

V2457.

Report Number TRC-96-N14

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Ford Motor Company

1996 Ford Ranger

Pickup

NHTSA Number: MT0209

TRC Test Number: 960905

Prepared By:

Transportation Research Center Inc.

10820 State Route 347

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October 3, 1996

Final Report

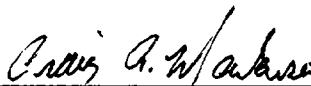
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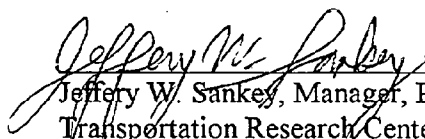
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16. Abstract A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1996 Ford Ranger pickup, NHTSA No. MT0209, at Transportation Research Center Inc. on September 5, 1996. This test was conducted to obtain new car assessment and research data indicant of FMVSS 208, 212, 219 (partial), and 301 performance. The barrier impact velocity was 56.5 kph. The vehicle's maximum static crush was 508 millimeters. The ambient temperature was 24° C. The driver's Head Injury Criteria (HIC) was 724. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.6 g. The driver's maximum chest deflection was 46 millimeters. The driver's left and right femur maximum axial forces were 5715 N and 6434 N, respectively. The passenger's HIC was 711. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 53.4 g. The passenger's maximum chest deflection was 46 millimeters. The passenger's left and right femur maximum axial forces were 4413 N and 5890 N, respectively.			
17. Key Words 56 kph (35 mph) Frontal Barrier Impact Test: New Car Assessment Program (NCAP) FMVSS 208, "Occupant Crash Protection" FMVSS 212, "Windshield Retention" FMVSS 219, "Windshield Zone Intrusion" FMVSS 301, "Fuel System Integrity"		18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division Nassif Building, Room 5108 400 Seventh Street, S.W. Washington, DC 20590	
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.5	centimeters	cm
ft	feet	30	centimeters	cm
yd	yards	0.9	meters	m
mi	miles	1.6	kilometers	km
AREA				
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				
tsp	teaspoons	5	milliliters	ml
Tbsp	tablespoons	15	milliliters	ml
fl oz	fluid ounces	30	milliliters	ml
c	cups	0.24	liters	l
pt	pints	0.47	liters	l
qt	quarts	0.95	liters	l
gal	gallons	3.8	liters	l
ft ³	cubic feet	0.03	cubic meters	m ³
yd ³	cubic yards	0.76	cubic meters	m ³
TEMPERATURE (exact)				
°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C

* 1 in = 2.54 exactly. For other exact conversions and more detailed tables, see NBS Misc. Publ. 206, Units of Heights and Measures, Price \$2.25, SD Catalog No. C13.10/206.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
km	kilometers	1.1	yards	yd
		0.6	miles	mi
AREA				
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
MASS (weight)				
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
VOLUME				
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
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

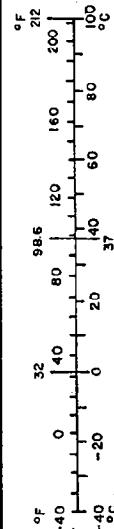


Table of Contents

<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	Static Footwell Deformation (Driver's Side)	4-11
14	Static Footwell Deformation (Passenger's Side)	4-12
15	Underbody Floorboard Deformation	4-13

List of Photographs

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

List of Photographs, Cont'd.

<u>Description</u>	<u>Figure</u>
Pre-Test Passenger Dummy Position View	A-29
Post-Test Passenger Dummy Position View	A-30
Pre-Test Driver Dummy & Vehicle Interior - View 1	A-31
Post-Test Driver Dummy & Vehicle Interior - View 1	A-32
Pre-Test Driver Dummy & Vehicle Interior - View 2	A-33
Post-Test Driver Dummy & Vehicle Interior - View 2	A-34
Pre-Test Passenger Dummy & Vehicle Interior - View 1	A-35
Post-Test Passenger Dummy & Vehicle Interior - View 1	A-36
Pre-Test Passenger Dummy & Vehicle Interior - View 2	A-37
Post-Test Passenger Dummy & Vehicle Interior - View 2	A-38
Post-Test Driver Dummy Head Contact - View 1	A-39
Post-Test Driver Dummy Head Contact - View 2	A-40
Post-Test Driver Dummy Knee Contact - View 1	A-41
Post-Test Driver Dummy Knee Contact - View 2	A-42
Post-Test Passenger Dummy Head Contact - View 1	A-43
Post-Test Passenger Dummy Head Contact - View 2	A-44
Post-Test Passenger Dummy Knee Contact - View 1	A-45
Post-Test Passenger Dummy Knee Contact - View 2	A-46
Pre-Test Vehicle Certification Label View	A-47
Post-Test Vehicle on Static Rollover Machine View	A-48

Section 1.0

Purpose and Test Procedure

Purpose

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

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1996 Ford Ranger pickup, NHTSA Number MT0209, at an impact speed in excess of the current 48 kph (30 mph) FMVSS 208 requirements.

Test Procedure

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

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

The test vehicle contained two (2) Part 572E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedures specified in Appendices VII and VIII of the Laboratory Indicant Test Procedure. This test was the first use of the driver dummy and 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 IP11 of the Laboratory Indicant Test Procedure.

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

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

Section 2.0

Frontal Barrier Impact Test Summary

Test Results Summary

This frontal load cell barrier test was conducted at TRC on September 5, 1996.

The test vehicle, a 1996 Ford Ranger pickup, NHTSA Number MT0209, was equipped with a 2.3-liter inline engine, manual transmission, power steering, and power brakes. The vehicle's test weight was 1709 kg. The vehicle's impact speed was 56.5 kph. The vehicle sustained 508 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 724. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 52.6 g. The driver's maximum chest deflection was 46 mm. The driver's left and right femur maximum axial forces were 5715 N and 6434 N, respectively.

The right front passenger's HIC was 711. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 53.4 g. The passenger's maximum chest deflection was 46 mm. The passenger's left and right femur maximum axial forces were 4413 N and 5890 N, respectively.

There was no loss of windshield periphery retention.

There was no penetration through the windshield.

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

Data Acquisition Explanations

The driver's redundant head X-axis accelerometer, HEDXR1, lost data from 80 to 82 milliseconds and after 88 milliseconds as a result of the accelerometer's cable being pinched during the impact event. The data loss affected the driver's redundant head resultant acceleration calculation.

The driver's redundant head Y- and Z-axis accelerometers, HEDYR1 and HEDZR1, lost data from approximately 87 milliseconds on as a result of the accelerometer's cable being pinched during the impact event. The data loss affected the driver's redundant head resultant acceleration calculation.

The driver's right foot Z-axis accelerometer at toe, FTRZT1, exceeded the data channel's full scale limit at 32 milliseconds.

Table 1 Crash Test Summary

NHTSA number:	MT0209	
Test type:	Frontal Load Cell Barrier	
Test date:	09/05/96	
Test time:	1743	
Ambient temperature:	24° C	
Vehicle year/make/ model/body style:	1996/Ford/Ranger/pickup	
Vehicle test weight:	1709 kg	
Impact angle ¹ :	0°	
Impact velocity ² :	Primary = 56.5 kph Secondary = 56.5 kph	
Maximum static crush:	508 mm	
Average rebound:	213 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:	40/dummy	
Number of cameras:	High-speed	16
	Real-time	2

¹ With respect to tow track centerline.

² Speed trap measurement (± .08 kph accuracy)

Table 2 Test Vehicle Information

Vehicle year/make/ model/body style:	1996/Ford/Ranger/pickup		
Color:	Red		
VIN:	1FTCR10AXTUD87476		
NHTSA number:	MT0209		
Engine data:			
Placement:	Inline		
Cylinders:	4		
Displacement	2.3 liters		
Transmission data:	<u>5</u> speed, <u>X</u> manual, __automatic, __overdrive __FWD, <u>X</u> RWD, __4WD		
Date vehicle received:	07/10/96		
Odometer reading:	64		
Dealer's name and address:	Ricart Ford Inc. 4255 South Hamilton Rd. Columbus, OH 43227		
<u>Accessories:</u>			
Power steering	Yes	Automatic transmission	No
Power brakes	Yes	Automatic speed control	Yes
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	Yes-rear
Clock	Yes	Rear window defroster	No
Other	Power mirrors		

Certification data from vehicle's label:

Vehicle manufactured by:	Ford Motor Company
Date of manufacture:	06/96
VIN:	1FTCR10AXTUD87476
GVWR:	1914 kg
GAWR: Front:	1020 kg
Rear:	1081 kg

Table 2 Test Vehicle Information, Cont'd.

Size of tires: P225/70R14 SL

Tire pressure with maximum
capacity vehicle load:

Front: 276 kPa

Rear: 276 kPa

Spare tire: P225/70R14 SL

Type of front seats: Split bench

Tire & capacity data from vehicle's label:

Recommended tire size: P225/70R14 SL

Recommended cold tire pressure:

Front: 241 kPa

Rear: 241 kPa

Designated seating capacity:

Front NA

Rear NA

Total NA

Vehicle capacity weight: NA

Test vehicle attitude:

Delivered attitude: LF 775 mm; RF 785 mm; LR 845 mm; RR 856 mm

Pre-test attitude: LF 777 mm; RF 781 mm; LR 801 mm; RR 805 mm

Post-test attitude: LF 640 mm; RF 554 mm; LR 818 mm; RR 803 mm

Table 2 Test Vehicle Information Cont'd

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

Right front	406 kg	Right rear	273 kg
Left front	462 kg	Left rear	287 kg
Total front weight	868 kg	(60.8% of total vehicle weight)	
Total rear weight	560 kg	(39.2% of total vehicle weight)	
Total delivered weight	1428 kg		

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1428 kg)

VCW¹ = Vehicle capacity weight (N/A)

DSC¹ = Designated seating capacity (N/A)

RCLW = VCW - 68 (DSC) = 136 kg

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

Target test weight = 1428 + 136 + 152

Target test weight = 1716 kg

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

Right front	388 kg	Right rear	485 kg
Left front	379 kg	Left rear	457 kg
Total front weight	767 kg	(44.9% of total vehicle weight)	
Total rear weight	942 kg	(55.1% of total vehicle weight)	
Total test weight	1709 kg	(0.4% under target test weight)	

Weight of ballast secured in vehicle: None

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 1512 mm

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

Table 3 Post-Impact Data

Test number: 960905
NHTSA number: MT0209
Test date: 09/05/96
Test time: 1743
Test type: Frontal load cell barrier
Impact angle: 0°
Ambient temperature
at impact area: 24° C
Temperature in
occupant compartment: 20° C
Impact velocity:
 Primary 56.5 kph
 Secondary 56.5 kph
 Specified range 55.5 to 57.1 kph

Distance from vehicle to barrier:

 Entering velocity trap 356 mm
 Exiting velocity trap 51 mm

Test vehicle static crush:

Overall length of test vehicle:

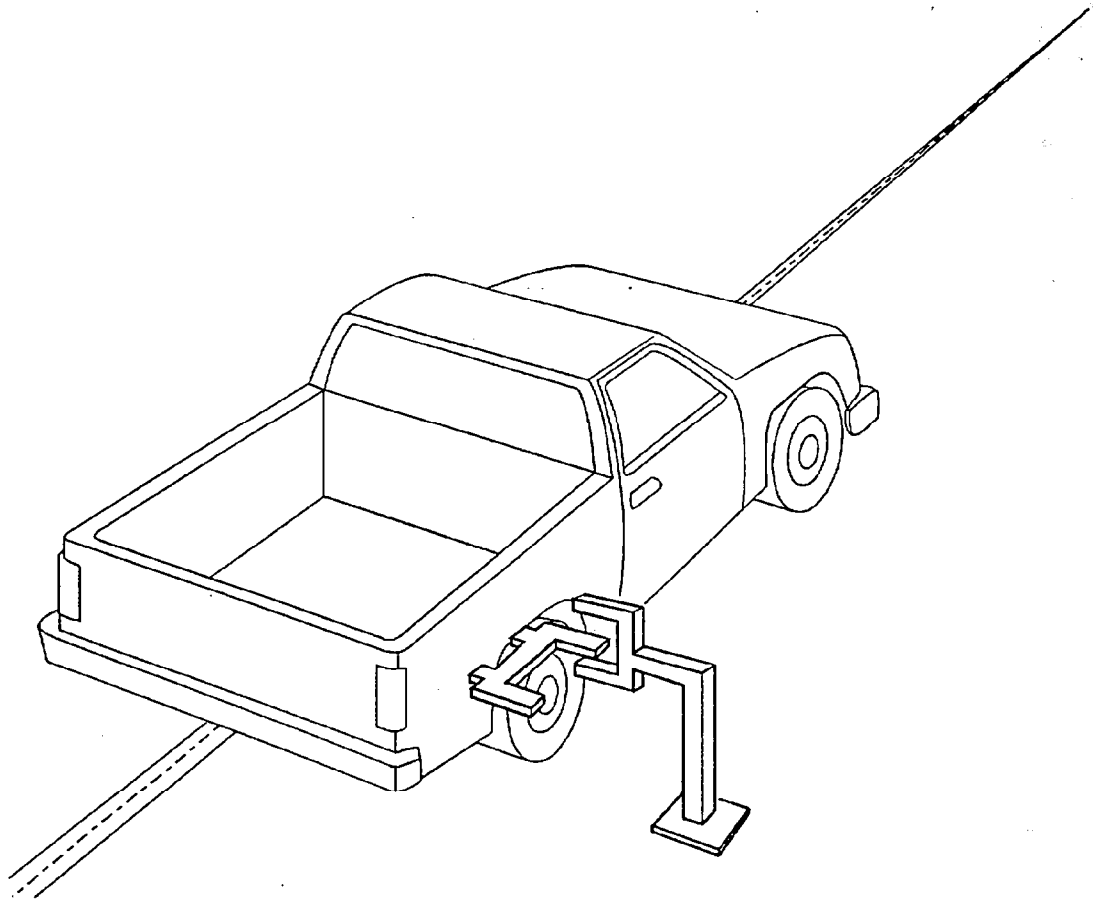
Pre-test: L 4630 mm; C 4710 mm; R 4637 mm
Post-test: L 4159 mm; C 4205 mm; R 4212 mm
Total crush: L 471 mm; C 505 mm; R 425 mm
Average crush: 467 mm

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test: L 214 mm; C 210 mm; R 215 mm
Average rebound 213 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.

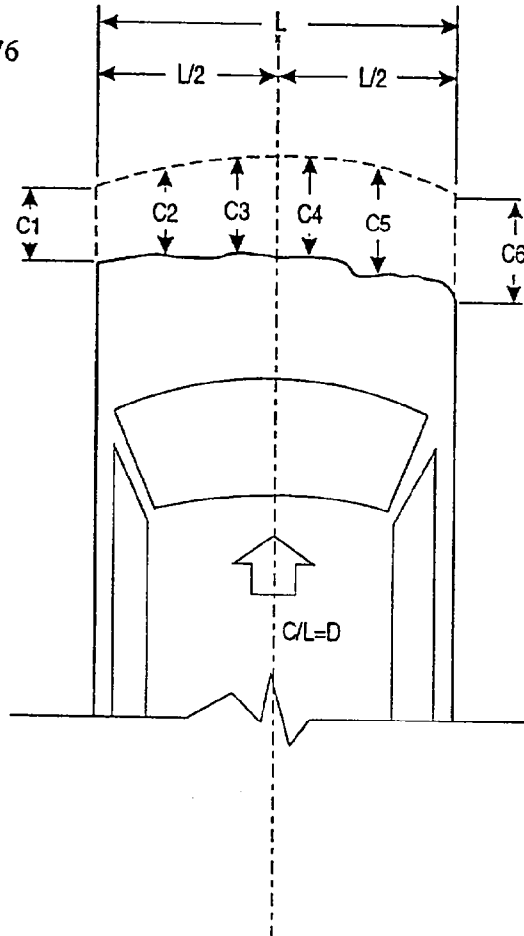
**Figure 2 Accident Investigation Division Data
for 56 kph (35 mph) Frontal Barrier Impact**

NHTSA number: MT0209
 Test date: 09/05/96
 Vehicle year/make/
 model/body style: 1996/Ford/Ranger/pickup
 Vehicle size category: Small pickup
 VIN: 1FTCR10AXTUD87476
 Build date: 06/96
 Test weight: 1709 kg
 Vehicle wheelbase: 2743 mm
 Maximum width: 1744 mm
 Front overhang: 739 mm

Collision Deformation
 Classification (CDC) code: 12FDEW3

Crush depth
 measurements:

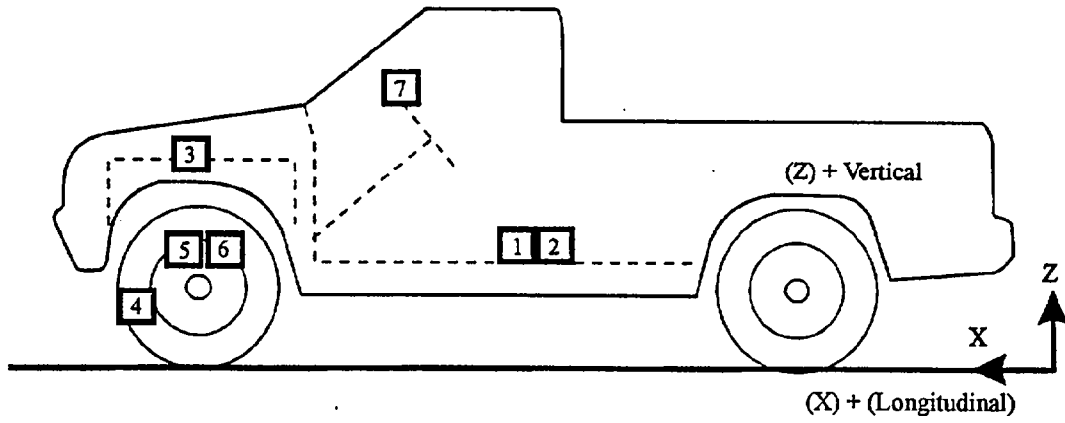
C1	=	471 mm
C2	=	469 mm
C3	=	506 mm
C4	=	508 mm
C5	=	410 mm
C6	=	425 mm



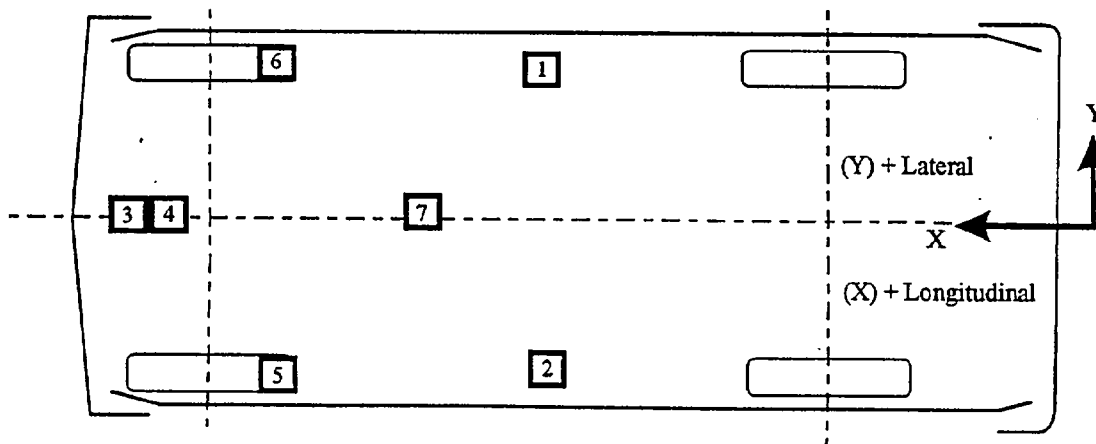
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1422 mm

Figure 3 Vehicle Accelerometer Placement



Side View



Bottom View

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 960905 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	2200 mm	560 mm	NA	9.8 g @ 53.1 ms 9.9 g @ 53.1 ms	54.1 g @ 14.6 ms 53.3 g @ 14.6 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	2200 mm	-570 mm	NA	2.1 g @ 201.4 ms 2.1 g @ 201.5 ms	55.7 g @ 14.6 ms 58.1 g @ 14.6 ms
3 ENGINE TOP LONGITUDINAL	900 mm	-72 mm	NA	27.3 g @ 49.7 ms	114.8 g @ 34.8 ms
4 ENGINE BOTTOM LONGITUDINAL	1000 mm	71 mm	NA	58.5 g @ 49.9 ms	111.7 g @ 36.1 ms
5 RIGHT BRAKE CALIPER LONGITUDINAL	975 mm	-578 mm	NA	33.0 g @ 48.2 ms	80.7 g @ 15.0 ms
6 LEFT BRAKE CALIPER LONGITUDINAL	975 mm	578 mm	NA	20.2 g @ 45.5 ms	95.7 g @ 19.4 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	1440 mm	0 mm	NA	20.2 g @ 42.6 ms	66.2 g @ 21.8 ms

REFERENCE: X: + REARWARD FROM FRONT BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

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 windshield cracked along the left A-pillar on impact.

Other Notable Impact Effects:

None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/
model/body style: 1996/Ford/Ranger/pickup
Vehicle NHTSA number: MT0209
Test date: 09/05/96

	Driver Dummy #142		Passenger Dummy #192	
<u>Maximum Accelerations:</u>				
Head X-axis	-51.4	g	-51.3	g
Head Y-axis	-12.2	g	8.3	g
Head Z-axis	-37.3	g	-43.3	g
Head resultant	62.2	g	65.1	g
Chest X-axis	-51.9	g	-52.4	g
Chest Y-axis	-6.6	g	-6.6	g
Chest Z-axis ¹	-19.8	g	-18.6	g
Chest resultant ²	52.6	g	53.4	g
Chest resultant time interval ²	.003	sec	.003	sec
<u>Head Injury Criteria (HIC) Values:</u>				
HIC ³	724		711	
HIC starting time	.0528	sec	.0489	sec
HIC ending time	.0874	sec	.0842	sec
Average head resultant acceleration during HIC time interval	53.4	g	52.6	g
<u>Maximum Chest Deflections:</u>				
Chest X-axis	46	mm	46	mm
Maximum chest deflection time	.0713	sec	.0684	sec
<u>Maximum Compressive Femur Forces:</u>				
Left femur	5715	N	4413	N
Right femur ⁴	6434	N	5890	N
<u>Maximum Seat Belt Forces:</u>				
Lap belt	3408	N	6351	N
Shoulder belt	7326	N	8599	N

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

¹ Passenger redundant acceleration data channel

² 0.003 Sec. Minimum duration.

³ The maximum HIC time interval is 36 milliseconds.

Table 7 Hybrid III Data Summary

Vehicle year/make/
model/body style: 1996/Ford/Ranger/pickup
Vehicle NHTSA number: MT0209
Test date: 09/05/96

	Driver Dummy #142	Passenger Dummy #192
<u>Maximum Forces</u>		
Neck X-axis shear force	253 N	846 N
Neck Y-axis shear force	636 N	403 N
Neck Z-axis axial force	2237 N	2393 N
 <u>Maximum Moments</u>		
Neck moment about X-axis	18.3 N·m	28.9 N·m
Neck moment about Y-axis	52.5 N·m	60.0 N·m
Neck moment about Z-axis	-11.9 N·m	18.8 N·m
 <u>Maximum Accelerations:</u>		
Pelvis X-axis	-64.3 g	-75.5 g
Pelvis Y-axis	-9.1 g	9.2 g
Pelvis Z-axis	12.8 g	12.1 g
Pelvis resultant	64.6 g	76.1 g

Table 7 Hybrid III Data Summary, Cont'd.

Vehicle year/make/
model/body style: 1996/Ford/Ranger/pickup
Vehicle NHTSA number: MT0209
Test date: 09/05/96

	Driver Dummy #142	Passenger Dummy #192
Left upper tibia moment about X-axis	-70.9 N·m	22.8 N·m
Left upper tibia moment about Y-axis	122.2 N·m	117.6 N·m
Right upper tibia moment about X-axis	-65.6 N·m	-47.5 N·m
Right upper tibia moment about Y-axis	211.6 N·m	99.9 N·m
Left lower tibia X-axis force	-924 N	-740.7 N
Left lower tibia Z-axis force	-2515 N	-2041 N
Left lower tibia moment about Y-axis	41.3 N·m	60.4 N·m
Right lower tibia X-axis force	-1439 N	-774 N
Right lower tibia Z-axis force	-4897 N	-2601 N
Right lower tibia moment about Y-axis	53.0 N·m	49.8 N·m
Left foot X-axis acceleration	-112.9 g	-86.3 g
Left foot Z-axis acceleration at heel	-203.7 g	86.4 g
Left foot Z-axis acceleration at toe	-336.0 g	128.6 g
Right foot X-axis acceleration	-163.4 g	-77.6 g
Right foot Z-axis acceleration at heel	95.1 g	46.4 g
Right foot Z-axis acceleration at toe ¹	800.9 g	74.4 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 impacted the airbag with the dummy's head rotating downward into the airbag. The dummy was restrained by the airbag and three-point unbelt. The dummy rebounded rearward and leftward into the seat back with the dummy's head rotating rearward contacting the head restraint. The driver dummy came to rest seated in the driver's seat restrained by the three-point unbelt.

Right Front Passenger Dummy

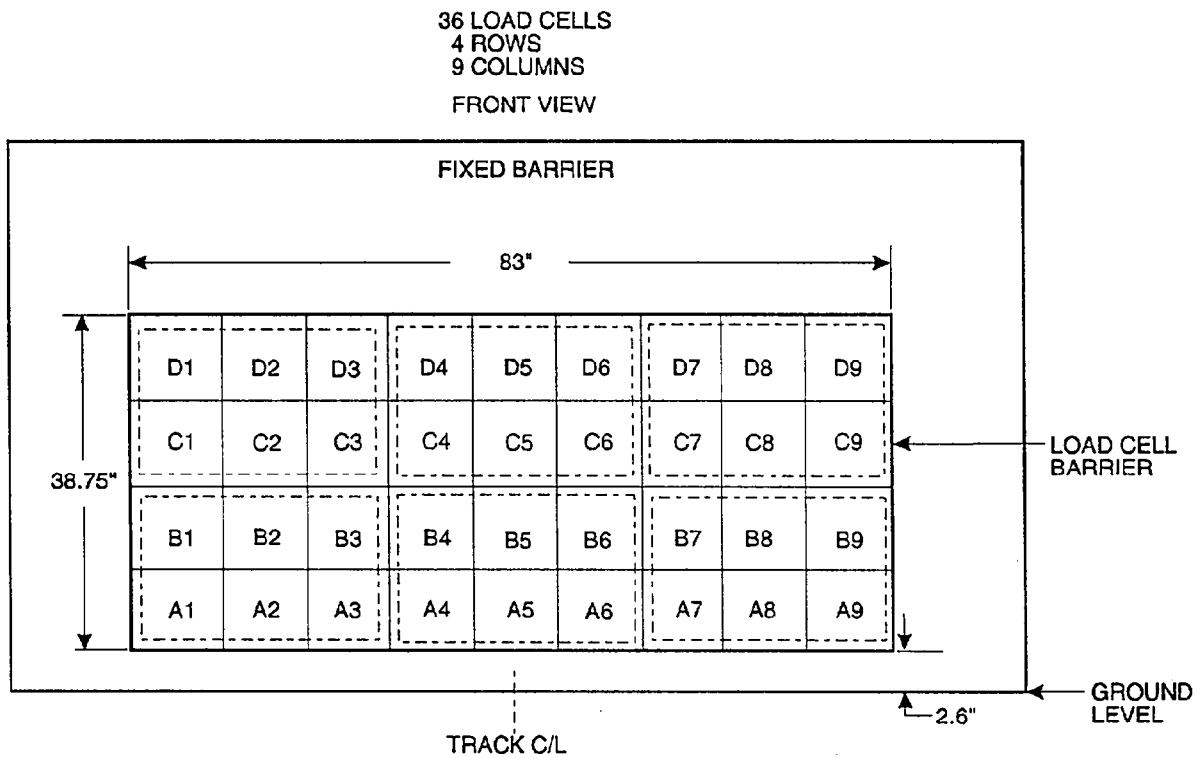
Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag with the dummy's head rotating downward into the airbag. The dummy was restrained by the passenger's airbag and three-point unbelt.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

Table 8 Seat Belt Performance Assessment Test Data

	Driver	Passenger
<u>Belt length data:</u>		
Belt length from trim panel exit to bolt hole anchor point for continuous webbing systems.	2654 mm	2650 mm
Shoulder belt length as measured on Part 572 dummy.	914 mm	870 mm
Lap belt length as measured on Part 572 dummy.	851 mm	820 mm
<u>Shoulder belt spool-off length:</u>		
As determined by film analysis	45 mm	NA ¹
As determined mechanically	40 mm	40 mm
As determined electronically	45 mm	46 mm
<u>Belt stretch length:</u>		
As measured mechanically	0 mm/m	0 mm/m
As measured electronically	0 mm/m	29 mm/m
<u>Retractor lock-up time:</u>		
As determined by shoulder belt spool-off	74	NA ¹

¹ The right front passenger's shoulder belt camera view was obstructed by an interior trim panel that became detached approximately 36 milliseconds after impact, making it impossible to determine shoulder belt spoolout length and retractor lockup time.

Figure 4 Load Cell Barrier Configuration



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

Table 9 Load Cell Barrier Data Summary

Location	Positive direction	Negative direction
Total group 1	3.7 kN @ 5.4 ms	59.7 kN @ 29.2 ms
Total group 2	1.7 kN @ 0.6 ms	145.8 kN @ 14.8 ms
Total group 3	3.4 kN @ 3.0 ms	128.5 kN @ 13.6 ms
Total group 4	0.9 kN @ 3.0 ms	85.2 kN @ 31.8 ms
Total group 5	0.2 kN @ 291.5 ms	181.3 kN @ 37.4 ms
Total group 6	0.3 kN @ 106.3 ms	72.9 kN @ 35.8 ms
Total load cell force	2.2 kN @ 123.6 ms	593.9 kN @ 31.4 ms

Tension is positive
Compression is negative

Section 3.0

FMVSS 212, 219 (partial), and 301 Data

Figure 5 FMVSS 212 Test Data

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

Plastic trim around outer perimeter, adhesive around inner perimeter.

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

Windshield periphery measurements:

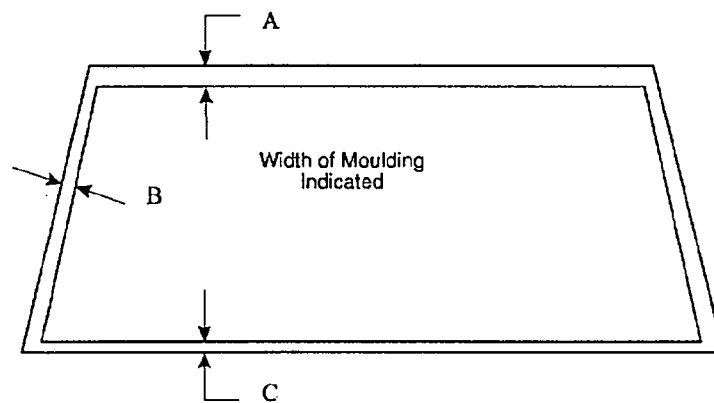
	<u>Pre-test</u>	<u>Post-test</u>	<u>Percent retention</u>
Right side	1950 mm	1950 mm	100
Left side	1950 mm	1950 mm	100
Total	3900 mm	3900 mm	100

Pre-test windshield mounting material temperature: 20° C

A = 20 mm

B = 20 mm

C = 20 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 = 1240 mm

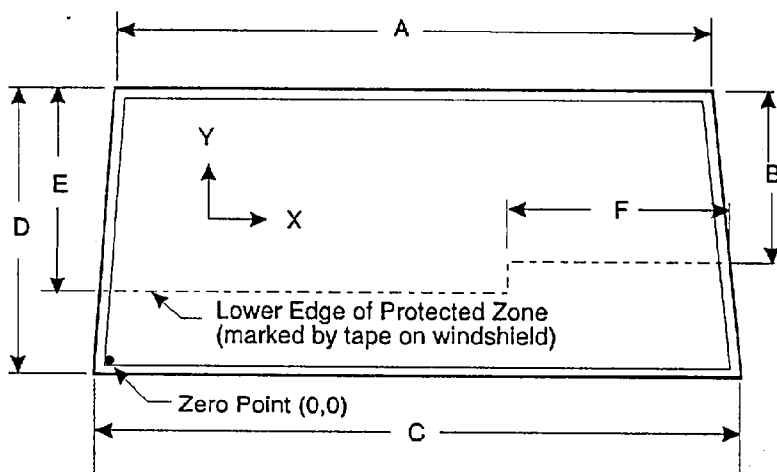
B = 333 mm

C = 1544 mm

D = 620 mm

E = 395 mm

F = 630 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:	1996/Ford/Ranger/pickup
NHTSA number:	MT0209
Fuel system capacity:	62.4 liters (from owner's manual)
Usable capacity:	62.4 liters (furnished by COTR)
Test volume range:	57.4 liters to 58.7 liters (92-94% of usable)
Actual test volume:	57.9 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 filler cap was located on the left side of the vehicle. The fuel tank was located inside the left frame rail and in front of the rear axle. The fuel filler neck enters the left side of the fuel tank. The fuel lines run along the inside of the left frame rail to engine compartment.

Table 11 FMVSS 301 Post-Impact Test Data

NHTSA number: MT0209
Test date: 09/05/96
Vehicle year/make/
model/body style: 1996/Ford/Ranger/pickup

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:

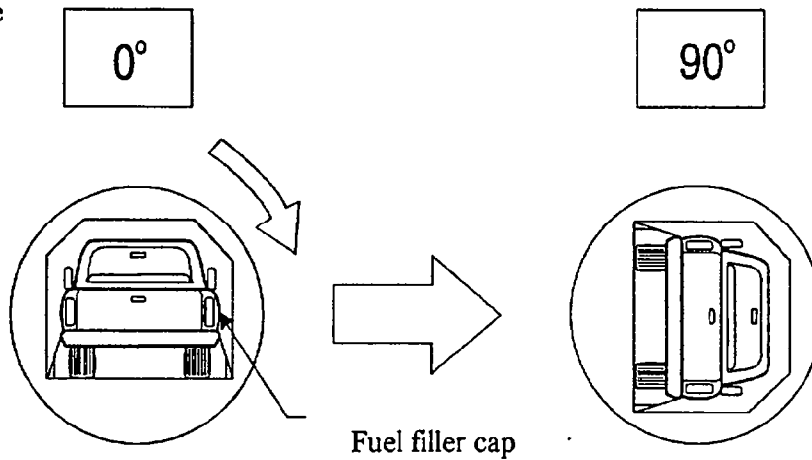
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MT0209

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

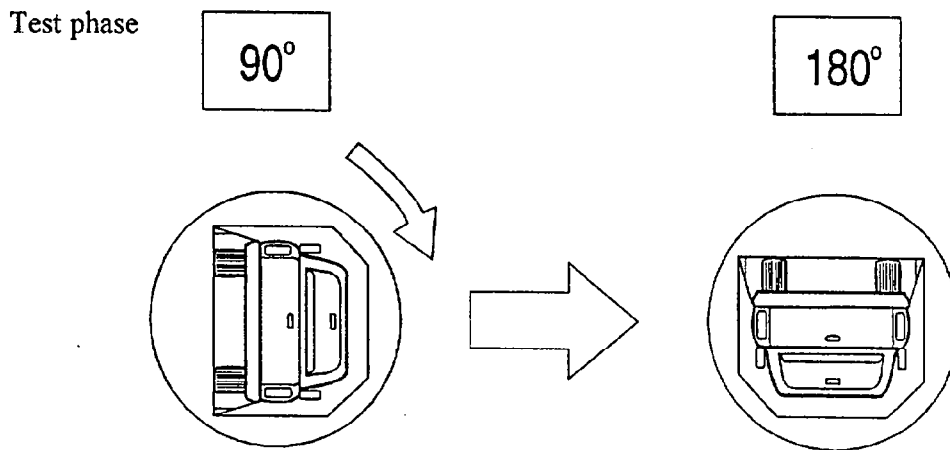
Next whole minute interval = 7 minutes

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.



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

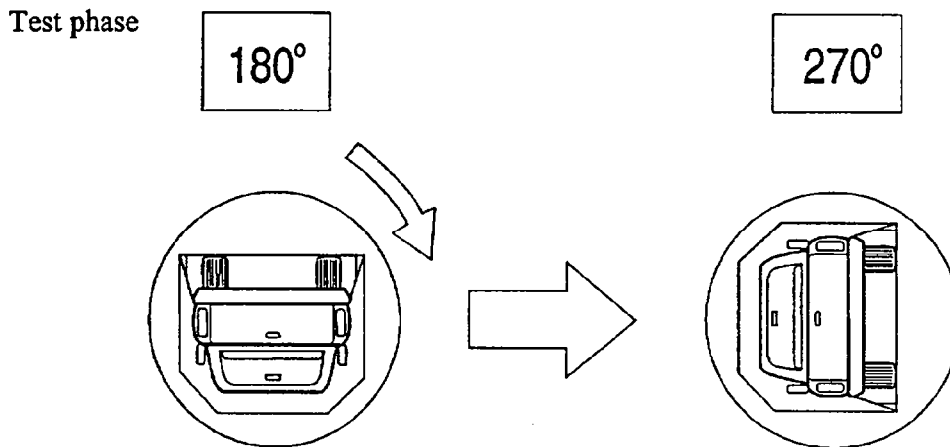
Time required for machine to rotate 90°	=	2 minutes,	0	seconds
FMVSS 301 position hold time	=	5 minutes,	0	seconds
Total	=	7 minutes,	0	seconds
Next whole minute interval	=	14 minutes		

Fuel system fluid spillage measurements:

<u>90° to 180° rotation</u>	<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.



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

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

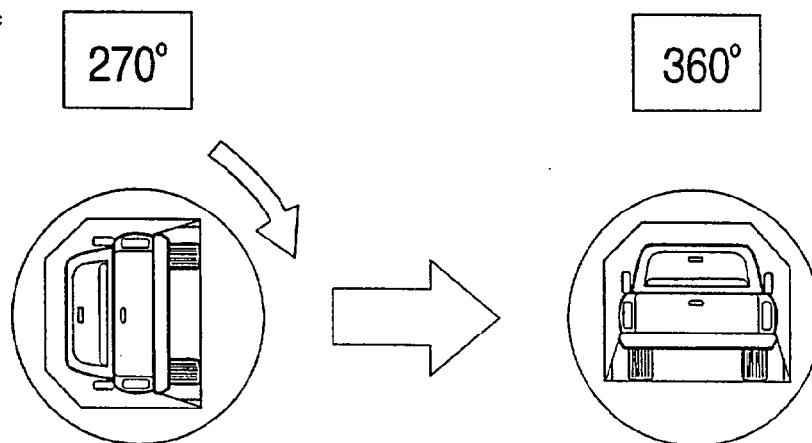
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>180° to 270° rotation</u>		
1. First 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>	<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

Section 4.0

Occupant, Camera, and Vehicle Information

Figure 8 Dummy Measurement Locations for Front Seat Occupants

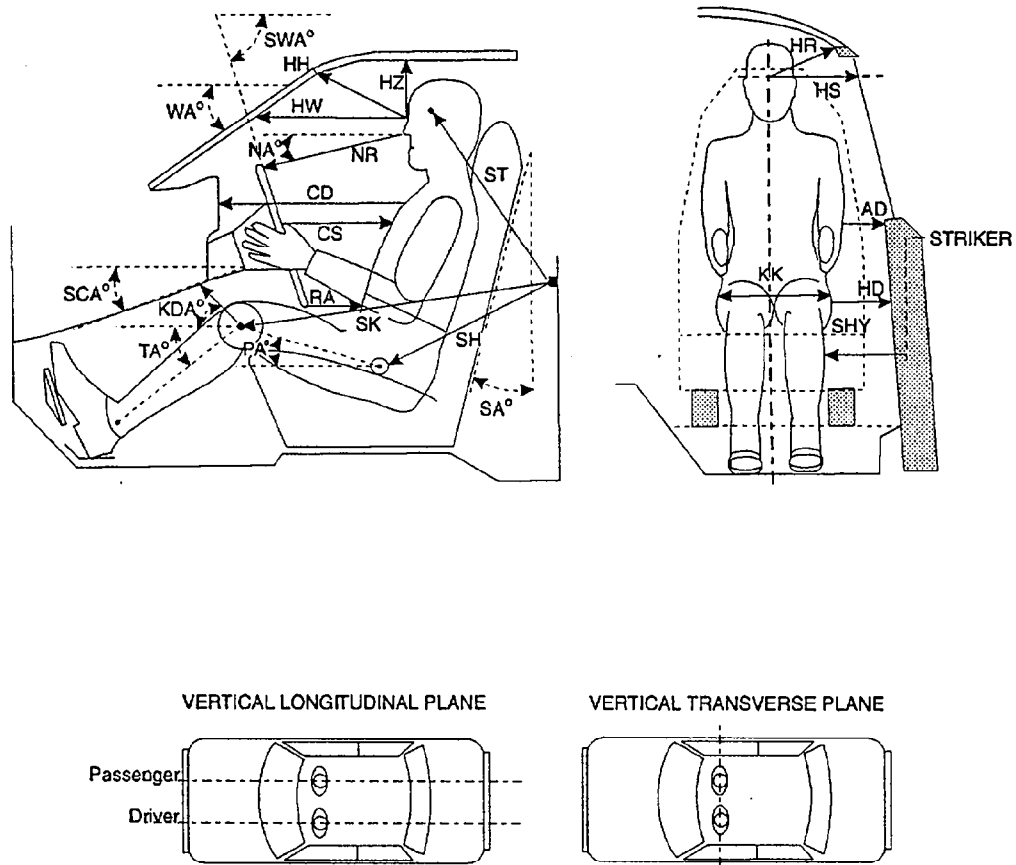


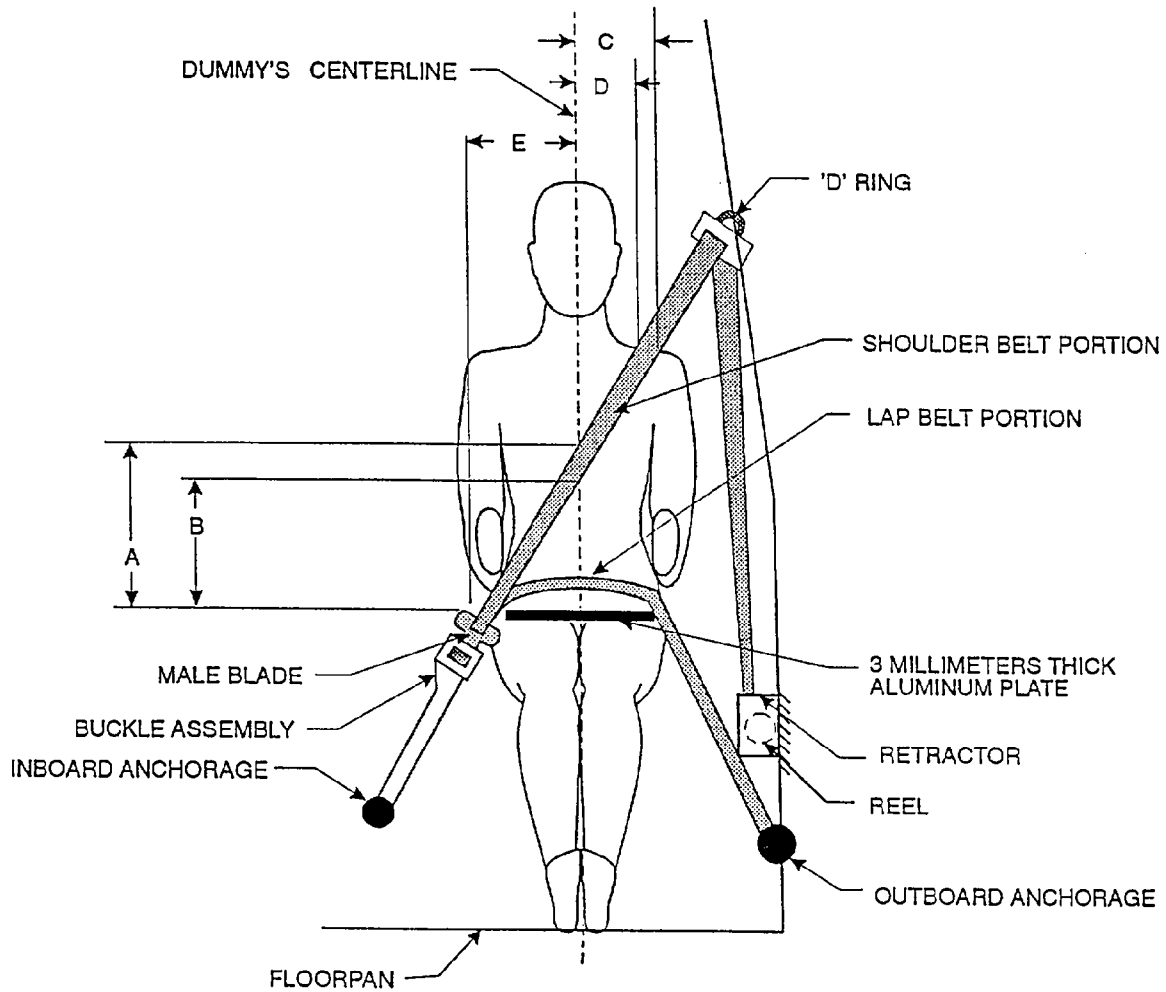
Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #142)	Passenger (Serial #192)
WA	Windshield angle	43°	43°
SWA	Steering wheel angle	68°	NA
SCA	Steering column angle	22°	NA
SA	Seat back angle	15°	°
HZ	Head to roof	225 mm	205 mm
HH	Head to header	459 mm	445 mm
HW	Head to windshield	570 mm	545 mm
HR	Head to side header	275 mm	272 mm
NR	Nose to rim	347 mm	NA
NA	Nose to rim angle	12°	NA
CD	Chest to dash	512 mm	525 mm
CS	Steering wheel to chest	268 mm	NA
RA	Rim to abdomen	160 mm	NA
KDL	Left knee to dash	148 mm	165 mm
KDR	Right knee to dash	143 mm	180 mm
KDA	Outboard knee to dash angle	33°	34°
PA	Pelvic angle	22.5°	20°
TA	Tibial angle	46°	42°
KK	Knee to knee	318 mm	270 mm
ST ¹	Striker to head	540 mm	559 mm
	Striker to head angle	-70°	-71°
SK ¹	Striker to knee	687 mm	663 mm
	Striker to knee angle	-3°	-1°
SH ¹	Striker to H-point	346 mm	323 mm
	Striker to H-point angle	22°	22°
SHY	Striker to H-point (Y dir.)	203 mm	204 mm
HS	Head to side window	348 mm	331 mm
HD	H-point to door	143 mm	162 mm
AD	Arm to door	85 mm	101 mm

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

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

Figure 9 Seat Belt Positioning Data



	Driver	Passenger
A - Top surface of aluminum plate to belt upper edge	355 mm	330 mm
B - Top surface of aluminum plate to belt lower edge	270 mm	240 mm
C - Dummy centerline to outer edge of belt at chest flesh top	100 mm	115 mm
D - Dummy centerline to inner edge of belt at chest flesh top	40 mm	60 mm
Lap belt tension	9 N	9 N
Shoulder belt tension	18 N	18 N
Position of adjustable belt anchorage	Full up	Full up

Figure 10 Camera Positions

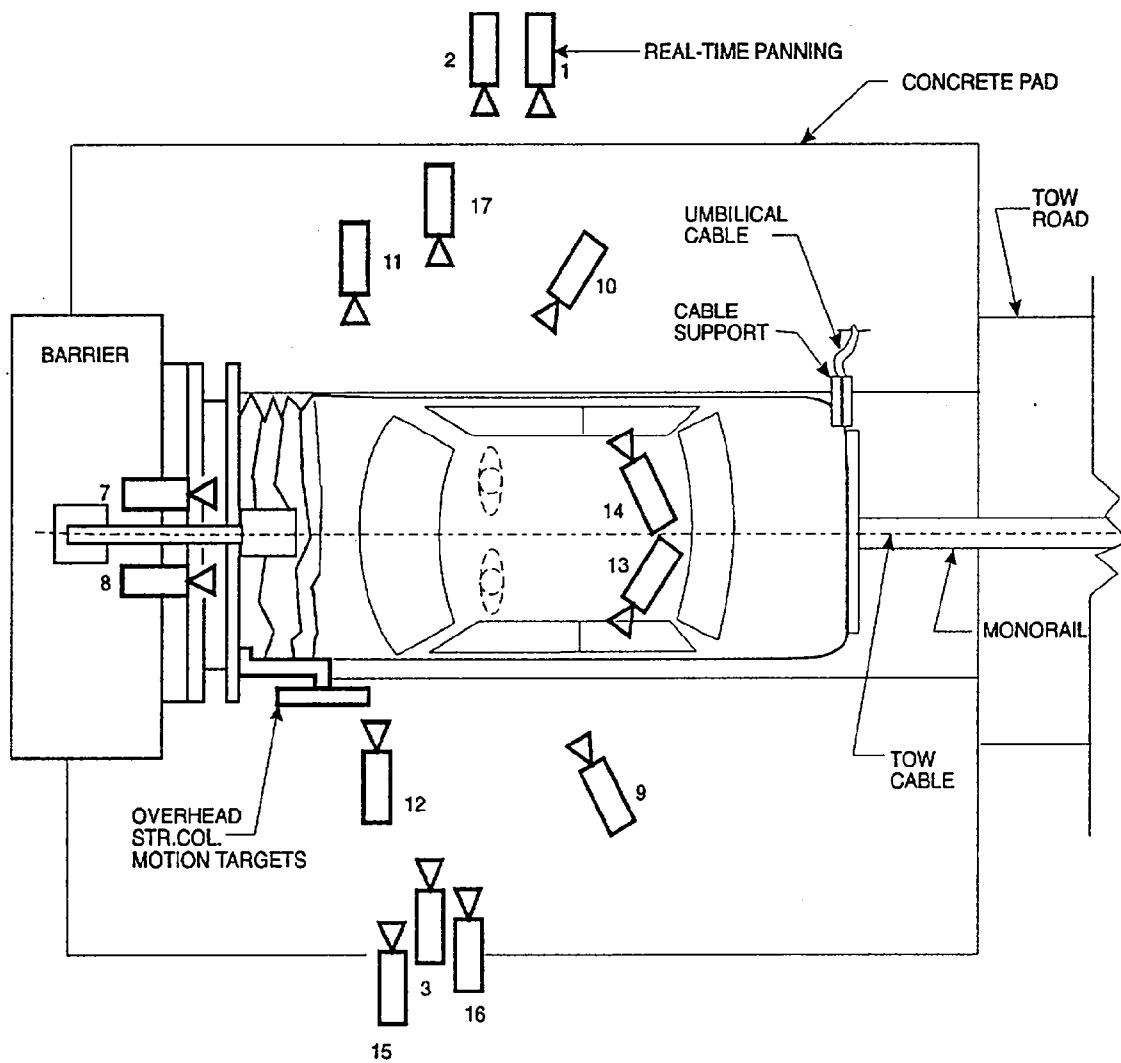


Figure 10 Camera Positions, Cont'd.

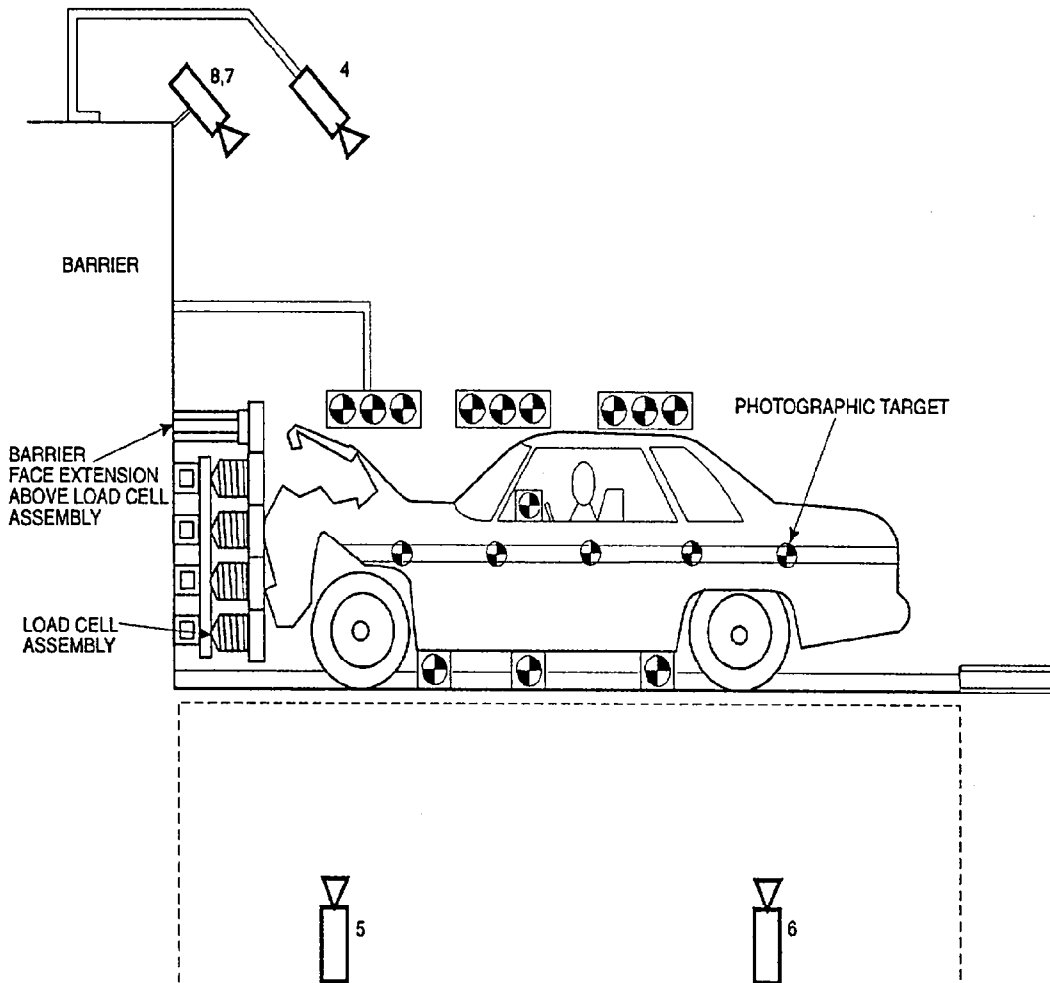


Table 13 Motion Picture Camera Locations

Test Number: 960905

Vehicle year/make/model/body style: 1996/Ford/Ranger/pickup

Camera Number	View	Camera Positions ¹			Angle ²	Film Plane to Head Target	Lens	Film Speed
		X	Y	Z				
1	Real-time panning	-3607 mm	-2802 mm	1549 mm	NA	NA mm	16 mm	24 frames/s
2	Vehicle crush	-2065 mm	-6767 mm	942 mm	-2°	NA mm	13 mm	502 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	6858 mm	25 mm	1055 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	NA mm	17 mm	505 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	NA mm	13 mm	1002 frames/s
6	Fluid spillage	-2522 mm	0 mm	-2515 mm	90°	NA mm	13 mm	995 frames/s
7	Passenger kinematics	-114 mm	-351 mm	2159 mm	-40°	NA mm	13 mm	502 frames/s
8	Driver kinematics	-173 mm	368 mm	2159 mm	-41°	NA mm	17 mm	498 frames/s
9	Driver kinematics	-4572 mm	1854 mm	2591 mm	-27°	2438 mm	25 mm	495 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	2388 mm	25 mm	495 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA mm	50 mm	508 frames/s
12	Windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA mm	50 mm	502 frames/s
13	Driver seat belt movement	NA	NA	NA	NA	NA	8 mm	500 frames/s
14	Passenger seat belt movement	NA	NA	NA	NA	NA	8 mm	500 frames/s
15	Column movement	-3172 mm	7051 mm	2594 mm	-14°	NA mm	25 mm	492 frames/s
16	Column movement	-3172 mm	7051 mm	2011 mm	-9°	NA mm	25 mm	500 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	6579 mm	25 mm	1020 frames/s

¹ +X = Film plane forward of barrier face

+Y = Film plane to left of monorail centerline

+Z = Film plane above ground level

² +Angle = Film plane angled upward from horizontal plane

Figure 11 Vehicle Target Locations

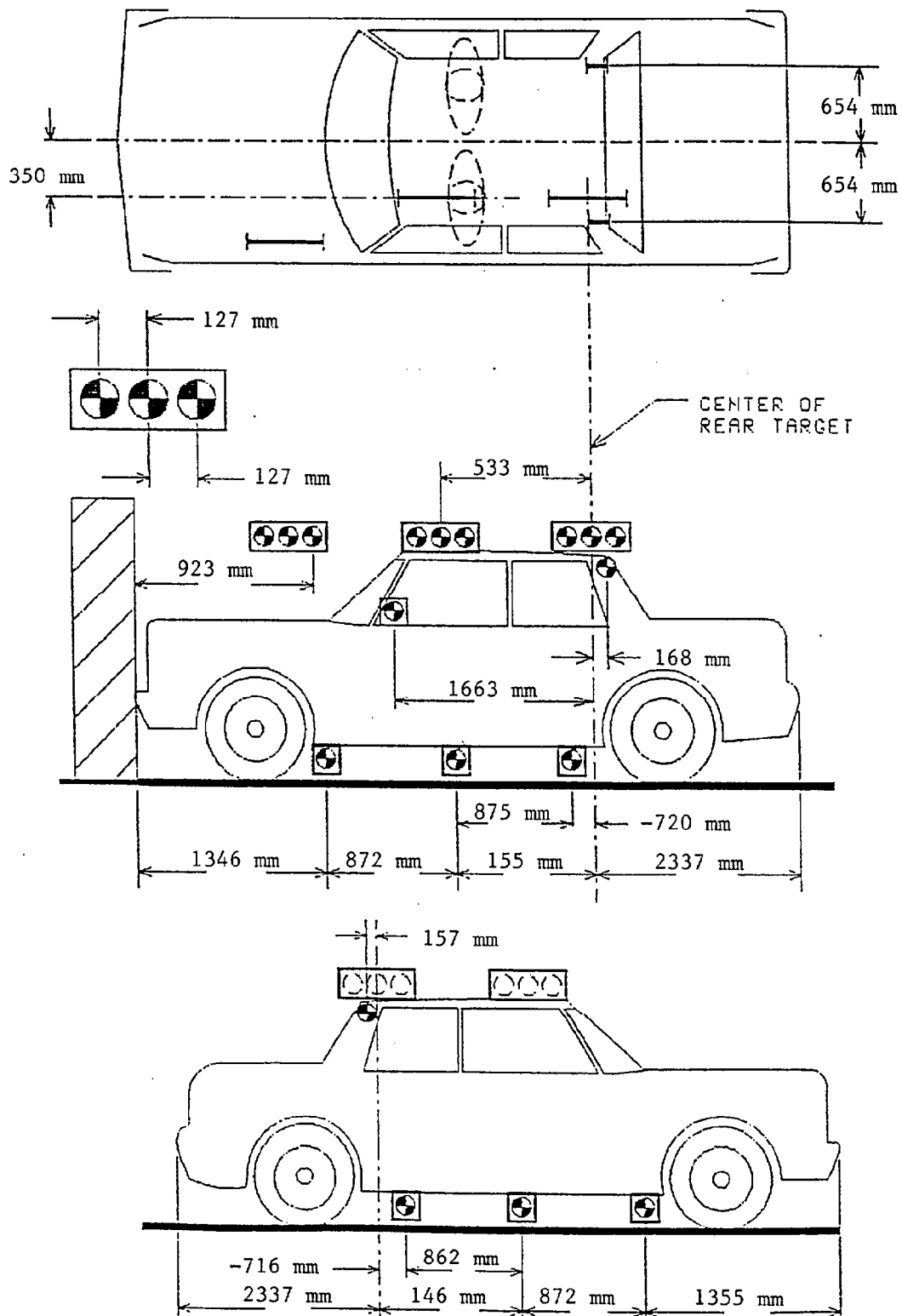


Figure 12 Pre-Test And Post-Test Measurement Points

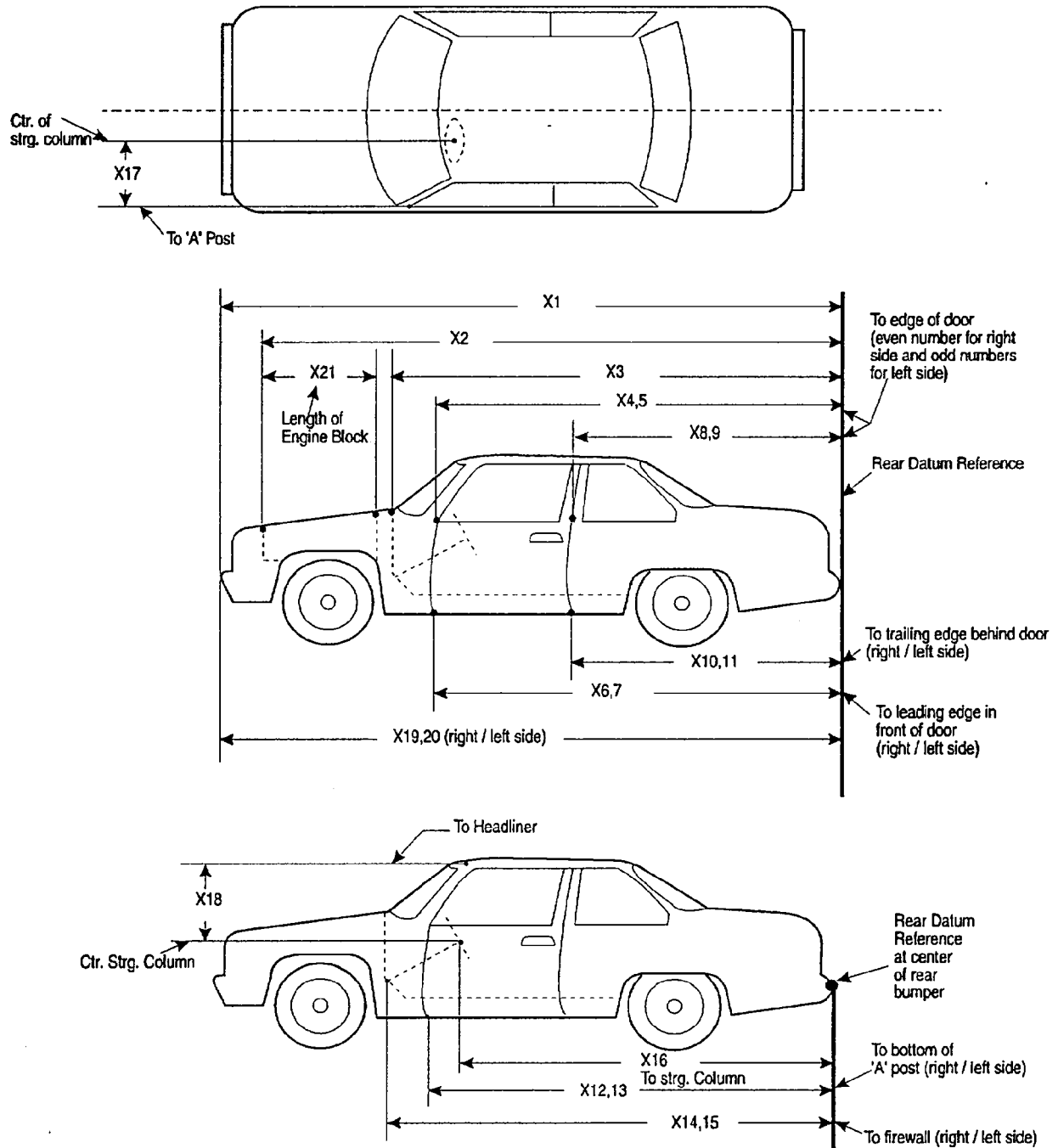
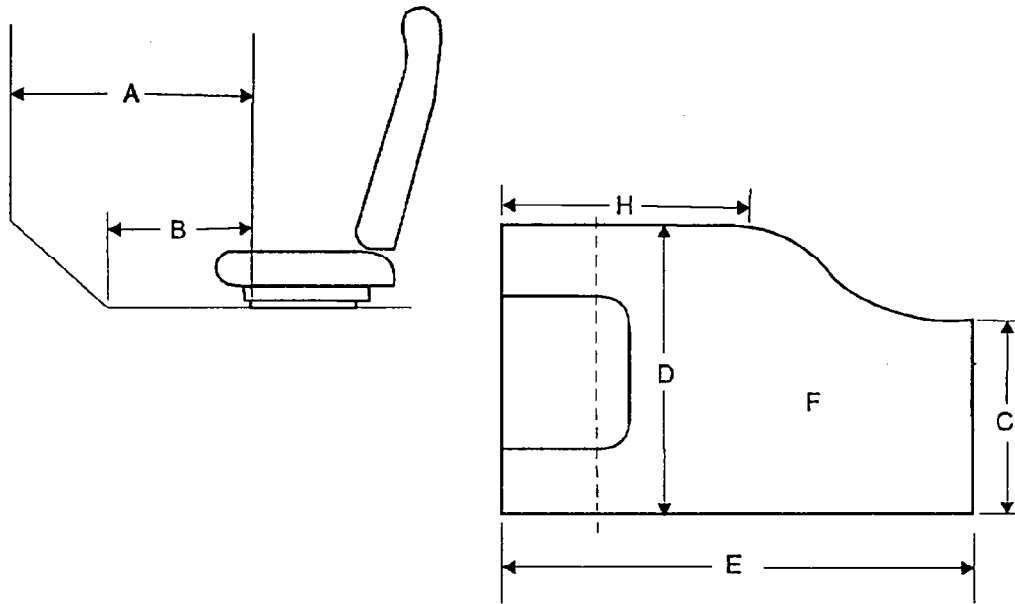


Table 14 Impacted Vehicle Measurements

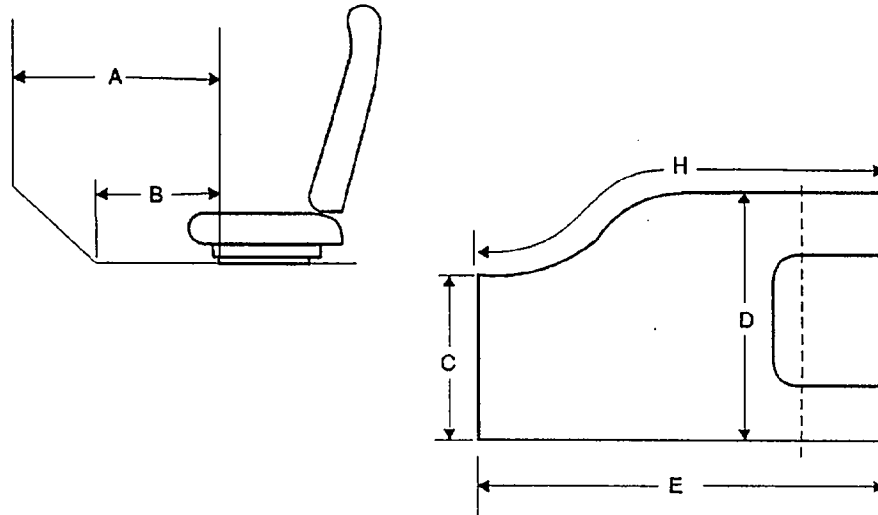
<u>Vehicle Make/Model:</u> Ford/Ranger		<u>Test Number:</u> 960905				
No.	Type of measurement	Pre-test		Post-test		Diff.
X1	Total length of vehicle at centerline	4710	mm	4205	mm	505 mm
X2	Rear surface of vehicle to front of engine block	4038	mm	3900	mm	138 mm
X3	Rear surface of vehicle to firewall	3584	mm	3488	mm	96 mm
X4	Rear surface of vehicle to upper leading edge of right door	3300	mm	3305	mm	-5 mm
X5	Rear surface of vehicle to upper leading edge of left door	3290	mm	3272	mm	18 mm
X6	Rear surface of vehicle to lower leading edge of right door	3215	mm	3230	mm	-15 mm
X7	Rear surface of vehicle to lower leading edge of left door	3220	mm	3215	mm	5 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2180	mm	2180	mm	0 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2170	mm	2152	mm	18 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2165	mm	2164	mm	1 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2165	mm	2148	mm	17 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3234	mm	3236	mm	-2 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3229	mm	3223	mm	6 mm
X14	Rear surface of vehicle to firewall - right side	3502	mm	3515	mm	-13 mm
X15	Rear surface of vehicle to firewall - left side	3524	mm	3449	mm	75 mm
X16	Rear surface of vehicle to steering wheel center	2836	mm	2790	mm	46 mm
X17	Center of steering column to "A" post	292	mm	255	mm	37 mm
X18	Center of steering column to headliner	450	mm	415	mm	35 mm
X19	Rear surface of vehicle to right side of front bumper	4637	mm	4212	mm	425 mm
X20	Rear surface of vehicle to left side of front bumper	4630	mm	4159	mm	471 mm
X21	Length of engine block	431	mm	431	mm	0 mm

Figure 13 Static Footwell Deformation
(Driver's Side)



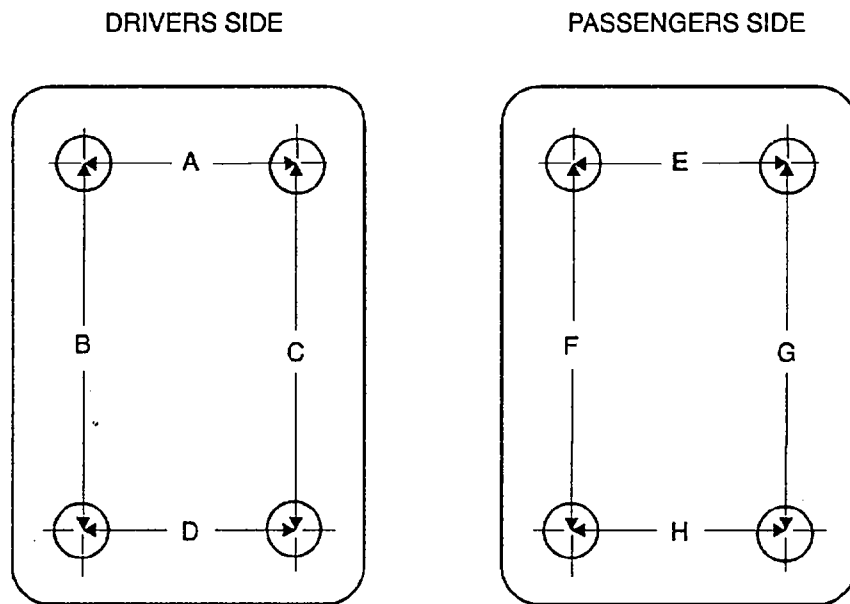
Measurement	Pre-Test	Post-Test	Difference
A	654 mm	650 mm	4 mm
B	542 mm	517 mm	25 mm
C	239 mm	317 mm	-78 mm
D	315 mm	267 mm	48 mm
E	940 mm	928 mm	12 mm
H	976 mm	522 mm	454 mm

Figure 14 Static Footwell Deformation
(Passenger's Side)



Measurement	Pre-Test	Post-Test	Difference
A	654 mm	639 mm	15 mm
B	505 mm	508 mm	-3 mm
C	245 mm	235 mm	10 mm
D	330 mm	327 mm	3 mm
E	892 mm	920 mm	-28 mm
H	943 mm	910 mm	33 mm

Figure 15 Underbody Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	311 mm	311 mm	0 mm
B	593 mm	591 mm	2 mm
C	605 mm	608 mm	-3 mm
D	325 mm	340 mm	-15 mm
E	410 mm	465 mm	-55 mm
F	695 mm	687 mm	8 mm
G	570 mm	563 mm	7 mm
H	470 mm	445 mm	25 mm

Appendix A

Photographs

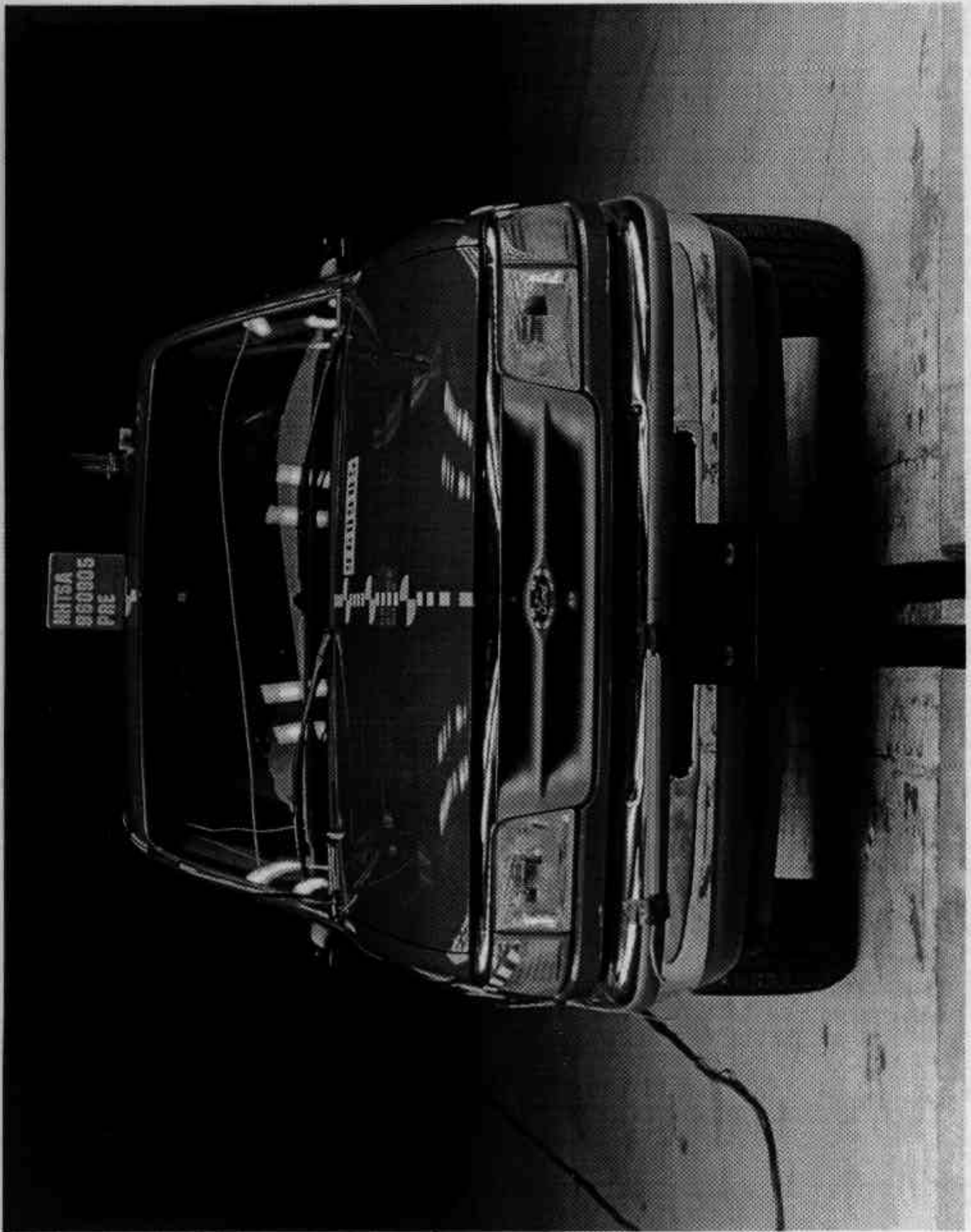


Figure A-1 Pre-Test Front View
A-2

960905

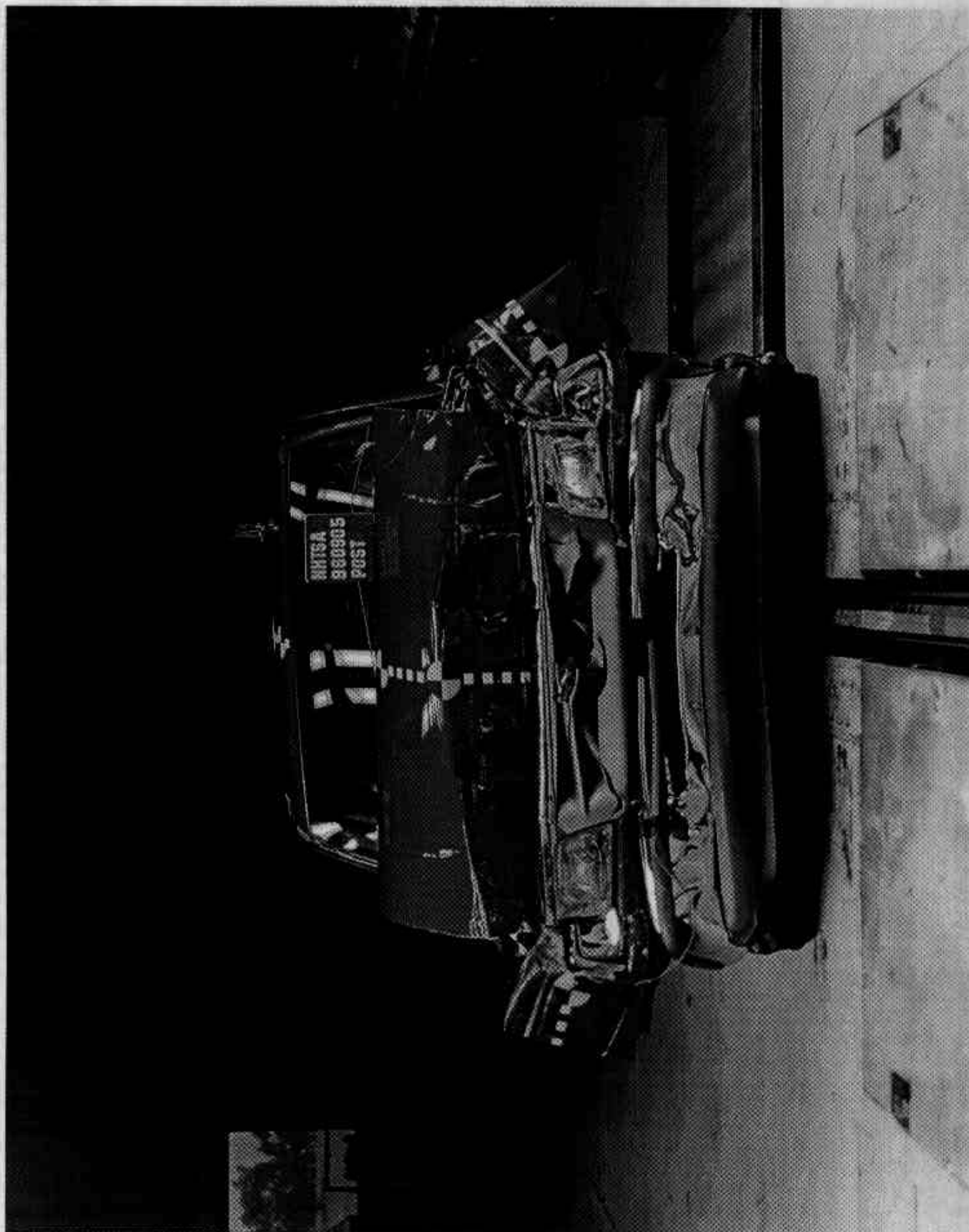


Figure A-2 Post-Test Front View

A-3

960905

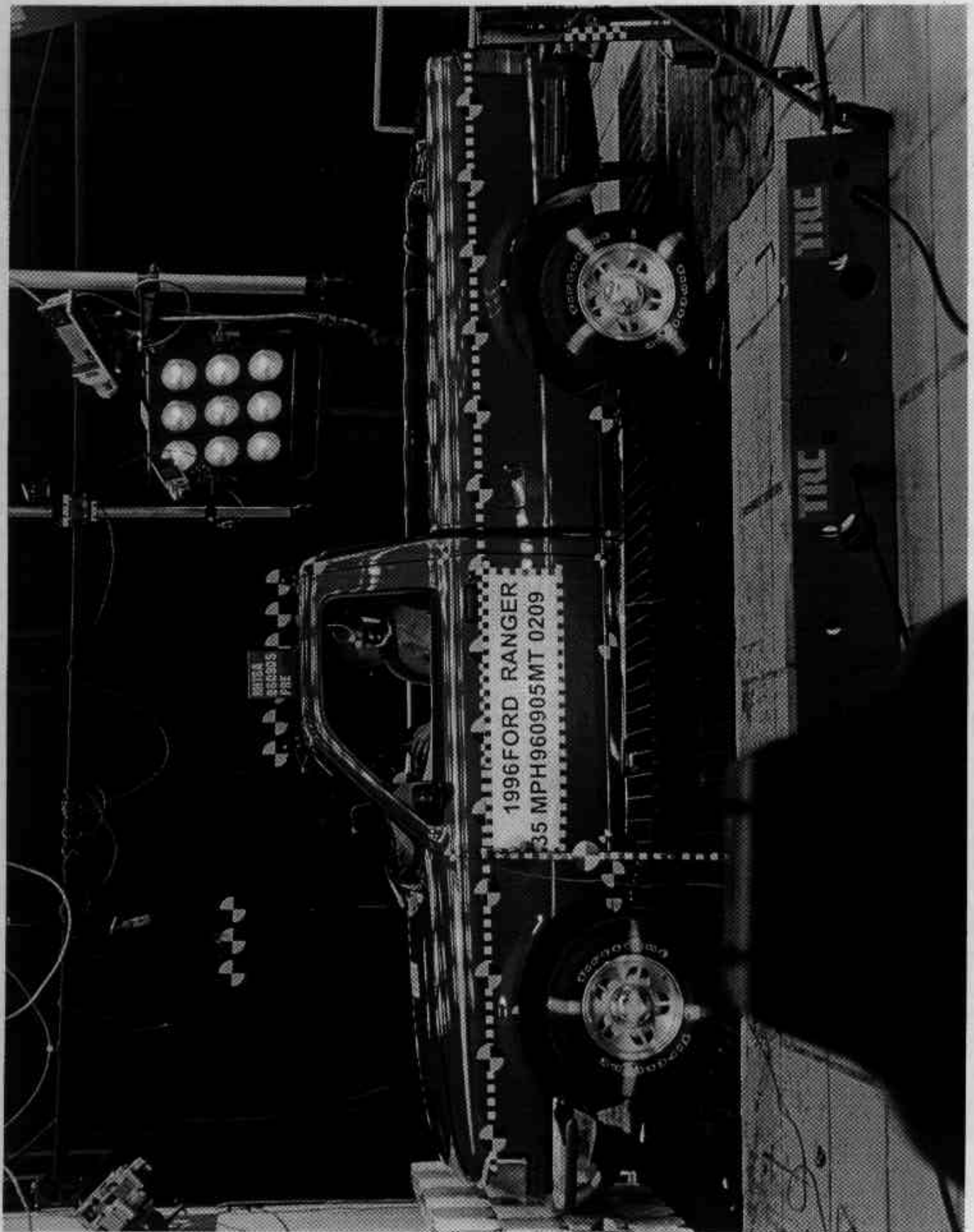


Figure A-3 Pre-Test Left Side View

A-4

960905

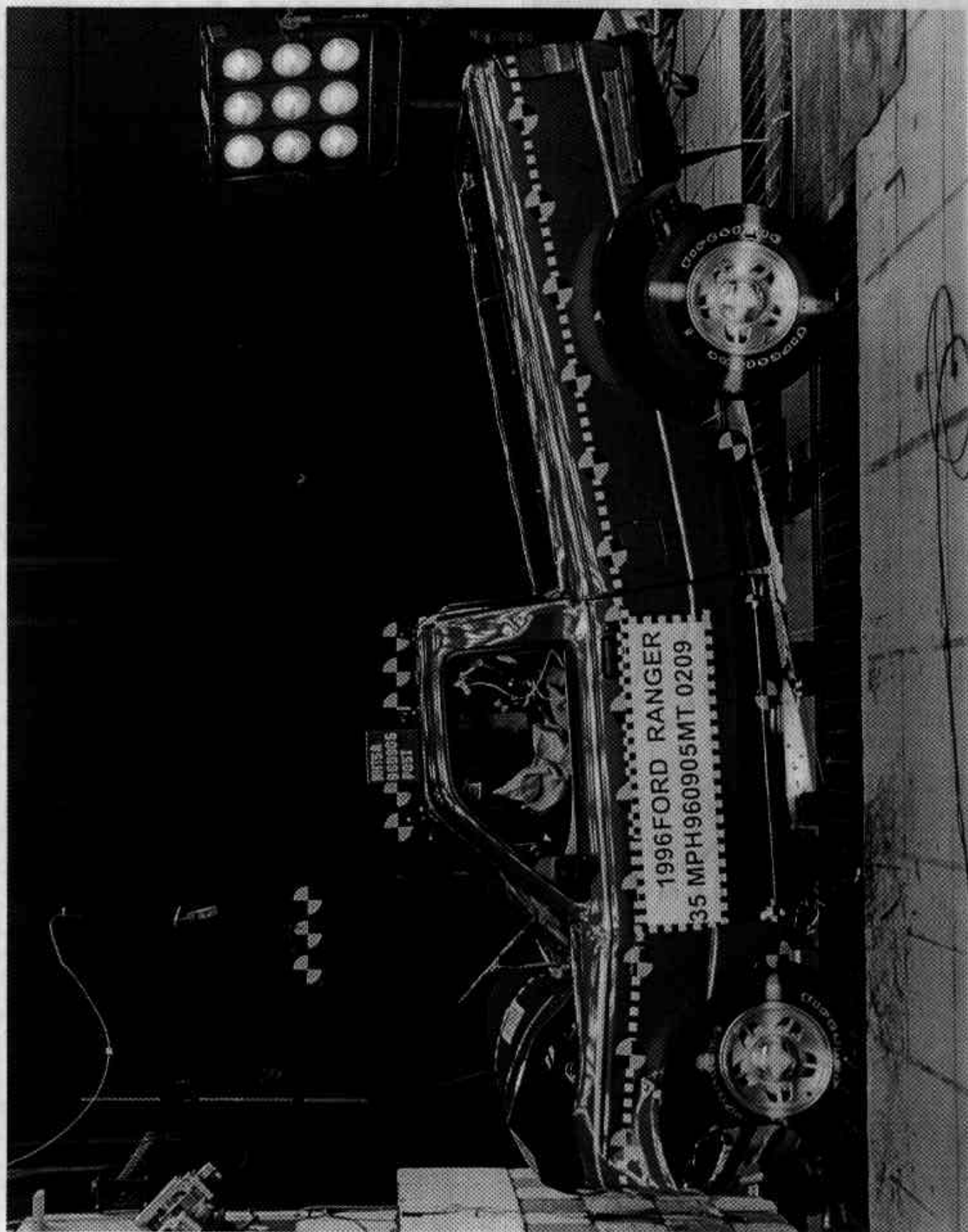


Figure A-4 Post-Test Left Side View

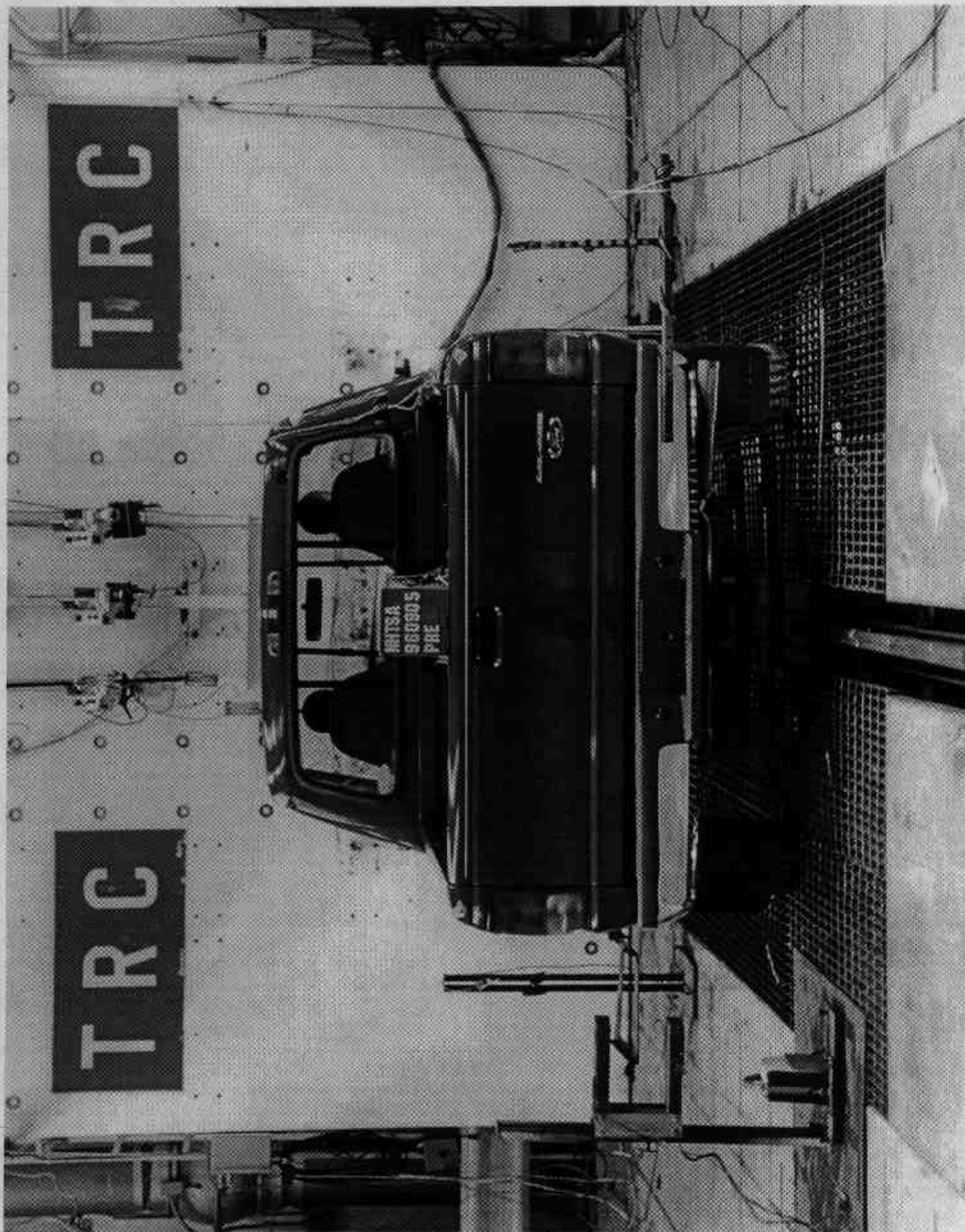


Figure A-5 Pre-Test Rear View

A-6

960905

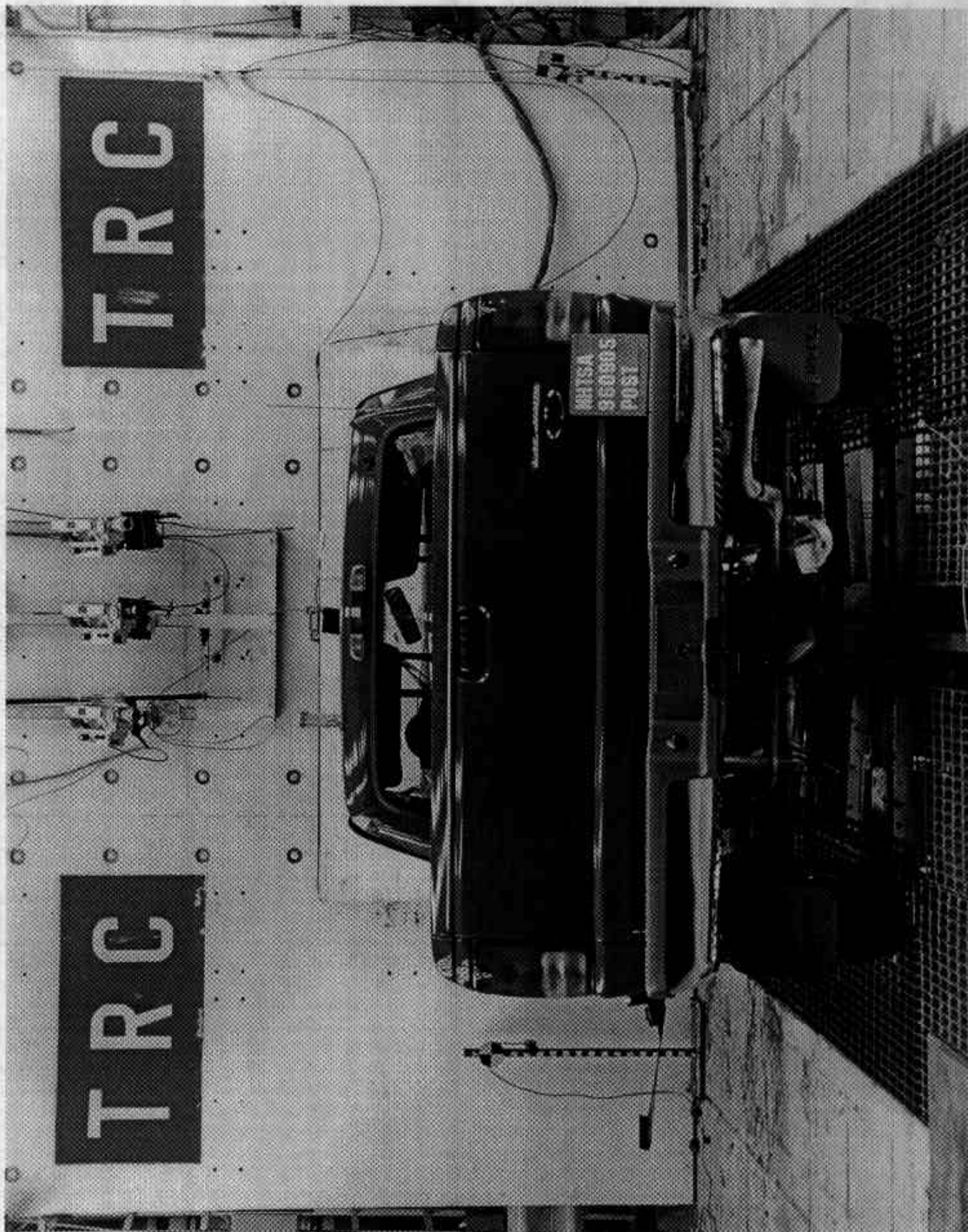


Figure A-6 Post-Test Rear View

A-7

960905

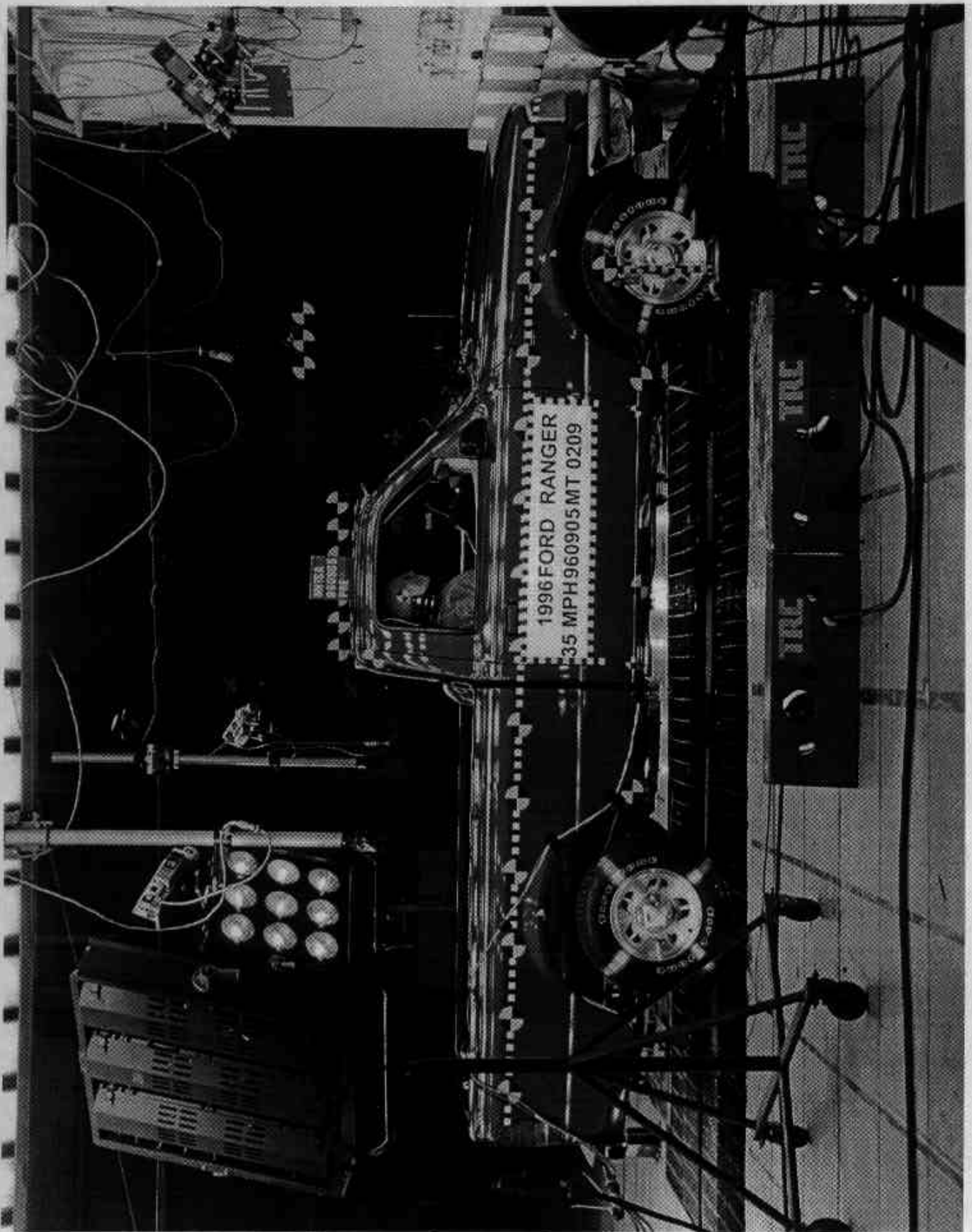


Figure A-7 Pre-Test Right Side View

A-8

960905

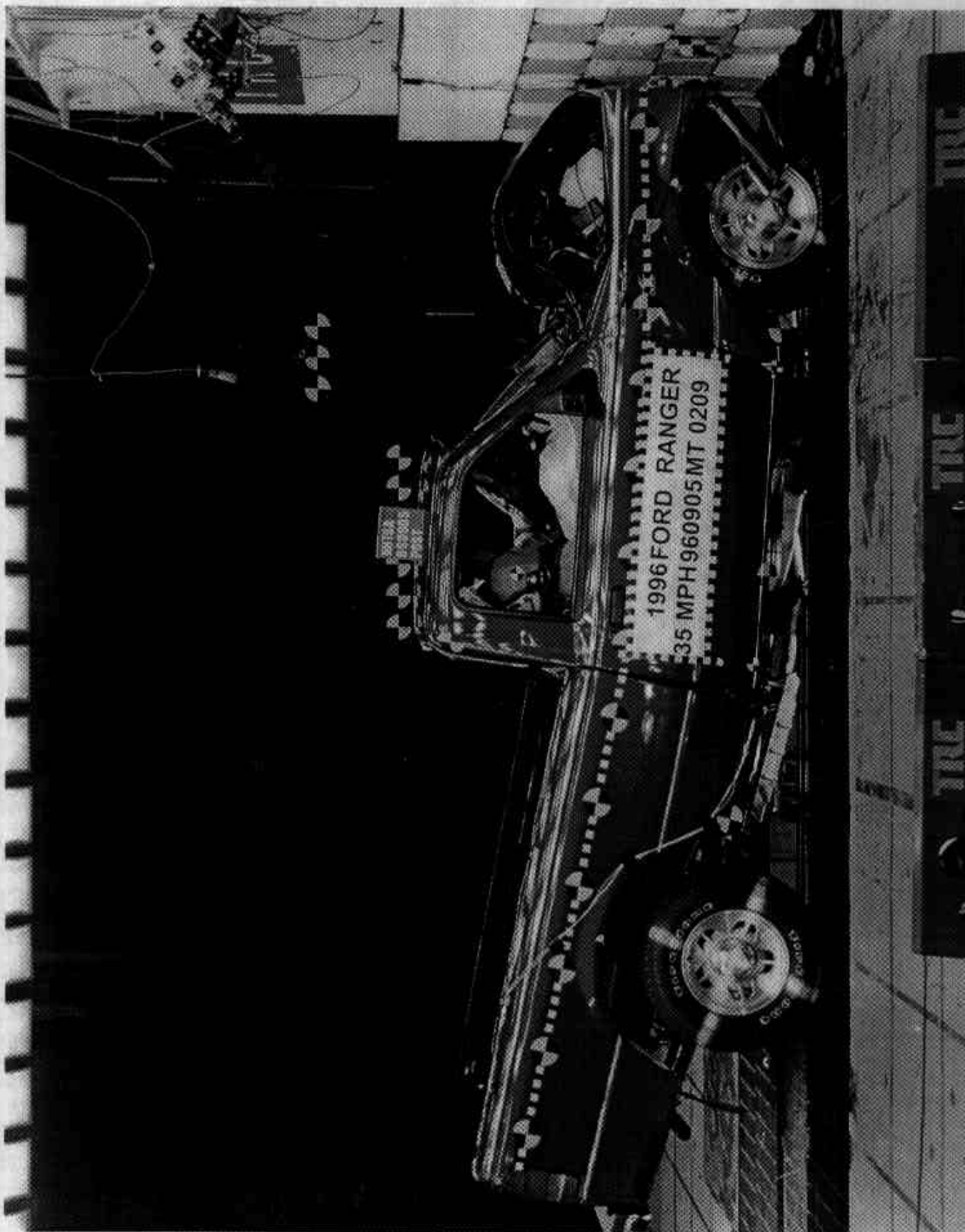


Figure A-8 Post-Test Right Side View

A-9

960905

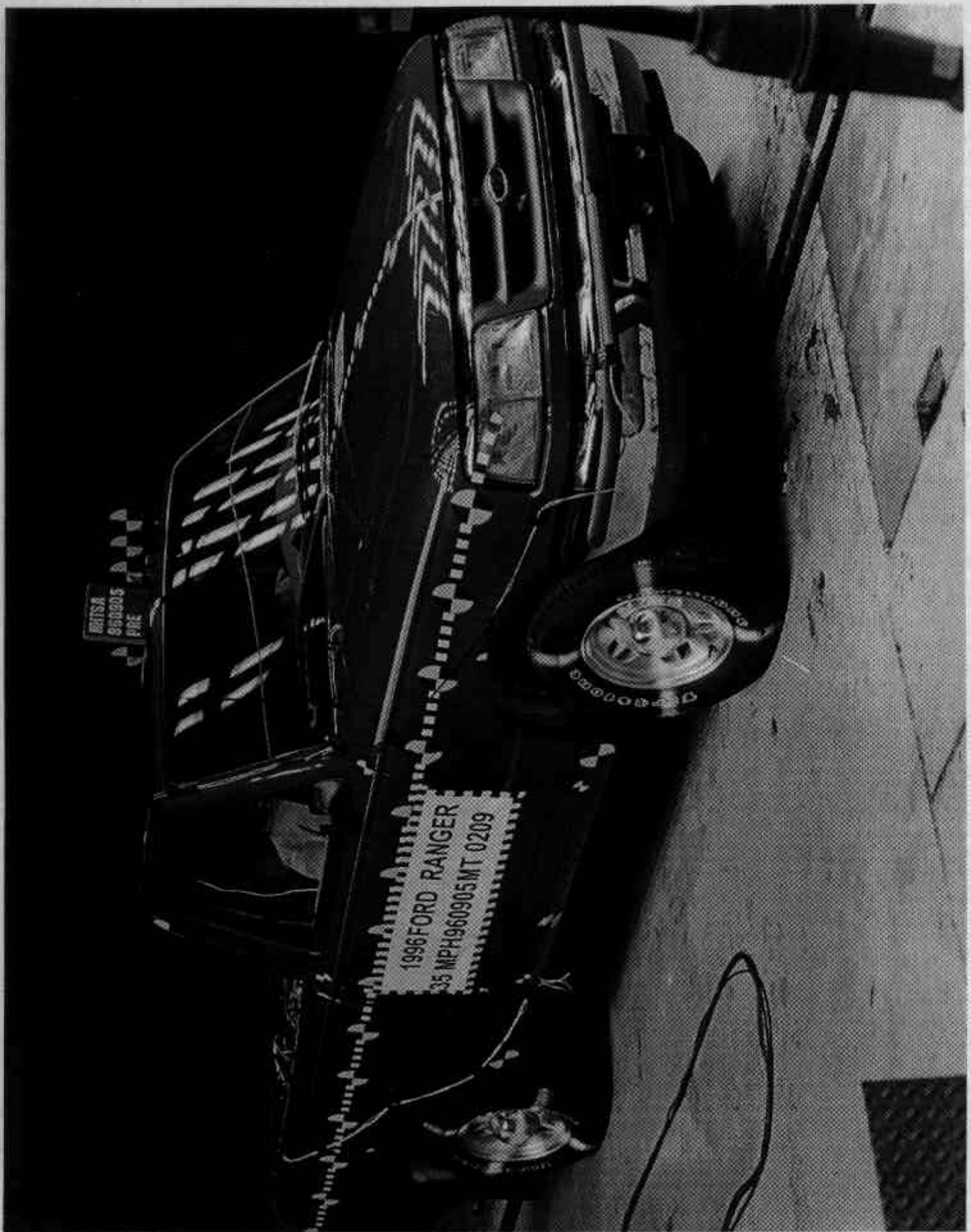


Figure A-9 Pre-Test Right Front Three-Quarter View

A-10

960905

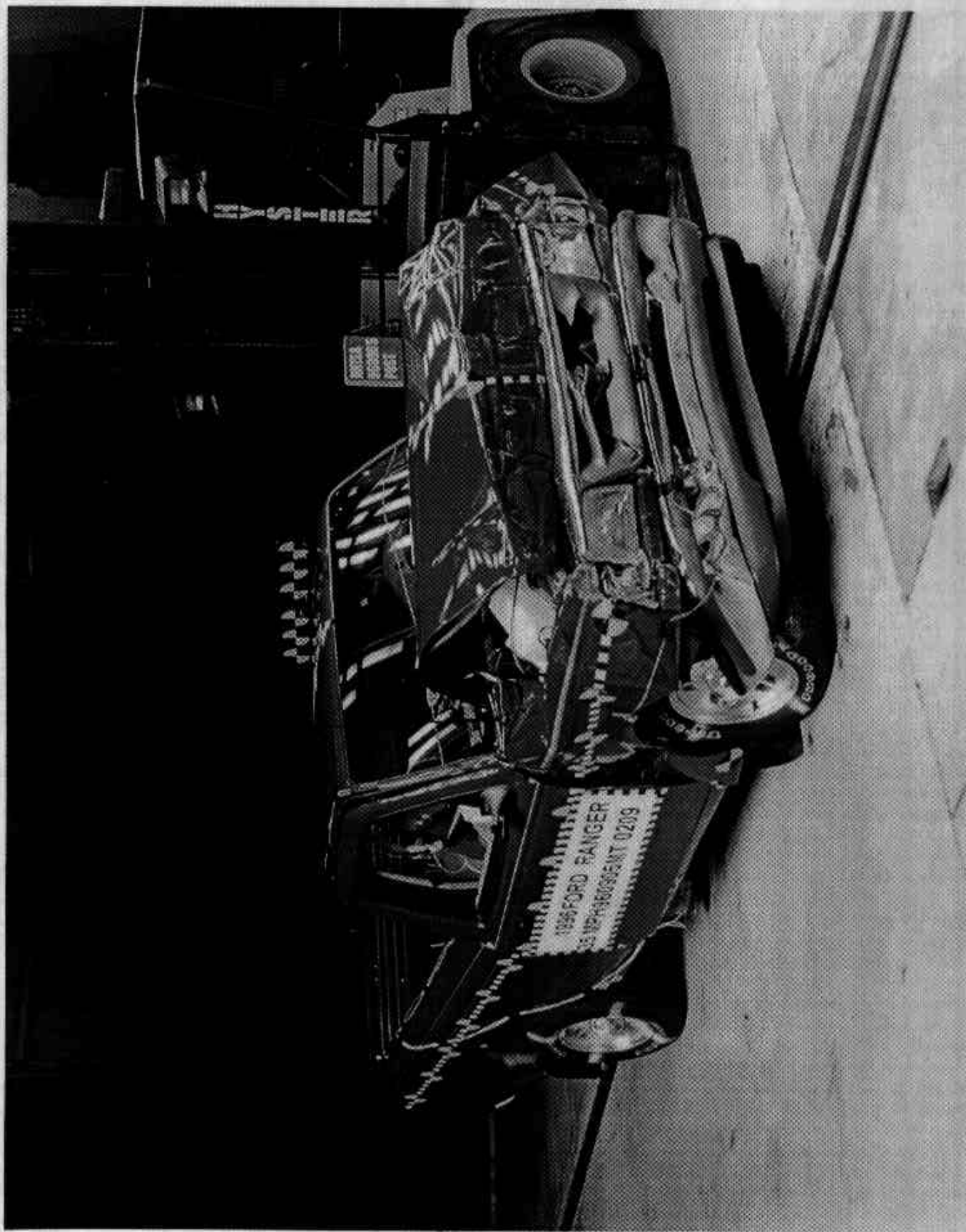


Figure A-10 Post-Test Right Front Three-Quarter View

A-11

960905

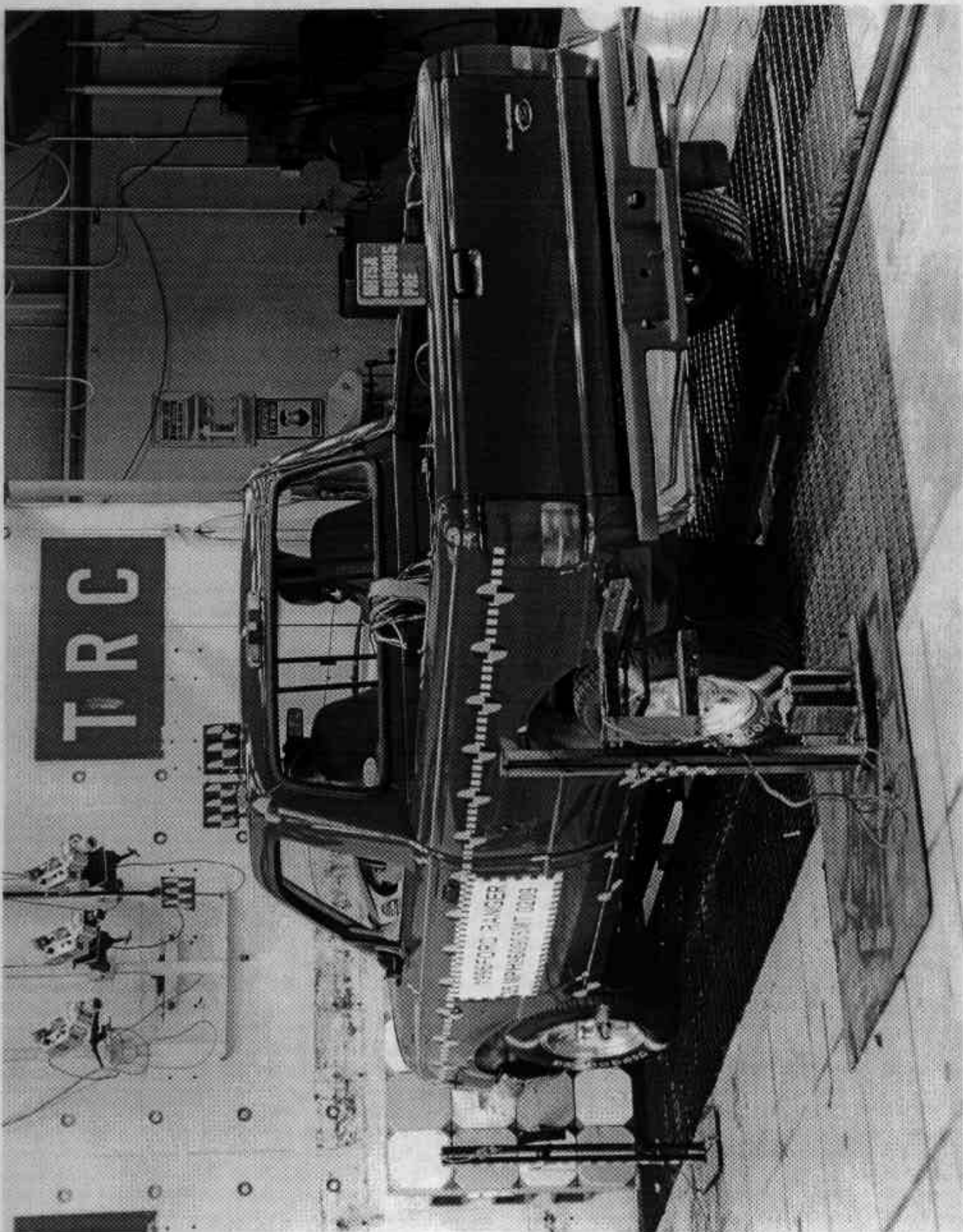


Figure A-11 Pre-Test Left Rear Three-Quarter View

A-12

960905

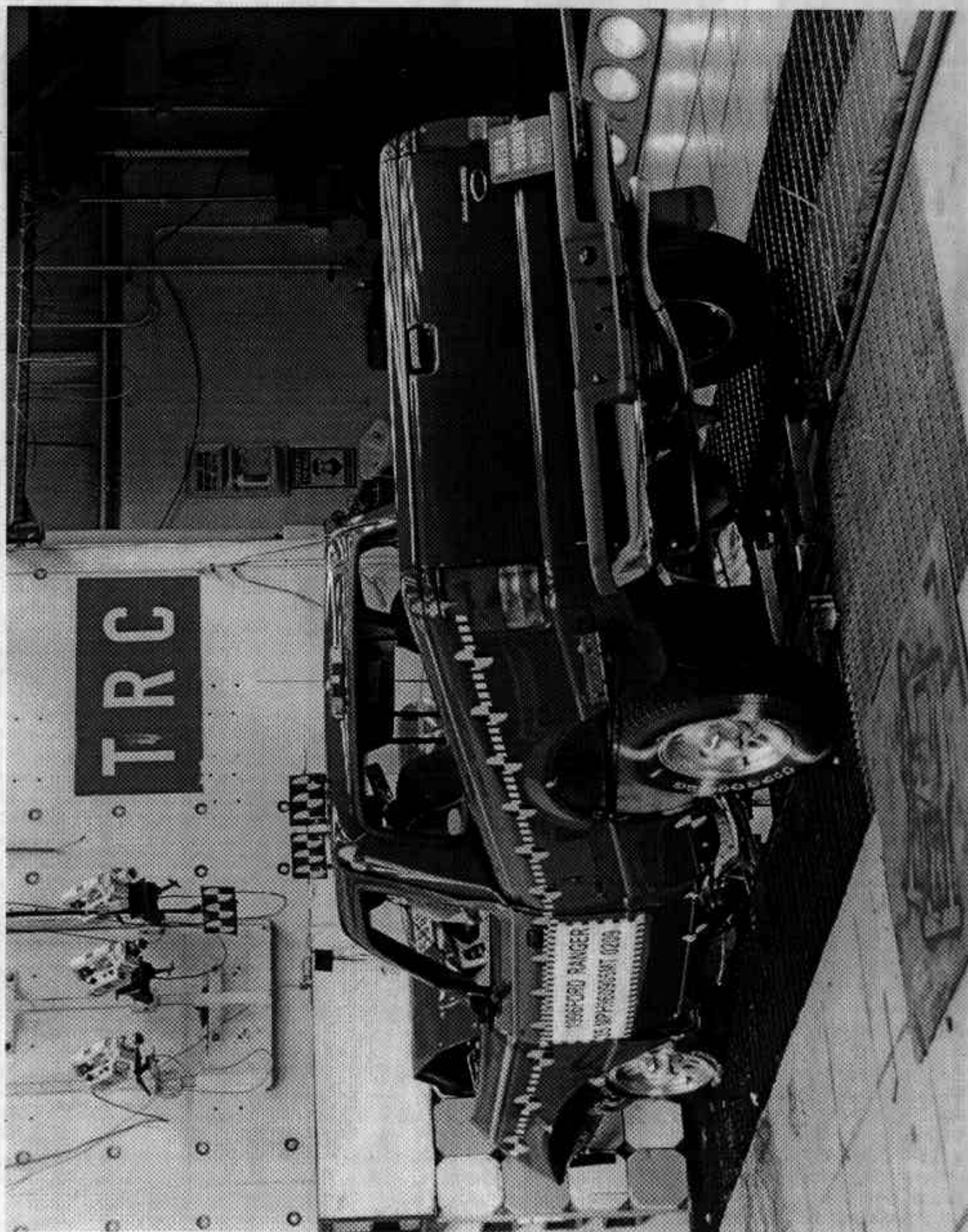


Figure A-12 Post-Test Left Rear Three-Quarter View

A-13

960905

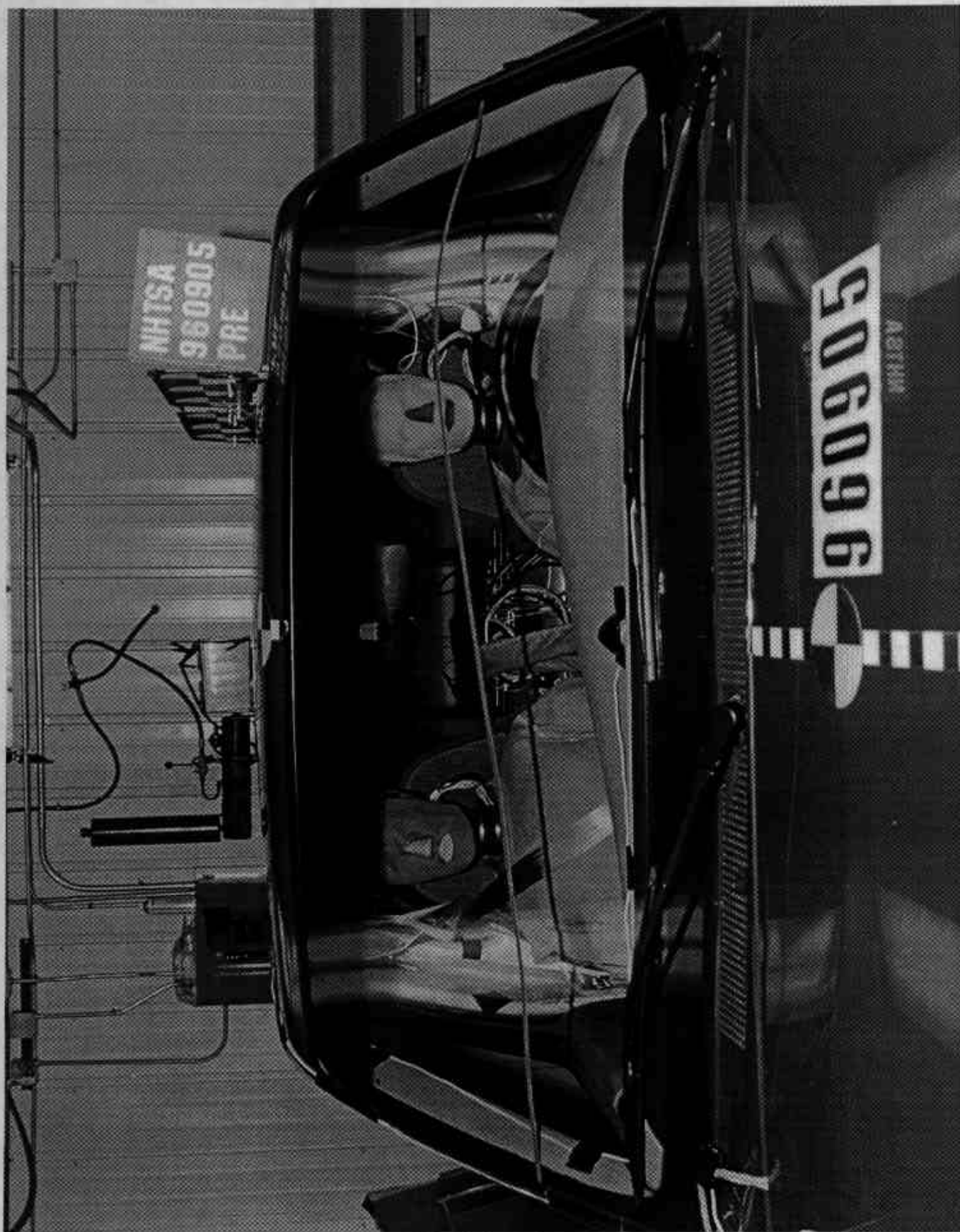


Figure A-13 Pre-Test Windshield View

A-14

960905

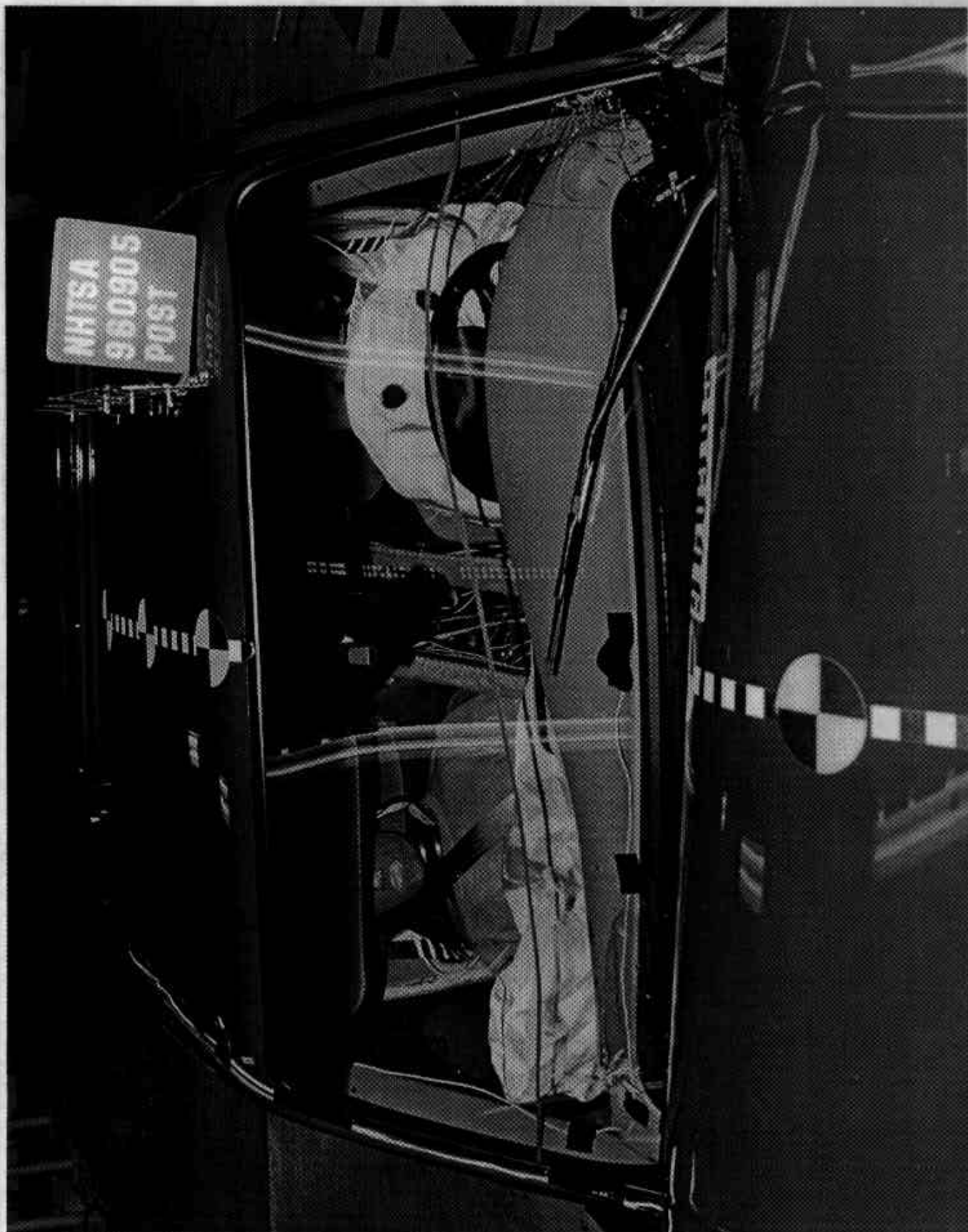


Figure A-14 Post-Test Windshield View
A-15

960905

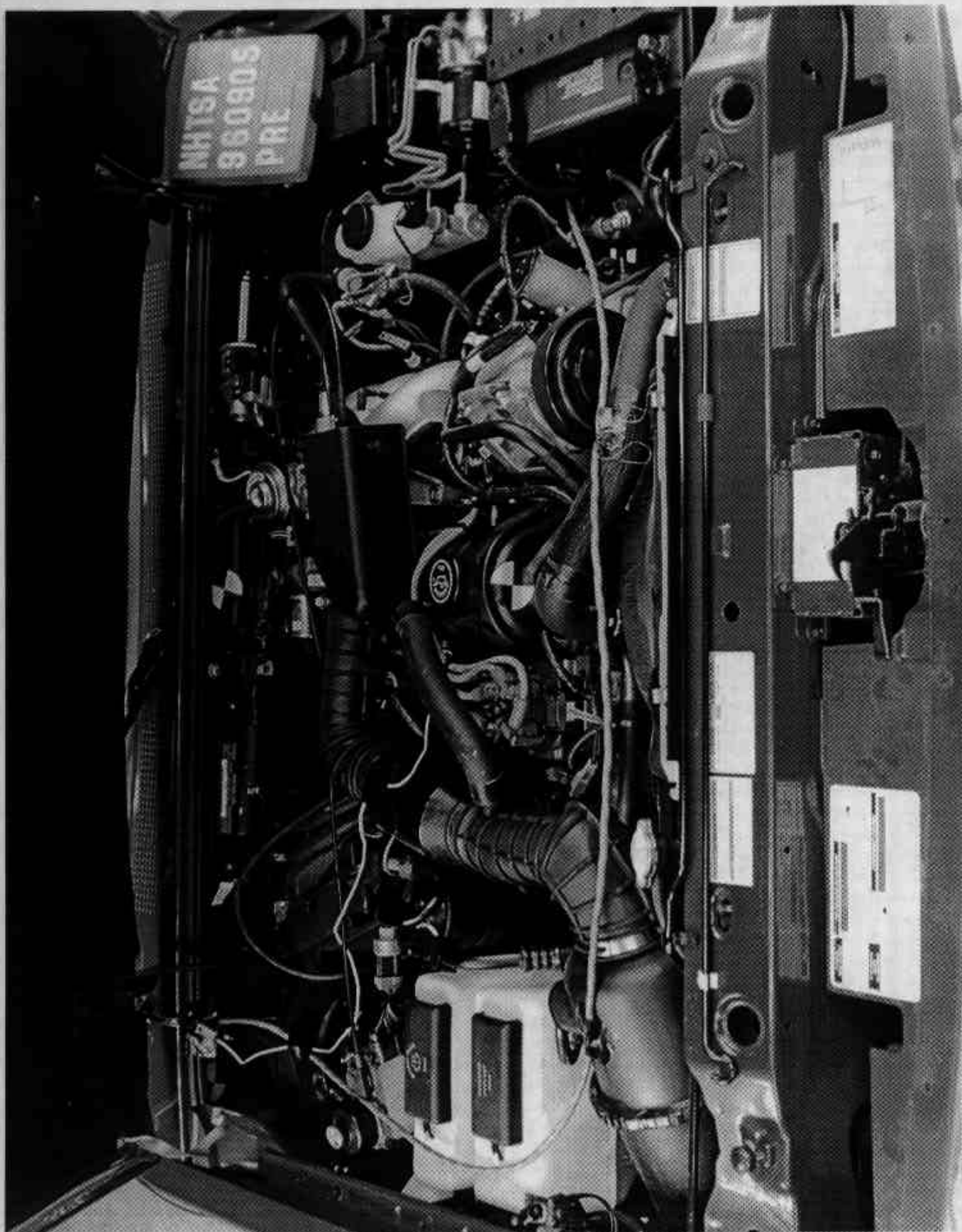


Figure A-15 Pre-Test Engine Compartment View

A-16

960905

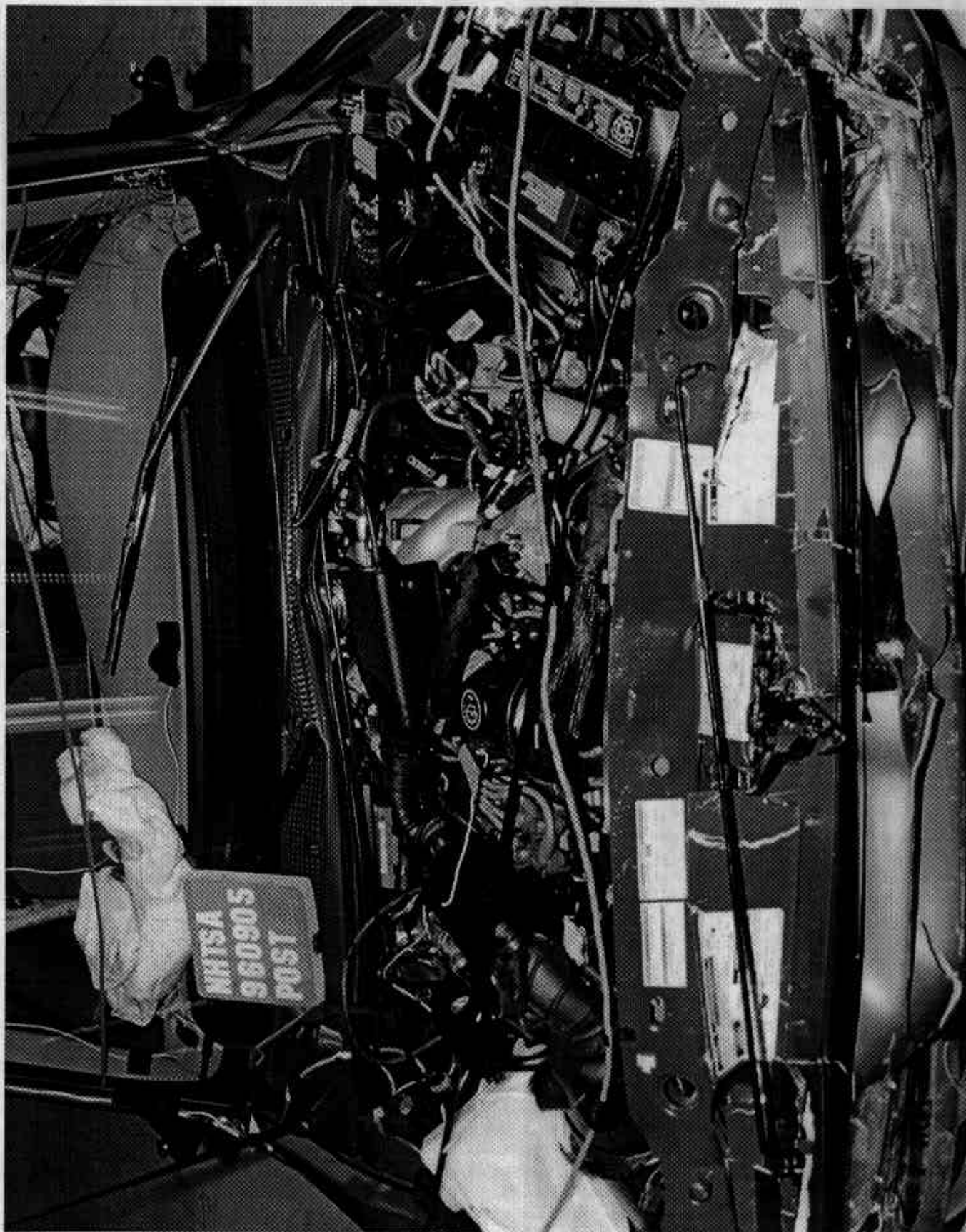


Figure A-16 Post-Test Engine Compartment View

A-17

960905



Figure A-17 Pre-Test Fuel Filler Cap View



Figure A-18 Post-Test Fuel Filler Cap View

A-19

960905



Figure A-19 Pre-Test Fuel Filler Neck View

A-20

960905



Figure A-20 Post-Test Fuel Filler Neck View

A-21

960905

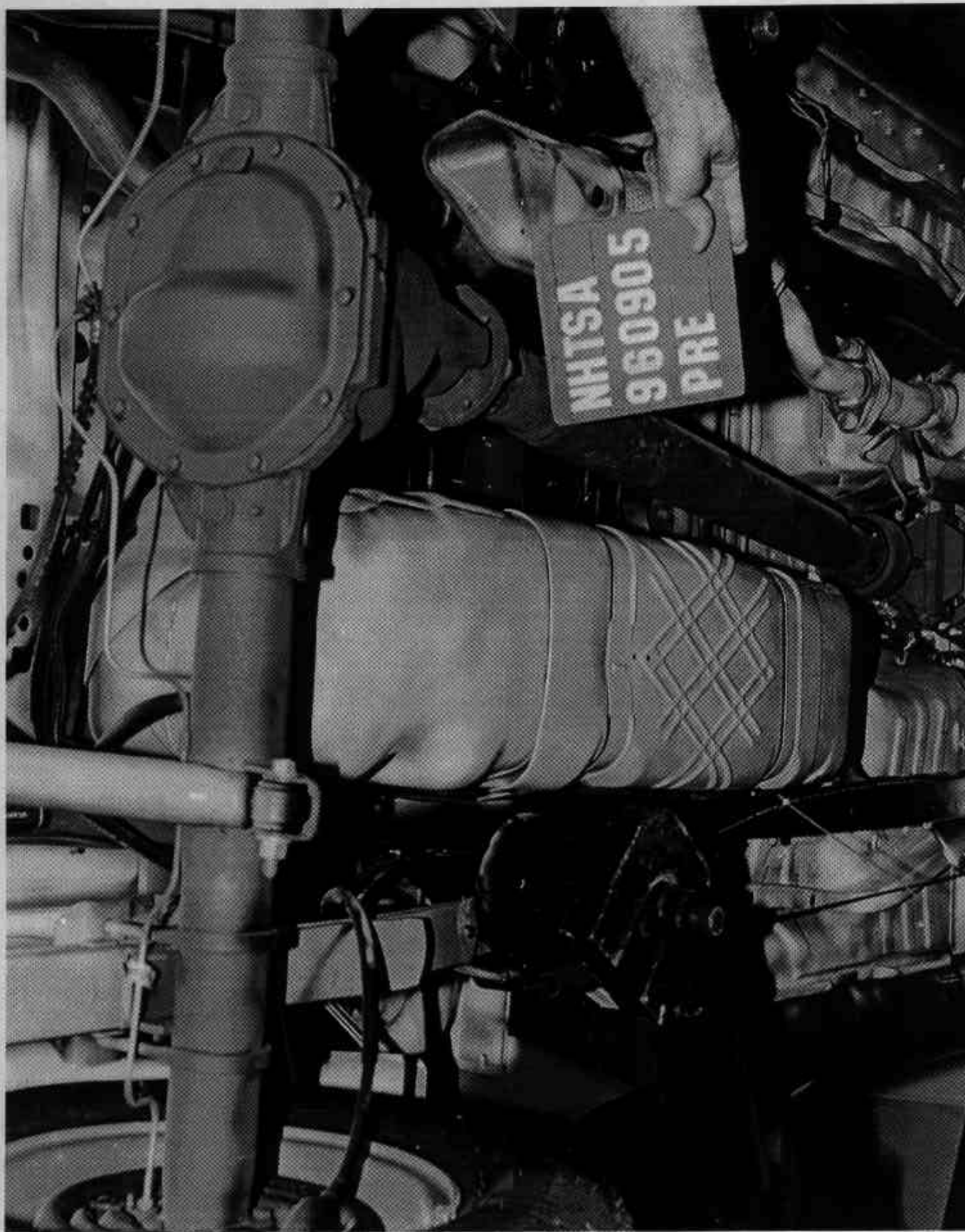


Figure A-21 Pre-Test Fuel Tank View

A-22

960905



Figure A-22 Post-Test Fuel Tank View

A-23

960905

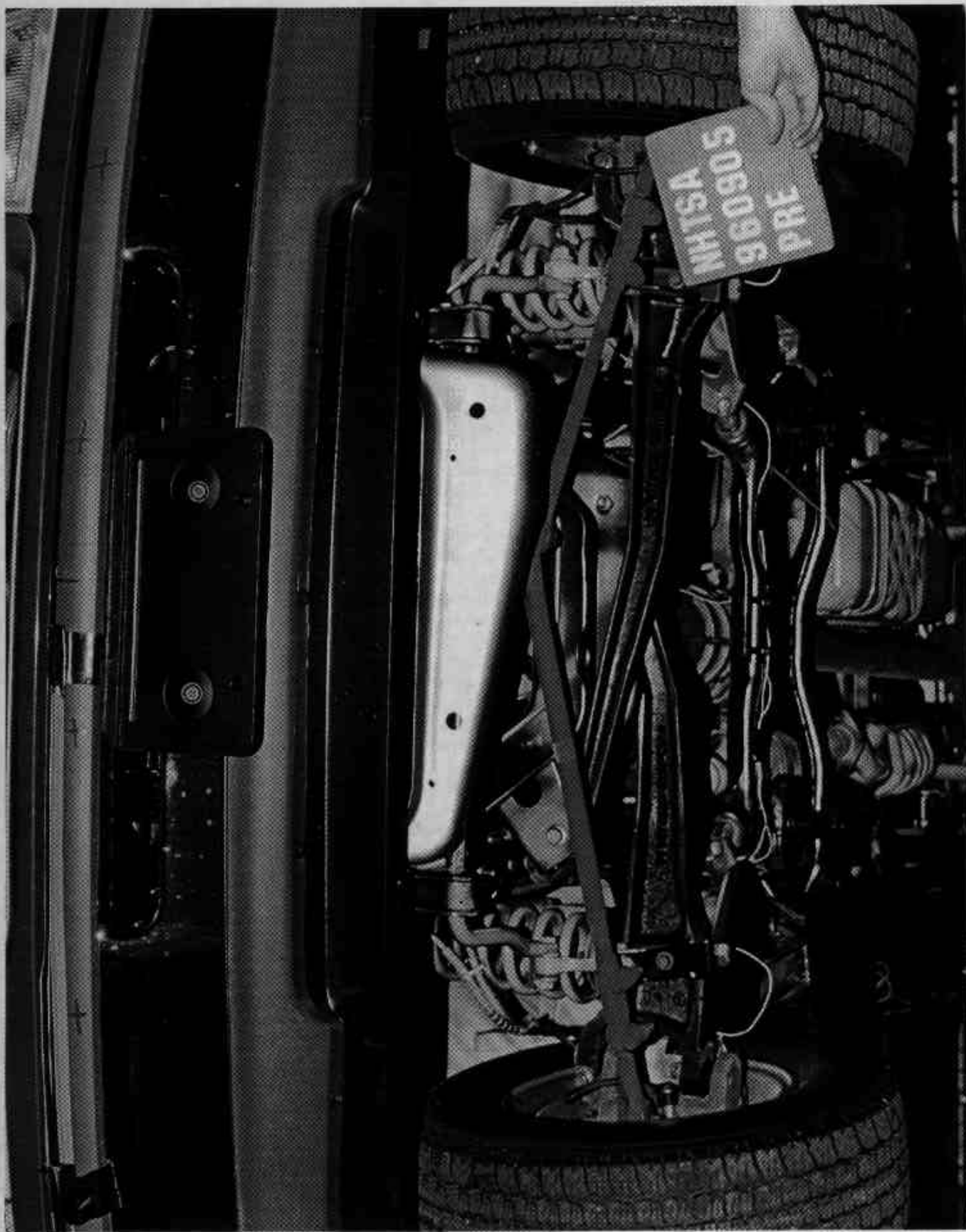


Figure A-23 Pre-Test Front Underbody View

A-24

960905

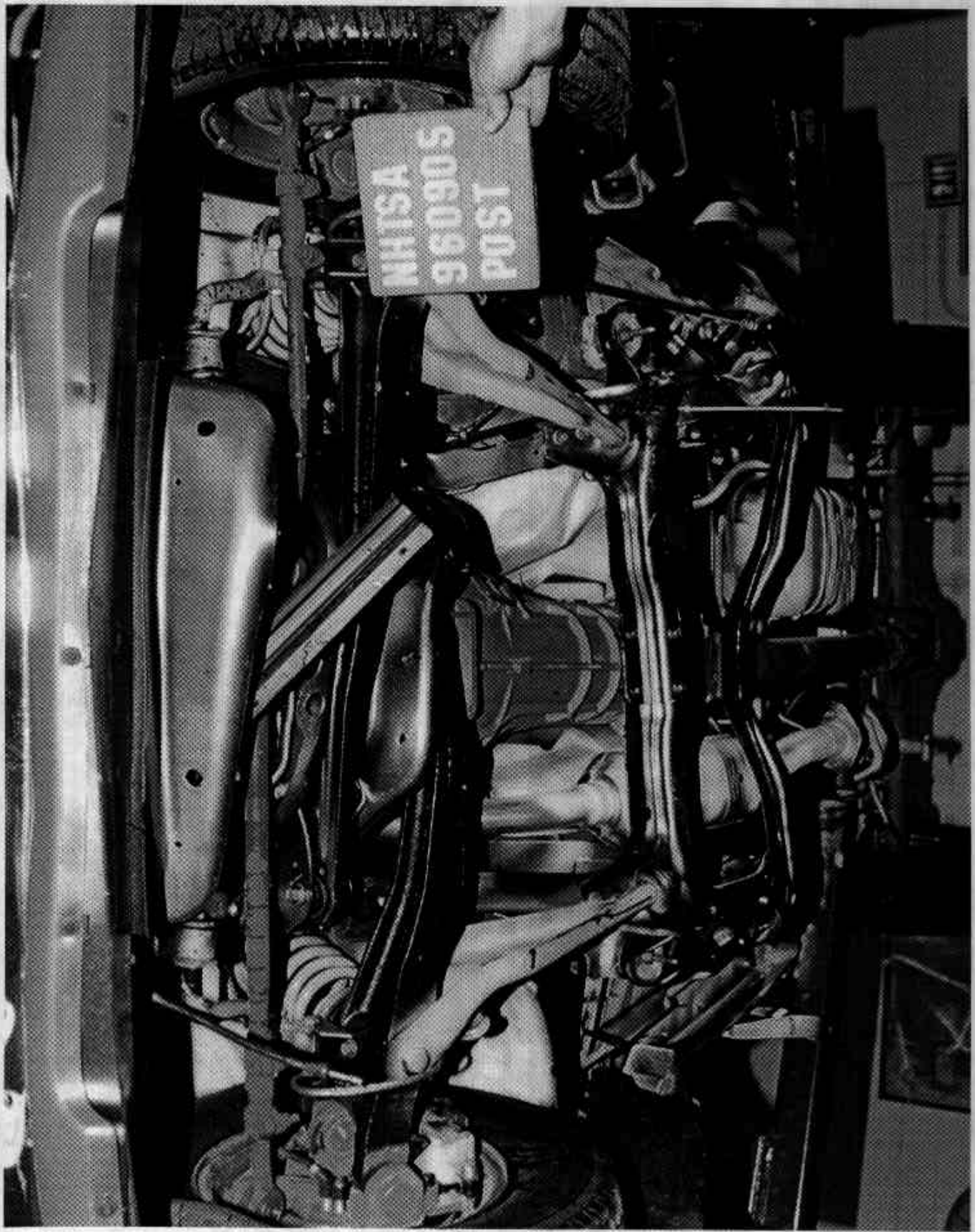


Figure A-24 Post-Test Front Underbody View

A-25

960905

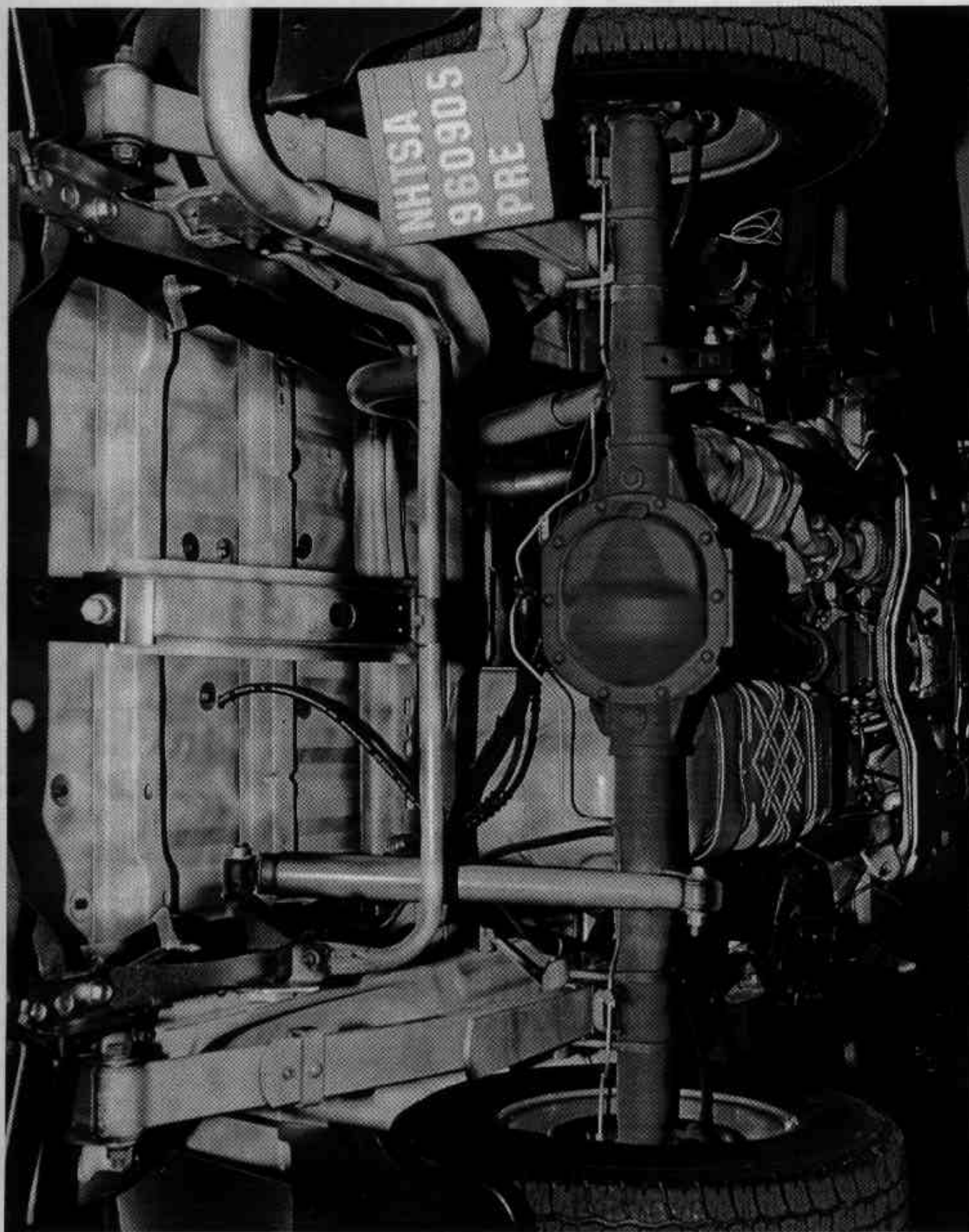


Figure A-25 Pre-Test Rear Underbody View

A-26

960905

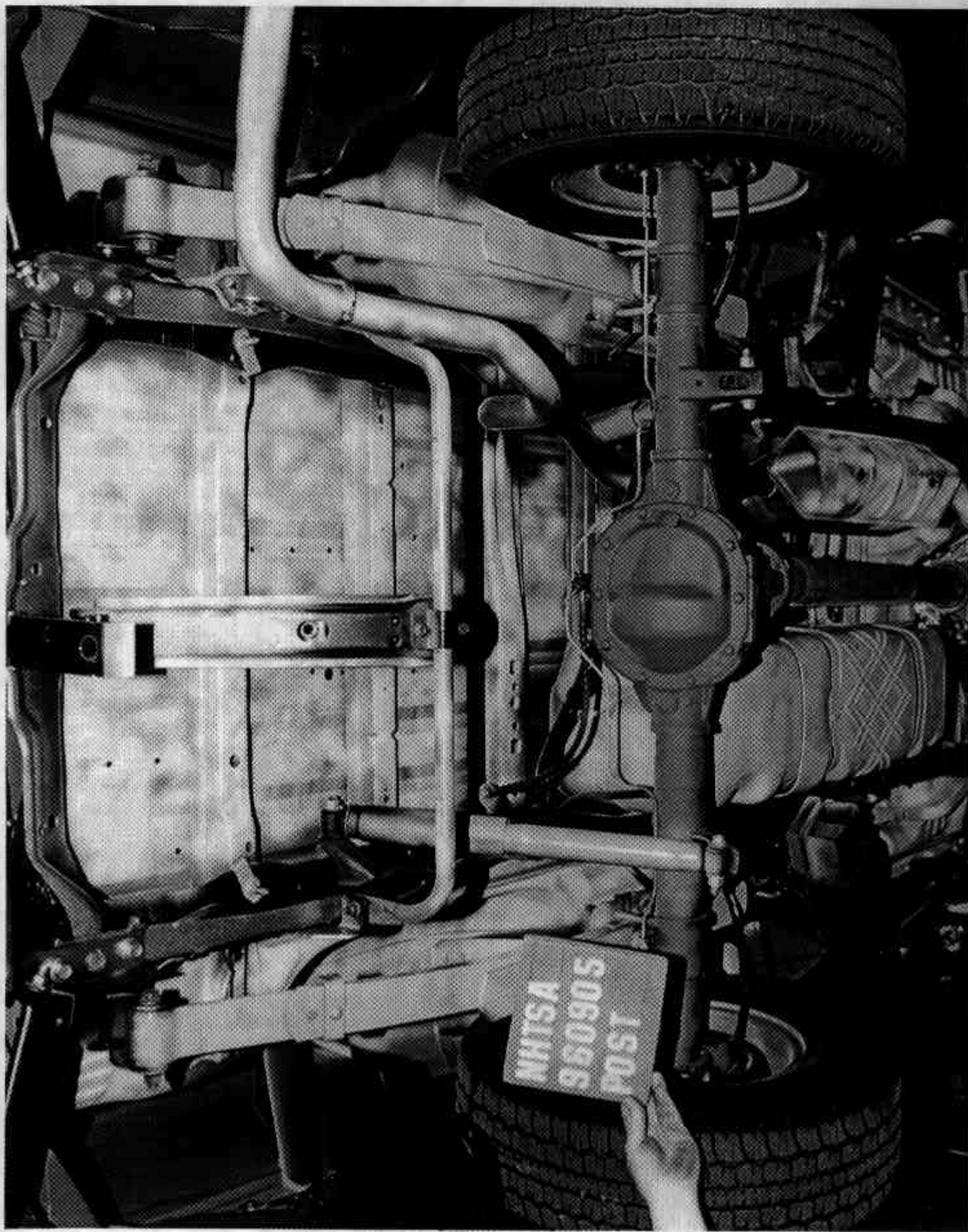


Figure A-26 Post-Test Rear Underbody View

A-27

960905



Figure A-27 Pre-Test Driver Dummy Position View



Figure A-28 Post-Test Driver Dummy Position View



Figure A-29 Pre-Test Passenger Dummy Position View

A-30

960905



Figure A-30 Post-Test Passenger Dummy Position View

A-31

960905



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



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

A-33

960905

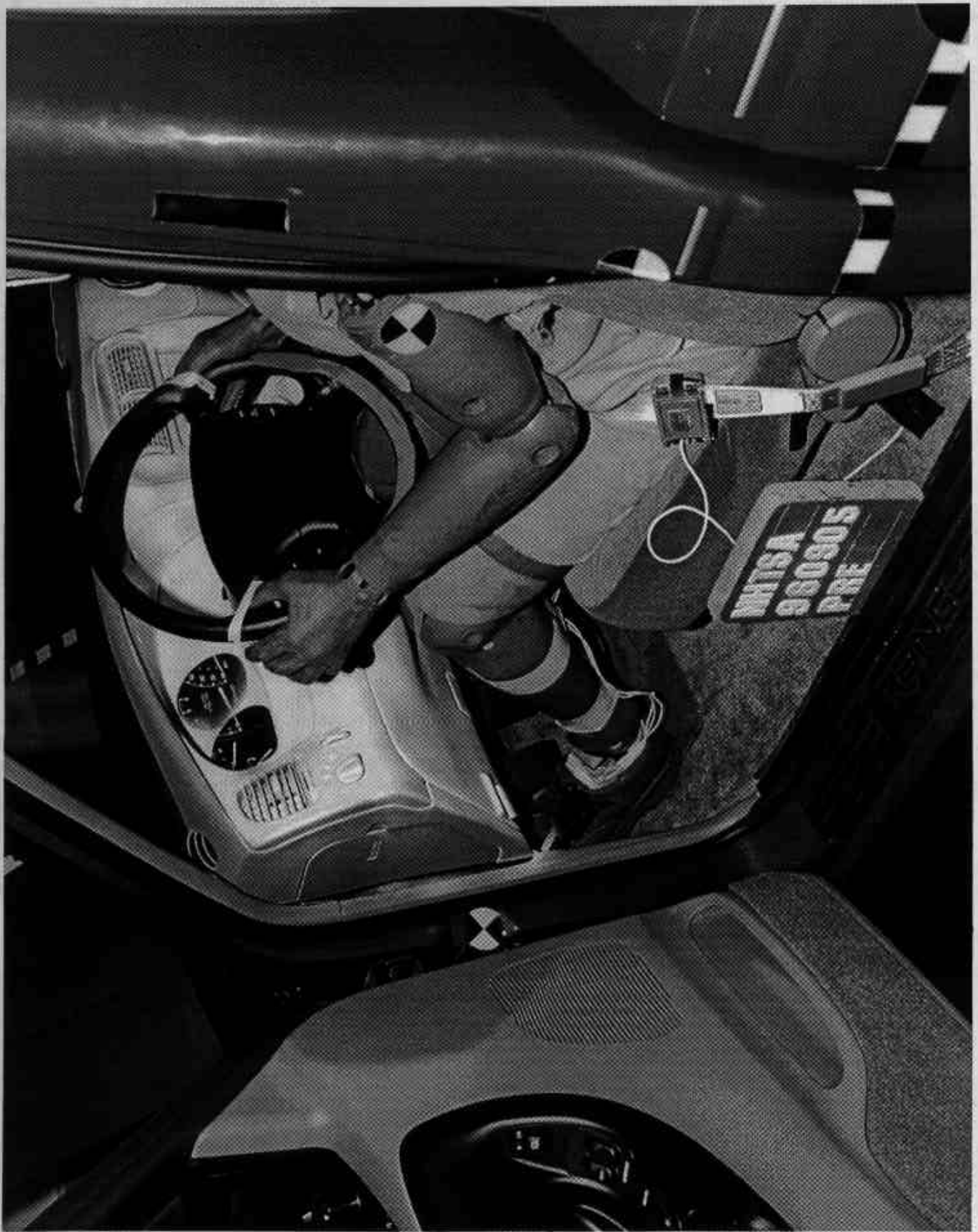


Figure A-33 Pre-Test Driver Dummy and Vehicle Interior - View 2



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

A-35

960905



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

A-36

960905



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

A-37

960905



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

A-38

960905



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



Figure A-39 Post-Test Driver Dummy Head Contact - View 1

A-40

960905



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

A-41

960905



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

A-42

960905

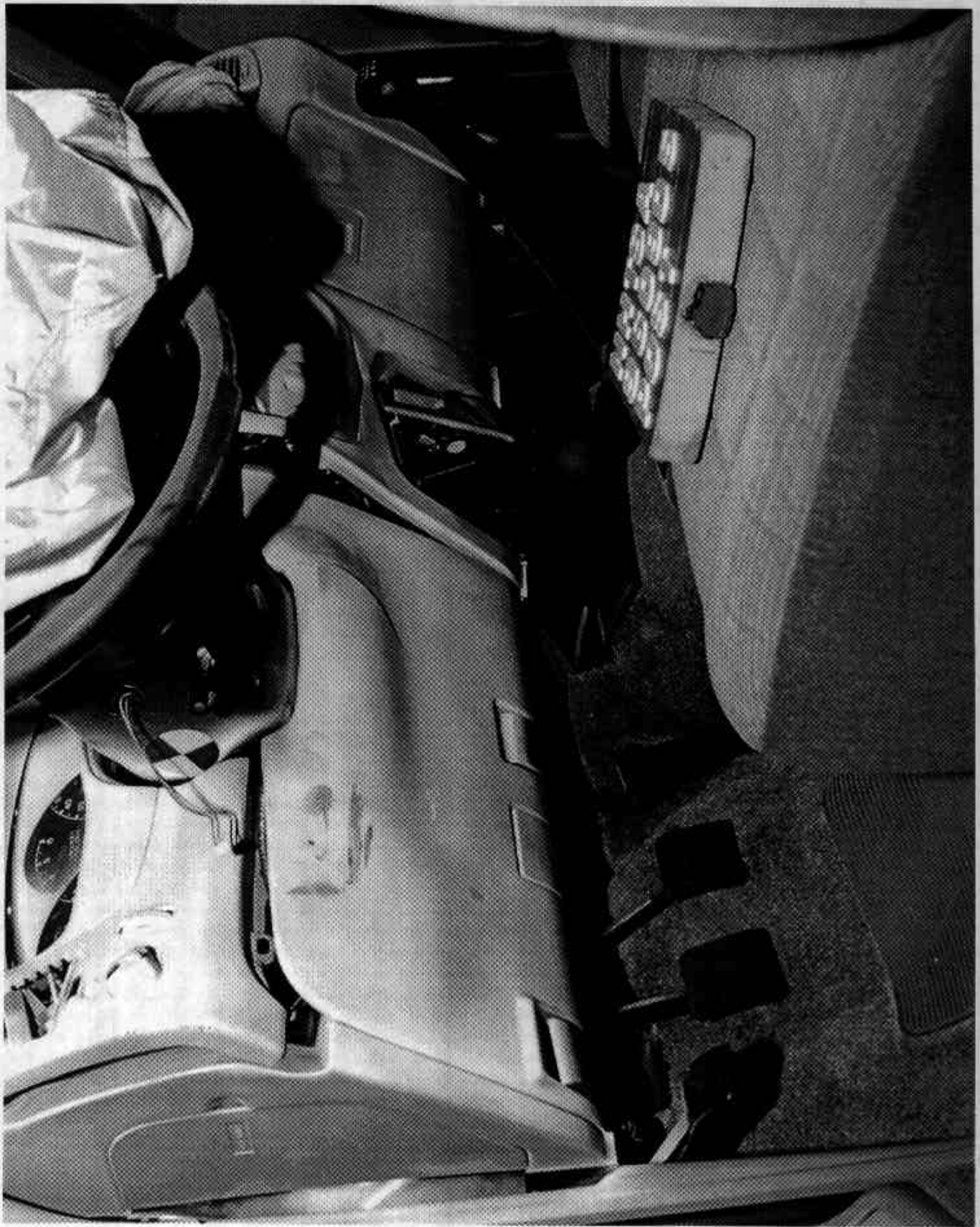


Figure A-42 Post-Test Driver Dummy Knee Contact - View 2

A-43

960905



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

A-44

960905

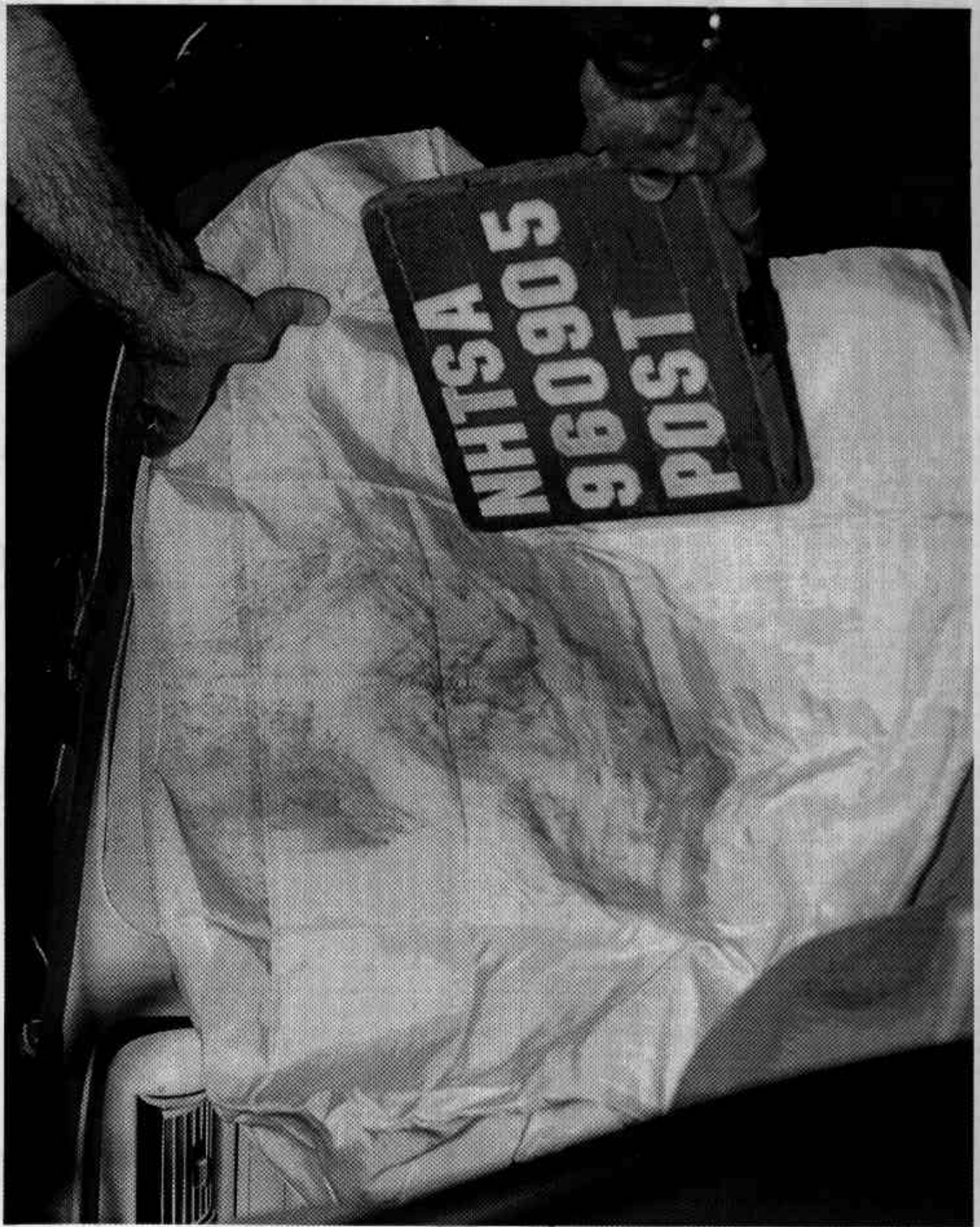


Figure A-44 Post-Test Passenger Dummy Head Contact - View 2

A-45

960905



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

A-46

960905

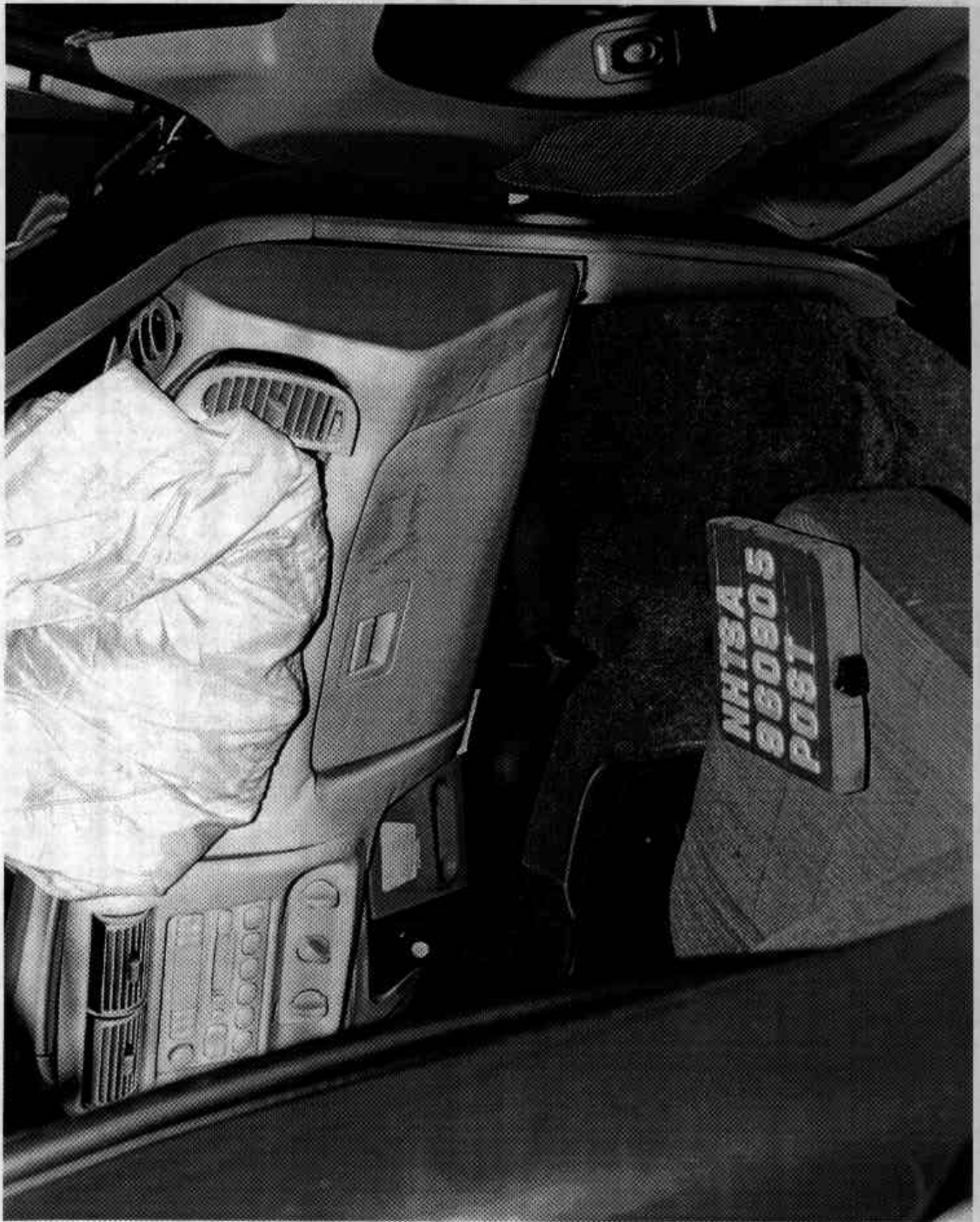


Figure A-46 Post-Test Passenger Dummy Knee Contact - View 2

A-47

960905

MFD. BY FORD MOTOR CO. IN U.S.A.

DATE: 06/96

GVWR: 4220LB/ 1914KG

FRONT GAWR: 2250LB

REAR GAWR: 2384LB

1020KG

WITH

1081KG

WITH

P225/70R14SL

TIRES

P225/70R14SL

TIRES

14X6.0J

RIMS

14X6.0J

RIMS

AT 241 kPa/ 35 PSI COLD

AT 241 kPa/ 35 PSI COLD

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

VIN: 1FTCR10AXTUD87476

TYPE: TRUCK

F0080

T0136



EG

EXTERIOR PAINT

NO. 1B0K1INT TR1TP/PS1RTAXLE1TRISPR

100 0

E2

E

86

H BE B

UTC

VF600-152672-00

47

RC 1 DSO

Figure A-47 Pre-Test Vehicle Certification Label View

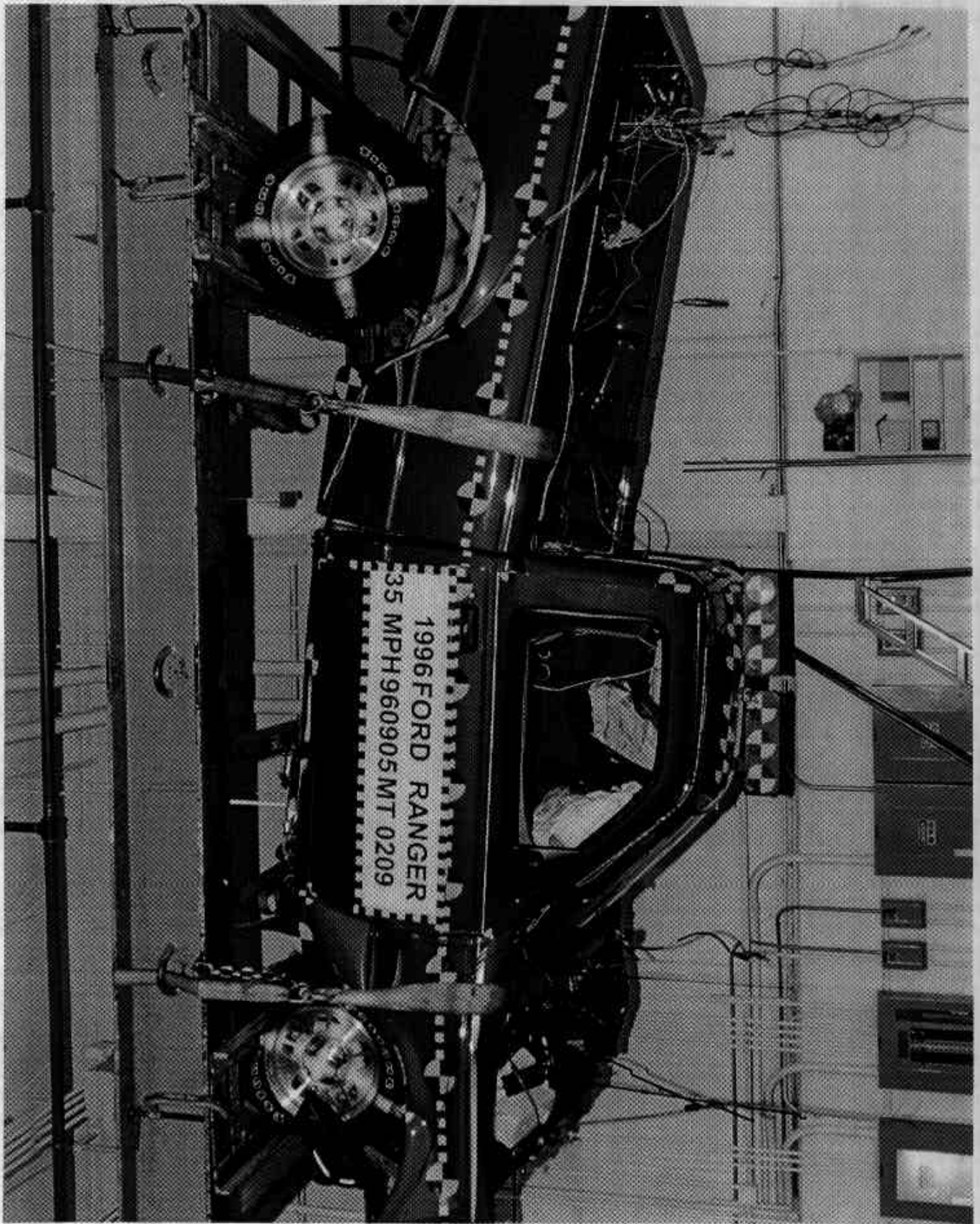


Figure A-48 Post-Test Vehicle on Static Rollover Machine View

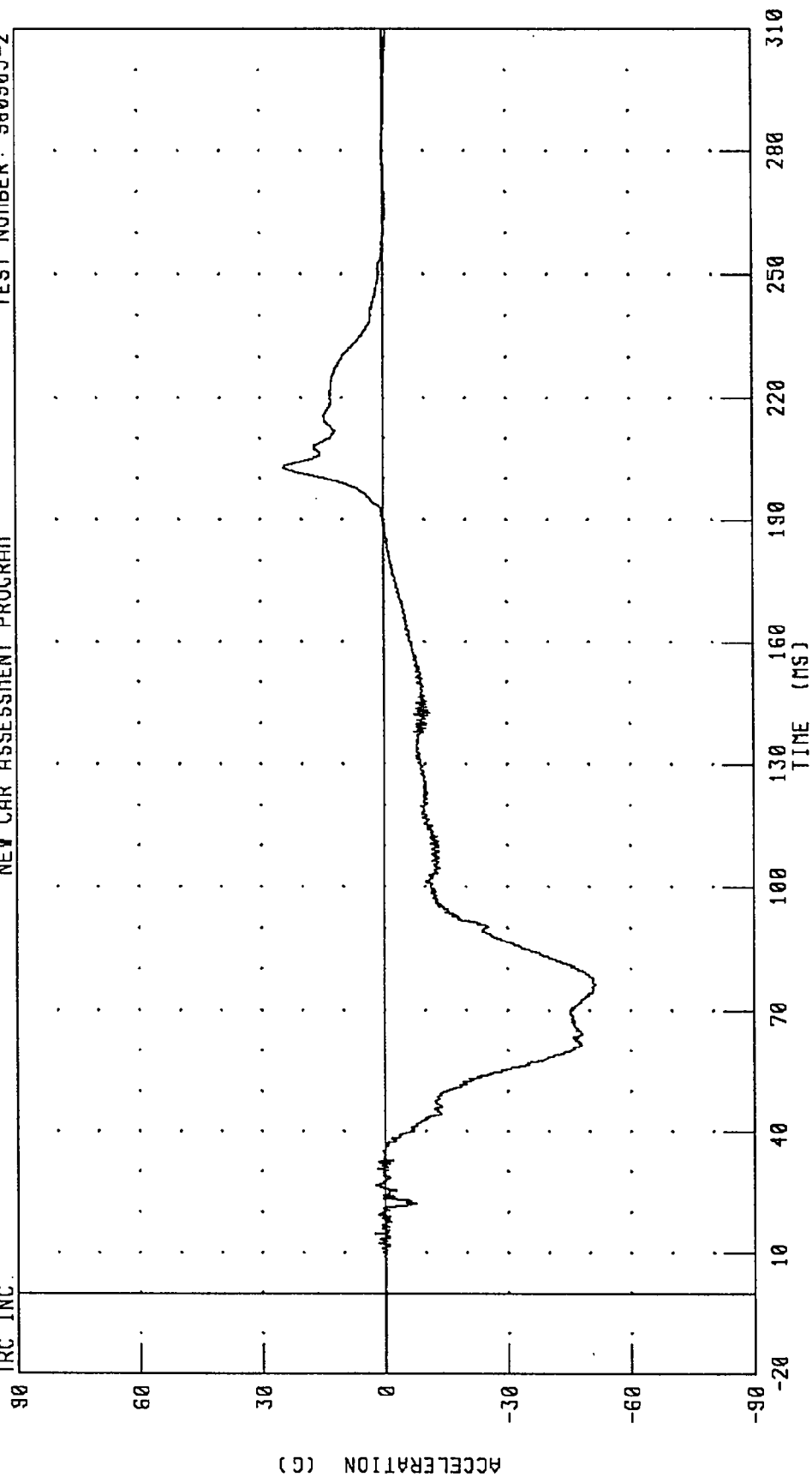
Appendix B

Data Plots

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

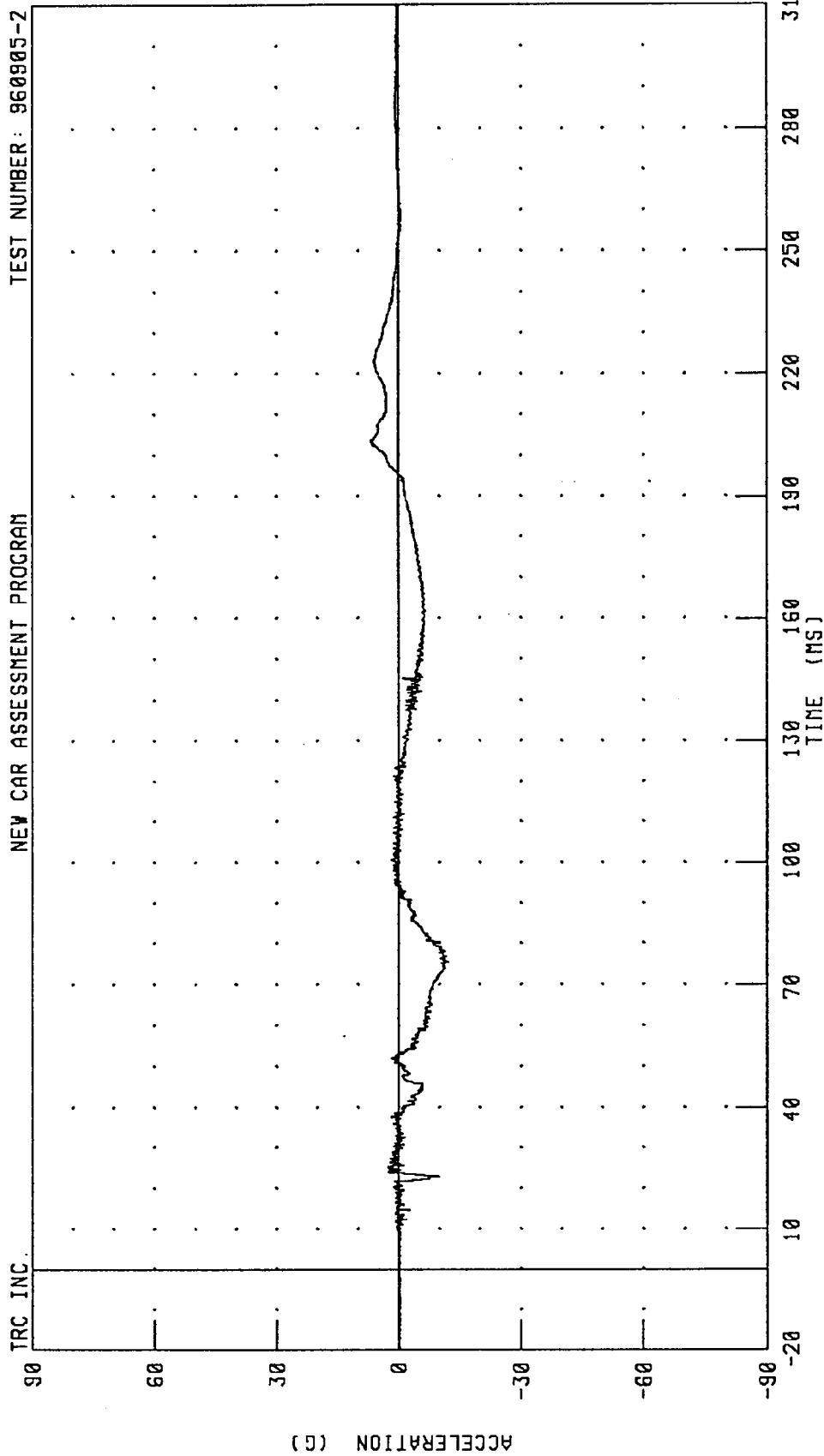


CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 24.33 G @ 202.64 MS; -51.43 G @ 76.32 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

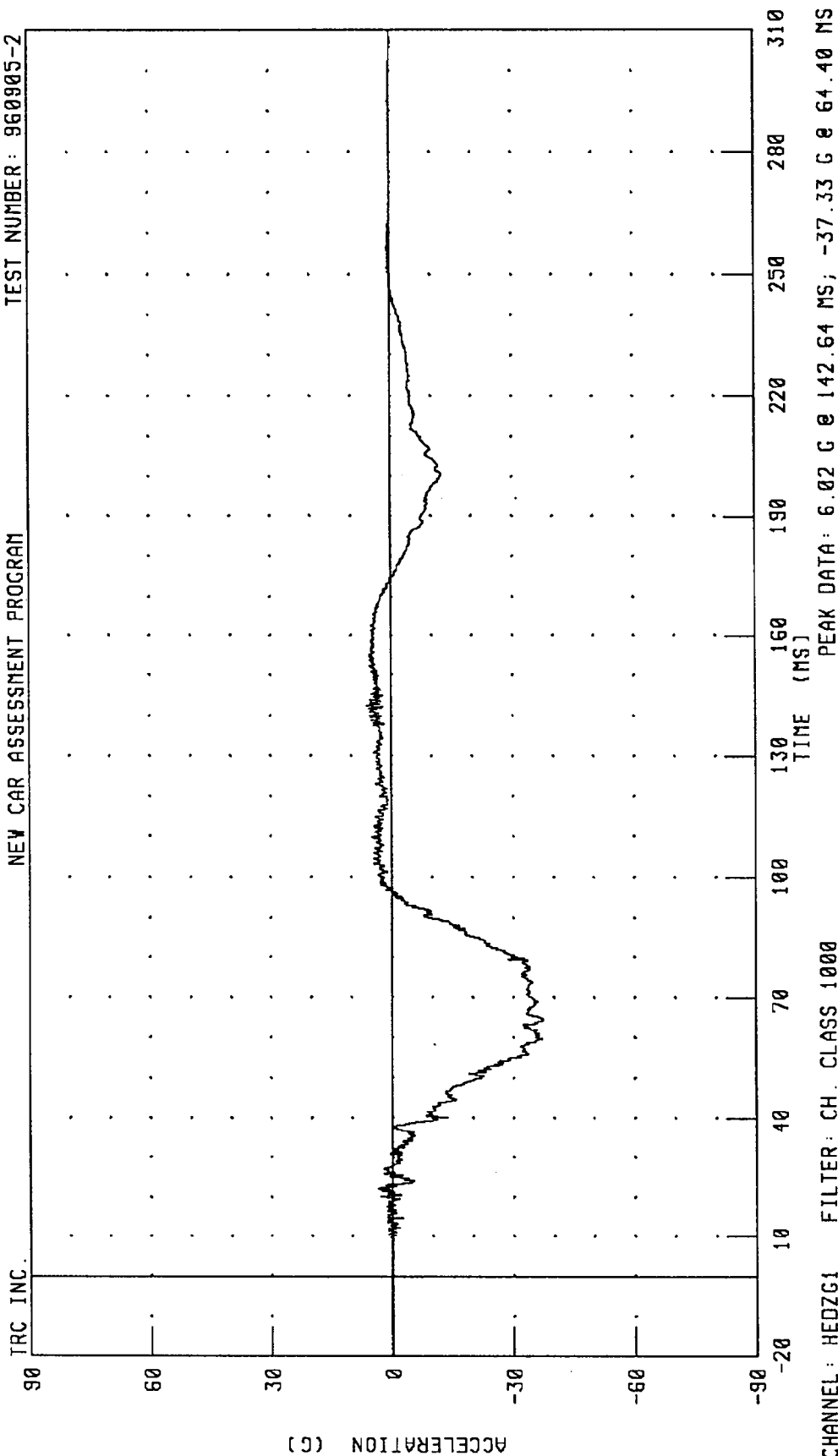


PEAK DATA: 6.51 G @ 203.12 MS; -12.21 G @ 75.60 MS

CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 6.02 G @ 142.64 MS; -37.33 G @ 64.40 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

120

100

80

60

40

20

0

ACCELERATION (G)

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

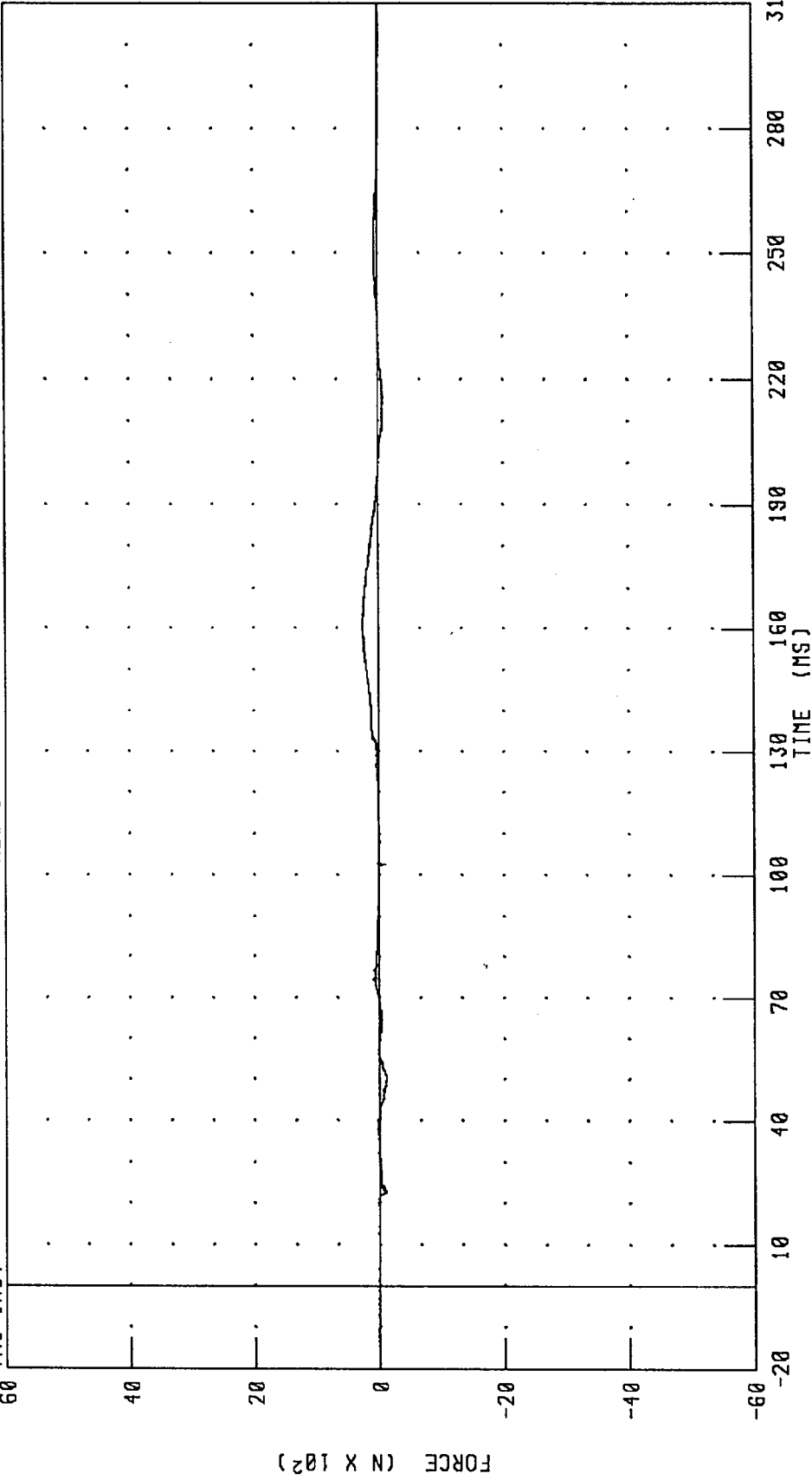
CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 62.16 G @ 76.88 MS; 0.07 G @ -19.28 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK X-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

960905

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Y-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

60

40

20

0

-20

-40

-60

FORCE (N X 10²)

-20

40

70

100

130

160

190

220

250

280

310

TIME (MS)

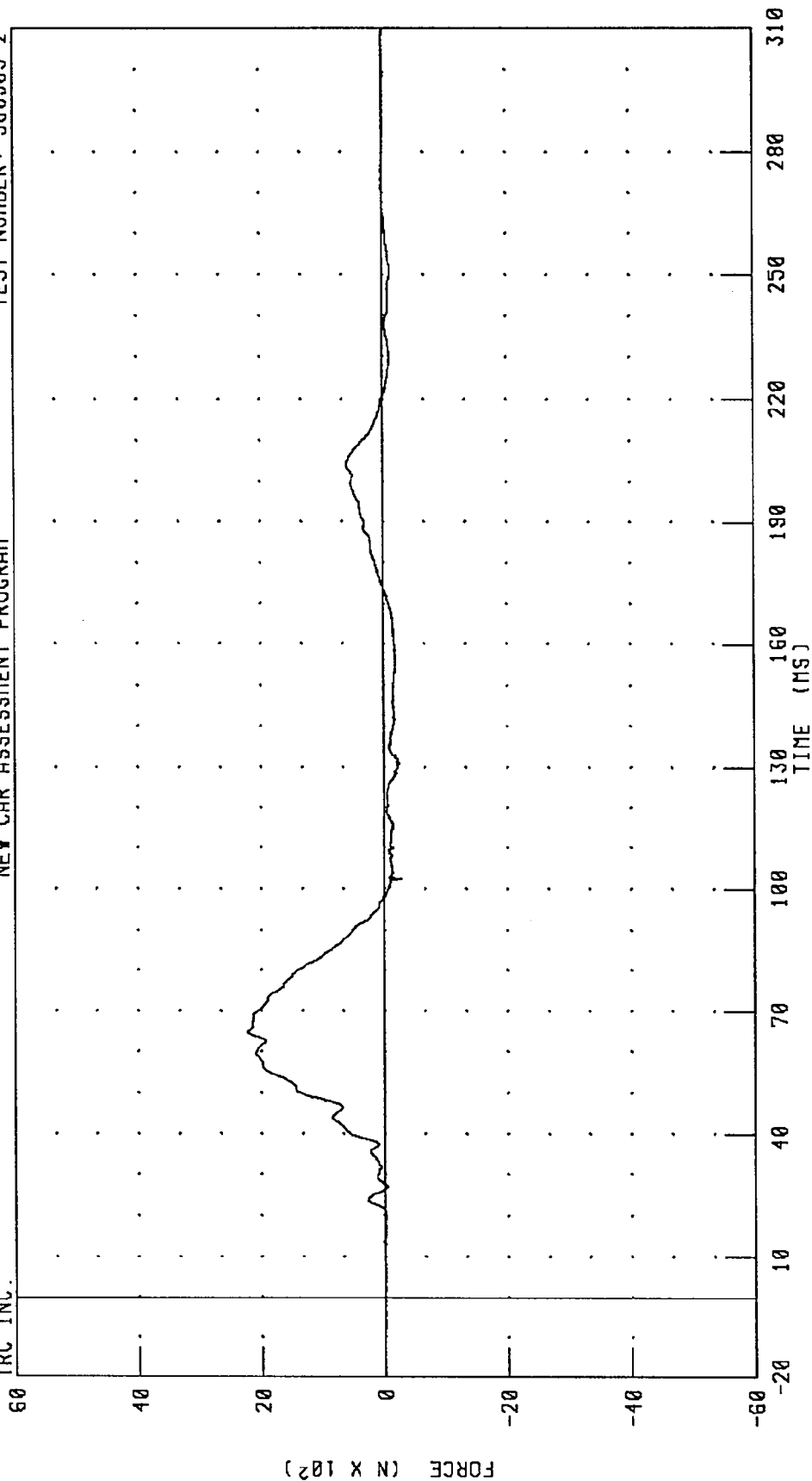
CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 636.03 N @ 83.28 MS; -98.90 N @ 22.00 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Z-AXIS AXIAL FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 2236.83 N @ 64.96 MS; -292.92 N @ 102.48 MS

CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK MOMENT ABOUT X AXIS
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

180

120

60

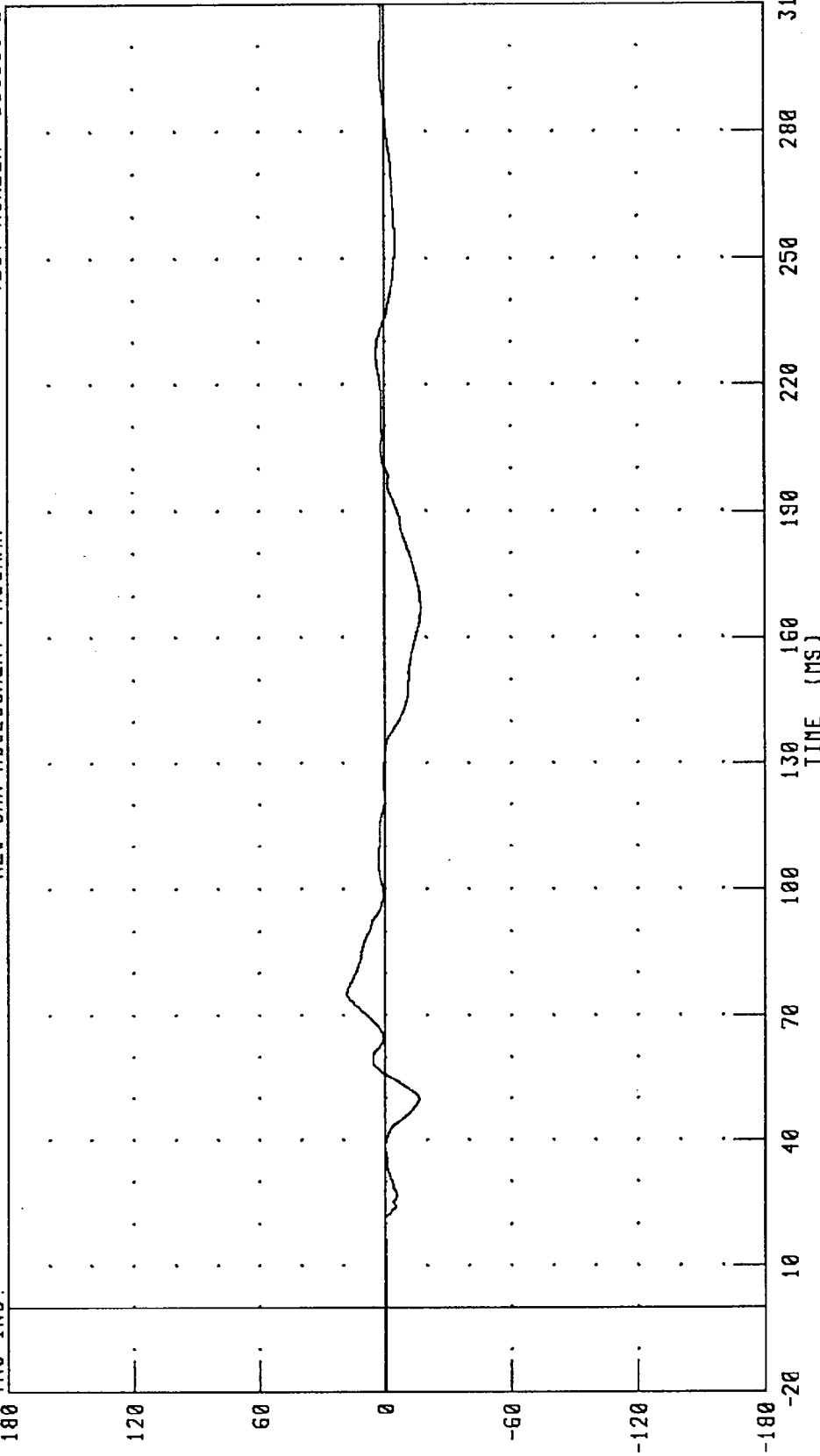
0

-60

-120

-180

TORQUE (N·M)



CHANNEL: NEKXMI FILTER: CH. CLASS 600

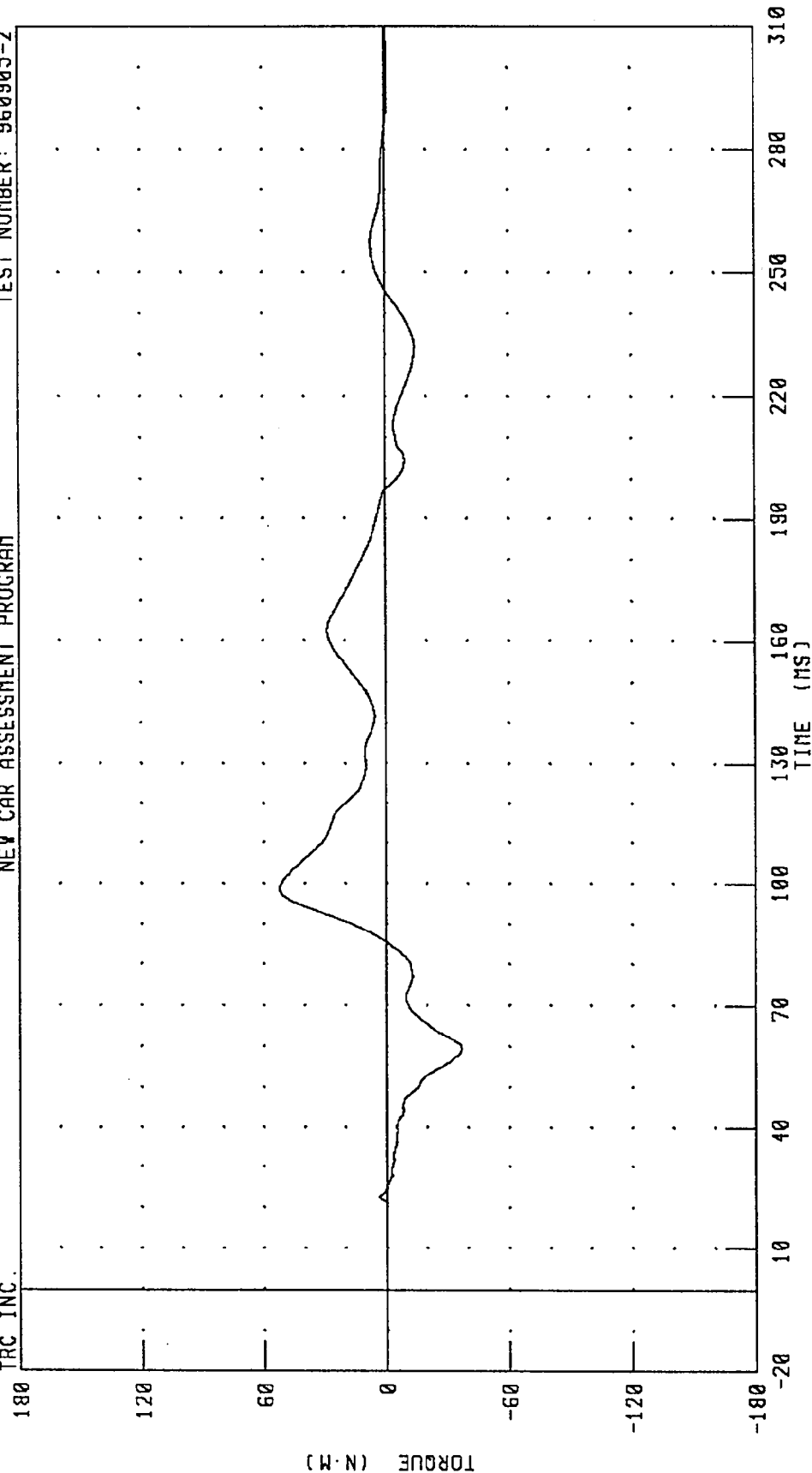
PEAK DATA: 18.28 N·M @ 74.96 MS; -17.07 N·M @ 166.56 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 52.46 N.M @ 98.80 MS; -36.82 N.M @ 59.44 MS

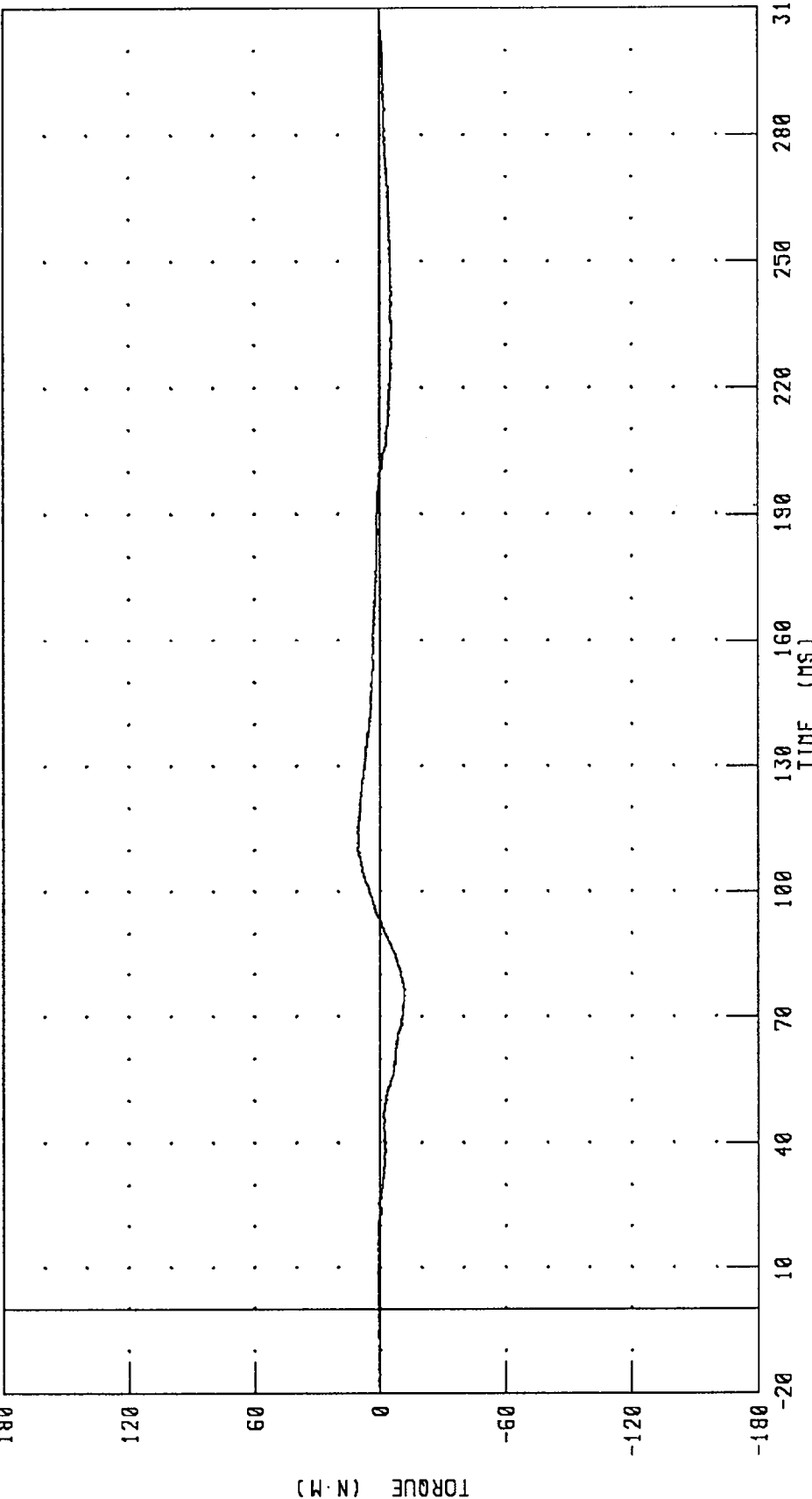
CHANNEL: NEKYM1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



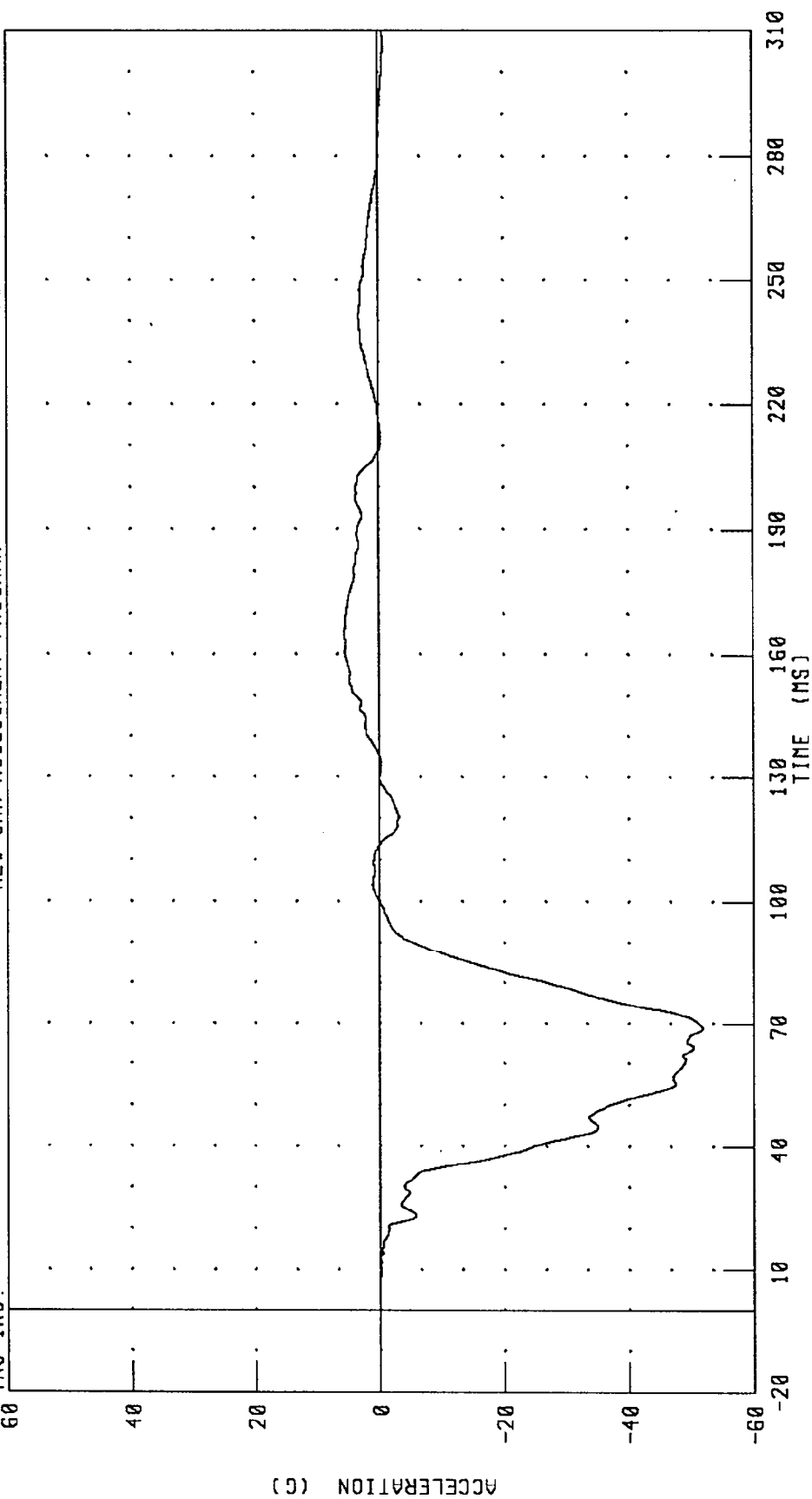
CHANNEL: NEKZM1 FILTER: CH. CLASS 600

PEAK DATA: 10.69 N·M @ 114.48 MS; -11.94 N·M @ 76.40 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



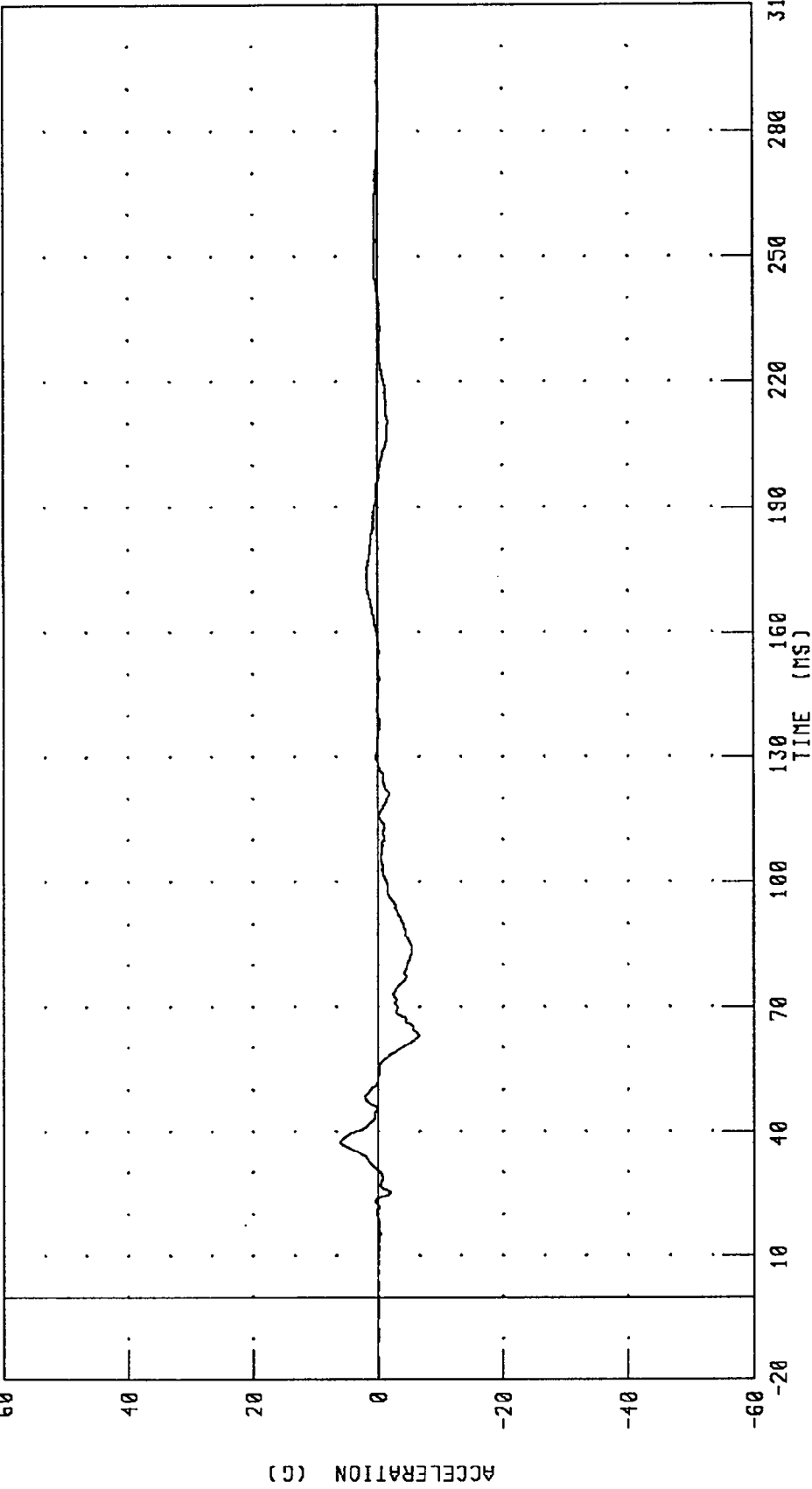
CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 5.56 G @ 164.88 MS; -51.85 G @ 68.96 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Y-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



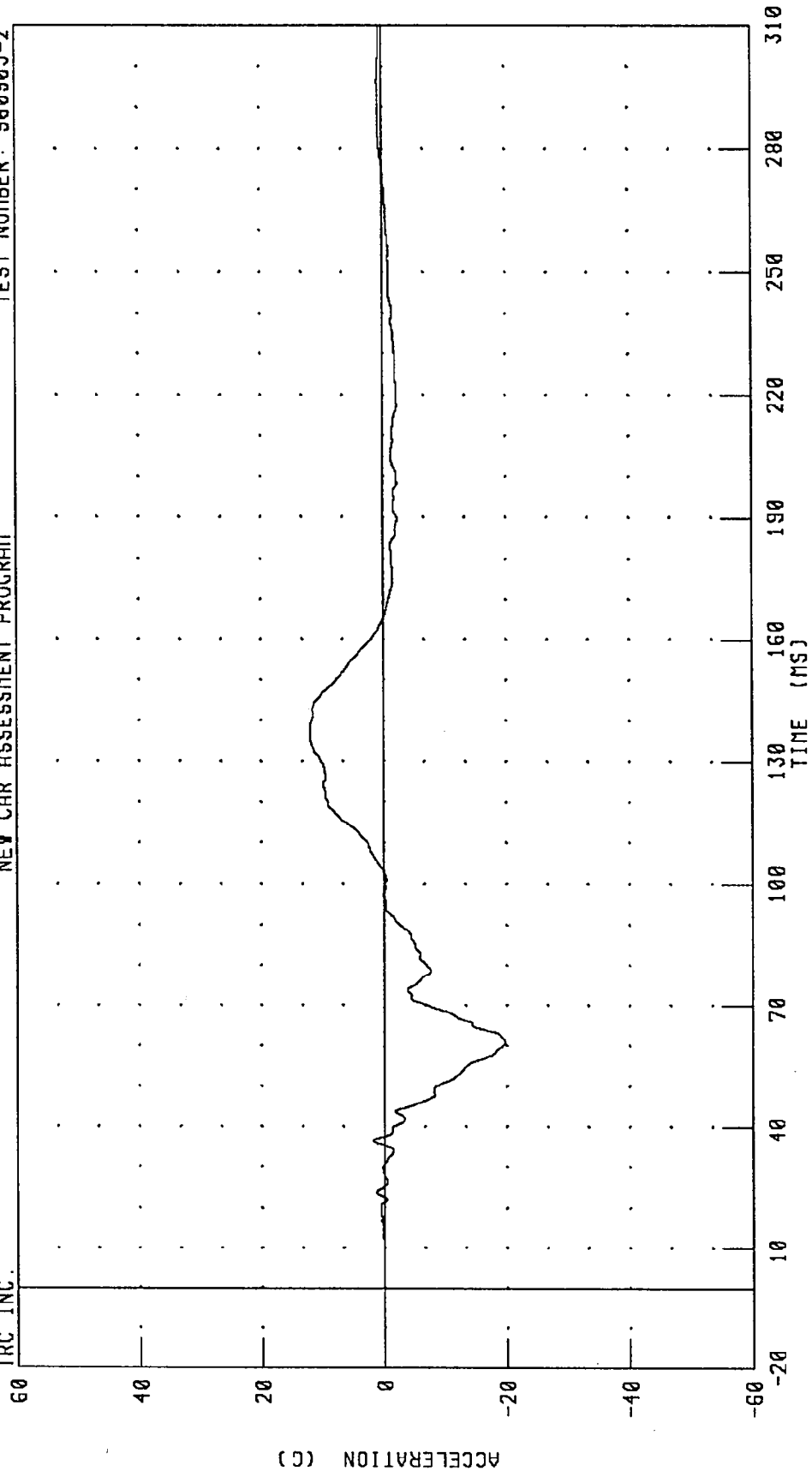
CHANNEL: CSTYG1 FILTER: CH. CLASS 180

PEAK DATA: 6.08 G @ 37.52 MS; -6.57 G @ 63.20 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



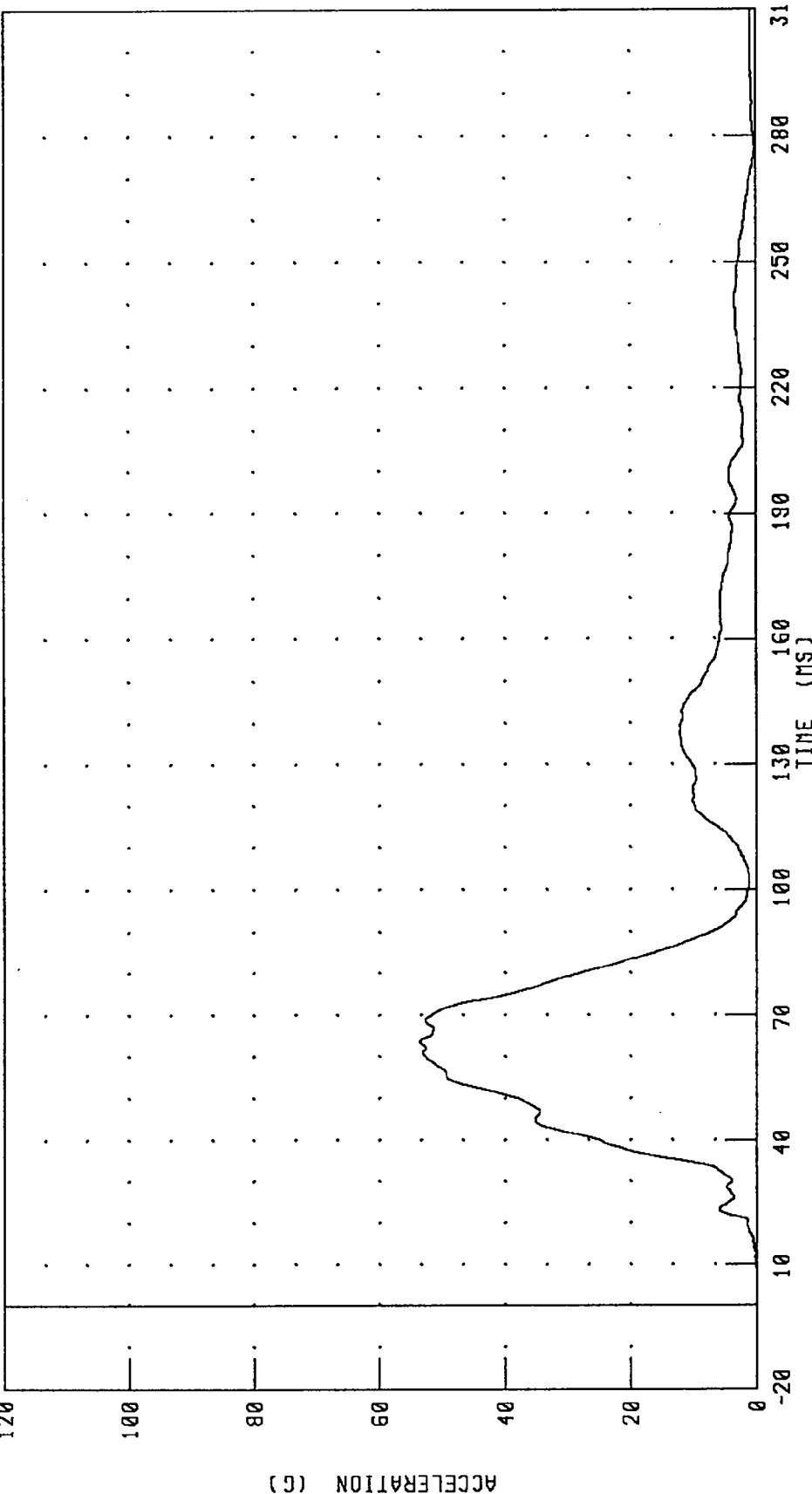
CHANNEL: CSTZG1 FILTER: CH. CLASS 180

PEAK DATA: 12.06 G @ 138.00 MS; -19.81 G @ 60.80 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST RESULTANT ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

PEAK DATA: 53.55 G @ 63.60 MS; 0.01 G @ -20.00 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER CHEST DEFLECTION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

30

10

DISPLACEMENT (MM)

-10

-30

-50

-70

-90

-20

10

40

70

100

130

160

190

220

250

280

310

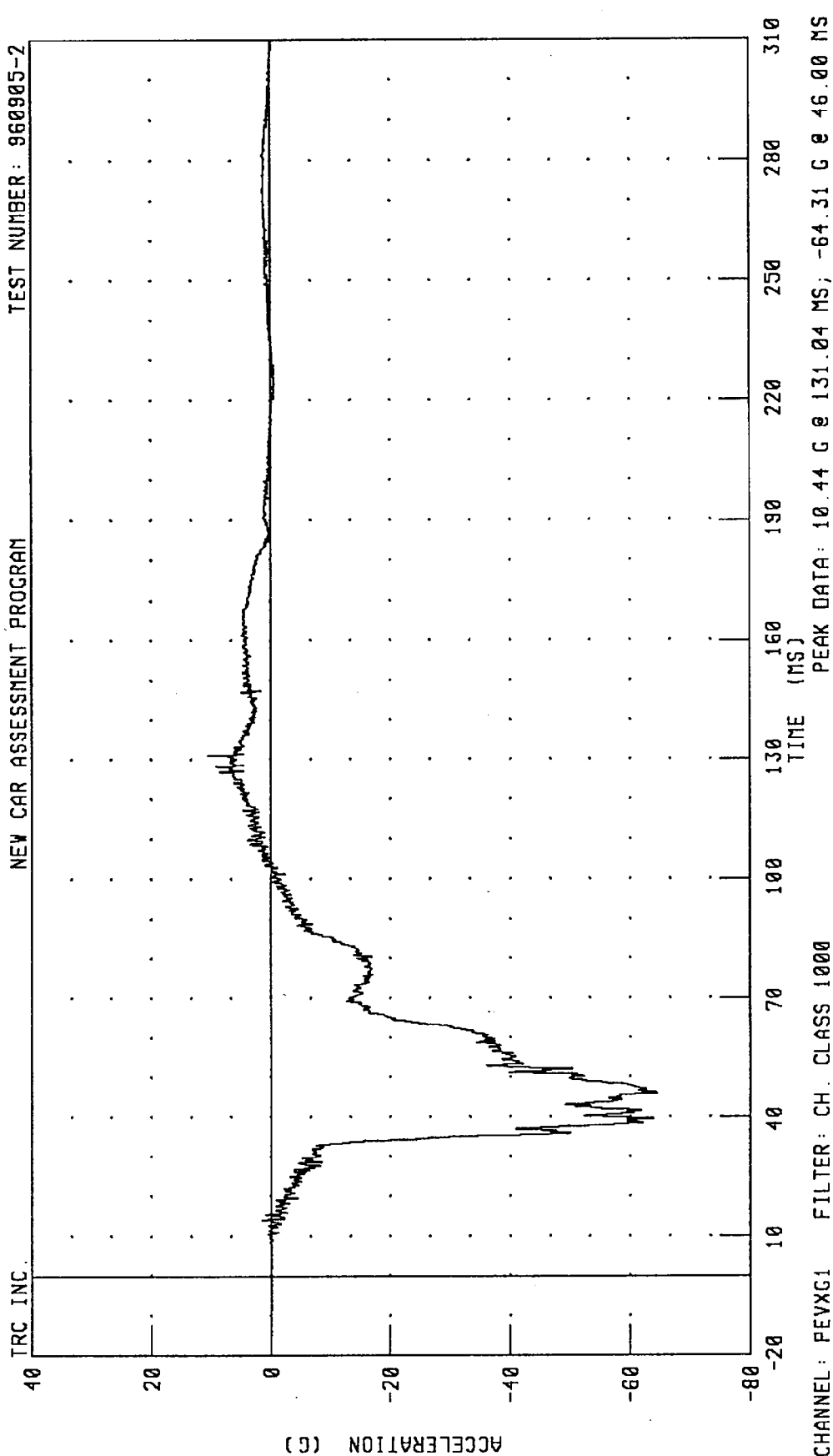
TIME (MS)

CHANNEL: CSTXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.01 MM @ 11.52 MS; -46.49 MM @ 71.28 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



CHANNEL: PEVXC1 FILTER: CH. CLASS 1000

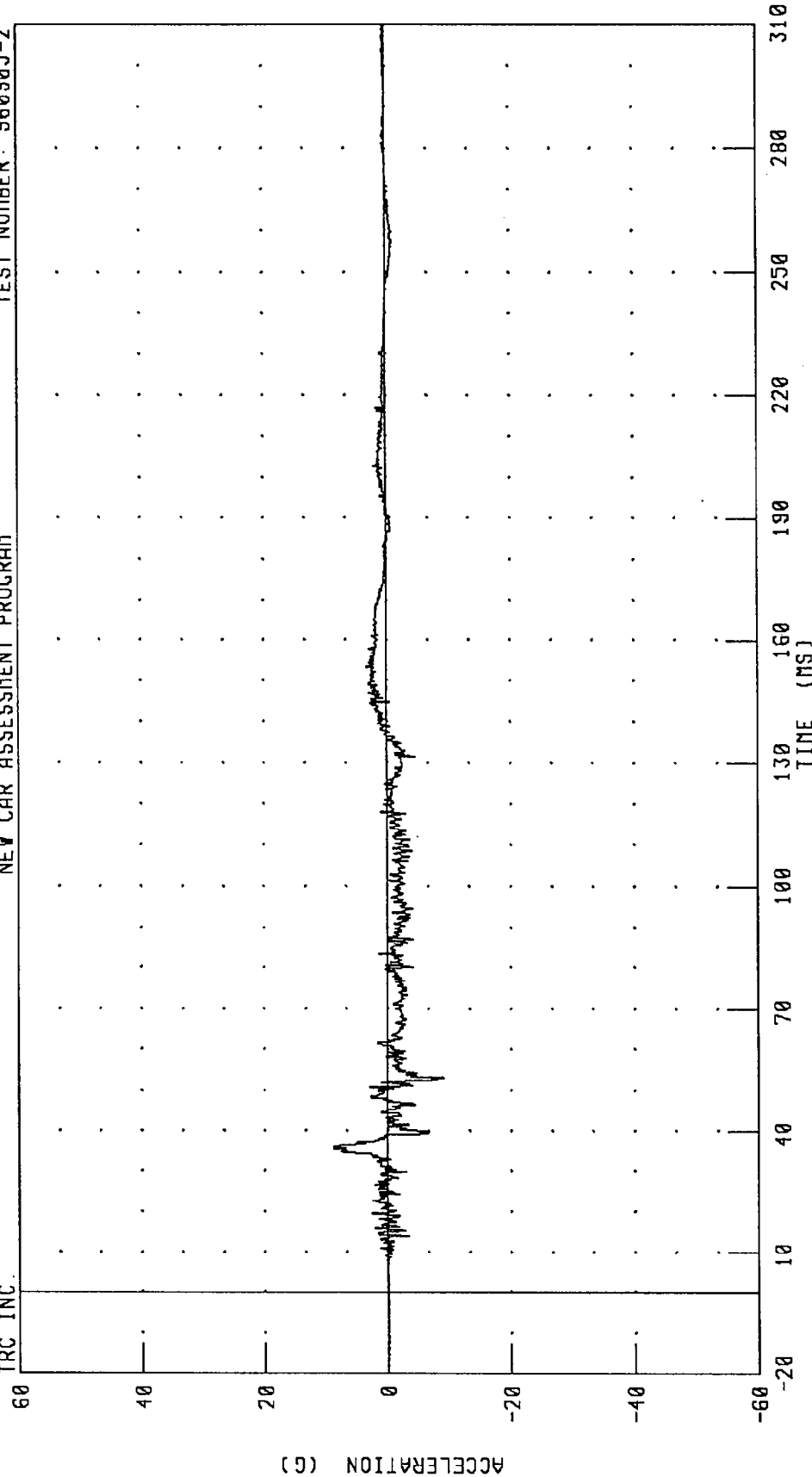
PEAK DATA: 10.44 G @ 131.04 MS; -64.31 G @ 46.00 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

PEAK DATA: 8.82 G @ 35.52 MS; -9.10 G @ 52.96 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS Z-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

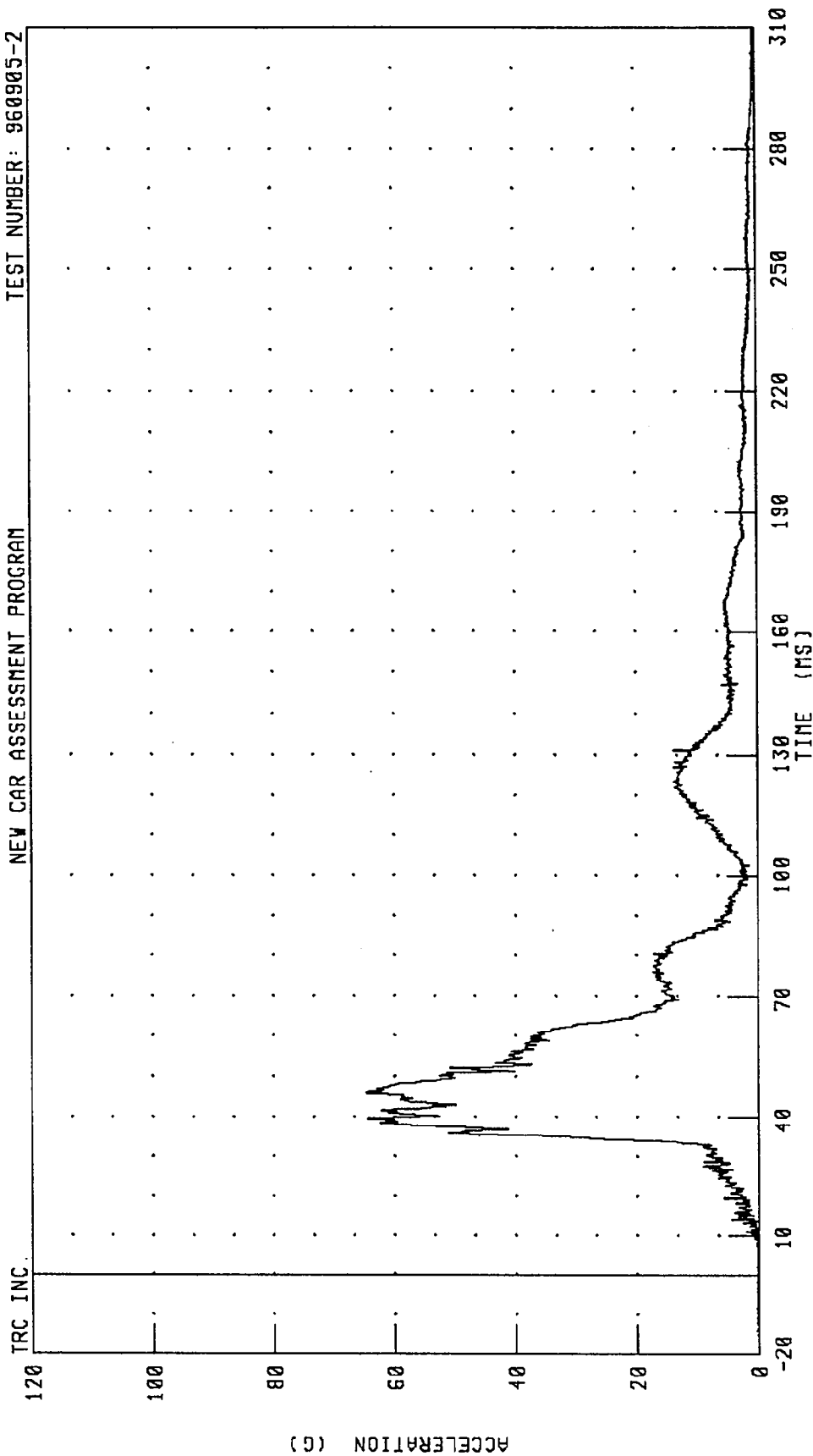
TIME (MS)

PEAK DATA: 12.77 G @ 122.16 MS; -2.85 G @ 61.12 MS

CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER PELVIS RESULTANT ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



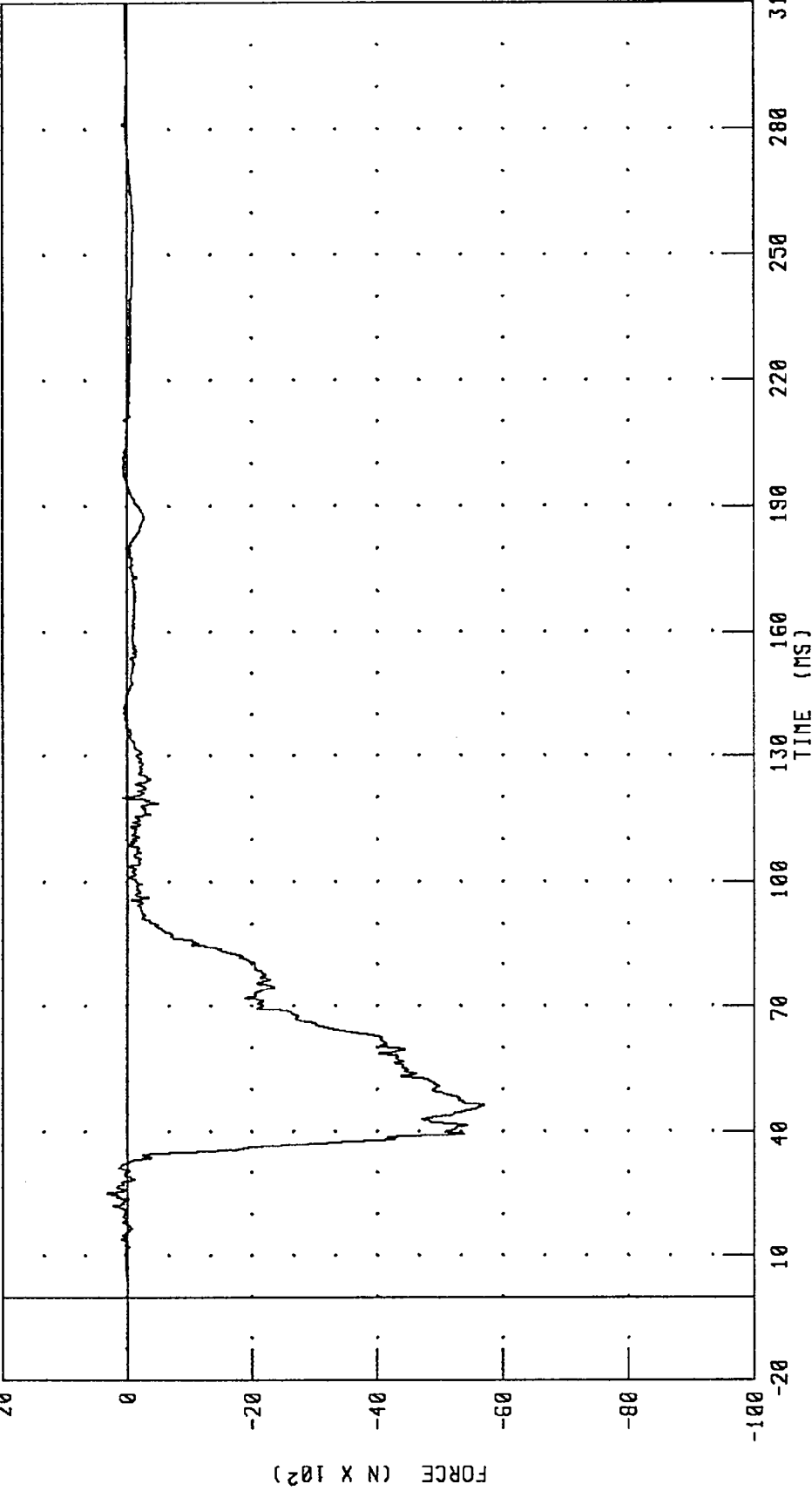
CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT FEMUR FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



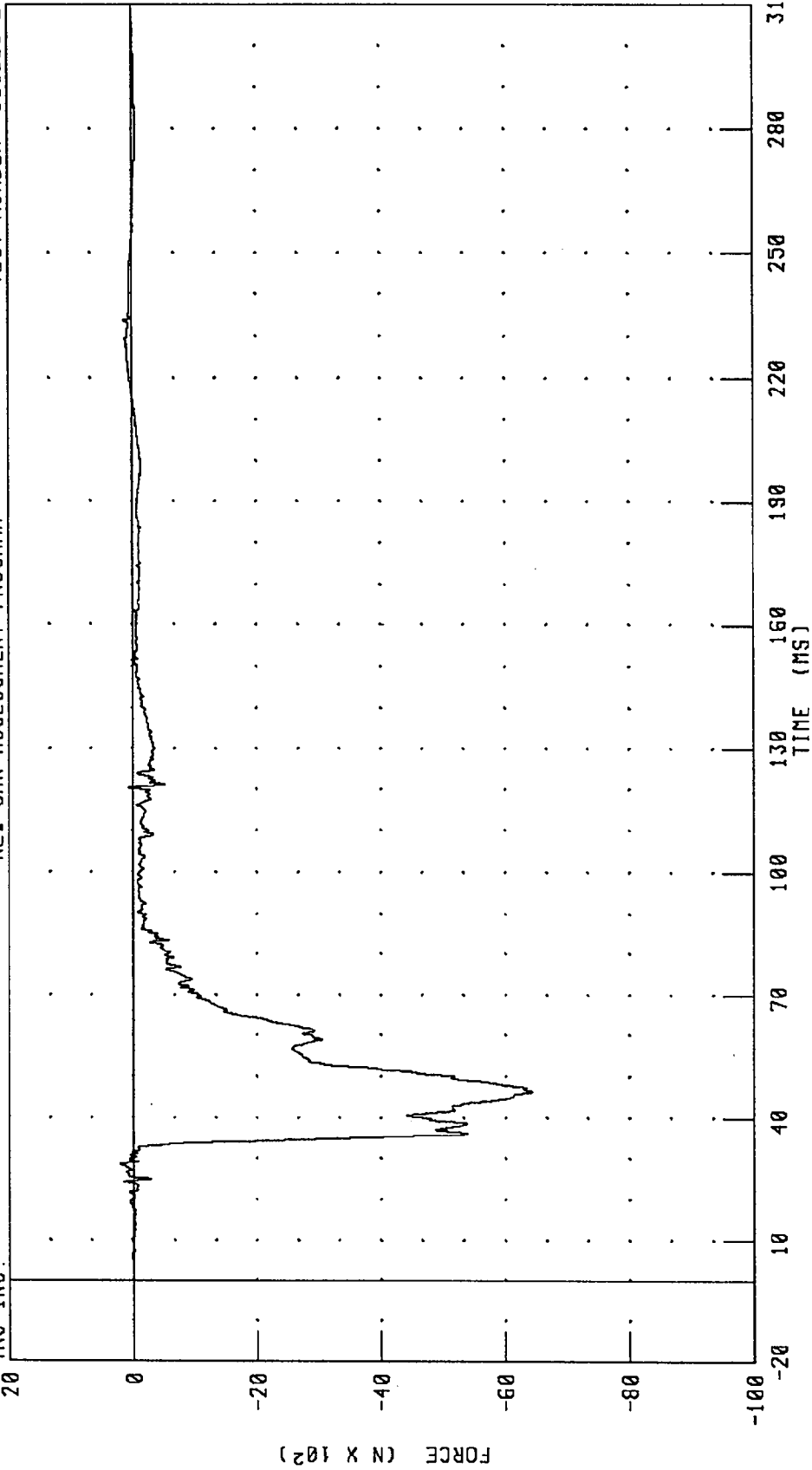
PEAK DATA: 319.69 N @ 25.04 MS; -5715.30 N @ 46.32 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT FEMUR FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: RFMF1 FILTER: CH. CLASS 600

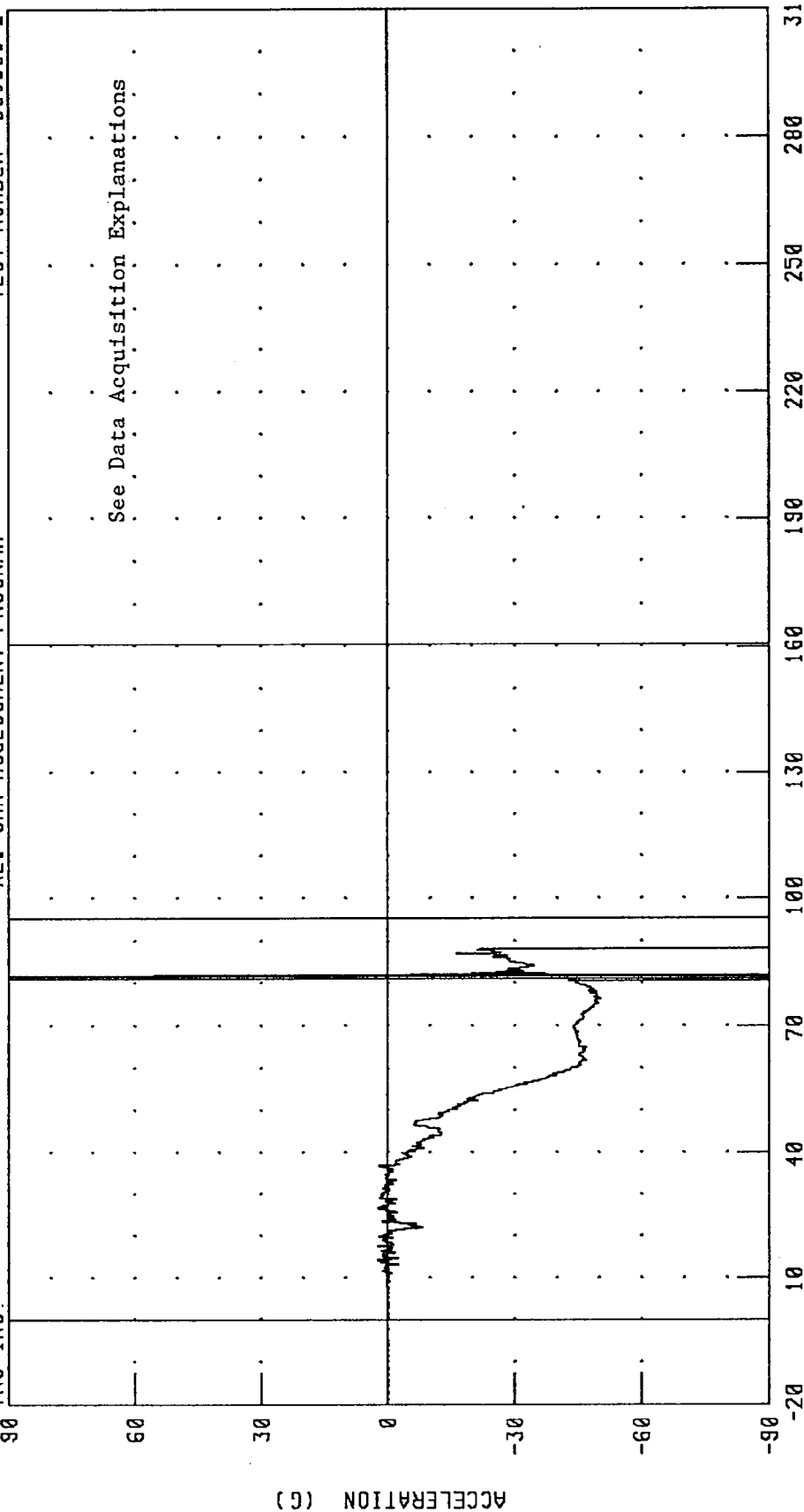
PEAK DATA: 218.79 N @ 28.64 MS; -6434.20 N @ 46.40 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 403.86 G @ 81.20 MS; -403.20 G @ 80.88 MS

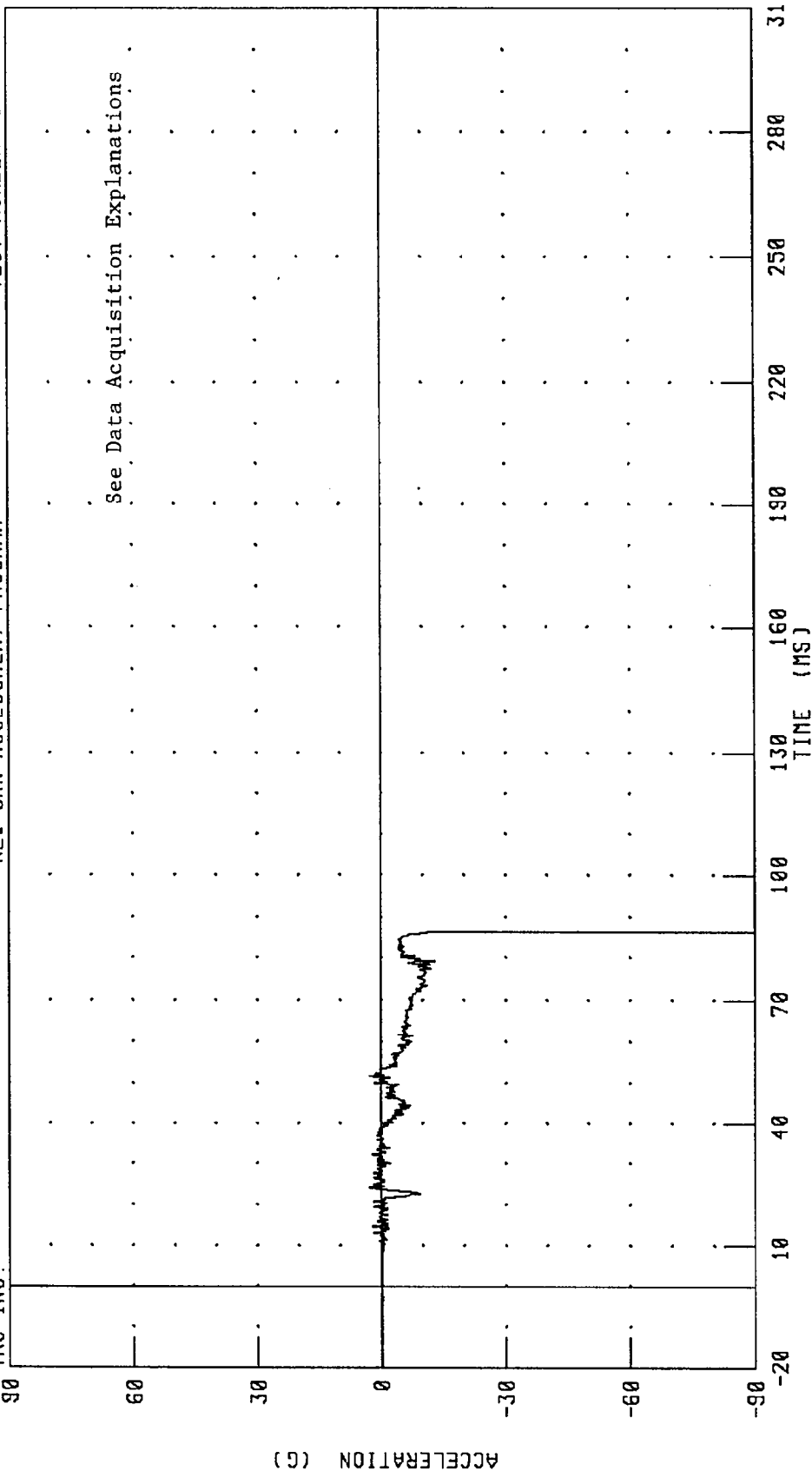
CHANNEL: HEDXR1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: HEDYR1 FILTER: CH. CLASS 1000

PEAK DATA: 2.89 G @ 24.08 MS; -401.62 G @ 86.48 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

90

60

30

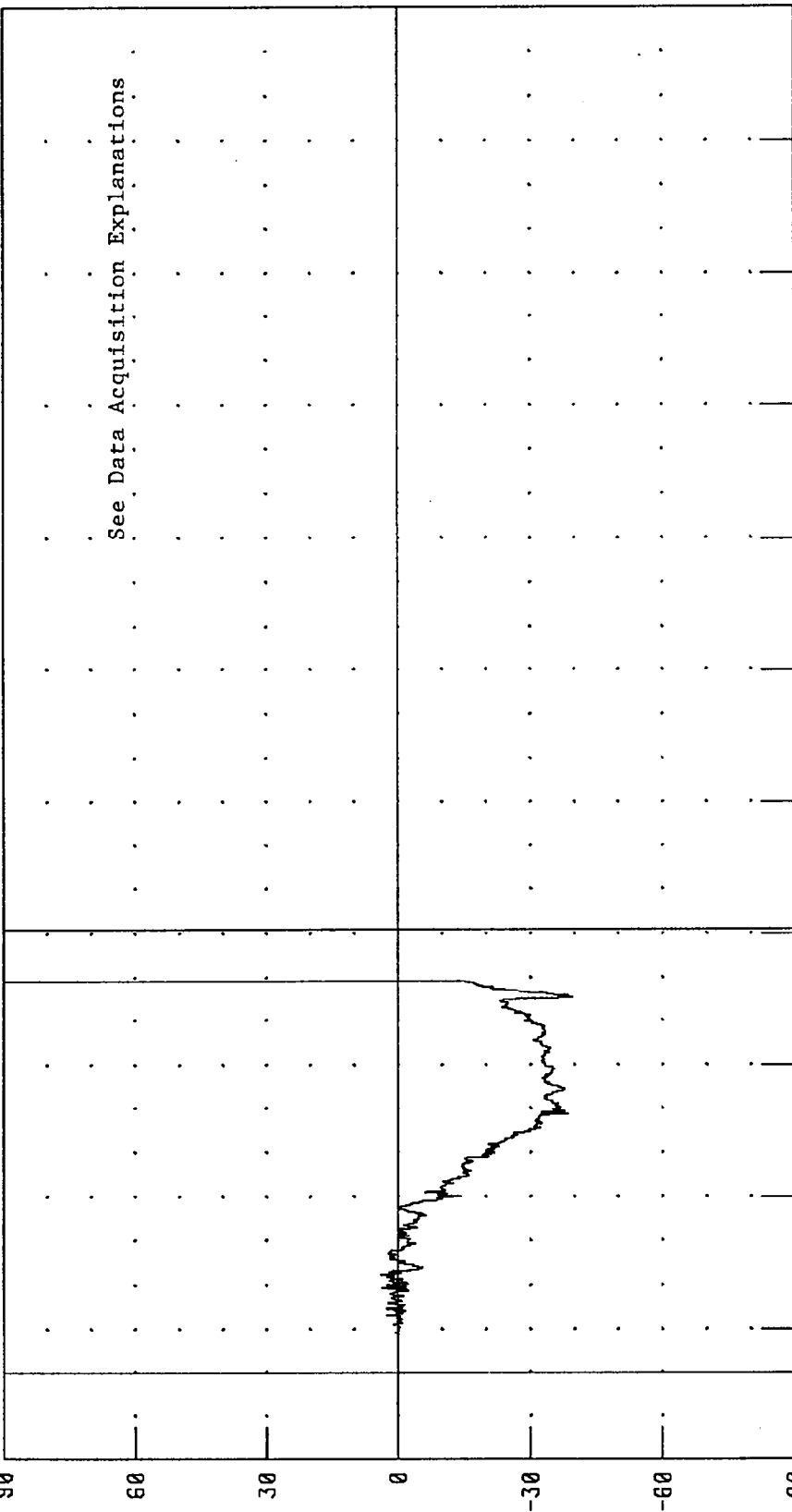
0

-30

-60

-90

ACCELERATION (G)



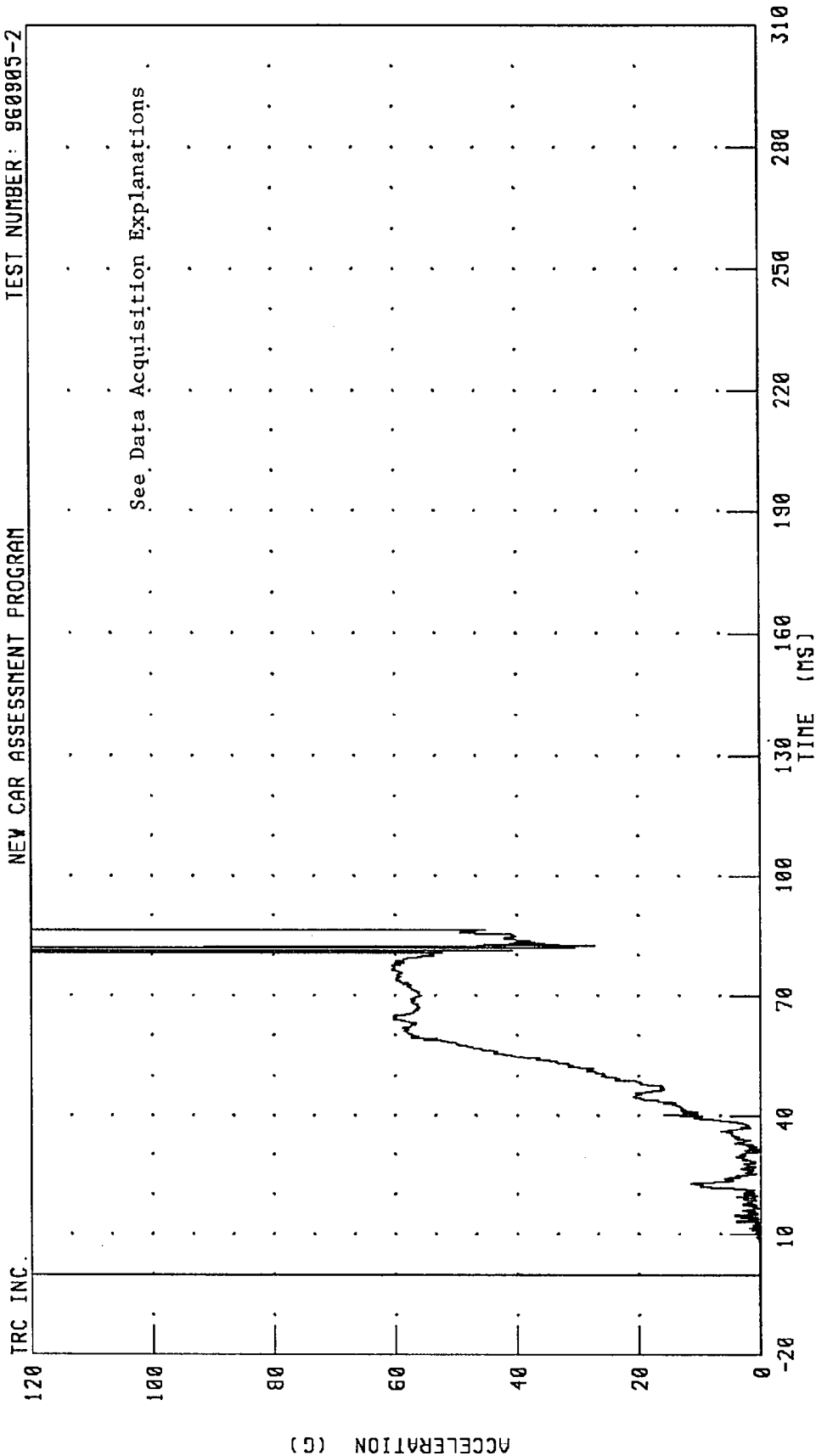
TIME (MS) 130 160 190 220 250 280 310

CHANNEL: HEDZR1 FILTER: CH. CLASS 1000

PEAK DATA: 402.78 G @ 89.52 MS; -403.57 G @ 101.04 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER HEAD RESULTANT ACCELERATION - REDUNDANT
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



PEAK DATA: 698.05 G @ 101.04 MS; 0.12 G @ -20.00 MS

CHANNEL: HEDRR1 FILTER: CH. CLASS 1000

ACCELERATION (G)

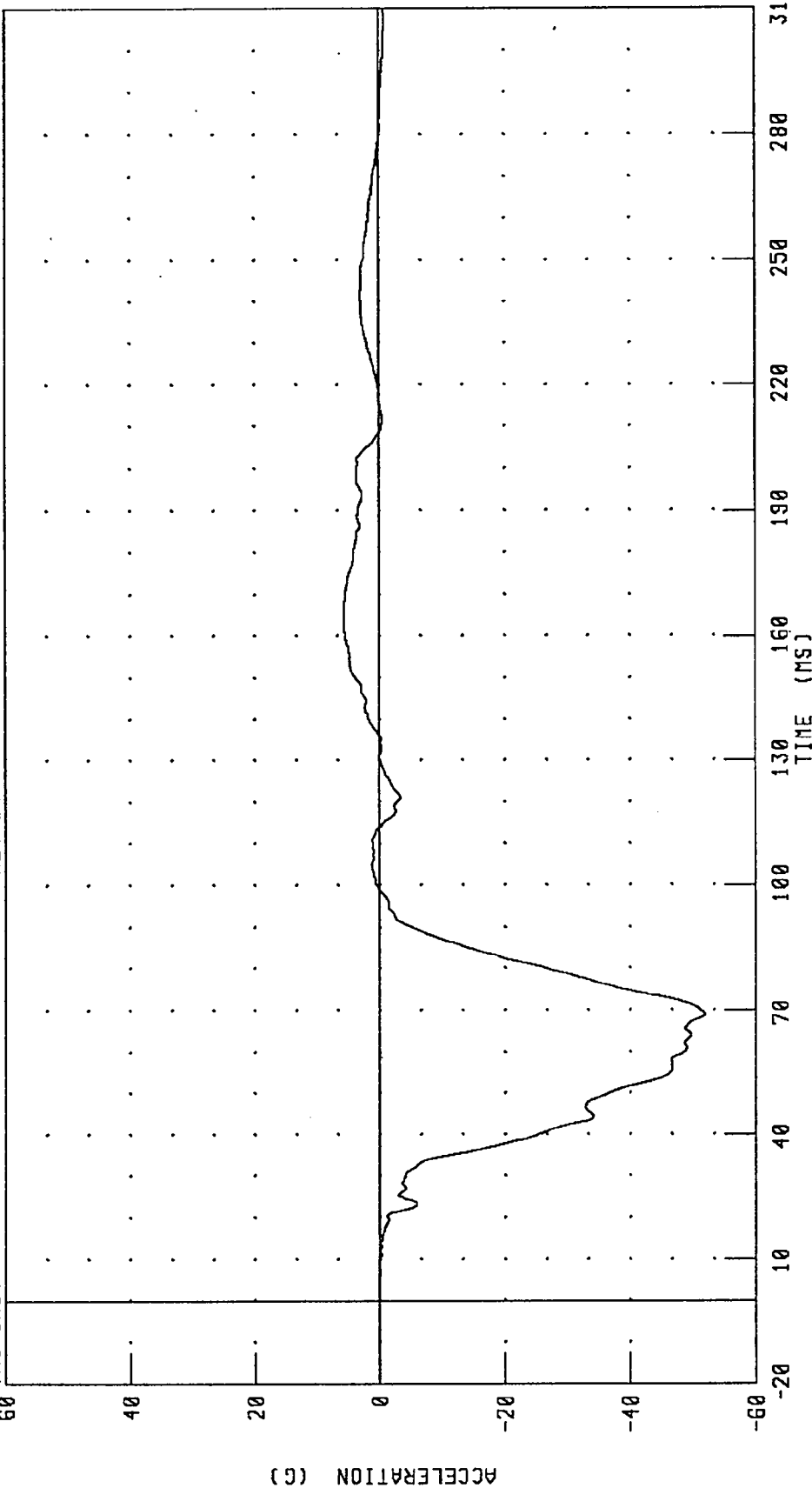
TIME (MS)

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 5.67 G @ 167.28 MS; -51.96 G @ 68.96 MS

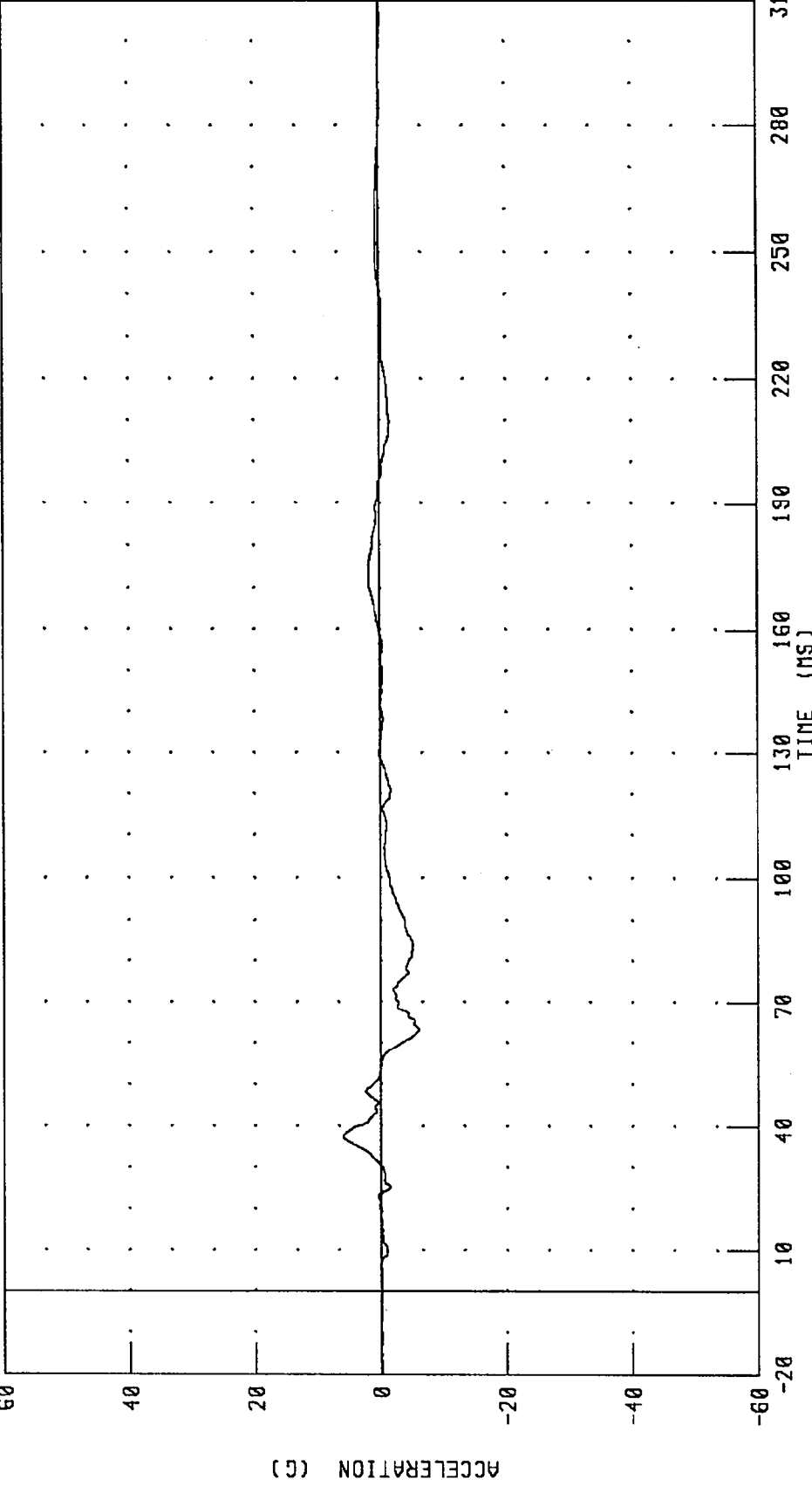
CHANNEL: CSTXR1 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 5.94 G @ 37.68 MS; -6.15 G @ 63.36 MS

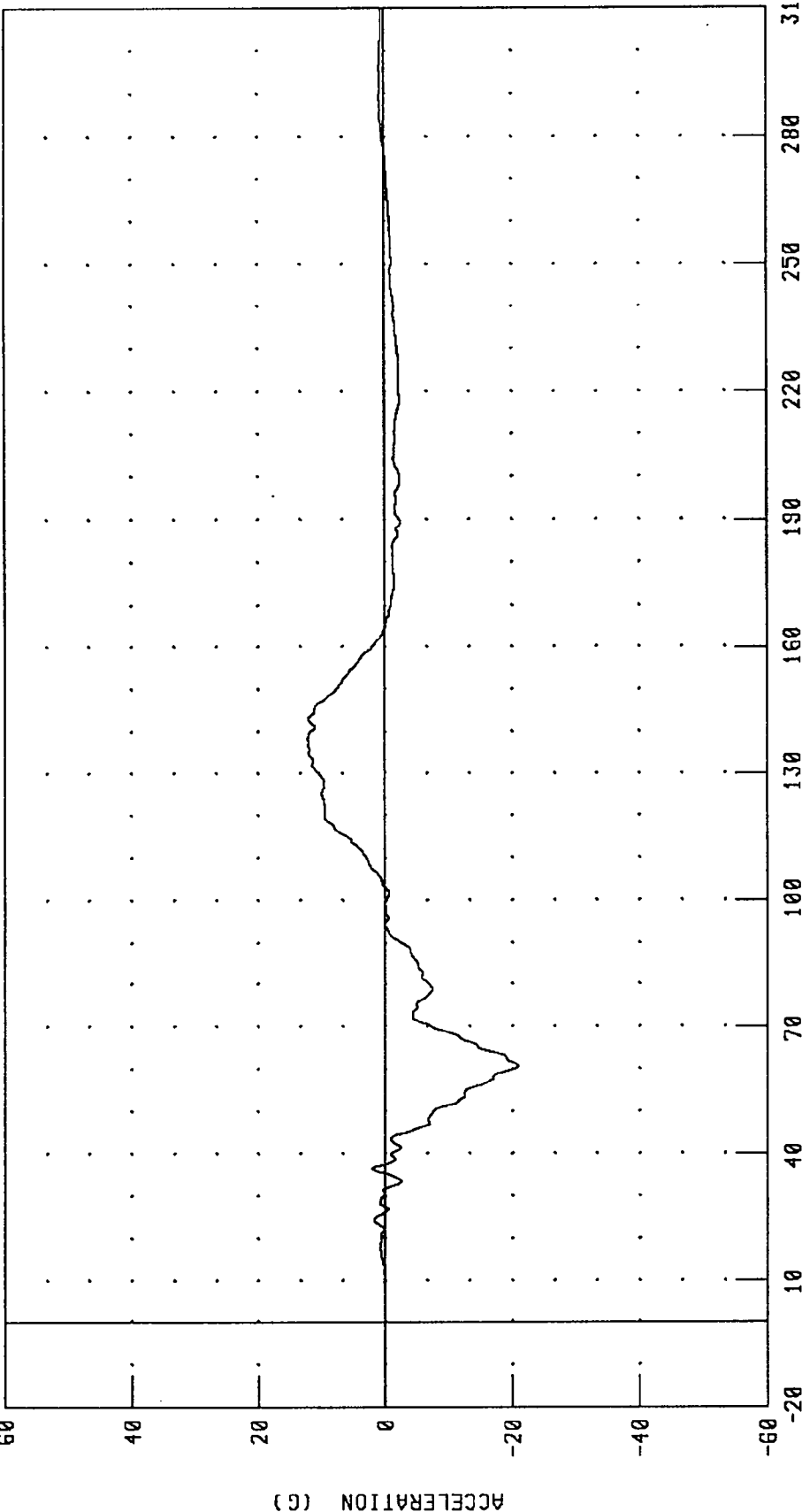
CHANNEL: CSTYR1 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: CSTZR1 FILTER: CH. CLASS 180

PEAK DATA: 12.15 G @ 138.32 MS; -20.98 G @ 60.72 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

120

100

80

60

40

20

0

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

CHANNEL: CSTRR1 FILTER: CH. CLASS 180

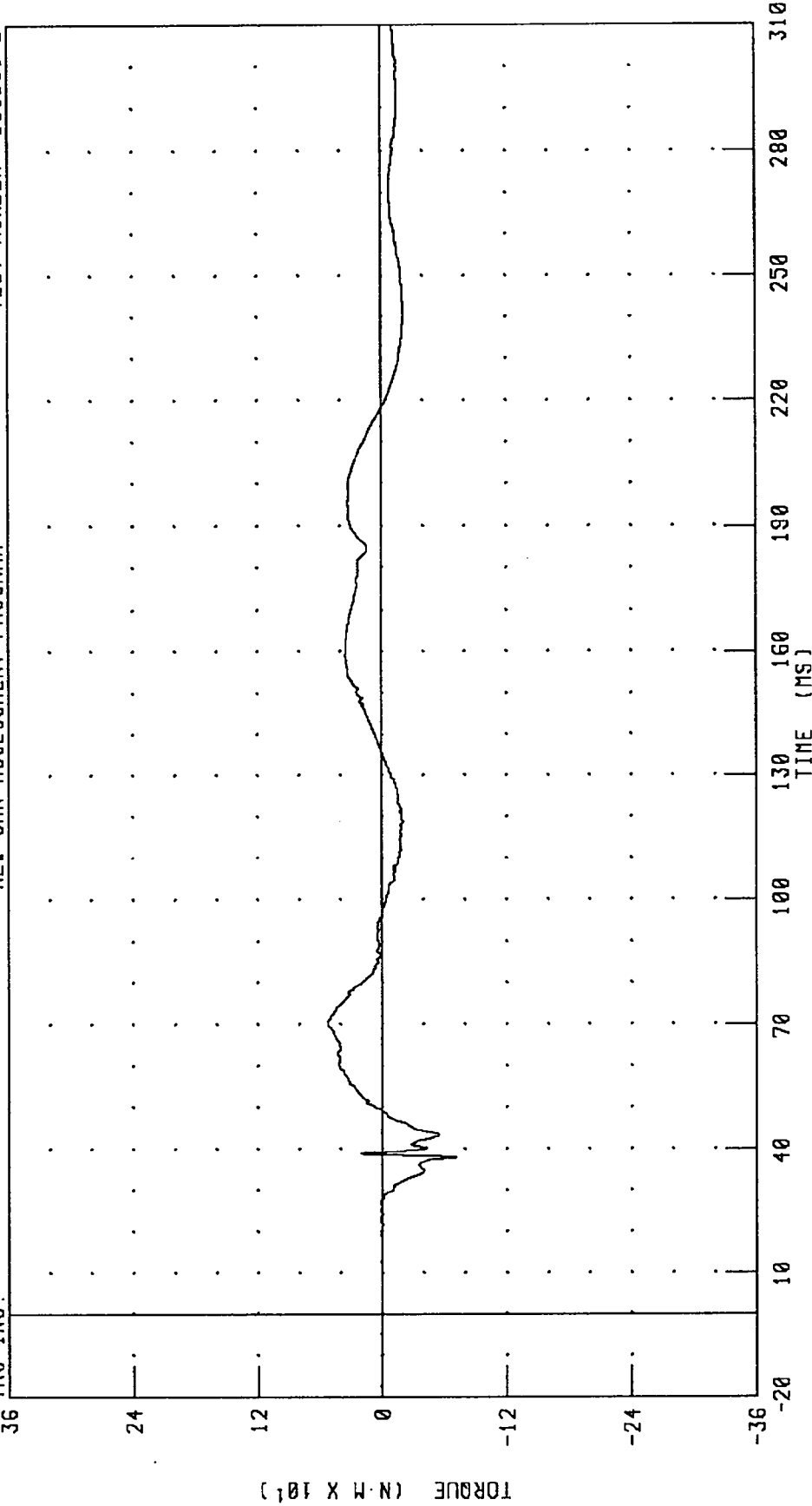
PEAK DATA: 53.46 G @ 60.96 MS; 0.01 G @ -20.00 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 52.36 N-M @ 70.08 MS; -70.94 N-M @ 38.08 MS

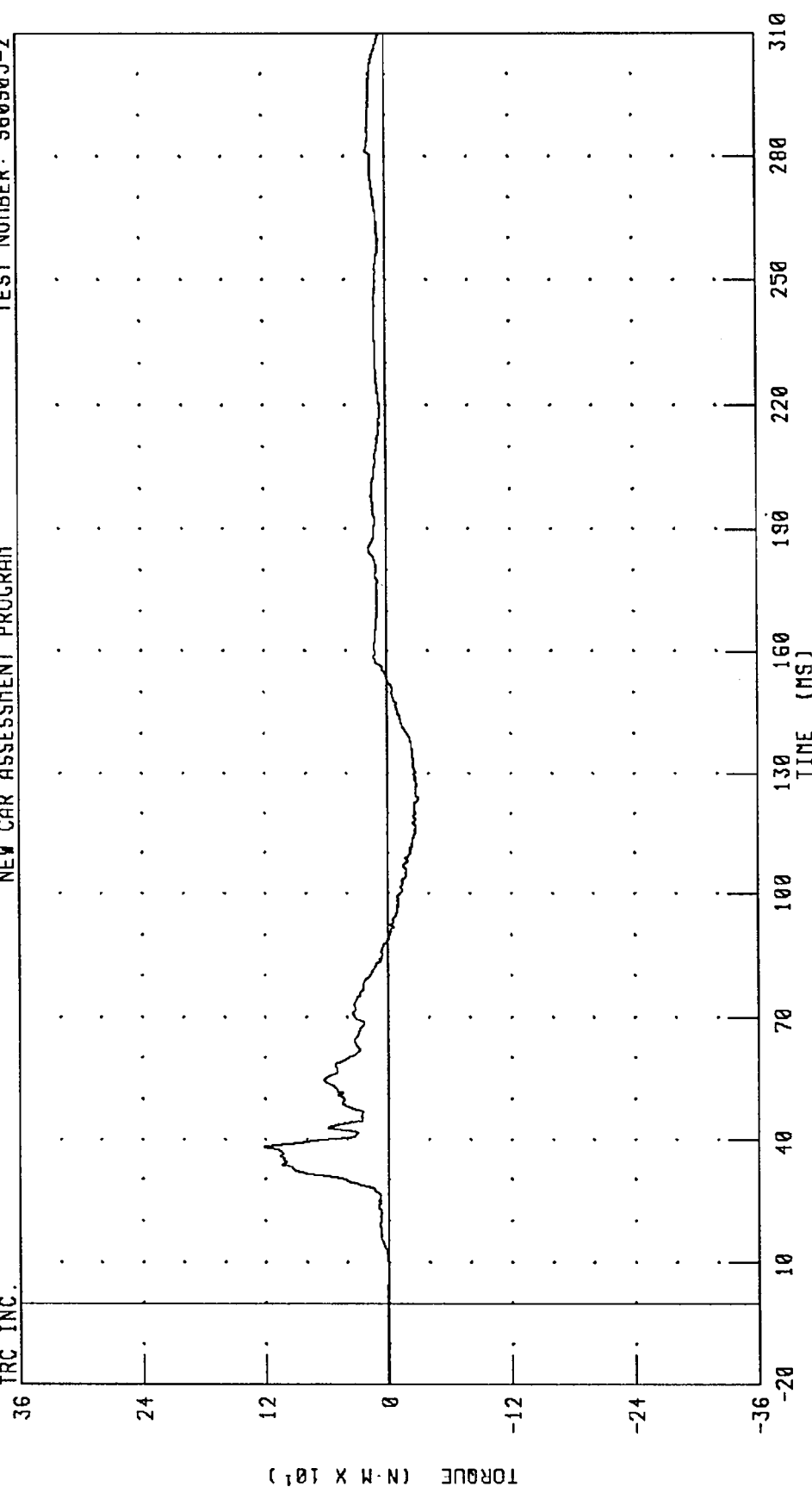
CHANNEL: TBLXM1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 122.24 N-M @ 38.24 MS; -29.99 N-M @ 123.92 MS

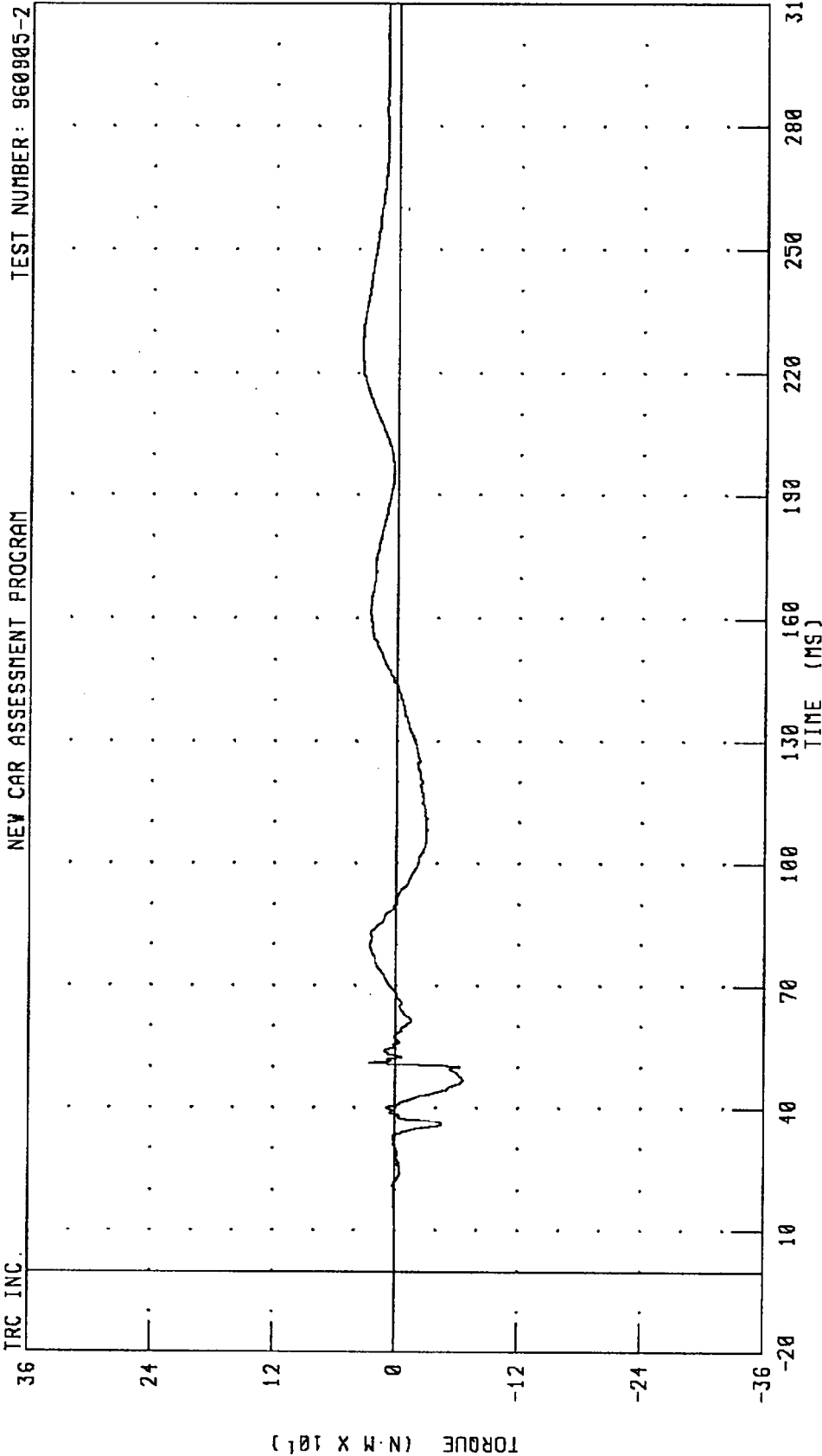
CHANNEL: TBLYM1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TBRXM1 FILTER: CH. CLASS 600

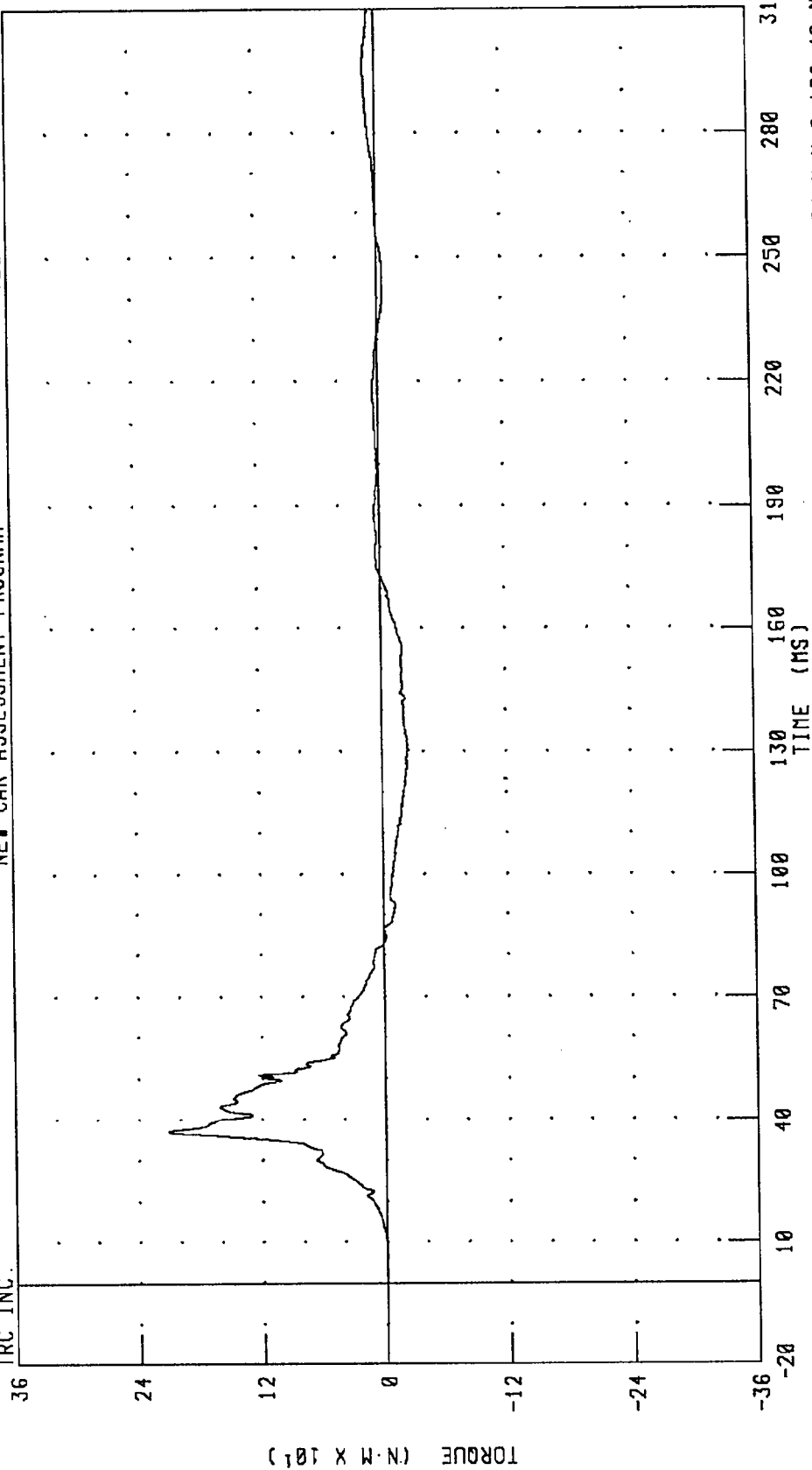
PEAK DATA: 35.49 N·m @ 226.40 MS; -65.58 N·m @ 46.88 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

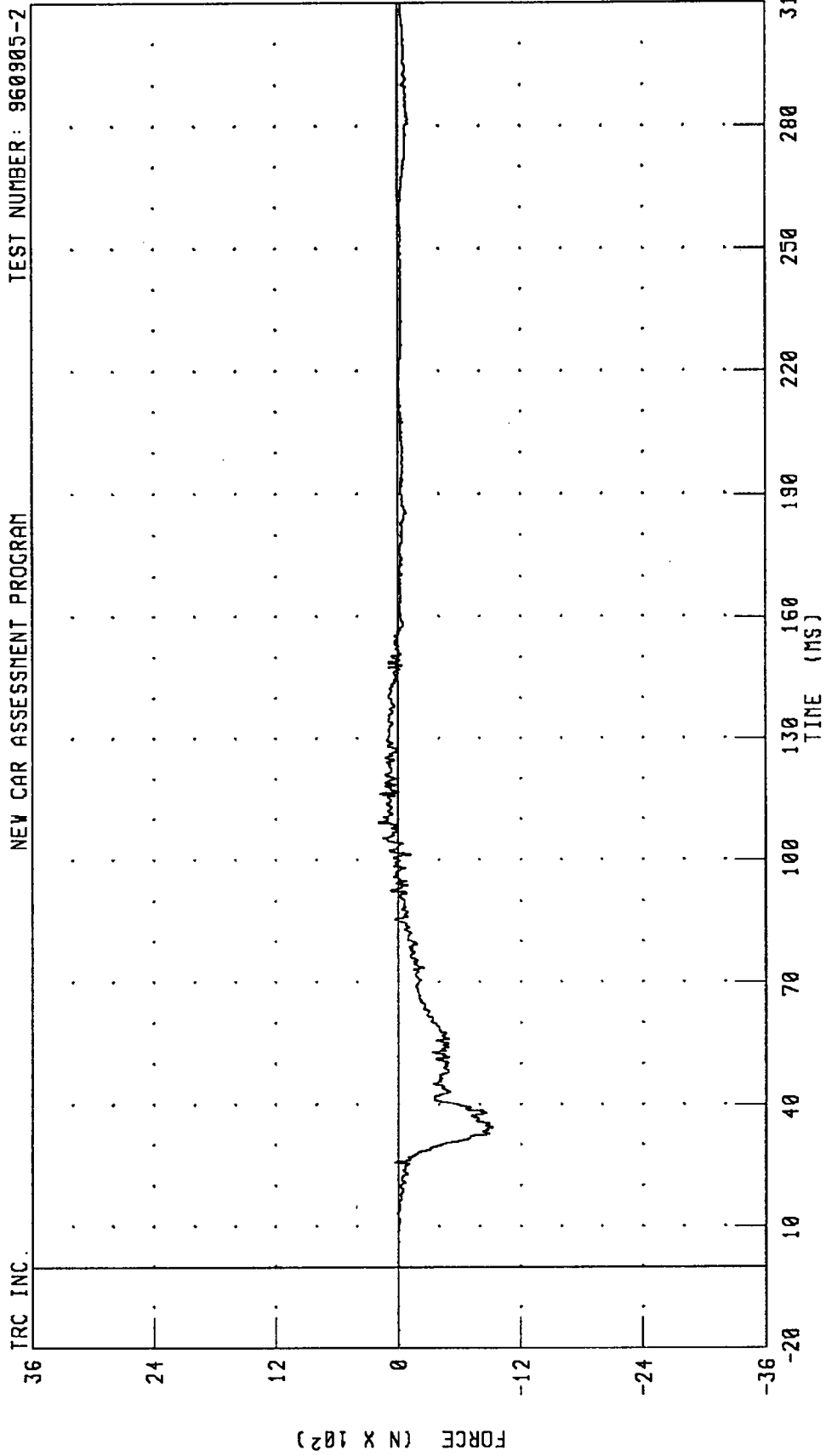


PEAK DATA: 211.62 N·m @ 37.04 ms; -26.04 N·m @ 130.40 ms

CHANNEL: TBRYM1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT LOWER TIBIA X-AXIS FORCE

NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 960905-2



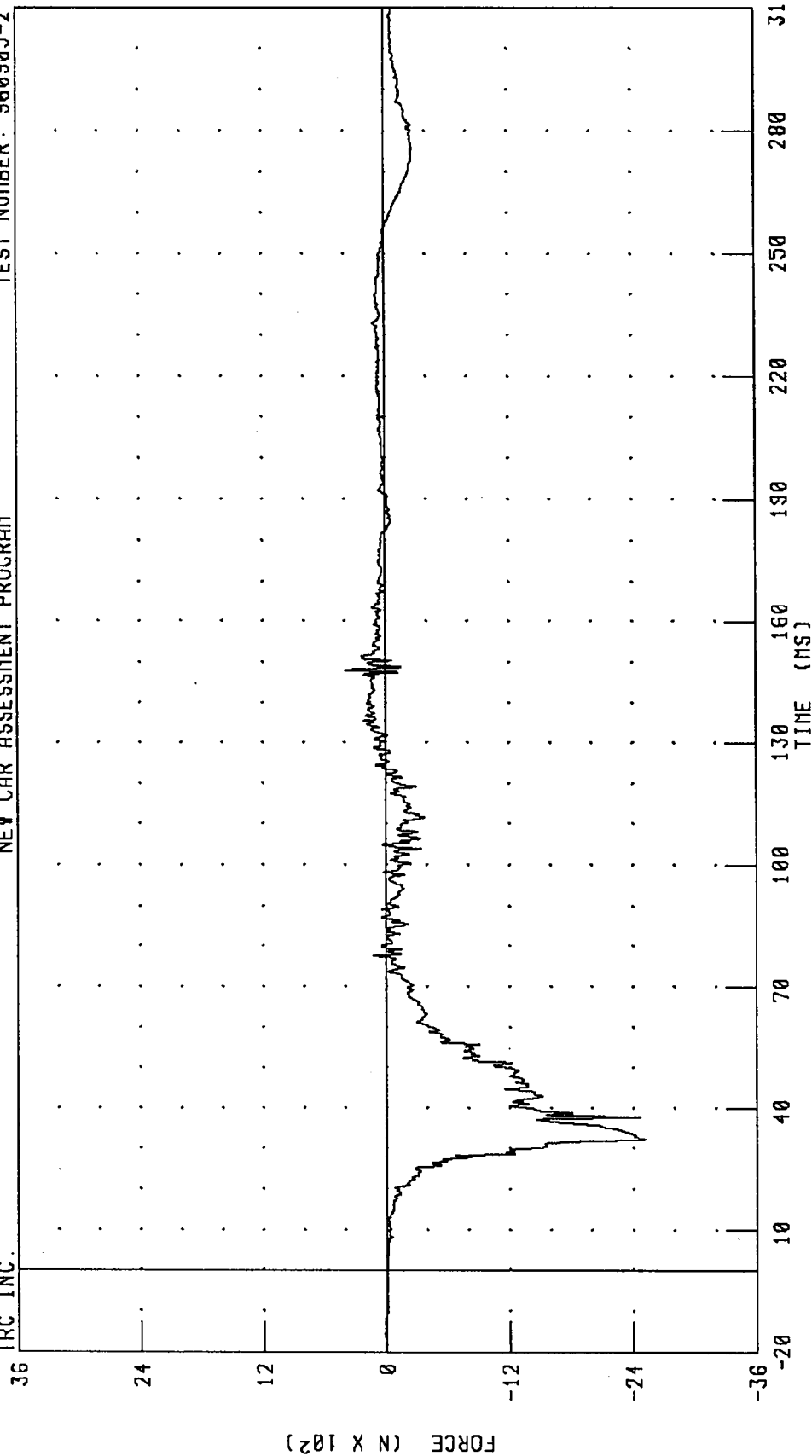
CHANNEL: ANLXF1 FILTER: CH. CLASS 600

PEAK DATA: 191.29 N @ 109.20 MS; -924.13 N @ 34.64 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT LOWER TIBIA Z-AXIS FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 400.55 N @ 148.16 MS; -2515.19 N @ 32.32 MS

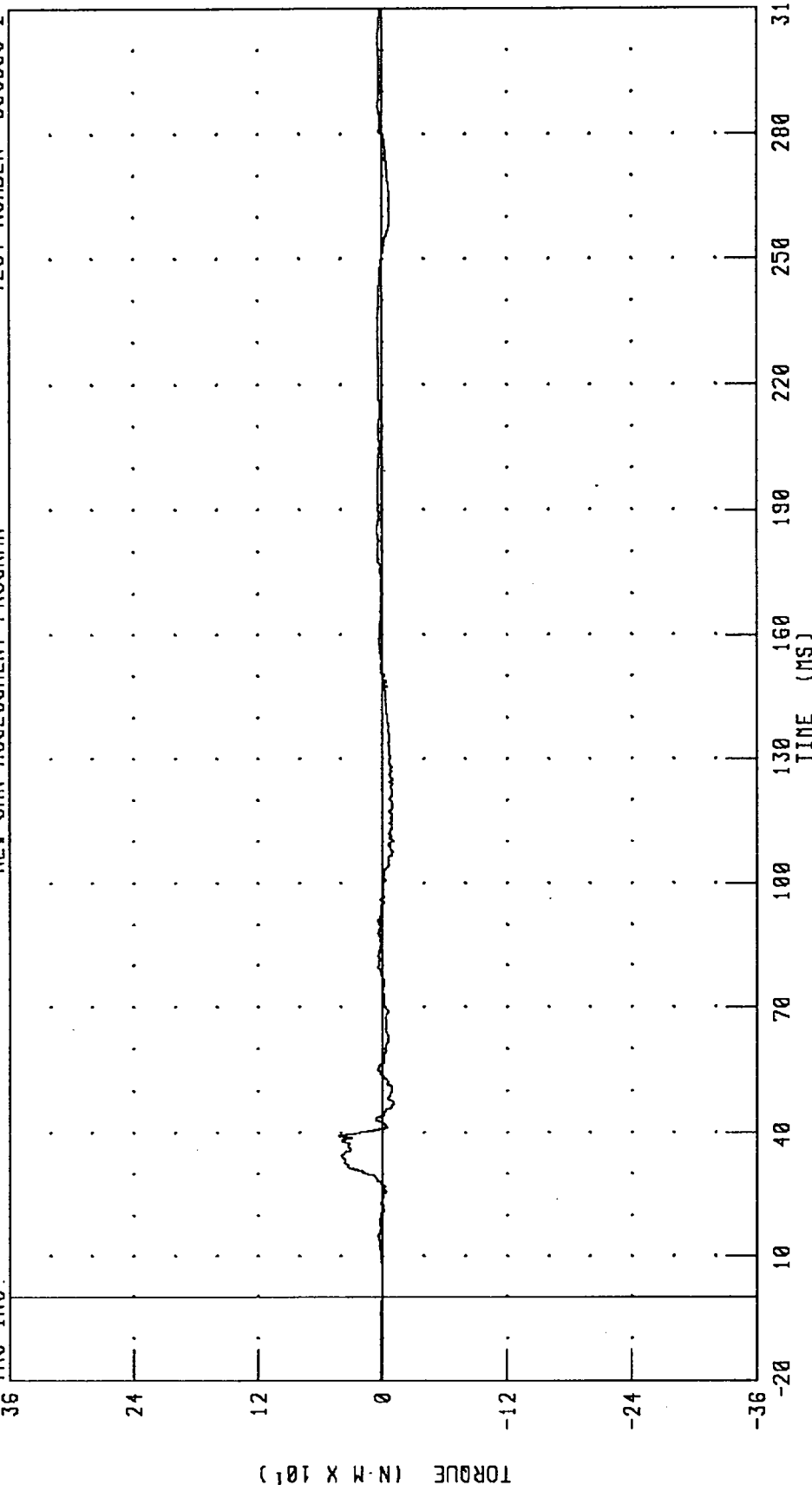
CHANNEL: ANLZF1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



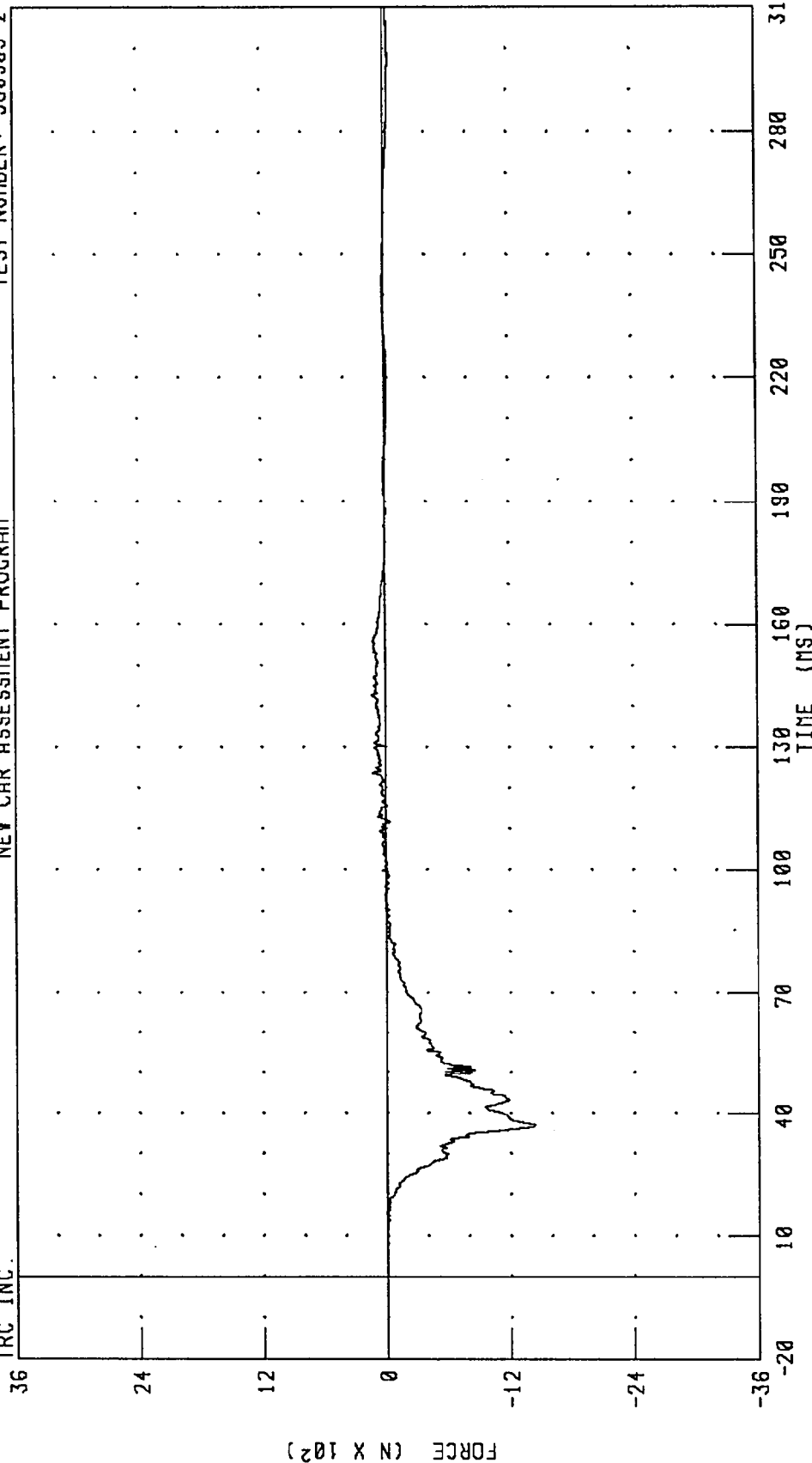
CHANNEL: ANLYM1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT LOWER TIBIA X-AXIS FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



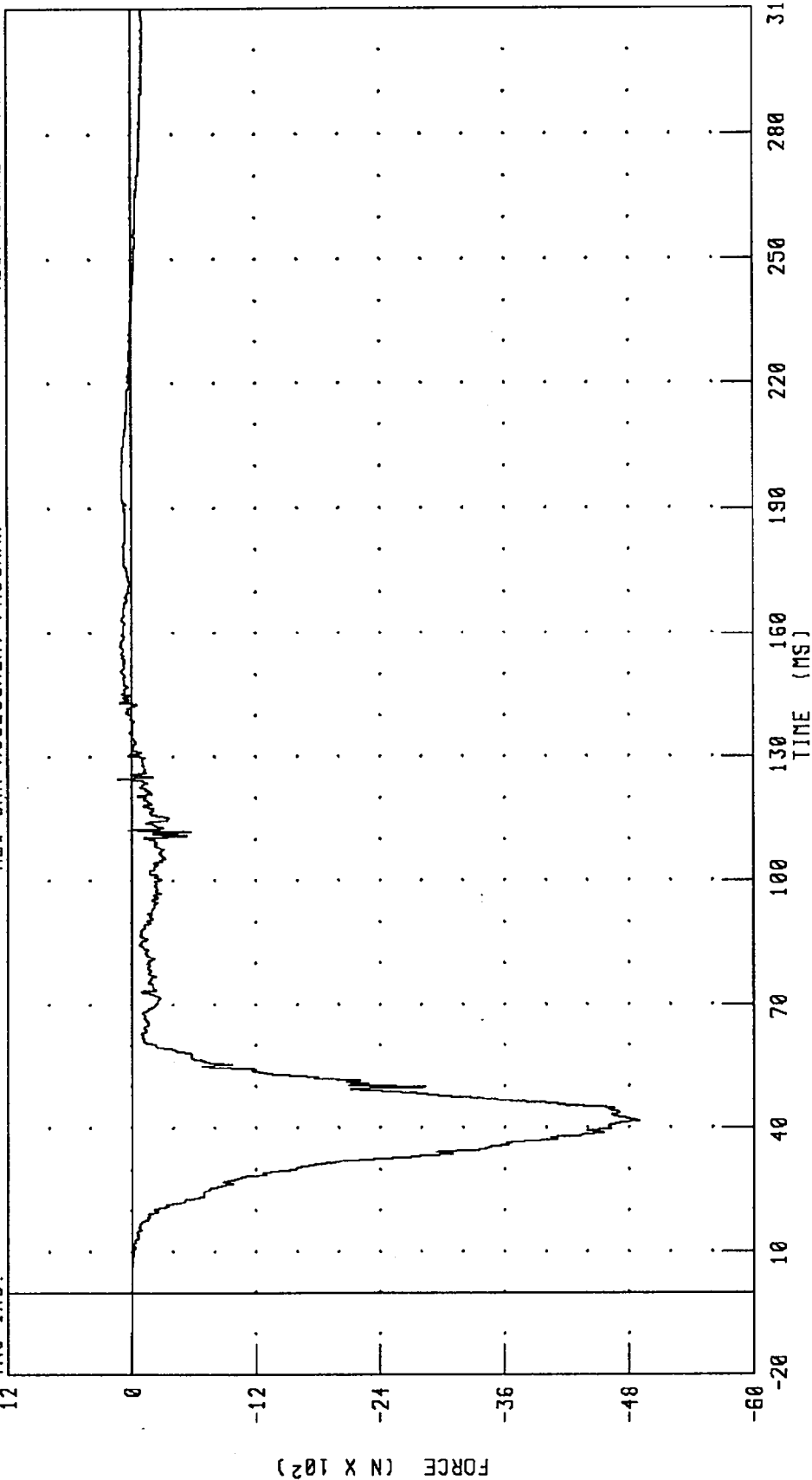
CHANNEL: ANRXF1 FILTER: CH. CLASS 600

PEAK DATA: 135.62 N @ 142.72 MS; -1438.62 N @ 37.20 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



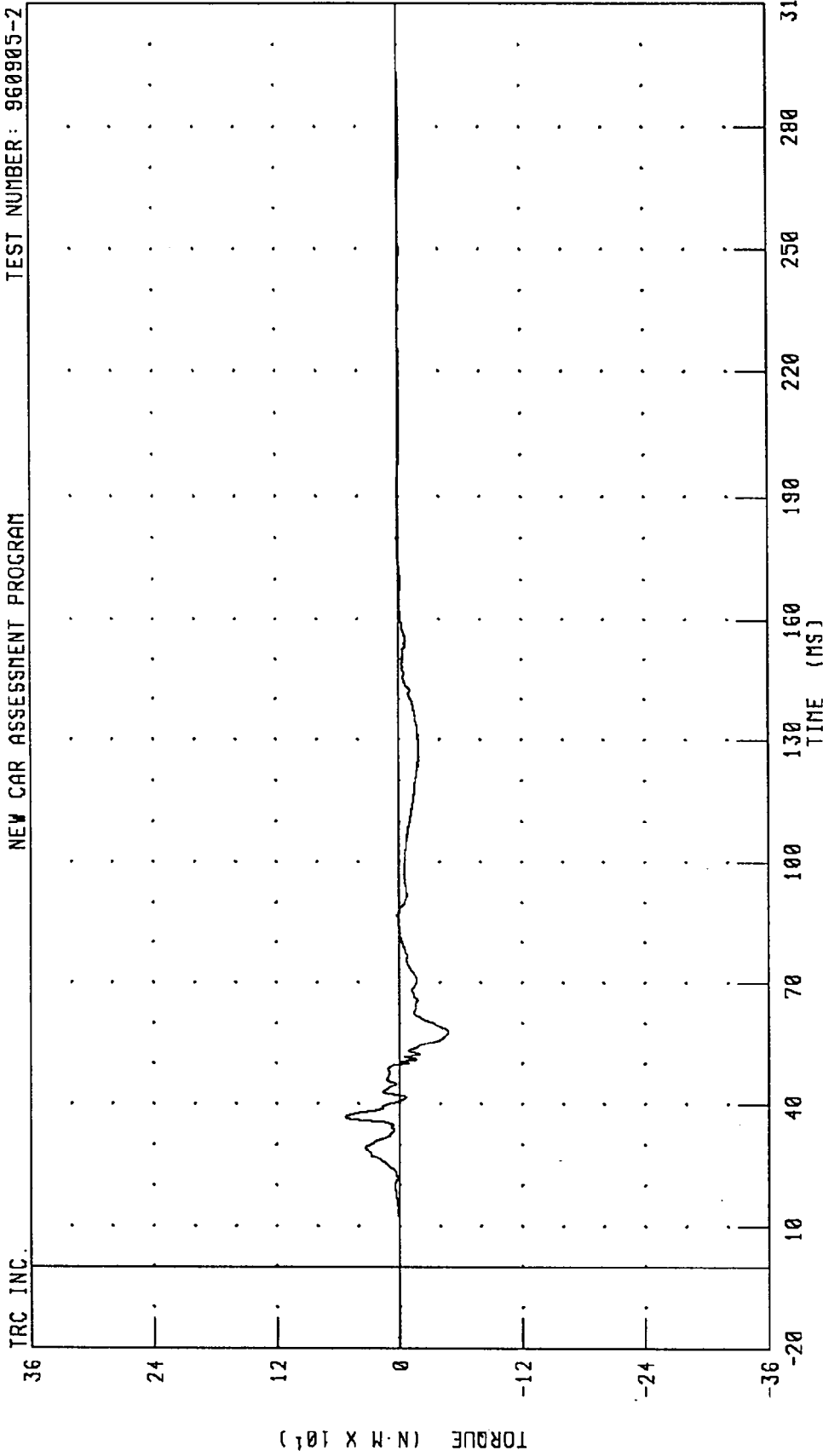
PEAK DATA: 133.94 N @ 124.72 MS; -4897.37 N @ 41.76 MS

CHANNEL: ANRZF1 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



CHANNEL: ANYM1 FILTER: CH. CLASS 600

PEAK DATA: 52.97 N·M @ 36.88 MS; -47.53 N·M @ 57.92 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

60

30

0

ACCELERATION (G)

-30

-60

-90

-120

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

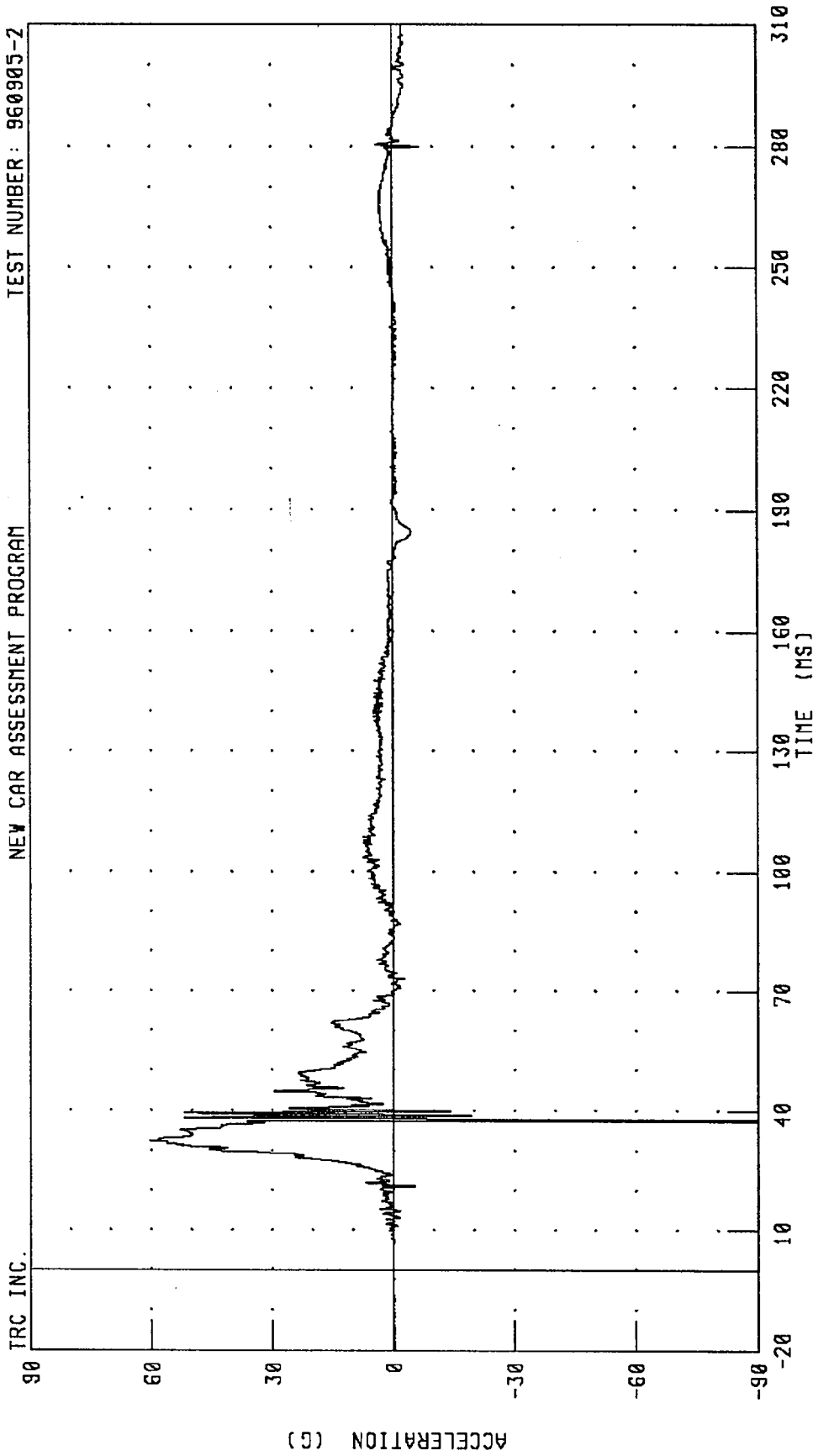
PEAK DATA: 11.62 G @ 259.44 MS; -112.92 G @ 33.60 MS

CHANNEL: FTLXG1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT HEEL

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



CHANNEL: FTLZH1 FILTER: CH. CLASS 1000

PEAK DATA: 60.52 G @ 32.56 MS; -203.74 G @ 37.76 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT TOE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

120

90

60

30

0

-30

-60

ACCELERATION (G)

310

280

250

220

190

160

130

100

70

40

10

-20

TIME (MS)

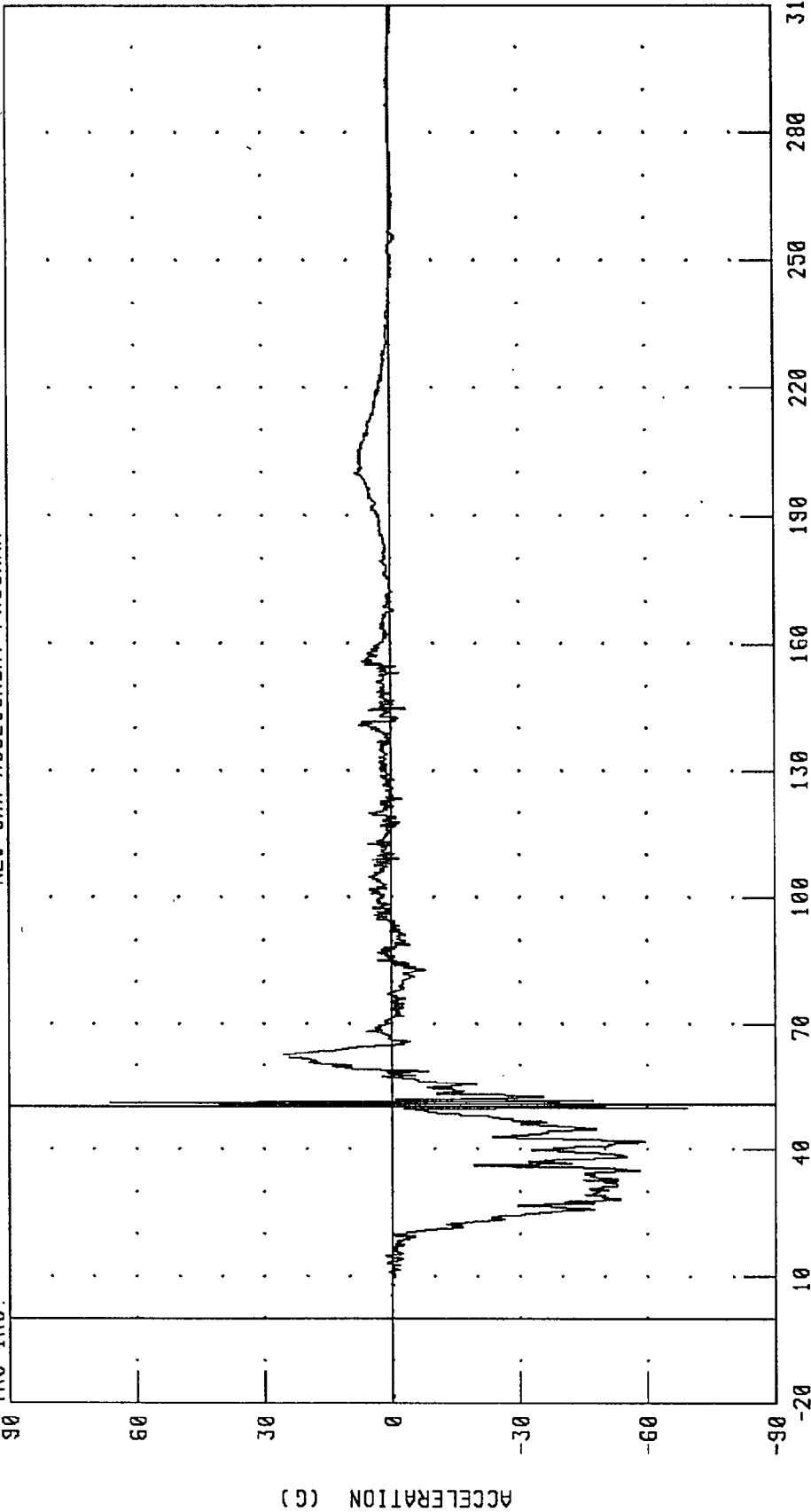
CHANNEL: FTLZT1 FILTER: CH. CLASS 1000

PEAK DATA: 104.31 G @ 31.28 MS; -336.05 G @ 37.84 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: FTRXG1 FILTER: CH. CLASS 1000

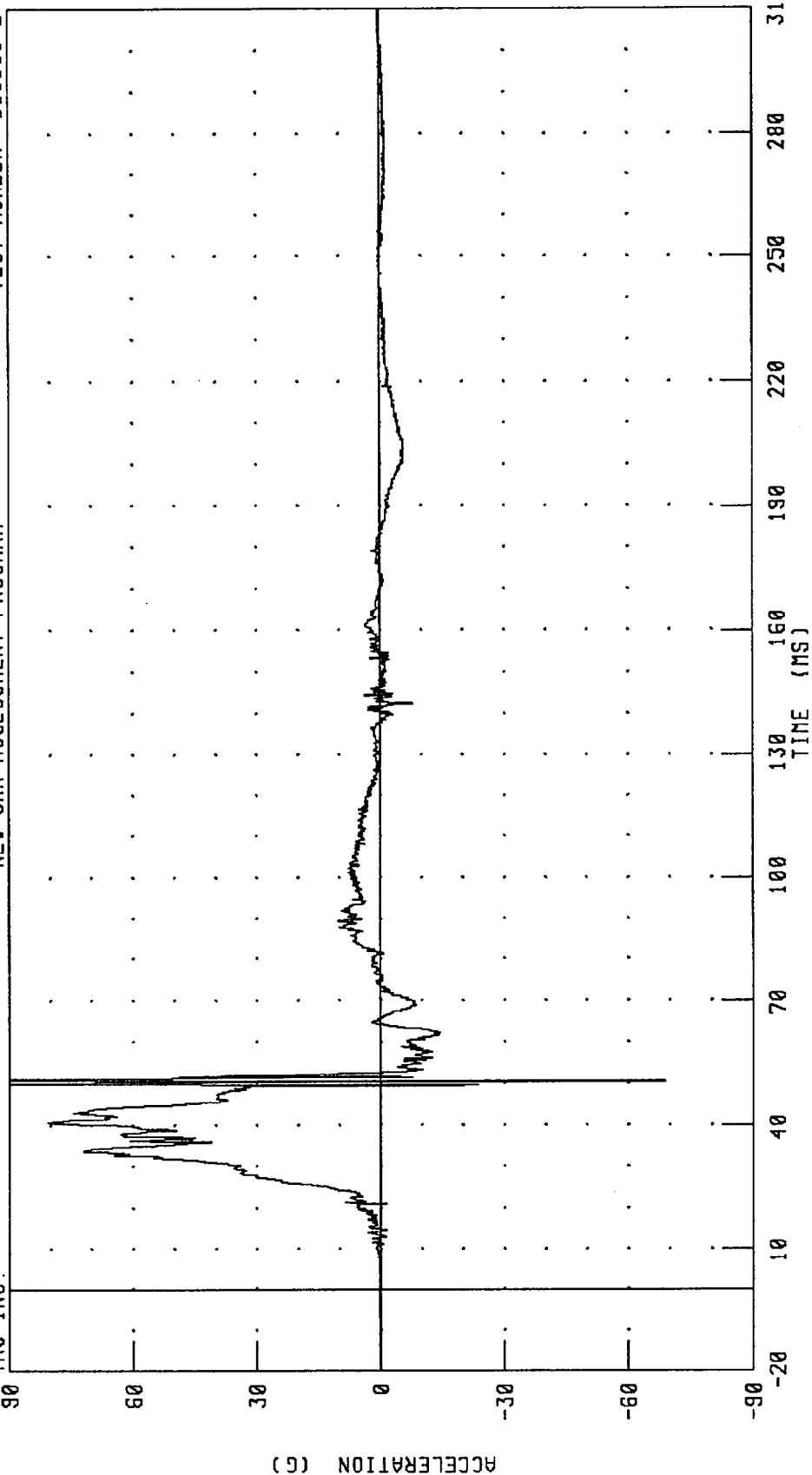
PEAK DATA: 125.56 G @ 50.08 MS; -163.44 G @ 50.48 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 95.05 G @ 50.24 MS; -68.90 G @ 50.56 MS

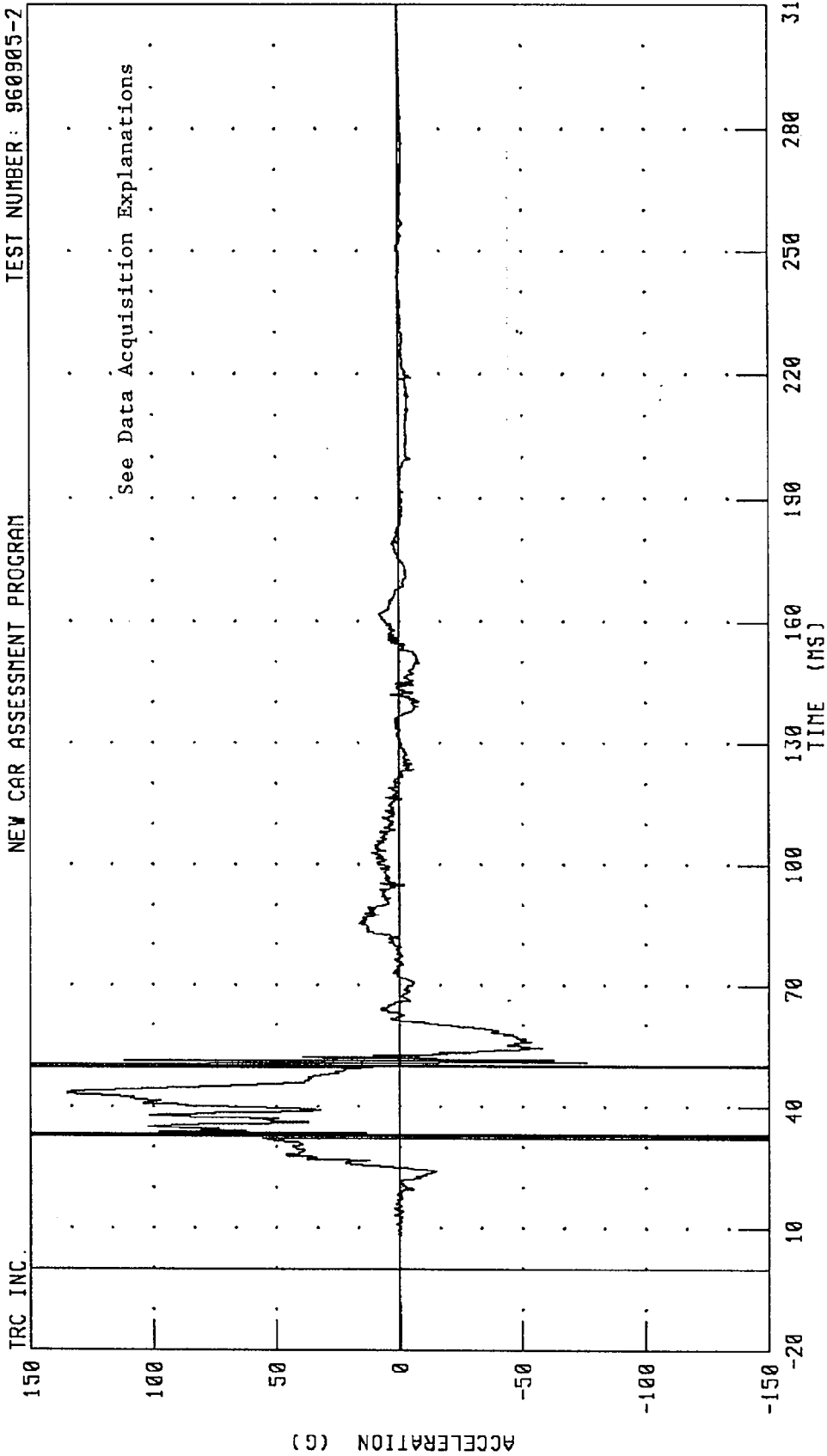
CHANNEL: FTRZH1 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



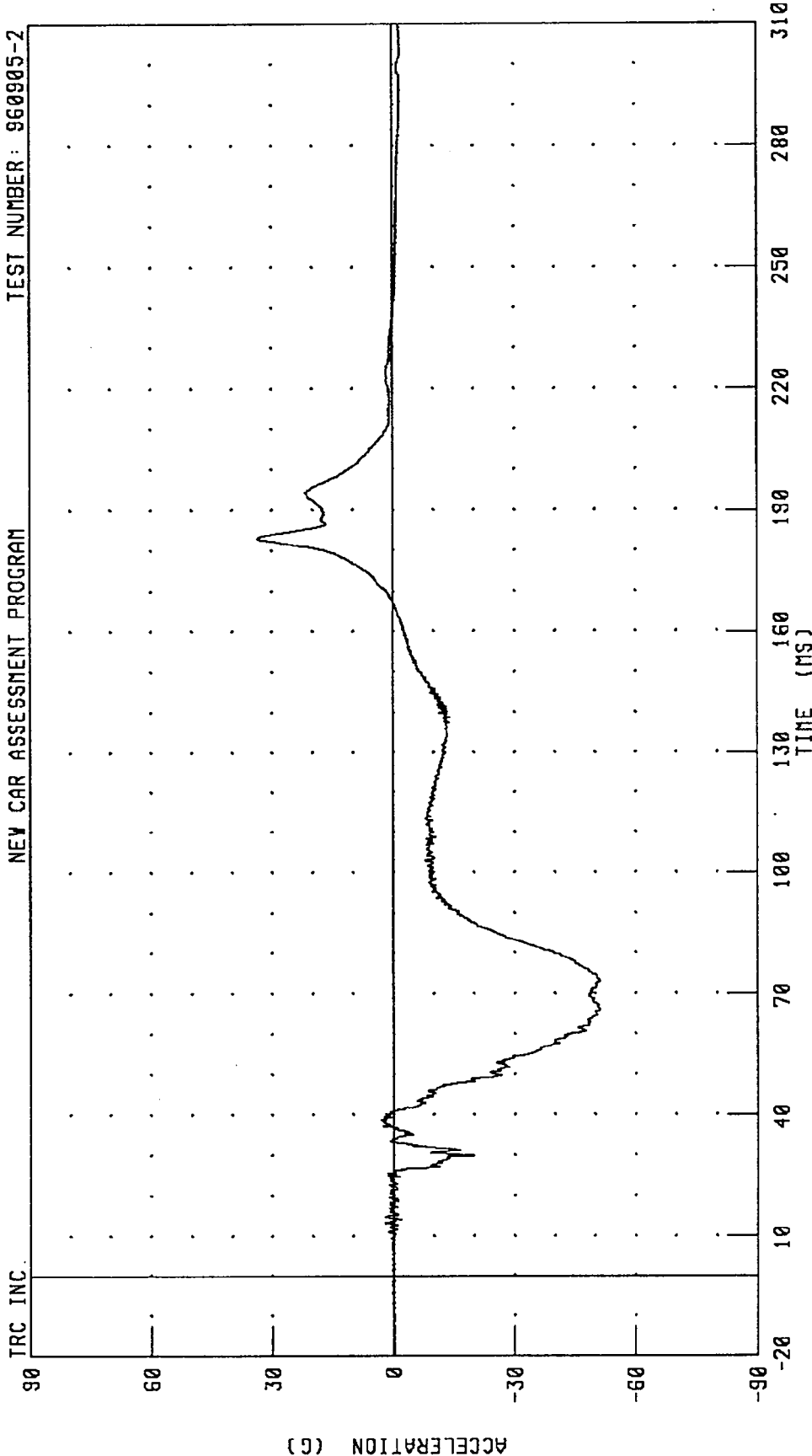
CHANNEL: FTRZT1 FILTER: CH. CLASS 1000

PEAK DATA: 800.91 G @ 32.64 MS; -781.81 G @ 32.40 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

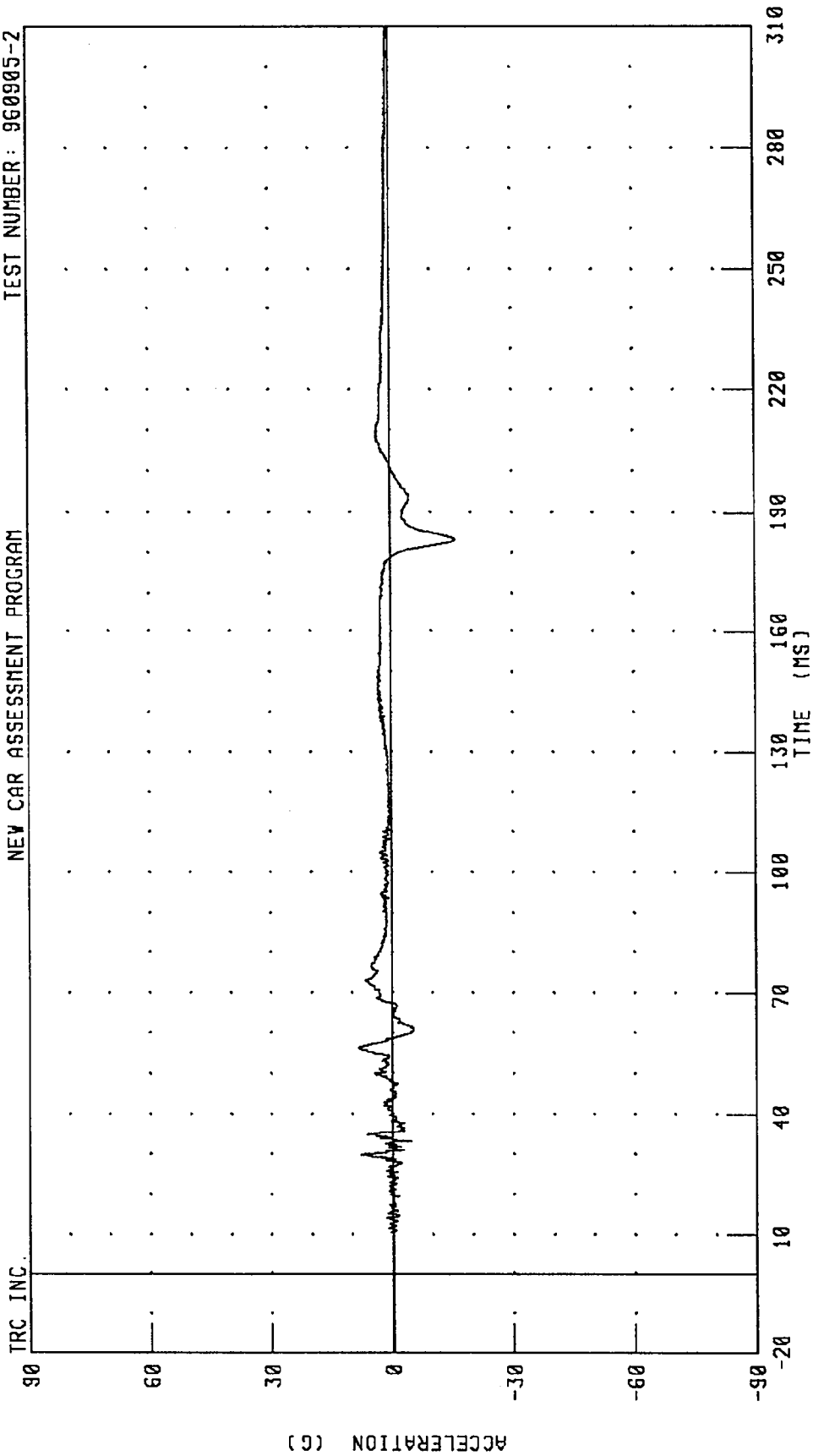


PEAK DATA: 33.60 G @ 182.88 MS; -51.33 G @ 65.92 MS

CHANNEL: HEDXC2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



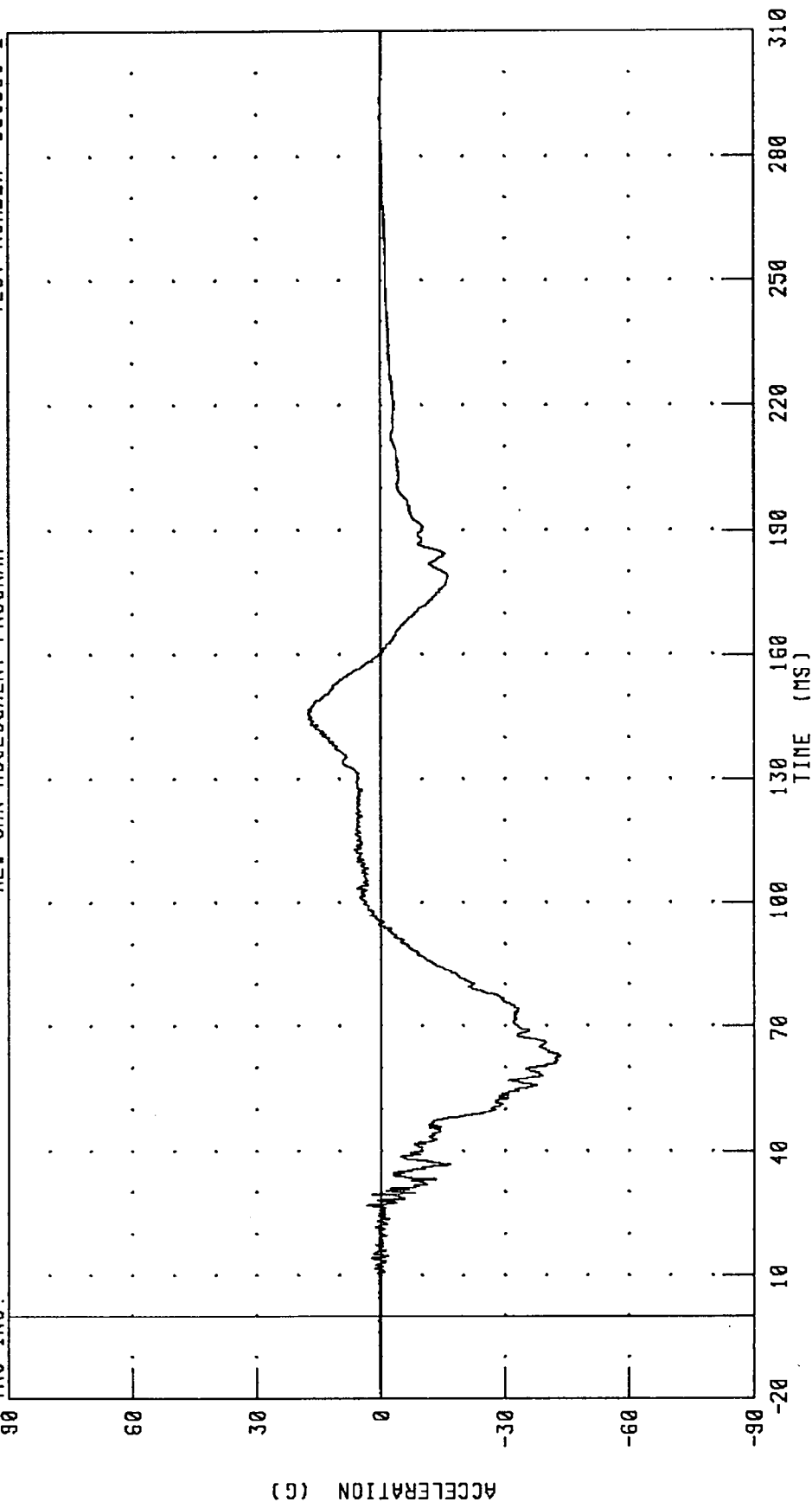
PEAK DATA: 8.35 G @ 56.24 MS; -16.09 G @ 183.28 MS

CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 17.66 G @ 144.56 MS; -43.34 G @ 62.80 MS

CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

120

100

80

60

40

20

0

ACCELERATION (G)

TIME (MS)

130

160

190

220

250

280

310

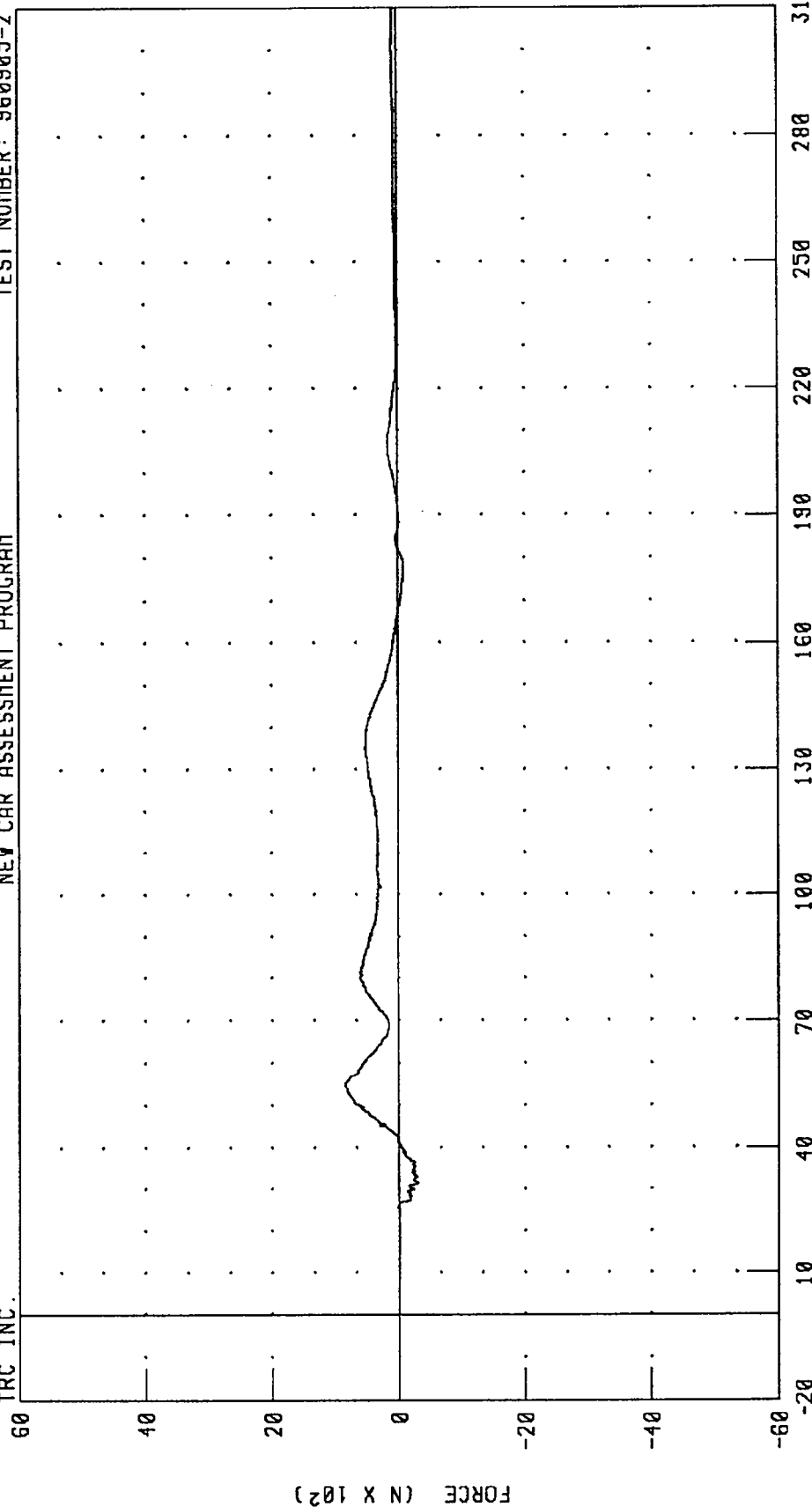
PEAK DATA: 65.13 G @ 62.88 MS; 0.14 G @ -16.48 MS

CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



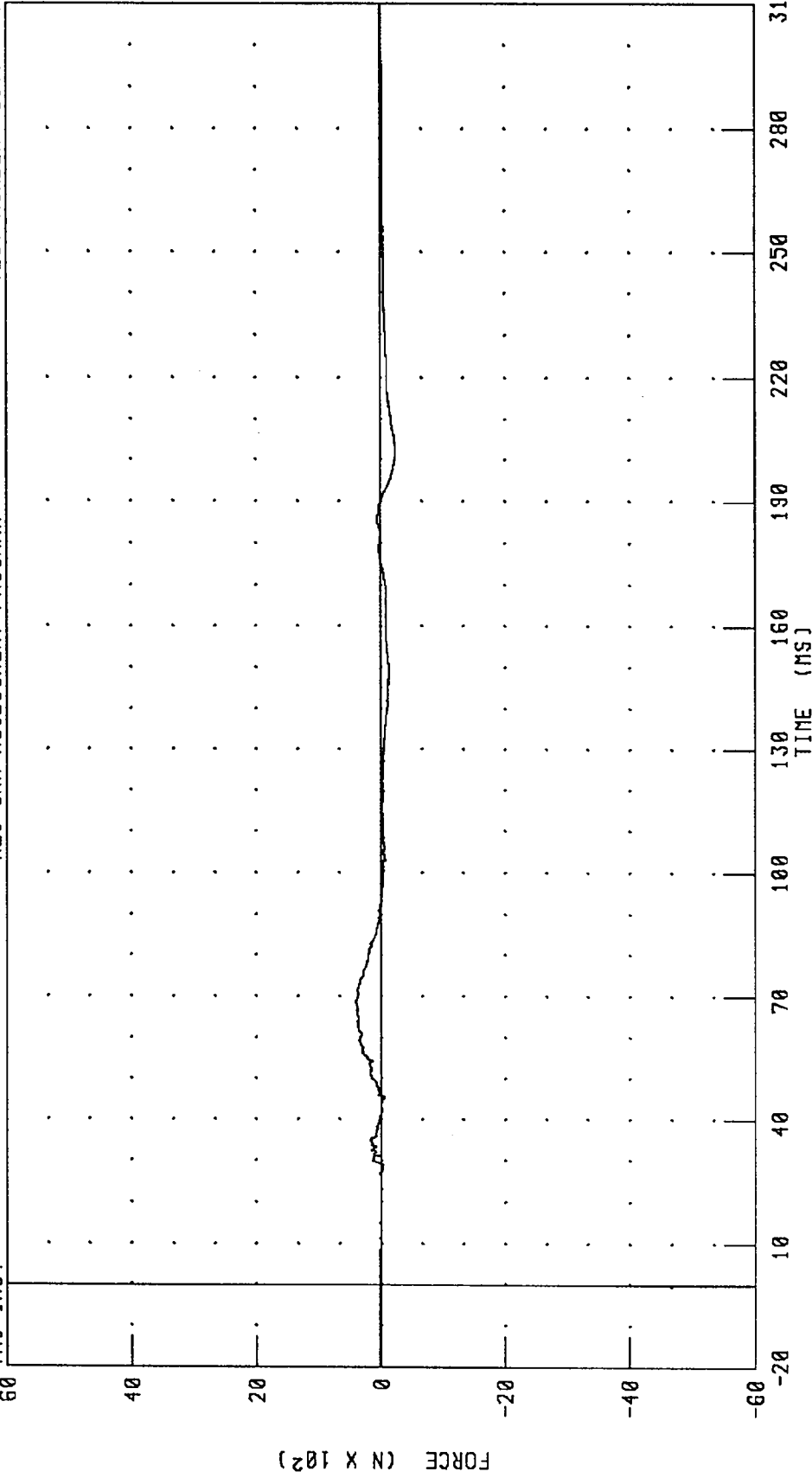
PEAK DATA: 846.25 N @ 54.64 MS; -305.08 N @ 31.68 MS

CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Y-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 403.09 N @ 68.48 MS; -231.90 N @ 201.04 MS

CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

60

40

20

0

-20

-40

-60

FORCE (N X 10²)

TIME (MS)

130

160

190

220

250

280

310

CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

PEAK DATA: 2392.88 N @ 61.68 MS; -718.13 N @ 145.20 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

180

120

60

0

-60

-120

-180

TORQUE (N·M)

310 280 250 220 190 160 130 100 70 40 10 TIME (MS)

PEAK DATA: 28.90 N·M @ 60.16 MS; -5.83 N·M @ 202.40 MS

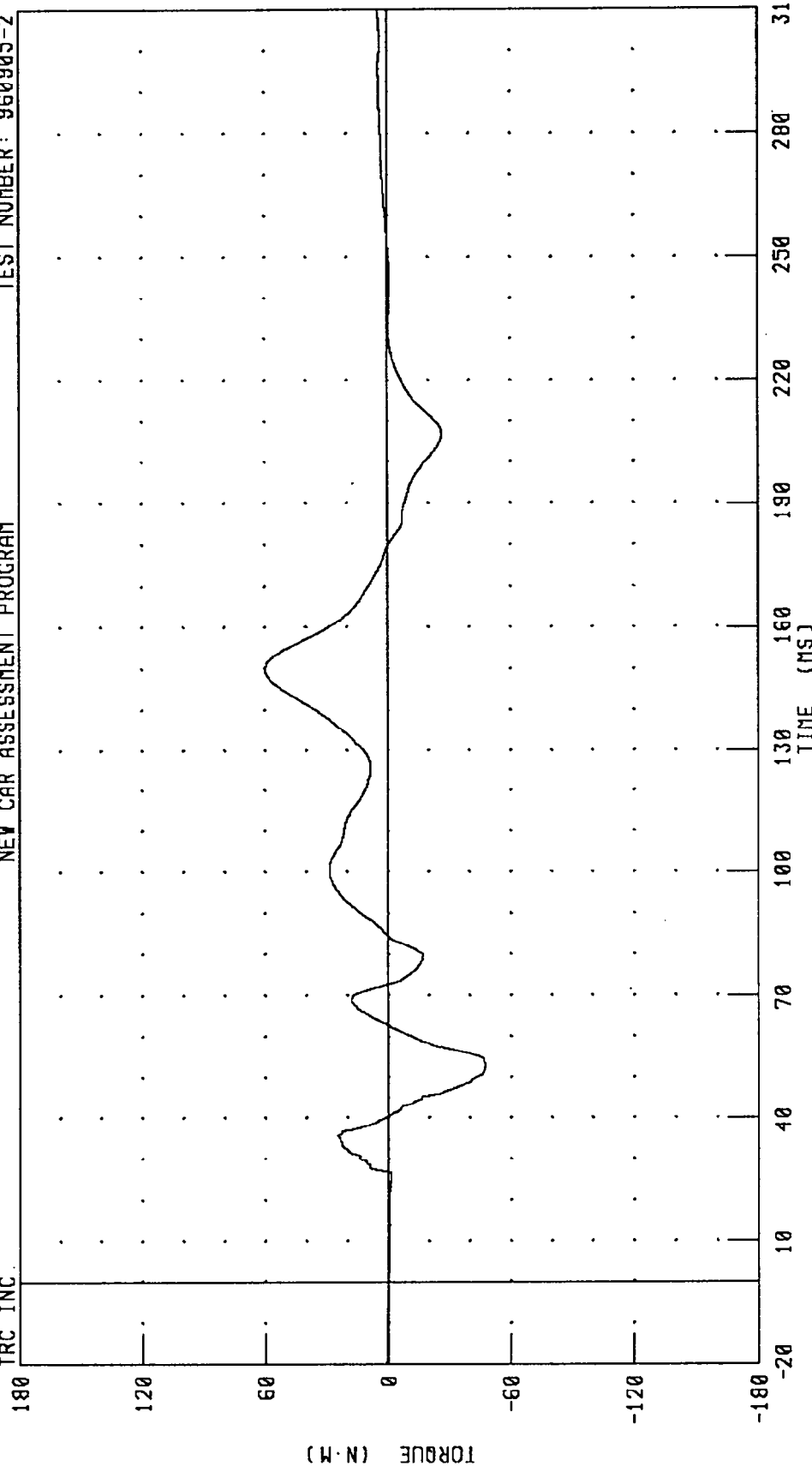
CHANNEL: NEKX2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: NEKYM2 FILTER: CH. CLASS 600

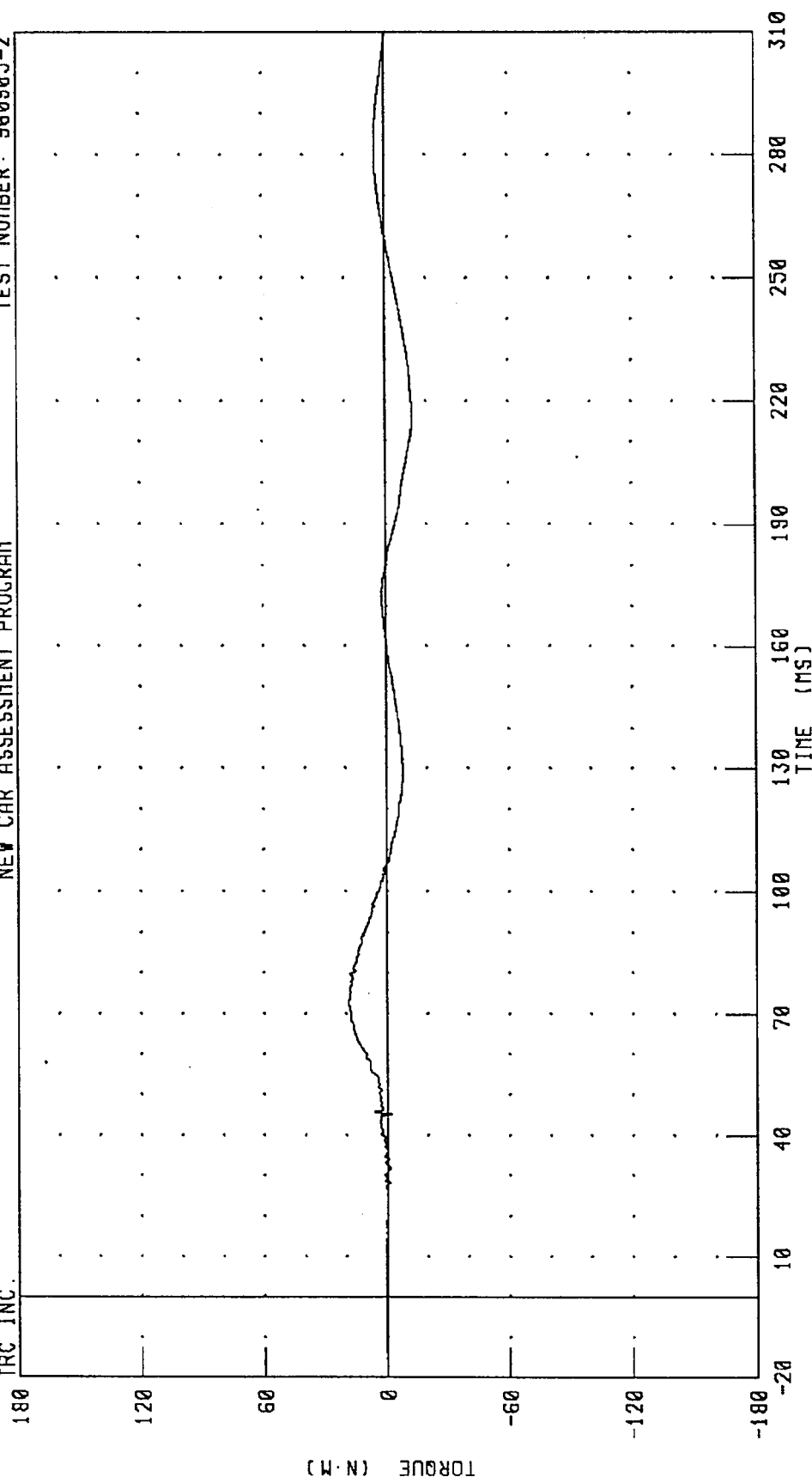
PEAK DATA: 60.06 N·M @ 150.16 MS; -47.65 N·M @ 52.72 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



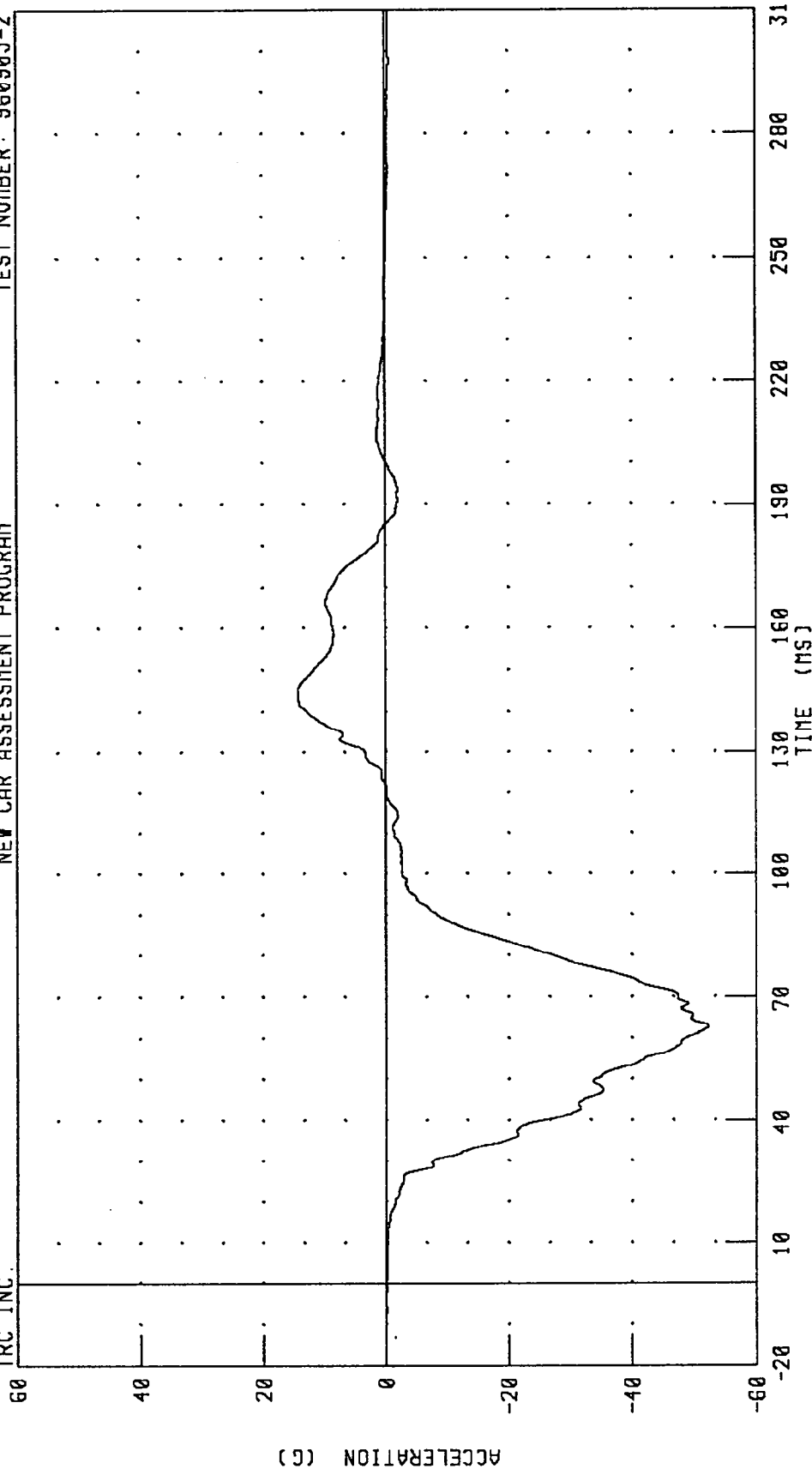
PEAK DATA: 18.83 N·M @ 72.56 MS, -13.35 N·M @ 214.96 MS

CHANNEL: NEKZM2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER CHEST X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



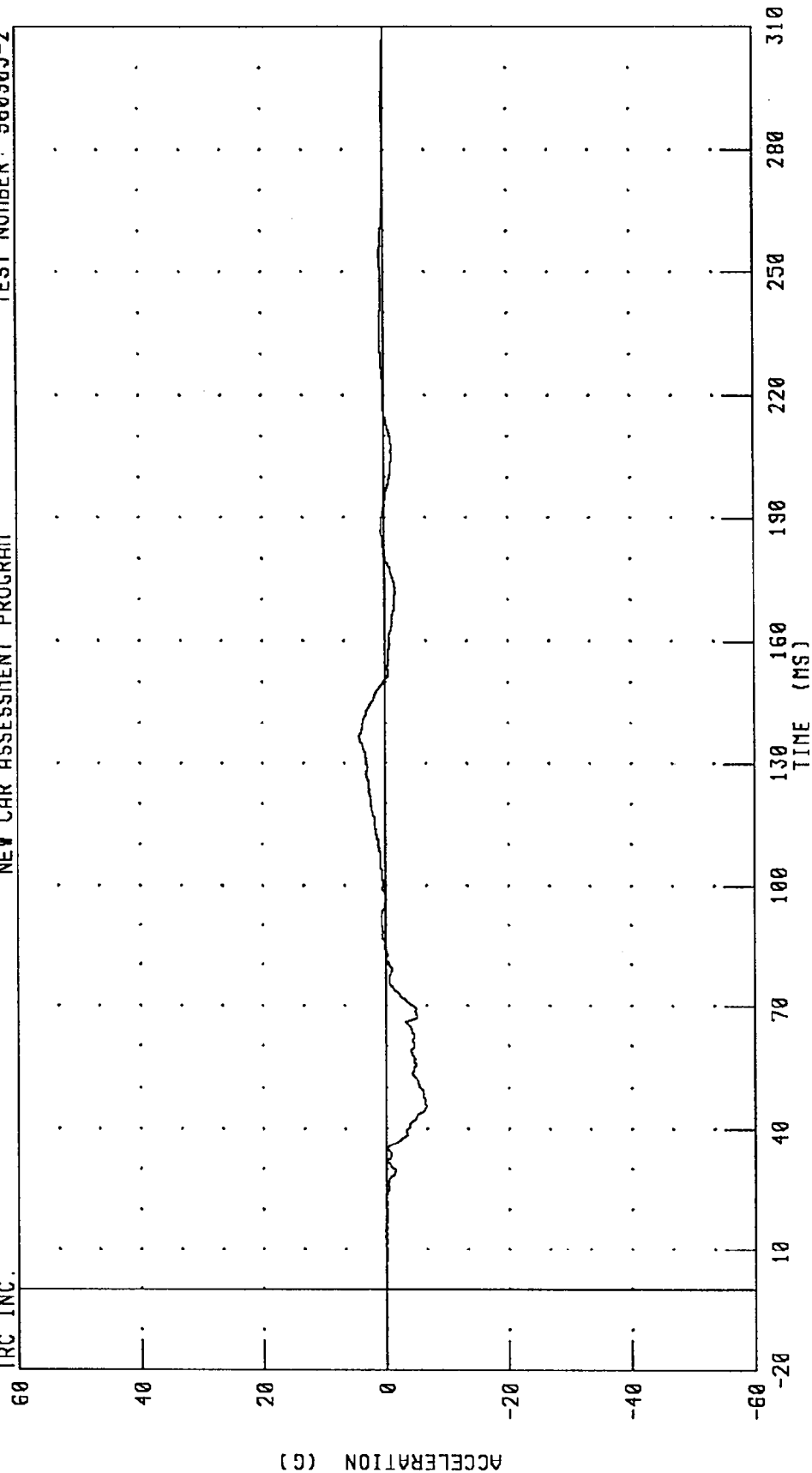
PEAK DATA: 14.30 G @ 144.96 MS; -52.37 G @ 62.88 MS

CHANNEL: CSTXG2 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

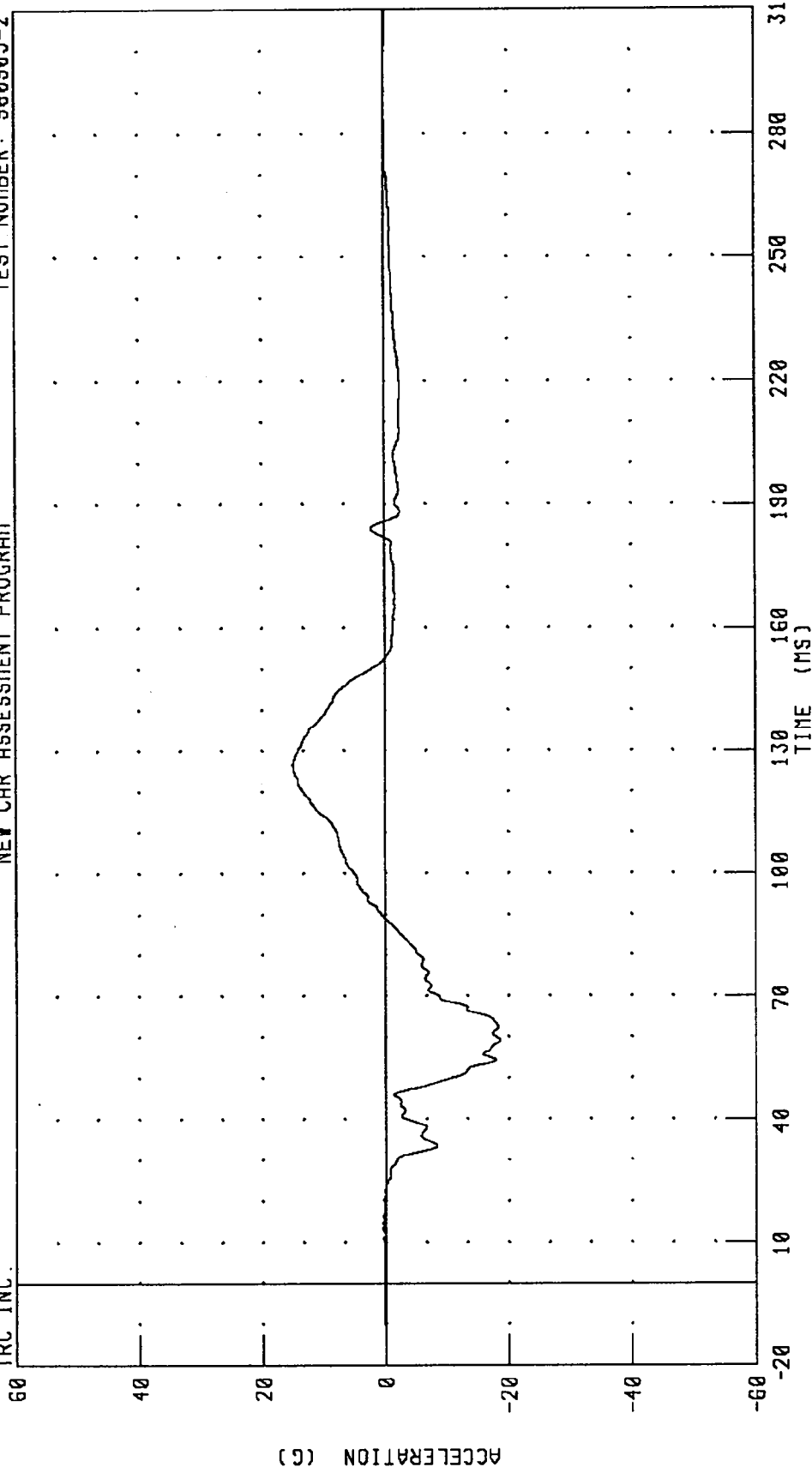


CHANNEL: CSTYG2 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 15.02 G @ 126.56 MS; -18.61 G @ 59.28 MS

CHANNEL: CSTZG2 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

120

100

80

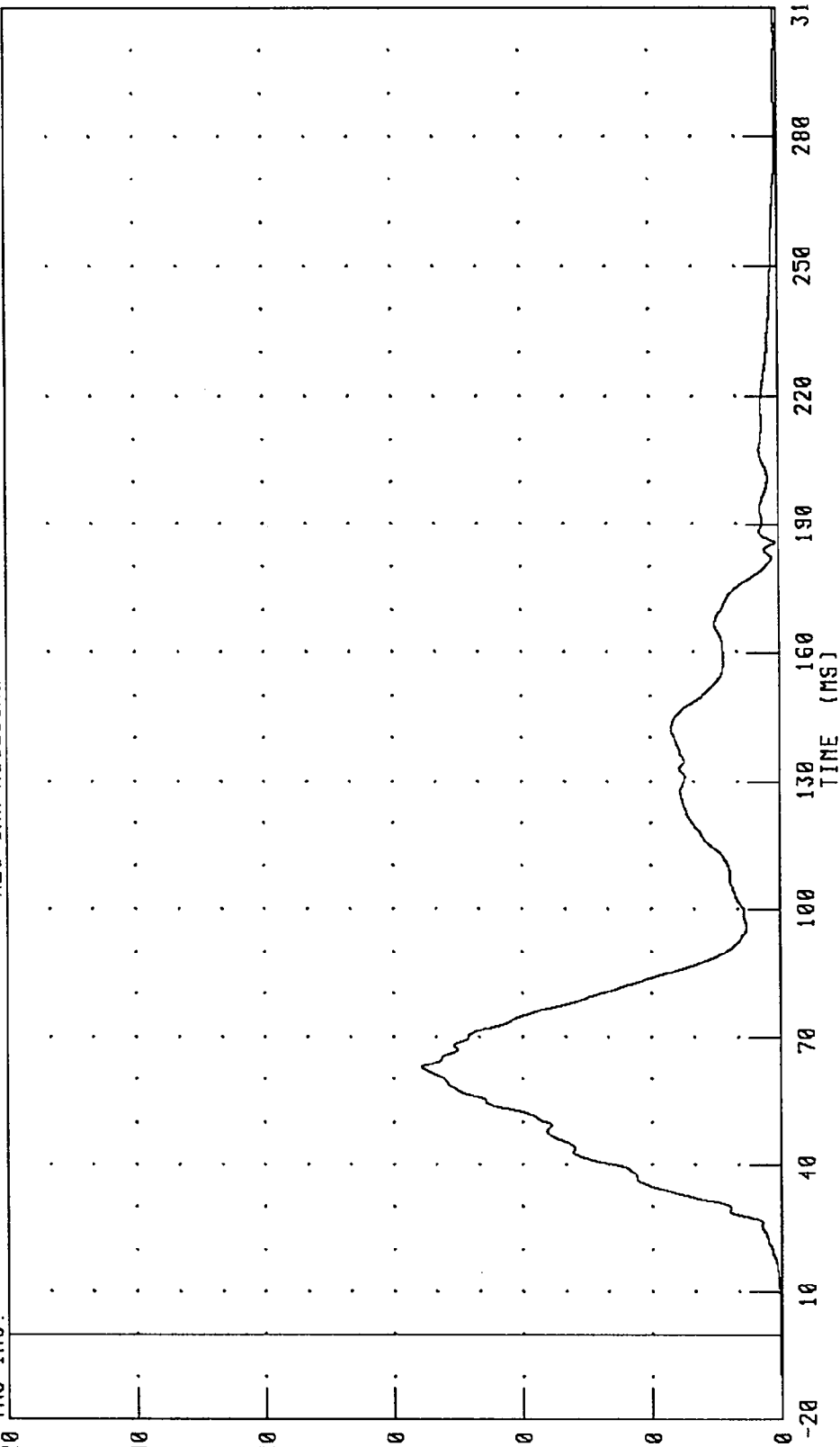
60

40

20

0

ACCELERATION (G)



TIME (MS)

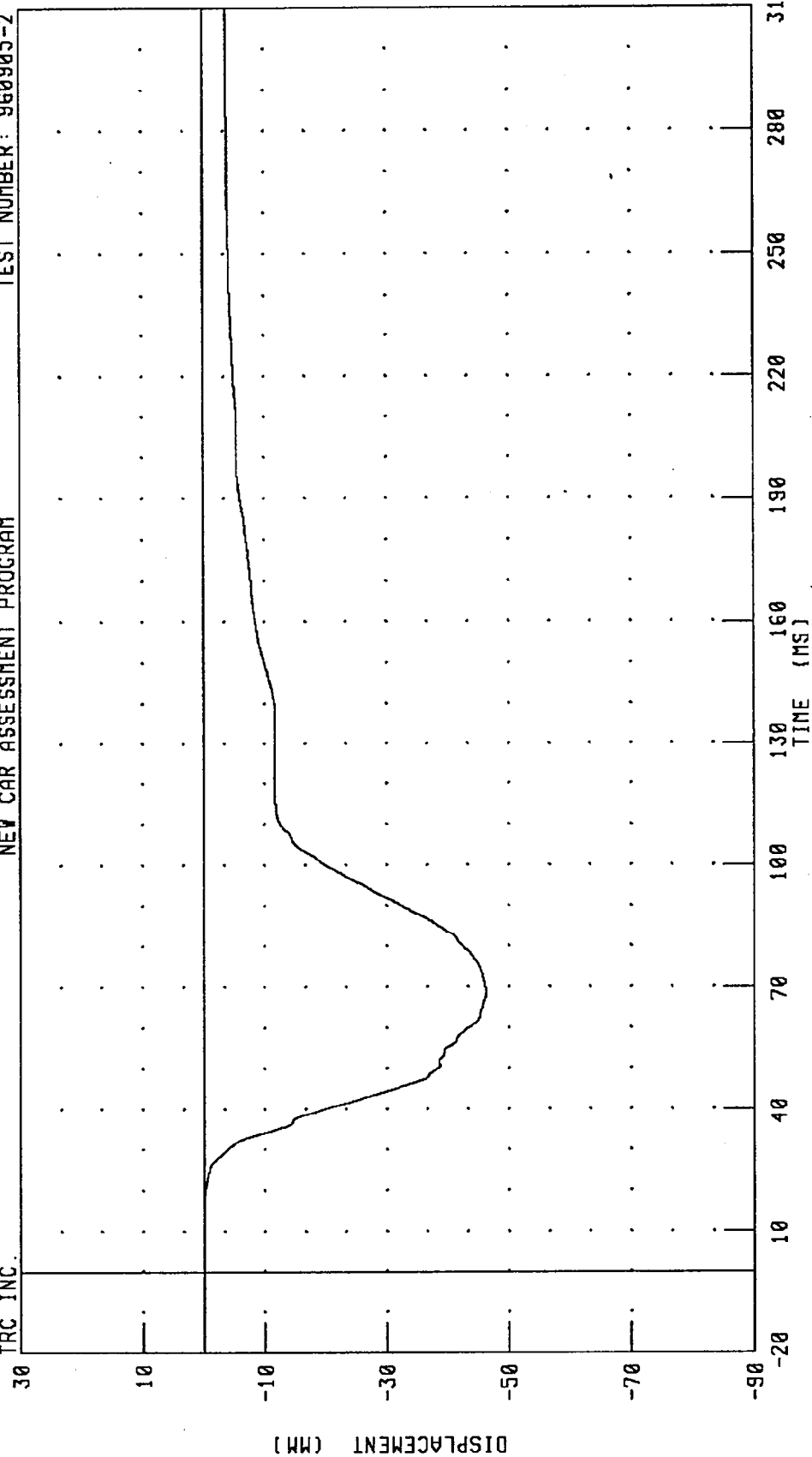
PEAK DATA: 55.62 G @ 62.88 MS; 0.01 G @ -20.00 MS

CHANNEL: CSTRG2 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

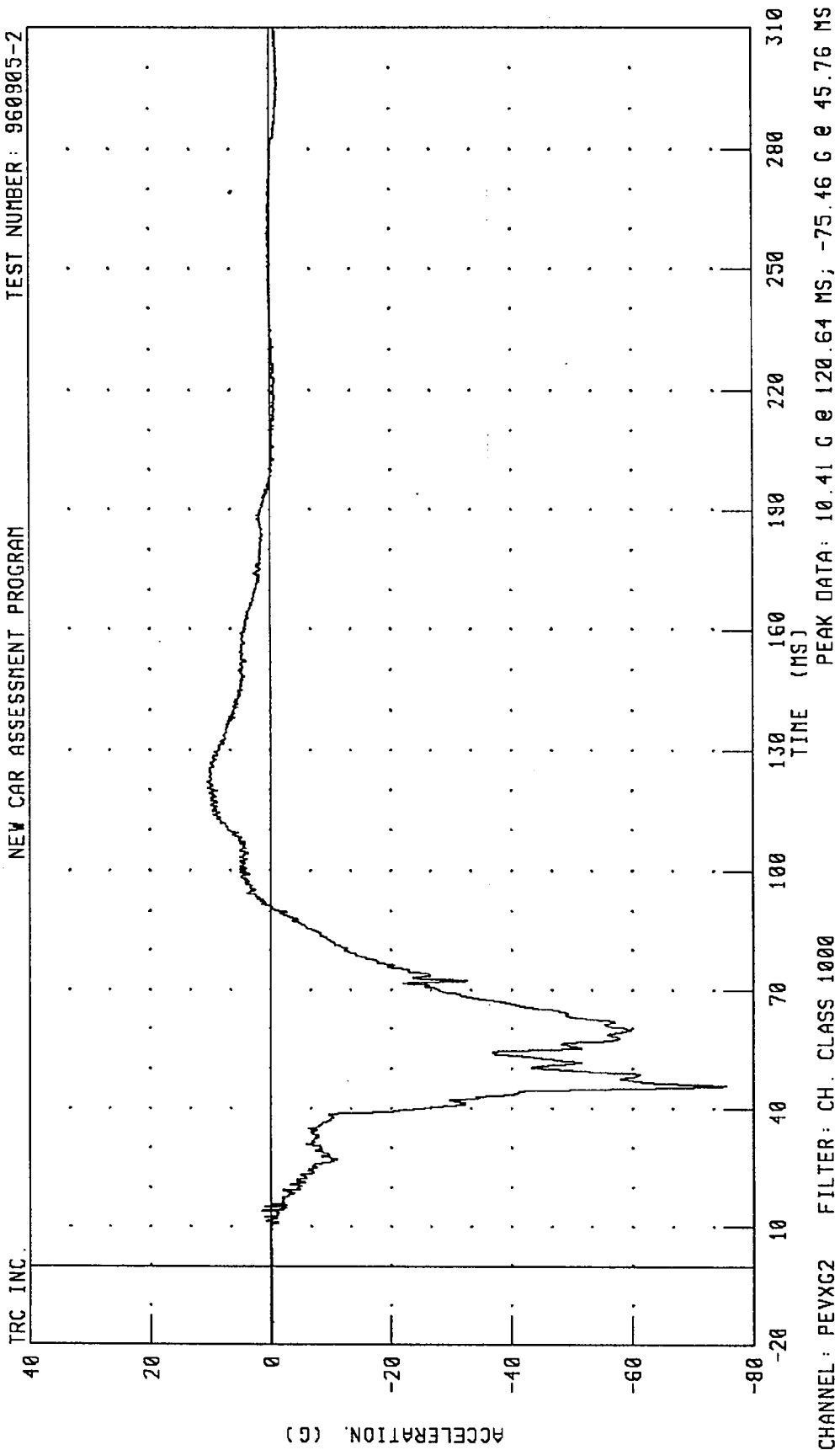


PEAK DATA: 0.02 MM @ 13.44 MS; -46.22 MM @ 68.40 MS

CHANNEL: CSTXD2 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 PASSENGER PELVIS X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



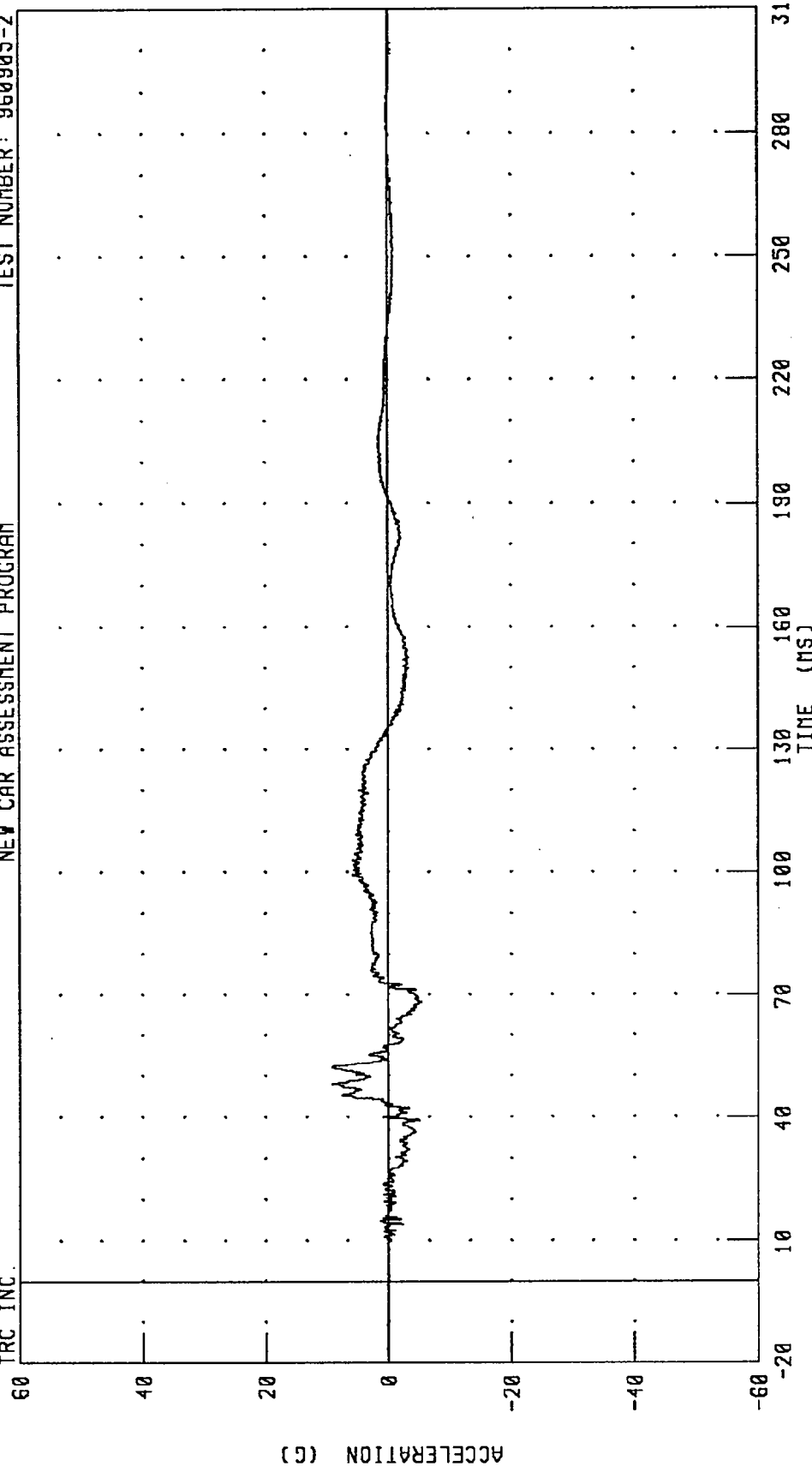
CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

PEAK DATA: 10.41 G @ 120.64 MS; -75.46 G @ 45.76 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 9.18 G @ 48.00 MS; -5.35 G @ 68.16 MS

CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

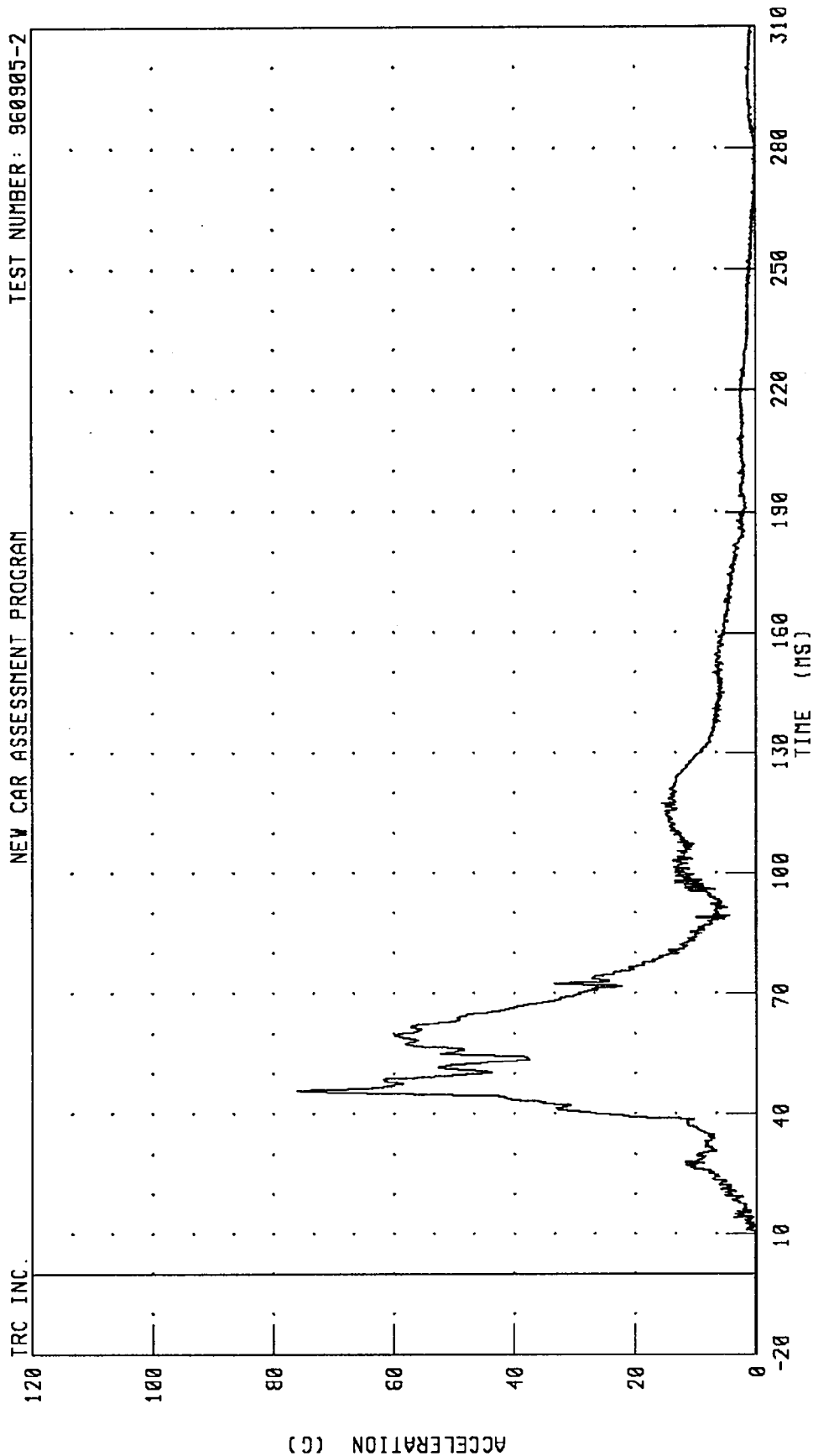
PEAK DATA: 12.10 G @ 52.08 MS; -4.40 G @ 167.60 MS

CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



PEAK DATA: 76.14 G @ 45.84 MS; 0.09 G @ -19.52 MS

CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

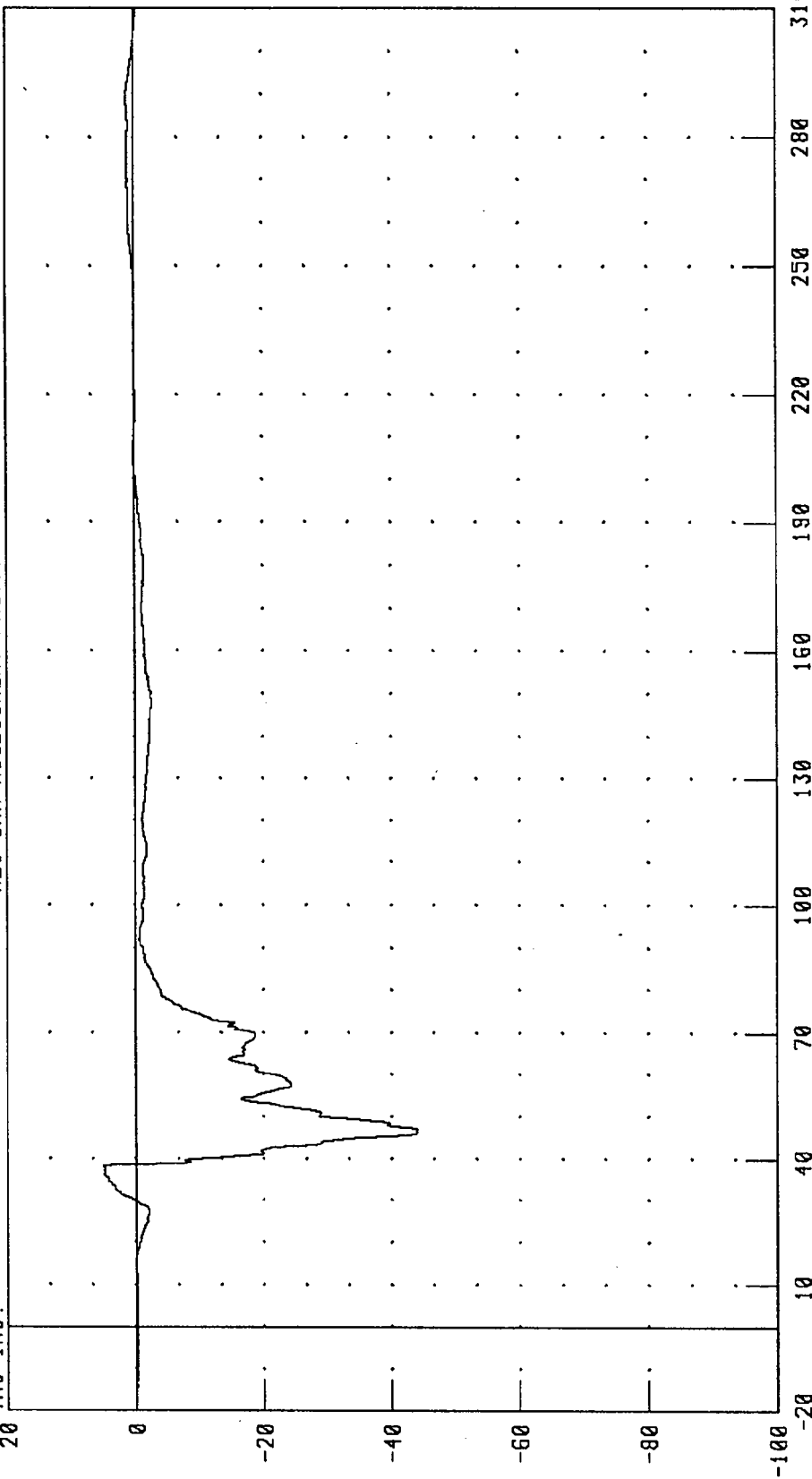
1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

20

FORCE (N X 10²)



PEAK DATA: 507.79 N @ 38.32 MS; -4413.36 N @ 46.80 MS

CHANNEL: LFMF2 FILTER: CH. CLASS 600

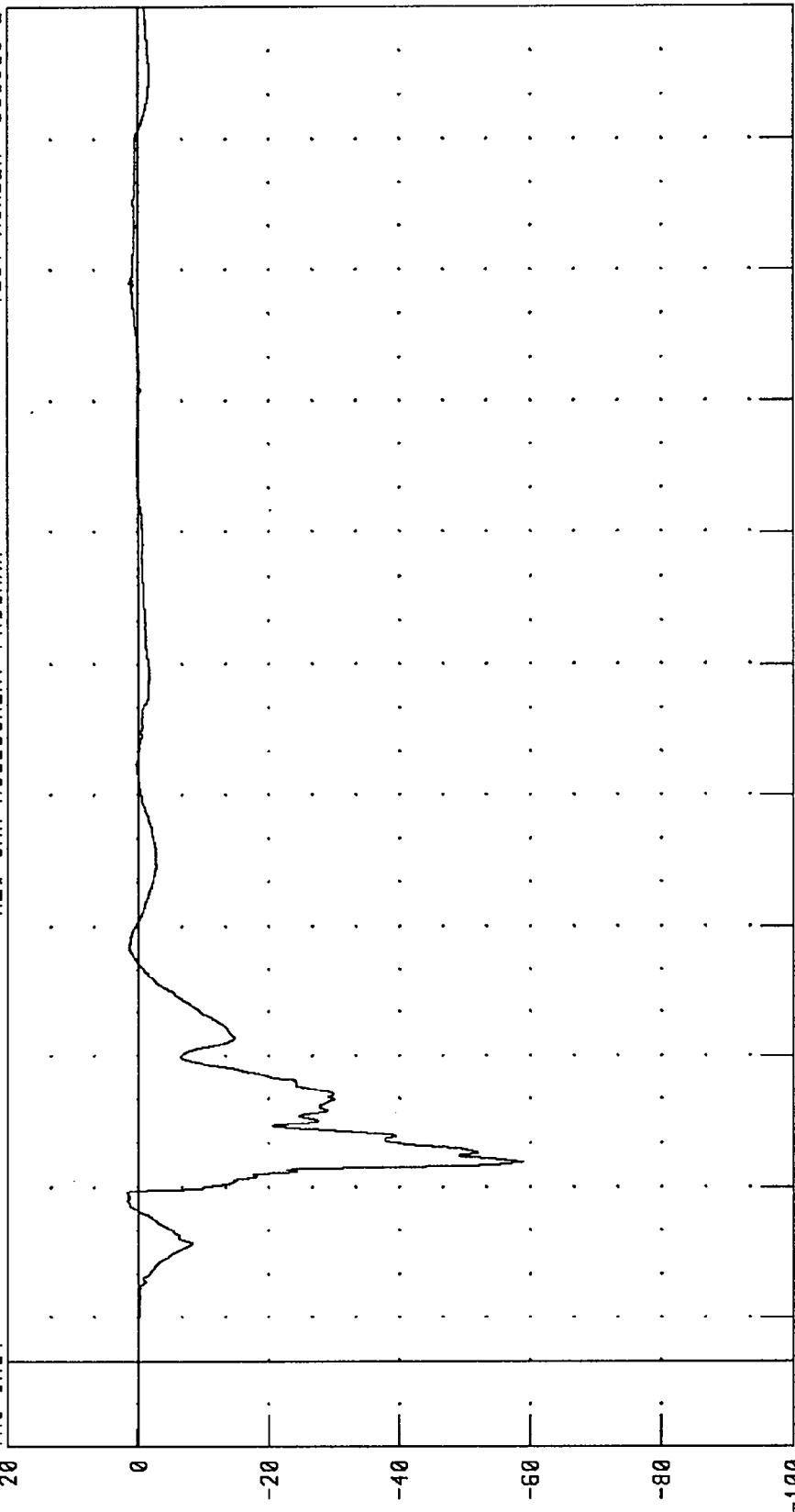
1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

20

FORCE (N X 10²)



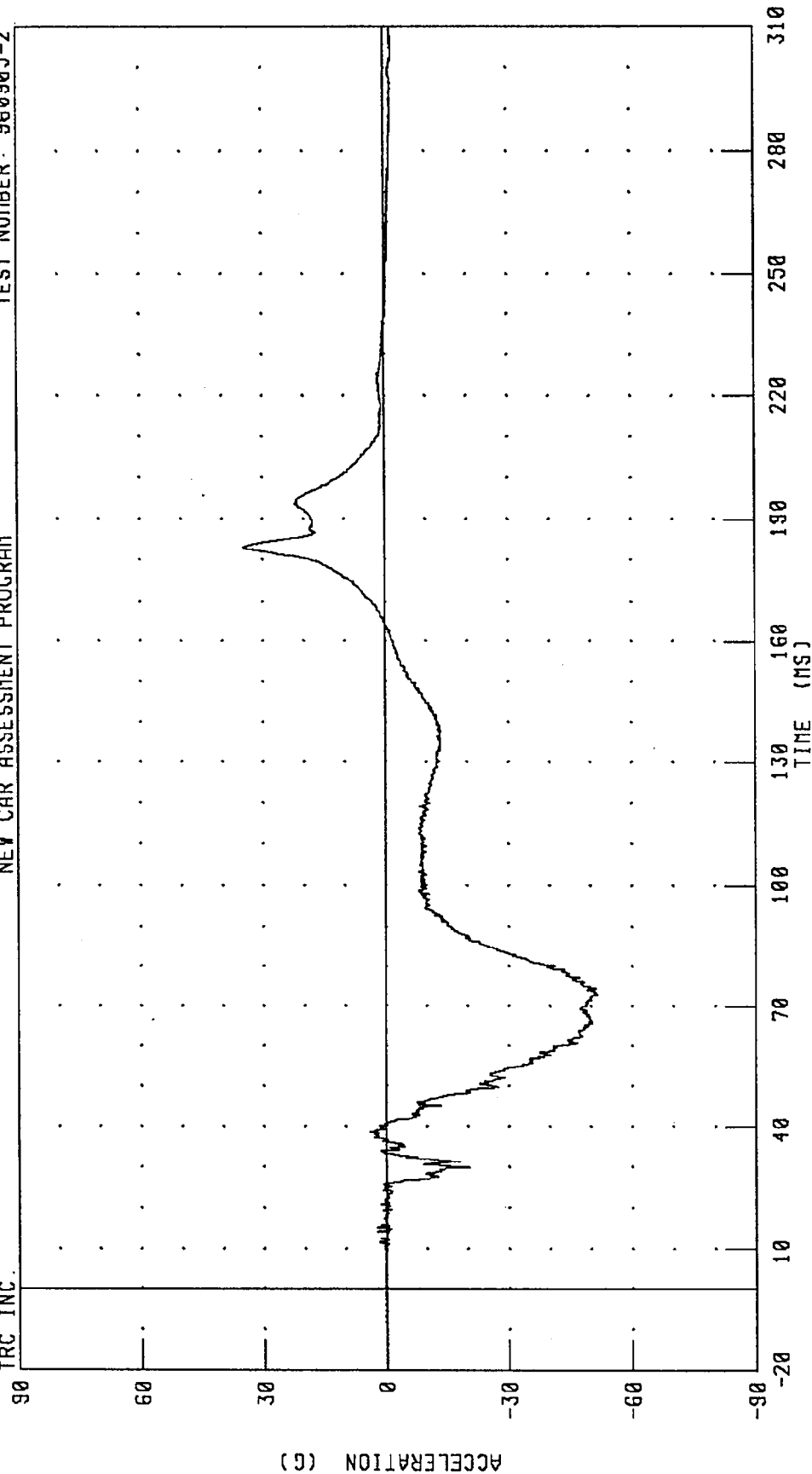
TIME (MS) 310 280 250 220 190 160 130 100 70 40 10
PEAK DATA: 168.41 N @ 38.96 MS; -5889.80 N @ 45.76 MS

CHANNEL: RFMF2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: HEDXR2 FILTER: CH. CLASS 1000

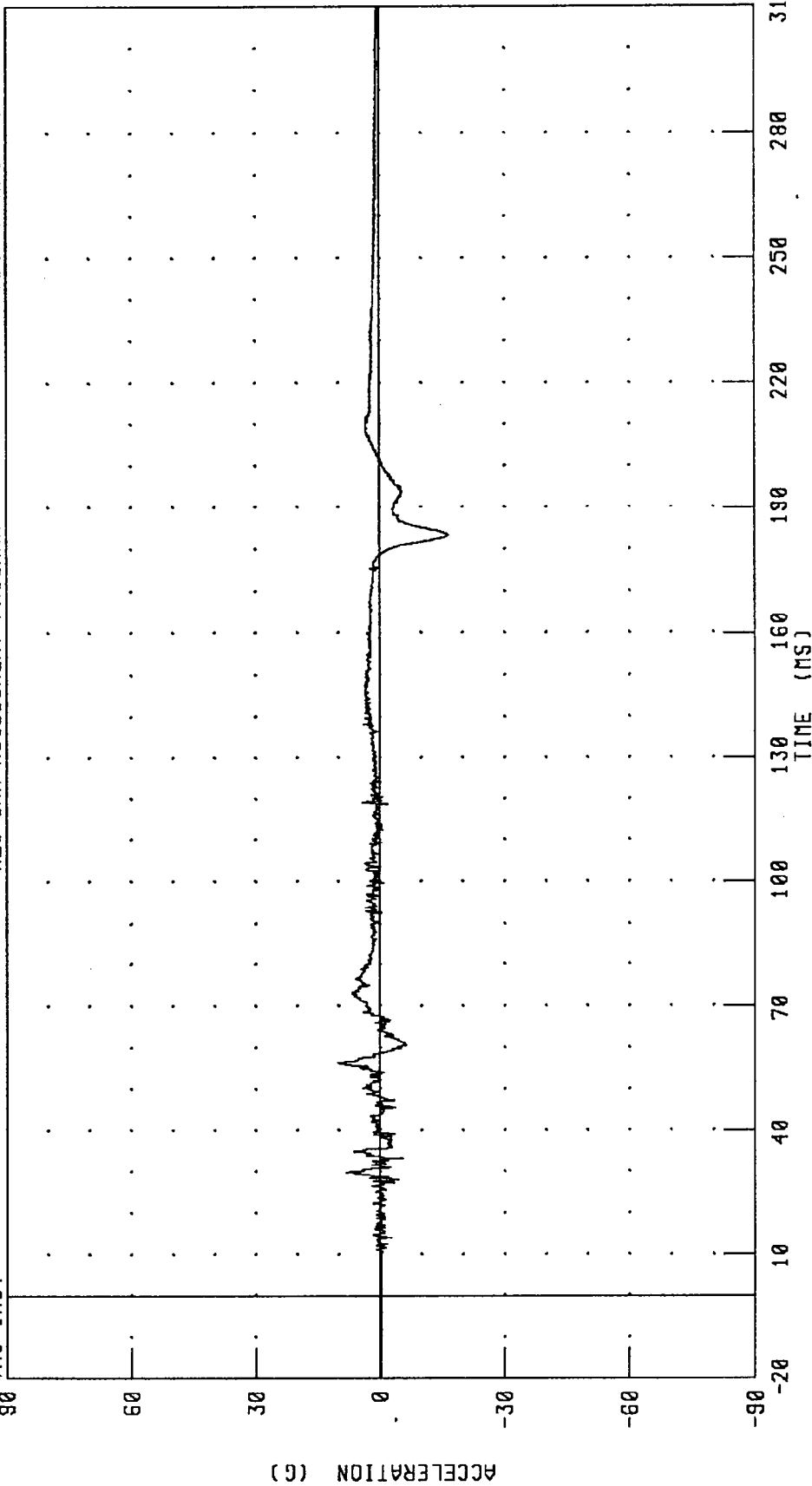
PEAK DATA: 34.80 G @ 182.96 MS; -51.45 G @ 72.88 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: HEDYR2 FILTER: CH. CLASS 1000

PEAK DATA: 10.08 G @ 56.24 MS; -16.62 G @ 183.44 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

90

60

30

0

-30

-60

-90

ACCELERATION (G)

TIME (MS)

130

160

190

220

250

280

310

20

40

70

100

PEAK DATA: 17.41 G @ 146.16 MS; -44.50 G @ 62.72 MS

CHANNEL: HEDZR2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

120

100

80

60

40

20

0

ACCELERATION (G)

TIME (MS)

100

130

160

190

220

250

280

310

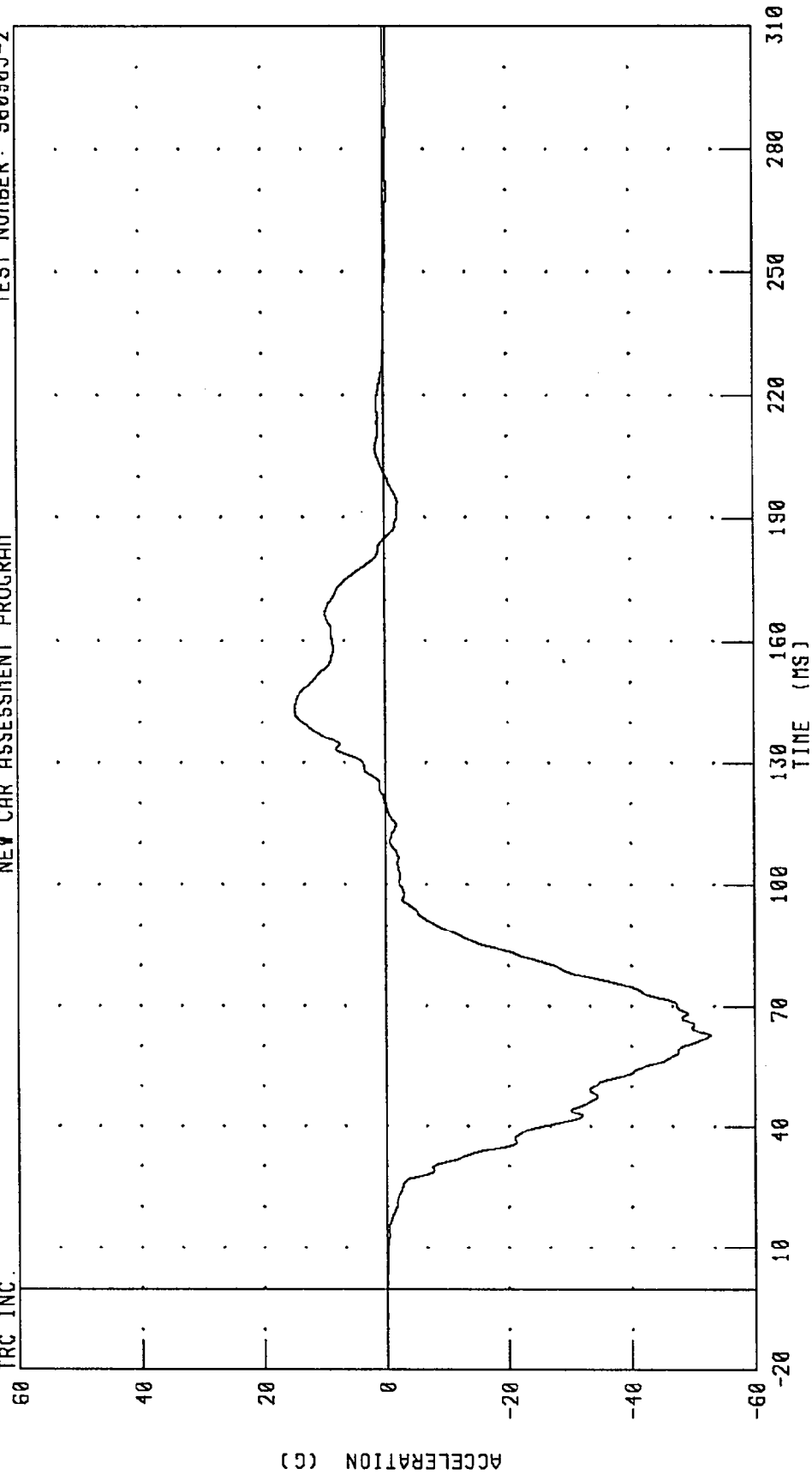
PEAK DATA: 65.17 G @ 62.56 MS; 0.00 G @ 20.56 MS

CHANNEL: HEDRR2 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: CSTXR2 FILTER: CH. CLASS 180

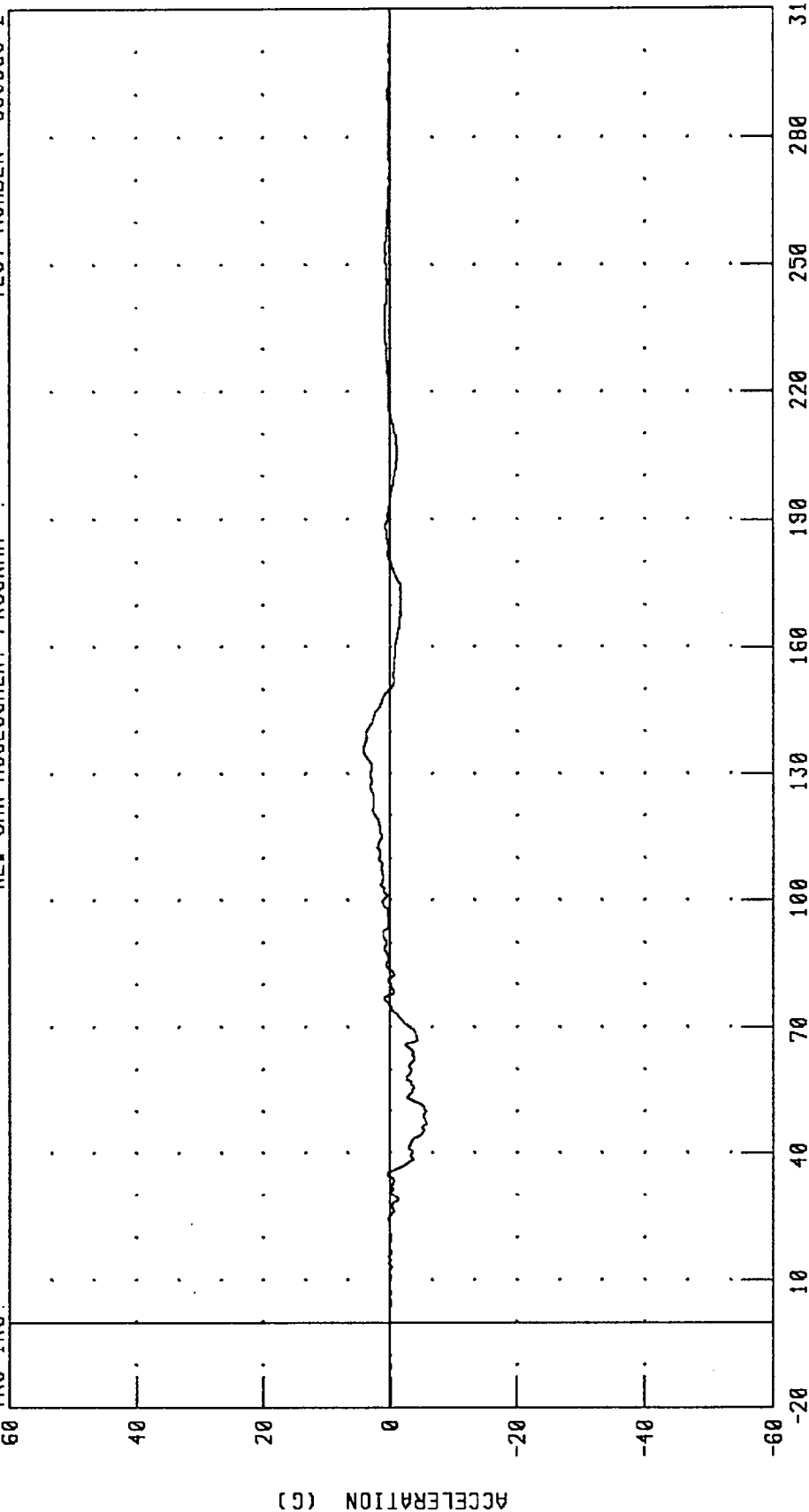
PEAK DATA: 14.80 G @ 142.72 MS; -52.84 G @ 62.88 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION - REDUNDANT

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: CSTYR2 FILTER: CH. CLASS 180

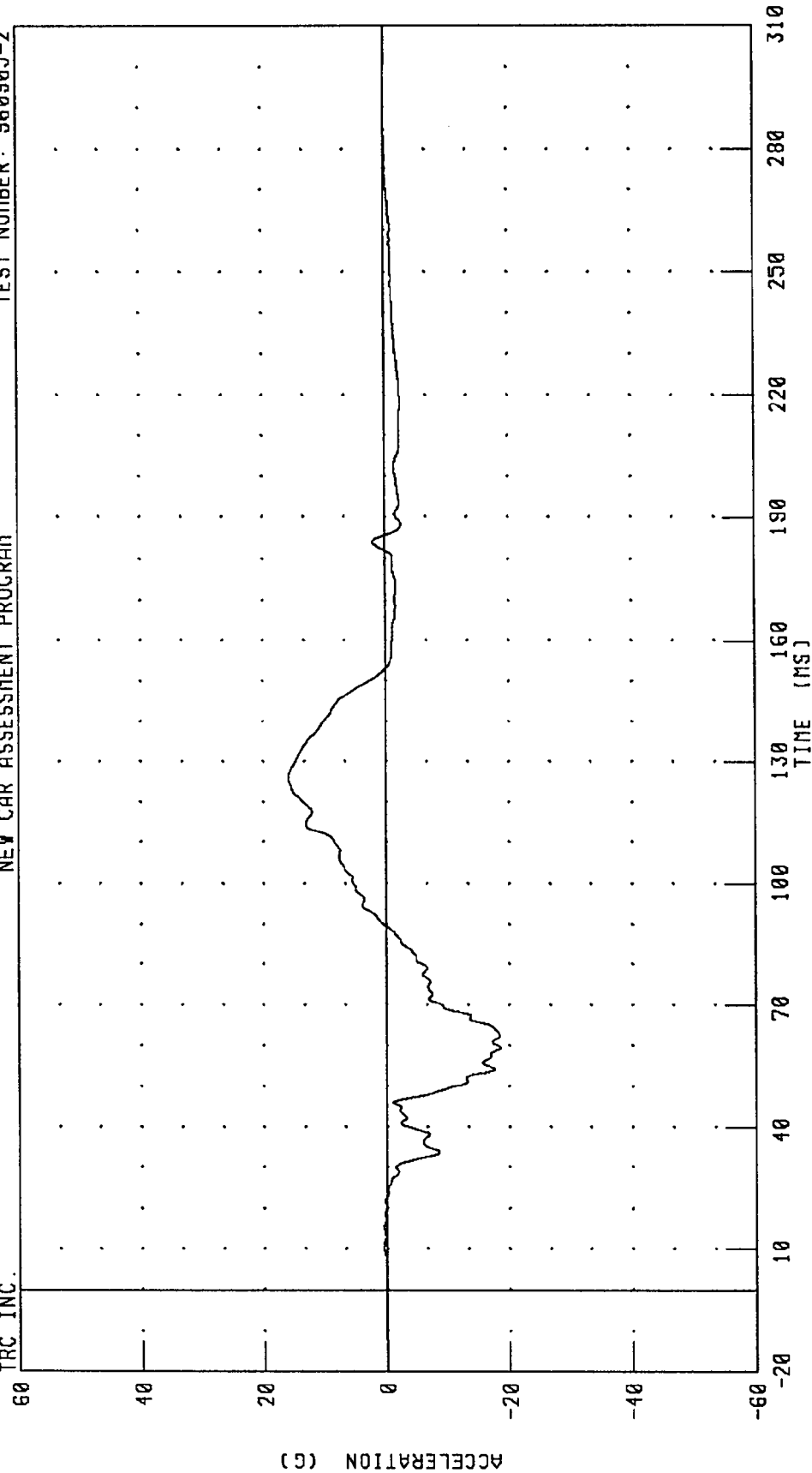
PEAK DATA: 4.14 G @ 135.36 MS; -5.77 G @ 17.20 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: CSTZR2 FILTER: CH. CLASS 180

PEAK DATA: 15.92 G @ 126.64 MS; -18.64 G @ 59.44 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION - REDUNDANT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

120

100

80

60

40

20

0

ACCELERATION (G)

-20 10 40 70 100 130 160 190 220 250 280 310
TIME (MS)

CHANNEL: CSTR2 FILTER: CH. CLASS 180

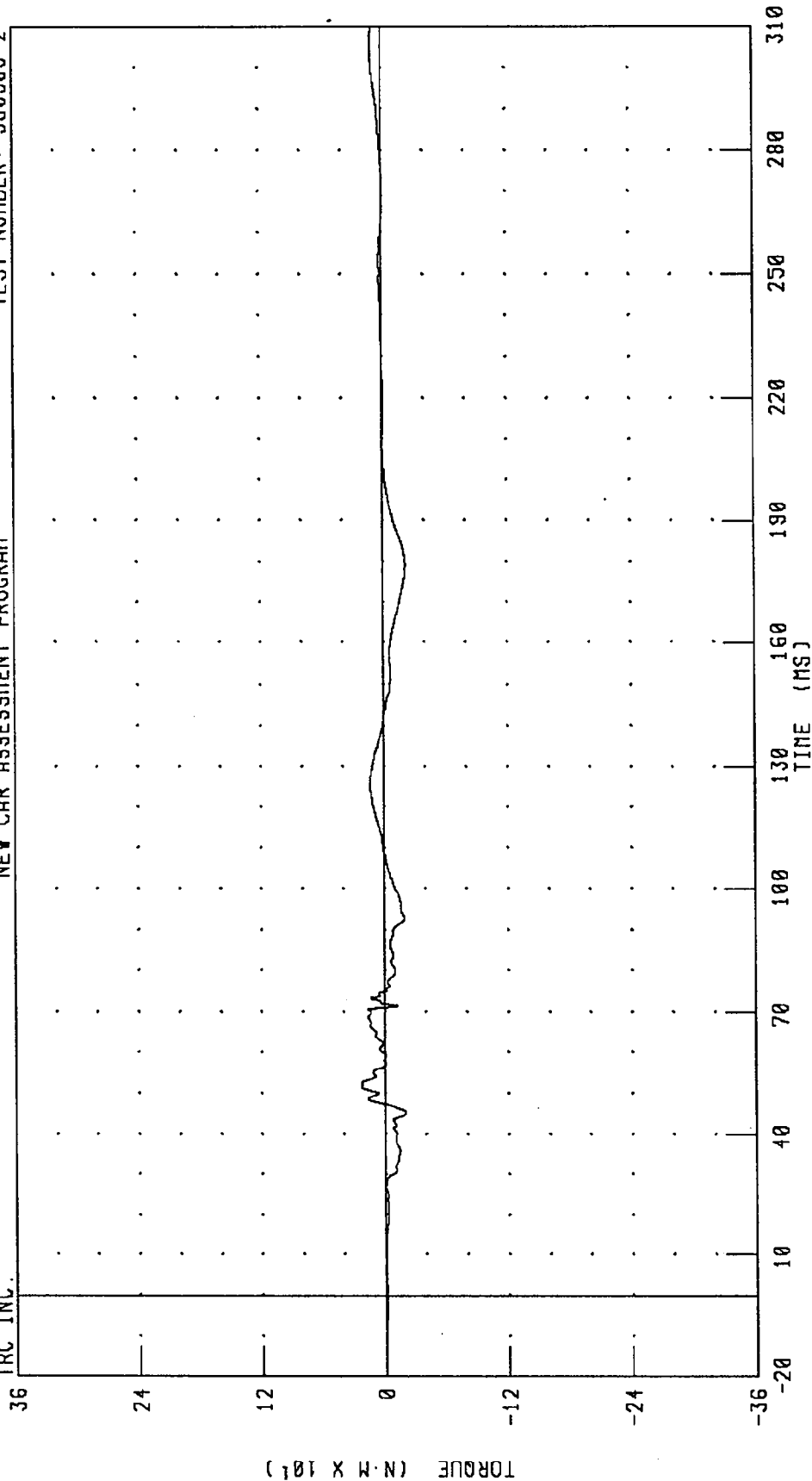
PEAK DATA: 56.08 G @ 62.88 MS; 0.01 G @ -20.00 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 22.77 N·m @ 51.52 MS; -21.83 N·m @ 179.04 MS

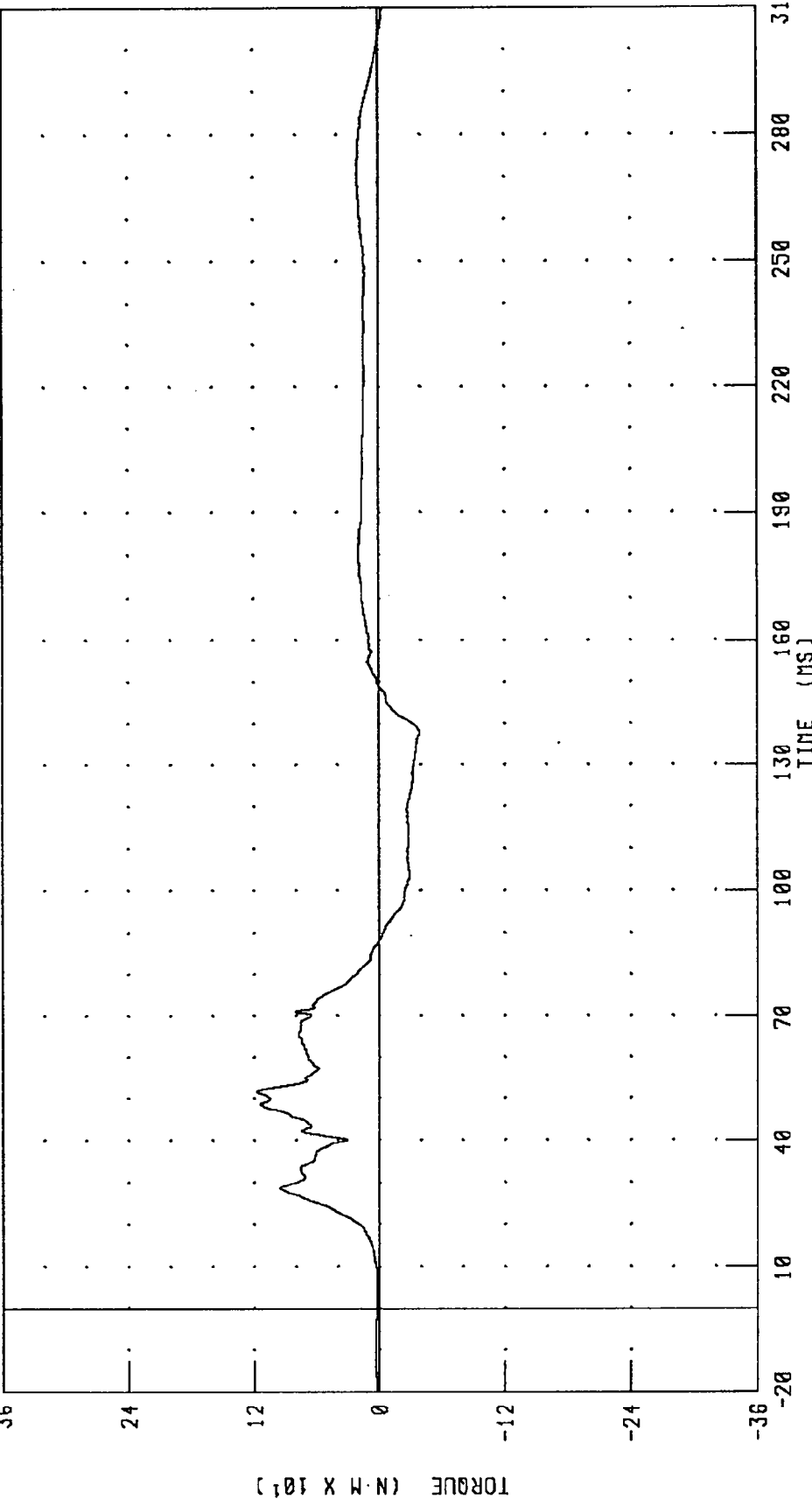
CHANNEL: TBLXM2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: TBLYM2 FILTER: CH. CLASS 600

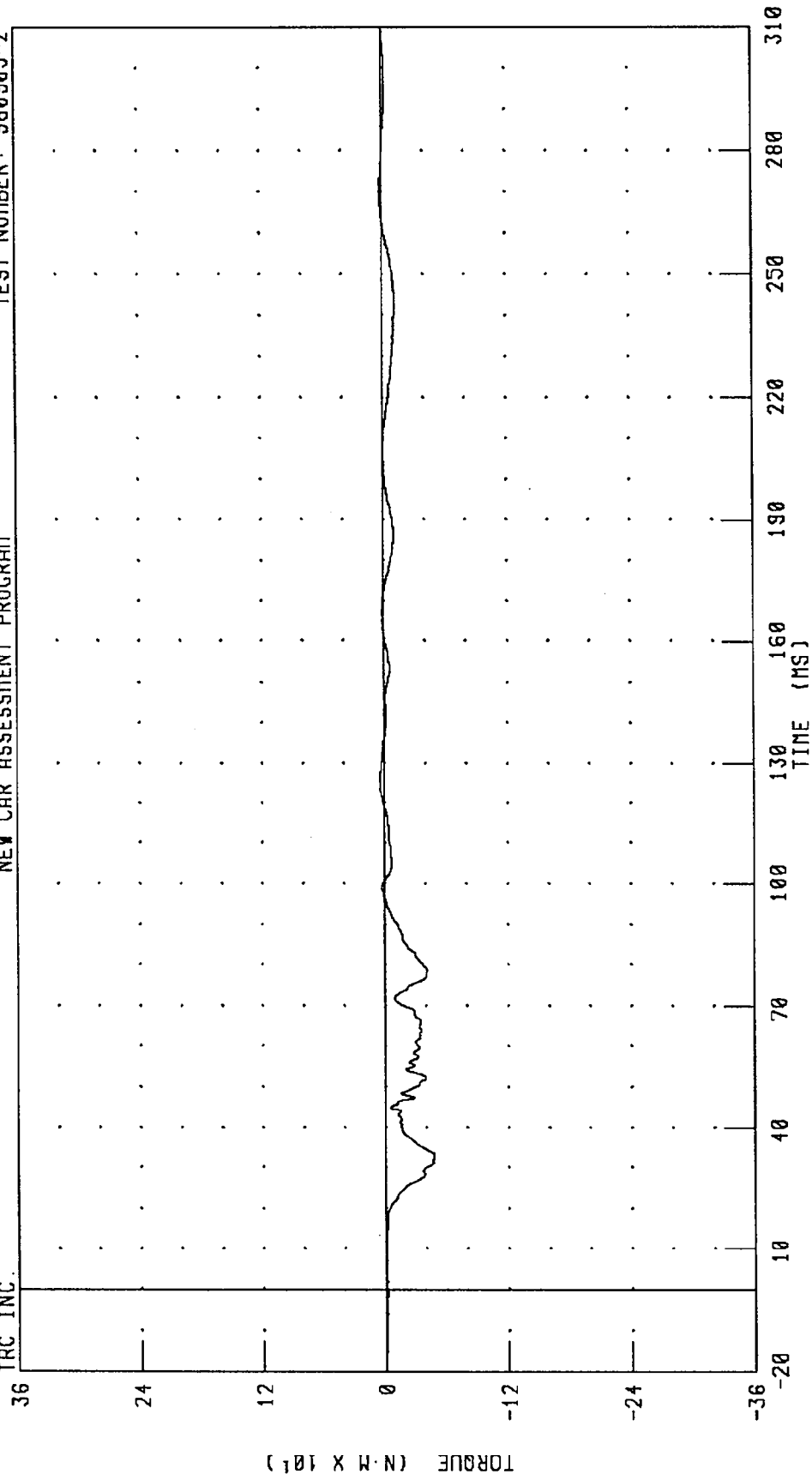
PEAK DATA: 117.60 N·m @ 51.60 MS; -38.37 N·m @ 138.00 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 4.48 N-M @ 125.12 MS; -47.45 N-M @ 32.88 MS

CHANNEL: TBRXM2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

36

24

12

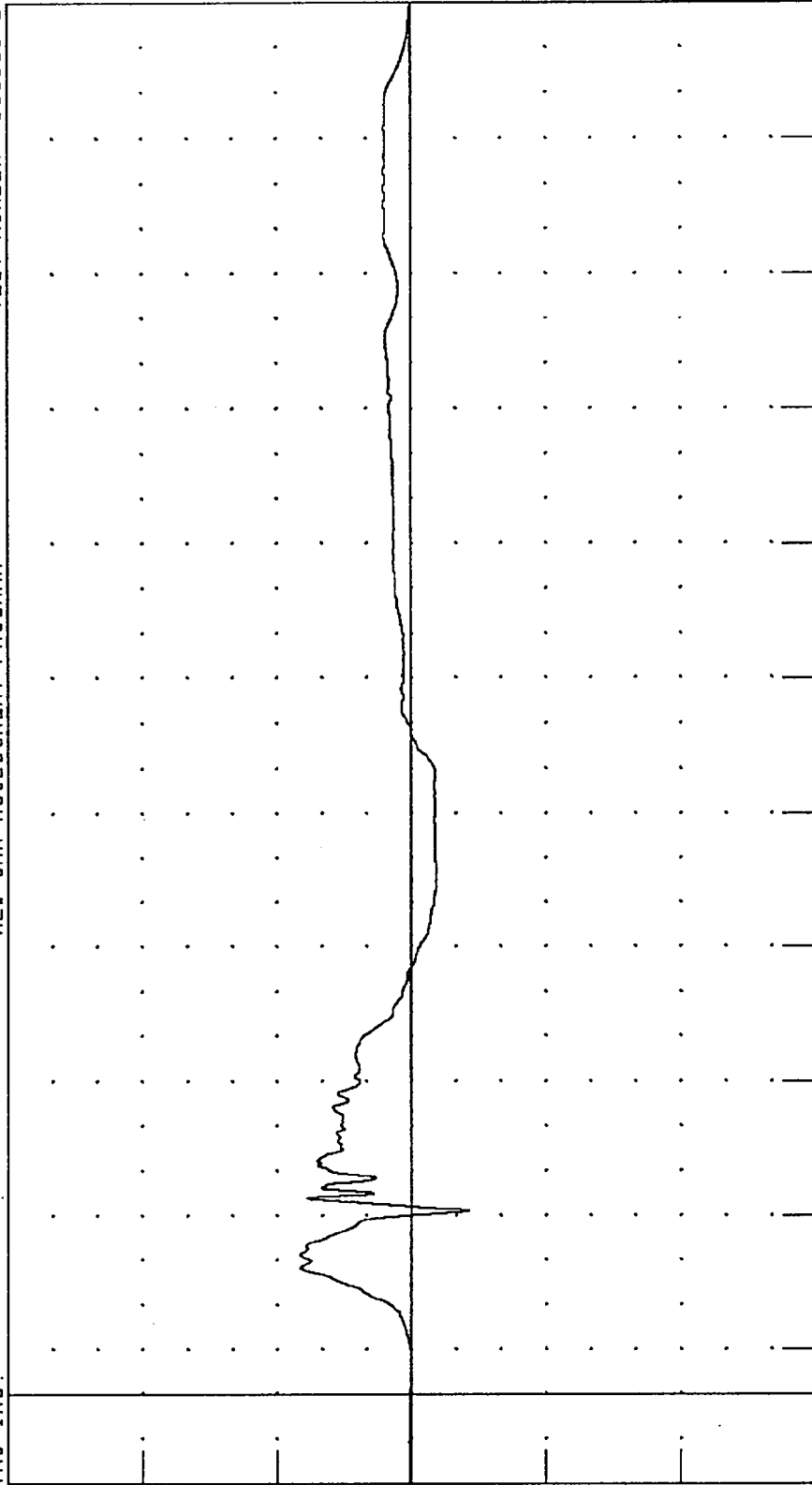
0

-12

-24

-36

TORQUE (N·M X 10¹)



TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

PEAK DATA: 99.88 N·M @ 31.28 MS; -50.72 N·M @ 41.12 MS

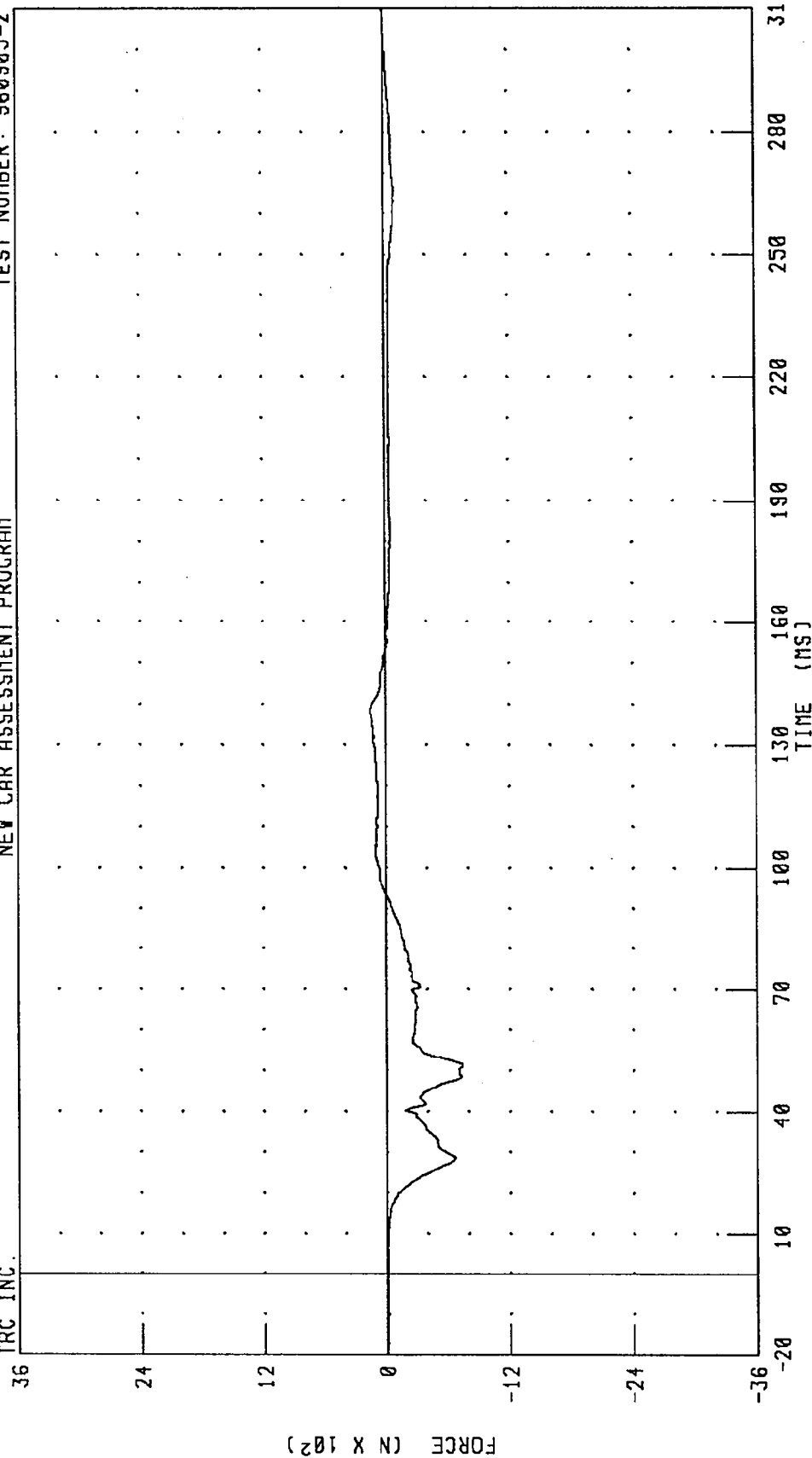
CHANNEL: TORYM2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA X-AXIS FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 152.33 N @ 138.56 MS; -740.69 N @ 51.28 MS

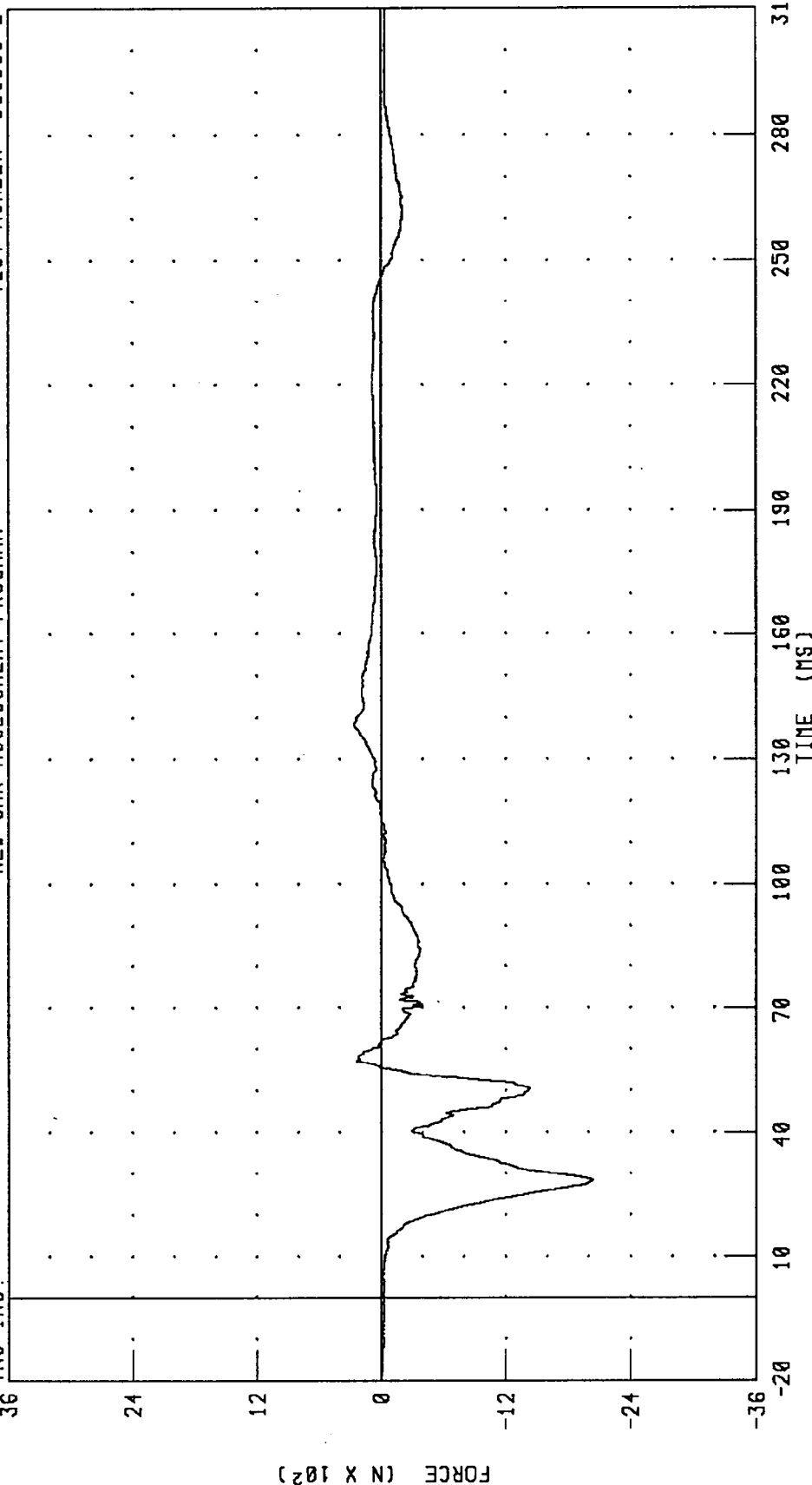
CHANNEL: ANLXF2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA Z-AXIS FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: ANLZF2 FILTER: CH. CLASS 600

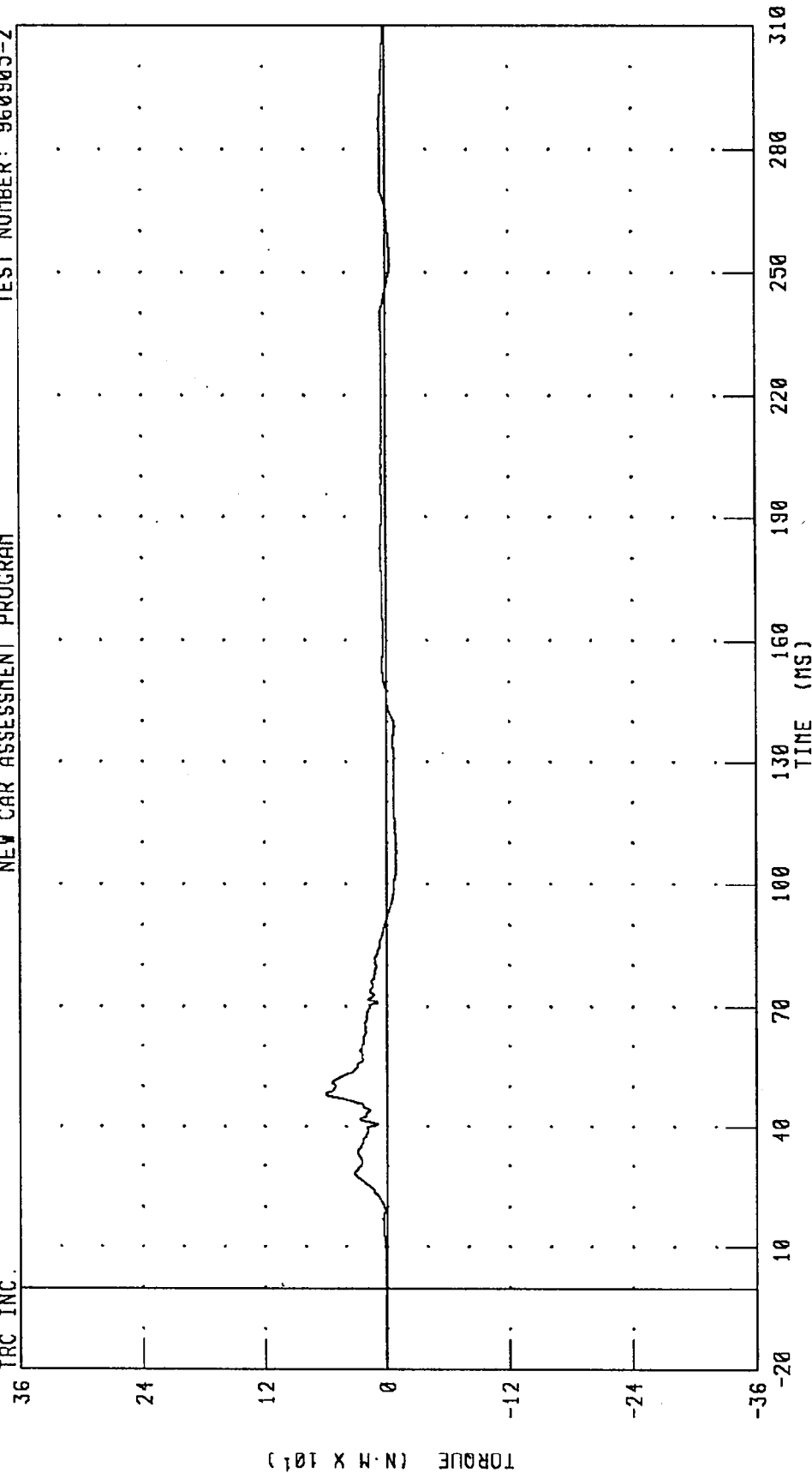
PEAK DATA: 254.83 N @ 138.32 MS; -2041.06 N @ 28.40 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 60.38 N·m @ 48.16 ms; -9.63 N·m @ 107.84 ms

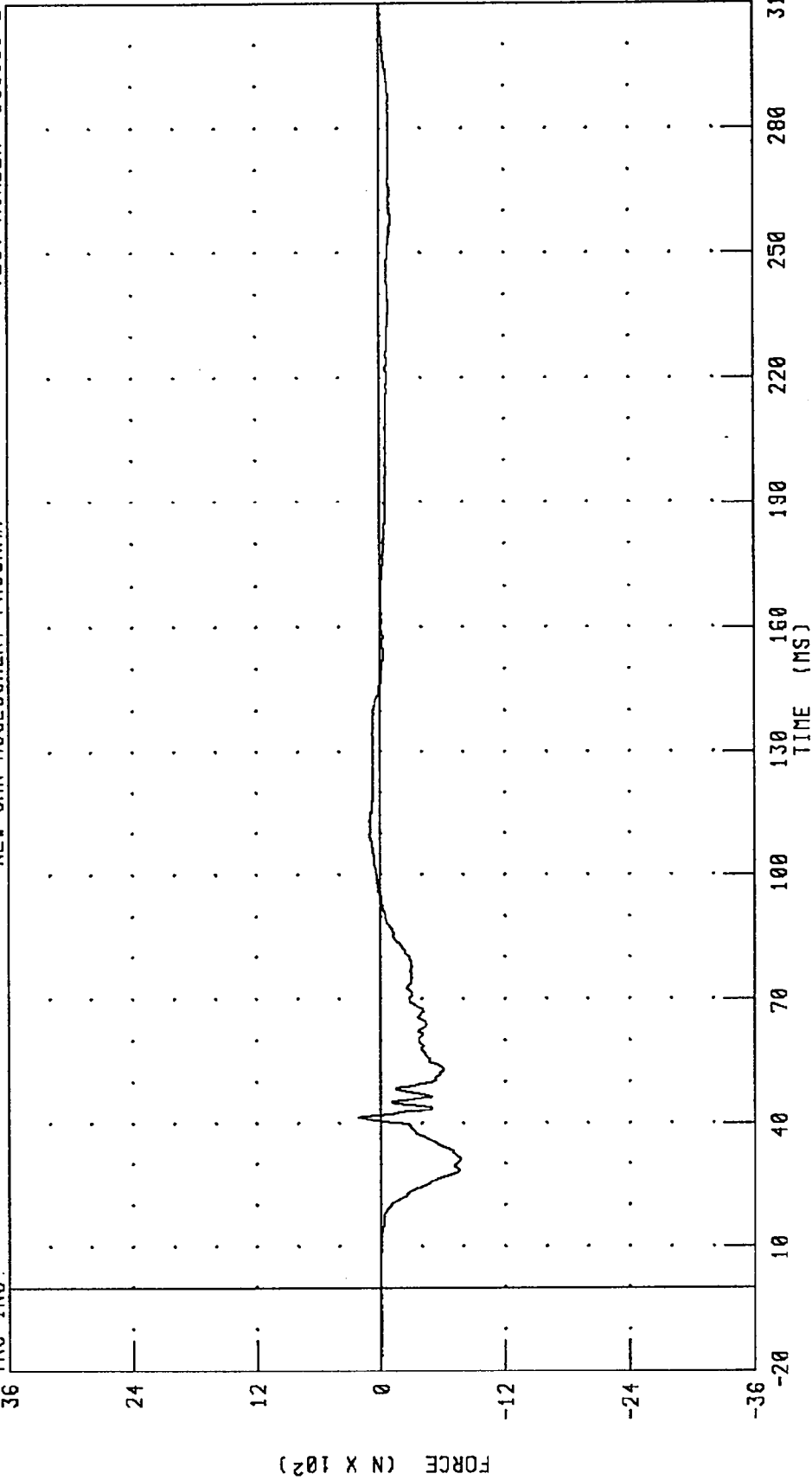
CHANNEL: ANLYM2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA X-AXIS FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



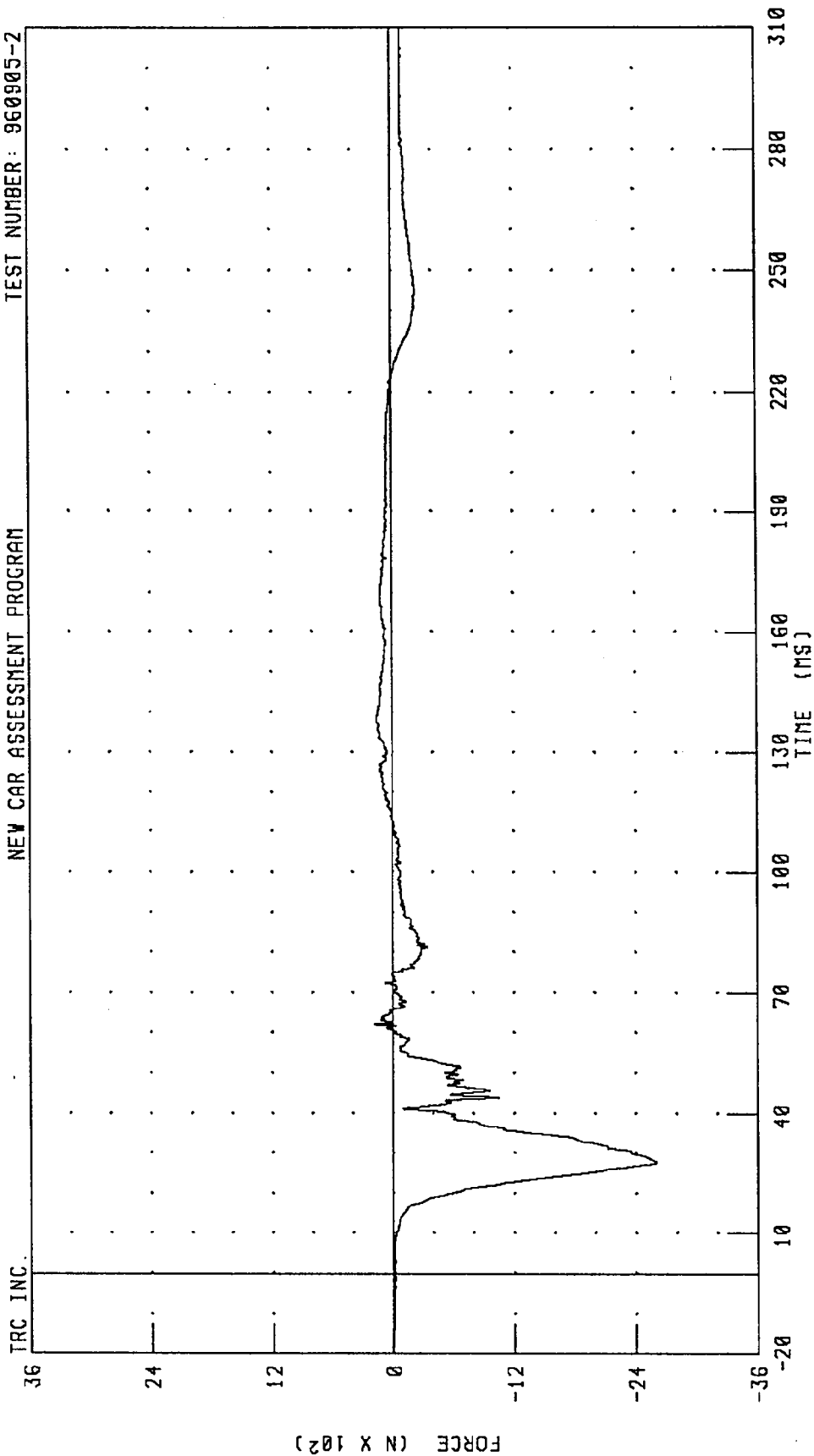
CHANNEL: ANRFX2 FILTER: CH. CLASS 600

PEAK DATA: 211.81 N @ 41.60 MS; -773.81 N @ 31.36 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM



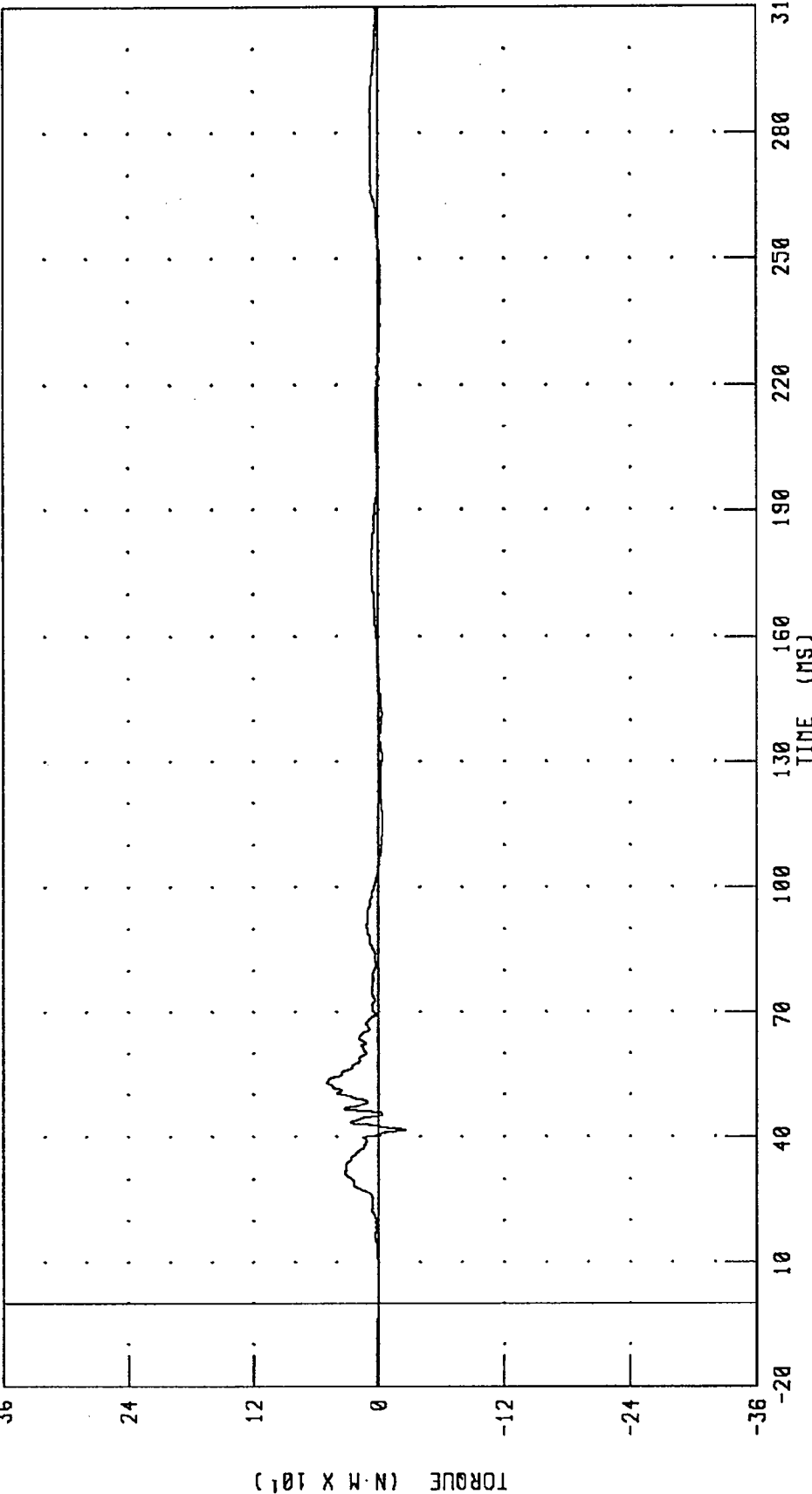
PEAK DATA: 179.26 N @ 62.08 MS; -2601.27 N @ 27.68 MS

CHANNEL: ANRZF2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 49.77 N·m @ 53.04 ms; -25.97 N·m @ 41.68 ms

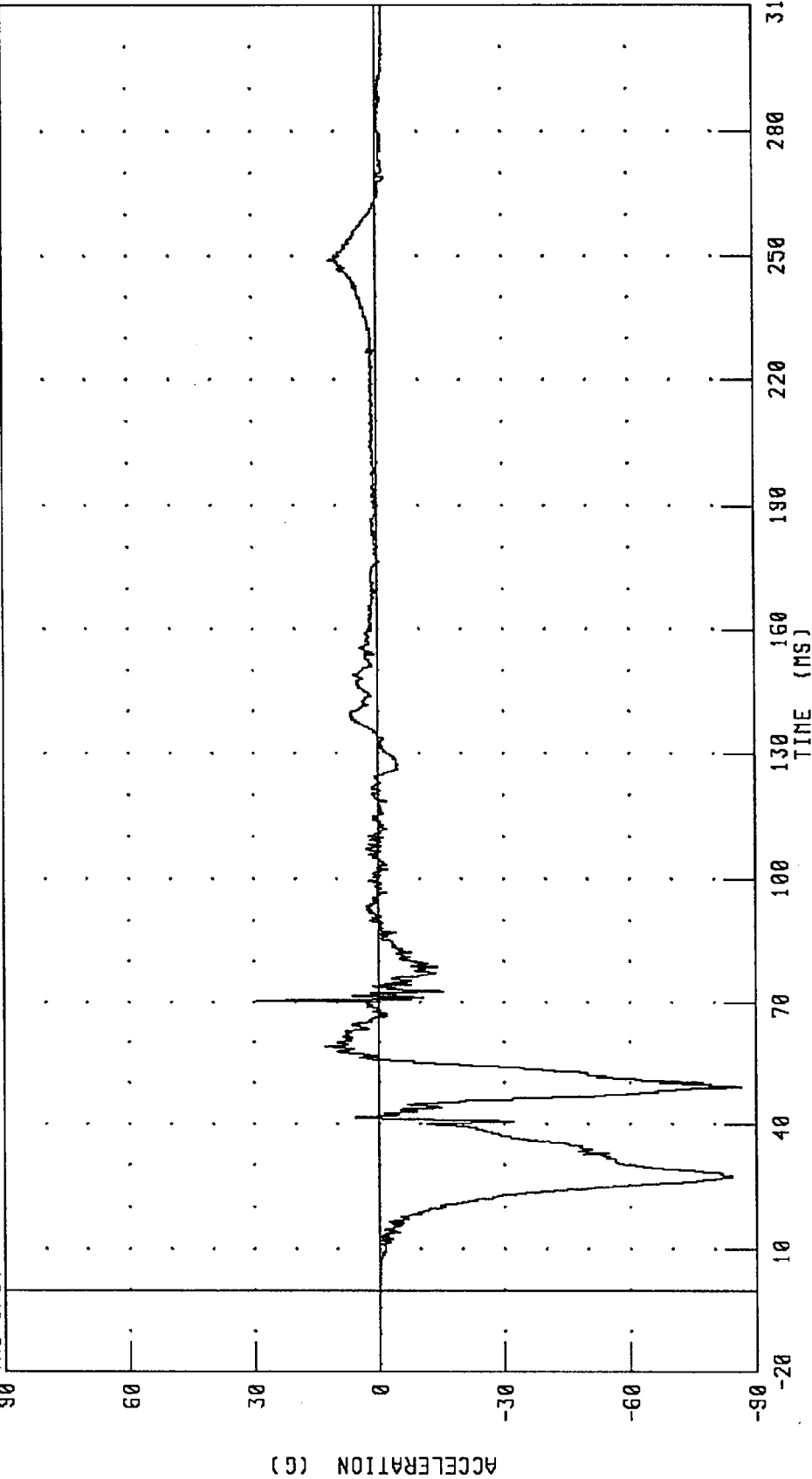
CHANNEL: ANRYM2 FILTER: CH. CLASS 600

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT X-AXIS ACCELERATION

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: FTLXG2 FILTER: CH. CLASS 1000

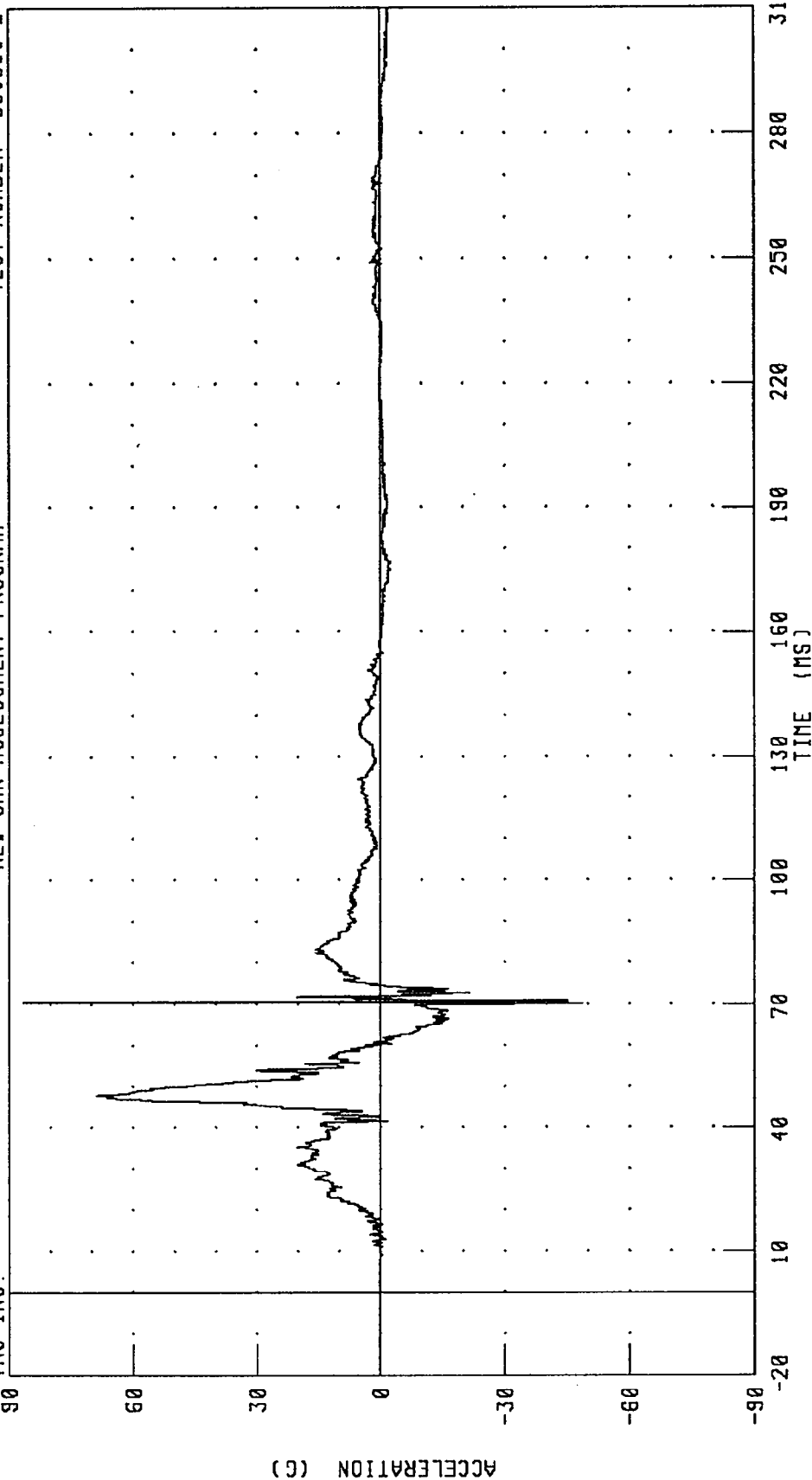
PEAK DATA: 29.53 G @ 70.48 MS; -86.28 G @ 48.88 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: FTLZH2 FILTER: CH. CLASS 1000

PEAK DATA: 86.44 G @ 70.56 MS; -48.83 G @ 70.16 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

130

100

70

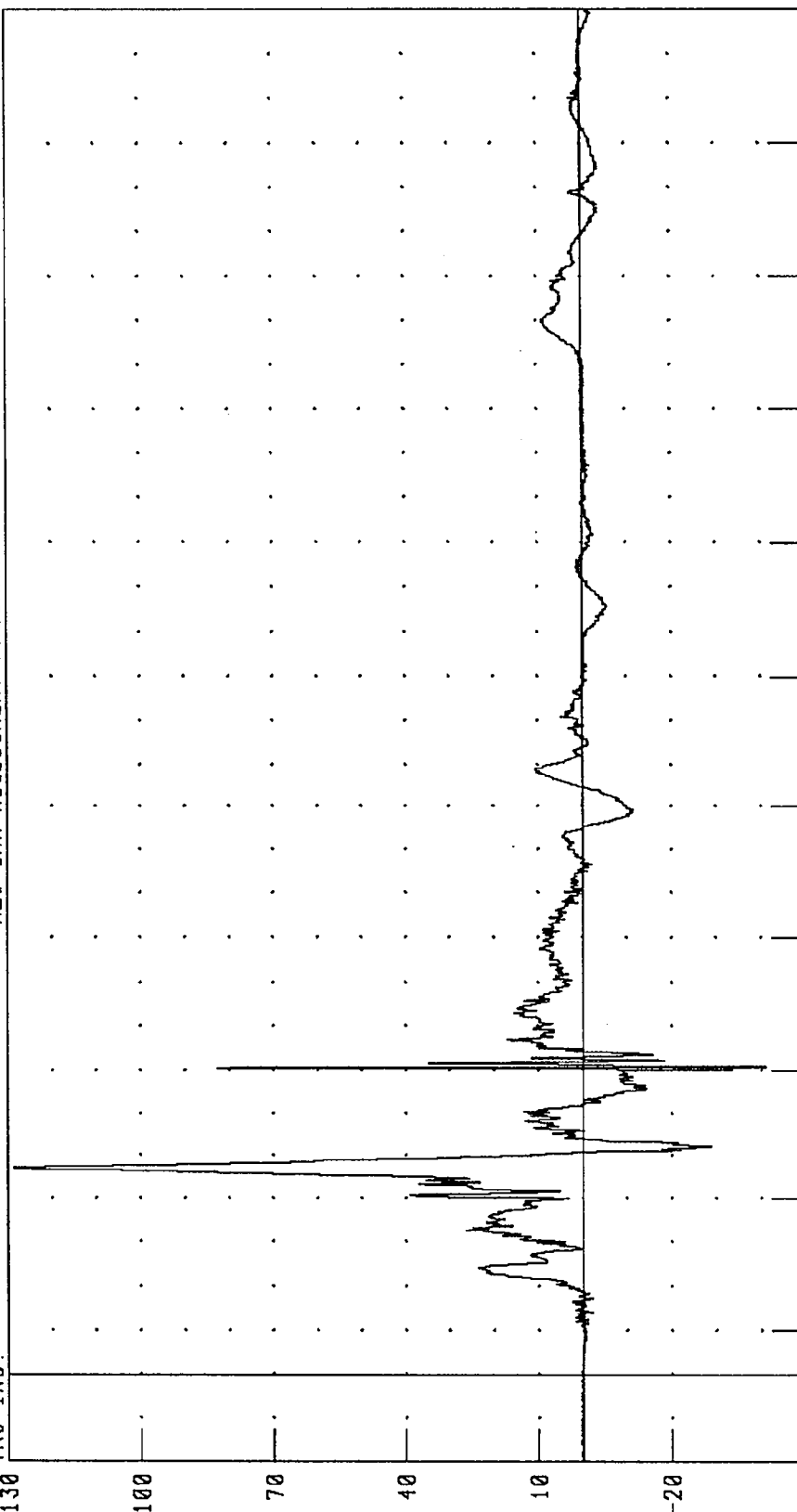
40

10

-20

-50

ACCELERATION (G)



TIME (MS) 310 280 250 220 190 160 130 100 70 40 10
PEAK DATA: 128.59 G @ 46.88 MS; -41.05 G @ 70.88 MS

CHANNEL: FILT12 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

90

60

30

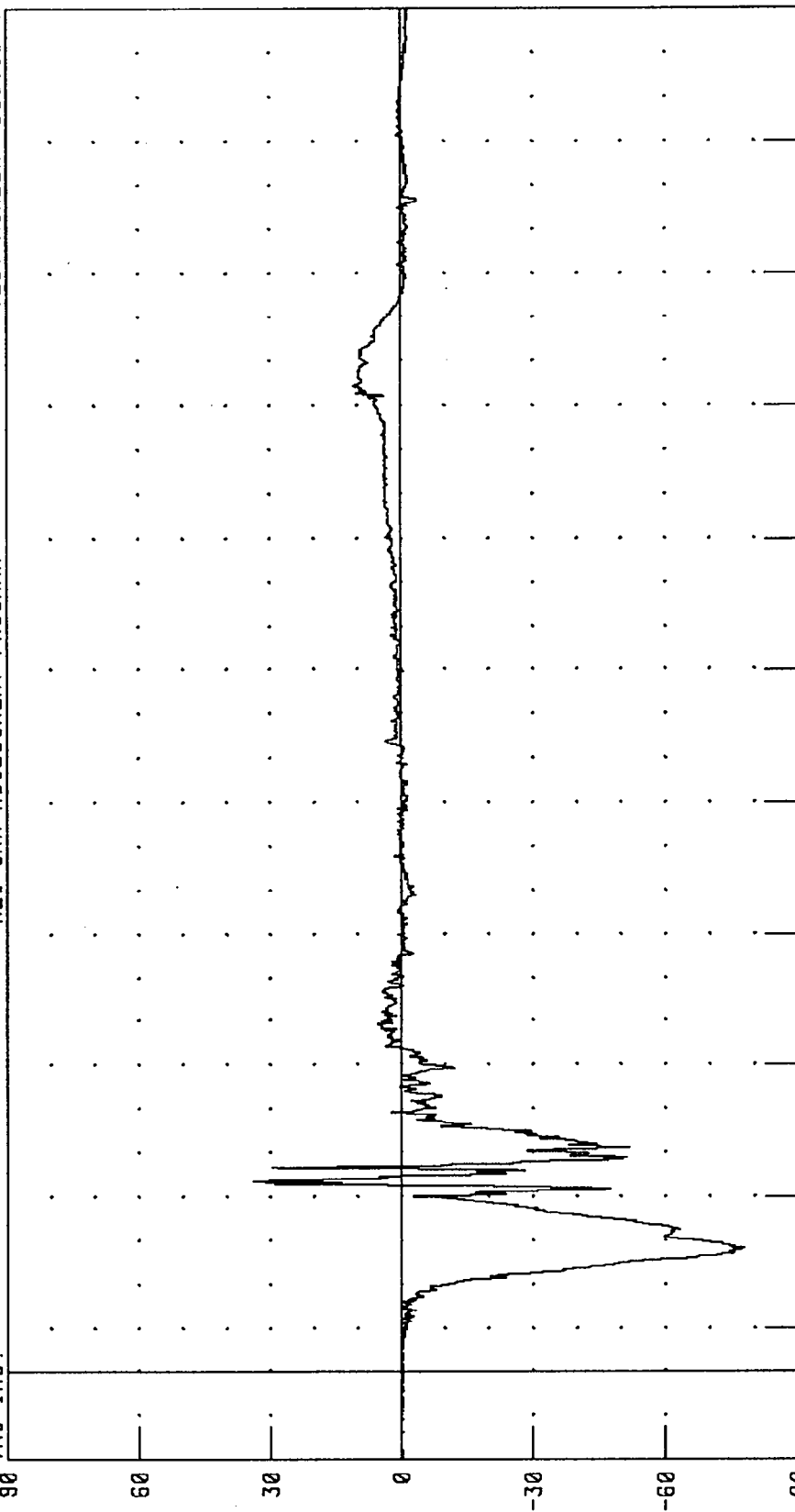
0

-30

-60

-90

ACCELERATION (G)



TIME (MS) 310 280 250 220 190 160 130 100 70 40 10

CHANNEL: FTRXG2 FILTER: CH. CLASS 1000

PEAK DATA: 34.06 G @ 43.52 MS; -77.62 G @ 28.24 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

90

60

30

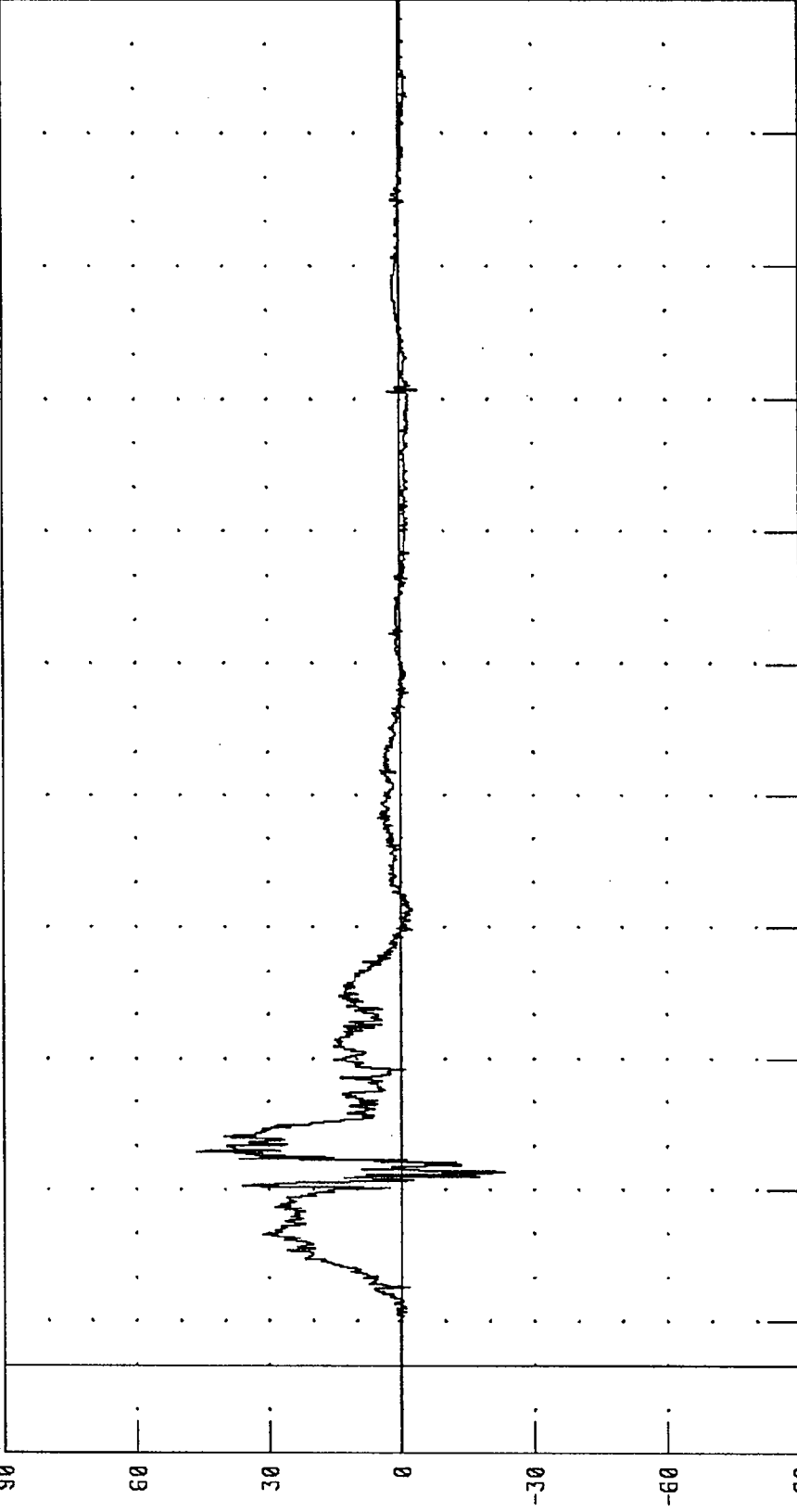
0

-30

-60

-90

ACCELERATION (G)



TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

-20

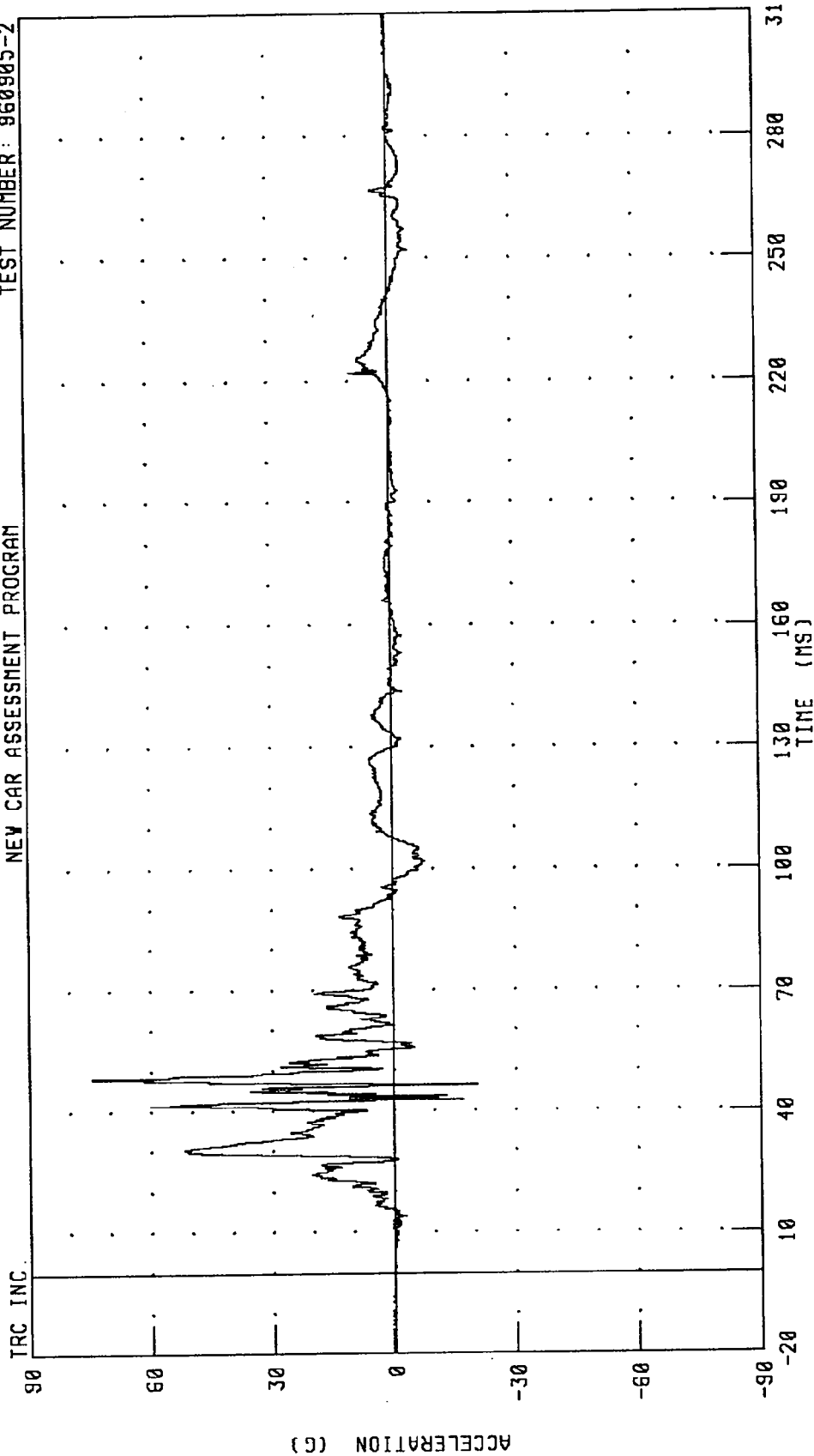
CHANNEL: FTRZH2 FILTER: CH. CLASS 1000

PEAK DATA: 46.41 G @ 48.64 MS; -23.35 G @ 44.08 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

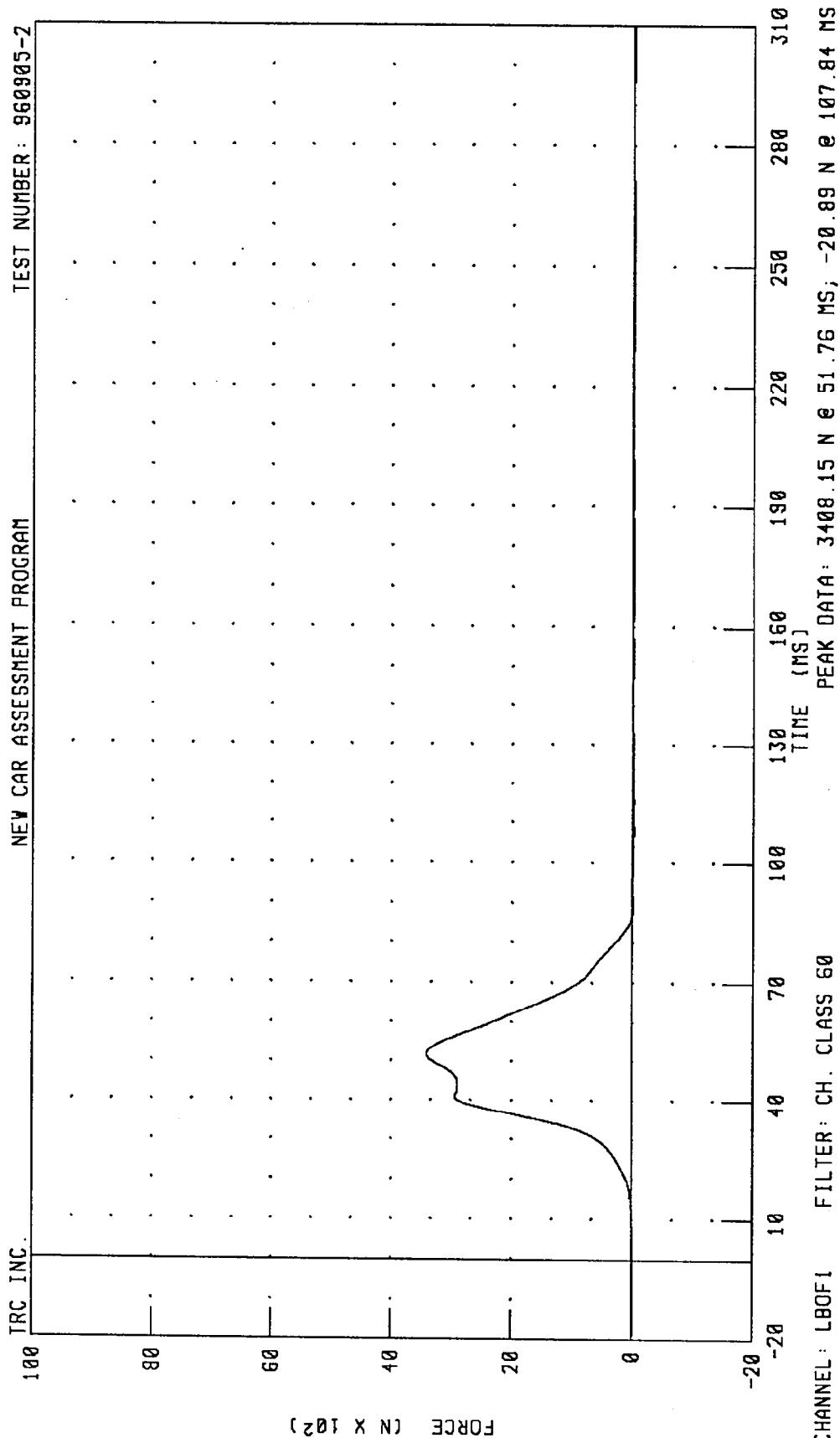


PEAK DATA: 74.42 G @ 48.24 MS; -20.53 G @ 46.48 MS

CHANNEL: FTRZ12 FILTER: CH. CLASS 1000

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

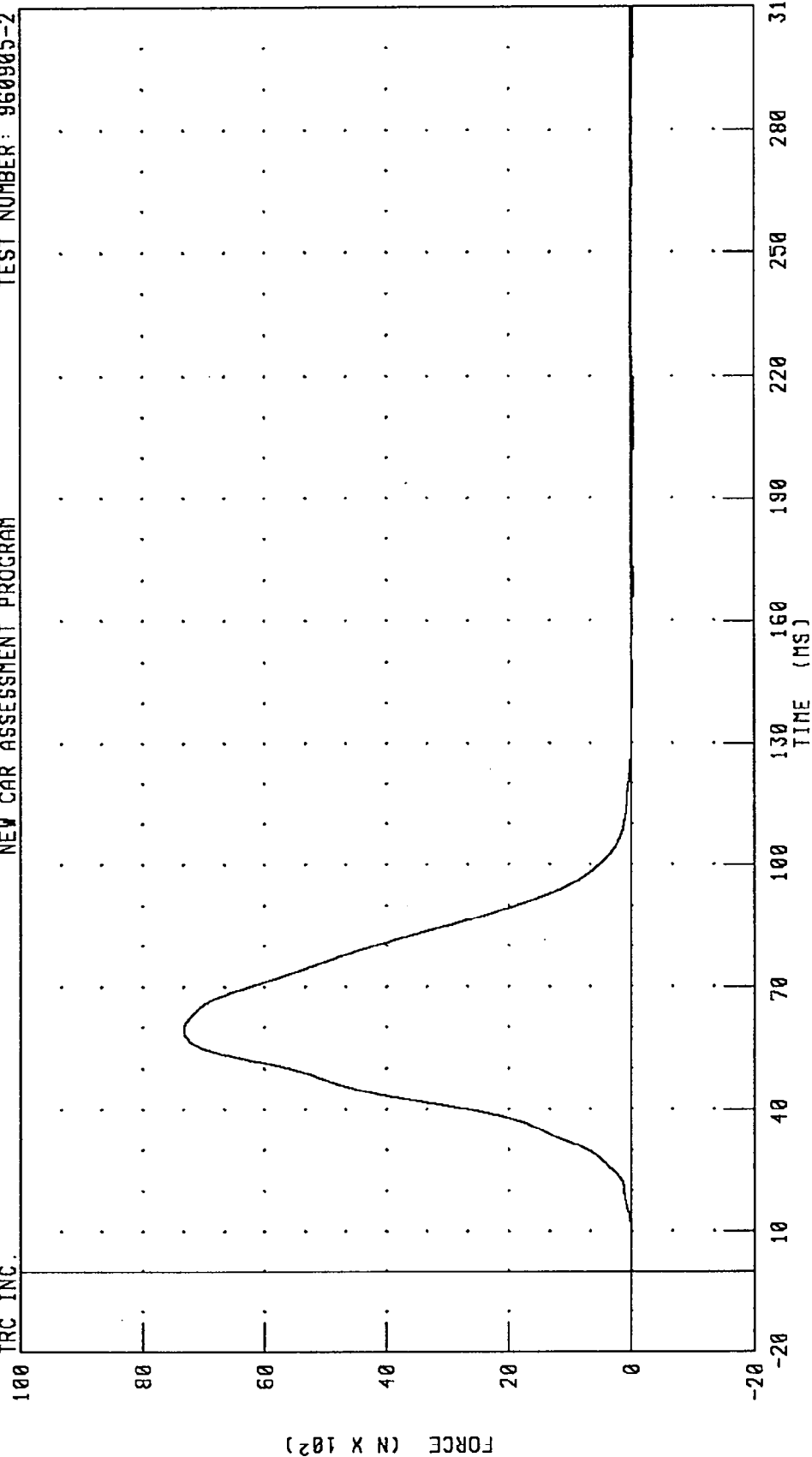


CHANNEL: LBOF1 FILTER: CH. CLASS 60
 PEAK DATA: 3408.15 N @ 51.76 MS; -20.89 N @ 107.84 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: SHBF1 FILTER: CH. CLASS 60

PEAK DATA: 7325.61 N @ 59.52 MS; -25.94 N @ 302.48 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER SHOULDER BELT DISPLACEMENT
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

150

120

90

60

30

0

-30

DISPLACEMENT (MM)

310 280 250 220 190 160 130 100 70 40 10
 TIME (MS)

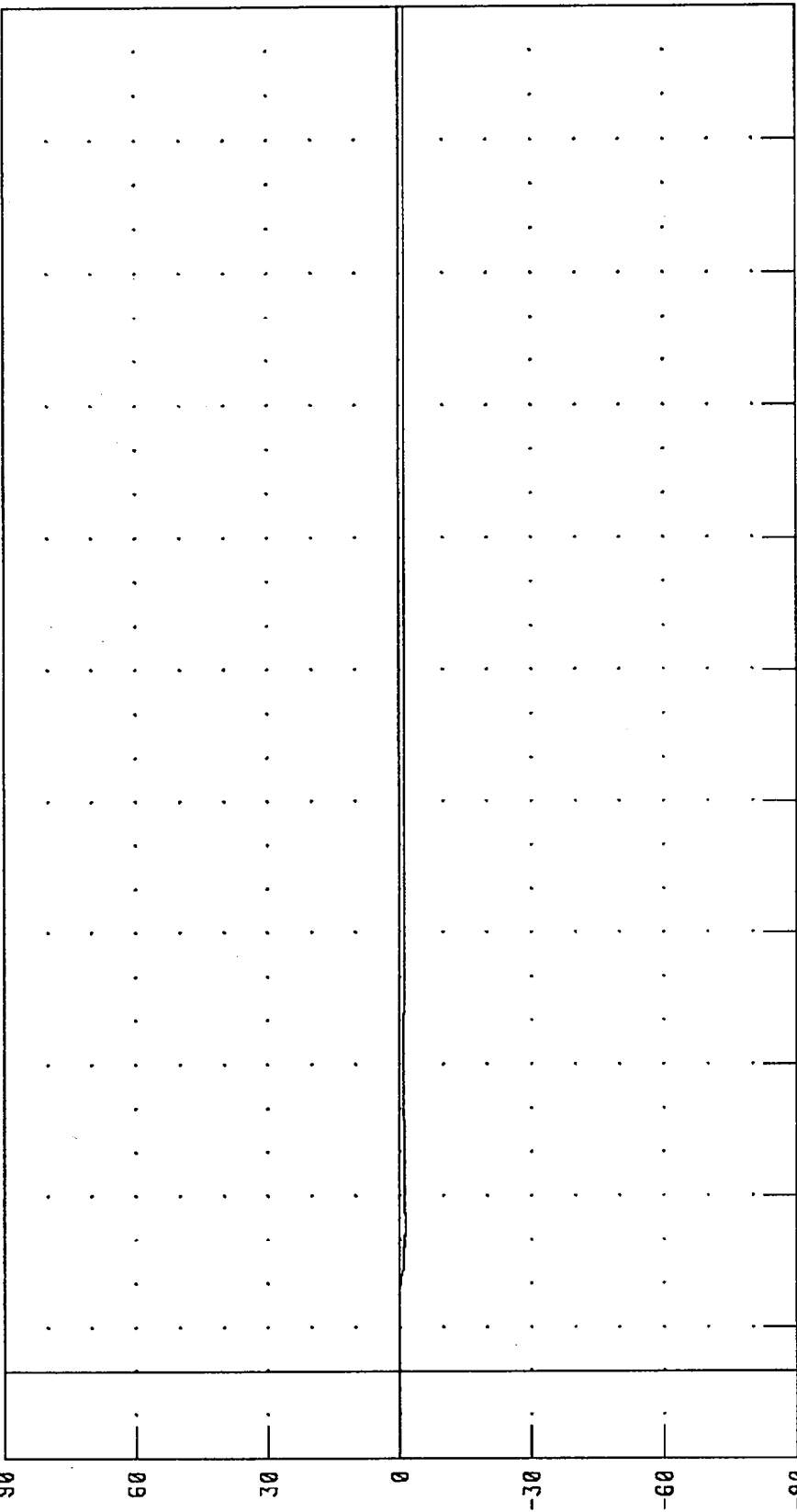
PEAK DATA: 45.28 MM @ 65.52 MS; -0.04 MM @ 7.04 MS.

CHANNEL: SHBD1 FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 DRIVER SEAT BELT EXTENSION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



DISPLACEMENT (MM X 10⁻¹)

TIME (MS)

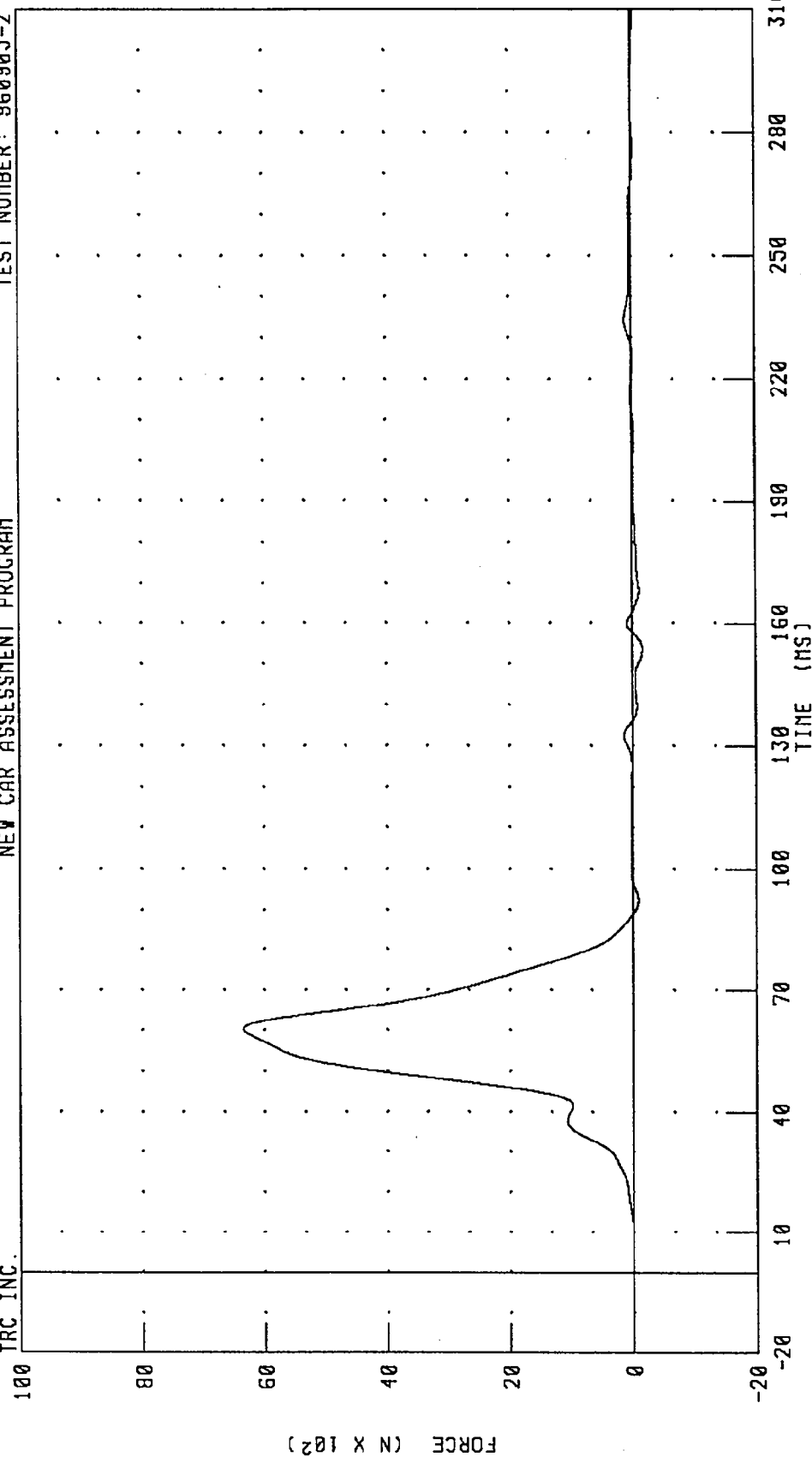
PEAK DATA: 0.00 NM @ 16.96 MS; -0.14 NM @ 32.80 MS

CHANNEL: SBED1 FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 6350.80 N @ 60.32 MS; -150.66 N @ 153.60 MS

FILTER: CH. CLASS 60

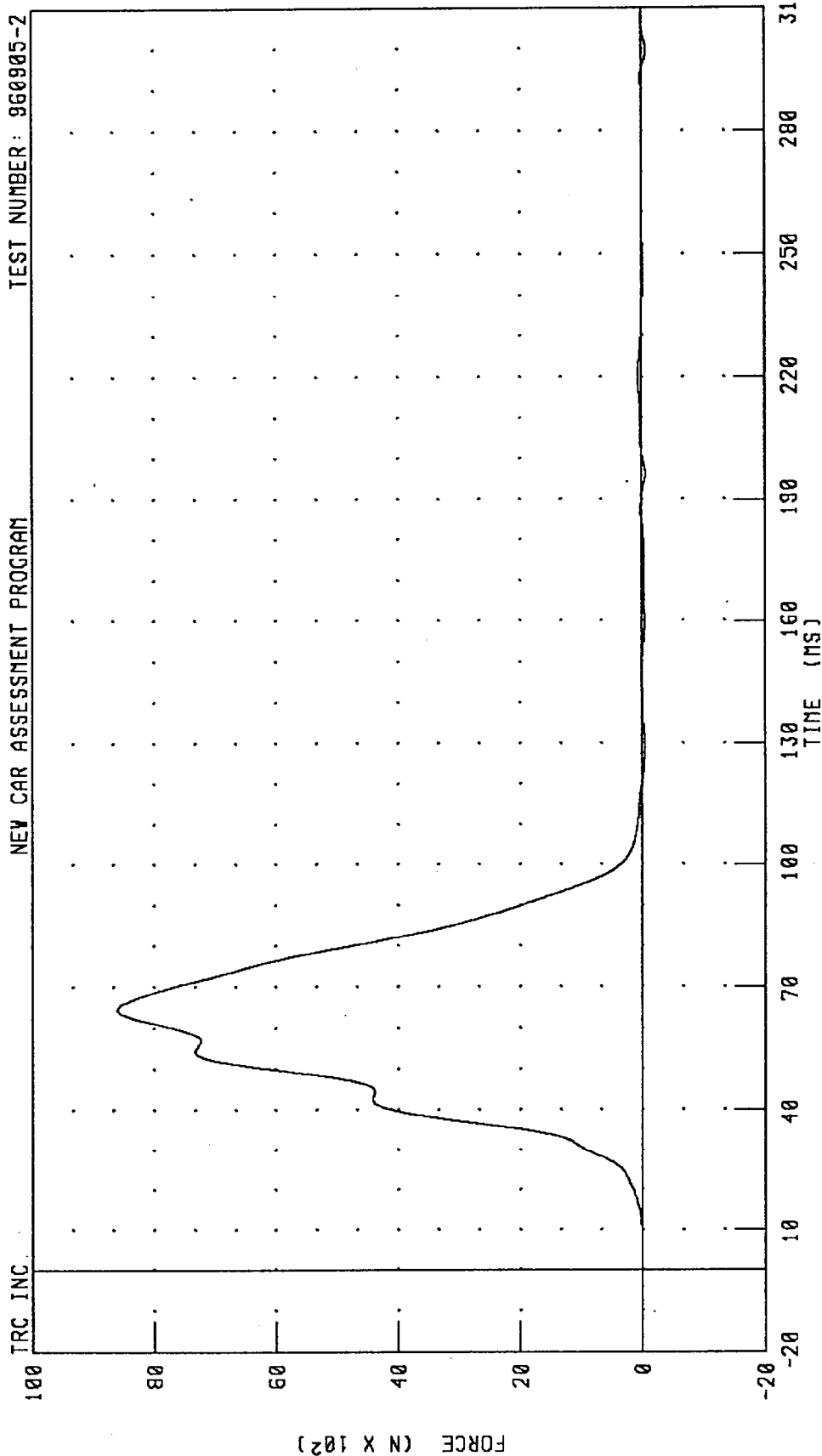
CHANNEL: LBOF2

FORCE (N X 10²)

TIME (MS)

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



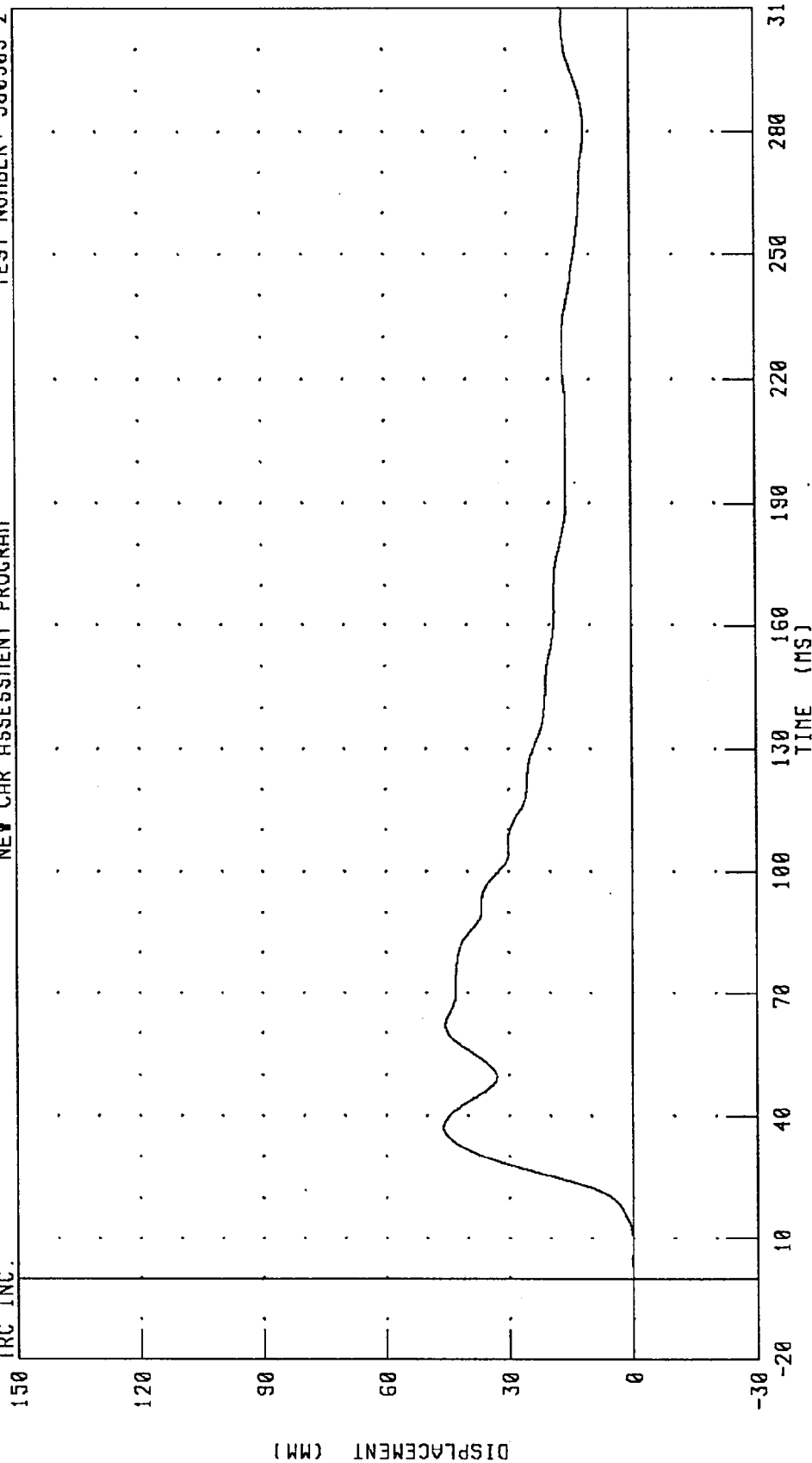
CHANNEL: SHBF2 FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

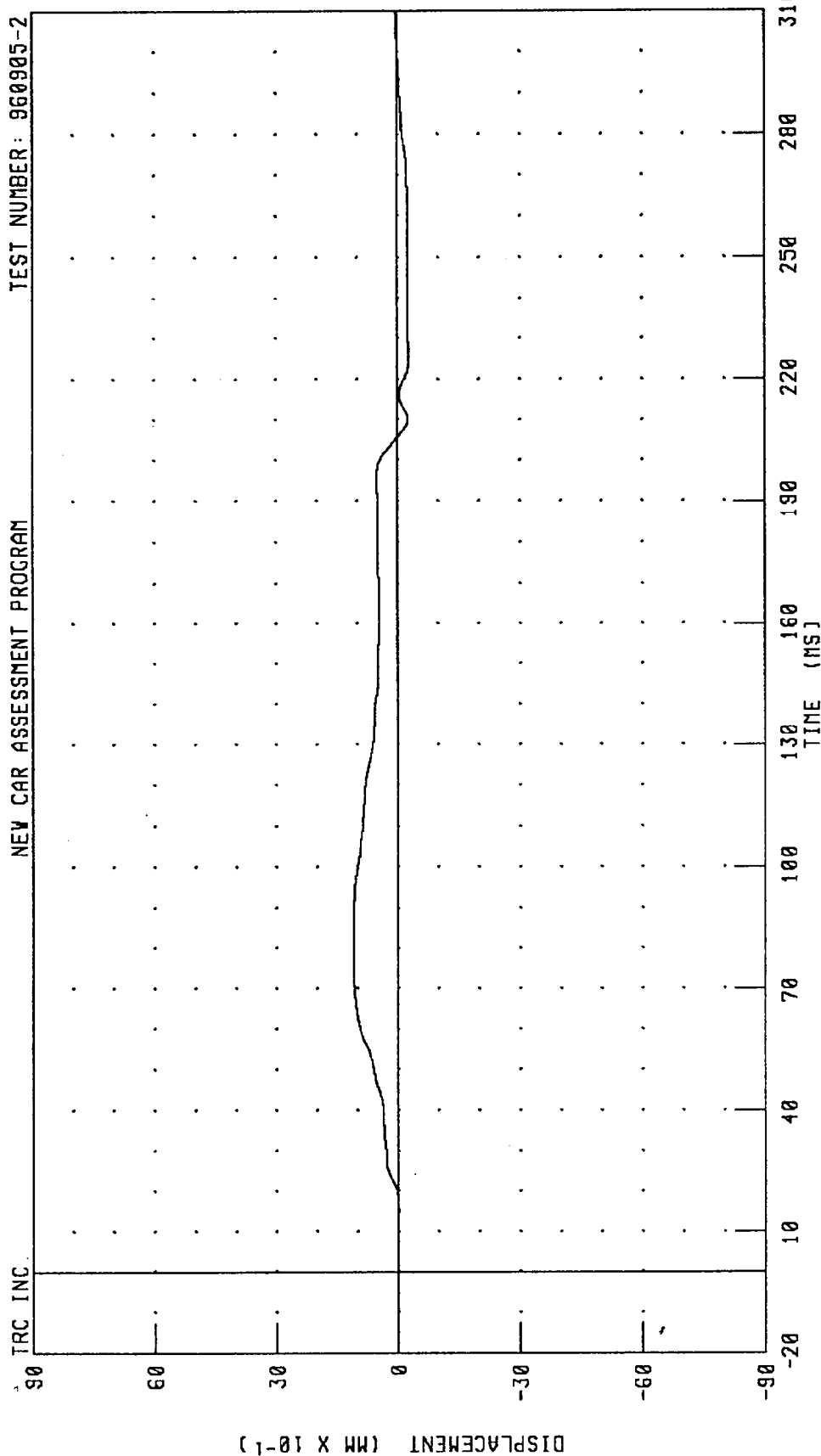


PEAK DATA: 45.95 MM @ 37.20 MS; 0.00 MM @ -20.00 MS

CHANNEL: SHBD2 FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



CHANNEL: SBED2 FILTER: CH. CLASS 60

PEAK DATA: 1.09 MM @ 74.08 MS; -0.28 MM @ 224.72 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

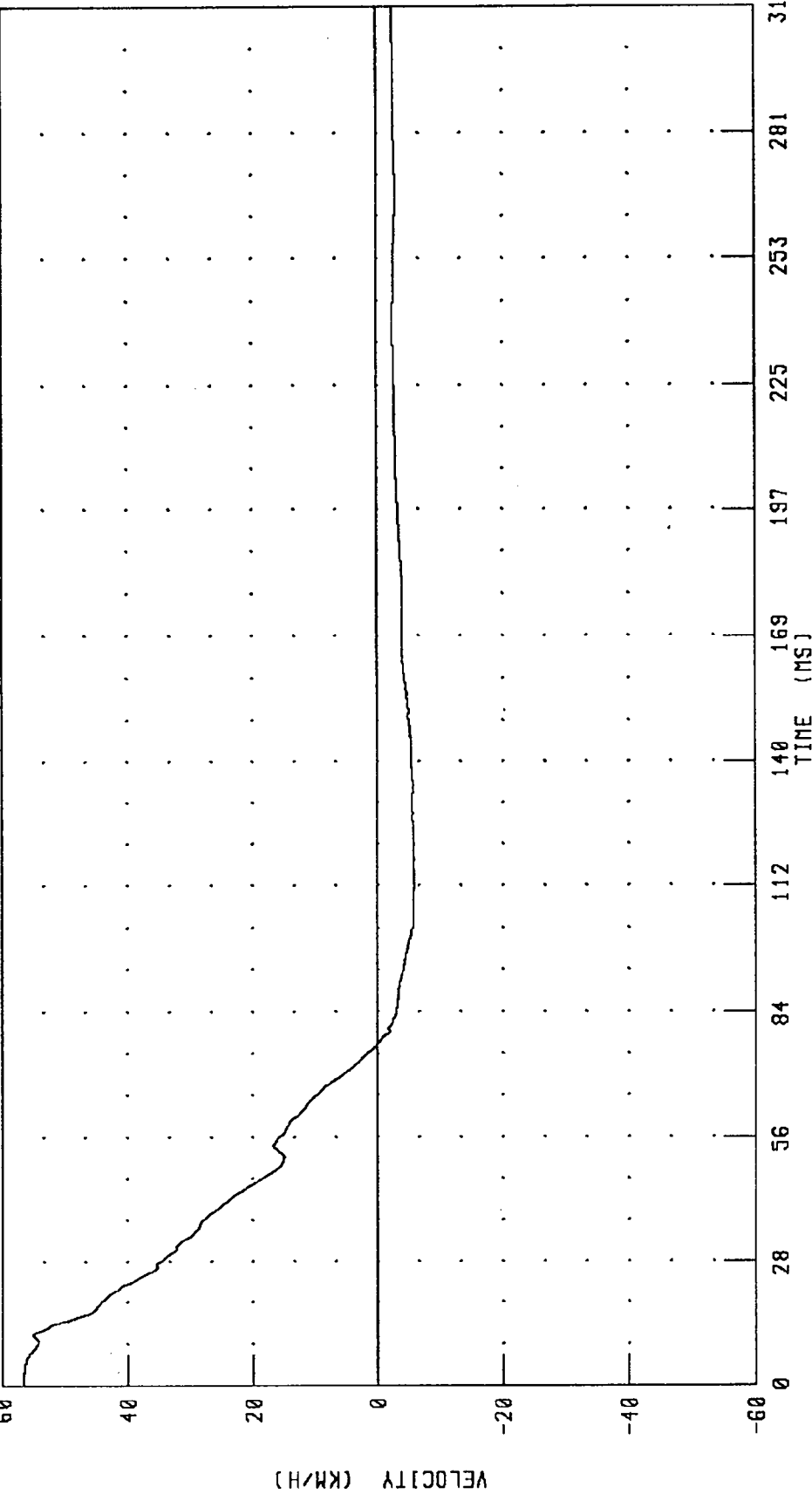
PEAK DATA: 9.81 G @ 53.12 MS; -54.12 G @ 14.64 MS

CHANNEL: TLRXG1 FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



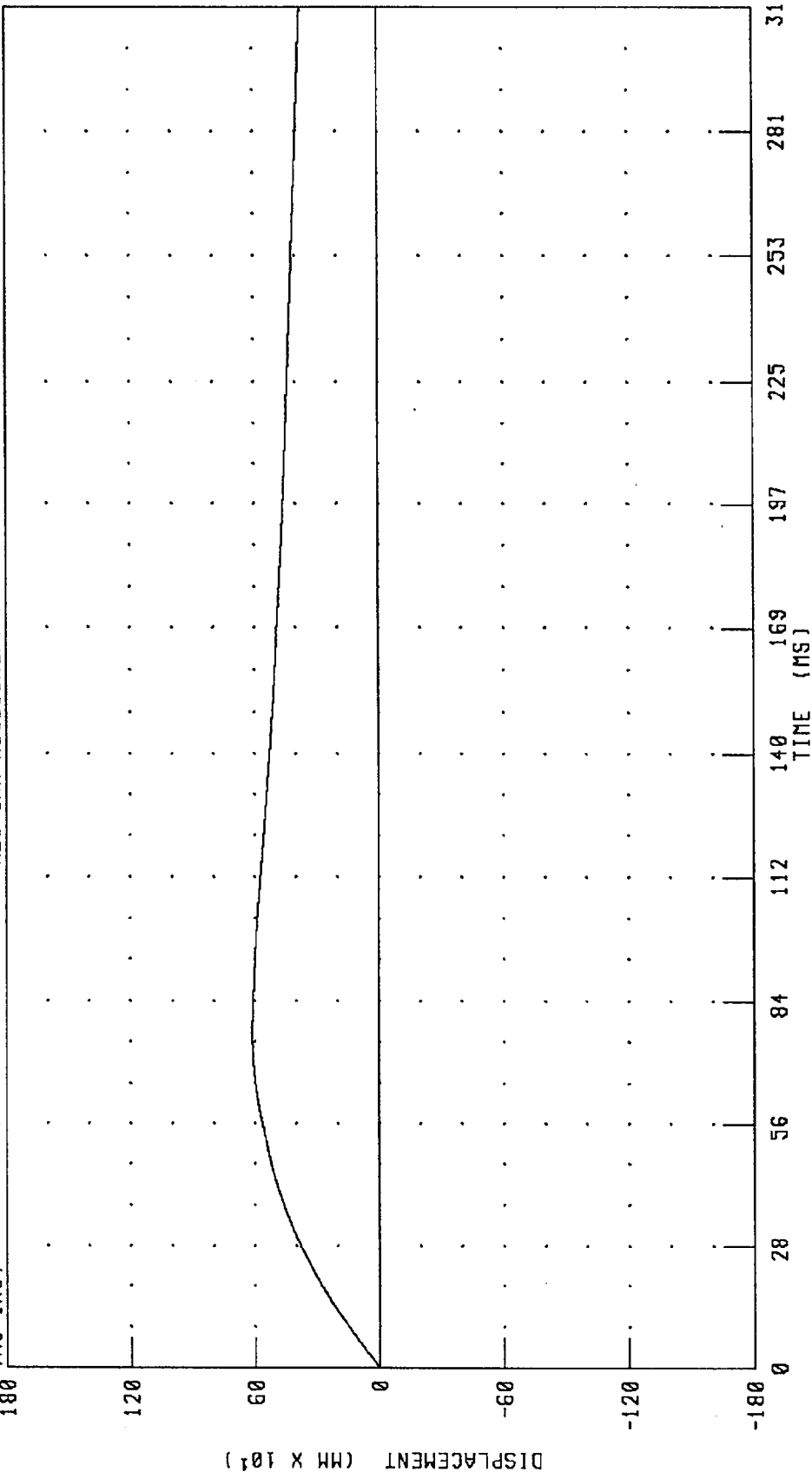
PEAK DATA: 56.50 KM/H @ 0.00 MS; -5.93 KM/H @ 114.32 MS

CHANNEL: TLRXV1 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 613.18 MM @ 77.04 MS; 0.00 MM @ 0.00 MS

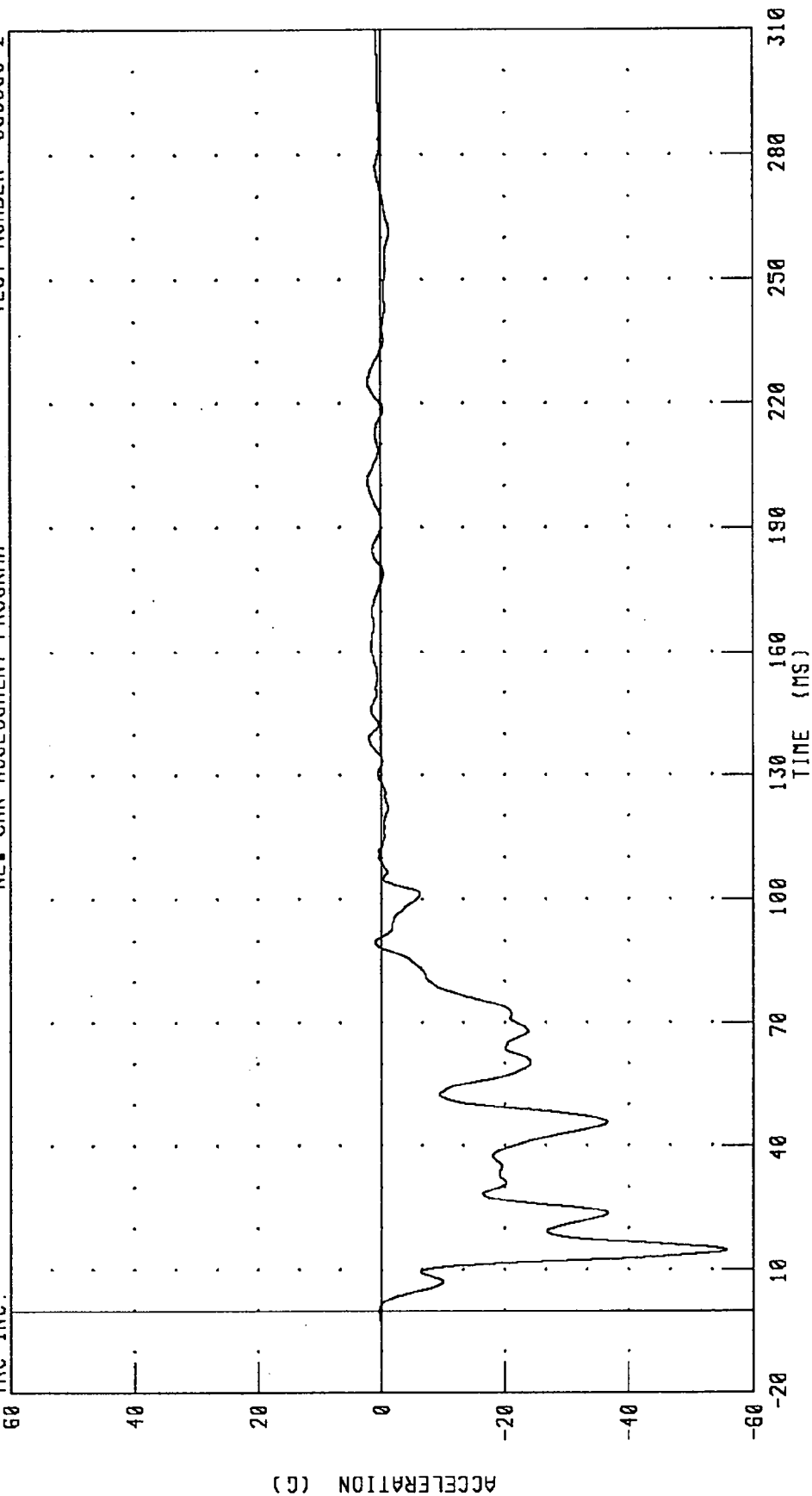
CHANNEL: TLRX01 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TRRXG1 FILTER: CH. CLASS 60

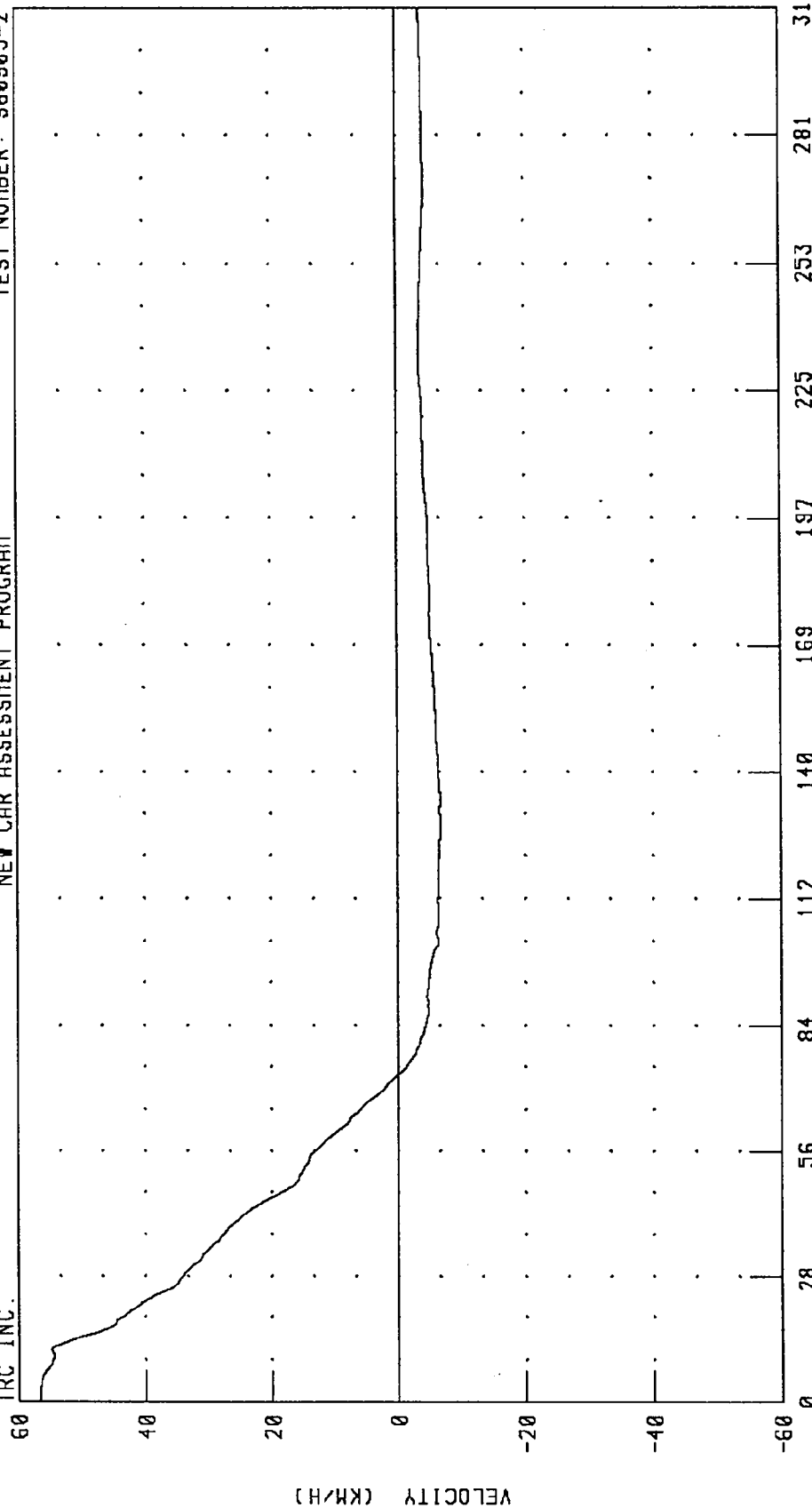
PEAK DATA: 2.10 G @ 201.44 MS; -55.73 G @ 14.64 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TRRXV1 FILTER: CH. CLASS 180

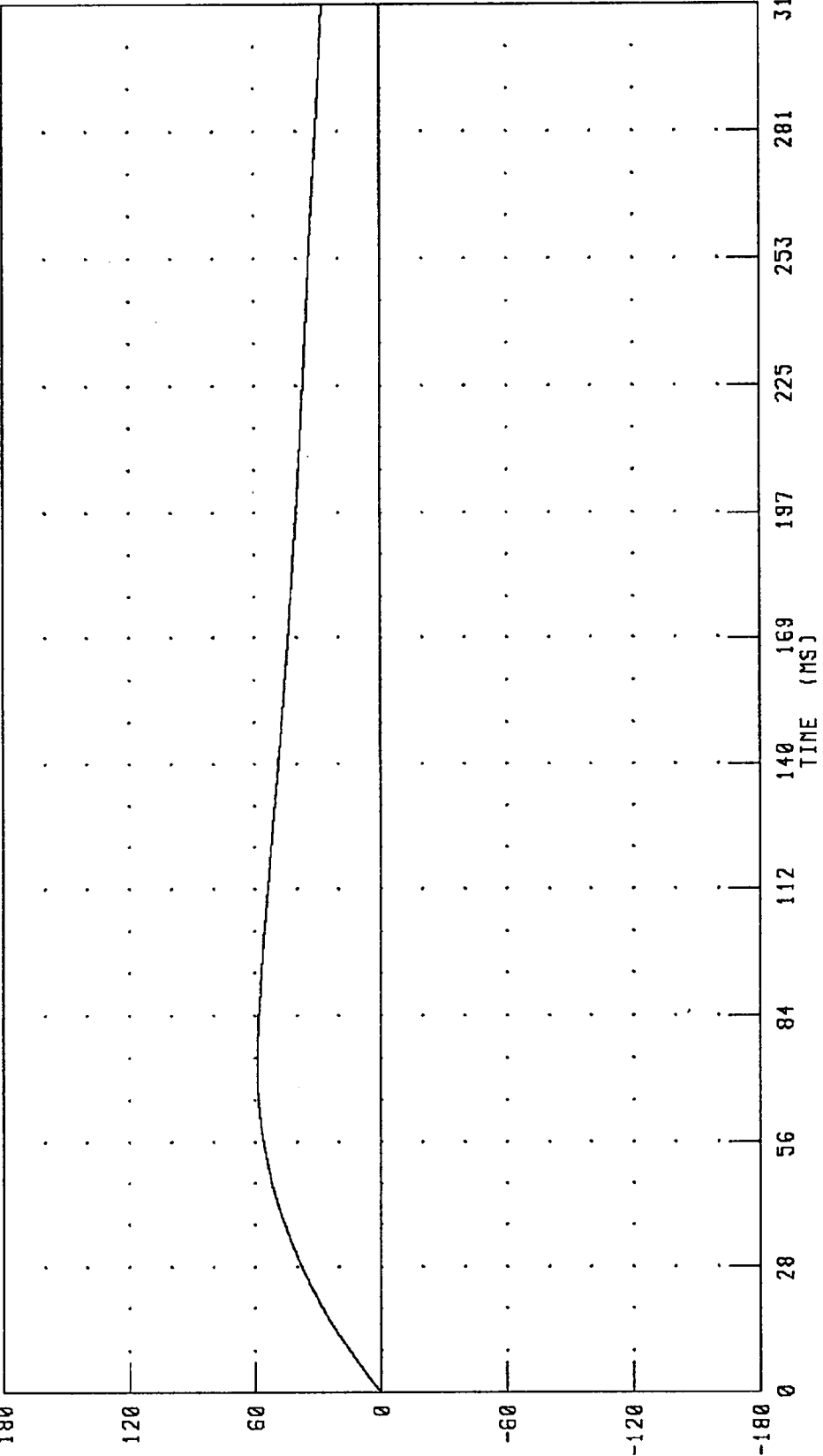
PEAK DATA: 56.50 KM/H @ 1.36 MS; -6.75 KM/H @ 127.84 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

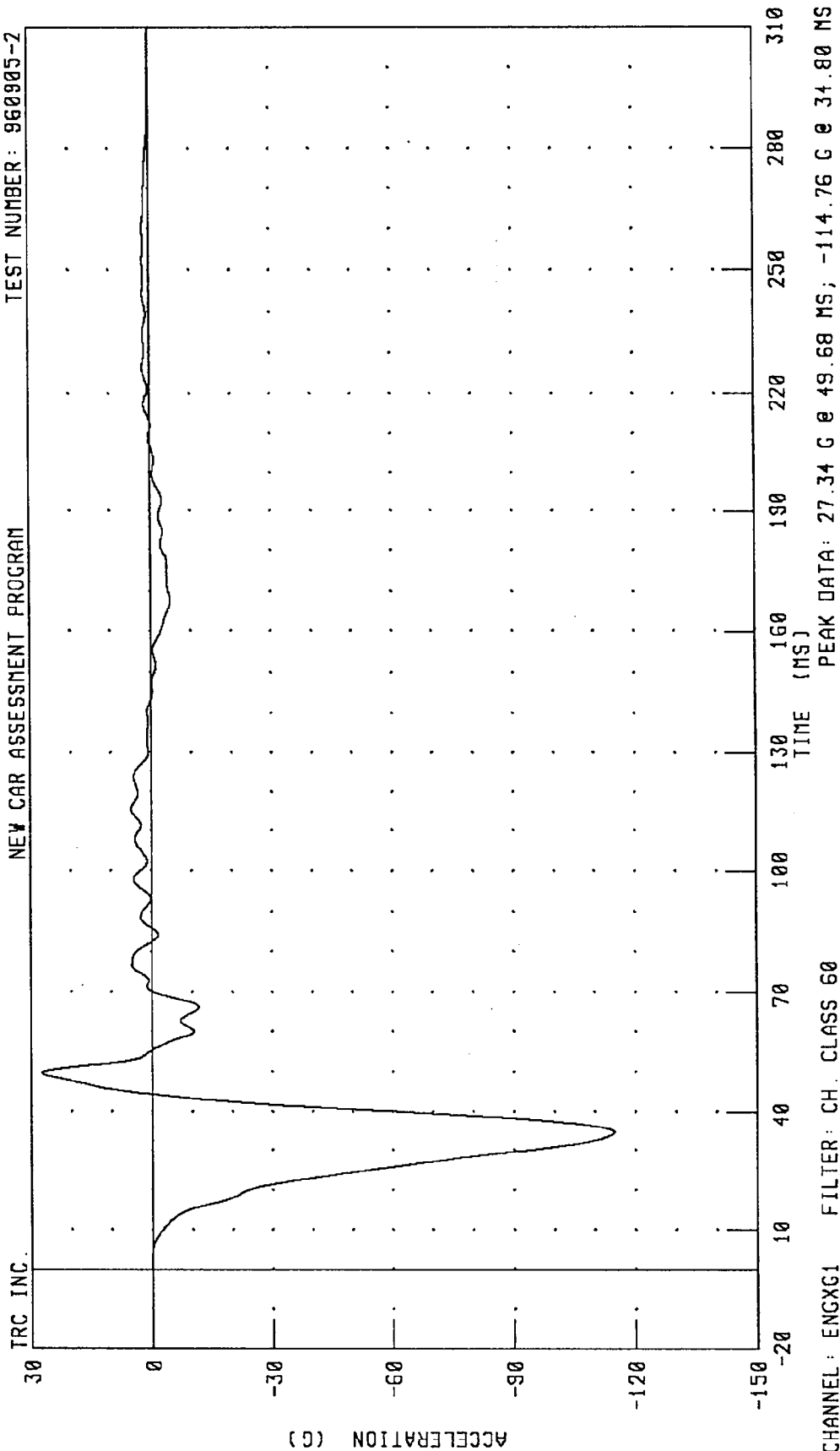


PEAK DATA: 590.95 MM @ 73.36 MS; 0.00 MM @ 0.00 MS

CHANNEL: TRRXD1 FILTER: CH. CLASS 180

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 ENGINE TOP X-AXIS ACCELERATION
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



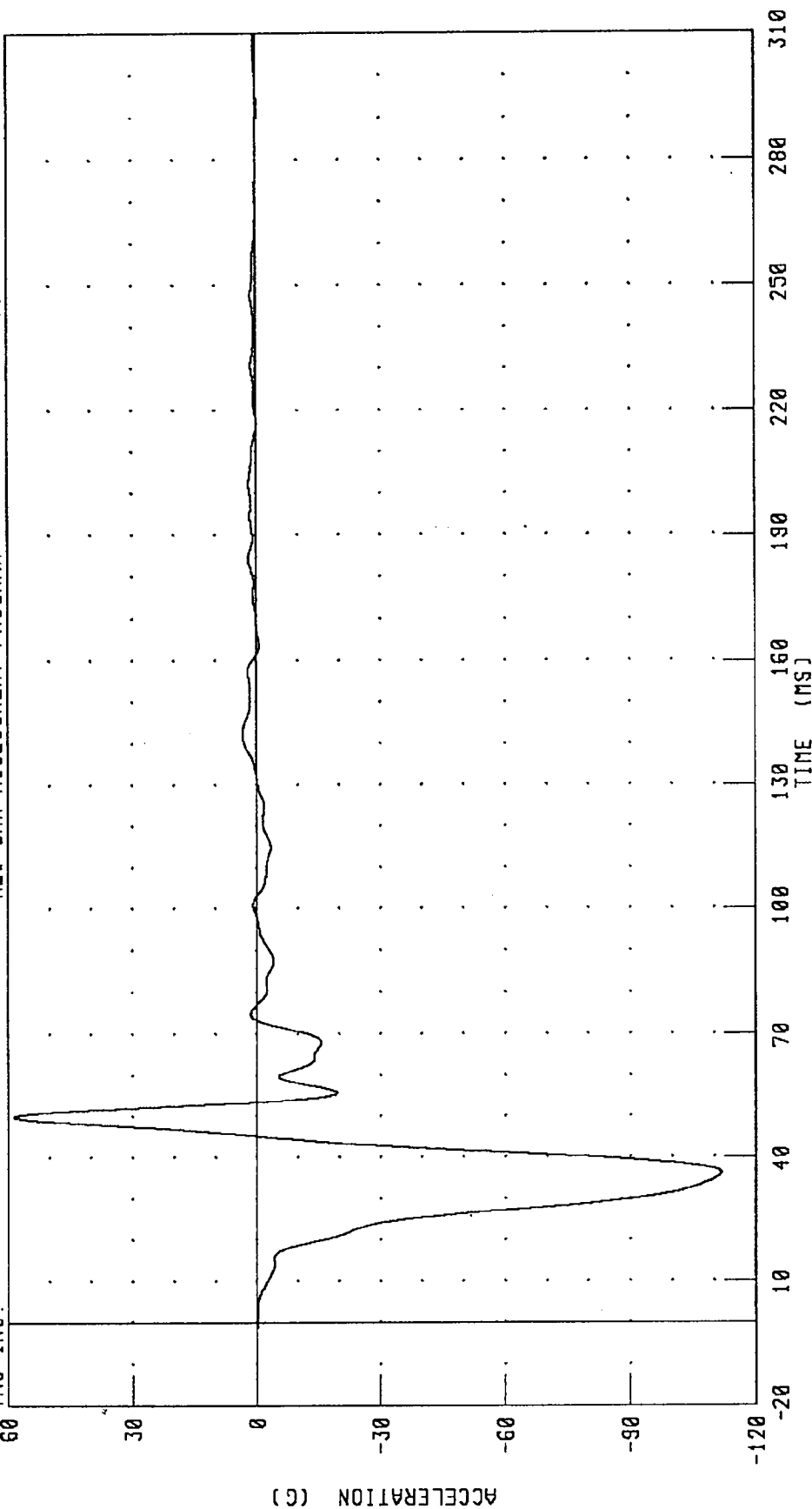
CHANNEL: ENGXC1 FILTER: CH. CLASS 60

PEAK DATA: 27.34 G @ 49.68 MS; -114.76 G @ 34.80 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



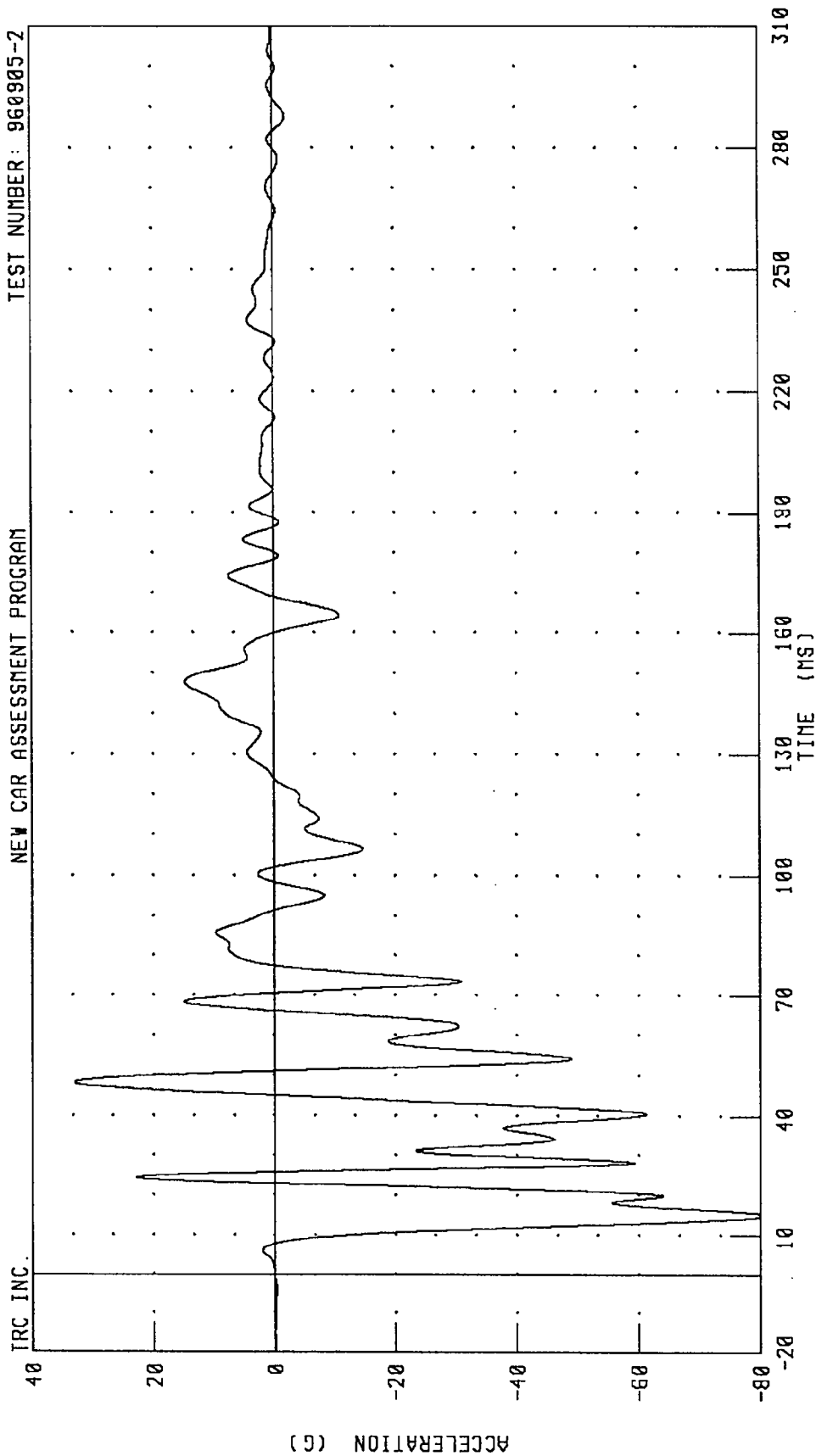
PEAK DATA: 58.53 G @ 49.92 MS; -111.67 G @ 36.08 MS

CHANNEL: ENGXC2 FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

IRC INC.

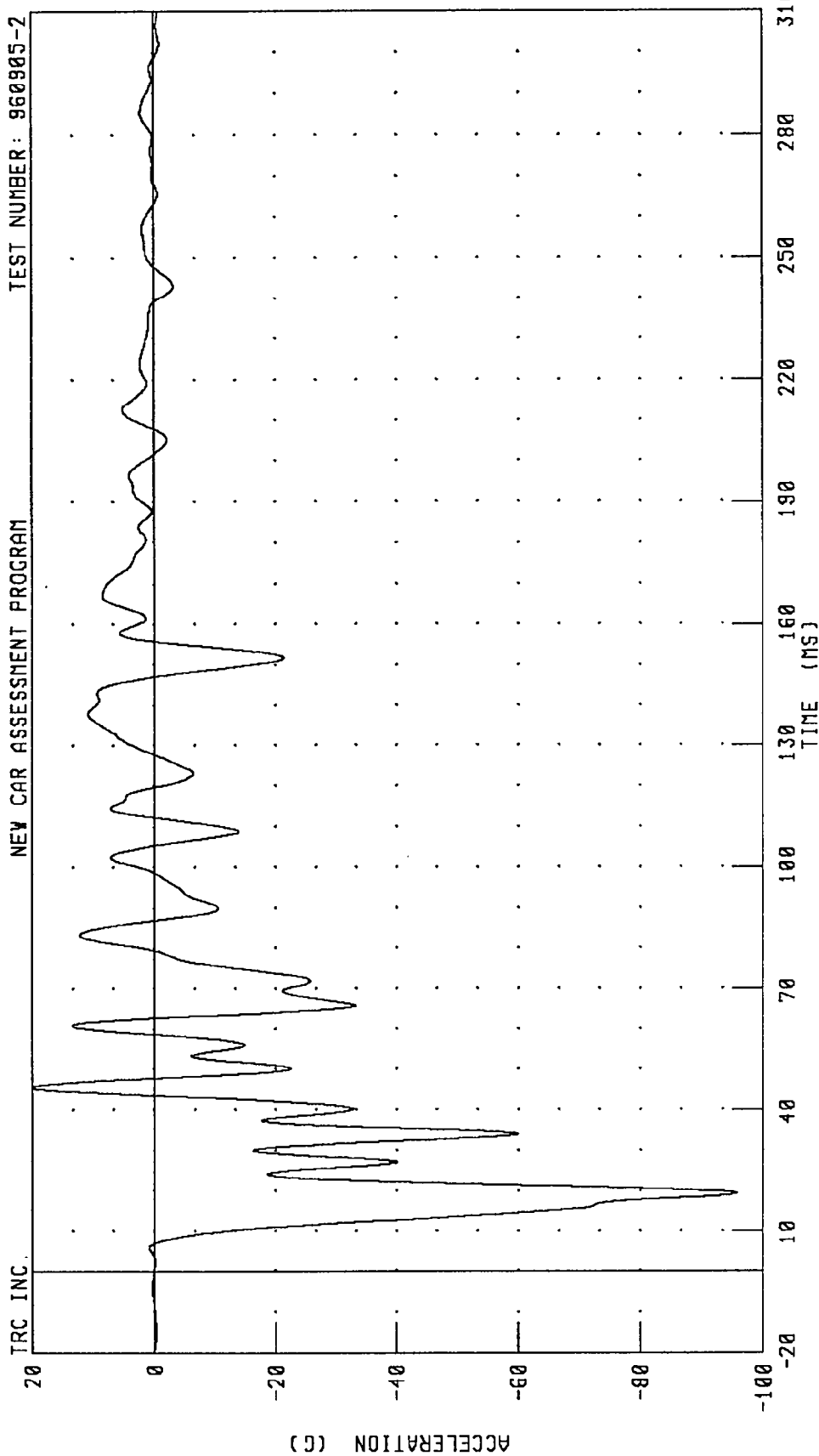


CHANNEL: BCRXG1 FILTER: CH. CLASS 60

PEAK DATA: 33.05 G @ 48.16 MS, -80.67 G @ 15.04 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2



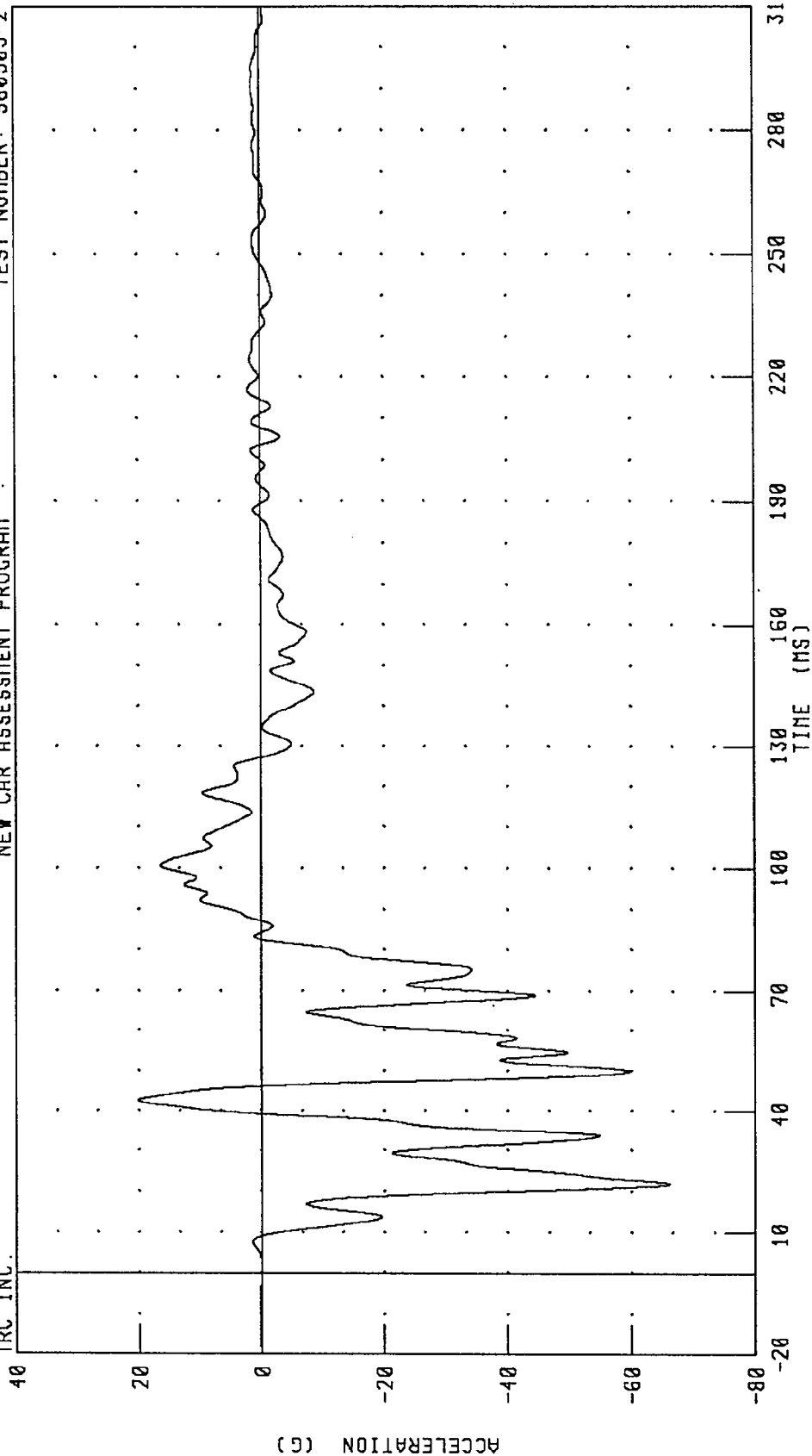
CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 20.15 G @ 45.52 MS; -95.65 G @ 19.36 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: DPCXG1 FILTER: CH. CLASS 60

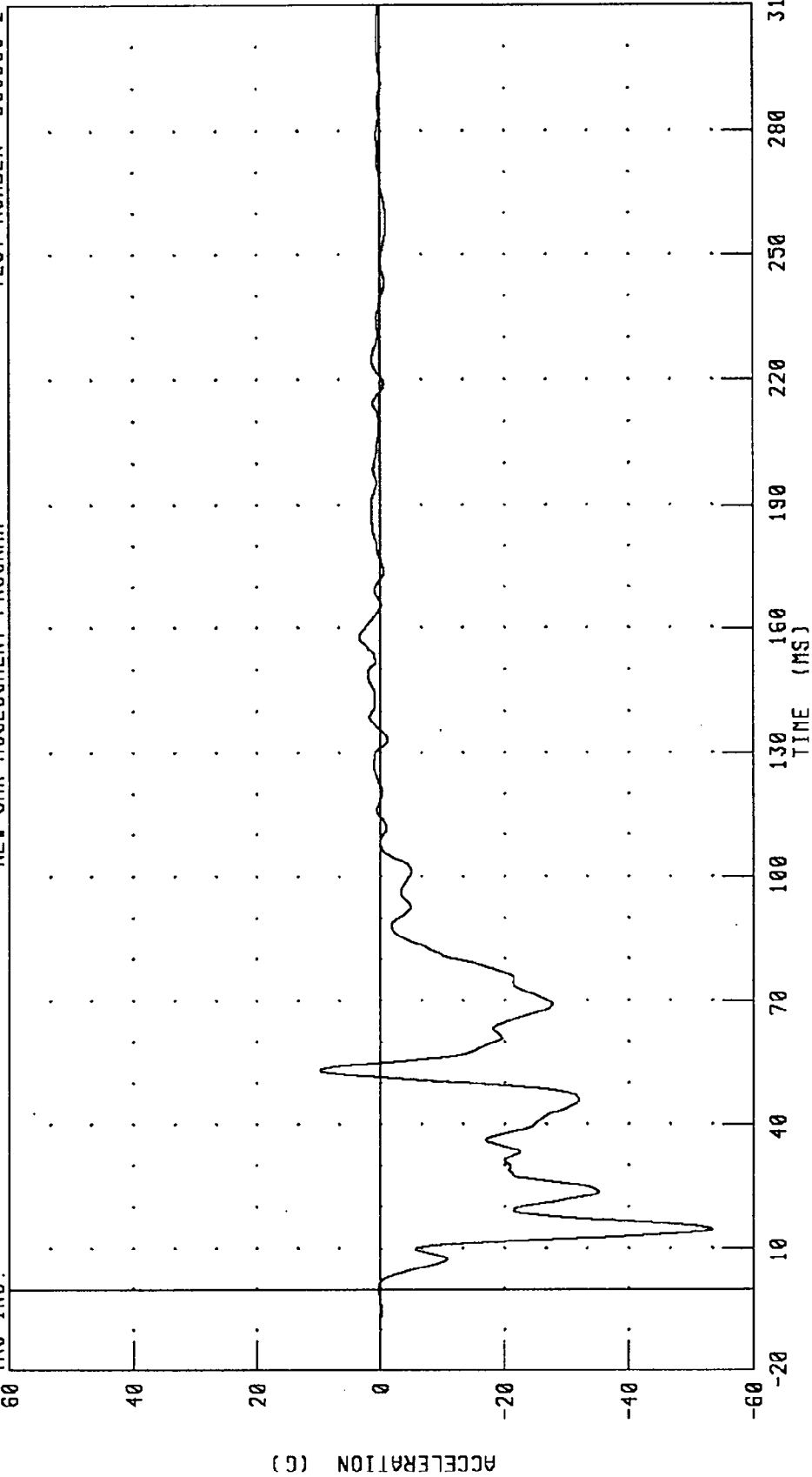
PEAK DATA: 20.21 G @ 42.64 MS; -66.21 G @ 21.84 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TLRXGA FILTER: CH. CLASS 60

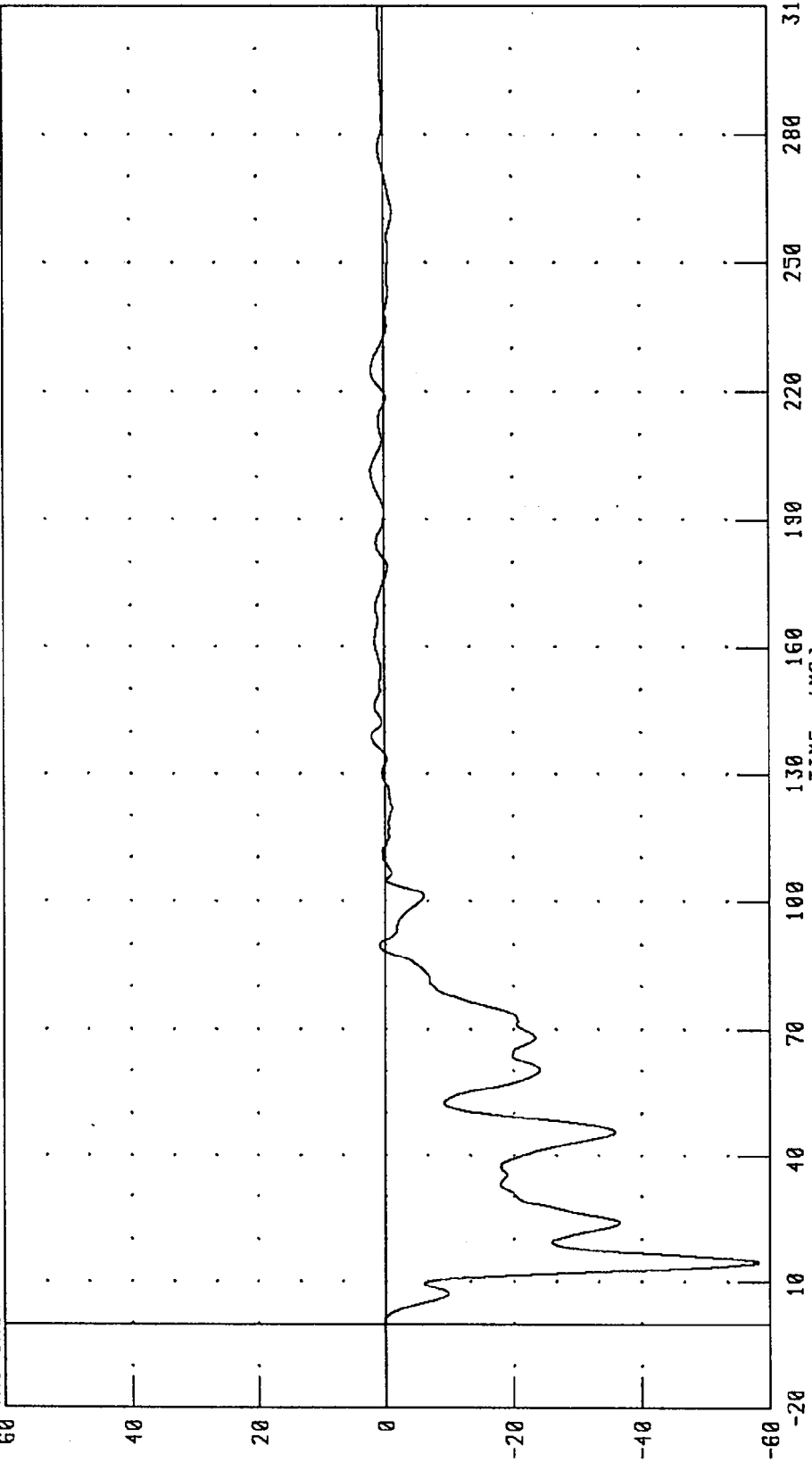
PEAK DATA: 9.87 G @ 53.12 MS; -53.27 G @ 14.64 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TRRXGA FILTER: CH. CLASS 60

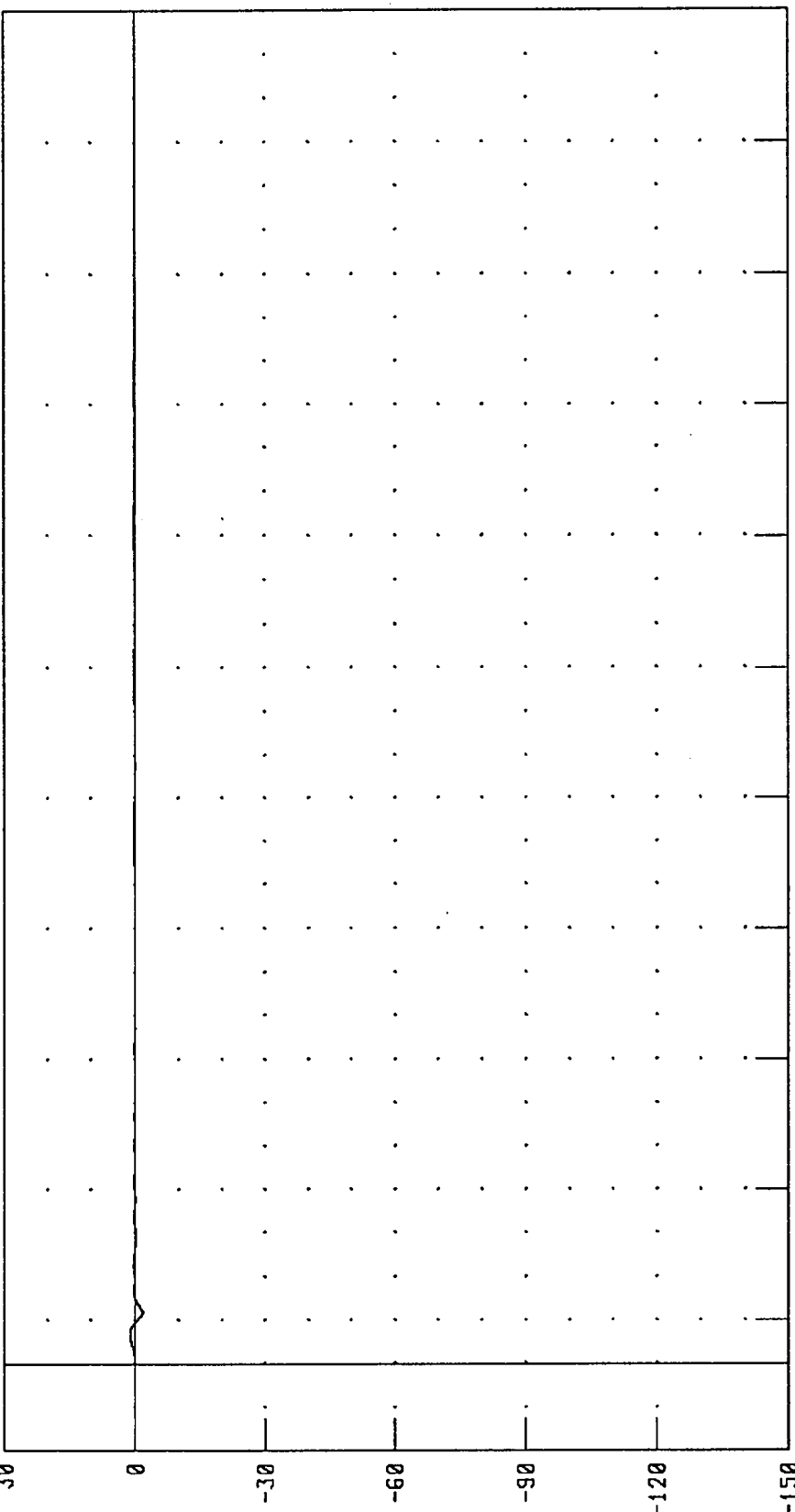
PEAK DATA: 2.14 G @ 201.52 MS; -58.10 G @ 14.56 MS

1986 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 1.04 KN @ 6.80 MS; -1.70 KN @ 11.84 MS

FILTER: CH. CLASS 60

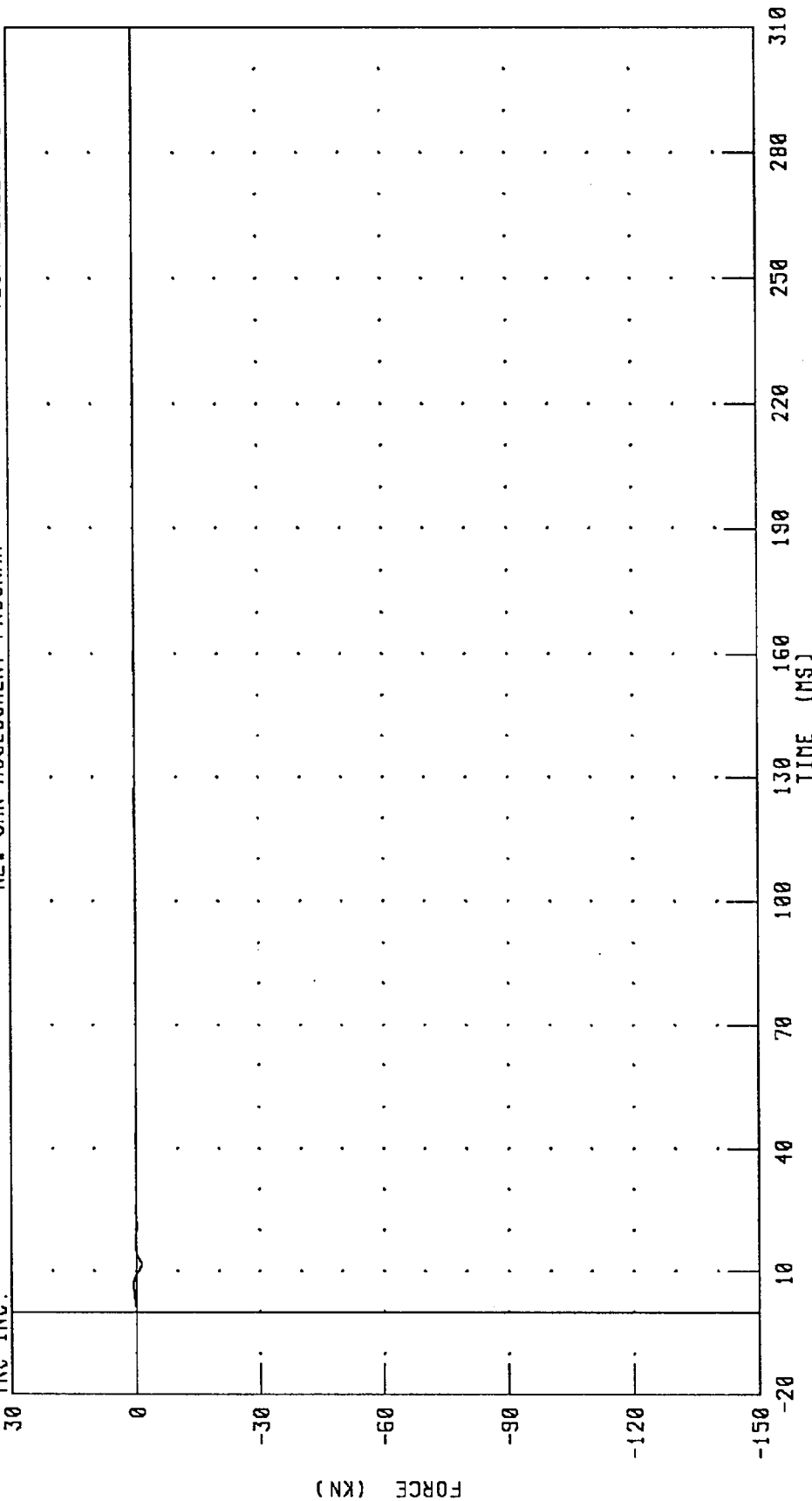
CHANNEL: BA1F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A2 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.68 KN @ 6.56 MS; -1.31 KN @ 11.60 MS

FILTER: CH. CLASS 60

CHANNEL: BA2F

FORCE (KN)

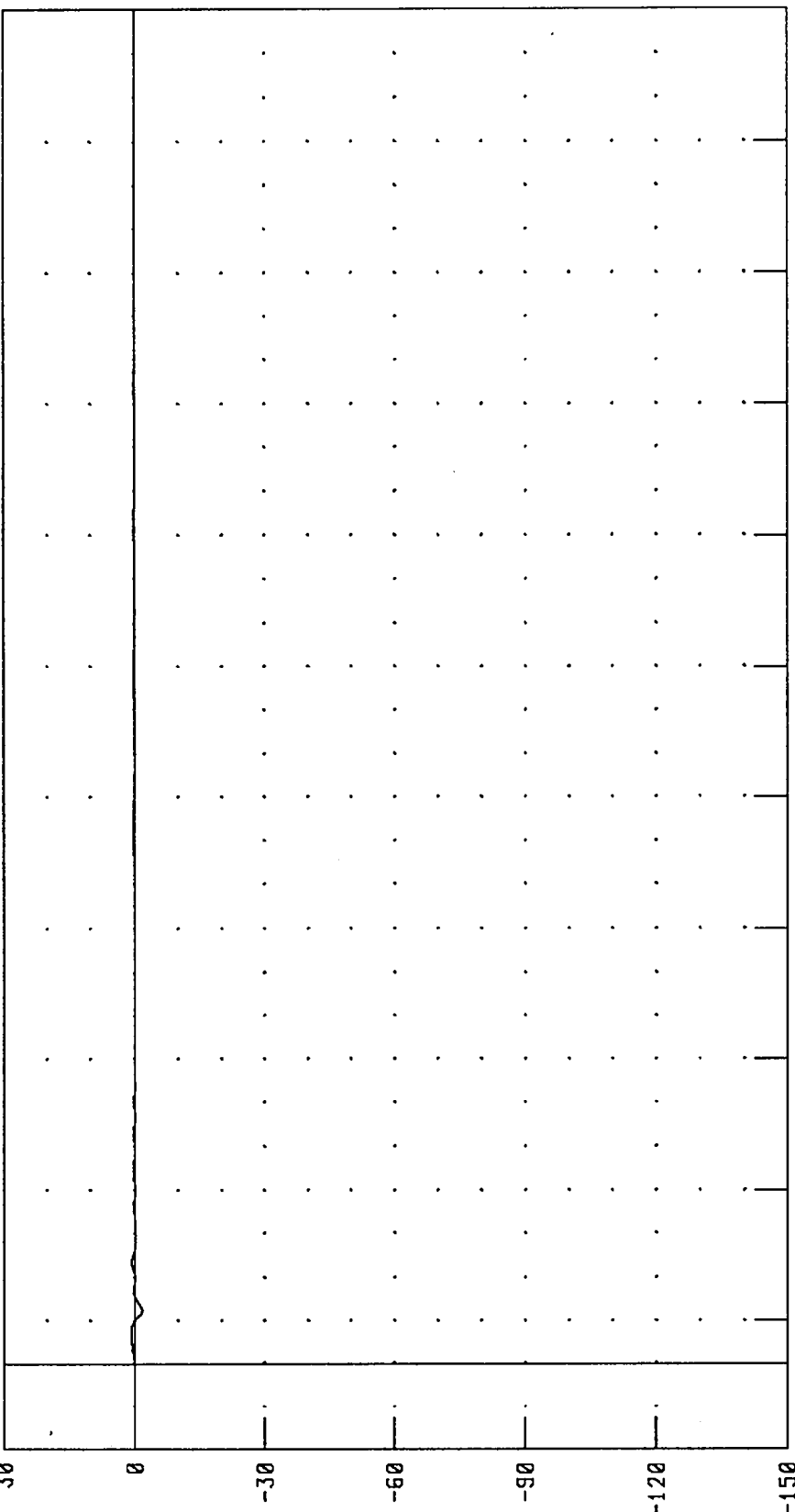
TIME (MS)

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A3 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.83 KN @ 7.04 MS, -1.78 KN @ 12.40 MS

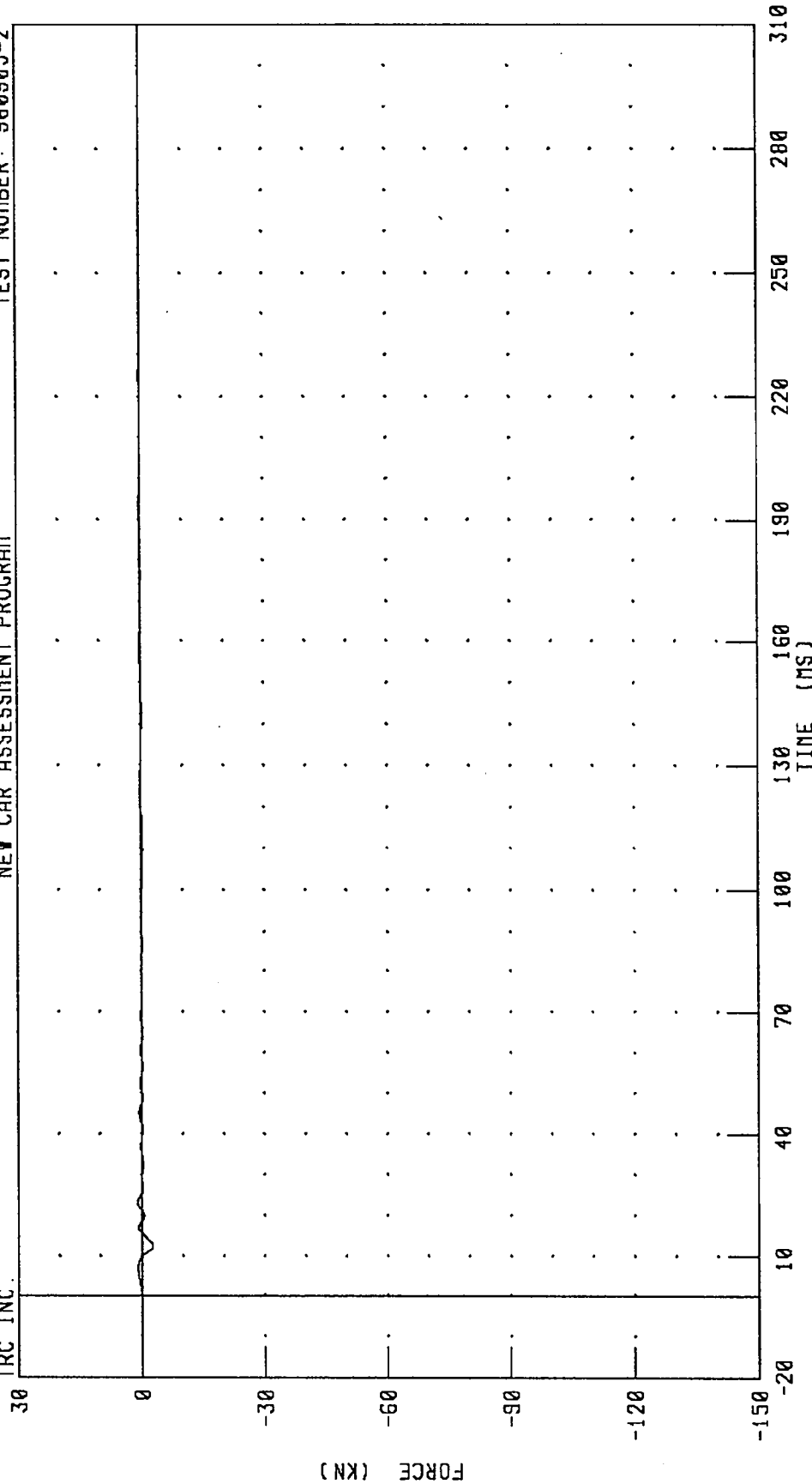
CHANNEL: BA3F FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A4 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.97 KN @ 23.12 MS; -2.69 KN @ 12.40 MS

FILTER: CH. CLASS 60

CHANNEL: BA4F

FORCE (KN)

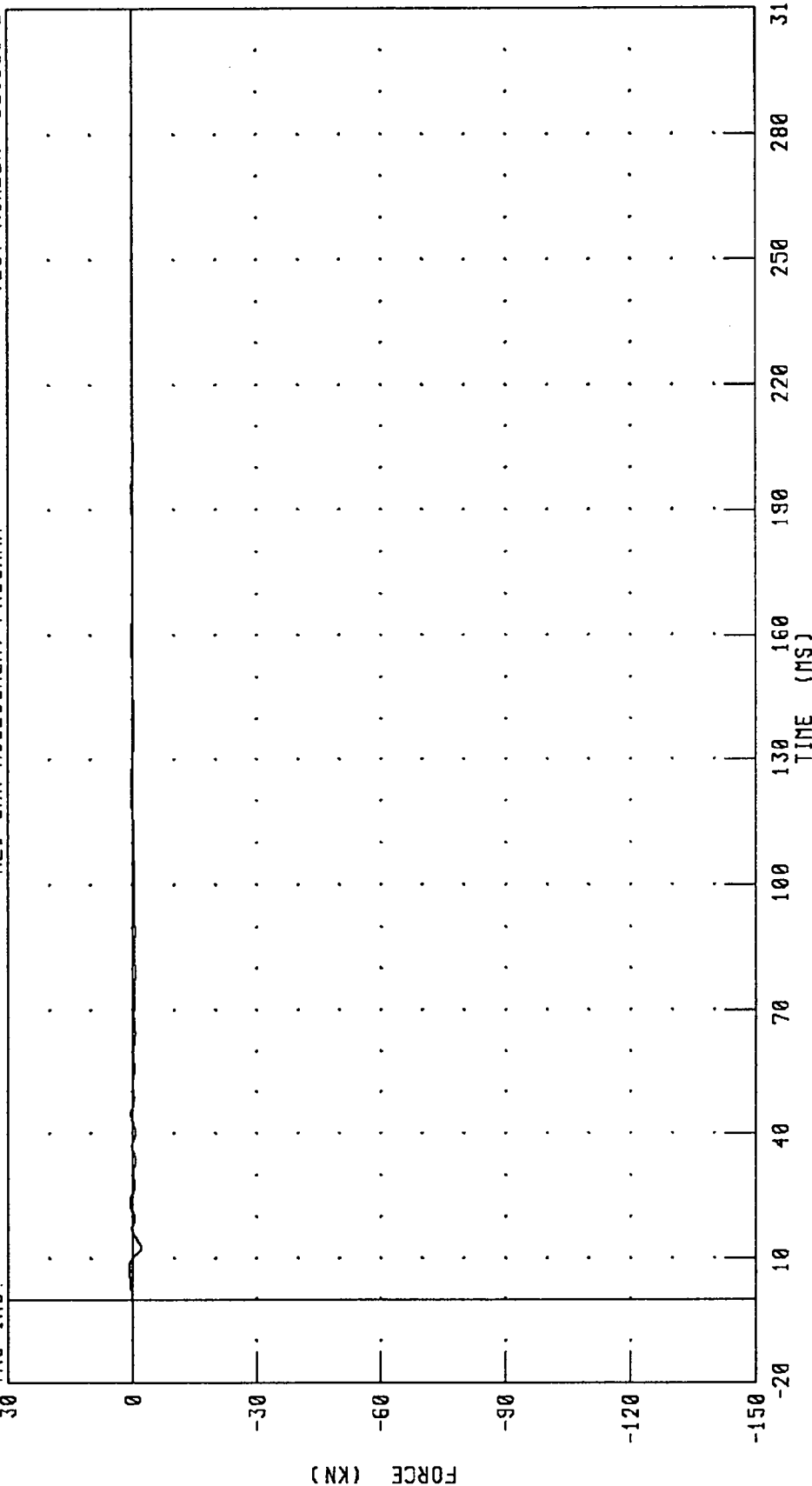
TIME (MS)

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: BASF

FILTER: CH. CLASS 60

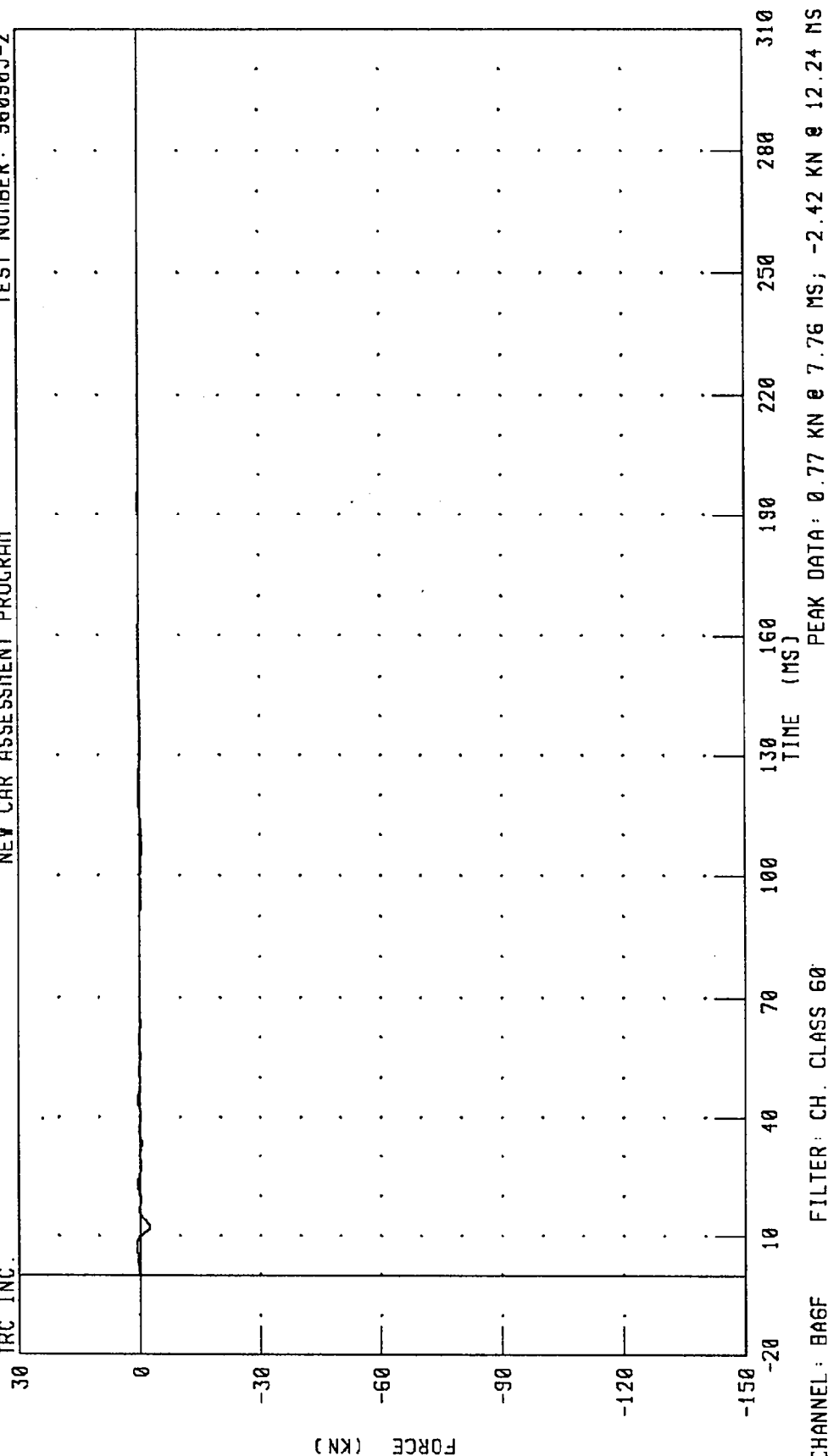
PEAK DATA: 0.80 KN @ 7.68 MS; -2.10 KN @ 12.64 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION AG FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: BASF

FILTER: CH. CLASS 60

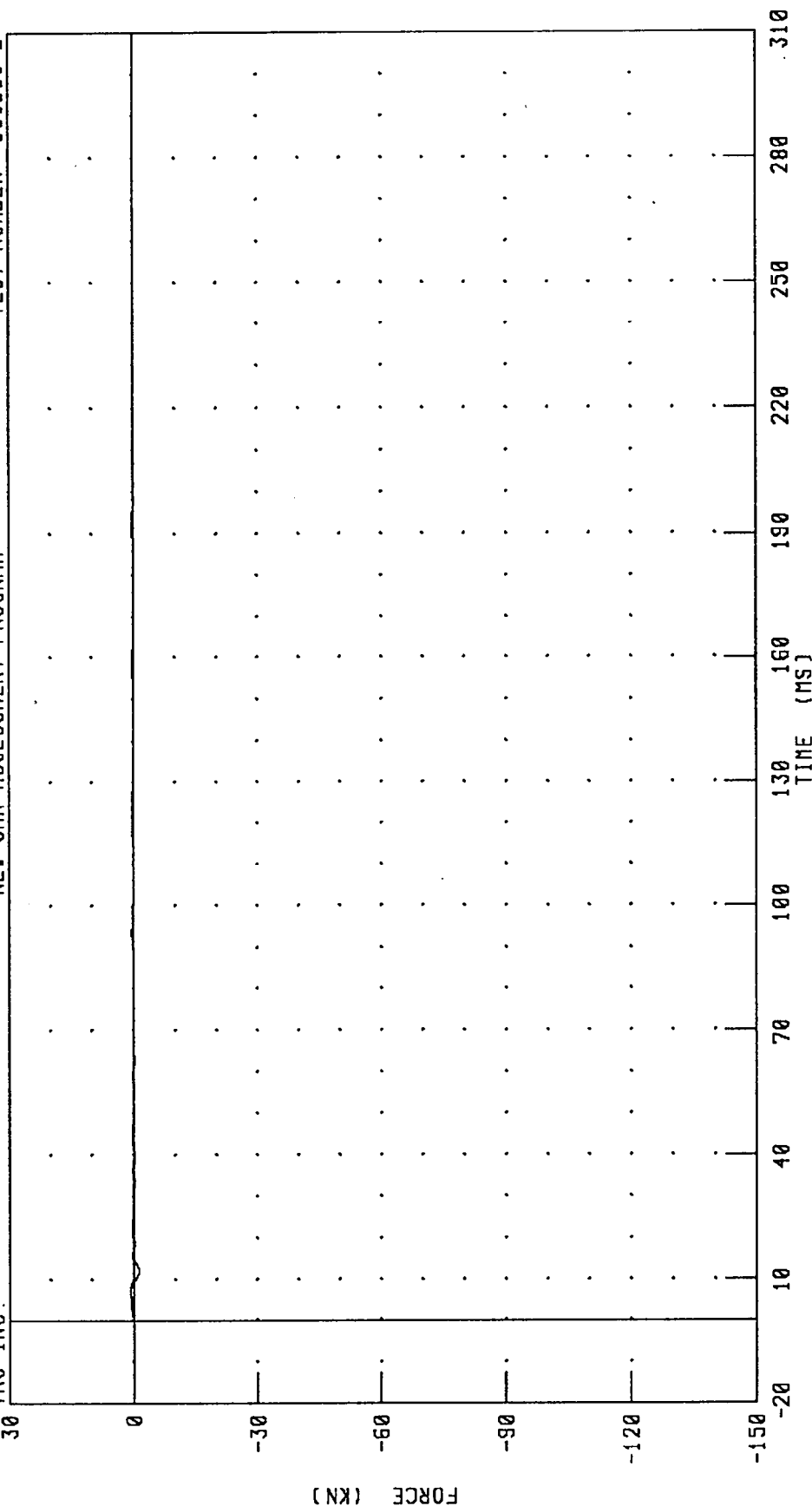
PEAK DATA: 0.77 KN @ 7.76 MS; -2.42 KN @ 12.24 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.69 KN @ 7.04 MS; -1.36 KN @ 12.00 MS

FILTER: CH. CLASS 60

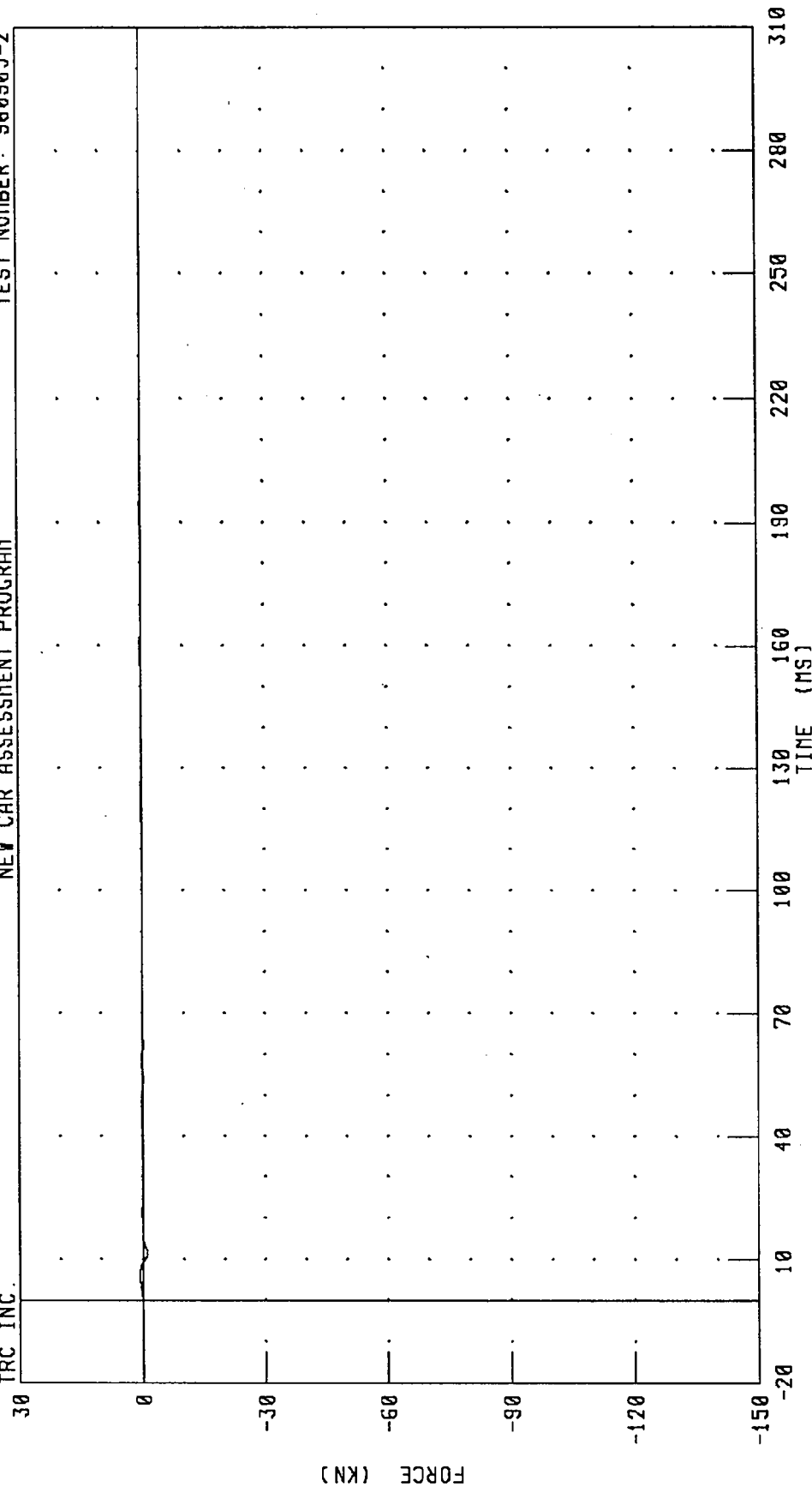
CHANNEL: BA7F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

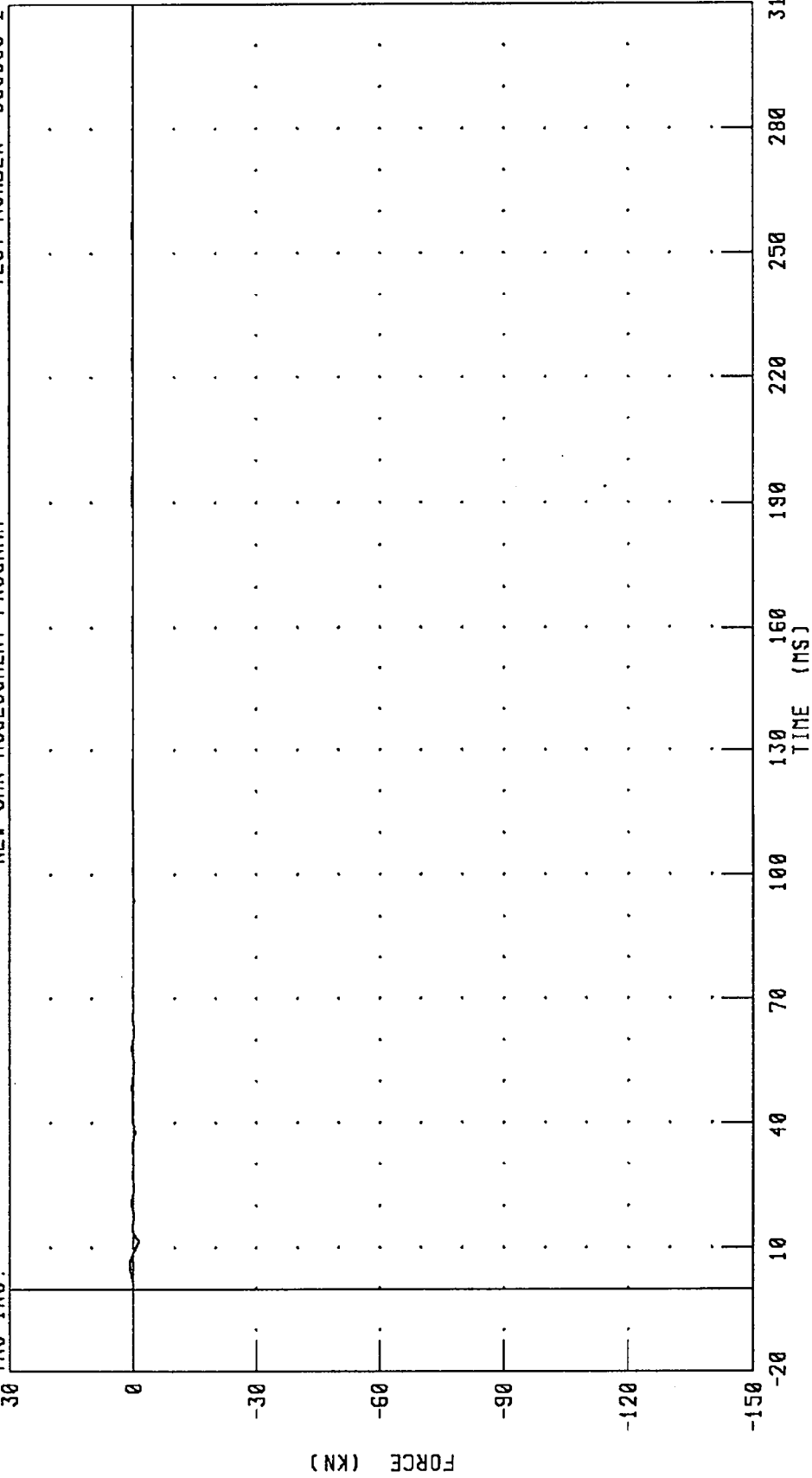


1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A9 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.82 KN @ 5.52 MS; -1.26 KN @ 11.52 MS

FILTER: CH. CLASS 60

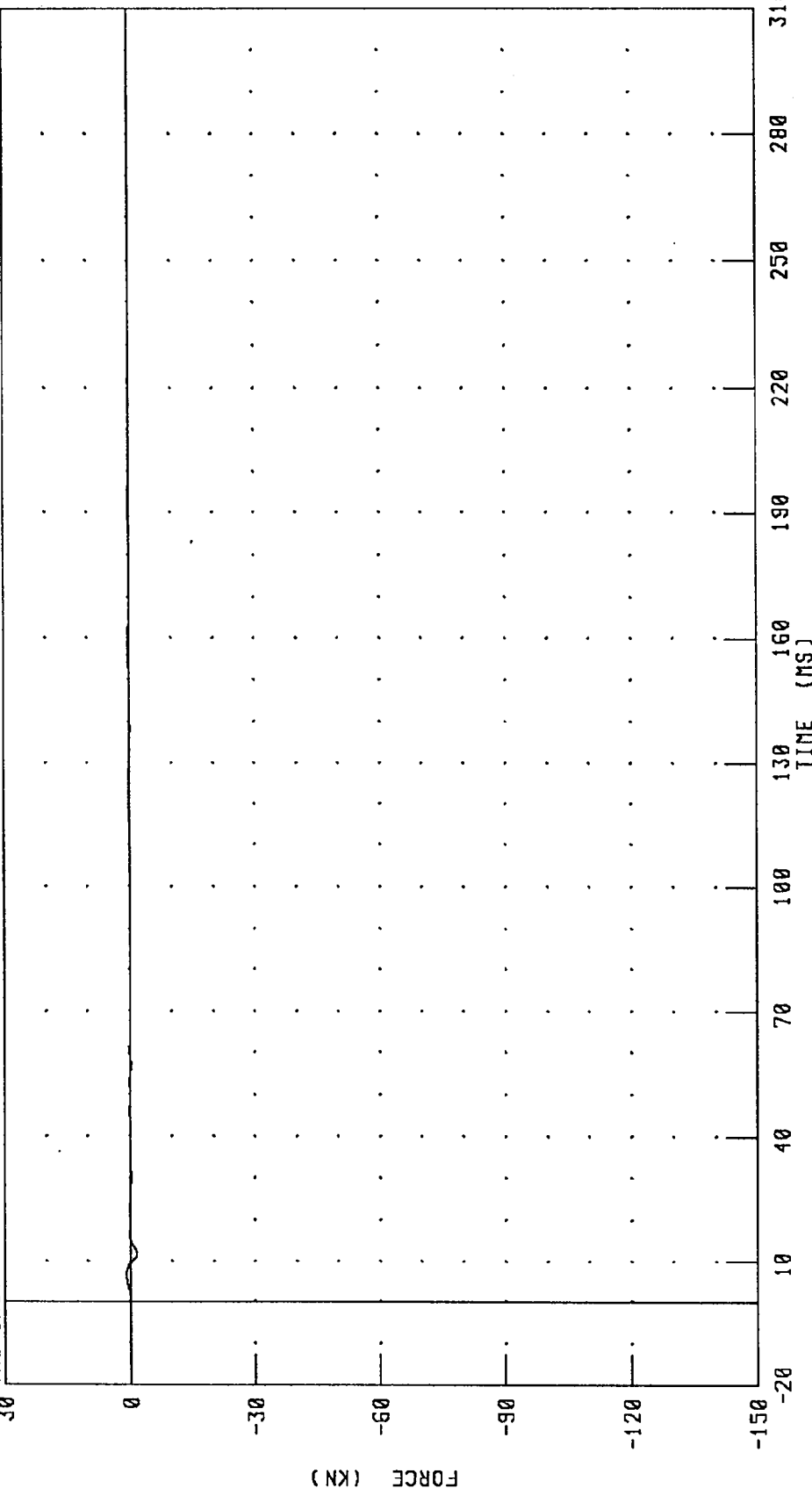
CHANNEL: BA9F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B1 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.92 KN @ 6.64 MS; -1.67 KN @ 11.92 MS

FILTER: CH. CLASS 60

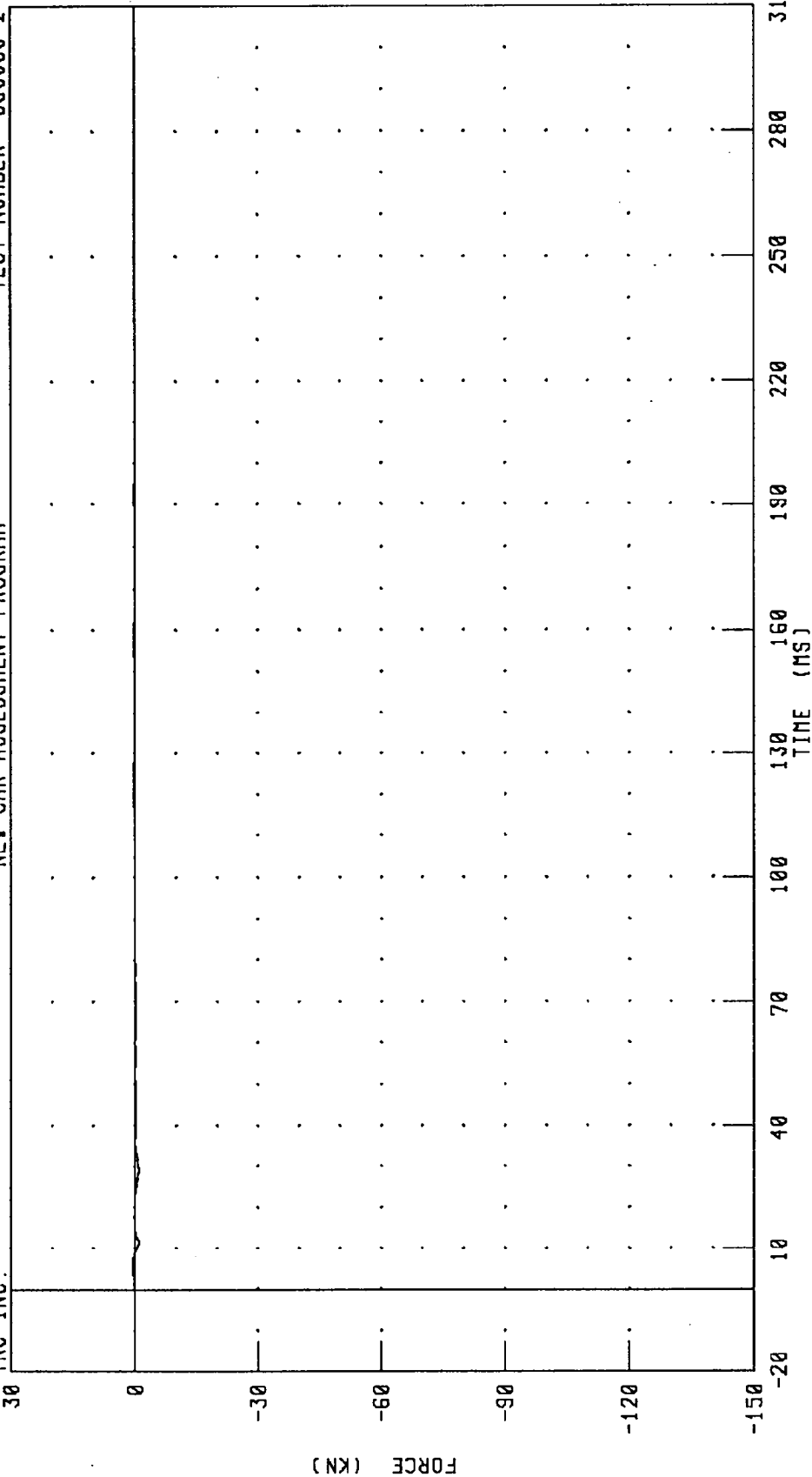
CHANNEL: BB1F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.52 KN @ 6.08 MS; -0.99 KN @ 11.52 MS

FILTER: CH. CLASS 60

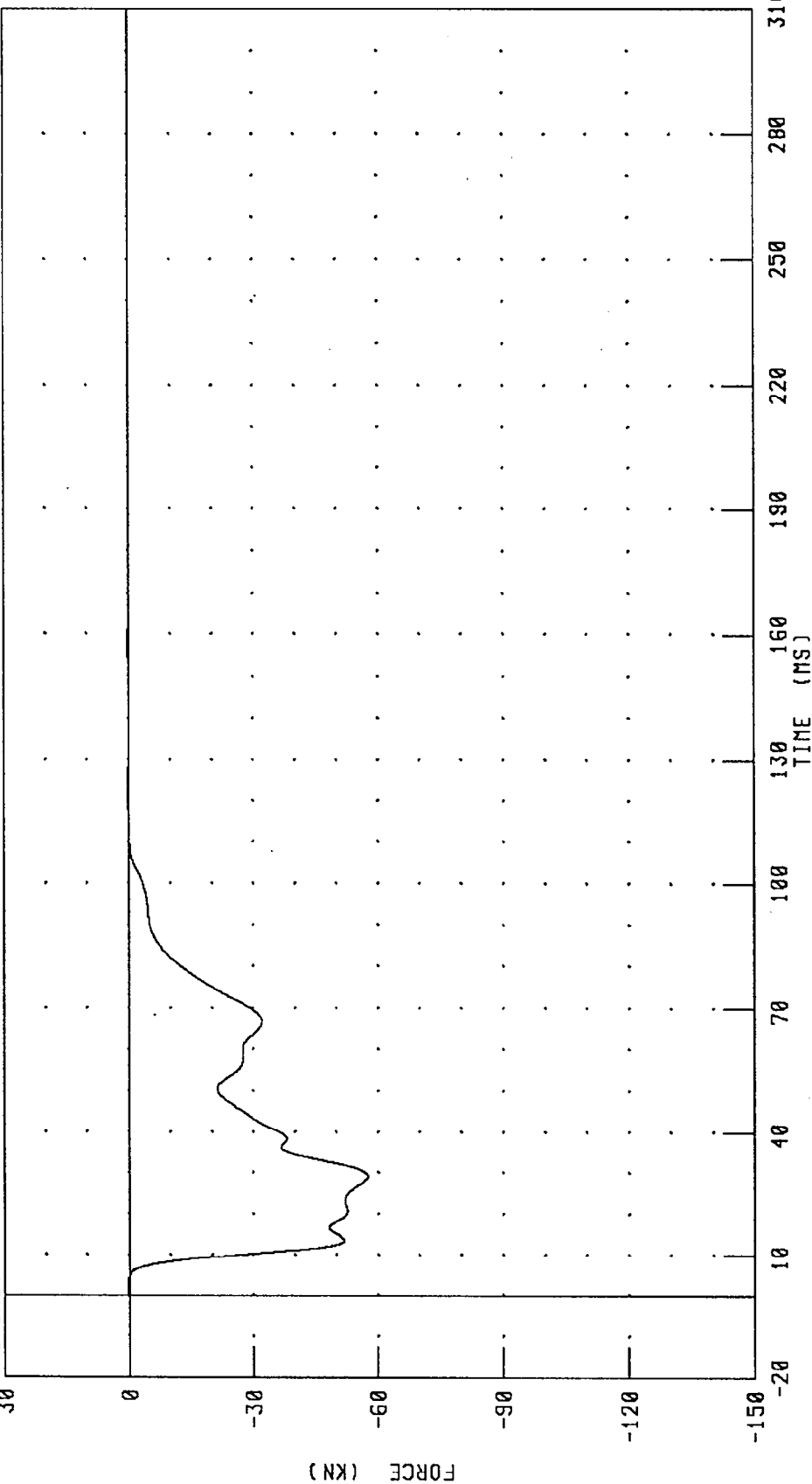
CHANNEL: BB2F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.33 KN @ 2.16 MS; -57.63 KN @ 29.12 MS

FILTER: CH. CLASS 60

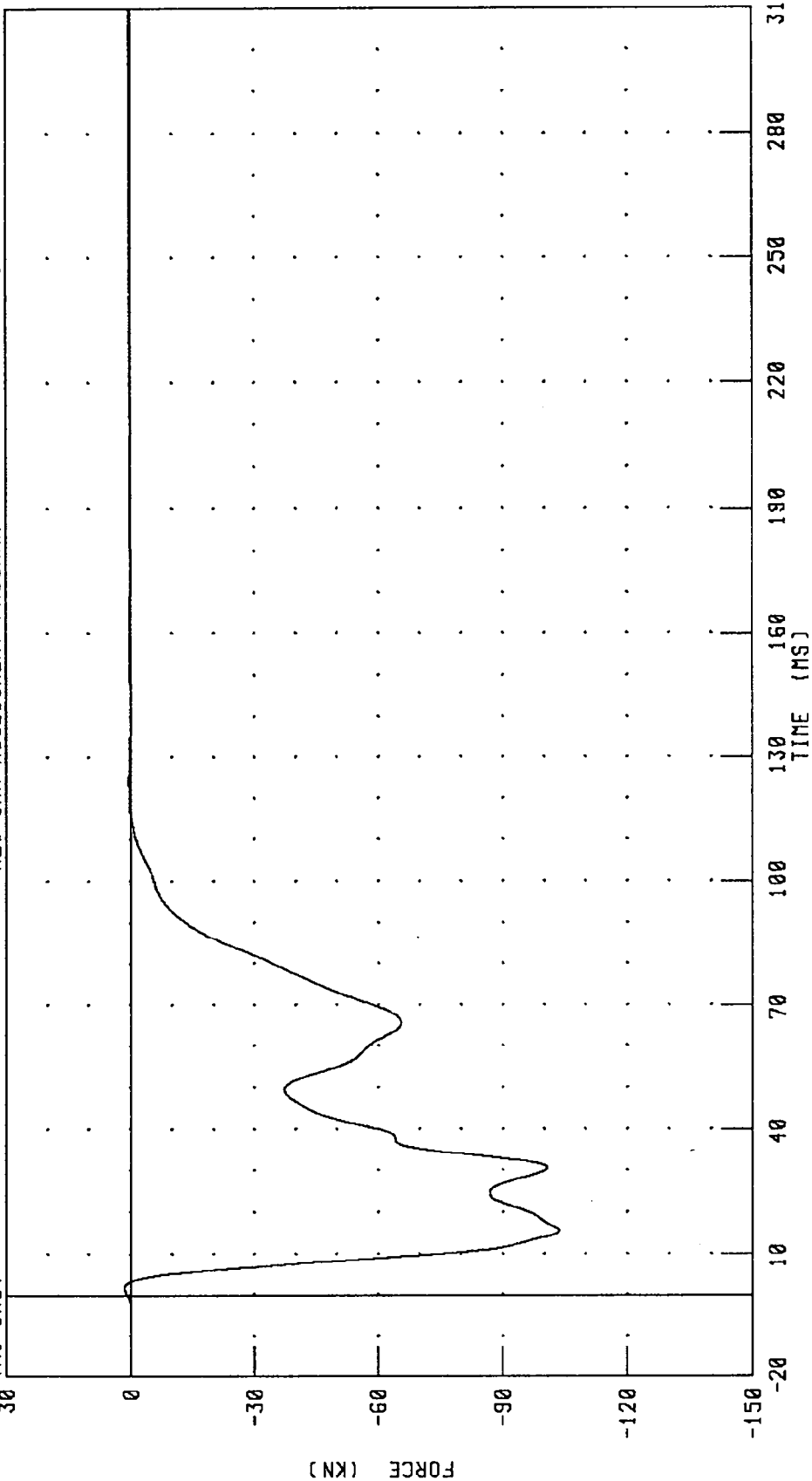
CHANNEL: BB3F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 1.45 KN @ 1.76 MS; -103.72 KN @ 15.52 MS

FILTER: CH. CLASS 60

CHANNEL: BB4F

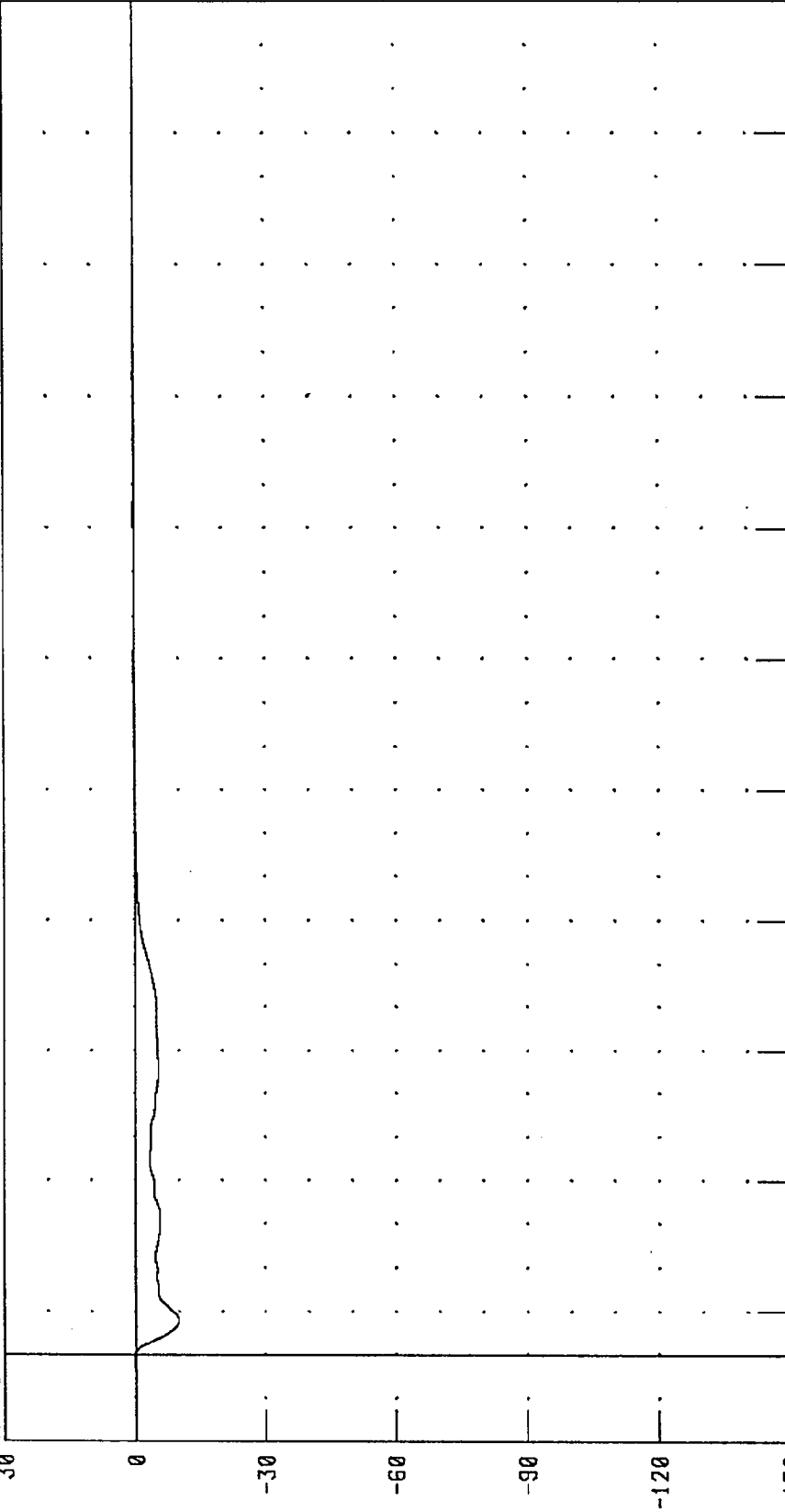
1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.

30



FORCE (KN)

TIME (MS)

PEAK DATA: 0.29 KN @ -0.72 MS; -9.98 KN @ 7.84 MS

FILTER: CH. CLASS 60

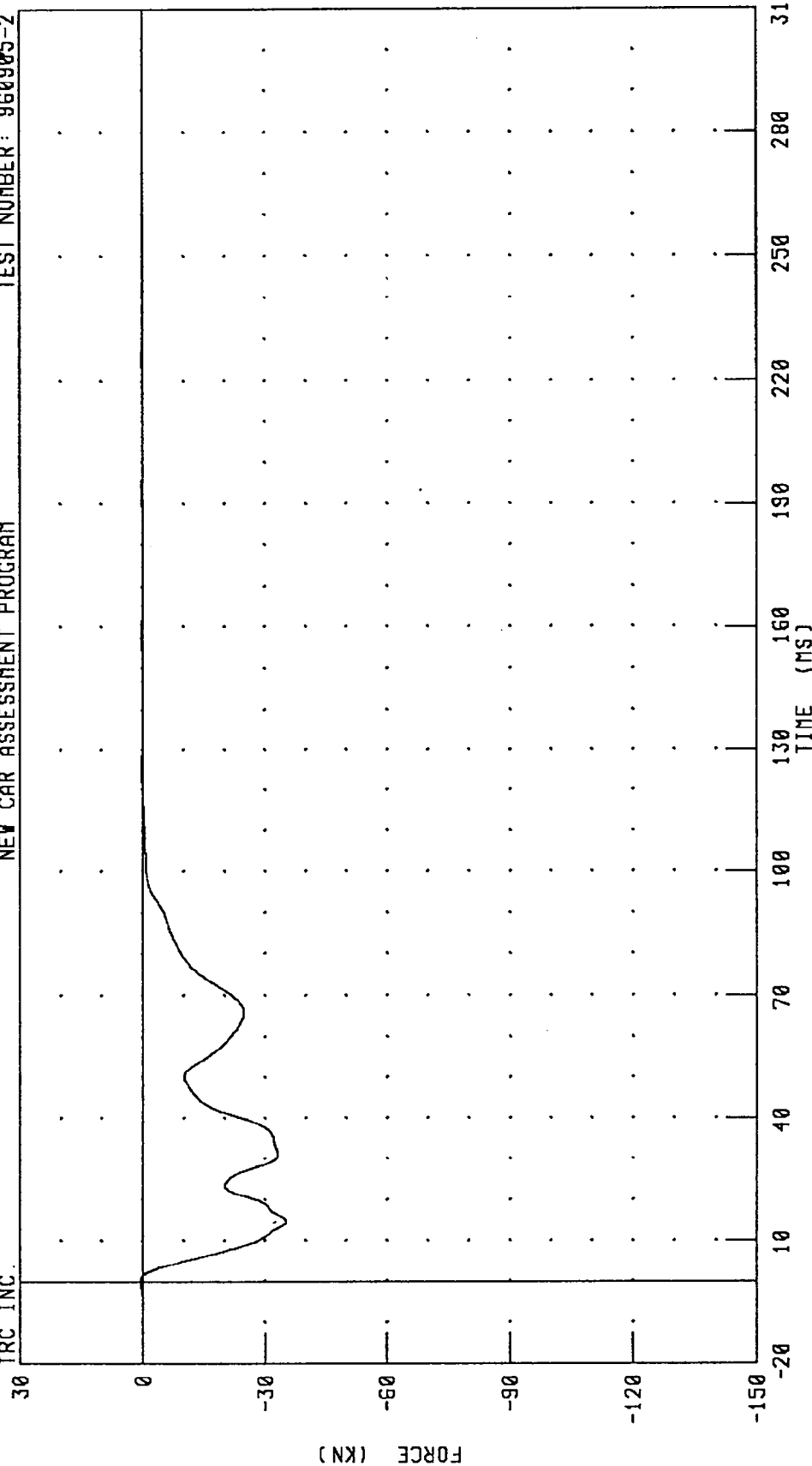
CHANNEL: BBSF

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.55 KN @ -0.08 MS; -35.21 KN @ 14.64 MS

FILTER: CH. CLASS 60

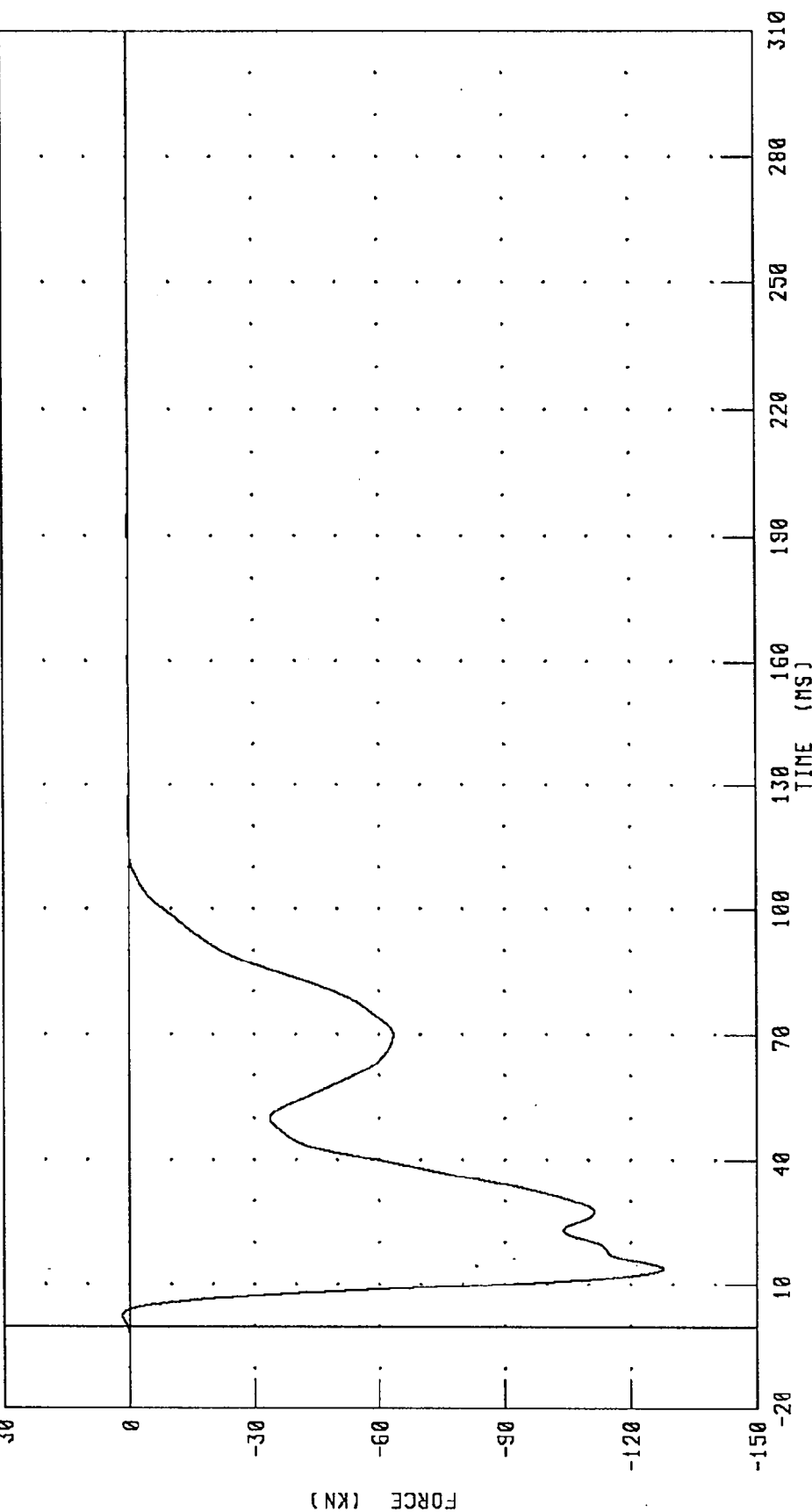
CHANNEL: BB6F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 1.71 KN @ 2.40 MS; -127.92 KN @ 13.92 MS

FILTER: CH. CLASS 60

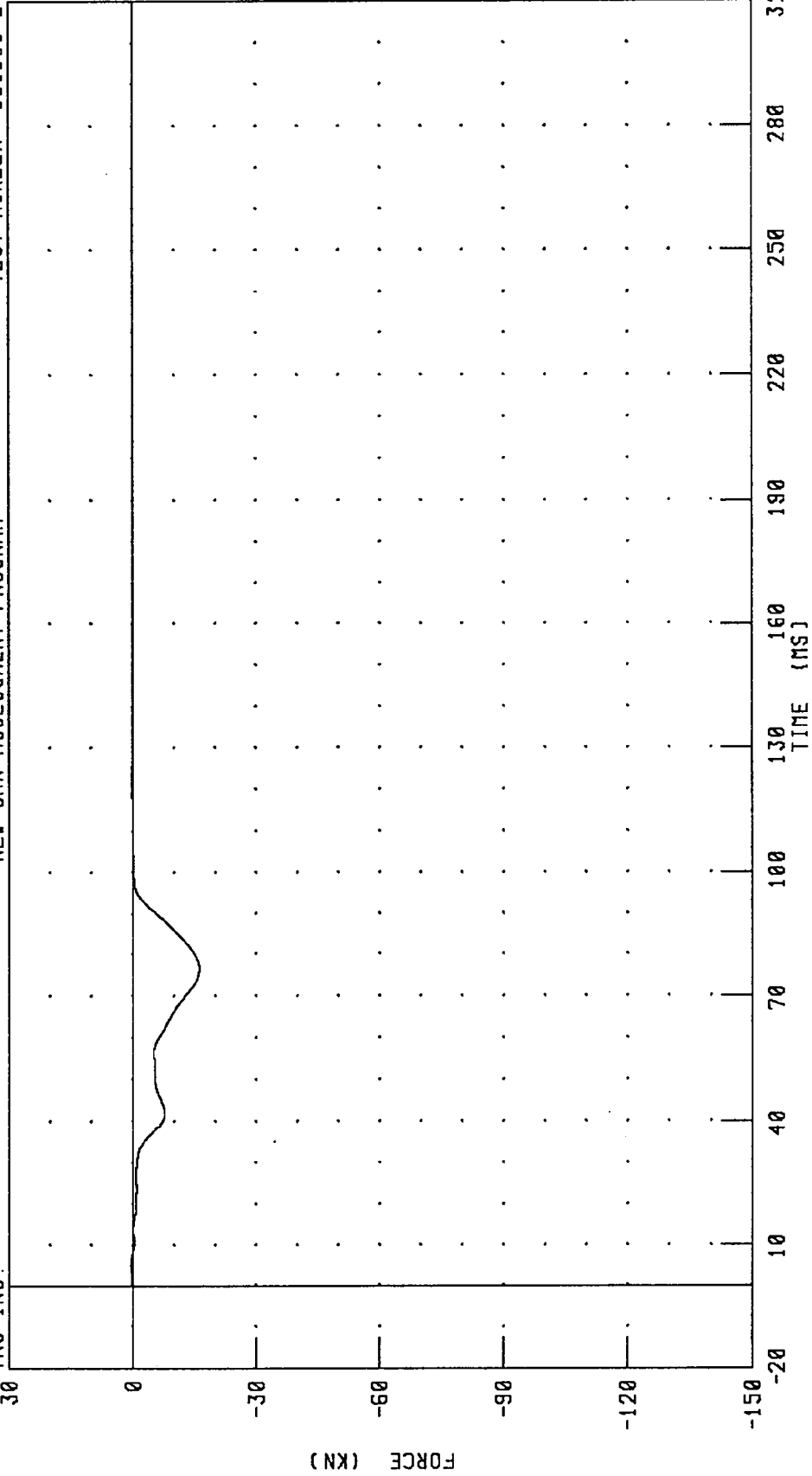
CHANNEL: BB7F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B8 FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 0.46 KN @ 5.52 MS; -16.23 KN @ 76.56 MS

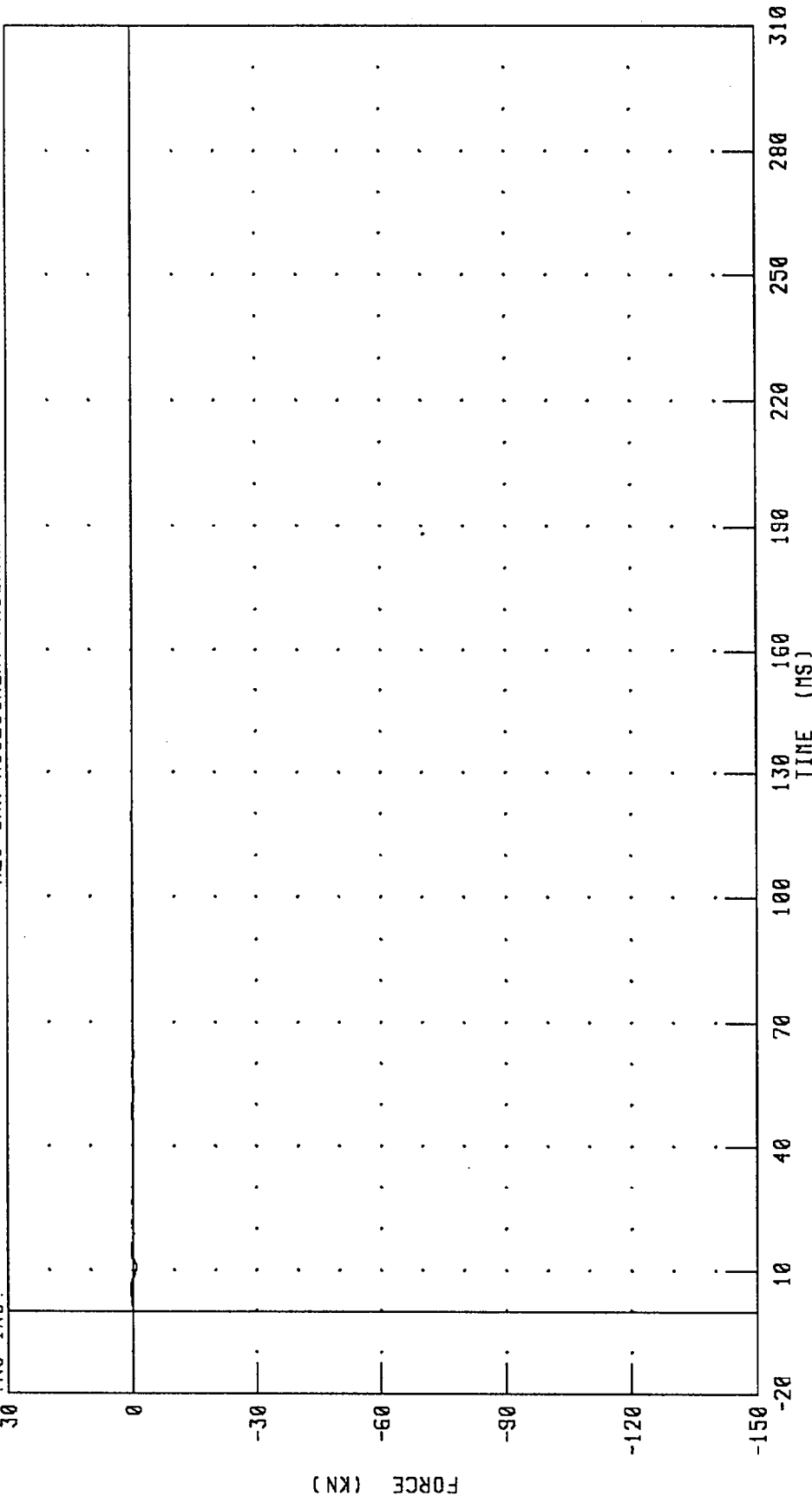
FILTER: CH. CLASS 60

CHANNEL: BB8F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B9 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 0.51 KN @ 5.68 MS; -0.77 KN @ 10.96 MS

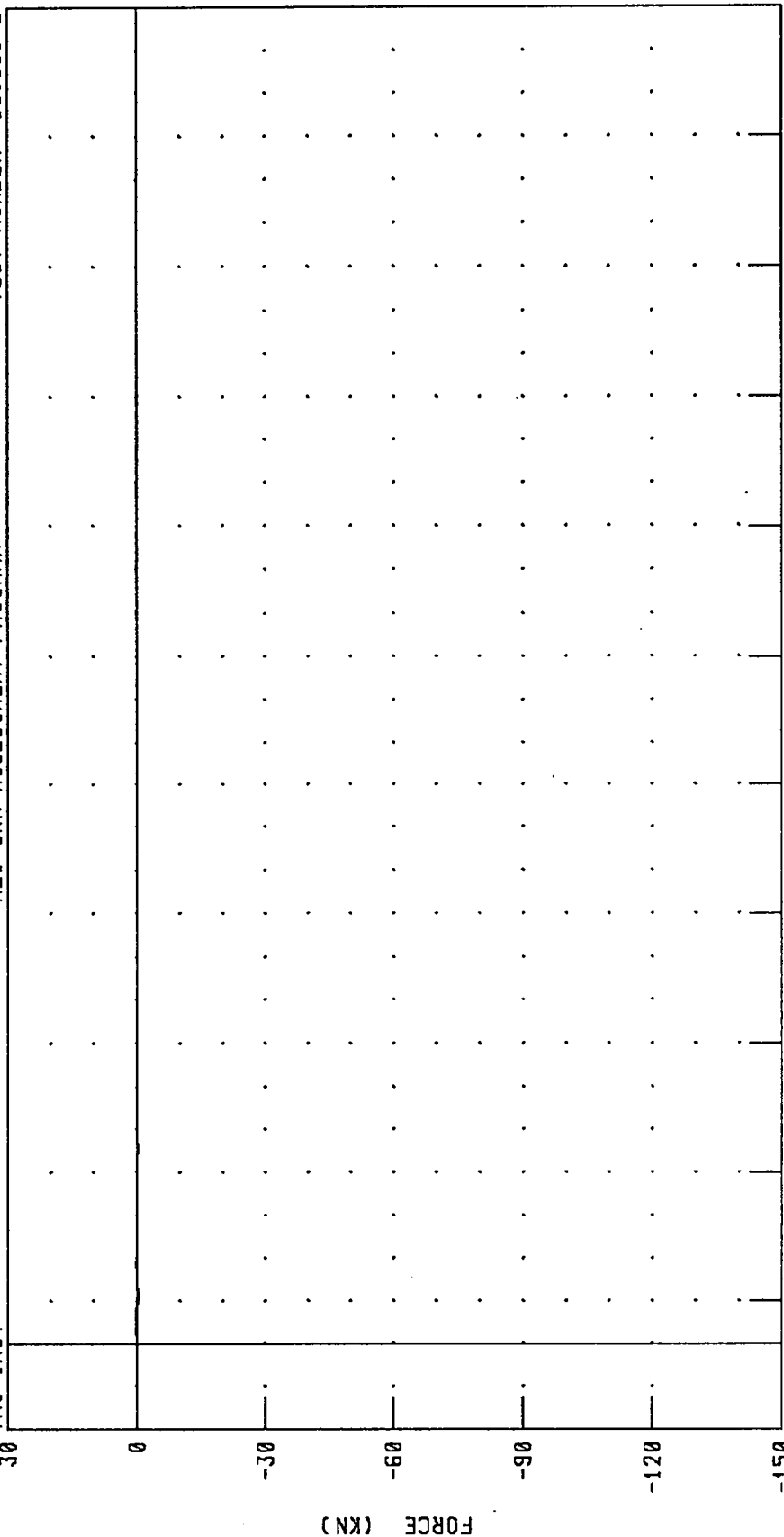
CHANNEL: BB9F FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C1 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: BC1F

FILTER: CH. CLASS 60

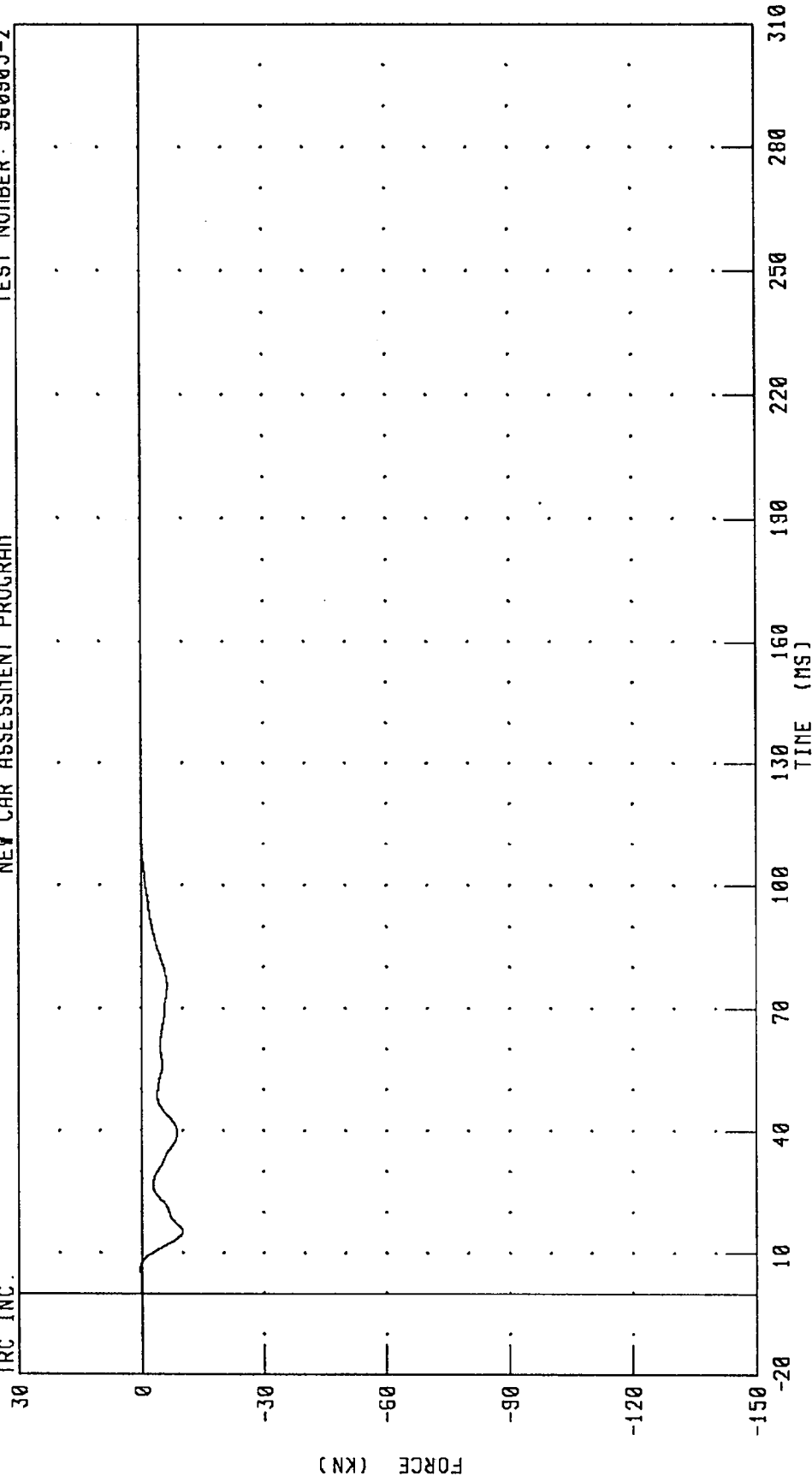
PEAK DATA: 0.21 KN @ 5.68 MS; -0.58 KN @ 11.28 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.35 KN @ 5.92 MS; -10.05 KN @ 15.12 MS

FILTER: CH. CLASS 60

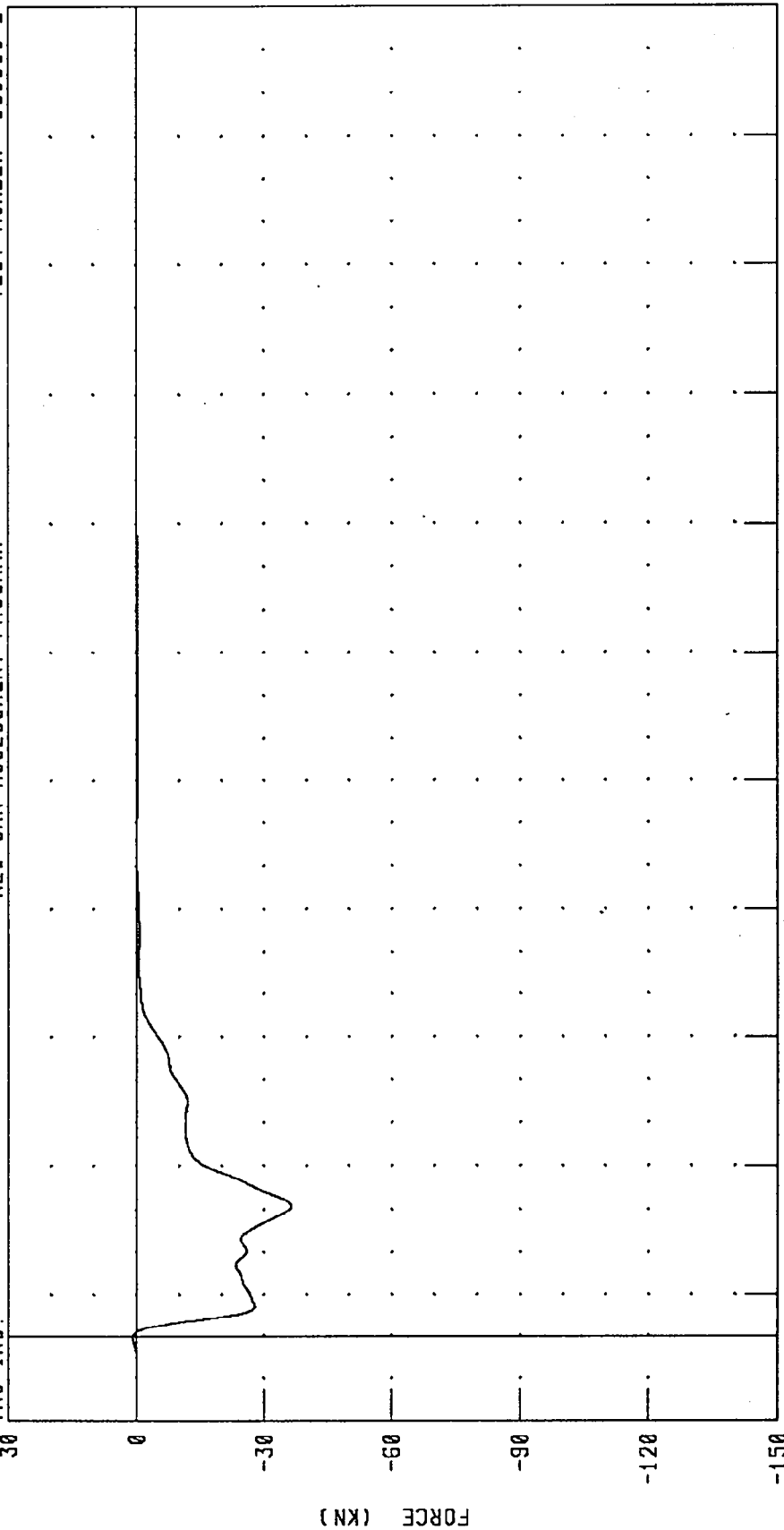
CHANNEL: BC2F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.91 KN @ -0.40 MS; -36.47 KN @ 30.96 MS

FILTER: CH. CLASS 60

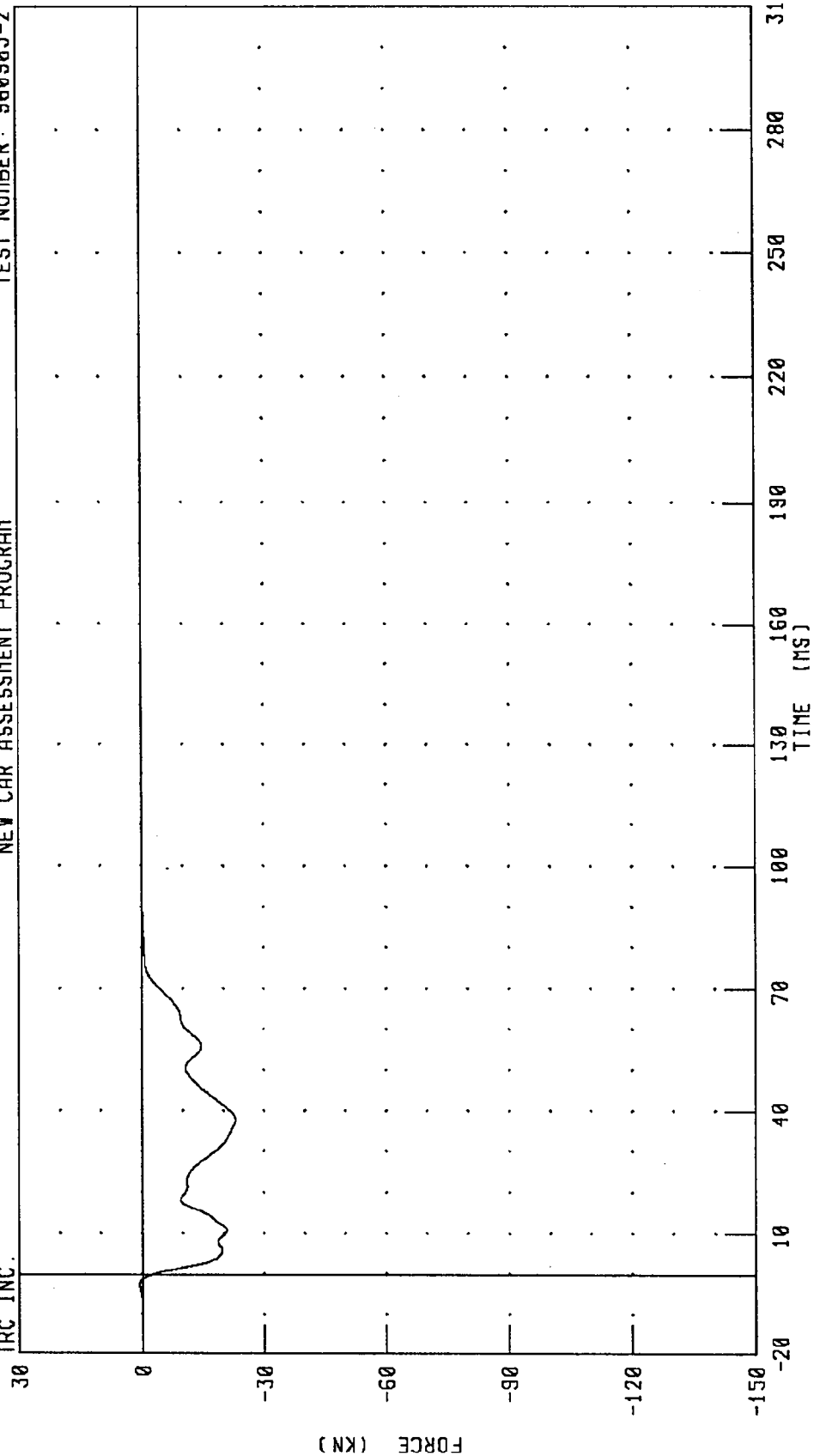
CHANNEL: BC3F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.64 KN @ -2.64 MS; -22.87 KN @ 37.92 MS

FILTER: CH. CLASS 60

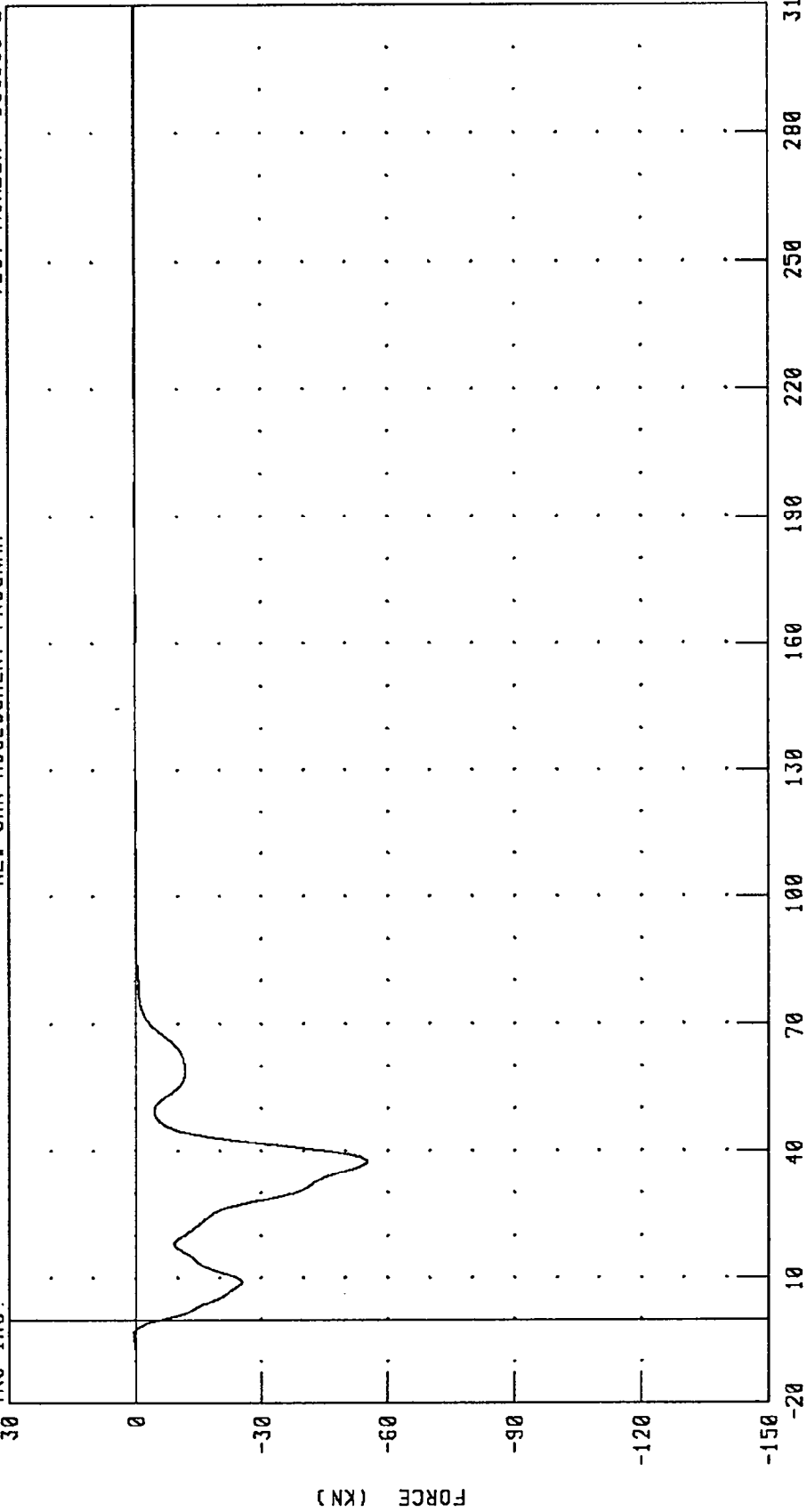
CHANNEL: BC4F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: BC5F

FILTER: CH. CLASS 60

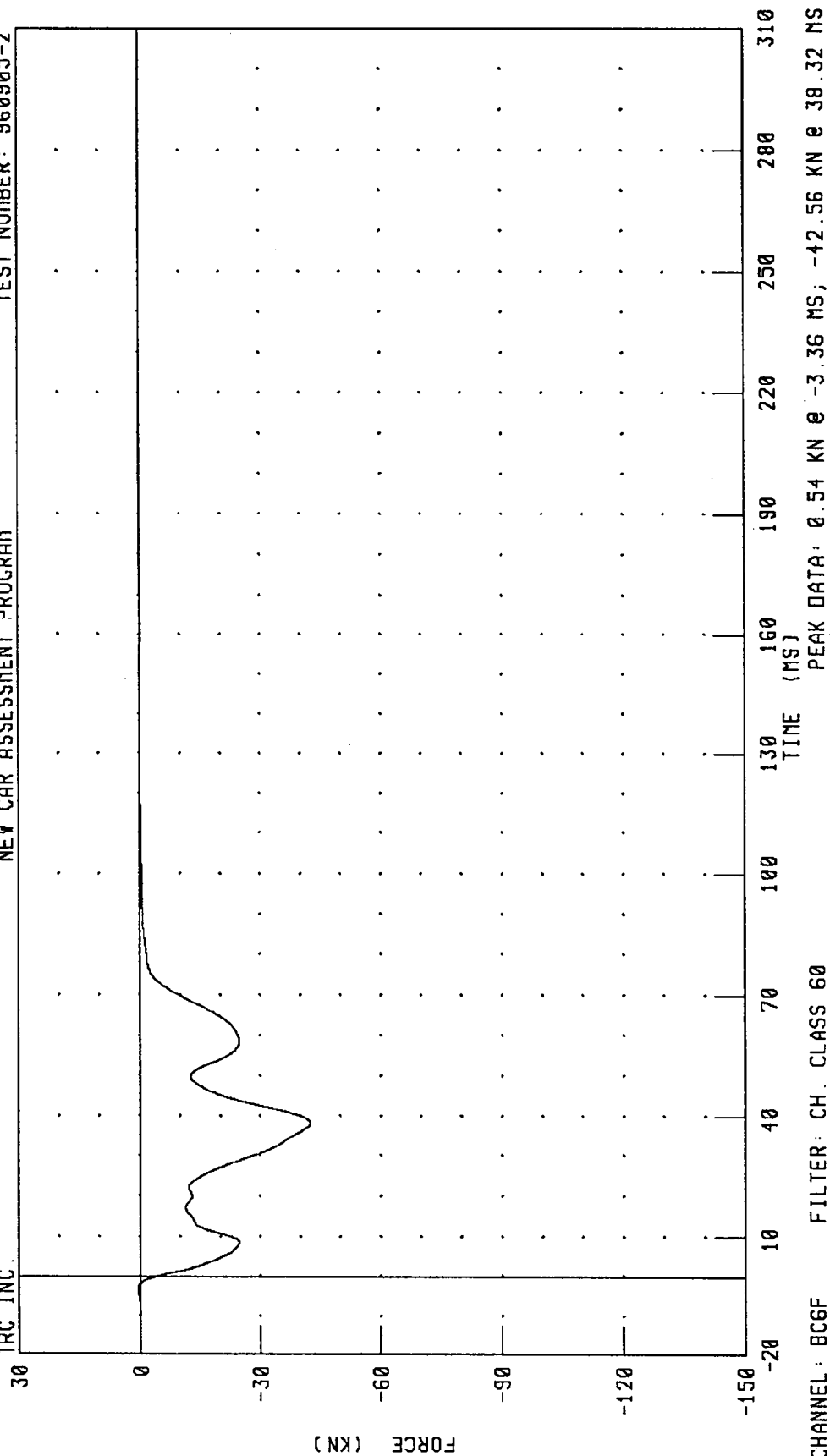
PEAK DATA: 0.53 KN @ -3.92 MS; -55.18 KN @ 37.52 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



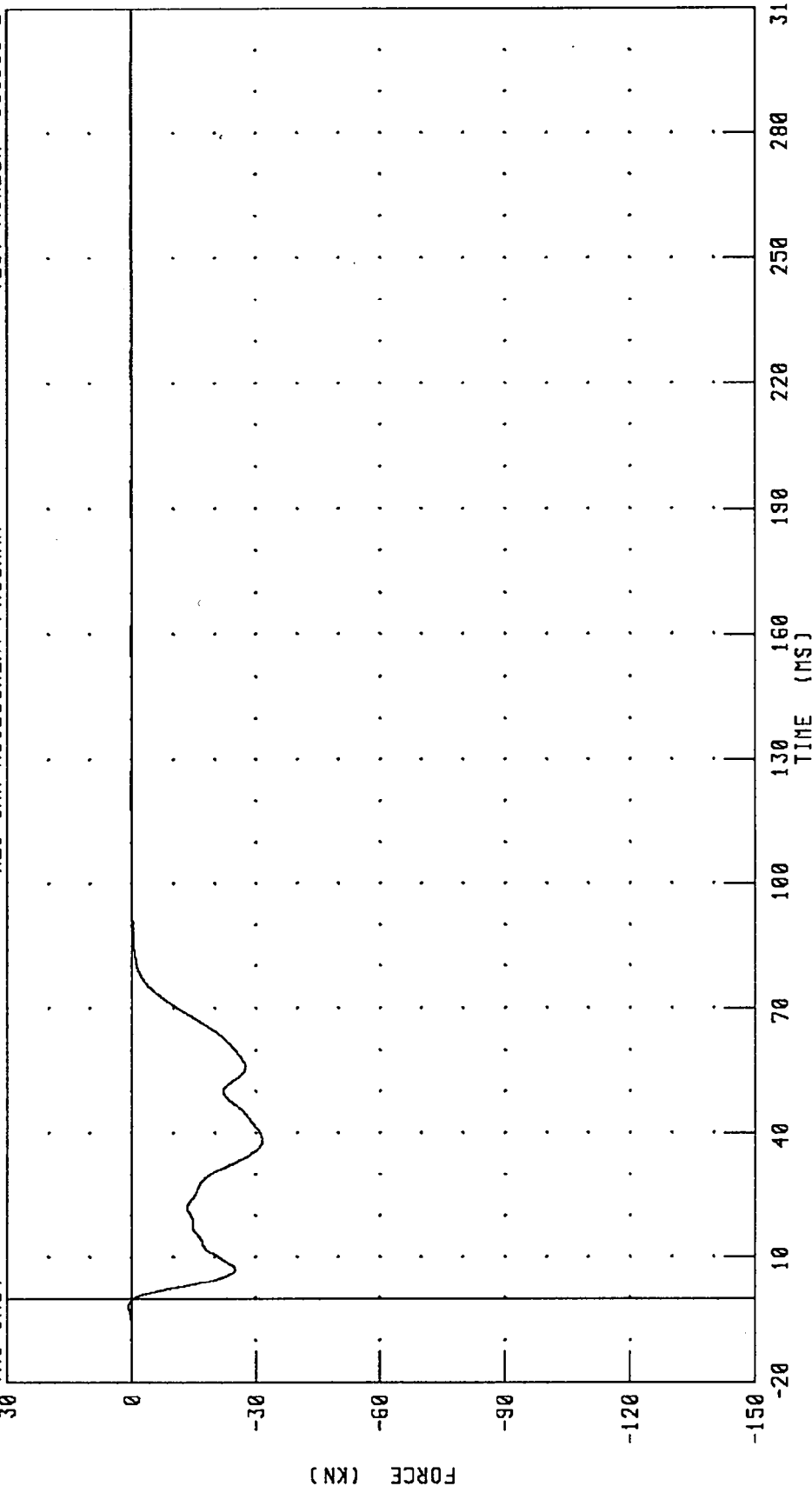
CHANNEL: BC6F FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.67 KN @ -1.92 MS; -31.57 KN @ 38.48 MS

FILTER: CH. CLASS 60

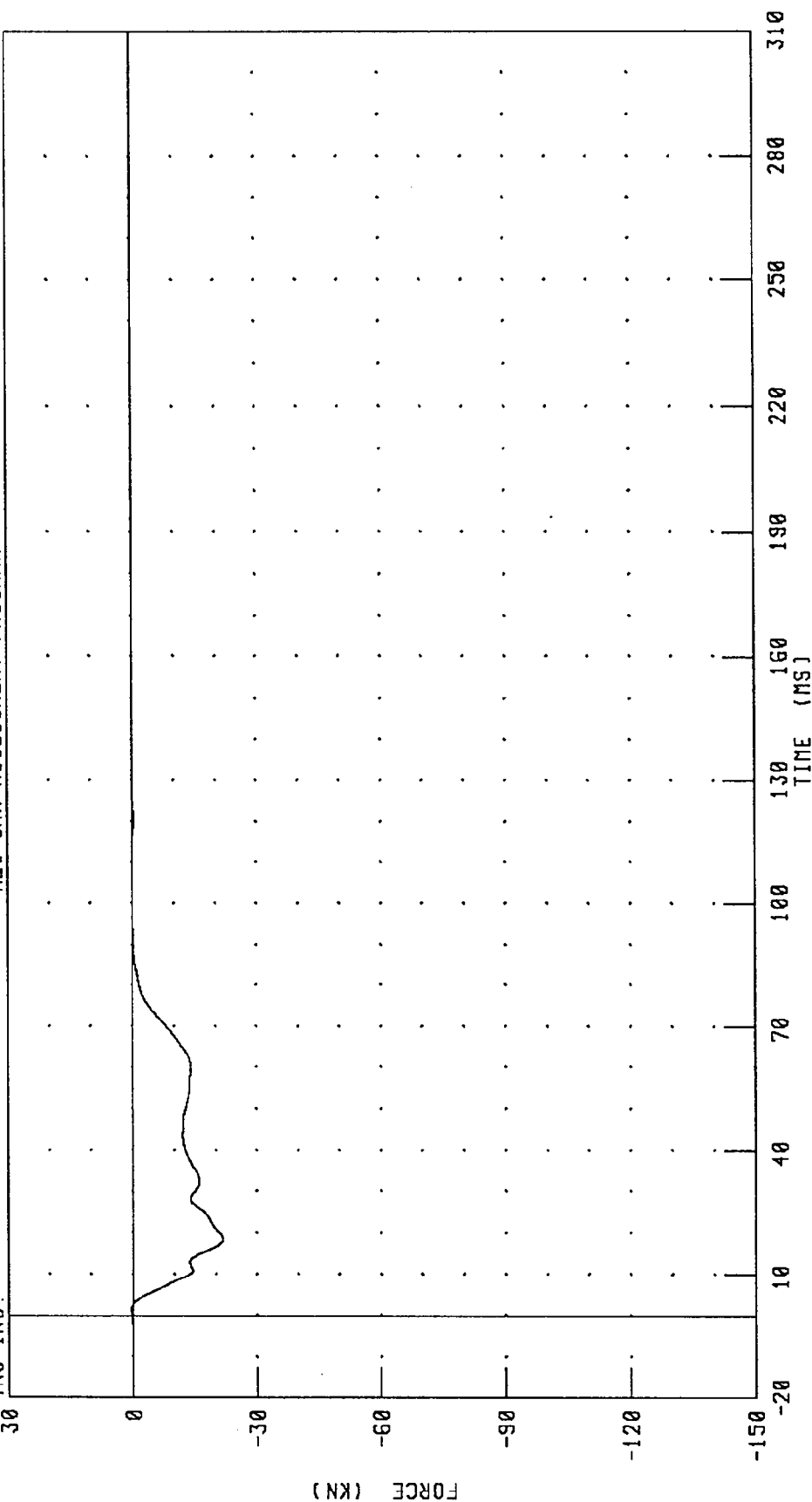
CHANNEL: BC7F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C8 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.39 KN @ 1.12 MS; -21.67 KN @ 18.56 MS

FILTER: CH. CLASS 60

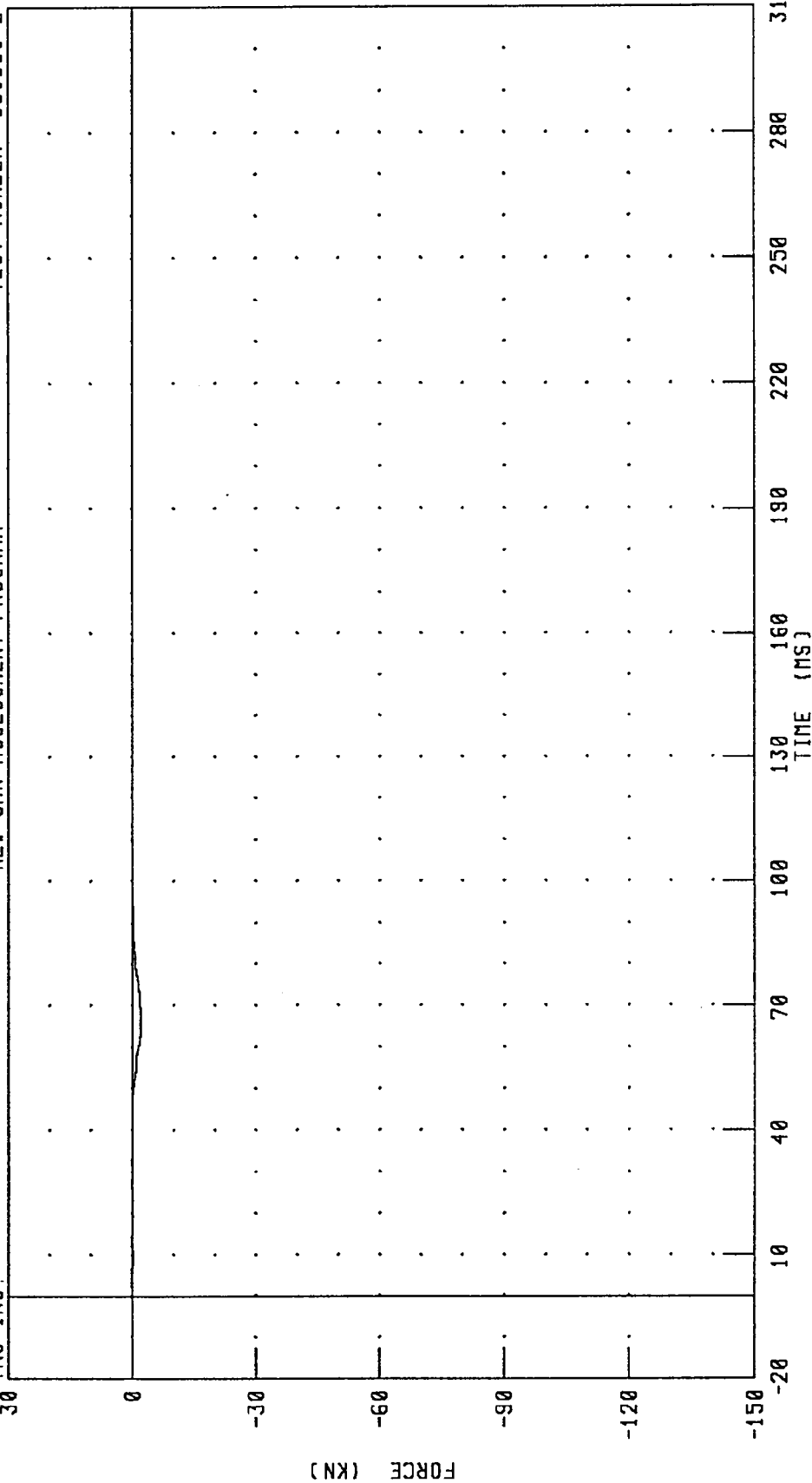
CHANNEL: BC8F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C9 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.32 KN @ 13.36 MS; -2.19 KN @ 67.28 MS

FILTER: CH. CLASS 60

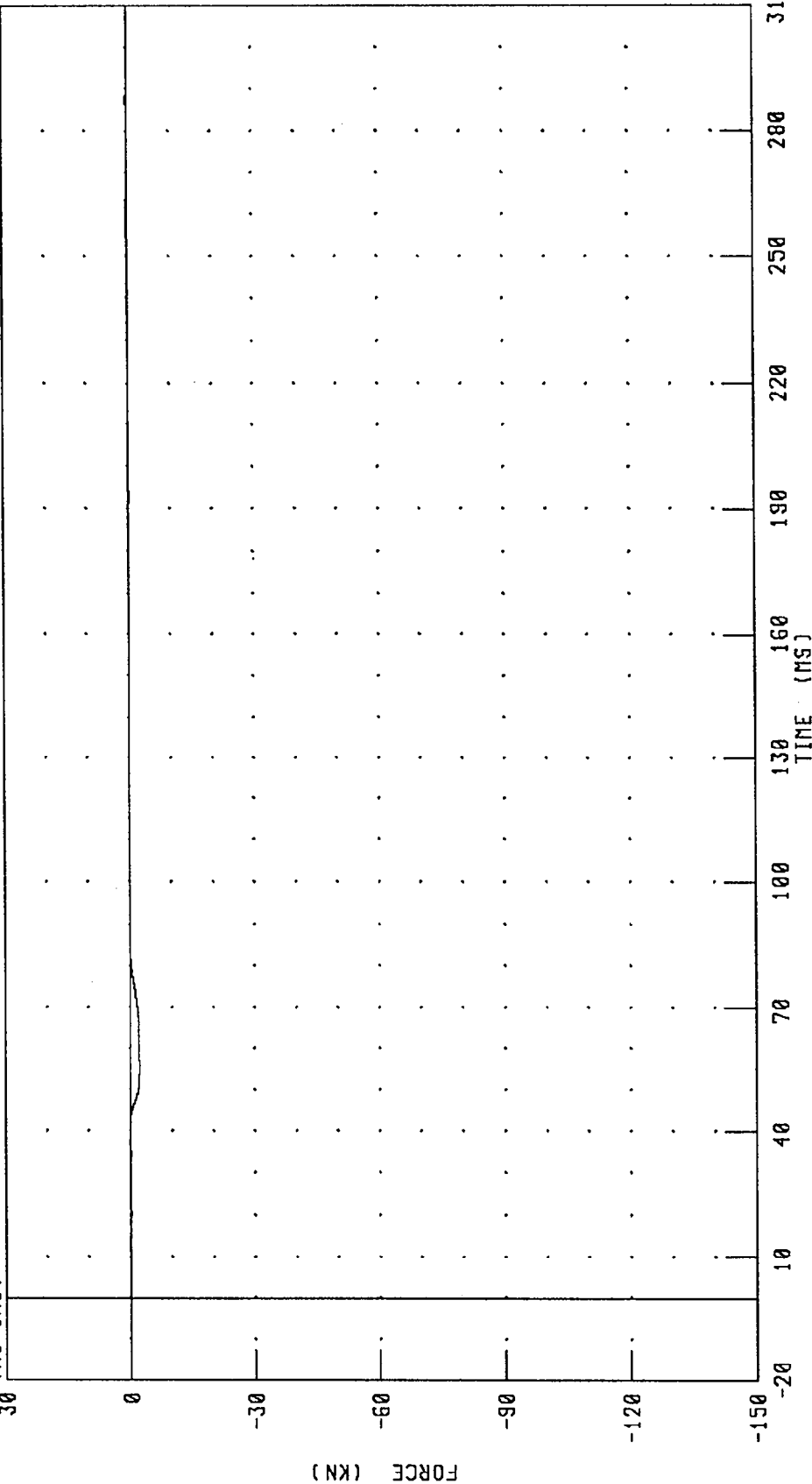
CHANNEL: BC9F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.19 KN @ 258.24 MS; -2.29 KN @ 55.28 MS

FILTER: CH. CLASS 60

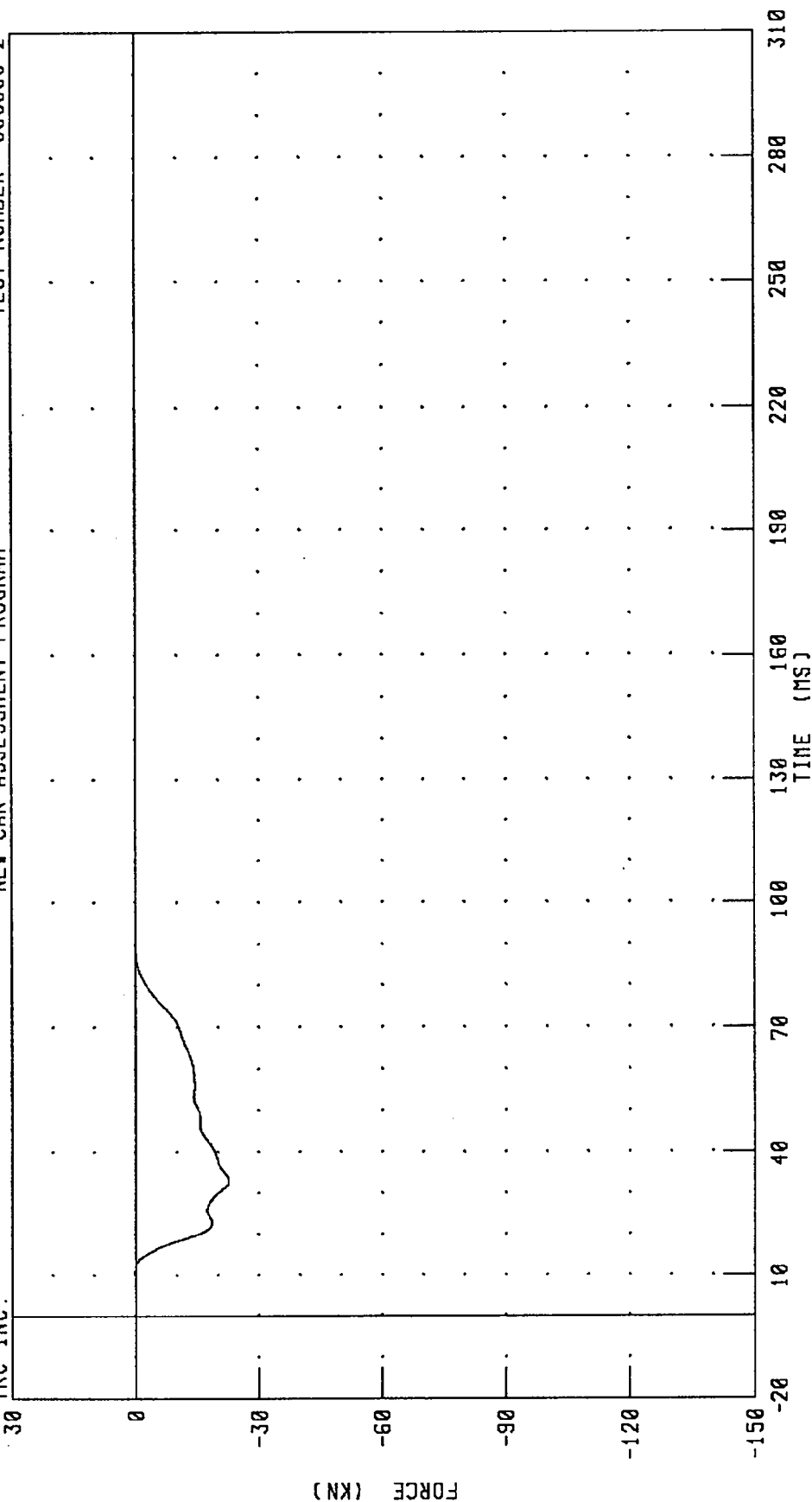
CHANNEL: B01F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.10 KN @ 10.56 MS; -22.72 KN @ 33.12 MS

FILTER: CH. CLASS 60

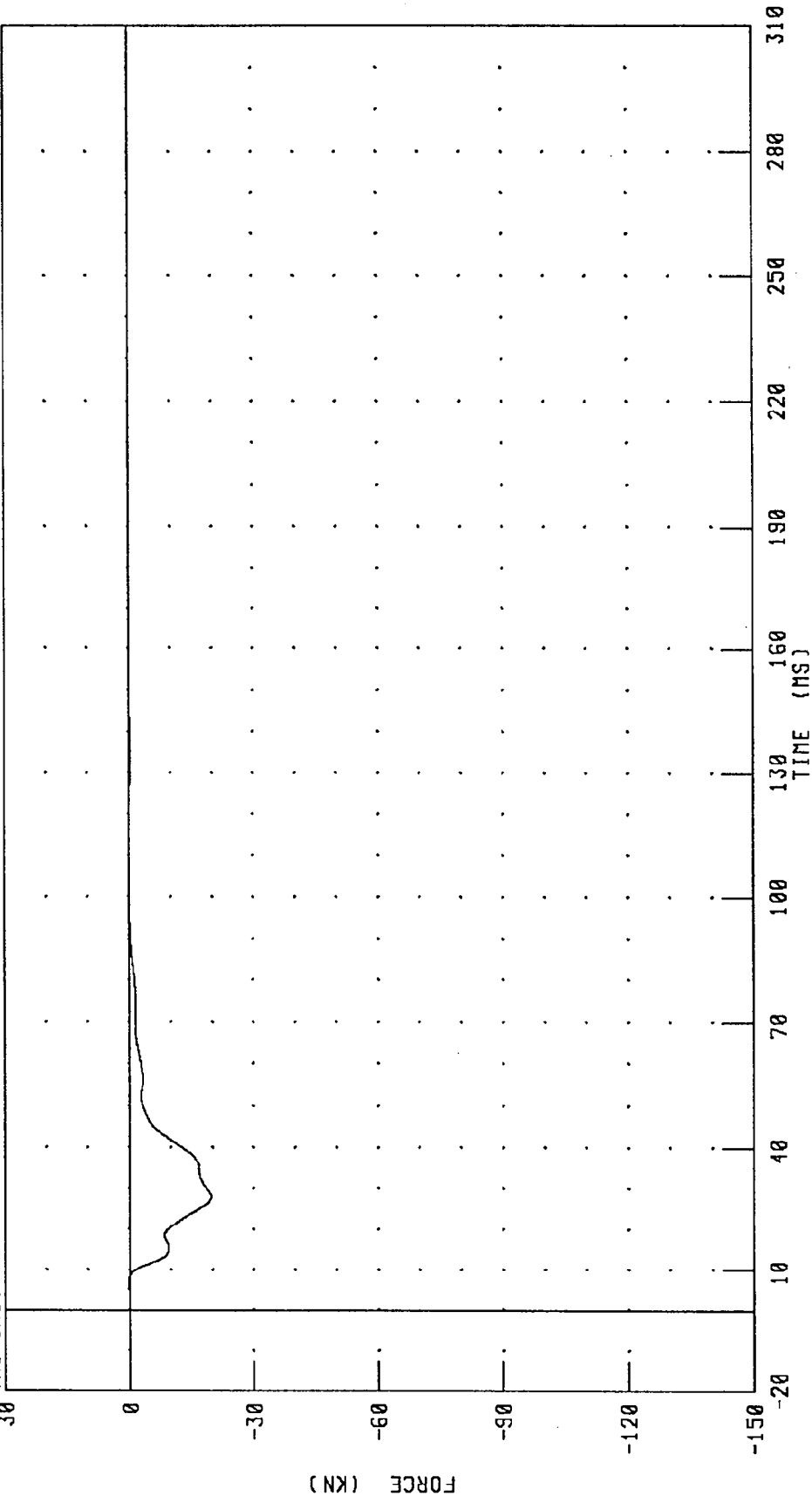
CHANNEL: BD2F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.16 KN @ 6.96 MS; -19.74 KN @ 28.08 MS

FILTER: CH. CLASS 60

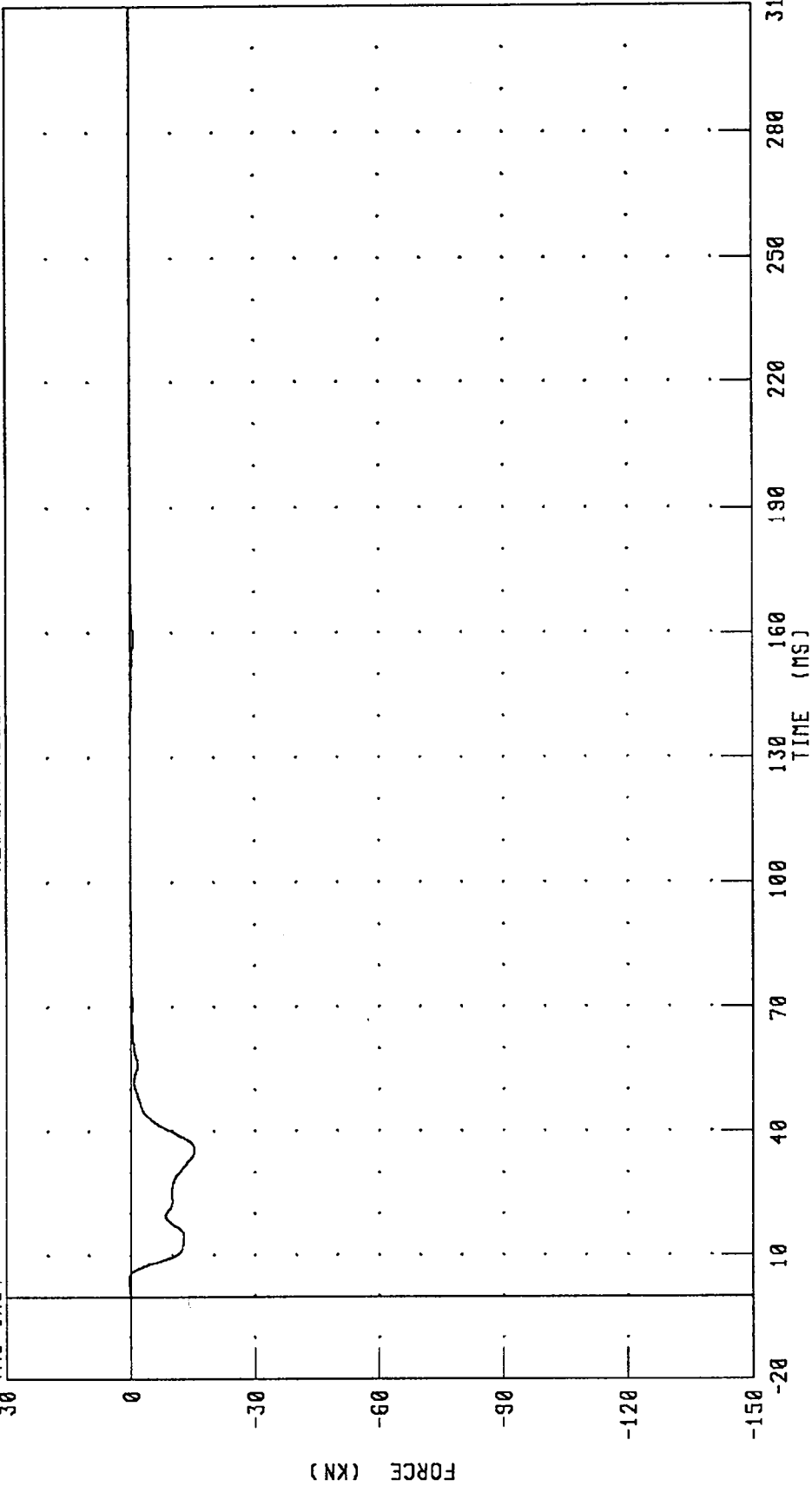
CHANNEL: B03F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D4 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.51 KN @ 3.92 MS; -15.36 KN @ 35.68 MS

FILTER: CH. CLASS 60

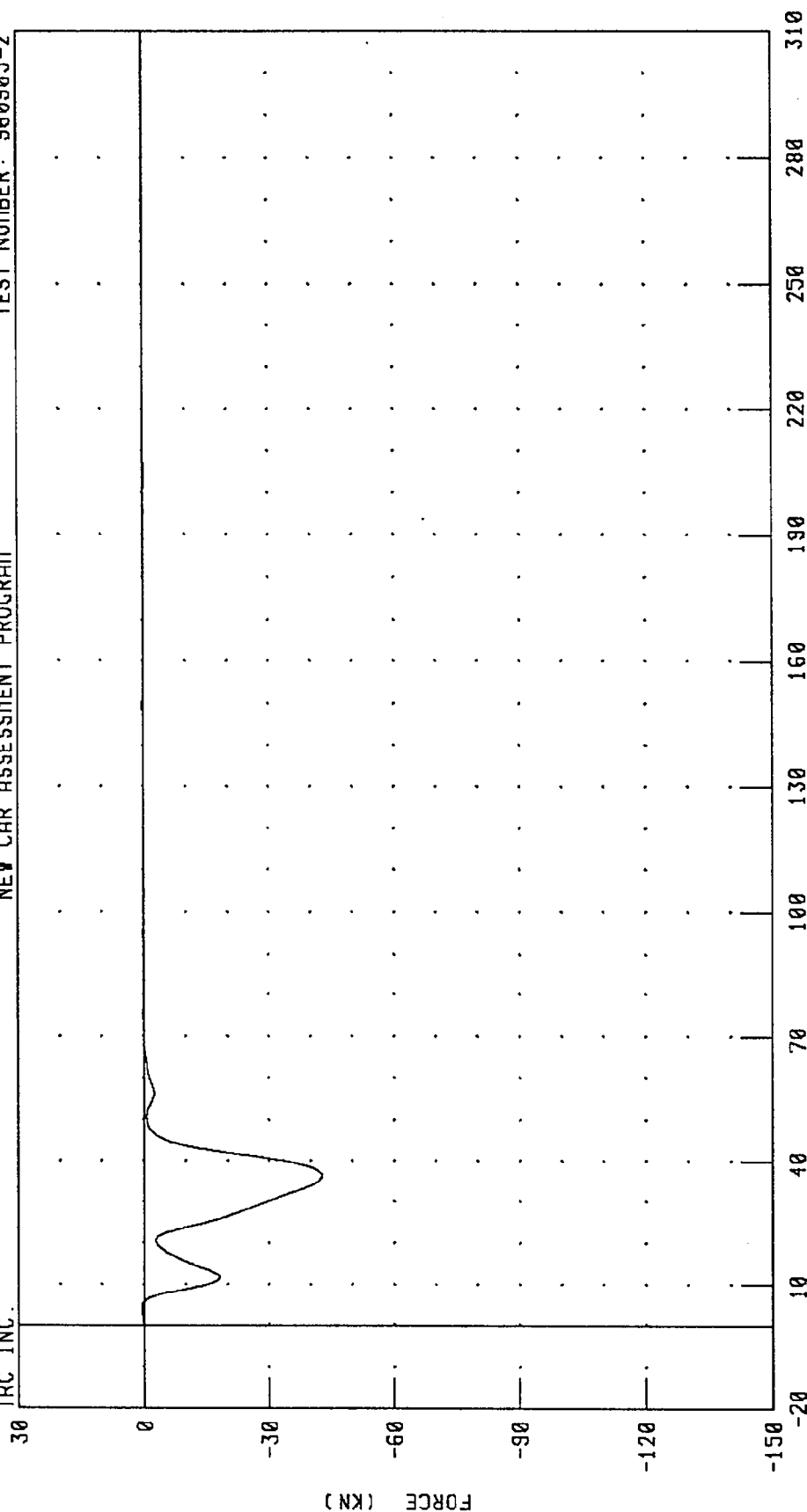
CHANNEL: BD4F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



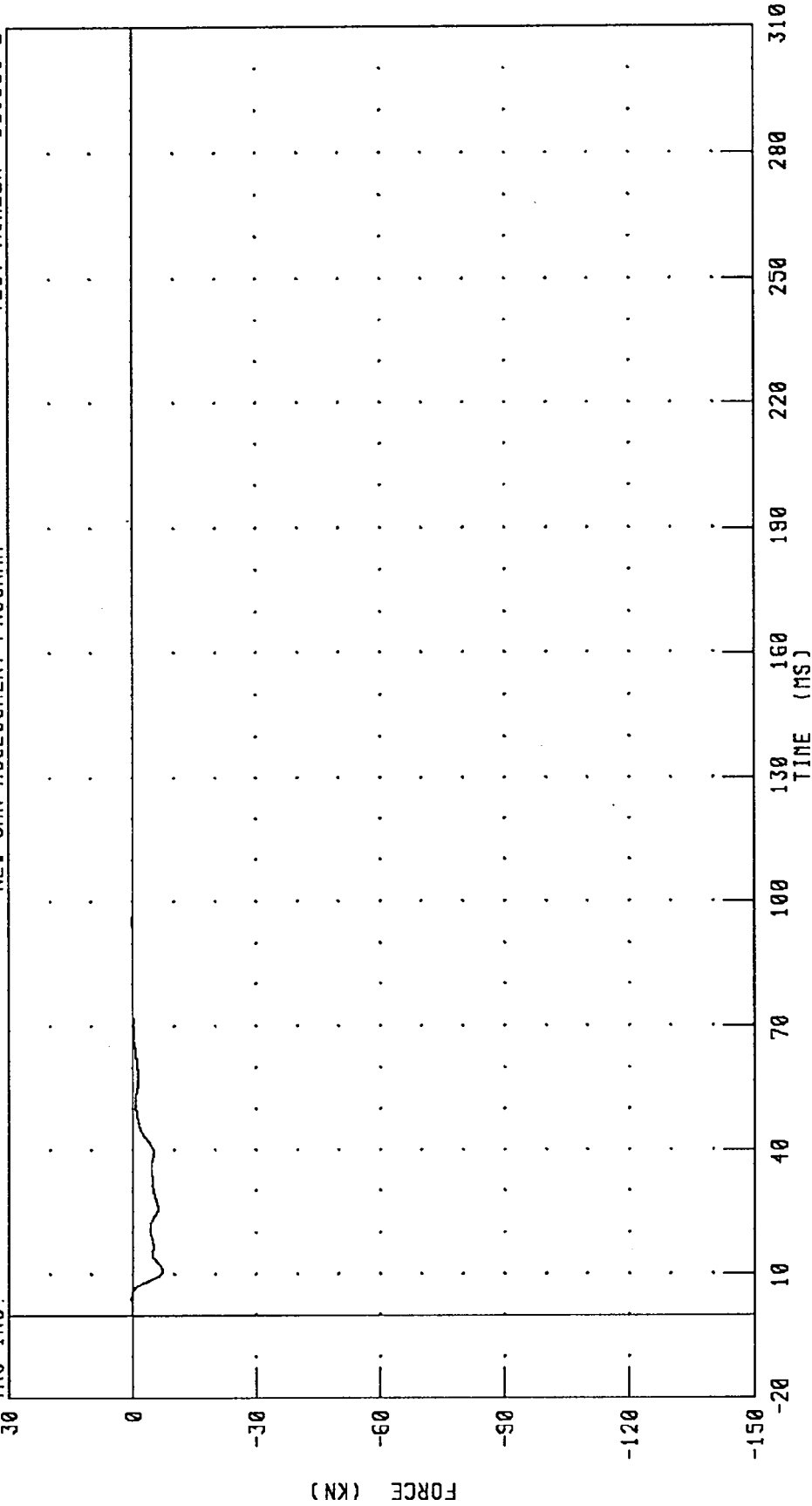
PEAK DATA: 0.59 KN @ 4.00 MS; -42.68 KN @ 36.48 MS

FILTER: CH. CLASS 60

CHANNEL: B05F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE

TRC INC. NEW CAR ASSESSMENT PROGRAM TEST NUMBER: 960905-2



PEAK DATA: 0.34 KN @ 4.00 MS; -7.24 KN @ 10.80 MS

FILTER: CH. CLASS 60

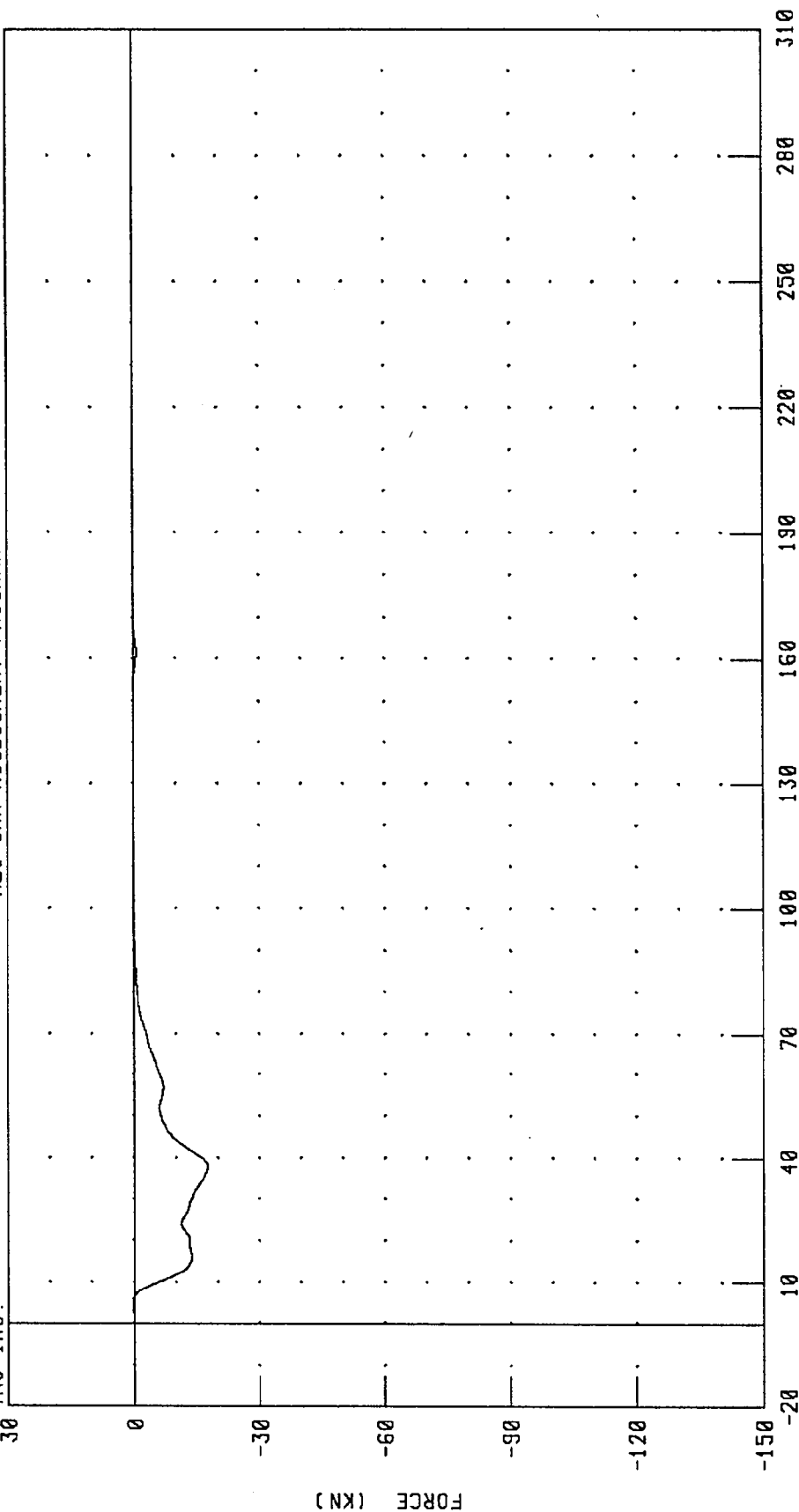
CHANNEL: BD6F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.26 KN @ 4.88 MS; -17.57 KN @ 37.84 MS

FILTER: CH. CLASS 60

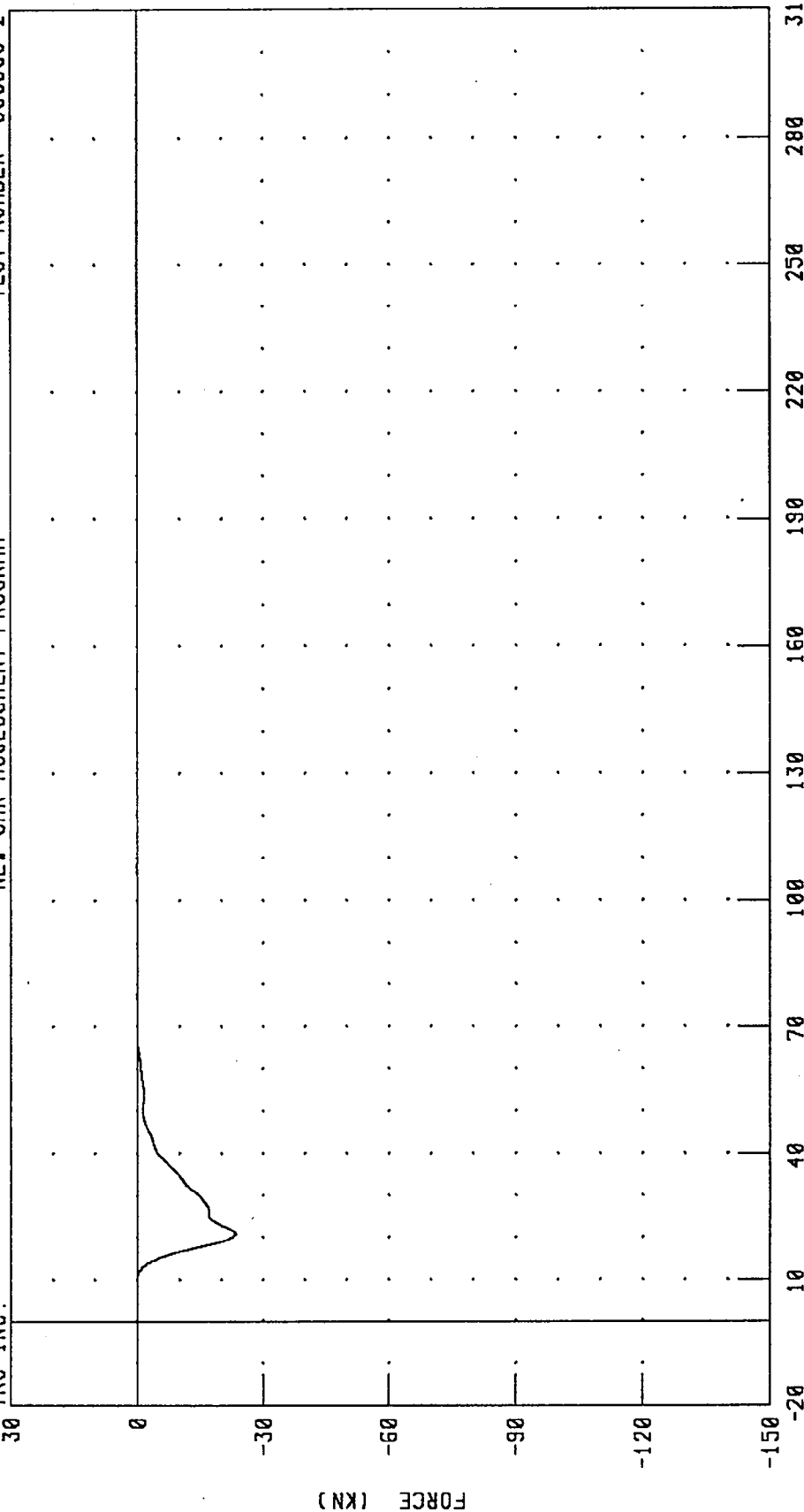
CHANNEL: 807F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D8 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.09 KN @ 107.60 MS; -23.32 KN @ 20.88 MS

FILTER: CH, CLASS 60

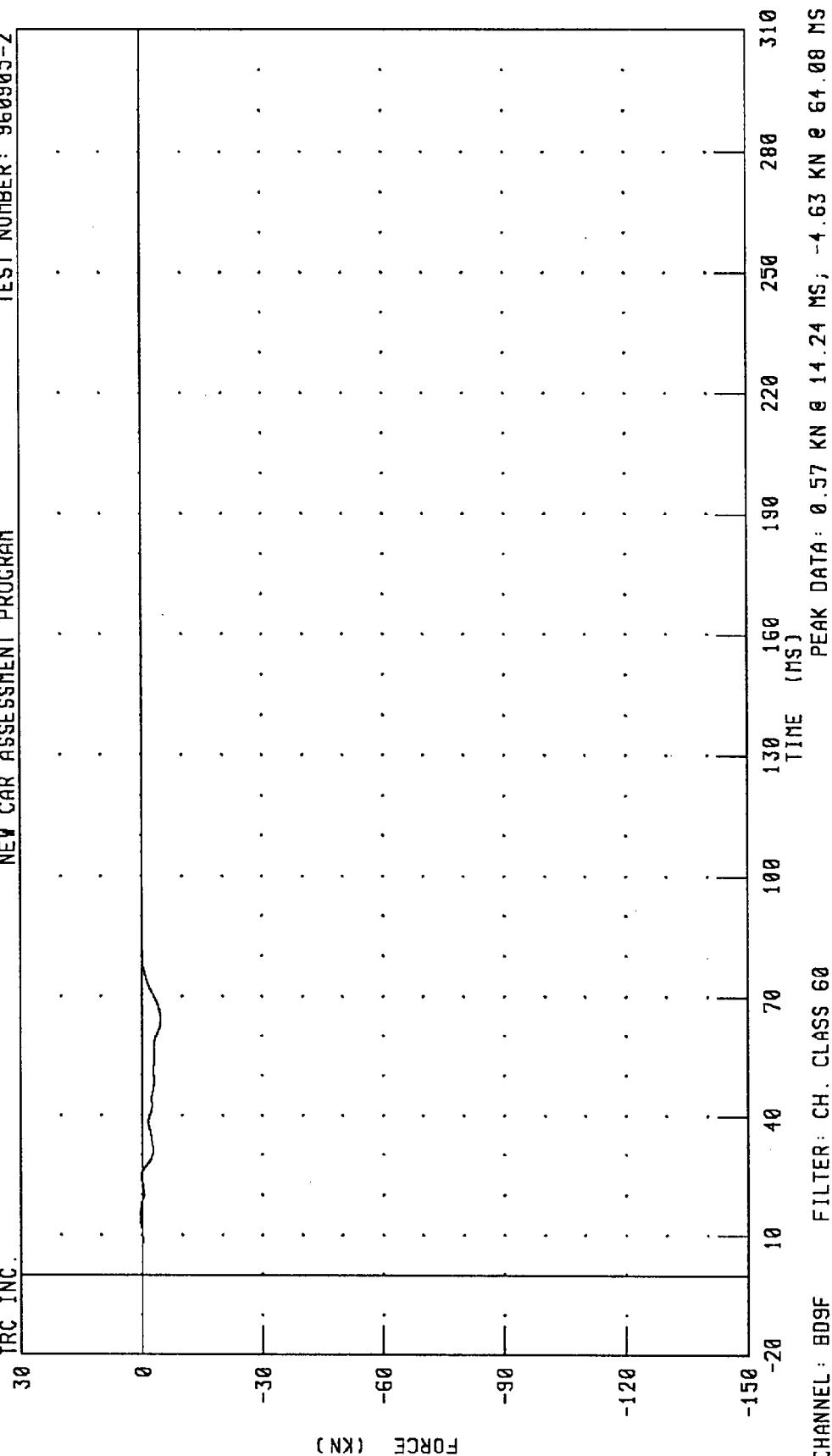
CHANNEL: BD8F

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D9 FORCE

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: BD9F

FILTER: CH. CLASS 60

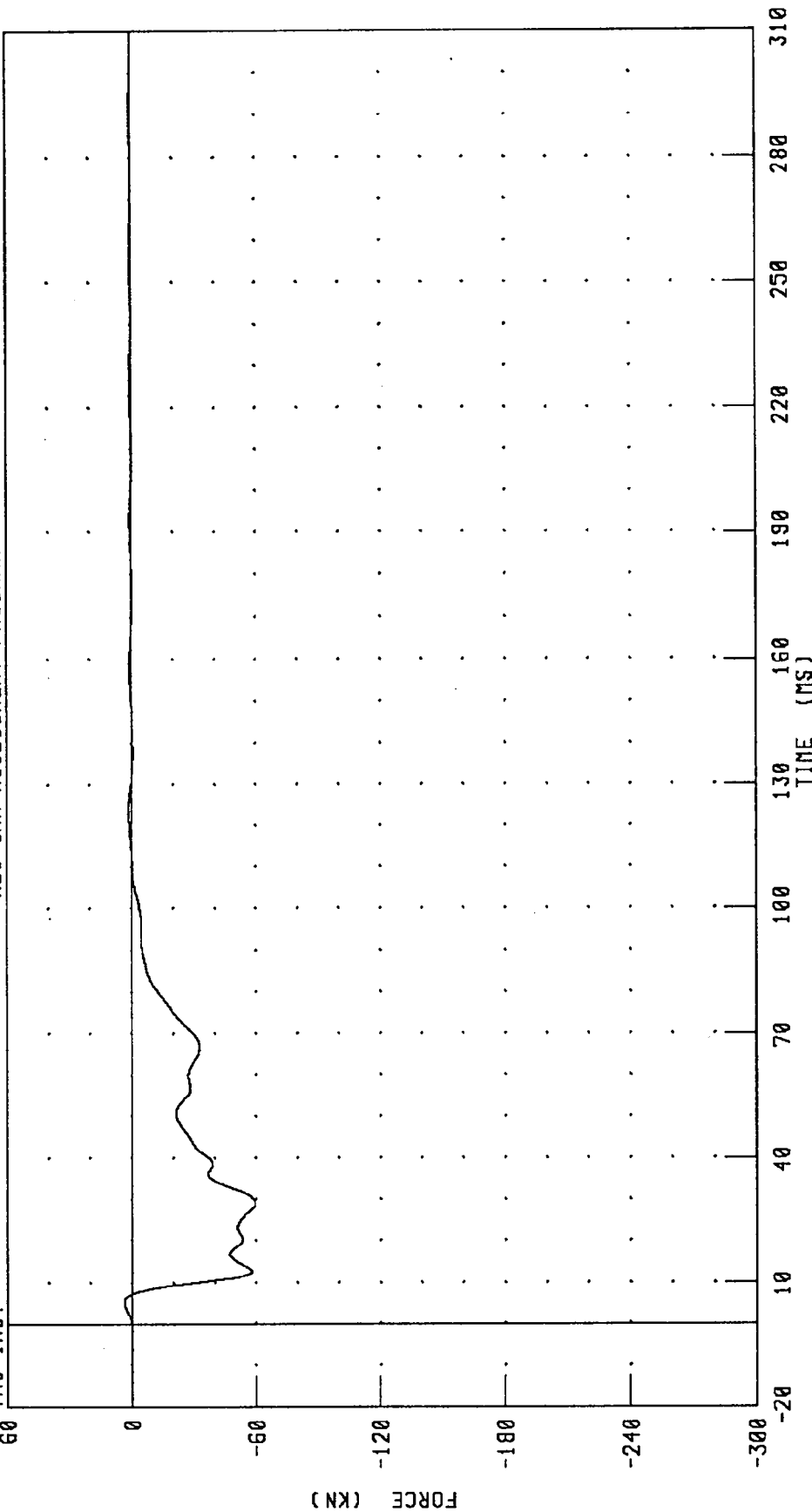
PEAK DATA: 0.57 KN @ 14.24 MS; -4.63 KN @ 64.08 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER GROUP # 1 FORCE TOTAL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: LCBGIF FILTER: CH. CLASS 60

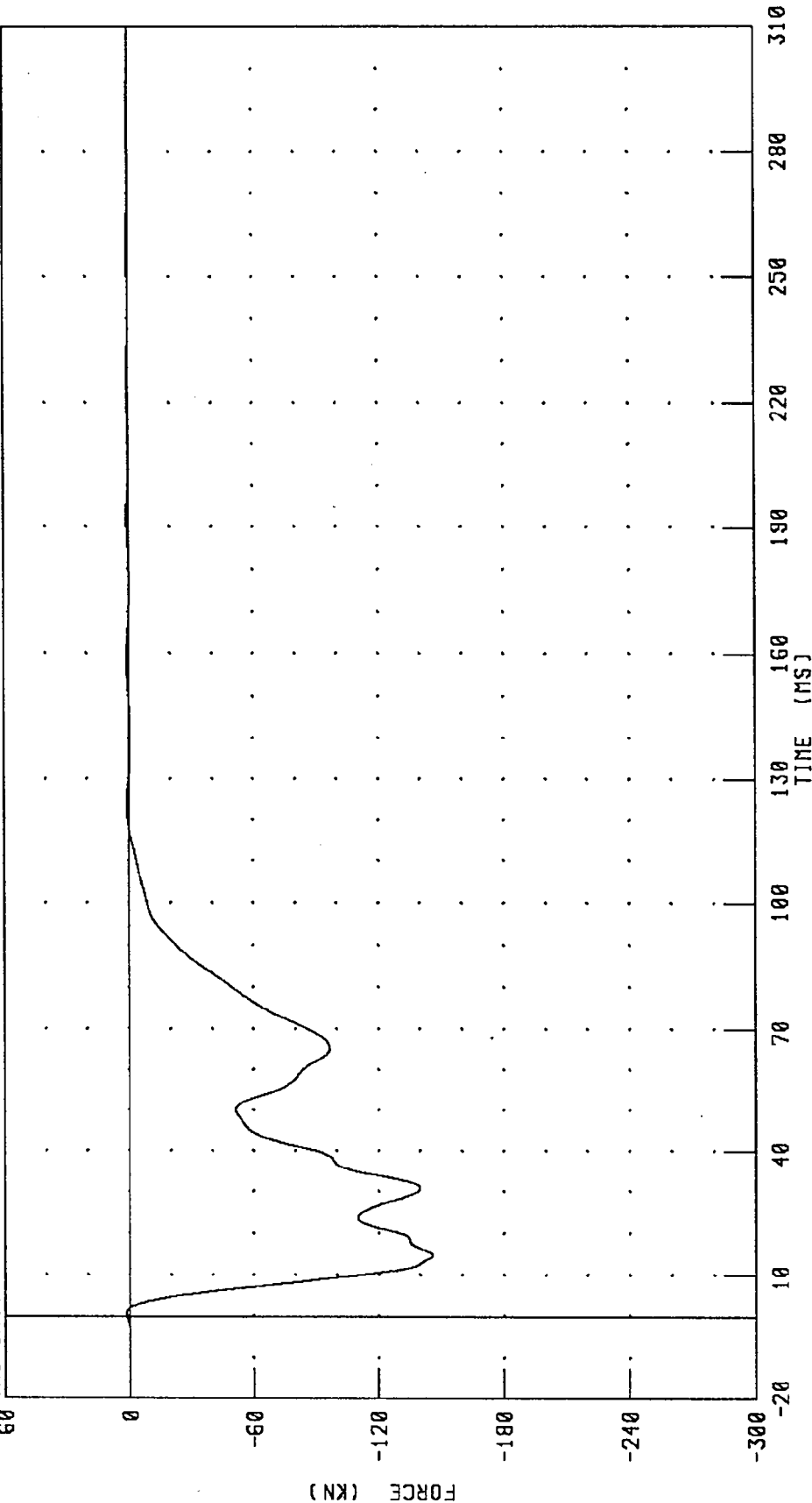
PEAK DATA: 3.70 KN @ 5.36 MS; -59.71 KN @ 29.20 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 1.70 KN @ 0.56 MS; -145.78 KN @ 14.80 MS

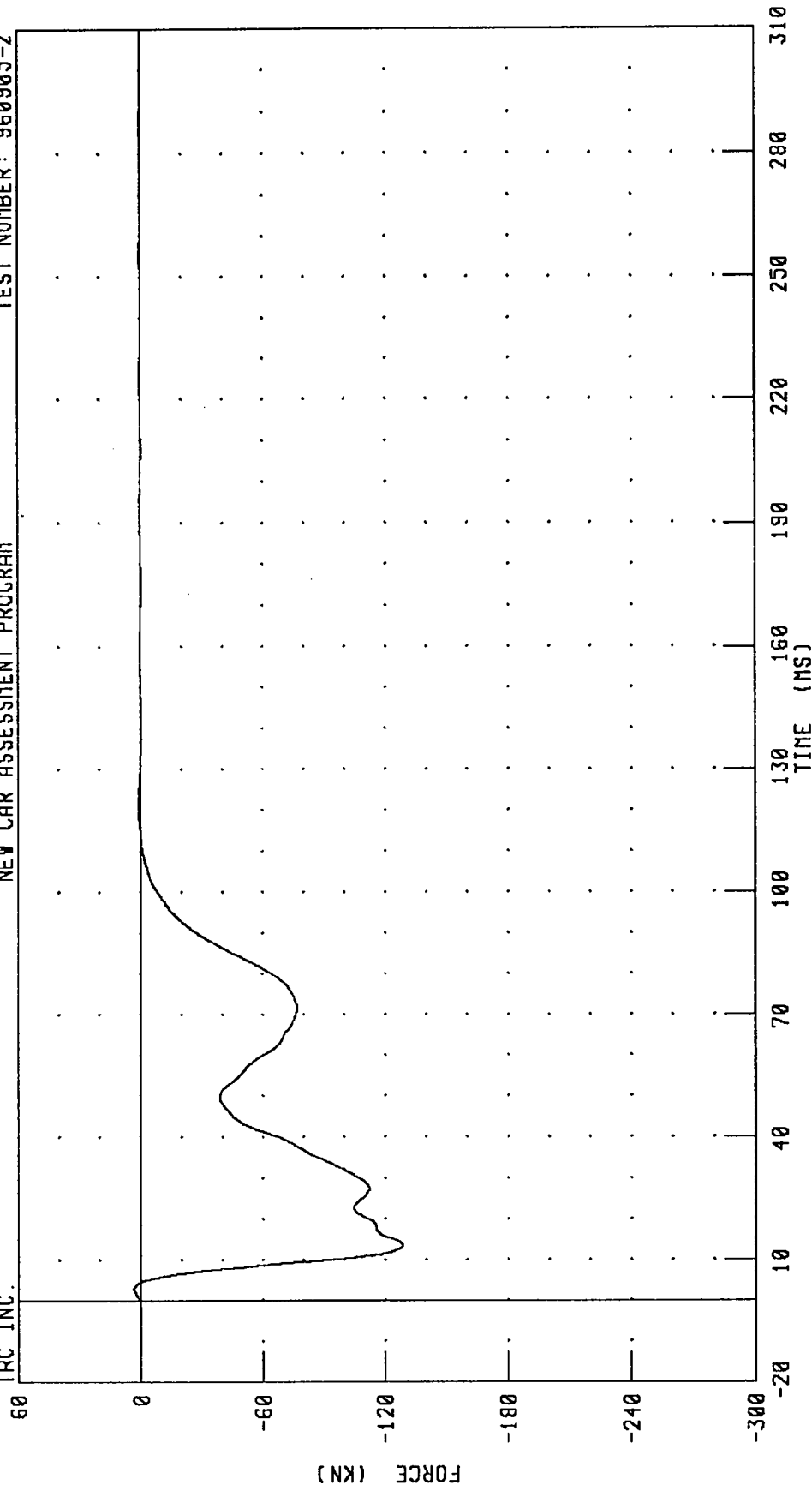
CHANNEL: LCBG2F FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



CHANNEL: LCBG3F FILTER: CH. CLASS 60

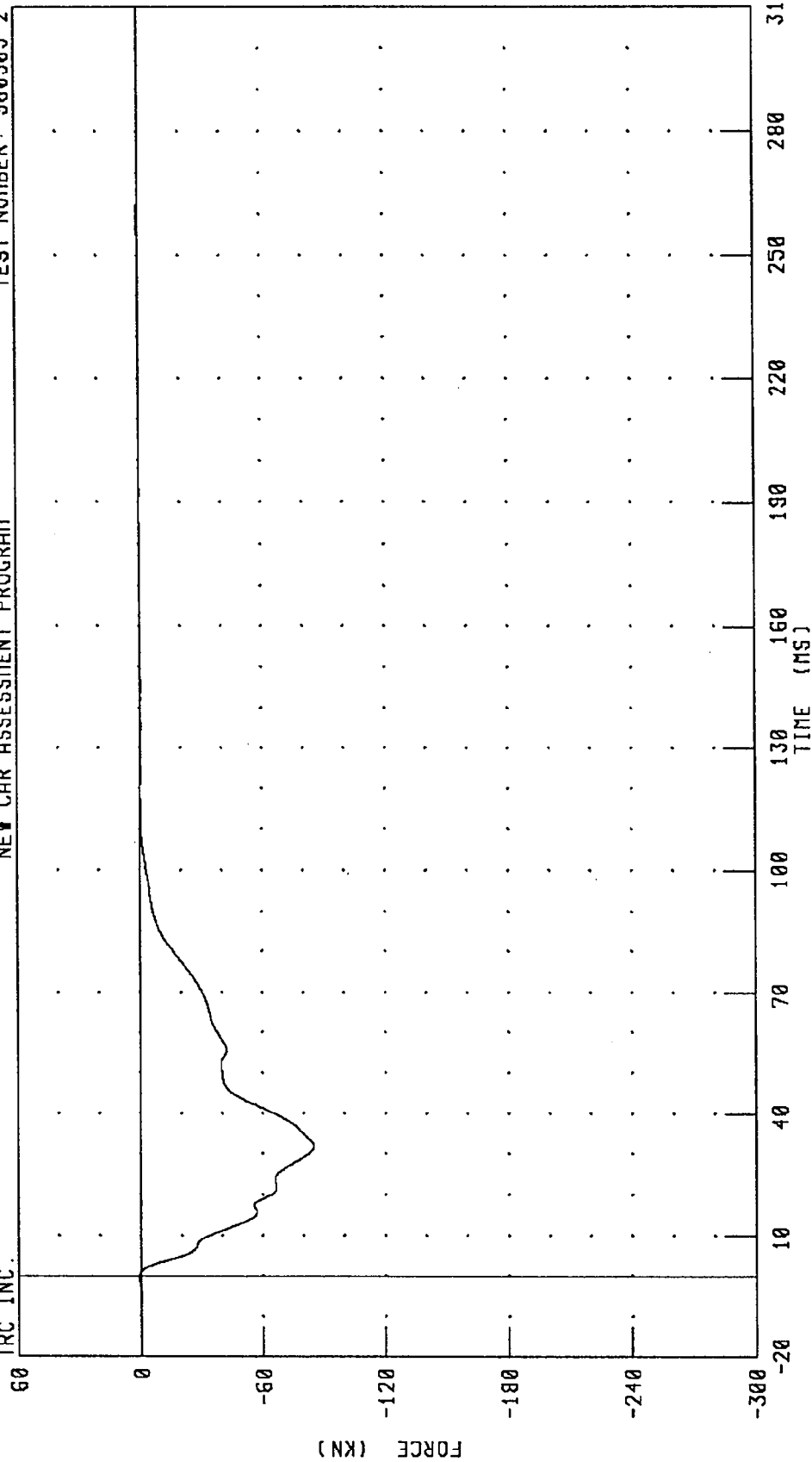
PEAK DATA: 3.35 KN @ 3.04 MS; -128.54 KN @ 13.60 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: LCBG4F FILTER: CH. CLASS 60

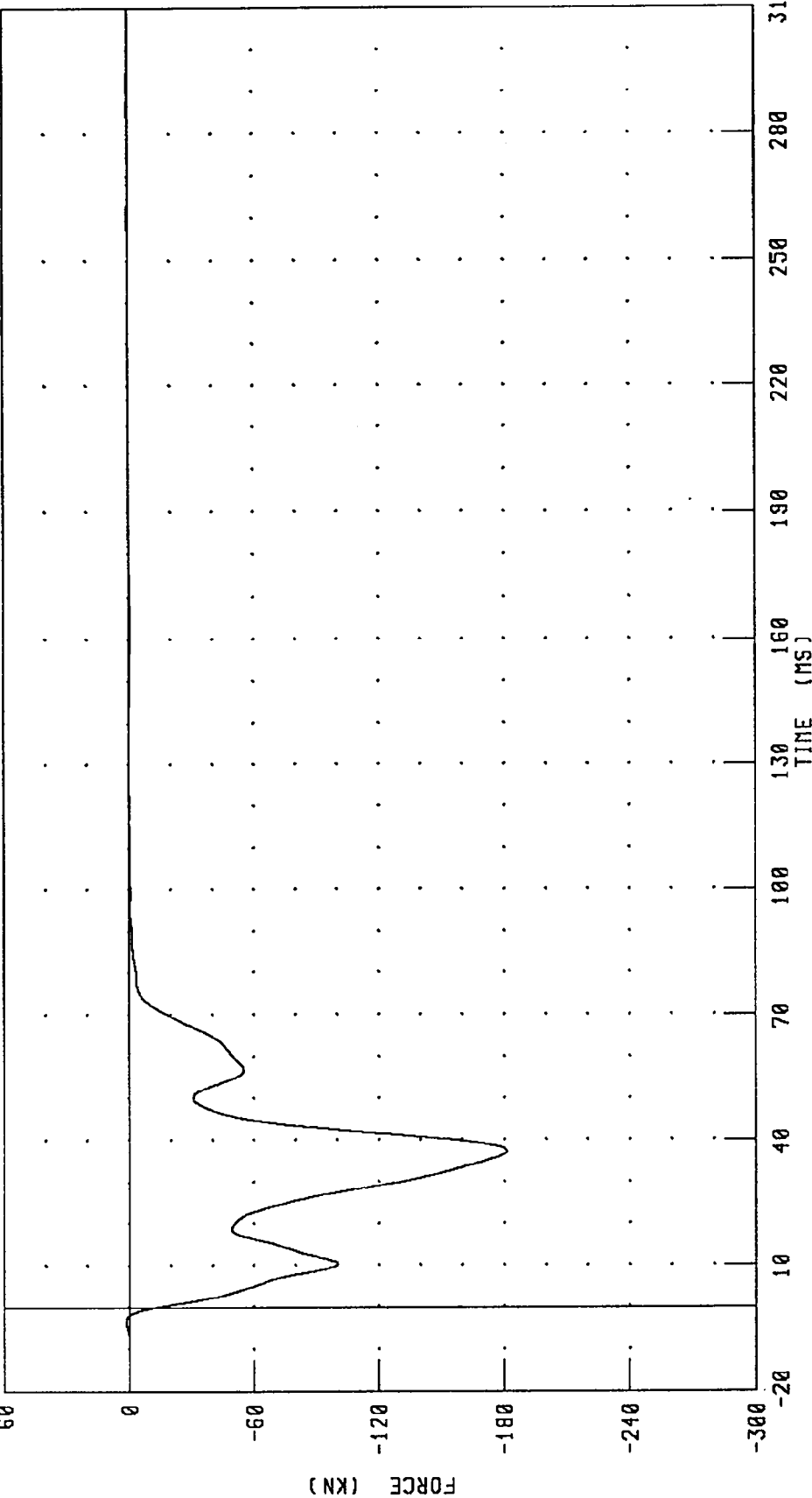
PEAK DATA: 0.89 KN @ -0.24 MS; -85.15 KN @ 31.84 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 1.53 KN @ -3.44 MS; -181.28 KN @ 37.36 MS

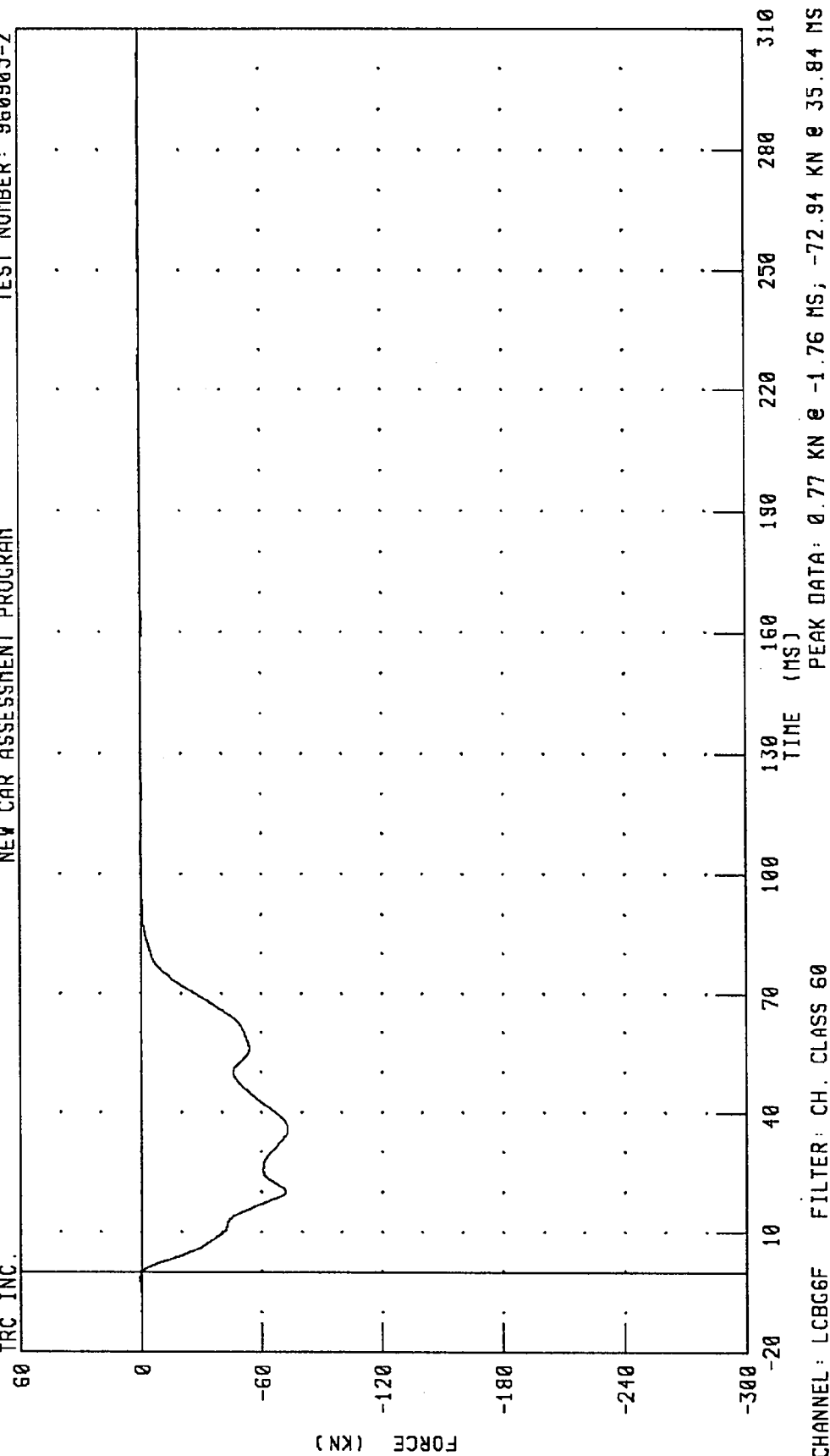
CHANNEL: LCBG5F FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



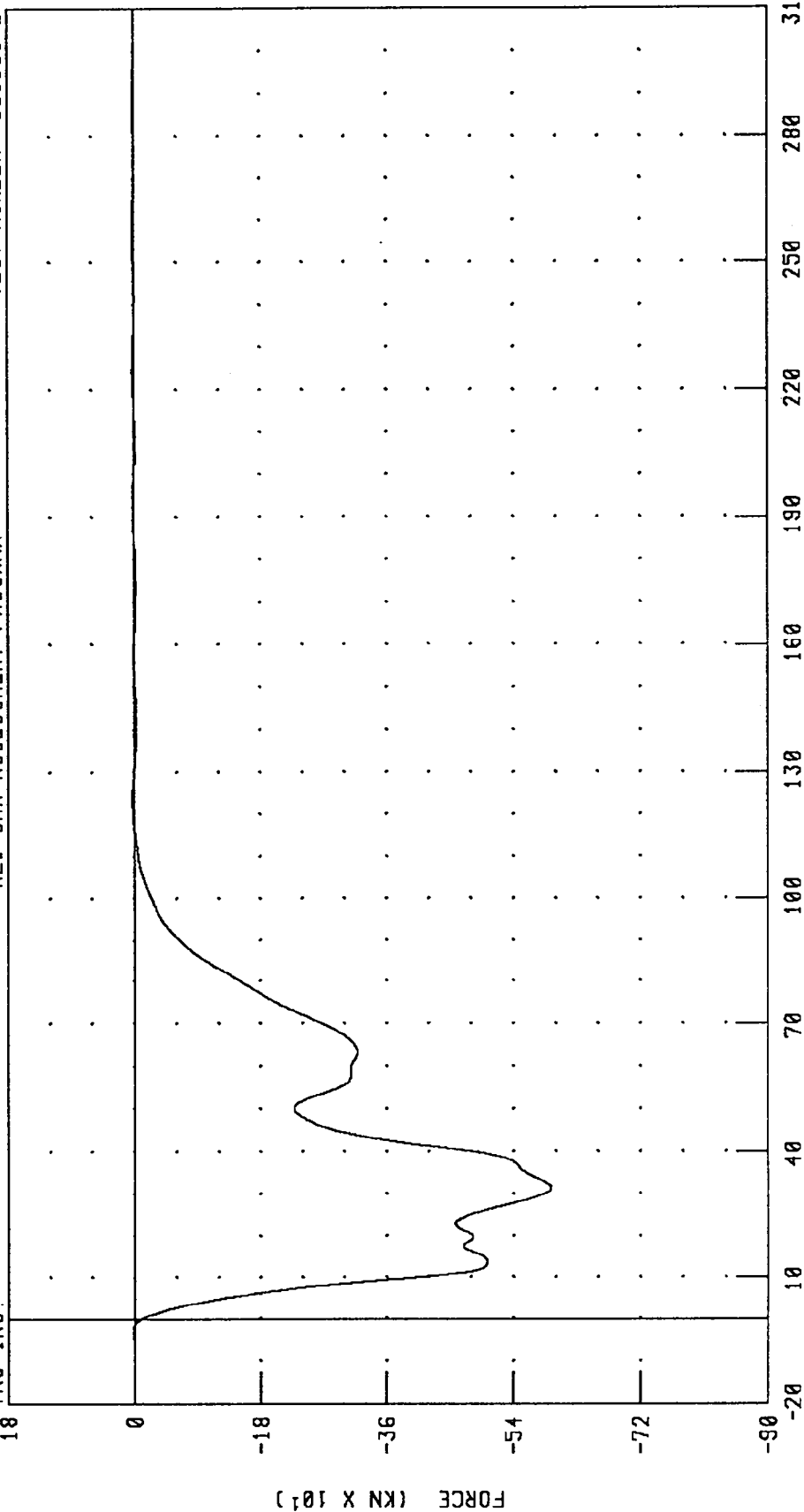
CHANNEL: LCBG6F FILTER: CH. CLASS 60

PEAK DATA: 0.77 KN @ -1.76 MS; -72.94 KN @ 35.84 MS

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960905-2

TRC INC.



PEAK DATA: 2.25 KN @ 123.60 MS; -593.86 KN @ 31.44 MS

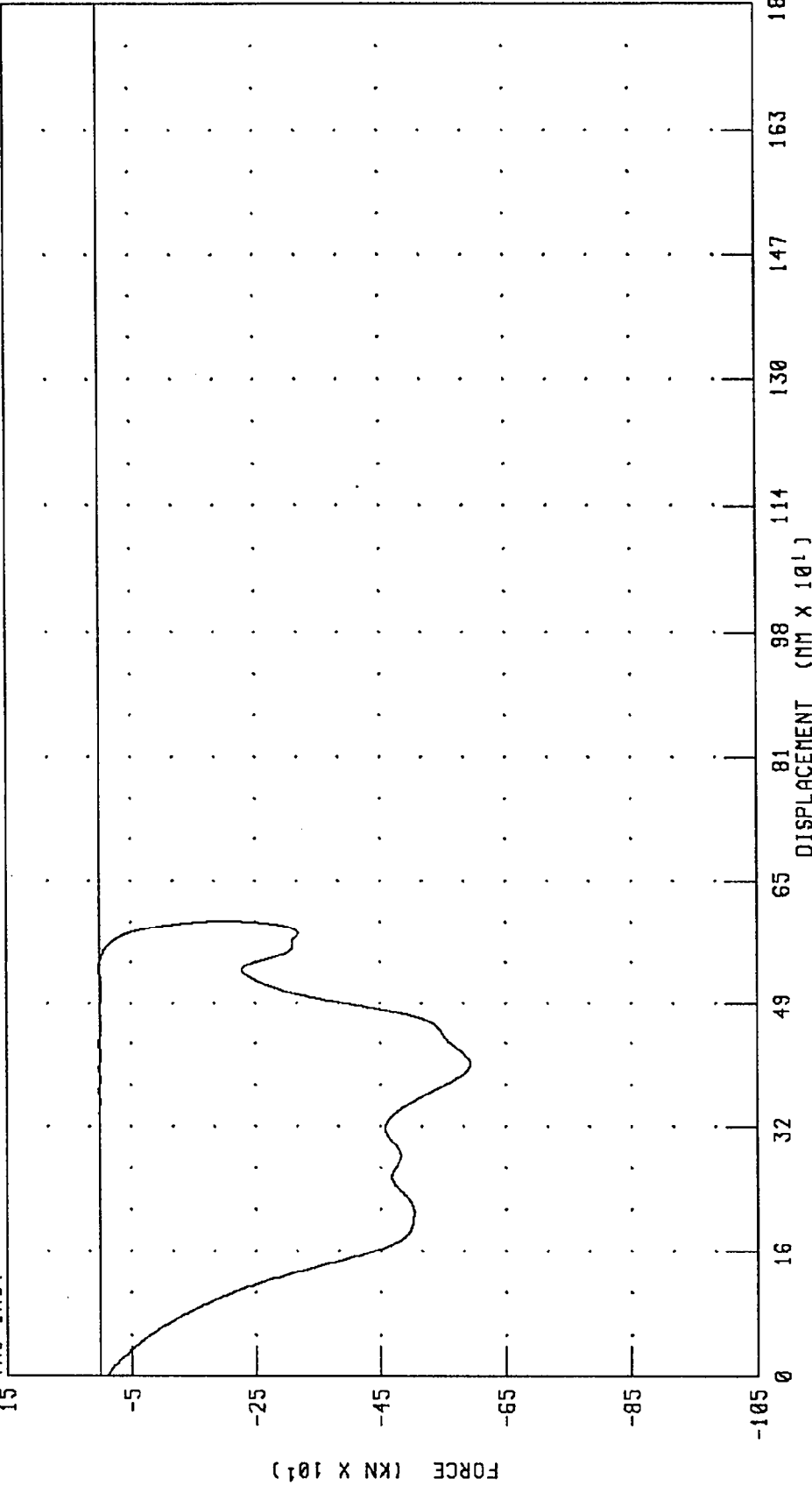
CHANNEL: LCBGT FILTER: CH. CLASS 60

1996 FORD RANGER INTO FRONTAL LOAD CELL BARRIER
TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TEST NUMBER: 960905-2

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: QTHXD LCBGT FILTER: CH. CLASS 180 CH. CLASS 60
PEAK DATA: 601.68 MM @ 75.44 MS; 0.00 MM @ 0.00 MS
2.25 KN @ 123.60 MS; -593.86 KN @ 31.44 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

3-SEPT-96

TRC INC.

TEST NO: 142C34ED1

572E SN142 EXT.DIMENSION CAL34

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. Van

RUN NUMBER: 101196.1221

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

03-SEP-96

TRC INC.

TEST NO: 142C34HD1

572E SN142 HEAD DROP CAL 34

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	260.60 G
PEAK LATERAL ACCELERATION	15 G MAX	-1.35 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Lom

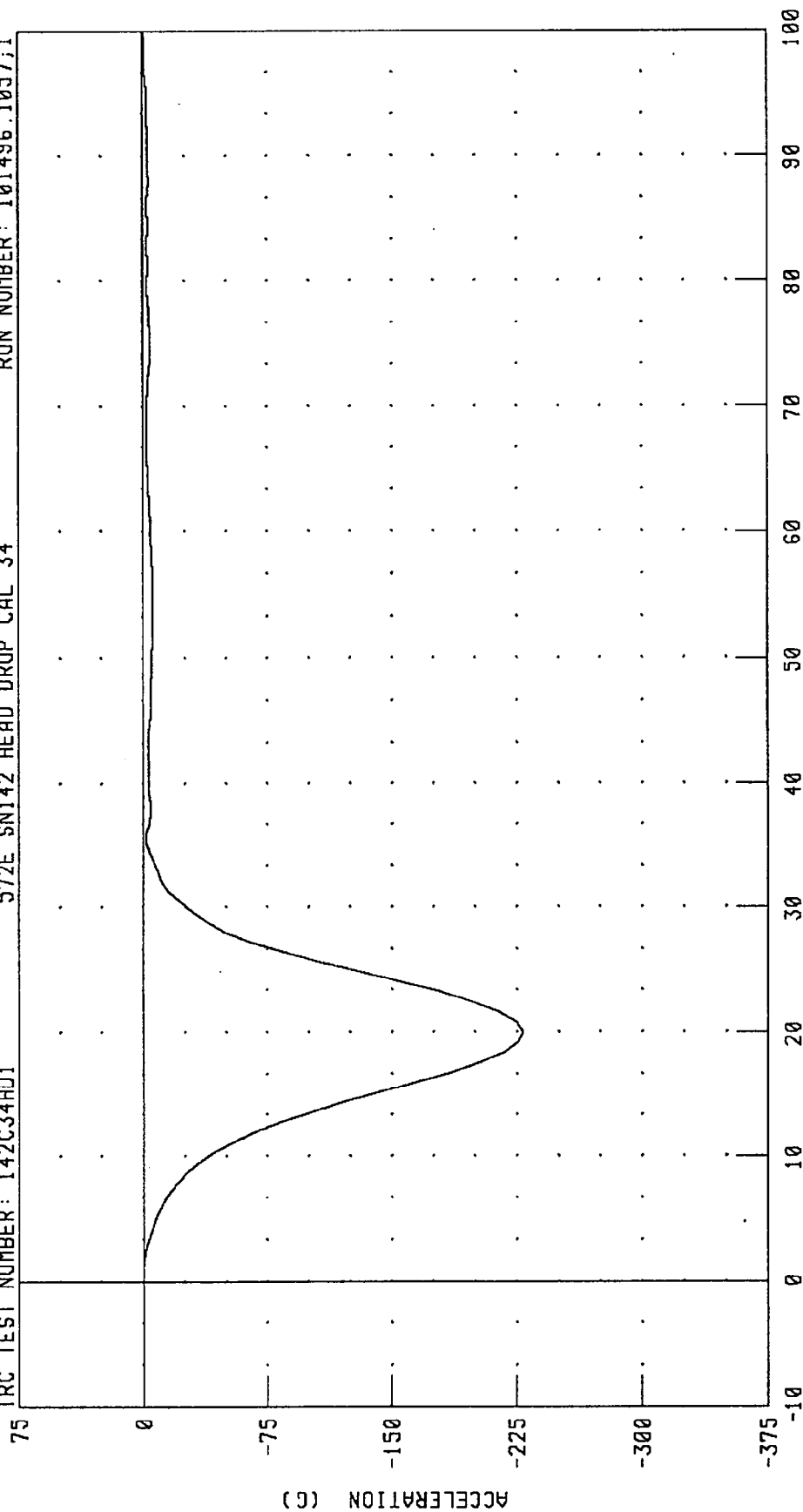
RUN NUMBER: 090396.0847;1

PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

572E SN142 HEAD DROP CAL 34 RUN NUMBER: 101496.1057;1

TRC TEST NUMBER: 142C34HD1



PEAK DATA: 0.02 G @ 0.00 MS; -228.81 G @ 2.00 MS

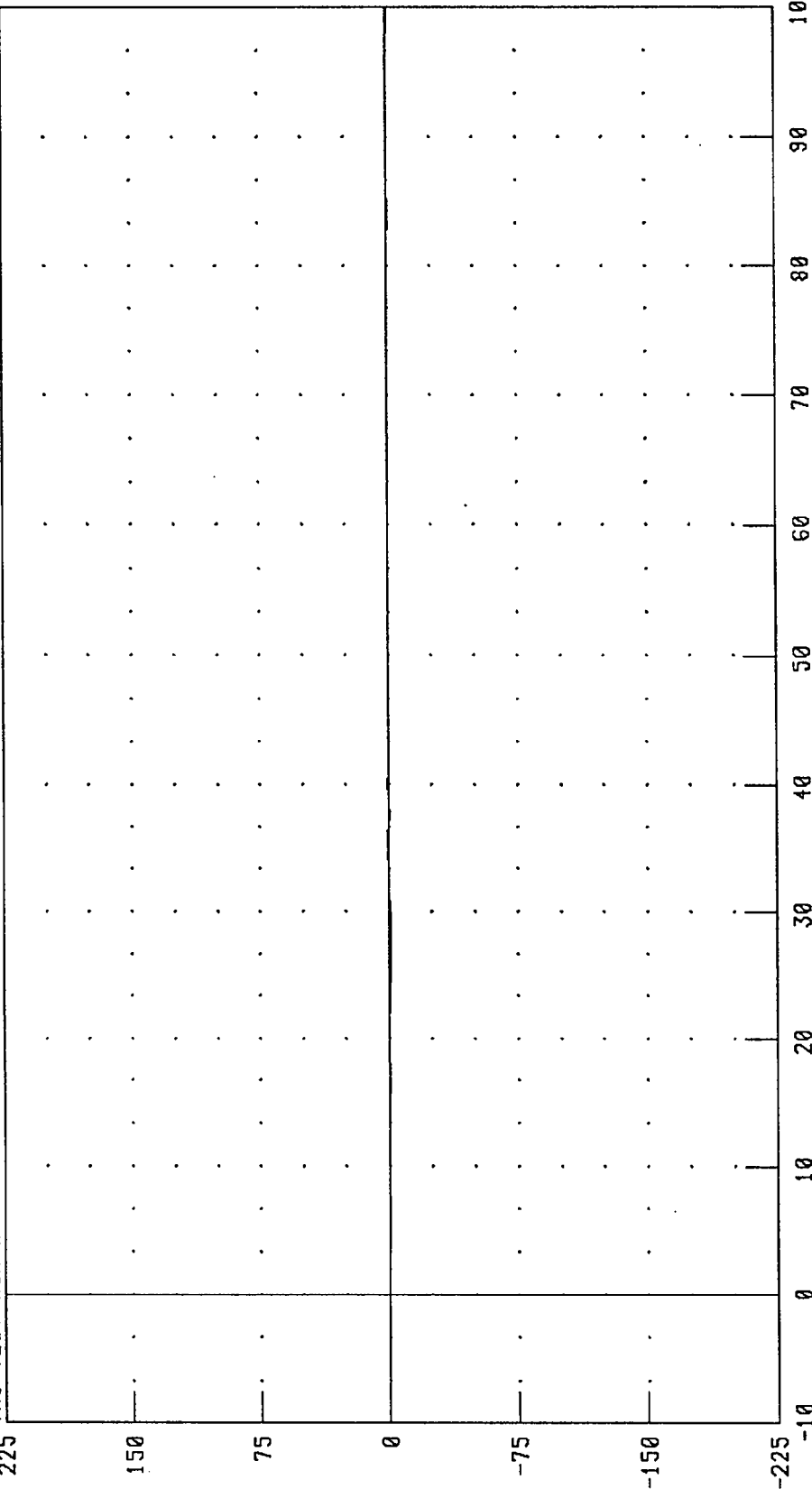
CHANNEL: HEDXG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 142C34HD1

572E SN142 HEAD DROP CAL 34

RUN NUMBER: 101496.1057;1



TIME (MS X 10⁻¹)

PEAK DATA: 0.77 G @ 3.52 MS; -1.36 G @ 2.64 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

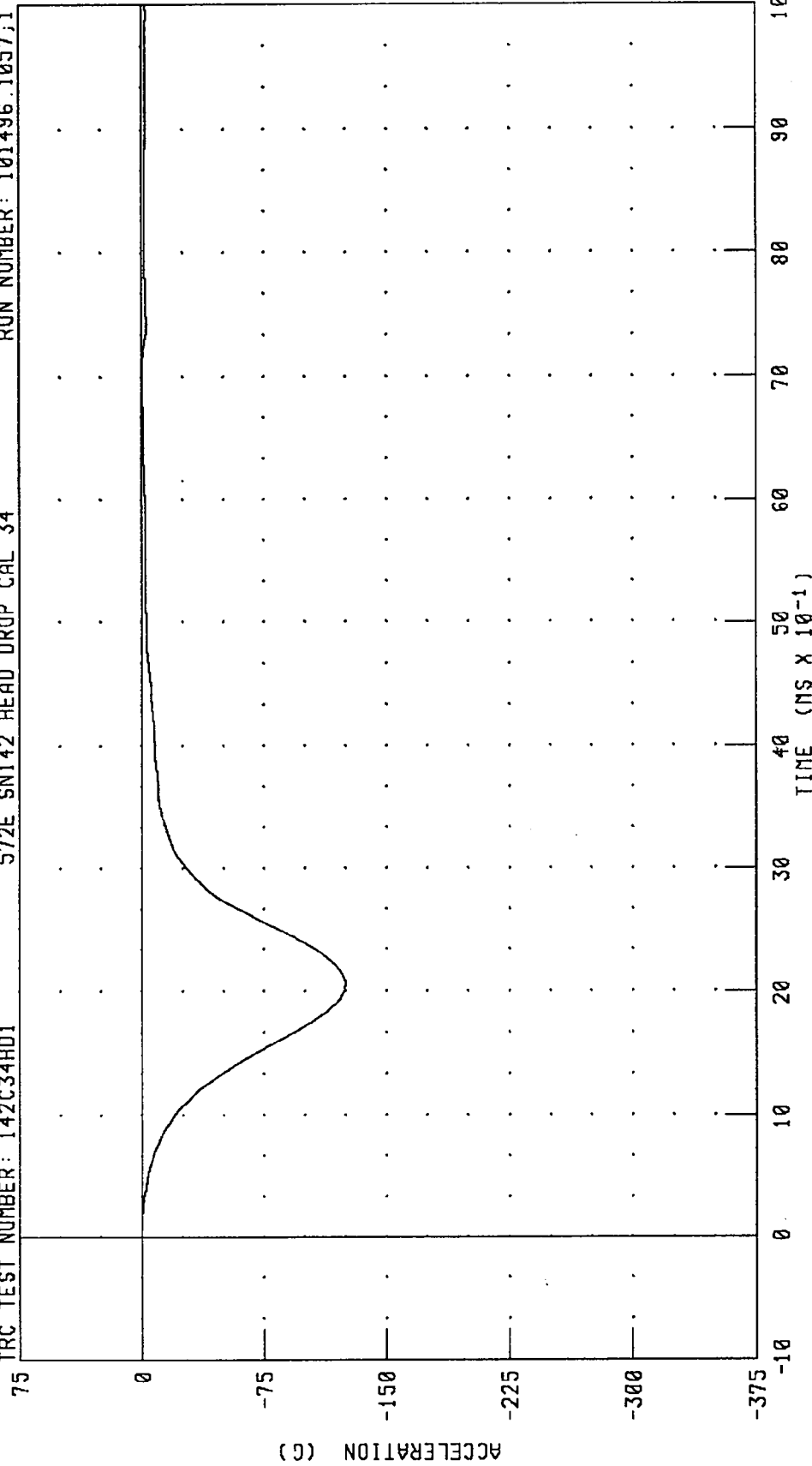
ACCELERATION (G)

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

TRC TEST NUMBER: 142C34HD1

572E SN142 HEAD DROP CAL 34

RUN NUMBER: 101496.1057;1

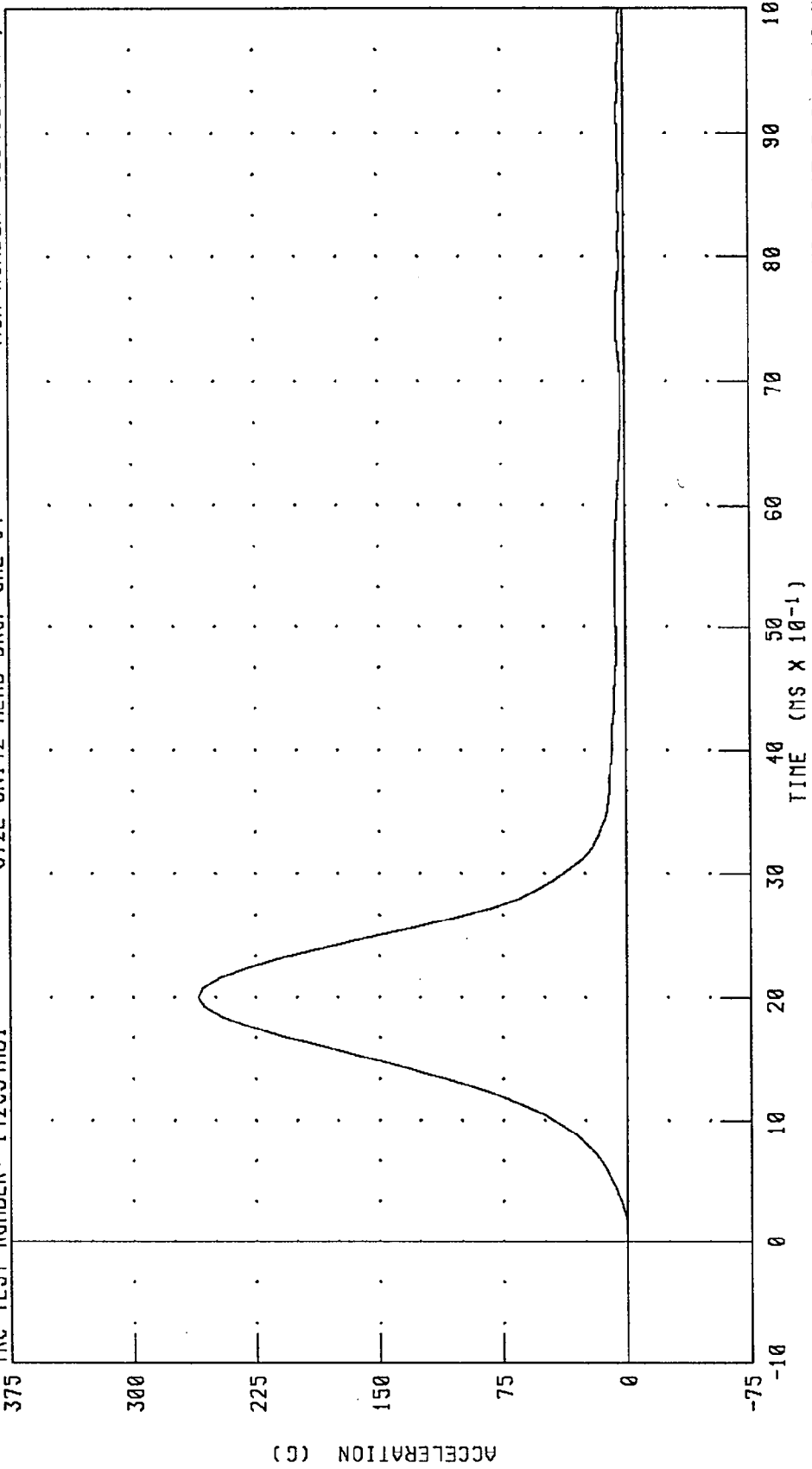


PEAK DATA: 0.05 G @ 0.08 MS; -125.15 G @ 2.08 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 142C34HD1 572E SN142 HEAD DROP CAL 34 RUN NUMBER: 101496.1057;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 260.61 G @ 2.00 MS; 0.15 G @ -0.48 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

04-SEP-96

TRC INC. TEST NO: 142C34NF1 572E SN? NECK FLEXION CAL34

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	64.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.93 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.93 G
	20 MS	17.60 - 22.60 G	21.17 G
	30 MS	12.50 - 18.50 G	15.51 G
MAX PENDULUM G		29 G MAX	24.58 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.48 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	35.60 MS
D PLANE	MAX	64 - 78 DEG.	73.88 DEG.
ROTATION	TIME	57 - 64 MS	58.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	95.39 NM
	TIME	47 - 58 MS	48.64 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.12 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	101.12 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Lee

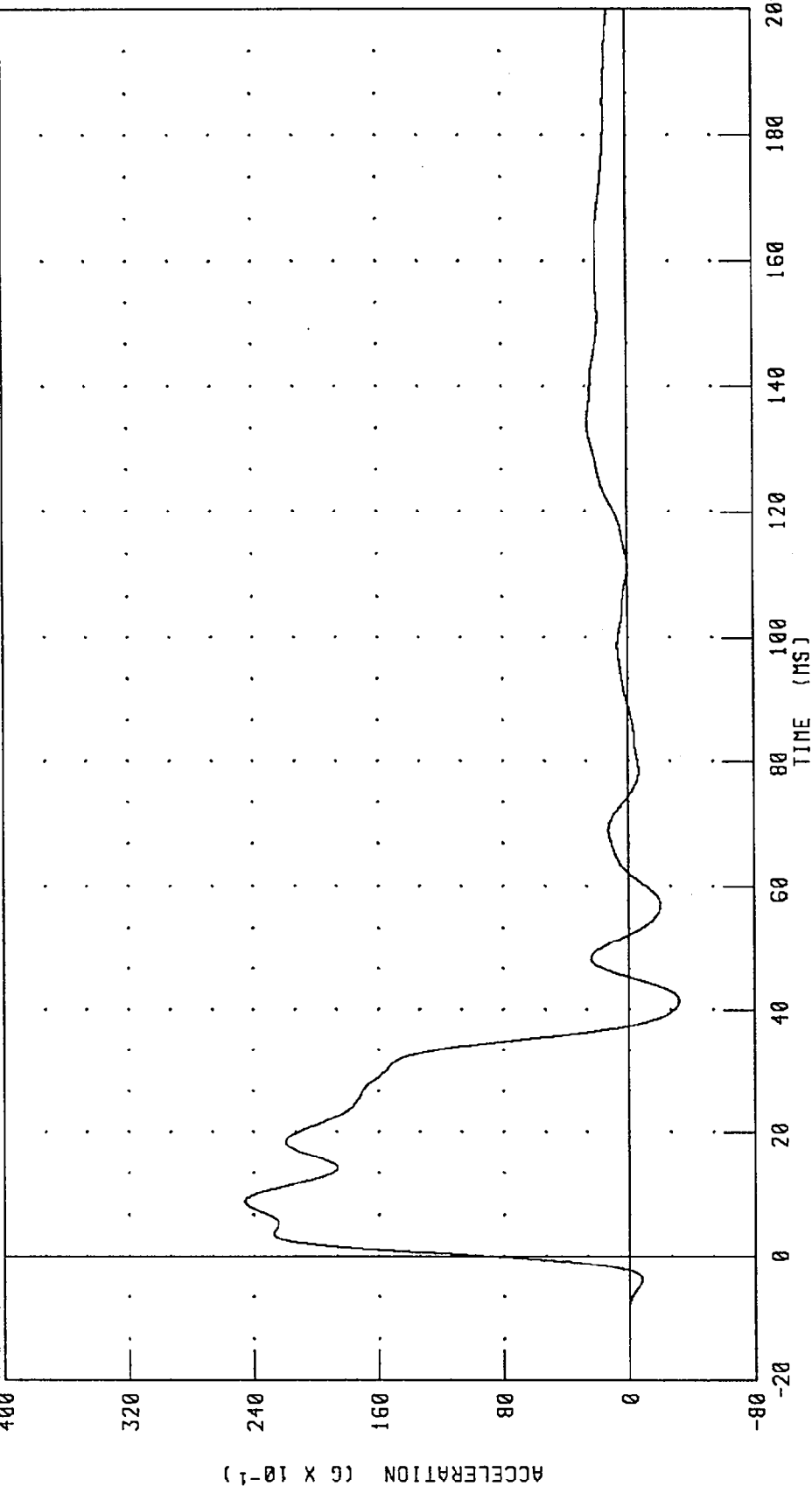
RUN NUMBER: 090496.1006;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C34NF1

572E SN? NECK FLEXION CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 24.58 G @ 8.80 MS; -3.21 G @ 41.52 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

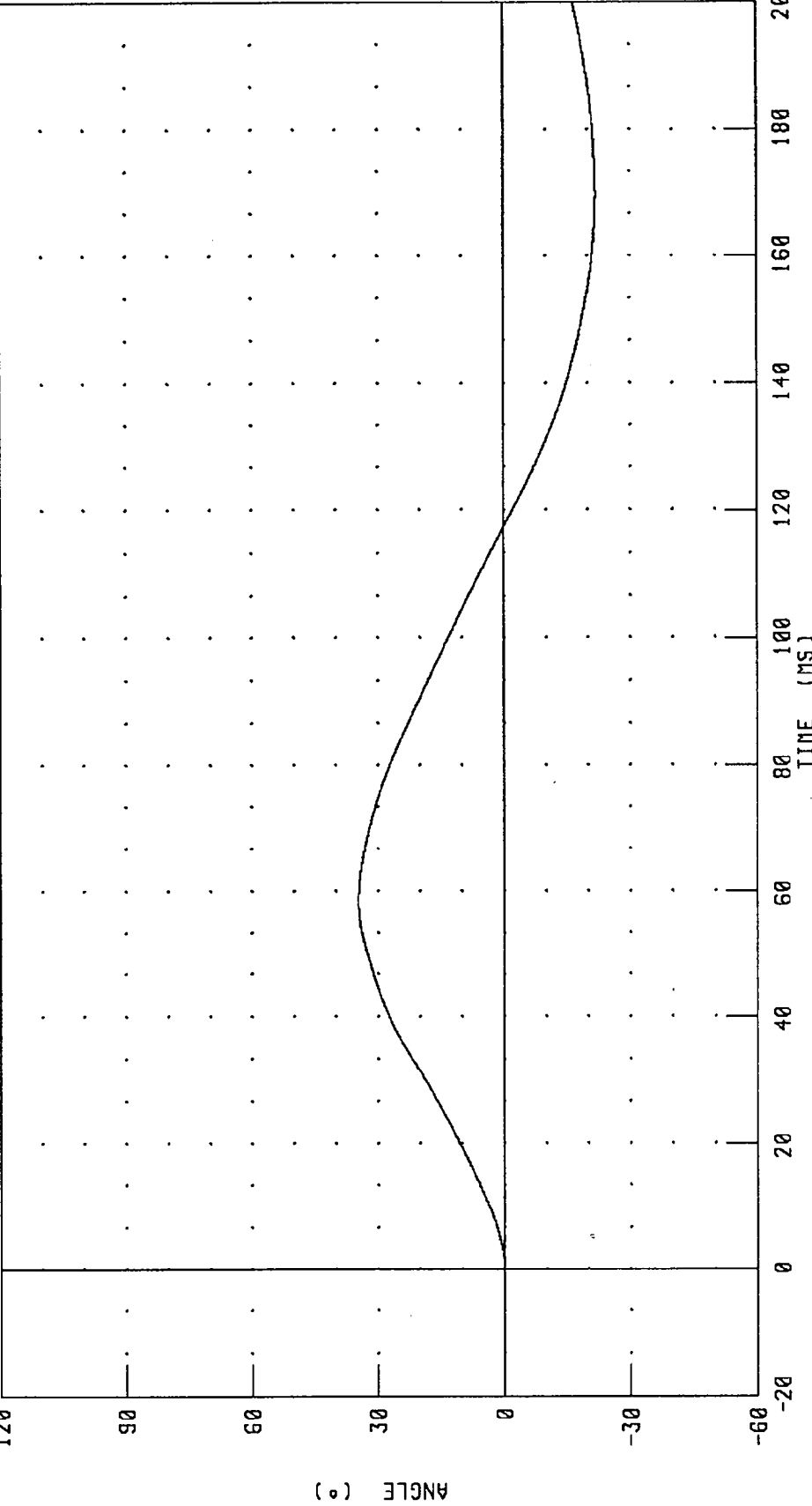
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN? NECK FLEXION CAL34

TRC TEST NUMBER: 142C34NF1

RUN NUMBER: 101496.1057;1



PEAK DATA: 34.52 ° @ 58.40 MS; -21.93 ° @ 169.68 MS

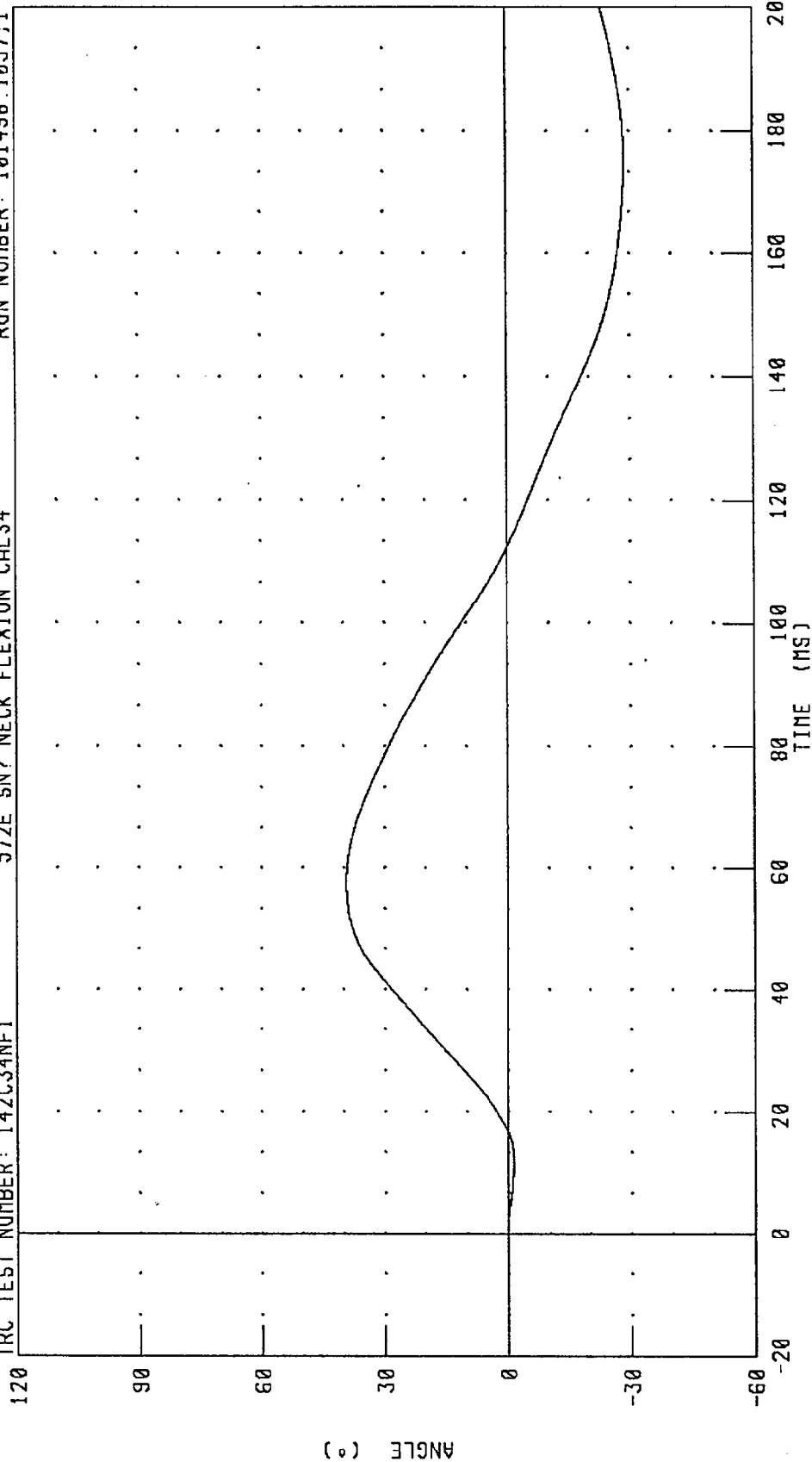
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NF1

572E SN? NECK FLEXION CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 39.37 ° @ 57.76 MS; -28.63 ° @ 175.12 MS

CHANNEL: THETA FILTER: CH. CLASS 60

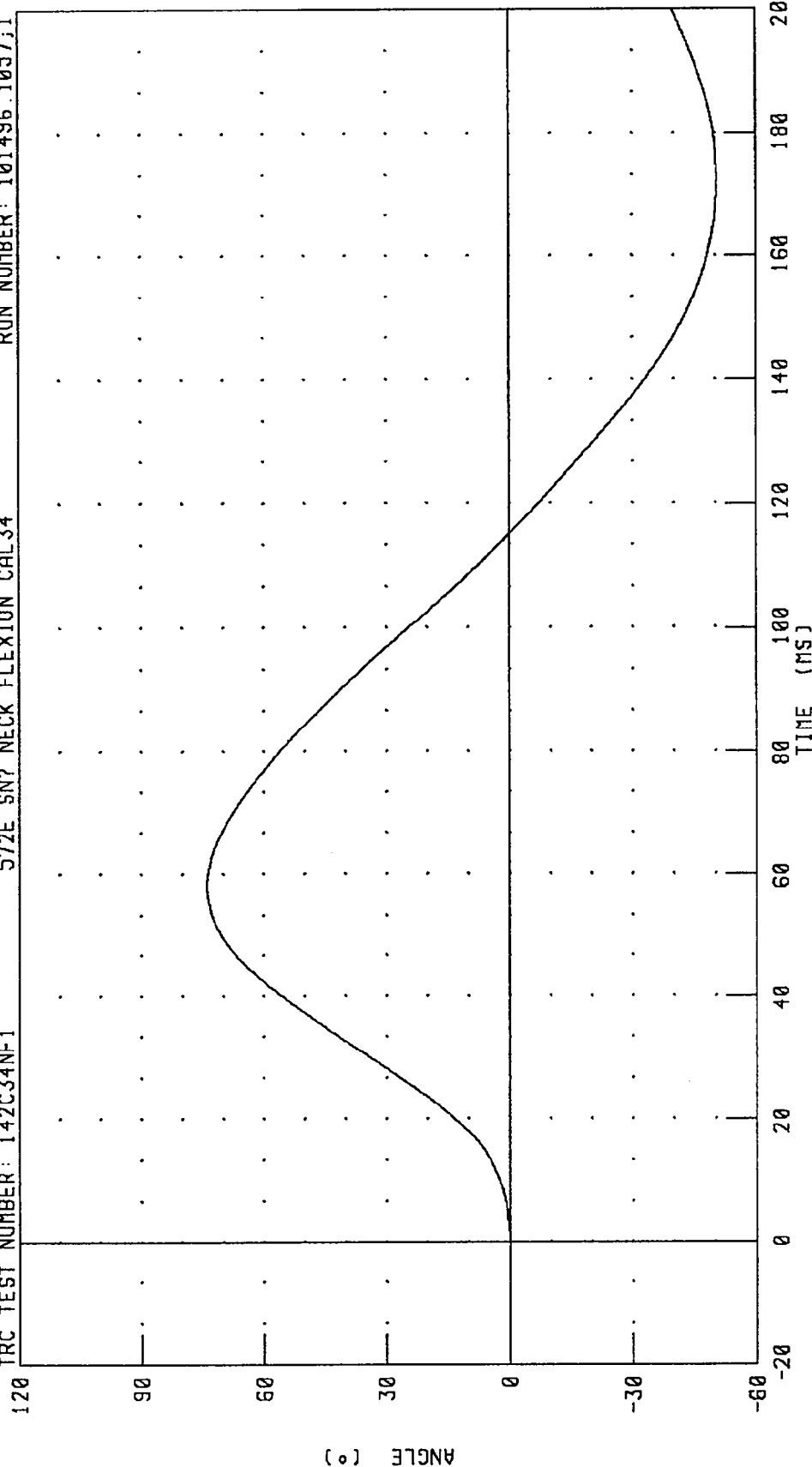
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C34NF1

572E SN? NECK FLEXION CAL34

RUN NUMBER: 101496.1057,1



PEAK DATA: 73.89 ° @ 58.00 MS; -50.47 ° @ 172.24 MS

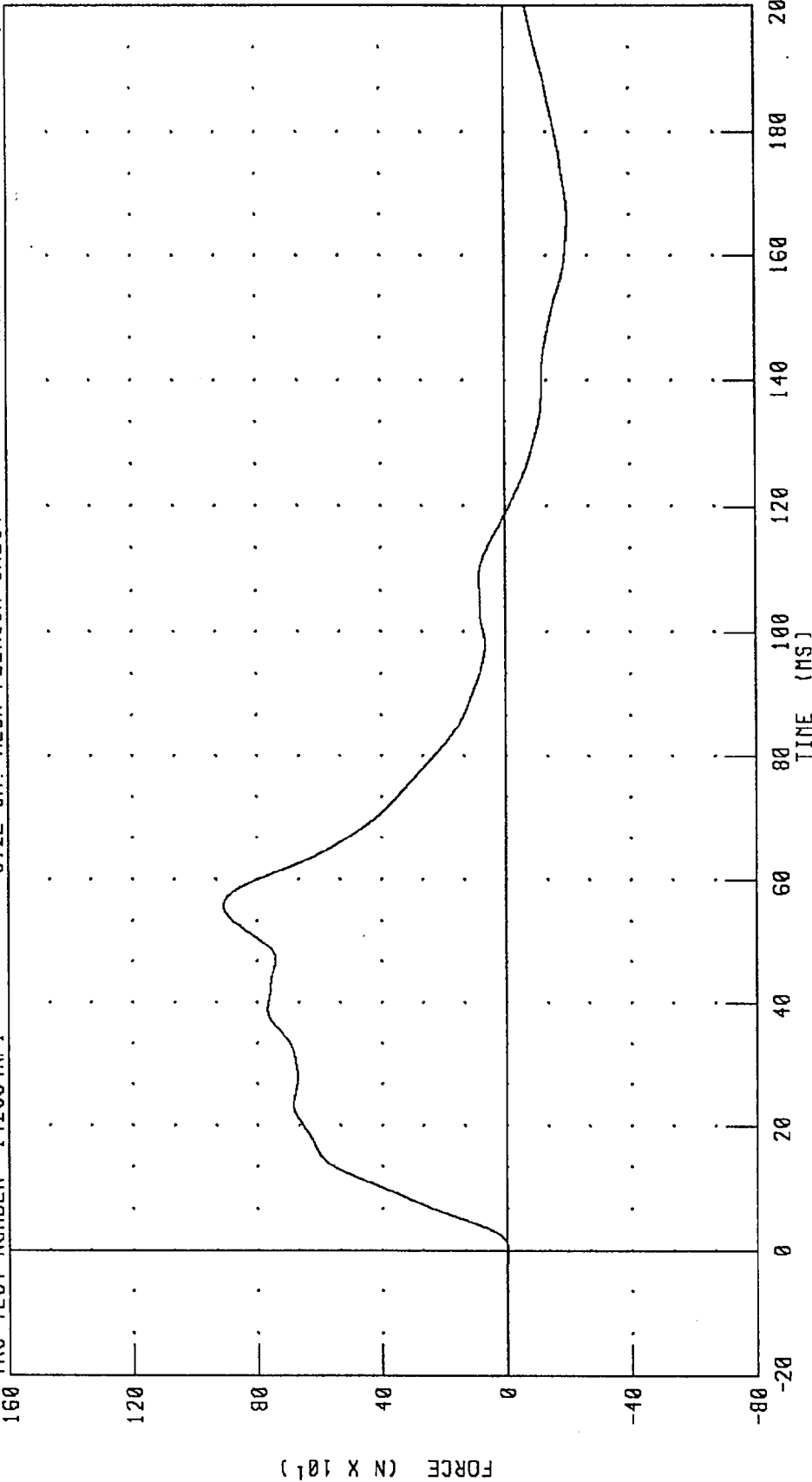
CHANNEL: TOTAL FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NF1

572E SN? NECK FLEXION CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 908.64 N @ 55.76 MS; -201.64 N @ 166.08 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

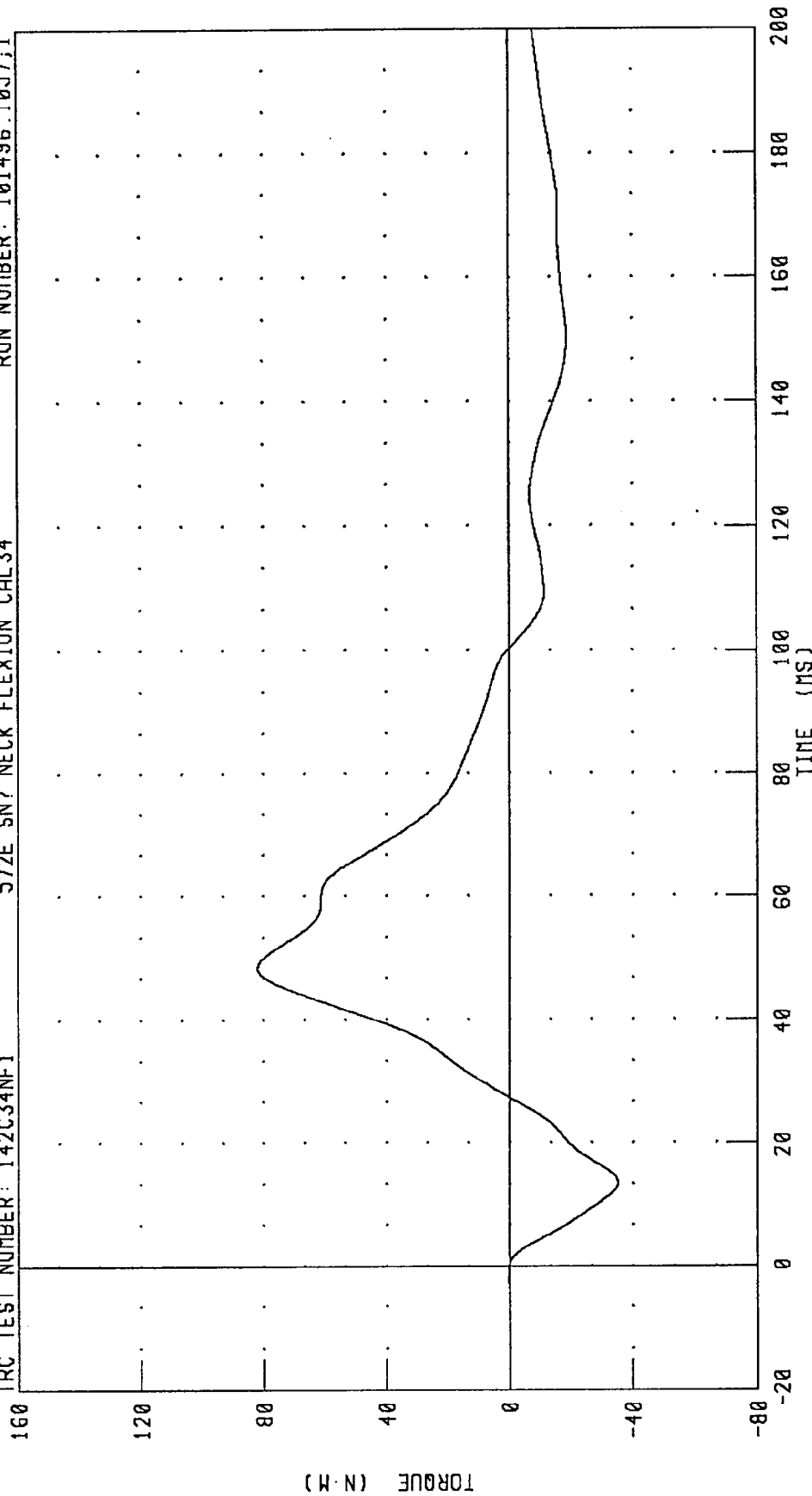
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 142C34NF1

572E SN? NECK FLEXION CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 81.99 N·M @ 48.48 MS; -35.14 N·M @ 13.52 MS

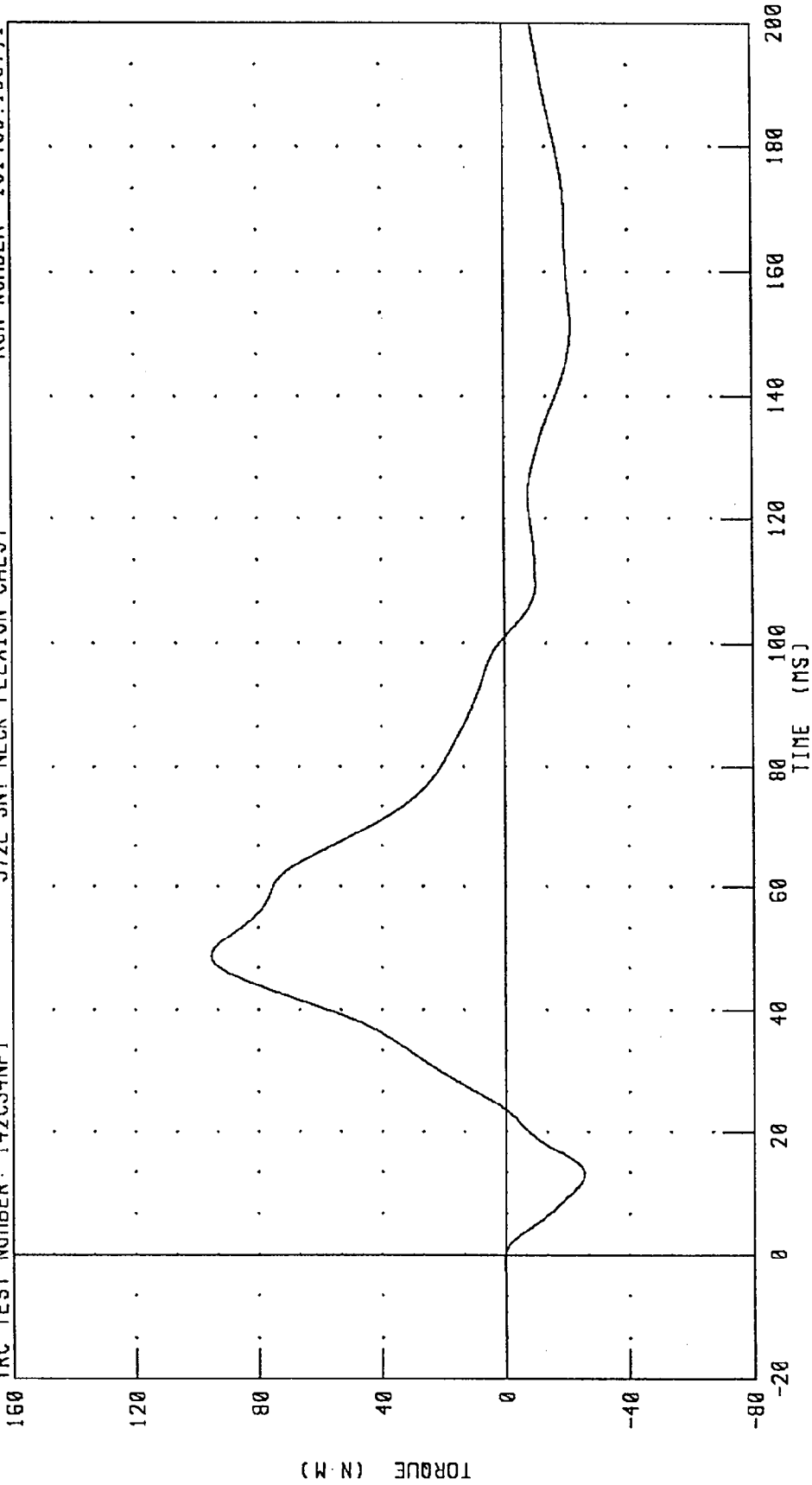
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NF1

572E SN? NECK FLEXION CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 95.39 N·M @ 48.64 MS; -25.35 N·M @ 13.04 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

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

HYBRID III

04-SEP-96

TRC INC. TEST NO: 142C34NE1 572E SN142 NECK EXT. CAL34

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	64.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.33 G
	20 MS	14.00 - 19.00 G	16.36 G
	30 MS	11.00 - 16.00 G	12.75 G
MAX PENDULUM G		22 G MAX	18.17 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	12.70 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.96 MS
D PLANE	MAX	81 - 106 DEG.	95.88 DEG.
ROTATION	TIME	72 - 82 MS	74.48 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-71.01 NM
	TIME	65 - 79 MS	70.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	152.64 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	136.08 MS

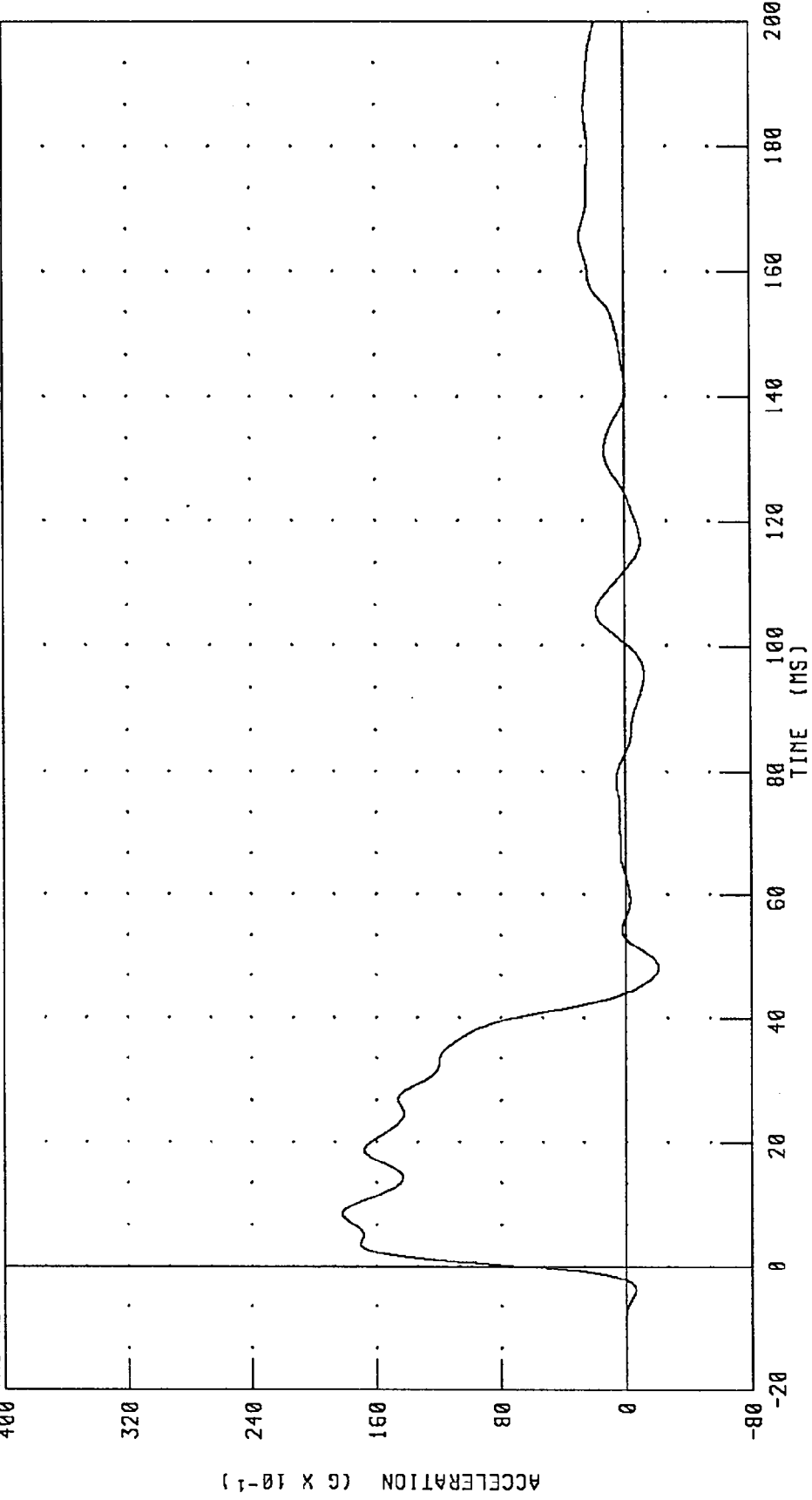
TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

RUN NUMBER: 090496.1034;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C34NE1 572E SN142 NECK EXT. CAL34 RUN NUMBER: 101496.1057,1



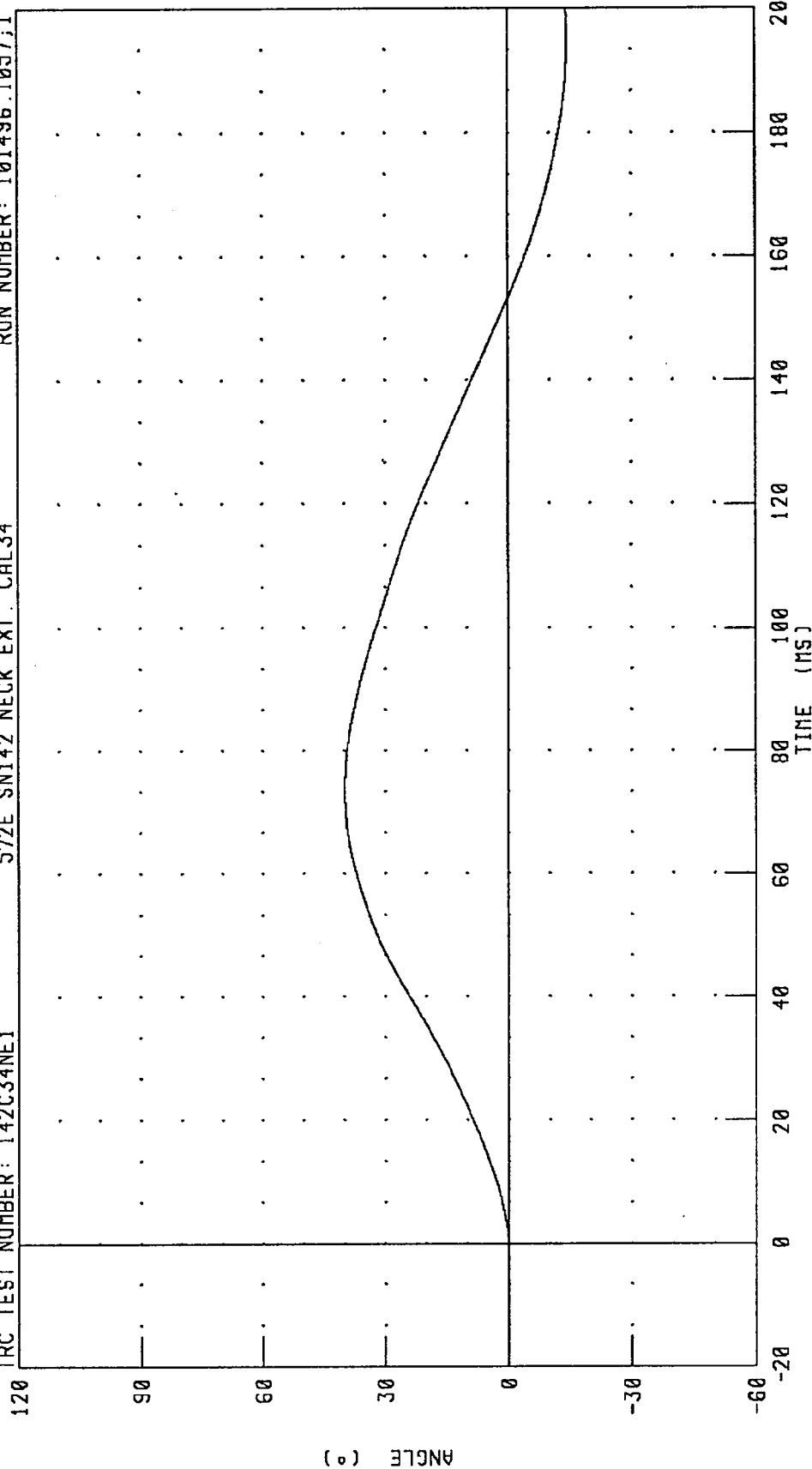
CHANNEL: PENXC FILTER: CH. CLASS 60 PEAK DATA: 18.18 G @ 8.40 MS; -2.09 G @ 48.00 MS

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

TRC TEST NUMBER: 142C34NE1

572E SN142 NECK EXT. CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 39.88 ° @ 73.60 MS; -14.41 ° @ 194.96 MS

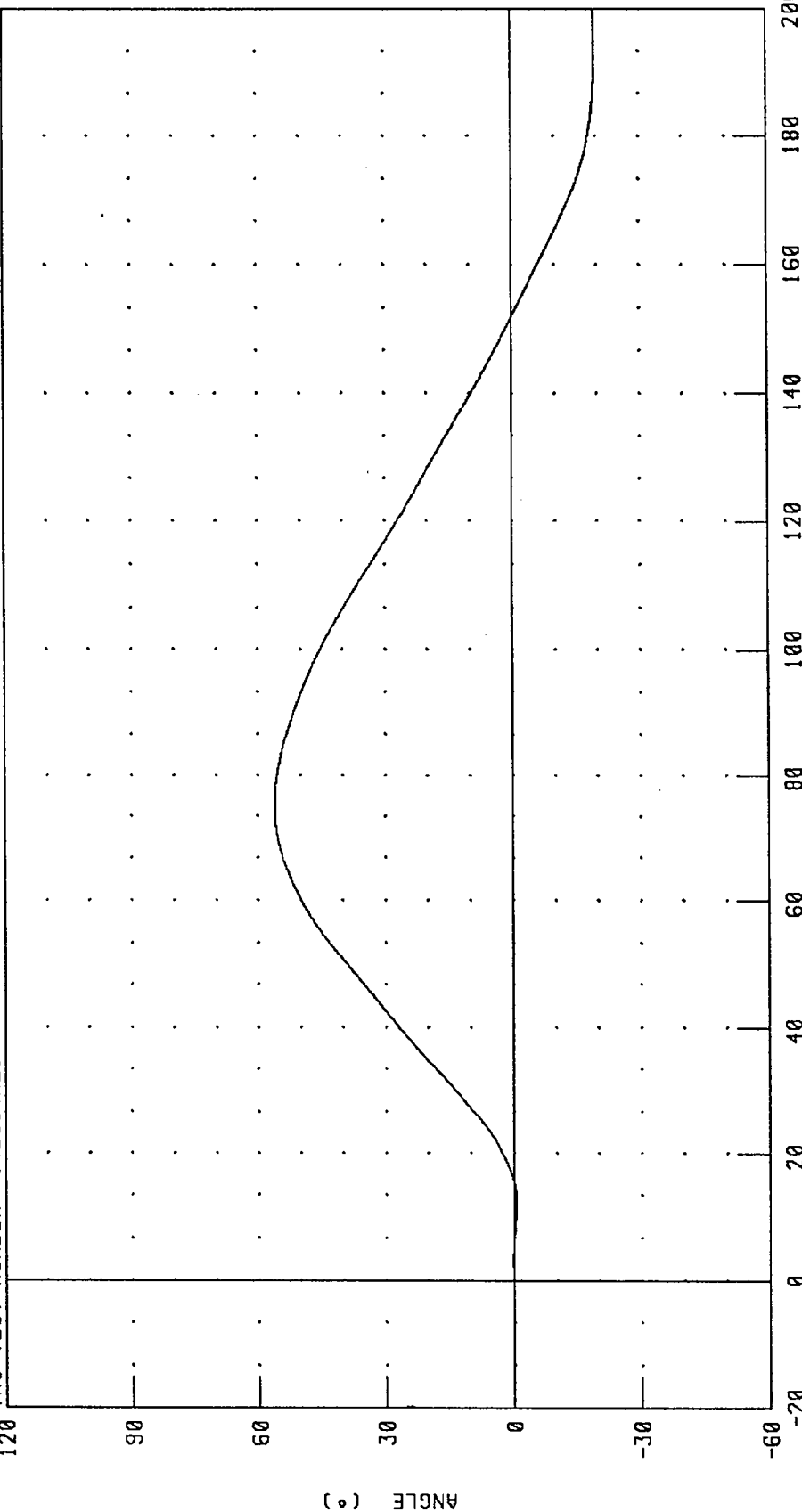
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NE1

572E SNI42 NECK EXT. CAL34

RUN NUMBER: 101496.1057;1



CHANNEL: THETA FILTER: CH. CLASS 60

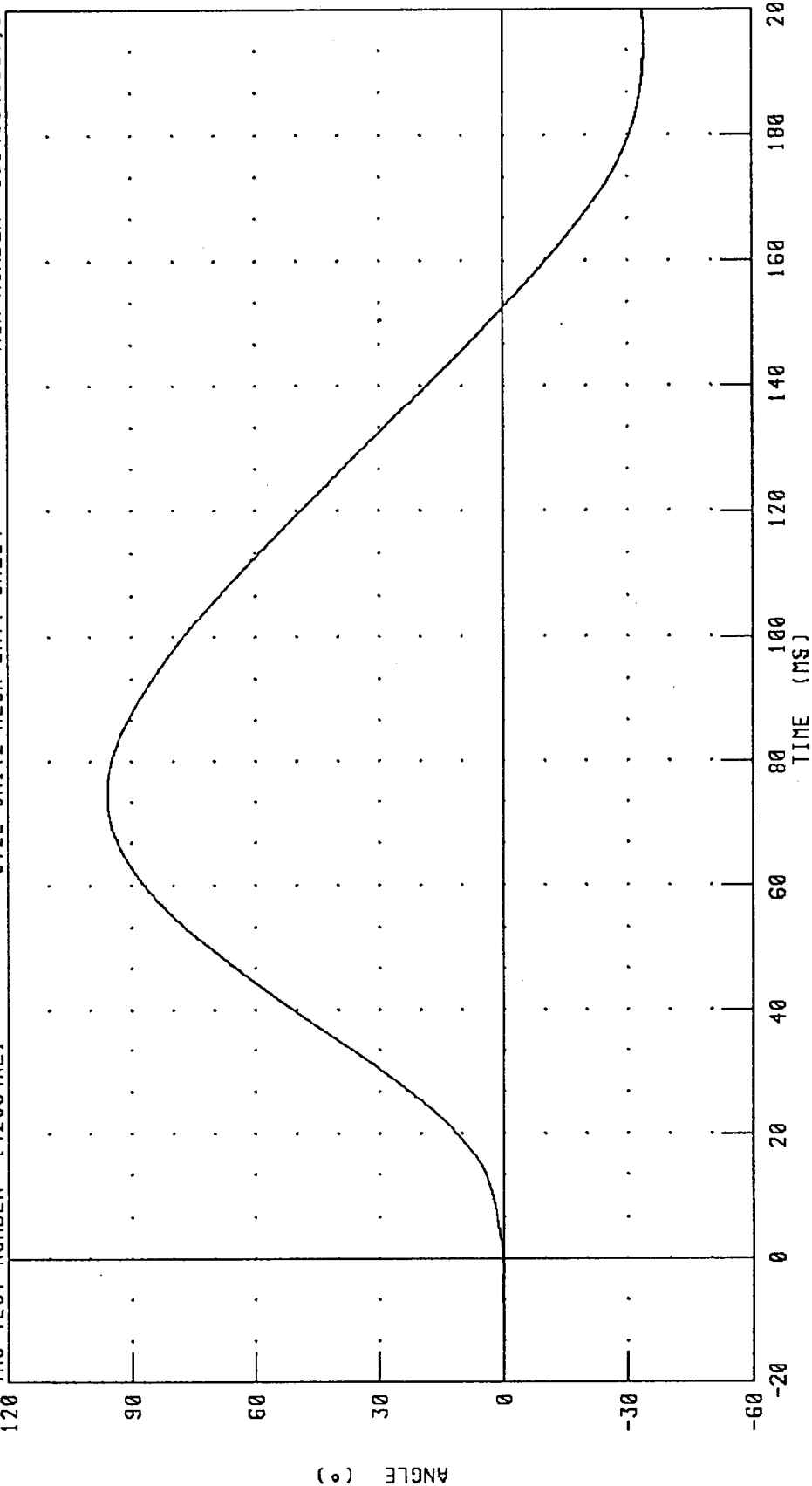
PEAK DATA: 56.03 ° @ 75.36 MS; -19.54 ° @ 196.88 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION

TRC TEST NUMBER: 142C34NE1

572E SNI42 NECK EXT. CAL34

RUN NUMBER: 101496.1057;1

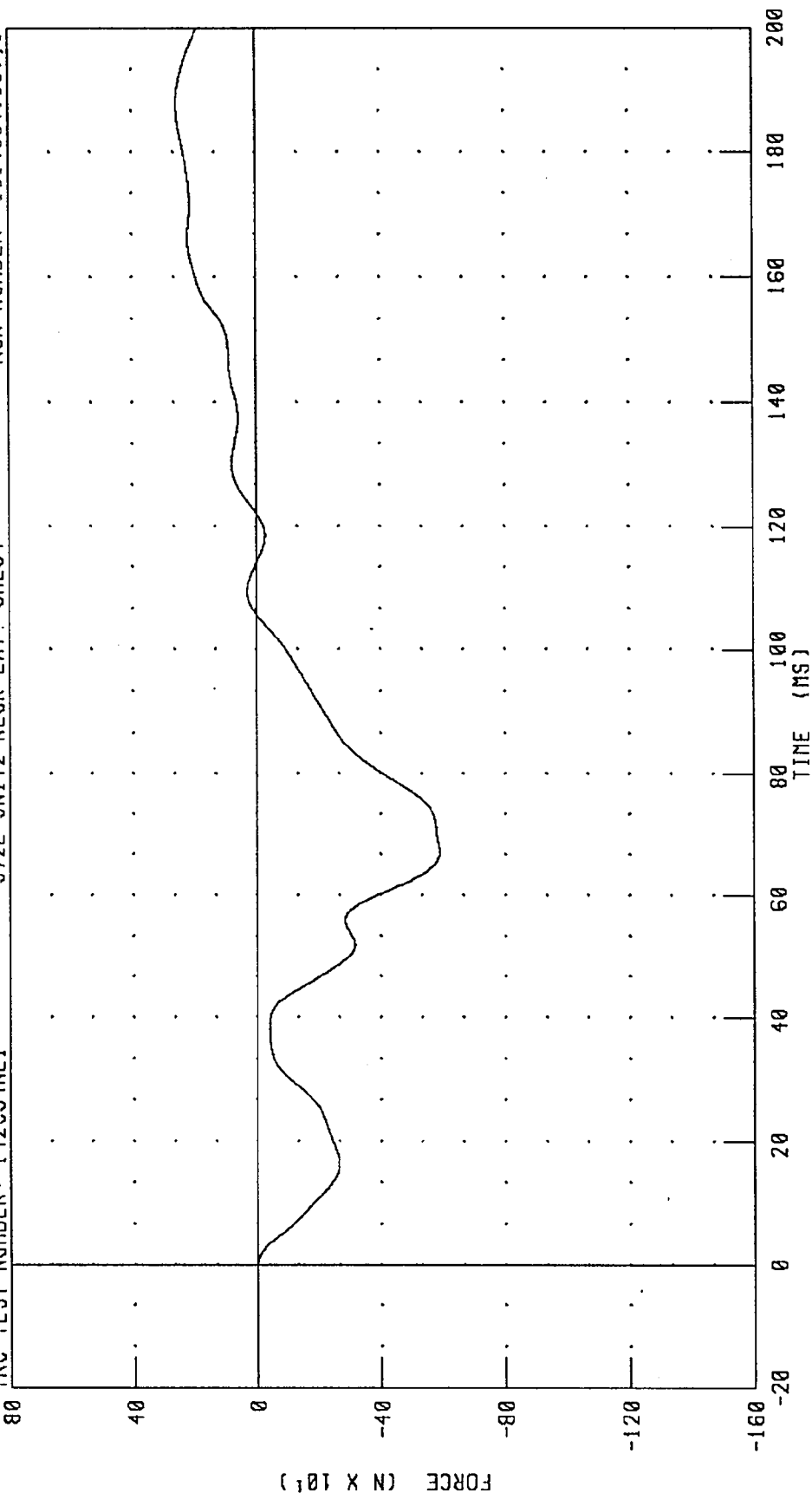


PEAK DATA: 95.88 ° @ 74.48 MS; -33.94 ° @ 195.12 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NE1 572E SN142 NECK EXT. CAL34 RUN NUMBER: 101496.1057;1

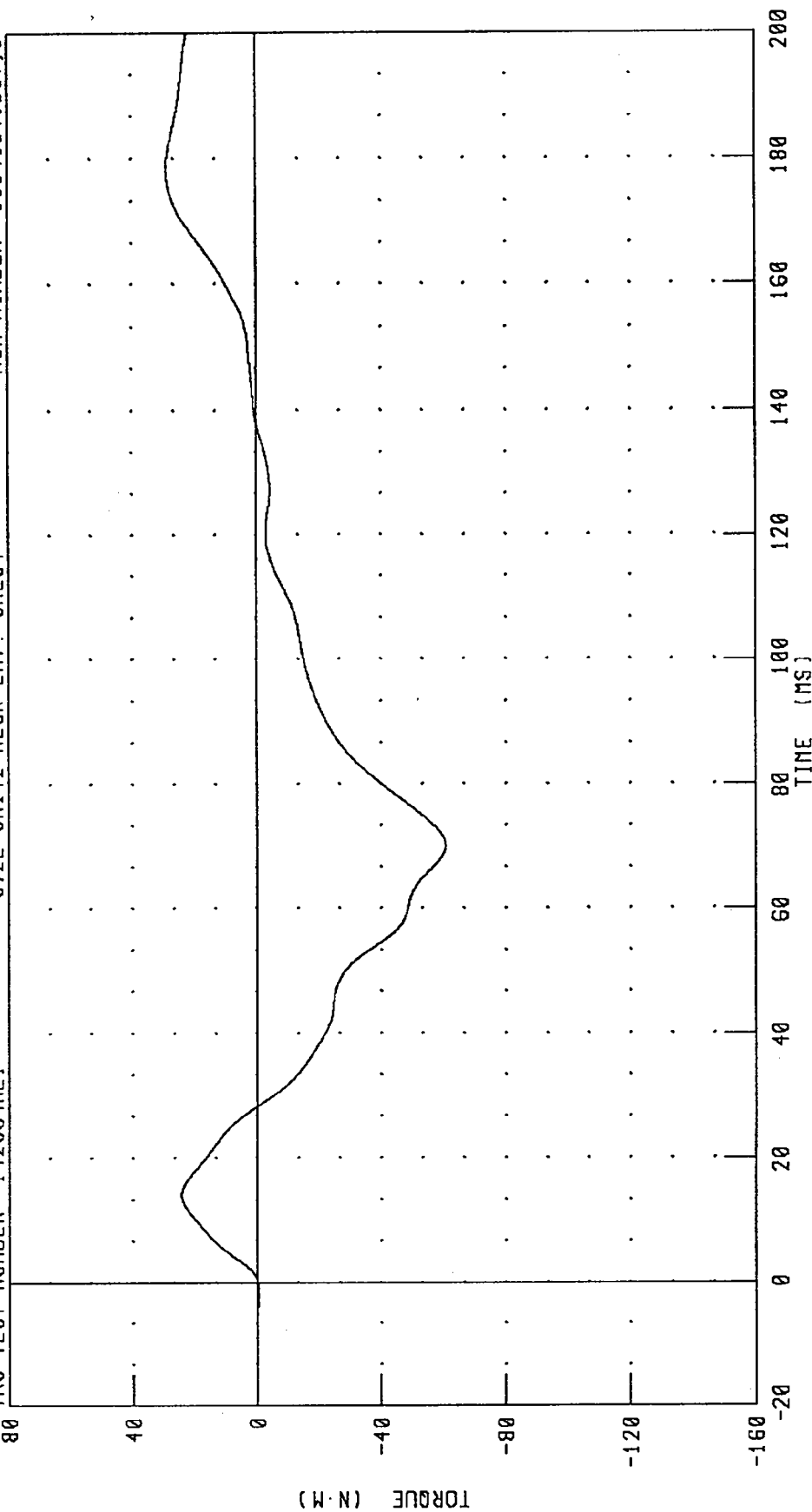


PEAK DATA: 256.19 N @ 187.76 MS; -588.94 N @ 67.12 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NE1 572E SN142 NECK EXT. CAL34 RUN NUMBER: 101496.1057,1



PEAK DATA: 28.83 N·M @ 178.40 MS; -60.69 N·M @ 70.08 MS

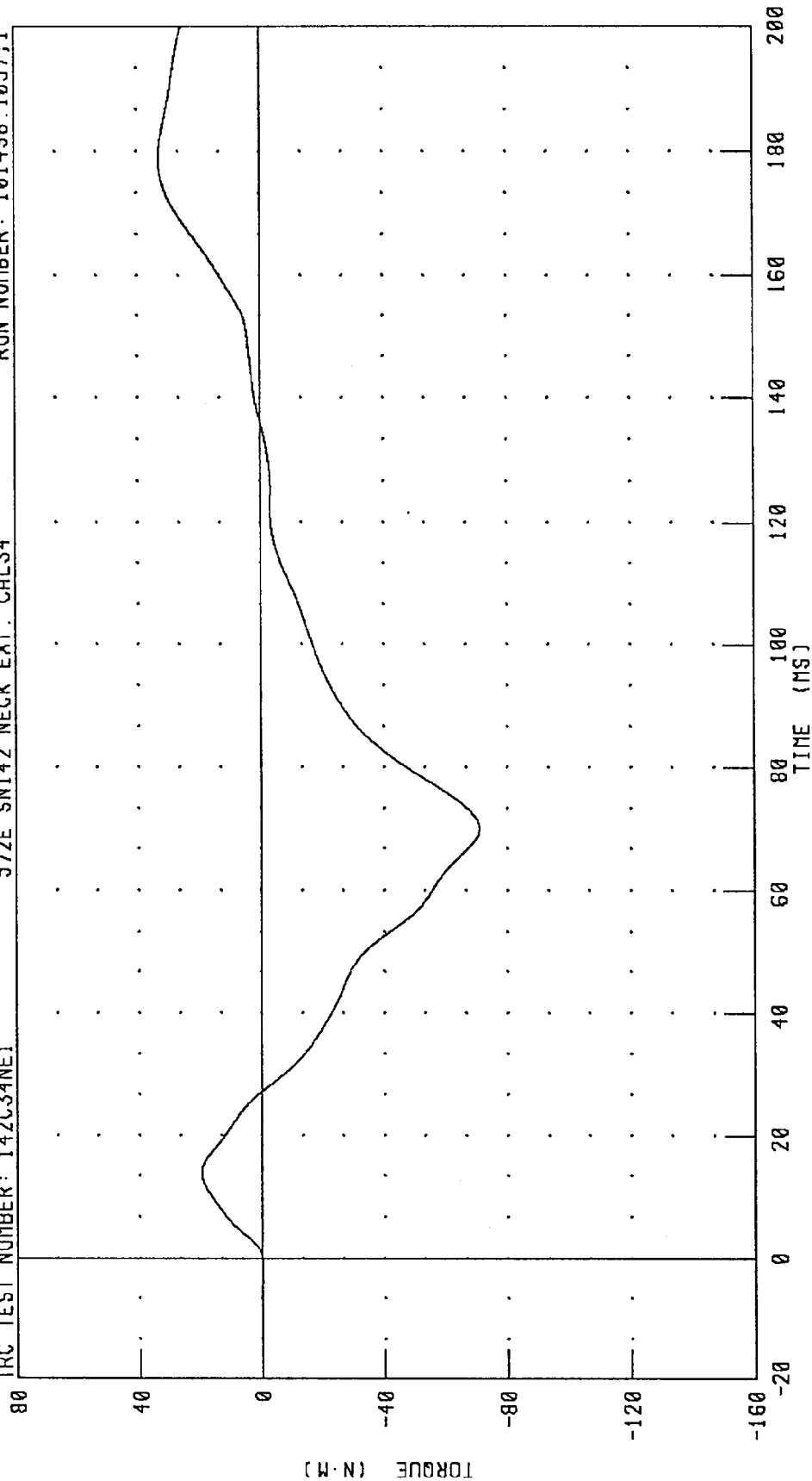
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C34NE1

572E SN142 NECK EXT. CAL34

RUN NUMBER: 101496.1057;1



PEAK DATA: 32.89 N·M @ 178.80 MS; -71.01 N·M @ 70.00 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

04-SEP-96

TRC INC.

TEST NO: 142C34TH2

572E SN 142 H.S.THORAX CAL 34

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	64.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	71.3 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5533. N
INTERNAL HYSTERESIS	69% - 85%	71.1%

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Lom

RUN NUMBER: 090496.1555;1

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 142C34TH2

572E SN 142 H.S. THORAX CAL 34

RUN NUMBER: 101496.1057;1

50

40

30

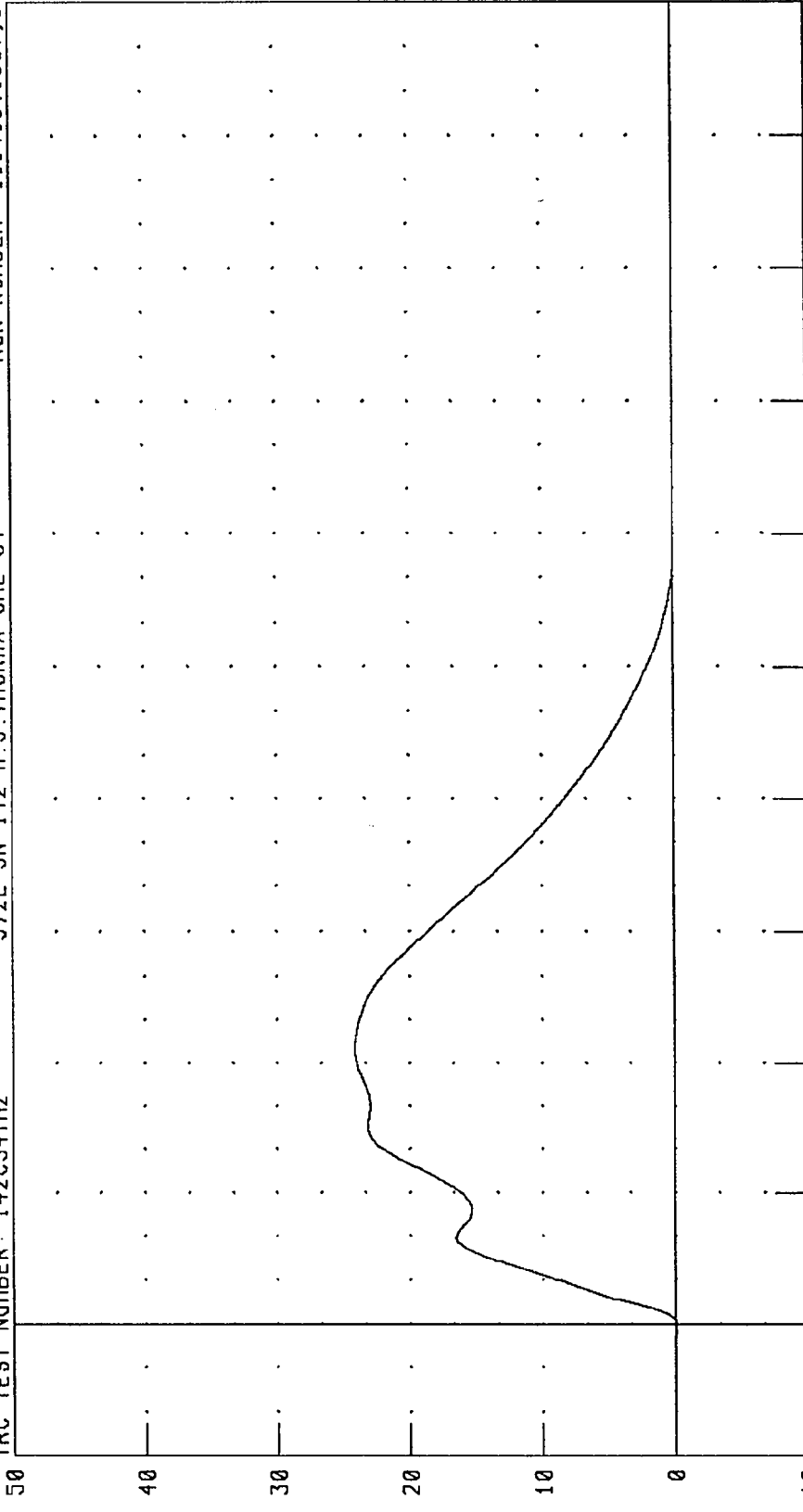
20

10

0

-10

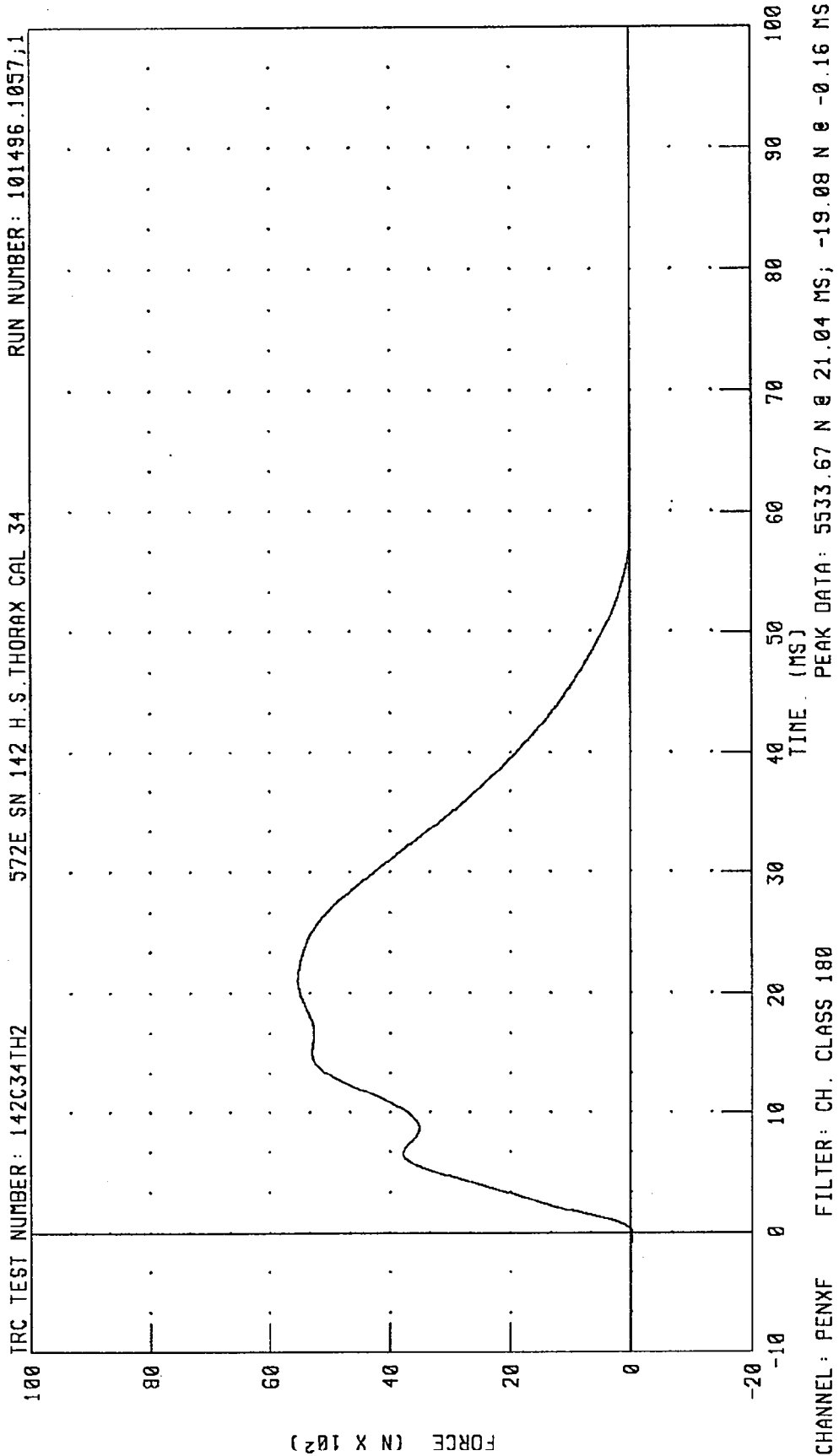
ACCELERATION (G)



PEAK DATA: 24.16 G @ 21.04 MS; -0.08 G @ -0.16 MS

CHANNEL: PENXC FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM FORCE

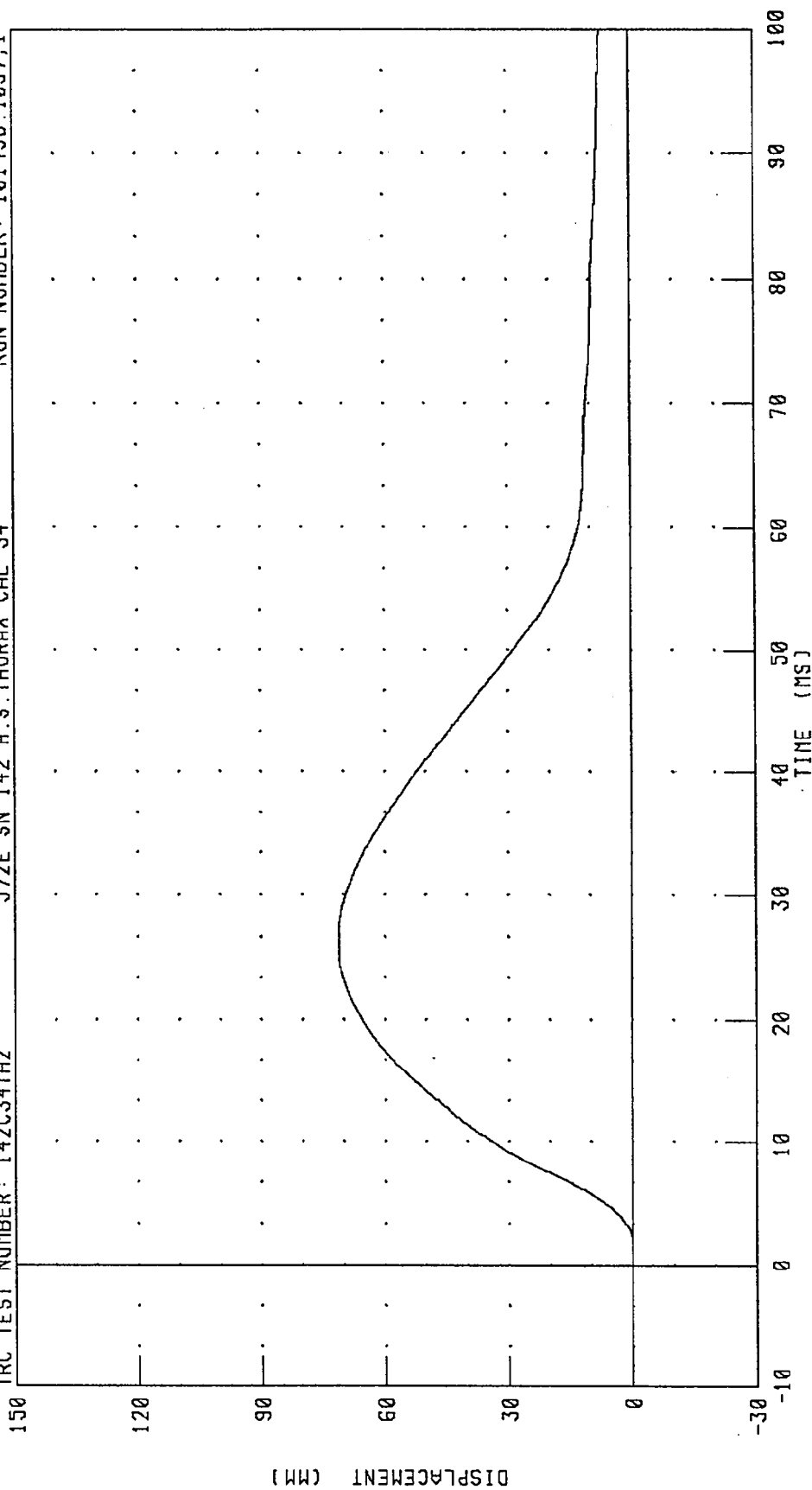


PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 142C34TH2

572E SN 142 H.S. THORAX CAL 34

RUN NUMBER: 101496.1057;1



PEAK DATA: 71.32 MM @ 26.56 MS; -0.05 MM @ 1.52 NS

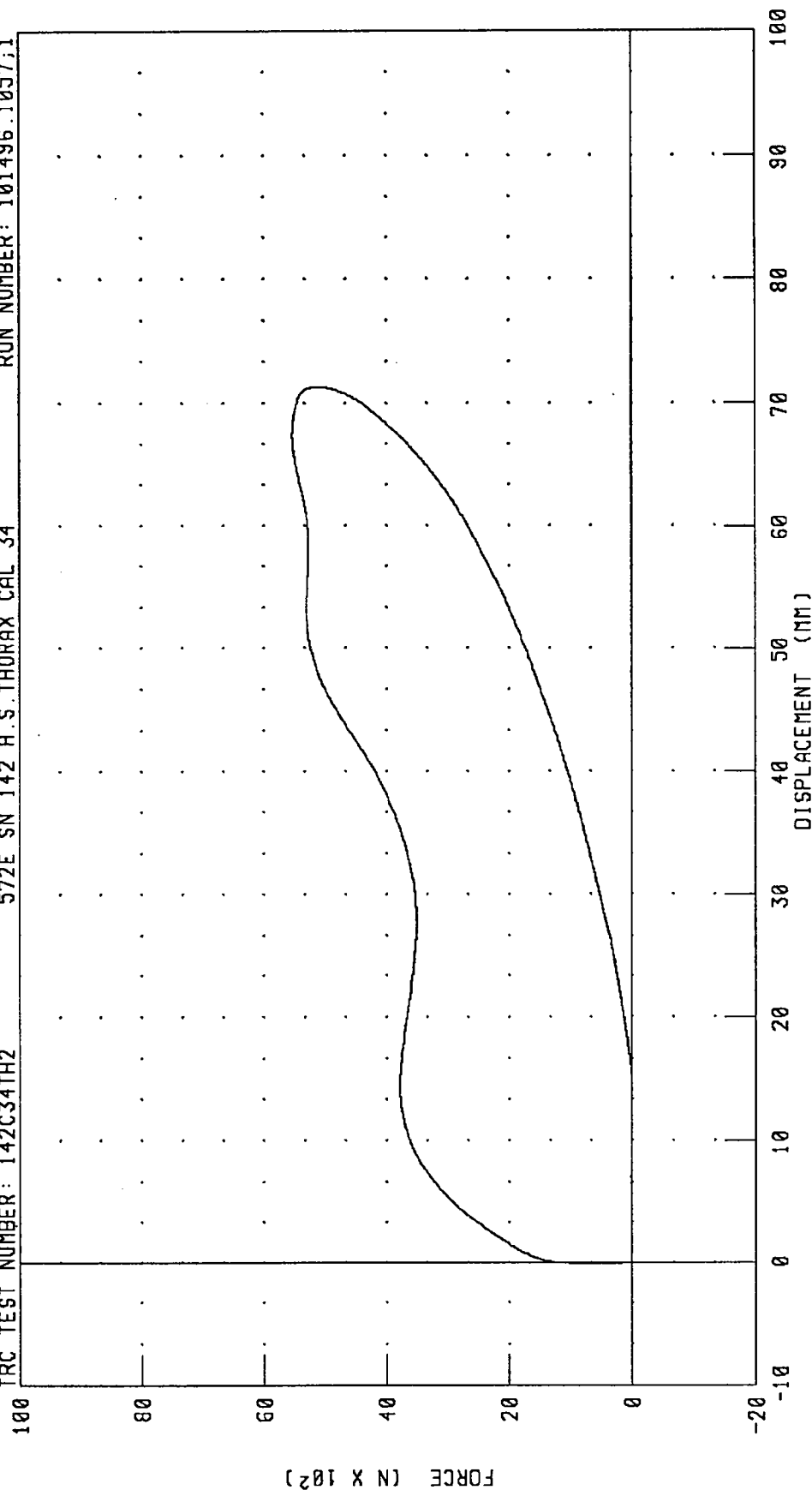
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 142C34TH2

572E SN 142 H.S. THORAX CAL 34

RUN NUMBER: 101496.1057;1



PEAK DATA: 71.32 MM @ 26.56 MS; -0.05 NM @ 1.52 MS
5533.67 N @ 21.04 MS; -19.08 N @ -0.16 MS

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

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

03-SEP-96

TRC INC.

TEST NO: 142C34RK1

572E SN142 RIGHT KNEE CAL 34

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	62.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5157.7 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Bye Craft

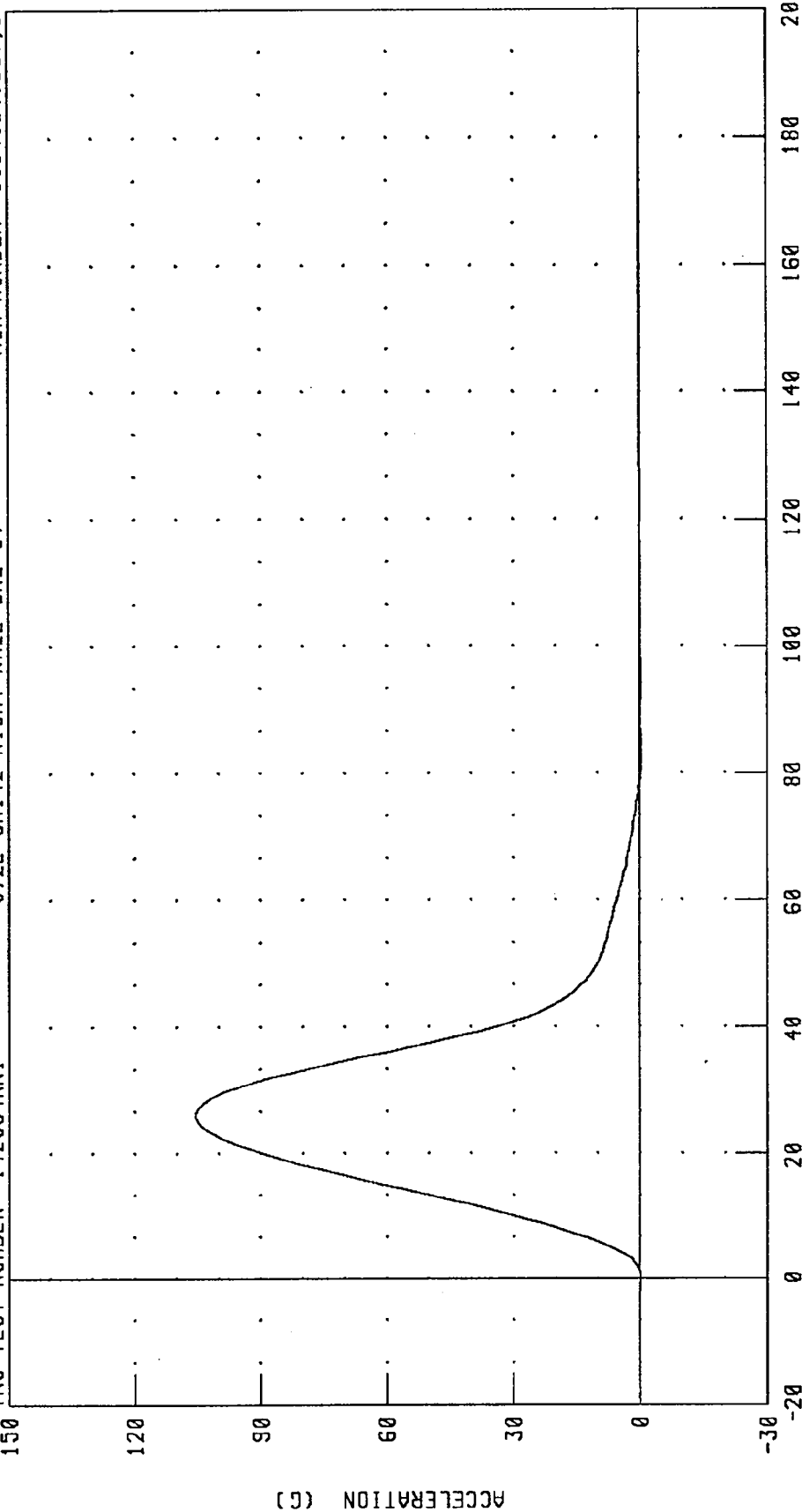
RUN NUMBER: 090396.1324;1

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

TRC TEST NUMBER: 142C34RK1

572E SN142 RIGHT KNEE CAL 34

RUN NUMBER: 101496.1057;1



PEAK DATA: 105.41 G @ 2.56 MS; -0.41 G @ 9.52 MS

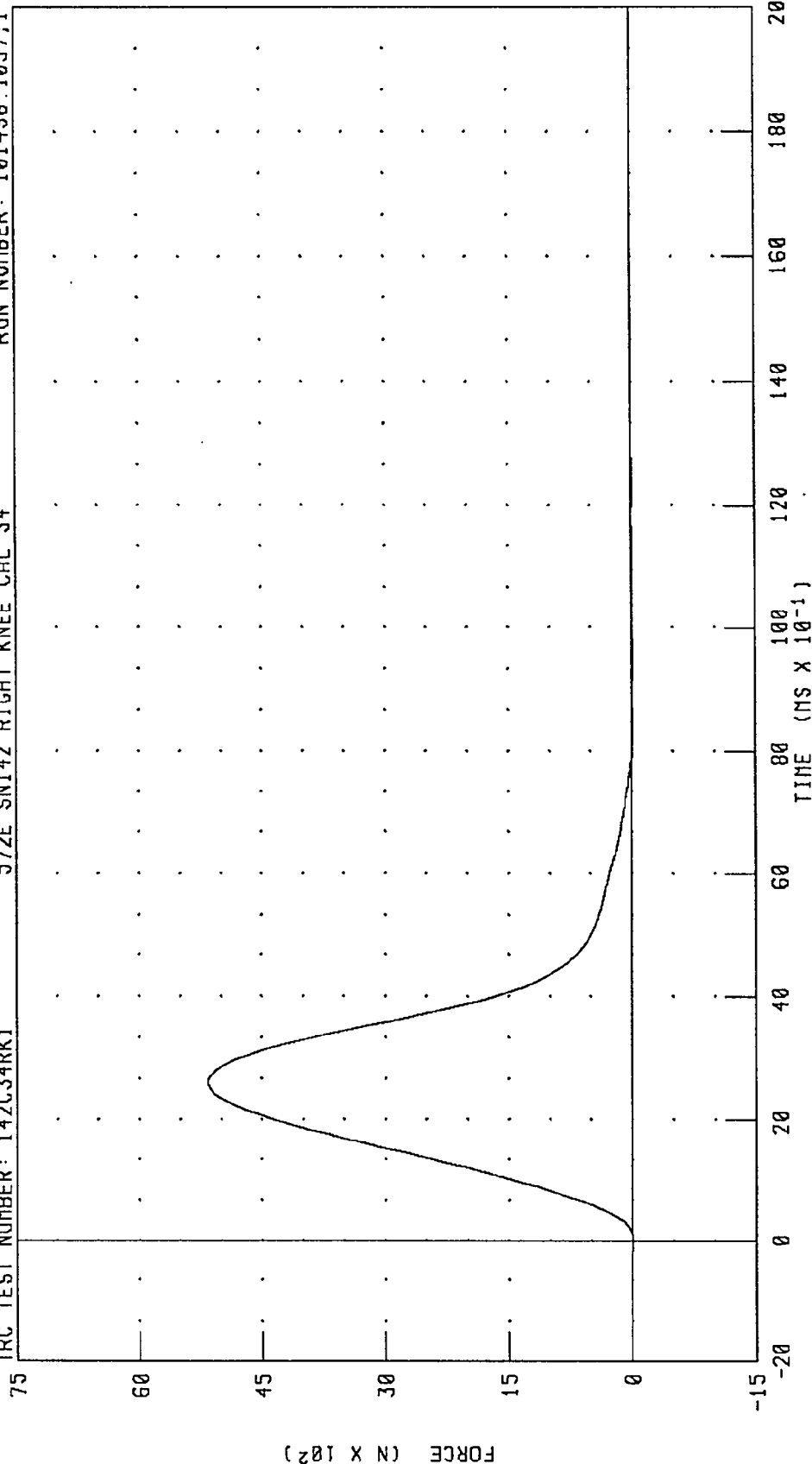
CHANNEL: PENXC FILTER: CH. CLASS 600

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

TRC TEST NUMBER: 142C34RK1

572E SN142 RIGHT KNEE CAL 34

RUN NUMBER: 101496.1057;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5157.72 N @ 2.56 MS; -19.97 N @ 9.52 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

03-SEP-96

TRC INC.

TEST NO: 142C34LK1

572E SN142 LEFT KNEE CAL 34

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	62.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5208.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

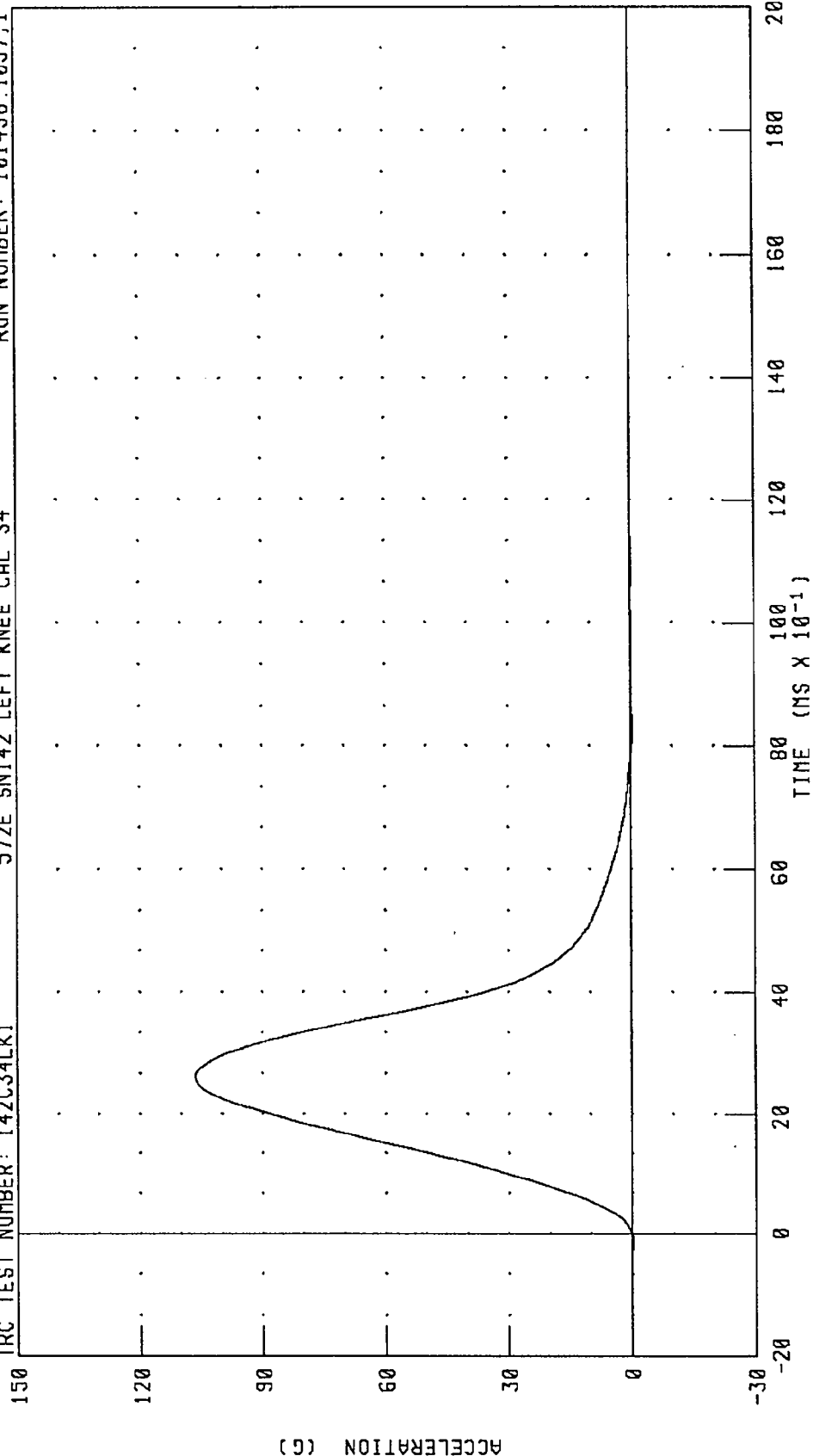
RUN NUMBER: 090396.1321;1

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

TRC TEST NUMBER: 142C34LK1

572E SN142 LEFT KNEE CAL 34

RUN NUMBER: 101496.1057.1



PEAK DATA: 106.46 G @ 2.56 MS; -0.42 G @ 8.24 NS

CHANNEL: PENXG FILTER: CH. CLASS 600

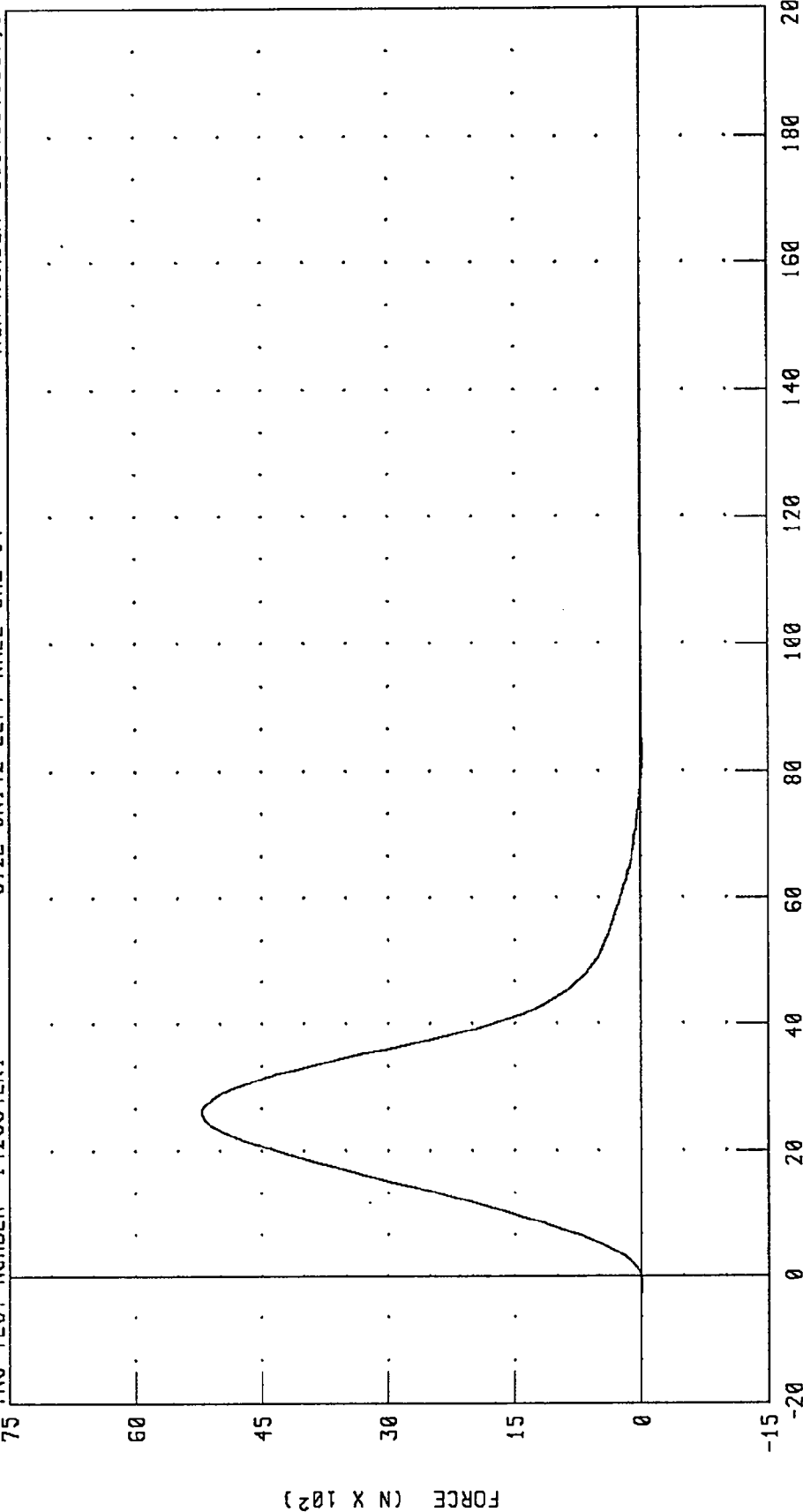
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN142 LEFT KNEE CAL 34

TRC TEST NUMBER: 142C34LK1

RUN NUMBER: 101496.1057;1



PEAK DATA: 5208.69 N @ 2.56 MS, -20.54 N @ 8.24 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

Pre-test Certification Data

Passenger Dummy S/N: 192

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III EXTERNAL DIMENSIONS

SN 192 ALDERSON

3-SEPT-96

TRC INC.

TEST NO: 192C33ED1

572E SN192 EXT.DIMENSION CAL33

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 Le Van

RUN NUMBER: 101196.1225

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

04-SEP-96

TRC INC.

TEST NO: 192C33HD1

572E SN192 HEAD DROP CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	263.11 G
PEAK LATERAL ACCELERATION	15 G MAX	-11.90 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

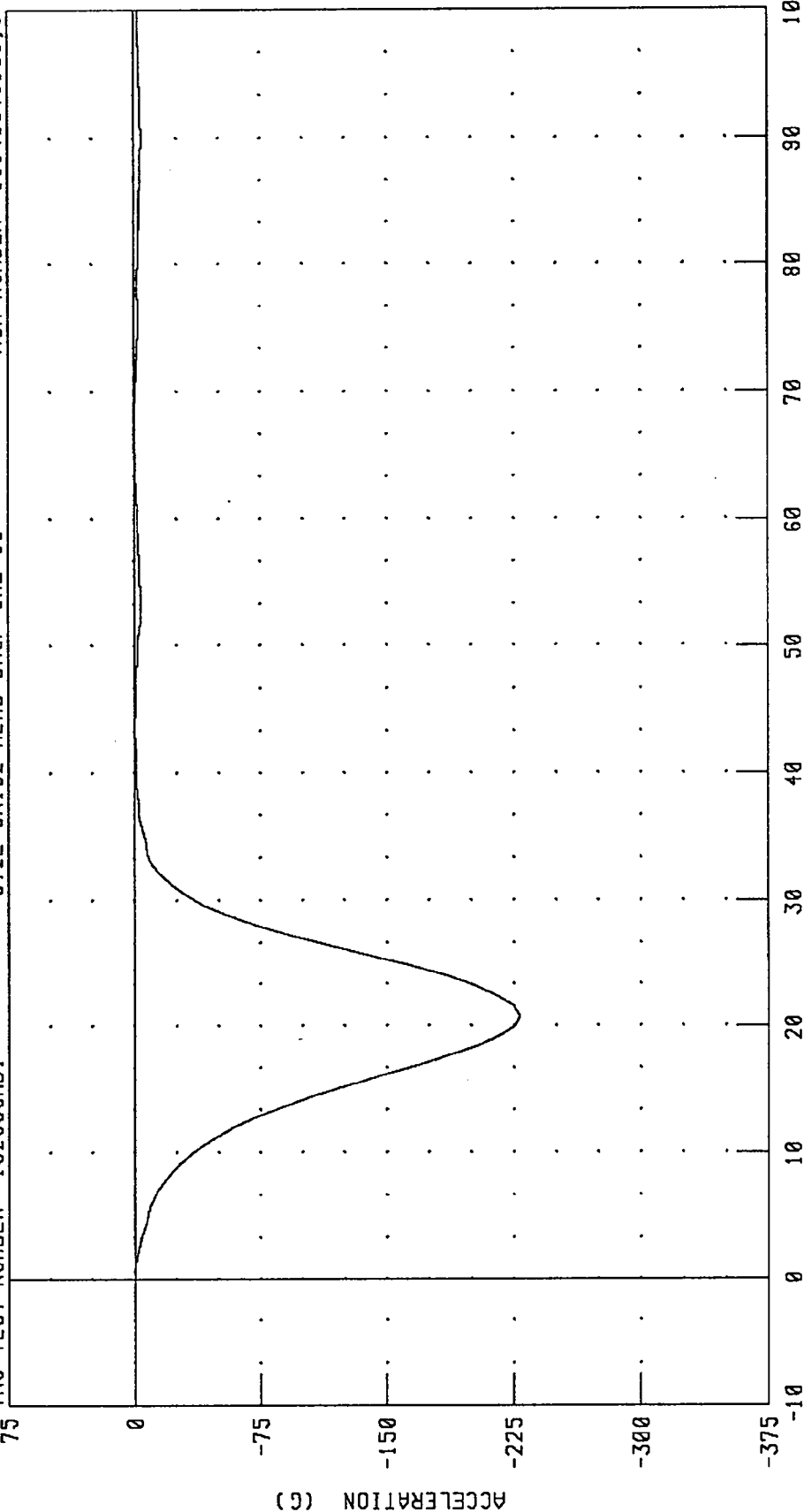
RUN NUMBER: 090396.0923;1

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

TRC TEST NUMBER: 192C33HD1

572E SN192 HEAD DROP CAL 33

RUN NUMBER: 101496.1105.1



PEAK DATA: 0.20 G @ 6.64 MS, -228.67 G @ 2.08 MS

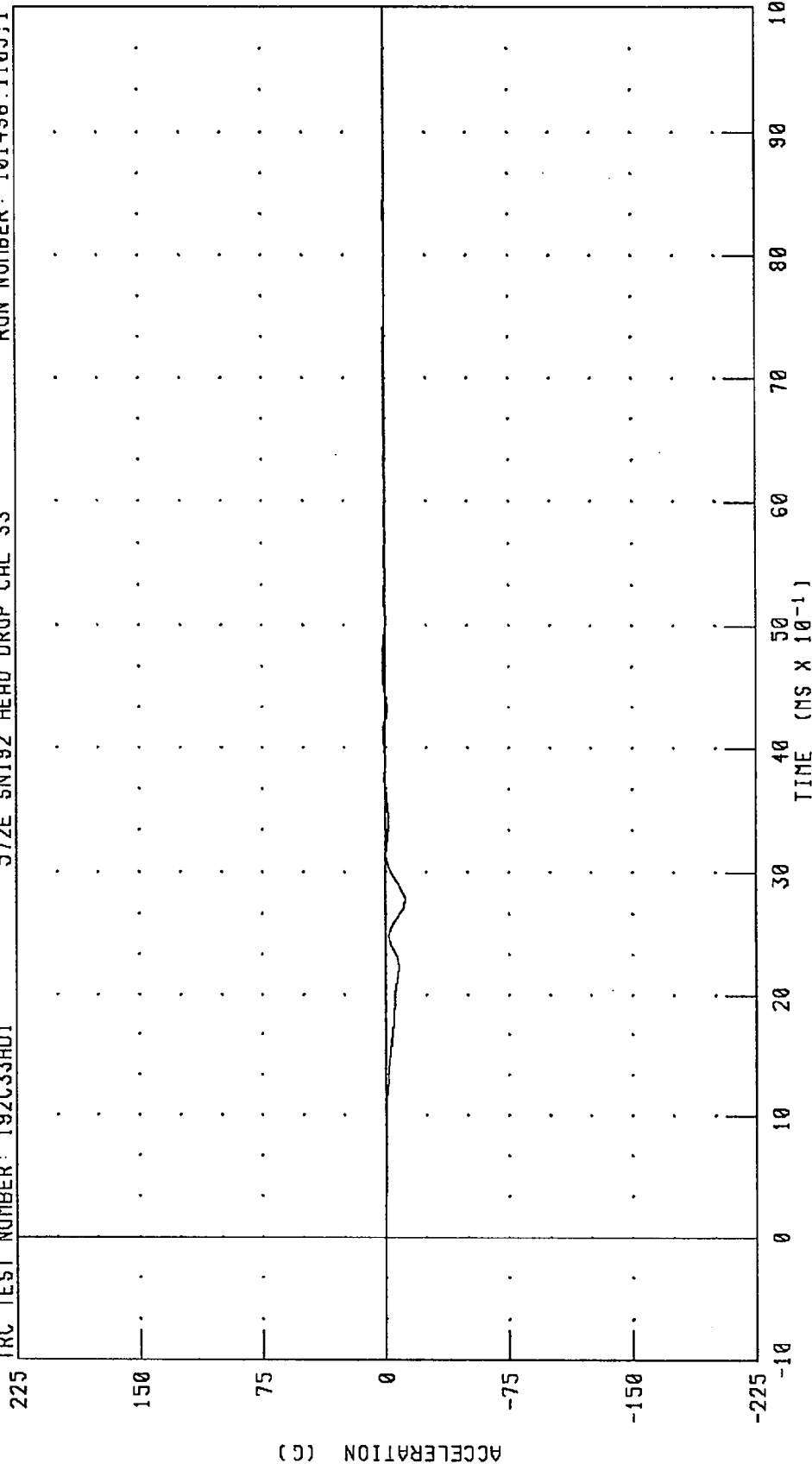
CHANNEL: HEDXG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 192C33HD1

572E SN192 HEAD DROP CAL 33

RUN NUMBER: 101496.1105;1

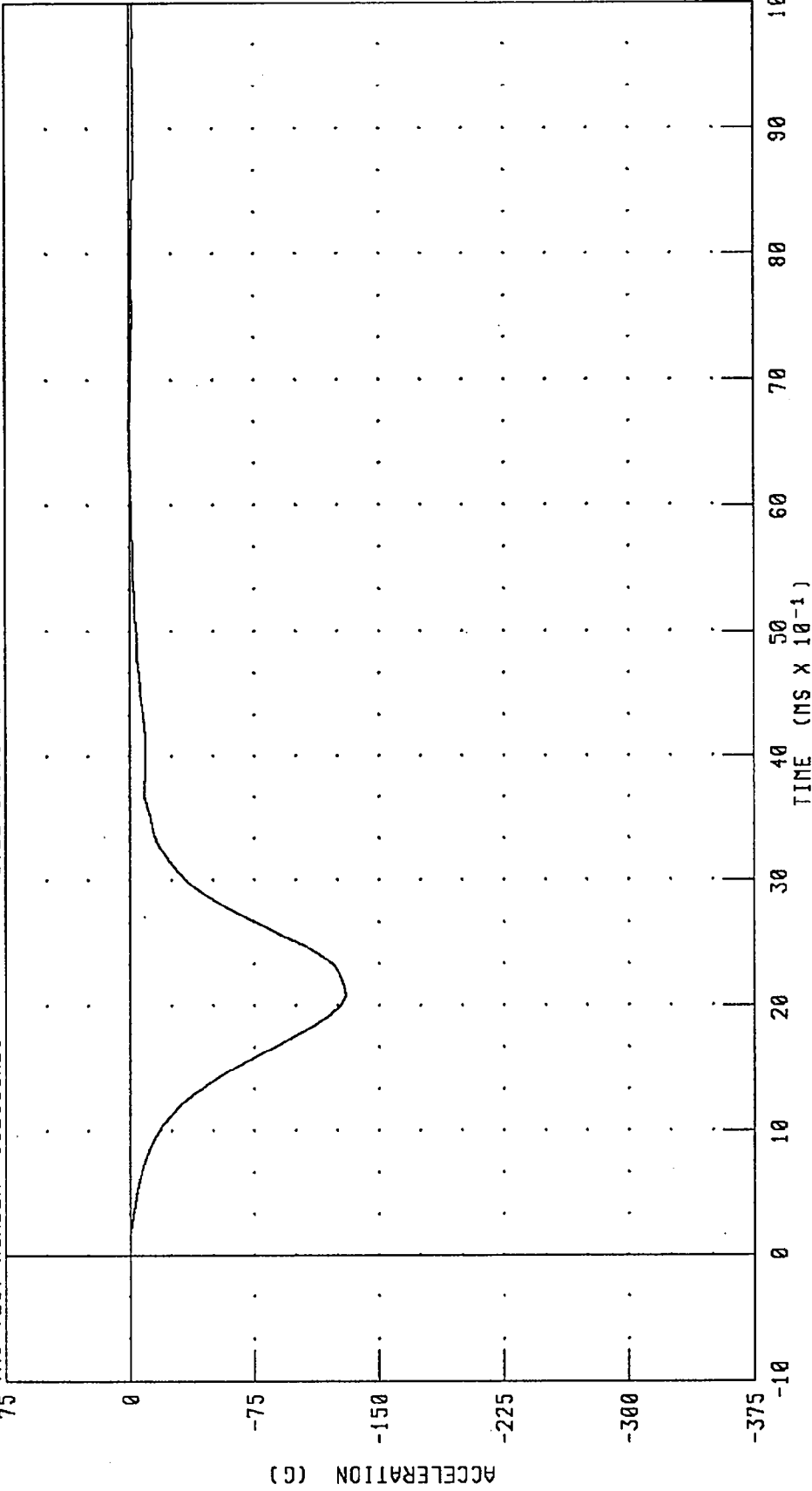


PEAK DATA: 1.44 G @ 4.08 MS; -11.90 G @ 2.80 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 192C33HD1 572E SN192 HEAD DROP CAL 33 RUN NUMBER: 101496.1105;1



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 0.24 G @ 6.64 MS; -130.00 G @ 2.08 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 192C33HD1

572E SN192 HEAD DROP CAL 33

RUN NUMBER: 101496.1105;1

375

300

225

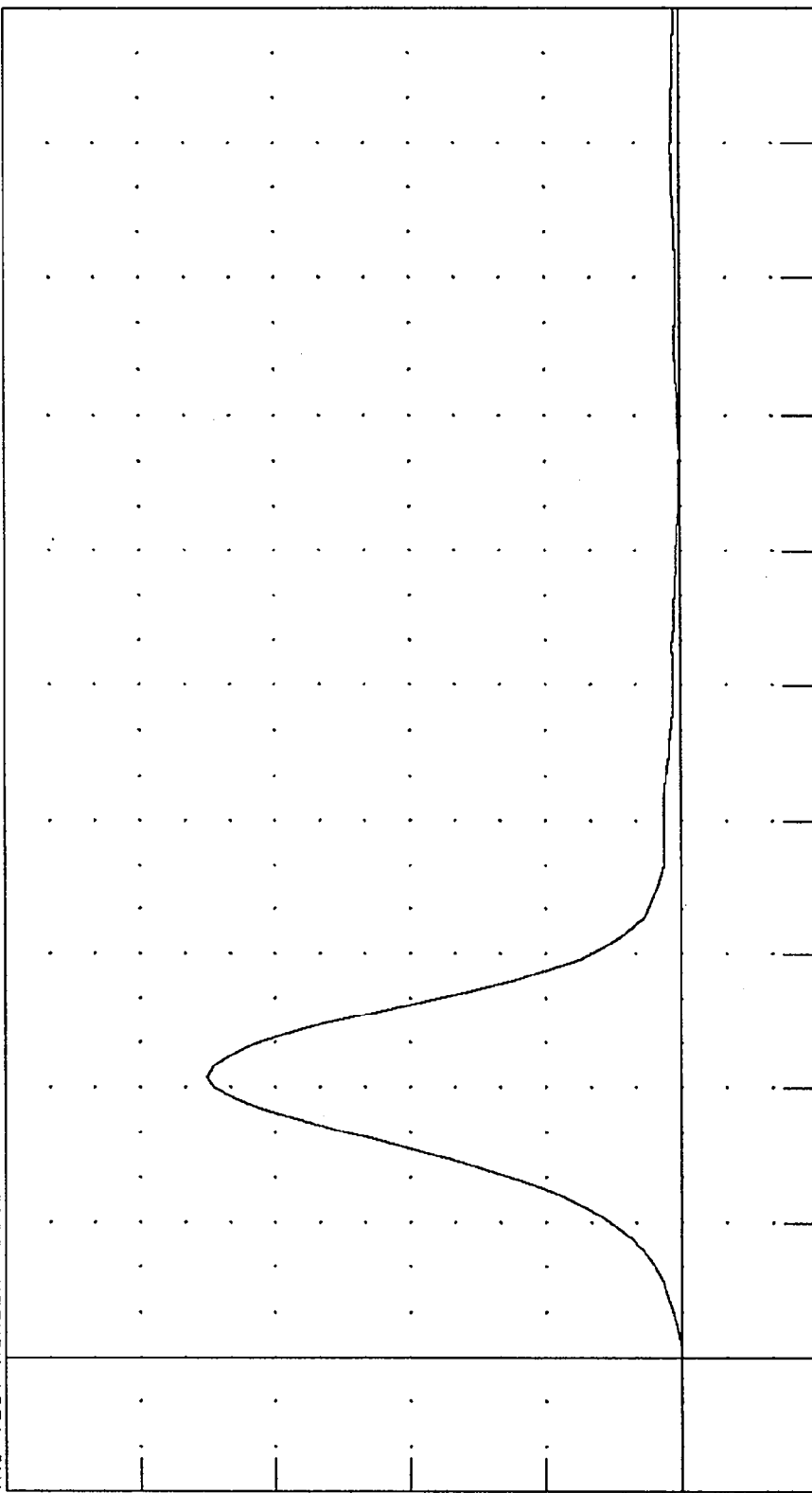
150

75

0

-75

ACCELERATION (G)



TIME (MS X 10⁻¹)

PEAK DATA: 263.11 G @ 2.08 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

04-SEP-96

TRC INC. TEST NO: 192C33NF4 572E SN192 NECK FLEXION CAL33

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	64.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.93 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.97 G
	20 MS	17.60 - 22.60 G	20.26 G
	30 MS	12.50 - 18.50 G	15.35 G
MAX PENDULUM G		29 G MAX	23.78 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.30 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	35.92 MS
D PLANE	MAX	64 - 78 DEG.	70.31 DEG.
ROTATION	TIME	57 - 64 MS	58.24 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	100.25 NM
	TIME	47 - 58 MS	48.56 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.32 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	98.56 MS

TEST MEETS SPECIFICATIONS

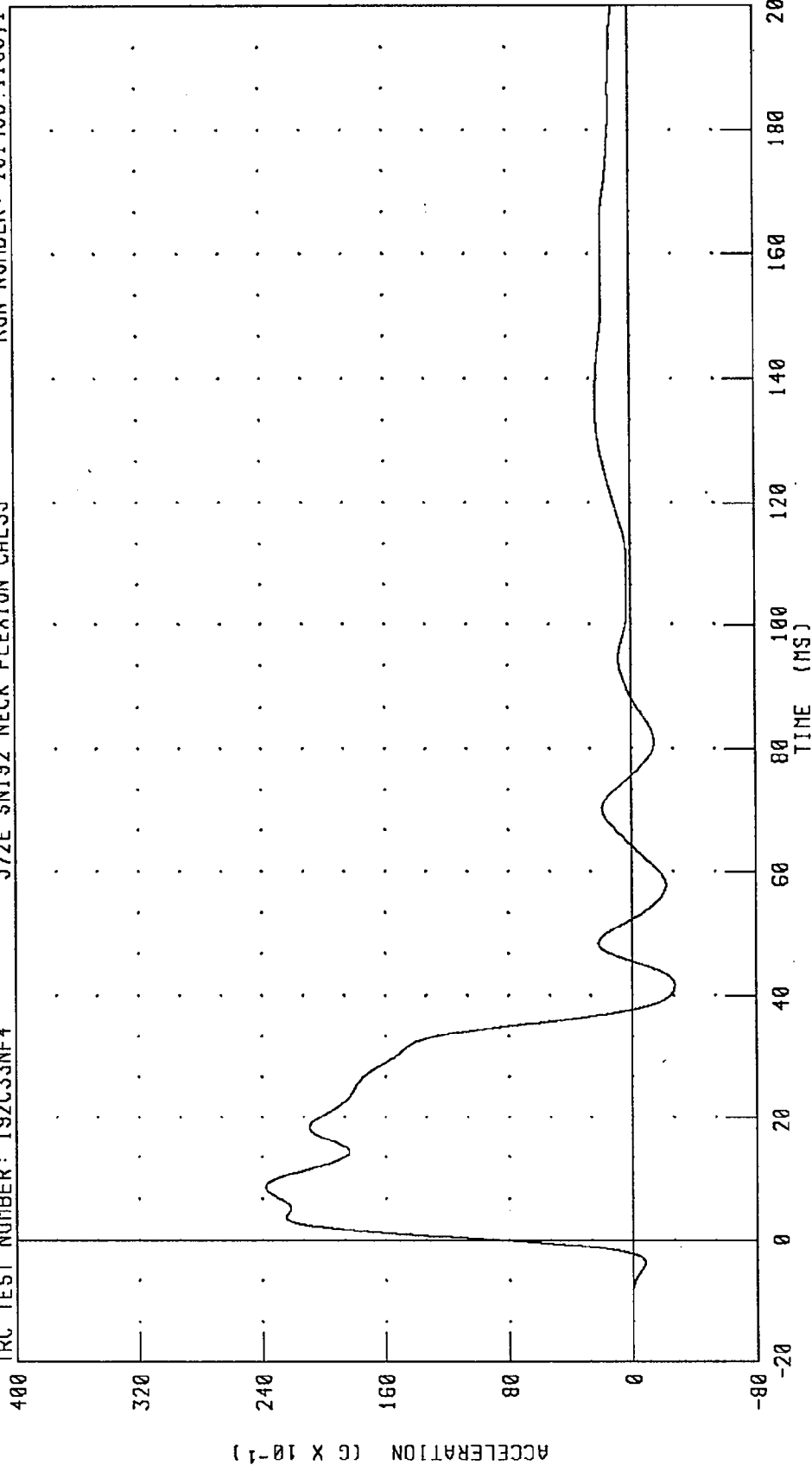
TECHNICIAN Richard Le Van

RUN NUMBER: 090496.0830;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 192C33NF4 RUN NUMBER: 101496.1105;1

572E SN192 NECK FLEXION CAL33



PEAK DATA: 23.79 G @ 8.56 MS; -2.74 G @ 41.60 MS

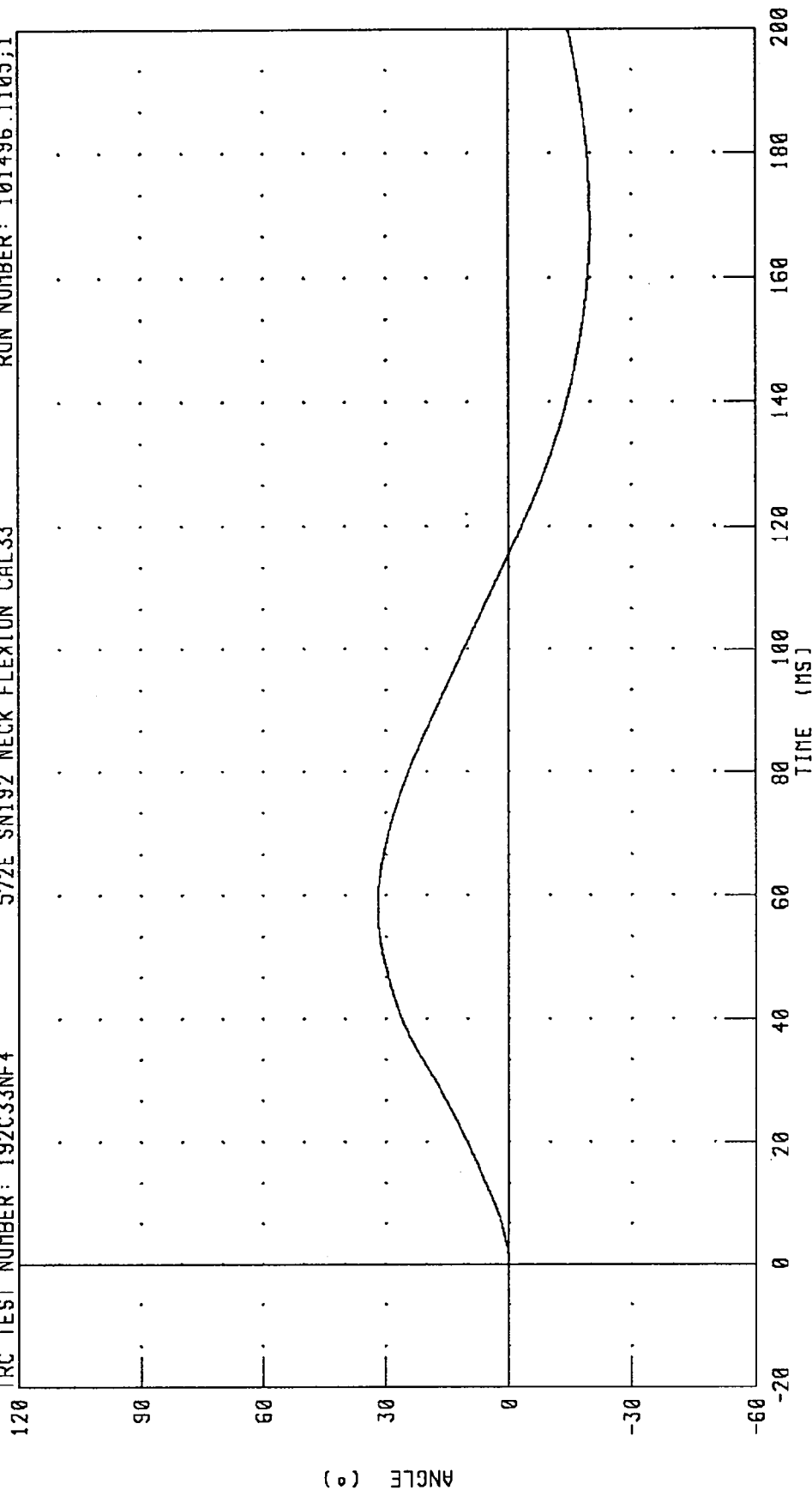
CHANNEL: PENXG FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NF4

572E SN192 NECK FLEXION CAL33

RUN NUMBER: 101496.1105;1

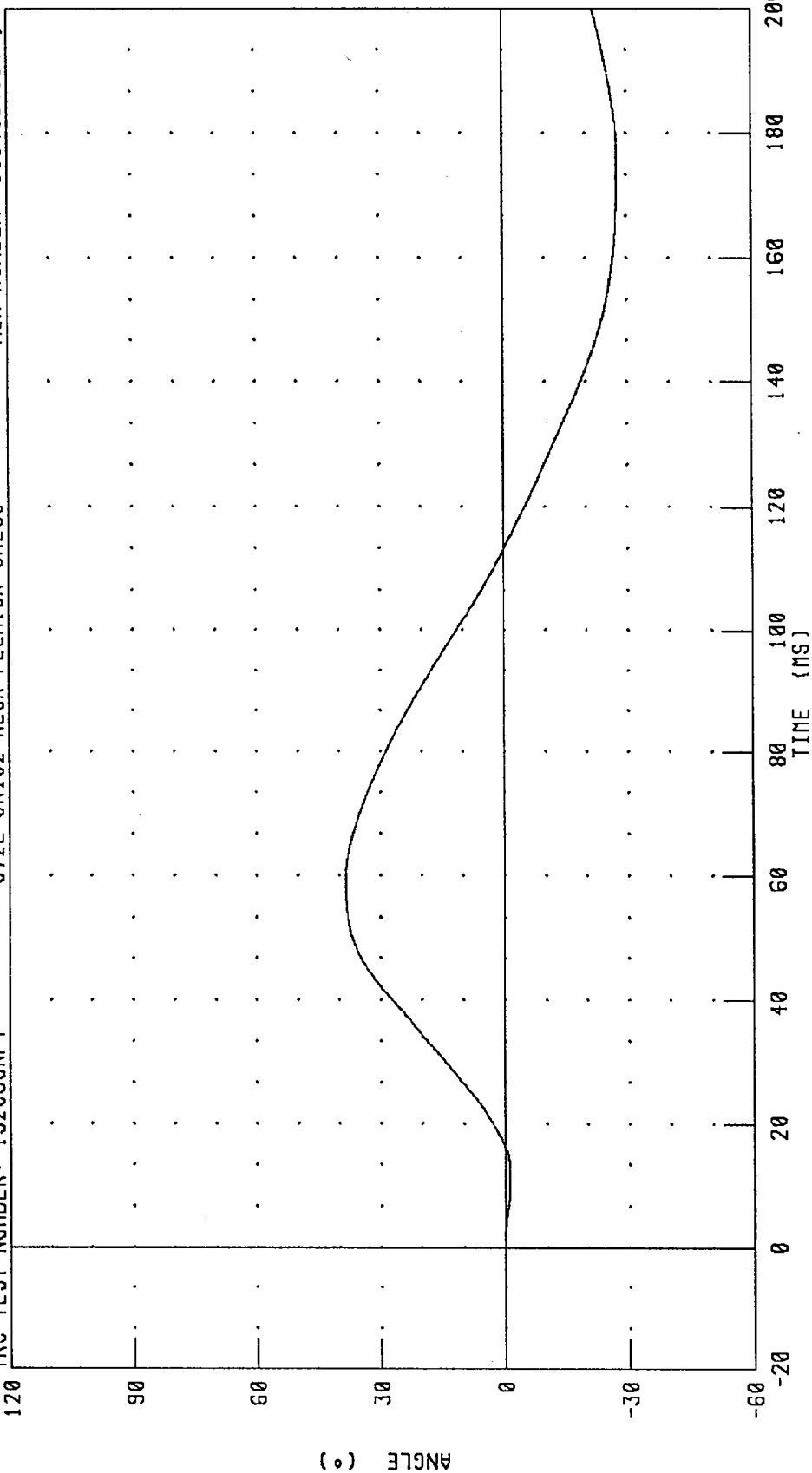


PEAK DATA: 31.92 ° @ 57.84 MS; -19.95 ° @ 168.16 MS

CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NF4 572E SN192 NECK FLEXION CAL33 RUN NUMBER: 101496.1105;1

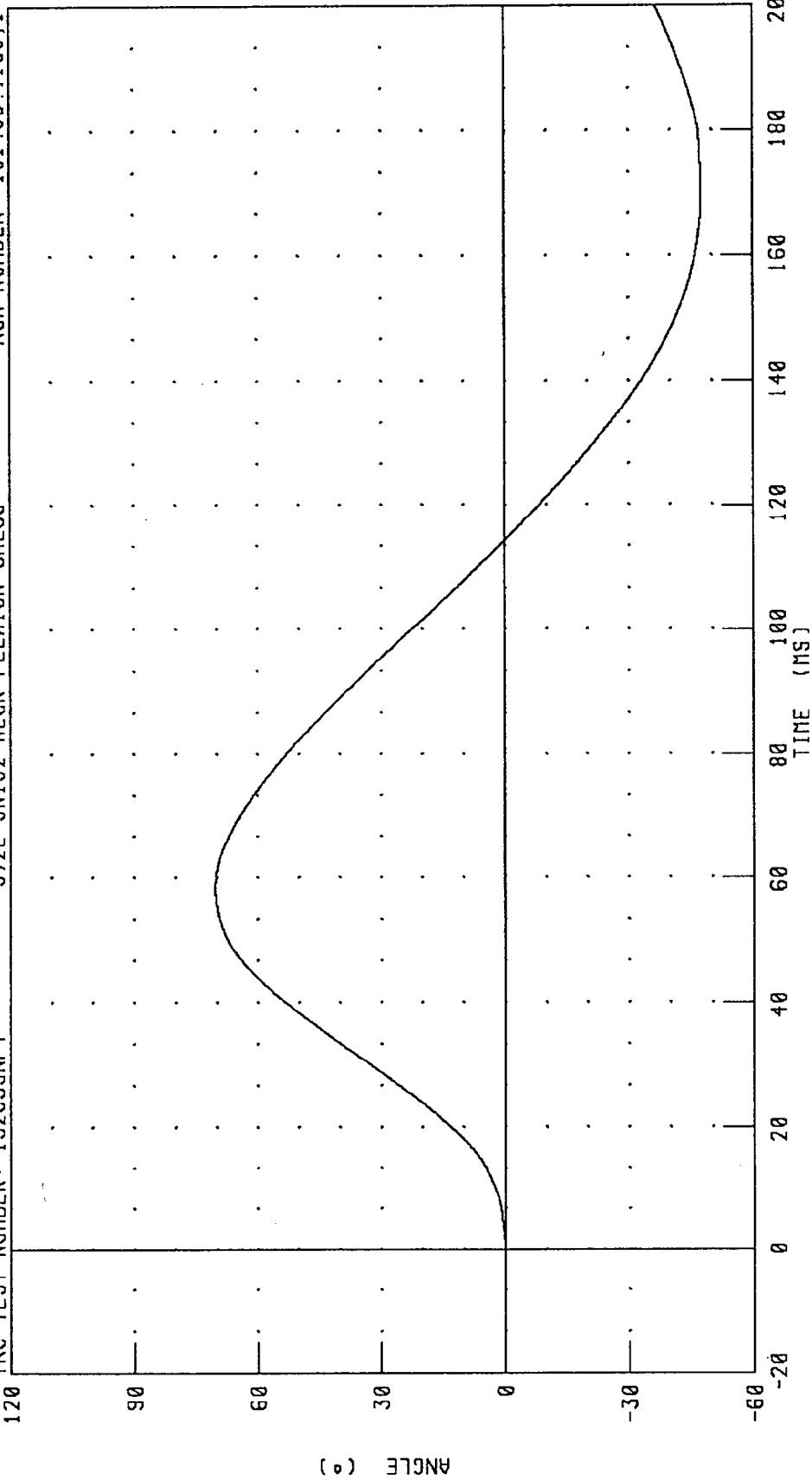


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 38.41 ° @ 58.80 MS; -27.65 ° @ 175.68 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TRC TEST NUMBER: 192C33NF4 572E SN192 NECK FLEXION CAL33 RUN NUMBER: 101496.1105;1

TOTAL ROTATION

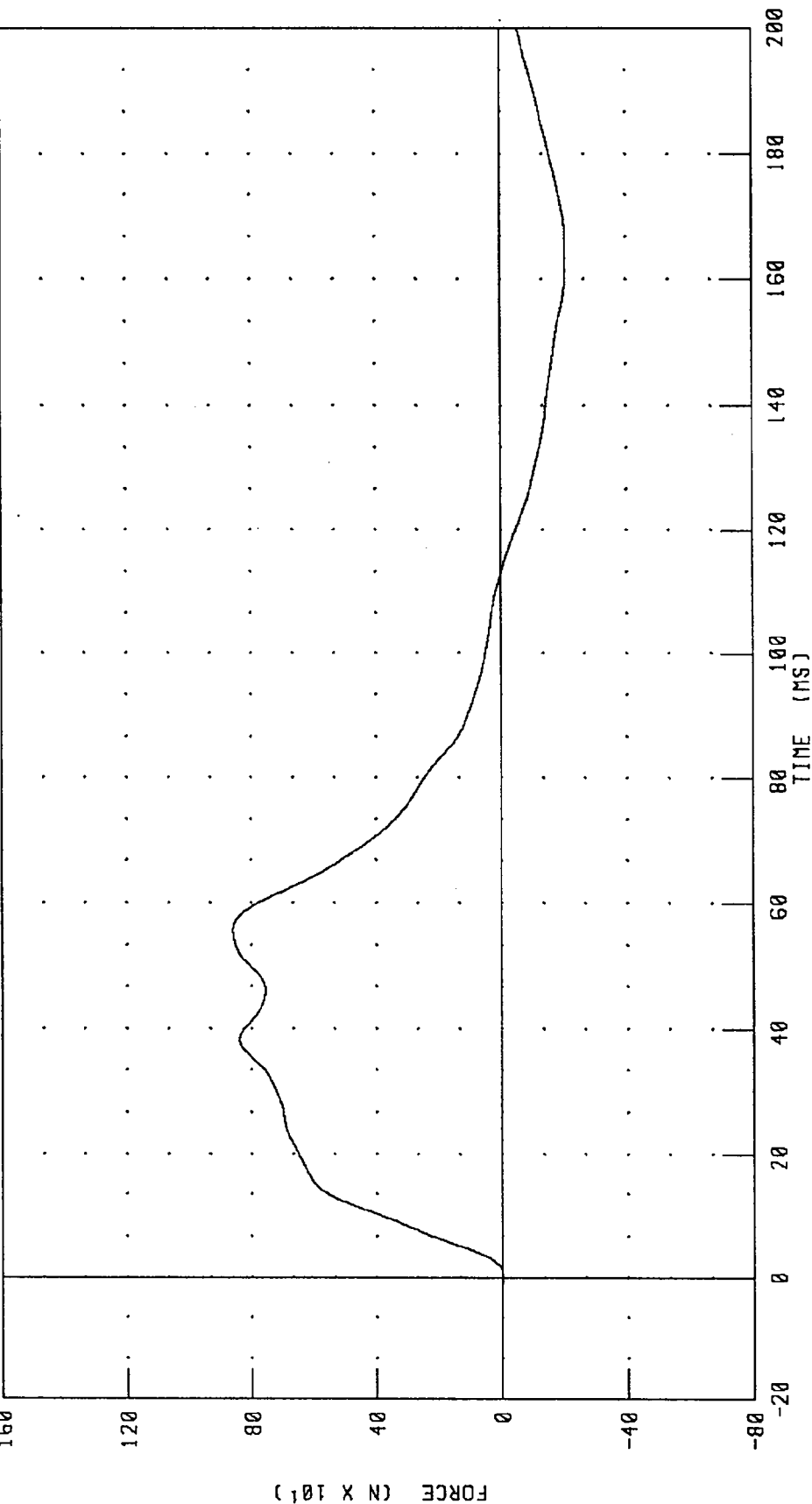


PEAK DATA: 70.32 ° @ 58.24 MS; -47.52 ° @ 169.52 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NF4 572E SN192 NECK FLEXION CAL33 RUN NUMBER: 101496.1105.1



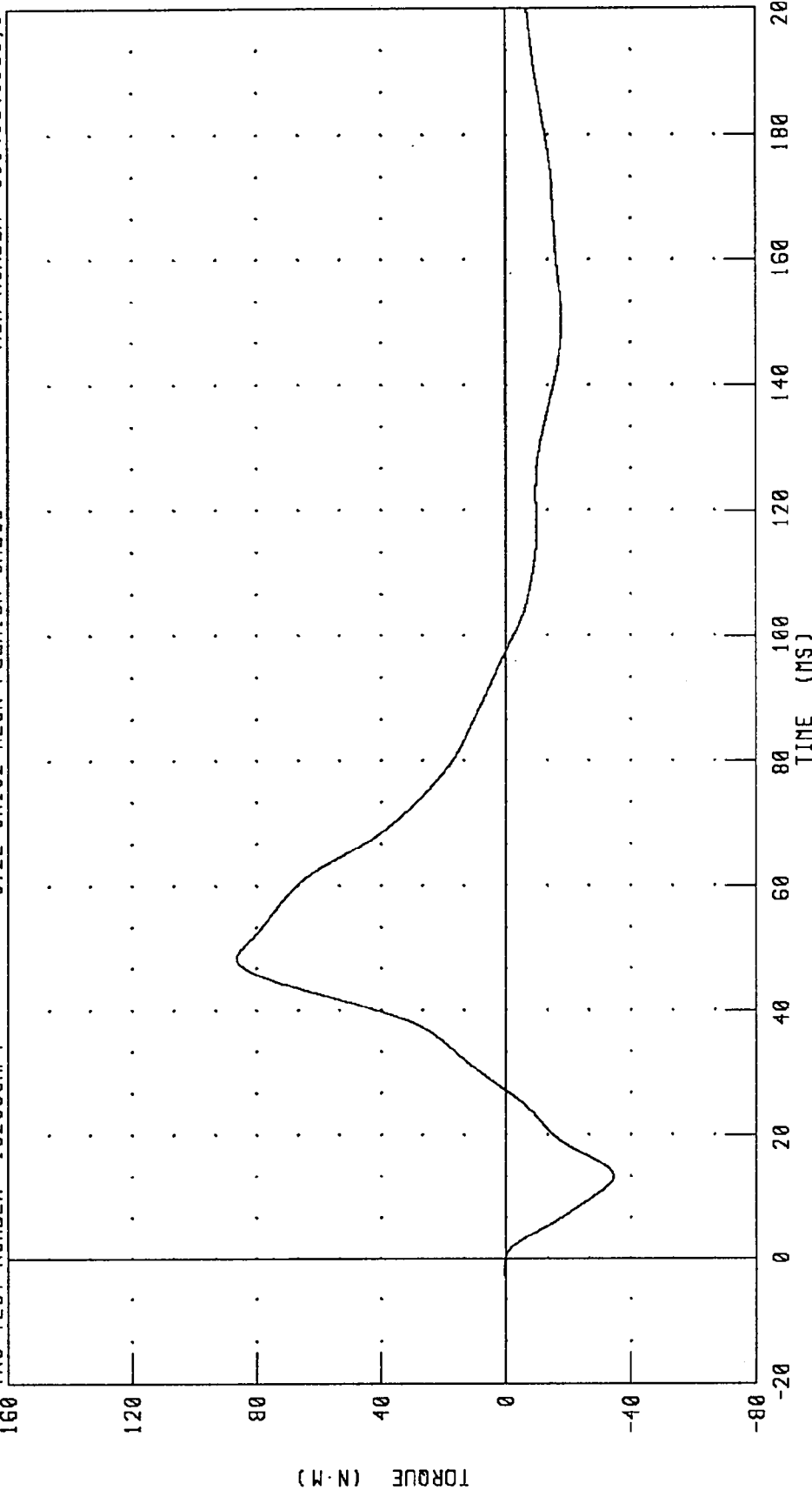
PEAK DATA: 859.69 N @ 55.60 MS; -206.86 N @ 162.24 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 192C33NF4 572E SN192 NECK FLEXION CAL33 RUN NUMBER: 101496.1105,1



PEAK DATA: 86.46 N·M @ 48.40 MS; -34.51 N·M @ 13.44 MS

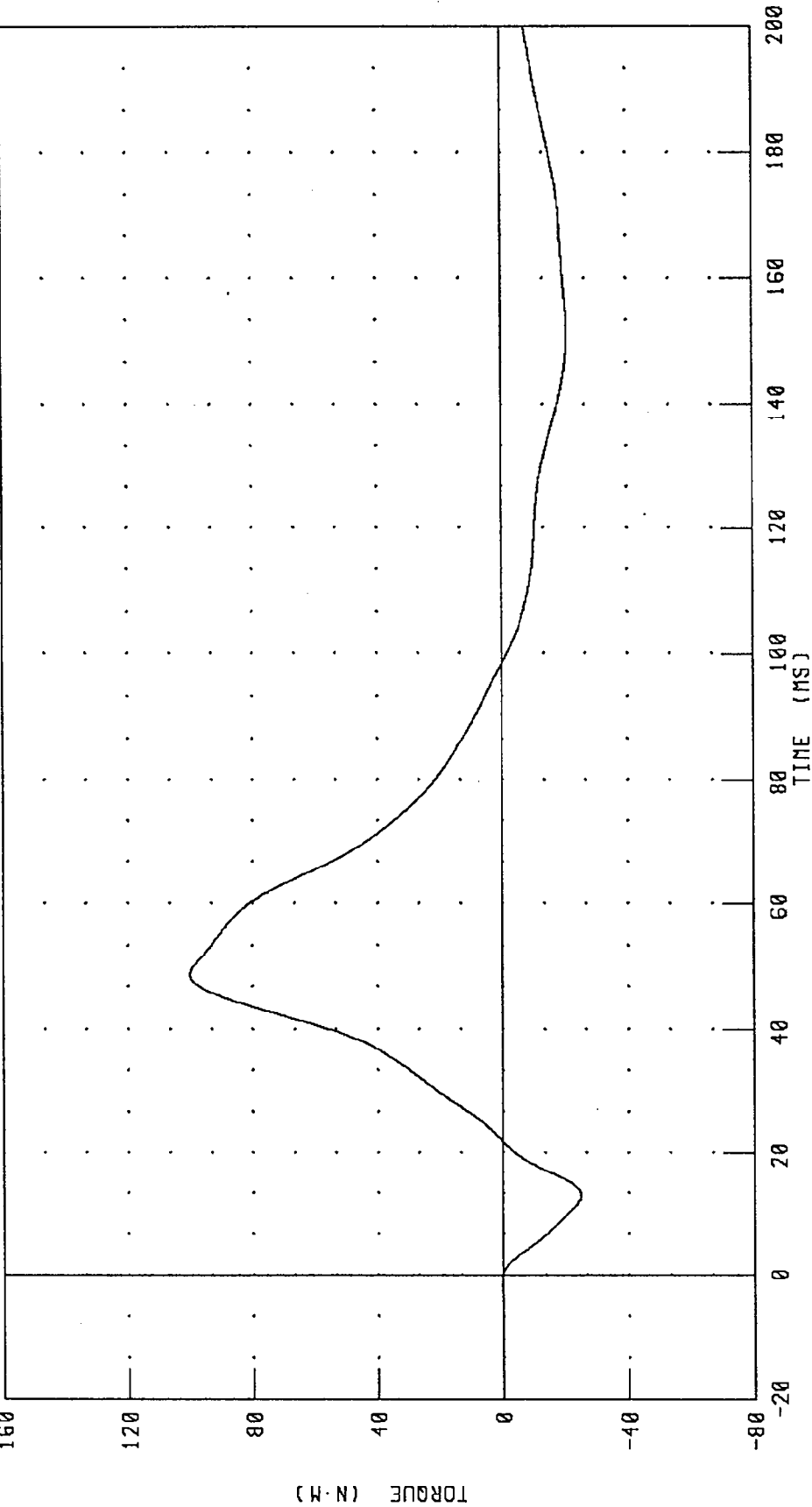
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NF4

572E SN192 NECK FLEXION CAL33

RUN NUMBER: 101496.1105;1



PEAK DATA: 100.25 N-M @ 48.56 MS; -24.76 N-M @ 12.96 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

04-SEP-96

TRC INC. TEST NO: 192C33NE1 572E SN192 NECK EXT. CAL33

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	64.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.45 G
	20 MS	14.00 - 19.00 G	16.07 G
	30 MS	11.00 - 16.00 G	13.30 G
MAX PENDULUM G		22 G MAX	17.70 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.27 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.88 MS
D PLANE	MAX	81 - 106 DEG.	95.36 DEG.
ROTATION	TIME	72 - 82 MS	77.52 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-62.11 NM
	TIME	65 - 79 MS	71.44 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	157.60 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	138.80 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Voss

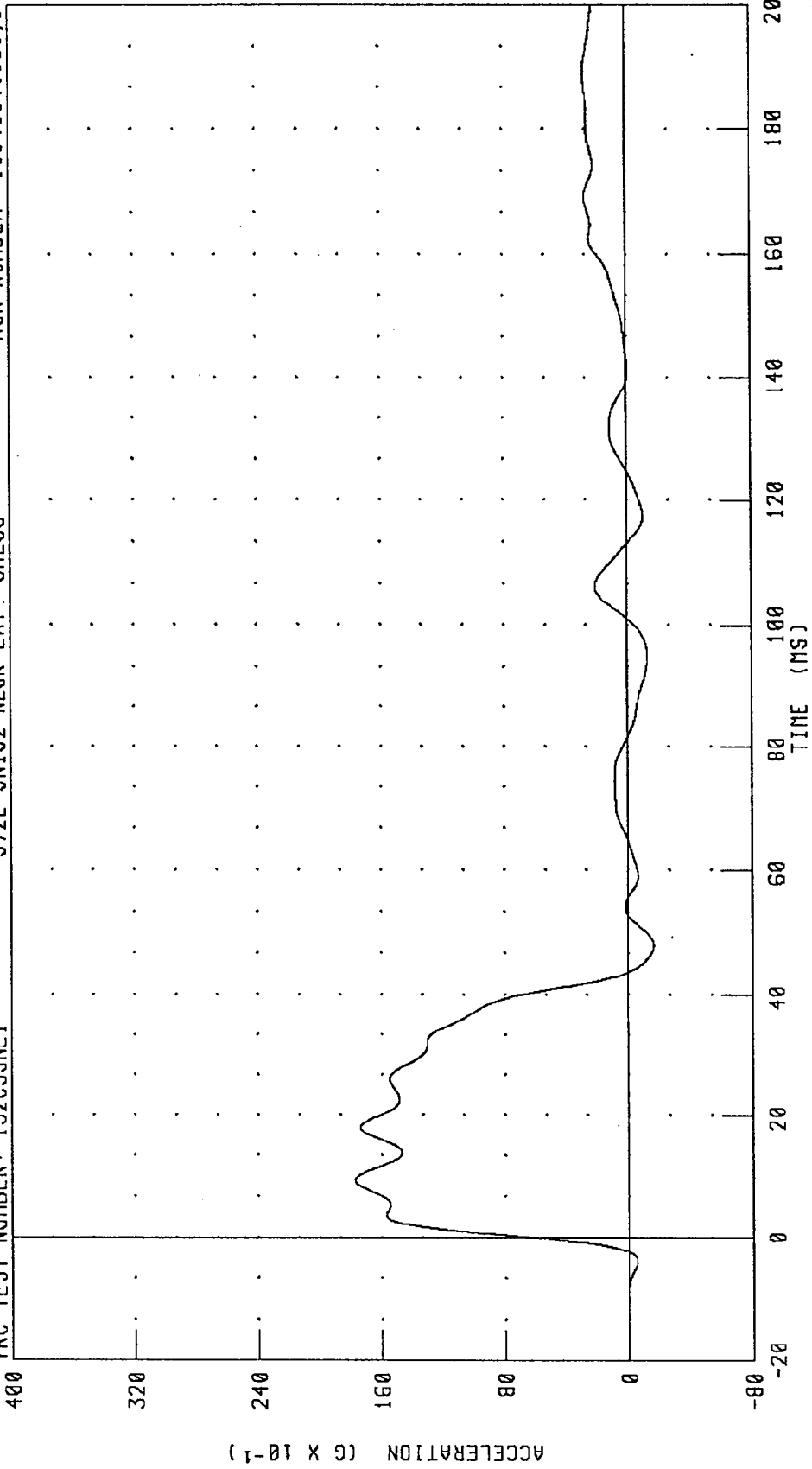
RUN NUMBER: 090496.0901;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENOUULUM DECELERATION

TRC TEST NUMBER: 192C33NE1

572E SN192 NECK EXT. CAL33

RUN NUMBER: 101496.1105;1



PEAK DATA: 17.71 G @ 9.20 MS; -1.64 G @ 47.84 MS

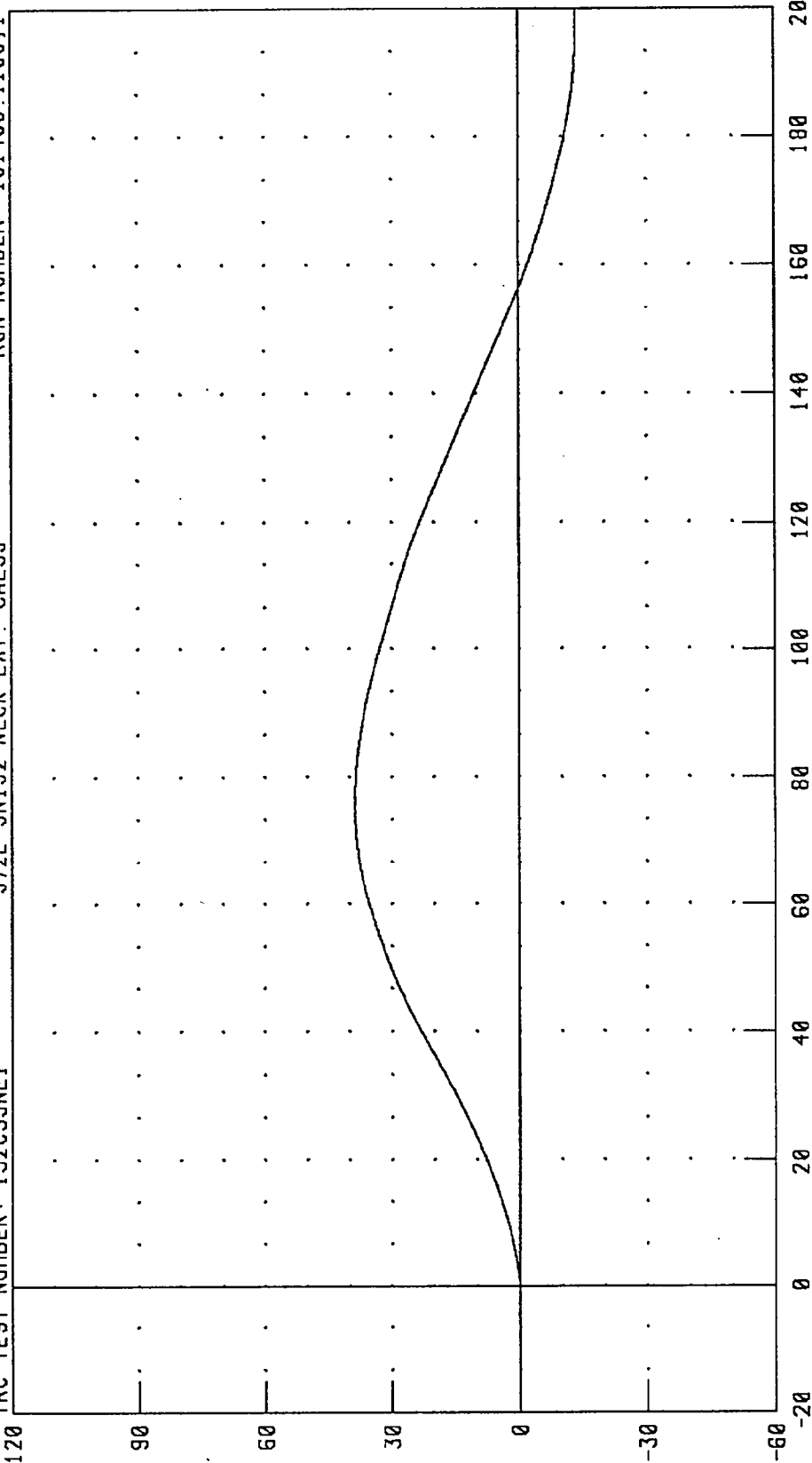
CHANNEL: PENXG FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NE1

572E SN192 NECK EXT. CAL33

RUN NUMBER: 101496.1105;1



PEAK DATA: 38.62 ° @ 75.44 MS; -13.45 ° @ 196.96 MS

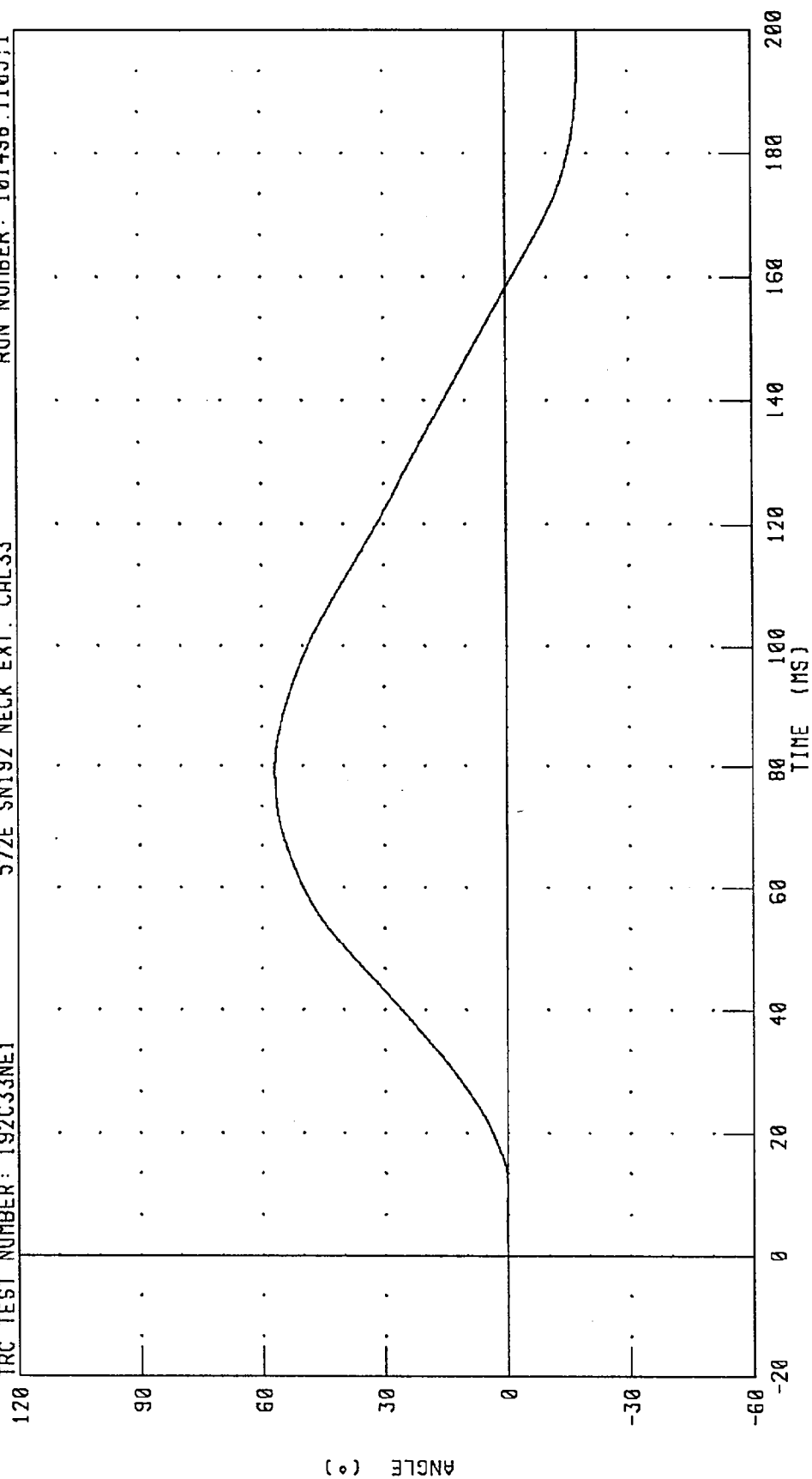
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NE1

572E SN192 NECK EXT. CAL33

RUN NUMBER: 101496.1105;1



PEAK DATA: 56.83 ° @ 79.36 MS; -17.80 ° @ 200.00 MS

CHANNEL: THETA FILTER: CH. CLASS 60

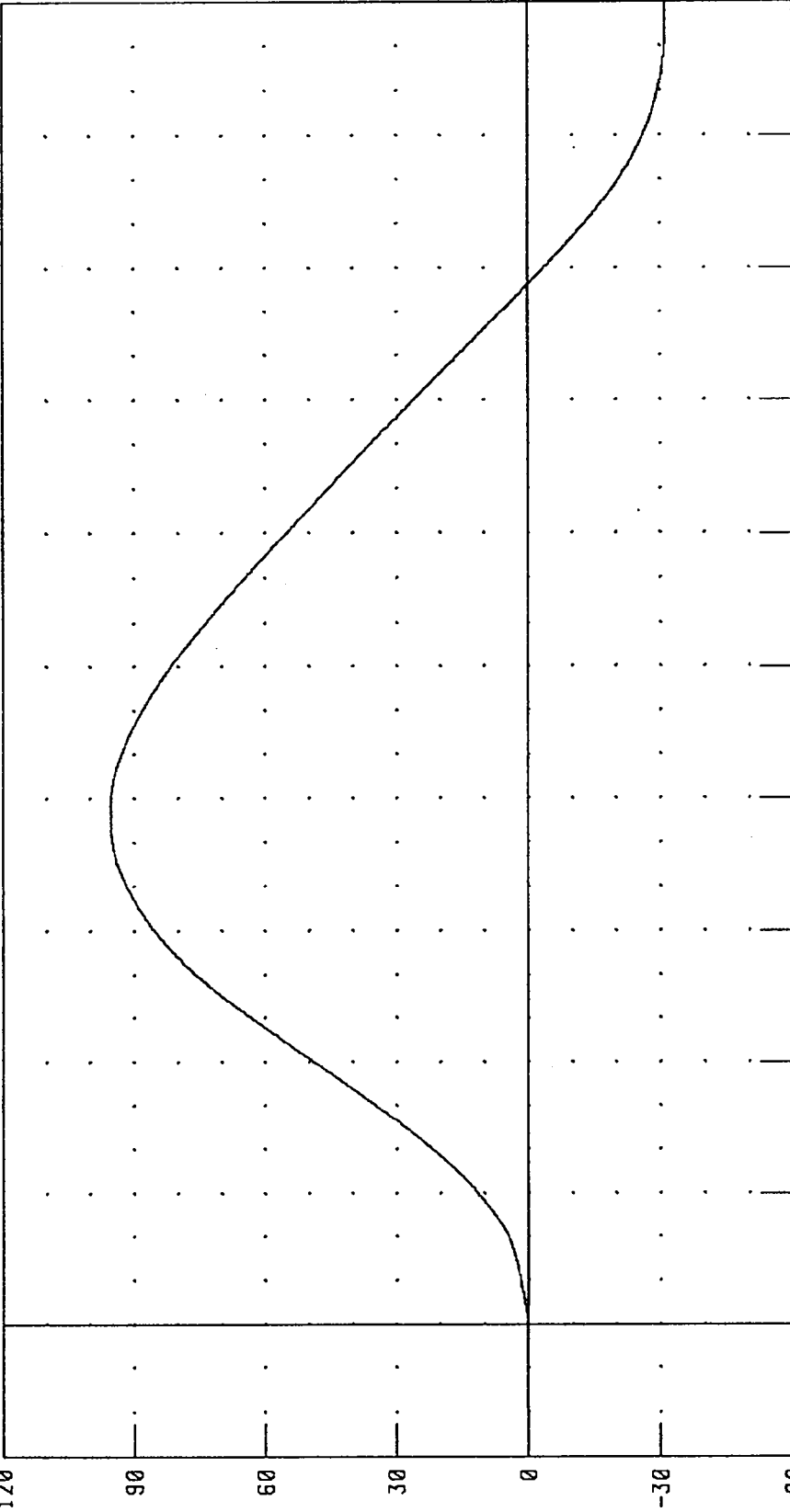
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 192C33NE1

572E SN192 NECK EXT. CAL33

RUN NUMBER: 101496.1105;1



PEAK DATA: 95.37 ° @ 77.52 MS; -31.24 ° @ 197.20 MS

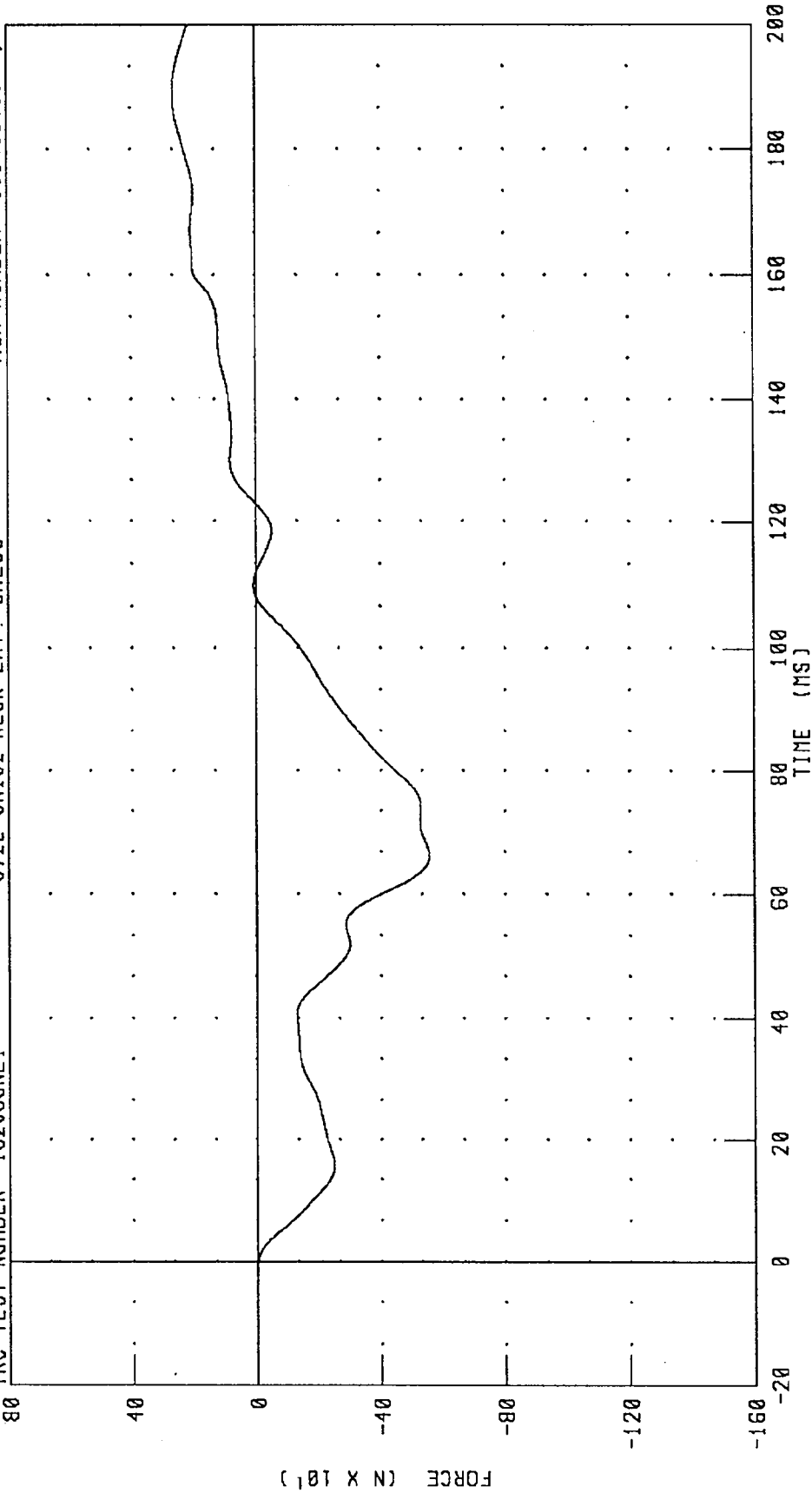
CHANNEL: TOTAL FILTER: CH. CLASS 60

ANGLE (°)

TIME (MS)

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

TRC TEST NUMBER: 192C33NE1 572E SN192 NECK EXT. CAL33 RUN NUMBER: 101496.1105;1

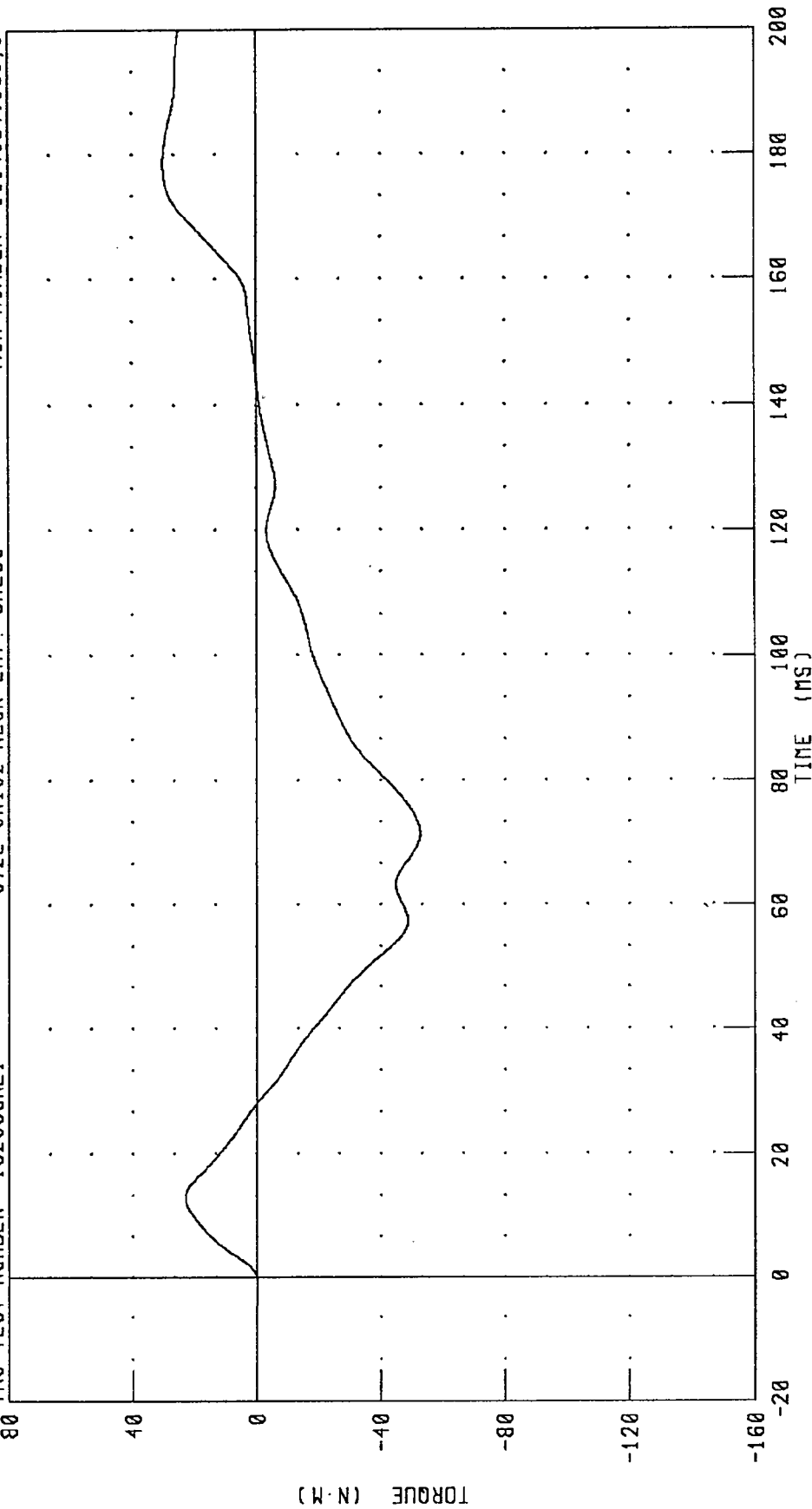


PEAK DATA: 265.50 N @ 188.96 MS; -555.70 N @ 555.70 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C33NE1 572E SN192 NECK EXT. CAL33 RUN NUMBER: 101496.1105;1



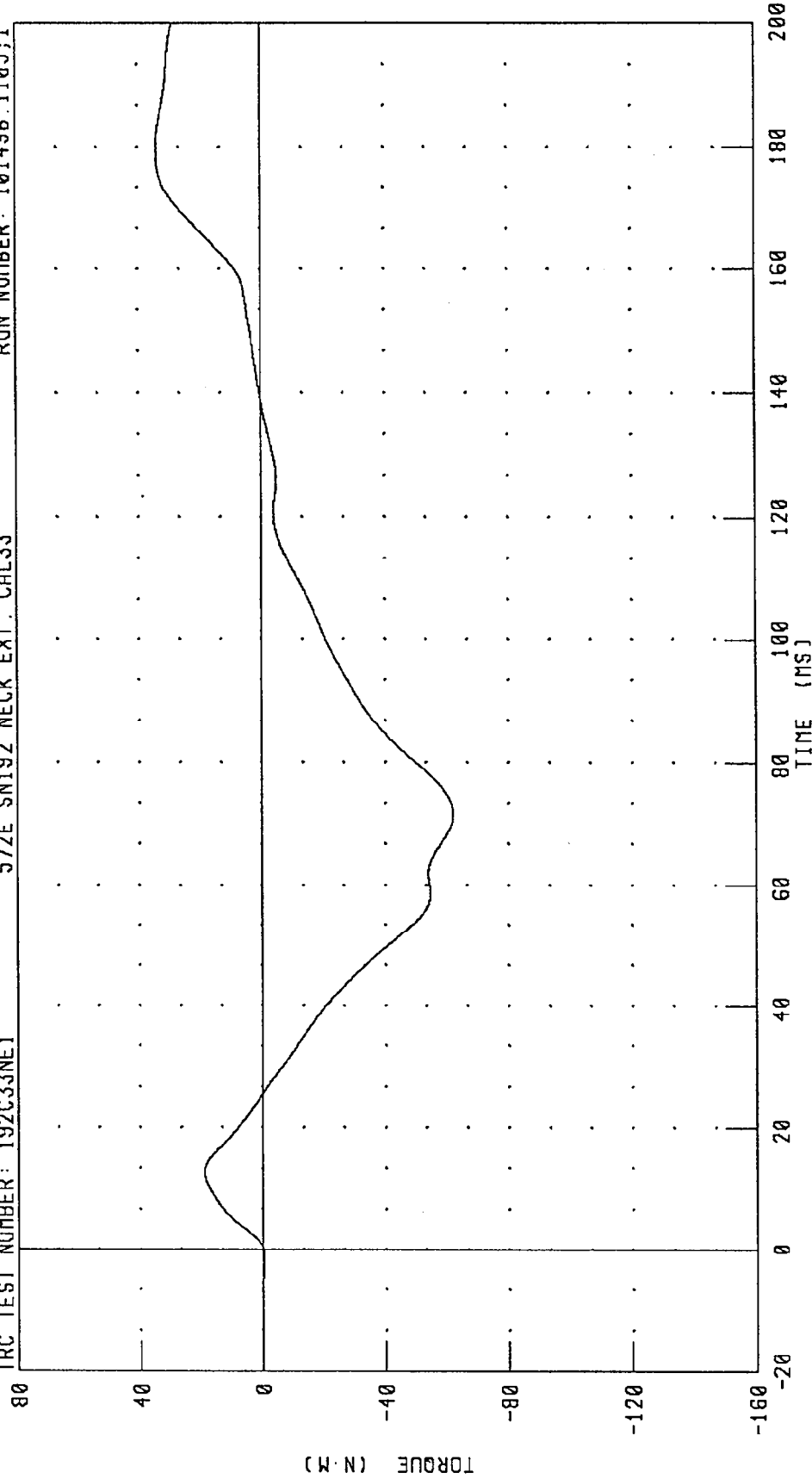
CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 30.00 N.M @ 178.56 MS; -52.74 N.M @ 71.44 MS

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

TRC TEST NUMBER: 192C33NE1

572E SN192 NECK EXT. CAL33

RUN NUMBER: 101496.1105;1



PEAK DATA: 34.00 N.M @ 179.76 MS; -62.11 N.M @ 71.44 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

05-SEP-96

TRC INC.

TEST NO: 192C33TH1

572E SN 192 H.S.THORAX CAL 33

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	64.1 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5682. N
INTERNAL HYSTERESIS	69% - 85%	74.1%

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

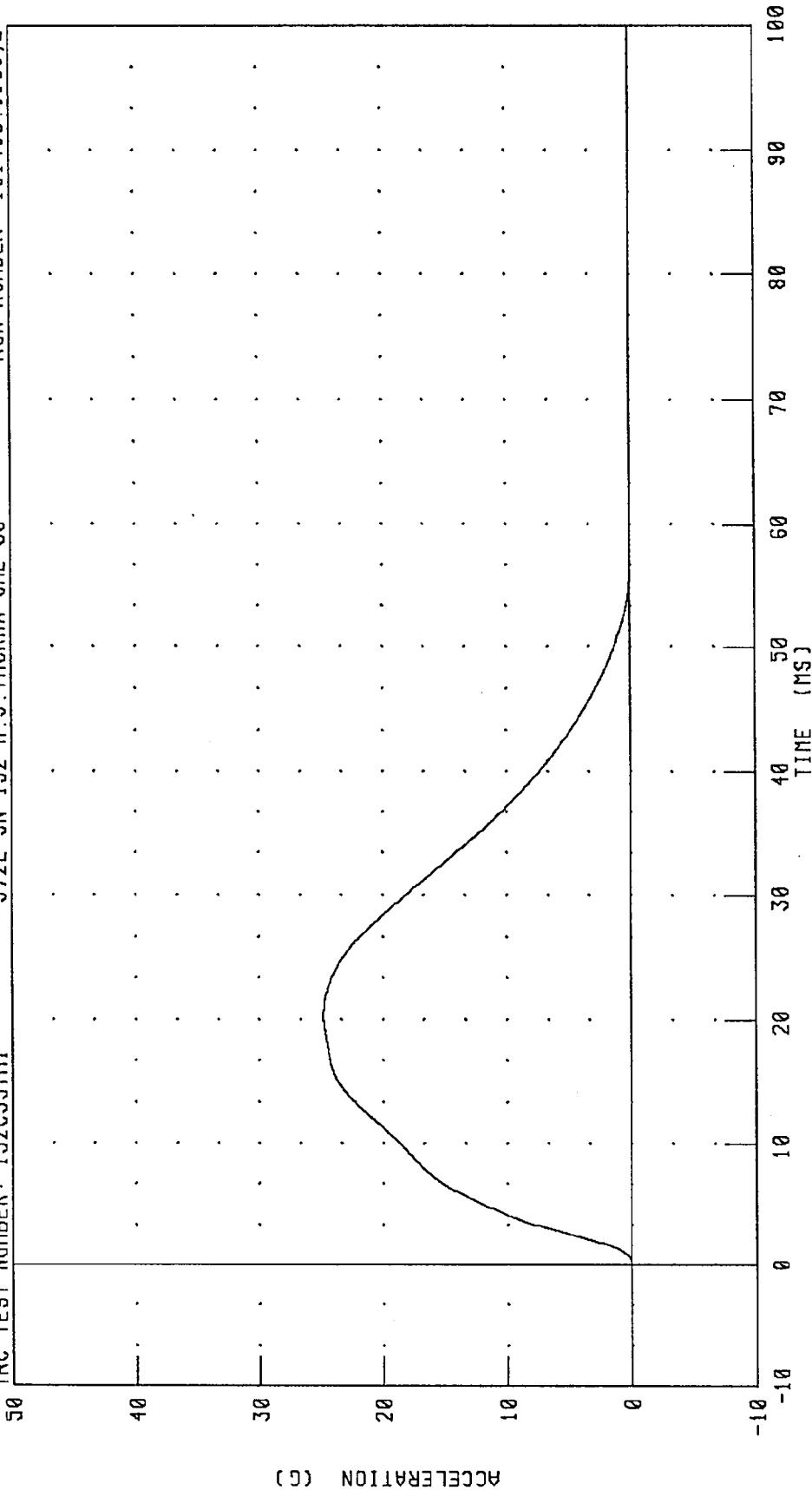
RUN NUMBER: 090596.1142;2

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 192C33TH1

572E SN 192 H.S. THORAX CAL 33

RUN NUMBER: 101496.1105;2

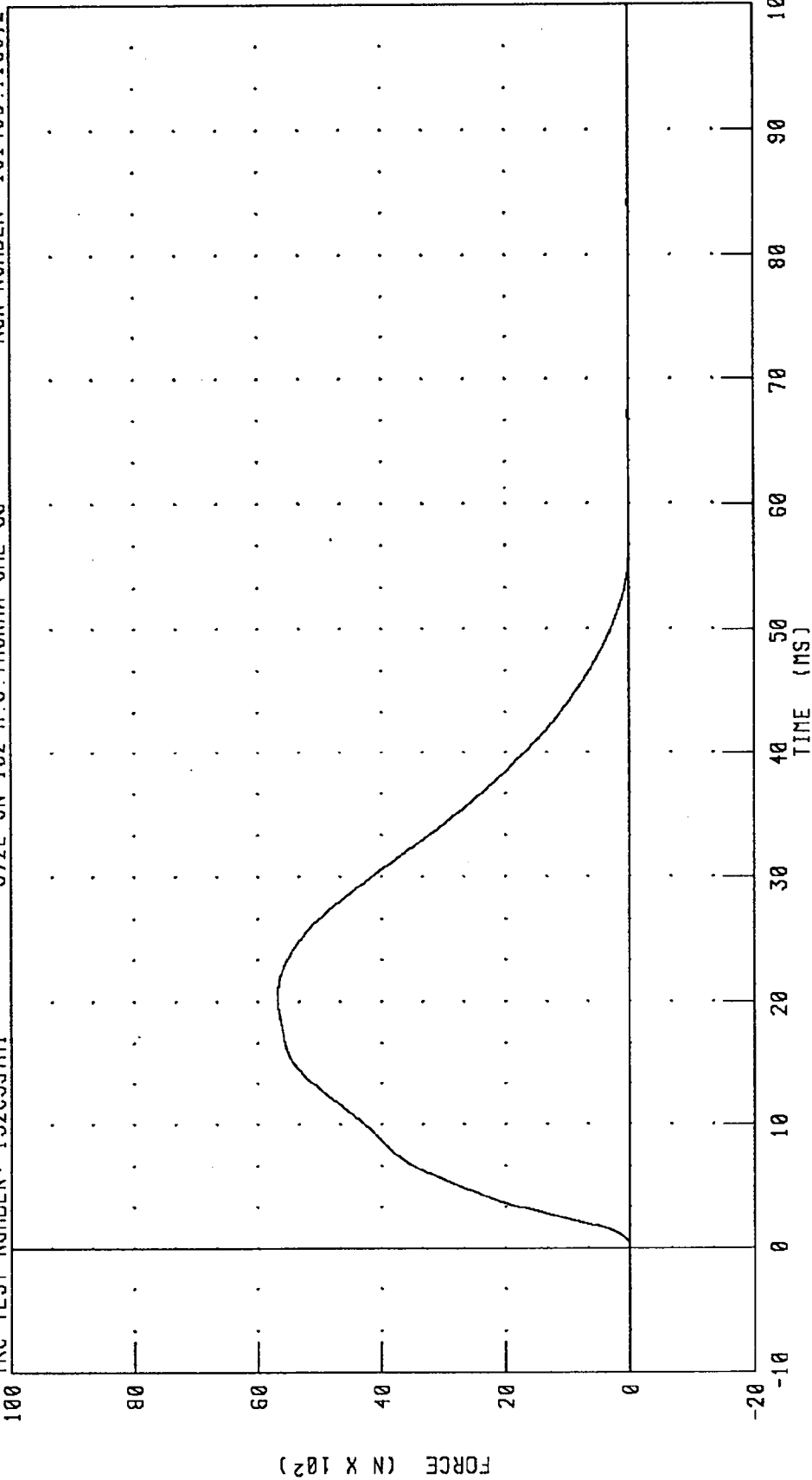


CHANNEL: PENXG FILTER: CH. CLASS 180

PEAK DATA: 24.80 G @ 20.32 MS; -0.01 G @ -0.08 MS

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM FORCE

TRC TEST NUMBER: 192C33TH1 572E SN 192 H.S. THORAX CAL 33 RUN NUMBER: 101496.1105;2

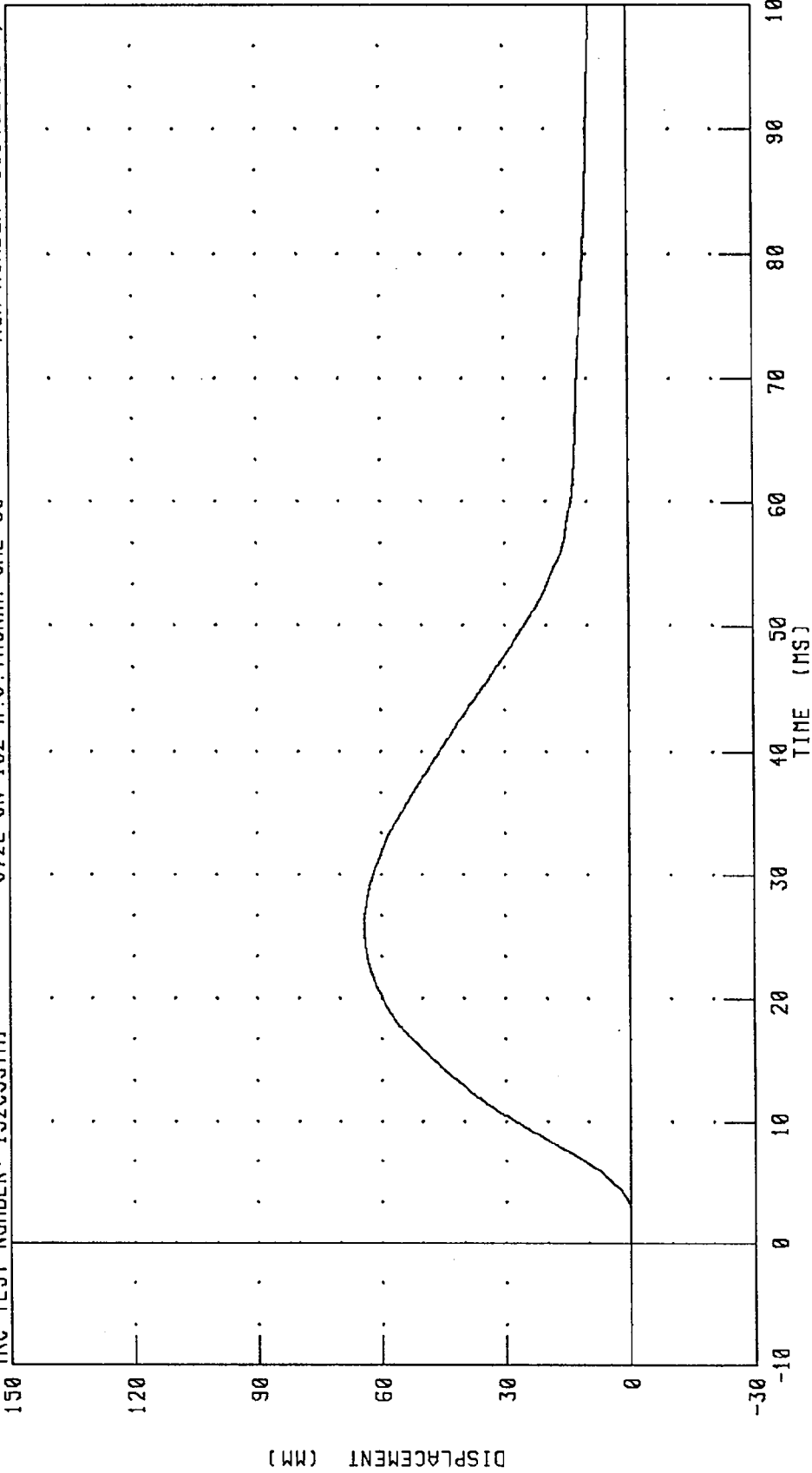


PEAK DATA: 5682.01 N @ 20.32 MS; -3.37 N @ -0.08 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C33TH1 572E SN 192 H.S. THORAX CAL 33 RUN NUMBER: 101496.1105;2



PEAK DATA: 64.15 MM @ 25.92 MS; -0.02 MM @ 1.44 MS

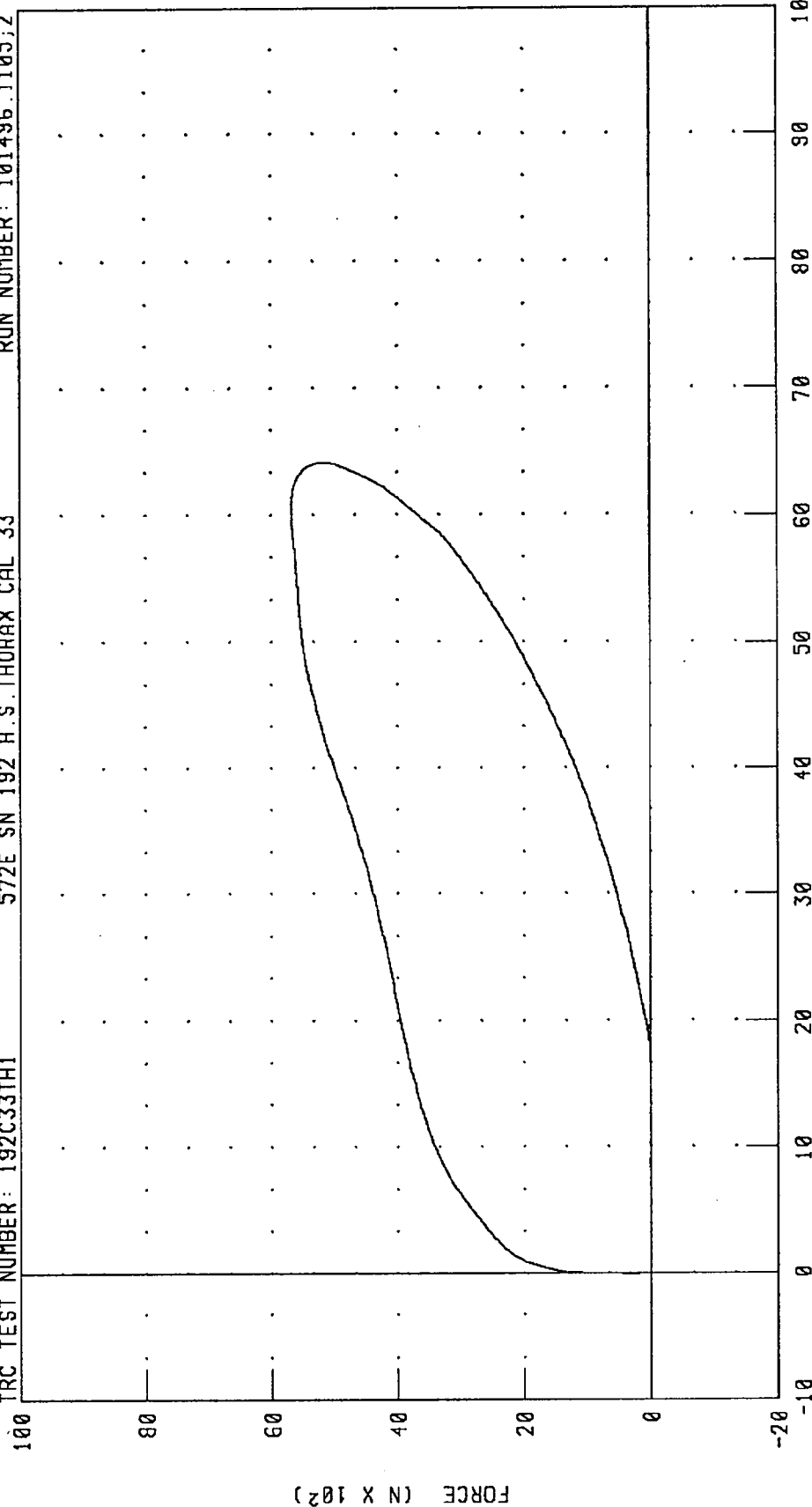
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 192C33TH1

572E SN 192 H.S. THORAX CAL 33

RUN NUMBER: 101496.1105;2



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

PEAK DATA: 64.15 NM @ 25.92 MS; -0.02 NM @ 1.44 MS
5682.01 N @ 20.32 MS; -3.37 N @ -0.08 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

03-SEP-96

TRC INC.

TEST NO: 192C33RK1

572E SN192 RIGHT KNEE CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	62.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5457.9 N

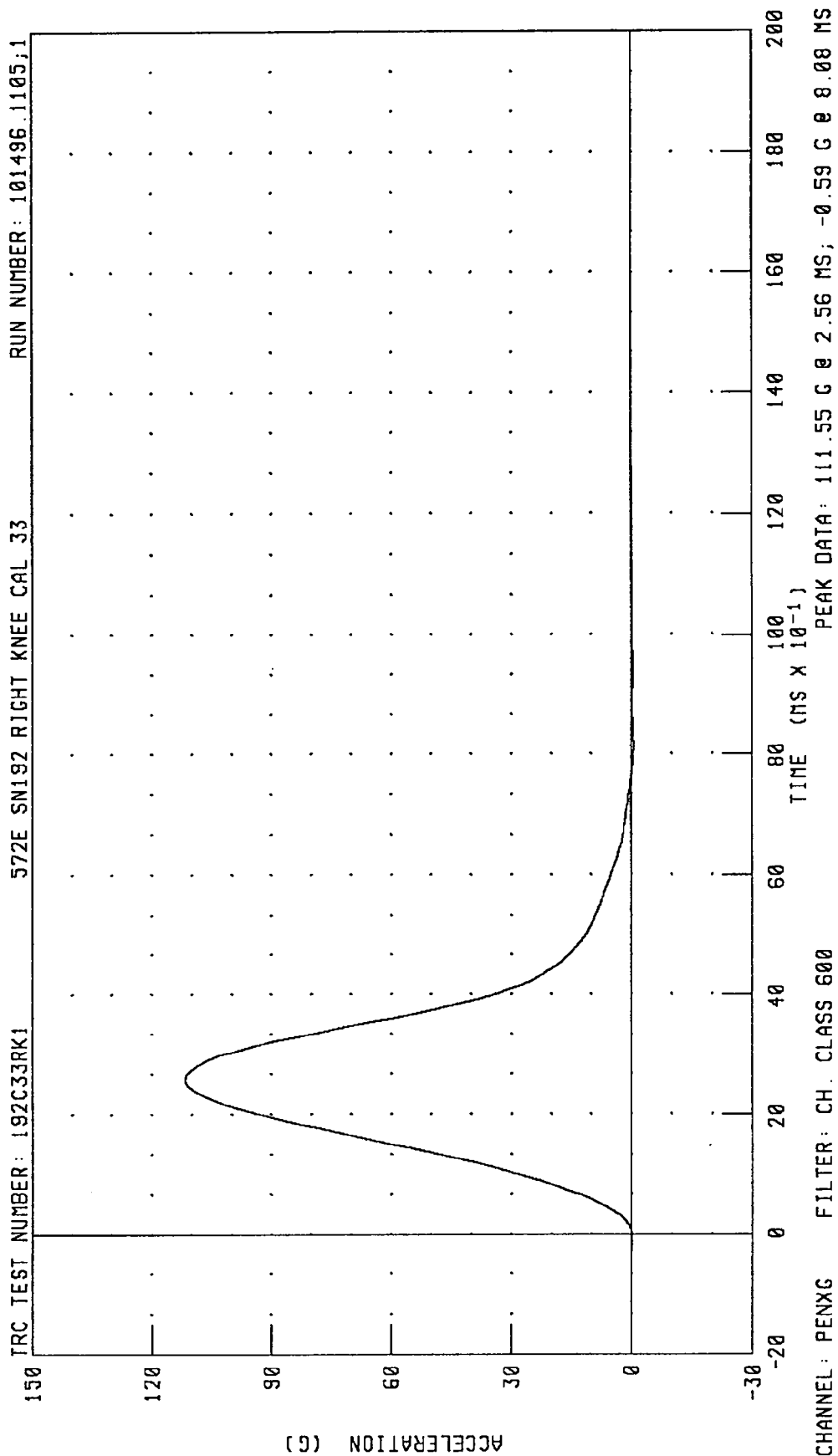
TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

RUN NUMBER: 090396.1359;1

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



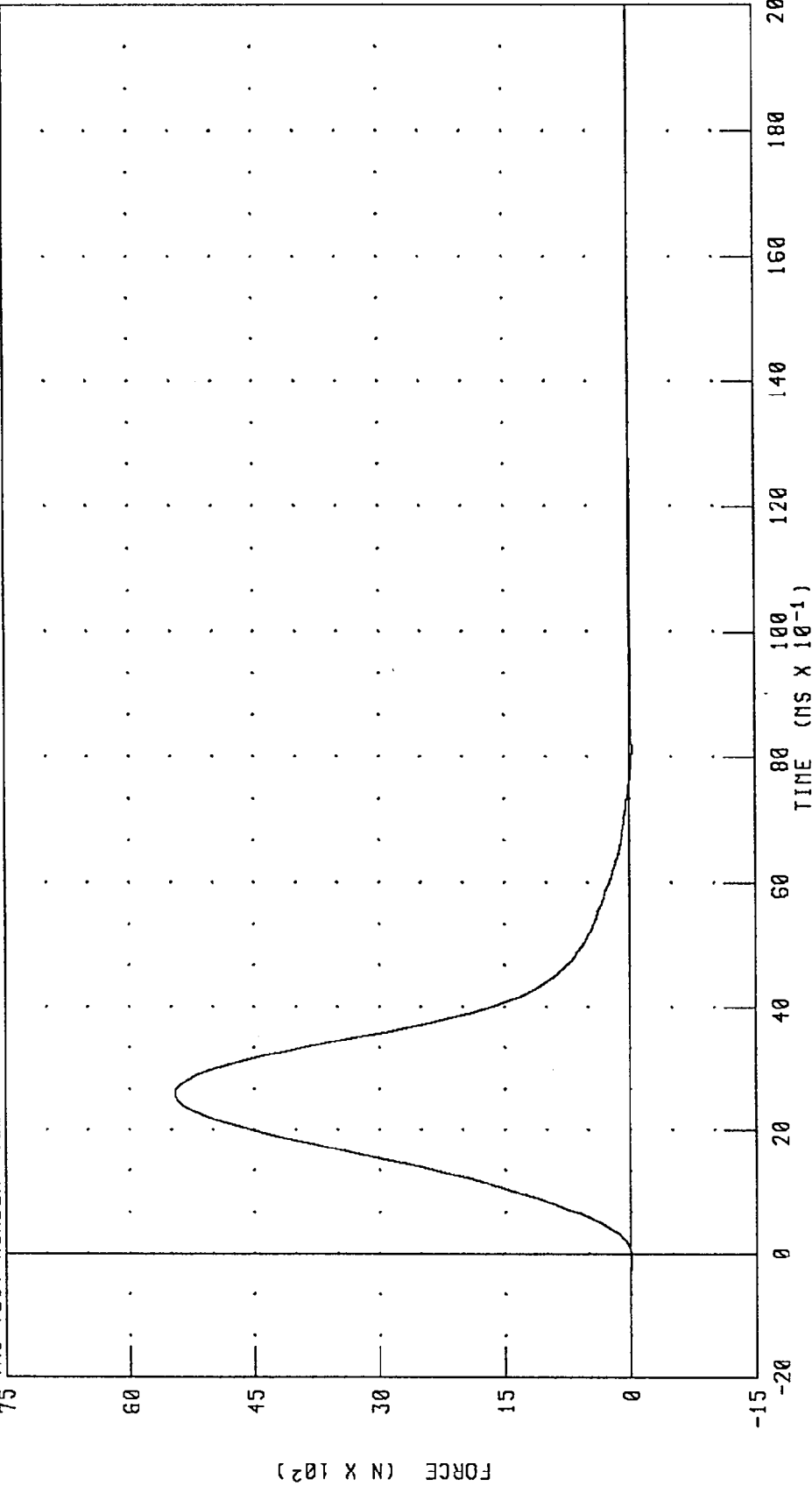
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C33RK1

572E SN192 RIGHT KNEE CAL 33

RUN NUMBER: 101496.1105;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5457.91 N @ 2.56 MS; -28.91 N @ 8.08 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

03-SEP-96

TRC INC.

TEST NO: 192C33LK1

572E SN192 LEFT KNEE CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	62.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5287.0 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

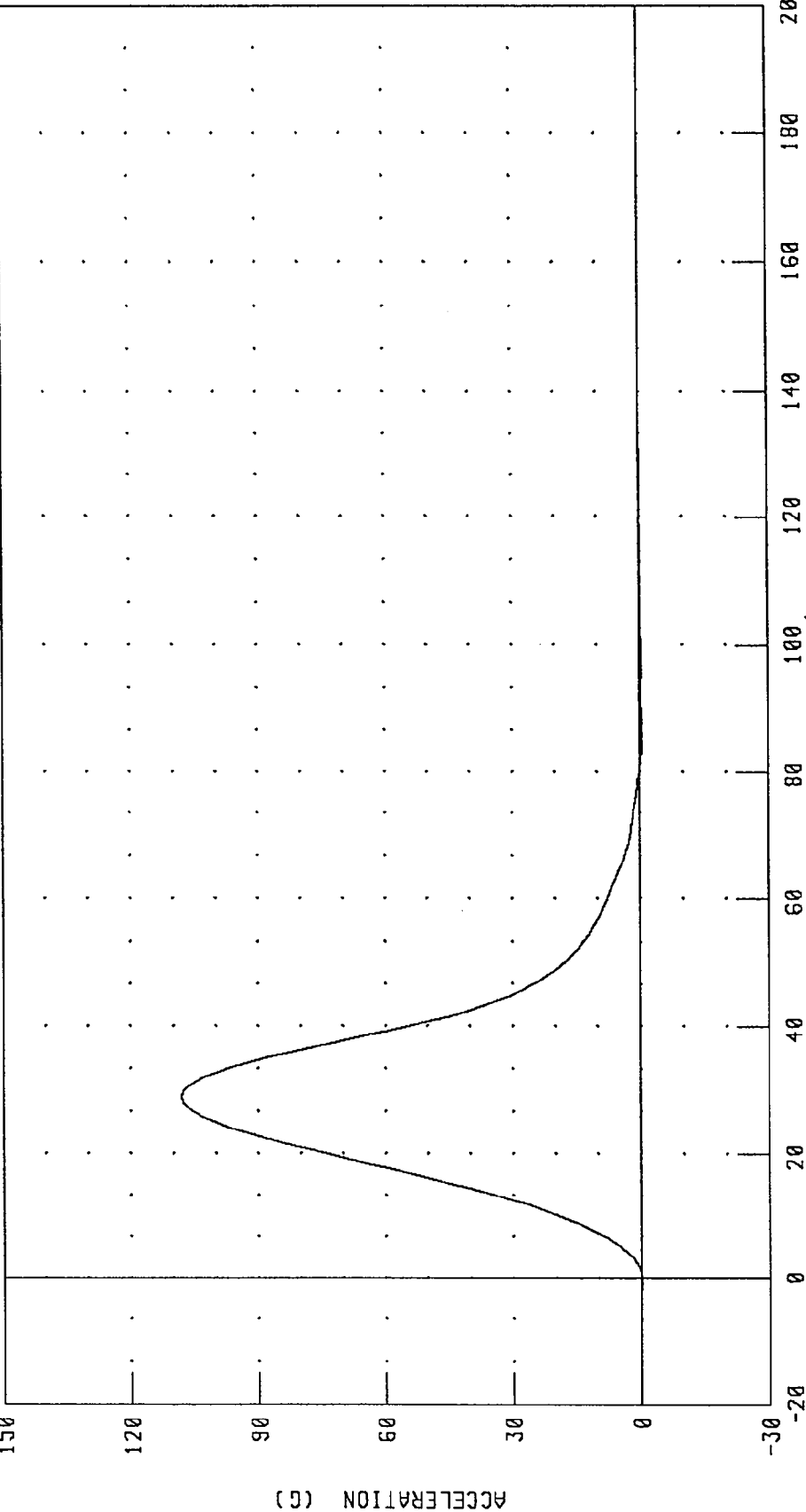
RUN NUMBER: 090396.1355;1

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

TRC TEST NUMBER: 192C33LK1

572E SN192 LEFT KNEE CAL 33

RUN NUMBER: 101496.1105.1



CHANNEL: PENXC FILTER: CH. CLASS 600

PEAK DATA: 108.06 G @ 2.88 MS; -0.52 G @ 8.48 MS

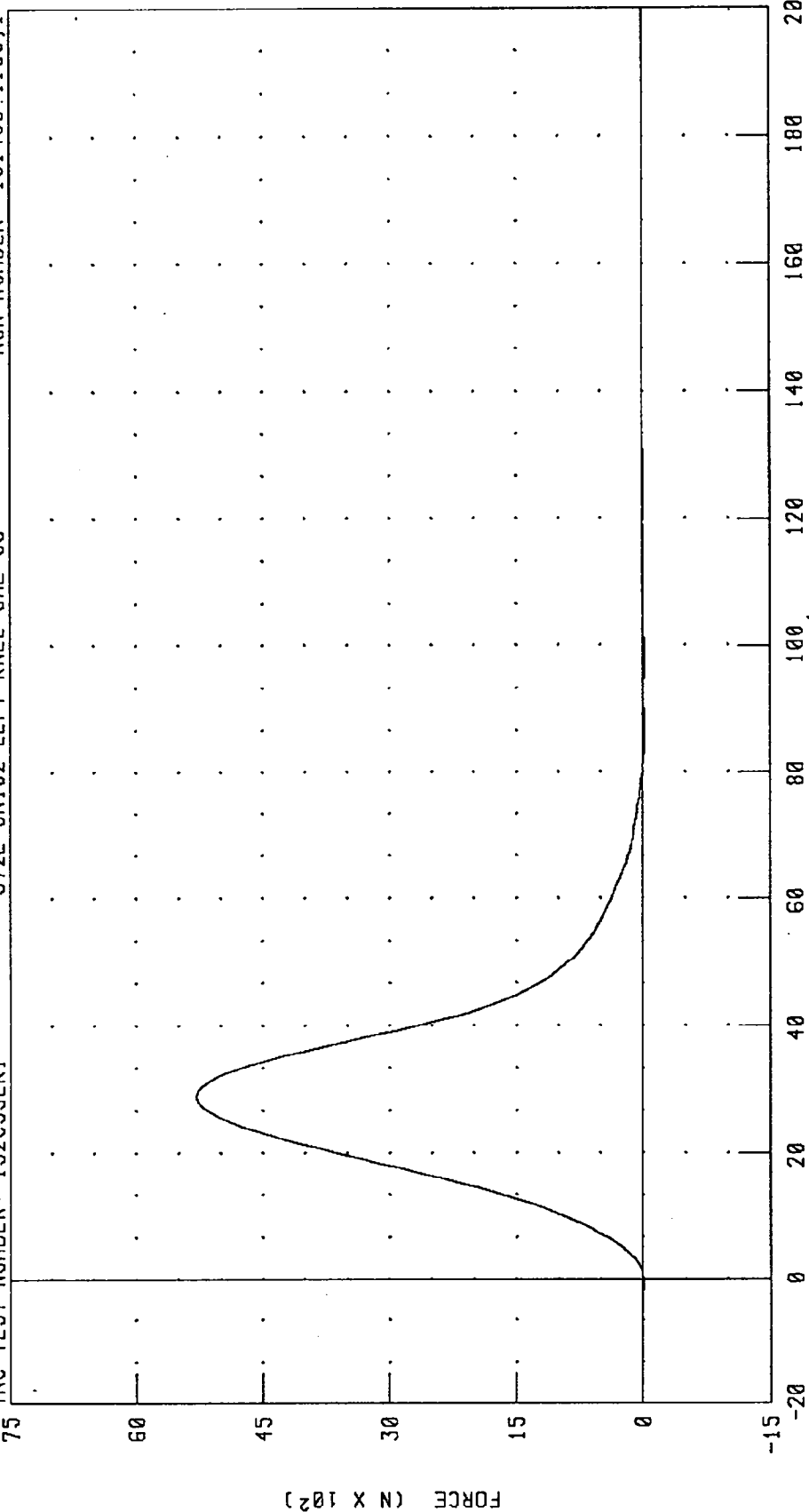
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 192C33LK1

572E SN192 LEFT KNEE CAL 33

RUN NUMBER: 101496.1105;1



CHANNEL: PENXF

FILTER: CH. CLASS 600

PEAK DATA: 5287.03 N @ 2.88 MS;

-25.30 N @ 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	07/26/96	01/26/97
Head X-axis accelerometer-redundant	AC8L5	7264	Endevco	08/15/96	02/15/97
Head Y-axis accelerometer	ACC02	7264	Endevco	07/26/96	01/26/97
Head Y-axis accelerometer-redundant	ACCR7	7264	Endevco	08/15/96	02/15/97
Head Z-axis accelerometer	ACCF3	7264	Endevco	07/26/96	01/26/97
Head Z-axis accelerometer-redundant	A68JJ	7264	Endevco	08/15/96	02/15/97
Chest X-axis accelerometer	ACC14	7264	Endevco	07/26/96	01/26/97
Chest X-axis accelerometer-redundant	A65JJ	7264	Endevco	08/15/96	02/15/97
Chest Y-axis accelerometer	ACCR0	7264	Endevco	07/26/96	01/26/97
Chest Y-axis accelerometer-redundant	FH14J	7264	Endevco	08/15/96	02/15/97
Chest Z-axis accelerometer	ACCT5	7264	Endevco	07/26/96	01/26/97
Chest Z-axis accelerometer-redundant	AC745	7264	Endevco	08/15/96	02/15/97
Left femur force load cell	257	2121	Denton	07/29/96	01/29/97
Right femur force load cell	258	2121	Denton	07/29/96	01/29/97
Neck X-axis force load cell ¹	441	1716	Denton	07/26/96	01/26/97
Neck Y-axis force load cell ¹	441	1716	Denton	07/26/96	01/26/97
Neck Z-axis force load cell ¹	441	1716	Denton	07/26/96	01/26/97
Neck Moment about X-axis load cell ¹	441	1716	Denton	07/26/96	01/26/97
Neck Moment about Y-axis load cell ¹	441	1716	Denton	07/26/96	01/26/97
Neck Moment about Z-axis load cell ¹	441	1716	Denton	07/26/96	01/26/97
Pelvis X-axis accelerometer	CY63H	7264	Endevco	08/15/96	02/15/97
Pelvis Y-axis accelerometer	AMWA9	7264	Endevco	08/15/96	02/15/97
Pelvis Z-axis accelerometer	ANA55	7264	Endevco	08/15/96	02/15/97
Chest deflection potentiometer ¹	142	14CB1-2981	Vernitech	07/26/96	01/26/97
Lap belt force load cell	143	3419	Lebow	07/03/96	01/03/97
Shoulder belt force load cell	613	3419	Lebow	07/02/96	01/02/97

¹ Hybrid III use only.

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	08/20/96	02/20/97
Left upper tibia moment about Y-axis load cell	46	1583	Denton	08/20/96	02/20/97
Right upper tibia moment about X-axis load cell	35	1583	Denton	08/20/96	02/20/97
Right upper tibia moment about Y-axis load cell	35	1583	Denton	08/20/96	02/20/97
Left Lower tibia X-axis force load cell	42	1584	Denton	08/20/96	02/20/97
Left Lower tibia Z-axis force load cell	42	1584	Denton	08/20/96	02/20/97
Left Lower tibia moment about Y-axis load cell	42	1584	Denton	08/20/96	02/20/97
Right Lower tibia X-axis force load cell	39	1584	Denton	08/20/96	02/20/97
Right Lower tibia Z-axis force load cell	39	1584	Denton	08/20/96	02/20/97
Right Lower tibia moment about Y-axis load cell	39	1584	Denton	08/20/96	02/20/97
Left foot X-axis accelerometer	APOA1	7264	Endevco	08/15/96	02/15/97
Left foot heel Z-axis accelerometer	10102	7264	Endevco	08/15/96	02/15/97
Left foot toe Z-axis accelerometer	10074	7264	Endevco	08/15/96	02/15/97
Right foot X-axis accelerometer	10088	7264	Endevco	08/15/96	02/15/97
Right foot heel Z-axis accelerometer	10089	7264	Endevco	08/15/96	02/15/97
Right foot toe Z-axis accelerometer	10087	7264	Endevco	08/15/96	02/15/97

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	07/26/96	01/26/97
Head X-axis accelerometer-redundant	AJ8J7	7264	Endevco	08/15/96	02/15/97
Head Y-axis accelerometer	AAMP6	7264	Endevco	07/26/96	01/26/97
Head Y-axis accelerometer-redundant	AJ8A6	7264	Endevco	08/15/96	02/15/97
Head Z-axis accelerometer	ACB35	7264	Endevco	07/26/96	01/26/97
Head Z-axis accelerometer-redundant	AC8W6	7264	Endevco	08/15/96	02/15/97
Chest X-axis accelerometer	ACCD0	7264	Endevco	07/26/96	01/26/97
Chest X-axis accelerometer-redundant	A79GJ	7264	Endevco	08/15/96	02/15/97
Chest Y-axis accelerometer	ACC82	7264	Endevco	07/26/96	01/26/97
Chest Y-axis accelerometer-redundant	AGR69	7264	Endevco	08/15/96	02/15/97
Chest Z-axis accelerometer	ACC59	7264	Endevco	07/26/96	01/26/97
Chest Z-axis accelerometer-redundant	AAL82	7264	Endevco	08/15/96	02/15/97
Left femur force load cell	263	2121	Denton	07/29/96	01/29/97
Right femur force load cell	264	2121	Denton	07/29/96	01/29/97
Neck X-axis force load cell ¹	445	1716	Denton	07/29/96	01/29/97
Neck Y-axis force load cell ¹	445	1716	Denton	07/29/96	01/29/97
Neck Z-axis force load cell ¹	445	1716	Denton	07/29/96	01/29/97
Neck Moment about X-axis load cell ¹	445	1716	Denton	07/29/96	01/29/97
Neck Moment about Y-axis load cell ¹	445	1716	Denton	07/29/96	01/29/97
Neck Moment about Z-axis load cell ¹	445	1716	Denton	07/29/96	01/29/97
Pelvis X-axis accelerometer	AJ694	7264	Endevco	08/15/96	02/15/97
Pelvis Y-axis accelerometer	AJ656	7264	Endevco	08/15/96	02/15/97
Pelvis Z-axis accelerometer	AJ788	7264	Endevco	08/15/96	02/15/97
Chest deflection potentiometer	87313-96	14CB1-2981	Vernitech	07/26/96	01/26/97
Lap belt force load cell	234	3419	Lebow	07/03/96	01/03/97
Shoulder belt force load cell	249	3419	Lebow	07/03/96	01/03/97

¹ Hybrid III use only.

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	08/20/96	02/20/97
Left upper tibia moment about Y-axis load cell	617	1583	Denton	08/20/96	02/20/97
Right upper tibia moment about X-axis load cell	616	1583	Denton	08/20/96	02/20/97
Right upper tibia moment about Y-axis load cell	616	1583	Denton	08/20/96	02/20/97
Left Lower tibia X-axis force load cell	600	1584	Denton	08/20/96	02/20/97
Left Lower tibia Z-axis force load cell	600	1584	Denton	08/20/96	02/20/97
Left Lower tibia moment about Y-axis load cell	600	1584	Denton	08/20/96	02/20/97
Right Lower tibia X-axis force load cell	599	1584	Denton	08/20/96	02/20/97
Right Lower tibia Z-axis force load cell	599	1584	Denton	08/20/96	02/20/97
Right Lower tibia moment about Y-axis load cell	599	1584	Denton	08/20/96	02/20/97
Left foot X-axis accelerometer	10073	7264	Endevco	08/15/96	02/15/97
Left foot heel Z-axis accelerometer	10263	7264	Endevco	08/15/96	02/15/97
Left foot toe Z-axis accelerometer	10101	7264	Endevco	08/15/96	02/15/97
Right foot X-axis accelerometer	APYT4	7264	Endevco	08/15/96	02/15/97
Right foot heel Z-axis accelerometer	APOR8	7264	Endevco	08/15/96	02/15/97
Right foot toe Z-axis accelerometer	10076	7264	Endevco	08/15/96	02/15/97

Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left rear seat crossmember X-axis	AMT82	7264	Endevco	05/09/96	11/09/96
Left rear seat crossmember X-axis redundant	DK71J	7264	Endevco	06/18/96	12/18/96
Right rear seat crossmember X-axis	APBG4	7264	Endevco	07/02/96	01/02/97
Right rear seat crossmember X-axis redundant	AC820	7264	Endevco	09/19/96	03/19/97
Engine top X-axis	FH18J	7264	Endevco	07/02/96	01/02/97
Engine bottom X-axis	J13570	7264	Endevco	06/18/96	12/18/96
Right brake caliper X-axis	J14342	7264	Endevco	05/23/96	11/23/96
Left brake caliper X-axis	J10923	7264	Endevco	10/14/96	04/14/97
Instrument panel center X-axis	J11039	7264	Endevco	07/01/96	01/01/97

Calibration Laboratory Instruments

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Neck bending pendulum accelerometer	CB27	7232	Endevco	03/19/96	09/19/96
Neck bending rotary potentiometer	NA	35435-1-102	Bournes	Mfr. Specification	
Neck bending linear potentiometer	NA	5184-2051846003	Bournes	03/19/96	09/19/96
Thorax/Hybrid II femur pendulum accelerometer	CC64	7232	Endevco	03/19/96	09/19/96
Lumbar flexion force gauge	NA	DPPH-50	Chatillon	05/03/89	repaired
Lumbar flexion rotation gauge	CP17-0601-1	7020	Humphrey	Mfr. Specification	
Abdomen compression displacement gauge	4075-175	80294-2051941504	Bournes	03/19/96	09/19/96
Abdomen compression force gauge	3443	3167	Lebow	03/19/96	09/19/96
Hybrid III femur pendulum accelerometer	CG83	7232	Endevco	03/19/96	09/19/96

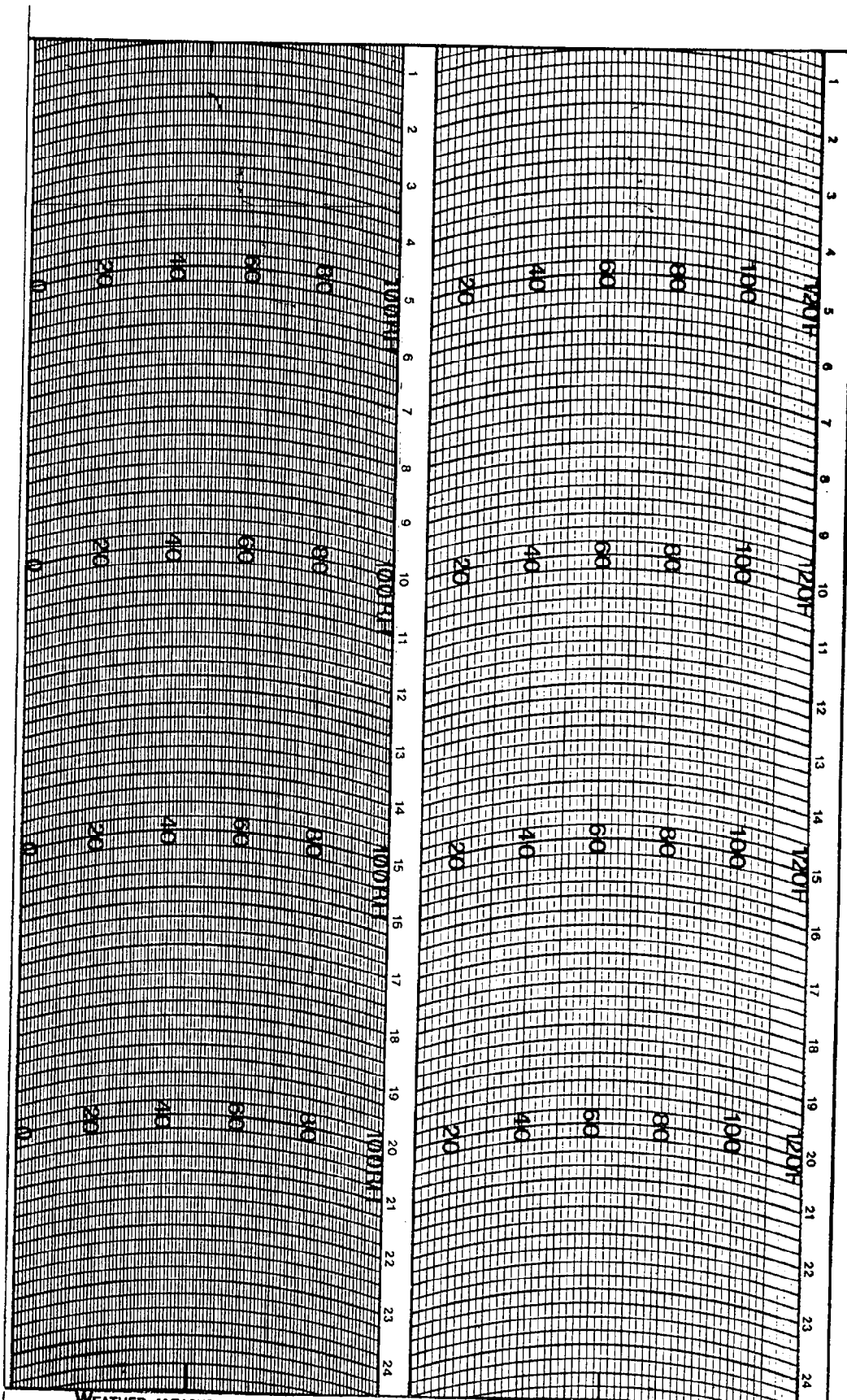
Sign Convention
NHTSA Data Tape Reference Guide

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

Frequency Response Classes

SAE J211 OCT88

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



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

HYGROTHERMOGRAPH
1 DAY

CHART # C311 D HF
PART # 699123

STATION _____ DATE ON 9/5/96 DATE OFF _____

Appendix E

Restraint System Instructions from Owner's Manual

Safety Restraints

Important Safety Belt Information

The use of safety belts helps to restrain you and your passengers in case of a collision. In most states and in Canada the law requires their use.

Safety belts provide best restraint when:

- the seatback is upright
- the occupant is sitting upright (not slouched)
- the lap belt is snug and low on the hips
- the shoulder belt is snug against the chest
- the knees are straight forward

To help you remember to fasten your safety belt, a warning light may come on and a chime may sound. See *Safety Belt Warning Light and Chime* in the *Warning Lights and Gauges* chapter.

See the following sections in this chapter for directions on how to properly use these safety belts. Also see *Safety Restraints for Children* in this chapter for special instructions about using safety belts for children.

WARNING

Make sure that you and your passengers wear safety belts. Always drive and ride with your seatback upright and the lap belt snug and low across the hips.

WARNING

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

⚠ WARNING

Ford recommends that all safety belt assemblies and attaching hardware should be inspected by a qualified technician after any collision. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

⚠ WARNING

To reduce the risk of serious injury in a collision, children should always ride with the seatback upright.

⚠ WARNING

Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Never use a single belt for more than one person or across more than one seating position. Each seating position in your vehicle has a specific safety belt assembly which is made up of one buckle and one tongue that are designed to be used as a pair. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

⚠ WARNING

Lock the doors of your vehicle before driving to lessen the risk of the door coming open in a collision.

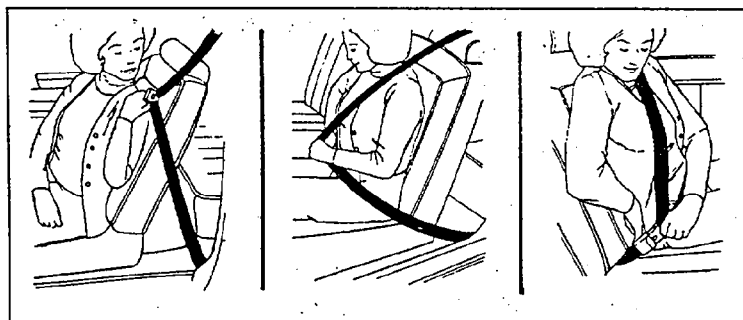
Safety Restraints

Combination Lap and Shoulder Belts

While your vehicle is in motion, the combination lap and shoulder belt adjusts to your movement. However, if you brake hard, turn hard, or if your vehicle receives an impact of 5 mph (8 km/h) or more, the lap/shoulder belt locks and helps reduce your forward movement.

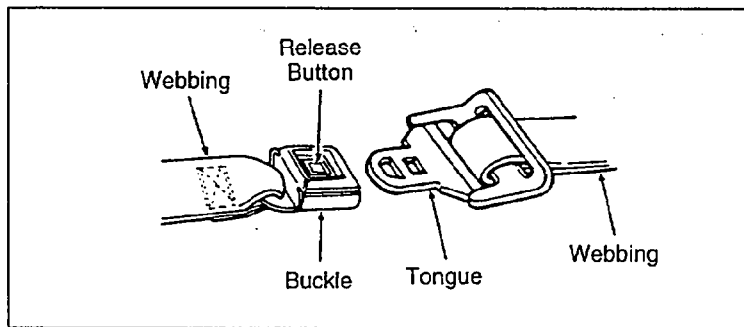
After you get into your vehicle, close the door and lock it. Then adjust the seat to the position that suits you best.

Pull the combination lap/shoulder belt from the retractor so that the shoulder portion of the belt crosses your shoulder and chest. Be sure the belt is not twisted. If it is, remove the twist. Insert the belt tongue into the proper buckle until you hear a snap and feel it latch. Make sure the tongue is securely fastened to the buckle by pulling on tongue.



Unfastening the outboard lap/shoulder belts

NOTE: Be sure to read and understand *Important Safety Belt Information* at the beginning of this chapter.



Unfastening the outboard lap/shoulder belts

While the belt retracts, guide the tongue to its original position to prevent it from striking you or the vehicle.

Safety Belts for Front Outboard Passenger and Rear Outboard Seating Positions

Your vehicle is equipped with a dual locking mode retractor on the shoulder belt portion of the combination lap/shoulder safety belt for the front seat outboard passenger and rear outboard passengers.

Dual locking mode retractors operate in two ways:

Vehicle sensitive (emergency) locking mode

In this operating mode, the shoulder belt retractor will allow the occupant freedom of movement, locking tight only on hard braking, hard cornering or impacts of approximately 5 mph (8 km/h) or more. The retractor can also be made to lock by pulling the belt out quickly.

Safety Restraints

Automatic locking mode

In this operating mode, the shoulder belt retractor will be automatically locked and will remain locked when the combination lap/shoulder safety belt is buckled, and does not allow the occupant freedom of movement. This mode provides the following:

- A tight lap/shoulder belt on the occupant.
- Child safety seat installation.

This mode **must be used** when installing a child safety seat on the front passenger seat and rear outboard seats where dual locking retractors are provided.

To switch the retractor from the emergency locking mode to the automatic locking mode, perform the following steps:

1. Buckle the lap/shoulder combination belt.
2. Grasp the shoulder portion of the belt and pull downward until all of the belt is extracted and, when allowed to retract, a clicking sound is heard. At this time, the belt retractor is in the automatic locking mode (child restraint mode).
3. A clicking sound will continue to be heard as the belt is allowed to retract. This indicates that the retractor is in the automatic locking mode.

NOTE: When the combination lap/shoulder belt is unbuckled and allowed to retract completely, the retractor will switch to the vehicle sensitive (emergency) locking mode. See the detailed instructions under *Safety Seats for Children* in this chapter.

Shoulder Belt Height Adjustment

Driver and right front passenger

The driver and right front passenger shoulder belt height is adjustable to one of four (4) positions (Regular cab model) or five (5) positions (Super cab model).

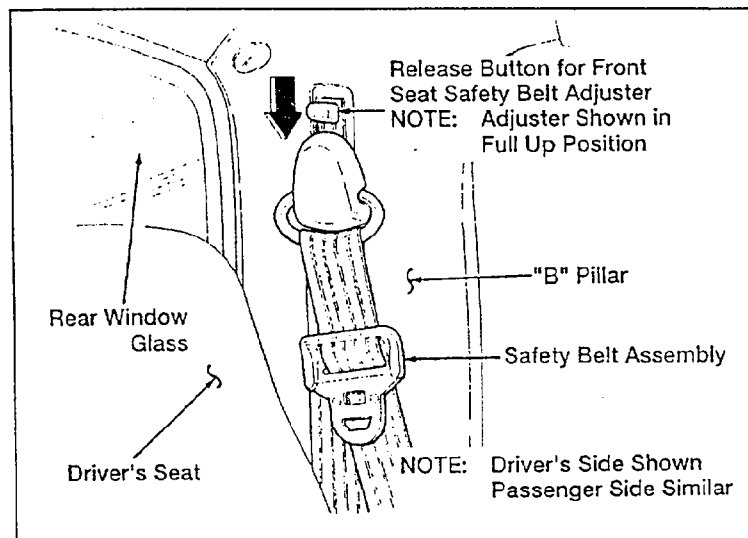
To adjust the belt down, push the release button on the adjuster down and slide the adjuster down. Then release the button and make sure the adjuster is firmly in one of the positions. To adjust the belt up, slide the adjuster up. (You do not have to push the release button.) Slide it up or down until the belt rests across the middle of your shoulder.

WARNING

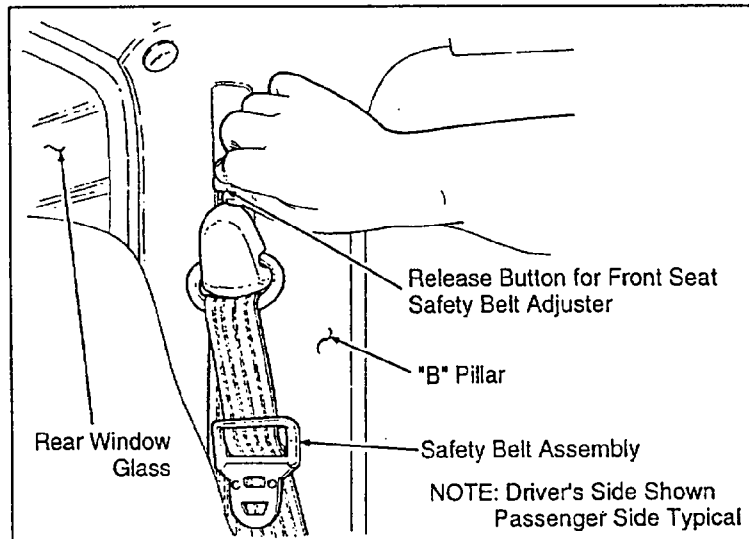
Position the shoulder belt height adjuster so that the belt rests across the middle of your shoulder. Be sure the shoulder belt is properly positioned on your shoulder each time you use the belt. If the shoulder belt is off your shoulder, on your upper arm or neck, there is a greater risk of severe injury in a collision.

NOTE: Be sure the belt is properly positioned on your shoulder each time you use the belt.

Safety Restraints

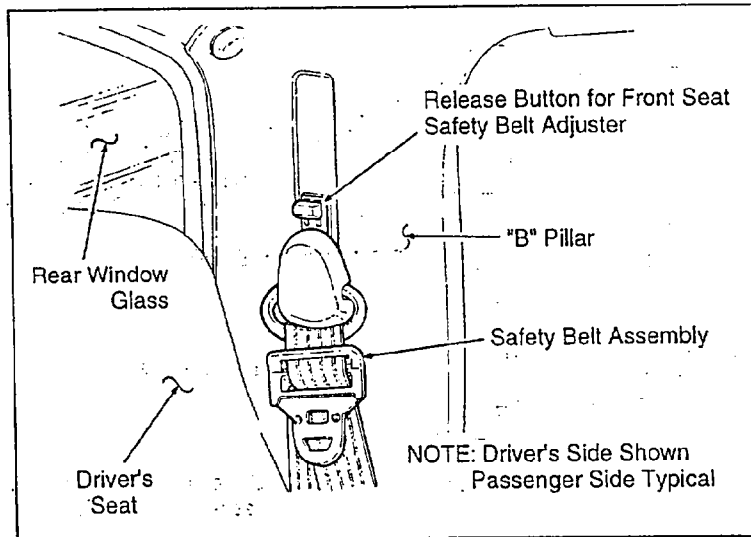


Shoulder belt height adjuster — full up position (regular cab models)

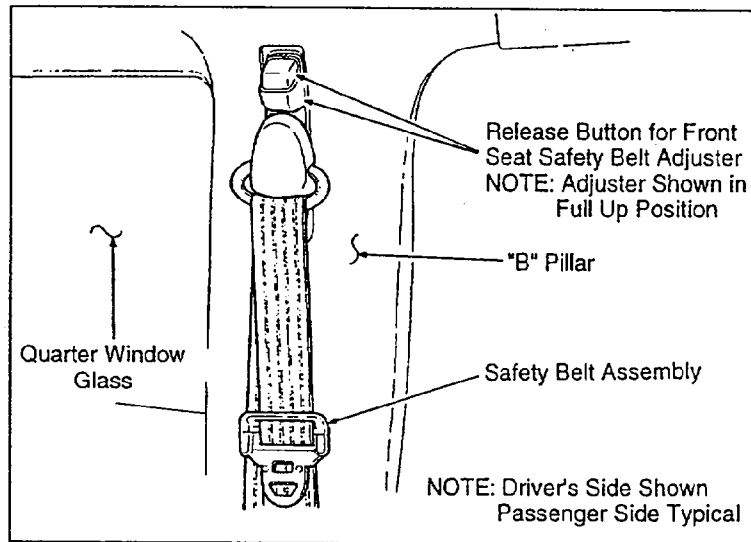


Adjusting shoulder belt height (regular cab models)

Safety Restraints

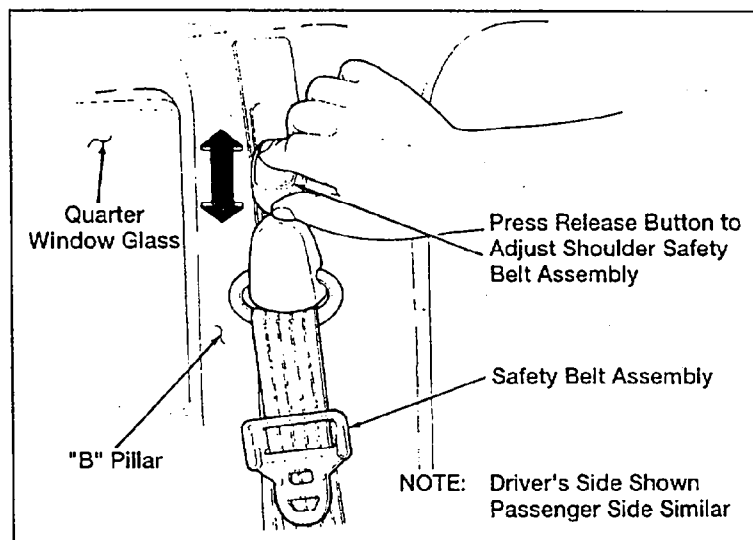


Shoulder belt height adjuster — full down position (regular cab models)

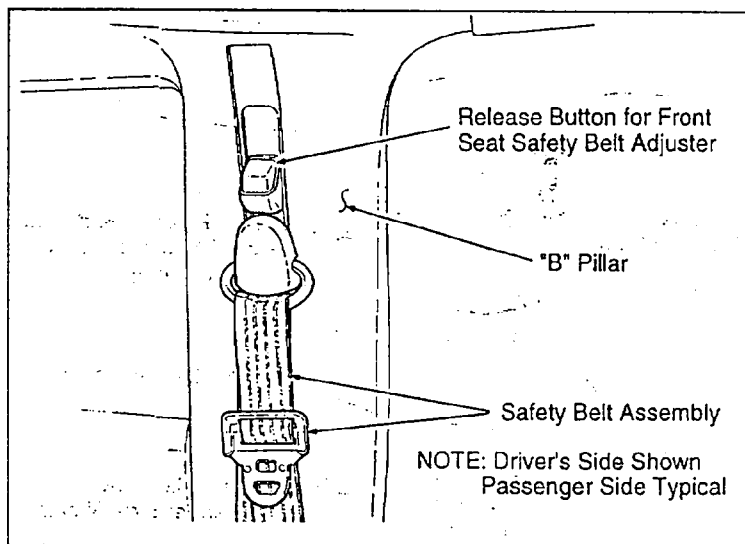


Shoulder belt height adjuster — full up position (SuperCab models)

Safety Restraints



Adjusting shoulder belt height (SuperCab models)



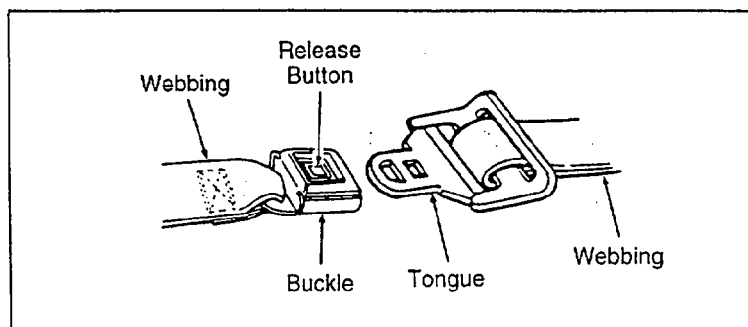
Shoulder belt height adjuster — full down position (SuperCab models)

⚠ WARNING

Use the shoulder belt on the outside shoulder only. Never wear the shoulder belt under the arm. Never swing it around the neck over the inside shoulder. Never use a single belt for more than one person. Failure to follow these precautions could increase the risk and/or severity of injury in a collision.

To tighten the lap portion of the belt, pull up on the shoulder belt until it fits you snugly. The belt should rest as low on your hips as possible.

Safety Restraints



Unfastening the outboard lap/shoulder belts

Center Front Lap Belt (If equipped)

The lap belt in the center of the front seat does not adjust automatically. You must adjust it to fit snugly around your hips. Do not wear it around your waist.

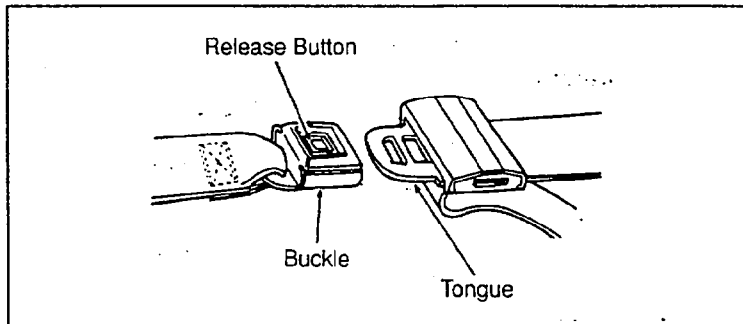
To fasten the belt, pull the belt across your hips and insert the tongue into the correct buckle on your seat until you hear a snap and feel it lock. Make sure the buckle is securely fastened.

If you need to lengthen the belt, unfasten it and tip the belt tongue at a right angle to the belt. Pull the belt tongue over your lap until it reaches the buckle.

If you need to shorten the belt, pull on the loose end of the webbing until the belt fits snugly.

To unfasten the belt, push the release button on the buckle. This allows the tongue to unlatch from the buckle.

Because the center front lap belt does not have a retractor, it should be shortened and fastened when not in use.



Fastening and unfastening the front center safety belt

⚠ WARNING

The lap belts should fit snugly and as low as possible around the hips, not around the waist.

Rear Lap Belt with Retractor

Pull the belt out of the retractor with a steady motion and insert the tongue into the proper buckle until you hear a snap and feel the latch engage.

To Unfasten the Safety Belts with Retractors:

1. Push the release button on the buckle. This allows the tongue to unlatch from the buckle.
2. While the belt retracts, guide the tongue to its stowed position. If you do not guide the tongue, it may strike you or part of the vehicle.

Safety Restraints

Safety Belt Extension Assembly

For some people, the safety belt may be too short even when it is fully extended. You can add about eight inches (20 cm) to the belt length with a safety belt extension assembly (part number 611C22). Safety belt extensions are available at no cost from your dealer.

Use only extensions manufactured by the same supplier as the safety belt. Manufacturer identification is located at the end of the webbing on the label. Also, use the safety belt extension only if the safety belt is too short for you when fully extended. Do not use extension to change the fit of the shoulder belt across the torso.

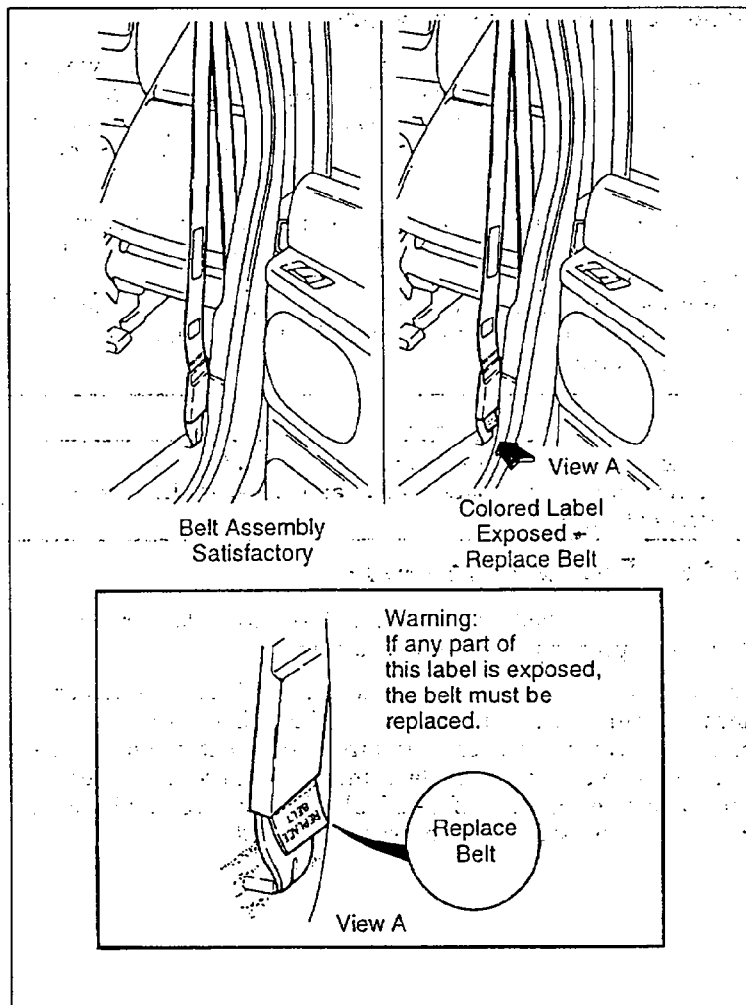
WARNING

Failure to follow these instructions will affect the performance of the safety belts and increase the risk of personal injury.

Safety Belt Maintenance

Check the safety belt systems periodically to make sure that they work properly and are not damaged.

The short plastic boot on the front safety belt at the outboard anchor location (Regular Cab, driver; SuperCab, driver and passenger) covers an energy absorbing sew pattern on the safety belt. In the event of an accident, the sew pattern may release, and the colored label (REPLACE BELT) may become visible. If this occurs, the safety belt must be replaced.



Energy absorbing sew pattern

Safety Restraints

⚠ WARNING

FAILURE TO REPLACE THE SAFETY BELT ASSEMBLY UNDER THE ABOVE CONDITIONS COULD RESULT IN SEVERE PERSONAL INJURIES IN THE EVENT OF A COLLISION.

All safety belt assemblies, including retractors, buckles, front seat belt buckle support assemblies (slide bar) (if equipped), child safety seat tether bracket assemblies (if equipped), and attaching hardware, should be inspected after any collision. Ford recommends that all safety belt assemblies used in vehicles involved in a collision be replaced. However, if the collision was minor and a qualified technician finds that the belts do not show damage and continue to operate properly, they do not need to be replaced. Safety belt assemblies not in use during a collision should also be inspected and replaced if either damage or improper operation is noted.

Cleaning the Safety Belts

Clean the safety belts with any mild soap solution that is recommended for cleaning upholstery or carpets. Do not bleach or dye the belt webbing because this may weaken it.

Air Bag Supplemental Restraint System (SRS)

The driver and right front passenger air bags are Supplemental Restraint Systems (SRS), provided at these seating positions in addition to the lap/shoulder belt, and are designed to supplement the protection provided to properly belted occupants in moderate to severe frontal collisions. The supplemental air bag system does not provide restraint to the lower body.

The Importance of Wearing Safety Belts

⚠ WARNING

Safety belts must be worn by all vehicle occupants to be properly restrained and help reduce the risk of injury in a collision.

⚠ WARNING

All occupants of the vehicle, including the driver, should always wear their safety belts, even when an air bag Supplemental Restraint System is provided.

There are four very important reasons to use safety belts even with an air bag system. Use your safety belts to:

- help keep you in the proper position (away from the air bag) when it inflates
- reduce the risk of harm in rollover, side or rear impact collisions, because an air bag is not designed to inflate in such situations
- reduce the risk of harm in frontal collisions that are not severe enough to activate the supplemental air bag
- reduce the risk of being thrown from your vehicle

⚠ WARNING

The right front passenger air bag is not designed to restrain occupants in the center front seating position.

Safety Restraints

The Importance of Being Properly Seated

In a collision, the air bag must inflate extremely fast to help provide additional protection for you. In order to do this, the air bag must inflate with considerable force. If you are not seated in a normal riding position with your back against the seatback, the air bag may not protect you properly and could possibly hurt you as it inflates.

Important Information About the Right Front Passenger Air Bag (If equipped)

It is important for the front seat passengers' safety that they remain properly seated whenever the vehicle is moving. This means that small children should be secured in appropriate child safety seats or infant seats, and all other occupants should sit upright, with their backs against the seatback, and restrained by lap and shoulder belts. No passenger should sit toward the front edge of the seat, or stand or lean near the air bag cover (which is near the glove box).

WARNING

Rear-facing infant seats should not be placed in the front seat unless the passenger air bag deactivate switch is turned to OFF. In rear-facing infant seats, the infant's head is closer to the passenger air bag. The force of the rapidly inflating air bag could push the top of the rear-facing seat against the vehicle seatback. Turning the passenger air bag deactivate switch to OFF will prevent the passenger air bag from deploying, avoiding any interaction between the passenger air bag and the rear-facing infant seat.

Passenger Air Bag Deactivate Switch

If your vehicle is equipped with the passenger air bag option, it also has a passenger air bag deactivate switch. The switch is located at the lower center of the instrument panel, next to the ashtray. The switch must be used to turn off the passenger air bag when a rear-facing infant seat is installed in the right front or center front passenger seat position. To turn the passenger air bag off:

NOTE: If the yellow peel-off label is still on the switch, pull the tab to remove it, and discard it.

1. Insert the ignition key into the switch.
2. Rotate the ignition key clockwise until the key points to the word OFF printed on the instrument panel.
3. Remove the ignition key.

⚠ WARNING

In order to avoid inadvertent deployment of the passenger air bag, always remove the ignition key from the passenger air bag deactivate switch.

4. Check that the amber OFF light illuminates when the ignition switch is placed in ON.

⚠ WARNING

If the light fails to illuminate when the passenger air bag switch is in the OFF position and the ignition switch is in ON, have the passenger air bag switch serviced at your Ford or Lincoln-Mercury dealer immediately.

The passenger air bag will remain off until it is turned on. When the infant seat is removed, turn the air bag on. To turn the passenger air bag on:

Safety Restraints

1. Insert the ignition key into the switch.
2. Rotate the ignition key counterclockwise until it points to the ON printed on the instrument panel.
3. Remove the ignition key from the switch.
4. Check that the amber OFF light is not illuminated when the ignition switch is placed in ON.

WARNING

If the light is illuminated when the passenger air bag switch is in the ON position and the ignition switch is in ON, have the passenger air bag switch serviced at your Ford or Lincoln-Mercury dealer immediately.

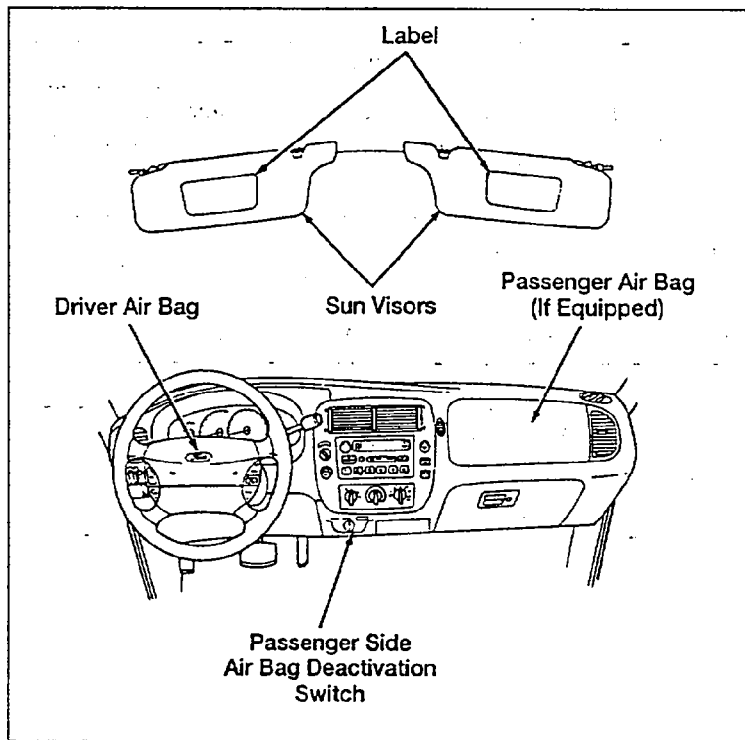
The amber OFF light warns the driver and any passengers that the passenger air bag is turned off. The passenger air bag should be turned off ONLY when the rear-facing infant seat is installed at the right front or center front seats.

WARNING

Keep the passenger air bag turned on unless there is a rear-facing infant seat installed in the front seat. When the passenger air bag switch is turned off, the passenger air bag will not inflate in a collision.

How the Air Bag Supplemental Restraint System Operates

The Air Bag Supplemental Restraint System consists of the driver air bag, passenger air bag (if equipped), impact sensors, a system diagnostic module, a readiness light and tone, and the electrical wiring which connects the components.



The location of the air bags and warning labels

Safety Restraints

The driver air bag is in the center of the steering wheel. The right front passenger seat air bag (if equipped) is in the upper right hand section of the instrument panel ledge above the glove compartment.

If a collision occurs, the sensors sense the severity of the impact and activate the air bags if necessary. The air bag system is designed to deploy in frontal and front-angled collisions more severe than hitting a parked vehicle (of similar size and weight) head-on at about 28 mph (45 km/h). Because the system senses the crash severity rather than vehicle speed, some frontal collisions at speeds above 28 mph (45 km/h) will not inflate the air bag.

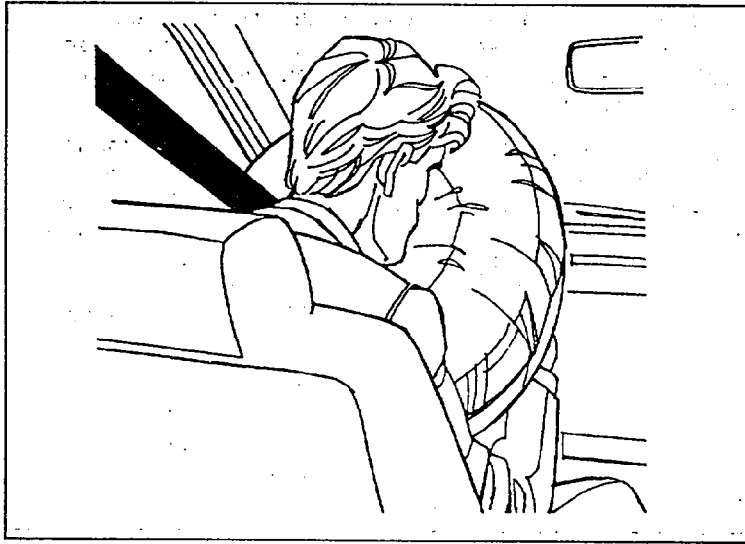
When the sensors activate the system, the air bags inflate rapidly, filling with non-toxic nitrogen gas in a fraction of a second. Immediately after inflation, the air bags deflate by releasing the nitrogen gas through vent holes. The whole process takes place in a matter of seconds.

⚠ WARNING

Air bag system components get hot after inflation. Do not touch them after inflation.

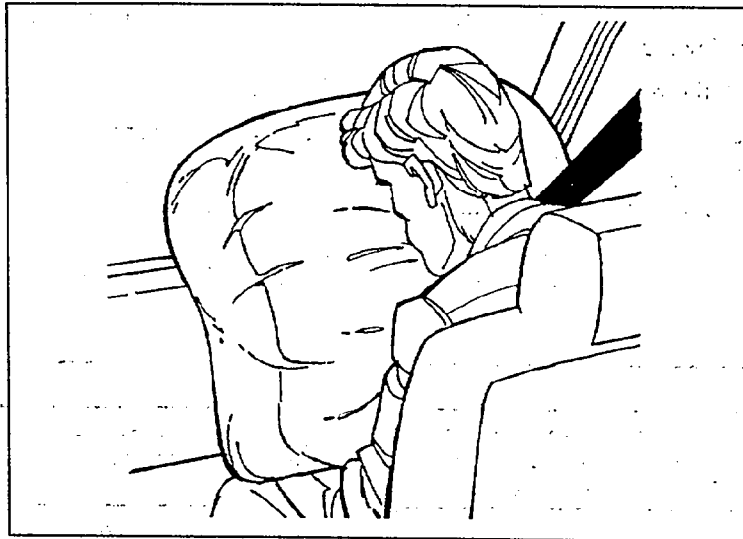
The air bag system uses a readiness light on the instrument cluster and a tone to indicate the condition of the system. When you turn the ignition key to the ON position, this light will illuminate for approximately six (6) seconds and then turn off. This indicates that the system is operating normally. NOTE: Maintenance of the air bag system is not required.

SECTION 9-10



Inflated driver-side air bag

Safety Restraints



Inflated passenger-side air bag

⚠ WARNING

If the air bag is inflated, THE AIR BAG WILL NOT FUNCTION AGAIN AND MUST BE REPLACED IMMEDIATELY. If the air bag is not replaced, the unrepaired area will increase the risk of injury in a collision.

To ensure that the air bag system will operate as intended in a crash, the system is equipped with a diagnostic module, which controls a readiness lamp and a warning tone. The diagnostic module monitors its own circuits, the air bag electrical system, the air bag readiness light, the air bag power, and the air bag inflators.

A problem with the system is indicated by one or more of the following:

- the readiness light will either flash or stay lit,
- or it will not light immediately after ignition is turned on,
- or a group of five beeps will be heard. The tone pattern will repeat periodically until the problem and light are repaired.

If any of these things happen, have the air bag system serviced at your Ford or Lincoln-Mercury dealer immediately. Unless serviced, the air bag supplemental restraint system may not function properly in the event of a collision.

⚠WARNING

Do not attempt to service, repair, or modify the Air Bag Supplemental Restraint System or its fuses. See your Ford or Lincoln-Mercury dealer.

Disposal of supplemental air bag equipped vehicles

For disposal of air bags or air bag equipped vehicles, see your local Ford or Lincoln-Mercury dealer. Air bags **MUST** be disposed of by qualified personnel.

Safety Restraints for Children

In the U.S. and Canada, you are required by law to use safety restraints for children. If small children ride in your vehicle — this generally includes children who are four years old or younger and who weigh 40 pounds (18 kg) or less — you must put them in safety seats that are made specially for children. Safety belts alone do not provide maximum protection for these children. Check your local and state laws for specific requirements.

Safety Restraints

WARNING

Never let a passenger hold a child on his or her lap while the vehicle is moving. The passenger cannot protect the child from injury in a collision.

WARNING

To prevent the risk of injury, make sure children sit where they can be properly restrained.

WARNING

It is extremely dangerous to ride in a cargo area, inside or outside of a vehicle. In a collision, people riding in these areas are more likely to be seriously injured or killed.

WARNING

Do not allow people to ride in any area of your vehicle that is not equipped with seats and safety belts.

WARNING

Be sure everyone in your vehicle is in a seat and using a safety belt properly.

WARNING

Carefully follow all of the manufacturer's instructions included with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

When possible, put children in the rear seat of your vehicle. Accident statistics suggest that children are safer when properly restrained in the rear seating positions than in the front seating positions.

⚠ WARNING

Do not install a child seat in a center facing jump seat.

⚠ WARNING

Safety belts and seats can become hot in a vehicle that has been closed up in sunny weather; they could burn a small child. Check seat covers and buckles before you place a child anywhere near them.

⚠ WARNING

Never leave a child unattended in your vehicle.

Safety Seats for Children

Use a safety seat that is recommended for the size and weight of the child. Always follow the safety seat manufacturer's instructions when installing and using the safety seat.

Ford recommends the use of a child safety seat having a top tether strap. Install the child safety seat in a seating position which is capable of providing a tether anchorage. For more information on top tether straps see *Attaching Safety Seats With Tether Straps* in this chapter.

When installing a child safety seat, be sure to use the correct safety belt buckle for that seating position, and make sure the tongue is securely fastened in the buckle. For a shoulder/lap belt combination with a sliding tongue, make sure the retractor is in the automatic locking mode.

Safety Restraints

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

WARNING

If you do not properly secure the safety seat, the child occupying the seat may be injured during a collision or sudden stop. An unsecured safety seat could also injure other passengers.

WARNING

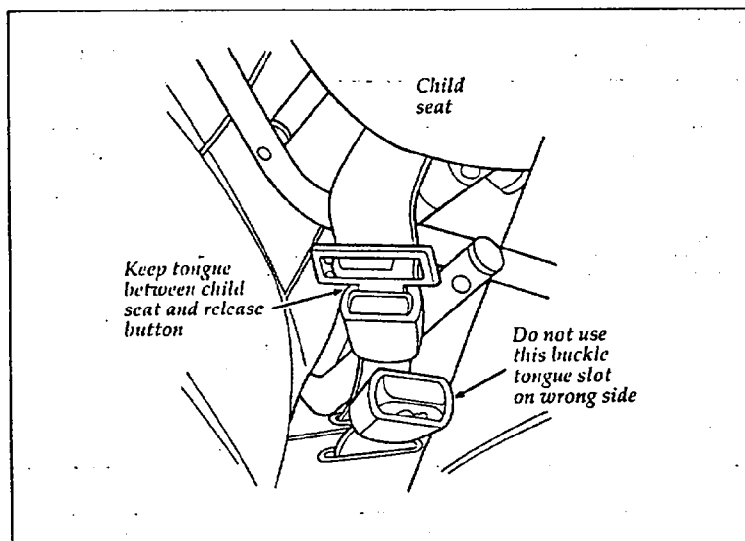
Carefully follow all of the manufacturer's instructions included with the safety seat you put in your vehicle. If you do not install and use the safety seat properly, the child may be injured in a sudden stop or collision.

WARNING

Seatbacks should be upright for use with child safety seats.

WARNING

Always keep the buckle release button pointing upward and away from the child seat, with the tongue between the child seat and the release button as shown in the following illustration.



Attaching Safety Seats With Tether Straps

General Instructions

Some manufacturers make safety seats that include a tether strap that goes over the back of the vehicle seat and attaches to an anchoring point. Other manufacturers offer the tether strap as an accessory: Contact the manufacturer of your child safety seat for information about ordering a tether strap.

You can attach a tether strap anchor bracket to the cab inner back panel by using a tether anchor kit (613D74) available at no charge from any Ford dealer.

Read and follow the instructions provided with the kit carefully, for installation of the child tether strap anchor.

Safety Restraints

Follow the child seat manufacturer's instructions to attach the tether strap to the tether bracket.

⚠ WARNING

Only use the tether attachment hole locations shown in the illustrations. The tether anchor may not perform properly if the wrong mounting location is used.

In Super Cabs equipped with Center Facing Jump Seats, the tether strap anchor bracket should be installed only at the center of the cab's back panel with the child seat in the front center seating position. Installing an anchor bracket at the right rear of the cab may increase risk of injury to an occupant of the right rear center facing jump seat in the event of a collision or sudden stop. If a tethered child seat is installed in the right front seating position, secure the tether strap to the webbing of the buckled right rear lap belt.

⚠ WARNING

Do not install a child seat in a center facing jump seat.

Safety Belts for Children

Children who are too large for child safety seats should always wear safety belts. (See instructions with your child seat, or contact its manufacturer, to determine maximum size of child that will safely fit in the seat.)

⚠ WARNING

If safety belts are not properly worn and adjusted as described, the risk of serious injury to the child in a collision will be much greater.

If the shoulder belt portion of one of the lap and shoulder belts can be positioned so that it does not cross or rest in front of the child's face or neck, the child should wear the lap and shoulder belt. Moving the child closer to the center of the vehicle may help provide a good shoulder belt fit.

To improve the fit of lap and shoulder belts on children who have outgrown child safety seats, Ford recommends use of a belt-positioning booster seat that is labelled as conforming to all Federal motor vehicle safety standards. Belt-positioning booster seats raise the child and provide a shorter, firmer seating cushion that encourages safer seating posture and better fit of lap and shoulder belts on the child. A belt-positioning booster should be used if the shoulder belt rests in front of the child's face or neck, or if the lap belt does not fit snugly on both thighs, or if the thighs are too short to let the child sit all the way back on the seat cushion when the lower legs hang over the edge of the seat cushion. You may wish to discuss the specific needs of your child with your pediatrician.

Lap belts and the lap belt portion of lap and shoulder belts should always be worn snugly and below the hips, touching the child's thighs.

⚠ WARNING

To reduce the risk of serious injury in a collision, children should always ride with the seatback upright.