

V 2262

Report Number TRC-95-N13

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Isuzu Motors, Ltd.

1995 Isuzu Trooper

4-door Multipurpose Passenger Vehicle

NHTSA Number: MS5700

TRC Test Number: 950222

Prepared By:

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March 20, 1995

Final Report

Prepared For:

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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1995 Isuzu Trooper 4-door Multi-Purpose Passenger Vehicle NHTSA No. MS5700, at Transportation Research Center Inc. on February 22, 1995. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.3 kph. The vehicle's maximum static crush was 568 millimeters. The ambient temperature was 24° C. The driver's Head Injury Criteria (HIC) was 853. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 53.5 g. The driver's chest maximum deflection was 45 millimeters. The driver's left and right femur maximum axial forces were 5906 N and 5570 N, respectively. The passenger's HIC was 735. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 58.5 g. The passenger's chest maximum deflection was 44 millimeters. The passenger's left and right femur maximum axial forces were 5502 N and 8080 N, respectively.			
17. Key Words 56 kph (35 mph) Frontal Barrier Impact Test: New Car Assessment Program (NCAP) FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Retention" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division Nassif Building, Room 5108 400 Seventh Street, S.W. Washington, DC 20590	
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
m ²	square inches	6.5	square centimeters	cm ²
ft ²	square feet	0.09	square meters	m ²
yd ²	square yards	0.8	square meters	m ²
mi ²	square miles	2.6	square kilometers	km ²
	acres	0.4	hectares	ha
MASS (weight)				
oz	ounces	28	grams	g
lb	pounds	0.45	kilograms	kg
	short tons (2000 lb)	0.9	tonnes	t
VOLUME				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
fl 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. C13.10.286.

Approximate Conversions from Metric Measures

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

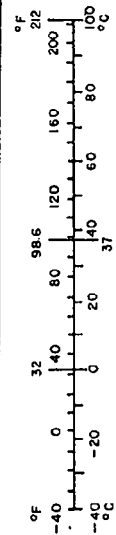


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Section 1.0

Purpose and Test Procedure

Purpose

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

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1995 Isuzu Trooper 4-door MPV, NHTSA Number MS5700, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

Test Procedure

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

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations. The driver's and passenger's restraint systems were instrumented with four (4) seat belt load cells to measure lap belt tension and shoulder belt tension; two (2) string potentiometers to measure shoulder belt displacement; and two (2) linear potentiometers to measure shoulder belt stretch. The vehicle impacted a frontal load cell barrier instrumented with thirty-six (36) barrier face load cells. The vehicle's specified impact velocity range was 55.5 to 57.1 kph.

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

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. Each 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-nine (89) 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 February 22, 1995.

The test vehicle, a 1995 Isuzu Trooper 4-door MPV, NHTSA Number MS5700, was equipped with a 3.2-liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 2232 kg. The vehicle's impact speed was 56.3 kph. The vehicle sustained 568 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 853. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 53.5 g. The driver's chest maximum deflection was 45 mm. The driver's left and right femur maximum axial forces were 5906 N and 5570 N, respectively.

The passenger's HIC was 735. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 58.5 g. The passenger's chest maximum deflection was 44 mm. The passenger's left and right femur maximum axial forces were 5502 N and 8080 N, respectively.

There was loss of windshield periphery retention along the lower edge between 75 and 100 mm and 170 and 290 mm as measured from the lower right corner of the windshield.

There was no penetration through the windshield.

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

Data Acquisition Explanations

One multiplexed data acquisition group recorded a questionable data spike at 29 milliseconds. The channels affected were:

PEVXG1, driver's pelvis X-axis acceleration

PEVYG1, driver's pelvis Y-axis acceleration

PEVZG1, driver's pelvis Z-axis acceleration

PEVXG2, right front passenger pelvis X-axis acceleration

PEVYG2, right front passenger pelvis Y-axis acceleration

PEVZG2, right front passenger pelvis Z-axis acceleration

The driver's and right front passenger's pelvis resultant acceleration calculations, PEVRG1 and PEVRG2, were affected by these data spikes. No cause of these spikes was found.

The driver's shoulder belt displacement potentiometer, SHBD1, recorded questionable data spikes at 36, 70, and 76 milliseconds. No cause of the spikes was found.

The left brake caliper X-axis accelerometer, BCLXG1, lost data after 58 milliseconds as a result of the vehicle's crush cutting the accelerometer's cable.

The engine bottom X-axis accelerometer, ENGXG2, lost data after 62 milliseconds as a result of the vehicle's crush cutting the accelerometer's cable.

The B4, B7, and C5 barrier face load cells, BB4F, BB7F, and BC5F, did not return to zero after the impact. This affected the barrier Group #2, Group #3, Group #5, and total force calculations.

Table 1 Crash Test Summary

NHTSA number:	MS5700	
Test type:	Frontal Load Cell Barrier	
Test date:	02/22/95	
Test time:	1543	
Ambient temperature:	24° C	
Vehicle year/make/ model/body style:	1995/Isuzu/Trooper/MPV	
Vehicle test weight:	2232 kg	
Impact angle ¹ :	0°	
Impact velocity ² :	Primary = 56.3 kph Secondary = 56.3 kph	
Maximum static crush:	568 mm	
Average rebound:	622 mm	
Dummies:	Driver #192	Passenger #142
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	3-point unbelt and airbag	3-point unbelt and airbag
Number of data channels:	89	
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/Isuzu/Trooper/MPV
Color: Red
VIN: JACDJ58V5S7901885
NHTSA number: MS5700
Engine data:
Placement: Longitudinal
Cylinders: 6
Displacement 3.2 liters
Transmission data: 4 speed, ___manual, Xautomatic, ___overdrive
___FWD, ___RWD, X4WD
Date vehicle received: 01/27/95
Odometer reading: 58
Dealer's name
and address: Hatfield Isuzu
1400 Automall Dr.
Columbus, OH 43228

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	Rear only
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by: Isuzu Motors, Ltd.
Date of manufacture: 12/94
VIN: JACDJ58V5S7901885
GVWR: 5510 lb
GAWR: Front: 2755 lb
Rear: 3085 lb

Table 2 Test Vehicle Information, Cont'd.

Size of tires: P245/70R16

Tire pressure with maximum
capacity vehicle load:

Front: 240 kPa

Rear: 240 kPa

Spare tire: P245/70R16

Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: P245/70R16

Recommended cold tire pressure:

Front: 210 kPa

Rear: 240 kPa

Designated seating capacity:

Front NA

Rear NA

Total NA

Vehicle capacity weight: NA kg

Test vehicle attitude:

Delivered attitude: LF 848 mm; RF 847 mm; LR 866 mm; RR 864 mm

Pre-test attitude: LF 848 mm; RF 855 mm; LR 822 mm; RR 840 mm

Post-test attitude: LF 867 mm; RF 912 mm; LR 834 mm; RR 819 mm

Table 2 Test Vehicle Information, Cont'd

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

Right front	497 kg	Right rear	473 kg
Left front	502 kg	Left rear	479 kg
Total front weight	999 kg	(51.2% of total vehicle weight)	
Total rear weight	952 kg	(48.8% of total vehicle weight)	
Total delivered weight	1951 kg		

Calculation of test vehicle's target test weight:

RCLW¹ = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1951 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)

Target test weight = 1951 + 136 + 152

Target test weight = 2239 kg

Weight of test vehicle with required dummies and 129 kg of cargo weight:

Right front	547 kg	Right rear	572 kg
Left front	547 kg	Left rear	566 kg
Total front weight	1094 kg	(49.0% of total vehicle weight)	
Total rear weight	1138 kg	(51.0% of total vehicle weight)	
Total test weight	2232 kg	(0.3% under target test weight)	

Weight of ballast secured in vehicle: 4 kg

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 1408 mm

Vehicle wheelbase: 2762 mm

¹ Cargo weight for multipurpose 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: 950222
NHTSA number: MS5700
Test date: 02/22/95
Test time: 1543
Test type: Frontal load cell barrier
Impact angle: 0°
Ambient temperature
at impact area: 24° 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:

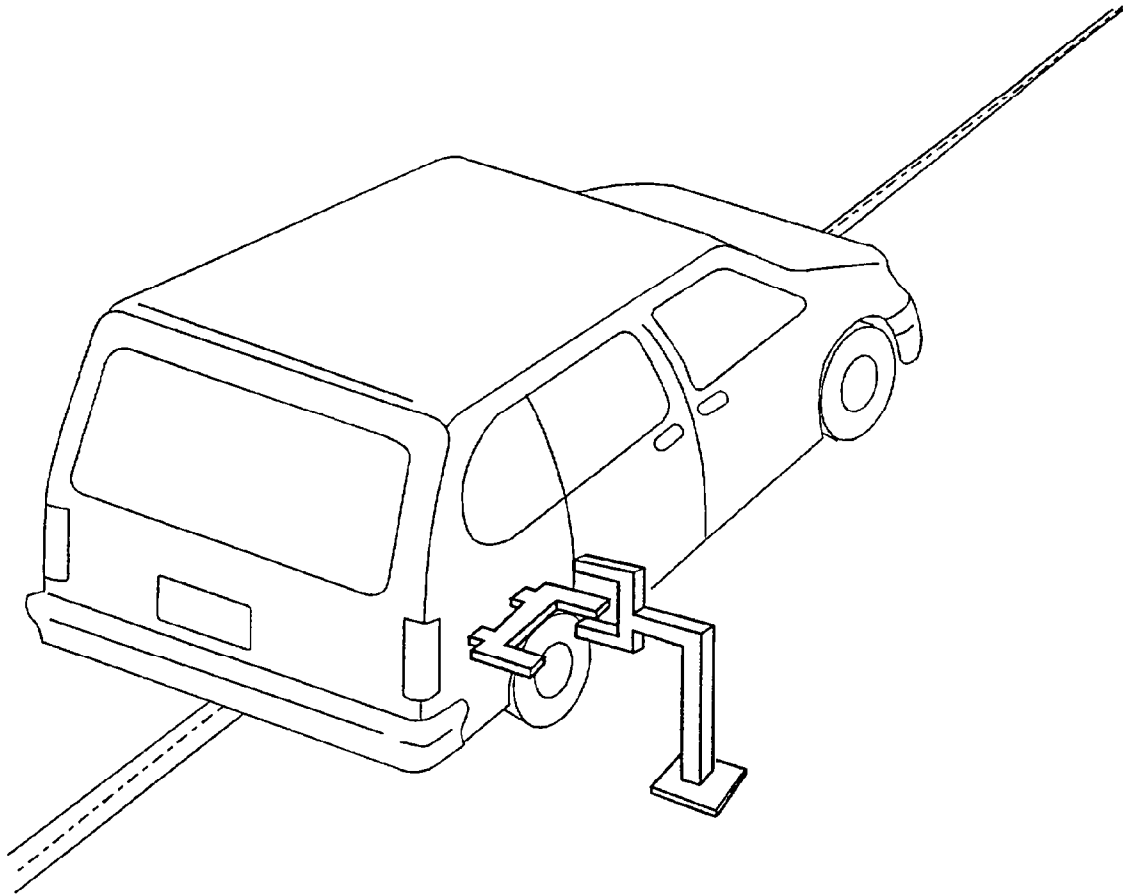
Pre-test: L 4609 mm; C 4693 mm; R 4608 mm
Post-test: L 4103 mm; C 4125 mm; R 4070 mm
Total crush: L 506 mm; C 568 mm; R 538 mm
Average crush: 537 mm

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test: L 623 mm; C 600 mm; R 643 mm
Average rebound 622 mm

Figure 1 Impact Velocity Measurement System



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

The vanes have 305-millimeter spacing.

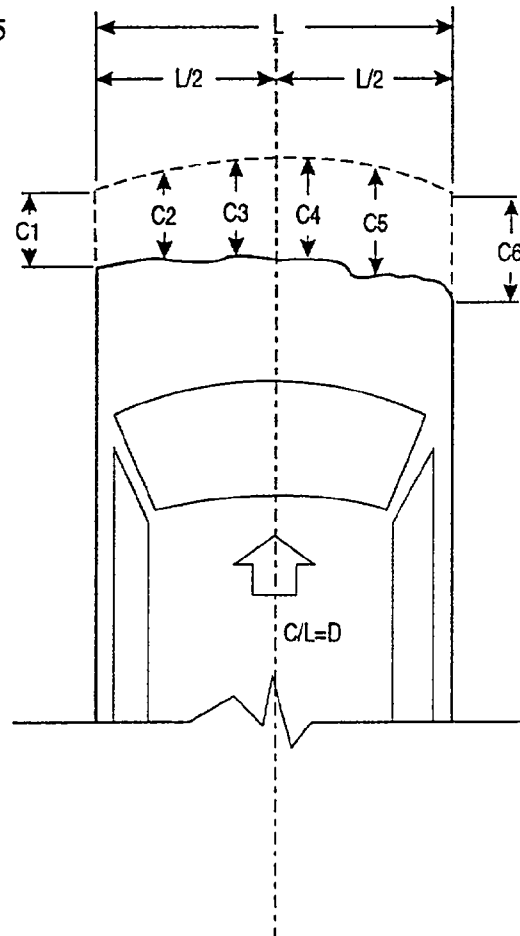
**Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact**

NHTSA number: MS5700
 Test date: 02/22/95
 Vehicle year/make/
 model/body style: 1995/Isuzu/Trooper/MPV
 Vehicle size category: Special Purpose
 VIN: JACDJ58V5S7901885
 Build date: 12/94
 Test weight: 2232 kg
 Vehicle wheelbase: 2762 mm
 Maximum width: 1749 mm
 Front overhang: 785 mm

Collision Deformation
 Classification (CDC) code: 12FDEW3

Crush depth
 measurements:

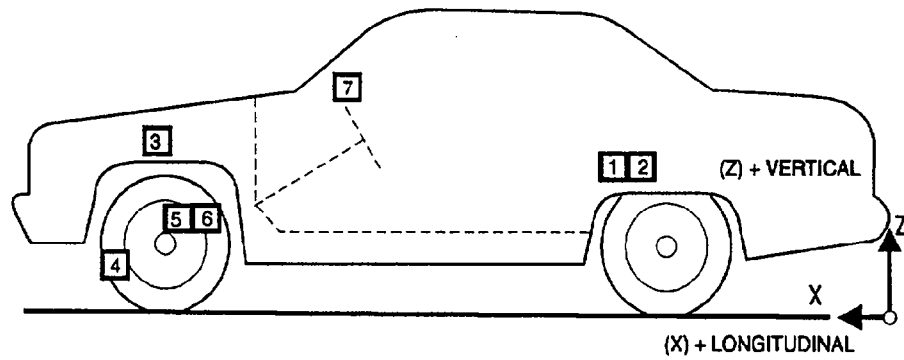
C1	=	506 mm
C2	=	525 mm
C3	=	561 mm
C4	=	565 mm
C5	=	574 mm
C6	=	538 mm



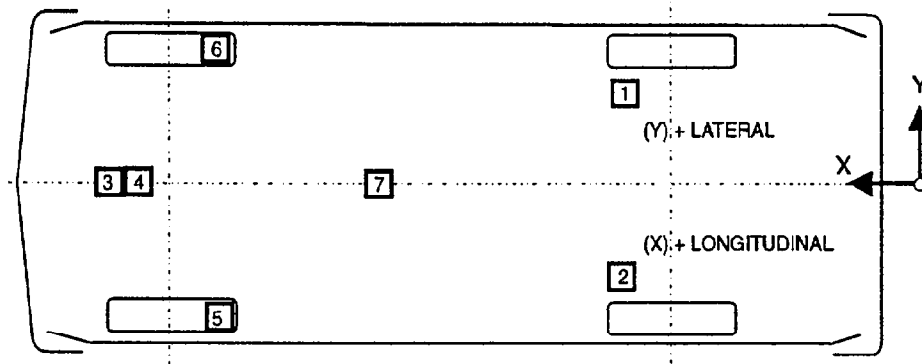
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1575 mm

Figure 3 Vehicle Accelerometer Placement



SIDE VIEW



BOTTOM VIEW

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 950222							
No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3285 mm	420 mm	680 mm	1.9 g	@ 129.4 ms	40.1 g	@ 22.8 ms
				0.6 g	@ 143.0 ms	41.3 g	@ 23.2 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	3261 mm	-420 mm	680 mm	1.4 g	@ 126.0 ms	40.4 g	@ 21.6 ms
				2.4 g	@ 126.2 ms	39.5 g	@ 21.4 ms
3 ENGINE TOP LONGITUDINAL	875 mm	-63 mm	1032 mm	36.9 g	@ 45.4 ms	151.4 g	@ 31.4 ms
4 ENGINE BOTTOM LONGITUDINAL ¹	865 mm	-78 mm	272 mm	---	---	---	---
5 RIGHT BRAKE CALIPER LONGITUDINAL	874 mm	-638 mm	340 mm	23.9 g	@ 65.1 ms	76.2 g	@ 37.4 ms
6 LEFT BRAKE CALIPER LONGITUDINAL ¹	881 mm	638 mm	342 mm	---	---	---	---
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1548 mm	0 mm	1294 mm	9.4 g	@ 104.4 ms	86.1 g	@ 69.4 ms

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 #142</u>
Head	Airbag	Airbag
Chest	Airbag	Airbag
Abdomen	None	None
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door Opening:

	<u>Left</u>	<u>Right</u>
Front	Tools required	Difficult, tools required
Rear	Easy	Easy

Seat Movement:

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

Glazing Damage:

The entire windshield cracked on impact.

Other Notable Impact Effects:

None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/
model/body style: 1995/Isuzu/Trooper/MPV
Vehicle NHTSA number: MS5700
Test date: 02/22/95

	Driver Dummy #192		Passenger Dummy #142	
<u>Maximum Accelerations:</u>				
Head X-axis	-75.8	g	-69.0	g
Head Y-axis	10.3	g	11.9	g
Head Z-axis	-43.2	g	-34.1	g
Head resultant	77.7	g	76.3	g
Chest X-axis	-54.6	g	-59.8	g
Chest Y-axis	-4.0	g	4.2	g
Chest Z-axis	-19.5	g	-17.6	g
Chest resultant ¹	53.5	g	58.5	g
Chest resultant time interval ¹	.003	sec	.003	sec
<u>Head Injury Criteria (HIC) Values:</u>				
HIC ²	853		735	
HIC starting time	.059	sec	.055	sec
HIC ending time	.095	sec	.091	sec
Avg. head resultant accel. during HIC time interval	56.2	g	52.9	g
<u>Maximum Chest Deflections:</u>				
Chest X-axis	45	mm	44	mm
Maximum chest deflection time	.077	sec	.062	sec
<u>Maximum Compressive Femur Forces:</u>				
Left femur	5906	N	5502	N
Right femur	5570	N	8080	N
<u>Maximum Seat Belt Forces:</u>				
Lap belt	5882	N	4872	N
Shoulder belt	9239	N	7463	N

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

¹ 0.003 Sec. Minimum duration.

² The maximum HIC time interval is 36 milliseconds.

Table 7 Hybrid III Neck and Pelvis Data Summary

Vehicle year/make/
model/body style: 1995/Isuzu/Trooper/MPV
Vehicle NHTSA number: MS5700
Test date: 02/22/95

	Driver Dummy #192	Passenger Dummy #142
<u>Maximum Values:</u>		
Neck X-axis force	828 N	-712 N
Neck Y-axis force	323 N	236 N
Neck Z-axis force	2326 N	2161 N
Neck moment about X-axis	22 N-m	13 N-m
Neck moment about Y-axis	49 N-m	41 N-m
Neck moment about Z-axis	10 N-m	11 N-m
Pelvis X-axis ¹	-74.7 g	-77.9 g
Pelvis Y-axis ¹	12.0 g	6.9 g
Pelvis Z-axis ¹	16.9 g	13.1 g
Pelvis Resultant ¹	64.6 g	78.9 g

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

¹ See Data Acquisition Explanations

Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest were restrained by the driver's airbag as the dummy's torso was restrained by the three-point unbelt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The driver dummy came to rest in the driver's seat restrained by the three-point unbelt.

Right Front Passenger Dummy

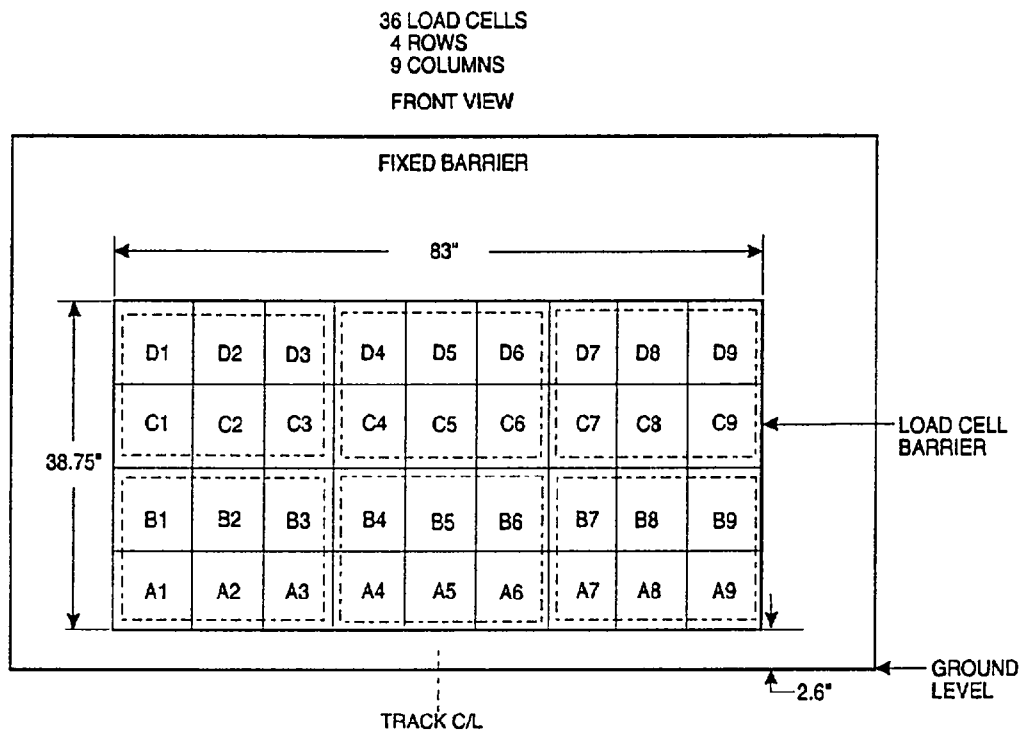
Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head rotated forward as the dummy's head and chest were restrained by the passenger's airbag and the dummy's torso was restrained by the three-point unbelt. The dummy's head rotated rearward as the dummy rebounded into the seat back. The right front passenger dummy came to rest in the right front passenger's seat 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.	2555 mm	2710 mm
Shoulder belt length as measured on Part 572 dummy.	850 mm	860 mm
Lap belt length as measured on Part 572 dummy.	890 mm	920 mm
<u>Shoulder belt spool-off length:</u>		
As determined by film analysis	75 mm	110 mm
As determined mechanically	111 mm	141 mm
As determined electronically ¹	112 mm	163 mm
<u>Belt stretch length:</u>		
As measured mechanically	0 mm/m	0 mm/m
As measured electronically	86 mm/m	48 mm/m
<u>Retractor lock-up time:</u>		
As determined by shoulder belt spool-off	70 ms	72 ms

¹ See Data Acquisition Explanations

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	1.7 kN @ 219.0 ms	106.5 kN @ 31.5 ms
Total group 2 ¹	0.5 kN @ 4.0 ms	380.5 kN @ 32.2 ms
Total group 3 ¹	0.8 kN @ 4.4 ms	197.0 kN @ 18.7 ms
Total group 4	0.9 kN @ 216.6 ms	61.0 kN @ 28.7 ms
Total group 5 ¹	-1.7 kN @ 154.7 ms	293.8 kN @ 34.1 ms
Total group 6	1.5 kN @ 155.0 ms	100.4 kN @ 24.0 ms
Total load cell force ¹	-6.6 kN @ 155.0 ms	1066.9 kN @ 32.4 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.:

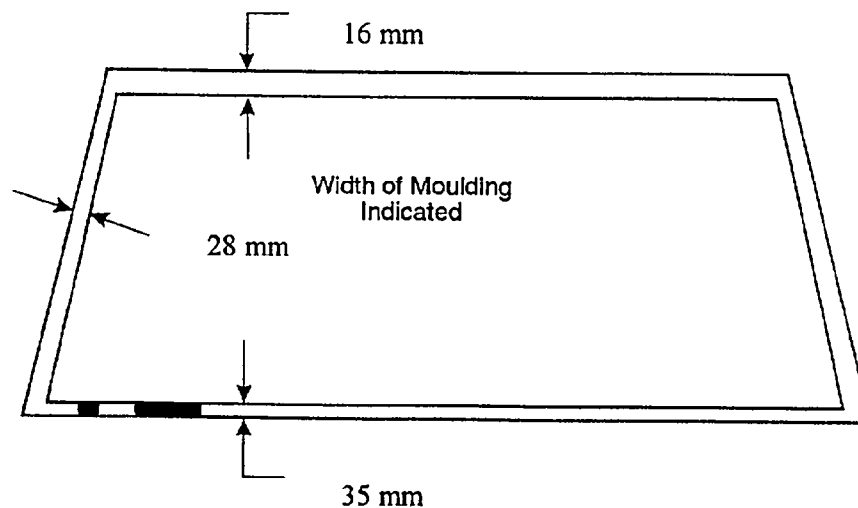
Plastic trim around outer perimeter, adhesive around inner perimeter.

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	2068 mm	1923 mm	93.0
Left side	2068 mm	2068 mm	100.0
Total	4136 mm	3991 mm	96.5

Pre-test windshield mounting material temperature: 20° C



Front view of windshield¹

Loss of windshield retention lengths: Retention was lost along the bottom edge between 75 and 100 mm and 170 and 290 mm as measured from the lower right corner.

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

Figure 6 FMVSS 219 Test Data

Protected zone lower edge requirement:

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

Windshield measurements:

A = 1326 mm

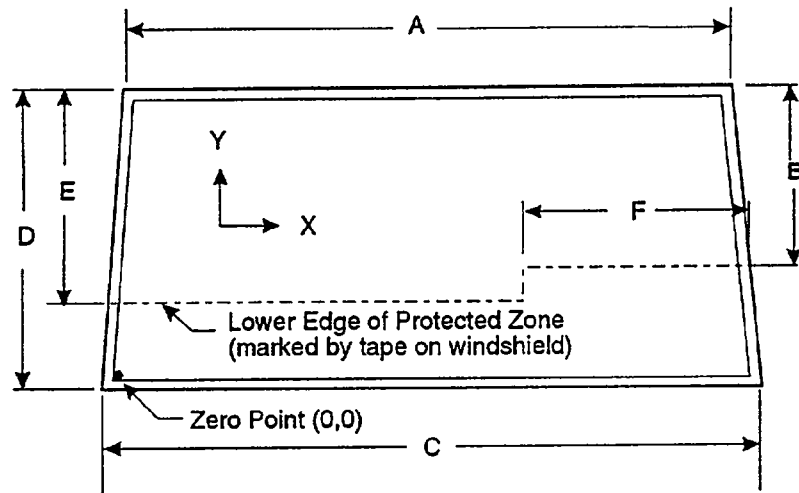
B = 421 mm

C = 1619 mm

D = 701 mm

E = 502 mm

F = 978 mm



FRONT VIEW

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/Isuzu/Trooper/MPV
NHTSA number:	MS5700
Fuel system capacity:	85.0 liters (from owner's manual)
Usable capacity:	84.0 liters (furnished by COTR)
Test volume range:	77.3 liters to 79.0 liters (92-94% of usable)
Actual test volume:	78.0 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 behind the rear axle. The fuel filler neck is located on the right. The fuel lines run along the right frame rail to the front.
-------------------------	--

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MS5700
Test date: 02/22/95
Vehicle year/make/
model/body style: 1995/Isuzu/Trooper/MPV

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:

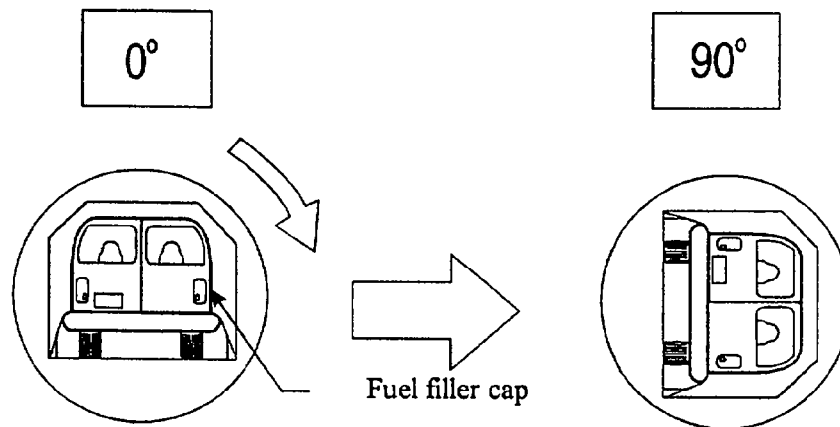
	Test Results	Maximum Allowable
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MS5700

Test phase



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

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

FMVSS 301 position hold time = 5 minutes, 0 seconds

Total = 7 minutes, 0 seconds

Next whole minute interval = 7 minutes

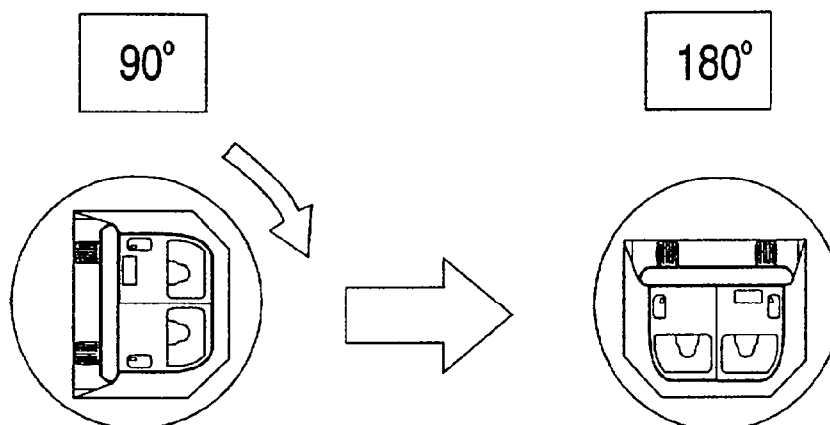
Fuel system fluid spillage measurements:

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

Fuel system fluid spillage location(s): None

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

Test phase



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

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

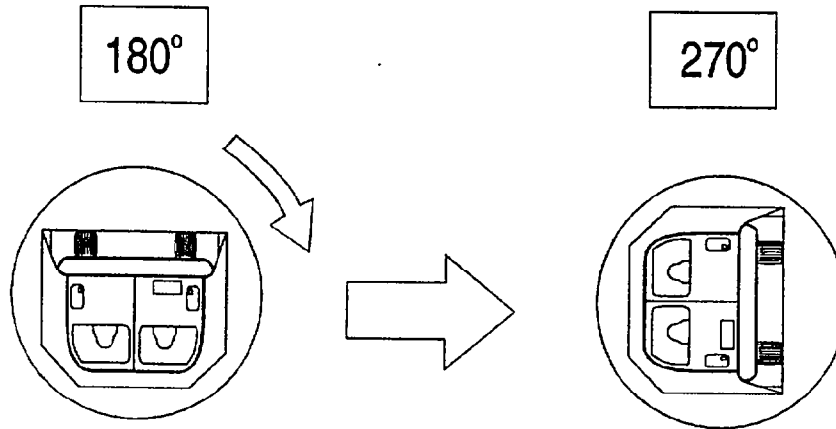
Fuel system fluid spillage measurements:

	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

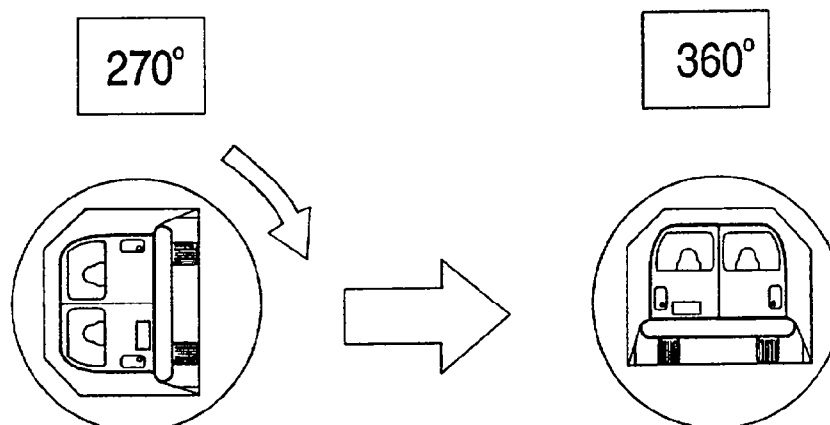
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>180° to 270° 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 = 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

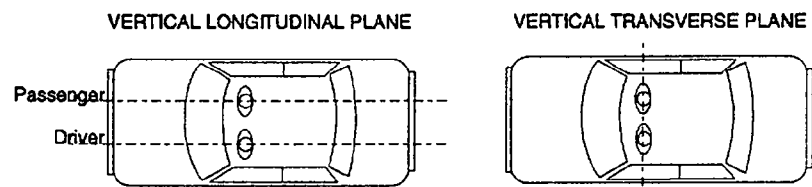
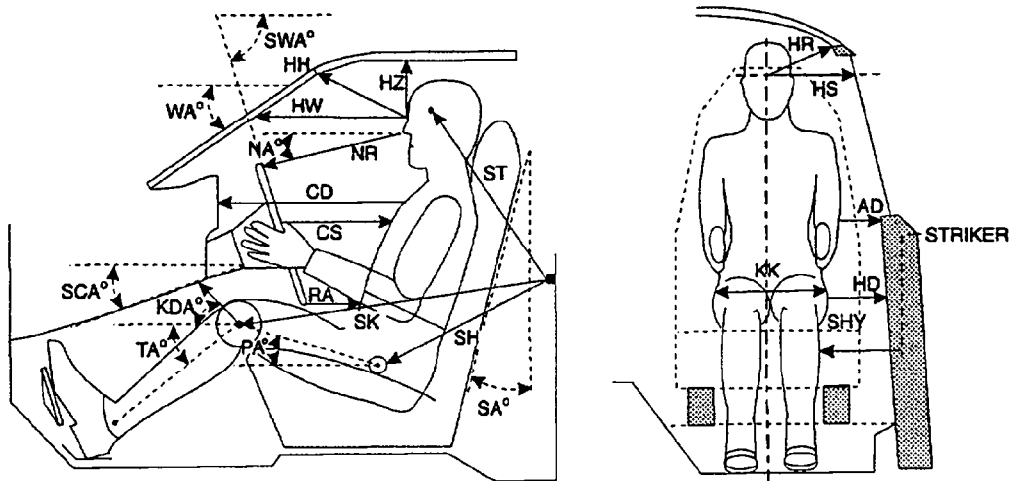


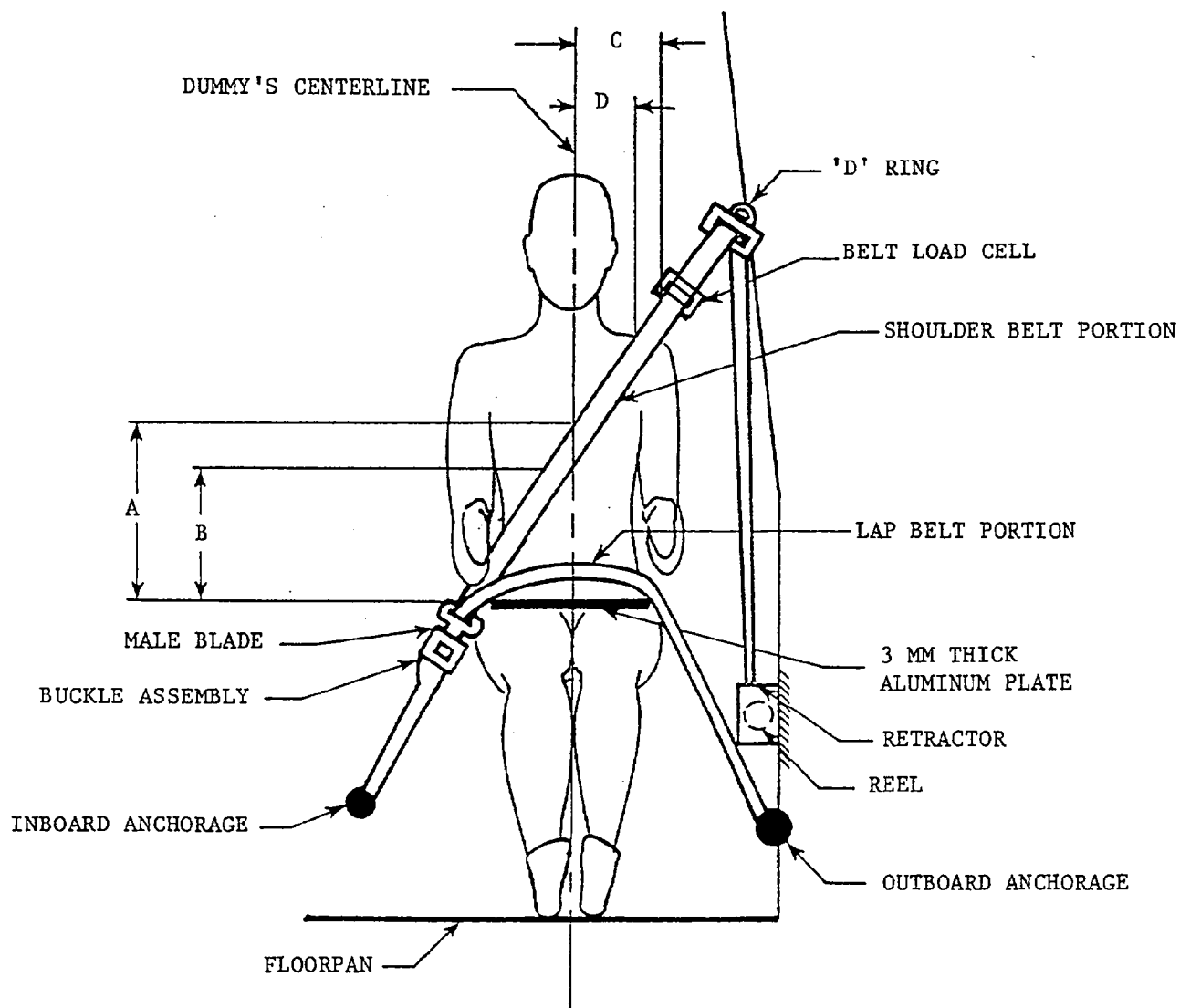
Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #192)	Passenger (Serial #142)
WA	Windshield angle	40°	NA
SWA	Steering wheel angle	60°	NA
SCA	Steering column angle	30°	NA
SA	Seat back angle	20°	20°
HZ	Head to roof	217 mm	219 mm
HH	Head to header	410 mm	404 mm
HW	Head to windshield	552 mm	545 mm
HR	Head to side header	249 mm	253 mm
NR	Nose to rim	392 mm	NA
NA	Nose to rim angle	17°	NA
CD	Chest to dash	527 mm	545 mm
CS	Steering wheel to chest	299 mm	NA
RA	Rim to abdomen	155 mm	NA
KDL	Left knee to dash	169 mm	158 mm
KDR	Right knee to dash	162 mm	151 mm
KDA	Outboard knee to dash angle	25°	21°
PA	Pelvic angle	23°	23°
TA	Tibial angle	47°	47°
KK	Knee to knee	330 mm	270 mm
ST ¹	Striker to head	645 mm	639 mm
	Striker to head angle	-79°	-84°
SK ¹	Striker to knee	605 mm	625 mm
	Striker to knee angle	-2°	-3°
SH ¹	Striker to H-point	224 mm	239 mm
	Striker to H-point angle	3°	5°
SHY	Striker to H-point (Y dir.)	204 mm	234 mm
HS	Head to side window	328 mm	326 mm
HD	H-point to door	175 mm	178 mm
AD	Arm to door	109 mm	110 mm

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

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

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
A - Top surface of aluminum plate to belt upper edge	365 mm	360 mm
B - Top surface of aluminum plate to belt lower edge	280 mm	272 mm
C - Dummy centerline to outer edge of belt at chest flesh top	132 mm	135 mm
D - Dummy centerline to inner edge of belt at chest flesh top	69 mm	72 mm
Lap belt tension	13 N	13 N
Shoulder belt tension	18 N	18 N
Adjustable seat belt anchorage position	NA	NA

Figure 10 Camera Positions

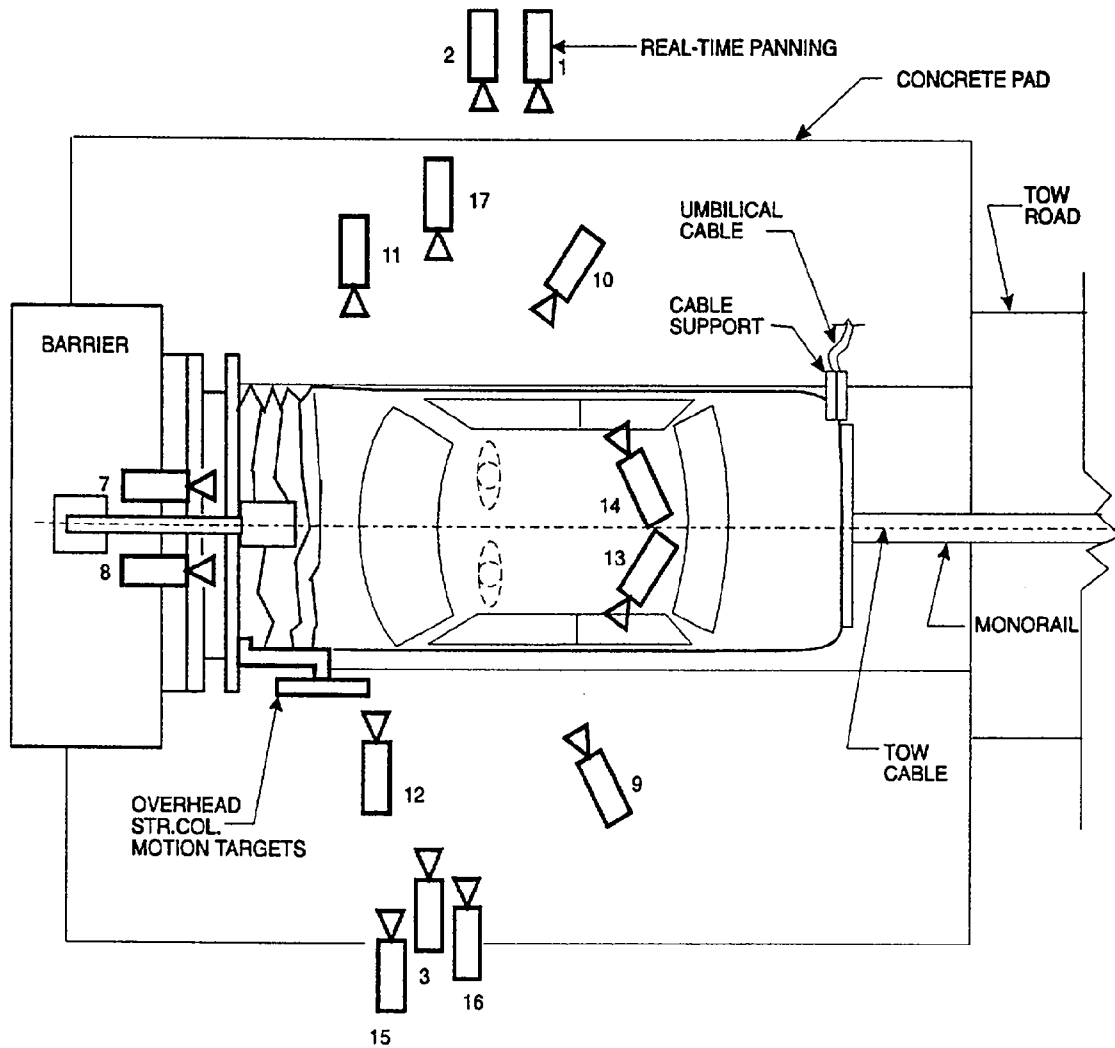


Figure 10 Camera Positions, Cont'd.

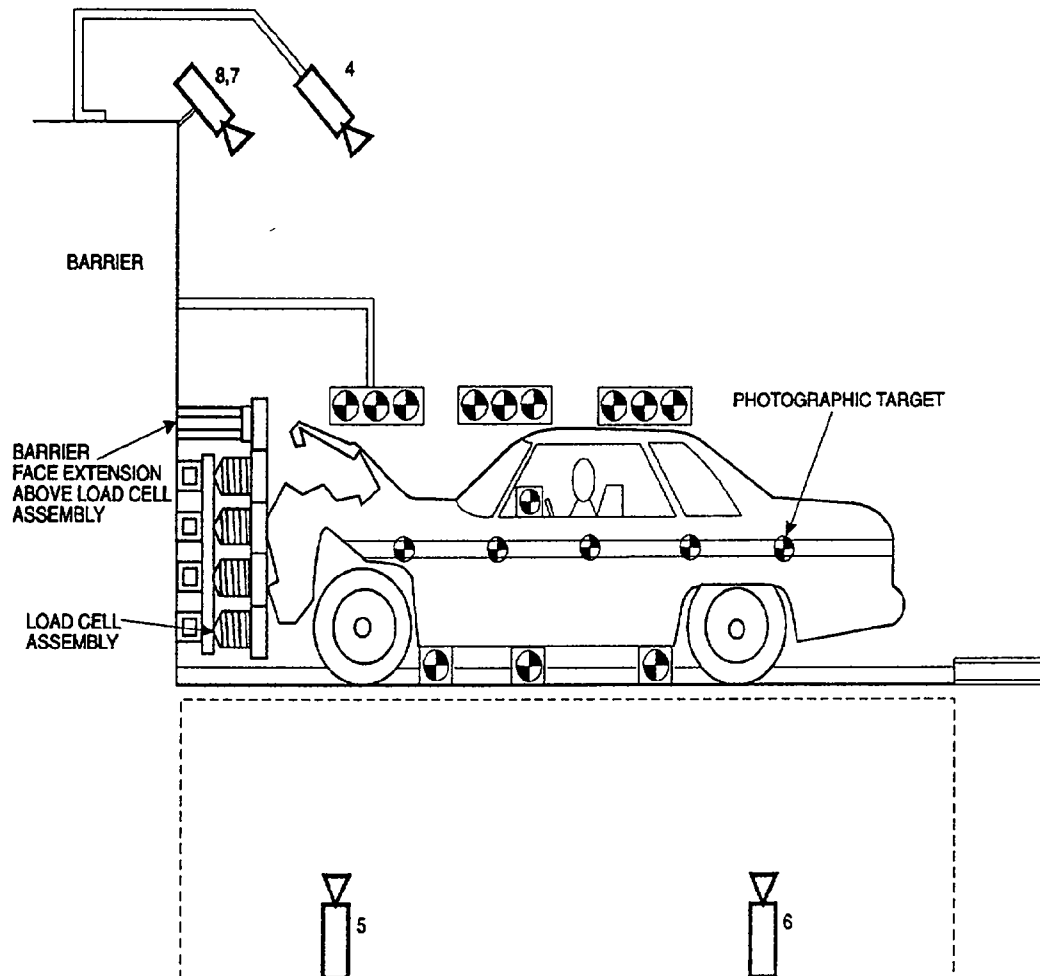


Table 13 Motion Picture Camera Locations

Test Number: 950222

Vehicle year/make/model/body style: 1995/Isuzu/Trooper/MPV

Camera Number	View	Camera Positions ¹			Z	Angle ²	Film Plane to Head Target	Lens	Film Speed
		X	Y						
1	Real-time panning	-3607 mm	-2802 mm	1549 mm	NA	NA	NA mm	16 mm	24 frames/s
2	Vehicle crush	-2065 mm	-6767 mm	942 mm	-2°	-2°	NA mm	13 mm	518 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	-12°	5740 mm	25 mm	995 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	-40°	NA mm	13 mm	500 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	90°	NA mm	13 mm	1000 frames/s
6	Fluid spillage	-2522 mm	0 mm	-2515 mm	90°	90°	NA mm	13 mm	1002 frames/s
7	Passenger kinematics	-114 mm	-351 mm	2159 mm	-40°	-40°	NA mm	17 mm	502 frames/s
8	Driver kinematics	-173 mm	368 mm	2159 mm	-41°	-41°	NA mm	17 mm	502 frames/s
9	Driver kinematics	-4572 mm	1854 mm	2591 mm	-27°	-27°	2388 mm	25 mm	500 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	-26°	2591 mm	25 mm	495 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	0°	NA mm	50 mm	500 frames/s
12	Windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	0°	NA mm	50 mm	502 frames/s
13	Driver seat belt movement	NA	NA	NA	NA	NA	NA mm	NA mm	500 frames/s
14	Passenger seat belt movement	NA	NA	NA	NA	NA	NA mm	NA mm	498 frames/s
15	Column movement	-2438 mm	7264 mm	2616 mm	-14°	-14°	NA mm	25 mm	510 frames/s
16	Column movement	-2438 mm	7264 mm	1908 mm	-9°	-9°	NA mm	25 mm	500 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	7°	6147 mm	25 mm	1005 frames/s

¹ +X = Film plane forward of barrier face² +Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

+Angle = Film plane angled upward from horizontal plane

Figure 11 Vehicle Target Locations

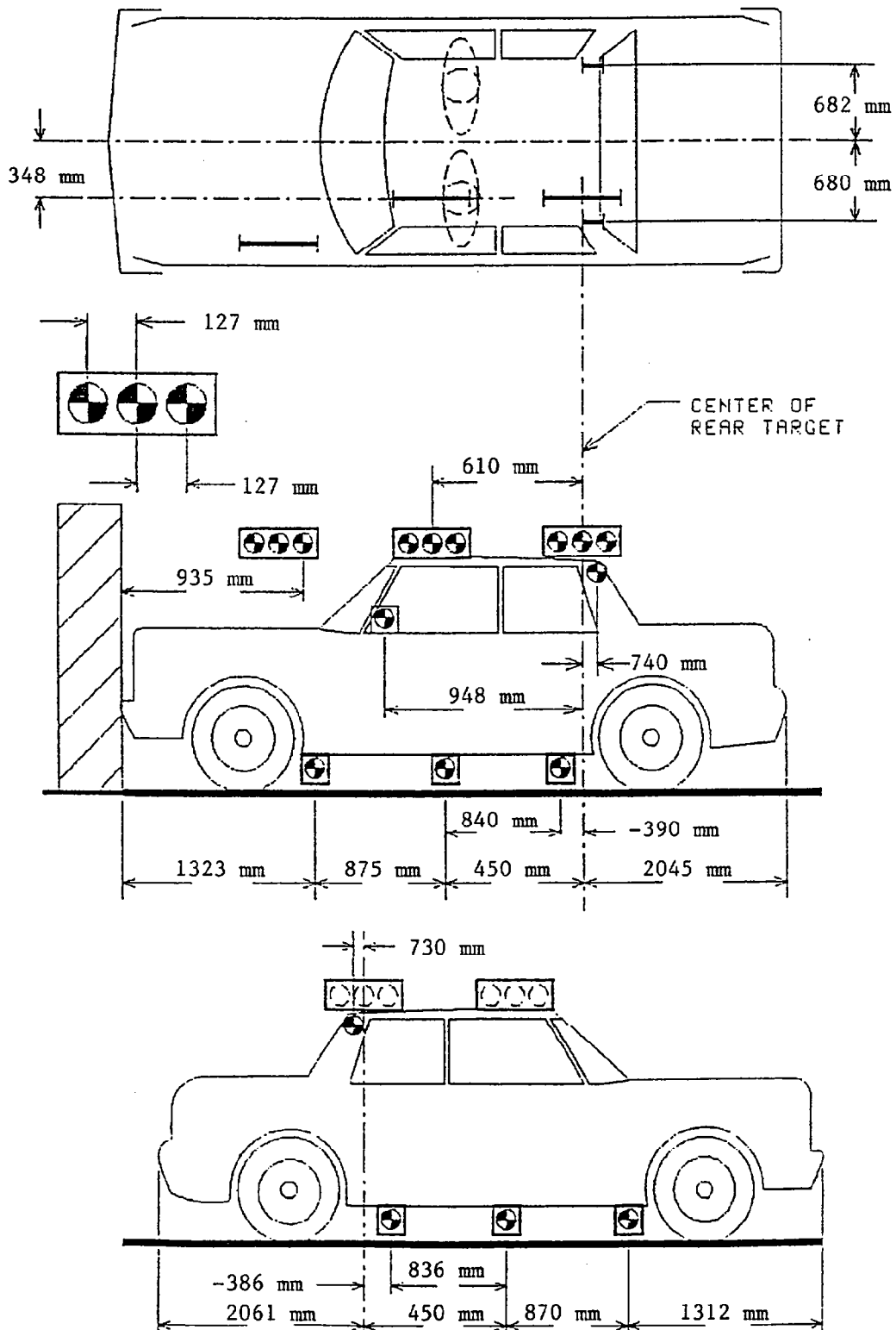


Figure 12 Pre-Test And Post-Test Measurement Points

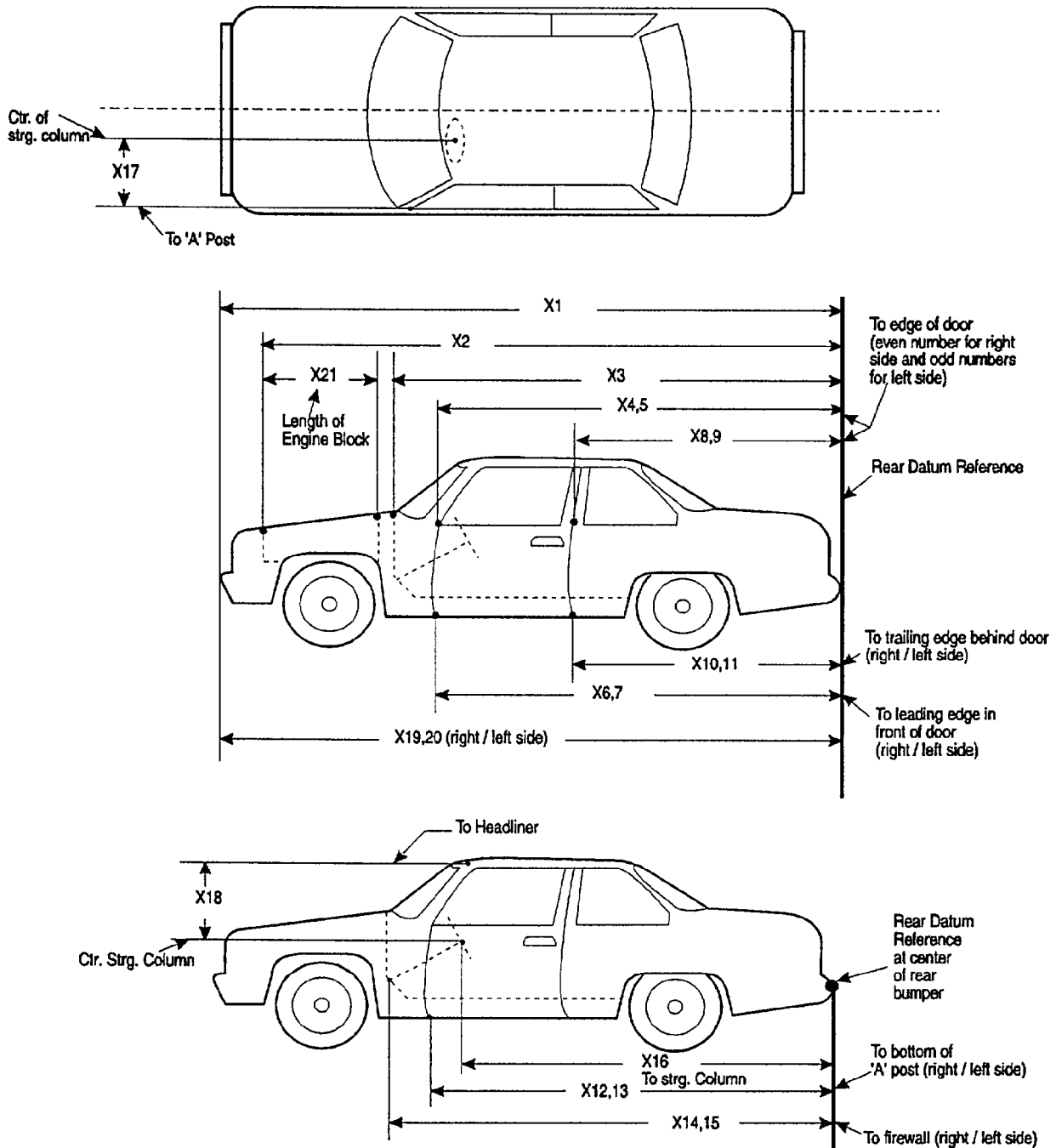


Table 14 Impacted Vehicle Measurements

Vehicle Make/Model: Isuzu/Trooper

Test Number: 950222

No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4693 mm	4125 mm	568 mm
X2	Rear surface of vehicle to front of engine block	4064 mm	3825 mm	239 mm
X3	Rear surface of vehicle to firewall	3615 mm	3475 mm	140 mm
X4	Rear surface of vehicle to upper leading edge of right door	3349 mm	3290 mm	59 mm
X5	Rear surface of vehicle to upper leading edge of left door	3345 mm	3285 mm	60 mm
X6	Rear surface of vehicle to lower leading edge of right door	3323 mm	3250 mm	73 mm
X7	Rear surface of vehicle to lower leading edge of left door	3325 mm	3290 mm	35 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2315 mm	2262 mm	53 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2312 mm	2330 mm	-18 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2321 mm	2251 mm	70 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2322 mm	2283 mm	39 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3338 mm	3266 mm	72 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3337 mm	3292 mm	45 mm
X14	Rear surface of vehicle to firewall - right side	3604 mm	3498 mm	106 mm
X15	Rear surface of vehicle to firewall - left side	3604 mm	3566 mm	38 mm
X16	Rear surface of vehicle to steering wheel center	2869 mm	2850 mm	19 mm
X17	Center of steering column to "A" post	314 mm	285 mm	29 mm
X18	Center of steering column to headliner	506 mm	515 mm	-9 mm
X19	Rear surface of vehicle to right side of front bumper	4608 mm	4070 mm	538 mm
X20	Rear surface of vehicle to left side of front bumper	4609 mm	4103 mm	506 mm
X21	Length of engine block	385 mm	385 mm	0 mm

Appendix A

Photographs

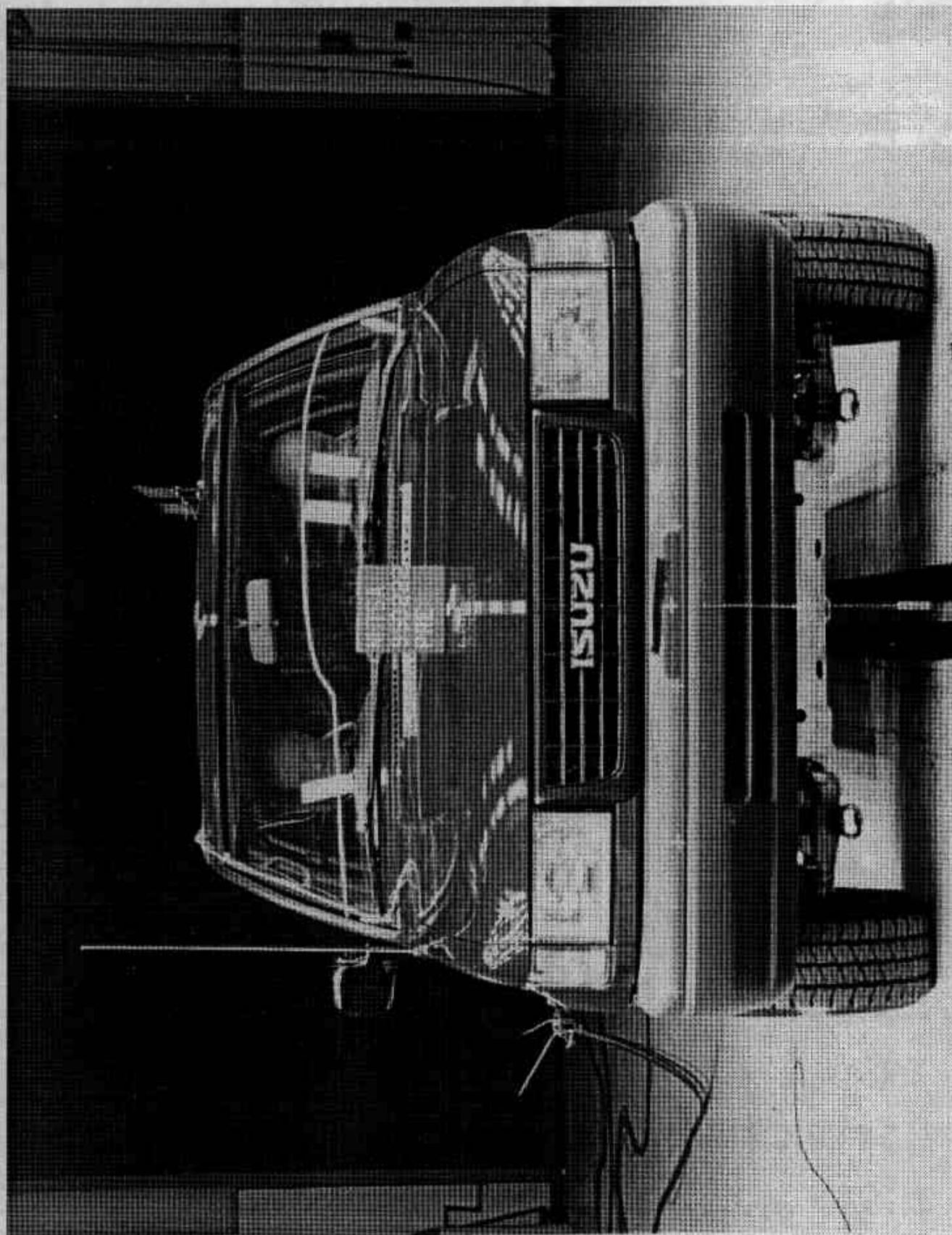


Figure A-1. Pre-Test Front View
A-2

950222

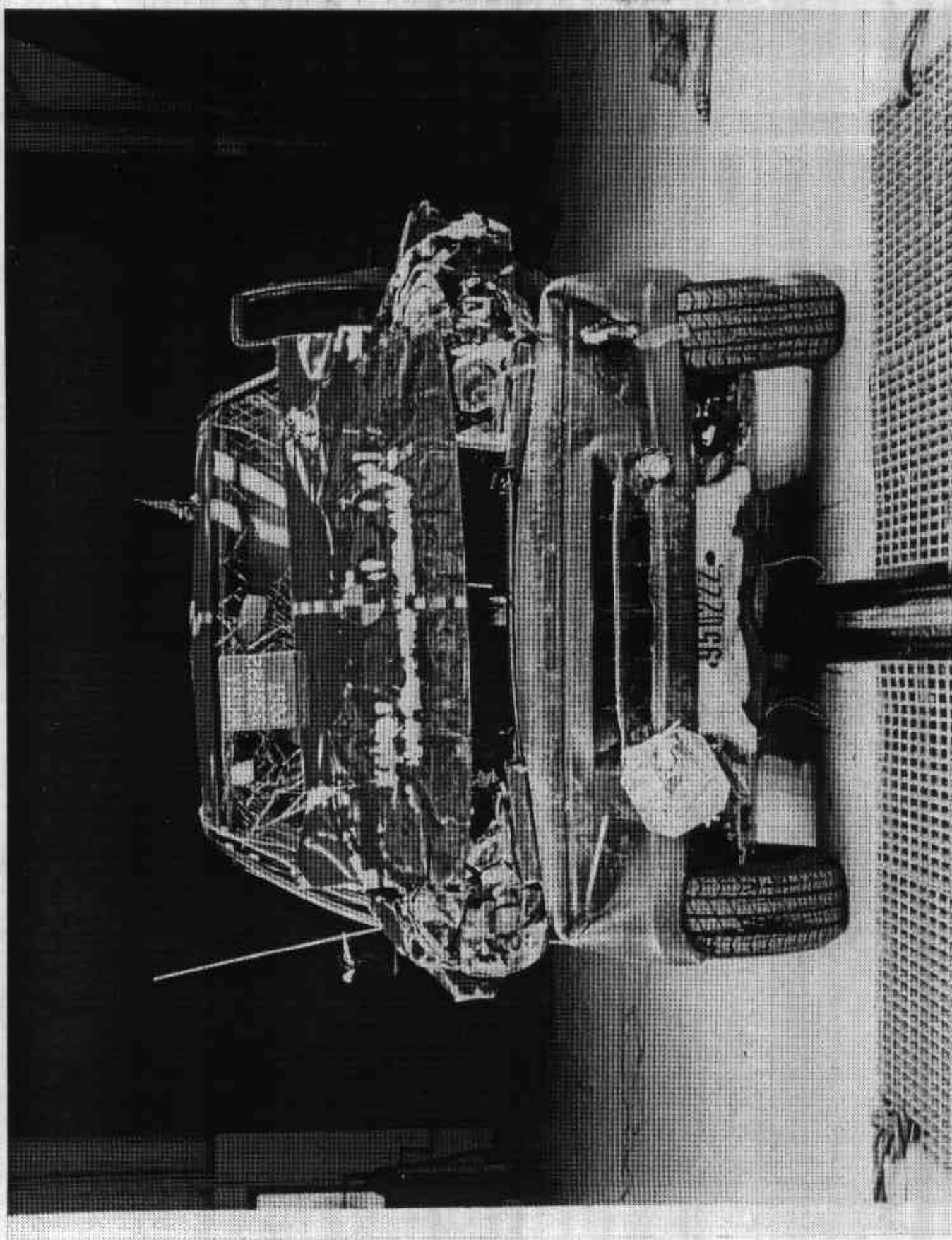


Figure A-2. Post-Test Front View
A-3

950222

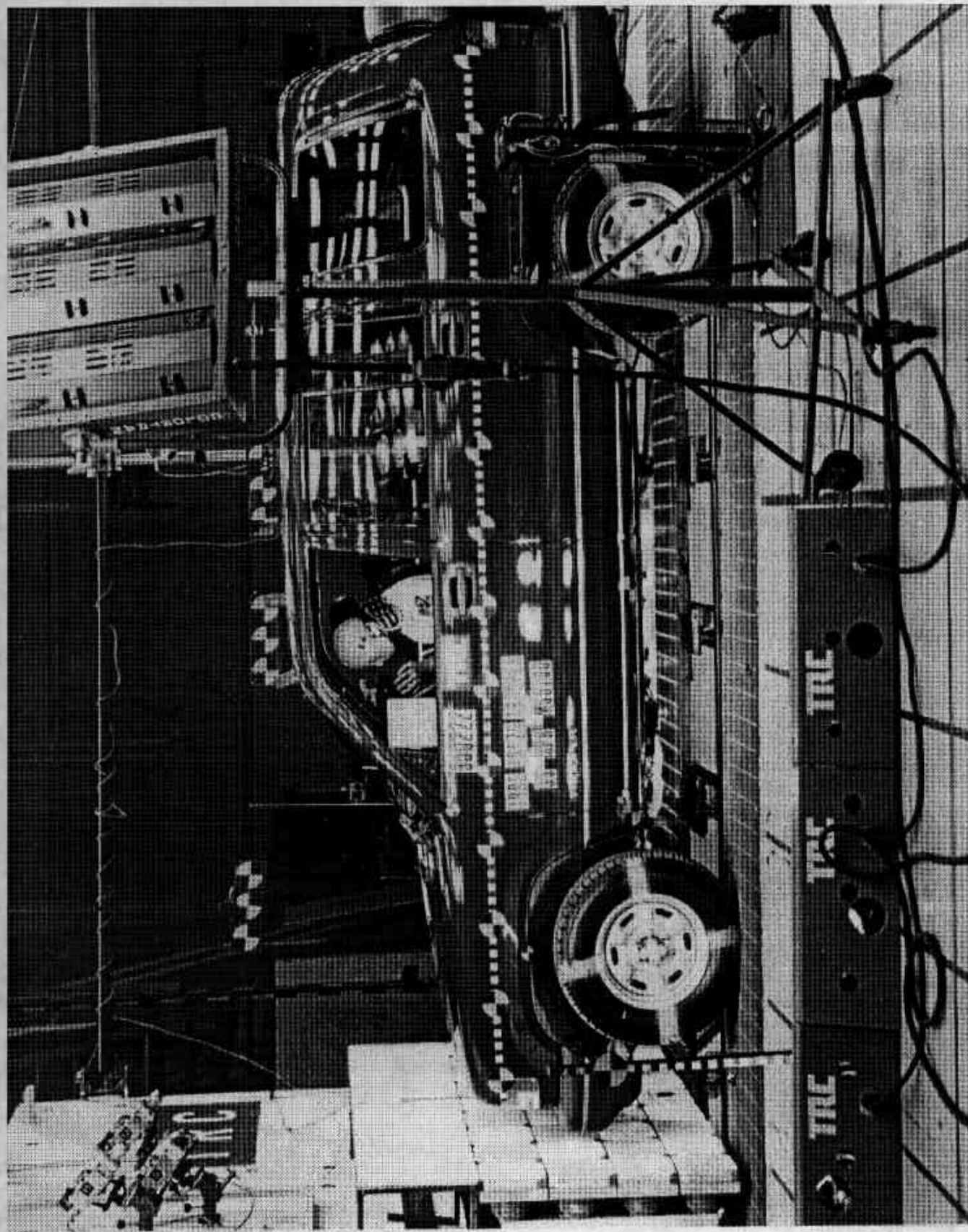


Figure A-3. Pre-Test Left Side View
A-4

950222

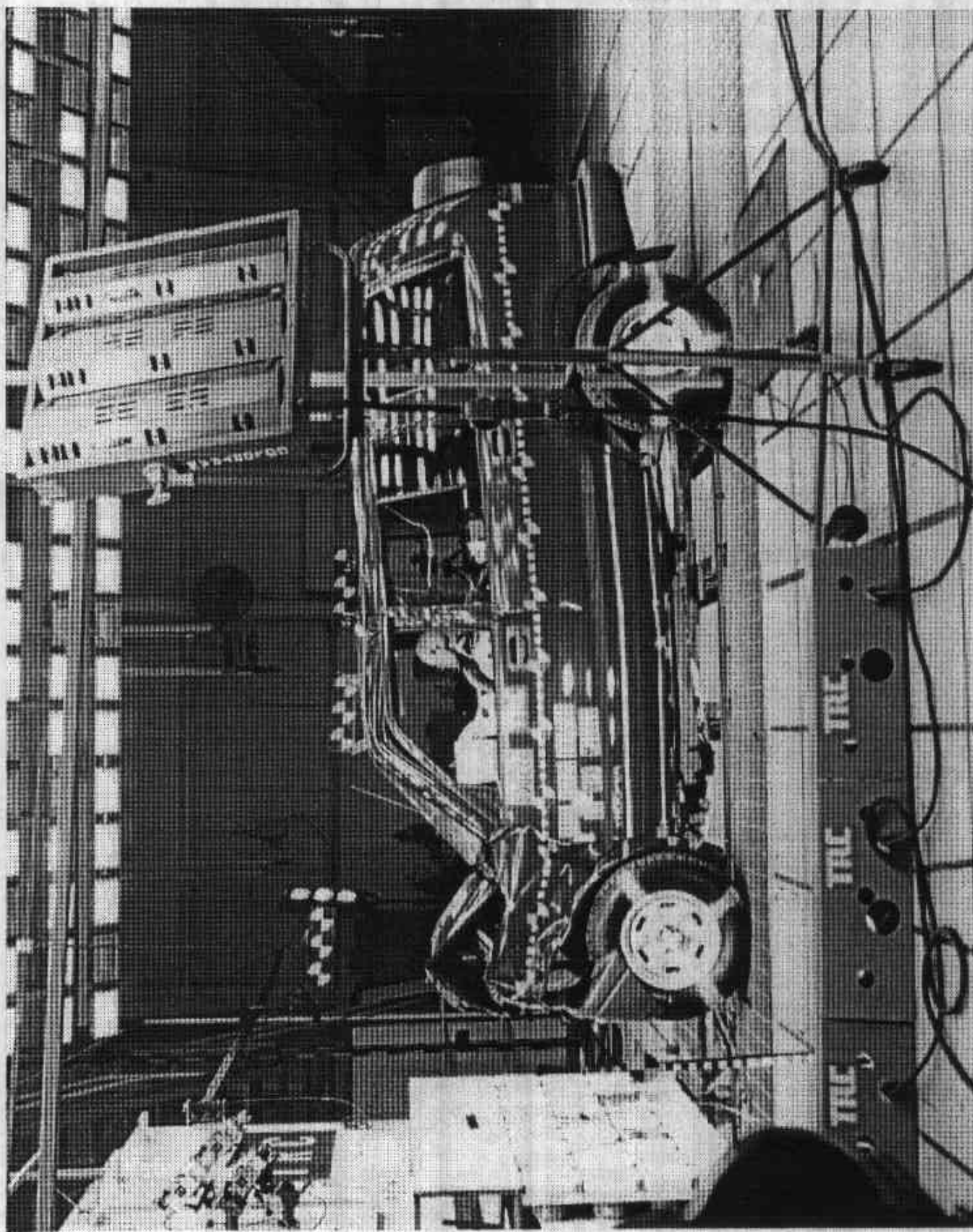


Figure A-4. Post-Test Left Side View
A-5

950222

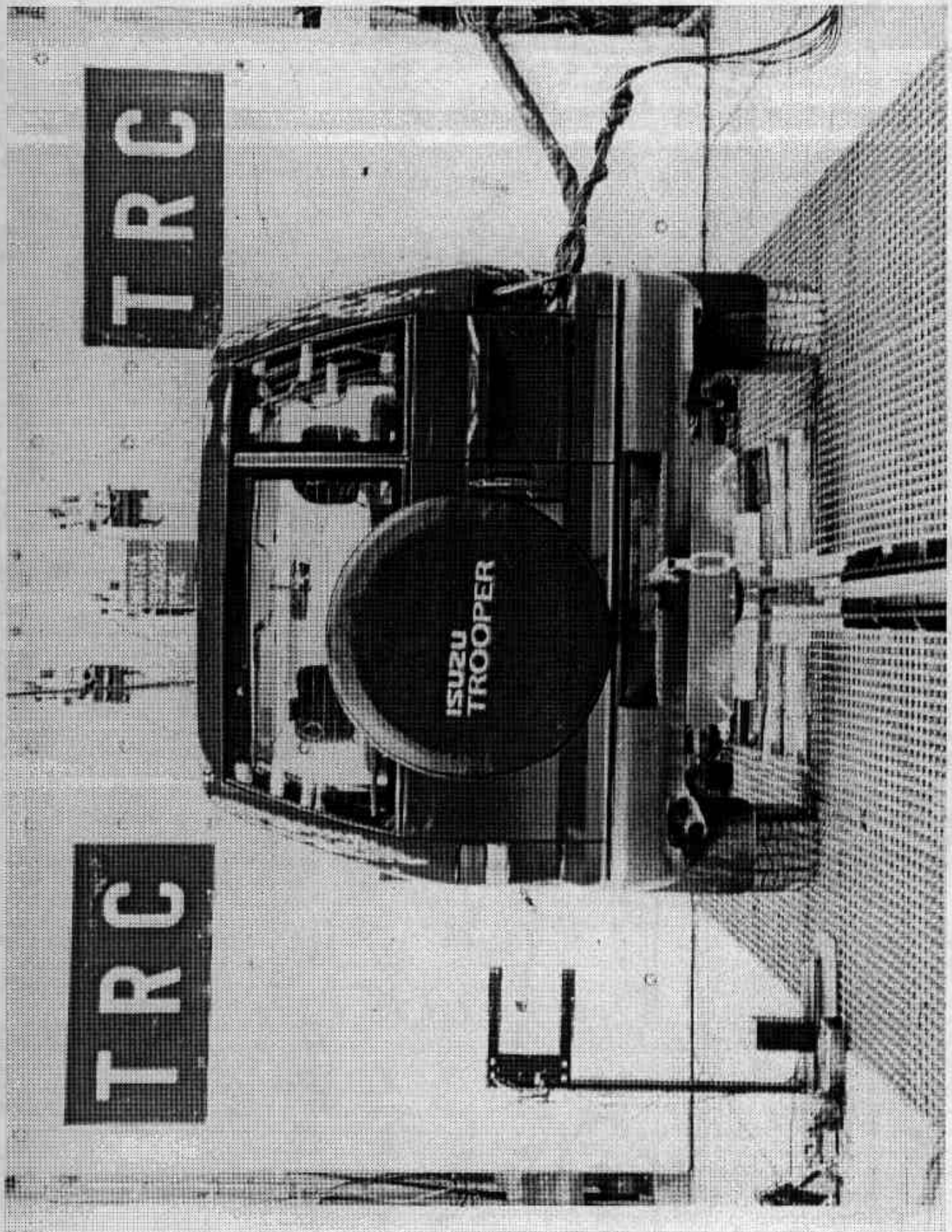


Figure A-5. Pre-Test Rear View
A-6

950222

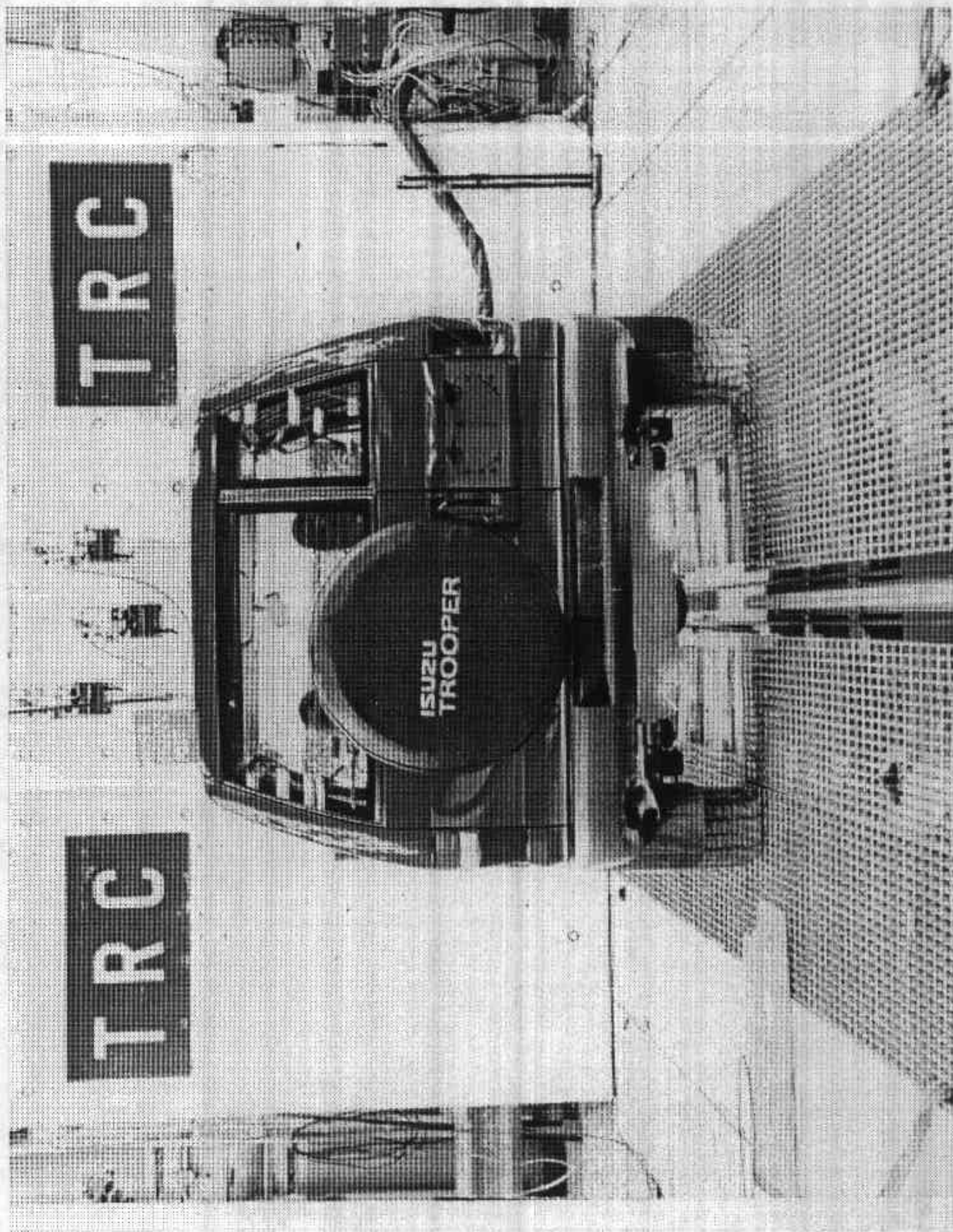


Figure A-6. Post-Test Rear View
A-7

950222

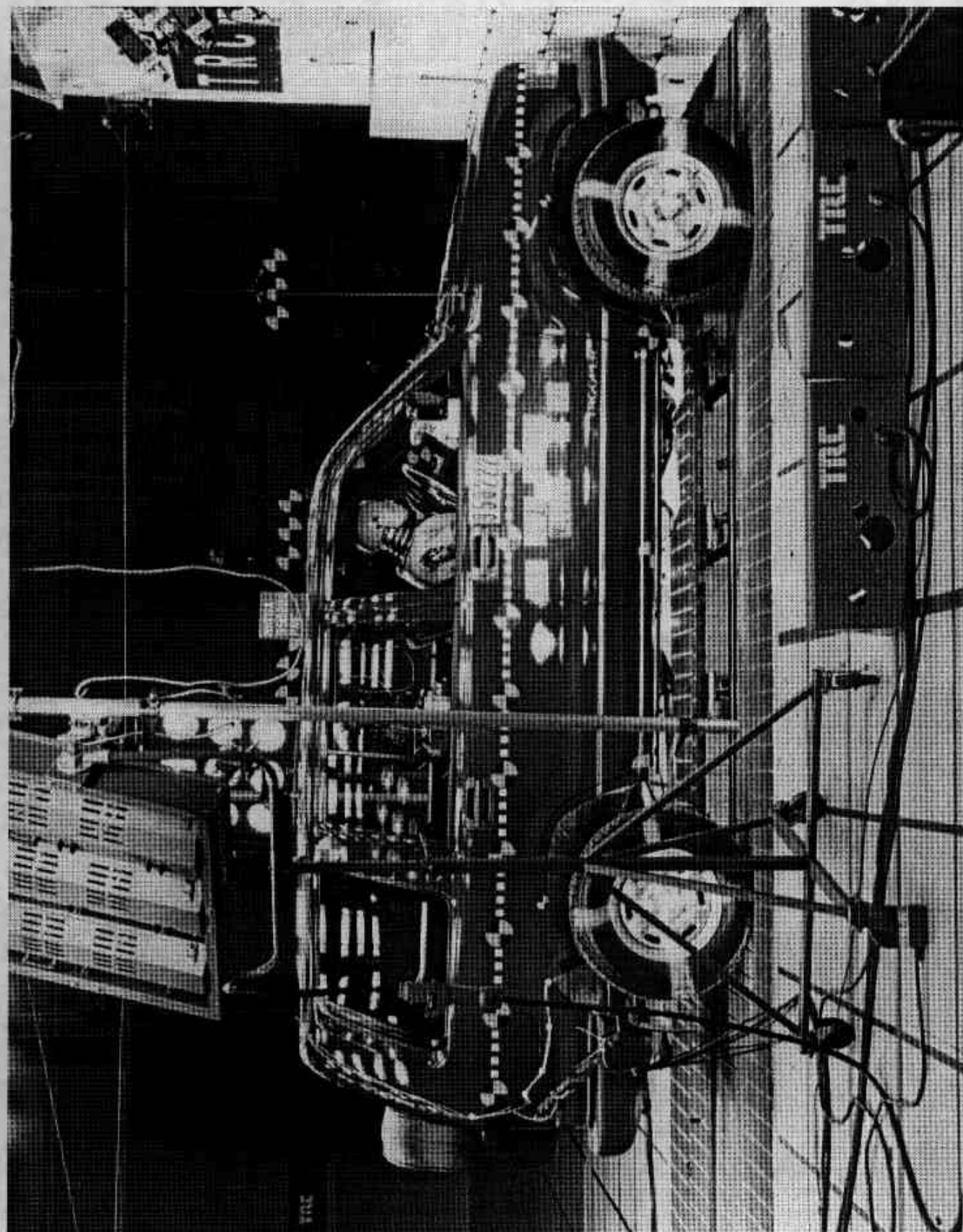


Figure A-7. Pre-Test Right Side View
A-8

950222

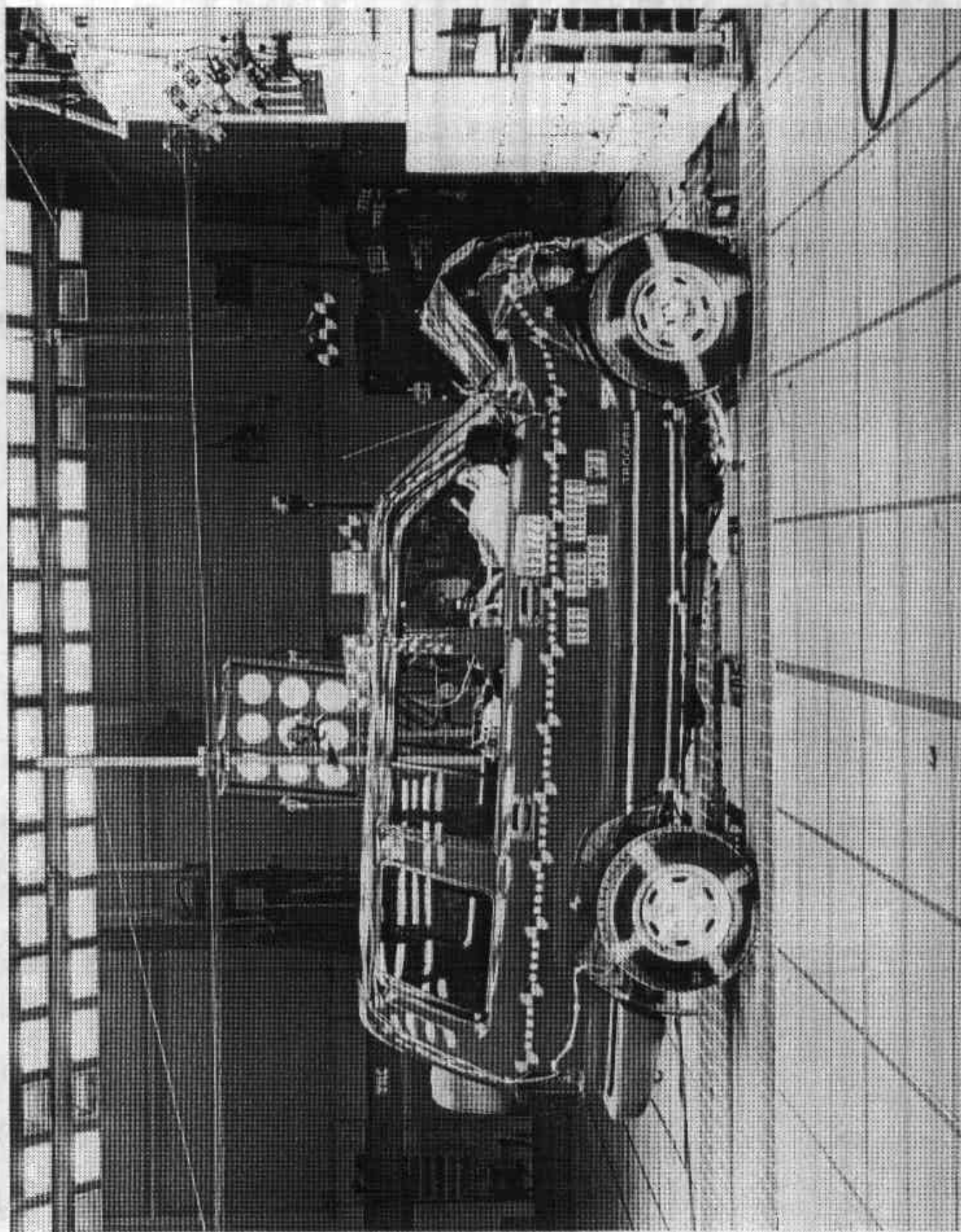


Figure A-8. Post-Test Right Side View
A-9

950222

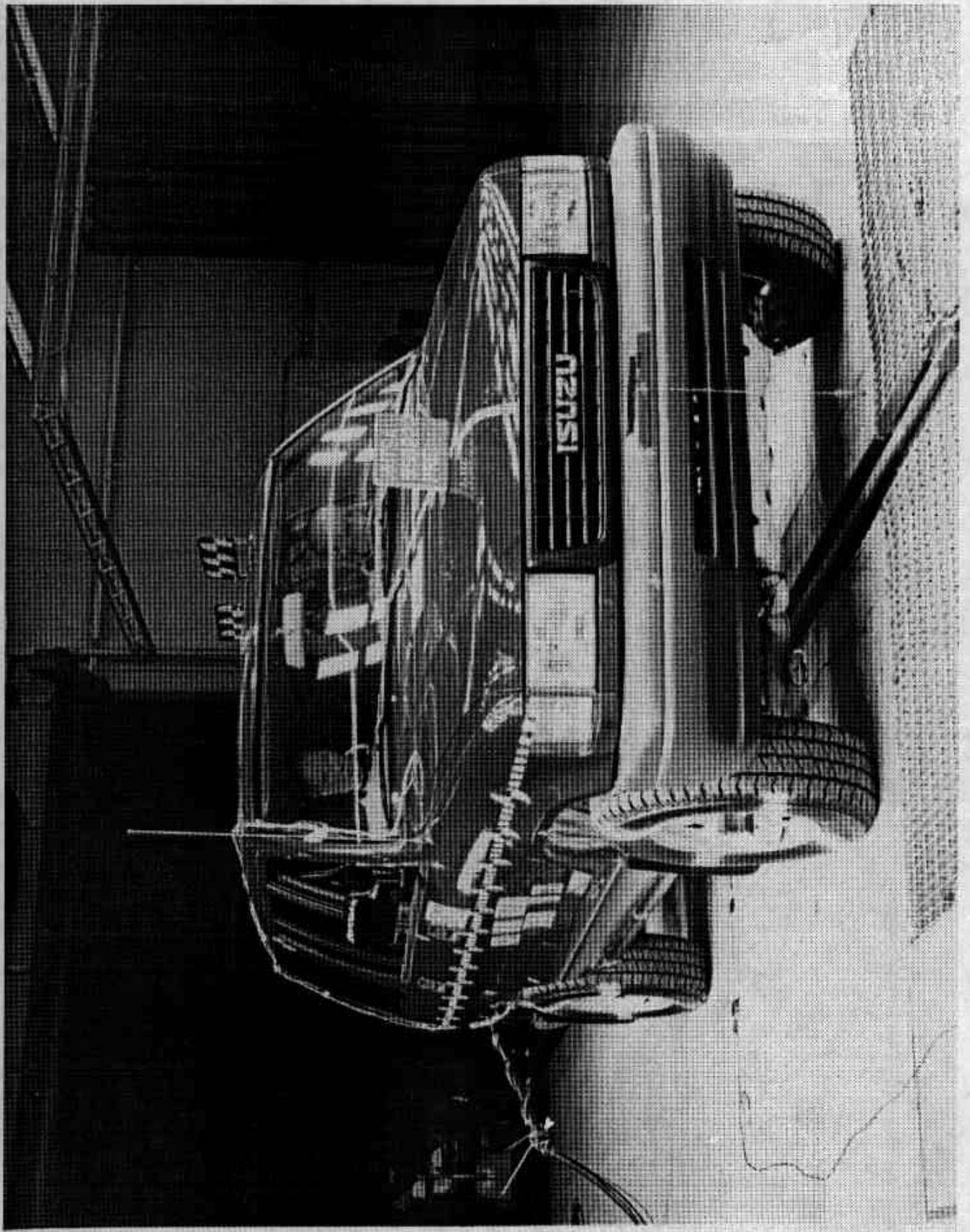


Figure A-9. Pre-Test Right Front Three-Quarter View
A-10

950222

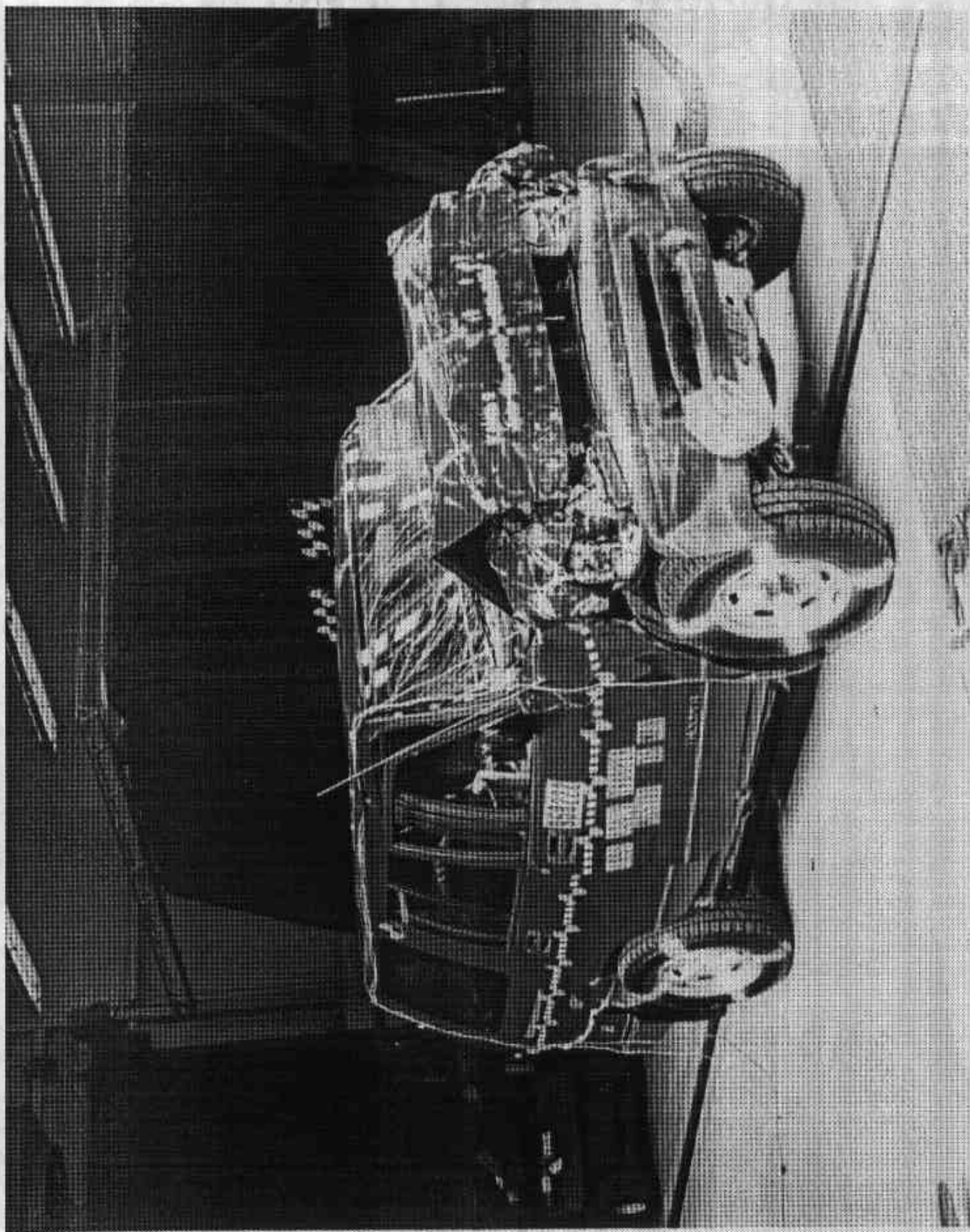


Figure A-10. Post-Test Right Front Three-Quarter View
A-11

950222

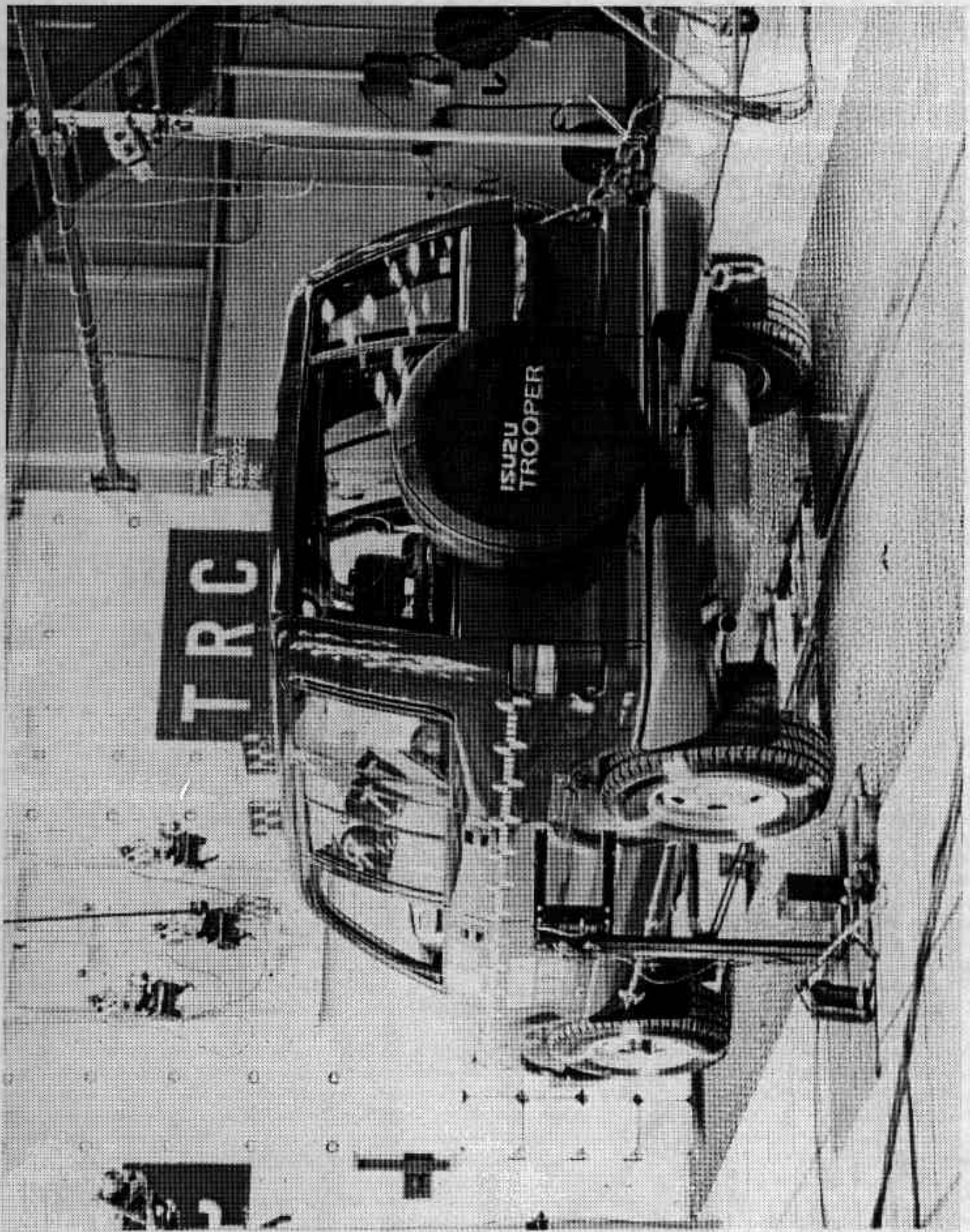


Figure A-11. Pre-Test Left Rear Three-Quarter View
A-12

950222

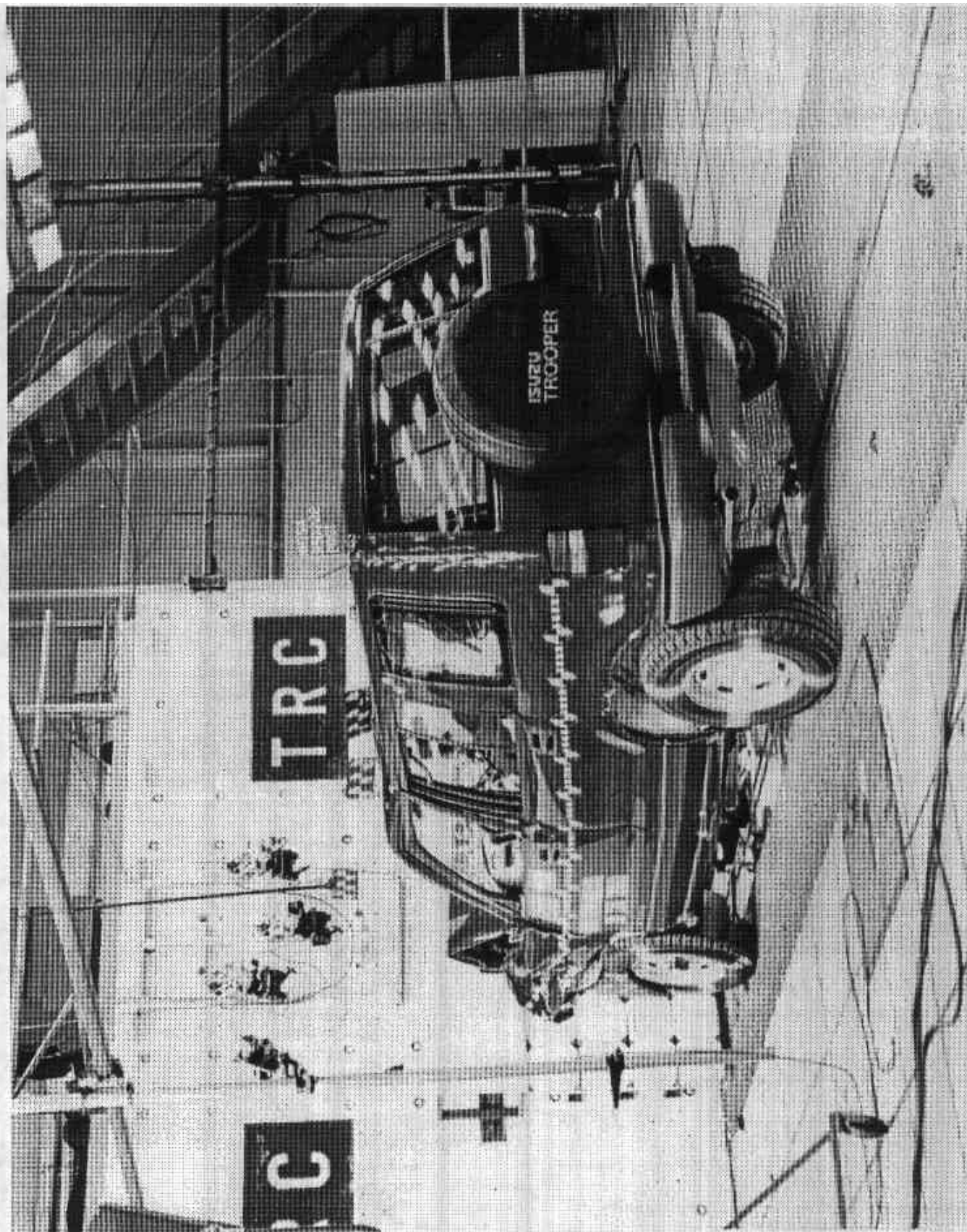


Figure A-12. Post-Test Left Rear Three-Quarter View
A-13

950222

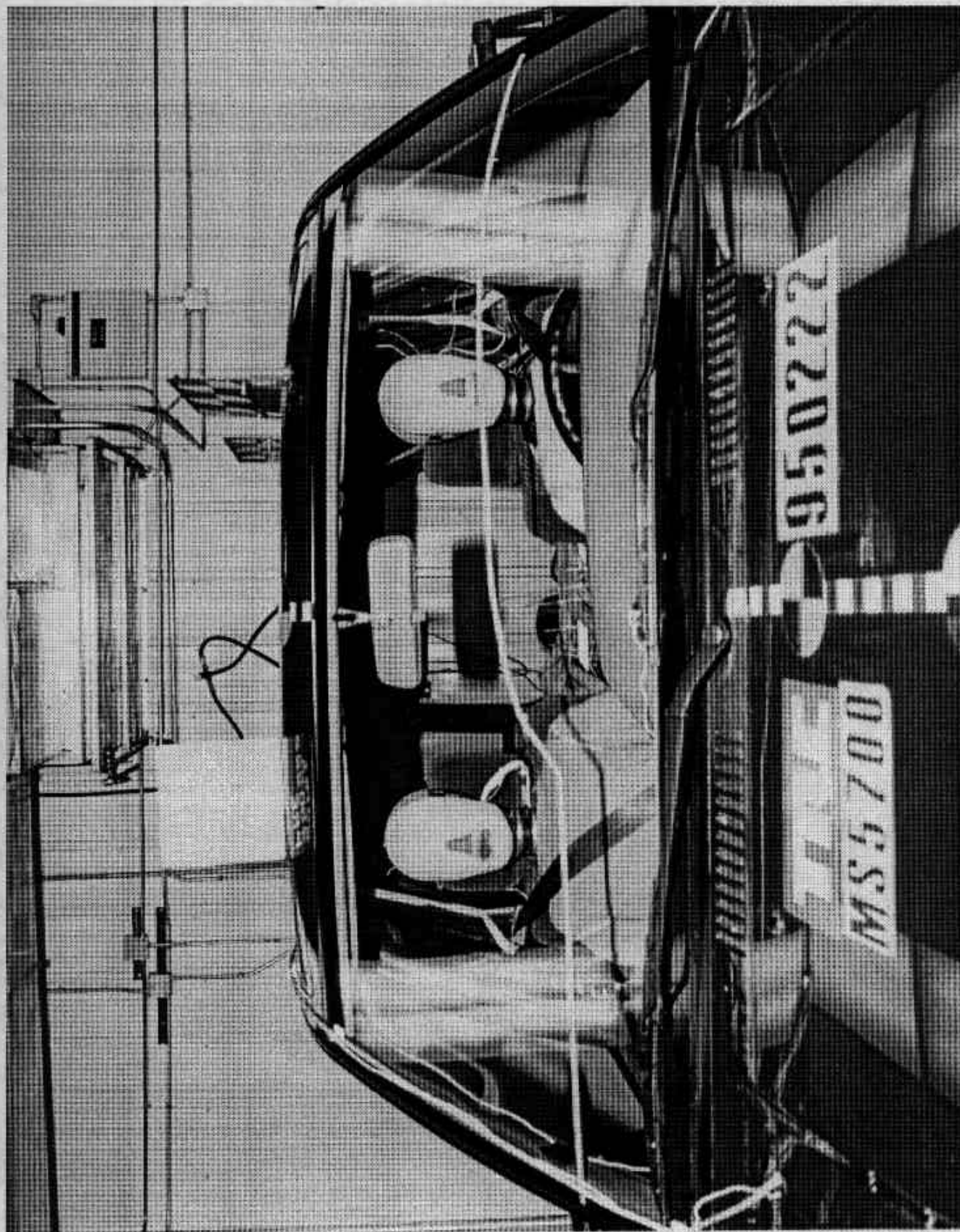


Figure A-13. Pre-Test Windshield View
A-14

950222

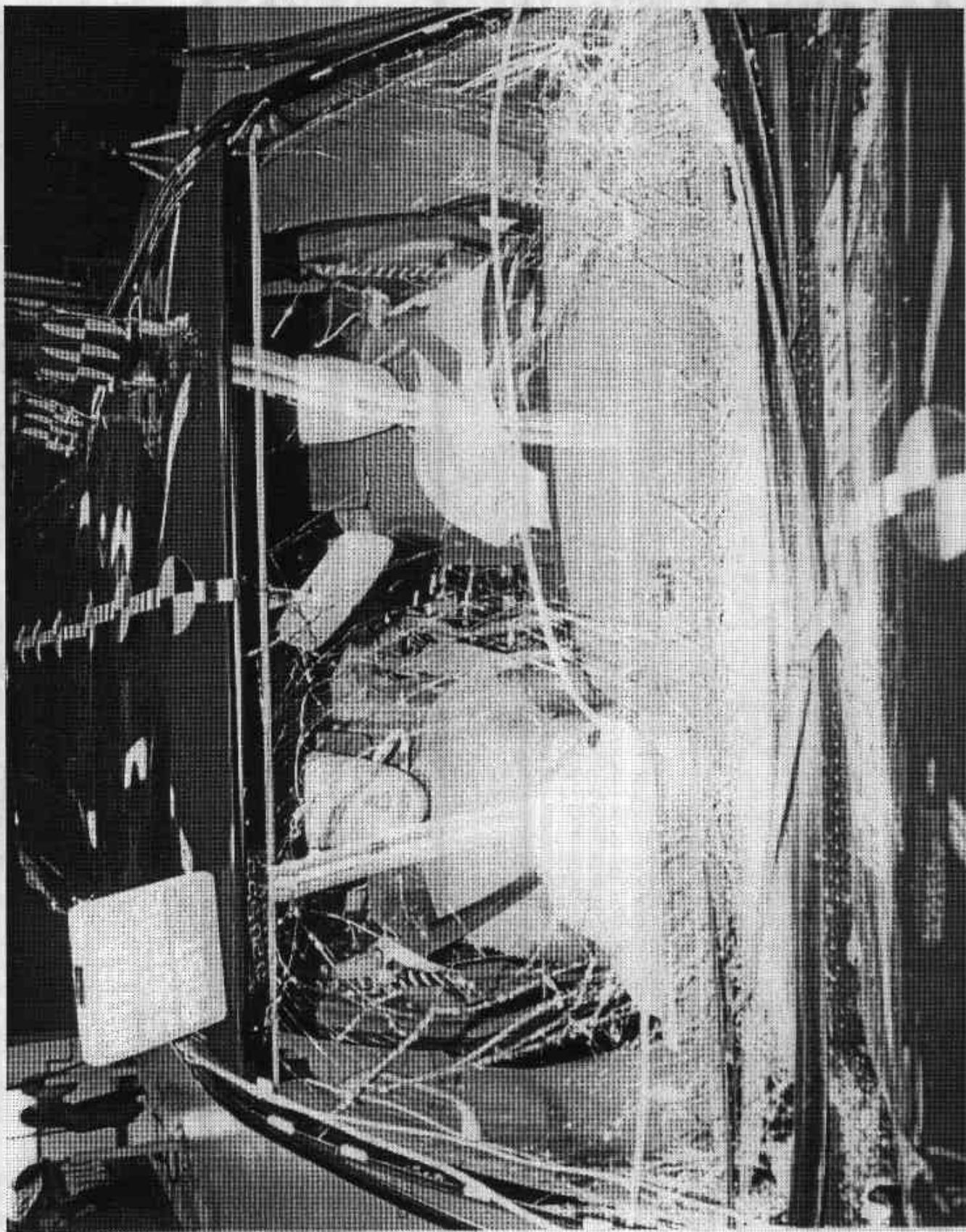


Figure A-14. Post-Test Windshield View
A-15

950222

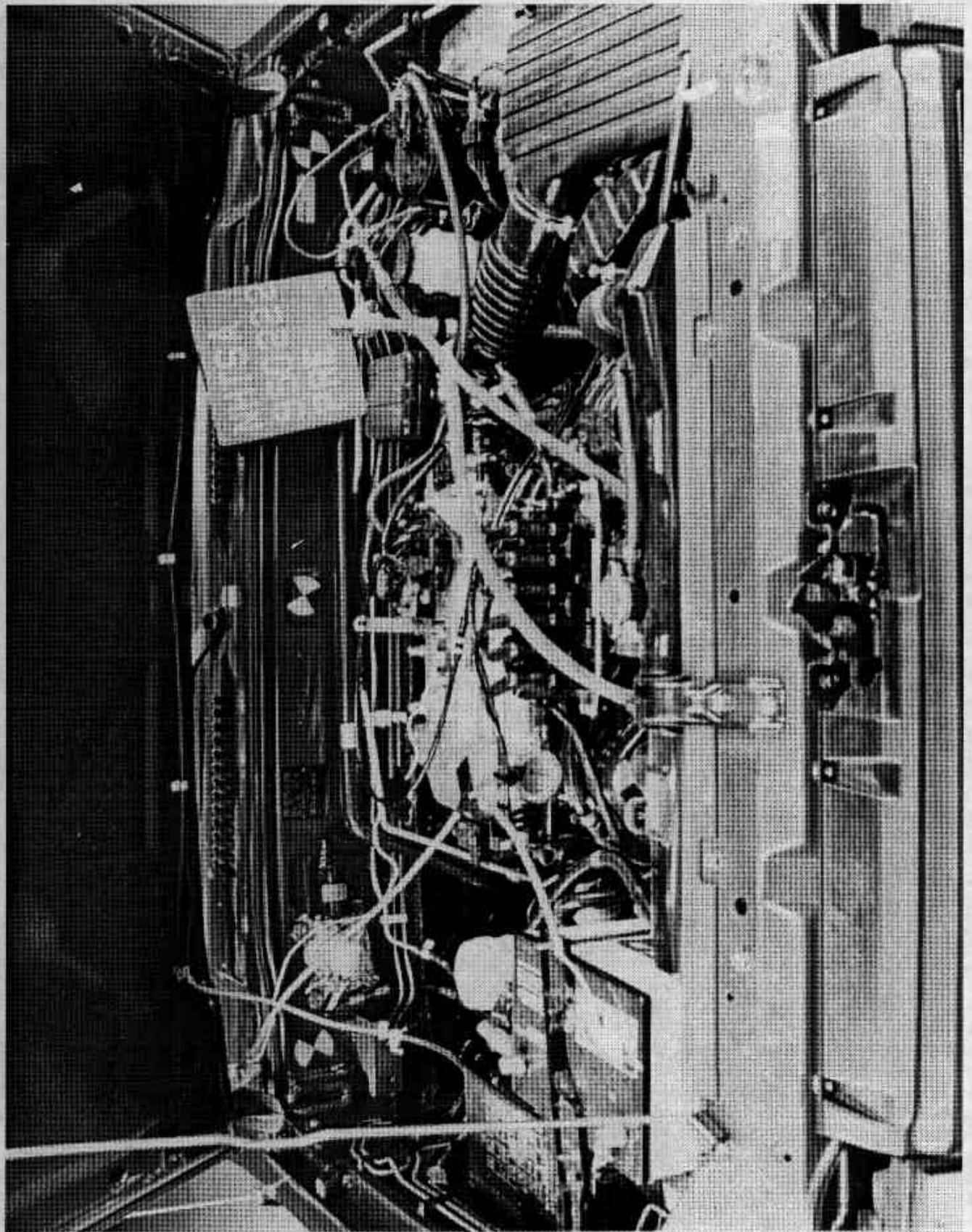


Figure A-15. Pre-Test Engine Compartment View
A-16

950222



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

950222

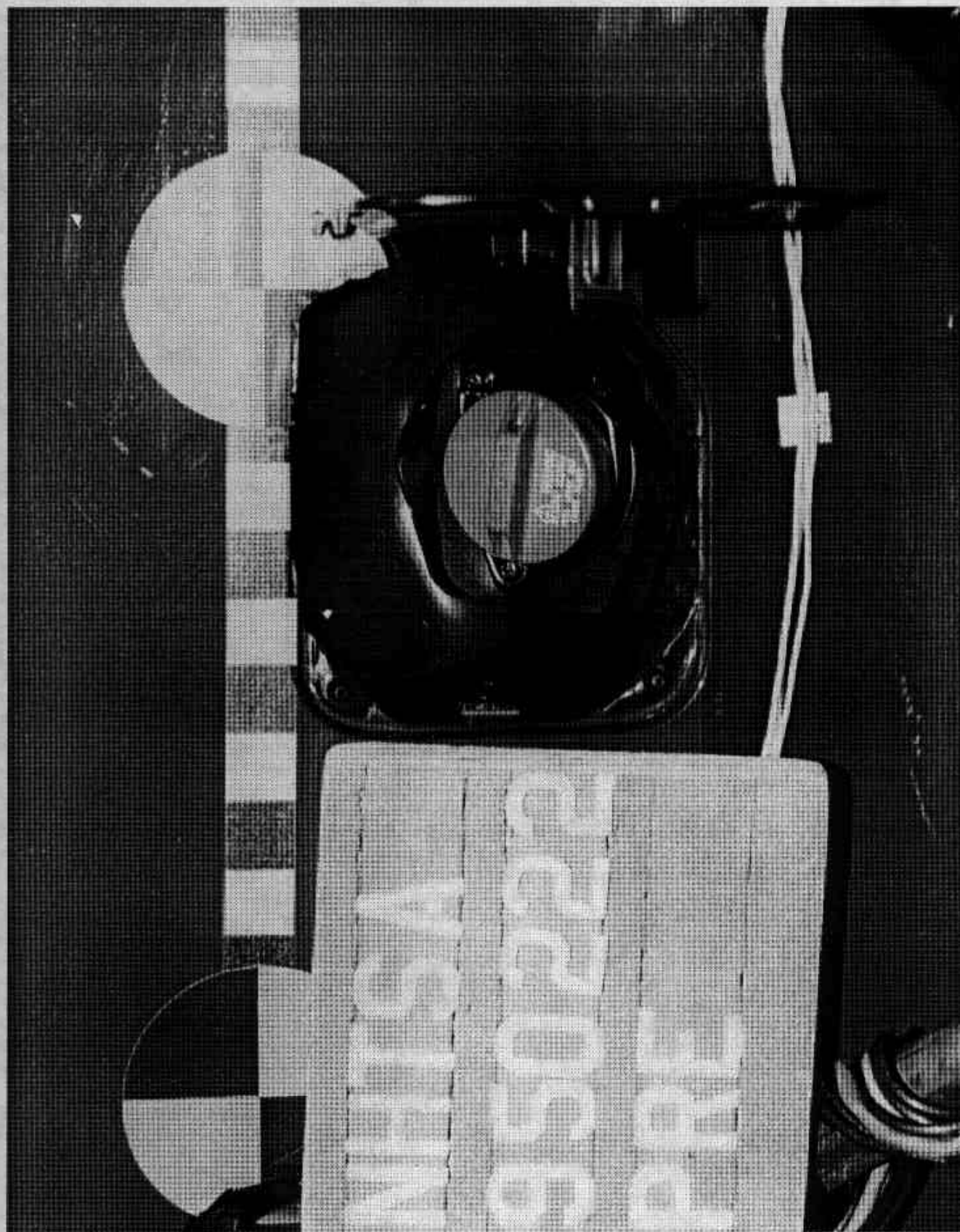


Figure A-17. Pre-Test Fuel Filler Cap View
A-18

950222

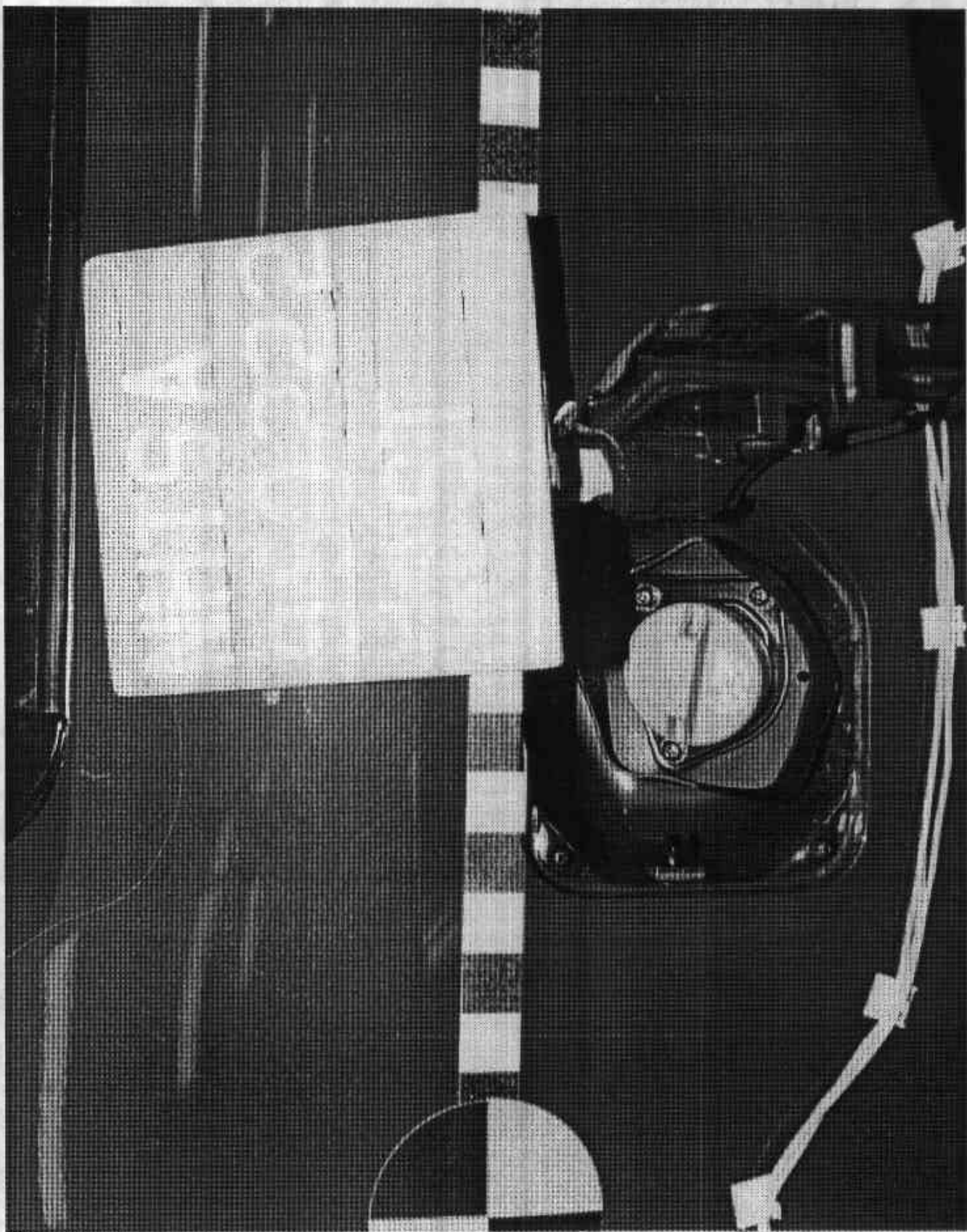


Figure A-18. Post-Test Fuel Filler Cap View
A-19

950222

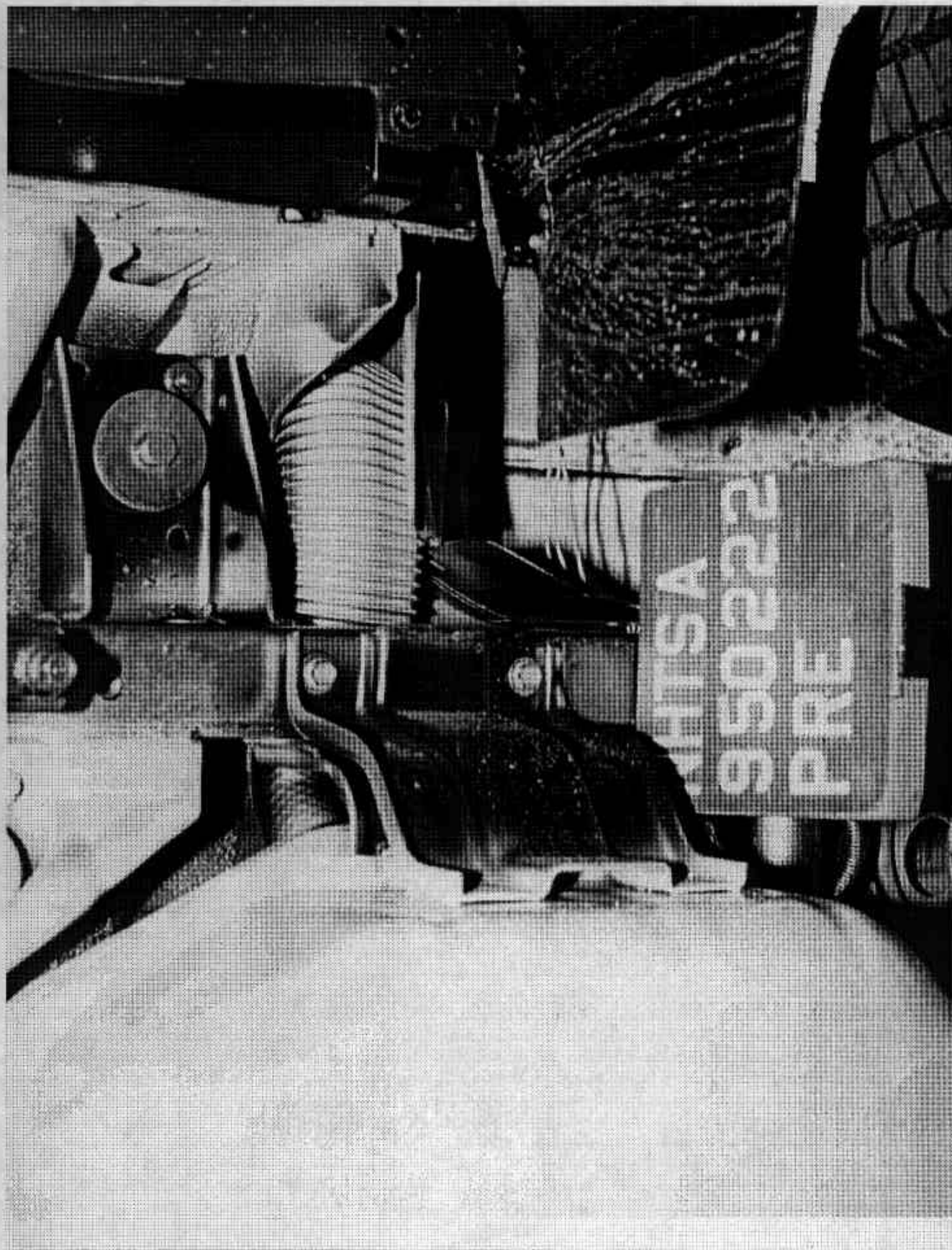


Figure A-19. Pre-Test Fuel Filler Neck View
A-20

950222

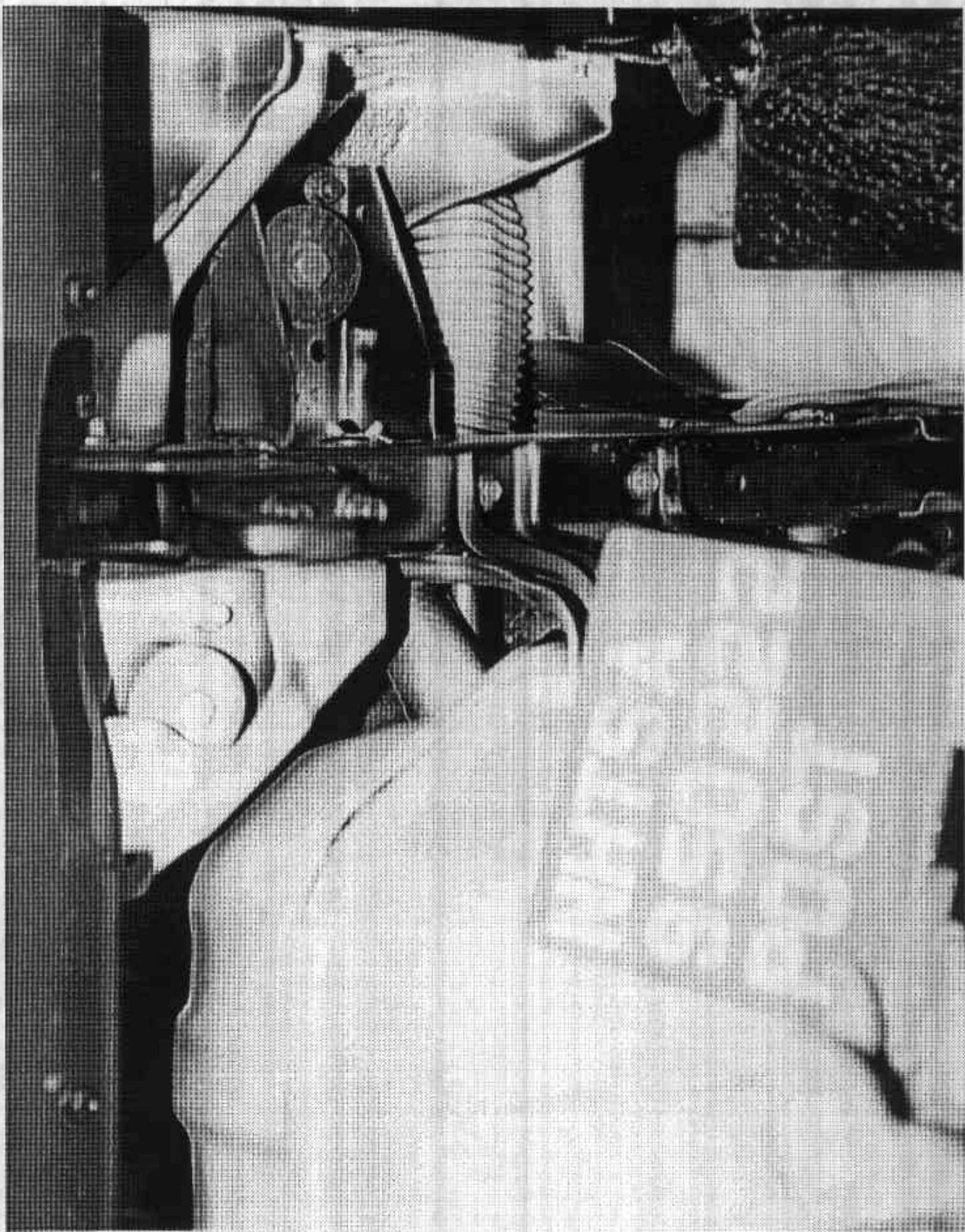


Figure A-20. Post-Test Fuel Filler Neck View
A-21

950222

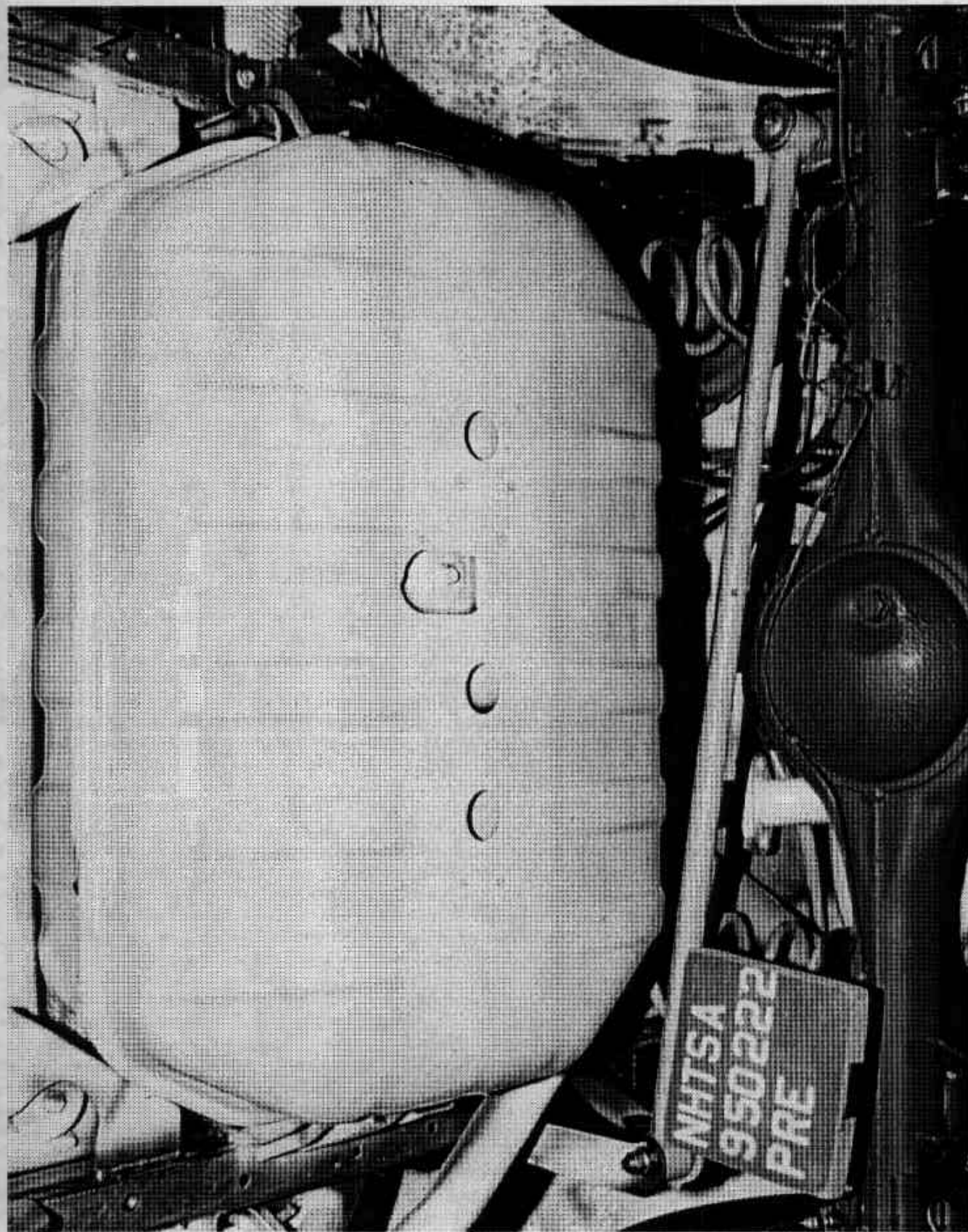


Figure A-21. Pre-Test Fuel Tank View
A-22

950222

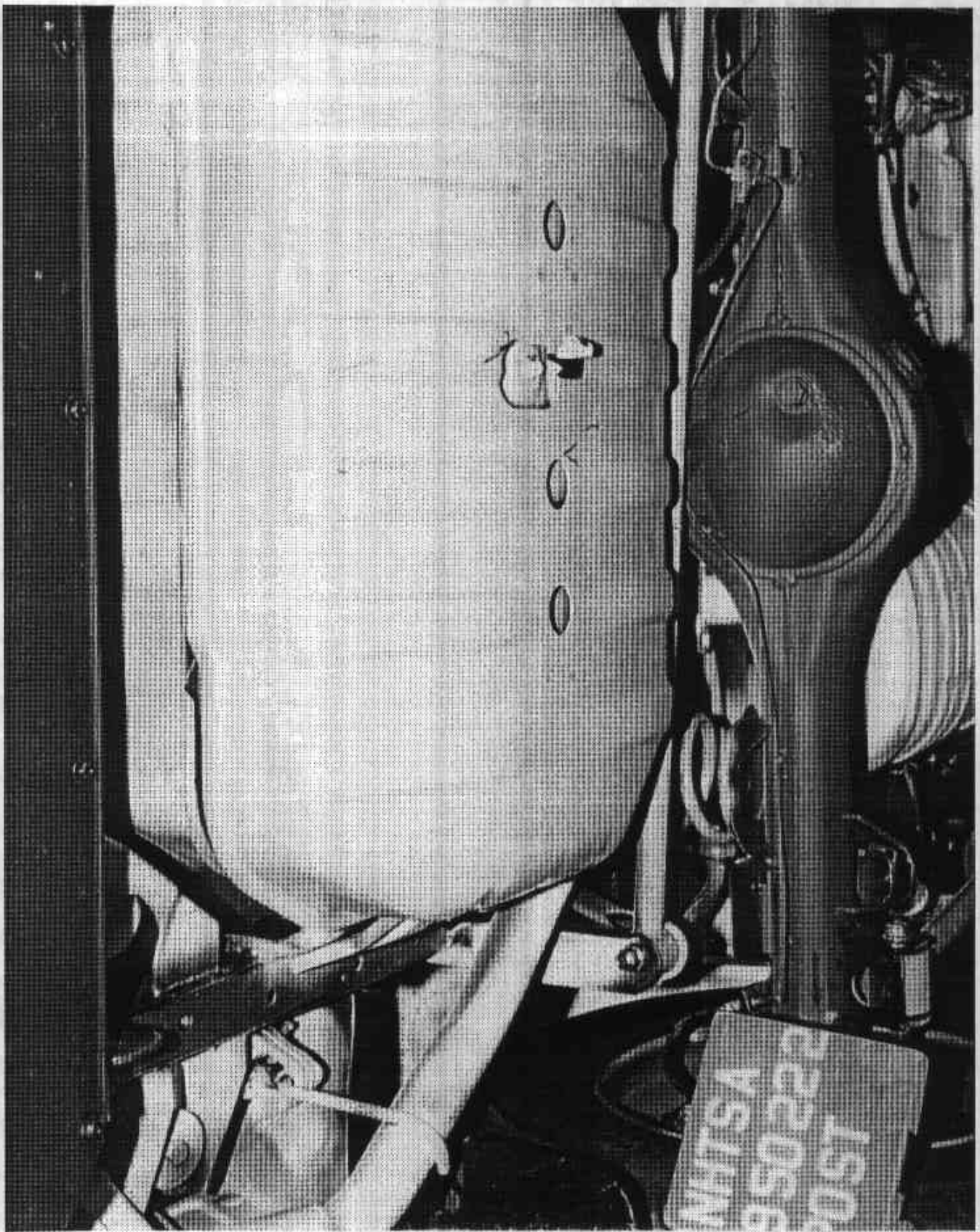


Figure A-22. Post-Test Fuel Tank View
A-23

950222

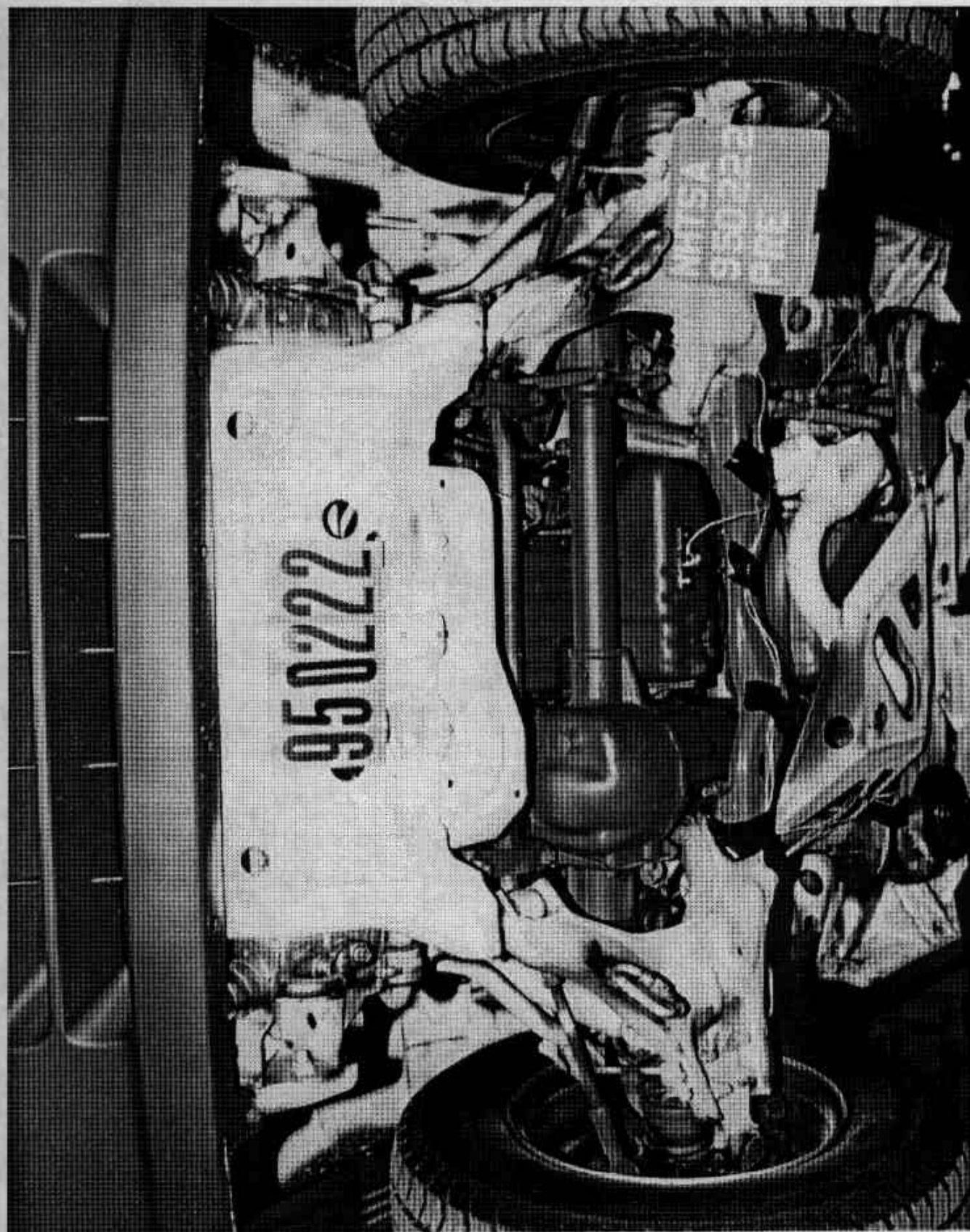


Figure A-23. Pre-Test Front Underbody View
A-24

950222

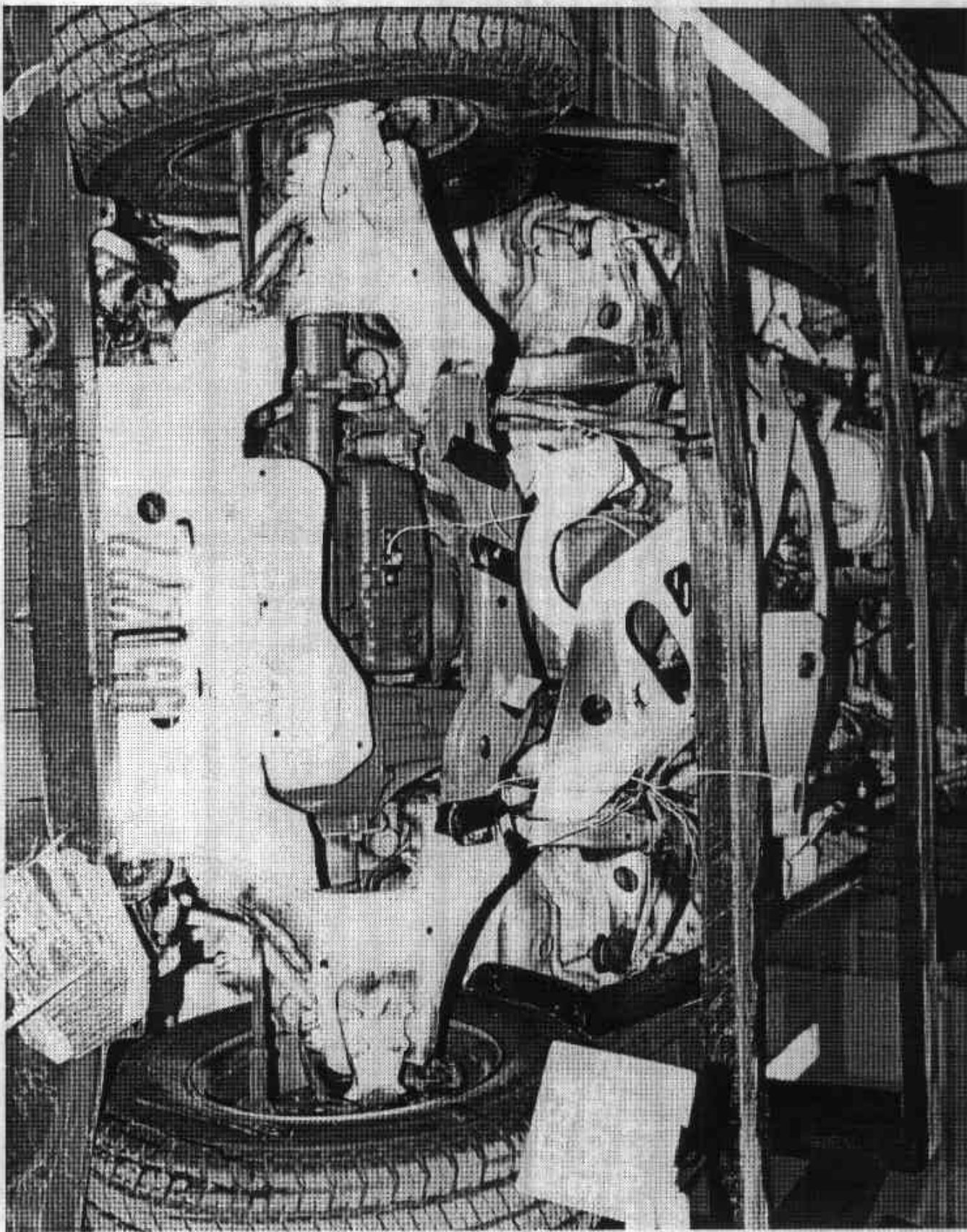


Figure A-24. Post-Test Front Underbody View
A-25

950222

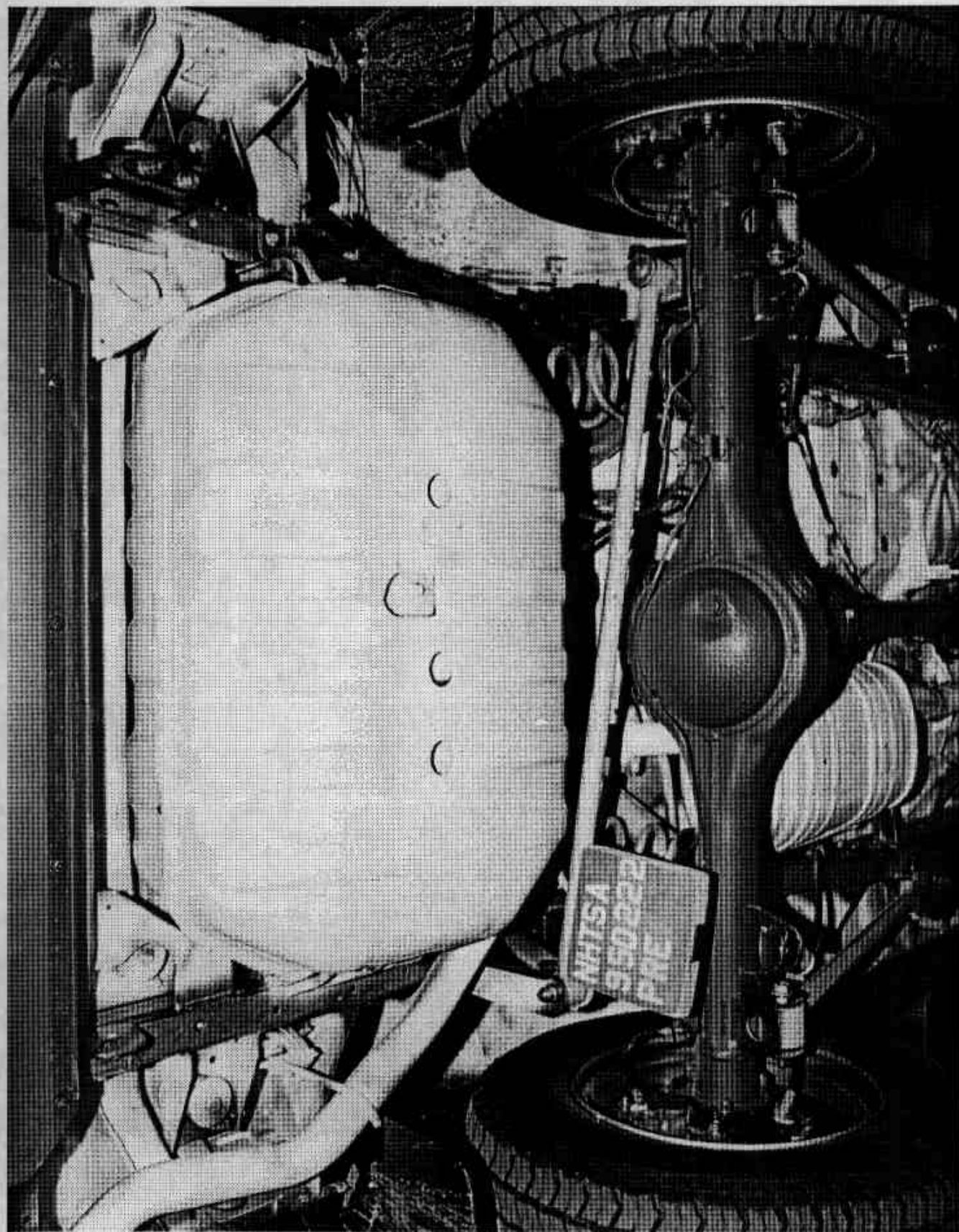


Figure A-25. Pre-Test Rear Underbody View
A-26

950222

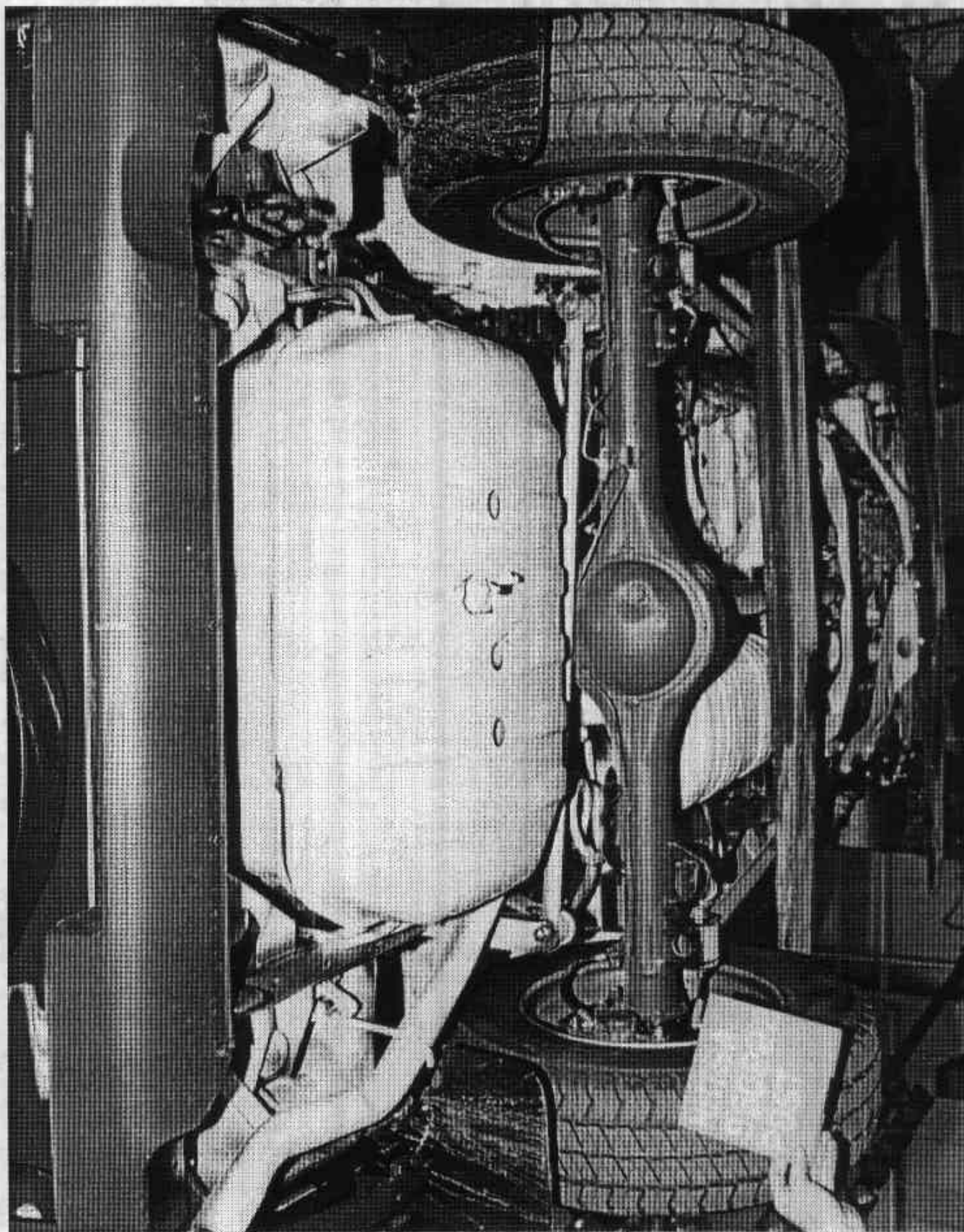


Figure A-26. Post-Test Rear Underbody View
A-27

950222

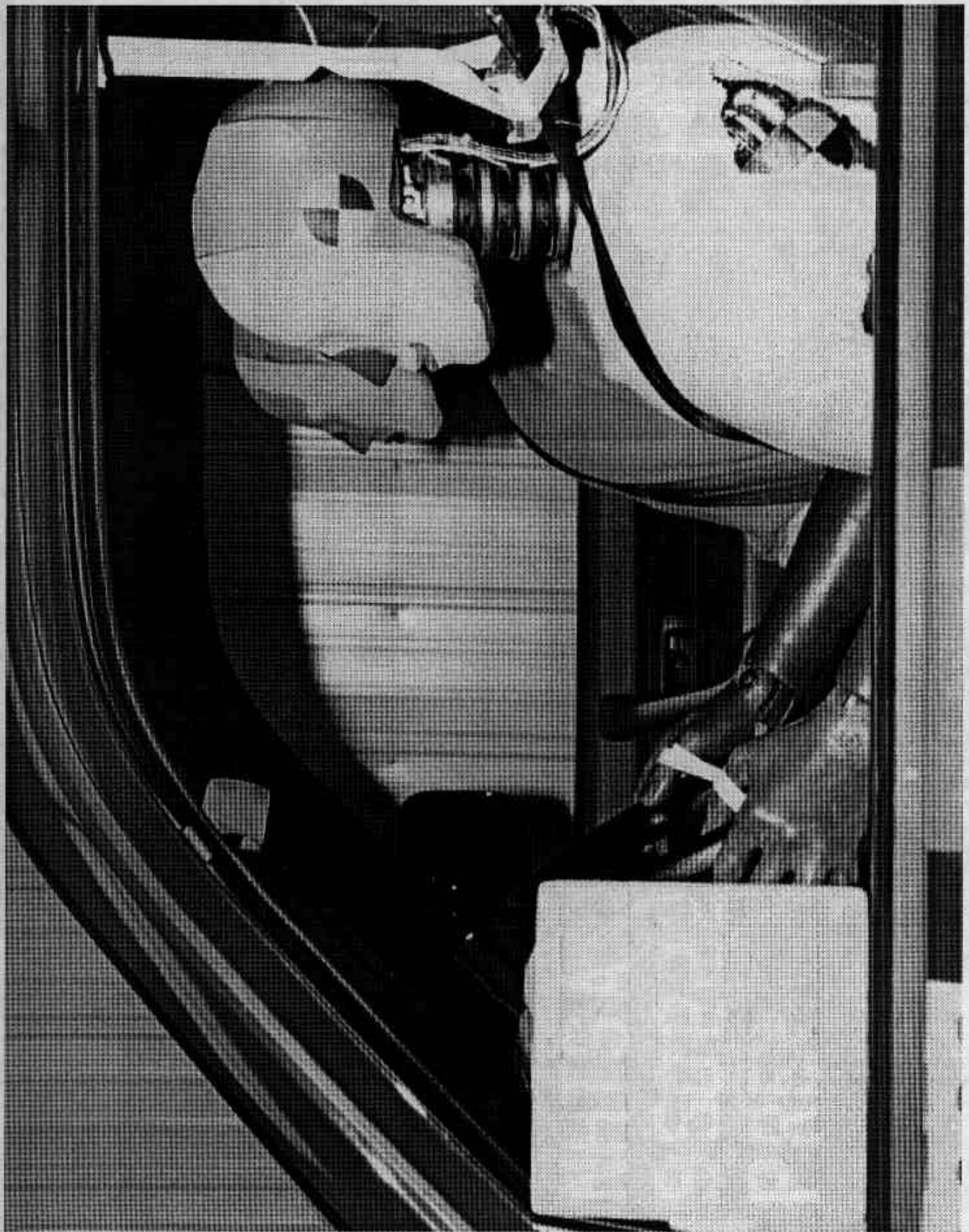


Figure A-27. Pre-Test Driver Dummy Position View
A-28

950222

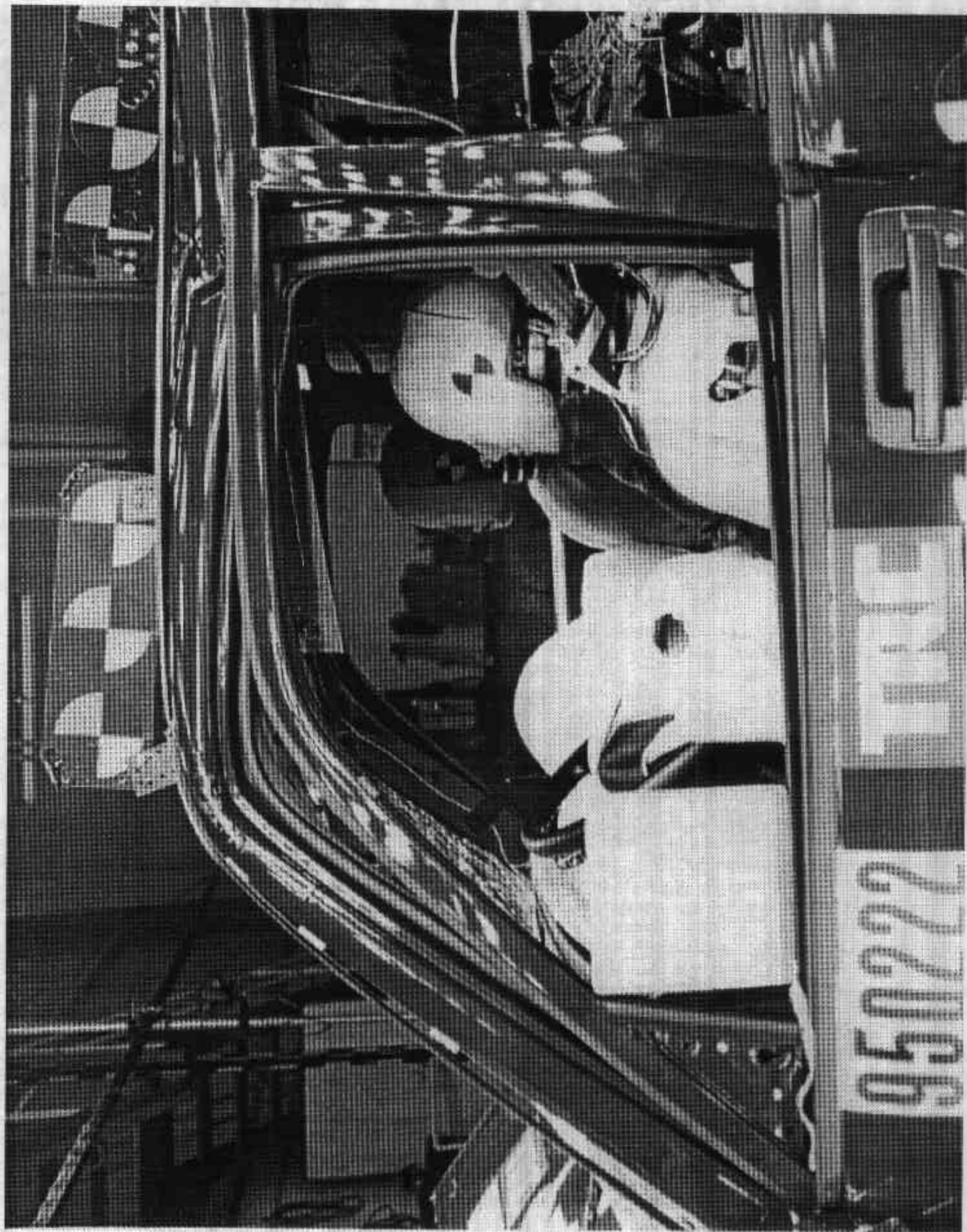


Figure A-28. Post-Test Driver Dummy Position View
A-29

950222

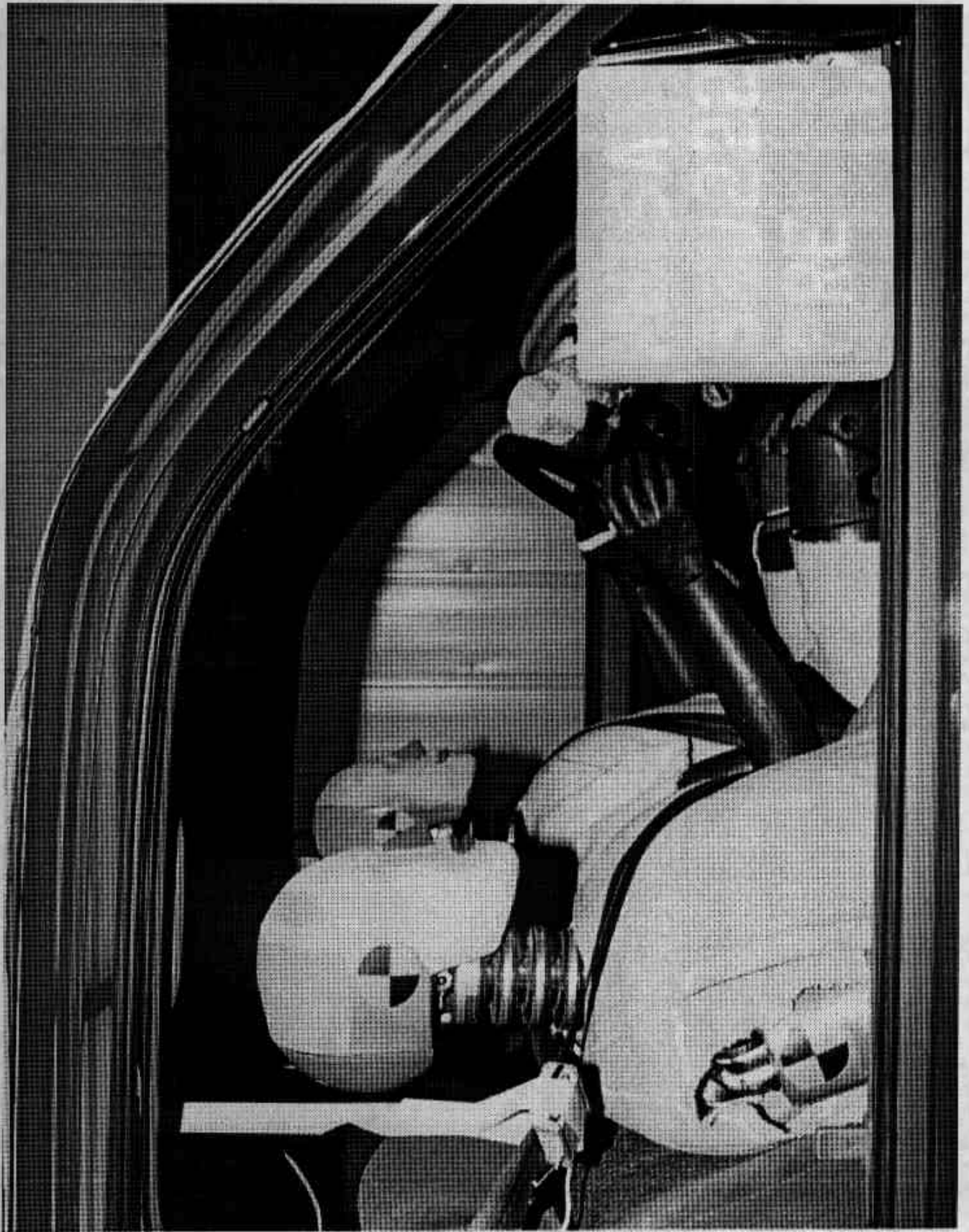


Figure A-29. Pre-Test Passenger Dummy Position View
A-30

950222



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

950222

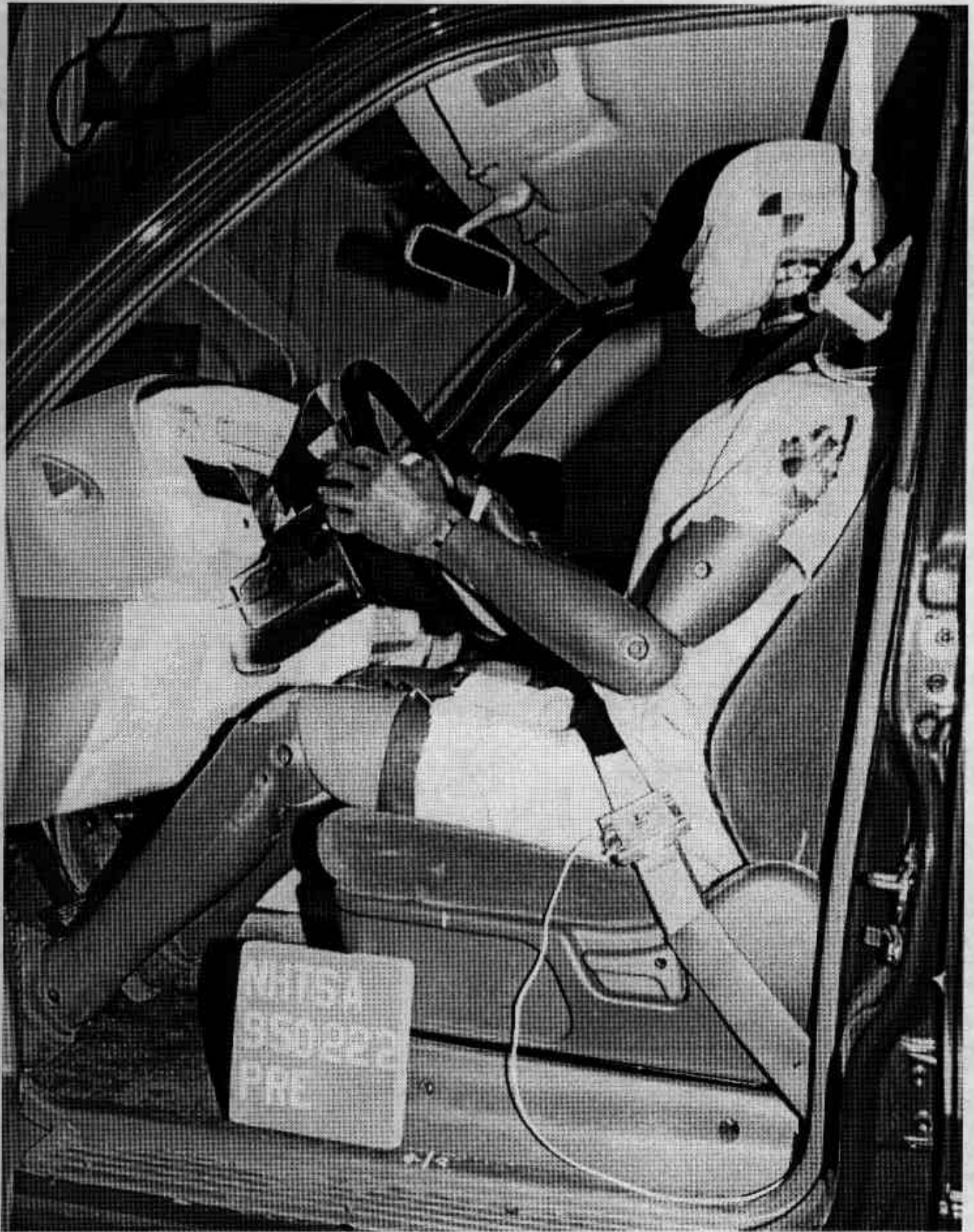


Figure A-31. Pre-Test Driver Dummy & Vehicle Interior - View 1

A-32

950222



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

A-33

950222

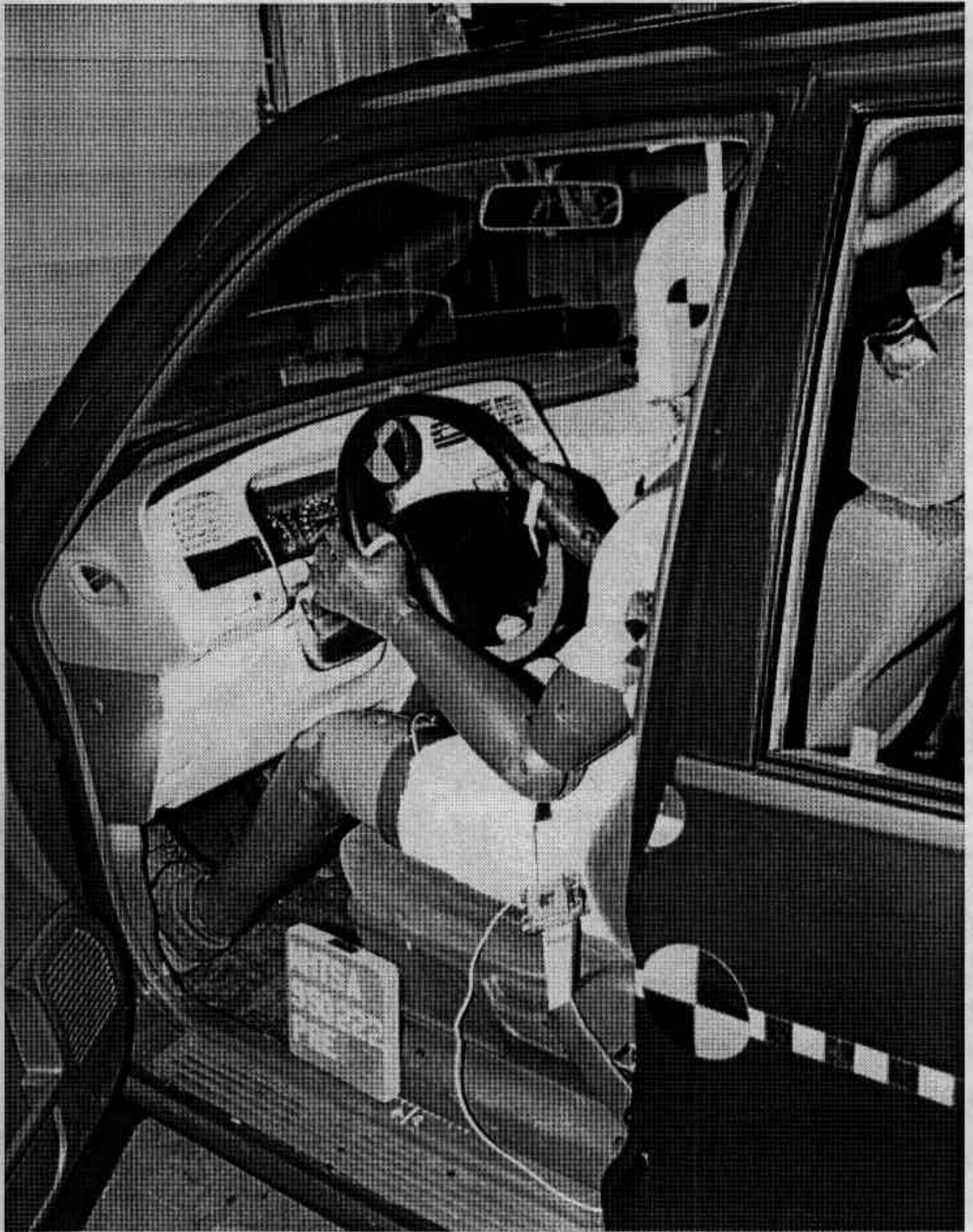


Figure A-33. Pre-Test Driver Dummy & Vehicle Interior - View 2

A-34

950222



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

A-35

950222

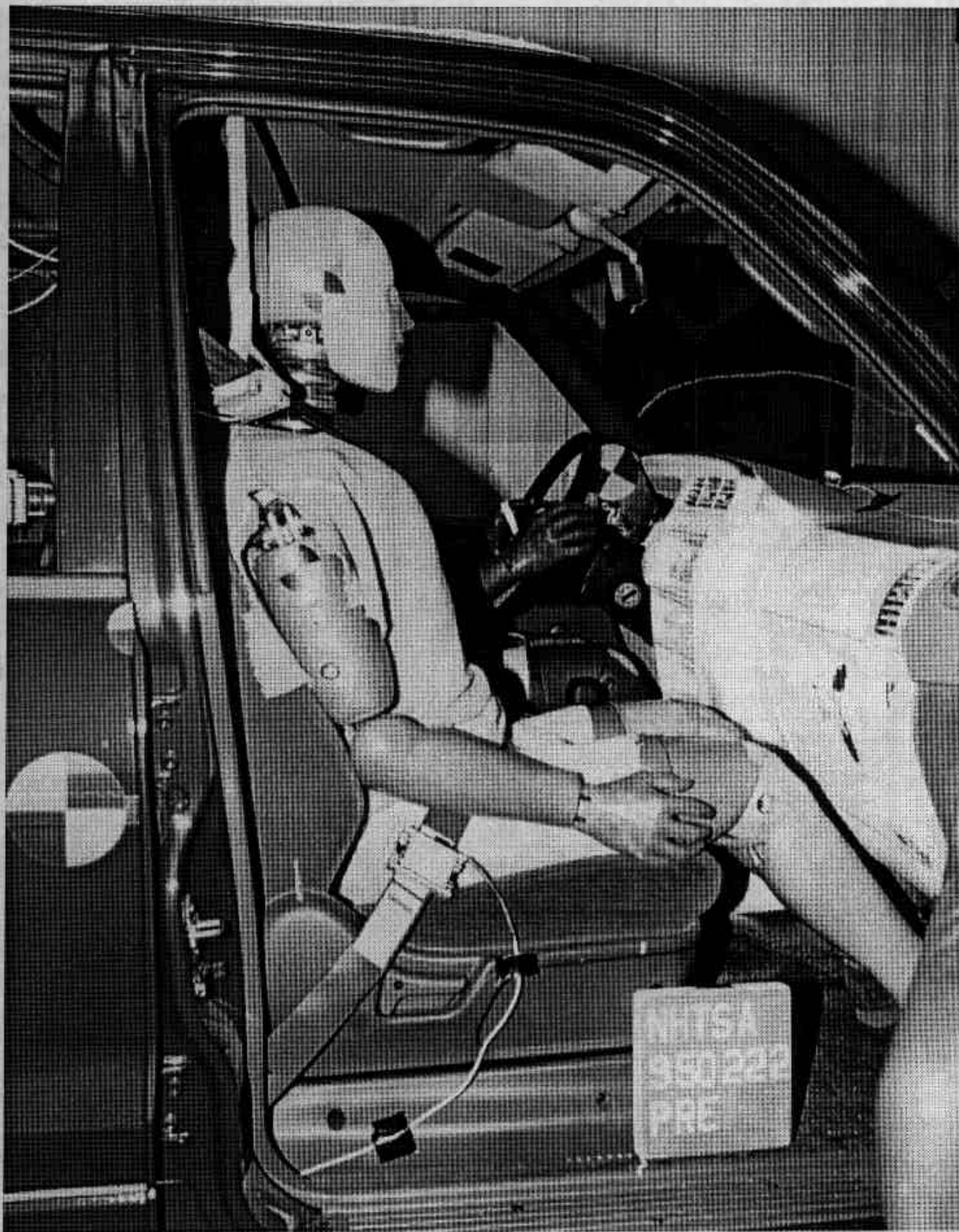


Figure A-35. Pre-Test Passenger Dummy & Vehicle Interior - View 1
A-36

950222



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

A-37

950222



Figure A-37. Pre-Test Passenger Dummy & Vehicle Interior - View 2

A-38

950222



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

A-39

950222

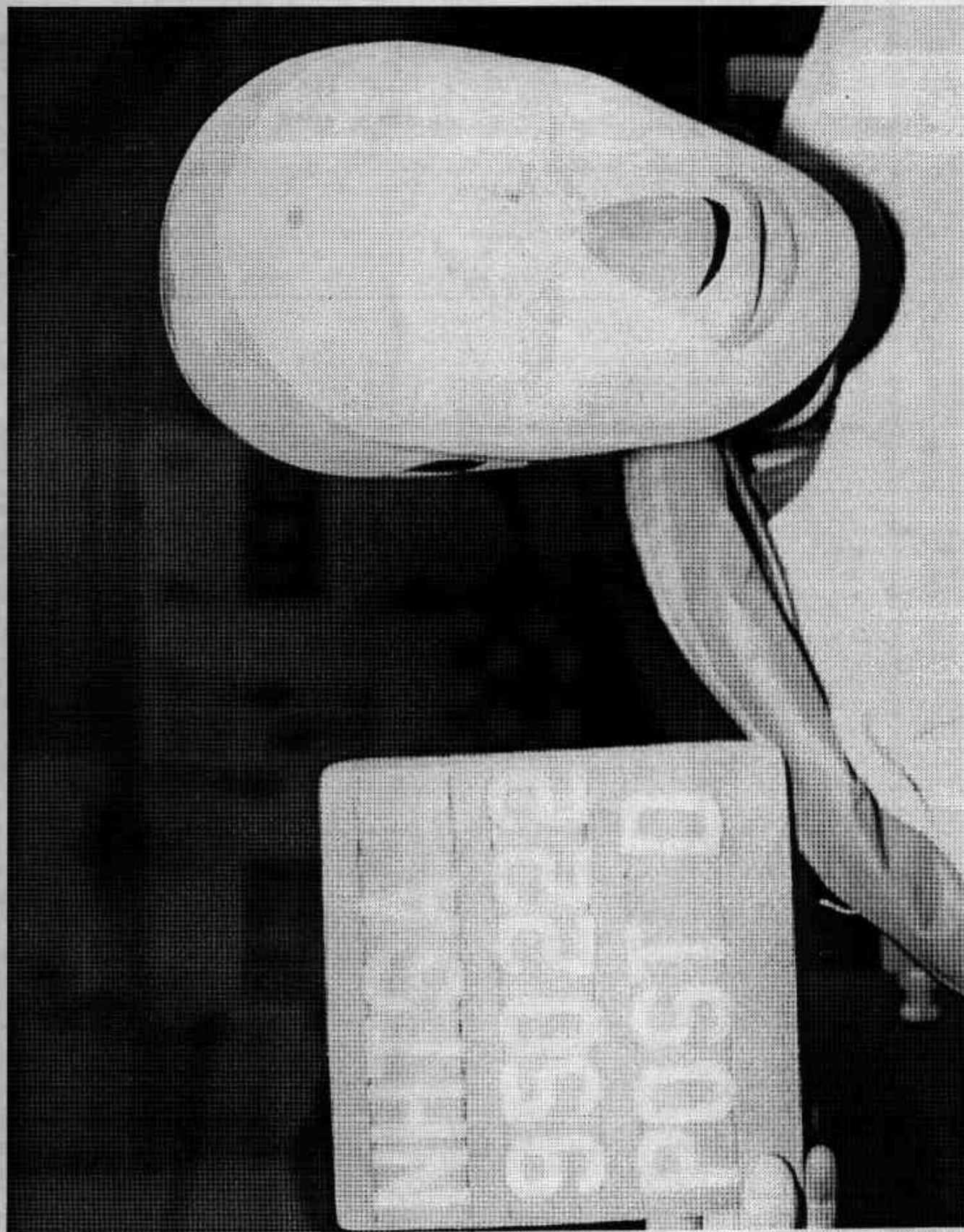


Figure A-39. Post-Test Driver Dummy Head Contact - View I
A-40

950222

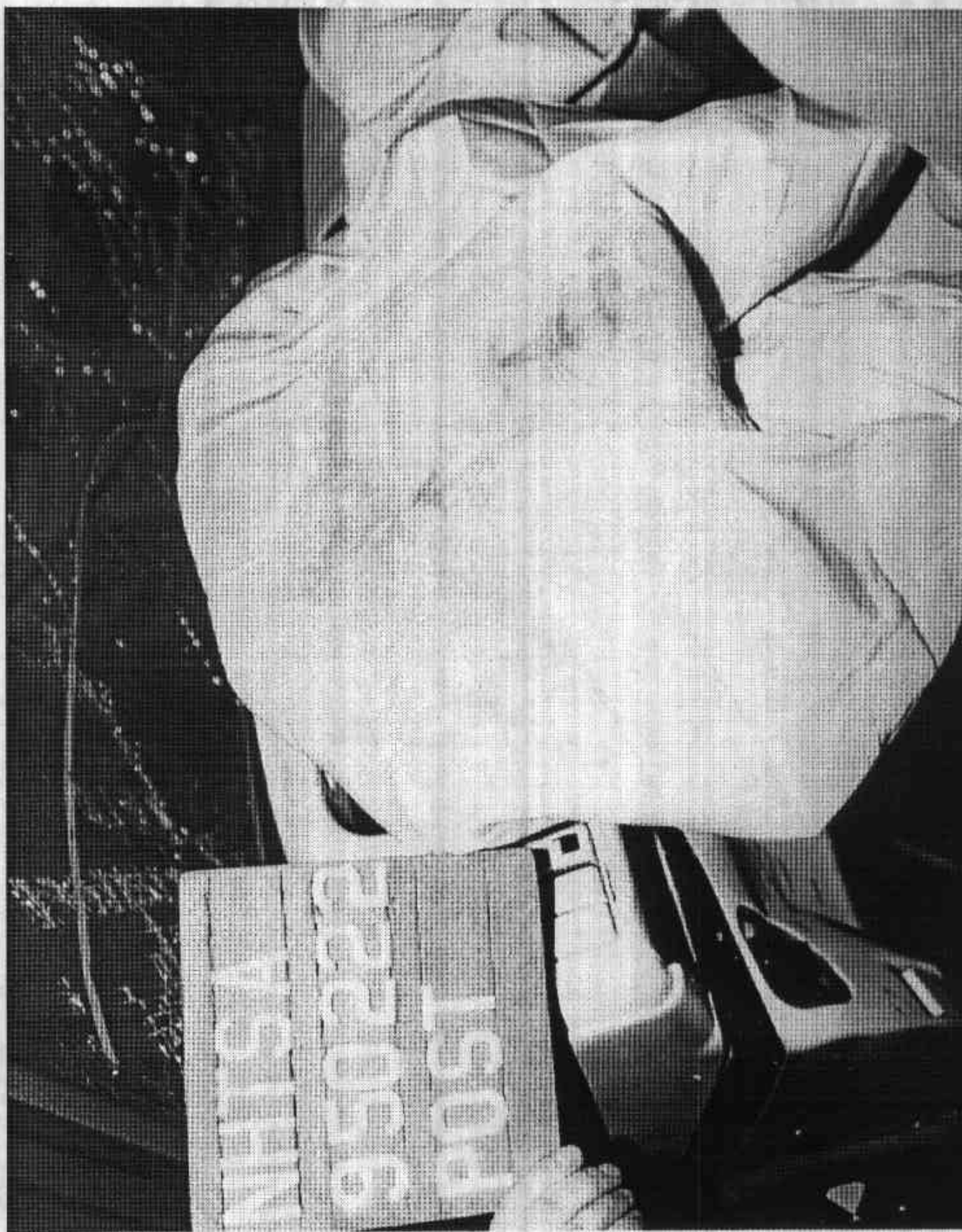


Figure A-40. Post-Test Driver Dummy Head Contact - View 2
A-41

950222

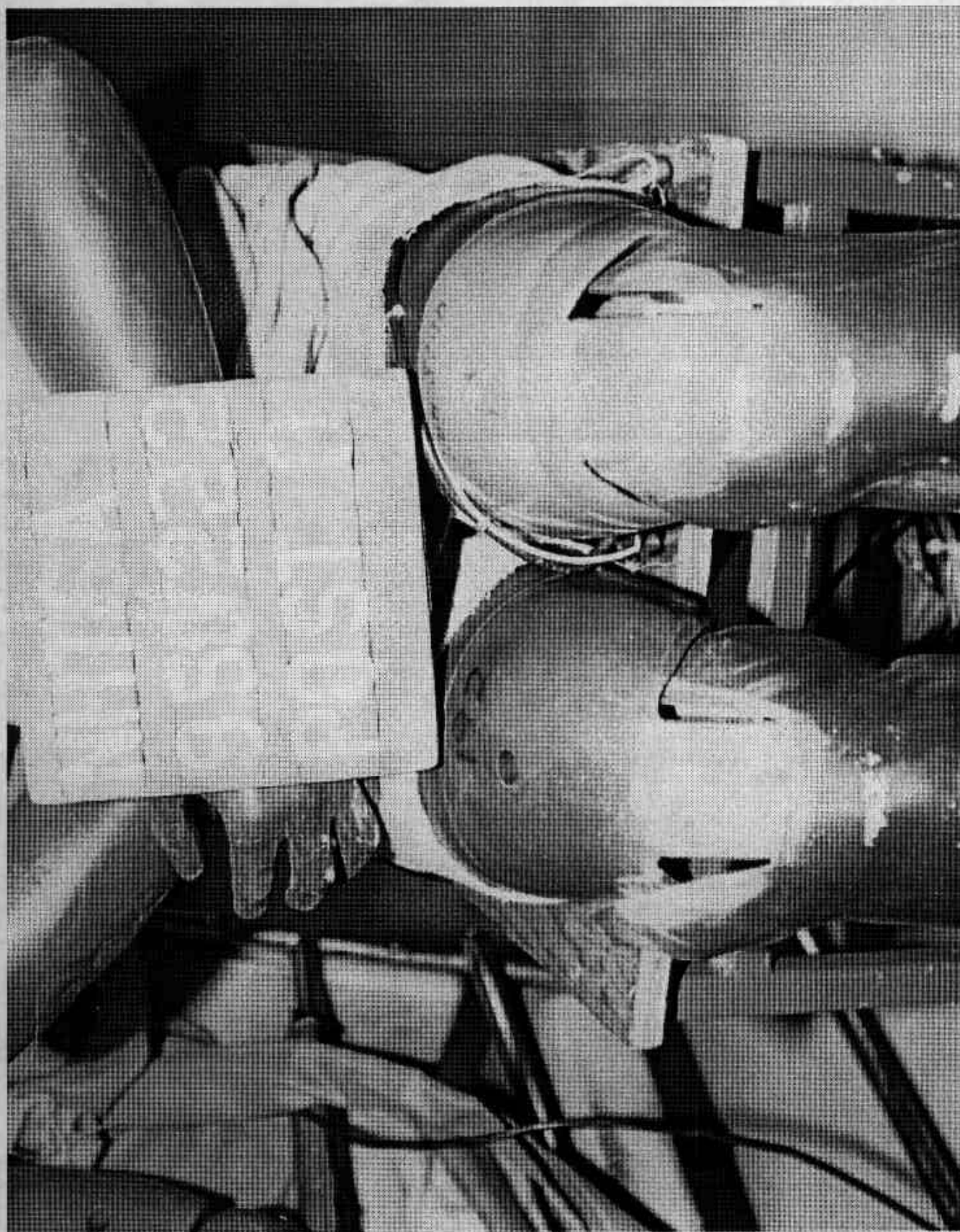


Figure A-41. Post-Test Driver Dummy Knee Contact - View 1
A-42

950222



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

A-43

950222

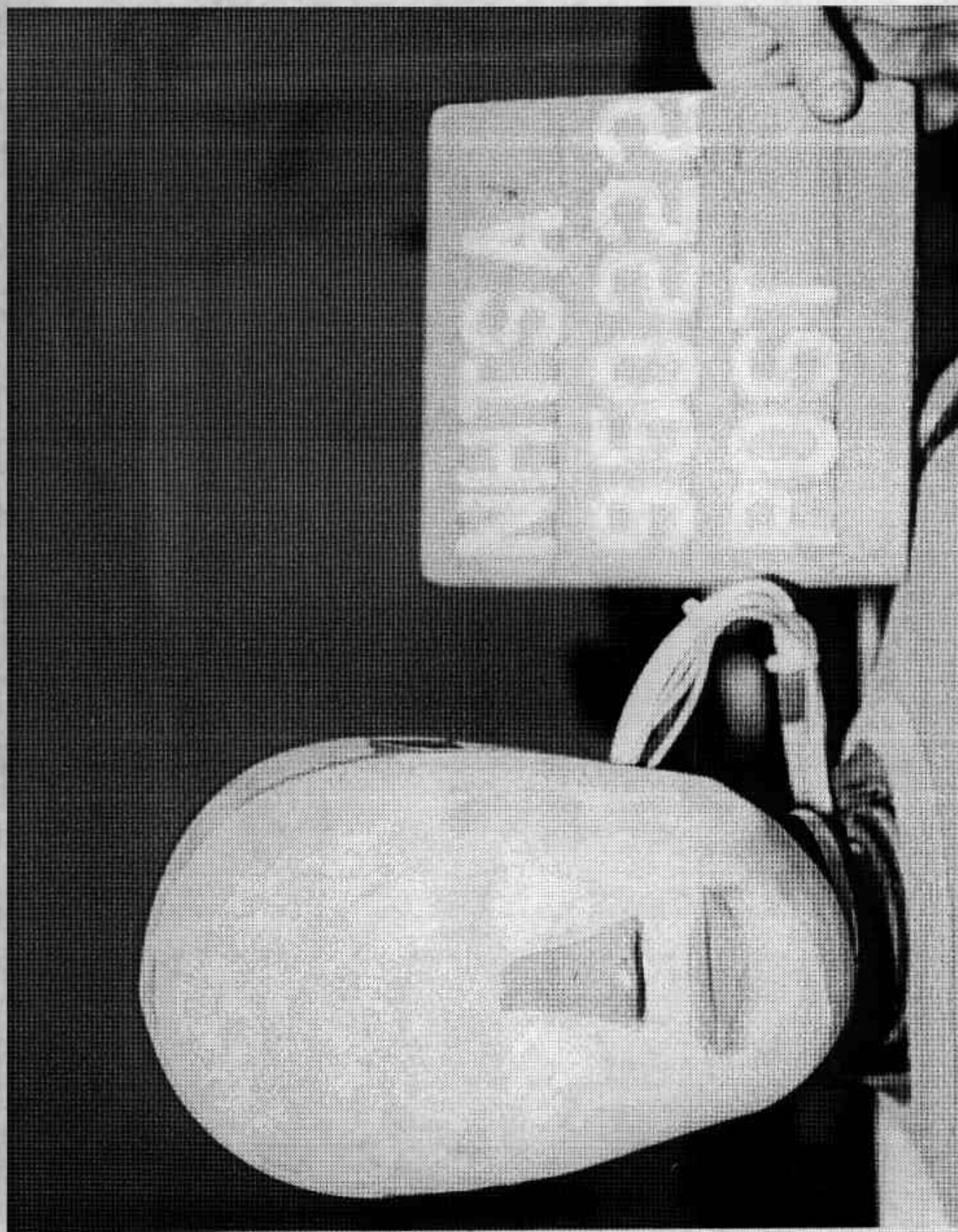


Figure A-43. Post-Test Passenger Dummy Head Contact - View 1
A-44

950222



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

A-45

950222

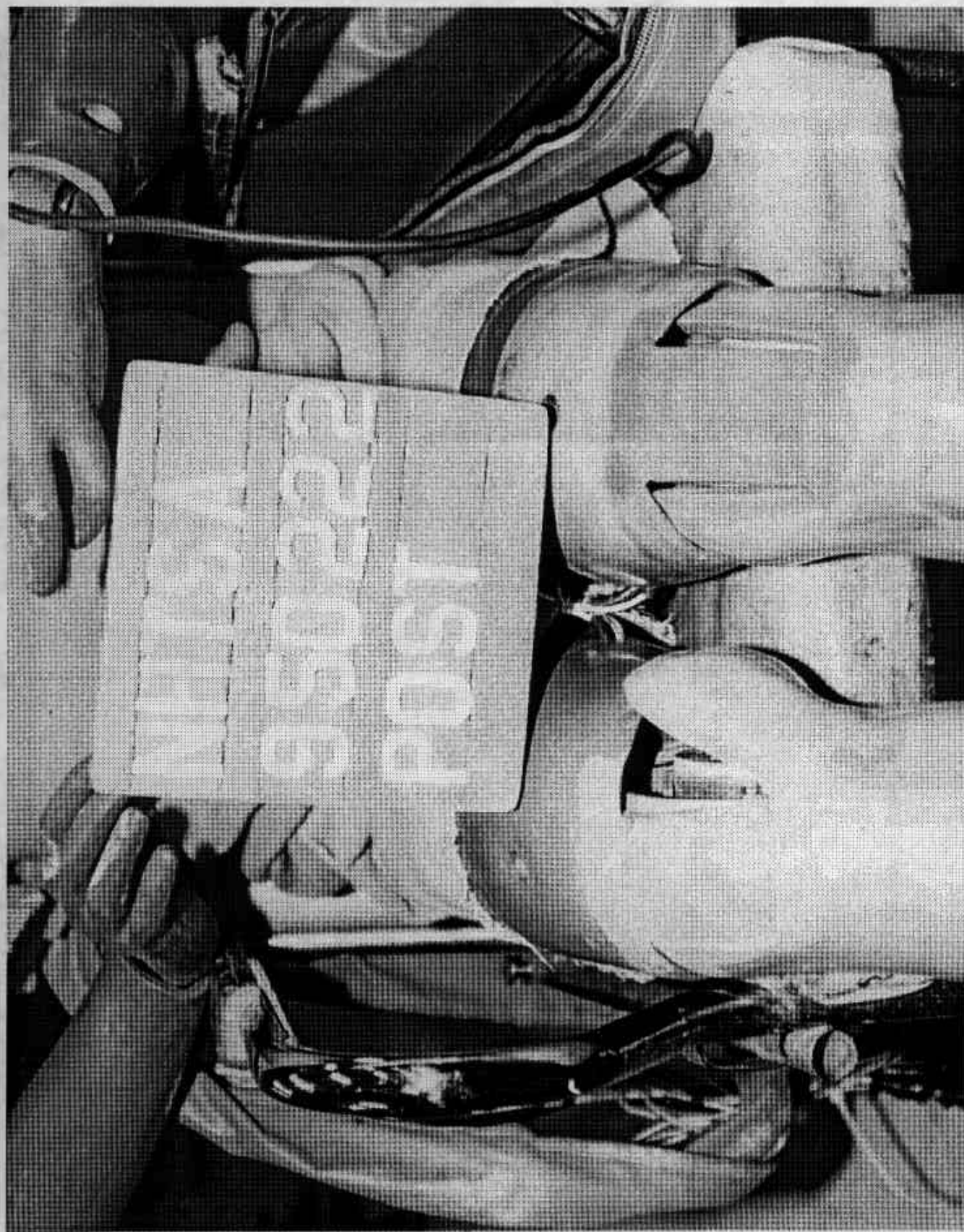


Figure A-45. Post-Test Passenger Dummy Knee Contact - View 1
A-46

950222



Figure A-46. Post-Test Passenger Dummy Knee Contact - View 2

A-47

950222



MANUFACTURED BY
ISUZU MOTORS LTD. JAPAN
GVWR: 5510LBS DEC. 94

GAWR FRONT: 2755LBS
WITH P245/70R16 TIRES &
16X7 RIMS AT 30PSI COLD.

GAWR REAR: 3085LBS
WITH P245/70R16 TIRES &
16X7 RIMS AT 35PSI COLD.

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

JACDJ58V5S7901885
M.P.V.

Figure A-47. Pre-Test Vehicle Certification & Recommended Tire Pressure Label

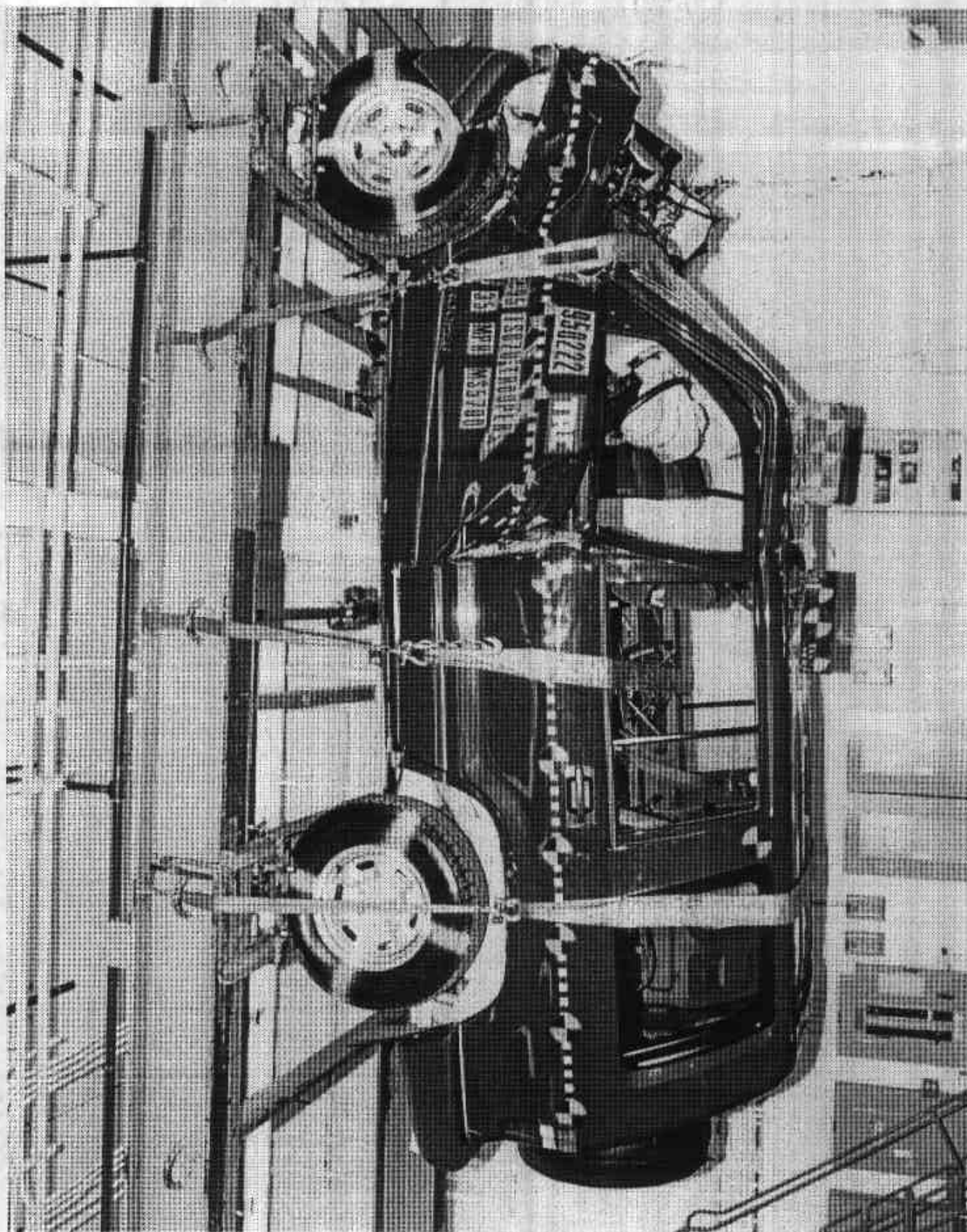


Figure A-48. Post-Test Vehicle on Static Rollover Machine View

A-49

950222

Appendix B

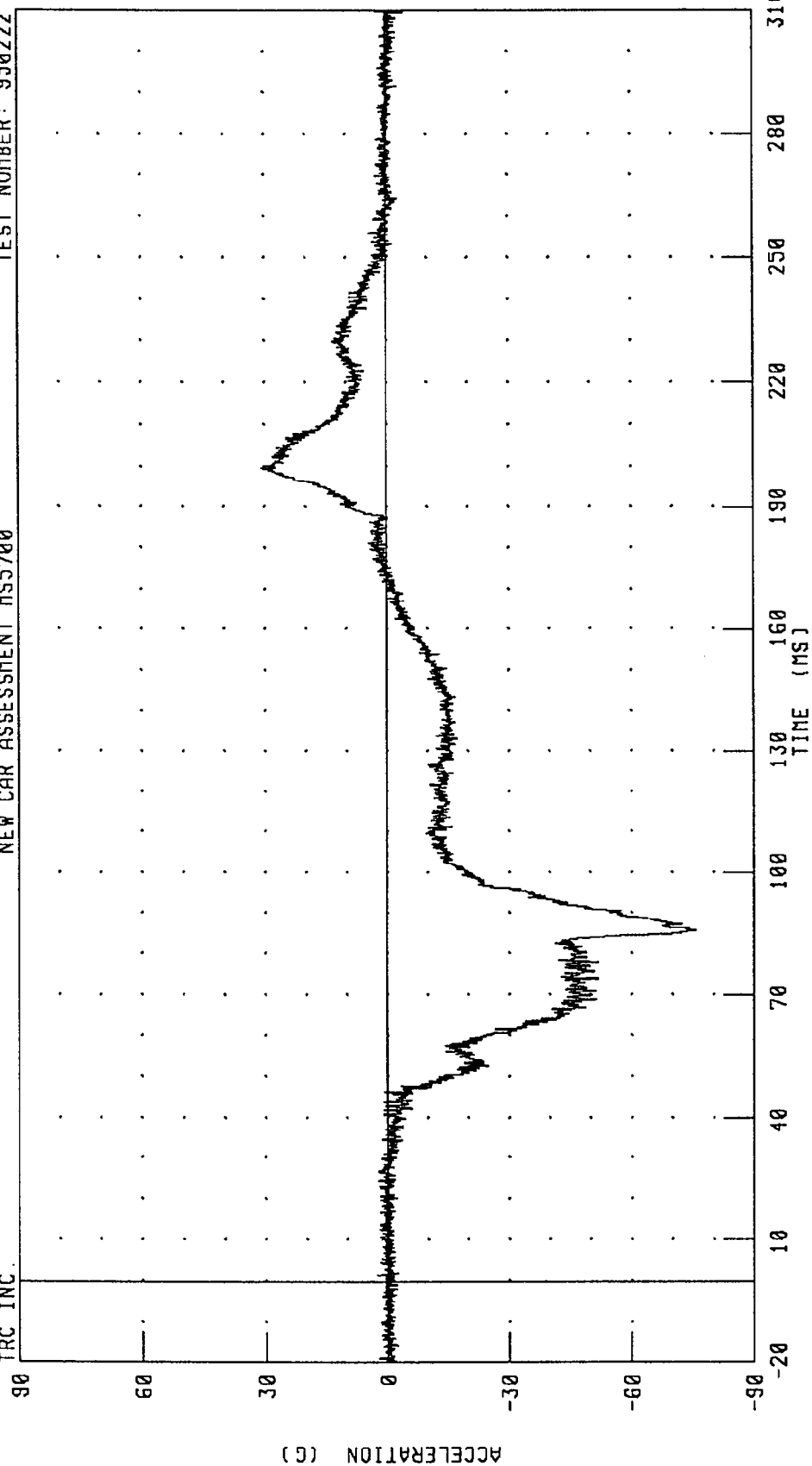
Data Plots

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

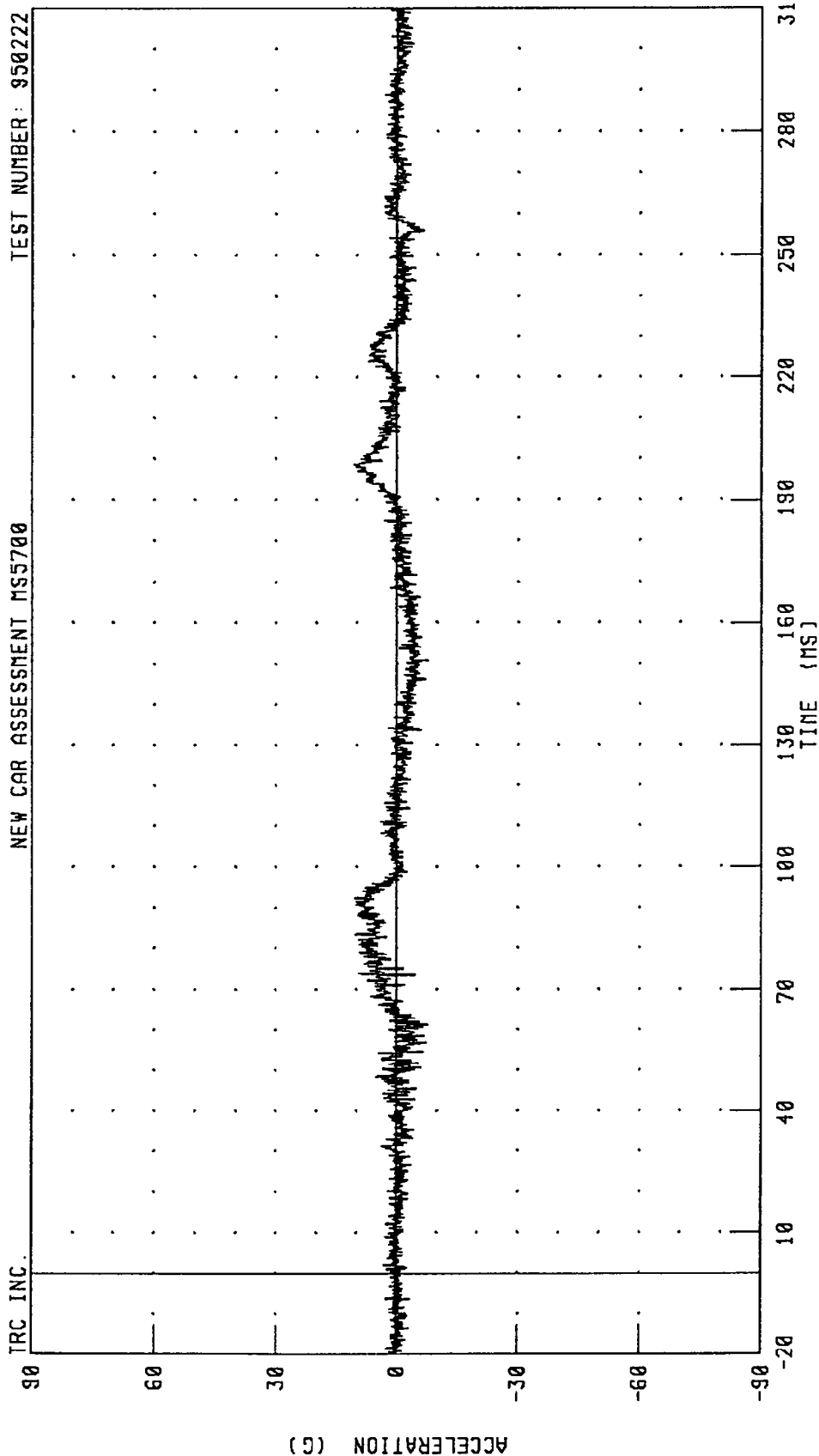


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



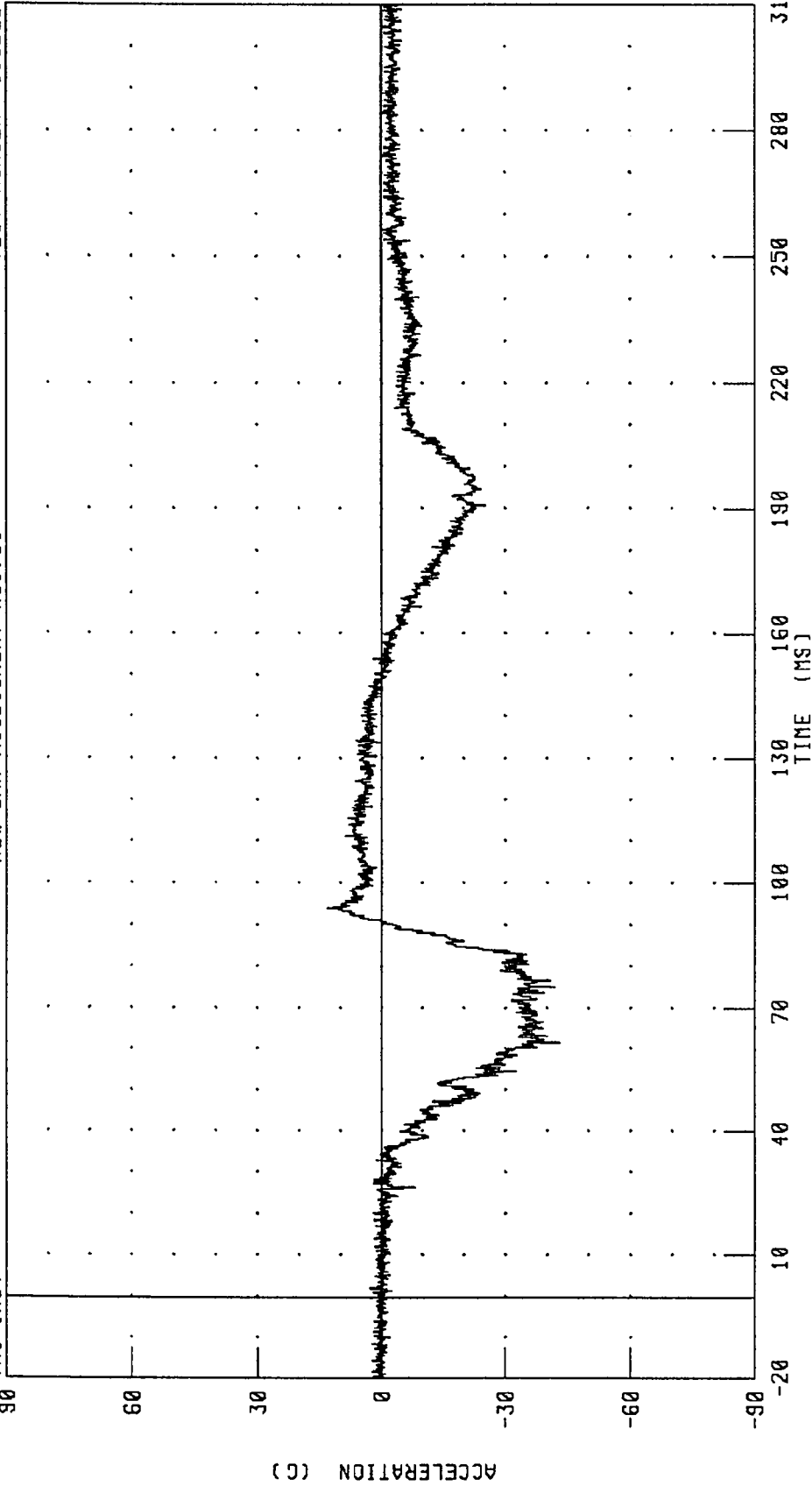
CHANNEL: HEDYGI FILTER: CH. CLASS 1000

PEAK DATA: 10.68 G @ 198.64 MS; -7.49 G @ 61.44 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

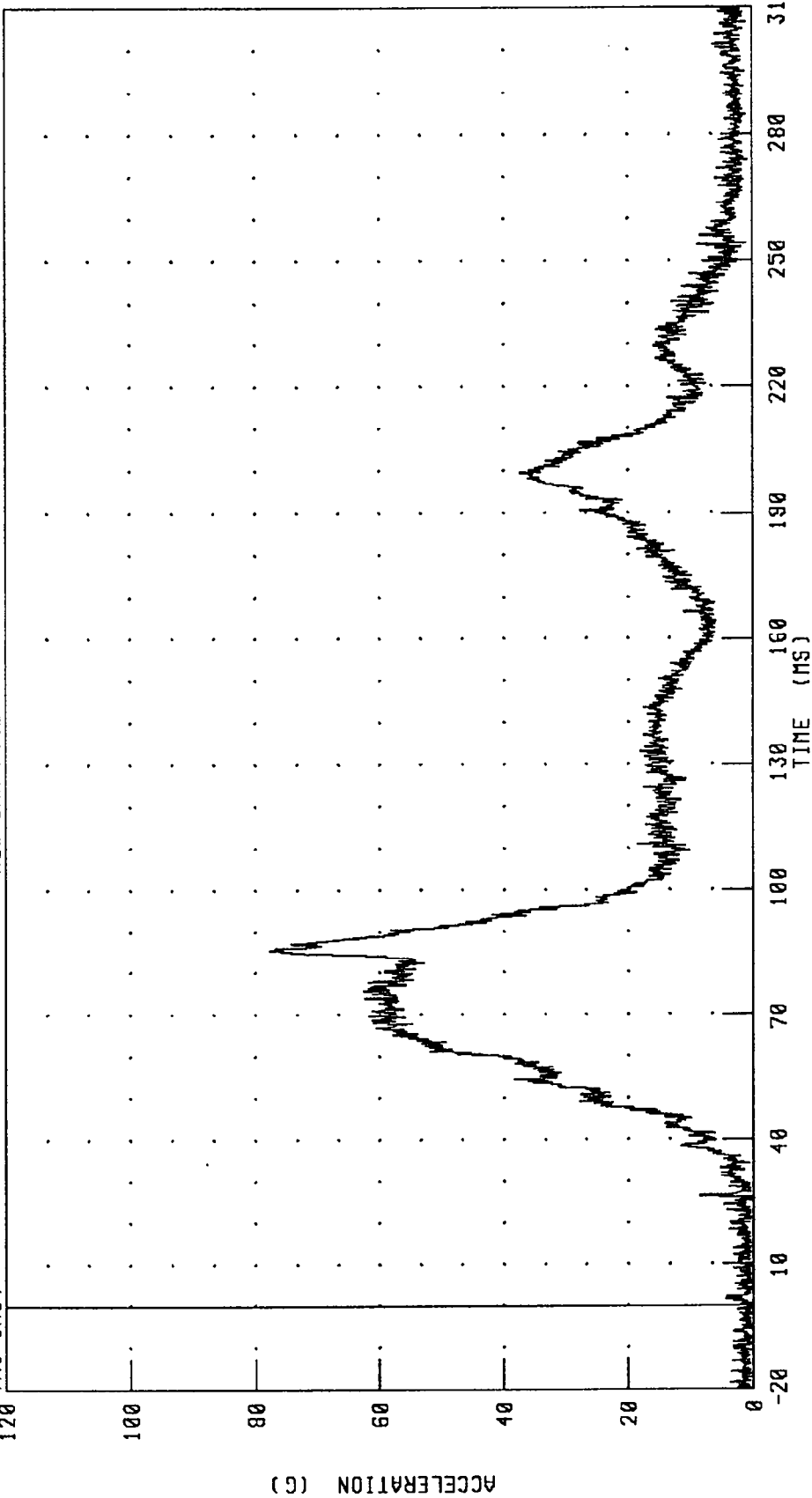
PEAK DATA: 13.25 G @ 94.08 MS; -43.16 G @ 61.36 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

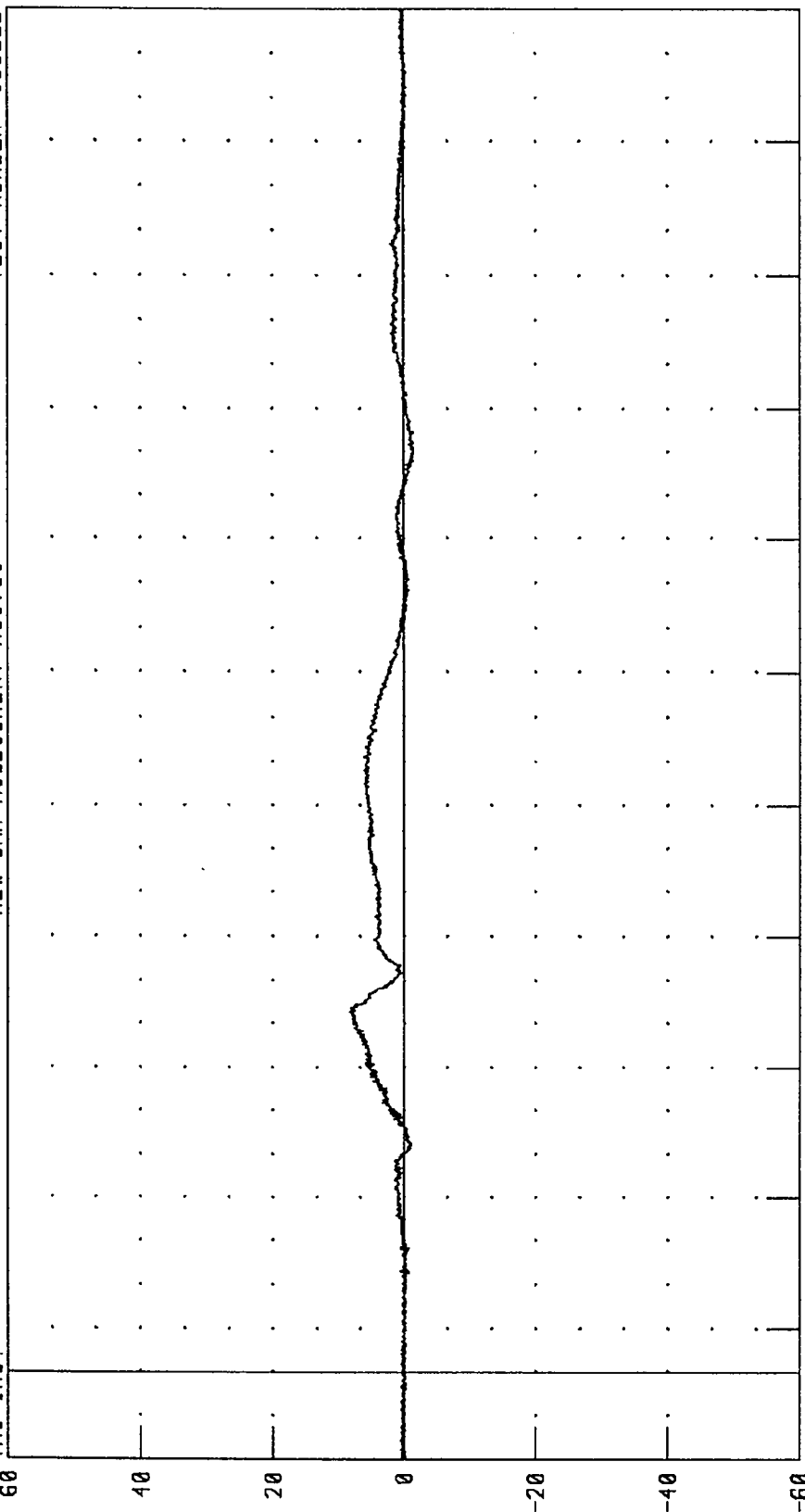
PEAK DATA: 77.75 G @ 85.52 MS; 0.20 G @ -5.12 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

60



FORCE (N X 10²)

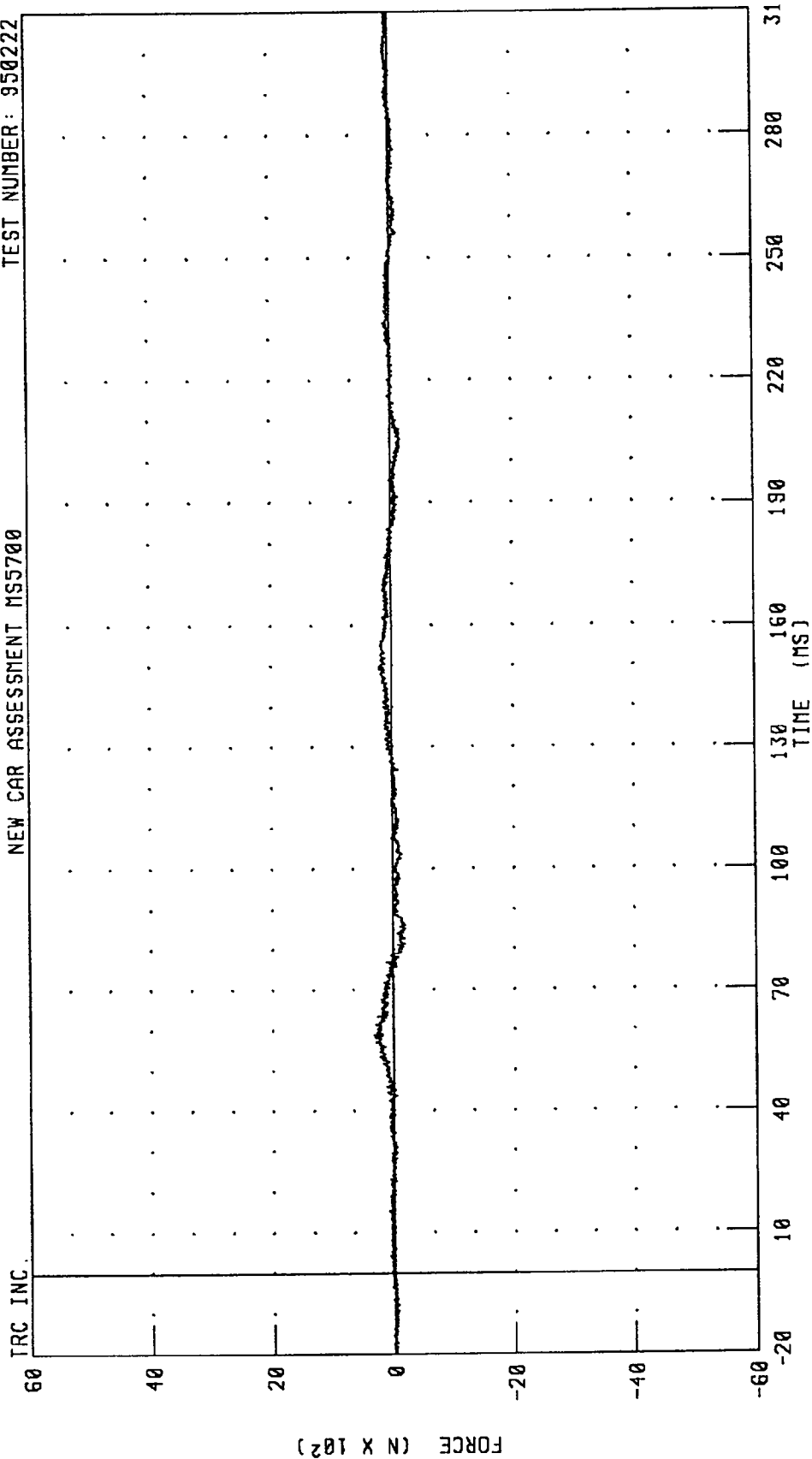
TIME (MS)

PEAK DATA: 828.11 N @ 82.72 MS; -157.30 N @ 209.84 MS

CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Y-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



PEAK DATA: 322.72 N @ 58.96 MS; -209.42 N @ 81.44 MS

CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

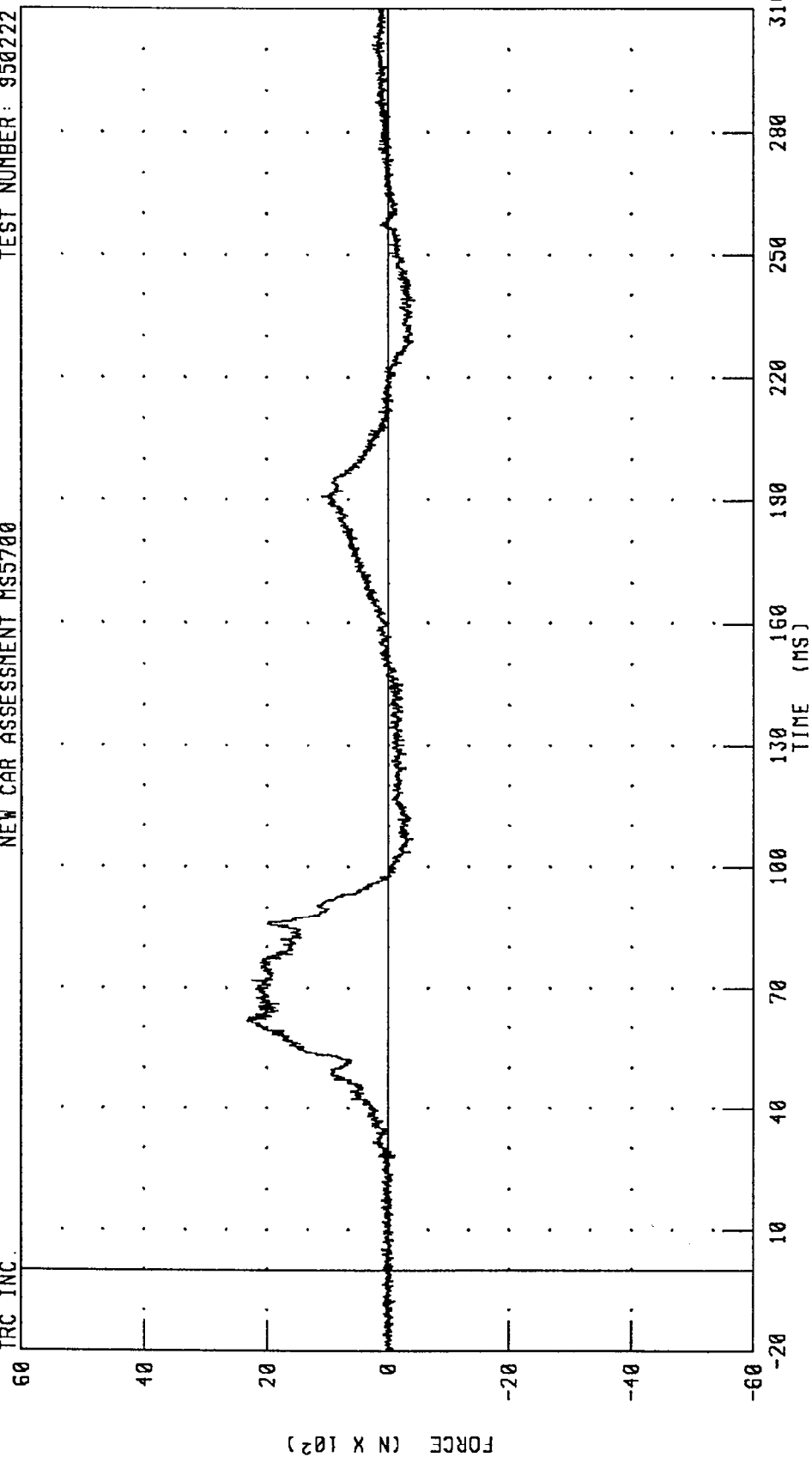
950222

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

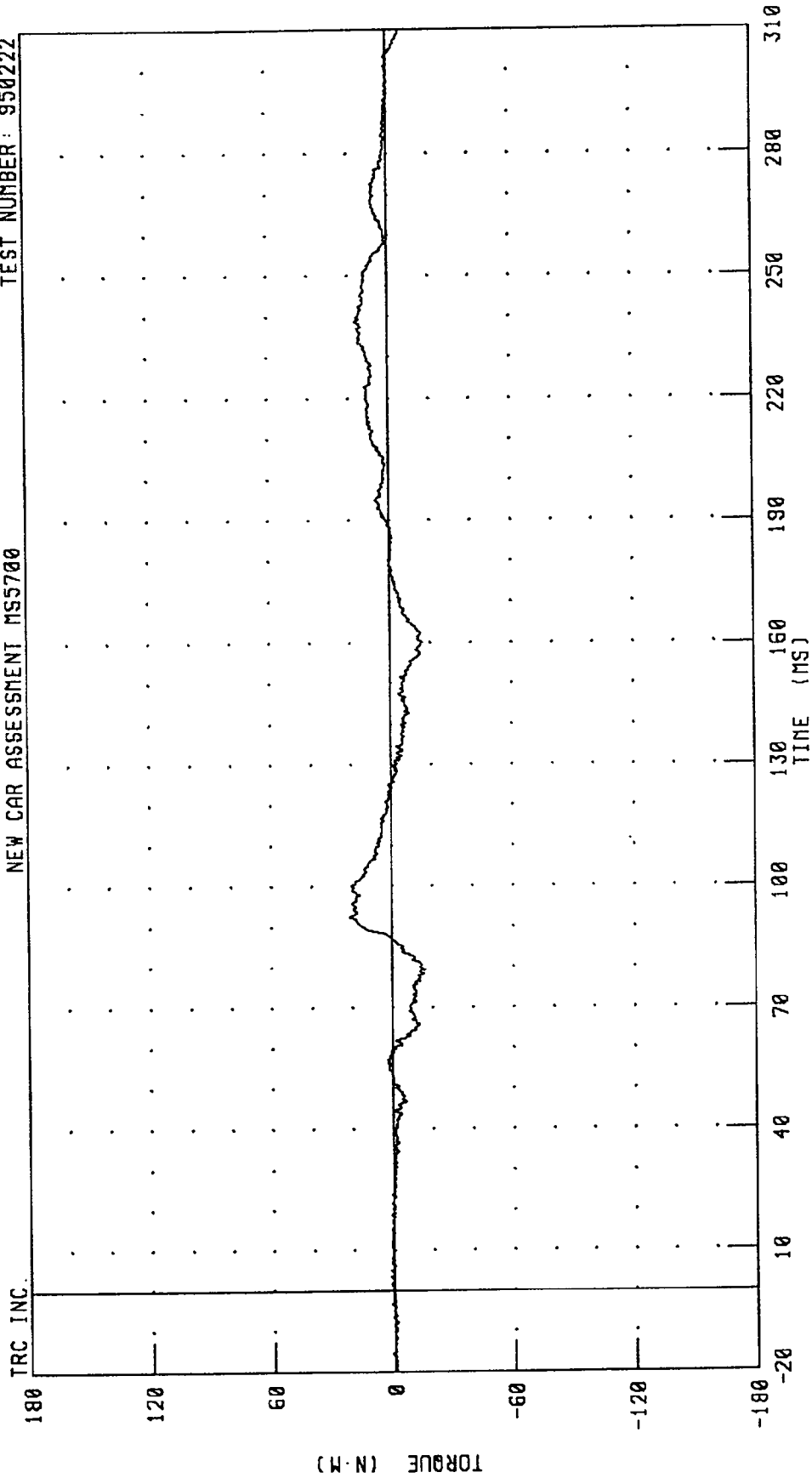


CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 2325.71 N @ 62.00 MS; -431.36 N @ 238.64 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT X AXIS
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



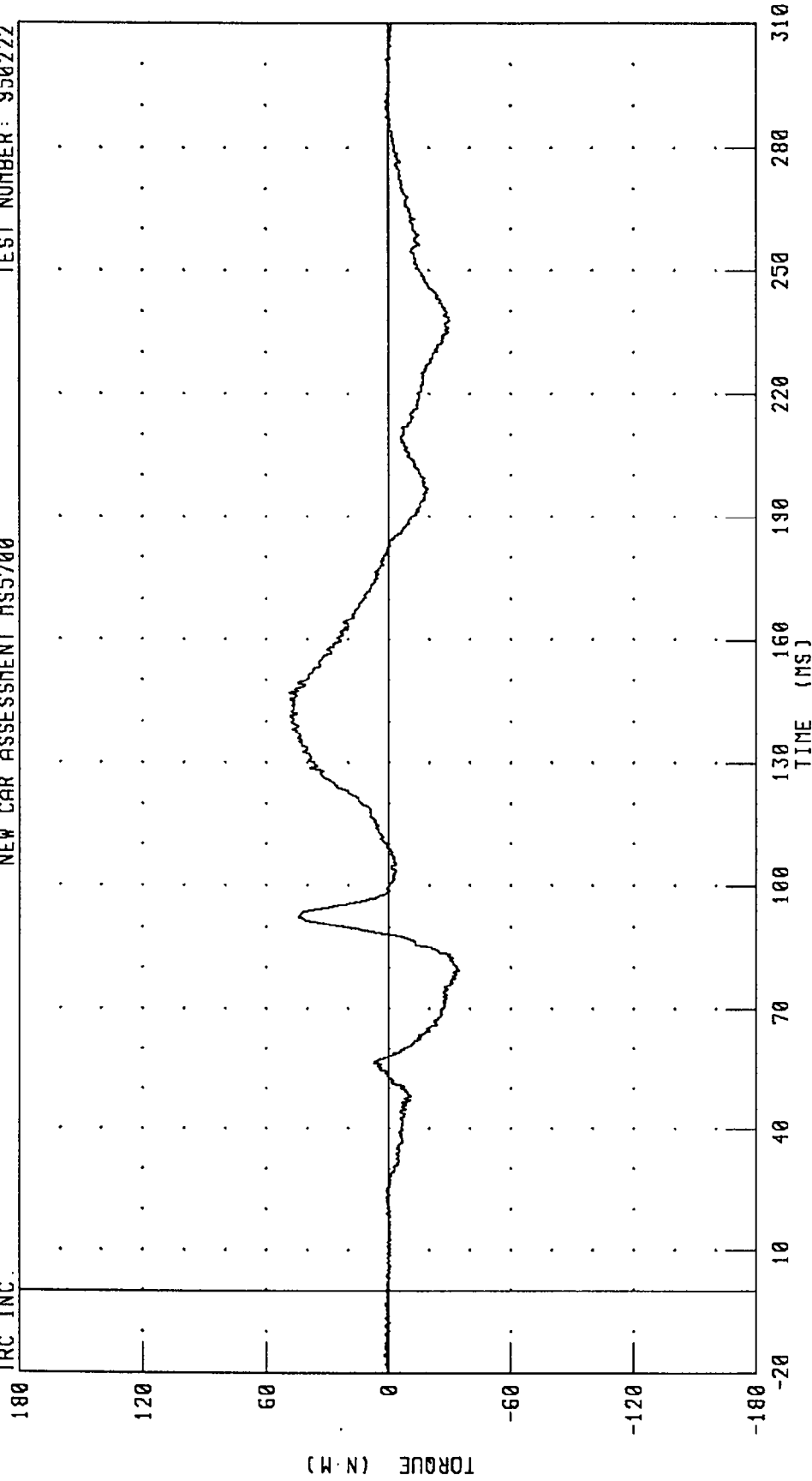
PEAK DATA: 21.58 N·M @ 92.56 MS, -16.11 N·M @ 79.52 MS

CHANNEL: NEKX01 FILTER: CH. CLASS 600

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT Y AXIS
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

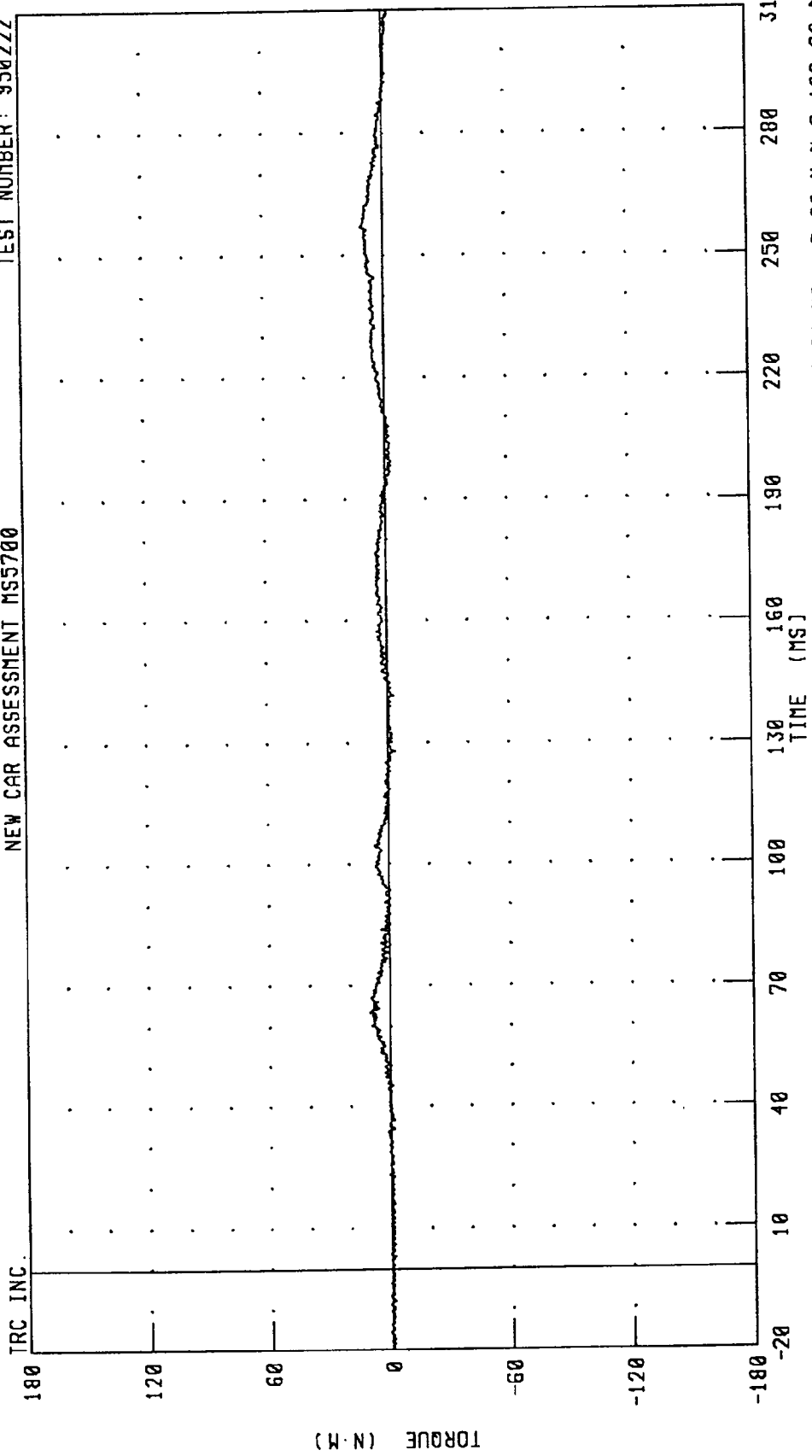
TRC INC.



CHANNEL: NEKYM1 FILTER: CH. CLASS 600

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT Z AXIS
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



CHANNEL: NEKZM1 FILTER: CH. CLASS 600

950222

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

IRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

-20

10

40

70

100

130

160

190

220

250

280

310

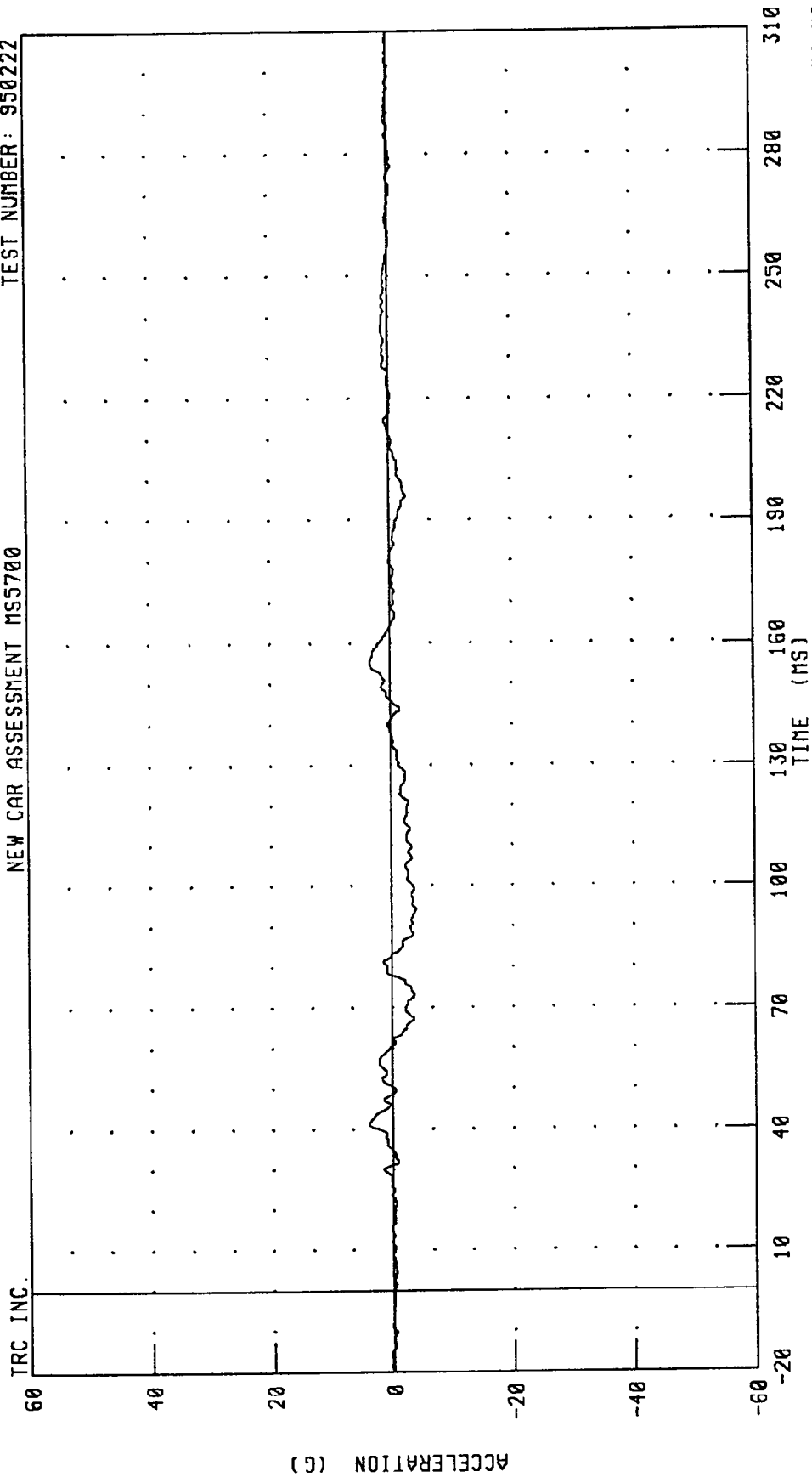
TIME (MS)

CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 5.96 G @ 168.56 MS; -54.57 G @ 76.08 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



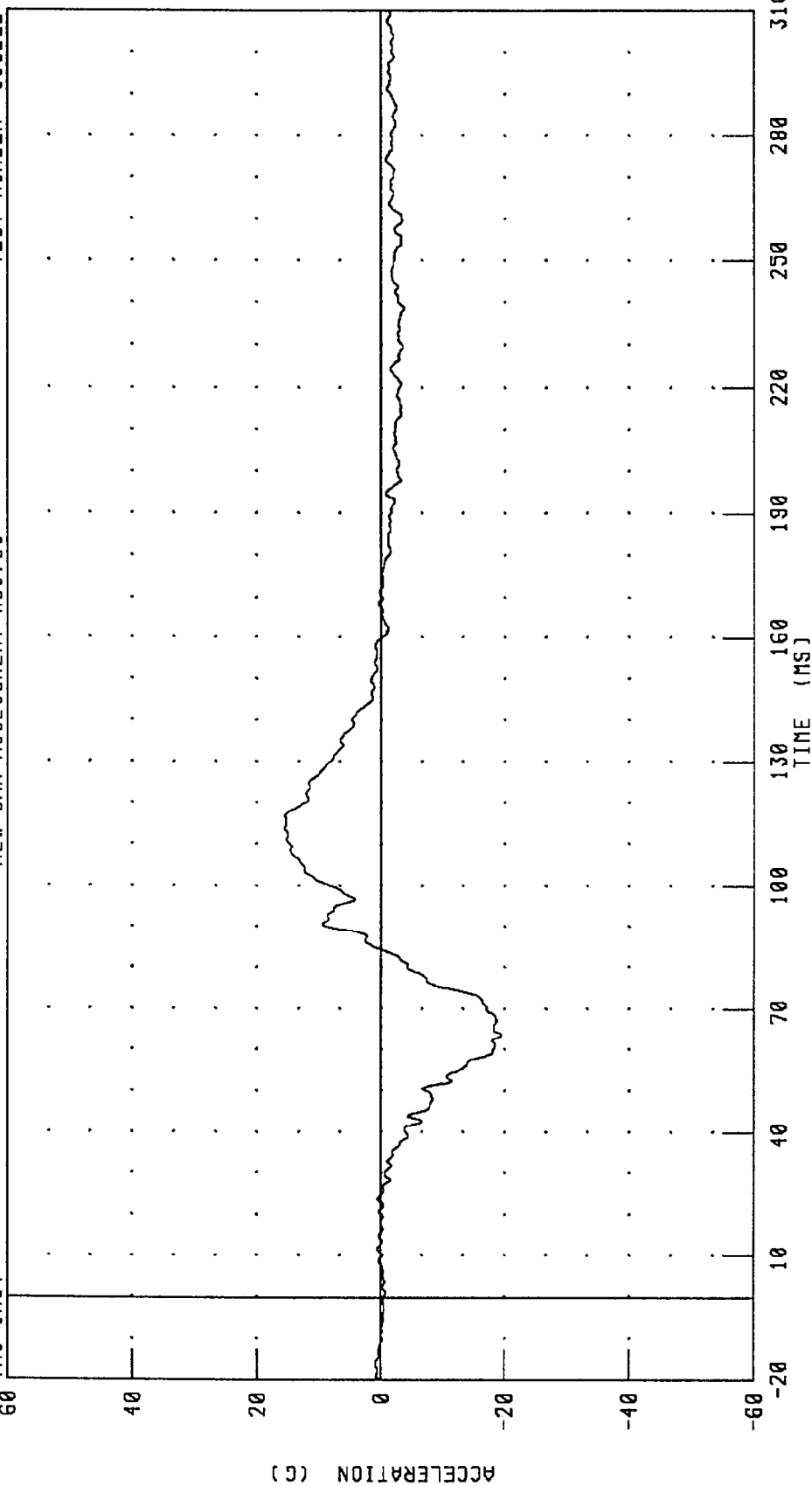
PEAK DATA: 3.95 G @ 41.36 MS; -3.98 G @ 94.32 MS

CHANNEL: CSTYG1 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

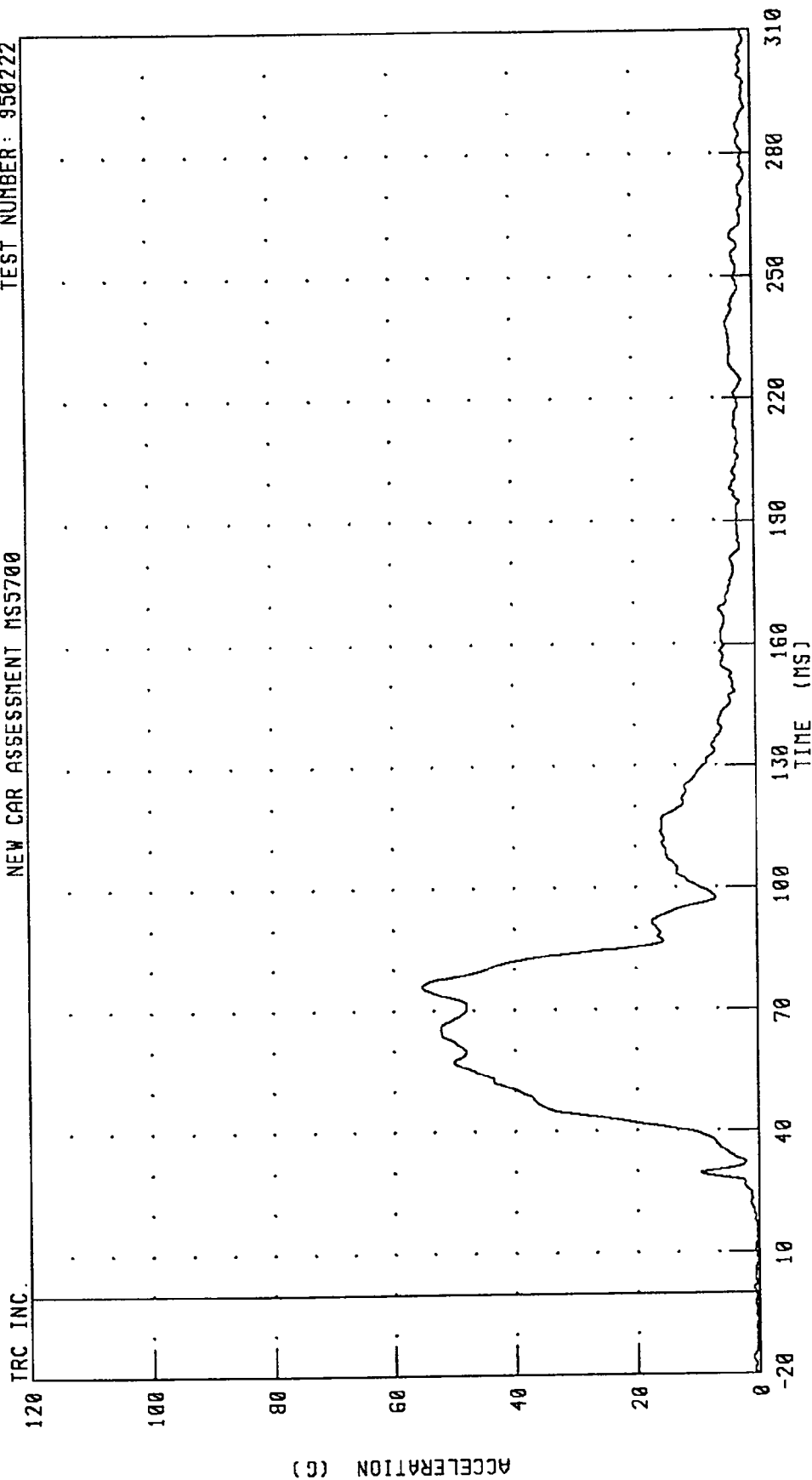


CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 15.56 G @ 113.84 MS; -19.52 G @ 63.68 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



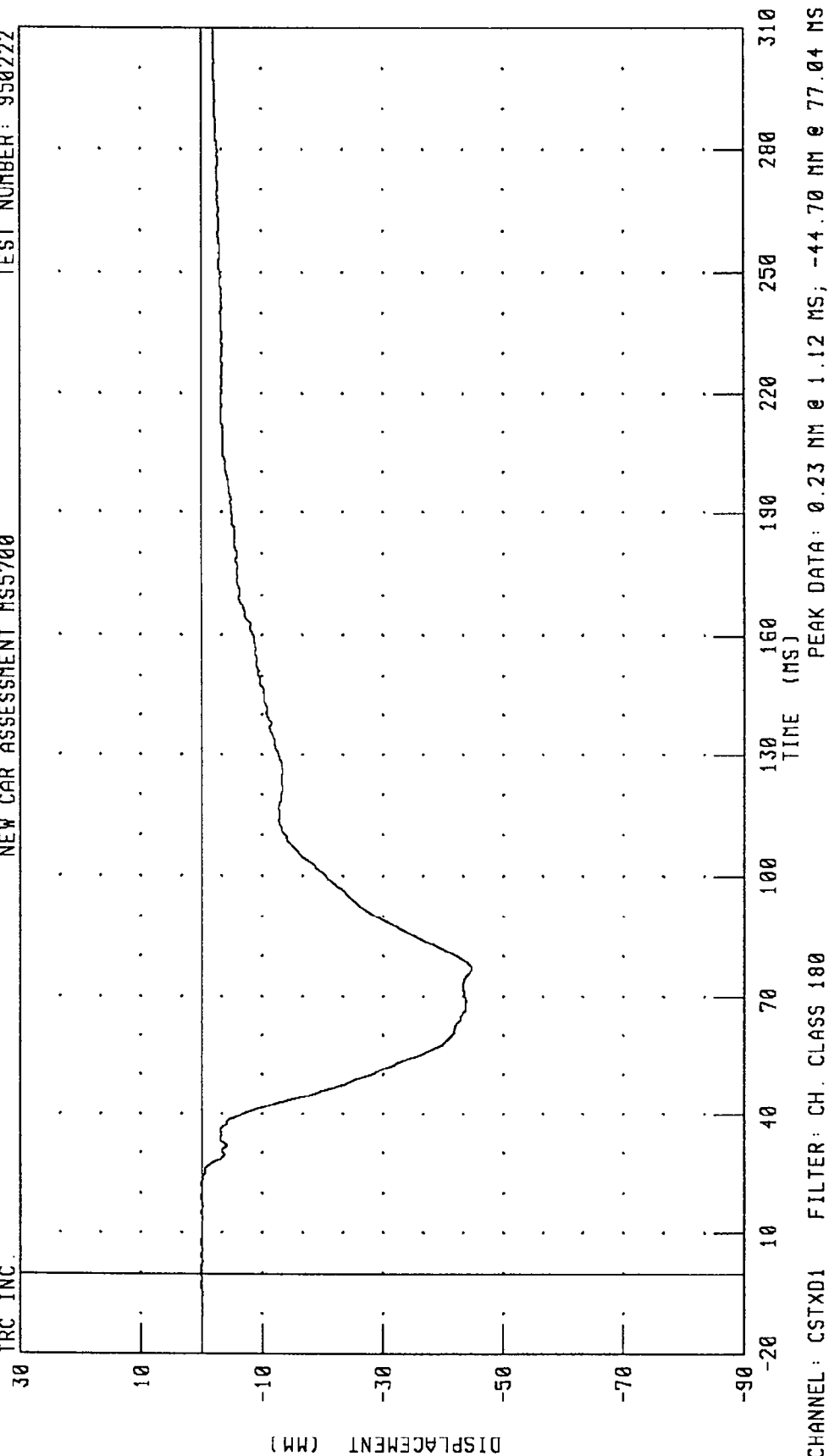
PEAK DATA: 55.23 G @ 76.00 MS; 0.08 G @ -20.00 MS

CHANNEL: CSTRG1 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST DEFLECTION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

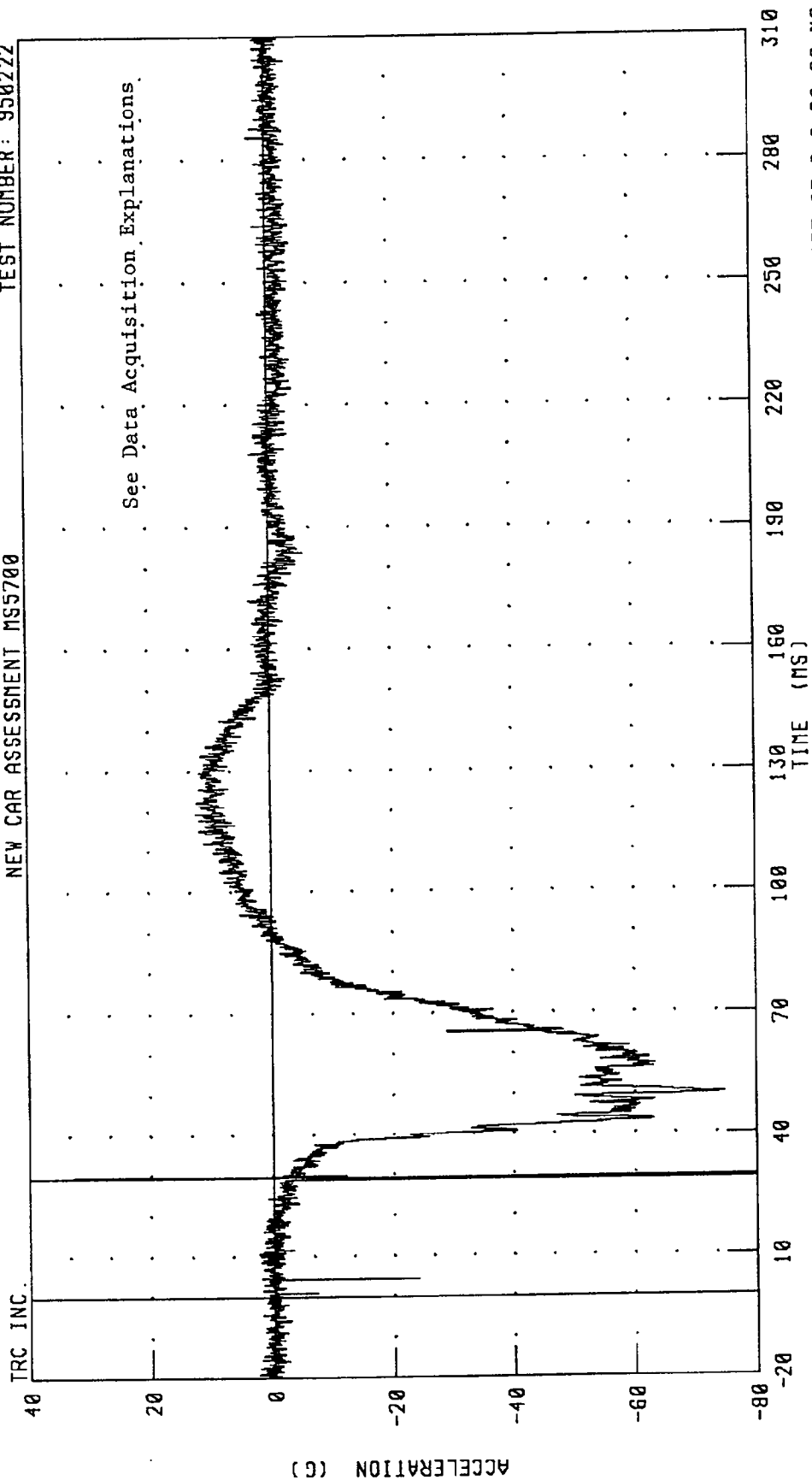


PEAK DATA: 0.23 NM @ 1.12 MS; -44.70 MM @ 77.04 MS

CHANNEL: CSTXD1 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

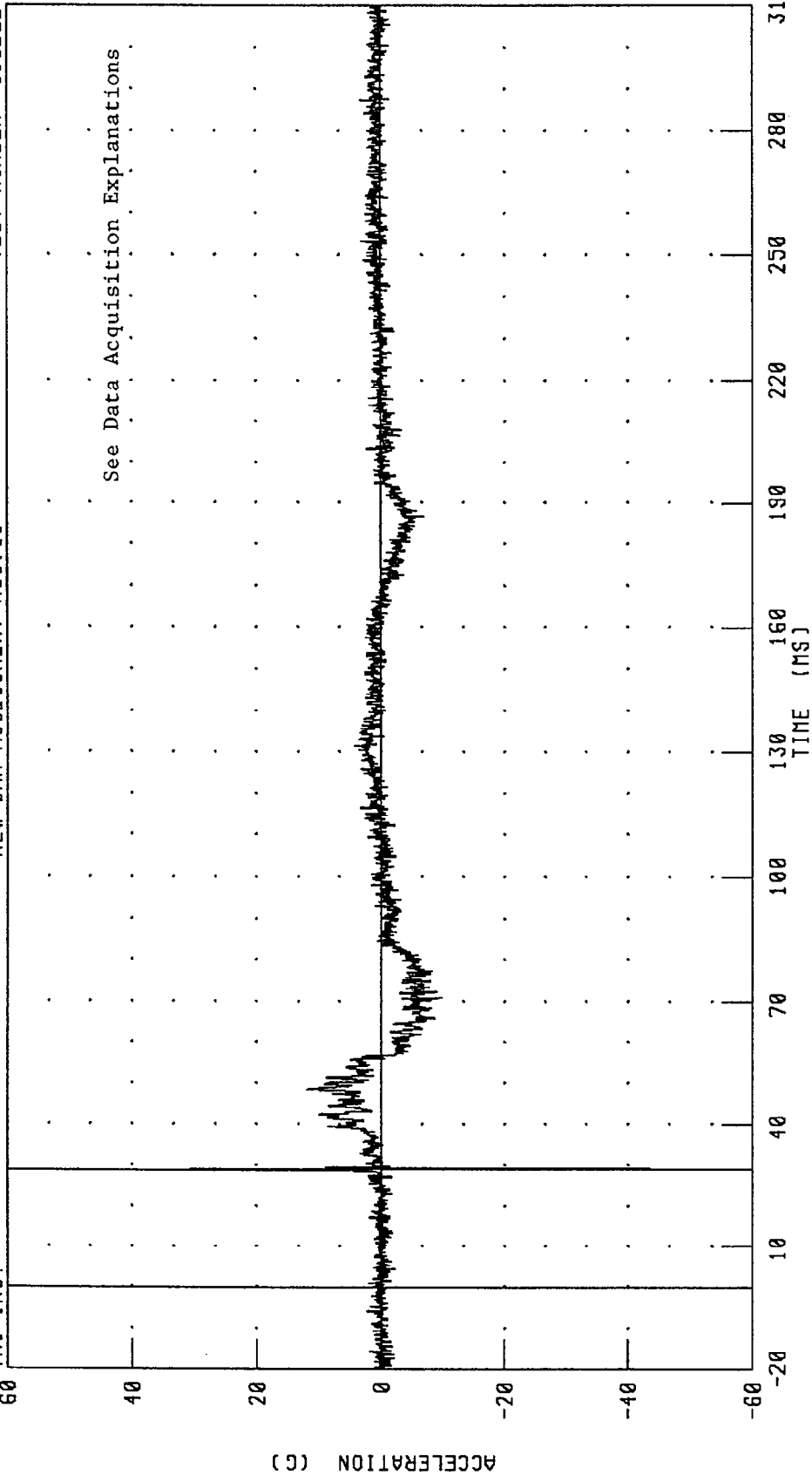
PEAK DATA: 55.53 G @ 29.36 MS; -477.03 G @ 28.96 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

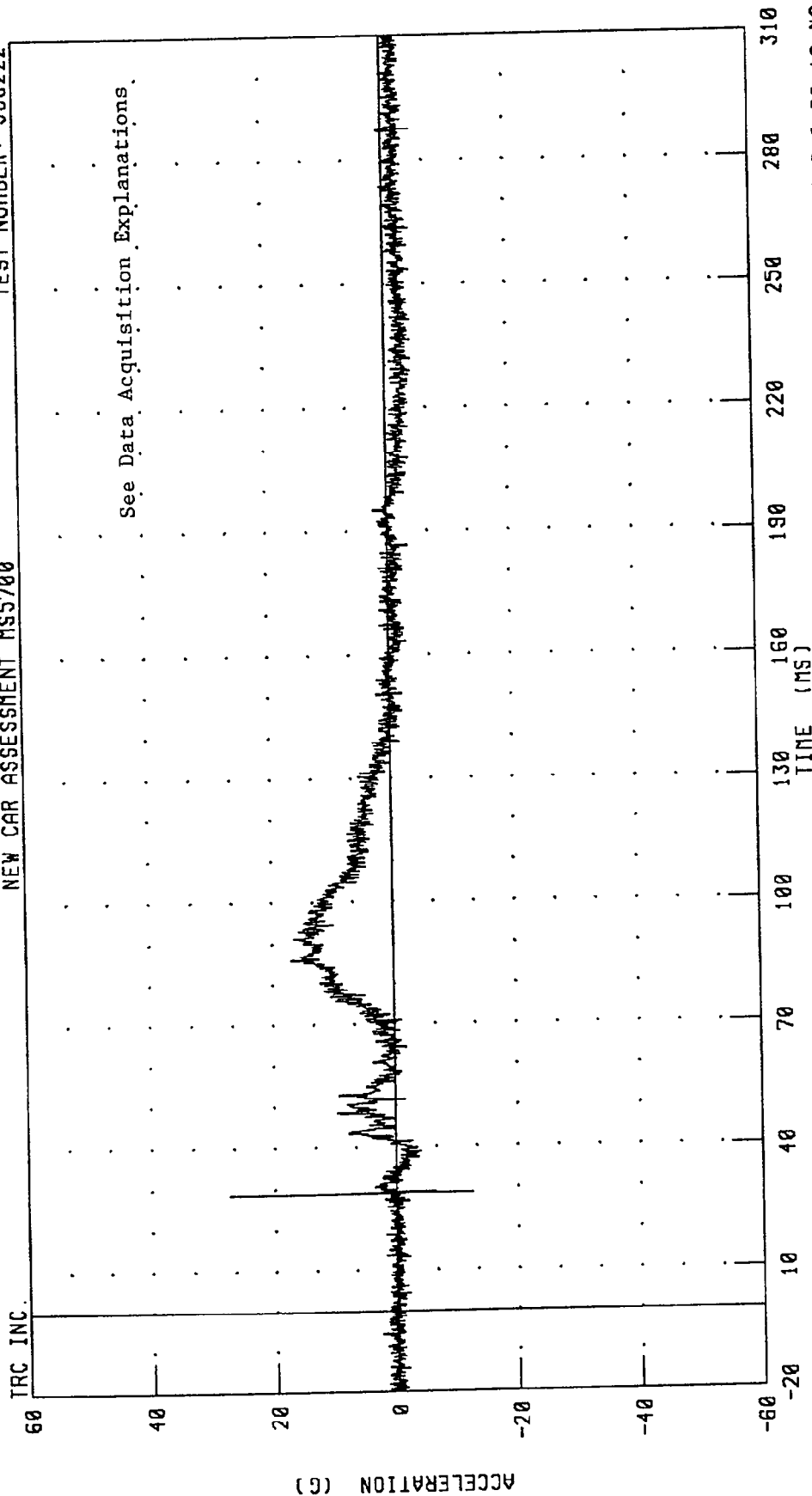


CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

PEAK DATA: 84.70 G @ 28.88 MS, -65.47 G @ 29.12 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



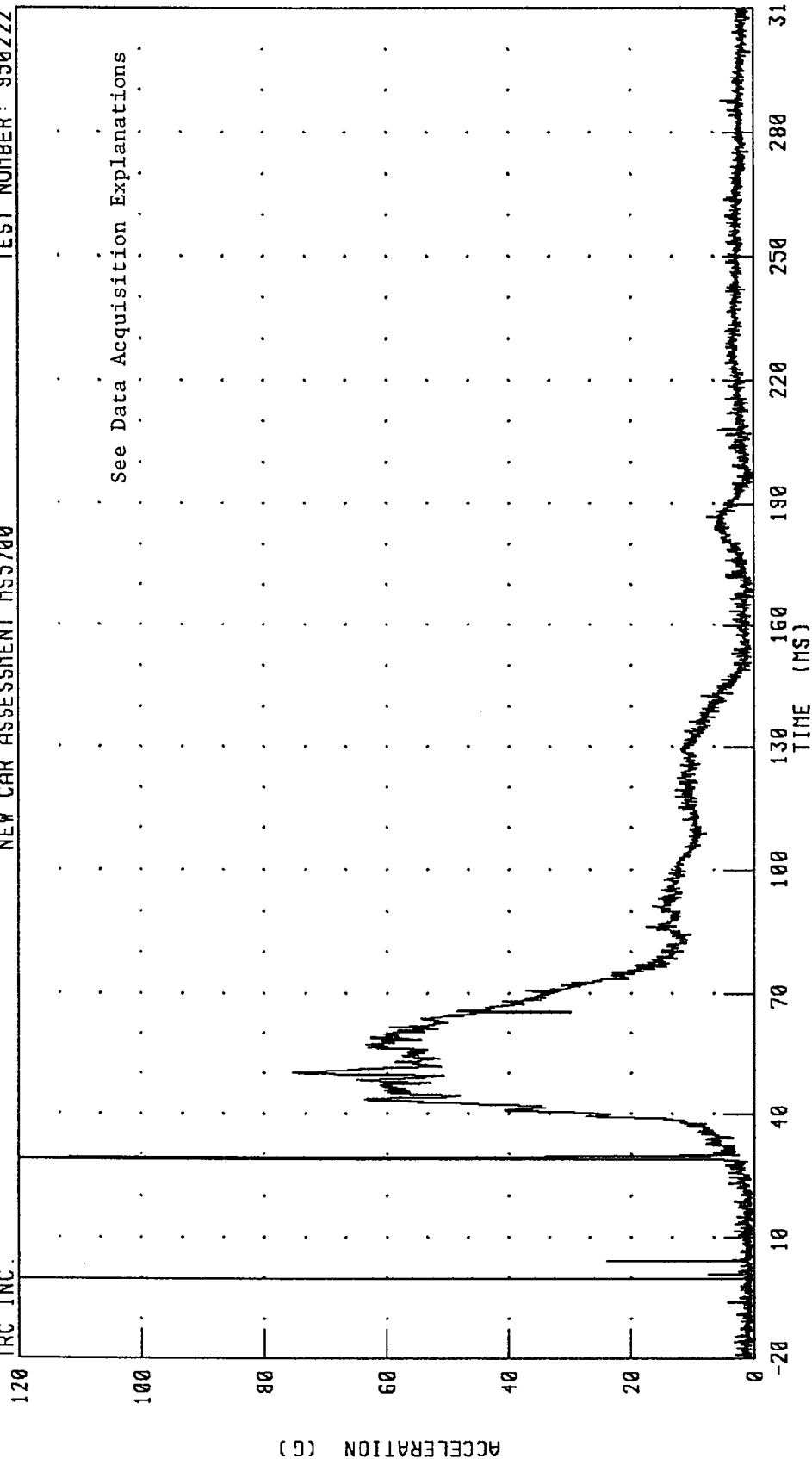
PEAK DATA: 27.50 G @ 28.88 MS; -12.56 G @ 29.12 MS

CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS RESULTANT ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 479.24 G @ 29.04 MS; 0.12 G @ 5.04 MS

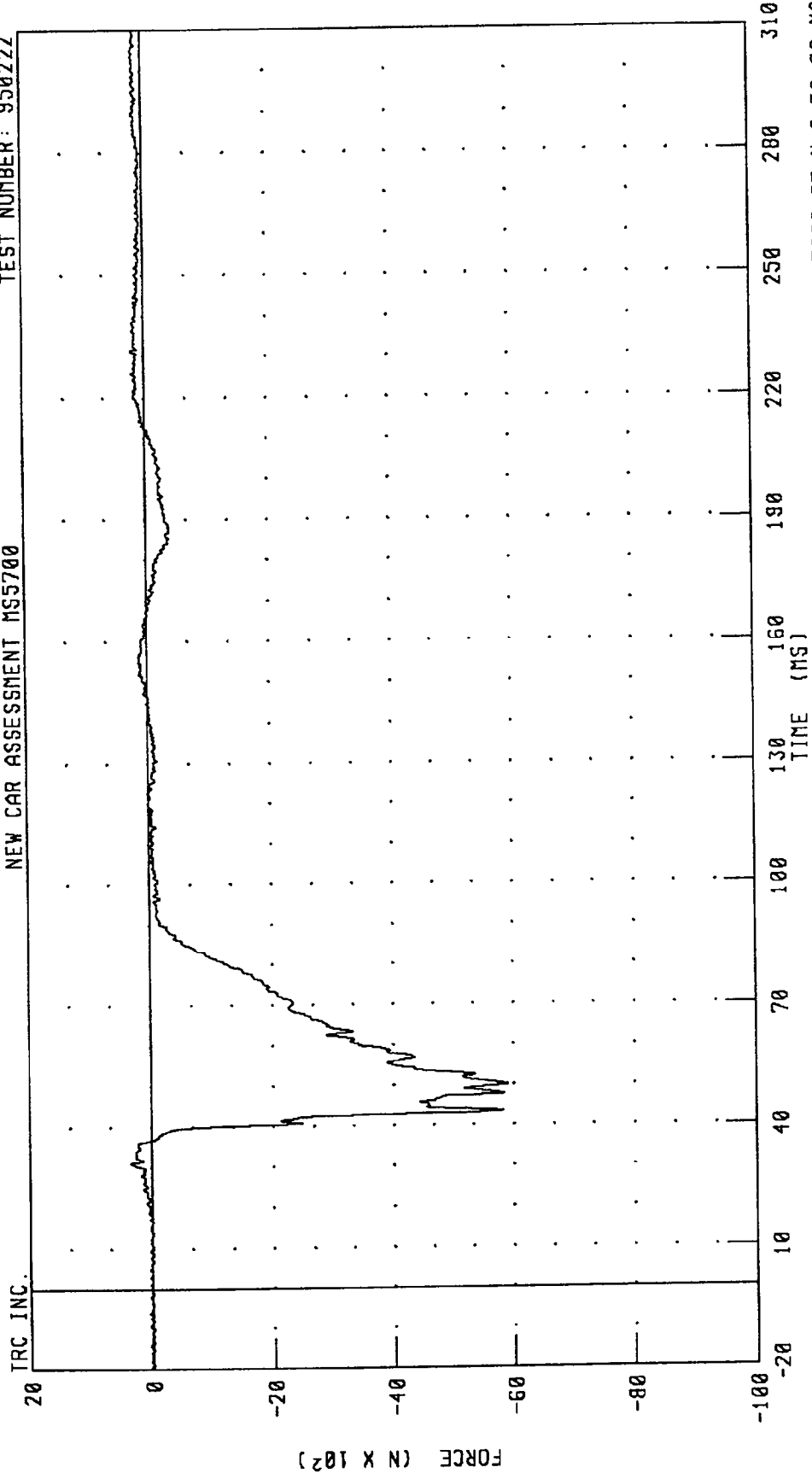
CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER

DRIVER LEFT FEMUR FORCE

NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



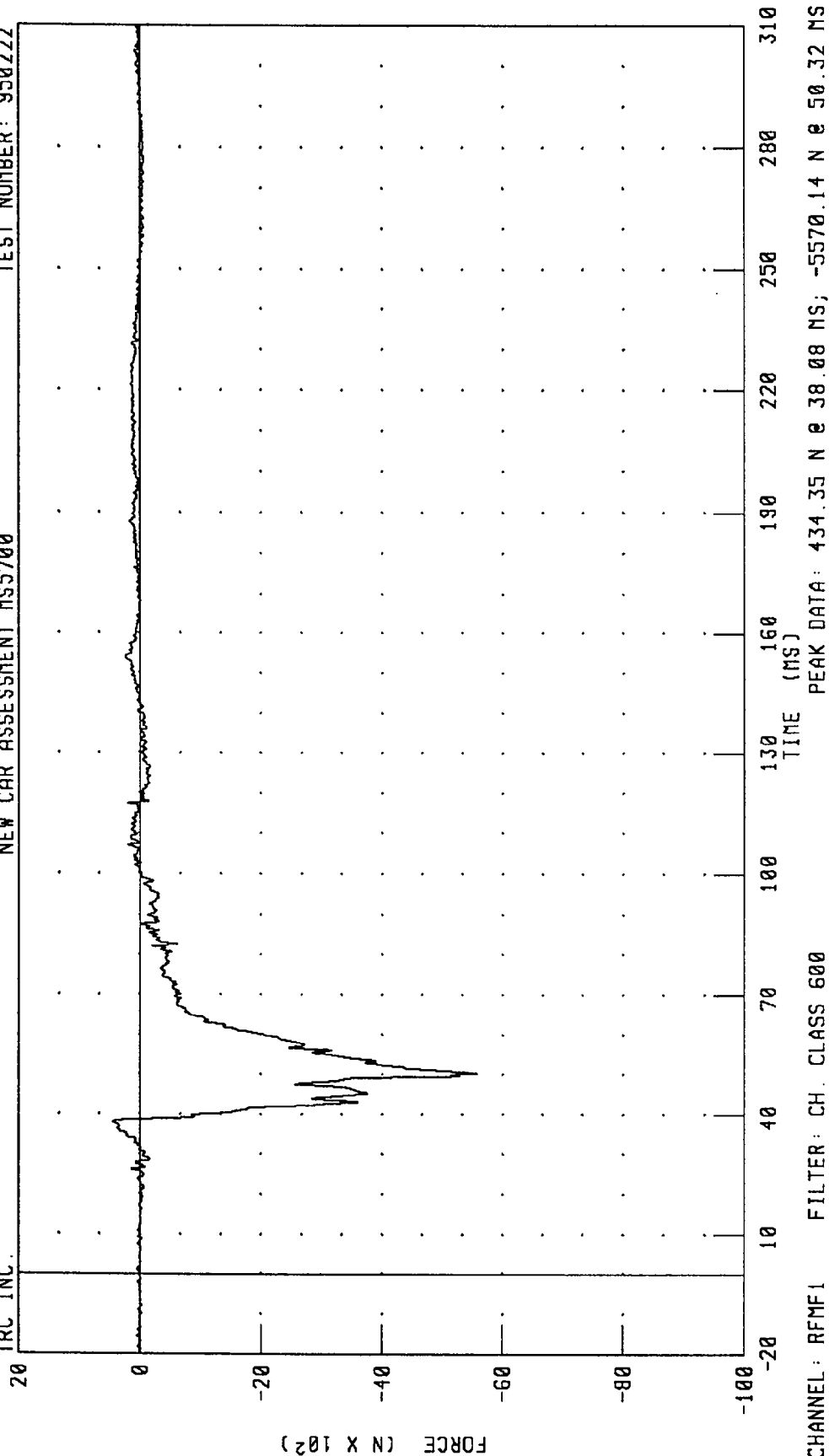
CHANNEL: LFMF1 FILTER: CH. CLASS 600

PEAK DATA: 330.03 N @ 31.04 MS; -5906.05 N @ 50.08 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

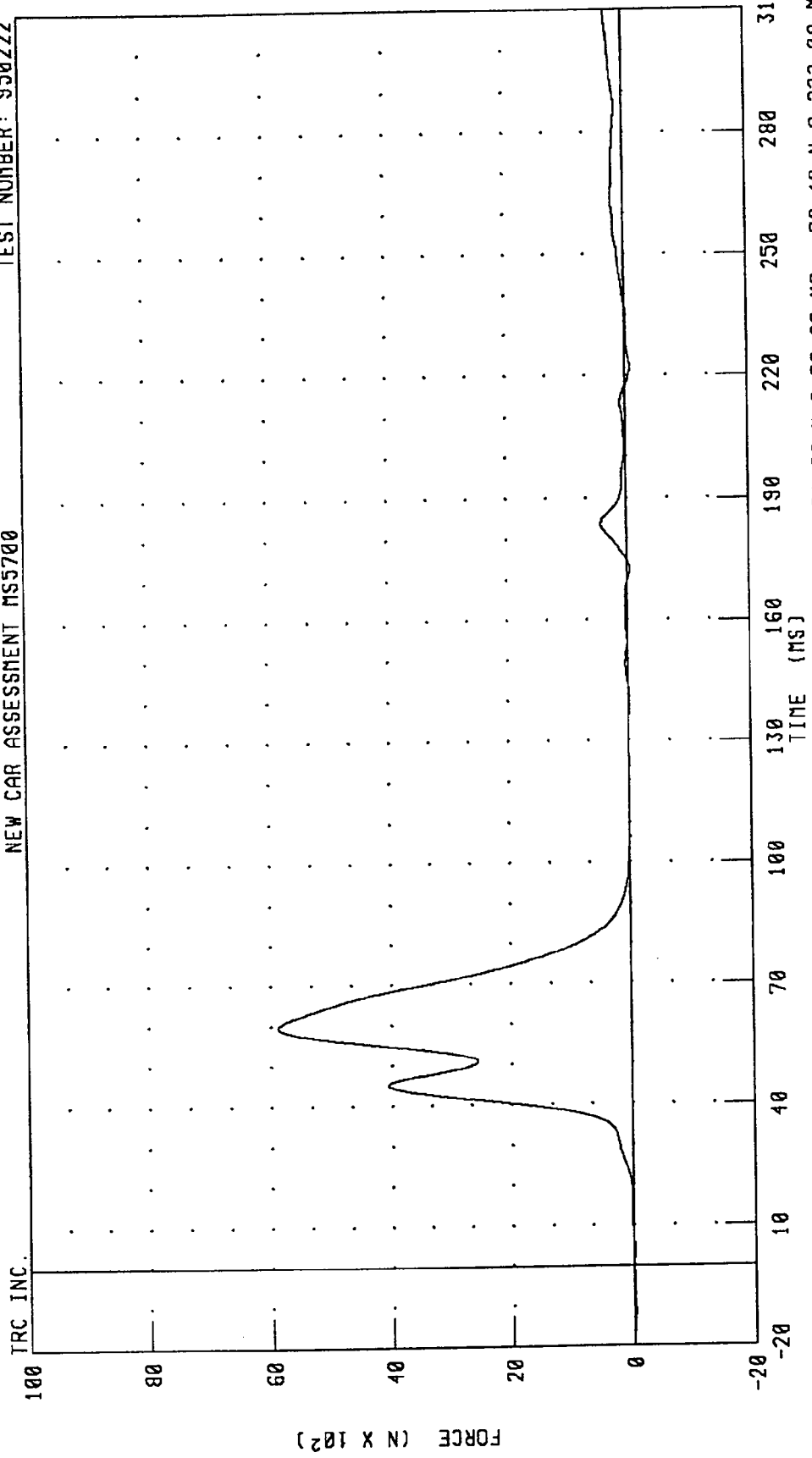


PEAK DATA: 434.35 N @ 38.08 MS; -5570.14 N @ 50.32 MS

CHANNEL: RFMF1 FILTER: CH. CLASS 600

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



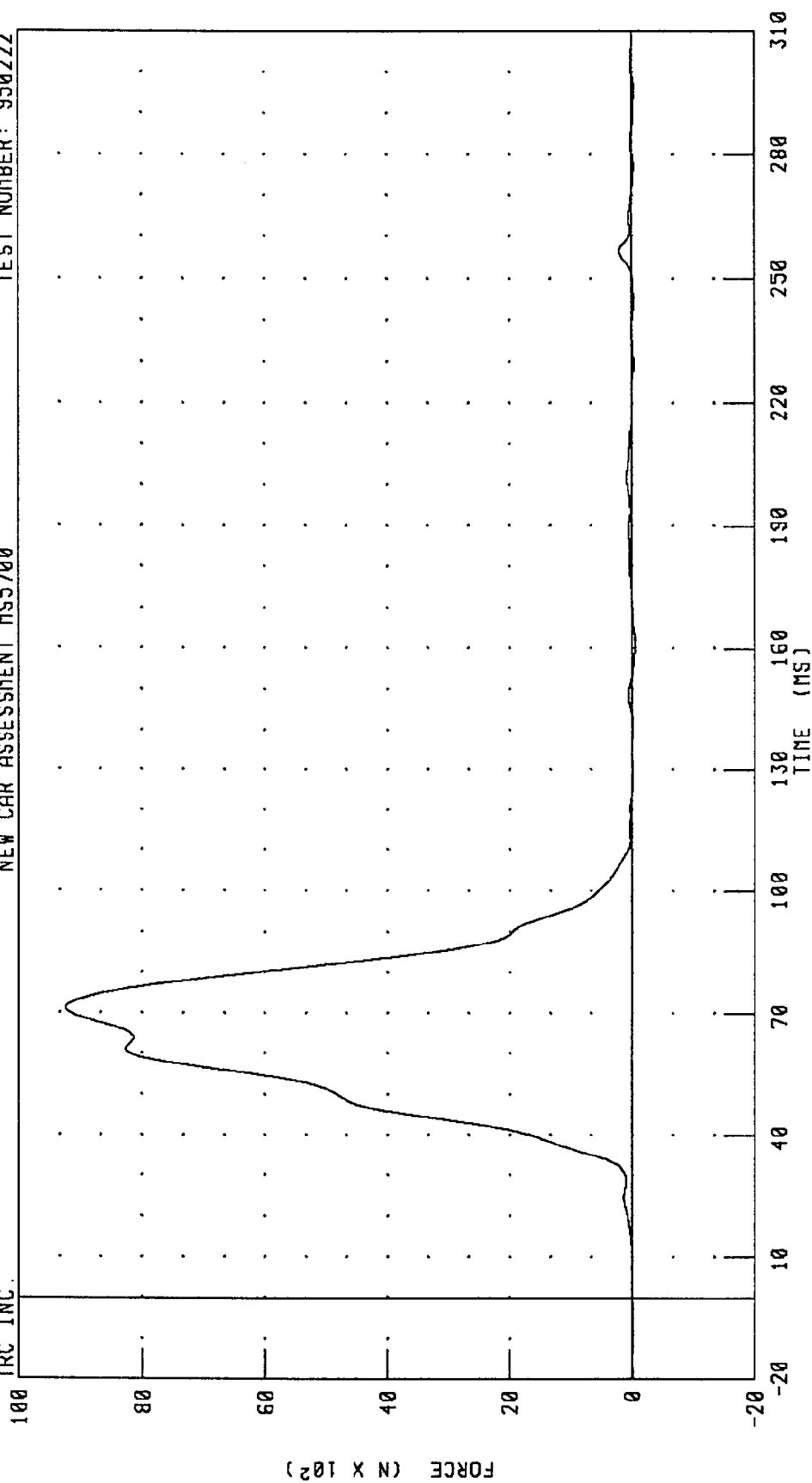
PEAK DATA: 5881.86 N @ 59.68 MS; -76.40 N @ 222.08 MS

CHANNEL: LBOFI FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

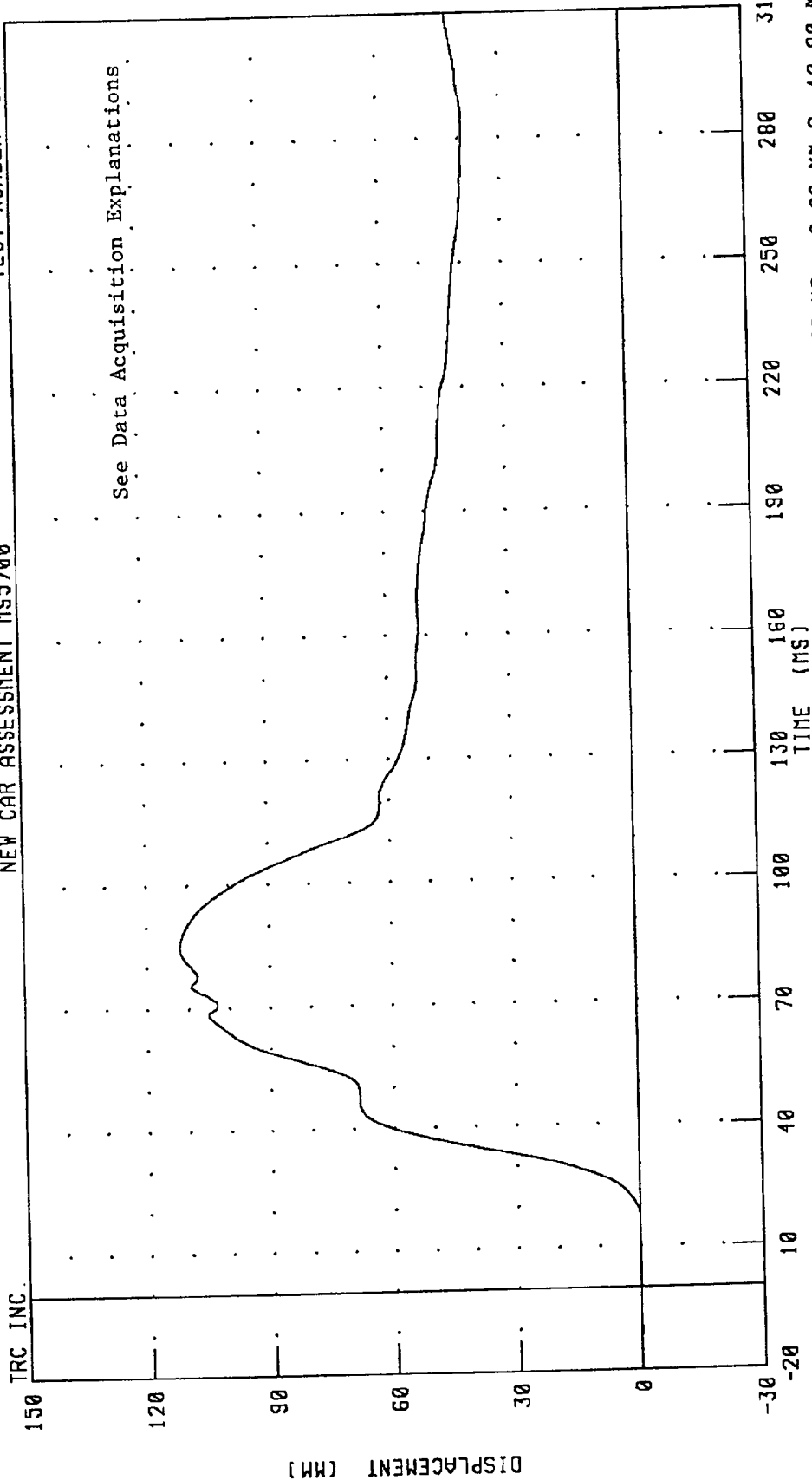


PEAK DATA: 9238.94 N @ 71.28 MS; -43.72 N @ 160.48 MS

CHANNEL: SHBF1 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

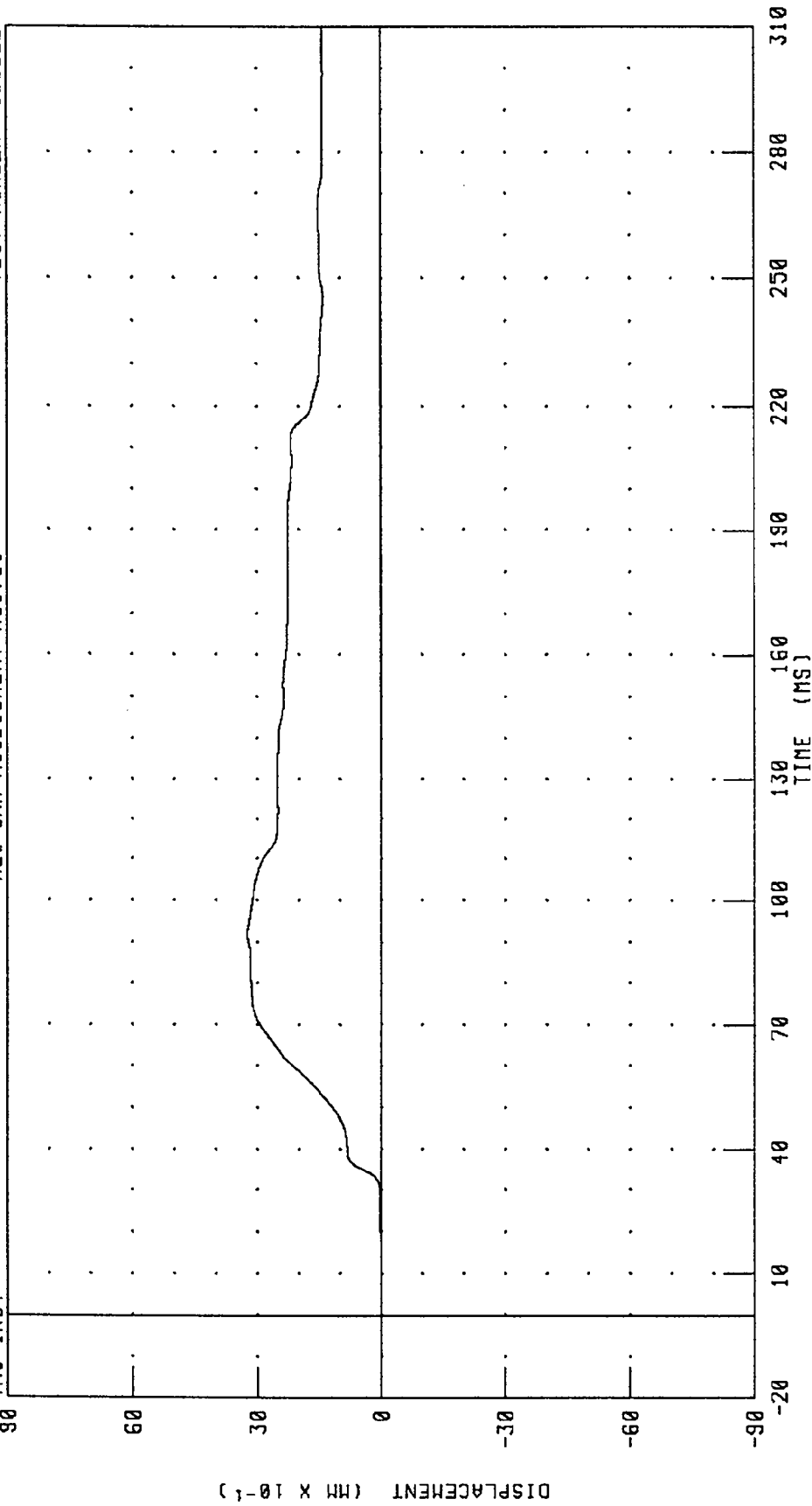


CHANNEL: SHBD1 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 DRIVER SEAT BELT EXTENSION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

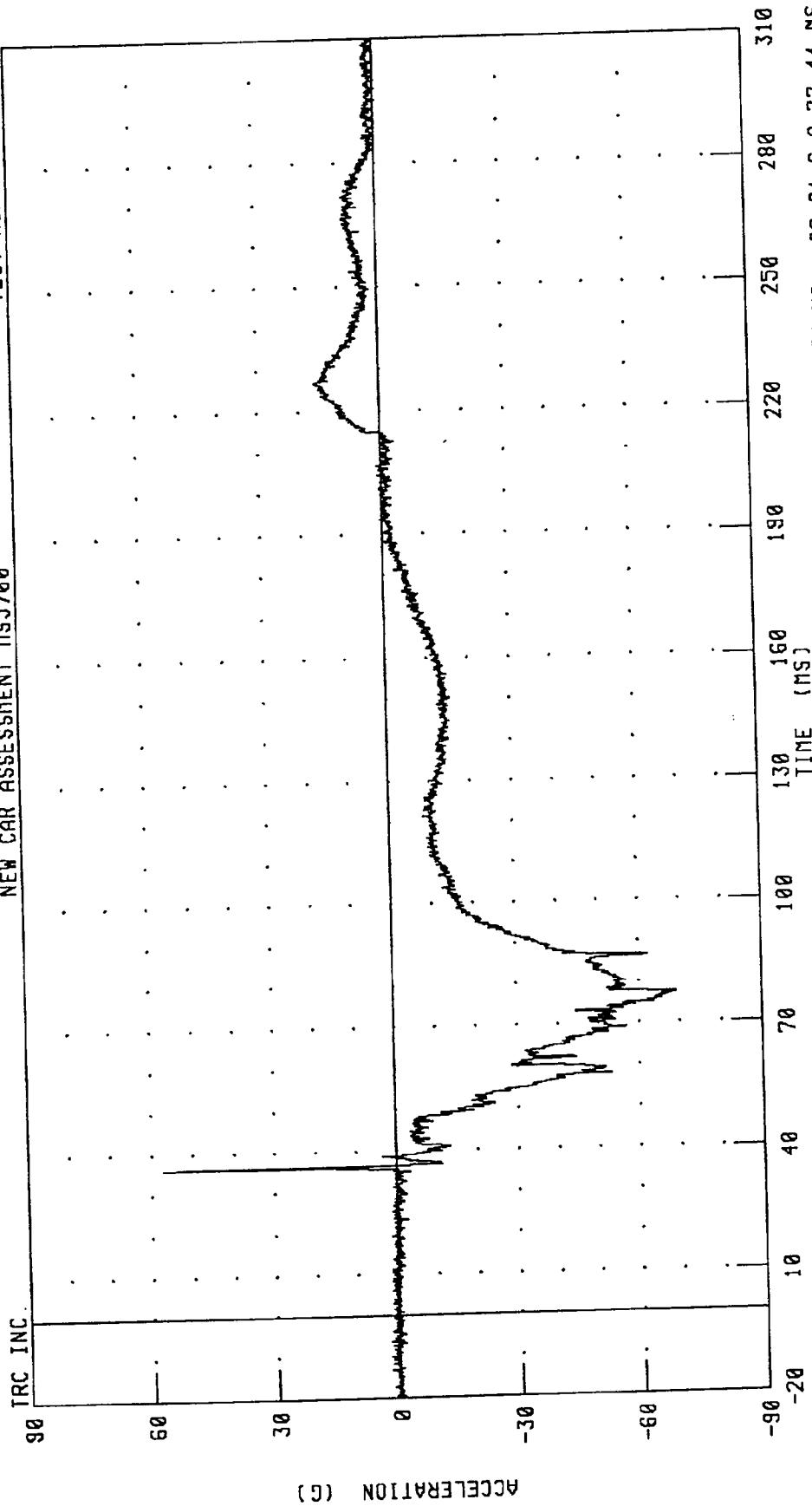
TRC INC.



CHANNEL: SBED1 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

90

60

30

ACCELERATION (G)

-30

-60

-90

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

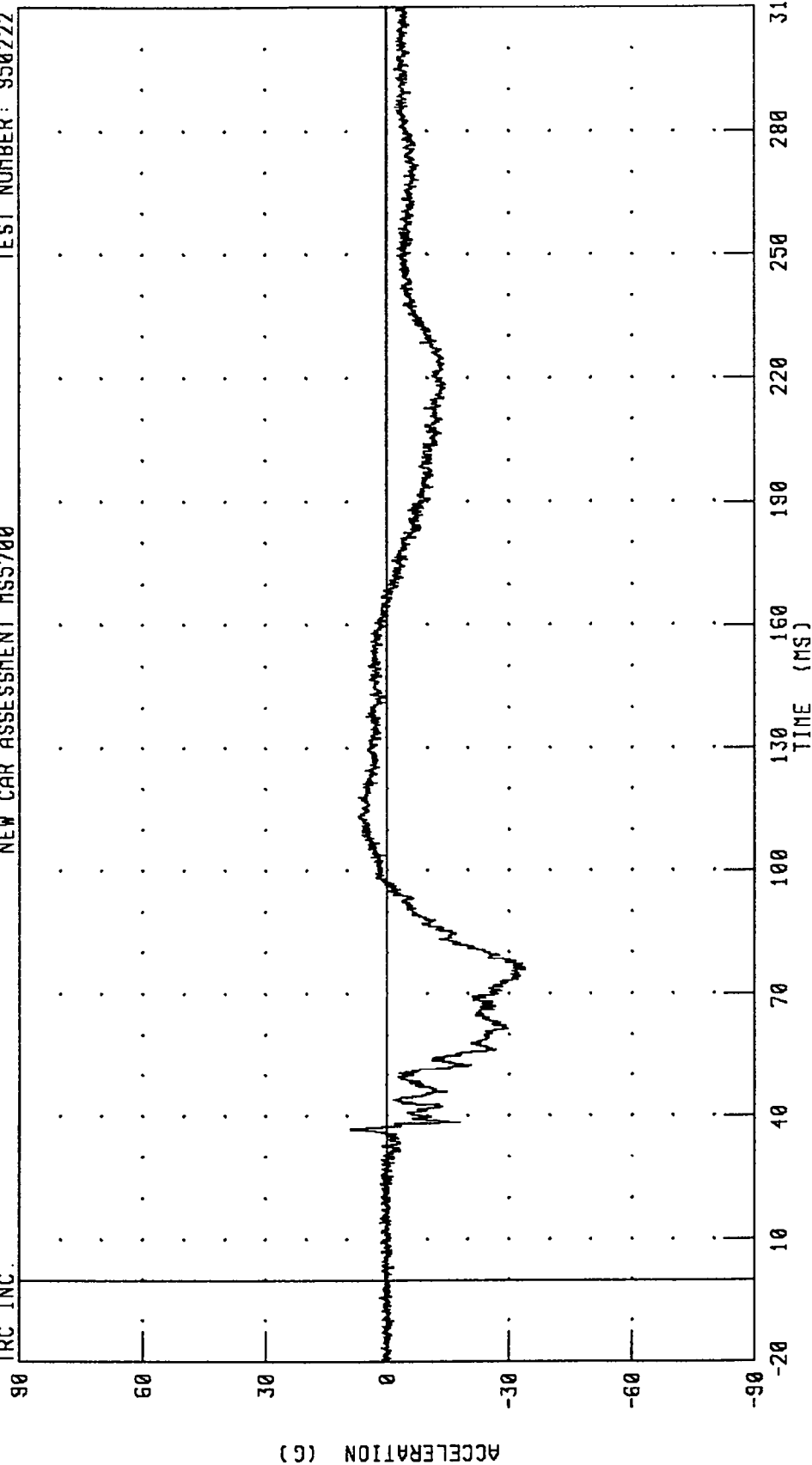
CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA: 11.87 G @ 51.04 MS; -7.69 G @ 40.64 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

PEAK DATA: 9.08 G @ 36.88 MS; -34.14 G @ 76.40 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER : 950222

IRC INC.

120

100

80

60

40

20

0

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

CHANNEL : HEDRG2

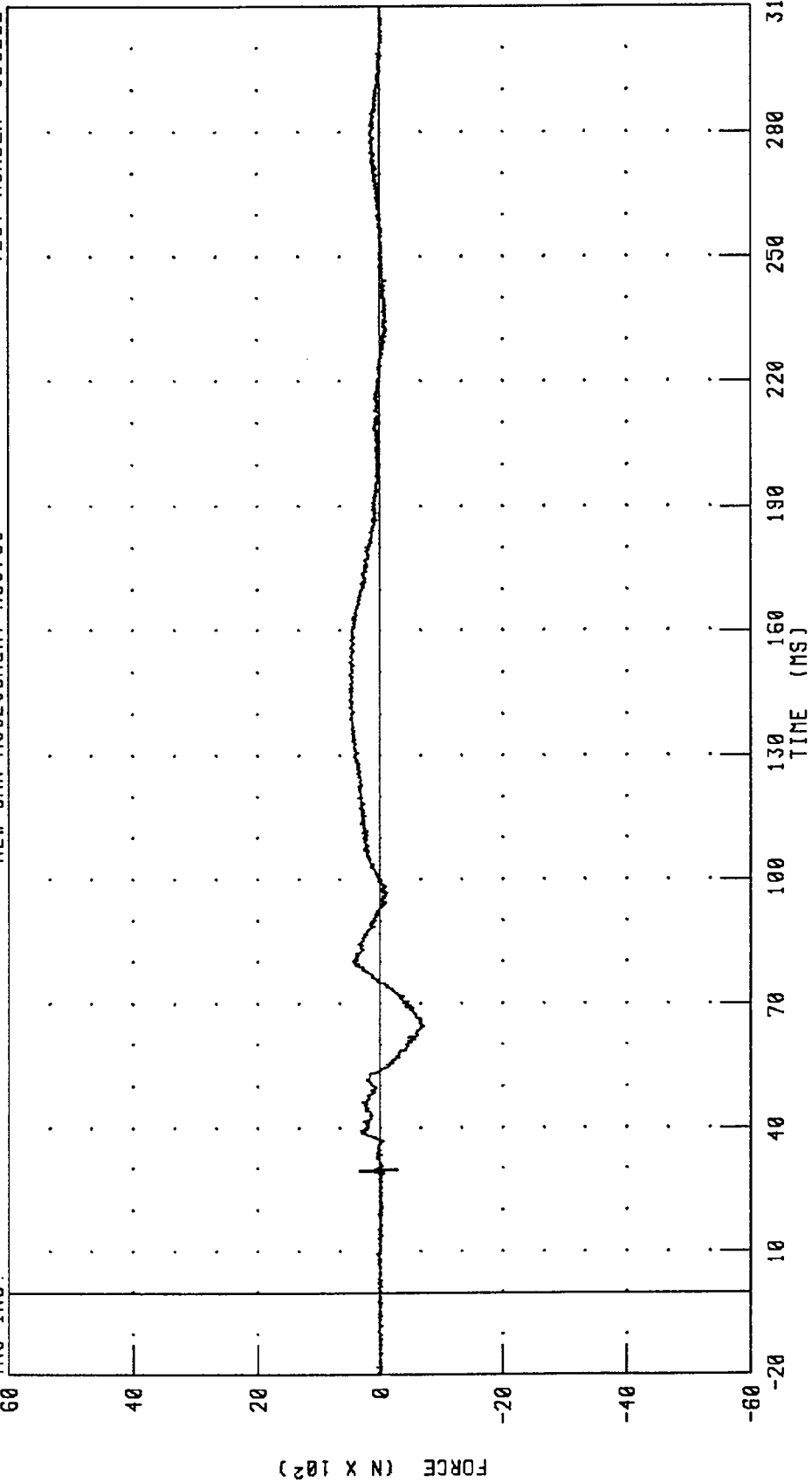
FILTER : CH. CLASS 1000

PEAK DATA : 76.25 G @ 77.36 MS; 0.14 G @ -18.24 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

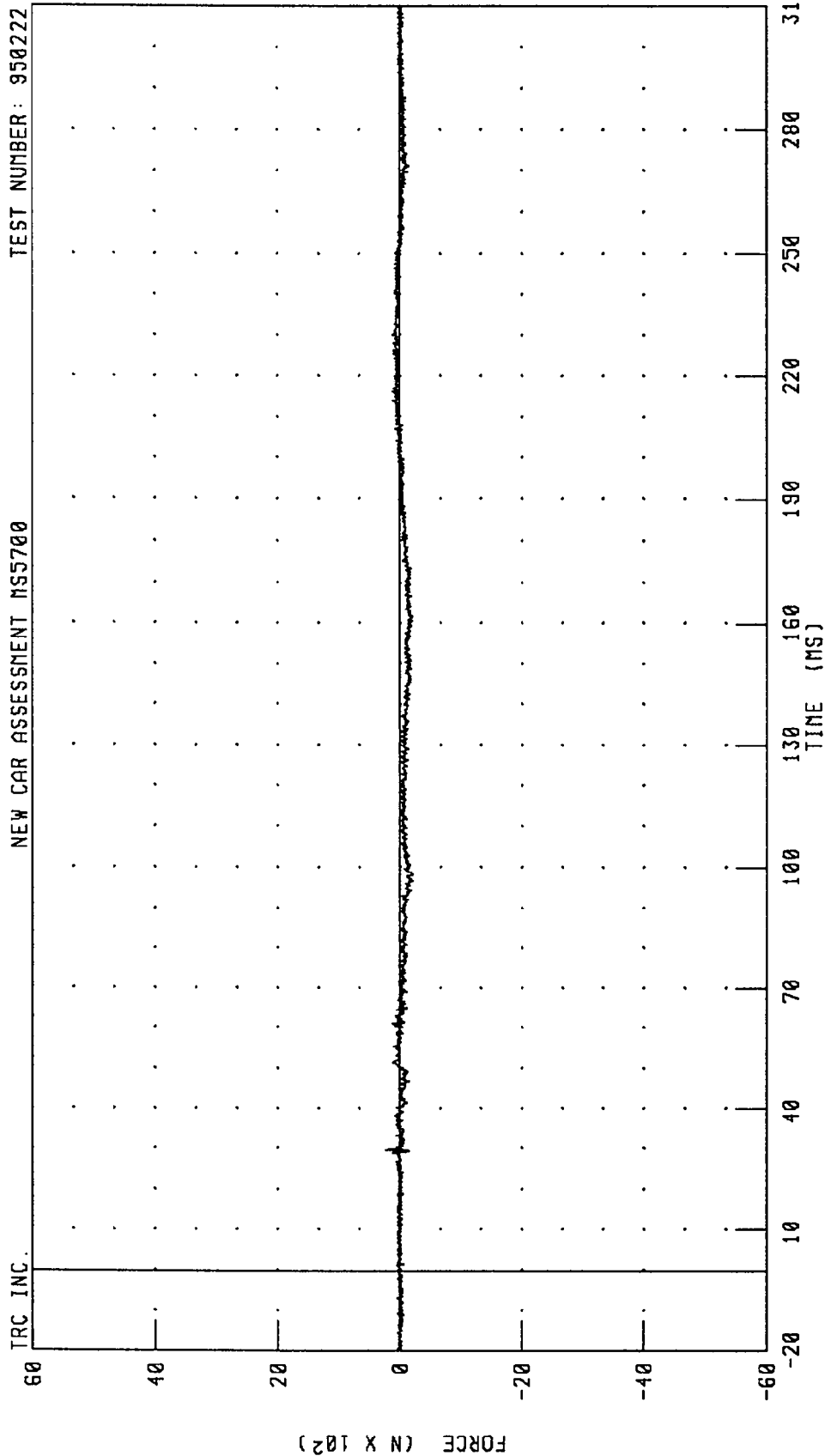


PEAK DATA: 508.14 N @ 143.36 MS; -711.83 N @ 64.80 MS

CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



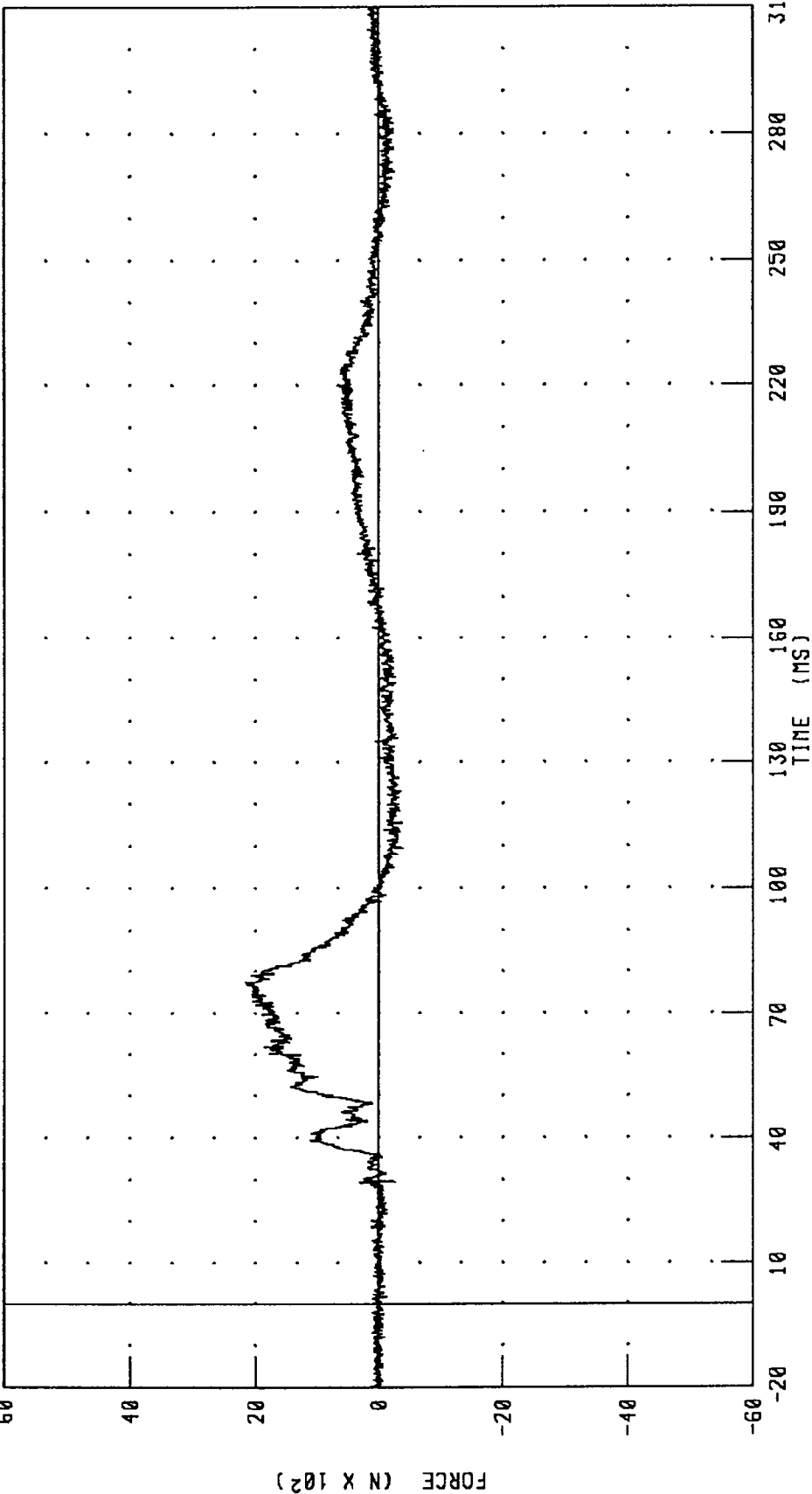
CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

PEAK DATA: 236.46 N @ 29.60 MS; -221.10 N @ 98.40 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT NS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

PEAK DATA: 2160.83 N @ 77.52 MS; -390.10 N @ 109.68 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

180

120

60

TORQUE (N·M)

0

-60

-120

-180

-20

10

40

70

100

130

160

190

220

250

280

310

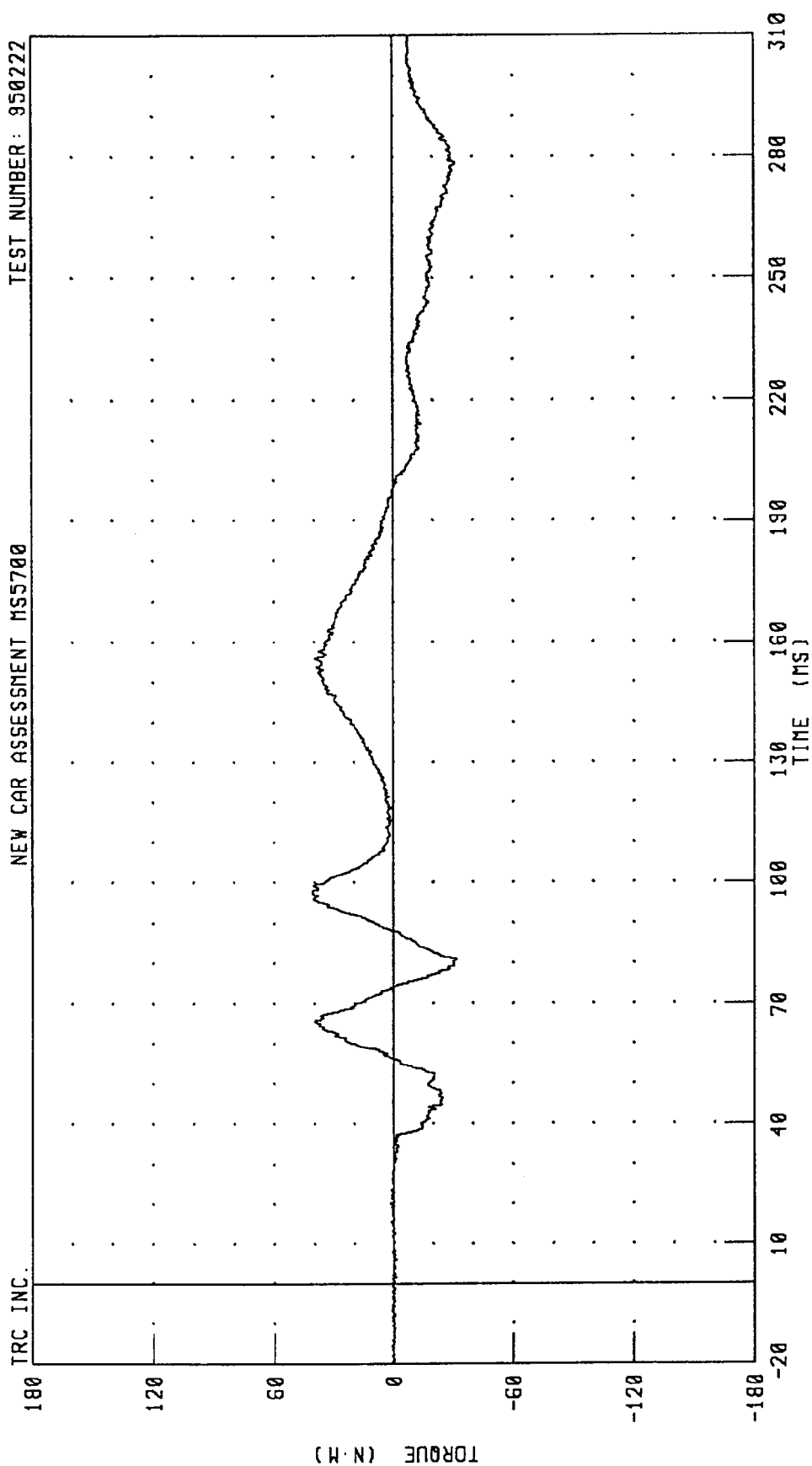
TIME (MS)

CHANNEL: NEKXM2 FILTER: CH. CLASS 600

PEAK DATA: 12.53 N·M @ 56.48 MS; -8.72 N·M @ 271.28 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

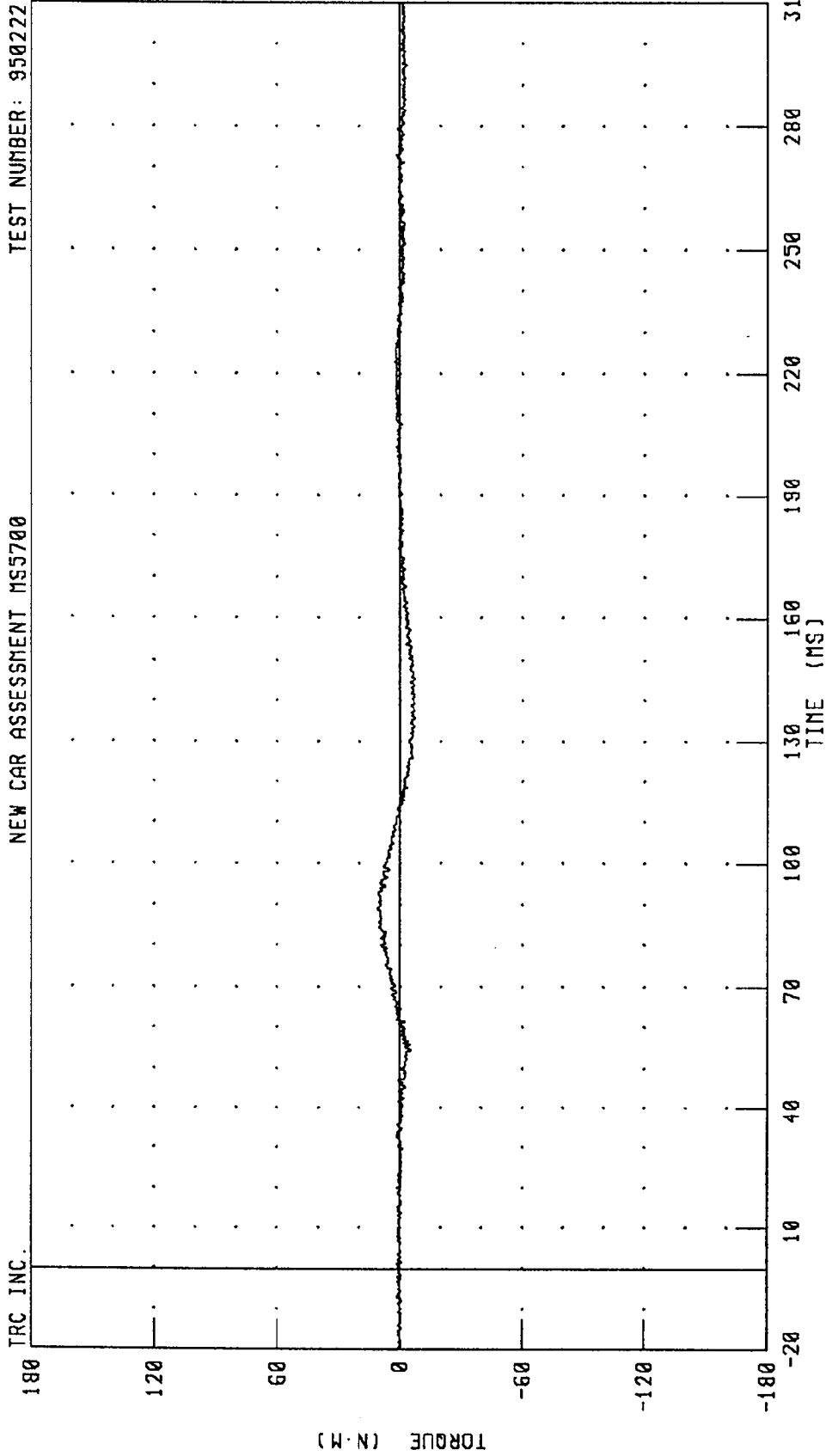


PEAK DATA: 41.39 N·M @ 97.76 MS; -31.99 N·M @ 81.04 MS

CHANNEL: NEKYM2 FILTER: CH. CLASS 600

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



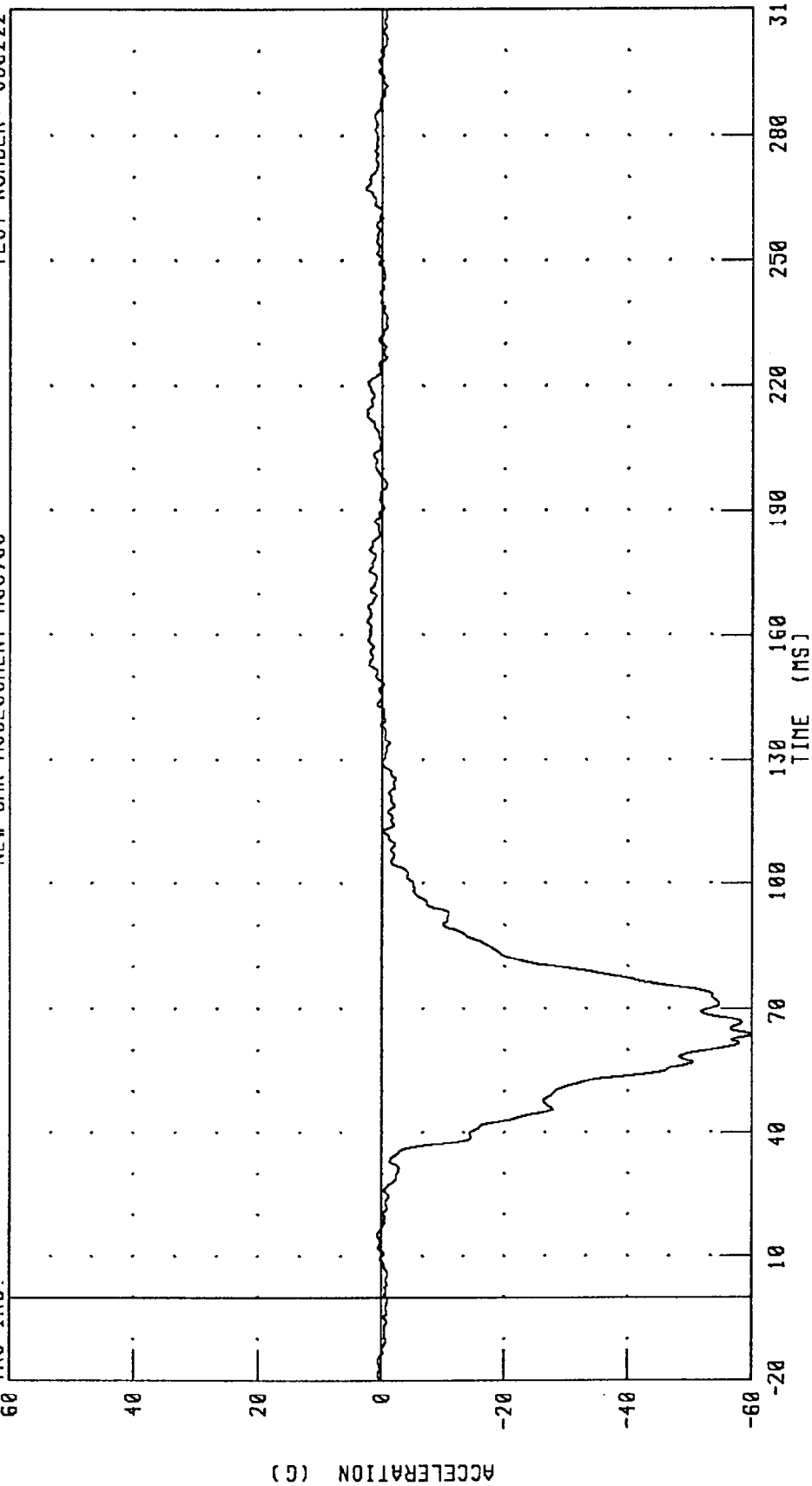
PEAK DATA: 11.12 N.M @ 88.80 MS; -7.69 N.M @ 135.92 MS

CHANNEL: NEKZM2 FILTER: CH. CLASS 600

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST X-AXIS ACCELERATION
 NEW CAR ASSESSMENT NS5700

TEST NUMBER: 950222

TRC INC.

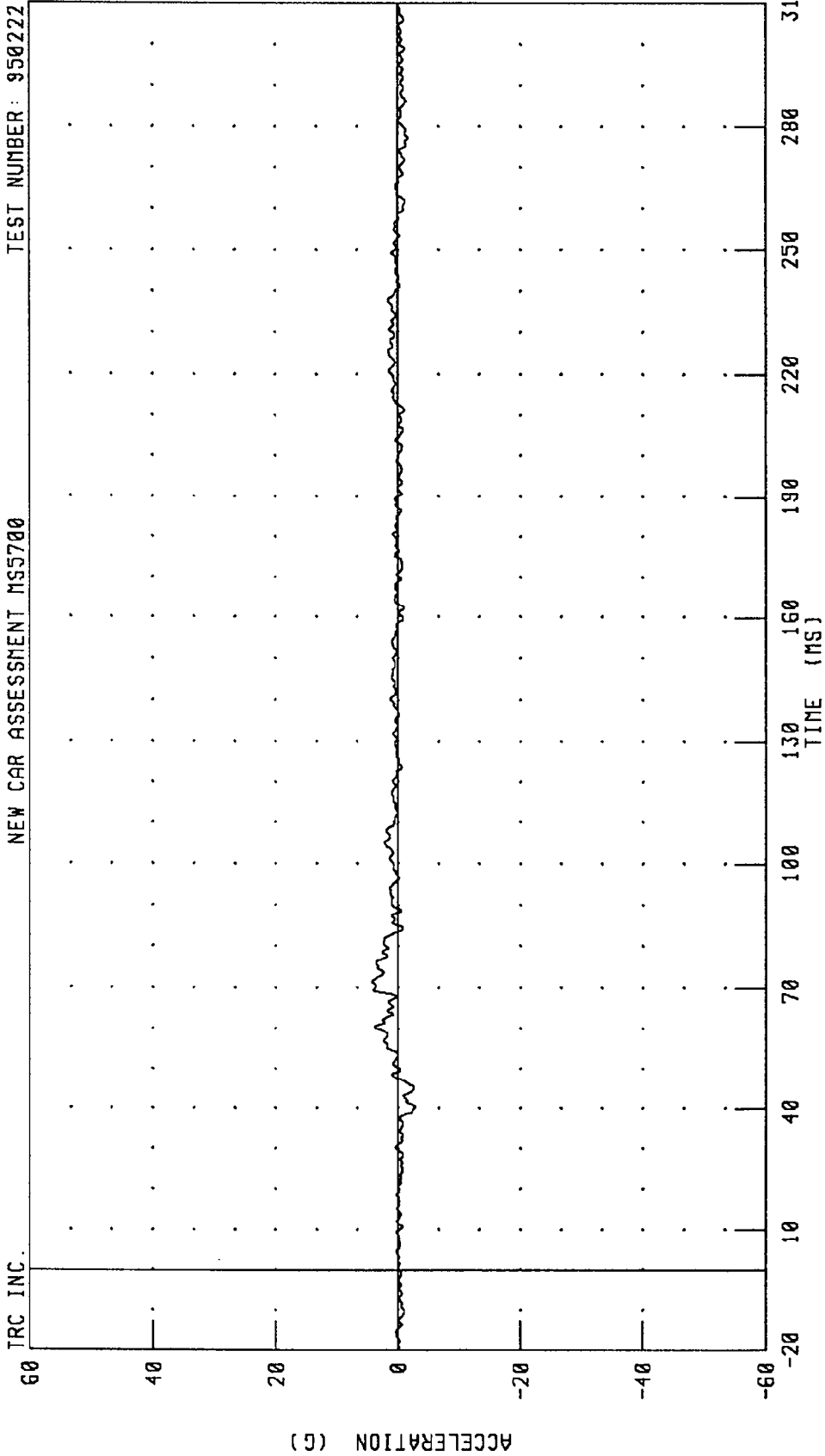


CHANNEL: CSTXG2 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: CSTYC2 FILTER: CH. CLASS 180

PEAK DATA: 4.19 G @ 71.44 MS; -2.81 G @ 40.40 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

60

40

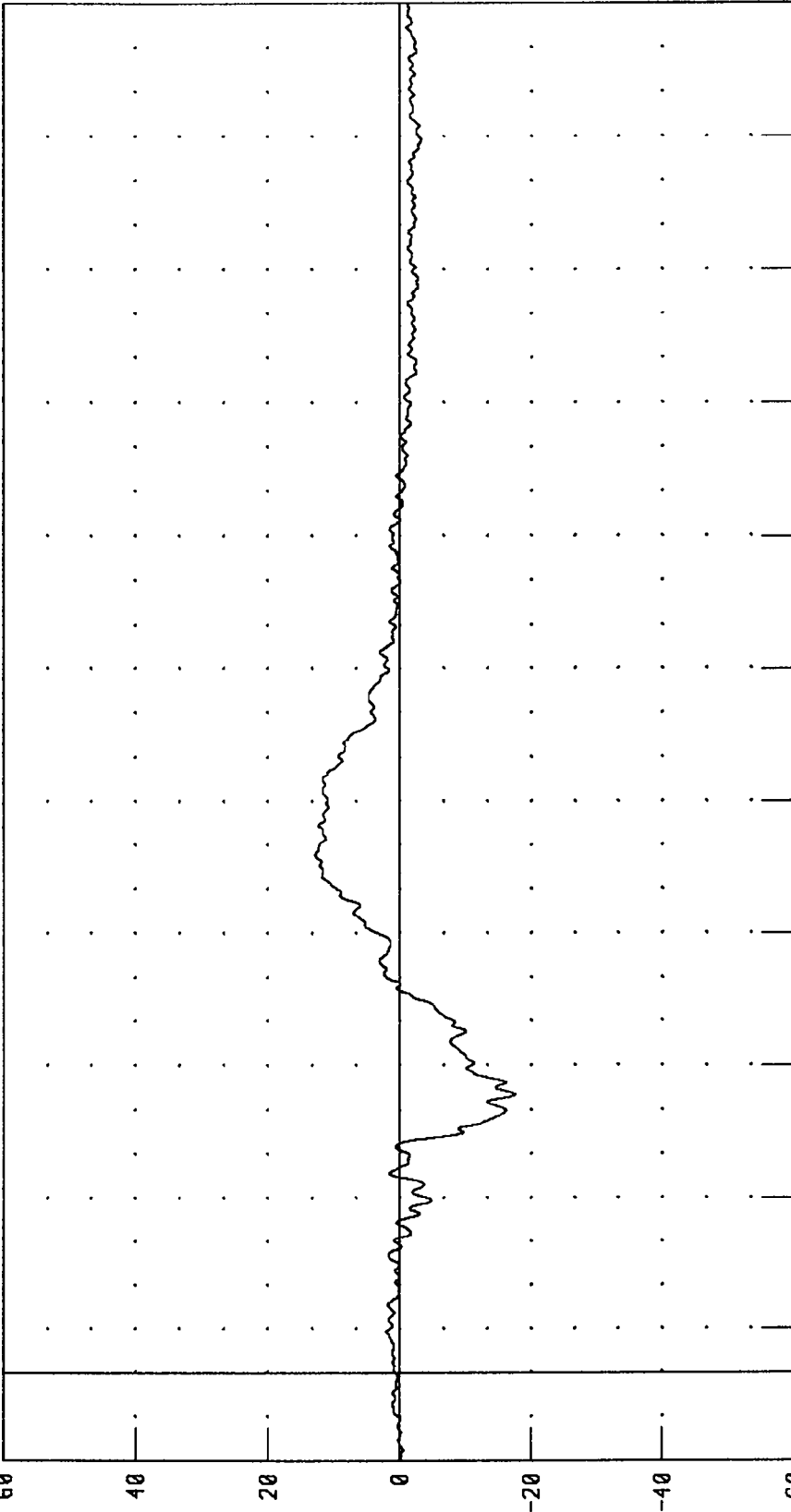
20

0

-20

-40

-60



ACCELERATION (G)

TIME (MS)

PEAK DATA: 12.81 G @ 17.76 MS; -17.55 G @ 63.44 MS

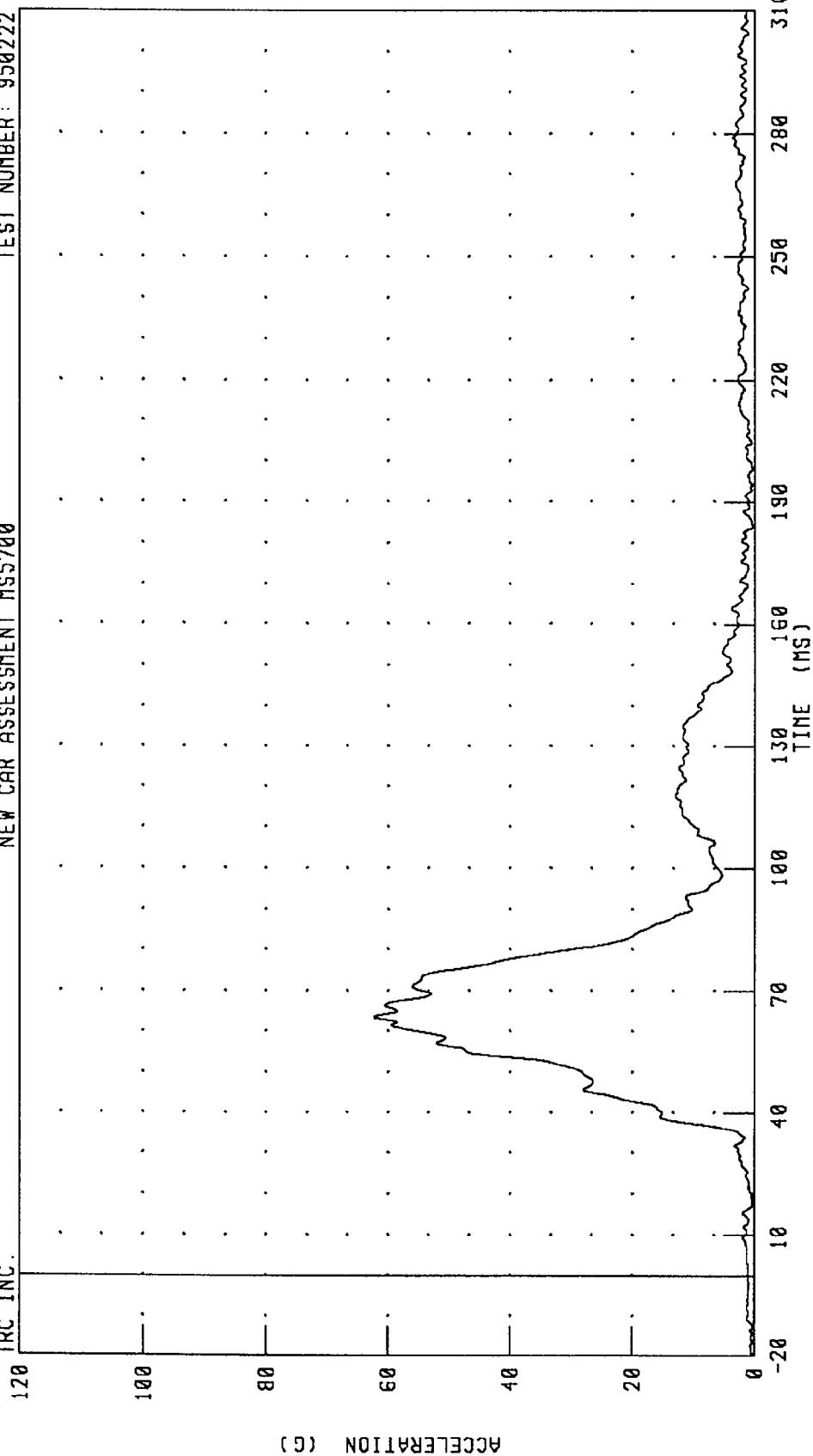
CHANNEL: CSTZG2 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

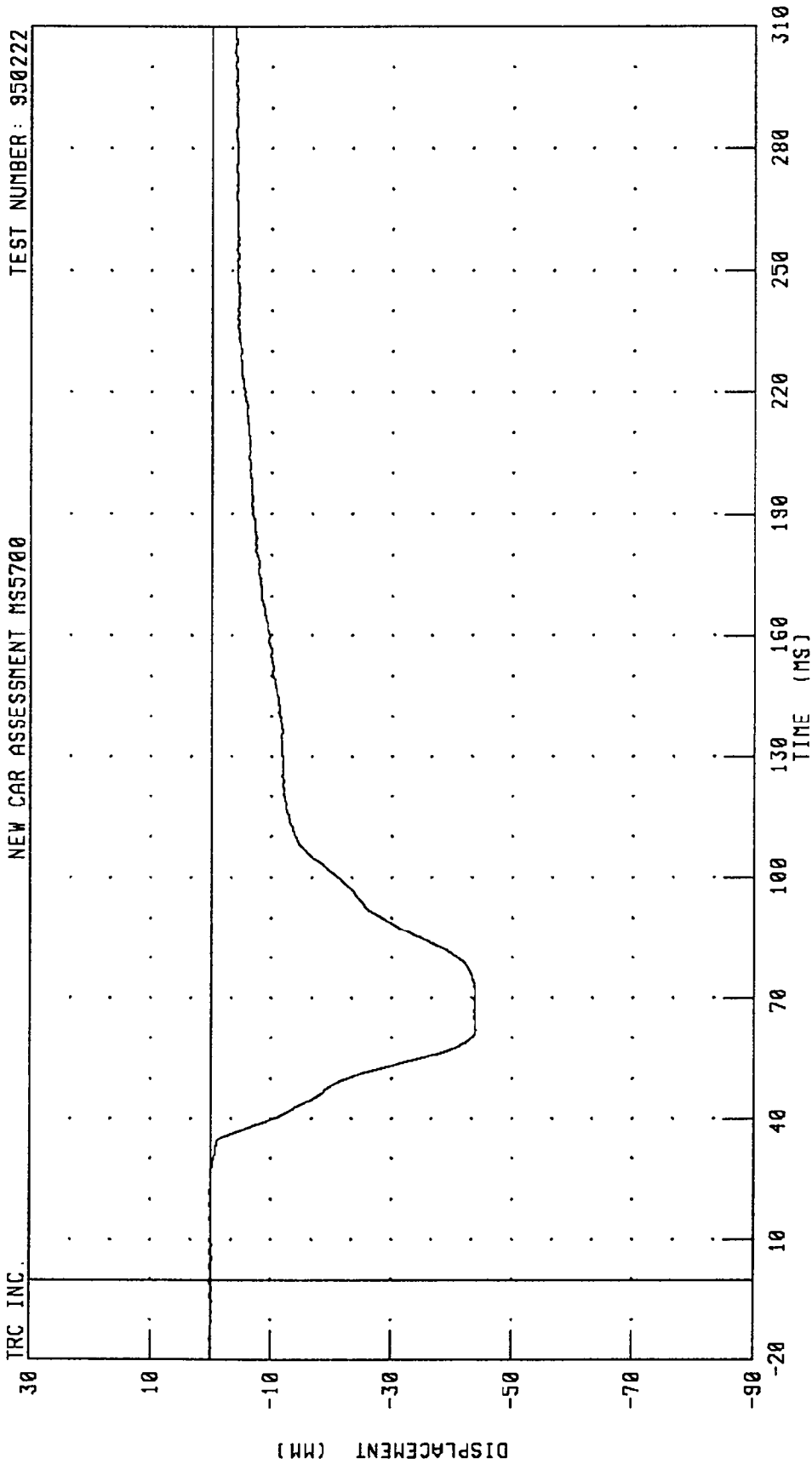


CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 62.29 G @ 63.68 MS; 0.10 G @ -20.00 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

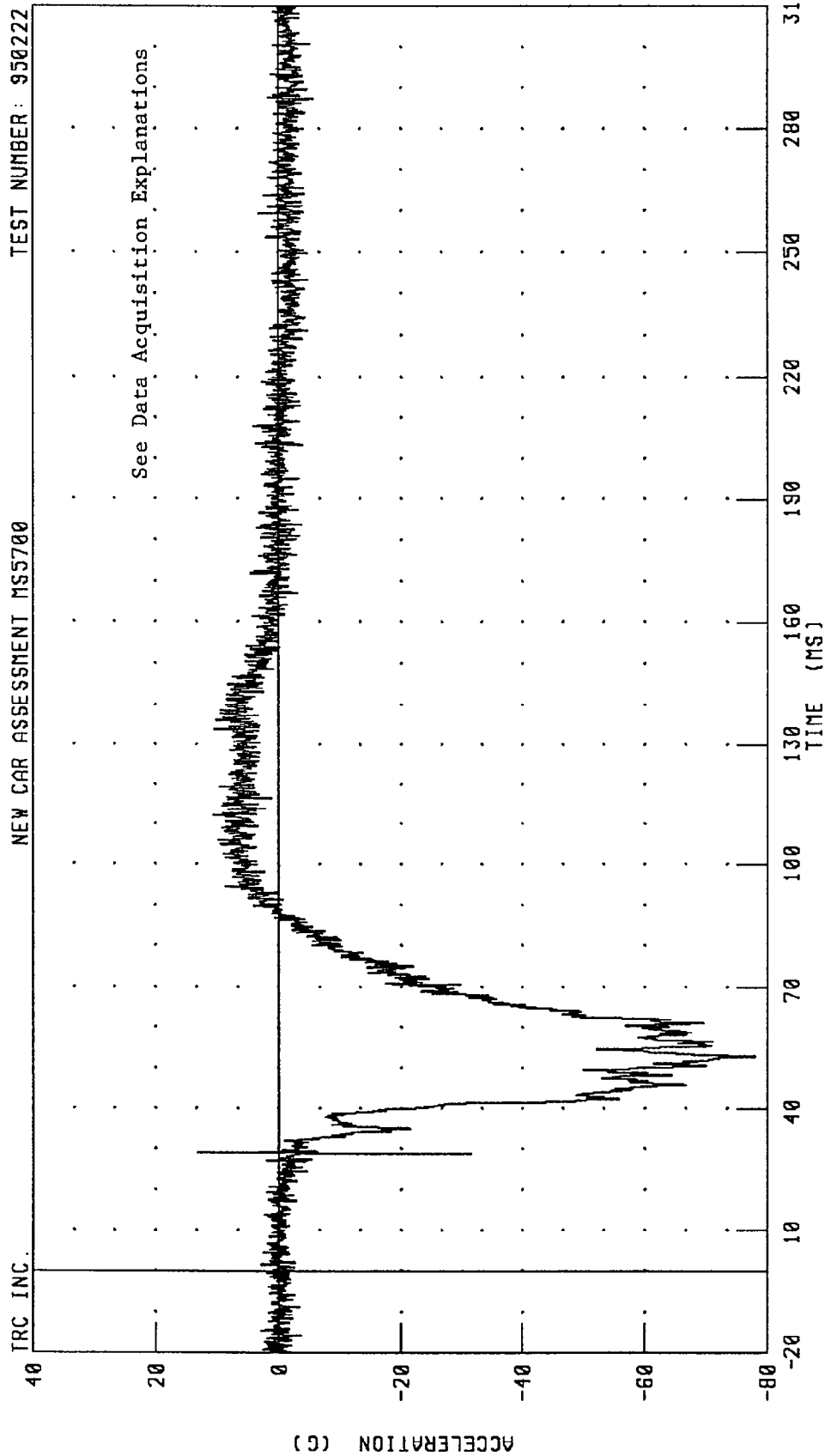


PEAK DATA: 0.23 MS @ -43.97 MM @ 62.16 MS

CHANNEL: CSTXD2 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER PELVIS X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

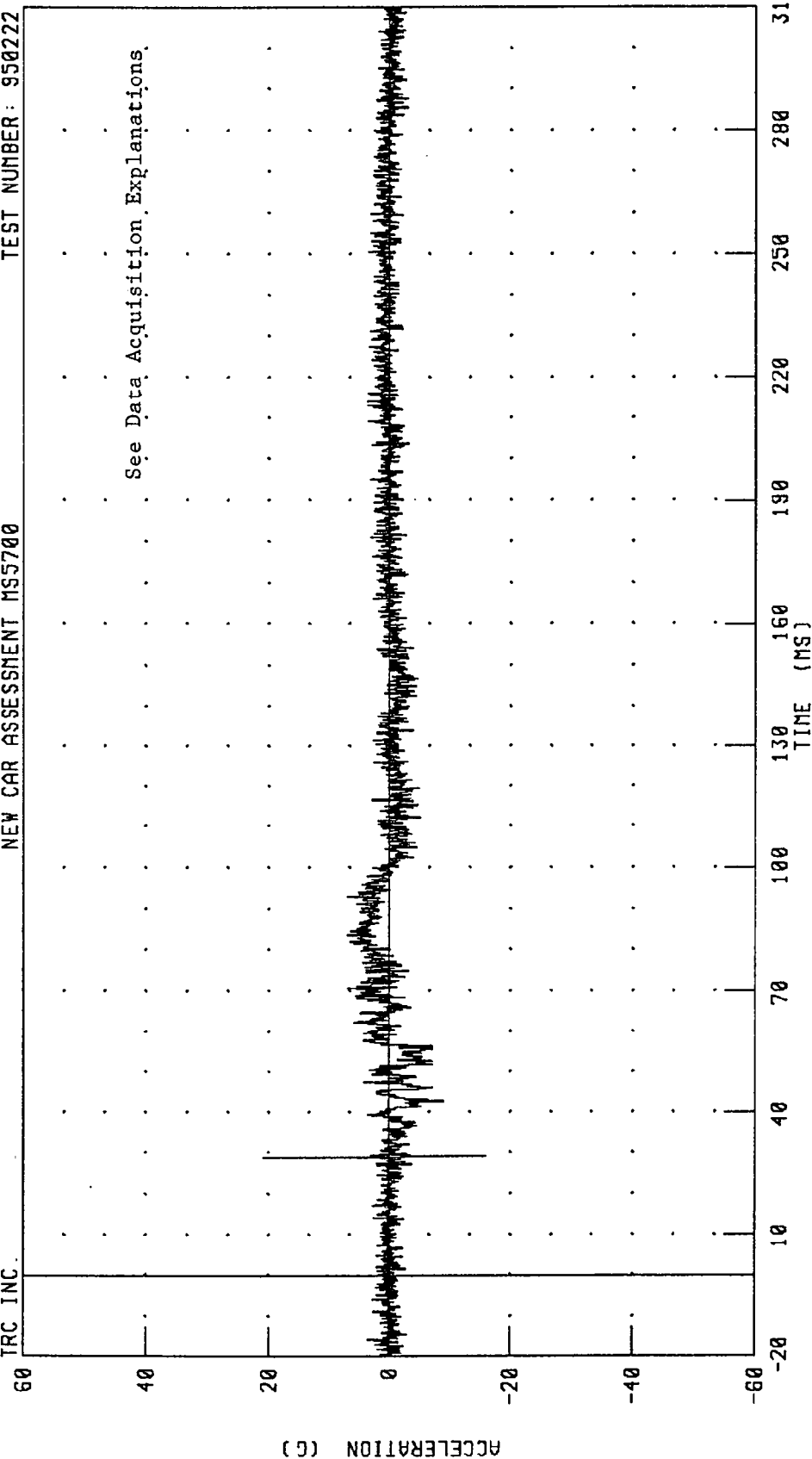
PEAK DATA: 13.14 G @ 29.04 MS; -77.93 G @ 52.80 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 20.78 G @ 28.88 MS; -15.89 G @ 29.04 MS

CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

60

40

20

ACCELERATION (G)

-20

-40

-60

See Data Acquisition Explanations.

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

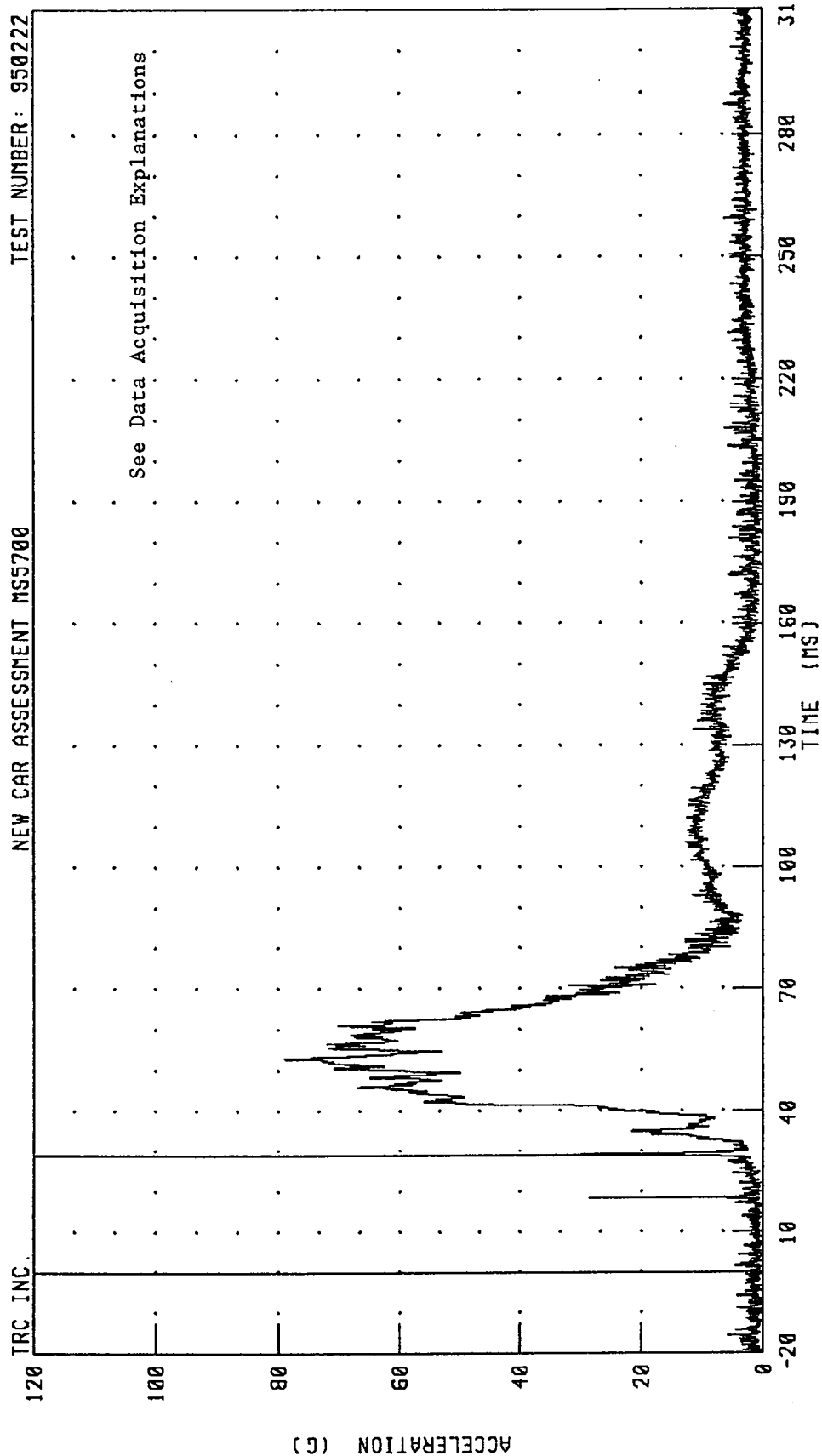
PEAK DATA: 29.27 G @ 29.28 MS; -307.46 G @ 28.96 MS

CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION

NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

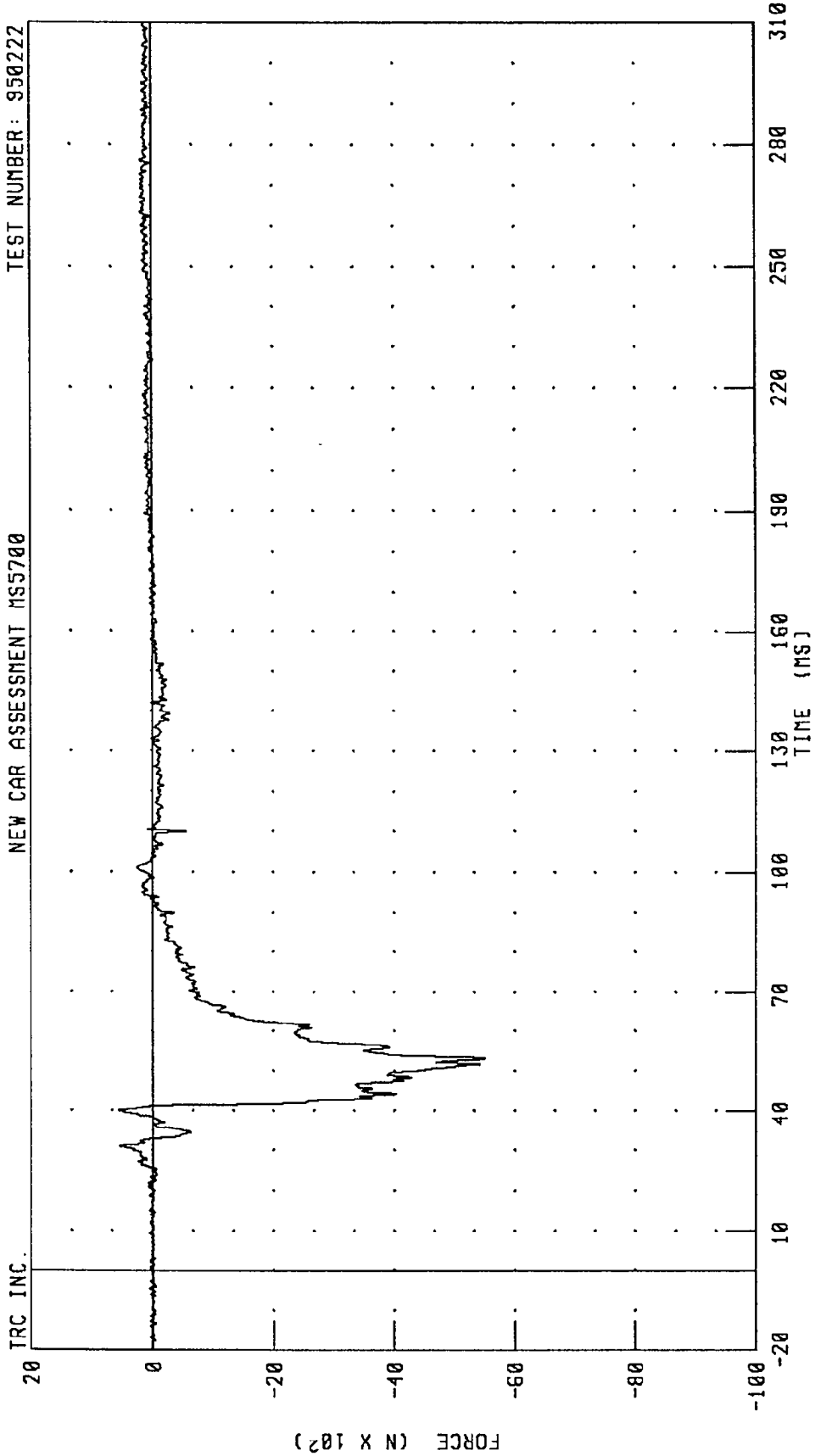


CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

PEAK DATA: 307.51 G @ 28.96 MS; 0.13 G @ -9.84 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER LEFT FEMUR FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

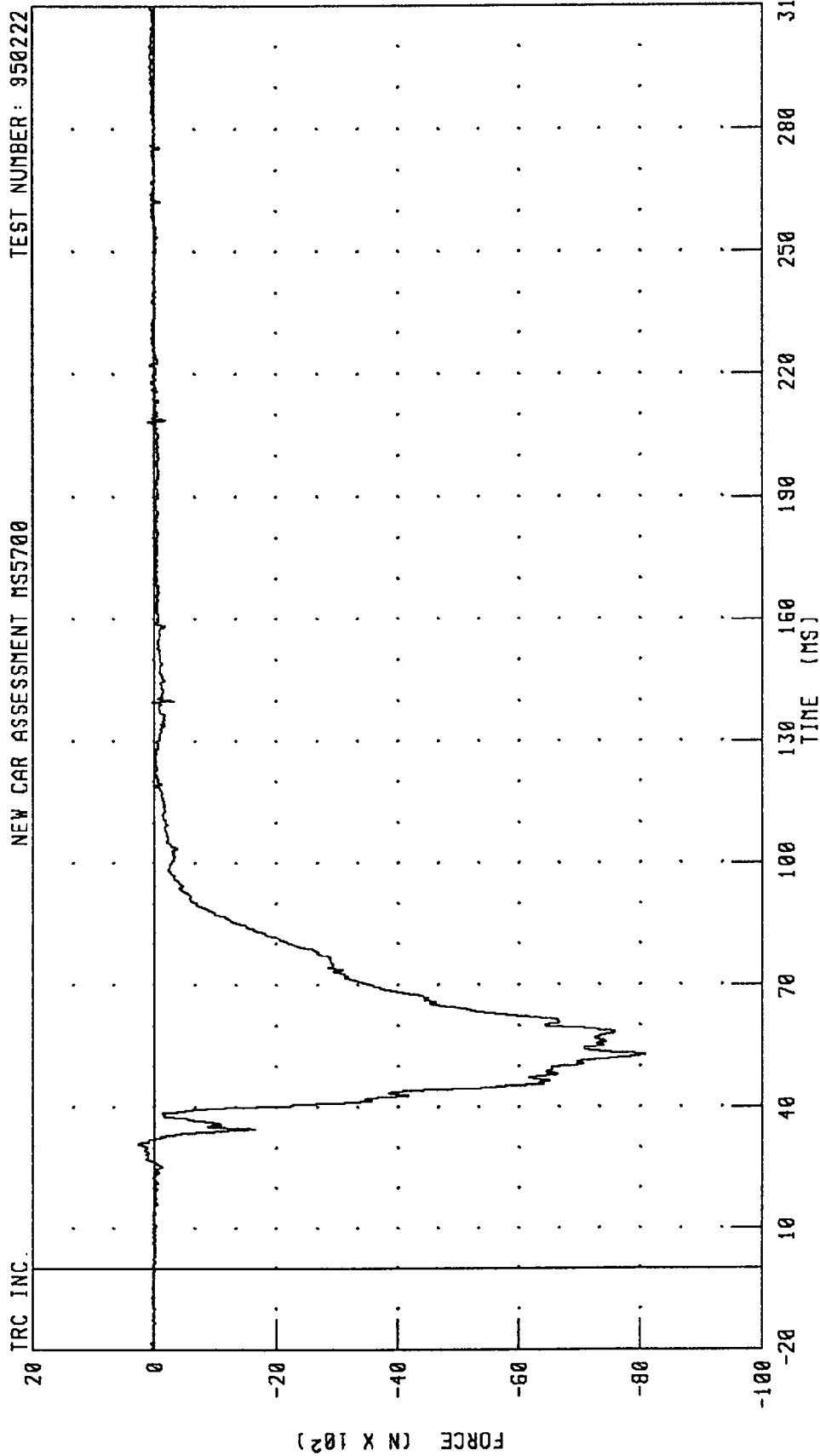


CHANNEL: LFMF2 FILTER: CH. CLASS 600

PEAK DATA: 554.32 N @ 40.08 MS; -5501.69 N @ 53.04 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



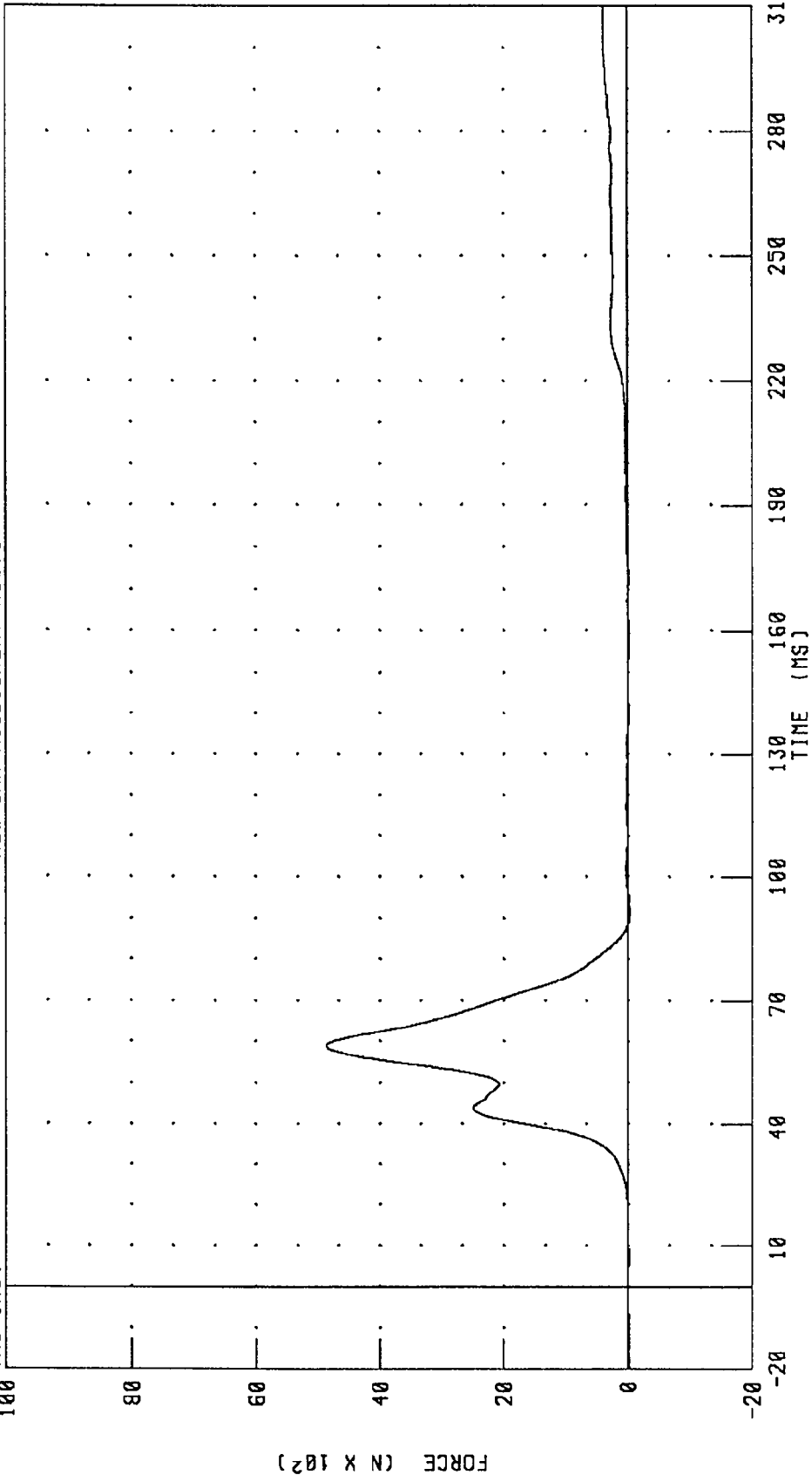
PEAK DATA: 268.23 N @ 31.04 MS; -8079.94 N @ 52.80 MS

CHANNEL: RFMF2 FILTER: CH. CLASS 600

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



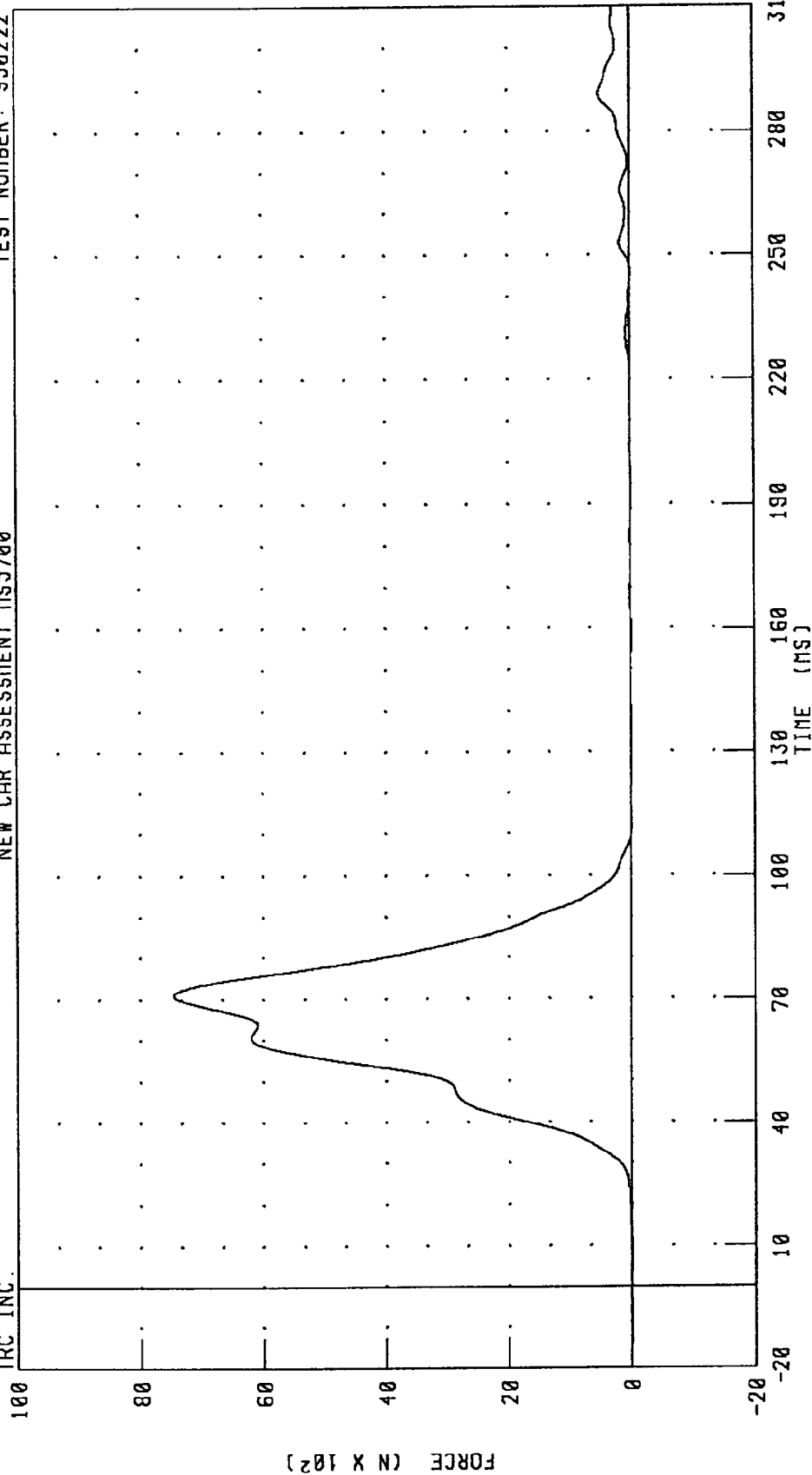
PEAK DATA: 4872.00 N @ 58.88 MS; -21.70 N @ 91.68 MS

CHANNEL: LBOF2 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 7462.82 N @ 71.04 MS; -17.24 N @ 195.52 MS

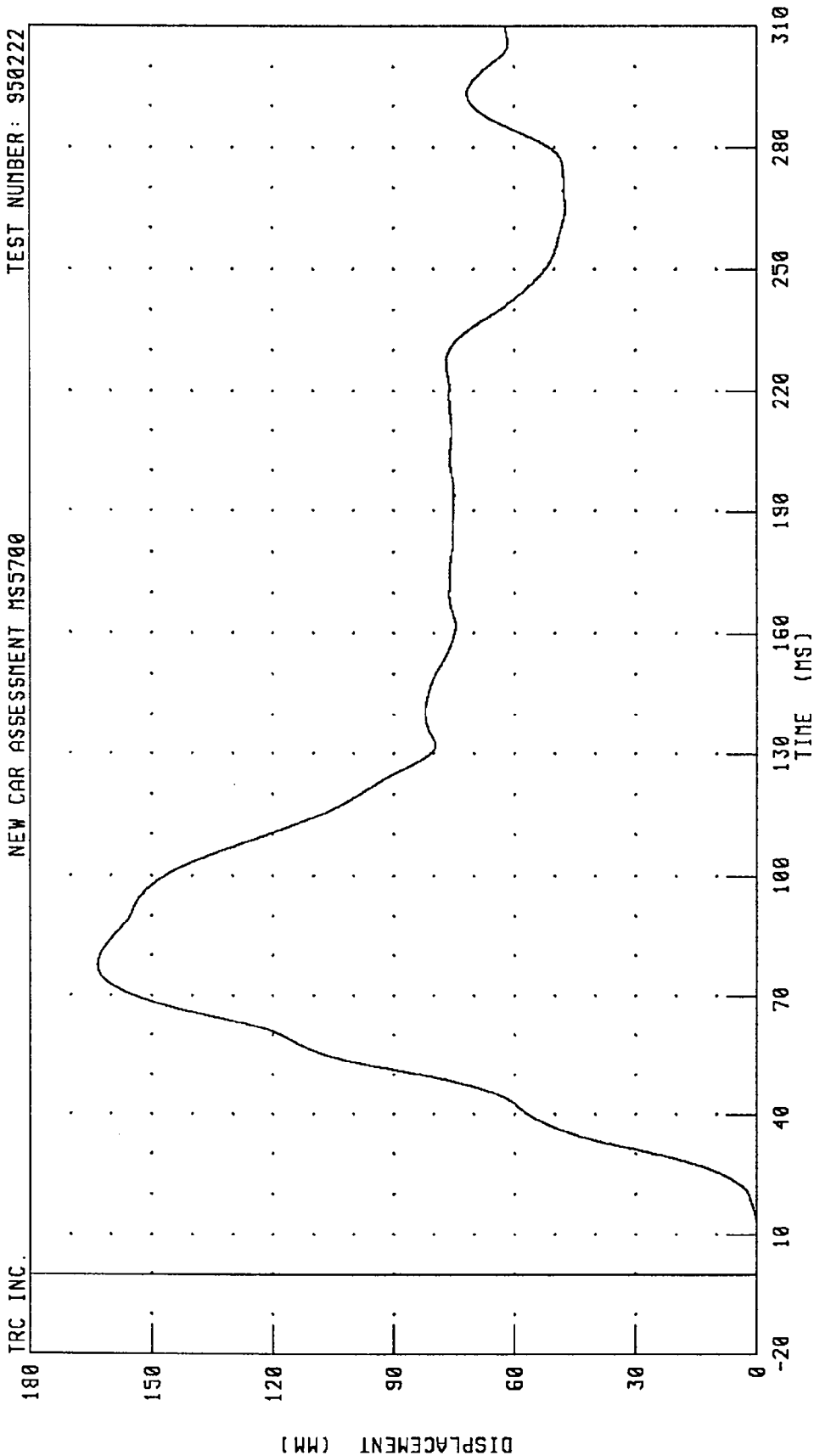
CHANNEL: SHBF2 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



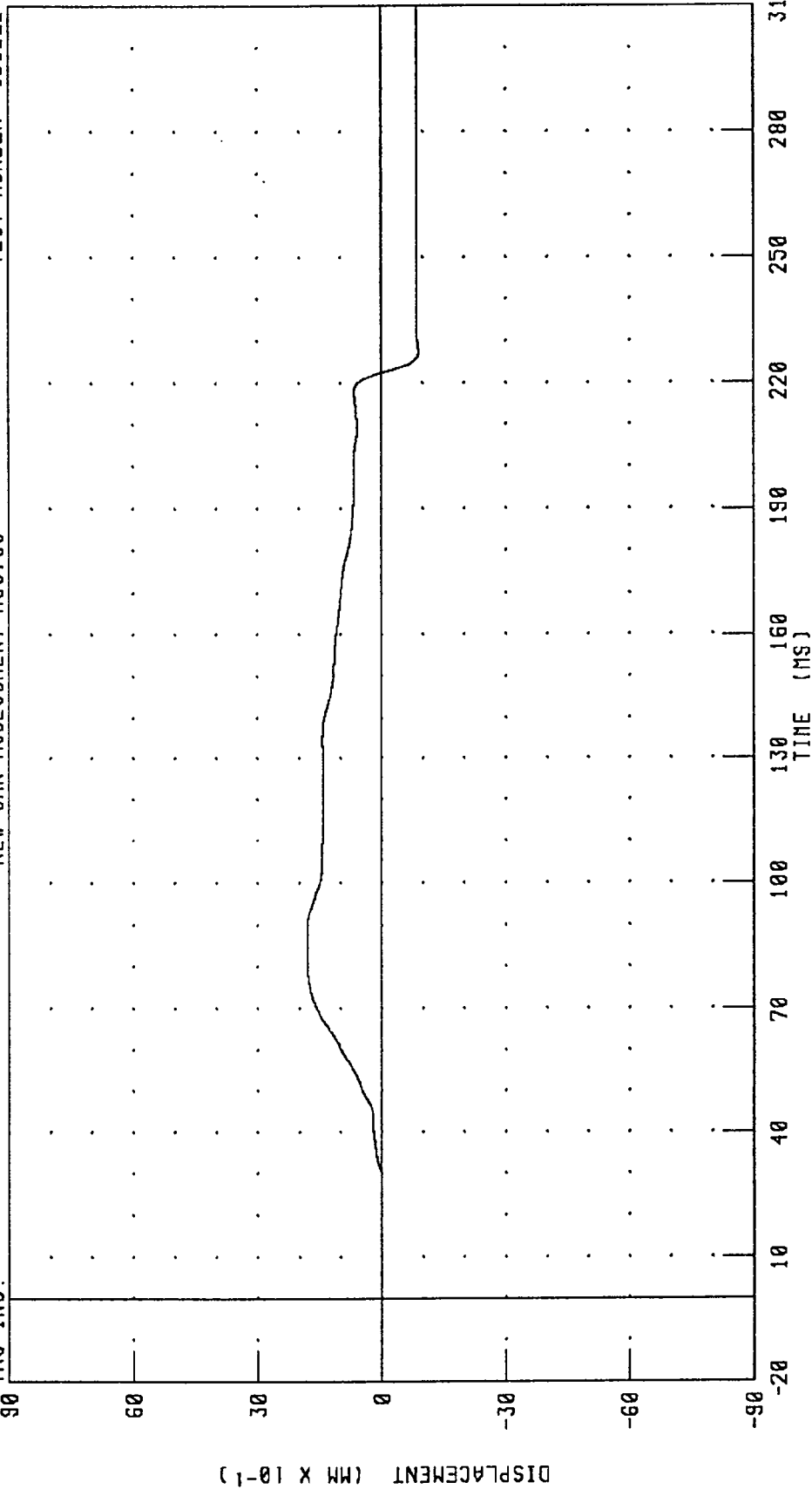
CHANNEL: SHB02 FILTER: CH. CLASS 60

PEAK DATA: 163.30 MM @ 77.76 MS; -0.41 MM @ -20.00 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 1.81 MN @ 89.28 MS; -0.91 MN @ 227.44 MS

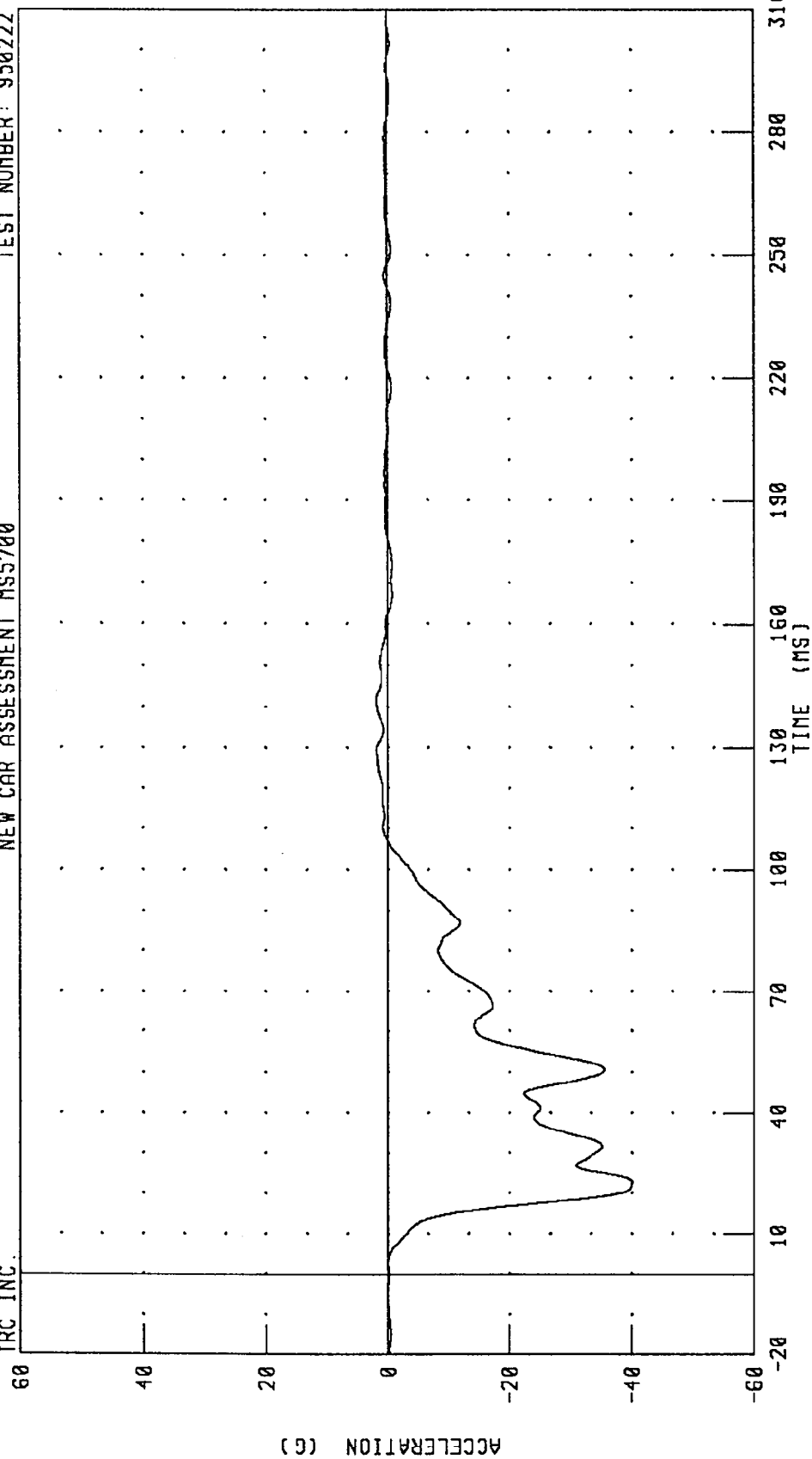
FILTER: CH. CLASS 60

CHANNEL: SBED2

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

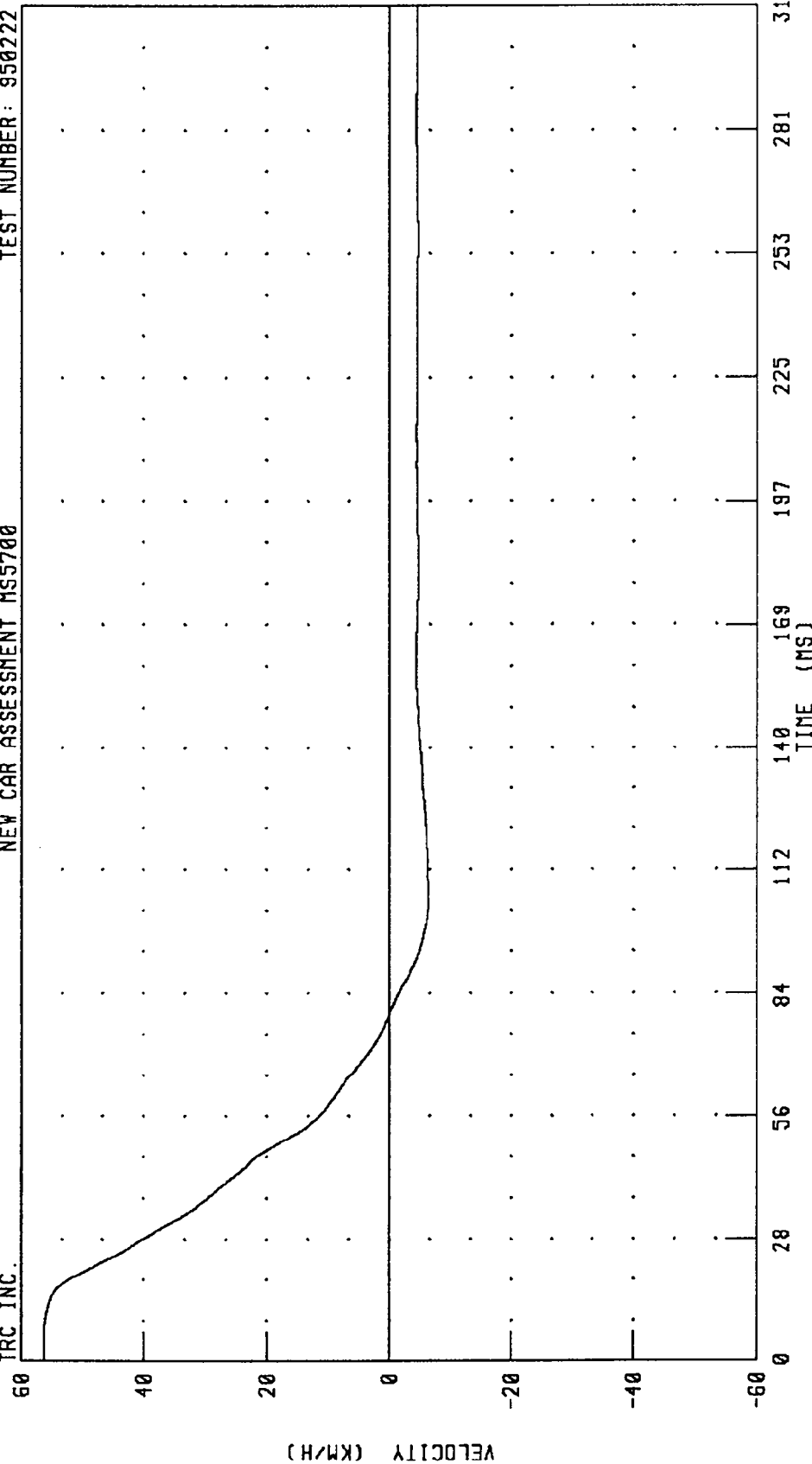
PEAK DATA: 1.87 G @ 129.44 MS; -40.10 G @ 22.80 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 56.30 KM/H @ 0.00 MS; -6.40 KM/H @ 107.36 MS

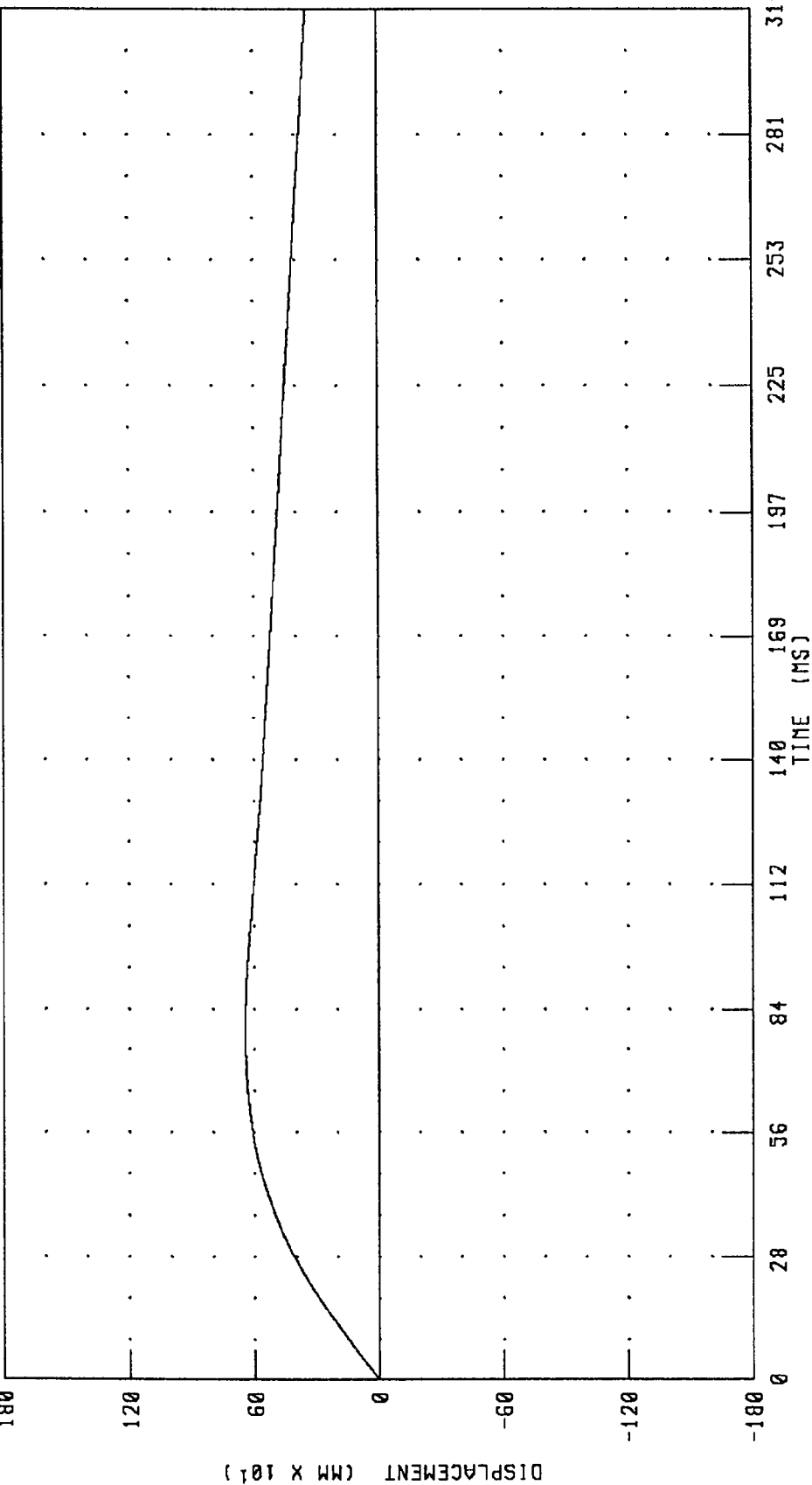
CHANNEL: TLRXV1 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



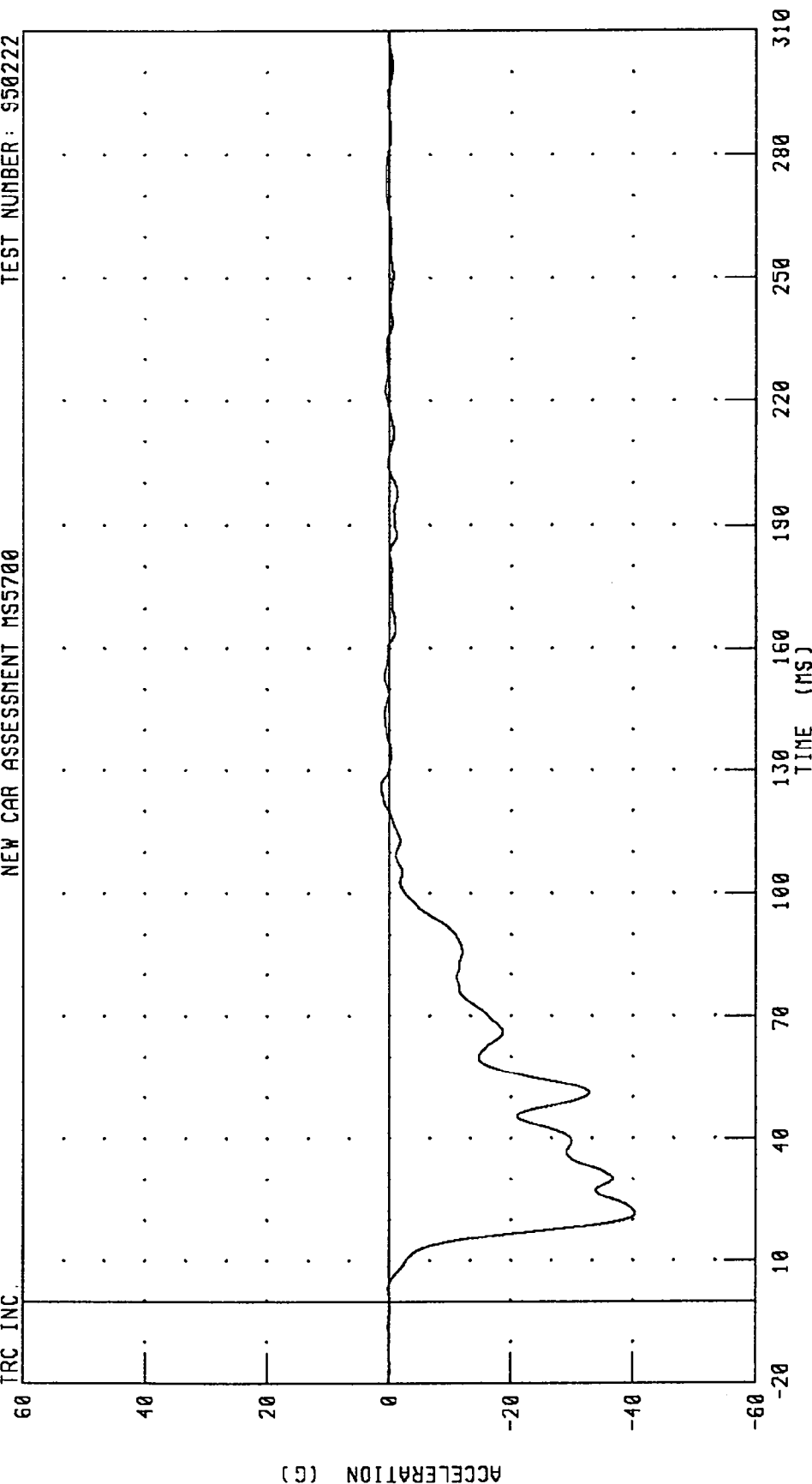
CHANNEL: TLRXD1 FILTER: CH. CLASS 180

PEAK DATA: 644.63 MM @ 79.60 MS; 0.00 MM @ 0.00 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



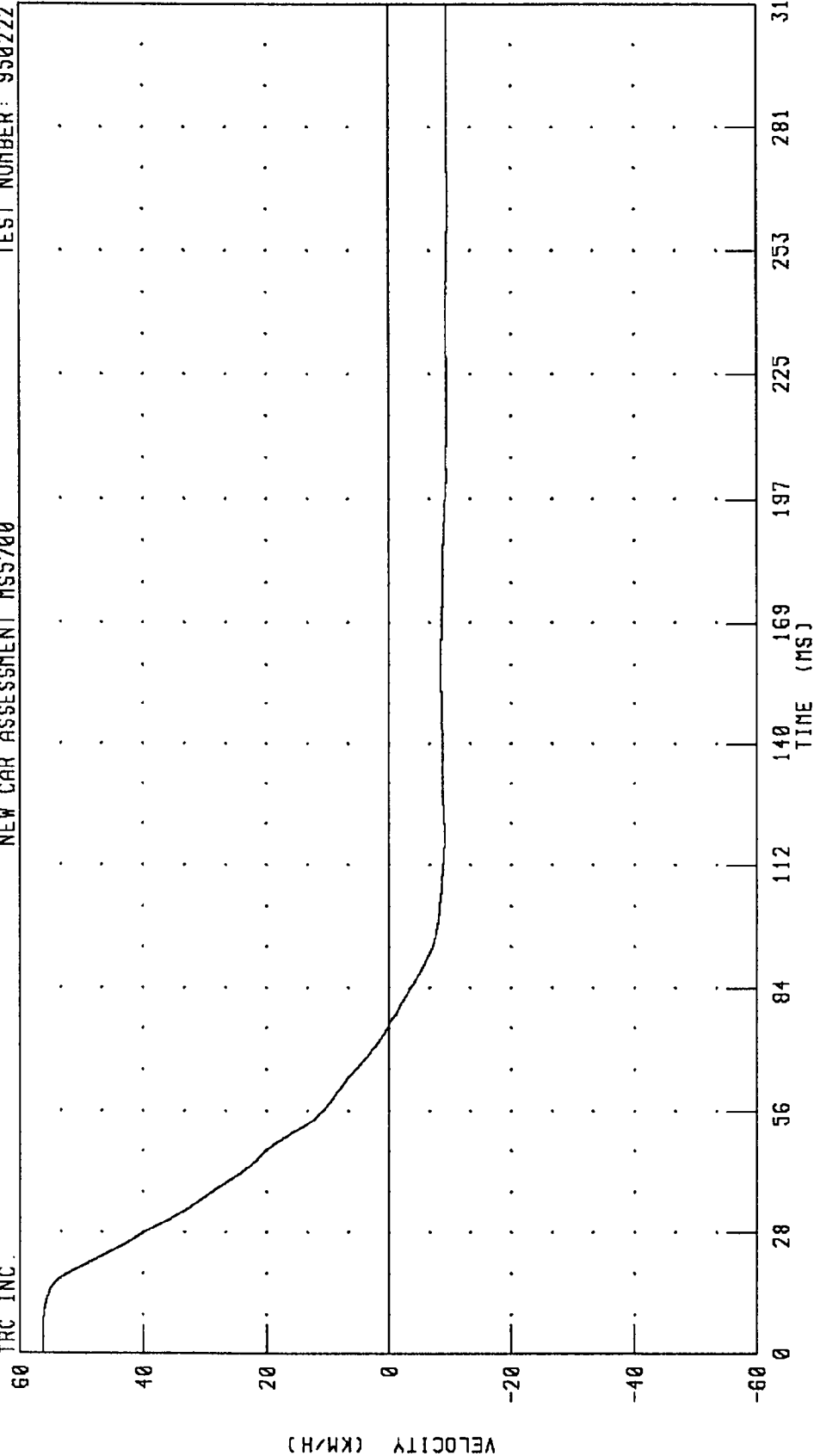
CHANNEL: TRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.43 G @ 126.00 MS; -40.35 G @ 21.60 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



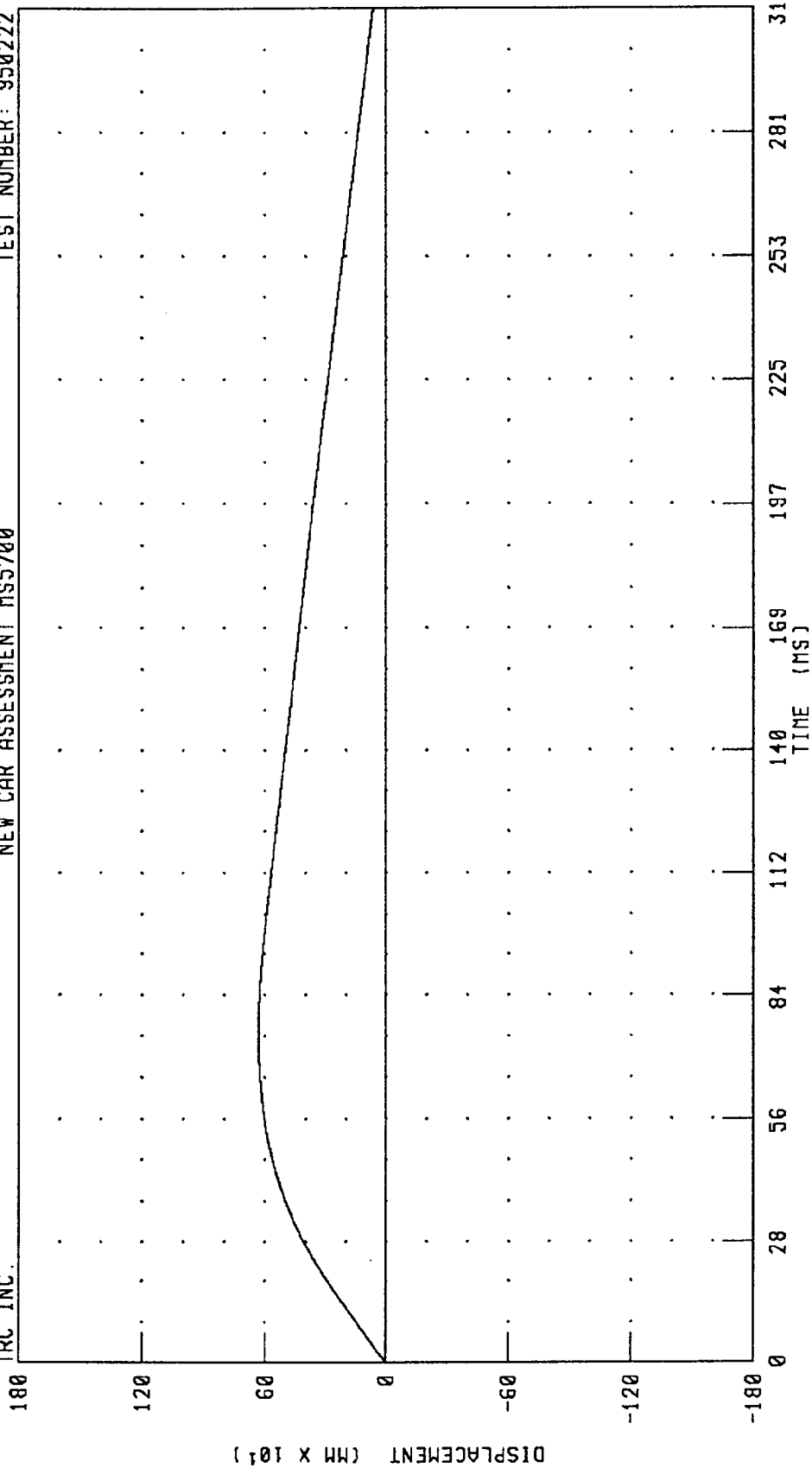
PEAK DATA: 56.30 KM/H @ 4.80 MS; -9.63 KM/H @ 264.96 MS

CHANNEL: TRRXV1 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

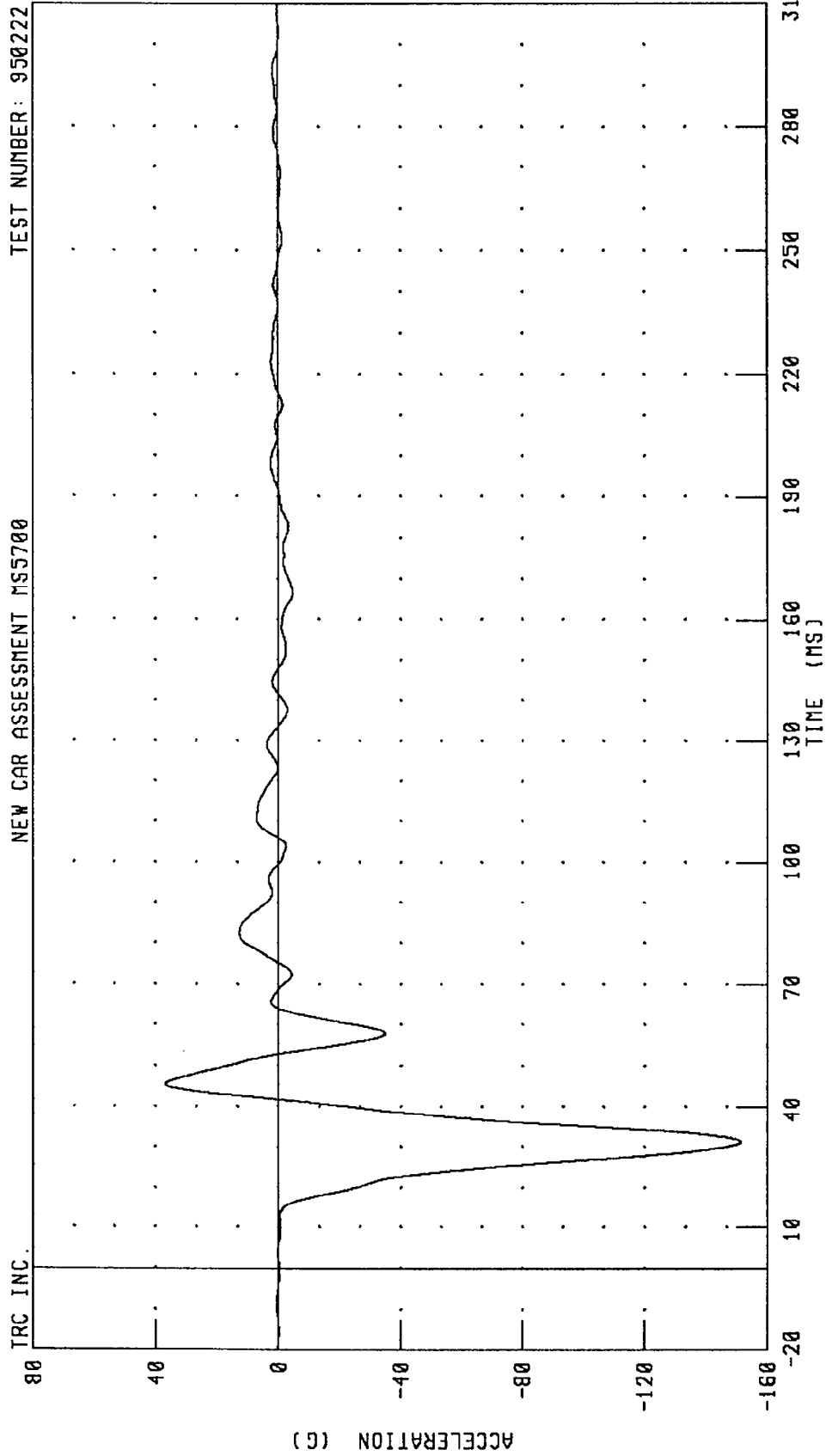


PEAK DATA: 630.84 MM @ 75.84 MS; 0.00 MM @ 0.00 MS

CHANNEL: TRRXD1 FILTER: CH. CLASS 180

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 ENGINE TOP X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

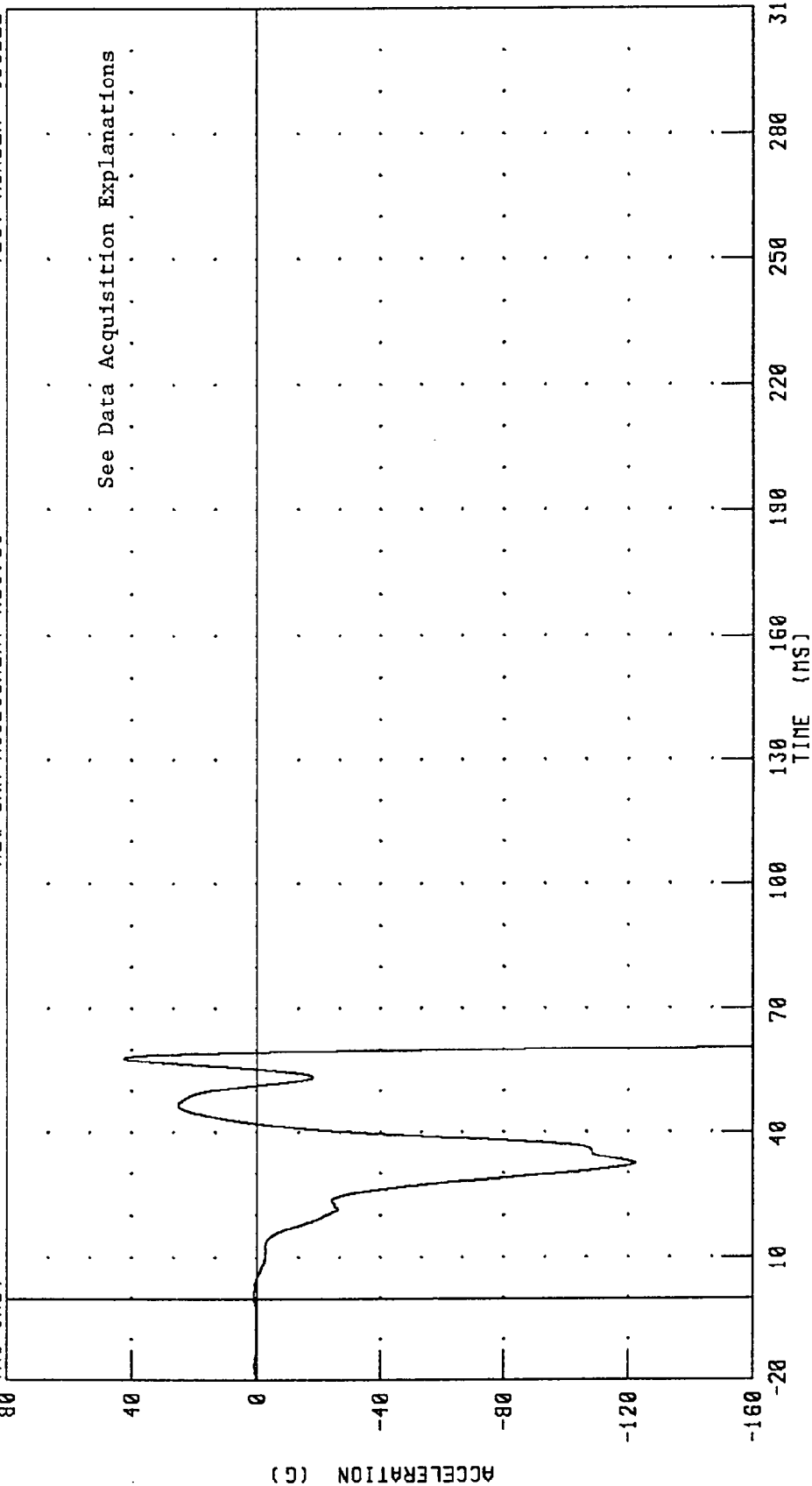


CHANNEL: ENGXC1 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 ENGINE BOTTOM X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



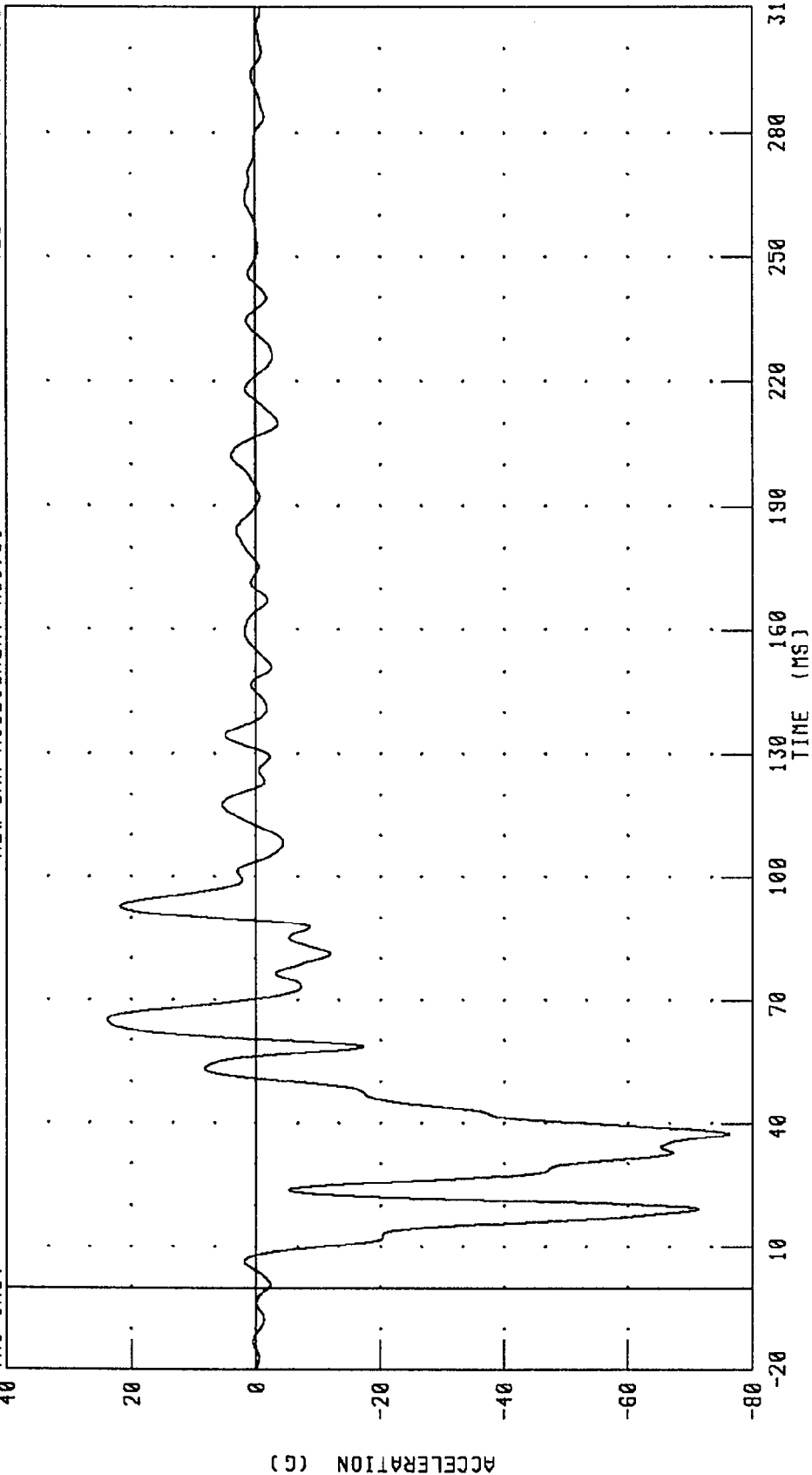
CHANNEL: ENGXC2 FILTER: CH. CLASS 60

PEAK DATA: 42.34 G @ 58.00 MS; -1372.44 G @ 66.56 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: BCRXG1 FILTER: CH. CLASS 60

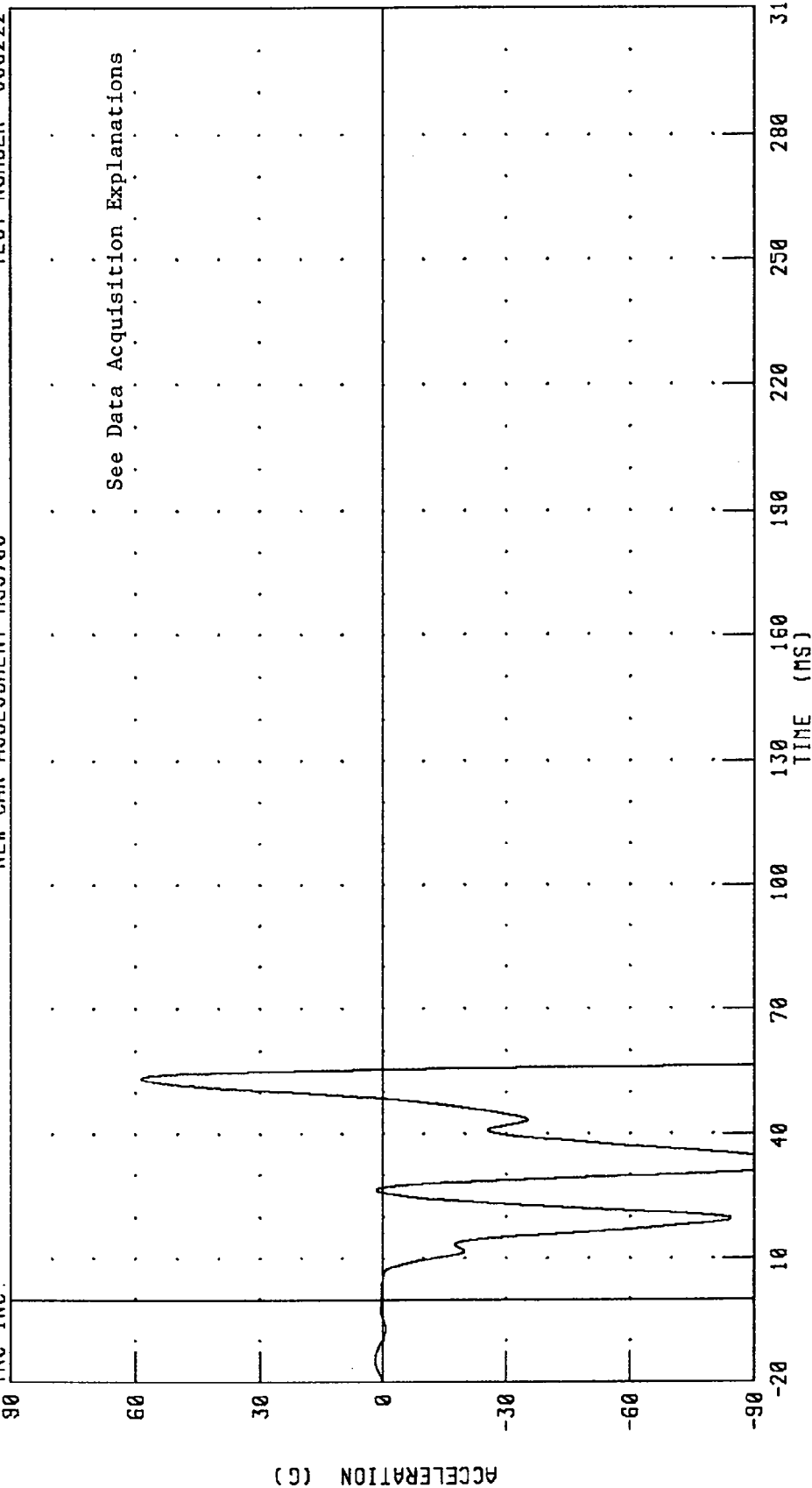
PEAK DATA: 23.86 G @ 65.12 MS, -76.23 G @ 37.44 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



CHANNEL: BCLXC1 FILTER: CH. CLASS 60

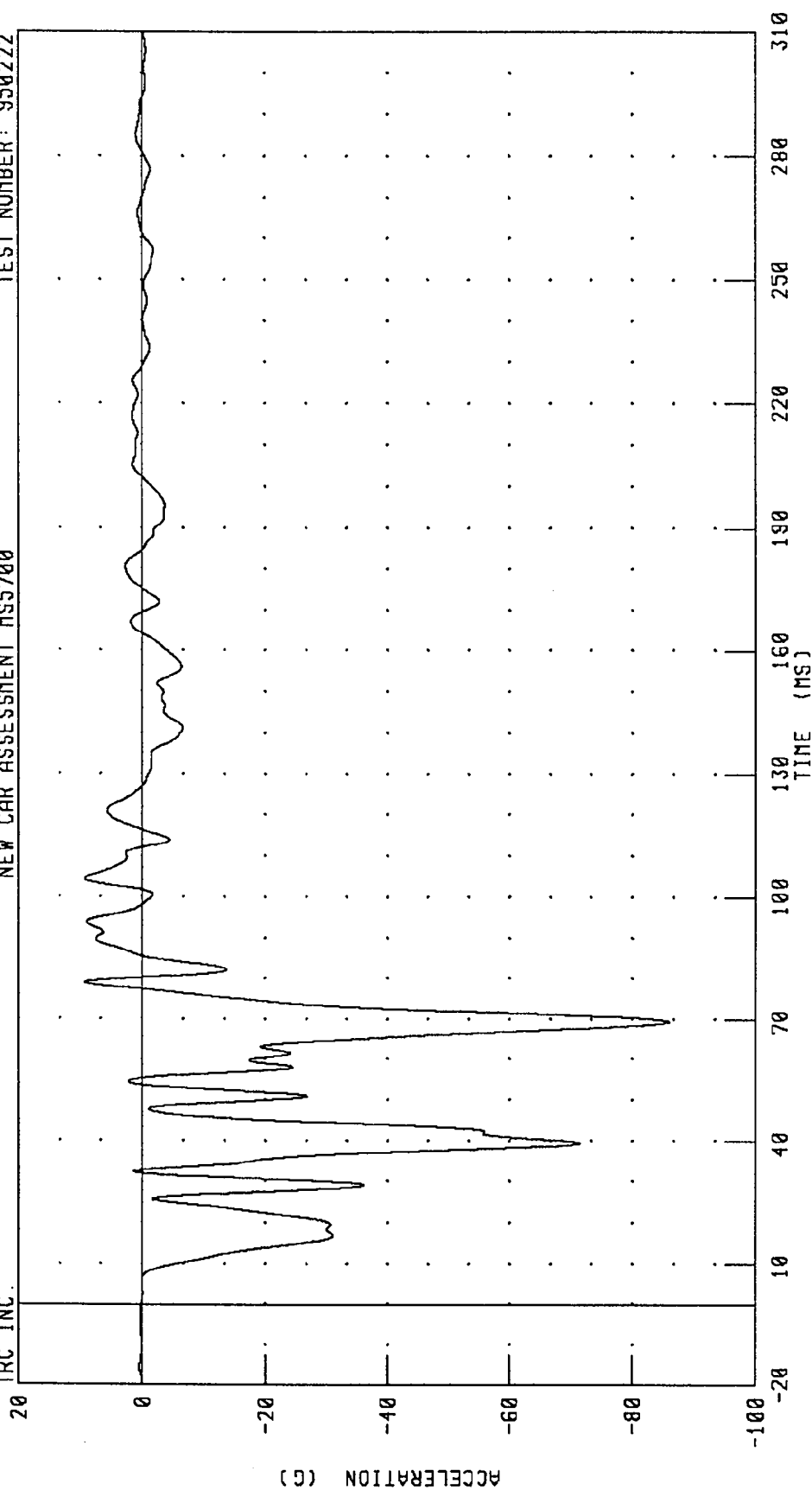
PEAK DATA: 58.76 G @ 53.36 MS; -1086.02 G @ 82.16 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



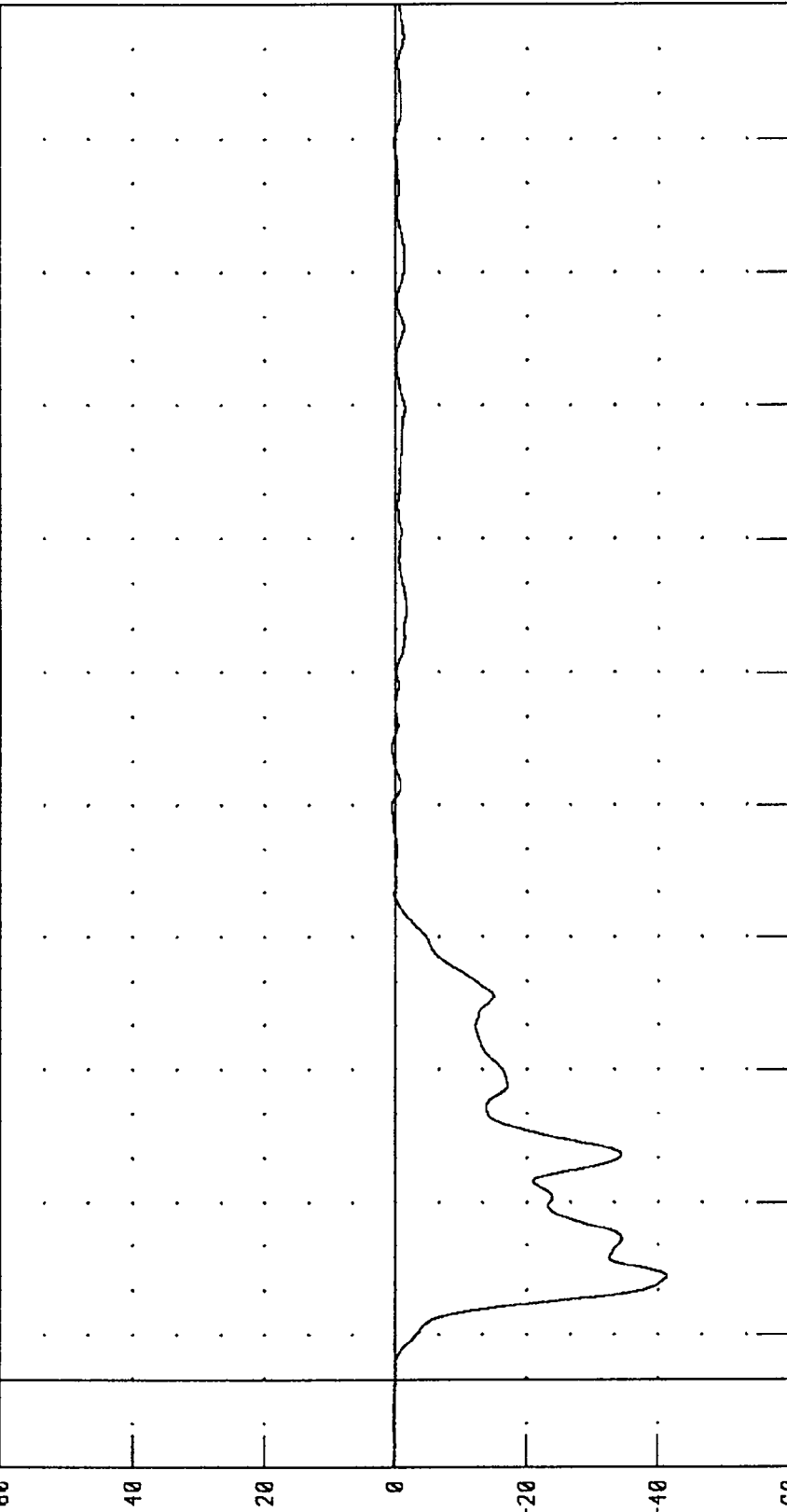
CHANNEL: DPCXG1 FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

60



ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

-40

-60

CHANNEL: TLRXGA FILTER: CH. CLASS 60

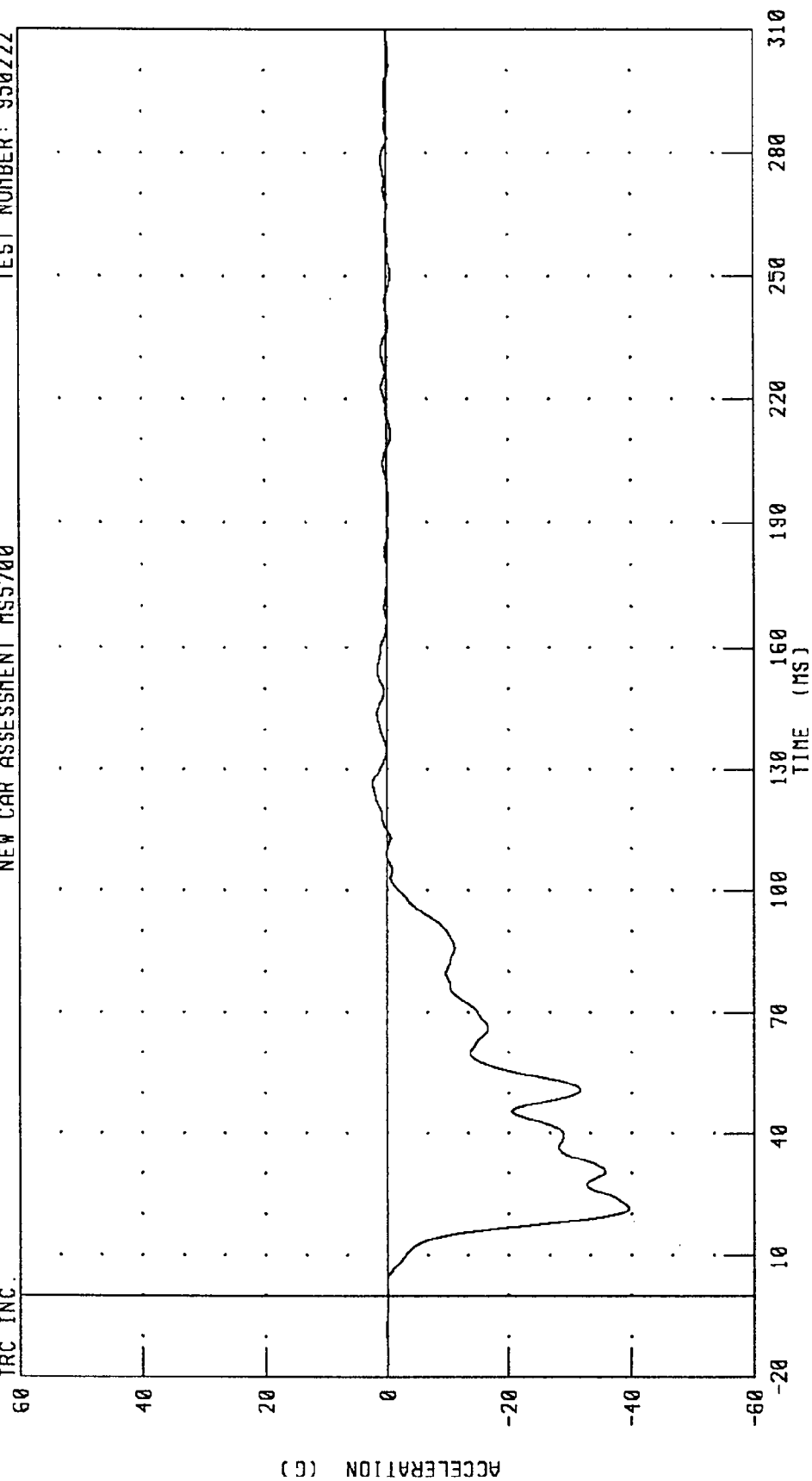
PEAK DATA: 0.57 G @ 142.96 MS; -41.32 G @ 23.20 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

IRC INC.



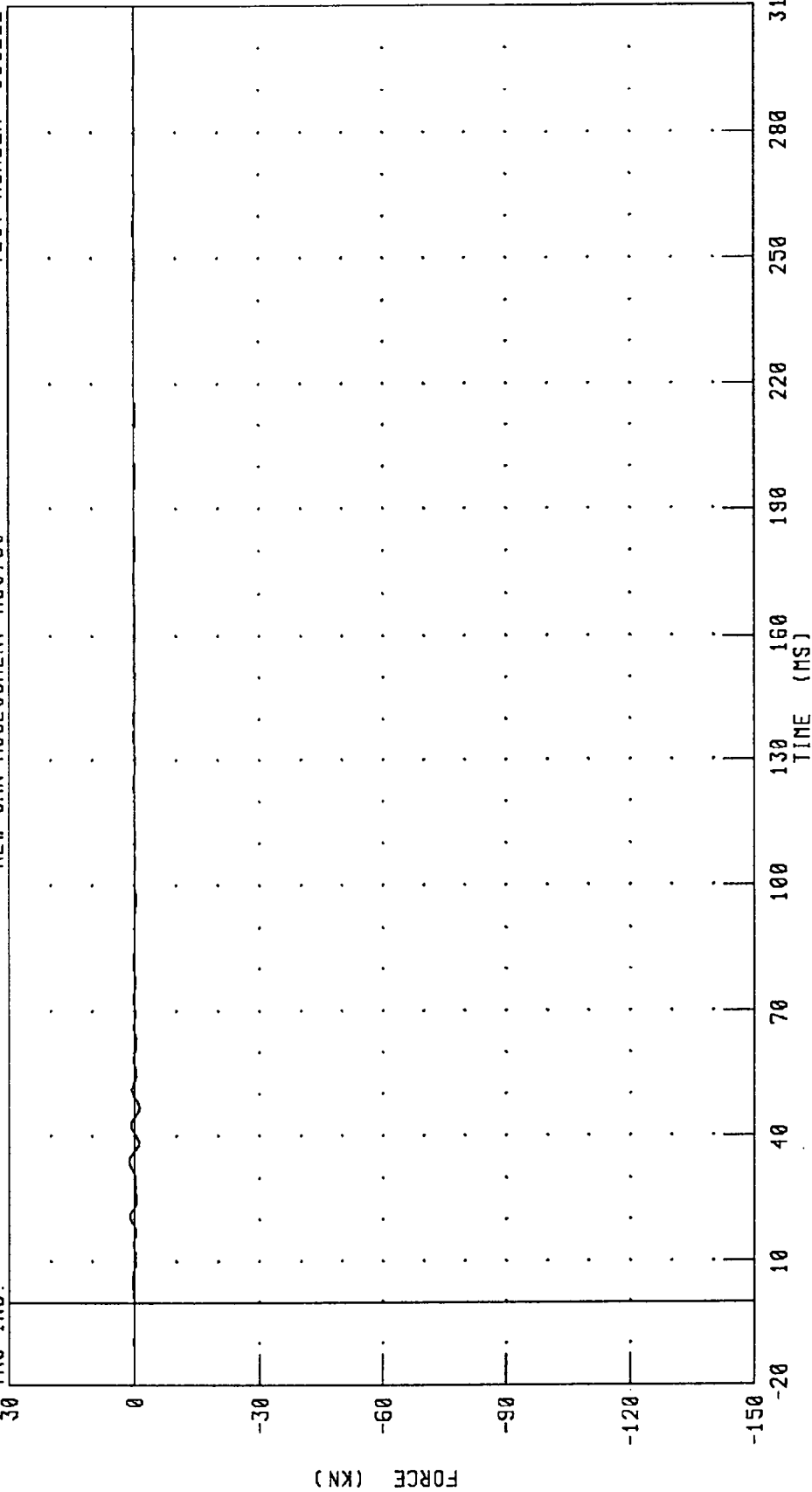
CHANNEL: TRRXGA FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



CHANNEL: BA1F FILTER: CH. CLASS 60

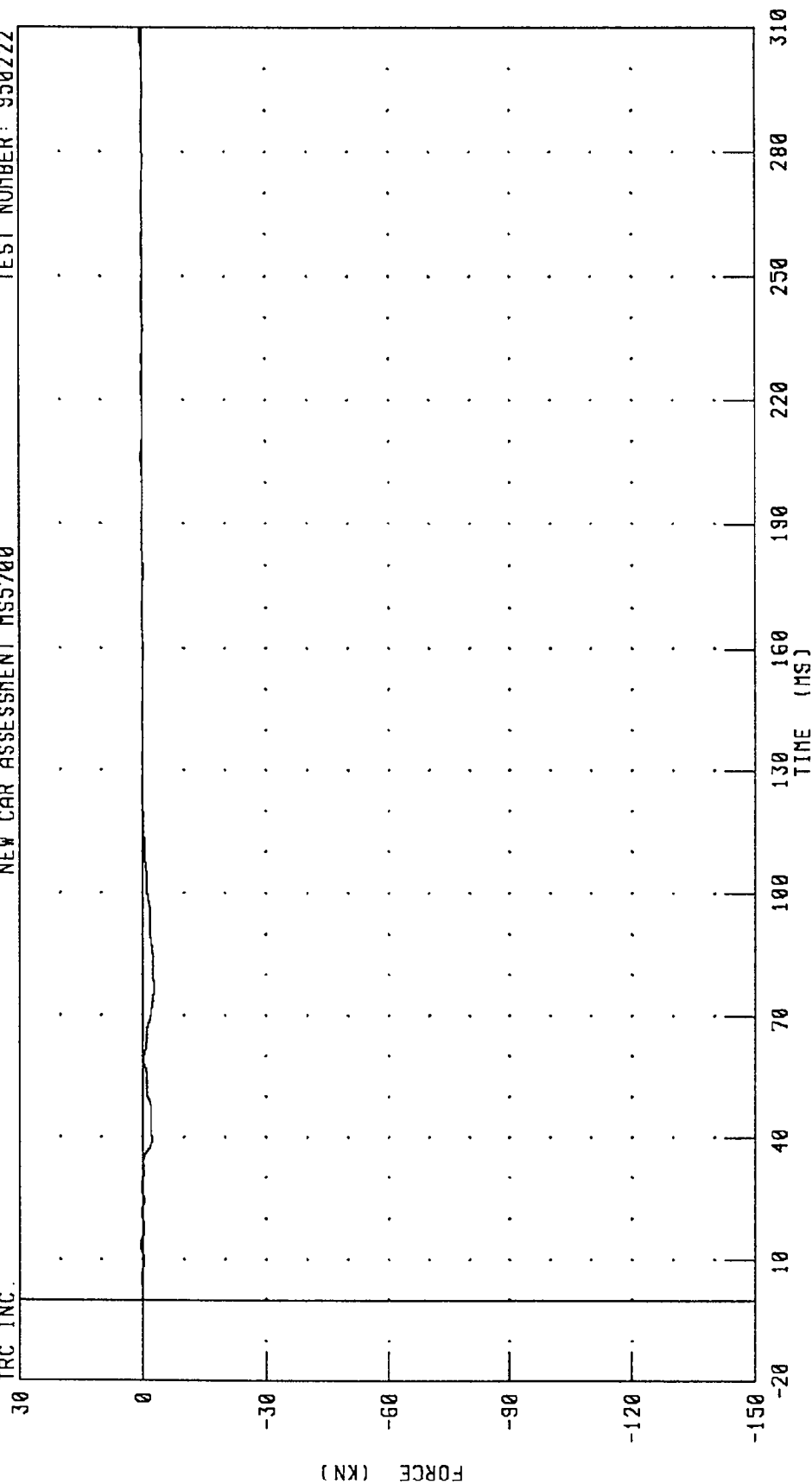
PEAK DATA: 1.20 KN @ 34.16 MS; -1.20 KN @ 46.80 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



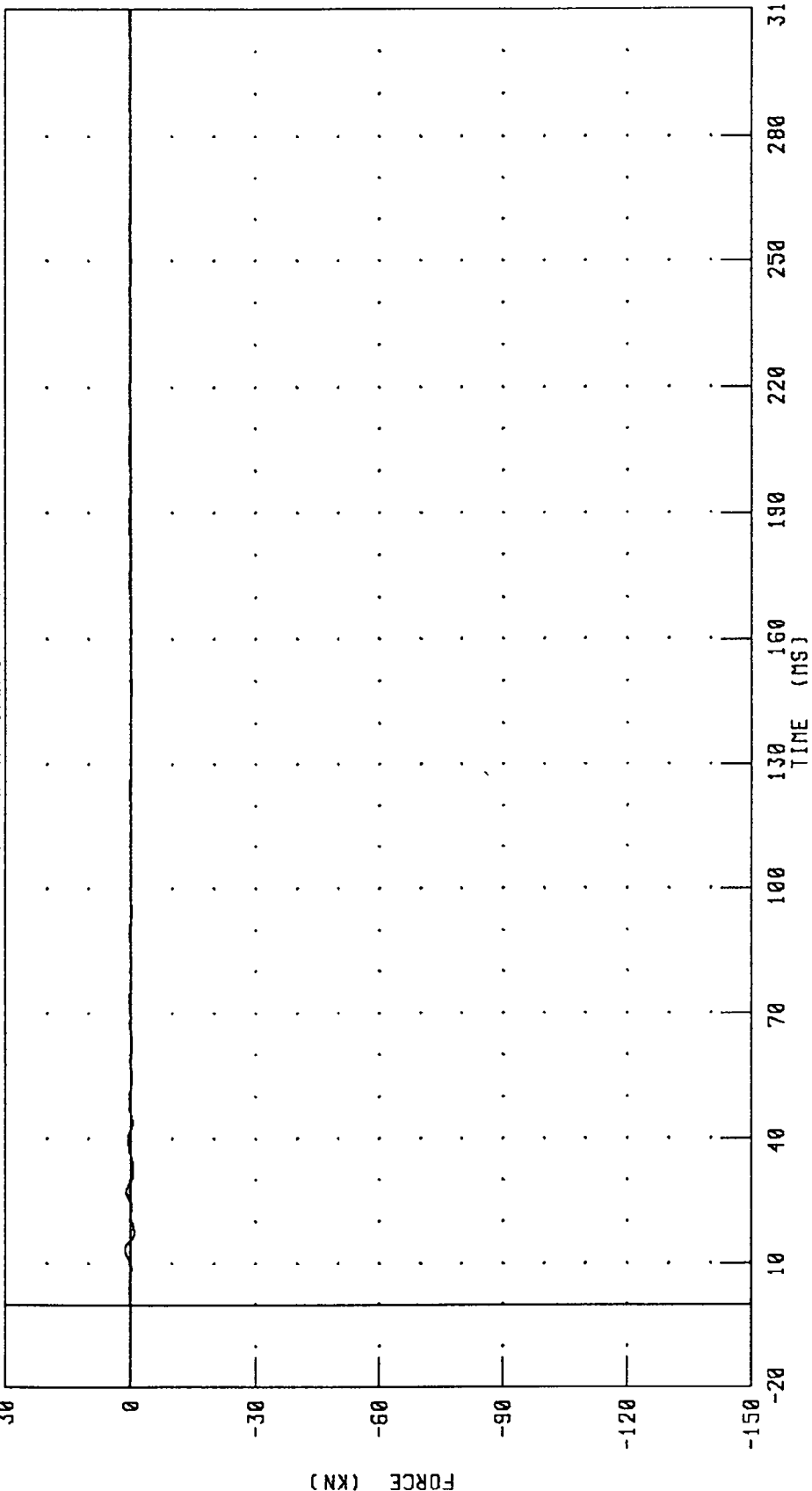
CHANNEL: BA2F FILTER: CH. CLASS 60

950222

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A3 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 1.24 KN @ 13.44 MS; -0.97 KN @ 17.44 MS

FILTER: CH. CLASS 60

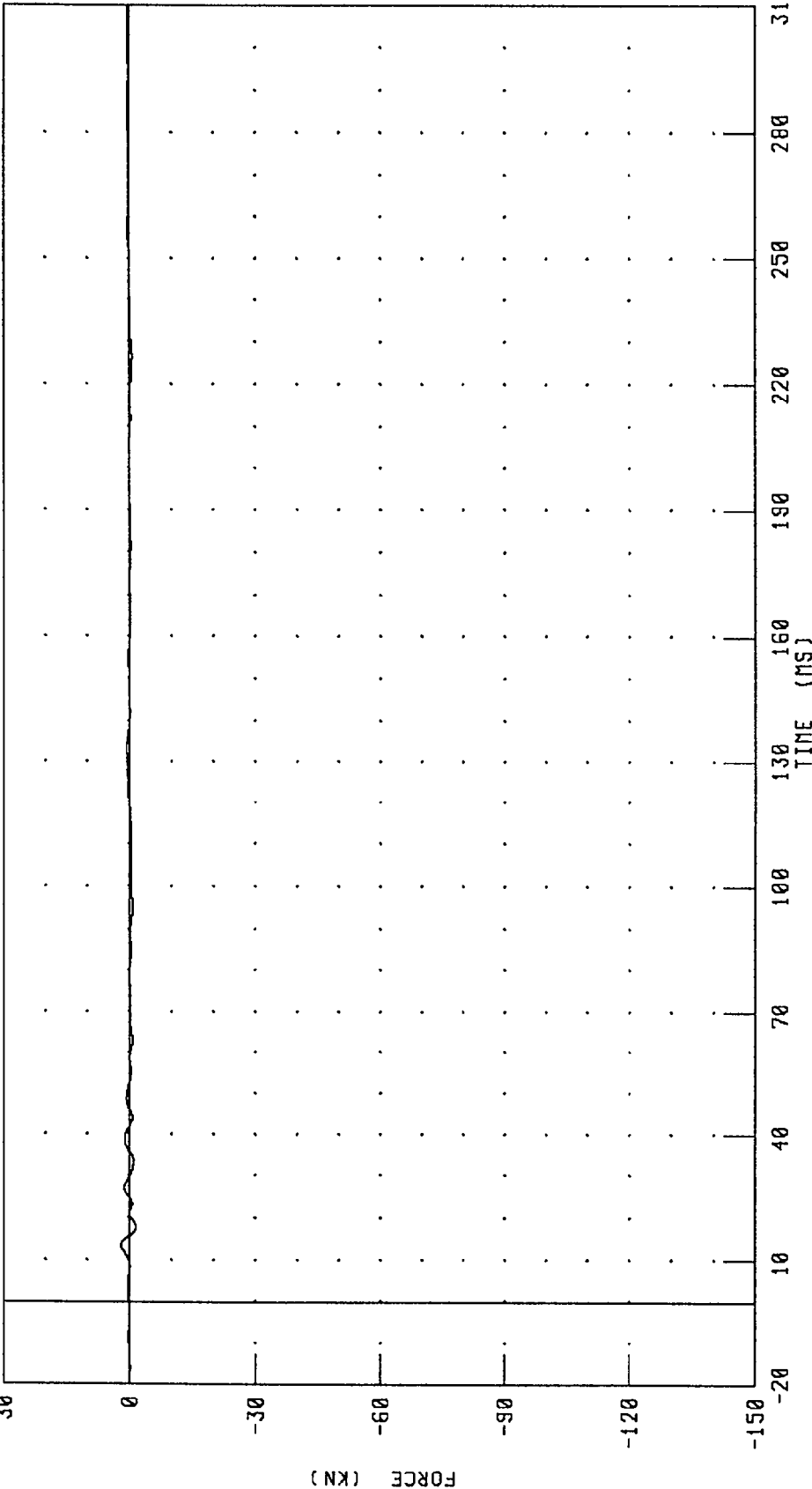
CHANNEL: BA3F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 1.92 KN @ 13.52 MS; -1.60 KN @ 17.76 MS

FILTER: CH. CLASS 60

CHANNEL: BA4F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A5 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.

30

0

-30

-60

-90

-120

-150

FORCE (KN)

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

FILTER: CH. CLASS 60

CHANNEL: BASF

950222

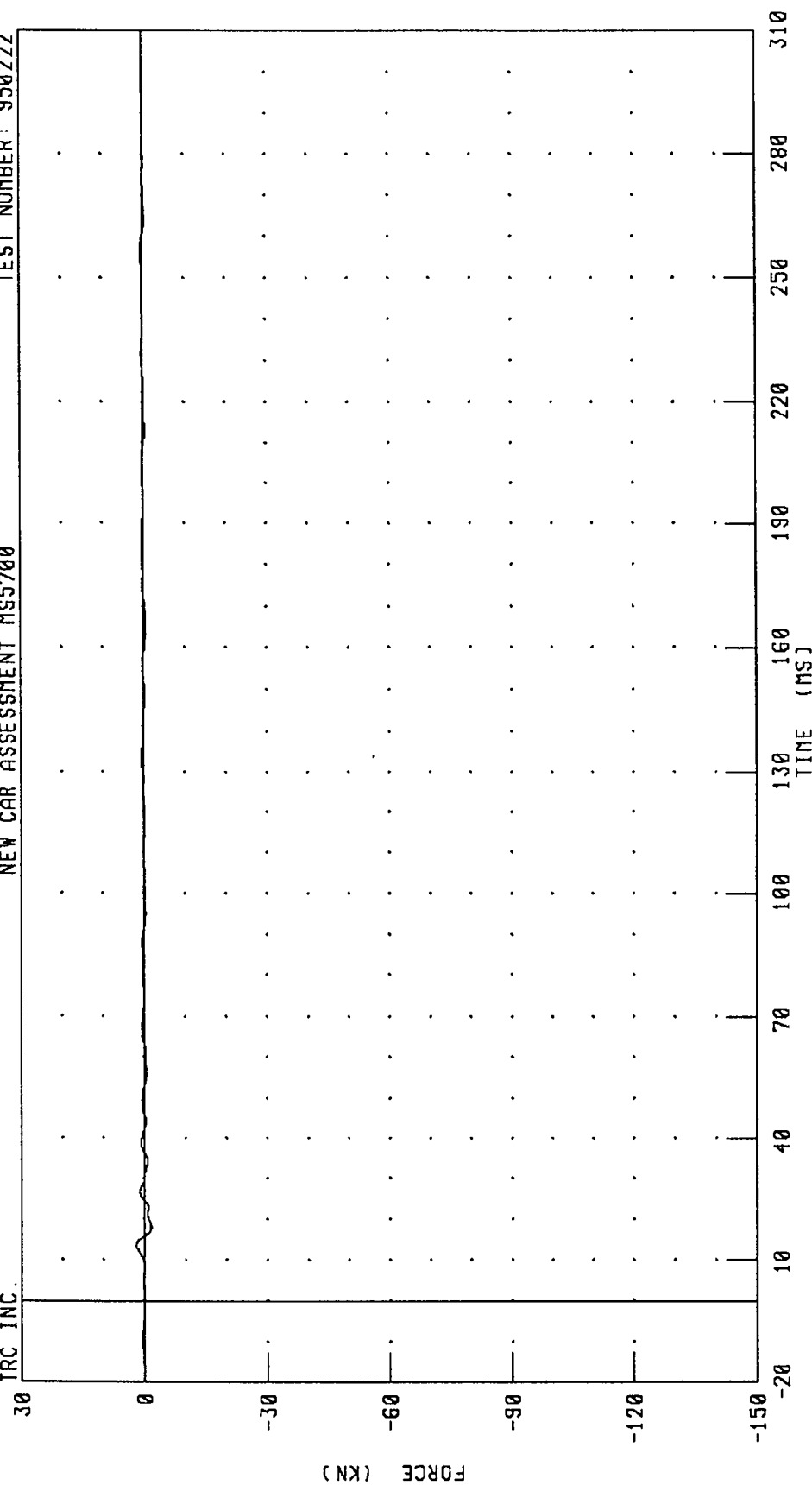
PEAK DATA: 2.07 KN @ 13.52 MS; -1.61 KN @ 17.52 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A6 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 2.06 KN @ 13.60 MS; -1.72 KN @ 17.84 MS

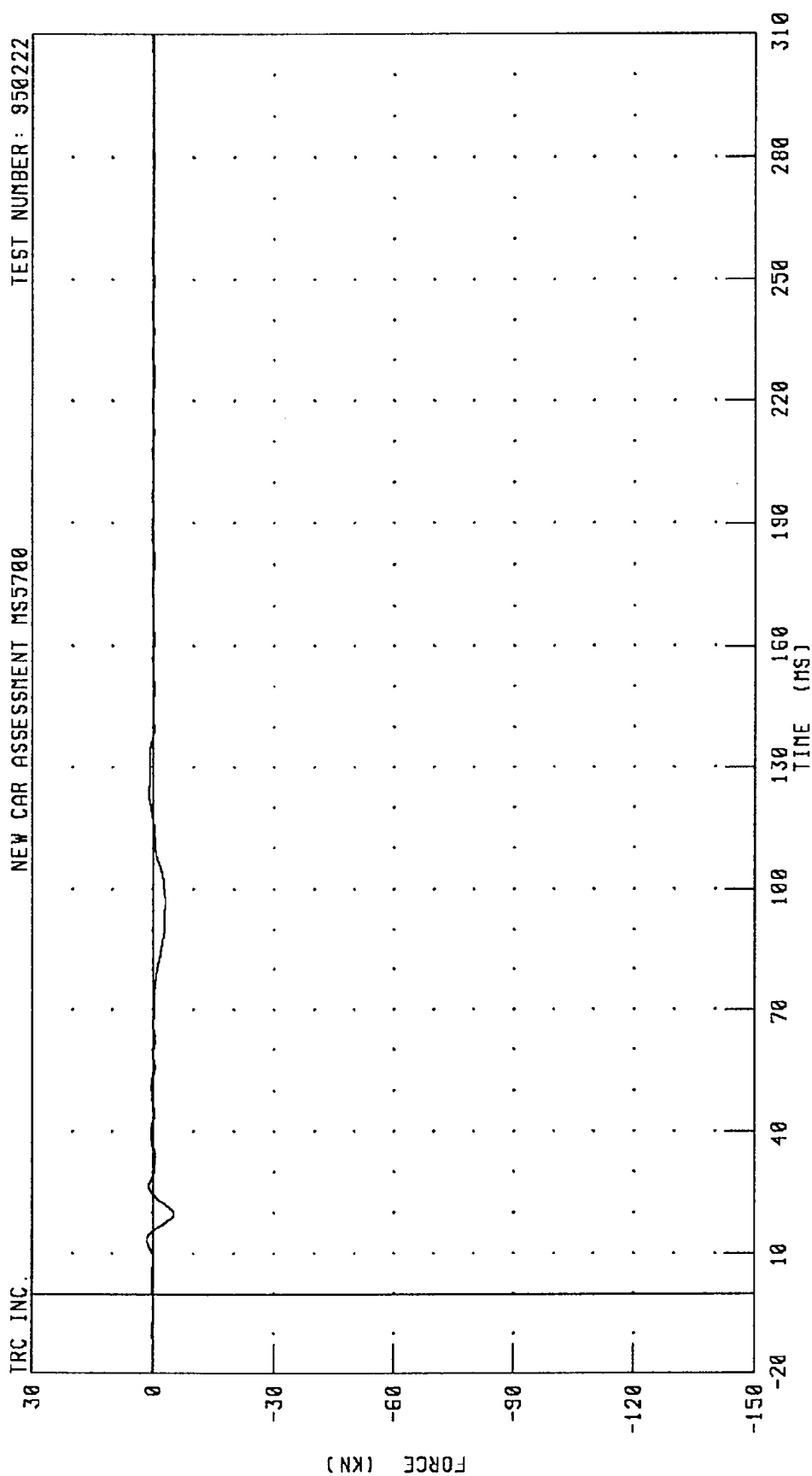
FILTER: CH. CLASS 60

CHANNEL: BA6F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A7 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

IRC INC.



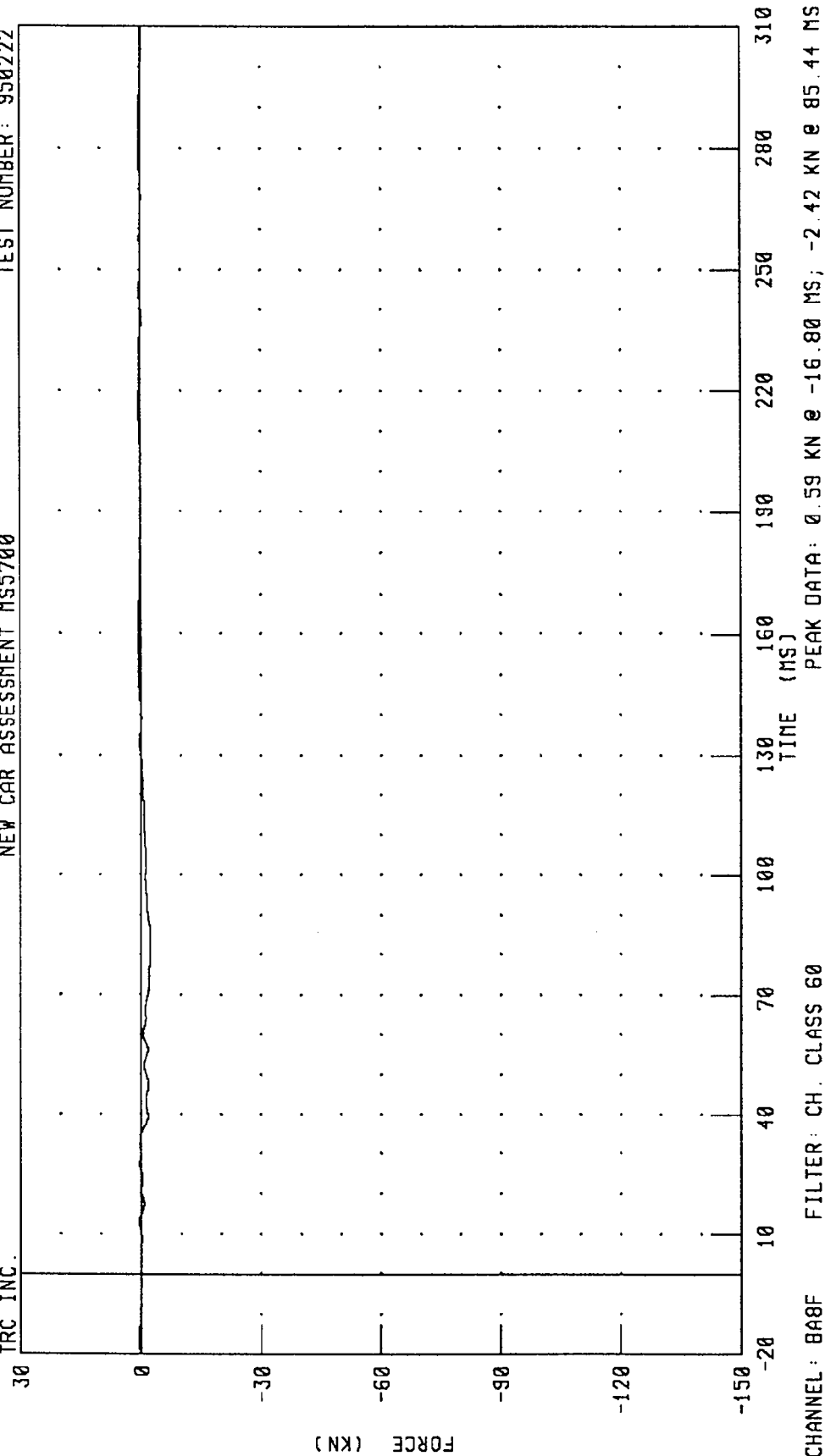
CHANNEL: BA7F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE

TEST NUMBER: 950222

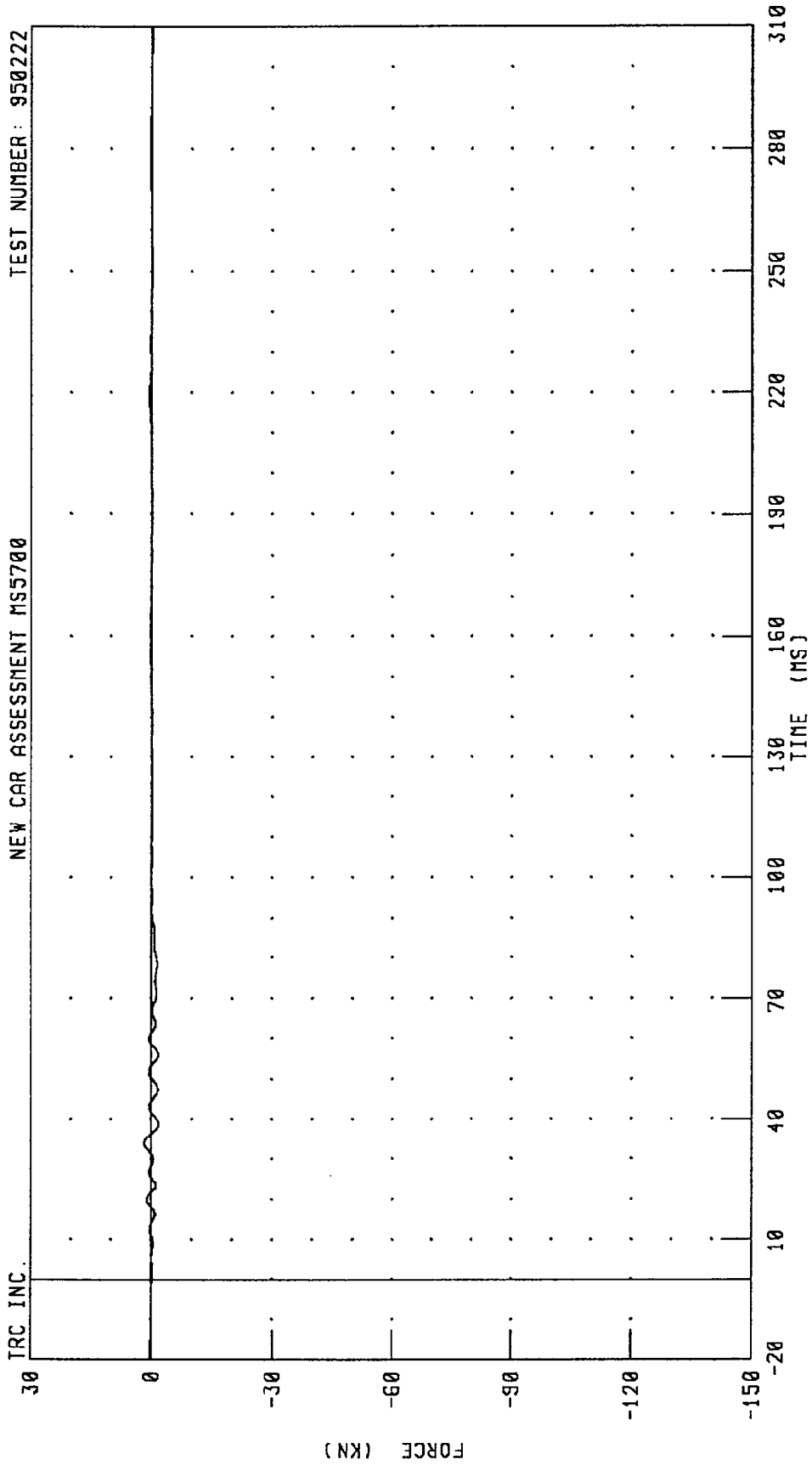
NEW CAR ASSESSMENT MS5700

TRC INC.



1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION AS FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



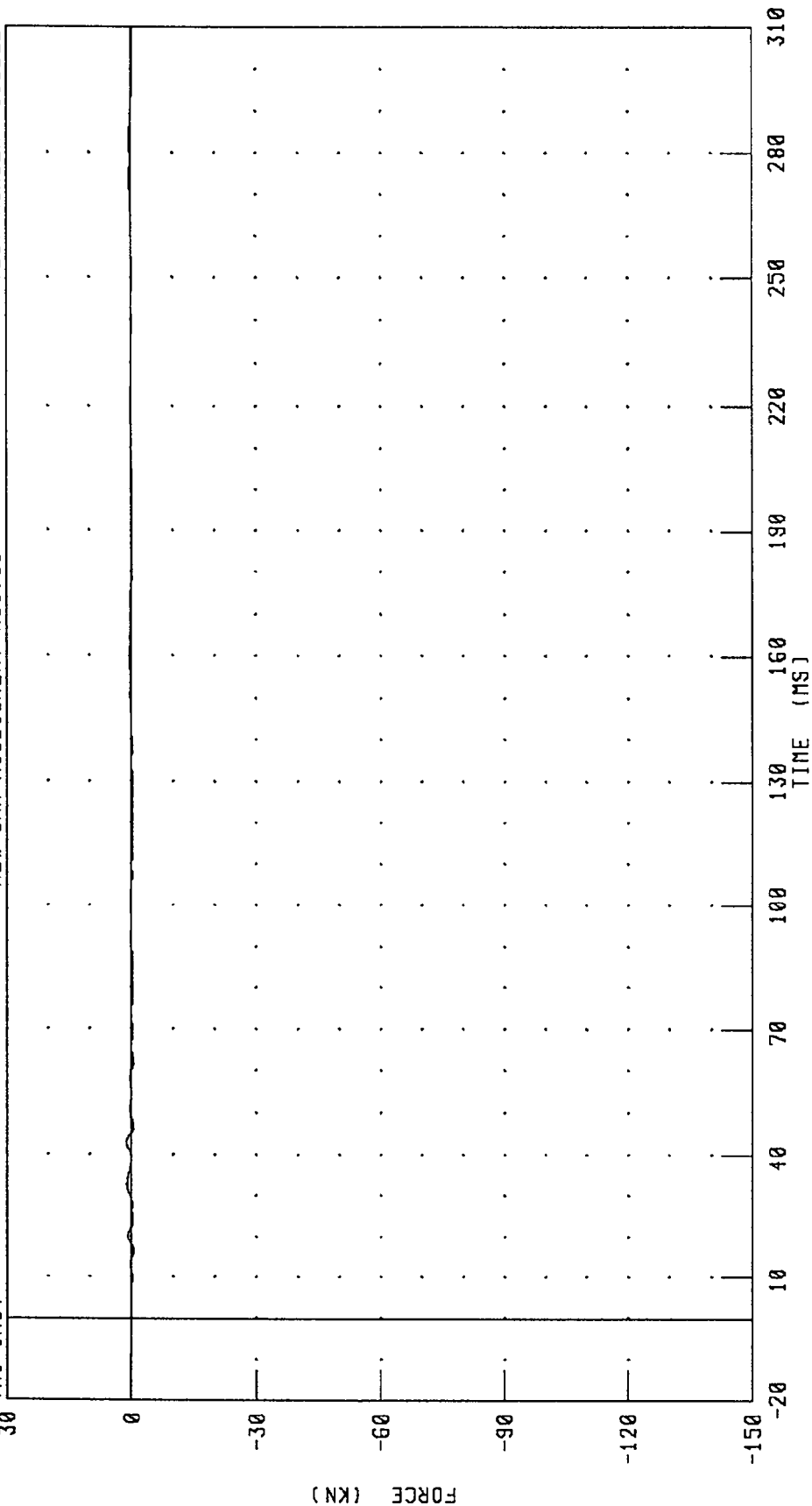
CHANNEL: BASF FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 1.22 KN @ 42.88 MS; -0.64 KN @ 46.72 MS

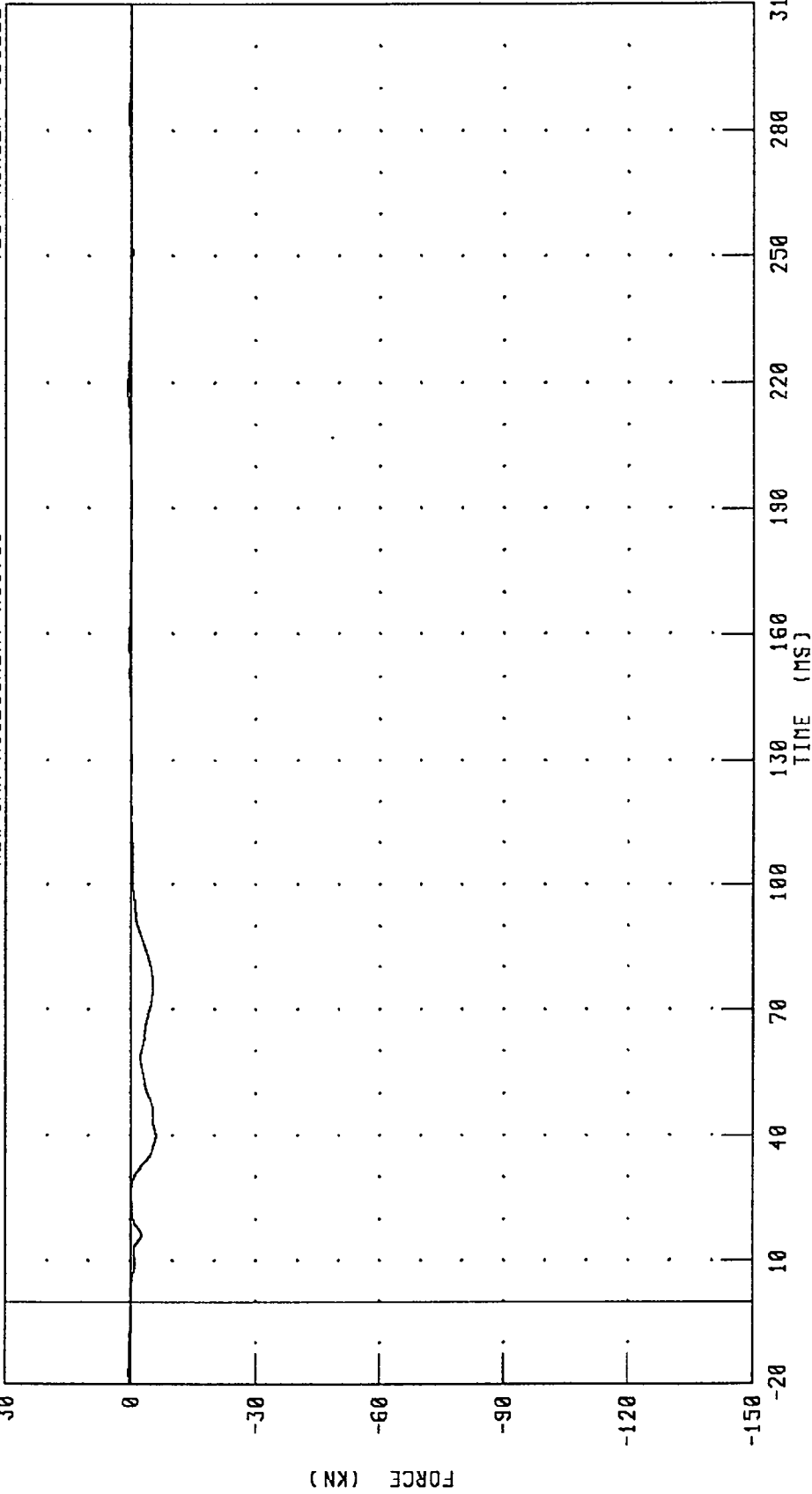
FILTER: CH. CLASS 60

CHANNEL: 881F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B2 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: BB2F

FILTER: CH. CLASS 60

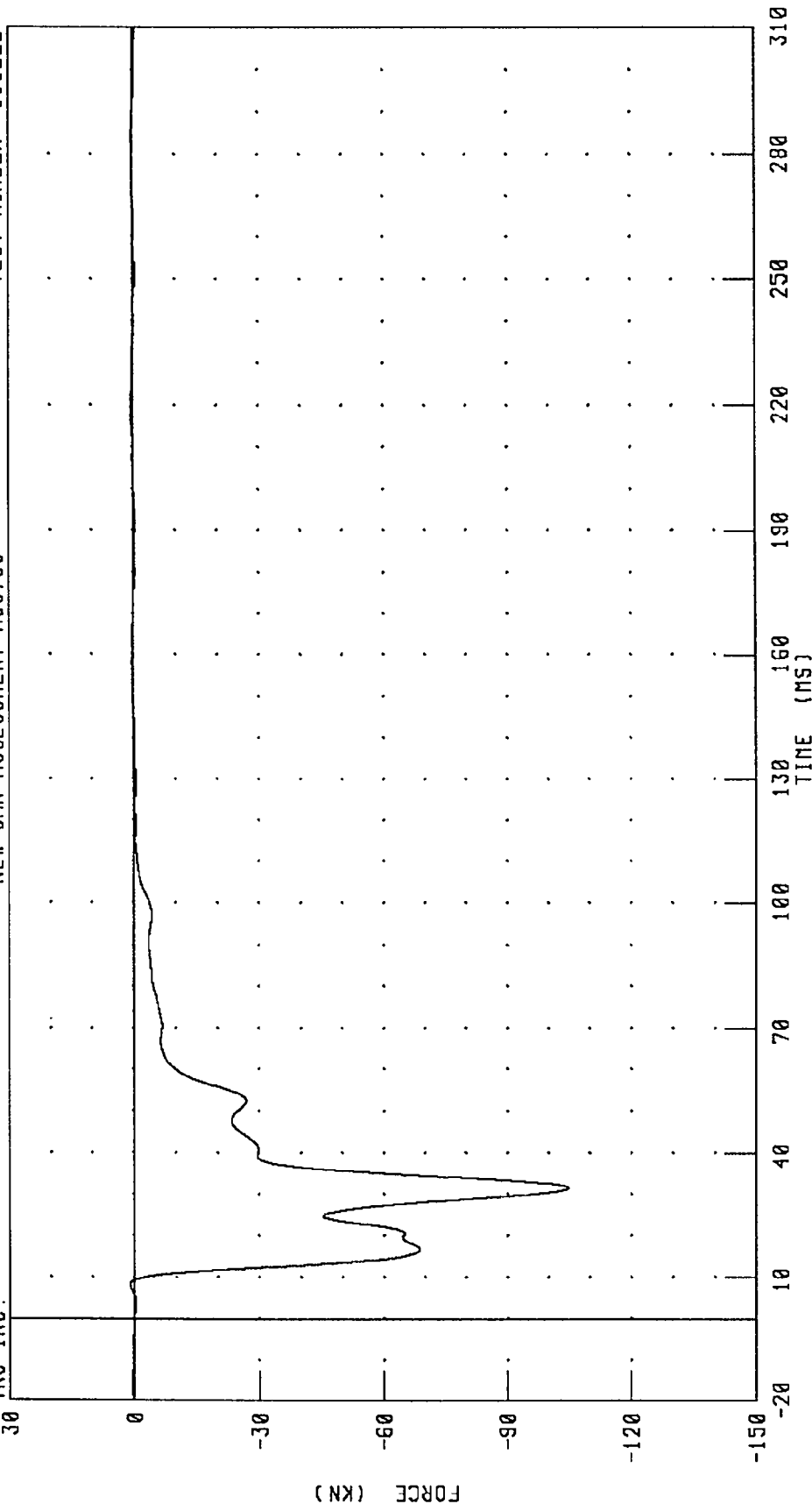
PEAK DATA: 0.68 KN @ 218.24 MS; -6.05 KN @ 40.00 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.94 KN @ 8.08 MS; -105.04 KN @ 31.52 MS

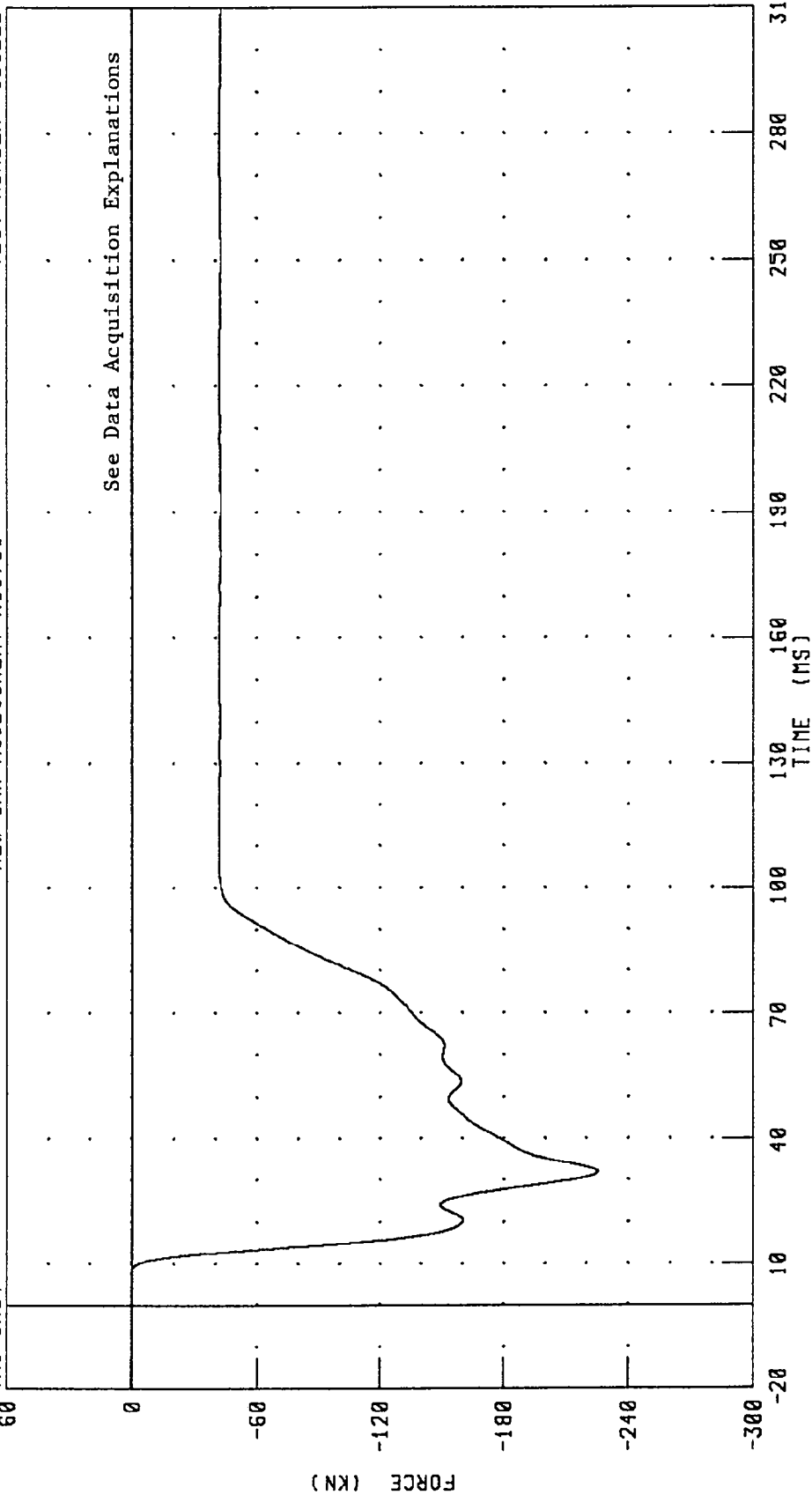
FILTER: CH. CLASS 60

CHANNEL: BB3F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B4 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



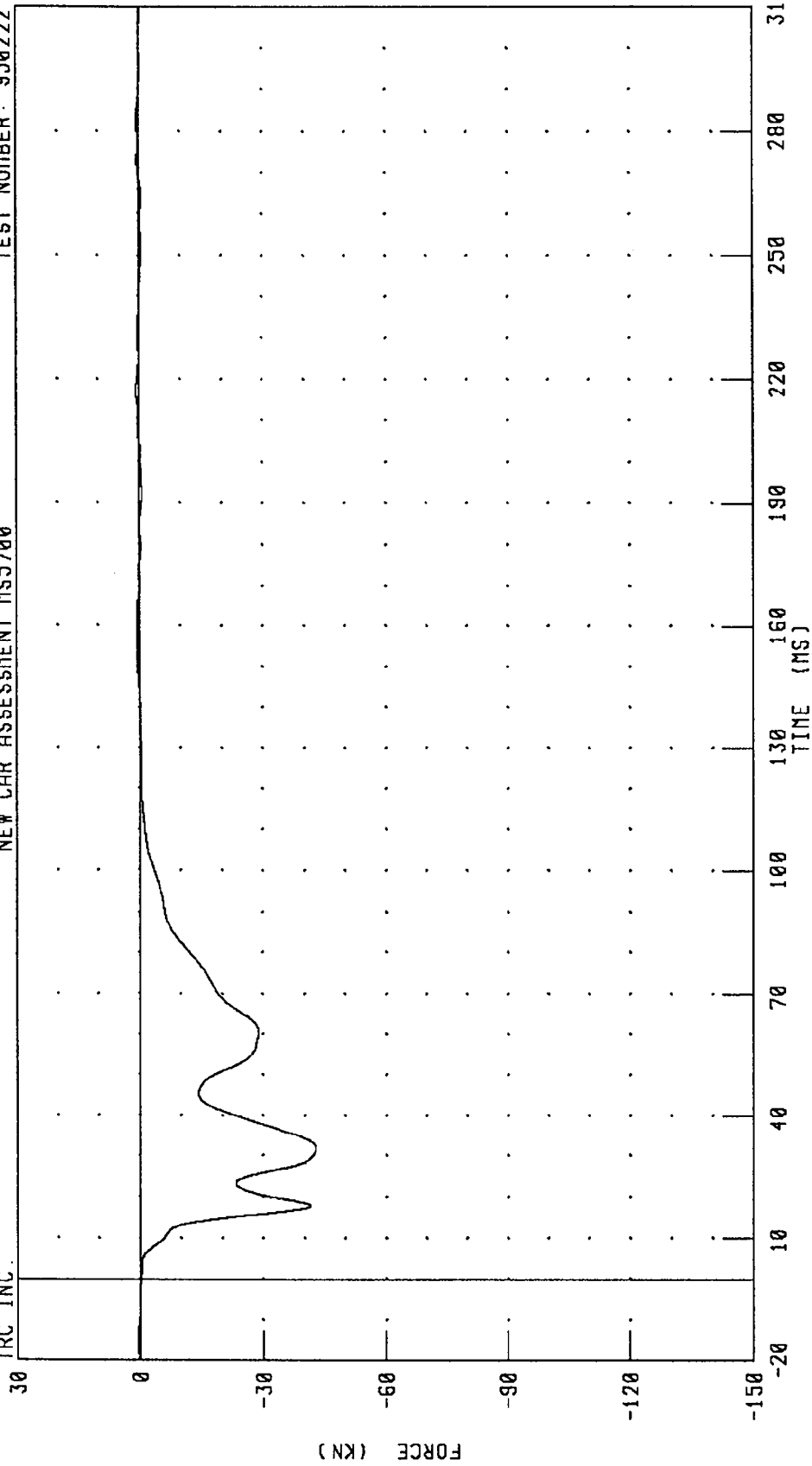
PEAK DATA: 0.39 KN @ -16.96 MS; -225.41 KN @ 31.92 MS

CHANNEL: BB4F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B5 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



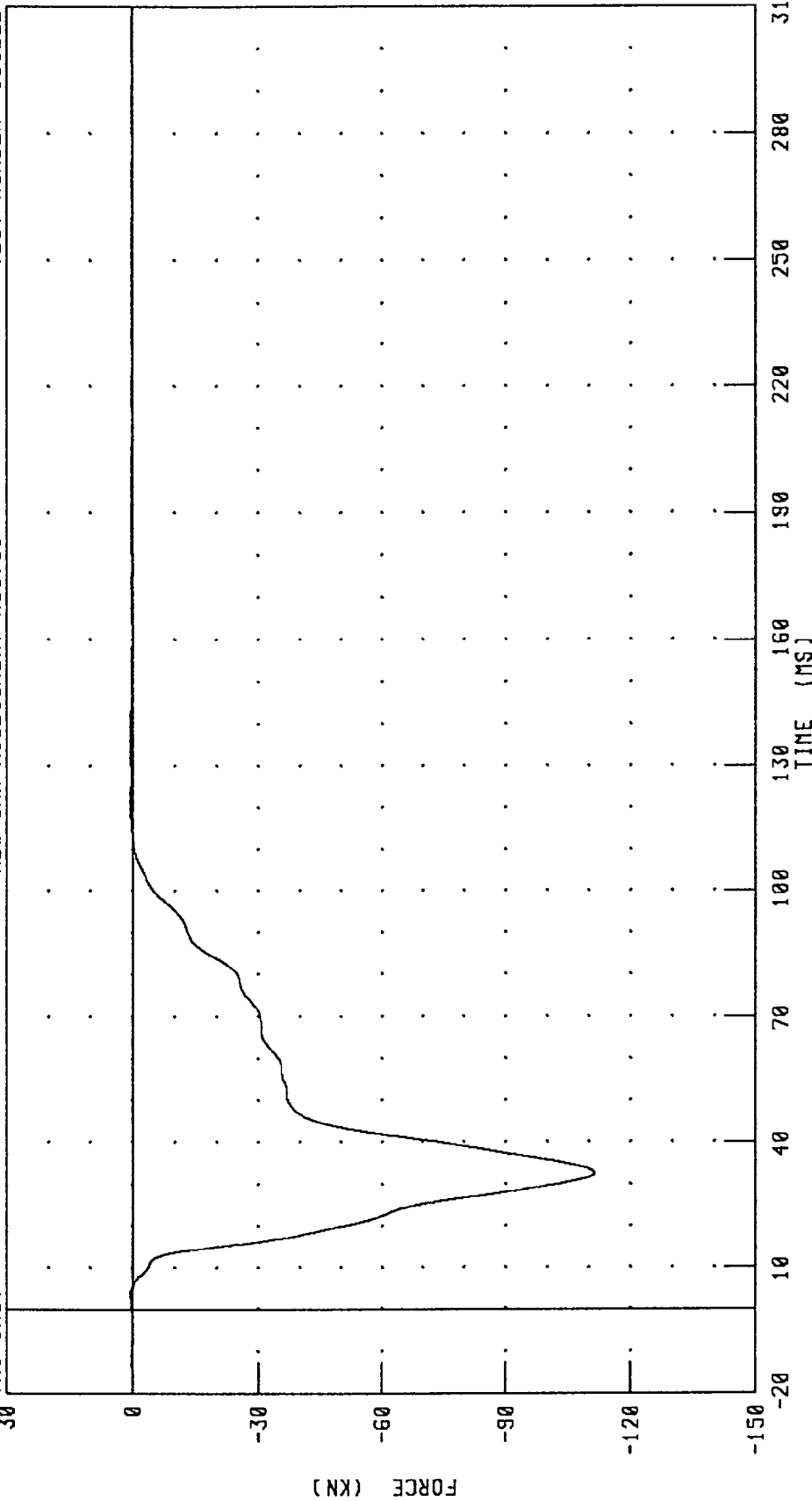
CHANNEL: BB5F FILTER: CH. CLASS 60

PEAK DATA: 0.72 KN @ 217.20 MS; -42.81 KN @ 31.76 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B6 FORCE
 NEW CAR ASSESSMENT M55700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 0.57 KN @ 132.88 MS; -111.29 KN @ 32.72 MS

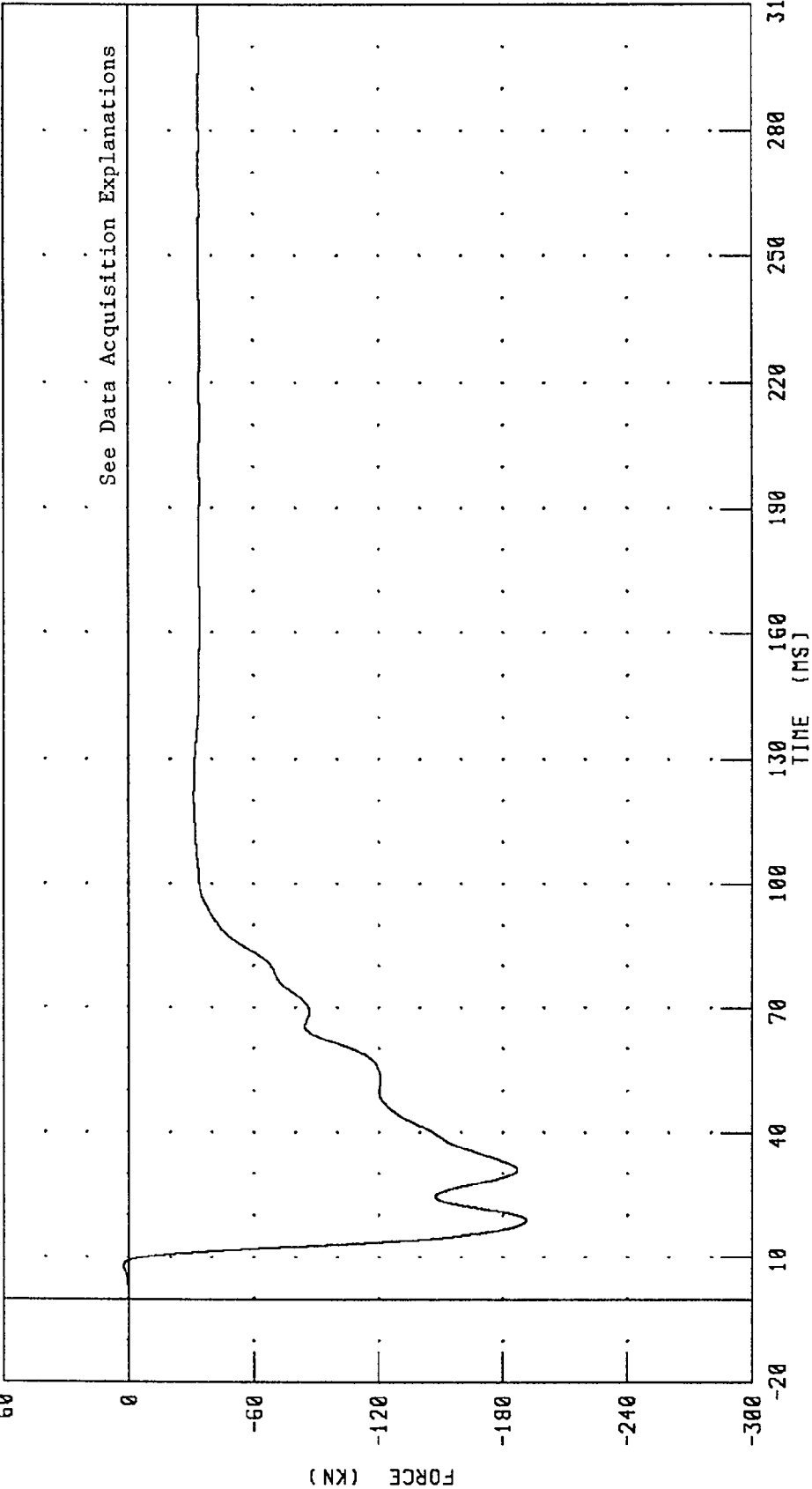
CHANNEL: BB6F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



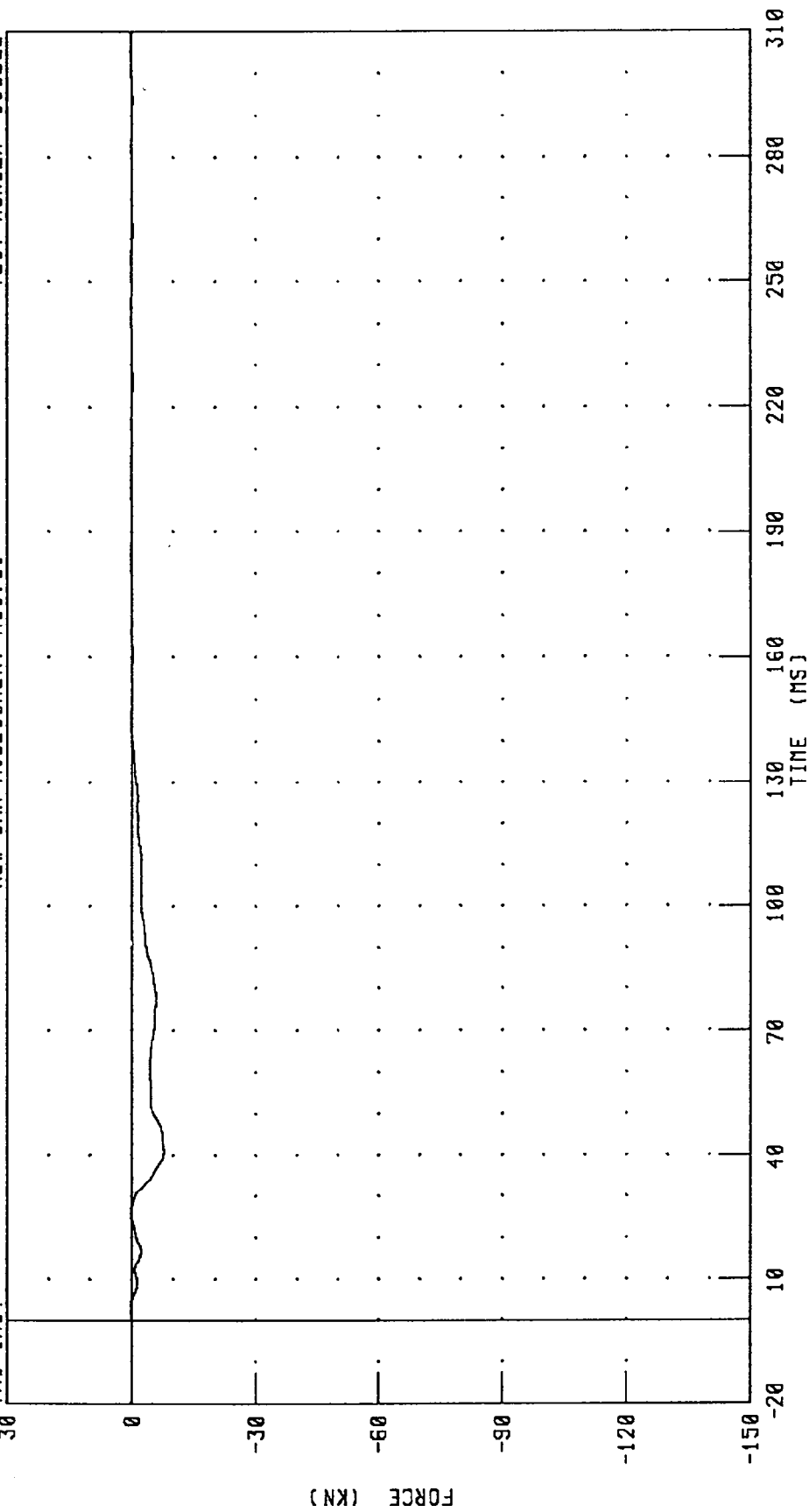
CHANNEL: BB7F FILTER: CH. CLASS 60

PEAK DATA: 2.47 KN @ 7.92 MS; -191.47 KN @ 18.88 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE
NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 0.30 KN @ 26.16 MS; -7.82 KN @ 40.96 MS

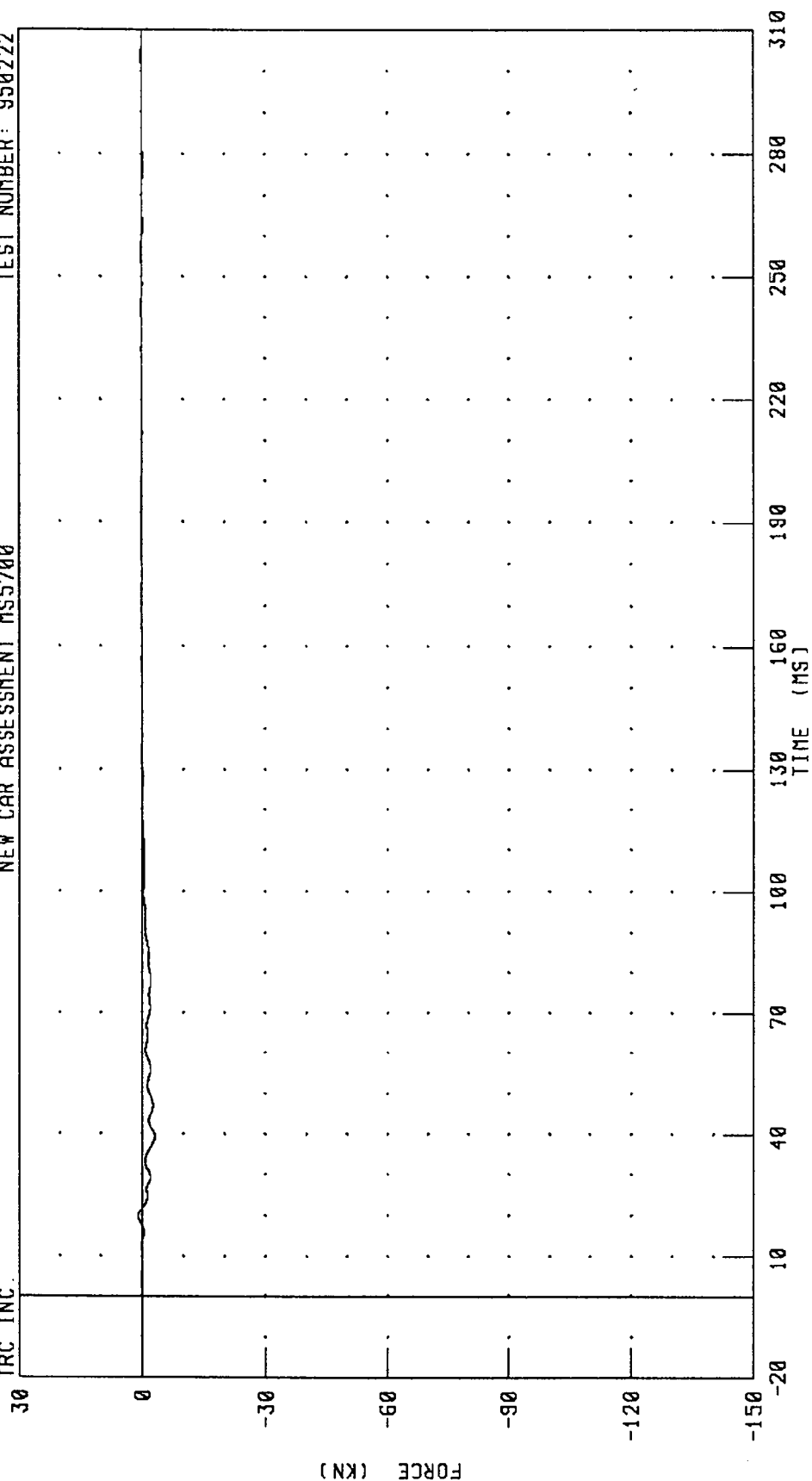
CHANNEL: 888F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.95 KN @ 19.84 MS; -3.11 KN @ 39.36 MS

FILTER: CH. CLASS 60

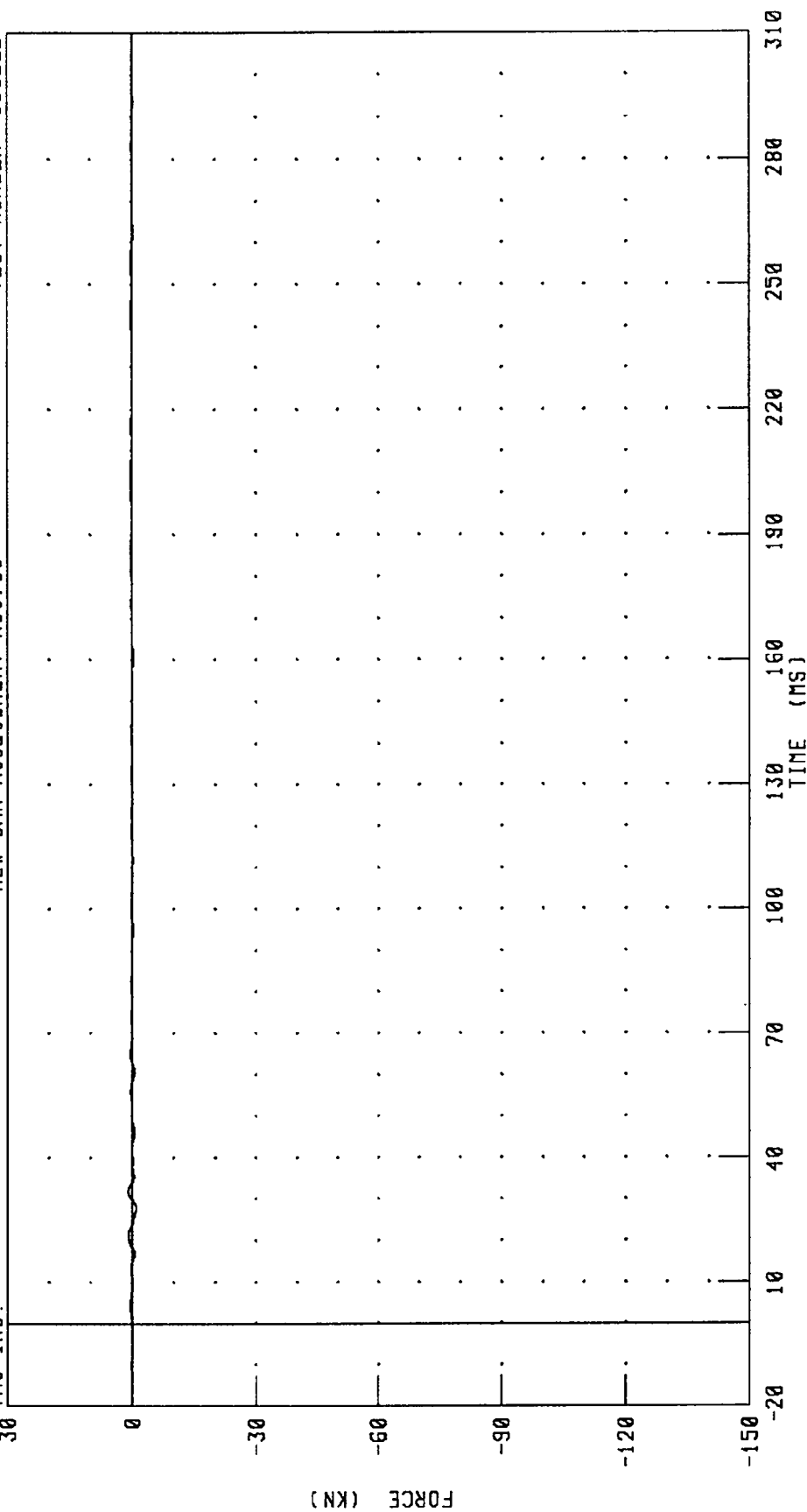
CHANNEL: BB9F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE

NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 0.88 KN @ 32.00 MS; -1.10 KN @ 27.92 MS

FILTER: CH. CLASS 60

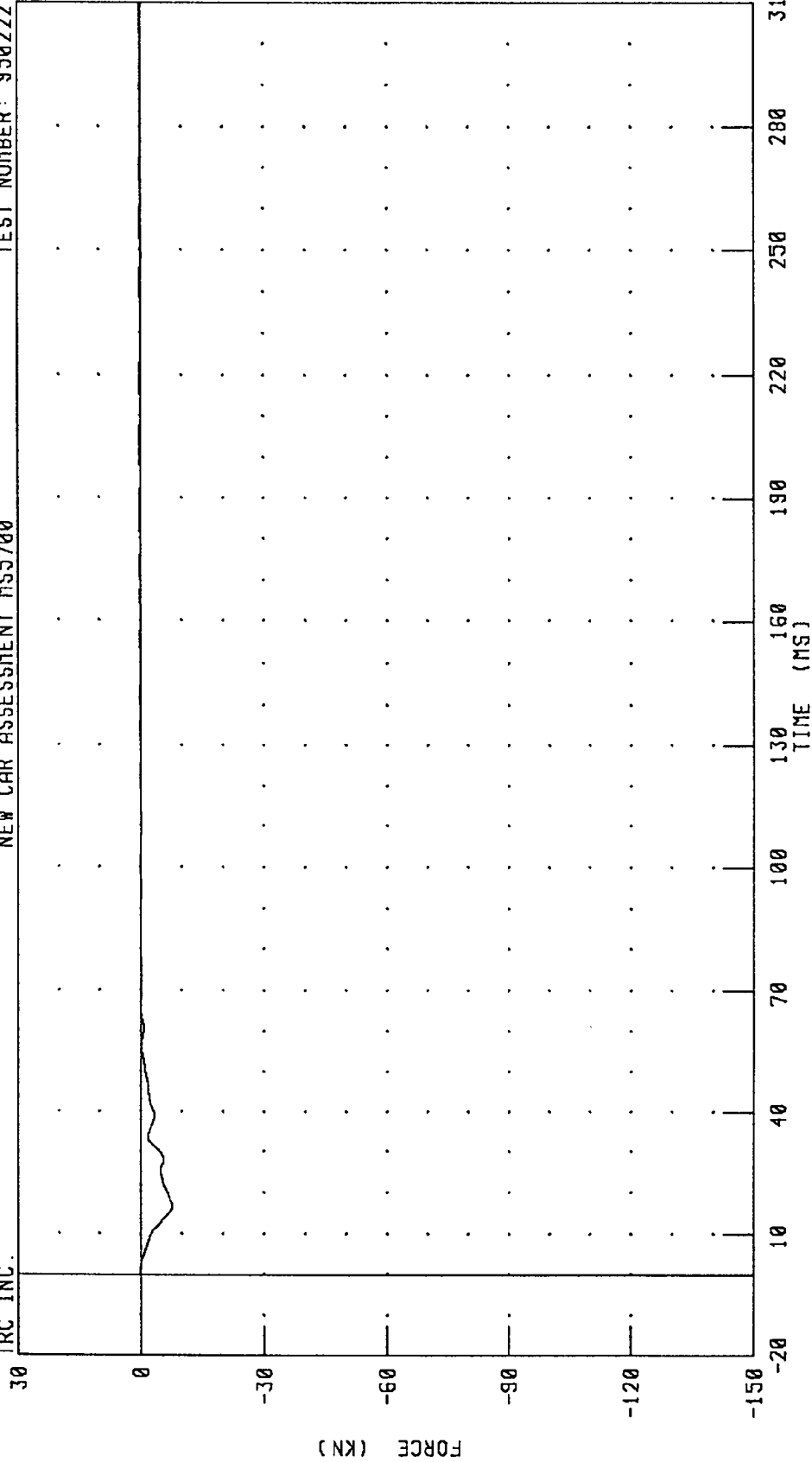
CHANNEL: BC1F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

IRC INC.



PEAK DATA: 0.29 KN @ 256.08 MS; -7.72 KN @ 16.48 MS

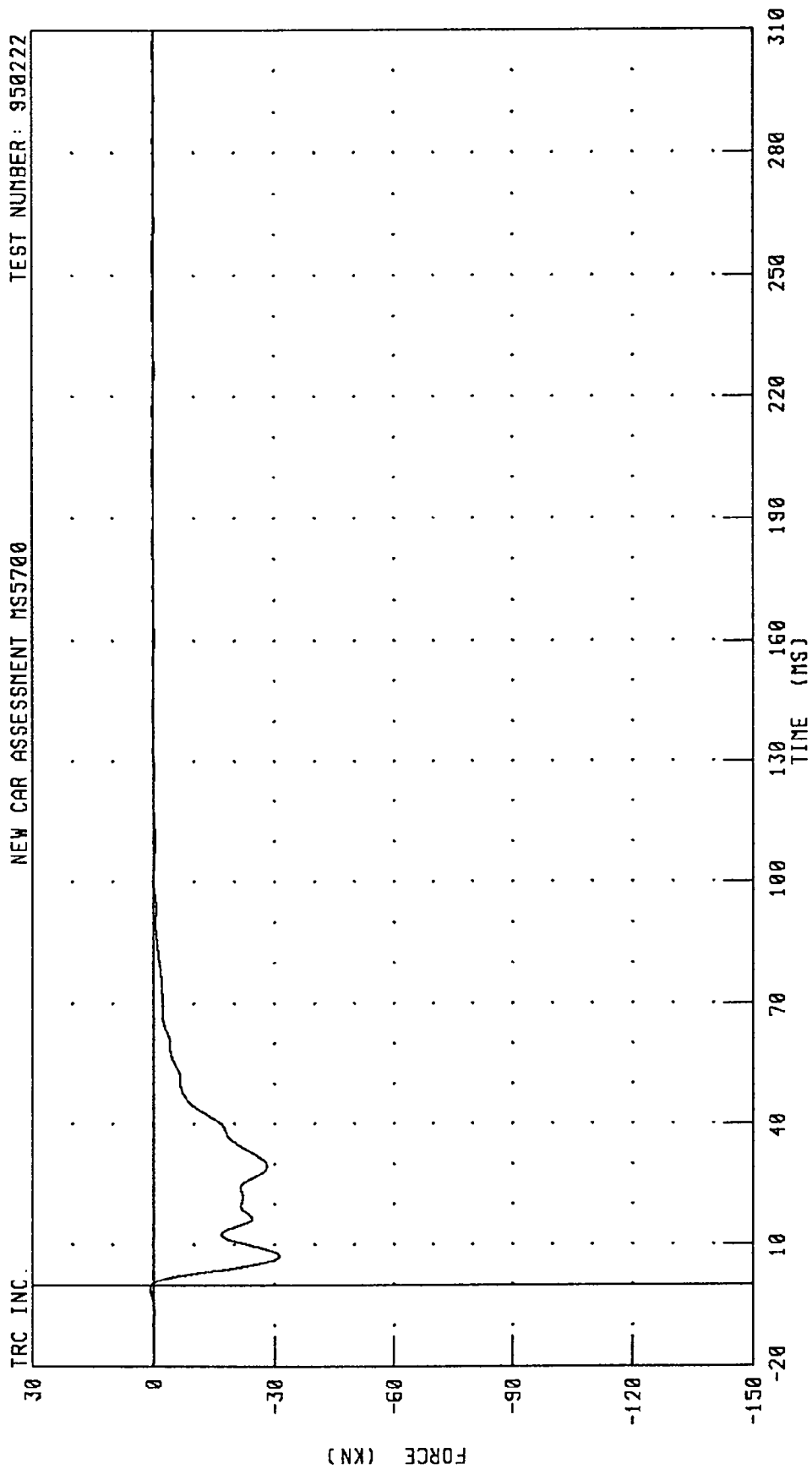
FILTER: CH. CLASS 60

CHANNEL: BC2F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE

NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



PEAK DATA: 0.80 KN @ -0.96 MS; -31.30 KN @ 7.28 MS

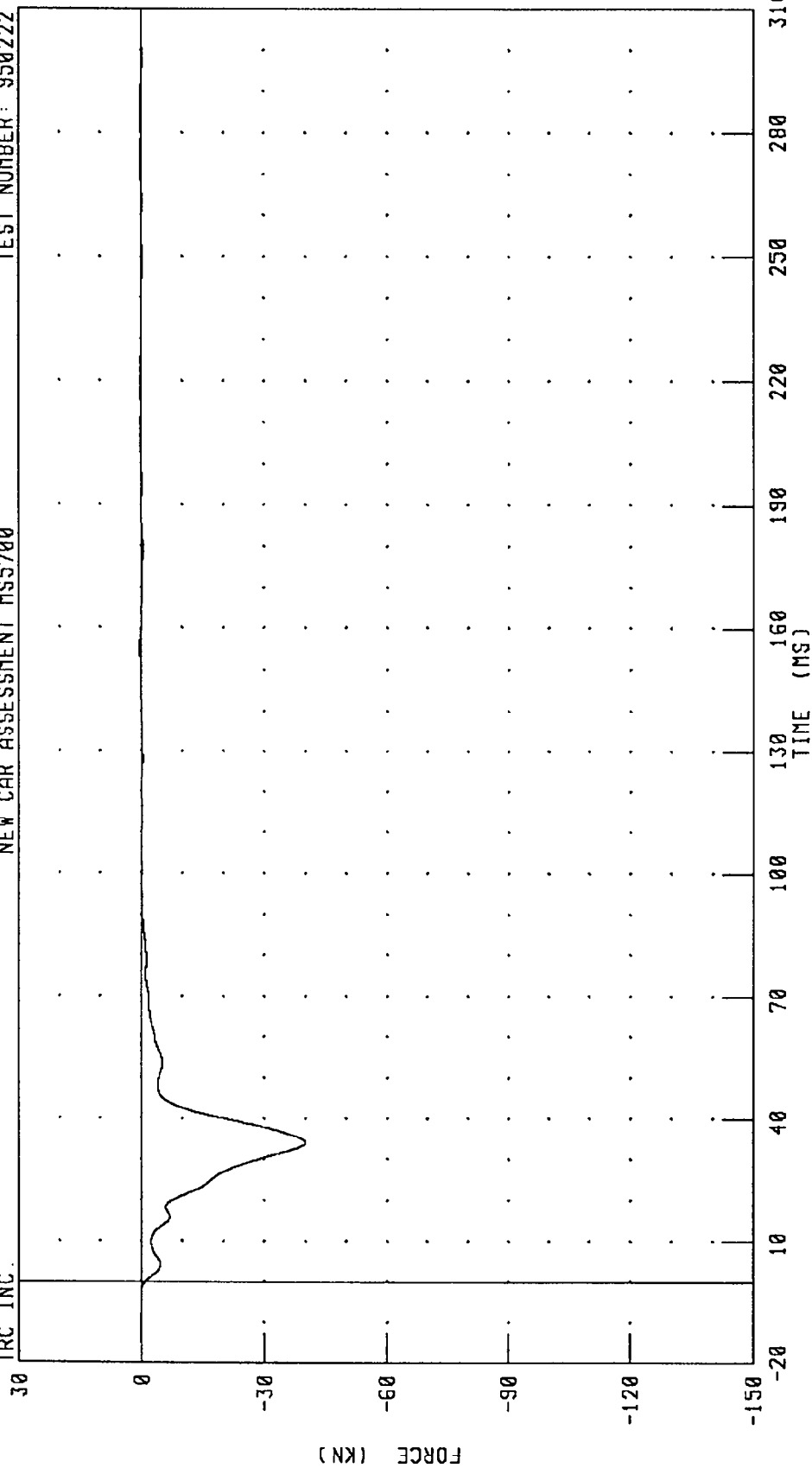
CHANNEL: BC3F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



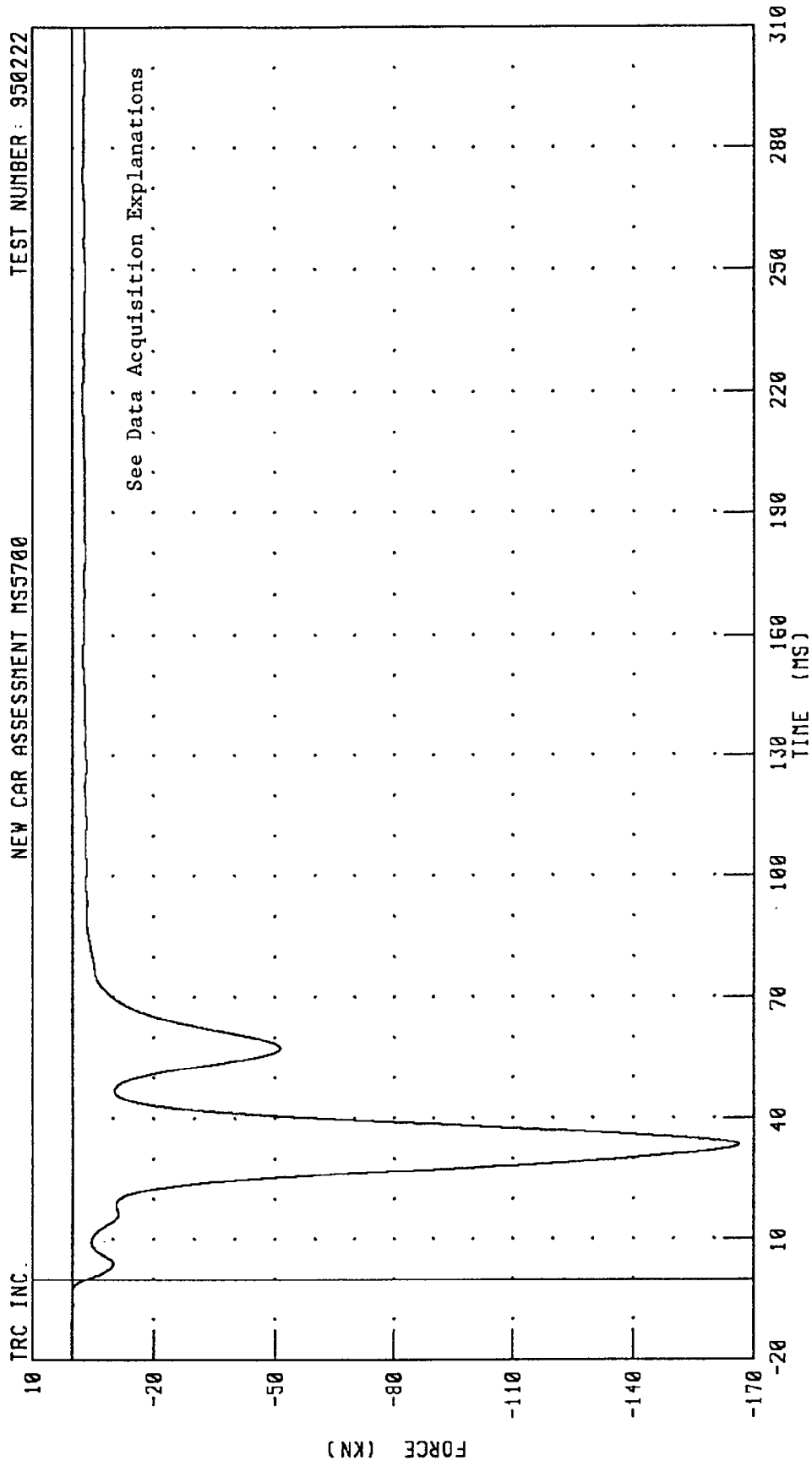
PEAK DATA: 0.40 KN @ 155.04 MS; -39.91 KN @ 34.08 MS

FILTER: CH. CLASS 60

CHANNEL: BC4F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C5 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222



PEAK DATA: 0.21 KN @ -14.72 MS, -166.13 KN @ 33.52 MS

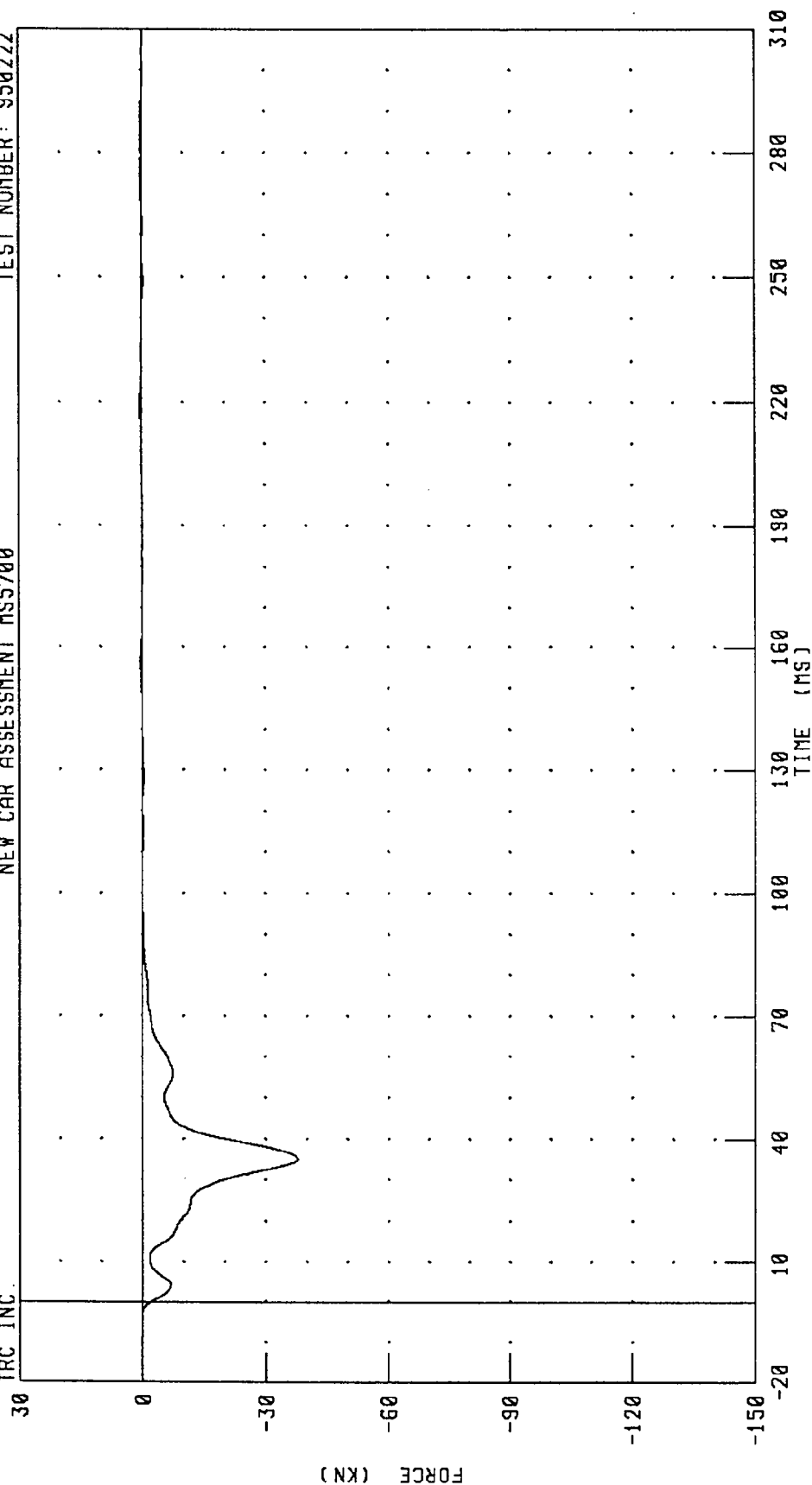
CHANNEL: BC5F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



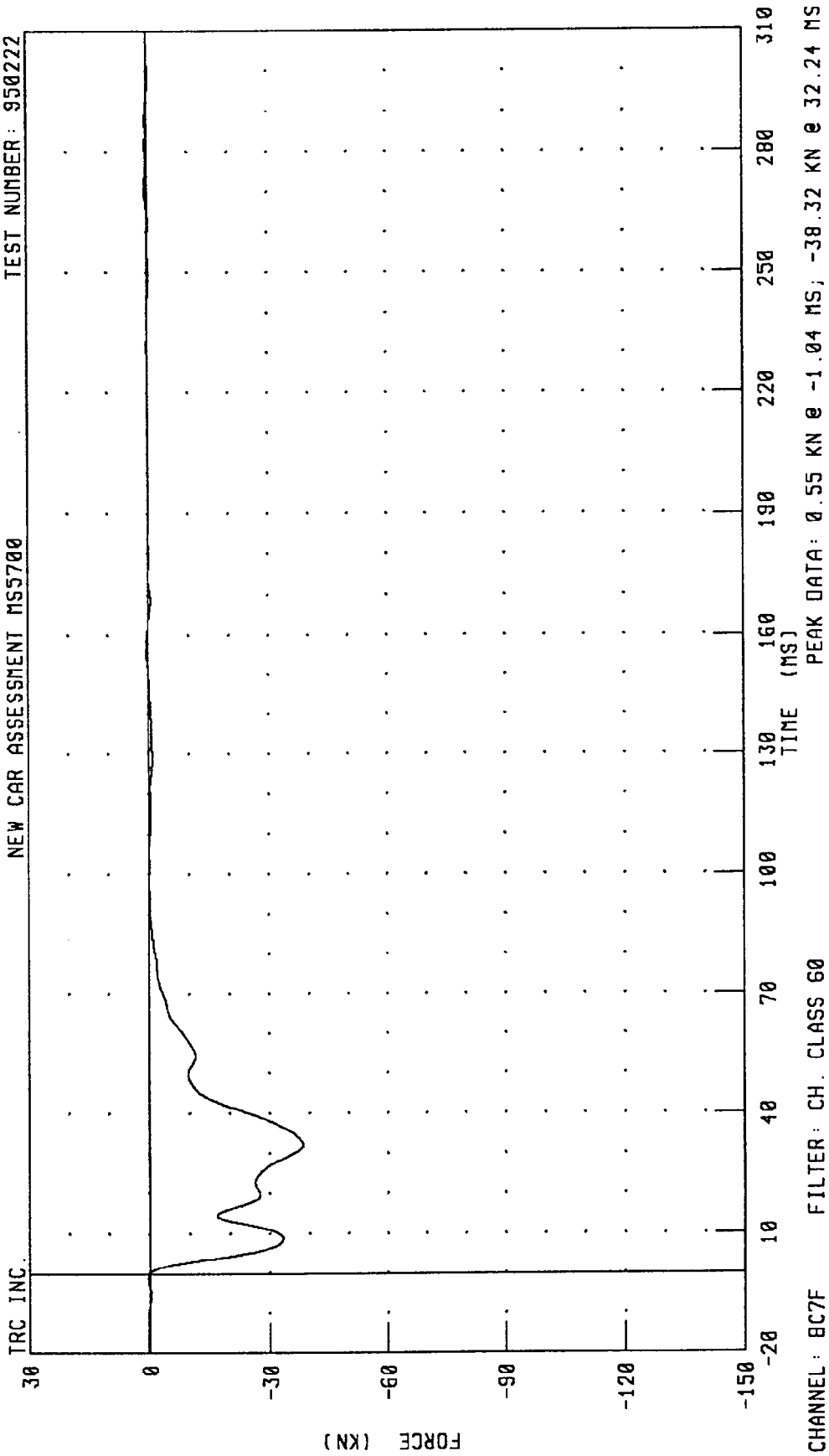
PEAK DATA: 0.39 KN @ 217.44 MS; -37.80 KN @ 35.28 NS

FILTER: CH. CLASS 60

CHANNEL: BCGF

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C7 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER : 950222



CHANNEL : BC7F

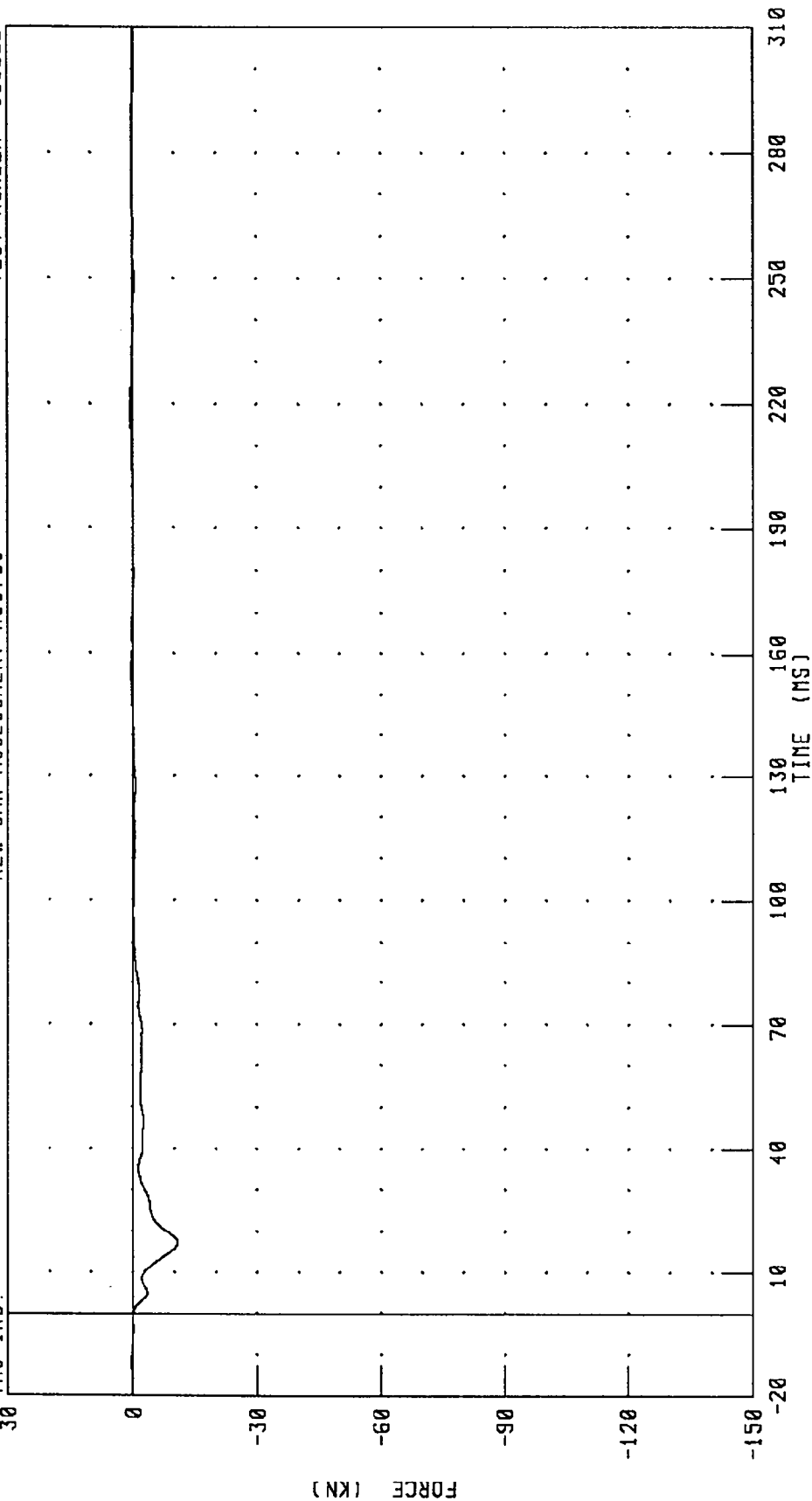
FILTER : CH. CLASS 60

PEAK DATA: 0.55 KN @ -1.04 MS; -38.32 KN @ 32.24 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C8 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

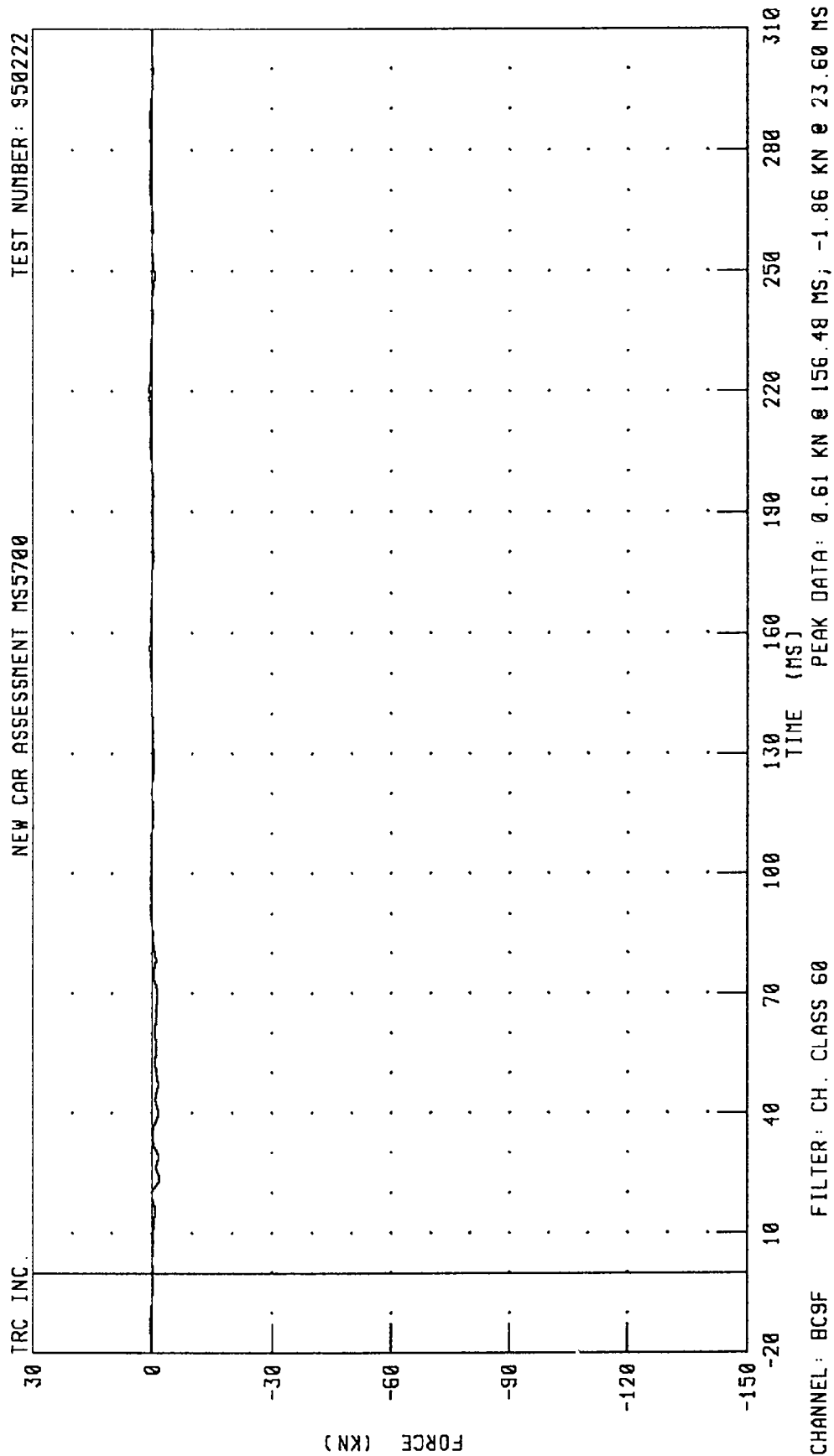
TRC INC.



PEAK DATA: 0.52 KN @ 217.52 MS; -10.78 KN @ 17.44 MS

CHANNEL: BC8F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE

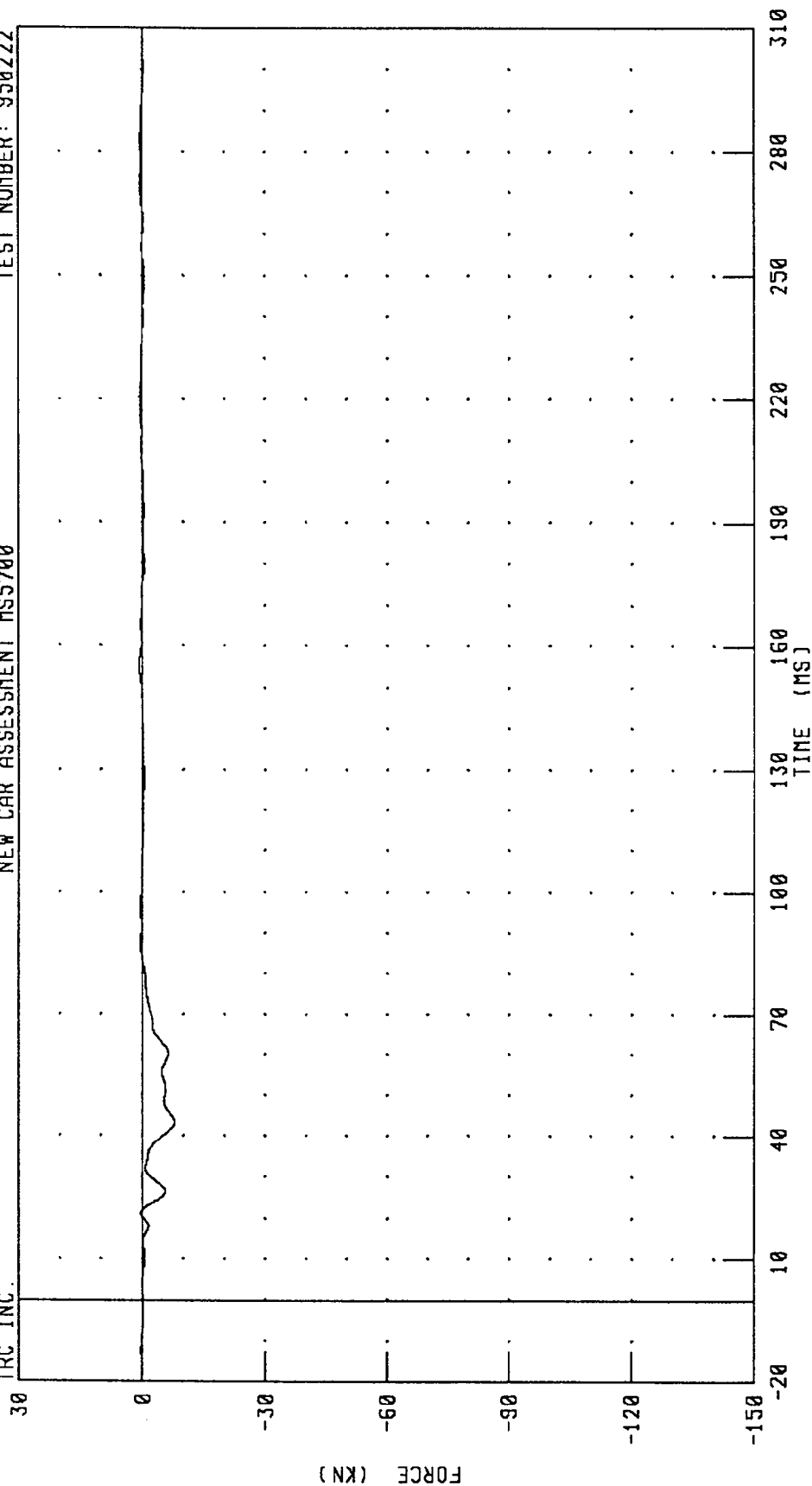


1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.69 KN @ 154.80 MS; -7.86 KN @ 43.28 MS

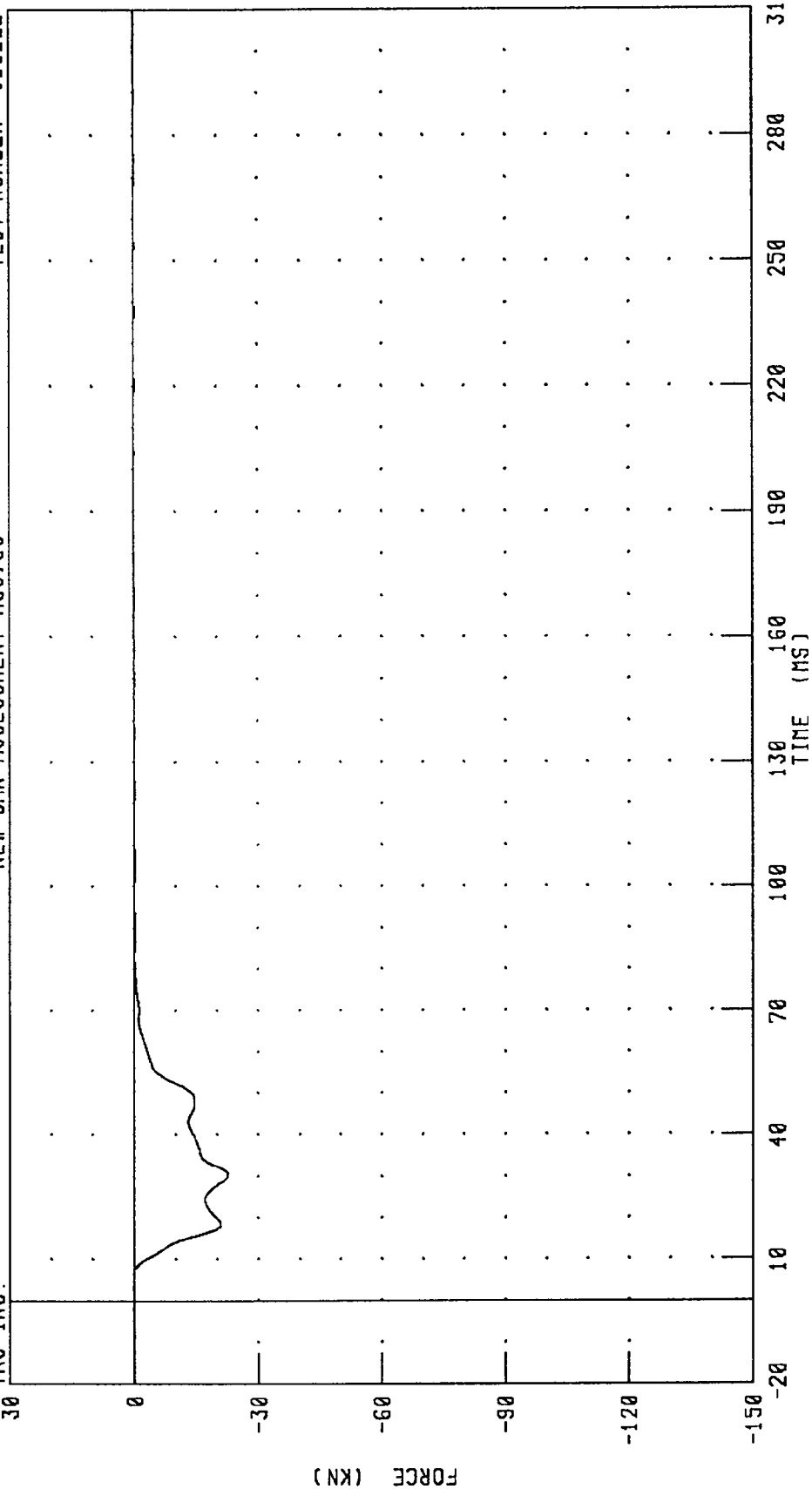
CHANNEL: BD1F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



CHANNEL: B02F

FILTER: CH. CLASS 60

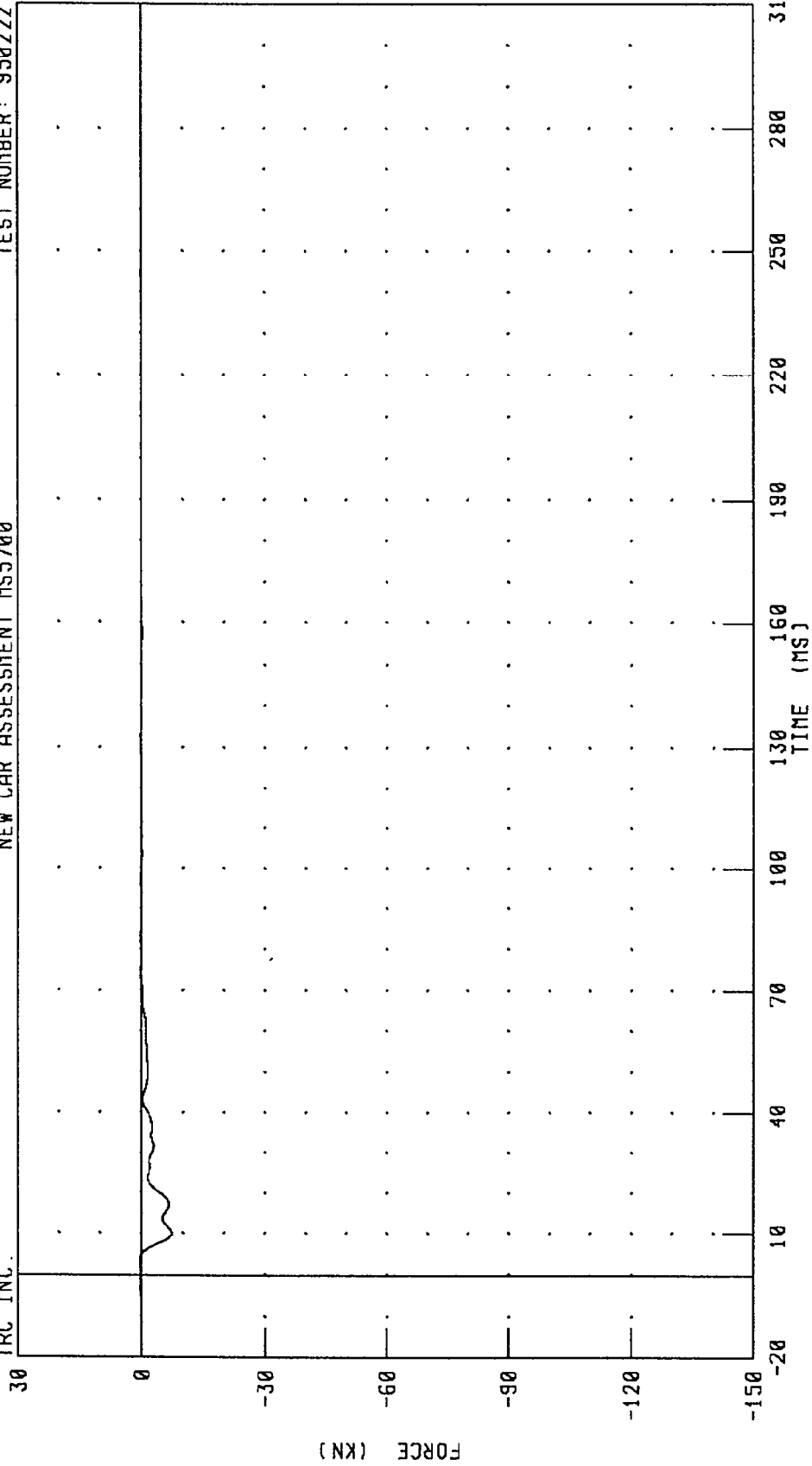
PEAK DATA: 0.16 KN @ 5.44 MS; -22.73 KN @ 30.48 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.40 KN @ 3.04 MS; -7.35 KN @ 9.92 MS

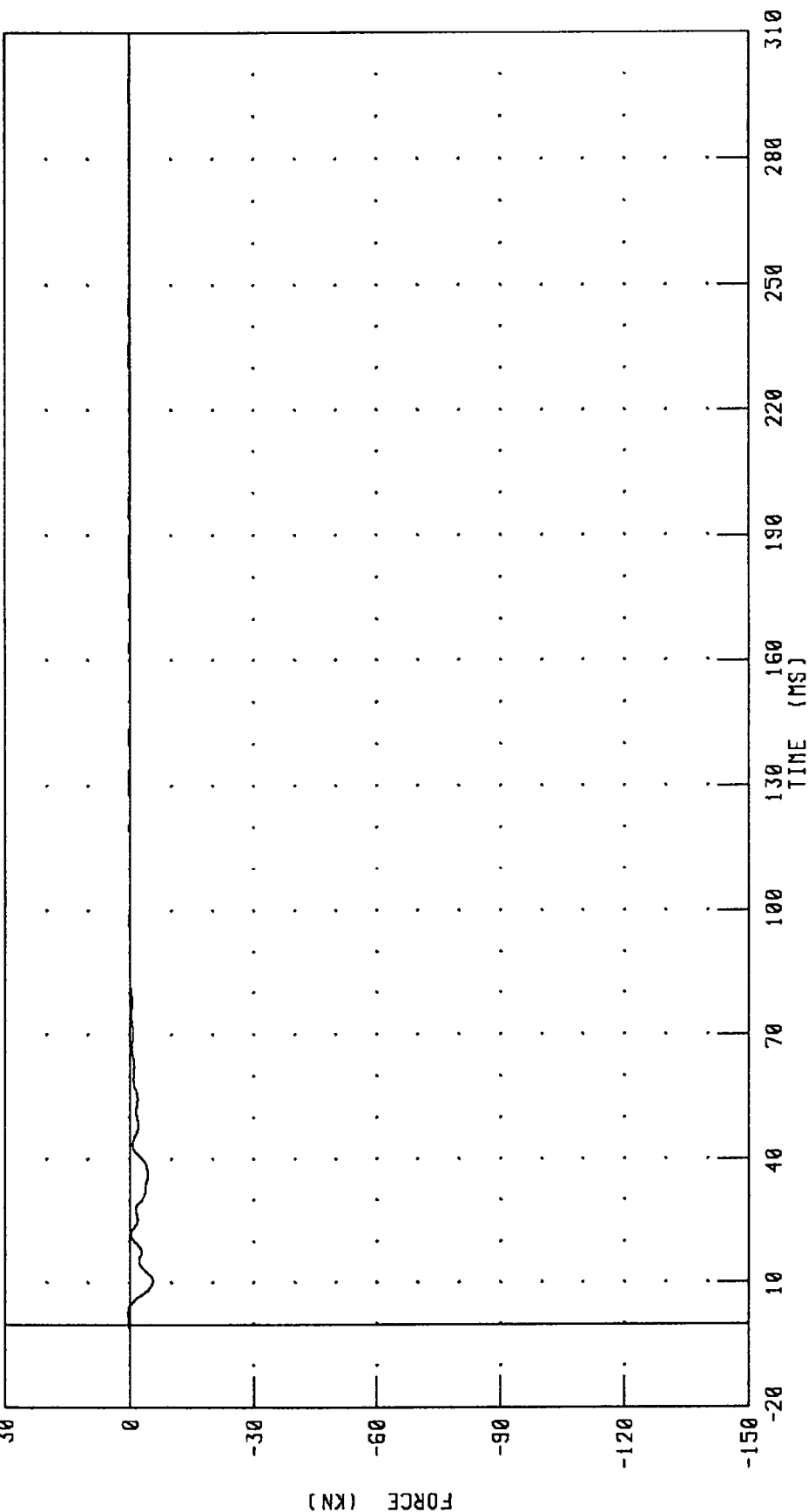
FILTER: CH. CLASS 60

CHANNEL: BD3F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D4 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



PEAK DATA: 0.36 KN @ 2.40 MS; -5.54 KN @ 10.40 MS

FILTER: CH. CLASS 60

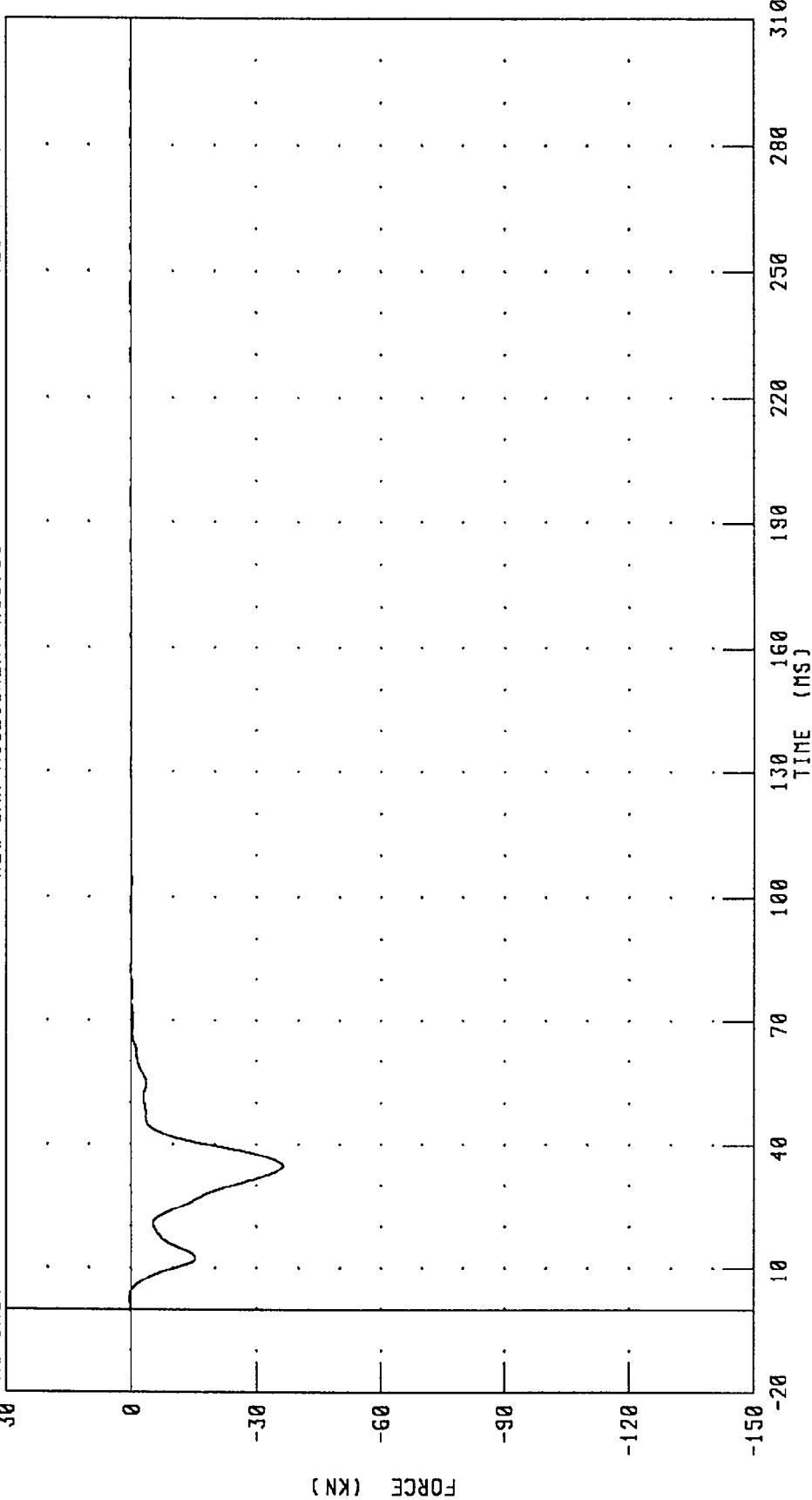
CHANNEL: B04F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.39 KN @ 2.24 MS; -36.26 KN @ 34.96 MS

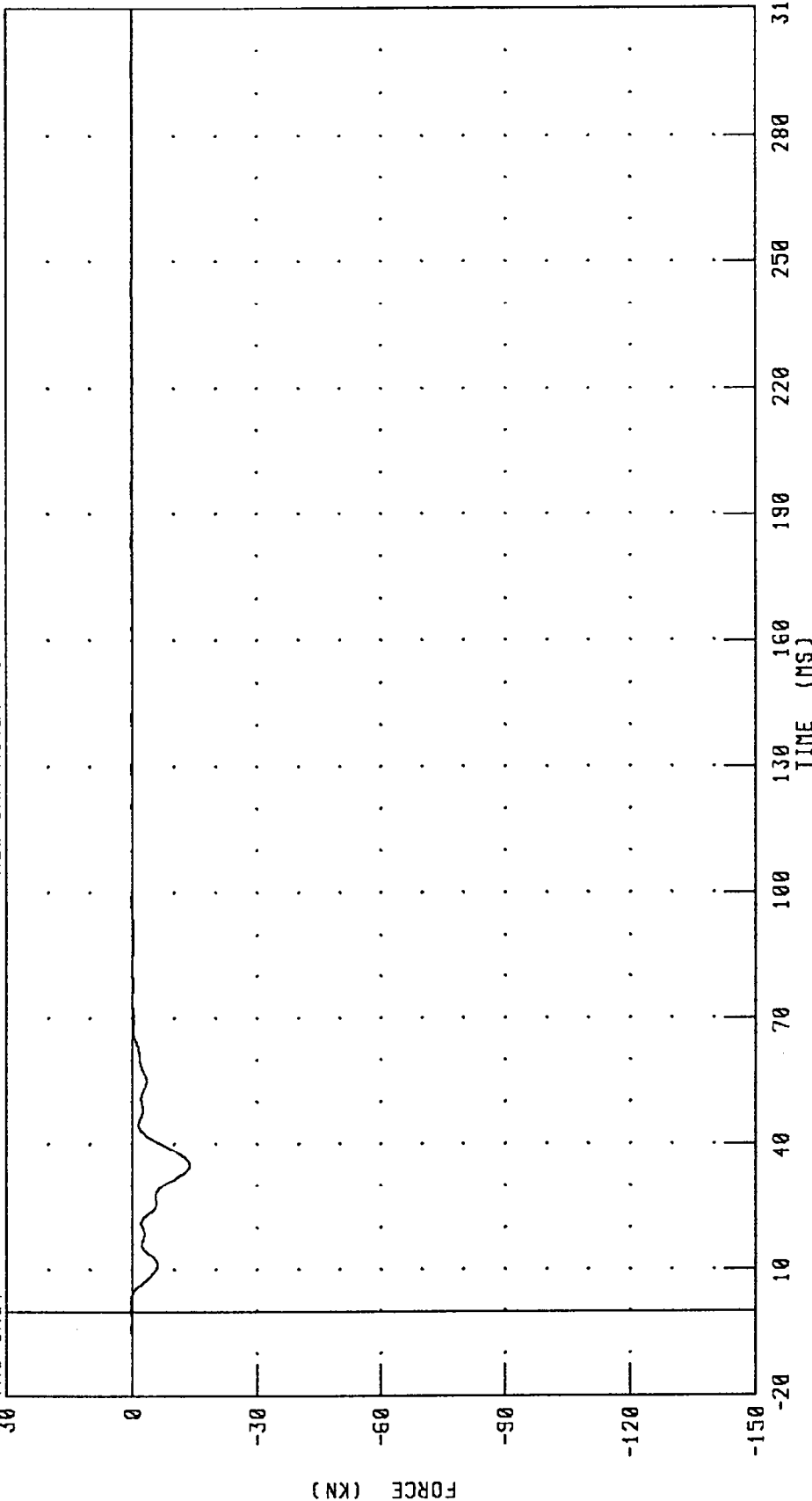
FILTER: CH. CLASS 60

CHANNEL: B05F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D6 FORCE
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



CHANNEL: BD6F

FILTER: CH. CLASS 60

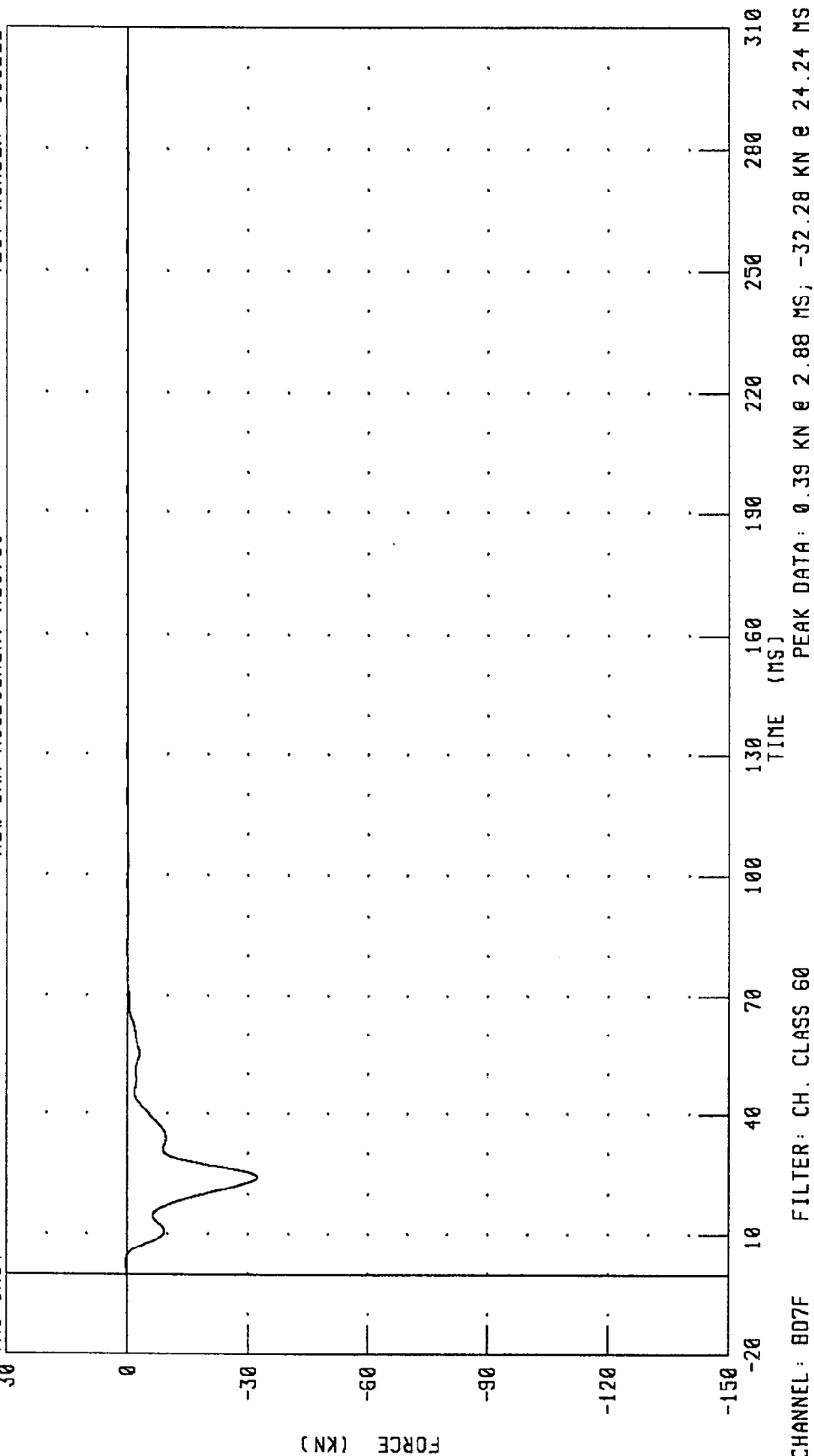
PEAK DATA: 0.32 KN @ 1.92 MS; -13.79 KN @ 35.20 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



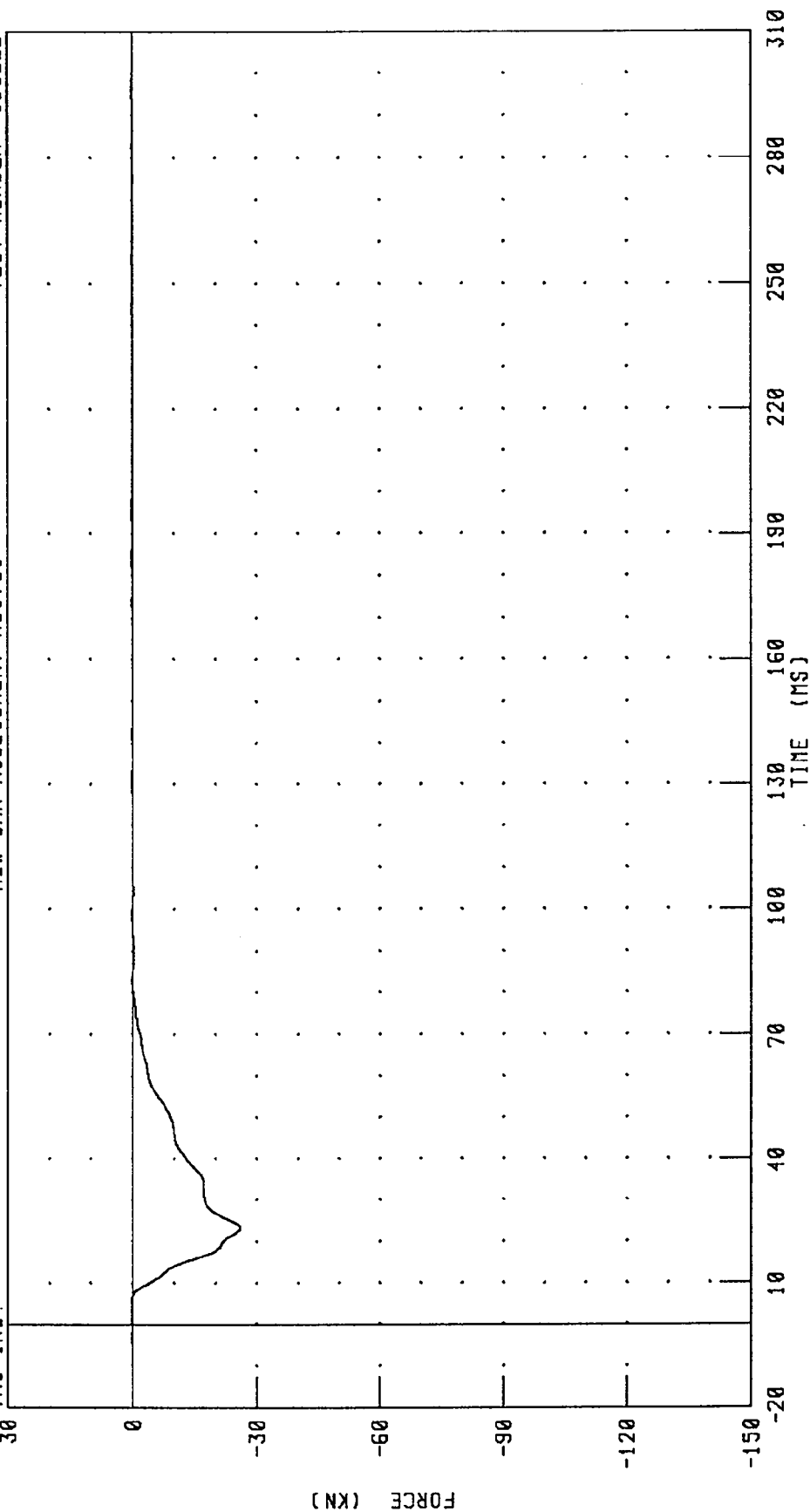
CHANNEL: BD7F FILTER: CH. CLASS 60 PEAK DATA: 0.39 KN @ 2.88 MS; -32.28 KN @ 24.24 MS

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.22 KN @ 5.20 MS; -25.99 KN @ 23.28 MS

FILTER: CH. CLASS 60

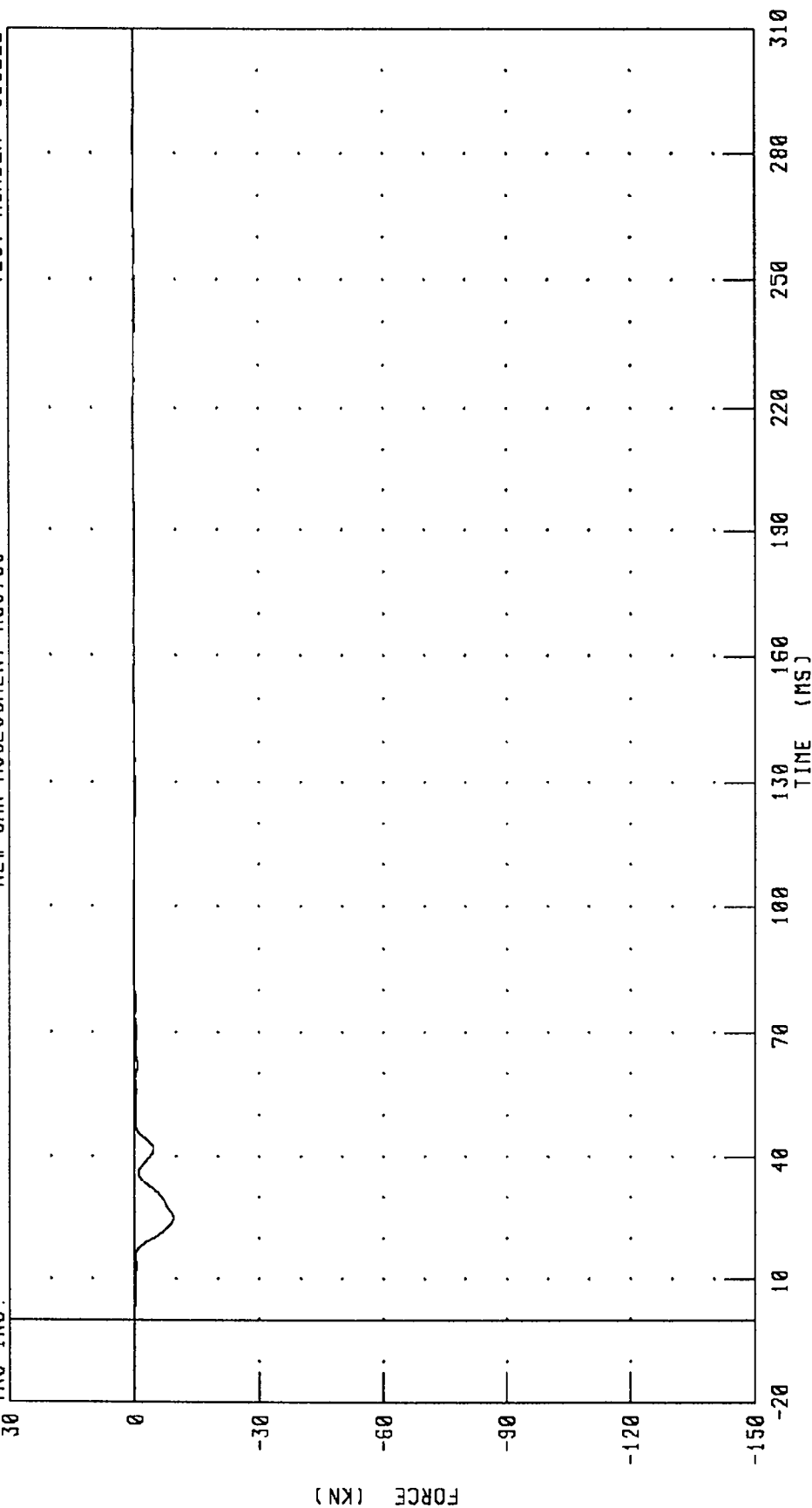
CHANNEL: B08F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.



PEAK DATA: 0.33 KN @ 83.68 MS; -9.35 KN @ 24.80 MS

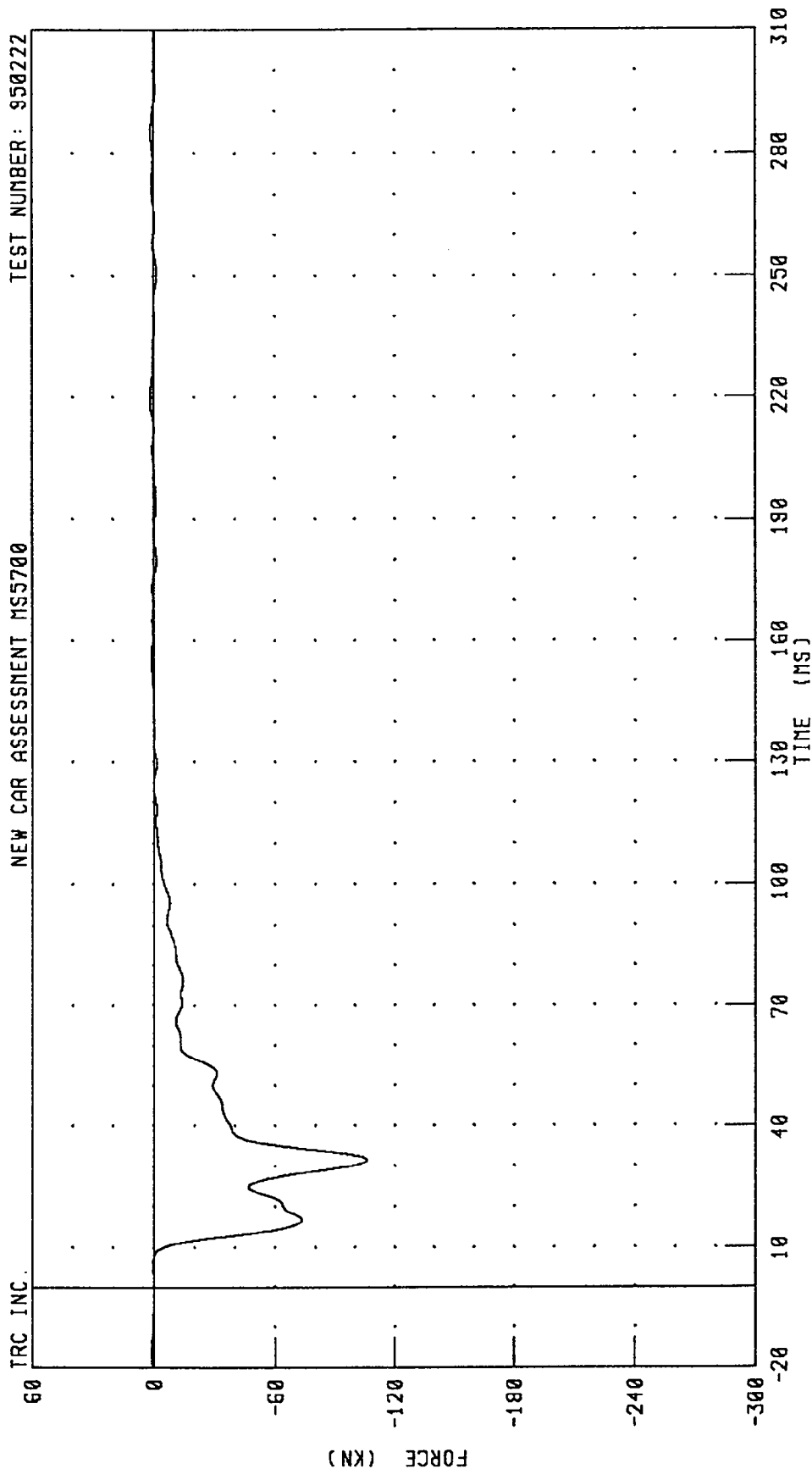
FILTER: CH. CLASS 60

CHANNEL: BD9F

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 1 FORCE TOTAL
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

TRC INC.



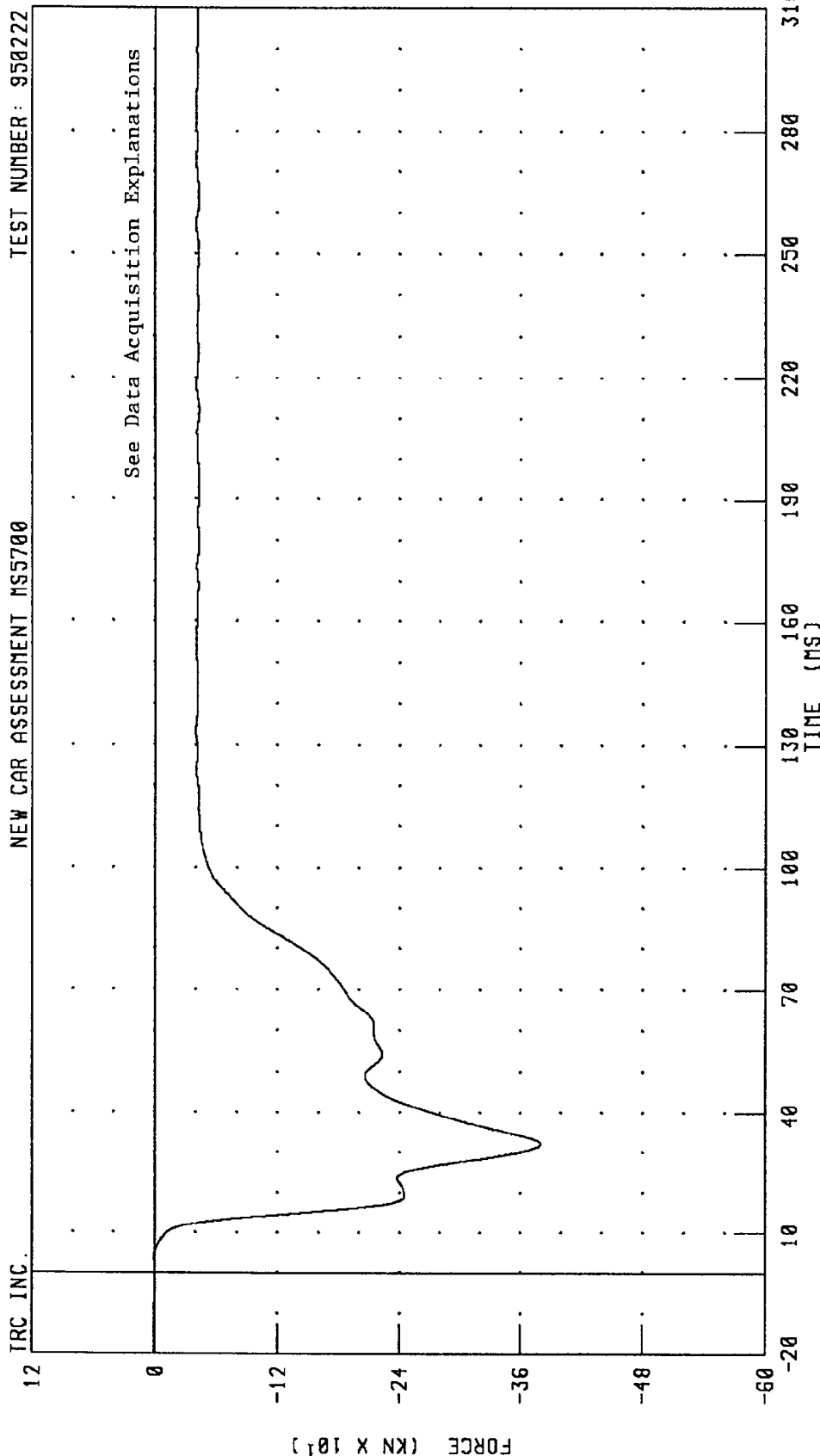
PEAK DATA: 1.69 KN @ 219.04 MS; -106.46 KN @ 31.52 MS

CHANNEL: LCBG1F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
 NEW CAR ASSESSMENT MS5700

TEST NUMBER: 950222

IRC INC.



PEAK DATA: 0.90 KN @ -11.60 MS; -380.51 KN @ 32.16 MS

CHANNEL: LCBG2F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

60

See Data Acquisition Explanations

FORCE (KN)

TIME (MS)

CHANNEL: LCBG3F FILTER: CH. CLASS 60

PEAK DATA: 0.82 KN @ 4.40 MS; -196.38 KN @ 18.72 MS

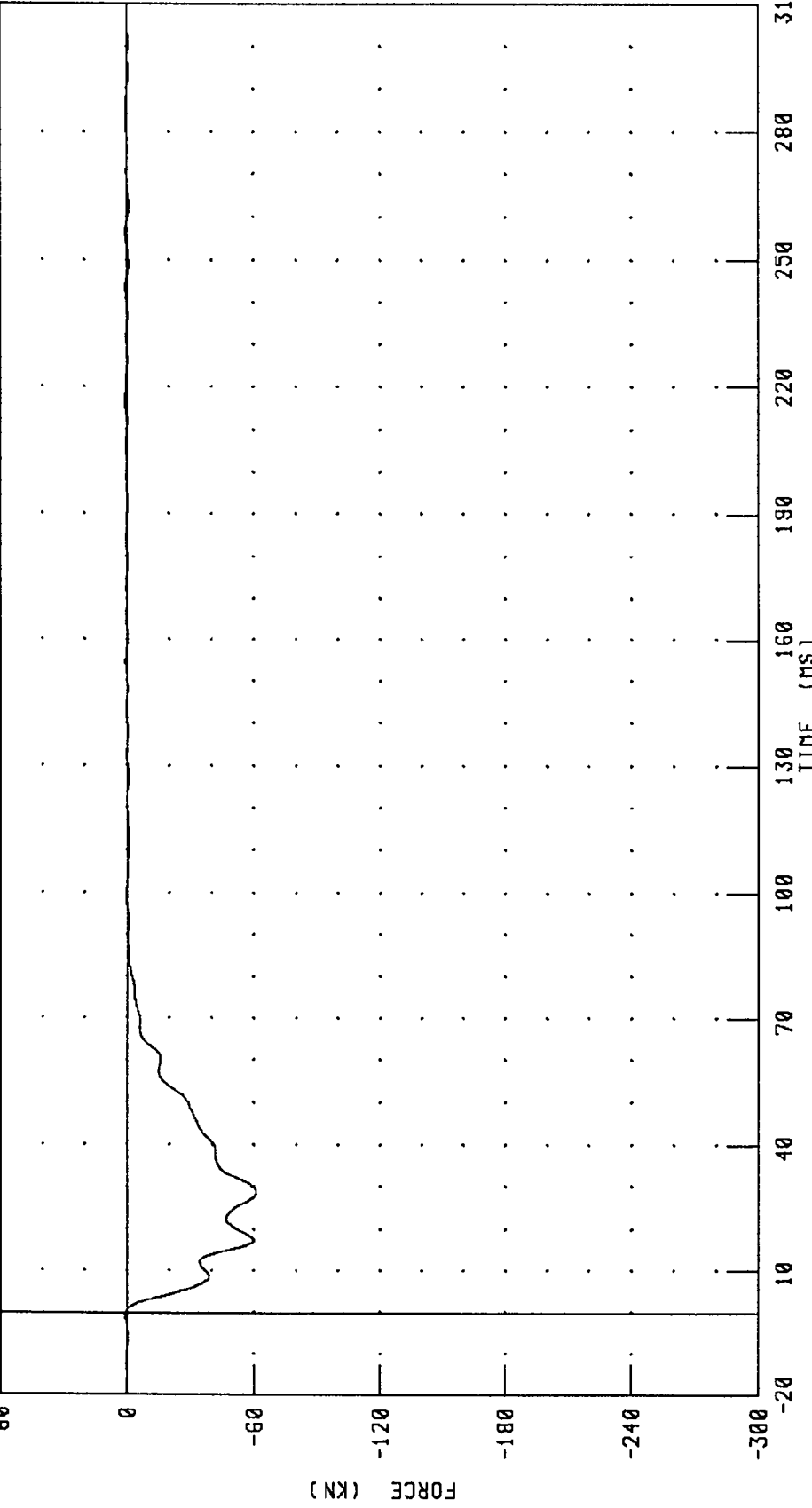
1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

IRC INC.

60



PEAK DATA: 0.92 KN @ 216.56 MS; -61.01 KN @ 28.72 MS

CHANNEL: LCBG4F FILTER: CH. CLASS 60

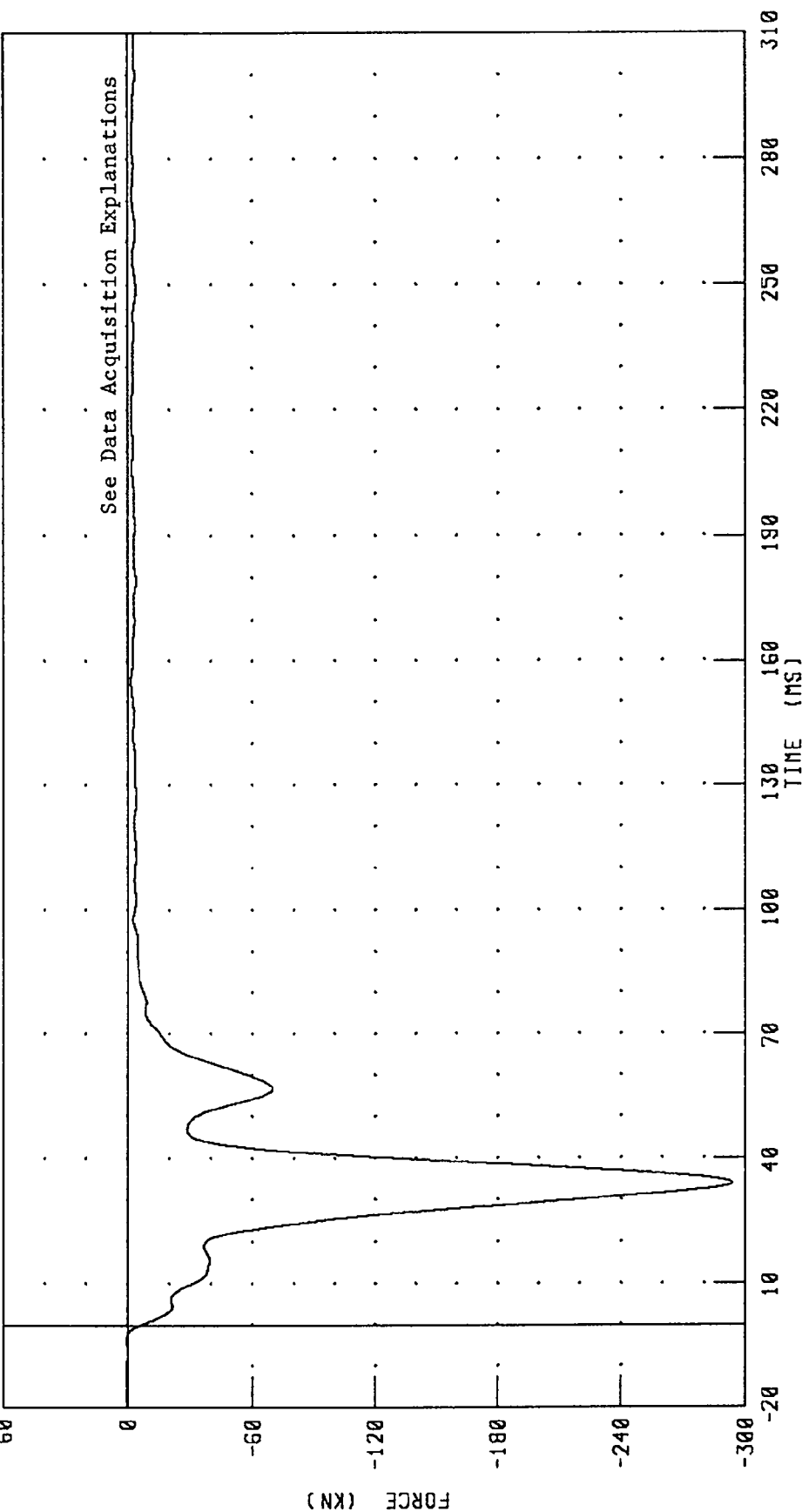
1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

See Data Acquisition Explanations



PEAK DATA: 0.55 KN @ -11.84 MS; -293.84 KN @ 34.08 MS

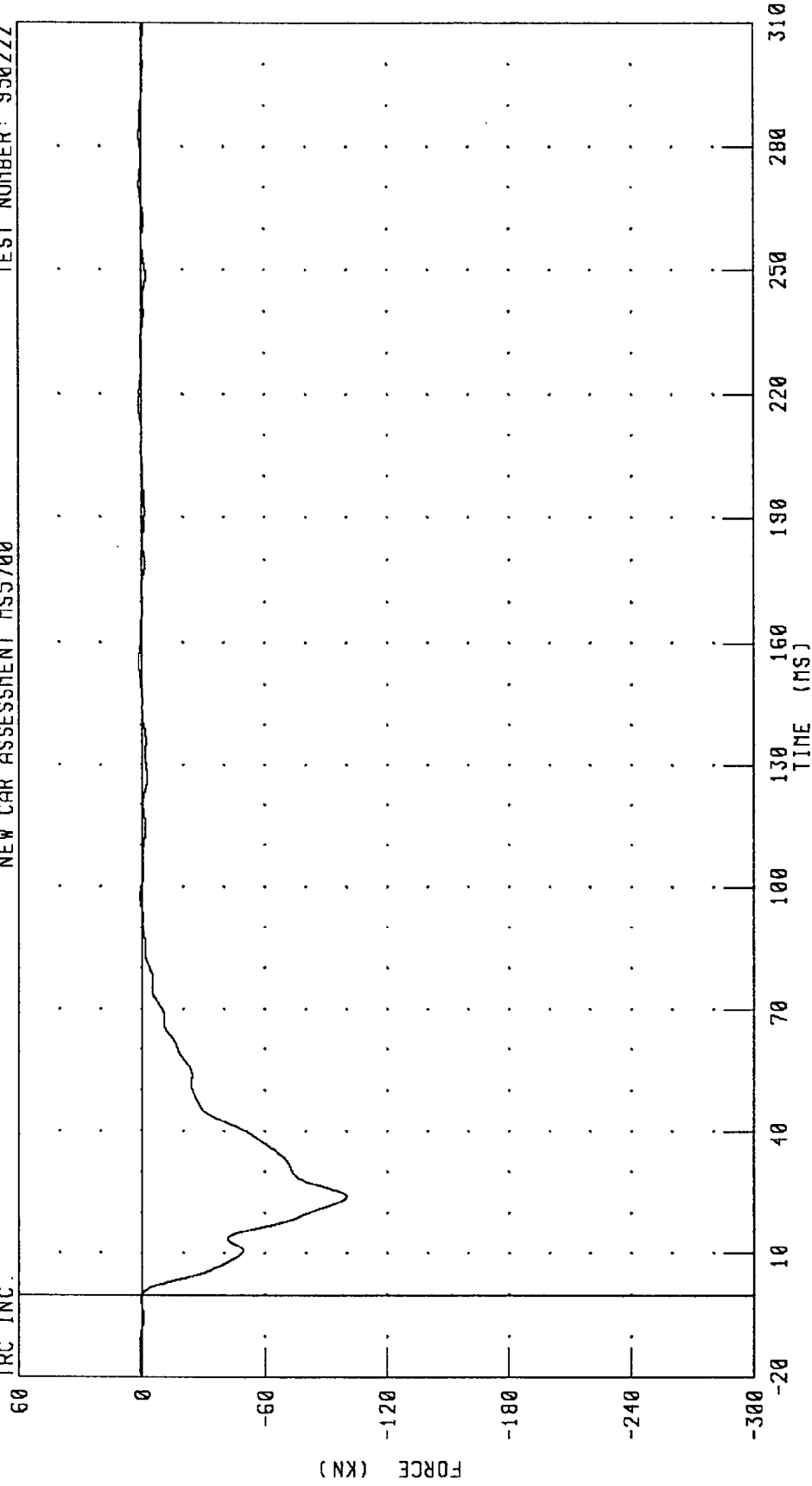
CHANNEL: LCBG5F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

TEST NUMBER: 950222

NEW CAR ASSESSMENT MS5700

TRC INC.

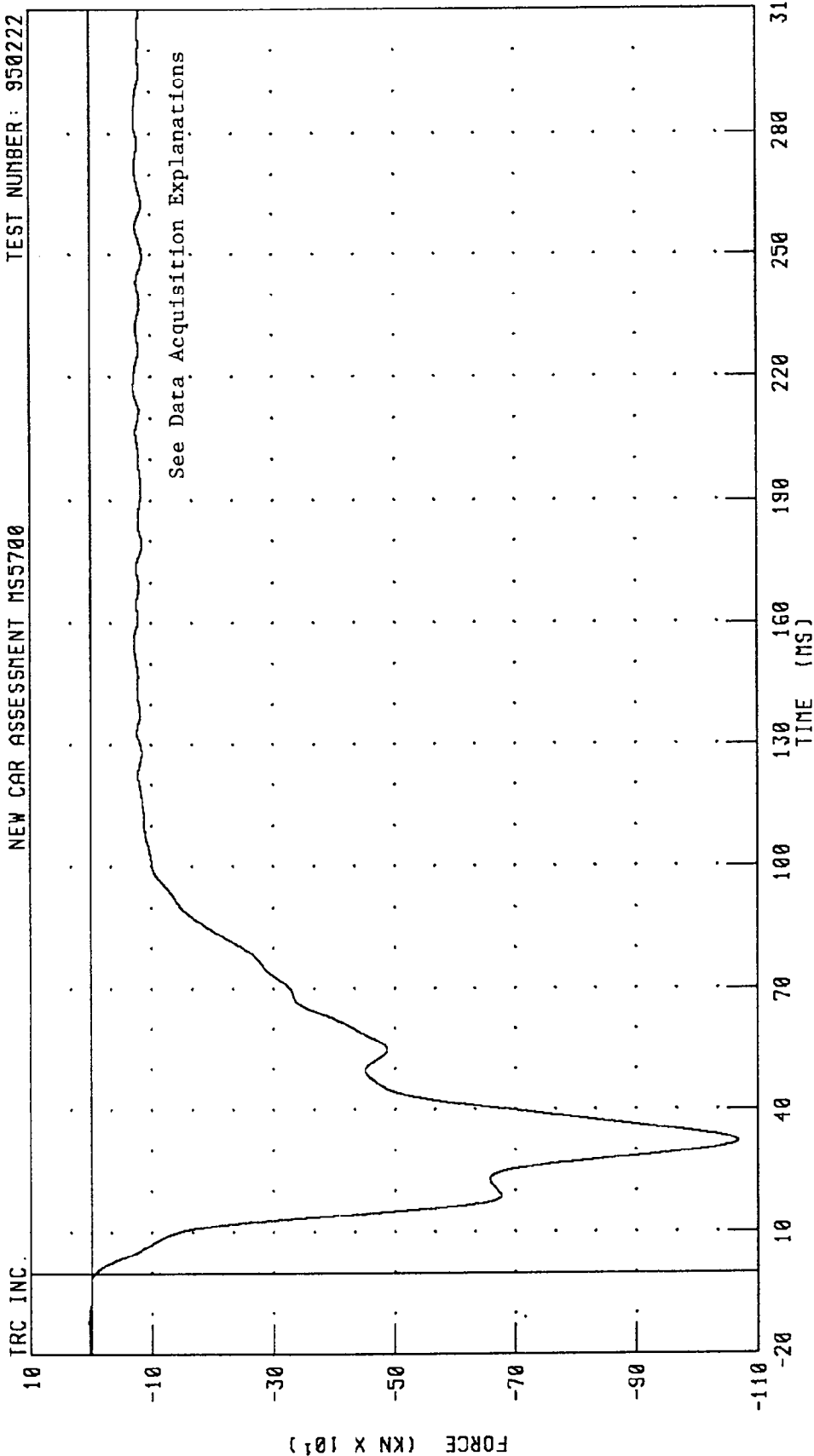


PEAK DATA: 1.52 KN @ 155.04 MS; -99.94 KN @ 24.00 MS

CHANNEL: LCBG6F FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT MS5700

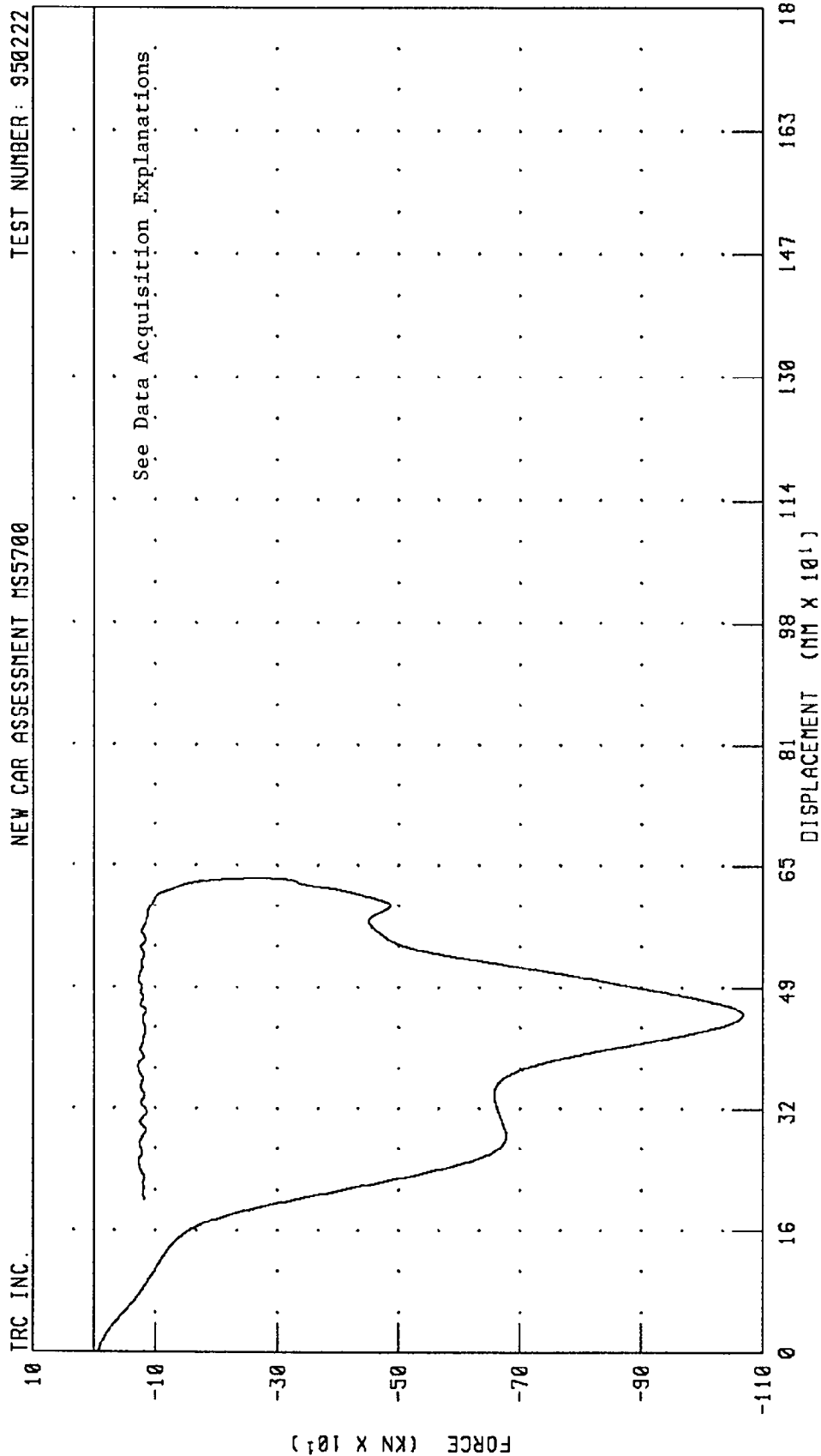
TEST NUMBER: 950222



PEAK DATA: 3.89 KN @ -12.08 MS; -1066.87 KN @ 32.40 MS

CHANNEL: LCBGT FILTER: CH. CLASS 60

1995 ISUZU TROOPER INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT MS5700 TEST NUMBER: 950222



CHANNEL: QTHXD FILTER: CH. CLASS 180
 LCBGT CH. CLASS 60
 PEAK DATA: 637.56 NM @ 77.44 MS;
 -6.56 KN @ 0.00 MS; -1066.87 KN @ 32.40 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

15-FEB-95

TRC INC.

TEST NO: 192C26ED1

572E SN192 EXT.DIMENSION CAL26

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

Cra. Middel

RUN NUMBER: 021595.1313

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

16-FEB-95

TRC INC.

TEST NO: 192C26HD1

572E SN192 HEAD DROP CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	30.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	239.88 G
PEAK LATERAL ACCELERATION	15 G MAX	-3.05 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Chan Middleton

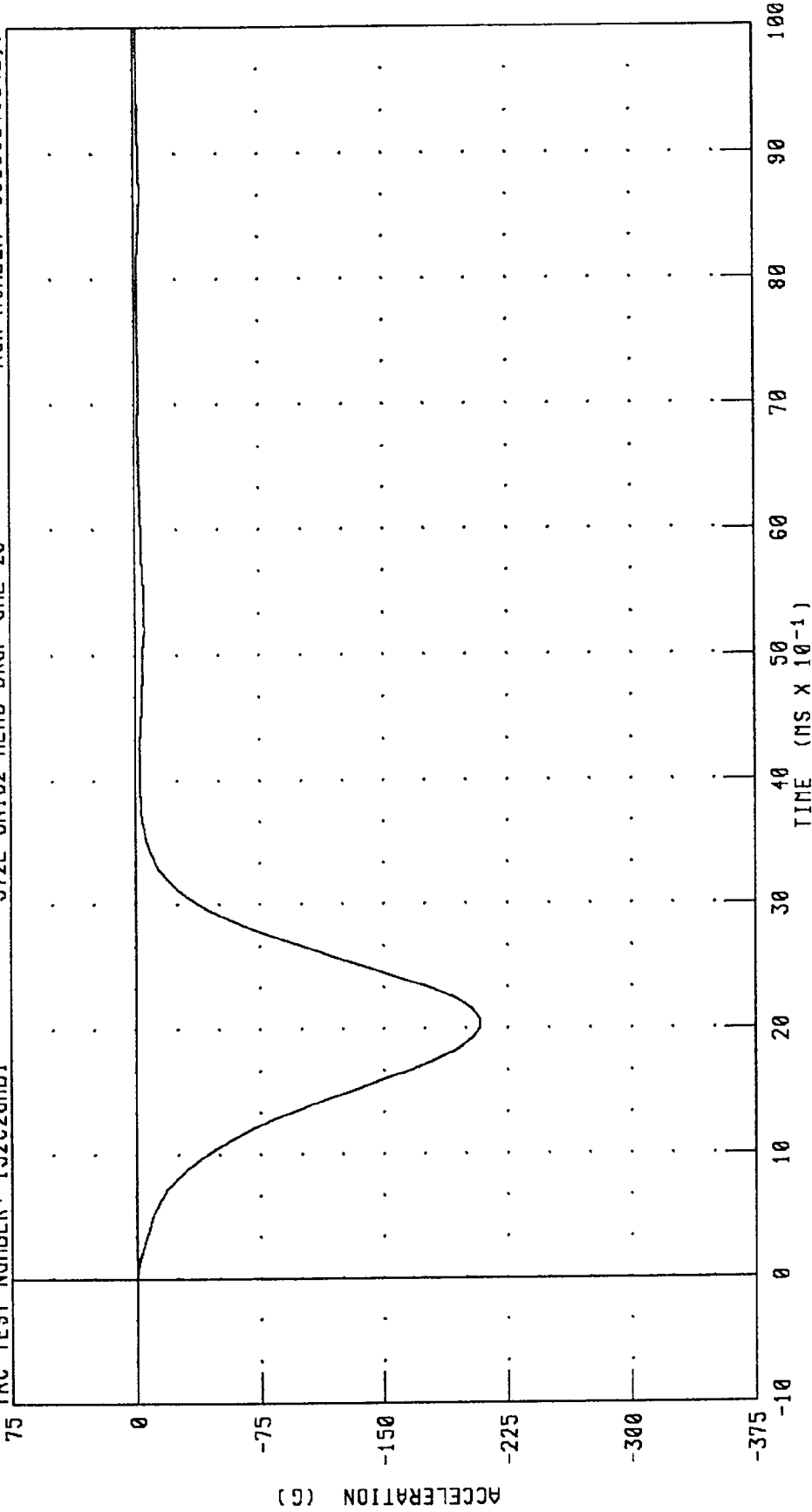
RUN NUMBER: 021695.1252;7

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

TRC TEST NUMBER: 192C26HD1

572E SN192 HEAD DROP CAL 26

RUN NUMBER: 030695.1042;7



PEAK DATA: -0.07 G @ -0.80 MS; -208.16 G @ 2.00 MS

CHANNEL: HEDXC FILTER: CH. CLASS 1000

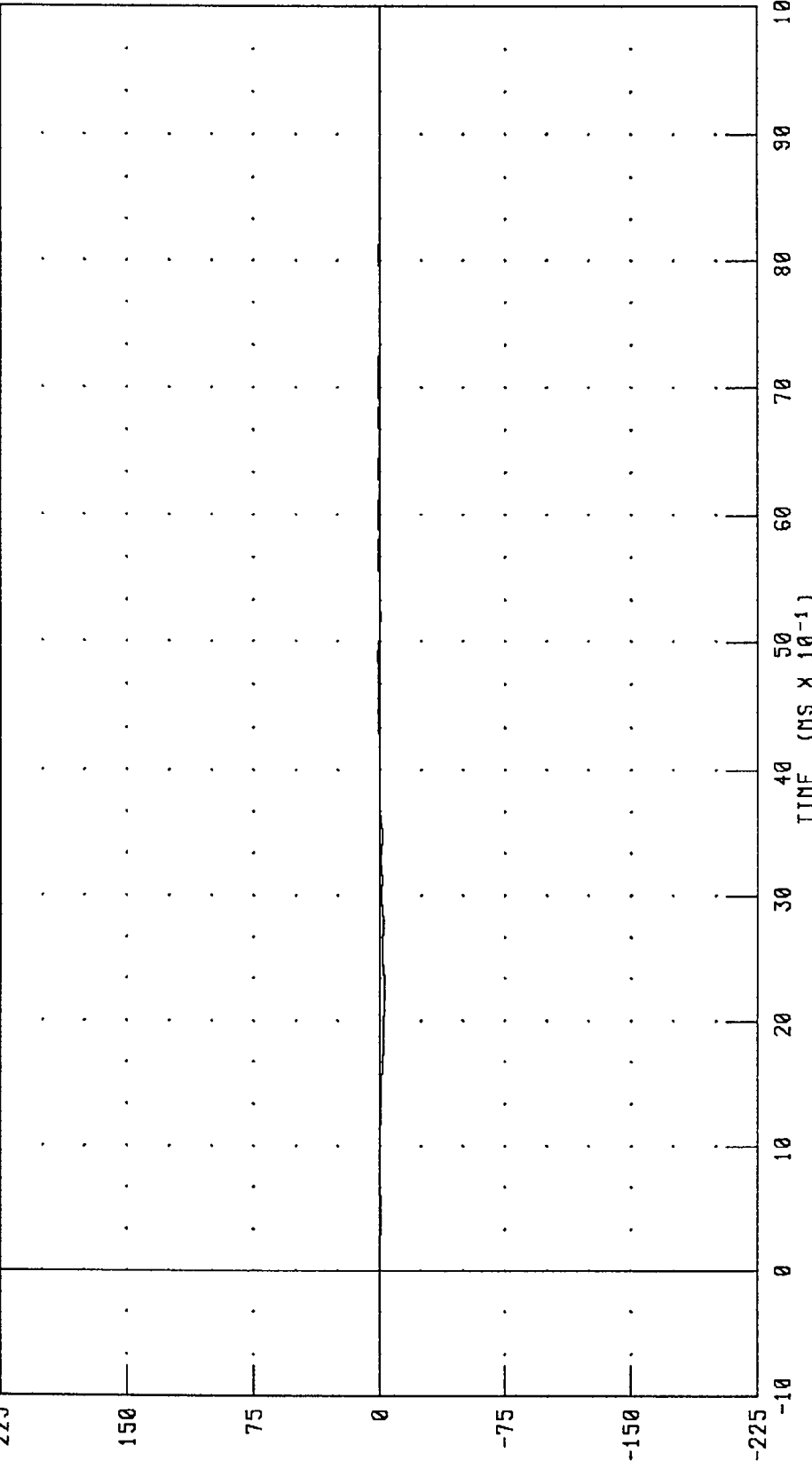
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 192C26HD1

572E SN192 HEAD DRDP CAL 26

RUN NUMBER: 030695.1042;7

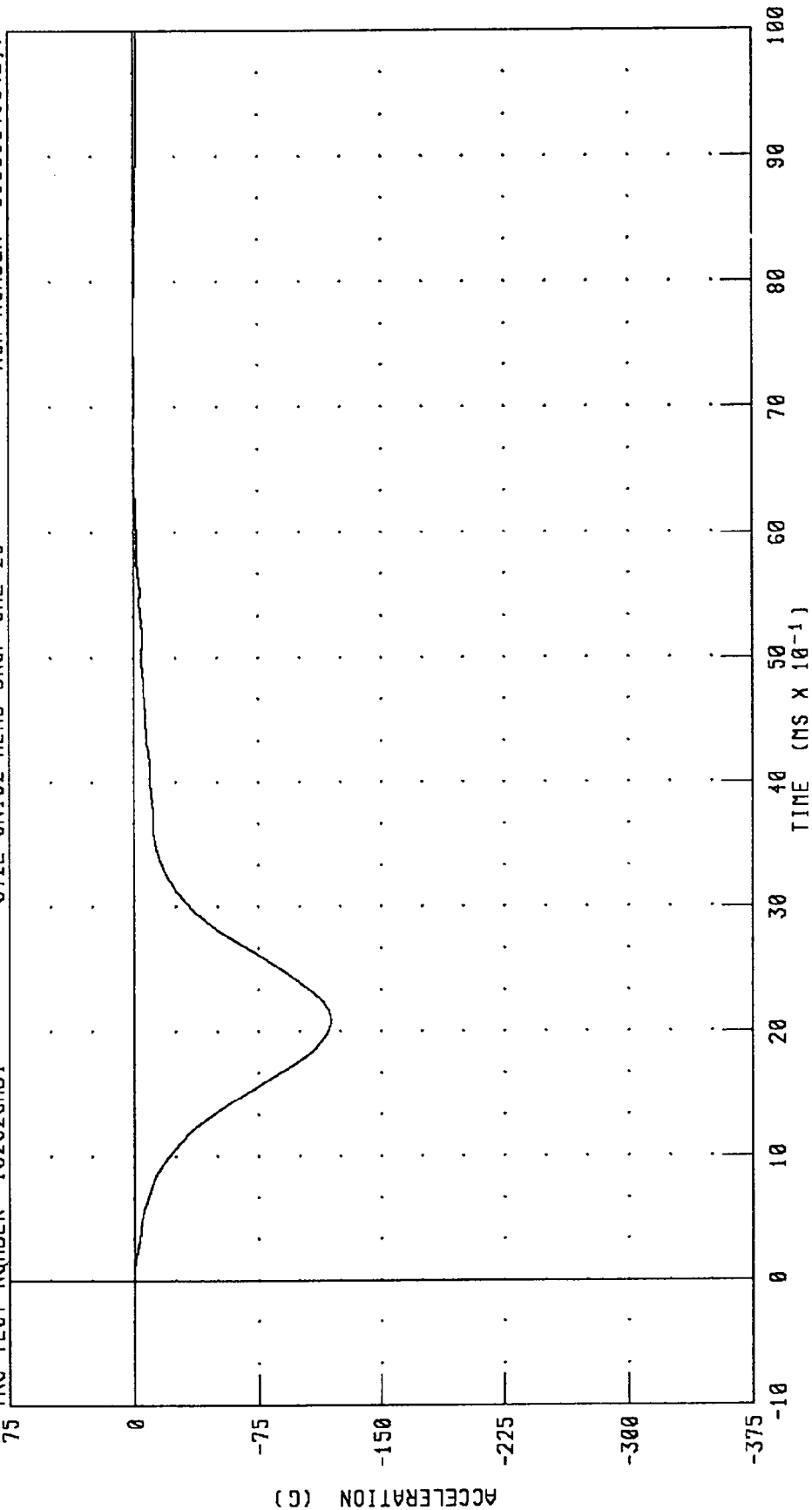


PEAK DATA: 1.01 G @ 4.88 MS; -3.06 G @ 2.16 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 192C26HD1 572E SN192 HEAD DROP CAL 26 RUN NUMBER: 030695.1042;7



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: -0.05 G @ -0.48 MS; -119.25 G @ 2.08 MS

PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SN192 HEAD DROP CAL 26

TRC TEST NUMBER: 192C26HD1

375

300

225

150

75

0

-75

-10

0

10

20

30

40

50

60

70

80

90

100

TIME (MS X 10⁻¹)

PEAK DATA: 239.88 G @ 2.08 MS; 0.11 G @ -0.80 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

RUN NUMBER: 030695.1042;7

ACCELERATION (G)

8-3

950222

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

15-FEB-95

TRC INC. TEST NO: 192C26NF1 572E SN192 NECK FLEXION CAL26

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	30.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.50 G
	20 MS	17.60 - 22.60 G	20.67 G
	30 MS	12.50 - 18.50 G	16.94 G
MAX PENDULUM G		29 G MAX	23.38 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.91 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	38.96 MS
D PLANE	MAX	64 - 78 DEG.	65.49 DEG.
ROTATION	TIME	57 - 64 MS	58.80 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	91.51 NM
	TIME	47 - 58 MS	51.36 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.00 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.04 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

RUN NUMBER: 021695.0855;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION PENDULUM DECELERATION

TRC TEST NUMBER: 192C26NF1

572E SN192 NECK FLEXION CAL26

RUN NUMBER: 030695.1042;1

400

320

ACCELERATION (G X 10⁻¹)

240

160

80

0

-80

-20

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

0

20

40

60

80

100

120

140

160

180

200

CHANNEL: PENXG

FILTER: CH. CLASS 60

PEAK DATA: 23.38 G @ 8.40 MS; -3.57 G @ 45.04 MS

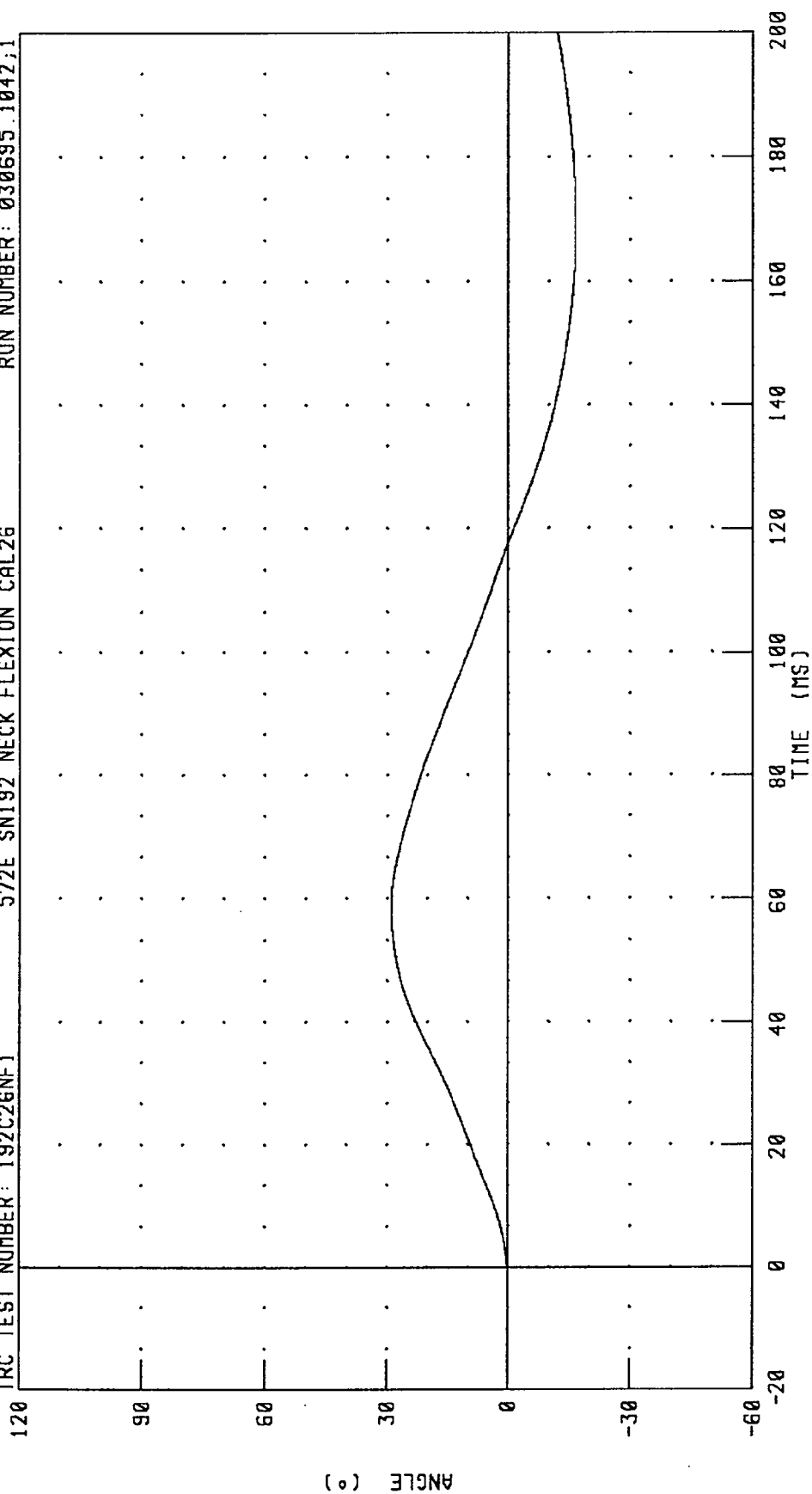
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN192 NECK FLEXION CAL26

TRC TEST NUMBER: 192C26NF1

RUN NUMBER: 030695.1042;1

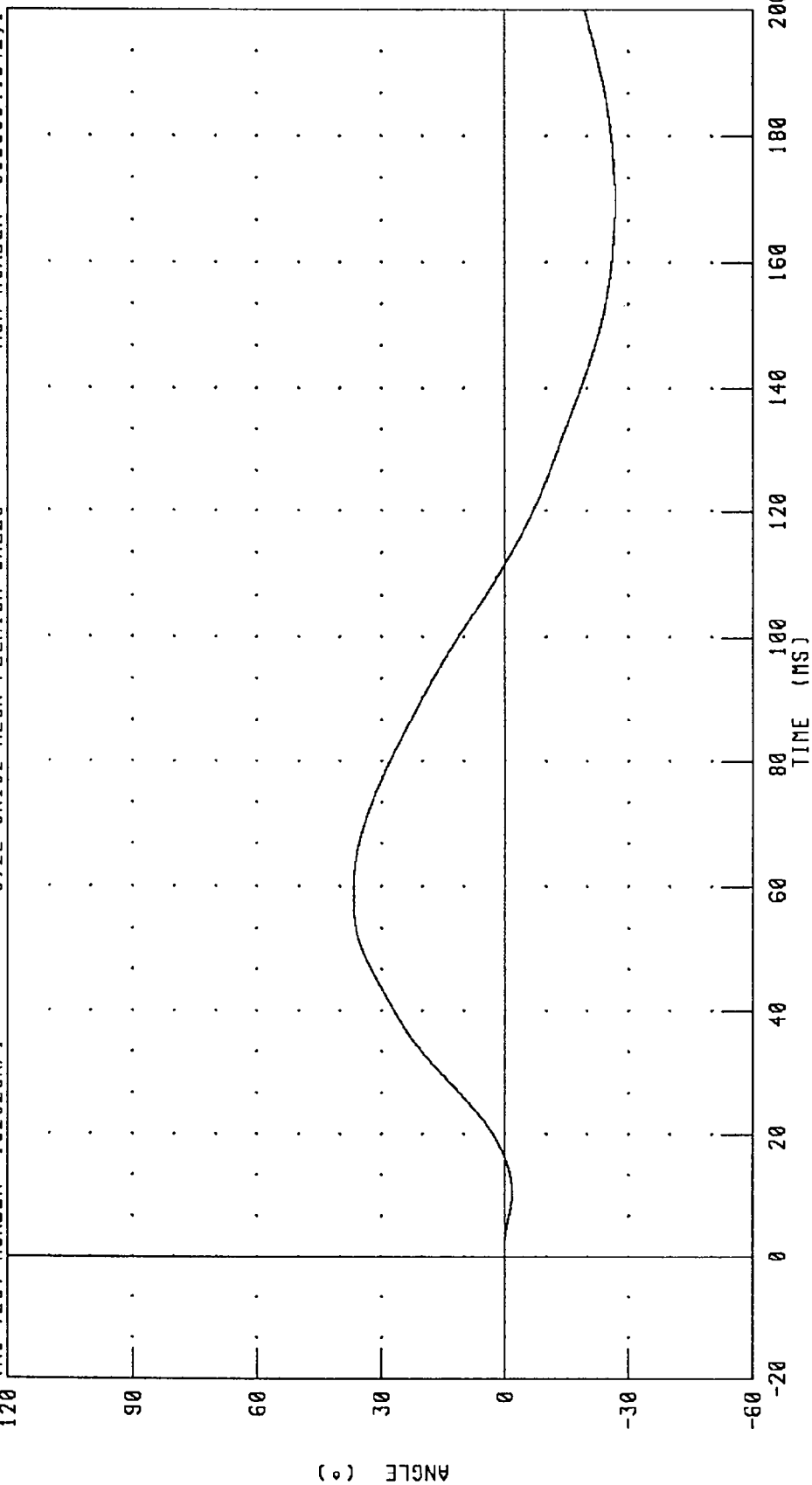


PEAK DATA: 28.83 ° @ 58.80 MS; -16.50 ° @ 168.48 MS

CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C26NF1 572E SN192 NECK FLEXION CAL26 RUN NUMBER: 030695.1042;1



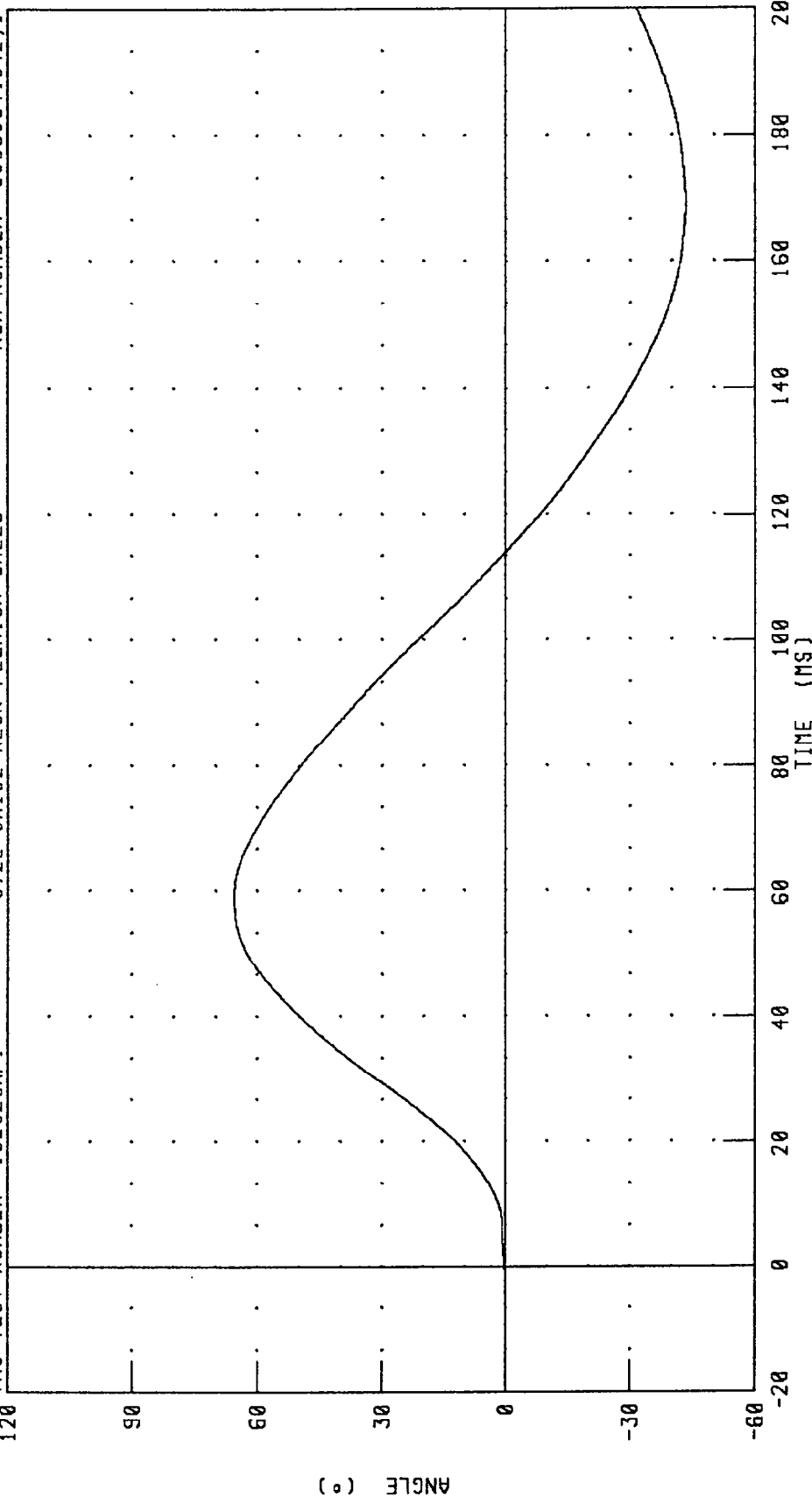
CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 36.67 ° @ 58.72 MS; -26.86 ° @ 169.68 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C26NF1 572E SN192 NECK FLEXION CAL26 RUN NUMBER: 030695.1042.1



PEAK DATA: 65.50 ° @ 58.80 MS; -43.35 ° @ 169.12 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C26NF1

572E SN192 NECK FLEXION CAL26

RUN NUMBER: 030695.1042;1

160

120

80

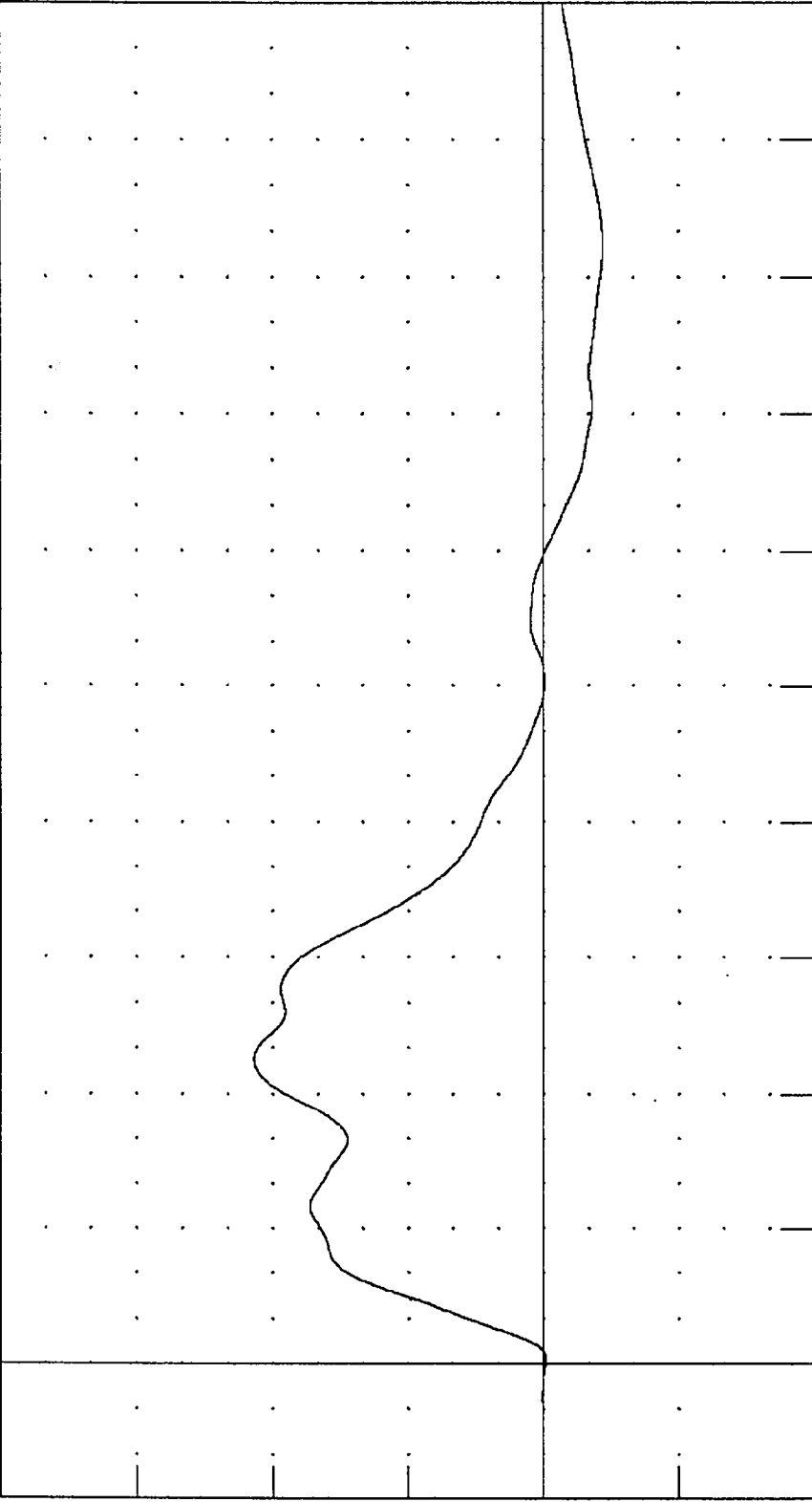
40

0

-40

-80

FORCE (N X 10¹)



TIME (MS)

PEAK DATA: 855.85 N @ 45.04 MS; -175.71 N @ 164.80 MS

FILTER: CH. CLASS 60

CHANNEL: NEKXF

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

IRC TEST NUMBER: 192C26NF1

572E SN192 NECK FLEXION CAL26

RUN NUMBER: 030695.1042;1

160

120

80

40

0

-40

-80

TORQUE (N·M)

TIME (MS)

200

180

160

140

120

100

80

60

40

20

0

-20

PEAK DATA: 77.91 N·M @ 51.44 MS; -28.66 N·M @ 13.68 MS

FILTER: CH. CLASS 60

CHANNEL: NEKYM

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

TRC TEST NUMBER: 192C26NF1

572E SN192 NECK FLEXION CAL26

RUN NUMBER: 030695.1042;1

160

120

80

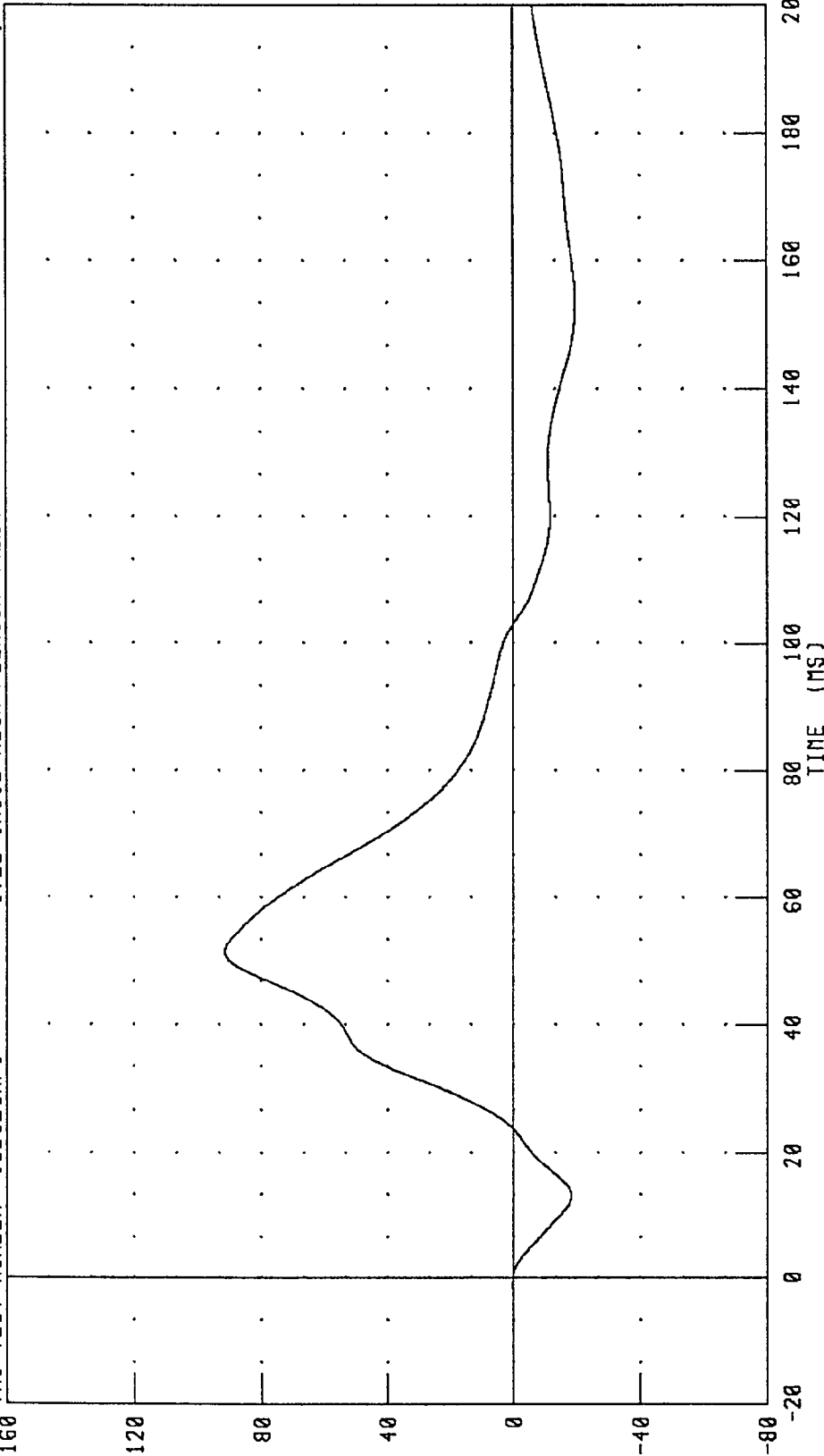
40

0

-40

-80

TORQUE (N·M)



PEAK DATA: 91.51 N·M @ 51.36 MS; -19.70 N·M @ 153.36 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.
NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

15-FEB-95

TRC INC. TEST NO: 192C26NE1 572E SN192 NECK EXT. CAL26

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	30.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.17 G
	20 MS	14.00 - 19.00 G	16.23 G
	30 MS	11.00 - 16.00 G	13.13 G
MAX PENDULUM G		22 G MAX	18.71 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.17 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	41.84 MS
D PLANE	MAX	81 - 106 DEG.	93.44 DEG.
ROTATION	TIME	72 - 82 MS	79.92 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-58.26 NM
	TIME	65 - 79 MS	72.08 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	157.76 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	140.64 MS

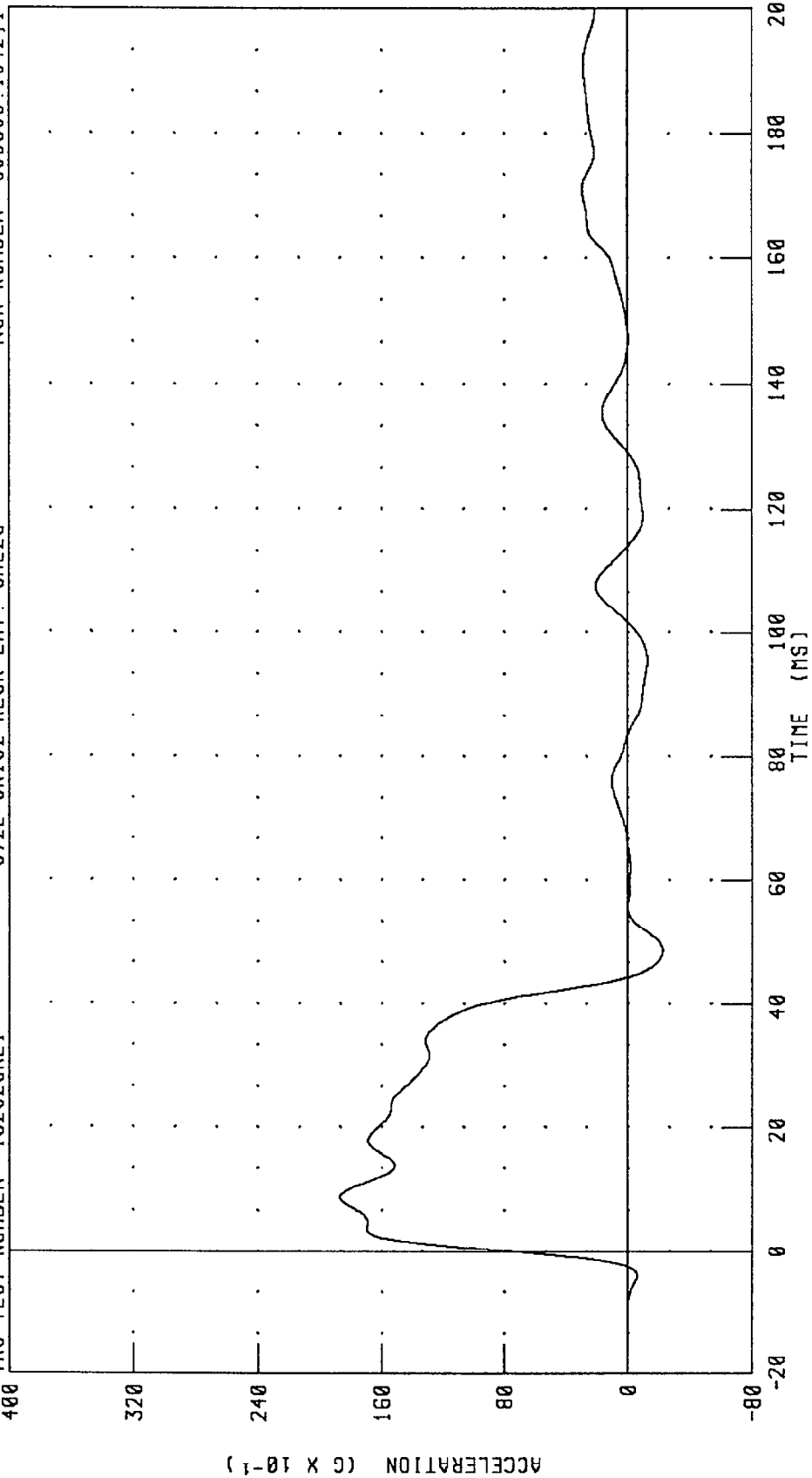
TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

RUN NUMBER: 021695.0904;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 192C26NE1 572E SN192 NECK EXT. CAL26 RUN NUMBER: 030695.1042;1



CHANNEL: PENXG FILTER: CH. CLASS 60

PEAK DATA: 18.71 G @ 8.80 MS; -2.25 G @ 48.56 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN192 NECK EXT. CAL26

IRC TEST NUMBER: 192C26NE1

120

90

60

30

0

-30

-60

ANGLE (°)

0

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

TIME (MS)

PEAK DATA: 36.50 ° @ 73.76 MS; -11.40 ° @ 198.00 MS

CHANNEL: BETA

FILTER: CH. CLASS 60

RUN NUMBER: 030695.1042;1

950222

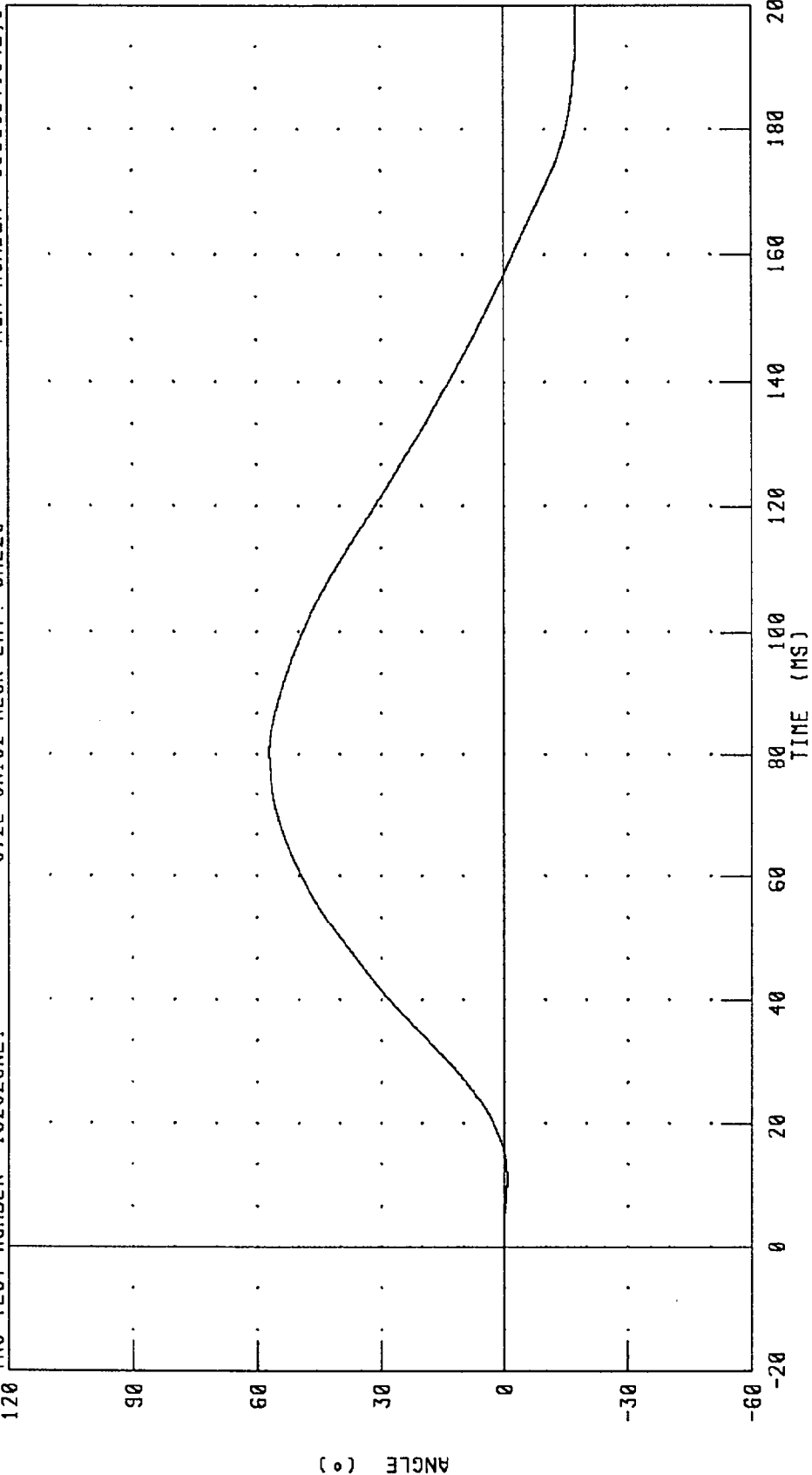
C-19

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

TRC TEST NUMBER: 192C26NE1

572E SN192 NECK EXT. CAL26

RUN NUMBER: 030695.1042.1



PEAK DATA: 57.11 ° @ 80.40 MS; -17.52 ° @ 198.80 MS

CHANNEL: THETA FILTER: CH. CLASS 60

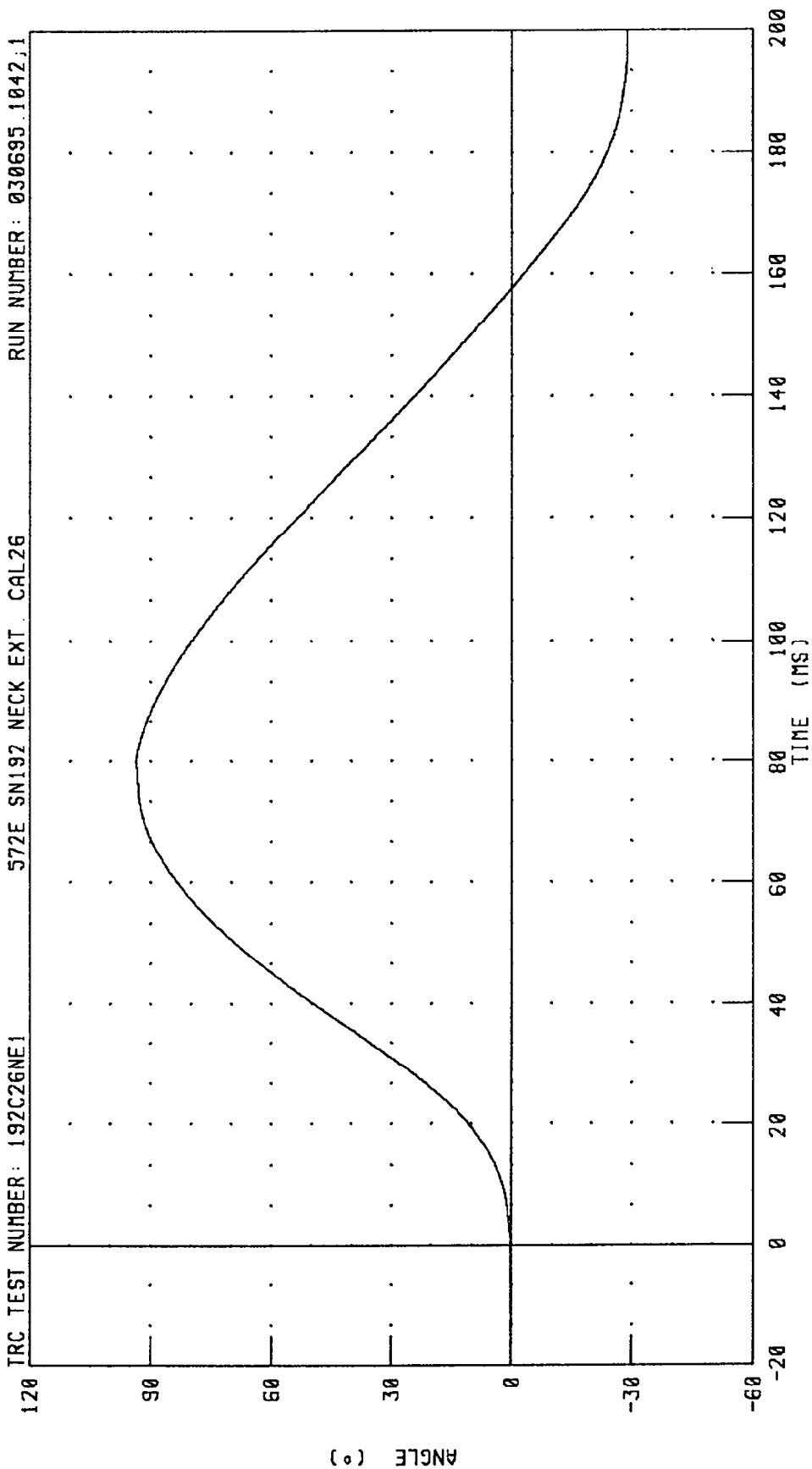
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C26NE1

572E SN192 NECK EXT. CAL26

RUN NUMBER: 030695.1042.1



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 93.45 ° @ 79.92 MS; -28.92 ° @ 198.24 MS

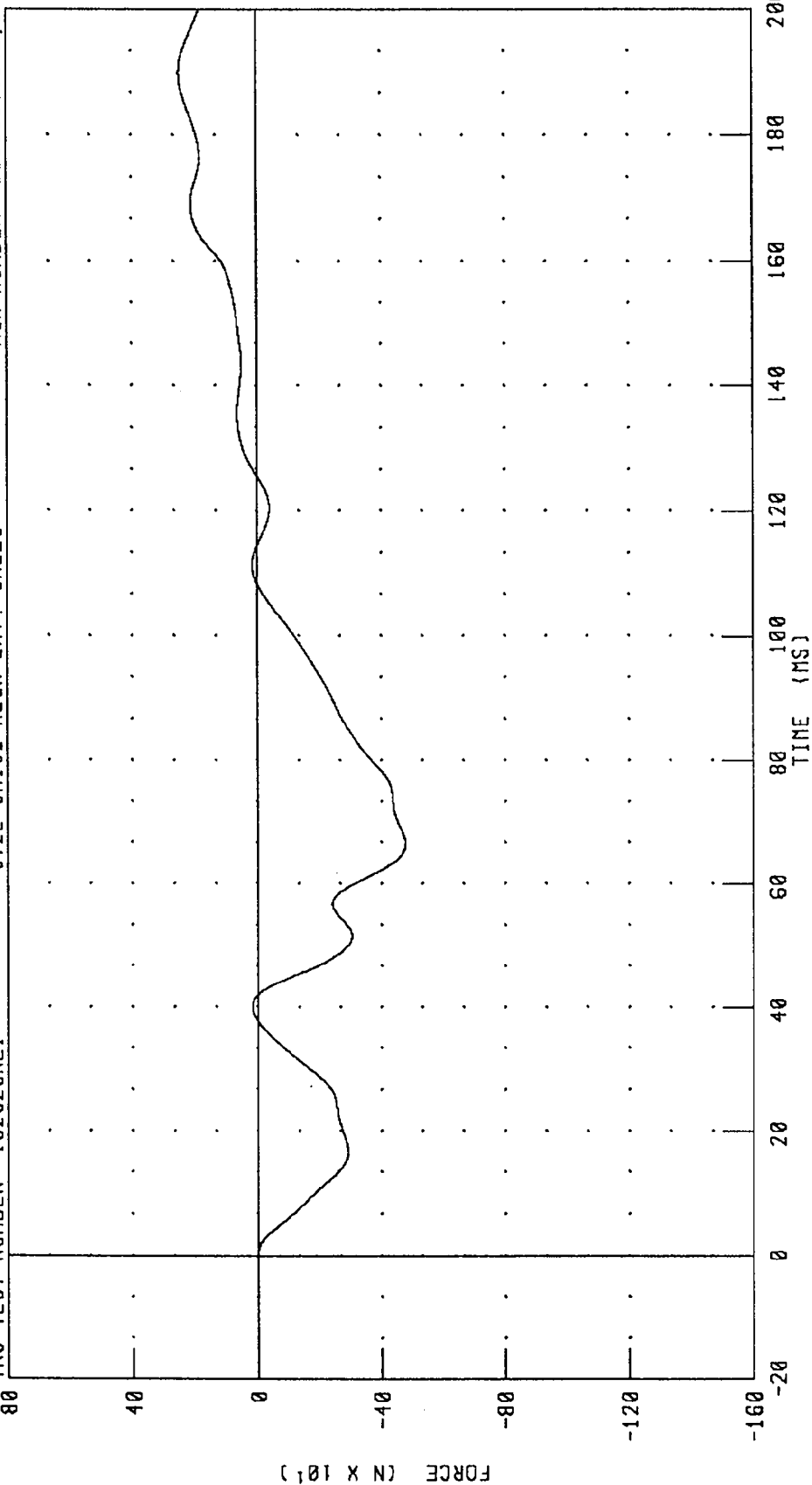
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C26NE1

572E SN192 NECK EXT. CAL26

RUN NUMBER: 030695.1042.1



CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 248.88 N @ 189.92 MS; -478.47 N @ 66.32 MS

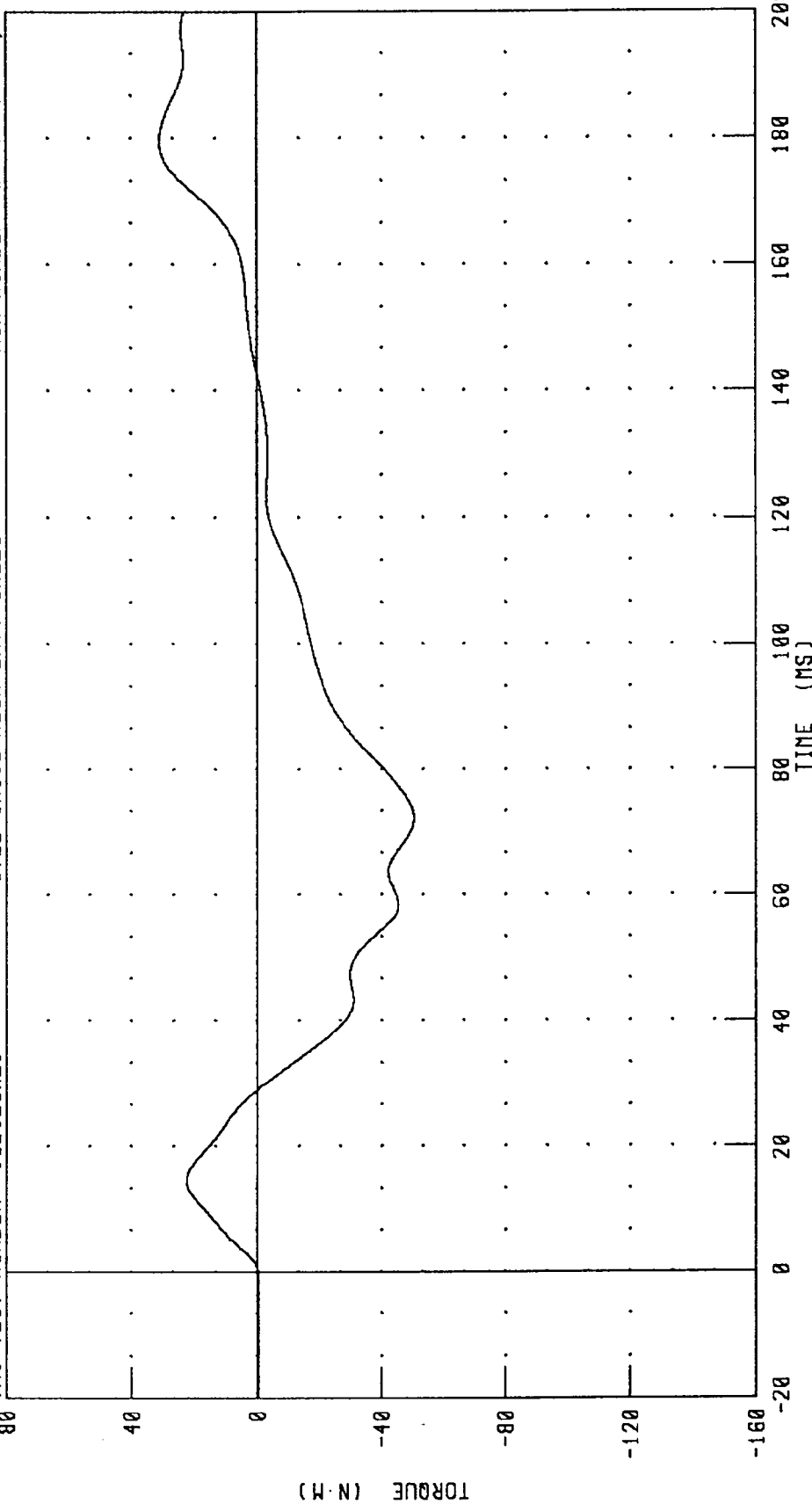
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C26NE1

572E SNI92 NECK EXT. CAL26

RUN NUMBER: 030695.1042;1



PEAK DATA: 30.81 N.M @ 179.60 MS; -50.41 N.M @ 72.24 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C26NE1

572E SN192 NECK EXT. CAL26

RUN NUMBER: 030695.1042,1

80

40

0

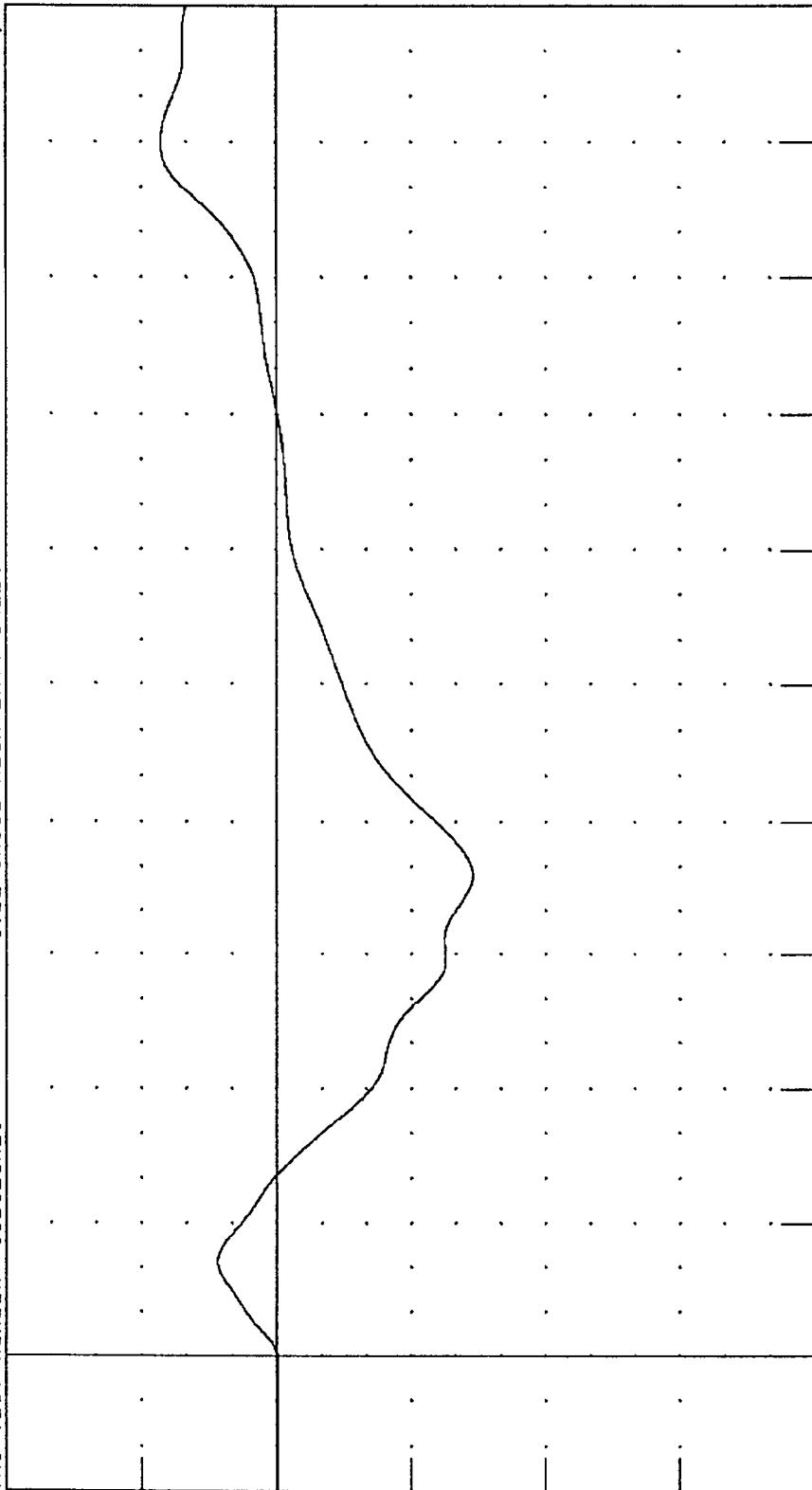
-40

-80

-120

-160

TORQUE (N·M)



TIME (MS)

PEAK DATA: 34.23 N·M @ 180.00 MS; -58.26 N·M @ 72.08 MS

FILTER: CH. CLASS 60

CHANNEL: NEKOM

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

16-FEB-95

TRC INC.

TEST NO: 192C26TH1

572E SN192 H.S.THORAX CAL26

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	30.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	66.8 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5661. N
INTERNAL HYSTERESIS	69% - 85%	70.8%

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

RUN NUMBER: 021695.1333;1

PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 192C26TH1

572E SN192 H.S. THORAX CAL26

RUN NUMBER: 030695.1042;1

50

40

30

20

10

0

-10

ACCELERATION (G)

0

10

20

30

40

50

TIME (MS)

0

10

20

30

40

50

60

70

80

90

100

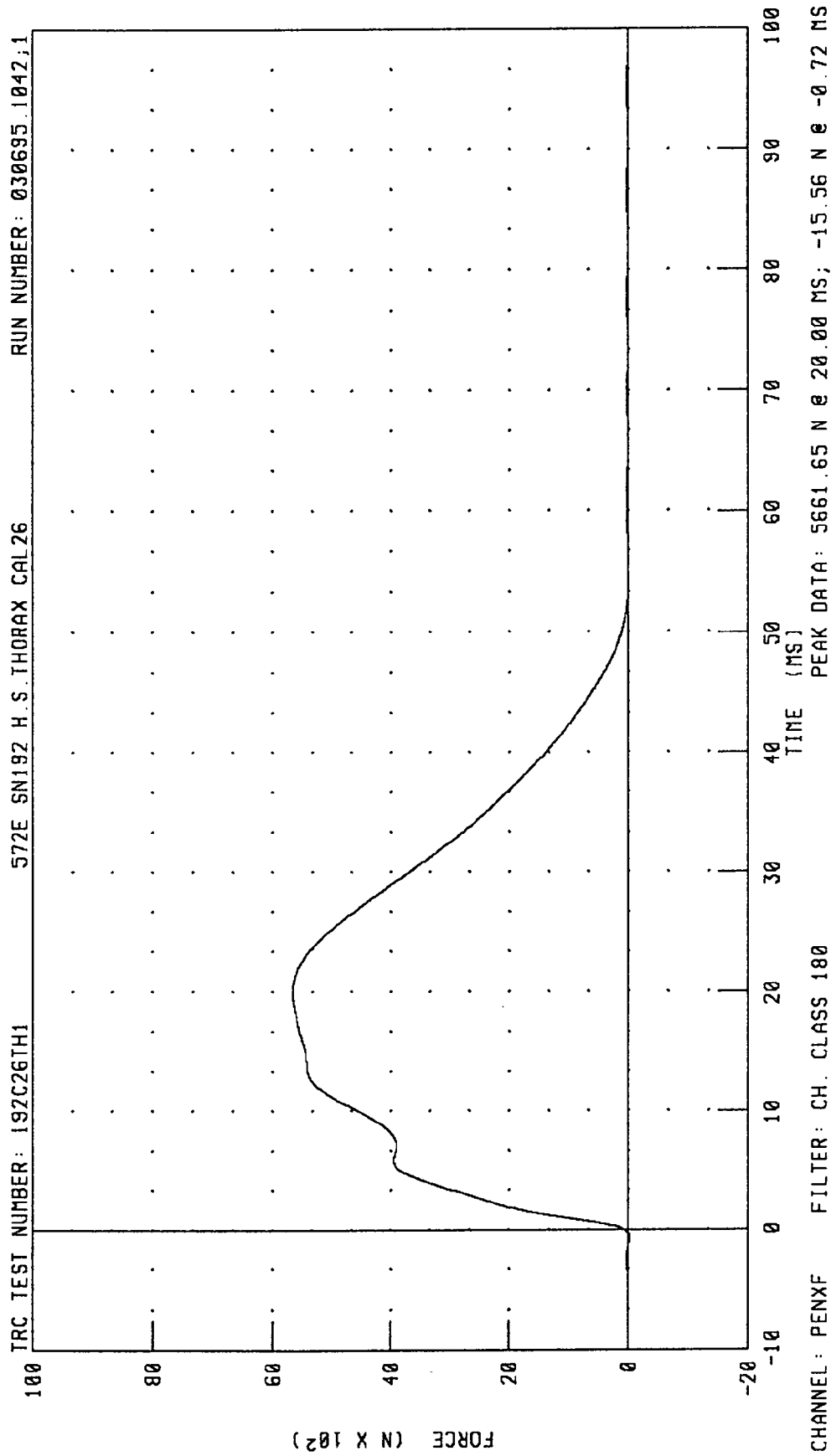
PEAK DATA: 24.71 G @ 20.00 MS; -0.07 G @ -0.72 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

950222

92-C

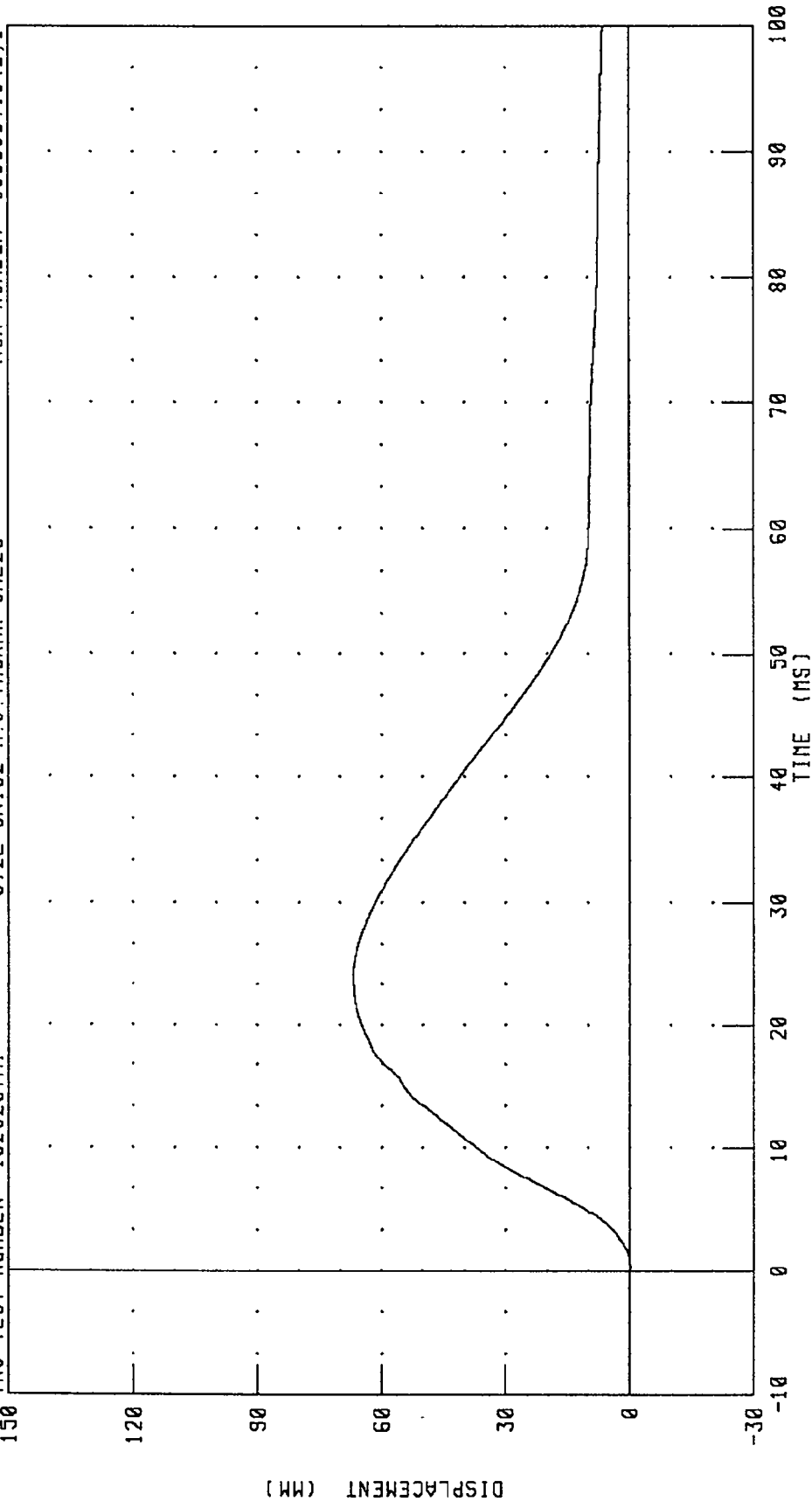
PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE



CHANNEL: PENXF FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION STERNUM DISPLACEMENT

IRC TEST NUMBER: 192C26THJ 572E SN192 H.S. THORAX CAL26 RUN NUMBER: 030695.1042;1



PEAK DATA: 66.87 MM @ 24.00 MS; -0.06 MM @ 0.40 MS

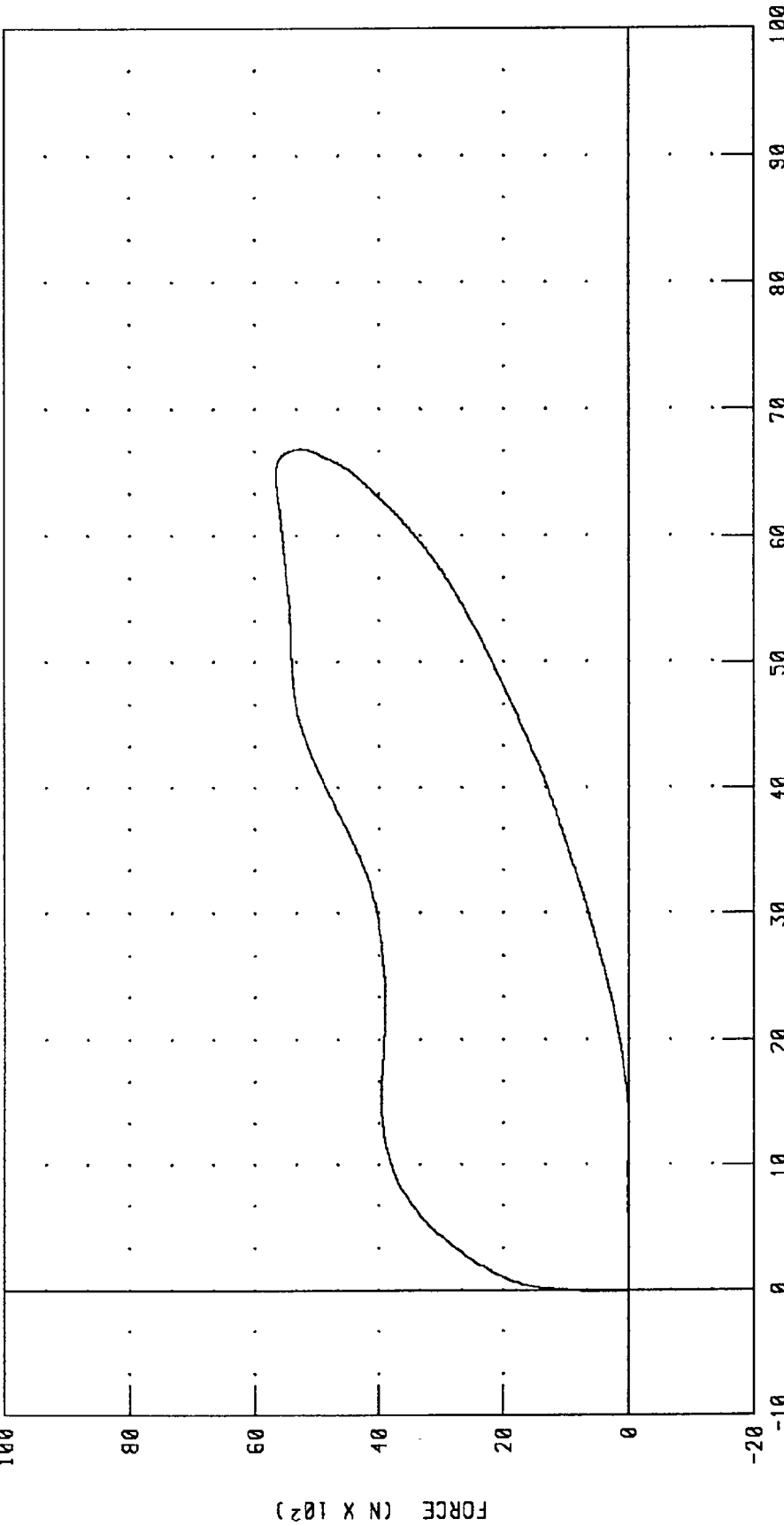
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 192C26TH1

572E SN192 H.S. THORAX CAL26

RUN NUMBER: 030695.1042;1



CHANNEL: CSTXD
PENXF

FILTER: CH: CLASS 180
CH: CLASS 180

DISPLACEMENT (MM)

PEAK DATA: 66.87 MM @ 24.00 MS; -0.06 MM @ 0.40 MS
5661.65 N @ 20.00 MS; -15.56 N @ -0.72 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

15-FEB-95

TRC INC.

TEST NO: 192C26RK1

572E SN192 RIGHT KNEE CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	25.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5398.0 N

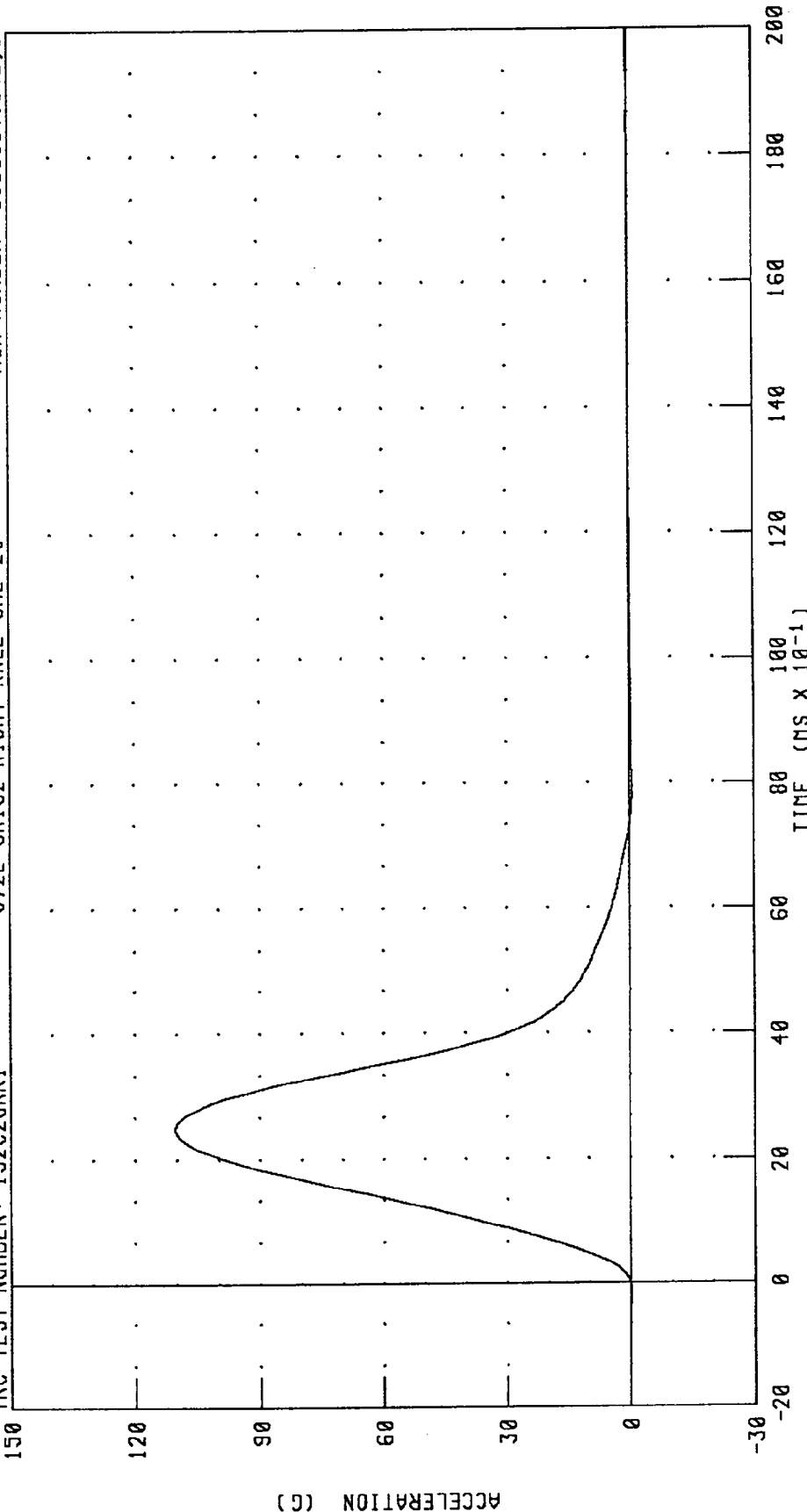
TEST MEETS SPECIFICATIONS

TECHNICIAN Char. Middleton

RUN NUMBER: 021595.1335;1

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

TRC TEST NUMBER: 192C26RK1 572E SN192 RIGHT KNEE CAL 26 RUN NUMBER: 030695.1042;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 110.33 G @ 2.48 MS; -0.67 G @ 7.92 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION

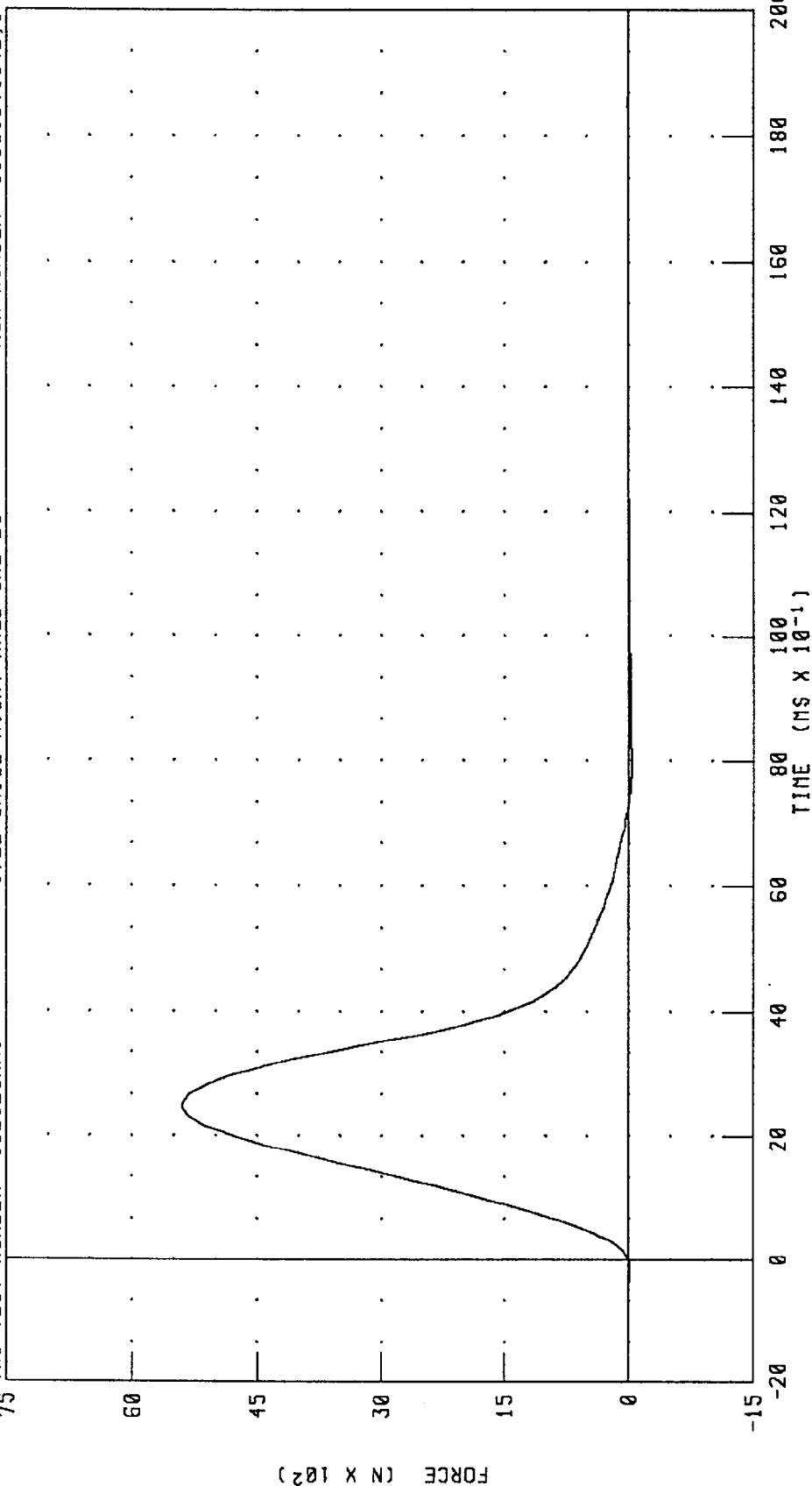
PENDULUM FORCE (5 KG PEND.)

572E SN192 RIGHT KNEE CAL 26

IRC TEST NUMBER: 192C26RK1

75

RUN NUMBER: 030635.1042;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5398.09 N @ 2.48 NS, -32.77 N @ 7.92 NS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

15-FEB-95

TRC INC.

TEST NO: 192C26LK1

572E SN192 LEFT KNEE CAL 26

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	26.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5180.4 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas Middleton

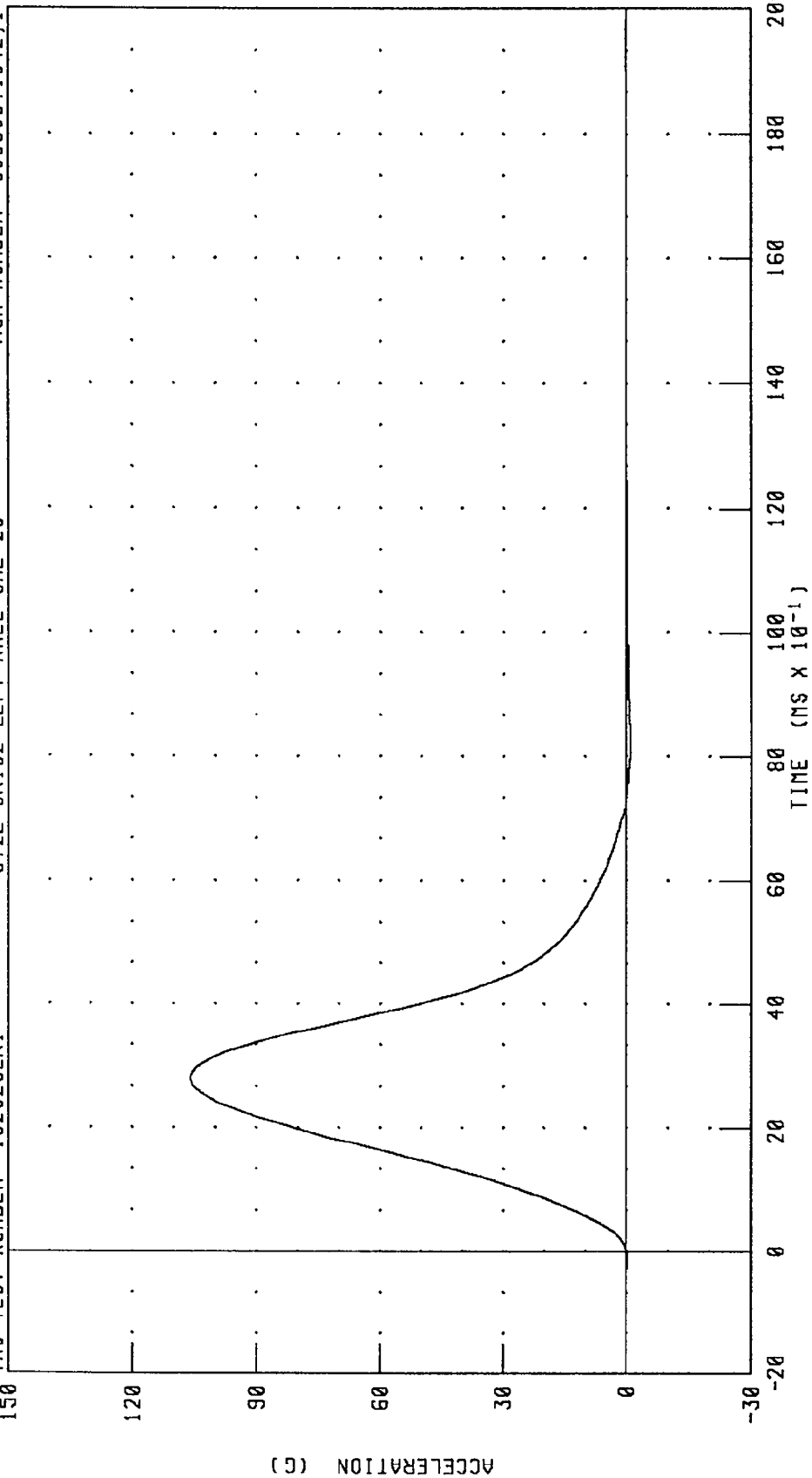
RUN NUMBER: 021595.1330;1

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

TRC TEST NUMBER: 192C26LK1

572E SN192 LEFT KNEE CAL 26

RUN NUMBER: 030695.1042;1



CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 105.88 G @ 2.80 MS; -0.94 G @ 8.24 MS

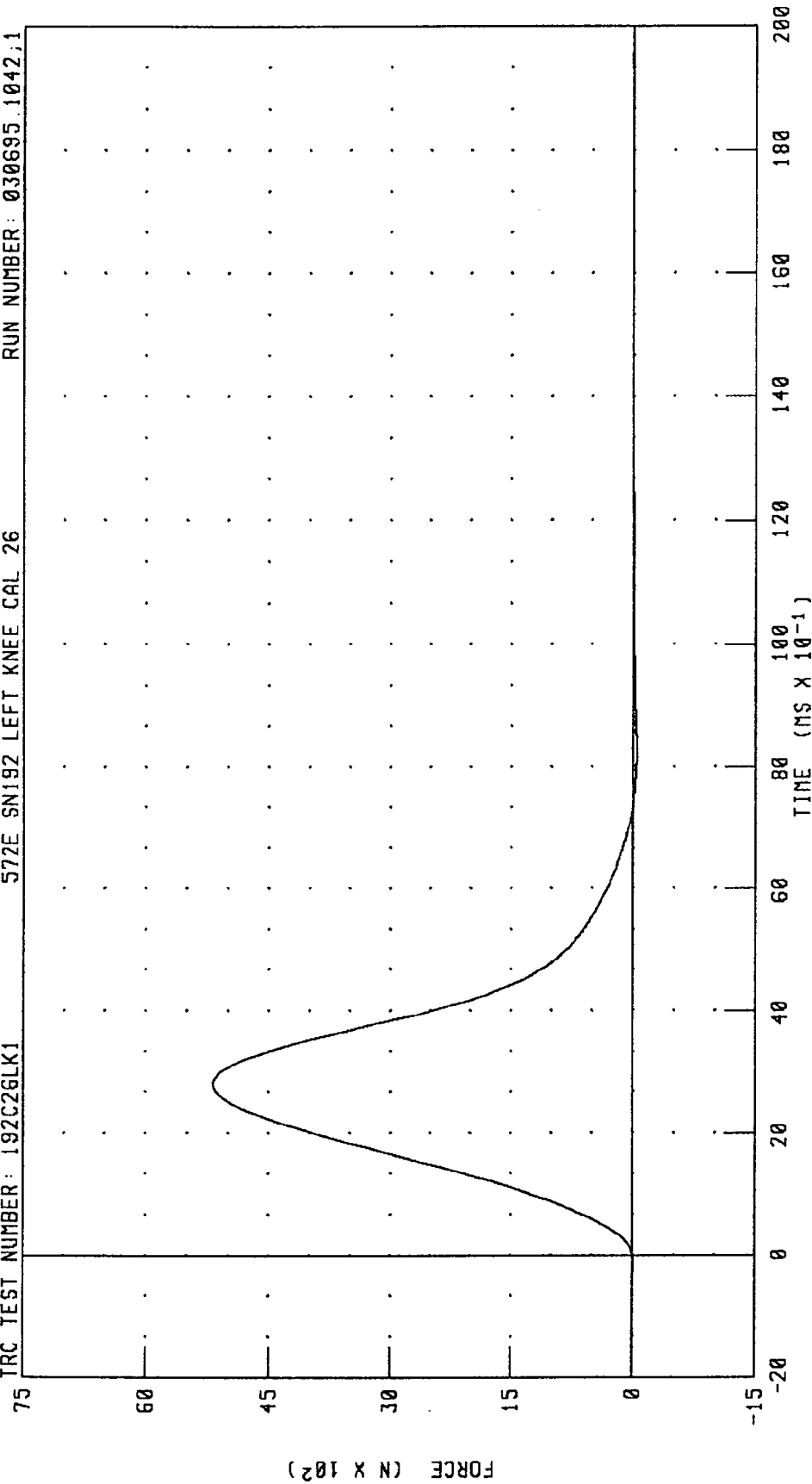
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C26LK1

572E SN192 LEFT KNEE CAL 26

RUN NUMBER: 030695.1042;1



PEAK DATA: 5180.42 N @ 2.80 MS; -45.96 N @ 8.24 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

Pre-test Certification Data

Passenger Dummy S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS

142 HUMANOID

15-FEB-95

TRC INC. TEST NO: 142C27ED1 572E SN142 EXT.DIMENSION CAL27

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	986. MM
WAIST CIRCUMFERENCE	(Z)	836 - 866 MM	848. MM
CHEST DEPTH	(O)	213 - 229 MM	221. MM
H-POINT HEIGHT	(C)	84 - 89 MM	84. MM
H-POINT FROM SEATBACK	(D)	135 - 140 MM	137. MM
SKULL CAP TO BACKLINE	(H)	41 - 46 MM	43. MM
TOTAL SITTING HEIGHT	(A)	879 - 889 MM	879. MM
THIGH CLEARANCE	(F)	140 - 155 MM	145. MM
BUTTOCK KNEE LENGTH	(K)	579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH	(N)	452 - 478 MM	470. MM
POPLITEAL HEIGHT	(L)	429 - 455 MM	445. MM
KNEE PIVOT HEIGHT	(M)	485 - 500 MM	488. MM
FOOT LENGTH	(P)	252 - 267 MM	257. MM
FOOT BREADTH	(W)	91 - 107 MM	97. MM
SHOULDER PIVOT FROM BACKLINE	(E)	84 - 94 MM	91. MM
SHOULDER BREADTH	(V)	422 - 437 MM	429. MM
SHOULDER PIVOT HEIGHT	(B)	506 - 521 MM	508. MM
ELBOW REST HEIGHT	(J)	191 - 211 MM	203. MM
SHOULDER-ELBOW LENGTH	(I)	330 - 345 MM	345. MM
BACK OF ELBOW TO WRIST PIVOT	(G)	290 - 305 MM	292. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN Chas Middleton

RUN NUMBER: 021595.1247

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

16-FEB-95

TRC INC.

TEST NO: 142C27HD1

572E SN142 HEAD DROP CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	30.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	245.67 G
PEAK LATERAL ACCELERATION	15 G MAX	-1.98 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

RUN NUMBER: 021695.1031;3

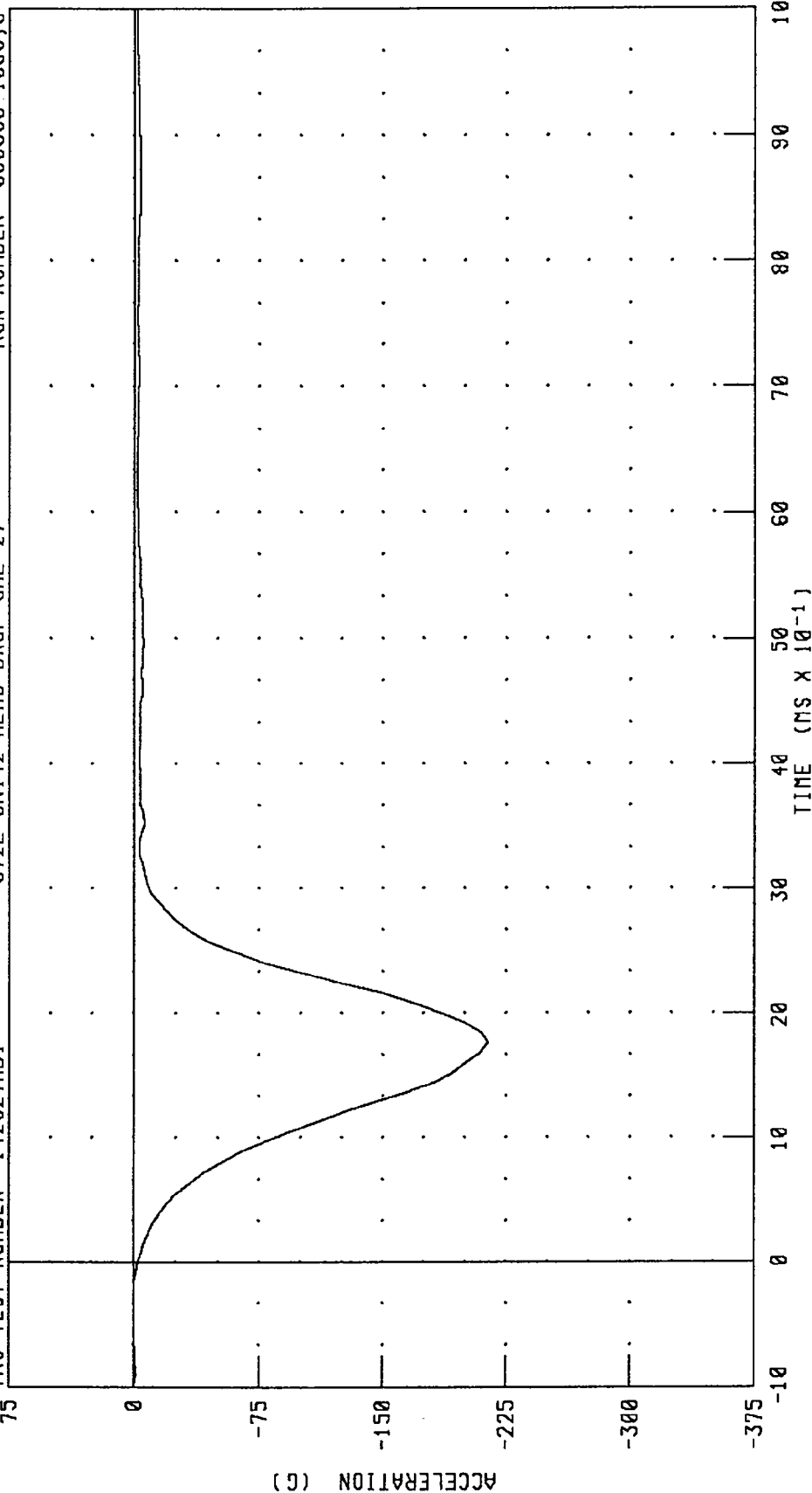
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 142C27HD1

572E SN142 HEAD DROP CAL 27

RUN NUMBER: 030695 1059,3



PEAK DATA: 0.04 G @ -0.32 MS; -213.88 G @ 1.76 MS

CHANNEL: HEDXG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

572E SN142 HEAD DROP CAL 27 RUN NUMBER: 030695.1059,3

TRC TEST NUMBER: 142C27HD1

225

150

75

0

-75

-150

-225

ACCELERATION (G)

TIME (NS X 10⁻¹)

FILTER: CH. CLASS 1000

CHANNEL: HEDYG

PEAK DATA: 1.40 G @ 3.12 MS; -1.99 G @ 2.48 MS

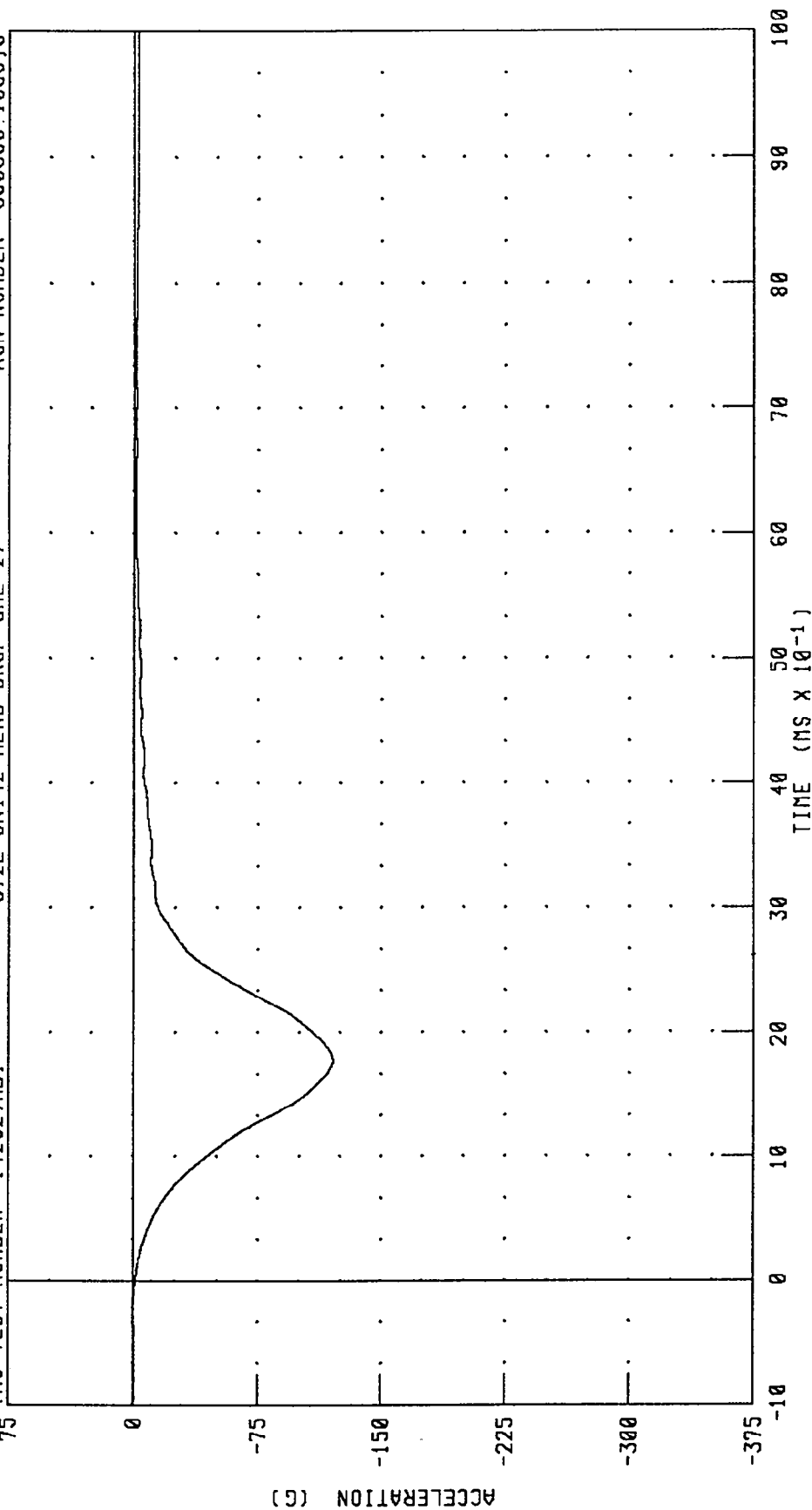
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 142C27HD1

572E SN142 HEAD DROP CAL 27

RUN NUMBER: 030695.1059;3



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: -0.21 G @ -0.24 MS; -120.88 G @ 1.76 MS

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD RESULTANT ACCELERATION
 572E SN142 HEAD DROP CAL 27

RUN NUMBER: 030695.1059.3

TRC TEST NUMBER: 142C27HD1

375

300

225

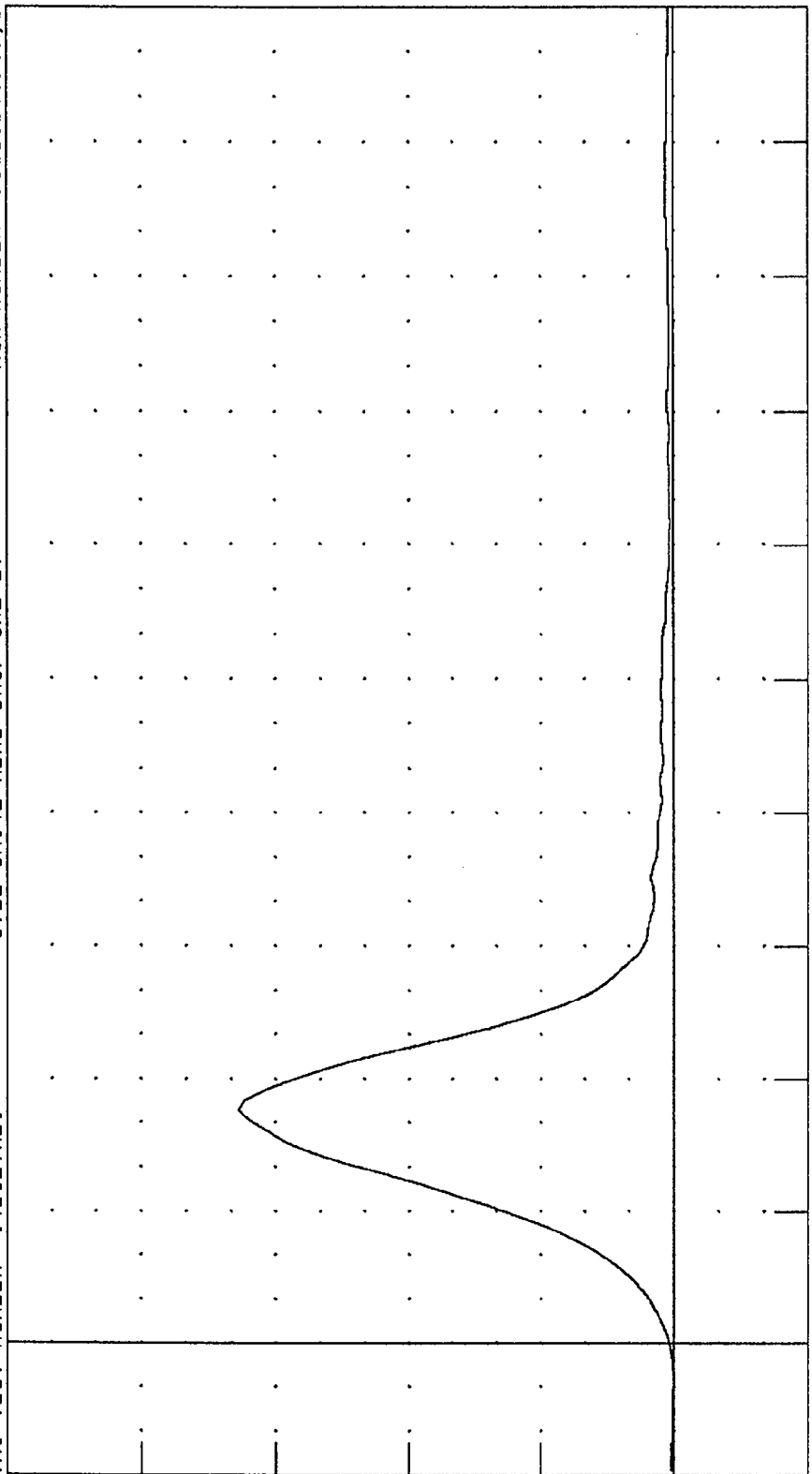
150

75

0

-75

ACCELERATION (G)



TIME (MS X 10⁻¹)

PEAK DATA: 245.68 G @ 1.76 MS; 0.27 G @ -0.24 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

15-FEB-95

TRC INC. TEST NO: 142C27NF1 572E SN142 NECK FLEXION CAL27

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	25.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.81 G
	20 MS	17.60 - 22.60 G	21.34 G
	30 MS	12.50 - 18.50 G	16.80 G
MAX PENDULUM G		29 G MAX	24.12 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.78 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.68 MS
D PLANE	MAX	64 - 78 DEG.	73.36 DEG.
ROTATION	TIME	57 - 64 MS	60.72 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	92.09 NM
	TIME	47 - 58 MS	51.20 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.92 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	104.72 MS

TEST MEETS SPECIFICATIONS

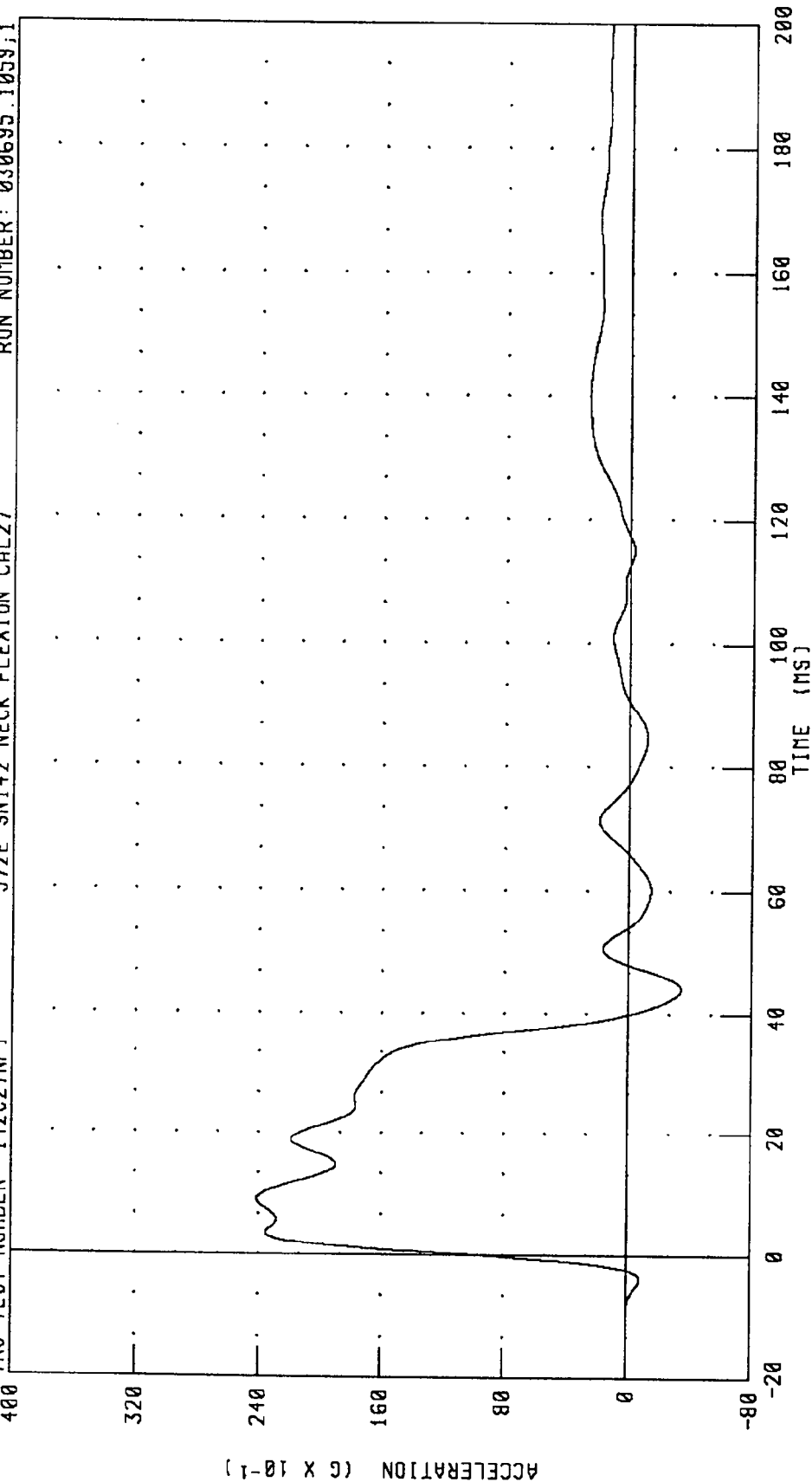
TECHNICIAN Chas. Middle T

RUN NUMBER: 021595.1442;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

IRC TEST NUMBER: 142027NF1 572E SN142 NECK FLEXION CAL27 RUN NUMBER: 030695.1059;1



CHANNEL: PENXG FILTER: CH. CLASS 60

PEAK DATA: 24.13 G @ 9.12 MS; -3.43 G @ 44.16 MS

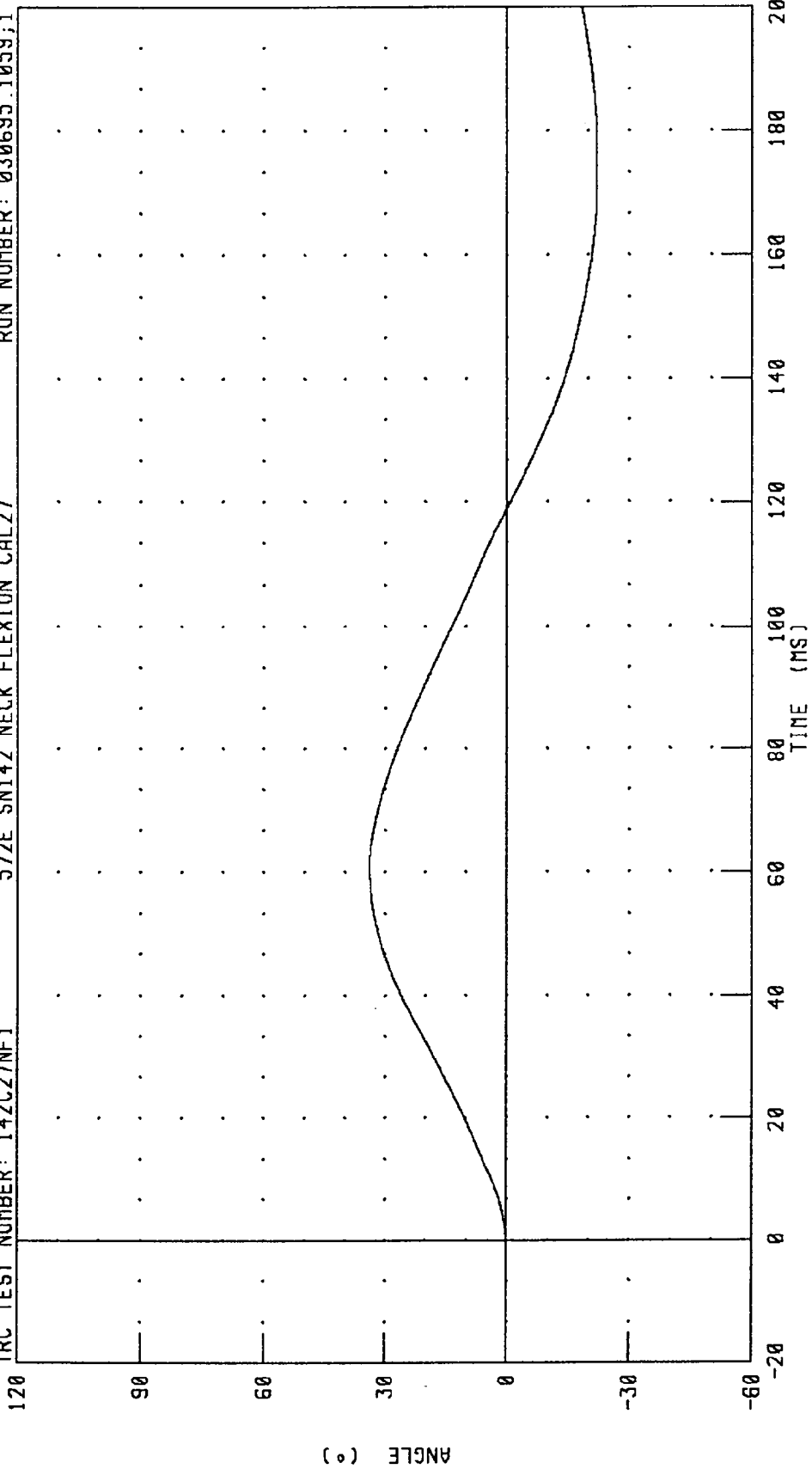
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C27NF1

572E SN142 NECK FLEXION CAL27

RUN NUMBER: 030695.1059;1

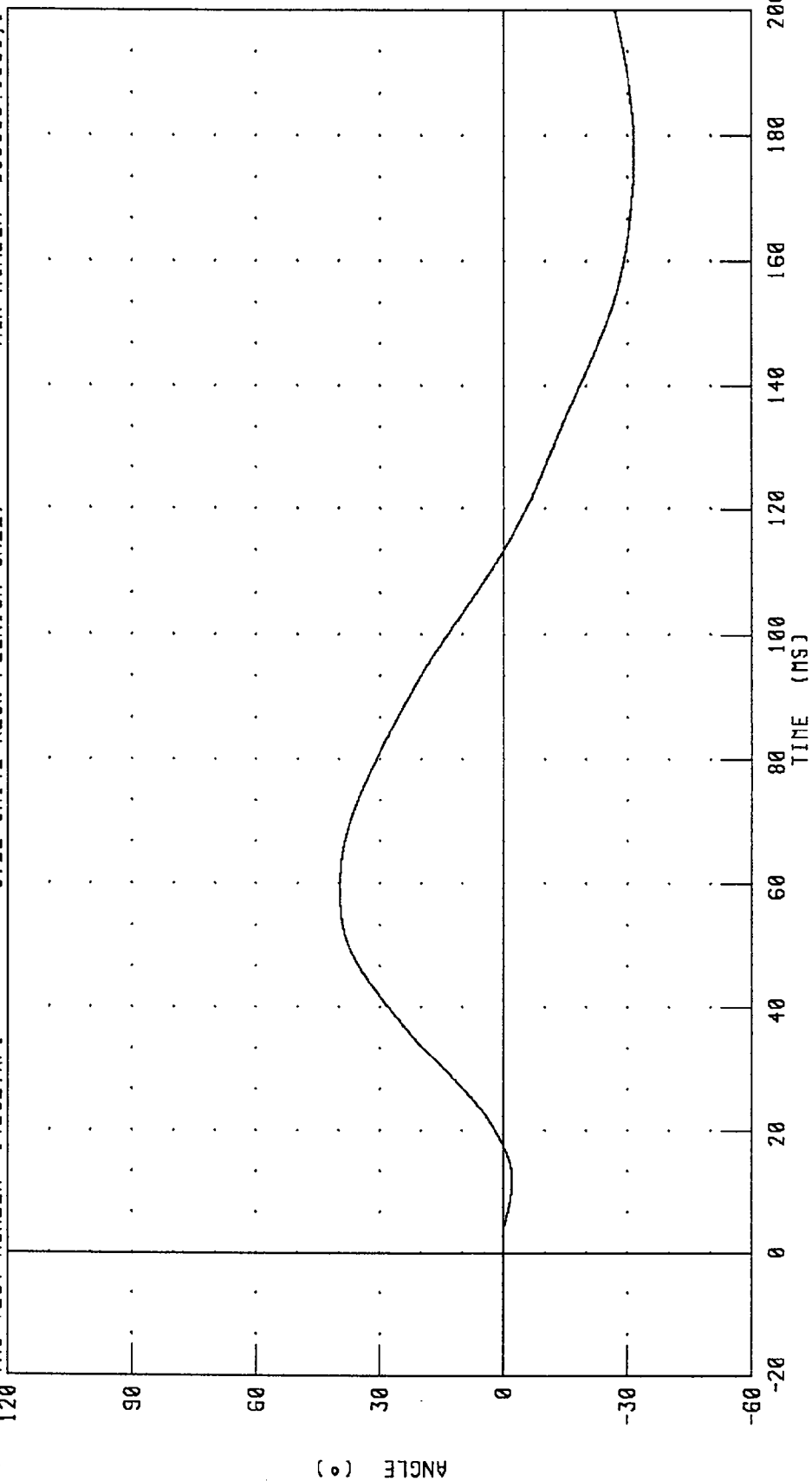


CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 33.80 ° @ 60.88 MS; -22.07 ° @ 173.20 MS

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

TRC TEST NUMBER: 142C27NF1 572E SN142 NECK FLEXION CAL27 RUN NUMBER: 030695.1059;1



PEAK DATA: 39.57 ° @ 58.16 MS; -31.48 ° @ 177.92 MS

CHANNEL: THETA FILTER: CH. CLASS 60

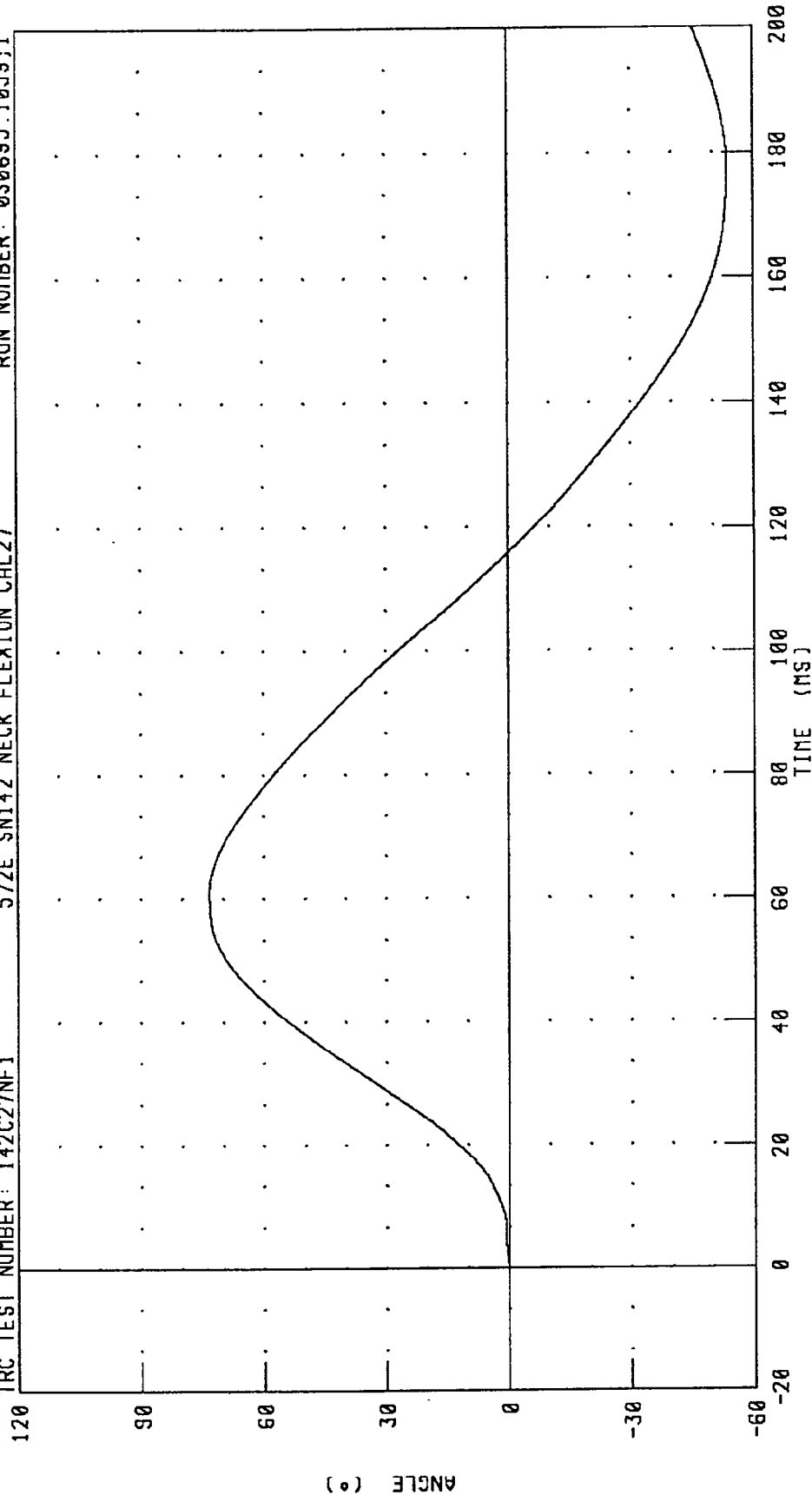
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C27NF1

572E SN142 NECK FLEXION CAL27

RUN NUMBER: 030695.1059;1



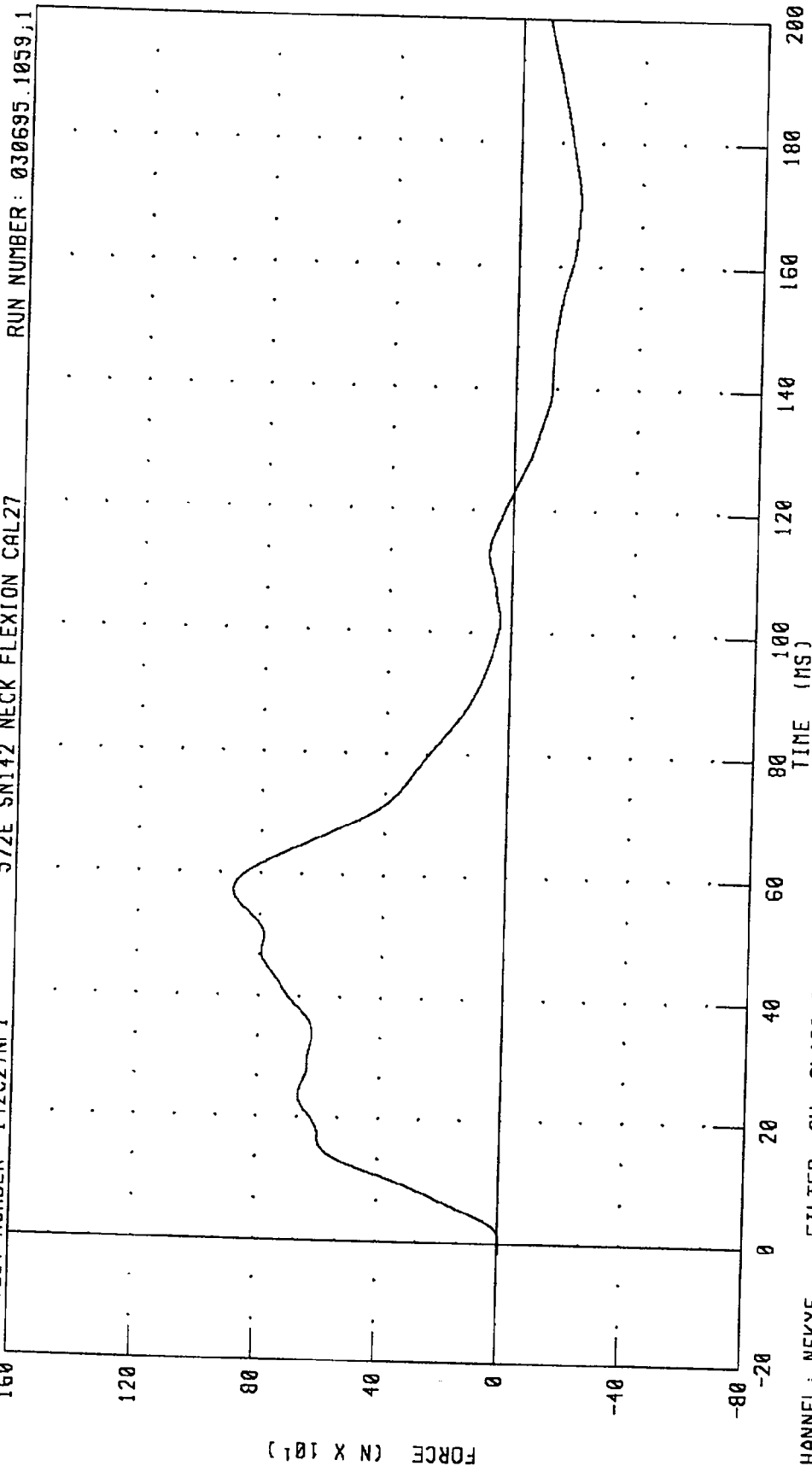
PEAK DATA: 73.36 ° @ 60.72 MS; -53.53 ° @ 175.36 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C27NF1 572E SN142 NECK FLEXION CAL27 RUN NUMBER: 030695.1059;1



PEAK DATA: 890.06 N @ 57.28 MS; -198.26 N @ 170.40 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

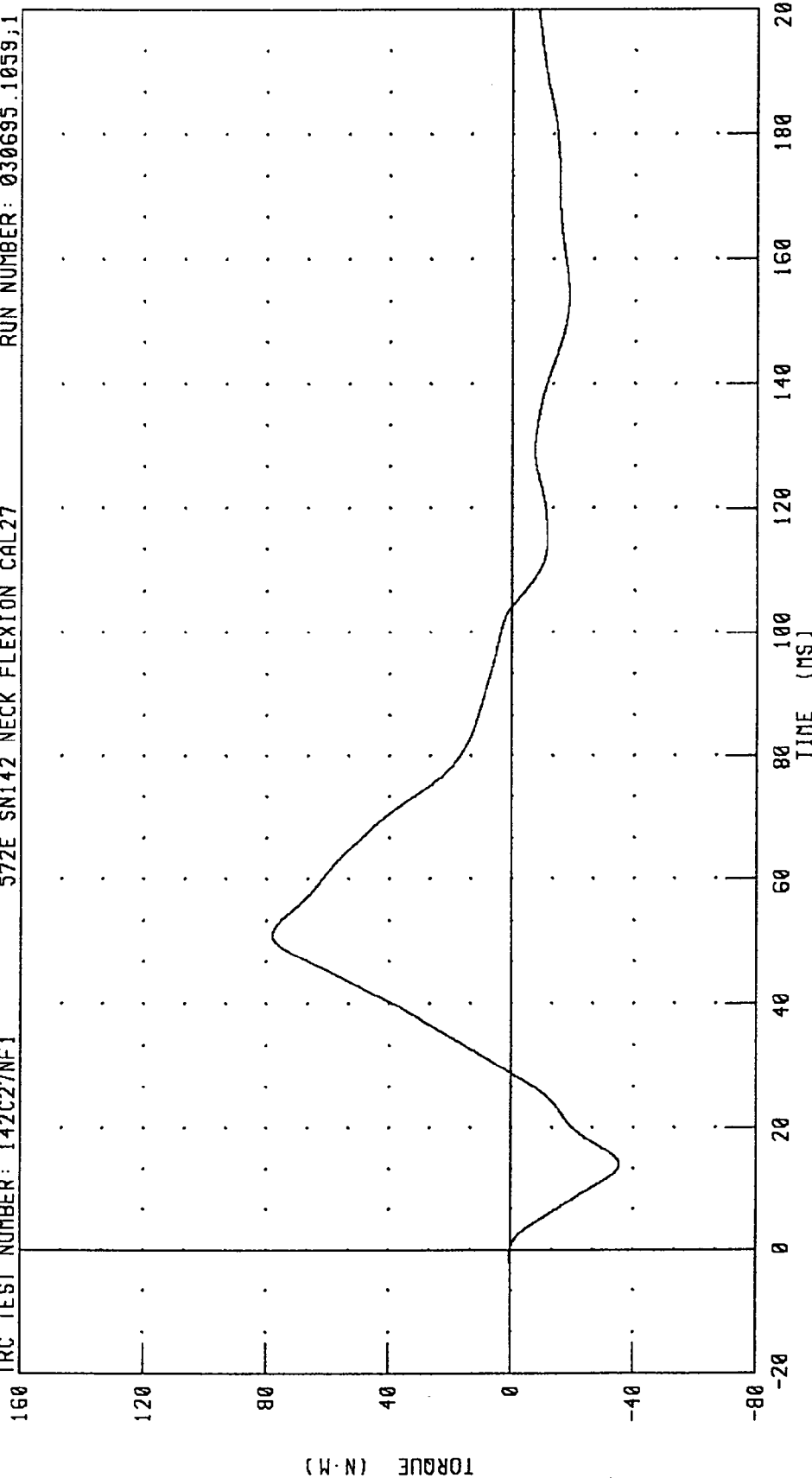
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C27NF1

572E SN142 NECK FLEXION CAL27

RUN NUMBER: 030695.1059;1



PEAK DATA: 78.00 N·M @ 51.12 MS; -35.19 N·M @ 14.00 MS

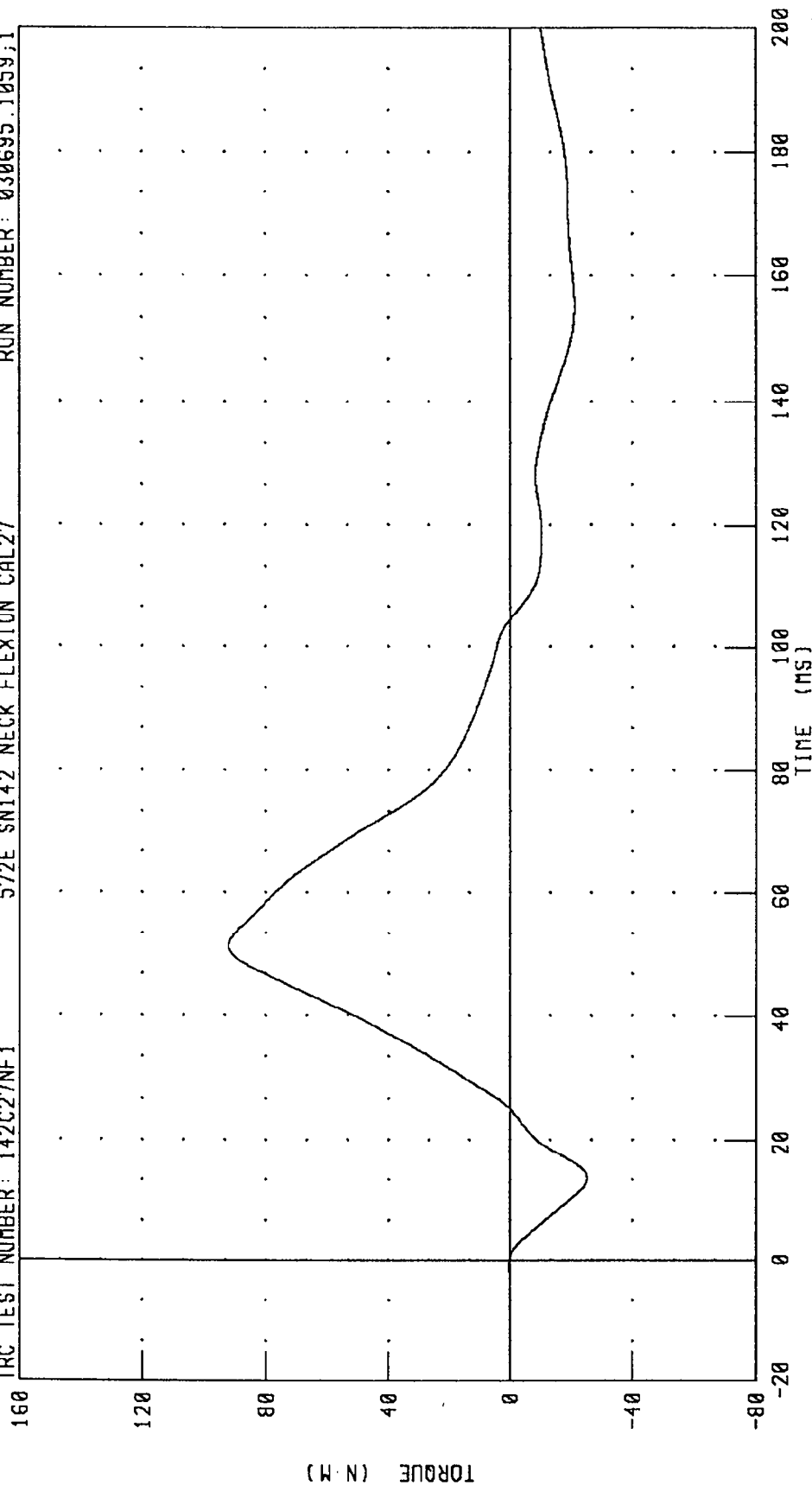
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C27NF1

572E SN142 NECK FLEXION CAL27

RUN NUMBER: 030695.1059;1



PEAK DATA: 92.09 N.M @ 51.20 MS; -25.24 N.M @ 13.60 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

15-FEB-95

TRC INC. TEST NO: 142C27NE1 572E SN142 NECK EXT. CAL27

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	25.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.45 G
	20 MS	14.00 - 19.00 G	15.62 G
	30 MS	11.00 - 16.00 G	13.50 G
MAX PENDULUM G		22 G MAX	18.43 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.43 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	42.72 MS
D PLANE	MAX	81 - 106 DEG.	97.62 DEG.
ROTATION	TIME	72 - 82 MS	76.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-71.10 NM
	TIME	65 - 79 MS	71.44 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	154.32 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	140.88 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

RUN NUMBER: 021595.1452;1

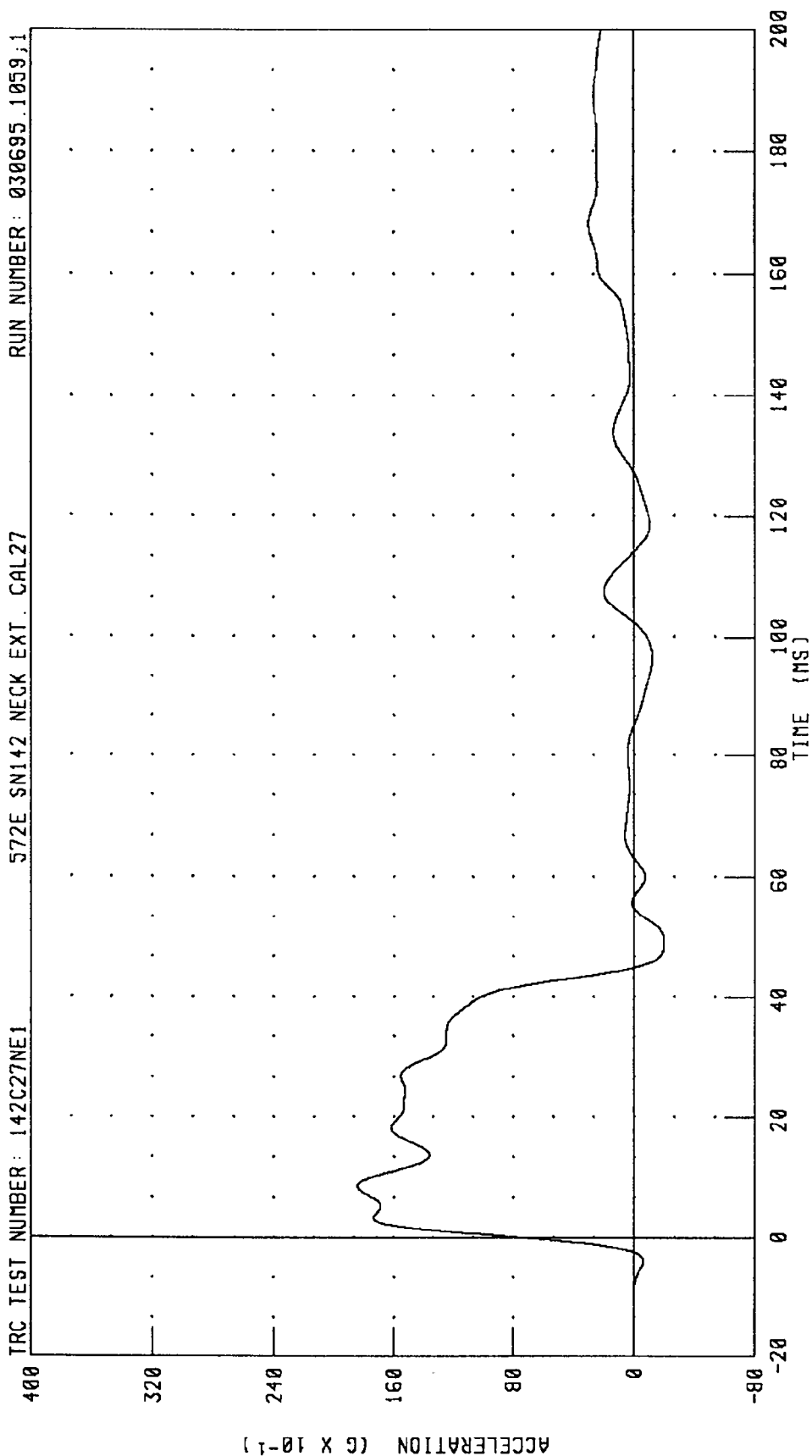
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C27NE1

572E SN142 NECK EXT. CAL27

RUN NUMBER: 030695.1059;1



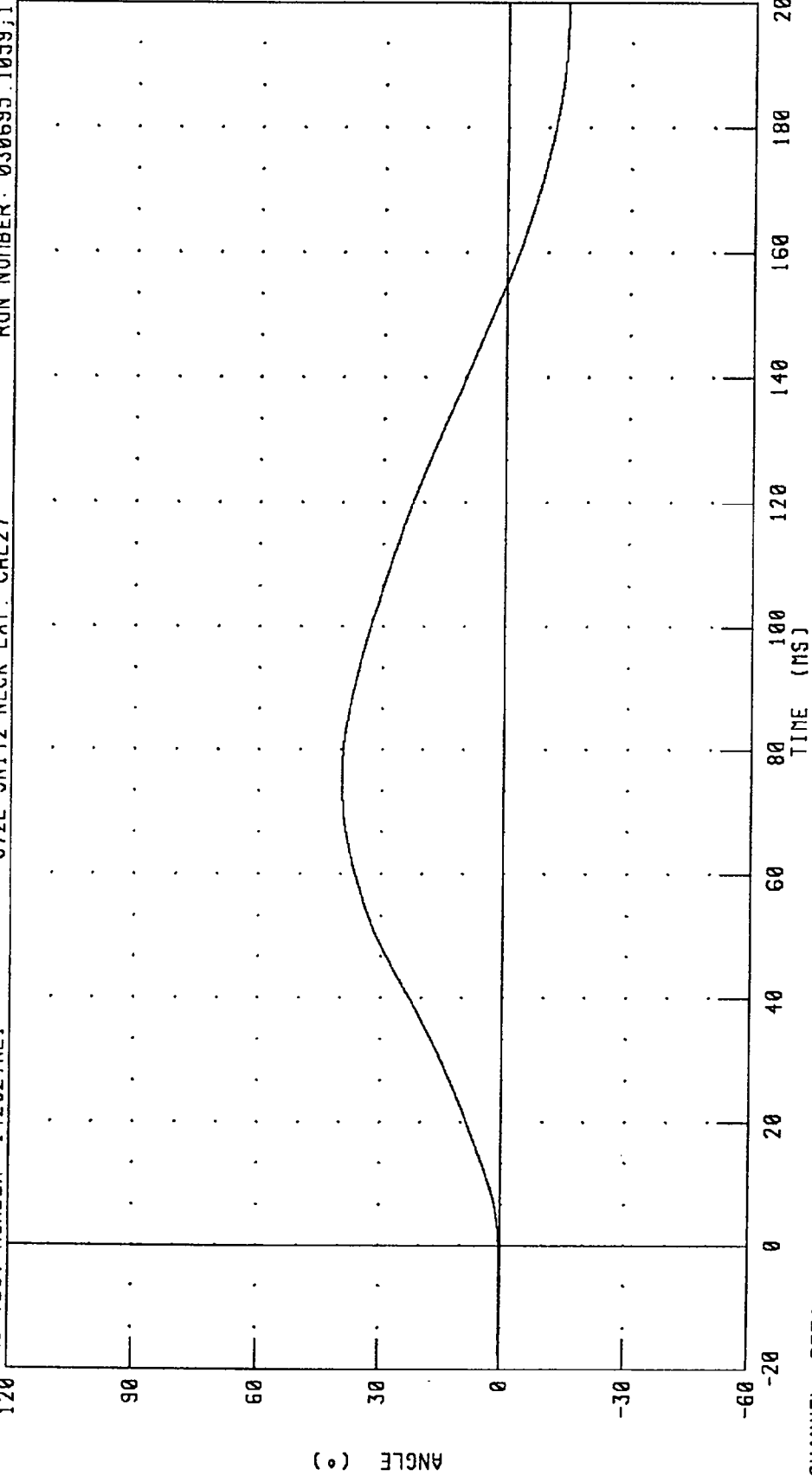
PEAK DATA: 18.44 G @ 8.56 MS; -1.96 G @ 49.28 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

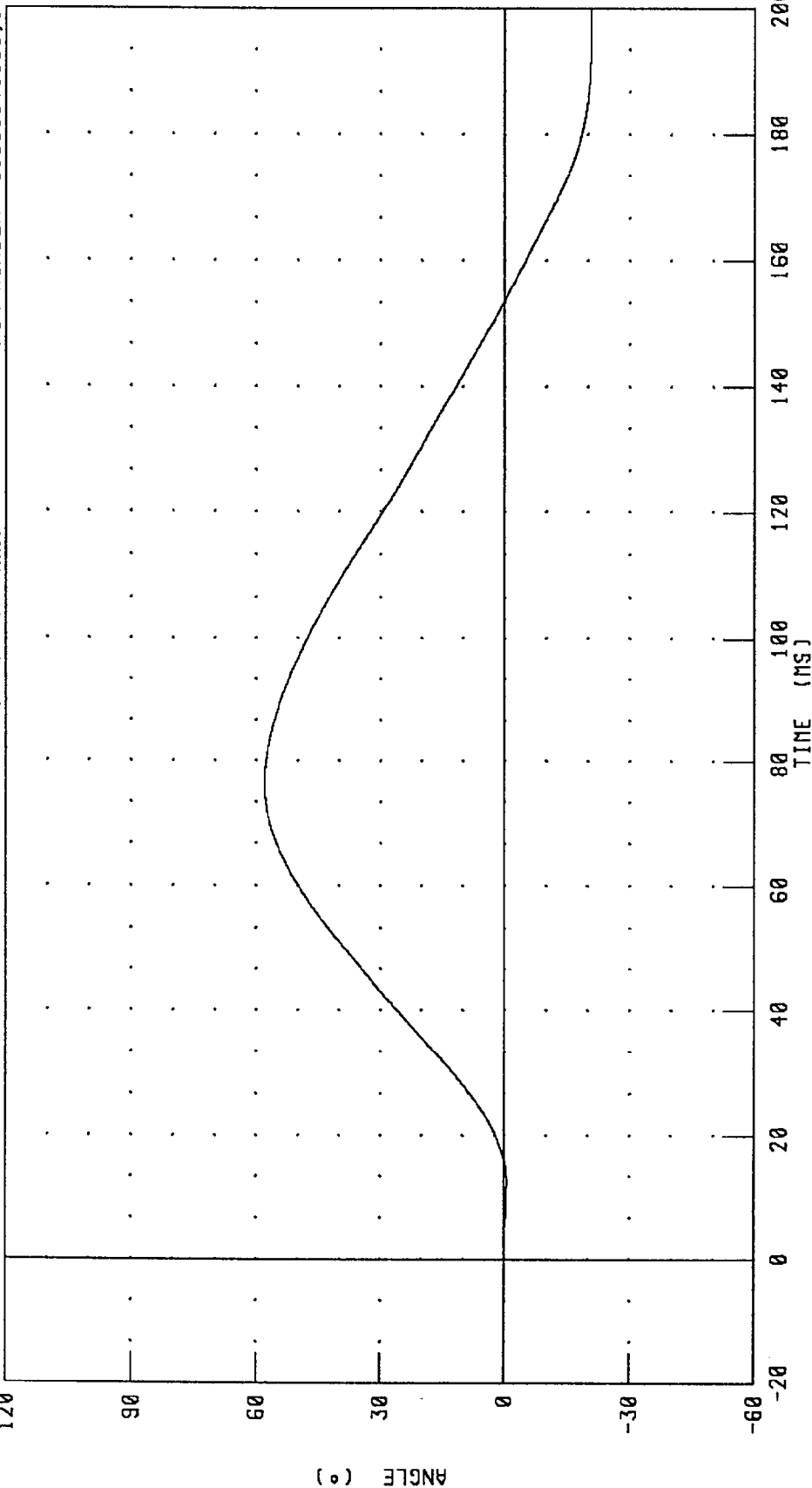
TRC TEST NUMBER: 142C27NE1 572E SN142 NECK EXT. CAL27 RUN NUMBER: 030695.1059;1



CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C27NE1 572E SN142 NECK EXT. CAL27 RUN NUMBER: 030695.1059;1

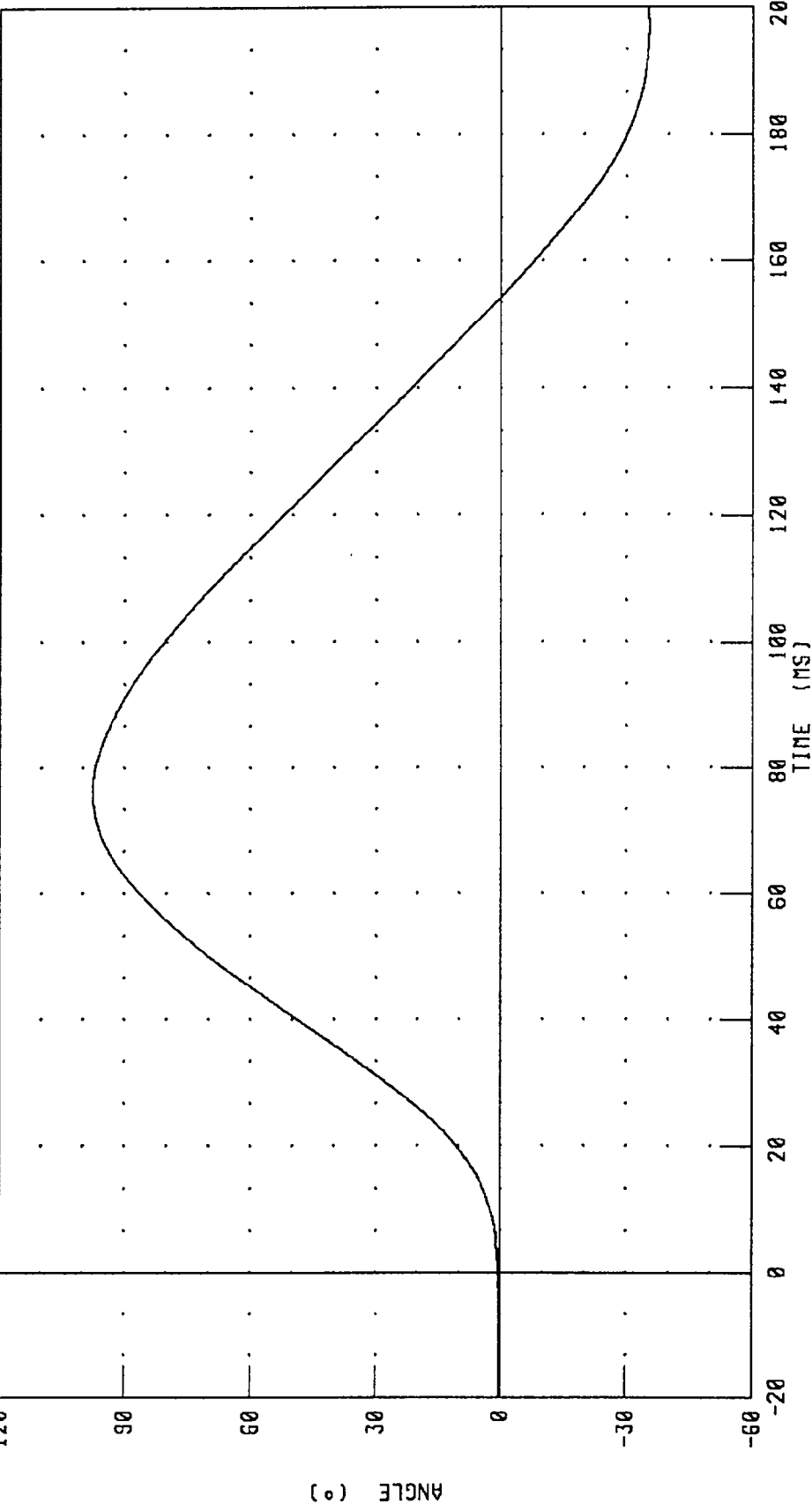


PEAK DATA: 57.98 ° @ 76.40 MS; -20.84 ° @ 196.72 MS

CHANNEL: THETA FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION TOTAL ROTATION

TRC TEST NUMBER: 142C27NE1 572E SN142 NECK EXT. CAL27 RUN NUMBER: 030695 1059;1

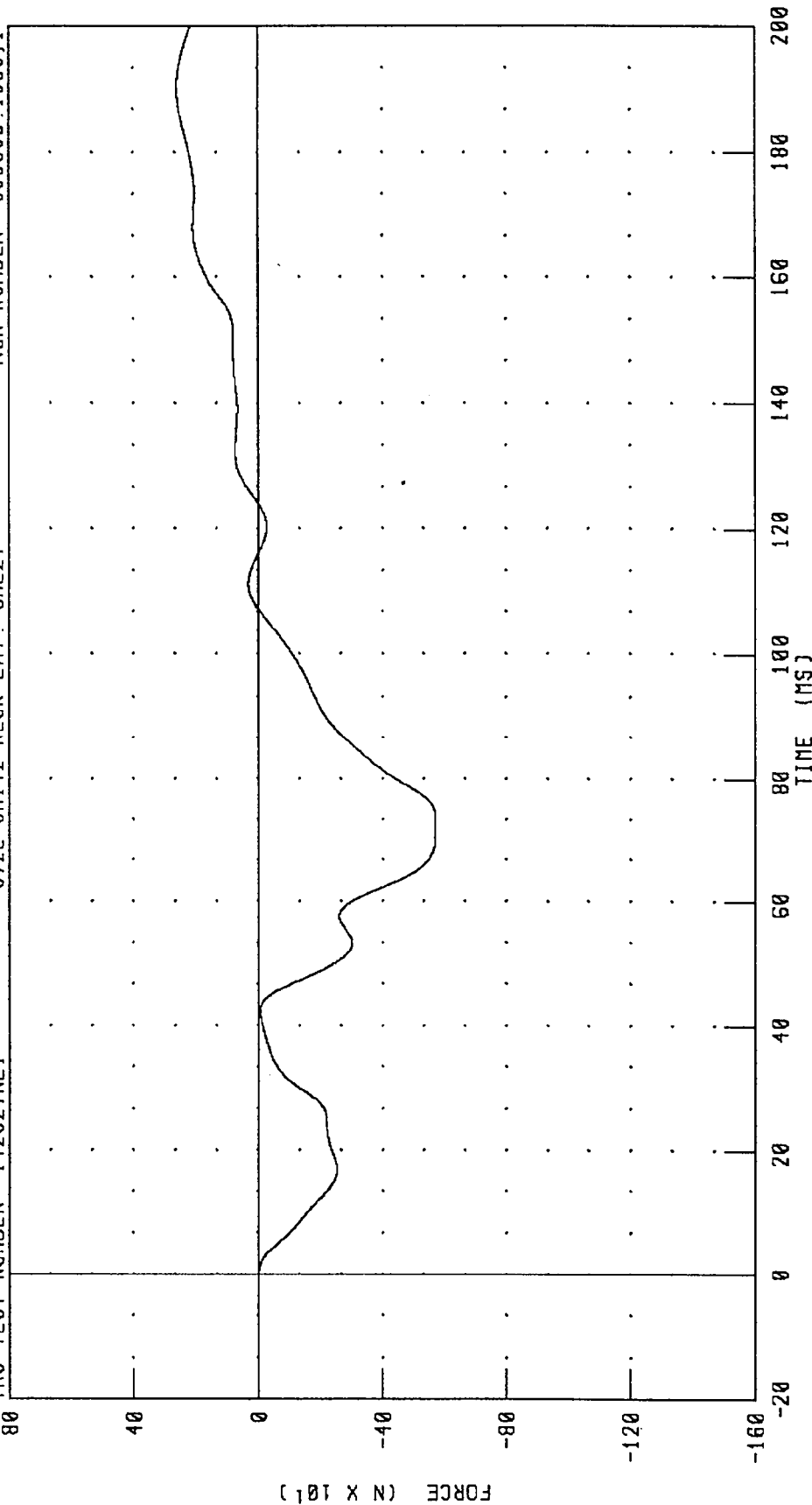


PEAK DATA: 97.62 ° @ 76.00 MS; -35.41 ° @ 196.96 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS

TRC TEST NUMBER: 142C27NE1 572E SN142 NECK EXT. CAL27 RUN NUMBER: 030695.1059,1

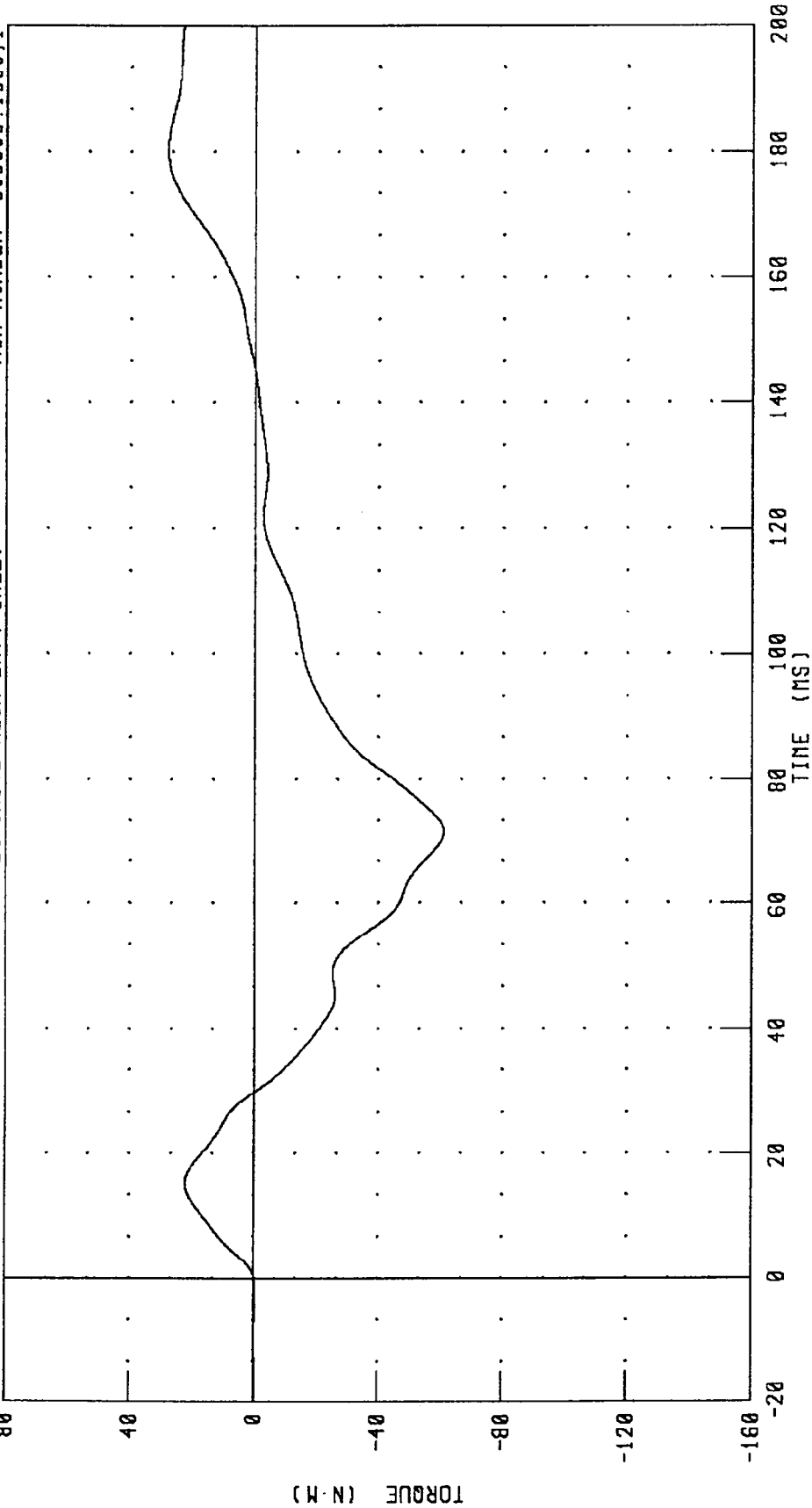


CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 260.37 N @ 190.08 MS; -570.82 N @ 73.44 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C27NE1 572E SN142 NECK EXT. CAL27 RUN NUMBER: 030695.1059,1

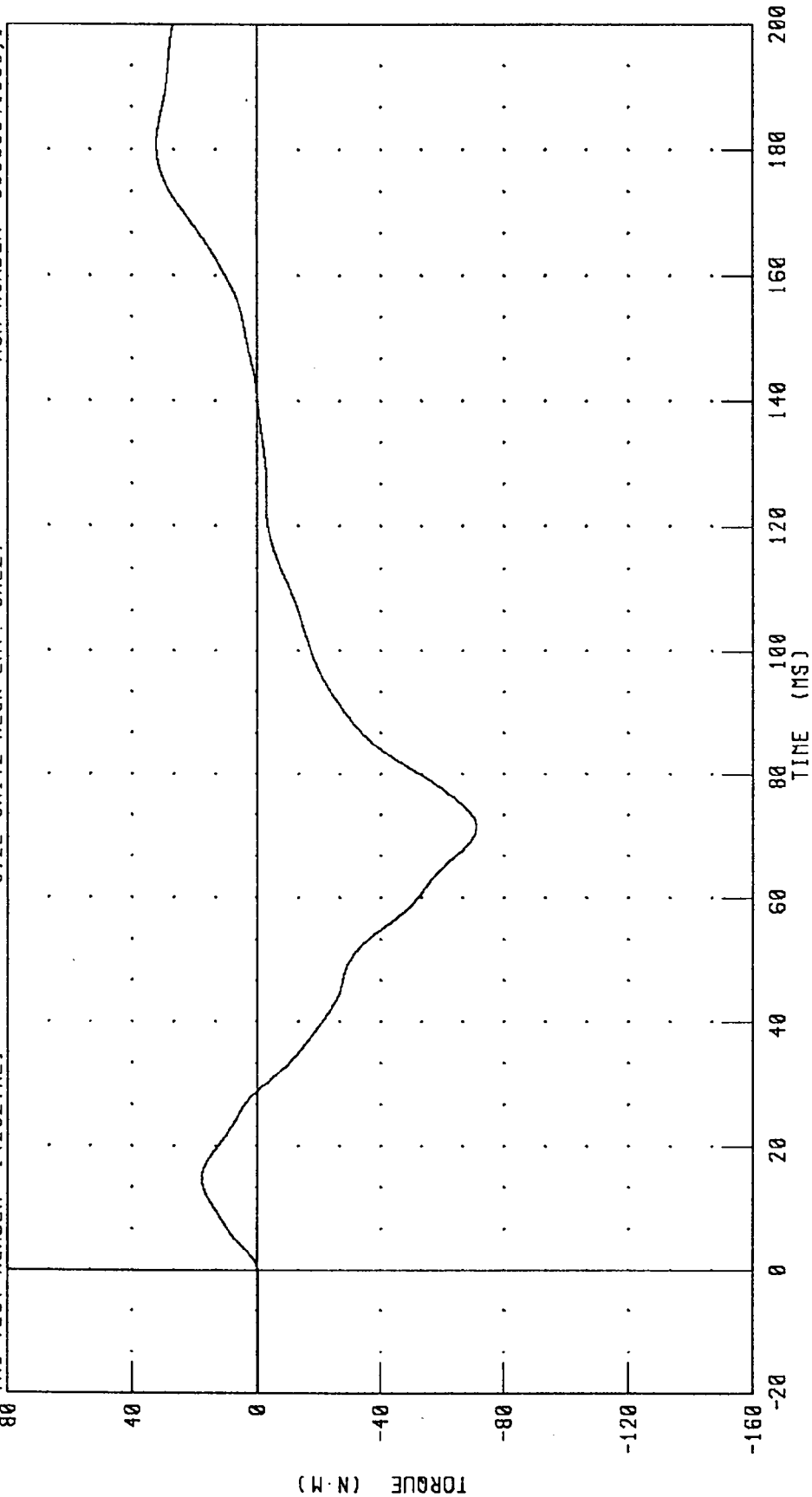


PEAK DATA: 28.09 N.M @ 180.24 MS; -60.96 N.M @ 71.44 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C27NE1 572E SN142 NECK EXT. CAL27 RUN NUMBER: 030695.1059;1



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 32.07 N-M @ 180.88 MS; -71.10 N-M @ 71.44 NS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

16-FEB-95

TRC INC.

TEST NO: 142C27TH1

572E SN 142 H.S.THORAX CAL 27

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	30.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	68.5 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5551. N
INTERNAL HYSTERESIS	69% - 85%	73.2%

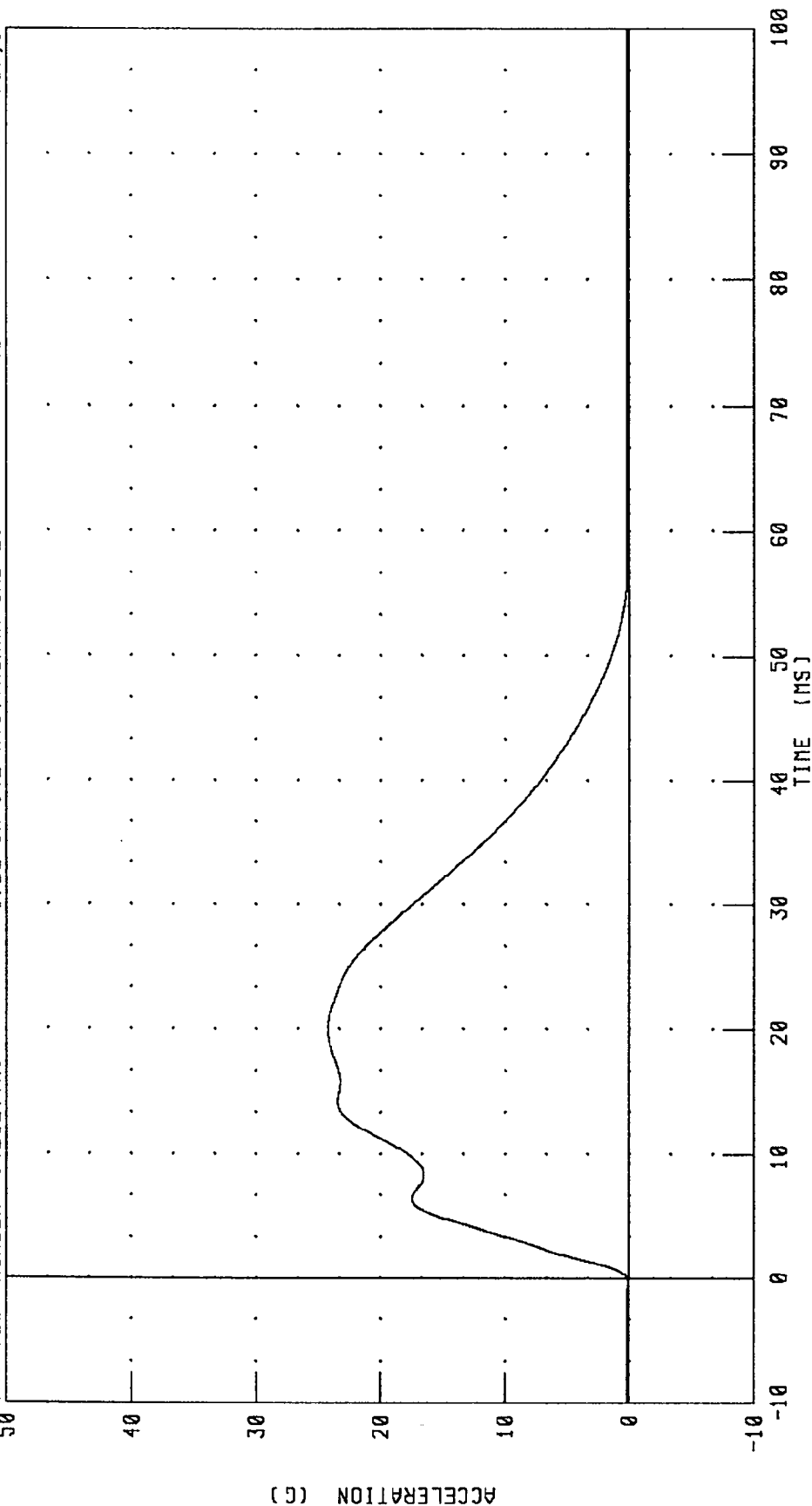
TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

RUN NUMBER: 021695.1221;1

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C27TH1 572E SN 142 H.S. THORAX CAL 27 RUN NUMBER: 030695.1059;1



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 24.23 G @ 20.00 MS; 0.10 G @ -0.32 MS

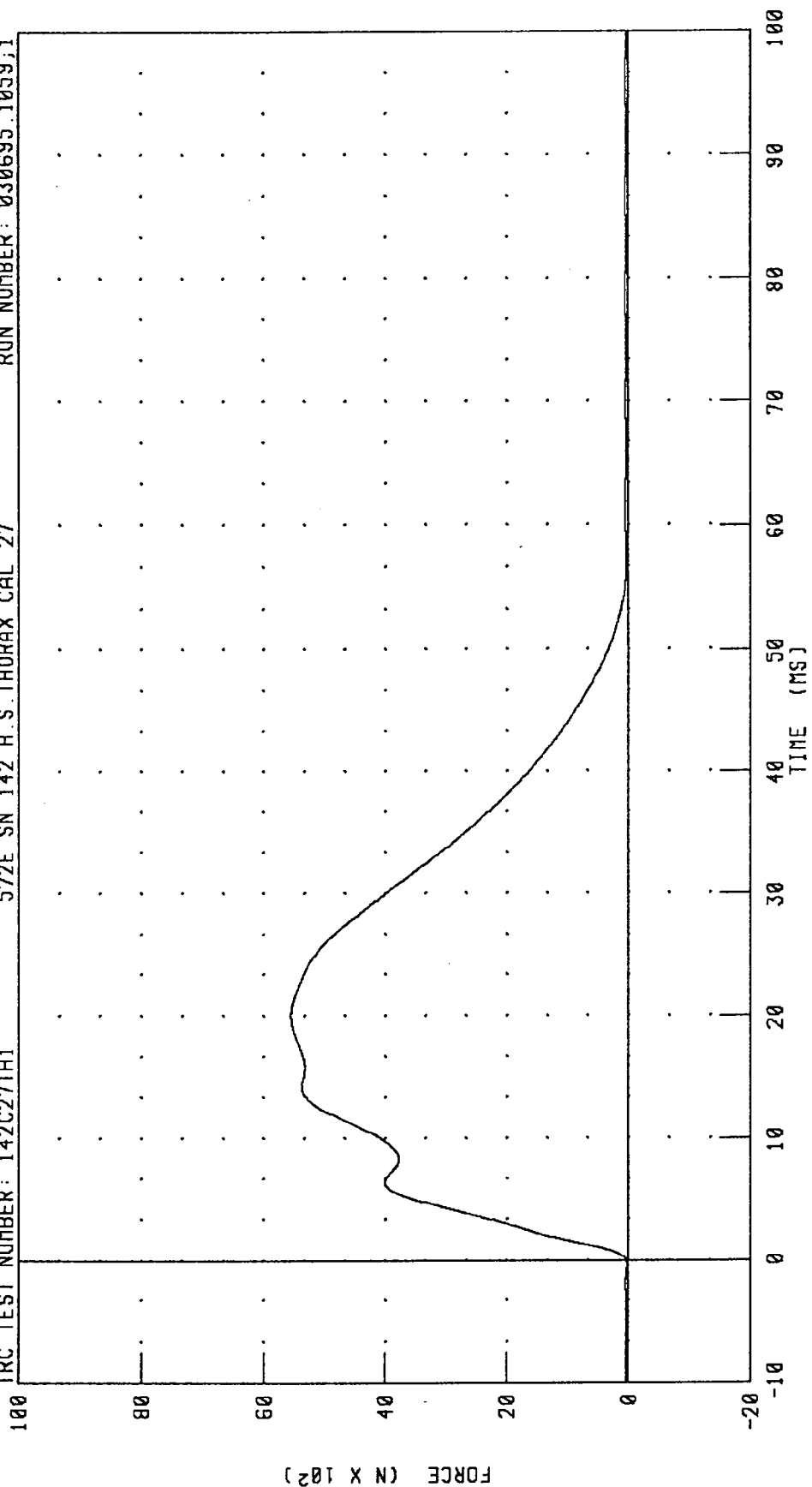
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 142C27TH1

572E SN 142 H.S. THORAX CAL 27

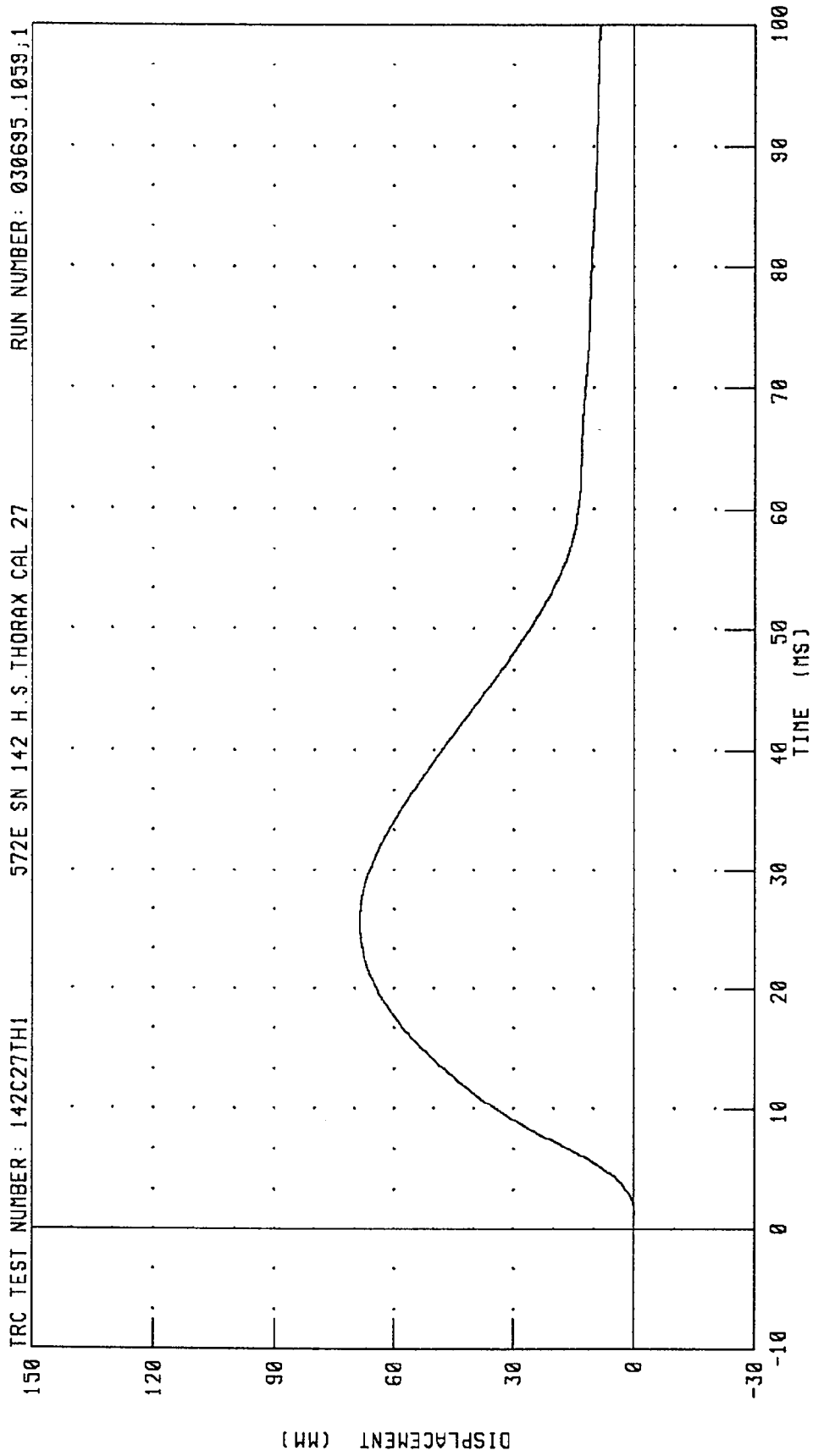
RUN NUMBER: 030695.1059;1



CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5551.67 N @ 20.00 MS; 23.63 N @ -0.32 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

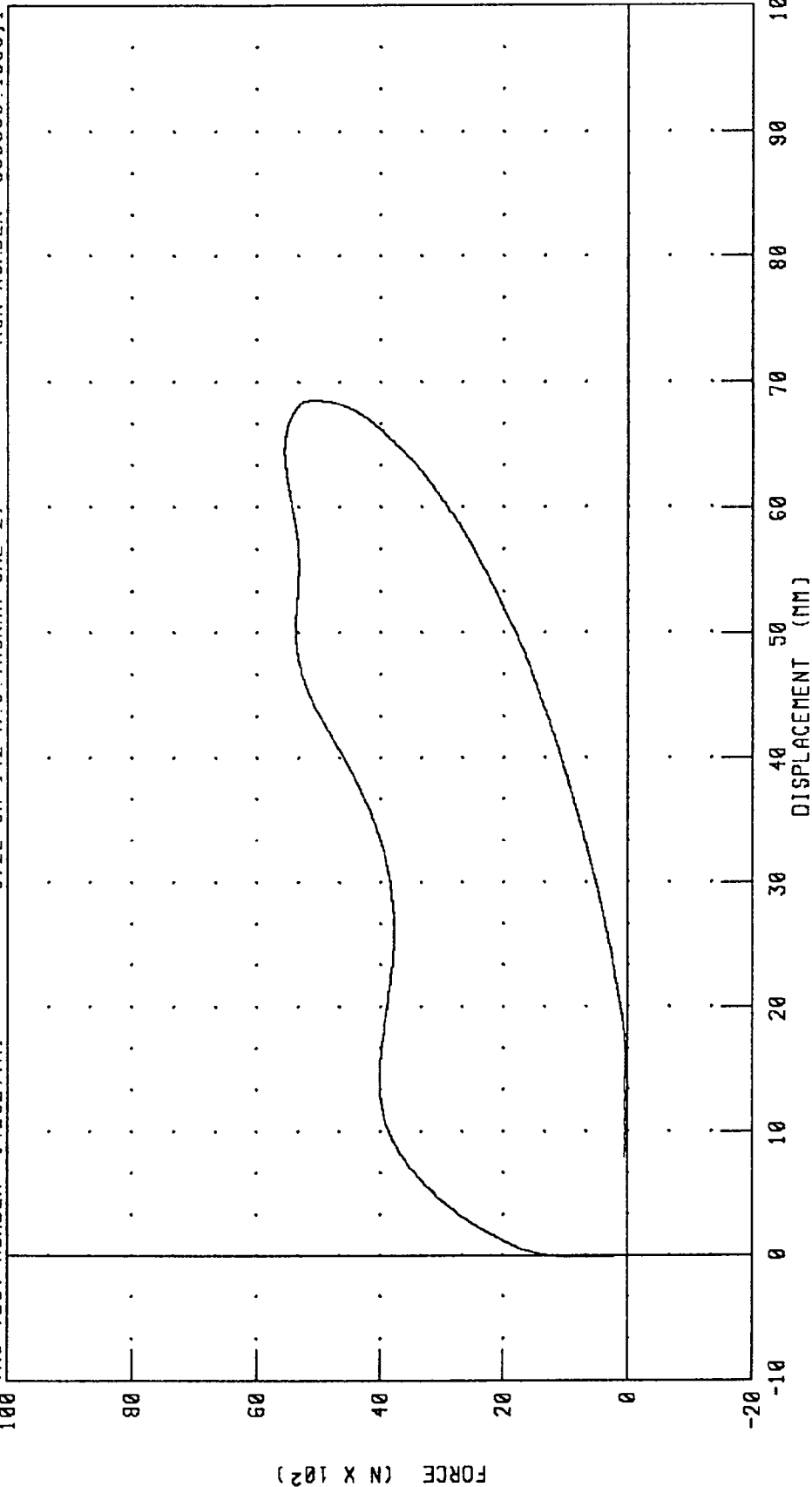


CHANNEL: CSTXD FILTER: CH. CLASS 180

PEAK DATA: 68.57 MM @ 25.44 MS; -0.06 MM @ 1.28 MS

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

TRC TEST NUMBER: 142C27TH1 572E SN 142 H.S. THORAX CAL 27 RUN NUMBER: 030695.1059;1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

DISPLACEMENT (MM)

PEAK DATA:

68.57 MM @ 25.44 MS; -0.06 MM @ 1.28 MS
5551.67 N @ 20.00 MS; 23.63 N @ -0.32 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

15-FEB-95

TRC INC.

TEST NO: 142C27RK1

572E SN142 RIGHT KNEE CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	21.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	5434.0 N

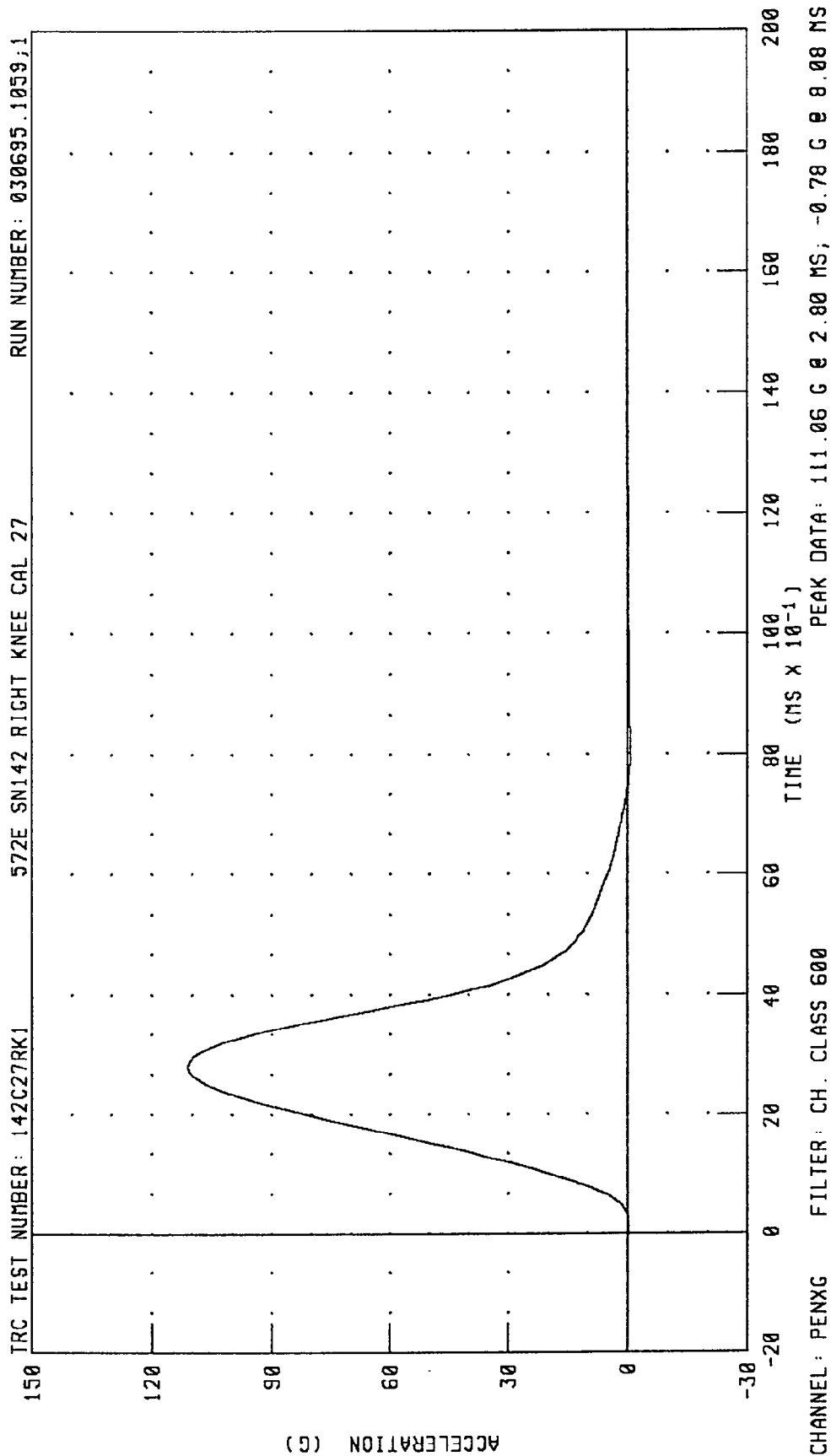
TEST MEETS SPECIFICATIONS

TECHNICIAN

Chas. Middleton

RUN NUMBER: 021595.1348;1

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



PART 572-E HYBRID III RIGHT KNEE CALIBRATION

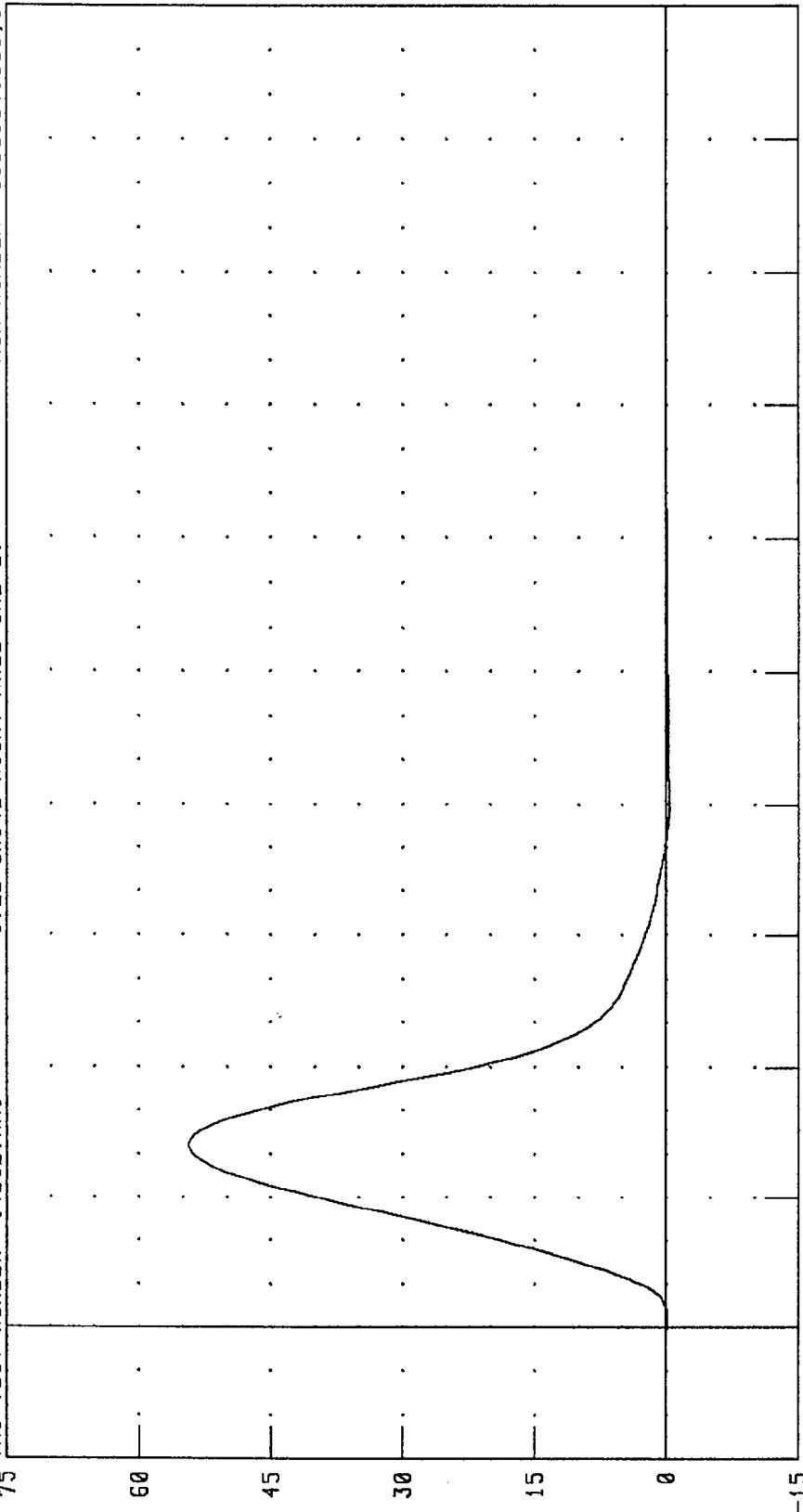
PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C27RK1

572E SN142 RIGHT KNEE CAL 27

RUN NUMBER: 030695.1059;1

75



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5434.05 N @ 2.80 MS; -38.28 N @ 8.08 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

15-FEB-95

TRC INC.

TEST NO: 142C27LK1

572E SN142 LEFT KNEE CAL 27

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	25.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4714 - 5783 N	4903.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Chas. Middleton

RUN NUMBER: 021595.1341;1

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

572E SN142 LEFT KNEE CAL 27 RUN NUMBER: 030695.1059;1

IRC TEST NUMBER: 142C27LK1

150

120

90

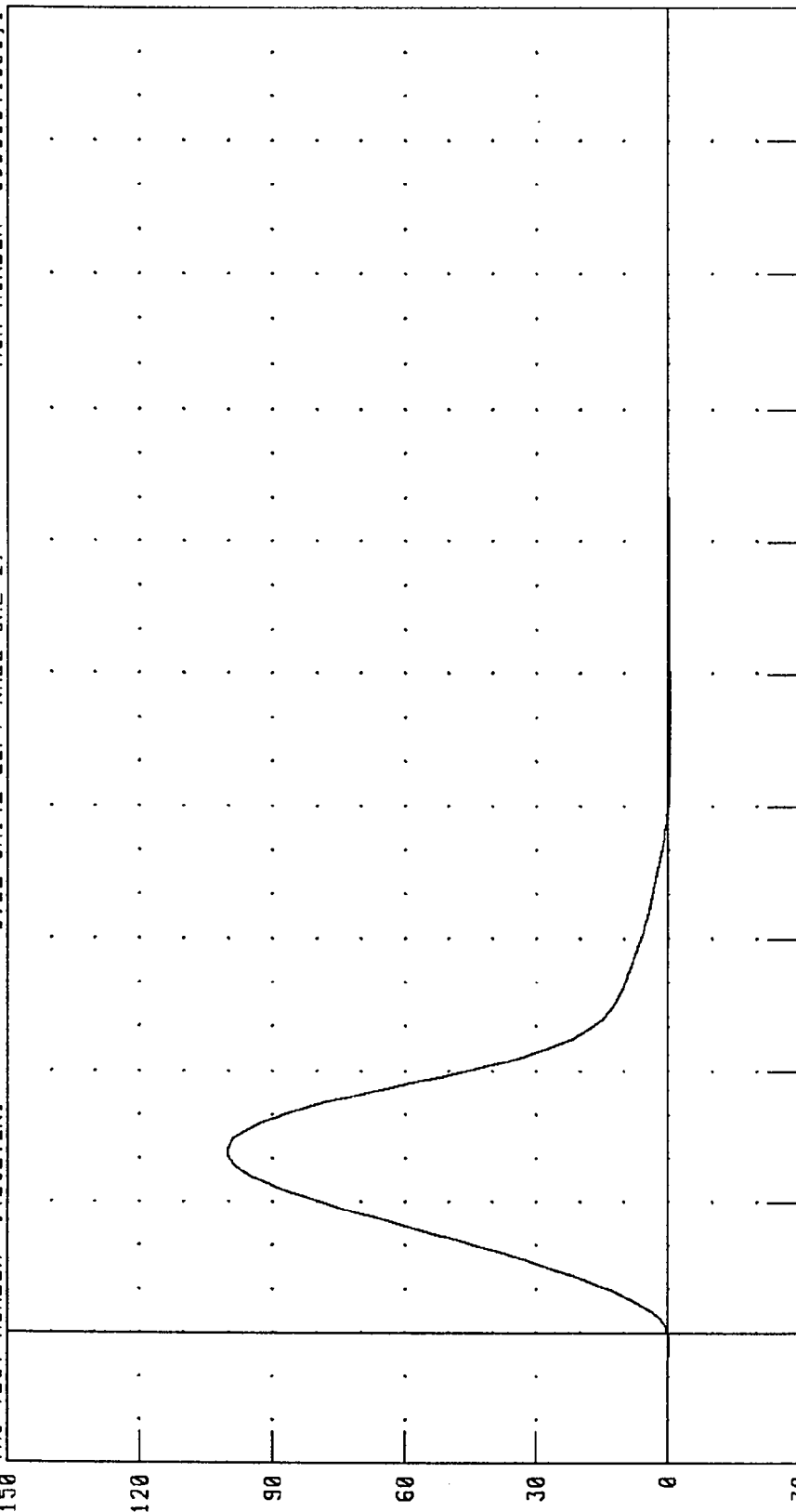
60

30

0

-30

ACCELERATION (G)



TIME (MS X 10⁻¹)

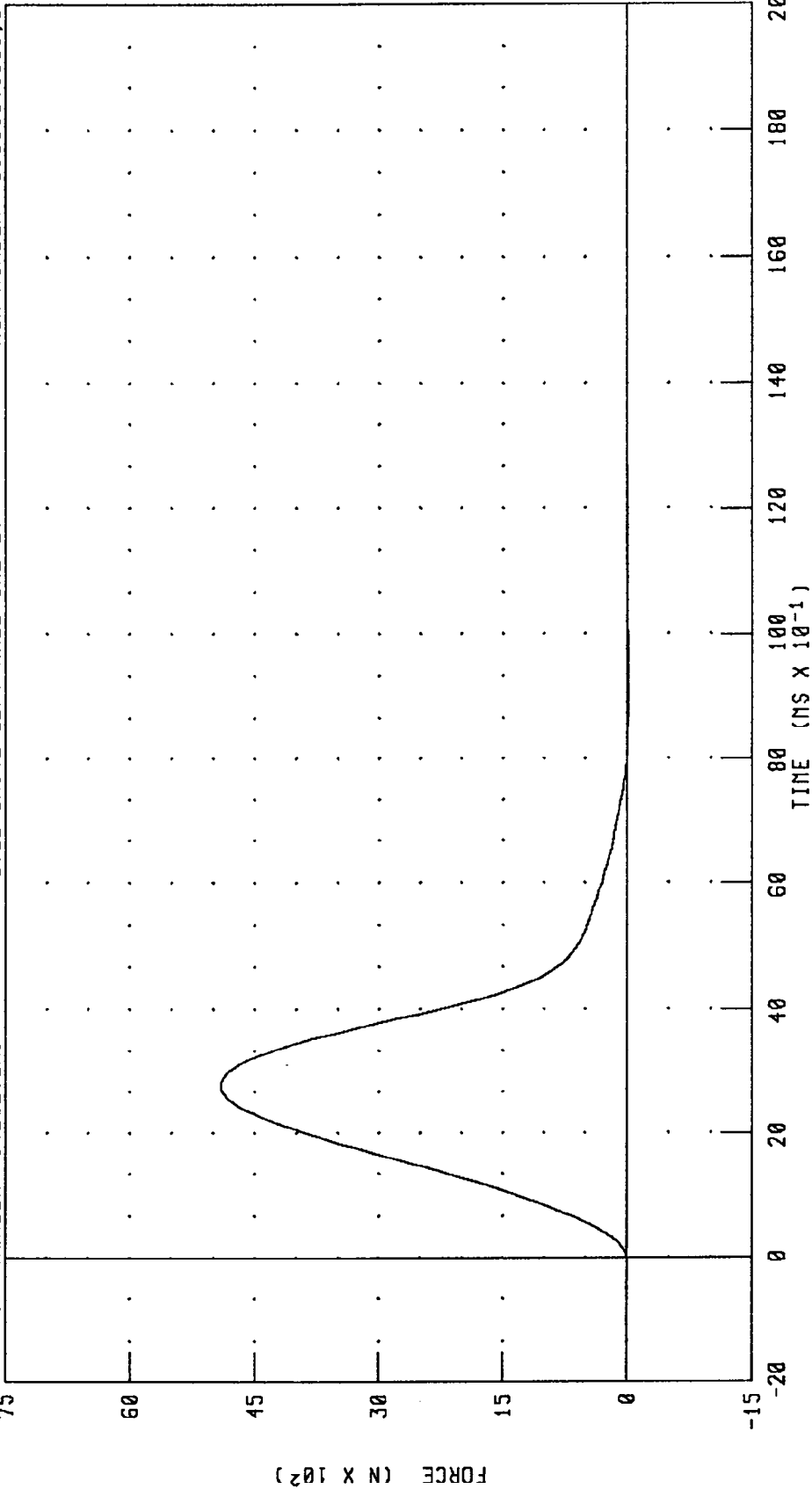
CHANNEL: PENXC FILTER: CH. CLASS 600

PEAK DATA: 100.23 G @ 2.80 MS; -0.50 G @ 9.28 MS

PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C27LK1 572E SN142 LEFT KNEE CAL 27 RUN NUMBER: 030695.1059;1



CHANNEL: PENXF

FILTER: CH. CLASS 600

PEAK DATA: 4903.99 N @ 2.80 MS; -24.24 N @ 9.28 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	02/30/95
Head Y-axis accelerometer	A84JJ	7264	Endevco	08/30/94	02/30/95
Head Z-axis accelerometer	DW04J	7264	Endevco	08/30/94	02/30/95
Chest X-axis accelerometer	CT22H	7264	Endevco	08/30/94	02/30/95
Chest Y-axis accelerometer	AC708	7264	Endevco	08/30/94	02/30/95
Chest Z-axis accelerometer	CW59H	7264	Endevco	08/30/94	02/30/95
Left femur force load cell	986	2430	GSE	08/30/94	02/30/95
Right femur force load cell	987	2430	GSE	08/30/94	02/30/95
Neck X-axis force load cell ¹	085	1716	Denton	08/30/94	02/30/95
Neck Y-axis force load cell ¹	085	1716	Denton	08/30/94	02/30/95
Neck Z-axis force load cell ¹	085	1716	Denton	08/30/94	02/30/95
Neck Moment about X-axis load cell ¹	085	1716	Denton	08/30/94	02/30/95
Neck Moment about Y-axis load cell ¹	085	1716	Denton	08/30/94	02/30/95
Neck Moment about Z-axis load cell ¹	085	1716	Denton	08/30/94	02/30/95
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	08/29/94	02/29/95

¹Hybrid III use only.

Dummy Instrument Calibrations

Right Front Passenger Dummy #142

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Head X-axis accelerometer	AGR73	7264	Endevco	12/30/94	06/30/95
Head Y-axis accelerometer	CY32H	7264	Endevco	08/29/94	02/29/95
Head Z-axis accelerometer	DB81H	7264	Endevco	08/29/94	02/29/95
Chest X-axis accelerometer	A79GJ	7264	Endevco	08/25/94	02/25/95
Chest Y-axis accelerometer	AC8W6	7264	Endevco	08/29/94	02/29/95
Chest Z-axis accelerometer	CW42H	7264	Endevco	08/29/94	02/29/95
Left femur force load cell	901	2430	GSE	08/30/94	02/30/95
Right femur force load cell	902	2430	GSE	08/30/94	02/30/95
Neck X-axis force load cell ¹	0280	1716	Denton	08/30/94	02/30/95
Neck Y-axis force load cell ¹	0280	1716	Denton	08/30/94	02/30/95
Neck Z-axis force load cell ¹	0280	1716	Denton	08/30/94	02/30/95
Neck Moment about X-axis load cell ¹	0280	1716	Denton	08/30/94	02/30/95
Neck Moment about Y-axis load cell ¹	0280	1716	Denton	08/30/94	02/30/95
Neck Moment about Z-axis load cell ¹	0280	1716	Denton	08/30/94	02/30/95
Pelvis X-axis accelerometer	AJ8A6	7264	Endevco	10/11/94	04/11/95
Pelvis Y-axis accelerometer	AJ8J7	7264	Endevco	10/11/94	04/11/95
Pelvis Z-axis accelerometer	AJ789	7264	Endevco	10/11/94	04/11/95
Chest deflection potentiometer ¹	90320B	81422A	Vernitech	08/29/94	02/29/95

¹ Hybrid III use only.

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Left rear seat crossmember X-axis	DT96JT	7264	Endevco	01/31/95	07/31/95
Left rear seat crossmember X-axis redundant	AGRG7	7264	Endevco	09/08/94	03/08/95
Right rear seat crossmember X-axis	DW12J	7264	Endevco	12/13/94	06/13/95
Right rear seat crossmember X-axis redundant	DY61J	7264	Endevco	01/06/95	07/06/95
Engine top X-axis	AGR75	7264	Endevco	09/13/94	03/13/95
Engine bottom X-axis	ACCJO	7264	Endevco	09/08/94	03/08/95
Right brake caliper X-axis	DR10JT	7264	Endevco	09/08/94	03/08/94
Left brake caliper X-axis	DW19J	7264	Endevco	01/02/95	07/02/95
Instrument panel center X-axis	DW34JC	7264	Endevco	10/27/94	04/27/95

Calibration Laboratory Instruments

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

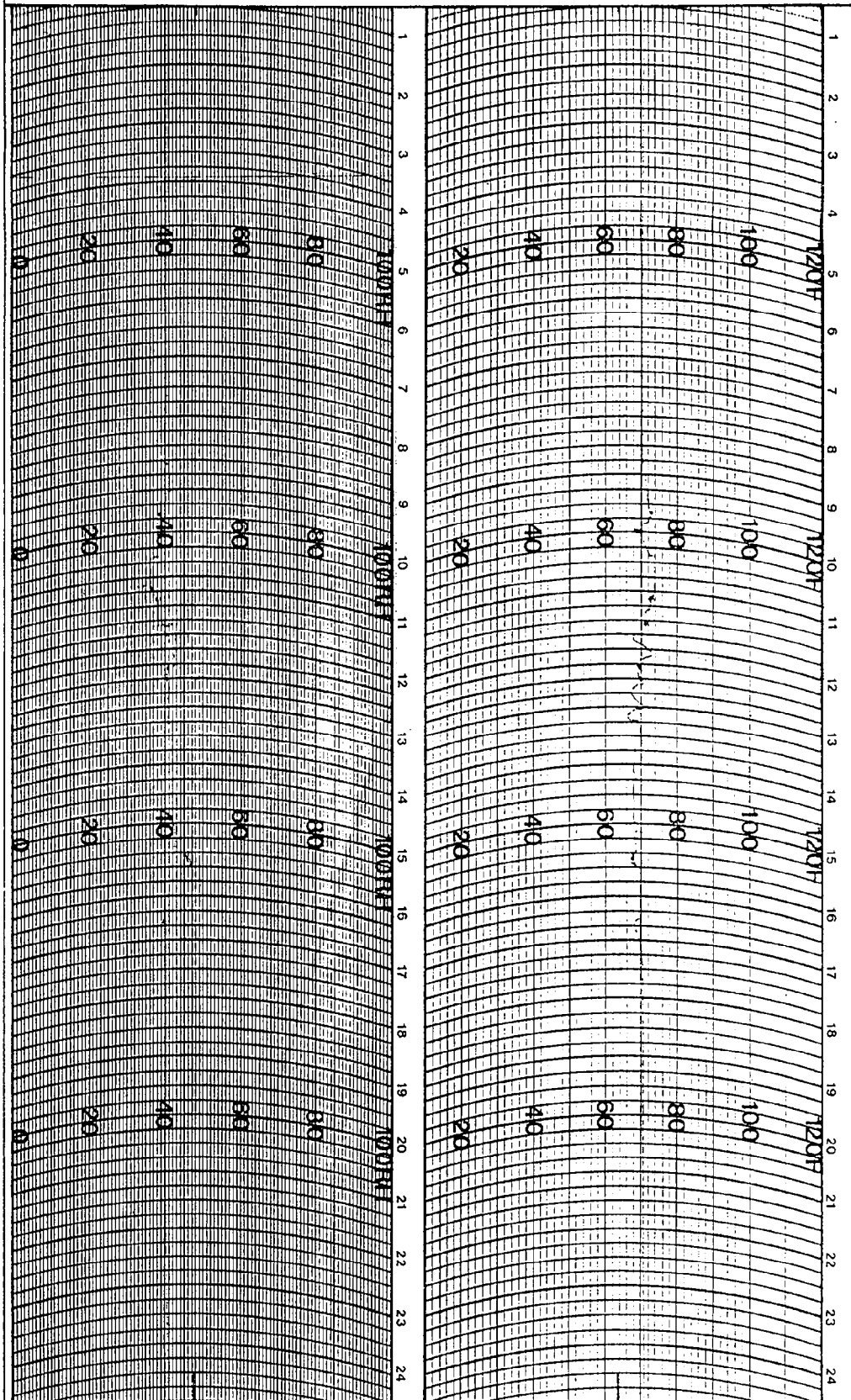
Sign Convention
NHTSA Data Tape Reference Guide

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

Frequency Response Classes

SAE J211 OCT88

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



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

HYGROTHERMOGRAPH
 1 DAY

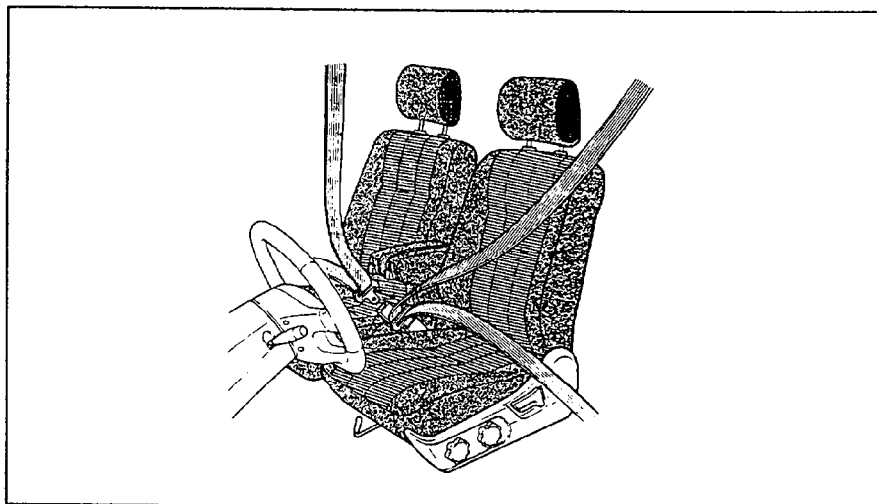
CHART # C311 D HF
 PART # 699123

STATION _____ DATE ON _____ DATE OFF _____

Appendix E

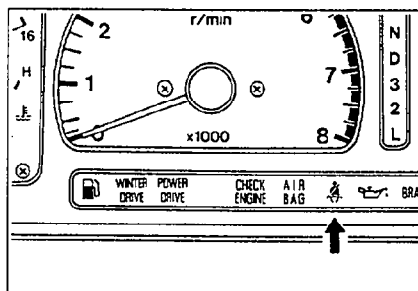
Restraint System Instructions from Owner's Manual

3. Seat, Seat belts and Air Bags / SEAT BELTS



① SEAT BELT REMINDER

When the key is turned to the "ON" position, a light will be illuminated until the driver's seat belt is buckled. Unless the driver's seat belt is buckled, a buzzer will sound for four to eight seconds.



3-16

② FRONT AND REAR SEAT LAP/SHOULDER BELTS

Safety Belt/Air Bag Relationship

The Air Bag is formally called a Supplemental Restraint System (SRS). The SRS may not provide protection for an unbelted driver and a right front passenger. Both the driver and the right front passenger must always use the seat belts. That's true not only in frontal collisions, but especially in side and other collisions.

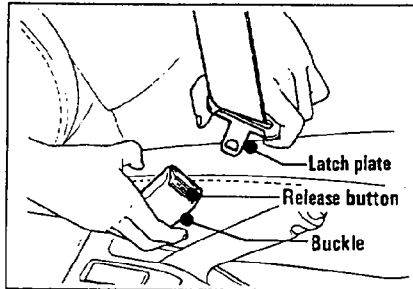
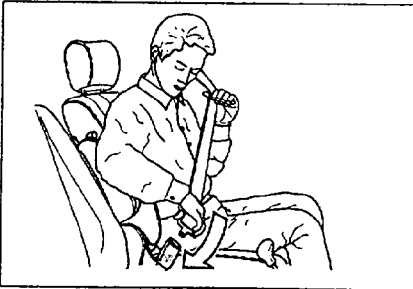
WARNING



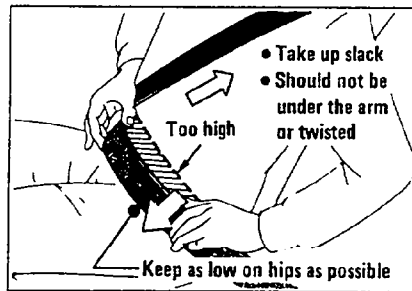
To help lessen the chance of injury in accidents or sudden stops, we urge that people riding in the vehicle must be properly restrained at all times, using the seat belts provided. This includes children and pregnant women. See the following pages for use of restraints by children and pregnant women.

To Fasten the Seat Lap/Shoulder Belt

1. Adjust the front seat as needed. Sit up straight and well back in the seat.
2. Grasp the latch plate and:
 - Pull the lap-shoulder belt webbing across the body.
 - At the same time, slide the latch along the belt until it reaches the buckle.
 - Push the latch plate into the buckle until it clicks.



3. Position the "lap" portion of the belt across the lap as **LOW ON THE HIPS** as possible.



Then, adjust to a **SNUG FIT** by holding the "shoulder" portion of the front seat belt and pulling it **UPWARD** through the latch plate

- until the lap portion is snug across the lap. This reduces the risk of sliding under the belt during an accident.
4. To unfasten the belt, push in the button on the buckle. The belt should retract when the buckle is unlatched but hold the latch plate as it does so, to keep it from hitting people or nearby objects. To help prevent damage to the safety belt and interior trim, before closing the door be sure the belt is fully retracted and the latch plate is out of the way.

WARNING



- A snug fit with the lap belt positioned low on the hips is necessary to lessen the chance of injury and/or the degree of injury in an accident. This spreads the force of the lap belt over the hip bone instead of across the abdomen.
- Never use the same seat belt for more than one person at a time. A seat belt worn by more than one person will not provide adequate protection in the event of a collision.
- Never wear twisted seat belts.

- Be very careful not to damage seat belts or seat belt buckles by pinching them in the seat or the door.
- Too much slack could increase the amount of injury because the belt would not be able to properly restrain you in an accident. **DO NOT** wear the shoulder belt under the arm or out of position. Such use could increase the chance of injury and/or the degree of injury in an accident.
- According to Federal accident statistics, children are safer when properly restrained in rear seating positions than in the front seating positions. It is advisable to have children seated in the rear center seat and restrained with the vehicle's safety belt. Children who have outgrown child restraint systems should use the vehicle's safety belts and sit in the rear seat. If the child's seating position has a shoulder belt which is on or very close to the face or neck, position the child so that the belt is properly positioned.

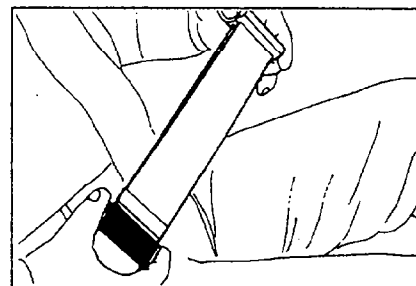
NOTE

- The retractor will lock the belt only during a sudden stop or on impact.
- At other times you can move around freely.
- The seat belts for the front and rear passenger seats have an additional locking mechanism designed for securing child restraint seats. When the belt is pulled all the way out, the locking mechanism will only permit the belt to retract. Do not pull the belt all the way out except when using it to secure a child restraint seat. If the belt is inadvertently pulled all the way out, let the belt fully retract before using it for an adult passenger.

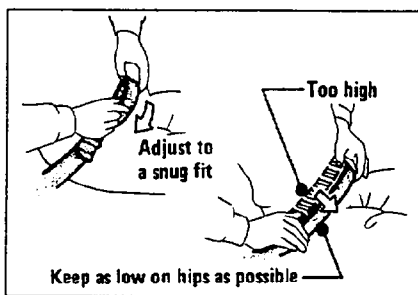
**③ REAR CENTER SEAT LAP BELTS
(Non-retractor type)**

1. Sit up straight and well back in the seat.
2. Take hold of the latch plate at an angle to the webbing and slide it toward the front of vehicle. Then pull it slowly across your lap and

push the latch plate into the buckle until it clicks.

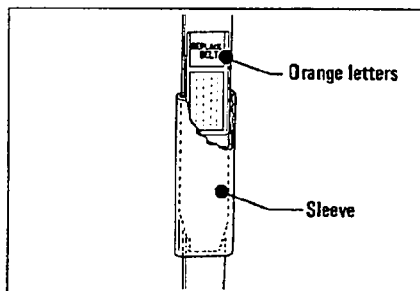


3. Position the belt across the lap as **LOW ON THE HIPS** as possible. Then, adjust to **SNUG FIT** by holding the free end of the webbing and pulling it through the latch plate until the belt is snug across the lap. This reduces the risk of sliding under the belt during an accident.
4. To unfasten the belt, push in the button on the buckle.



4 SEAT BELT REPLACEMENT LABEL

The front seat safety belts have a loop of webbing under the sleeve for effectiveness of the entire restraint system.



WARNING



• **Torn, frayed or damaged seat belts may not protect you in the event of an accident or a sudden stop. If a belt is torn, frayed or damaged, have it replaced immediately. Also, replace the front seat safety belt when the loop has been pulled out and the orange letter words "REPLACE BELT" are visible at the top edge of the sleeve.**

5 SEAT BELT INSPECTION

- Occasionally check that the belts, buckles, latch plates, retractors, reminder systems, guide loops, and anchors work properly. Also check for damage that could keep the restraint system from doing its job.
- Keep sharp edges and damaging objects away from the belts and other parts of the restraint system.
- Replace belts if cut, weakened, or frayed. Also, have belts replaced if they have been worn in a collision.
- If there is any doubt, have all related parts including belts replaced.
- Keep belts clean and dry.

WARNING



• **Do not bleach or dye the seat belts, since it may severely weaken them. In the event of an accident or a sudden stop, the belts may not adequately restrain the occupants. Clean the safety belts only with mild soap and luke warm water.**

6 CHILD RESTRAINT

Children in vehicles should be restrained to help lessen the chance and/or severity of injuries in the event of an accident or a sudden stop. Never let a child of any age stand or kneel on any seat. Use of infant or child restraint systems which conform to Federal motor vehicle safety standards and which are installed according to their manufacturer's instructions is the surest way of minimizing the risk of injury to young passengers. Older children should be placed on a seat and restrained with the seat belts provided with your vehicle. Both lap and shoulder belts should be used.

The use of infant or child restraint systems may be required by the laws of your state. You should check with the appropriate state authorities to ensure that you are in compliance with these laws.

- Secure the child in the restraint in accordance with the manufacturer's instructions.
- Push and pull the child restraint in all directions to be sure it is secure.
- If the child restraint is not secure, use a different seating position in the vehicle.
- Secure the child restraint with the lap belt or the portion of lap-shoulder belt

in accordance with restraint manufacturer's instructions.

WARNING



- For effective protection in automobile accidents and sudden stops, children should not be transported unrestrained. The preferred restraint for small children is a child restraint system. If this is not available, children should be placed in the rear seat and restrained with the lap belt if they are old enough to sit alone.
- Holding a child in your arms is dangerous. In an accident, a child held in a person's arms can be struck or crushed by any unrestrained occupant. An unrestrained child can also be injured by striking the interior, or by being ejected from the vehicle during a sudden maneuver or impact.
- All child restraint systems are designed to be secured in vehicle seats by lap belts or the lap portion of a lap-shoulder belt.

- Children could be injured in a crash if the child restraint is not properly secured in your vehicle.
- According to Federal accident statistics, children are safer when properly restrained in the rear seating positions than in the front seating positions.
- It is recommended that children or infants be restrained in an appropriate child or infant restraint secured in the rear seating position.
- An inflating air bag can seriously injure small children. Do not install rearward-facing child seats in front passenger seat position. You may secure a forward-facing child restraint in the rightfront seat. However, before securing a forward-facing child restraint, always move the front passenger seat in the most rearward position, or secure the child restraint in the rear seat.
- Children should not ride in the cargo area.

CHILD RESTRAINT SEAT INSTALLATION WITH THE SEAT BELT

A child restraint seat can be secured in either the front or a rear passenger seat with the seat belt, as follows:

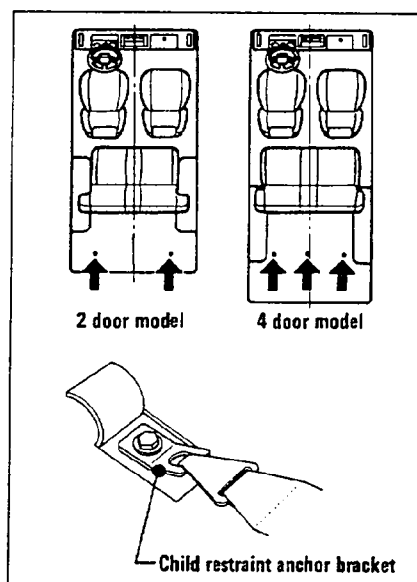
1. Place the child restraint seat on the passenger seat.
2. Secure the child in the child restraint seat, carefully following the child restraint seat instructions.
3. Pull out the seat belt and place the lap portion of the belt through or around the child restraint seat, carefully following the child restraint seat instructions.
4. Buckle the seat belt.
5. Pull the seat belt all the way out from the retractor to its full length and then let the belt retract slowly until the child restraint seat is secured by the belt. This step is required to lock the seat belt in place to secure the child restraint seat.
6. To remove the child restraint seat, unbuckle the seat belt and let it fully retract.



NOTE

- *The seat belts for the front and rear passenger seats have an additional locking mechanism designed for securing child restraint seats. When the belt is pulled all the way out, the locking mechanism will only permit the belt to retract. Do not pull the belt all the way out except when using it to secure a child restraint seat. If the belt is inadvertently pulled all the way out, let the belt fully retract before using it for adult passengers.*

Child Restraint Anchor Bracket Installation

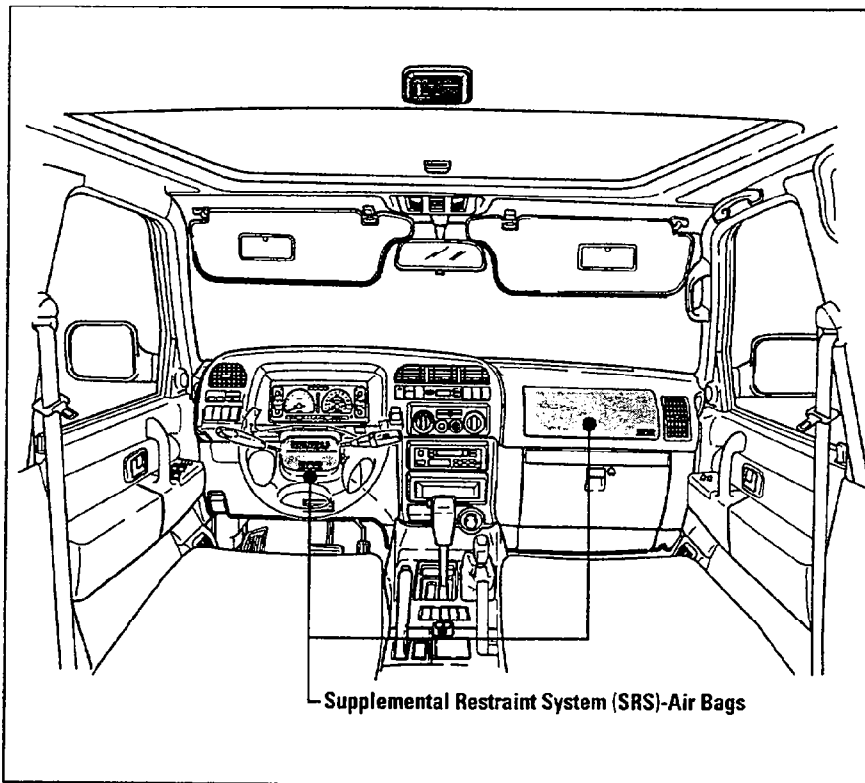


The child restraint anchor bracket is available, and it is stored in the glove box. Installation instructions are included with the bracket.

⑦ RESTRAINT OF PREGNANT WOMAN

It is recommended that pregnant women use seat belts. Check with your doctor for specific recommendations. The lap belt should be snug and positioned as low as possible around the hips. Do not position the lap belt around the waist. This can be very dangerous in the event of an accident or sudden stop.

3. *Seat, Seat belts and Air Bags* / **SUPPLEMENTAL RESTRAINT SYSTEM (SRS)- AIR BAGS**



Supplemental Restraint System (SRS)-Air Bags

This section explains the Supplemental Restraint System (SRS) - Air Bags. Your Trooper has an air bag for both the driver and the right-front passenger.

Here's the most important thing to know:

WARNING



- The Supplemental Restraint System (SRS) - Air Bags may not provide protection for an unbelted driver and a right front passenger. Air bags are not designed to inflate in rollovers or in rear, side or low-speed frontal crashes. You must wear your seat belt to reduce the chance of hitting things inside the vehicle or being ejected from it. Always wear your seat belt, even with an air bag. Also refer to the supplement "Supplemental Restraint System (AIR BAG)".

WARNING

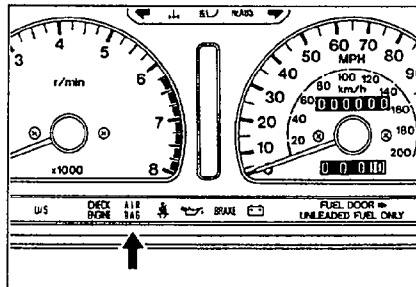


- If you're too close to an inflating air bag, it could seriously injure you, since it flates with great force, faster than the blink of an eye. Seat belts help keep you in position for an air bag inflation in a crash. Always wear your seat belt even with an air bag. The driver should sit as far as back possible while still maintaining control of the vehicle and the right passenger occupant should also sit as backwards as possible. Do not sit or learn unnecessarily close to the air bag.
- An inflating air bag can seriously injure small children. Always secure children properly in your vehicle. Do not install rearward-facing child seats in front passenger seat position. Because, a rear-facing child restraint in the front seat could be pushed into the seatback by the right front passenger's air bag if it inflates. A child in a

rear-facing child restraint can be seriously injured if this happens.

You may secure a forward-facing child restraint in the right front seat. However, before securing a forward-facing child restraint, always move the front passenger seat in the most rearward position, or secure the child restraint in the rear seat.

AIR BAG READINESS INDICATOR LIGHT



There is an air bag readiness indicator light on the instrument panel, which has "AIR BAG" on it. The system checks

itself and the light tells you if there is a problem. You will see this light blink 7 times when you turn your ignition to ON or START. Then the light should go out which means the system is ready. If the air bag readiness indicator light illuminates at any other time, or the indicator fails to perform properly when you turn your ignition to ON or START the Air Bag System needs repair. Until it is serviced, the system may not inflate in the event of the type of collision that would normally activate it or may inflate in the unwanted event.

The air bag readiness indicator light monitors itself and the electrical system that connects the sensors and various electronic components and power sources. Your Isuzu Dealer is best qualified to check and repair the system if needed.

WARNING

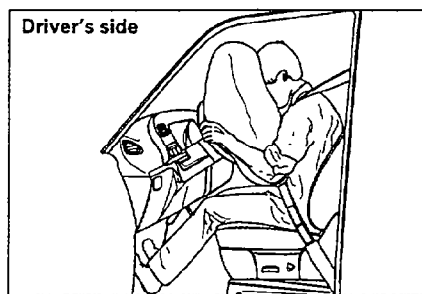


If the air bag readiness indicator light doesn't come on and blink 7 times when you turn your ignition to ON or START, your air bag system may not work properly. Have your vehicle serviced right away at your nearest Isuzu dealer.

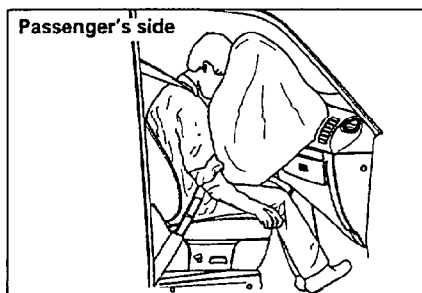
HOW THE AIR BAG SYSTEM WORKS

Where are the air bags?

The driver's air bag is in the middle of the steering wheel.



The right-front passenger's air bag is located in the instrument panel on the passenger's side.



What will you see after an air bag inflation?

After the air bag has inflated, it will then quickly deflate. This occurs so quickly that some people may not even realize that the air bag inflated. The air bag will not impede the driver's vision or ability to steer the vehicle, nor will it hinder the occupants from exiting the vehicle. There will be small amounts of smoke coming from vents in the deflated air bags. Some components of the air bag module in the steering wheel hub for the driver's air bag or the instrument panel for the passenger's bag may be hot for a short time.

The nitrogen gas in driver side and argon gas in right-front passenger side used to inflate the air bag will have vented into the passenger compartment and the bag will be deflated within seconds after the collision.

As the nitrogen and argon vent from the bag, small particles are also vented into the passenger compartment. In many crashes severe enough to inflate an air bag, windshields are broken by vehicle deformation. Additional windshield breakage may occur in vehicles with passenger air bags because the windshield acts as a reaction surface for the inflating air bag.

3-25

WARNING



- Don't put anything on, or attach anything to, the steering wheel pad or the instrument panel. Also, don't put anything (such as objects or pets) between any occupant and the steering wheel pad or instrument panel. If anything is between the occupant and the air bag, it could affect the performance of the air bag, or, worse, it could cause injuries to the occupants.
- The air bags are designed to inflate only once. After they inflate, you'll need some new parts for your air bag system. If you don't get them, the air bag system won't be there to help protect you in another crash. A new system will include air bag modules, sensors and possibly other parts.
- Let only qualified technicians work on your air bag system. Improper service can mean that your air bag system won't work properly. See your Isuzu dealer for service.

SERVICING YOUR ISUZU WITH THE AIR BAG SYSTEM

Please tell or remind anyone who works on your Isuzu that it has air bag system. There are parts of the air bag system in several places around your vehicle. You don't want the system to inflate while someone is working on your vehicle. The air bag system does not need regular maintenance. Your Isuzu Dealer and the 1995 Workshop Manual have information about the air bag system including repair or disposal.

WARNING



Do not attempt to repair or service the air bag system by your self.

Tampering with it could cause it to activate, and this could result in serious injuries. For service and repairs, have an authorized Isuzu dealer do the work.

NOTE

If you damage the door for the right-front passenger's air bag, it may not work properly. You may have to replace the air bag. Don't open or break the air bag door.

WARNING



For up to 2 minutes after the ignition key is turned off and the battery disconnected, an air bag can still inflate during improper service. You can be injured if you are close to an air bag when it inflates. Be sure to follow proper service procedures, and make sure the person performing the work for you is qualified to do so.

When is an air bag expected to inflate?

The air bag is designed to inflate in moderate to severe frontal or near-frontal crashes. The air bag will only inflate if the velocity of the impact is above the designed threshold level. When impacting straight into a wall that does not move or deform, the threshold level is between 9 and 15 mph (14 and 24 km/h). However, this velocity threshold may be several miles-per-hour faster or slower. In addition, this threshold velocity will be considerably higher if the vehicle strikes an object such as a parked car which will move and deform on impact. The air bag is also not designed to inflate in rollovers, side impacts, or rear impacts where the inflation would provide no occupant protection benefit. In any particular crash, the determination of whether the air bag should have inflated cannot be based solely on the level of damage on the vehicle(s). Inflation is determined by the angle of the impact and the vehicle's deceleration of which vehicle damage is only one indication. Repair cost is not a good indicator of whether an air bag should have deployed.

What makes an air bag inflate?

In a frontal or near-frontal impact of sufficient severity, sensors strategically located on the vehicle detect that the vehicle is suddenly stopping as a result of a crash. These sensors complete an electrical circuit, triggering a chemical reaction of the sodium azide sealed in the inflator. The reaction produces nitrogen gas in driver side and argon gas in right-front passenger side which inflates a cloth bag. The inflator, cloth bag, and related hardware are all part of the air bag inflator modules packed inside the steering wheel and in the instrument panel in front of the passenger.

How does an air bag restrain?

In moderate to severe frontal or near-frontal collisions, even belted occupants can contact the steering wheel or the instrument panel. The air bag supplements the protection provided by safety belts. Air bags distribute the force of the impact more evenly over the occupant's upper body, stopping the occupant more gradually. But air bags will not provide protection in many types of collisions, including rollovers and rear and side impacts, primarily because an occupant's motion is not toward the air bag. Air bags should never be regarded as anything more than a supplement to safety belt protection in moderate to severe frontal and near-frontal collisions.