

Report Number NCAP-TRC-97-003

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Toyota Motor Corporation

1997 Toyota RAV4

special purpose vehicle

NHTSA Number: MV5100

TRC Test Number: 970124

Prepared By:

Transportation Research Center Inc.

10820 State Route 347

East Liberty, OH 43319



February 20, 1997

Final Report

Prepared For:

U. S. Department of Transportation
National Highway Traffic Safety Administration

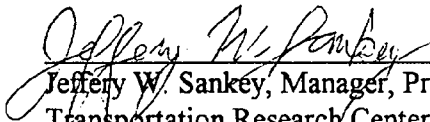
Performance Standards,
Office of Crashworthiness Standards,
Motor Vehicle Information Division

Mail Code: NPS-22
400 Seventh Street, S.W., Room 5315
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract Number DTNH22-96-D-22010. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

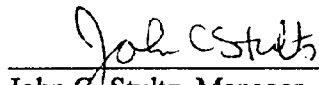
This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Report prepared by:


Jeffery W. Sankey, Manager, Project Operations
Transportation Research Center Inc.

Date 2/20/97

Report approved by:


John C. Stultz, Manager, Technical Development
Transportation Research Center Inc.

Date 2/20/97

Final report accepted by:

Manager, New Car Assessment Program
NHTSA, Office of Market Incentives

Date _____

Contracting Officer's Technical Representative (COTR),
NHTSA, Office of Market Incentives

Date _____

1. Report No. NCAP-TRC-97-003	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Final Report of New Car Assessment Program (NCAP) Frontal Barrier Impact Test of a 1997 Toyota RAV4 special purpose vehicle, NHTSA No. MV5100		5. Report Date February 20, 1997	
		6. Performing Organization Code TRC	
7. Author(s) Jeffery W. Sankey, Manager, Project Operations		8. Performing Organization Report No. NCAP-TRC-97-003	
9. Performing Organization Name and Address Transportation Research Center Inc. 10820 State Route 347 East Liberty, OH 43319-0367		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. DTNH22-96-D-22010	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Performance Standards, Office of Crashworthiness Standards; Motor Vehicle Information Division, Mail Code NPS-10 400 Seventh Street, S. W., Room 5311, Washington, DC 20590		13. Type of Report and Period Covered Final Report January - February 1997	
		14. Sponsoring Agency Code NPS-10	
15. Supplemental Notes			
16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1997 Toyota RAV4 special purpose vehicle, NHTSA No. MV5100, at Transportation Research Center Inc. on January 24, 1997. This test was conducted in accordance with Office of Crashworthiness Standards NCAPTP090196 for the determination of vehicle crashworthiness. The barrier impact velocity was 56.2 kph. The vehicle's maximum static crush was 583 millimeters. The ambient temperature was 21° C. The driver's Head Injury Criteria (HIC) was 919. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.4 g. The driver's maximum chest deflection was 39 millimeters. The driver's left and right femur maximum axial forces were 2762 N and 4764 N, respectively. The passenger's HIC was 743. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 57.1 g. The passenger's maximum chest deflection was 42 millimeters. The passenger's left and right femur maximum axial forces were 3922 N and 3351 N, respectively.			
17. Key Words 56 kph (35 mph) Frontal Barrier Impact Test: New Car Assessment Program (NCAP)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 400 Seventh Street, S. W., Room 5108 Washington, DC 20590	
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. Number of Pages 361	22. Price

METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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

*1 m = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Mon. Publ. 216, Units of Weights and Measures, Price \$2.25, 30 Carlogh Wn. C 13 10 266.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	miles	mi
		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

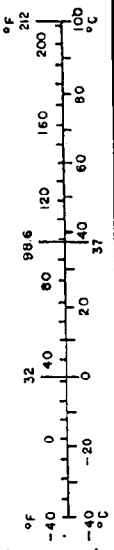


Table of Contents

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	Purpose and Test Procedure	1-1
2.0	Frontal Barrier Impact Test Summary	2-1
3.0	FMVSS 212, 219 (partial), and 301 Data	3-1
4.0	Occupant, Camera, And Vehicle Information	4-1
Appendix A	Photographs	A-1
Appendix B	Data Plots	B-1
Appendix C	Dummy Certification Data	C-1
Appendix D	Miscellaneous Test Information	D-1
Appendix E	Restraint System Instructions From Owner's Manual	E-1

List of Tables

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Crash Test Summary	2-4
2	Test Vehicle Information	2-5
3	Post-Impact Data	2-8
4	Vehicle Accelerometer Locations and Data Summary	2-12
5	Post-Impact Dummy/Vehicle Data	2-13
6	FMVSS 208 Data Summary	2-14
7	Hybrid III Data Summary	2-15
8	Seat Belt Performance Assessment Test Data	2-18
9	Load Cell Barrier Data Summary	2-20
10	Fuel System Data	3-4
11	FMVSS 301 Post-Impact Test Data	3-5
12	Dummy Measurement Data for Front Seat Occupants	4-3
13	Motion Picture Camera Locations	4-7
14	Impacted Vehicle Measurements	4-10

List of Figures

<u>Number</u>	<u>Title</u>	<u>Page</u>
1	Impact Velocity Measurement System	2-9
2	Accident Investigation Division Data For 56 kph (35 mph) Frontal Barrier Impact	2-10
3	Vehicle Accelerometer Placement	2-11
4	Load Cell Barrier Configuration	2-19
5	FMVSS 212 Test Data	3-2
6	FMVSS 219 Test Data	3-3
7	FMVSS 301 Static Rollover Test Data	3-6
8	Dummy Measurement Locations For Front Seat Occupants	4-2
9	Seat Belt Positioning Data	4-4
10	Camera Positions	4-5
11	Vehicle Target Locations	4-8
12	Pre-Test and Post-Test Measurement Points	4-9
13	Vehicle Intrusion Measurements, Static Footwell Deformation	4-11
14	Vehicle Intrusion Measurements, Door Opening Width	4-12
15	Vehicle Intrusion Measurements, Static Passenger Compartment Intrusion	4-13

List of Photographs

Figure A-1	Pre-Test Front View
Figure A-2	Post-Test Front View
Figure A-3	Pre-Test Left Side View
Figure A-4	Post-Test Left Side View
Figure A-5	Pre-Test Rear View
Figure A-6	Post-Test Rear View
Figure A-7	Pre-Test Right Side View
Figure A-8	Post-Test Right Side View
Figure A-9	Pre-Test Right Front Three-Quarter View
Figure A-10	Post-Test Right Front Three-Quarter View
Figure A-11	Pre-Test Left Rear Three-Quarter View
Figure A-12	Post-Test Left Rear Three-Quarter View
Figure A-13	Pre-Test Windshield View
Figure A-14	Post-Test Windshield View
Figure A-15	Pre-Test Engine Compartment View
Figure A-16	Post-Test Engine Compartment View
Figure A-17	Pre-Test Fuel Filler Cap View
Figure A-18	Pre-Test Fuel Filler Neck - View 1
Figure A-19	Post-Test Fuel Filler Neck - View 1
Figure A-20	Pre-Test Fuel Filler Neck - View 2
Figure A-21	Post-Test Fuel Filler Neck - View 2
Figure A-22	Pre-Test Fuel Tank View
Figure A-23	Post-Test Fuel Tank View
Figure A-24	Pre-Test Front Underbody View
Figure A-25	Post-Test Front Underbody View
Figure A-26	Pre-Test Rear Underbody View
Figure A-27	Post-Test Rear Underbody View
Figure A-28	Pre-Test Driver's Knee Bolster View

List Of Photographs, Cont'd.

- Figure A-29 Pre-Test Passenger's Knee Bolster View
- Figure A-30 Pre-Test Steering Column View
- Figure A-31 Pre-Test Driver Dummy Position View
- Figure A-32 Post-Test Driver Dummy Position View
- Figure A-33 Pre-Test Passenger Dummy Position View
- Figure A-34 Post-Test Passenger Dummy Position View
- Figure A-35 Pre-Test Driver Dummy & Vehicle Interior - View 1
- Figure A-36 Post-Test Driver Dummy & Vehicle Interior - View 1
- Figure A-37 Pre-Test Driver Dummy & Vehicle Interior - View 2
- Figure A-38 Post-Test Driver Dummy & Vehicle Interior - View 2
- Figure A-39 Pre-Test Passenger Dummy & Vehicle Interior - View 1
- Figure A-40 Post-Test Passenger Dummy & Vehicle Interior - View 1
- Figure A-41 Pre-Test Passenger Dummy & Vehicle Interior - View 2
- Figure A-42 Post-Test Passenger Dummy & Vehicle Interior - View 2
- Figure A-43 Post-Test Driver Dummy Head Contact - View 1
- Figure A-44 Post-Test Driver Dummy Head Contact - View 2
- Figure A-45 Post-Test Driver Dummy Head Contact - View 3
- Figure A-46 Post-Test Driver Dummy Knee Contact - View 1
- Figure A-47 Post-Test Driver Dummy Knee Contact - View 2
- Figure A-48 Post-Test Passenger Dummy Head Contact - View 1
- Figure A-49 Post-Test Passenger Dummy Head Contact - View 2
- Figure A-50 Post-Test Passenger Dummy Head Contact - View 3
- Figure A-51 Post-Test Passenger Dummy Knee Contact - View 1
- Figure A-52 Post-Test Passenger Dummy Knee Contact - View 2
- Figure A-53 Pre-Test Vehicle Certification Label View
- Figure A-54 Post-Test Vehicle On Static Rollover Machine View

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 Crashworthiness Standards by Transportation Research Center Inc. (TRC) under Contract Number DTNH22-96-D-22010.

The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for the subject vehicle, a 1997 Toyota RAV4 special purpose vehicle, NHTSA Number MV5100, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208, 212, 219, and 301 requirements.

Test Procedure

This 56 kph (35 mph) test was conducted in accordance with NHTSA's Office of Crashworthiness Standards Laboratory Indicant Test Procedure, NCAPTP090196. Data was obtained indicant of FMVSS 208, "Occupant Crash Protection"; FMVSS 212, "Windshield Retention"; FMVSS 219, "Windshield Zone Intrusion"; and FMVSS 301, "Fuel System Integrity," performance.

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

The test vehicle contained two (2) Part 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 Appendix B of the Laboratory Indicant Test Procedure. This test was the first use of the driver dummy and the second use of the passenger dummy.

Both dummies were instrumented with primary and redundant head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations, and with left and right femur load cells to measure axial forces. The dummies were also instrumented with neck moment and force load cells, chest deflection potentiometers, foot accelerometers to measure longitudinal and vertical axis accelerations, and upper and lower tibia load cells to measure forces and moments.

The one-hundred-thirty-three (133) data channels were digitally sampled and recorded at 12,500 samples per second and processed per Section 11.13 of the Laboratory Indicant Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and sixteen (16) high-speed motion picture cameras. The pre- and post-test conditions were recorded by one (1) real-time motion picture camera.

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

Section 2.0

Frontal Barrier Impact Test Summary

Test Results Summary

This frontal load cell barrier test was conducted at TRC on January 24, 1997.

The test vehicle, a 1997 Toyota RAV4 special purpose vehicle, NHTSA Number MV5100, was equipped with a 2.0-liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1642 kg. The vehicle's impact speed was 56.2 kph. The vehicle sustained 583 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 919. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 51.4 g. The driver's maximum chest deflection was 39 mm. The driver's left and right femur maximum axial forces were 2762 N and 4764 N, respectively.

The right front passenger's HIC was 743. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 57.1 g. The passenger's maximum chest deflection was 42 mm. The passenger's left and right femur maximum axial forces were 3922 N and 3351 N, respectively.

There was no loss of windshield periphery retention.

There was no penetration through the windshield.

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

Data Acquisition Explanations

The driver's left foot X-axis accelerometer, FTLXG1, left foot Z-axis accelerometer at heel, FTLZH1, and left foot Z-axis accelerometer at toe, FTLZT1, recorded data spikes at 37 milliseconds.

The right front passenger's pelvis X-axis accelerometer, PEVXG2, recorded a spike at 19 milliseconds. This data spike affected the right front passenger's pelvis resultant acceleration calculation, PEVRG2.

The right front passenger's left foot X-axis accelerometer, FTLXG2, left foot Z-axis accelerometer at heel, FTLZH2, and left foot Z-axis accelerometer at toe, FTLZT2, recorded data spikes at 71 milliseconds.

The driver seat belt extension potentiometer, SBED1, lost data between 140 and 150 milliseconds and between 185 and 220 milliseconds.

The engine top X-axis accelerometer, ENGXG1, recorded intermittent spikes and data losses after 29 milliseconds.

Table 1 Crash Test Summary

NHTSA number:	MV5100	
Test type:	Frontal Load Cell Barrier	
Test date:	01/24/97	
Test time:	1722	
Ambient temperature:	21° C	
Vehicle year/make/ model/body style:	1997/Toyota/RAV4/special purpose vehicle	
Vehicle test weight:	1642 kg	
Impact angle ¹ :	0°	
Impact velocity ² :	Primary = 56.2 kph Secondary = 56.2 kph	
Maximum static crush:	583 mm	
Average rebound:	773 mm	
Dummies:	Driver #142	Passenger #192
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	Airbag and 3-point belt	Airbag and 3-point belt
Number of data channels:	34	34
Number of cameras:	High-speed 16 Real-time 1	

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:	1997/Toyota/RAV4/special purpose vehicle		
Color:	Prussian Red Pearl		
VIN:	JT3HP10V1V7036573		
NHTSA number:	MV5100		
Engine data:			
Placement:	transverse		
Cylinders:	4		
Displacement	2.0 liters		
Transmission data:	<u>4</u> speed, ___ manual, <u>X</u> automatic, ___ overdrive ___ FWD, ___ RWD, <u>X</u> 4WD		
Date vehicle received:	01/13/97		
Odometer reading:	87		
Dealer's name and address:	Germain Toyota of Columbus 5777 Scarborough Blvd. Columbus, OH 43232		
<u>Accessories:</u>			
Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	No
Power seats	No	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	No
Clock	Yes	Rear window defroster	Yes
Other	All weather equipment package, exterior mirrors, VIP-RS3000 security system, alloy wheels, and center console		
<u>Certification data from vehicle's label:</u>			
Vehicle manufactured by:	Toyota Motor Corporation		
Date of manufacture:	11/96		
VIN:	JT3HP10V1V7036573		
GVWR:	3893 lbs.		
GAWR: Front:	1973 lbs.		
Rear:	2161 lbs.		

Table 2 Test Vehicle Information, Cont'd.

Size of tires: P215/70R16

Tire pressure with maximum
capacity vehicle load:

Front: 240 kPa

Rear: 240 kPa

Spare tire: 215/70R16

Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: 215/70R16

Recommended cold tire pressure:

Front: 28 psi

Rear: 26 psi

Designated seating capacity:

Front NA

Rear NA

Total NA

Vehicle capacity weight: NA

Test vehicle attitude:

Delivered attitude: LF 820 mm; RF 823 mm; LR 825 mm; RR 823 mm

Pre-test attitude: LF 805 mm; RF 808 mm; LR 784 mm; RR 787 mm

Post-test attitude: LF 805 mm; RF 815 mm; LR 761 mm; RR 762 mm

Table 2 Test Vehicle Information Cont'd

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

Right front	409 kg	Right rear	286 kg
Left front	380 kg	Left rear	288 kg
Total front weight	789 kg	(57.9% of total vehicle weight)	
Total rear weight	574 kg	(42.1% of total vehicle weight)	
Total delivered weight	1363 kg		

Calculation of test vehicle's target test weight:

RCLW¹ = Rated cargo and luggage weight

GVWR = Gross Vehicle Weight Rating (1766 kg)

UDW = Unloaded delivered weight (1363 kg)

VCW = Vehicle capacity weight = GVWR - UDW = 1766 - 1363 = 403 kg

DSC = Designated seating capacity (5)

RCLW¹ = GVWR - UDW - 68 (DSC) = 1766 - 1363 - 68(5) = 282 kg

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

Target test weight = 1363 + 136 + 152 = 1651 kg

Target test weight = 1651 kg

Weight of test vehicle with required dummies and 127 kg of cargo weight:

Right front	443 kg	Right rear	389 kg
Left front	420 kg	Left rear	390 kg
Total front weight	863 kg	(52.6% of total vehicle weight)	
Total rear weight	779 kg	(47.4% of total vehicle weight)	
Total test weight	1642 kg	(0.5% under target test weight)	

Weight of ballast secured in vehicle: 3 kg

Components removed to meet target test weight: Spare tire

CG rearward of front wheel centerline: 1139 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 kilograms, whichever is less.

Table 3 Post-Impact Data

Test number: 970124
NHTSA number: MV5100
Test date: 01/24/97
Test time: 1722
Test type: Frontal load cell barrier
Impact angle: 0°
Ambient temperature
at impact area: 21° C
Temperature in
occupant compartment: 21° C
Impact velocity:
 Primary 56.2 kph
 Secondary 56.2 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:

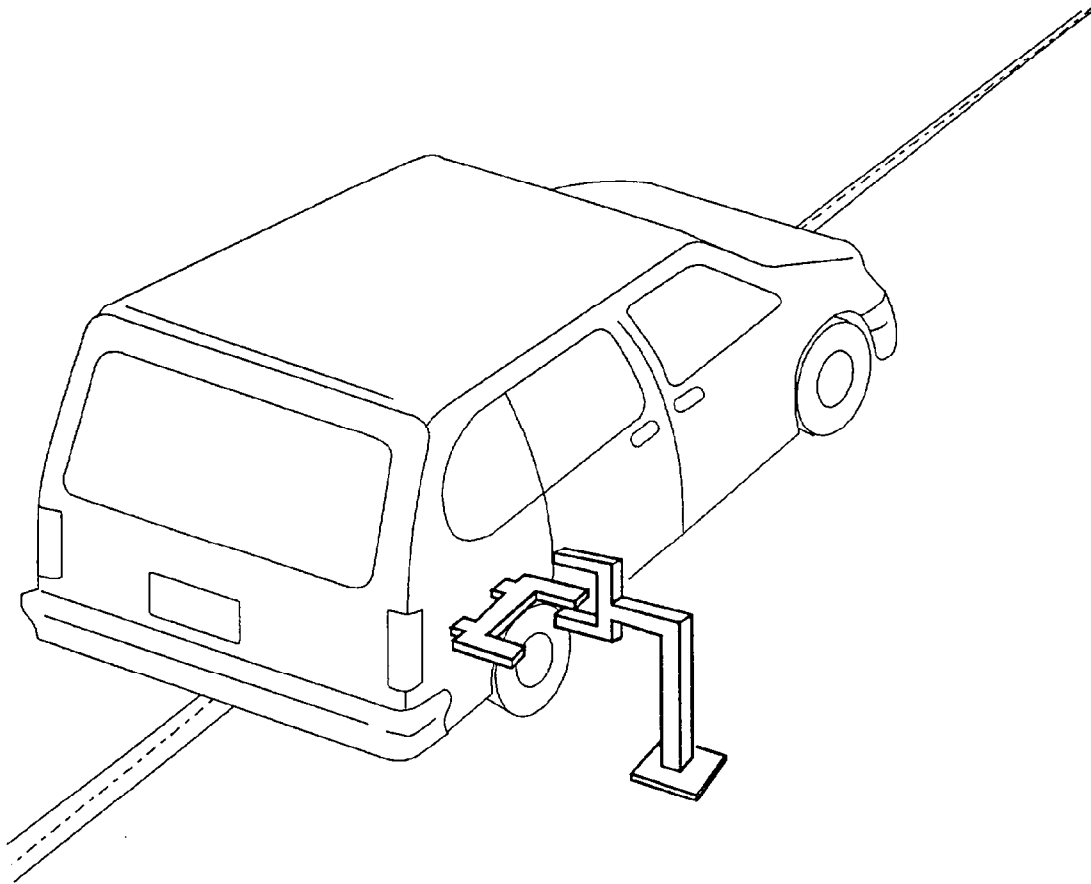
Pre-test: L 3999 mm; C 4177 mm; R 4005 mm
Post-test: L 3604 mm; C 3611 mm; R 3630 mm
Total crush: L 395 mm; C 566 mm; R 375 mm
Average crush: 445 mm

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test: L 760 mm; C 794 mm; R 764 mm
Average rebound 773 mm

Figure 1 Impact Velocity Measurement System



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

The vanes have 305-millimeter spacing.

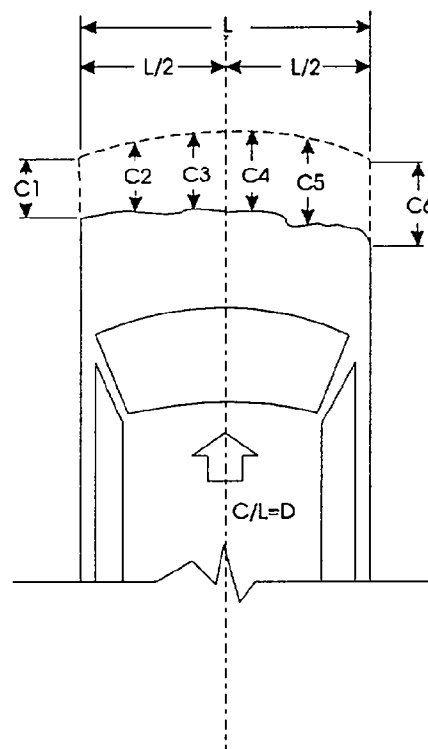
**Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact**

NHTSA number: MV5100
 Test date: 01/24/97
 Vehicle year/make/
 model/body style: 1997/Toyota/RAV4/special purpose vehicle
 Vehicle size category: Special purpose
 VIN: JT3HP10V1V7036573
 Build date: 11/96
 Test weight: 1642 kg
 Vehicle wheelbase: 2400 mm
 Maximum width: 1700 mm
 Front overhang: 722 mm

Collision Deformation
 Classification (CDC) code: 12FDEW3

Crush depth
 measurements:

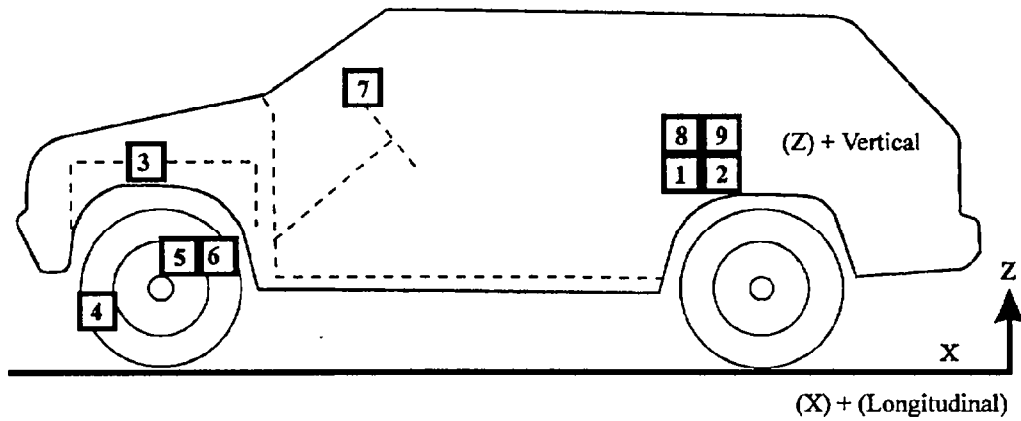
C1	=	395 mm
C2	=	574 mm
C3	=	559 mm
C4	=	557 mm
C5	=	583 mm
C6	=	375 mm



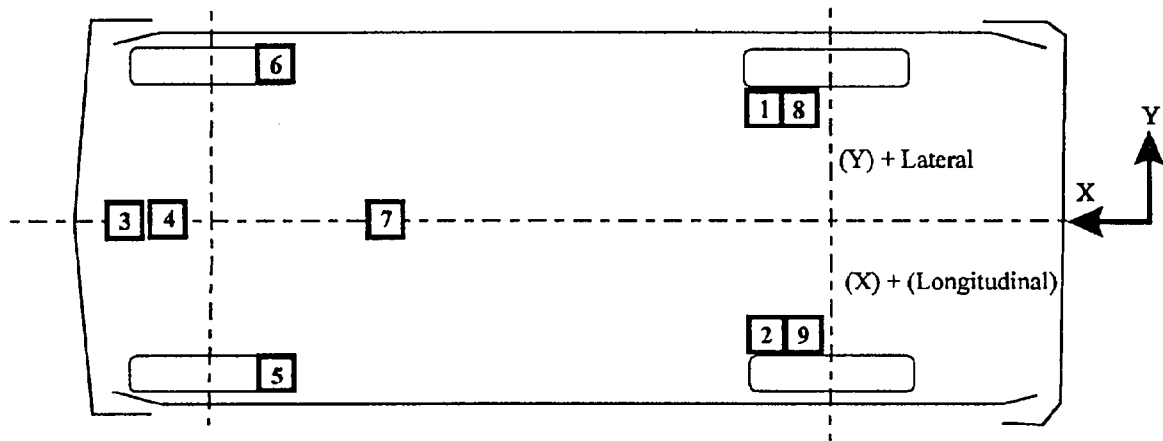
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1524 mm

Figure 3 Vehicle Accelerometer Placement



Side View



Bottom View

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 970124 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL	1600 mm	215 mm	483 mm	2.7 g @ 127.6 ms	52.3 g @ 48.8 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL	1600 mm	-215 mm	483 mm	2.5 g @ 125.7 ms	39.7 g @ 31.9 ms
3 ENGINE TOP LONGITUDINAL ¹	3507 mm	-67 mm	863 mm	---	---
4 ENGINE BOTTOM LONGITUDINAL	3695 mm	-285 mm	225 mm	23.0 g @ 30.6 ms	229.6 g @ 21.3 ms
5 RIGHT BRAKE CALIPER LONGITUDINAL	3607 mm	-621 mm	305 mm	47.6 g @ 47.4 ms	126.8 g @ 33.0 ms
6 LEFT BRAKE CALIPER LONGITUDINAL	3597 mm	621 mm	305 mm	56.4 g @ 45.7 ms	143.4 g @ 28.2 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	2926 mm	-30 mm	1083 mm	57.9 g @ 26.3 ms	106.2 g @ 40.7 ms
8 LEFT REAR SEAT CROSSMEMBER REDUNDANT LONGITUDINAL	1600 mm	160 mm	483 mm	2.7 g @ 127.1 ms	39.3 g @ 32.0 ms
9 RIGHT REAR SEAT CROSSMEMBER REDUNDANT LONGITUDINAL	1600 mm	-160 mm	483 mm	2.5 g @ 126.0 ms	39.9 g @ 31.2 ms

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

¹See DATA ACQUISITION EXPLANATIONS

Table 5 Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver #142</u>	<u>Passenger #192</u>
Head	Airbag, head restraint	Airbag, head restraint
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	Easy	Easy
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: 1997/Toyota/RAV4/special purpose vehicle
Vehicle NHTSA number: MV5100
Test date: 01/24/97

	Driver Dummy #142		Passenger Dummy #192	
<u>Maximum Accelerations:</u>				
Head X-axis	-74.2	g	-63.1	g
Head Y-axis	11.6	g	19.8	g
Head Z-axis	-34.8	g	-34.2	g
Head resultant	74.6	g	71.3	g
Chest X-axis	-53.4	g	-57.3	g
Chest Y-axis	-4.9	g	-5.4	g
Chest Z-axis	-17.4	g	-19.7	g
Chest resultant ¹	51.4	g	57.1	g
Chest resultant time interval ¹	.003	sec	.003	sec
<u>Head Injury Criteria (HIC) Values:</u>				
HIC ²	919		743	
HIC starting time	.052	sec	.053	sec
HIC ending time	.086	sec	.089	sec
Average head resultant acceleration during HIC time interval	59.0	g	53.2	g
<u>Maximum Chest Deflections:</u>				
Chest X-axis	39	mm	42	mm
Maximum chest deflection time	.056	sec	.075	sec
<u>Maximum Compressive Femur Forces:</u>				
Left femur	2762	N	3922	N
Right femur	4764	N	3351	N
<u>Maximum Seat Belt Forces:</u>				
Lap belt	8109	N	9312	N
Shoulder belt	6713	N	6626	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 Data Summary

Vehicle year/make/
model/body style: 1997/Toyota/RAV4/special purpose vehicle
Vehicle NHTSA number: MV5100
Test date: 01/24/97

	Driver Dummy #142	Passenger Dummy #192
<u>Maximum Forces</u>		
Neck X-axis shear force	-474 N	-912 N
Neck Y-axis shear force	-107 N	463 N
Neck Z-axis axial force	2580 N	1402 N
<u>Maximum Moments</u>		
Neck moment about X-axis	15.9 N·m	34.5 N·m
Neck moment about Y-axis	16.0 N·m	73.7 N·m
Neck moment about Z-axis	13.0 N·m	24.3 N·m
<u>Maximum Accelerations:</u>		
Pelvis X-axis ¹	-77.9 g	-69.6 g
Pelvis Y-axis	10.1 g	-15.4 g
Pelvis Z-axis	22.6 g	16.9 g
Pelvis resultant ¹	78.5 g	69.6 g

¹ See Data Acquisition Explanations

Table 7 Hybrid III Data Summary, Cont'd.

Vehicle year/make/
model/body style: 1997/Toyota/RAV4/special purpose vehicle
Vehicle NHTSA number: MV5100
Test date: 01/24/97

	Driver Dummy #142	Passenger Dummy #192
Left upper tibia moment about X-axis	66.9 N·m	-48.2 N·m
Left upper tibia moment about Y-axis	110.3 N·m	198.1 N·m
Right upper tibia moment about X-axis	-86.2 N·m	-75.8 N·m
Right upper tibia moment about Y-axis	329.1 N·m	188.6 N·m
Left lower tibia X-axis force	-1625 N	-1509 N
Left lower tibia Z-axis force	-1938 N	-4170 N
Left lower tibia moment about Y-axis	-257.2 N·m	155.6 N·m
Right lower tibia X-axis force	-3087 N	-1674 N
Right lower tibia Z-axis force	-7646 N	-3046 N
Right lower tibia moment about Y-axis	176.6 N·m	127.2 N·m
Left foot X-axis acceleration ¹	-165.0 g	343.5 g
Left foot Z-axis acceleration at heel ¹	-226.2 g	-153.9 g
Left foot Z-axis acceleration at toe ¹	416.6 g	-514.6 g
Right foot X-axis acceleration	-301.4 g	-257.6 g
Right foot Z-axis acceleration at heel	409.6 g	118.0 g
Right foot Z-axis acceleration at toe	685.0 g	204.2 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 dummy came to rest seated in the driver's seat, restrained by the three-point unbelt.

Right Front Passenger Dummy

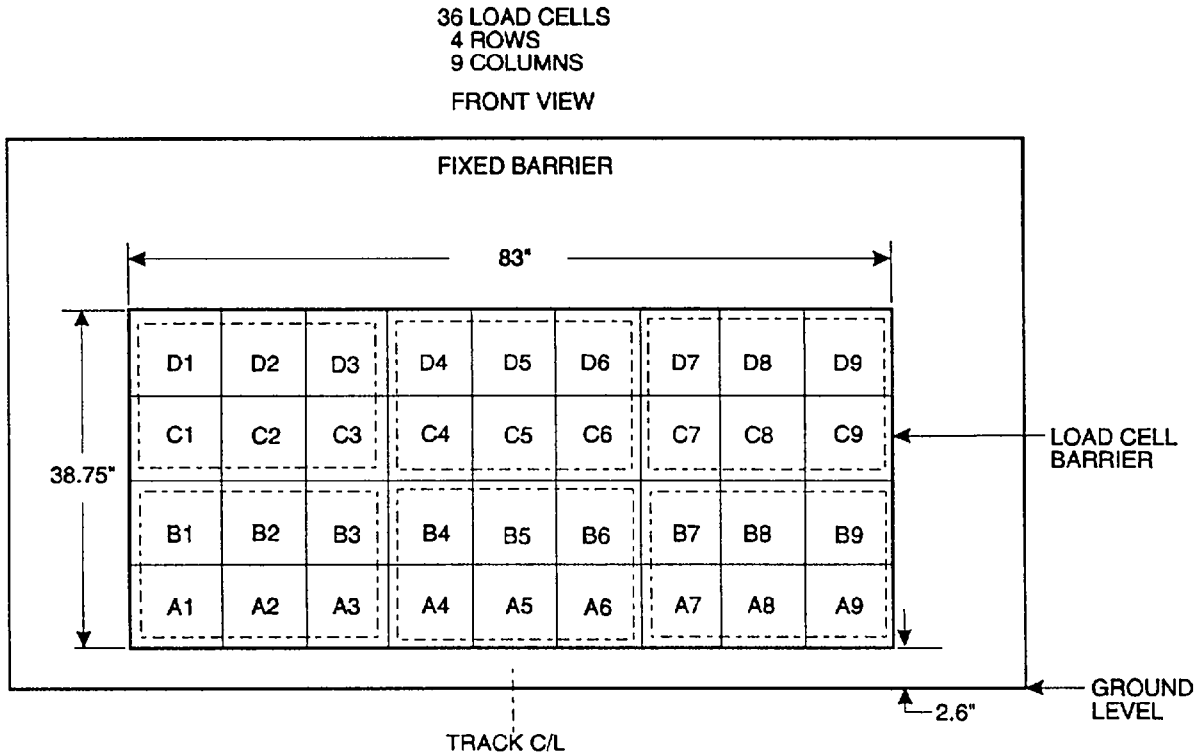
Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest were restrained by the passenger's airbag as the dummy's torso was restrained by the three-point unbelt. The dummy's head rotated rearward into the head restraint as the dummy rebounded into the seat back. The dummy came to rest seated 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.	2755 mm	2705 mm
Shoulder belt length as measured on Part 572 dummy.	850 mm	900 mm
Lap belt length as measured on Part 572 dummy.	877 mm	850 mm
<u>Shoulder belt spool-off length:</u>		
As determined by film analysis	96 mm	NA ¹
As determined mechanically	84 mm	130 mm
As determined electronically	177 mm	238 mm
<u>Belt stretch length:</u>		
As measured mechanically	3 mm/m	0 mm/m
As measured electronically	10 mm/m	14 mm/m
<u>Retractor lock-up time:</u>		
As determined by shoulder belt spool-off	63 ms	NA ¹

¹ The shoulder belt was not clearly visible at the time of maximum shoulder belt spool-off.

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	0.4 kN @ 150.6 ms	60.2 kN @ 35.0 ms
Total group 2	0.3 kN @ 150.6 ms	328.3 kN @ 36.8 ms
Total group 3	0.6 kN @ 3.0 ms	38.9 kN @ 12.1 ms
Total group 4	0.6 kN @ 0.7 ms	94.3 kN @ 22.2 ms
Total group 5	0.2 kN @ 284.2 ms	210.1 kN @ 22.9 ms
Total group 6	0.6 kN @ 0.5 ms	79.7 kN @ 21.3 ms
Total load cell force	0.4 kN @ 153.8 ms	743.6 kN @ 22.3 ms

Tension is positive
Compression is negative

Section 3.0

FMVSS 212, 219 (partial), and 301 Data

Figure 5 FMVSS 212 Test Data

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

Plastic trim around outer perimeter, adhesive around inner perimeter.

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

Windshield periphery measurements:

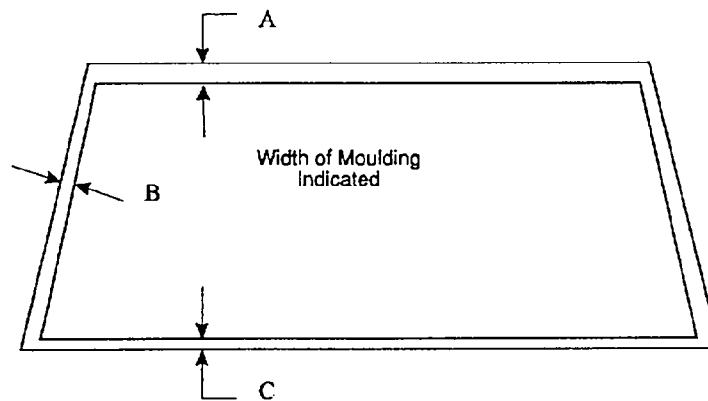
	<u>Pre-test</u>	<u>Post-test</u>	<u>Percent retention</u>
Right side	1921 mm	1921 mm	100
Left side	1921 mm	1921 mm	100
Total	3842 mm	3842 mm	100

Pre-test windshield mounting material temperature: 21° C

A = 17 mm

B = 17 mm

C = 22 mm



Front view of windshield¹

Loss of windshield retention lengths: None

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

Figure 6 FMVSS 219 Test Data

Protected zone lower edge requirement:

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

Windshield measurements:

A = 1070 mm

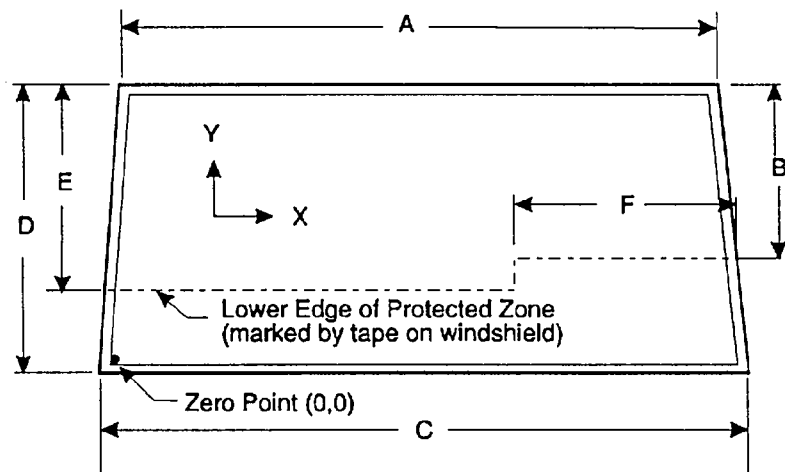
B = 420 mm

C = 1481 mm

D = 630 mm

E = 497 mm

F = 358 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:	1997/Toyota/RAV4/special purpose vehicle
NHTSA number:	MV5100
Fuel system capacity:	58.0 liters (from owner's manual)
Usable capacity:	57.9 liters (furnished by COTR)
Test volume range:	53.3 liters to 54.4 liters (92-94% of usable)
Actual test volume:	53.7 liters (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple
Did electric fuel pump operate with ignition switch "on" and the engine not operating.	No
Details of fuel system:	The fuel tank was located in front of the rear axle beside the left frame rail. The fuel filler neck was located on the left side and entered the left rear of the tank. The fuel lines ran along the left frame rail.

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MV5100
Test date: 01/24/97
Vehicle year/make/
model/body style: 1997/Toyota/RAV4/special purpose vehicle

Test requirements:

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

Test vehicle impact type:

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

Fuel system fluid spillage measurements:

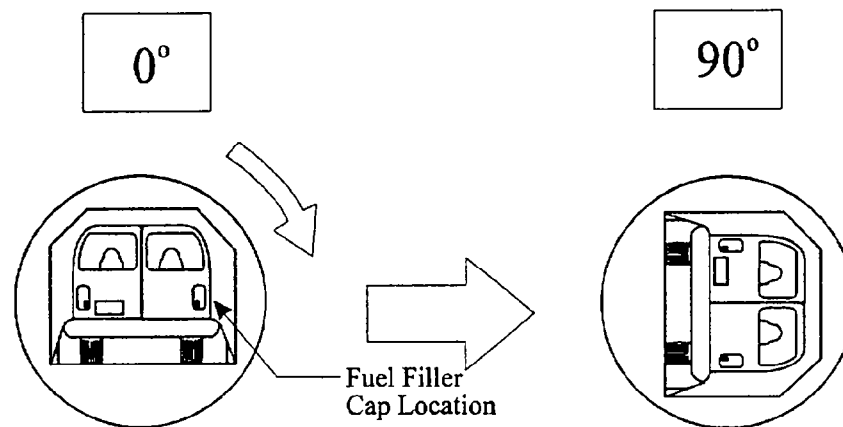
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MV5100

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

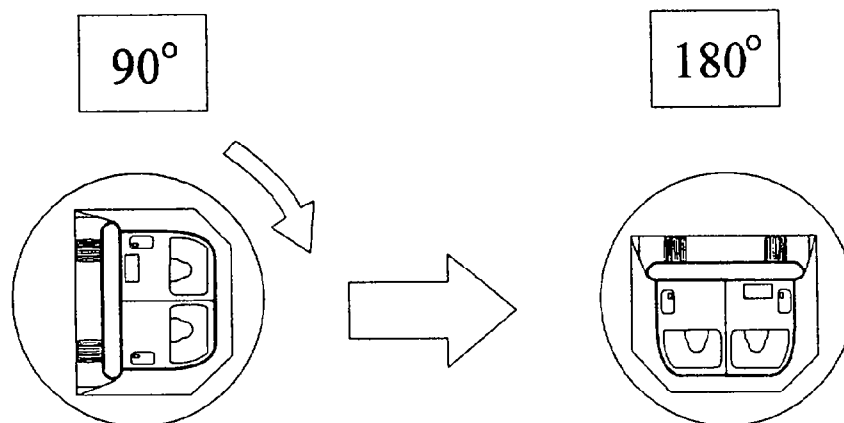
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>0° to 90° rotation (fuel filler cap down)</u>		
1. First five 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

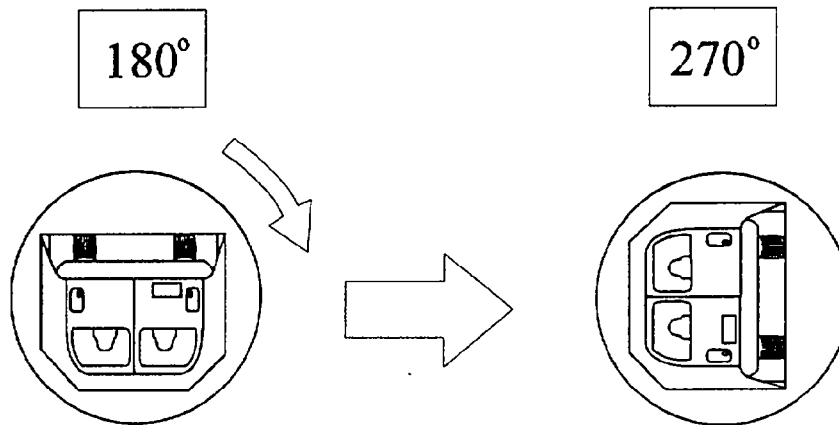
Fuel system fluid spillage measurements:

<u>90° to 180° rotation</u>		Test Results	Maximum Allowable
1.	First five 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

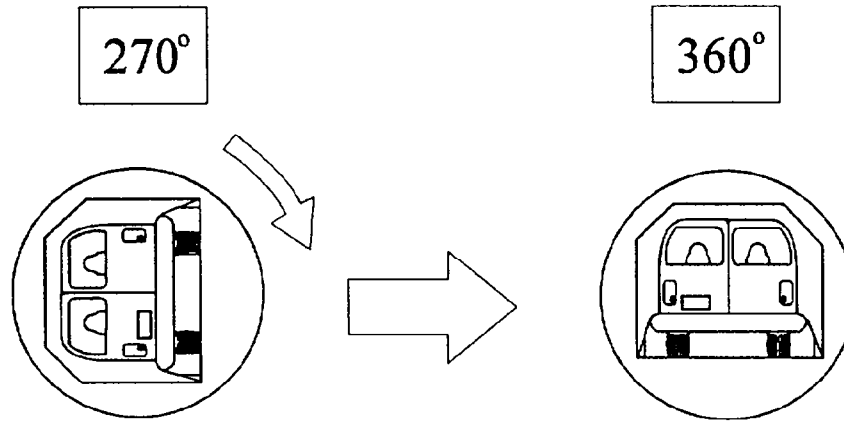
Fuel system fluid spillage measurements:

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

Fuel system fluid spillage location(s): None

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

Test phase



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

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

Fuel system fluid spillage measurements:

<u>270° to 360° rotation</u>		Test Results	Maximum Allowable
1.	First five 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

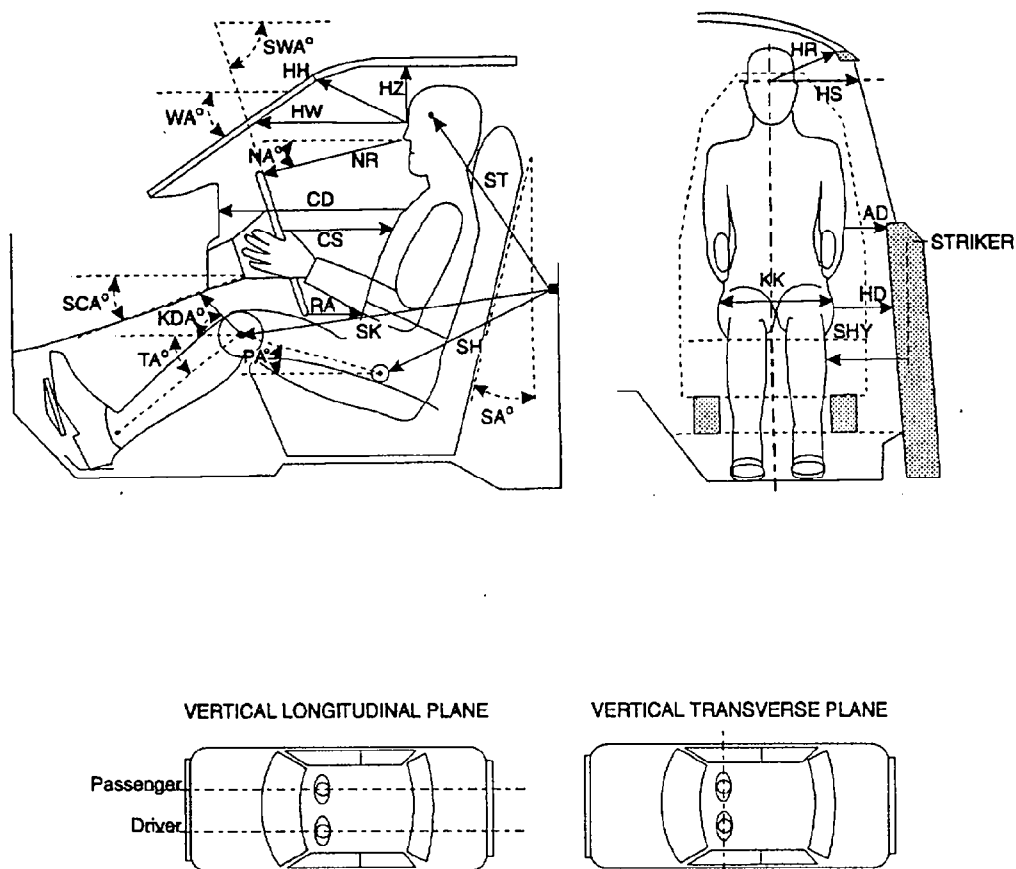


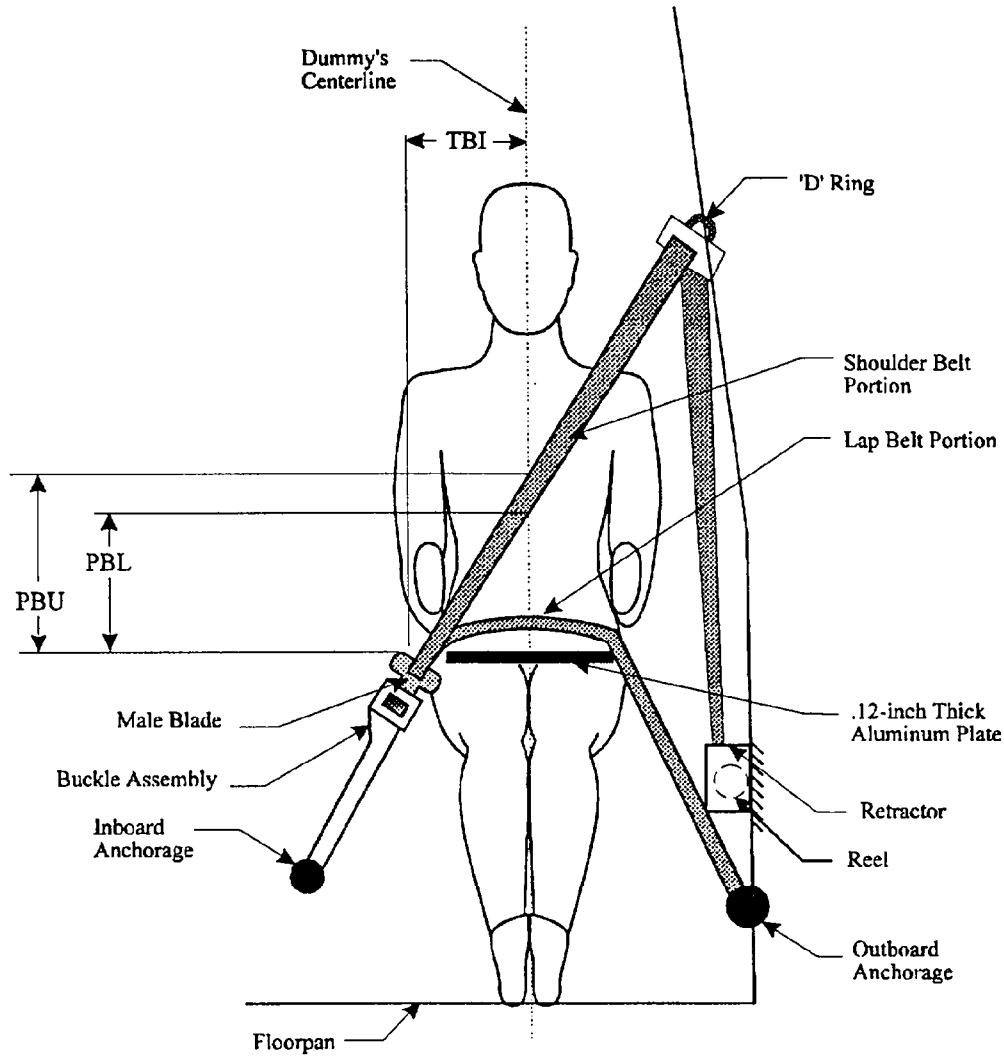
Table 12 Dummy Measurement Data For Front Seat Occupants

<u>Designation</u>	<u>Type of Measurement</u>	<u>Driver (Serial #142)</u>	<u>Passenger (Serial #192)</u>
WA	Windshield angle	39°	39°
SWA	Steering wheel angle	64°	NA
SCA	Steering column angle	26°	NA
SA	Seat back angle	8°	8°
HZ	Head to roof	229 mm	221 mm
HH	Head to header	358 mm	373 mm
HW	Head to windshield	497 mm	531 mm
HR	Head to side header	221 mm	213 mm
NR	Nose to rim	379 mm	NA
NA	Nose to rim angle	18°	NA
CD	Chest to dash	505 mm	532 mm
CS	Steering wheel to chest	290 mm	NA
RA	Rim to abdomen	167 mm	NA
KDL	Left knee to dash	140 mm	158 mm
KDR	Right knee to dash	135 mm	157 mm
KDA	Outboard knee to dash angle	23°	25°
PA	Pelvic angle	23°	21°
TA	Tibial angle	50°	48°
KK	Knee to knee	334 mm	280 mm
ST ¹	Striker to head	582 mm	605 mm
	Striker to head angle	-88°	-88°
SK ¹	Striker to knee	534 mm	523 mm
	Striker to knee angle	-5°	-4°
SH ¹	Striker to H-point	175 mm	162 mm
	Striker to H-point angle	12°	6°
SHY	Striker to H-point (Y dir.)	216 mm	225 mm
HS	Head to side window	297 mm	272 mm
HD	H-point to door	209 mm	186 mm
AD	Arm to door	103 mm	92 mm

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

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

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
PBU - Top surface of aluminum plate to belt upper edge	356 mm	356 mm
PBI - Top surface of aluminum plate to belt lower edge	283 mm	265 mm
TBI - Dummy centerline to intersection of upper torso belt and lap belt	295 mm	295 mm

[illegible]

Figure 10 Camera Positions, Cont'd.

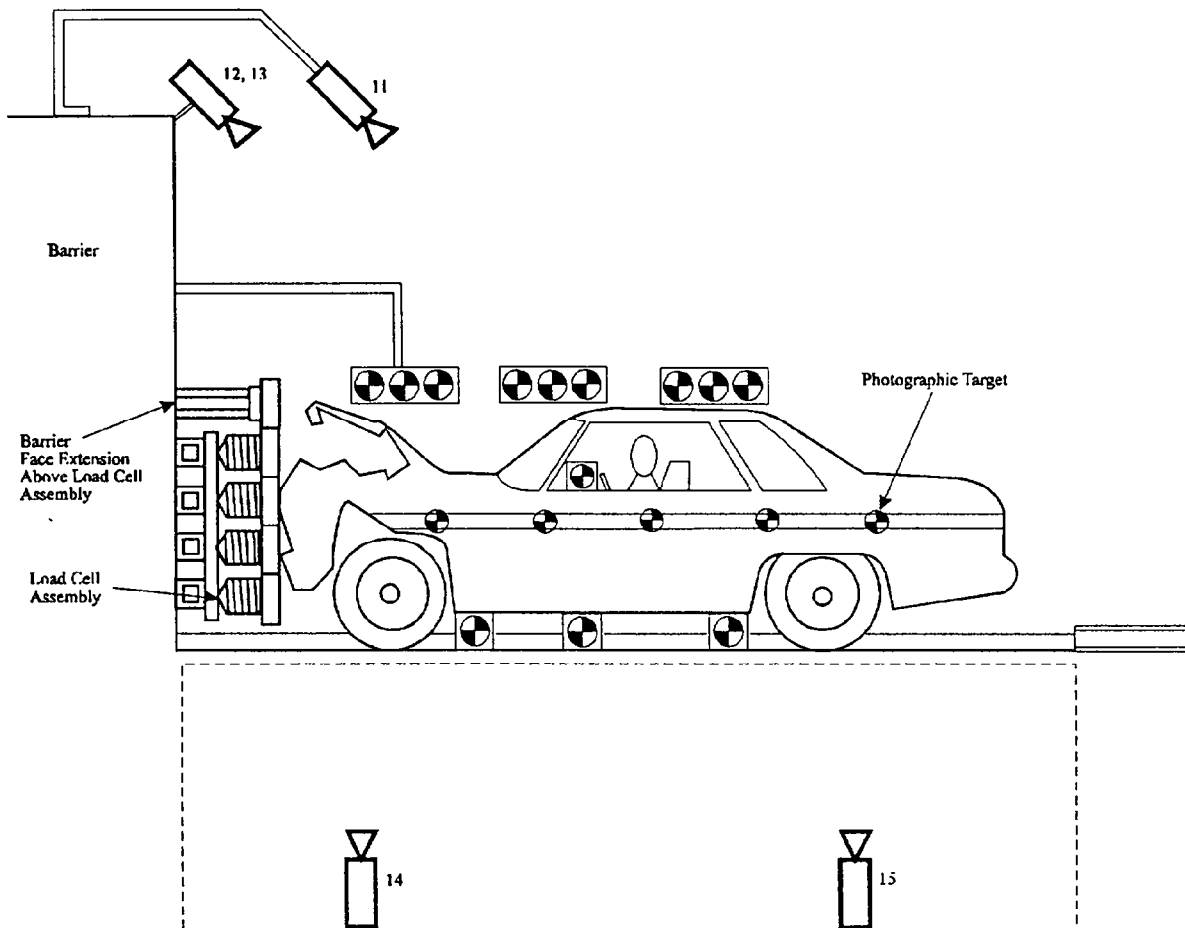


Table 13 Motion Picture Camera Locations

Test Number: 970124

Vehicle Year/Make/Model/Body Style: 1997/Toyota/RAV4/special purpose vehicle

Camera Number	View	Camera Positions ¹			Angle ²	Film Plane to Head Target	Lens	Film Speed
		X	Y	Z				
1	Real-time panning	-3607 mm	2802 mm	1549 mm	NA	NA	16 mm	24 frames/s
2	Left Barrier to seat back	-4572 mm	7315 mm	2591 mm	-27°	6706 mm	25 mm	992 frames/s
3	Left windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA	50 mm	NA ³ frames/s
4	Dummy angled view	-1054 mm	2438 mm	1118 mm	-12°	2438 mm	25 mm	995 frames/s
5	Column movement - upper	-2438 mm	8534 mm	2616 mm	-14°	NA	25 mm	990 frames/s
6	Column movement - lower	-2438 mm	8534 mm	1908 mm	-9°	NA	25 mm	1002 frames/s
7	Right side overall	-2065 mm	-6767 mm	942 mm	-2°	NA	13 mm	1010 frames/s
8	Right windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA	50 mm	1005 frames/s
9	Passenger angled view	-986 mm	2438 mm	1151 mm	7°	2134 mm	25 mm	1005 frames/s
10	Right medium tight	-4674 mm	6706 mm	2540 mm	-26°	5867 mm	25 mm	1015 frames/s
11	Windshield - barrier center	-925 mm	0 mm	2489 mm	-40°	NA	13 mm	998 frames/s
12	Driver - barrier view	-173 mm	368 mm	2159 mm	-41°	NA	17 mm	1000 frames/s
13	Passenger - barrier view	-114 mm	-351 mm	2159 mm	-40°	NA	17 mm	1000 frames/s
14	Crush & fluid spillage - front pit	-1283 mm	0 mm	-2347 mm	90°	NA	13 mm	988 frames/s
15	Fluid spillage - rear pit	-2522 mm	0 mm	-2515 mm	90°	NA	13 mm	1002 frames/s
16	Driver seat belt movement	NA	NA	NA	NA	NA	13 mm	975 frames/s
17	Passenger seat belt movement	NA	NA	NA	NA	NA	13 mm	1000 frames/s

¹ +X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

² +Angle = Film plane angled upward from horizontal plane]

³ Camera did not run during the crash test event.

Figure 11 Vehicle Target Locations

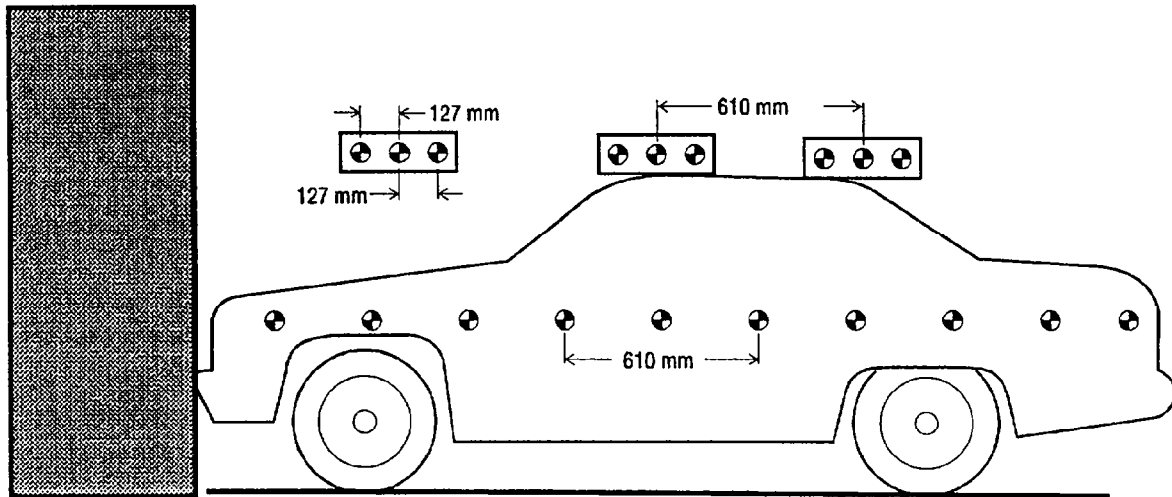


Figure 12 Pre-Test And Post-Test Measurement Points

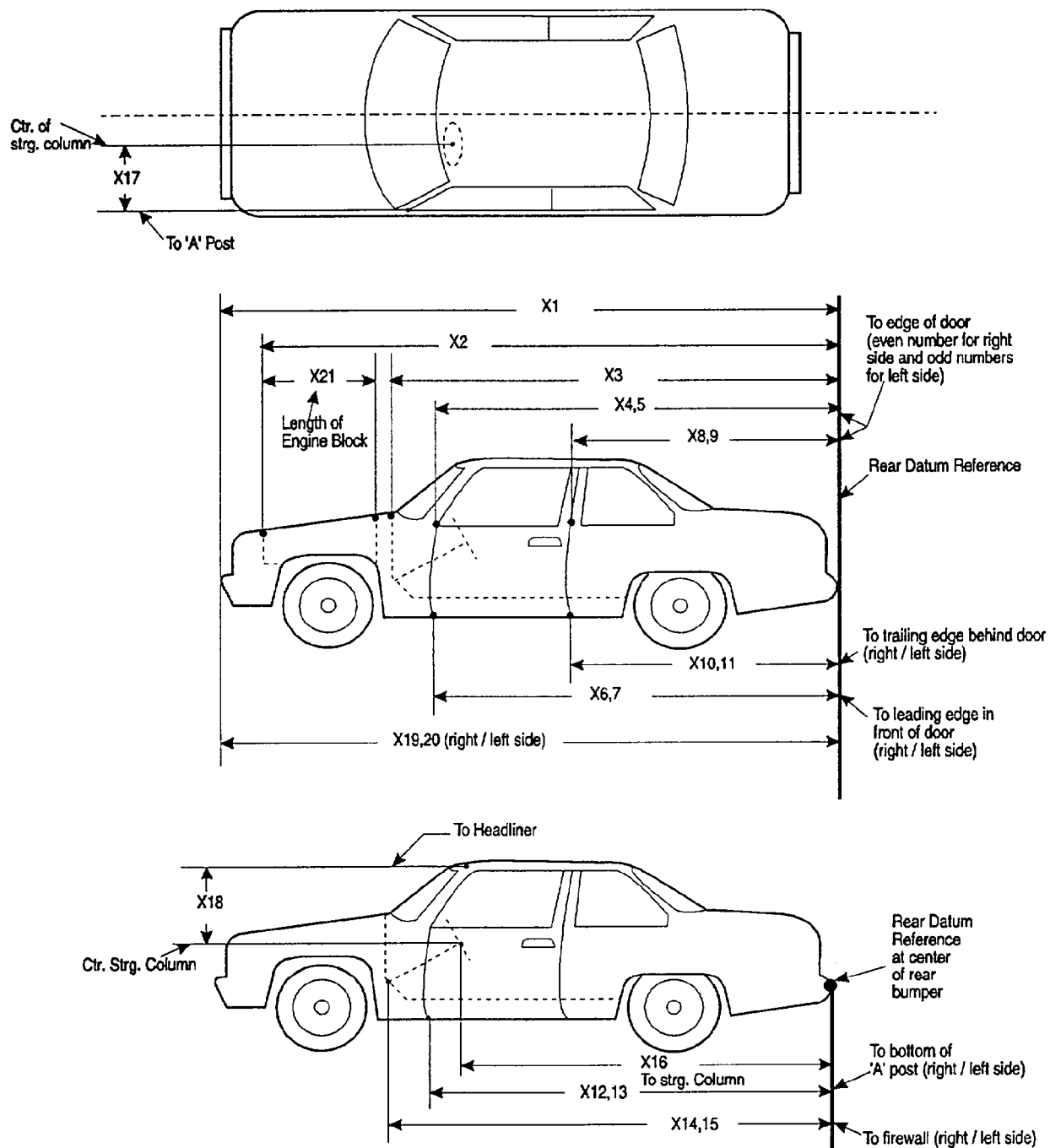


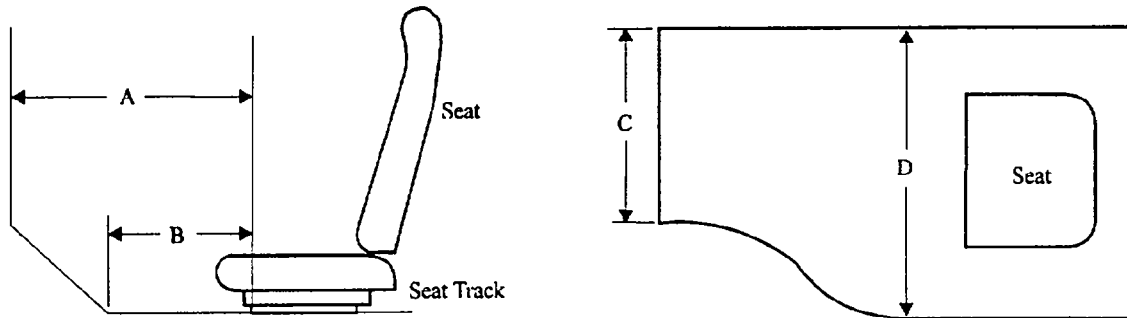
Table 14 Impacted Vehicle Measurements

Test number: 970124

Vehicle year/make/model/body style: 1997/Toyota/RAV4/special purpose vehicle

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	4177 mm	3611 mm	566 mm
X2	Rear surface of vehicle to front of engine block	3535 mm	3129 mm	406 mm
X3	Rear surface of vehicle to firewall	3182 mm	3061 mm	121 mm
X4	Rear surface of vehicle to upper leading edge of right door	2817 mm	2782 mm	35 mm
X5	Rear surface of vehicle to upper leading edge of left door	2826 mm	2788 mm	38 mm
X6	Rear surface of vehicle to lower leading edge of right door	2874 mm	2846 mm	28 mm
X7	Rear surface of vehicle to lower leading edge of left door	2876 mm	2835 mm	41 mm
X8	Rear surface of vehicle to upper trailing edge of right door	1955 mm	1921 mm	34 mm
X9	Rear surface of vehicle to upper trailing edge of left door	1956 mm	1915 mm	41 mm
X10	Rear surface of vehicle to lower trailing edge of right door	1964 mm	1935 mm	29 mm
X11	Rear surface of vehicle to lower trailing edge of left door	1966 mm	1928 mm	38 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	2869 mm	2826 mm	43 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	2870 mm	2831 mm	39 mm
X14	Rear surface of vehicle to firewall - right side	3098 mm	2985 mm	113 mm
X15	Rear surface of vehicle to firewall - left side	3084 mm	3040 mm	44 mm
X16	Rear surface of vehicle to steering wheel center	2525 mm	2470 mm	55 mm
X17	Center of steering column to "A" post	264 mm	250 mm	14 mm
X18	Center of steering column to headliner	490 mm	359 mm	131 mm
X19	Rear surface of vehicle to right side of front bumper	4005 mm	3630 mm	375 mm
X20	Rear surface of vehicle to left side of front bumper	3999 mm	3604 mm	395 mm
X21	Length of engine block	500 mm	500 mm	0 mm
RD	Rear surface of vehicle to right side of dash panel	2728 mm	2531 mm	197 mm
CD	Rear surface of vehicle to center of dash panel	2731 mm	2431 mm	300 mm
LD	Rear surface of vehicle to left side of dash panel	2692 mm	2483 mm	209 mm

Figure 13 Vehicle Intrusion Measurements
Static Footwell Deformation



Driver's Side

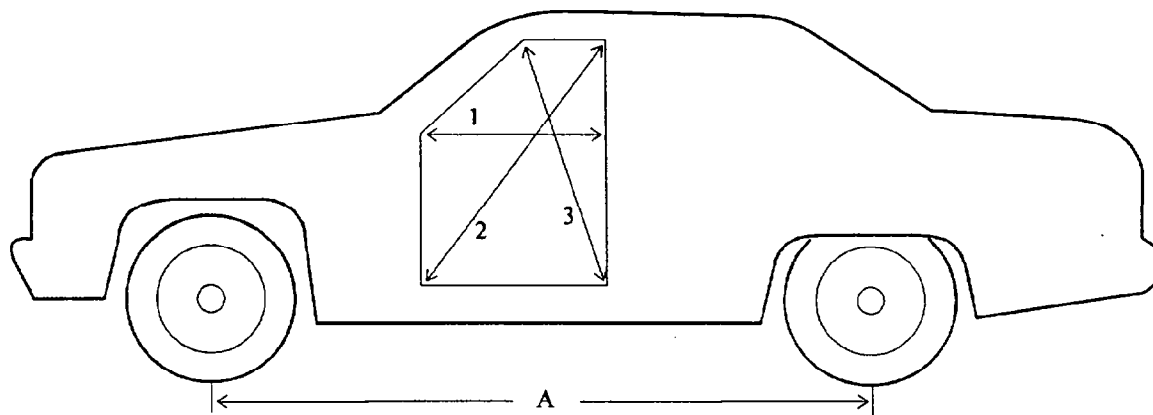
Measurement	Pre-Test	Post-Test	Difference
A	640 mm	518 mm	122 mm
B	497 mm	442 mm	55 mm
C	430 mm	409 mm	21 mm
D	335 mm	333 mm	2 mm

Passenger's Side

Measurement	Pre-Test	Post-Test	Difference
A	614 mm	496 mm	118 mm
B	462 mm	426 mm	36 mm
C	412 mm	385 mm	27 mm
D	292 mm	287 mm	5 mm

Figure 14 Vehicle Intrusion Measurements

Door Opening Width

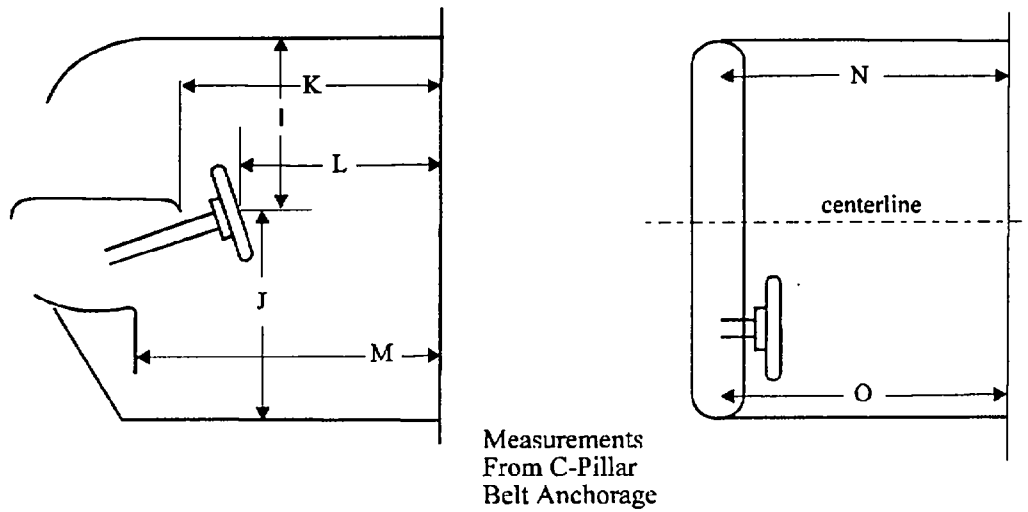


Units (mm)	Left			Right		
Measurement	1	2	3	1	2	3
Pre-Test	845 mm	1402 mm	1090 mm	844 mm	1414 mm	1058 mm
Post-Test	832 mm	1395 mm	1115 mm	822 mm	1403 mm	1084 mm
Difference	13 mm	7 mm	-25 mm	22 mm	11 mm	-26 mm

Units (mm)	A = Wheelbase Left	A = Wheelbase Right
Pre-Test	2400 mm	2400 mm
Post-Test	2270 mm	2300 mm
Difference	130 mm	100 mm

Figure 15 Vehicle Intrusion Measurements

Static Passenger Compartment Intrusion



Measurement	Pre-Test	Post-Test	Difference
I	512 mm	377 mm	135 mm
J	640 mm	750 mm	-110 mm
K (driver's side)	2255 mm	2230 mm	25 mm
L	2087 mm	2089 mm	-2 mm
M (driver's side)	2302 mm	2277 mm	25 mm
N	2290 mm	2260 mm	30 mm
O	2298 mm	2174 mm	124 mm
Passenger's side	2266 mm	2228 mm	38 mm
Passenger's side	2323 mm	2294 mm	29 mm

Appendix A

Photographs

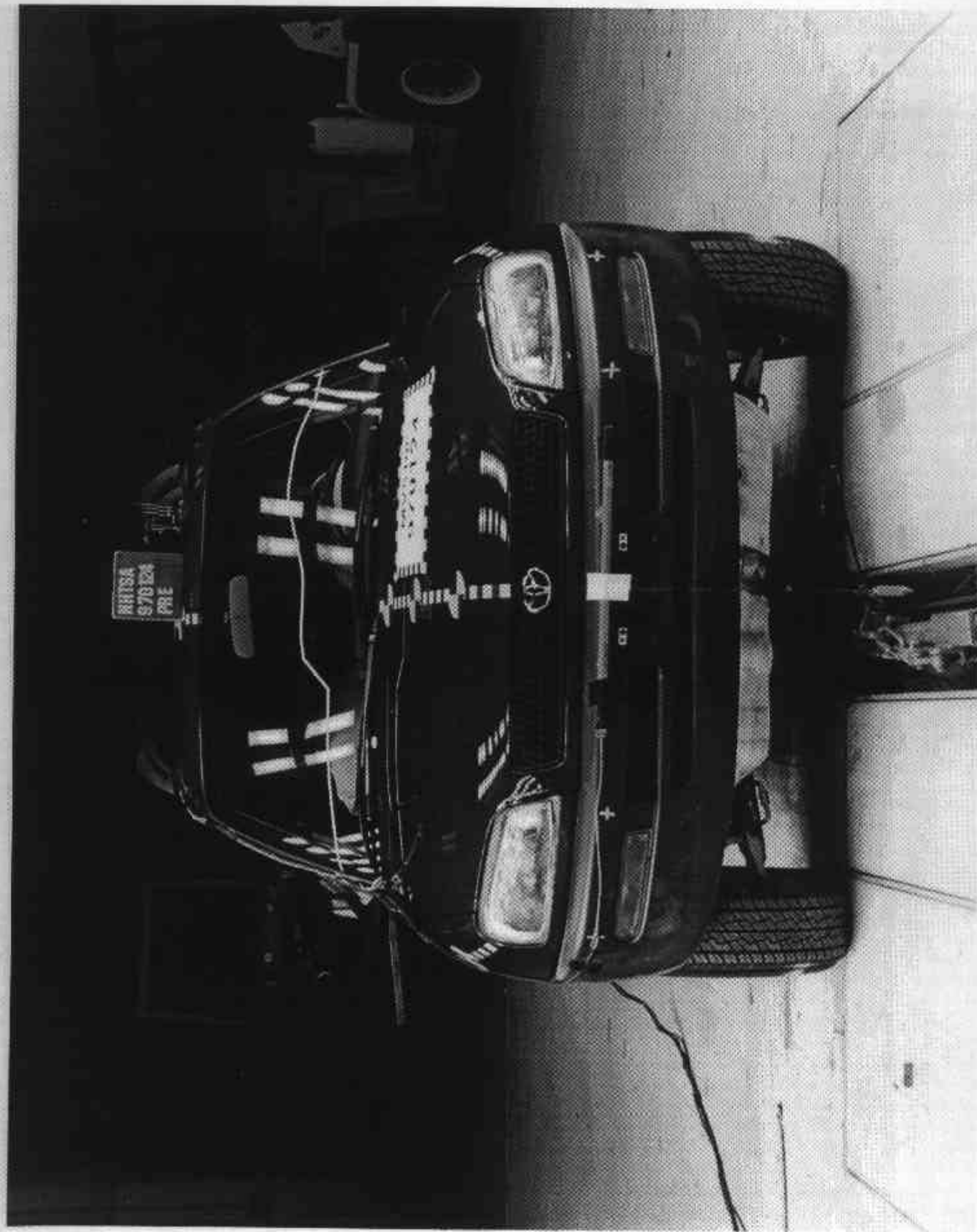


Figure A-1 Pre-Test Front View

A-2

970124

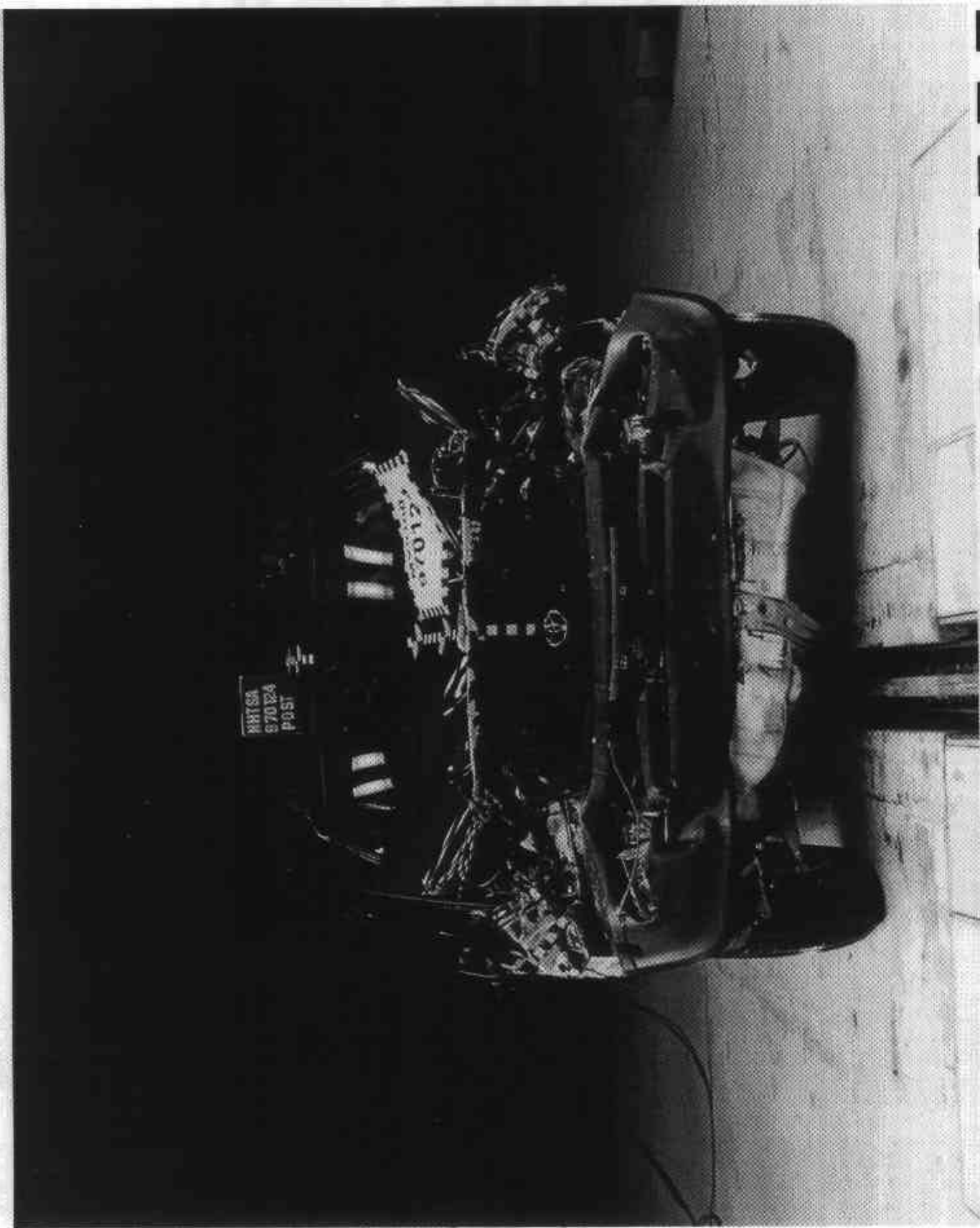


Figure A-2 Post-Test Front View

A-3

970124

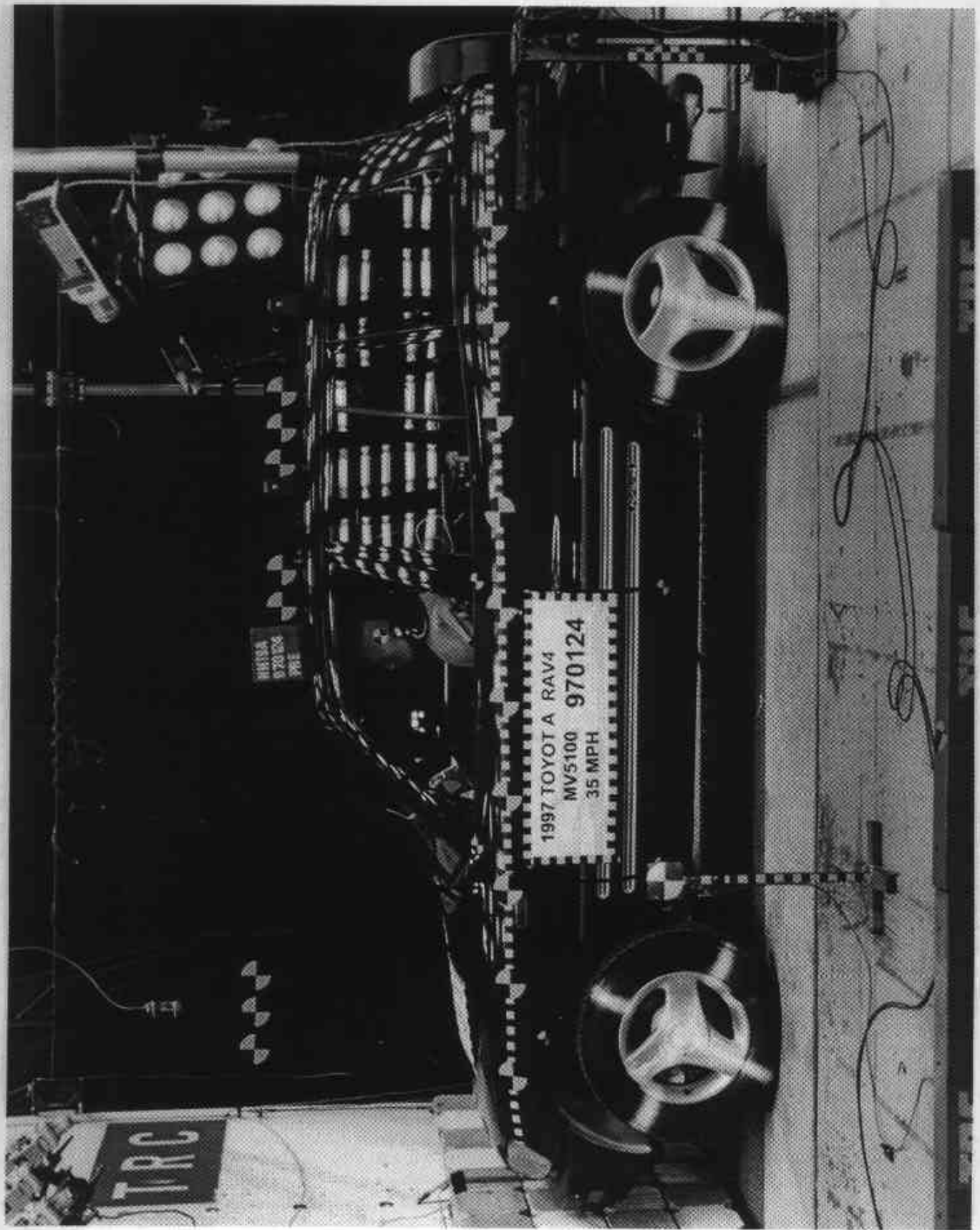


Figure A-3 Pre-Test Left Side View

A-4

970124

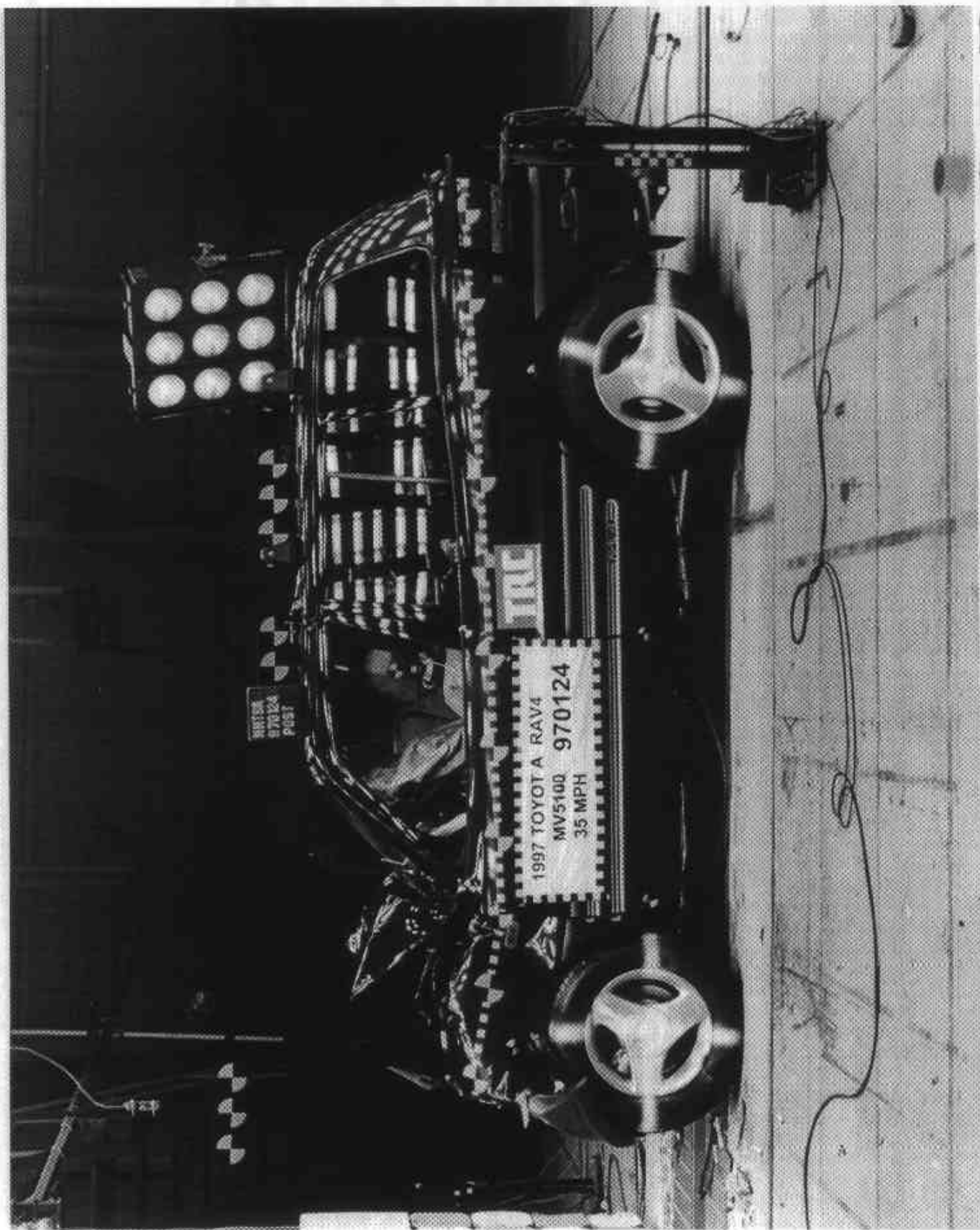


Figure A-4 Post-Test Left Side View

A-5

970124

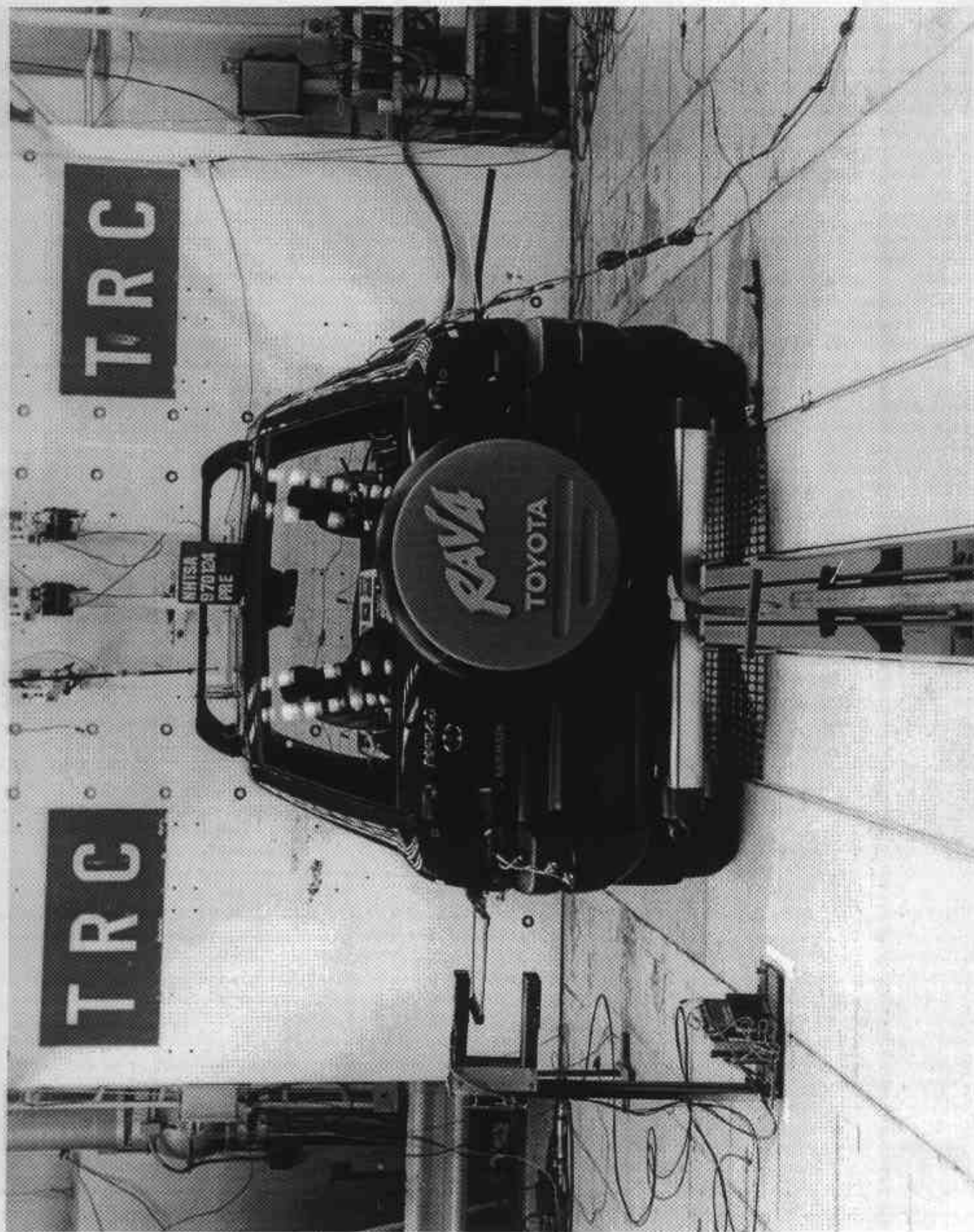


Figure A-5 Pre-Test Rear View

A-6

970124

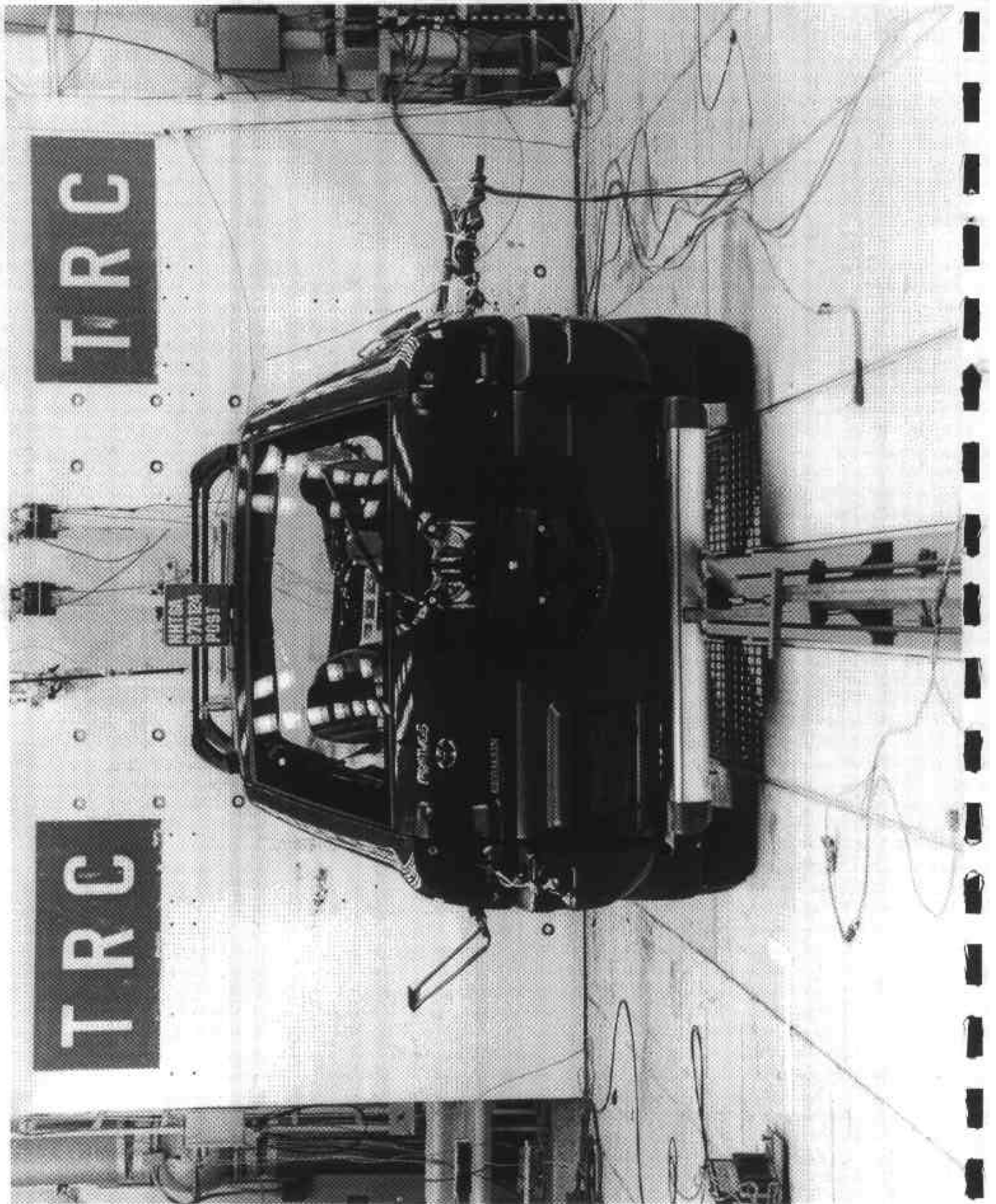


Figure A-6 Post-Test Rear View

A-7

970124

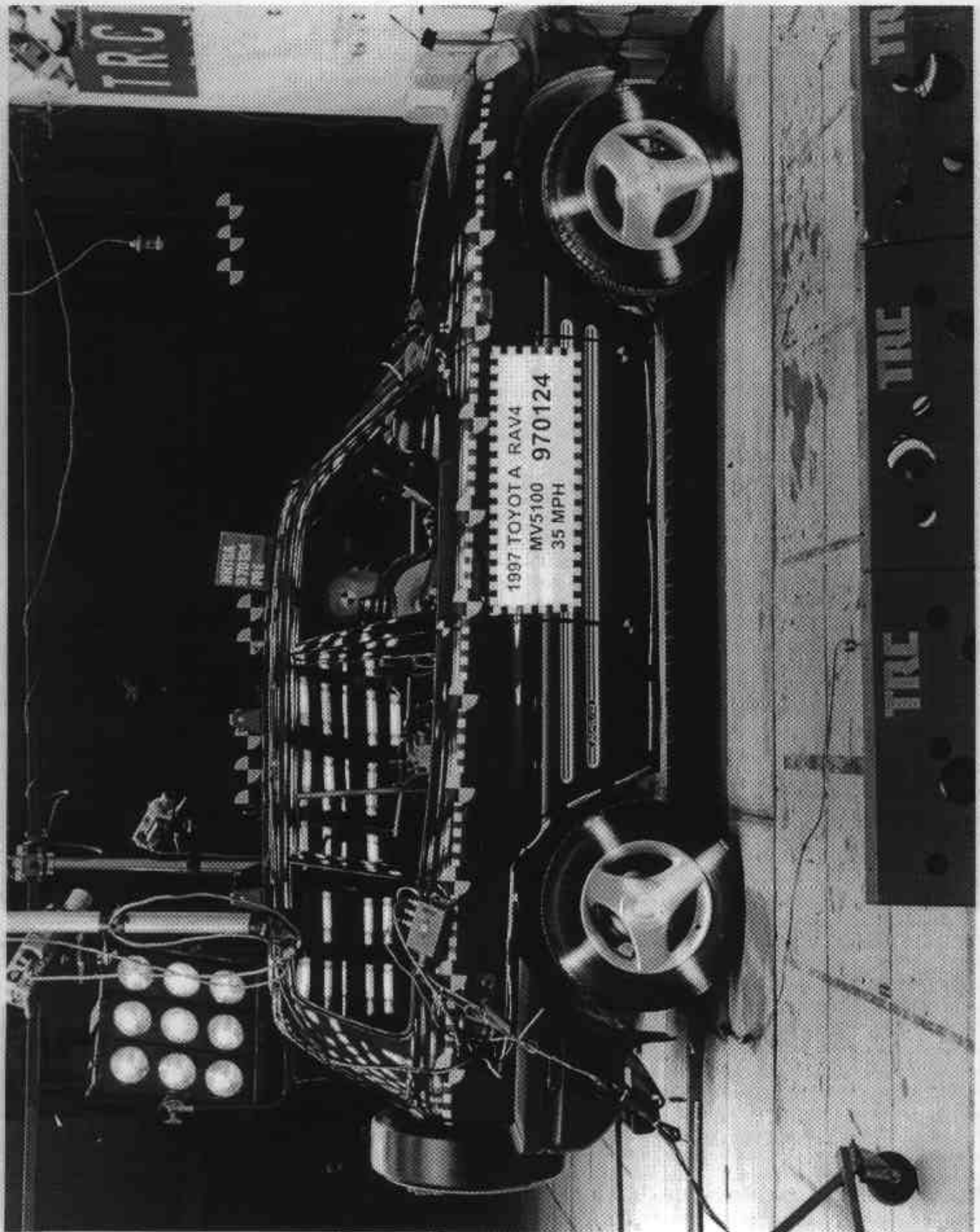


Figure A-7 Pre-Test Right Side View

A-8

970124

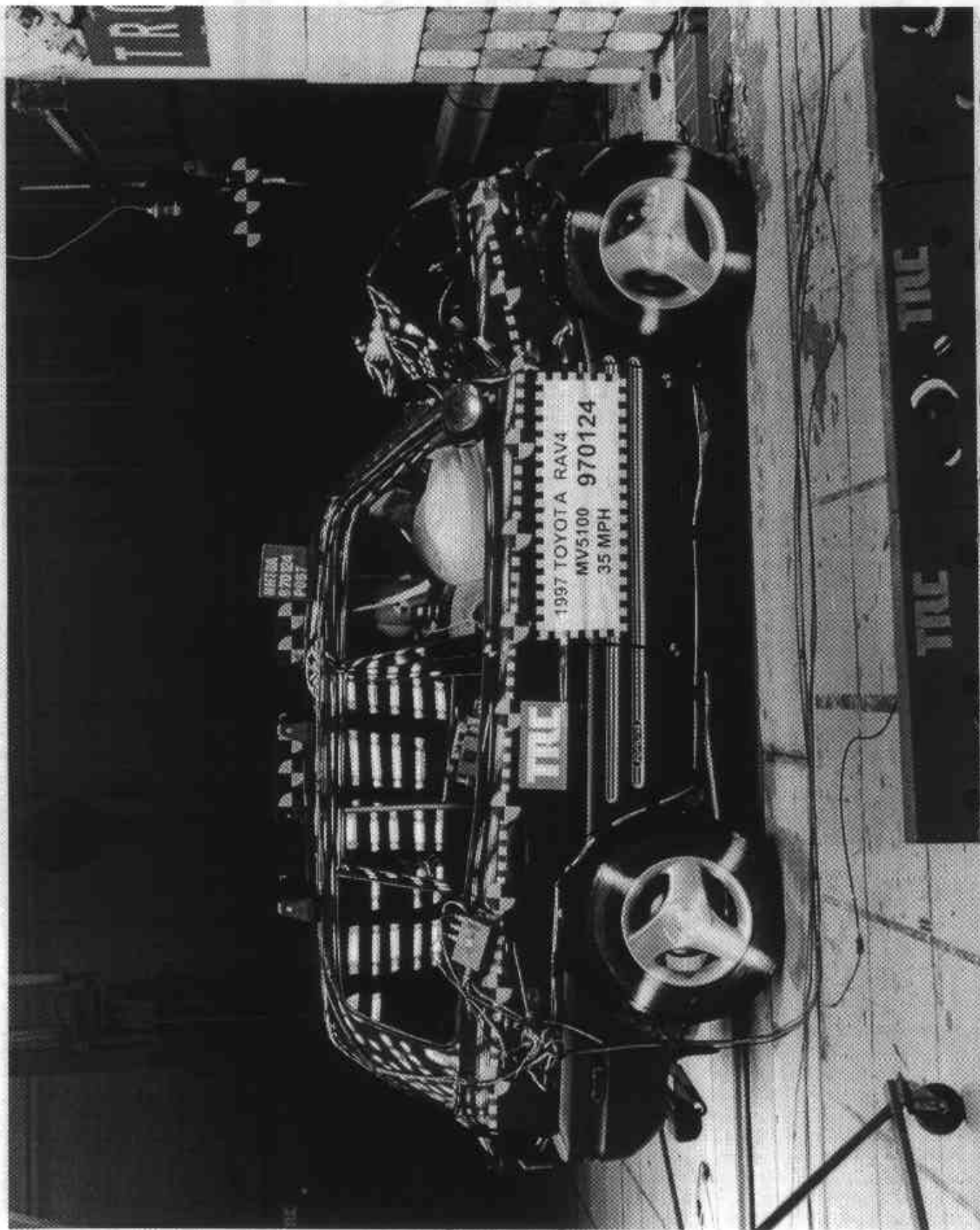


Figure A-8 Post-Test Right Side View

A-9

970124



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

A-10

970124

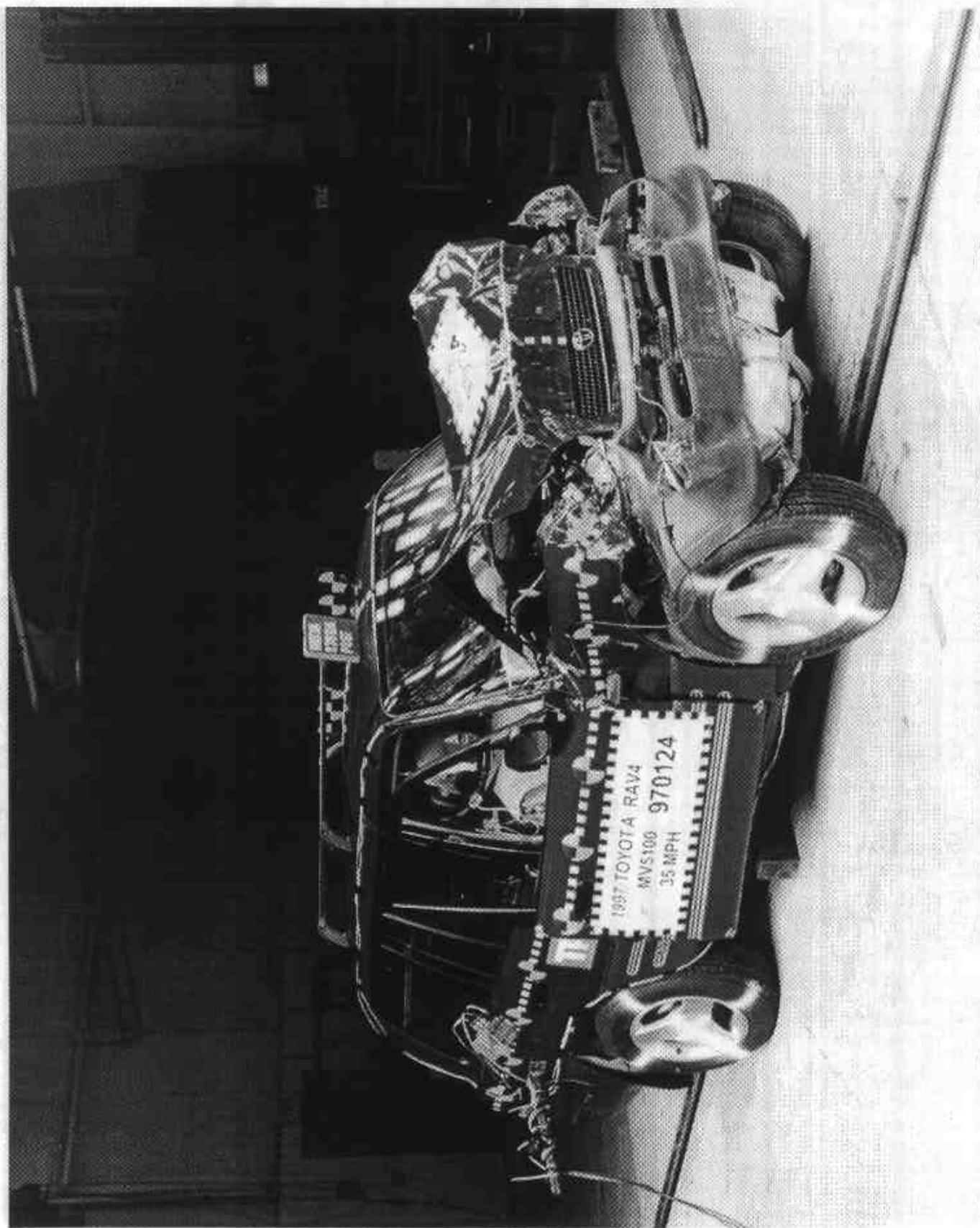


Figure A-10 Post-Test Right Front Three-Quarter View

A-11

970124

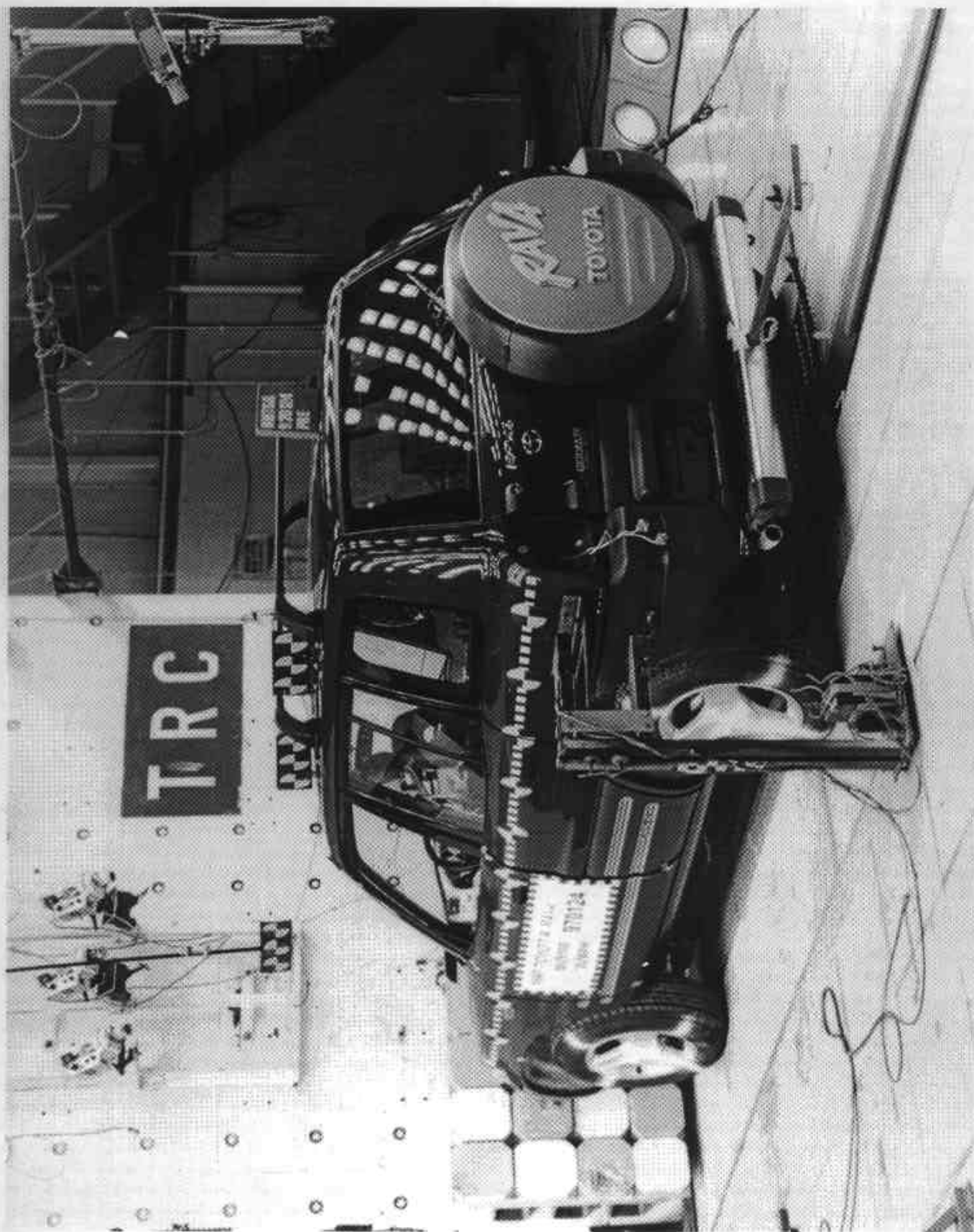


Figure A-11 Pre-Test Left Rear Three-Quarter View

A-12

970124

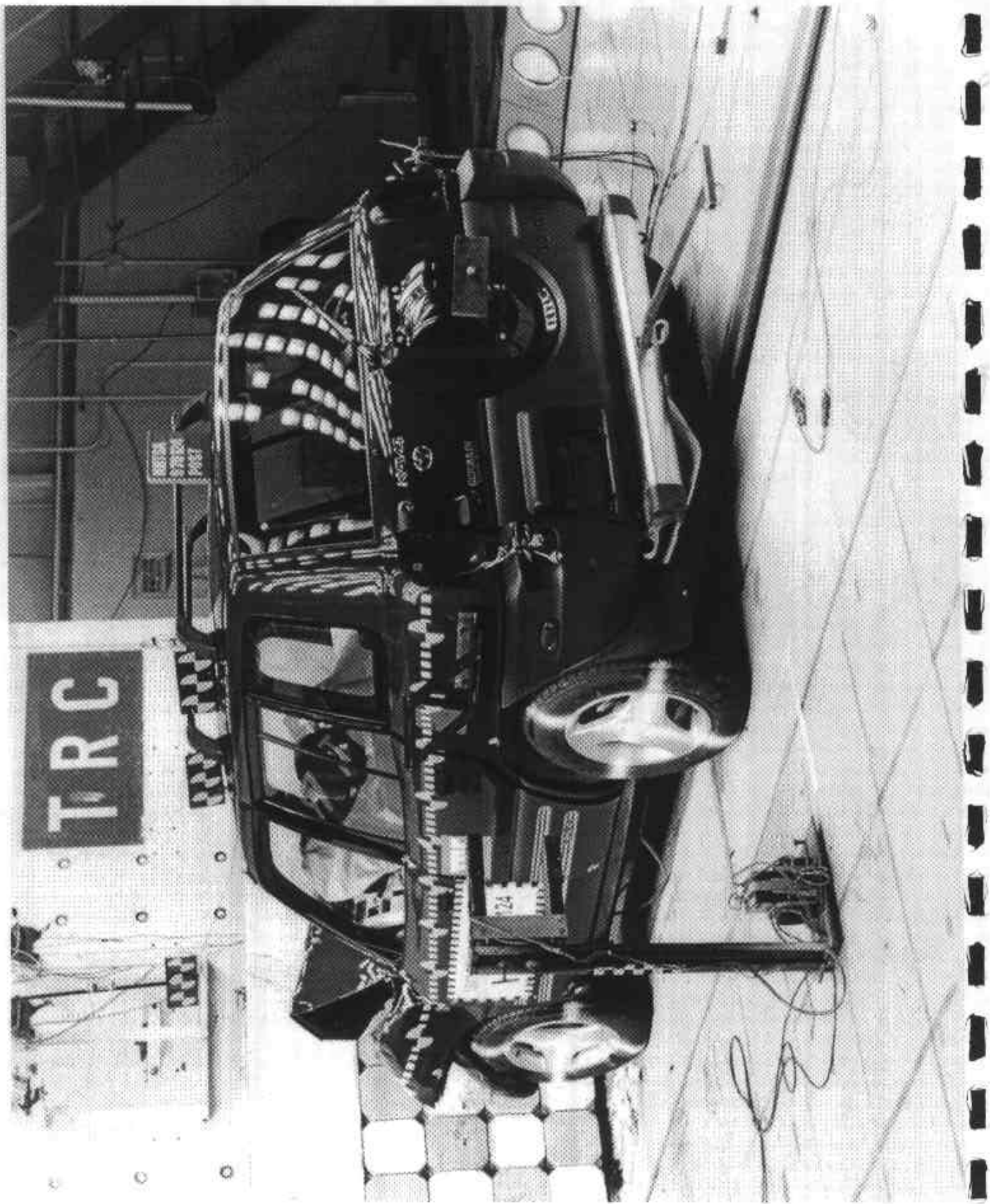


Figure A-12 Post-Test Left Rear Three-Quarter View

A-13

970124

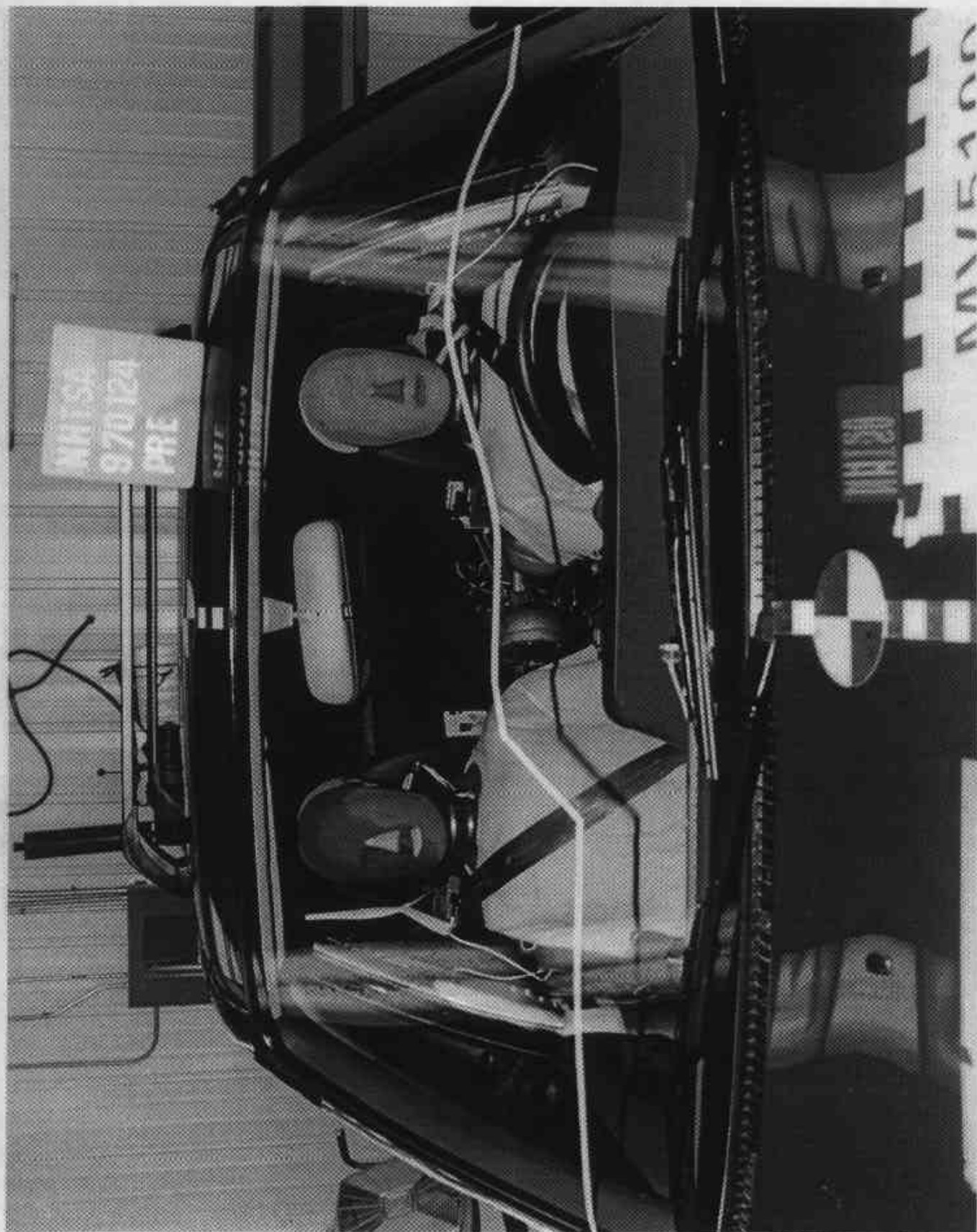


Figure A-13 Pre-Test Windshield View

A-14

970124

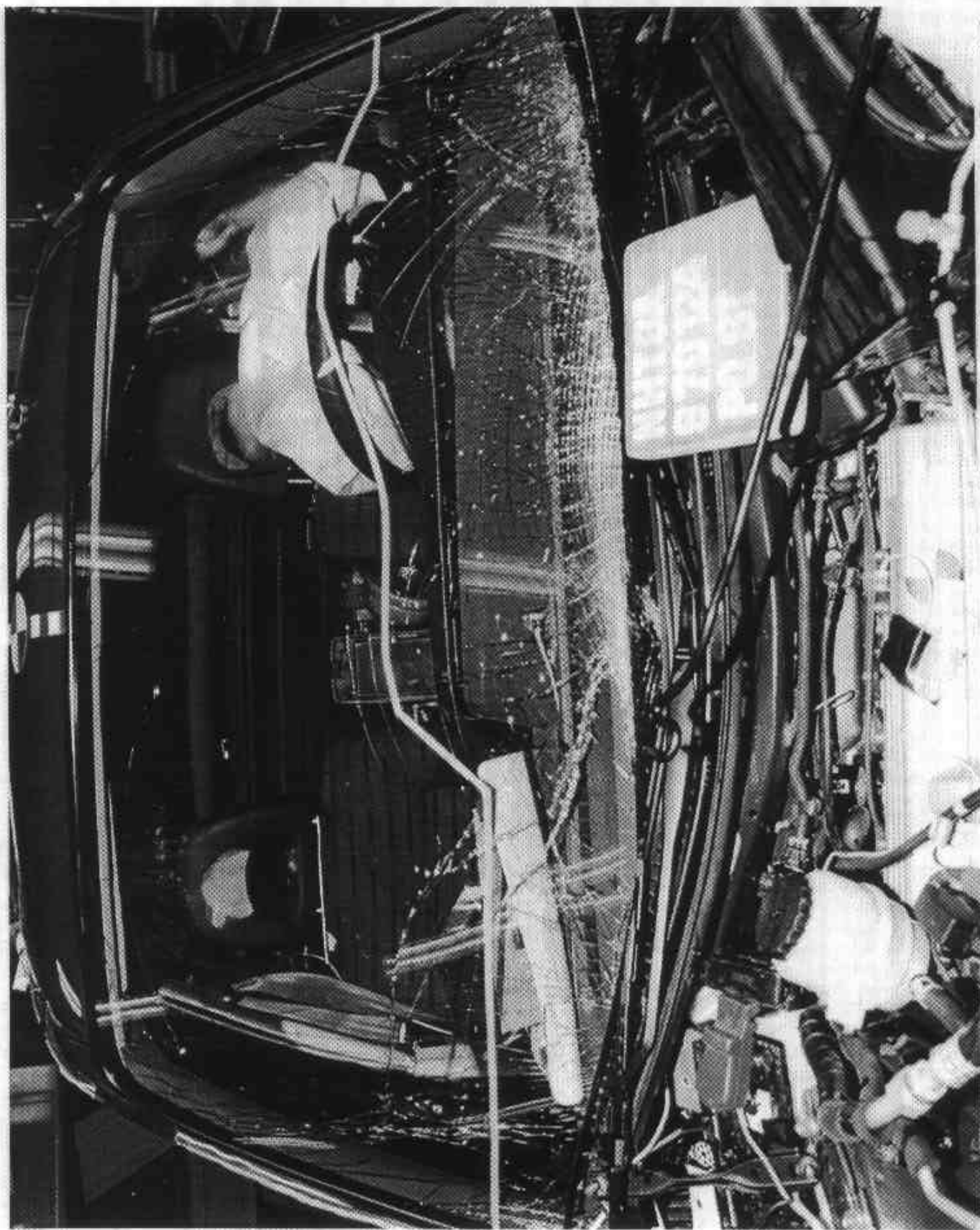


Figure A-14 Post-Test Windshield View

A-15

970124

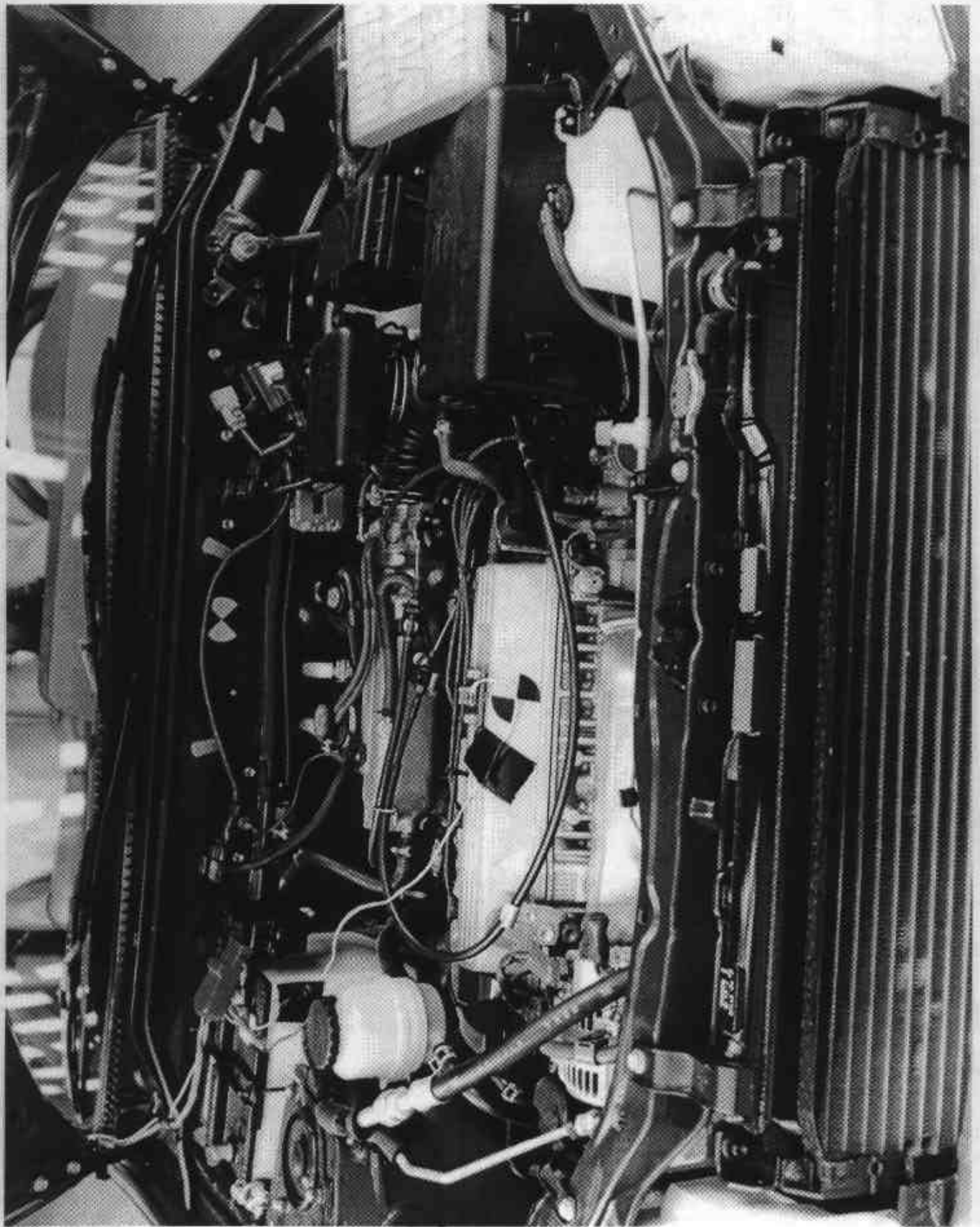


Figure A-15 Pre-Test Engine Compartment View

A-16

970124

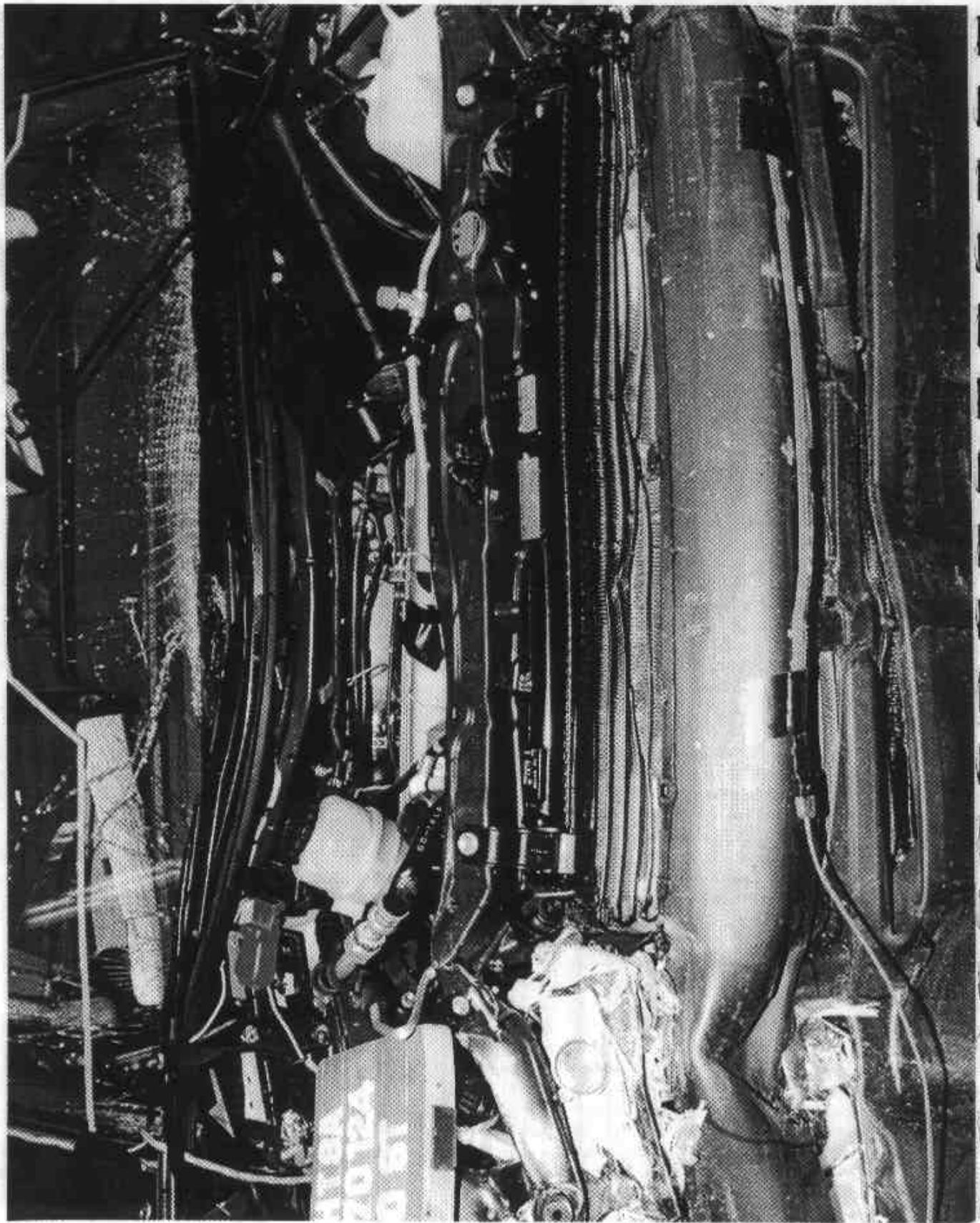


Figure A-16 Post-Test Engine Compartment View

A-17

970124



Figure A-17 Pre-Test Fuel Filler Cap View



Figure A-18 Pre-Test Fuel Filler Neck - View 1

A-19

970124

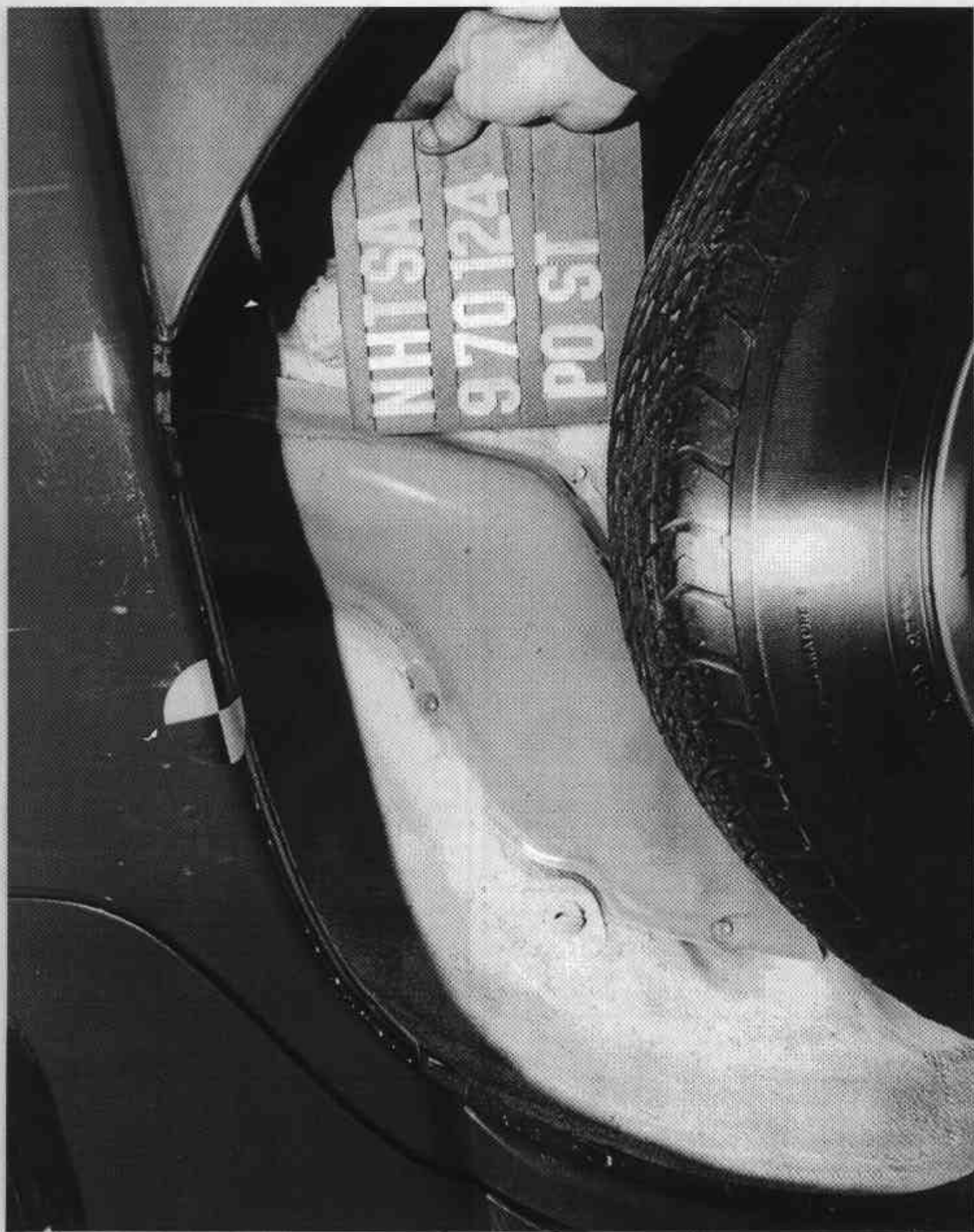


Figure A-19 Post-Test Fuel Filler Neck - View 1

A-20

970124

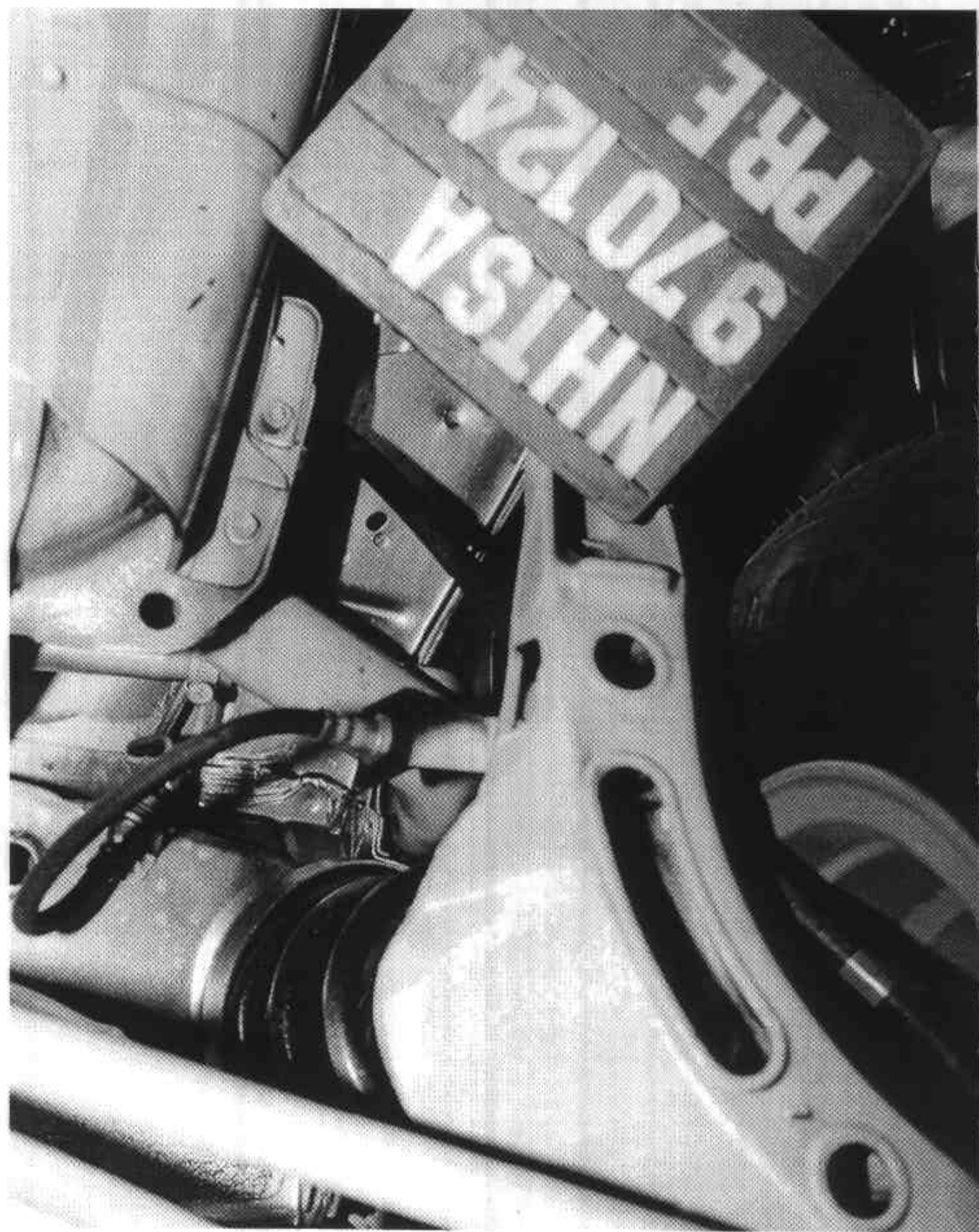


Figure A-20 Pre-Test Fuel Filler Neck - View 2

A-21

970124

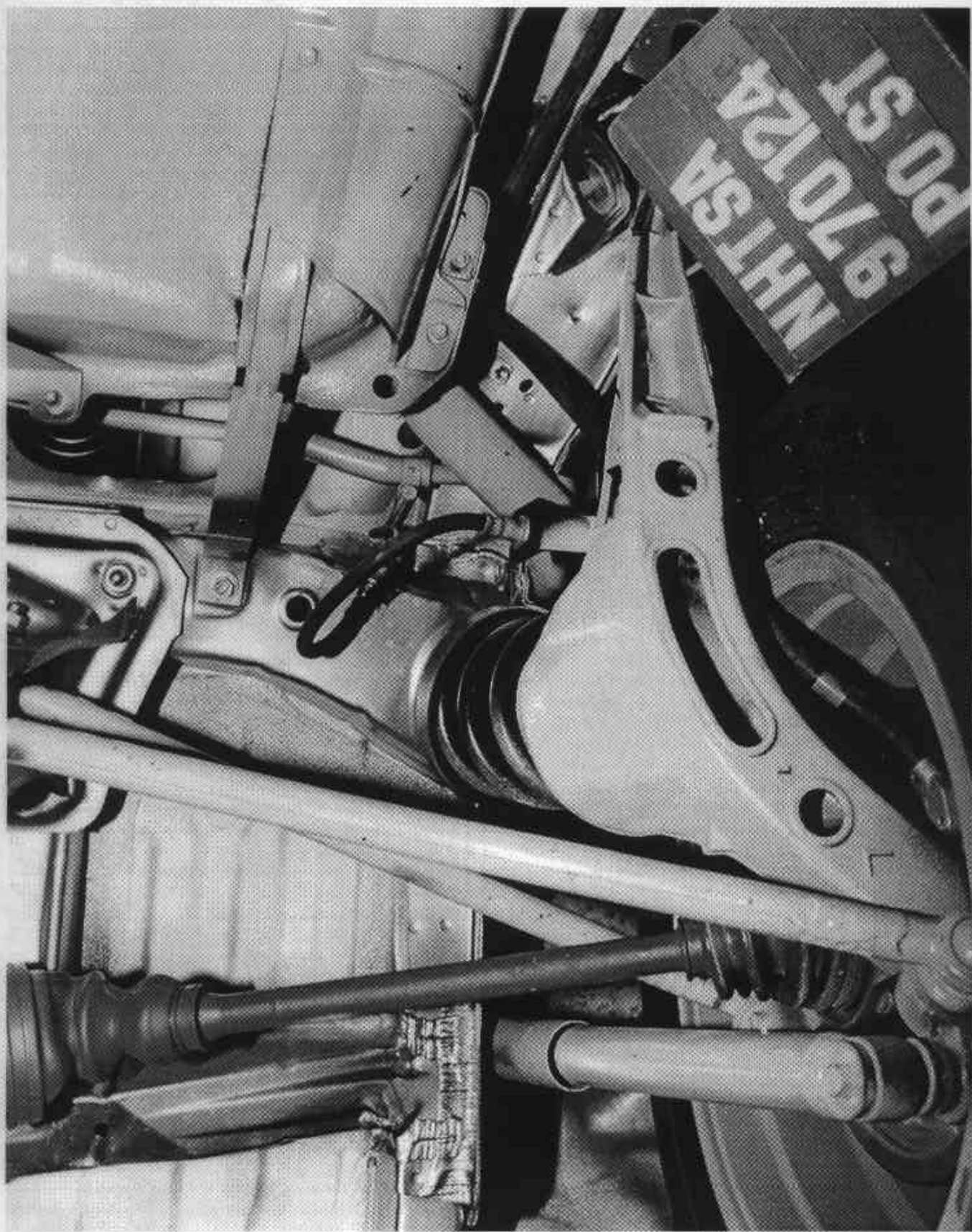


Figure A-21 Post-Test Fuel Filler Neck - View 2

A-22

970124

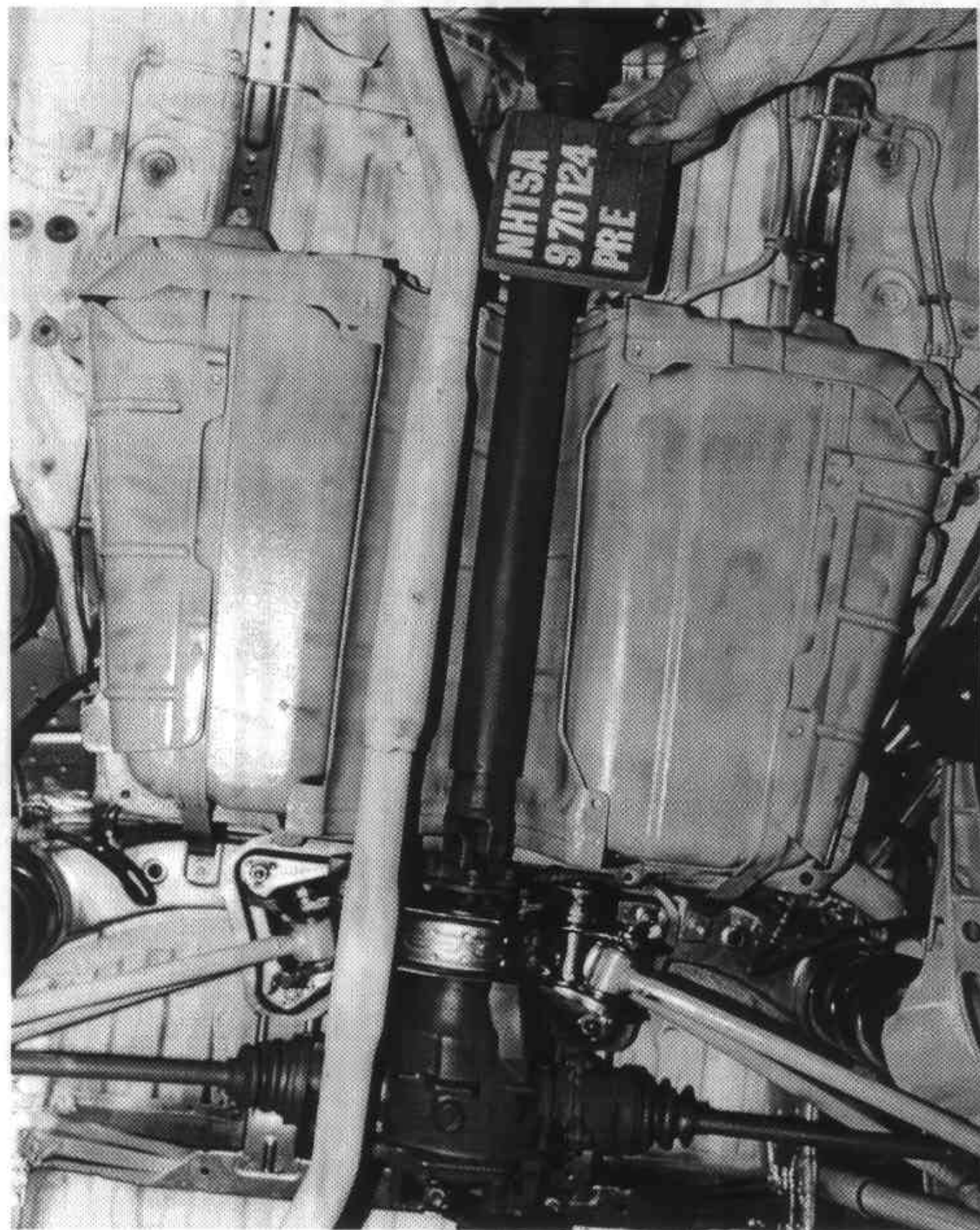


Figure A-22 Pre-Test Fuel Tank View

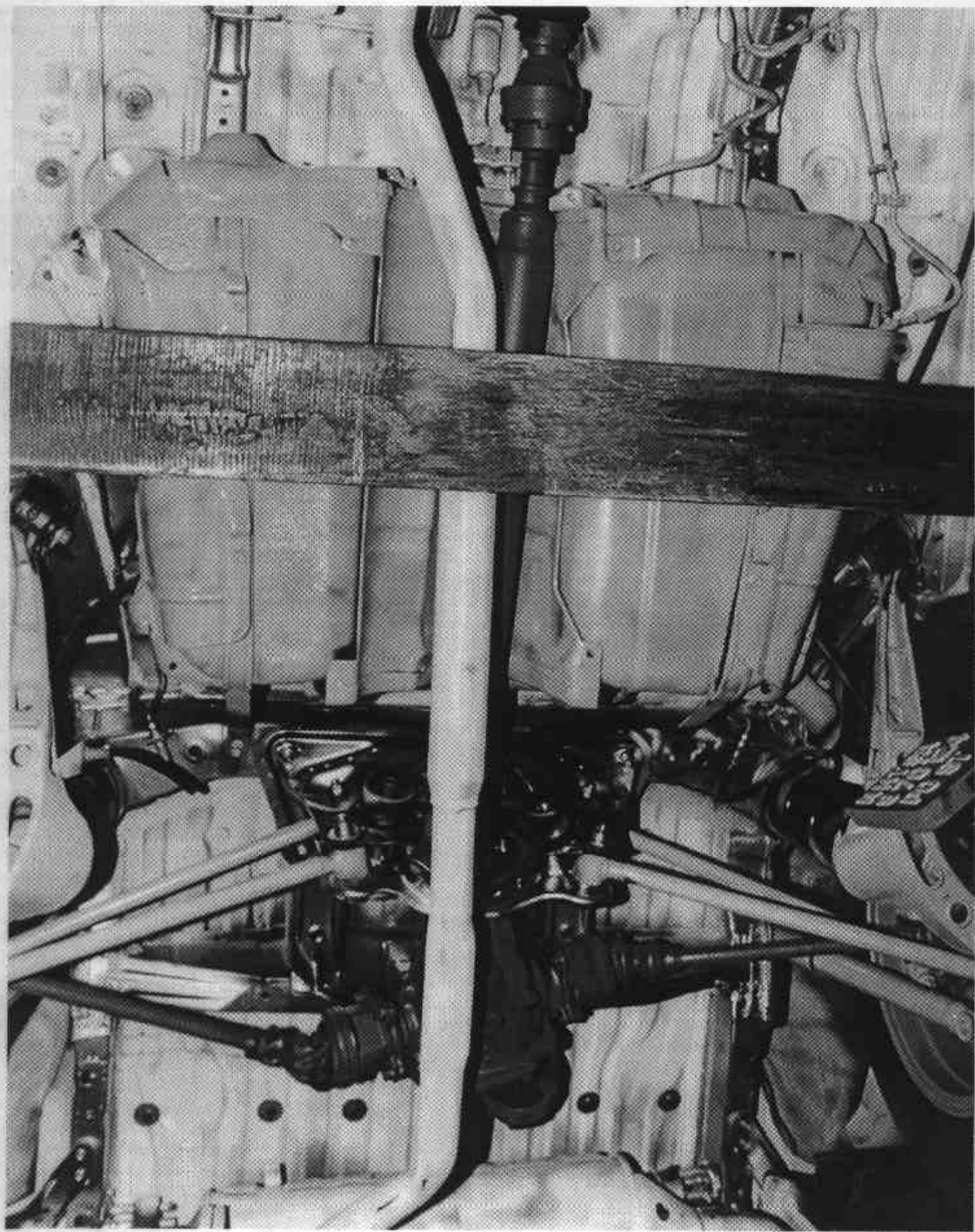


Figure A-23 Post-Test Fuel Tank View

A-24

970124

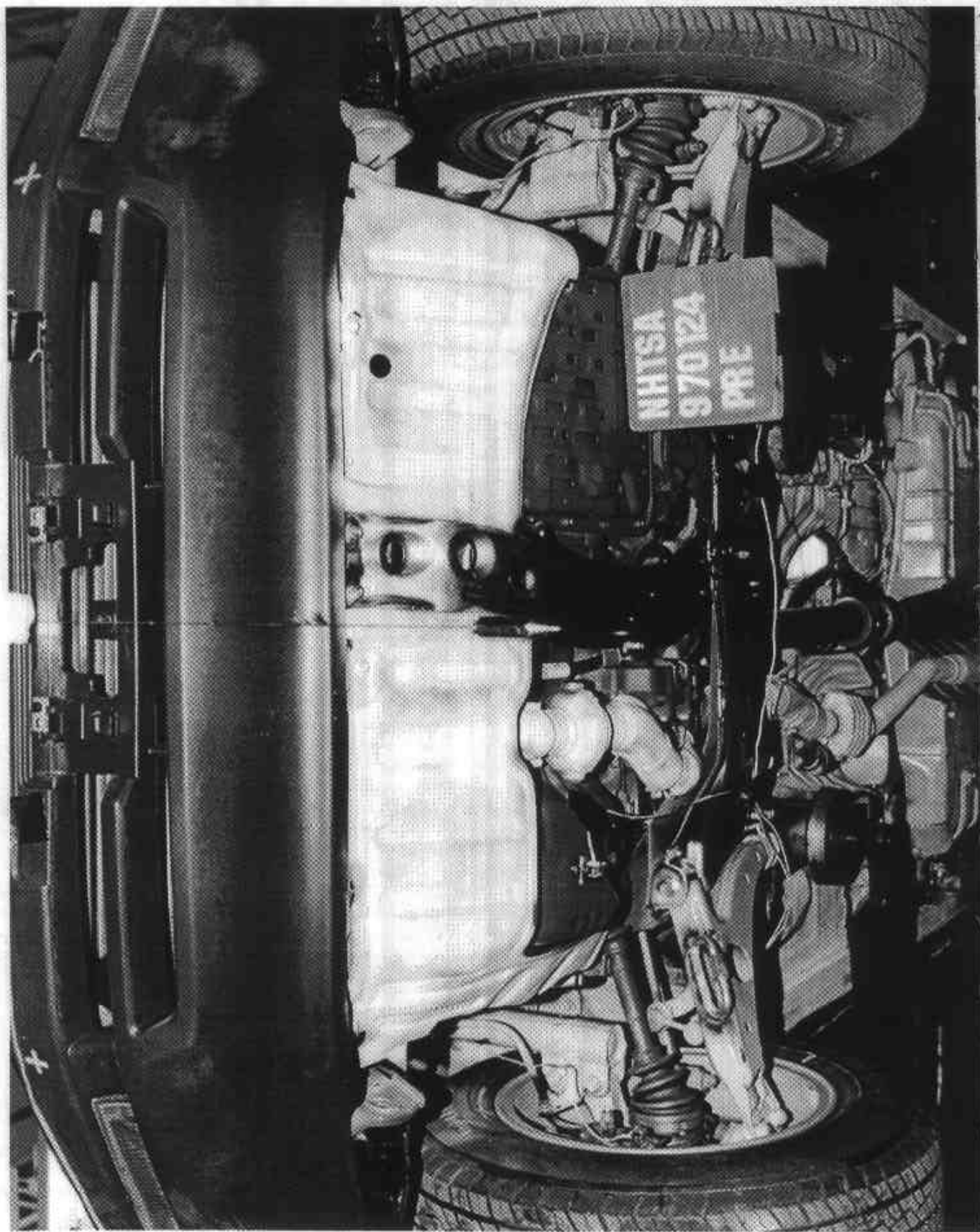


Figure A-24 Pre-Test Front Underbody View

A-25

970124

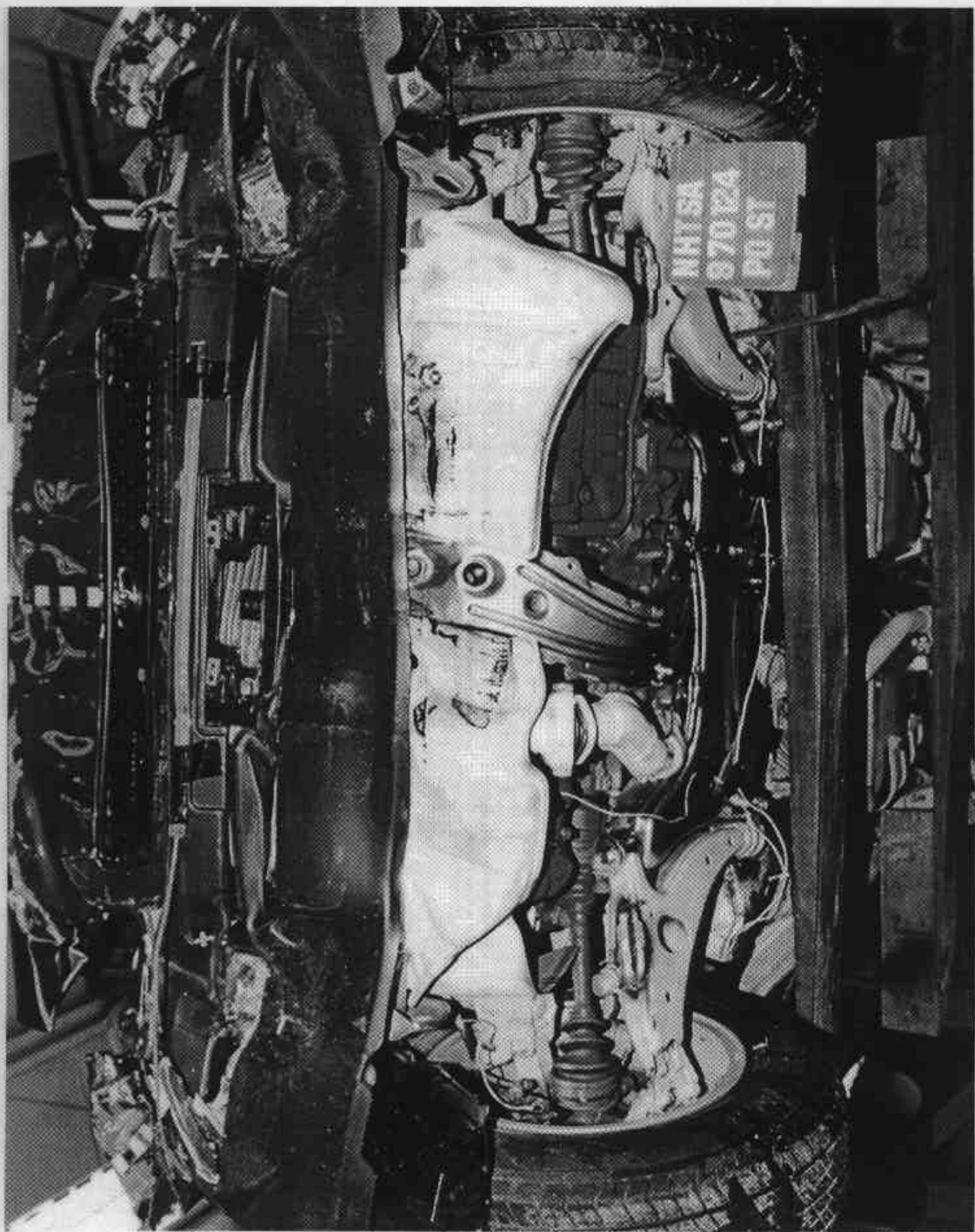


Figure A-25 Post-Test Front Underbody View

A-26

970124

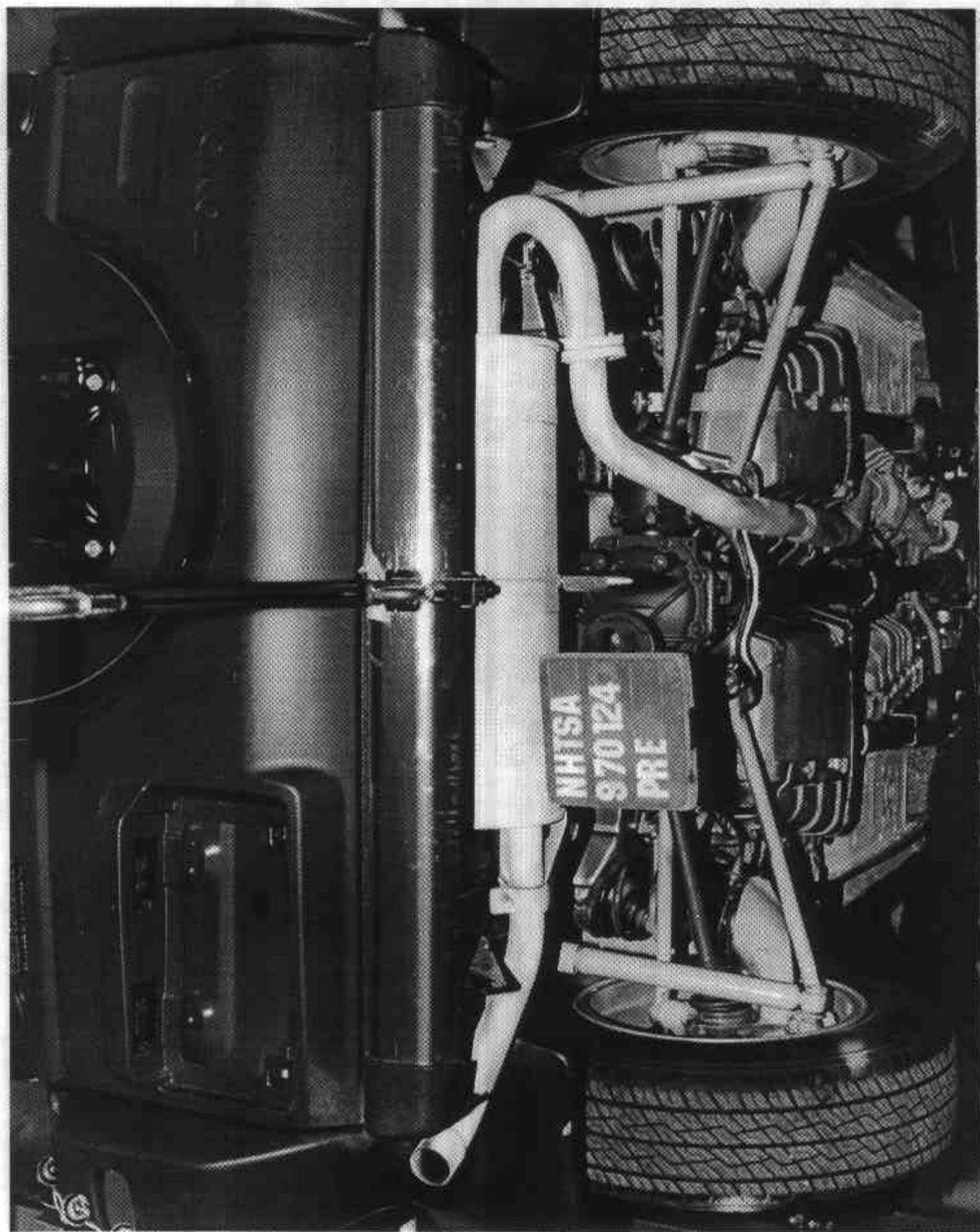


Figure A-26 Pre-Test Rear Underbody View

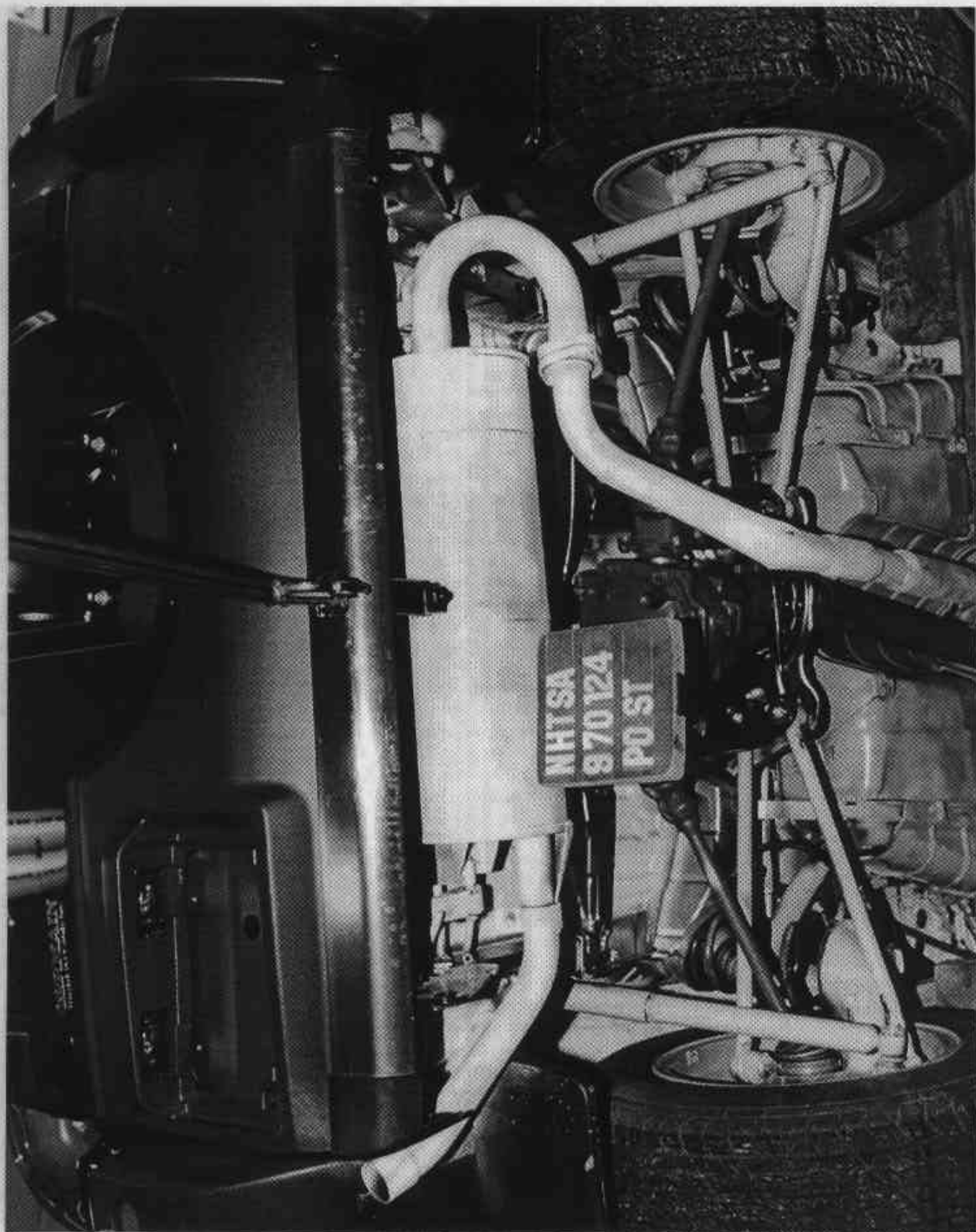


Figure A-27 Post-Test Rear Underbody View

A-28

970124

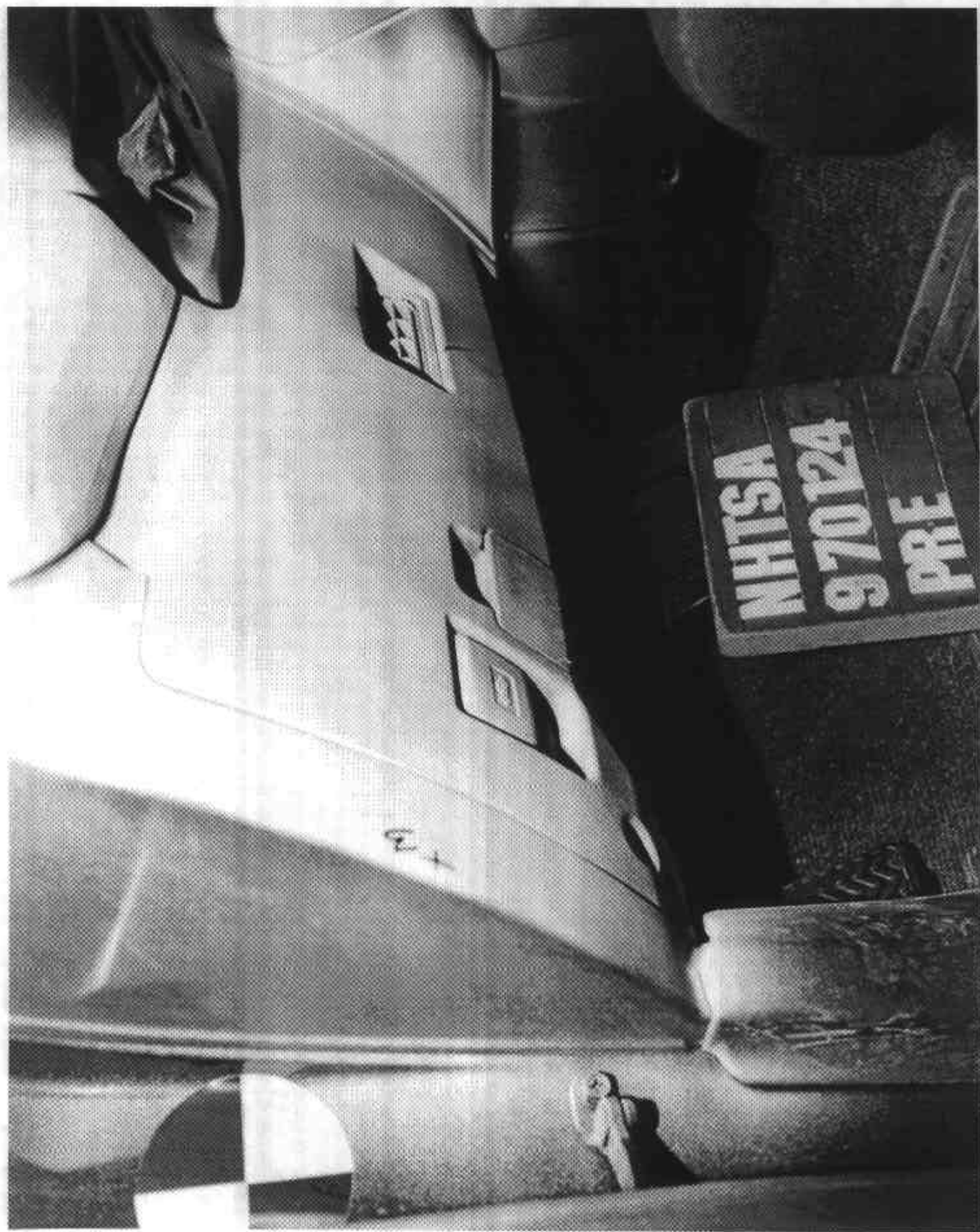


Figure A-28 Pre-Test Driver's Knee Bolster View



Figure A-29 Pre-Test Passenger's Knee Bolster View



Figure A-30 Pre-Test Steering Column View

A-31

970124



Figure A-31 Pre-Test Driver Dummy Position View

A-32

970124



Figure A-32 Post-Test Driver Dummy Position View

A-33

970124

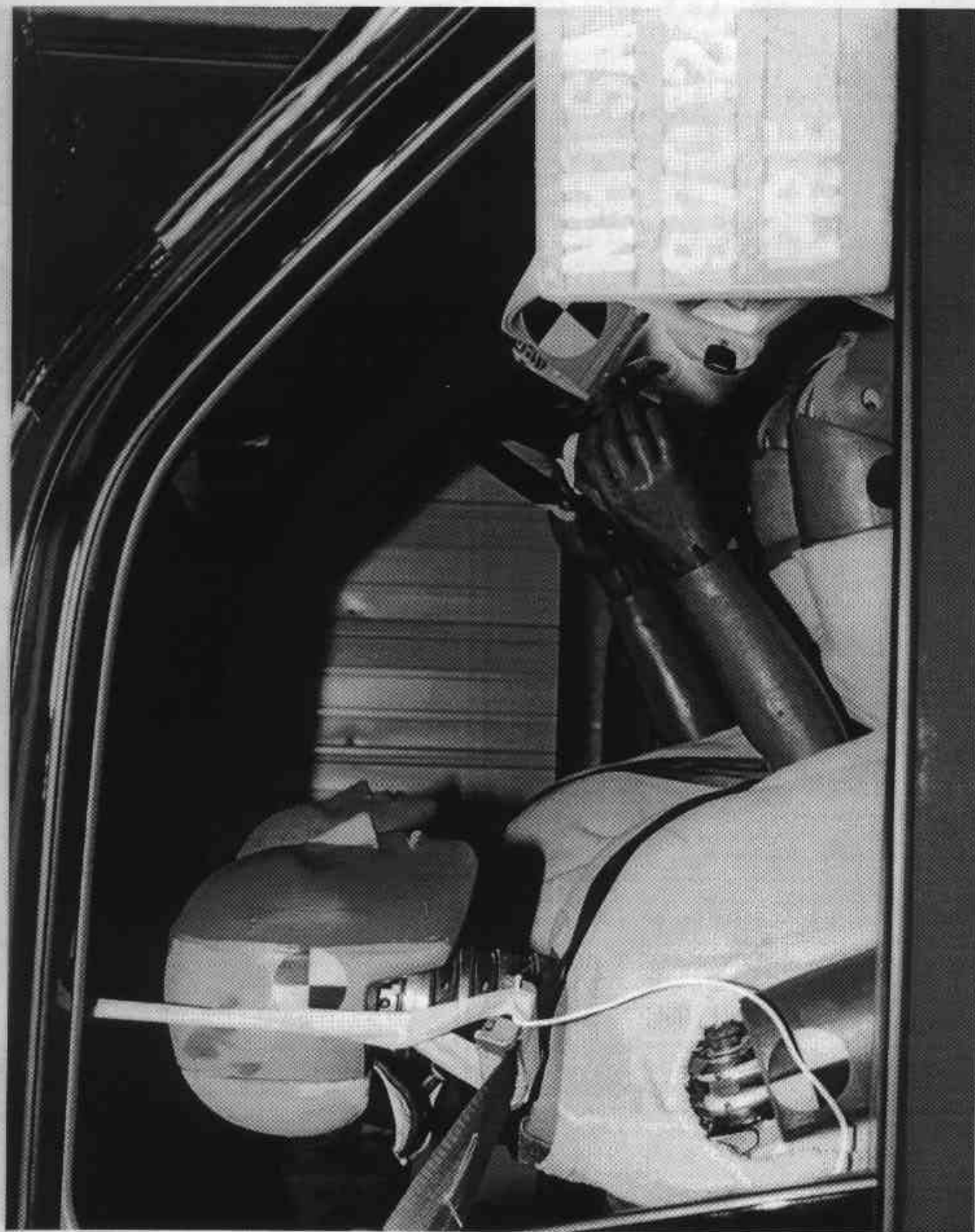


Figure A-33 Pre-Test Passenger Dummy Position View

A-34

970124

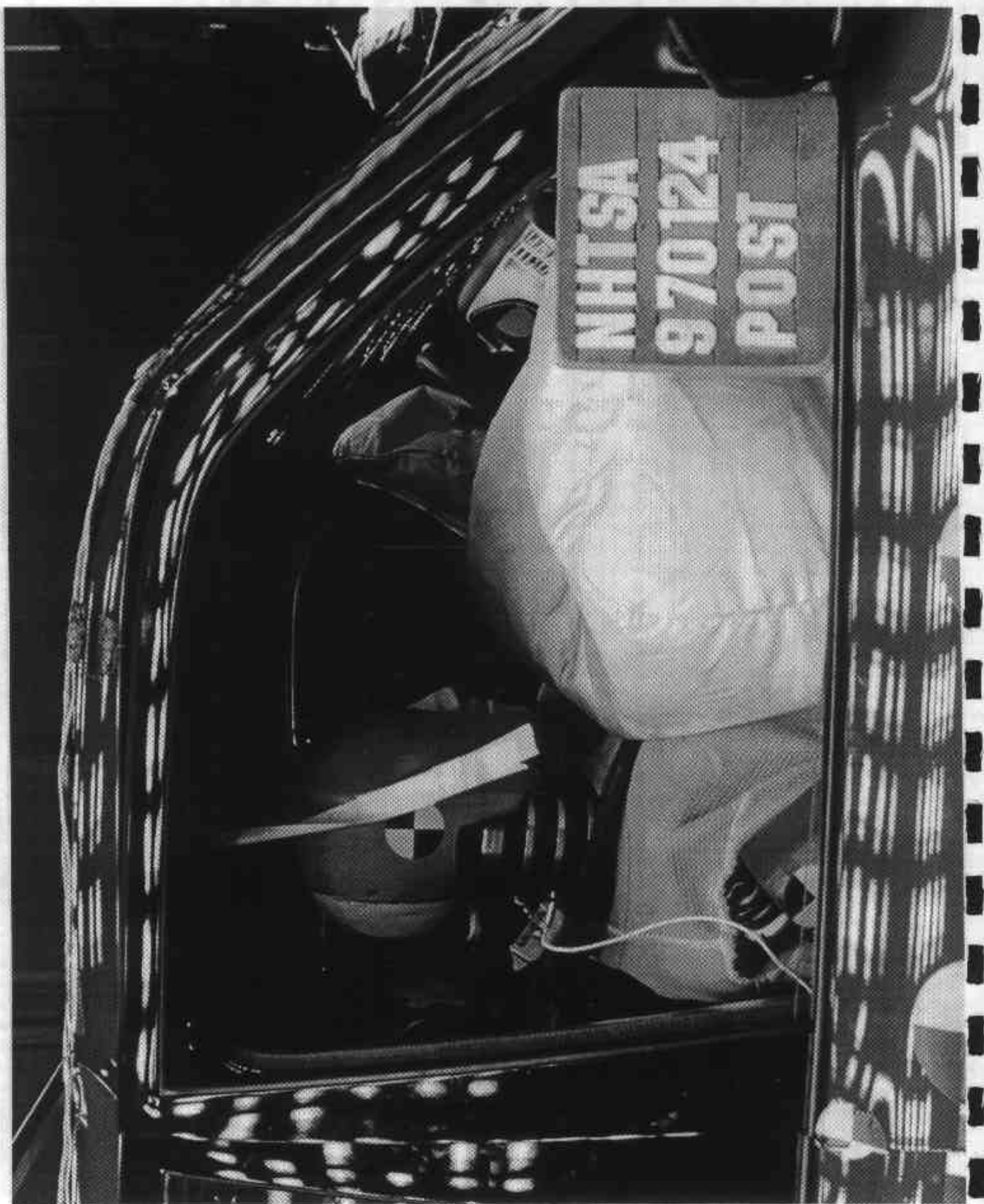


Figure A-34 Post-Test Passenger Dummy Position View

A-35

970124



Figure A-35 Pre-Test Driver Dummy and Vehicle Interior - View 1

A-36

970124



Figure A-36 Post-Test Driver Dummy and Vehicle Interior - View 1



Figure A-37 Pre-Test Driver Dummy and Vehicle Interior - View 2

A-38

970124



Figure A-38 Post-Test Driver Dummy and Vehicle Interior - View 2

A-39

970124



Figure A-39 Pre-Test Passenger Dummy and Vehicle Interior - View 1

A-40

970124



Figure A-40 Post-Test Passenger Dummy and Vehicle Interior - View 1

A-41

970124



Figure A-41 Pre-Test Passenger Dummy and Vehicle Interior - View 2

A-42

970124



Figure A-42 Post-Test Passenger Dummy and Vehicle Interior - View 2

A-43

970124

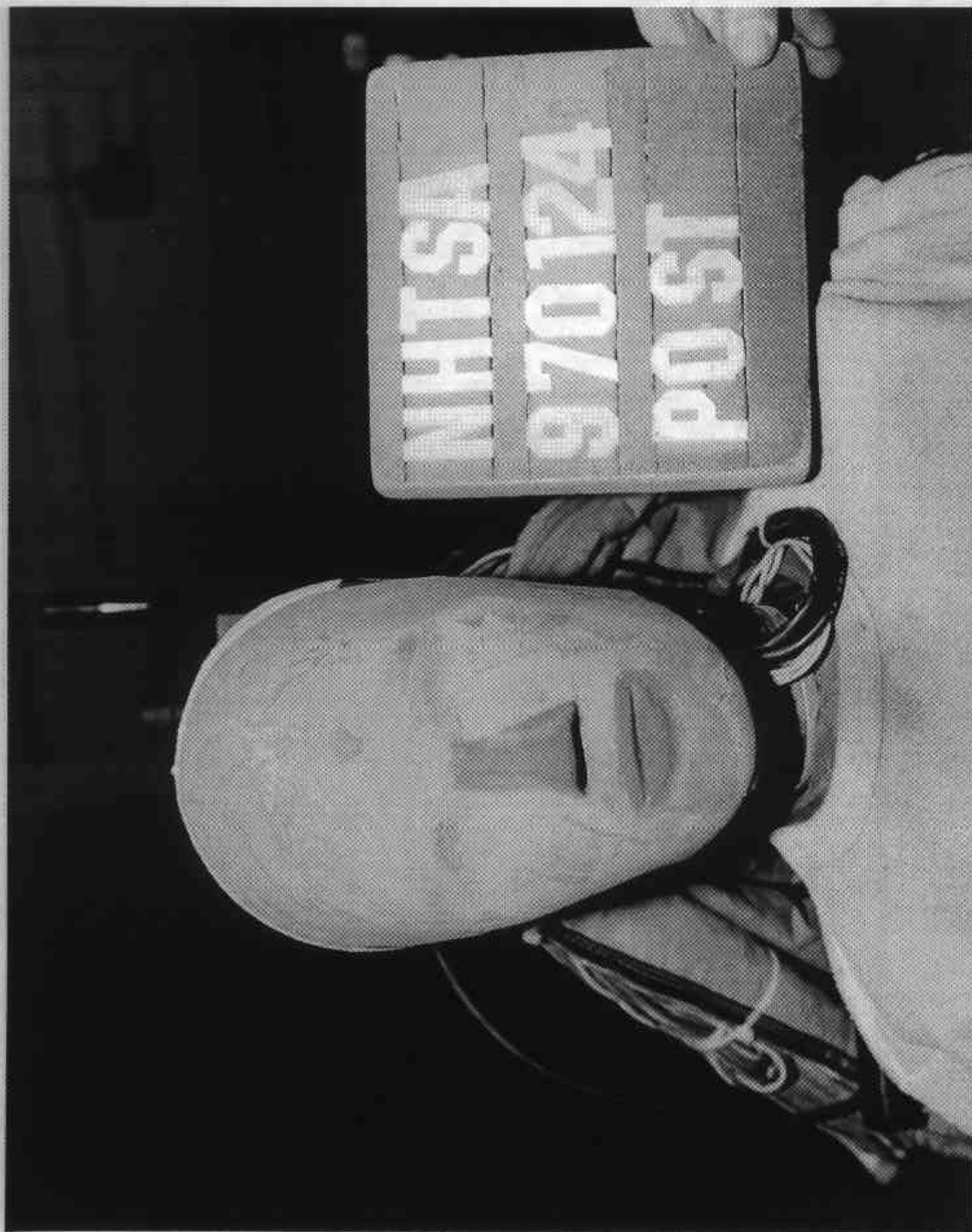


Figure A-43 Post-Test Driver Dummy Head Contact - View 1

A-44

970124



Figure A-44 Post-Test Driver Dummy Head Contact - View 2

A-45

970124



Figure A-45 Post-Test Driver Dummy Head Contact - View 3

A-46

970124



Figure A-46 Post-Test Driver Dummy Knee Contact - View 1

A-47

970124



Figure A-47 Post-Test Driver Dummy Knee Contact - View 2

A-48

970124

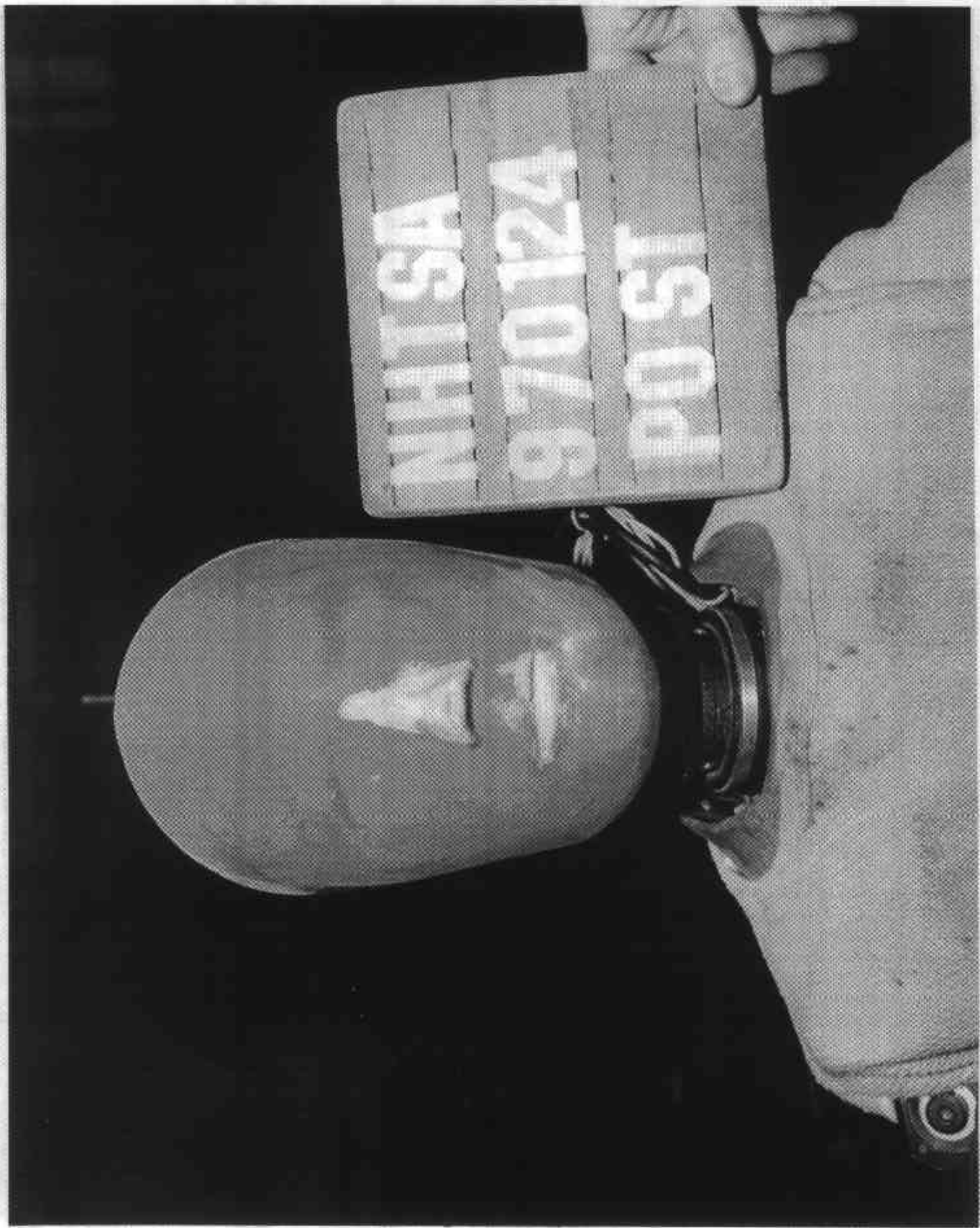


Figure A-48 Post-Test Passenger Dummy Head Contact - View 1

A-49

970124

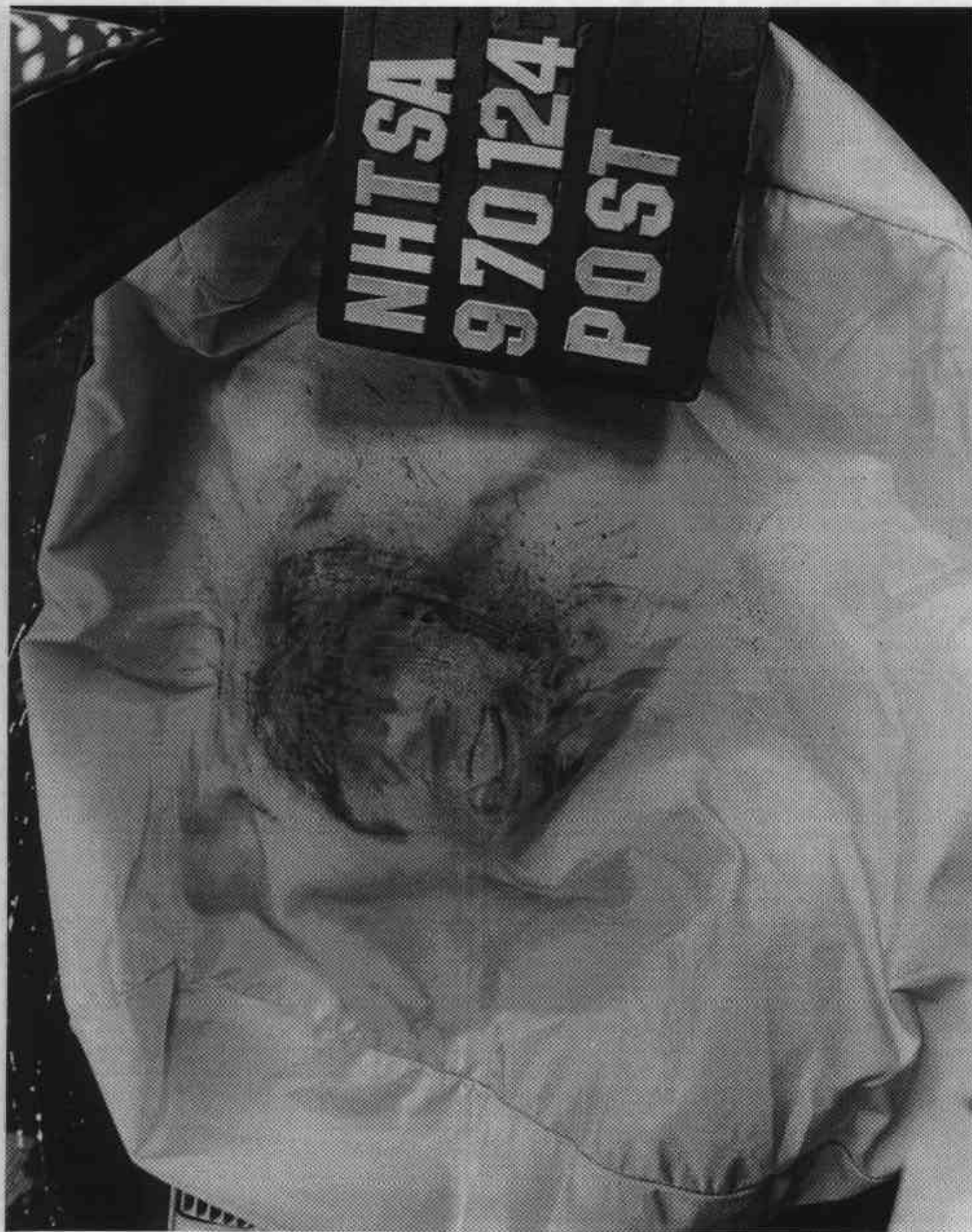


Figure A-49 Post-Test Passenger Dummy Head Contact - View 2

A-50

970124

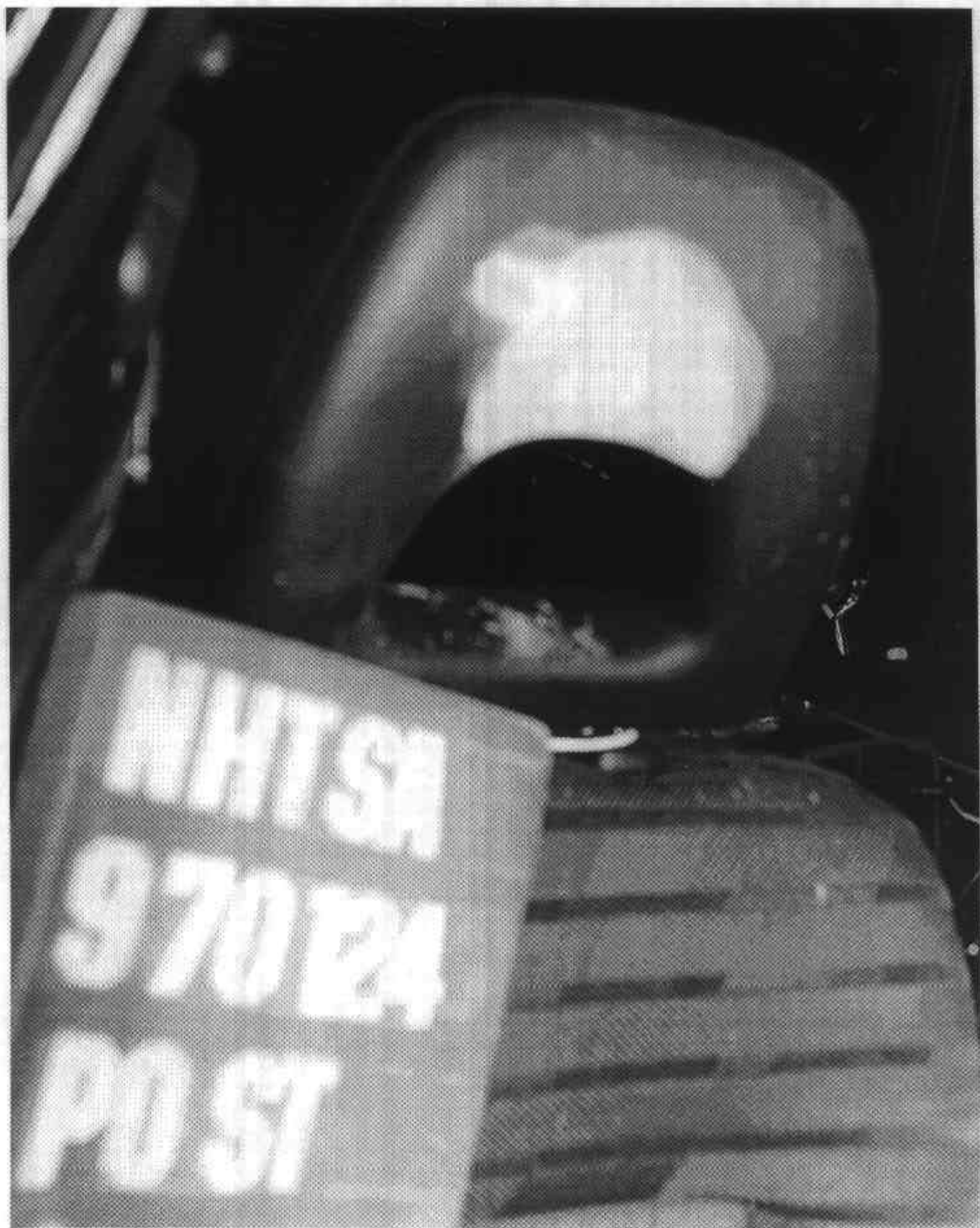


Figure A-50 Post-Test Passenger Dummy Head Contact - View 3

A-51

970124



Figure A-51 Post-Test Passenger Dummy Knee Contact - View 1

A-52

970124

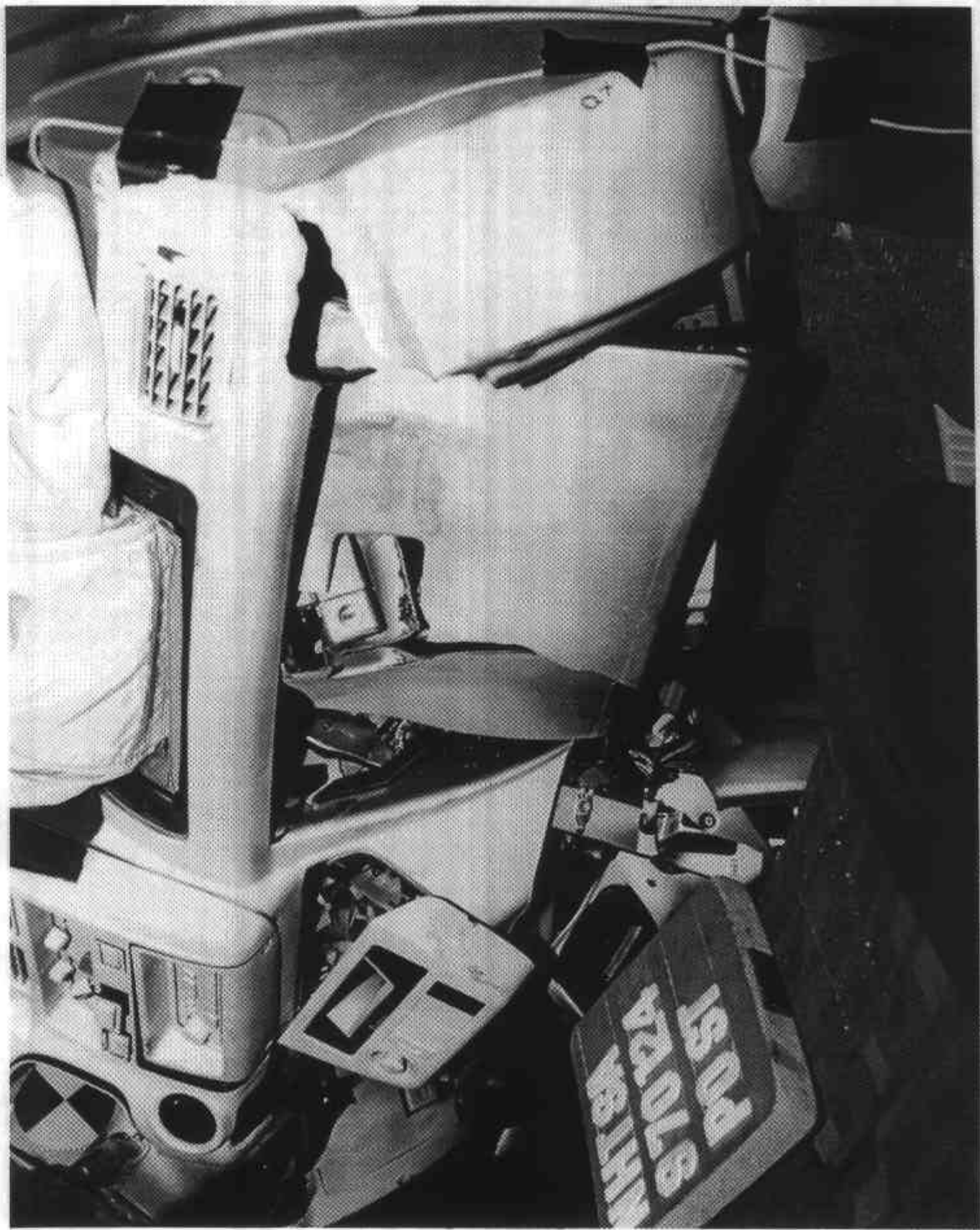


Figure A-52 Post-Test Passenger Dummy Knee Contact - View 2

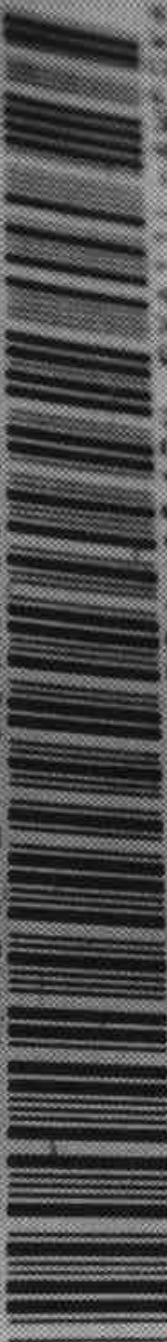
A-53

970124

MFD BY: TOYOTA MOTOR CORPORATION DATE 11/96
GVWR (LBS): 3893
GAWR (LBS): FRT. 1973 WITH 215/70R16
16X6JJ RIMS. AT 28 PSI COLD
TIRES.

RR. 2161 WITH 215/70R16
16X6JJ RIMS. AT 26 PSI COLD
TIRES.

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDER-
AL MOTOR VEHICLE SAFETY AND THEFT PREVENTION
STANDARDS IN EFFECT ON THE DATE OF MANUFAC-
TURE SHOWN ABOVE. JT3HP10V1V7036573 MPV



C/ TR-3JB/FK15 A/TM -02A-A340M 32A1A JAPAN

Figure A-53 Pre-Test Vehicle Certification Label View

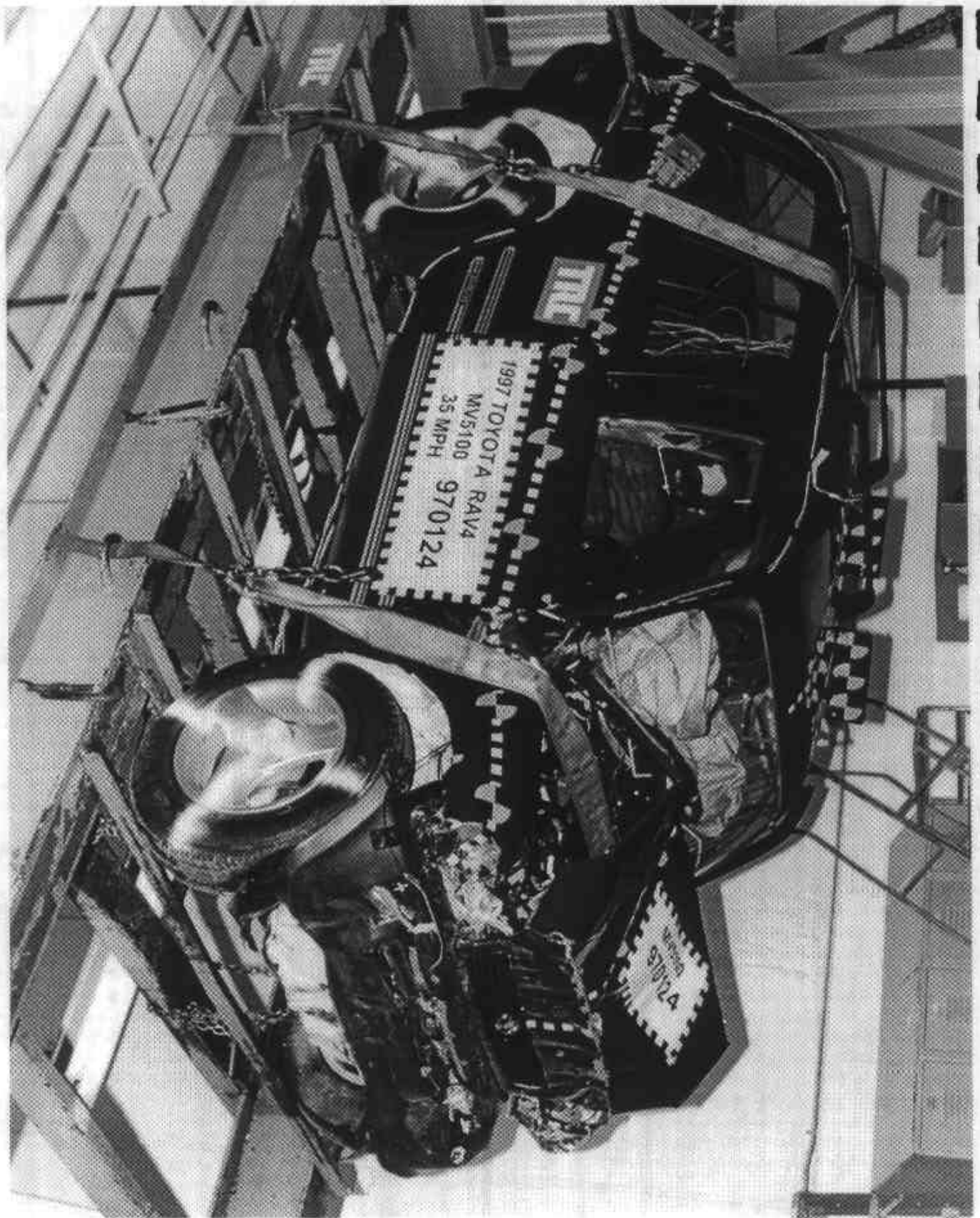


Figure A-54 Post-Test Vehicle on Static Rollover Machine View

A-55

970124

Appendix B

Data Plots

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

90

60

30

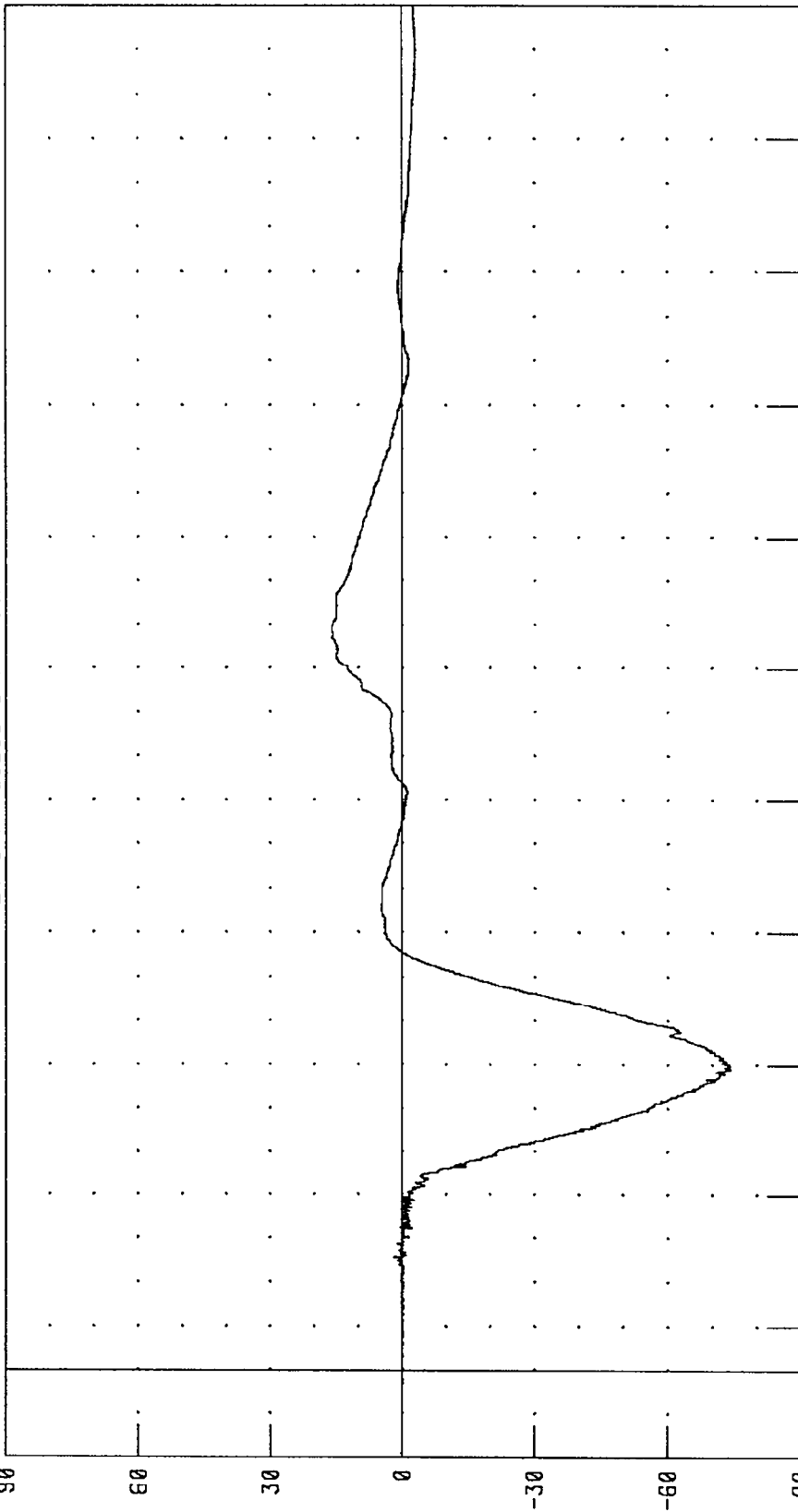
0

-30

-60

-90

ACCELERATION (G)



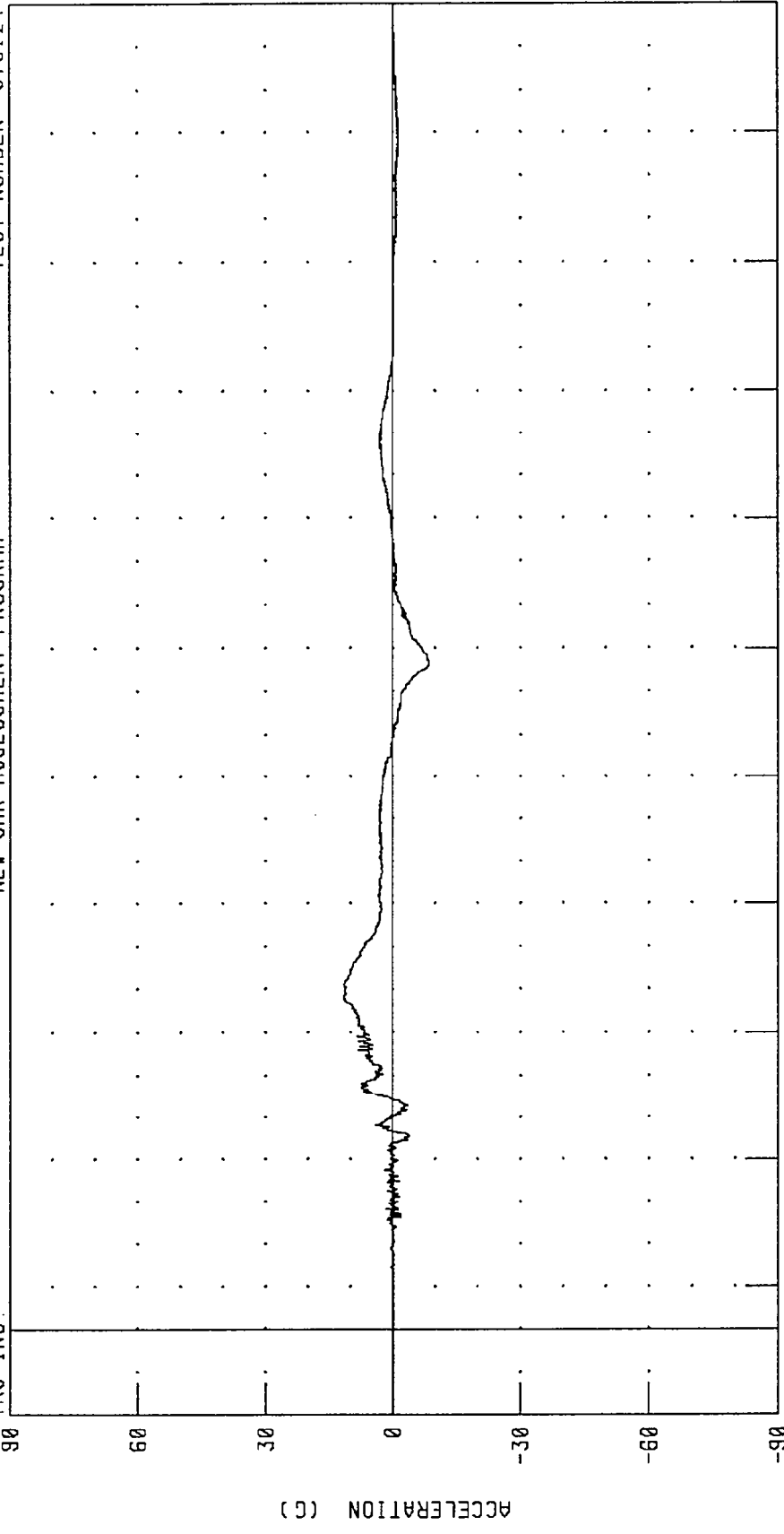
PEAK DATA: 16.27 G @ 166.96 MS; -74.23 G @ 69.68 MS

CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

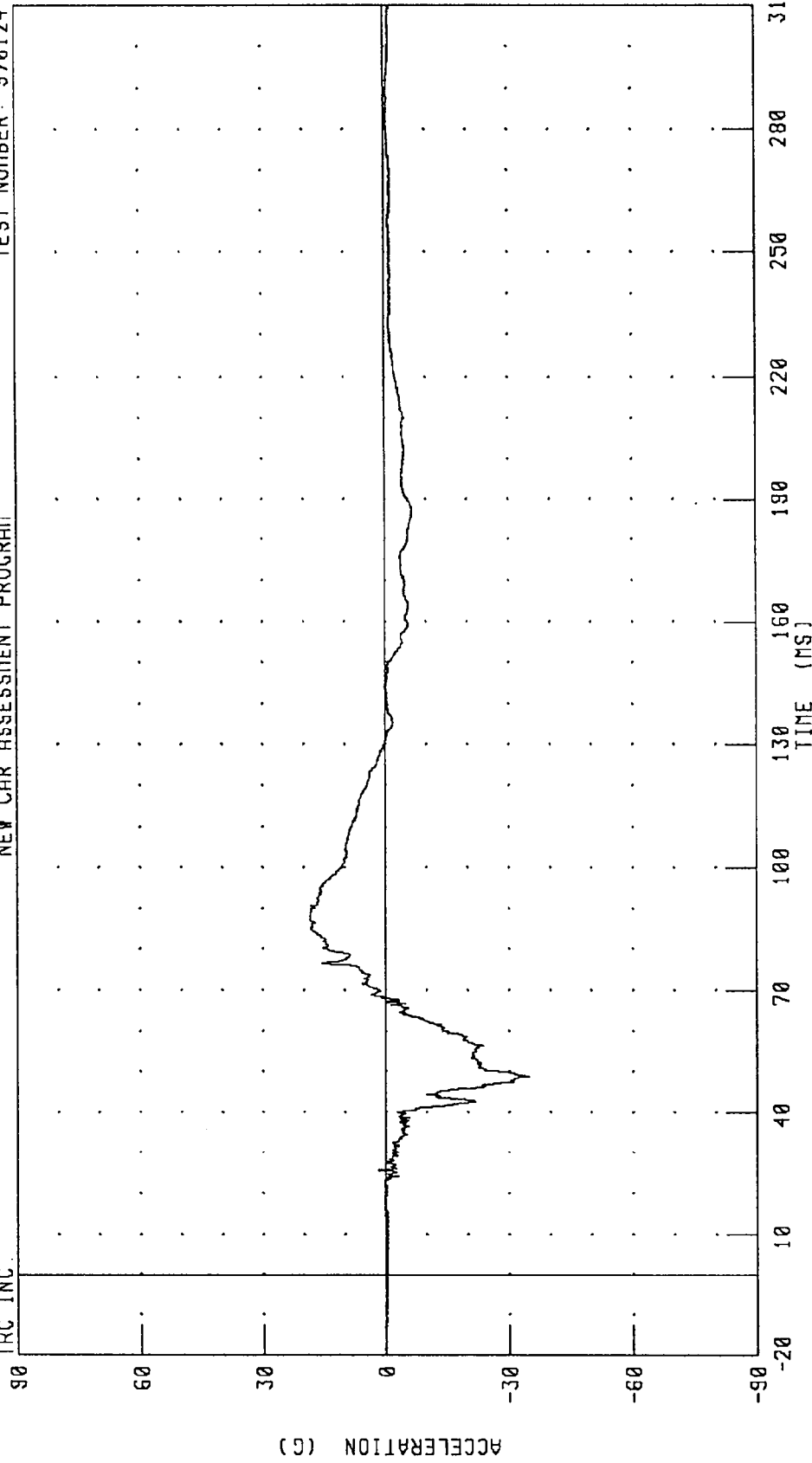
PEAK DATA: 11.59 G @ 77.52 MS; -8.59 G @ 156.48 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



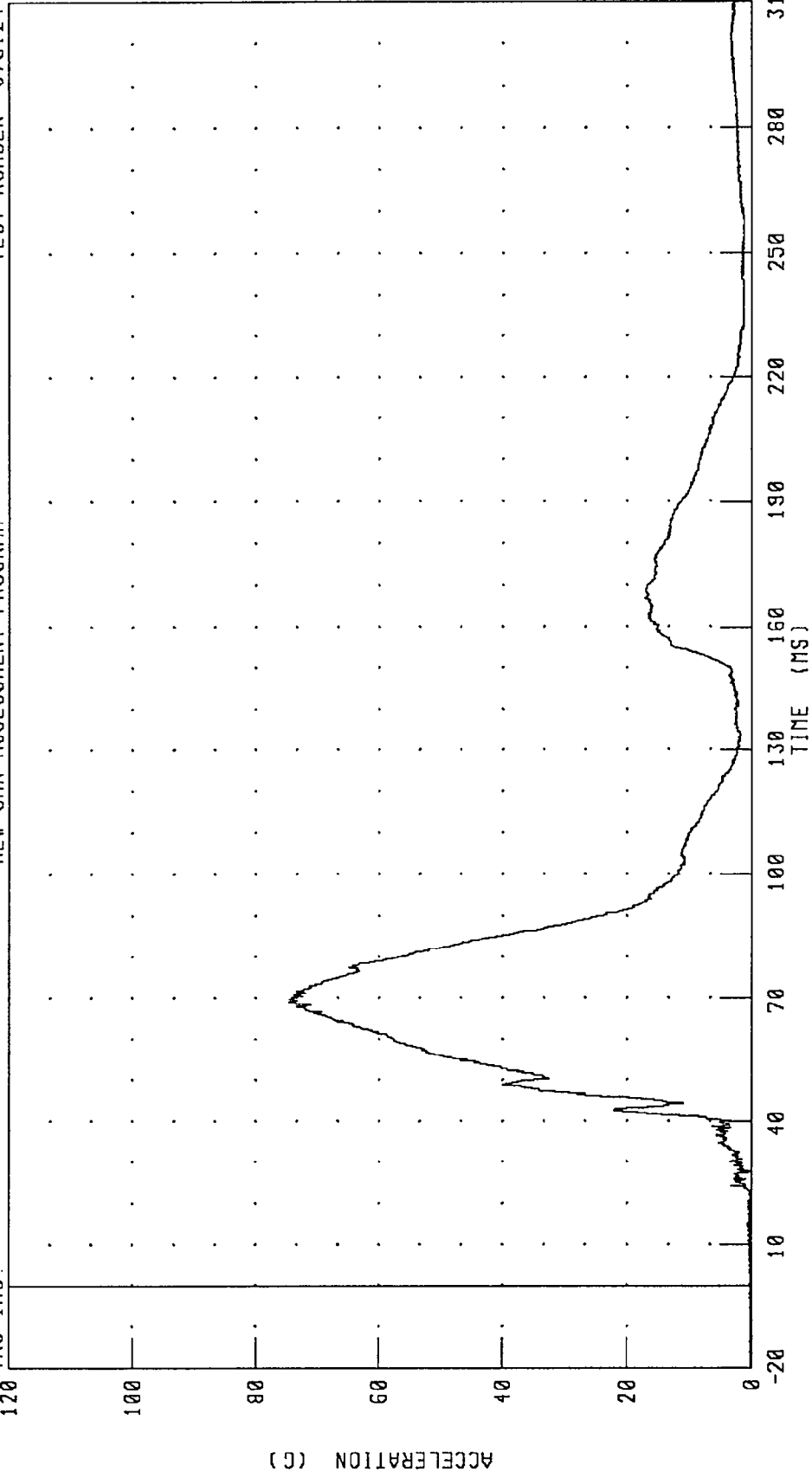
CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 18.58 G @ 87.36 MS; -34.84 G @ 48.72 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

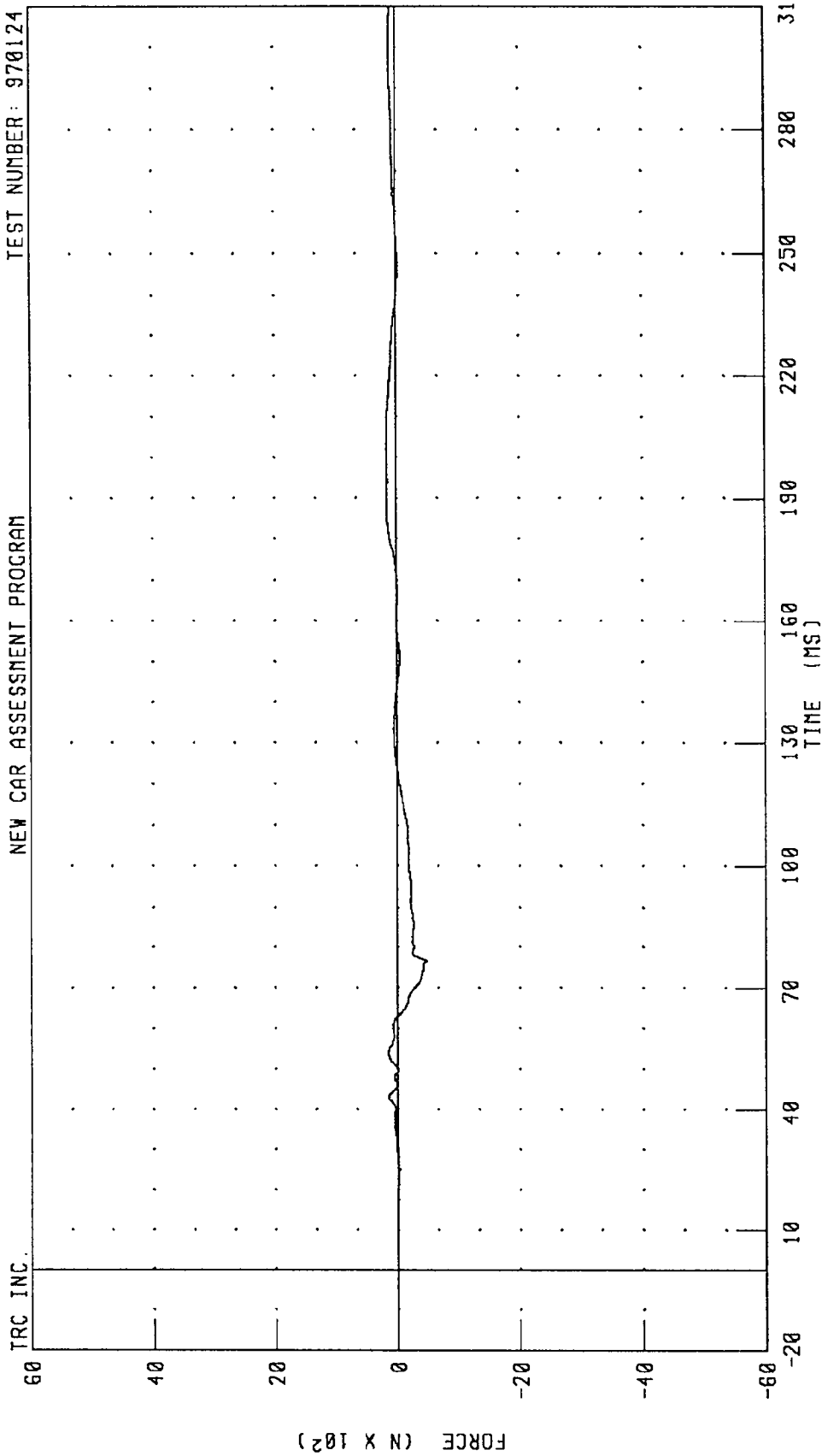


PEAK DATA: 74.58 G @ 69.12 MS; 0.04 G @ -20.00 MS

CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 165.14 N @ 202.16 MS; -474.16 N @ 76.64 MS

CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

60

40

20

0

-20

-40

-60

FORCE (N X 10²)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

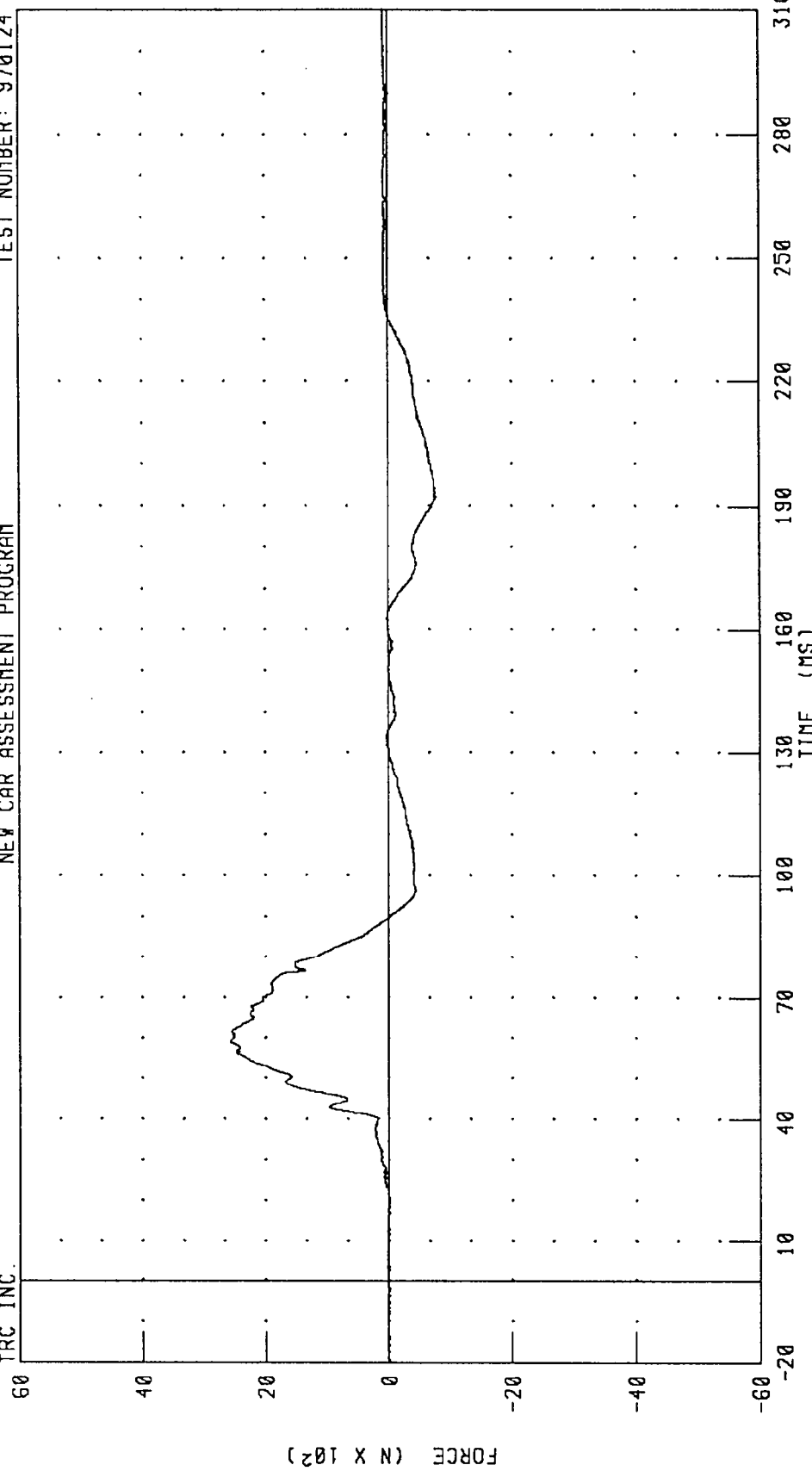
PEAK DATA: 167.00 N @ 162.64 MS; -106.70 N @ 121.52 MS

CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Z-AXIS AXIAL FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



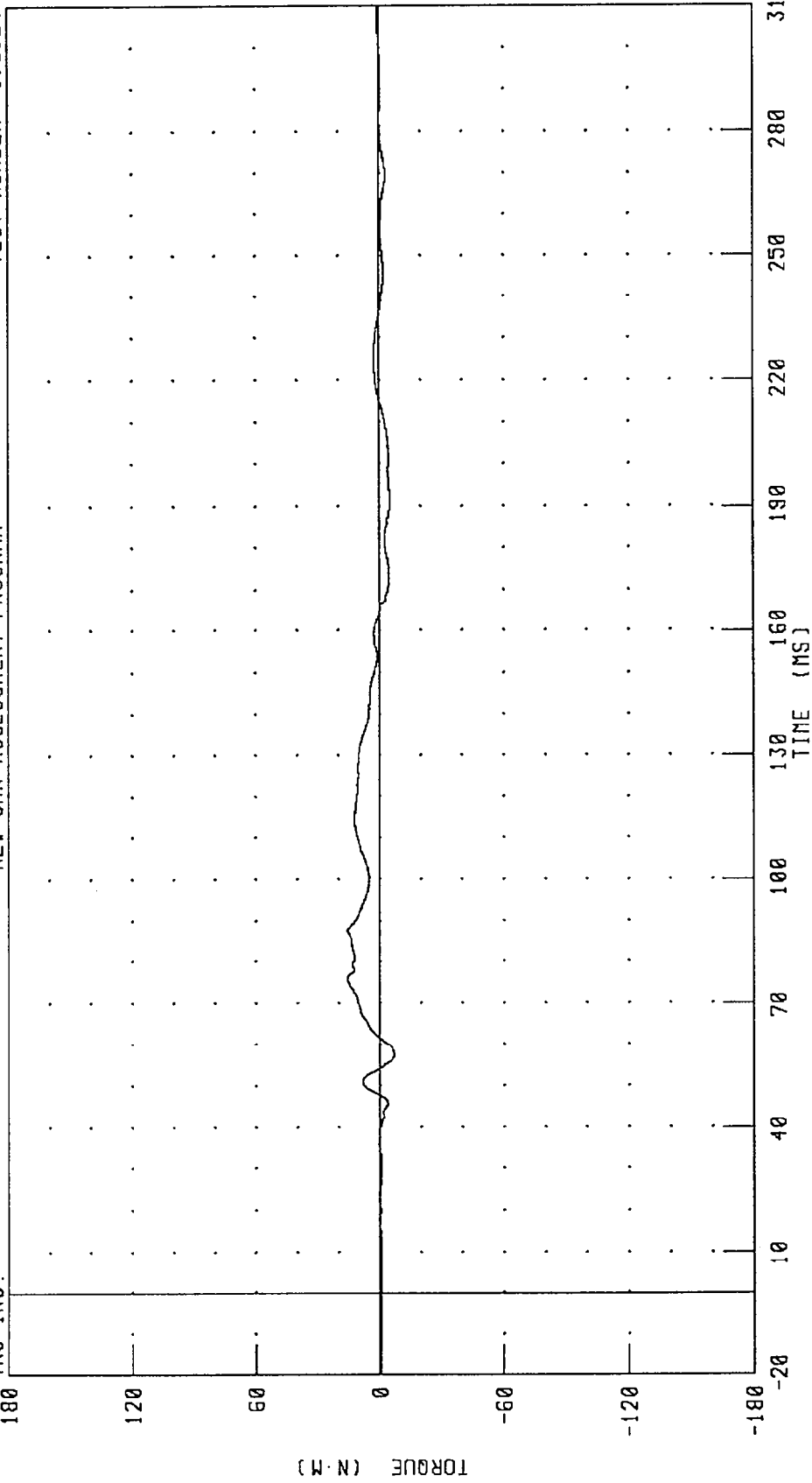
CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

PEAK DATA: 2579.68 N @ 59.12 MS; -784.59 N @ 192.24 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT X AXIS
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



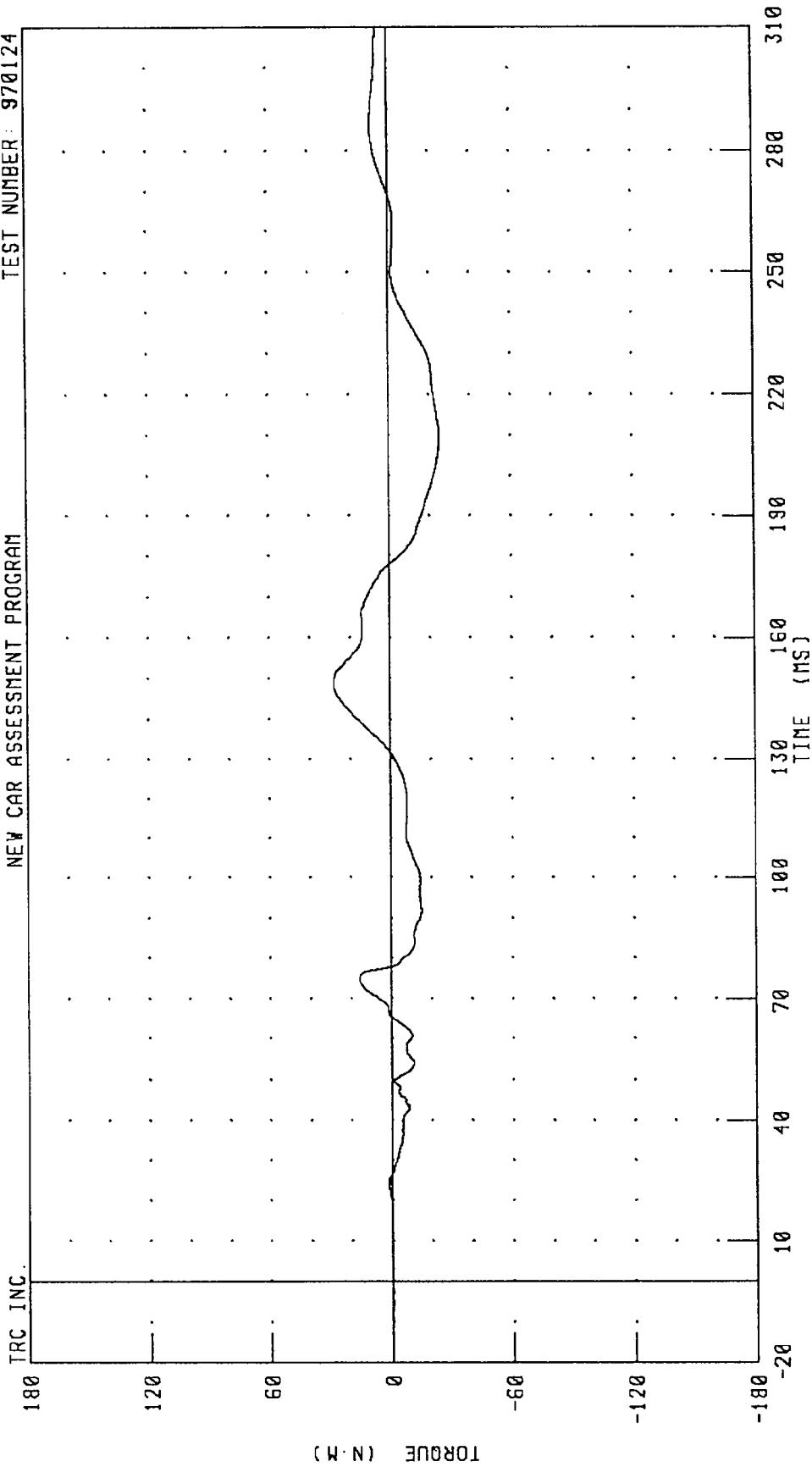
CHANNEL: NEKXM1 FILTER: CH. CLASS 600

PEAK DATA: 15.87 N·M @ 76.16 MS; -7.07 N·M @ 57.52 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

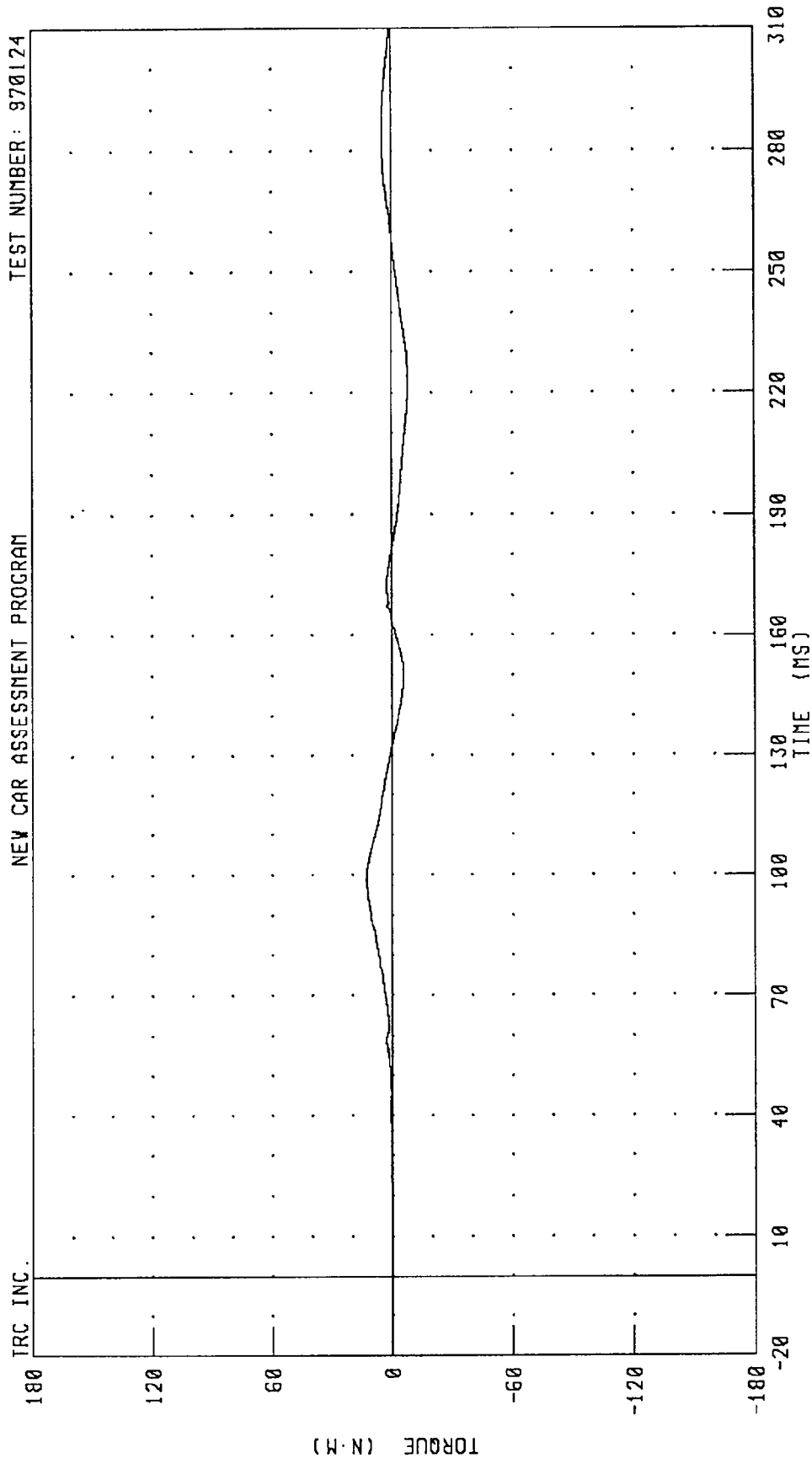


CHANNEL: NEKYM1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT Z AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

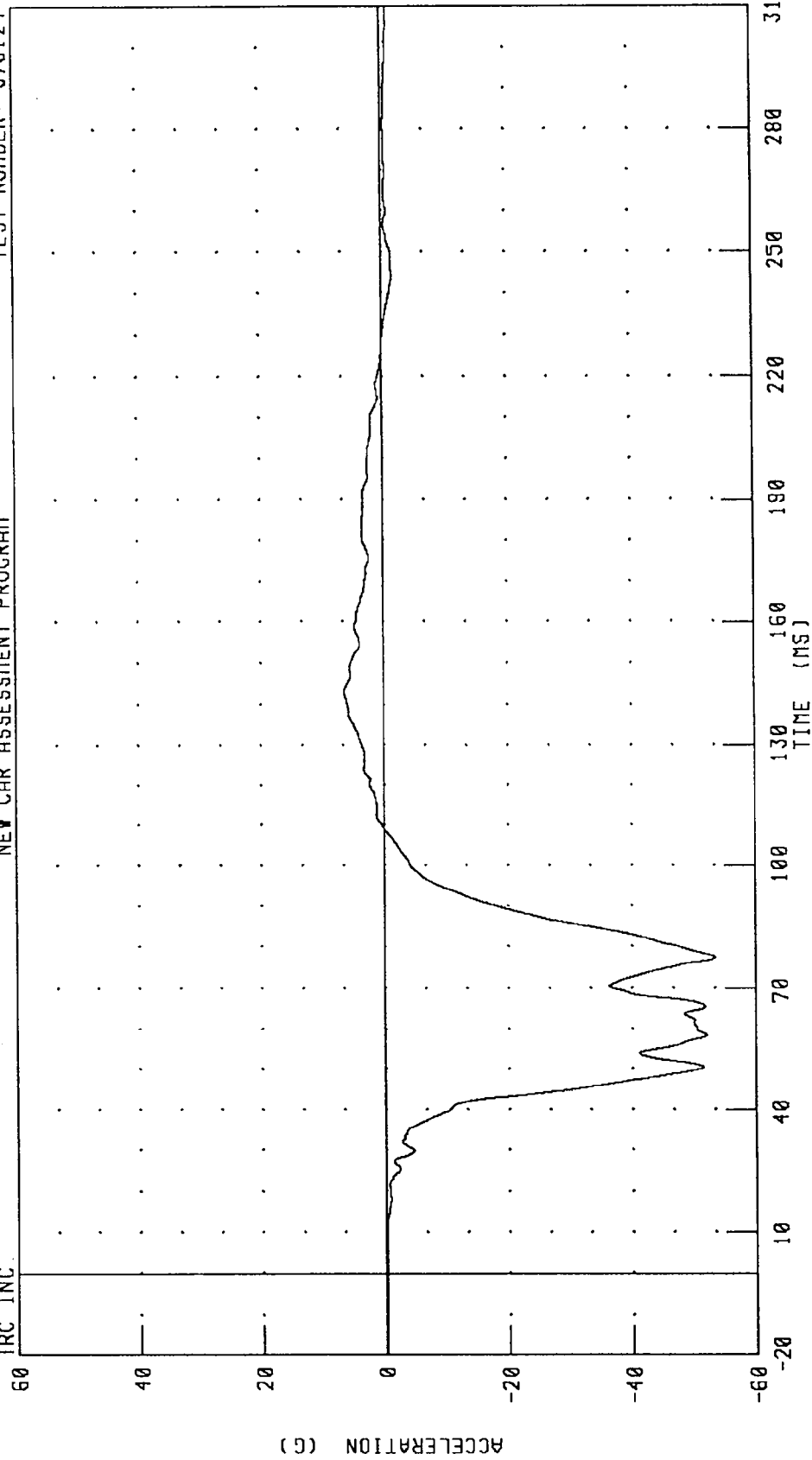


PEAK DATA: 13.01 N·M @ 98.80 MS; -8.06 N·M @ 225.04 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



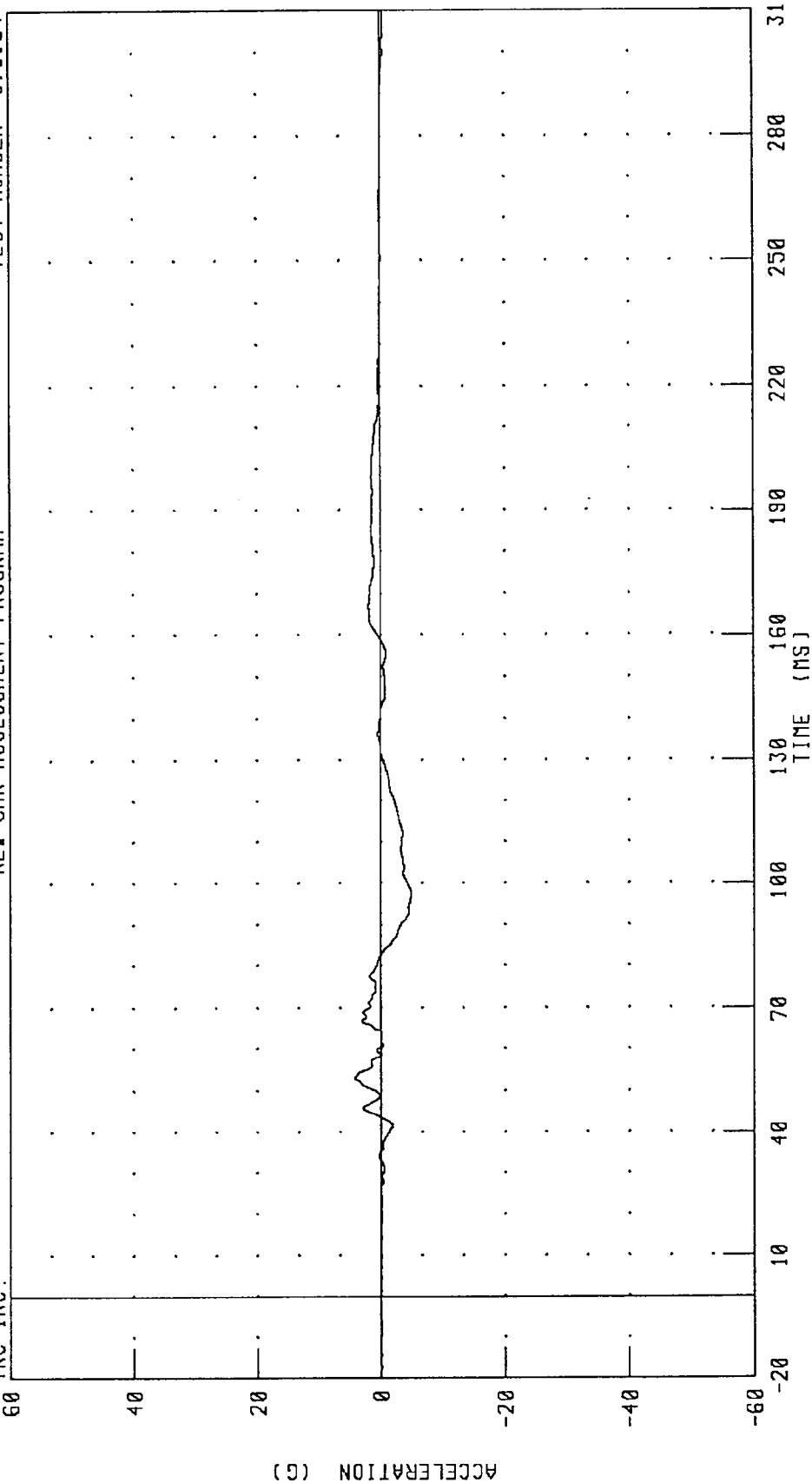
PEAK DATA: 6.42 G @ 143.20 MS; -53.43 G @ 77.36 MS

CHANNEL: CSTXG1 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



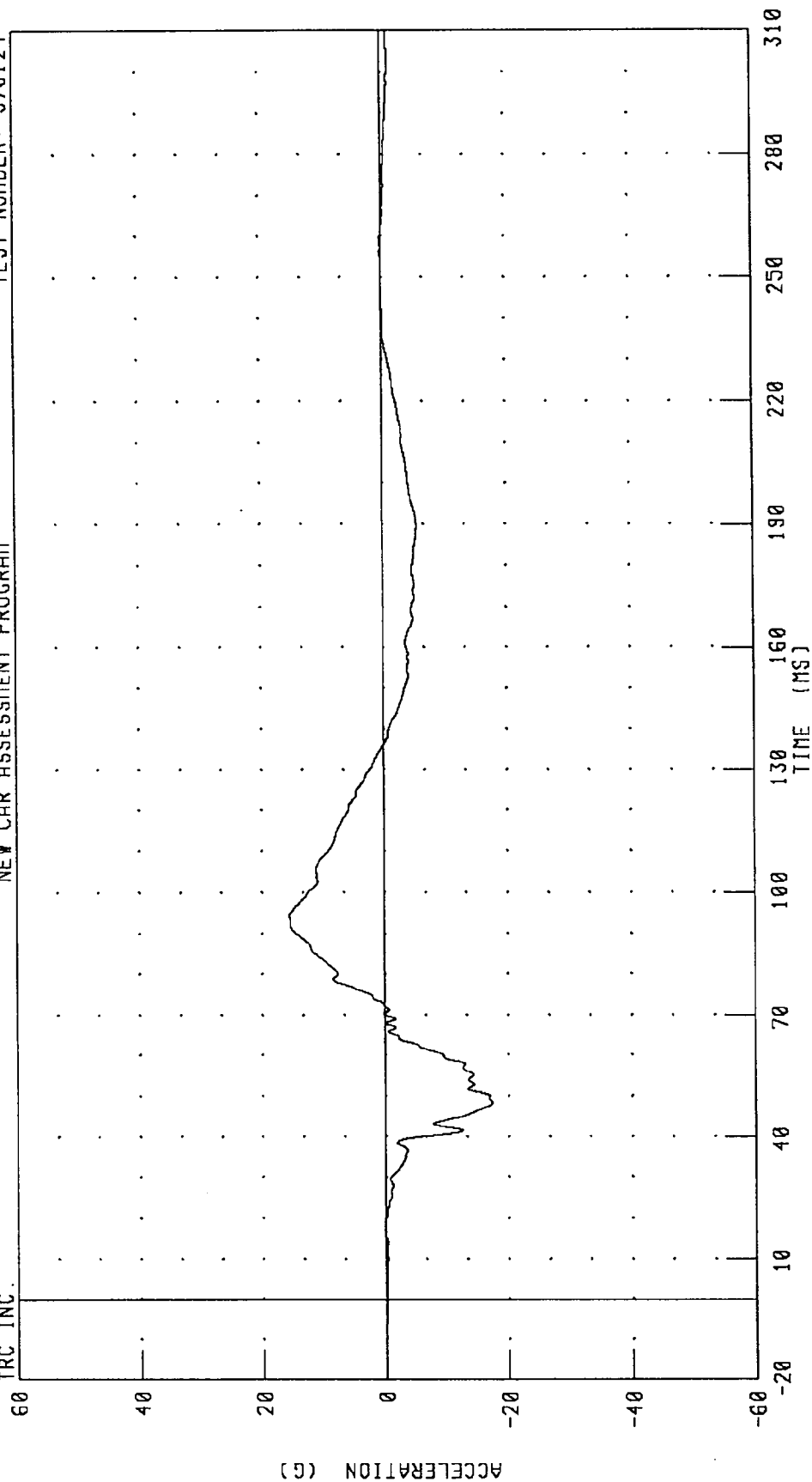
CHANNEL: CSTYG1 FILTER: CH. CLASS 180

PEAK DATA: 4.24 G @ 52.96 MS; -4.94 G @ 98.08 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



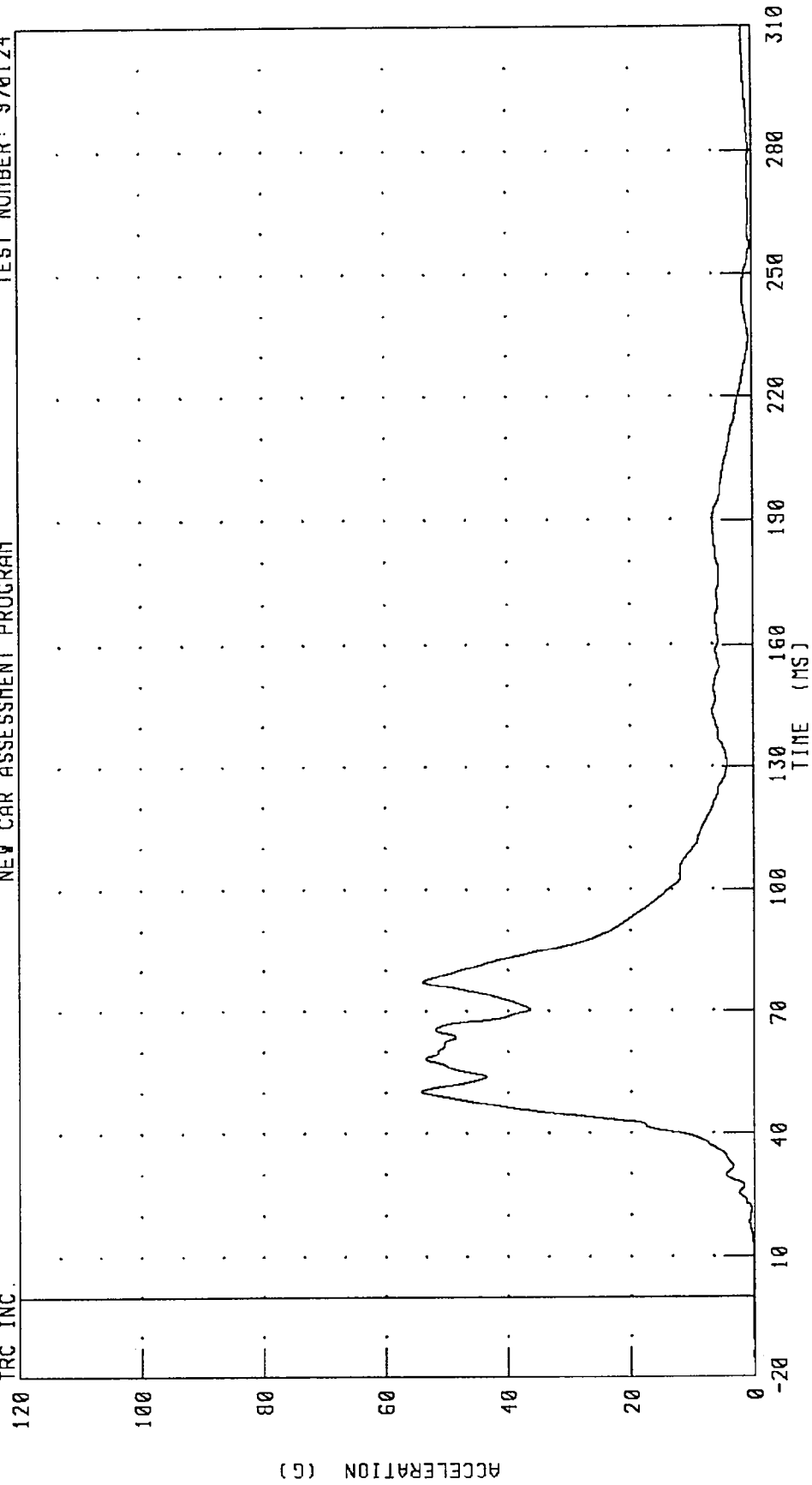
CHANNEL: CSTZG1 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



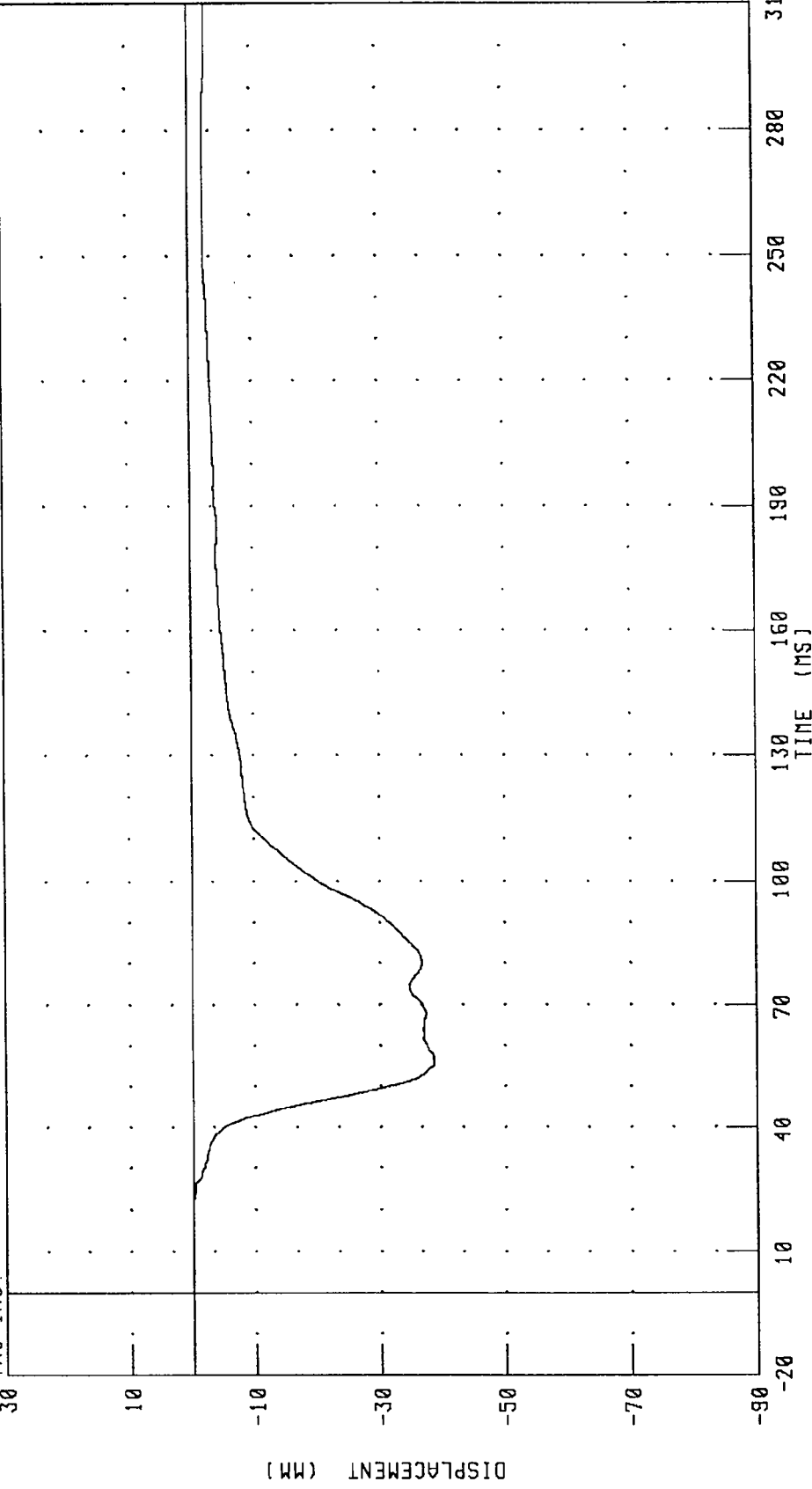
CHANNEL: CSTRG1 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

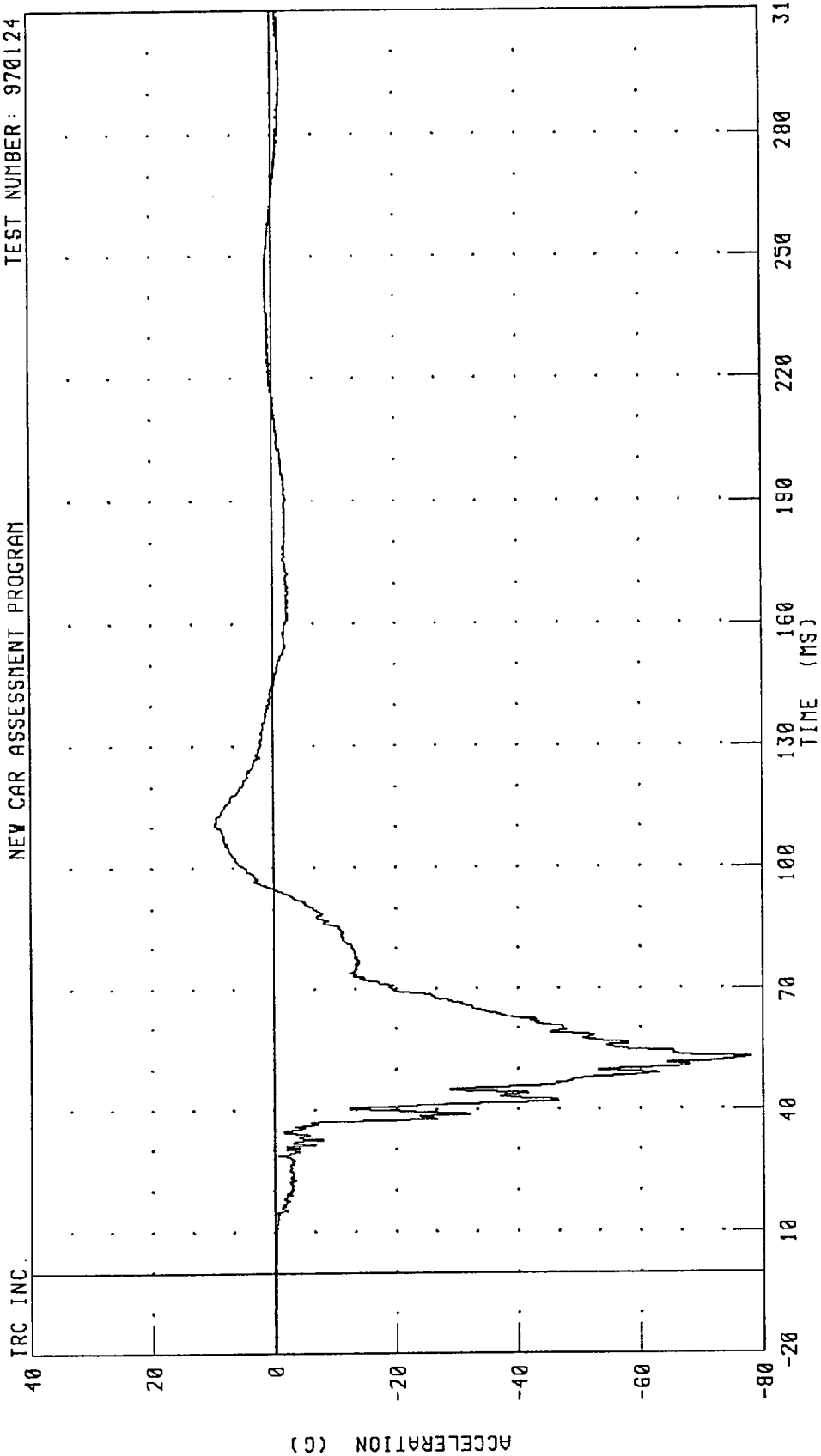


CHANNEL: CSTXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.02 MM @ -12.64 MS; -38.65 MM @ 55.52 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



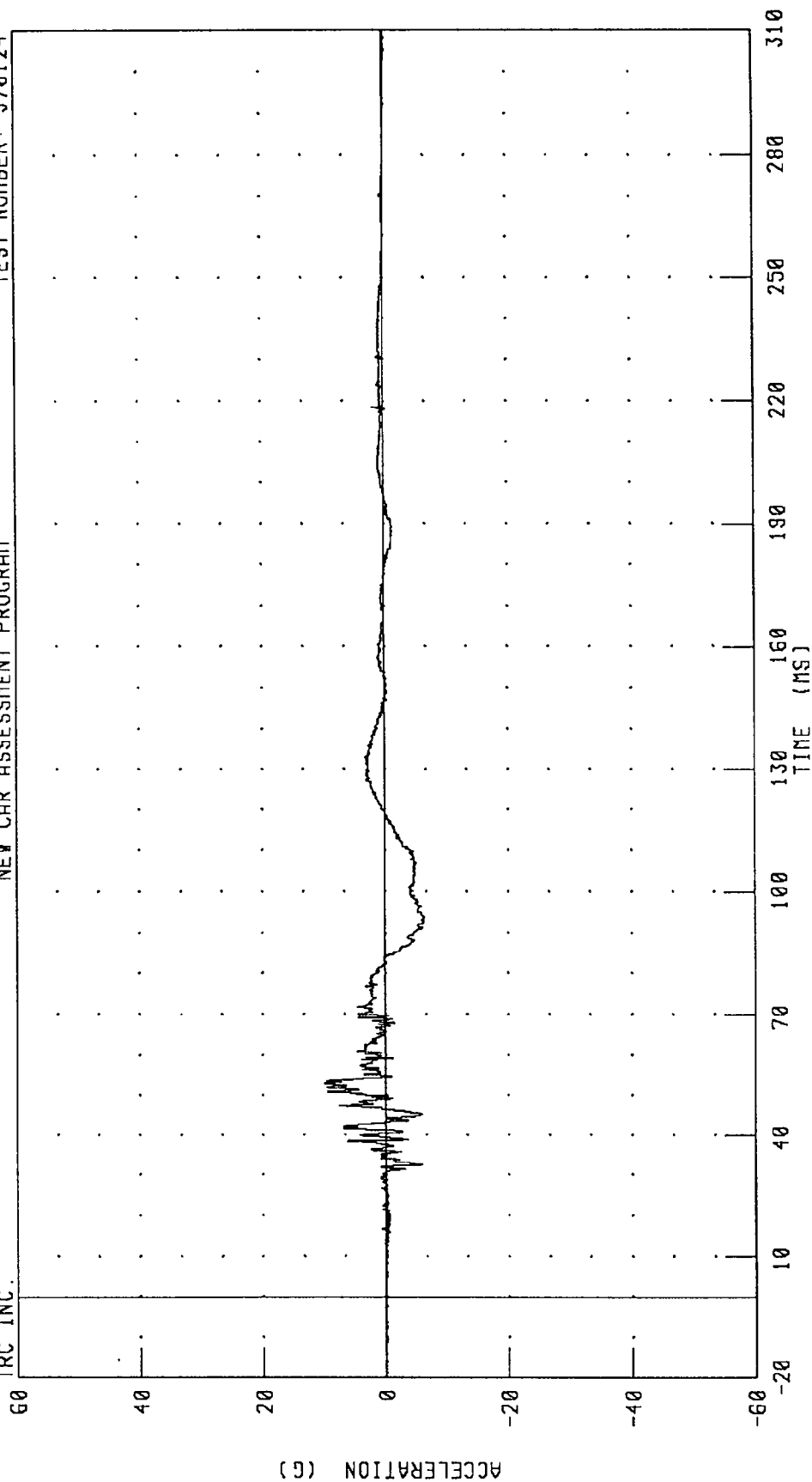
CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: PEVY01 FILTER: CH. CLASS 1000

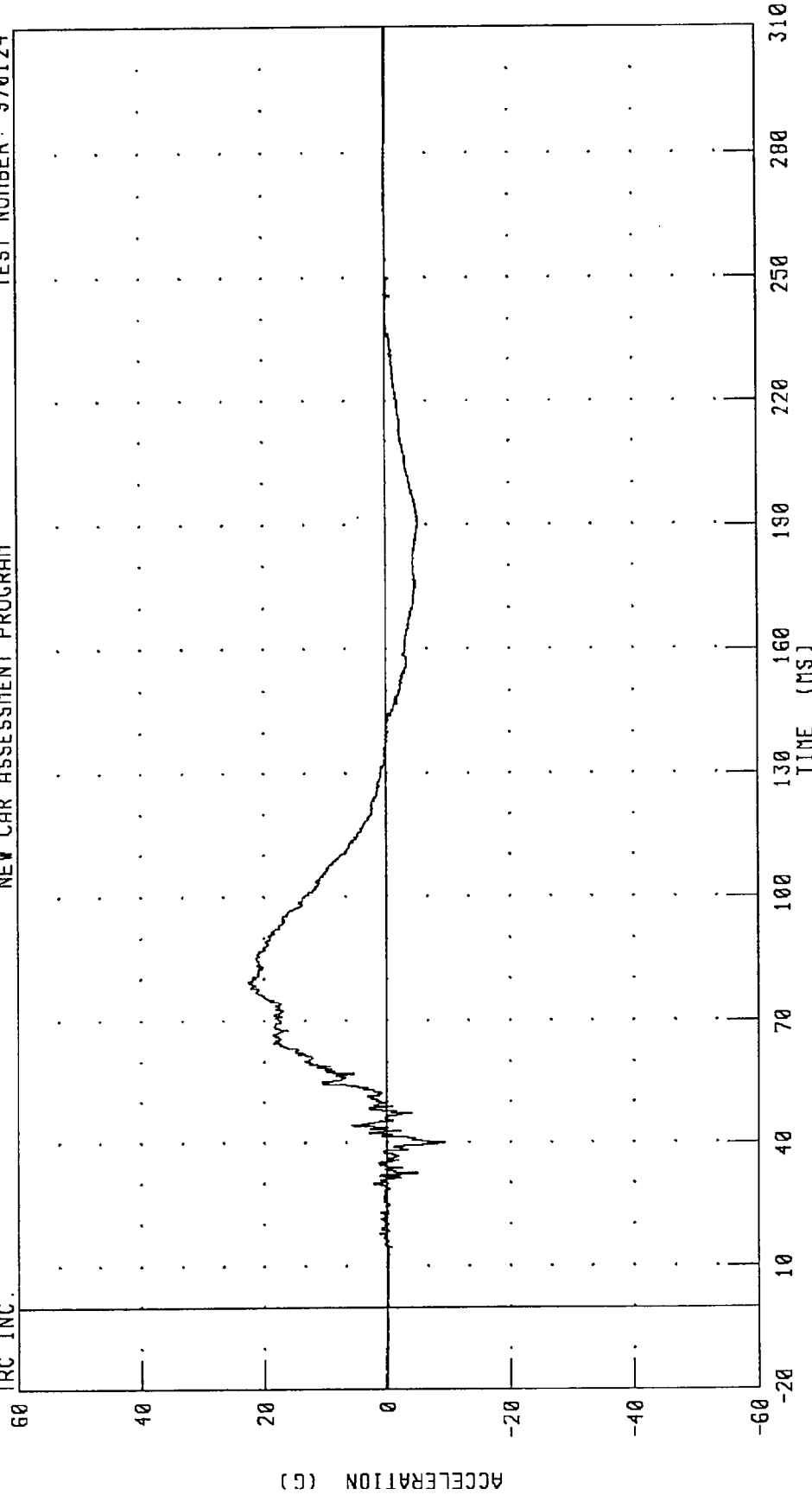
PEAK DATA: 10.06 G @ 52.80 MS; -6.44 G @ 93.84 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Z-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



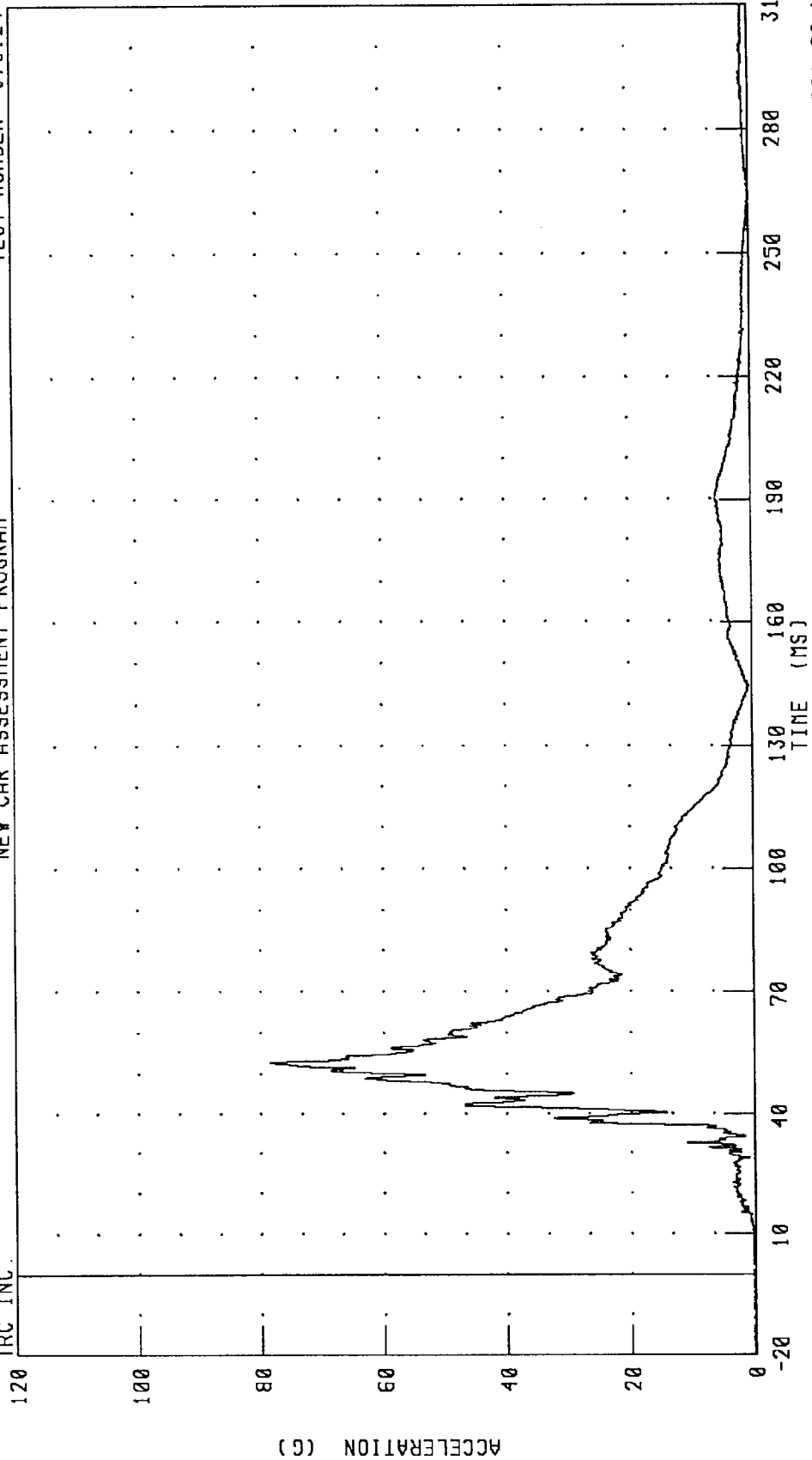
PEAK DATA: 22.57 G @ 79.36 MS; -9.23 G @ 40.08 MS

CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



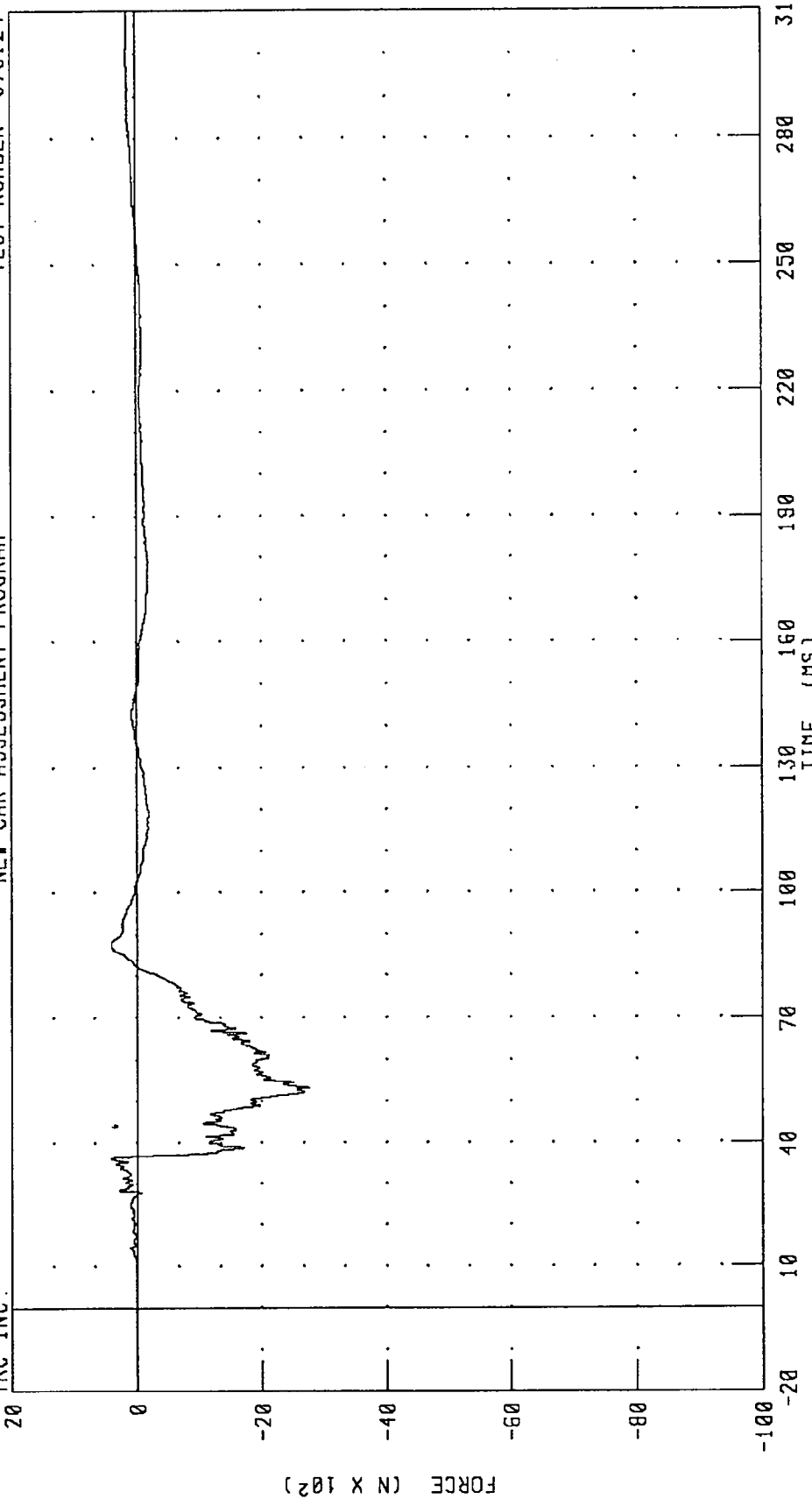
CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

PEAK DATA: 78.53 G @ 52.80 MS; 0.08 G @ 261.68 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT FEMUR FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



PEAK DATA: 420.87 N @ 36.40 MS; -2761.59 N @ 53.28 MS

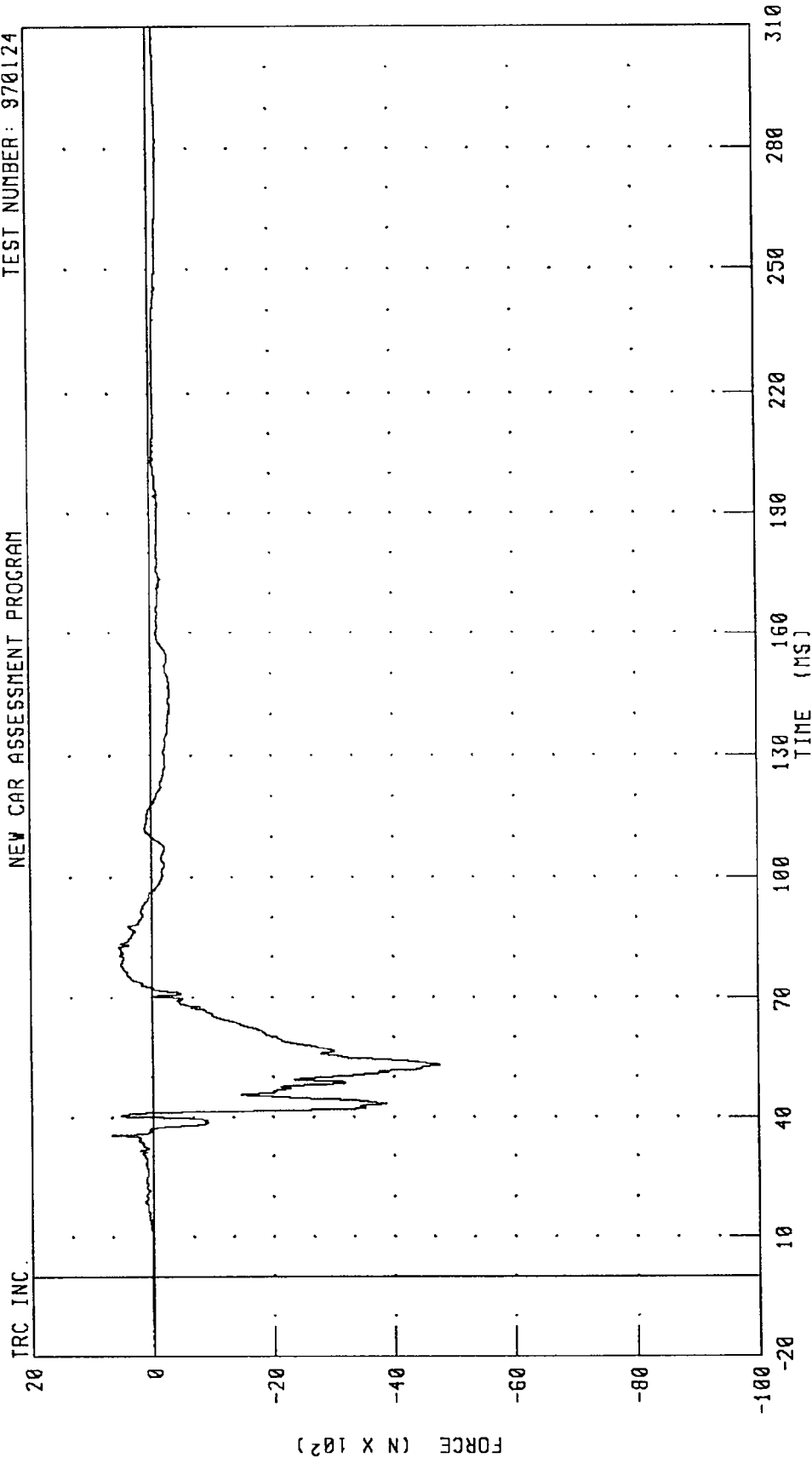
CHANNEL: LFMF1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER

DRIVER RIGHT FEMUR FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

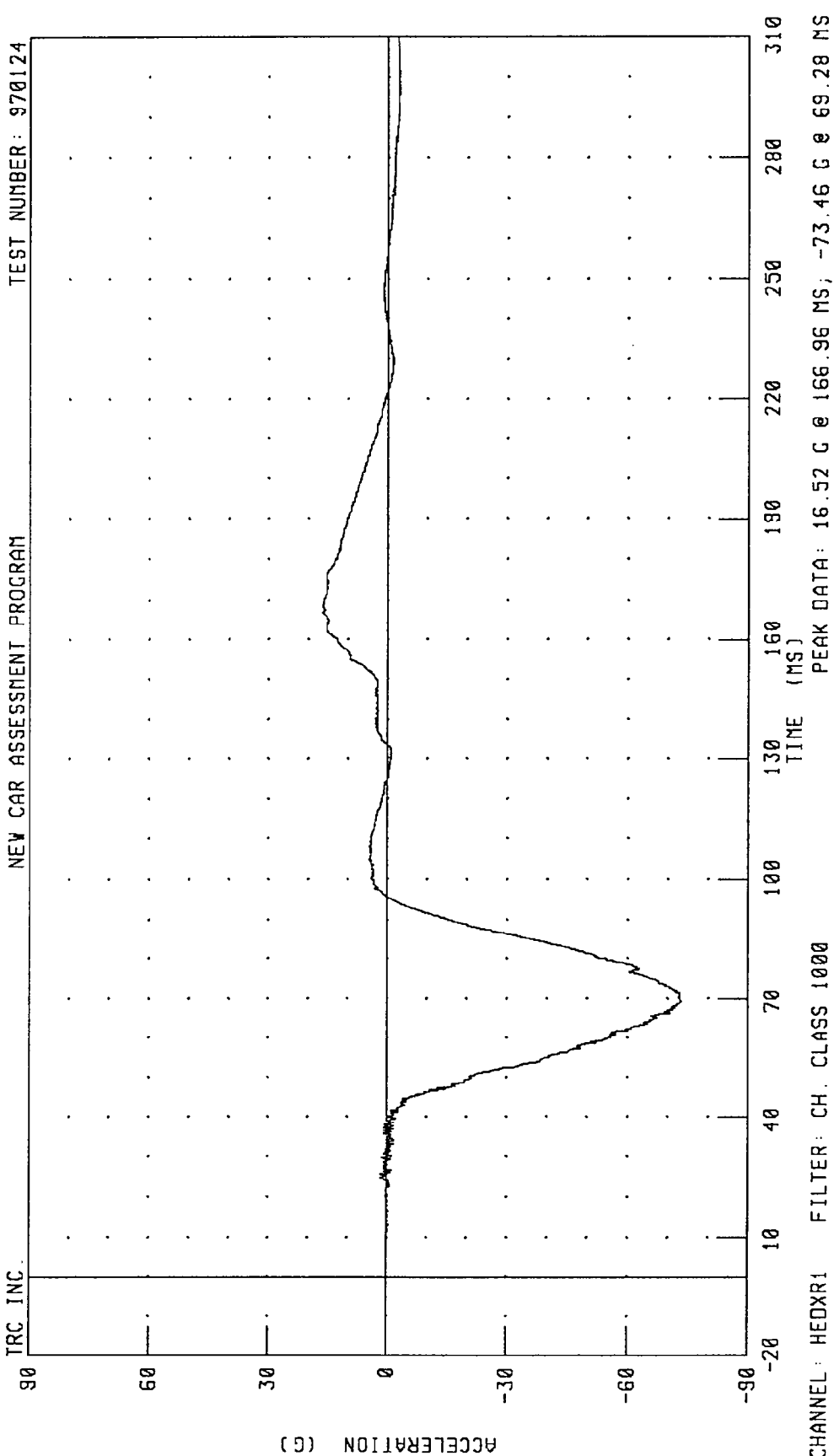


PEAK DATA: 669.27 N @ 35.52 MS; -4763.62 N @ 52.88 MS

CHANNEL: RFMF1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD X-AXIS ACCELERATION - REDUNDANT
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

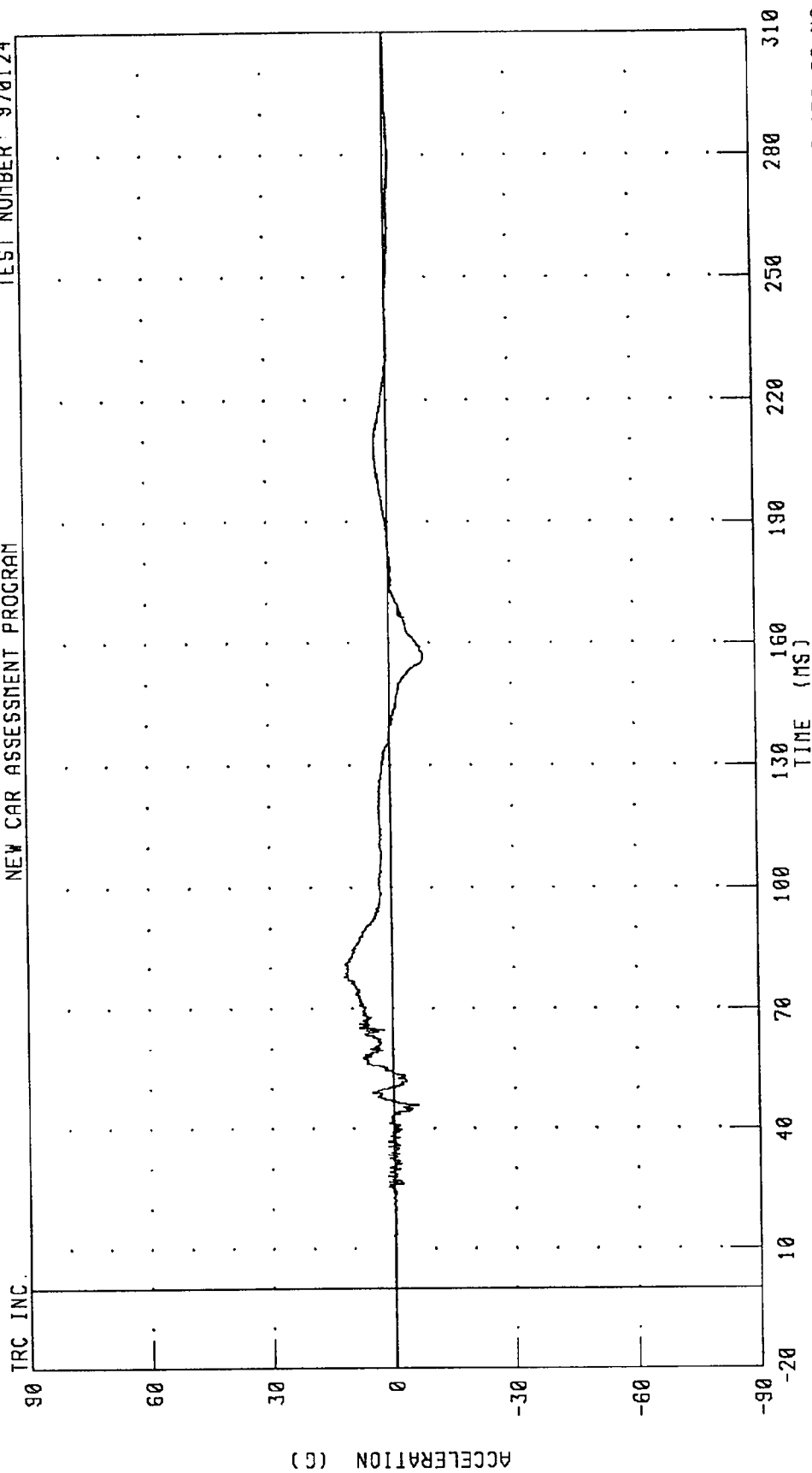


CHANNEL: HEDXR1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM



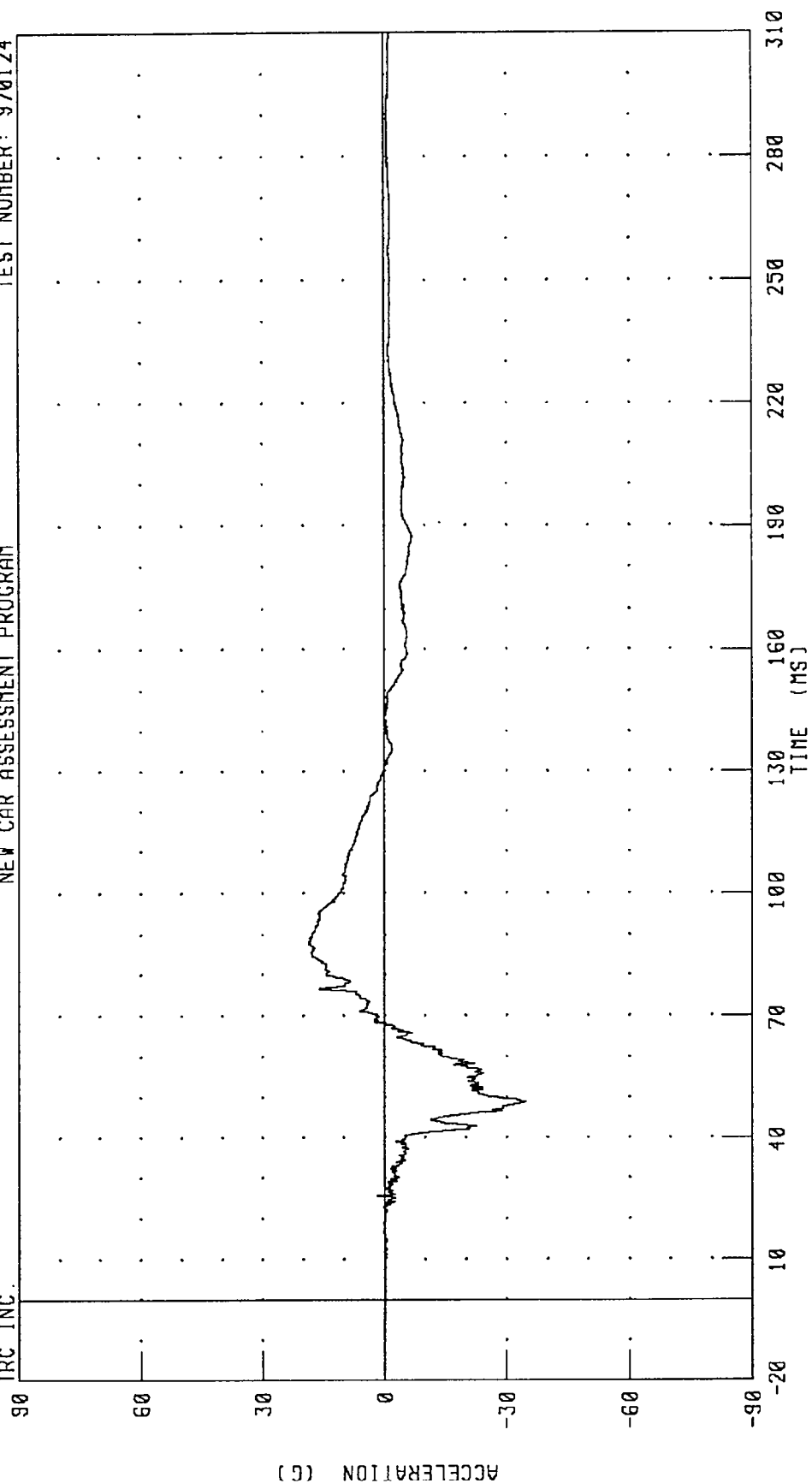
CHANNEL: HEDYR1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

IRC INC.



PEAK DATA: 18.67 G @ 88.24 MS; -34.81 G @ 48.88 MS

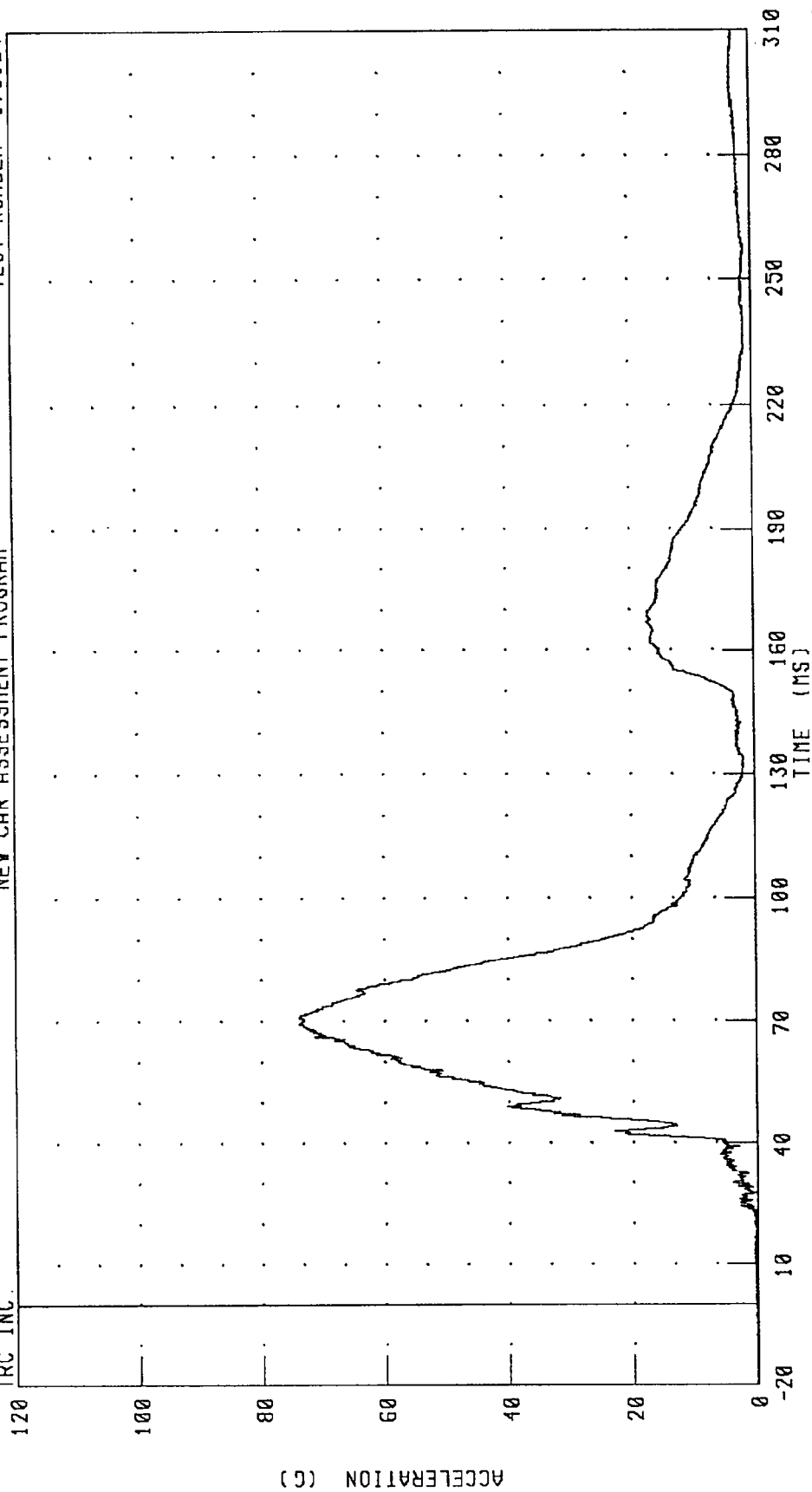
CHANNEL: HEDZR1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



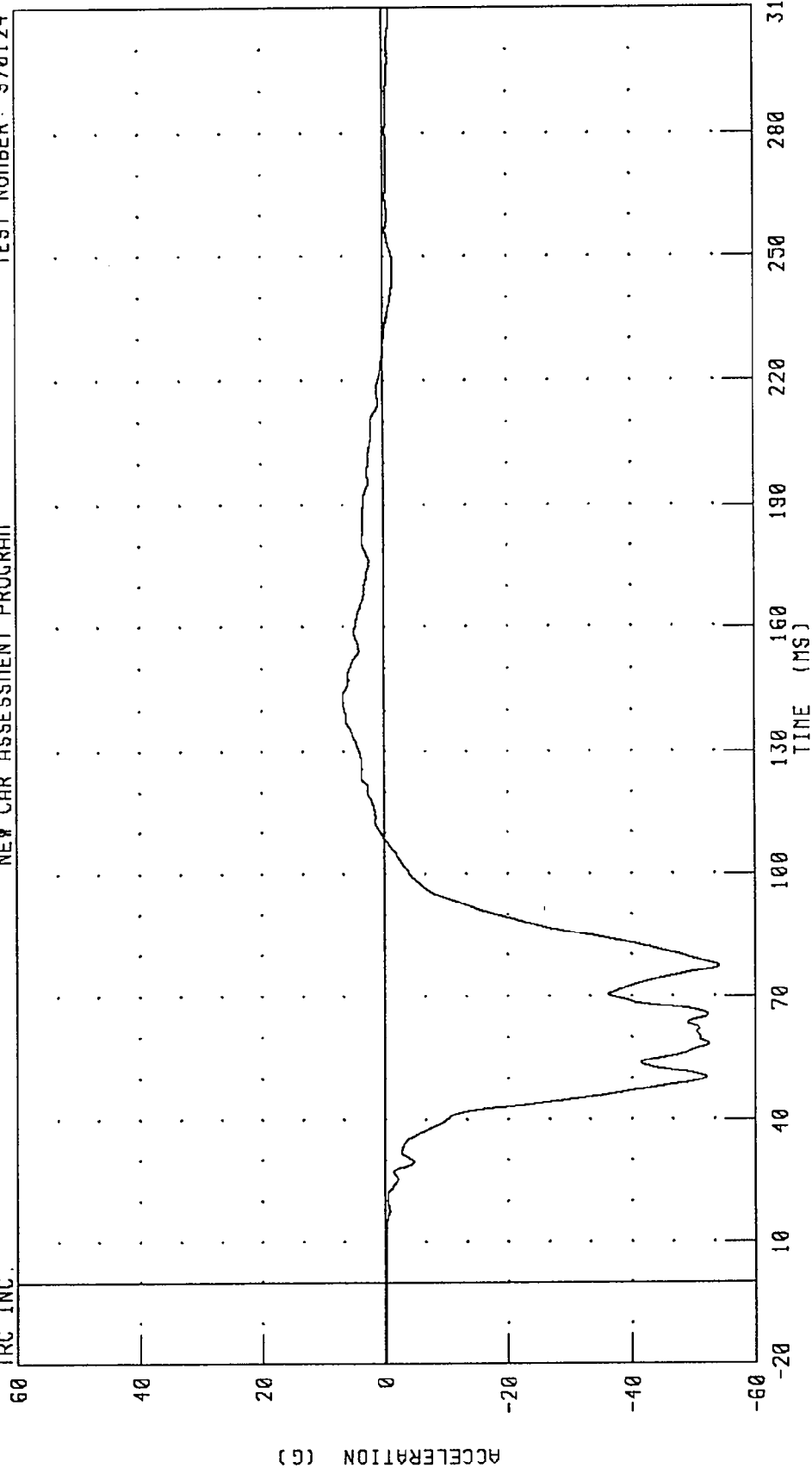
PEAK DATA: 73.85 G @ 69.28 MS; 0.12 G @ -19.20 MS

CHANNEL: HEDRR1 FILTER: CH. CLASS 1000

1987 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION - REDUNDANT
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



CHANNEL: CSTXR1 FILTER: CH. CLASS 180

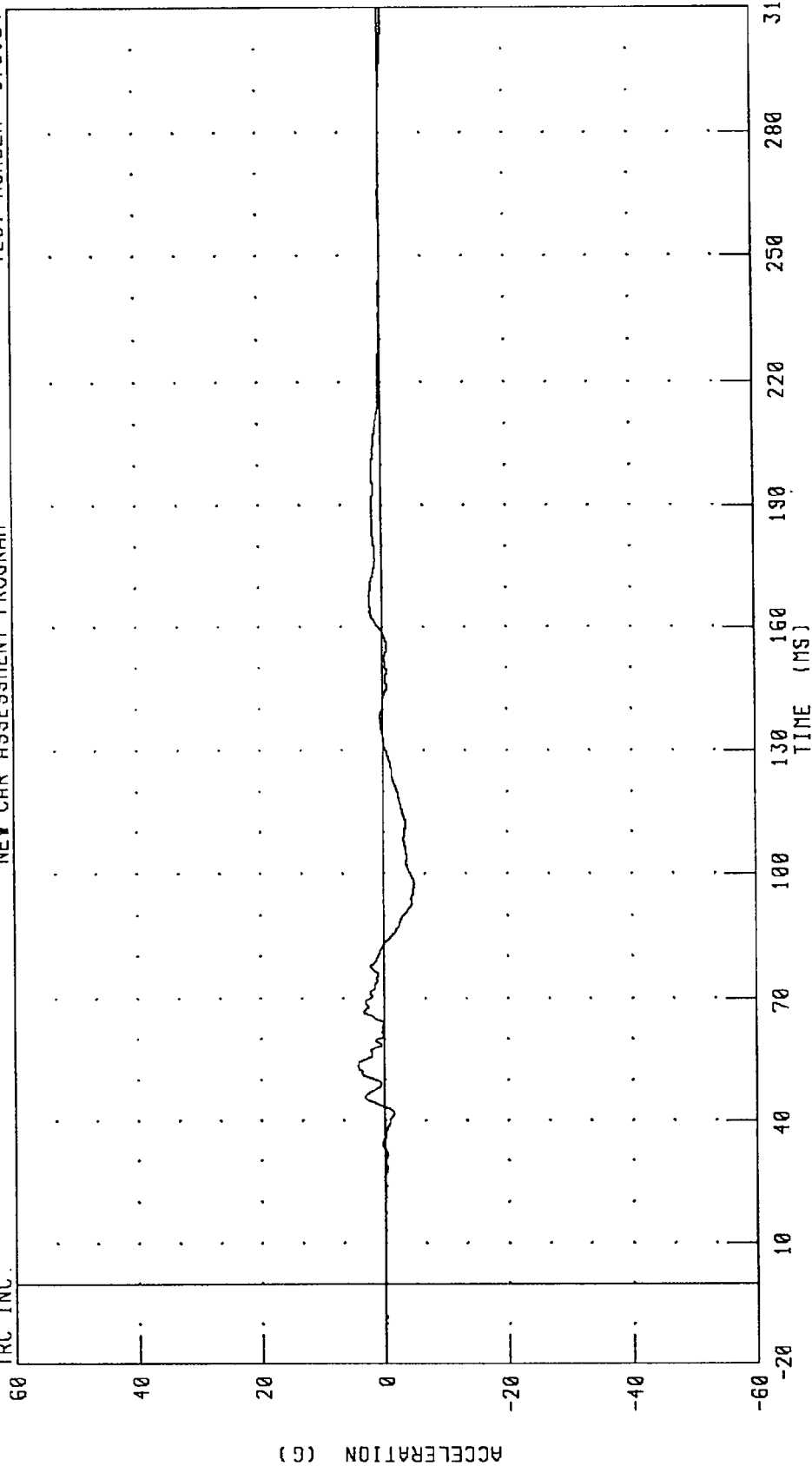
PEAK DATA: 6.84 G @ 143.04 MS; -54.17 G @ 77.28 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 4.33 G @ 53.20 MS; -4.93 G @ 98.08 MS

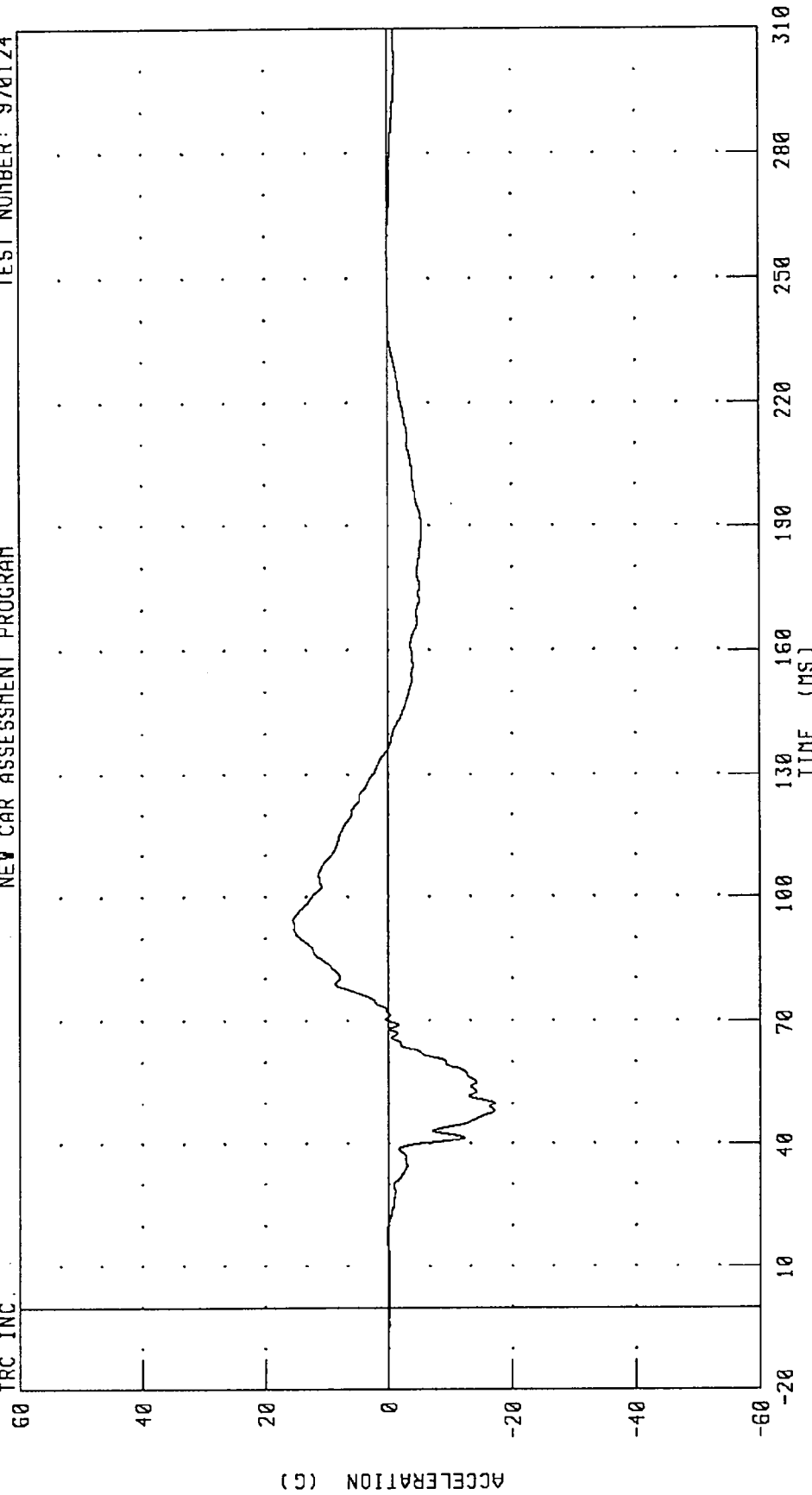
CHANNEL: CSTYR1 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 15.54 G @ 94.32 MS; -17.18 G @ 50.16 MS

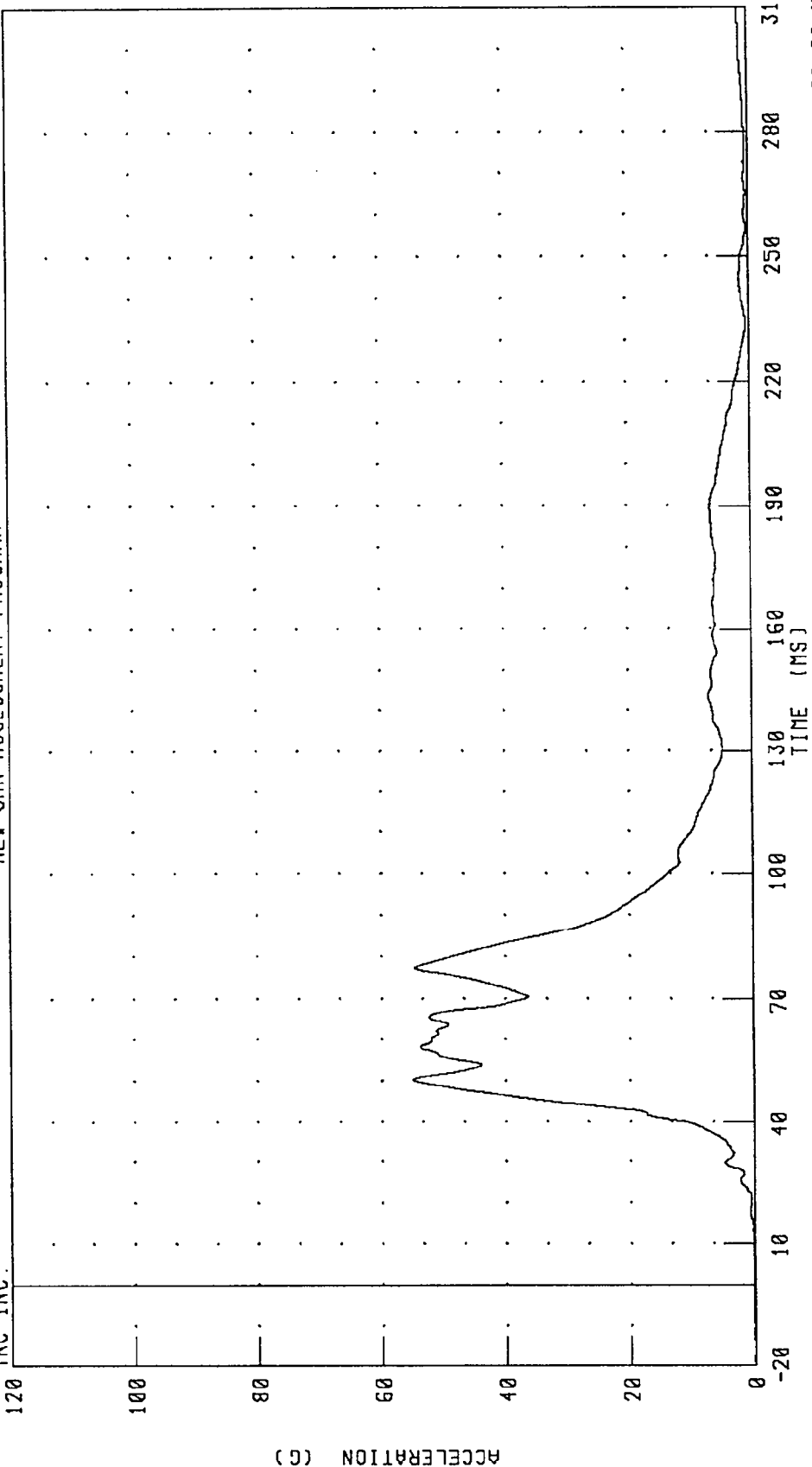
CHANNEL: CSTZR1 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION - REDUNDANT

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



CHANNEL: CSTRR1 FILTER: CH. CLASS 180

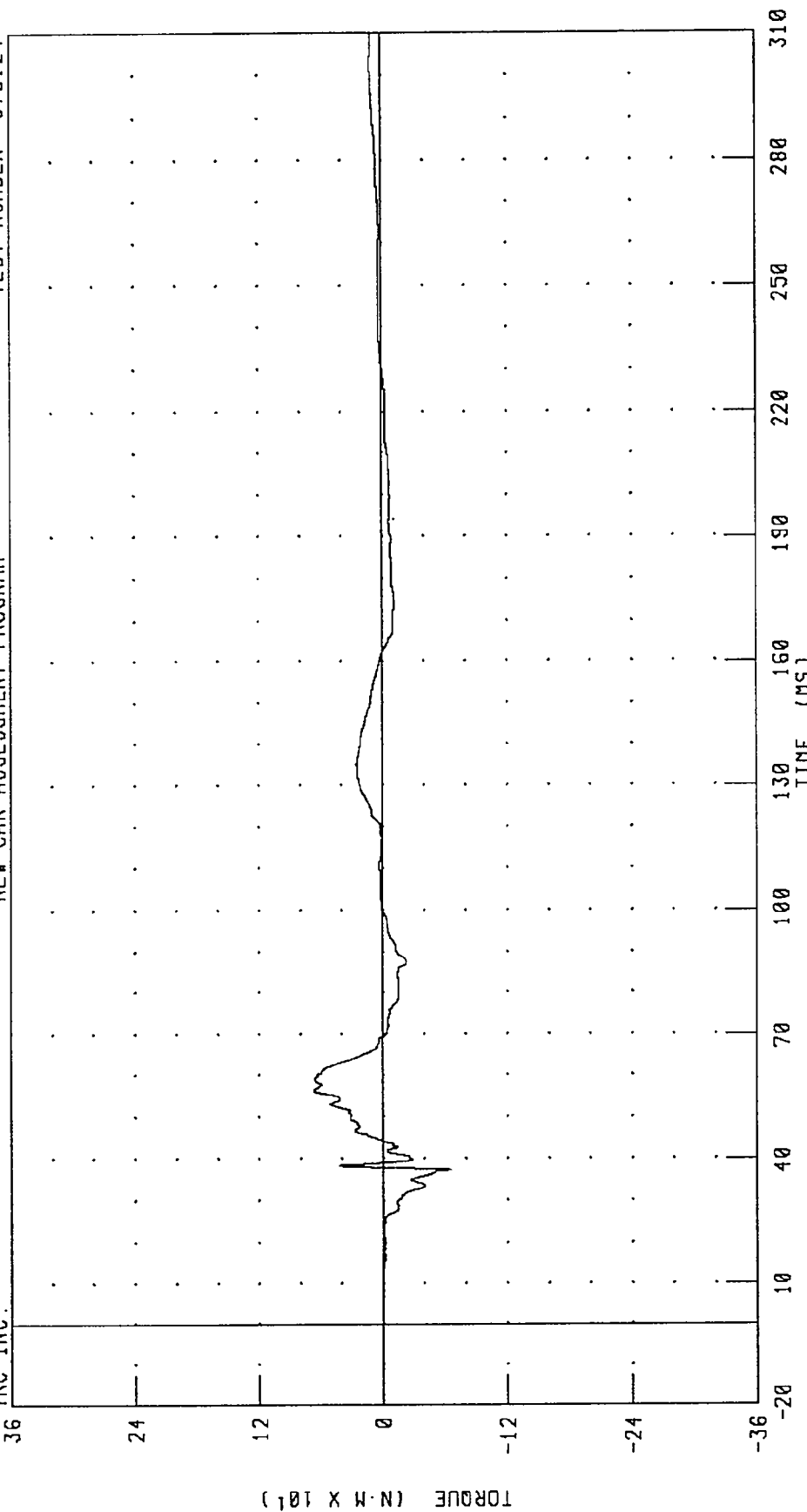
PEAK DATA: 54.92 G @ 50.24 MS; 0.01 G @ -20.00 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 66.90 N·m @ 56.24 ms; -66.40 N·m @ 37.52 ms

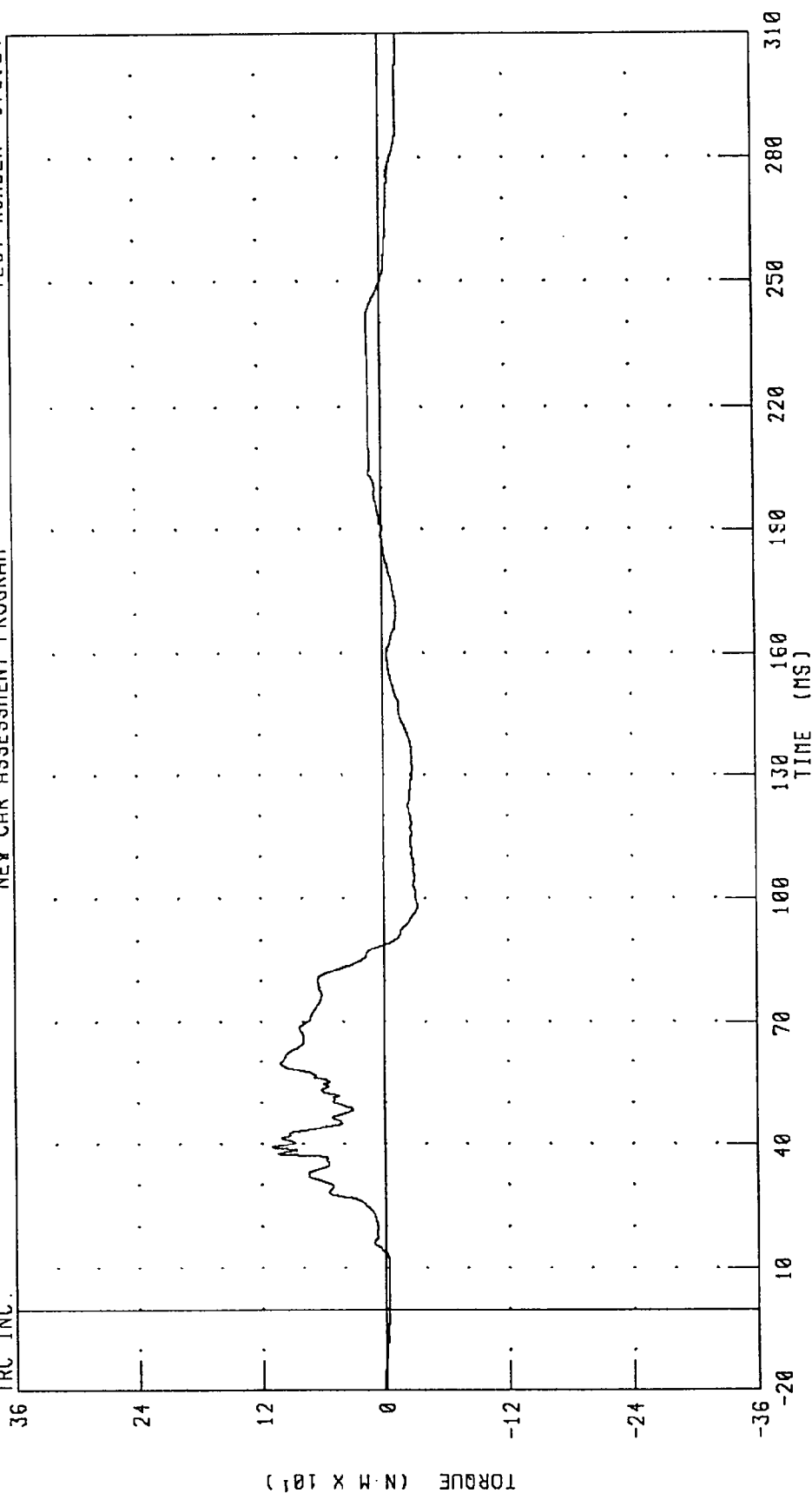
CHANNEL: TBLXM1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



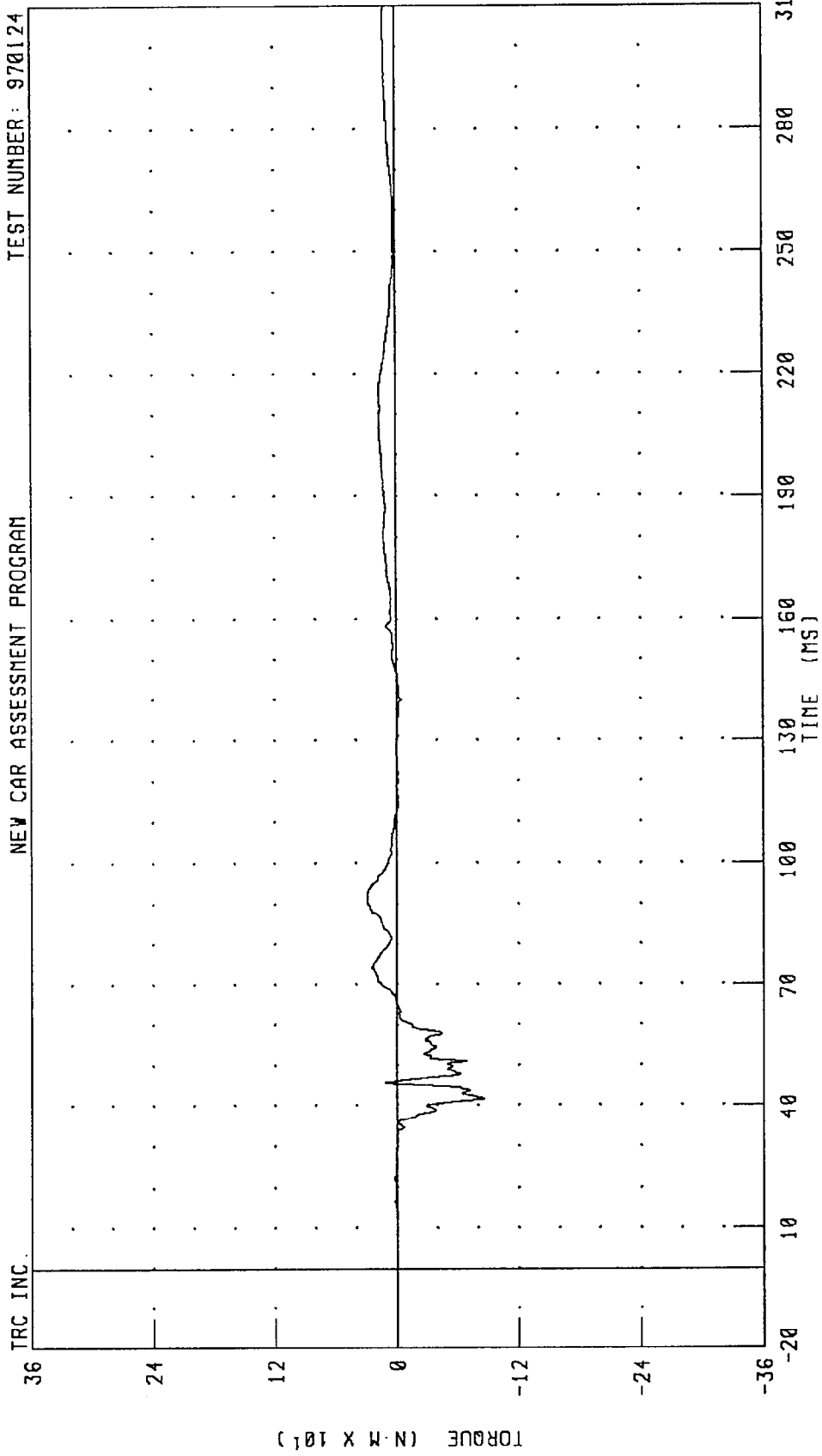
CHANNEL: TBLYM1 FILTER: CH. CLASS 600

PEAK DATA: 110.27 N·m @ 39.28 ms; -32.22 N·m @ 98.08 ms

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM



PEAK DATA: 28.77 N·m @ 91.36 ms; -86.23 N·m @ 41.76 ms

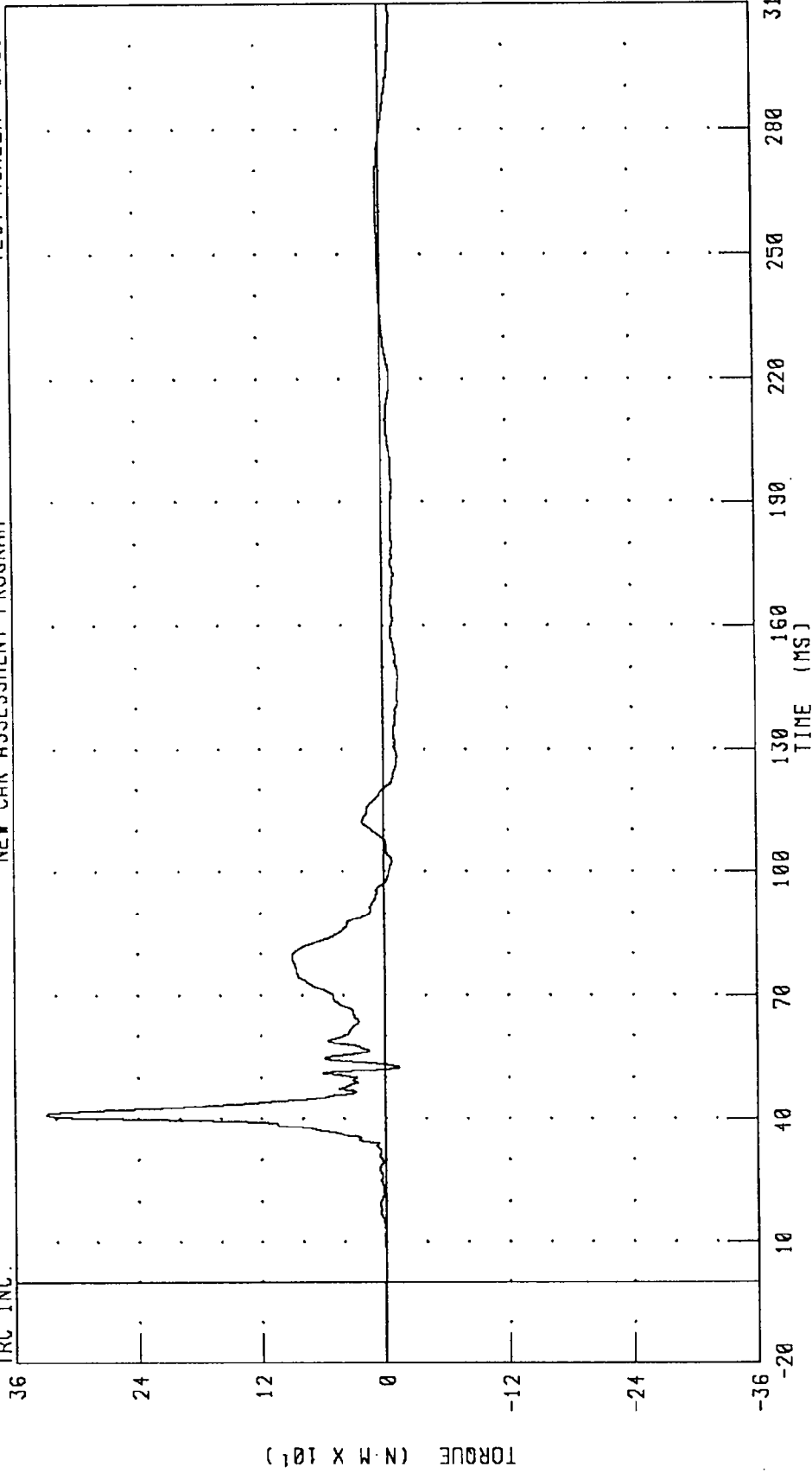
CHANNEL: TBRXM1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



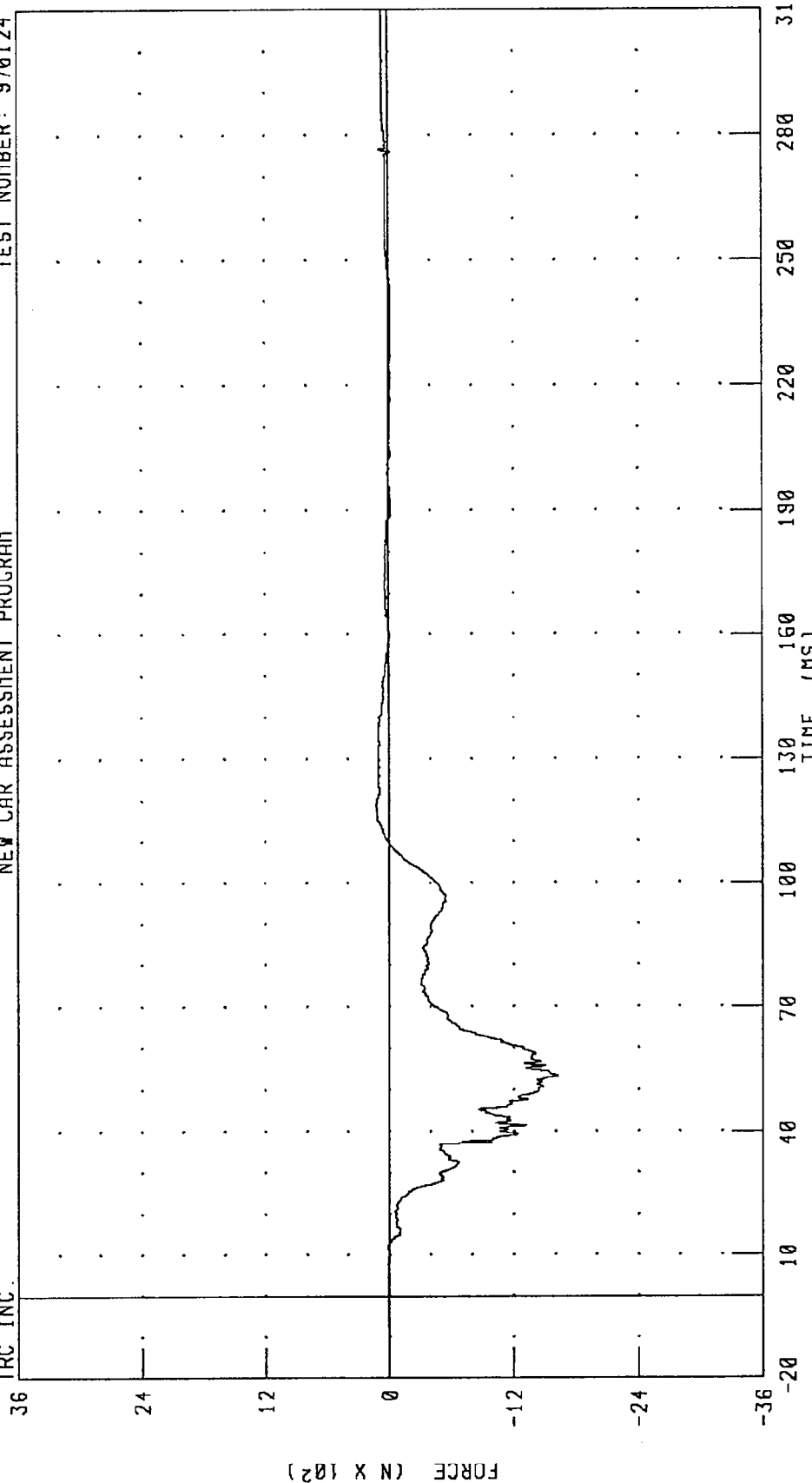
CHANNEL: TBRYM1 FILTER: CH. CLASS 600

PEAK DATA: 329.08 N·m @ 41.20 ms; -14.81 N·m @ 147.76 ms

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT LOWER TIBIA X-AXIS FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



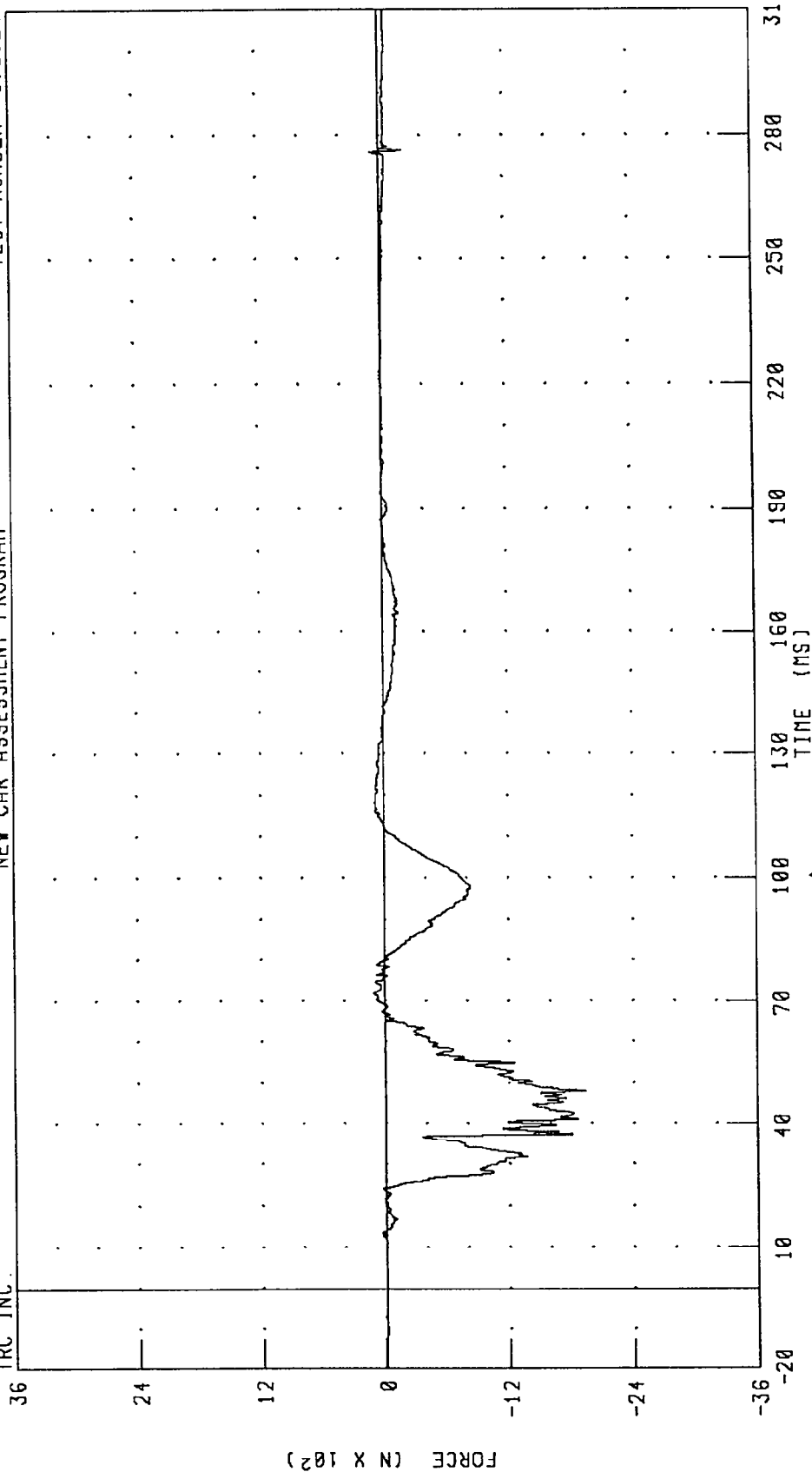
CHANNEL: ANLXF1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 109.58 N @ 71.84 MS; -1938.26 N @ 48.08 MS

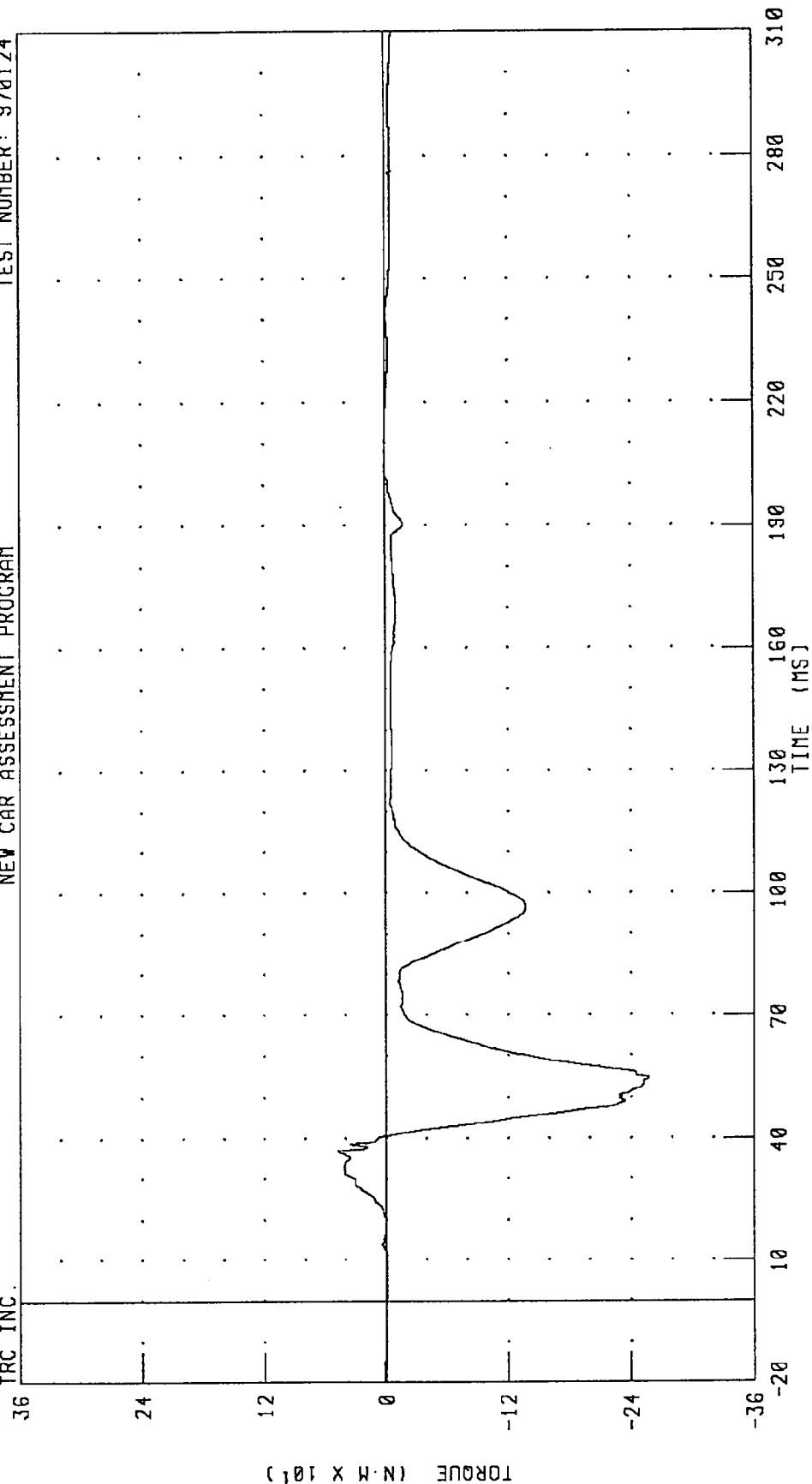
CHANNEL: ANLZF1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: ANLYM1 FILTER: CH. CLASS 600

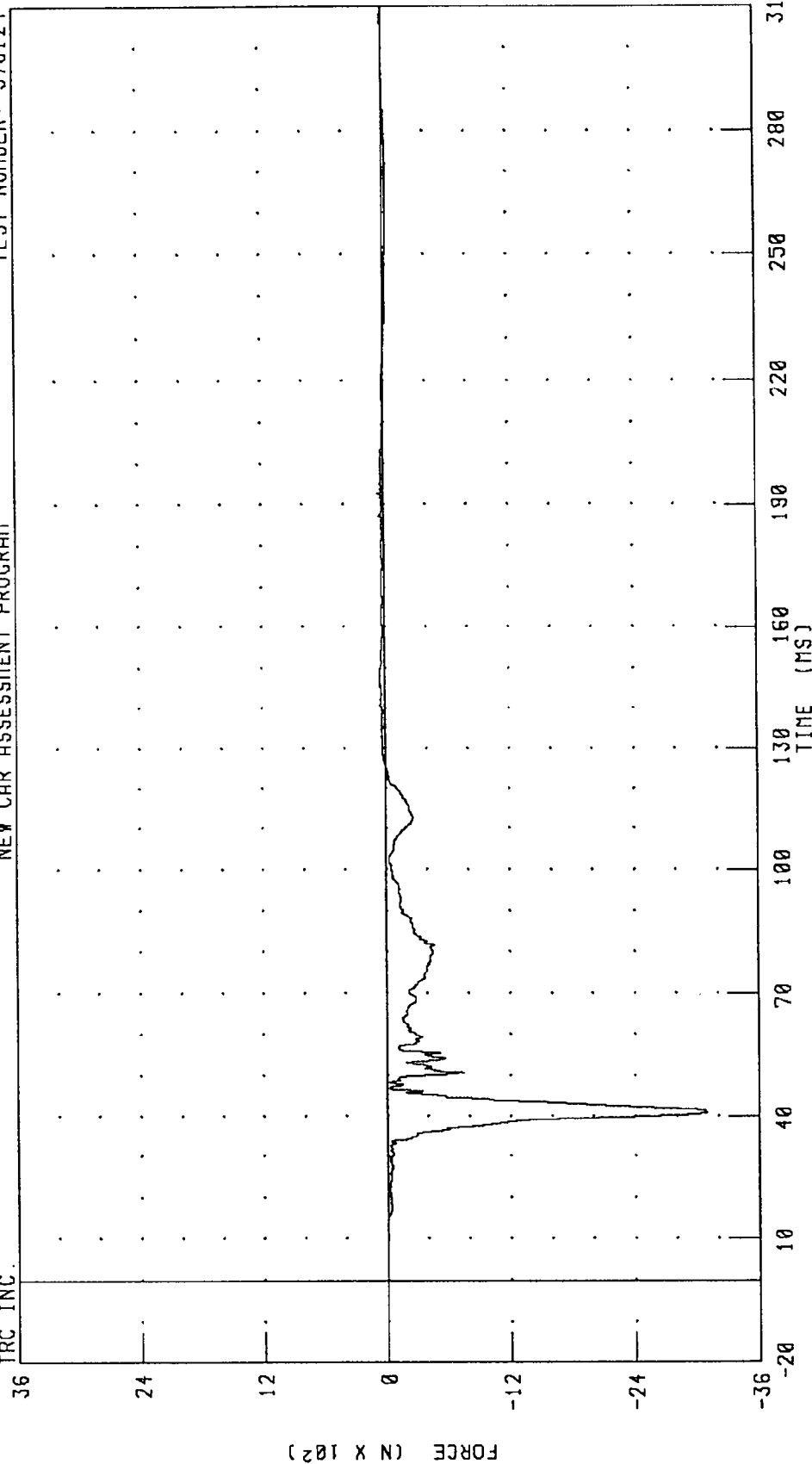
PEAK DATA: 48.02 N·m @ 36.96 ms, -257.24 N·m @ 54.80 ms

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT LOWER TIBIA X-AXIS FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC, INC.



PEAK DATA: 60.23 N @ 192.72 MS; -3087.03 N @ 40.96 MS

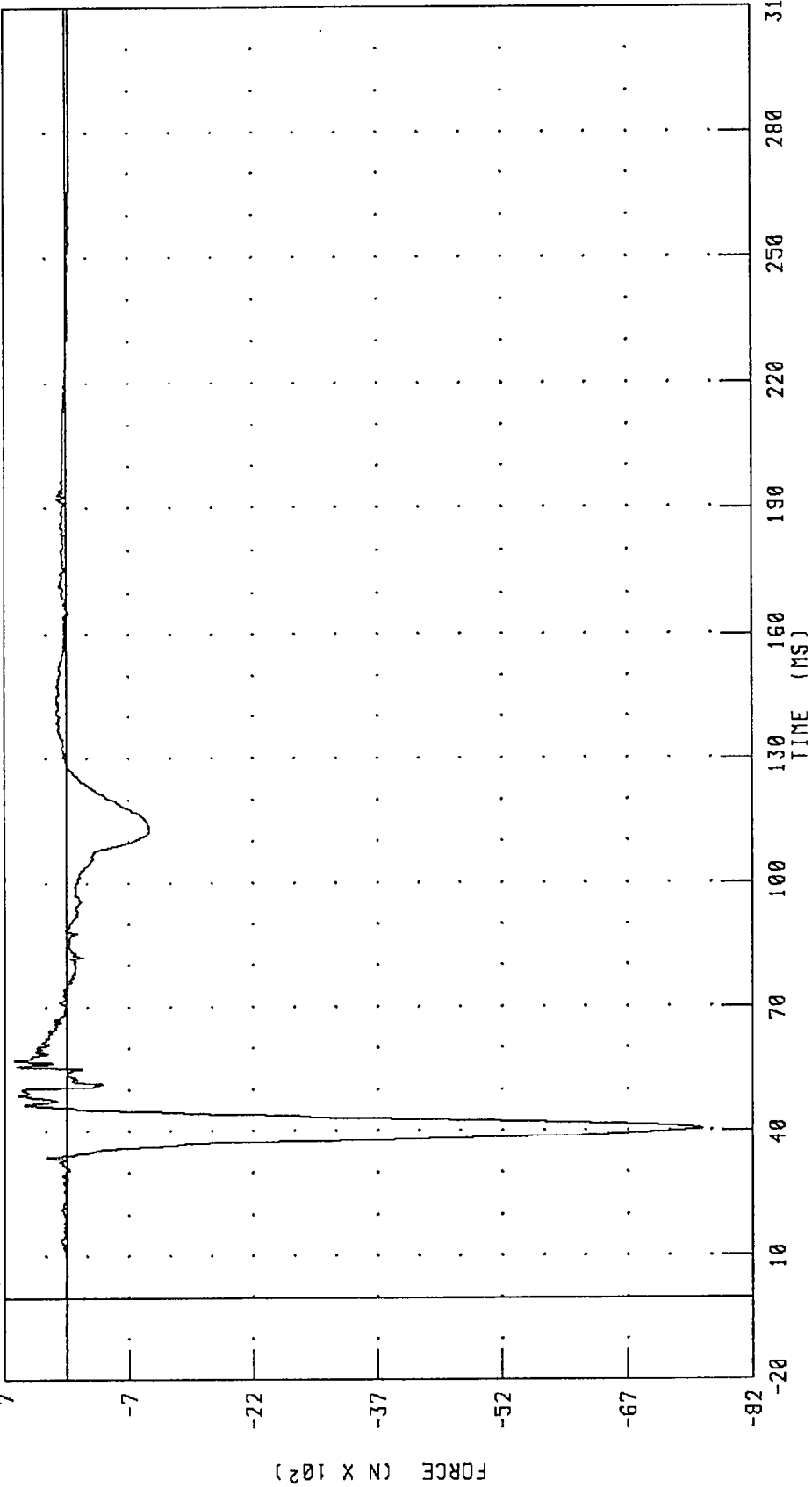
CHANNEL: ANRXF1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: ANRZF1 FILTER: CH. CLASS 600

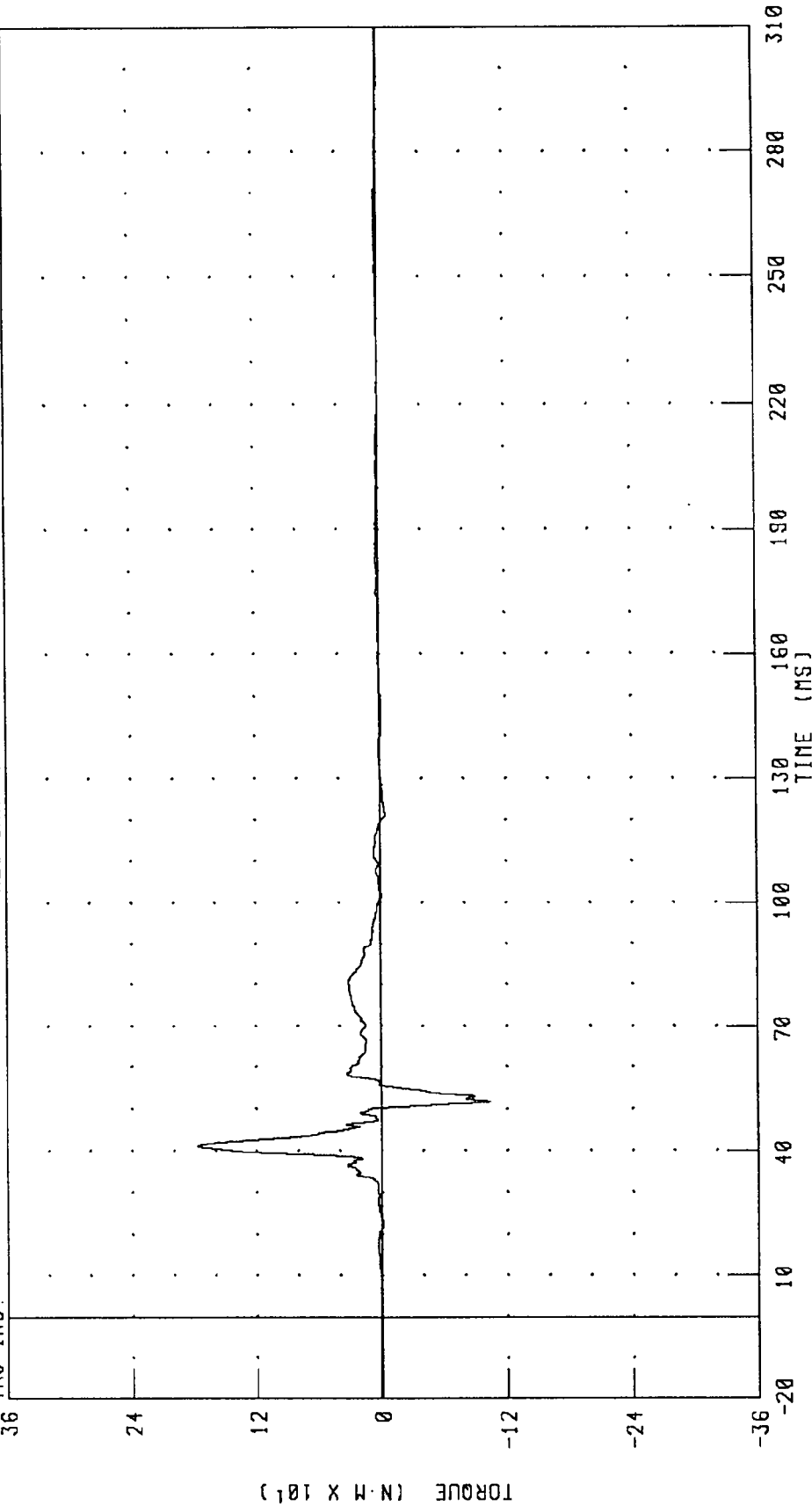
PEAK DATA: 638.01 N @ 57.12 MS; -7645.88 N @ 40.48 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

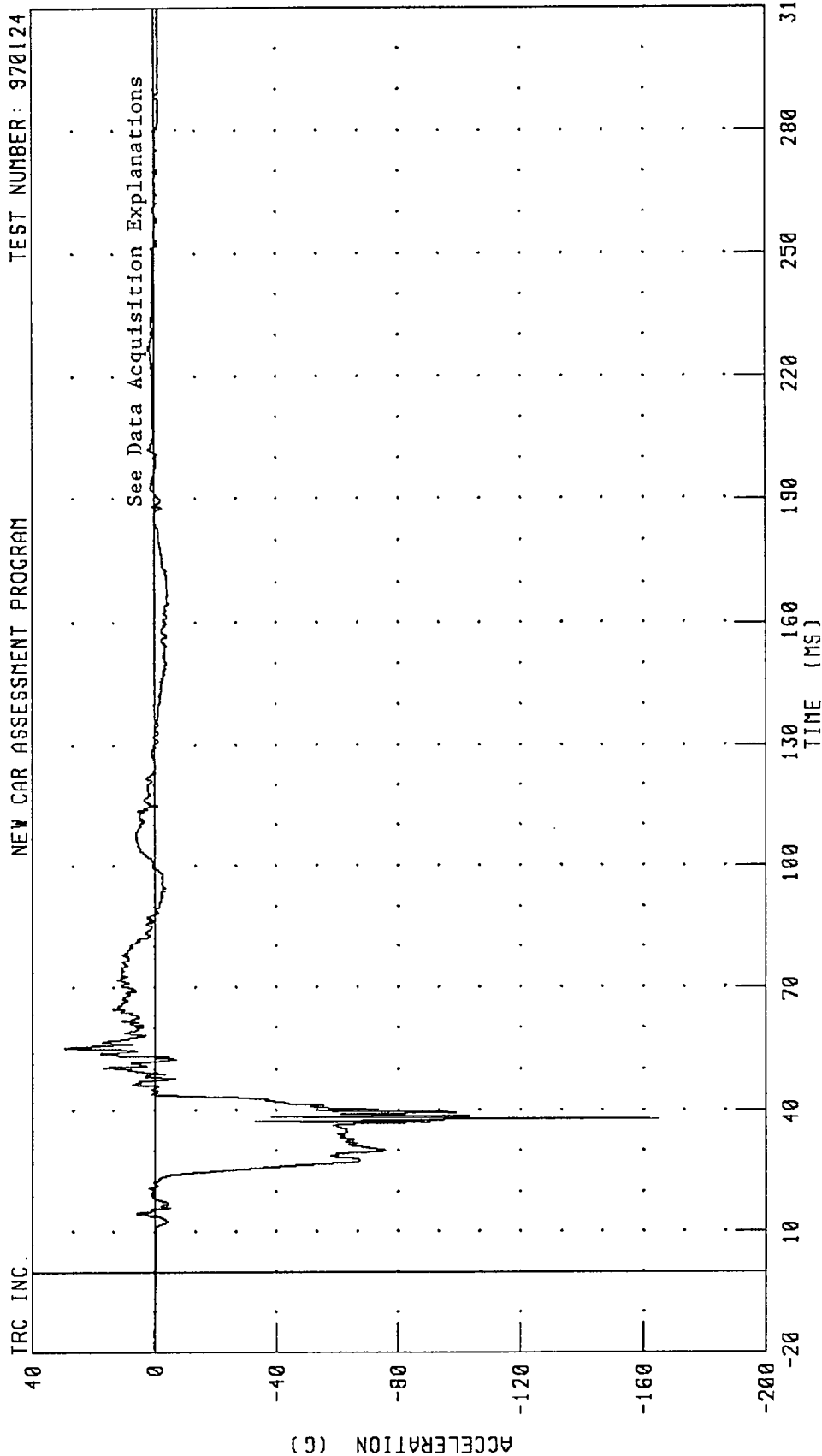
TRC INC.



CHANNEL: ANRYM1 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT FOOT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



CHANNEL: FTLXG1 FILTER: CH. CLASS 1000

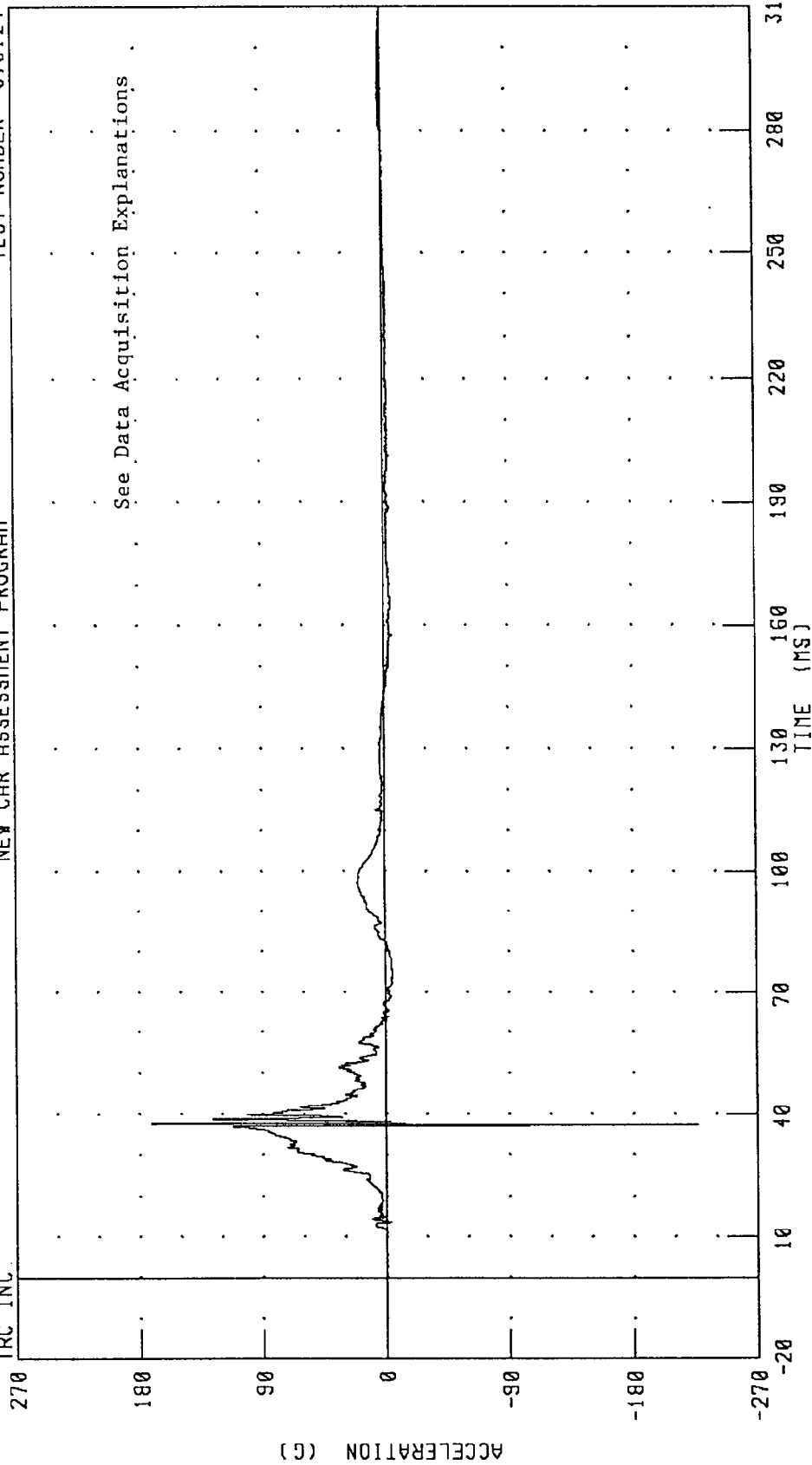
PEAK DATA: 29.37 G @ 55.28 MS; -164.98 G @ 37.76 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



See Data Acquisition Explanations.

PEAK DATA: 171.34 G @ 37.60 MS; -226.17 G @ 37.20 MS

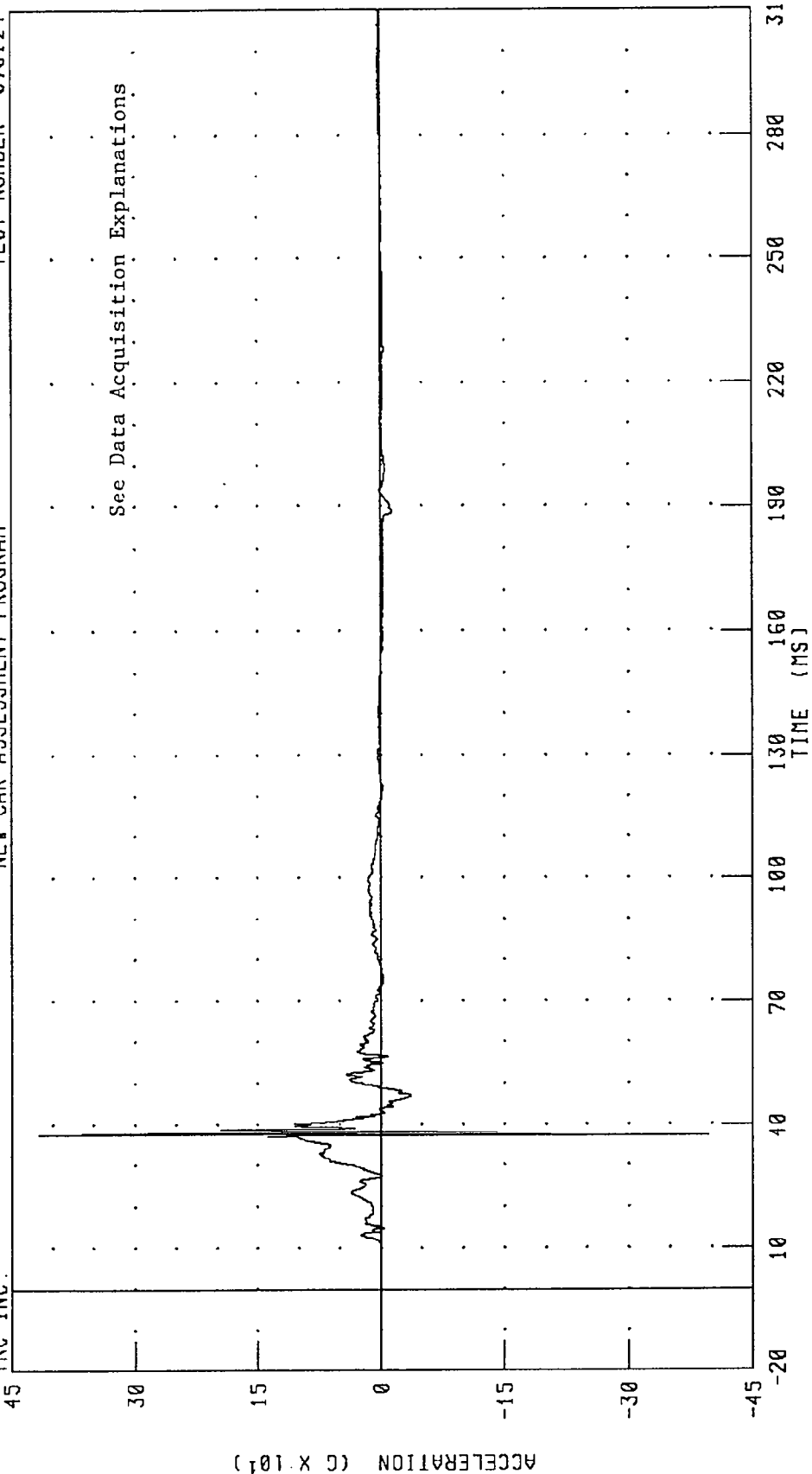
CHANNEL: FTLZH1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 416.61 G @ 37.52 MS; -396.37 G @ 37.28 MS

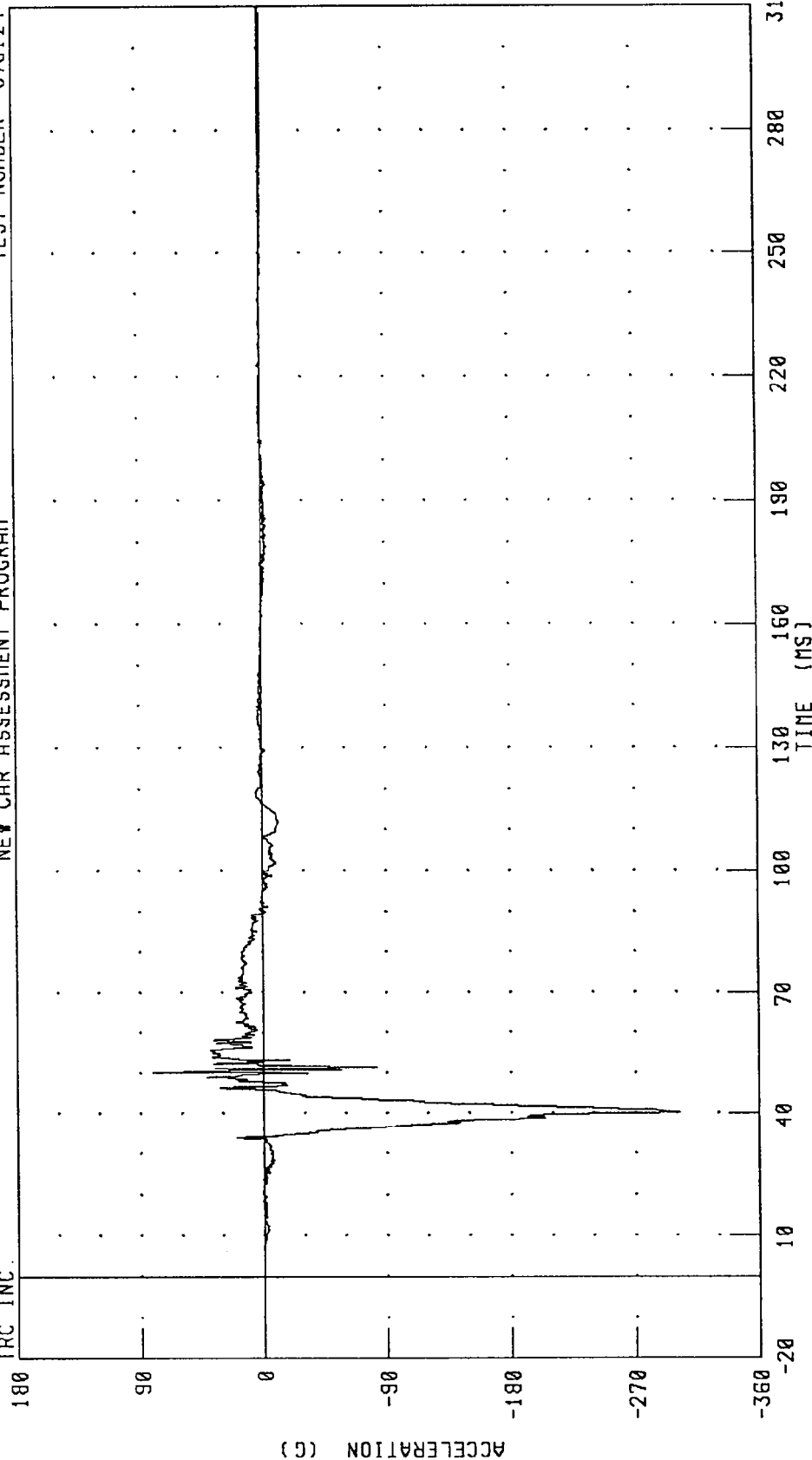
CHANNEL: FTLZT1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



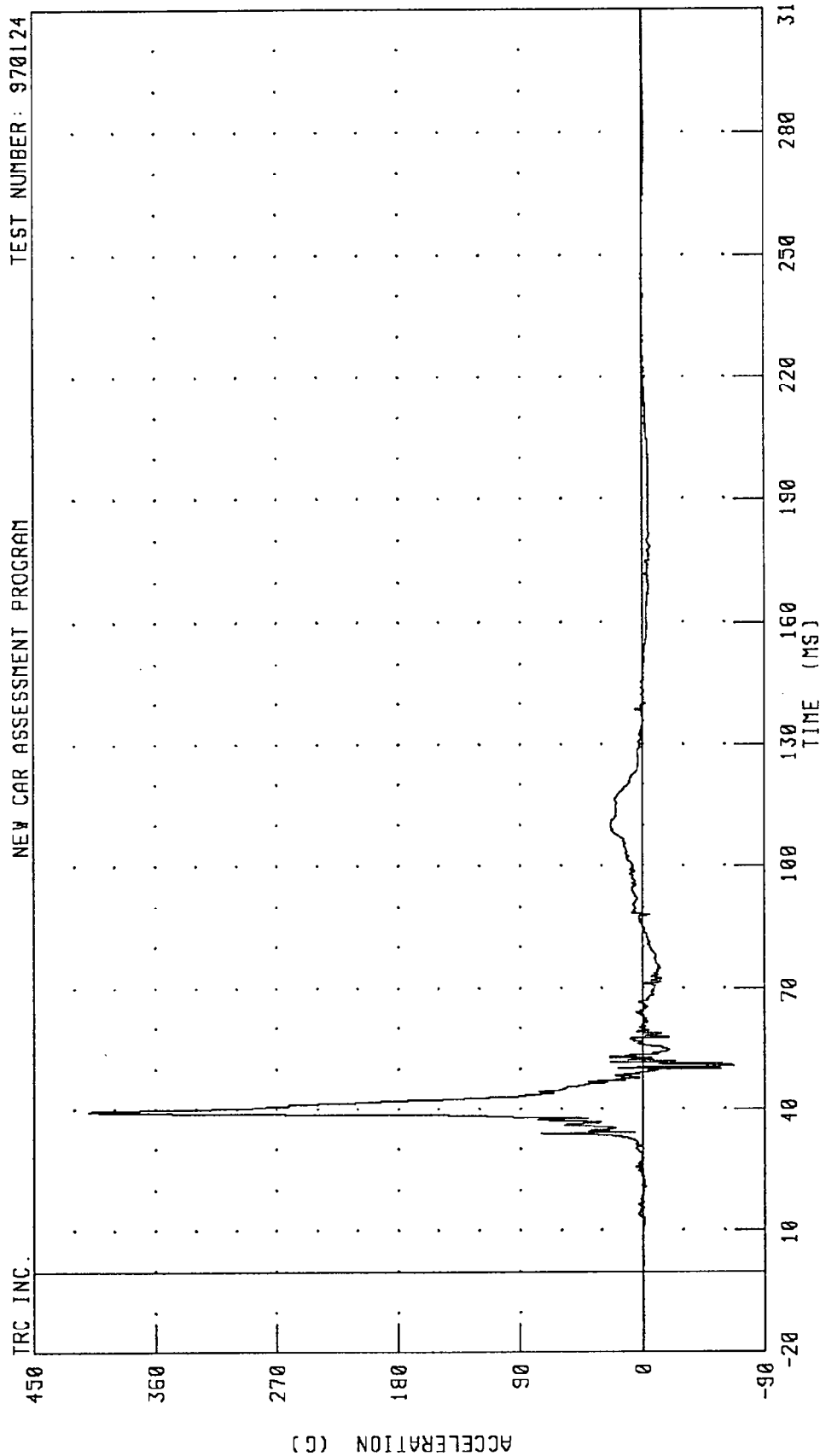
CHANNEL: FTRXG1 FILTER: CH. CLASS 1000

PEAK DATA: 80.48 G @ 50.24 MS; -301.41 G @ 40.24 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM



CHANNEL: FTRZHI FILTER: CH. CLASS 1000

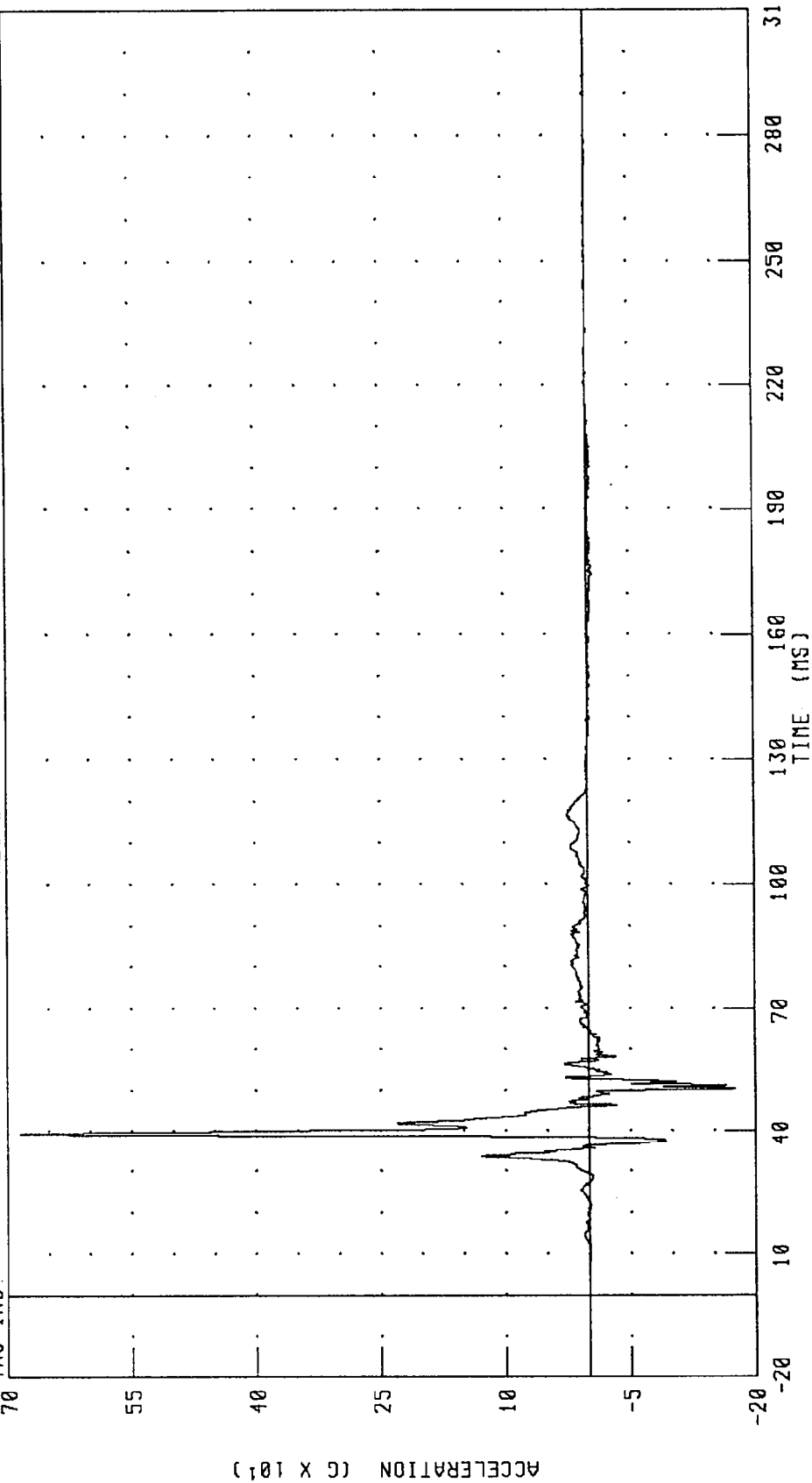
PEAK DATA: 409.65 G @ 39.52 MS; -67.16 G @ 50.72 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 685.01 G @ 39.28 MS; -174.79 G @ 50.40 MS

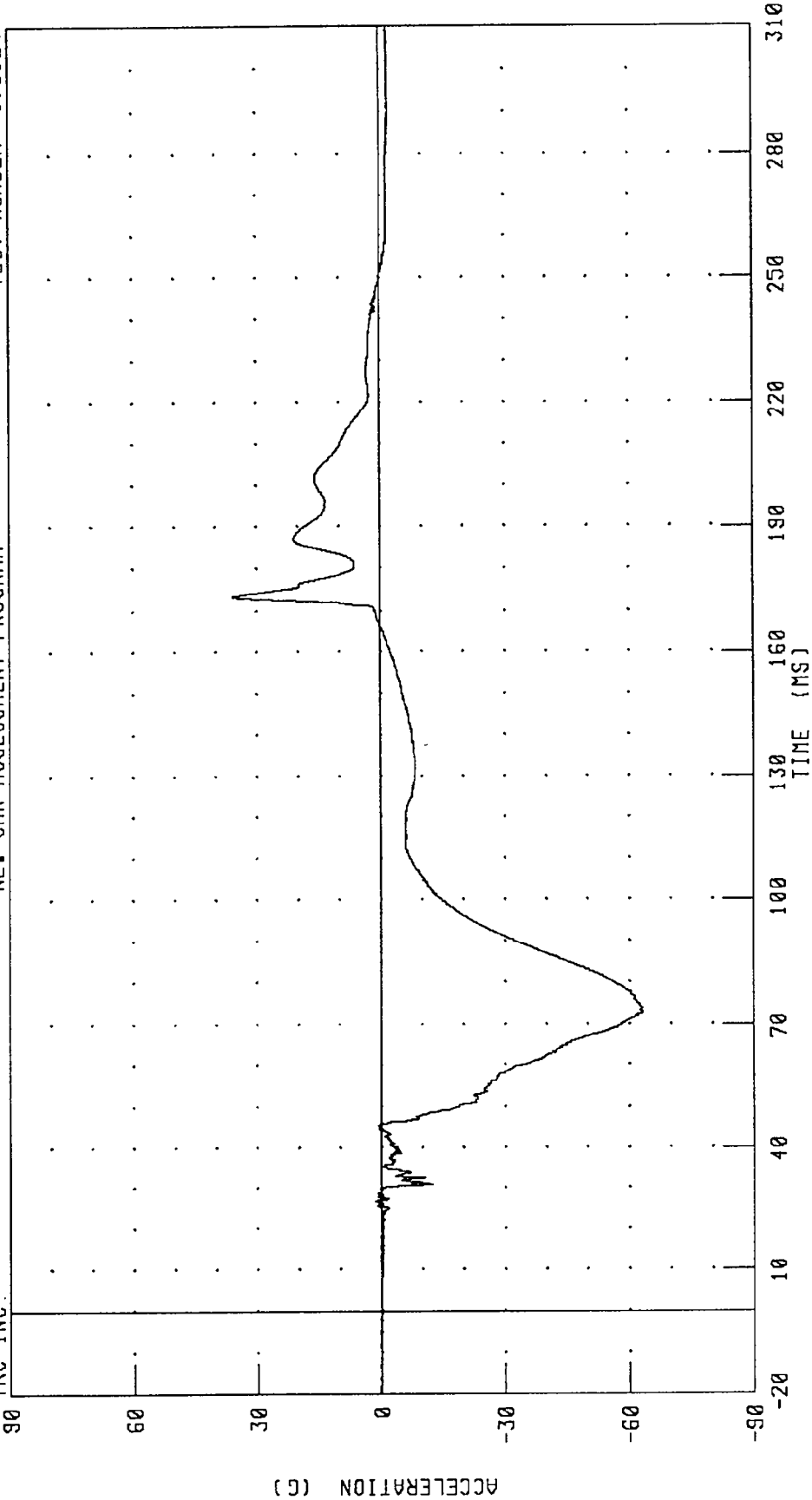
CHANNEL: FTRZT1 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

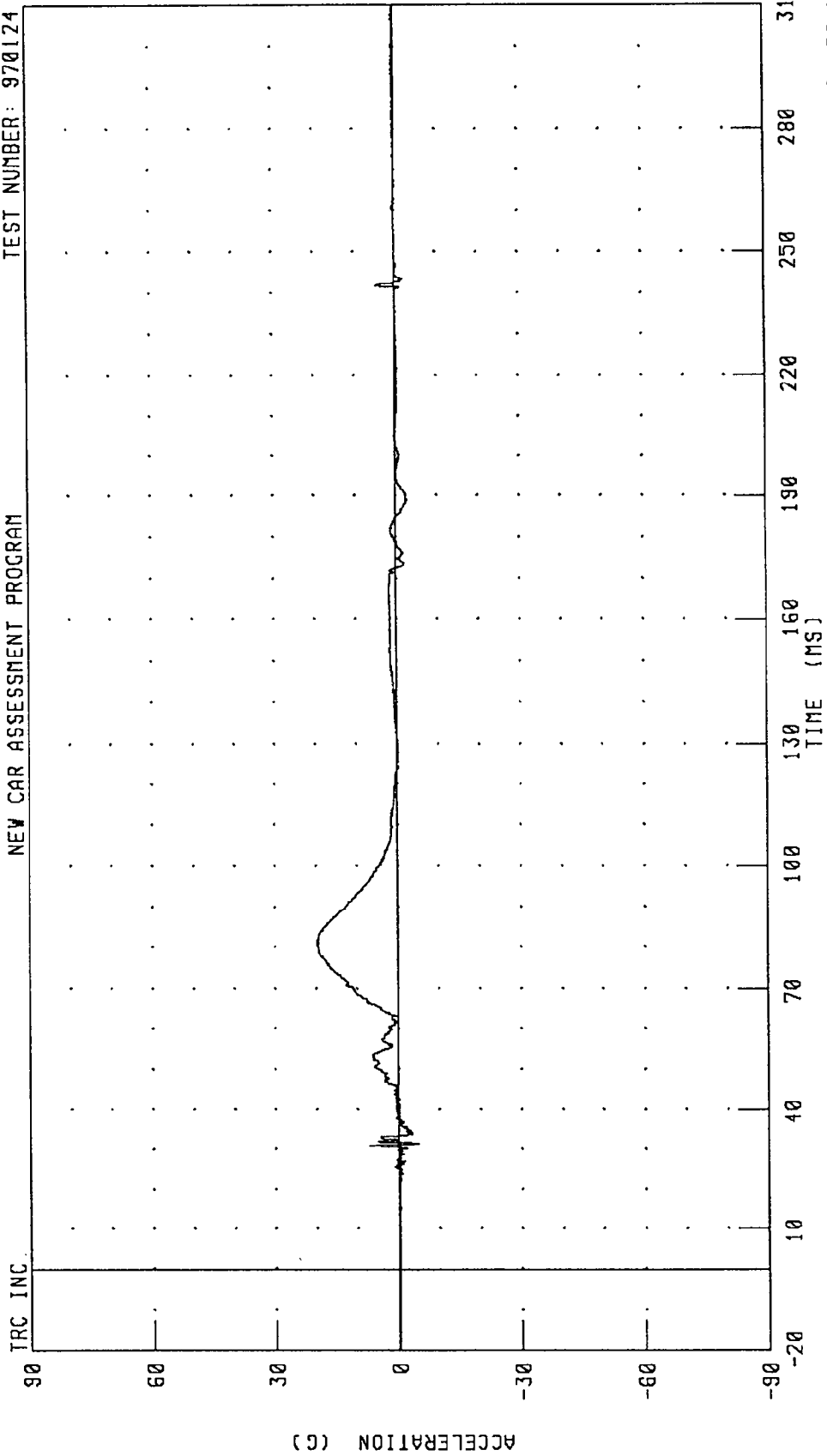


PEAK DATA: 35.94 G @ 173.36 MS; -63.12 G @ 72.72 MS

CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

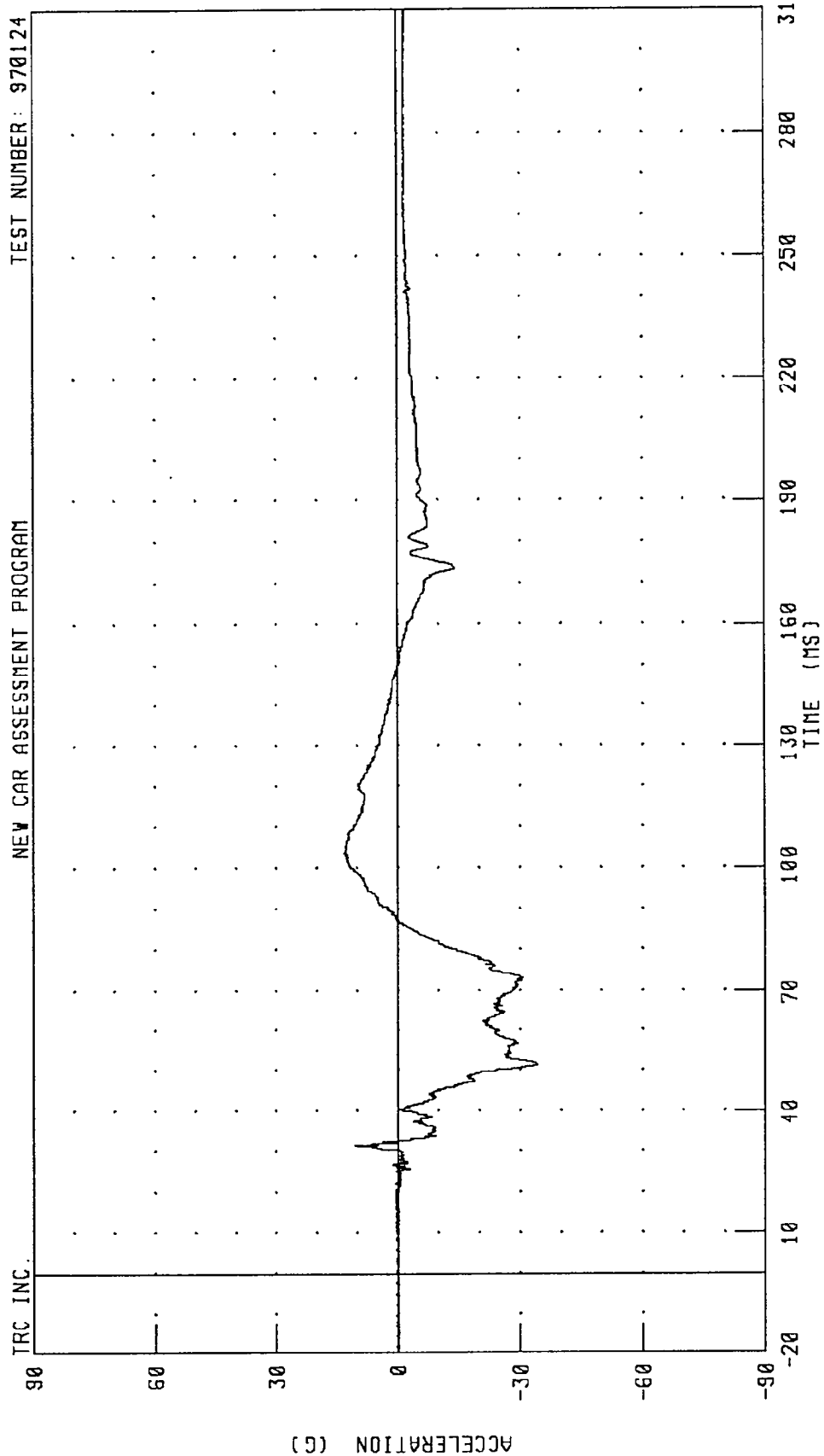
TEST NUMBER: 970124



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

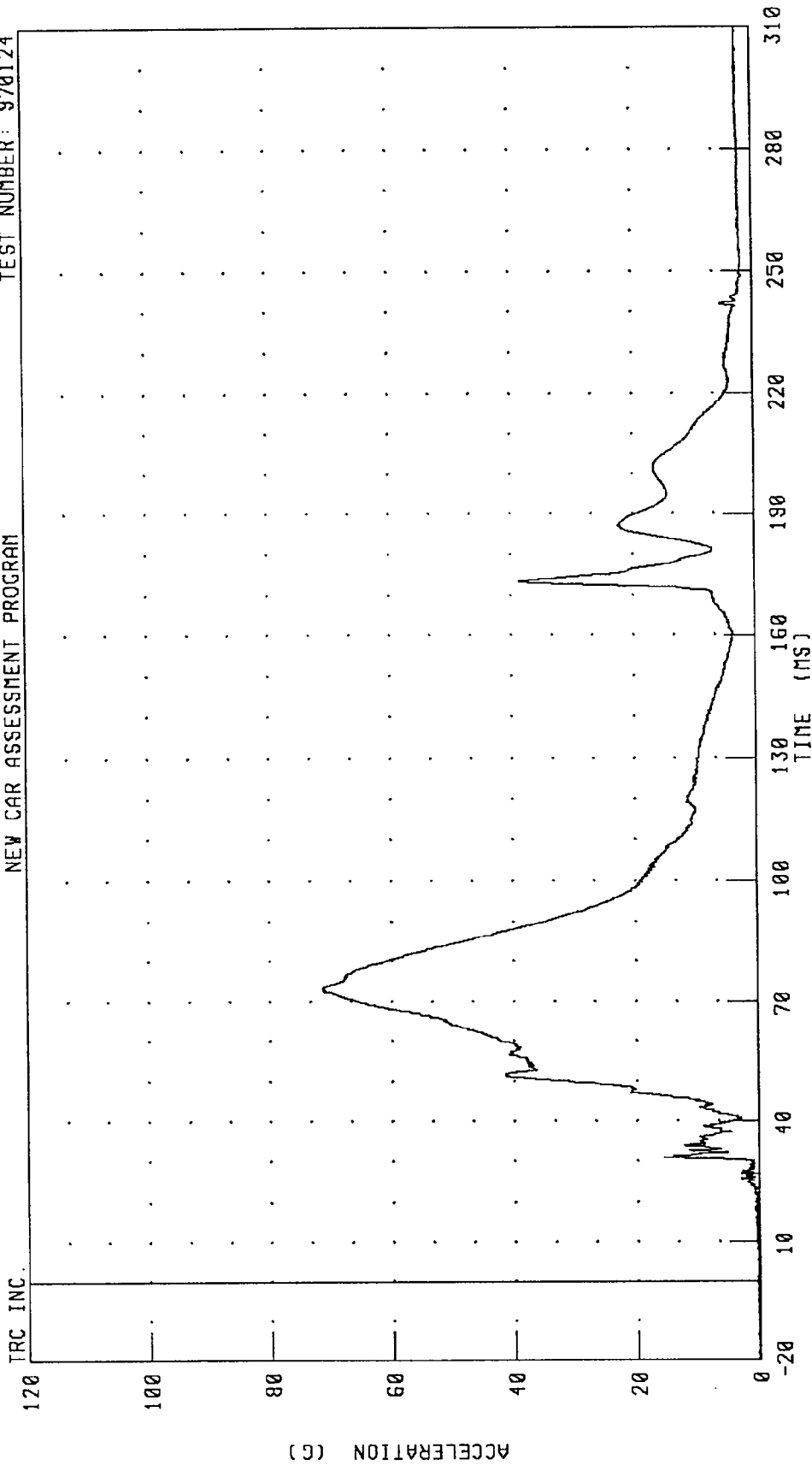
TEST NUMBER: 970124



CHANNEL: HEDZ02 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



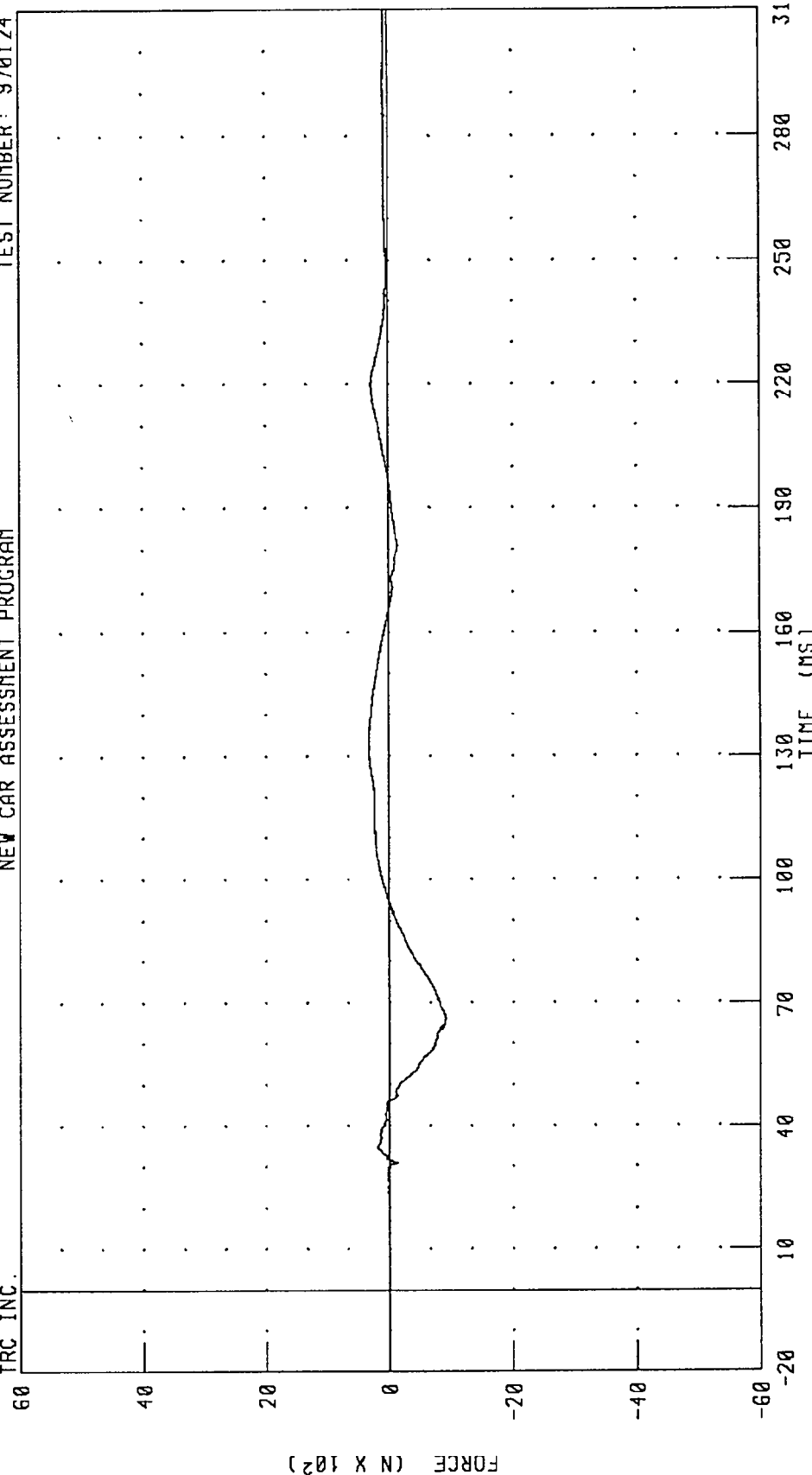
PEAK DATA: 71.33 G @ 73.60 MS; 0.06 G @ -16.80 MS

CHANNEL: HEDRC2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



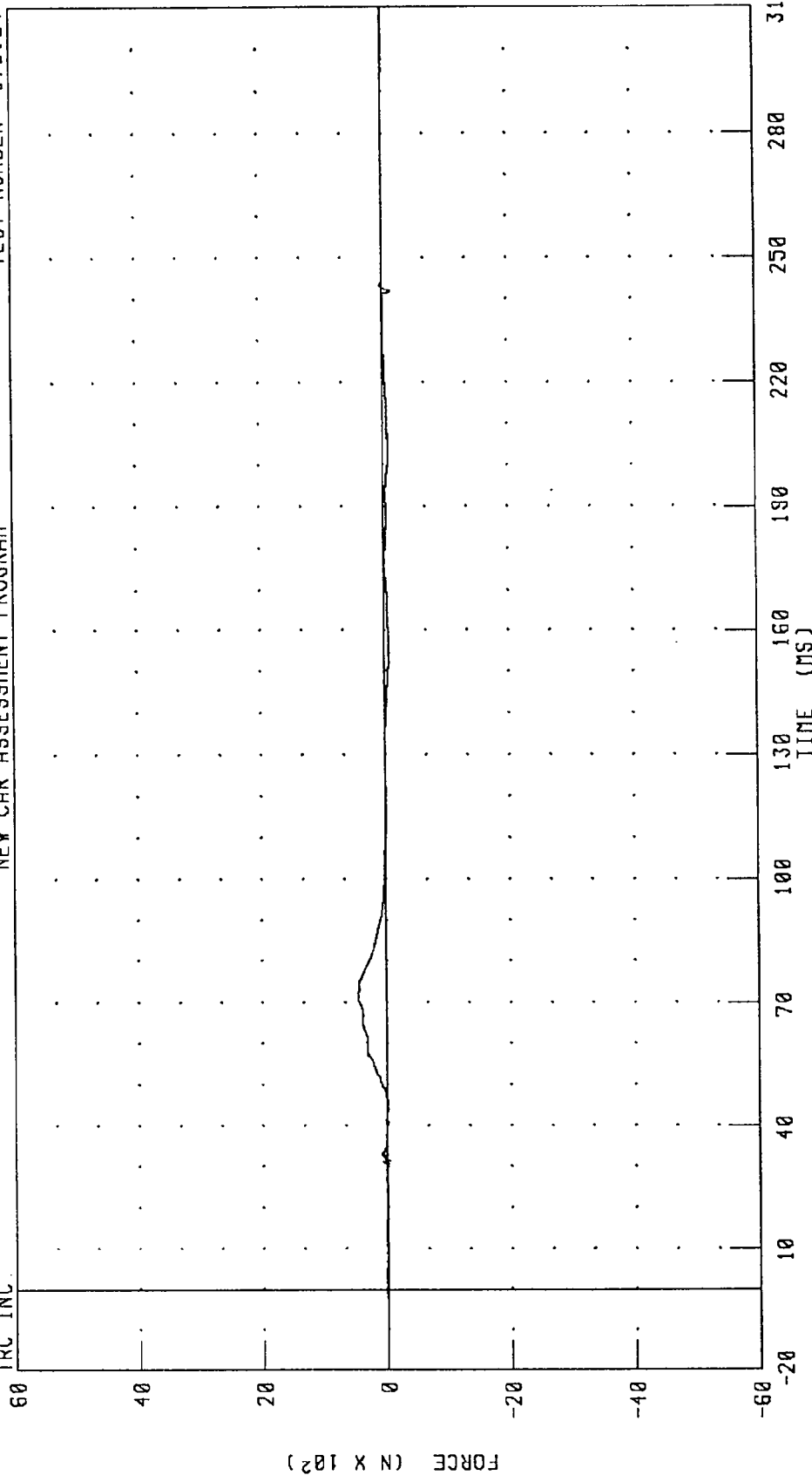
PEAK DATA: 326.31 N @ 131.68 MS; -911.71 N @ 66.40 MS

CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

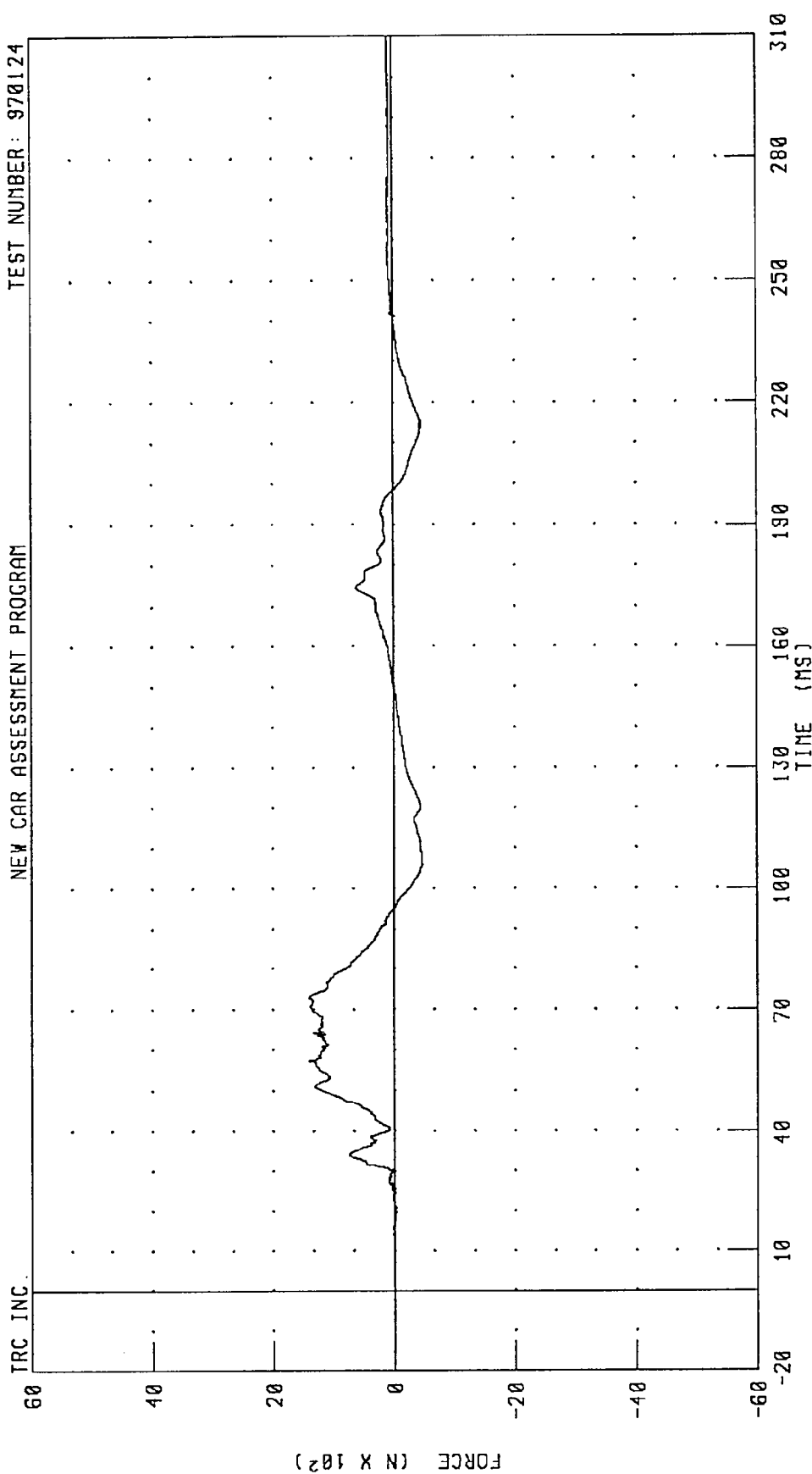
TRC INC.



CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

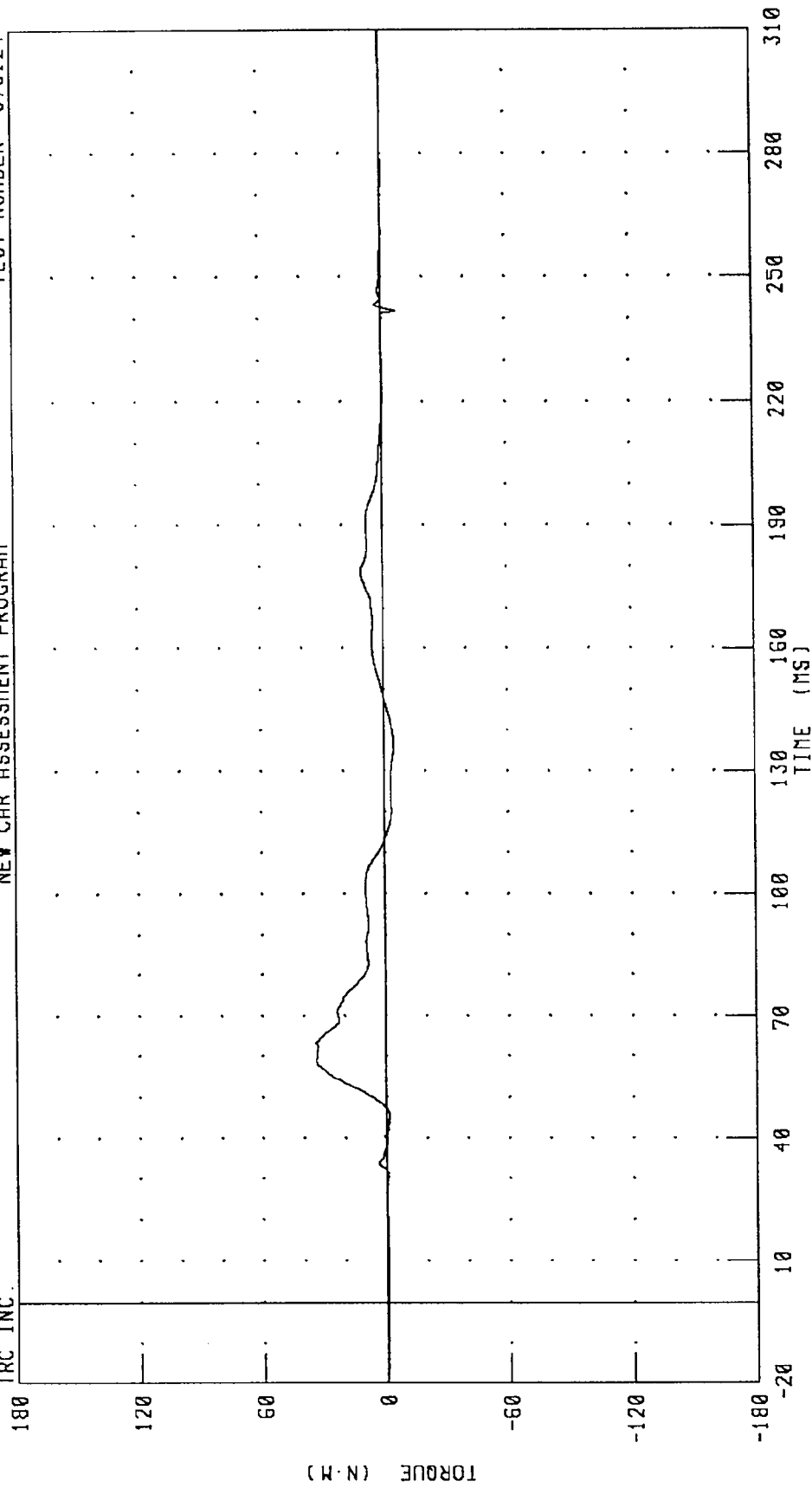
PEAK DATA: 1402.10 N @ 57.28 MS; -468.08 N @ 105.84 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: NEKX2 FILTER: CH. CLASS 600

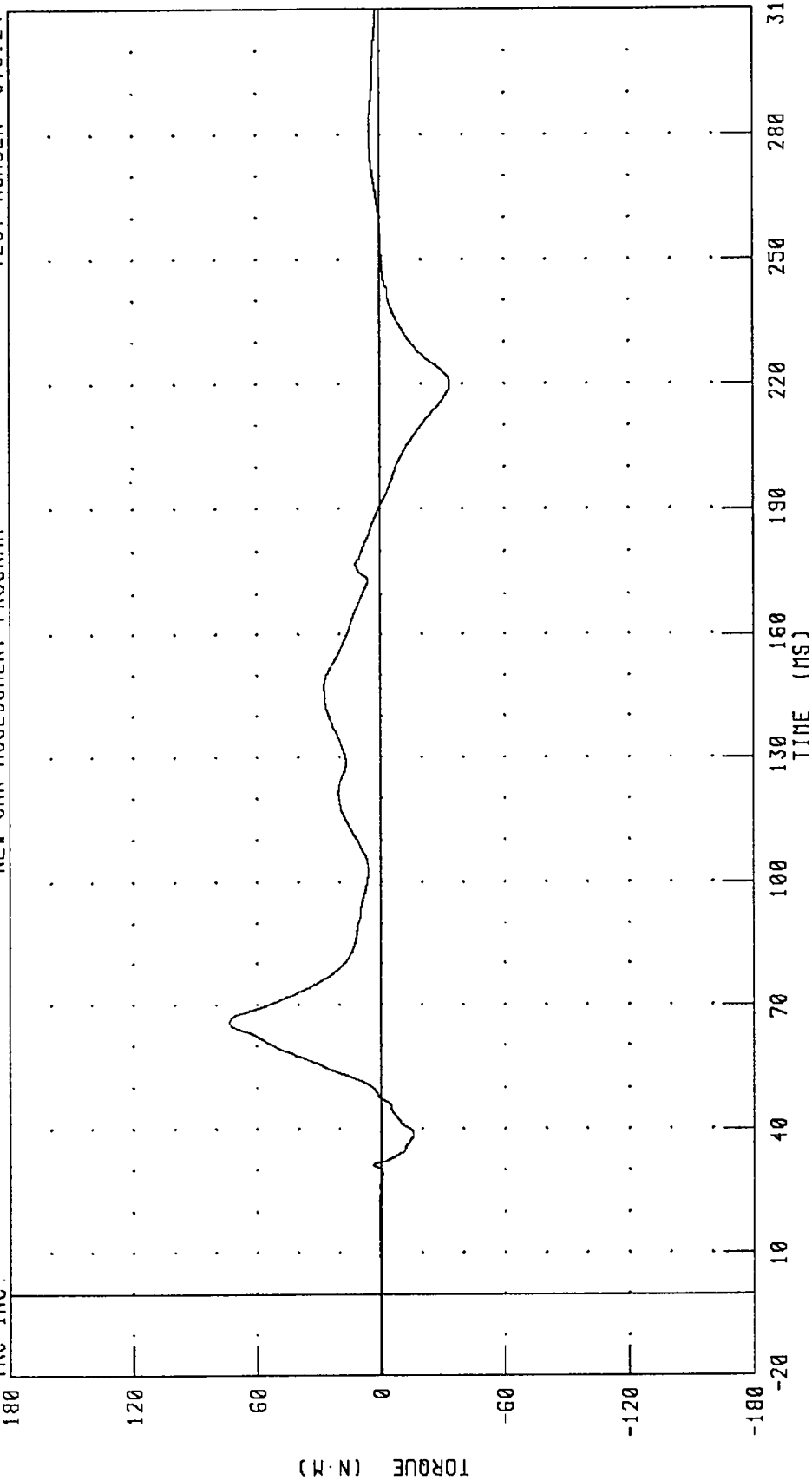
PEAK DATA: 34.53 N.M @ 63.36 MS; -7.10 N.M @ 241.84 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



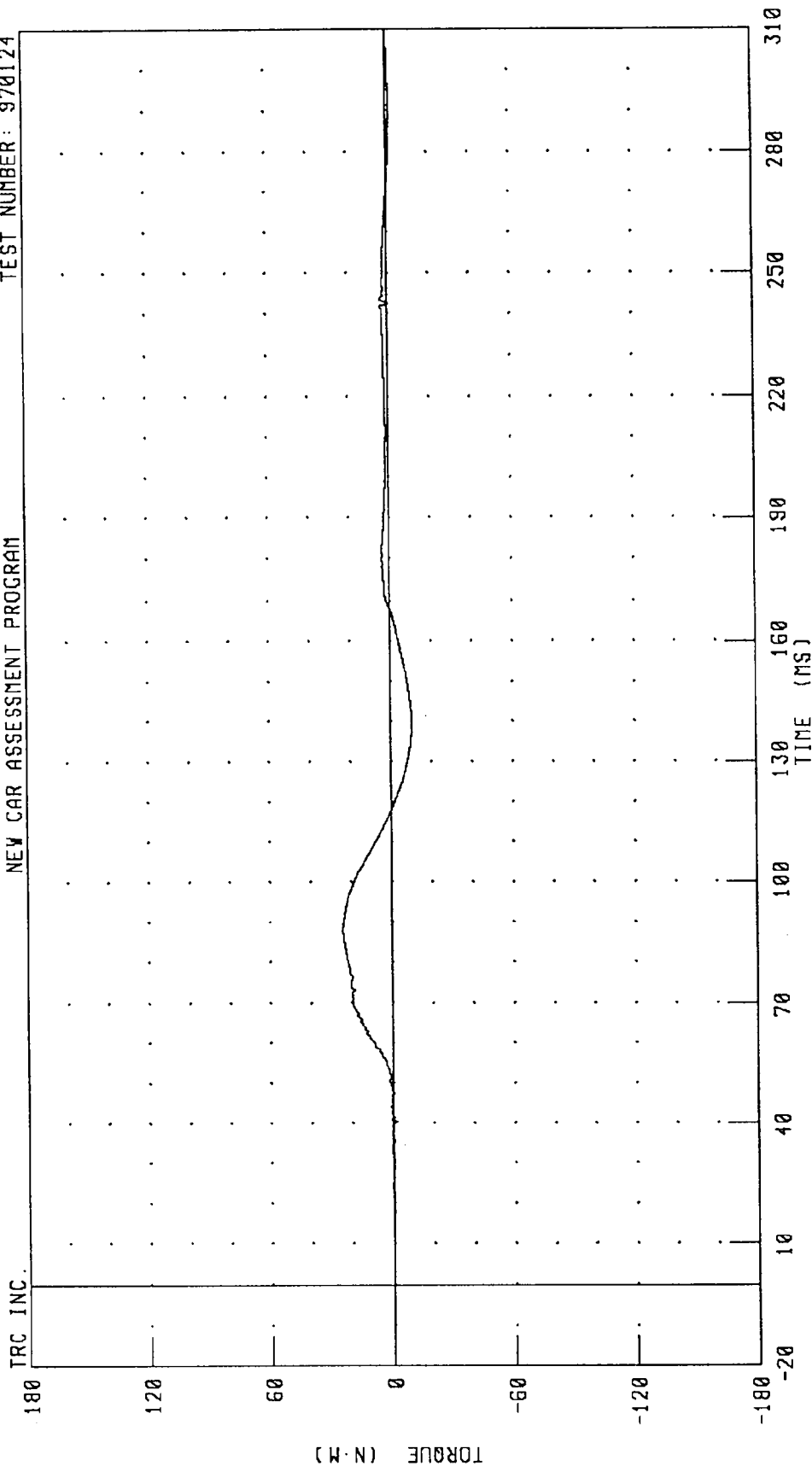
PEAK DATA: 73.66 N·M @ 65.84 MS; -33.66 N·M @ 220.00 MS

CHANNEL: NEKYM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

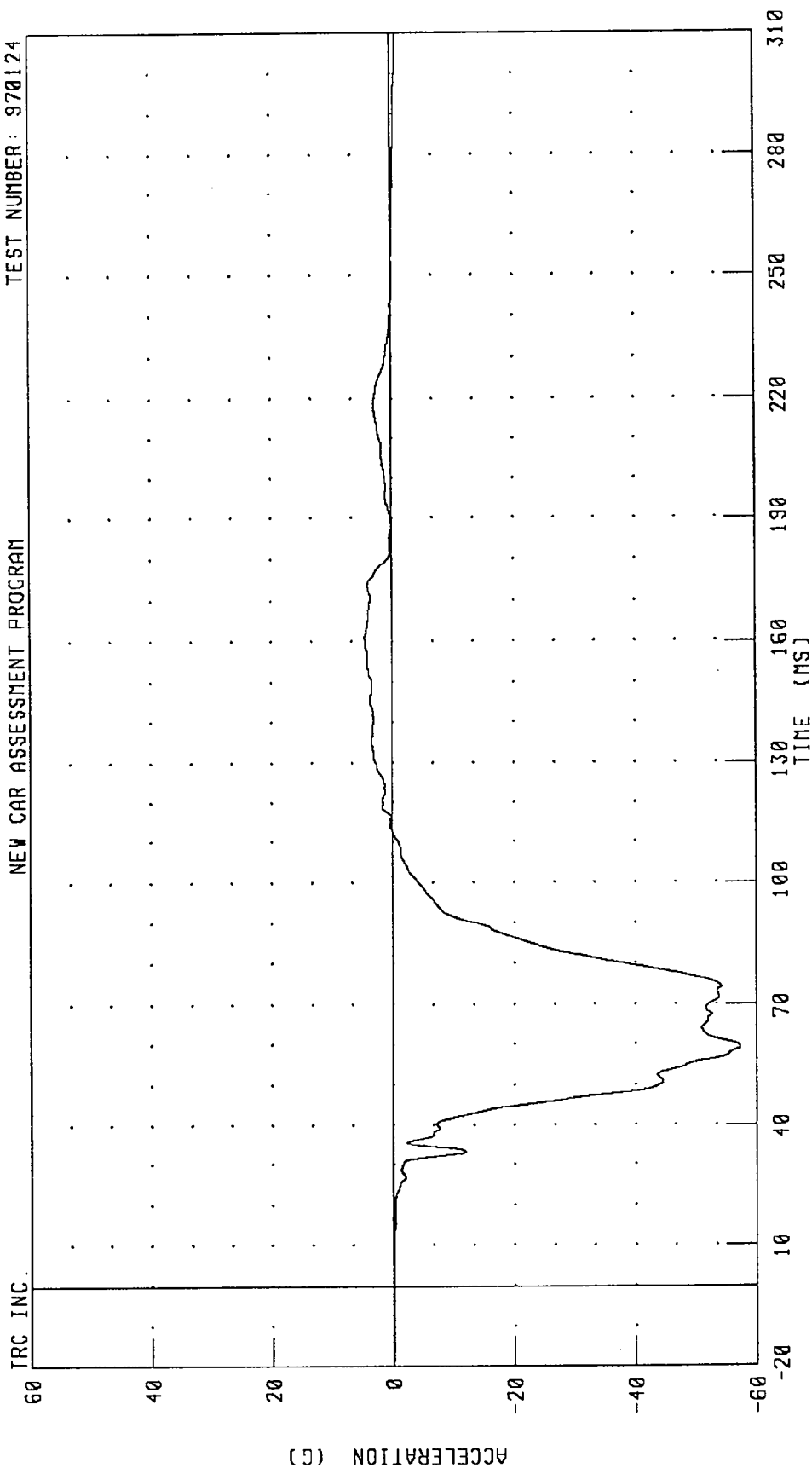


PEAK DATA: 24.31 N.M @ 88.00 MS; -10.16 N.M @ 138.48 MS

CHANNEL: NEKZM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

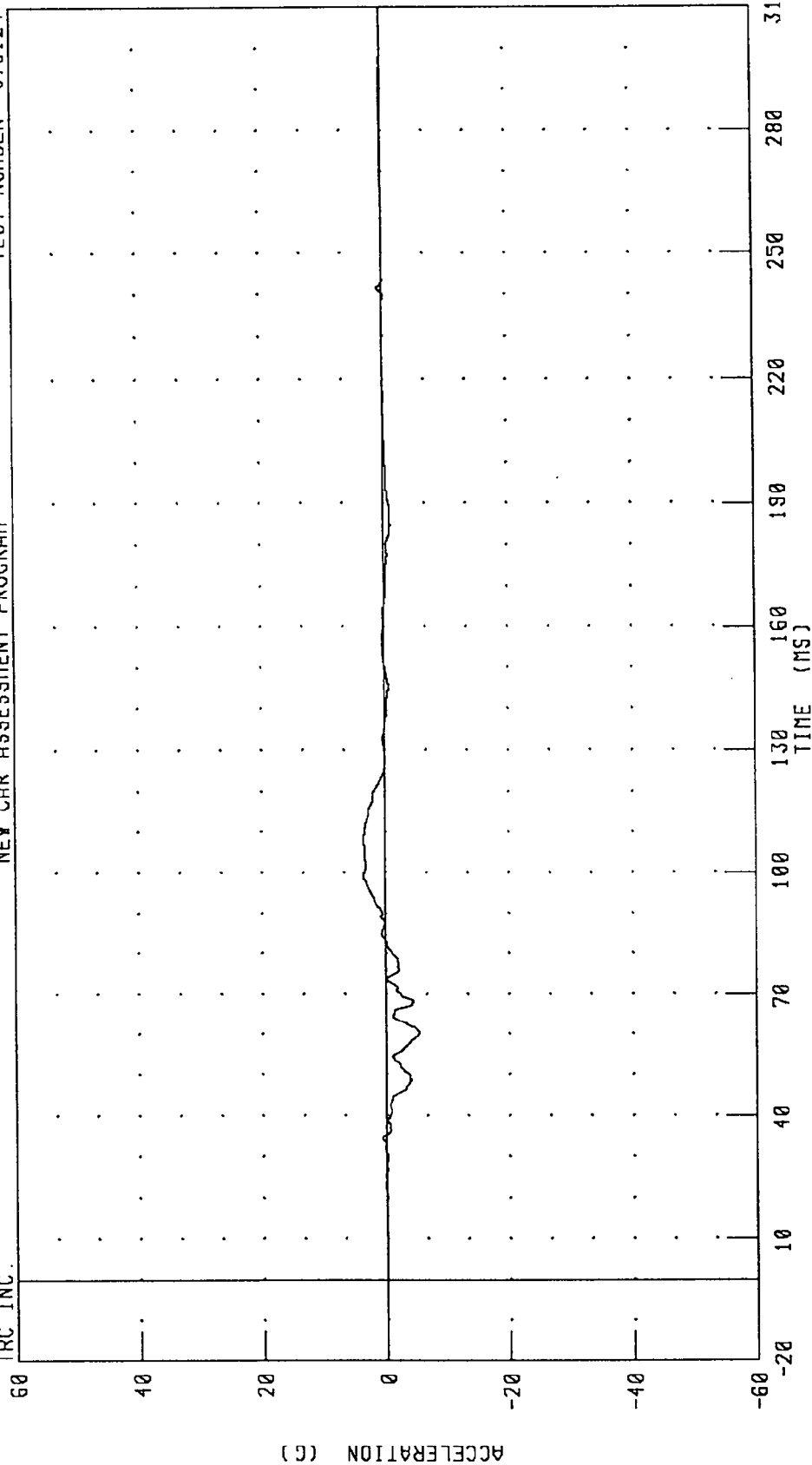


CHANNEL: CSTXG2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

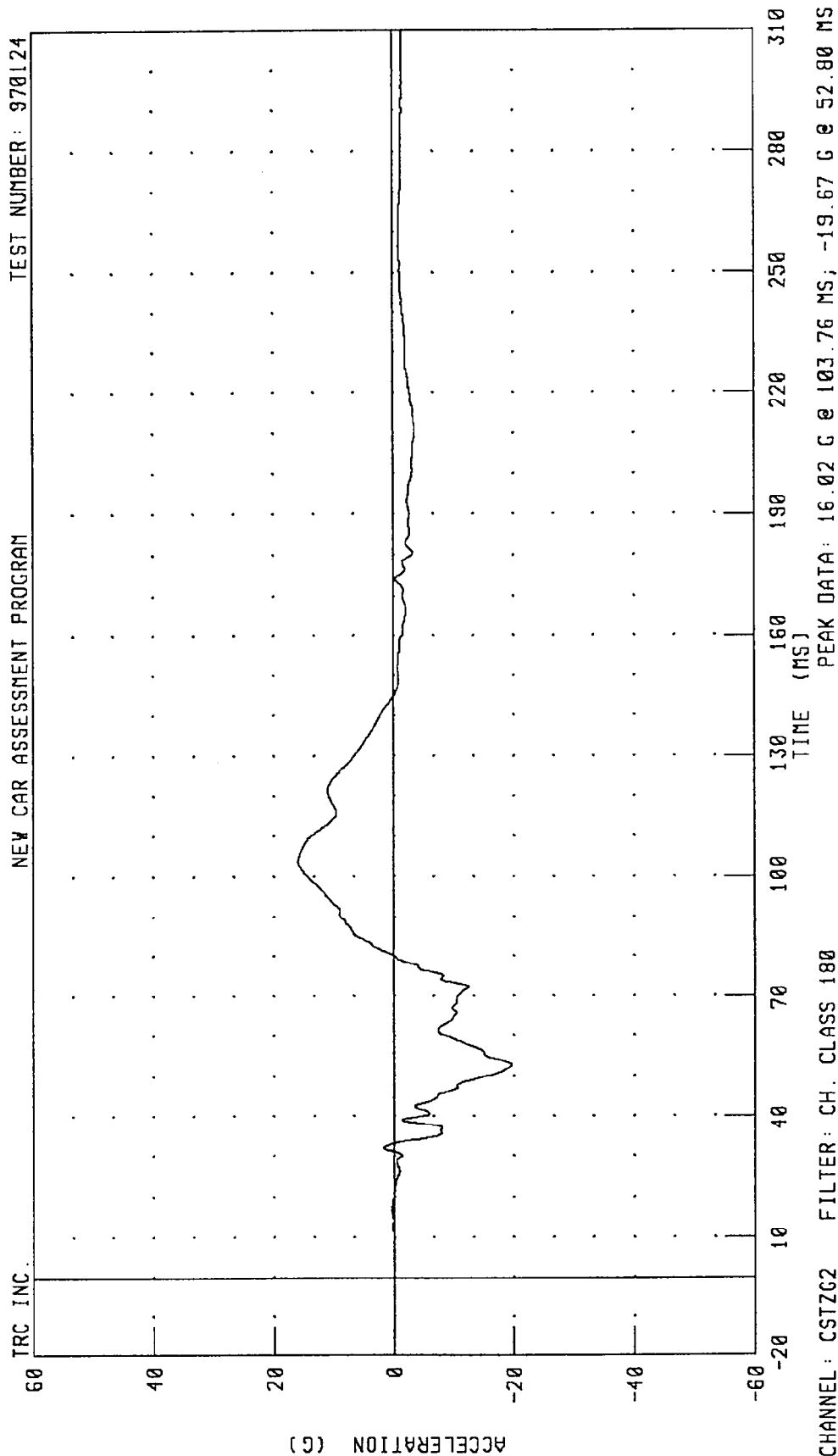


CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 3.64 G @ 99.20 MS; -5.40 G @ 60.24 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



CHANNEL: CSTZC2 FILTER: CH. CLASS 180

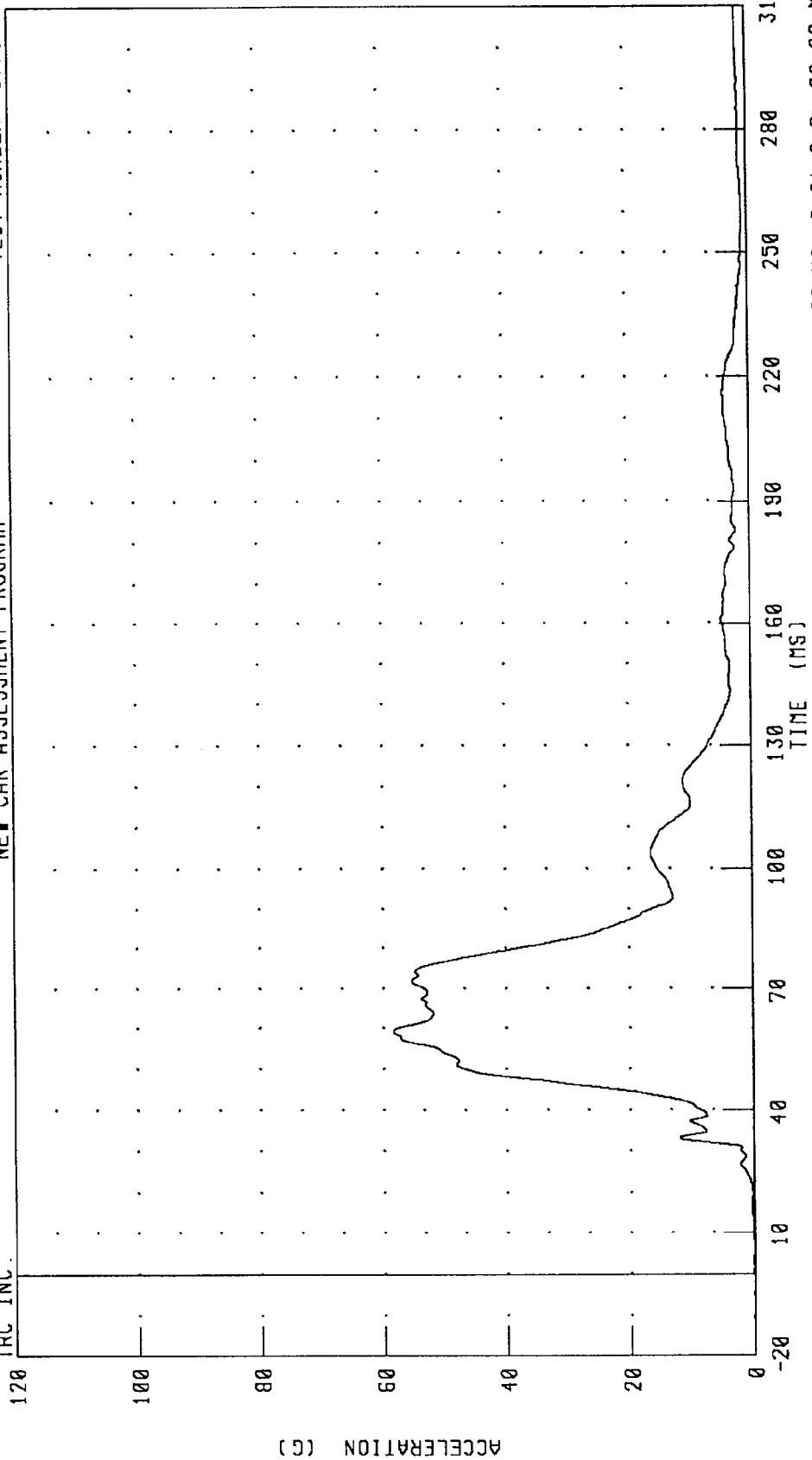
PEAK DATA: 16.02 G @ 103.76 MS; -19.67 G @ 52.80 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

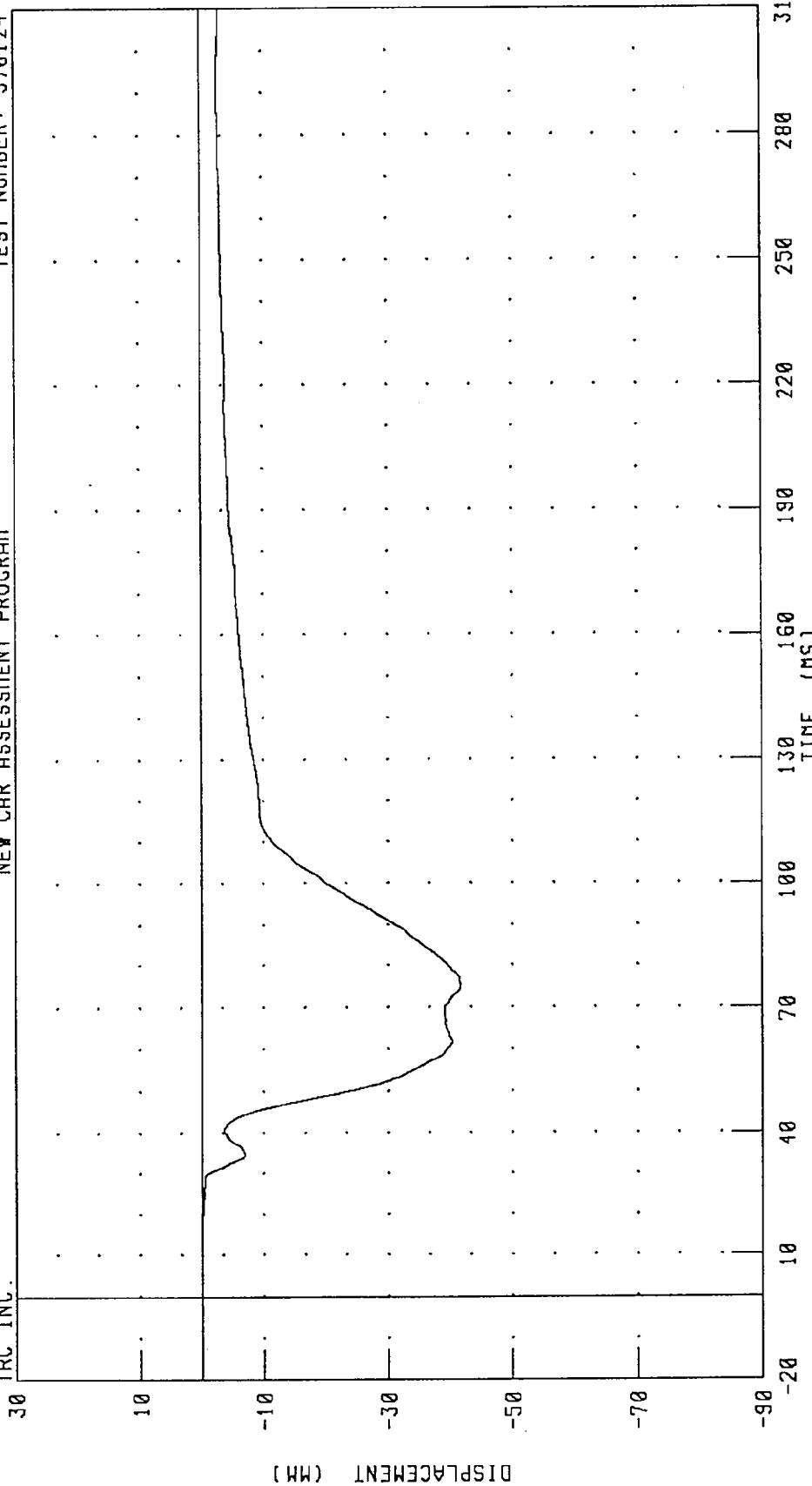


CHANNEL: CSTRG2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



PEAK DATA: 0.00 MM @ 13.12 MS; -41.67 MM @ 74.96 MS

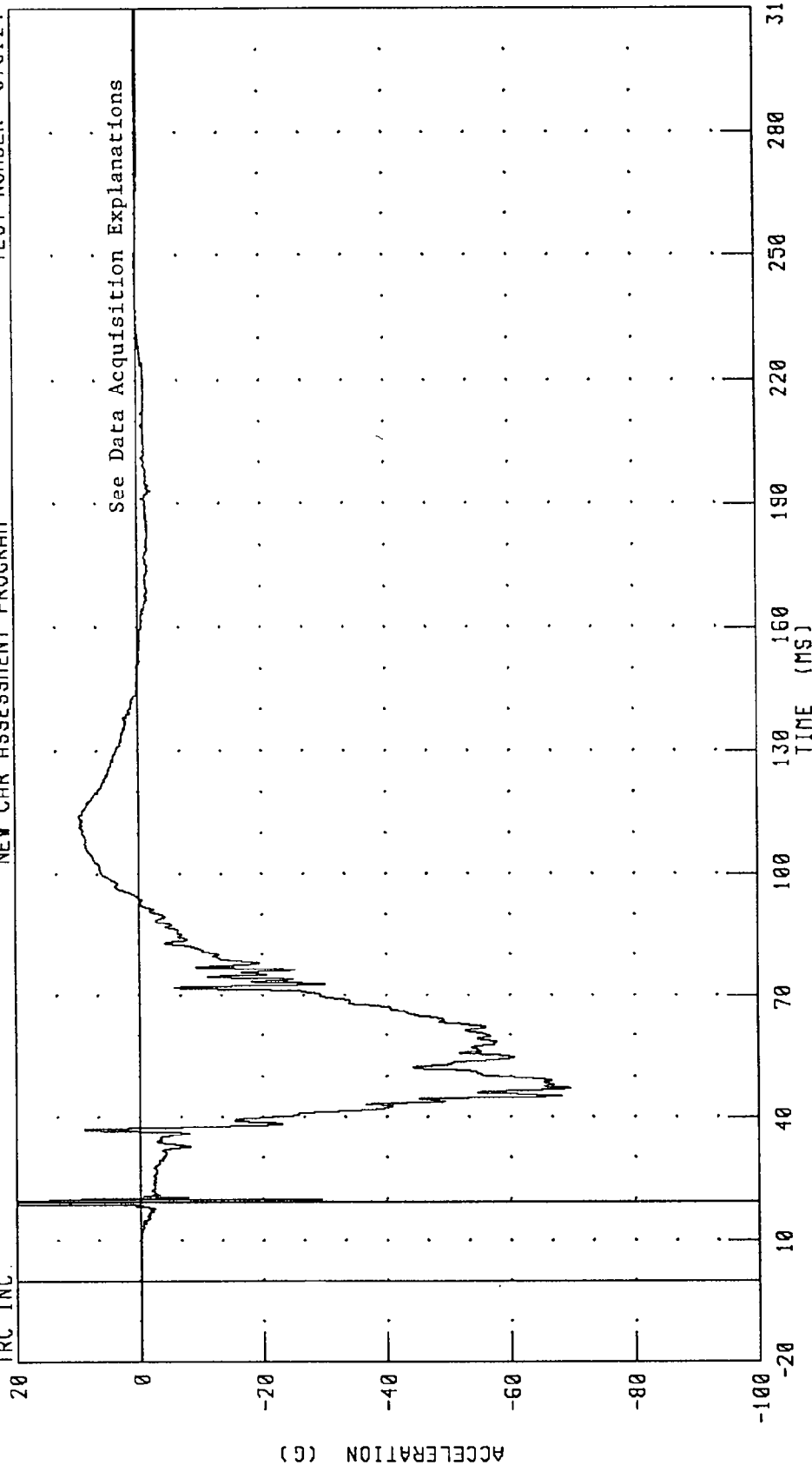
CHANNEL: CSTXD2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



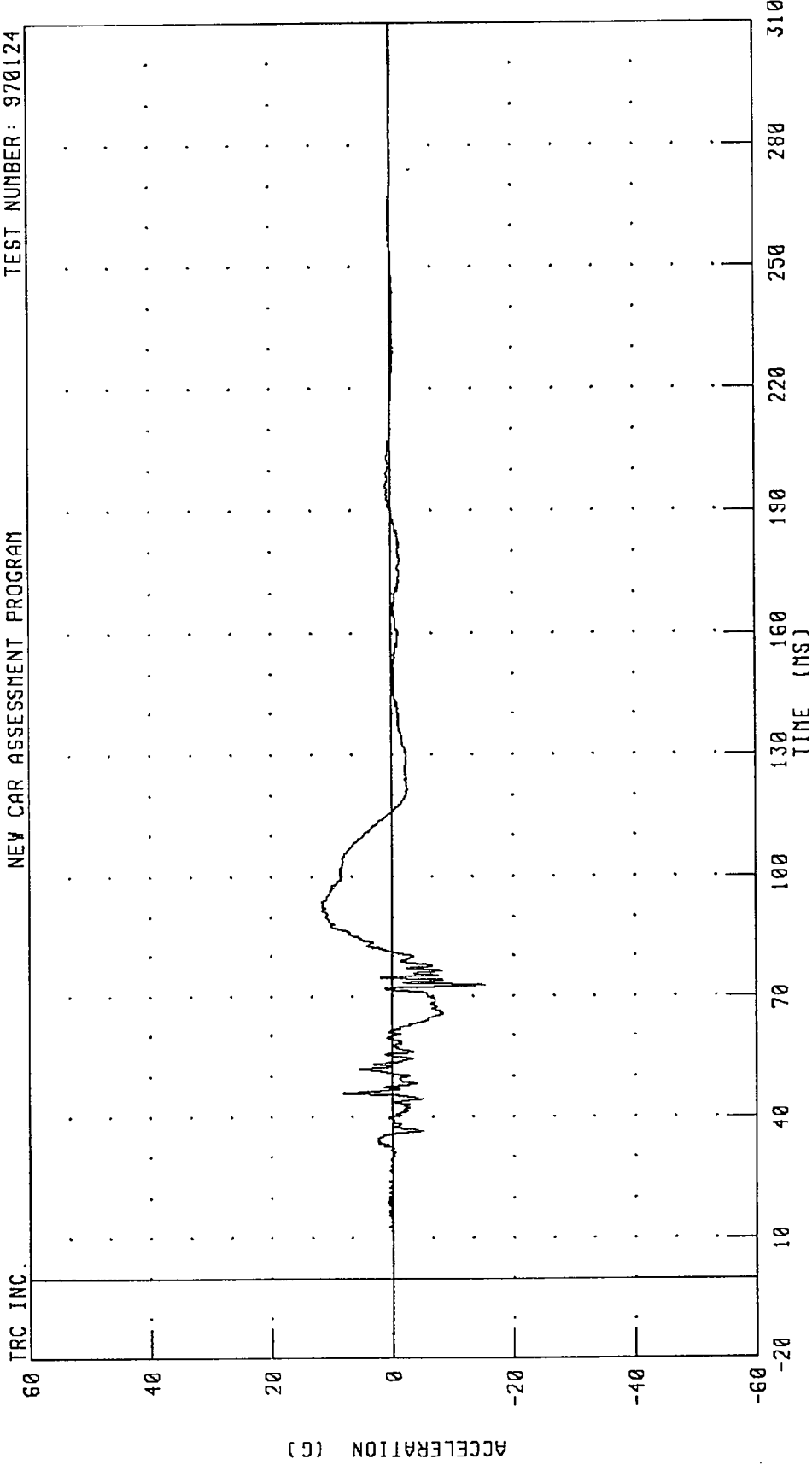
See Data Acquisition Explanations

PEAK DATA: 400.72 G @ 18.96 MS; -165.25 G @ 19.36 MS

CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

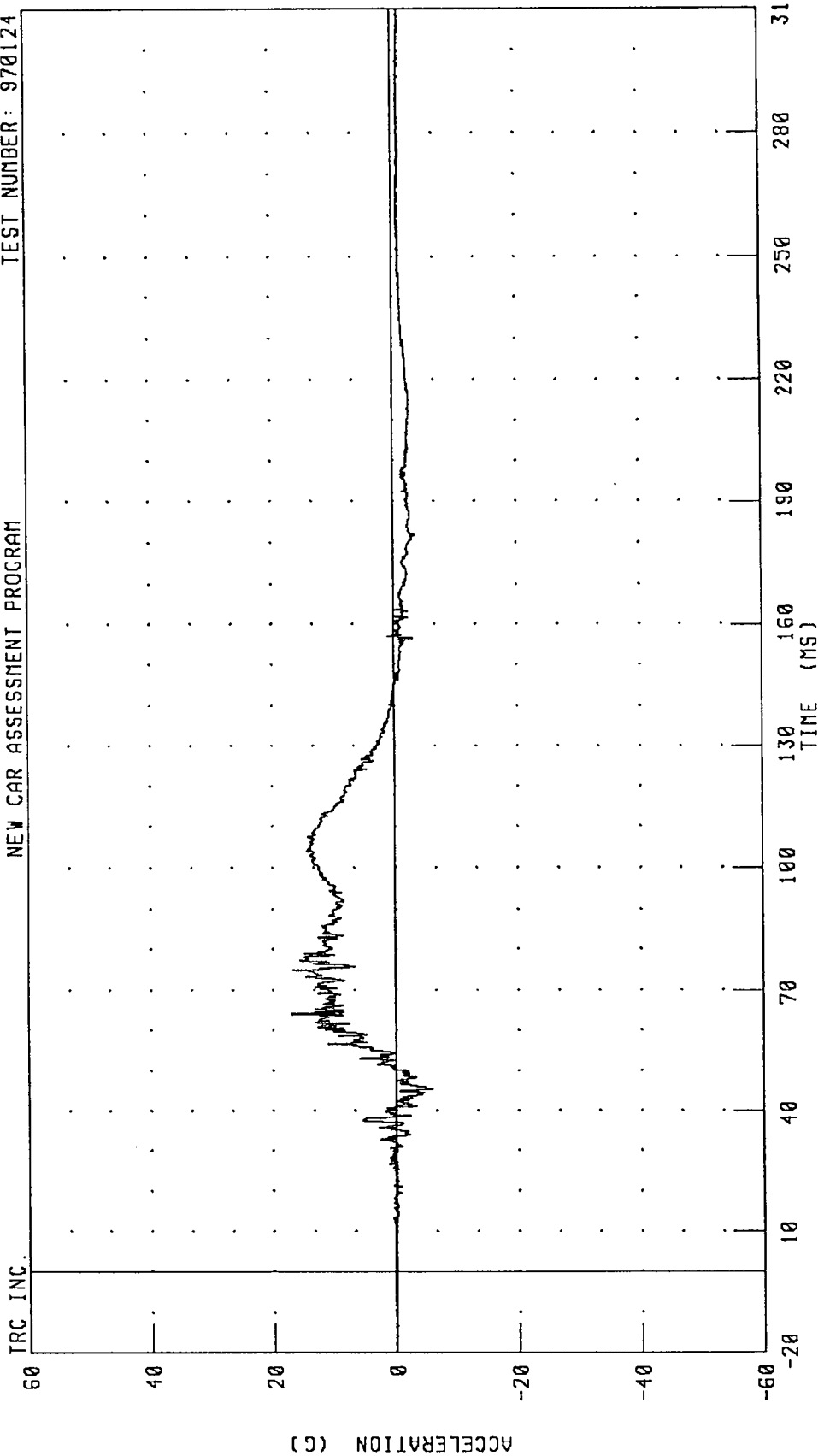
TEST NUMBER: 970124



CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



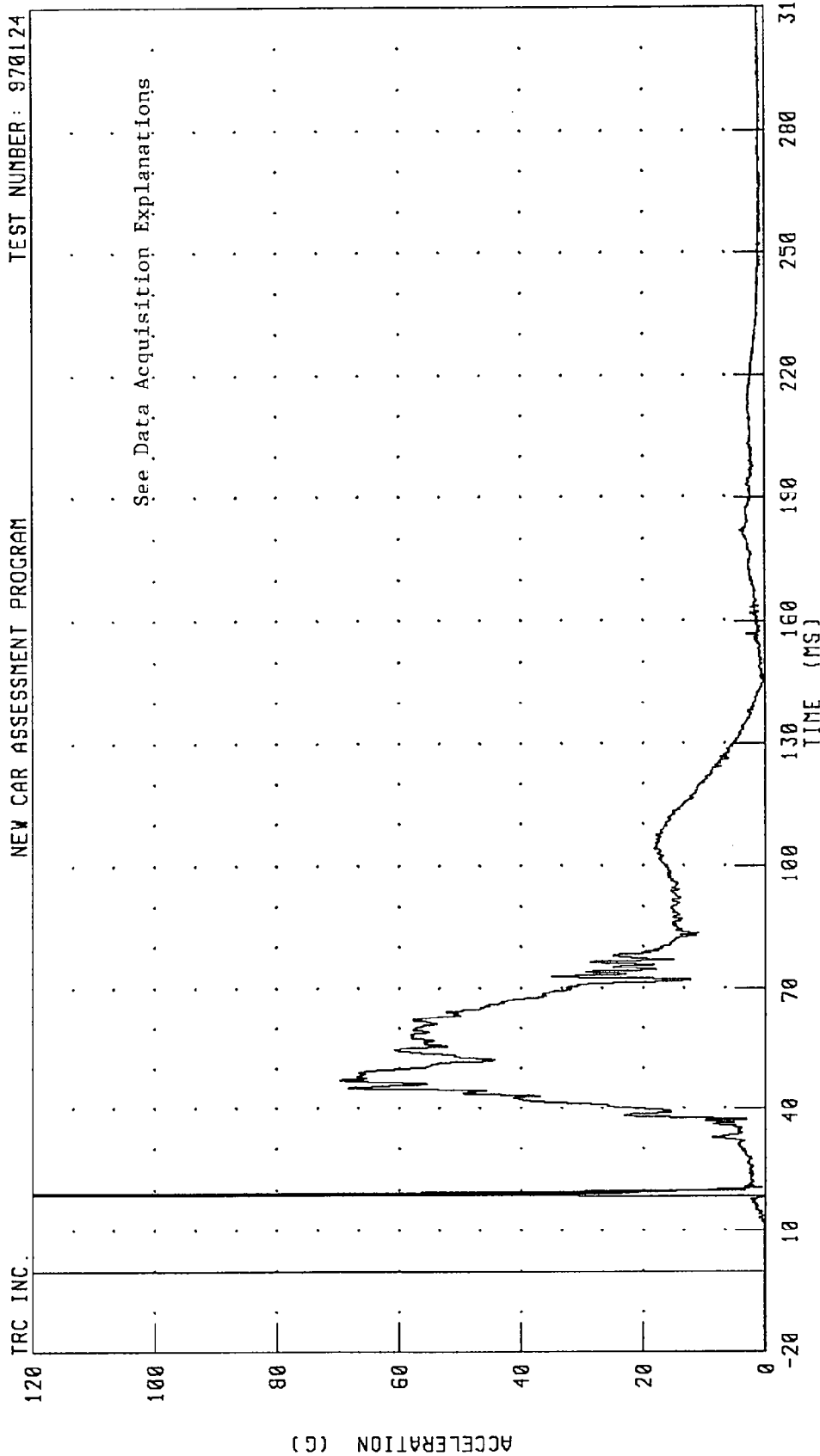
PEAK DATA: 16.92 G @ 64.24 MS; -5.92 G @ 45.44 MS

CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



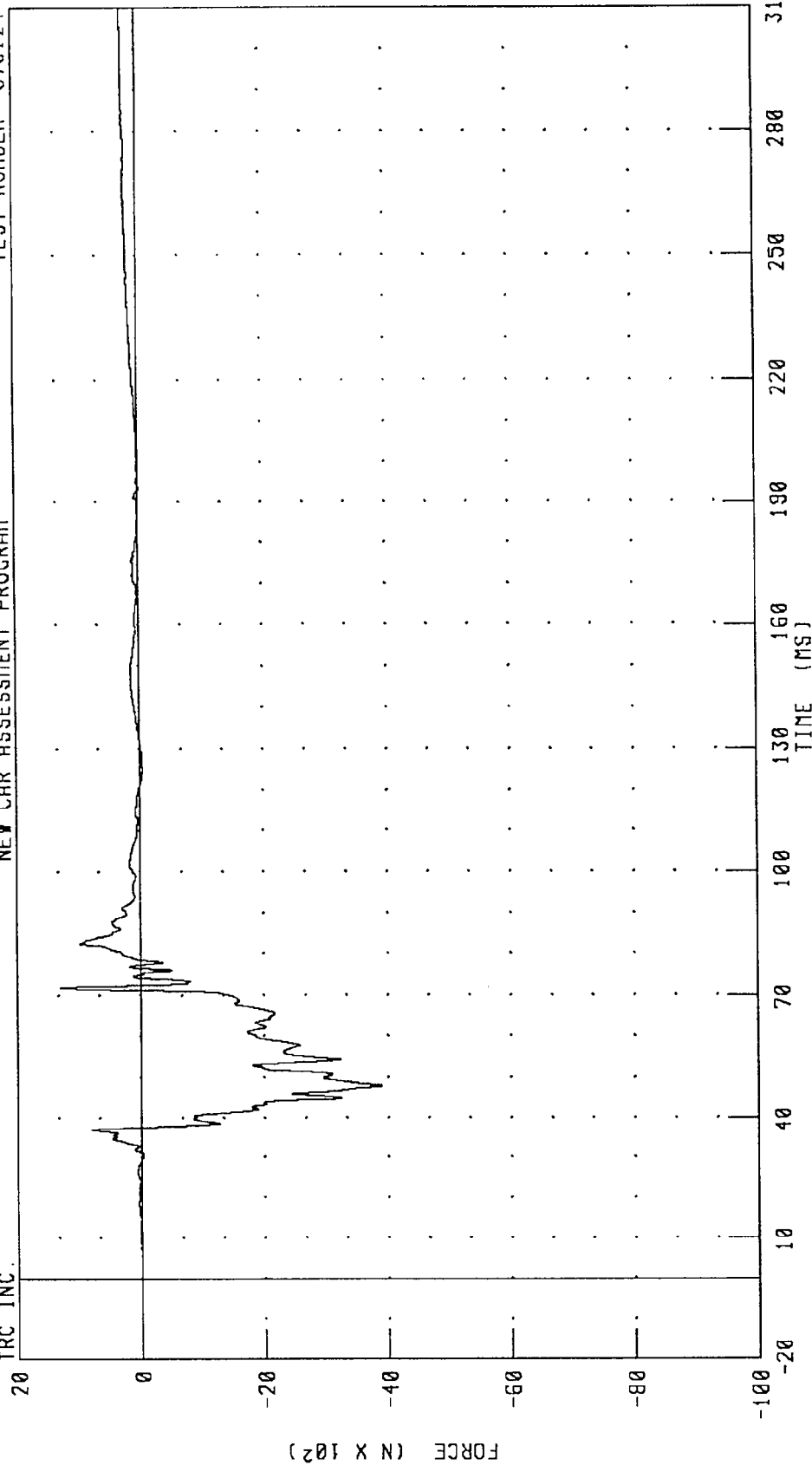
CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

PEAK DATA: 400.72 G @ 19.04 MS; 0.04 G @ -20.00 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



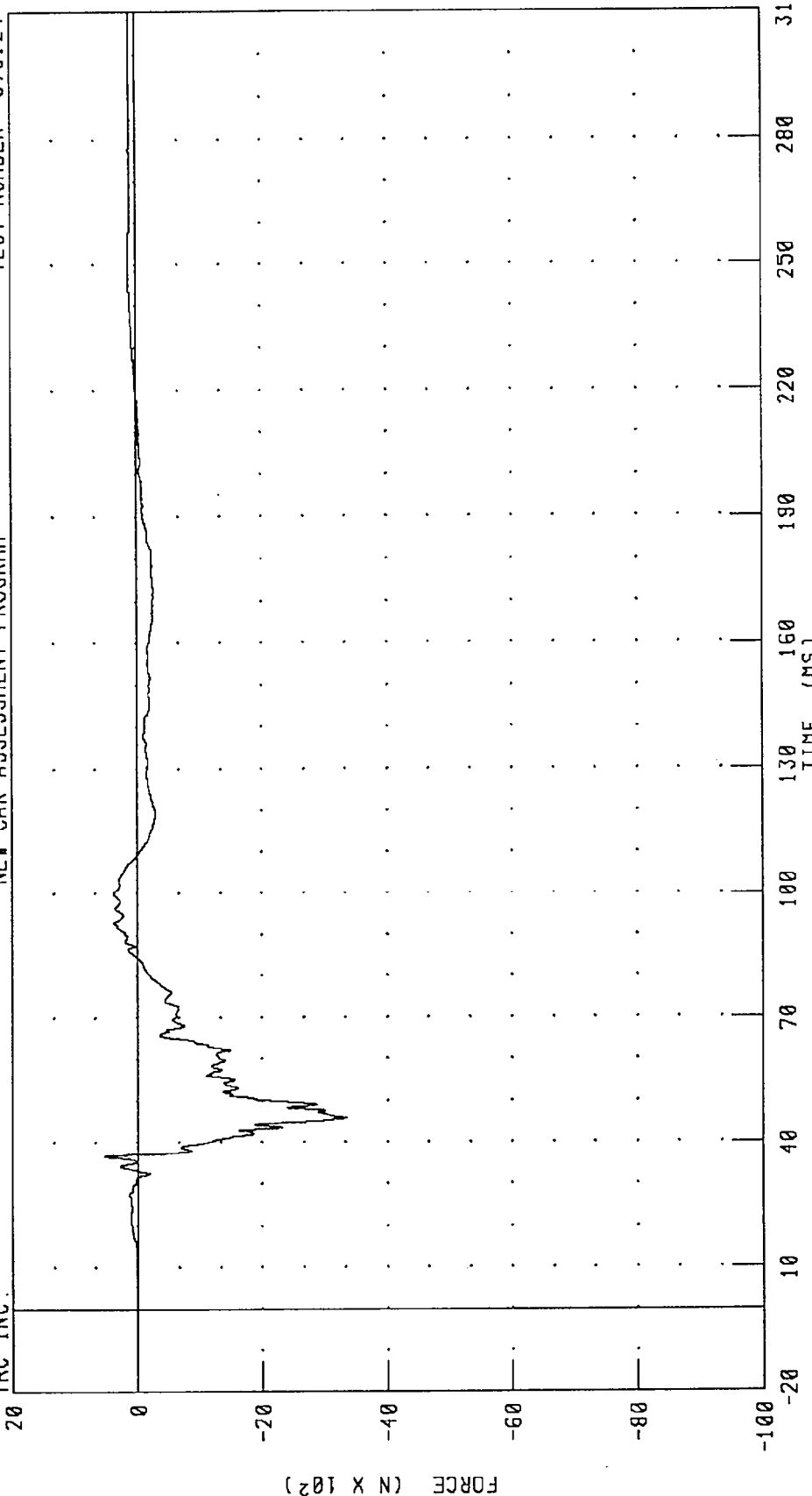
PEAK DATA: 1305.22 N @ 71.92 MS; -3922.08 N @ 47.84 MS

CHANNEL: LFMF2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



PEAK DATA: 527.95 N @ 36.72 MS; -3351.26 N @ 45.84 MS

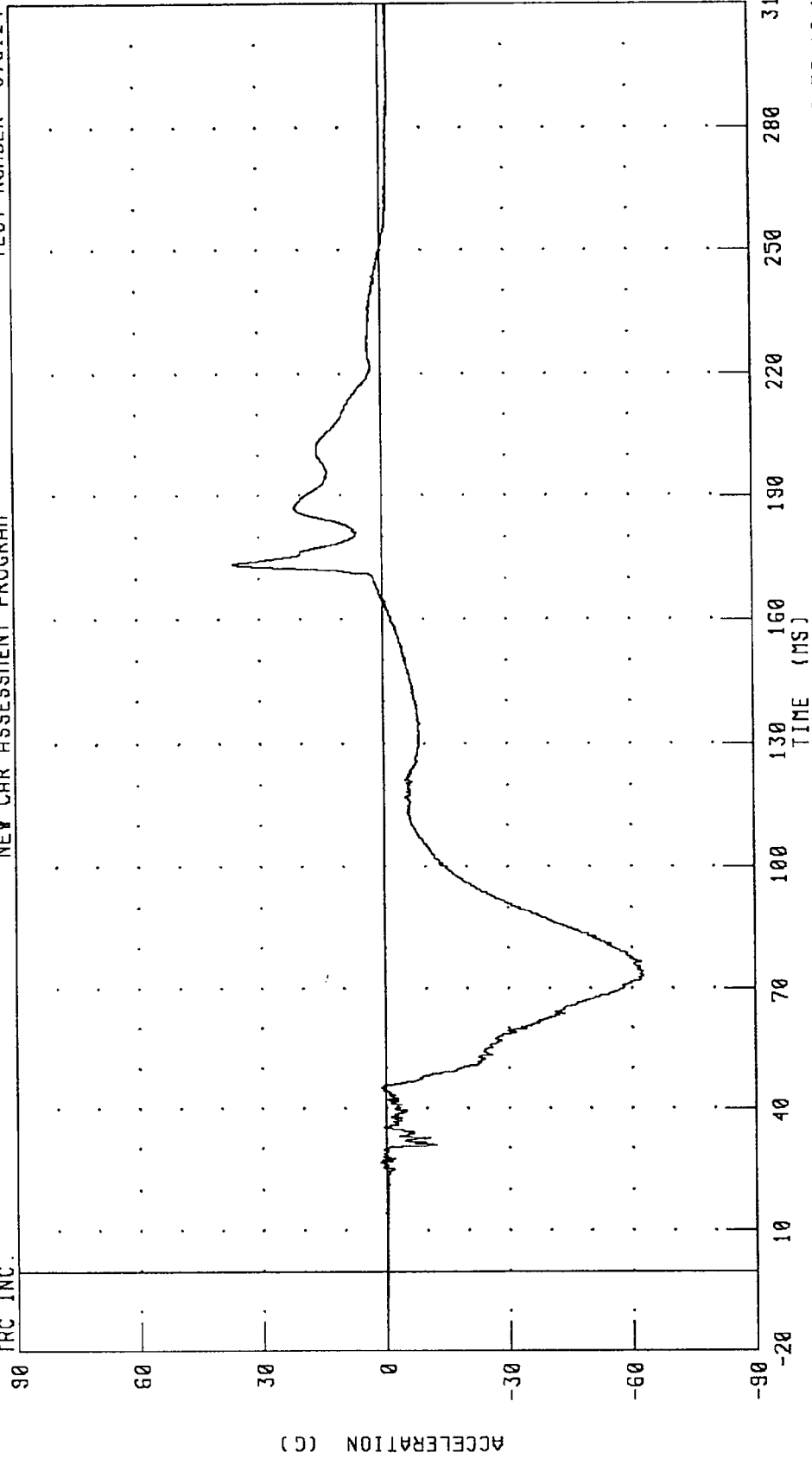
CHANNEL: RFMF2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: HEDXR2 FILTER: CH. CLASS 1000

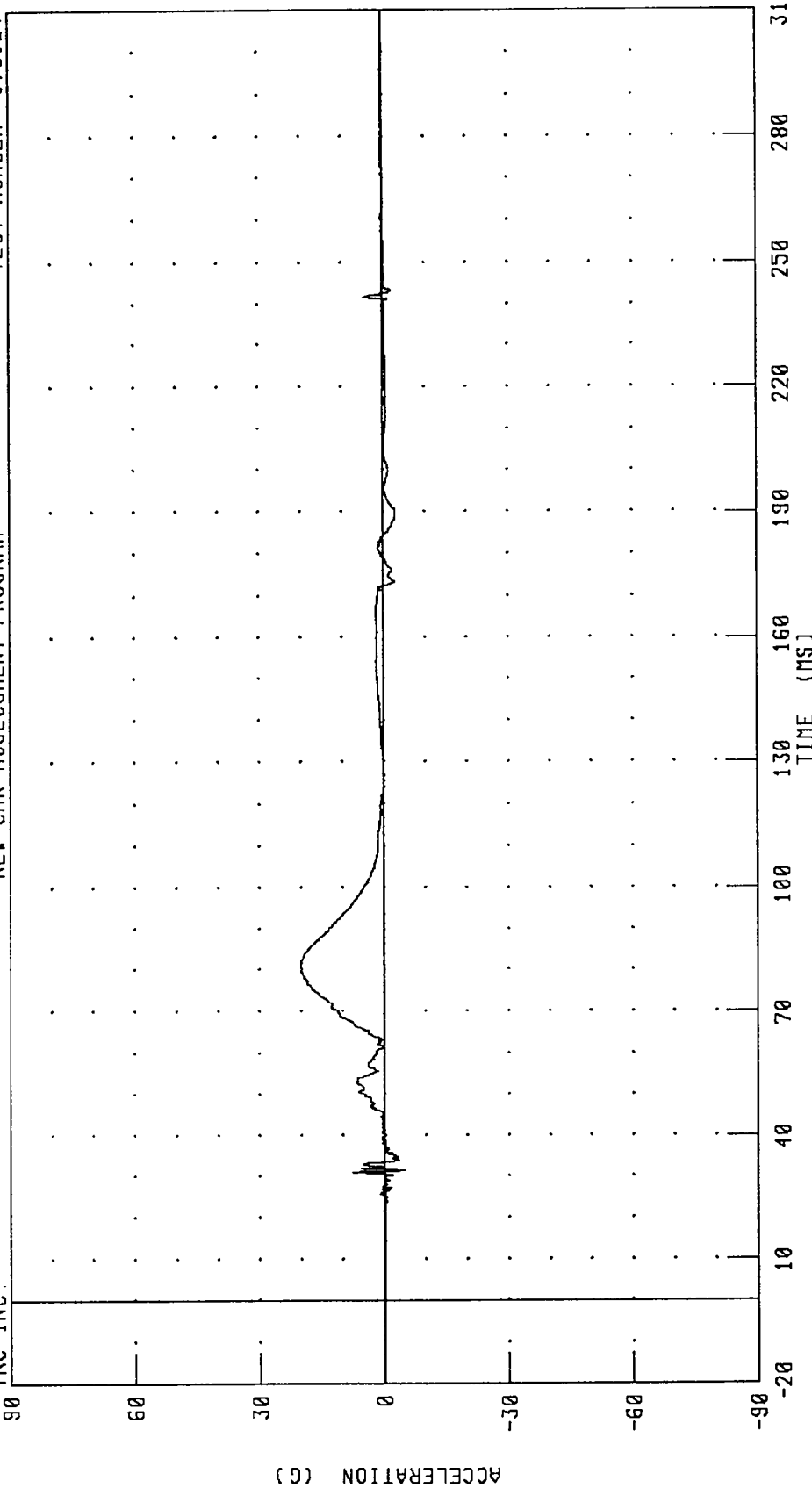
PEAK DATA: 36.56 G @ 173.36 MS; -62.71 G @ 73.12 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: HEDYR2 FILTER: CH. CLASS 1000

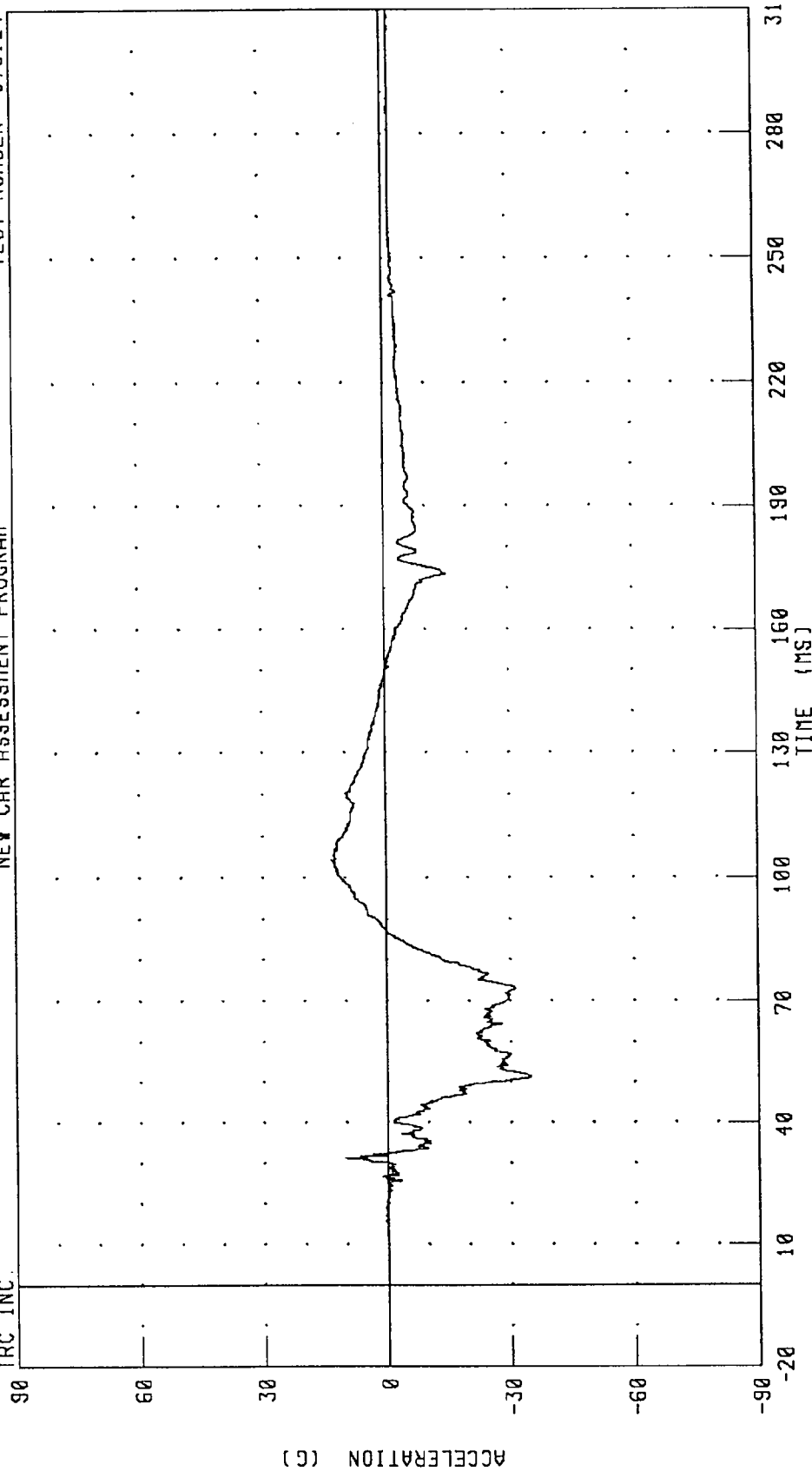
PEAK DATA: 20.16 G @ 81.04 MS; -5.05 G @ 31.36 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

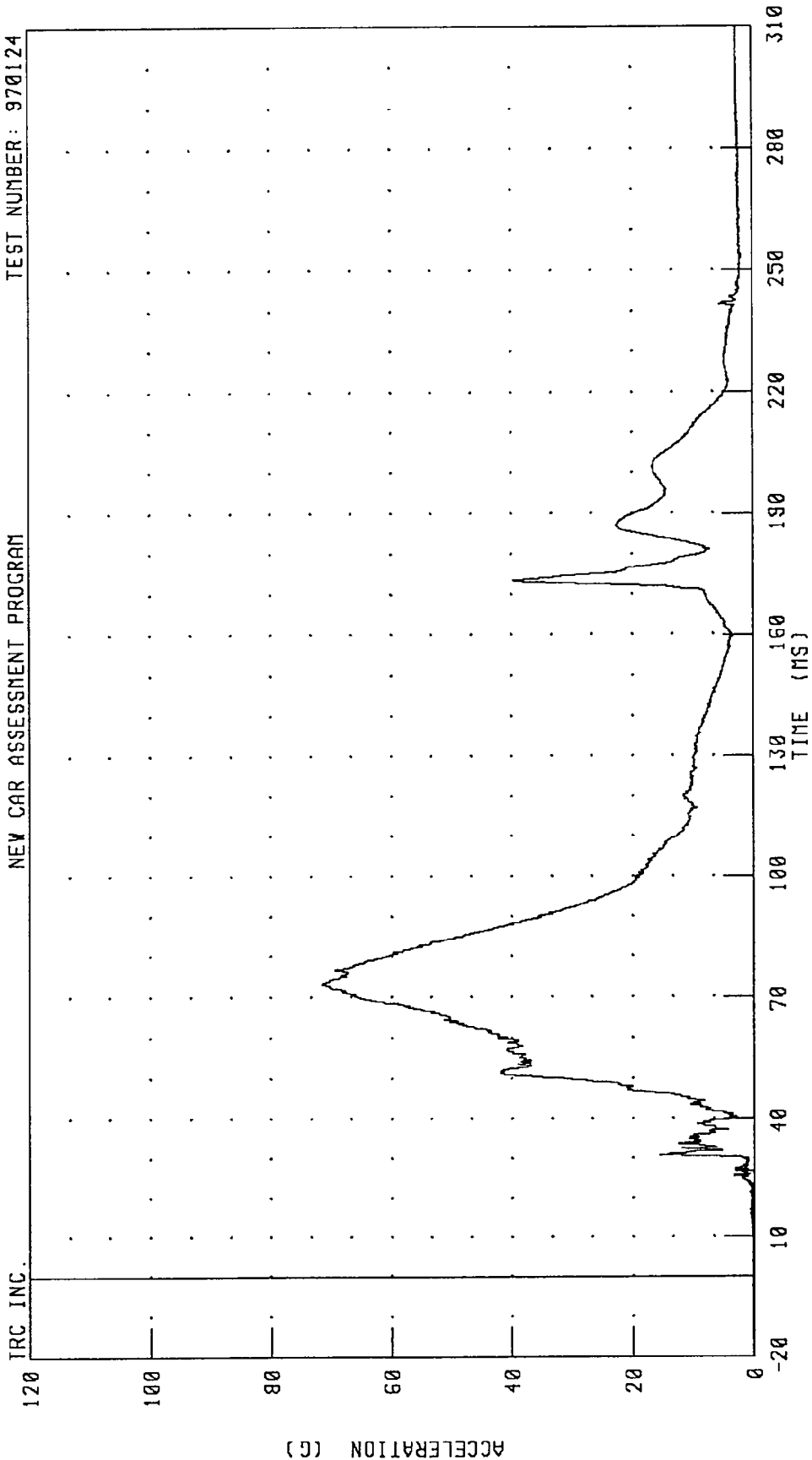


CHANNEL: HEDZR2 FILTER: CH. CLASS 1000

PEAK DATA: 13.46 G @ 104.24 MS; -34.71 G @ 51.12 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



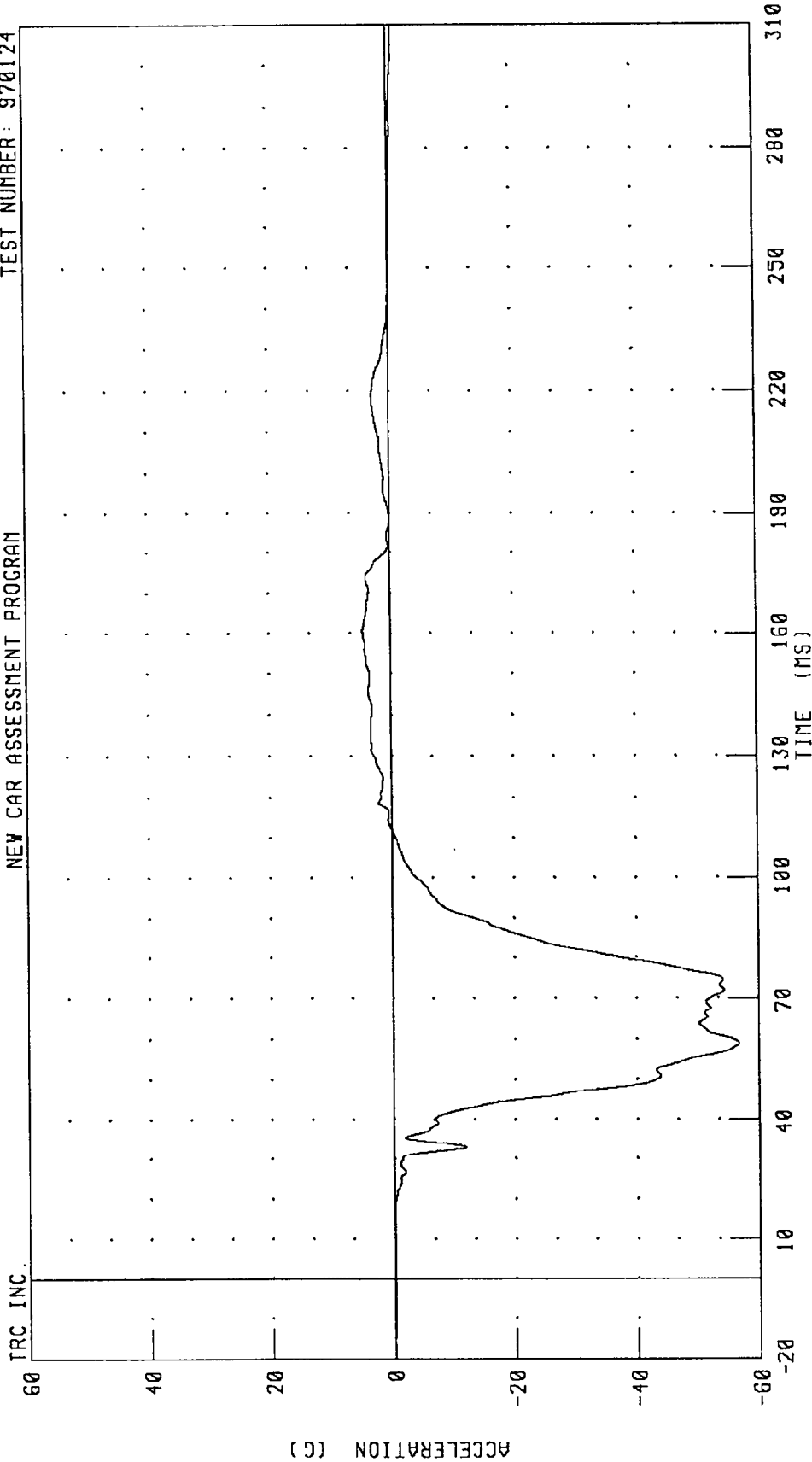
CHANNEL: HEDRR2 FILTER: CH. CLASS 1000

PEAK DATA: 71.60 G @ 73.28 MS; 0.10 G @ -16.24 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION - REDUNDANT

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

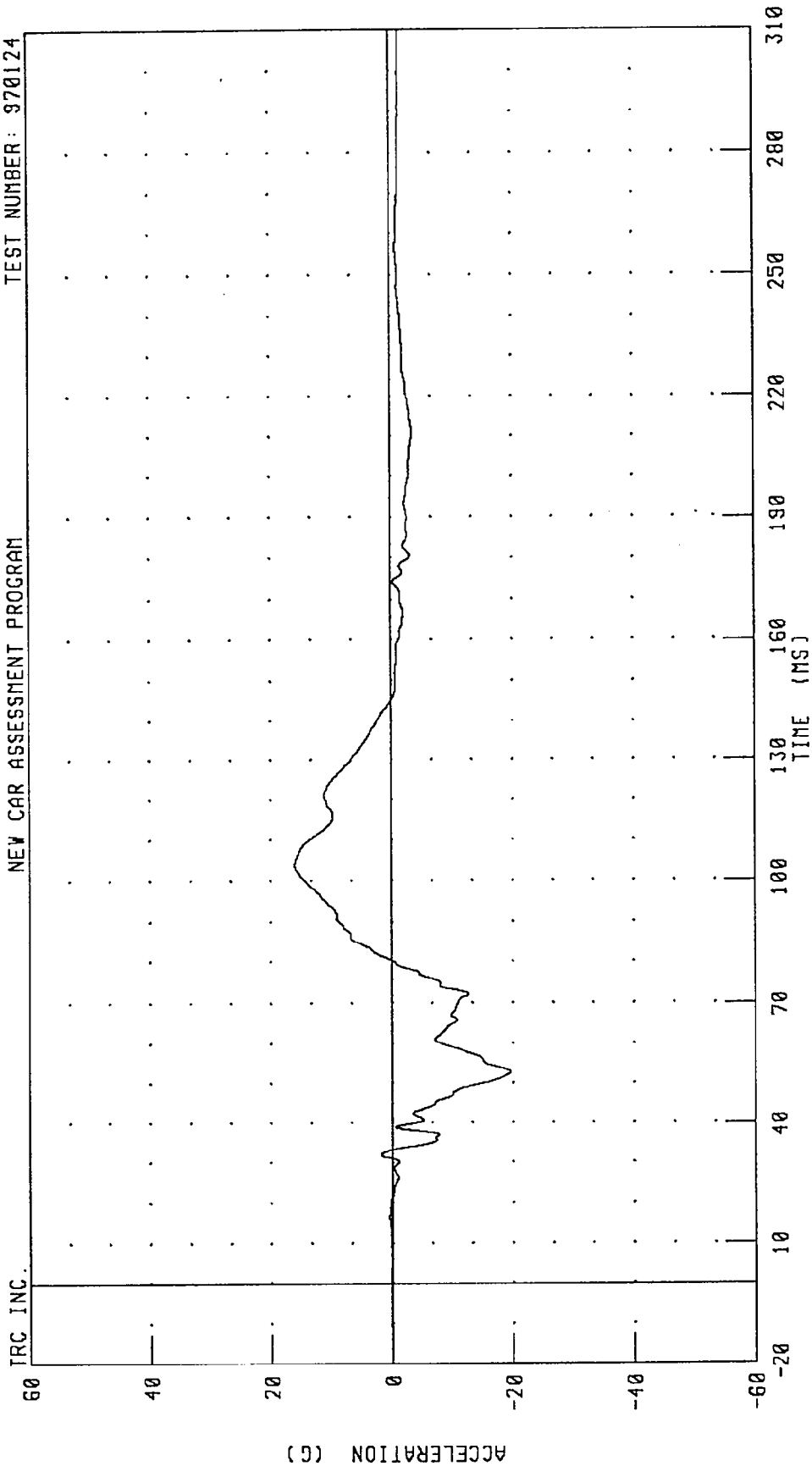


PEAK DATA: 4.69 G @ 160.64 MS; -56.79 G @ 58.96 MS

CHANNEL: CSTXR2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

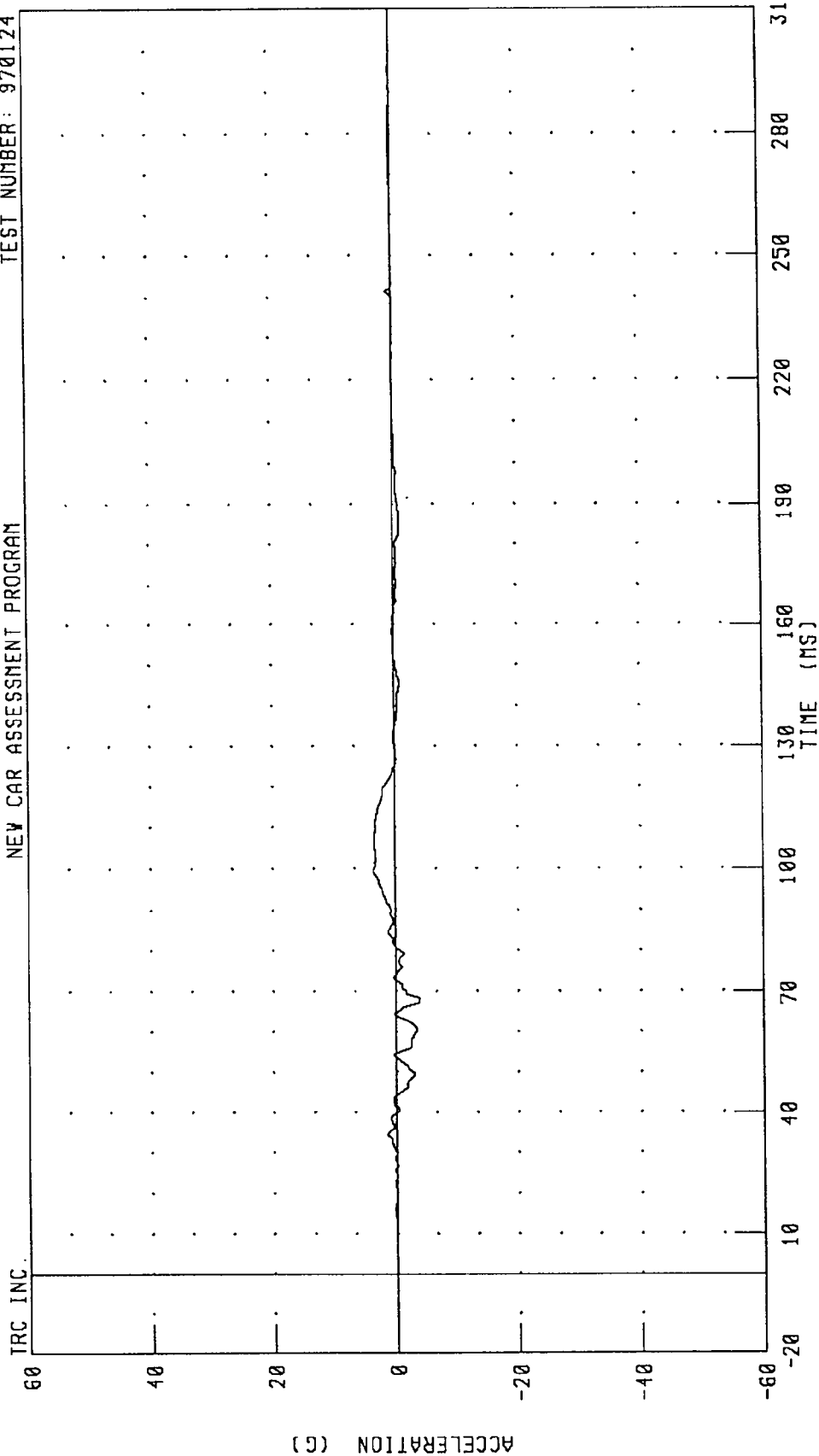


PEAK DATA: 16.04 G @ 103.92 MS; -19.66 G @ 52.80 MS

CHANNEL: CSTZR2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

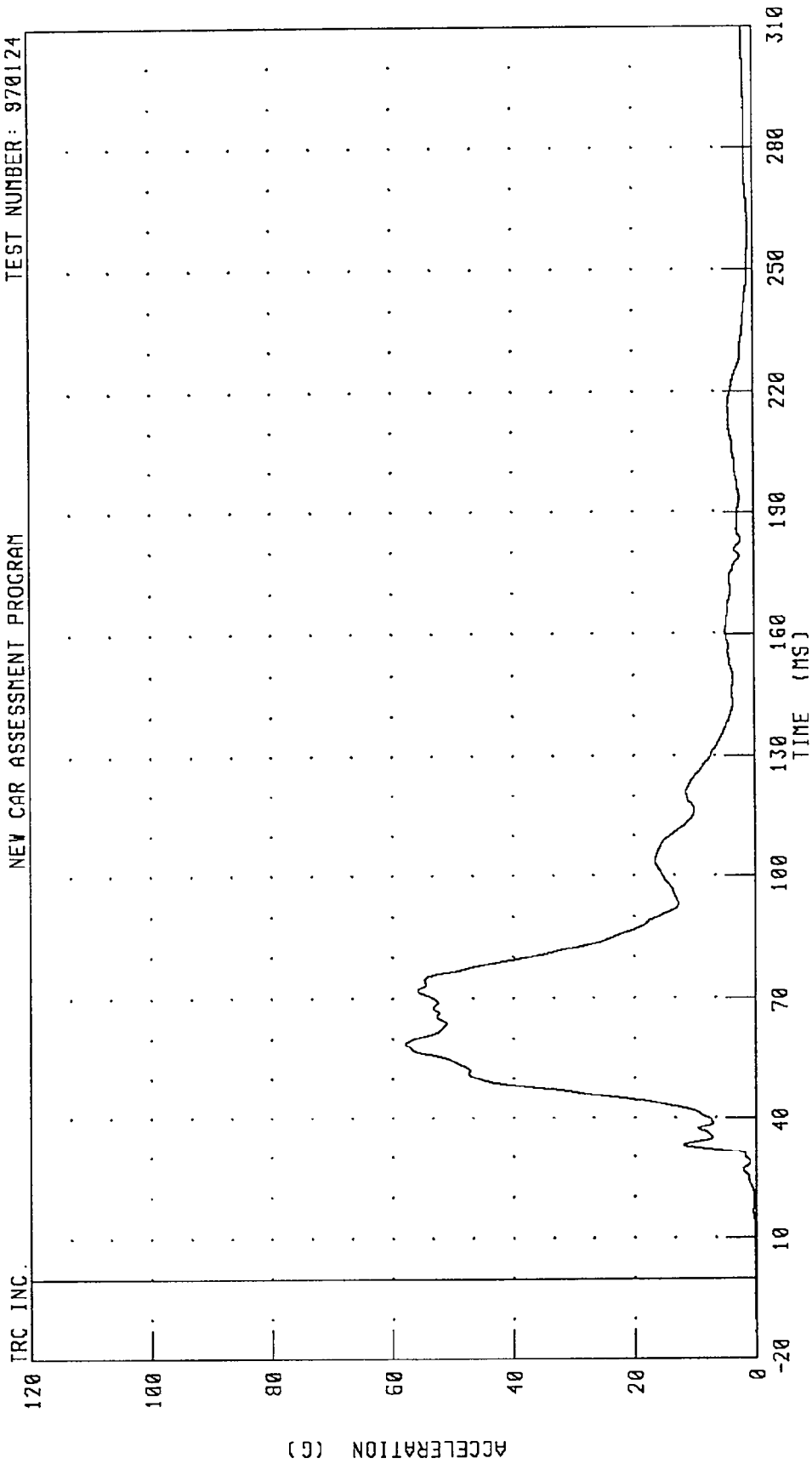
TEST NUMBER: 970124



CHANNEL: CSTYR2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



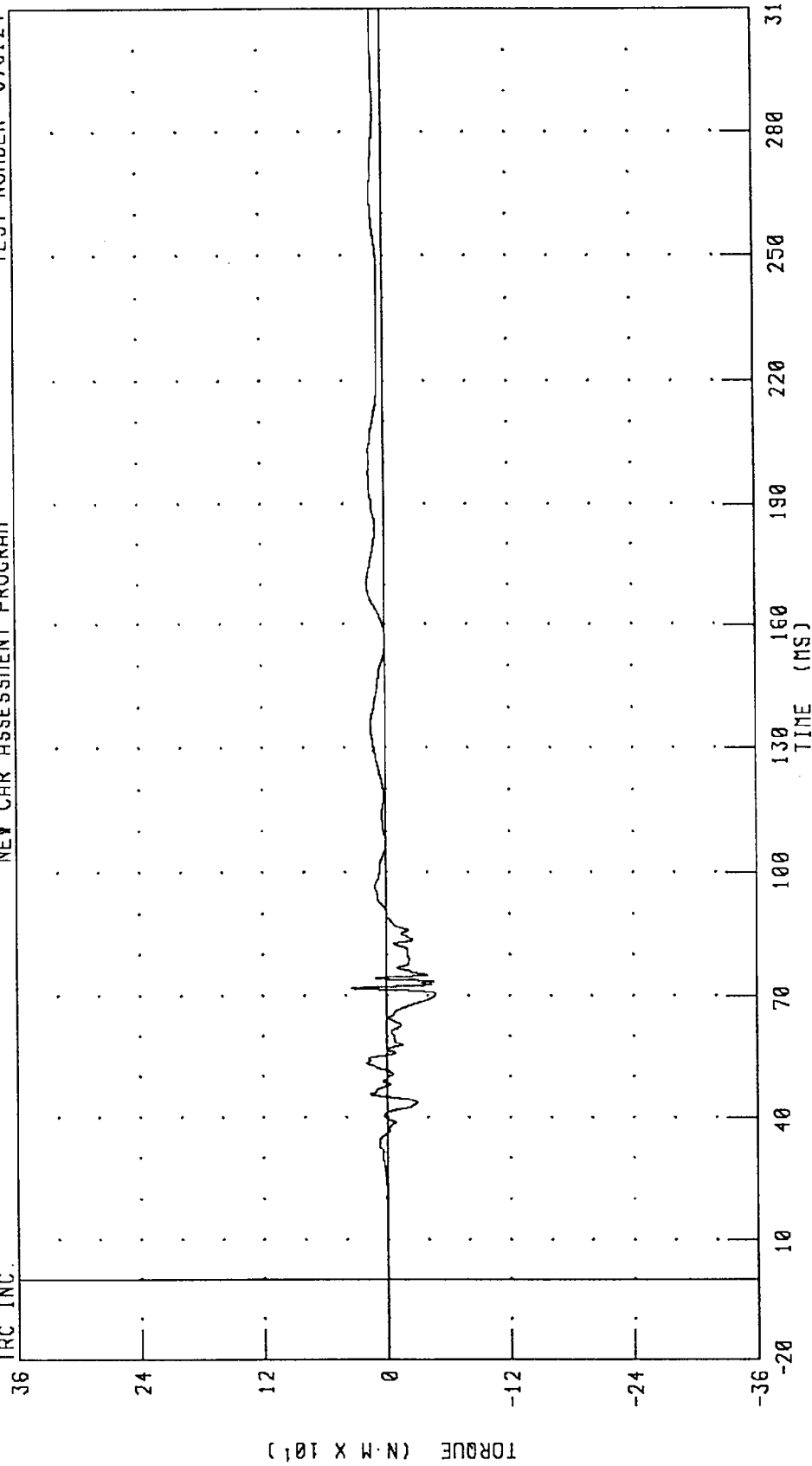
CHANNEL: CSTR2 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 34.32 N.M @ 71.92 MS, -48.15 N.M @ 70.64 MS

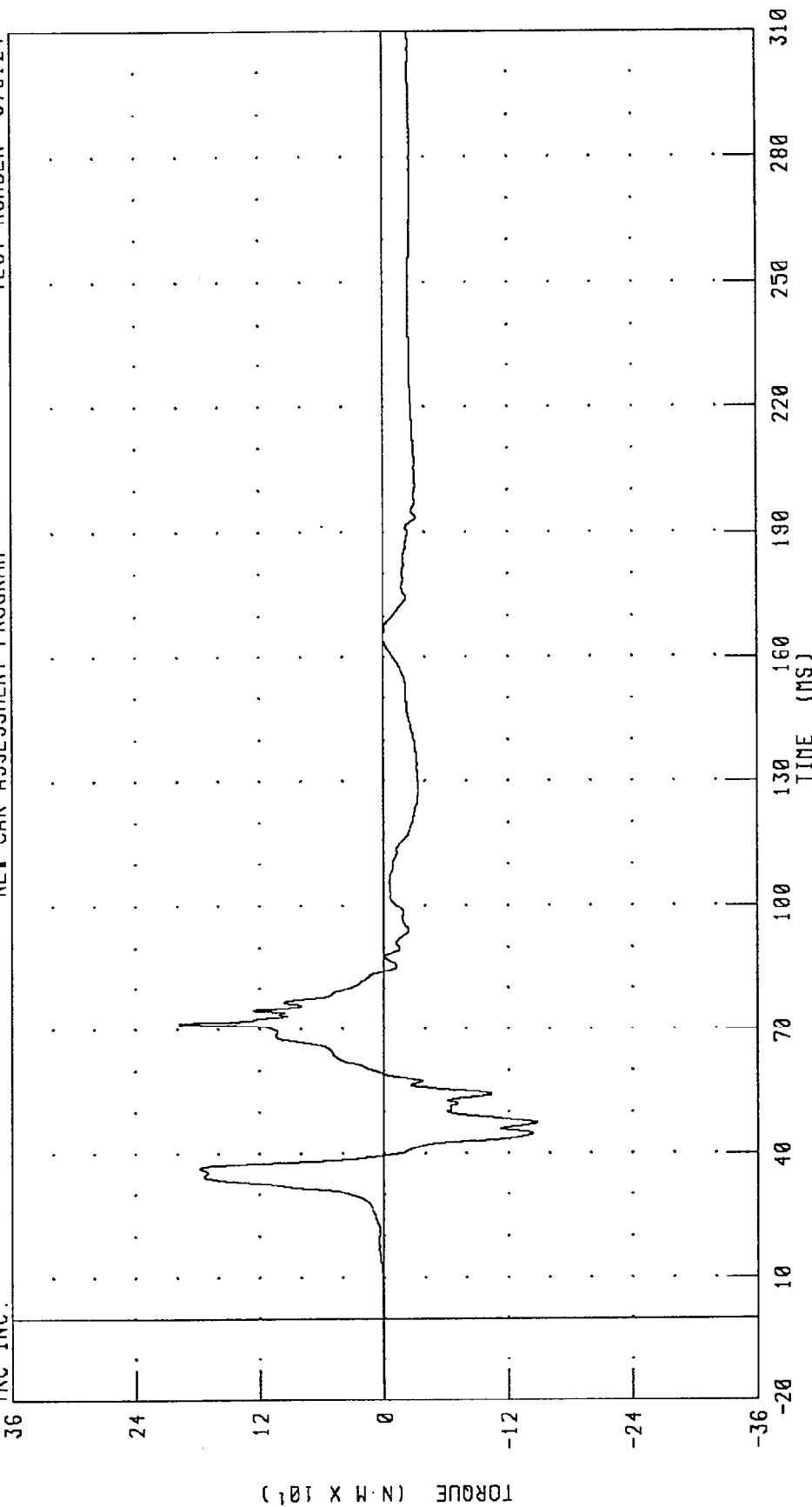
CHANNEL: TBLXM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 198.07 N-M @ 71.60 MS, -148.50 N-M @ 47.44 MS

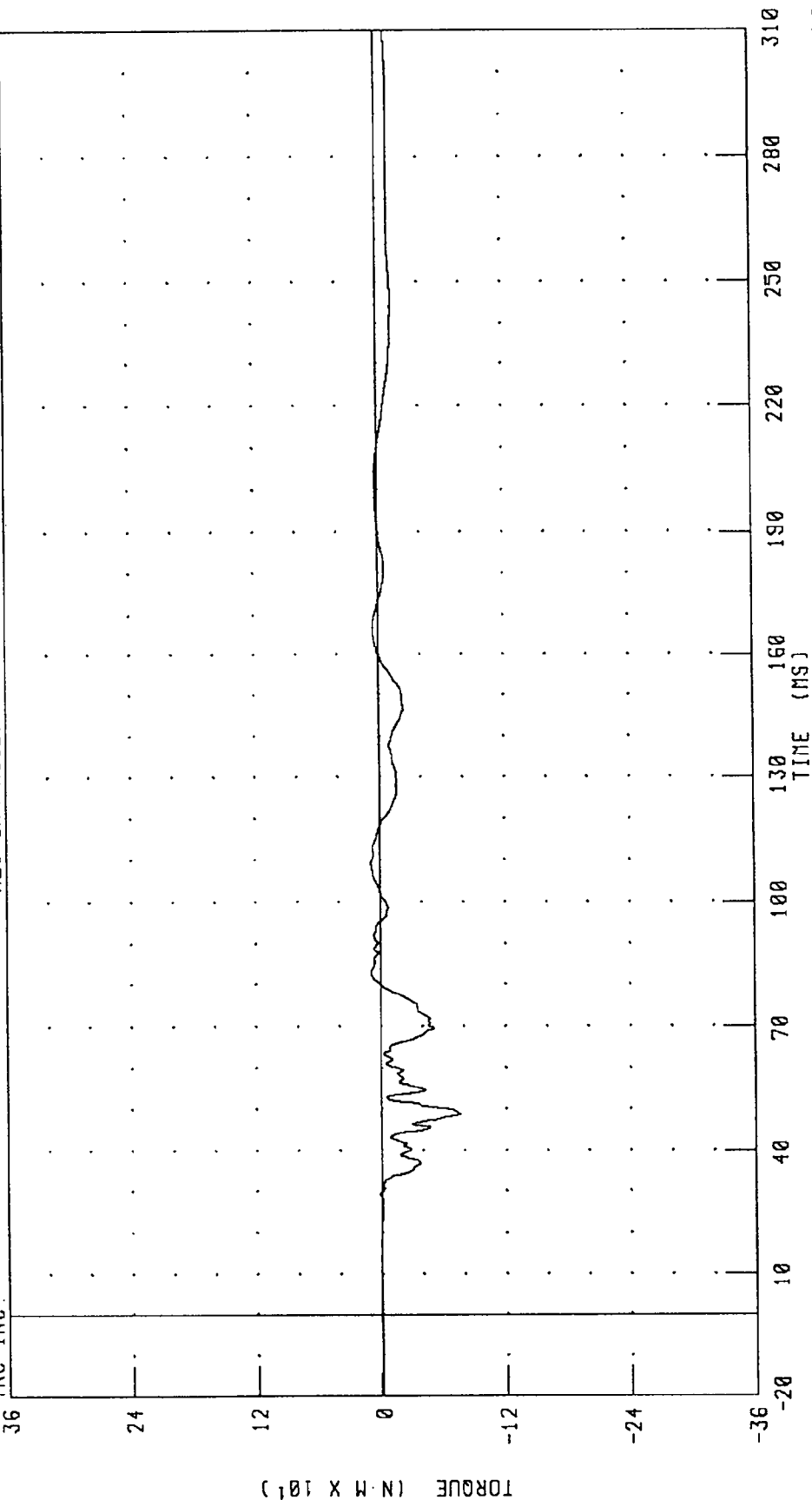
CHANNEL: TBLM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 9.39 N.M @ 82.64 MS; -75.80 N.M @ 48.72 MS

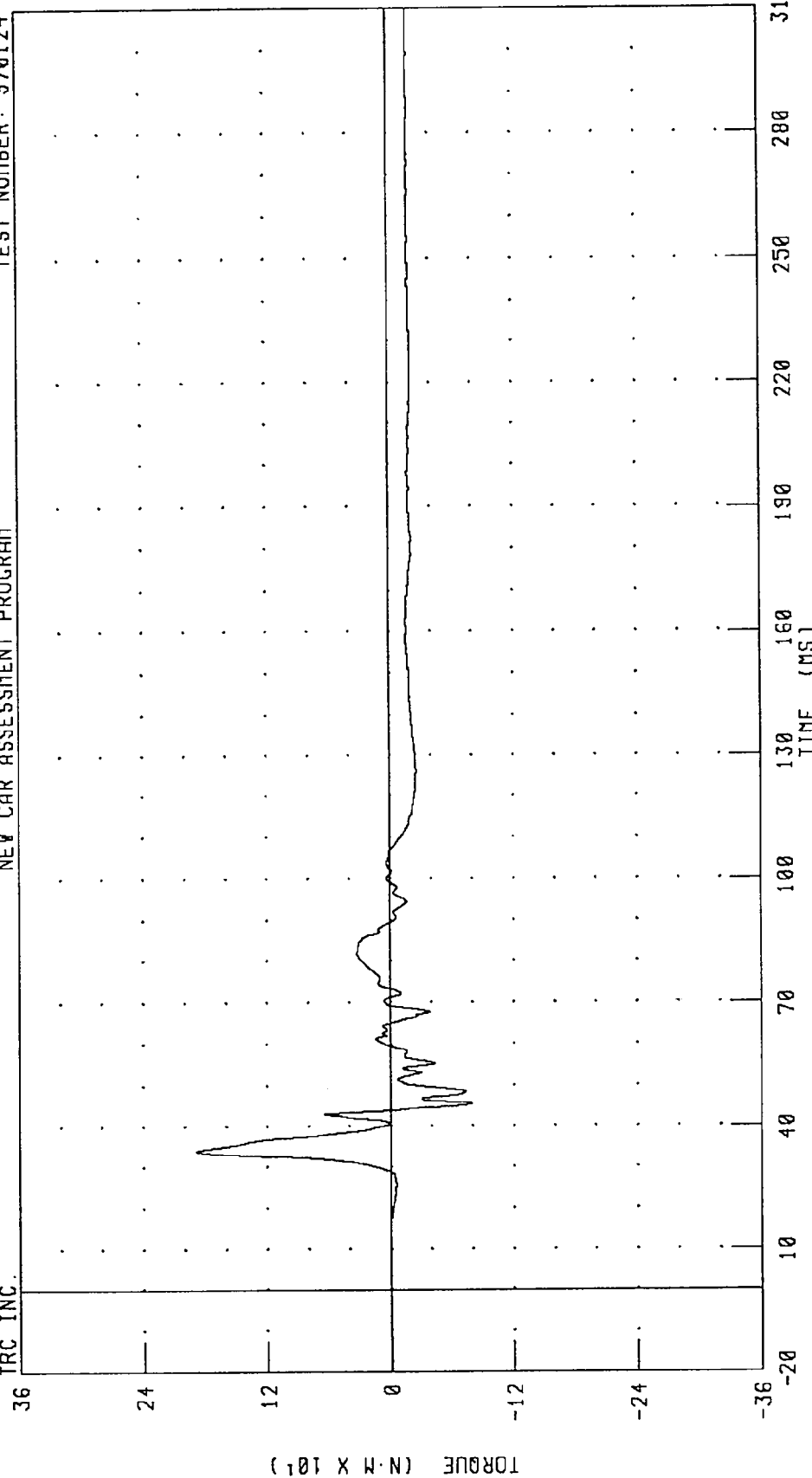
CHANNEL: TBRXM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 188.57 N·m @ 34.00 ms; -79.14 N·m @ 45.52 ms

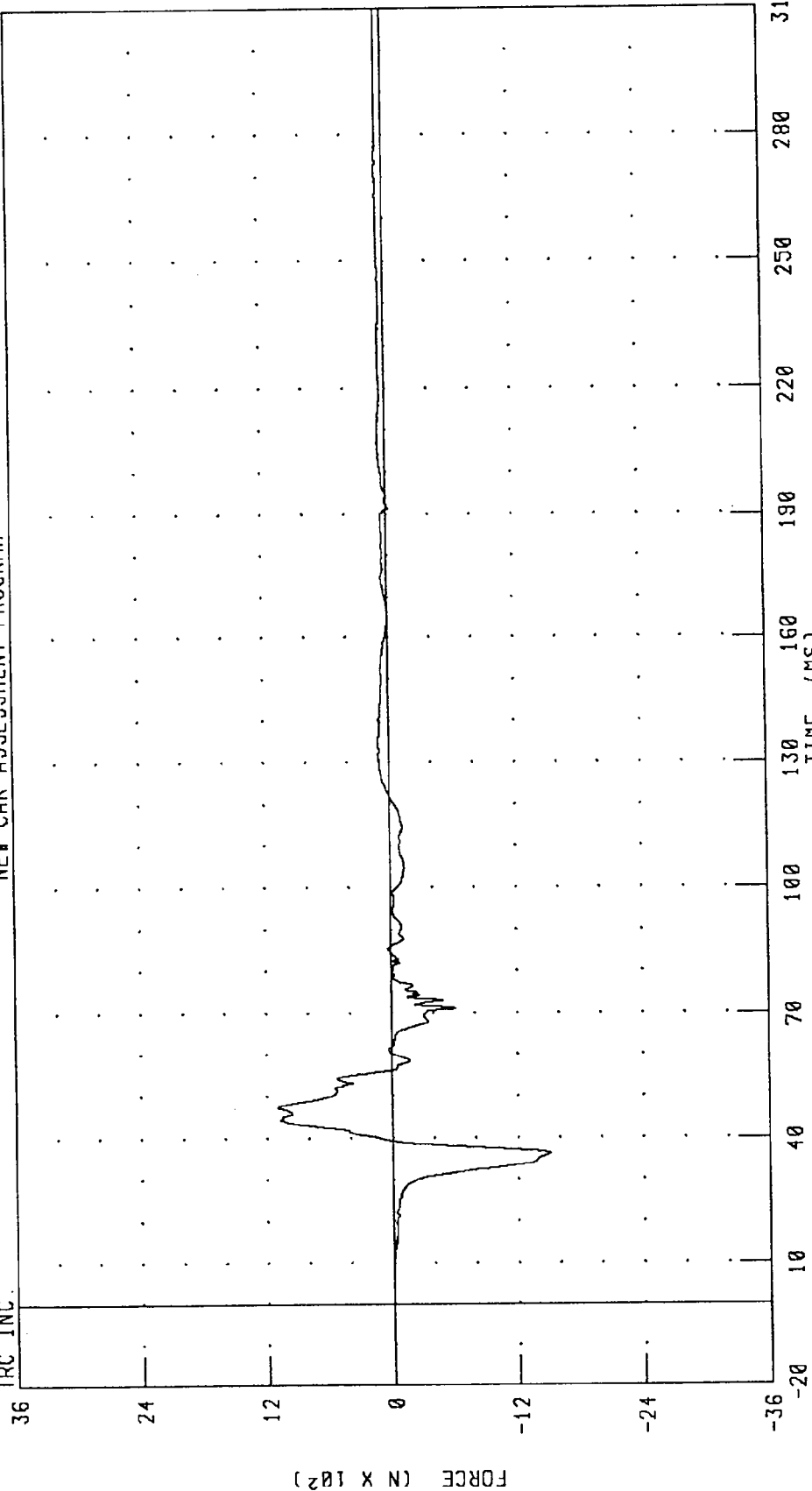
CHANNEL: TBRYM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA X-AXIS FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 1093.33 N @ 47.36 MS; -1508.91 N @ 36.40 MS

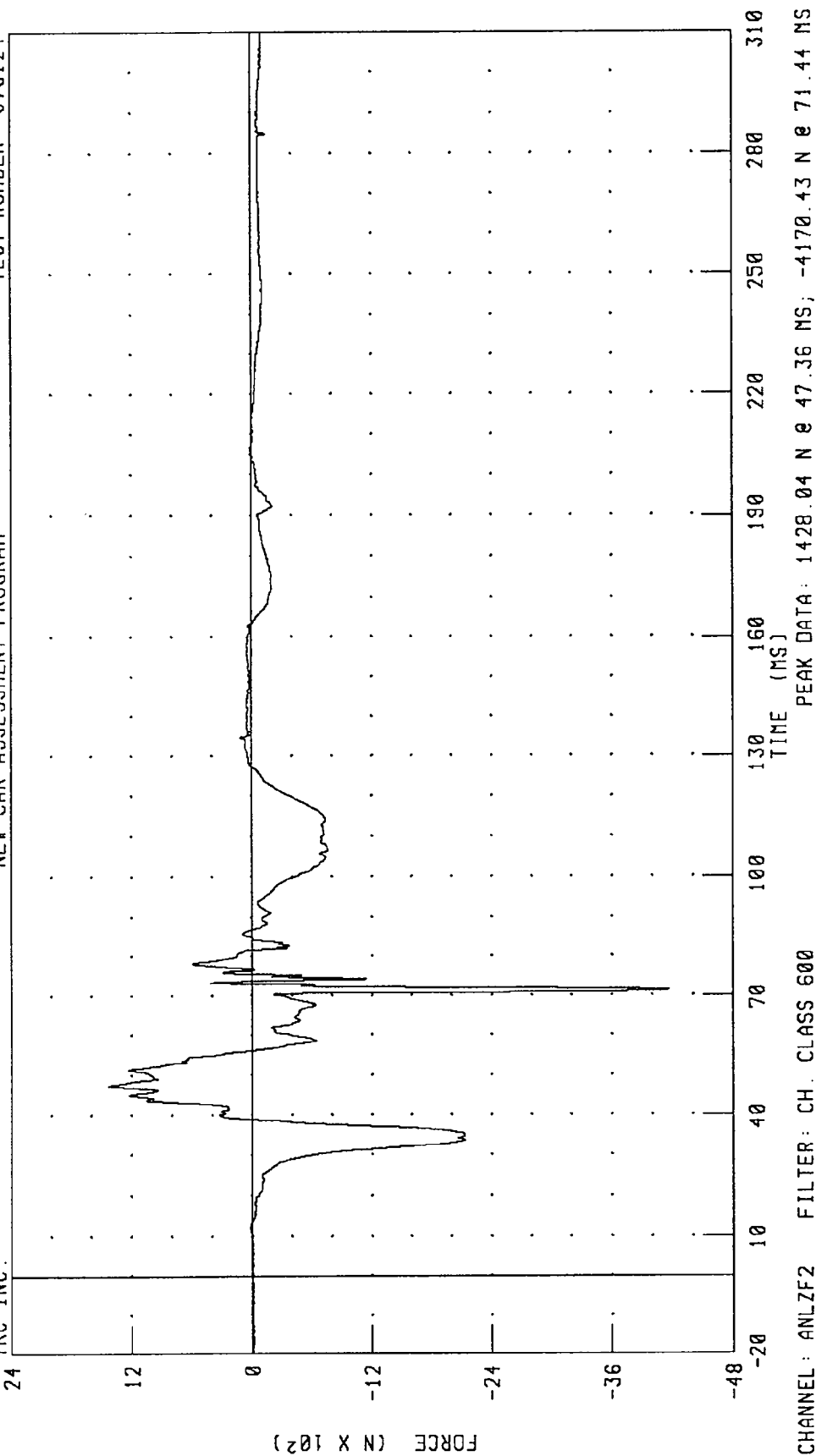
CHANNEL: ANLXF2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 970124

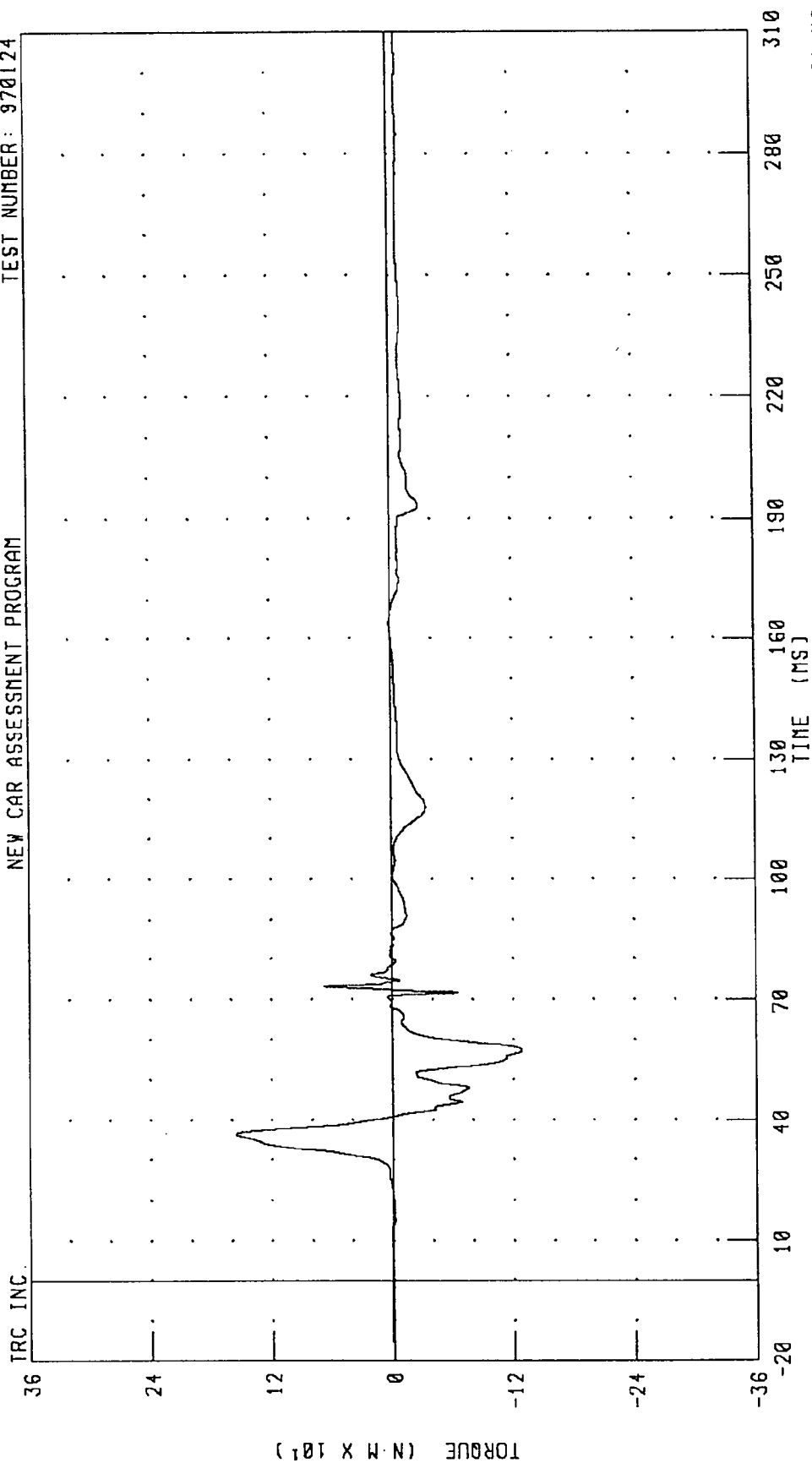
NEW CAR ASSESSMENT PROGRAM

TRC INC.



1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 155.65 N·M @ 36.56 MS; -128.30 N·M @ 57.28 MS

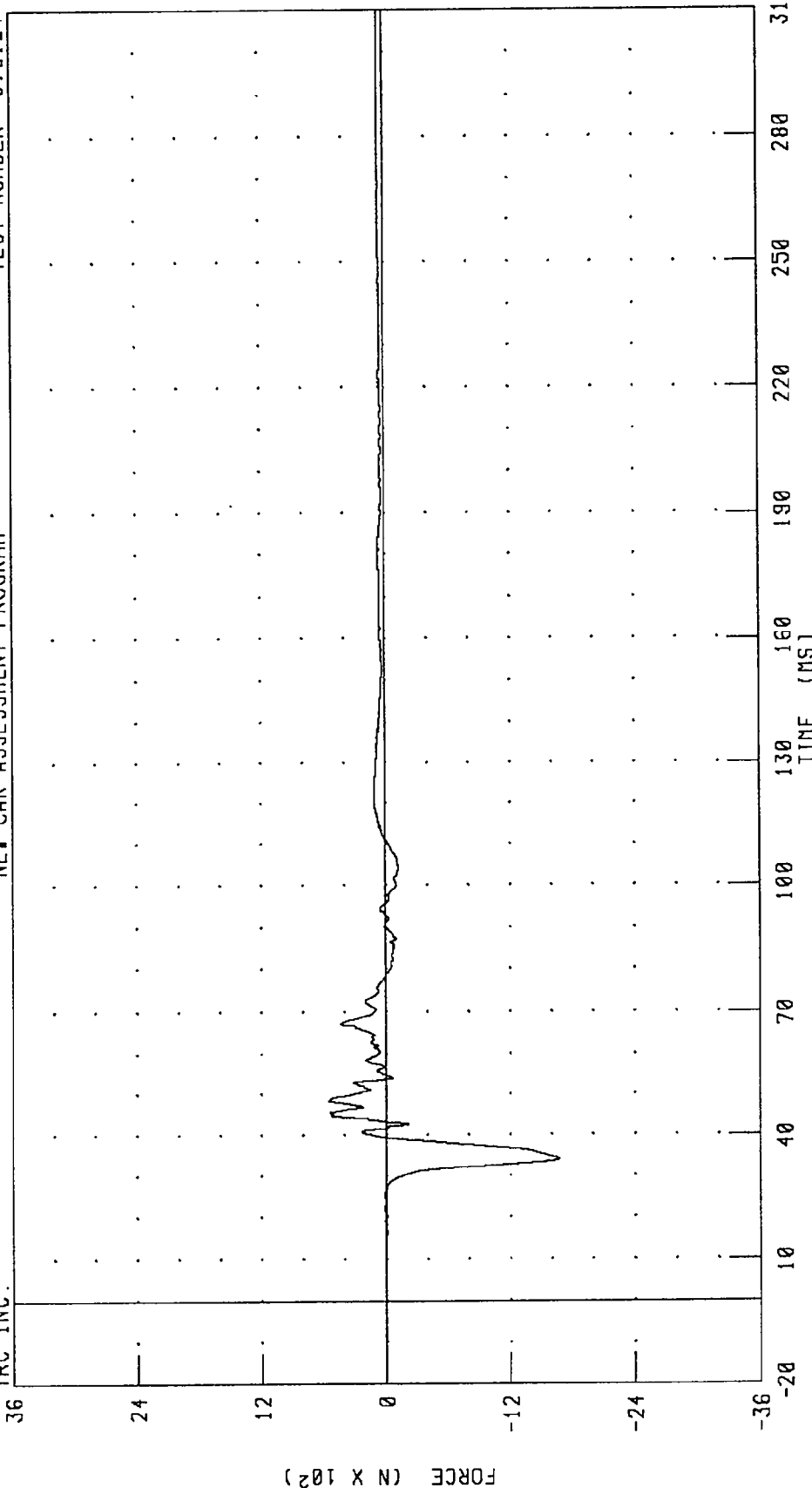
CHANNEL: ANLYM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA X-AXIS FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 548.81 N @ 48.32 MS; -1674.40 N @ 34.16 MS

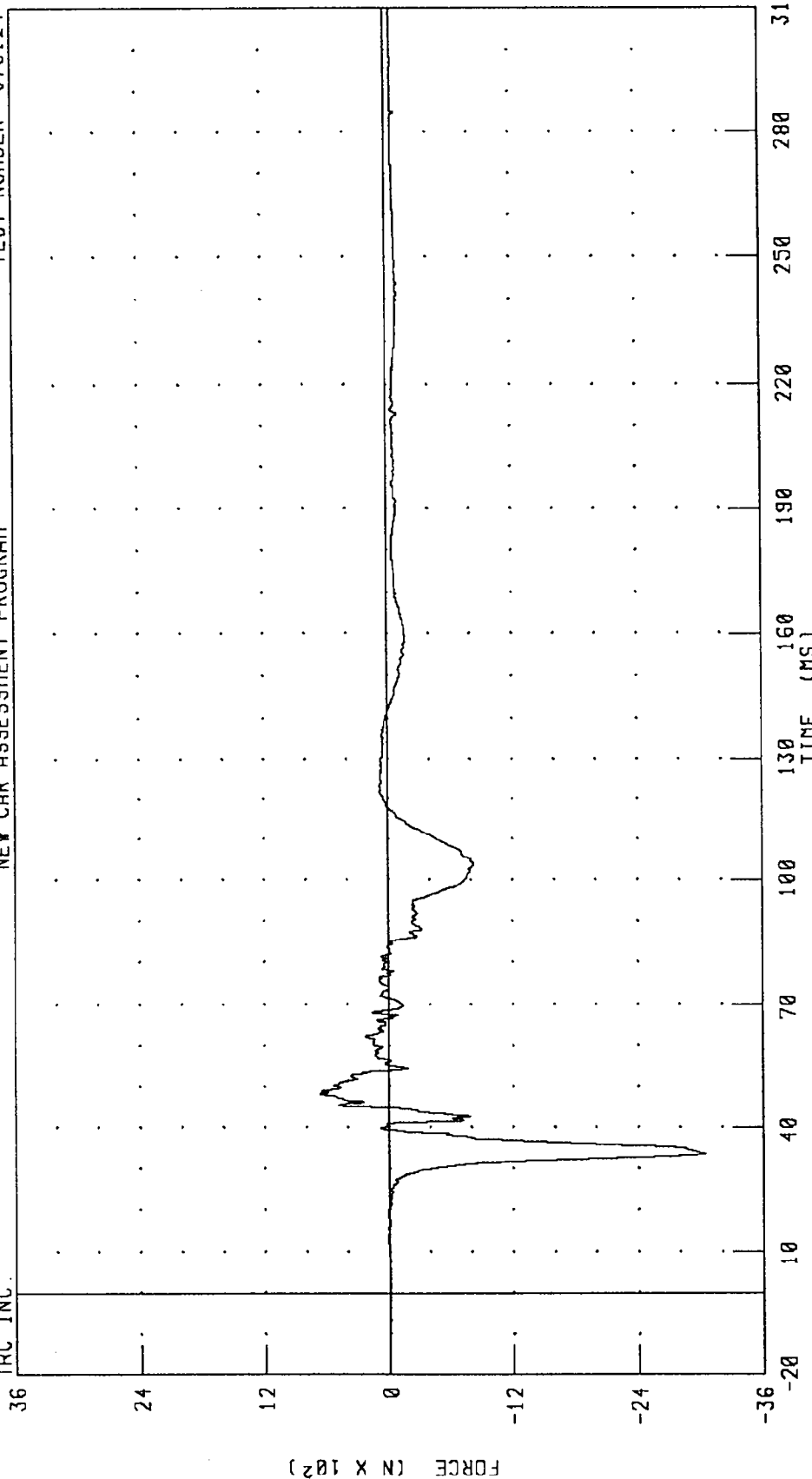
CHANNEL: ANRXP2 FILTER: CH. CLASS 600

1987 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 666.52 N @ 48.16 MS; -3045.76 N @ 33.60 MS

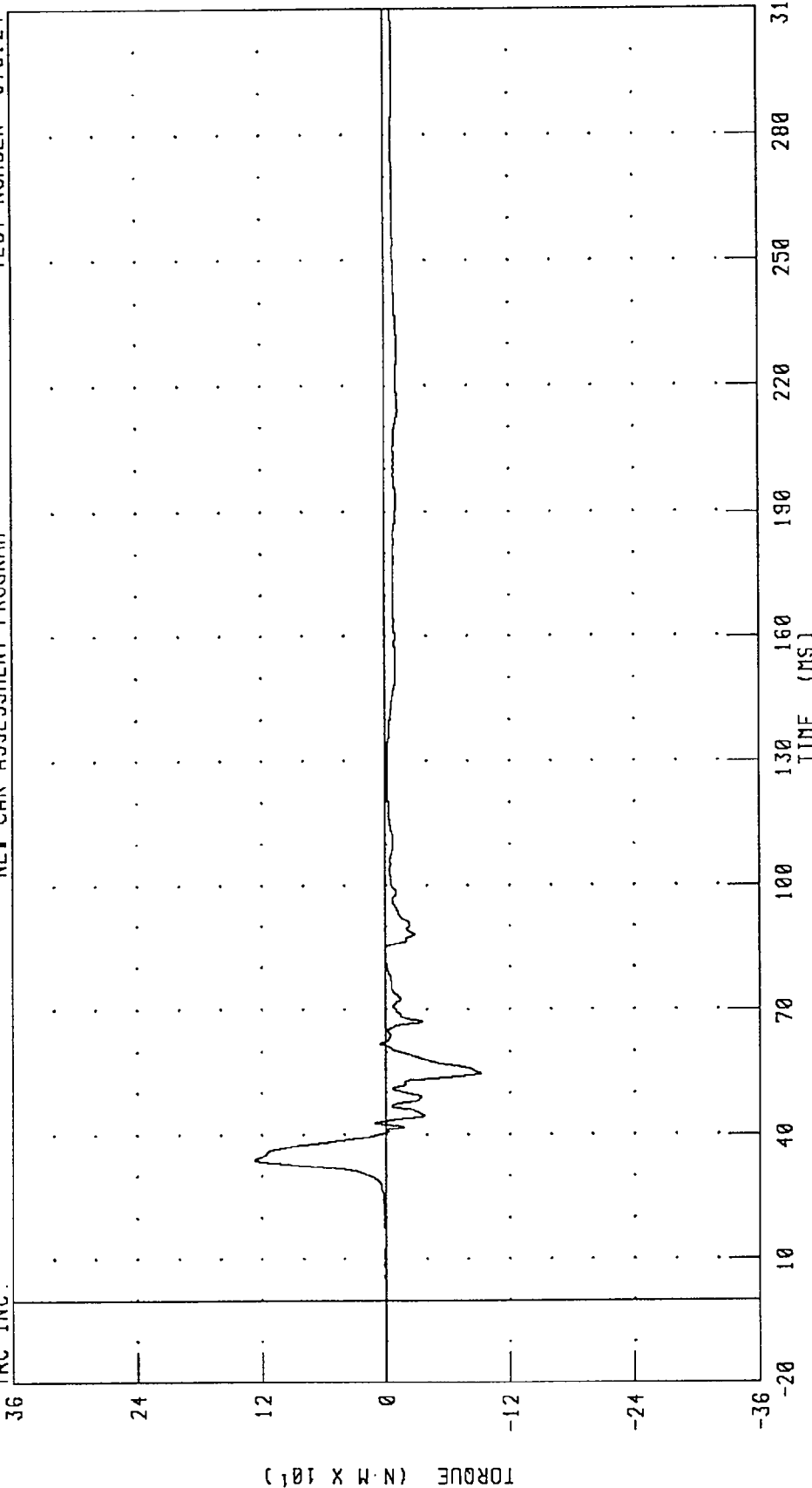
CHANNEL: ANRZF2 FILTER: CH. CLASS 600

1987 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 127.16 N·M @ 34.08 MS; -92.73 N·M @ 54.64 MS

CHANNEL: ANRYM2 FILTER: CH. CLASS 600

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT X-AXIS ACCELERATION

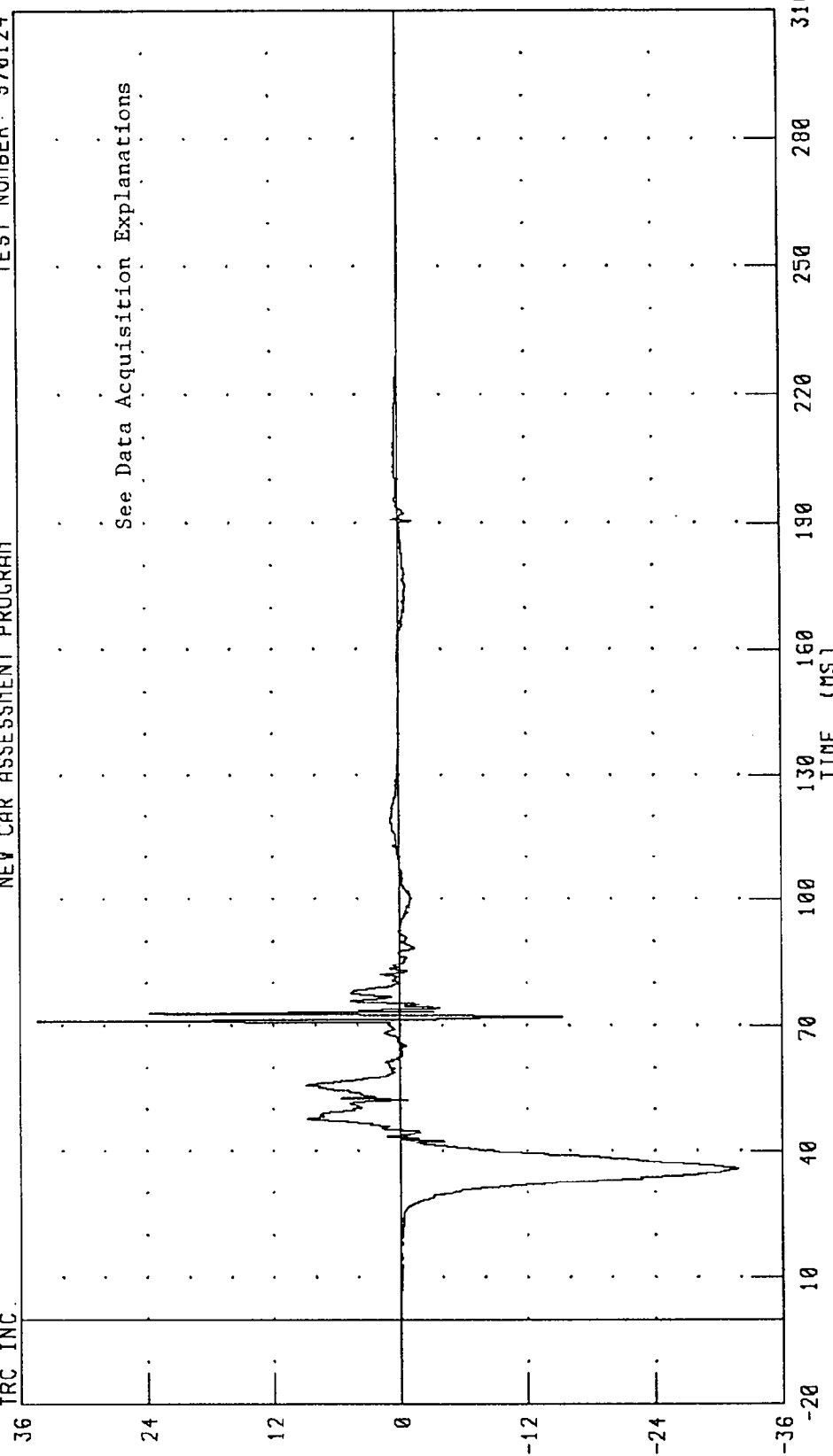
TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

See Data Acquisition Explanations

ACCELERATION (G X 10¹)



PEAK DATA: 343.52 G @ 71.12 MS; -317.74 G @ 35.92 MS

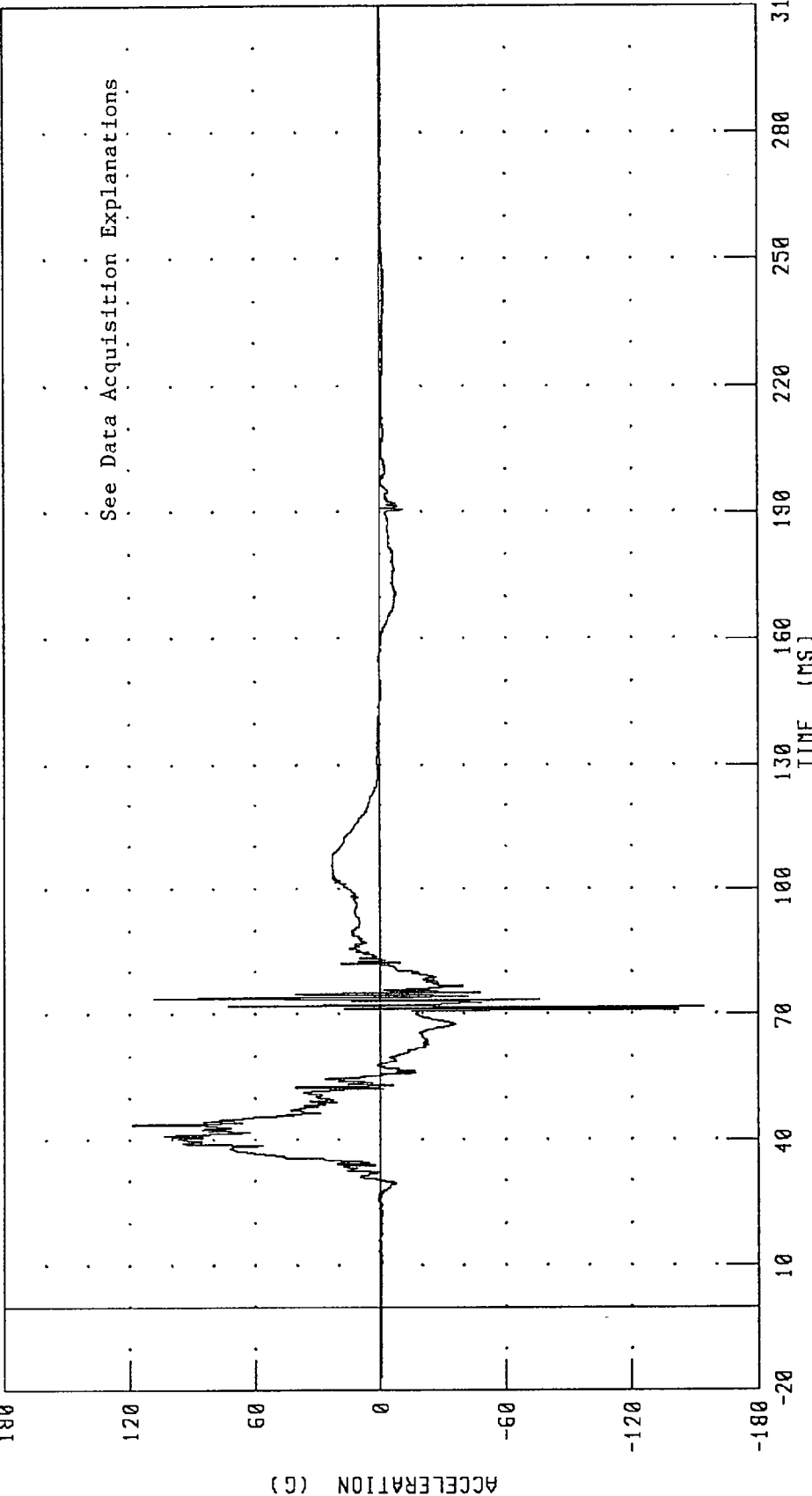
CHANNEL: FTLXG2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 118.88 G @ 43.68 MS; -153.89 G @ 71.68 MS

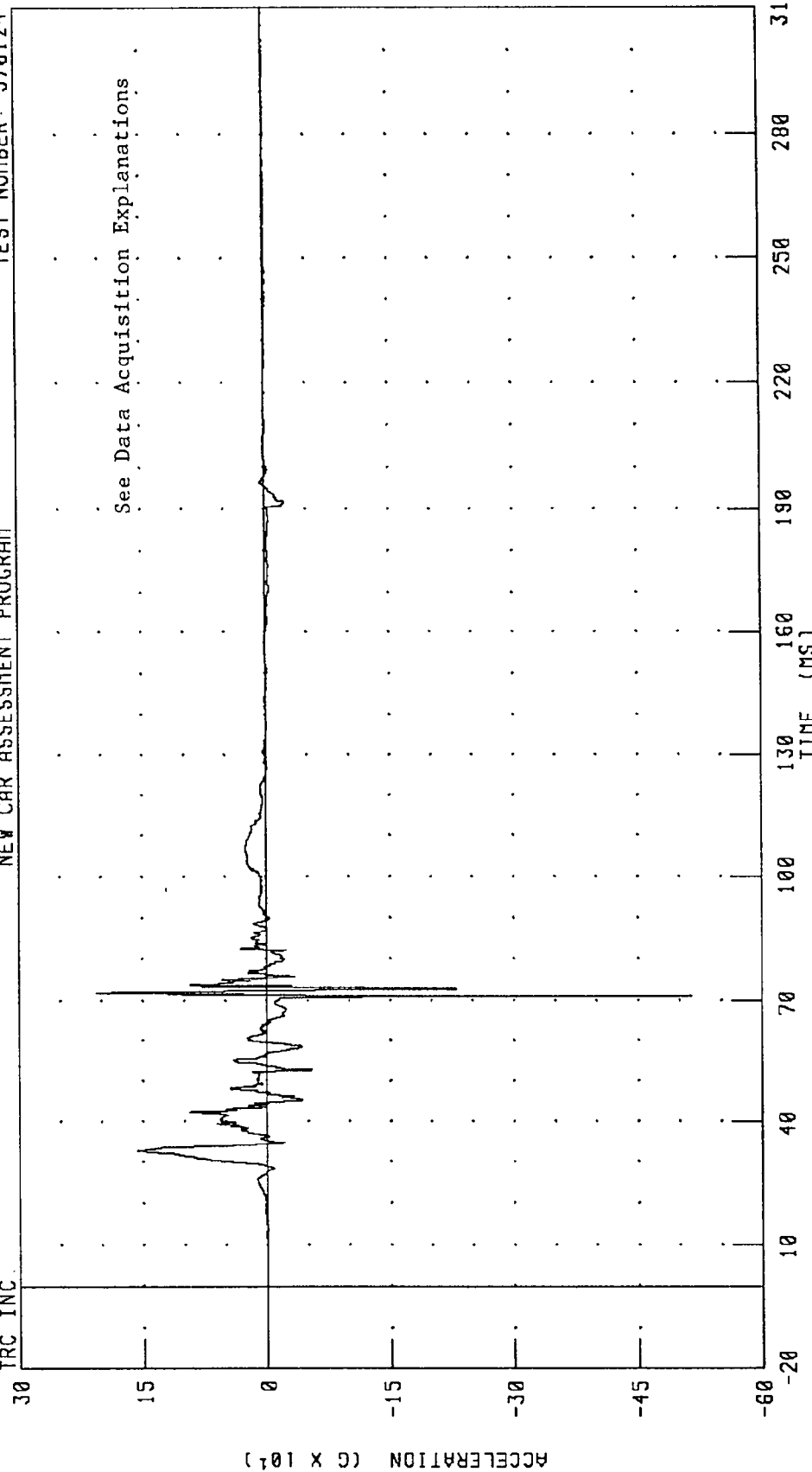
CHANNEL: FTLZH2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 206.08 G @ 72.00 MS; -514.56 G @ 71.12 MS

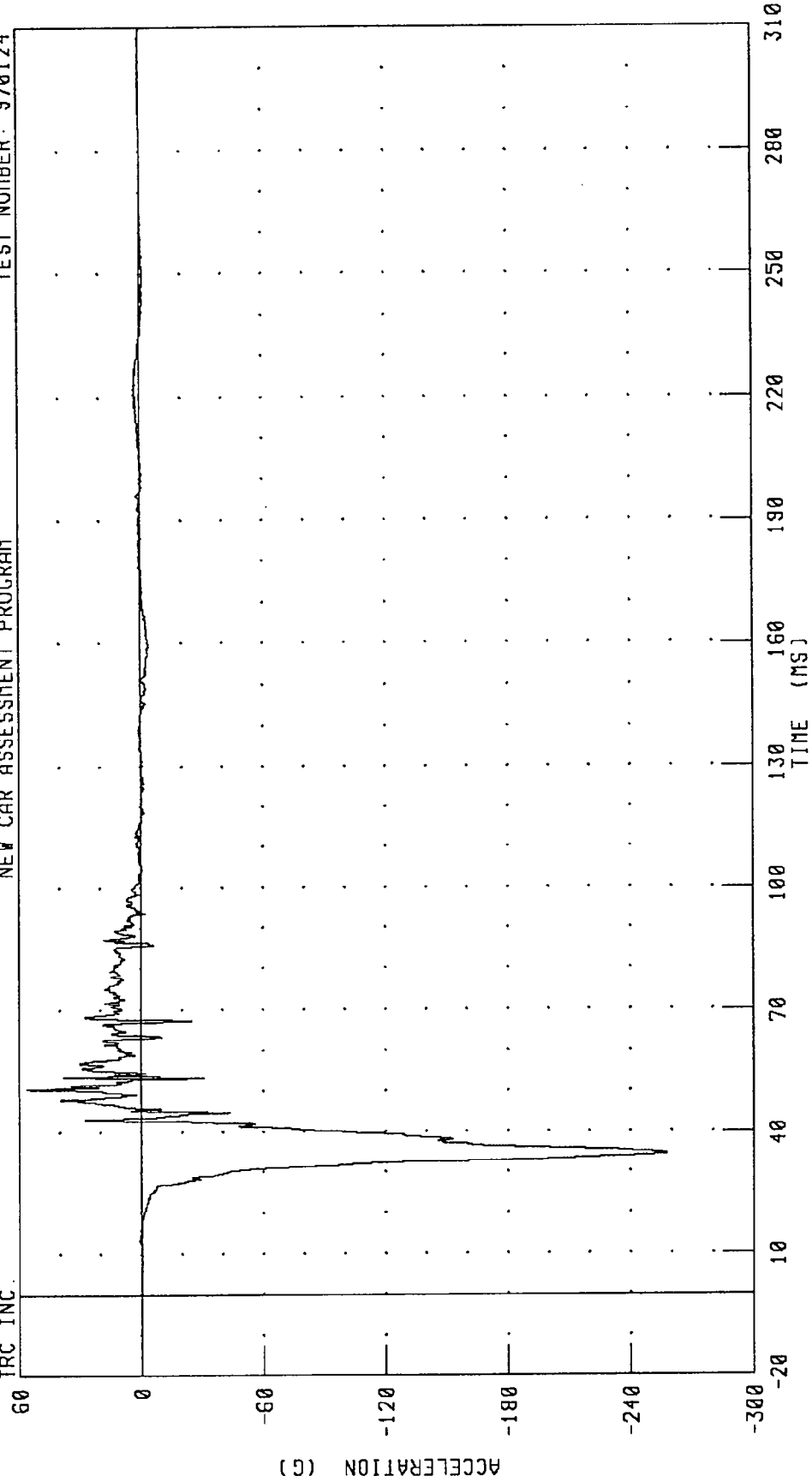
CHANNEL: FTLZT2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 56.31 G @ 50.64 MS; -257.60 G @ 34.56 MS

FILTER: CH. CLASS 1000

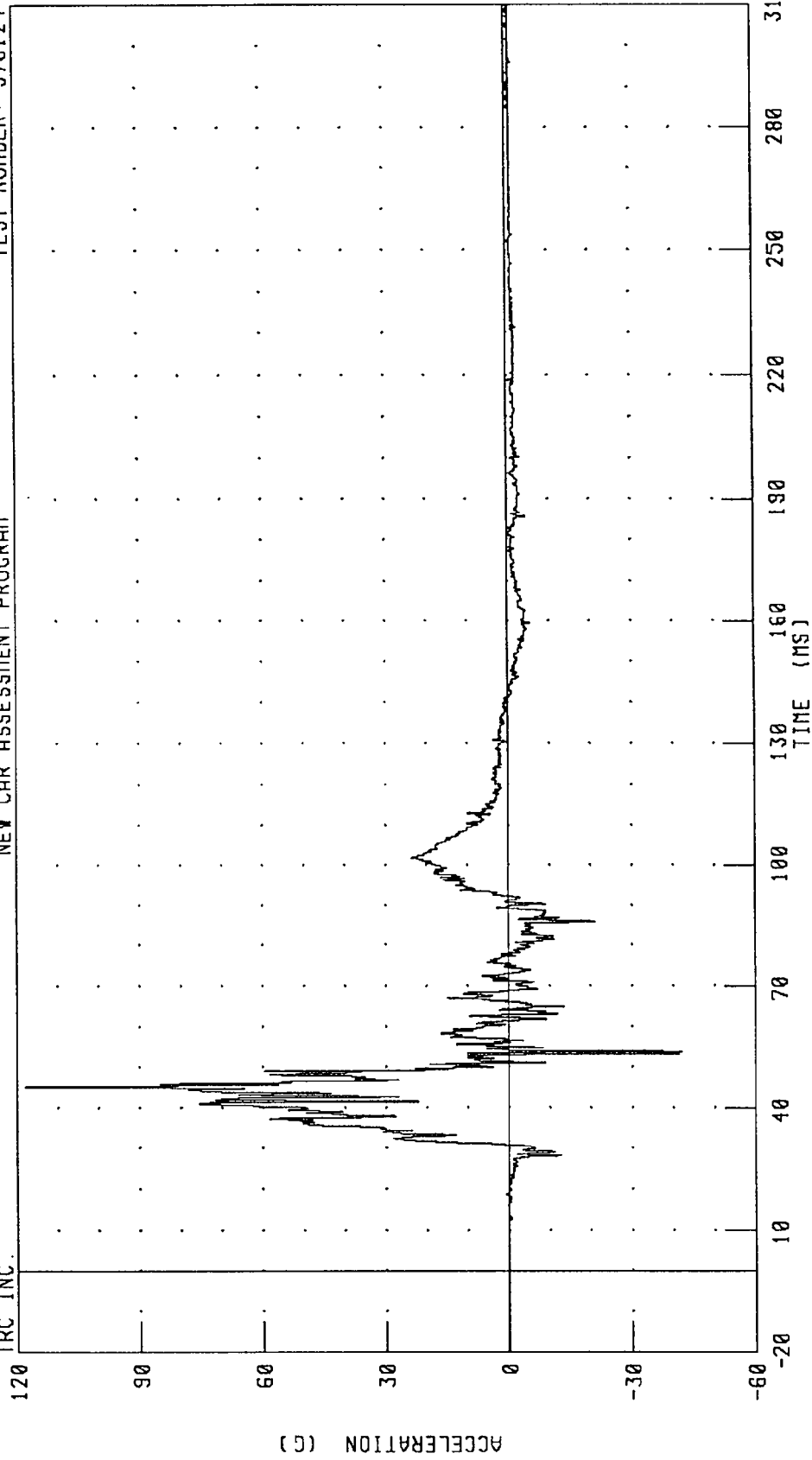
CHANNEL: FTRXG2

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: FTRZH2 FILTER: CH. CLASS 1000

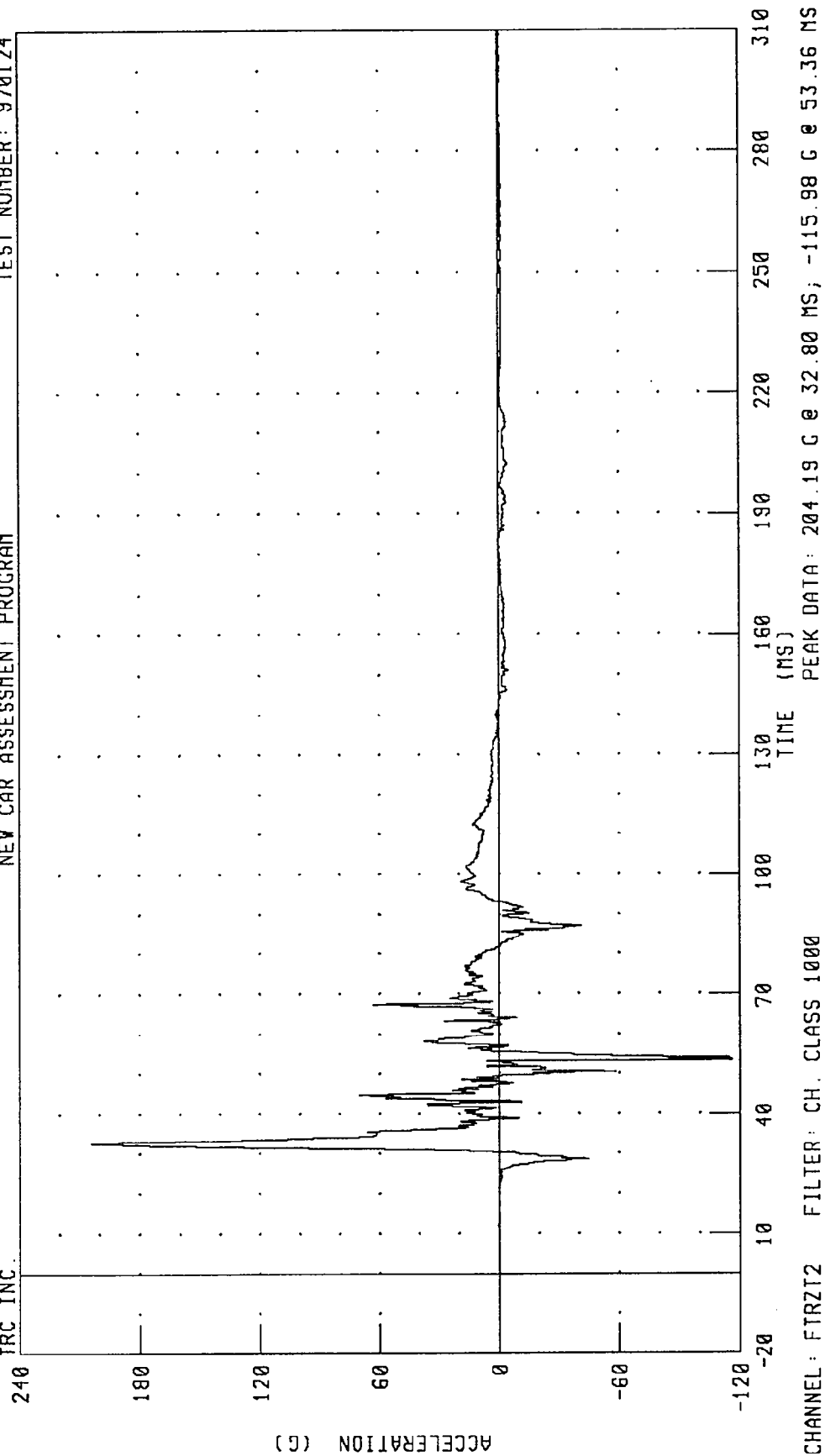
PEAK DATA: 117.99 G @ 45.20 MS; -42.04 G @ 53.76 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

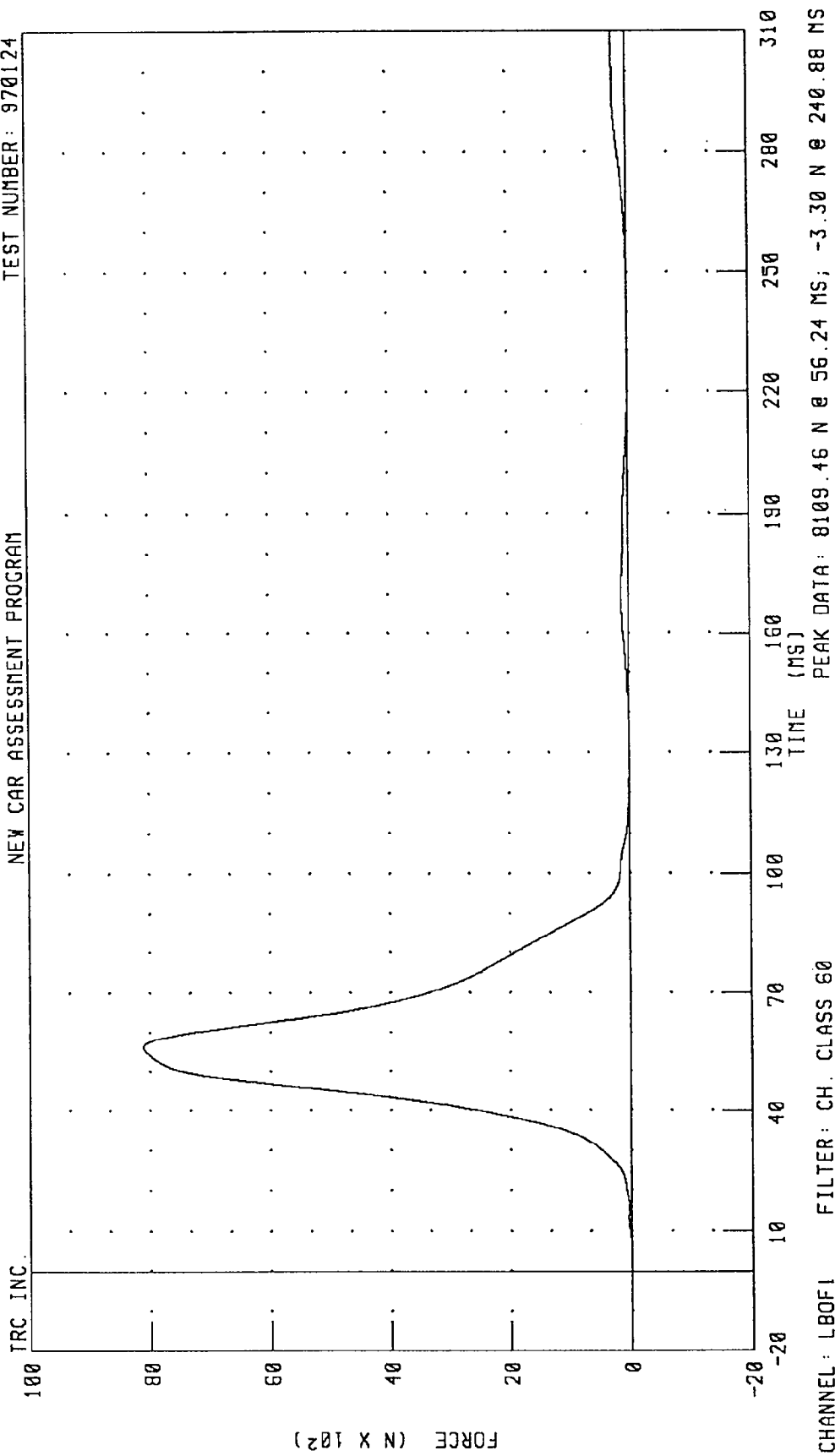
IRC INC.



CHANNEL: FTRZT2 FILTER: CH. CLASS 1000

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

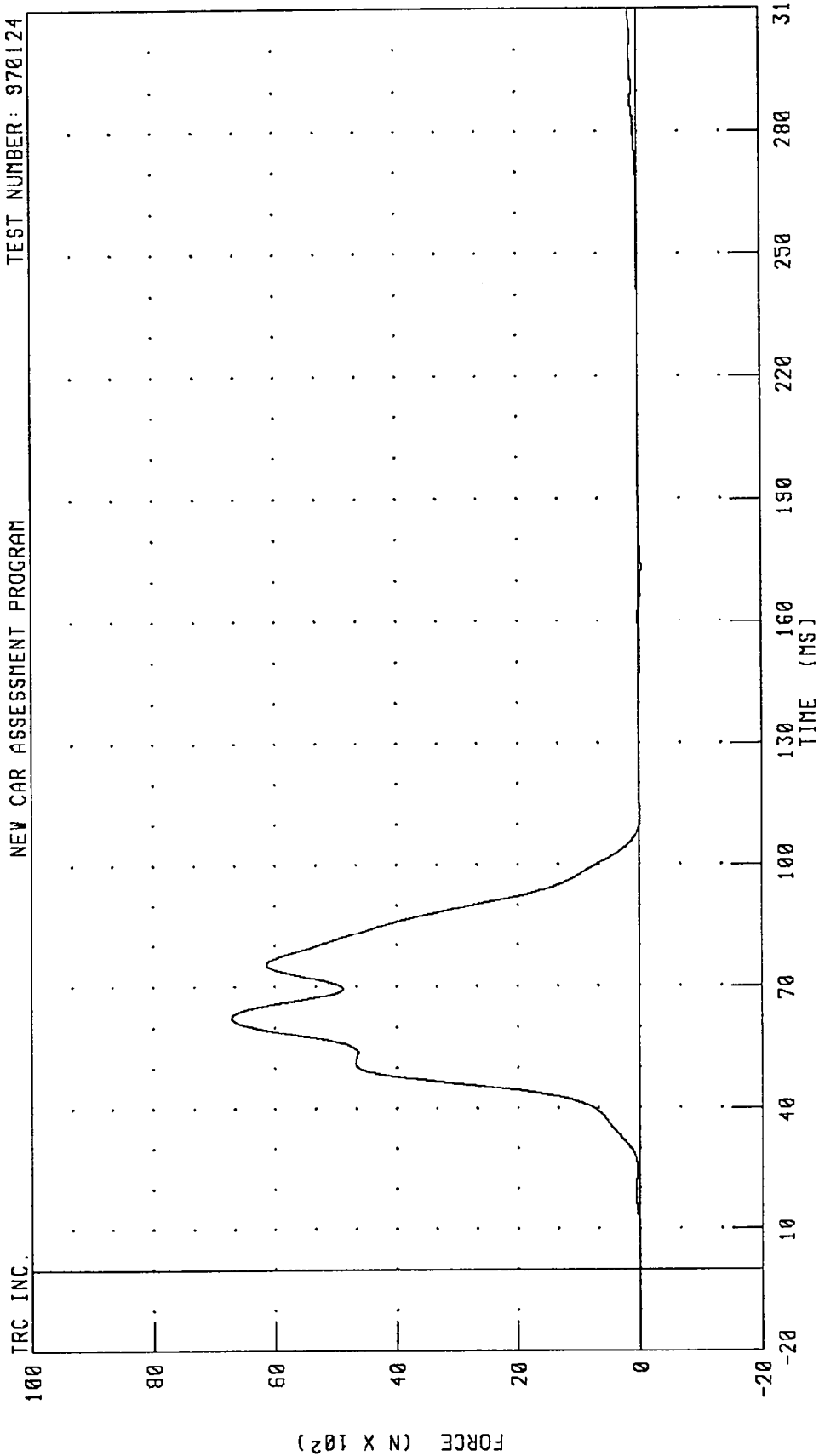


CHANNEL: LBOFI FILTER: CH. CLASS 60

PEAK DATA: 8109.46 N @ 56.24 MS; -3.30 N @ 240.88 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

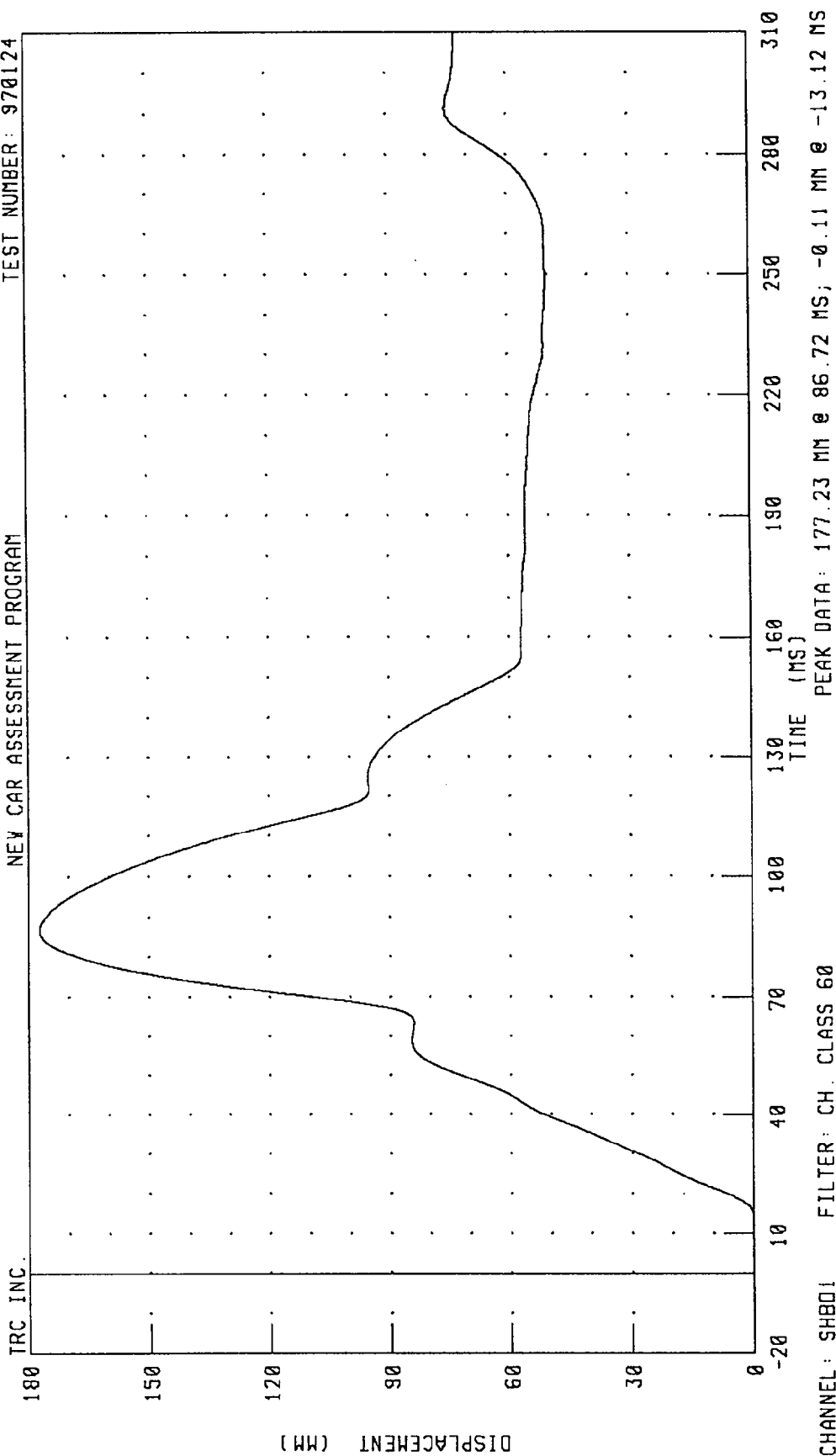


PEAK DATA: 6712.96 N @ 62.40 MS; -38.12 N @ 173.44 MS

CHANNEL: SHBF1 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

150

See Data Acquisition Explanations .

120

DISPLACEMENT (MM X 10⁻¹)

90

60

30

0

-30

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

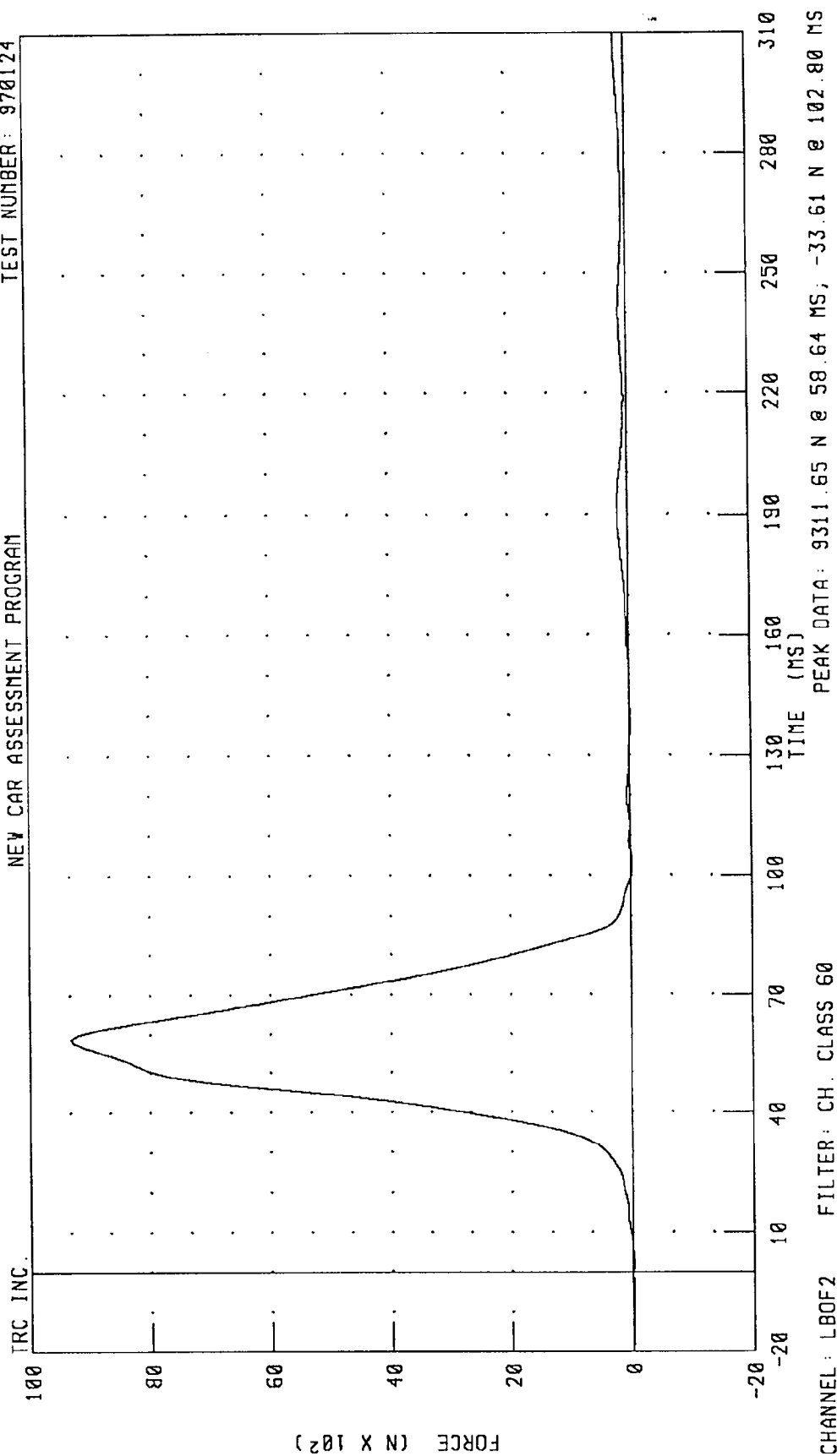
CHANNEL: SBEDI

FILTER: CH. CLASS 60

PEAK DATA: 12.50 MM @ 145.36 MS; -0.99 MM @ 180.72 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 9311.65 N @ 58.64 MS, -33.61 N @ 102.80 MS

CHANNEL: LBOF2 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

100

80

60

40

20

0

-20

FORCE (N X 10²)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

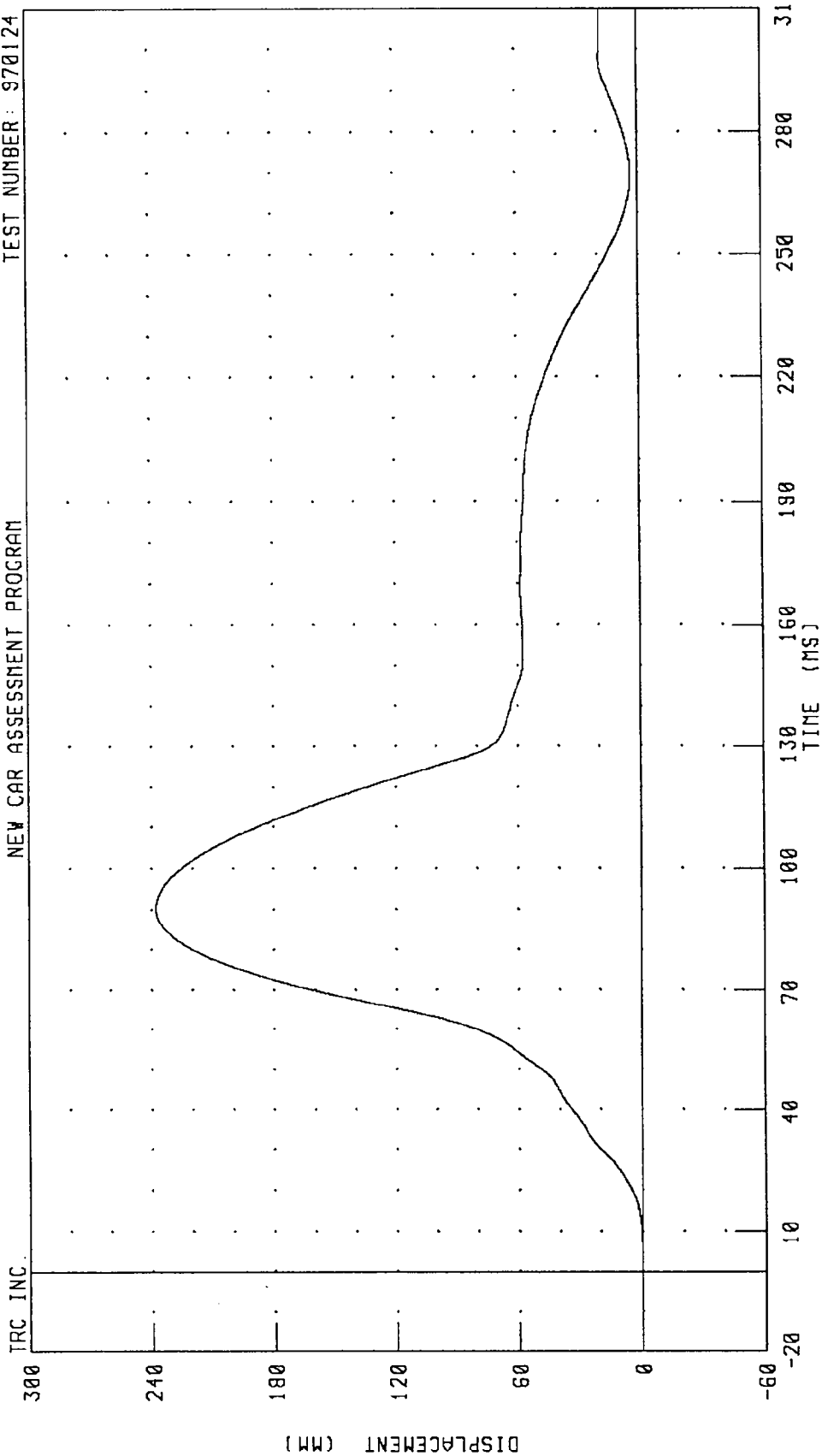
PEAK DATA: 6625.57 N @ 58.08 MS, -36.05 N @ 241.28 MS

FILTER: CH. CLASS 60

CHANNEL: SHBF2

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

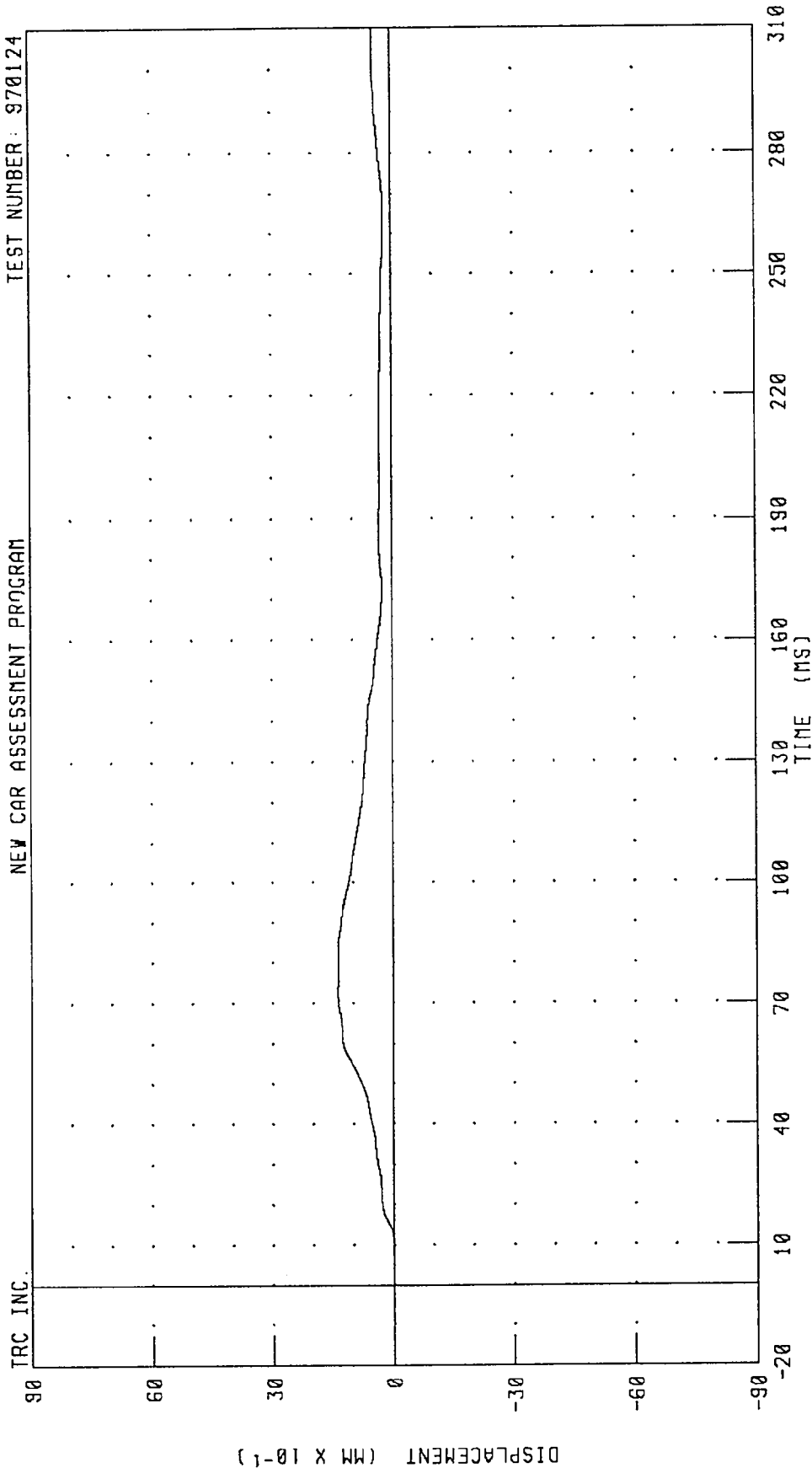


CHANNEL: SHBD2 FILTER: CH. CLASS 60

PEAK DATA: 237.80 MM @ 90.32 MS; 0.01 MM @ -20.00 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

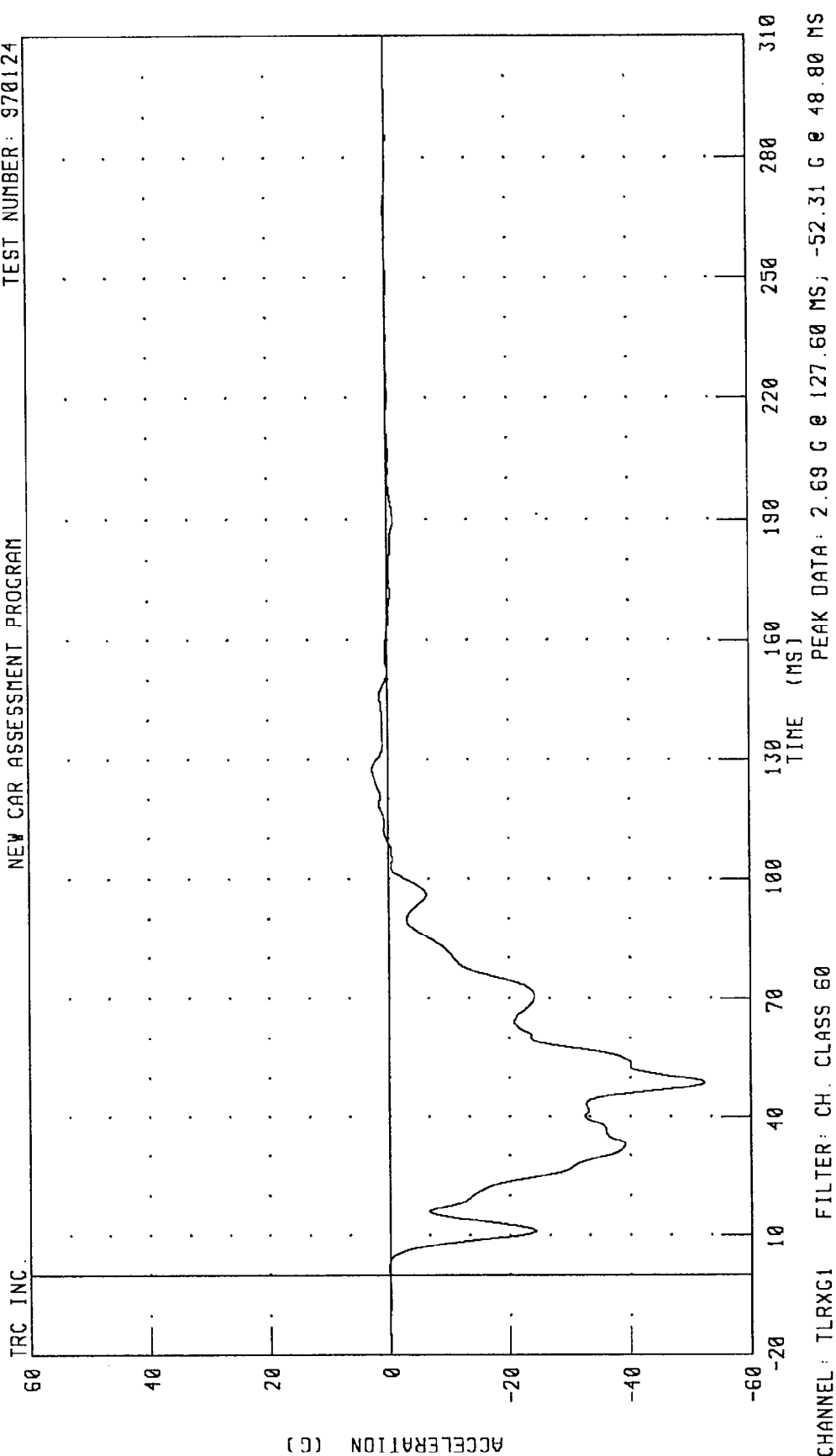


PEAK DATA: 1.39 MM @ 72.48 MS; 0.00 MM @ 9.52 MS

CHANNEL: SBED2 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

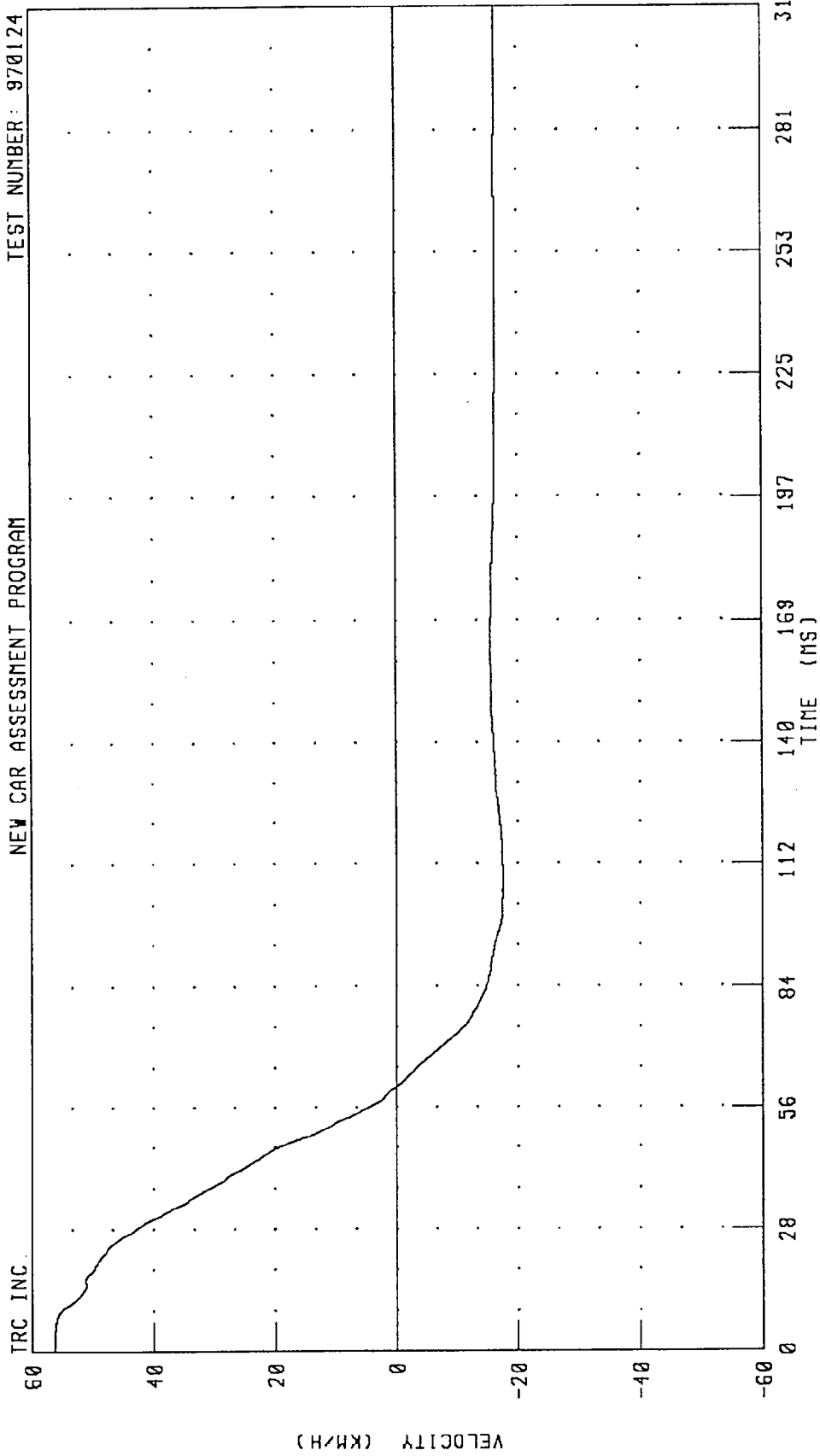
TEST NUMBER: 970124



CHANNEL: TLRXG1 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

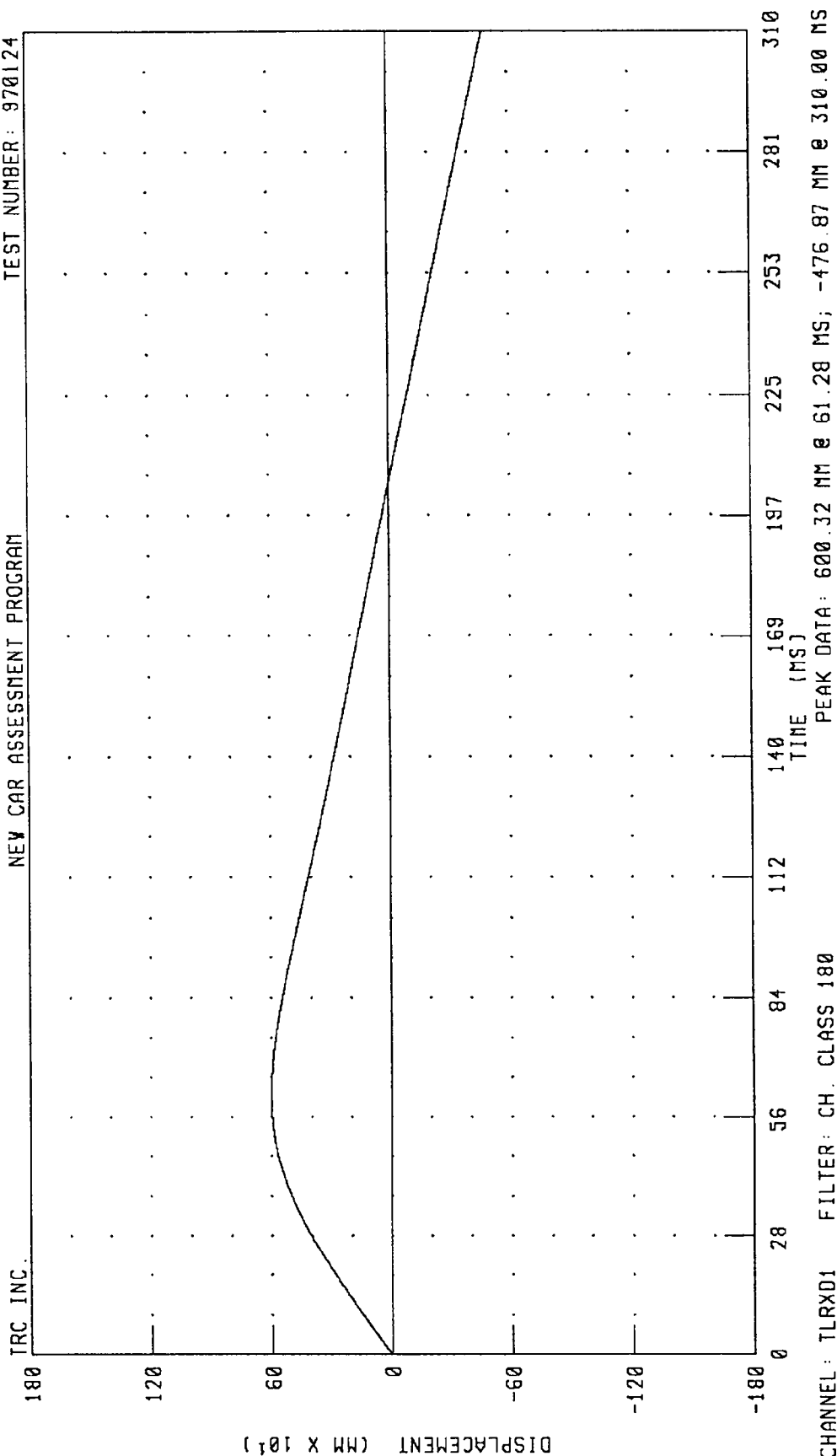


PEAK DATA: 56.21 KM/H @ 2.16 MS; -17.61 KM/H @ 108.16 MS

CHANNEL: TLRXV1 FILTER: CH. CLASS 180

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT PROGRAM

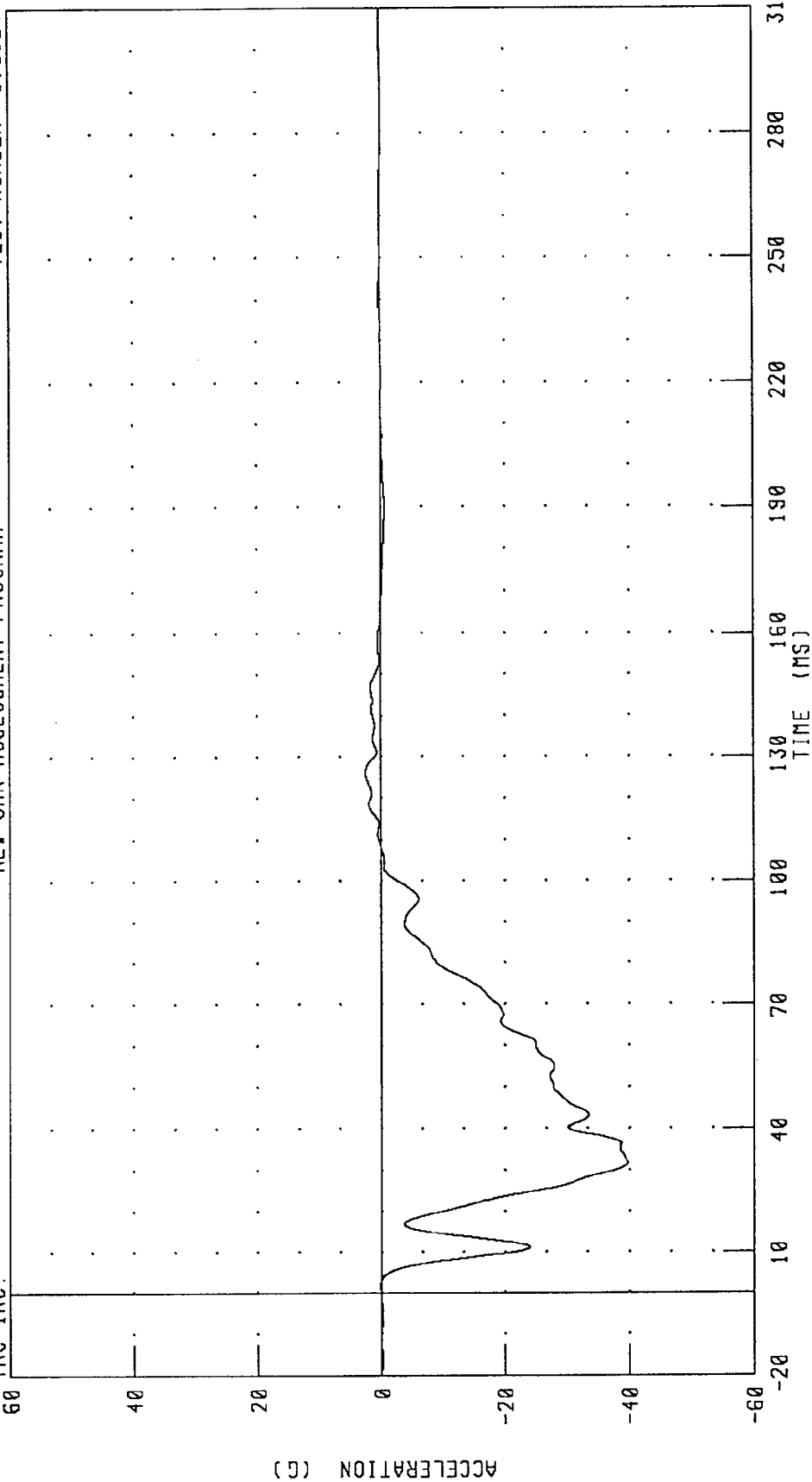
TEST NUMBER: 970124



1987 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

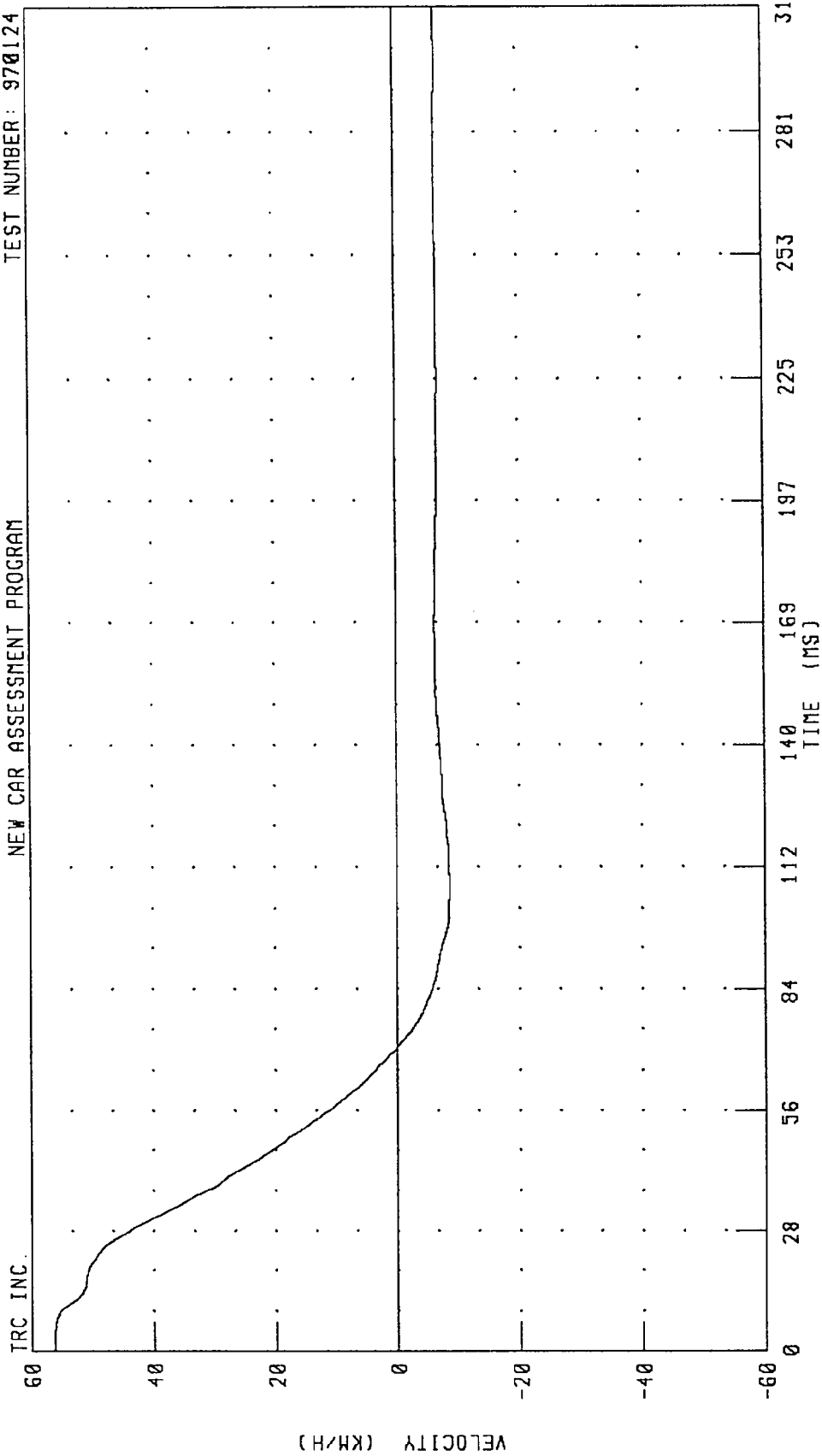


PEAK DATA: 2.52 G @ 125.68 MS; -39.75 G @ 31.92 MS

CHANNEL: TRRXG1 FILTER: CH. CLASS 60

1997 CHEVROLET TAHOE INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



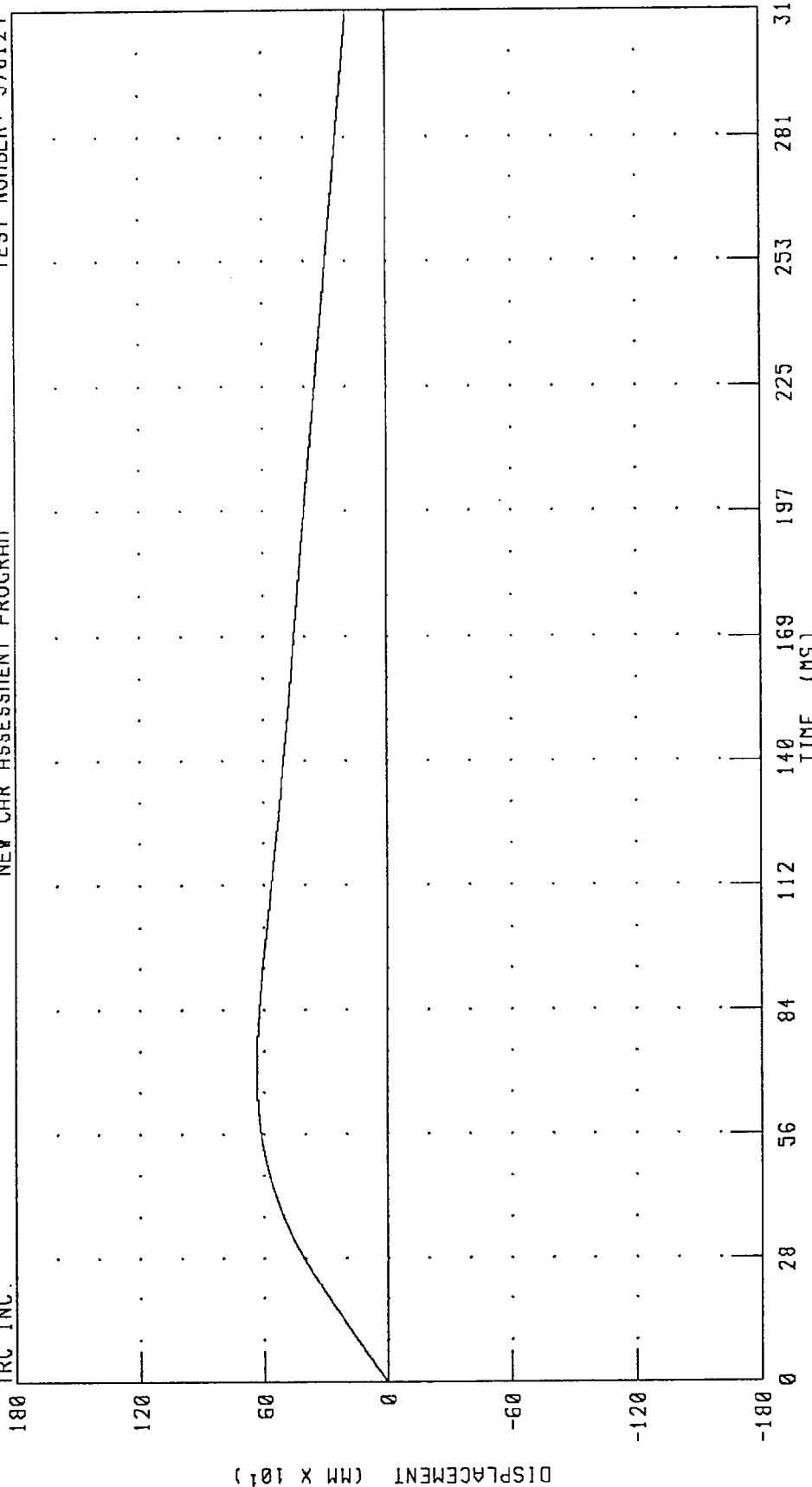
CHANNEL: TRRXV1 FILTER: CH. CLASS 180

1997 CHEVROLET TAHOE INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

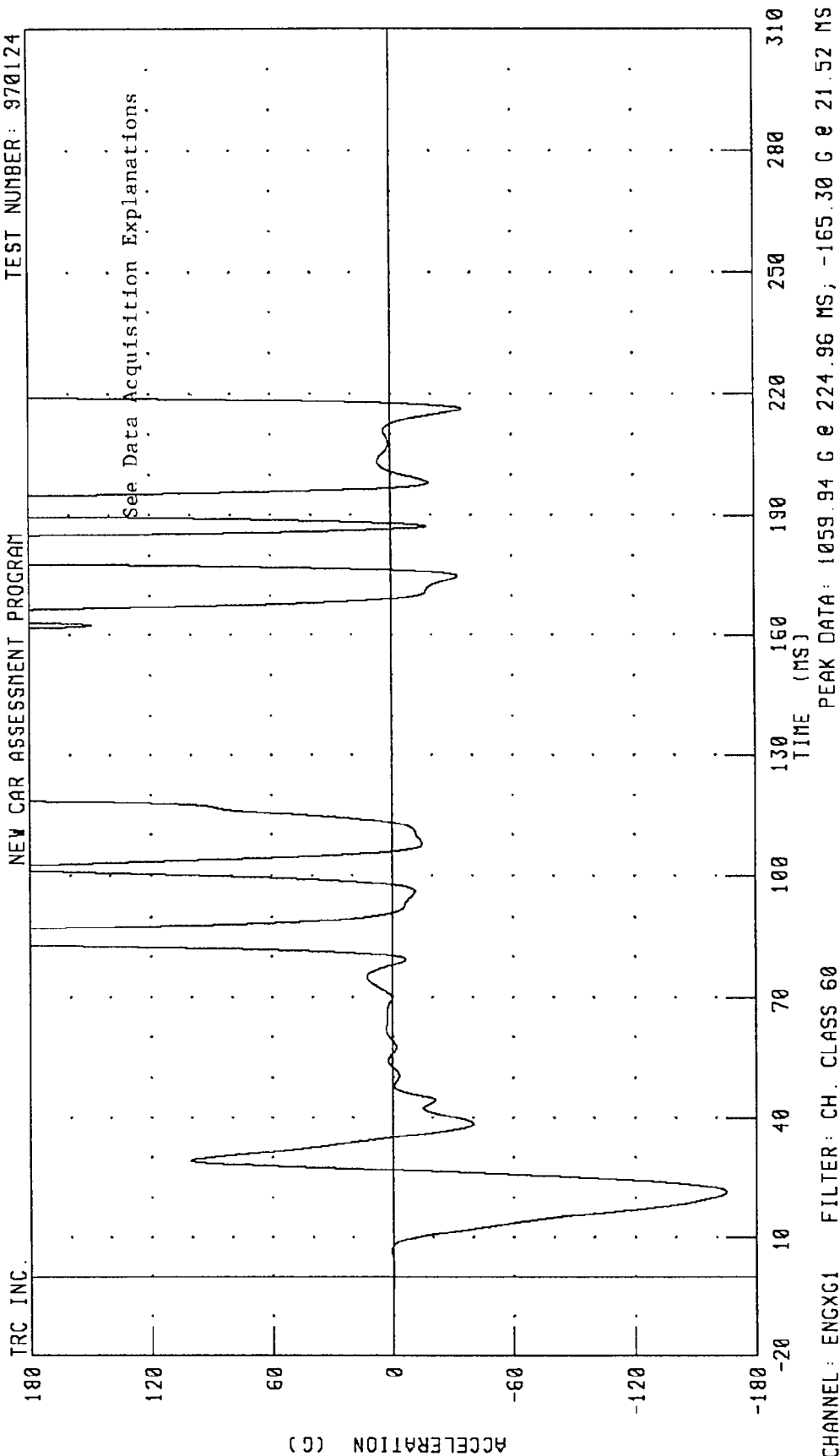


CHANNEL: TRRXD1 FILTER: CH. CLASS 180

PEAK DATA: 637.41 MM @ 70.96 MS; 0.00 MM @ 0.00 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 ENGINE TOP X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

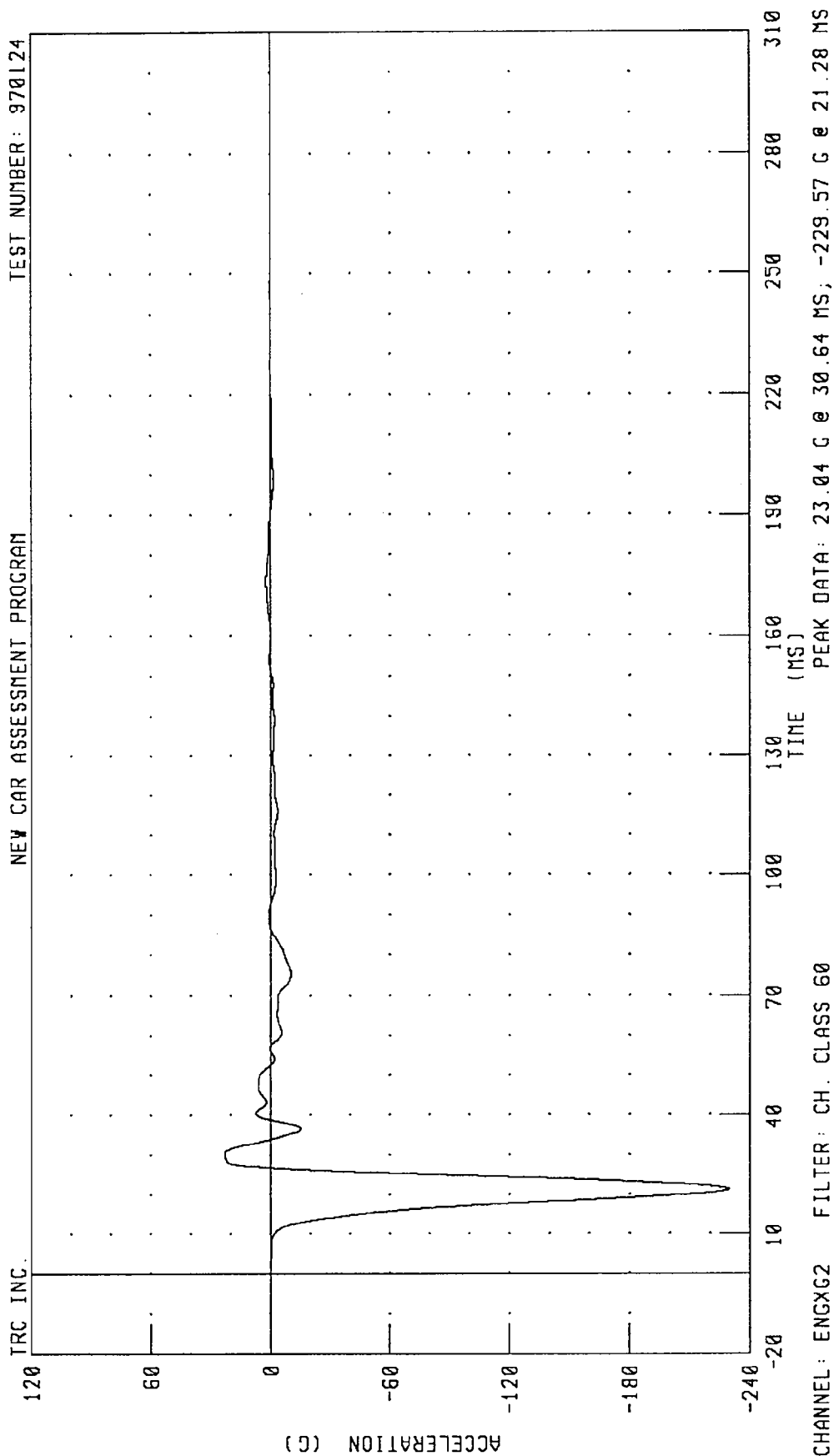
TEST NUMBER: 970124



CHANNEL: ENGXC1 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

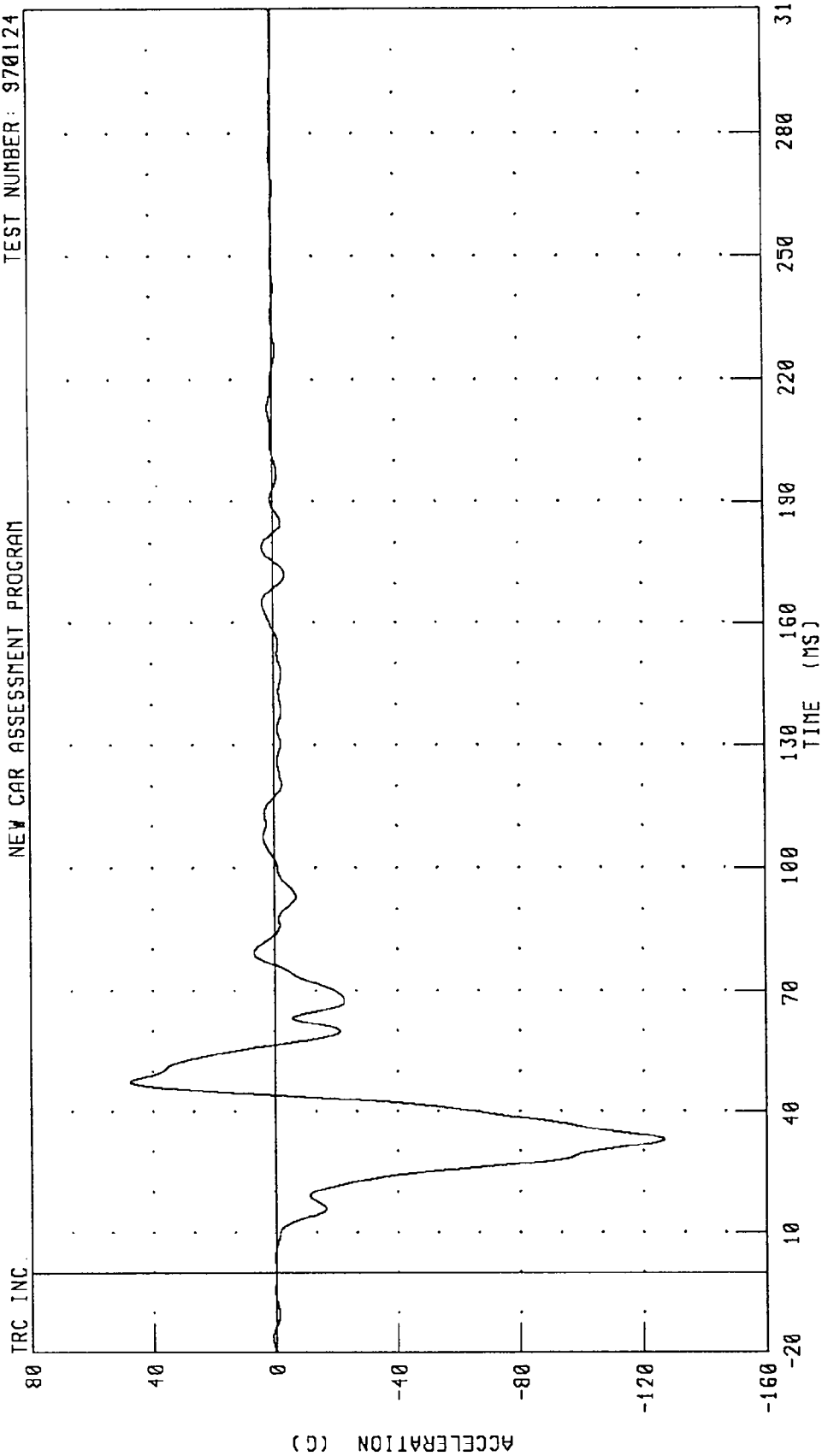


CHANNEL: ENGXG2 FILTER: CH. CLASS 60

PEAK DATA: 23.04 G @ 30.64 MS; -229.57 G @ 21.28 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 RIGHT BRAKE CALIPER X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

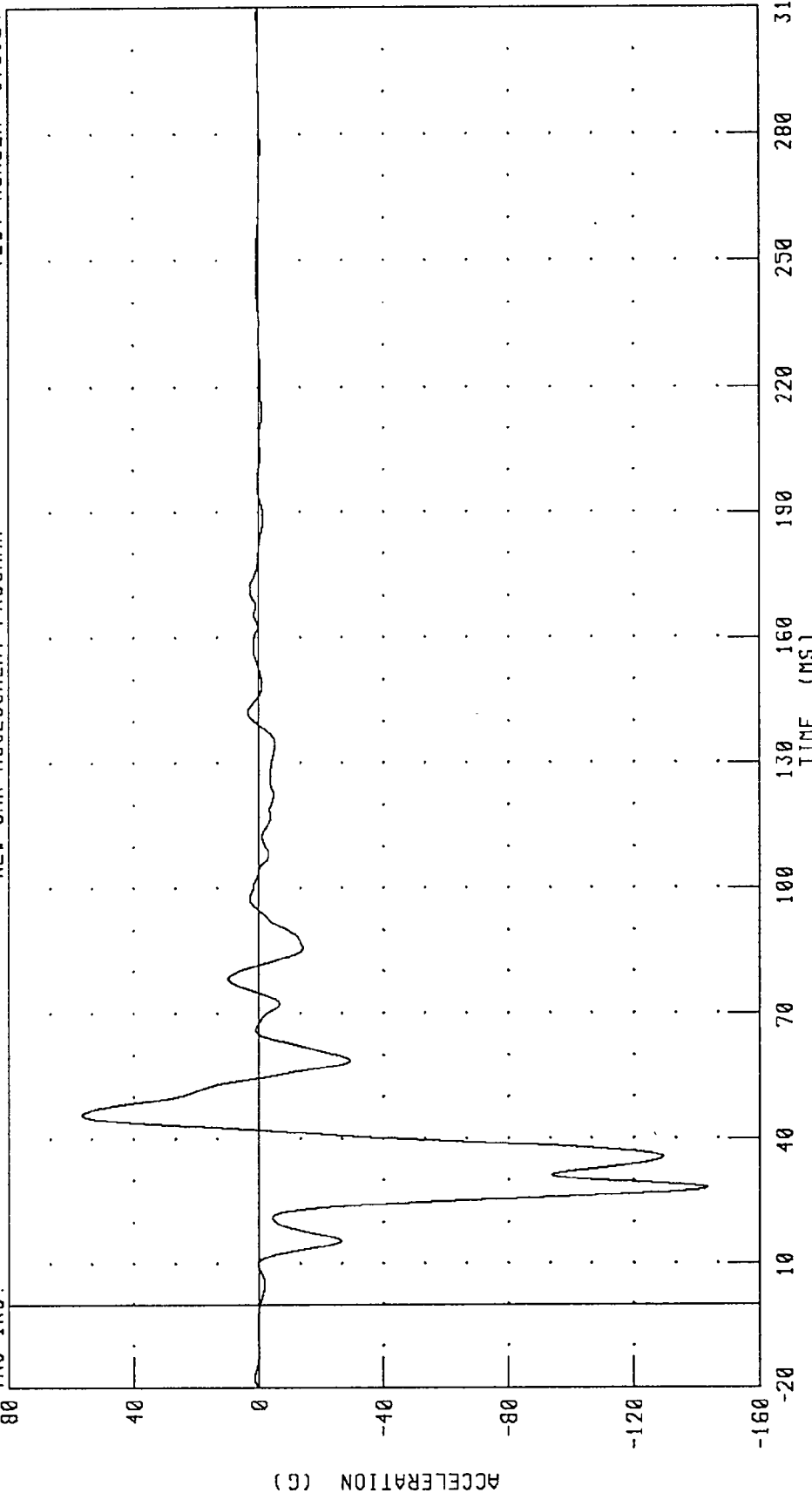


CHANNEL: BCRXG1 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.

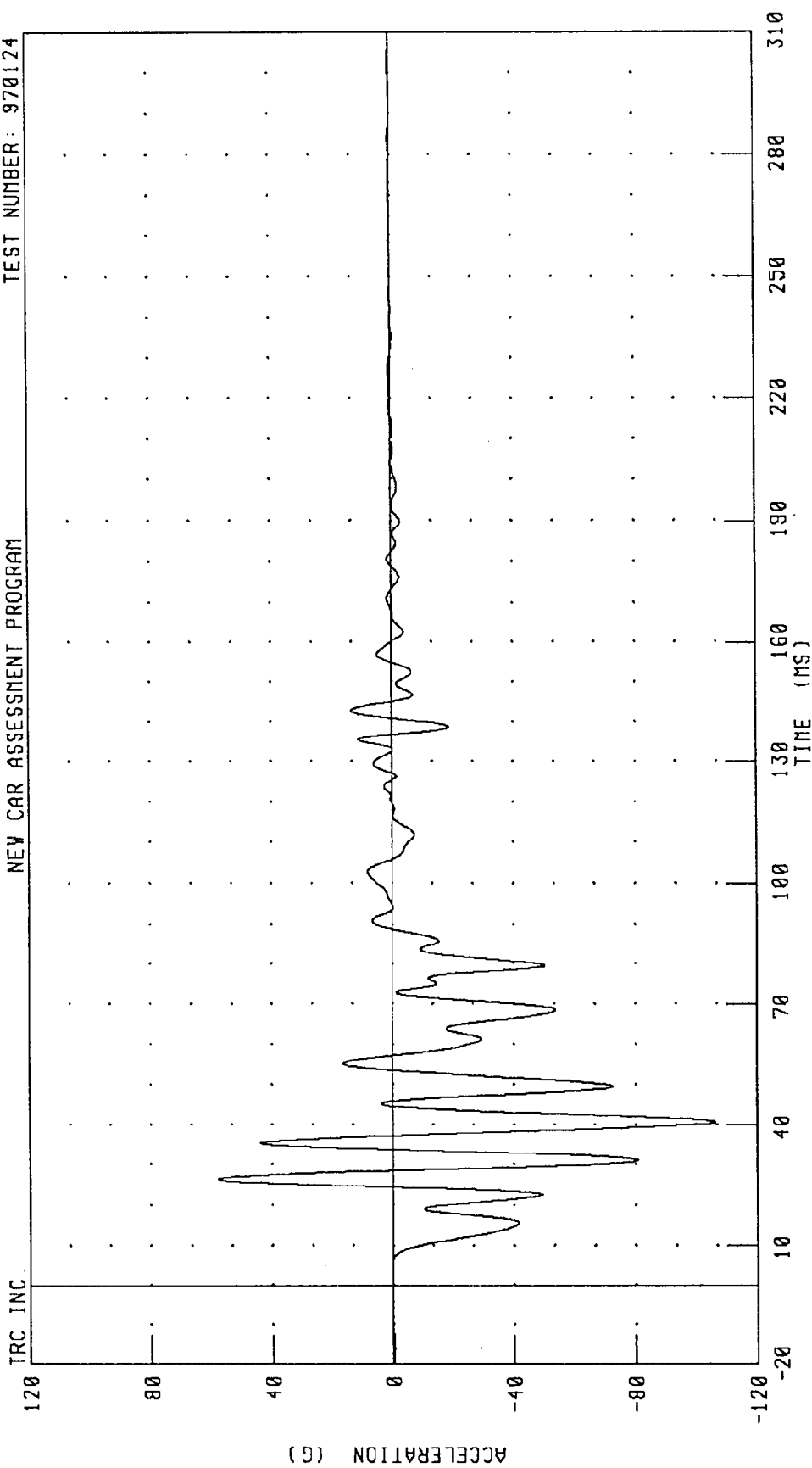


PEAK DATA: 56.42 G @ 45.68 MS; -143.36 G @ 28.16 MS

CHANNEL: BCLXG1 FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



CHANNEL: DPCXG1 FILTER: CH. CLASS 60

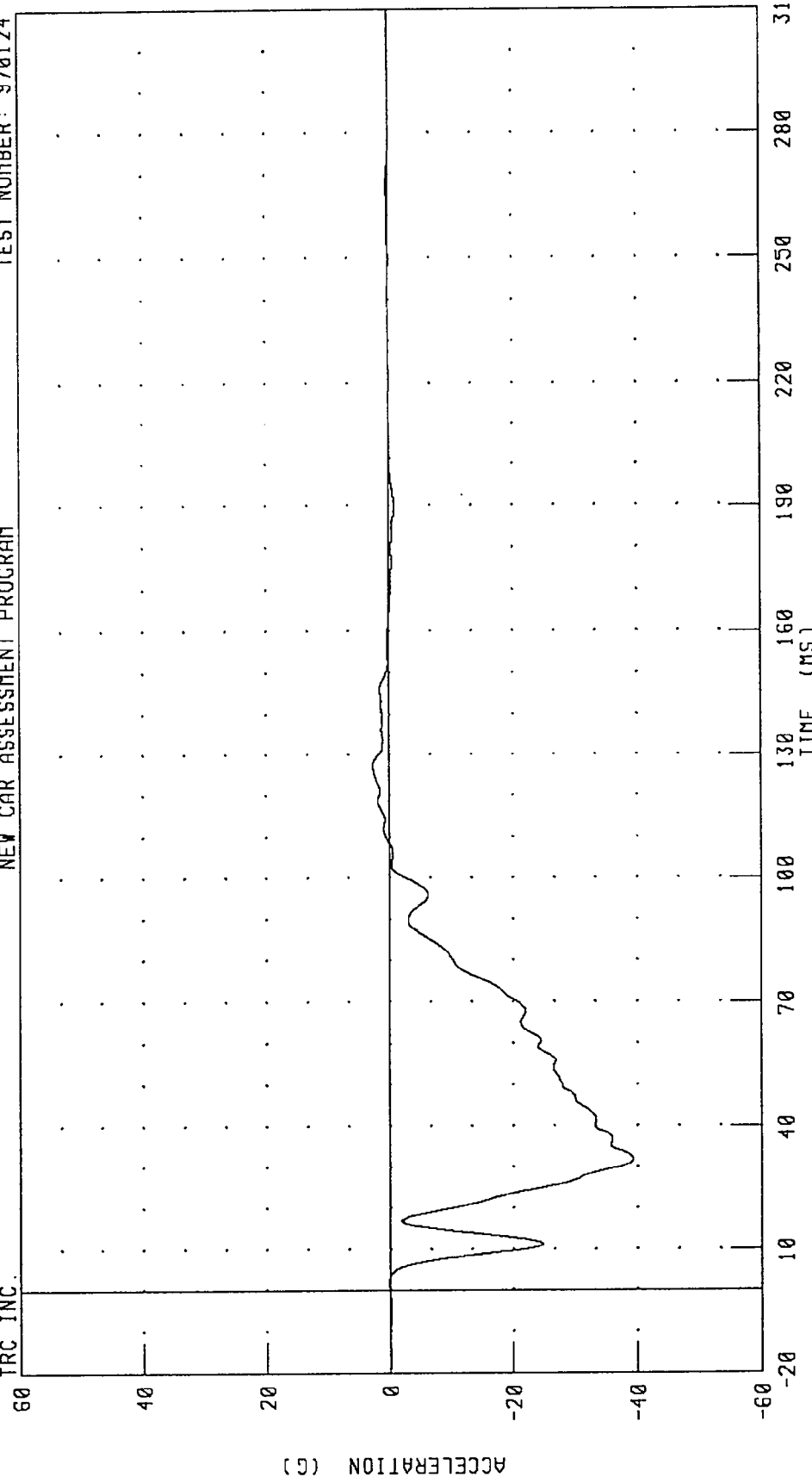
PEAK DATA: 57.94 G @ 26.32 MS; -106.21 G @ 40.72 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TLRXGA FILTER: CH. CLASS 60

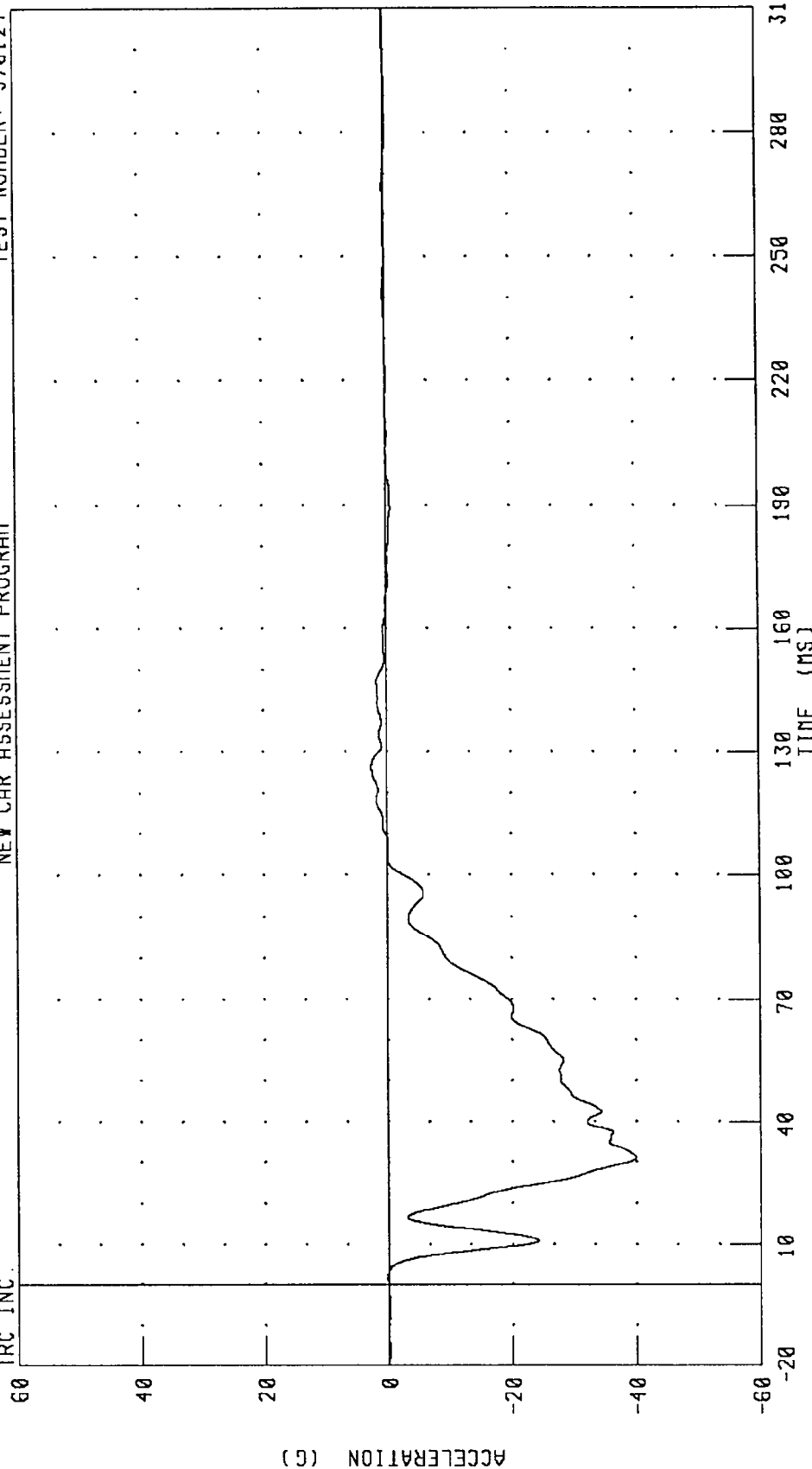
PEAK DATA: 2.69 G @ 127.12 MS; -39.27 G @ 32.00 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TRRXGA FILTER: CH. CLASS 60

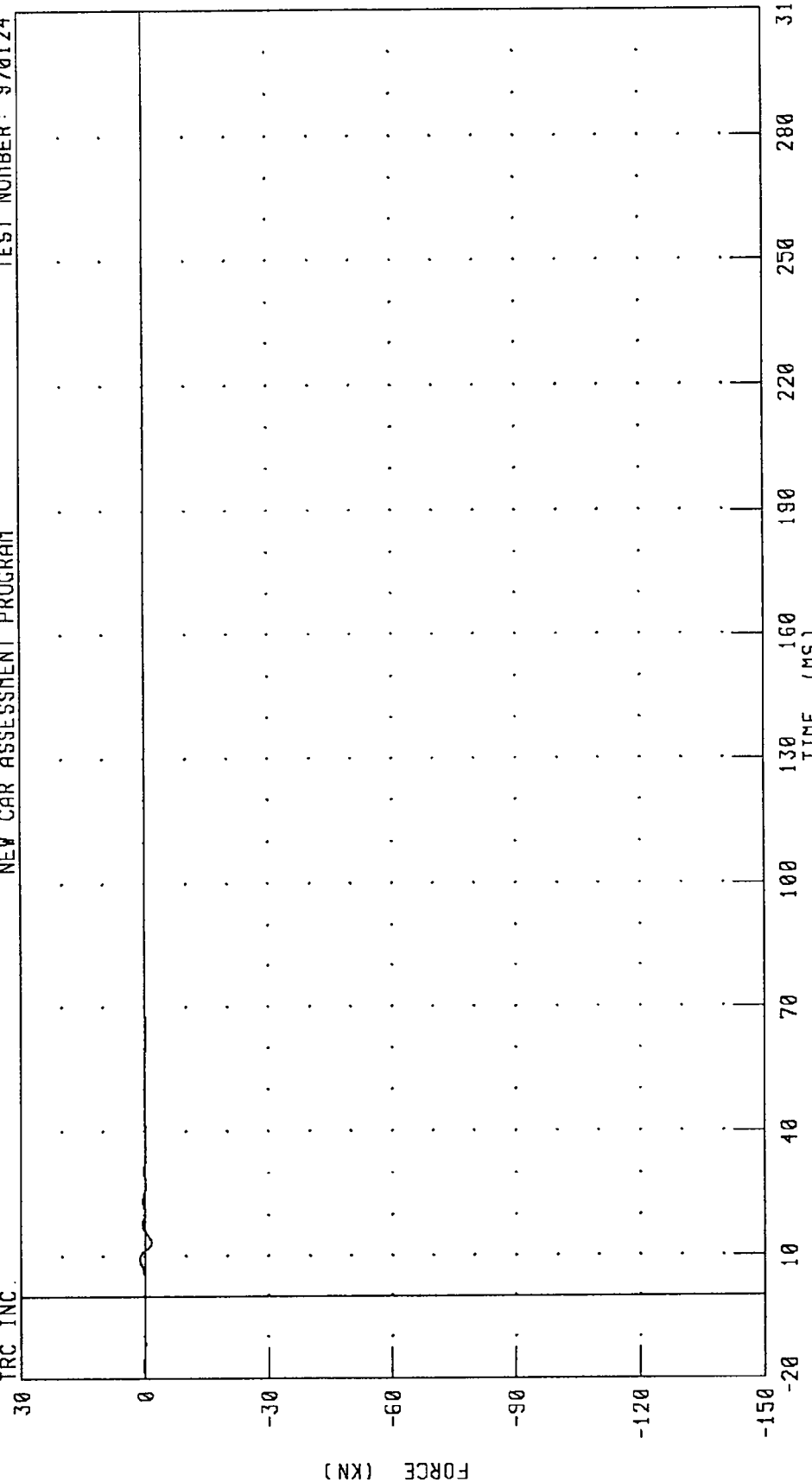
PEAK DATA: 2.50 G @ 126.00 MS; -39.93 G @ 31.20 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

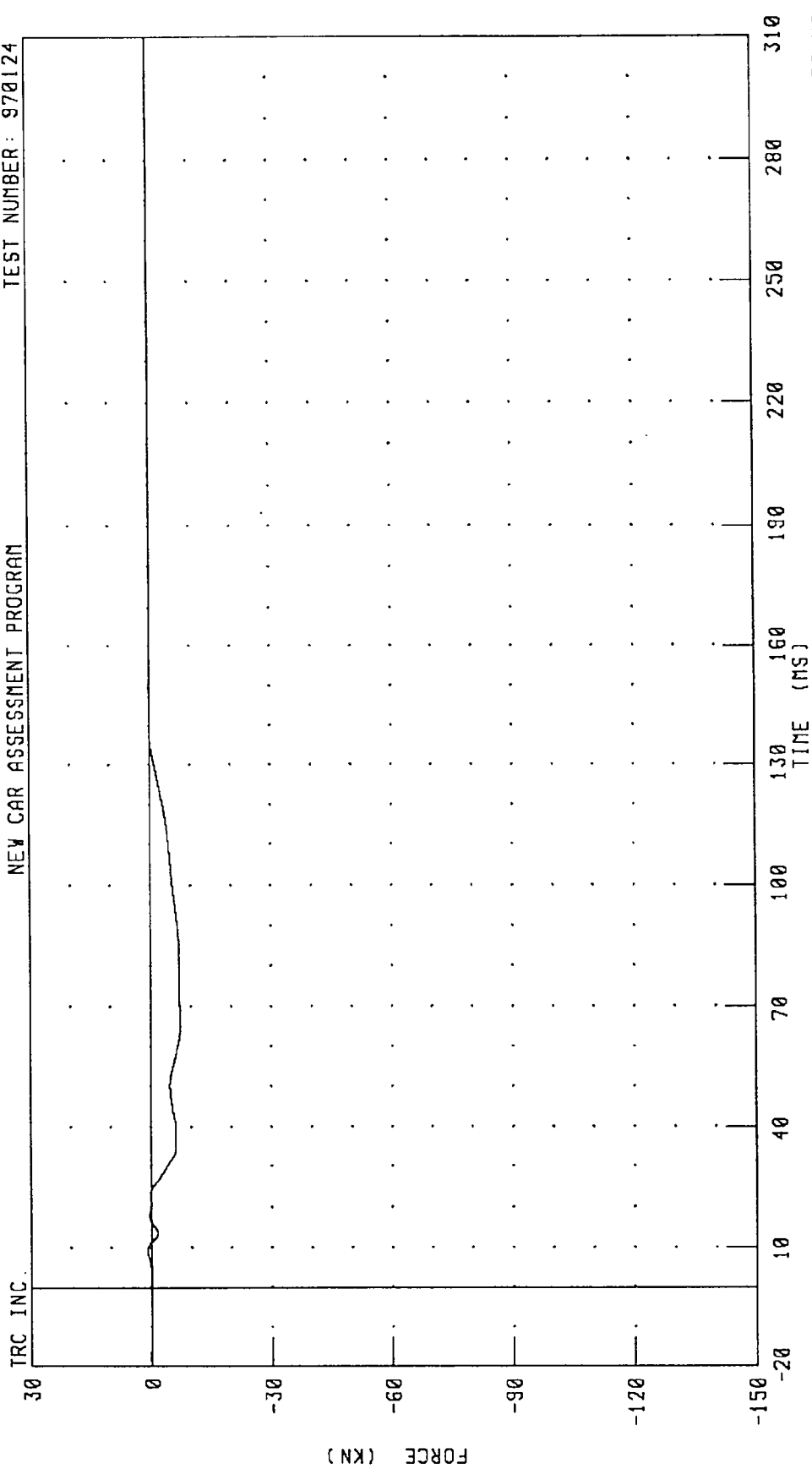


PEAK DATA: 1.16 KN @ 9.44 MS; -1.71 KN @ 13.44 MS

CHANNEL: BA1F FILTER: CH. CLASS 60

1987 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A2 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



CHANNEL: BA2F FILTER: CH. CLASS 60

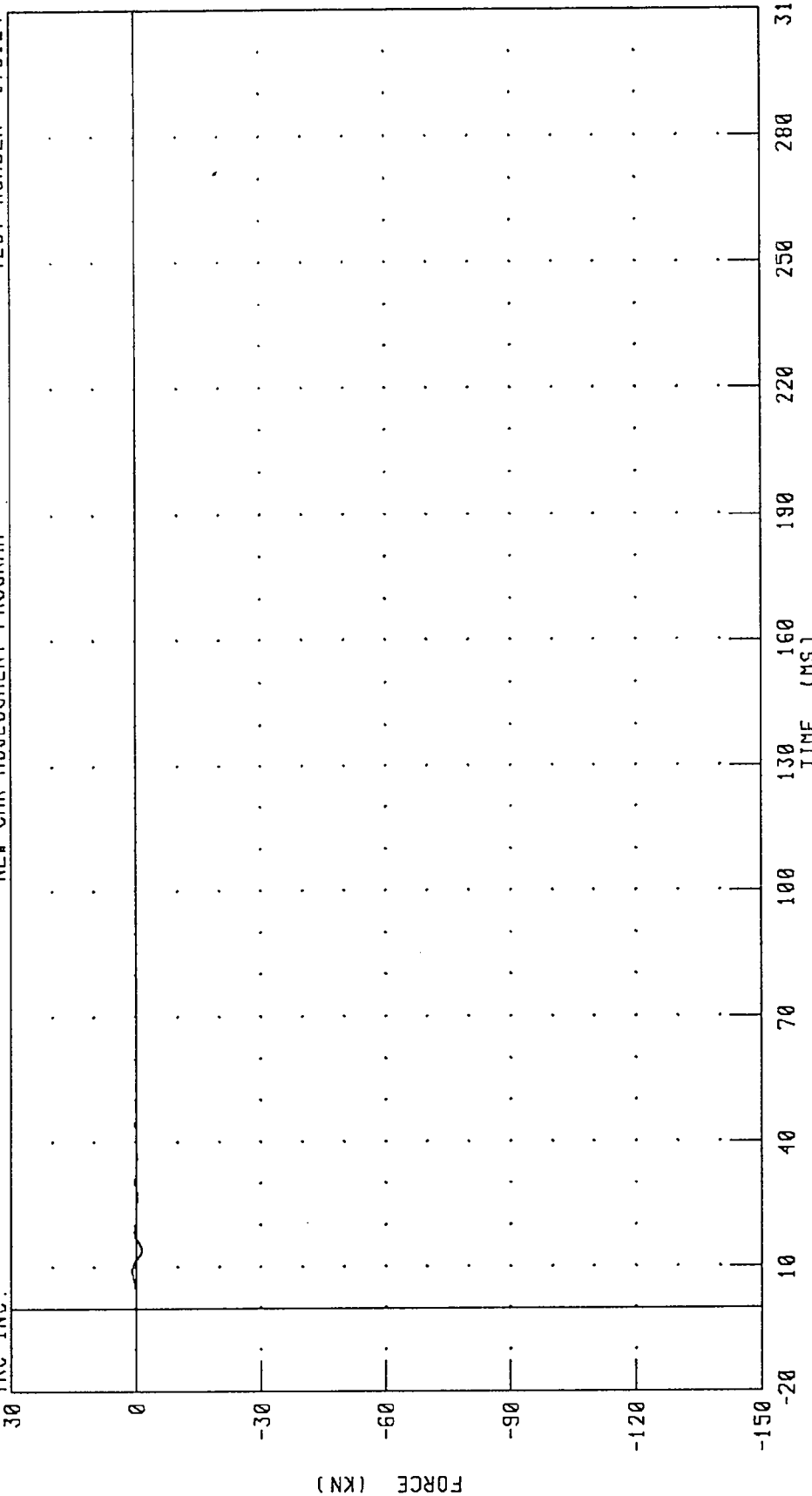
PEAK DATA: 1.07 KN @ 9.12 MS; -7.51 KN @ 66.56 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



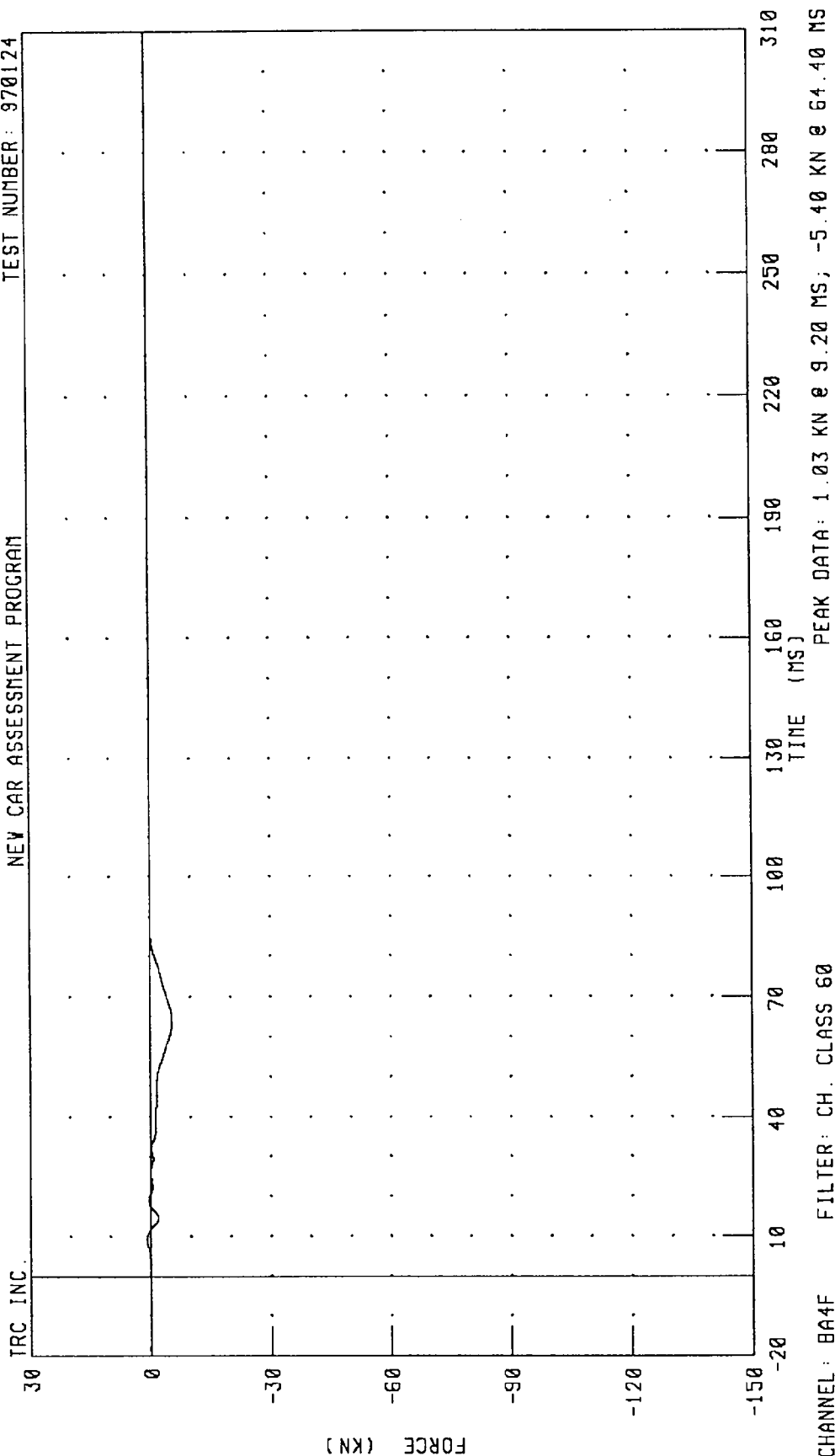
PEAK DATA: 0.94 KN @ 9.04 MS; -1.33 KN @ 13.92 MS

FILTER: CH. CLASS 60

CHANNEL: BA3F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A4 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

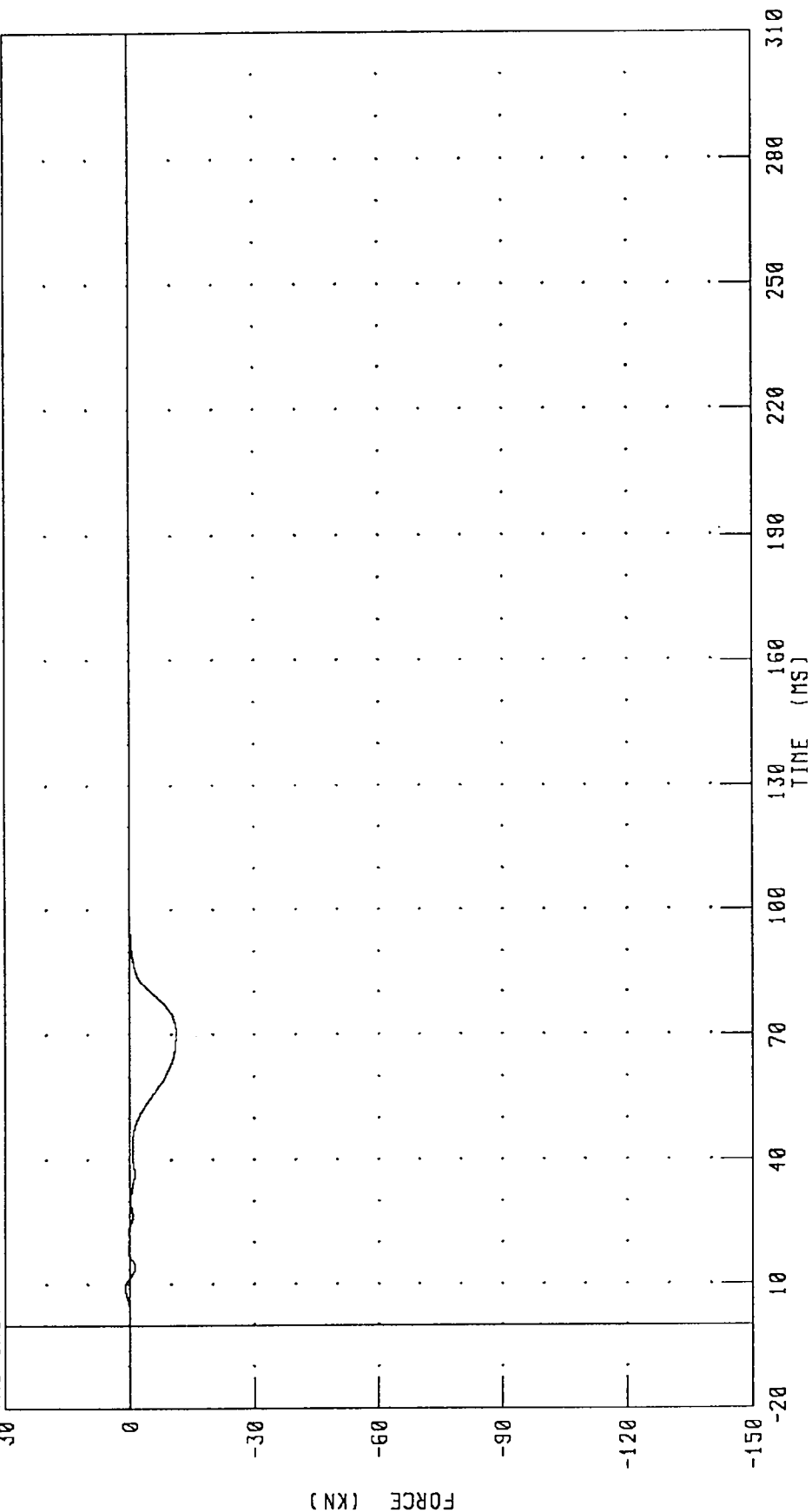


1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

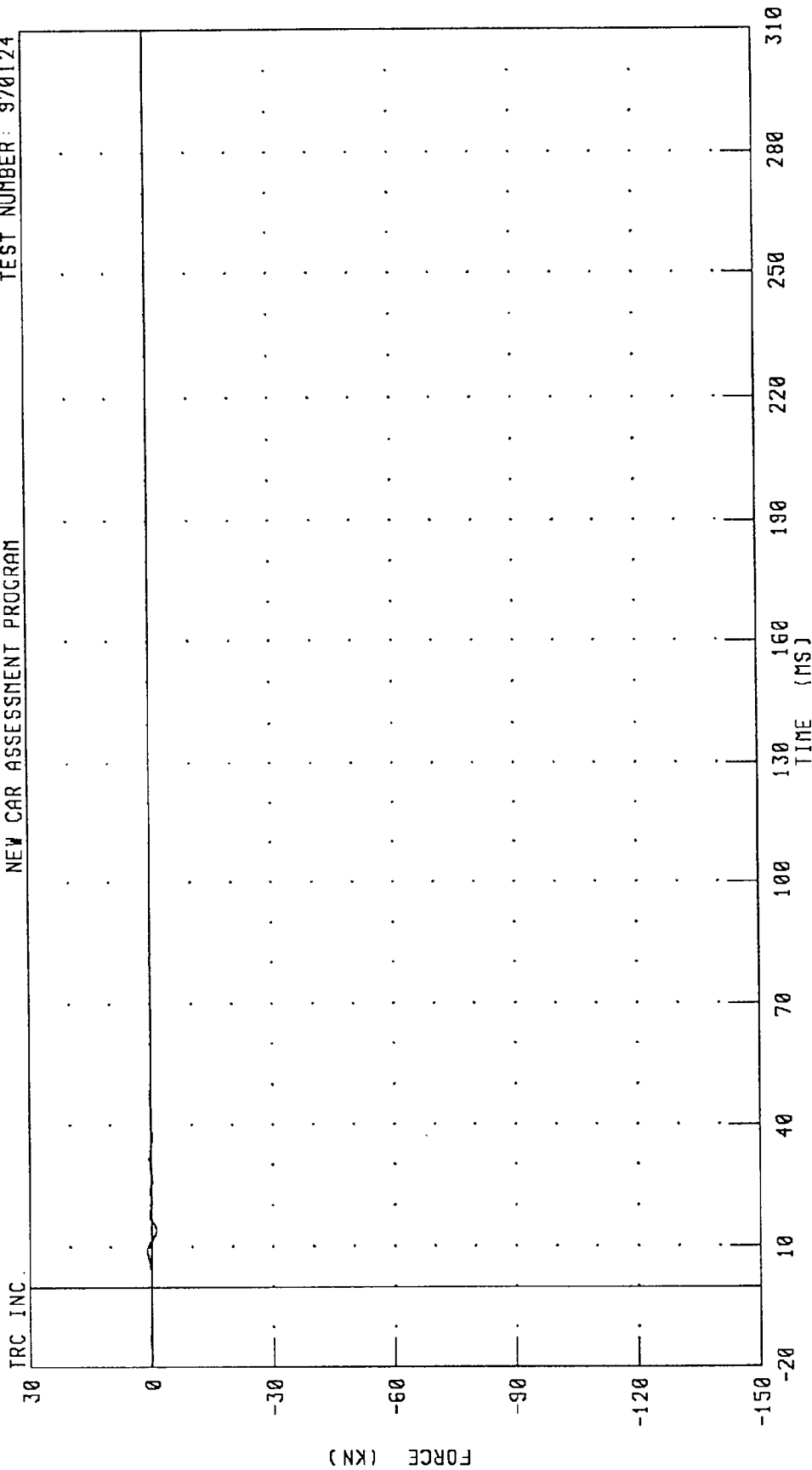


CHANNEL: BASF FILTER: CH. CLASS 60

PEAK DATA: 1.05 KN @ 9.04 MS; -11.14 KN @ 70.48 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A6 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

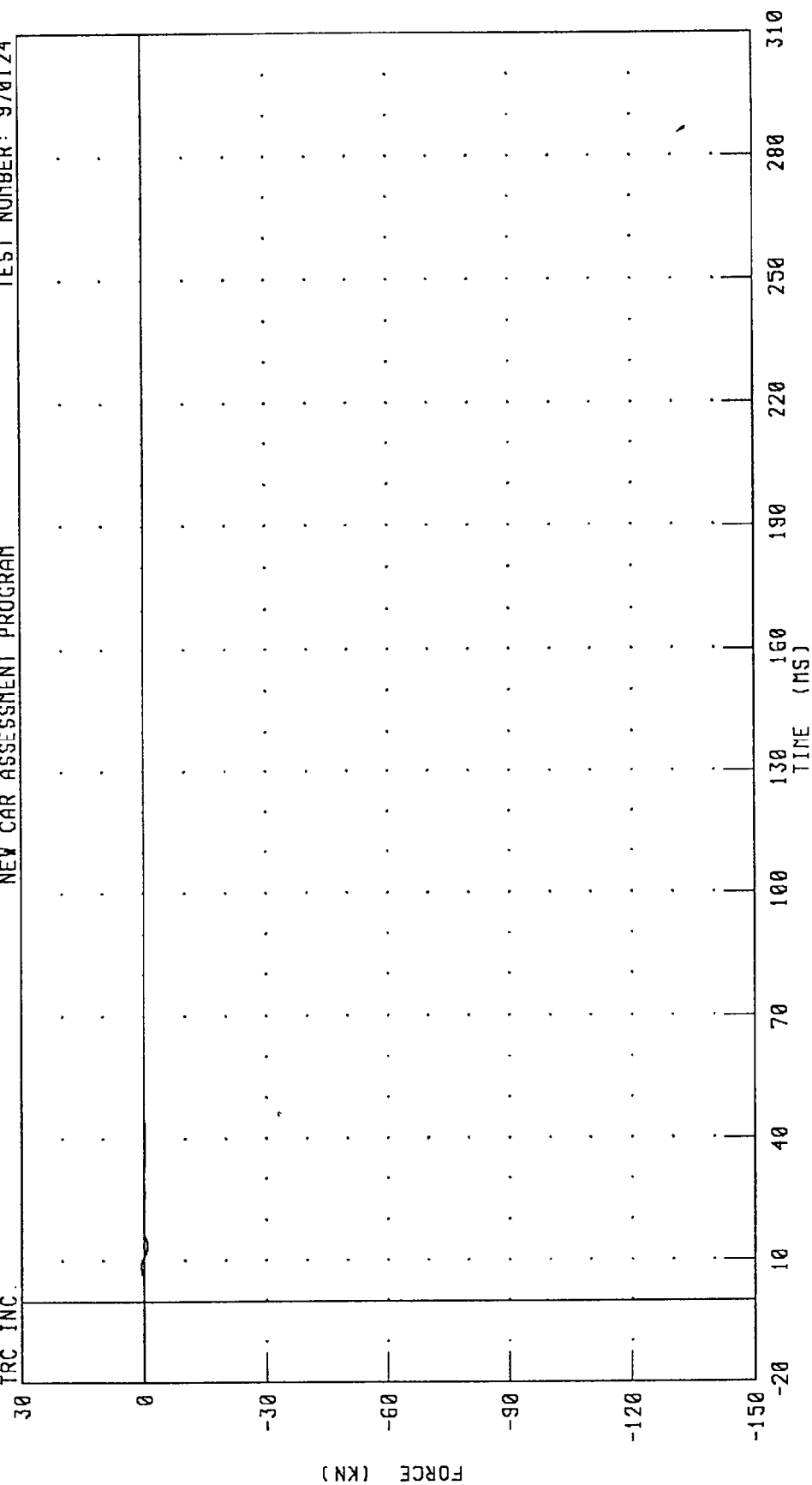


CHANNEL: BA6F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



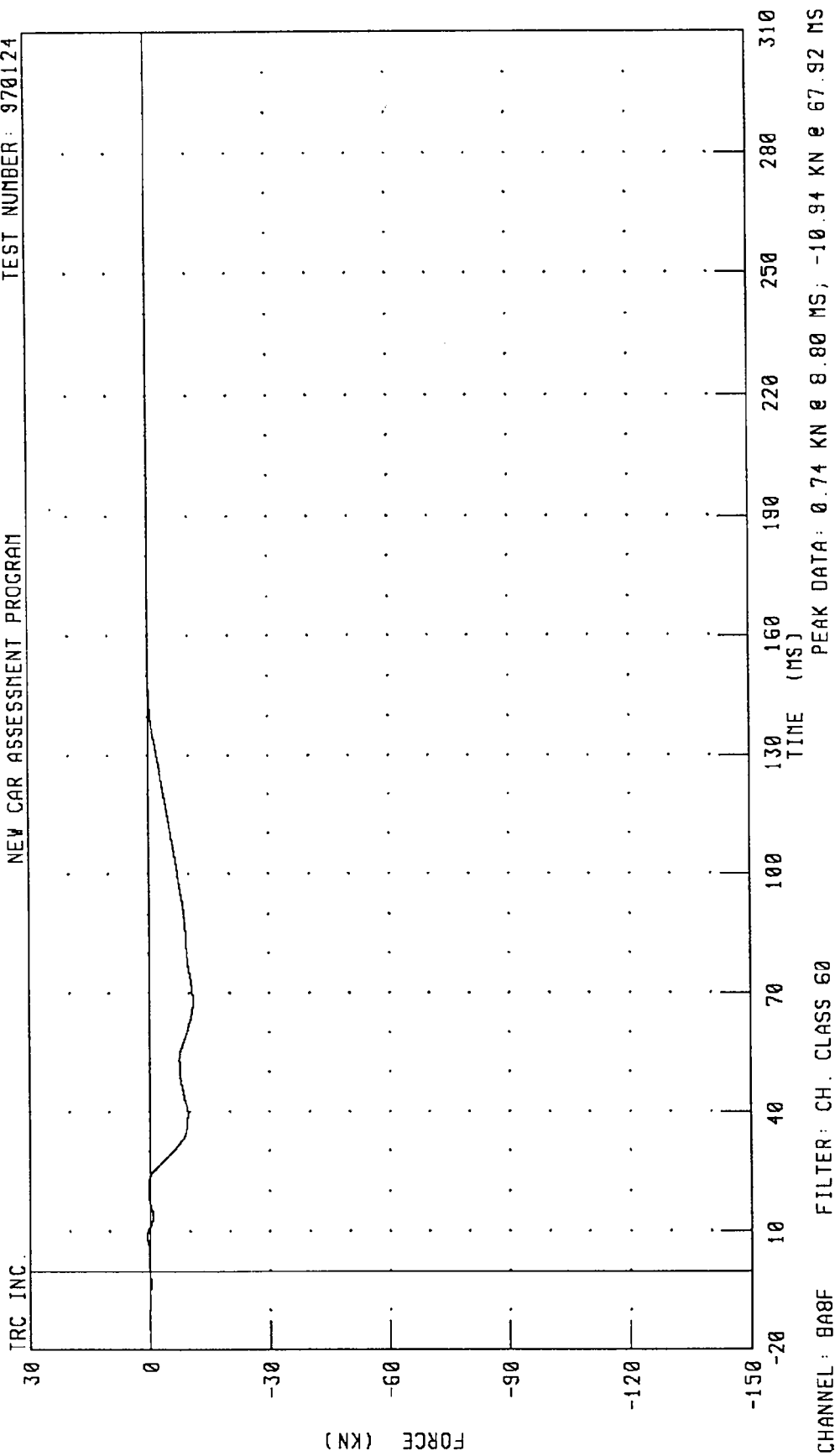
PEAK DATA: 0.70 KN @ 8.72 MS; -0.86 KN @ 13.76 MS

FILTER: CH. CLASS 60

CHANNEL: BA7F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A8 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



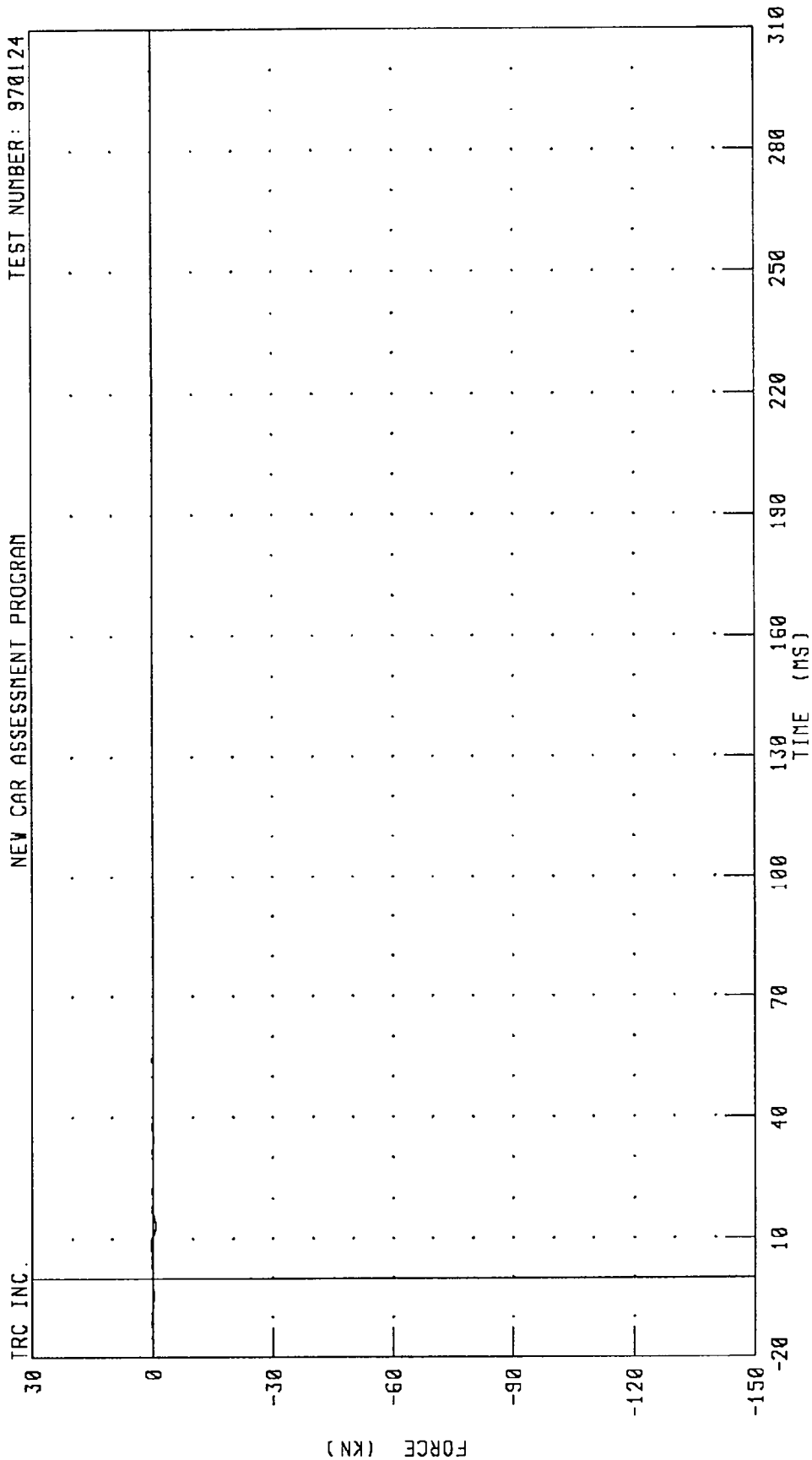
PEAK DATA: 0.74 KN @ 8.80 MS; -10.94 KN @ 67.92 MS

FILTER: CH. CLASS 60

CHANNEL: BA8F

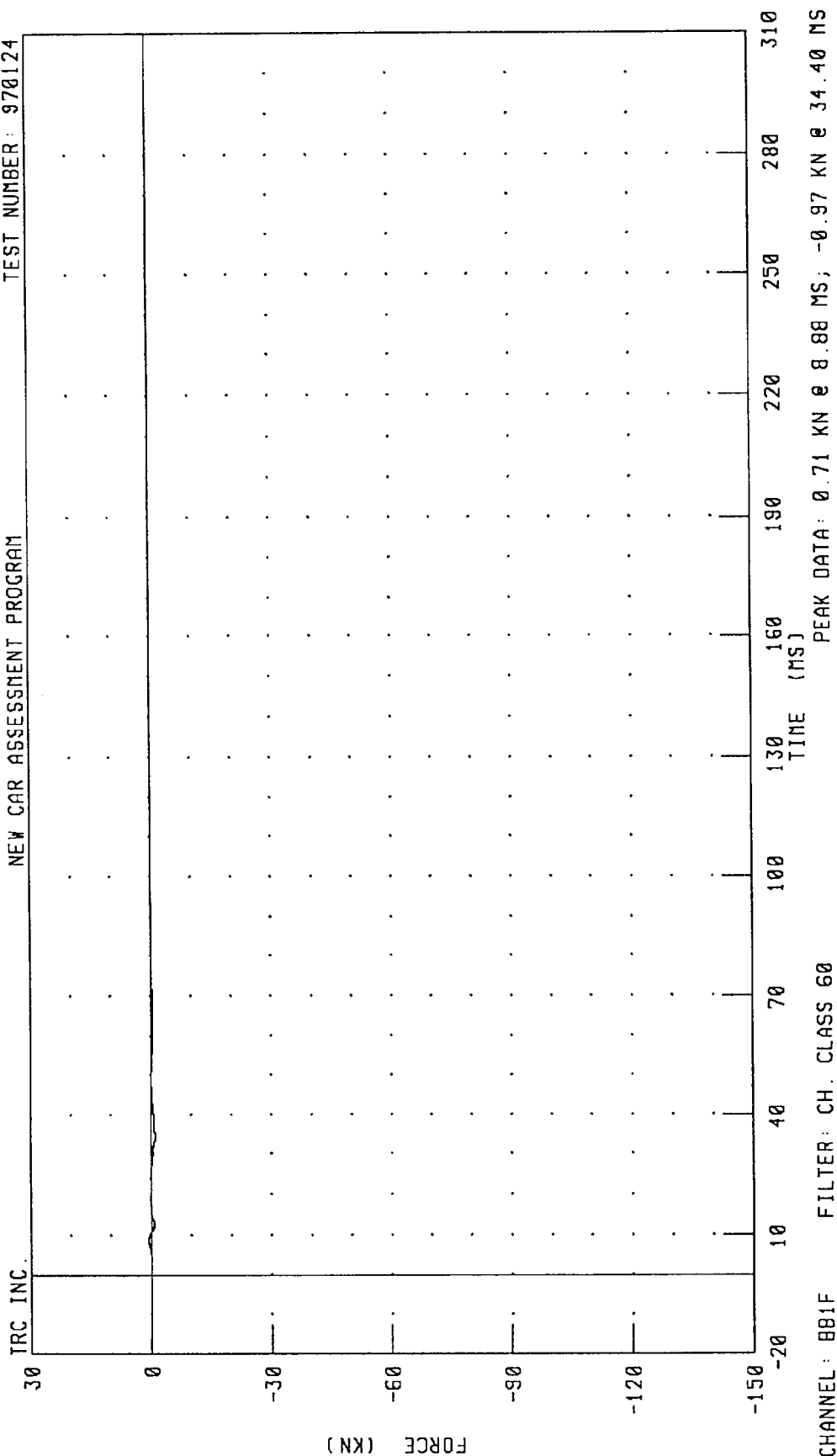
1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION AS FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B1 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

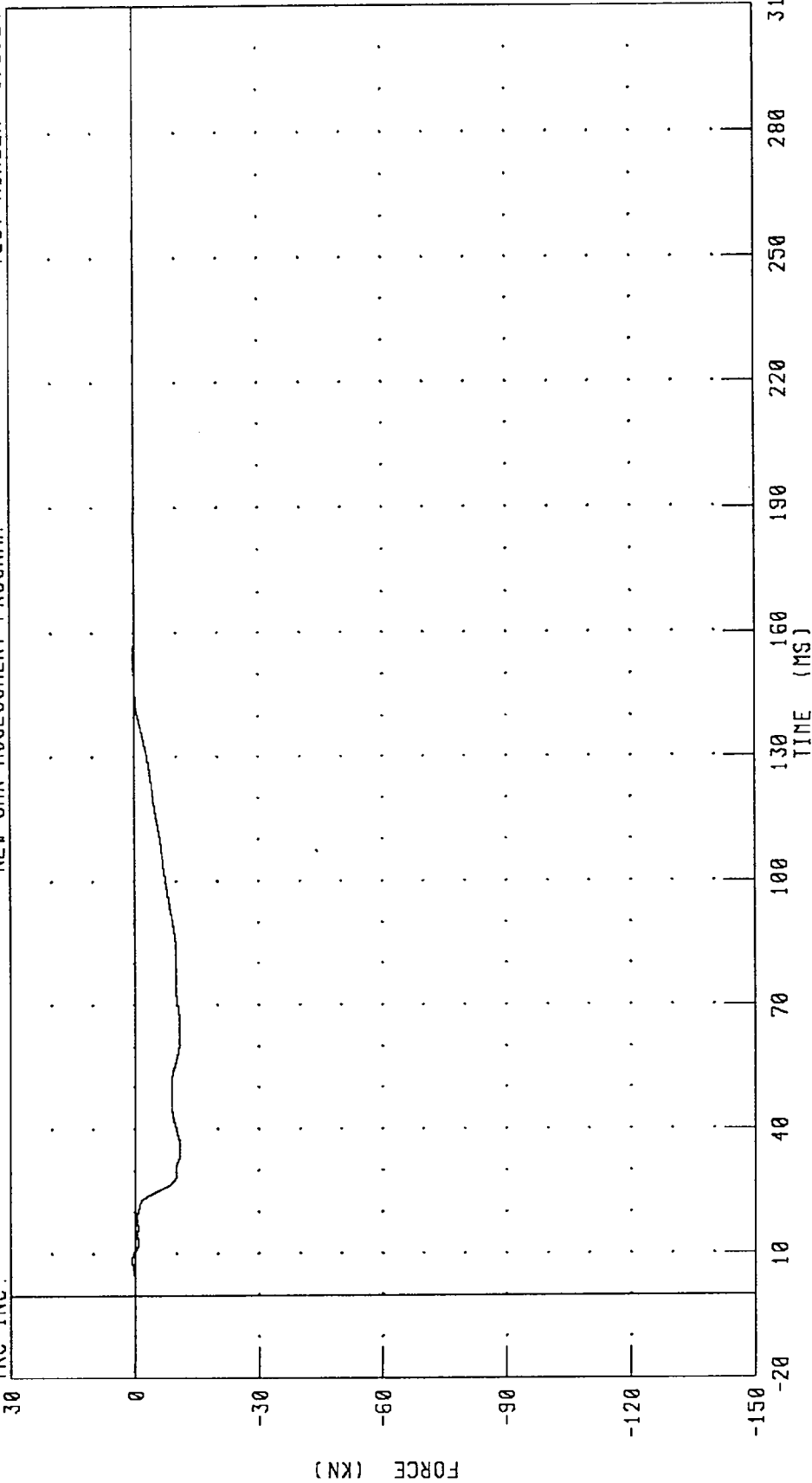


1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

IRC INC.



PEAK DATA: 0.72 KN @ 8.48 MS; -10.82 KN @ 35.44 MS

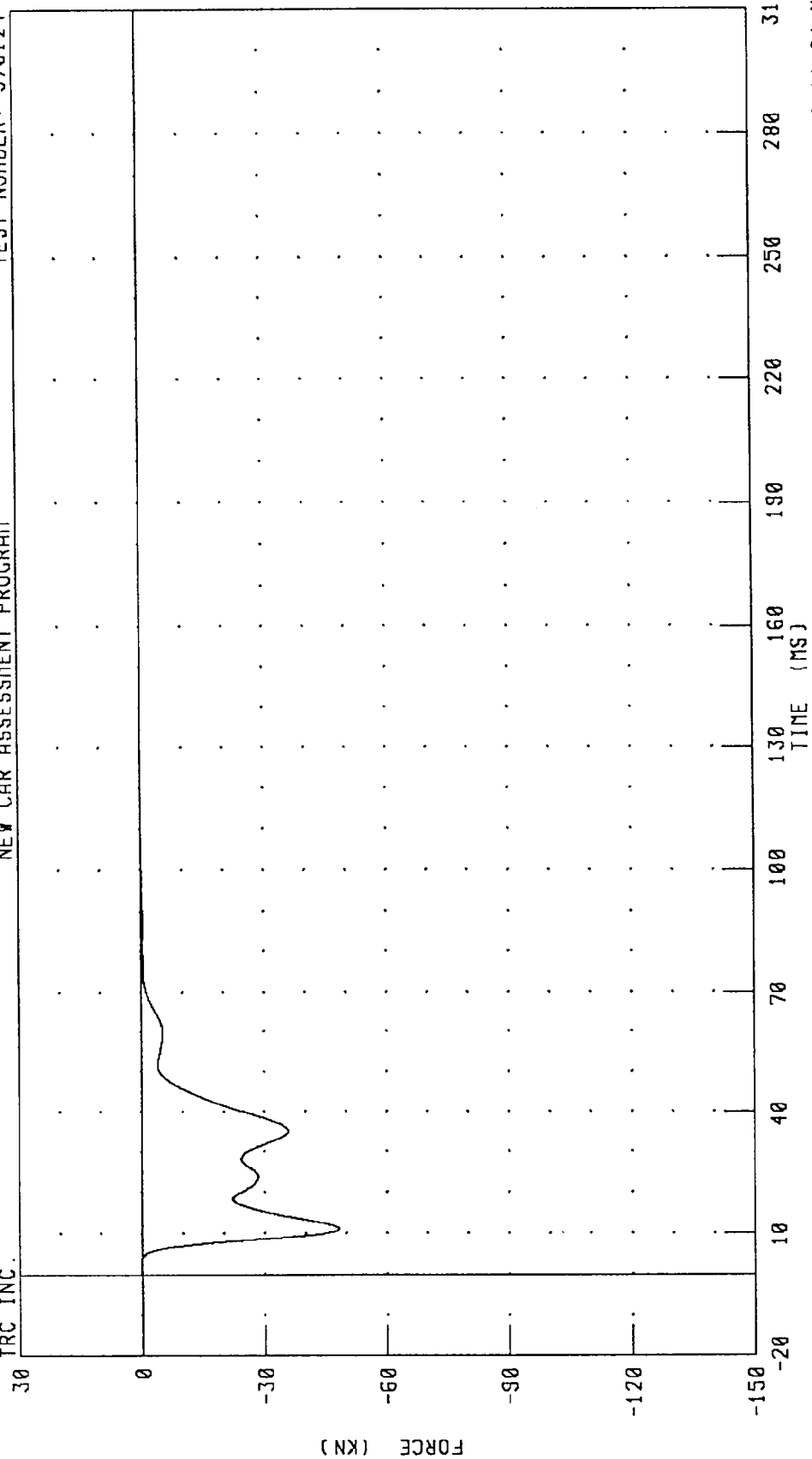
CHANNEL: BB2F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

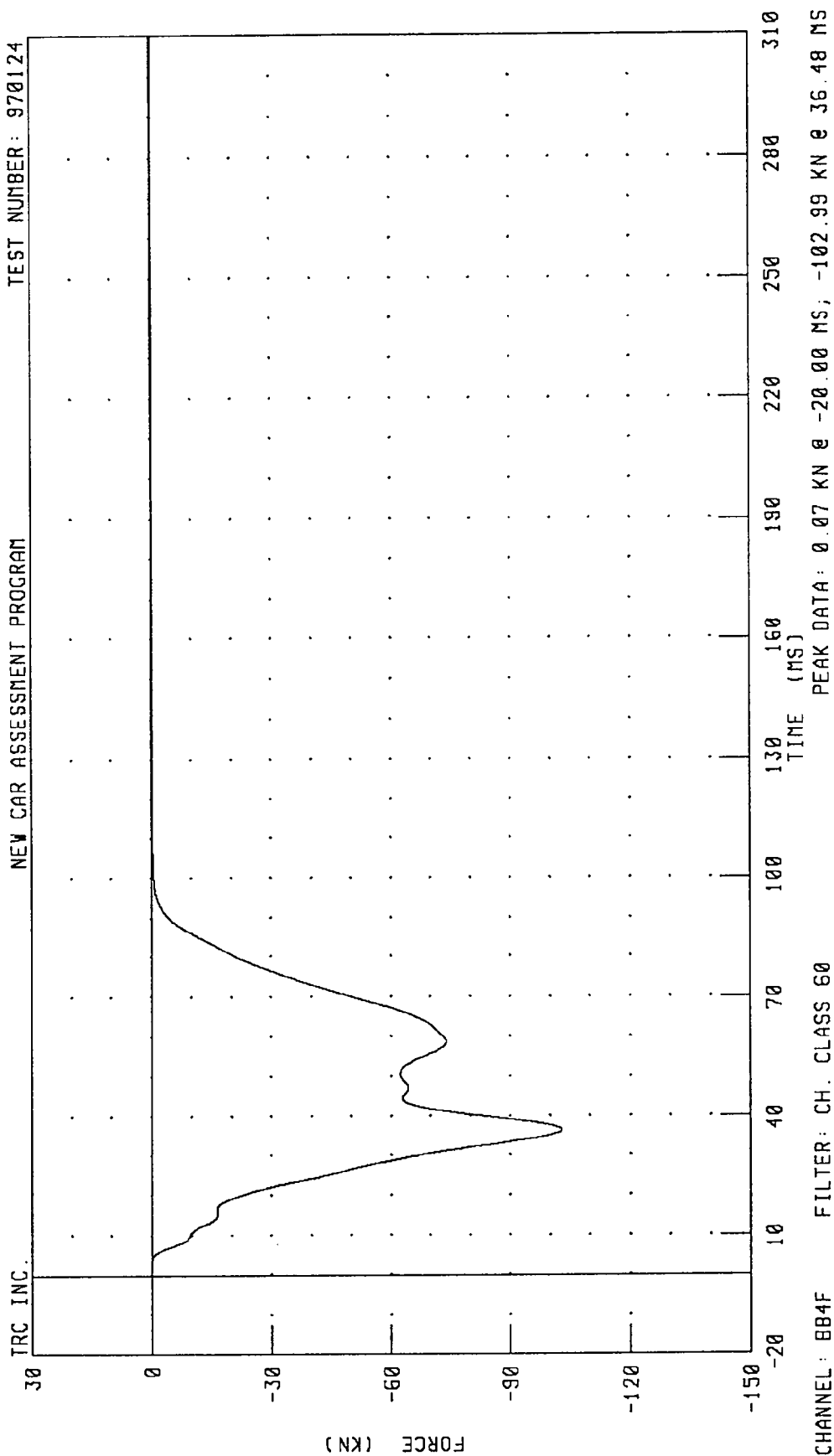


CHANNEL: BB3F FILTER: CH. CLASS 60

PEAK DATA: 0.26 KN @ 2.56 MS, -48.22 KN @ 11.04 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B4 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



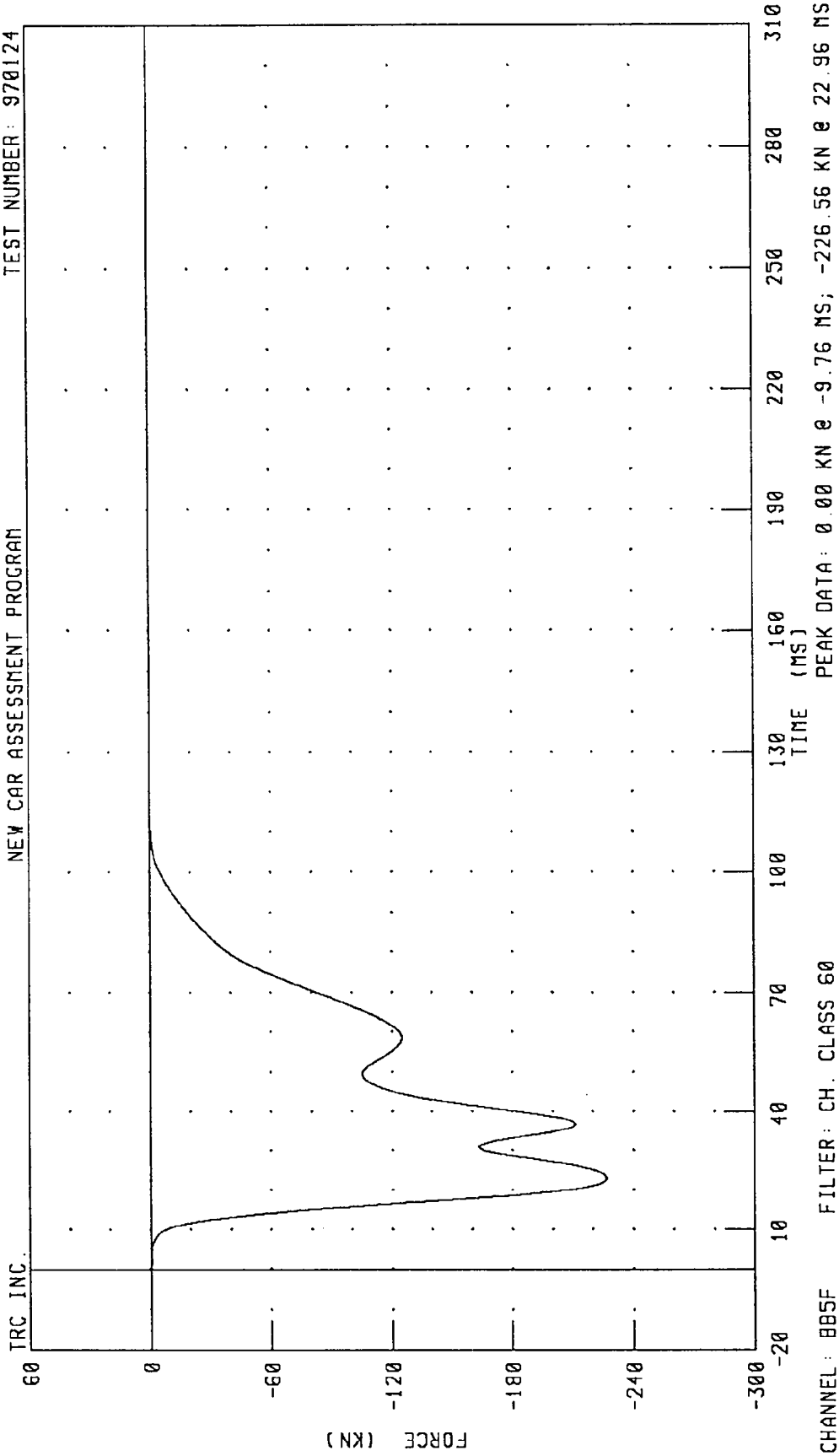
PEAK DATA: 0.07 KN @ -20.00 MS; -102.99 KN @ 36.48 MS

FILTER: CH. CLASS 60

CHANNEL: BB4F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B5 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



CHANNEL: BB5F

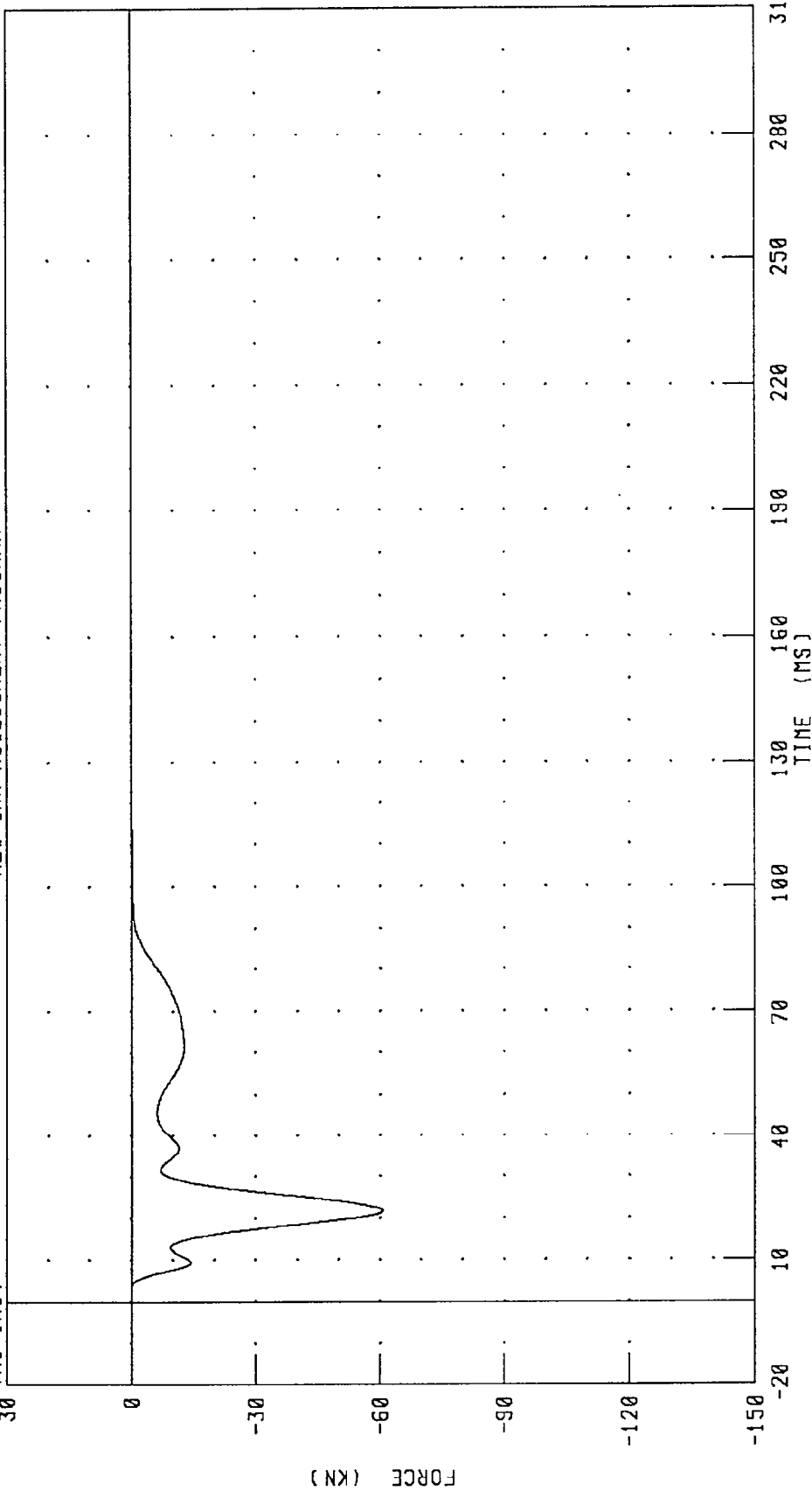
FILTER: CH. CLASS 60

PEAK DATA: 0.00 KN @ -9.76 MS; -226.56 KN @ 22.96 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B6 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



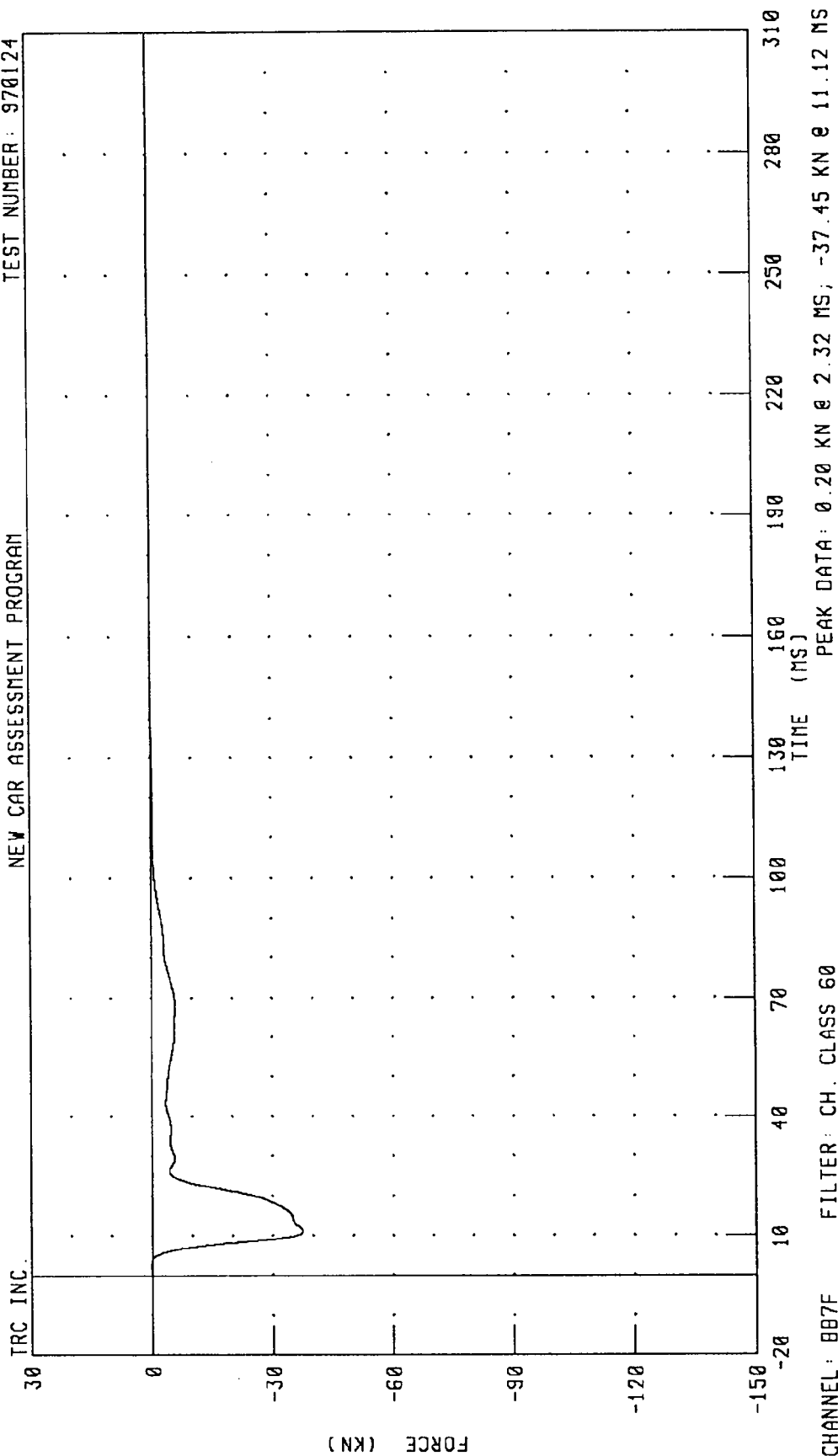
CHANNEL: BB6F

FILTER: CH. CLASS 60

PEAK DATA: 0.08 KN @ 2.00 MS, -60.67 KN @ 21.76 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B7 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

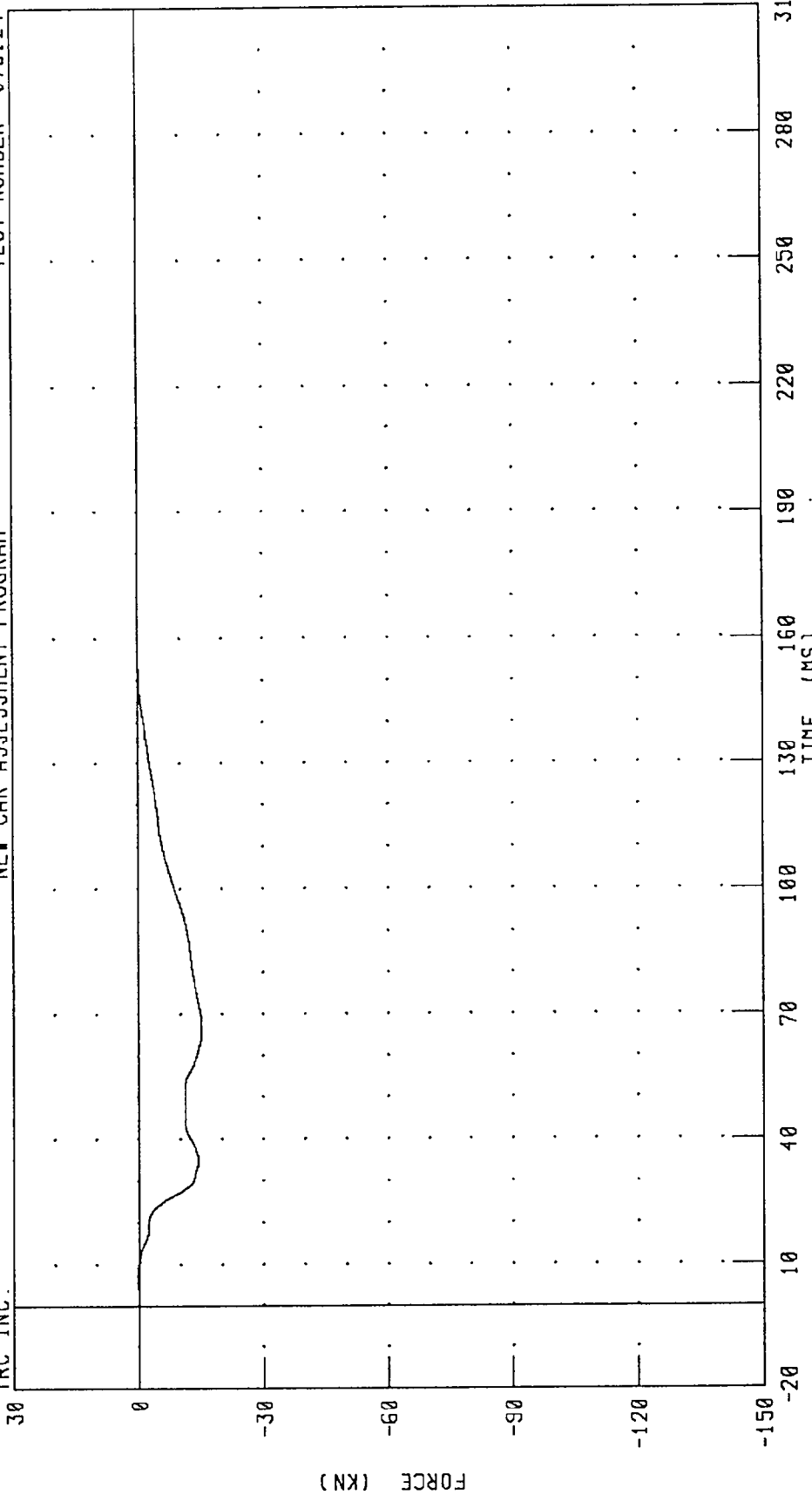


1987 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



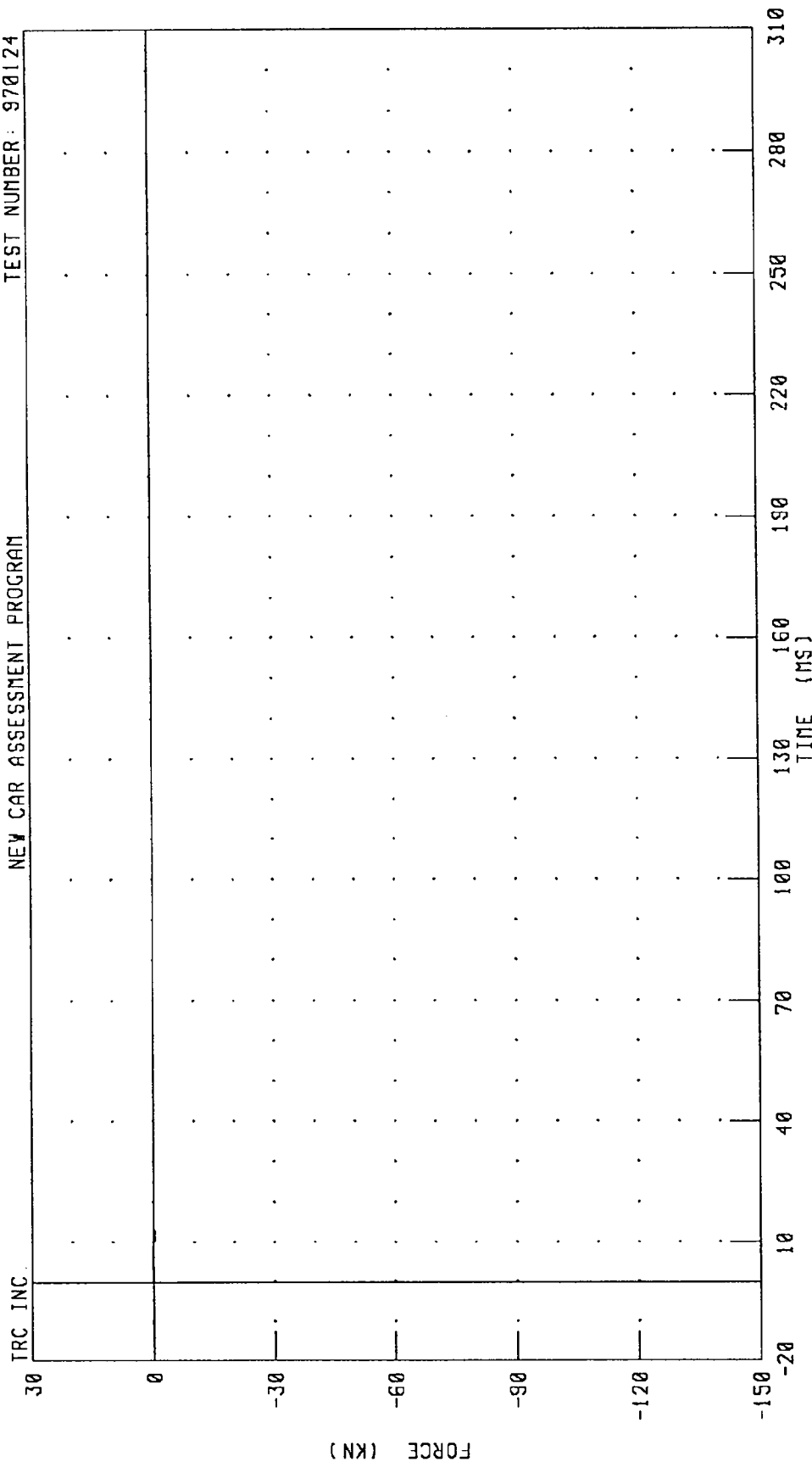
PEAK DATA: 0.31 KN @ 7.52 MS; -15.14 KN @ 66.48 MS

FILTER: CH. CLASS 60

CHANNEL: B88F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B9 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

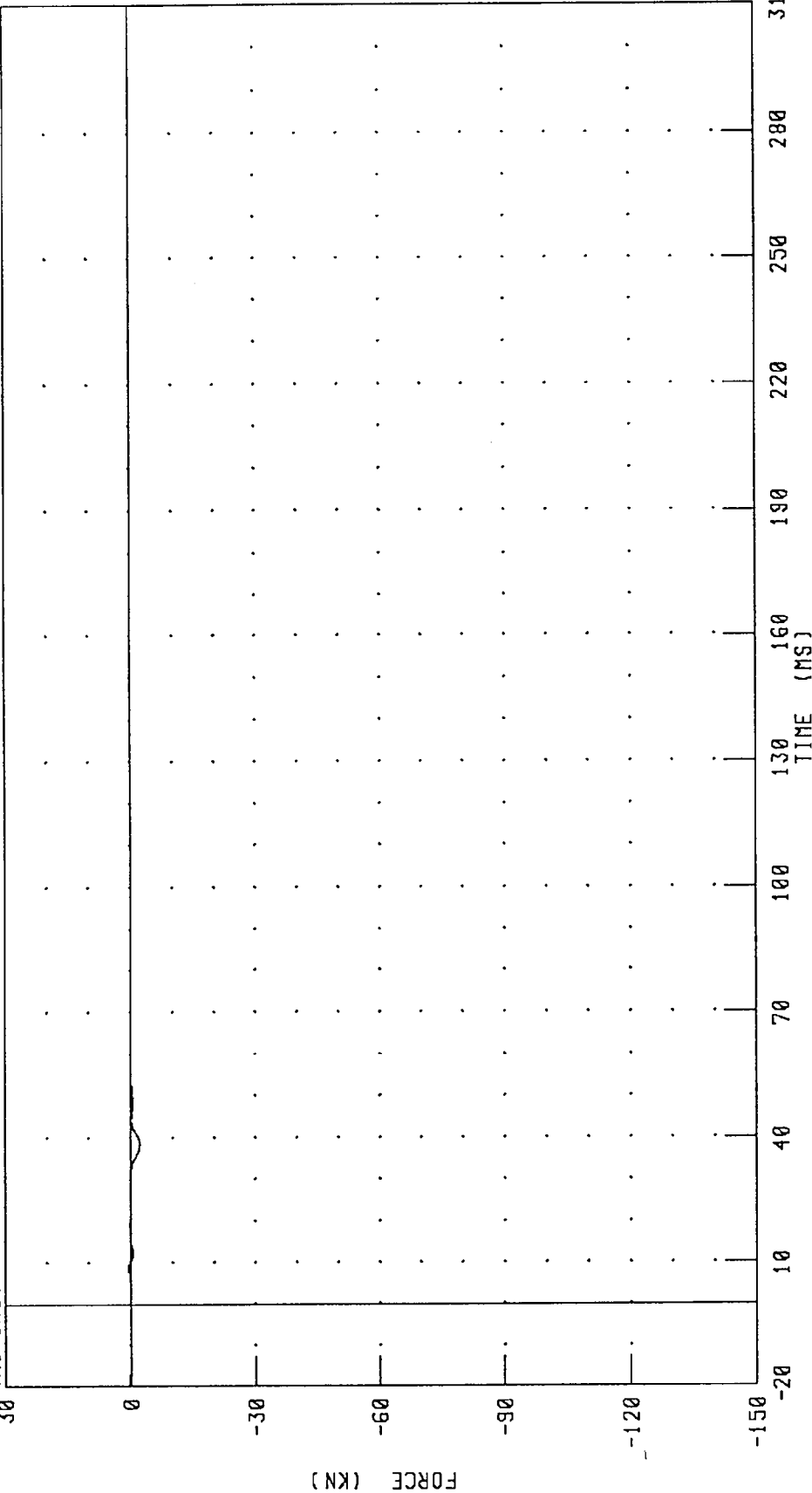


1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: BC1F FILTER: CH. CLASS 60

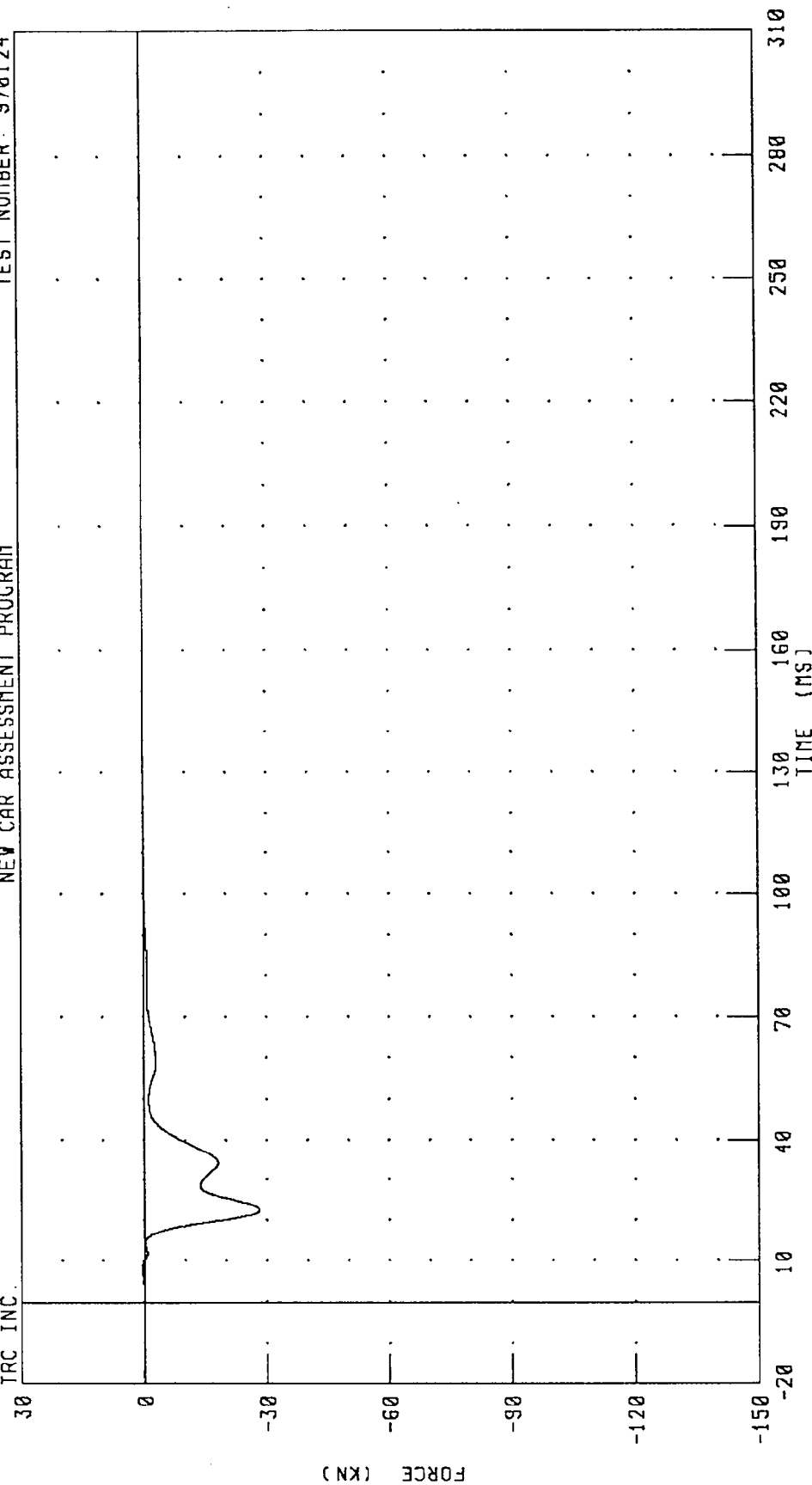
PEAK DATA: 0.41 KN @ 8.72 MS; -2.21 KN @ 38.72 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.44 KN @ 8.00 MS; -28.28 KN @ 22.56 MS

FILTER: CH. CLASS 60

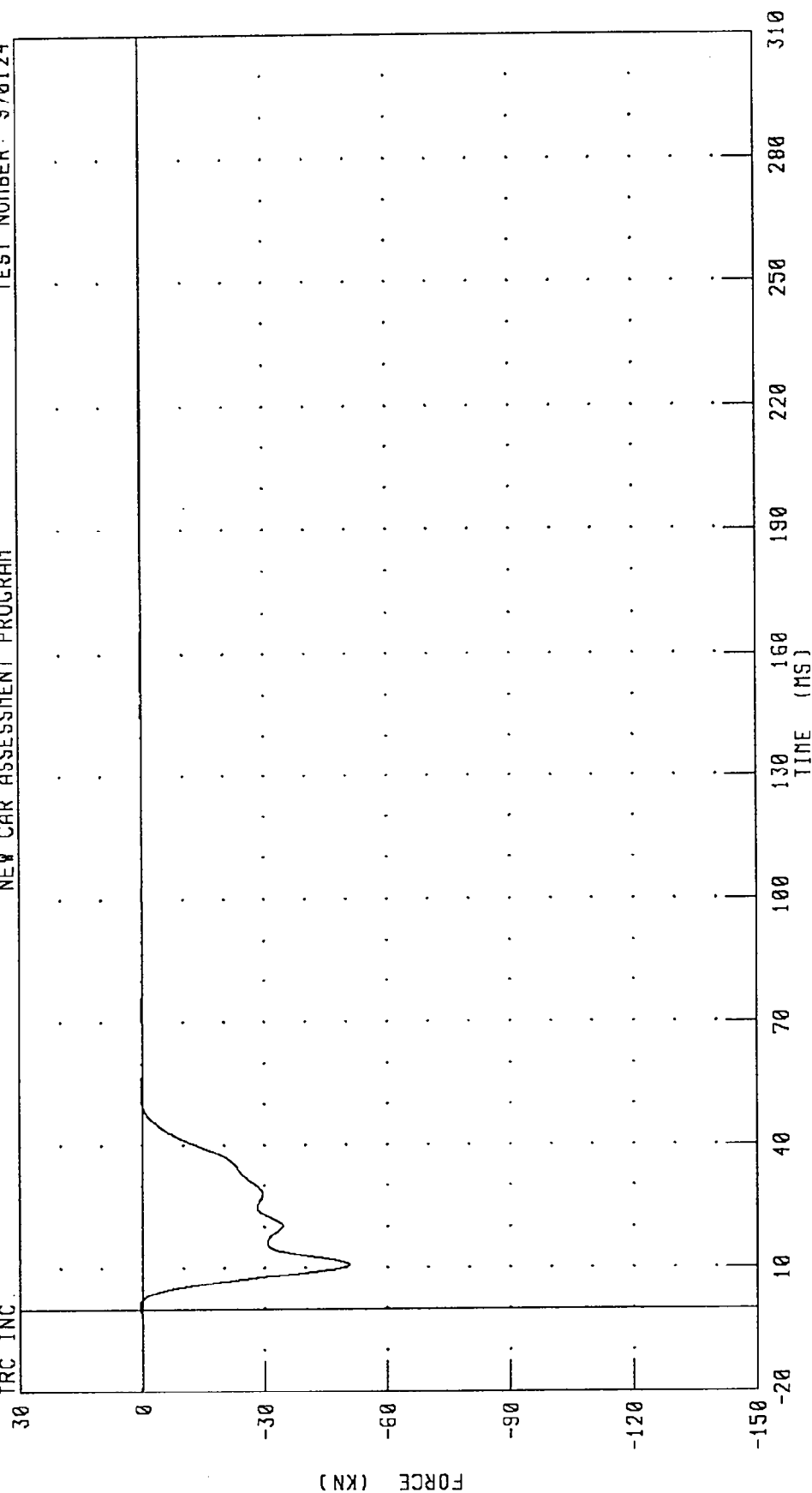
CHANNEL: BC2F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.56 KN @ 0.80 MS; -50.79 KN @ 10.80 MS

FILTER: CH. CLASS 60

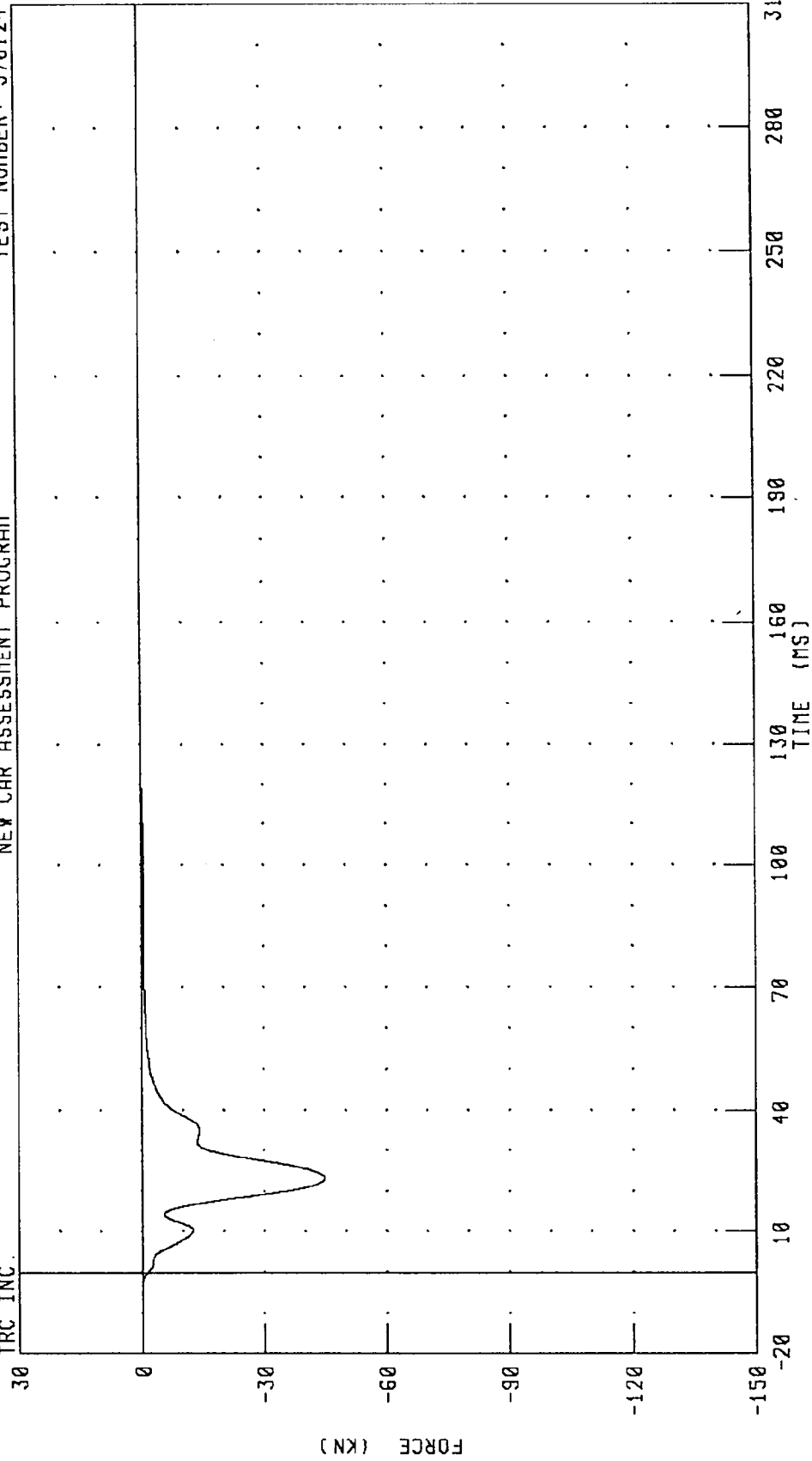
CHANNEL: BC3F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.07 KN @ -4.16 MS; -44.77 KN @ 23.20 MS

FILTER: CH. CLASS 60

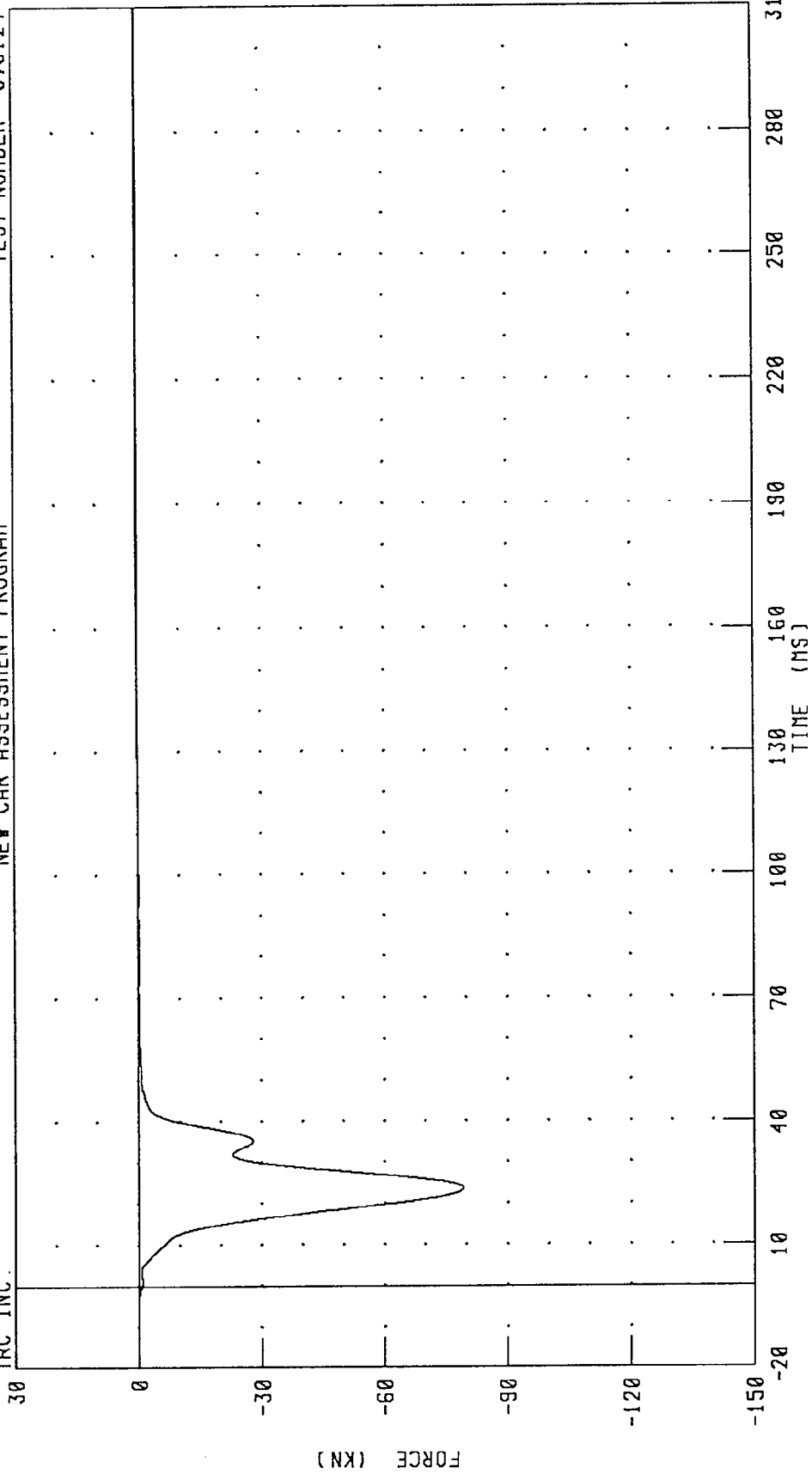
CHANNEL: BC4F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.20 KN @ 142.72 MS; -79.34 KN @ 23.68 MS

FILTER: CH. CLASS 60

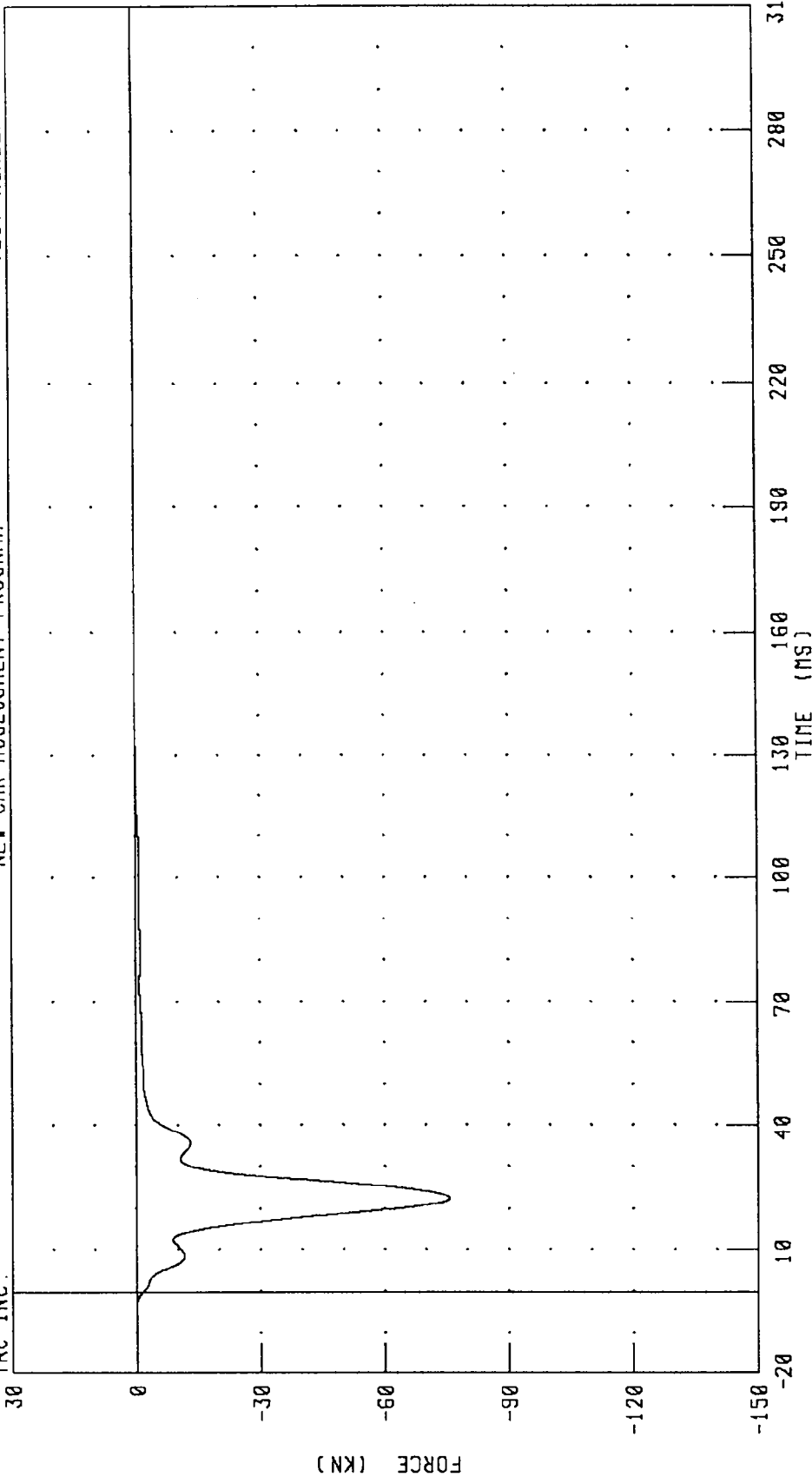
CHANNEL: BC5F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.08 KN @ -20.00 MS; -75.86 KN @ 22.40 MS

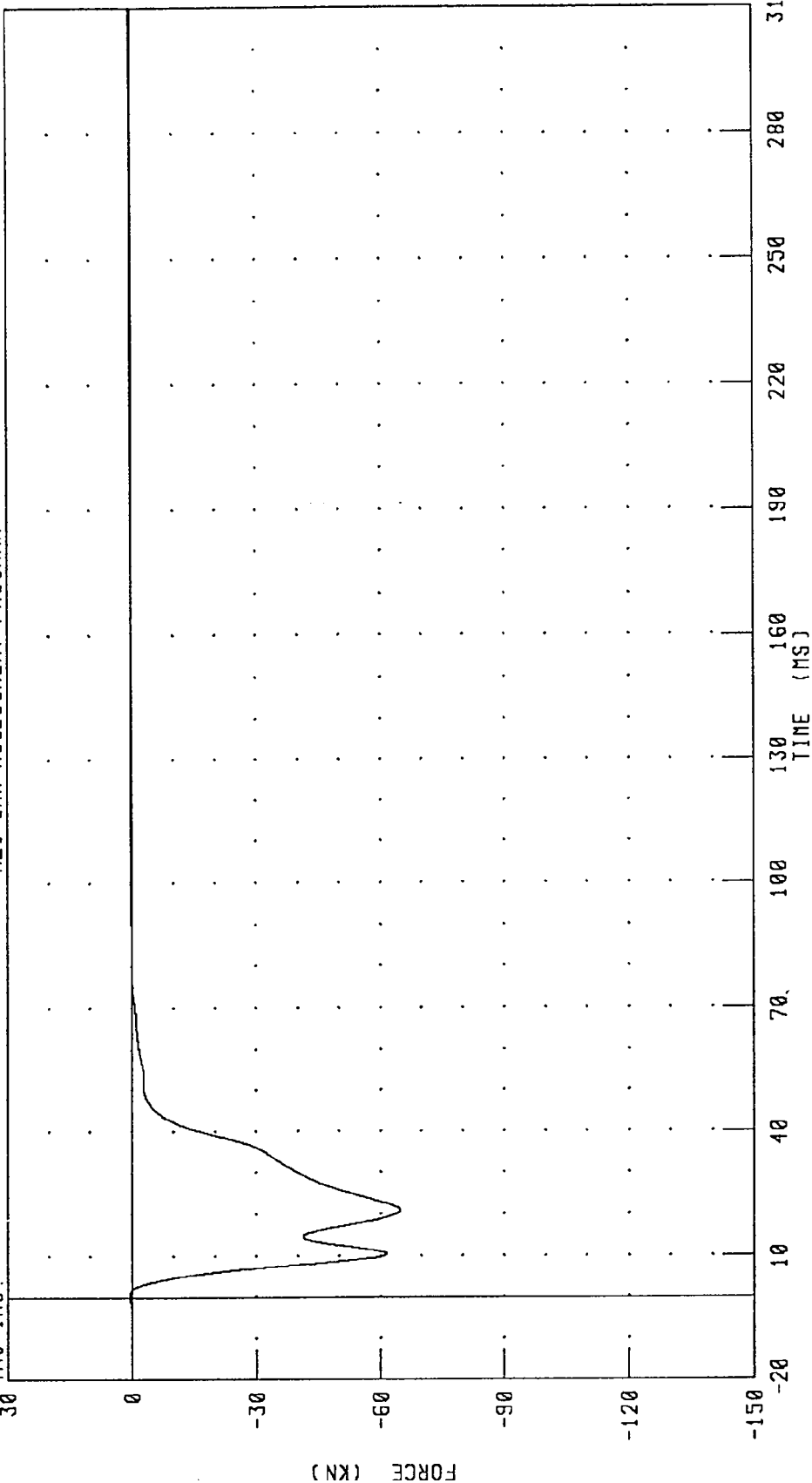
FILTER: CH. CLASS 60

CHANNEL: BC6F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C7 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124

TRC INC.



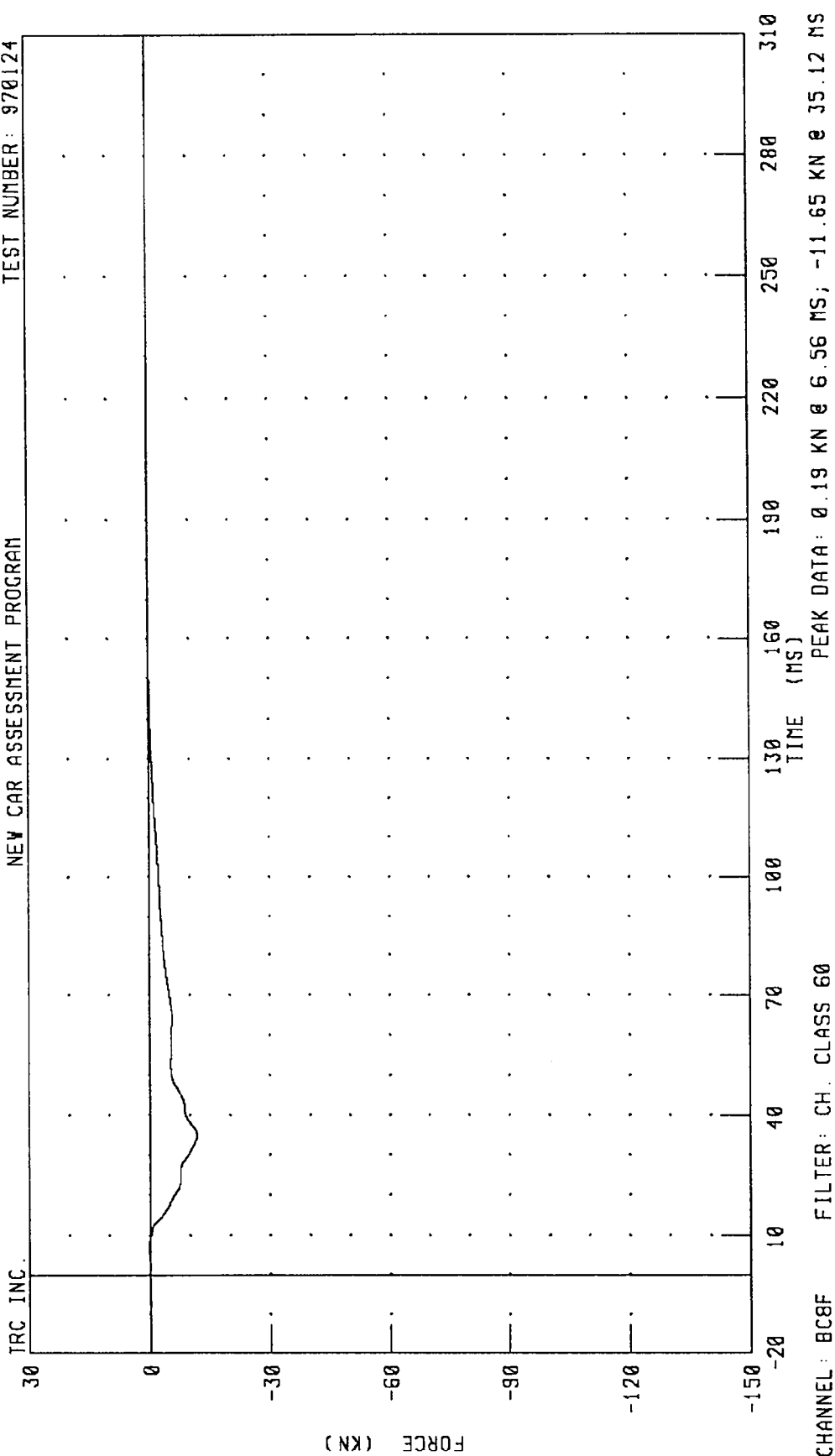
PEAK DATA: 0.57 KN @ 0.32 MS; -64.89 KN @ 20.88 MS

CHANNEL: BC7F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 0.19 KN @ 6.56 MS; -11.65 KN @ 35.12 MS

FILTER: CH. CLASS 60

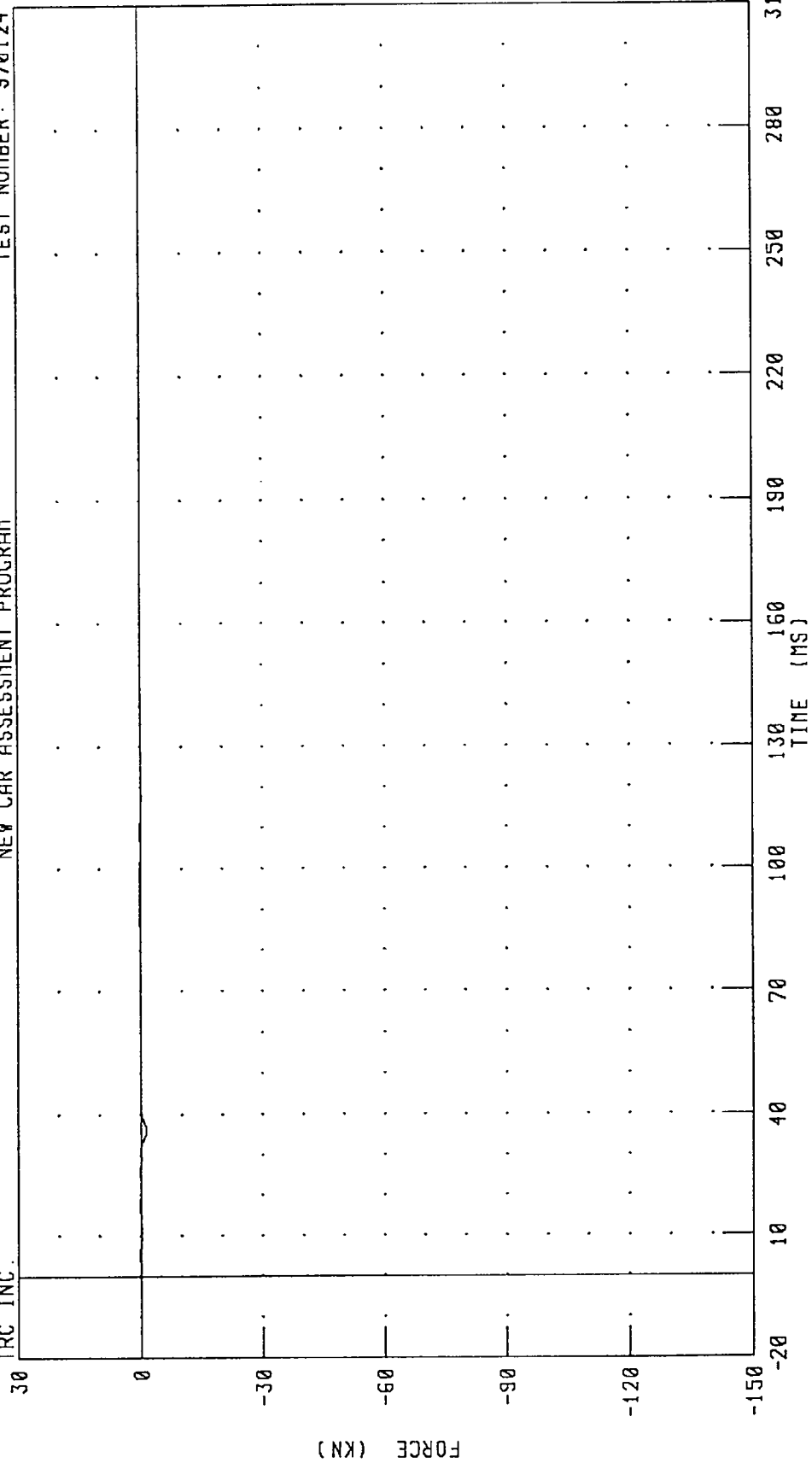
CHANNEL: BC8F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.32 KN @ 97.28 MS; -1.39 KN @ 36.24 MS

FILTER: CH. CLASS 60

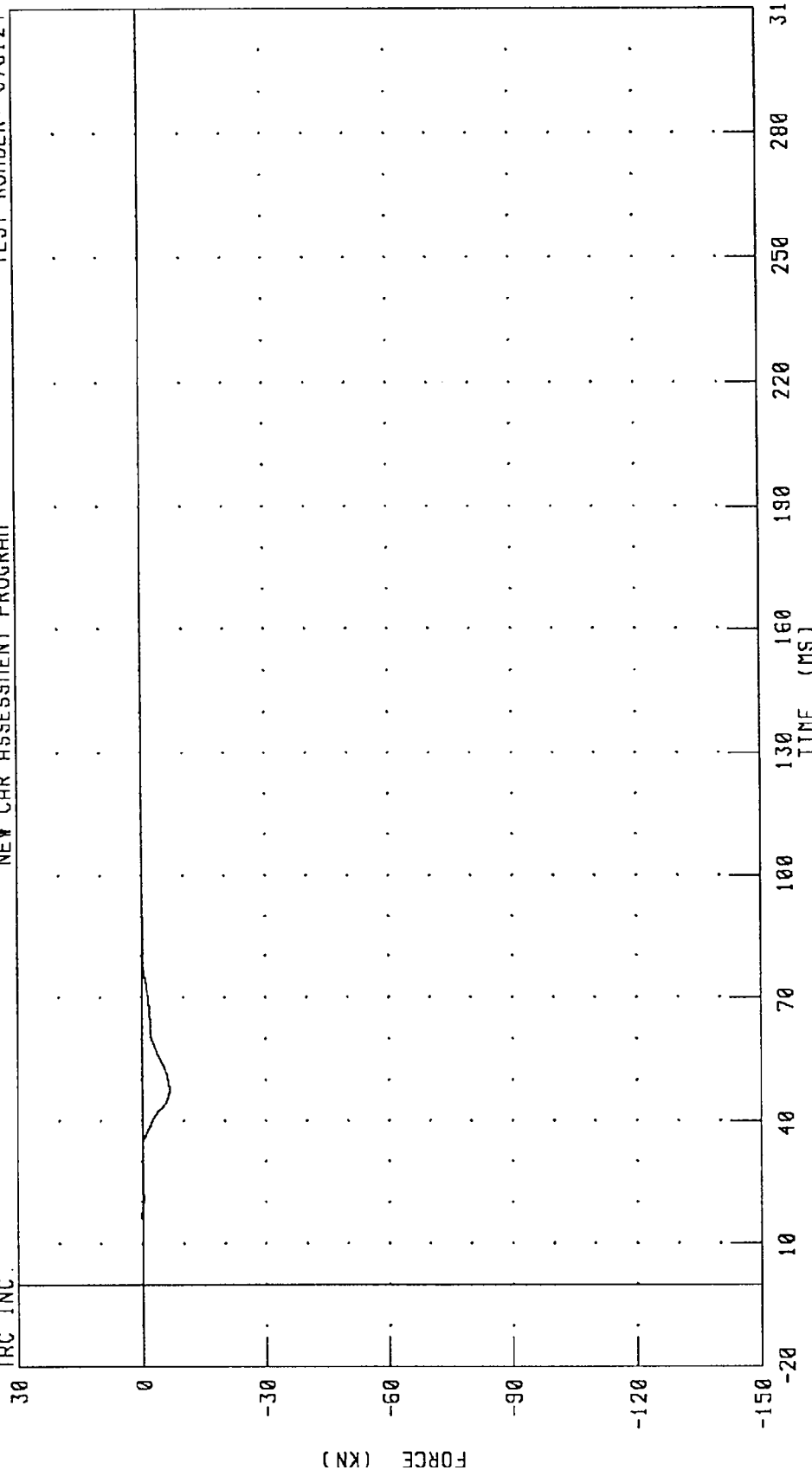
CHANNEL: BCSF

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



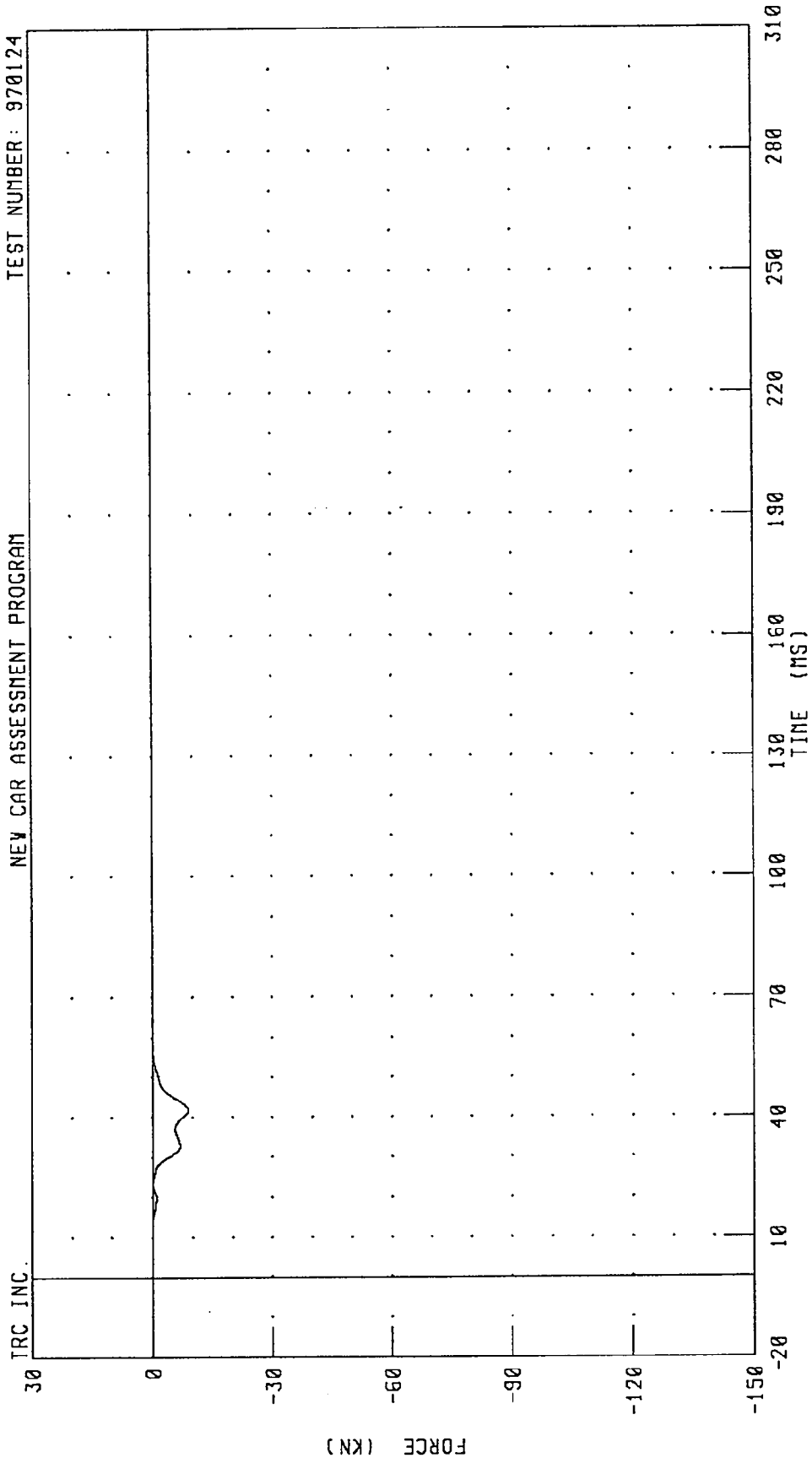
PEAK DATA: 0.11 KN @ 16.72 MS; -6.59 KN @ 47.68 MS

FILTER: CH. CLASS 60

CHANNEL: BD1F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D2 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 0.10 KN @ -20.00 MS; -9.03 KN @ 41.92 MS

FILTER: CH. CLASS 60

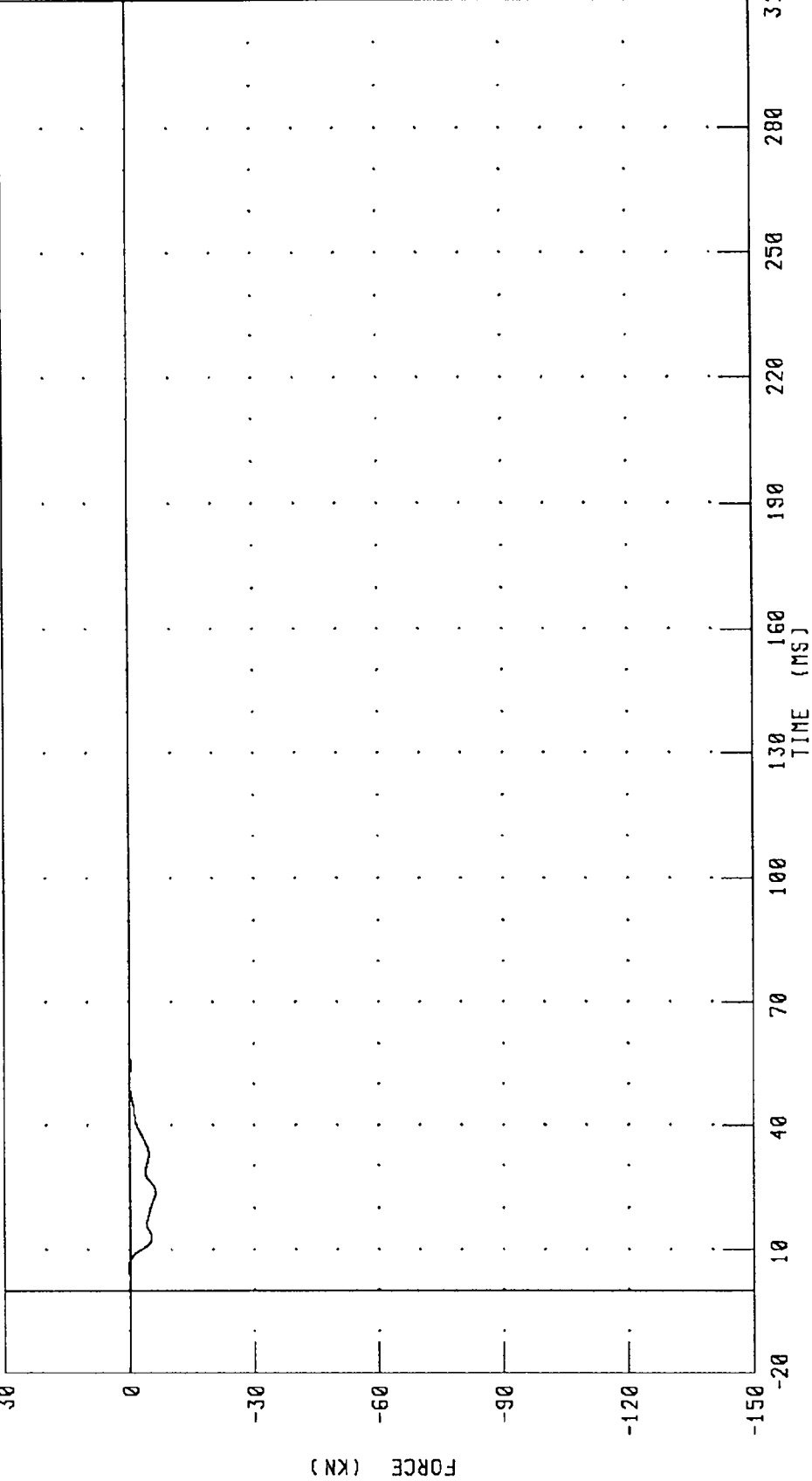
CHANNEL: BD2F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.24 KN @ 5.92 MS; -6.25 KN @ 23.84 MS

FILTER: CH. CLASS 60

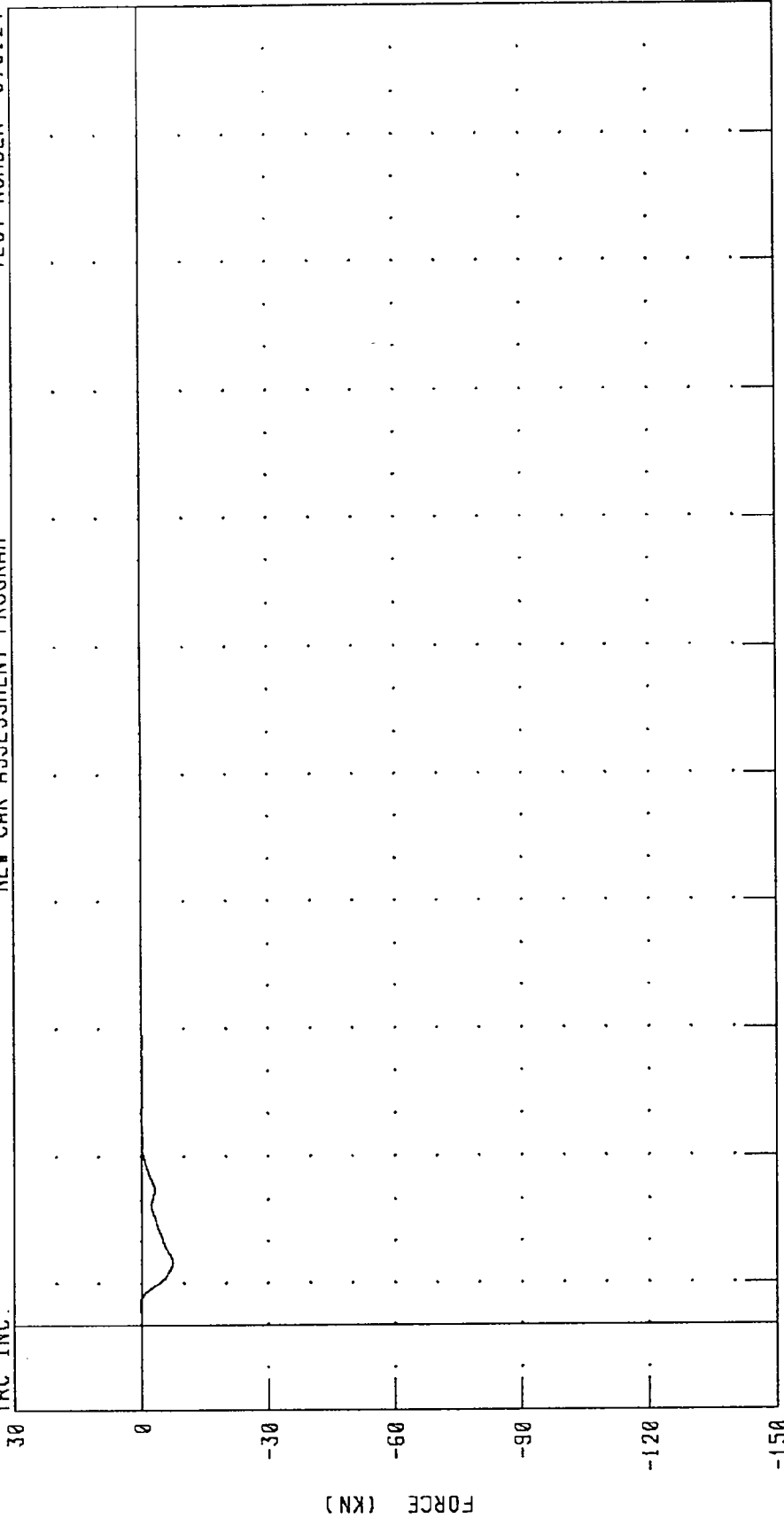
CHANNEL: BD3F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D4 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.23 KN @ 5.12 MS; -7.44 KN @ 14.96 MS

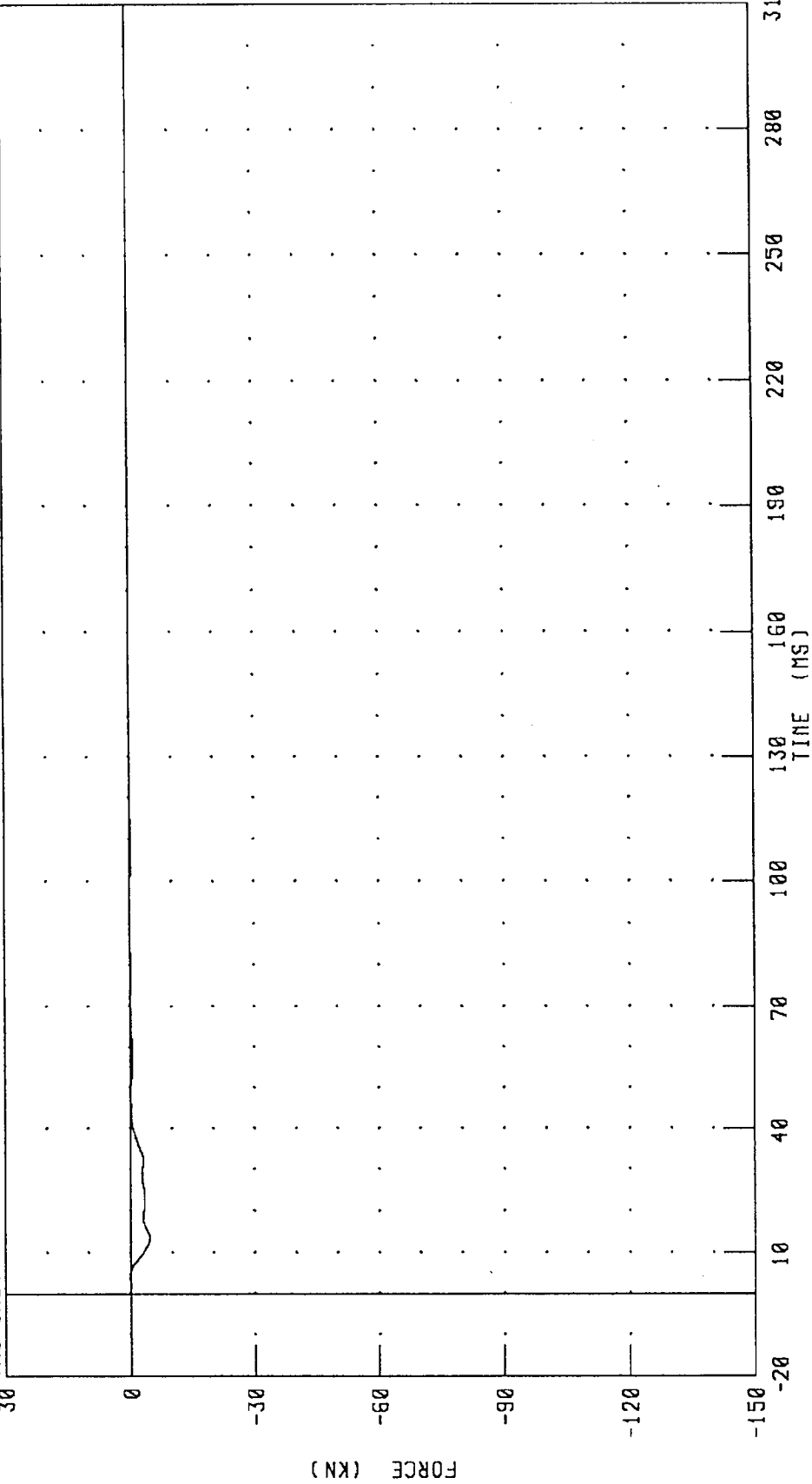
CHANNEL: BD4F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.12 KN @ 4.08 MS; -4.67 KN @ 13.36 MS

FILTER: CH. CLASS 60

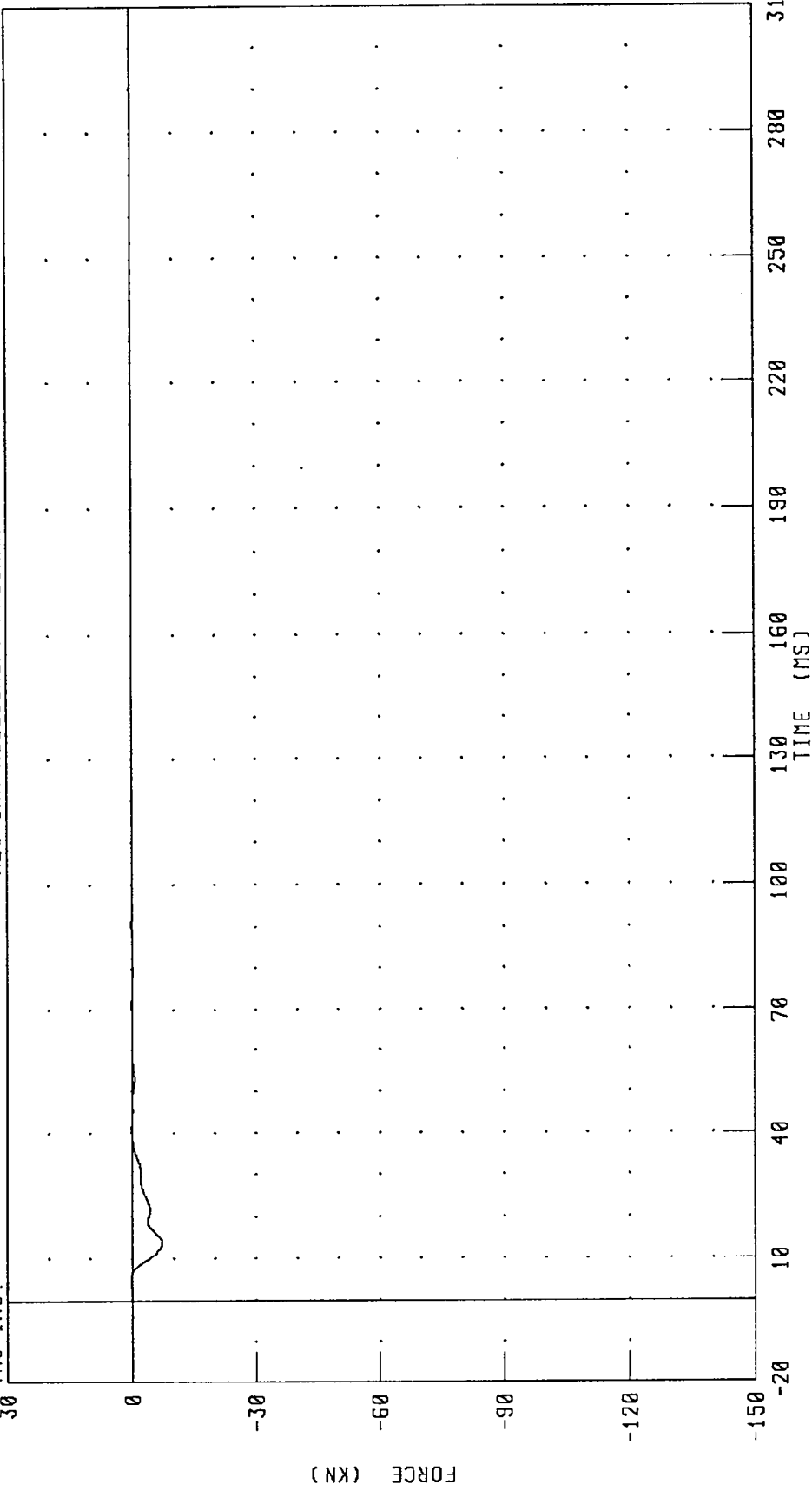
CHANNEL: B05F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.23 KN @ 5.12 MS; -7.23 KN @ 14.00 MS

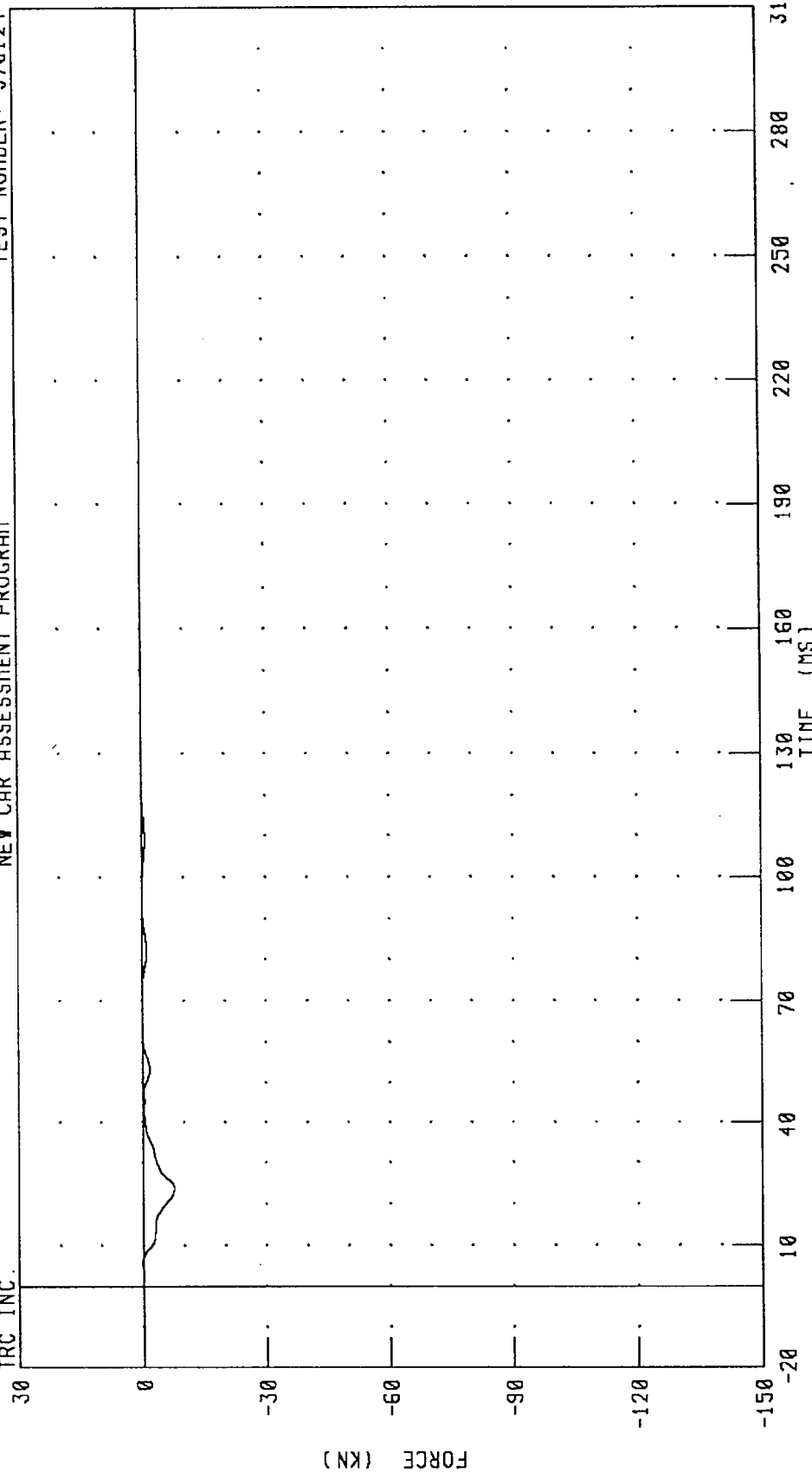
CHANNEL: 806F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.12 KN @ 5.36 MS; -7.58 KN @ 23.84 MS

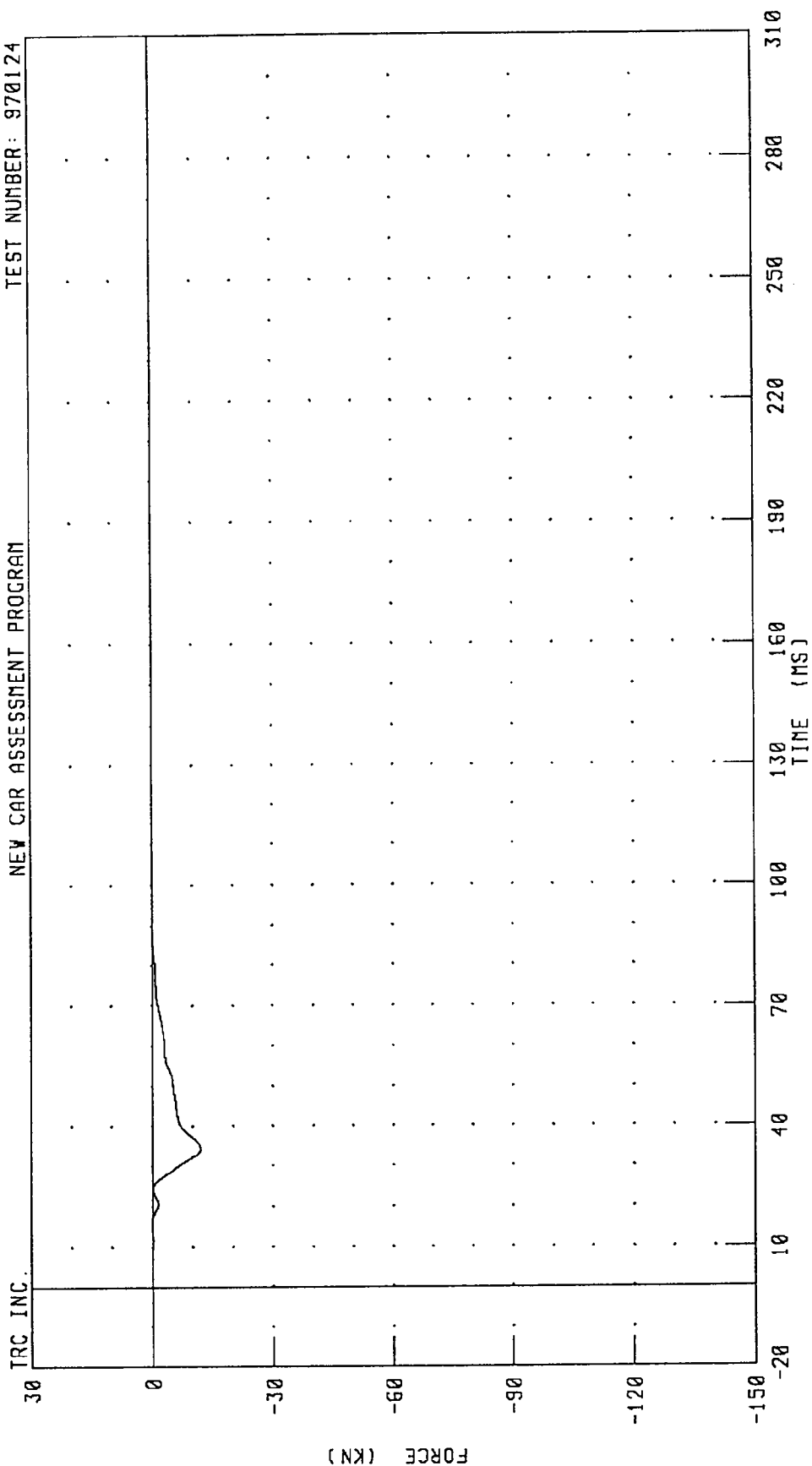
FILTER: CH. CLASS 60

CHANNEL: B07F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 0.30 KN @ 15.84 MS; -11.98 KN @ 34.32 MS

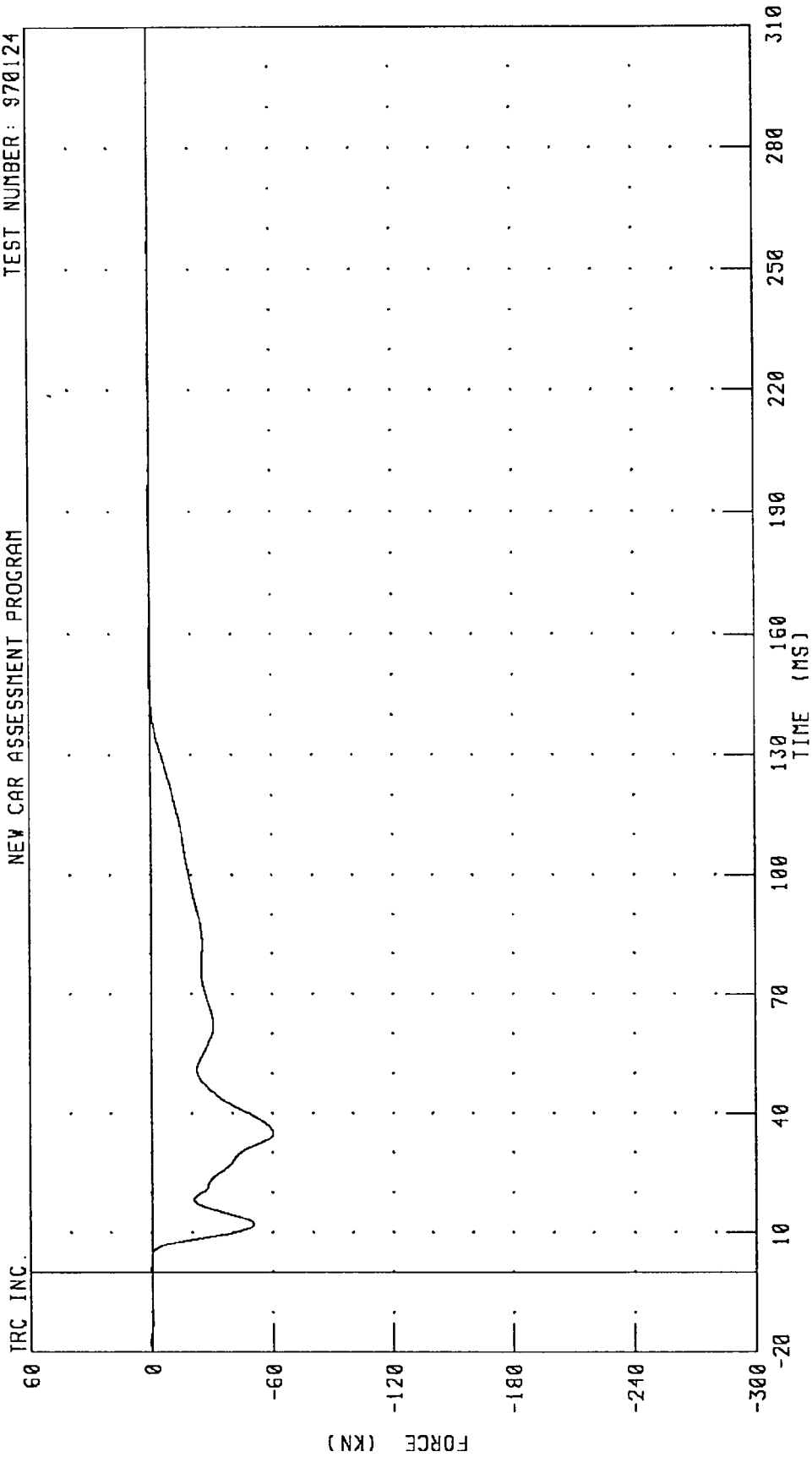
FILTER: CH. CLASS 60

CHANNEL: BD8F

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL

NEW CAR ASSESSMENT PROGRAM

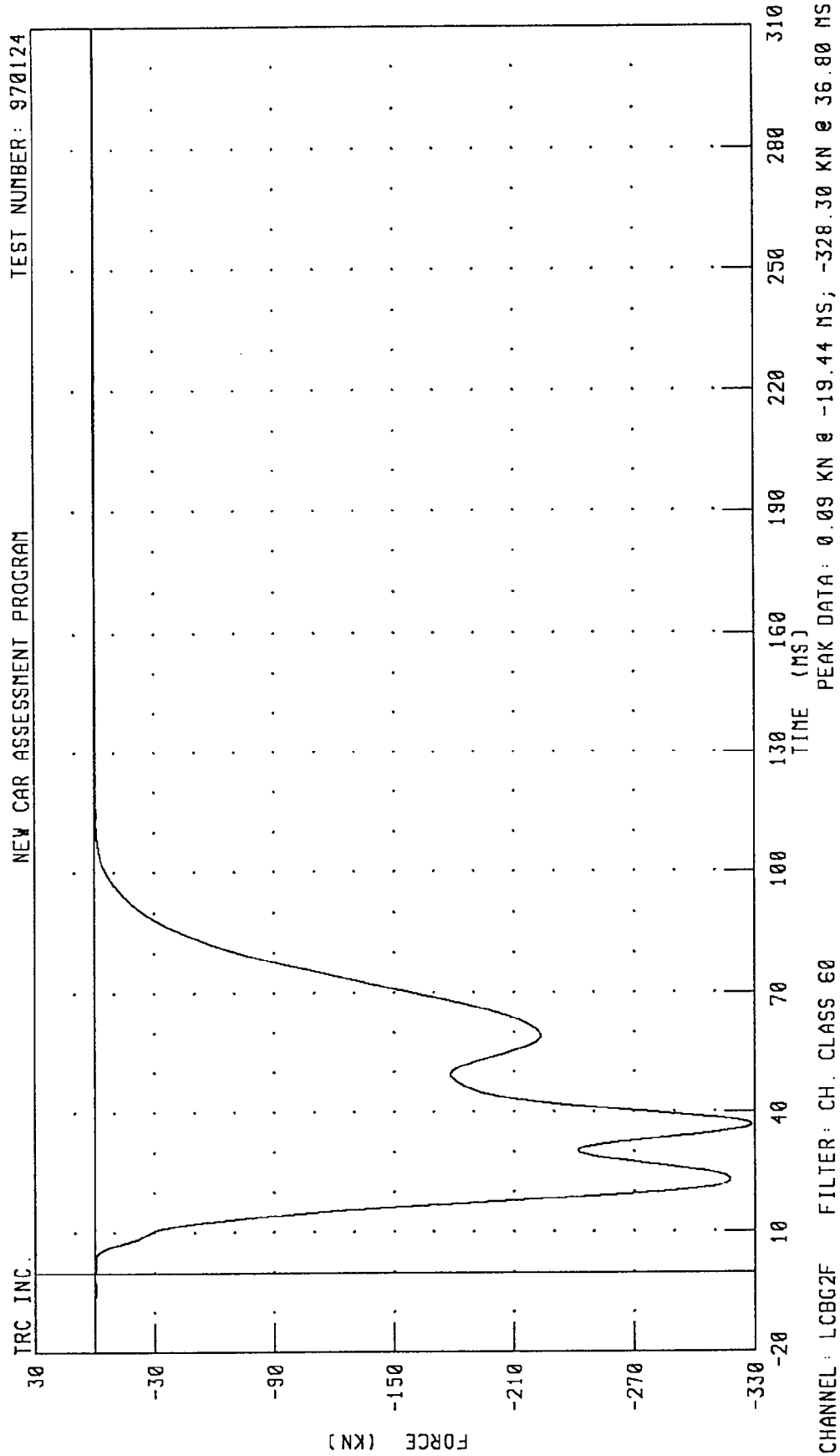
TEST NUMBER: 970124



PEAK DATA: 0.74 KN @ -17.44 MS; -60.25 KN @ 35.04 MS

CHANNEL: LCBGIF FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL

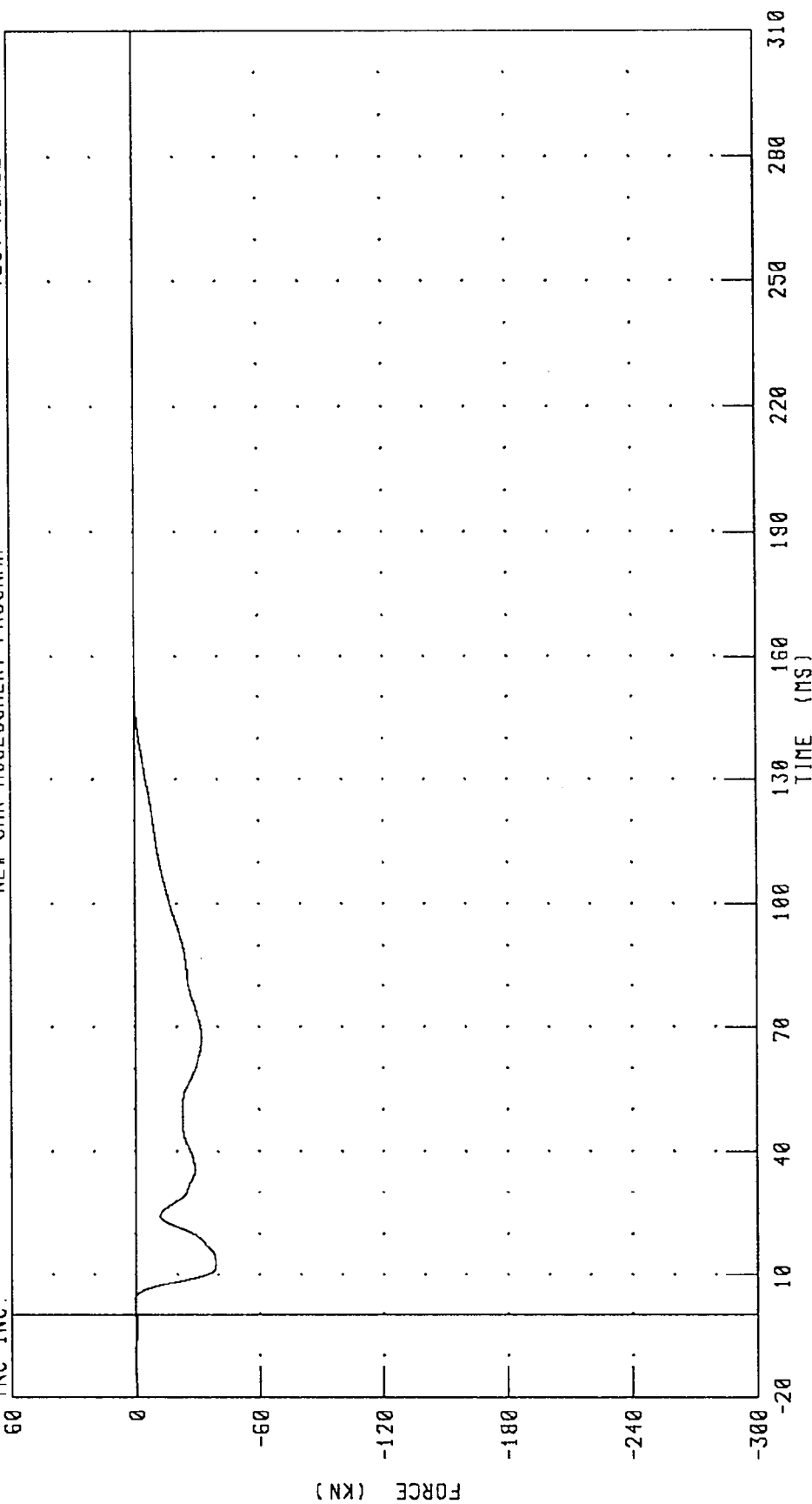


1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.57 KN @ 3.04 MS; -38.94 KN @ 12.08 MS

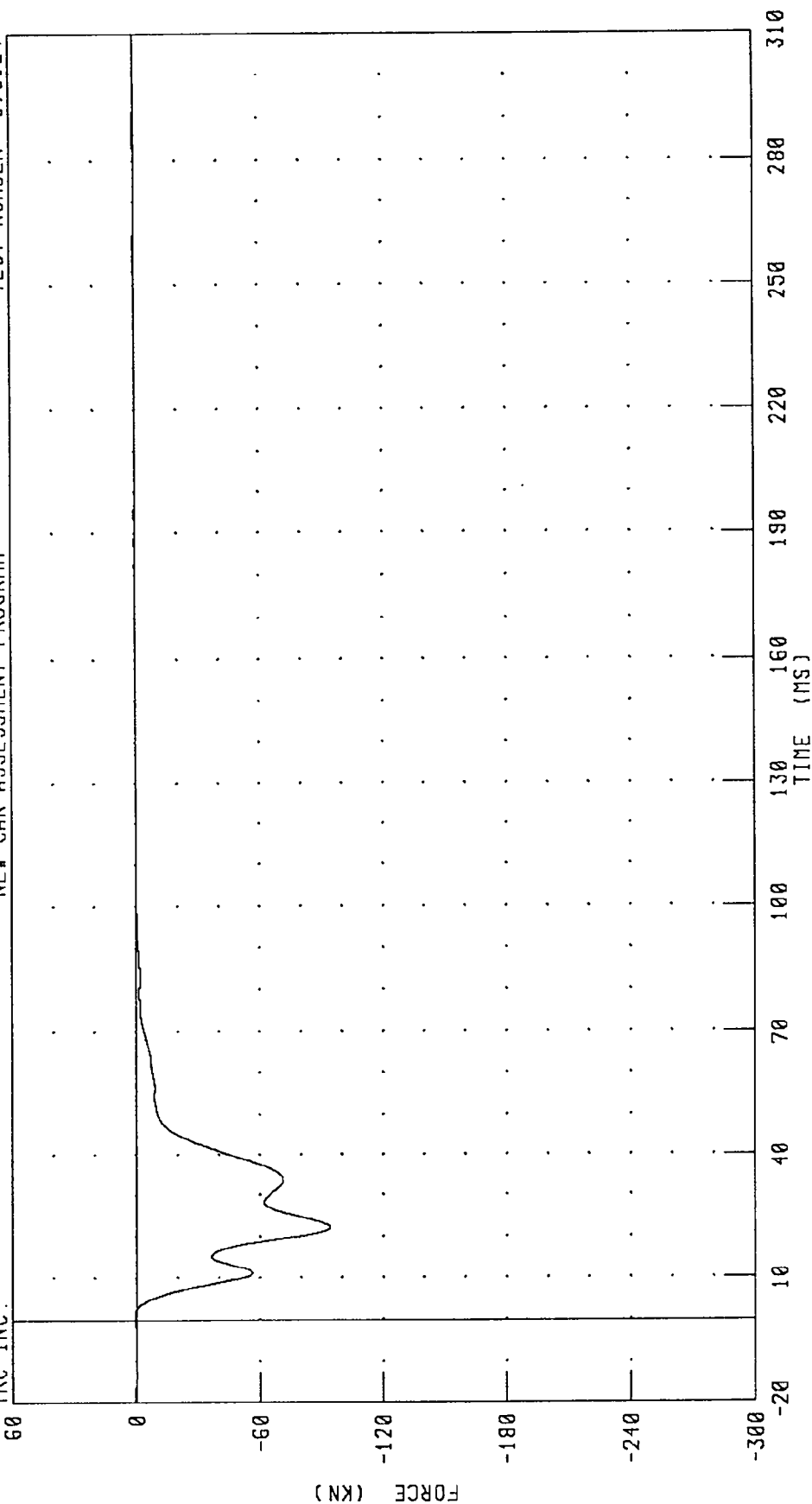
CHANNEL: LCBG3F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.61 KN @ 0.72 MS; -94.29 KN @ 22.16 MS

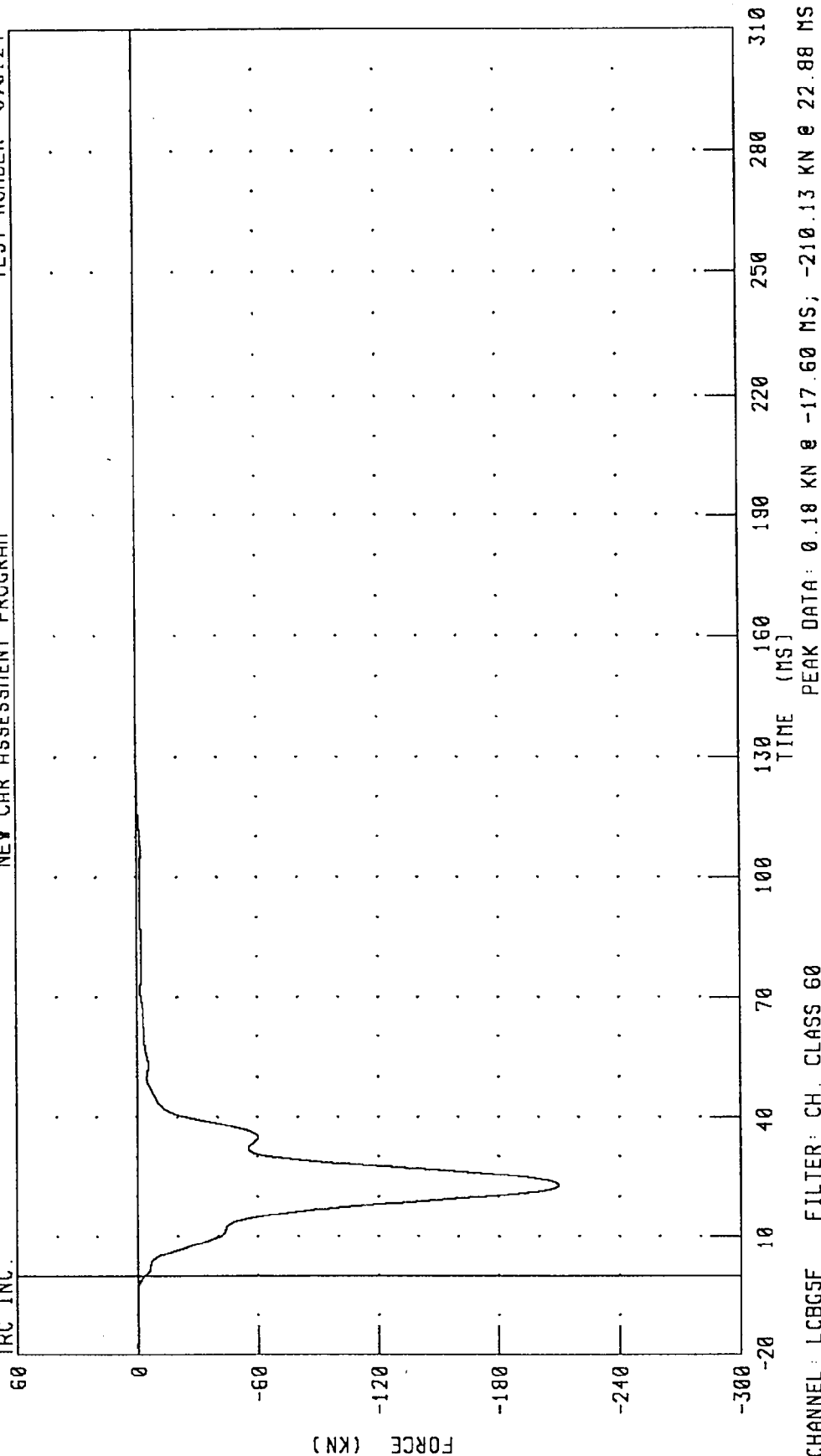
CHANNEL: LCBG4F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.18 KN @ -17.60 MS; -210.13 KN @ 22.88 MS

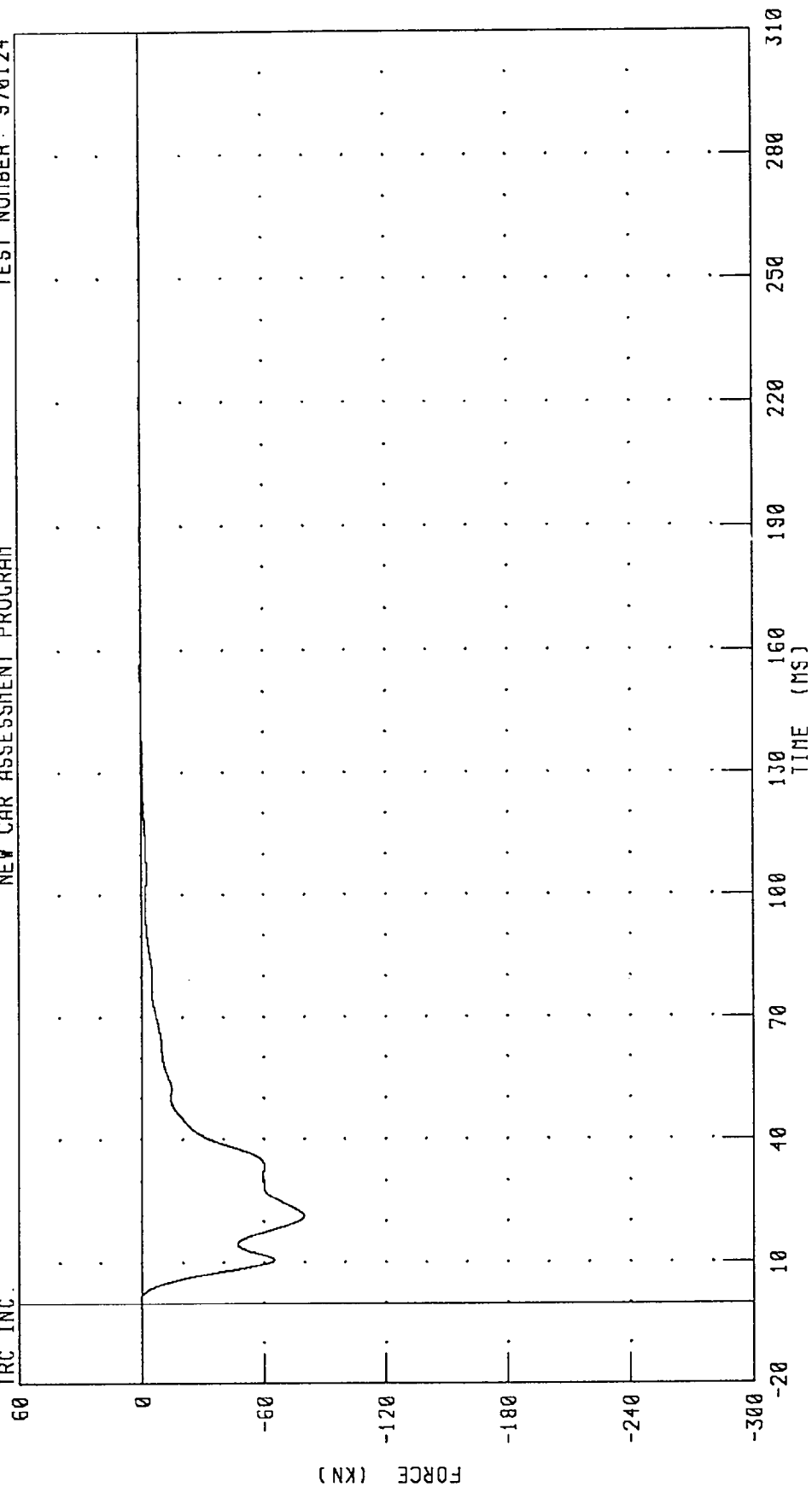
CHANNEL: LCBG5F FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.

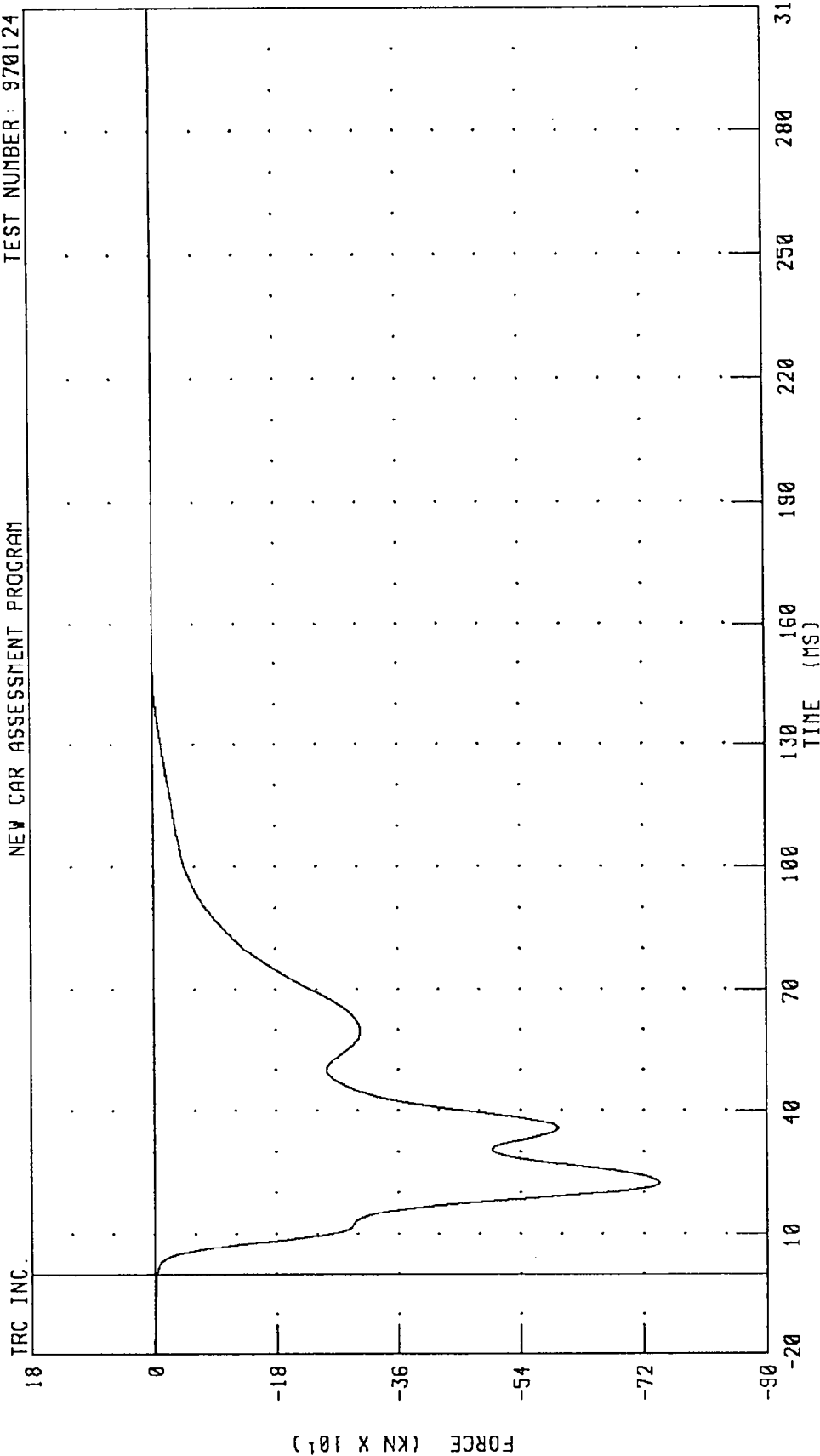


CHANNEL: LCBG6F FILTER: CH. CLASS 60

PEAK DATA: 0.62 KN @ 0.48 MS; -79.66 KN @ 21.28 MS

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 970124



PEAK DATA: 0.88 KN @ -17.68 MS; -743.56 KN @ 22.32 MS

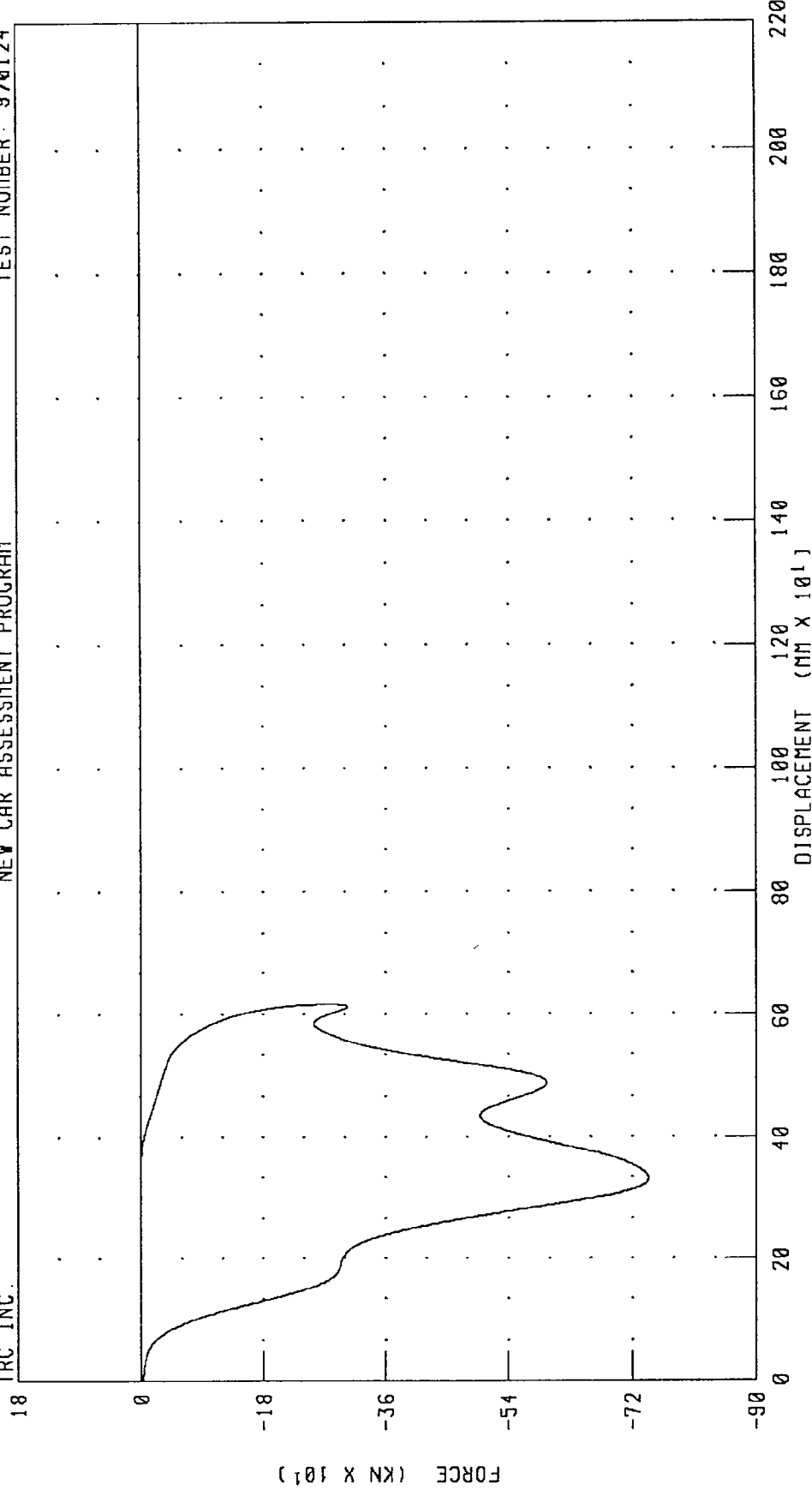
CHANNEL: LCBGT FILTER: CH. CLASS 60

1997 TOYOTA RAV4 INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TEST NUMBER: 970124

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: QTHXD FILTER: CH. CLASS 180
LCBGT CH. CLASS 60
PEAK DATA: 616.46 MM @ 65.84 MS; -142.94 MM @ 310.00 MS
0.37 KN @ 153.84 MS; -743.56 KN @ 22.32 MS

Appendix C

Dummy Certification Data

Pre-test Certification Data

Driver Dummy S/N: 142

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III EXTERNAL DIMENSIONS

SN 142 HUMANOID

23-JAN-97

TRC INC.

TEST NO: 142C36ED1

572E SN142 EXT.DIMENSION CAL36

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

Richard L. Lee

RUN NUMBER: 012397.0831

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

23-JAN-97

TRC INC.

TEST NO: 142C36HD1

572E SN142 HEAD DROP CAL 36

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	29.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	266.55 G
PEAK LATERAL ACCELERATION	15 G MAX	-5.57 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

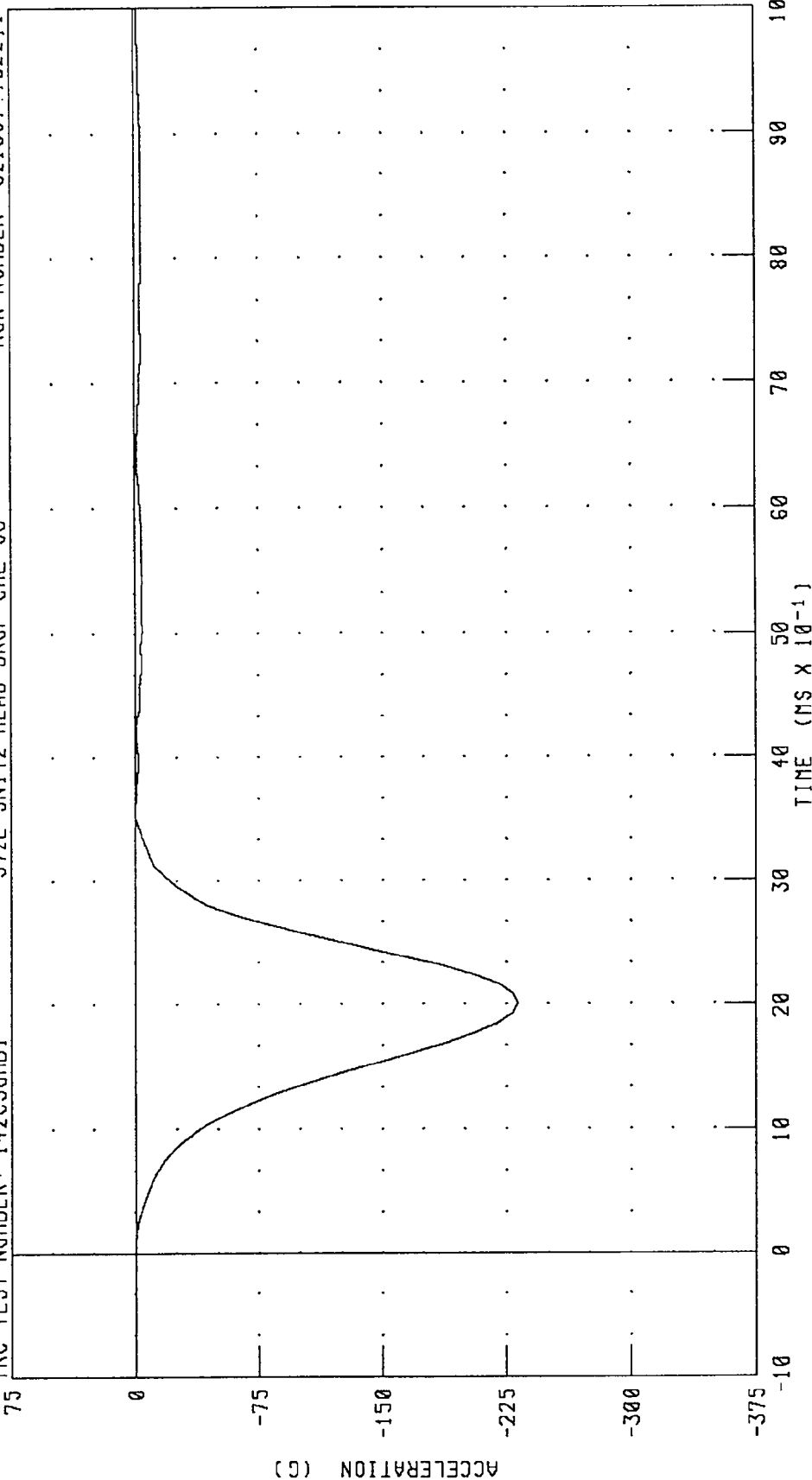
TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

RUN NUMBER: 012397.0933;1

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

TRC TEST NUMBER: 142C36HD1 572E SN142 HEAD DROP CAL 36 RUN NUMBER: 021897.1322;1

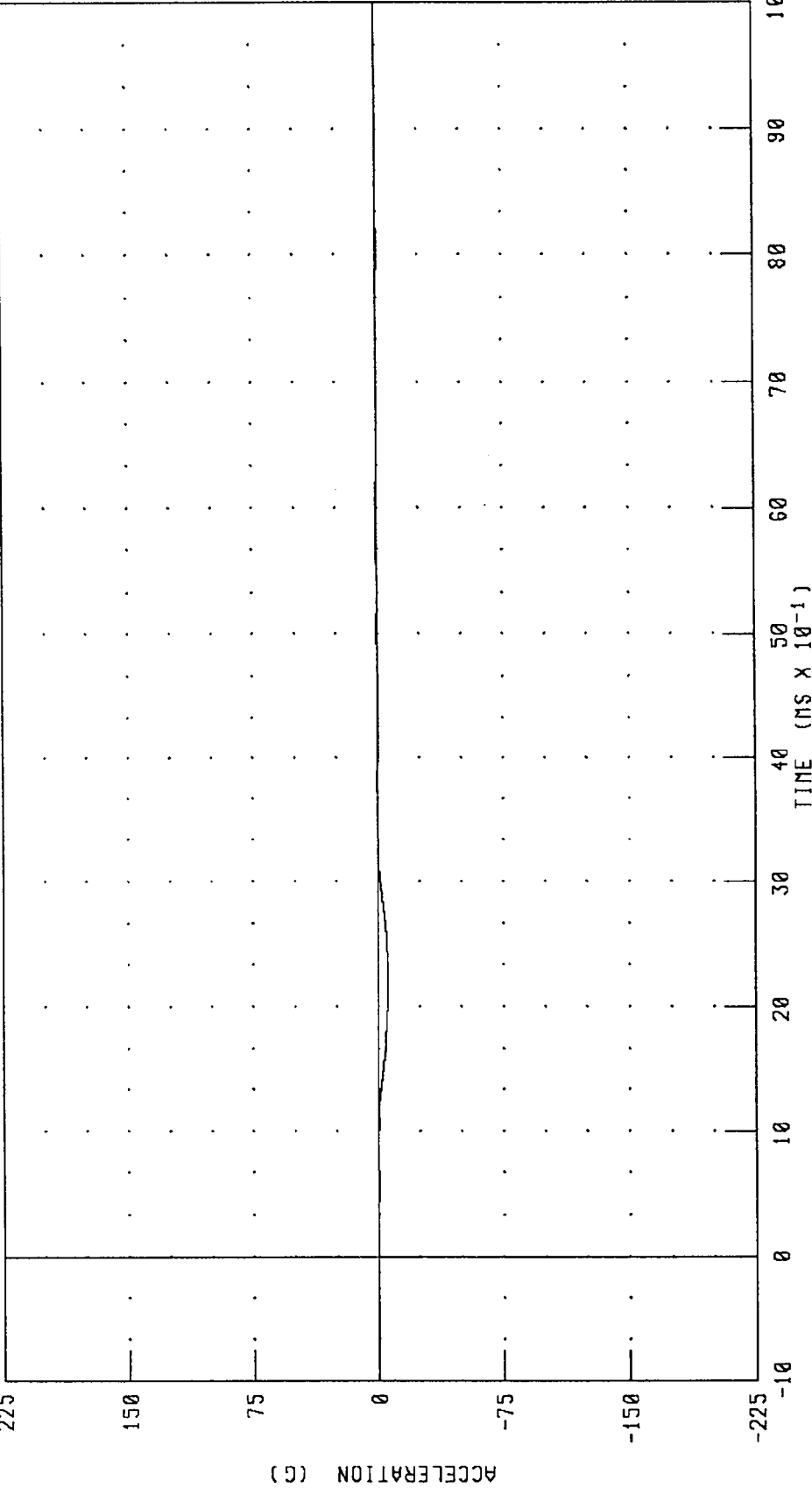


CHANNEL: HEDXG FILTER: CH. CLASS 1000

PEAK DATA: 0.06 G @ 0.00 MS; -232.00 G @ 2.00 MS

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

TRC TEST NUMBER: 142C36HD1 572E SN142 HEAD DROP CAL 36 RUN NUMBER: 021897.1322.1



PEAK DATA: 0.63 G @ 6.00 MS; -5.58 G @ 2.24 MS

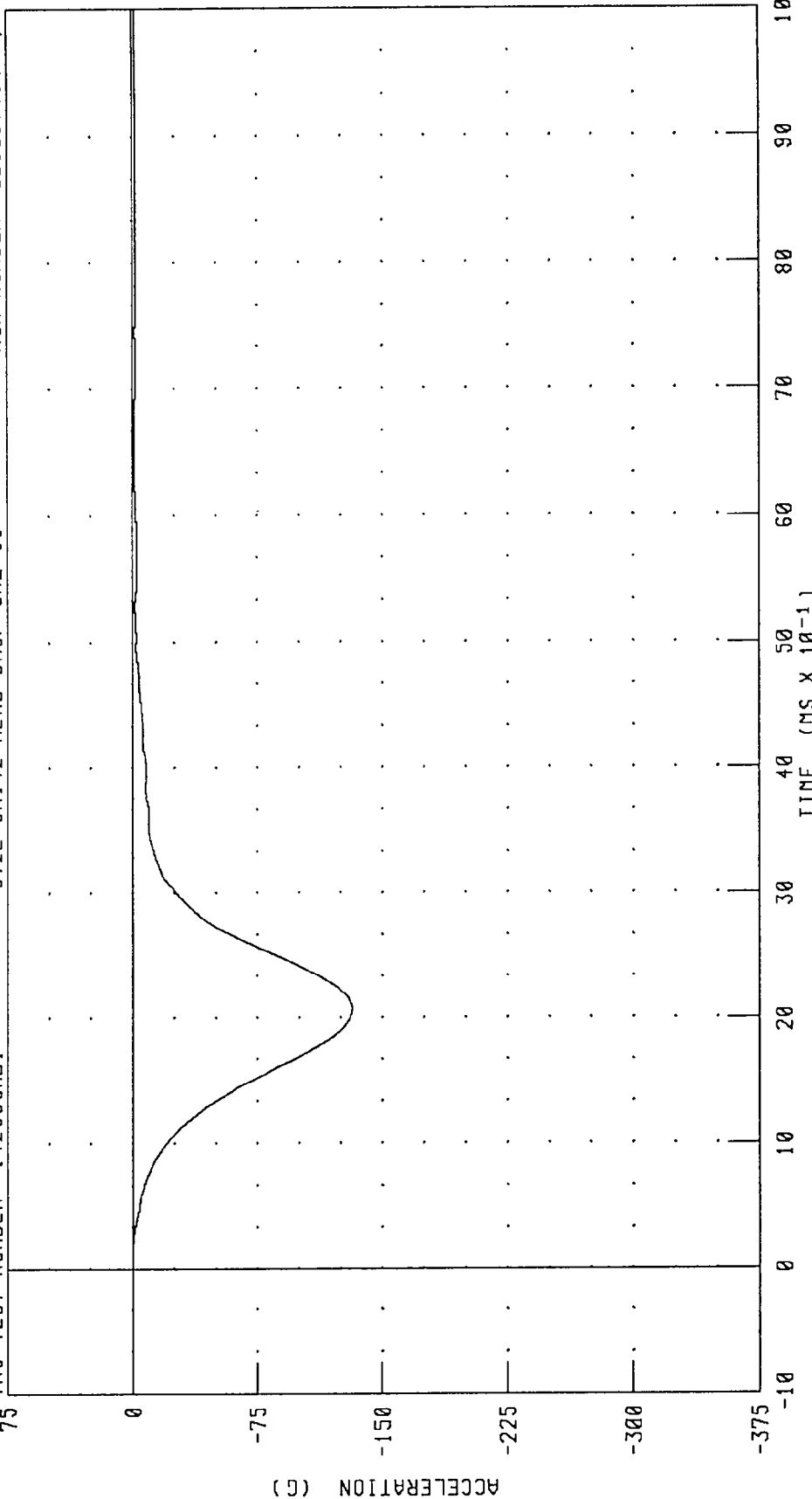
CHANNEL: HEDYG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

572E SN142 HEAD DROP CAL 36 RUN NUMBER: 021897.1322.1

TRC TEST NUMBER: 142C36HD1



PEAK DATA: 0.02 G @ 0.08 MS; -131.93 G @ 2.08 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SN142 HEAD DROP CAL 36

RUN NUMBER: 021897.1322;1

TRC TEST NUMBER: 142C36HD1

375

300

ACCELERATION (G)

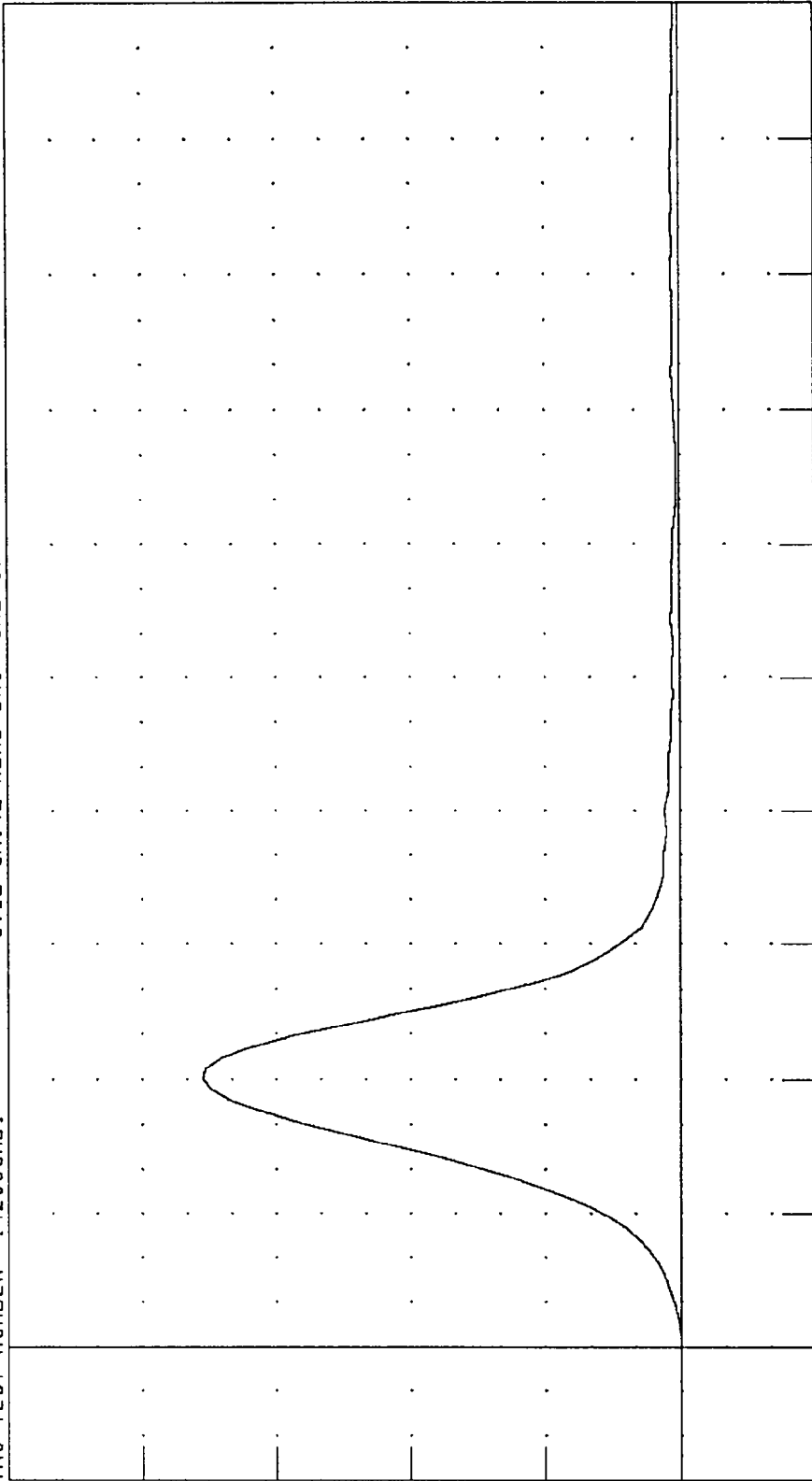
225

150

75

0

-75



TIME (MS X 10⁻¹)

100 90 80 70 60 50 40 30 20 10 0

PEAK DATA: 266.56 G @ 2.00 MS; 0.09 G @ -0.56 MS

CHANNEL: HEDRC FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

23-JAN-97

TRC INC. TEST NO: 142C36NF1 572E SN142 NECK FLEXION CAL36

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	29.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.93 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.07 G
	20 MS	17.60 - 22.60 G	20.97 G
	30 MS	12.50 - 18.50 G	15.98 G
MAX PENDULUM G		29 G MAX	23.84 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.88 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.40 MS
D PLANE	MAX	64 - 78 DEG.	74.39 DEG.
ROTATION	TIME	57 - 64 MS	58.56 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	97.12 NM
	TIME	47 - 58 MS	50.32 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.52 MS

TEST MEETS SPECIFICATIONS

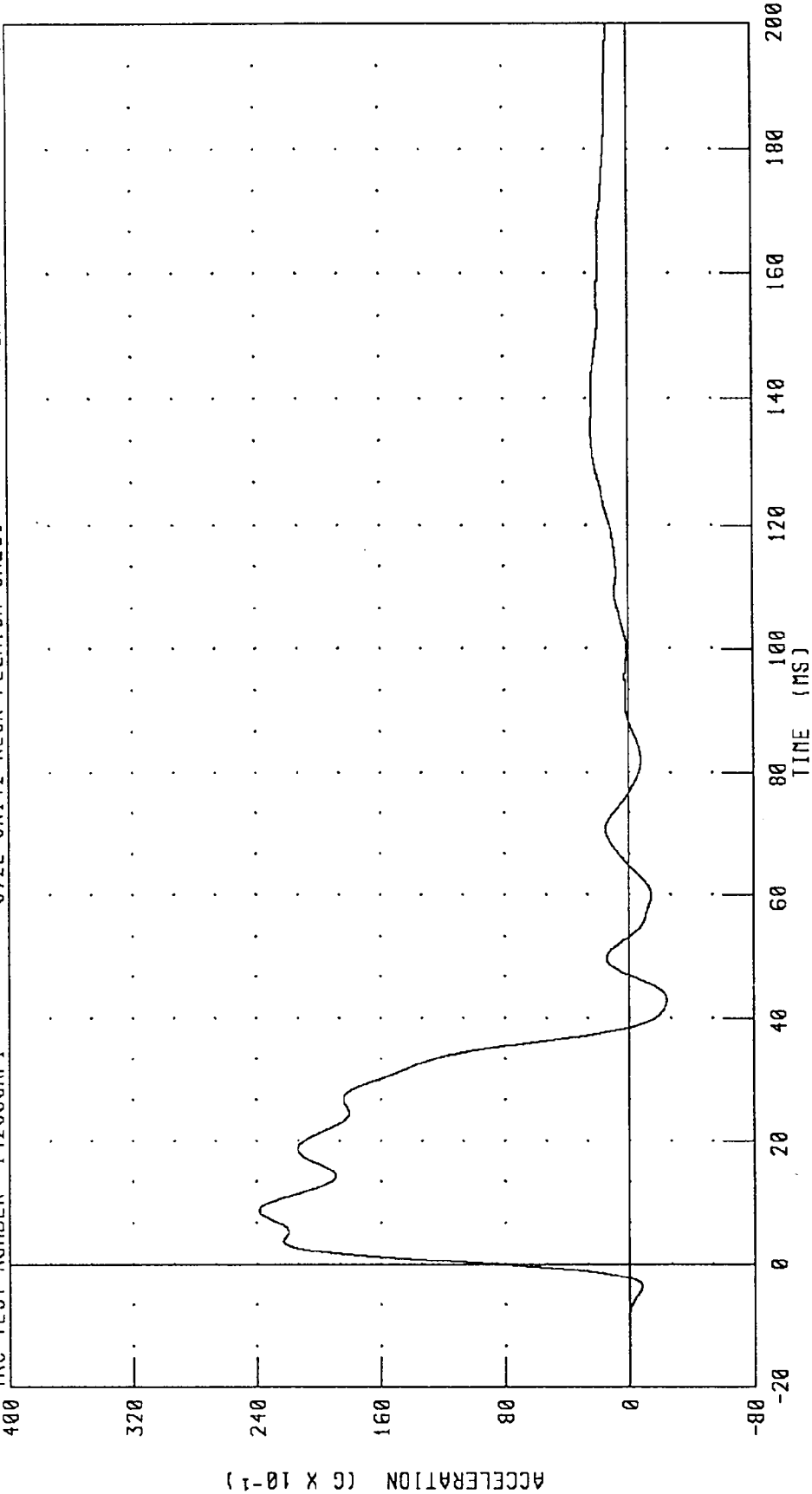
TECHNICIAN Richard L. Van

RUN NUMBER: 012397.1048;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 142C36NF1 572E SN142 NECK FLEXION CAL36 RUN NUMBER: 021897.1322;1



PEAK DATA: 23.84 G @ 8.64 MS; -2.40 G @ 42.96 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

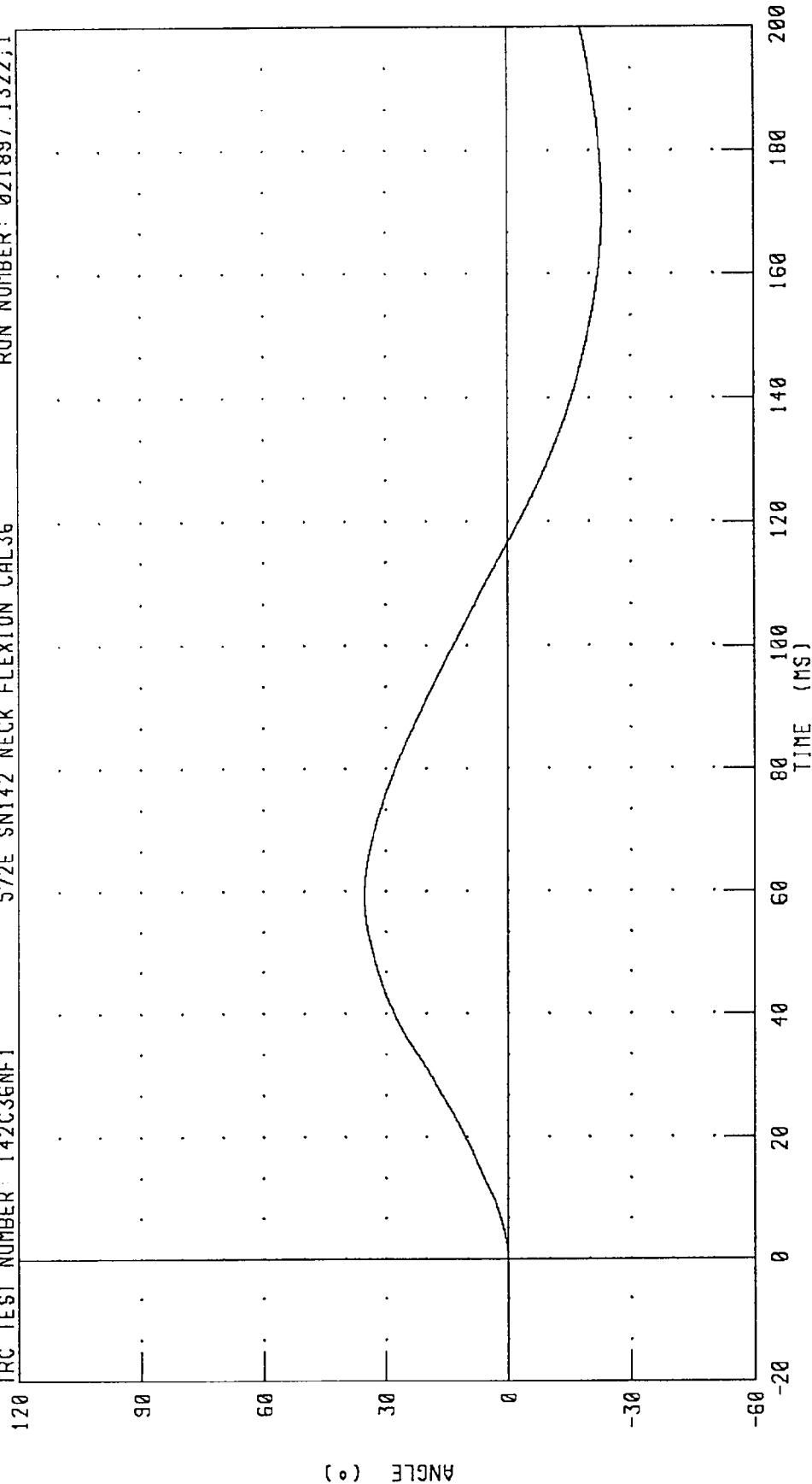
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN142 NECK FLEXION CAL36

IRC TEST NUMBER: 142C36NF1

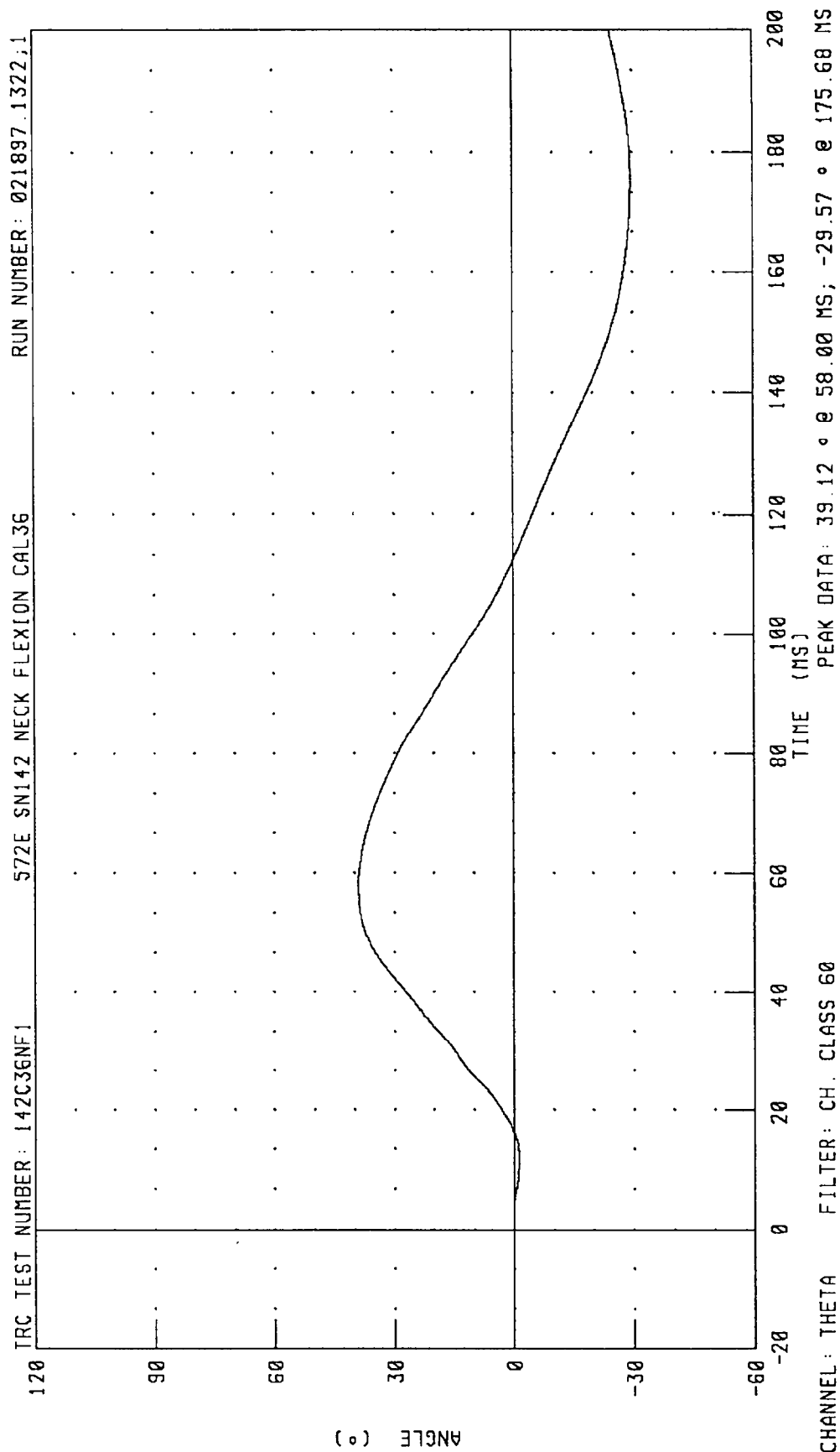
RUN NUMBER: 021897.1322,1



PEAK DATA: 35.30 ° @ 59.20 MS; -23.05 ° @ 170.88 MS

CHANNEL: BETA FILTER: CH. CLASS 60

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



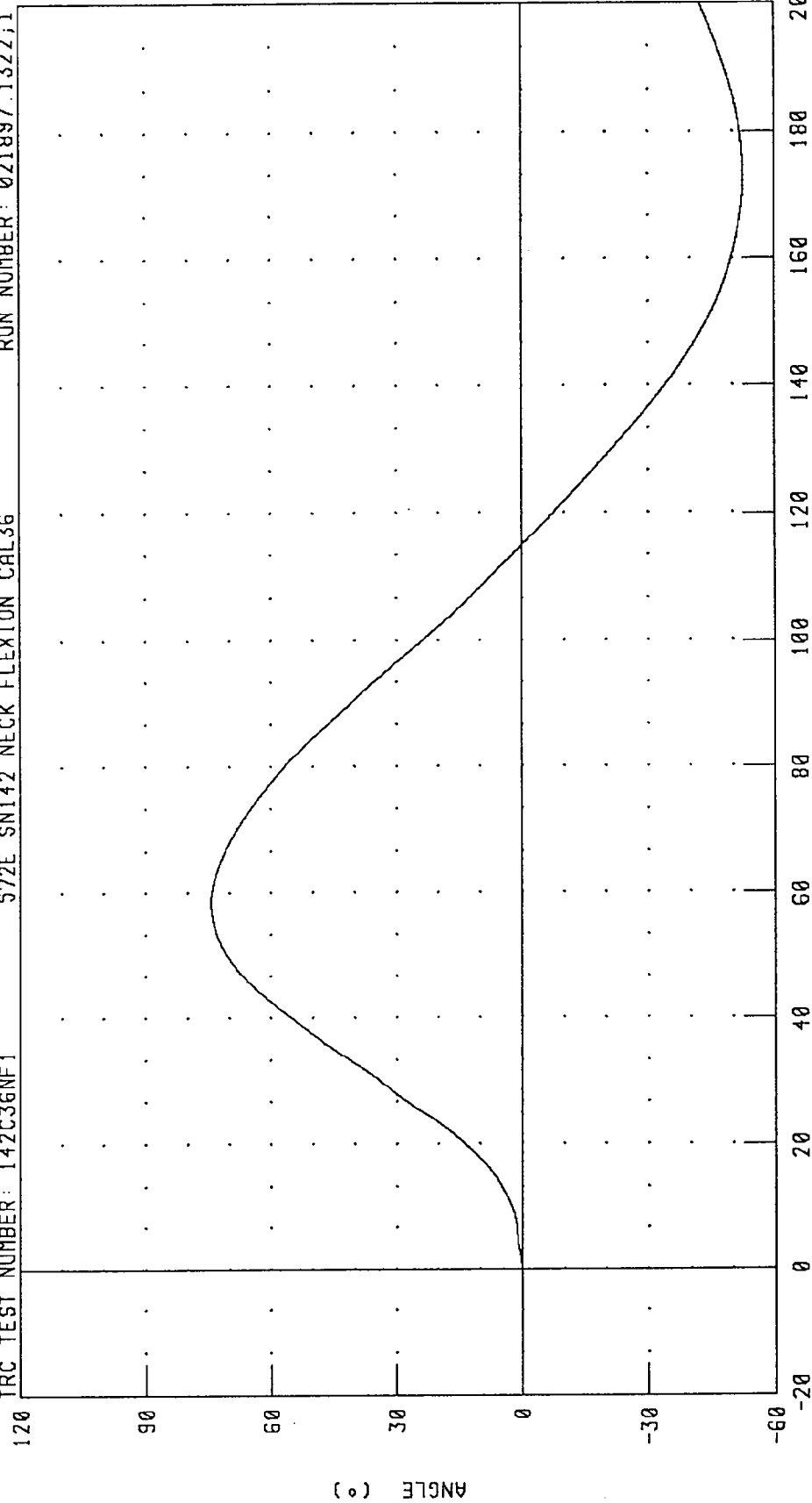
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C36NF1

572E SN142 NECK FLEXION CAL36

RUN NUMBER: 021897.1322;1



CHANNEL: TOTAL FILTER: CH. CLASS 60

PEAK DATA: 74.40 ° @ 58.56 MS, -52.53 ° @ 173.20 MS

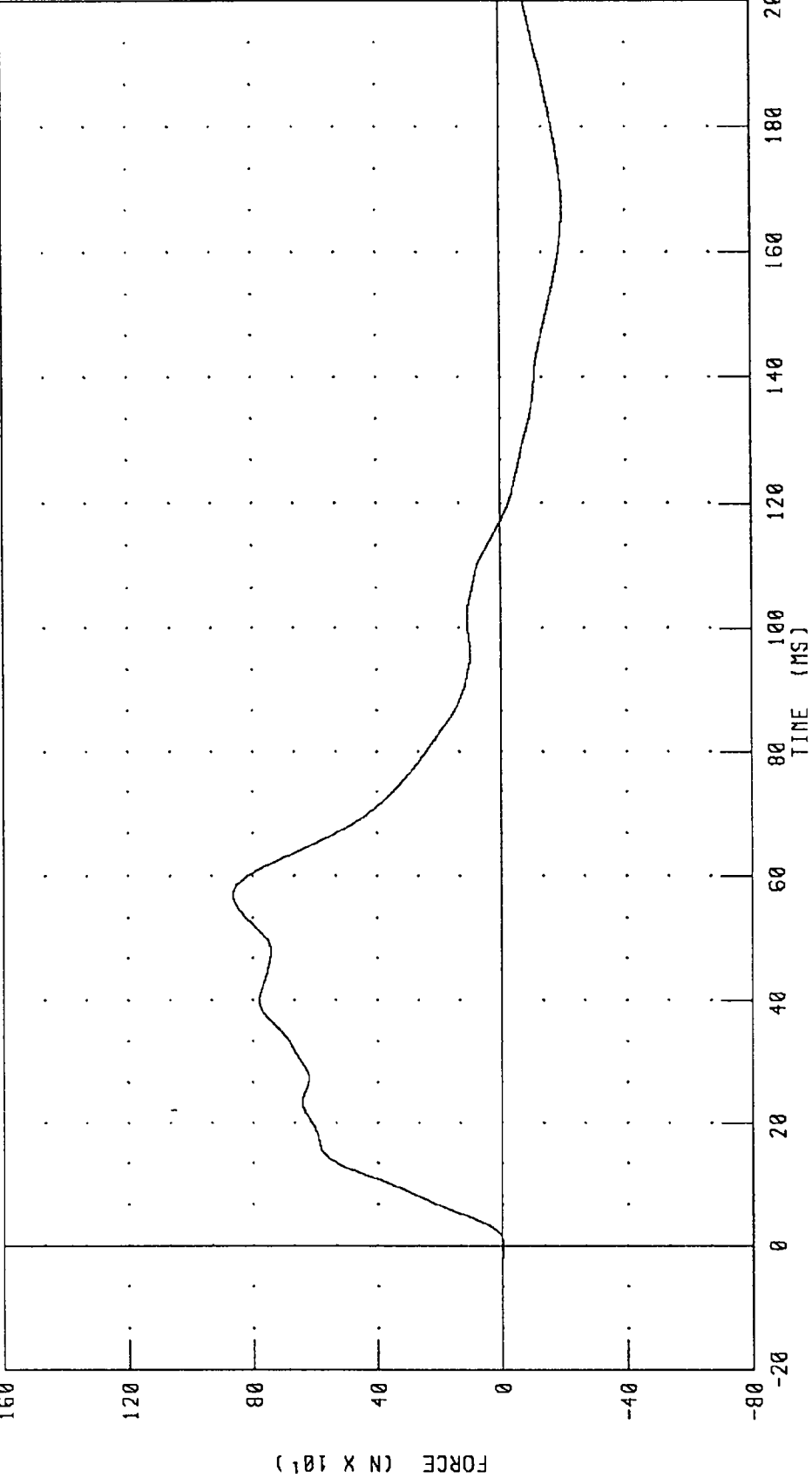
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C36NF1

572E SN142 NECK FLEXION CAL36

RUN NUMBER: 021897.1322.1

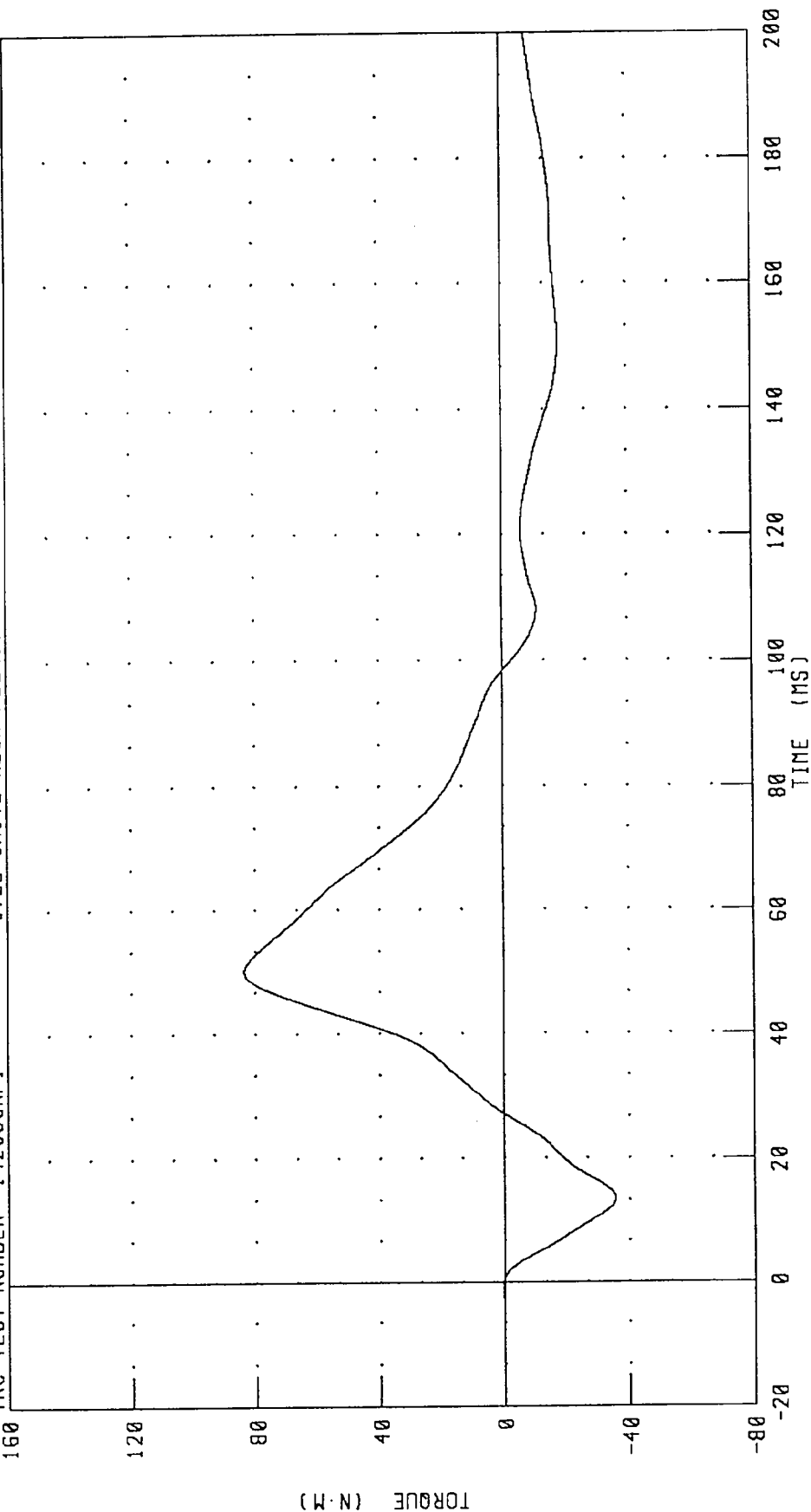


PEAK DATA: 863.99 N @ 57.04 MS; -199.75 N @ 167.36 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C36NF1 572E SN142 NECK FLEXION CAL36 RUN NUMBER: 021897.1322.1



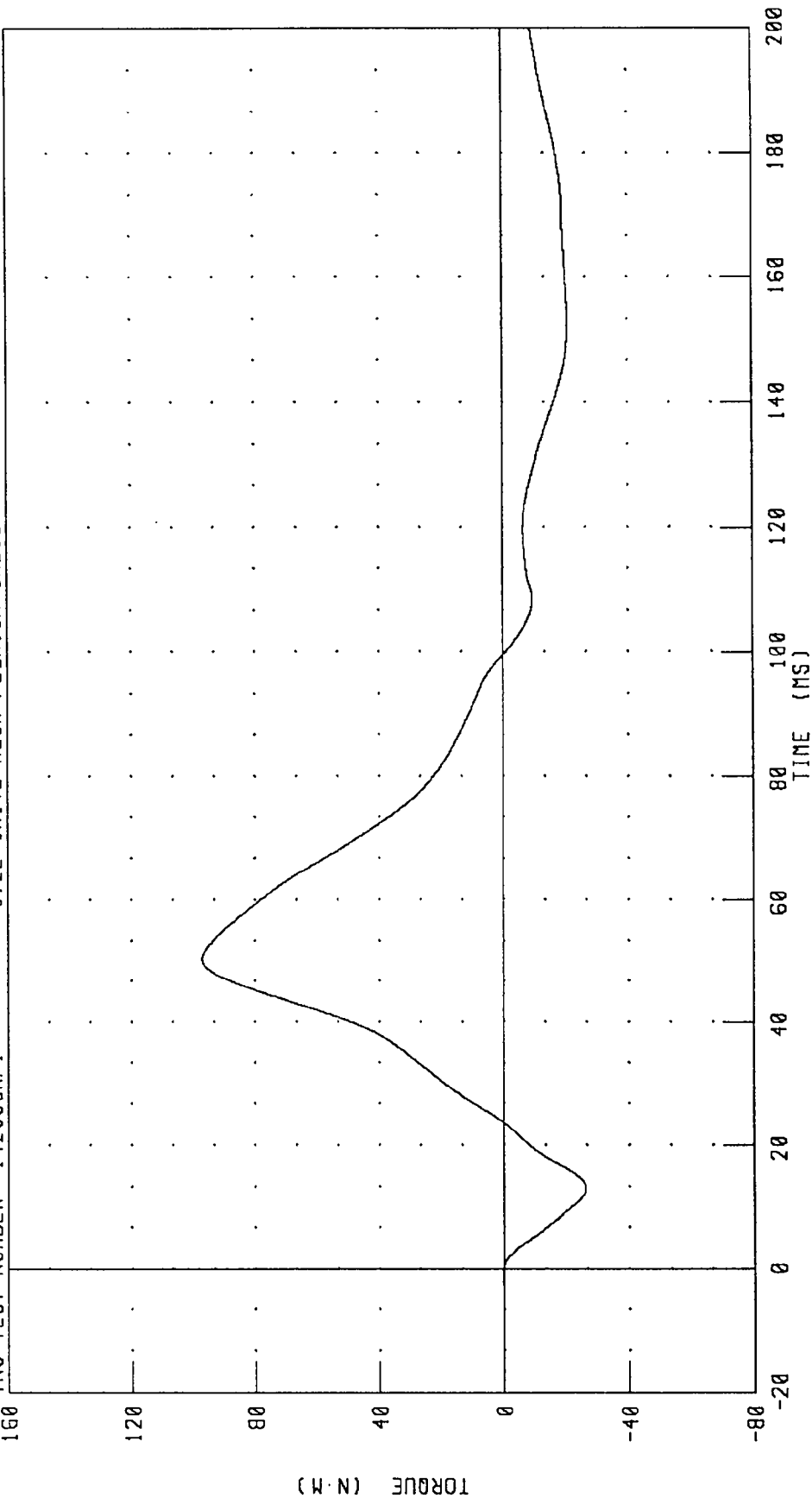
PEAK DATA: 83.59 N·M @ 50.16 MS; -35.59 N·M @ 13.60 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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

IRC TEST NUMBER: 142C36NF1 RUN NUMBER: 021897.1322.1

572E SN142 NECK FLEXION CAL36



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 97.12 N.M @ 50.32 MS; -26.15 N.M @ 13.12 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

23-JAN-97

TRC INC. TEST NO: 142C36NE1 572E SN142 NECK EXT. CAL36

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	29.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.04 G
	20 MS	14.00 - 19.00 G	17.30 G
	30 MS	11.00 - 16.00 G	13.86 G
MAX PENDULUM G		22 G MAX	19.19 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.81 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.08 MS
D PLANE	MAX	81 - 106 DEG.	96.29 DEG.
ROTATION	TIME	72 - 82 MS	73.44 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-76.75 NM
	TIME	65 - 79 MS	68.72 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	150.32 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	133.44 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. L...

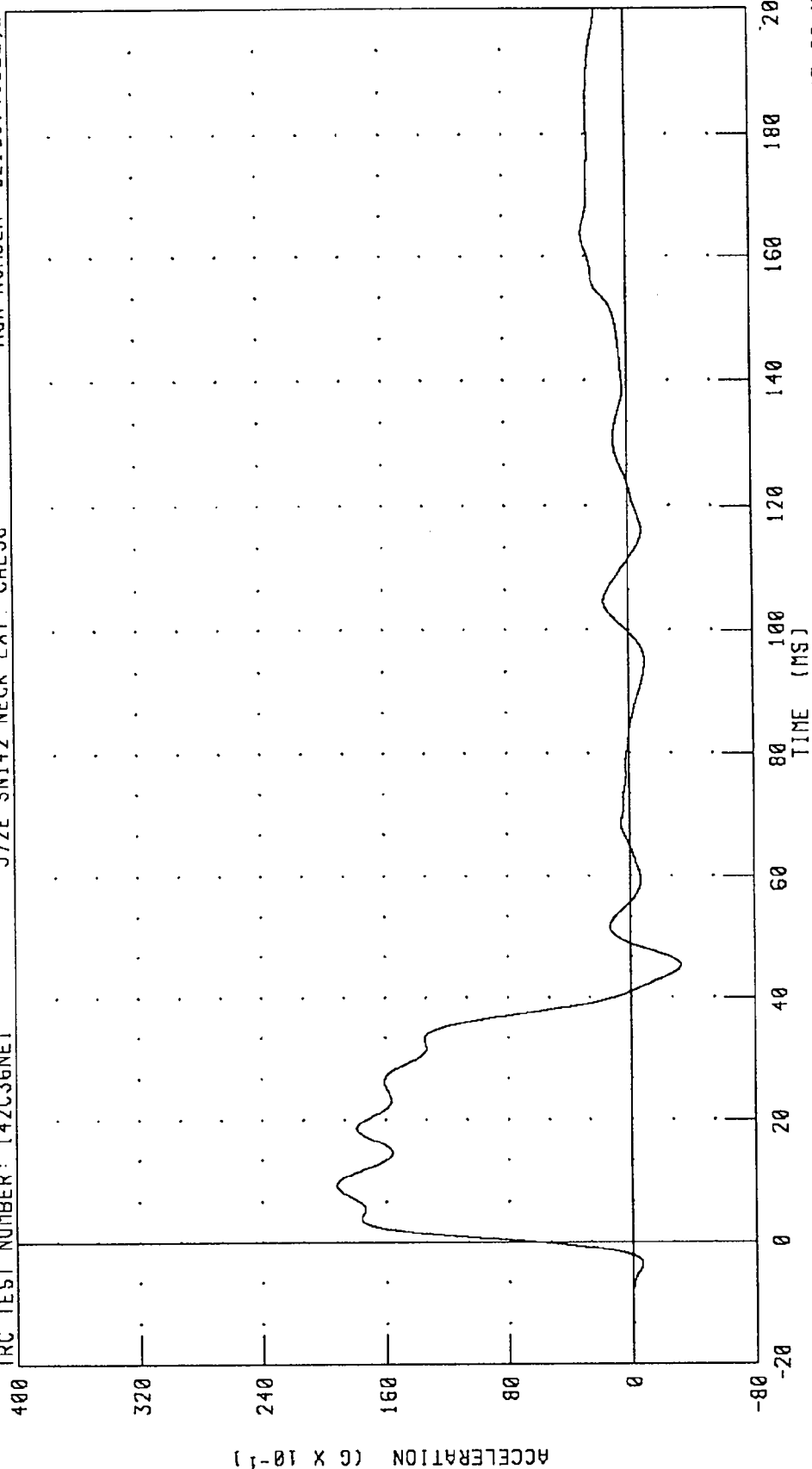
RUN NUMBER: 012397.1121;2

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C36NE1

572E SN142 NECK EXT. CAL36

RUN NUMBER: 021897.1322;2



PEAK DATA: 19.19 G @ 9.36 MS; -3.21 G @ 45.28 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

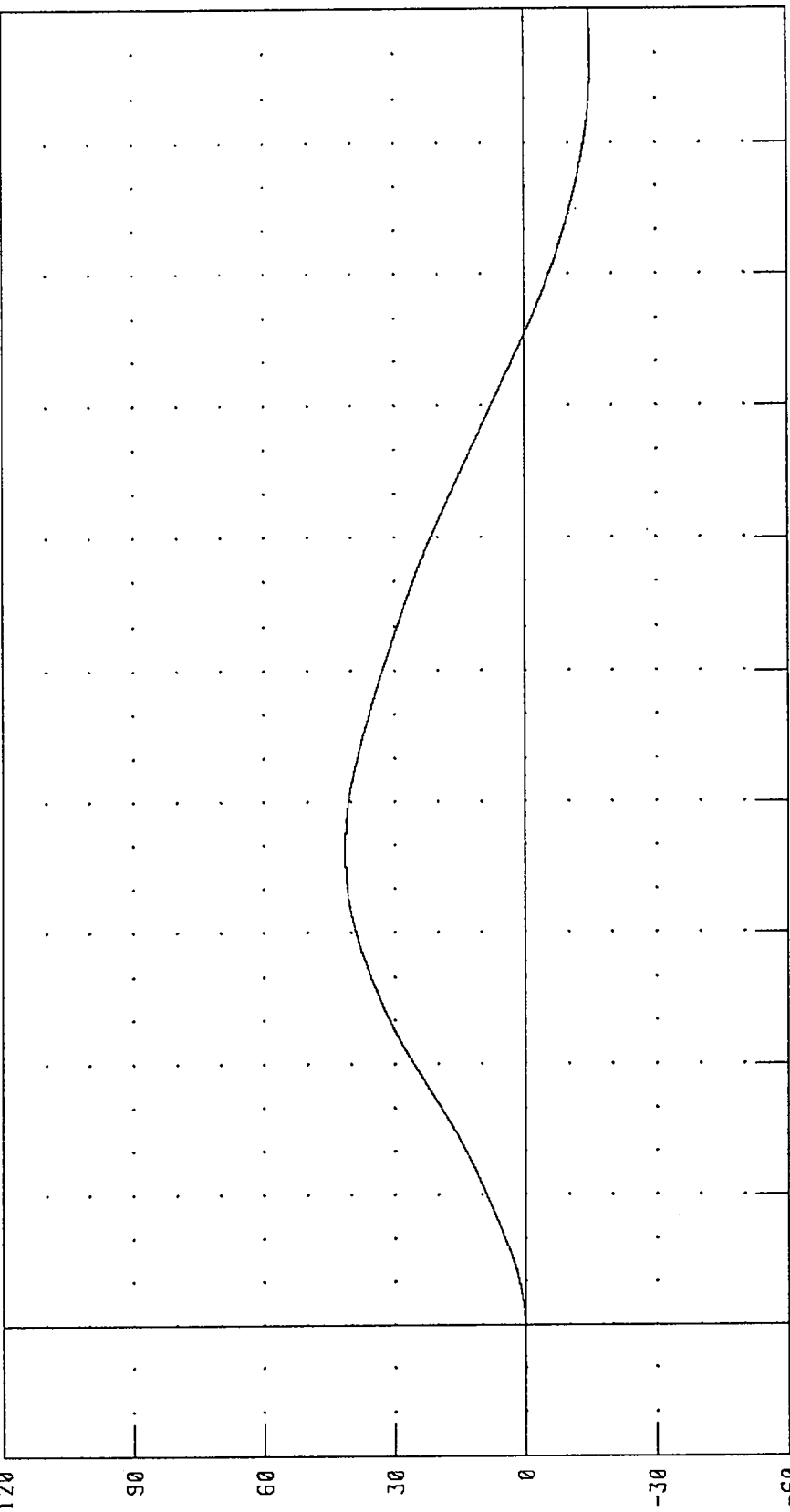
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 142C36NE1

572E SN142 NECK EXT. CAL36

RUN NUMBER: 021897.1322;2

120



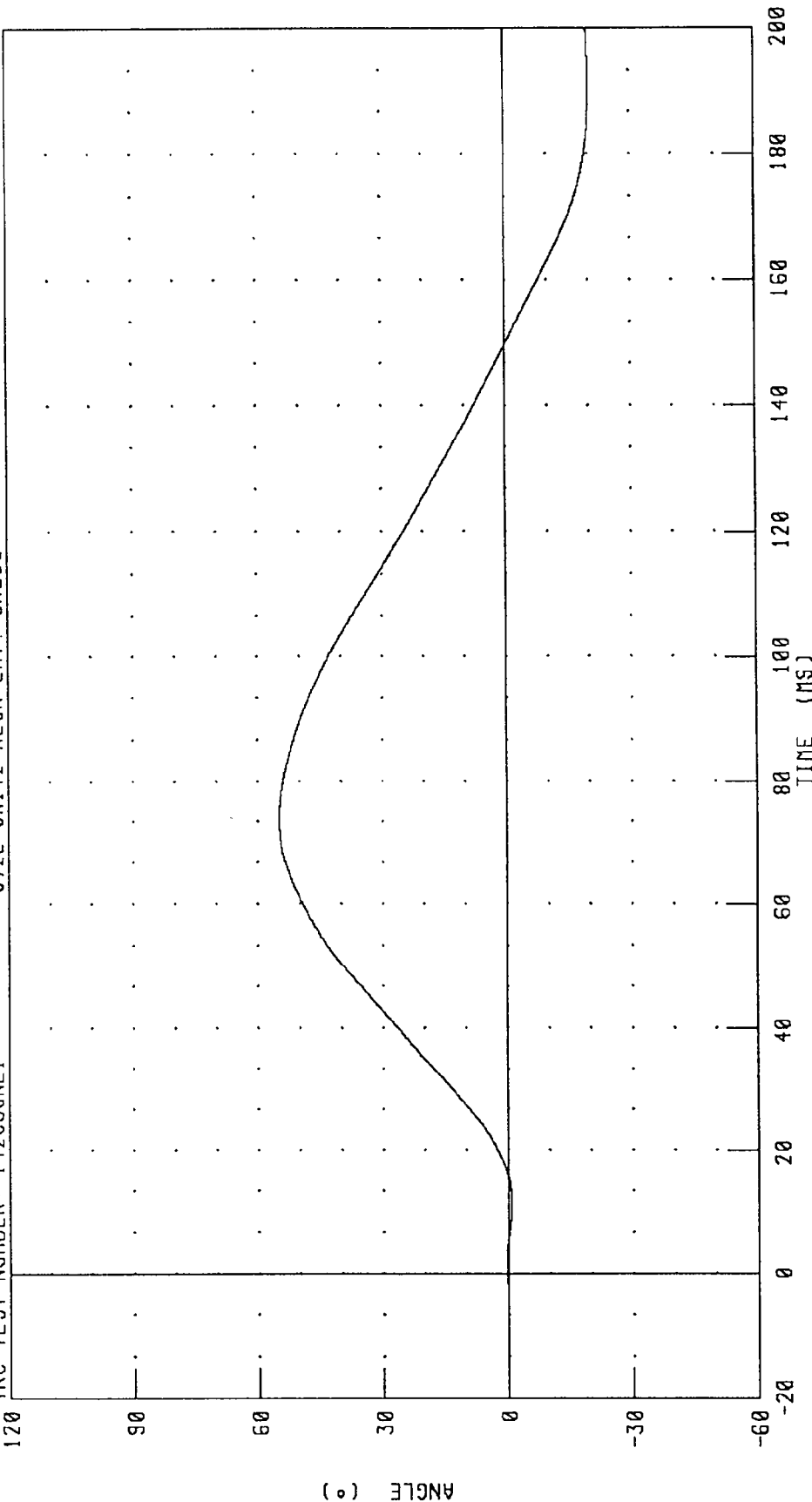
CHANNEL: BETA FILTER: CH. CLASS 60
 PEAK DATA: 41.43 ° @ 72.64 MS; -15.23 ° @ 192.72 MS

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

IRC TEST NUMBER: 142C36NE1

572E SN142 NECK EXT. CAL36

RUN NUMBER: 021897.1322,2



PEAK DATA: 54.88 ° @ 73.92 MS; -20.32 ° @ 191.44 MS

CHANNEL: THETA FILTER: CH. CLASS 60

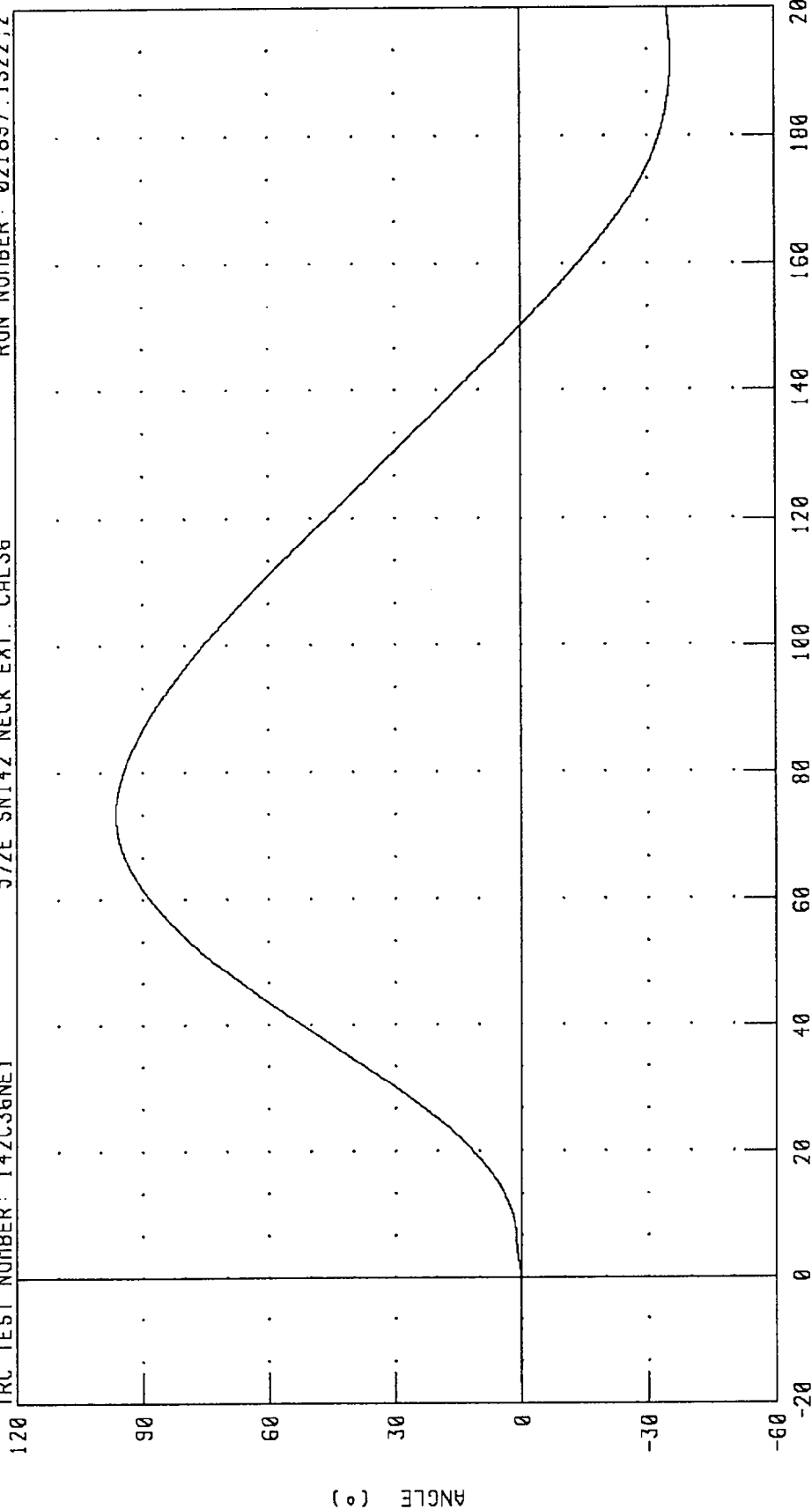
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C36NE1

572E SN142 NECK EXT. CAL36

RUN NUMBER: 021897.1322,2



PEAK DATA: 96.29 ° @ 73.44 MS; -35.54 ° @ 192.08 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

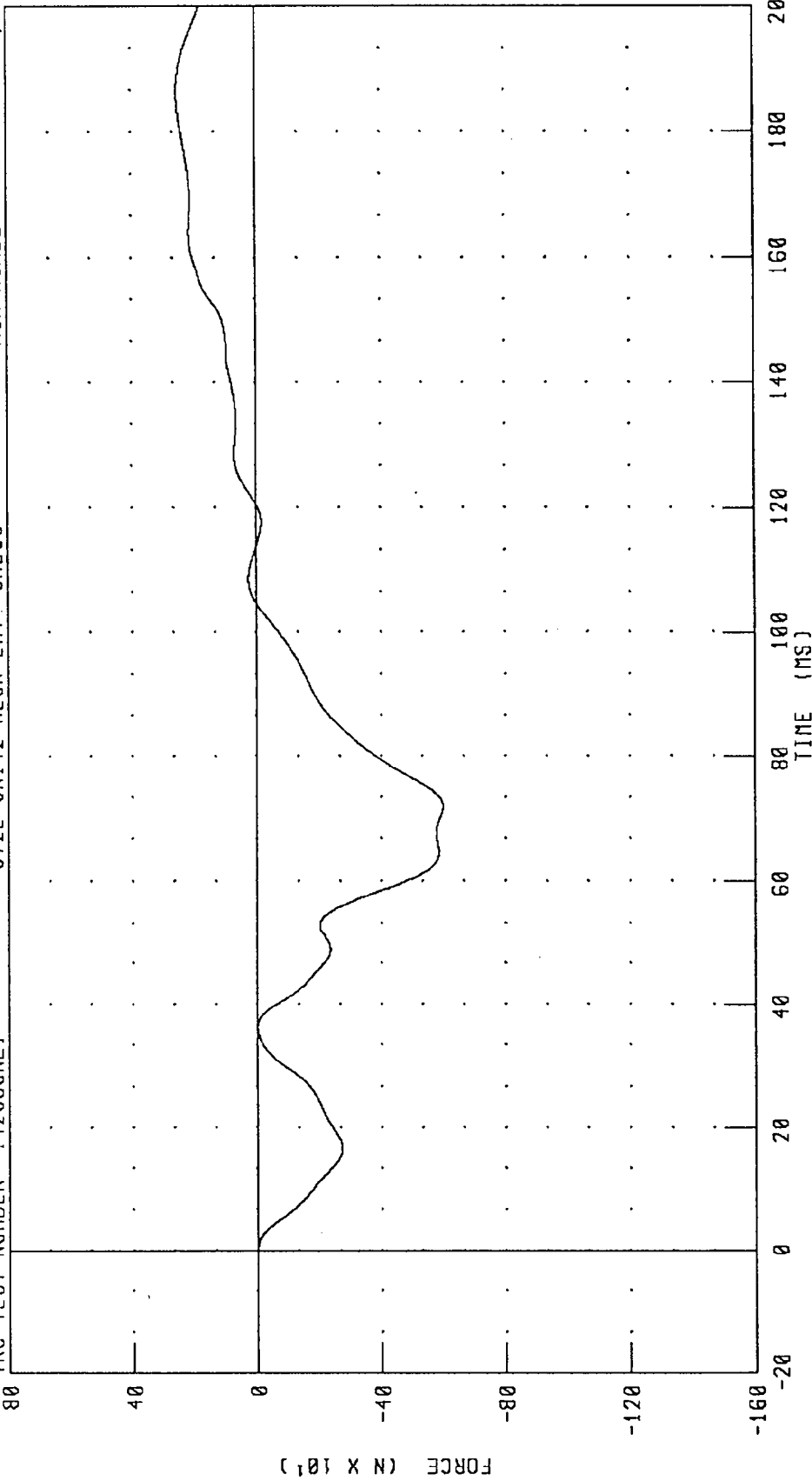
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 142C36NE1

572E SN142 NECK EXT. CAL36

RUN NUMBER: 021897.1322,2

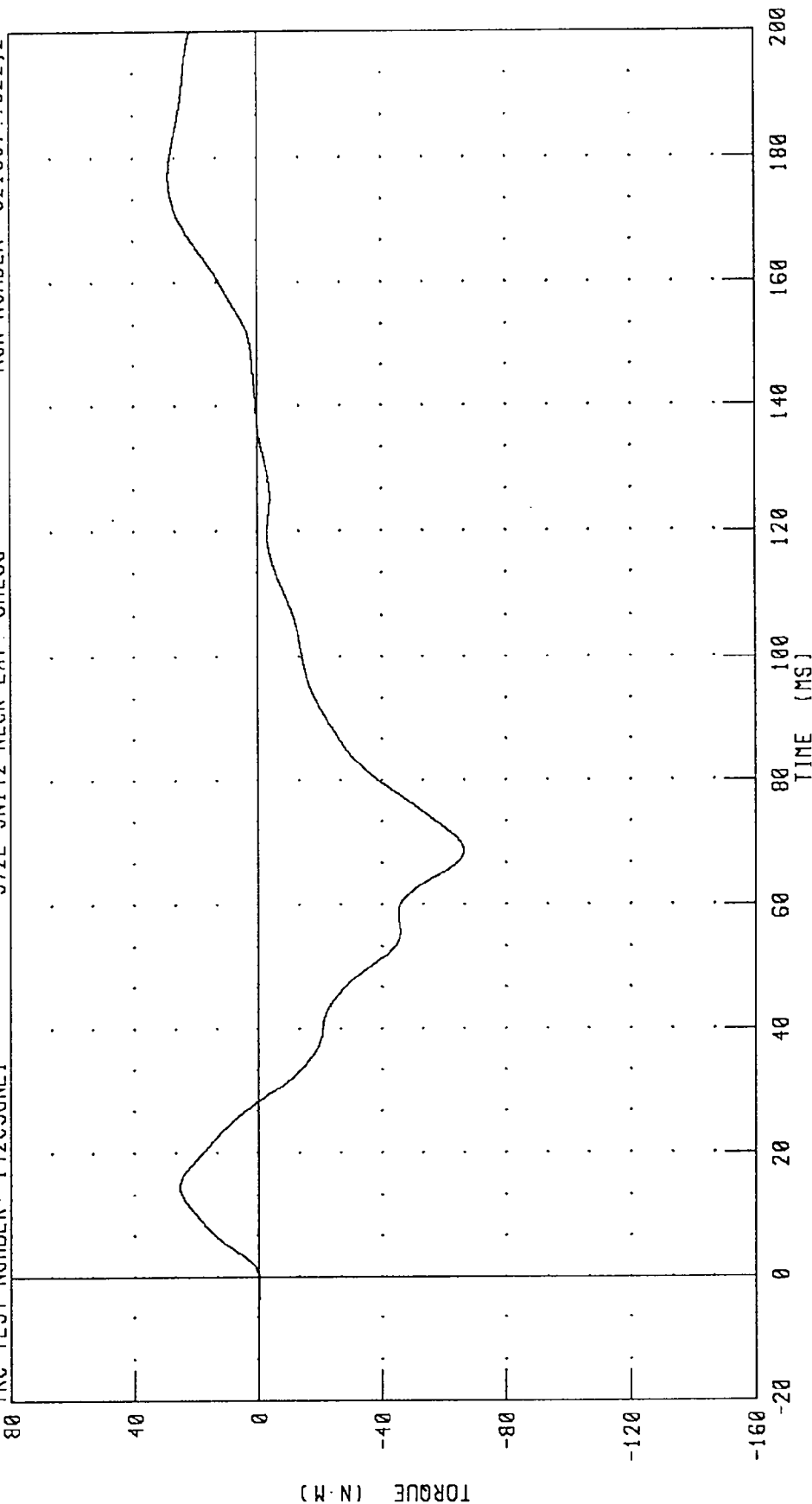


PEAK DATA: 253.00 N @ 186.48 MS; -598.67 N @ 71.92 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C36NE1 572E SN142 NECK EXT. CAL36 RUN NUMBER: 021897.1322;2

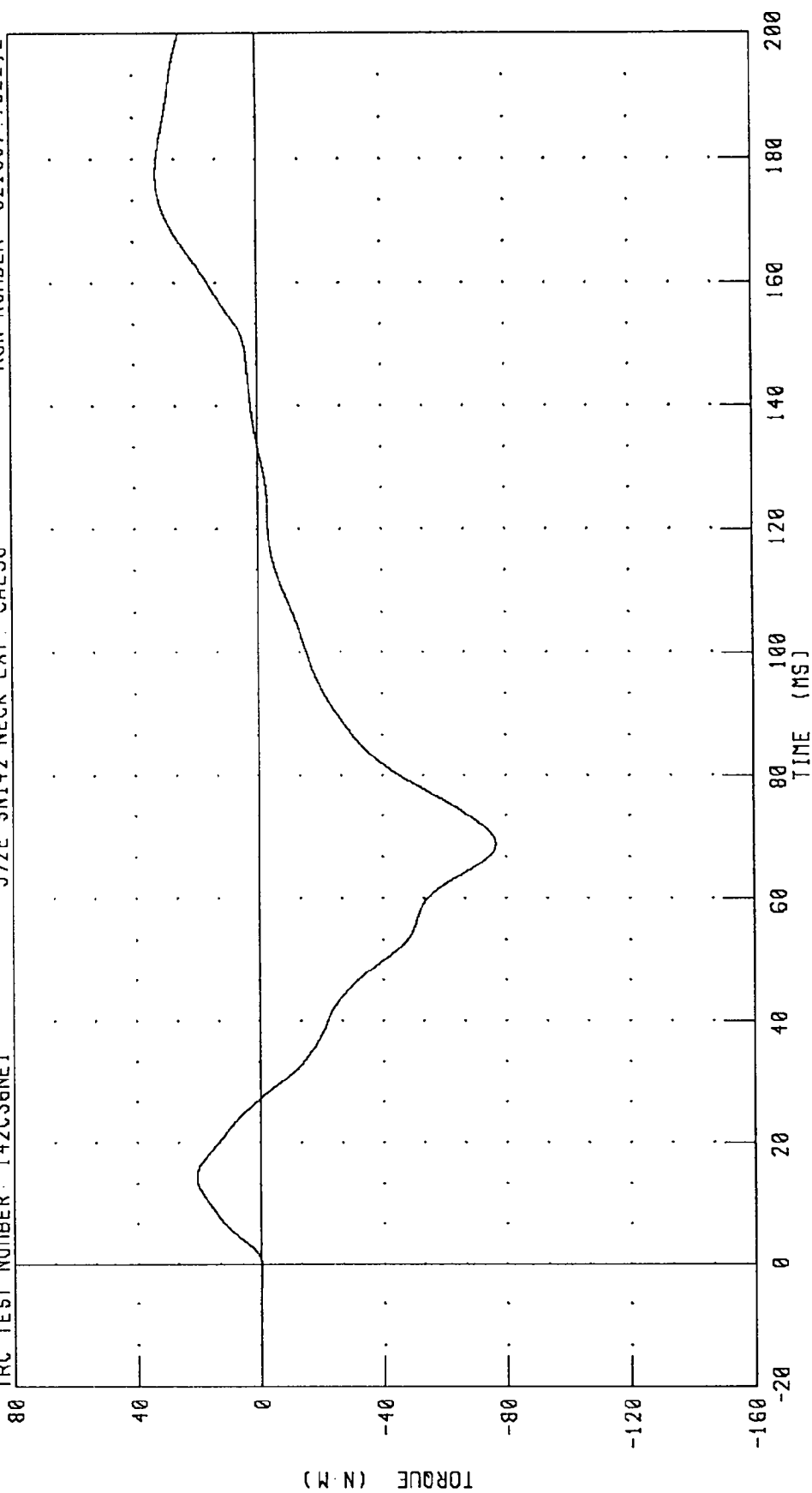


PEAK DATA: 28.64 N.M @ 177.12 MS; -66.42 N.M @ 68.72 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C36NE1 572E SN142 NECK EXT. CAL36 RUN NUMBER: 021897.1322,2



PEAK DATA: 32.72 N·M @ 177.68 MS; -76.75 N·M @ 68.72 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

23-JAN-97

TRC INC.

TEST NO: 142C36TH2

572E SN 142 H.S.THORAX CAL 36

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.8 DEG. C
RELATIVE HUMIDITY	10 - 70 %	29.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	71.6 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5608. N
INTERNAL HYSTERESIS	69% - 85%	70.2%

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Lee

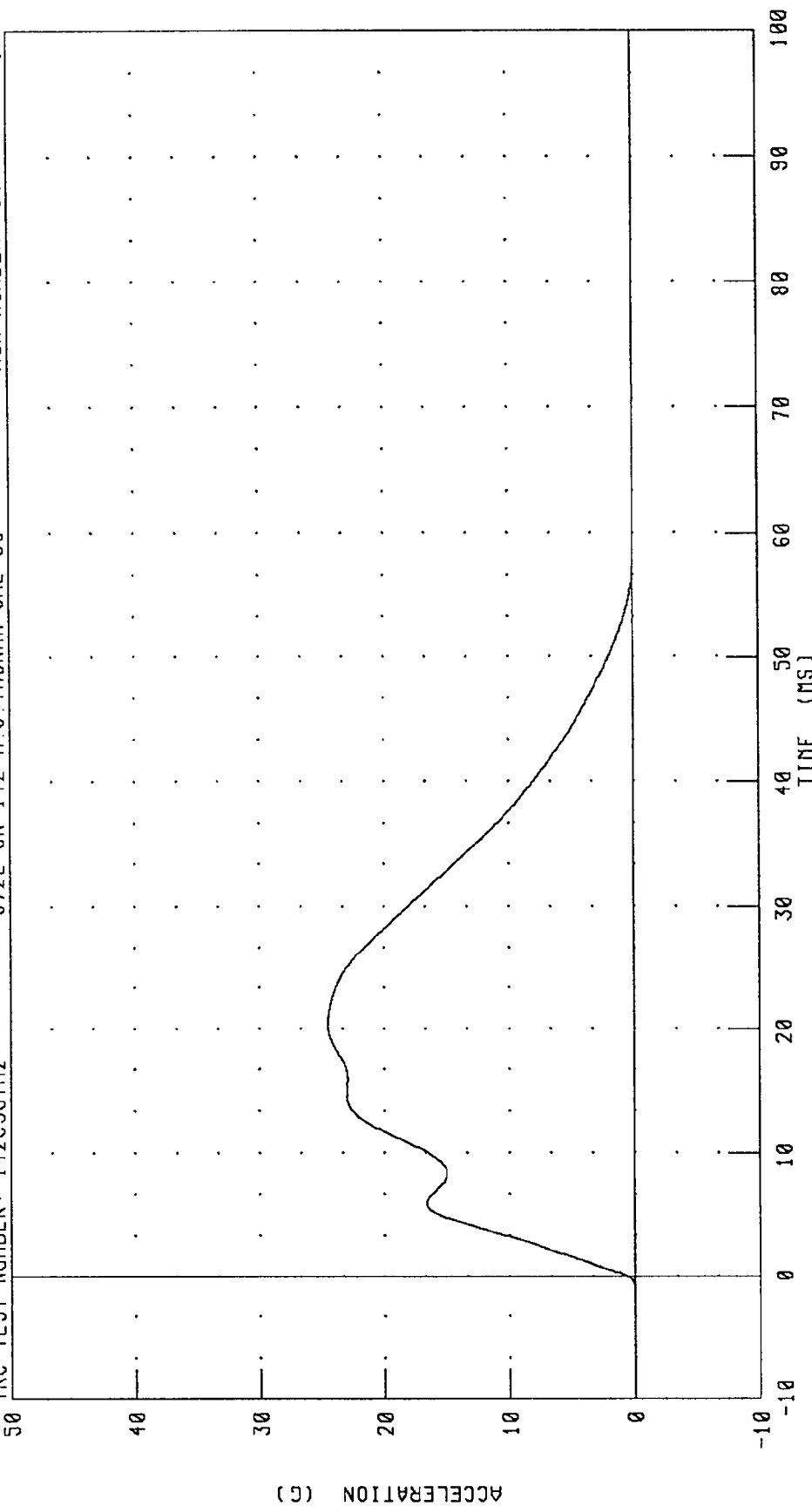
RUN NUMBER: 012397.1603;1

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C36TH2

572E SN 142 H.S. THORAX CAL 36

RUN NUMBER: 021897.1322;1

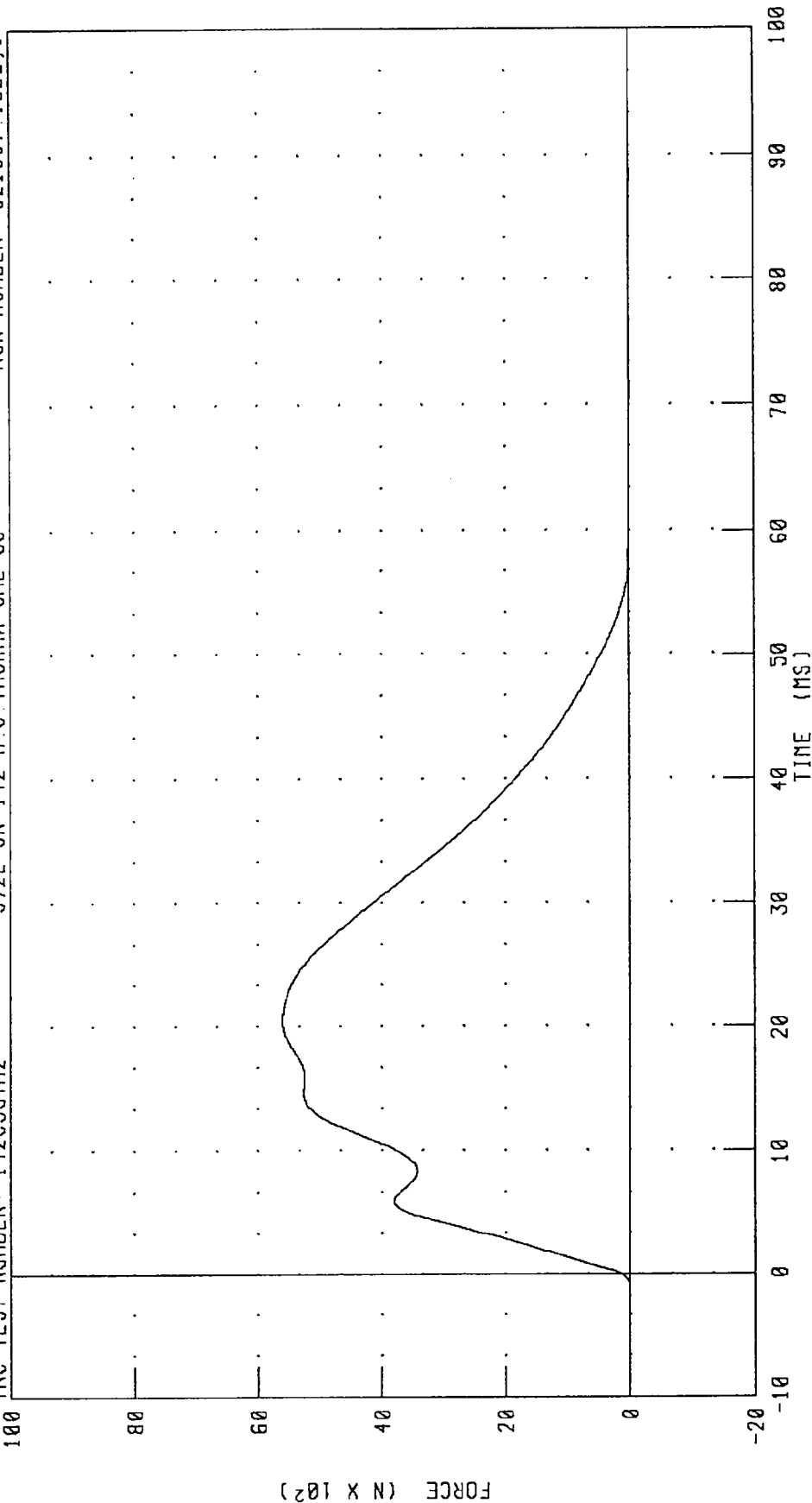


PEAK DATA: 24.48 G @ 20.40 MS; -0.03 G @ 71.12 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 142C36TH2 572E SN 142 H.S. THORAX CAL 36 RUN NUMBER: 021897 1322,1



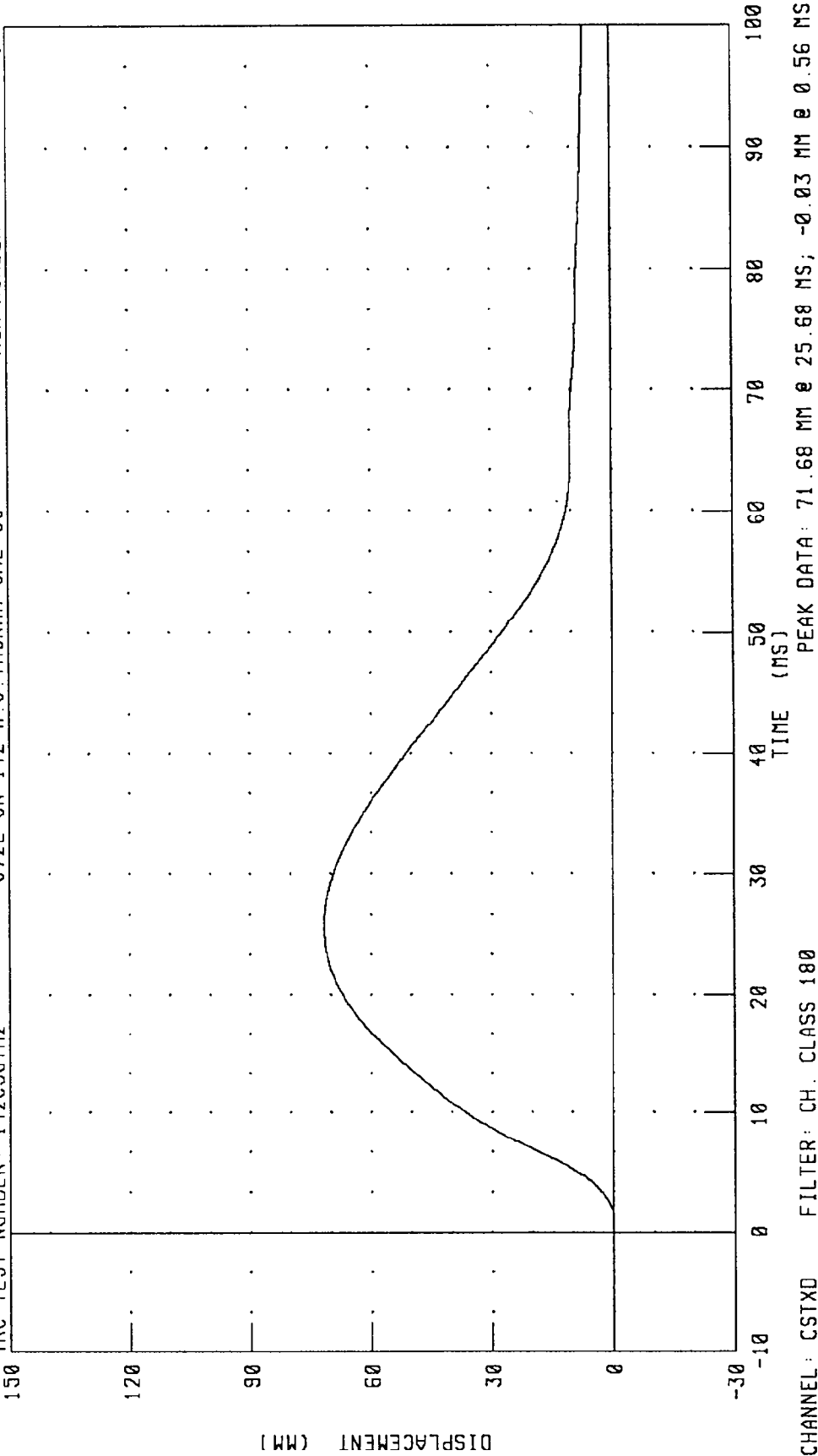
PEAK DATA: 5608.72 N @ 20.40 MS; -5.78 N @ 71.12 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

IRC TEST NUMBER: 142C36TH2 572E SN 142 H.S. THORAX CAL 36 RUN NUMBER: 021897.1322;1



CHANNEL: CSTXD FILTER: CH. CLASS 180

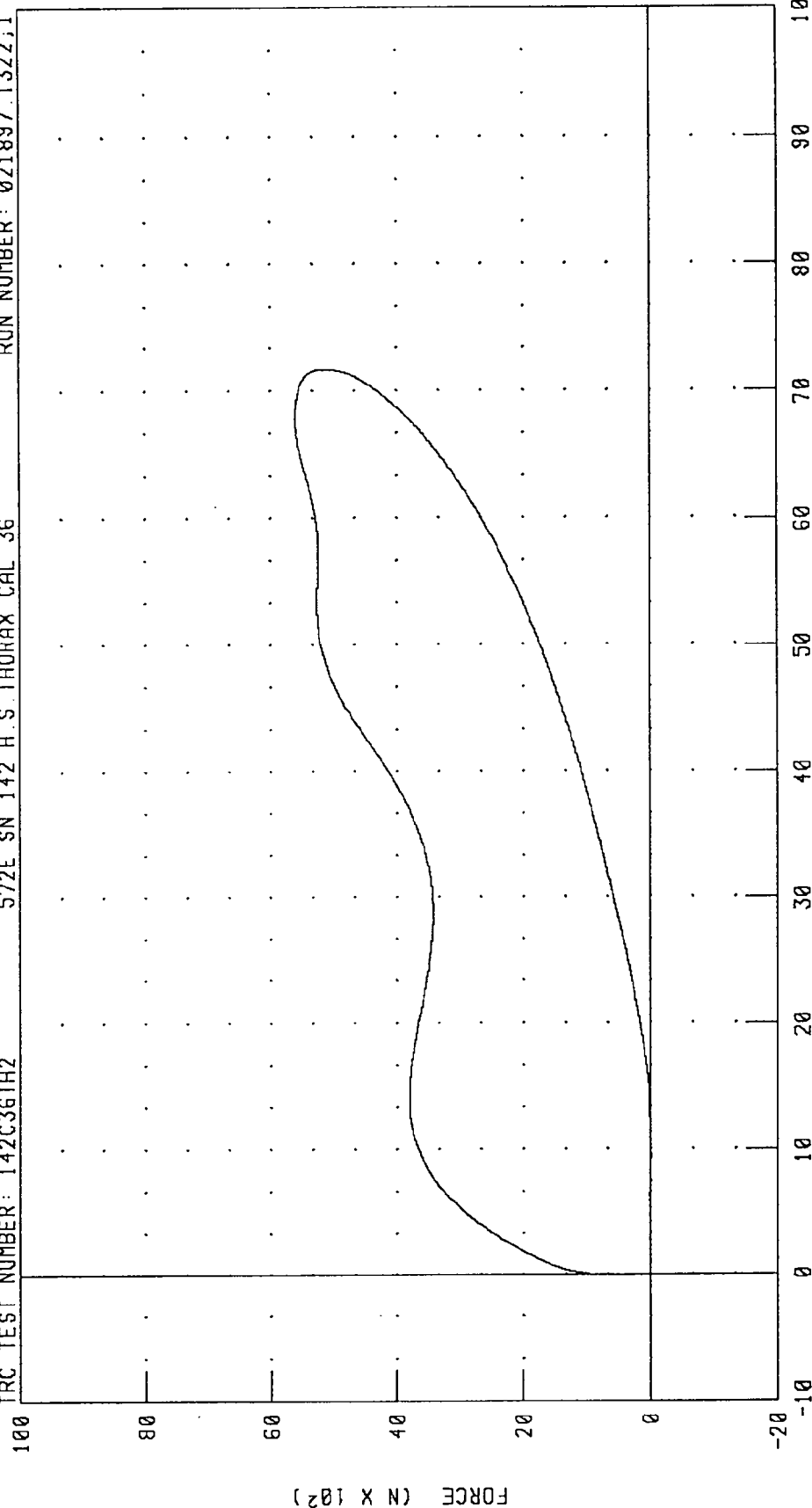
PEAK DATA: 71.68 MM @ 25.68 MS; -0.03 MM @ 0.56 MS

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

TRC TEST NUMBER: 142C36TH2

572E SN 142 H.S. THORAX CAL 36

RUN NUMBER: 021897.1322;1



CHANNEL: CSTXD
PENXF
FILTER: CH. CLASS 180
CH. CLASS 180
PEAK DATA: 71.68 NM @ 25.68 MS; -0.03 NM @ 0.56 MS
5608.72 N @ 20.40 MS; -5.78 N @ 71.12 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

23-JAN-97

TRC INC.

TEST NO: 142C36RK1

572E SN142 RIGHT KNEE CAL 36

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	29.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4895.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Lee

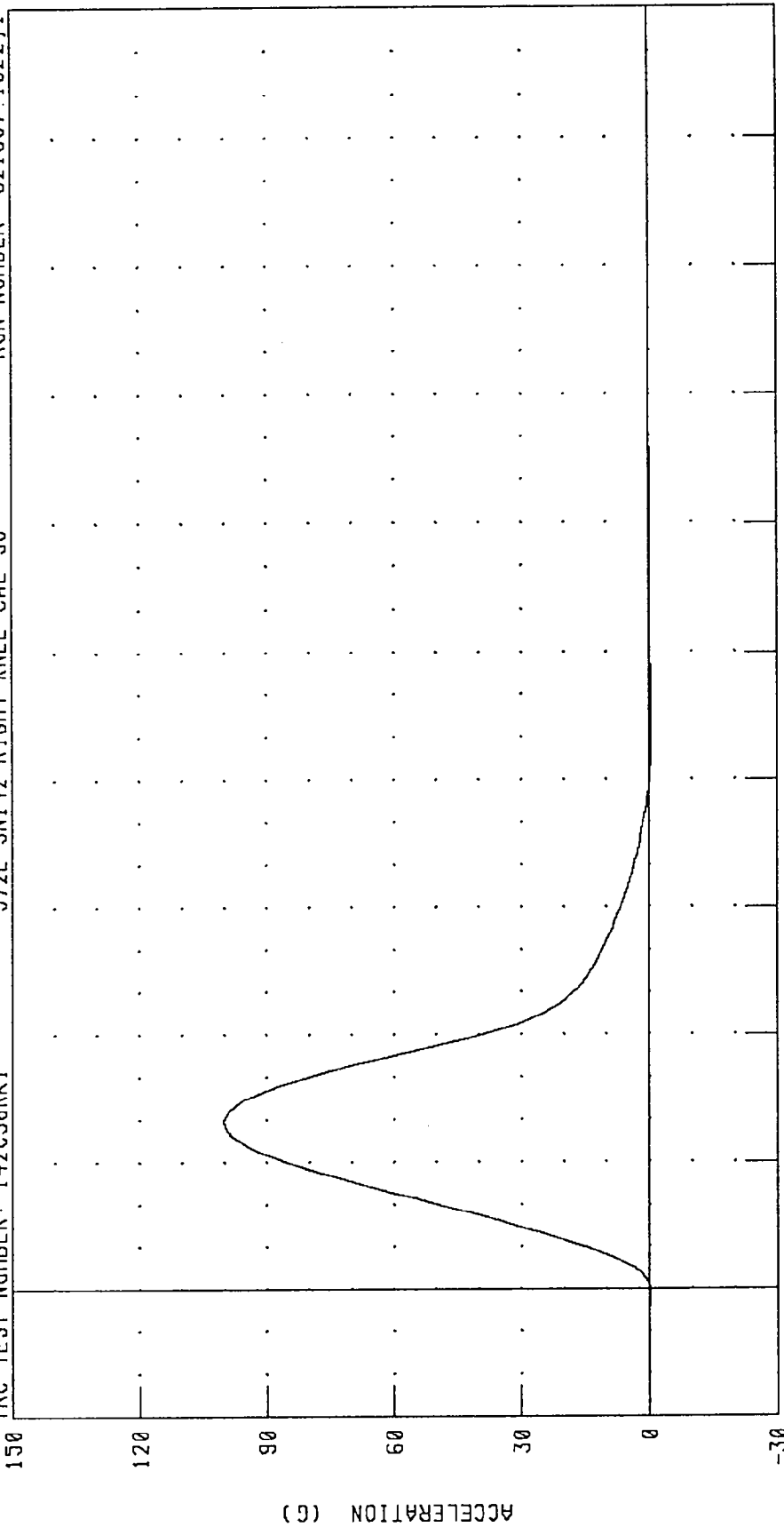
RUN NUMBER: 012397.0908;1

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

TRC TEST NUMBER: 142C36RK1

572E SN142 RIGHT KNEE CAL 36

RUN NUMBER: 021897.1322,1



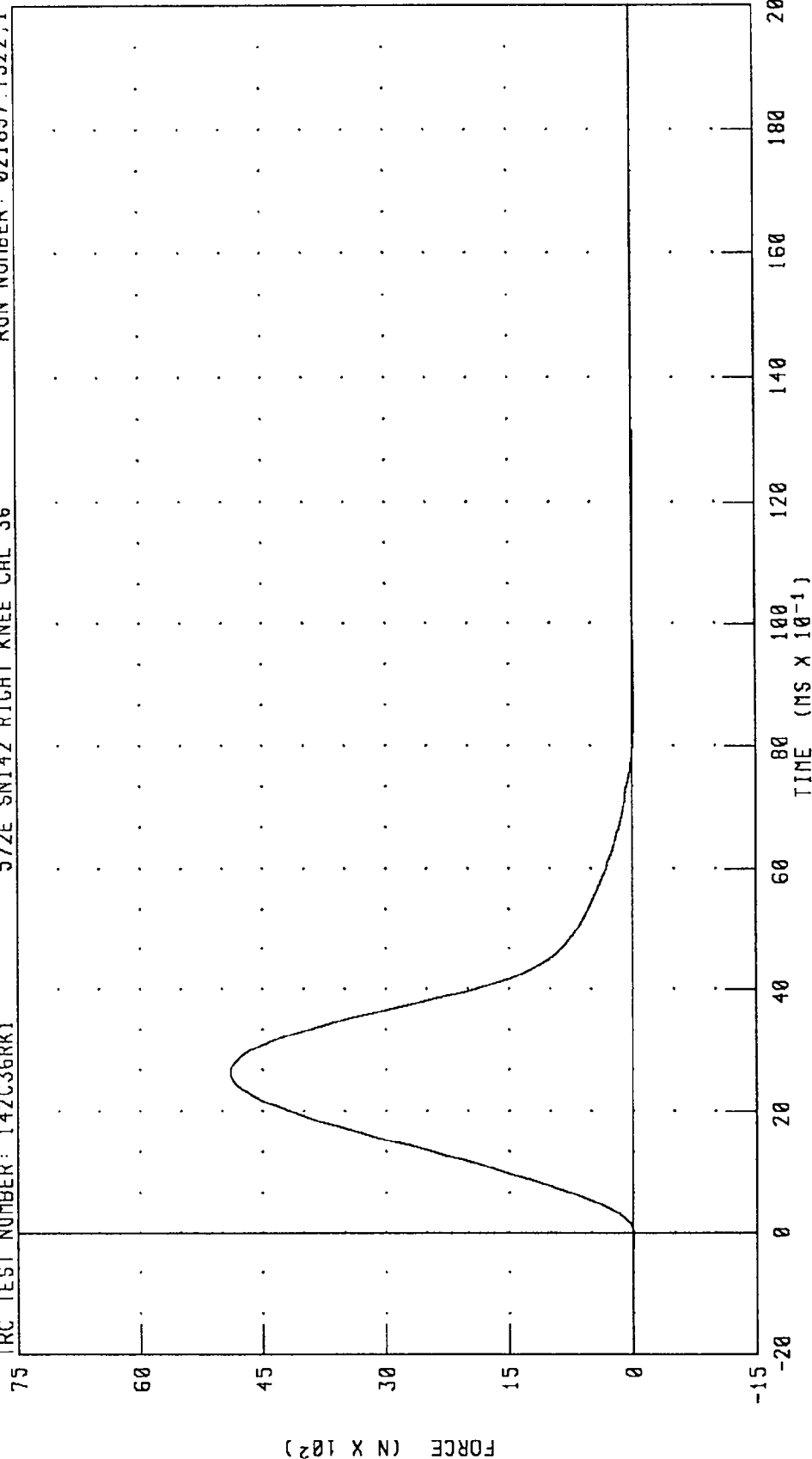
CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 100.06 G @ 2.64 MS; -0.45 G @ 8.56 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C36RK1 572E SN142 RIGHT KNEE CAL 36 RUN NUMBER: 021897.1322.1



PEAK DATA: 4895.67 N @ 2.64 MS; -22.21 N @ 8.56 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

23-JAN-97

TRC INC.

TEST NO: 142C36LK1

572E SN142 LEFT KNEE CAL 36

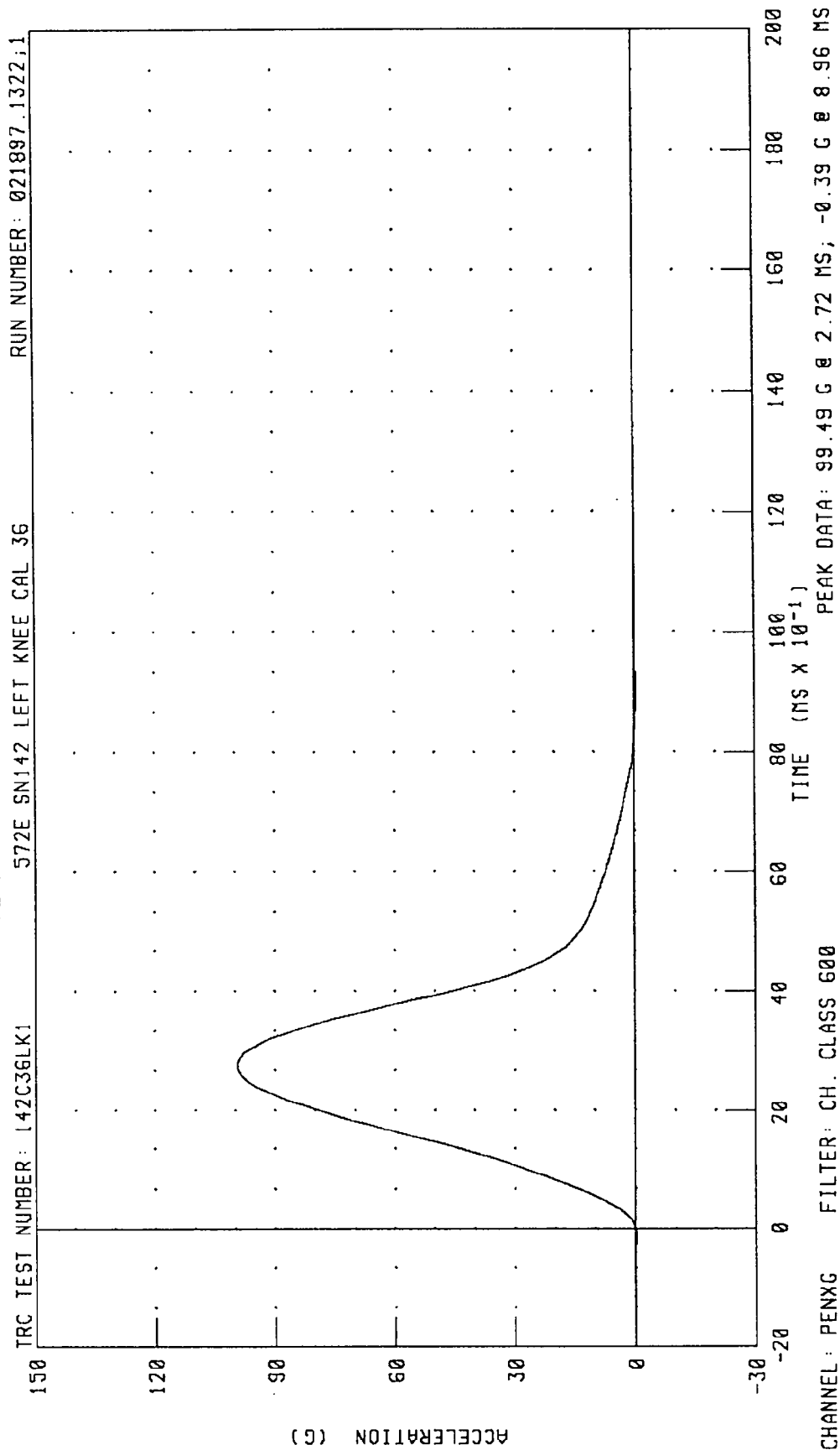
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	29.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4867.7 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. L...

RUN NUMBER: 012397.0903;1

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



PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 142C36LK1

572E SN142 LEFT KNEE CAL 36

RUN NUMBER: 021897.1322;1

75

60

45

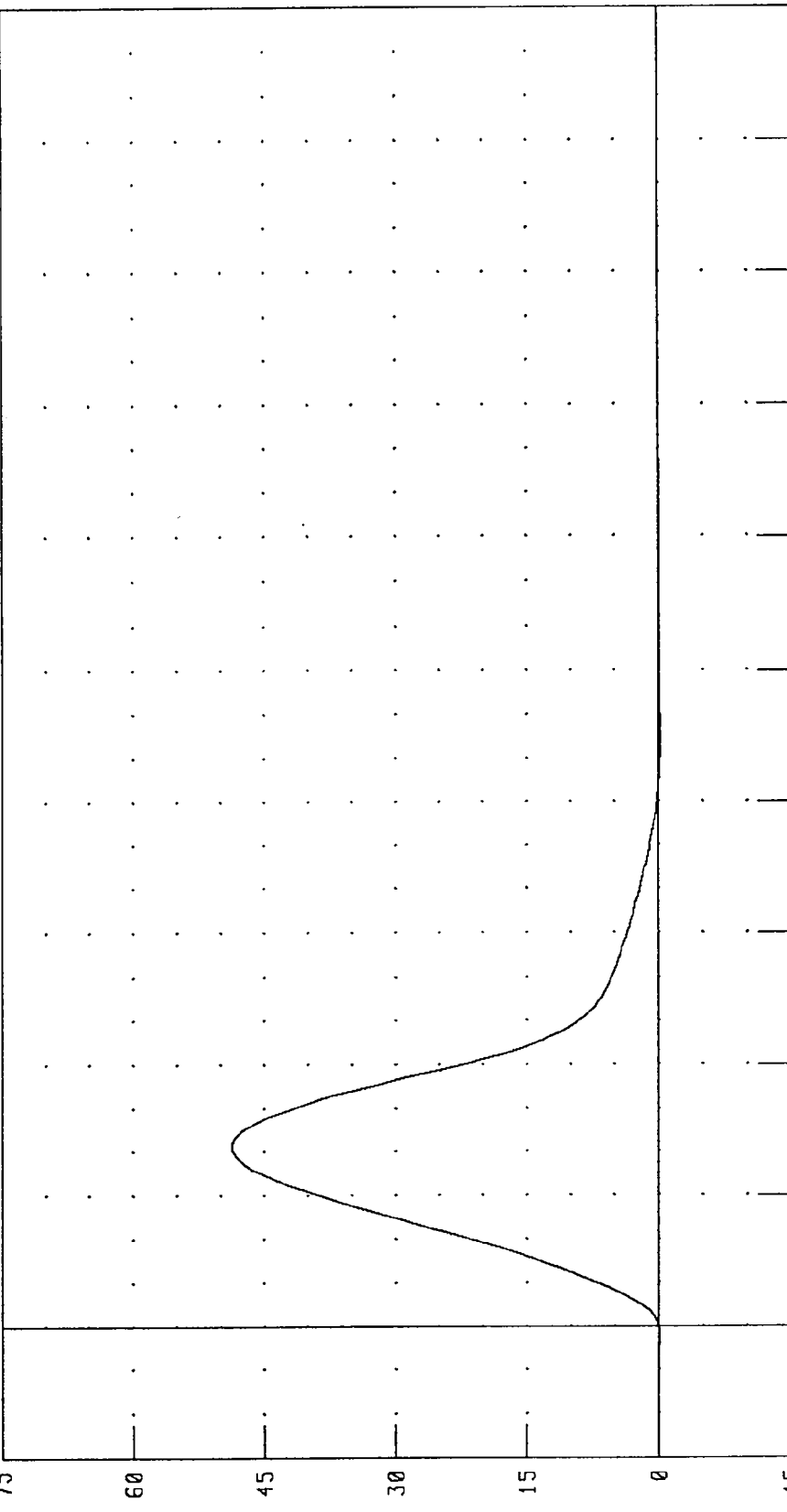
30

15

0

-15

FORCE (N X 10²)



TIME (MS X 10⁻¹)

CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 4867.71 N @ 2.72 MS; -19.09 N @ 8.96 MS

Pre-test Certification Data

Passenger Dummy S/N: 192

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III EXTERNAL DIMENSIONS

SN 192 ALDERSON

14-JAN-97

TRC INC.

TEST NO: 192C35ED1

572E SN192 EXT.DIMENSION CAL35

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

Richard L. L...

RUN NUMBER: 011497.1405

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

14-JAN-97

TRC INC.

TEST NO: 192C35HD1

572E SN192 HEAD DROP CAL 35

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	16.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	252.06 G
PEAK LATERAL ACCELERATION	15 G MAX	-11.44 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

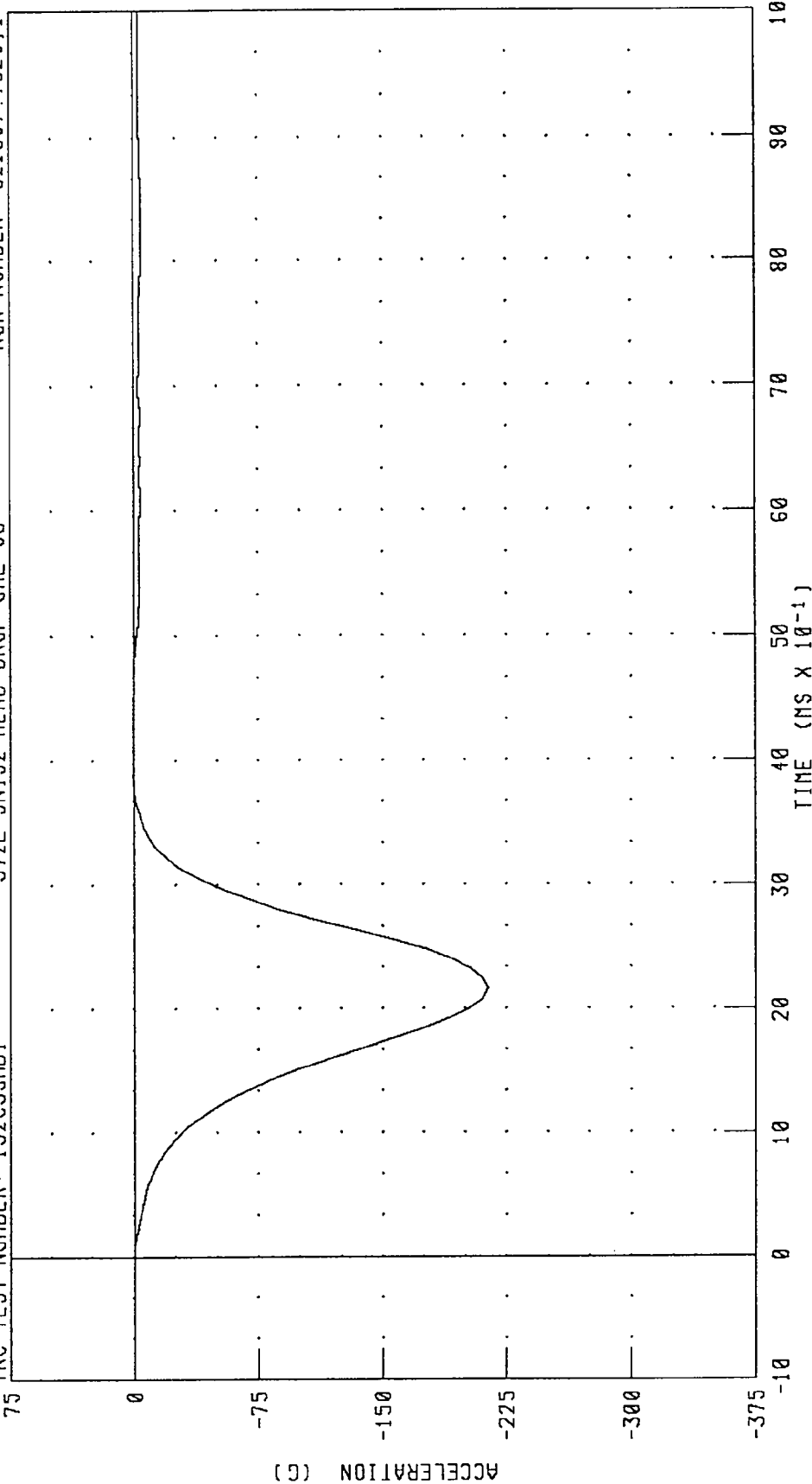
TEST MEETS SPECIFICATIONS

TECHNICIAN Richard LeVan

RUN NUMBER: 011497.1507;1

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

TRC TEST NUMBER: 192C35HD1 572E SN192 HEAD DROP CAL 35 RUN NUMBER: 021897.1329;1



CHANNEL: HEDXC FILTER: CH. CLASS 1000

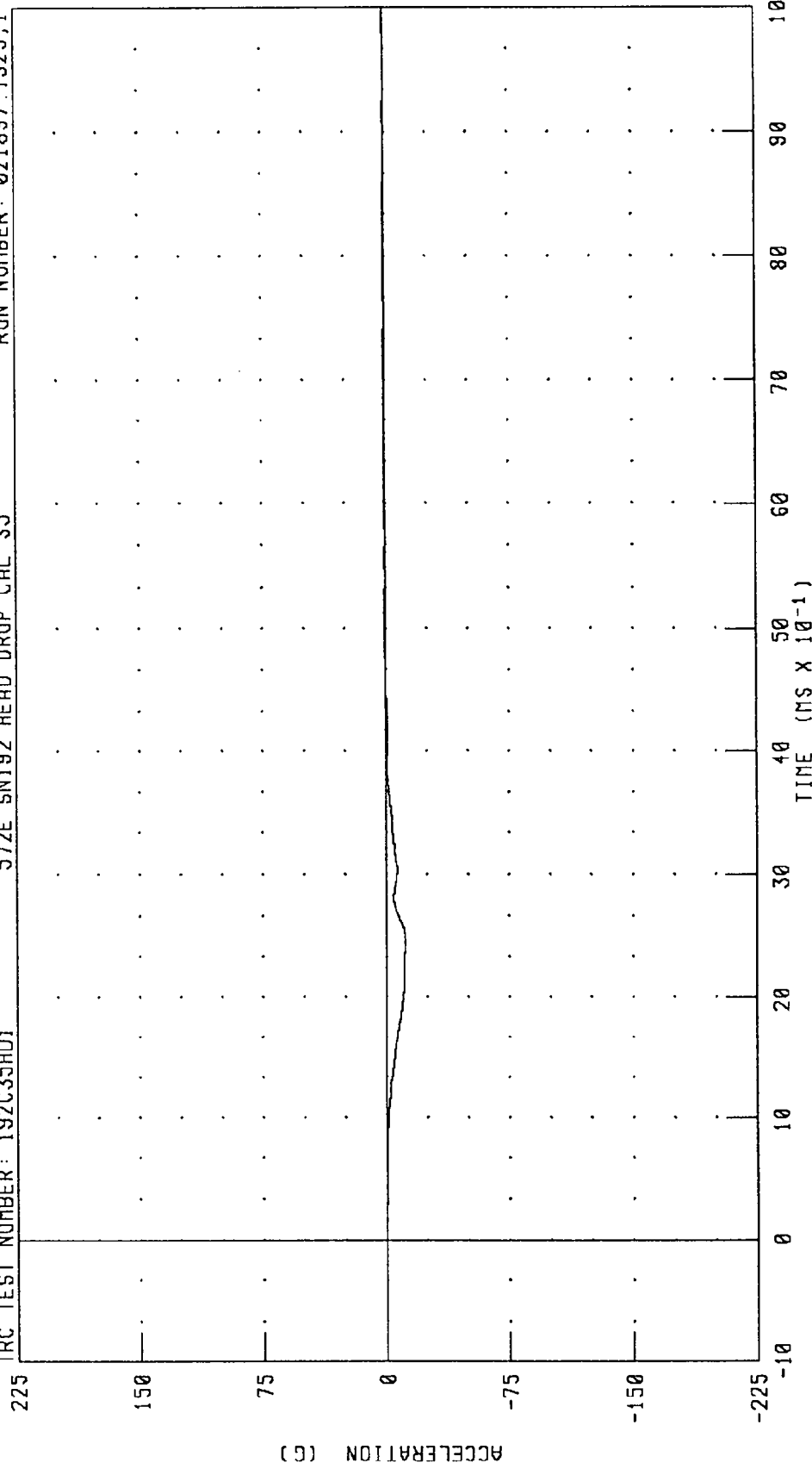
PEAK DATA: 0.84 G @ 4.24 MS; -214.26 G @ 2.16 MS

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

TRC TEST NUMBER: 192C35HD1

572E SN192 HEAD DROP CAL 35

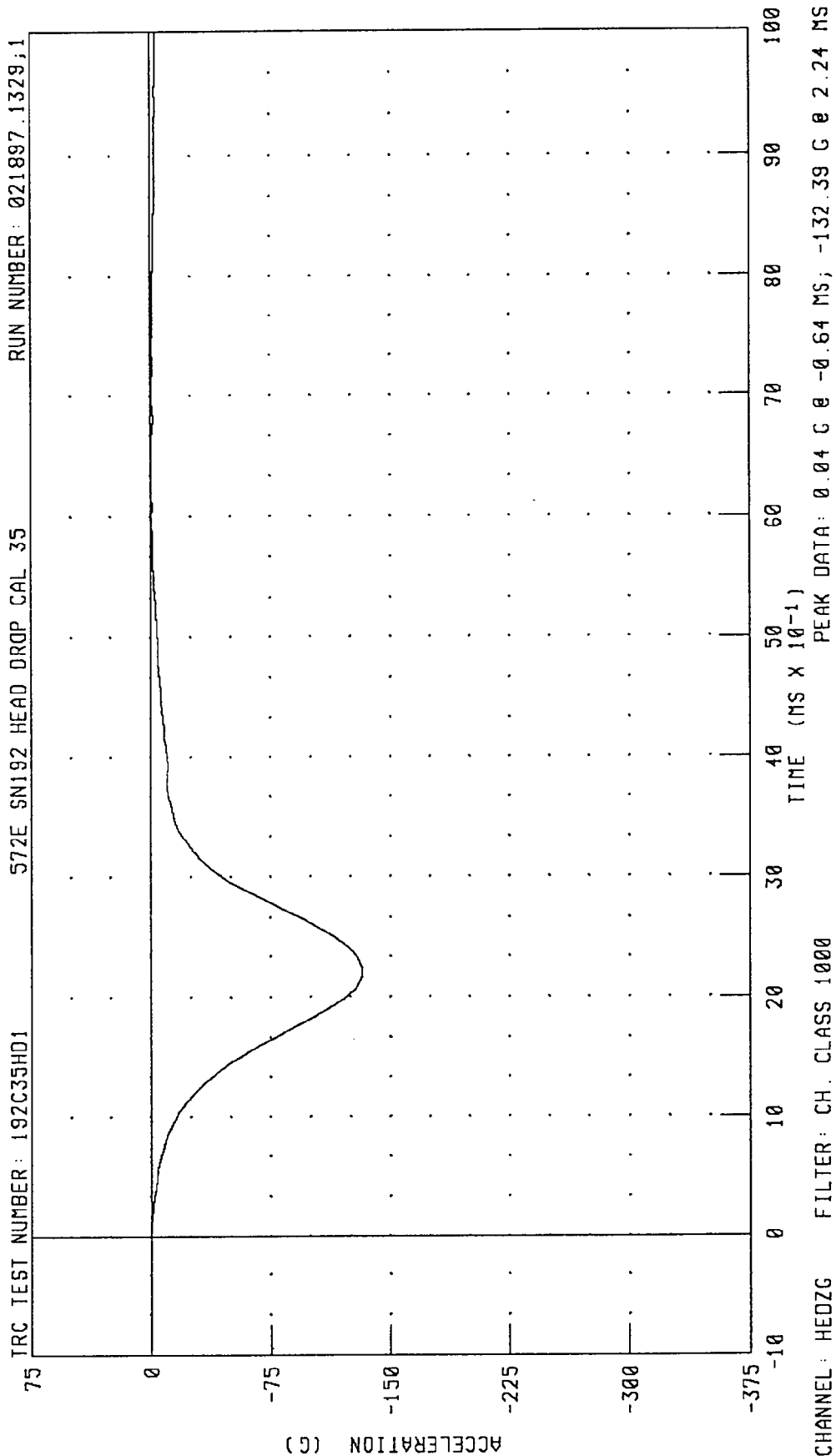
RUN NUMBER: 021897.1329.1



PEAK DATA: 0.86 G @ 7.04 MS; -11.45 G @ 2.48 MS

CHANNEL: HEDYC FILTER: CH. CLASS 1000

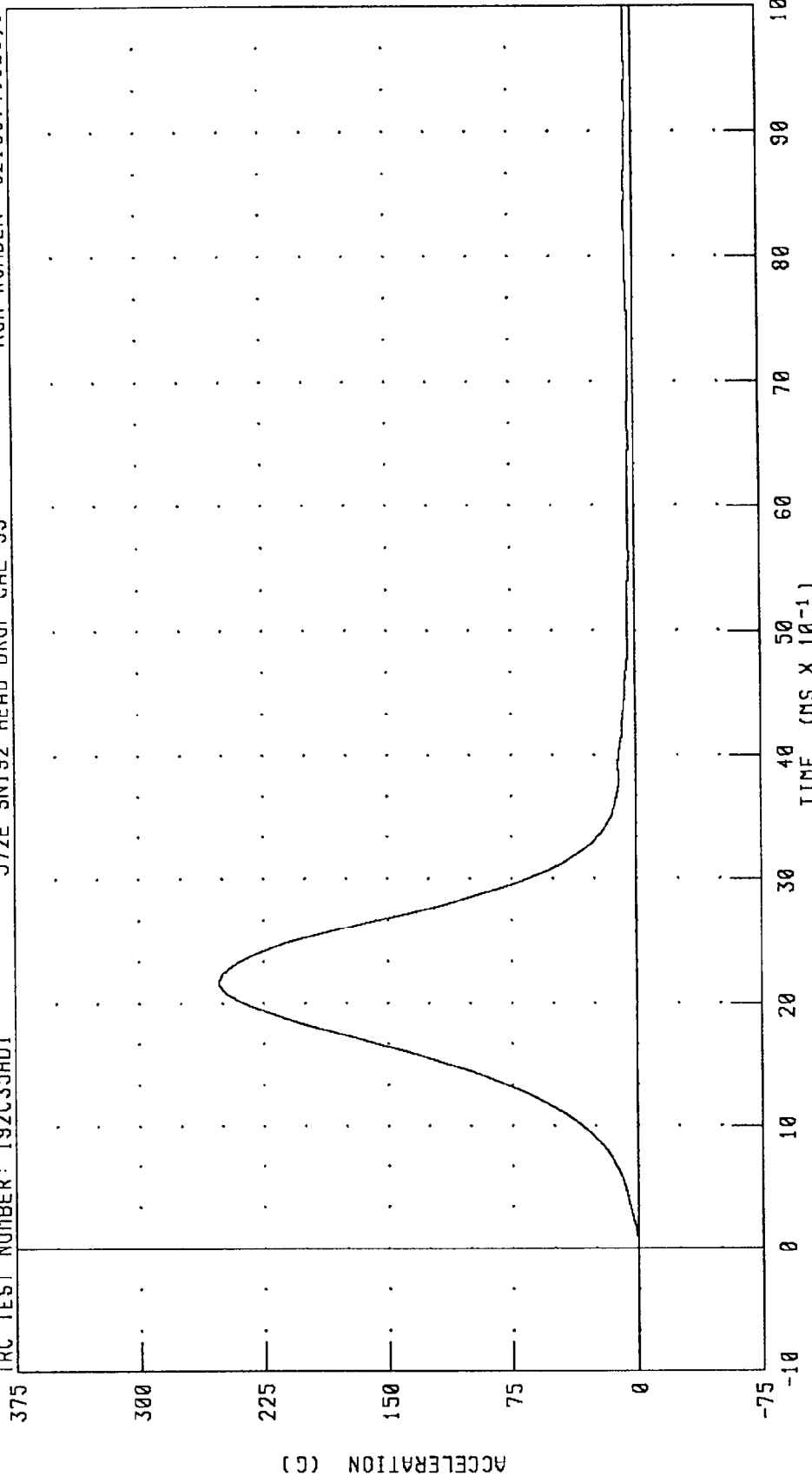
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS



PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

572E SN192 HEAD DROP CAL 35 RUN NUMBER: 021897.1329;1

TRC TEST NUMBER: 192C35HD1



PEAK DATA: 252.06 G @ 2.16 MS; 0.01 G @ -0.80 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

14-JAN-97

TRC INC. TEST NO: 192C35NF1 572E SN192 NECK FLEXION CAL35

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	16.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.93 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.66 G
	20 MS	17.60 - 22.60 G	20.78 G
	30 MS	12.50 - 18.50 G	16.07 G
MAX PENDULUM G		29 G MAX	23.46 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.99 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	36.96 MS
D PLANE	MAX	64 - 78 DEG.	70.11 DEG.
ROTATION	TIME	57 - 64 MS	57.84 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	96.03 NM
	TIME	47 - 58 MS	50.32 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	113.44 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	100.48 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

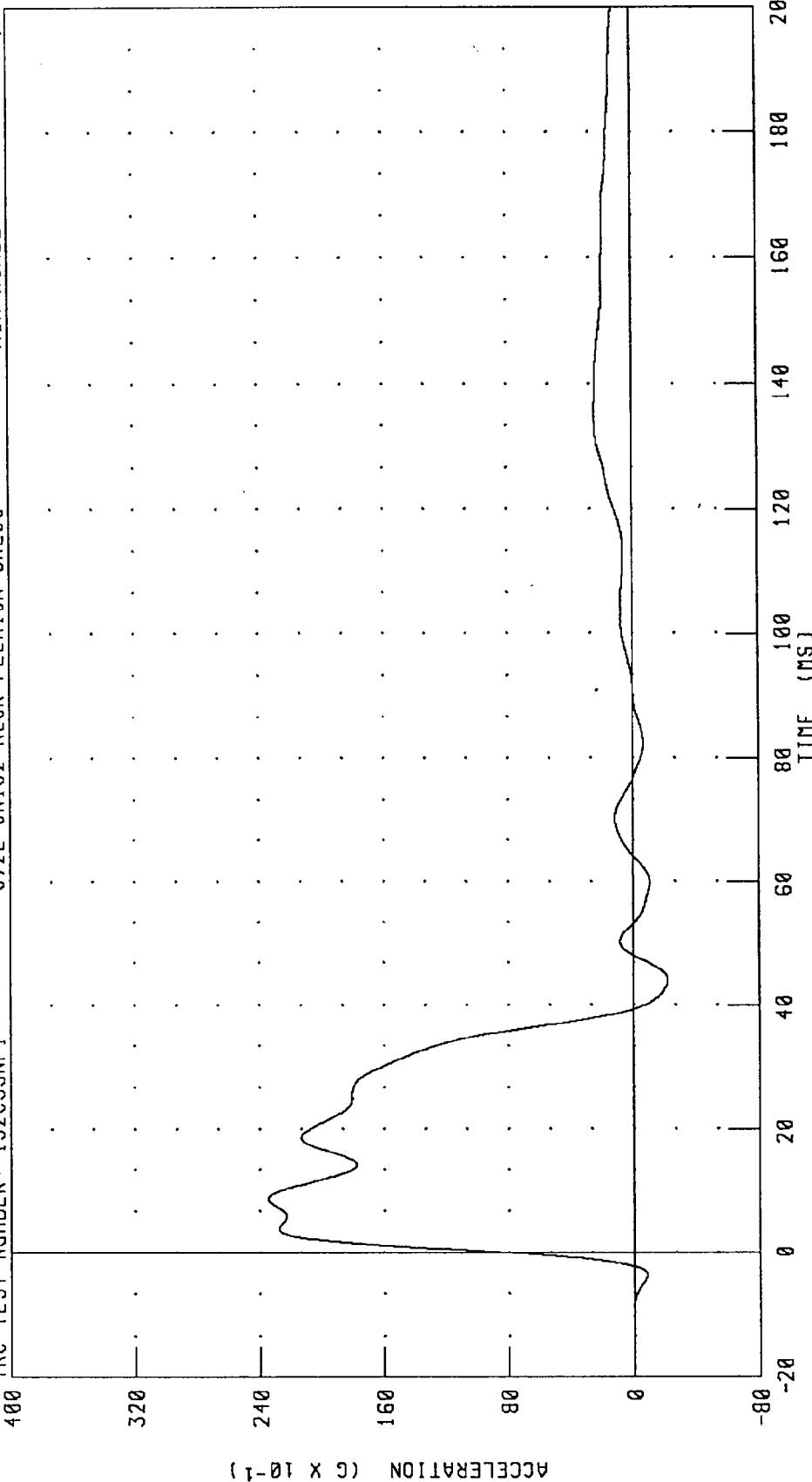
RUN NUMBER: 011497.1616;2

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 192C35NF1

572E SN192 NECK FLEXION CAL35

RUN NUMBER: 021897.1329,2



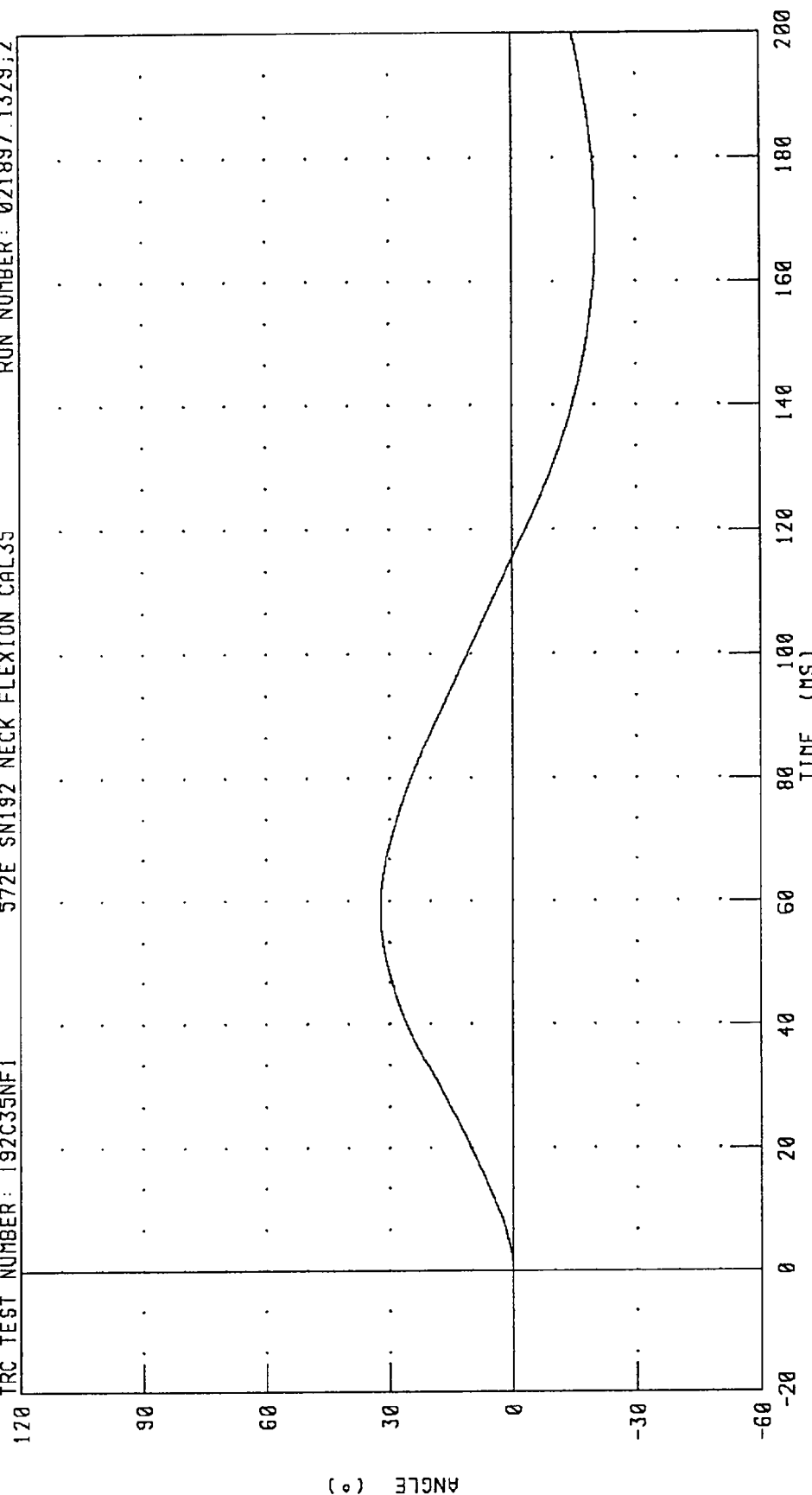
PEAK DATA: 23.46 G @ 8.64 MS; -2.18 G @ 44.00 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C35NF1 RUN NUMBER: 021897.1329;2

572E SN192 NECK FLEXION CAL35



PEAK DATA: 32.15 ° @ 58.48 MS; -20.24 ° @ 168.00 MS

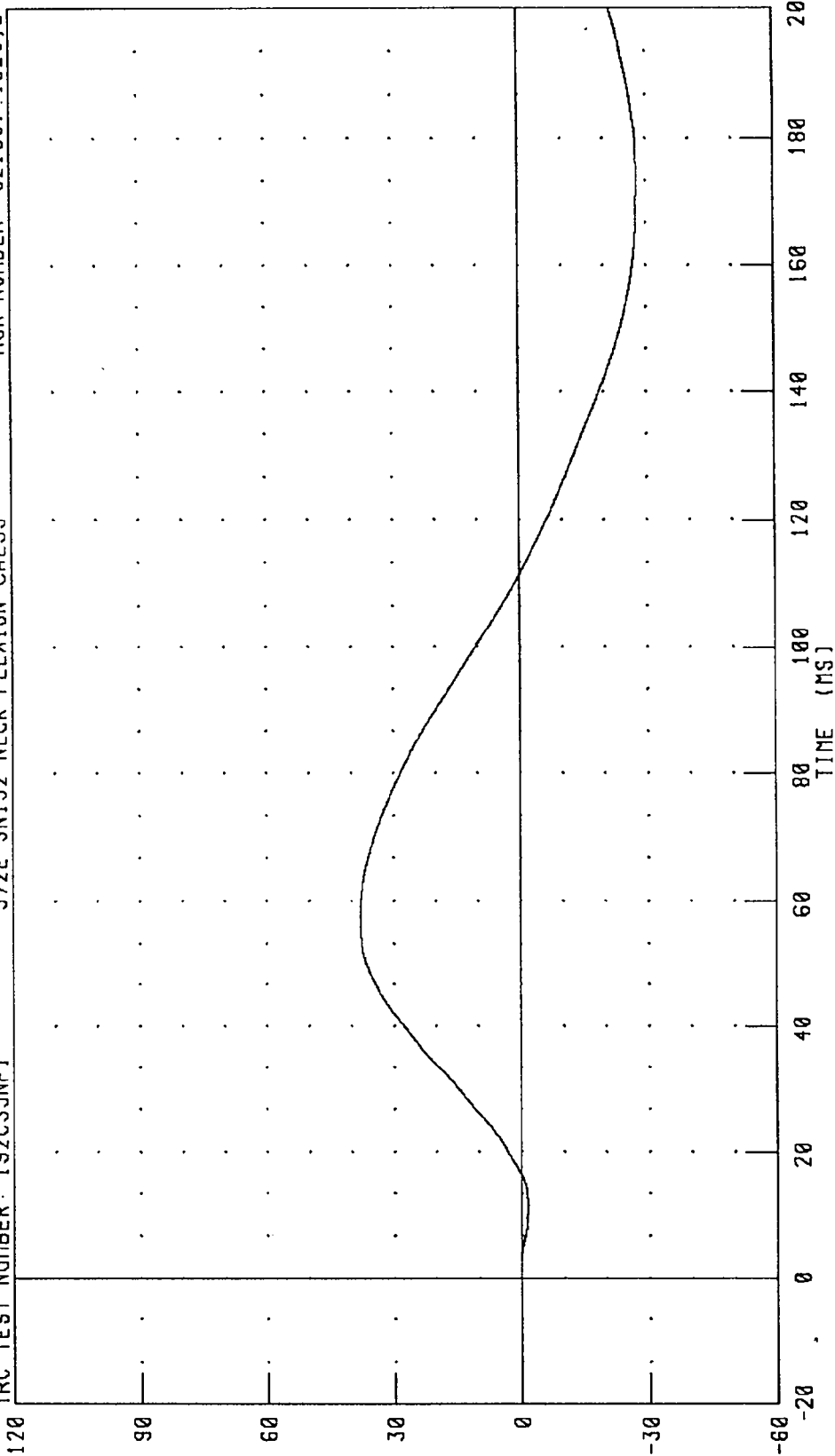
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C35NF1

572E SN192 NECK FLEXION CAL35

RUN NUMBER: 021897.1329;2



PEAK DATA: 37.98 ° @ 57.36 MS; -27.80 ° @ 173.60 MS

CHANNEL: THETA FILTER: CH. CLASS 60

ANGLE (°)

TIME (MS)

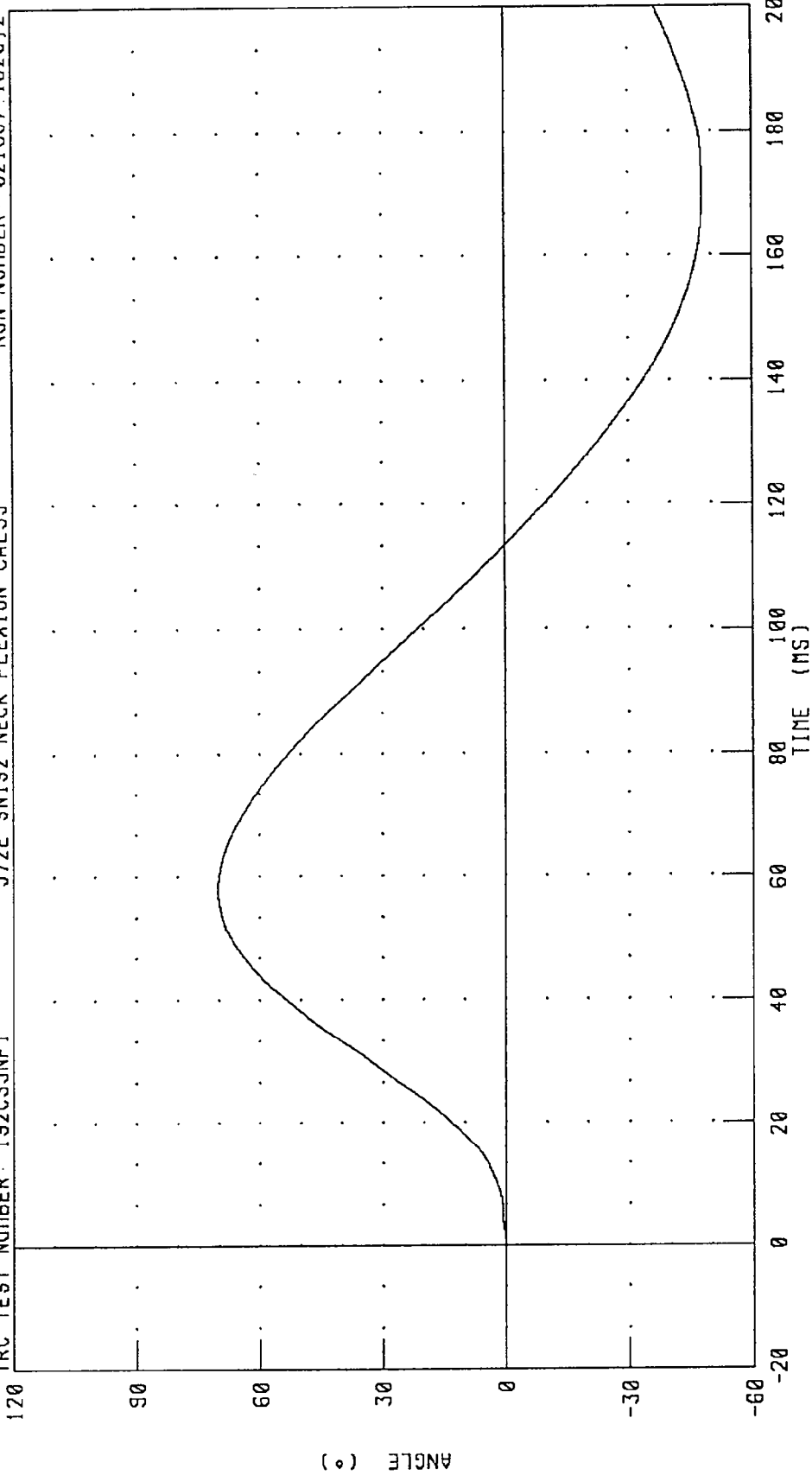
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C35NF1

572E SN192 NECK FLEXION CAL35

RUN NUMBER: 021897 1329;2



PEAK DATA: 70.12 ° @ 57.84 MS; -47.96 ° @ 170.16 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

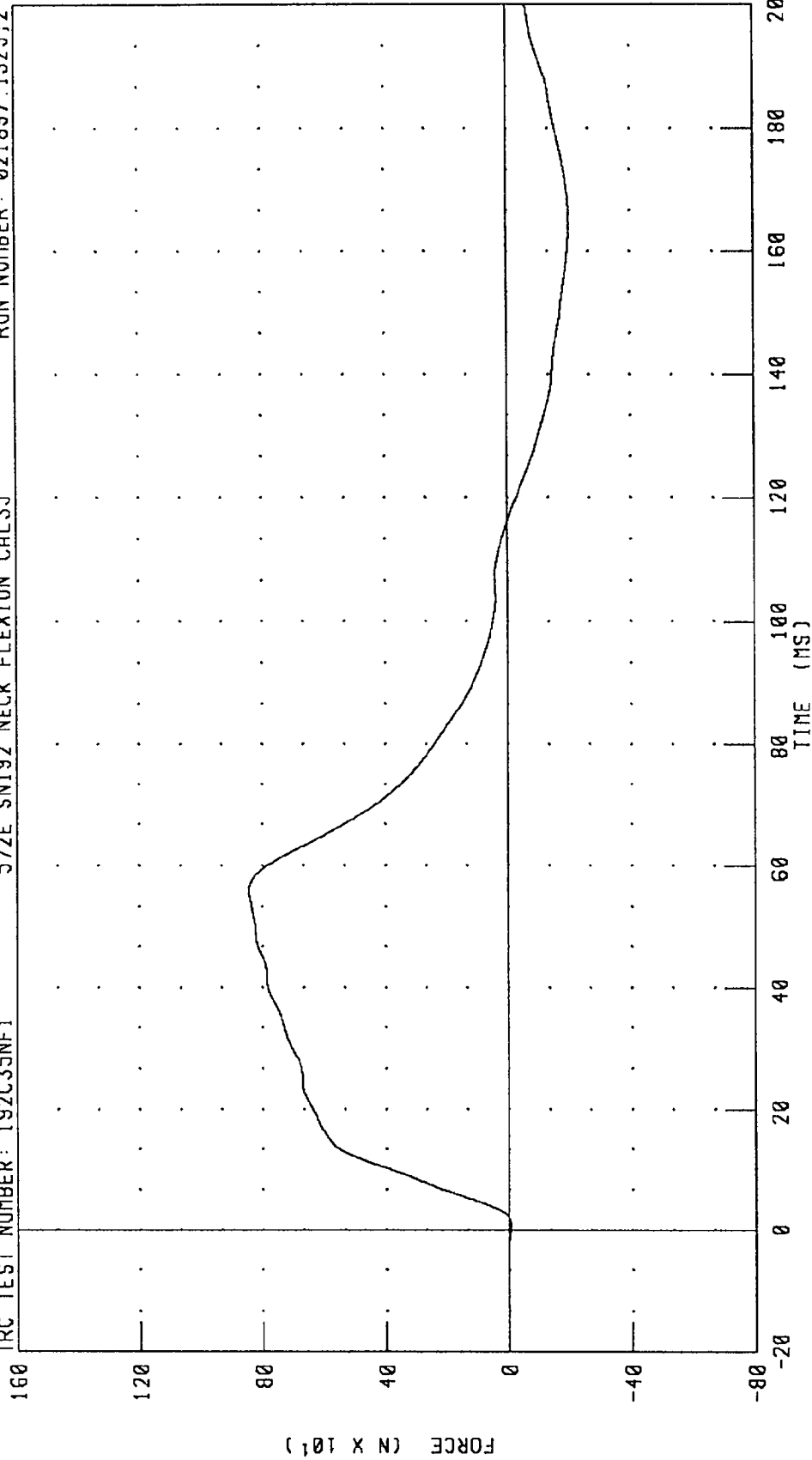
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 192C35NF1

572E SN192 NECK FLEXION CAL35

RUN NUMBER: 021897.1329;2



PEAK DATA: 843.66 N @ 56.00 MS; -202.27 N @ 164.96 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

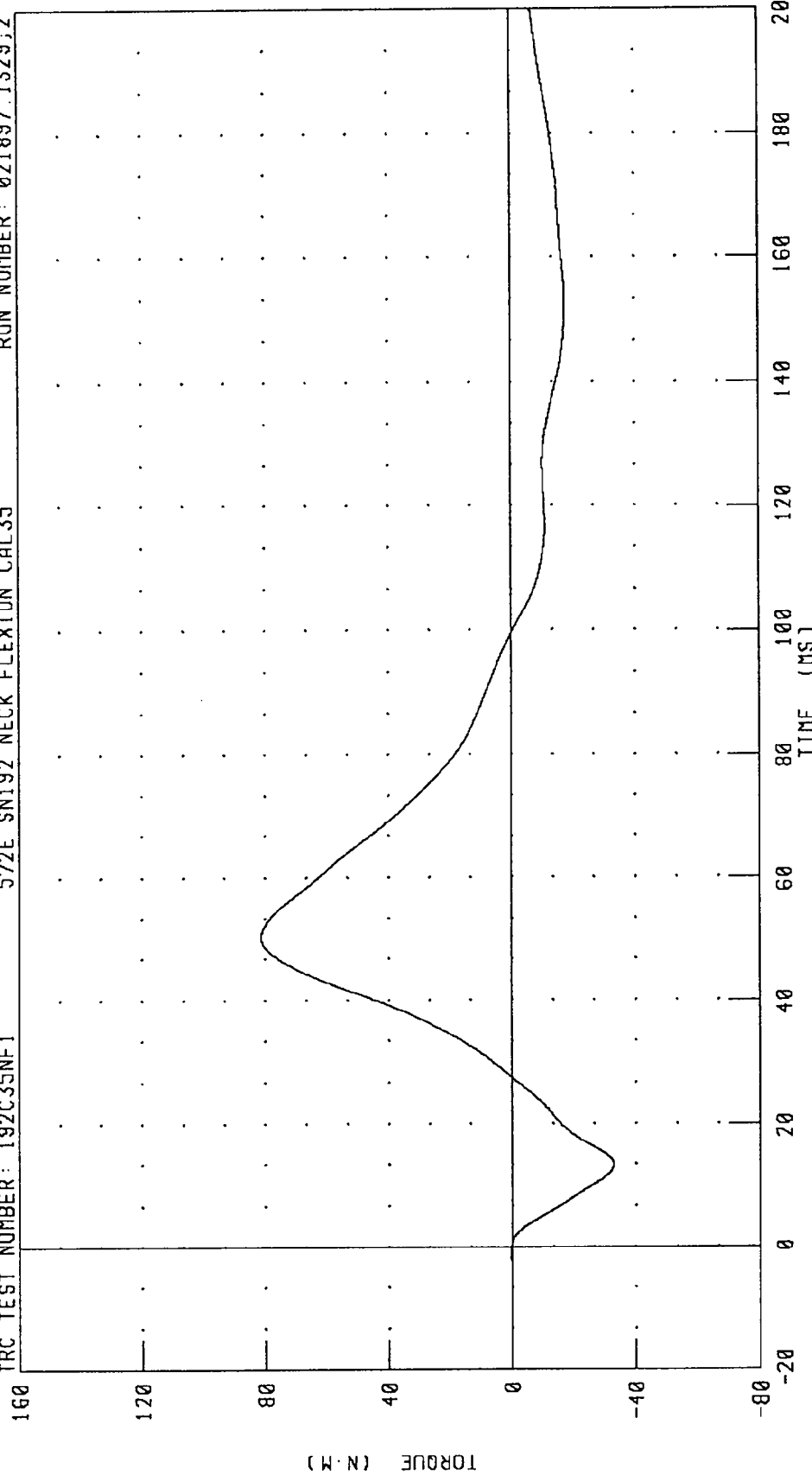
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C35NF1

572E SN192 NECK FLEXION CAL35

RUN NUMBER: 021897 1329;2



PEAK DATA: 81.37 N.M @ 50.24 MS; -32.78 N.M @ 13.28 MS

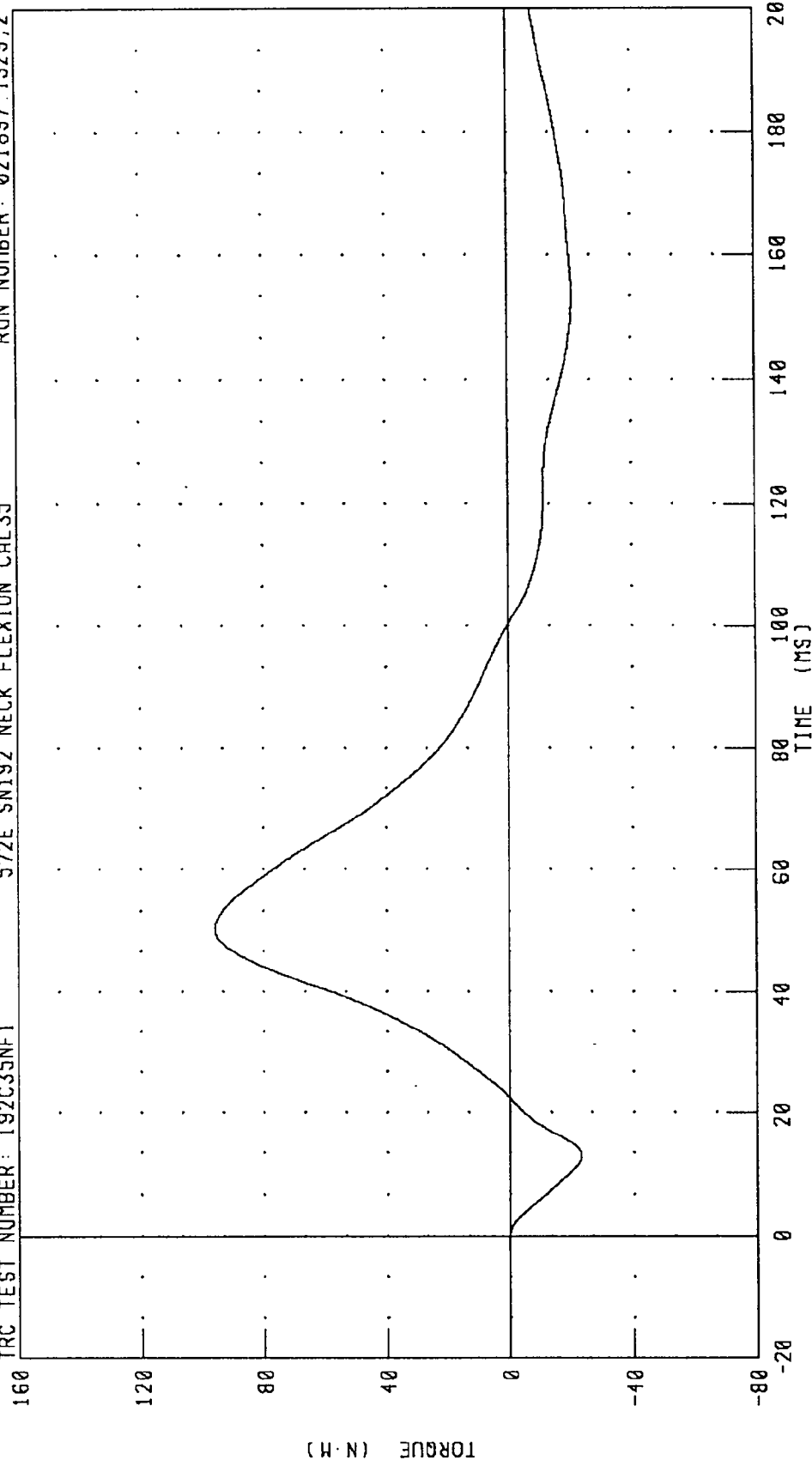
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C35NFI

572E SN192 NECK FLEXION CAL35

RUN NUMBER: 021897.1329,2



PEAK DATA: 96.03 N·M @ 50.32 MS; -23.13 N·M @ 12.88 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

15-JAN-97

TRC INC. TEST NO: 192C35NE1 572E SN192 NECK EXT. CAL35

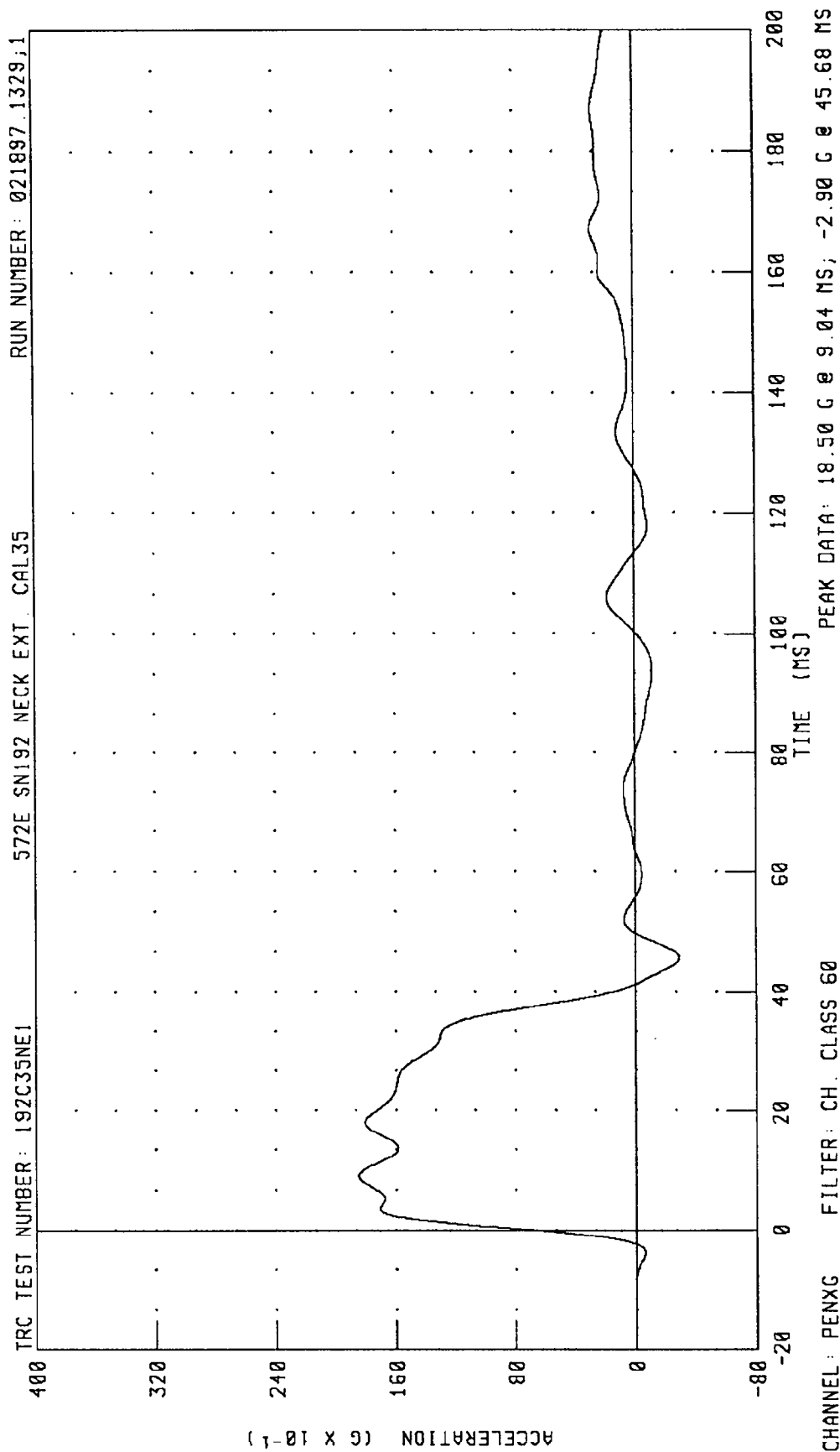
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	17.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.19 G
	20 MS	14.00 - 19.00 G	17.26 G
	30 MS	11.00 - 16.00 G	13.70 G
MAX PENDULUM G		22 G MAX	18.49 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.65 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.32 MS
D PLANE	MAX	81 - 106 DEG.	94.87 DEG.
ROTATION	TIME	72 - 82 MS	75.44 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-63.37 NM
	TIME	65 - 79 MS	70.24 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	154.64 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.32 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard Le Van

RUN NUMBER: 011597.0825;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION



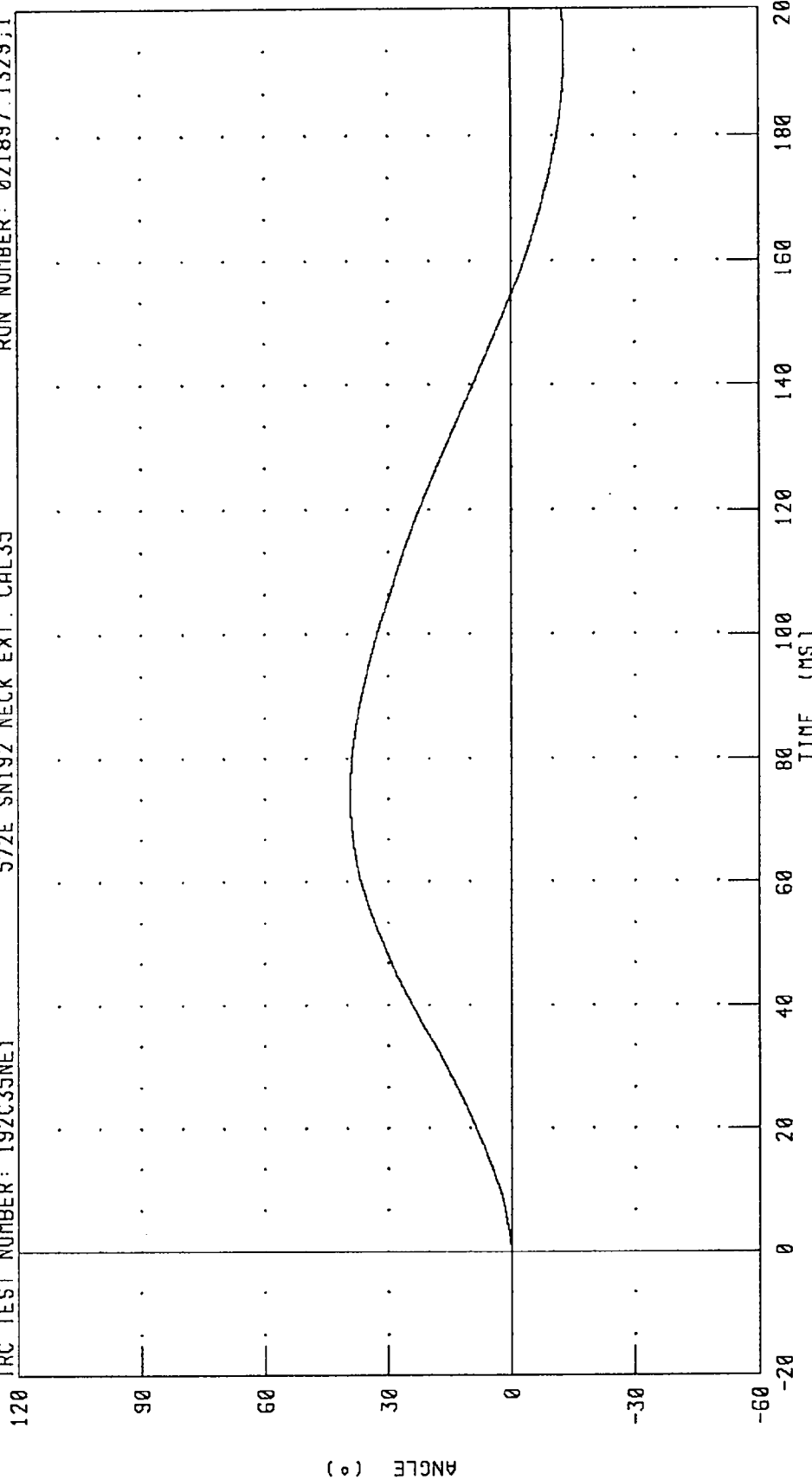
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 192C35NE1

572E SN192 NECK EXT. CAL35

RUN NUMBER: 021897.1329.1



PEAK DATA: 39.20 ° @ 74.00 MS; -12.97 ° @ 193.68 MS

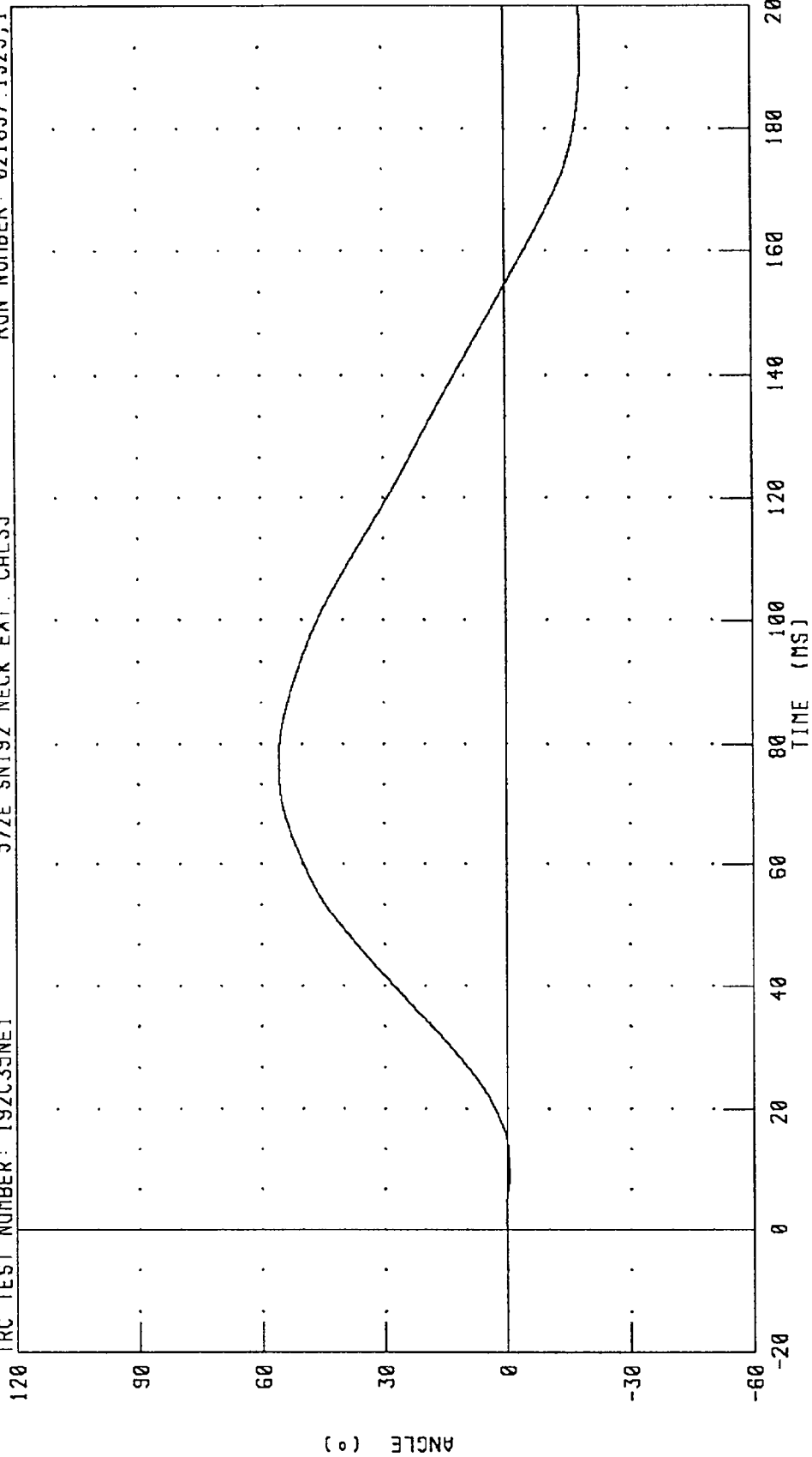
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C35NE1

572E SN192 NECK EXT. CAL35

RUN NUMBER: 021897.1329;1



PEAK DATA: 55.72 ° @ 77.04 MS; -18.51 ° @ 193.60 MS

CHANNEL: THETA FILTER: CH. CLASS 60

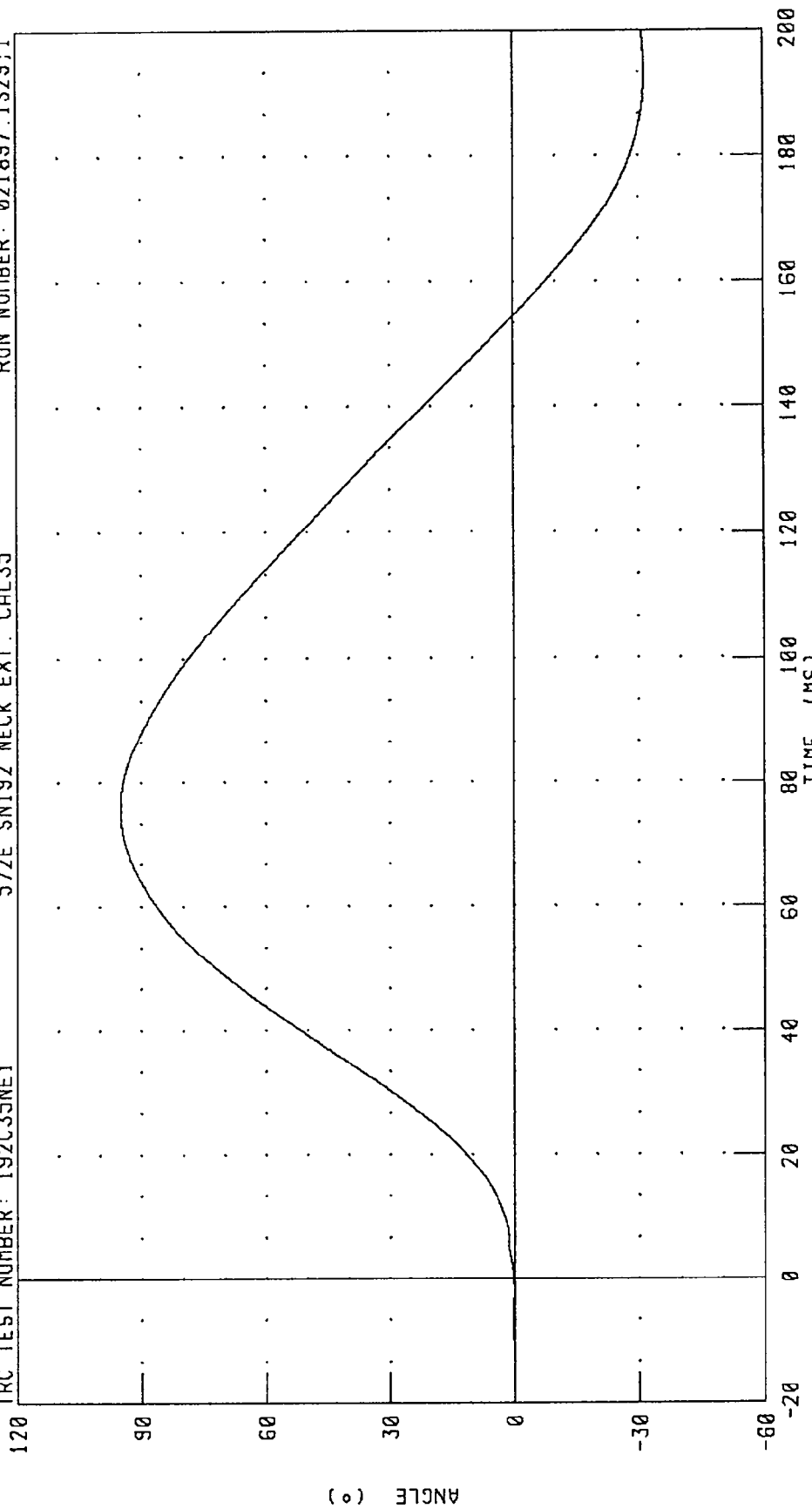
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C35NE1

572E SN192 NECK EXT. CAL35

RUN NUMBER: 021897.1329;1

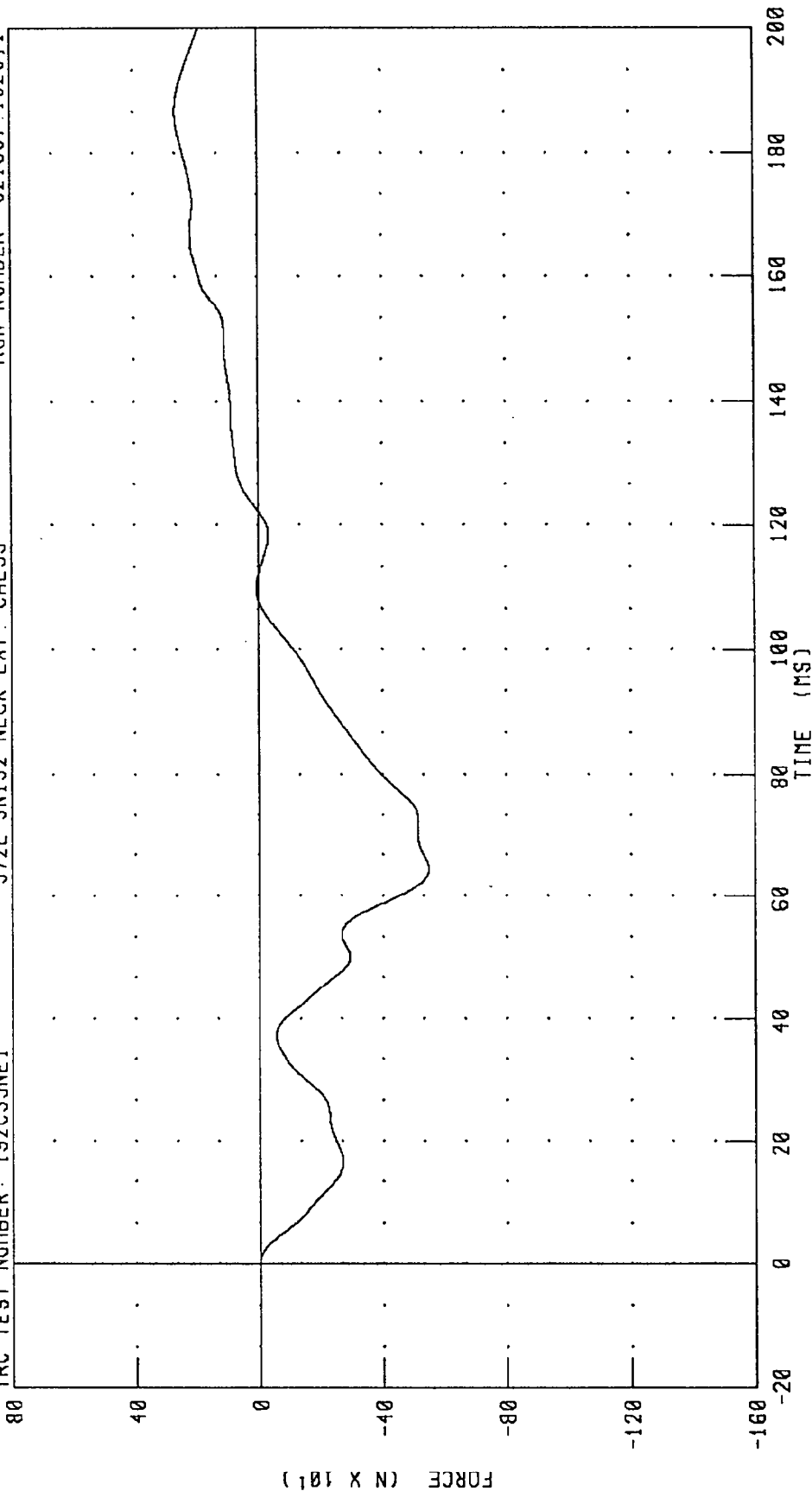


PEAK DATA: 94.87 ° @ 75.44 MS; -31.48 ° @ 193.60 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C35NE1 572E SN192 NECK EXT. CAL35 RUN NUMBER: 021897.1329,1

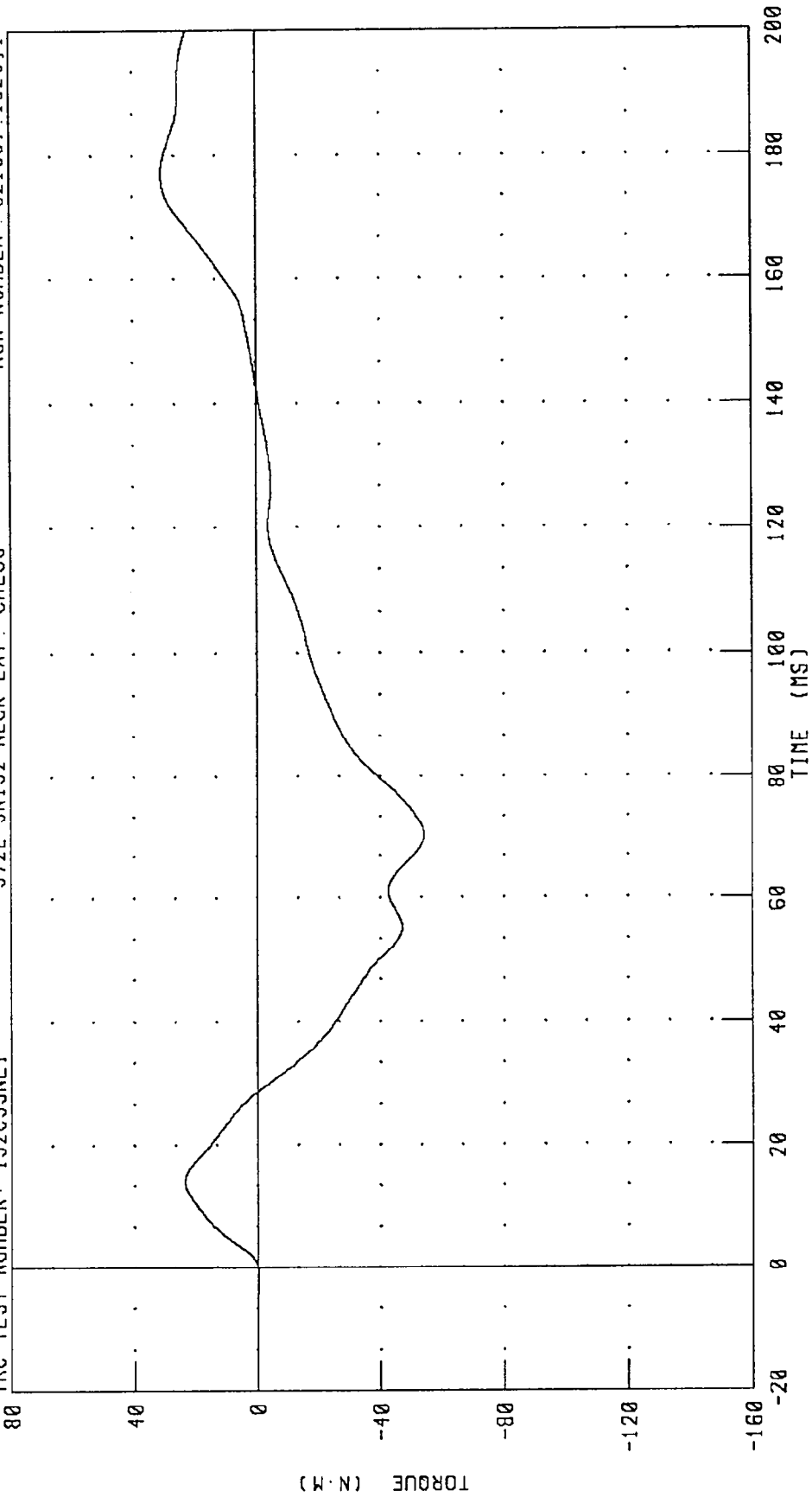


PEAK DATA: 265.99 N @ 186.72 MS; -548.92 N @ 64.32 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

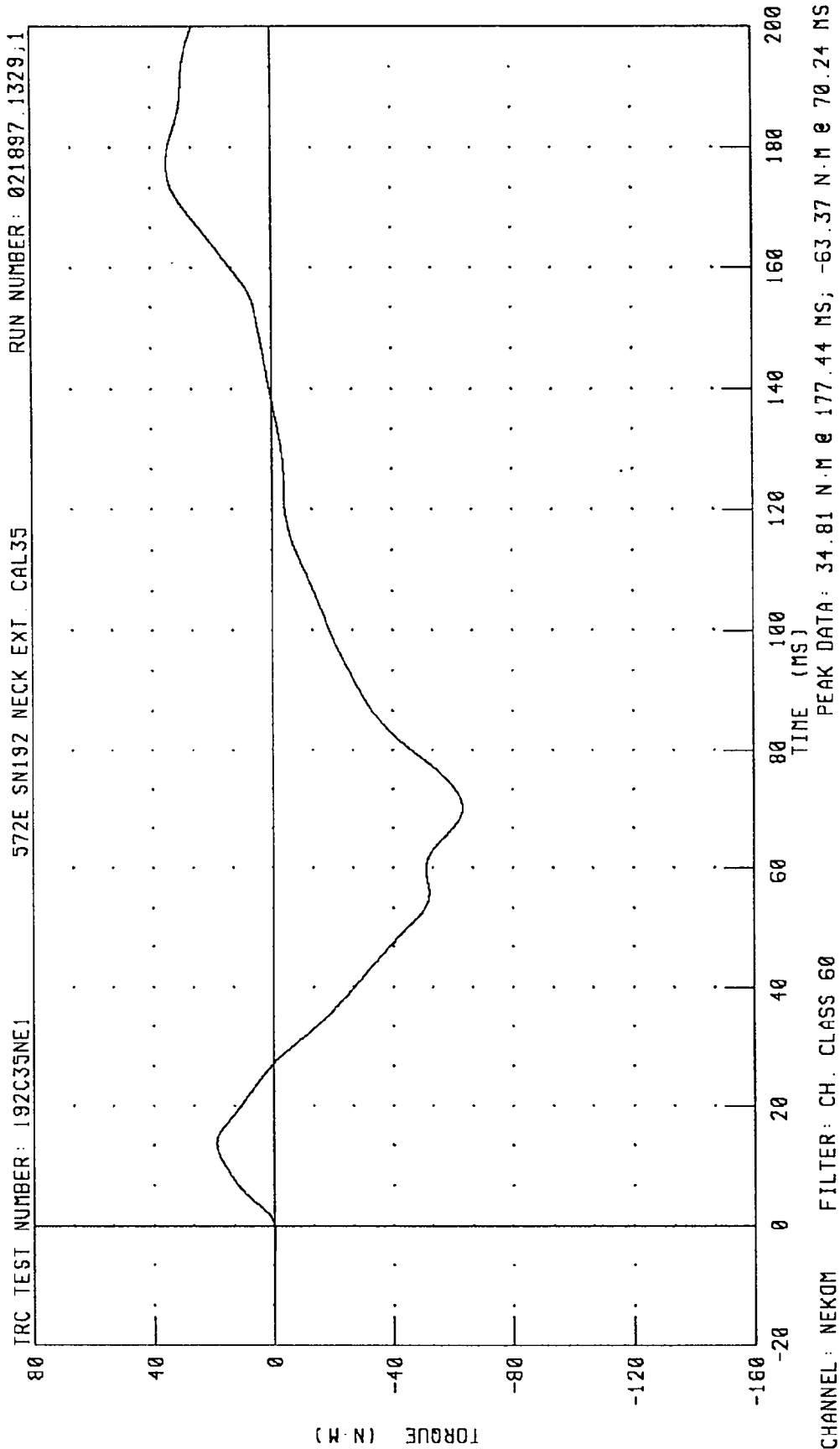
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C35NE1 572E SN192 NECK EXT. CAL35 RUN NUMBER: 021897.1329;1



CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 30.76 N·M @ 176.96 MS; -54.24 N·M @ 70.24 MS

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



TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

15-JAN-97

TRC INC.

TEST NO: 192C35TH1

572E SN192 H.S.THORAX CAL 35

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	24.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.68 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	67.7 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5768. N
INTERNAL HYSTERESIS	69% - 85%	73.1%

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

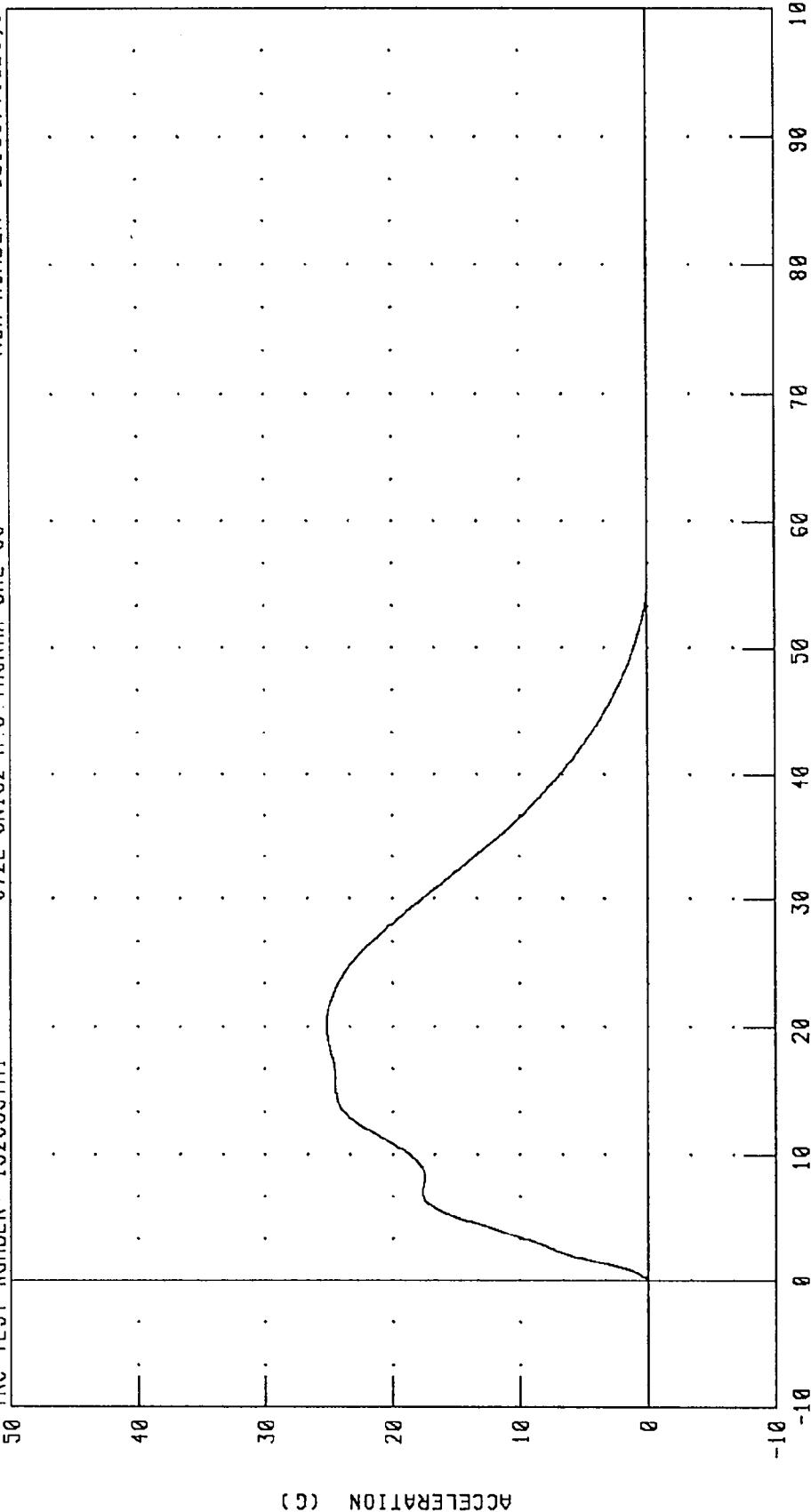
RUN NUMBER: 011597.1338;1

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 192C35TH1

572E SN192 H.S. THORAX CAL 35

RUN NUMBER: 021897.1329,1

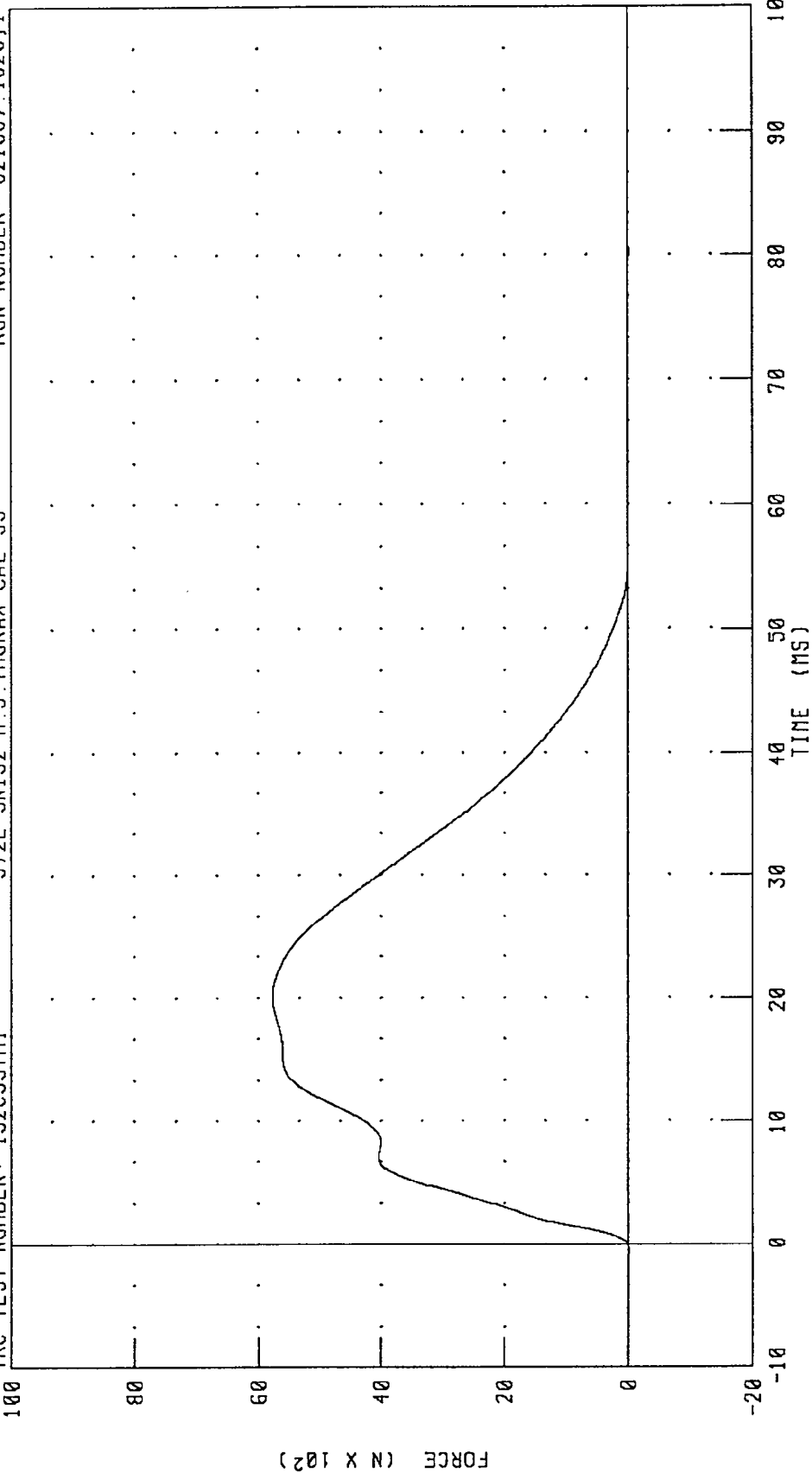


PEAK DATA: 25.18 G @ 20.16 MS; -0.02 G @ -0.56 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION PENDULUM FORCE

TRC TEST NUMBER: 192C35TH1 572E SN192 H.S. THORAX CAL 35 RUN NUMBER: 021897 1329;1



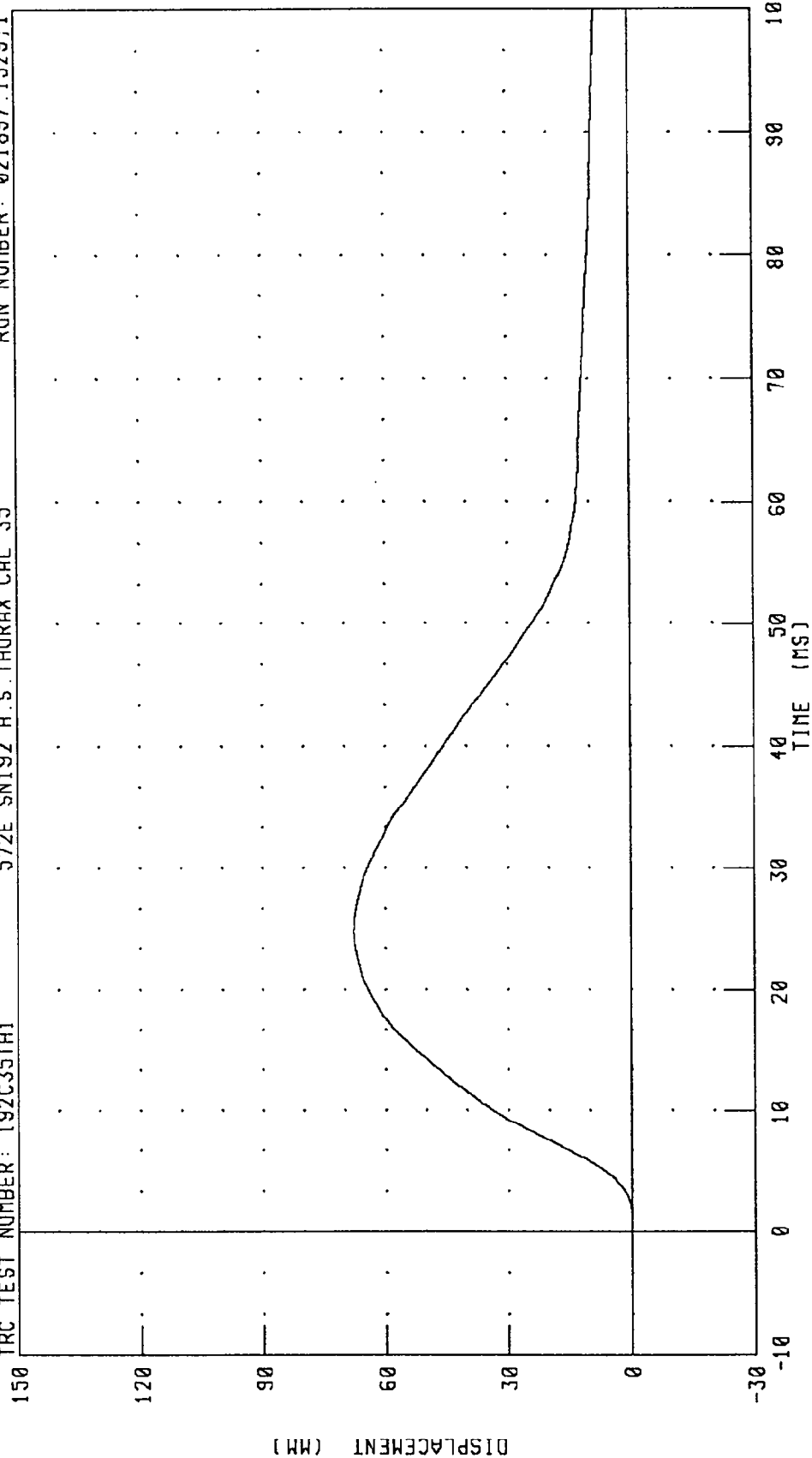
CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5768.06 N @ 20.16 MS; -5.25 N @ -0.56 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C35TH1

572E SN192 H.S. THORAX CAL 35

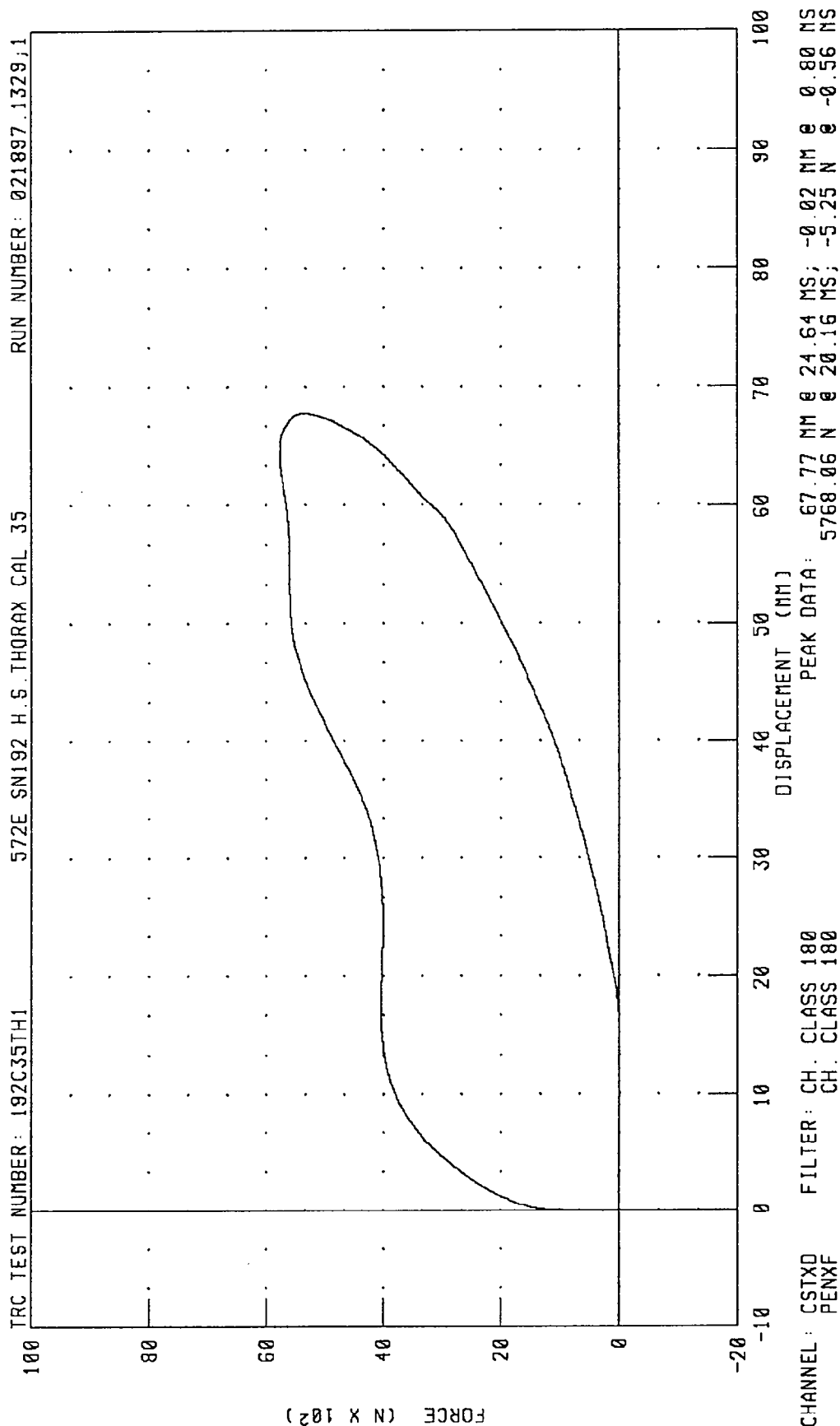
RUN NUMBER: 021897.1329.1



PEAK DATA: 67.77 MM @ 24.64 MS; -0.02 MM @ 0.80 MS

CHANNEL: CSTXD FILTER: CH. CLASS 180

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



TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

14-JAN-97

TRC INC.

TEST NO: 192C35RK1

572E SN192 RIGHT KNEE CAL 35

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	16.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5145.2 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard LeVan

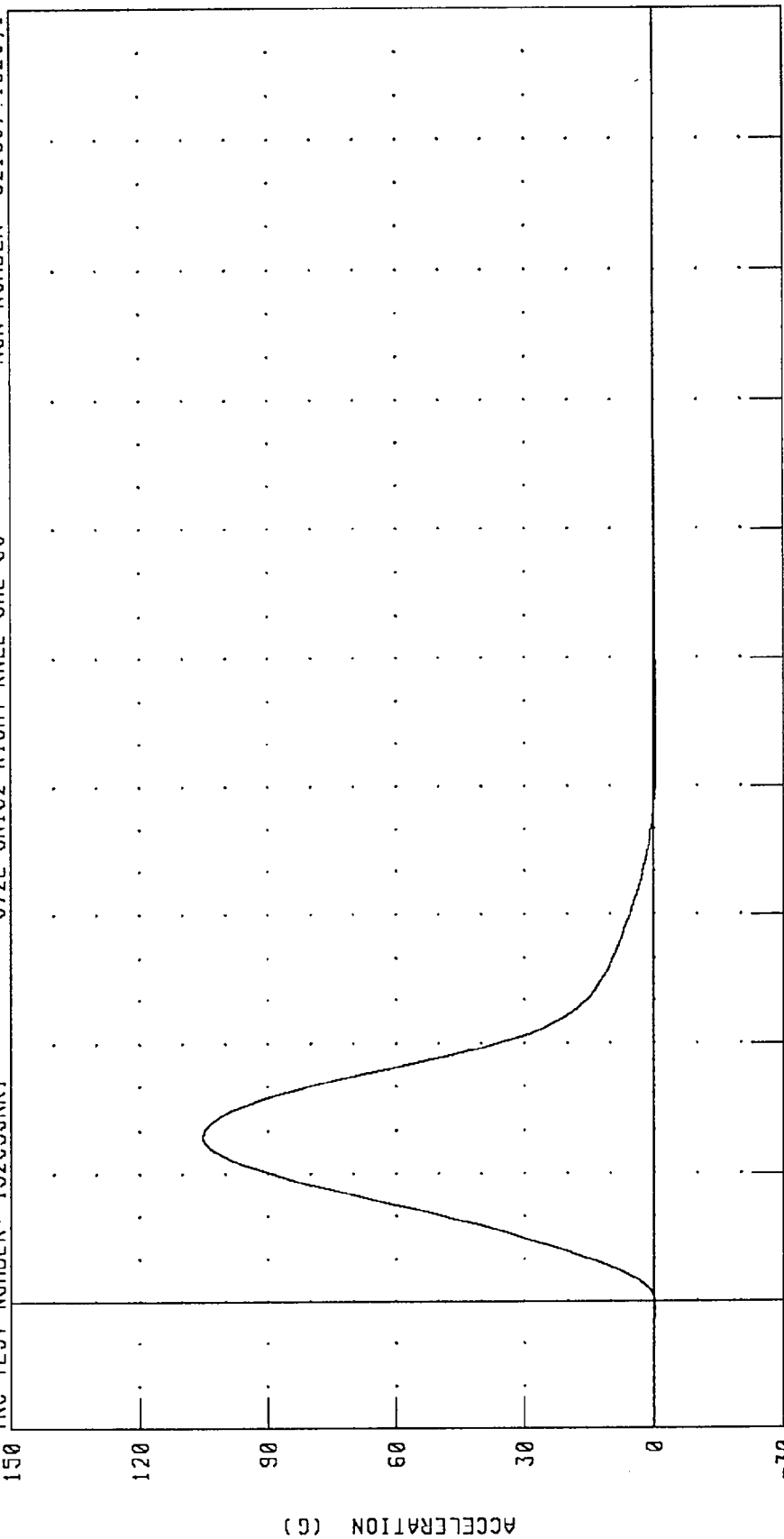
RUN NUMBER: 011497.1516;1

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

TRC TEST NUMBER: 192C35RK1

572E SN192 RIGHT KNEE CAL 35

RUN NUMBER: 021897.1329;1



PEAK DATA: 105.16 G @ 2.56 MS; -0.46 G @ 8.32 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

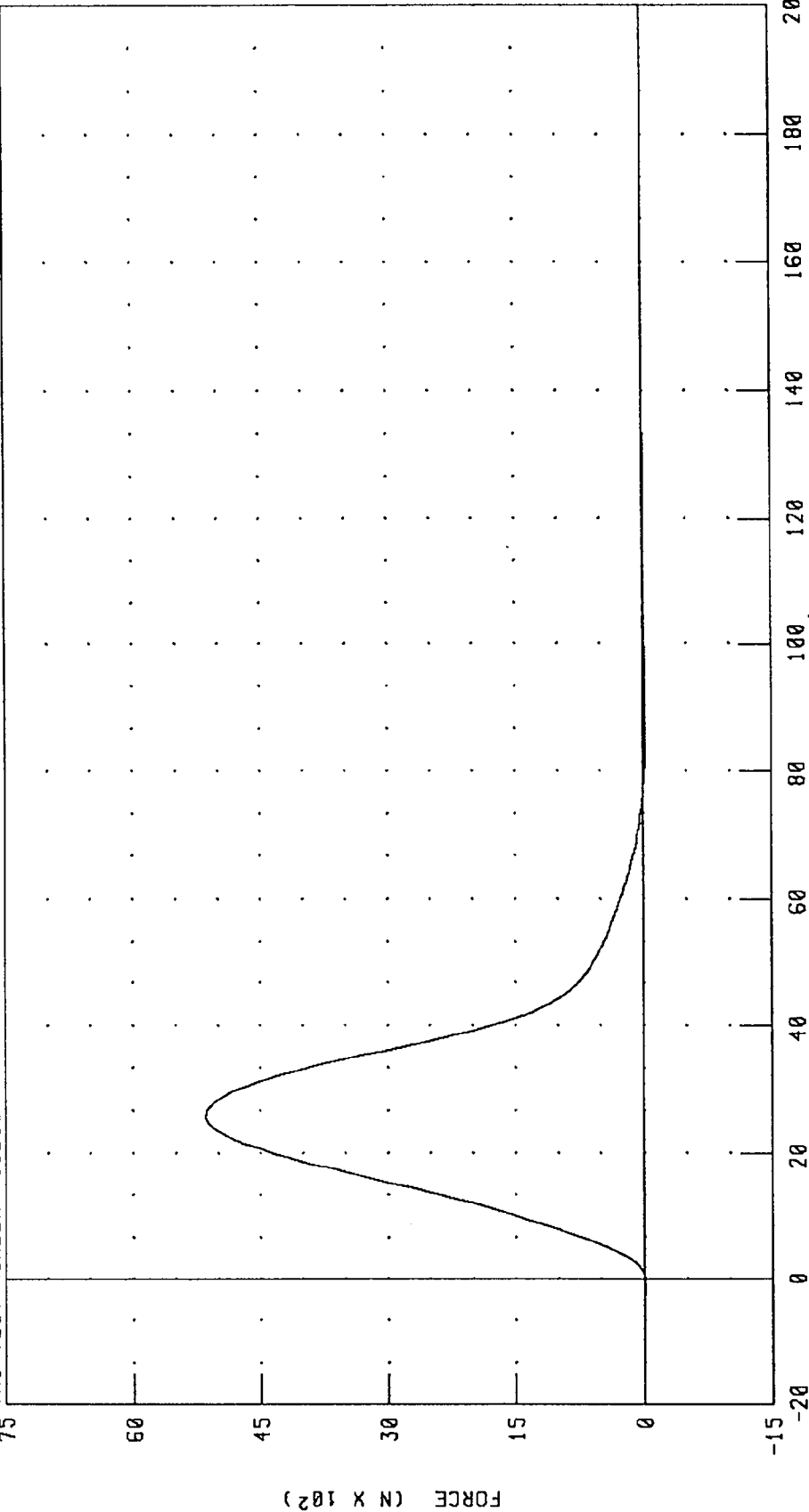
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C35RK1

572E SN192 RIGHT KNEE CAL 35

RUN NUMBER: 021897.1329;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5145.23 N @ 2.56 MS; -22.36 N @ 8.32 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

14-JAN-97

TRC INC.

TEST NO: 192C35LK1

572E SN192 LEFT KNEE CAL 35

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	16.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5263.0 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

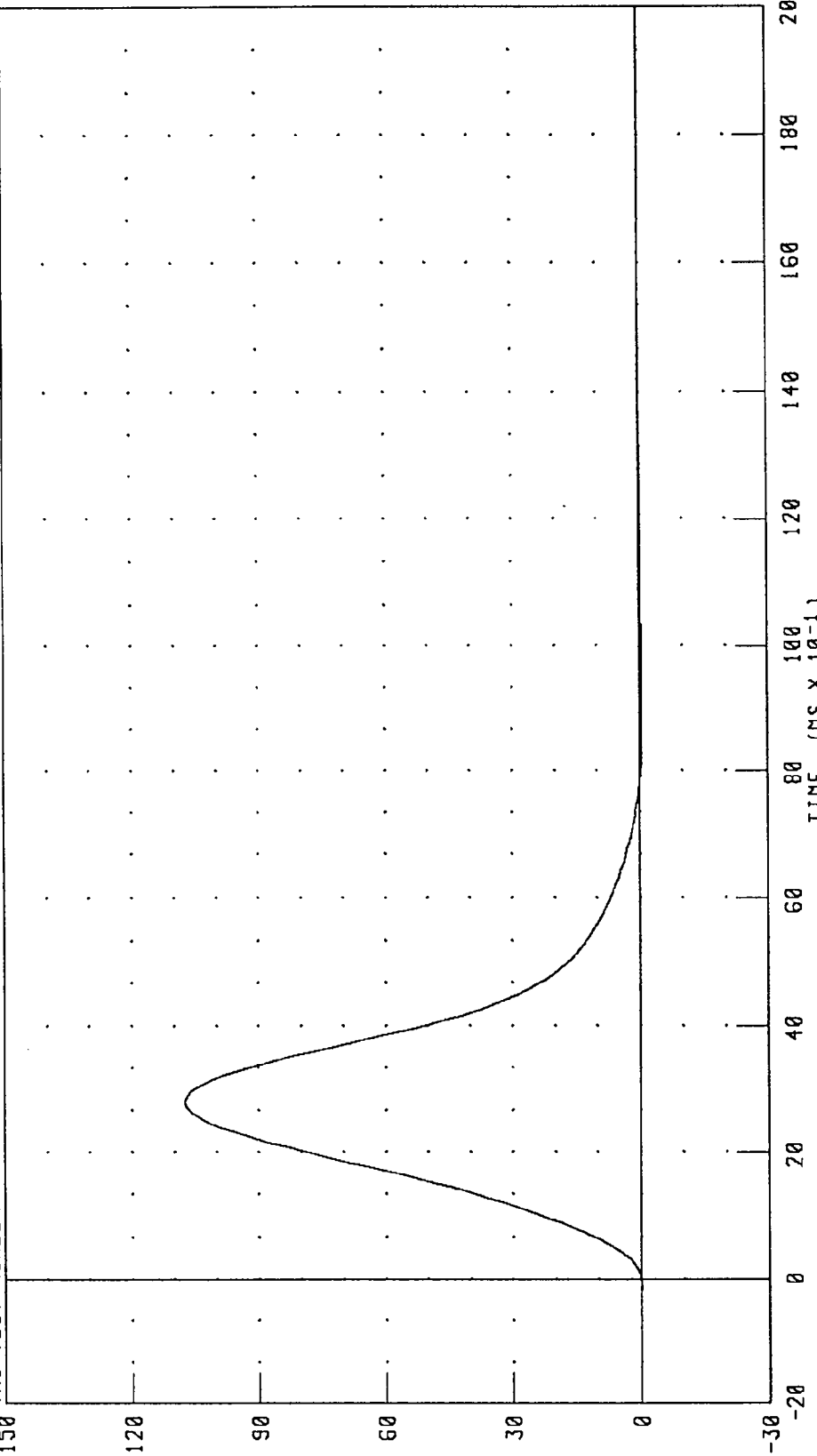
RUN NUMBER: 011497.1512;1

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

TRC TEST NUMBER: 192C35LK1

572E SN192 LEFT KNEE CAL 35

RUN NUMBER: 021897.1329;1



PEAK DATA: 107.57 G @ 2.80 MS; -0.52 G @ 8.48 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

14-JAN-97

TRC INC.

TEST NO: 192C35LK1

572E SN192 LEFT KNEE CAL 35

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	16.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5263.0 N

TEST MEETS SPECIFICATIONS

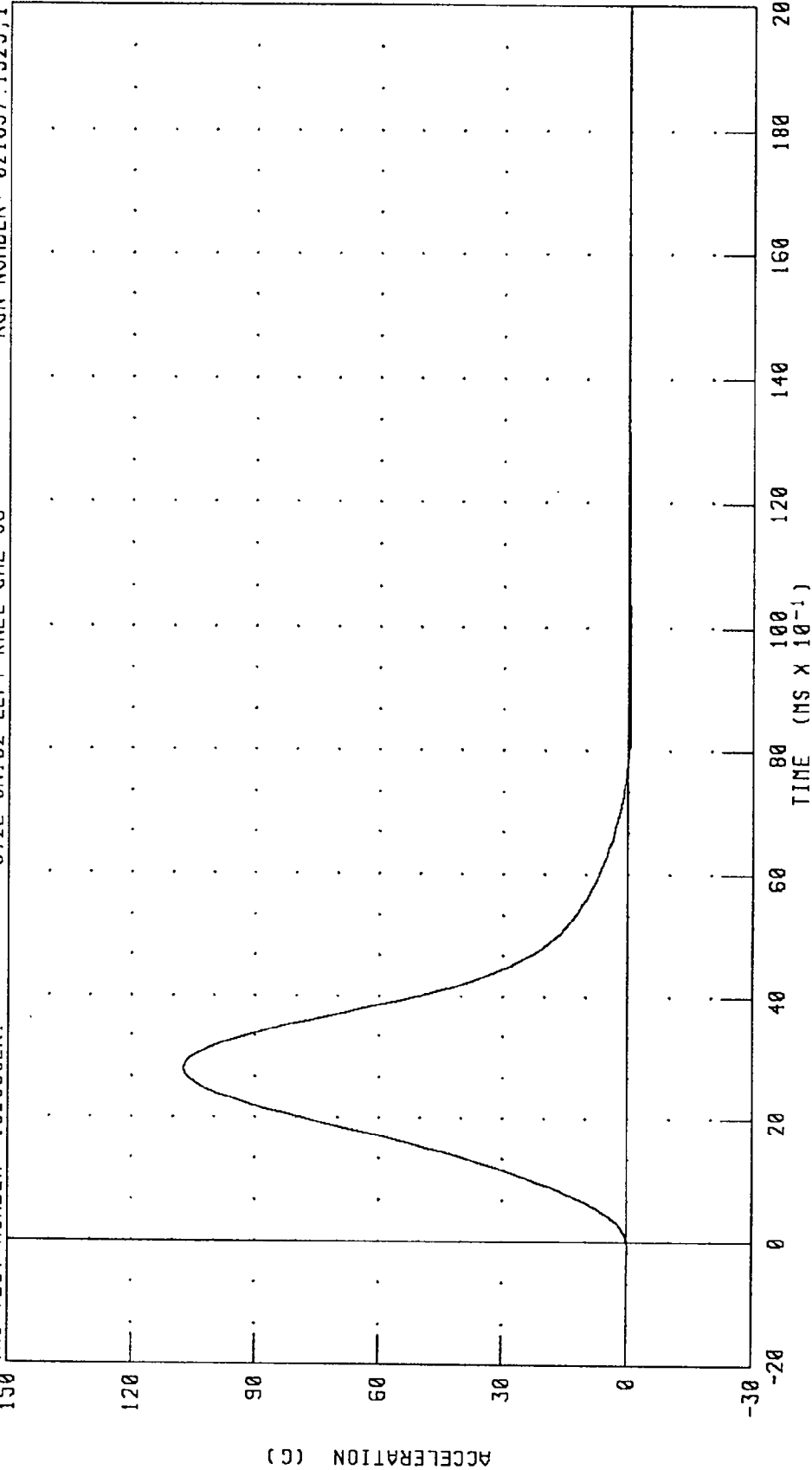
TECHNICIAN

Richard L. Lee

RUN NUMBER: 011497.1512;1

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

IRC TEST NUMBER: 192C35LK1 572E SN192 LEFT KNEE CAL 35 RUN NUMBER: 021897.1329,1



CHANNEL: PENXC FILTER: CH. CLASS 600

PEAK DATA: 107.57 G @ 2.80 MS; -0.52 G @ 8.48 MS

Appendix D

Miscellaneous Test Information

Dummy Instrument Calibrations
Driver Dummy #142

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Head X-axis accelerometer	ACC63	7264	Endevco	01/21/97	07/21/97
Head X-axis accelerometer-redundant	AC8L5	7264	Endevco	01/21/97	07/21/97
Head Y-axis accelerometer	ACC02	7264	Endevco	01/21/97	07/21/97
Head Y-axis accelerometer-redundant	ACCR7	7264	Endevco	01/21/97	07/21/97
Head Z-axis accelerometer	ACCF3	7264	Endevco	01/21/97	07/21/97
Head Z-axis accelerometer-redundant	A68JJ	7264	Endevco	01/21/97	07/21/97
Chest X-axis accelerometer	ACC14	7264	Endevco	01/21/97	07/21/97
Chest X-axis accelerometer-redundant	A65JJ	7264	Endevco	01/21/97	07/21/97
Chest Y-axis accelerometer	ACCR0	7264	Endevco	01/21/97	07/21/97
Chest Y-axis accelerometer-redundant	FH14J	7264	Endevco	01/21/97	07/21/97
Chest Z-axis accelerometer	ACCT5	7264	Endevco	01/21/97	07/21/97
Chest Z-axis accelerometer-redundant	AC745	7264	Endevco	01/21/97	07/21/97
Left femur force load cell	257	2121	Denton	01/21/97	07/21/97
Right femur force load cell	258	2121	Denton	01/21/97	07/21/97
Neck X-axis force load cell ¹	441	1716	Denton	01/21/97	07/21/97
Neck Y-axis force load cell ¹	441	1716	Denton	01/21/97	07/21/97
Neck Z-axis force load cell ¹	441	1716	Denton	01/21/97	07/21/97
Neck Moment about X-axis load cell ¹	441	1716	Denton	01/21/97	07/21/97
Neck Moment about Y-axis load cell ¹	441	1716	Denton	01/21/97	07/21/97
Neck Moment about Z-axis load cell ¹	441	1716	Denton	01/21/97	07/21/97
Pelvis X-axis accelerometer	CY63H	7264	Endevco	01/21/97	07/21/97
Pelvis Y-axis accelerometer	AMWA9	7264	Endevco	01/21/97	07/21/97
Pelvis Z-axis accelerometer	ANA55	7264	Endevco	01/21/97	07/21/97
Chest deflection potentiometer	142	14CB1-2981	Vernitech	01/21/97	07/21/97
Lap belt force load cell	236	3419	Lebow	07/03/96	01/03/97
Shoulder belt force load cell	134	3419	Lebow	07/03/96	01/03/97

Dummy Instrument Calibrations, Cont'd.
Driver Dummy #142

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left upper tibia moment about X-axis load cell	46	1583	Denton	01/21/97	07/21/97
Left upper tibia moment about Y-axis load cell	46	1583	Denton	01/21/97	07/21/97
Right upper tibia moment about X-axis load cell	35	1583	Denton	01/21/97	07/21/97
Right upper tibia moment about Y-axis load cell	35	1583	Denton	01/21/97	07/21/97
Left Lower tibia X-axis force load cell	42	1584	Denton	01/21/97	07/21/97
Left Lower tibia Z-axis force load cell	42	1584	Denton	01/21/97	07/21/97
Left Lower tibia moment about Y-axis load cell	42	1584	Denton	01/21/97	07/21/97
Right Lower tibia X-axis force load cell	39	1584	Denton	01/21/97	07/21/97
Right Lower tibia Z-axis force load cell	39	1584	Denton	01/21/97	07/21/97
Right Lower tibia moment about Y-axis load cell	39	1584	Denton	01/21/97	07/21/97
Left foot X-axis accelerometer	APA01	7264	Endevco	01/21/97	07/21/97
Left foot heel Z-axis accelerometer	10102	7264	Endevco	01/21/97	07/21/97
Left foot toe Z-axis accelerometer	10074	7264	Endevco	01/21/97	07/21/97
Right foot X-axis accelerometer	10088	7264	Endevco	01/21/97	07/21/97
Right foot heel Z-axis accelerometer	10089	7264	Endevco	01/21/97	07/21/97
Right foot toe Z-axis accelerometer	10087	7264	Endevco	01/21/97	07/21/97

Dummy Instrument Calibrations, Cont'd.
Driver Dummy #142

	Serial Number	Model Number	Manufacturer	Calibration Date Last	Due
Left knee left sensor	21	1587	Denton	08/20/96	02/20/97
Left knee right sensor	21	1587	Denton	08/20/96	02/20/97
Right knee left sensor	42	1587	Denton	08/20/96	02/20/97
Right knee right sensor	42	1587	Denton	08/20/96	02/20/97

Dummy Instrument Calibrations, Cont'd.
Right Front Passenger Dummy #192

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Head X-axis accelerometer	AAL54	7264	Endevco	01/13/97	07/13/97
Head X-axis accelerometer-redundant	AJ8J7	7264	Endevco	01/13/97	07/13/97
Head Y-axis accelerometer	AAMP5	7264	Endevco	01/13/97	07/13/97
Head Y-axis accelerometer-redundant	J10458	7264	Endevco	01/13/97	07/13/97
Head Z-axis accelerometer	ACB35	7264	Endevco	01/13/97	07/13/97
Head Z-axis accelerometer-redundant	AC8W6	7264	Endevco	01/13/97	07/13/97
Chest X-axis accelerometer	ACCD0	7264	Endevco	01/13/97	07/13/97
Chest X-axis accelerometer-redundant	A79GJ	7264	Endevco	01/13/97	07/13/97
Chest Y-axis accelerometer	ACC82	7264	Endevco	01/13/97	07/13/97
Chest Y-axis accelerometer-redundant	AGR69	7264	Endevco	01/13/97	07/13/97
Chest Z-axis accelerometer	ACC59	7264	Endevco	01/13/97	07/13/97
Chest Z-axis accelerometer-redundant	AAL82	7264	Endevco	01/13/97	07/13/97
Left femur force load cell	263	2121	Denton	01/13/97	07/13/97
Right femur force load cell	264	2121	Denton	01/13/97	07/13/97
Neck X-axis force load cell	445	1716	Denton	01/13/97	07/13/97
Neck Y-axis force load cell	445	1716	Denton	01/13/97	07/13/97
Neck Z-axis force load cell	445	1716	Denton	01/13/97	07/13/97
Neck Moment about X-axis load cell	445	1716	Denton	01/13/97	07/13/97
Neck Moment about Y-axis load cell	445	1716	Denton	01/13/97	07/13/97
Neck Moment about Z-axis load cell	445	1716	Denton	01/13/97	07/13/97
Pelvis X-axis accelerometer	AJ694	7264	Endevco	01/13/97	07/13/97
Pelvis Y-axis accelerometer	AJ656	7264	Endevco	01/13/97	07/13/97
Pelvis Z-axis accelerometer	AJ788	7264	Endevco	01/13/97	07/13/97
Chest deflection potentiometer	87313-96	14CB1-2981	Vernitech	01/13/97	07/13/97
Lap belt force load cell	130	3419	Lebow	07/03/96	01/03/97
Shoulder belt force load cell	143	3419	Lebow	07/03/96	01/03/97

Dummy Instrument Calibrations, Cont'd.
Right Front Passenger Dummy #192

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left upper tibia moment about X-axis load cell	617	1583	Denton	01/14/97	07/14/97
Left upper tibia moment about Y-axis load cell	617	1583	Denton	01/14/97	07/14/97
Right upper tibia moment about X-axis load cell	616	1583	Denton	01/14/97	07/14/97
Right upper tibia moment about Y-axis load cell	616	1583	Denton	01/14/97	07/14/97
Left Lower tibia X-axis force load cell	600	1584	Denton	01/14/97	07/14/97
Left Lower tibia Z-axis force load cell	600	1584	Denton	01/14/97	07/14/97
Left Lower tibia moment about Y-axis load cell	600	1584	Denton	01/14/97	07/14/97
Right Lower tibia X-axis force load cell	599	1584	Denton	01/14/97	07/14/97
Right Lower tibia Z-axis force load cell	599	1584	Denton	01/14/97	07/14/97
Right Lower tibia moment about Y-axis load cell	599	1584	Denton	01/14/97	07/14/97
Left foot X-axis accelerometer	10073	7264	Endevco	01/13/97	07/13/97
Left foot heel Z-axis accelerometer	10263	7264	Endevco	01/13/97	07/13/97
Left foot toe Z-axis accelerometer	10101	7264	Endevco	01/13/97	07/13/97
Right foot X-axis accelerometer	APYT4	7264	Endevco	01/13/97	07/13/97
Right foot heel Z-axis accelerometer	AP0R8	7264	Endevco	01/13/97	07/13/97
Right foot toe Z-axis accelerometer	10076	7264	Endevco	01/13/97	07/13/97

Dummy Instrument Calibrations, Cont'd.
Right Front Passenger Dummy #192

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left knee left sensor	574	1587	Denton	08/20/96	02/20/97
Left knee right sensor	574	1587	Denton	08/20/96	02/20/97
Right knee left sensor	573	1587	Denton	08/20/96	02/20/97
Right knee right sensor	573	1587	Denton	08/20/96	02/20/97

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left rear seat crossmember X-axis	ANB43	7264	Endevco	07/01/96	01/01/97
Left rear seat crossmember X-axis redundant	J14708	7264	Endevco	10/23/96	04/23/97
Right rear seat crossmember X-axis	AGR84	7264	Endevco	10/14/96	04/14/97
Right rear seat crossmember X-axis redundant	AGR76	7264	Endevco	11/13/96	05/13/97
Engine top X-axis	J13520	7264	Endevco	07/31/96	01/31/97
Engine bottom X-axis	CP50H	7264	Endevco	11/13/96	05/13/97
Right brake caliper X-axis	ACC05	7264	Endevco	07/01/96	01/01/97
Left brake caliper X-axis	J10458	7264	Endevco	09/25/96	03/25/97
Instrument panel center X-axis	J14150	7264	Endevco	07/01/96	01/01/97

A. T. D. Calibration Laboratory Instruments

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Neck bending pendulum accelerometer	CB27	7232	Endevco	09/18/96	03/18/97
Neck bending rotary potentiometer (Beta)	006	66575-1-102	Bournes	07/22/96	01/22/97
Neck bending linear potentiometer (Theta)	007	66575-1-102	Bournes	07/22/96	01/22/97
Thorax pendulum accelerometer	CC64	7232	Endevco	09/18/96	03/18/97
Hybrid III femur pendulum accelerometer	CB35	7232	Endevco	09/18/96	03/18/97

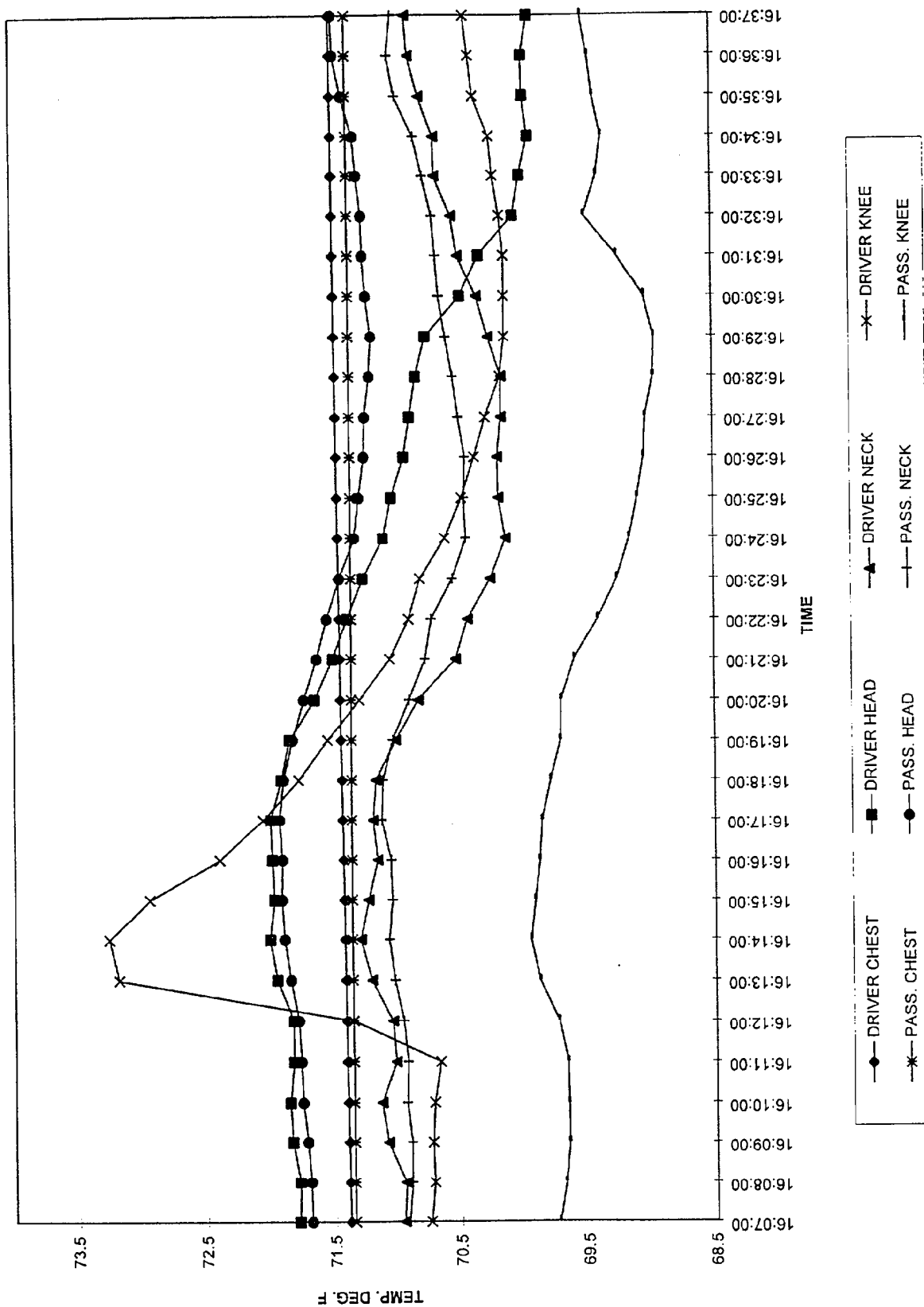
Sign Convention
NHTSA Data Tape Reference Guide

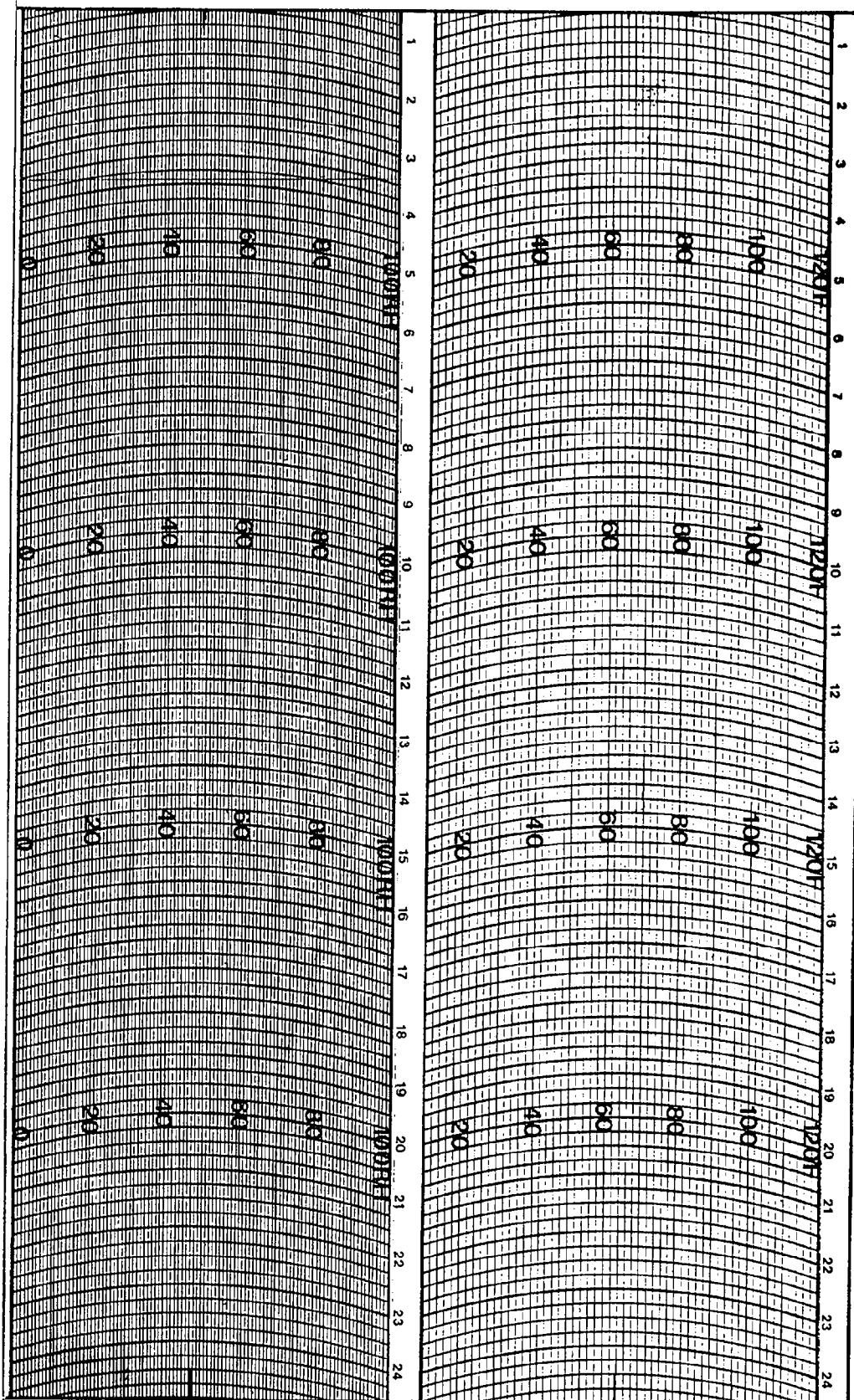
<u>Accelerometers:</u>	+X: Forward	
	+Y: Leftward	
	+Z: Upward	
<u>Potentiometers:</u>	+Chest longitudinal deflection:	Outward
	+Chest lateral deflection:	Leftward
	+Seat belt displacement:	Outward
	+Seat belt extension:	Elongation
	+Knee slider displacement:	Distance between femur and tibia increased (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

970124





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

HYGROTHERMOGRAPH
 1 DAY

CHART # C311 D HF
 PART # 699123

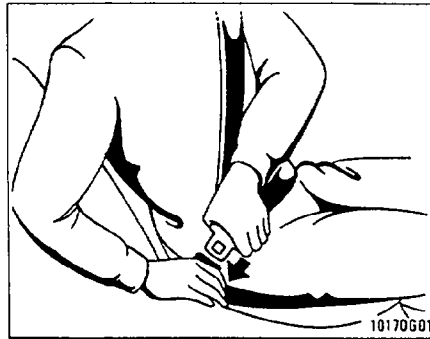
STATION _____ DATE ON 1-24 DATE OFF _____

Appendix E

Restraint System Instructions from Owner's Manual

—Front seat belts and rear outside seat belts

- Inspect the belt system periodically. Check for cuts, fraying, and loose parts. Damaged parts should be replaced. Do not disassemble or modify the system.
- Keep the belts clean and dry. If they need cleaning, use a mild soap solution or lukewarm water. Never use bleach, dye, or abrasive cleaners—they may severely weaken the belts.
- Replace the belt assembly (including bolts) if it has been used in a severe impact. The entire assembly should be replaced even if damage is not obvious.



Adjust the seat as needed (front seats only) and sit up straight and well back in the seat. To fasten your belt, pull it out of the retractor and insert the tab into the buckle.

You will hear a click when the tab locks into the buckle.

The seat belt length automatically adjusts to your size and the seat position.

The retractor will lock the belt during a sudden stop or on impact. It also may lock if you lean forward too quickly. A slow, easy motion will allow the belt to extend, and you can move around freely.

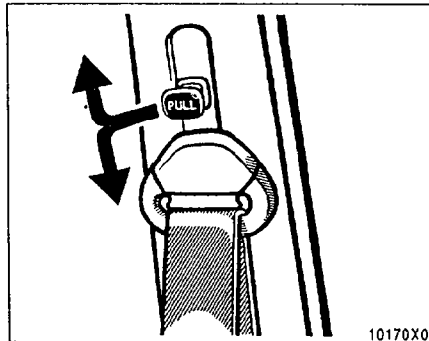
If the seat belt cannot be pulled out of the retractor, firmly pull the belt and release it. You will then be able to smoothly pull the belt out of the retractor.

When a passenger's shoulder belt is completely extended and is then retracted even slightly, the belt is locked in that position and cannot be extended. This feature is used to hold the child restraint system securely. (For details, see "Child restraint" in this chapter.) To free the belt again, fully retract the belt and then pull the belt out once more.

31

CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, immediately contact your Toyota dealer. Do not use the seat until the seat belt is fixed. It cannot protect an adult occupant or your child from injury.



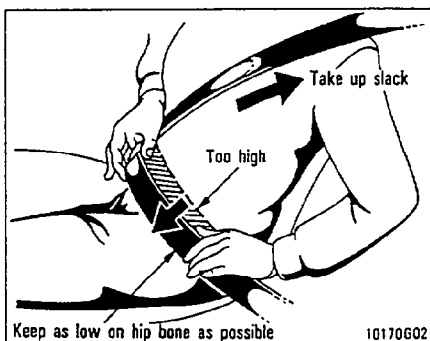
Seat belts with an adjustable shoulder anchor—

Adjust the shoulder anchor position to your size.

To adjust the anchor position, pull the knob out and slide it up or down. Release the knob and make sure the anchor is locked in position.

CAUTION

Always make sure the shoulder belt is positioned across the center of your shoulder. The belt should be kept away from your neck, but not falling off your shoulder. Failure to do so could reduce the amount of protection in an accident and cause severe injuries in a collision.

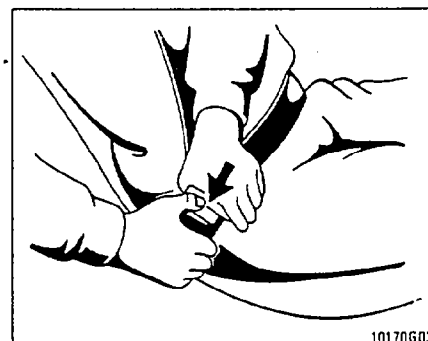


Adjust the position of the lap and shoulder belts.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit by pulling the shoulder portion upward through the latch plate.

⚠ CAUTION

- High-positioned lap belts and loose-fitting belts both could cause severe injuries due to sliding under the lap belt during a collision. Keep the lap belt positioned as low on hips as possible.
- For your safety, do not place the shoulder belt under your arm.

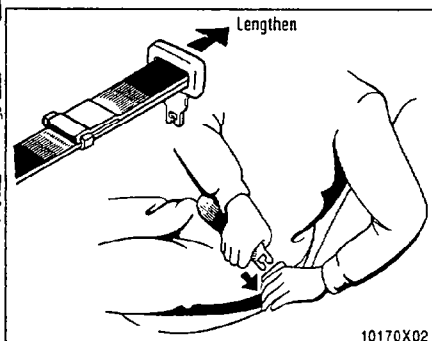


To release the belt, press the buckle-release button and allow the belt to retract.

If the belt does not retract smoothly, pull it out and check for kinks or twists. Then make sure it remains untwisted as it retracts.

33

—Rear center seat belt (4-door models)



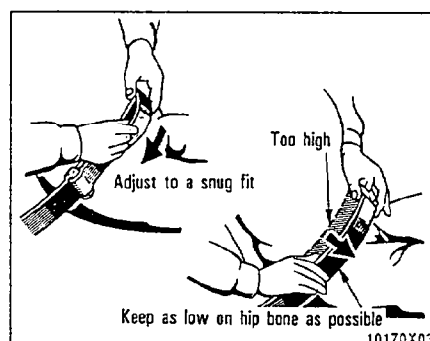
Sit up straight and well back in the seat. To fasten your belt, insert the tab into the buckle.

You will hear a click when the tab locks into the buckle.

If the belt is not long enough for you, hold the tab at a right angle to the belt and pull on the tab.

⚠ CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, immediately contact your Toyota dealer. Do not use the seat until the seat belt is fixed. It cannot protect an adult occupant or your child from injury.



Remove excess length of the belt and adjust the belt position.

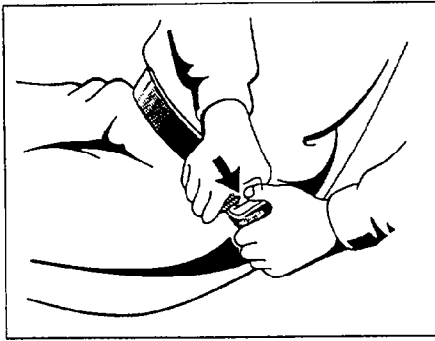
To shorten the belt, pull the free end of the belt.

Position the lap belt as low as possible on your hips—not on your waist, then adjust it to a snug fit.

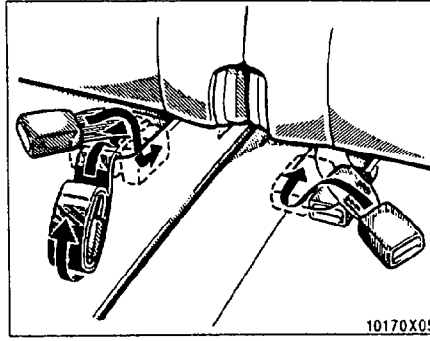
⚠ CAUTION

High-positioned and loose-fitting lap belts could cause severe injuries due to sliding under the lap belt during a collision. Keep the lap belt positioned as low on hips as possible.

—Stowing the rear seat belts
(4-door models)



To release the belt, press the buckle-release button.



The rear seat belts can be stowed when not in use.

Seat belts must be stowed before you fold the seatback. (See "Rear seats—Folding up rear seats" in this chapter.)

—Seat belt extender

If your seat belt cannot be fastened securely because it is not long enough, a personalized seat belt extender is available from your Toyota dealer free of charge.

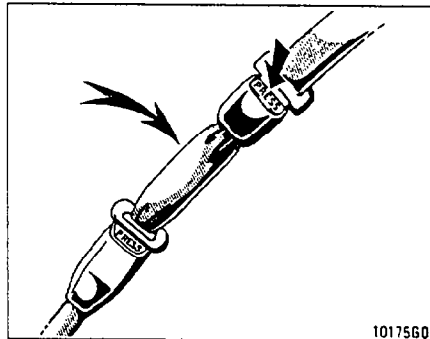
Please contact your local Toyota dealer so that the dealer can order the proper required length for the extender. Bring the heaviest coat you expect to wear for proper measurement and selection of length. Additional ordering information is available at your Toyota dealer.

35

 CAUTION

When using the seat belt extender, observe the following. Failure to follow these instructions could result in less effectiveness of the seat belt restraint system in case of vehicle accident, increasing the chance of personal injury.

- Never use the seat belt extender if you can fasten the seat belt without it.
- Remember that the extender provided for you may not be safe when used on a different vehicle, or for another person or at a different seating position than the one originally intended for.



To connect the extender to the seat belt, insert the tab into the seat belt buckle so that the "PRESS" signs on the buckle-release buttons of the extender and the seat belt are both facing outward as shown.

You will hear a click when the tab locks into the buckle.

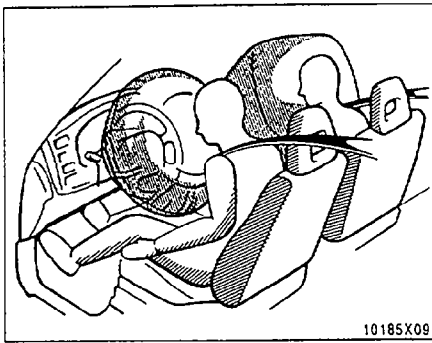
When releasing the seat belt, press on the buckle-release button on the extender, not on the seat belt. This helps prevent damage to the vehicle interior and extender itself.

When not in use, remove the extender and store in the vehicle for future use.

 CAUTION

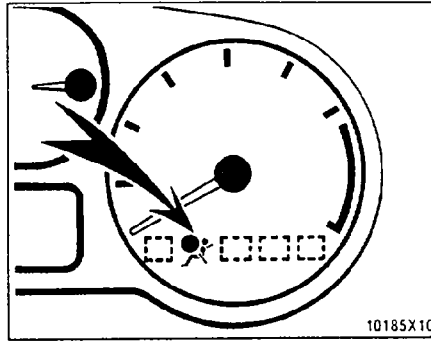
- After inserting the tab, make sure the tab and buckle are locked and that the seat belt extender is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, immediately contact your Toyota dealer. Do not use the seat until the seat belt is fixed. It cannot protect an adult occupant or your child from injury.

SRS airbags



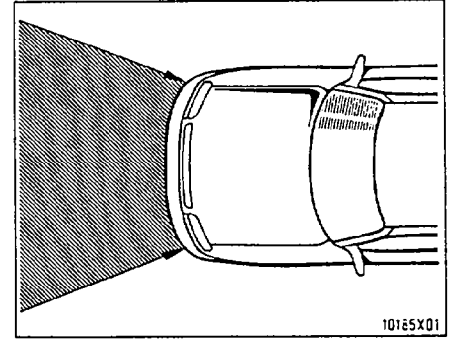
The SRS (Supplemental Restraint System) airbags are designed to provide further protection to the driver and front passenger when added to the primary protection provided by the seat belts.

In response to a severe frontal impact, the SRS airbags work together with the seat belts to help preventing or reduce injury by inflating, in order to decrease the likelihood of the driver's or front passenger's head or chest directly hitting the steering wheel or dashboard. The passenger airbag is activated even with no passenger in the front seat.



This indicator comes on when the ignition key is turned to the "ACC" or "ON" position. It goes off after about 6 seconds. This means the SRS airbags are operating properly.

The SRS airbag warning light system monitors the airbag sensor assembly, inflators, warning light, interconnecting wiring and power sources.



The SRS airbag system is designed to activate in response to a severe frontal impact within the shaded area between the arrows in the illustration.

The SRS airbags will deploy if the severity of the impact is above the designed threshold level, comparable to an approximate 20 km/h (14 mph) collision when impacting straight into a fixed barrier that does not move or deform.

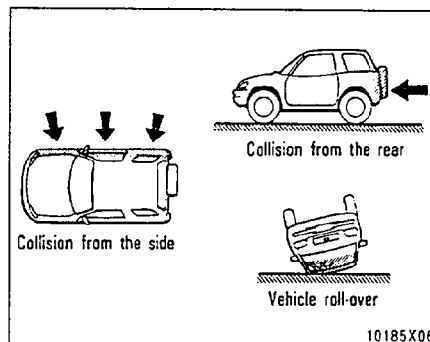
If the severity of the impact is below the above threshold level, the SRS airbags may not deploy.

37

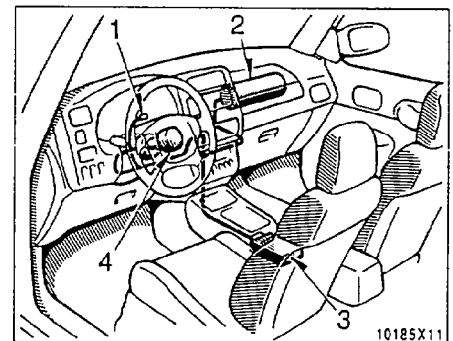
However, this threshold velocity will be considerably higher if the vehicle strikes an object, such as a parked vehicle or sign pole, which can move or deform on impact, or if it is involved in an underride collision (e.g. a collision in which the nose of the vehicle "underrides", or goes under, the bed of a truck).

It is possible with collision severity at the marginal level of airbag sensor detection and activation that only one of your vehicle's two airbags will deploy.

For the safety of all occupants, be sure to always wear your seat belts.



The SRS airbags are not designed to inflate if the vehicle is subjected to a side or rear impact, if it rolls over, or if it is involved in a low-speed frontal collision.



The SRS airbag system mainly consists of the following components and their locations are shown in the illustration.

- 1 SRS airbag warning light
- 2 Passenger airbag module (airbag and inflator)
- 3 Airbag sensor assembly
- 4 Steering wheel pad (airbag and inflator)

The airbag sensor assembly consists of a safing sensor and airbag sensor.

In a severe frontal impact, sensors detect deceleration and the system triggers the airbag inflators. Then a chemical reaction in the inflators momentarily fills the airbags with non-toxic nitrogen gas to help restrain the forward motion of the occupants.

When the airbags inflate, they produce a fairly loud noise and release some smoke along with the nitrogen gas. This is not harmful and does not indicate a fire. Be sure to wash off any residue as soon as possible to prevent minor skin irritation.

Deployment of the airbags happen in a fraction of a second, so the airbags must inflate with considerable force. While the system is designed to reduce serious injuries, it may also cause minor burns or abrasions and swellings.

Parts of the airbag module (steering wheel hub, dashboard) may be hot for several minutes, but the airbags themselves will not be hot. The airbags are designed to inflate only once.

A crash severe enough to inflate the airbags may break the windshield as the vehicle buckles. In vehicles with a passenger airbag the windshield may also be damaged by absorbing some of the force of the inflating airbag.

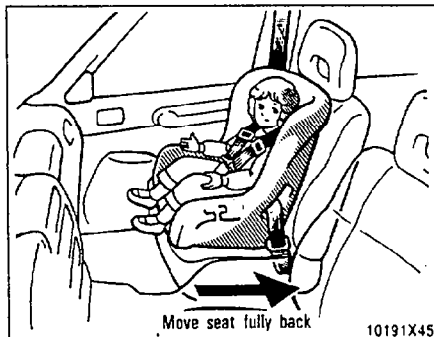
⚠ CAUTION

- The SRS airbag system is designed only as a supplement to the primary protection of the seat belt systems of the driver and front passenger. The front seat occupants are particularly susceptible to injury if they do not wear their seat belts; when sudden braking or a collision occurs, they may be thrown forward. To obtain maximum protection in an accident, the driver and all passengers in the vehicle should always wear their seat belts when driving because serious injuries can result to unrestrained occupants. For instructions and precautions concerning the seat belt system, see "Seat belts" in this chapter.
- A baby or small child who is too small to use a seat belt should be properly secured in a rear seat using a child restraint system.

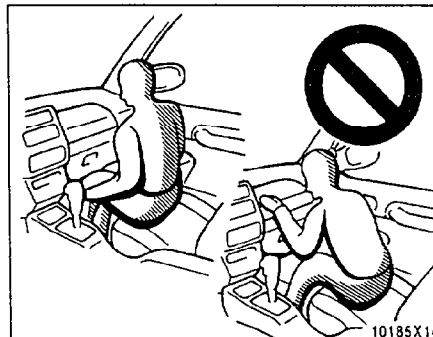


- Never use a rear-facing child restraint system in the front seat because the force of the rapid inflation of the passenger airbag can cause severe injury to the child. Vehicles with a passenger airbag display a caution label on the passenger side instrument panel as shown above to remind you not to install a rear-facing child restraint system on the front seat at any time.

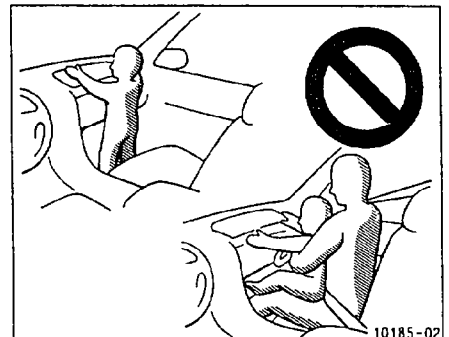
39



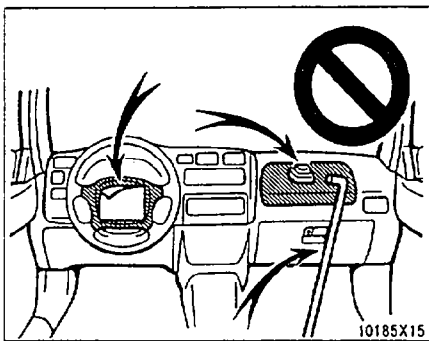
- Only when it is unavoidable a forward-facing child restraint system in the front seat, the seat must be moved as far back as possible. For instructions concerning the installation of a child restraint system, see "Child restraint" in this chapter.



- Do not sit on the edge of the seat or lean over the dashboard when the vehicle is in use. The airbags inflate with considerable speed and force; you may be severely injured. Sit up straight and well back in the seat, and always use your seat belt.



- Do not allow a child to stand up, or to kneel on the front passenger seat. The airbag inflates with considerable speed and force; the child may be severely injured.
- Do not hold a child on your lap or in your arms. Use a child restraint system in the rear seat. For instructions concerning the installation of a child restraint system, see "Child restraint" in this chapter.



- Do not put objects on or in front of the dashboard or steering wheel pad that houses the airbag system. They might restrict inflation or cause personal injury as they are projected rearward.

- Do not modify, remove or open any component or wiring, such as the steering wheel, column cover, front passenger airbag cover, front passenger airbag, airbag sensor assembly. Doing any of these may cause sudden SRS airbag inflation or disable the system, which could result in personal injury.

Failure to follow these instructions can result in severe injuries.

NOTICE

Do not perform any of the following changes without consulting your Toyota dealer. Such changes can interfere with proper operation of the SRS airbag system in some cases.

- ◆ Installation of electronic items such as a mobile two-way radio, cassette tape player or compact disc player
- ◆ Modification of the suspension system
- ◆ Modification of the front end structure
- ◆ Attachment of a grille guard (bull bar, kangaroo bar, etc.), snowplow, winches or any other equipment to the front end
- ◆ Repairs made on or near the front end structure, console, steering column, steering wheel or dashboard near the front passenger airbag

41

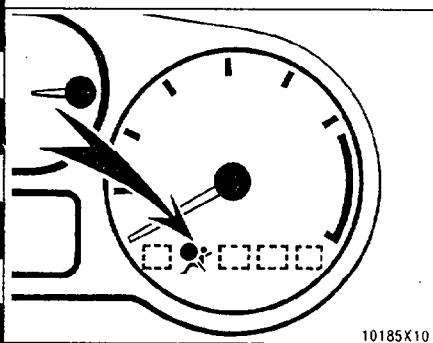
Child restraint— —Child restraint precautions

Toyota strongly urges the use of child restraint systems for children small enough to use it.

The laws of all fifty states in the U.S.A. and Canada now require the use of a child restraint system.

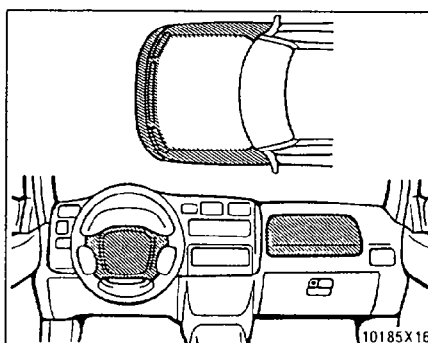
Your vehicle conforms to SAEJ1819.

If a child is too large for a child restraint system, the child should sit in the rear seat and must be restrained using the vehicle's seat belt. See "Seat belts" for details.



This SRS airbag system has a service reminder indicator to inform the driver of operating problems. If either of the following conditions occurs, this indicates a malfunction of the airbags. Contact your Toyota dealer as soon as possible to service the vehicle.

- The light does not come on when the ignition key is turned to the "ACC" or "ON" position, or remains on.
- The light comes on while driving.



In the following cases, contact your Toyota dealer as soon as possible:

- The SRS airbags have been inflated.
- The front part of the vehicle (shaded in the illustration) was involved in an accident not of the extent to cause the SRS airbags to inflate.
- The pad section of the steering wheel or front passenger airbag cover (shaded in the illustration) is scratched, cracked, or otherwise damaged.

CAUTION

- For effective protection in automobile accidents and sudden stops, children must be properly restrained using a seat belt or child restraint system depending on the age and size of the child. Holding a child in your arms is not a substitute for a child restraint system. In an accident, the child can be crushed against the windshield, or between you and the vehicle's interior.

- Toyota strongly urges use of a proper child restraint system that conforms to the size of the child on the rear seat. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat.
- Never install a rear-facing child restraint system on the front seat. In the event of an accident, the force of the rapid inflation of the airbag can cause severe injury if a rear-facing child restraint system is installed on the front seat.
- Unless it is unavoidable, do not install a forward-facing child restraint system on the front seat.
- If you must install a forward-facing child restraint system on the front seat, move the seat as far back as possible.
- Make sure that you have complied with all installation instructions provided by the child restraint manufacturer and that the system is properly secured.

—Child restraint system

A child restraint system for a small child or baby must itself be properly restrained on the seat with either the lap belt or the lap portion of the lap/shoulder belt. You must carefully consult the manufacturer's instructions which accompany by your child restraint system.

To provide proper restraint, use a child restraint system following the manufacturer's instructions about the appropriate age and size of the child for the child restraint system.

Install the child restraint system correctly following the instructions provided by its manufacturer of the system. General directions are also provided under the following illustrations.

The child restraint system should be installed on the rear seat. According to accident statistics, the child is safer when properly restrained in the rear seat than in the front seat.

⚠ CAUTION

- Never install a rear-facing child restraint system on the front seat. In the event of an accident, the force of the rapid inflation of the airbag can cause severe injury if a rear-facing child restraint system is installed on the front seat.
- Unless it is unavoidable, do not install a forward-facing child restraint system on the front seat.
- If you must install a forward-facing child restraint system on the front seat, move the seat as far back as possible.
- After installing the child restraint system, make sure it is secured in place following the manufacturer's instructions. If it is not restrained securely, it can cause injury to the child in the event of a sudden stop or accident.

43

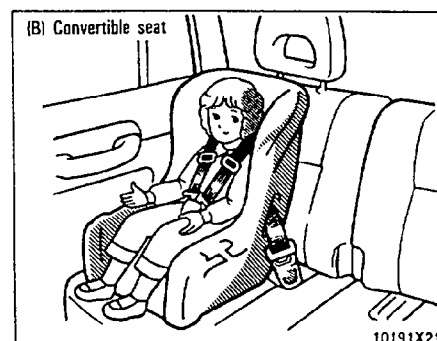
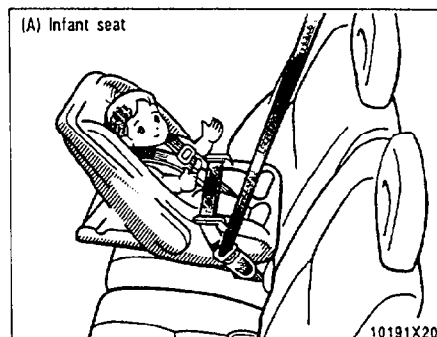
When not using the child restraint system, keep it secured with the seat belt. This will prevent it injuring passengers in the event of a sudden stop or accident.

—Types of child restraint system

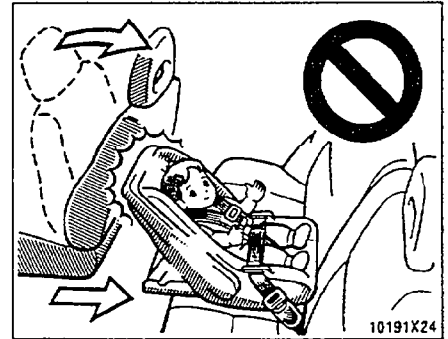
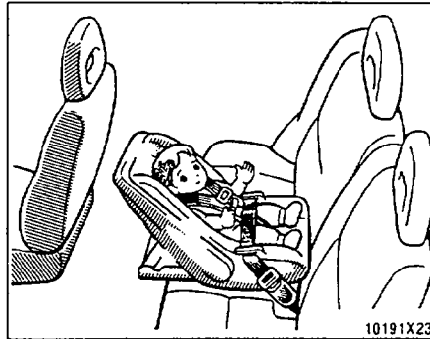
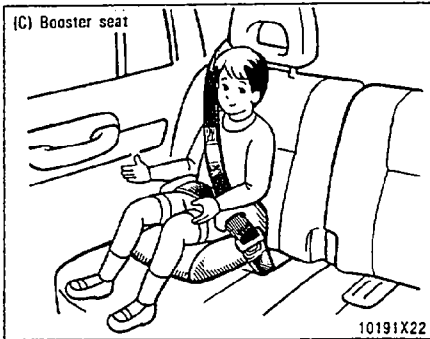
Child restraint systems are classified into the following 3 types depending on the child's age and size.

- (A) Infant seat
- (B) Convertible seat
- (C) Booster seat

Install the child restraint system following the instructions provided by its manufacturer.



—Installation with 2-point
type seat belt

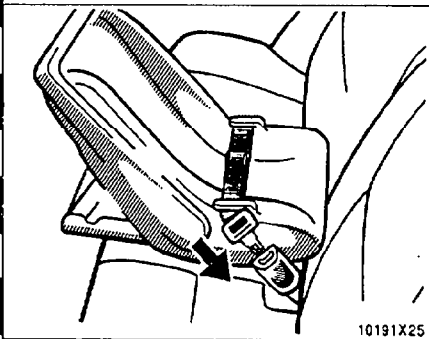


(A) INFANT SEAT INSTALLATION
An infant seat is used in rear-facing only.

CAUTION

Do not use a rear-facing child restraint system in the rear seat if it interferes with the lock mechanism of the front seats. This can cause severe injury to the child and front passenger in case of sudden braking or a collision.

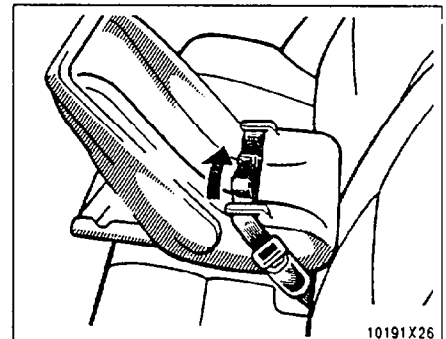
45



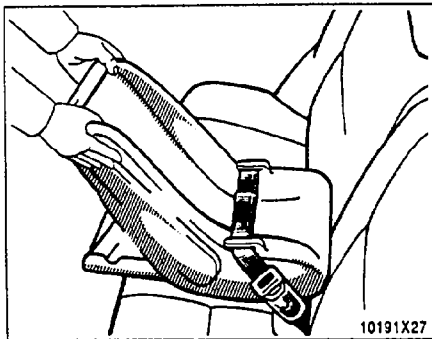
1. Run the center lap belt through or around the infant seat following the instructions provided by its manufacturer and insert the tab into the buckle taking care not to twist the lap belt.

CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the lap belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, it cannot protect your child from injury. Contact your Toyota dealer immediately. Do not use the seat until the seat belt is fixed.

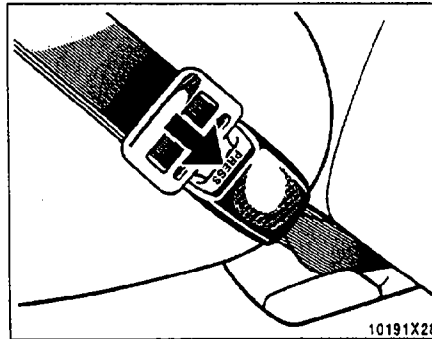


2. While pressing the infant seat firmly against the seat cushion and seatback, tighten the lap belt by pulling its free end to hold the infant seat securely.

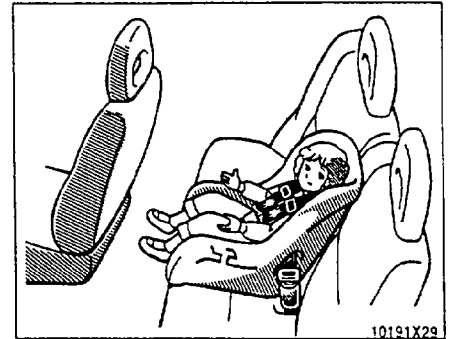


CAUTION

Push and pull the child restraint system in different directions to be sure it is secure. Follow all the installation instructions provided by its manufacturer.



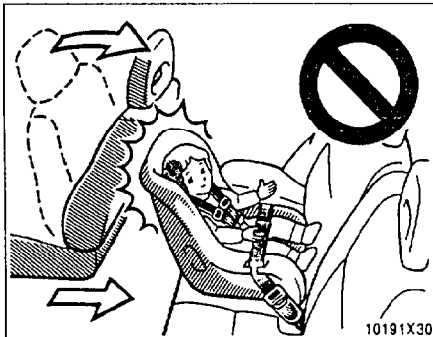
3. To remove the infant seat, press the buckle-release button.



(B) CONVERTIBLE SEAT INSTALLATION

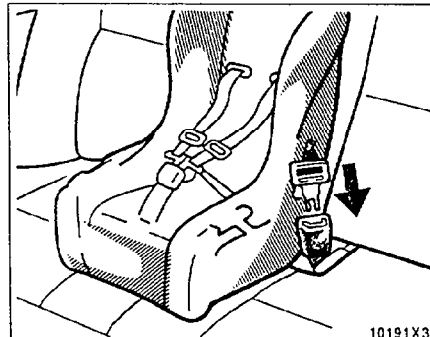
A convertible seat is used in forward-facing and rear-facing depending on the child's age and size. When installing, follow the manufacturer's instructions about the applicable child's age and size as well as direction of a child restraint system.

47



CAUTION

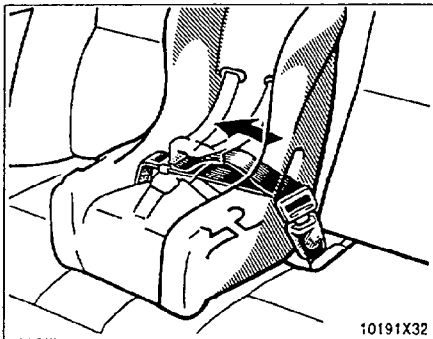
Do not use a rear-facing child restraint system in the rear seat if it interferes with the lock mechanism of the front seats. This can cause severe injury to the child and front passenger in case of sudden braking or a collision.



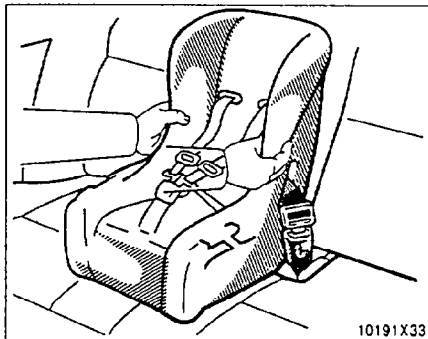
1. Run the center lap belt through or around the convertible seat following the instructions provided by its manufacturer and insert the tab into the buckle taking care not to twist the lap belt.

CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the lap belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, it cannot protect your child from injury. Contact your Toyota dealer immediately. Do not use the seat until the seat belt is fixed.

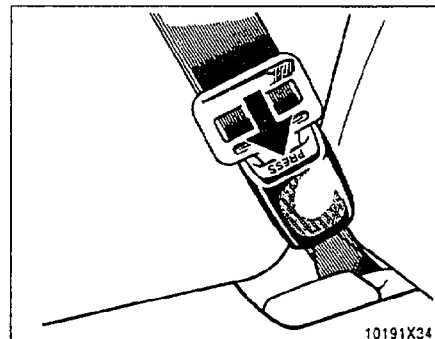


2. While pressing the convertible seat firmly against the seat cushion and seatback, tighten the lap belt by pulling its free end to hold the convertible seat securely.



CAUTION

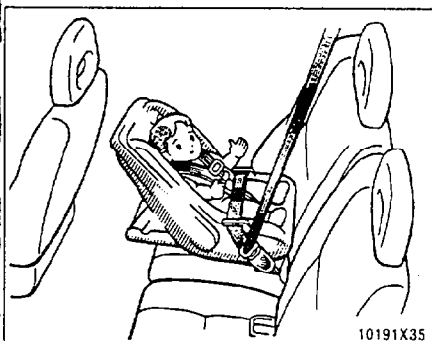
Push and pull the child restraint system in different directions to be sure it is secure. Follow all the installation instructions provided by its manufacturer.



3. To remove the convertible seat, press the buckle-release button.

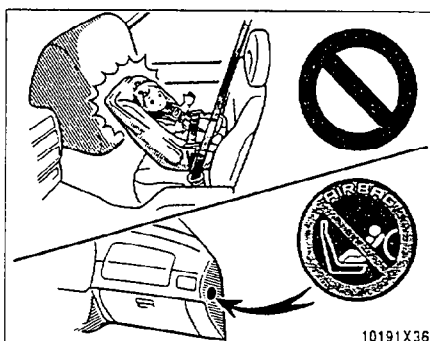
49

—Installation with 3-point type seat belt



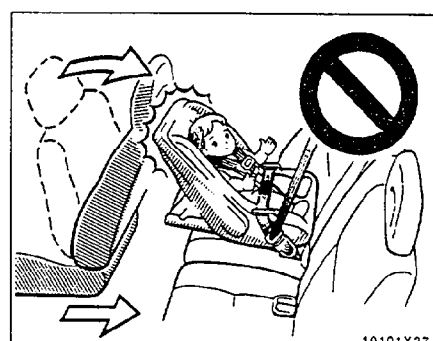
(A) INFANT SEAT INSTALLATION

An infant seat is used in rear-facing only.

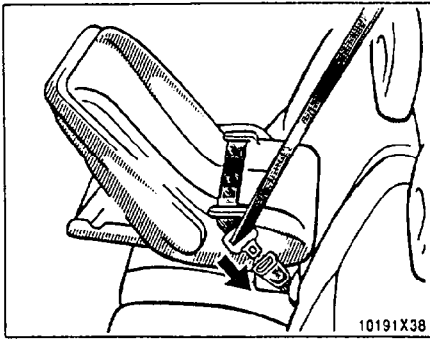


CAUTION

- Never use a rear-facing child restraint system in the front seat because the force of the rapid inflation of the passenger airbag can cause severe injury to the child. Vehicles with a passenger airbag display a caution label on the passenger side instrument panel as shown above to remind you not to install a rear-facing child restraint system on the front seat.



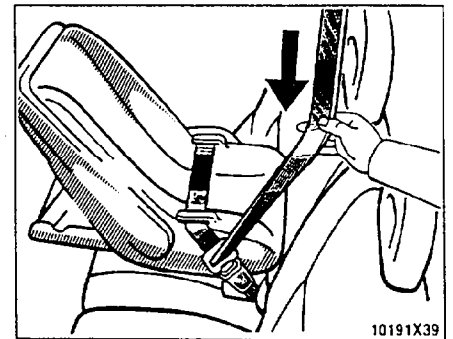
- Do not use a rear-facing child restraint system in the rear seat if it interferes with the lock mechanism of the front seats. This can cause severe injury to the child and front passenger in case of sudden braking or a collision.



1. Run the lap and shoulder belt through or around the infant seat following the instructions provided by its manufacturer and insert the tab into the buckle taking care not to twist the belt. Keep the lap portion of the belt tight.

! CAUTION

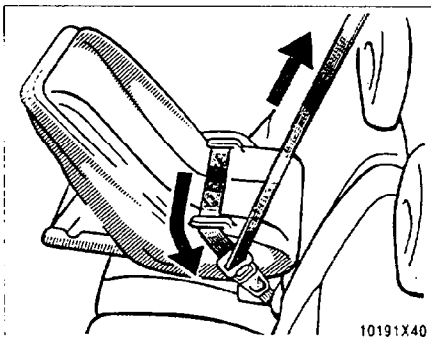
- After inserting the tab, make sure the tab and buckle are locked and that the lap and shoulder portions of the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, it cannot protect your child from injury. Contact your Toyota dealer immediately. Do not use the seat until the seat belt is fixed.



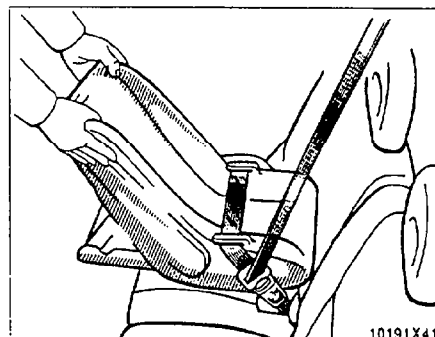
2. Fully extend the shoulder belt to put it in the lock mode. When the belt is then retracted even slightly, it cannot be extended.

To hold the infant seat securely, make sure the belt is in the lock mode before letting the belt to retract.

51

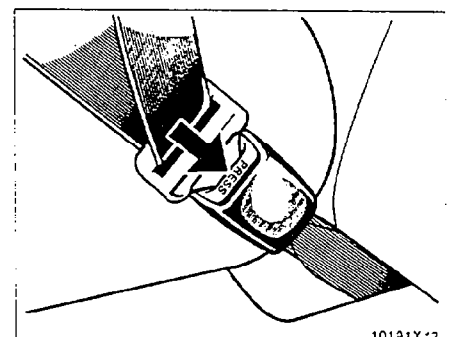


3. While pressing the infant seat firmly against the seat cushion and seatback, let the shoulder belt retract as far as it will go to hold the infant seat securely.

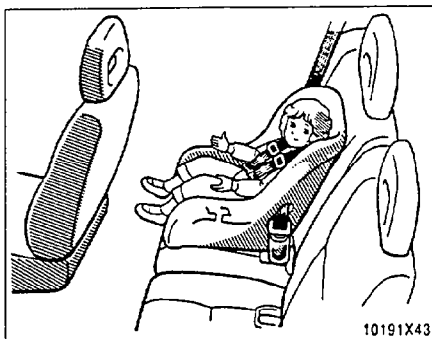


! CAUTION

Make sure the seat belt is securely locked. Also make sure the child restraint system is secure by pushing and pulling it in different directions. Follow all the installation instructions provided by its manufacturer.

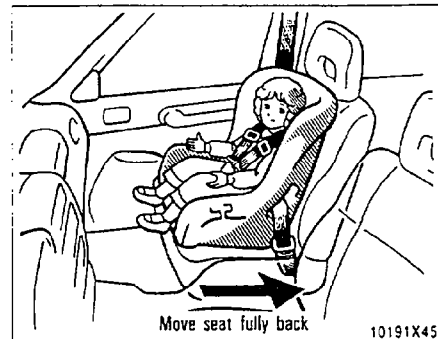


4. To remove the infant seat, press the buckle-release button and allow the belt to retract completely. The belt will move freely again and be ready to work for an adult or older child passenger.



(B) CONVERTIBLE SEAT INSTALLATION

A convertible seat is used in forward-facing and rear-facing depending on the child's age and size. When installing, follow the manufacturer's instruction about the applicable child's age and size as well as direction of a child restraint system.

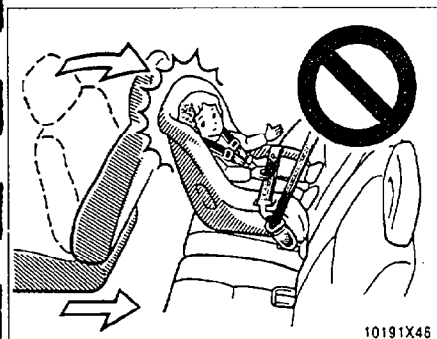


⚠ CAUTION

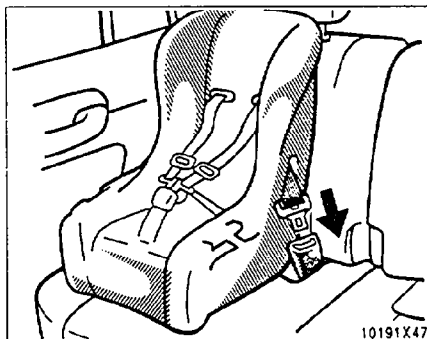
- Never use a rear-facing child restraint system in the front seat because the force of the rapid inflation of the passenger airbag can cause severe injury to the child. Vehicles with a passenger airbag display a caution label on the passenger side instrument panel as shown above to remind you not to install a rear-facing child restraint system on the front seat.

- Only when it is unavoidable should a forward-facing child restraint system be used on the front seat. Always move the seat as far back as possible because the force of deploying airbag would cause serious injury to the child.

53



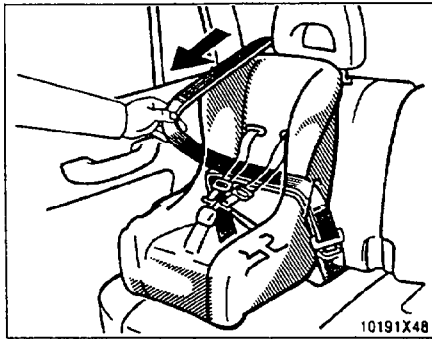
- Do not use a rear-facing child restraint system in the rear seat if it interferes with the lock mechanism of the front seats. This can cause severe injury to the child and front passenger in case of sudden braking or a collision.



1. Run the lap and shoulder belt through or around the convertible seat following the instructions provided by its manufacturer and insert the tab into the buckle taking care not to twist the belt. Keep the lap portion of the belt tight.

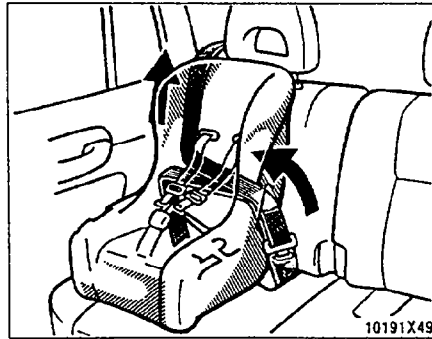
⚠ CAUTION

- After inserting the tab, make sure the tab and buckle are locked and that the lap and shoulder portions of the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.
- If the seat belt does not function normally, it cannot protect your child from injury. Contact your Toyota dealer immediately. Do not use the seat until the seat belt is fixed.

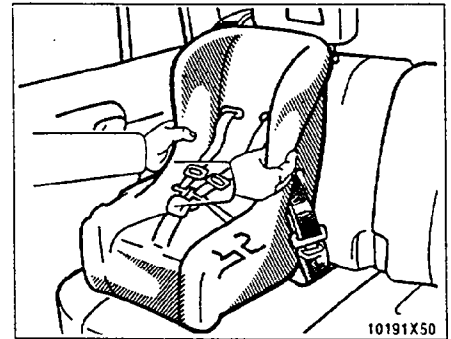


2. Fully extend the shoulder belt to put it in the lock mode. When the belt is then retracted slightly, it cannot be extended.

To hold the convertible seat securely, make sure the belt is in the lock mode before letting the belt to retract.



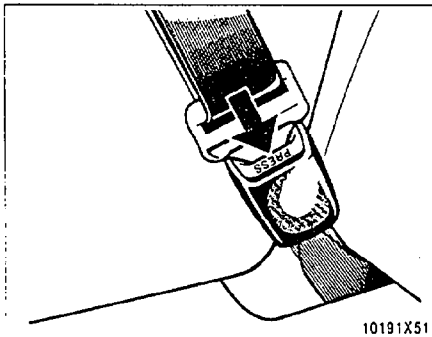
3. While pressing the convertible seat firmly against the seat cushion and seatback, let the shoulder belt retract as far as it will go to hold the convertible seat securely.



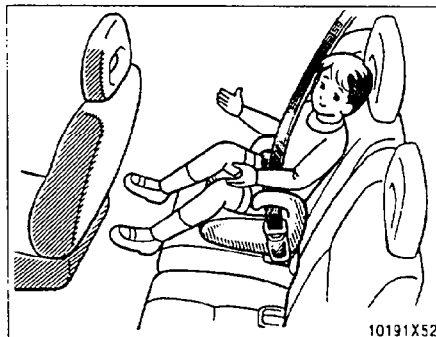
⚠ CAUTION

Make sure the seat belt is securely locked. Also make sure the child restraint system is secure by pushing and pulling it in different directions. Follow all the installation instructions provided by its manufacturer.

55

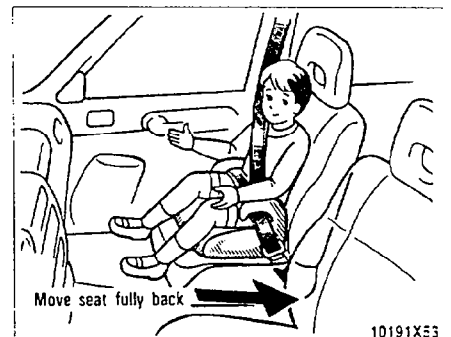


4. To remove the convertible seat, press the buckle-release button and allow the belt to retract completely. The belt will move freely again and be ready to work for an adult or older child passenger.



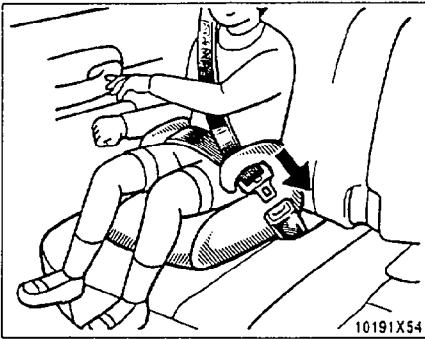
(C) BOOSTER SEAT INSTALLATION

A booster seat is used in forward-facing only.



⚠ CAUTION

Only when it is unavoidable should a forward-facing child restraint system be used on the front seat. Always move the seat as far back as possible because the force of deploying airbag would cause serious injury to the child.



1. Sit the child on a booster seat. Run the lap and shoulder belt through or around the booster seat and child following the instructions provided by its manufacturer and insert the tab into the buckle taking care not to twist the belt.

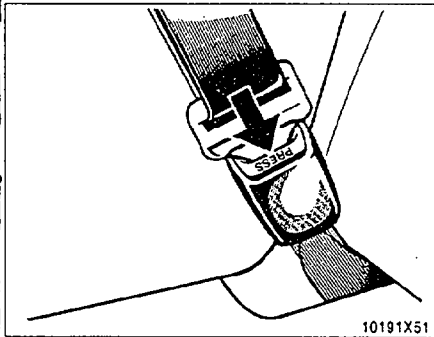
Make sure the shoulder belt is correctly across the child's shoulder and that the lap belt is positioned as low as possible on child's hips. See "Seat belts" for details.

⚠ CAUTION

- Always make sure the shoulder belt is positioned across the center of child's shoulder. The belt should be kept away from child's neck, but not falling off child's shoulder. Failure to do so could reduce the amount of protection in an accident and increase the chance of injury.
- High-positioned lap belts and loose-fitting belts both could increase the chance of injury due to sliding under the lap belt during an accident. Keep the lap belt as low on your hip bone as possible.
- For child's safety, do not place the shoulder belt under child's arm.
- After inserting the tab, make sure the tab and buckle are locked and that the lap and shoulder portions of the belt is not twisted.
- Do not insert coins, clips, etc. in the buckle as this may prevent you from properly latching the tab and buckle.

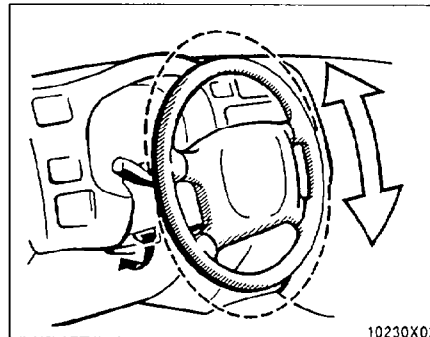
- If the seat belt does not function normally, it cannot protect your child from injury. Contact your Toyota dealer immediately. Do not use the seat until the seat belt is fixed.

57



2. To remove the child restraint system, press the buckle-release button and allow the belt to retract.

Tilt steering wheel

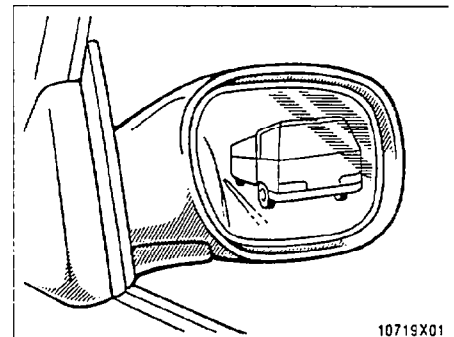


To change the steering wheel angle, hold the steering wheel, push down the lock release lever, tilt the steering wheel to the desired angle and release the lever.

⚠ CAUTION

- Do not adjust the steering wheel while the vehicle is moving.
- After adjusting the steering wheel, try moving it up and down to make sure it is locked in position.

Outside rear view mirrors—



Adjust the mirror so you can just see the side of your vehicle in the mirror. Be careful when judging the size or distance of any object seen in the outside rear view mirror on the passenger's side. It is a convex mirror with a curved surface. Any object seen in a convex mirror will look smaller and farther away than when seen in a flat mirror.