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Report Number TRC-96-N13

New Car Assessment Program (NCAP)

Frontal Barrier Impact Test

Chrysler Corporation
1996 Jeep Grand Cherokee
4-door mpv
NHTSA Number: MT0303
TRC Test Number: 960328

Prepared By:
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April 25, 1996

Final Report

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16. Abstract <p>A 56 kph (35 mph) frontal load cell barrier impact test was conducted on a 1996 Jeep Grand Cherokee 4-door mpv, NHTSA No. MT00303, at Transportation Research Center Inc. on March 28, 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 56.3 kph. The vehicle's maximum static crush was 523 millimeters. The ambient temperature was 22° C.</p> <p>The driver's Head Injury Criteria (HIC) was 952. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 59.0 g. The driver's maximum chest deflection was 41 mm. The driver's left and right femur maximum axial forces were 6119 N and 5333 N, respectively.</p> <p>The passenger's HIC was 554. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 57.2 g (see Data Acquisition Explanations). The passenger's maximum chest deflection was 41 mm. The passenger's left and right femur maximum axial forces were 6482 N and 4804 N, respectively.</p>			
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METRIC CONVERSION FACTORS

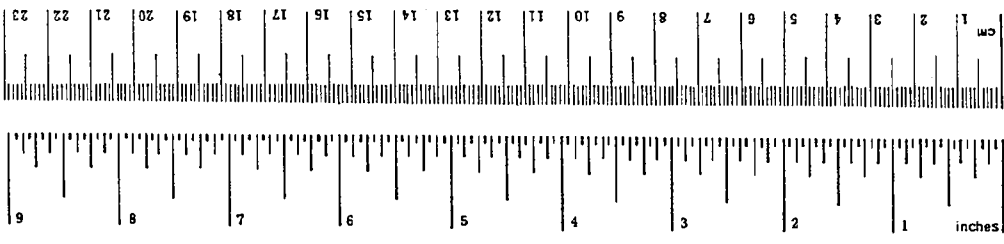
Approximate Conversions to Metric Measures

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
----	------------------------	----------------------------	---------------------	----

Symbol	When You Know	Multiply by	To Find	Symbol
	LENGTH			
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
	AREA			
cm ²	square centimeters	0.16	square inches	in ²
m ²	square meters	1.2	square yards	yd ²
km ²	square kilometers	0.4	square miles	mi ²
ha	hectares (10,000 m ²)	2.5	acres	
	MASS (weight)			
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
	VOLUME			
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m ³	cubic meters	36	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



*1 in = 2.54 exactly. For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10.286.

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Section 1.0

Purpose and Test Procedure

Purpose

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

The purpose of this test was to obtain new car assessment and research data for vehicle crashworthiness and occupant restraint system performance for the subject vehicle, a 1996 Jeep Grand Cherokee 4-door mpv, NHTSA Number MT0303, 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 March 28, 1996.

The test vehicle, a 1996 Jeep Grand Cherokee 4-door mpv, NHTSA Number MT0303, was equipped with a 4.0-liter inline engine, automatic transmission, power steering, and power brakes. The vehicle's test weight was 1997.5 kg. The vehicle's impact speed was 56.3 kph. The vehicle sustained 523 mm of static crush during the impact.

The driver's Head Injury Criteria (HIC) was 952. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 59.0 g. The driver's maximum chest deflection was 41 mm. The driver's left and right femur maximum axial forces were 6119 N and 5333 N, respectively.

The right front passenger's HIC was 554. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 57.2 g (see DAE's). The passenger's maximum chest deflection was 41 mm. The passenger's left and right femur maximum axial forces were 6482 N and 4804 N, respectively.

There was loss of windshield periphery retention along the lower edge from 0 to 98, 176 to 273, 311 to 765, and 1545 to 1699 millimeters as measured from the lower left corner.

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 dummy's left lower tibia Z-axis force data channel, ANLZF1, recorded questionable data spikes at approximately 50 milliseconds.

The passenger dummy's chest Z-axis acceleration data channel, CSTZG2, recorded questionable data throughout the impact even because the locking ring on the accelerometer's connector broke. Because of this anomaly, the dummy's redundant chest Z-axis acceleration data, CSTZGB, was used to compute the dummy's resultant chest acceleration.

The driver dummy's right femur force data channel, RFMF1, recorded a questionable data spike at approximately 27 milliseconds.

Table 1 Crash Test Summary

NHTSA number:	MT0303	
Test type:	Frontal Load Cell Barrier	
Test date:	03/28/96	
Test time:	1603	
Ambient temperature:	22° C	
Vehicle year/make/ model/body style:	1996/Jeep/Grand Cherokee/4-door mpv	
Vehicle test weight:	1997.5 kg	
Impact angle ¹ :	0°	
Impact velocity ² :	Primary = 56.3 kph	Secondary = 56.3 kph
Maximum static crush:	523 mm	
Average rebound:	1102 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 14	Real-time 2

¹ With respect to tow track centerline.

² Speed trap measurement ($\pm .08$ kph accuracy)

Table 2 Test Vehicle Information

Vehicle year/make/
model/body style: 1996/Jeep/Grand Cherokee/4-door mpv

Color: Black

VIN: 1J4GZ58S5JC234607

NHTSA number: MT0303

Engine data:

 Placement: Inline

 Cylinders: 6

 Displacement 4.0 liters

Transmission data: 4 speed, __manual, X automatic, __overdrive
 __FWD, __RWD, X4WD

Date vehicle received: 3/25/96

Odometer reading: 456

Dealer's name
and address: Ricart Chrysler Plymouth Jeep Eagle
667 South Hamilton Rd.
Columbus, OH 43213

Accessories:

Power steering	Yes	Automatic transmission	Yes
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
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by: Chrysler Corporation

Date of manufacture: 12/95

VIN: 1J4GZ58S5JC234607

GVWR: 2405 kg

GAWR: Front: 1248 kg

 Rear: 1339 kg

Table 2 Test Vehicle Information, Cont'd.

Size of tires: P215/75R15

Tire pressure with maximum capacity vehicle load:

Front: 303 kPa

Rear: 303 kPa

Spare tire: T155/90D16

Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: P215/75R15

Recommended cold tire pressure:

Front: 248 kPa

Rear: 248 kPa

Designated seating capacity:

Front NA

Rear NA

Total NA

Vehicle capacity weight: NA kg

Test vehicle attitude:

Delivered attitude: LF 805 mm; RF 800 mm; LR 812 mm; RR 815 mm

Pre-test attitude: LF 792 mm; RF 784 mm; LR 764 mm; RR 765 mm

Post-test attitude: LF 779 mm; RF 782 mm; LR 755 mm; RR 756 mm

Table 2 Test Vehicle Information Cont'd

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

Right front	485.5 kg	Right rear	366.0 kg
Left front	481.5 kg	Left rear	383.5 kg
Total front weight	967.0 kg	(56.3% of total vehicle weight)	
Total rear weight	749.5 kg	(43.7% of total vehicle weight)	
Total delivered weight	1716.5 kg		

Calculation of test vehicle's target test weight:

RCLW¹ = Rated cargo and luggage weight

GVWR = Gross Vehicle Weight Rating (2405 kg)

UDW = Unloaded delivered weight (1716.5 kg)

VCW = Vehicle capacity weight = GVWR - UDW = 2405-1716.5 = 688.5 kg

DSC = Designated seating capacity (5)

RCLW¹ = GVWR - UDW - 68 (DSC) = 2405.0 - 1716.5 - 68(5)

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

Target test weight = 1716.5 + 136 + 152 = 2004.5 kg

Target test weight = 2004.5 kg

Weight of test vehicle with required dummies and 129.5 kg of cargo weight:

Right front	518.0 kg	Right rear	480.5 kg
Left front	520.5 kg	Left rear	478.5 kg
Total front weight	1038.5 kg	(52.0% of total vehicle weight)	
Total rear weight	959.0 kg	(48.0% of total vehicle weight)	
Total test weight	1997.5 kg	(0.1% under target test weight)	

Weight of ballast secured in vehicle: 18 kg

Components removed to meet target test weight: Rear seats

CG rearward of front wheel centerline: 1291 mm

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

Table 3 Post-Impact Data

Test number: 960328
NHTSA number: MT0303
Test date: 03/28/96
Test time: 1603
Test type: Frontal load cell barrier
Impact angle: 0°
Ambient temperature at impact area: 22° C
Temperature in occupant compartment: 22° C
Impact velocity:
 Primary 56.3 kph
 Secondary 56.3 kph
 Specified range 55.5 to 57.1 kph

Distance from vehicle to barrier:

 Entering velocity trap 356 mm
 Exiting velocity trap 51 mm

Test vehicle static crush:

Overall length of test vehicle:

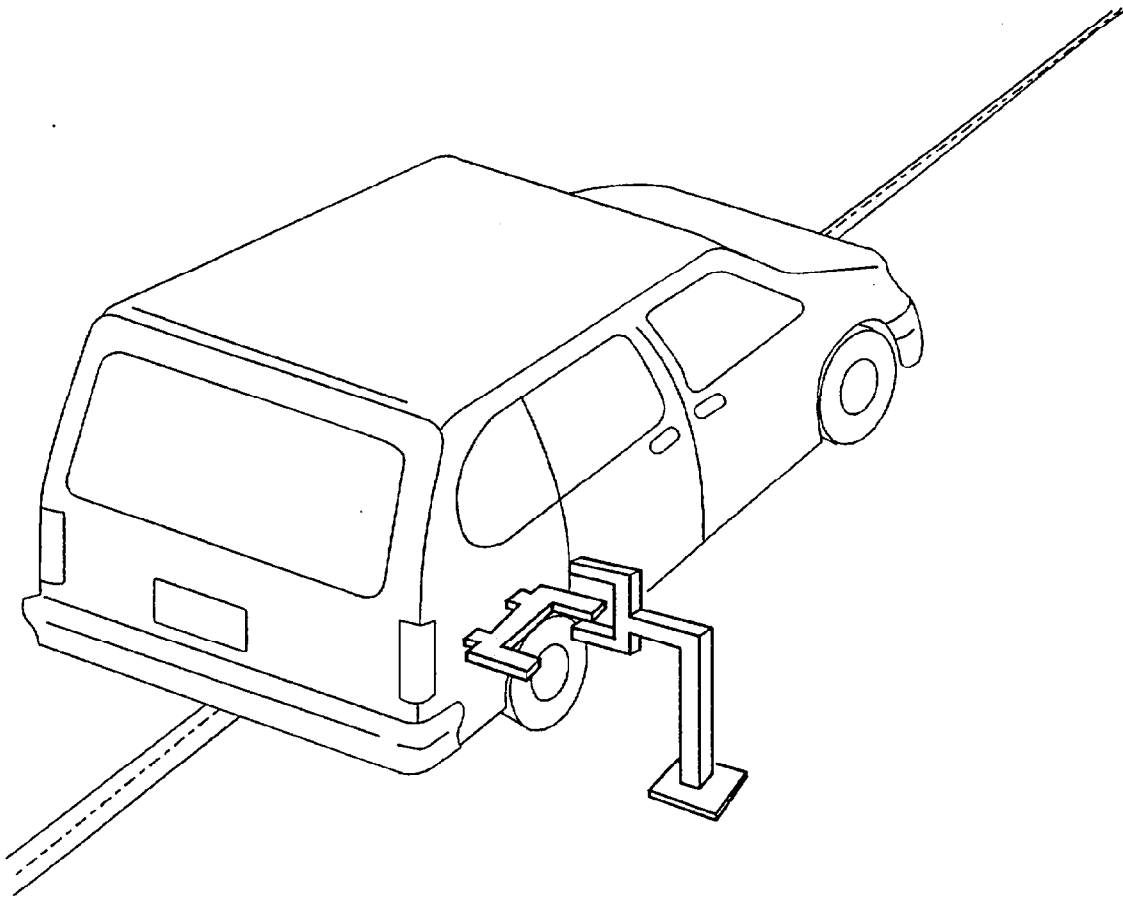
Pre-test: L 4450 mm; C 4550 mm; R 4458 mm
Post-test: L 3958 mm; C 4084 mm; R 4082 mm
Total crush: L 492 mm; C 466 mm; R 376 mm
Average crush: 445 mm

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test: L 1091 mm; C 1083 mm; R 1131 mm
Average rebound 1102 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: MT0303
 Test date: 03/28/96
 Vehicle year/make/
 model/body style: 1996/Jeep/Grand Cherokee/4-door mpv
 Vehicle size category: Special purpose
 VIN: 1J4GZ58S5TC234607
 Build date: 12/95
 Test weight: 1997.5 kg
 Vehicle wheelbase: 2690 mm
 Maximum width: 1816 mm
 Front overhang: 855 mm

Collision Deformation
 Classification (CDC) code: 12FDEW3

Crush depth
 measurements:

C1	=	492 mm
C2	=	523 mm
C3	=	509 mm
C4	=	468 mm
C5	=	466 mm
C6	=	376 mm

Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1524 mm

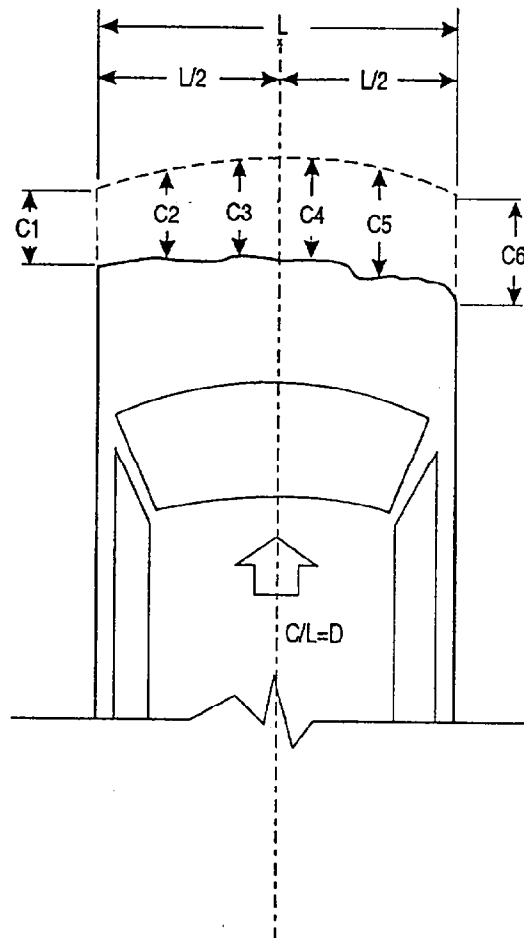
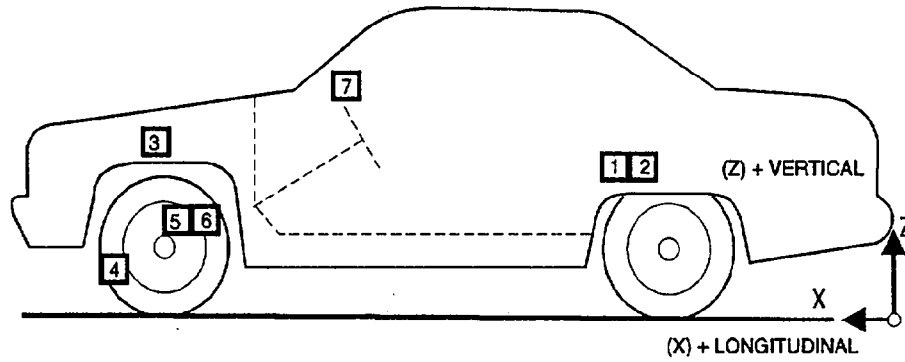
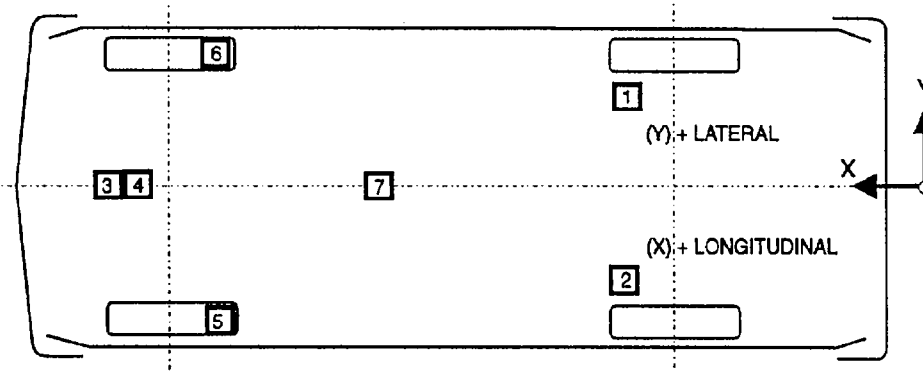


Figure 3 Vehicle Accelerometer Placement



SIDE VIEW



BOTTOM VIEW

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 960328 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	1743 mm	605 mm	412 mm	2.3 g @ 134.8 ms 2.3 g @ 134.8 ms	39.7 g @ 38.6 ms 40.3 g @ 38.6 ms
2 RIGHT REAR SEAT CROSSMEMBER LONGITUDINAL REDUNDANT	1749 mm	-620 mm	412 mm	2.1 g @ 138.4 ms 2.0 g @ 138.6 ms	34.2 g @ 36.2 ms 35.3 g @ 36.3 ms
3 ENGINE TOP LONGITUDINAL	3812 mm	-25 mm	1024 mm	13.2 g @ 42.6 ms	144.8 g @ 30.4 ms
4 ENGINE BOTTOM LONGITUDINAL	3339 mm	-148 mm	369 mm	41.8 g @ 38.6 ms	175.8 g @ 31.5 ms
5 RIGHT BRAKE CALIPER LONGITUDINAL	3540 mm	-617 mm	318 mm	28.8 g @ 55.7 ms	122.9 g @ 43.2 ms
6 LEFT BRAKE CALIPER LONGITUDINAL	3535 mm	617 mm	318 mm	64.8 g @ 58.0 ms	89.3 g @ 38.3 ms
7 INSTRUMENT PANEL CENTER LONGITUDINAL	3010 mm	-177 mm	1126 mm	103.1 g @ 27.8 ms	88.1 g @ 22.1 ms

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN MILLIMETERS. X-AXIS LOCATIONS ARE MEASURED REARWARD FROM THE FRONT BUMPER. REFERENCE: X: + FORWARD FROM REAR SURFACE OF VEHICLE
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	Airbag
Chest	Airbag	Airbag
Abdomen	None	None
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door Opening:

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

Seat Movement:

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

Glazing Damage:

The entire windshield cracked on impact.

Other Notable Impact Effects:

None

Table 6 FMVSS 208 Data Summary

Vehicle year/make/
model/body style: 1996/Jeep/Grand Cherokee/4-door mpv
Vehicle NHTSA number: MT0303
Test date: 03/28/96

	Driver Dummy #142		Passenger Dummy #192	
<u>Maximum Accelerations:</u>				
Head X-axis	-78.4	g	-54.7	g
Head Y-axis	11.3	g	7.8	g
Head Z-axis	26.5	g	-31.1	g
Head resultant	79.3	g	61.0	g
Chest X-axis	-59.6	g	-56.7	g
Chest Y-axis	3.3	g	-7.9	g
Chest Z-axis ¹	12.6	g	-16.0	g
Chest resultant ²	59.0	g	57.2	g
Chest resultant time interval ²	.003	sec	.003	sec
<u>Head Injury Criteria (HIC) Values:</u>				
HIC ³	952		554	
HIC starting time	.0536	sec	.0510	sec
HIC ending time	.0846	sec	.0870	sec
Average head resultant acceleration during HIC time interval	62.3	g	47.3	g
<u>Maximum Chest Deflections:</u>				
Chest X-axis	41	mm	41	mm
Maximum chest deflection time	.0631	sec	.0725	sec
<u>Maximum Compressive Femur Forces:</u>				
Left femur	6119	N	6482	N
Right femur ⁴	5333	N	4804	N
<u>Maximum Seat Belt Forces:</u>				
Lap belt	4511	N	4825	N
Shoulder belt	7405	N	6474	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.
- ⁴ See Data Acquisition Explanations

Table 7 Hybrid III Data Summary

Vehicle year/make/
model/body style: 1996/Jeep/Grand Cherokee/4-door mpv
Vehicle NHTSA number: MT0303
Test date: 03/28/96

	Driver Dummy #142	Passenger Dummy #192
<u>Maximum Forces</u>		
Neck X-axis shear force	911 N	-1196 N
Neck Y-axis shear force	-162 N	355 N
Neck Z-axis axial force	3634 N	1591 N
<u>Maximum Moments</u>		
Neck moment about X-axis	14.4 N·m	15.6 N·m
Neck moment about Y-axis	-69.4 N·m	119.5 N·m
Neck moment about Z-axis	19.3 N·m	14.0 N·m
<u>Maximum Accelerations:</u>		
Pelvis X-axis	-67.3 g	-60.8 g
Pelvis Y-axis	-15.1 g	-5.1 g
Pelvis Z-axis	15.7 g	16.8 g
Pelvis resultant	67.4 g	60.8 g

Table 7 Hybrid III Data Summary, Cont'd.

Vehicle year/make/
model/body style: 1996/Jeep/Grand Cherokee/4-door mpv
Vehicle NHTSA number: MT0303
Test date: 03/28/96

	Driver Dummy #142	Passenger Dummy #192
Left upper tibia moment about X-axis	-66.3 N·m	-55.7 N·m
Left upper tibia moment about Y-axis	100.6 N·m	99.9 N·m
Right upper tibia moment about X-axis	95.8 N·m	-55.7 N·m
Right upper tibia moment about Y-axis	220.8 N·m	-127.4 N·m
Left lower tibia X-axis force	-674 N	-704 N
Left lower tibia Z-axis force	N/A ¹ N	-1958 N
Left lower tibia moment about Y-axis	-58.3 N·m	-75.6 N·m
Right lower tibia X-axis force	-1731 N	-858 N
Right lower tibia Z-axis force	-2634 N	-3163 N
Right lower tibia moment about Y-axis	-363.6 N·m	42.9 N·m
Left foot X-axis acceleration	-51.7 g	-97.1 g
Left foot Z-axis acceleration at heel	64.3 g	81.5 g
Left foot Z-axis acceleration at toe	-63.2 g	108.0 g
Right foot X-axis acceleration	-188.0 g	-76.7 g
Right foot Z-axis acceleration at heel	-229.2 g	84.3 g
Right foot Z-axis acceleration at toe	464.0 g	101.6 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. The dummy was restrained by the airbag and three-point unbelt. The dummy rebounded rearward into the seat back with the dummy's head 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

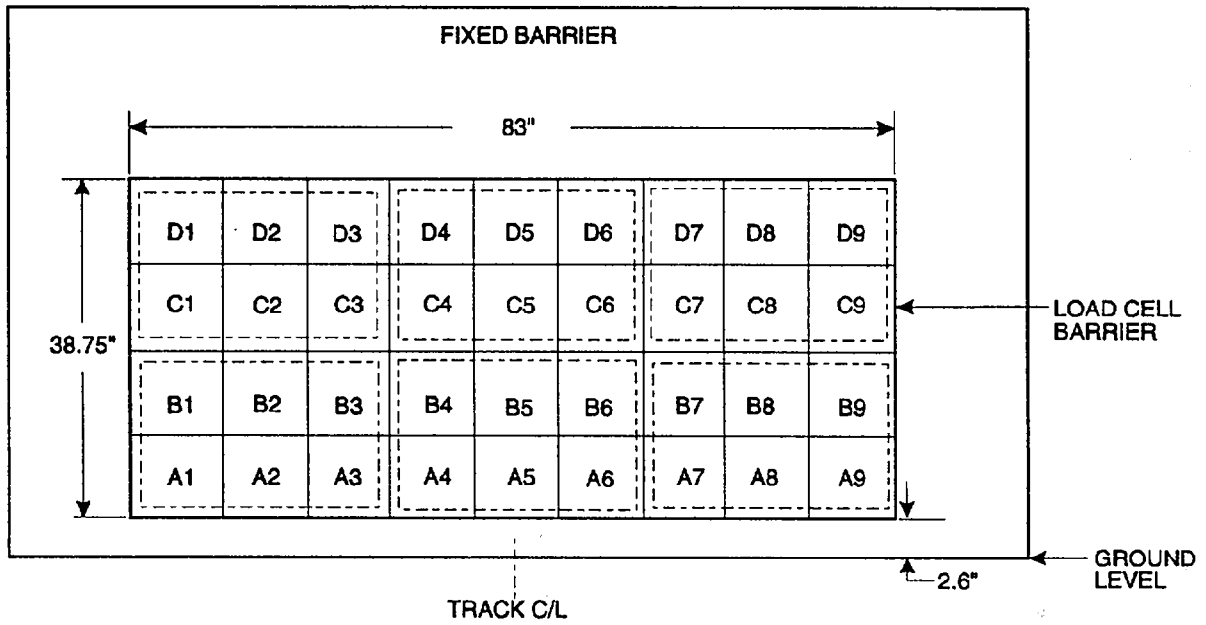
Upon impact, the right front passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy was restrained by the passenger's airbag and three-point unbelt. The dummy rebounded rearward into the seat back with the dummy's head 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.	2605 mm	2605 mm
Shoulder belt length as measured on Part 572 dummy.	774 mm	819 mm
Lap belt length as measured on Part 572 dummy.	841 mm	846 mm
<u>Shoulder belt spool-off length:</u>		
As determined by film analysis	84 mm	94 mm
As determined mechanically	111 mm	105 mm
As determined electronically	123 mm	128 mm
<u>Belt stretch length:</u>		
As measured mechanically	12 mm/m	19 mm/m
As measured electronically	5 mm/m	6 mm/m
<u>Retractor lock-up time:</u>		
As determined by shoulder belt spool-off	74	72

Figure 4 Load Cell Barrier Configuration

36 LOAD CELLS
4 ROWS
9 COLUMNS
FRONT VIEW



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

Table 9 Load Cell Barrier Data Summary

Location	Positive direction	Negative direction
Total group 1	1.1 kN @ 5.4 ms	37.7 kN @ 14.9 ms
Total group 2	0.2 kN @ 160.0 ms	69.2 kN @ 15.4 ms
Total group 3	1.4 kN @ 4.5 ms	53.7 kN @ 15.3 ms
Total group 4	0.0 kN @ 268.1 ms	118.7 kN @ 25.4 ms
Total group 5	-0.6 kN @ 258.2 ms	549.6 kN @ 31.7 ms
Total group 6	0.5 kN @ 256.2 ms	121.3 kN @ 26.7 ms
Total load cell force	0.0 kN @ 265.8 ms	809.1 kN @ 31.5 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.

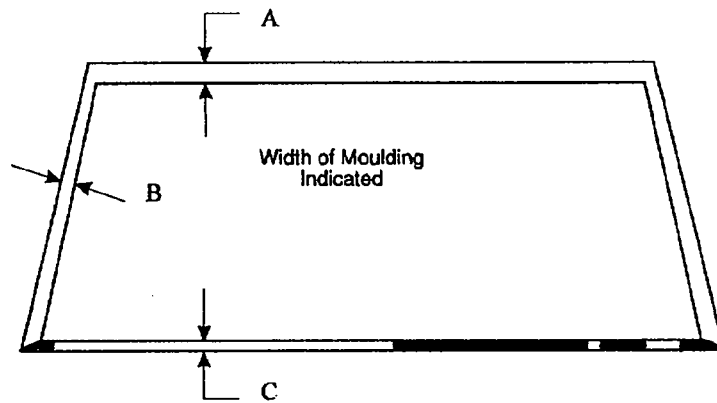
FMVSS 212 requirements: The post-test periphery retention amount must be at least 75% of the pre-test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of windshield for vehicles equipped with automatic restraint systems for front occupants.

Windshield periphery measurements:

	<u>Pre-test</u>	<u>Post-test</u>	<u>Percent retention</u>
Right side	2176 mm	2052 mm	94.3
Left side	2176 mm	1509 mm	69.3
Total	4352 mm	3561 mm	81.8

Pre-test windshield mounting material temperature: 21° C

- A = 20 mm
- B = 15 mm
- C = 35 mm



Front view of windshield¹

Loss of windshield retention lengths:

Retention was lost across the windshield's lower edge from 0 to 98 mm, 176 to 273 mm, 311 to 765 mm, and 1545 to 1669 mm as measured from the driver's side lower corner.

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

Figure 6 FMVSS 219 Test Data

Protected zone lower edge requirement:

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

Windshield measurements:

A = 1301 mm

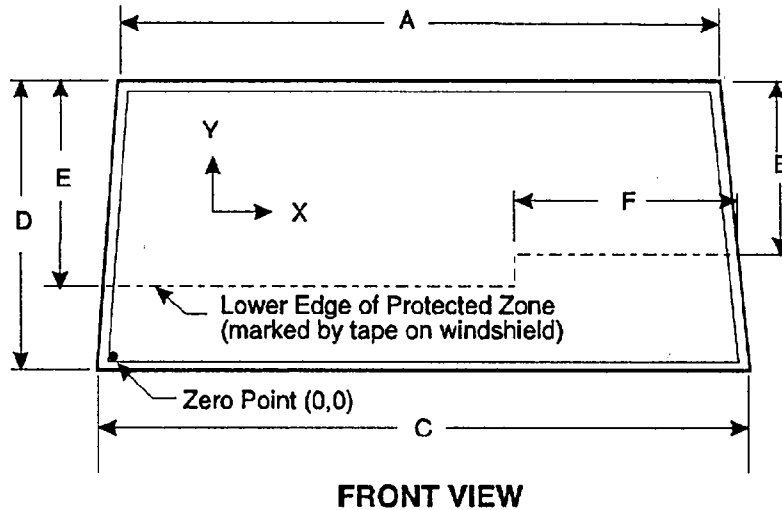
B = 382 mm

C = 1625 mm

D = 717 mm

E = 558 mm

F = 1023 mm



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/Jeep/Grand Cherokee/4-door mpv
NHTSA number:	MT0303
Fuel system capacity:	87.4 liters (from owner's manual)
Usable capacity:	76.5 liters (furnished by COTR)
Test volume range:	70.4 liters to 71.9 liters (92-94% of usable)
Actual test volume:	71.1 liters (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple
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 between frame rails and behind 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: MT0303
Test date: 03/28/96
Vehicle year/make/
model/body style: 1996/Jeep/Grand Cherokee/4-door mpv

Test requirements:

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

Test vehicle impact type:

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

Fuel system fluid spillage measurements:

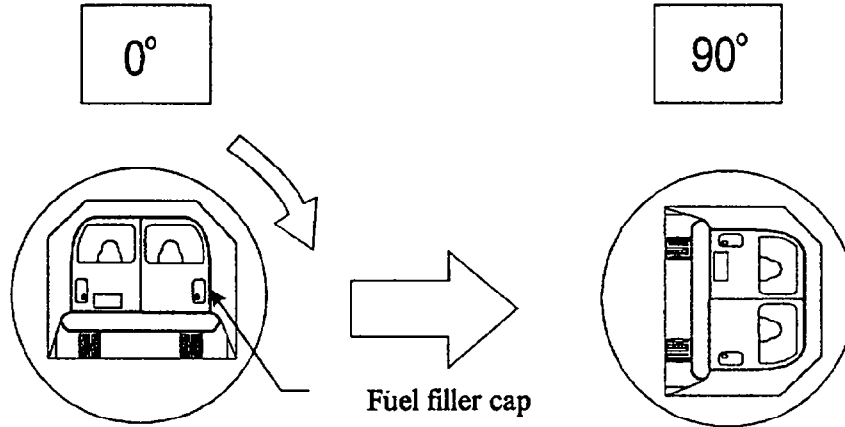
	<u>Test Results</u>	<u>Maximum Allowable</u>
1. From impact until vehicle motion ceases	0 g	28 g
2. 5-minute period after vehicle motion ceases	0 g	142 g
3. Next 25 minutes after 5-minute period	0 g	28 g/min

Fuel system fluid spillage location(s): None

Figure 7 FMVSS 301 Static Rollover Test Data

NHTSA number: MT0303

Test phase



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

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

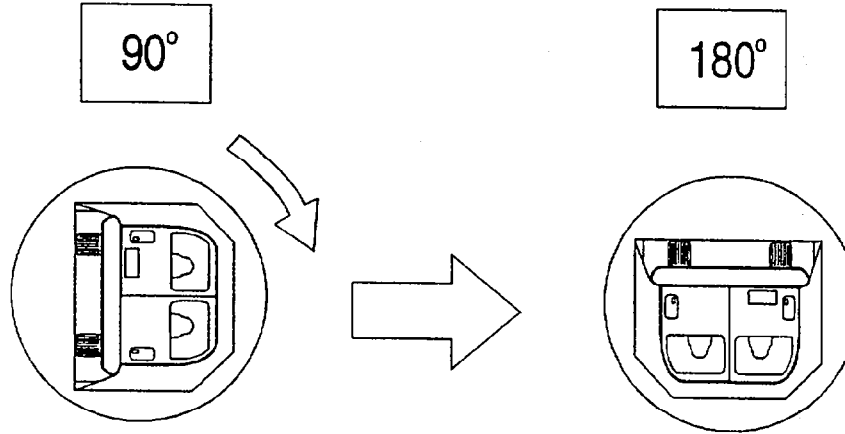
Fuel system fluid spillage measurements:

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

Fuel system fluid spillage location(s): None

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

Test phase



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

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

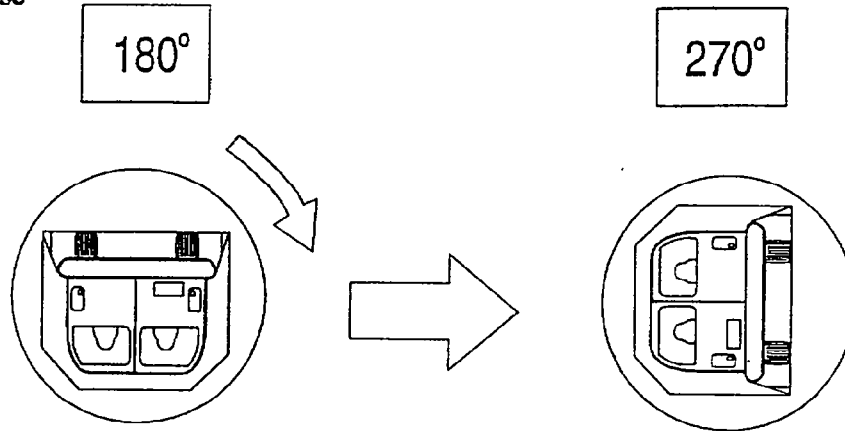
Fuel system fluid spillage measurements:

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

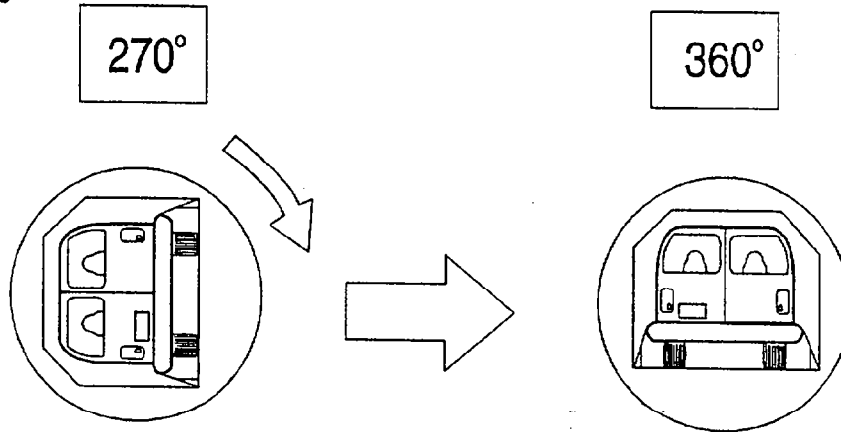
Fuel system fluid spillage measurements:

	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

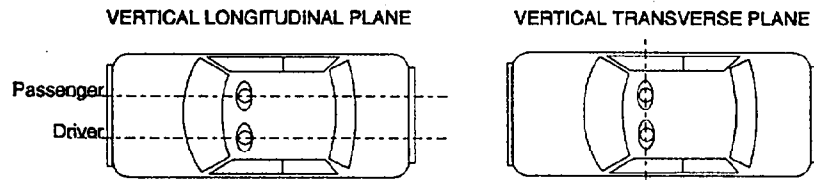
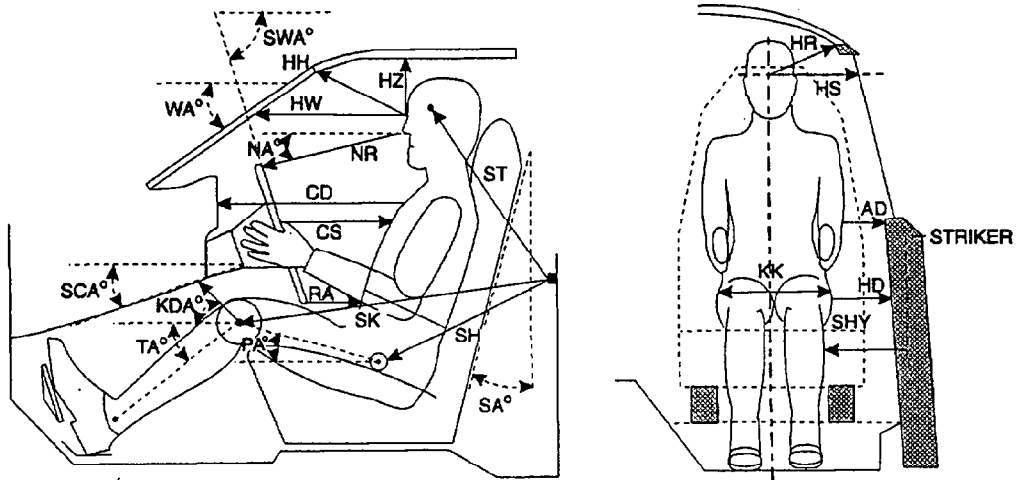


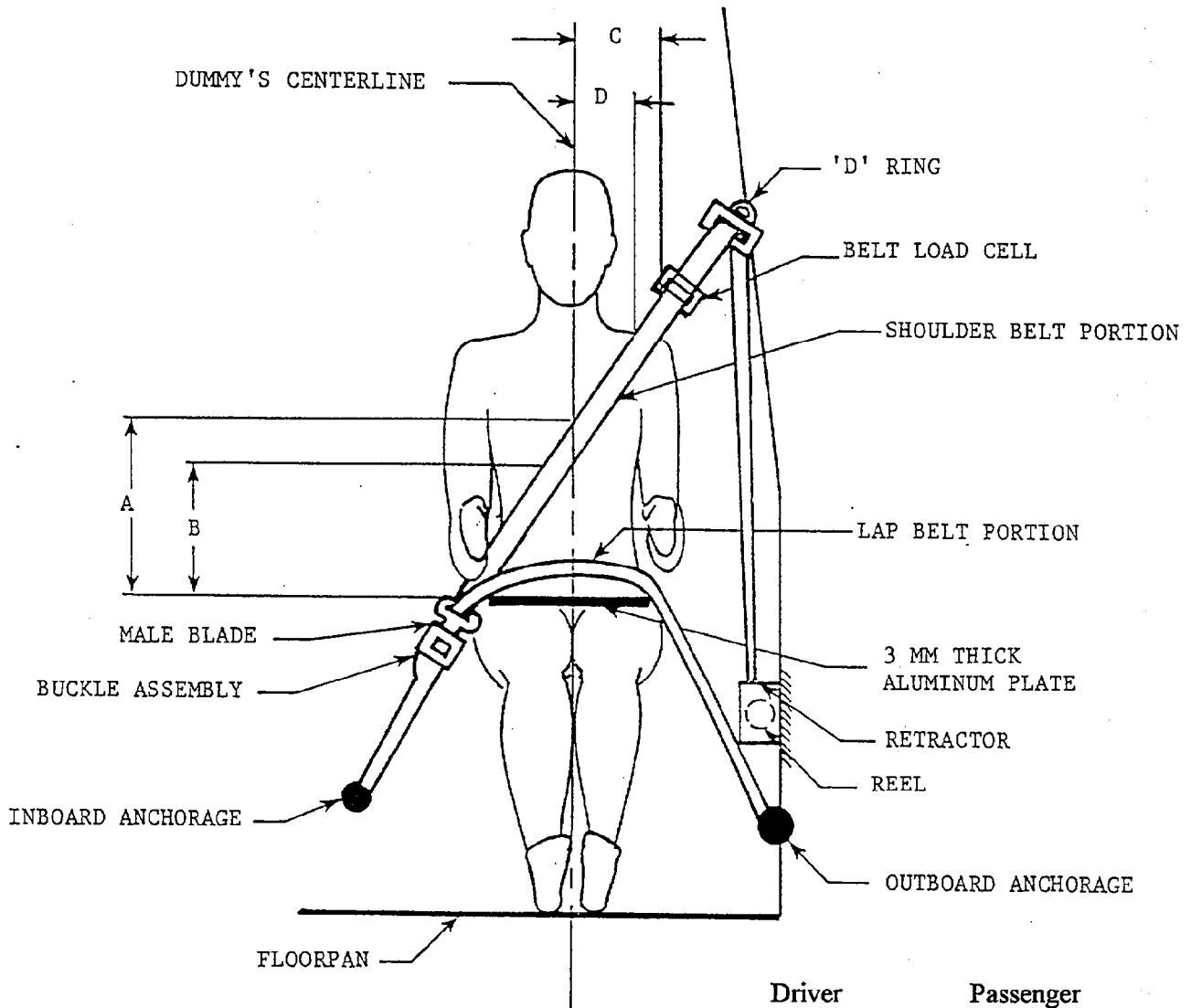
Table 12 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #142)	Passenger (Serial #192)
WA	Windshield angle	58°	58°
SWA	Steering wheel angle	24°	NA
SCA	Steering column angle	66°	NA
SA	Seat back angle	24°	24°
HZ	Head to roof	193 mm	187 mm
HH	Head to header	401 mm	349 mm
HW	Head to windshield	545 mm	522 mm
HR	Head to side header	208 mm	224 mm
NR	Nose to rim	388 mm	NA
NA	Nose to rim angle	15°	NA
CD	Chest to dash	530 mm	539 mm
CS	Steering wheel to chest	306 mm	NA
RA	Rim to abdomen	171 mm	NA
KDL	Left knee to dash	174 mm	149 mm
KDR	Right knee to dash	160 mm	152 mm
KDA	Outboard knee to dash angle	27°	26°
PA	Pelvic angle	24°	22.5°
TA	Tibial angle	45°	44°
KK	Knee to knee	303 mm	265 mm
ST ¹	Striker to head	567 mm	590 mm
	Striker to head angle	-85°	-81°
SK ¹	Striker to knee	578 mm	602 mm
	Striker to knee angle	4°	5°
SH ¹	Striker to H-point	211 mm	215 mm
	Striker to H-point angle	17°	15°
SHY	Striker to H-point (Y dir.)	171 mm	200 mm
HS	Head to side window	289 mm	298 mm
HD	H-point to door	114 mm	130 mm
AD	Arm to door	81 mm	91 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	345 mm	373 mm
B - Top surface of aluminum plate to belt lower edge	270 mm	298 mm
C - Dummy centerline to outer edge of belt at chest flesh top	133 mm	126 mm
D - Dummy centerline to inner edge of belt at chest flesh top	74 mm	67 mm
Lap belt tension	18 N	18 N
Shoulder belt tension	18 N	18 N
Position of adjustable belt anchorage	3rd of five	3rd of five

Figure 10 Camera Positions

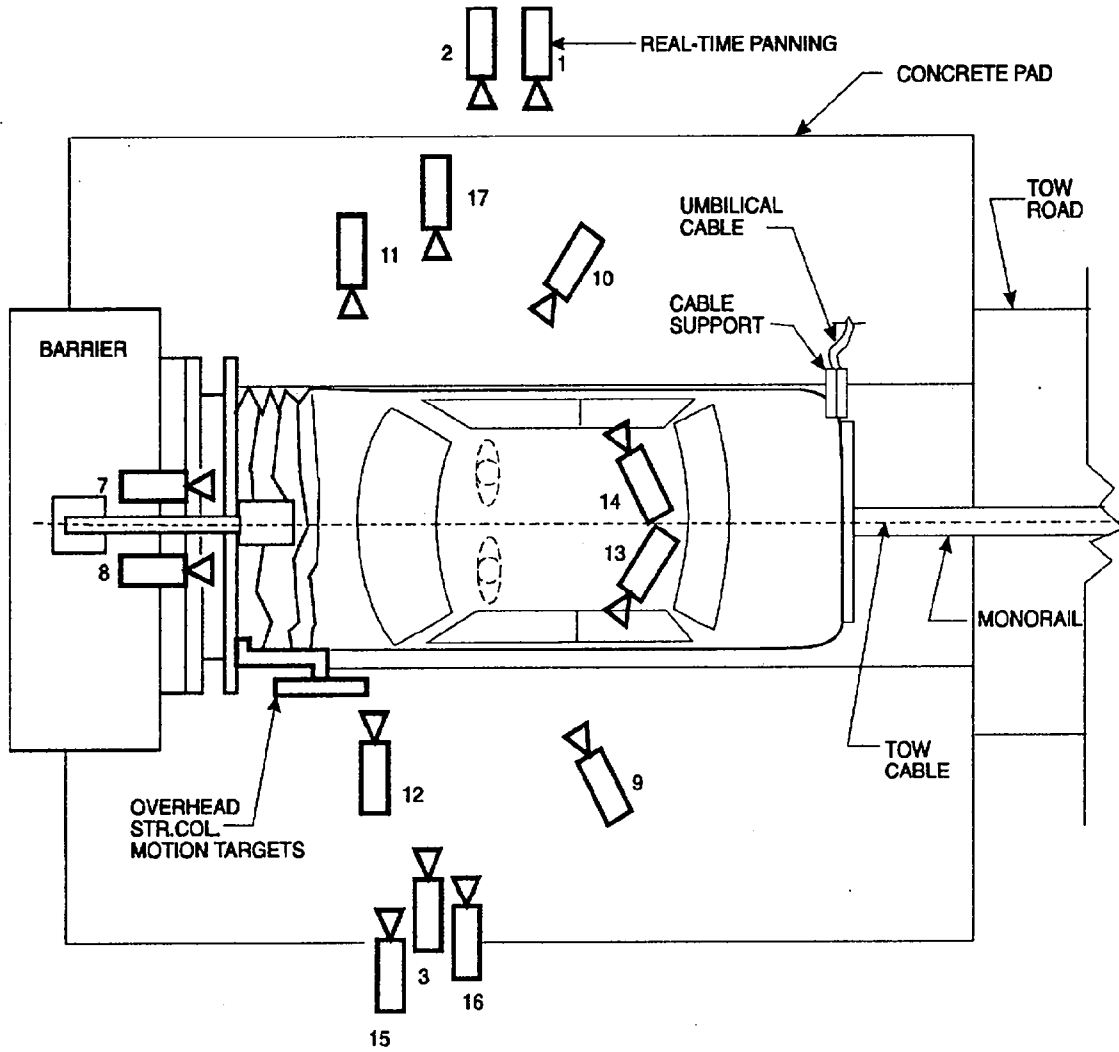


Figure 10 Camera Positions, Cont'd.

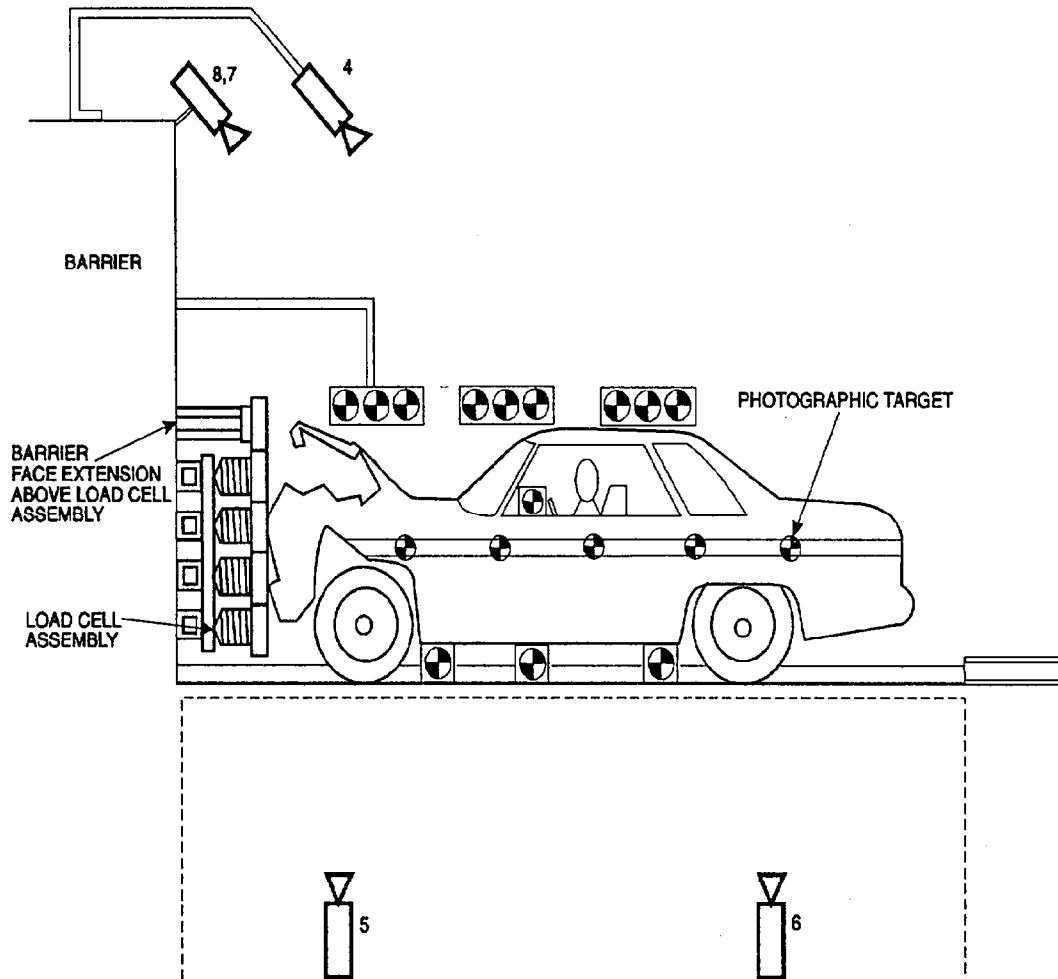


Table 13 Motion Picture Camera Locations

Test Number: 960328

Vehicle year/make/model/body style: 1996/Jeep/Grand Cherokee/4-door mpv

Camera Number	View	X	Y	Z	Angle ²	Film Plane to Head Target	Lens	Film Speed
1	Real-time panning	-3607 mm	-2802 mm	1549 mm	NA	NA mm	16 mm	24 frames/s
2	Vehicle crush	-2065 mm	-6767 mm	942 mm	-2°	NA mm	13 mm	480 frames/s
3	Dummy kinematics	-1054 mm	7493 mm	1118 mm	-12°	6858 mm	25 mm	1000 frames/s
4	Windshield damage	-925 mm	0 mm	2489 mm	-40°	NA mm	13 mm	500 frames/s
5	Crush & fluid spillage	-1283 mm	0 mm	-2347 mm	90°	NA mm	13 mm	998 frames/s
6	Fluid spillage	-2522 mm	0 mm	-2515 mm	90°	NA mm	13 mm	1002 frames/s
7	Passenger kinematics	-114 mm	-351 mm	2159 mm	-40°	NA mm	17 mm	498 frames/s
8	Driver kinematics	-173 mm	368 mm	2159 mm	-41°	NA mm	17 mm	500 frames/s
9	Driver kinematics	-4572 mm	1854 mm	2591 mm	-27°	2438 mm	25 mm	492 frames/s
10	Passenger kinematics	-4674 mm	-1880 mm	2540 mm	-26°	2388 mm	25 mm	508 frames/s
11	Windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA mm	50 mm	505 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	NA	498 frames/s
14	Passenger seat belt movement	NA	NA	NA	NA	NA	NA	498 frames/s
15	Column movement	-3353 mm	7264 mm	2616 mm	-14°	NA mm	25 mm	500 frames/s
16	Column movement	-3353 mm	7264 mm	1908 mm	-9°	NA mm	25 mm	505 frames/s
17	Passenger kinematics	-986 mm	-5354 mm	1151 mm	7°	6579 mm	25 mm	NA ³ frames/s

1 +X = Film plane forward of barrier face
 +Y = Film plane to left of monorail centerline
 +Z = Film plane above ground level
 2 +Angle = Film plane angled upward from horizontal plane
 3 Camera malfunctioned and did not run.

Figure 11 Vehicle Target Locations

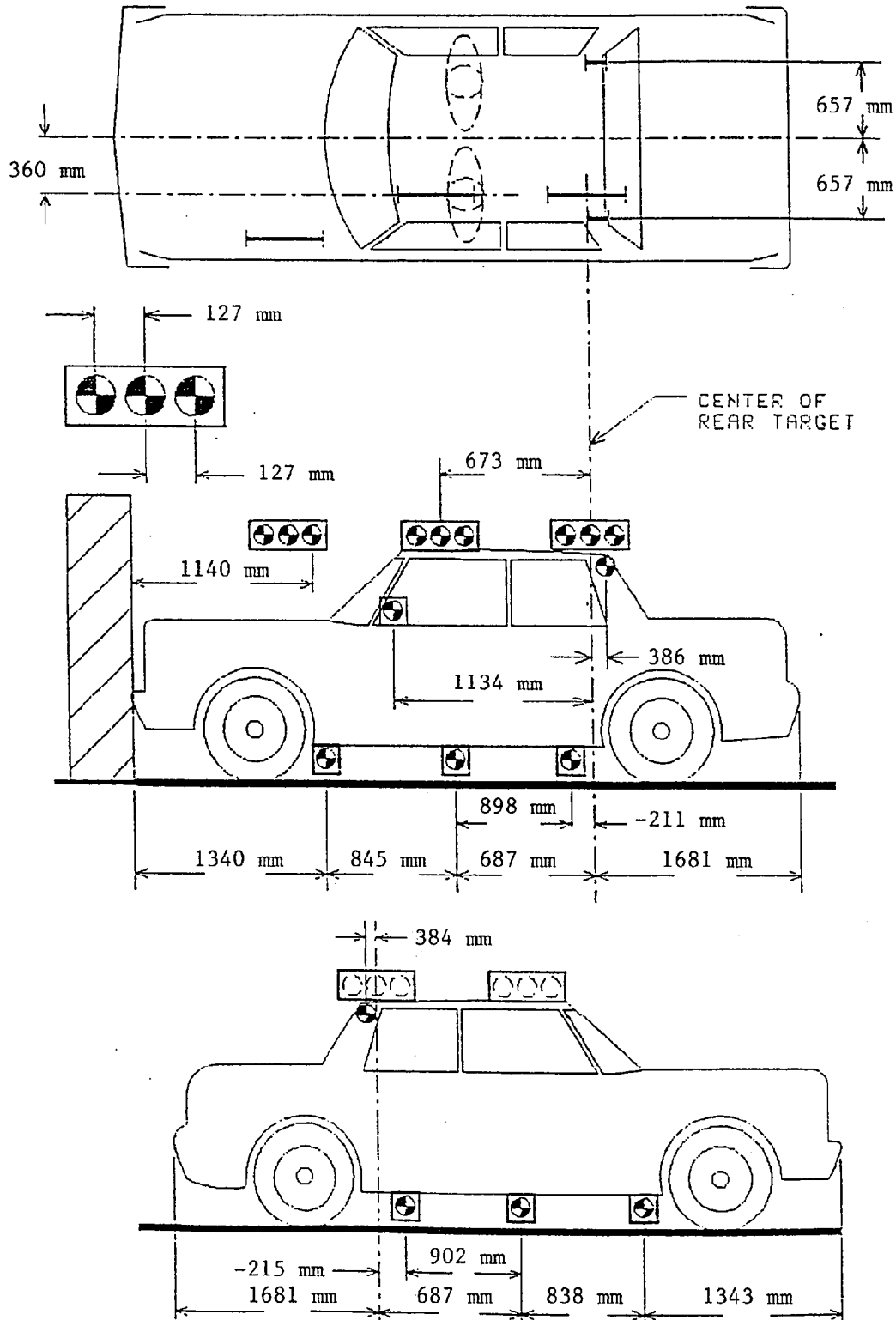


Figure 12 Pre-Test And Post-Test Measurement Points

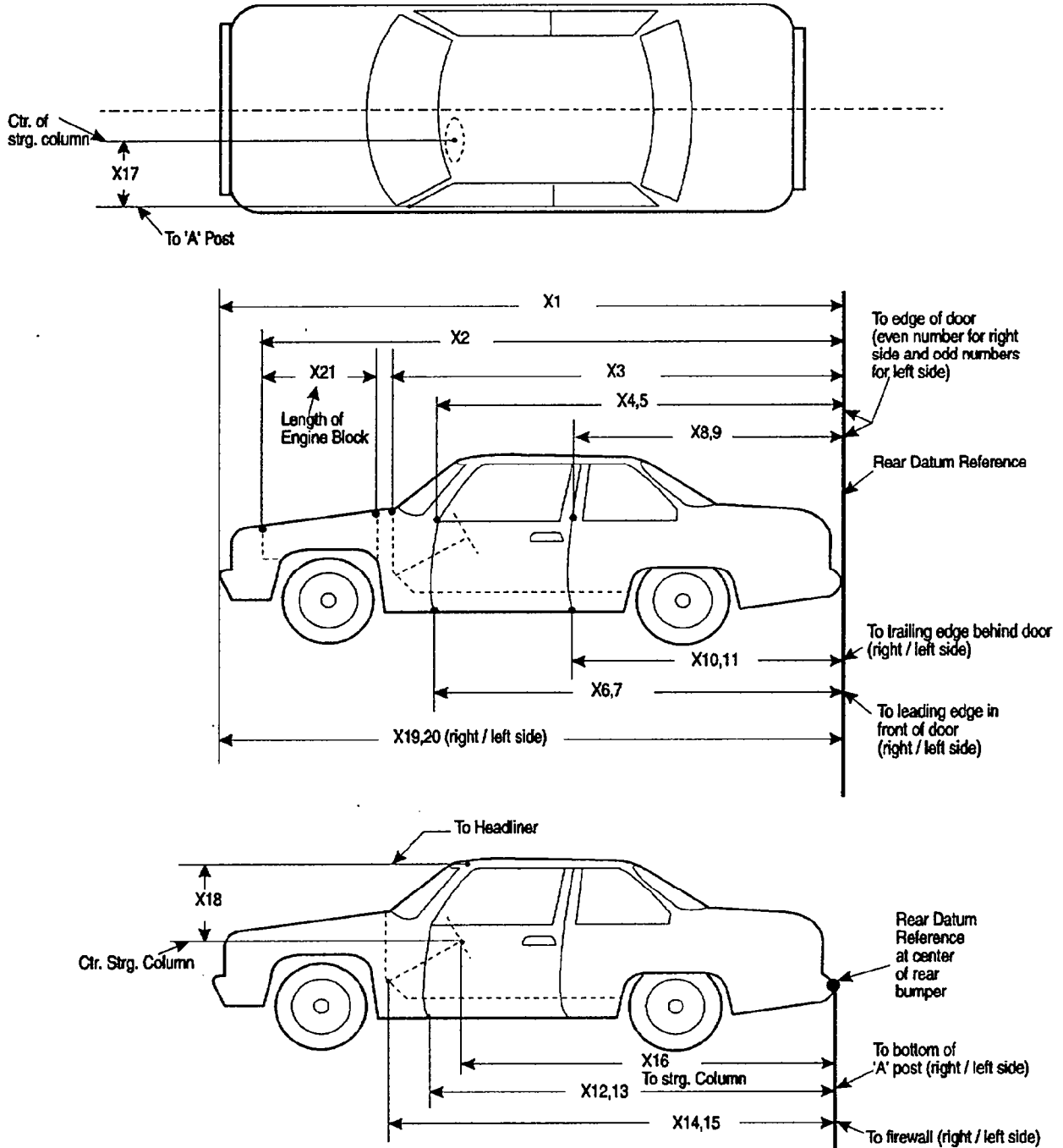


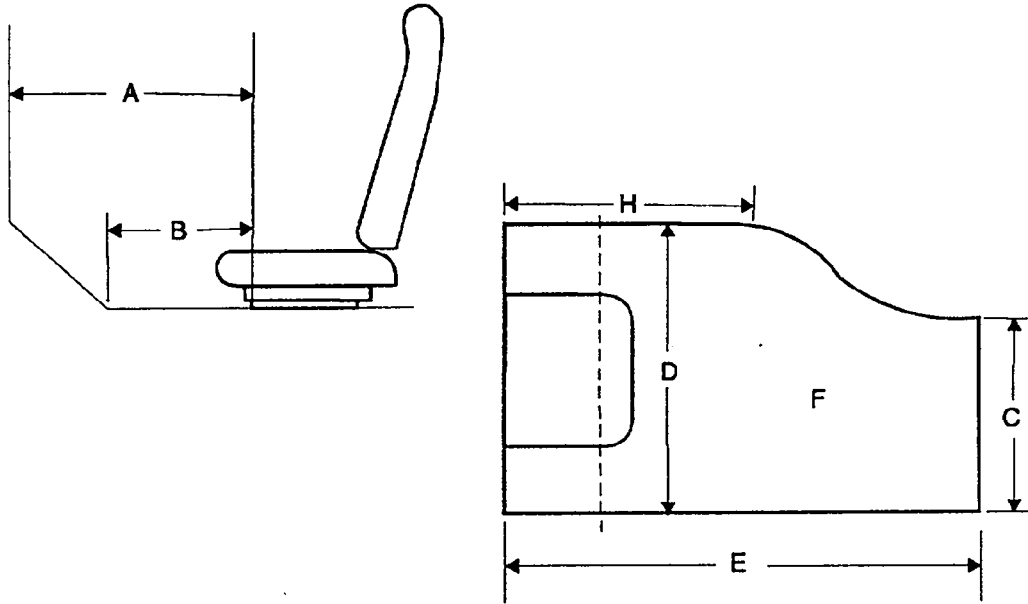
Table 14 Impacted Vehicle Measurements

Vehicle Make/Model: Jeep Grand/Cherokee

Test Number: 960328

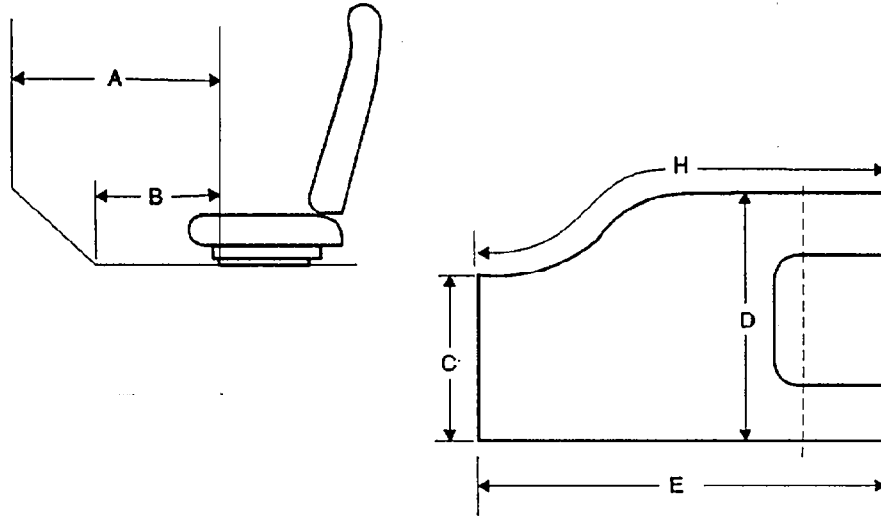
No.	Type of measurement	Pre-test	Post-test	Diff.
X1	Total length of vehicle at centerline	4550 mm	4084 mm	466 mm
X2	Rear surface of vehicle to front of engine block	4000 mm	3702 mm	298 mm
X3	Rear surface of vehicle to firewall	3479 mm	3337 mm	142 mm
X4	Rear surface of vehicle to upper leading edge of right door	3145 mm	3131 mm	14 mm
X5	Rear surface of vehicle to upper leading edge of left door	3145 mm	3125 mm	20 mm
X6	Rear surface of vehicle to lower leading edge of right door	3110 mm	3086 mm	24 mm
X7	Rear surface of vehicle to lower leading edge of left door	3110 mm	3074 mm	36 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2070 mm	2060 mm	10 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2070 mm	2057 mm	13 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2047 mm	2015 mm	32 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2047 mm	2025 mm	22 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3096 mm	3069 mm	27 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3096 mm	3078 mm	18 mm
X14	Rear surface of vehicle to firewall - right side	3468 mm	3310 mm	158 mm
X15	Rear surface of vehicle to firewall - left side	3425 mm	3370 mm	55 mm
X16	Rear surface of vehicle to steering wheel center	2640 mm	2626 mm	14 mm
X17	Center of steering column to "A" post	303 mm	270 mm	33 mm
X18	Center of steering column to headliner	463 mm	303 mm	160 mm
X19	Rear surface of vehicle to right side of front bumper	4458 mm	4082 mm	376 mm
X20	Rear surface of vehicle to left side of front bumper	4450 mm	3958 mm	492 mm
X21	Length of engine block	660 mm	660 mm	0 mm

**Figure 13 Static Footwell Deformation
(Driver's Side)**



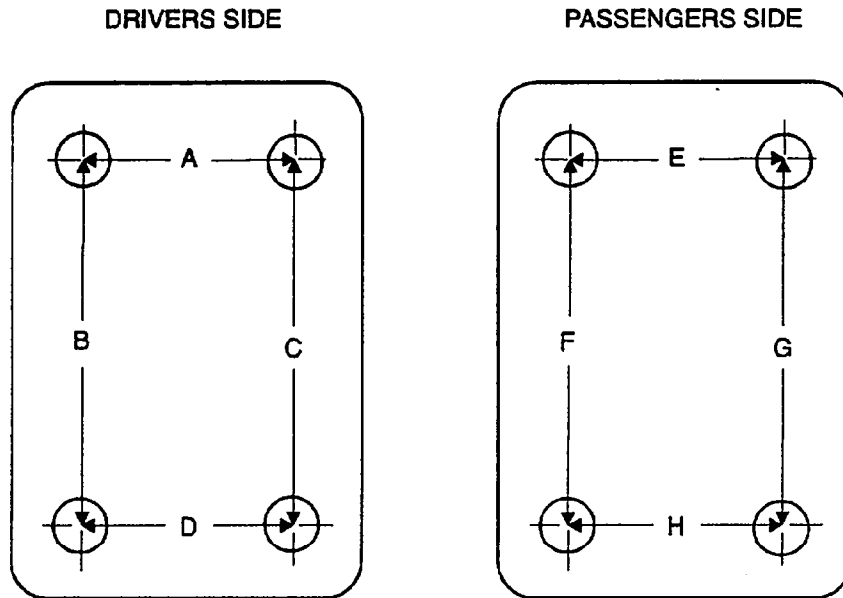
Measurement	Pre-Test	Post-Test	Difference
A	771 mm	743 mm	28 mm
B	542 mm	538 mm	4 mm
C	333 mm	321 mm	12 mm
D	345 mm	239 mm	106 mm
E	1195 mm	843 mm	352 mm
H	943 mm	896 mm	47 mm

**Figure 14 Static Footwell Deformation
(Passenger's Side)**



Measurement	Pre-Test	Post-Test	Difference
A	752 mm	701 mm	51 mm
B	495 mm	465 mm	30 mm
C	295 mm	265 mm	30 mm
D	345 mm	270 mm	75 mm
E	1129 mm	861 mm	268 mm
H	1100 mm	892 mm	208 mm

Figure 15 Underbody Floorboard Deformation



Measurement	Pre-Test	Post-Test	Difference
A	379 mm	390 mm	-11 mm
B	455 mm	463 mm	-8 mm
C	495 mm	498 mm	-3 mm
D	319 mm	285 mm	34 mm
E	356 mm	377 mm	-21 mm
F	523 mm	492 mm	31 mm
G	546 mm	548 mm	-2 mm
H	405 mm	408 mm	-3 mm

Appendix A

Photographs

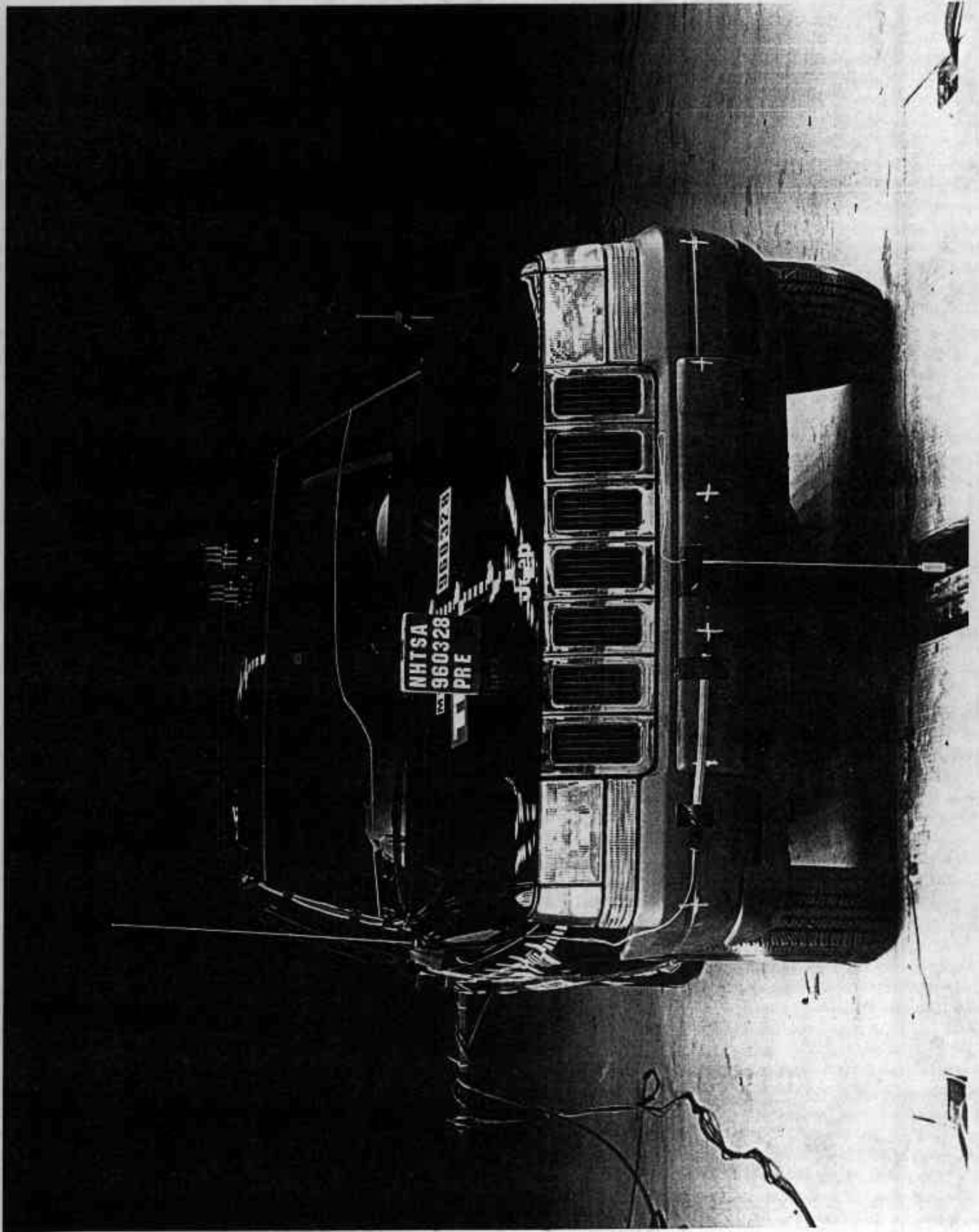


Figure A-1 Pre-Test Front View

A-2

960328

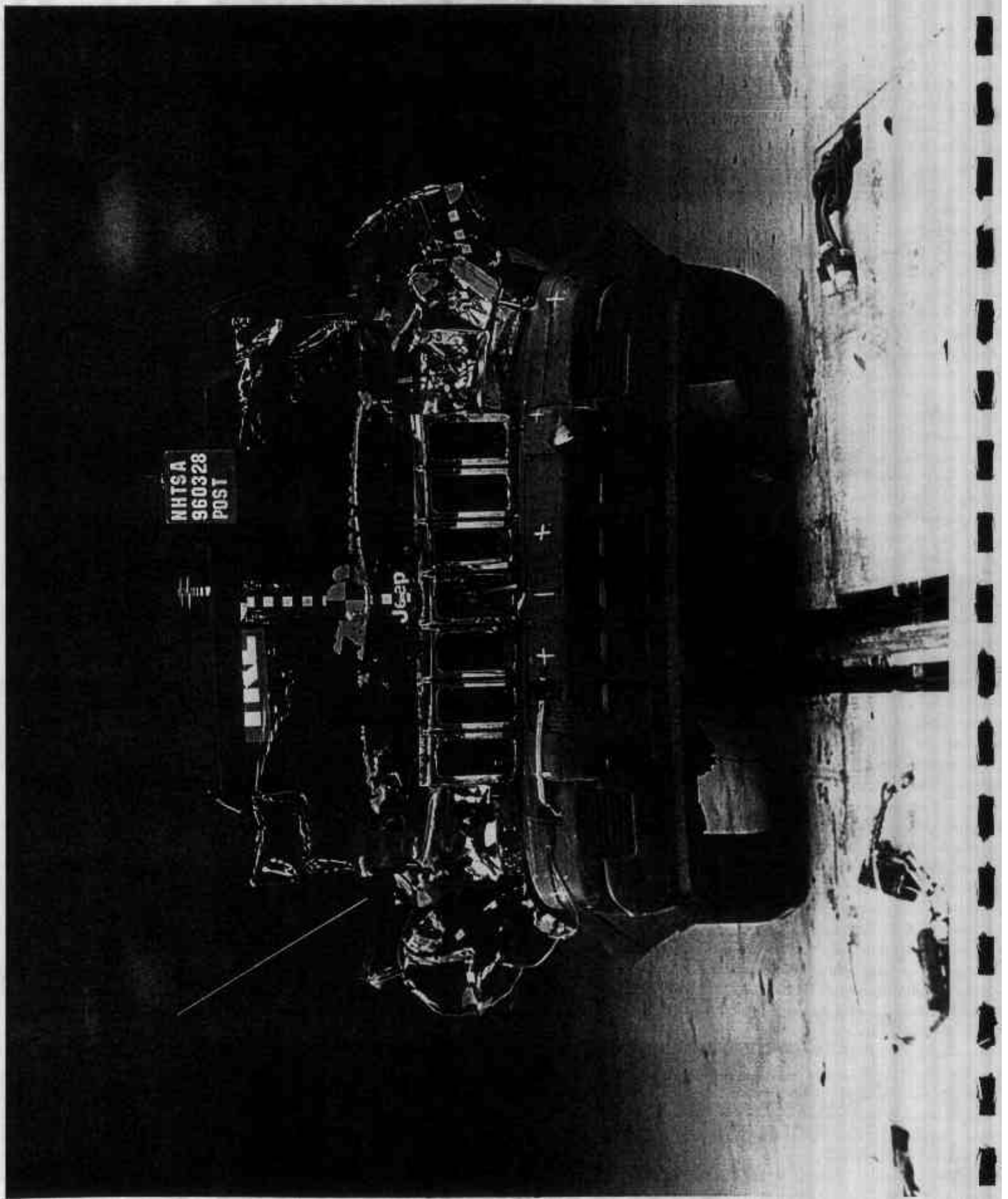


Figure A-2 Post-Test Front View

A-3

960328

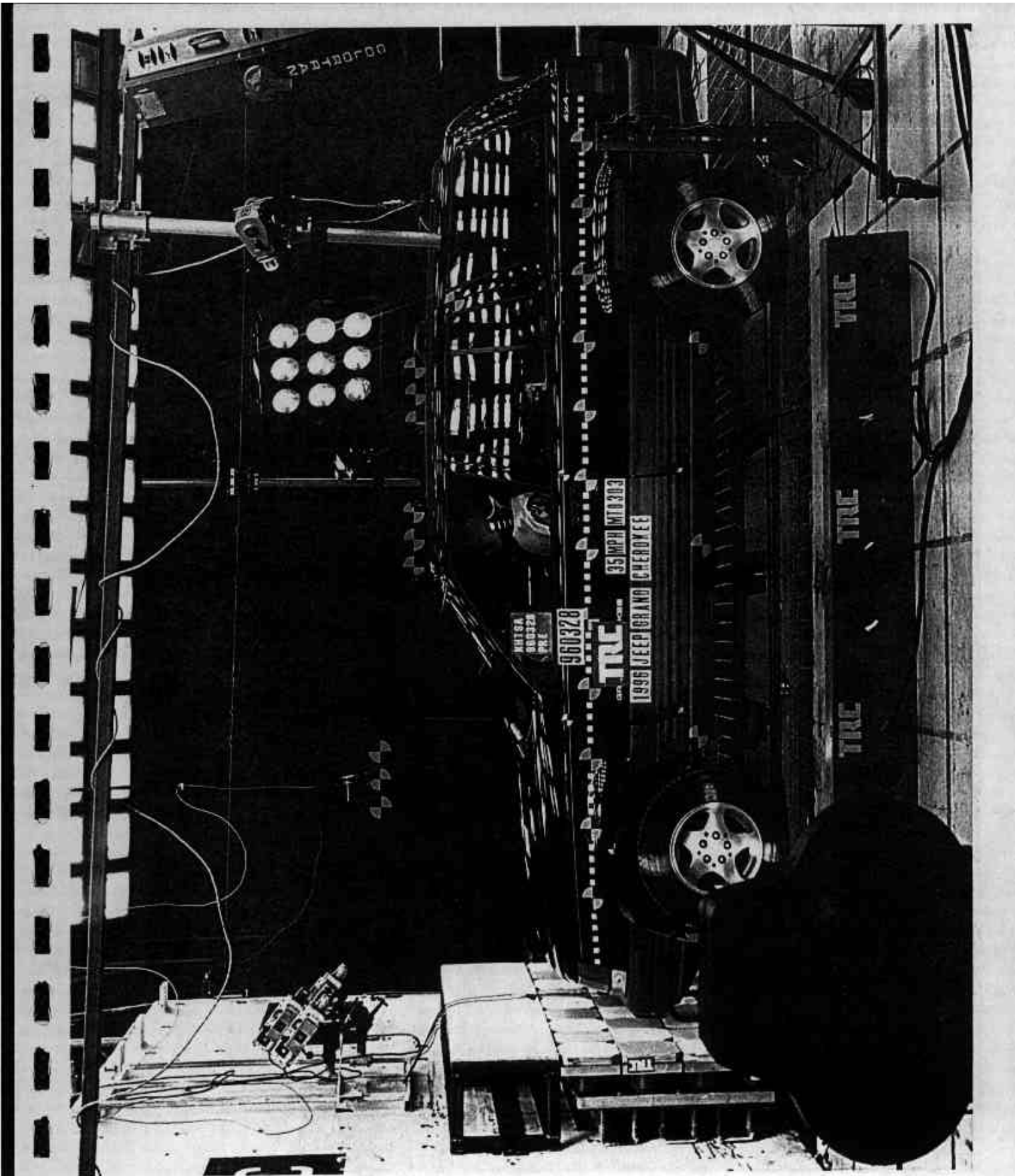


Figure A-3 Pre-Test Left Side View

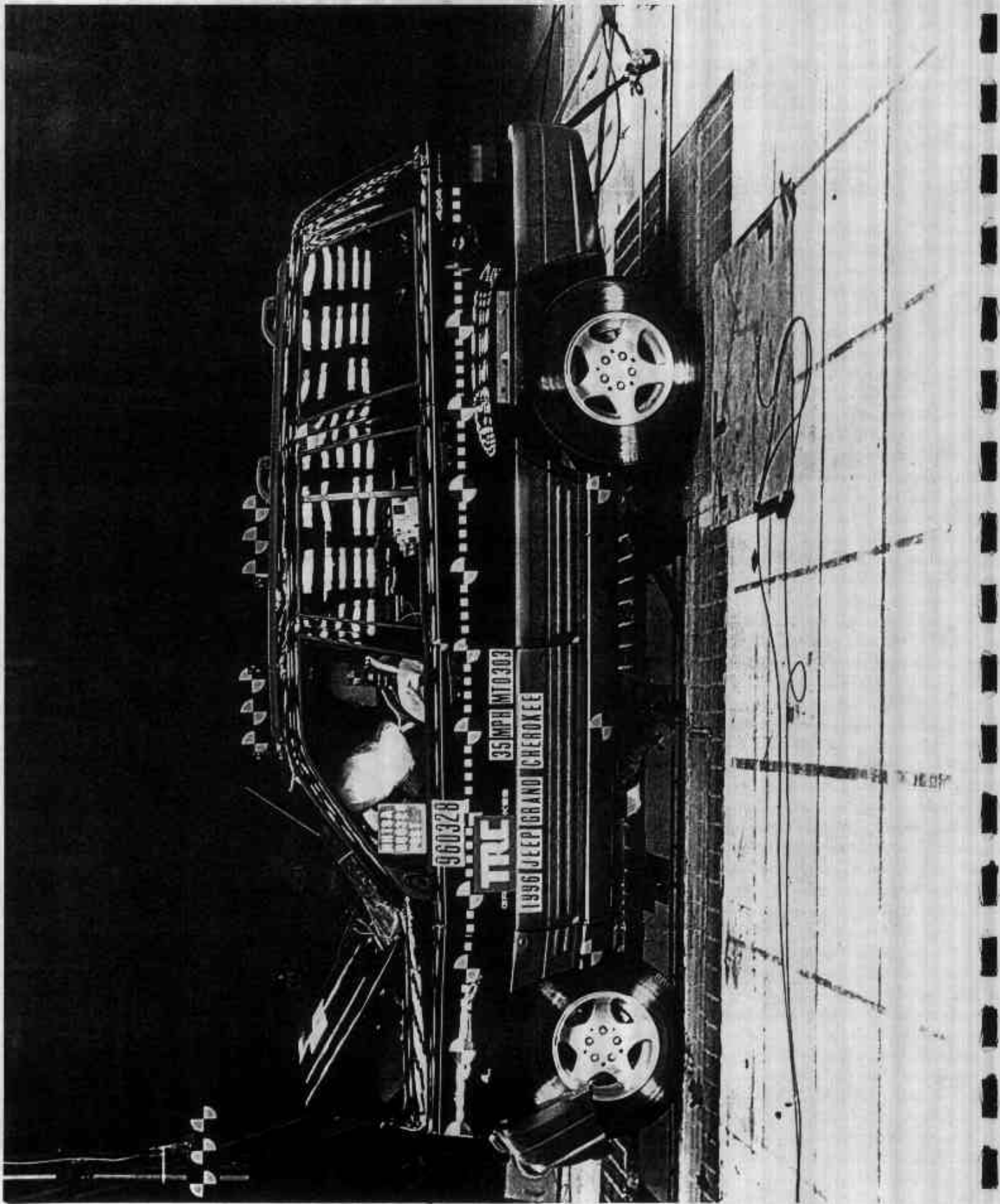


Figure A-4 Post-Test Left Side View

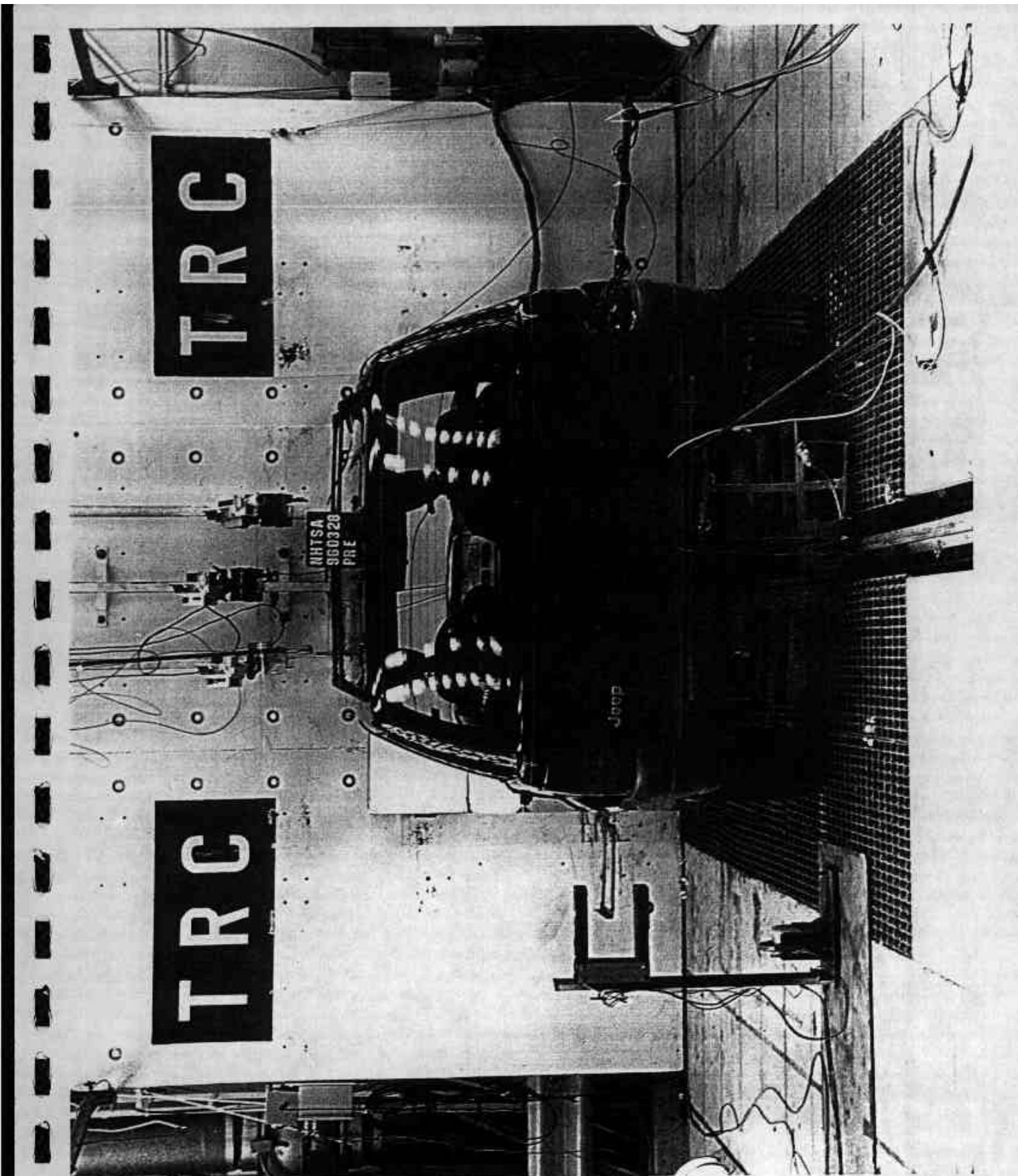


Figure A-5 Pre-Test Rear View

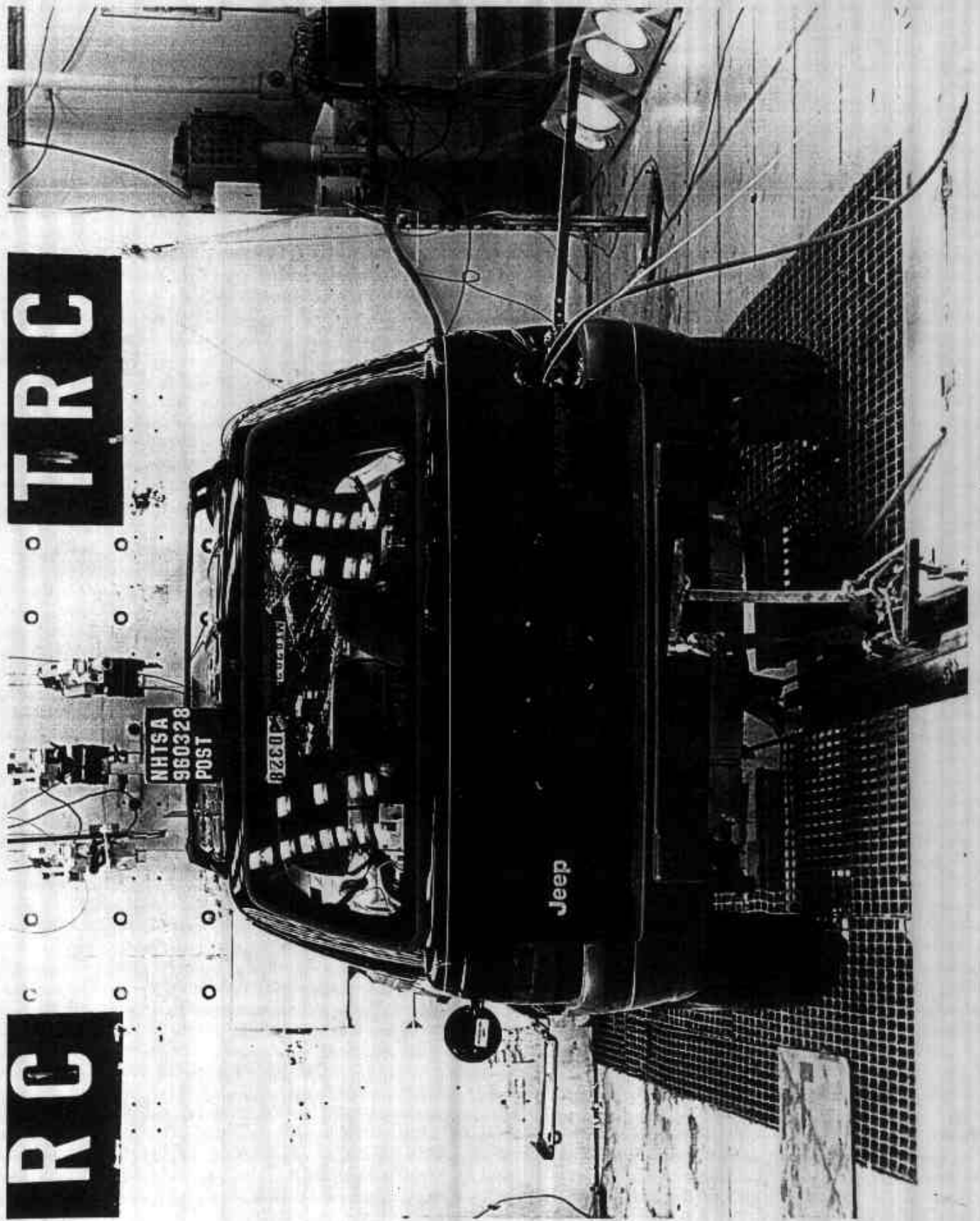


Figure A-6 Post-Test Rear View

A-7

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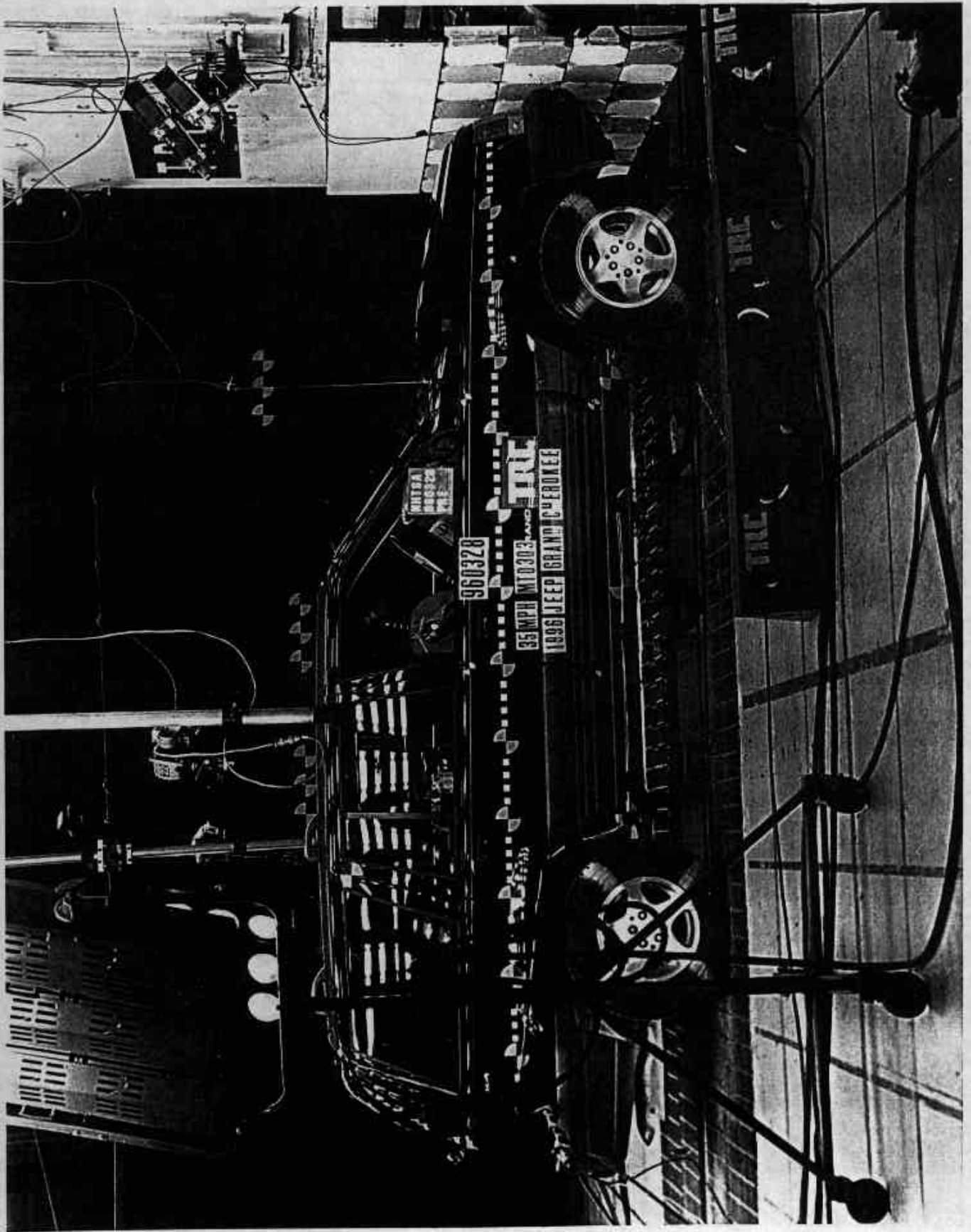


Figure A-7 Pre-Test Right Side View

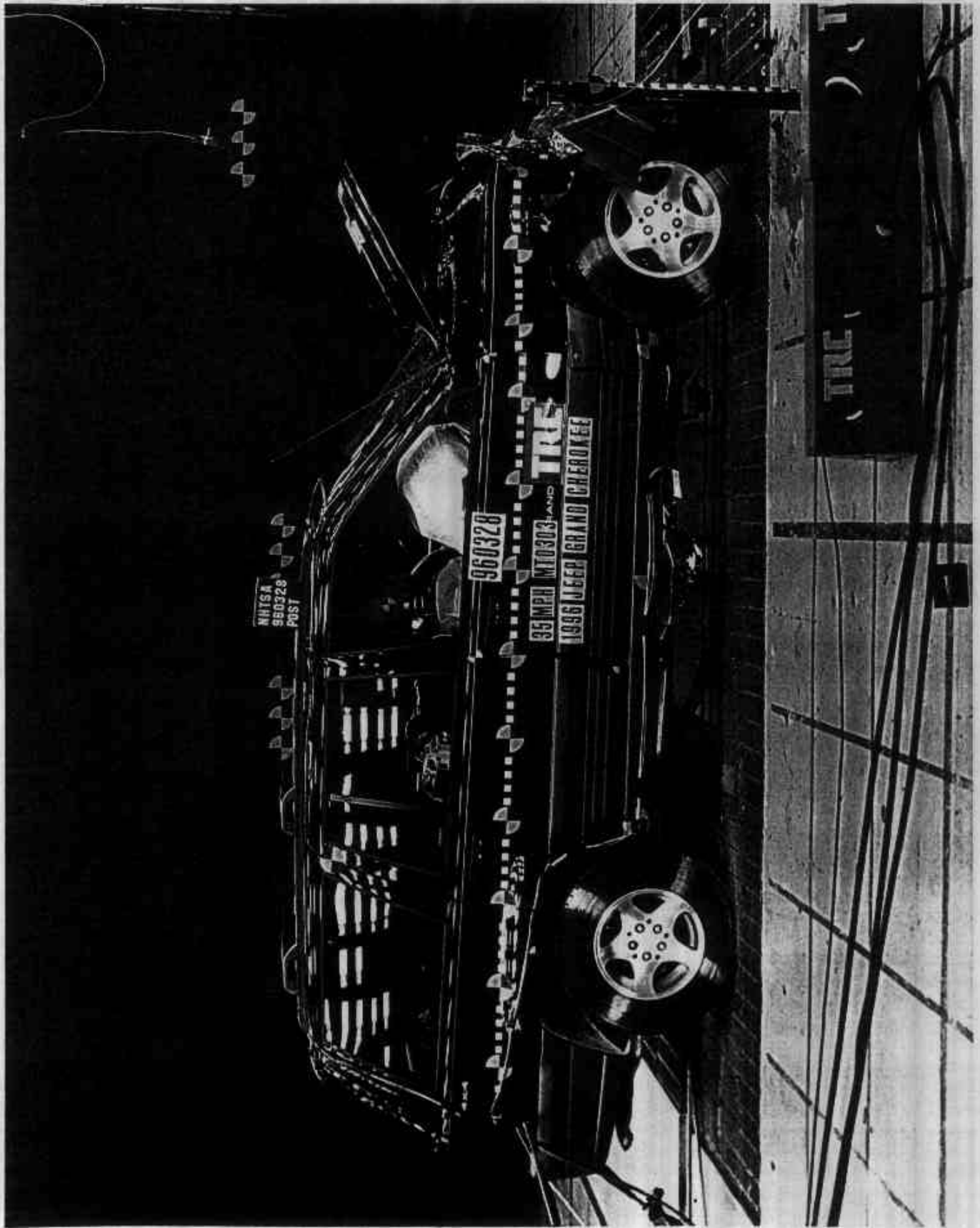


Figure A-8 Post-Test Right Side View

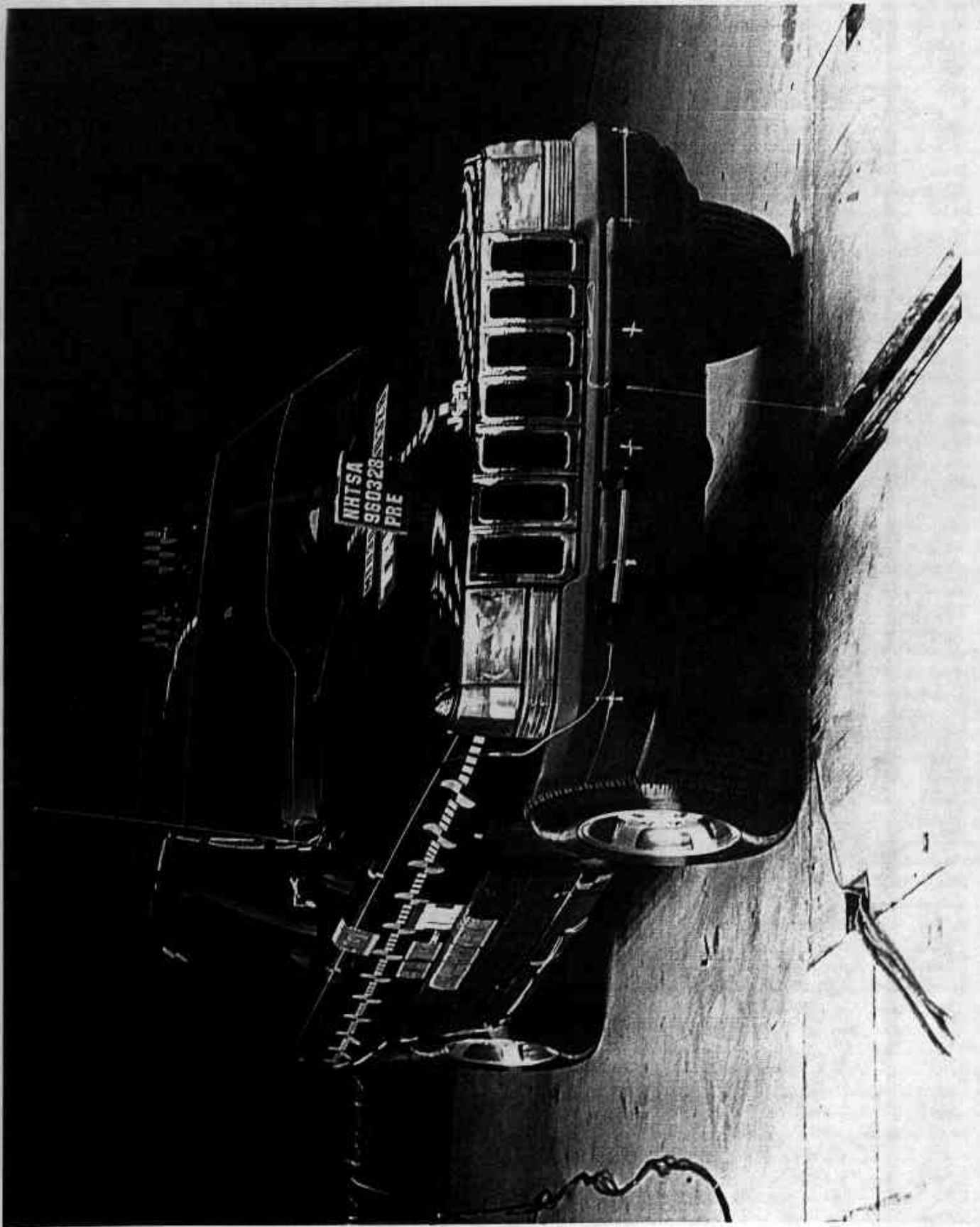


Figure A-9 Pre-Test Right Front Three-Quarter View

A-10

960328

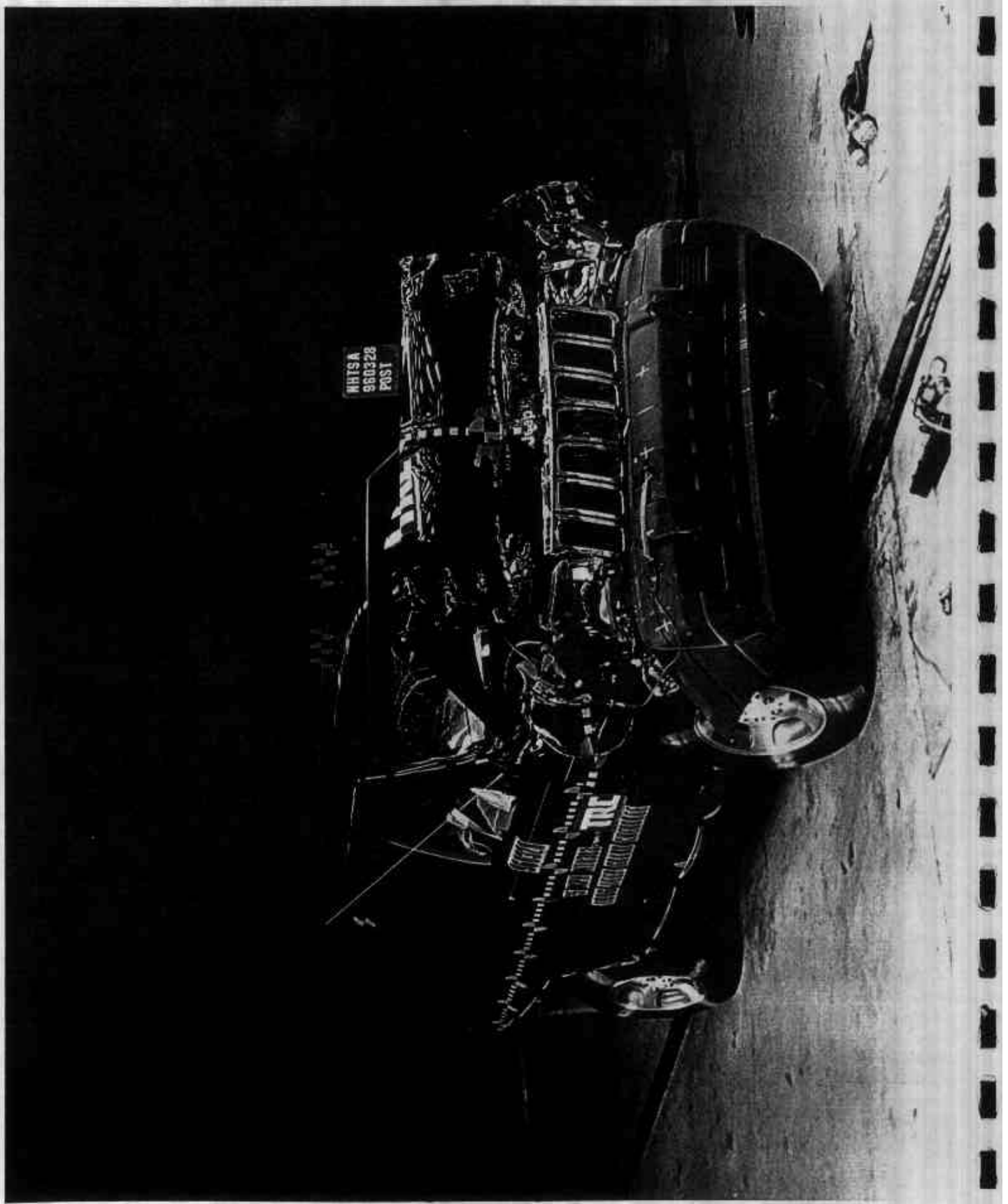


Figure A-10 Post-Test Right Front Three-Quarter View

A-11

960328

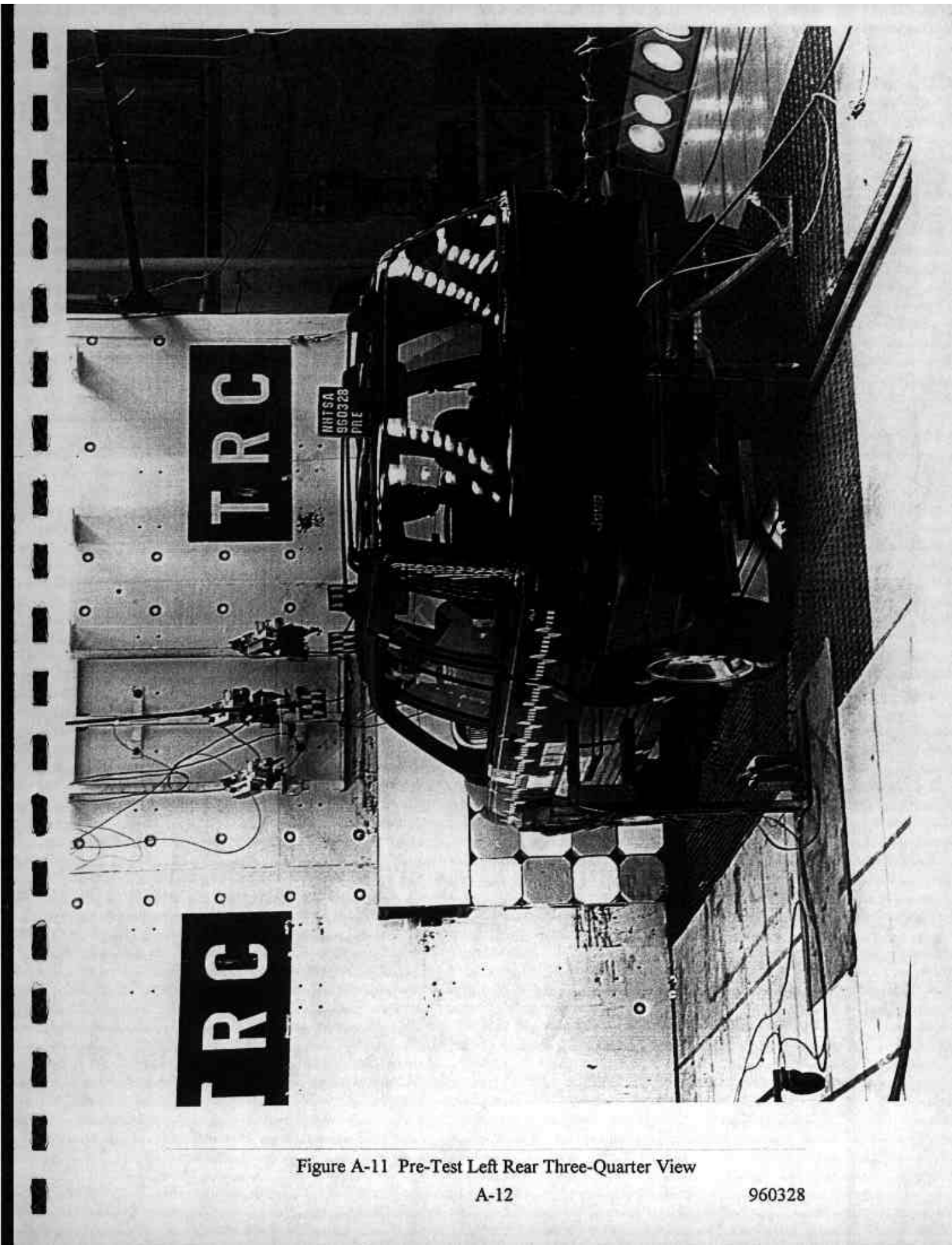


Figure A-11 Pre-Test Left Rear Three-Quarter View

A-12

960328

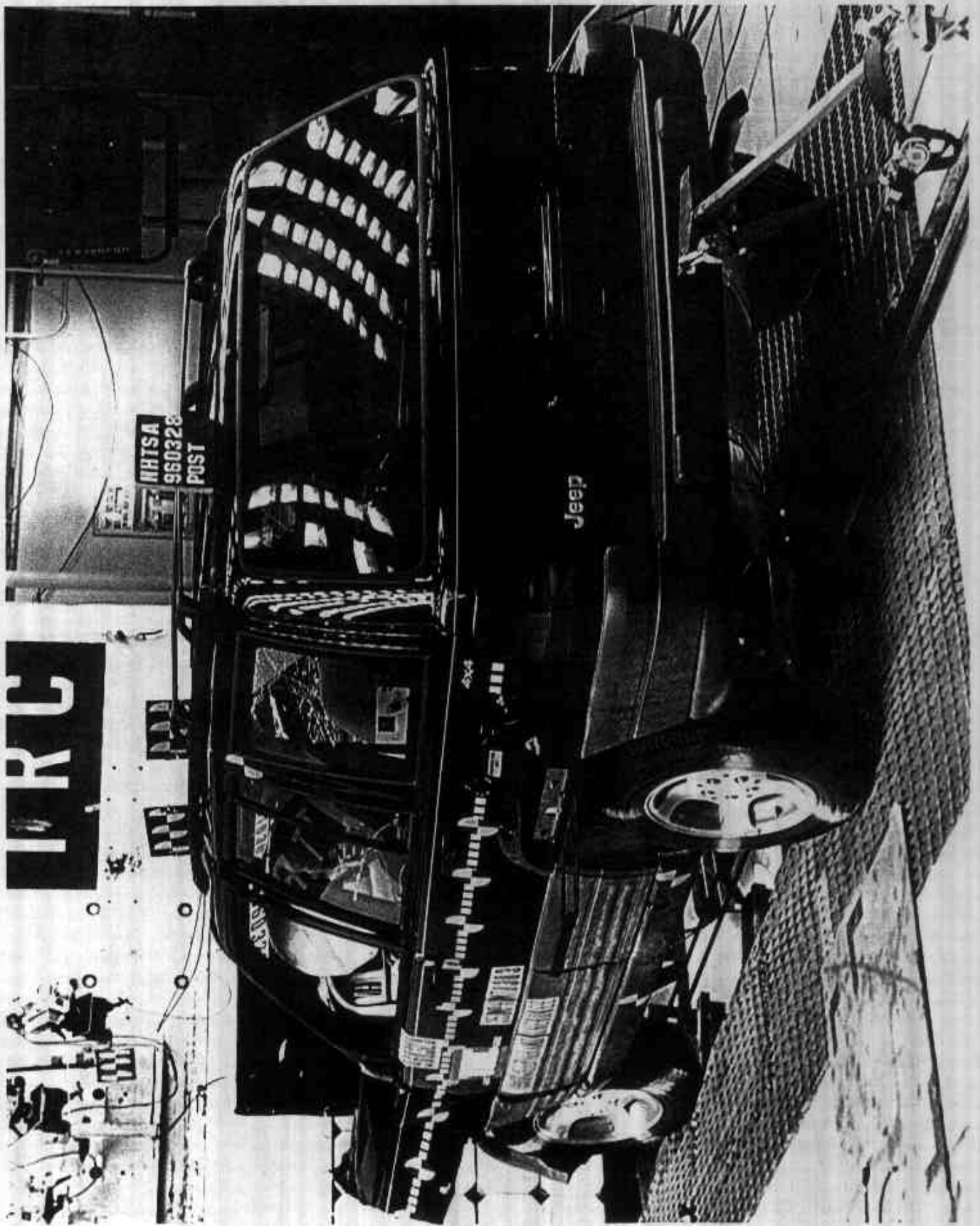


Figure A-12 Post-Test Left Rear Three-Quarter View

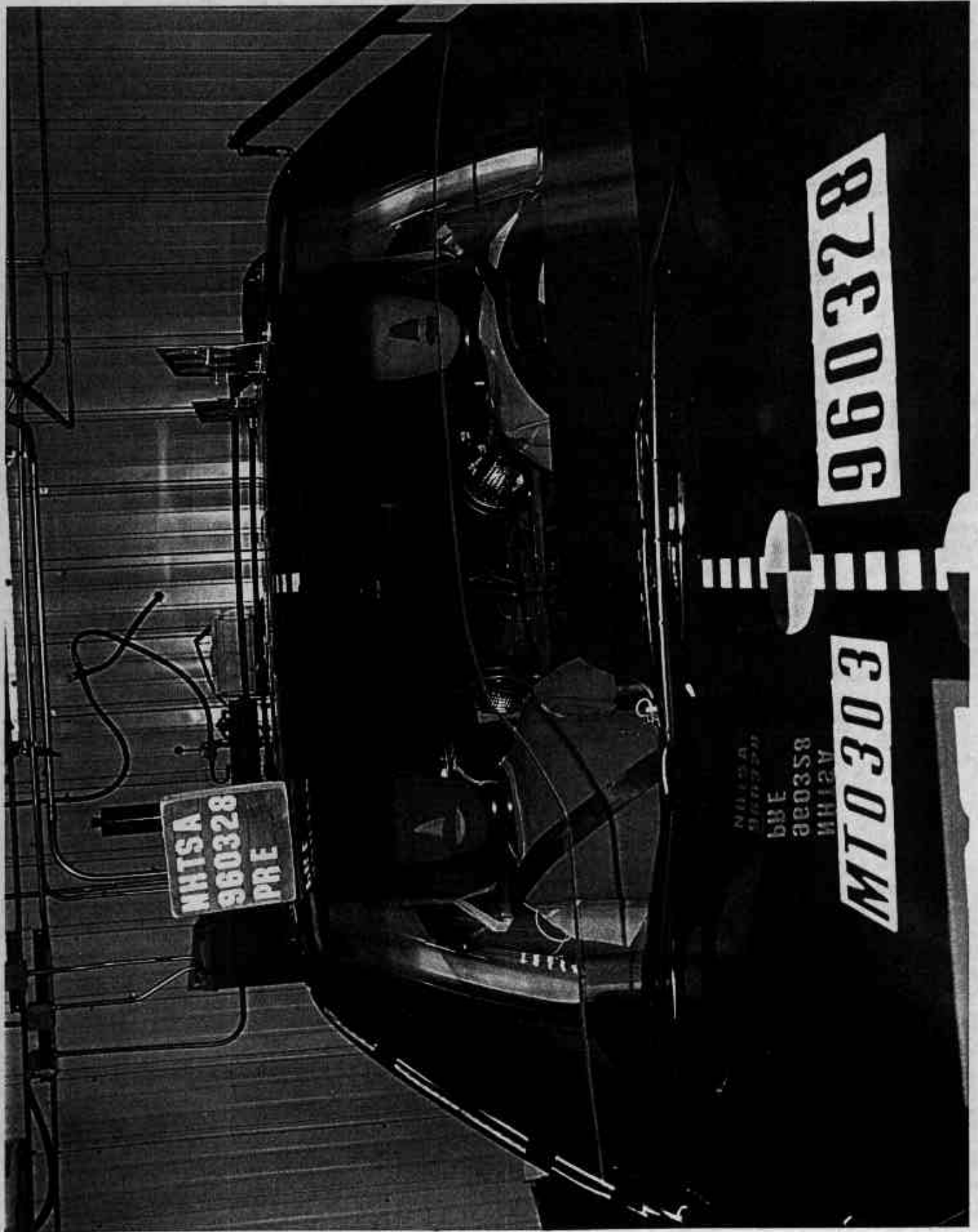


Figure A-13 Pre-Test Windshield View

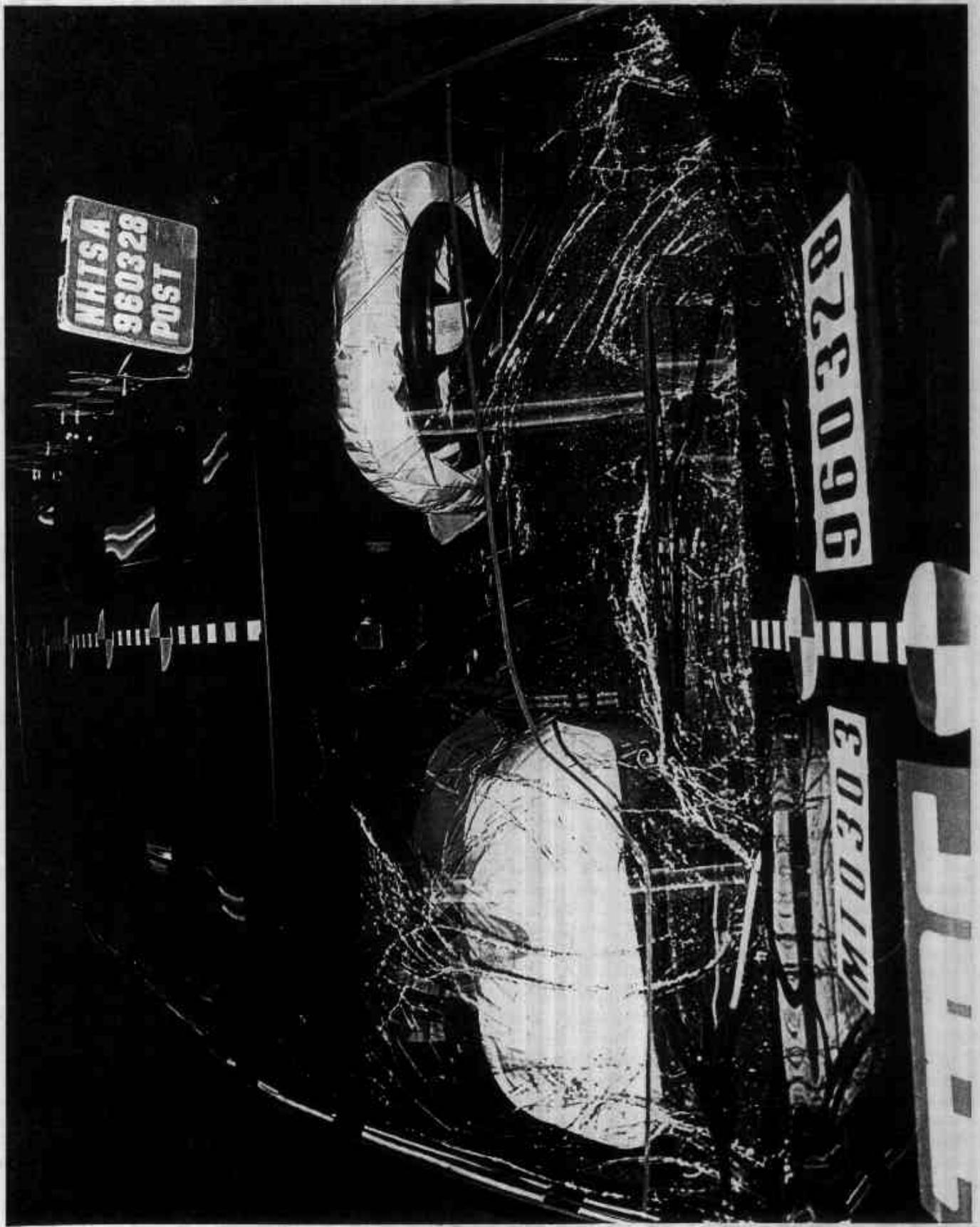


Figure A-14 Post-Test Windshield View

A-15

960328

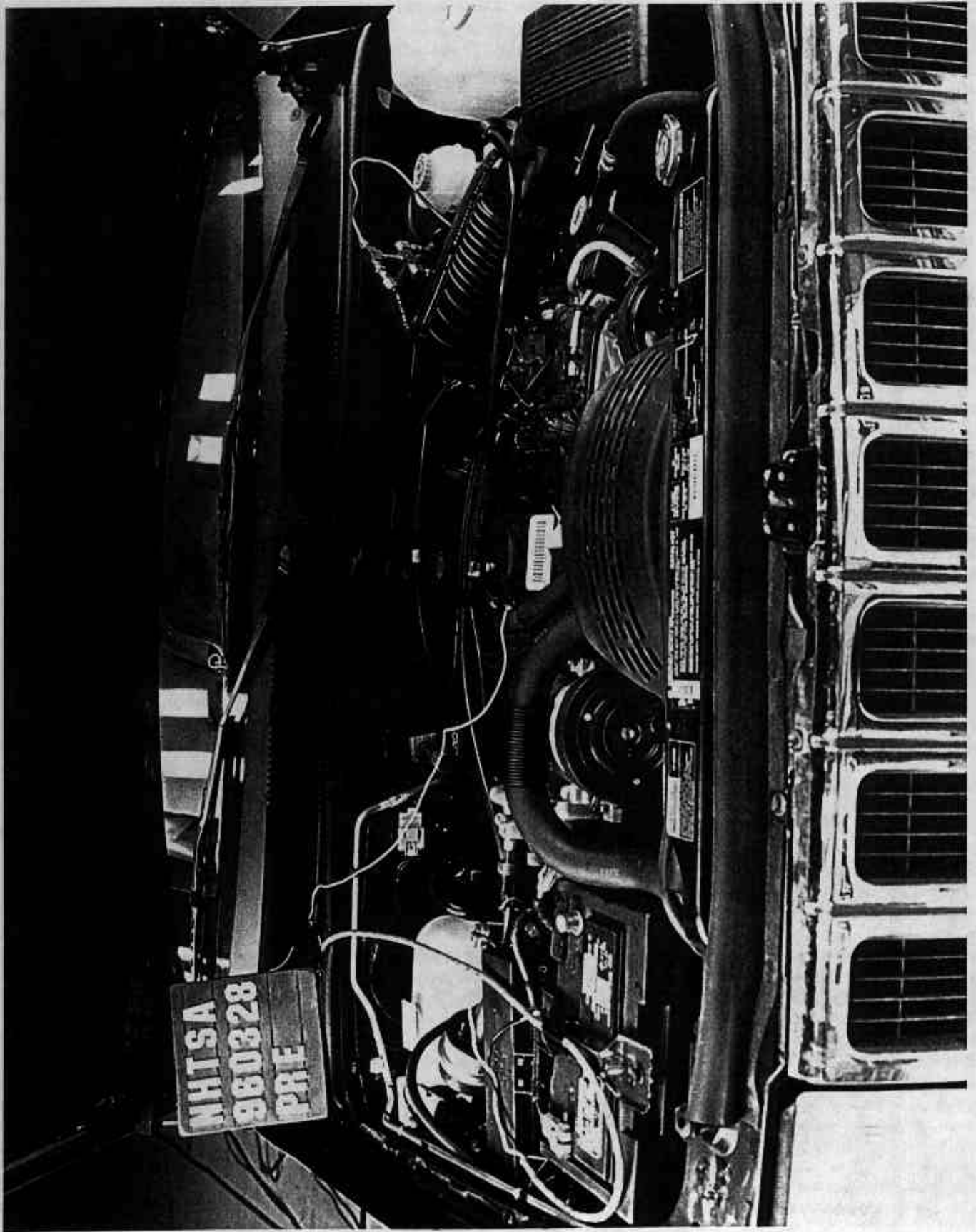


Figure A-15 Pre-Test Engine Compartment View

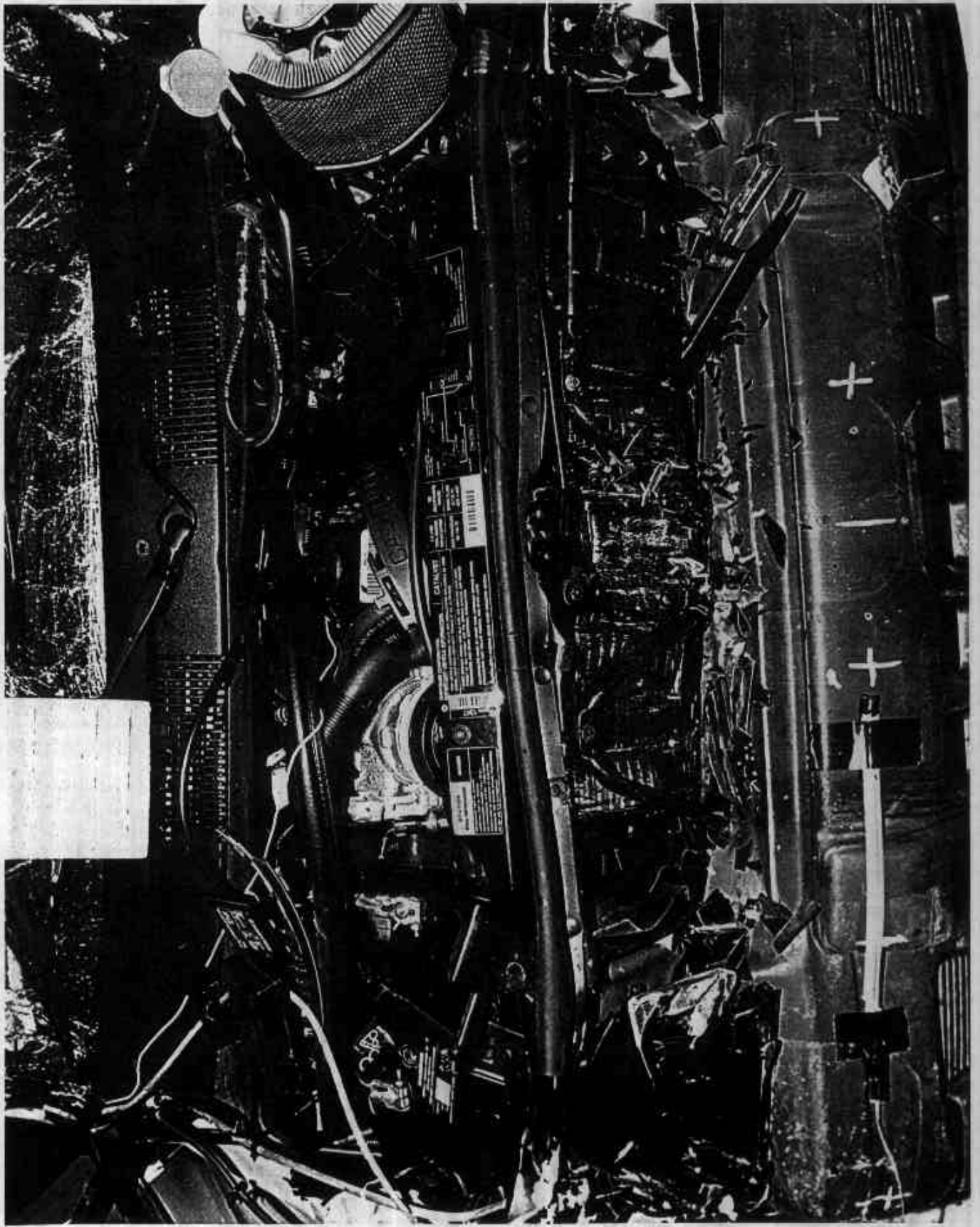


Figure A-16 Post-Test Engine Compartment View

A-17

960328

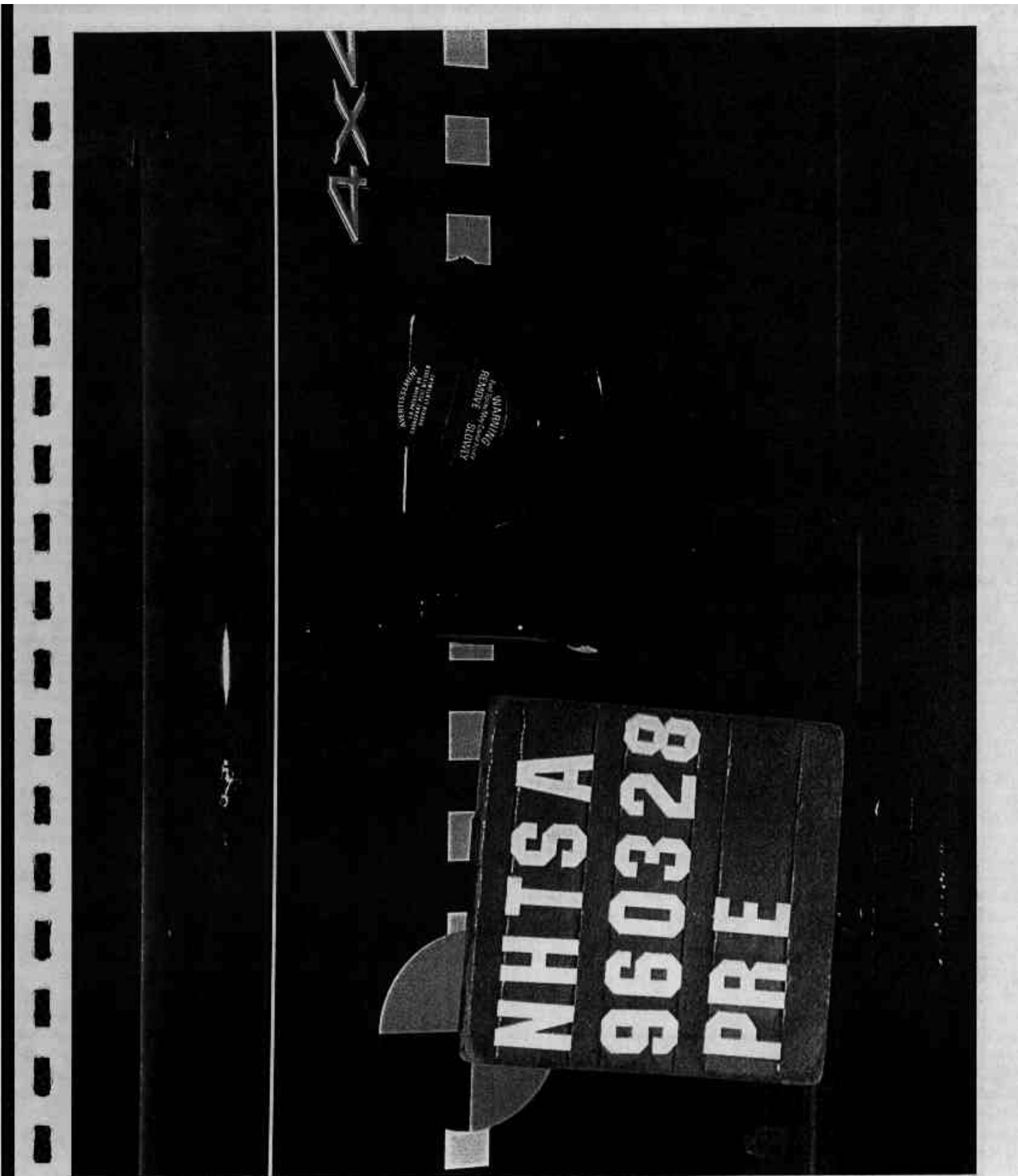


Figure A-17 Pre-Test Fuel Filler Cap View

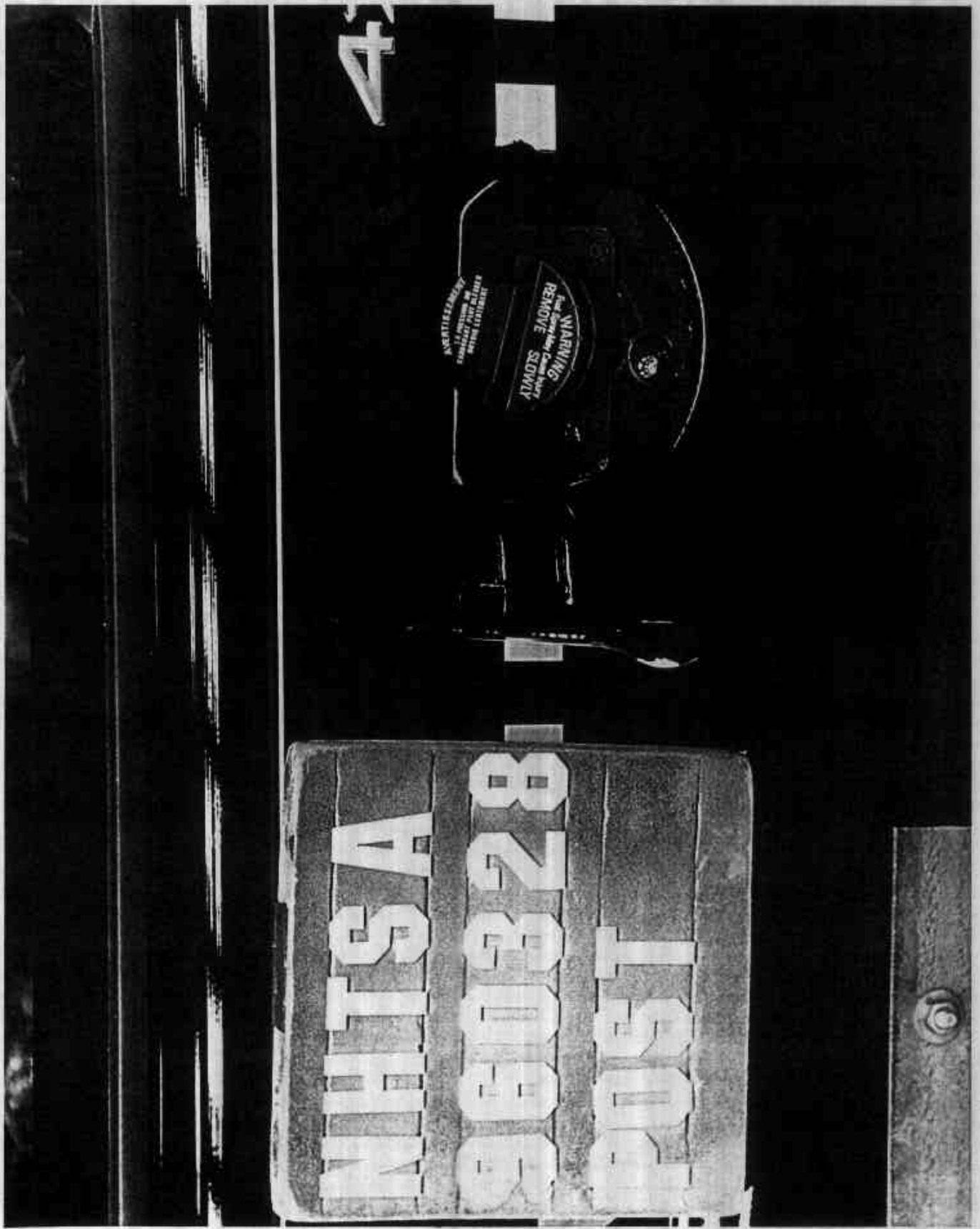


Figure A-18 Post-Test Fuel Filler Cap View

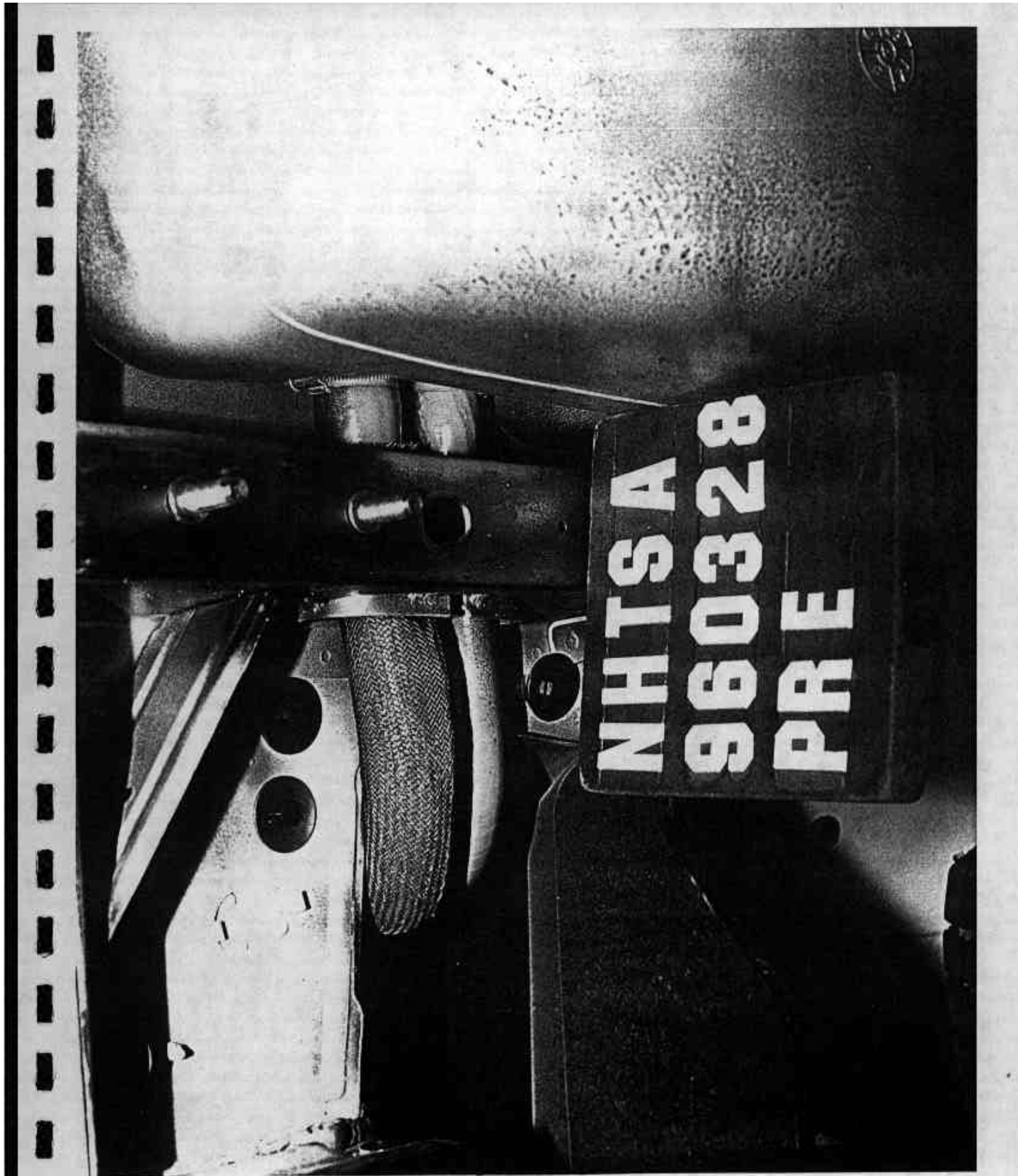


Figure A-19 Pre-Test Fuel Filler Neck View

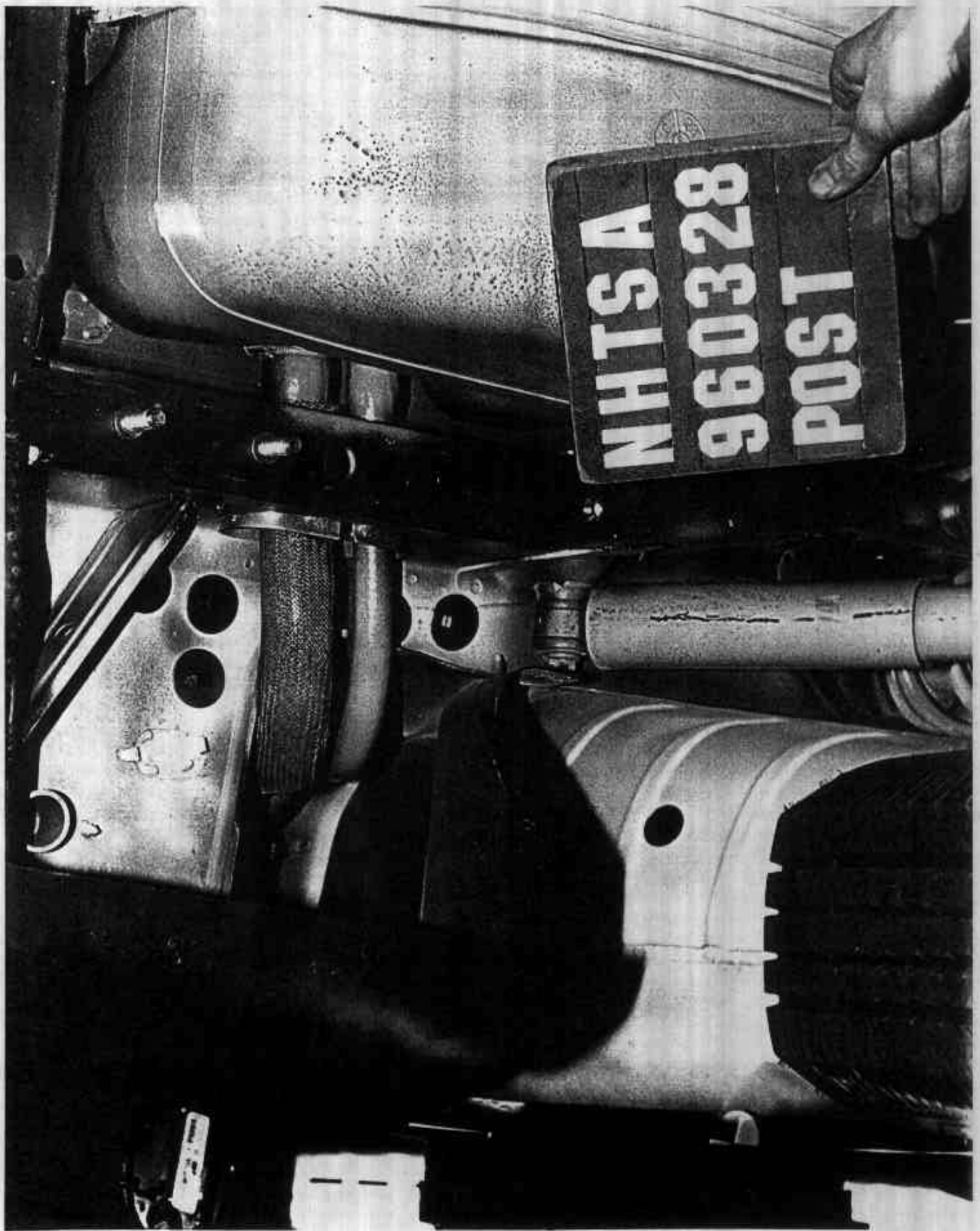


Figure A-20 Post-Test Fuel Filler Neck View

A-21

960328

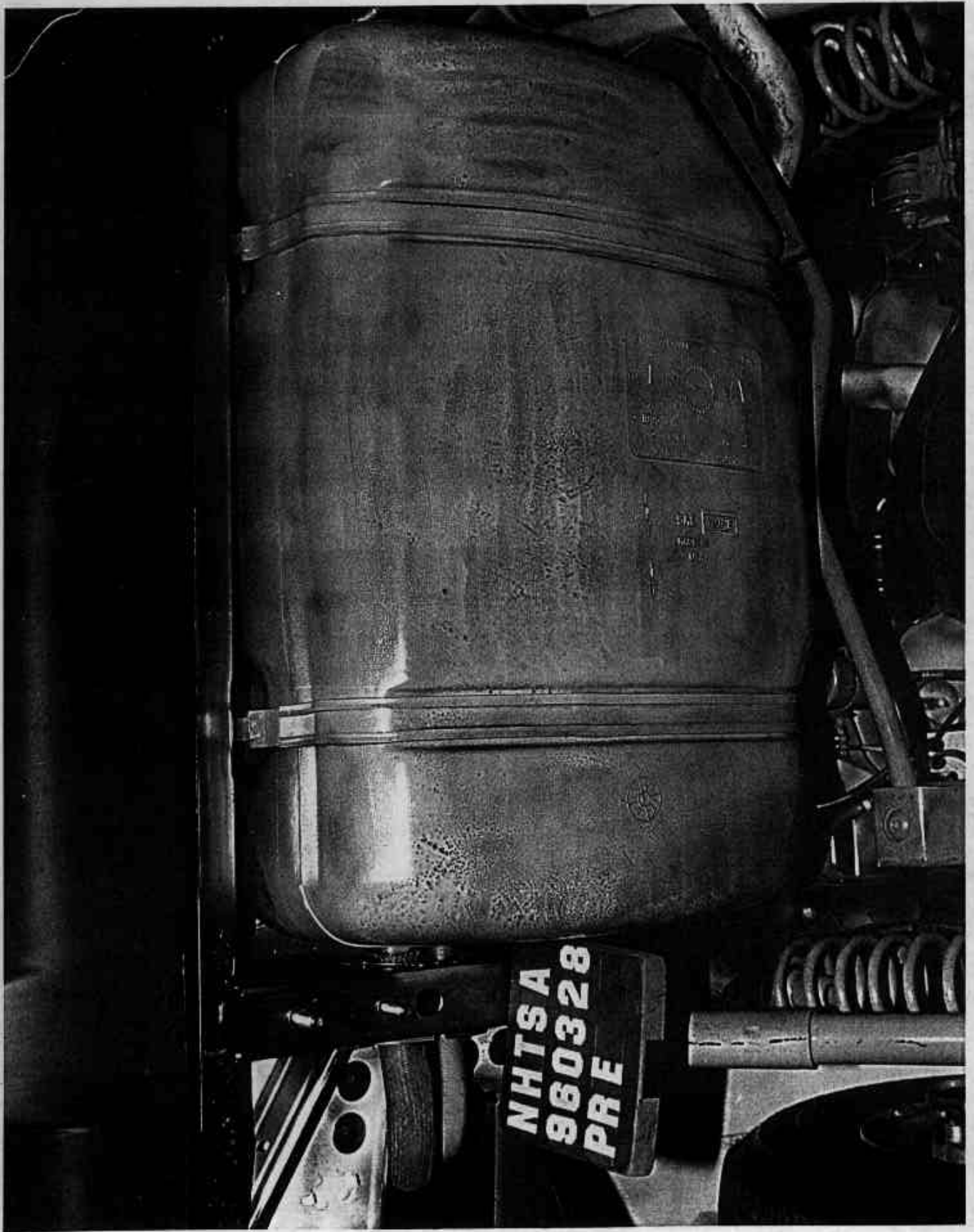


Figure A-21 Pre-Test Fuel Tank View

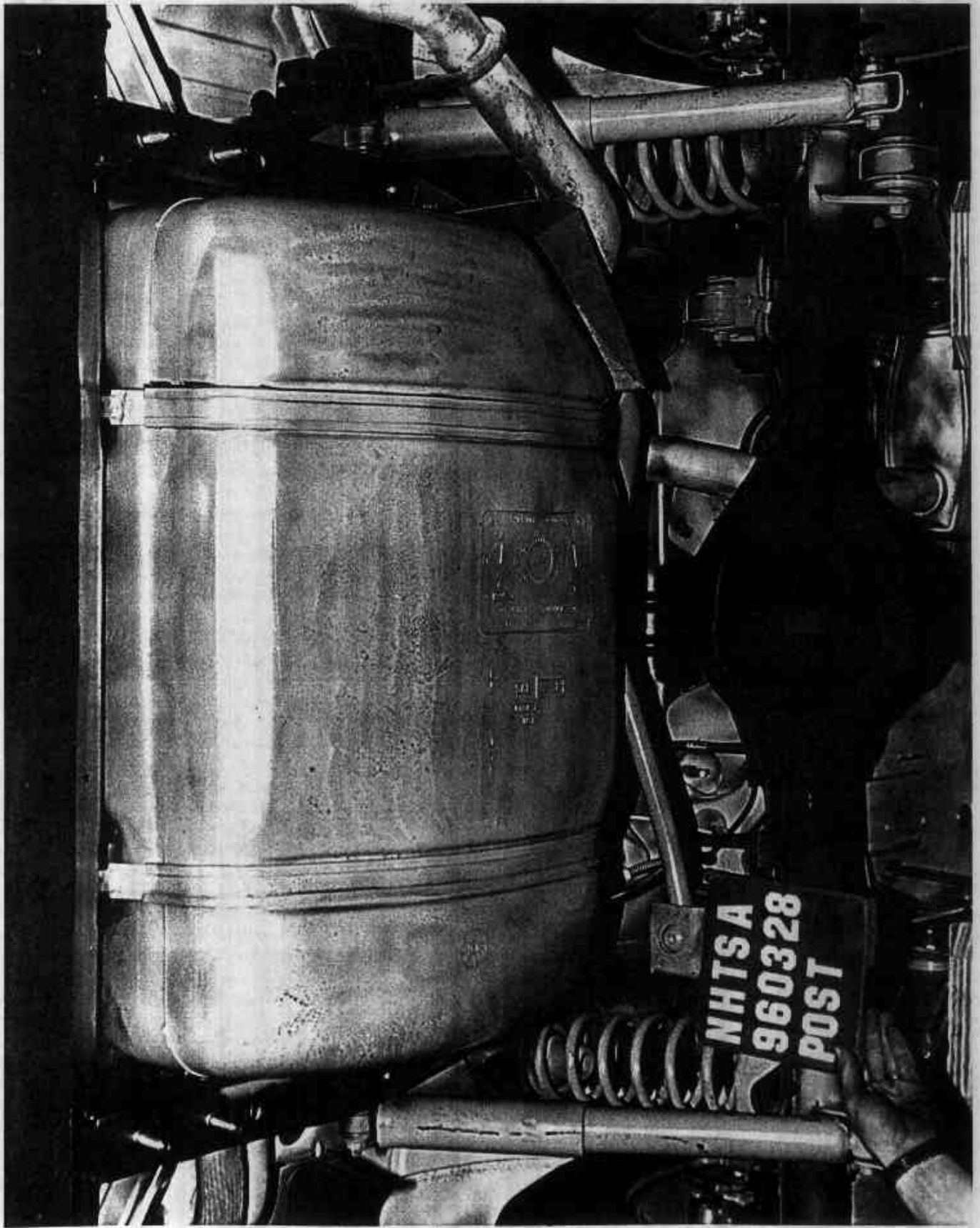


Figure A-22 Post-Test Fuel Tank View

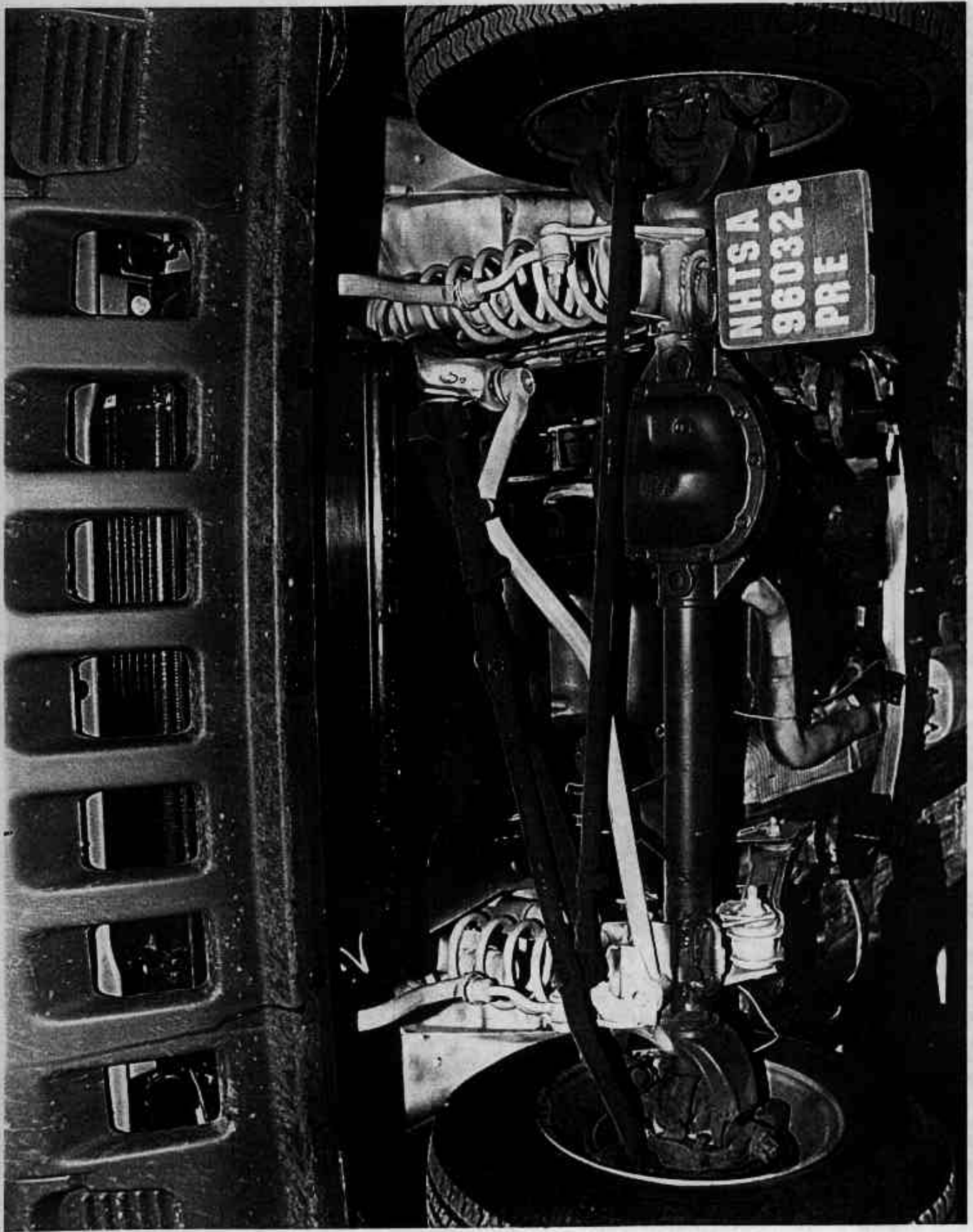


Figure A-23 Pre-Test Front Underbody View

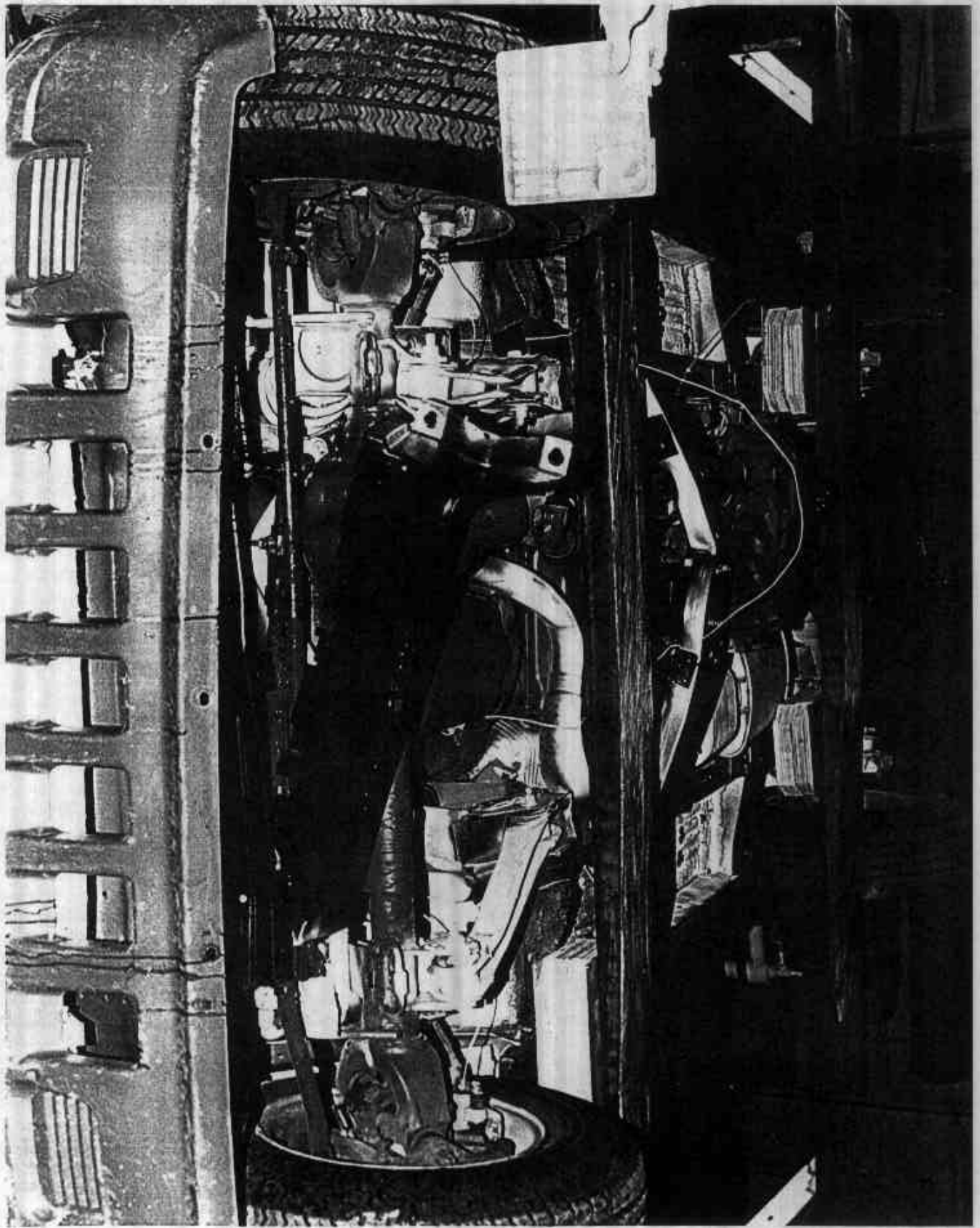


Figure A-24 Post-Test Front Underbody View

A-25

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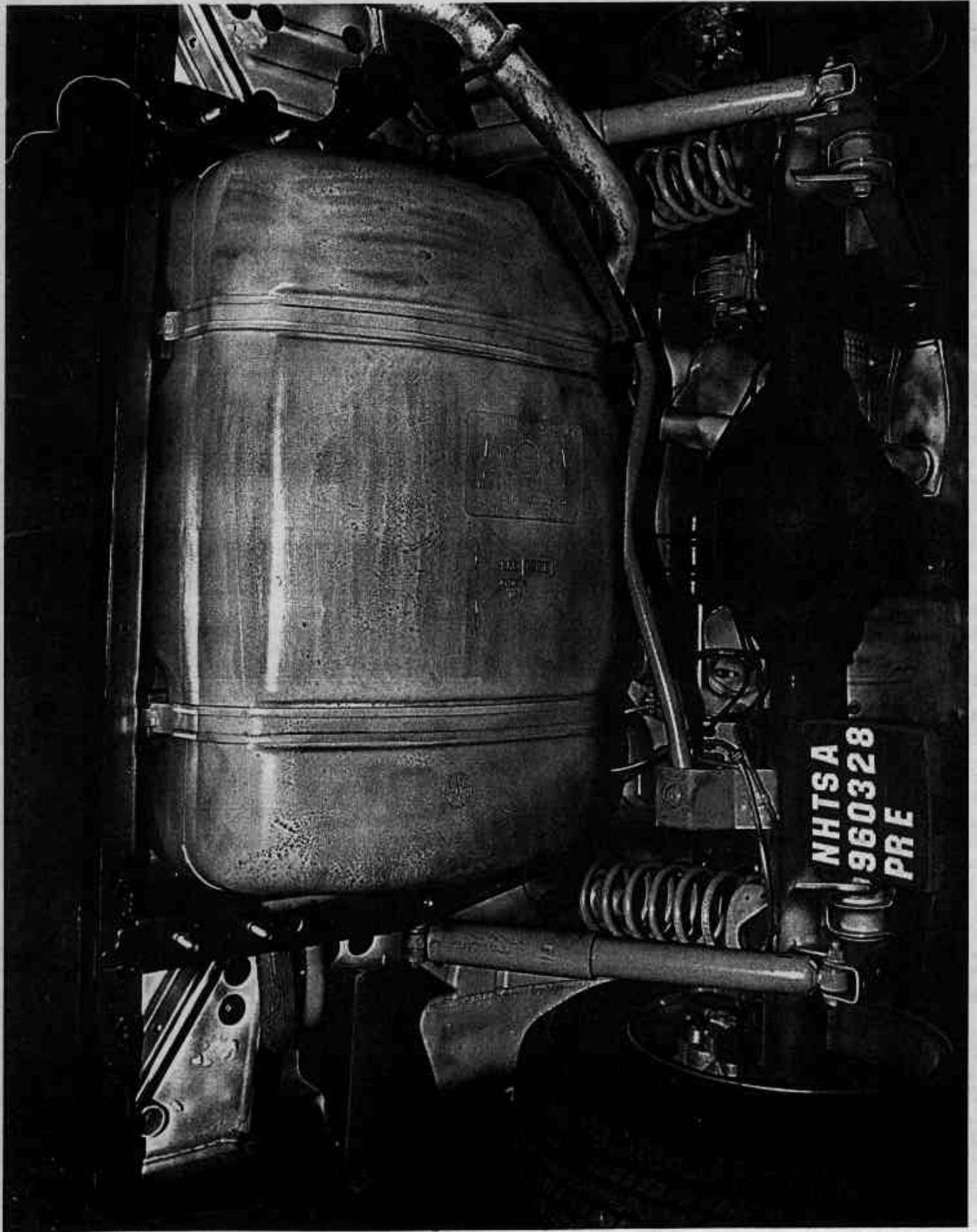


Figure A-25 Pre-Test Rear Underbody View

A-26

960328

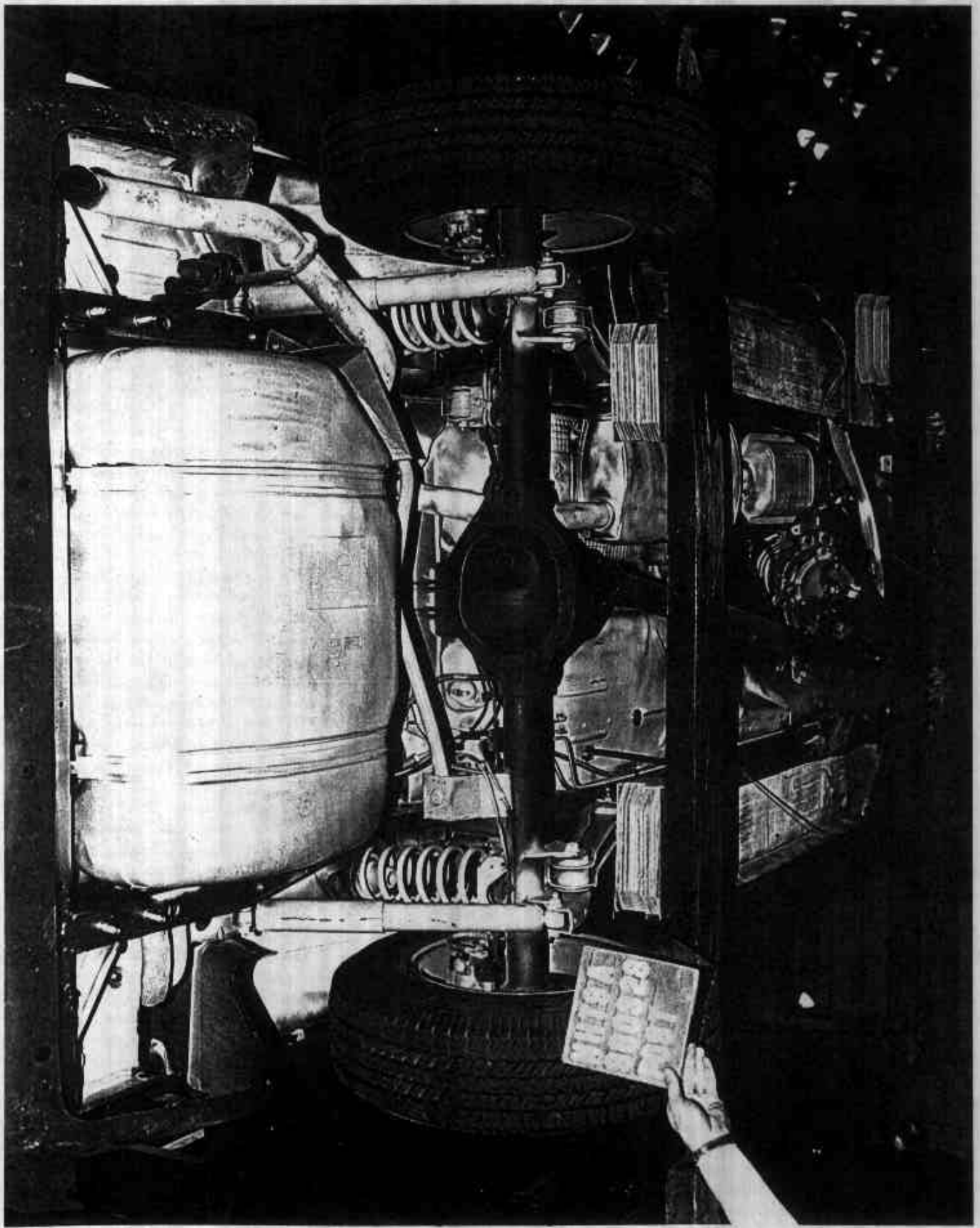


Figure A-26 Post-Test Rear Underbody View

A-27

960328

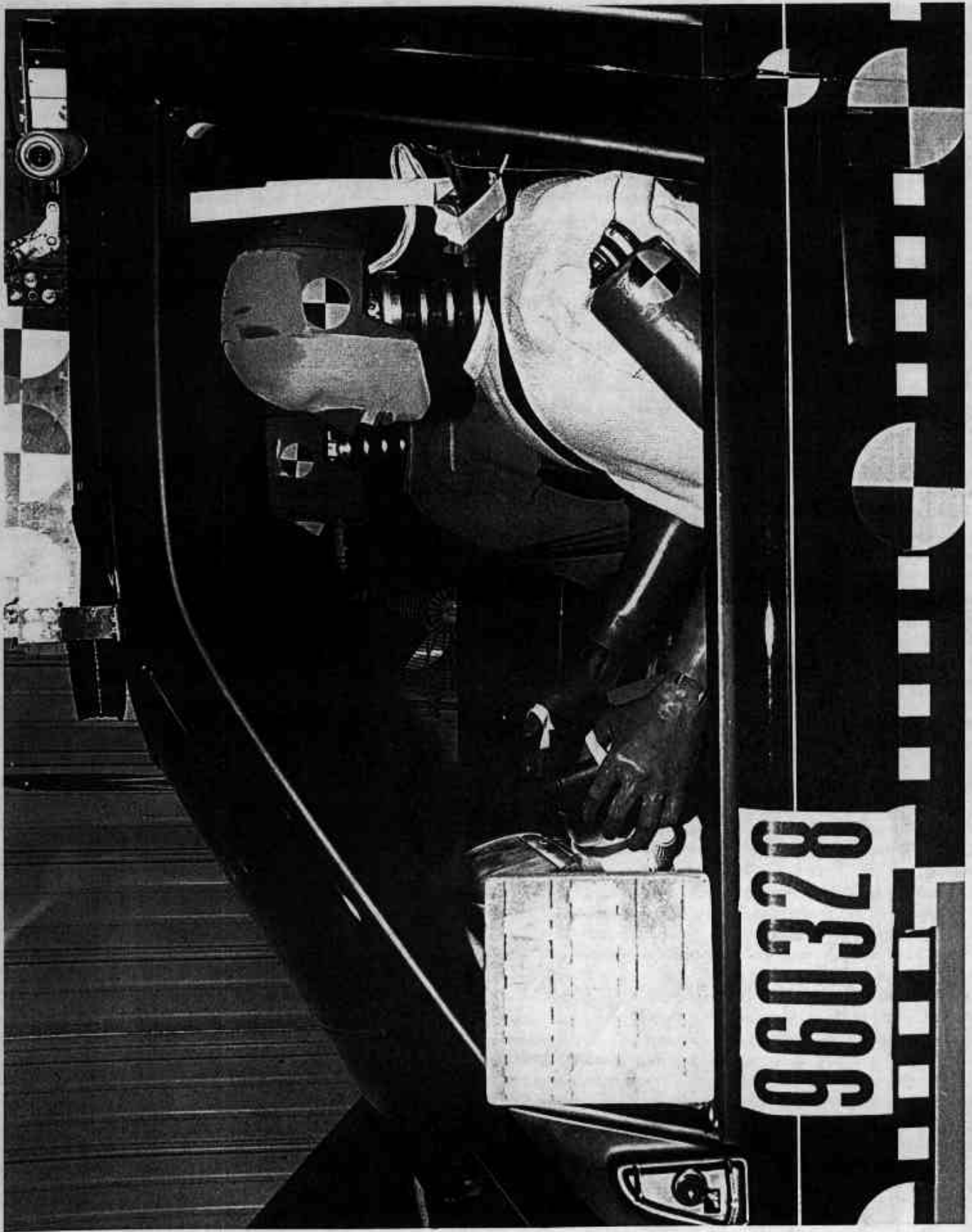


Figure A-27 Pre-Test Driver Dummy Position View

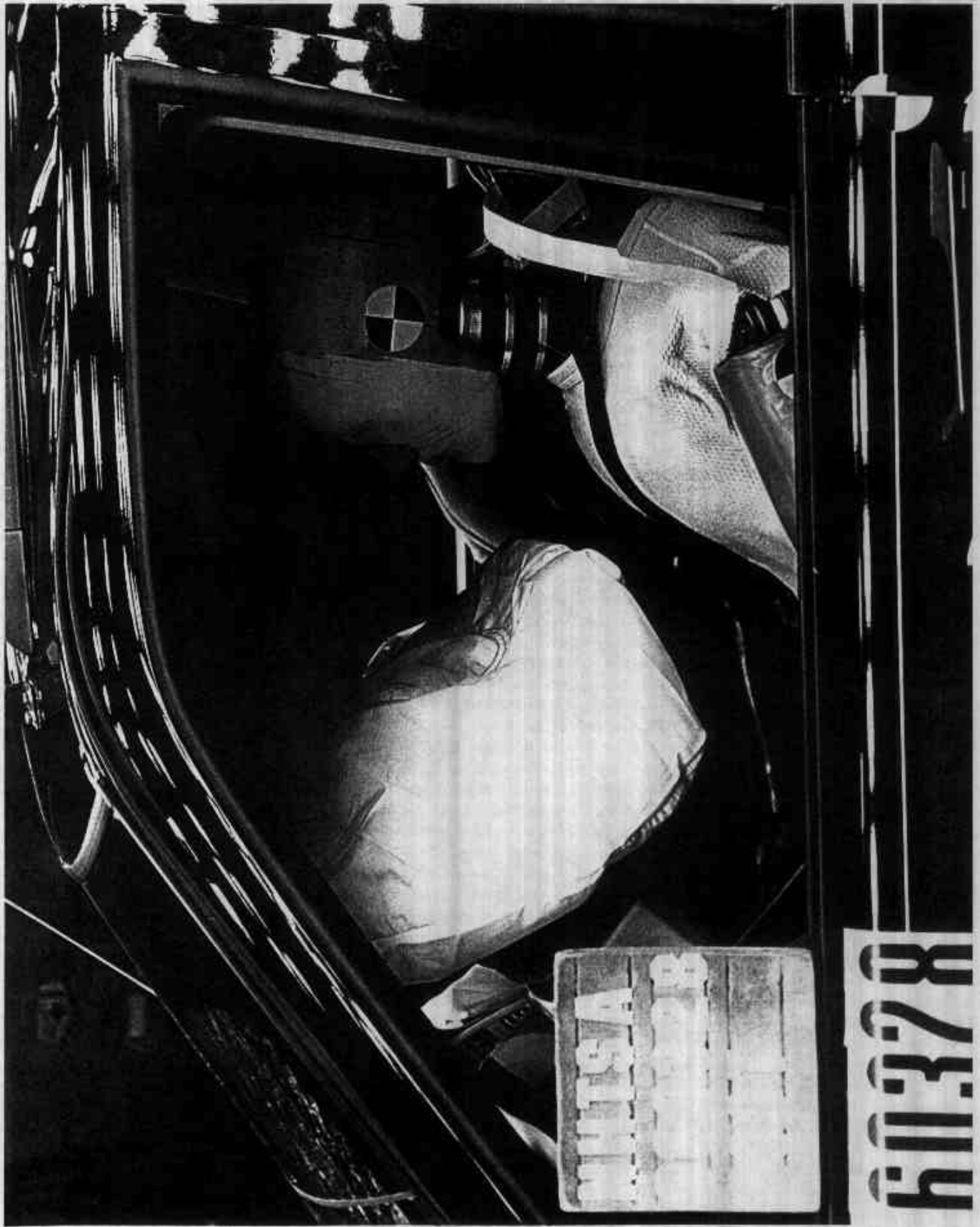


Figure A-28 Post-Test Driver Dummy Position View

A-29

960328

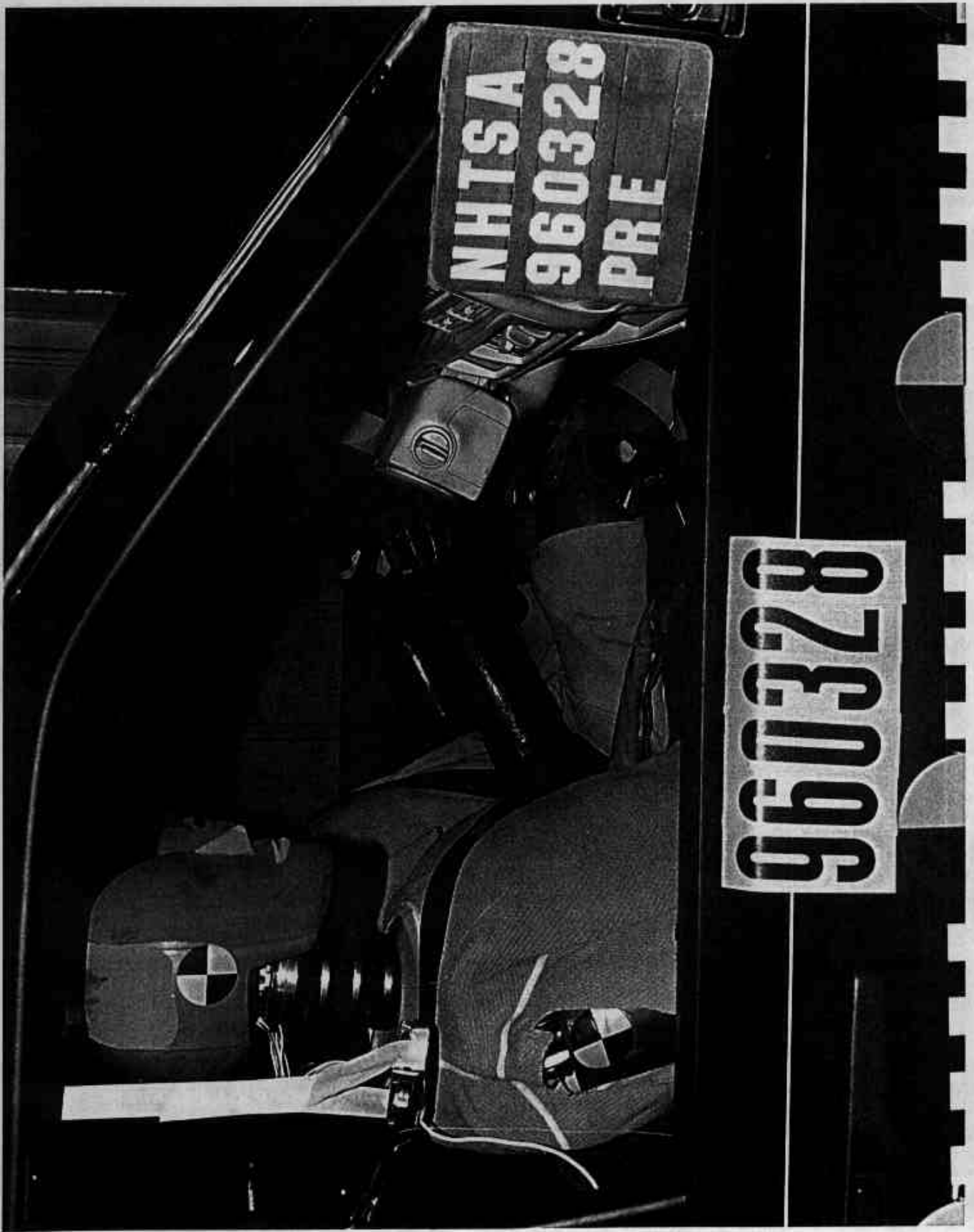


Figure A-29 Pre-Test Passenger Dummy Position View



Figure A-30 Post-Test Passenger Dummy Position View

A-31

960328

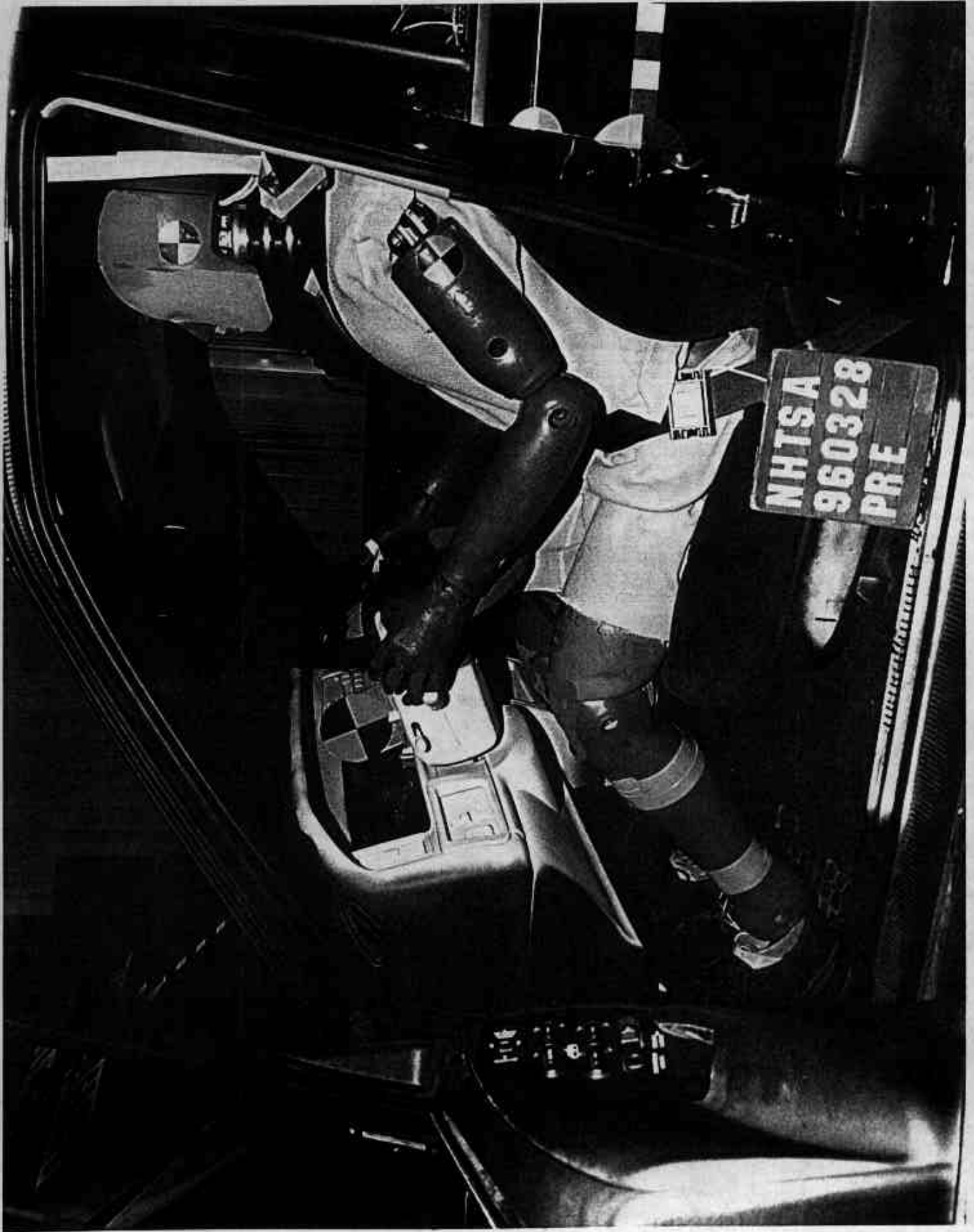


Figure A-31 Pre-Test Driver Dummy and Vehicle Interior - View 1

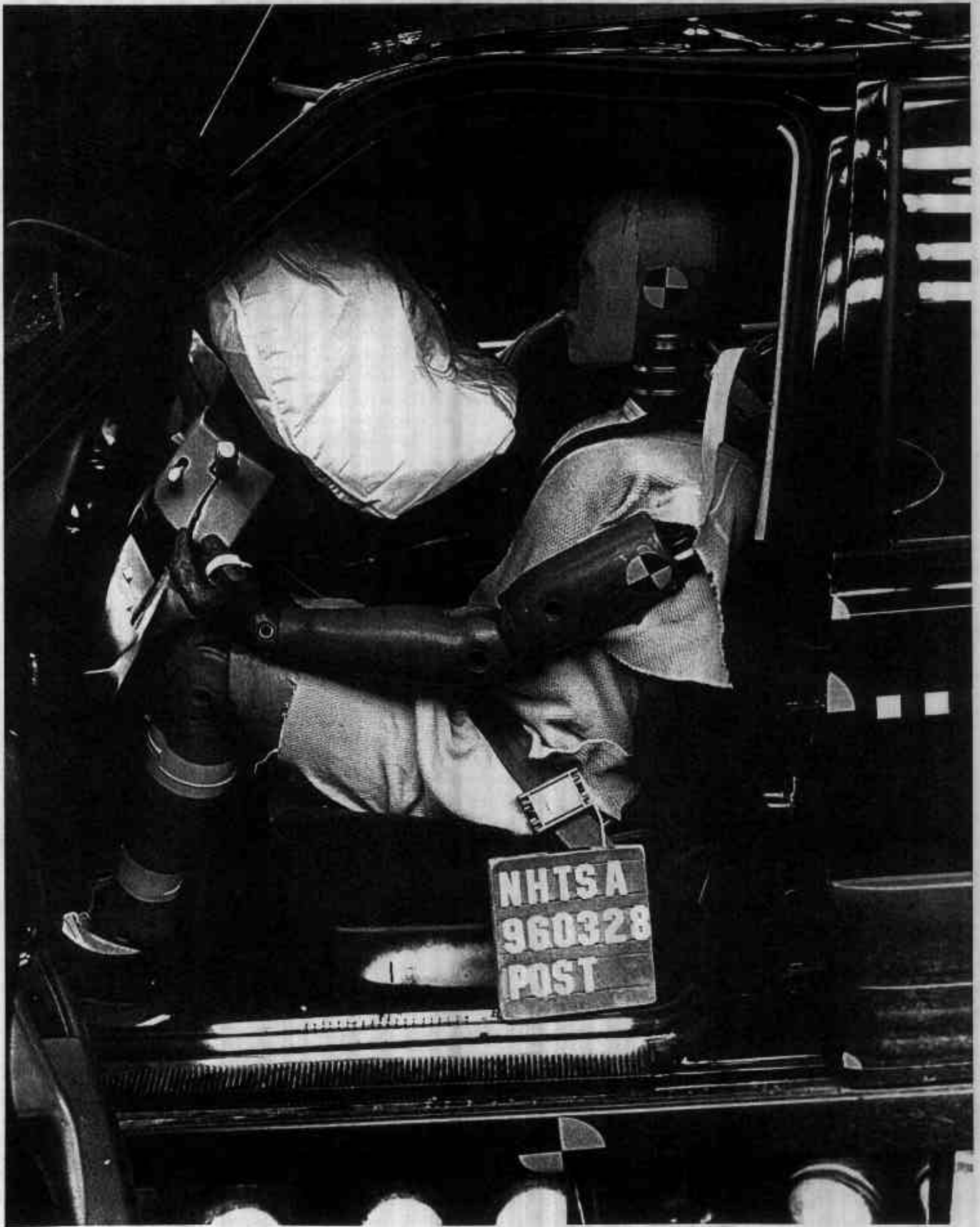


Figure A-32 Post-Test Driver Dummy and Vehicle Interior - View 1

A-33

960328

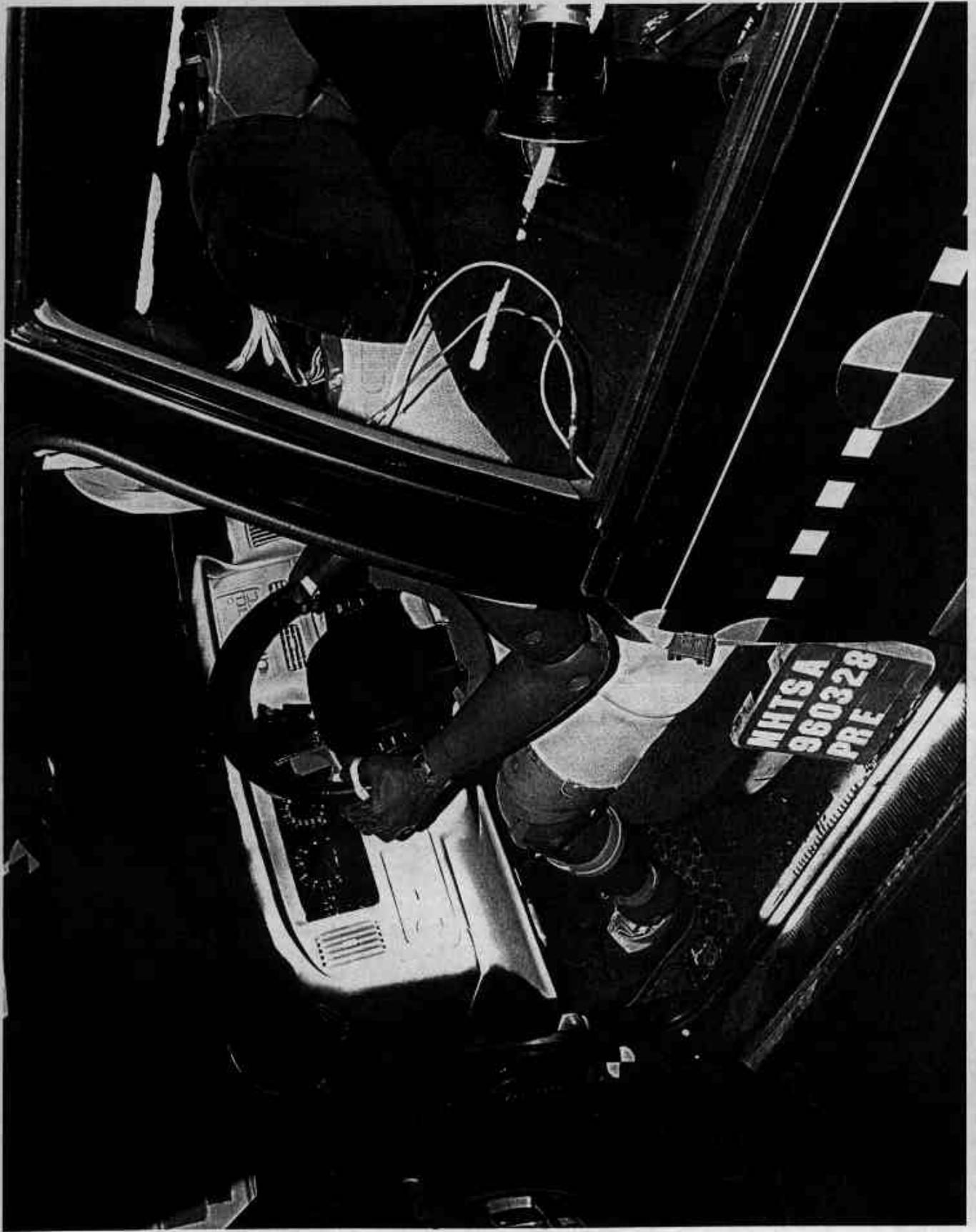


Figure A-33 Pre-Test Driver Dummy and Vehicle Interior - View 2

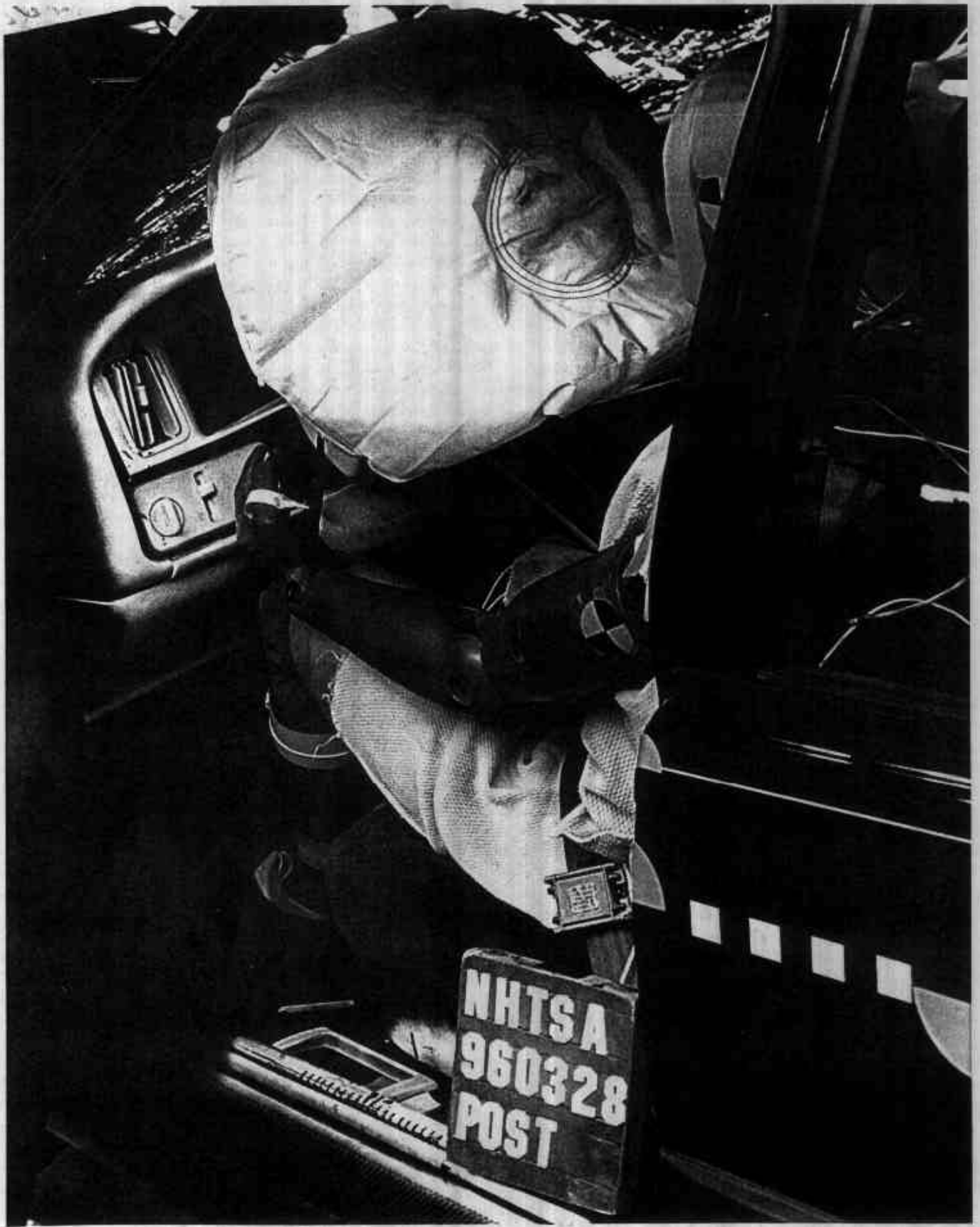


Figure A-34 Post-Test Driver Dummy and Vehicle Interior - View 2



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

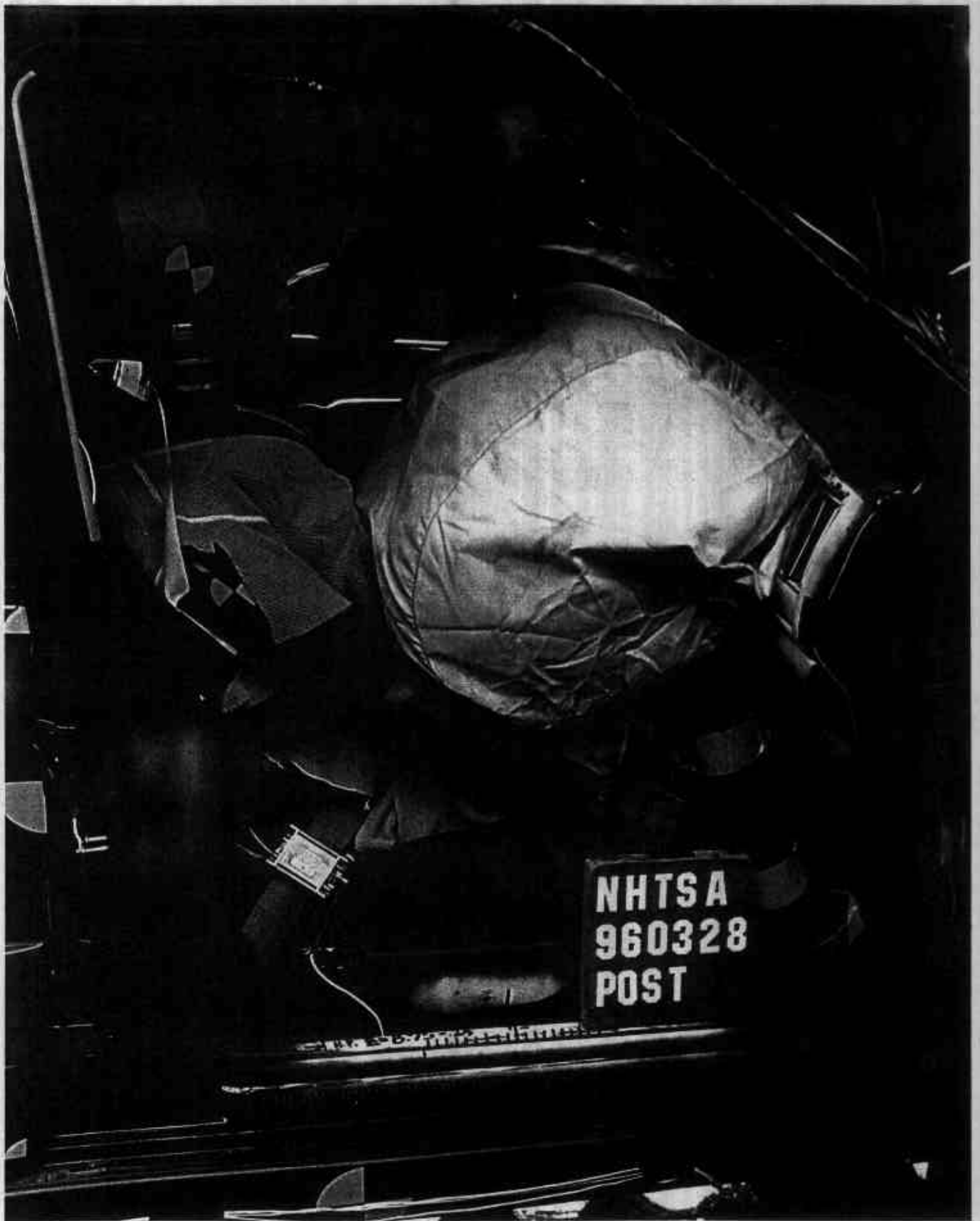


Figure A-36 Post-Test Passenger Dummy and Vehicle Interior - View 1



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



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

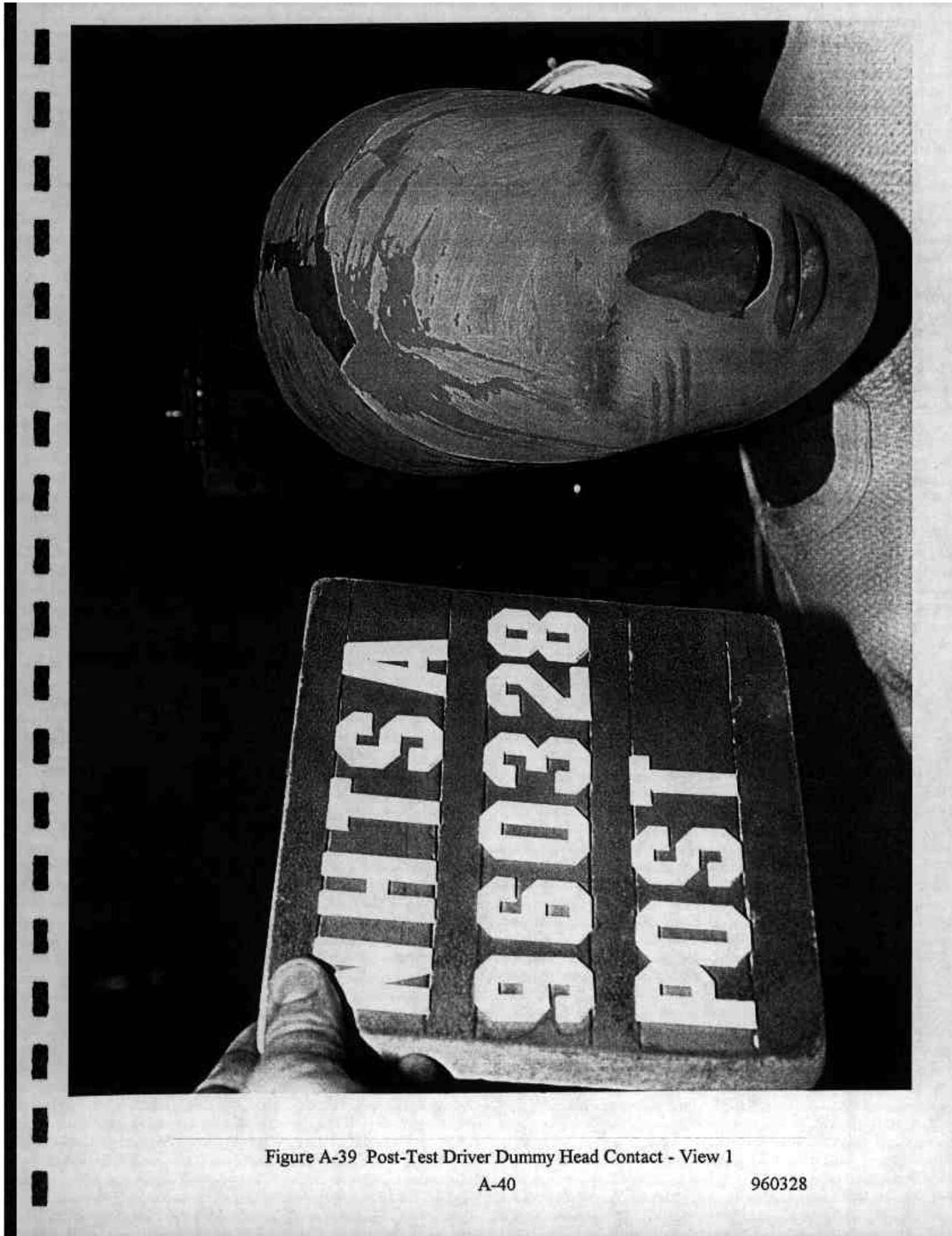


Figure A-39 Post-Test Driver Dummy Head Contact - View 1



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

A-41

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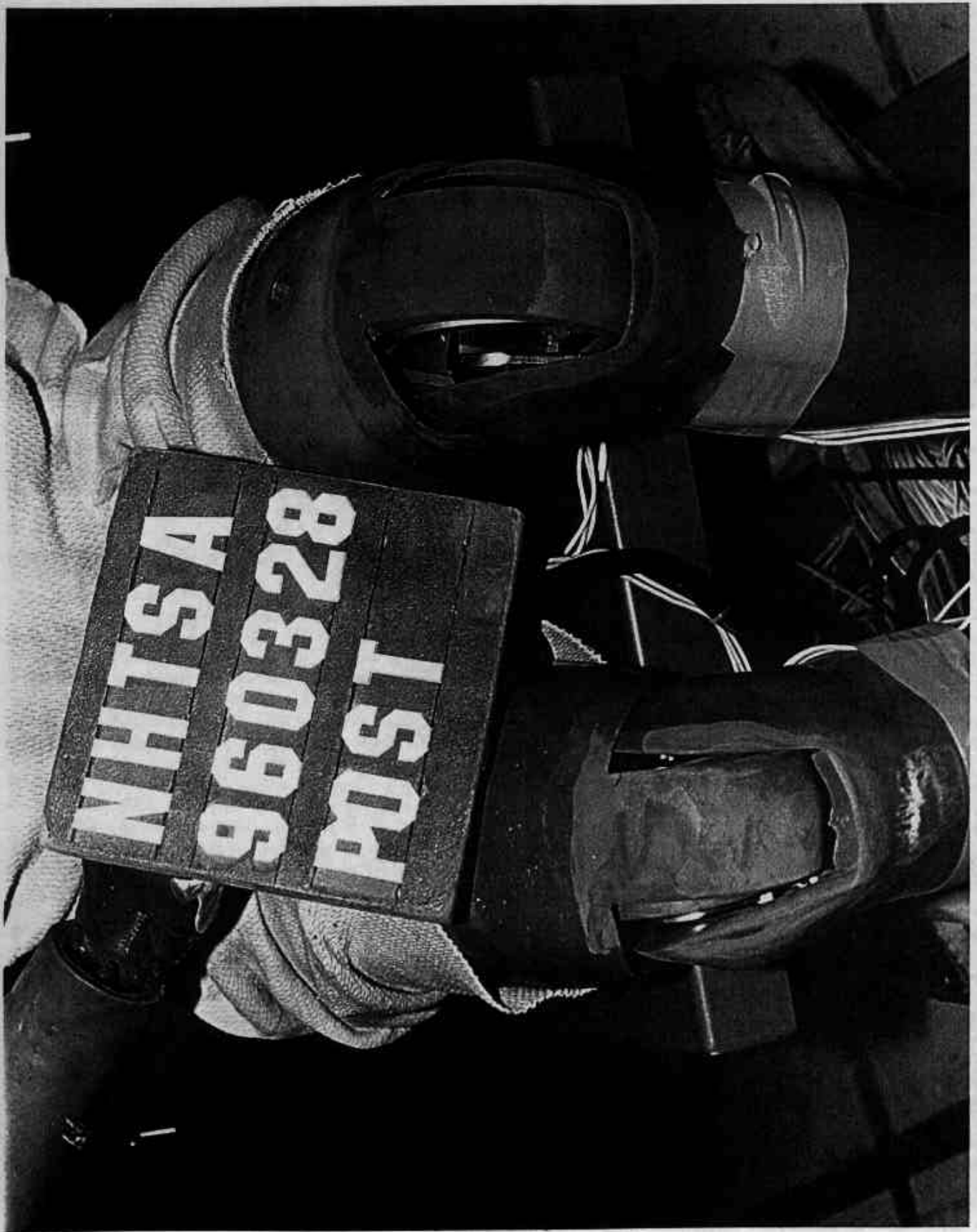


Figure A-41 Post-Test Driver Dummy Knee Contact - View 1

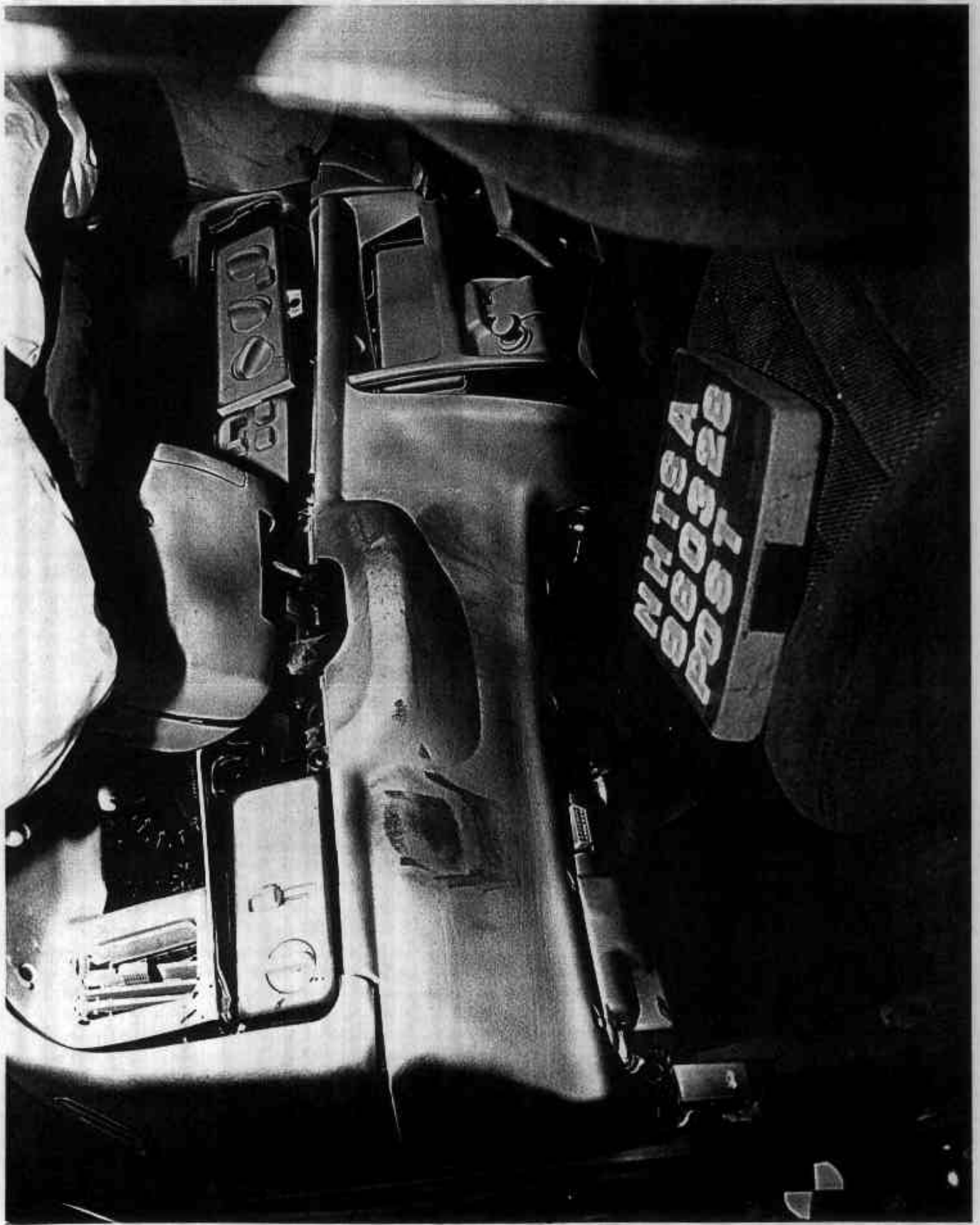


Figure A-42 Post-Test Driver Dummy Knee Contact - View 2

A-43

960328

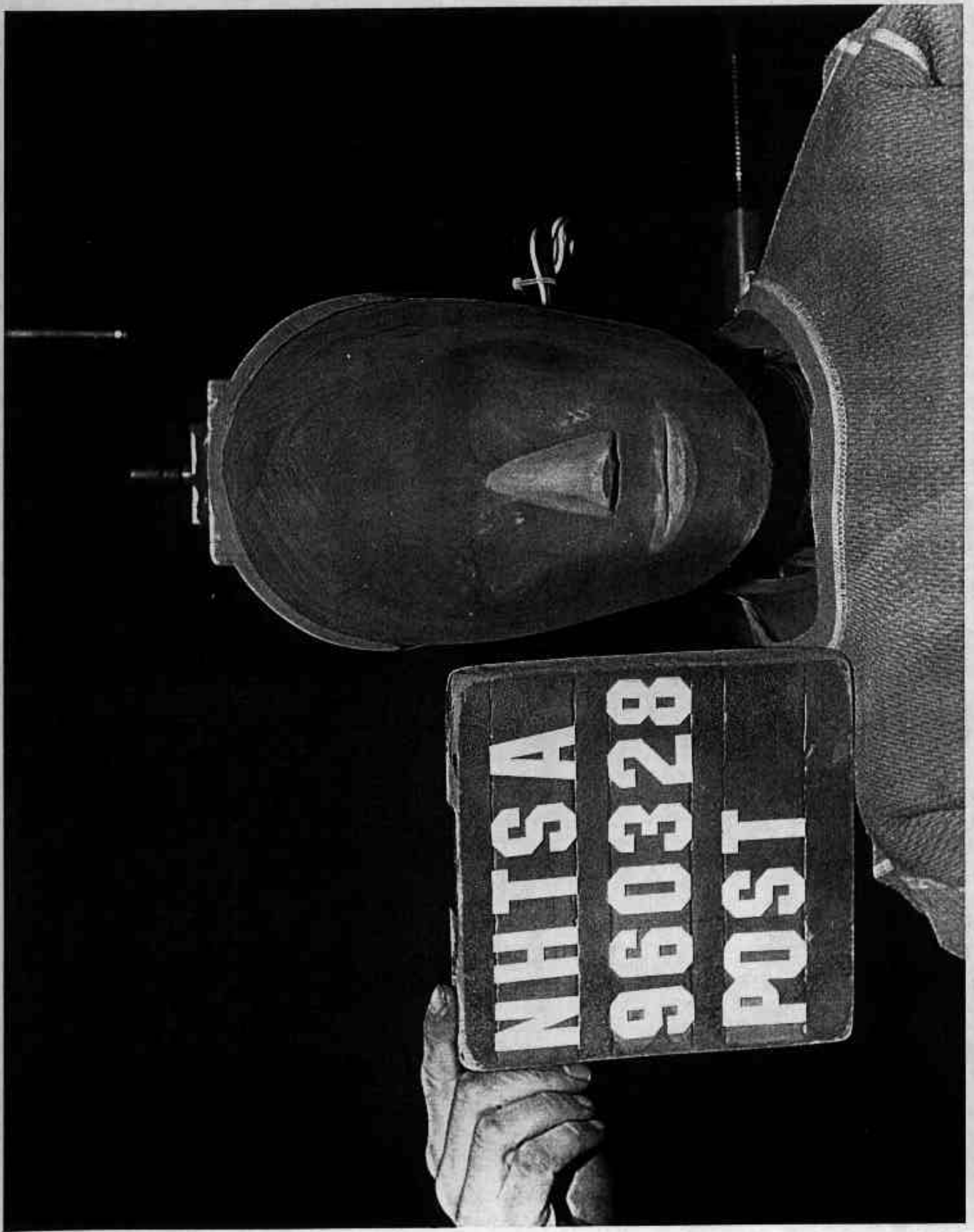


Figure A-43 Post-Test Passenger Dummy Head Contact - View 1

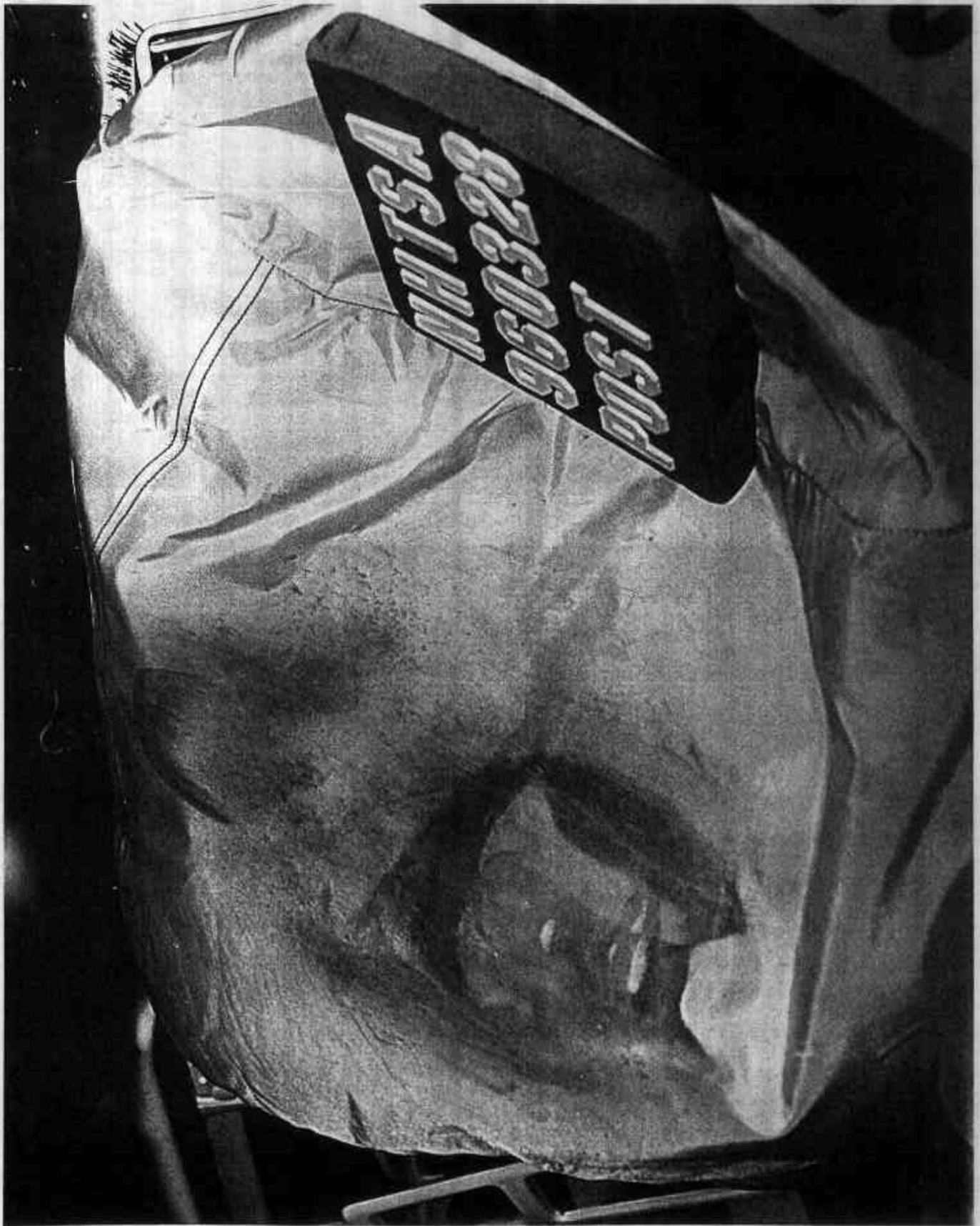


Figure A-44 Post-Test Passenger Dummy Head Contact - View 2

A-45

960328

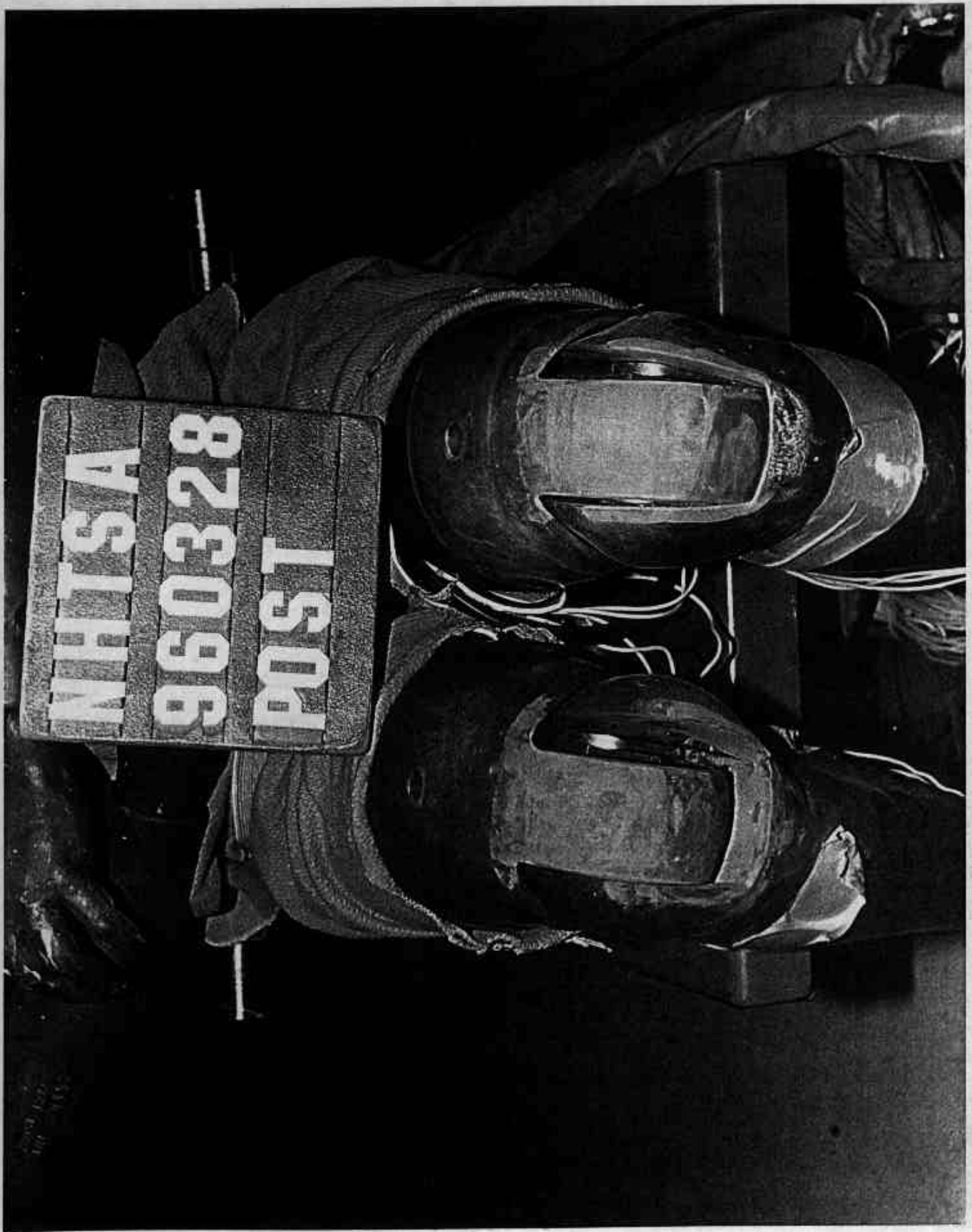


Figure A-45 Post-Test Passenger Dummy Knee Contact - View 1

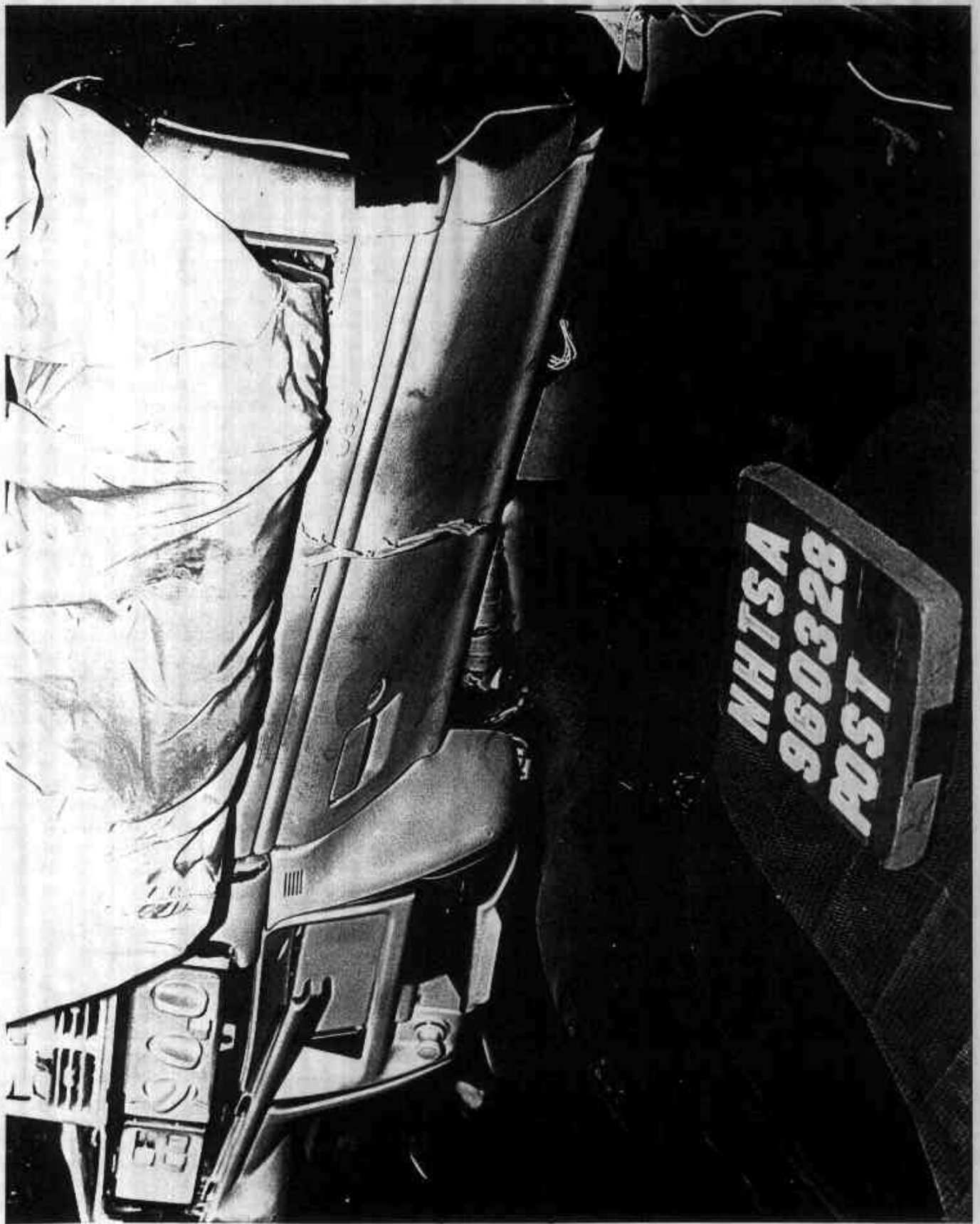


Figure A-46 Post-Test Passenger Dummy Knee Contact - View 2

A-47

960328

MFD BY	CHRYSLER CORPORATION	DATE OF MFR	12-95	GWR	05300 LB	2405 KG
GWR FRONT	1248 KG	WITH TIRES	P215/75R15	RIMS AT	15 X 7.0	PST COLD 36
GWR REAR	1339 KG	WITH TIRES	P215/75R15	RIMS AT	15 X 7.0	PST COLD 36
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.						
VIN:	1J4GZ58S5TC234607	TYPE:	MPV	SINGLE X DUAL		
						
MOH:	121211 347	PAINT:PYB	VEHICLE MADE IN U.S.A. TRM:F502			

Figure A-47 Pre-Test Vehicle Certification Label View

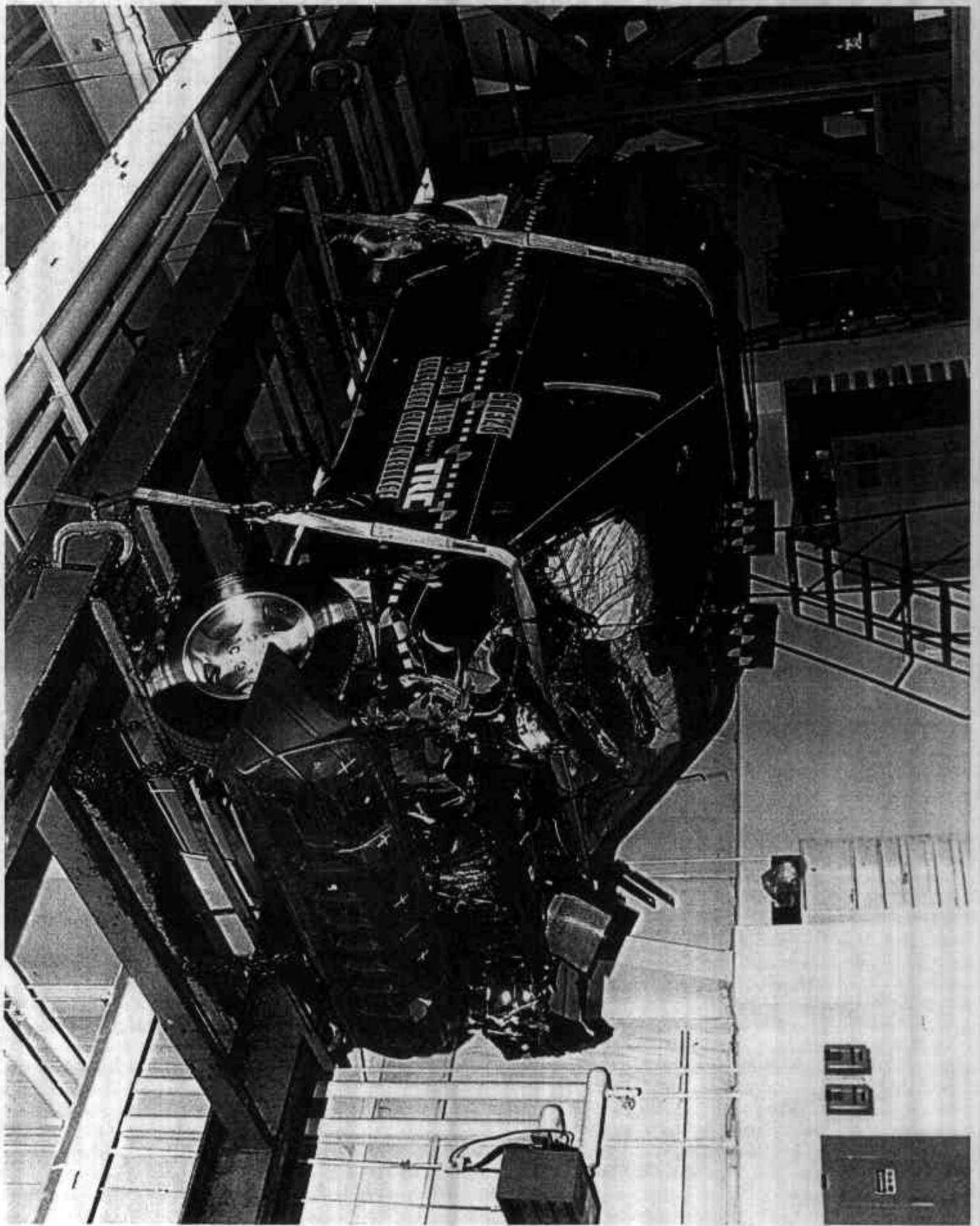


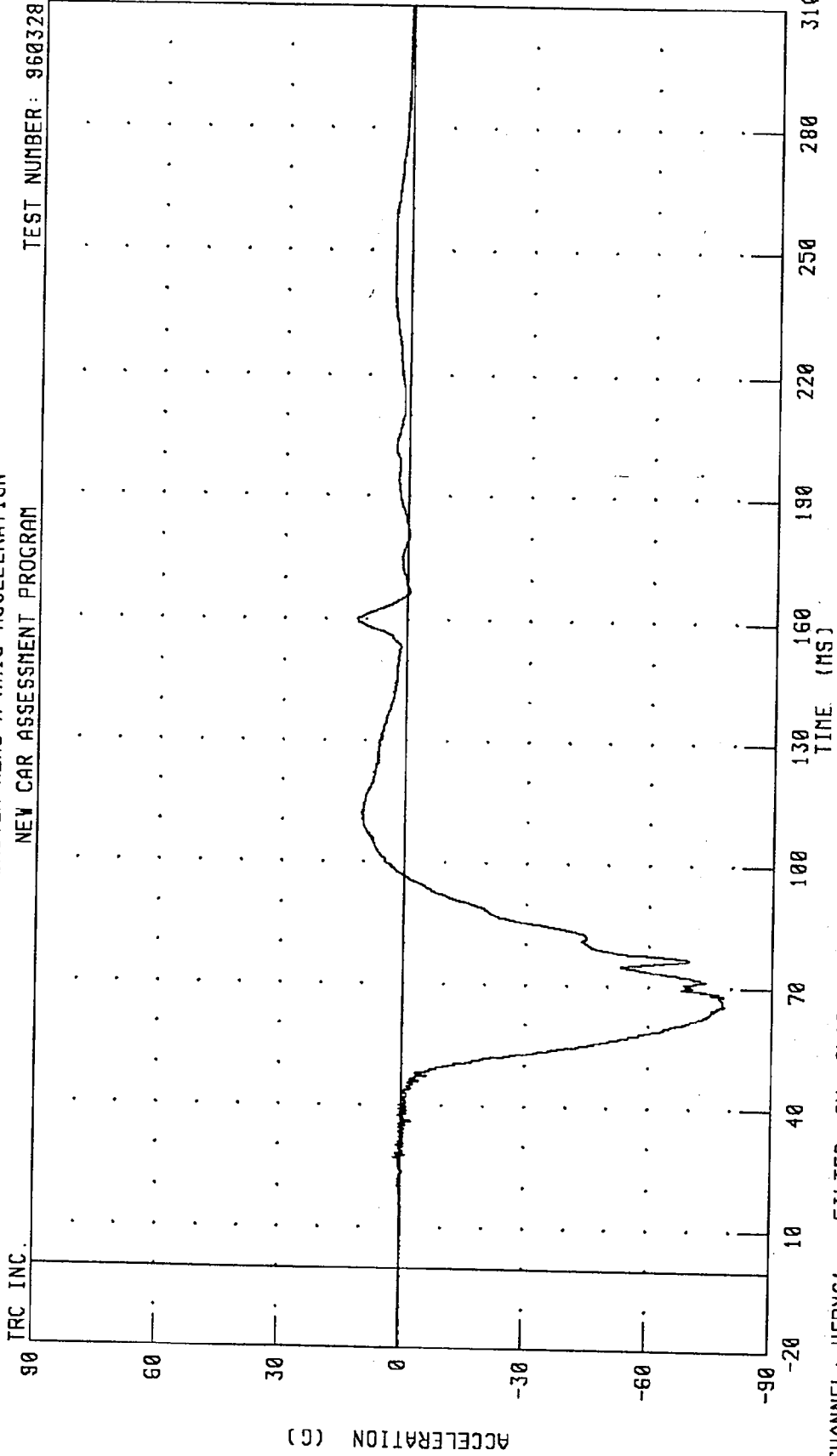
Figure A-48 Post-Test Vehicle on Static Rollover Machine View

Appendix B

Data Plots

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

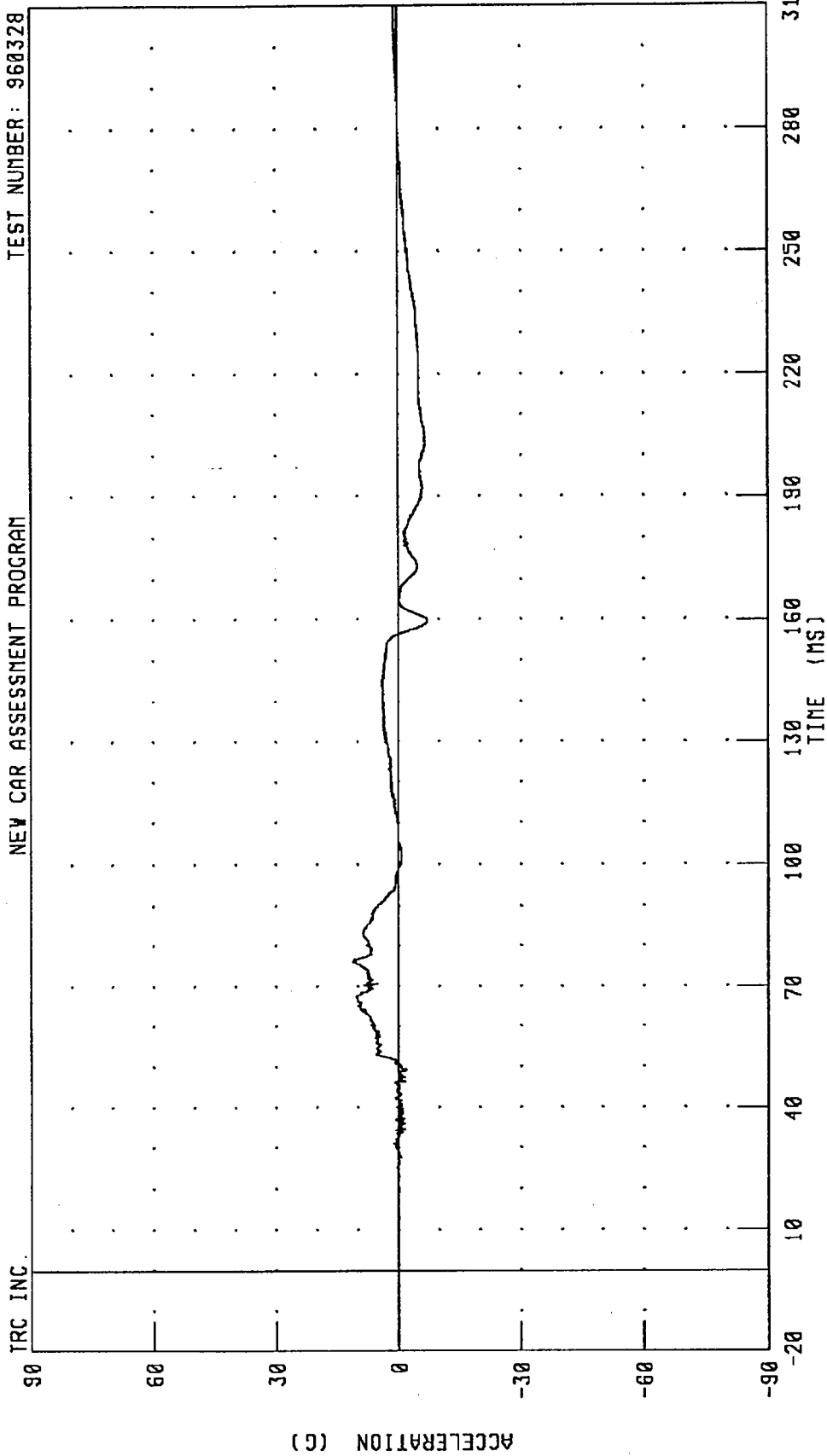
TEST NUMBER: 960328



TRC INC. CHANNEL: HEDXG1 FILTER: CH. CLASS 1000
PEAK DATA: 12.22 G @ 160.24 MS; -78.44 G @ 65.36 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

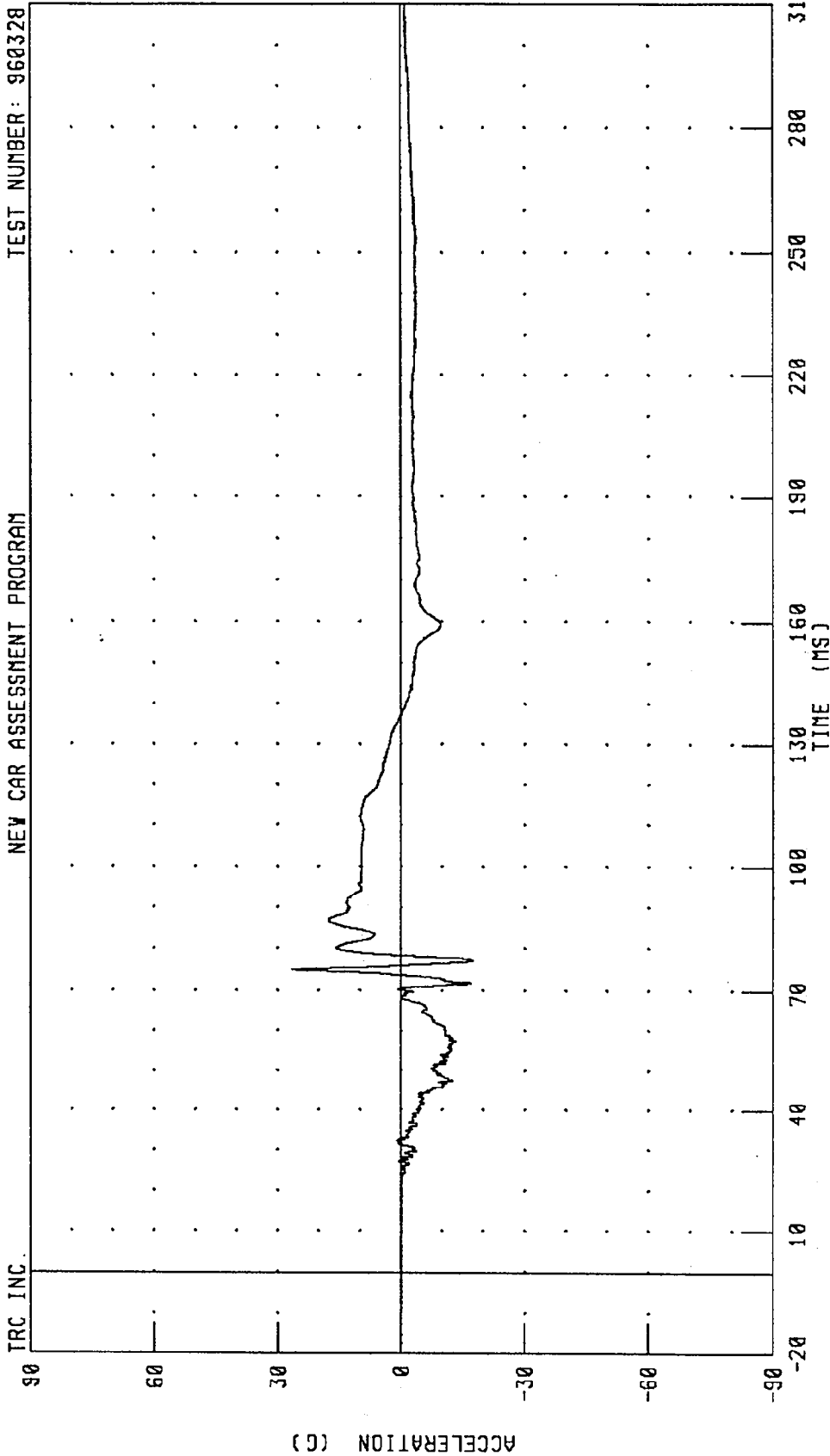
TEST NUMBER: 960328



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000 PEAK DATA: 11.26 G @ 76.32 MS; -7.11 G @ 159.44 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

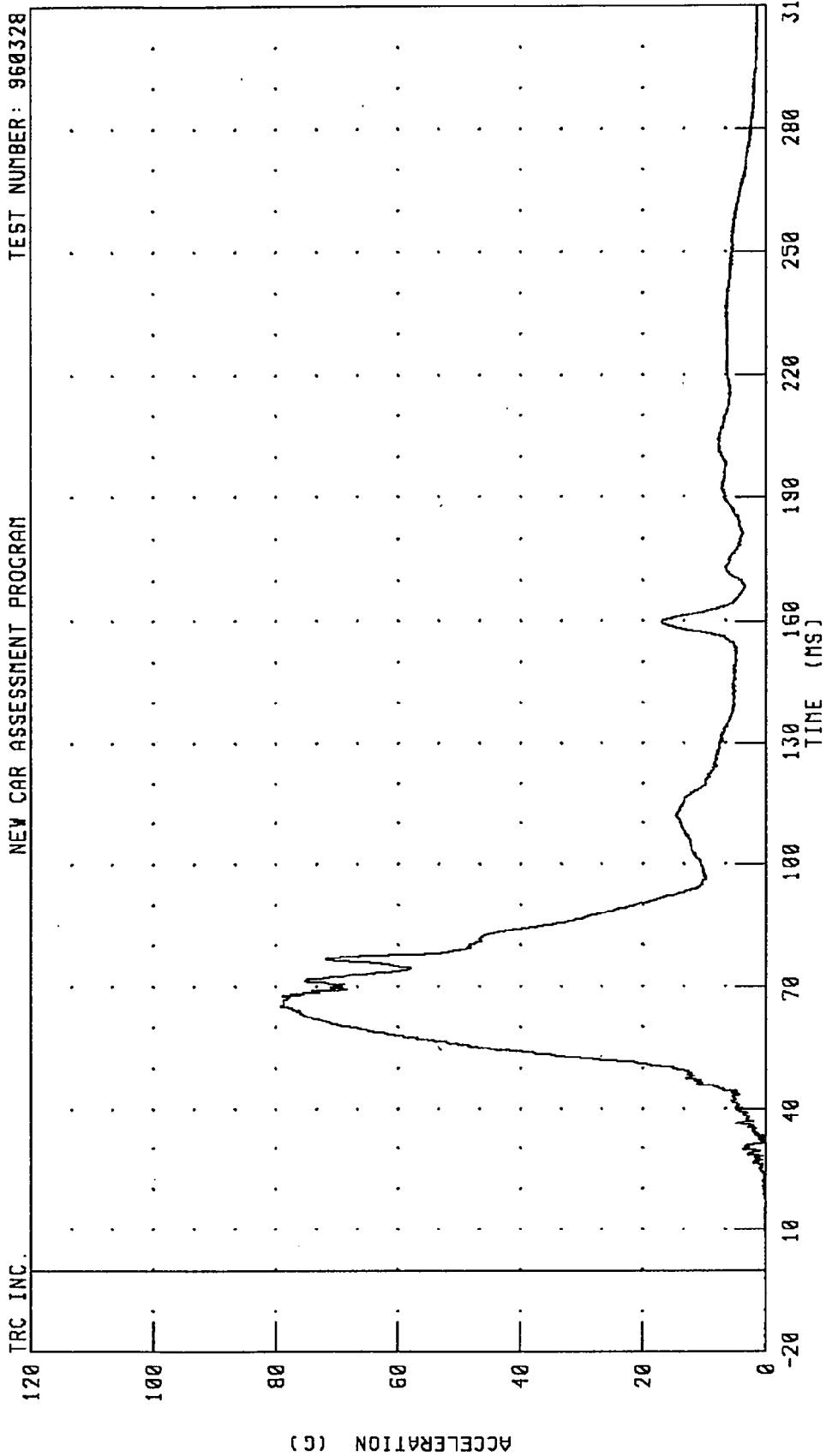


CHANNEL: HEDZG1 FILTER: CH. CLASS 1000
PEAK DATA: 26.50 G @ 74.96 MS; -17.48 G @ 77.20 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

IRC INC.

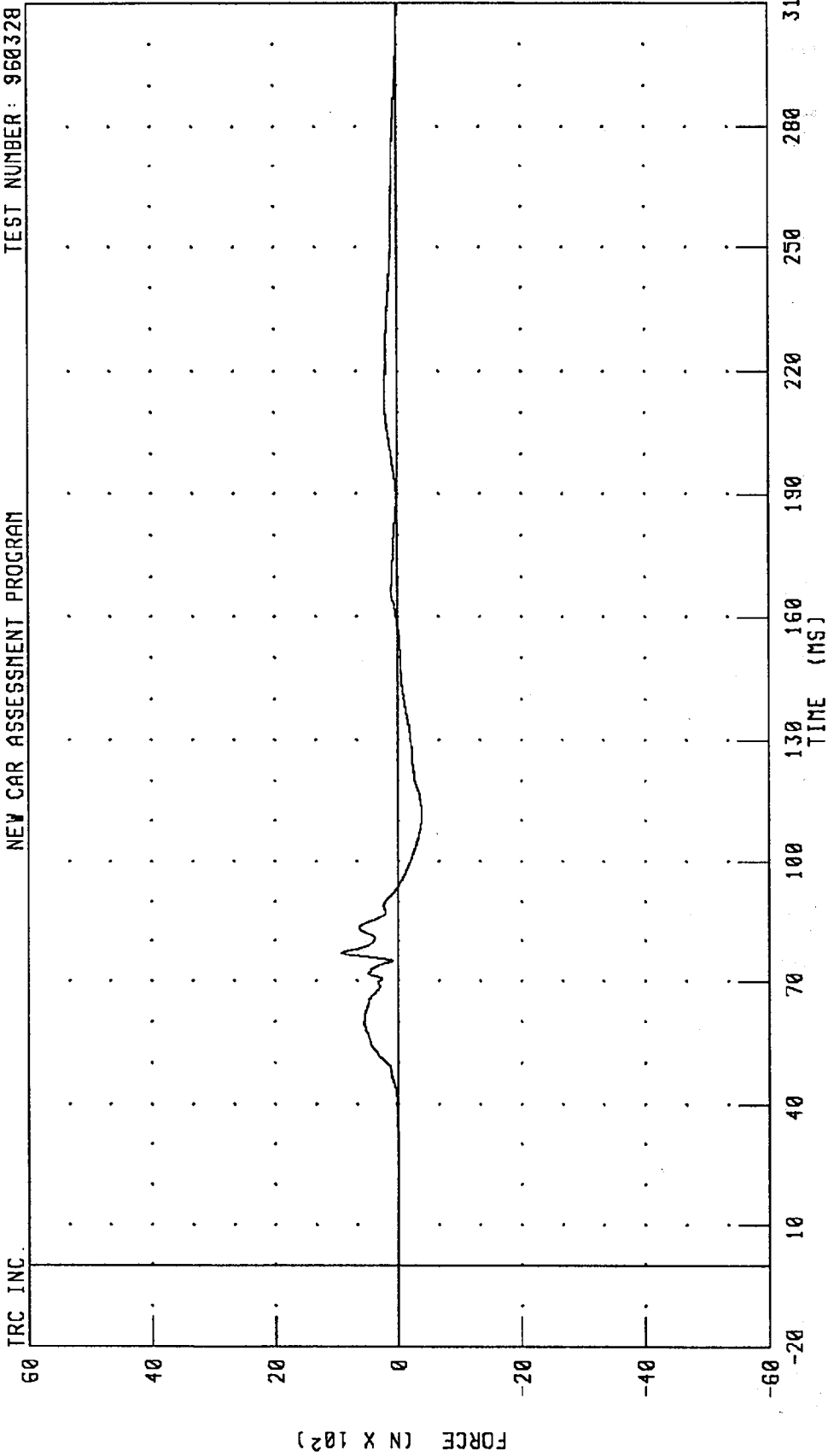


PEAK DATA: 79.32 G @ 65.36 MS; 0.10 G @ -19.84 MS

CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

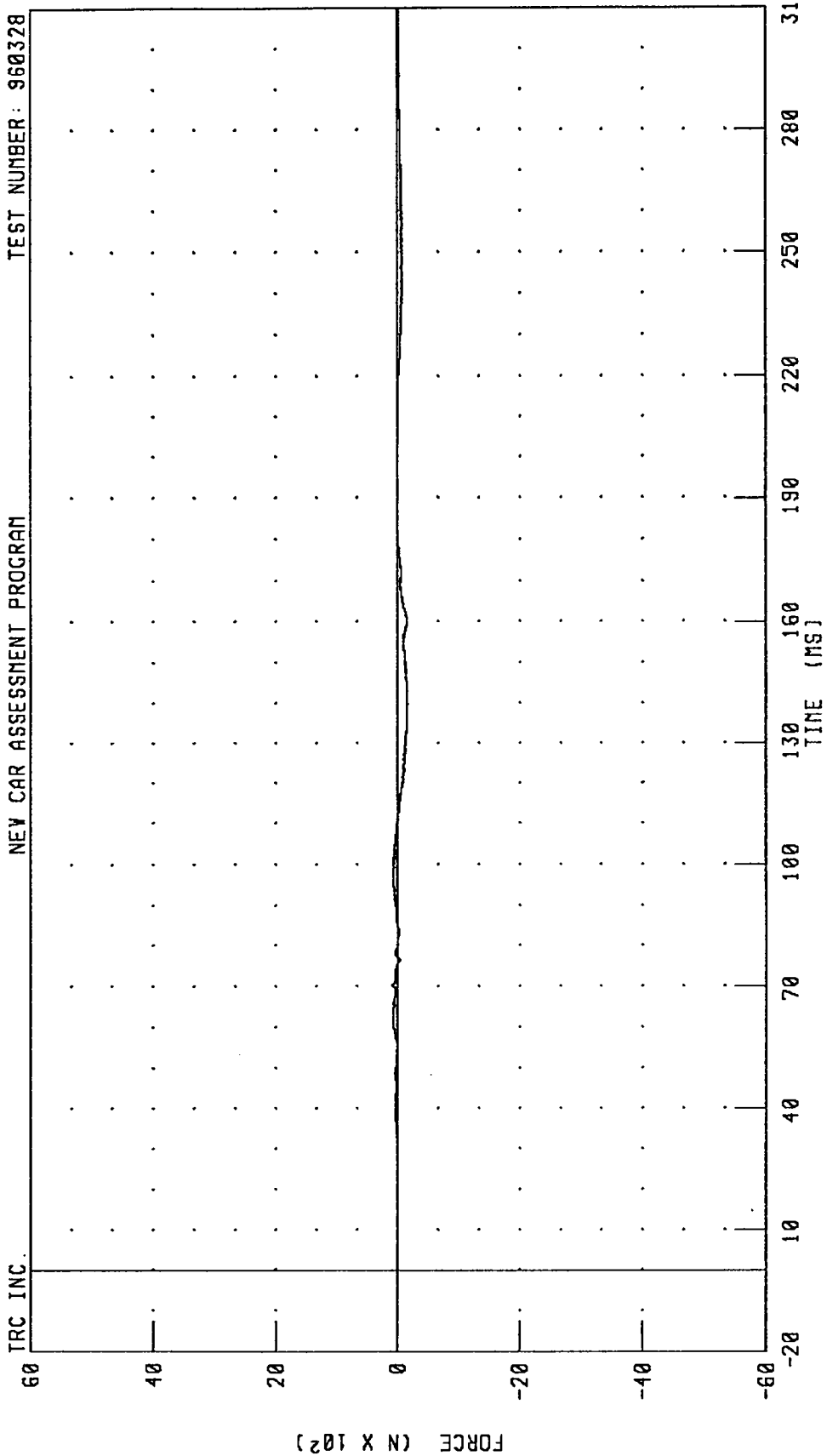


CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

PEAK DATA: 910.78 N @ 76.96 MS; -388.70 N @ 111.04 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 DRIVER NECK Y-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

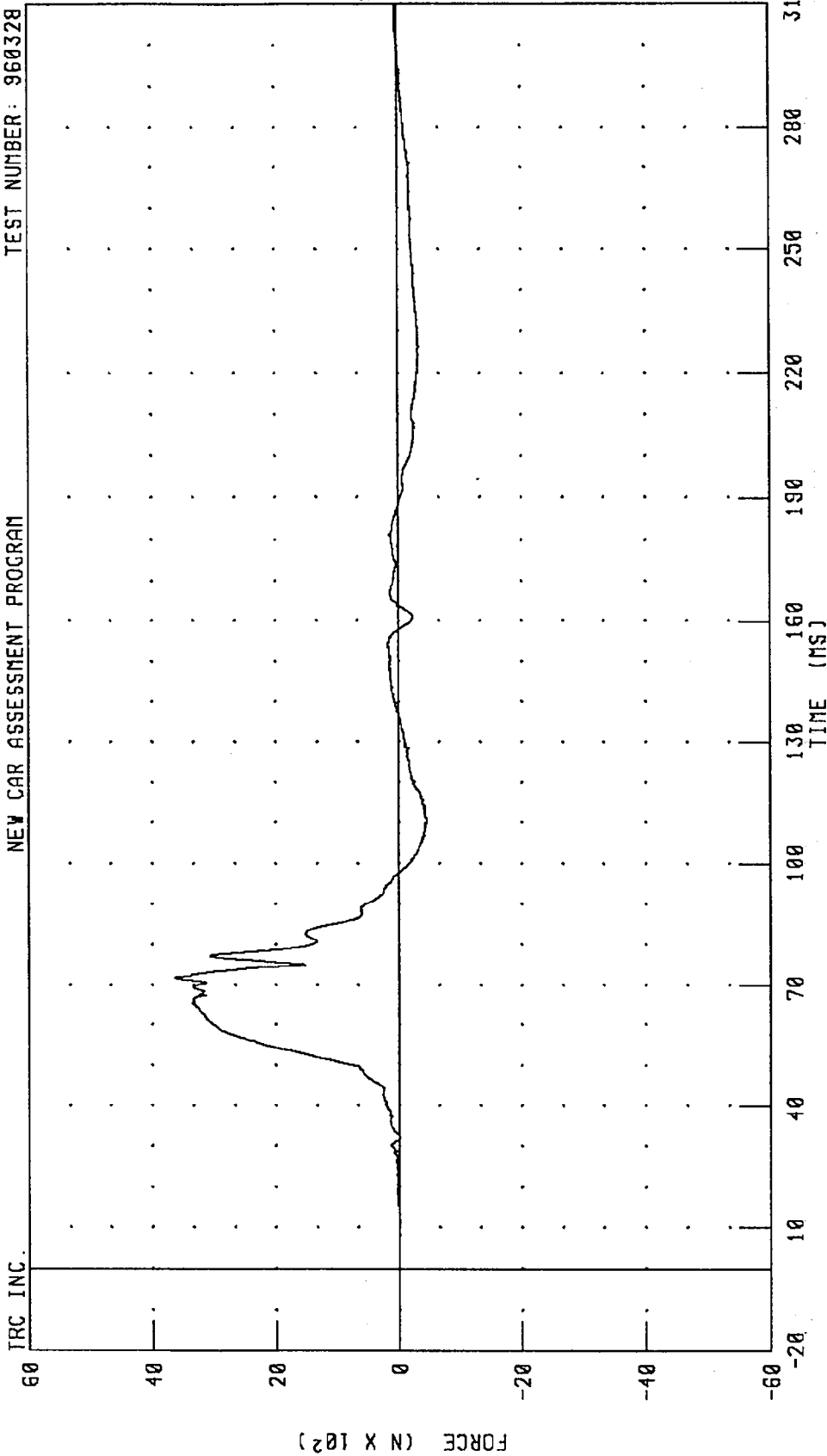


TRC INC.

CHANNEL: NEKYF1 FILTER: CH. CLASS 1000
 PEAK DATA: 89.92 N @ 70.16 MS; -162.23 N @ 139.76 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT PROGRAM

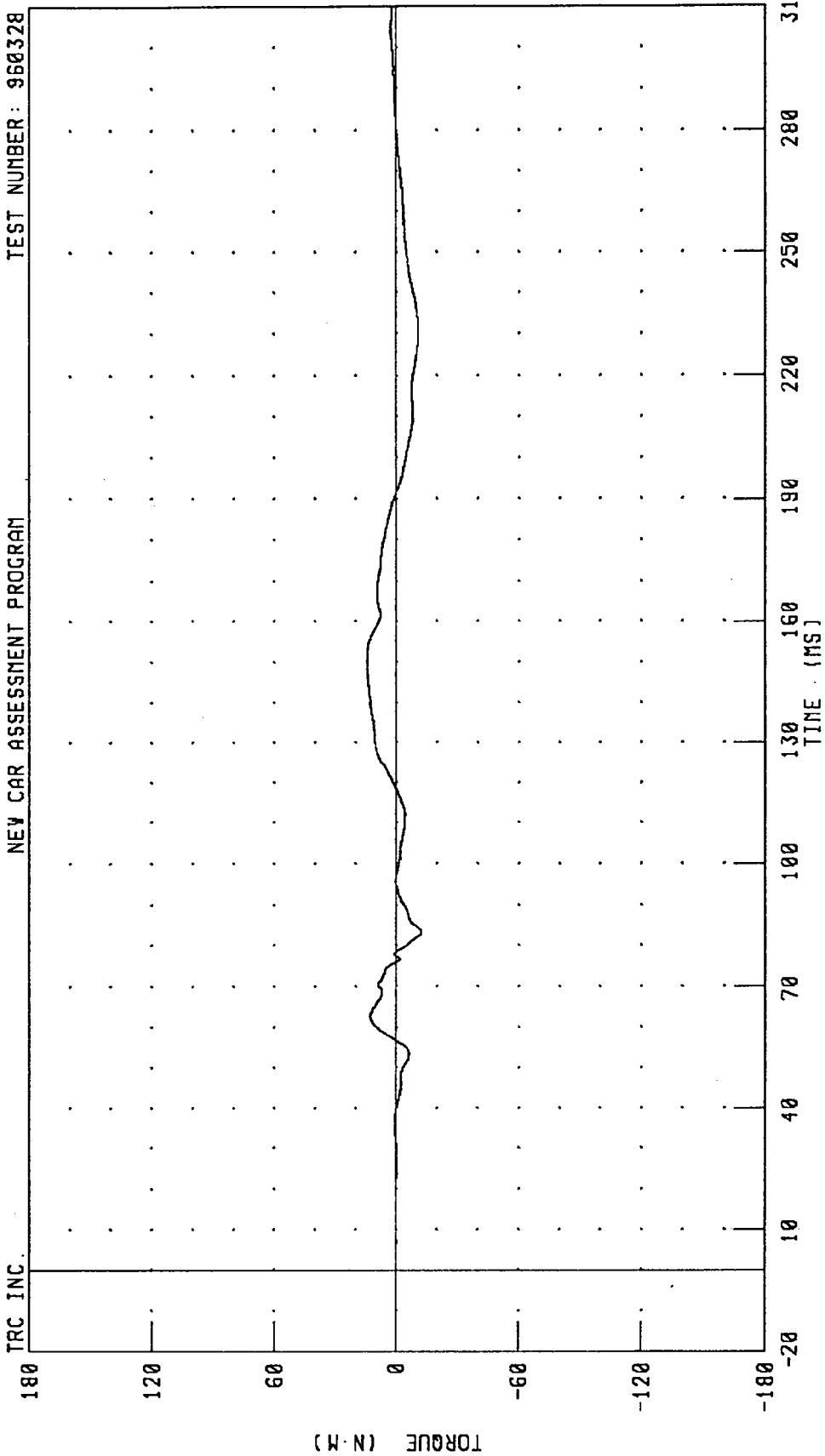
TEST NUMBER: 960328



TRC INC. CHANNEL: NEKZF1 FILTER: CH. CLASS 1000
PEAK DATA: 3634.28 N @ 71.68 MS; -454.52 N @ 110.08 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM

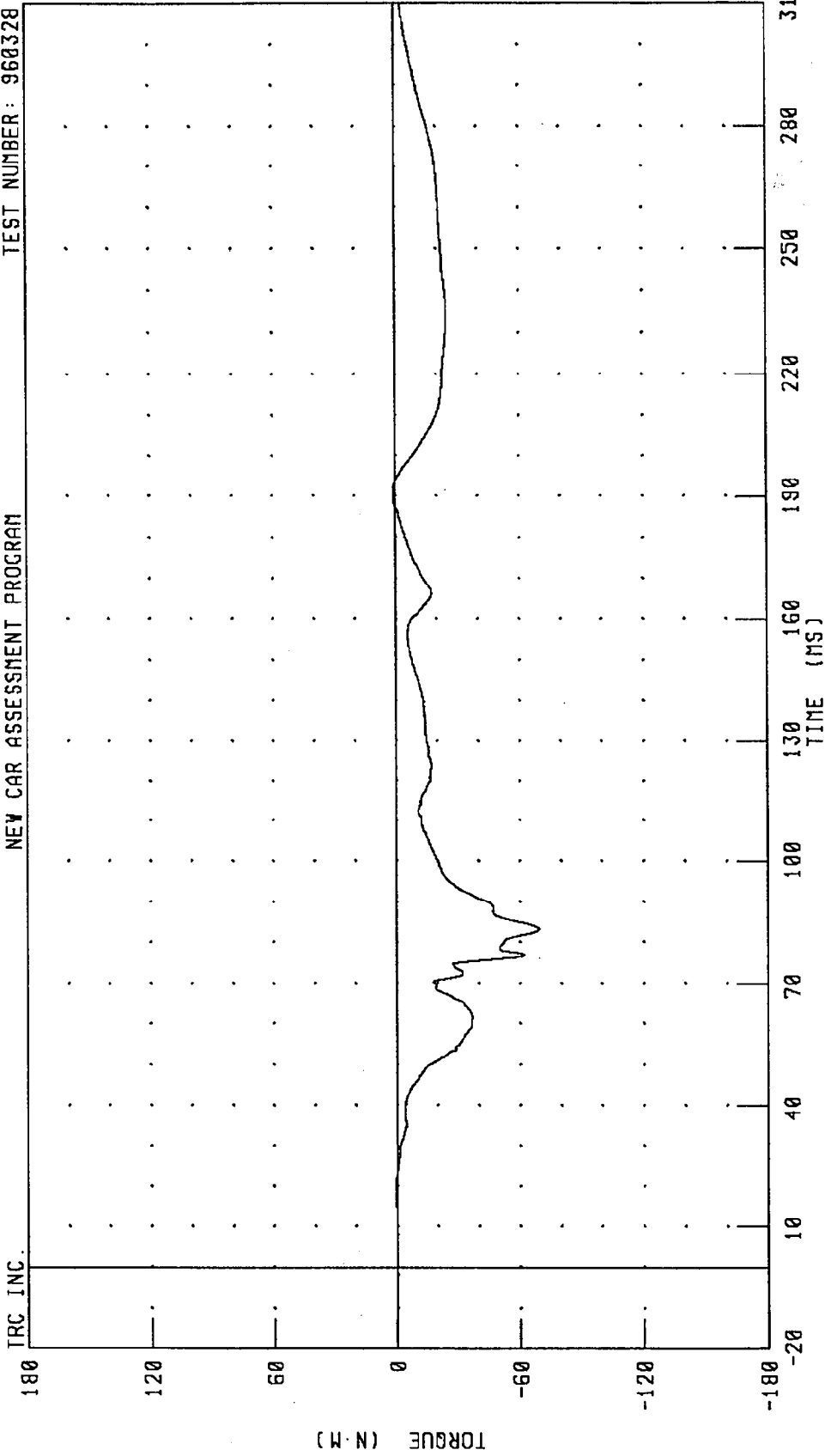
TEST NUMBER: 960328



CHANNEL: NEKXMI FILTER: CH. CLASS 600 PEAK DATA: 14.36 N.M @ 150.24 MS; -12.35 N.M @ 83.36 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

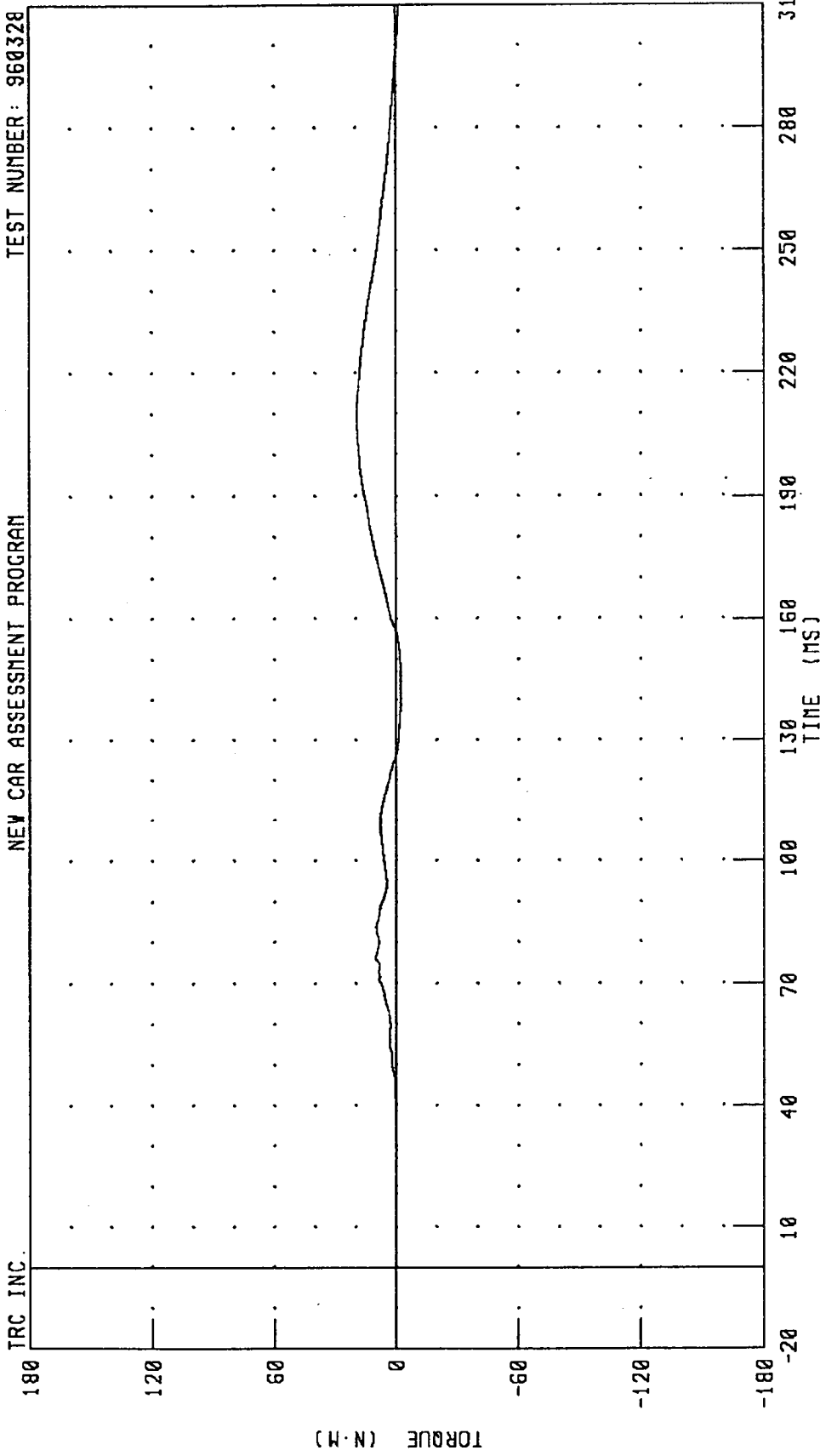


TRC INC.

CHANNEL: NEKYM1 FILTER: CH. CLASS 600
PEAK DATA: 1.28 N-M @ 191.12 MS; -69.43 N-M @ 83.28 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER NECK MOMENT ABOUT Z AXIS
NEW CAR ASSESSMENT PROGRAM

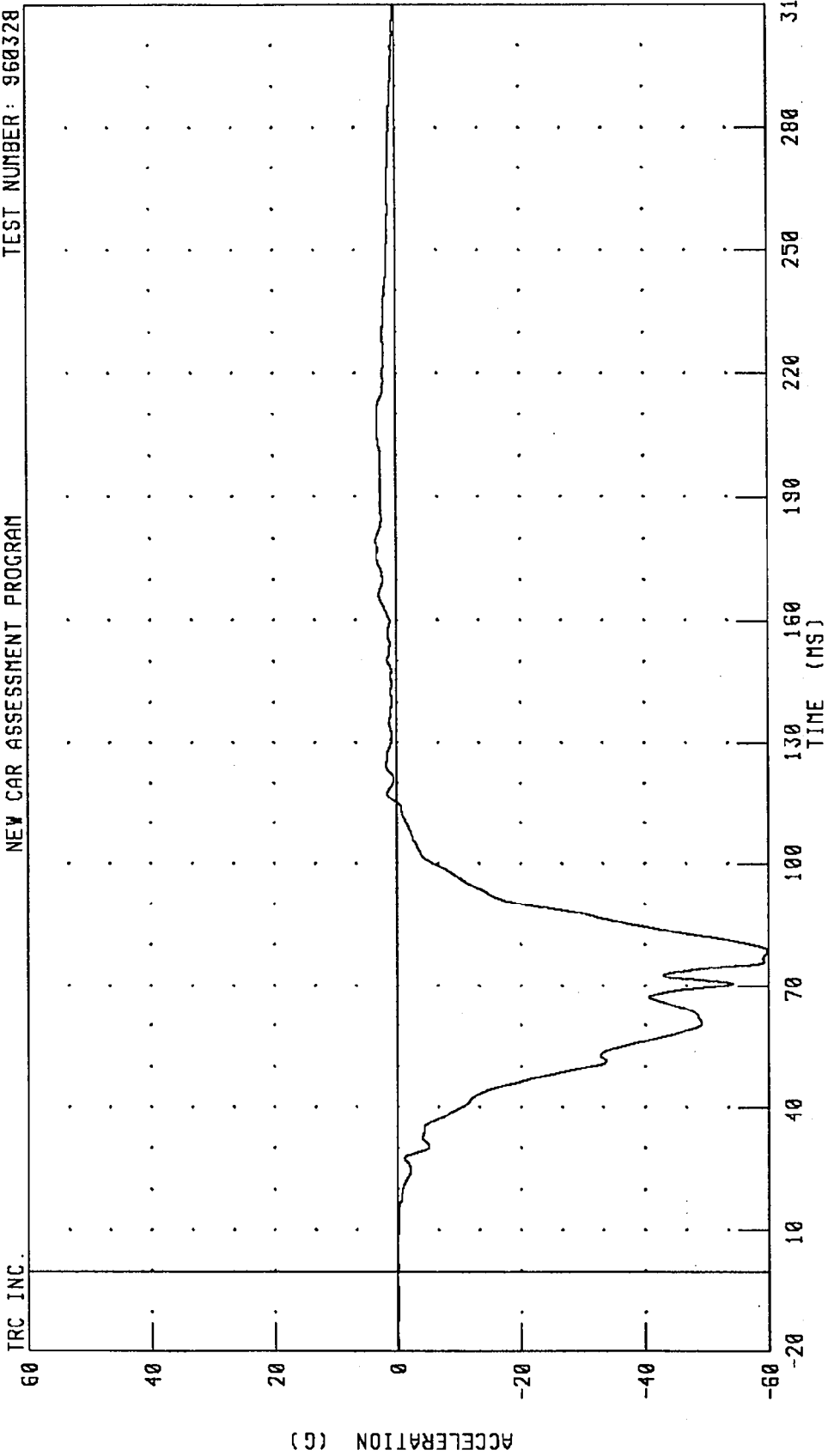
TEST NUMBER: 960328



TRC INC. CHANNEL: NEKZM1 FILTER: CH. CLASS 600
PEAK DATA: 19.28 N·M @ 210.88 MS; -2.68 N·M @ 145.12 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



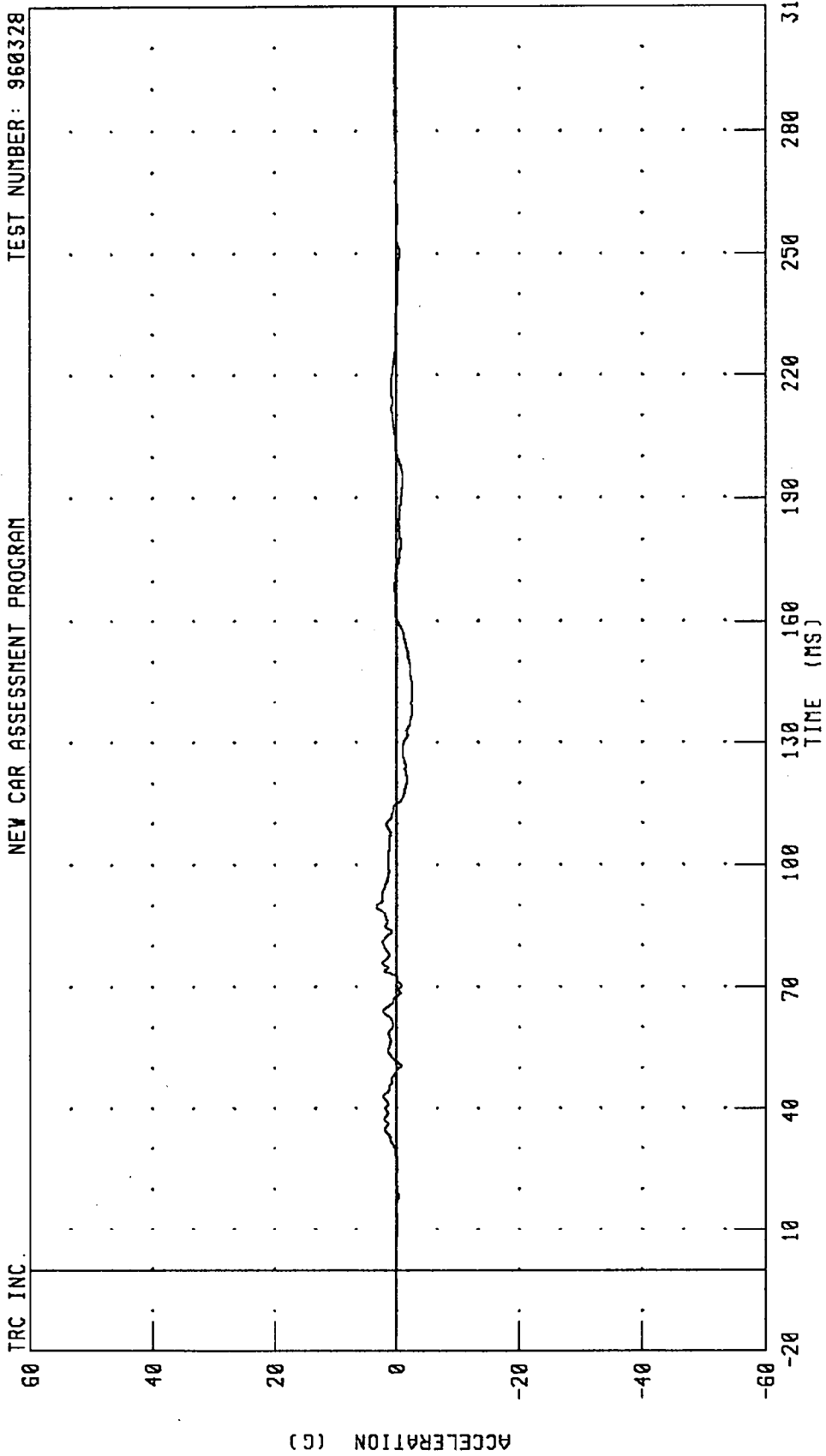
TRC INC.

CHANNEL: CSTXG1 FILTER: CH. CLASS 180
PEAK DATA: 3.32 G @ 179.76 MS; -59.62 G @ 78.72 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

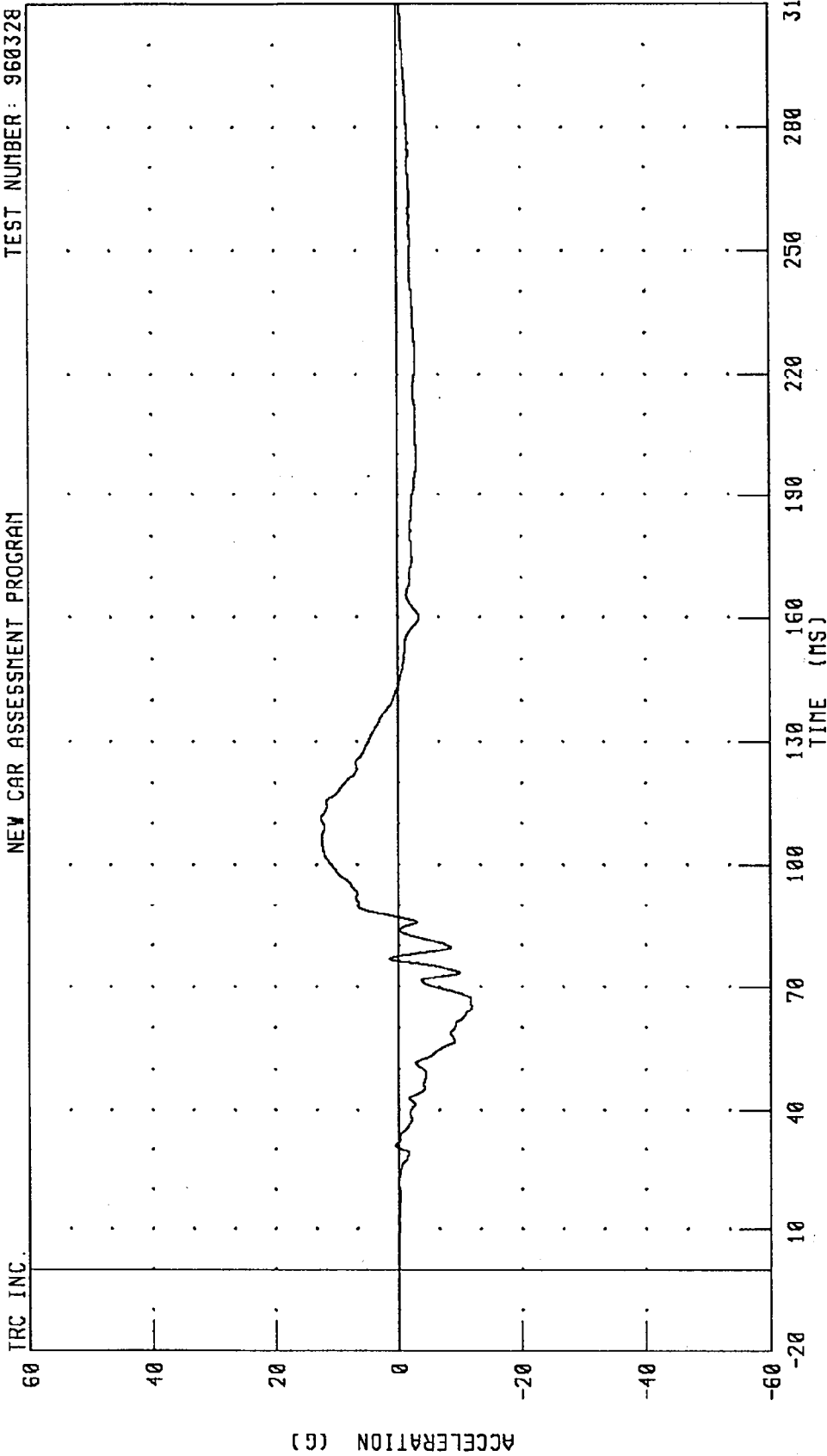


CHANNEL: CSTYG1 FILTER: CH. CLASS 180

PEAK DATA: 3.31 G @ 89.76 MS; -2.57 G @ 142.96 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



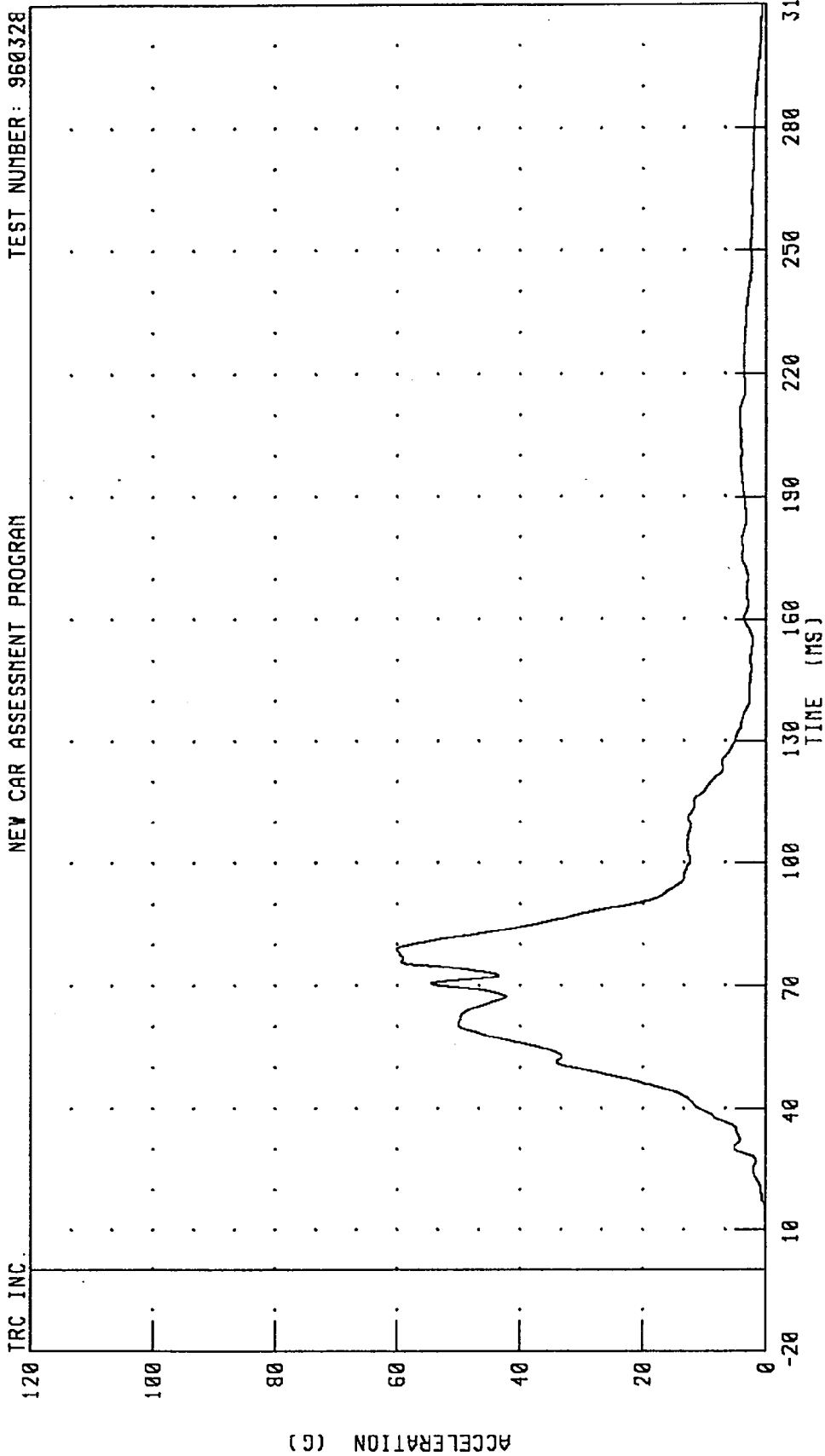
CHANNEL: CSTZG1 FILTER: CH. CLASS 180

960328

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

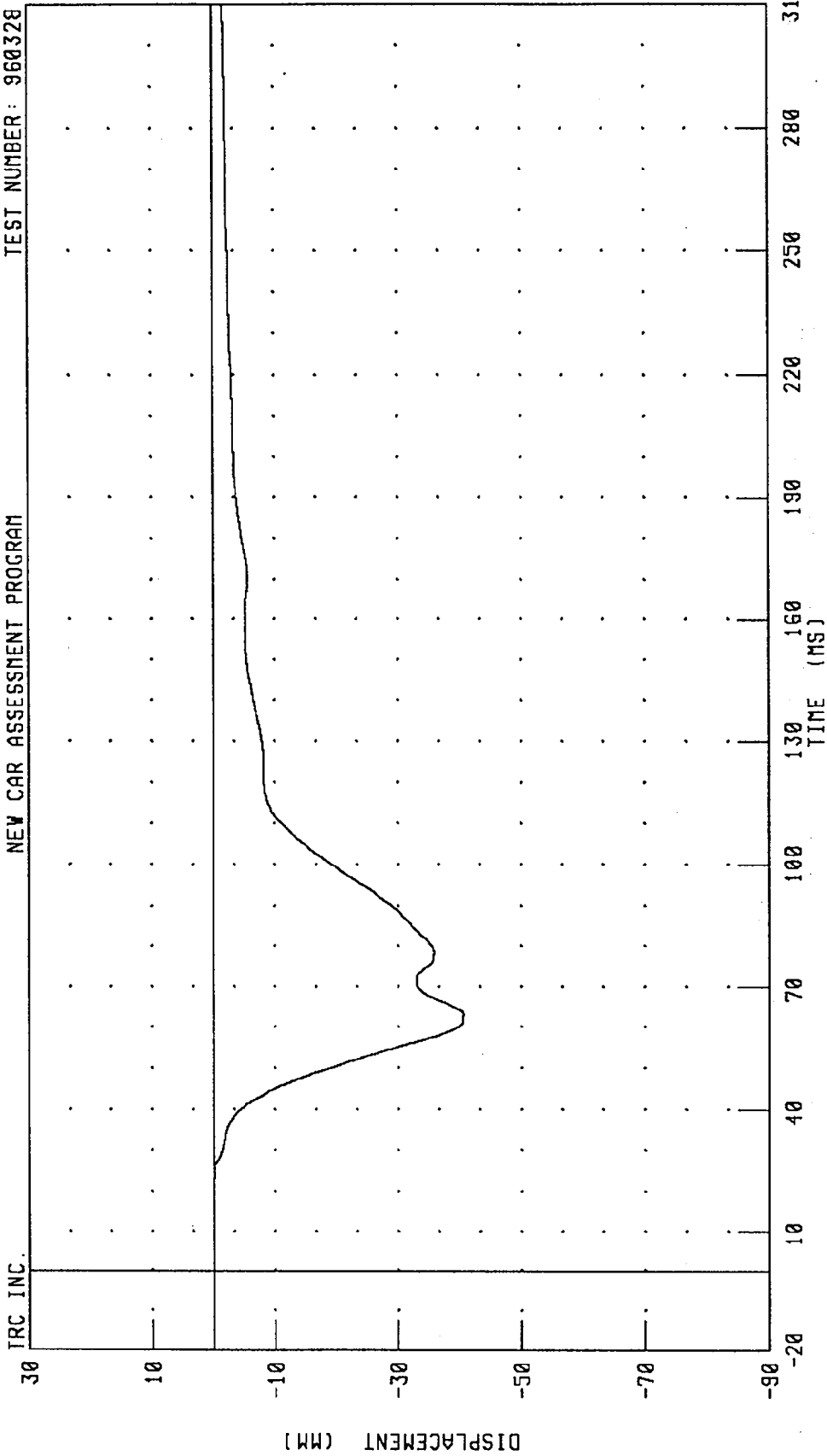
TRC INC.



CHANNEL: CSTRG1 FILTER: CH. CLASS 180 PEAK DATA: 60.01 G @ 78.96 MS; 0.01 G @ -20.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

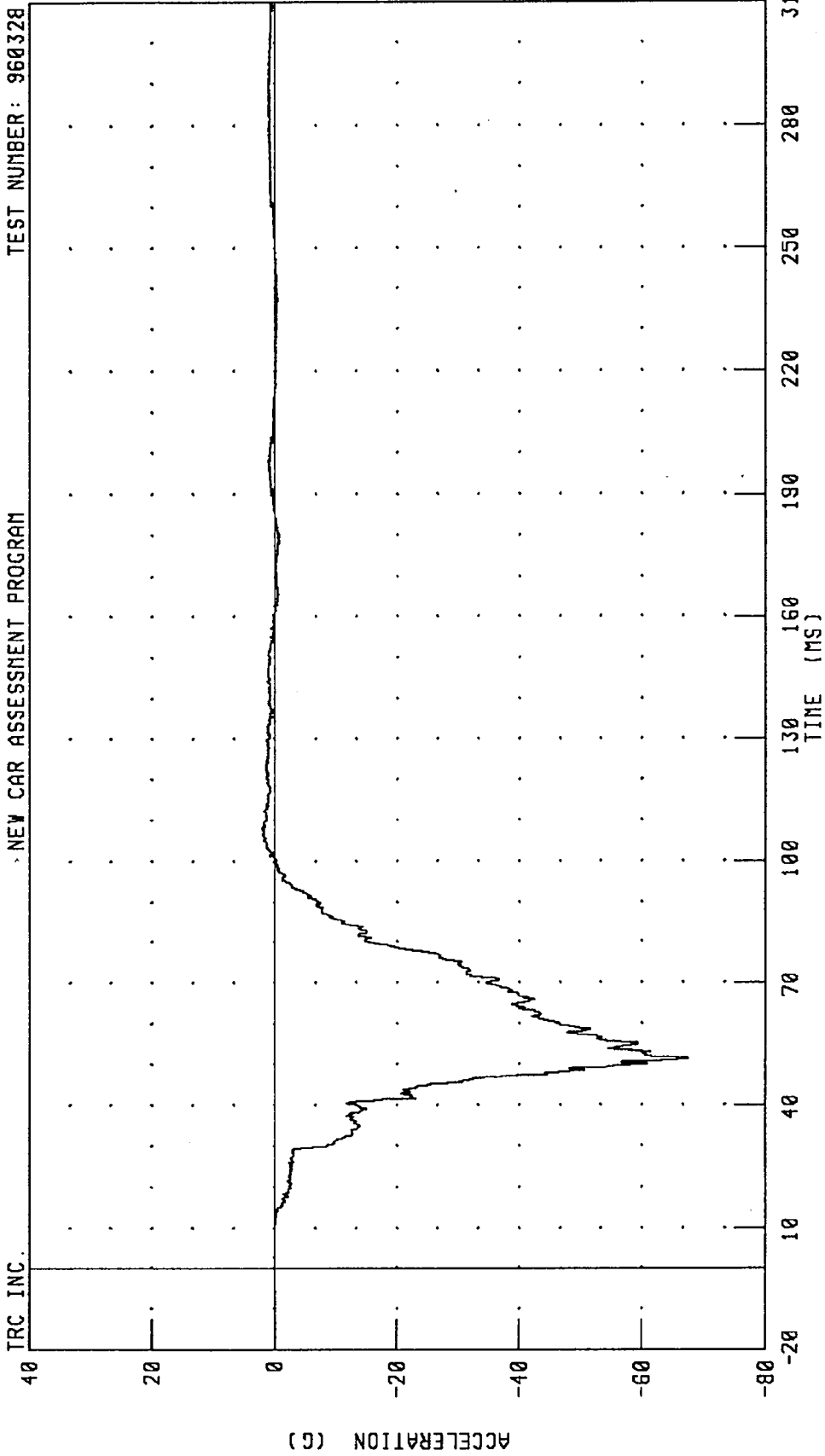


CHANNEL: CSTXD1 FILTER: CH. CLASS 180 PEAK DATA: 0.03 MM @ 0.08 MS; -40.59 MM @ 63.12 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

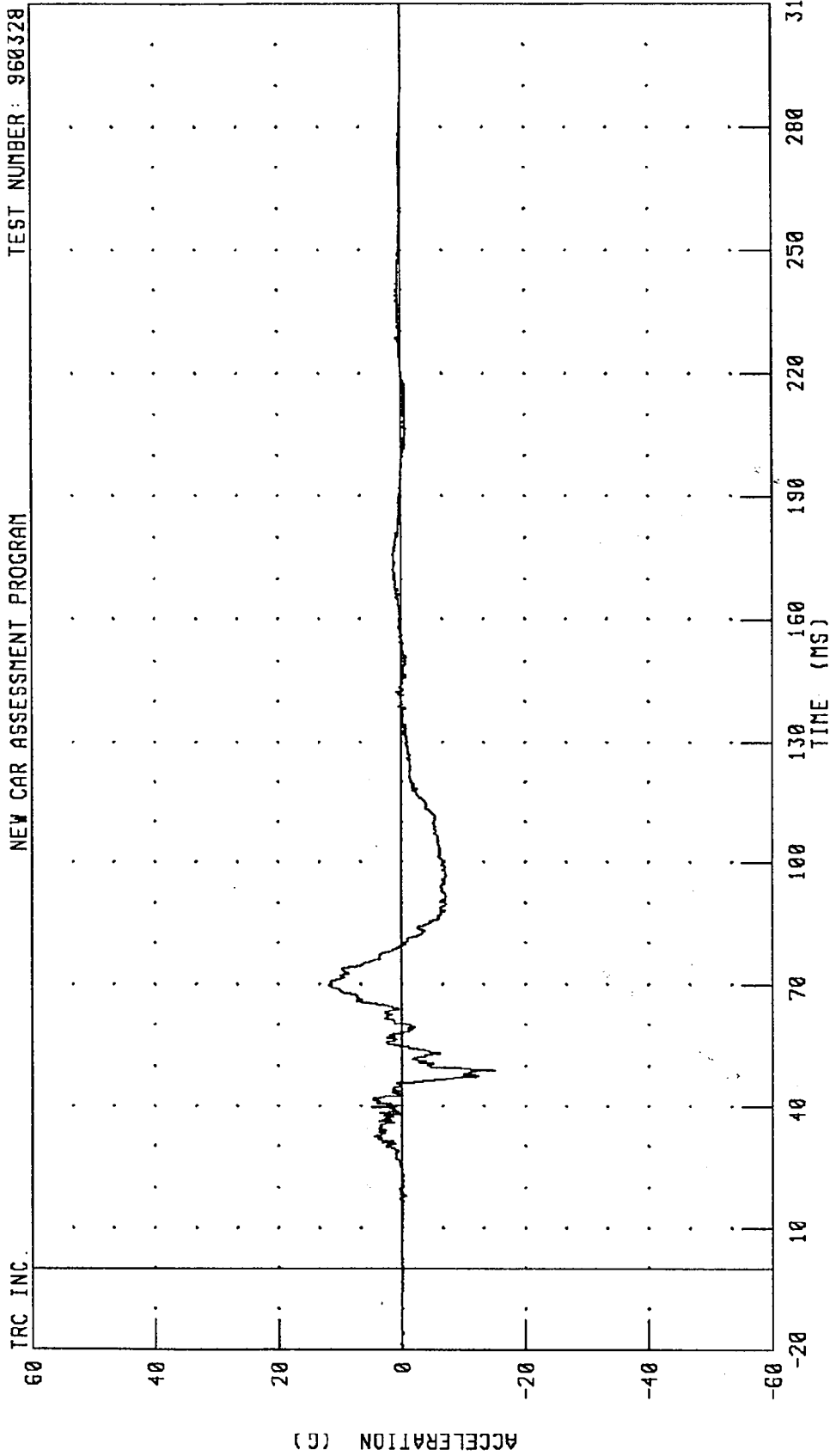
TRC INC.



CHANNEL: PEVXG1 FILTER: CH. CLASS 1000 PEAK DATA: 1.98 G @ 106.24 MS; -67.34 G @ 51.20 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

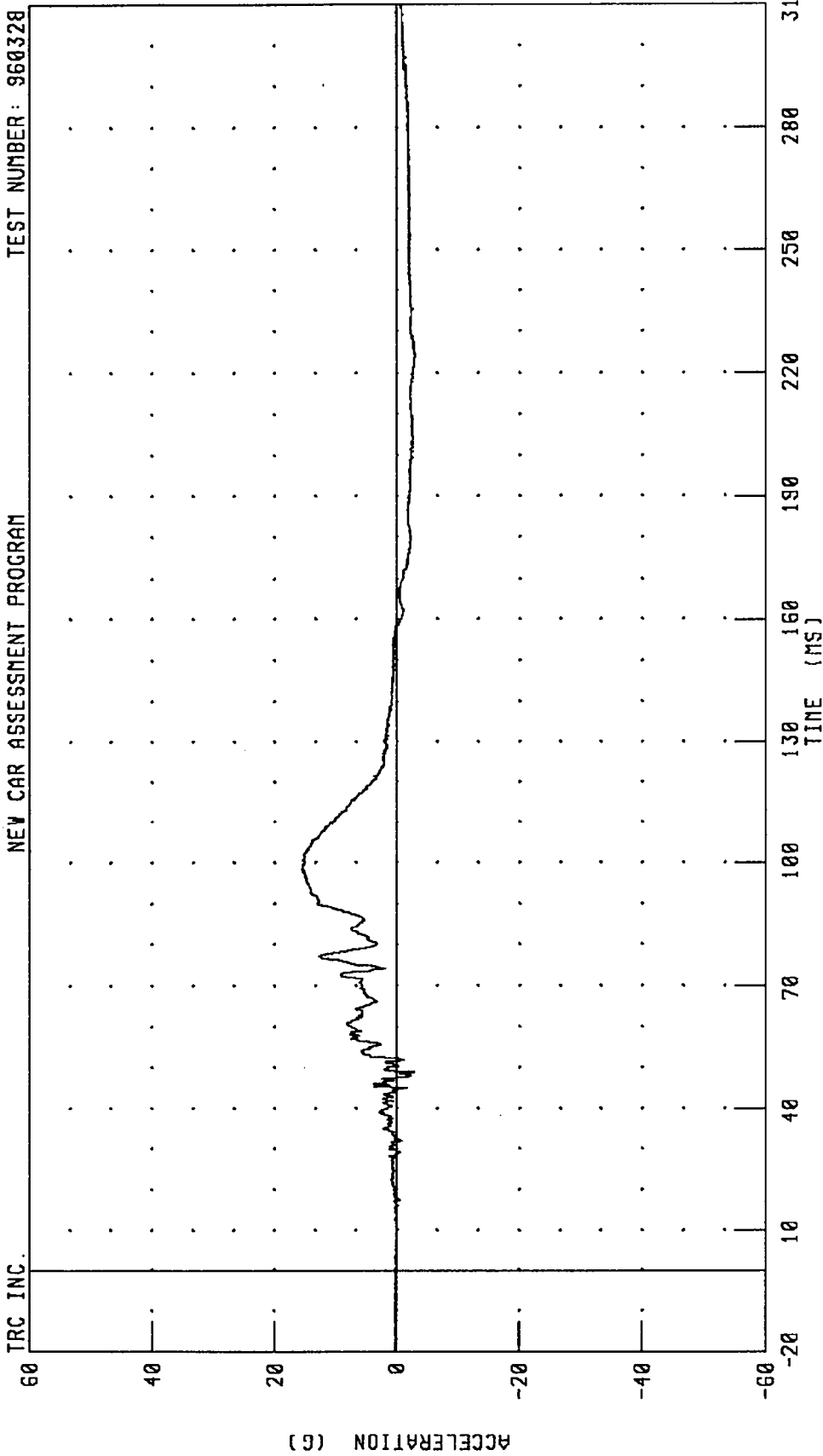


CHANNEL: PEVYGI FILTER: CH. CLASS 1000

PEAK DATA: 11.80 G @ 69.84 MS; -15.13 G @ 48.96 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

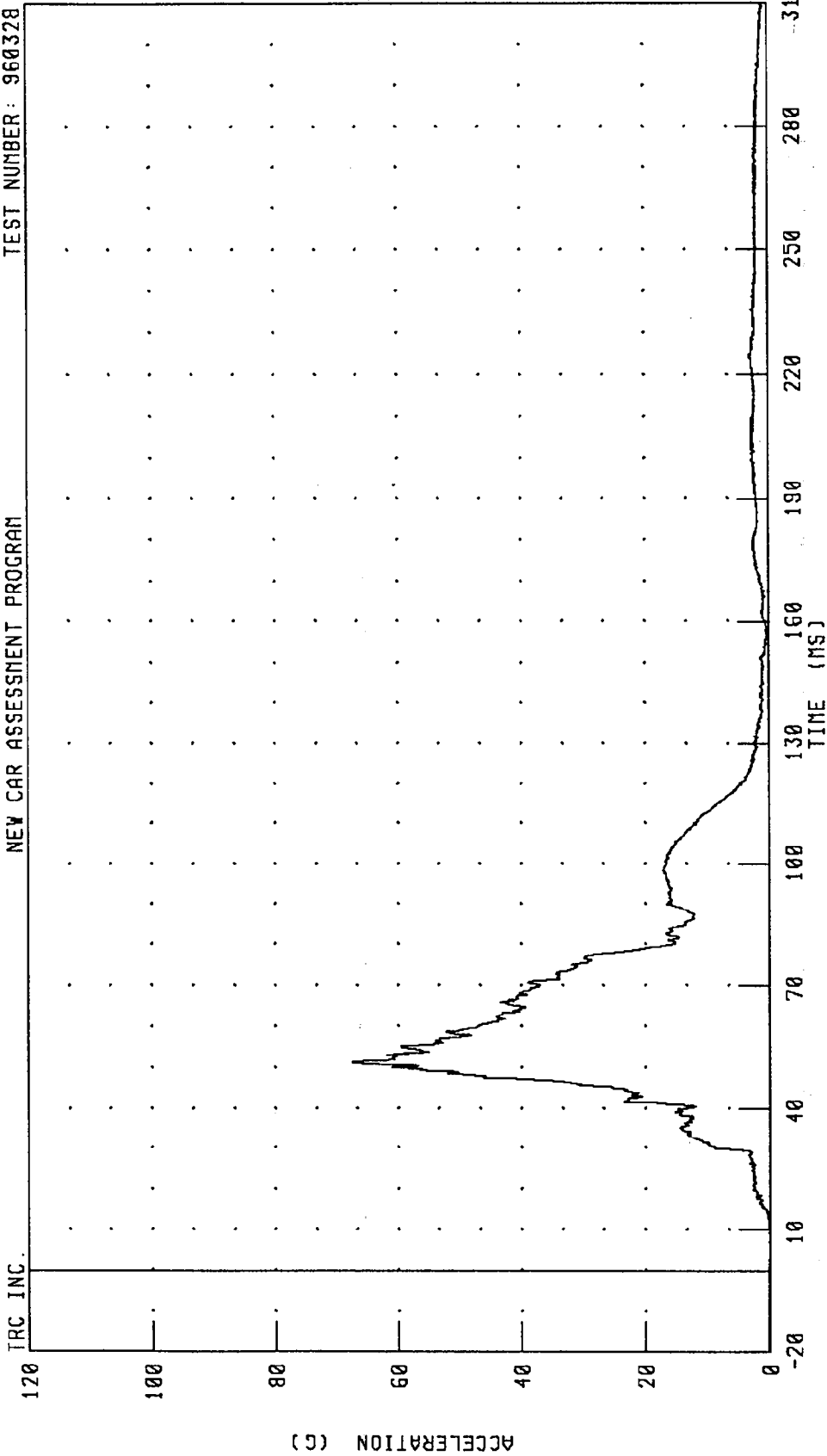


TRC INC.

CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER PELVIS RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

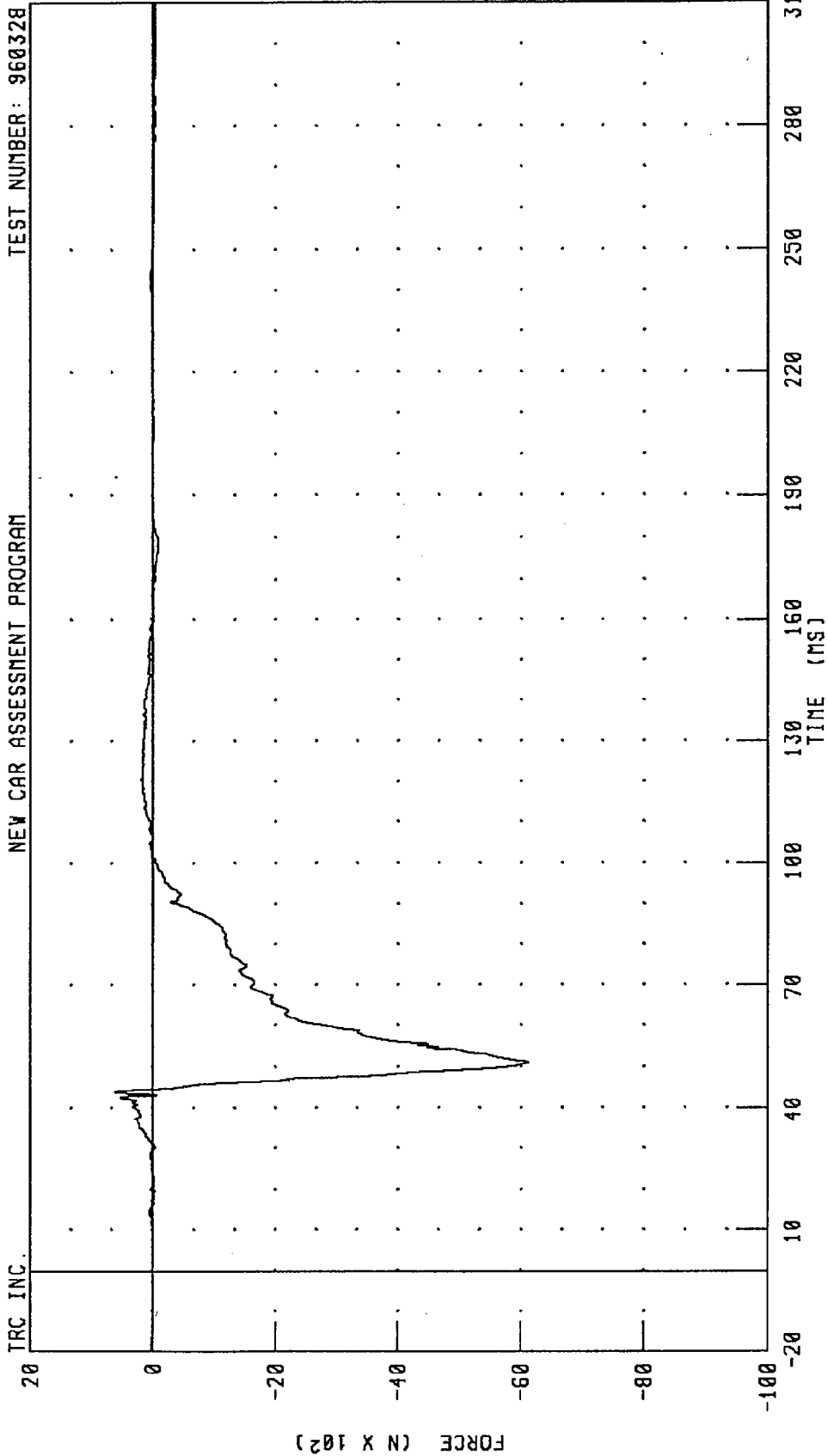


CHANNEL: PEVRG1 FILTER: CH. CLASS 1000
PEAK DATA: 67.44 G @ 51.20 MS; 0.07 G @ 18.96 MS

IRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

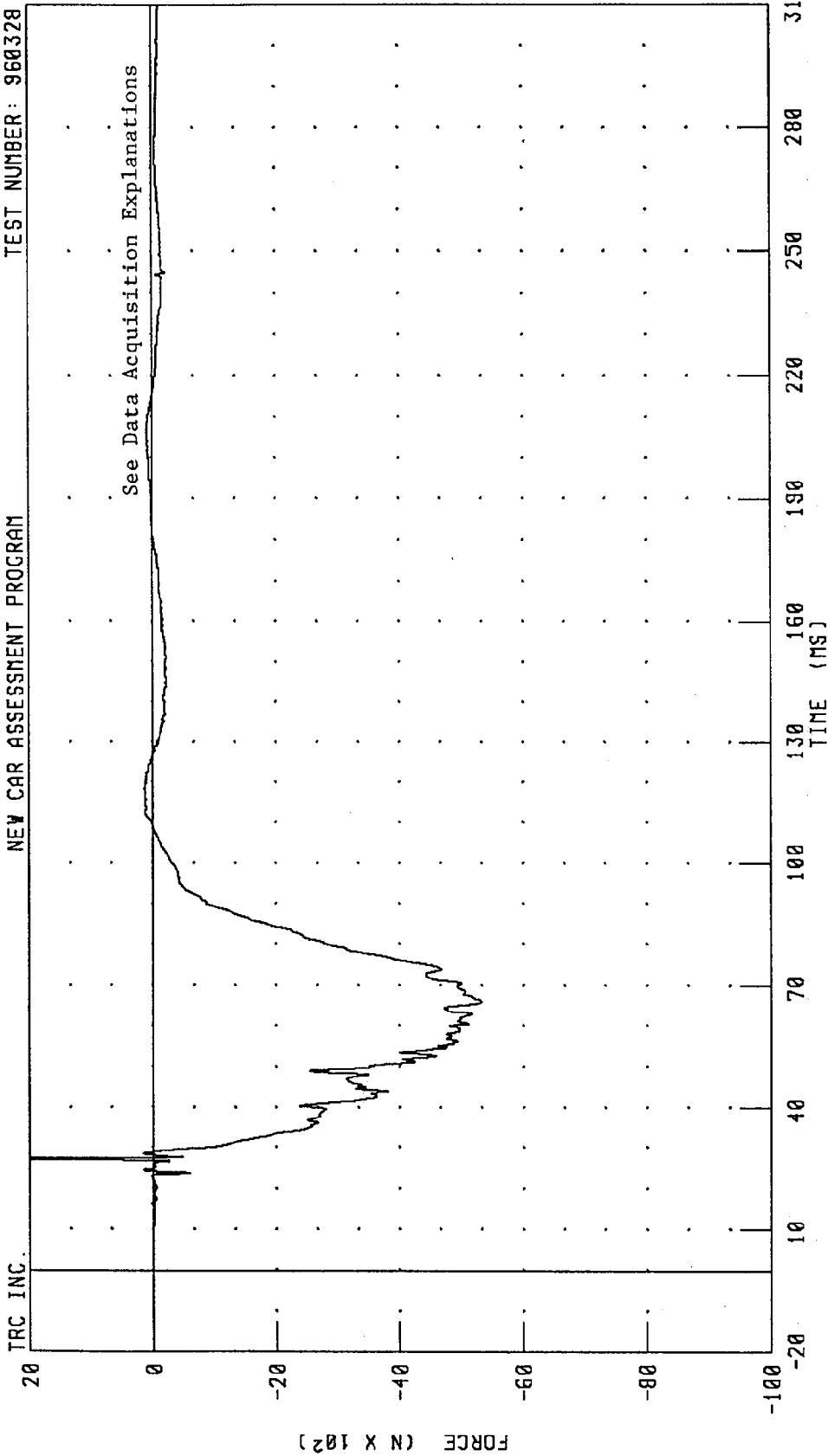
TEST NUMBER: 960328



CHANNEL: LFMF1 FILTER: CH. CLASS 600
PEAK DATA: 608.99 N @ 44.00 MS; -6118.89 N @ 51.04 MS

1986 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



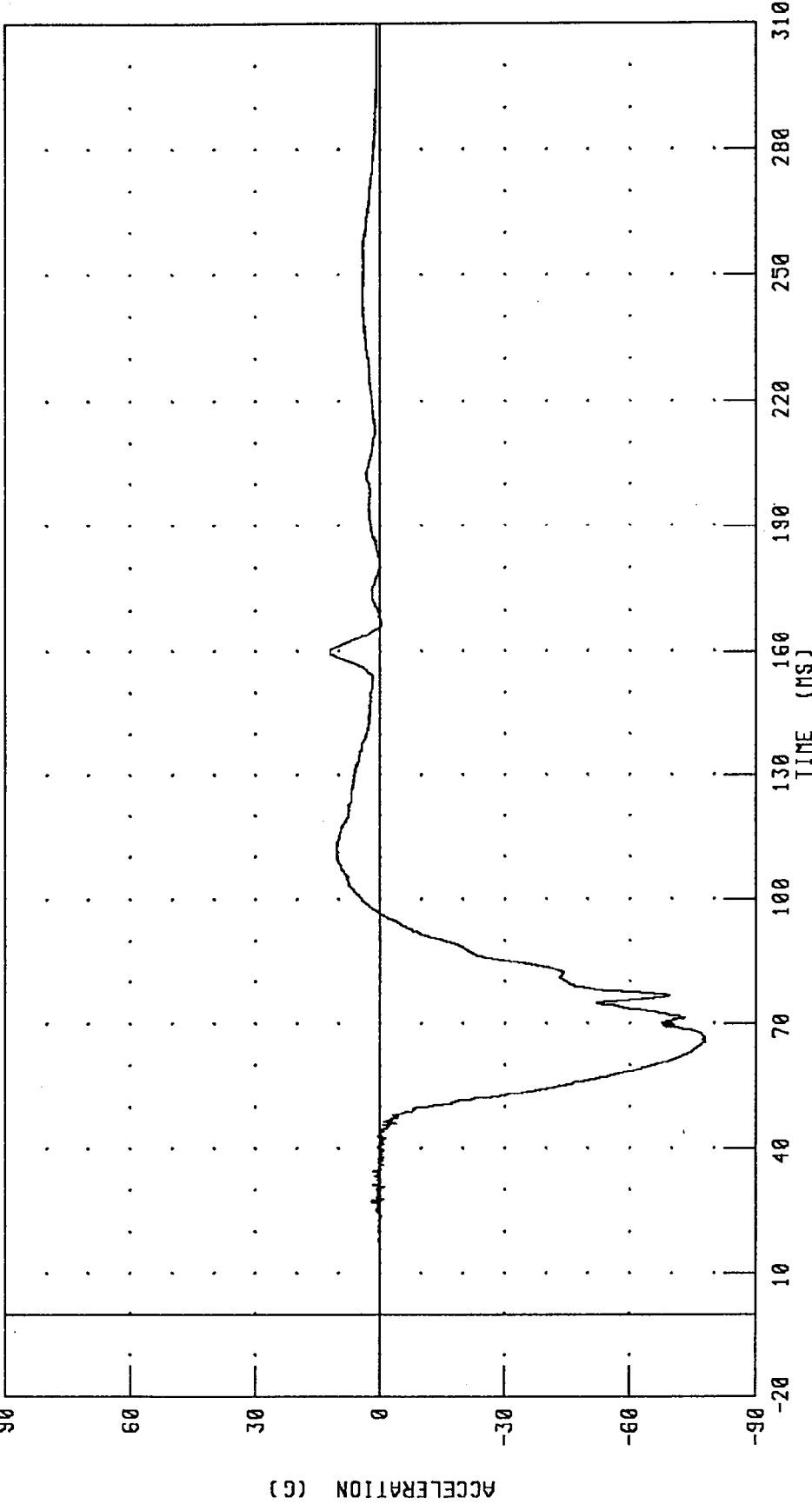
CHANNEL: RFMF1 FILTER: CH. CLASS 600

PEAK DATA: 5771.79 N @ 27.28 MS; -5333.42 N @ 66.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

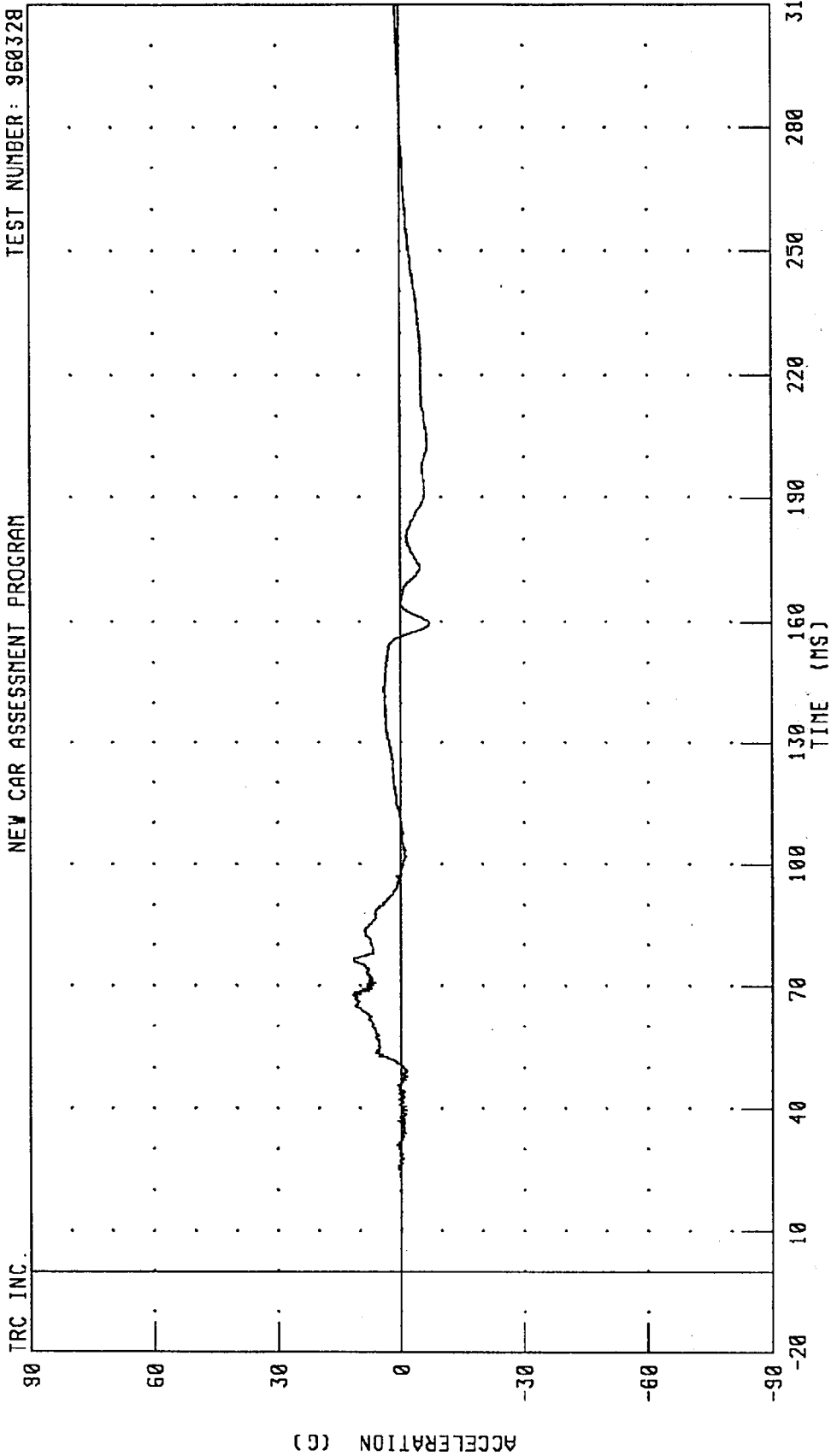
TRC INC.



CHANNEL: HEDXR1 FILTER: CH. CLASS 1000 PEAK DATA: 12.08 G @ 159.60 MS; -77.86 G @ 65.52 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



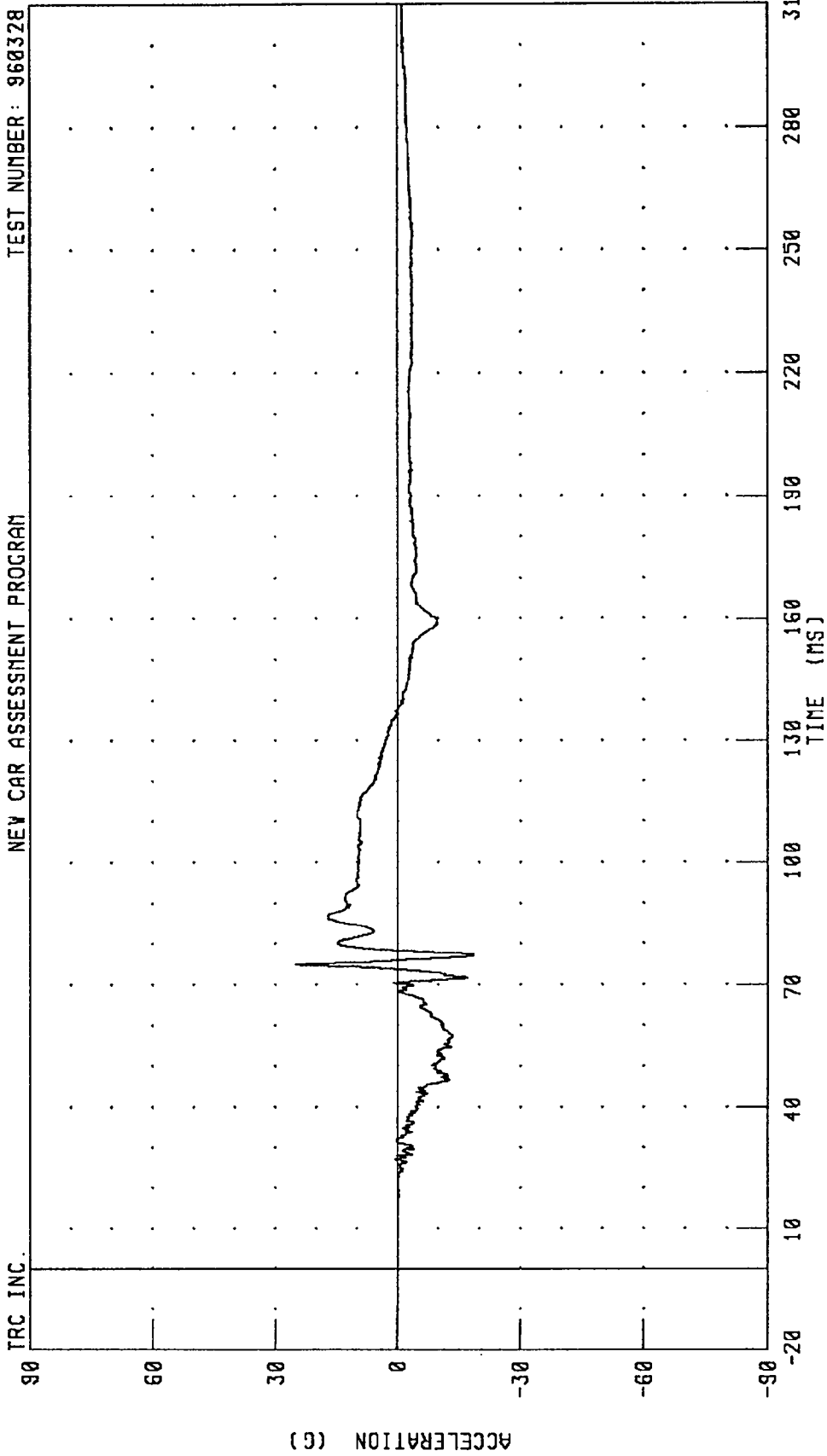
CHANNEL: HEDYR1 FILTER: CH. CLASS 1000

PEAK DATA: 11.72 G @ 67.84 MS; -7.11 G @ 159.52 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

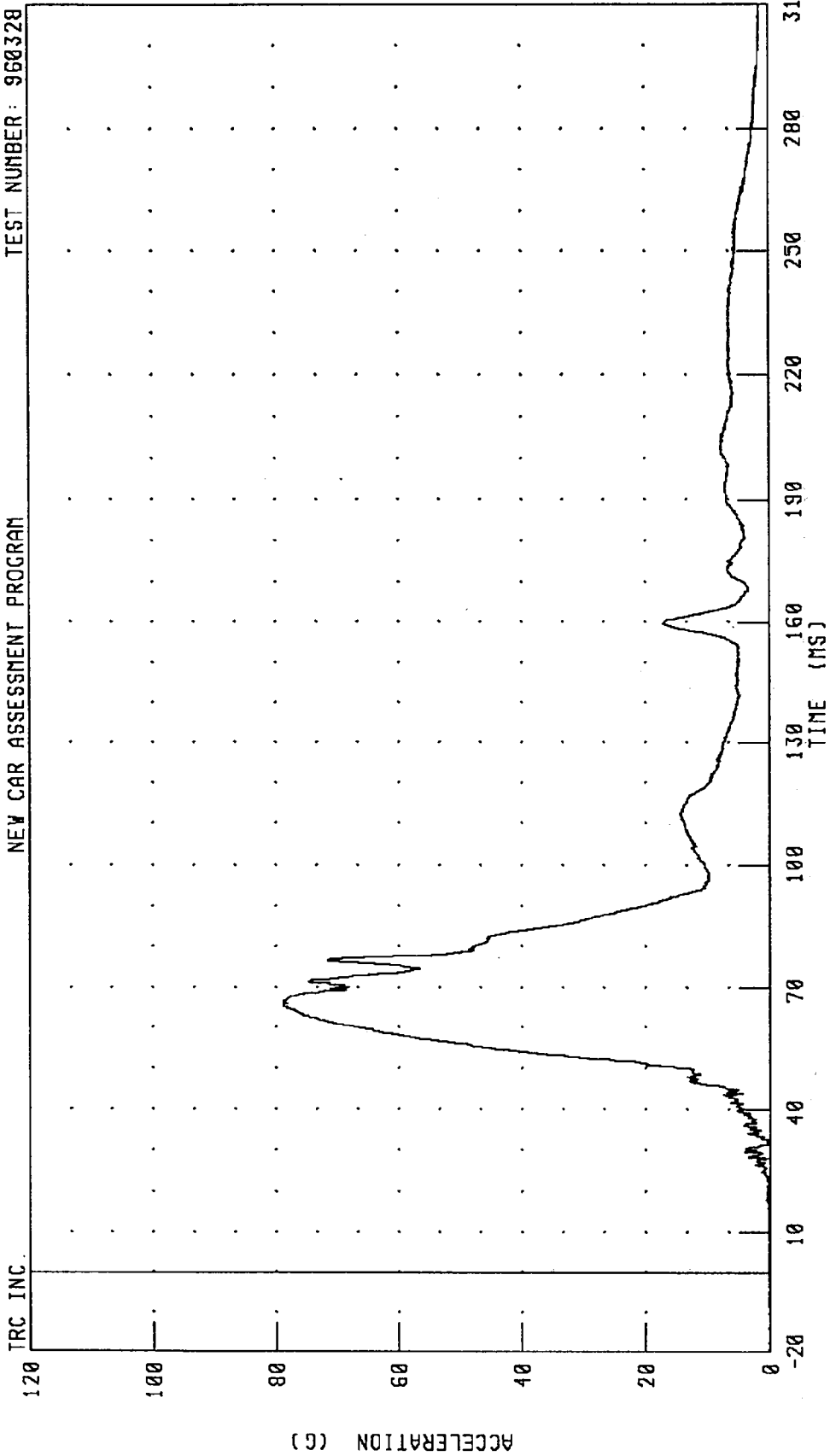
TEST NUMBER: 960328



CHANNEL: HEDZRI FILTER: CH. CLASS 1000 PEAK DATA: 25.16 G @ 74.96 MS; -18.60 G @ 77.28 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER HEAD RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



TRC_INC. CHANNEL: HEDRR1 FILTER: CH. CLASS 1000 PEAK DATA: 78.87 G @ 65.52 MS; 0.12 G @ -20.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST X-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

60

40

20

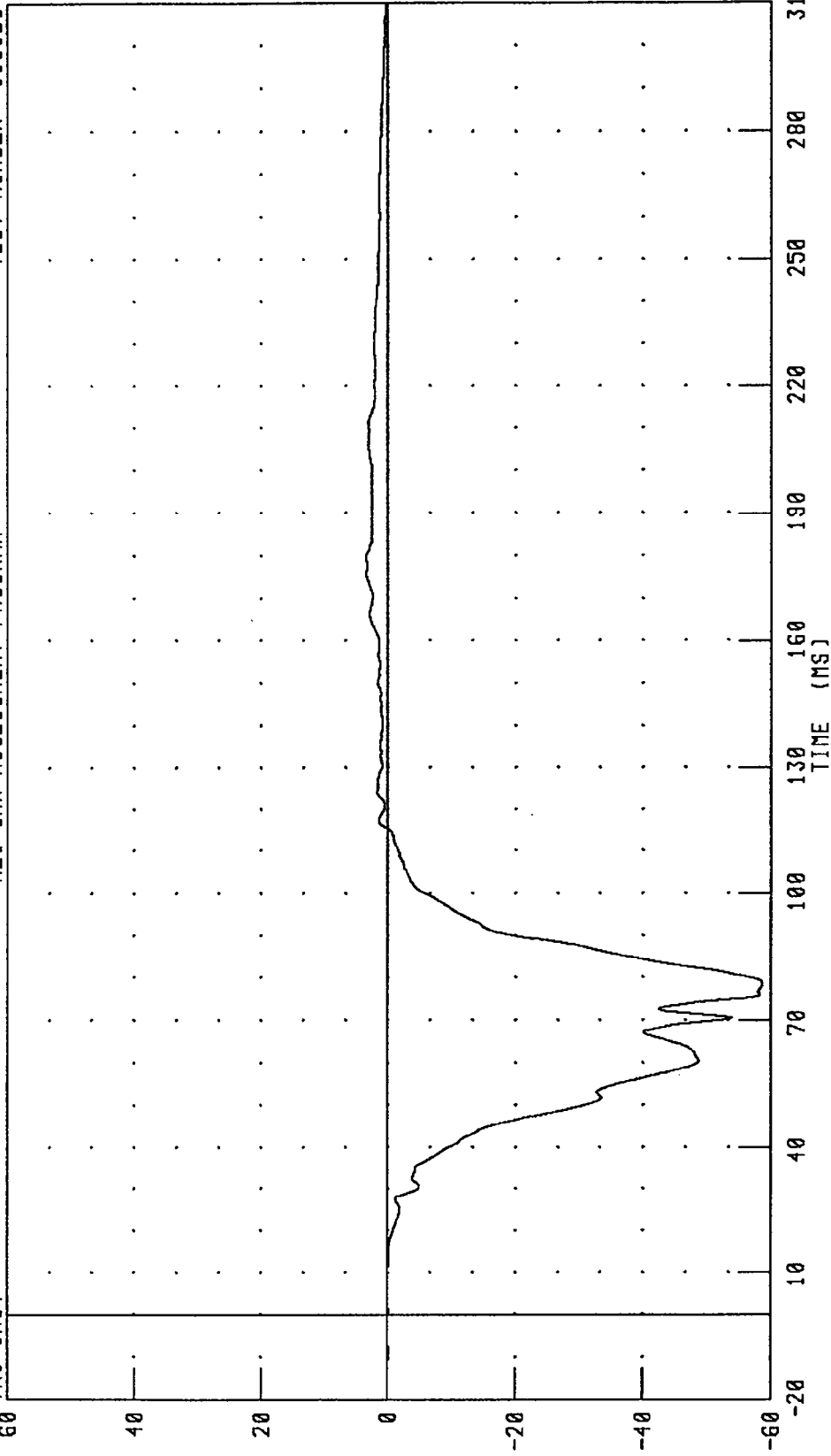
0

-20

-40

-60

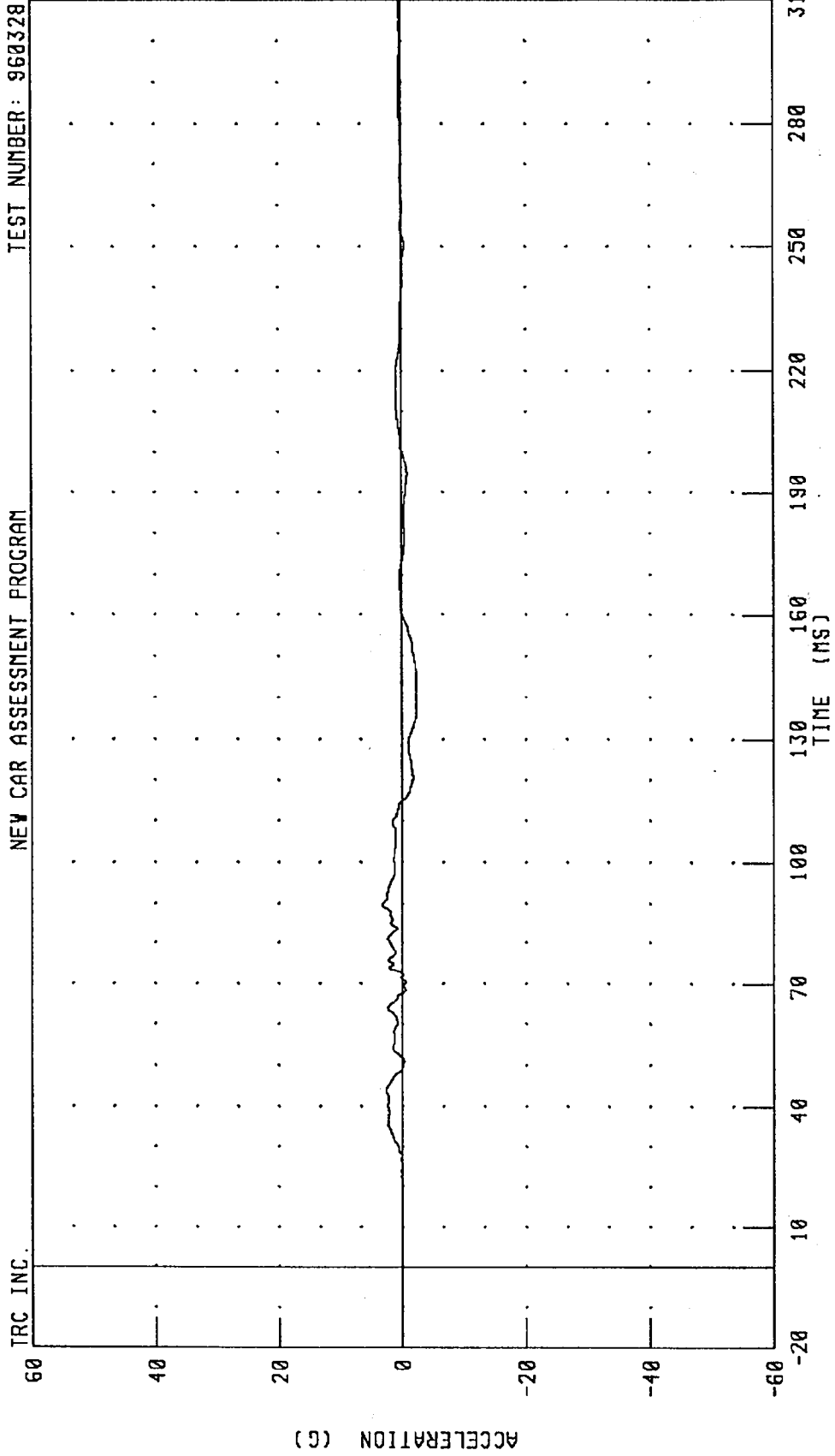
ACCELERATION (G)



CHANNEL: CSTXR1 FILTER: CH. CLASS 180
PEAK DATA: 3.39 G @ 175.92 MS; -58.63 G @ 78.80 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: CSTYR1 FILTER: CH. CLASS 180

PEAK DATA: 3.18 G @ 89.84 MS; -2.44 G @ 142.32 MS

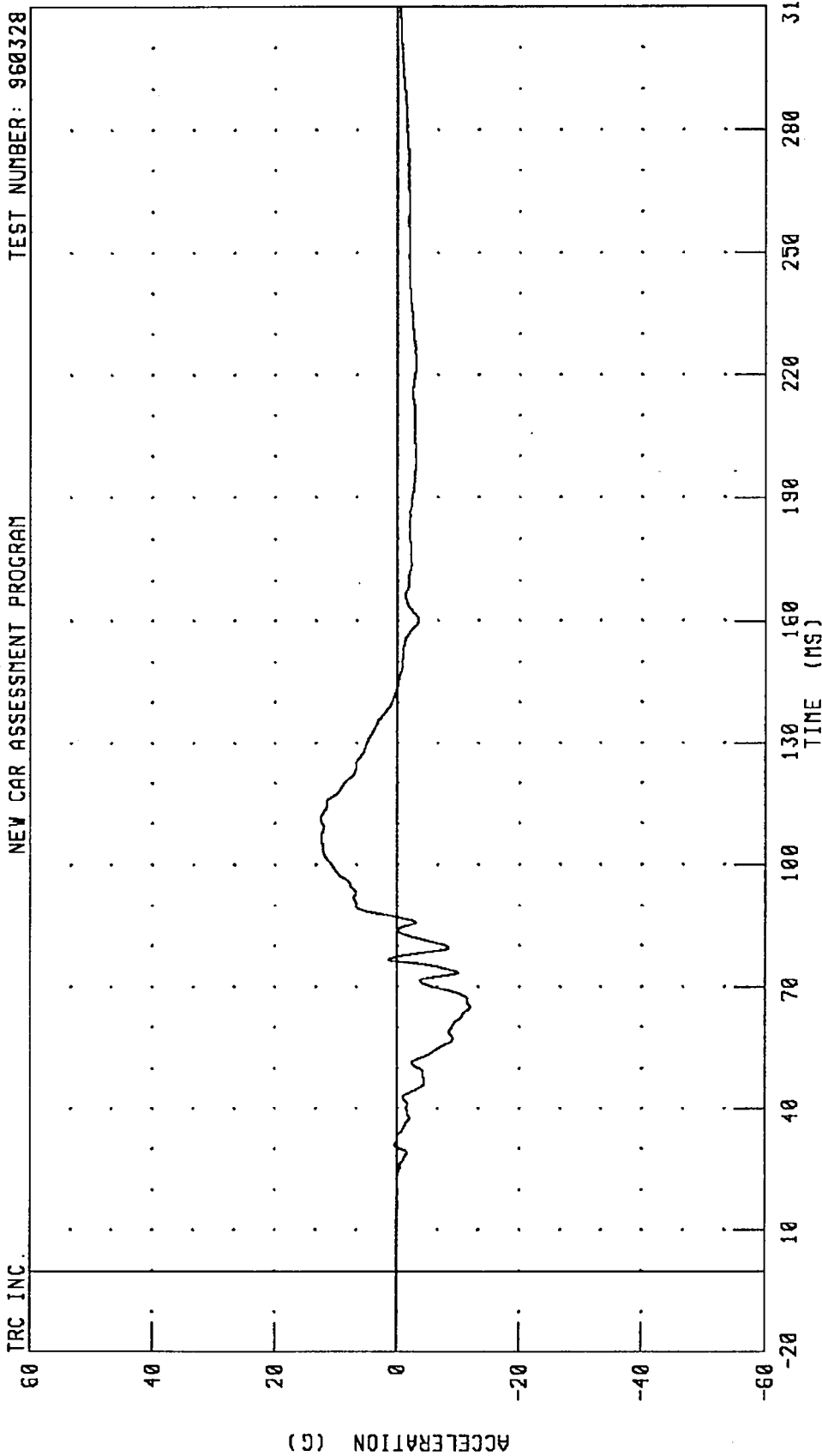
TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST Z-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

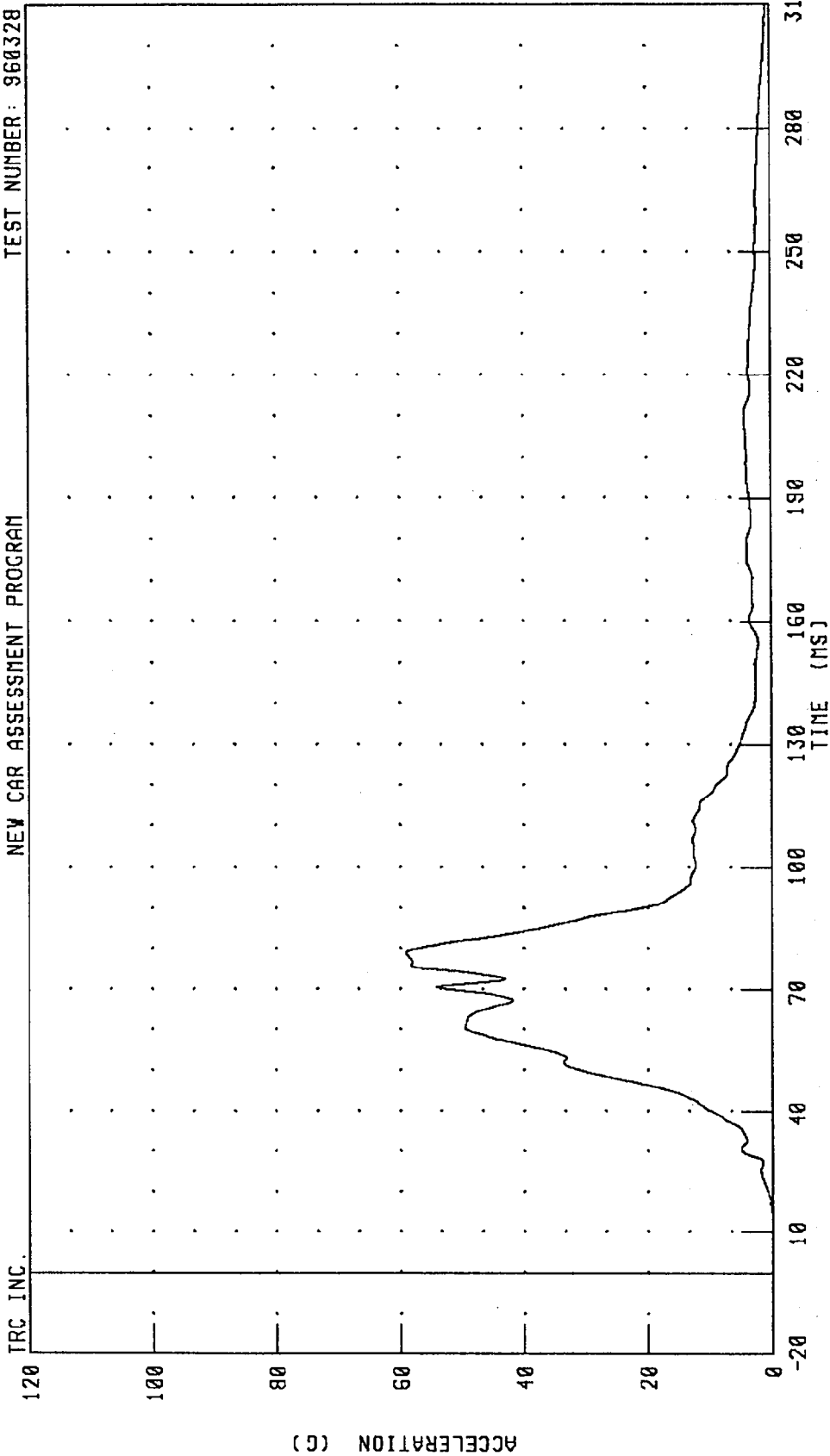


CHANNEL: CSTZR1 FILTER: CH. CLASS 180

PEAK DATA: 12.58 G @ 111.20 MS; -12.00 G @ 65.12 MS

1986 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER CHEST RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



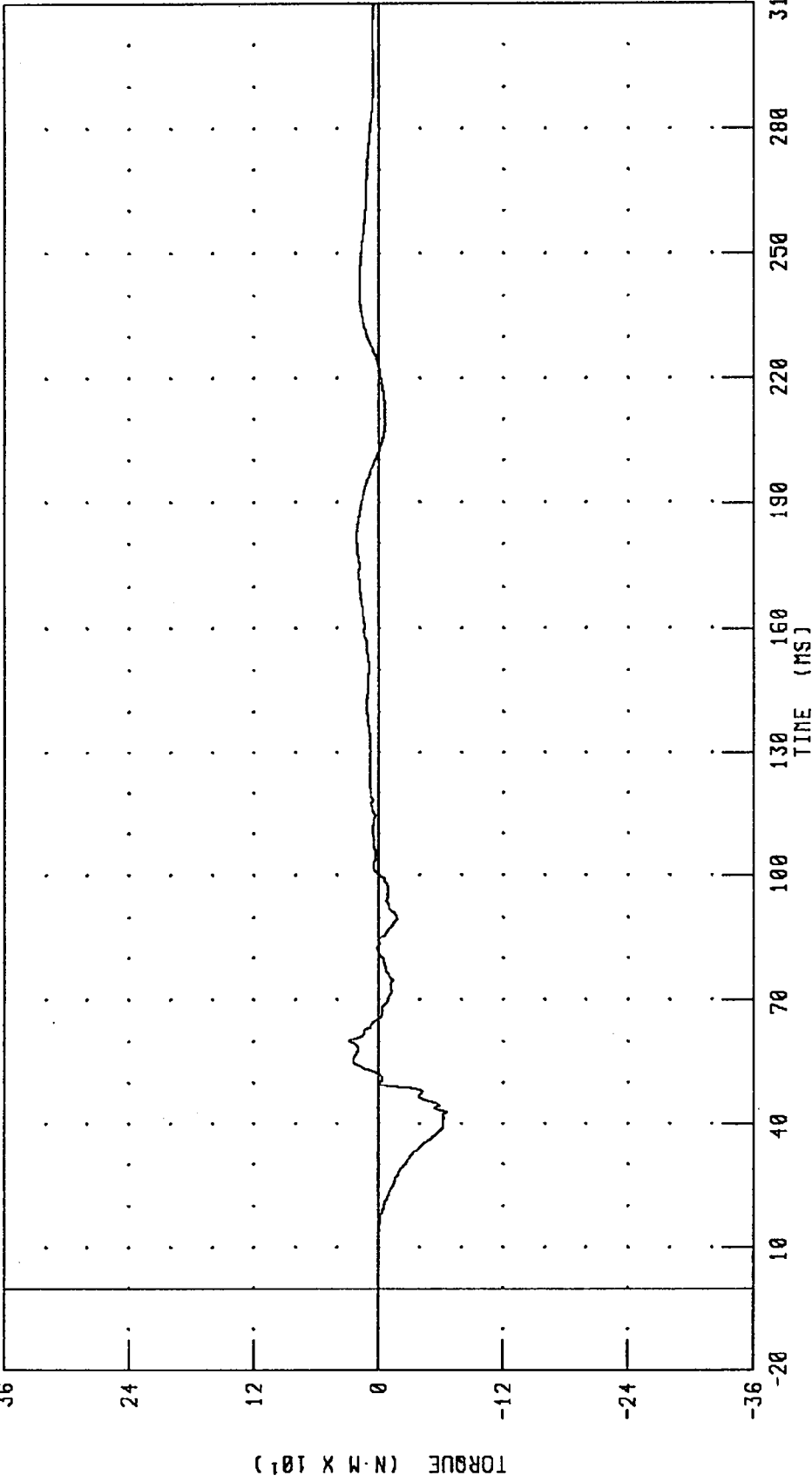
CHANNEL: CSTRR1 FILTER: CH. CLASS 180
PEAK DATA: 59.06 G @ 79.04 MS; 0.00 G @ -19.92 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

IRC INC.



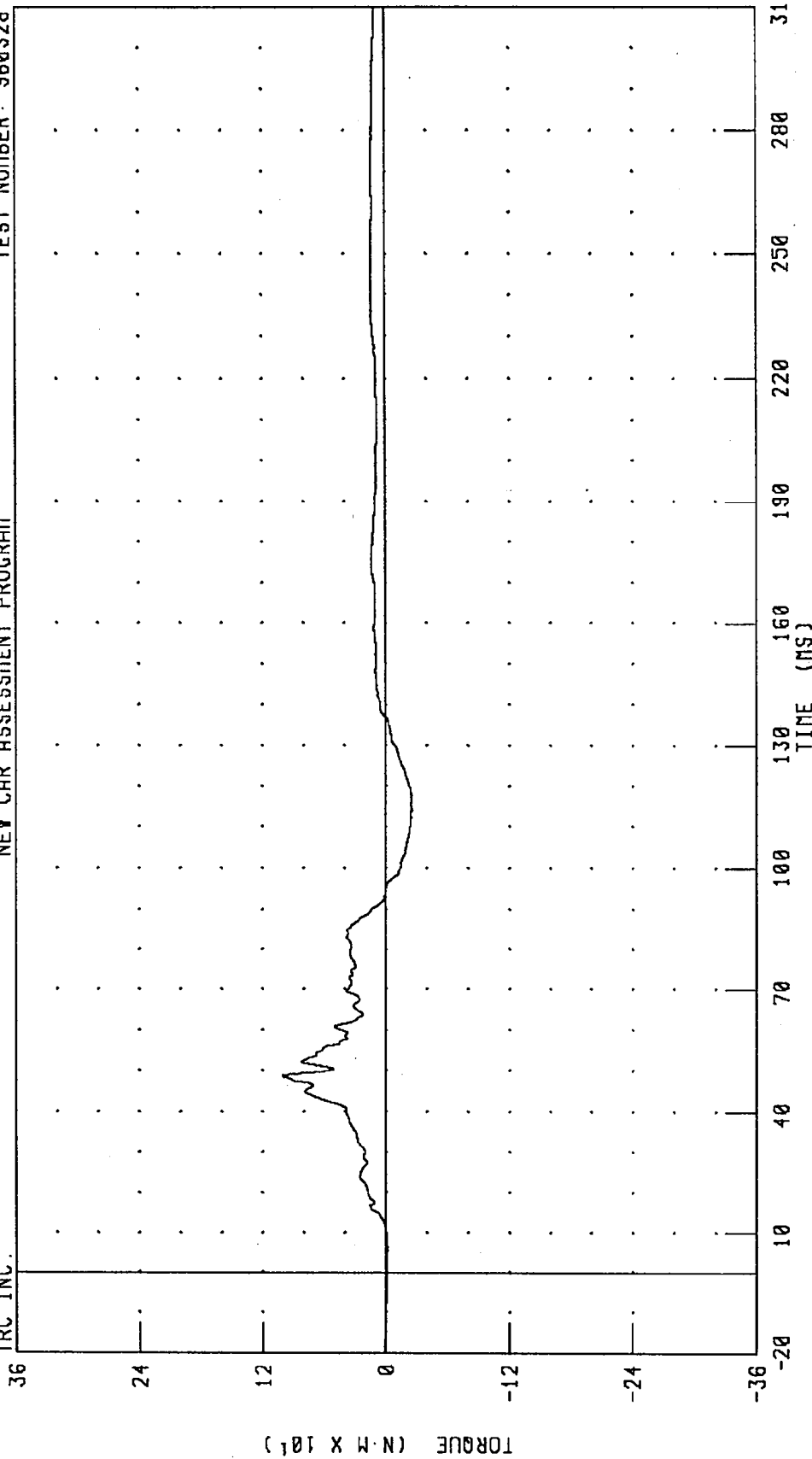
CHANNEL: TBLXMI FILTER: CH. CLASS 600 PEAK DATA: 28.68 N·M @ 60.24 MS; -66.33 N·M @ 42.88 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



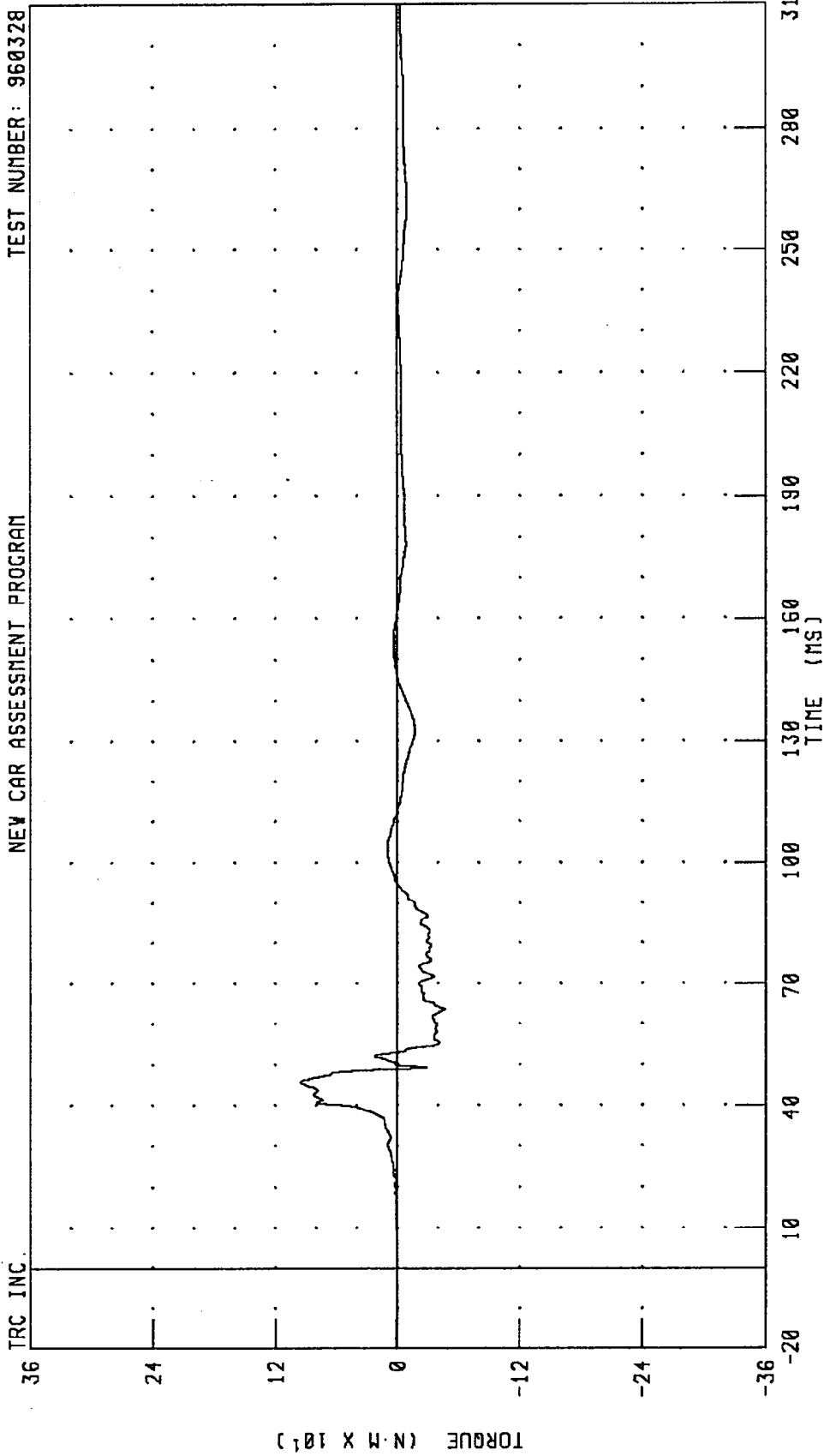
PEAK DATA: 100.63 N·M @ 48.72 MS; -25.89 N·M @ 114.32 MS

CHANNEL: TBLYM1 FILTER: CH. CLASS 600

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



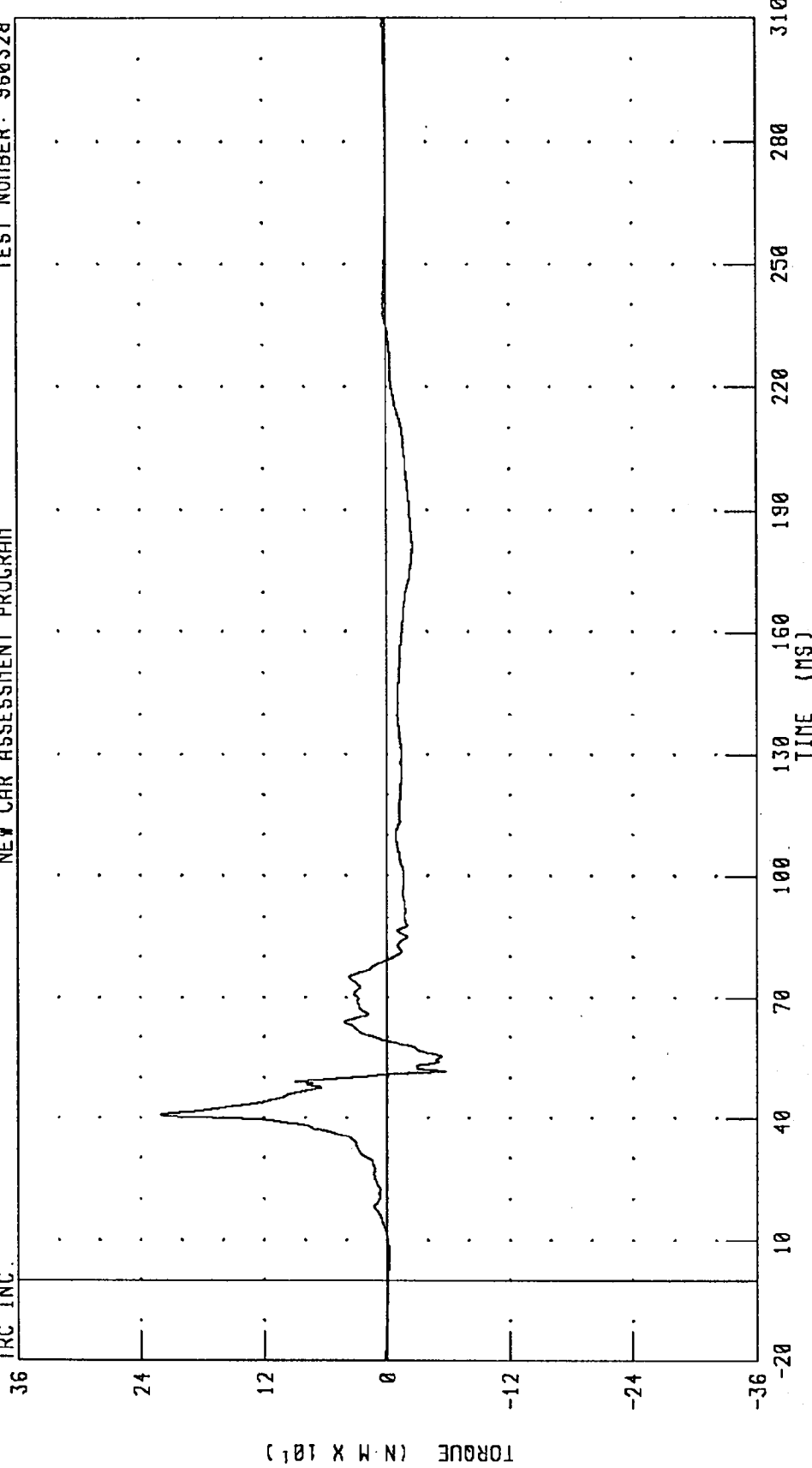
CHANNEL: TBRX11 FILTER: CH. CLASS 600 PEAK DATA: 95.84 N·M @ 45.76 MS; -46.64 N·M @ 63.68 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

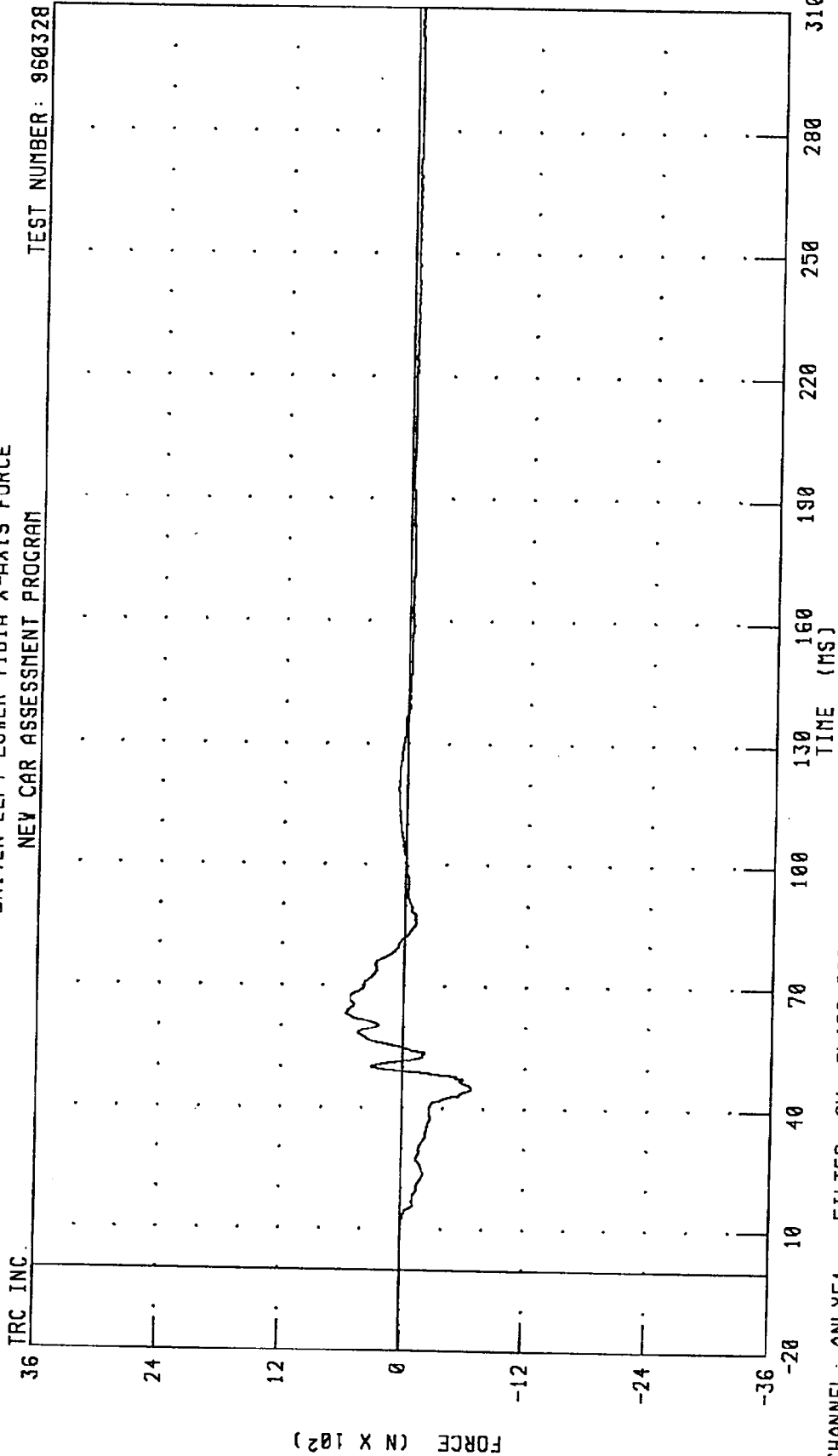


CHANNEL: TBRYM1 FILTER: CH. CLASS 600

PEAK DATA: 220.75 N·M @ 40.80 MS; -57.33 N·M @ 51.60 MS

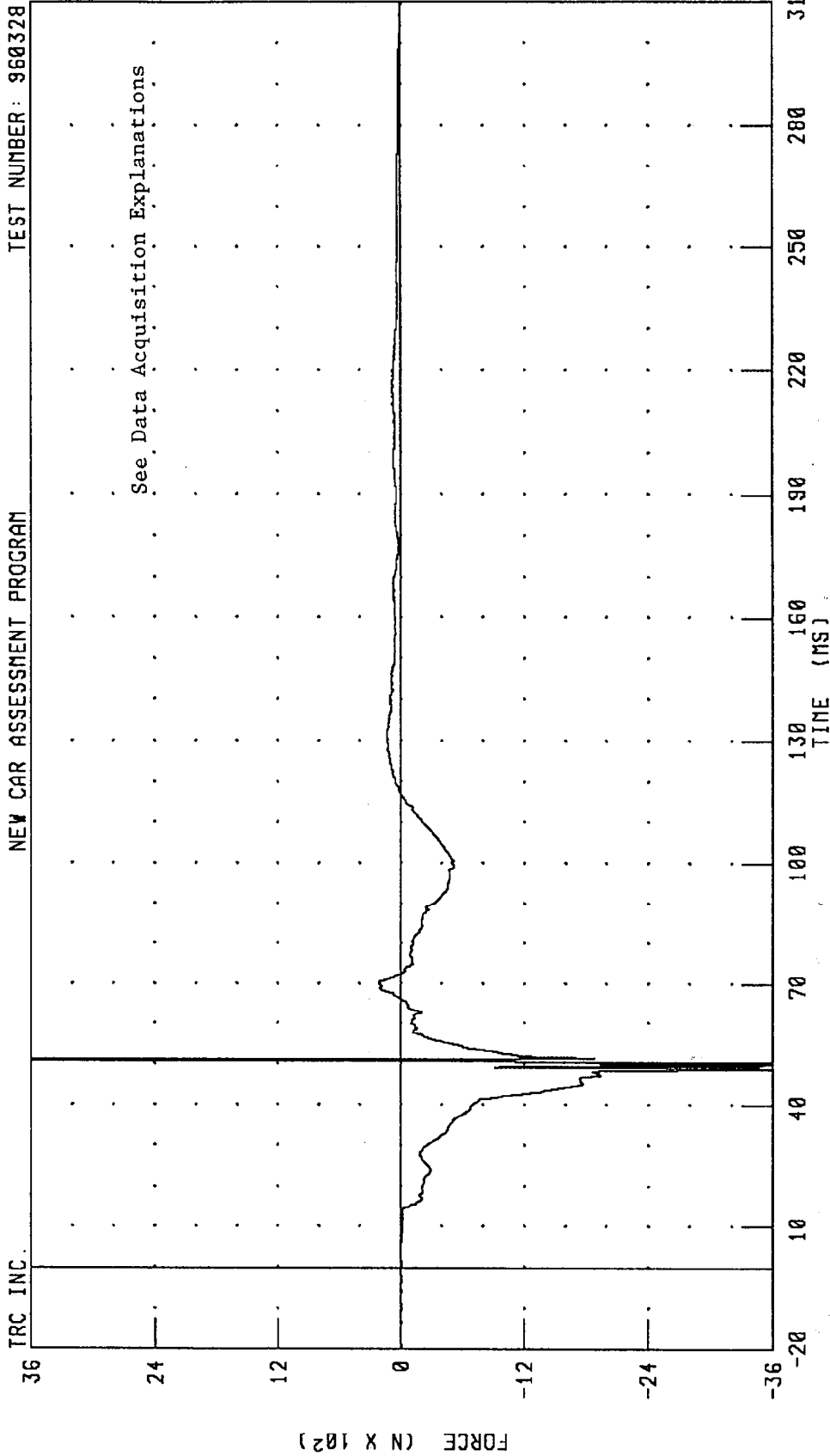
1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA X-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 DRIVER LEFT LOWER TIBIA Z-AXIS FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: ANLZF1 FILTER: CH. CLASS 600

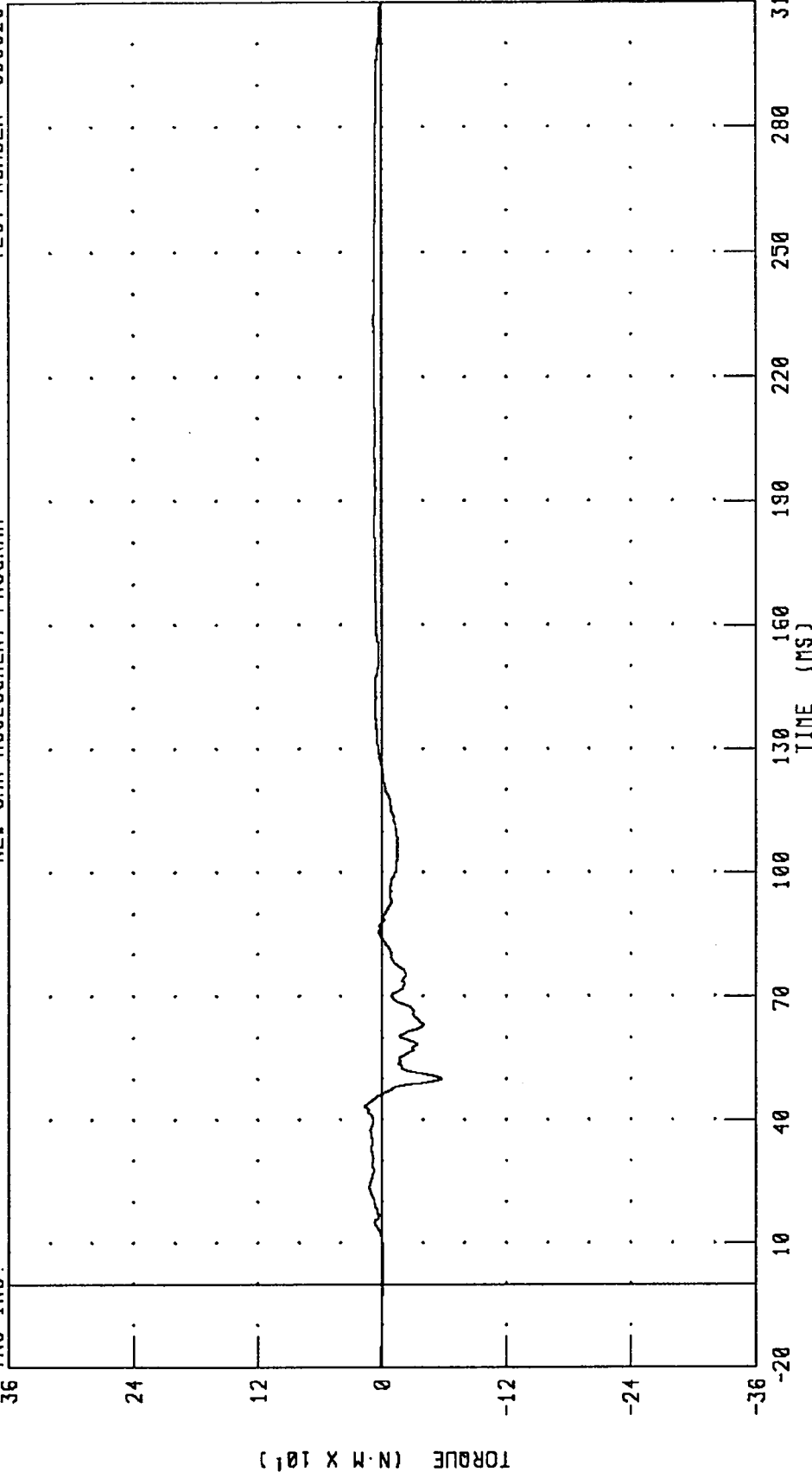
PEAK DATA: 7222.72 N @ 50.88 MS; -6899.55 N @ 50.24 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



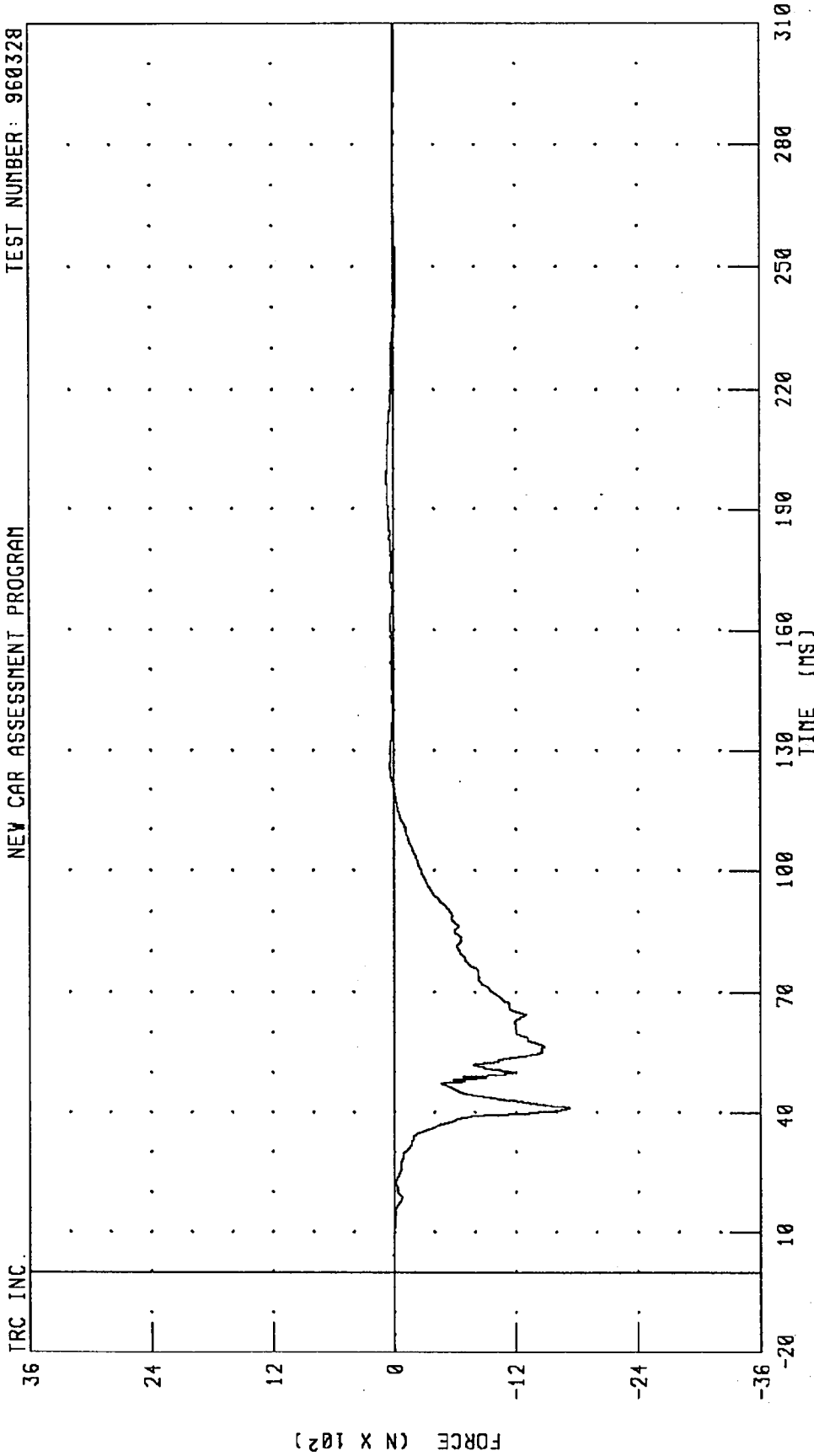
PEAK DATA: 16.41 N·M @ 43.28 MS; -58.30 N·M @ 50.16 MS

CHANNEL: ANLYM1 FILTER: CH. CLASS 600

1986 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA X-AXIS FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



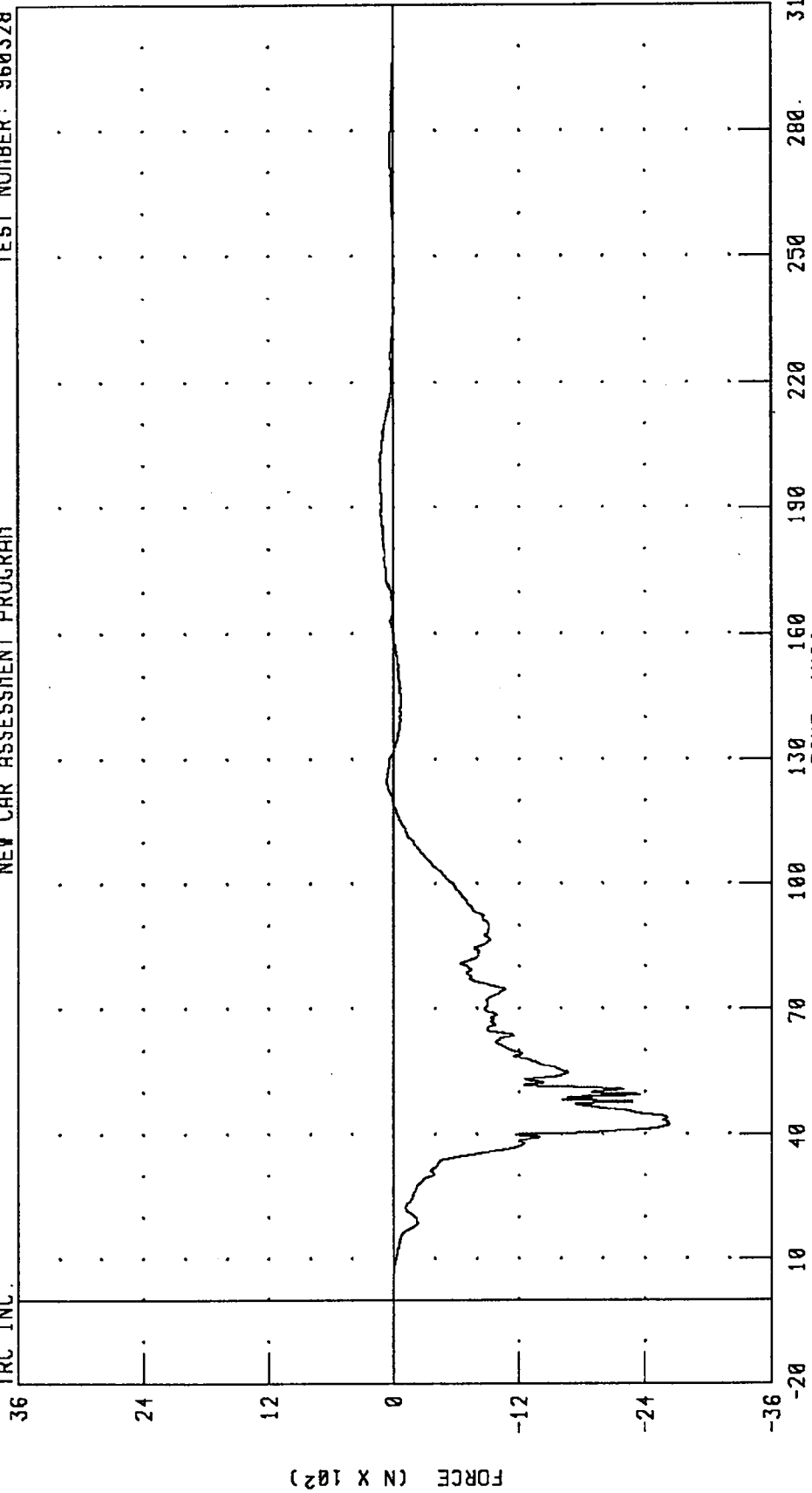
TRC INC. CHANNEL: ANRXF1 FILTER: CH. CLASS 600

PEAK DATA: 71.20 N @ 198.40 MS; -1730.92 N @ 41.12 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



PEAK DATA: 128.60 N @ 201.28 MS; -2634.32 N @ 42.32 MS

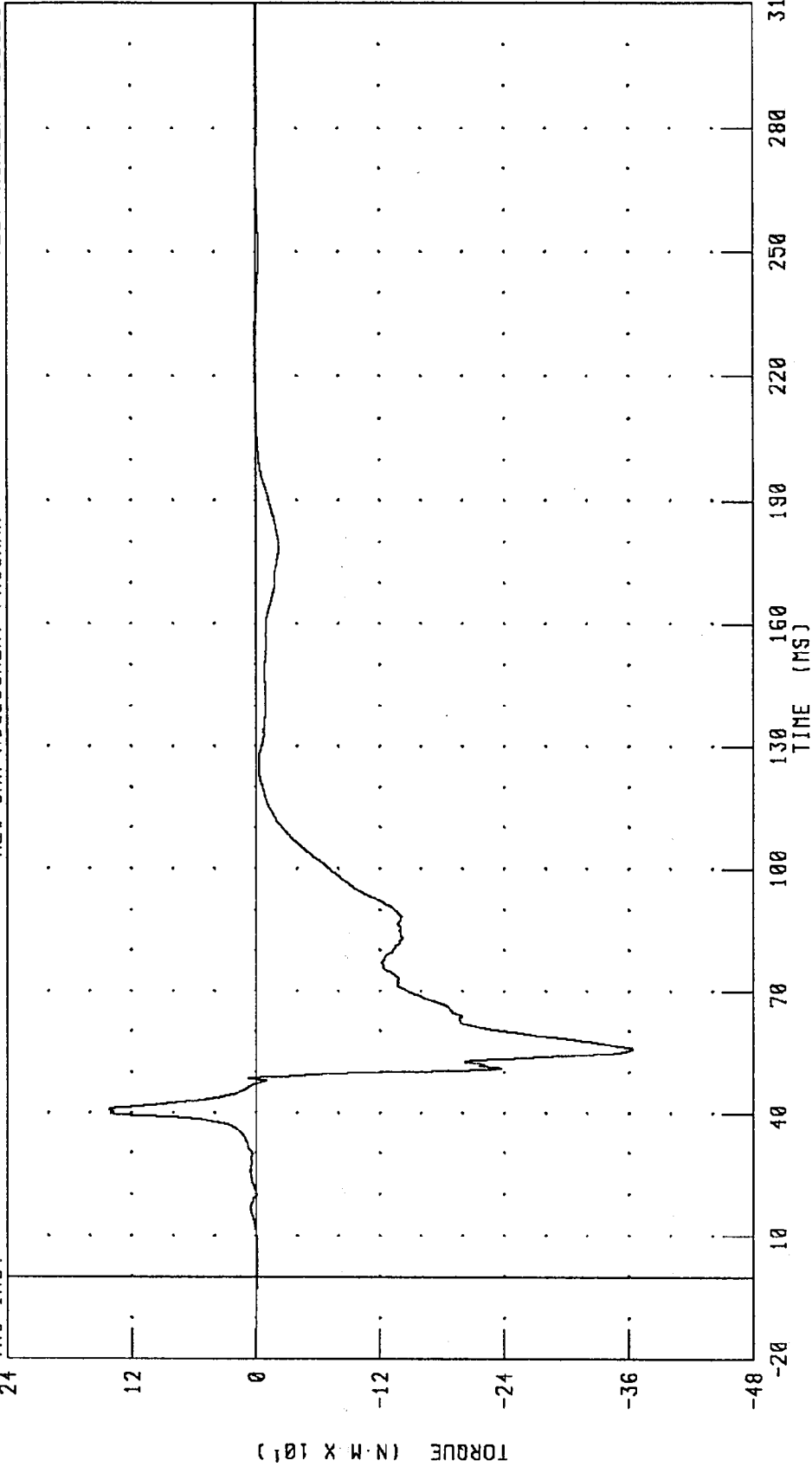
CHANNEL: ANRZF1 FILTER: CH. CLASS 600

1986 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

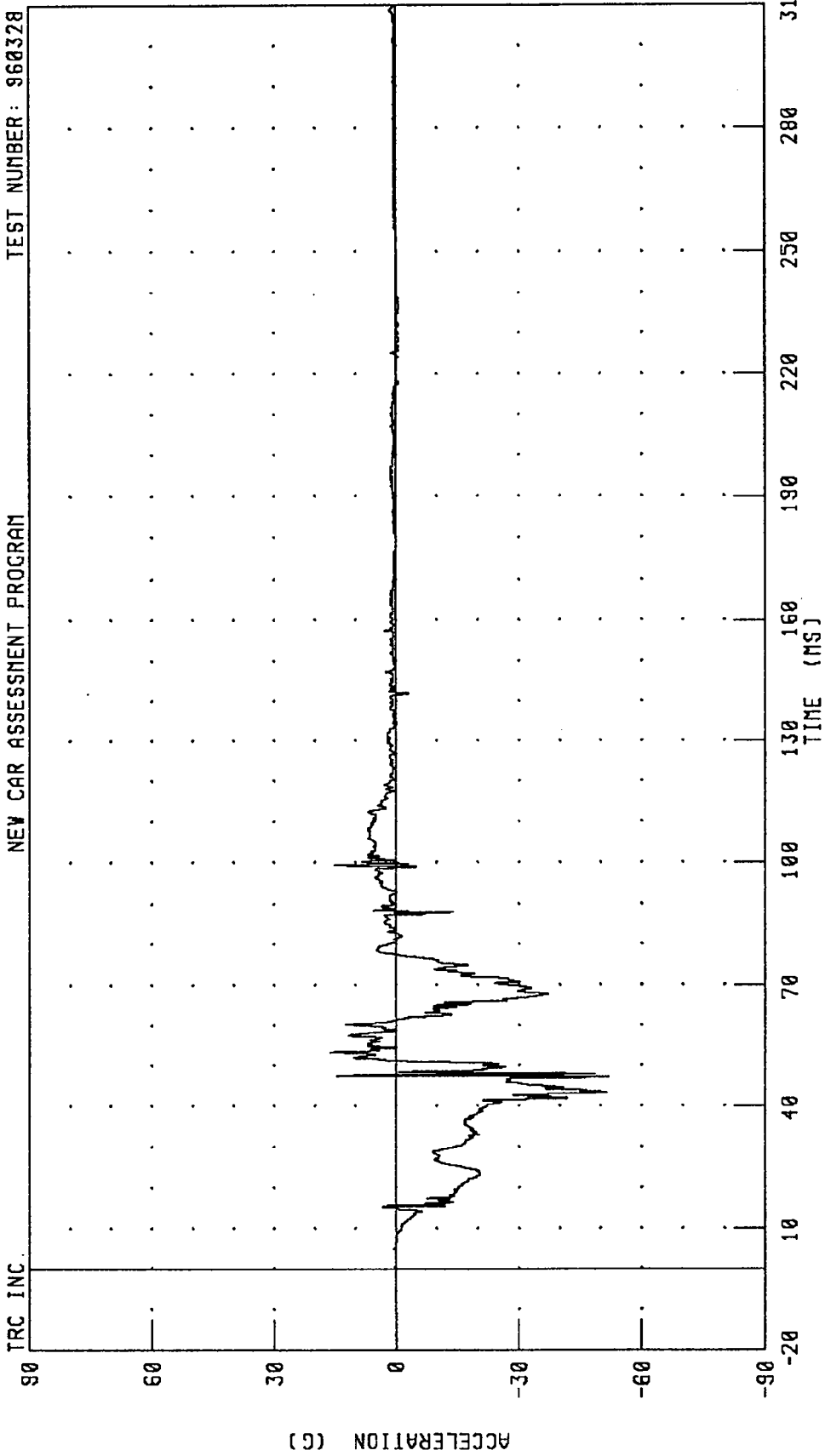


CHANNEL: ANRYM1 FILTER: CH. CLASS 600

PEAK DATA: 141.73 N·M @ 41.04 MS; -363.55 N·M @ 55.68 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



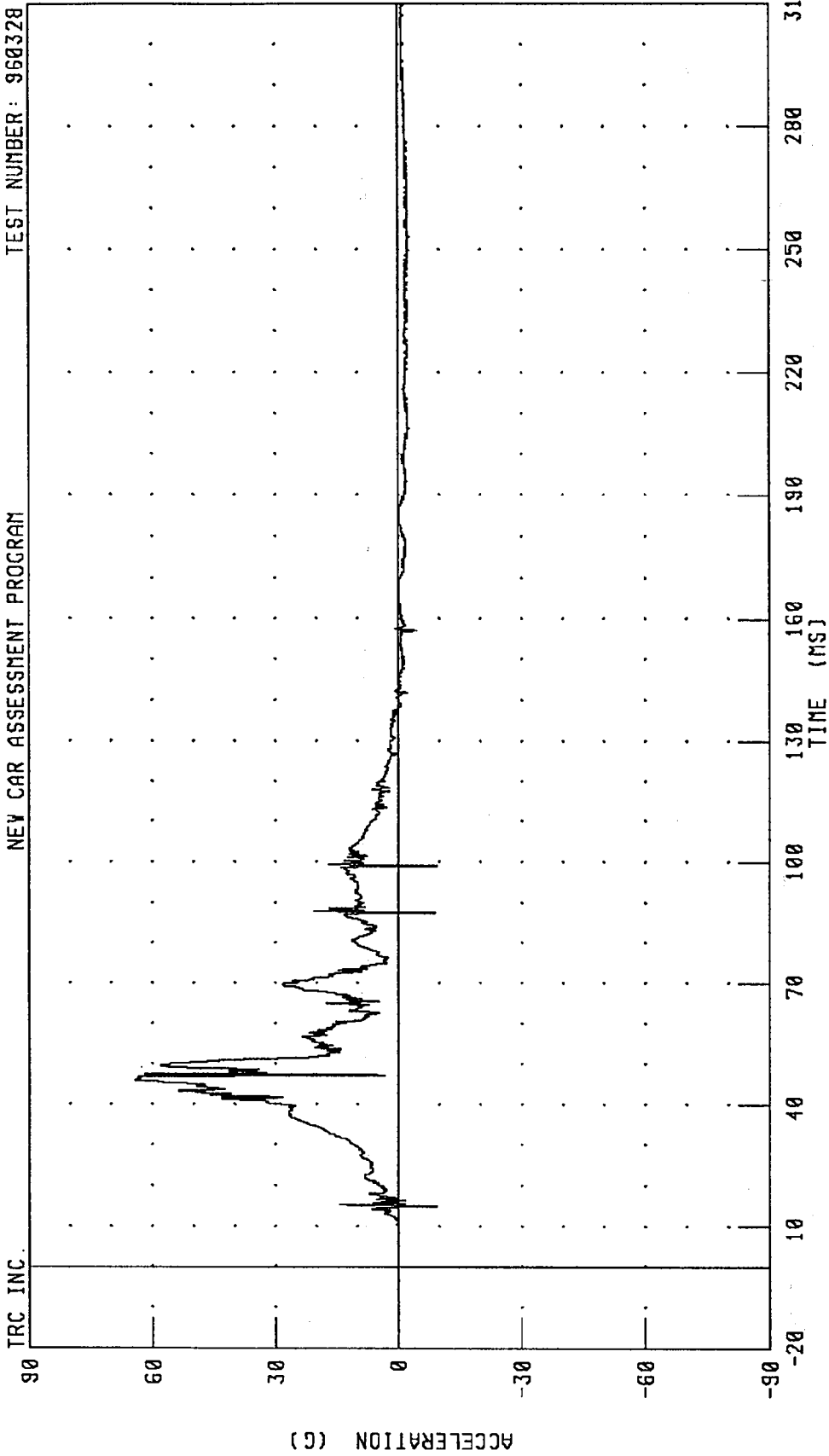
CHANNEL: FTLXG1 FILTER: CH. CLASS 1000

960328

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 960328

NEV CAR ASSESSMENT PROGRAM



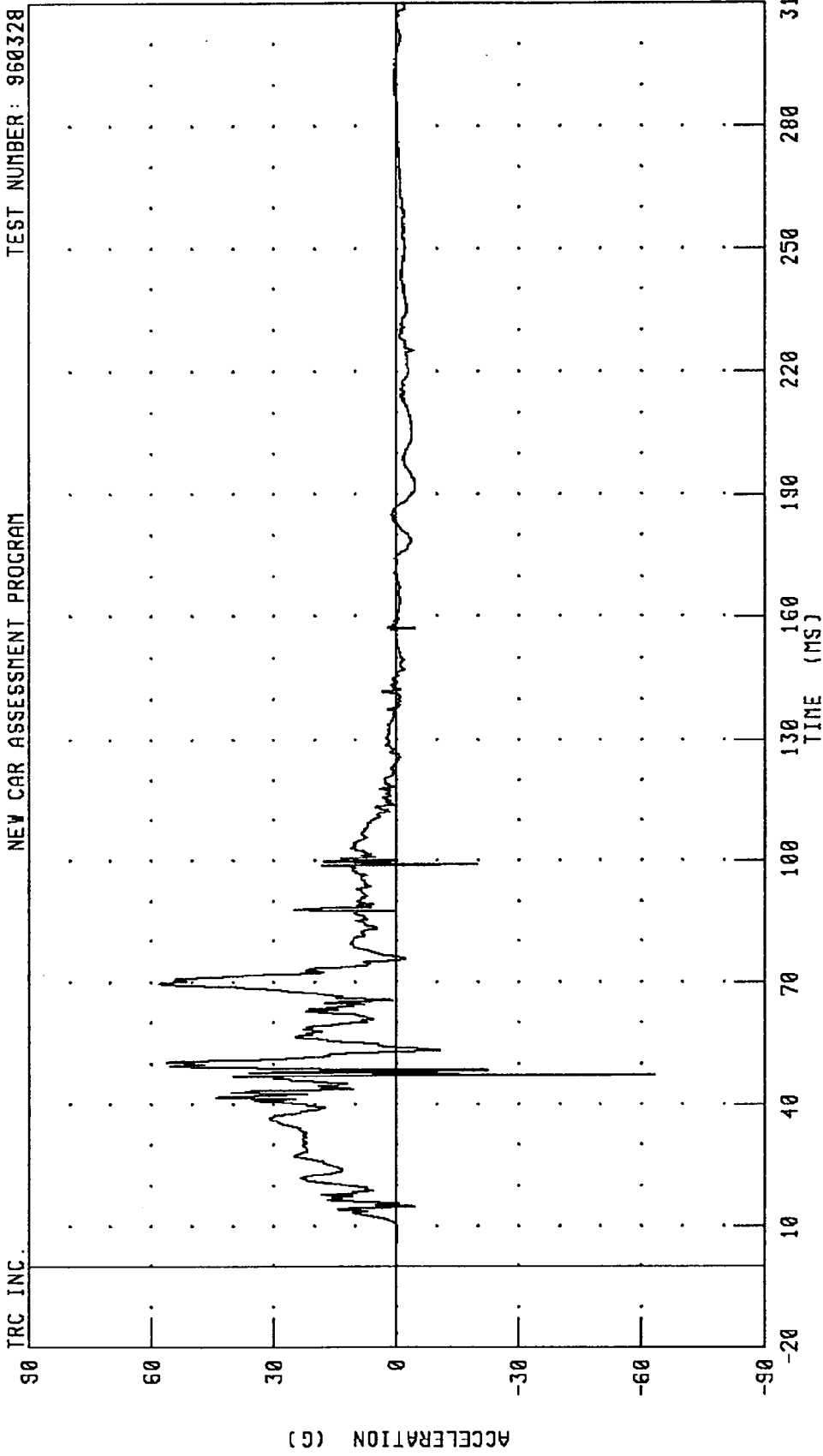
CHANNEL: FTLZH1 FILTER: CH. CLASS 1000

PEAK DATA: 64.27 G @ 46.00 MS, -9.39 G @ 149.6 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER LEFT FOOT Z-AXIS ACCELERATION AT TOE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

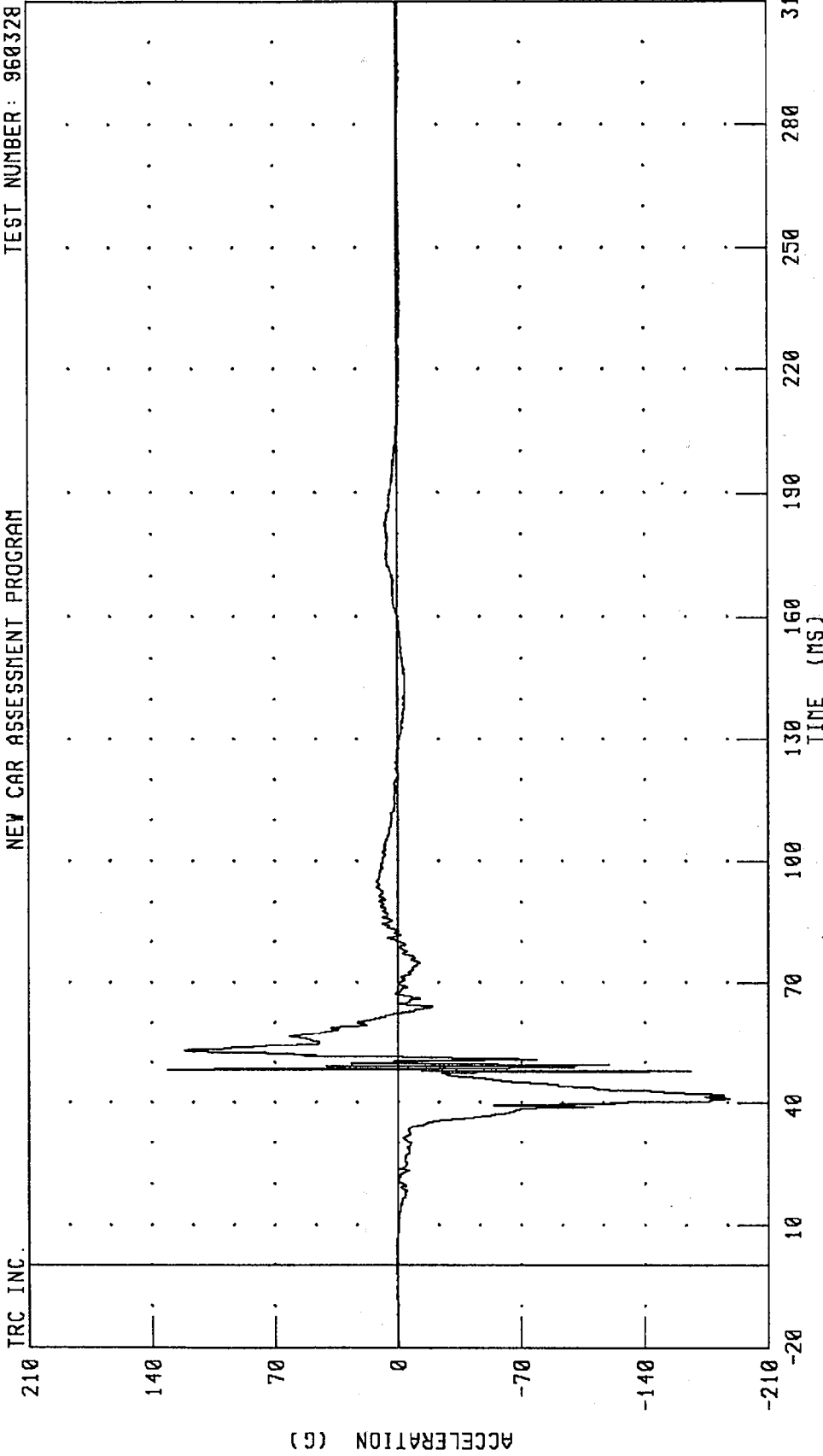
TRC INC.



CHANNEL: FTLZT1 FILTER: CH. CLASS 1000 PEAK DATA: 58.16 G @ 69.68 MS; -63.17 G @ 47.28 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: FTRXG1 FILTER: CH. CLASS 1000
PEAK DATA: 131.17 G @ 48.16 MS; -188.05 G @ 40.96 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

240

160

80

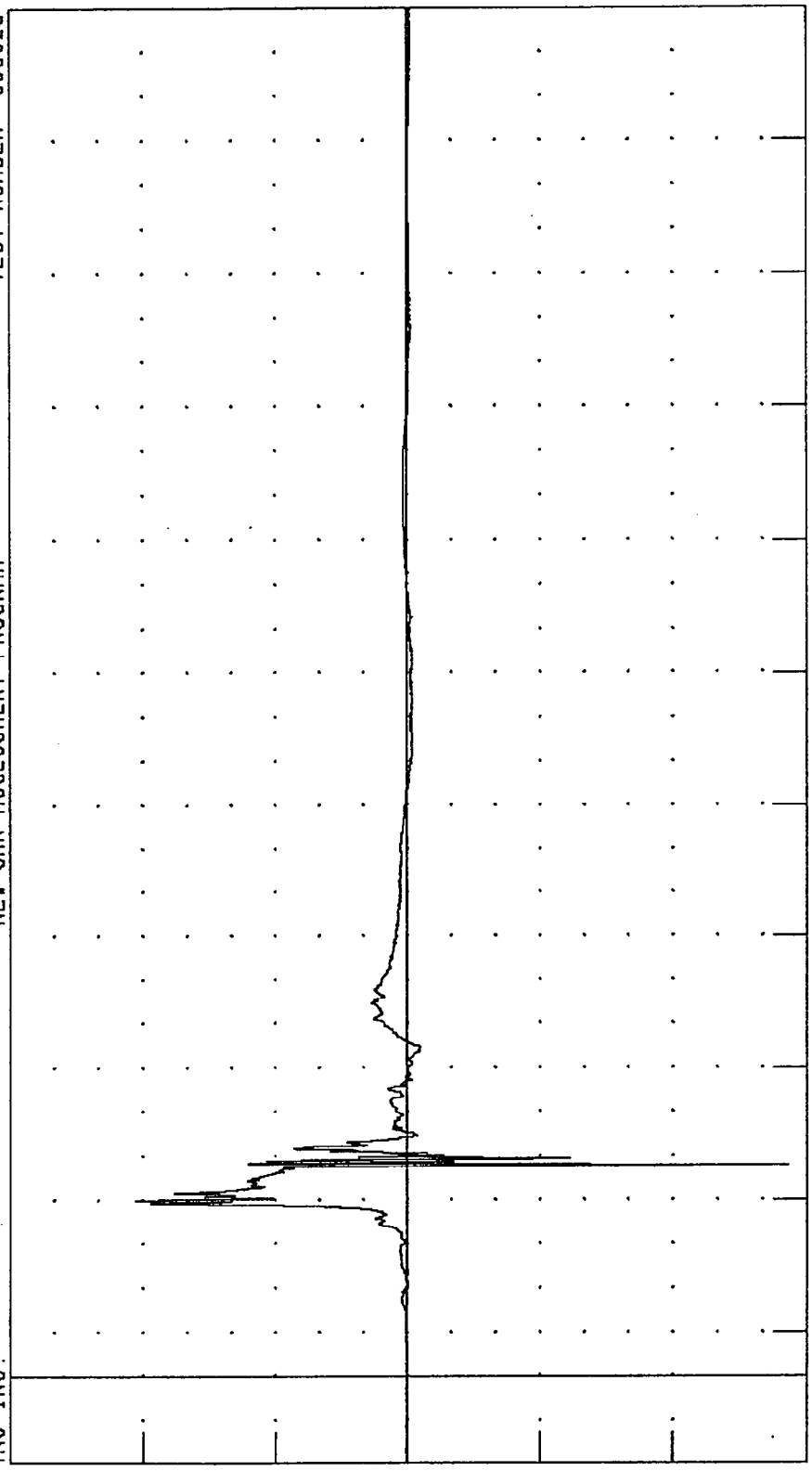
0

-80

-160

-240

ACCELERATION (G)



310 280 250 220 190 160 130 100 70 40 10 -20

TIME (MS)

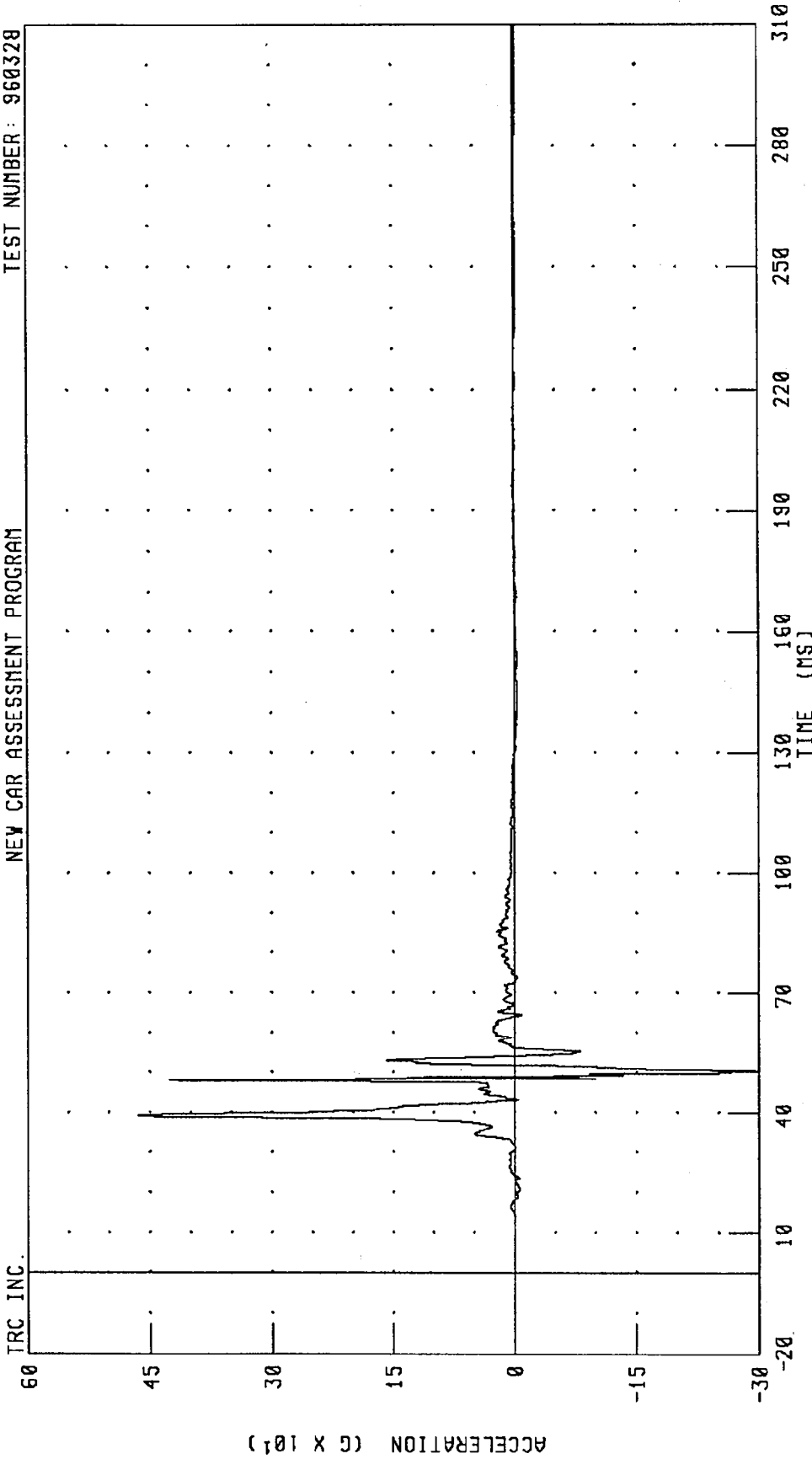
PEAK DATA: 164.95 G @ 40.00 MS; -229.18 G @ 47.84 MS

CHANNEL: FTRZH1 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER RIGHT FOOT Z-AXIS ACCELERATION AT TOE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: FTRZT1 FILTER: CH. CLASS 1000 PEAK DATA: 464.00 G @ 39.36 MS; -305.08 G @ 50.24 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

90

60

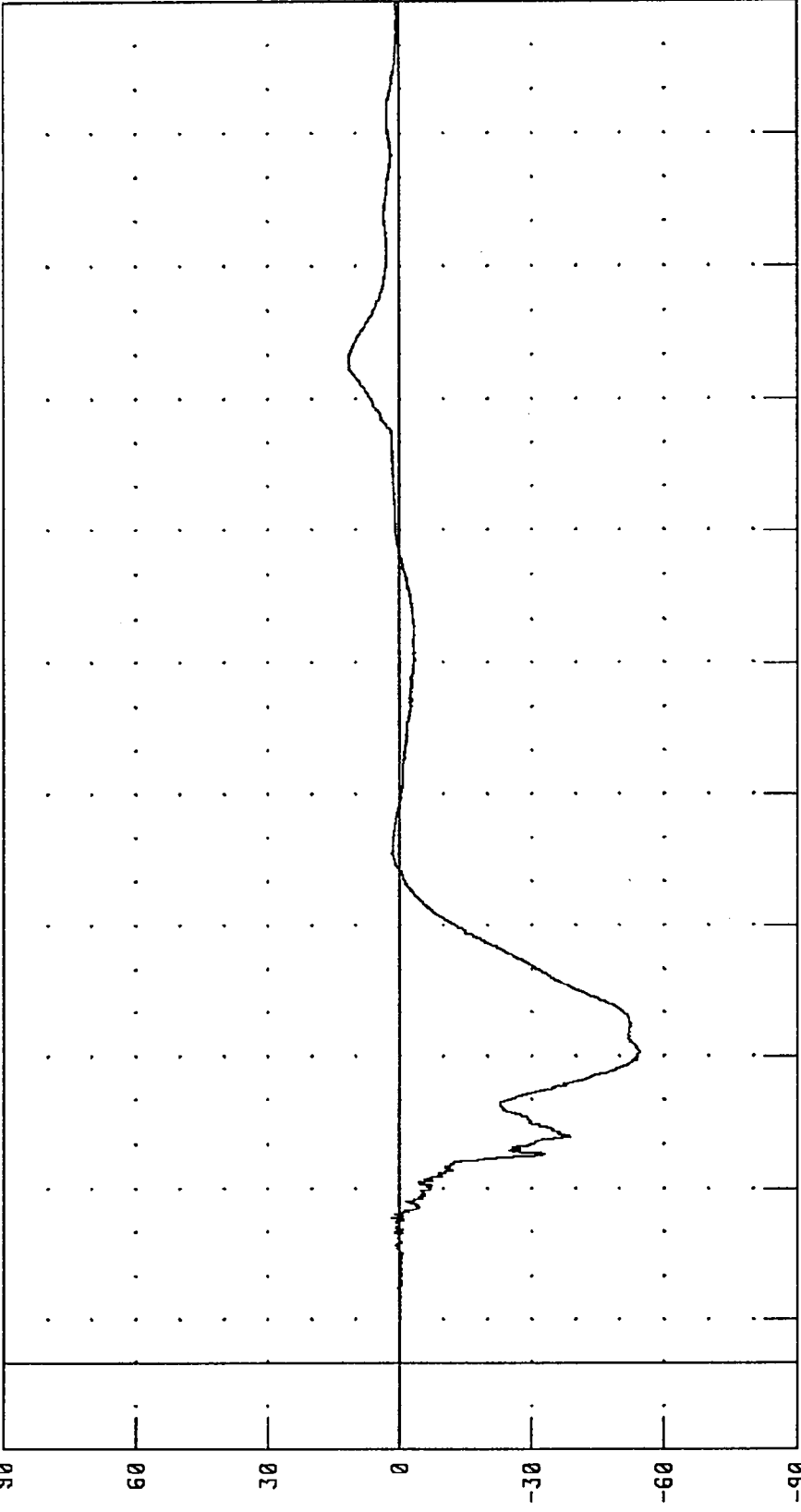
30

0

-30

-60

-90

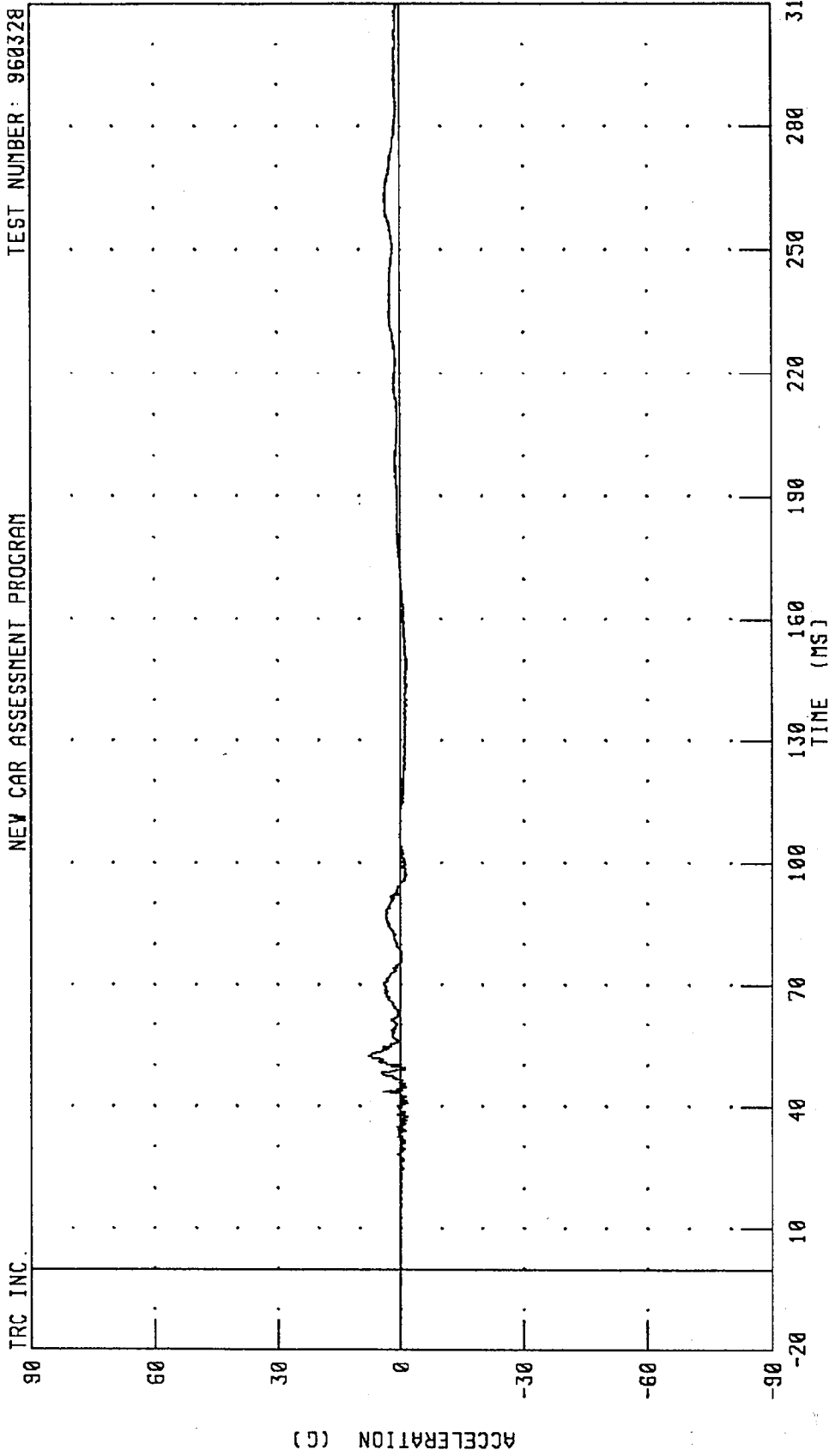


130 160 190 220 250 280 310
TIME (MS)

CHANNEL: HEDXC2 FILTER: CH. CLASS 1000
PEAK DATA: 11.75 G @ 228.64 MS; -54.70 G @ 70.88 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

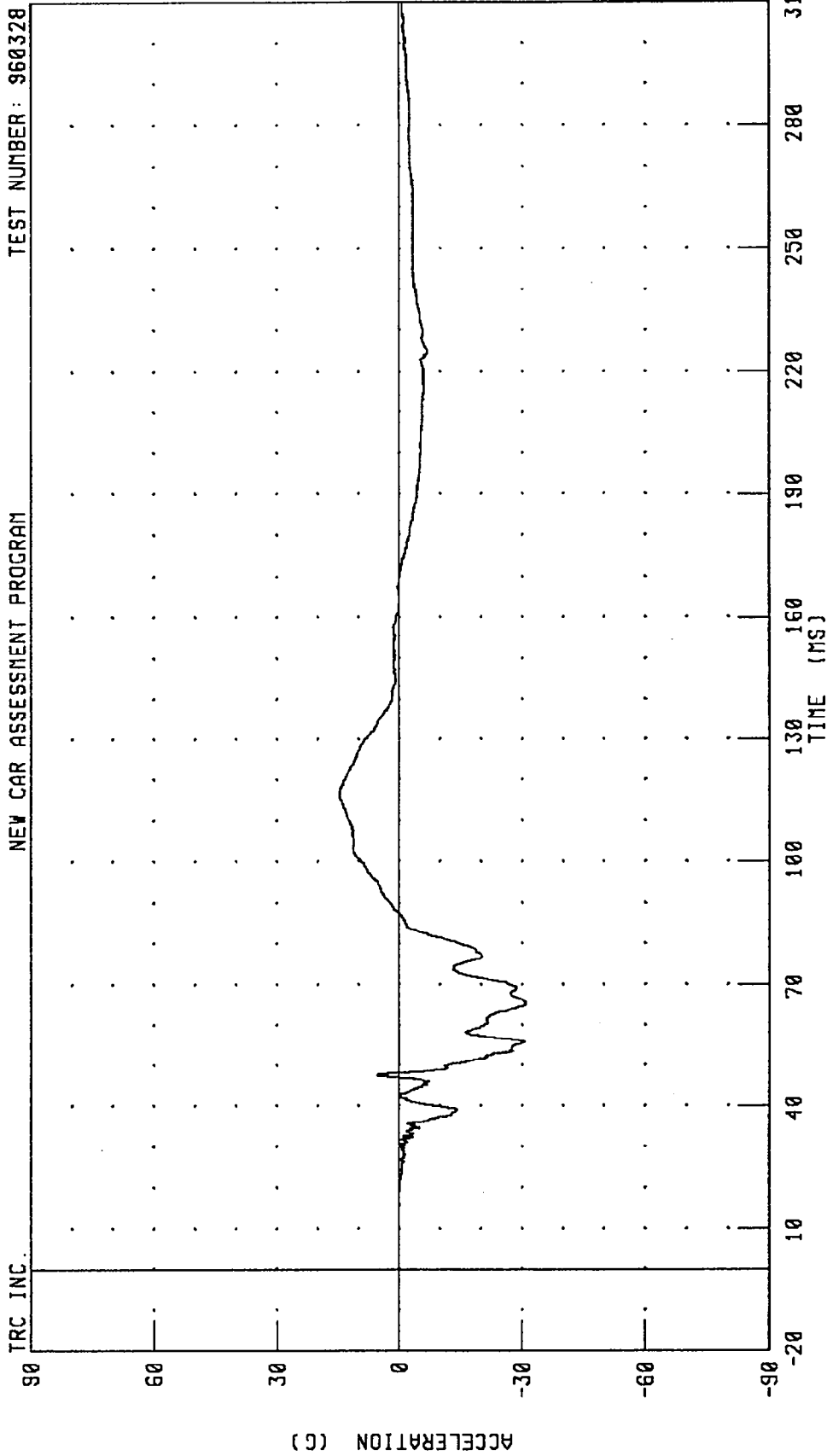


CHANNEL: HEDYG2 FILTER: CH: CLASS 1000
PEAK DATA: 7.81 G @ 52.24 MS; -1.67 G @ 37.44 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

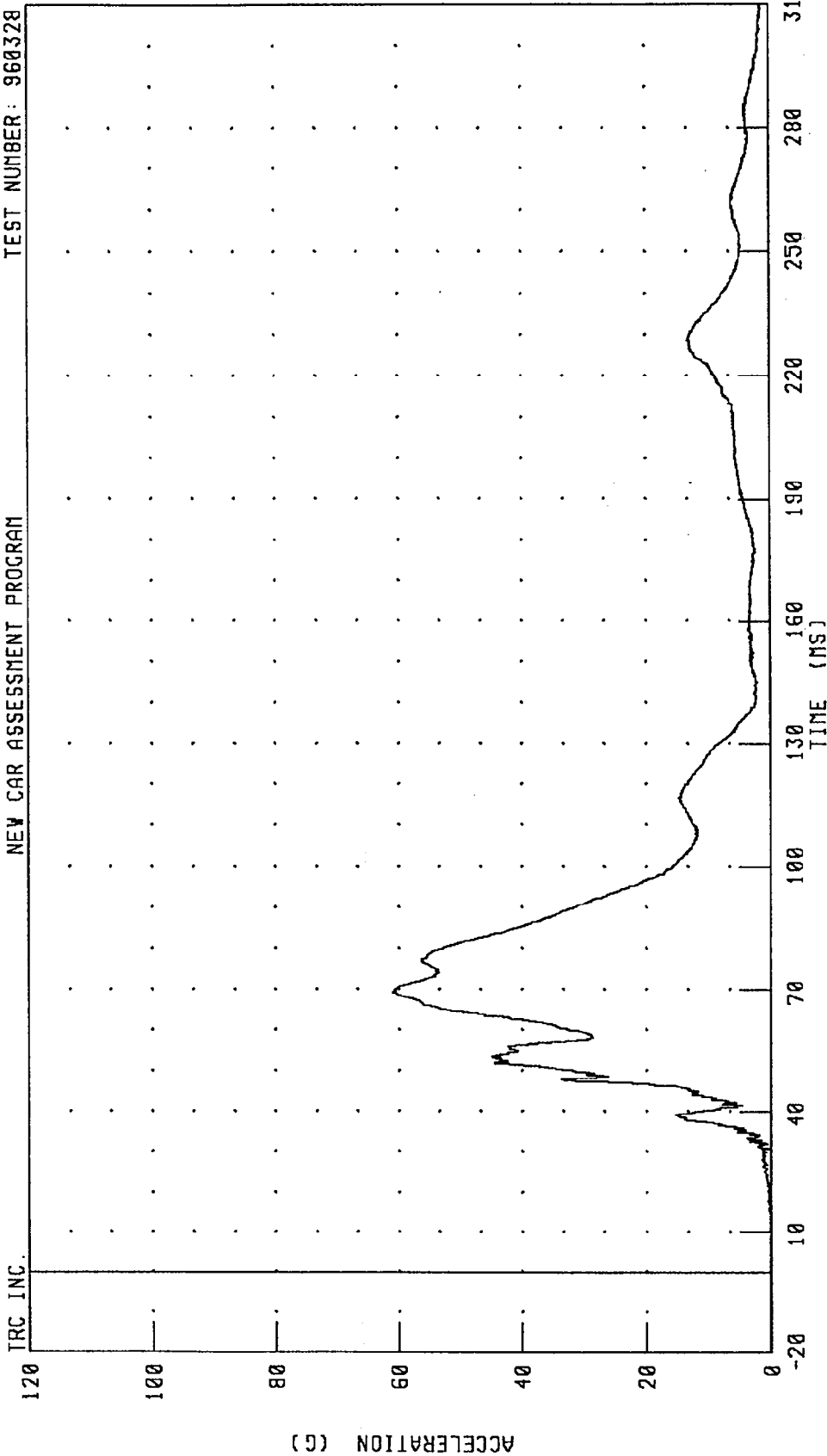
TRC INC.



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000
PEAK DATA: 14.63 G @ 115.84 MS; -31.06 G @ 65.60 MS

1986 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



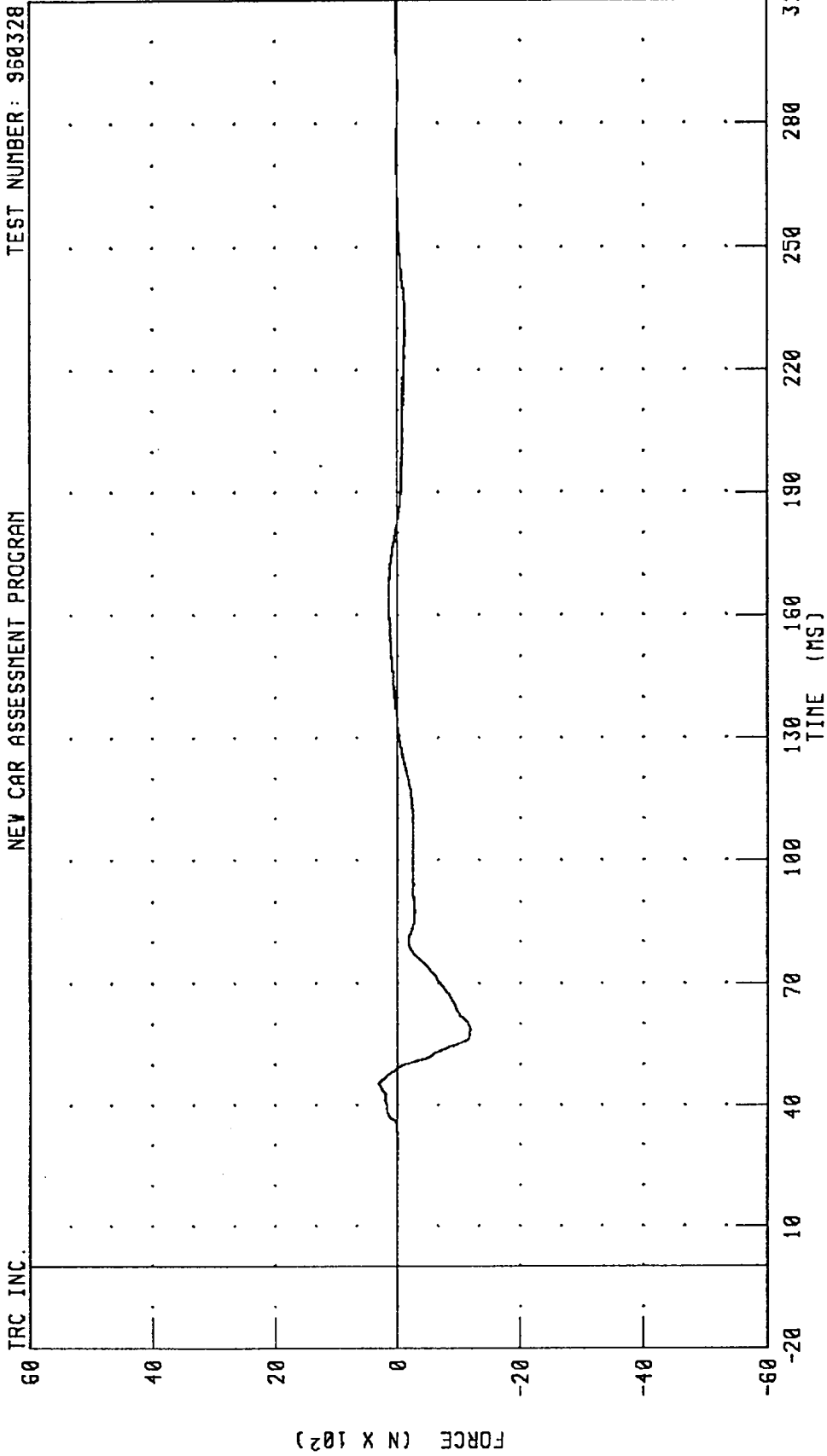
TRC INC.

CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

PEAK DATA: 61.02 G @ 69.36 MS; 0.14 G @ -19.44 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK X-AXIS SHEAR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



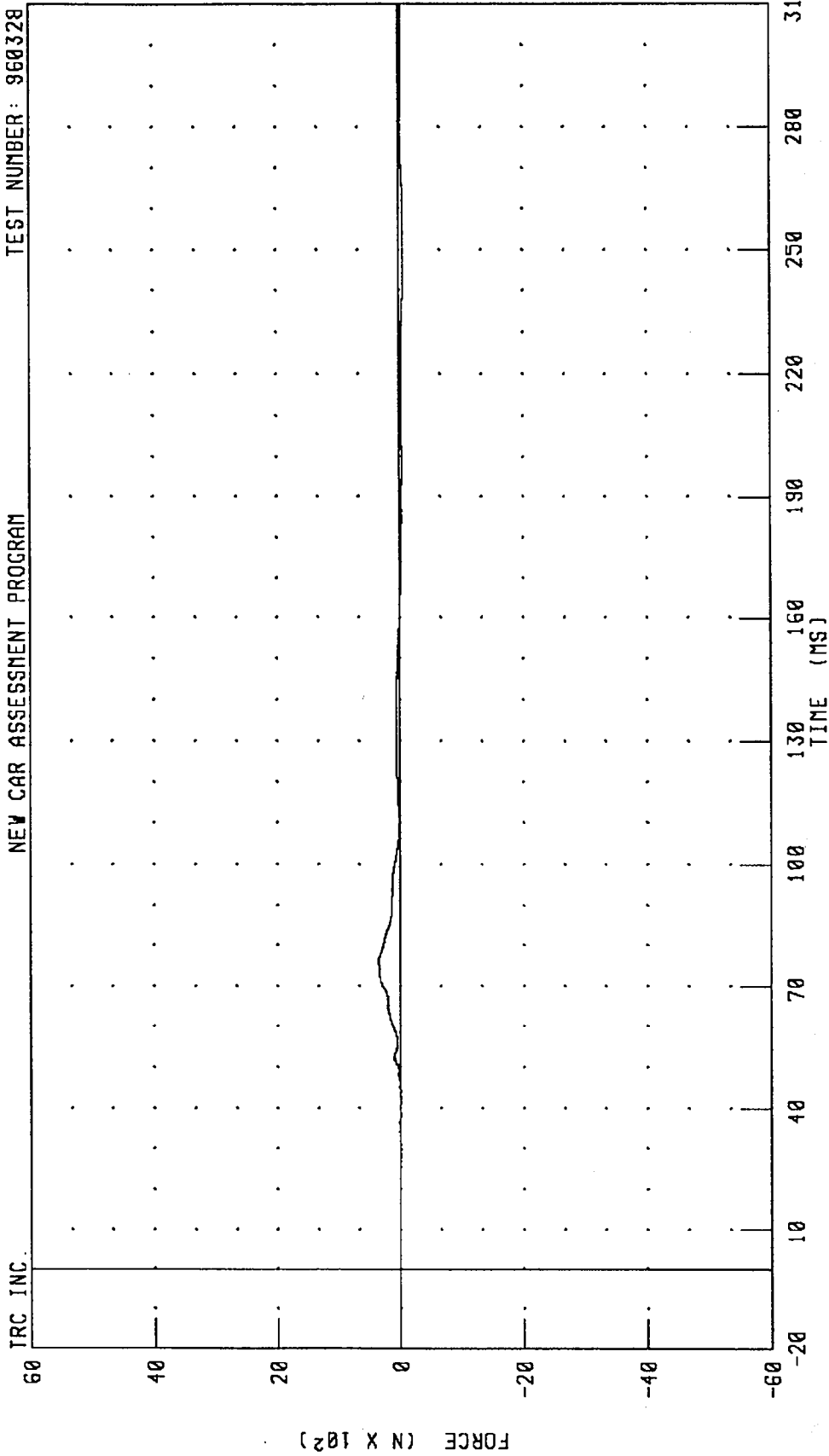
CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

PEAK DATA: 303.52 N @ 45.52 MS; -1195.86 N @ 58.64 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 PASSENGER NECK Y-AXIS SHEAR FORCE
 NEW CAR ASSESSMENT PROGRAM

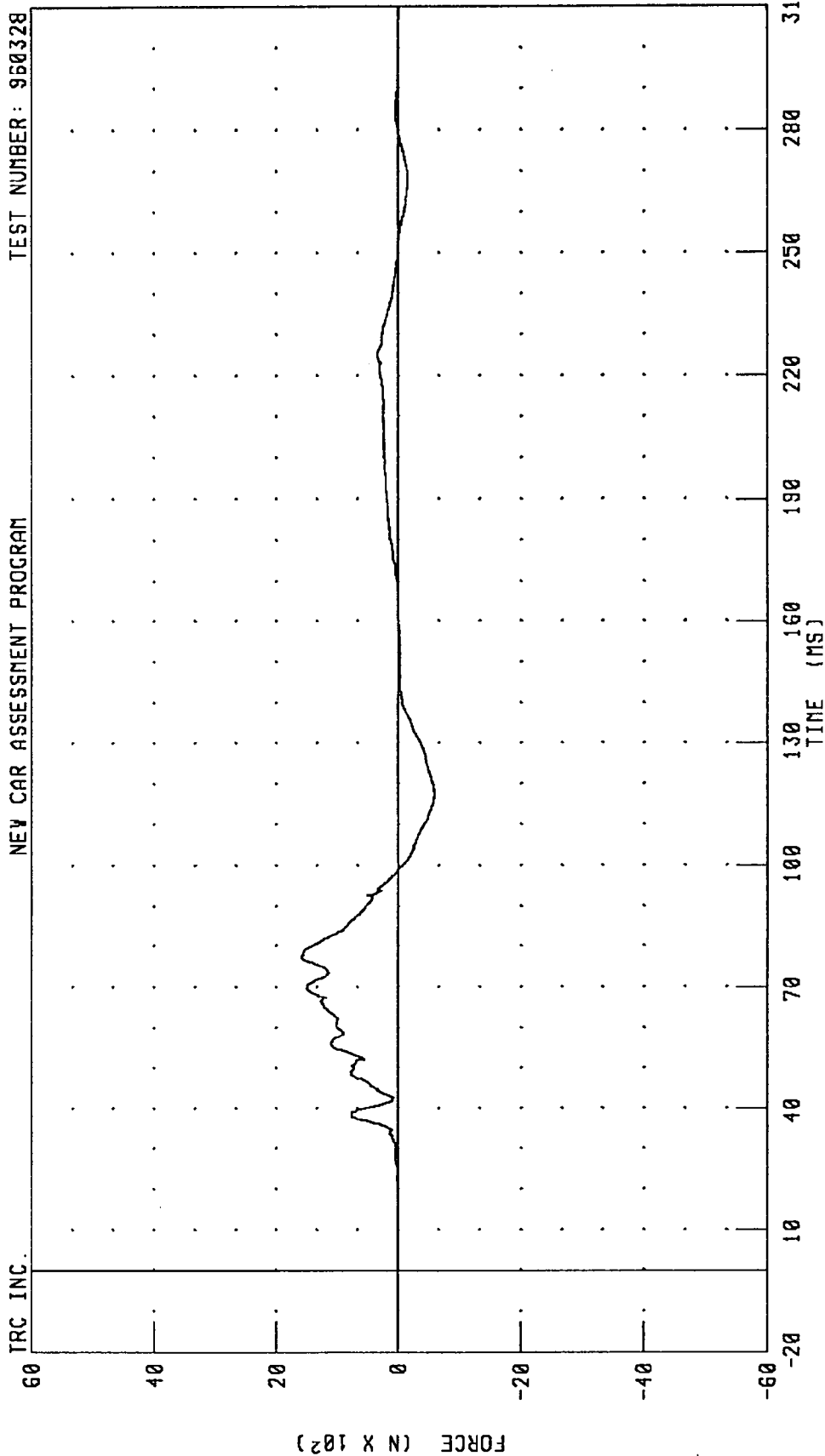
TEST NUMBER: 960328



CHANNEL: NEKYF2 FILTER: CH. CLASS 1000 PEAK DATA: 355.11 N @ 75.92 MS; -71.04 N @ 245.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK Z-AXIS AXIAL FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 950328



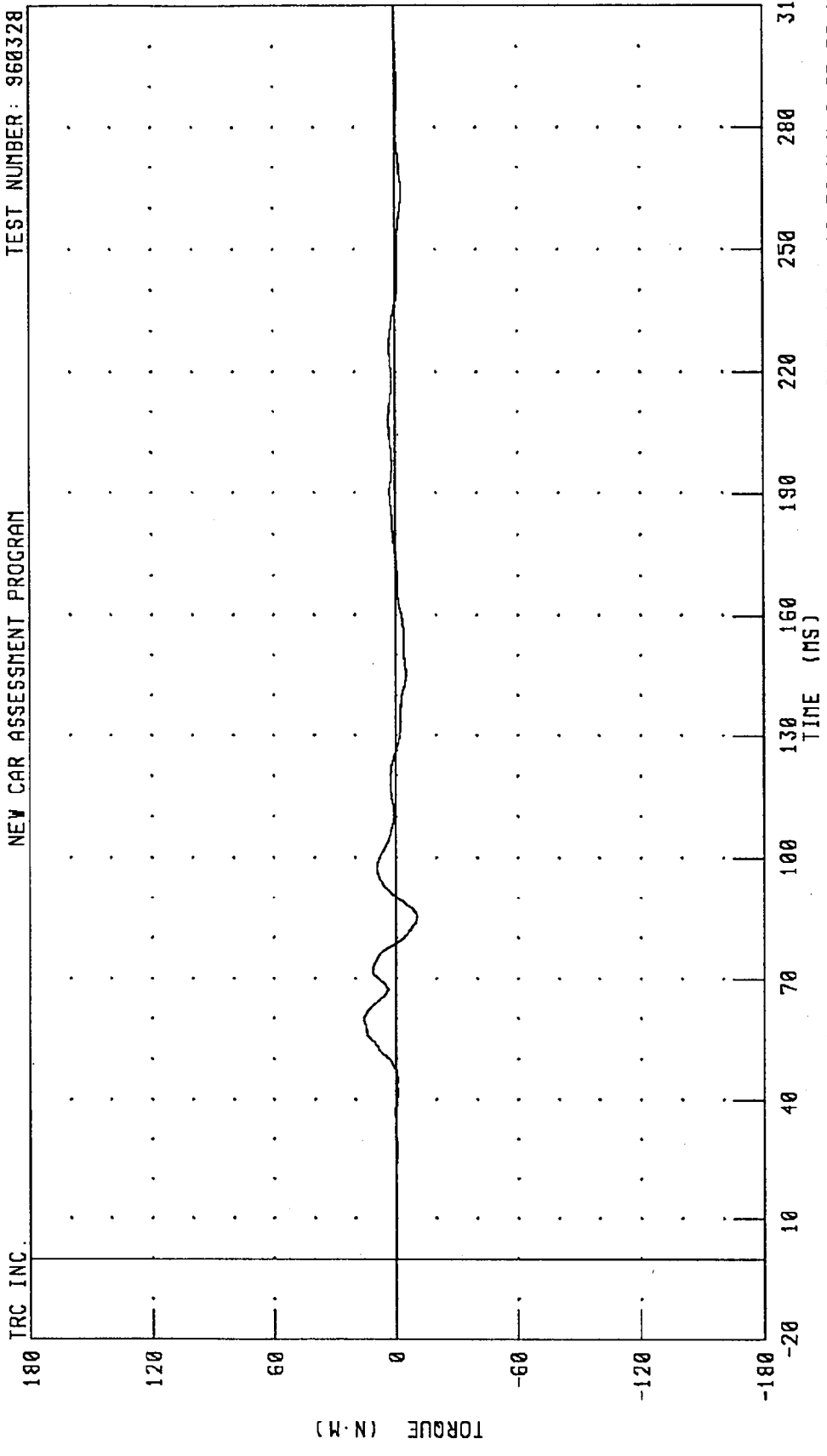
TRC INC.

CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

950328

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

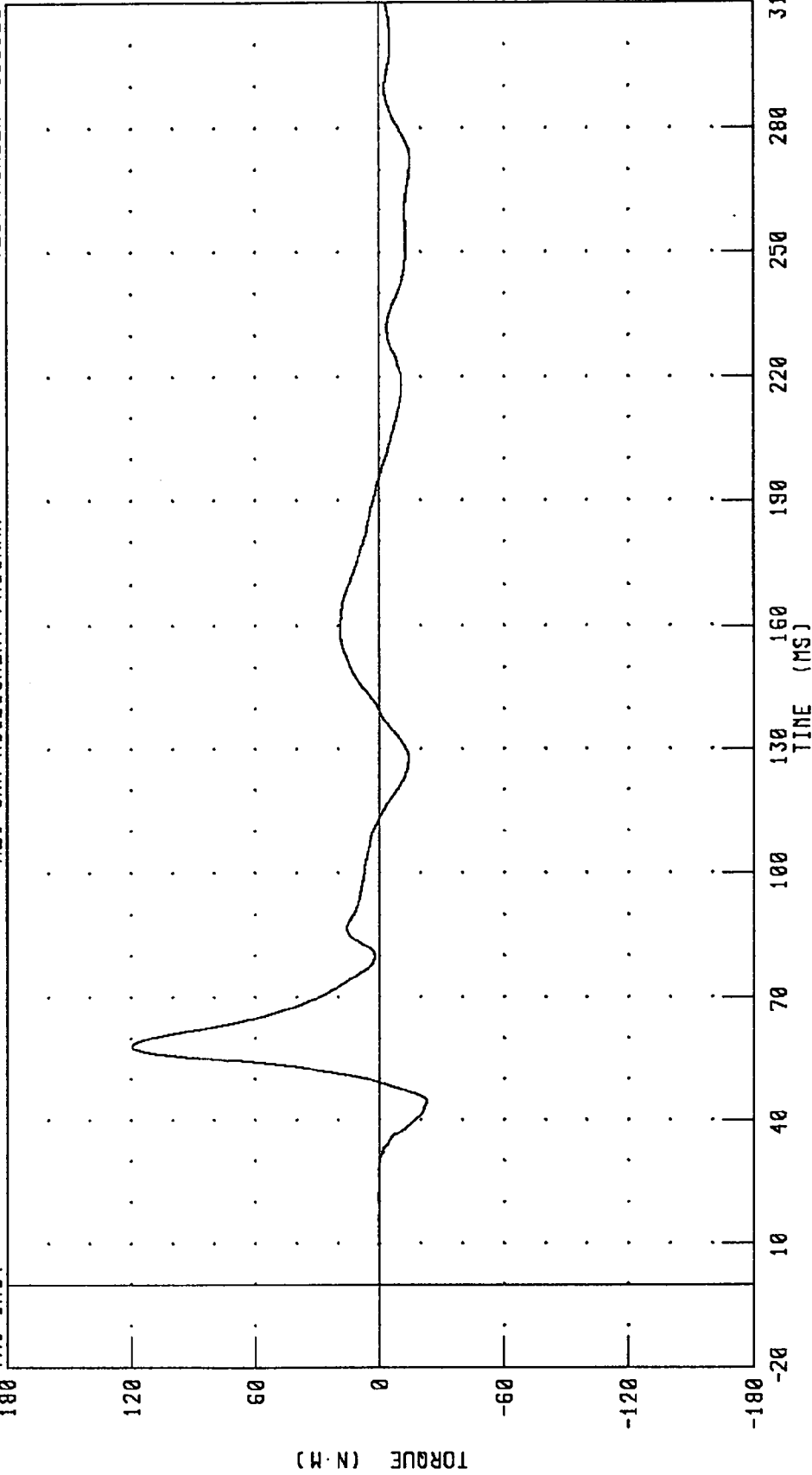


TRC INC. CHANNEL: NEKM2 FILTER: CH. CLASS 600
PEAK DATA: 15.62 N·M @ 59.60 MS; -10.38 N·M @ 85.36 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Y AXIS
NEY CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



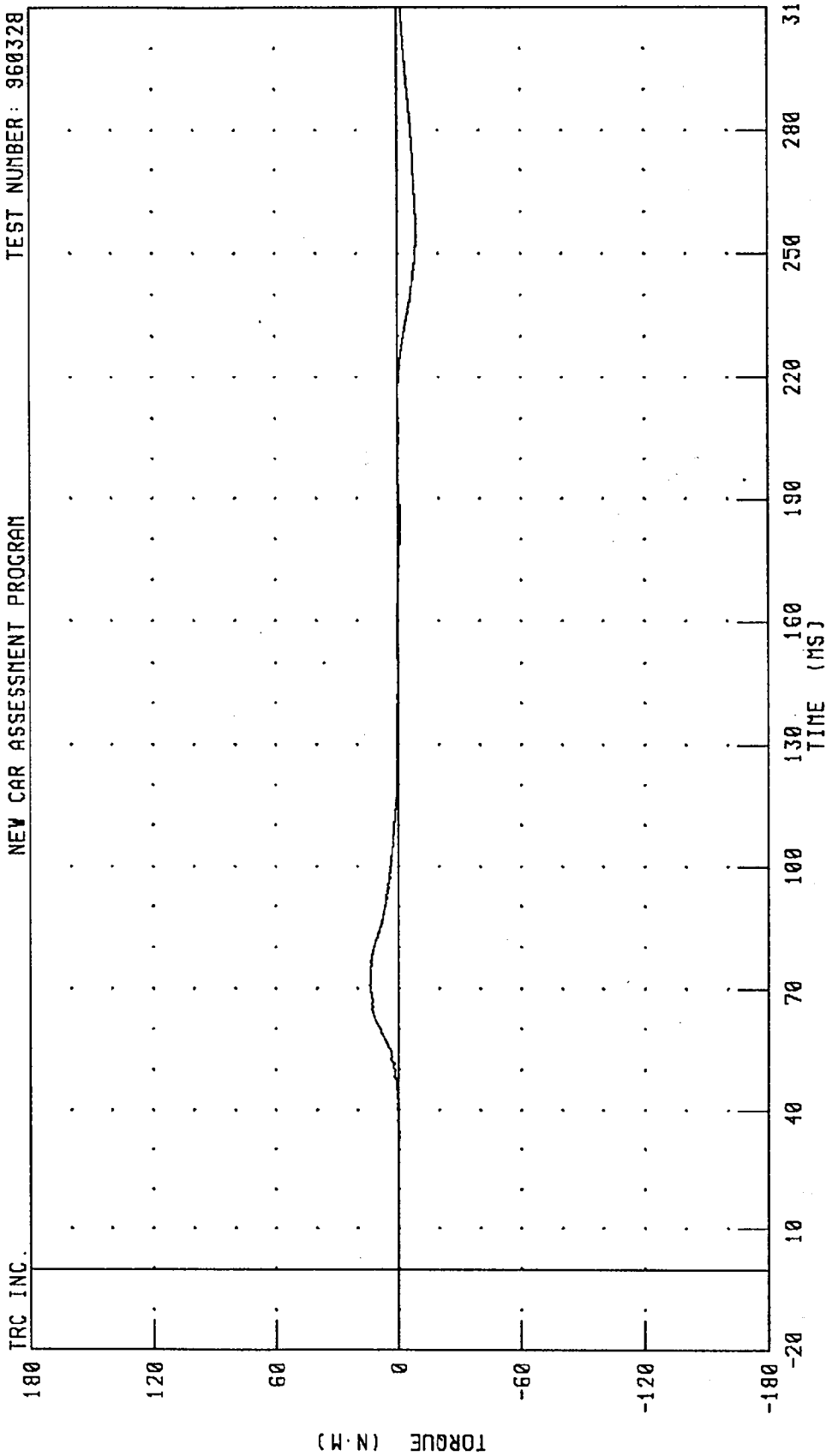
PEAK DATA: 119.49 N.M @ 57.92 MS; -22.96 N.M @ 44.48 MS

CHANNEL: NEKYM2 FILTER: CH. CLASS 600

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER NECK MOMENT ABOUT Z AXIS

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



TRC INC. CHANNEL: NEKZM2 FILTER: CH. CLASS 600
PEAK DATA: 14.02 N.M @ 70.80 MS; -9.08 N.M @ 254.72 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

60

40

20

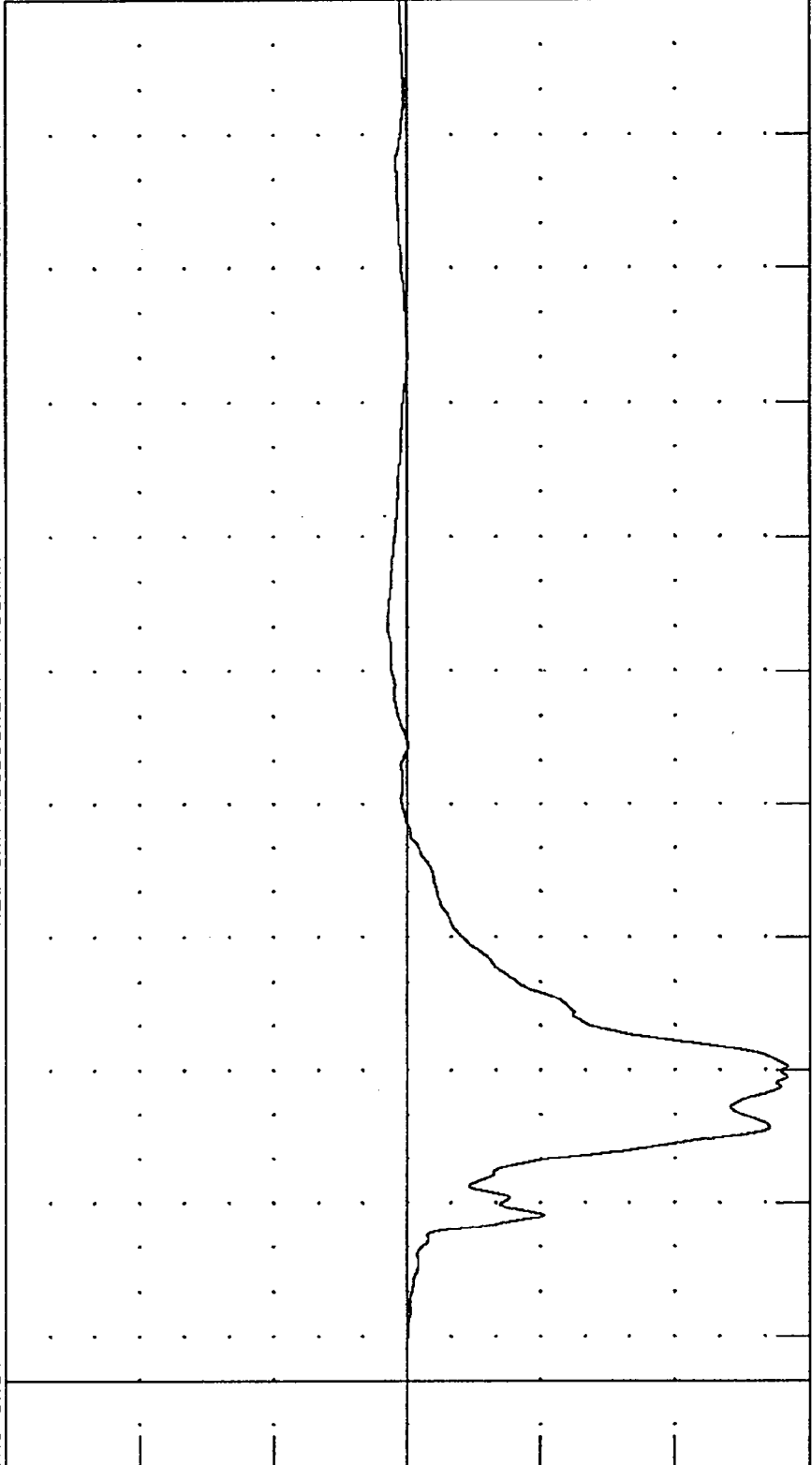
0

-20

-40

-60

ACCELERATION (G)



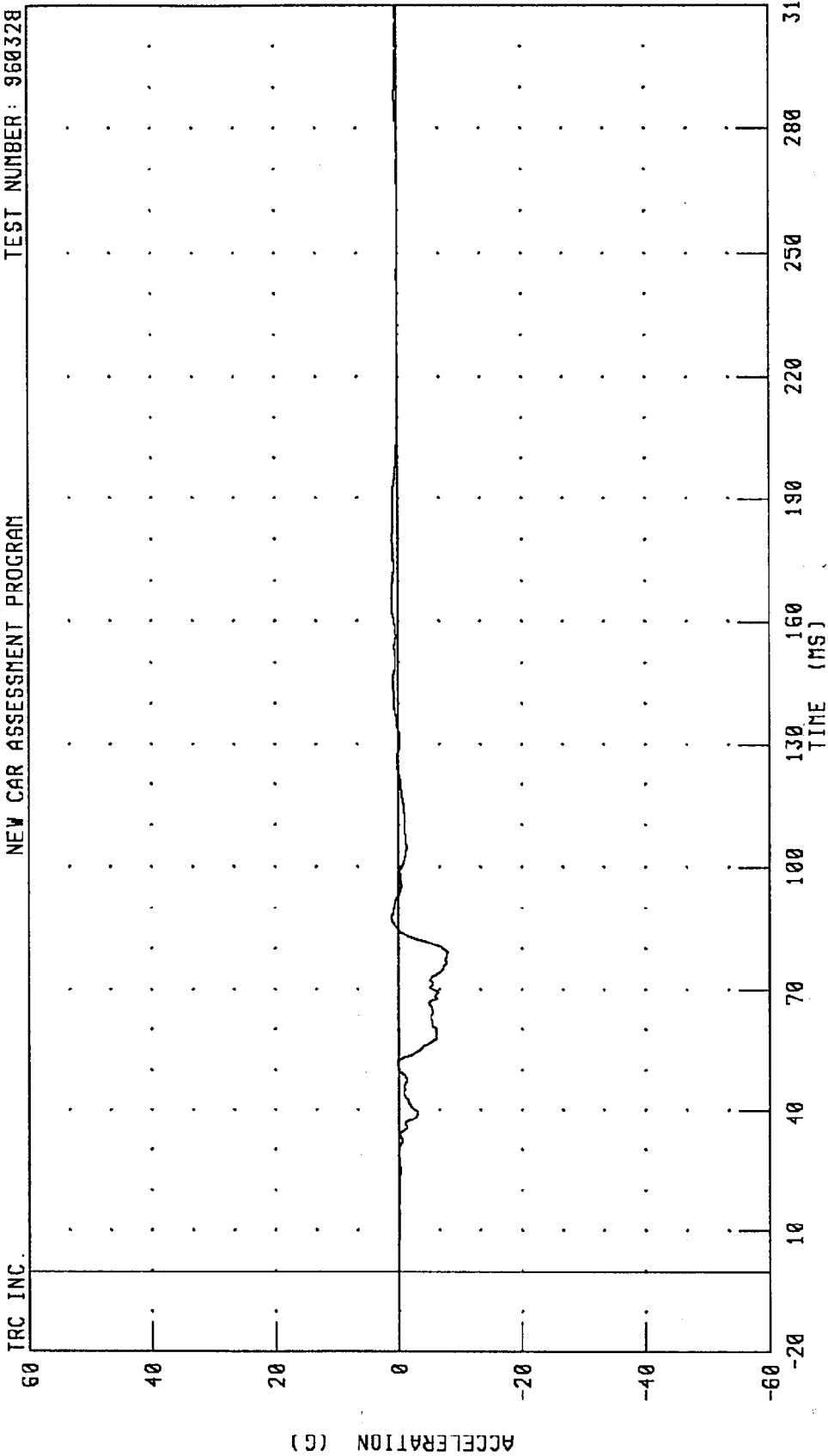
130 160 190 220 250 280 310
TIME (MS)

PEAK DATA: 2.93 G @ 171.36 MS; -56.69 G @ 70.88 MS

CHANNEL: CSTXC2 FILTER: CH. CLASS 180

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

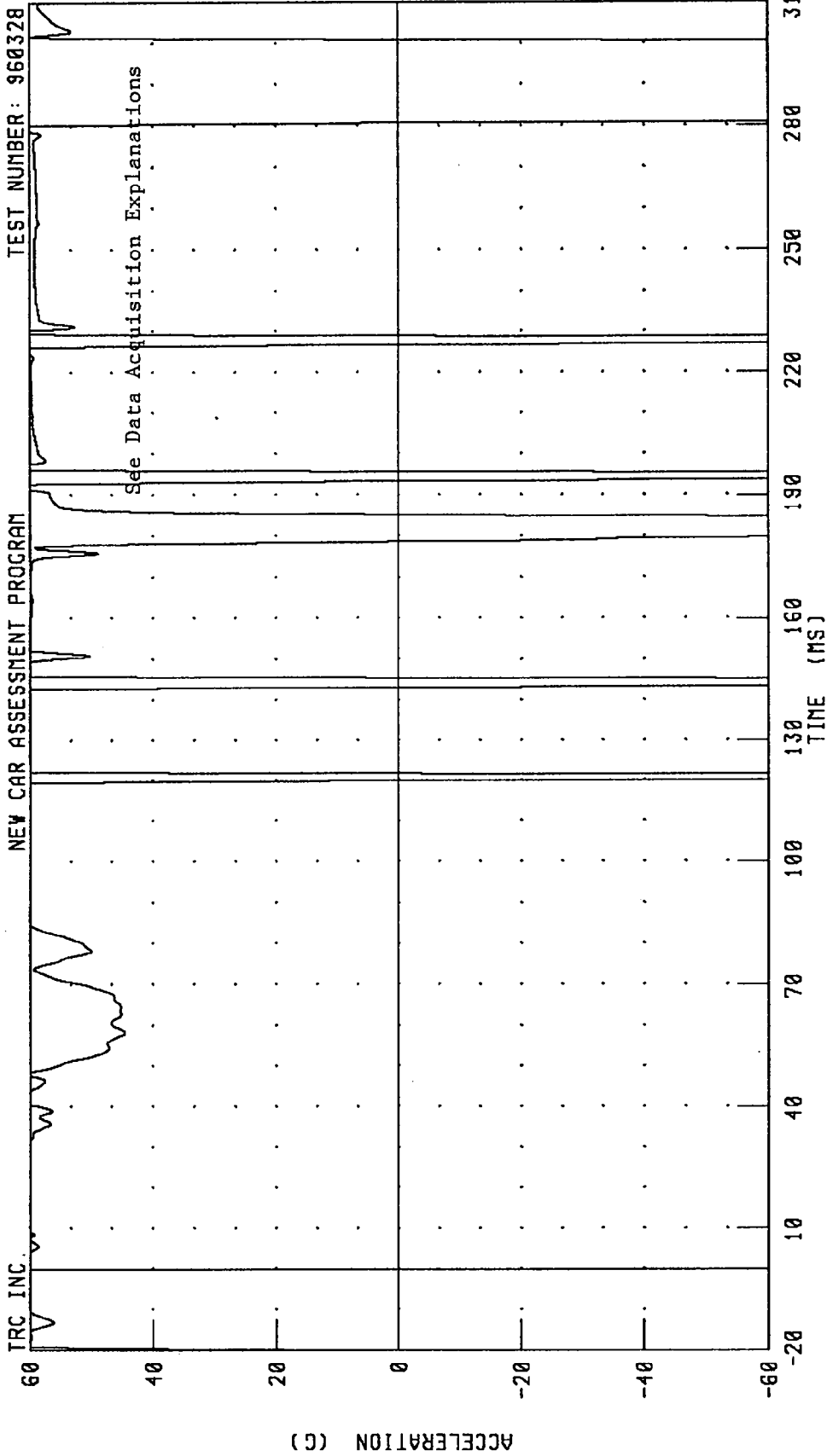


CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 1.22 G @ 87.68 MS; -7.90 G @ 79.12 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

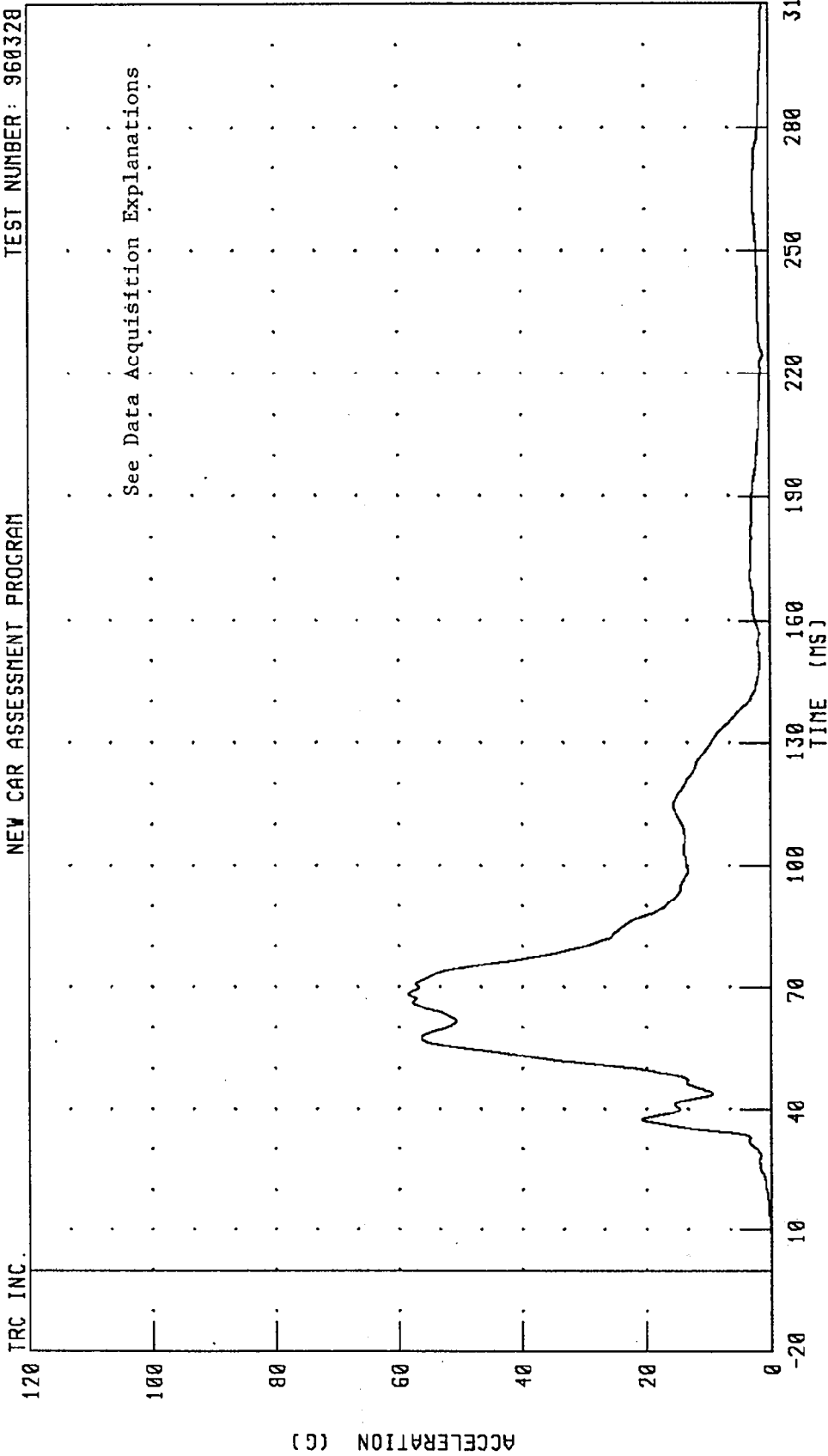


CHANNEL: CSTZG2 FILTER: CH. CLASS 180

PEAK DATA: 84.85 G @ 118.80 MS; -360.20 G @ 181.60 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

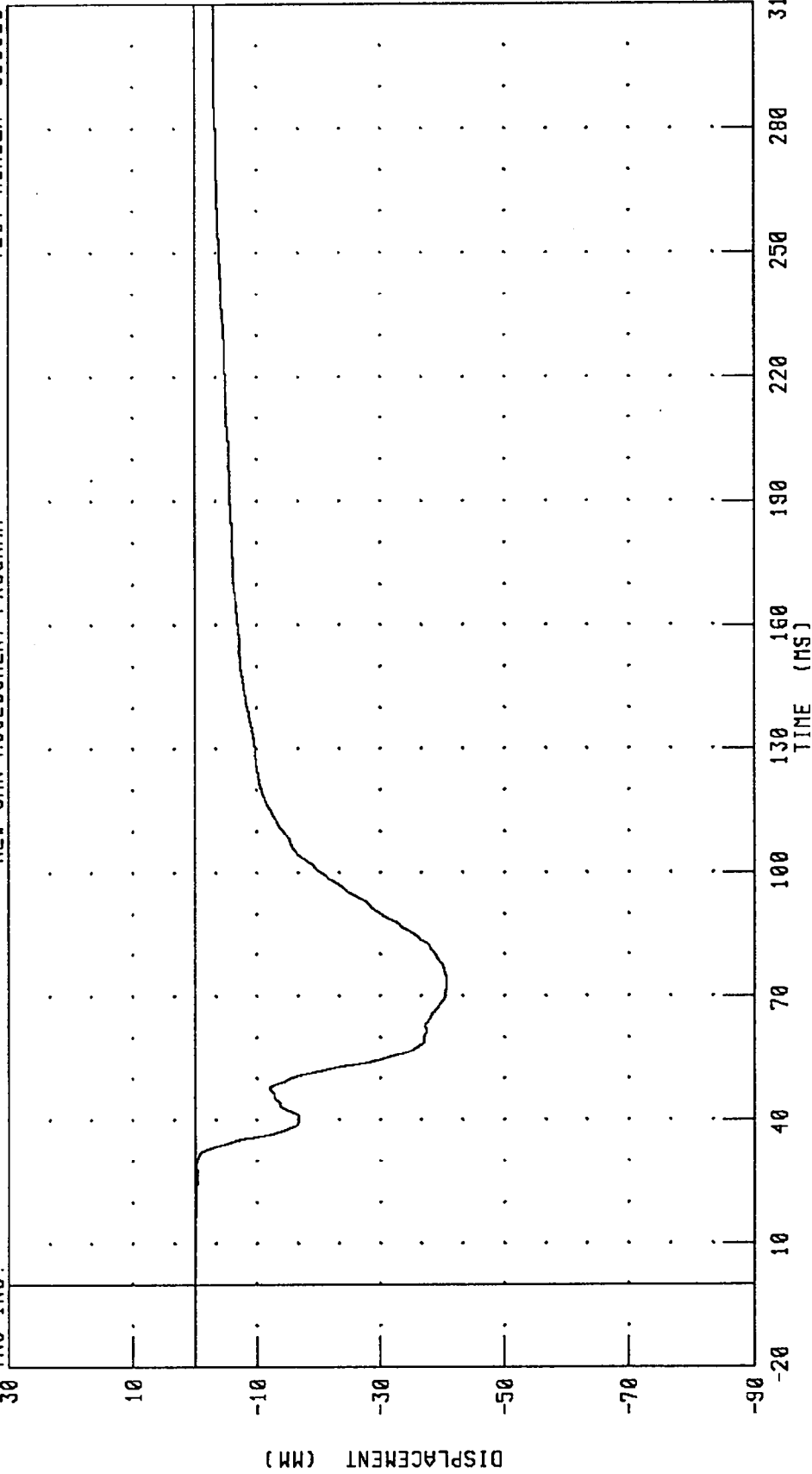


CHANNEL: CSTRG2 FILTER: CH. CLASS 180 PEAK DATA: 58.42 G @ 68.40 MS; 0.01 G @ -20.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST DEFLECTION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

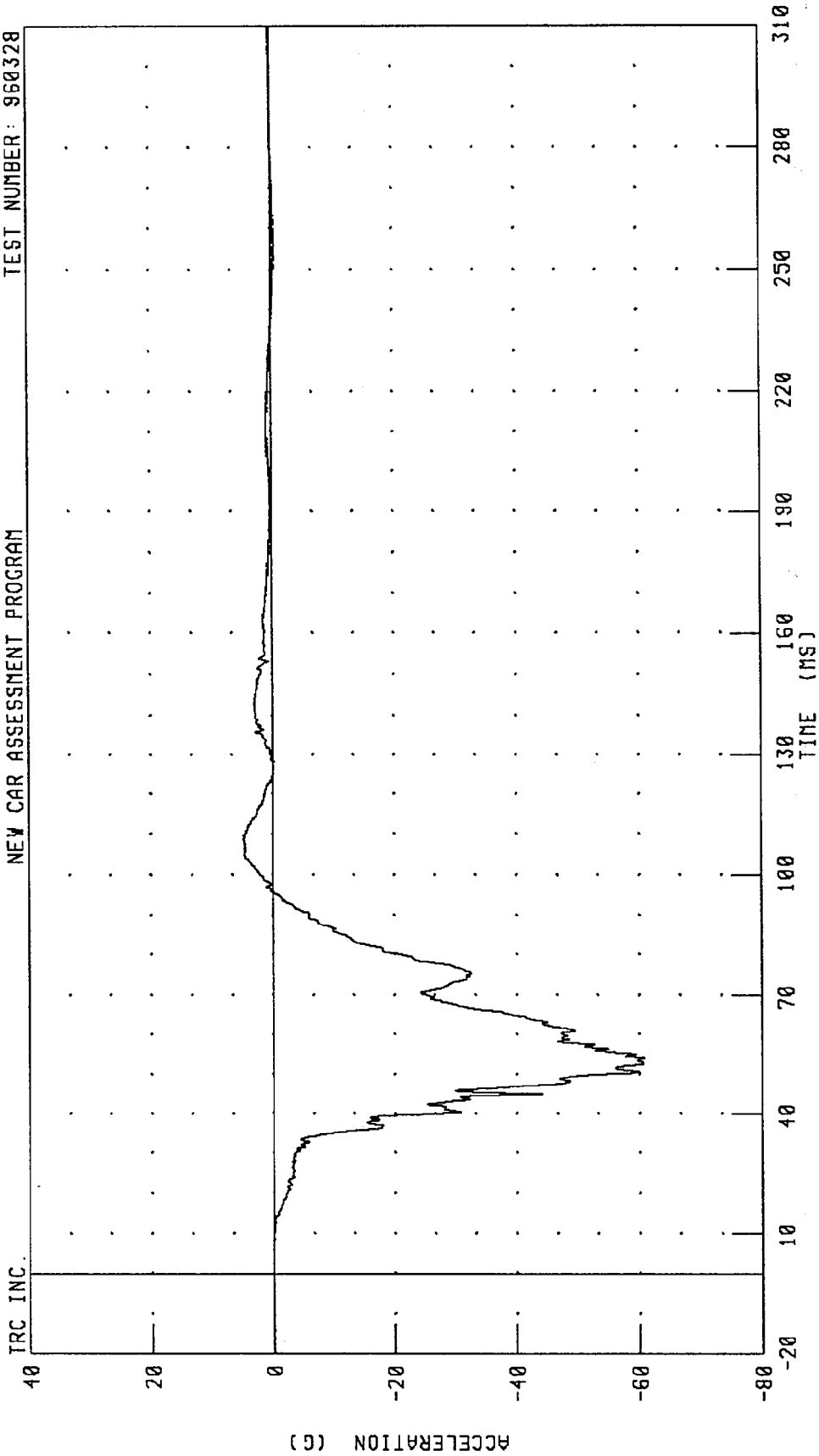


CHANNEL: CSTXD2 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MM @ 0.40 MS; -40.67 MM @ 72.48 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

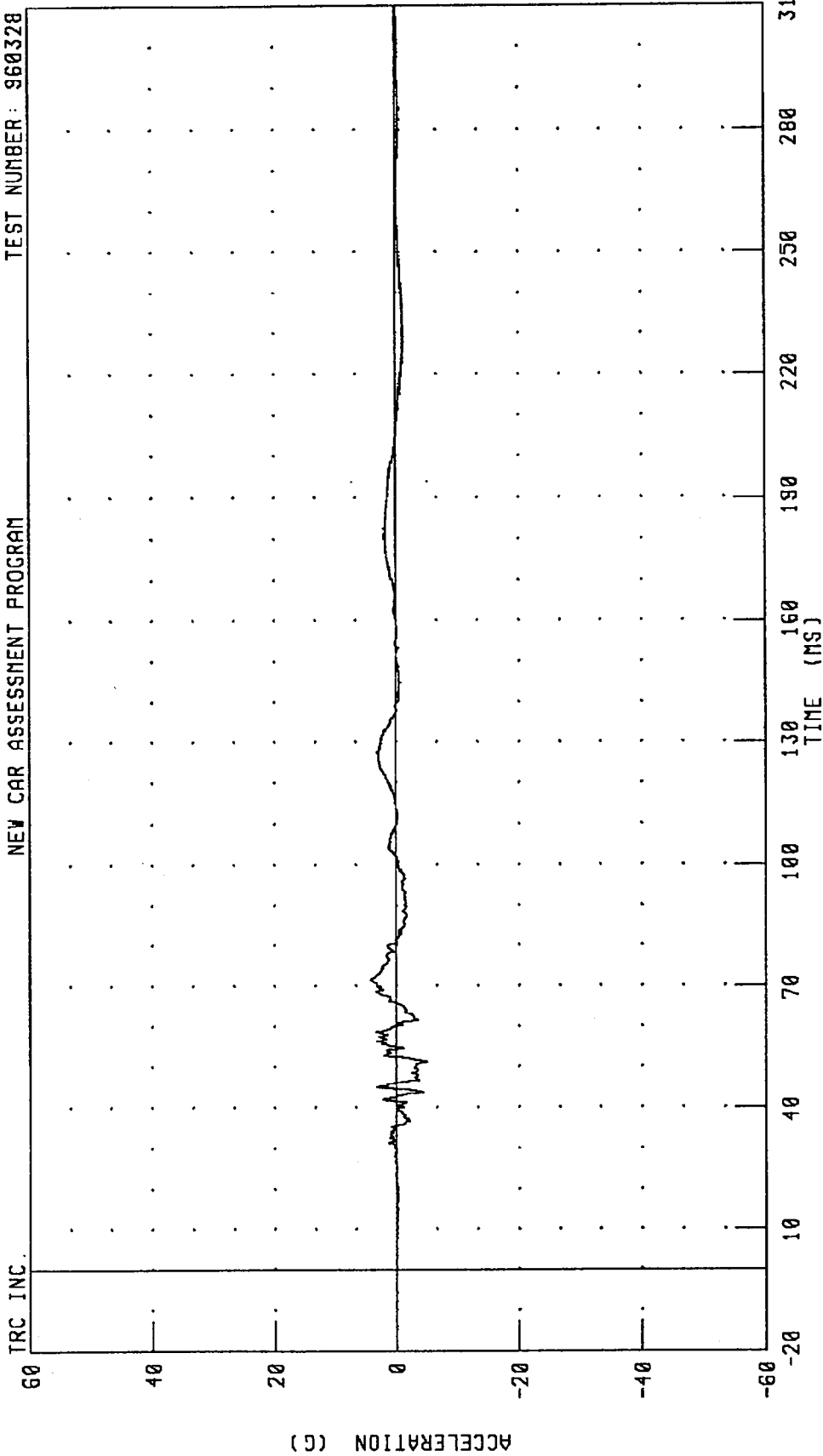


PEAK DATA: 4.88 G @ 108.88 MS; -60.78 G @ 54.00 MS

CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Y-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

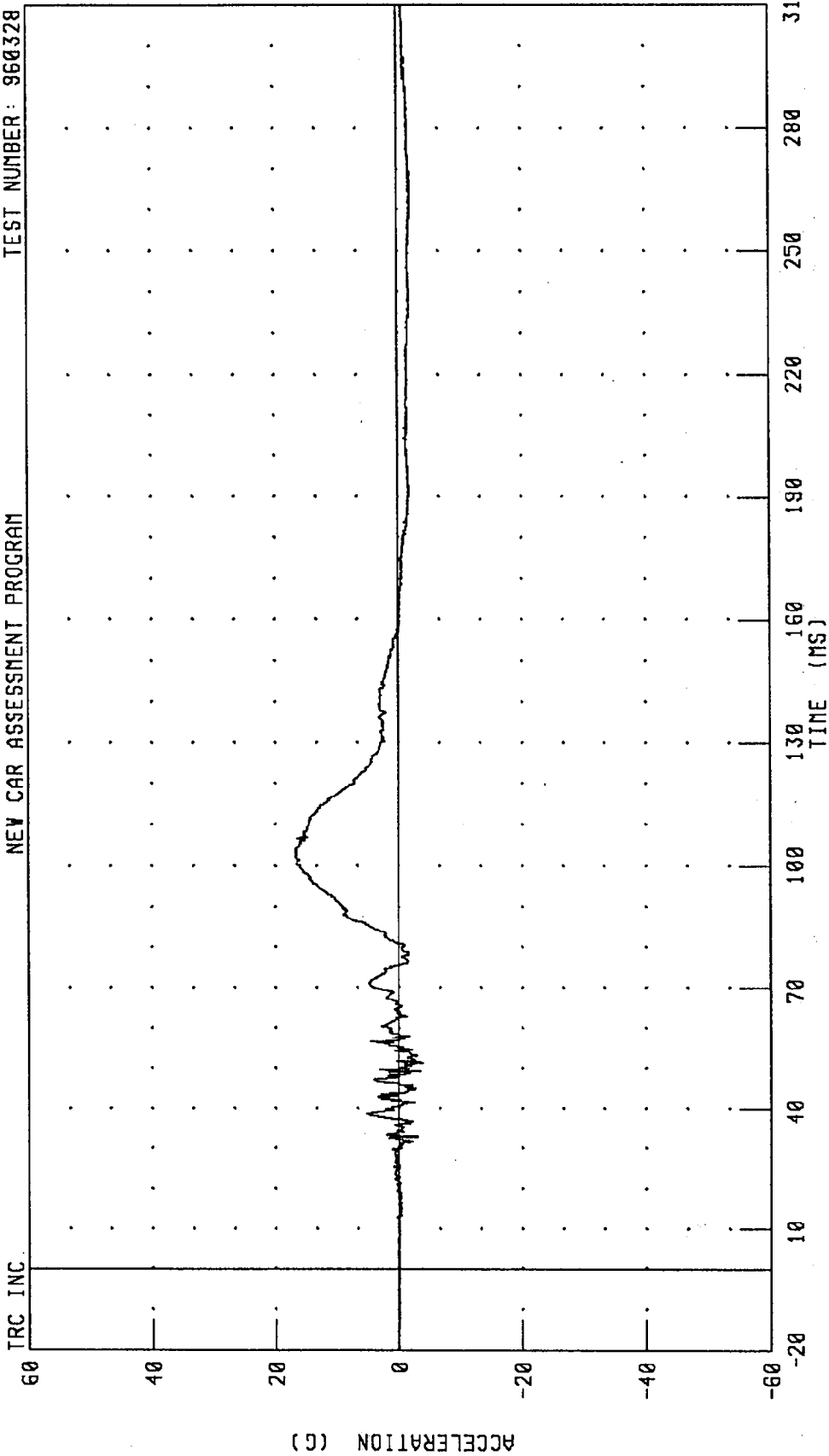


CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

PEAK DATA: 4.32 G @ 71.60 MS; -5.09 G @ 51.12 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS Z-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



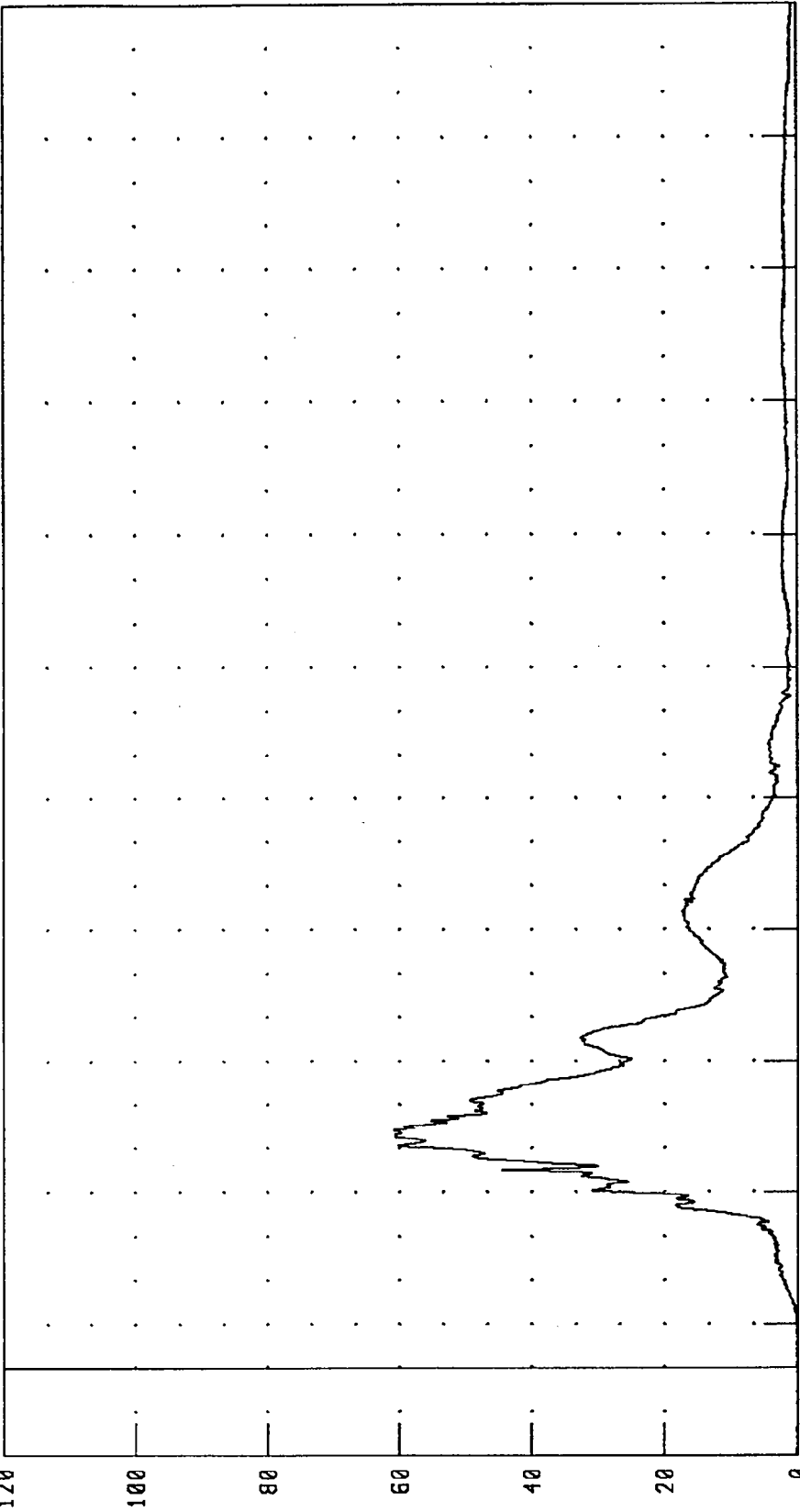
CHANNEL: PEVZG2 FILTER: CH. CLASS 1000 PEAK DATA: 16.75 G @ 102.08 MS; -3.81 G @ 51.20 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER PELVIS RESULTANT ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

120

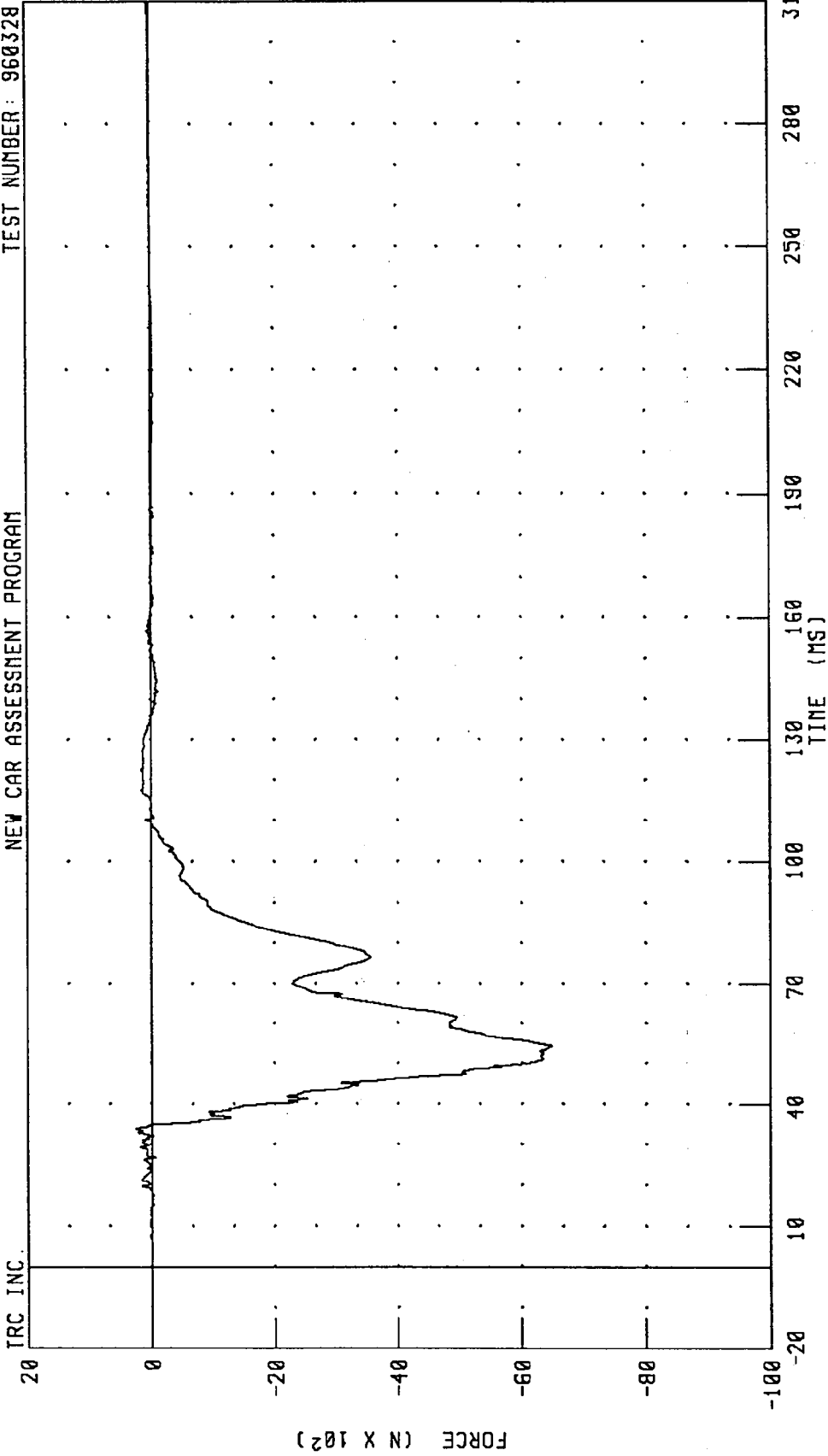


PEAK DATA: 60.81 G @ 54.00 MS; 0.10 G @ -16.32 MS

CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

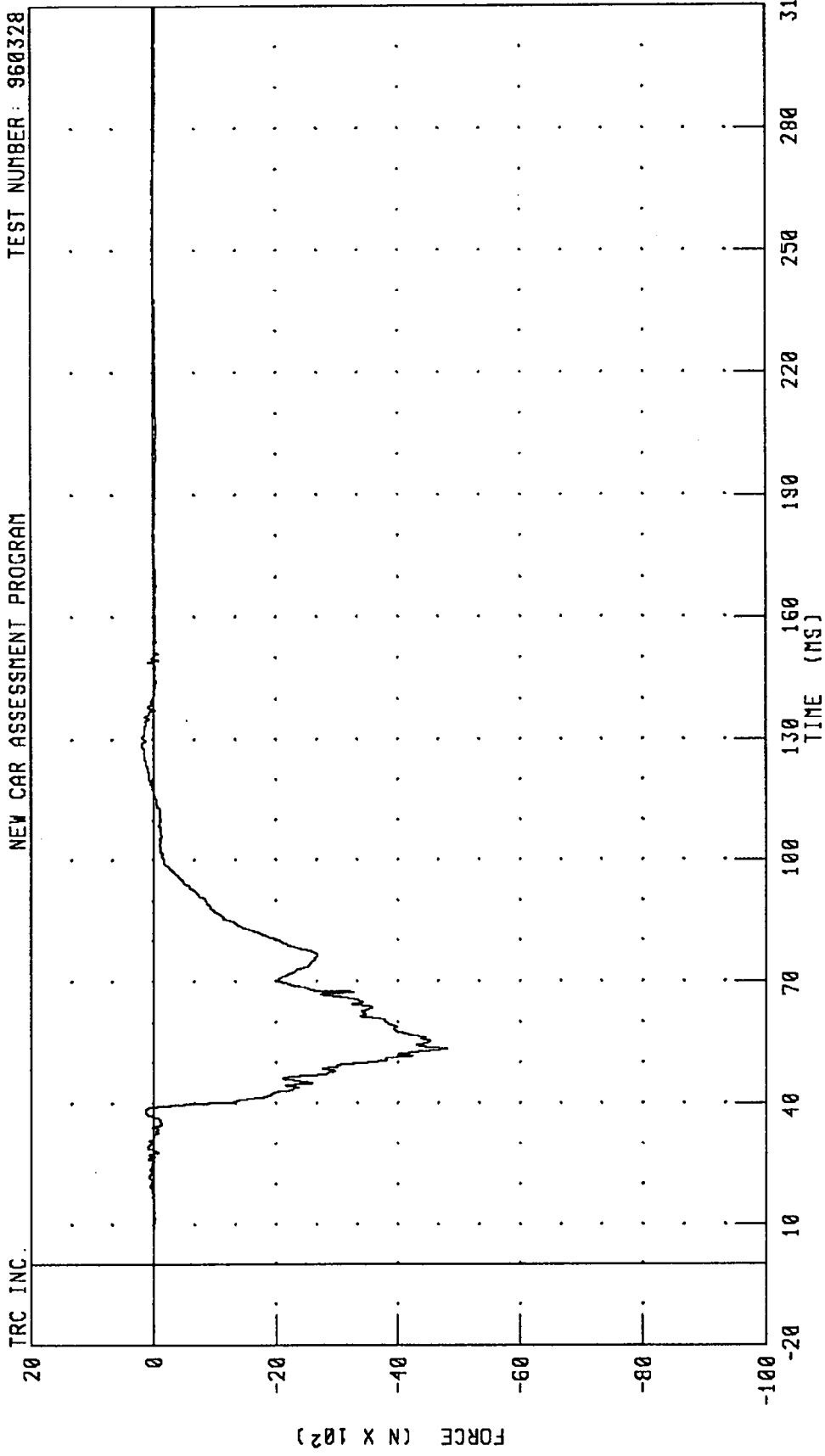


CHANNEL: LFMF2 FILTER: CH. CLASS 600

PEAK DATA: 256.35 N @ 34.08 MS; -6482.26 N @ 54.16 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FEMUR FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

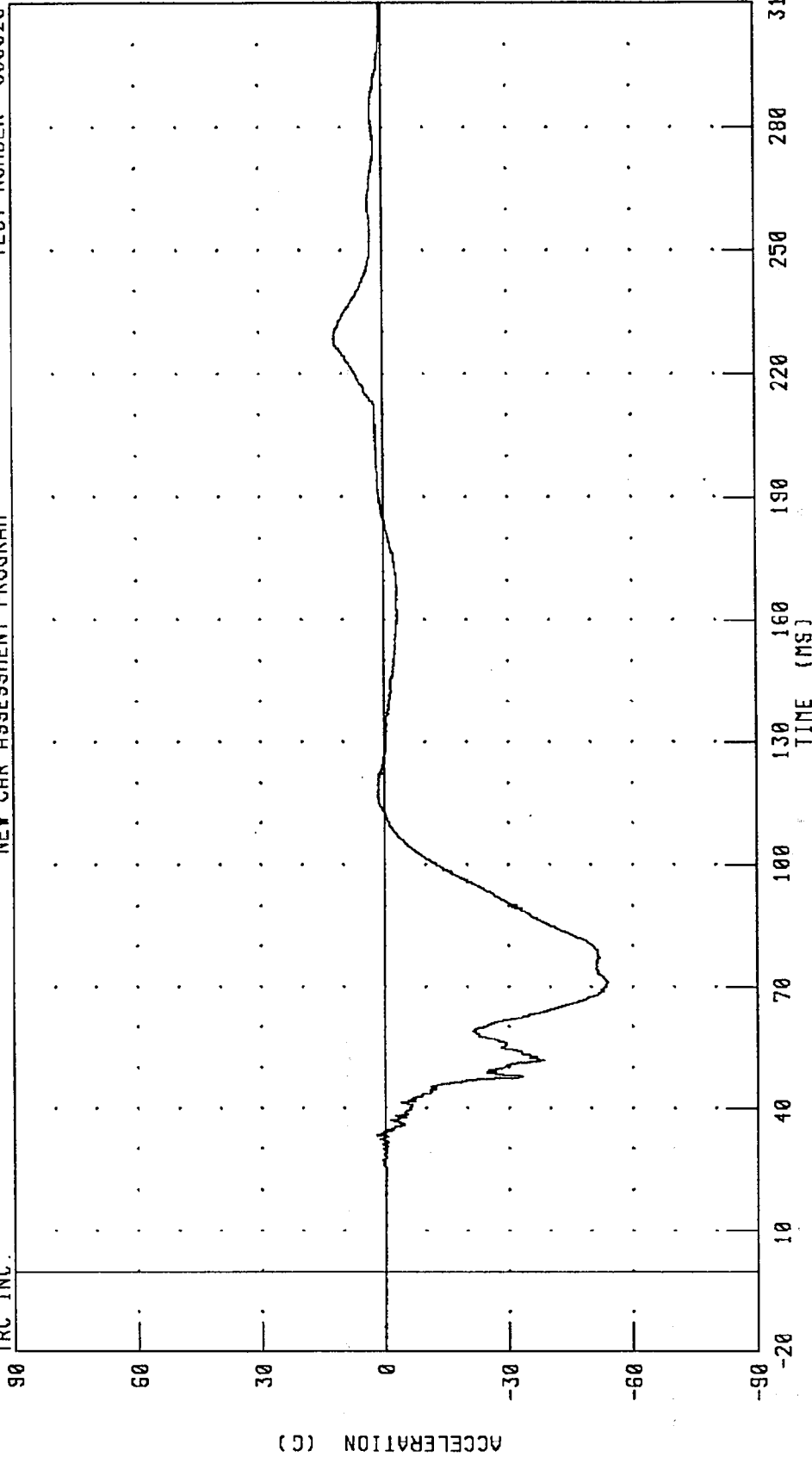


TRC INC. CHANNEL: RFMF2 FILTER: CH. CLASS 600
PEAK DATA: 184.44 N @ 128.32 MS; -4804.45 N @ 53.36 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD X-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



CHANNEL: HEDXR2 FILTER: CH. CLASS 1000

PEAK DATA: 11.98 G @ 228.40 MS; -53.99 G @ 71.20 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

90

60

30

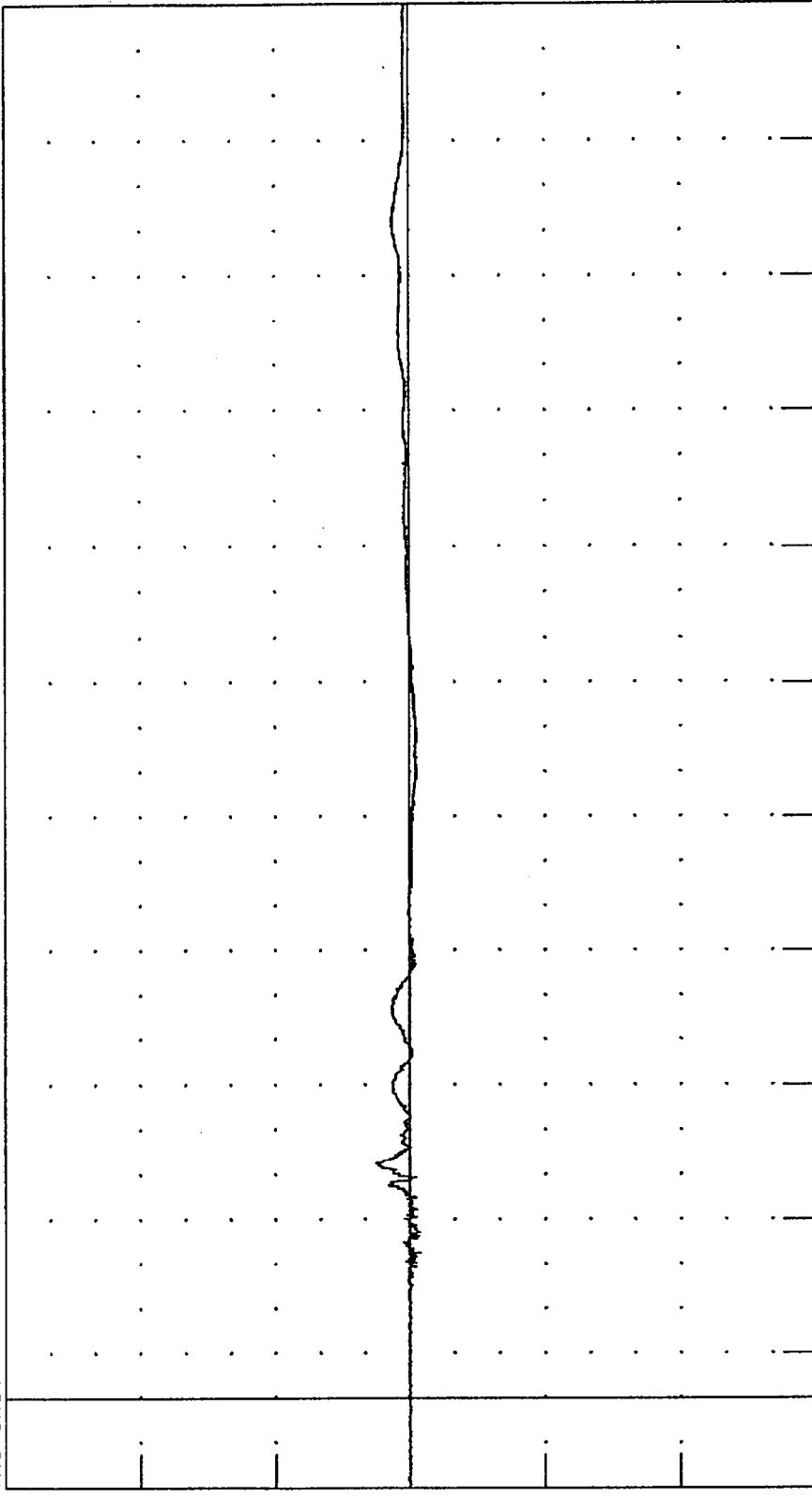
0

-30

-60

-90

ACCELERATION (G)



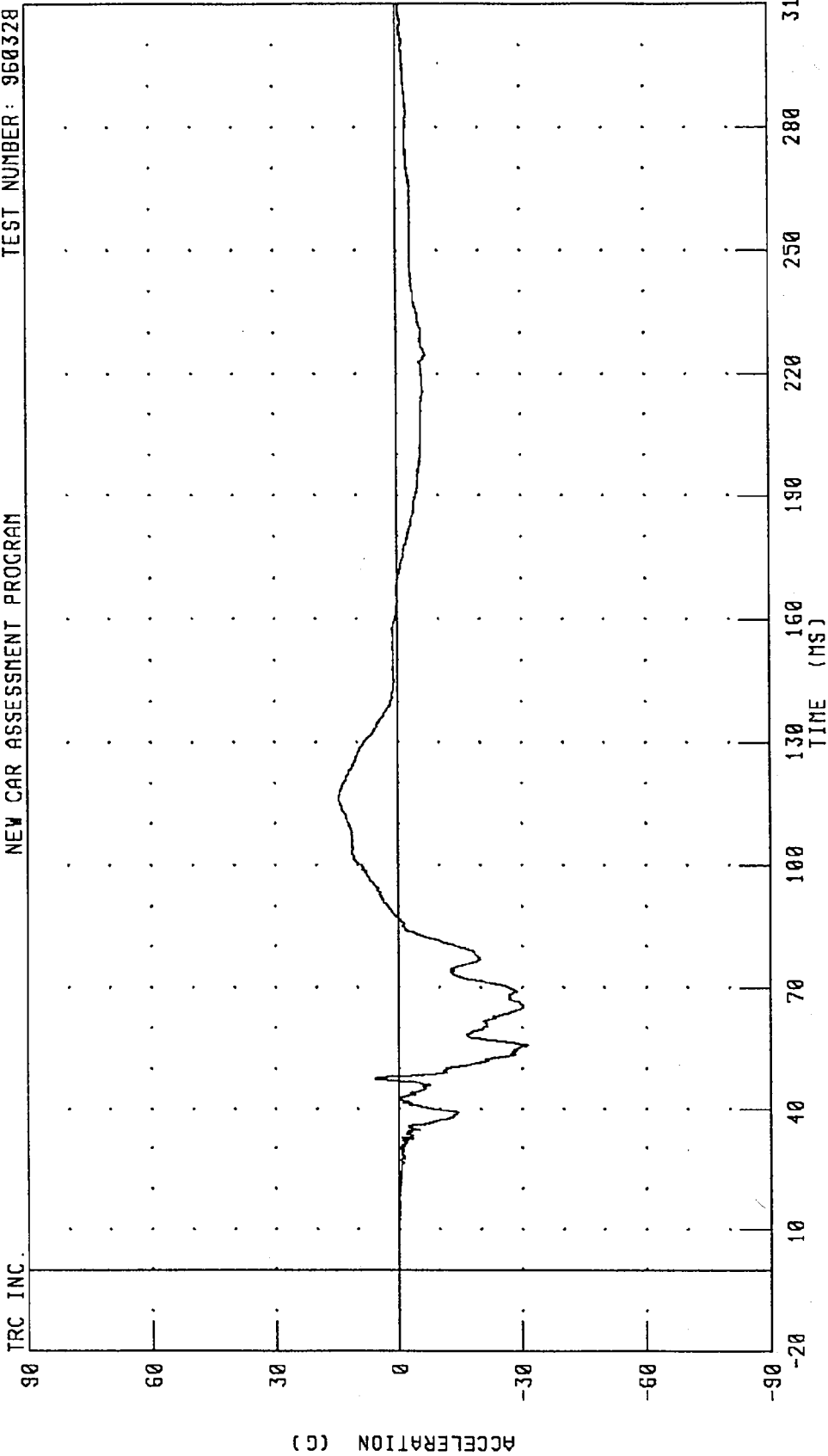
TIME (MS) 130 160 190 220 250 280 310

PEAK DATA: 7.64 G @ 52.48 MS; -2.17 G @ 32.64 MS

CHANNEL: HEDYR2 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



TRC INC.

CHANNEL: HEDZR2 FILTER: CH. CLASS 1000

PEAK DATA: 14.60 G @ 116.64 MS; -31.31 G @ 55.68 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER HEAD RESULTANT ACCELERATION - REDUNDANT

TEST NUMBER: 960328

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)

PEAK DATA: 60.32 G @ 69.04 MS; 0.05 G @ -19.92 MS

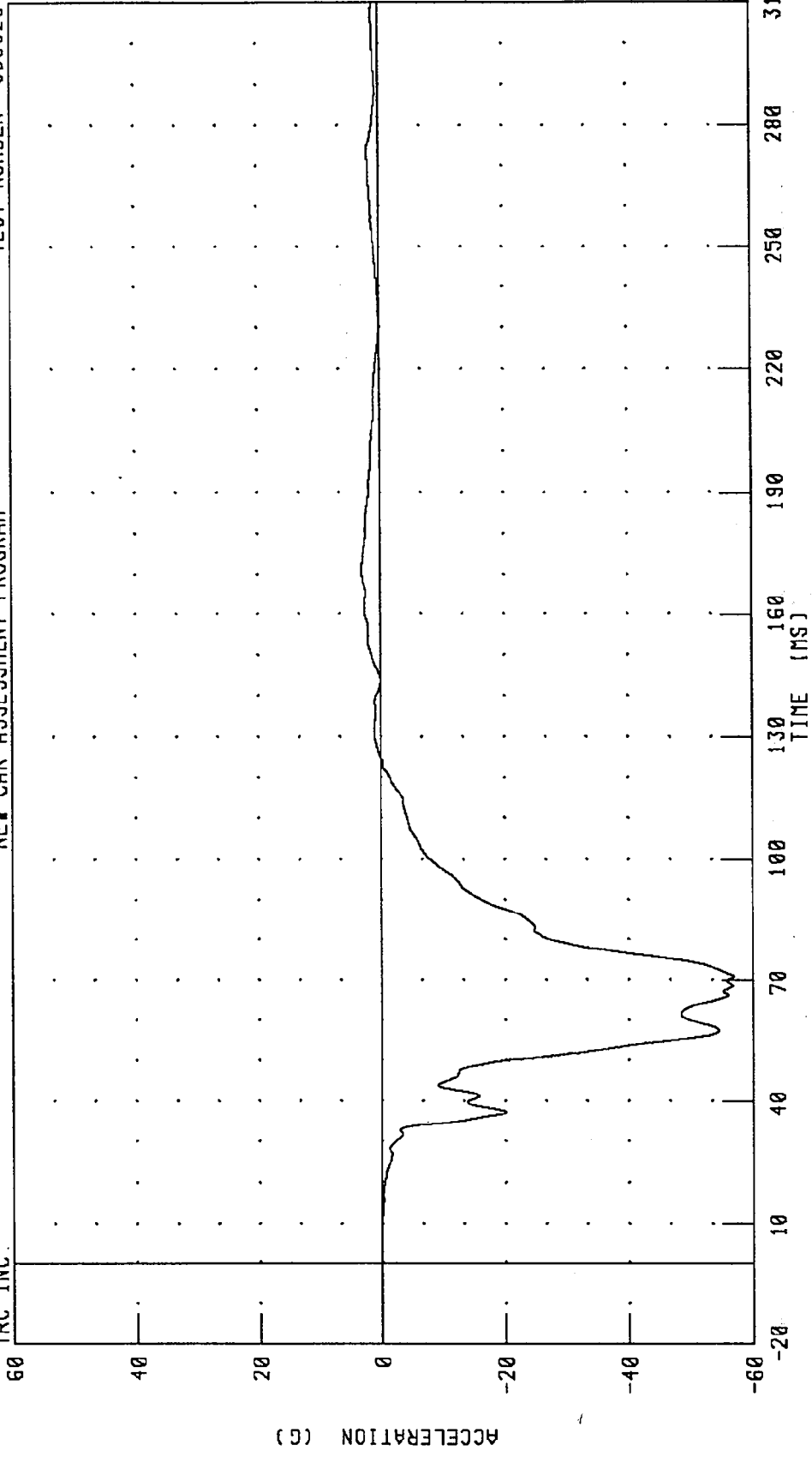
CHANNEL: HEDRR2 FILTER: CH. CLASS 1000

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST X-AXIS ACCELERATION - REDUNDANT

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: CSTXR2 FILTER: CH. CLASS 180 PEAK DATA: 3.03 G @ 171.12 MS; -56.91 G @ 70.80 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Y-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

310

280

250

220

190

160

130

100

70

40

10

TIME (MS)

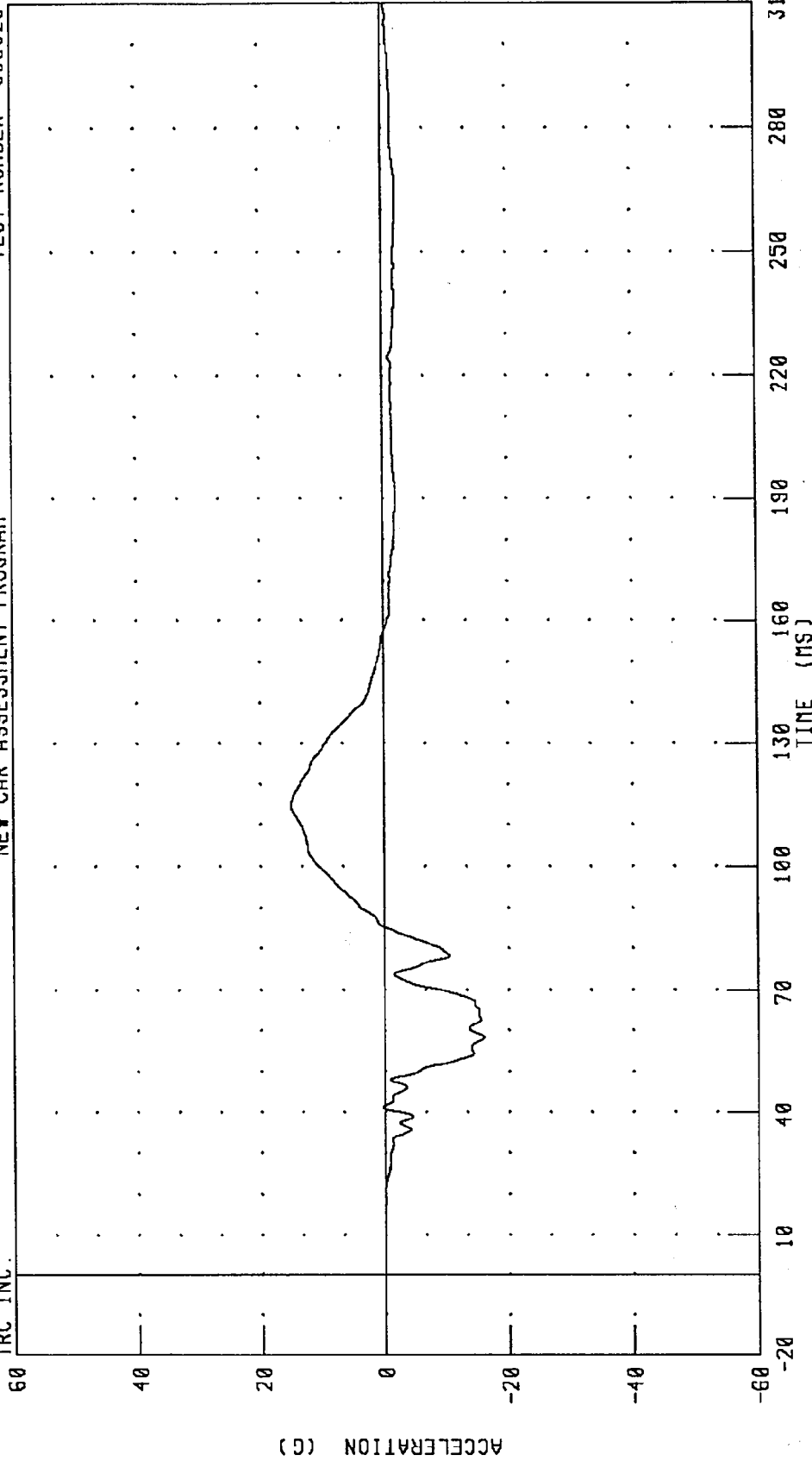
PEAK DATA: 1.80 G @ 87.76 MS; -7.15 G @ 79.20 MS

CHANNEL: CSTYR2 FILTER: CH. CLASS 180

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST Z-AXIS ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

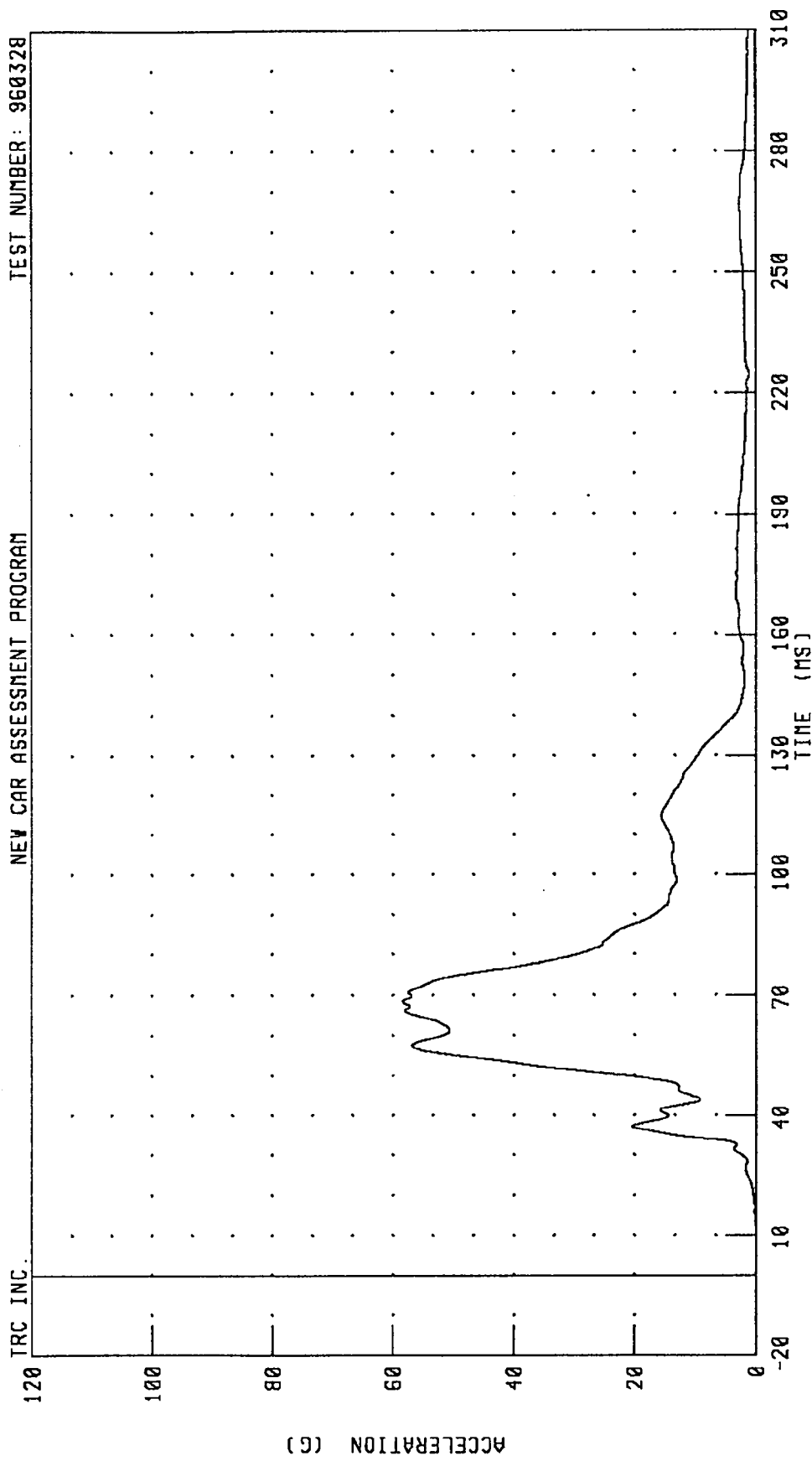


CHANNEL: CSTZR2 FILTER: CH. CLASS 180
PEAK DATA: 15.15 G @ 114.96 MS; -16.02 G @ 58.40 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER CHEST RESULTANT ACCELERATION - REDUNDANT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

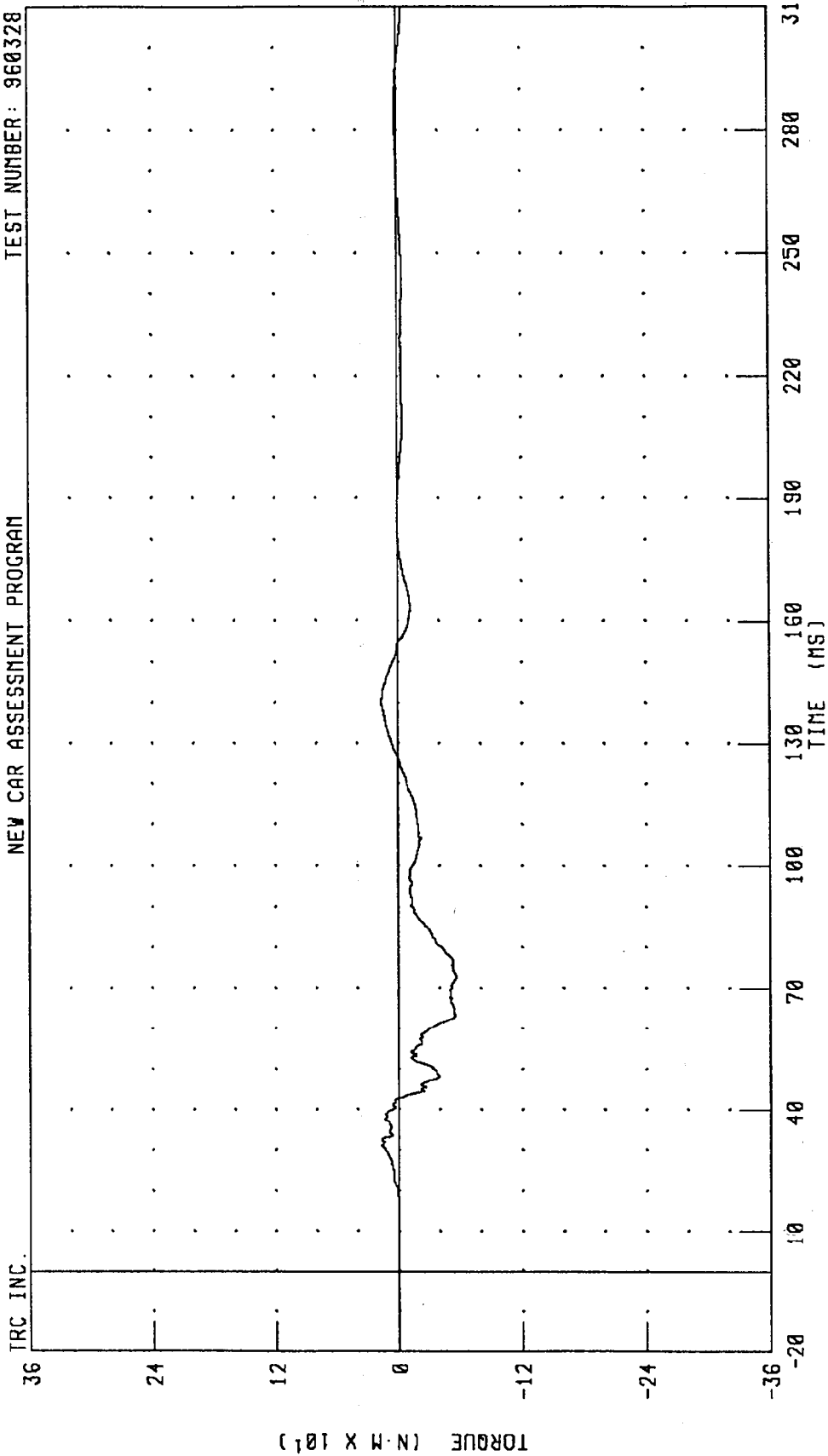


PEAK DATA: 58.33 G @ 68.40 MS; 0.01 G @ -20.00 MS

CHANNEL: CSTR2 FILTER: CH. CLASS 180

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT X AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: TBLX12 FILTER: CH. CLASS 600

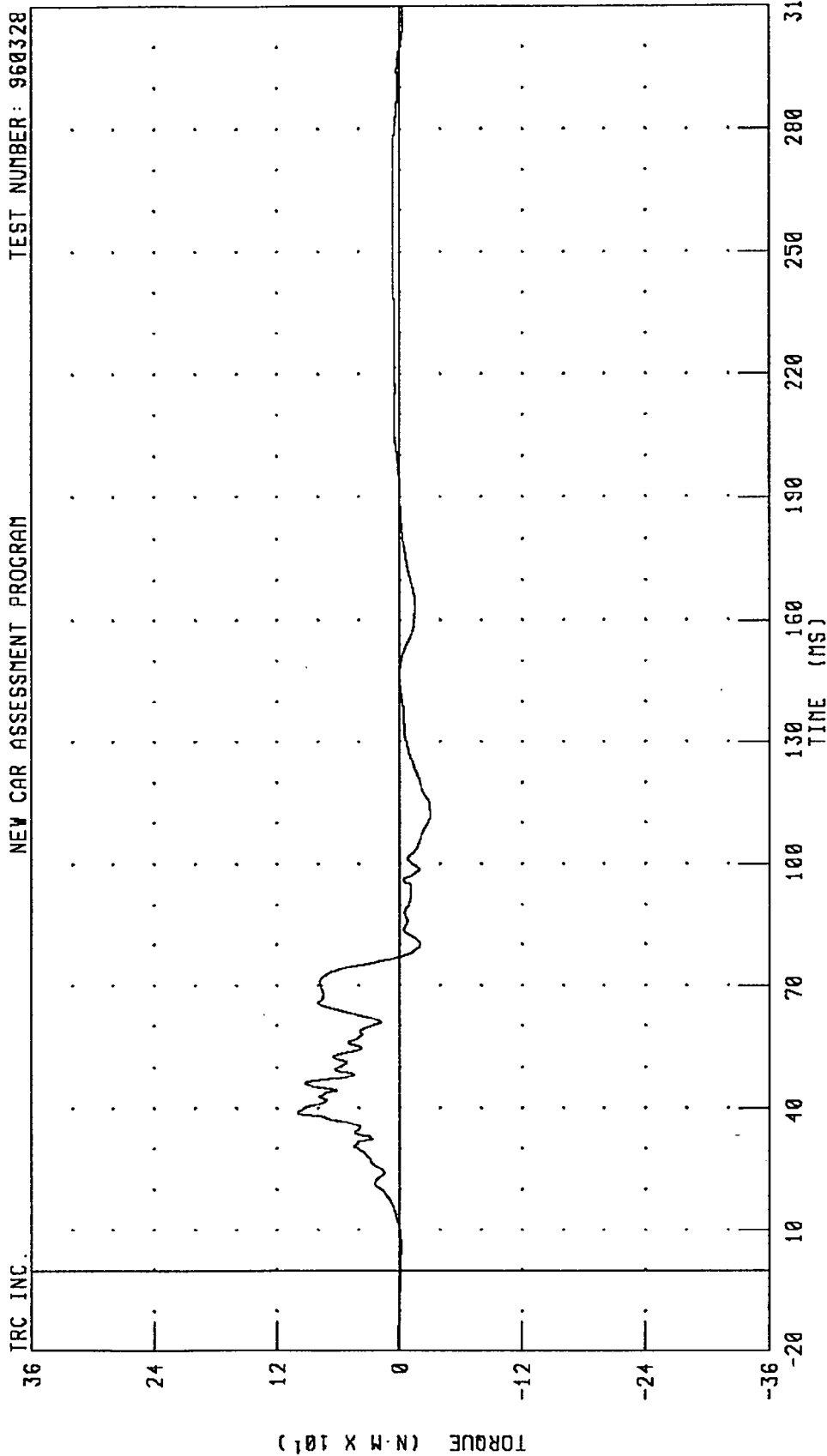
PEAK DATA: 16.90 N·M @ 31.12 MS, -55.66 N·M @ 72.88 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT UPPER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



PEAK DATA: 99.85 N·M @ 39.20 MS; -30.68 N·M @ 111.36 MS

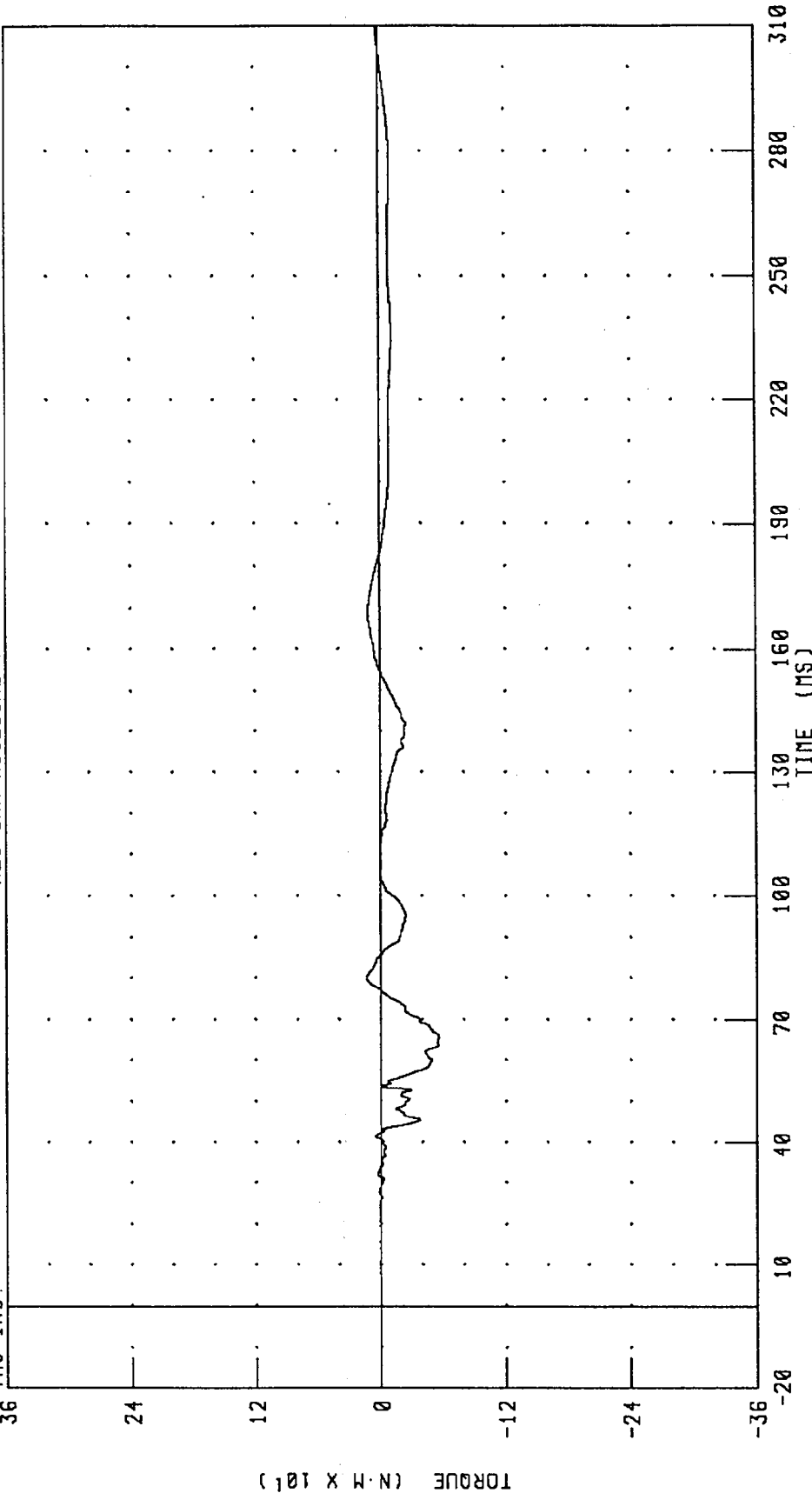
CHANNEL: TBLYM2 FILTER: CH. CLASS 600

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT X AXIS

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



CHANNEL: TBRXM2 FILTER: CH. CLASS 600

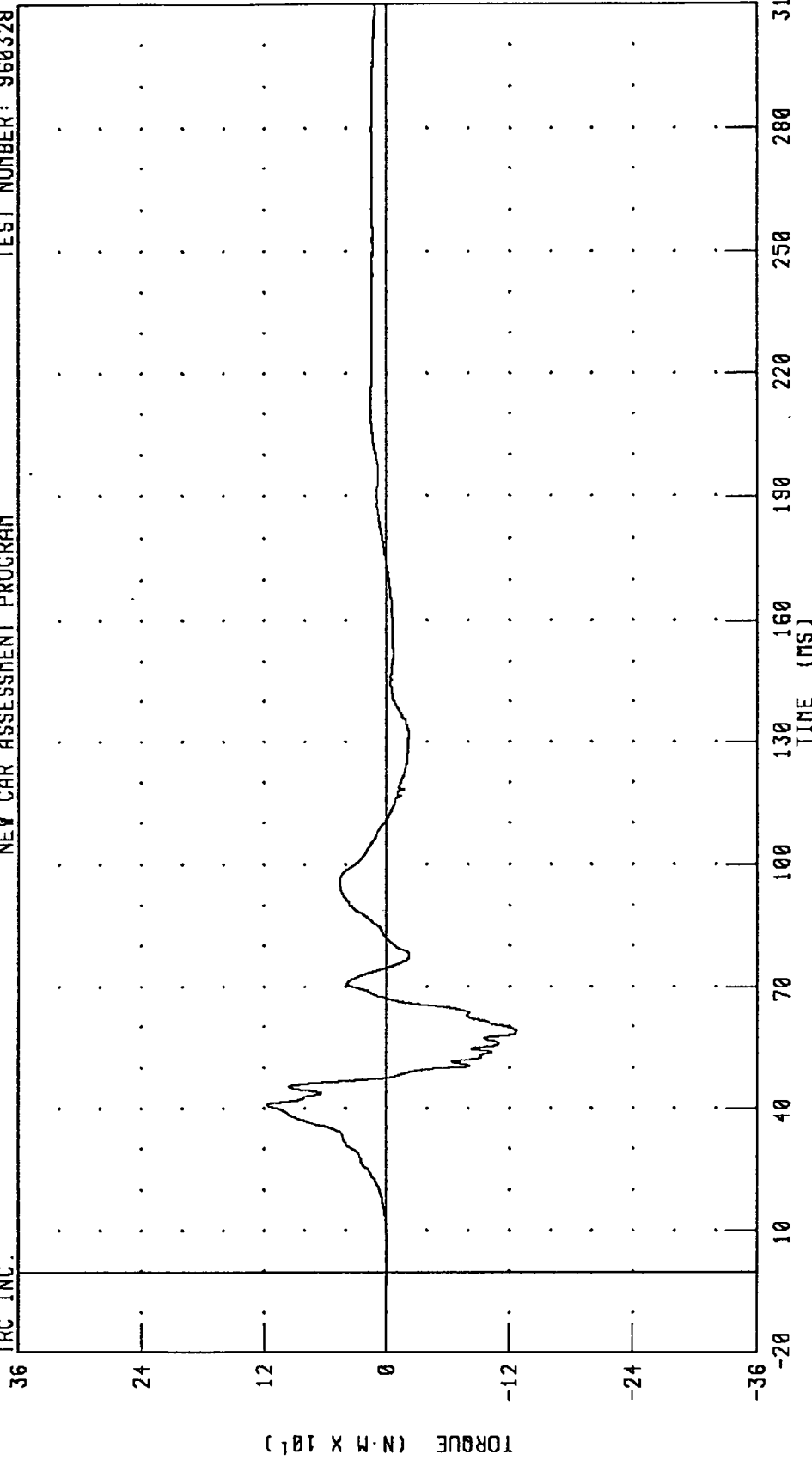
PEAK DATA: 13.62 N·M @ 80.08 MS; -55.70 N·M @ 65.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT UPPER TIBIA MOMENT ABOUT Y AXIS

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

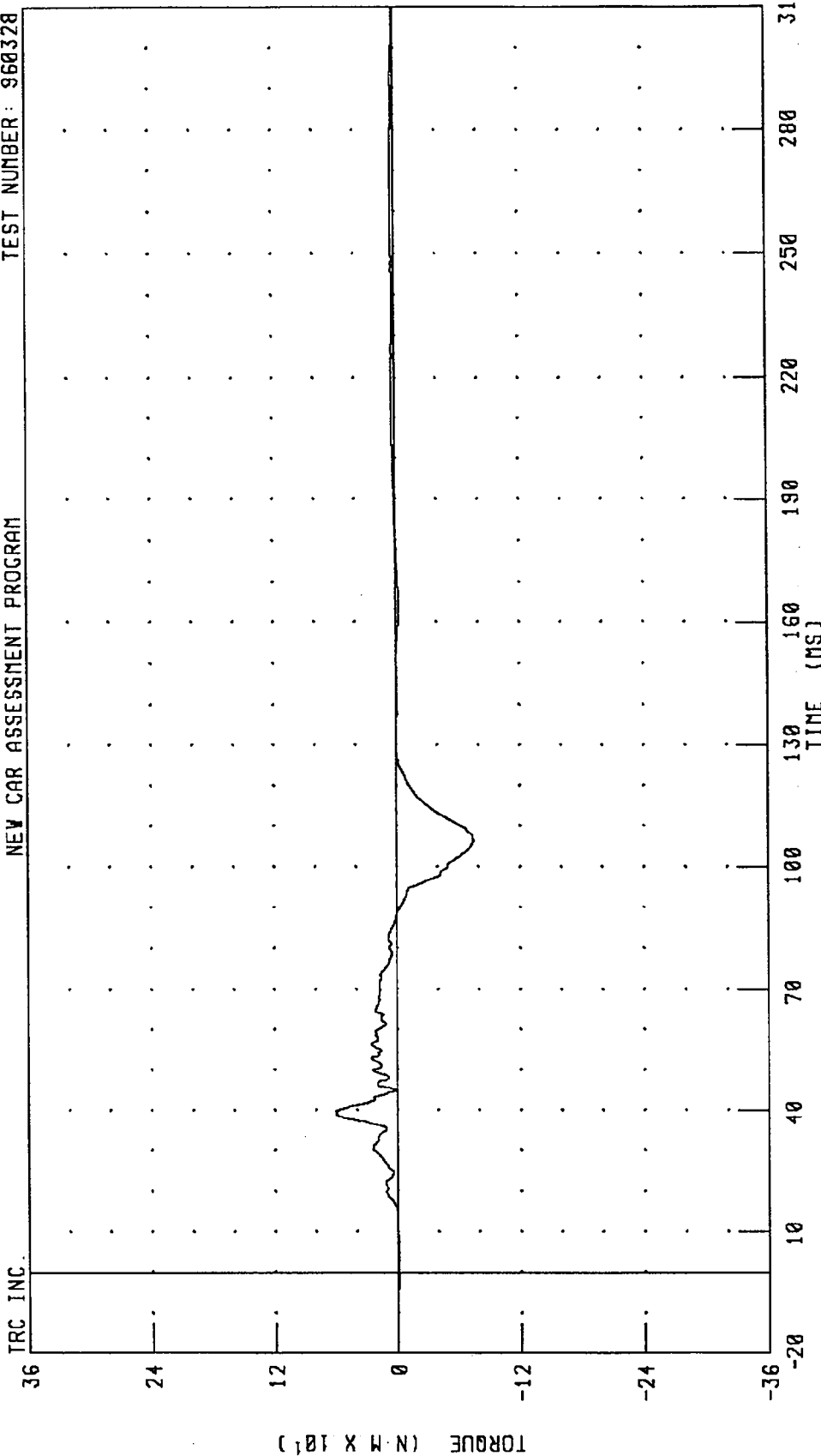


PEAK DATA: 117.30 N·M @ 40.96 MS; -127.38 N·M @ 59.04 MS

CHANNEL: TBRYM2 FILTER: CH. CLASS 600

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT LOWER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



TRC INC.

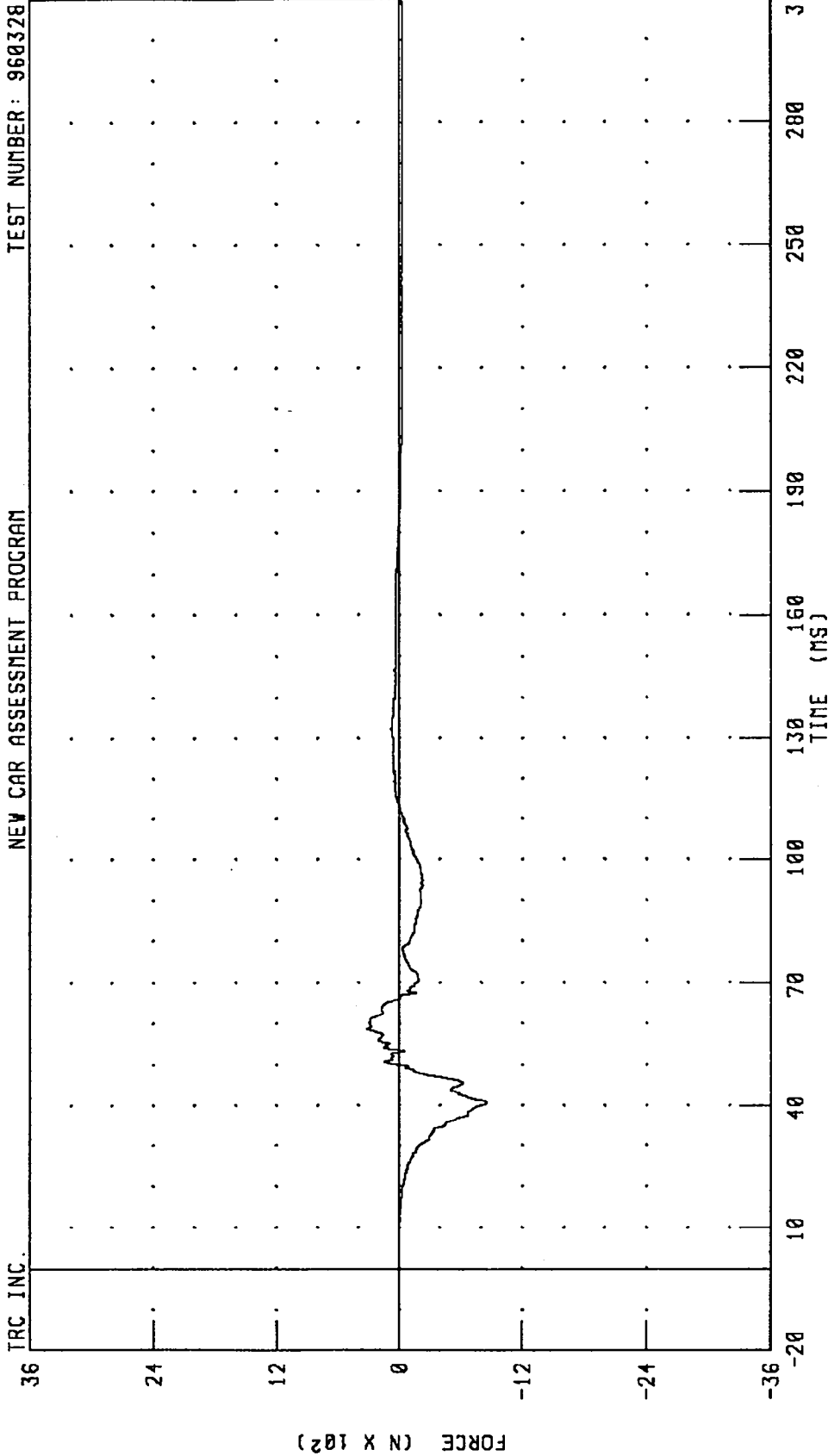
CHANNEL: ANLYM2 FILTER: CH. CLASS 600

960328

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA X-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

IRC INC.



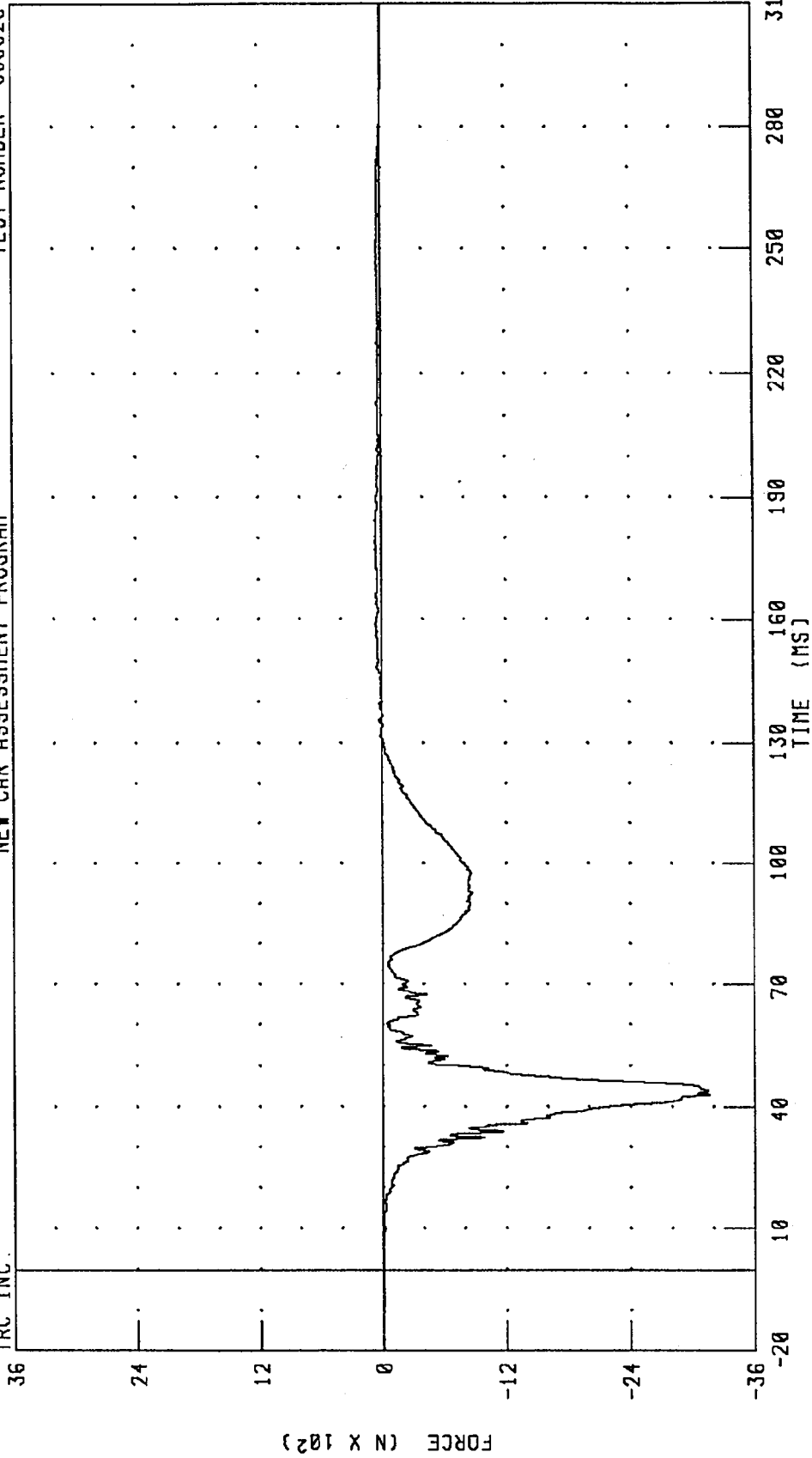
CHANNEL: ANRXP2 FILTER: CH. CLASS 600

PEAK DATA: 317.70 N @ 58.72 MS; -857.75 N @ 40.80 MS

1986 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA Z-AXIS FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

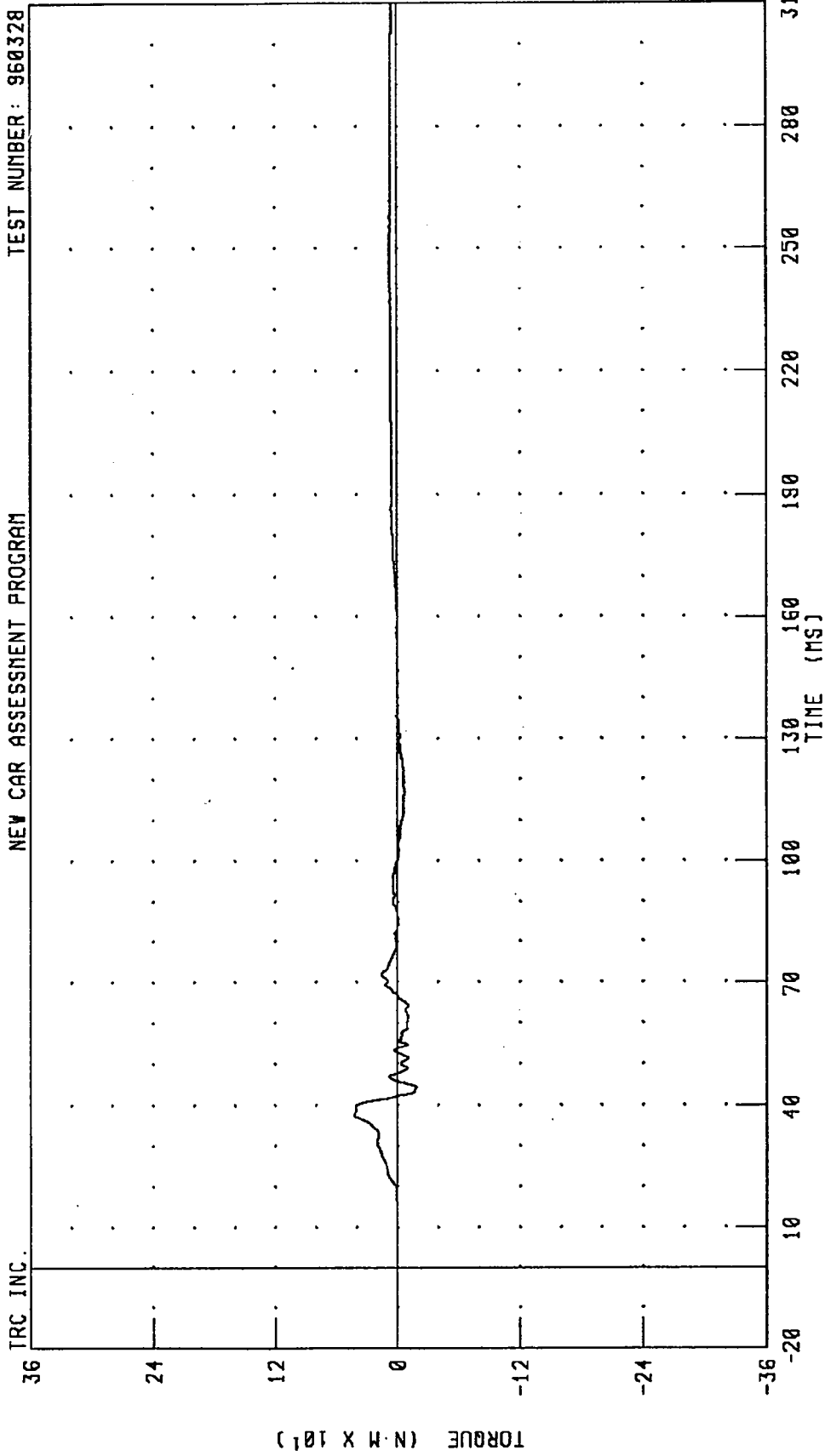
TRC INC.



CHANNEL: ANRZF2 FILTER: CH. CLASS 600
PEAK DATA: 56.87 N @ 158.80 MS; -3162.68 N @ 42.88 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT LOWER TIBIA MOMENT ABOUT Y AXIS
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

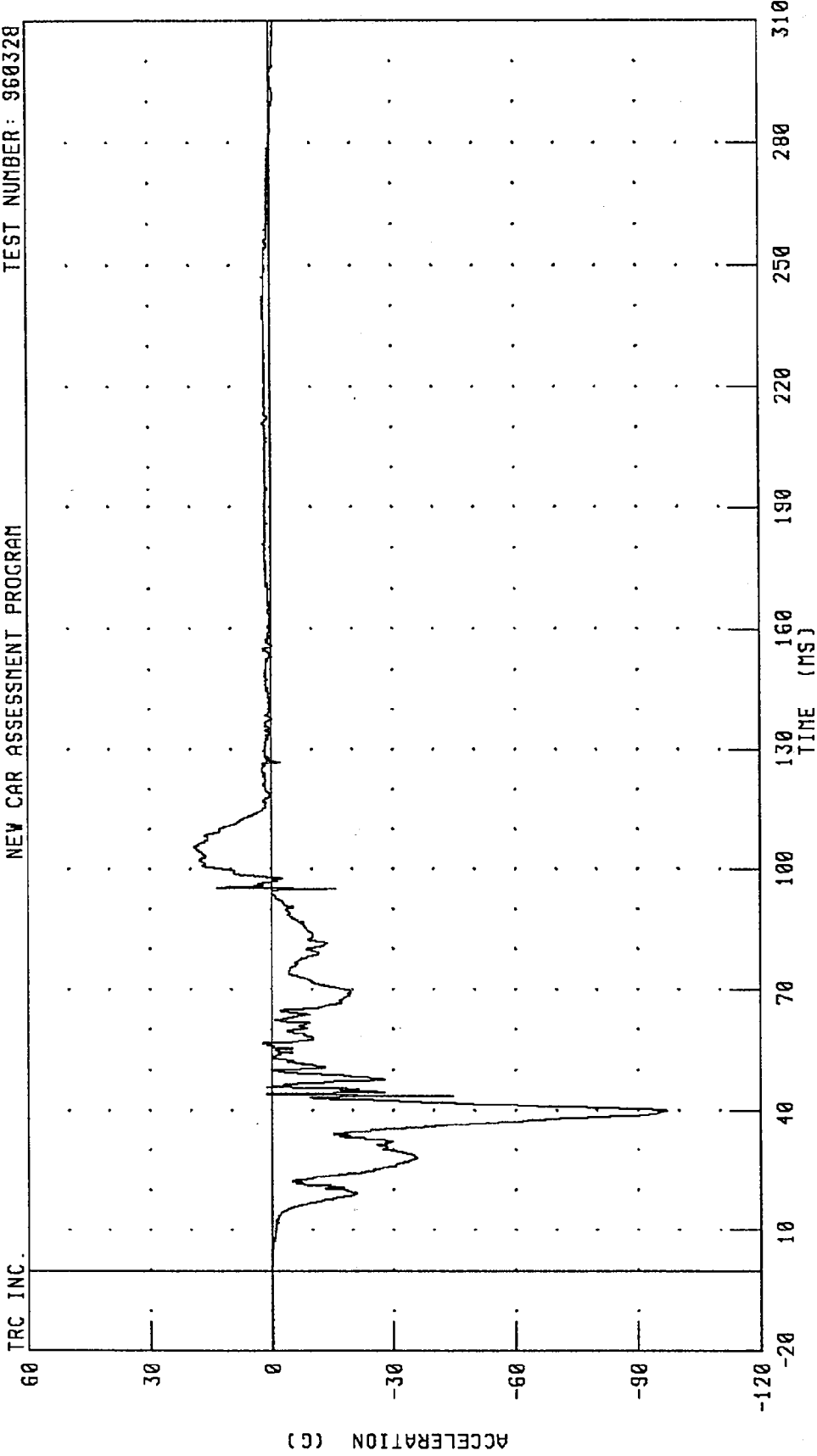


TRC INC.

CHANNEL: ANRYM2 FILTER: CH. CLASS 600
PEAK DATA: 42.88 N·M @ 37.68 MS; -18.75 N·M @ 44.40 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

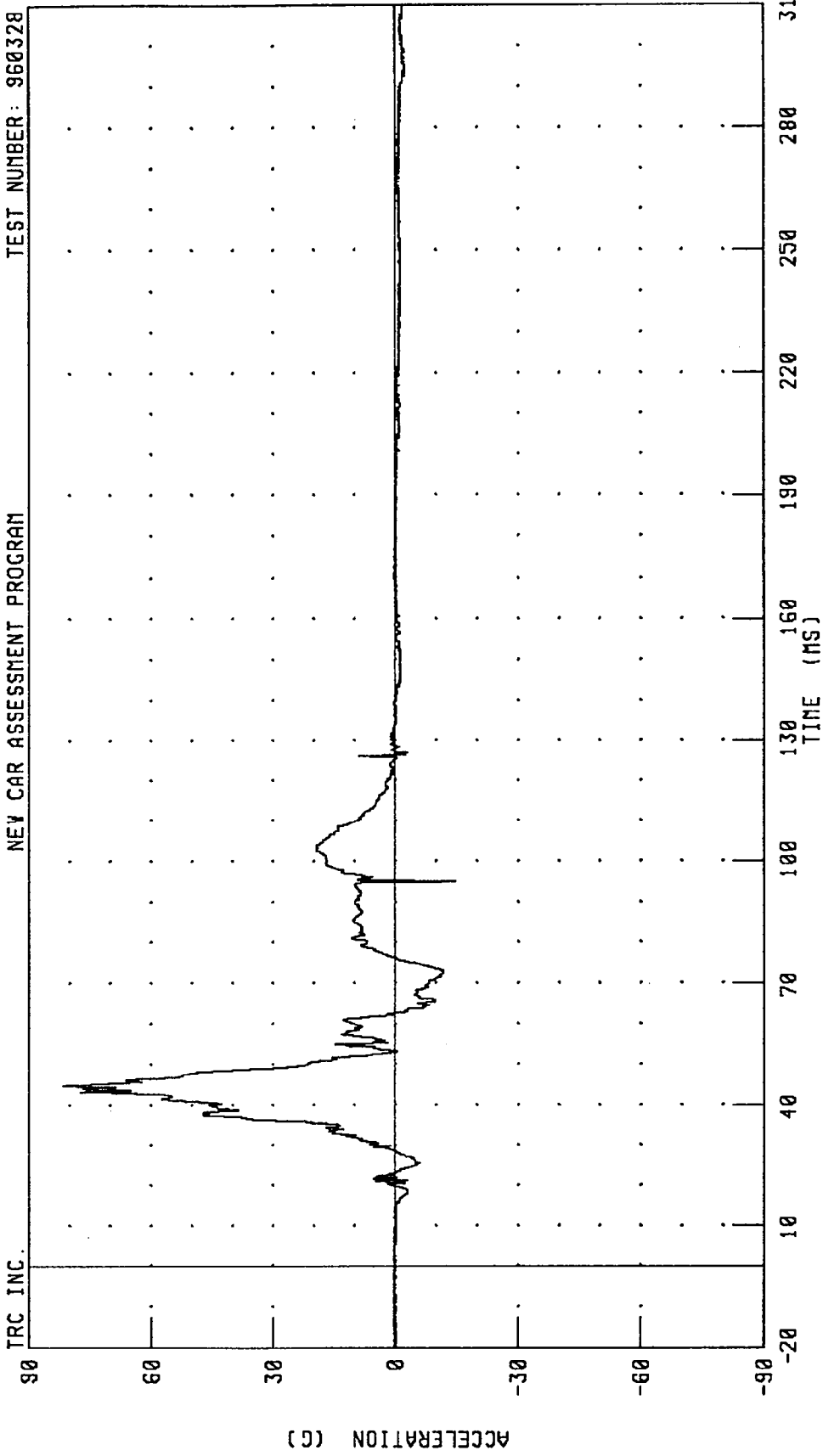
TEST NUMBER: 960328



CHANNEL: FTLXG2 FILTER: CH. CLASS 1000 PEAK DATA: 18.92 G @ 105.60 MS; -97.13 G @ 40.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT HEEL
NEY CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



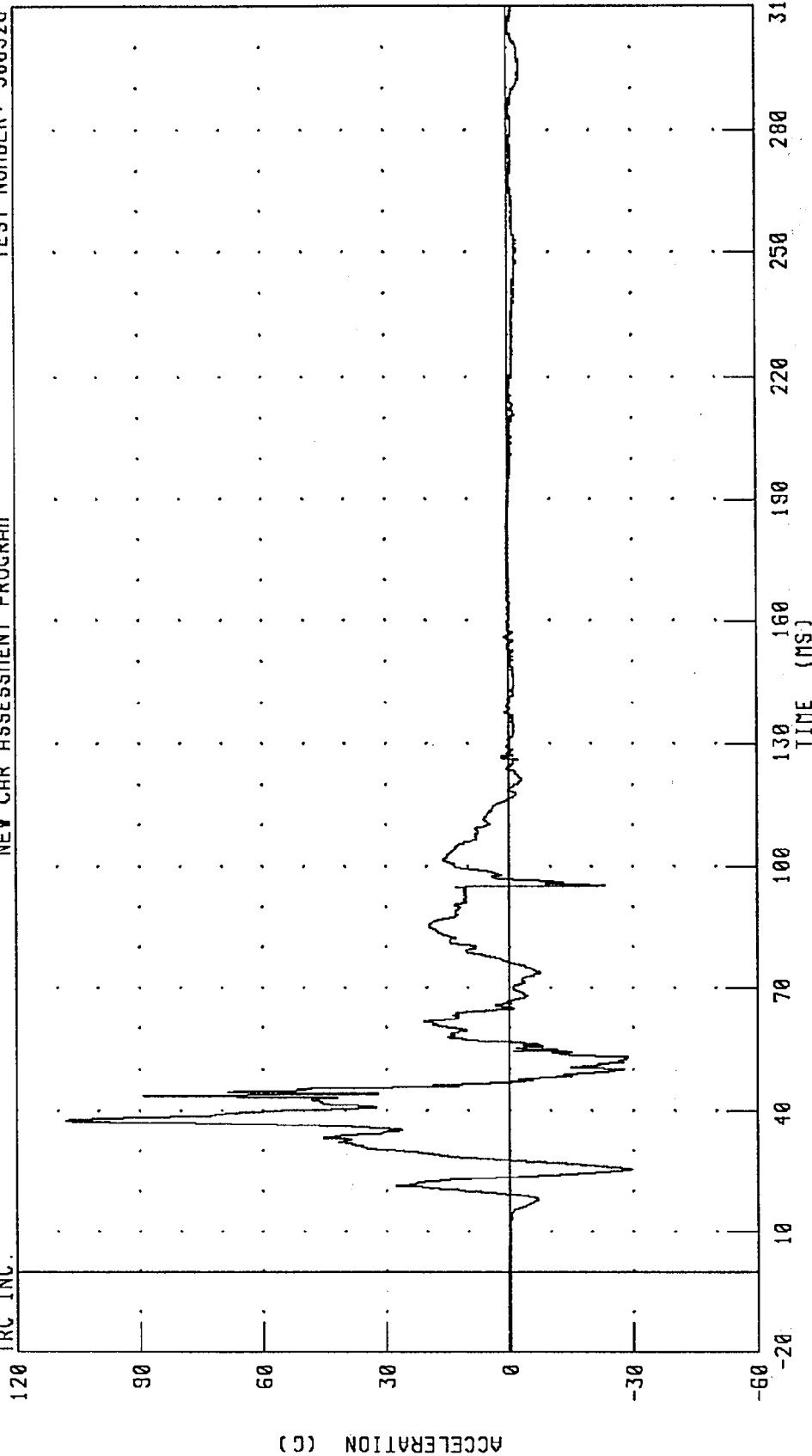
CHANNEL: FTLZH2 FILTER: CH. CLASS 1000 PEAK DATA: 81.48 G @ 44.88 MS; -14.71 G @ 95.04 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LEFT FOOT Z-AXIS ACCELERATION AT TOE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



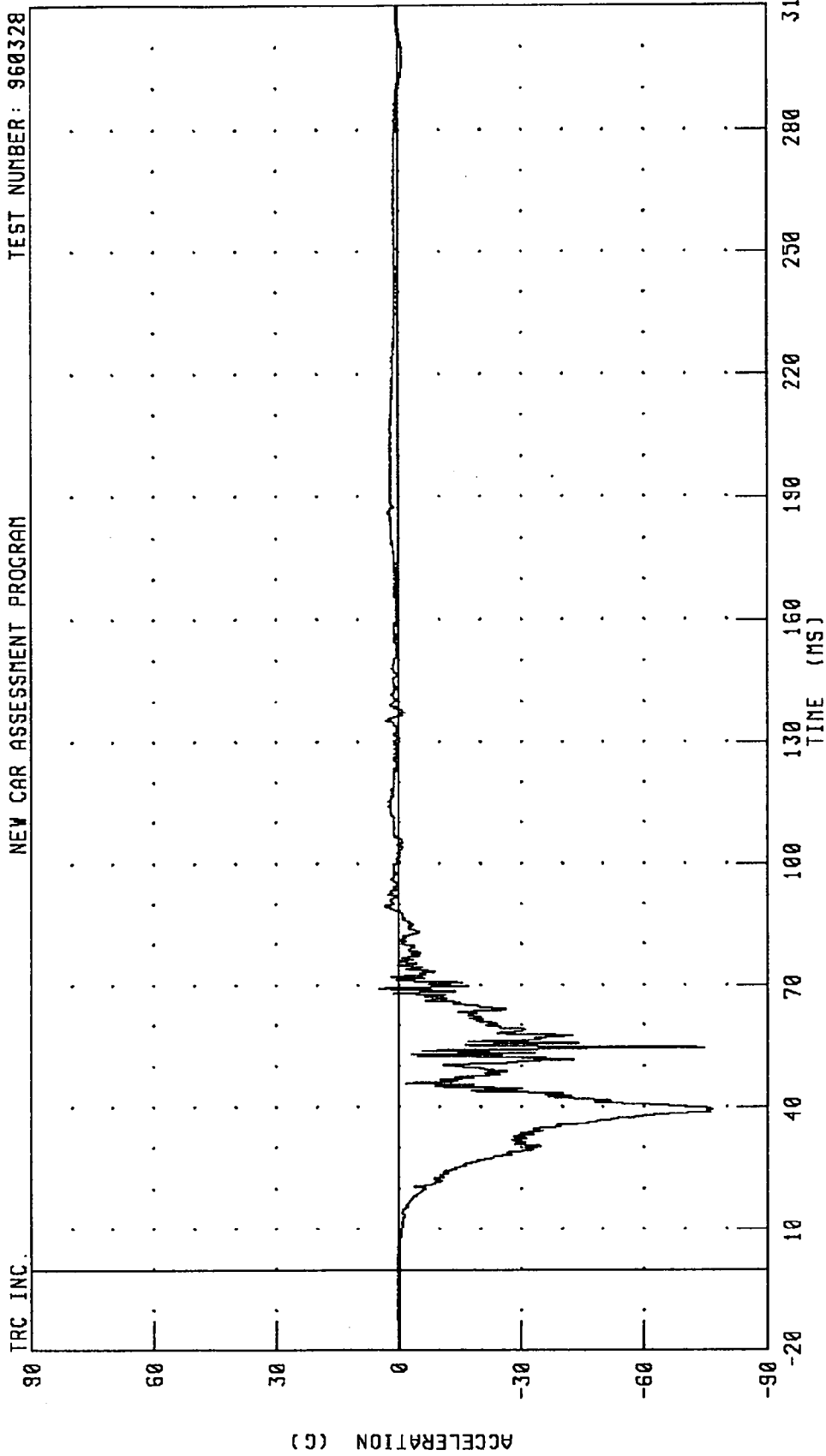
CHANNEL: FTLZT2 FILTER: CH. CLASS 1000

PEAK DATA: 107.97 G @ 37.68 MS; -29.57 G @ 25.44 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

IRC INC.

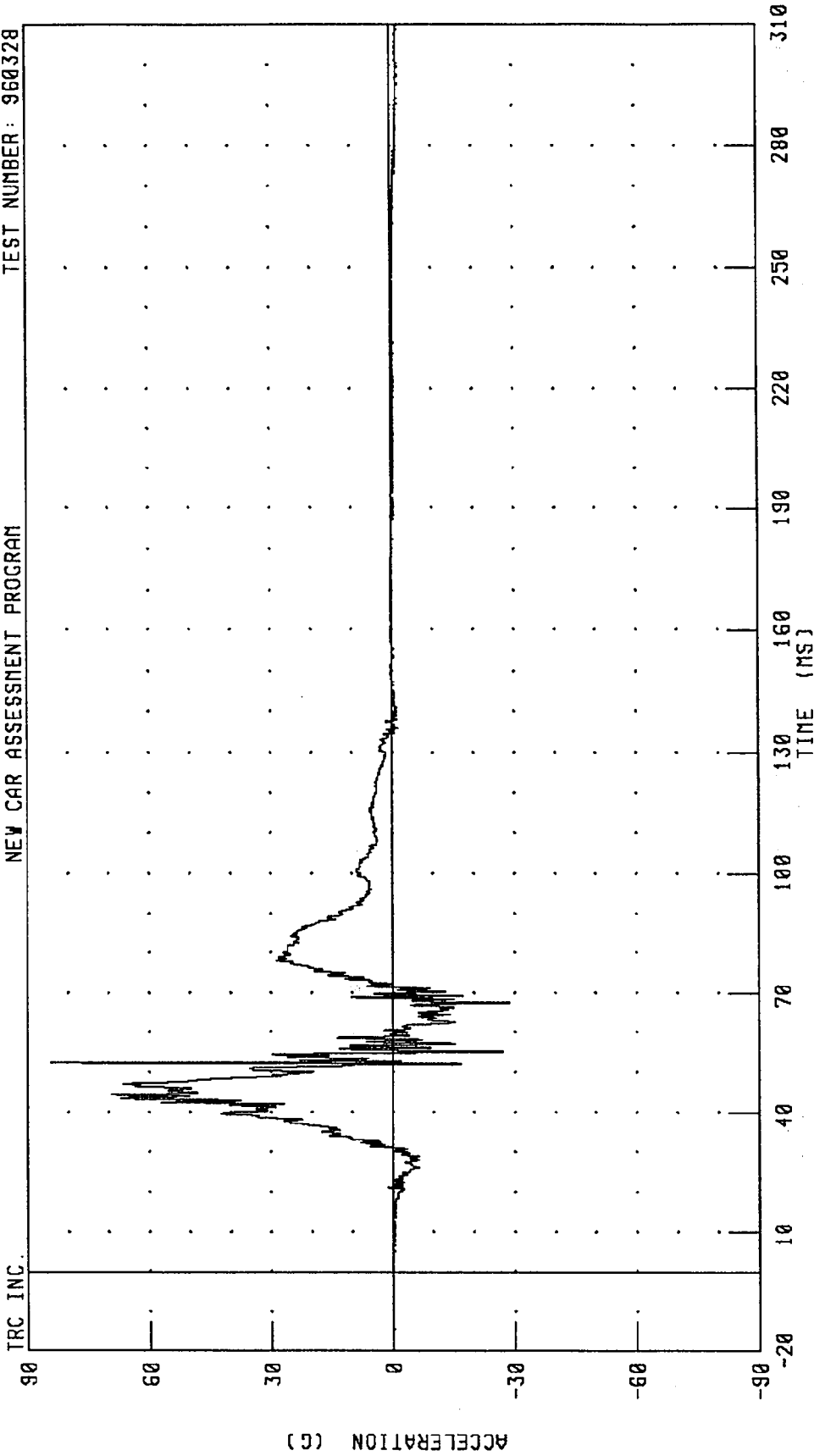


CHANNEL: FTRXG2 FILTER: CH. CLASS 1000 PEAK DATA: 4.93 G @ 69.20 MS; -76.68 G @ 39.52 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT HEEL

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

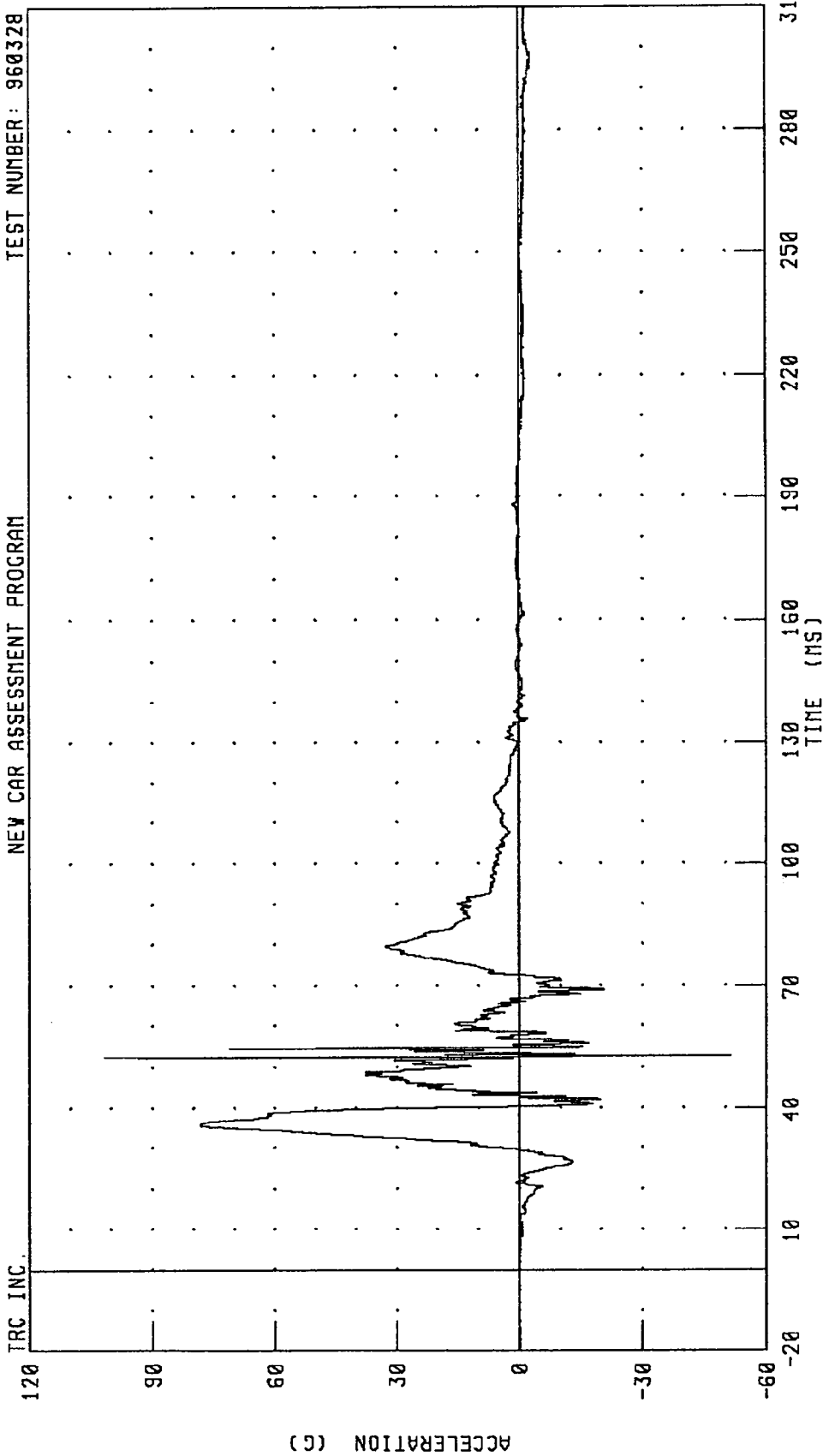


CHANNEL: FIRZH2 FILTER: CH. CLASS 1000 PEAK DATA: 84.28 G @ 52.40 MS, -28.62 G @ 67.52 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER RIGHT FOOT Z-AXIS ACCELERATION AT TOE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

IRC INC.

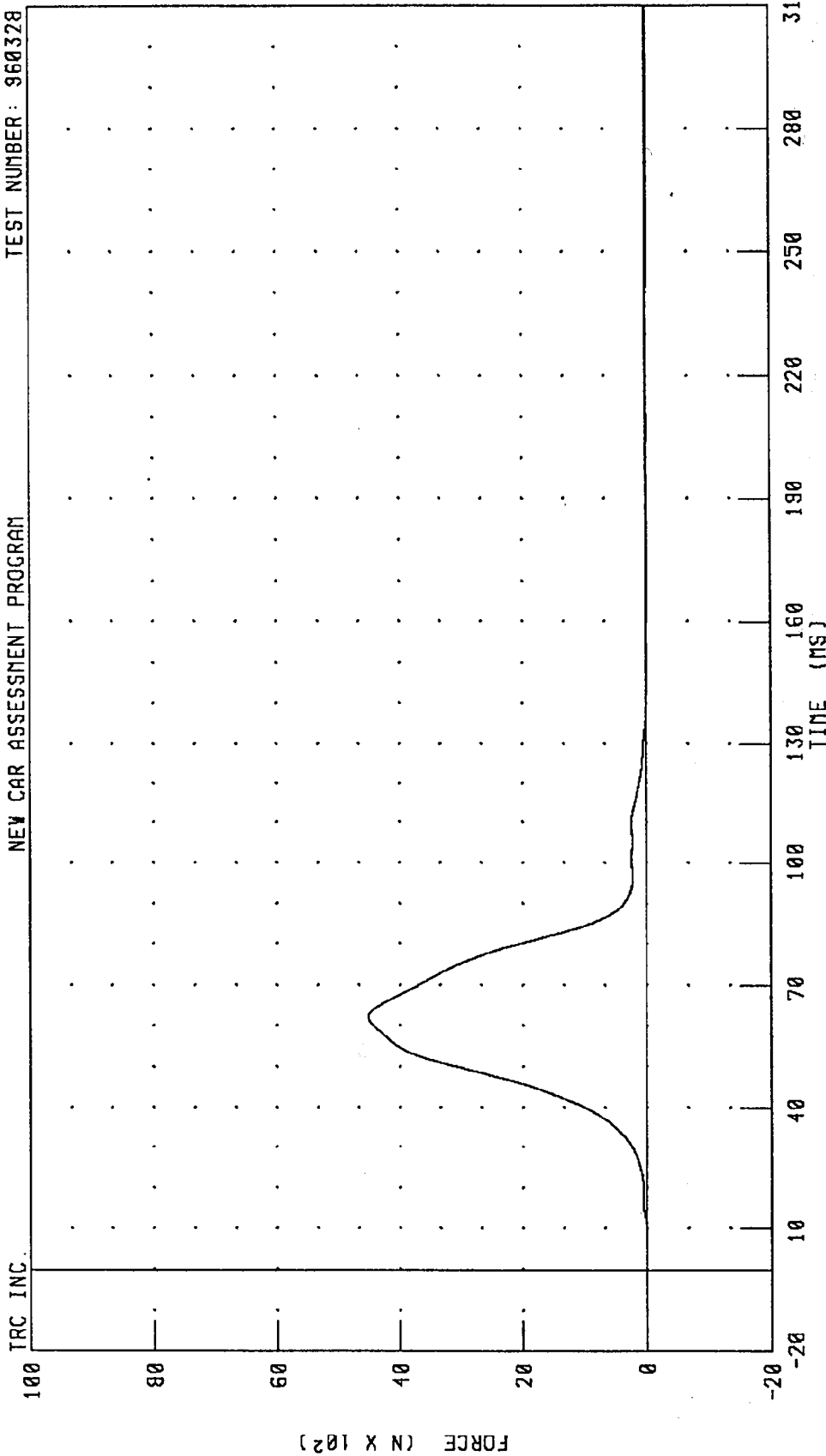


CHANNEL: FTRZT2 FILTER: CH. CLASS 1000

PEAK DATA: 101.64 G @ 52.40 MS; -51.29 G @ 52.64 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 DRIVER LAP BELT OUTBOARD FORCE
 NEW CAR ASSESSMENT PROGRAM

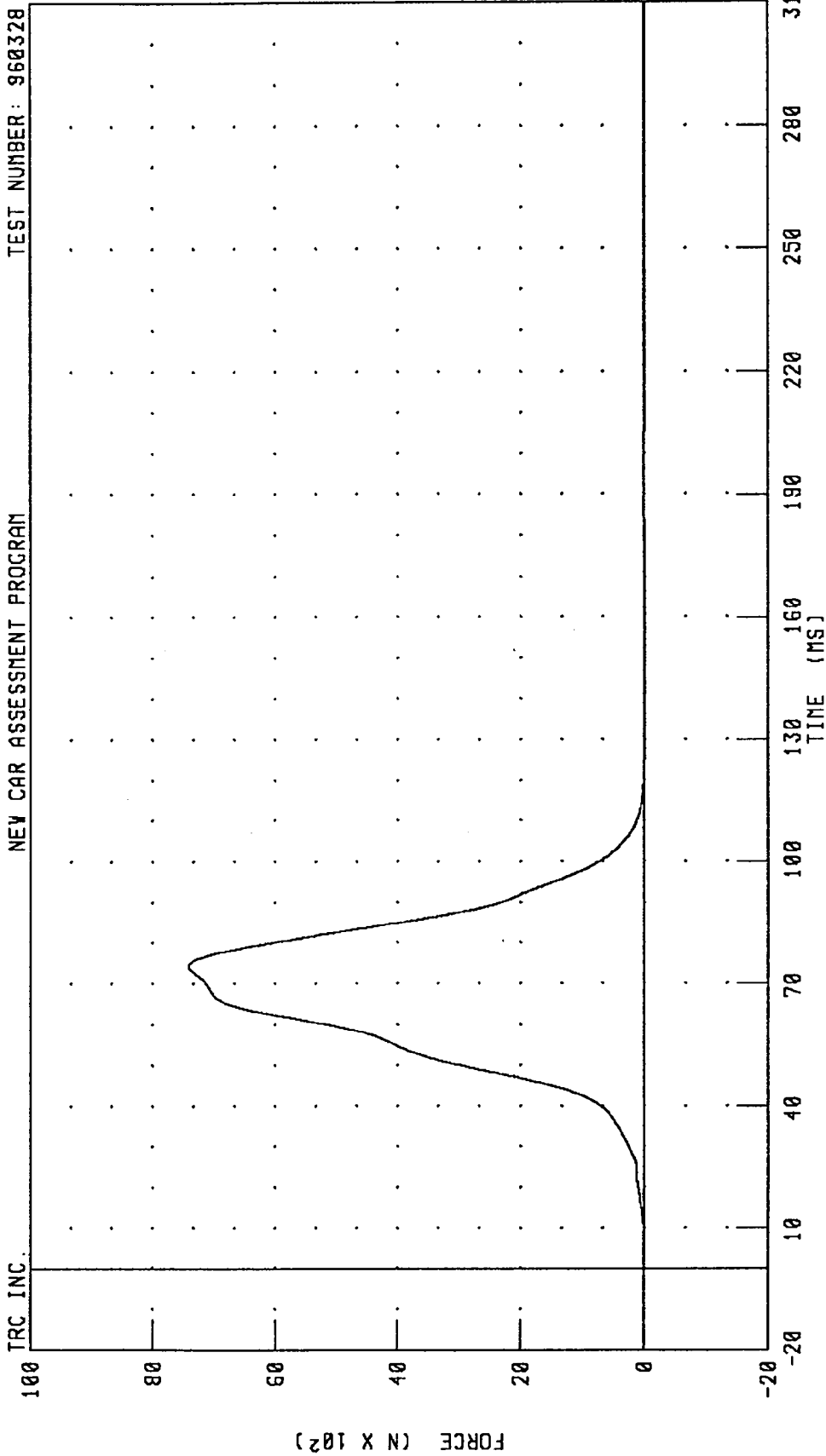
TEST NUMBER: 960328



CHANNEL: LBOF1 FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

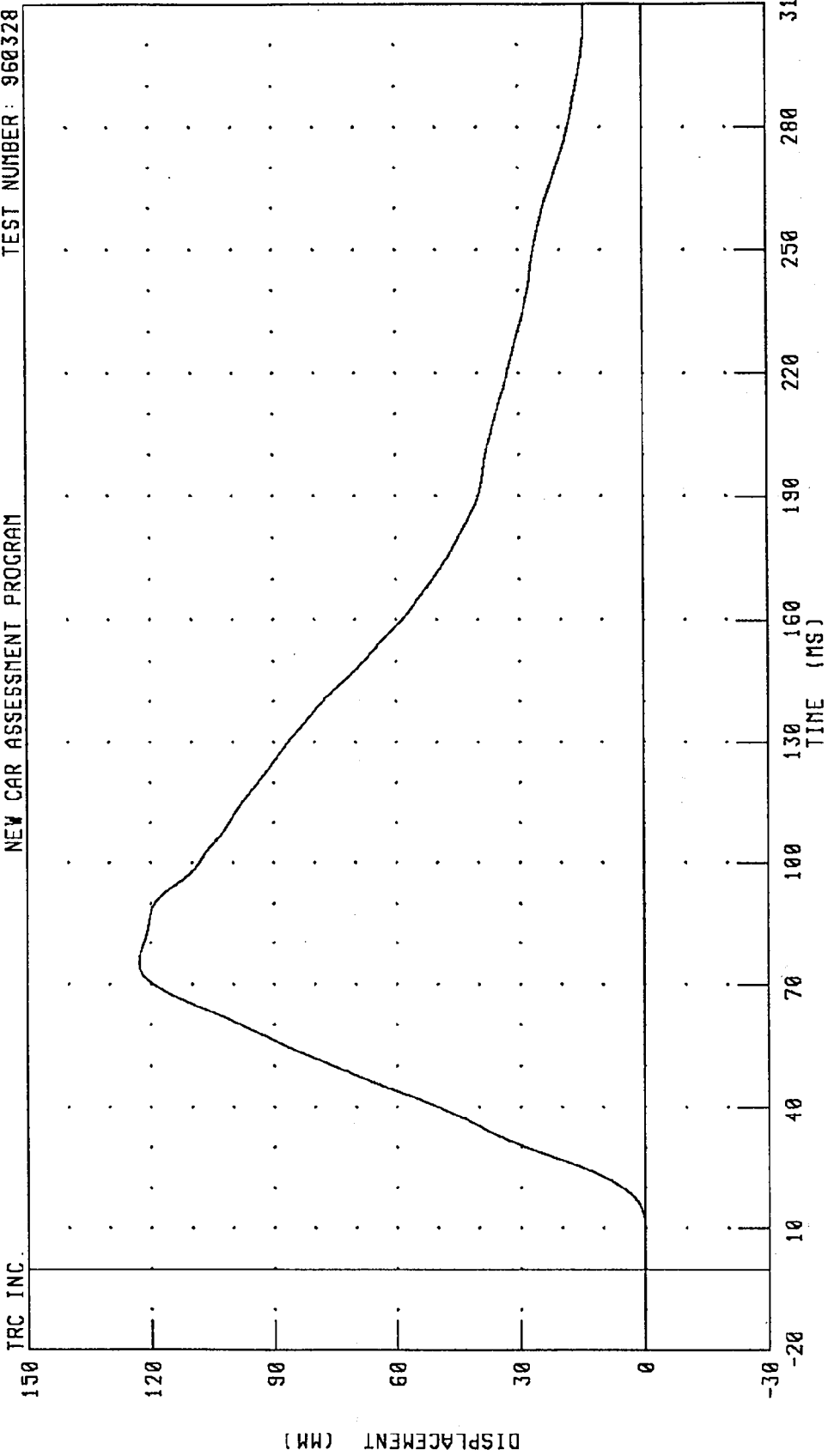


CHANNEL: SHBF1 FILTER: CH. CLASS 60
PEAK DATA: 7405.11 N @ 74.40 MS; -15.96 N @ 223.76 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

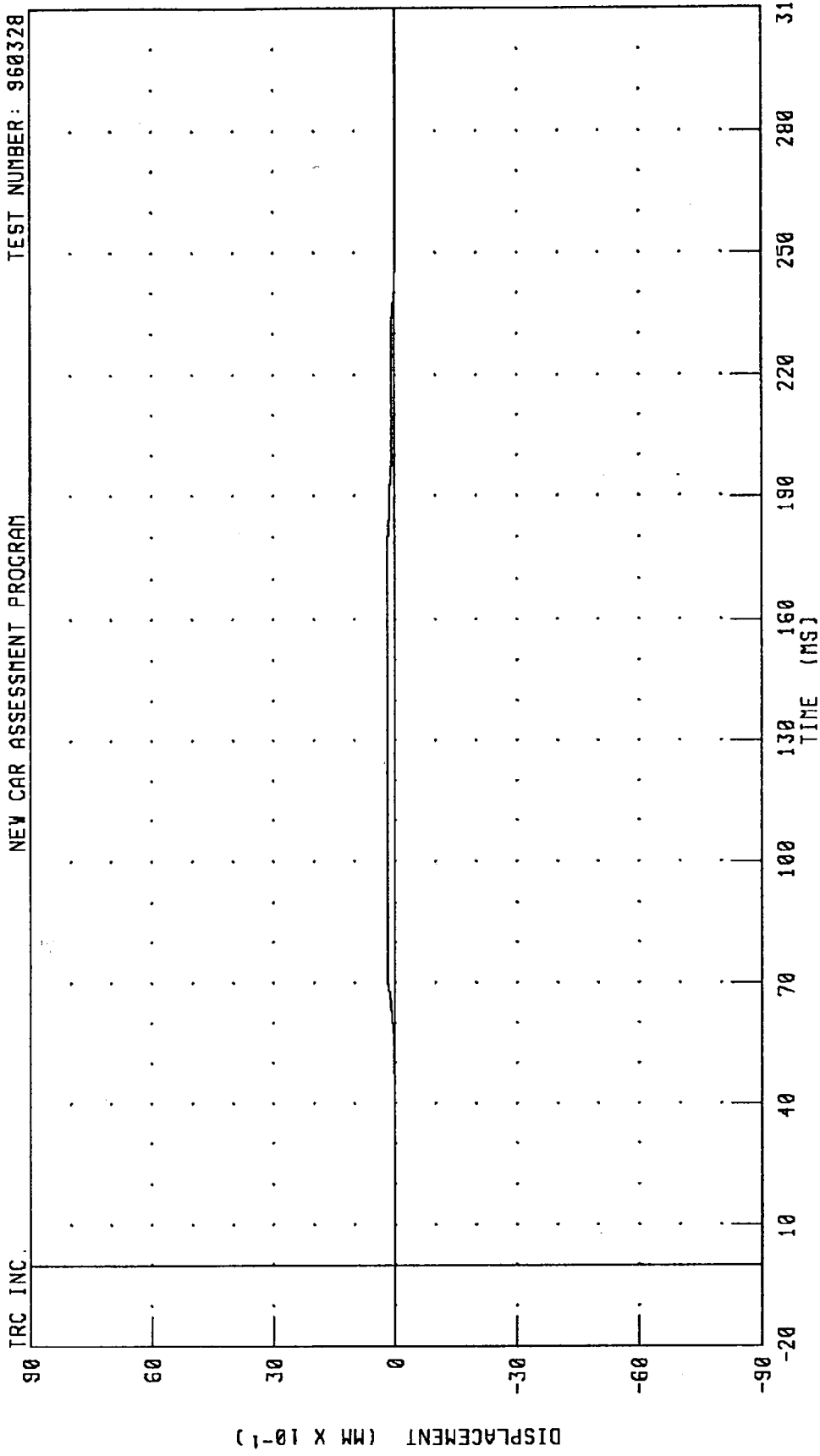


CHANNEL: SHBD1 FILTER: CH. CLASS 60 PEAK DATA: 122.81 MM @ 75.28 MS; -0.04 MM @ 2.48 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
DRIVER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM

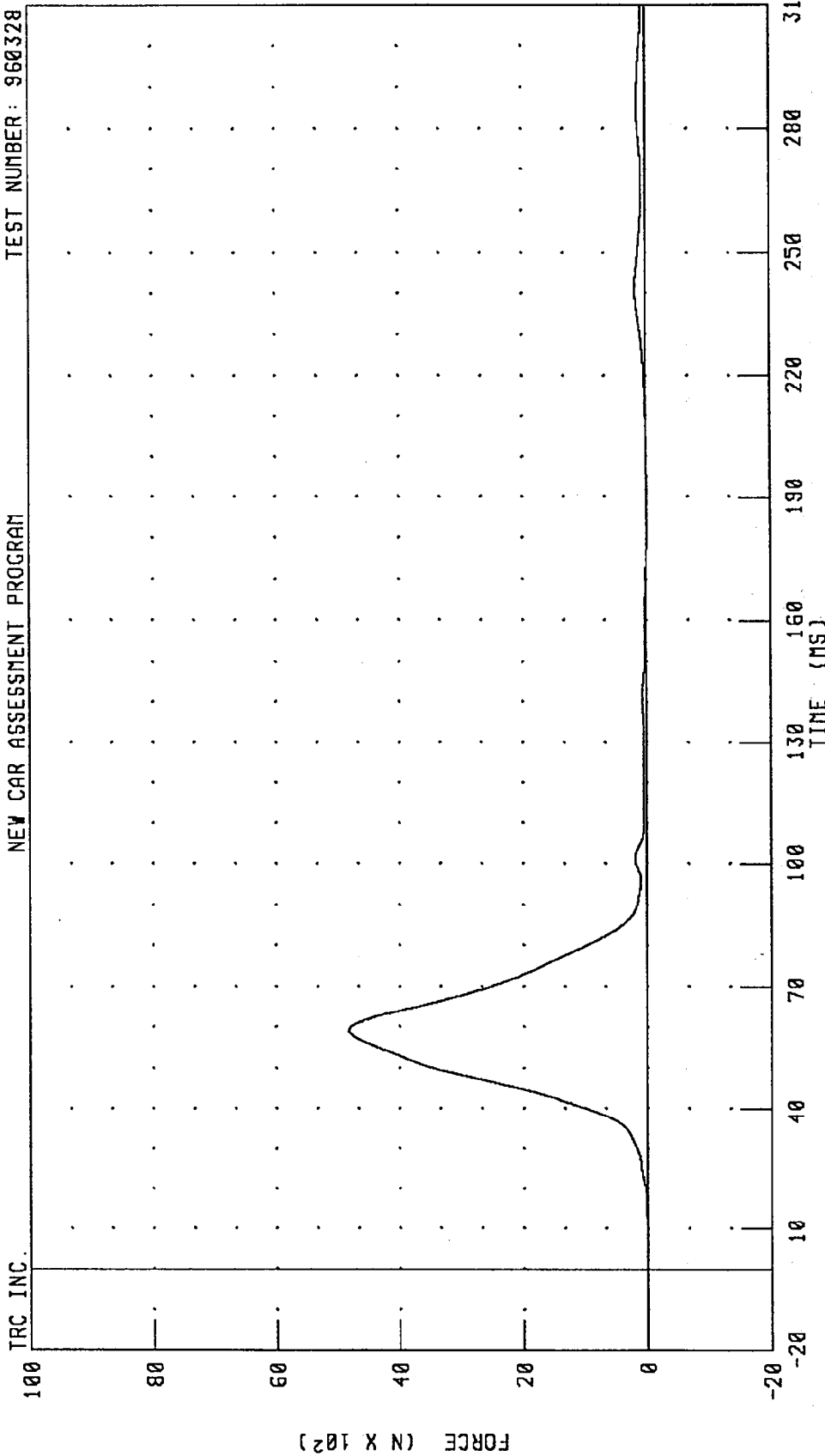
TEST NUMBER: 960328



CHANNEL: SBEDI FILTER: CH. CLASS 60
PEAK DATA: 0.19 MM @ 74.56 MS; -0.02 MM @ 299.04 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER LAP BELT OUTBOARD FORCE
NEW CAR ASSESSMENT PROGRAM

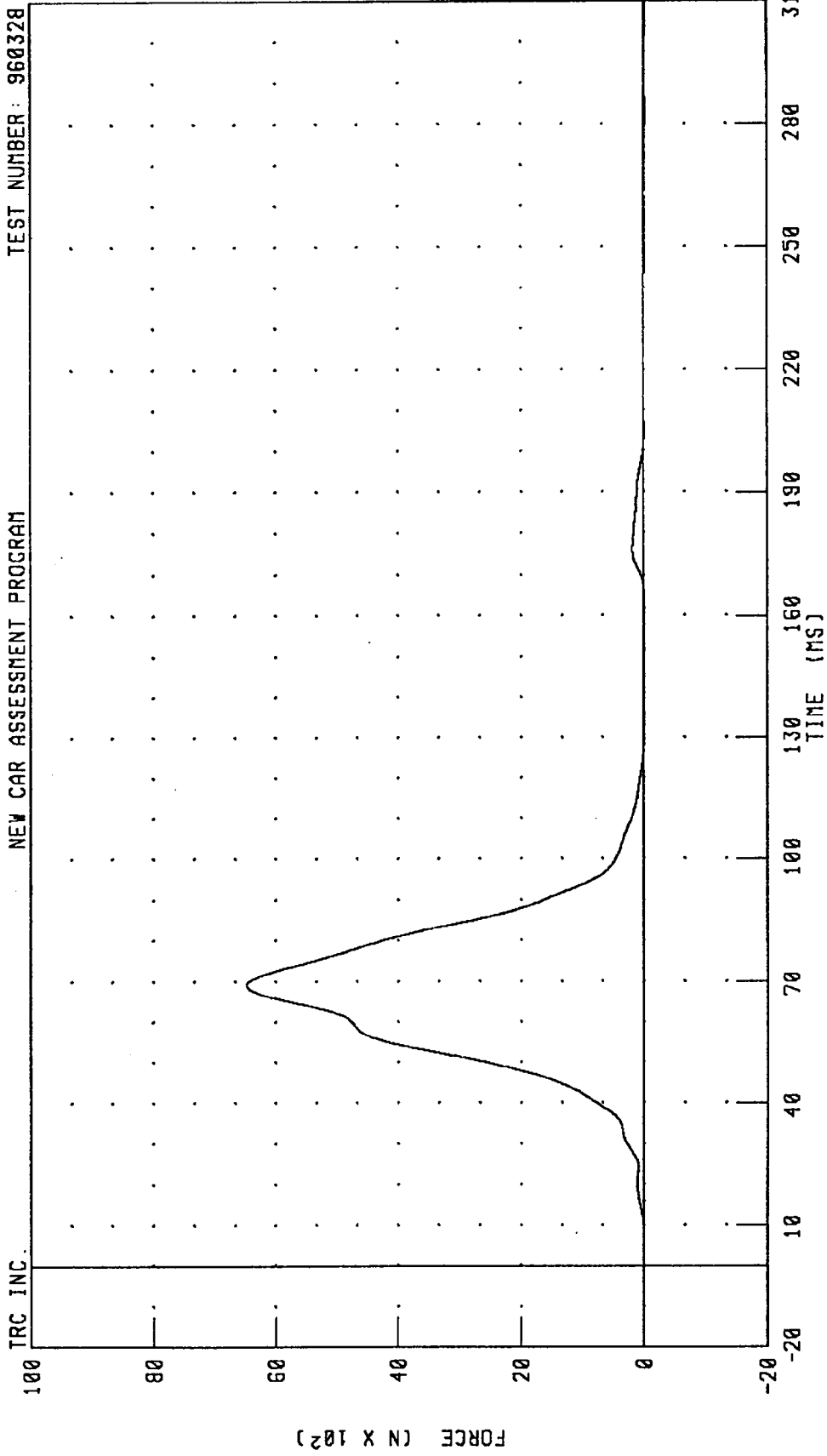
TEST NUMBER: 960328



TRC INC. CHANNEL: LBOF2 FILTER: CH. CLASS 60
PEAK DATA: 4824.95 N @ 59.12 MS; -11.54 N @ 188.80 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 PASSENGER SHOULDER BELT FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



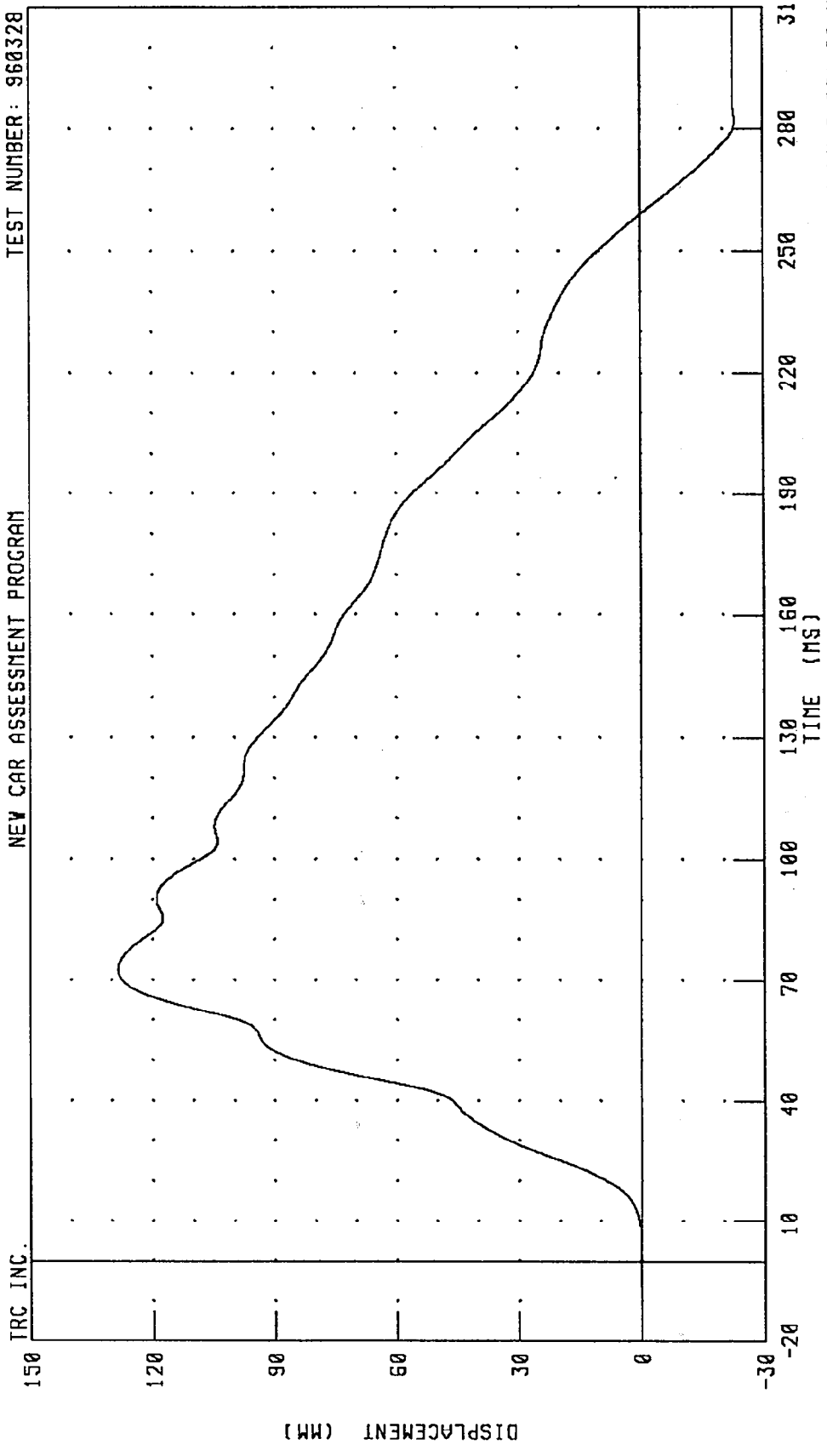
CHANNEL: SHBF2 FILTER: CH. CLASS 60 PEAK DATA: 6473.66 N @ 69.20 MS; -30.43 N @ 282.80 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER SHOULDER BELT DISPLACEMENT
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



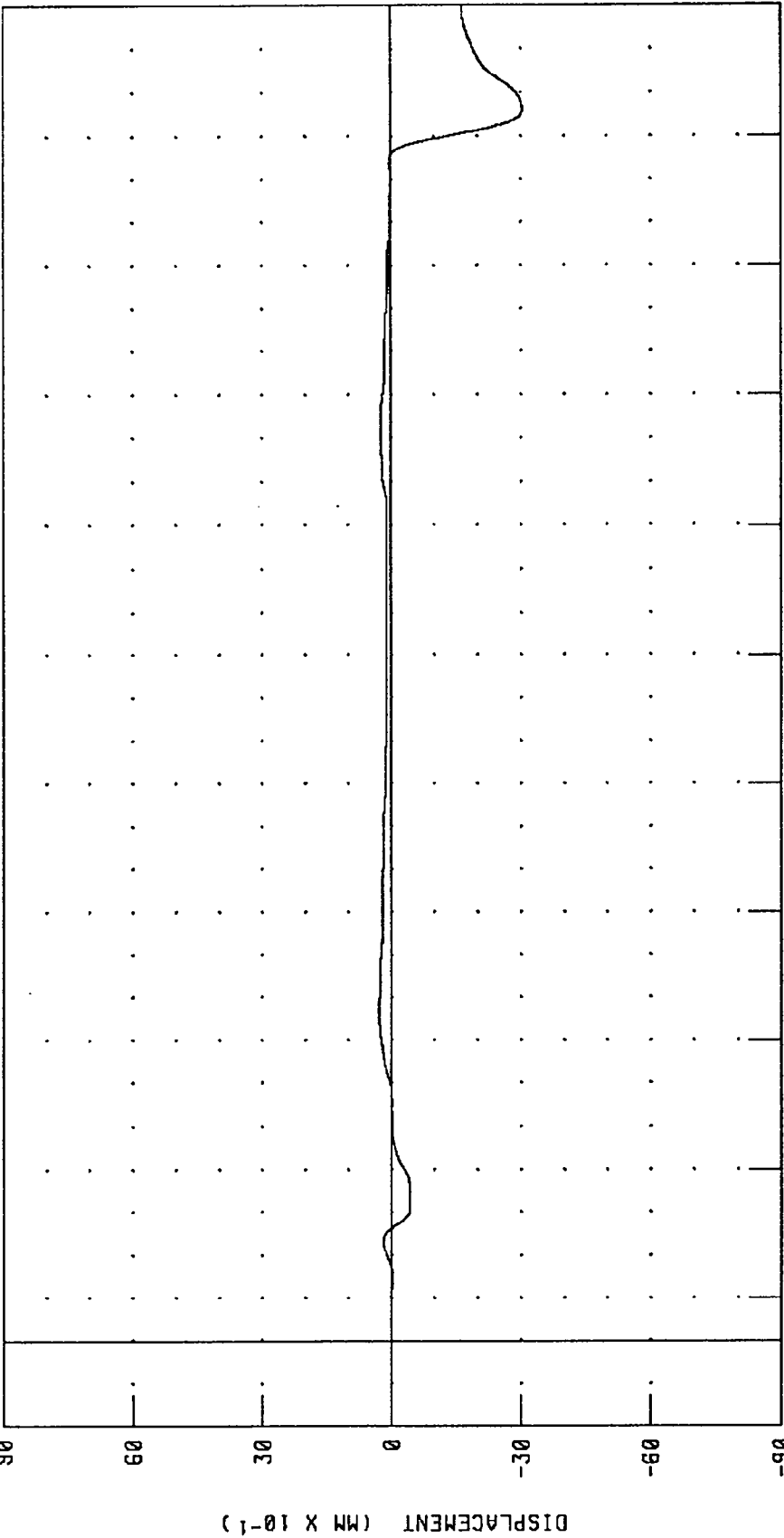
PEAK DATA: 128.48 MM @ 72.48 MS, -23.03 MM @ 281.92 MS

CHANNEL: SH002 FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
PASSENGER SEAT BELT EXTENSION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

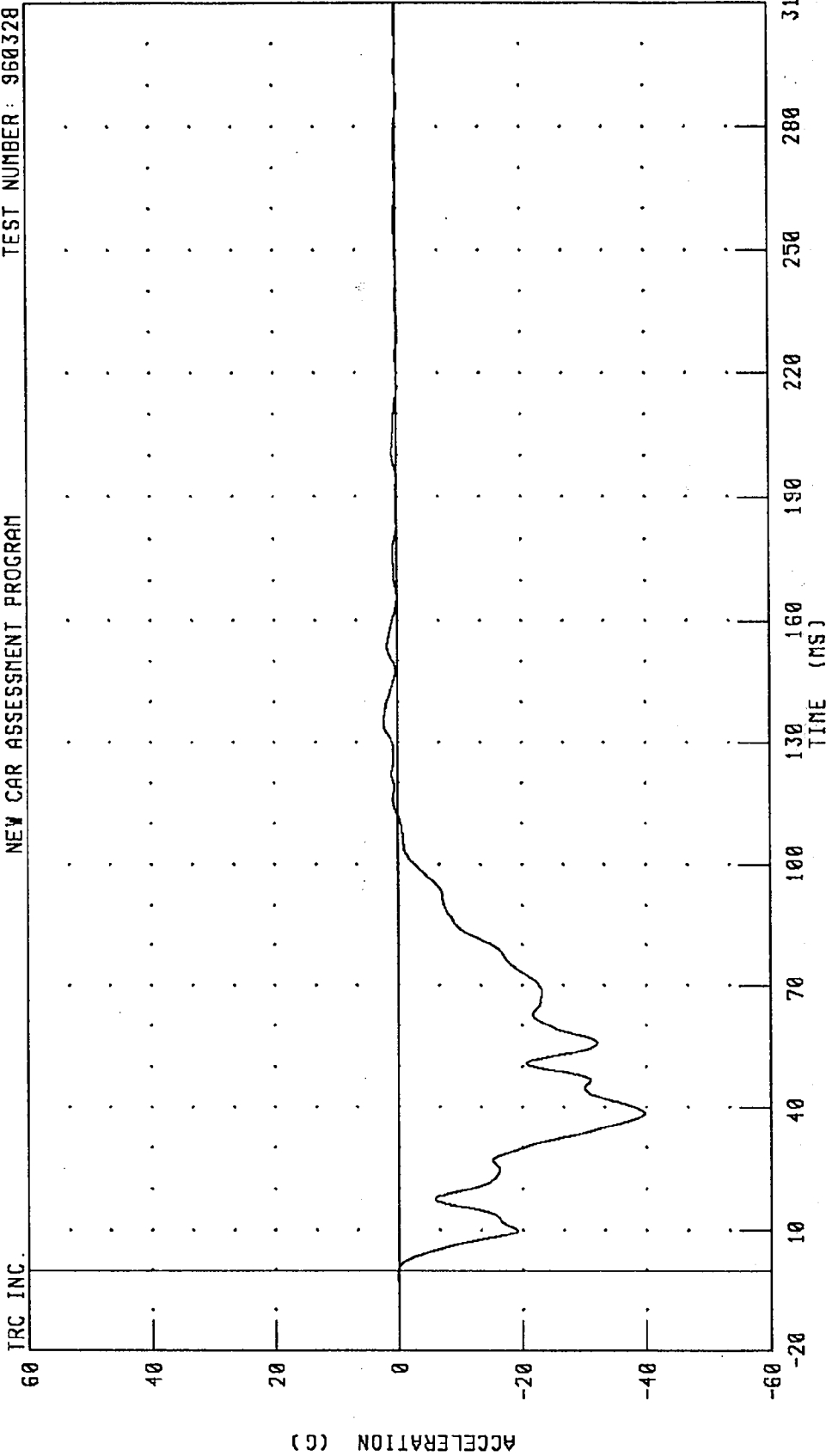
IRC INC.



CHANNEL: SBED2 FILTER: CH. CLASS 60
PEAK DATA: 0.27 MM @ 75.84 MS; -3.04 MM @ 286.24 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



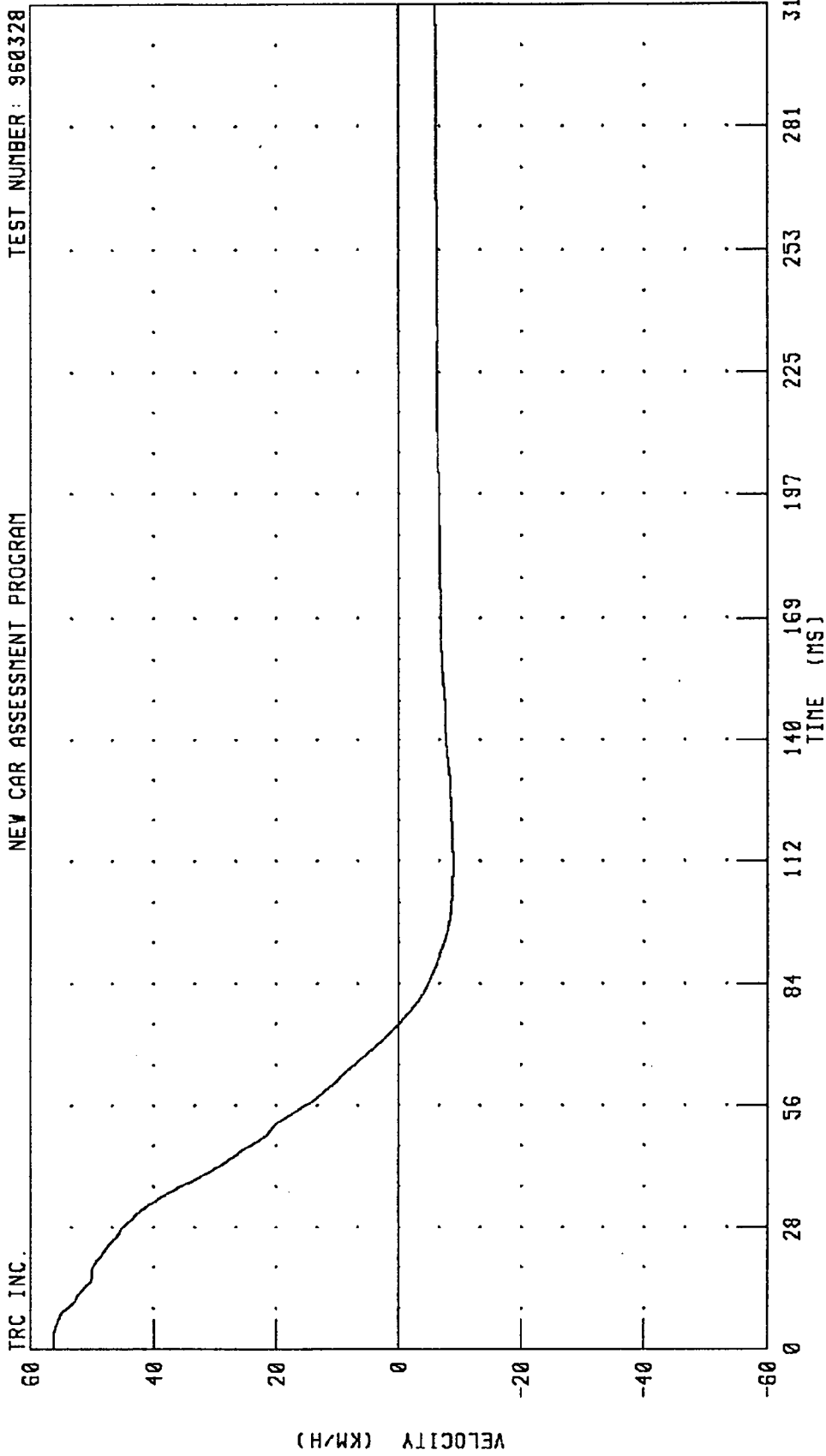
PEAK DATA: 2.29 G @ 134.80 MS; -39.73 G @ 38.56 MS

CHANNEL: TLRXG1 FILTER: CH. CLASS 60

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LEFT REAR SEAT X-AXIS VELOCITY
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



PEAK DATA: 56.30 KM/H @ 111.92 MS; -8.91 KM/H @ 111.92 MS

CHANNEL: TLRXVI FILTER: CH. CLASS 180

TRC INC.

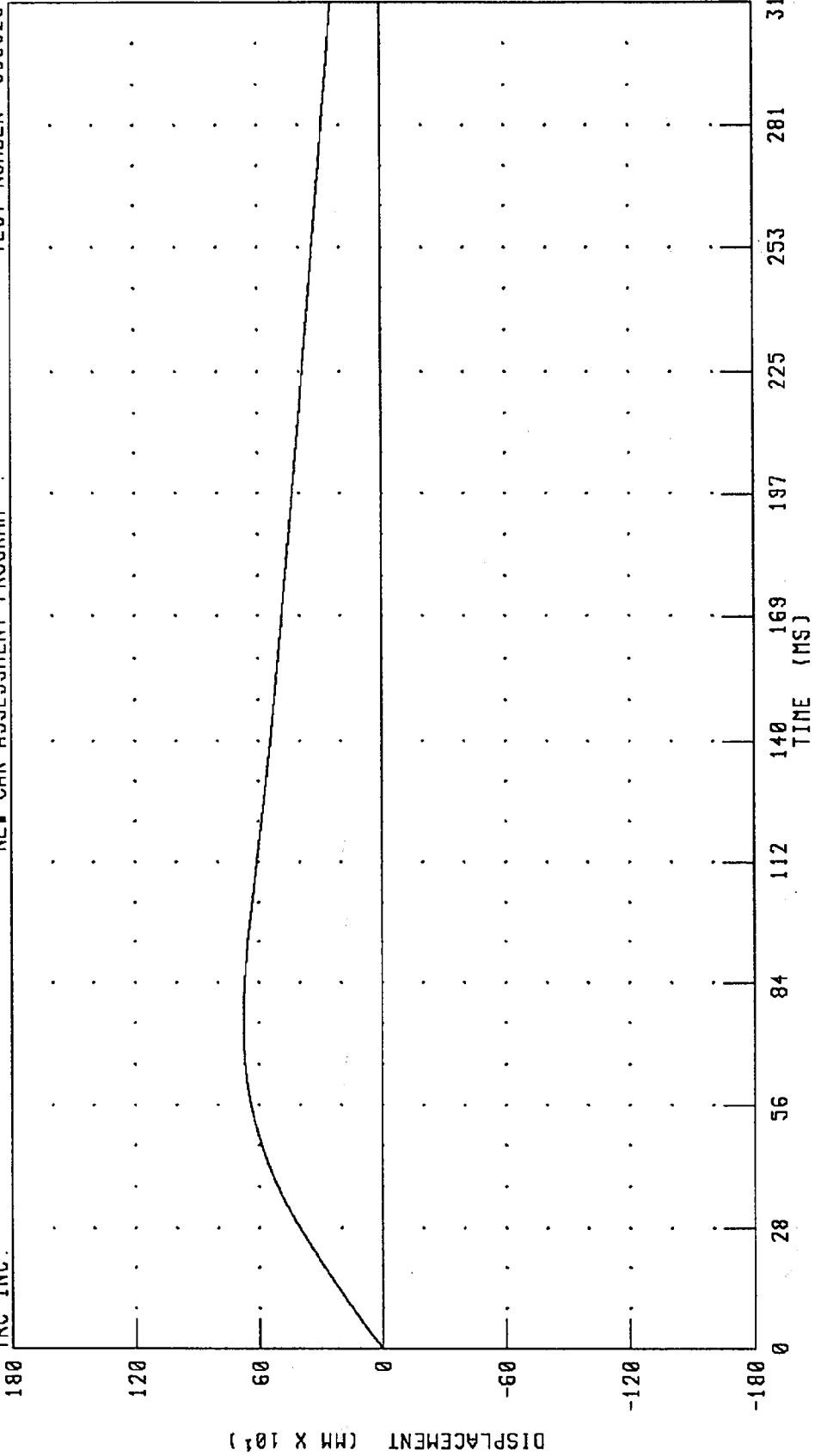
VELOCITY (KM/H)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT X-AXIS DISPLACEMENT

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

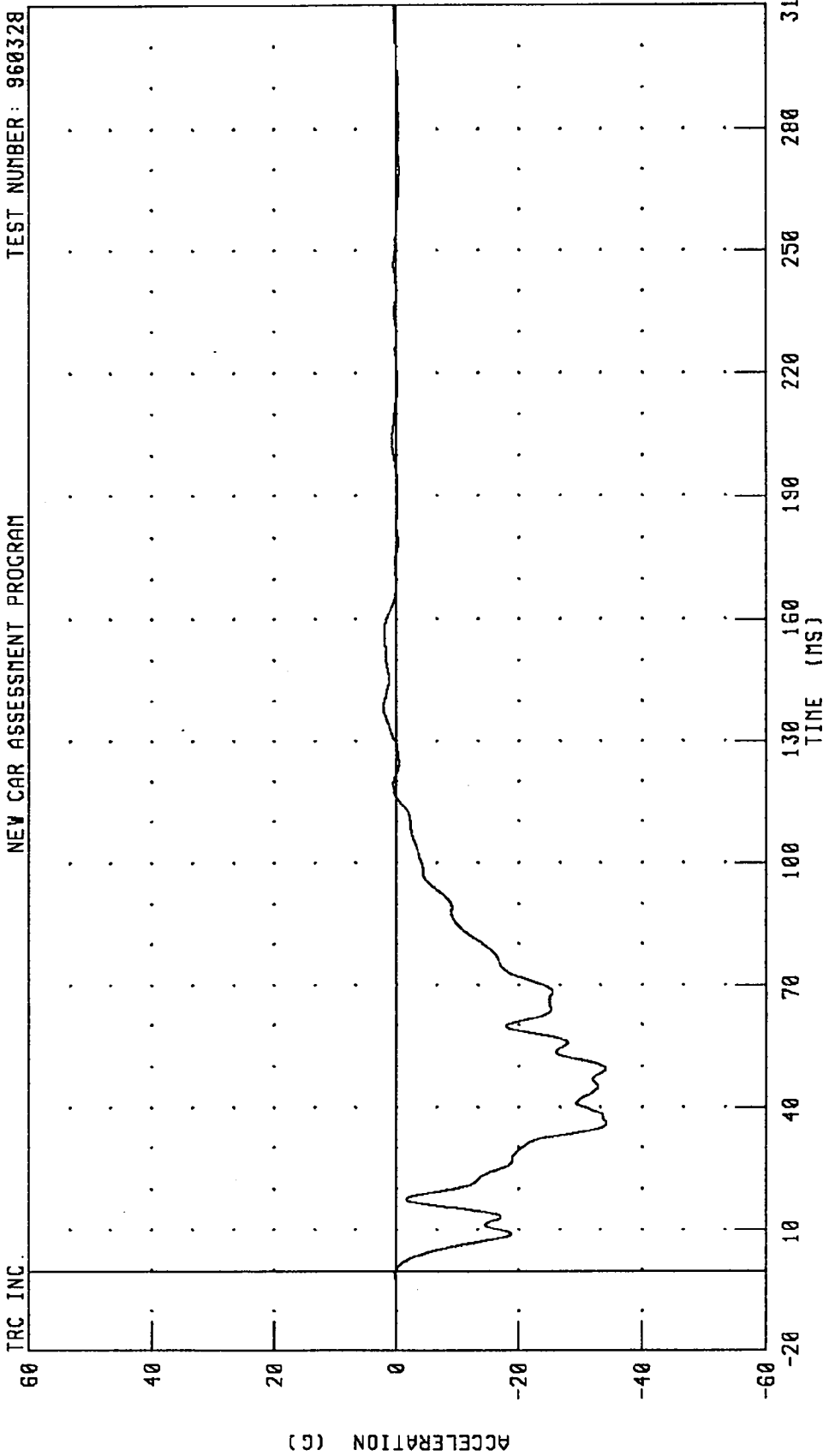


CHANNEL: TLRXD1 FILTER: CH. CLASS 180 PEAK DATA: 677.70 MM @ 75.12 MS; 0.00 MM @ 0.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

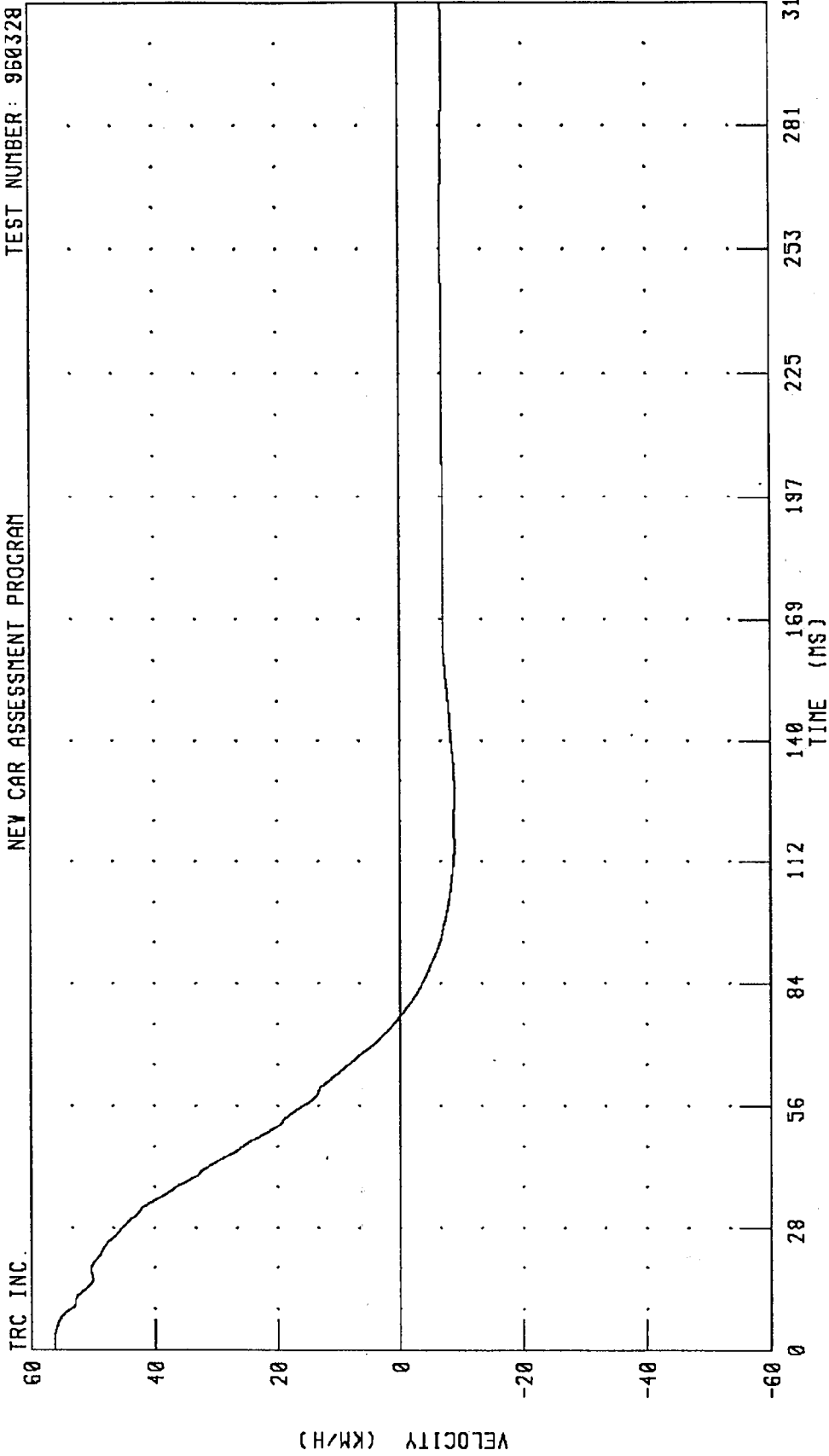


CHANNEL: TRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.10 G @ 138.40 MS; -34.23 G @ 36.24 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT X-AXIS VELOCITY
NEW CAR ASSESSMENT PROGRAM

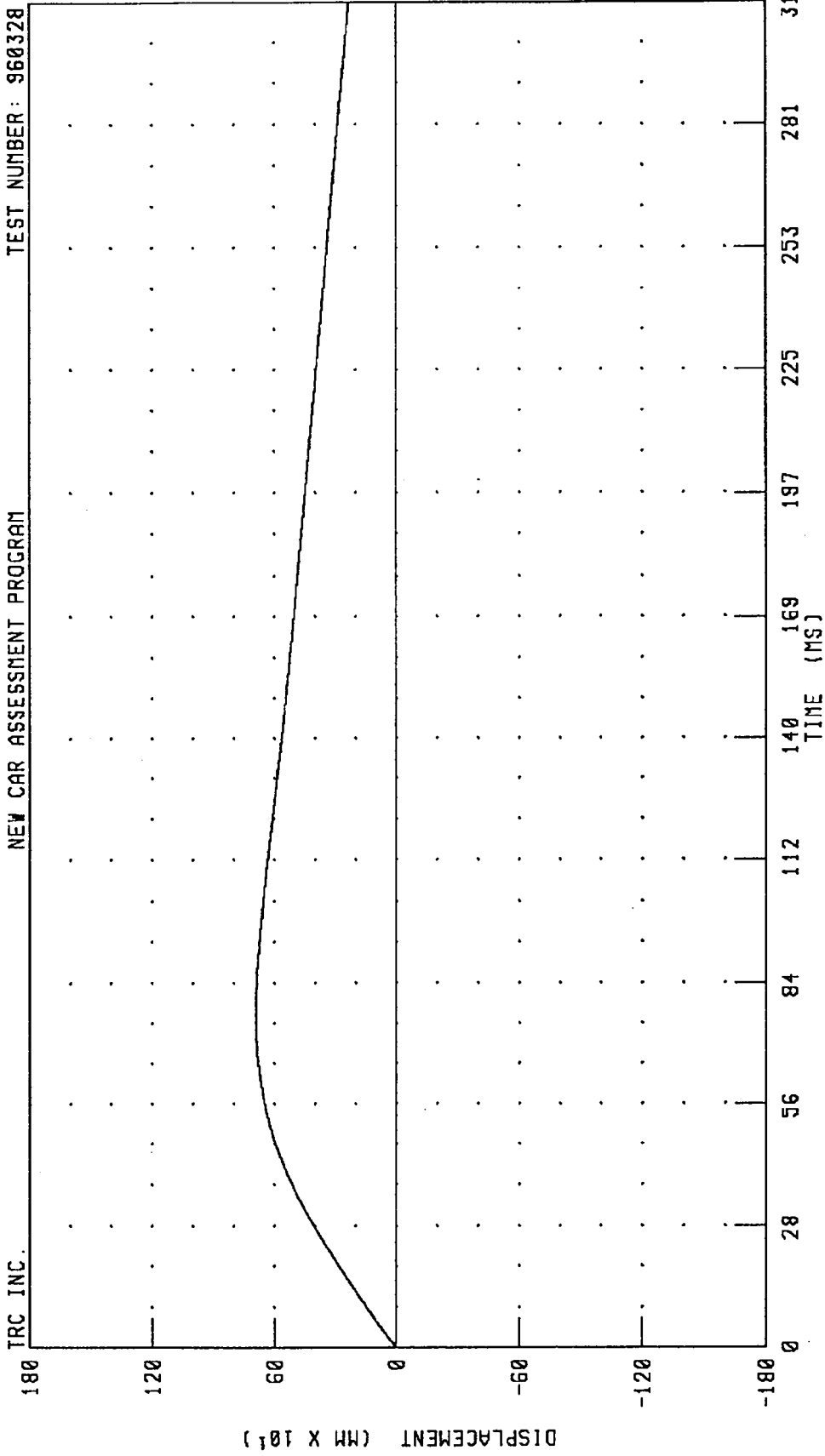
TEST NUMBER: 960328



CHANNEL: TRRXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.30 KM/H @ 0.96 MS; -8.92 KM/H @ 129.92 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 RIGHT REAR SEAT X-AXIS DISPLACEMENT
 NEW CAR ASSESSMENT PROGRAM

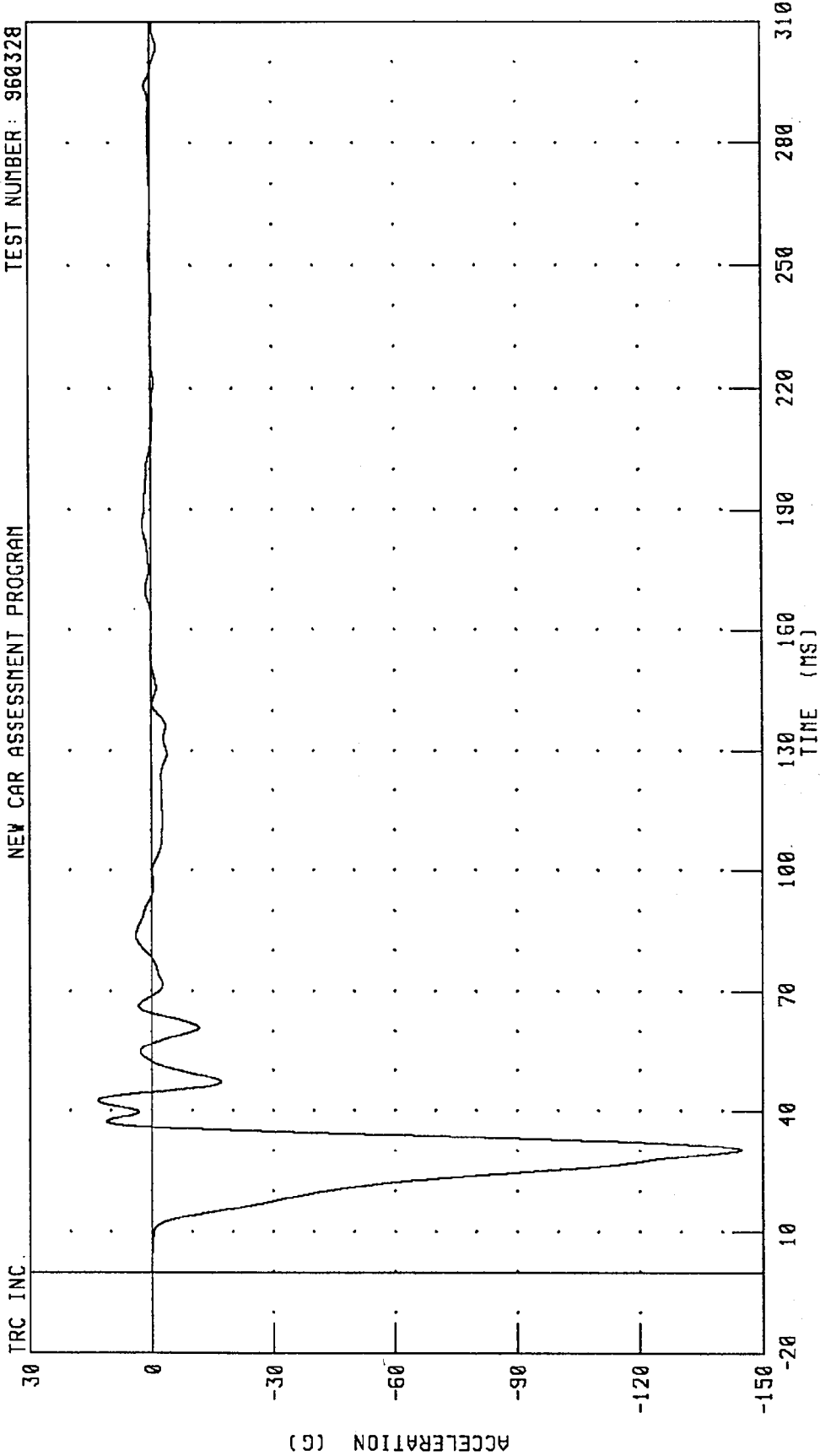
TEST NUMBER: 960328



CHANNEL: TRRXD1 FILTER: CH. CLASS 180 PEAK DATA: 691.84 MM @ 76.96 MS; 0.00 MM @ 0.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
ENGINE TOP X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: ENXG1 FILTER: CH. CLASS 60
PEAK DATA: 13.21 G @ 42.64 MS; -144.77 G @ 30.40 MS

TRC INC.

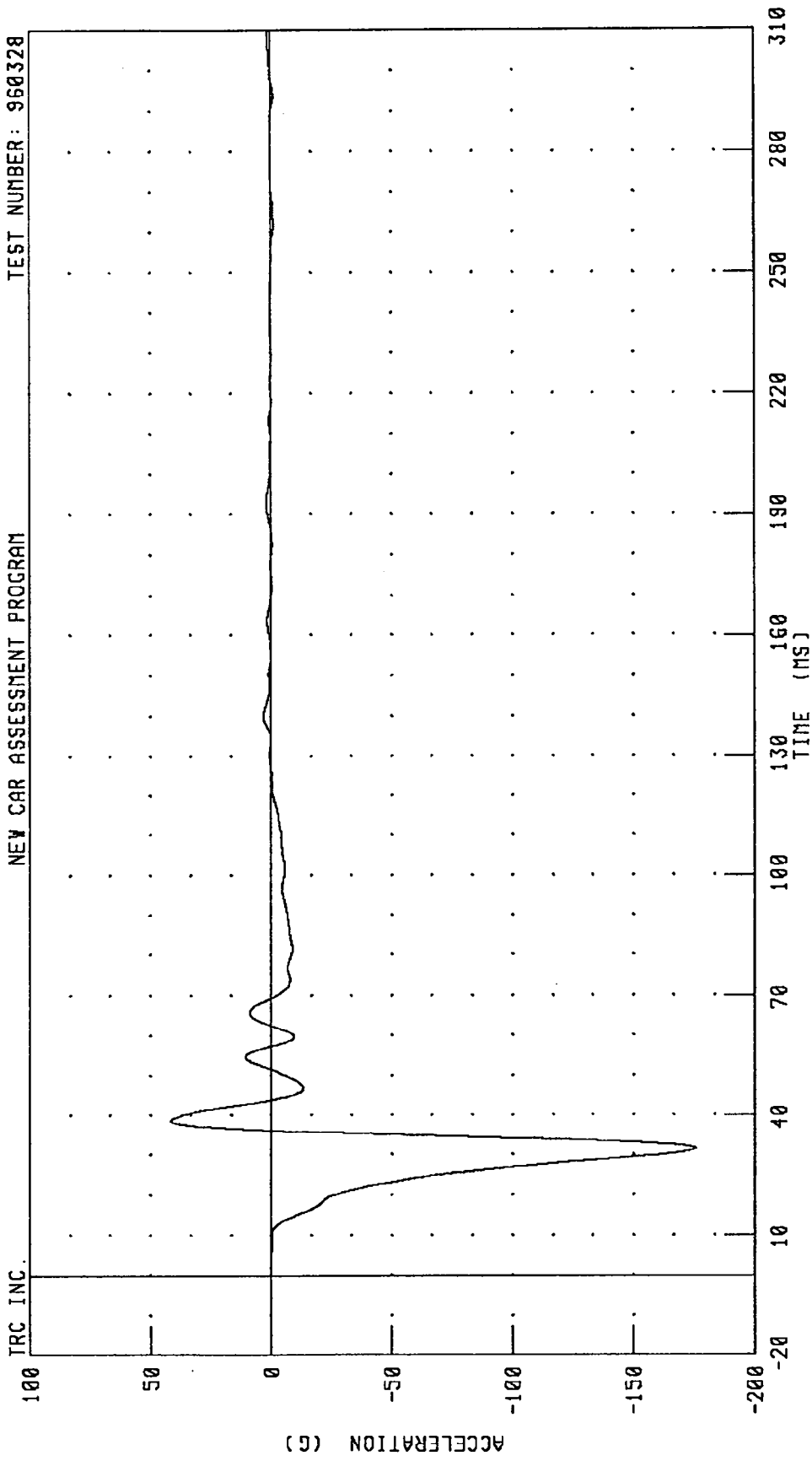
ACCELERATION (G)

TIME (MS)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
ENGINE BOTTOM X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

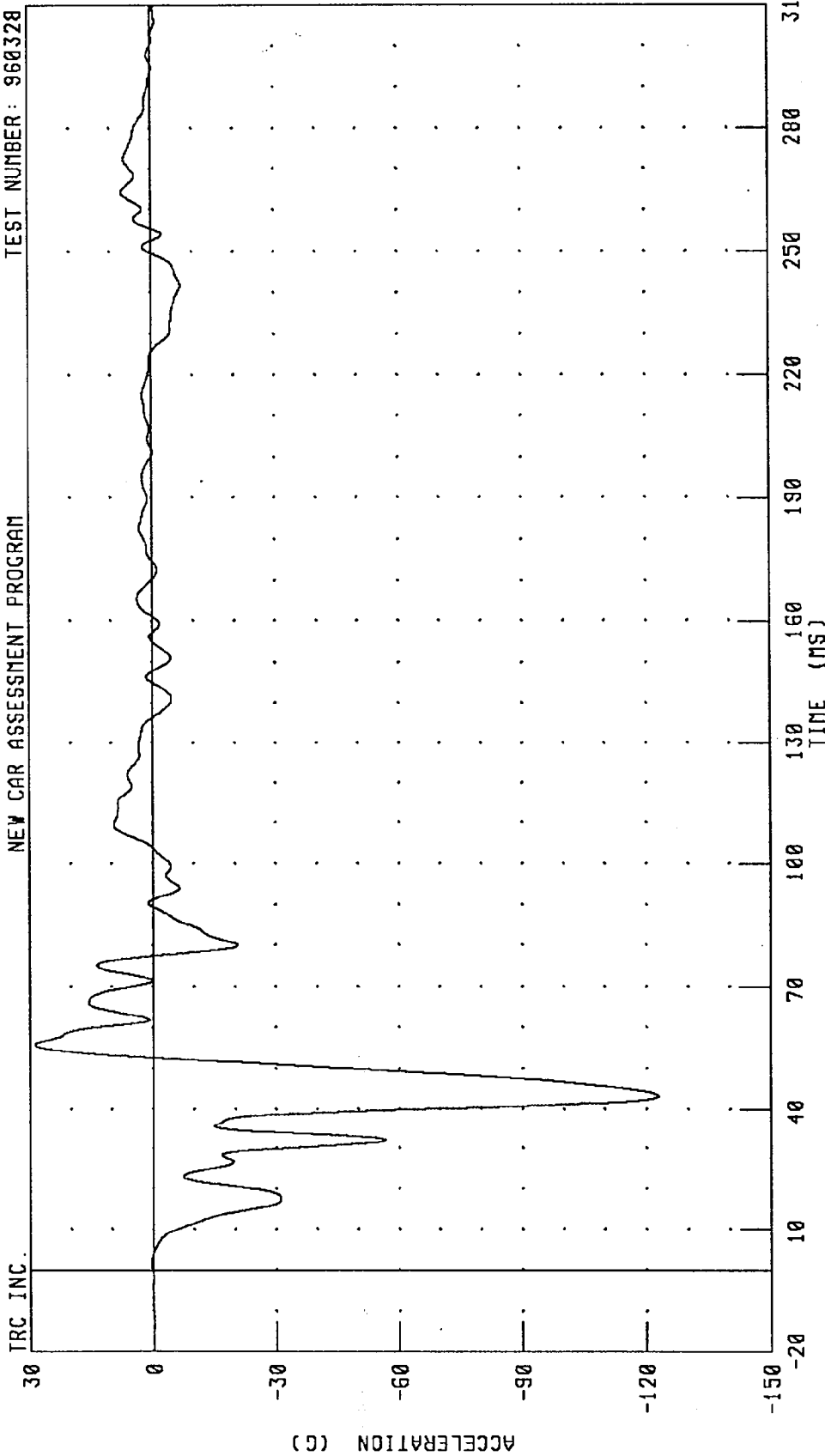
TRC INC.



CHANNEL: ENGXG2 FILTER: CH. CLASS 60 PEAK DATA: 41.79 G @ 38.64 MS; -175.81 G @ 31.52 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
RIGHT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

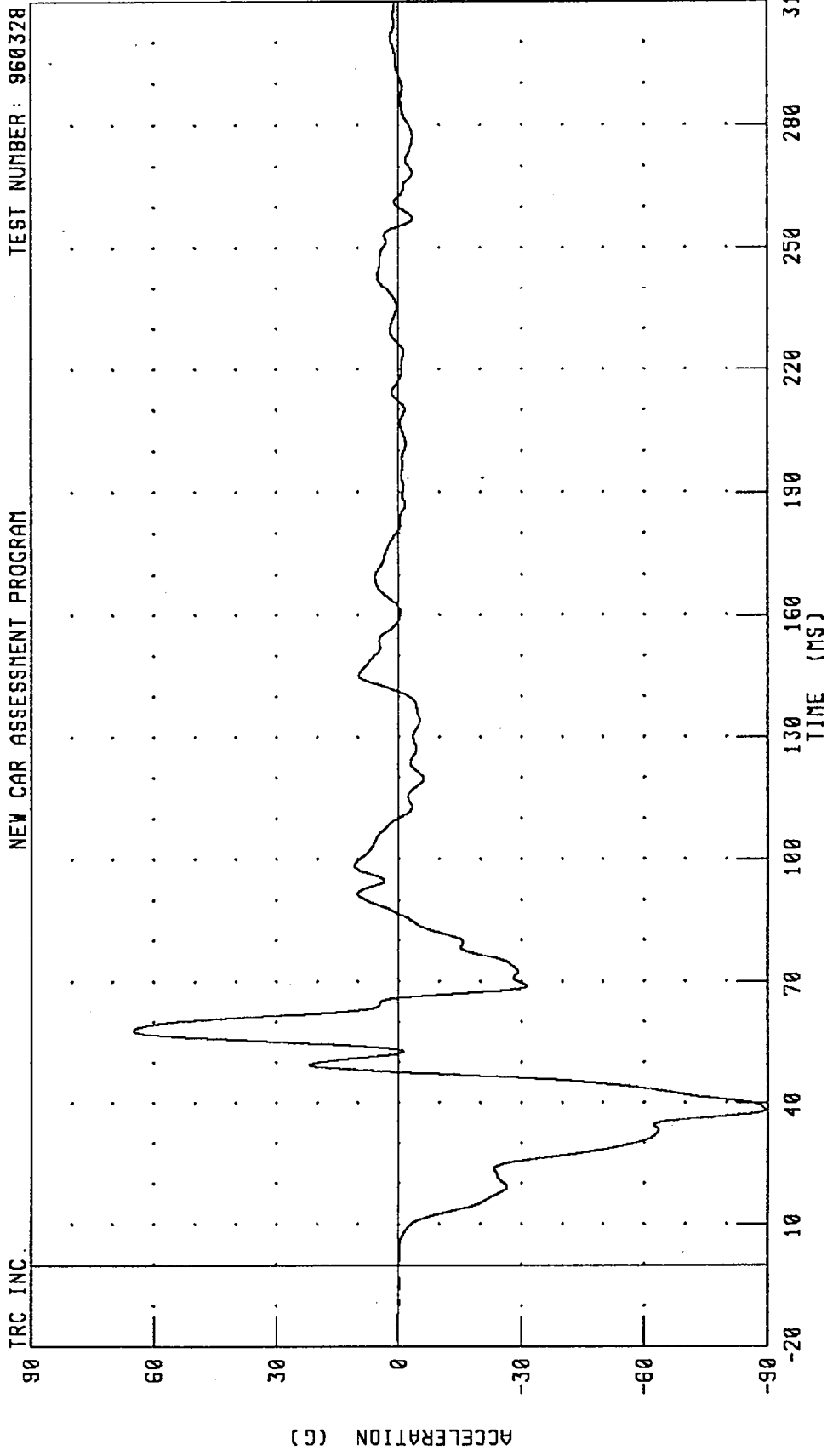


CHANNEL: BCRXG1 FILTER: CH. CLASS 60 PEAK DATA: 28.79 G @ 55.68 MS; -122.89 G @ 43.20 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LEFT BRAKE CALIPER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC, INC.

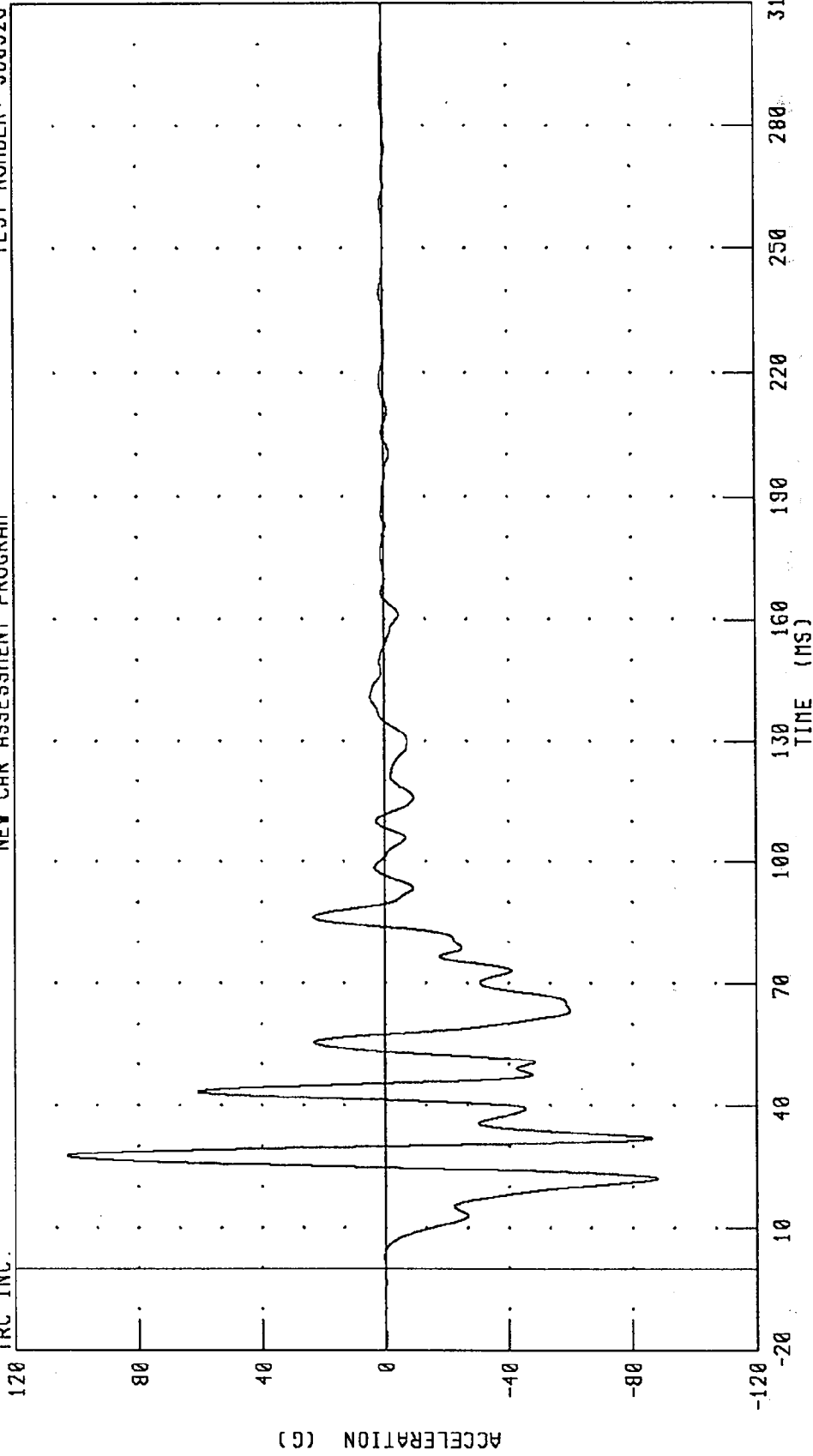


CHANNEL: BCLXG1 FILTER: CH. CLASS 60 PEAK DATA: 64.83 G @ 58.00 MS; -89.34 G @ 38.32 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
INSTRUMENT PANEL CENTER X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



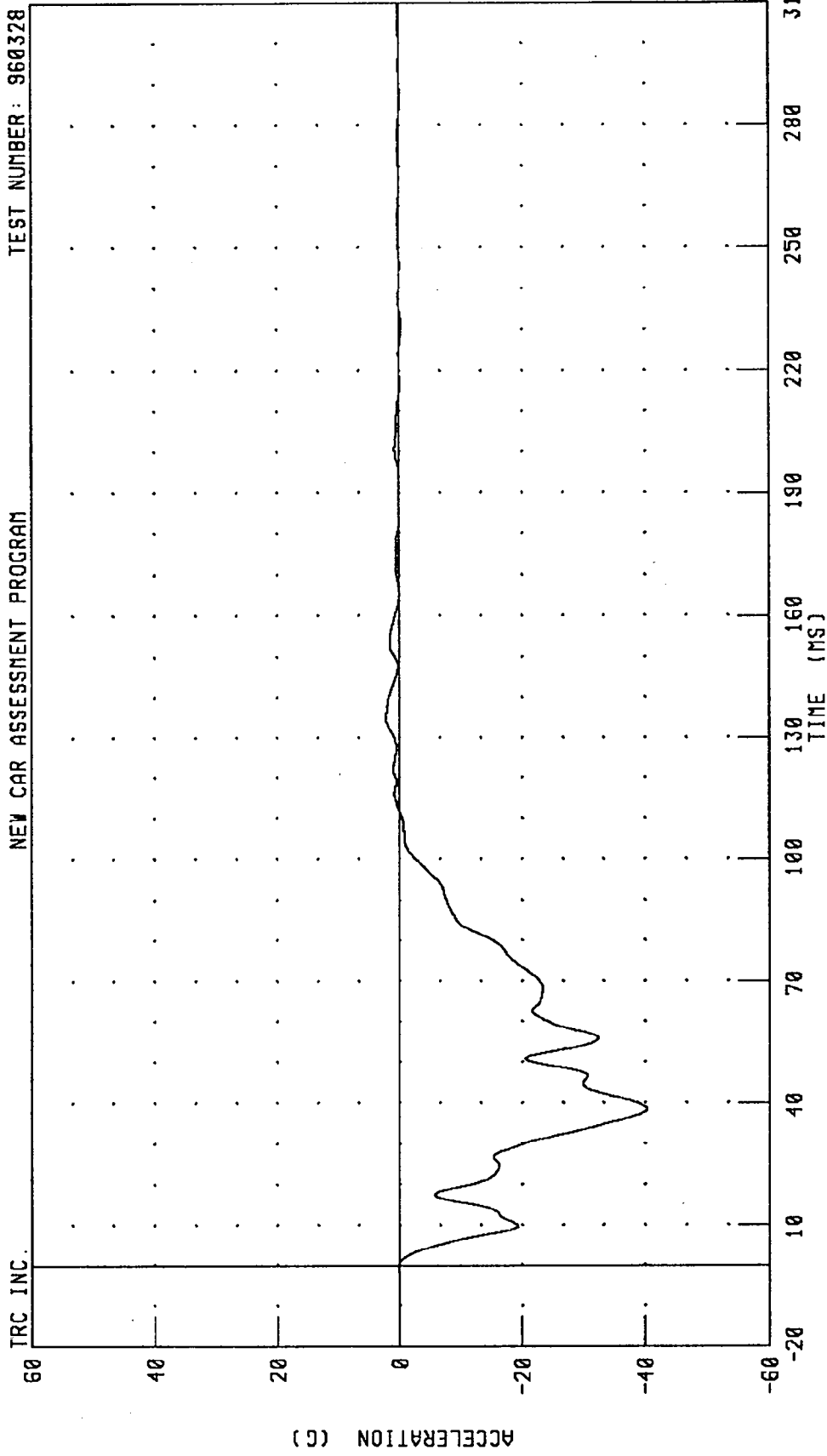
CHANNEL: DPCXG1 FILTER: CH CLASS 60

PEAK DATA: 103.07 G @ 27.76 MS; -88.05 G @ 222.05 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LEFT REAR SEAT REDUNDANT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

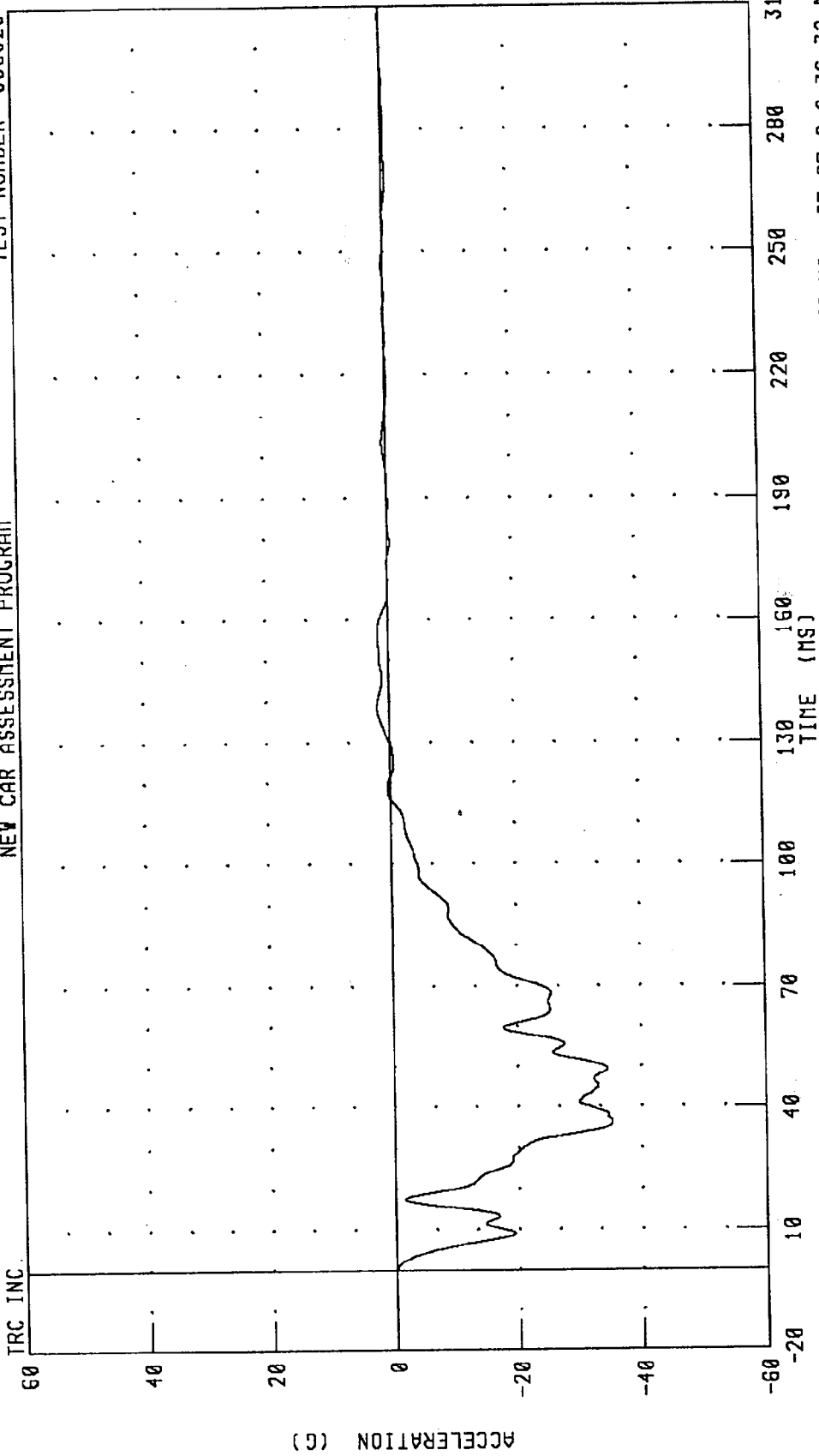


PEAK DATA: 2.26 G @ 134.80 MS; -40.34 G @ 38.64 MS

CHANNEL: TLRXGA FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
RIGHT REAR SEAT REDUNDANT X-AXIS ACCELERATION
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



PEAK DATA: 2.00 G @ 138.56 MS; -35.27 G @ 36.32 MS

CHANNEL: TRRXGA FILTER: CH. CLASS 60

TRC INC.

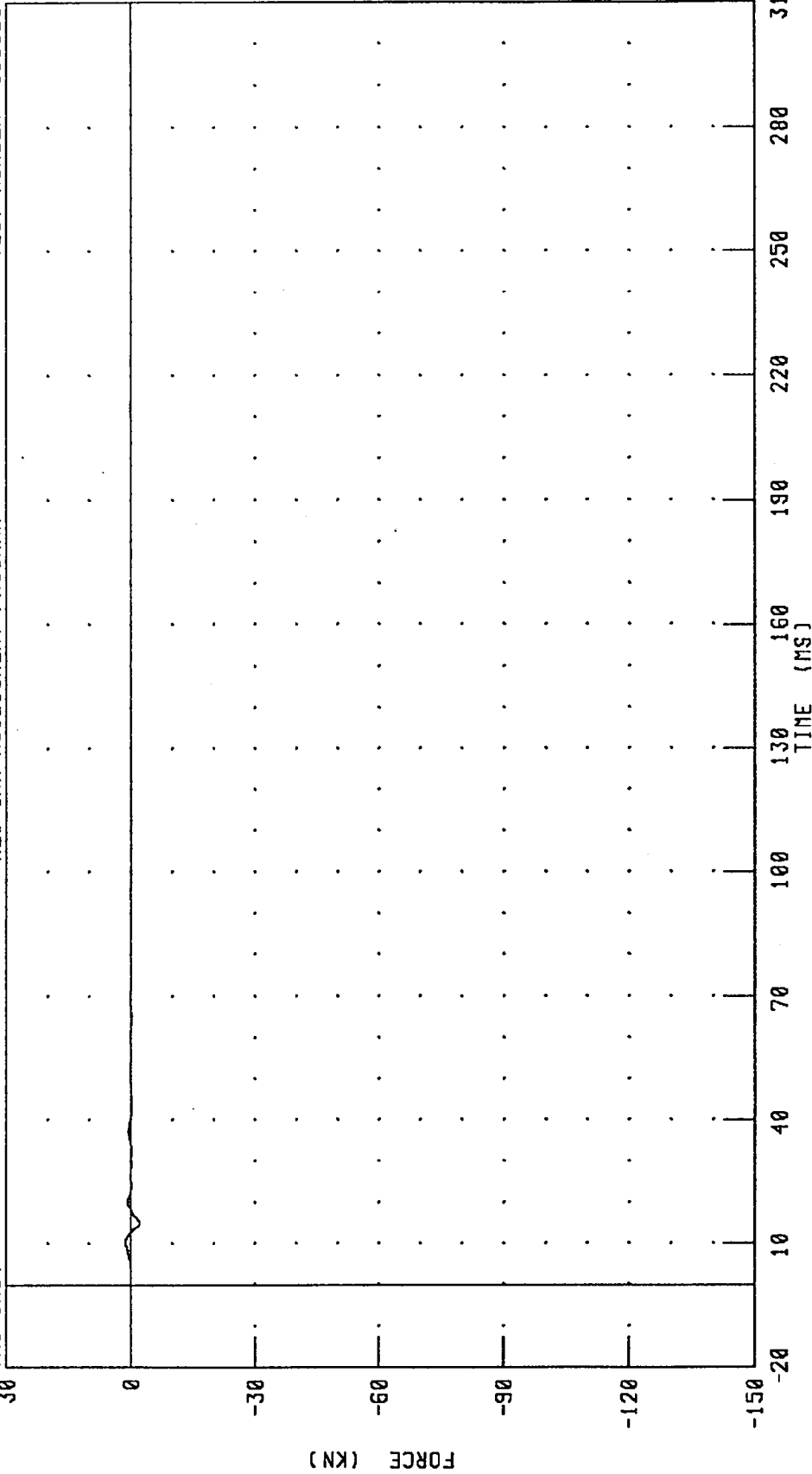
ACCELERATION (G)

TIME (MS)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A1 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



PEAK DATA: 1.19 KN @ 10.32 MS; -2.14 KN @ 15.12 MS

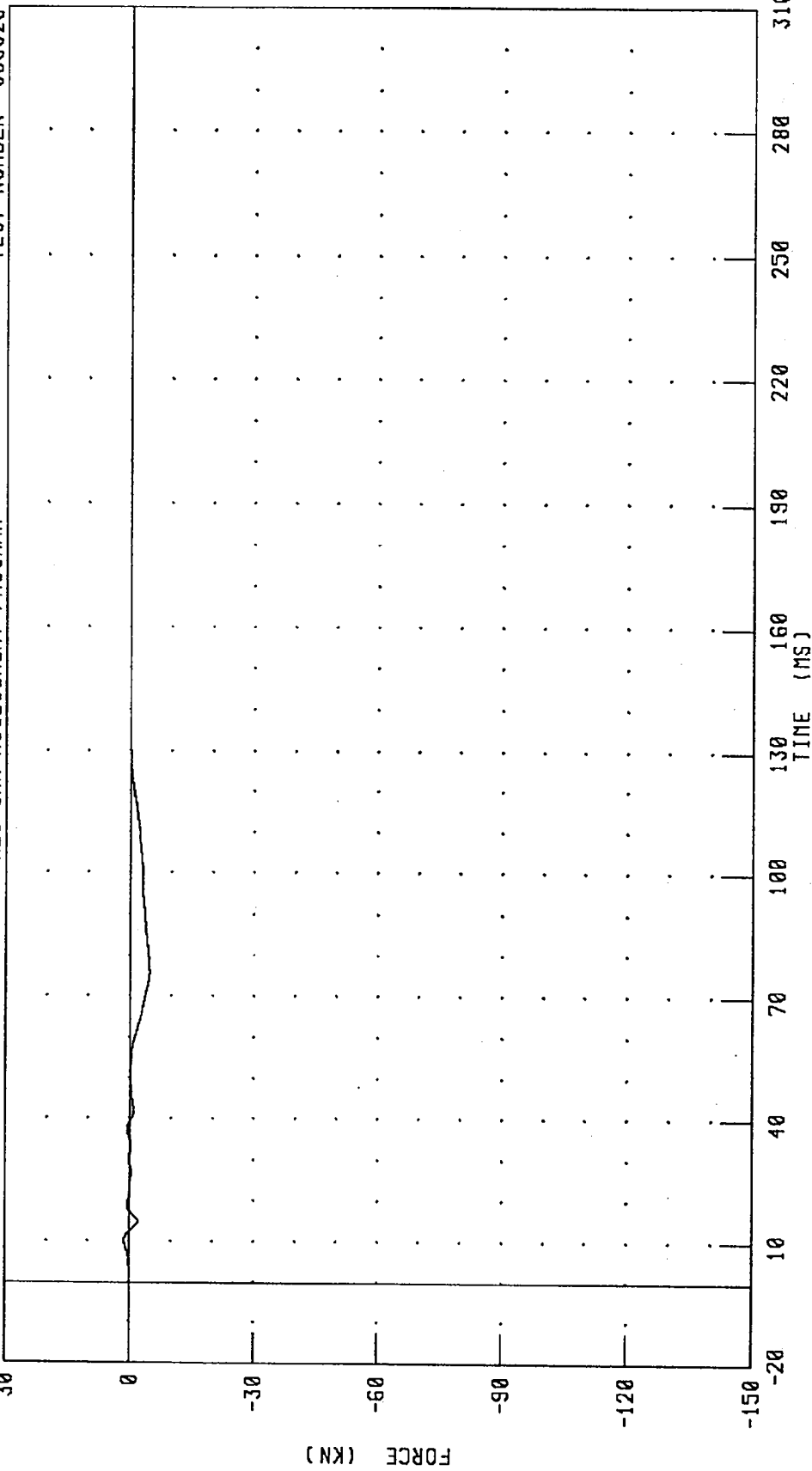
CHANNEL: BA1F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A2 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



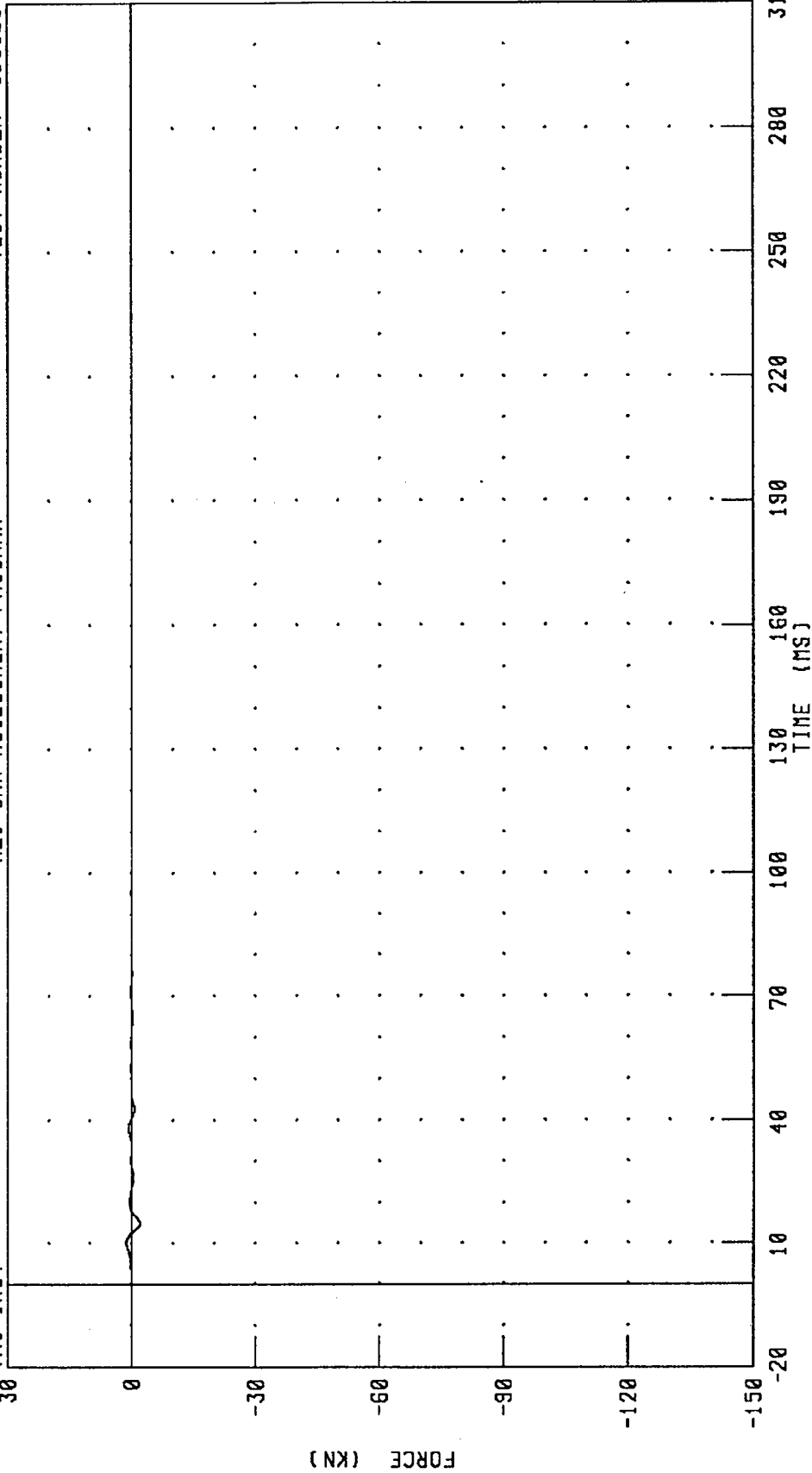
CHANNEL: BA2F FILTER: CH. CLASS 60

PEAK DATA: 1:16 KN @ 10.16 MS; -4.74 KN @ 75.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A3 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

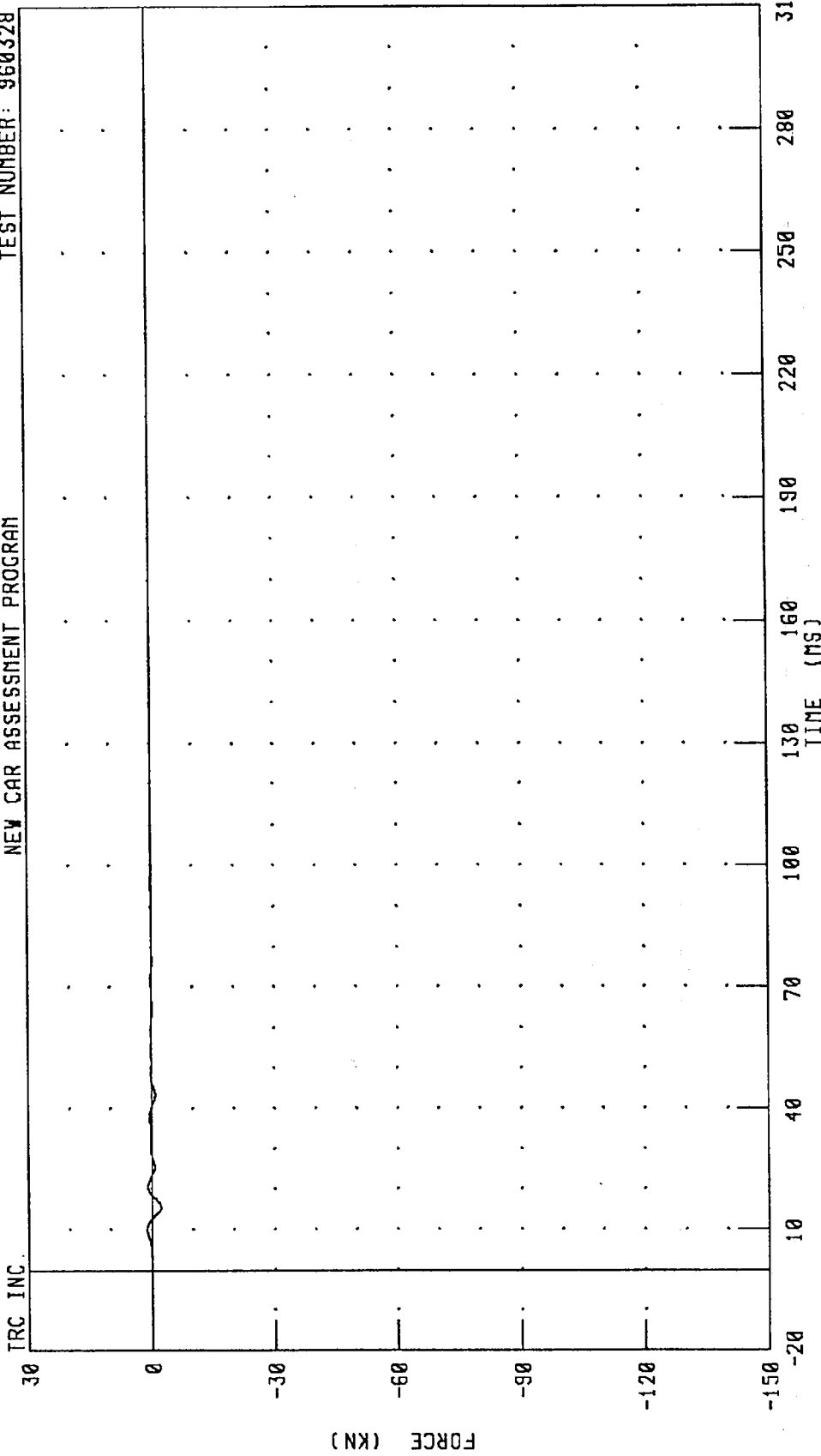


PEAK DATA: 1.18 KN @ 10.16 MS; -2.11 KN @ 14.96 MS

CHANNEL: BA3F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A4 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

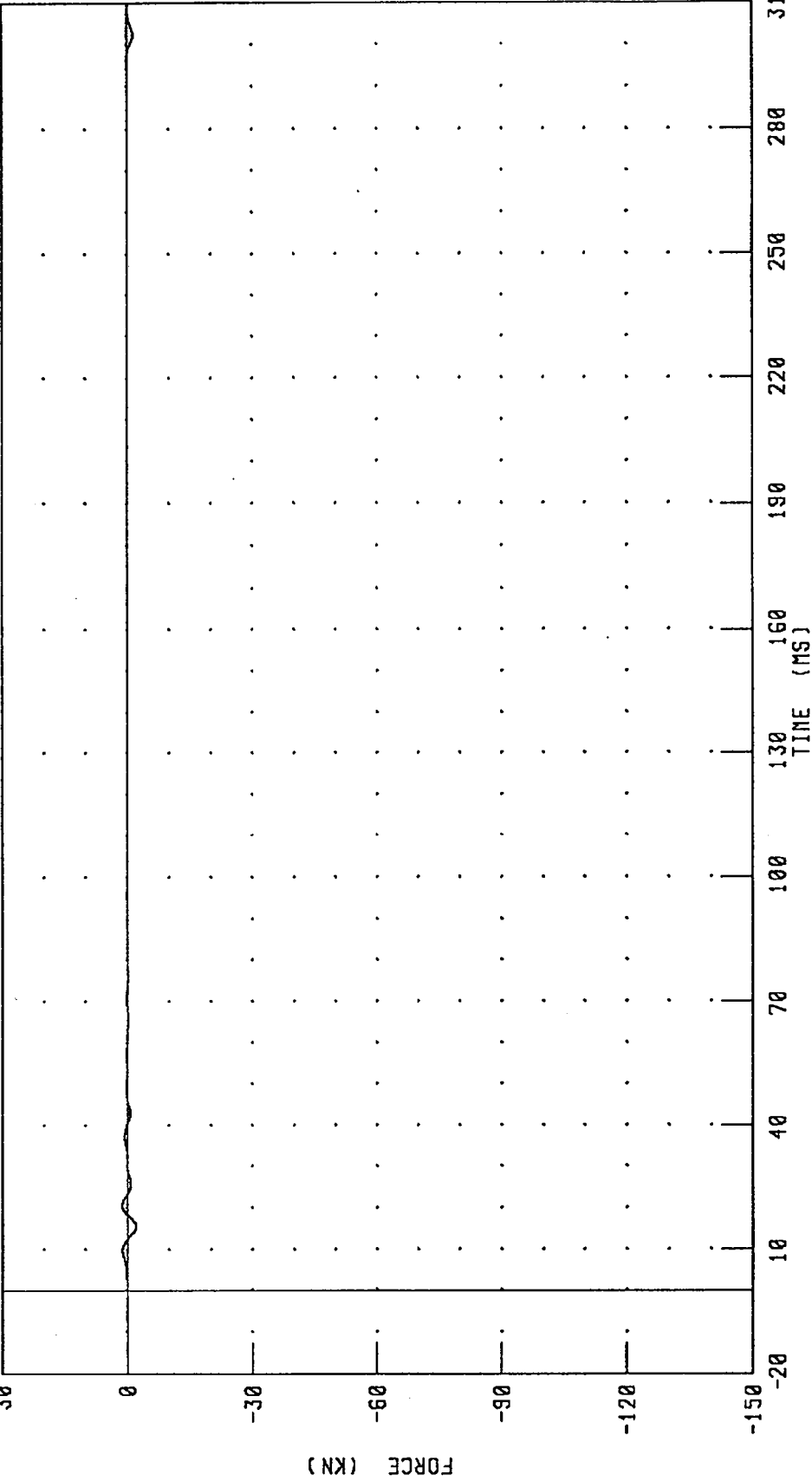


TRC INC. CHANNEL: BA4F FILTER: CH. CLASS 60
 PEAK DATA: 1.20 KN @ 10.08 MS; -2.24 KN @ 15.44 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A5 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER : 960328

TRC INC.

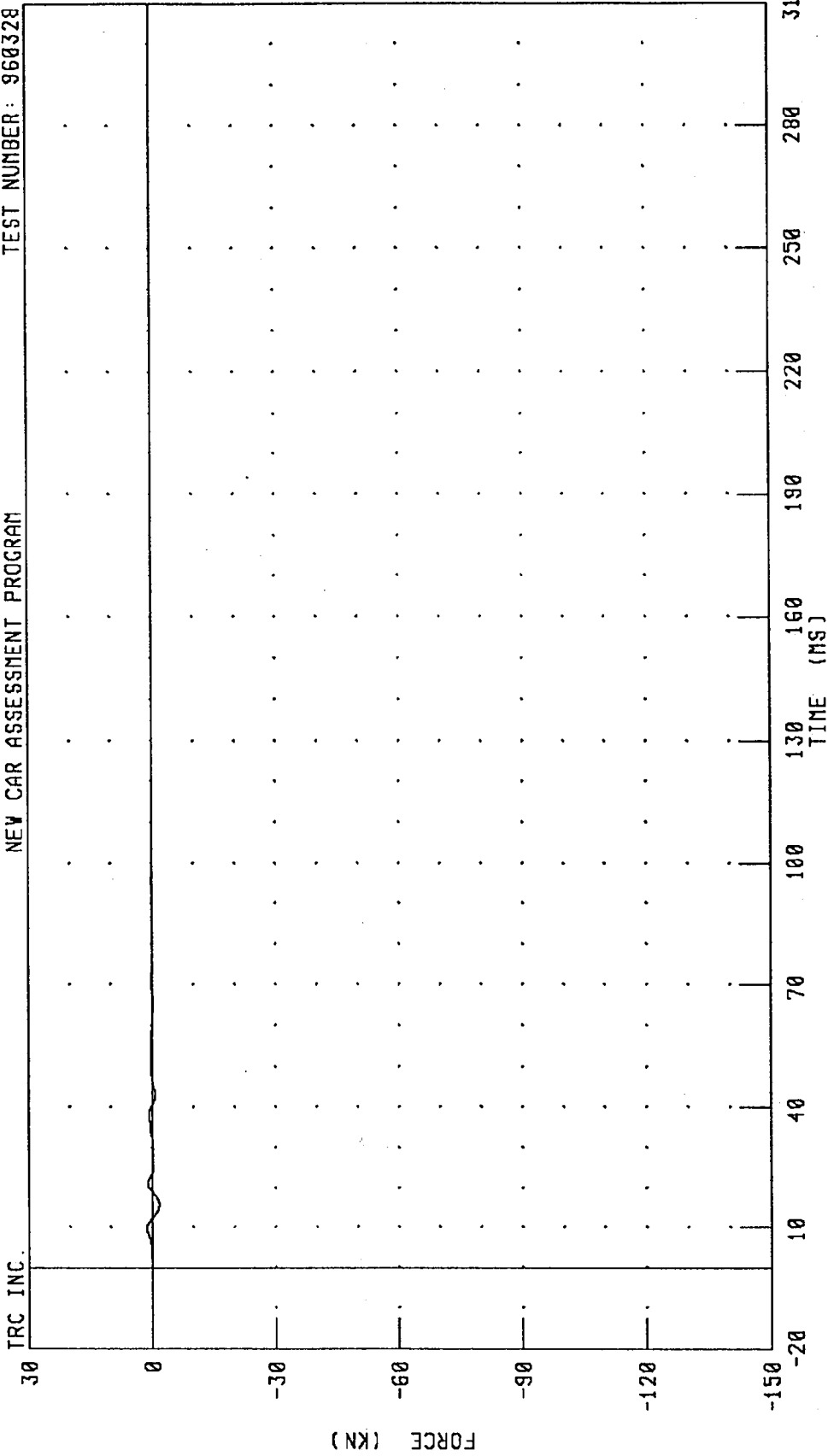


PEAK DATA: 1.21 KN @ 20.56 MS; -2.14 KN @ 15.60 MS

CHANNEL: BASF FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A6 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



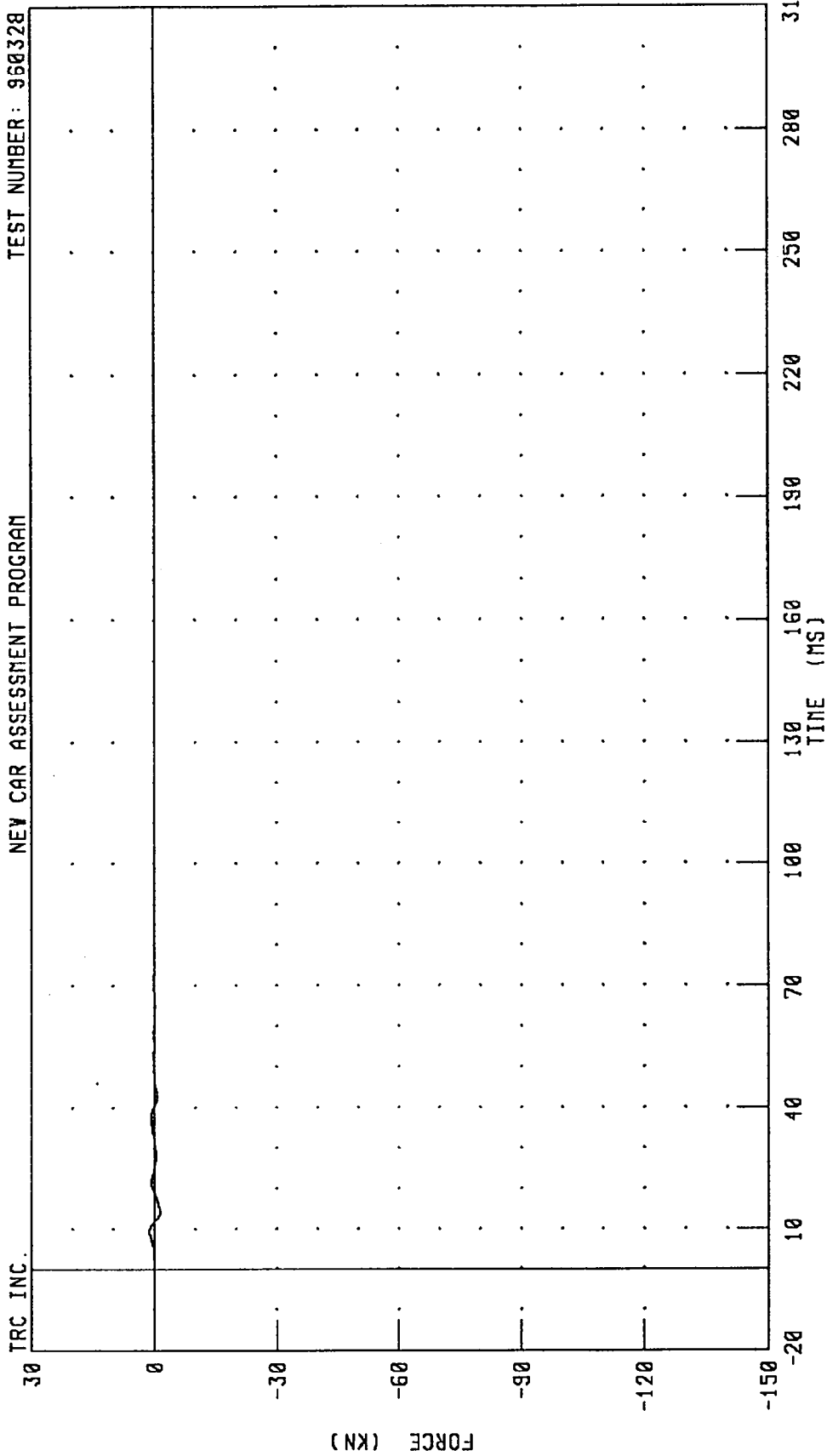
CHANNEL: BA6F FILTER: CH. CLASS 60

PEAK DATA: 1.24 KN @ 9.68 MS; -1.73 KN @ 15.68 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A7 FORCE

TRC INC. NEV CAR ASSESSMENT PROGRAM TEST NUMBER: 960328

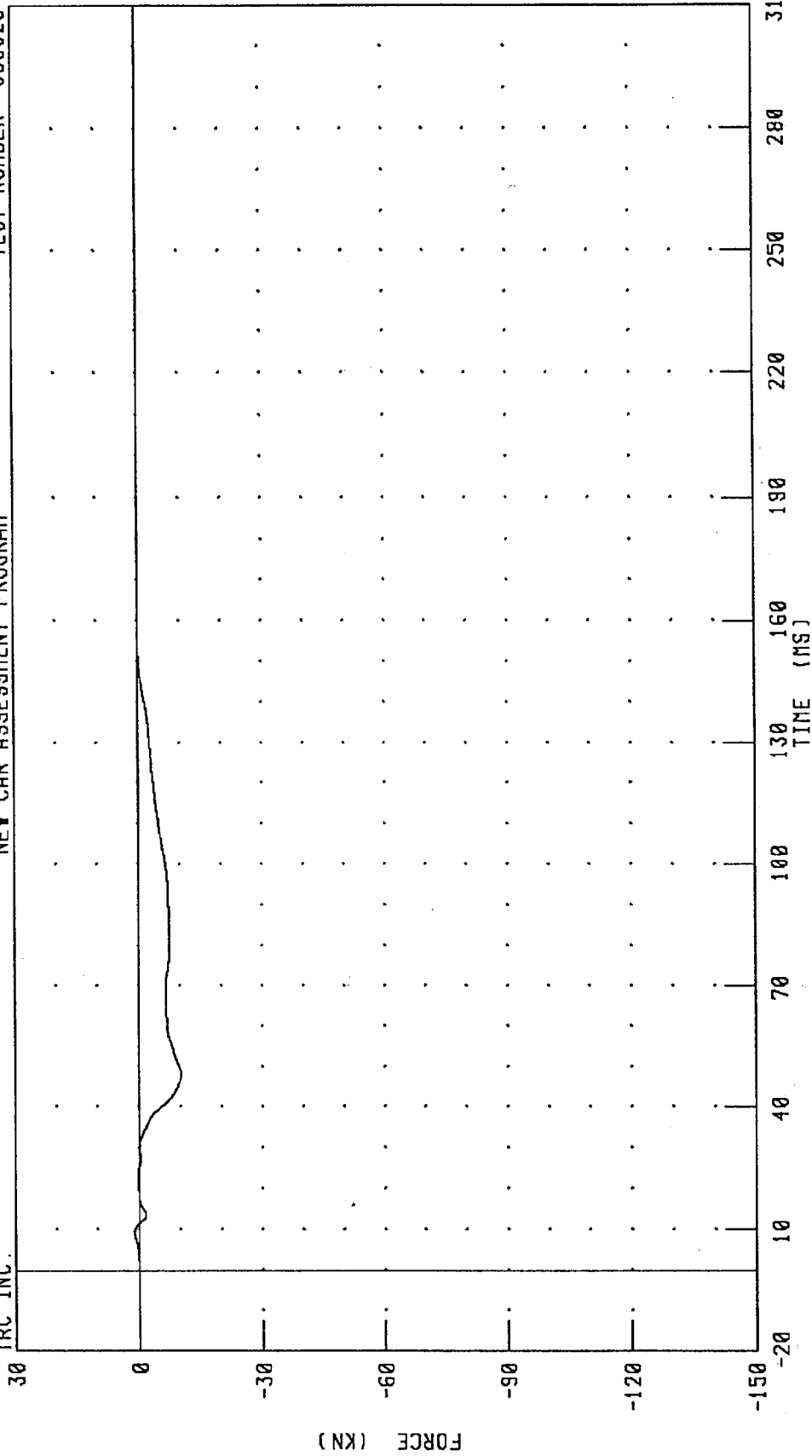


CHANNEL: BA7F FILTER: CH. CLASS 60 PEAK DATA: 1.17 KN @ 9.52 MS; -1.48 KN @ 14.16 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION A8 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



CHANNEL: BABF FILTER: CH. CLASS 60

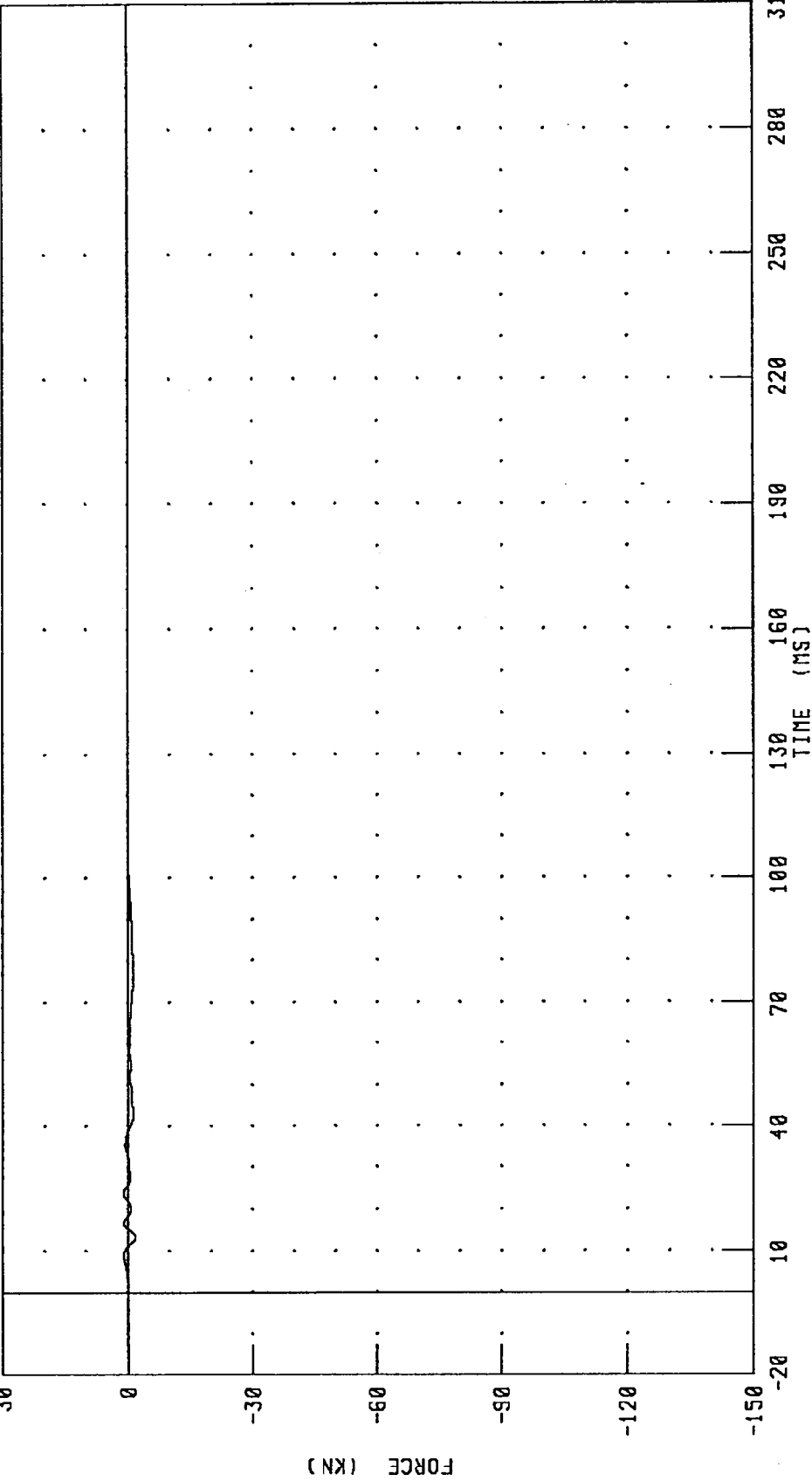
PEAK DATA: 1.12 KN @ 9.20 MS; -10.33 KN @ 47.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION A9 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

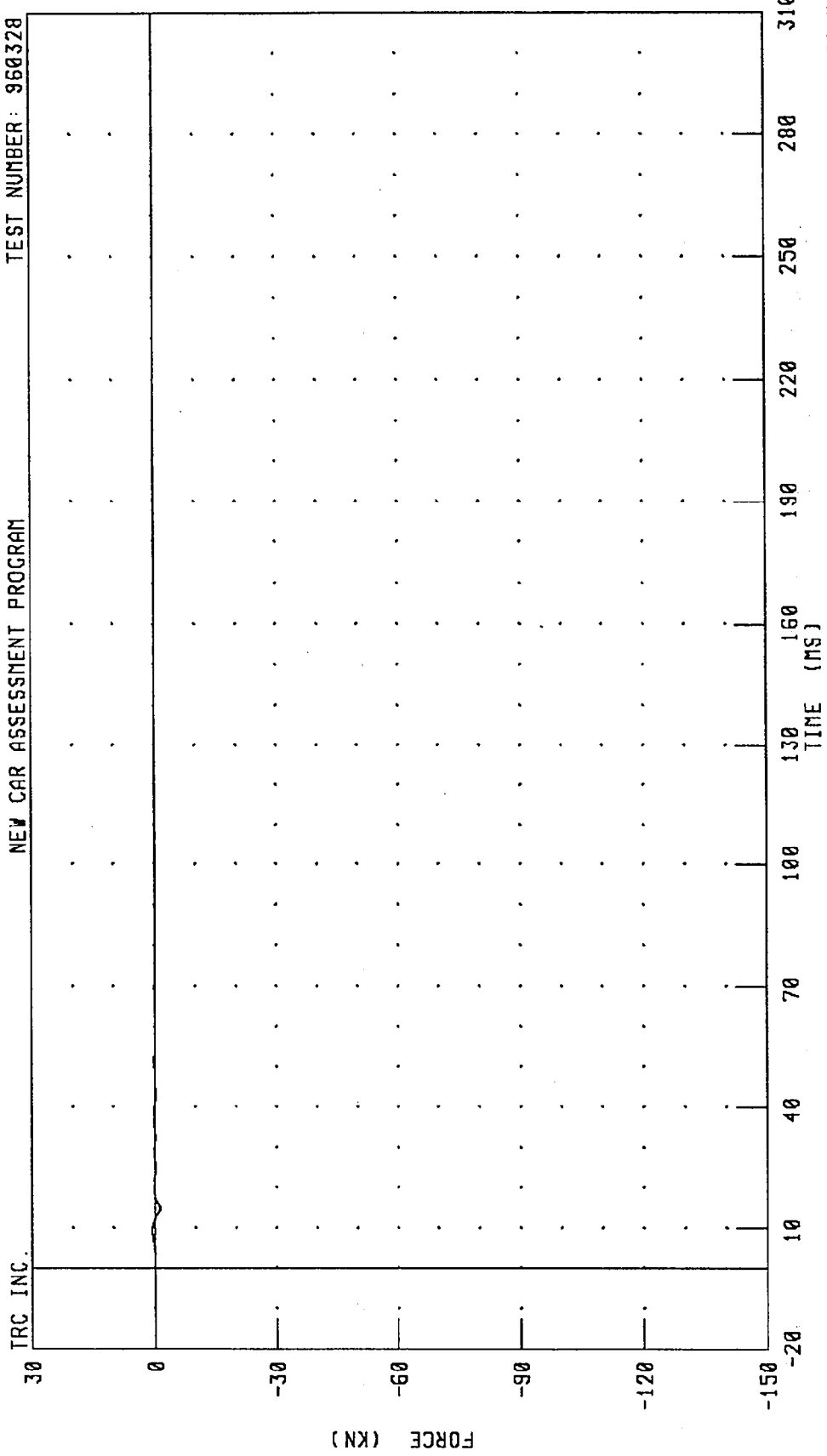


PEAK DATA: 1.01 KN @ 8.96 MS; -1.93 KN @ 13.44 MS

CHANNEL: BA9F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B1 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



PEAK DATA: 0.67 KN @ 9.28 MS; -1.35 KN @ 14.88 MS

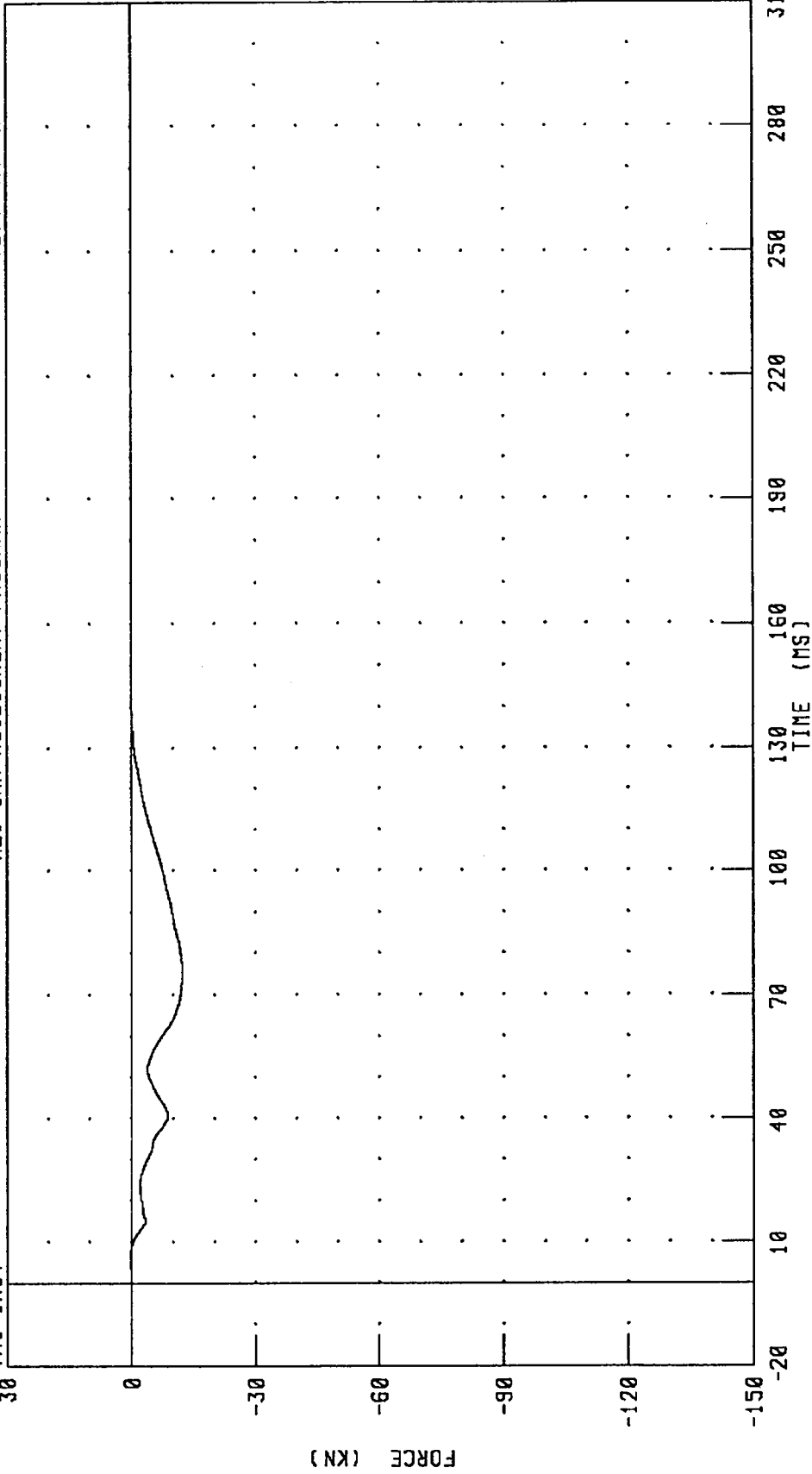
CHANNEL: BB1F FILTER: CH. CLASS 60

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B2 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

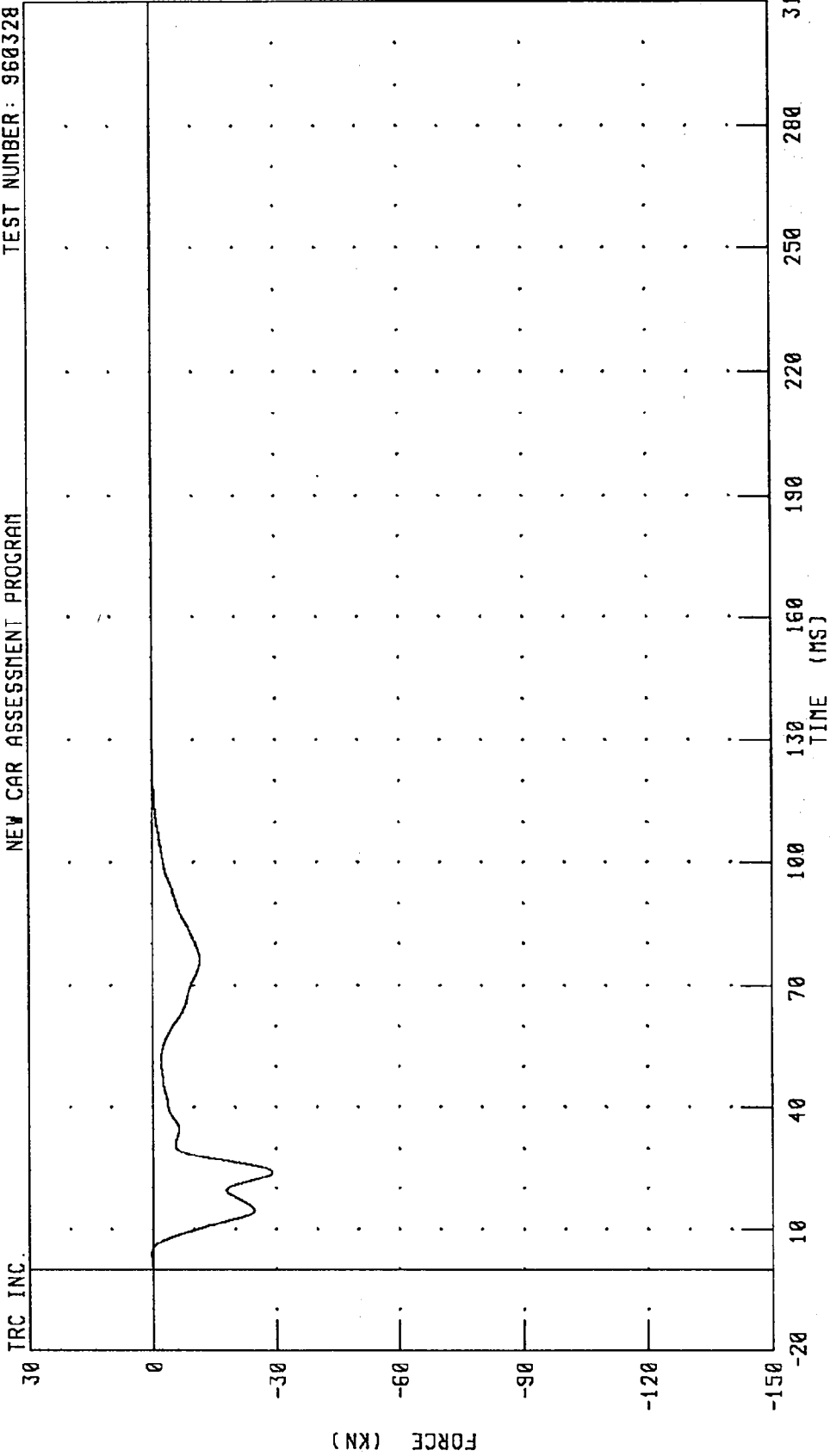


PEAK DATA: 0.23 KN @ 6.56 MS; -12.25 KN @ 75.44 MS

CHANNEL: BB2F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B3 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

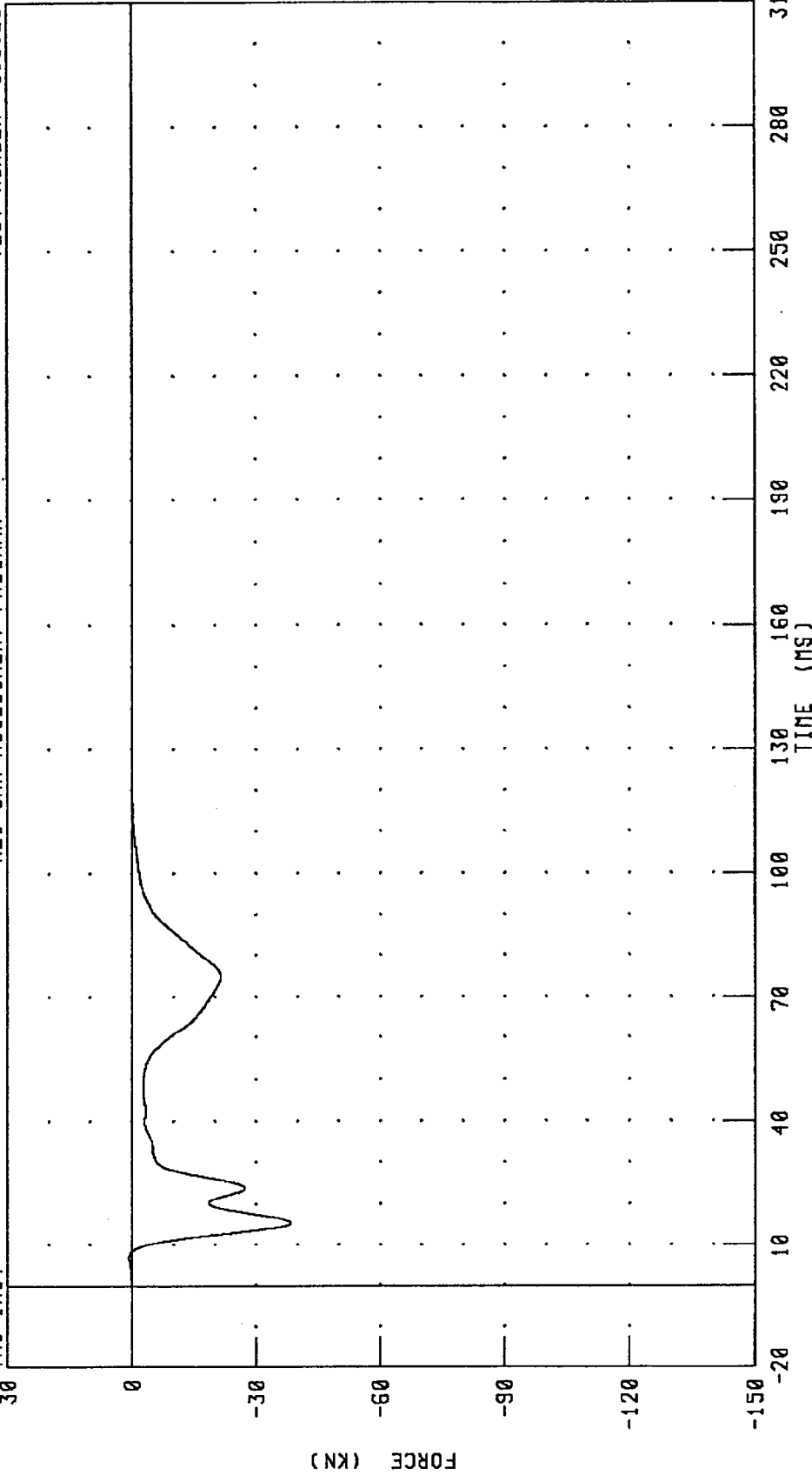


CHANNEL: BB3F FILTER: CH. CLASS 60
PEAK DATA: 0.38 KN @ 3.84 MS; -29.09 KN @ 23.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B4 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

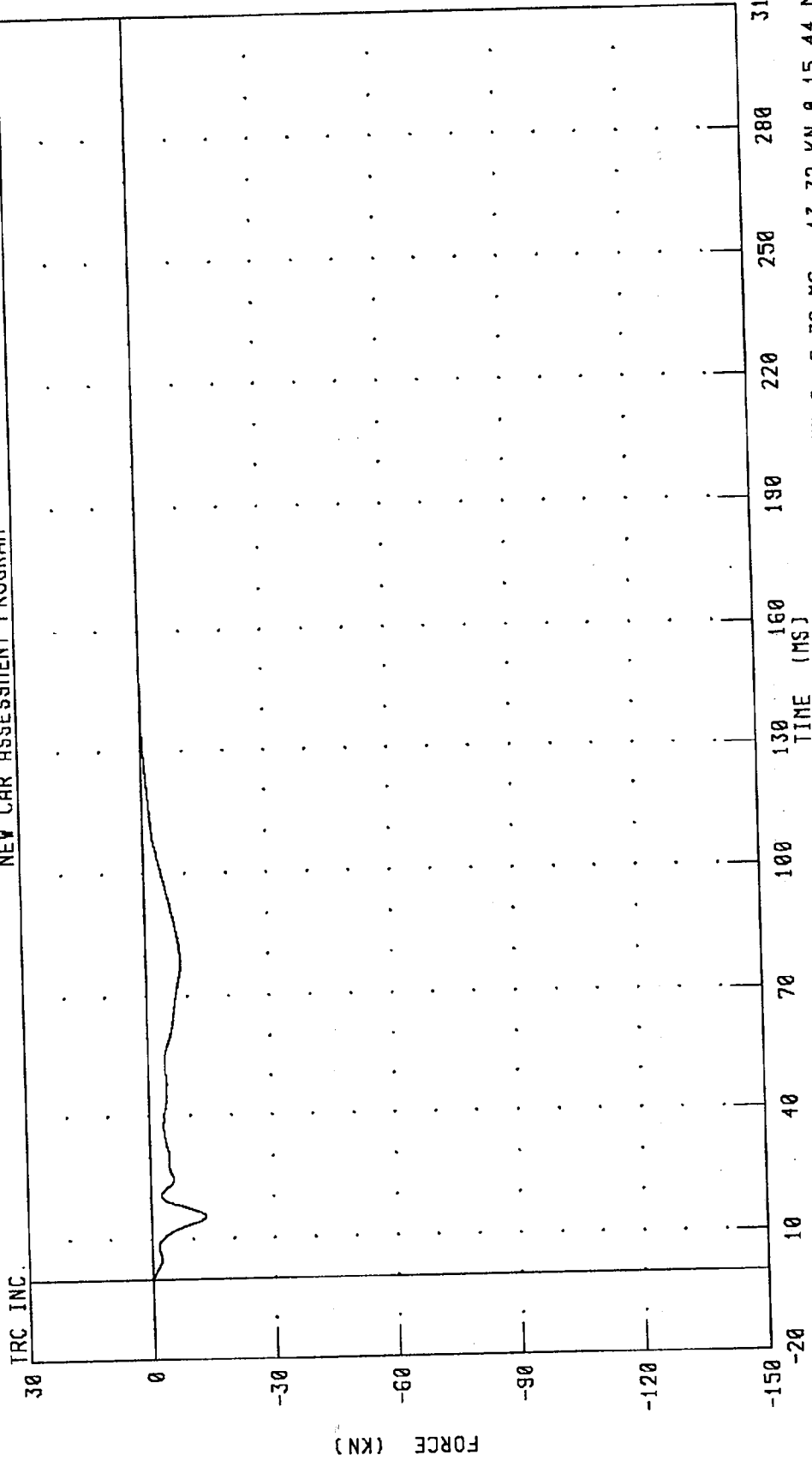


CHANNEL: BB4F FILTER: CH. CLASS 60

PEAK DATA: 0.65 KN @ 6.72 MS; -38.48 KN @ 15.36 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B5 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: BB5F FILTER: CH. CLASS 60

PEAK DATA: 0.06 KN @ -2.32 MS; -13.32 KN @ 15.44 MS

FORCE (KN)

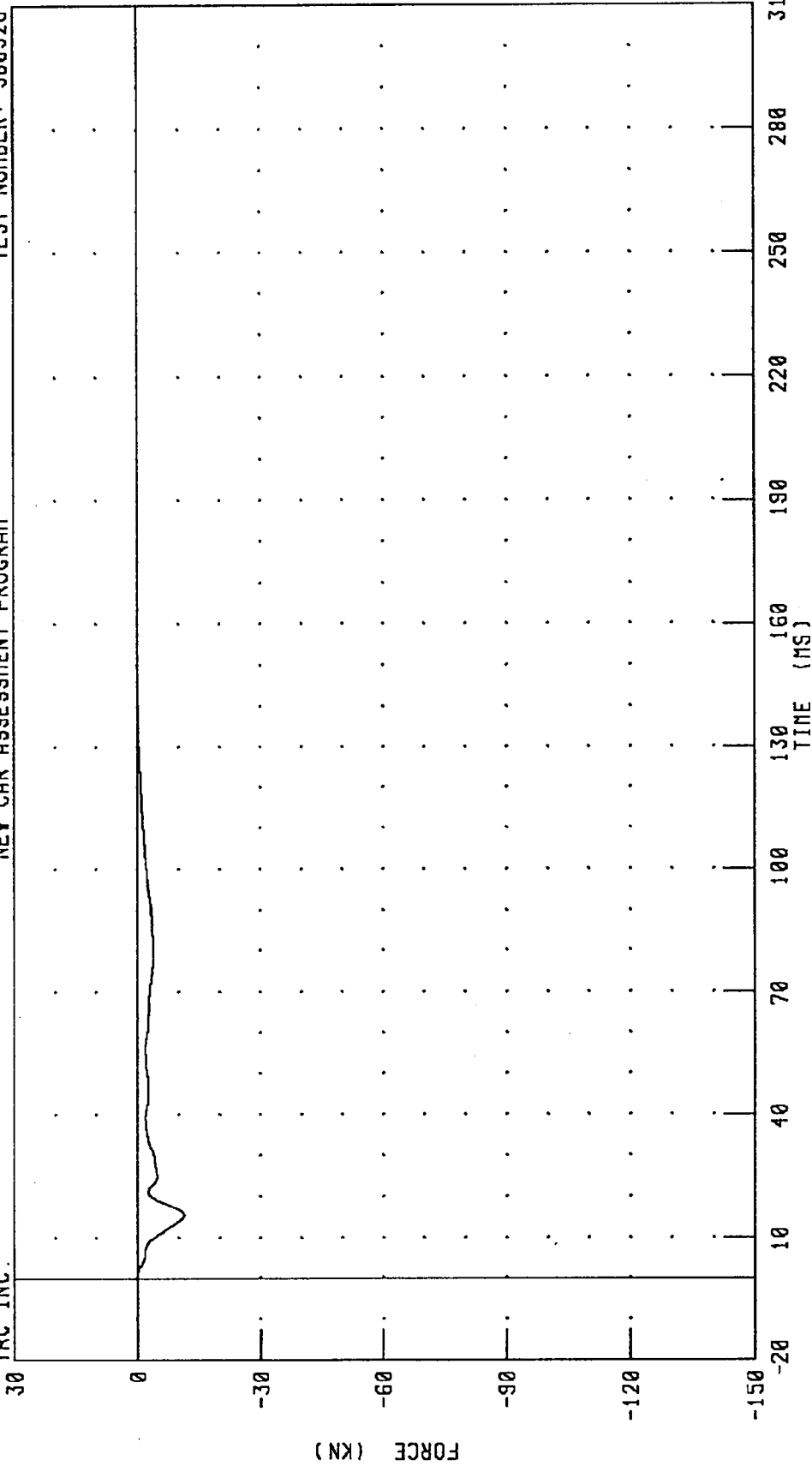
TIME (MS)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B6 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

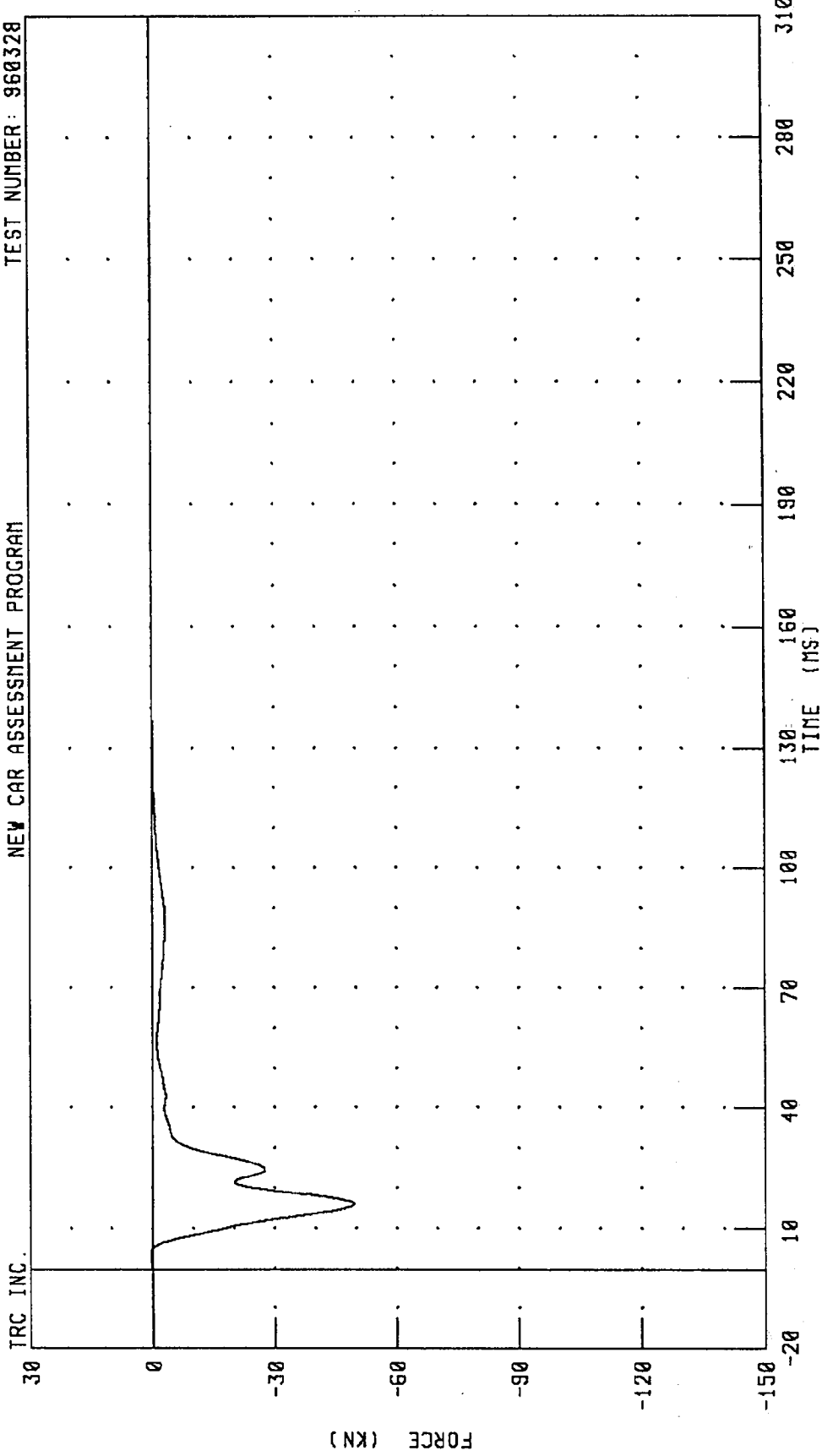


PEAK DATA: 0.08 KN @ -0.56 MS; -11.35 KN @ 15.60 MS

CHANNEL: BBGF FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B7 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

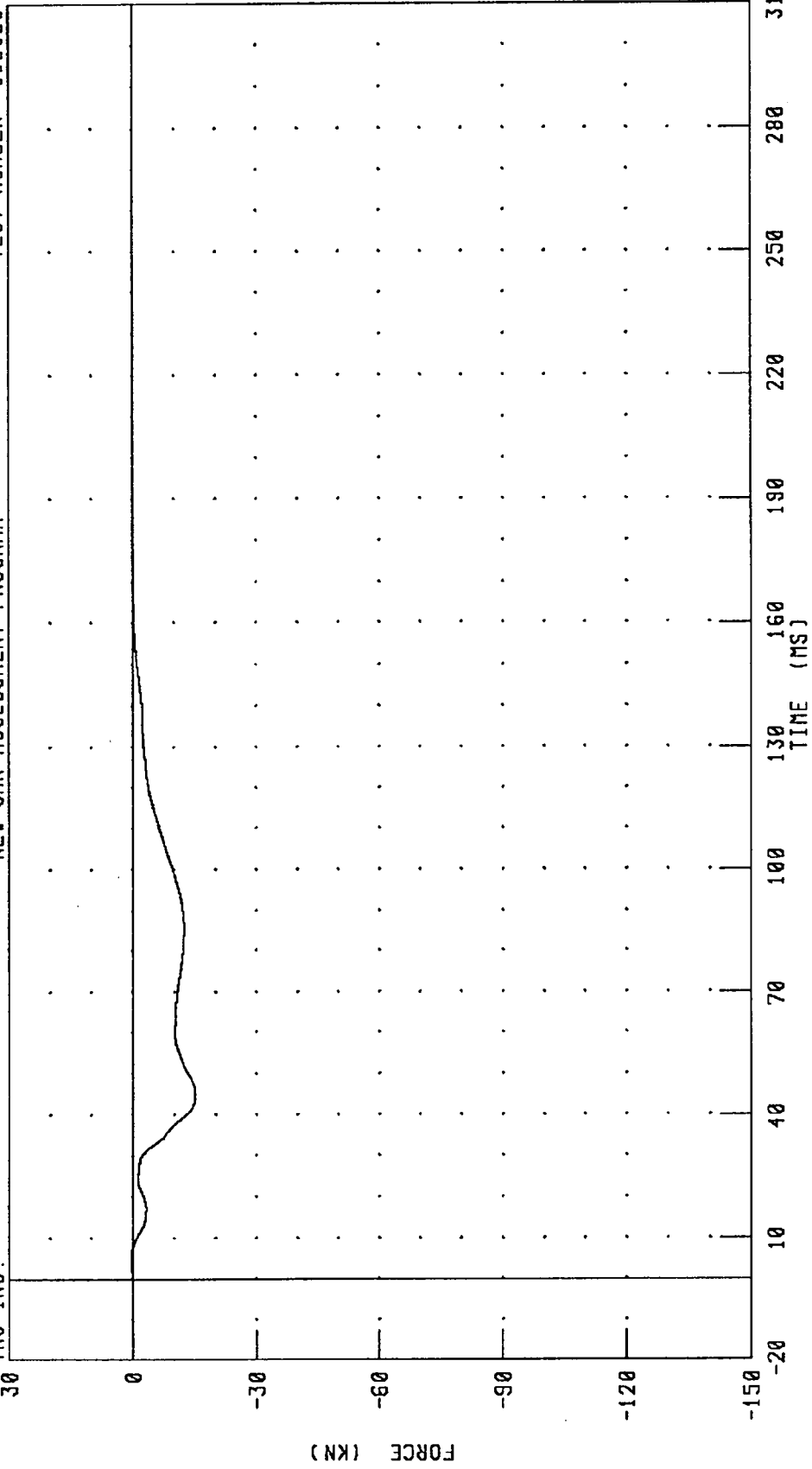


CHANNEL: 887F FILTER: CH. CLASS 60
PEAK DATA: 0.59 KN @ 3.52 MS; -49.45 KN @ 16.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION B8 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

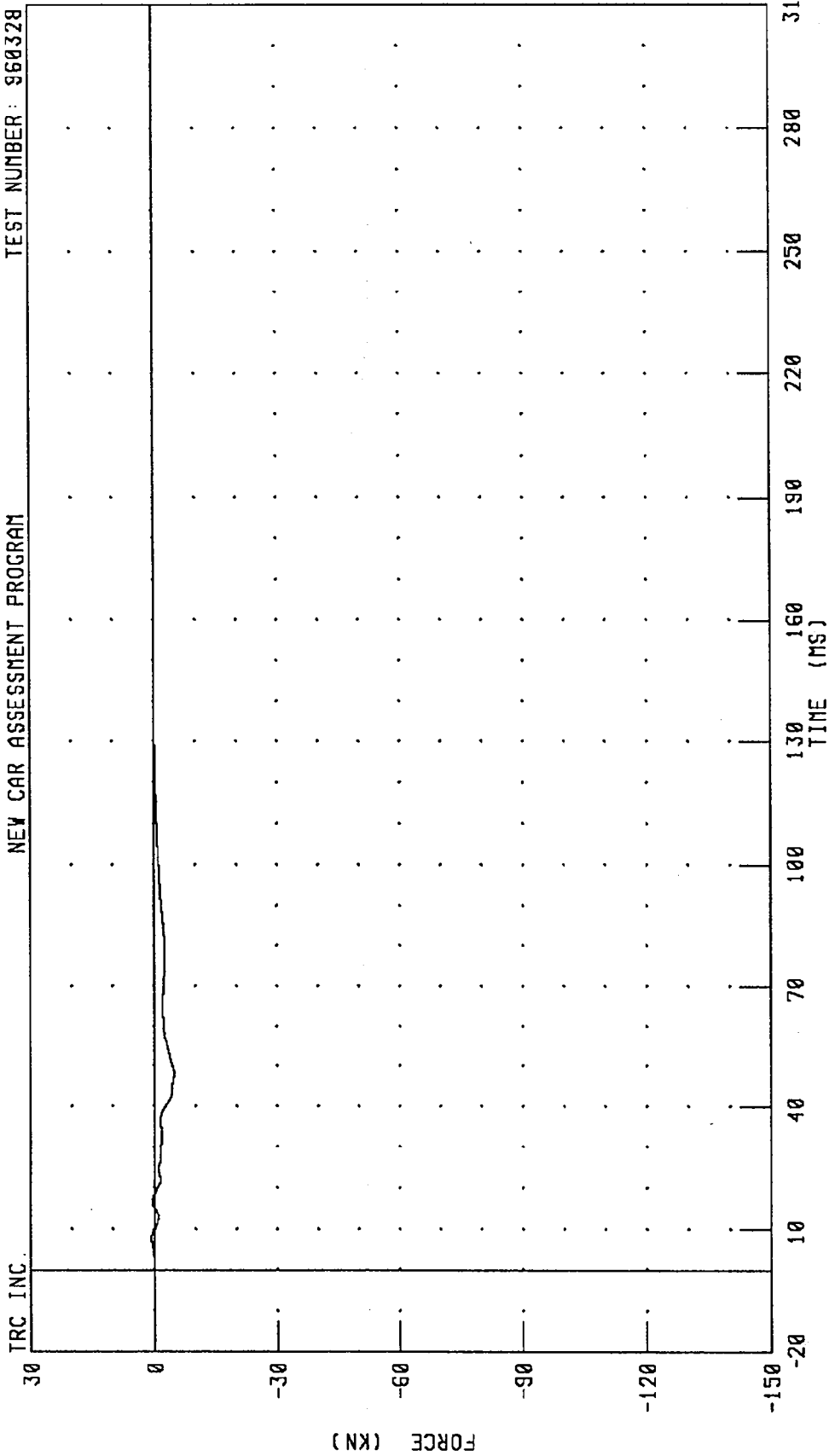


PEAK DATA: 0.26 KN @ 5.68 MS; -15.14 KN @ 44.64 MS

CHANNEL: BB8F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION B9 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



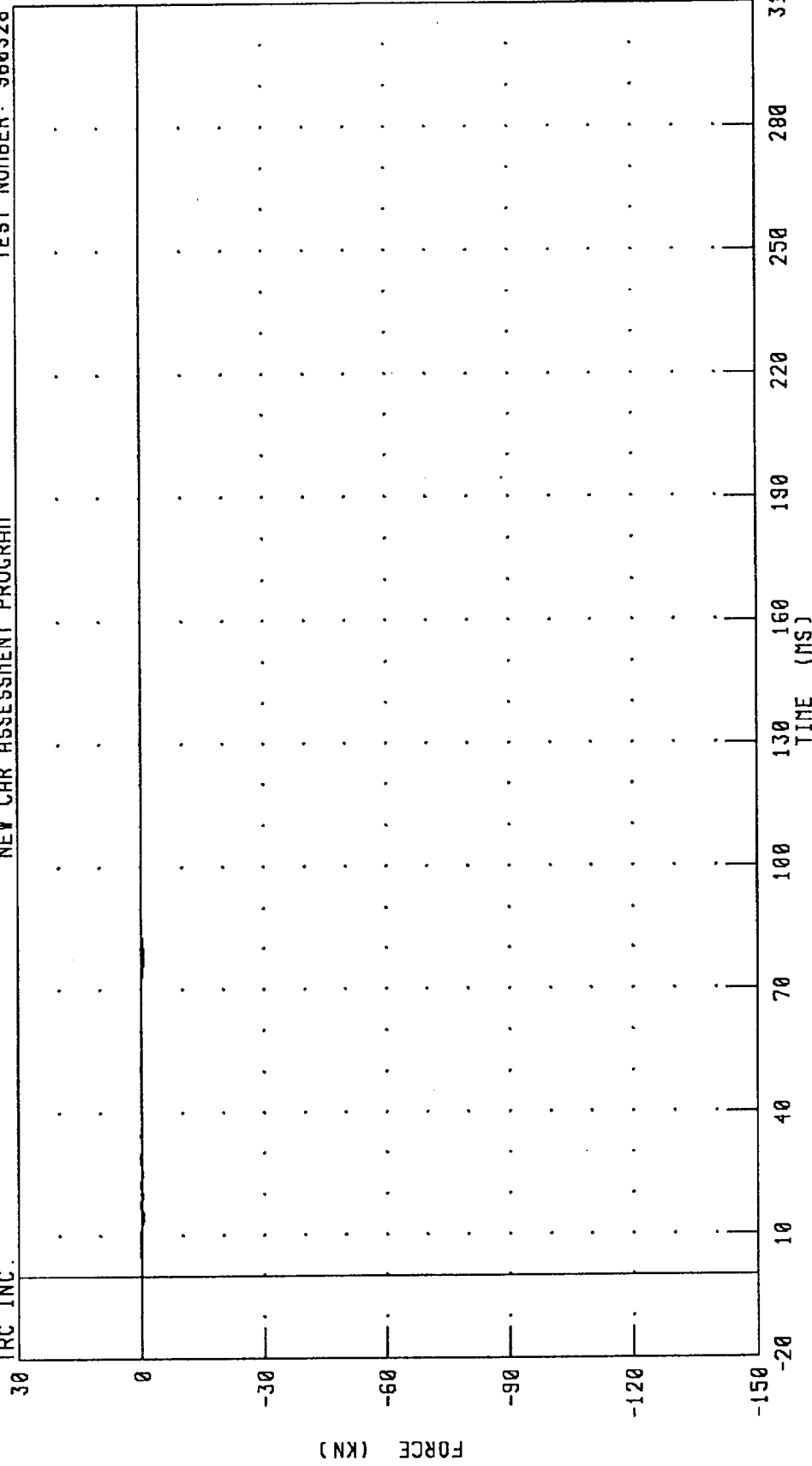
CHANNEL: BB9F FILTER: CH. CLASS 60 PEAK DATA: 0.66 KN @ 7.84 MS; -4.81 KN @ 48.00 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C1 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



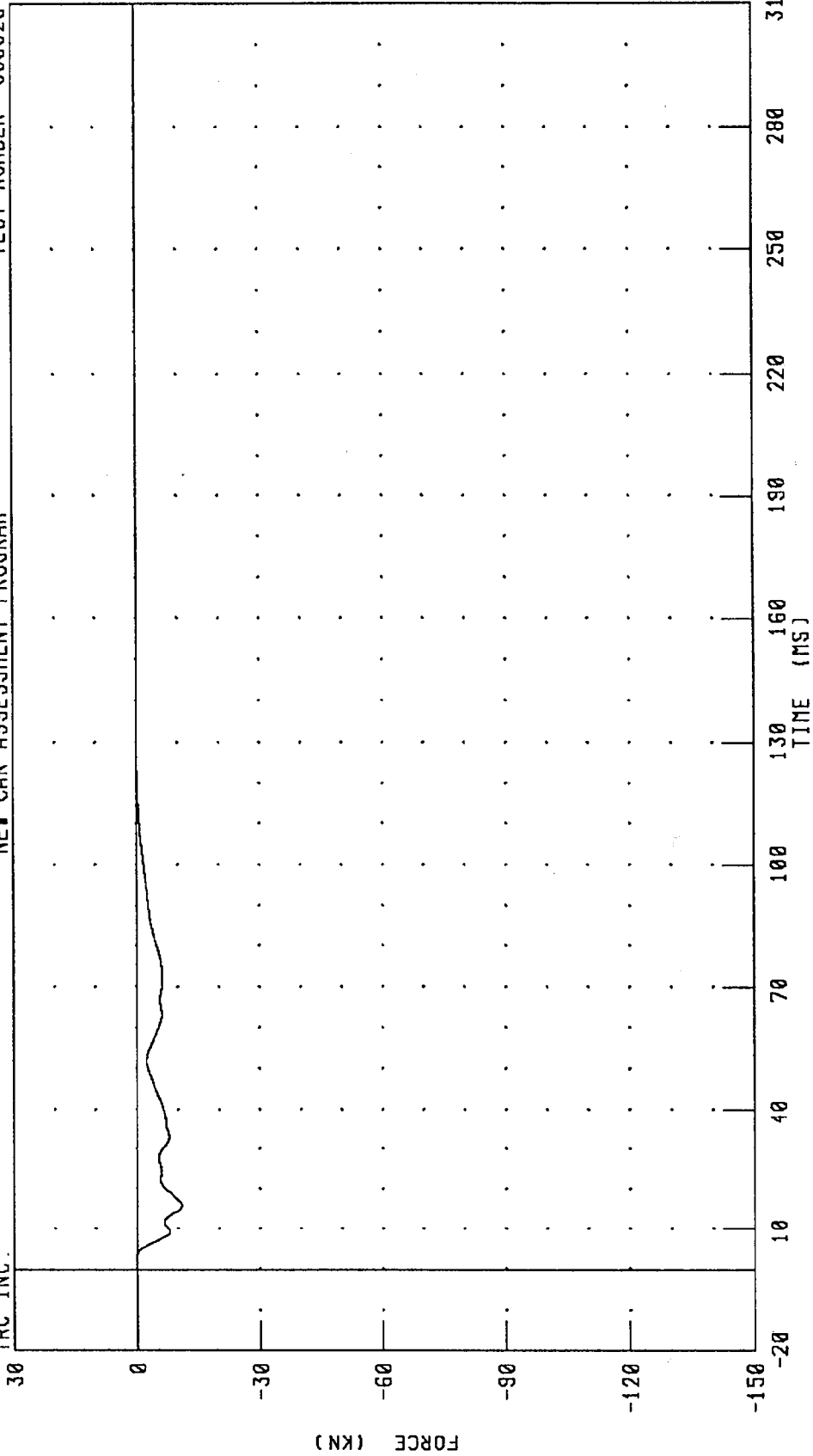
PEAK DATA: 0.33 KN @ 8.08 MS; -0.65 KN @ 14.72 MS

CHANNEL: BC1F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C2 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.

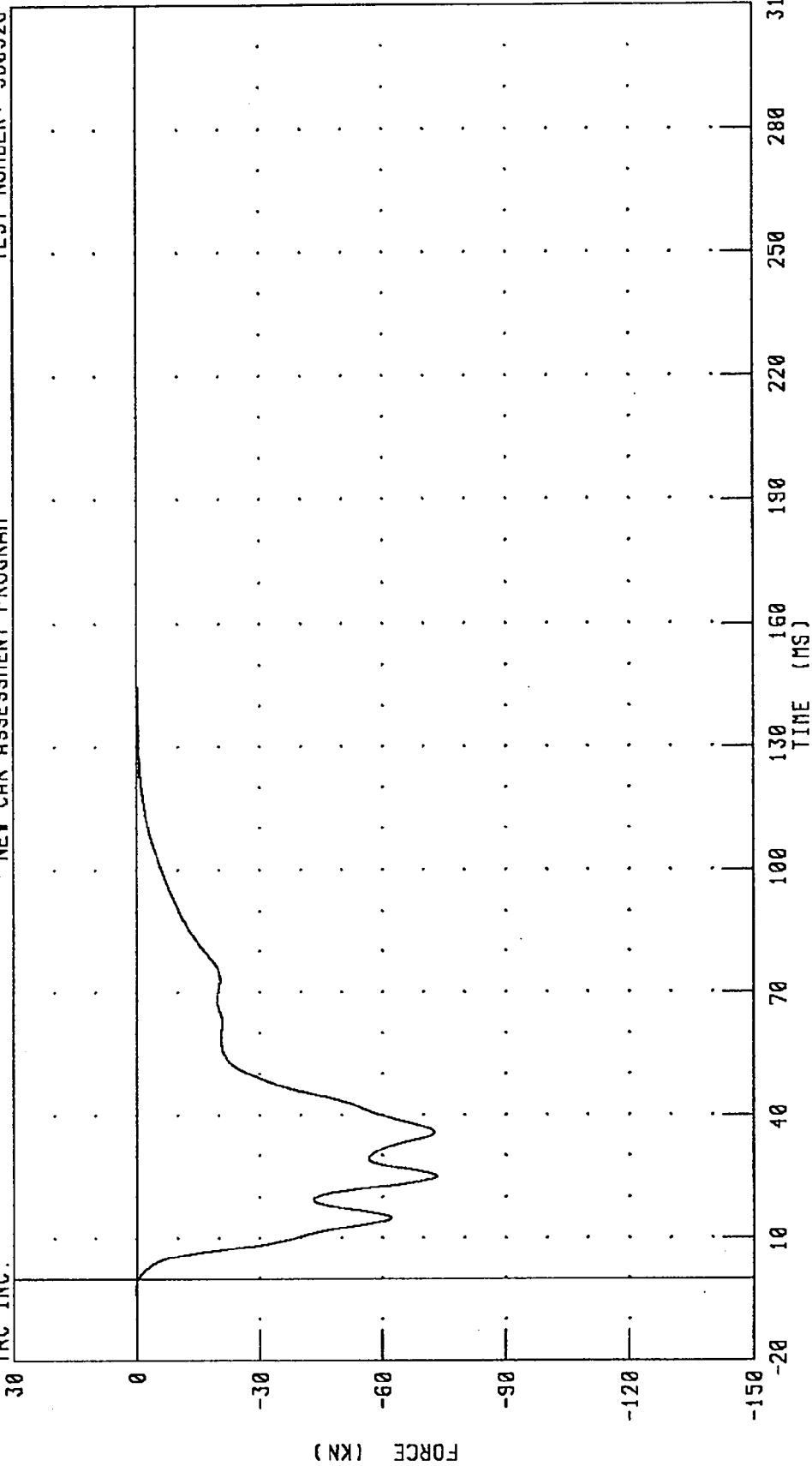


CHANNEL: BC2F FILTER: CH. CLASS 60
PEAK DATA: 0.29 KN @ 2.24 MS; -10.92 KN @ 15.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C3 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

TRC INC.



CHANNEL: BC3F

FILTER: CH. CLASS 60

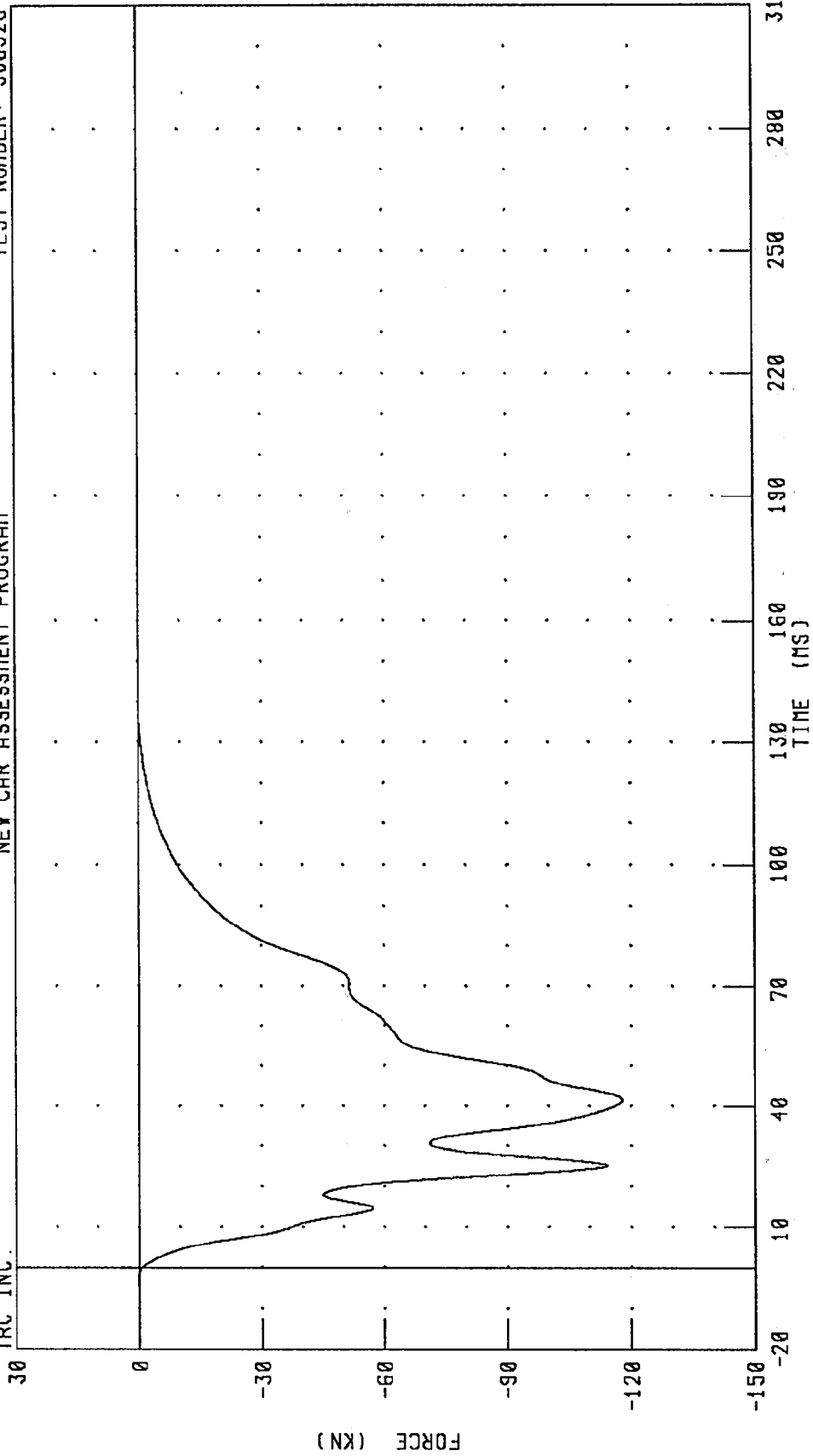
PEAK DATA: 0.13 KN @ -2.40 MS; -73.21 KN @ 25.04 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C4 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

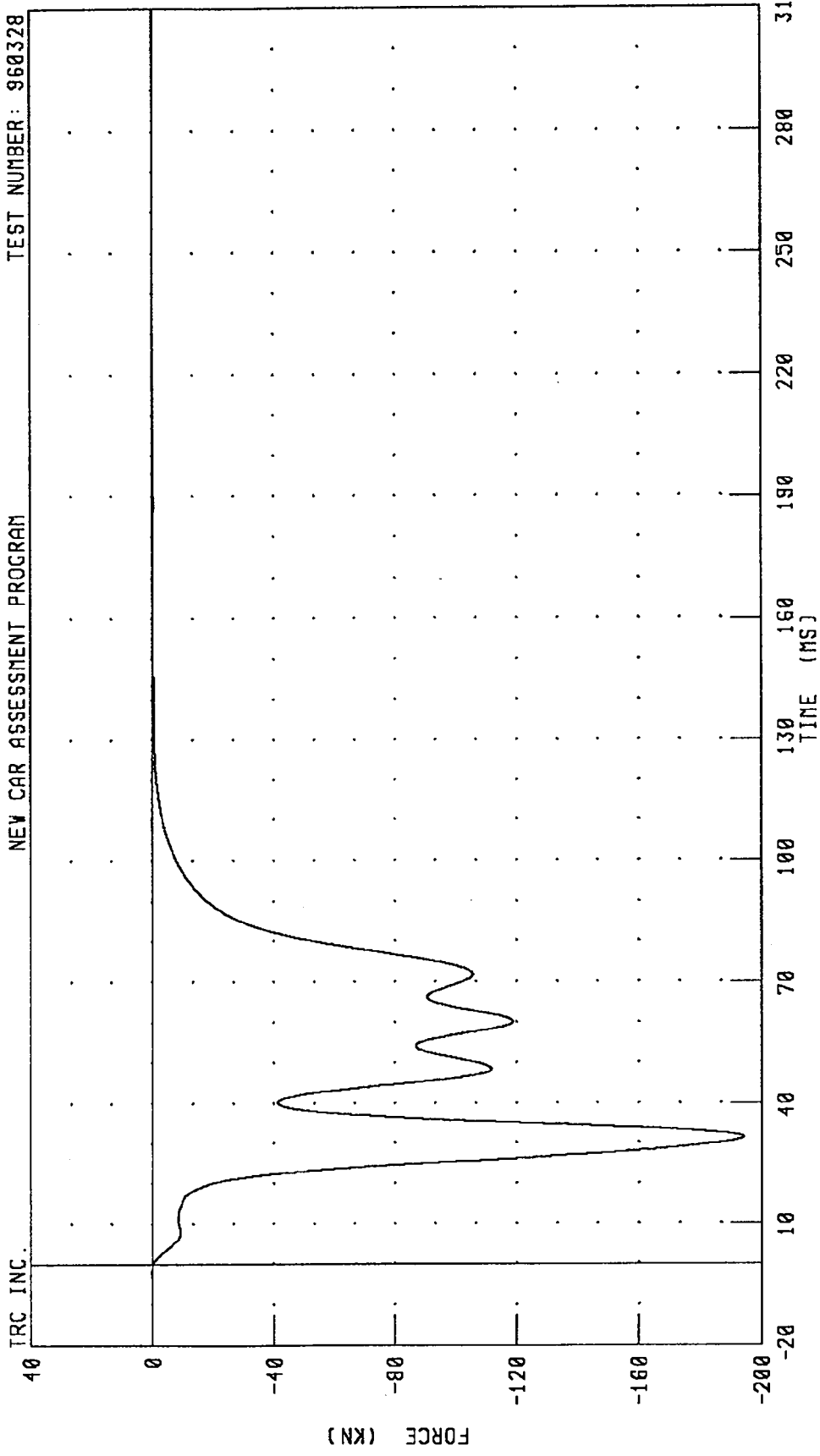


CHANNEL: BC4F FILTER: CH. CLASS 60

PEAK DATA: 0.20 KN e -2.64 MS; -117.85 KN e 41.60 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C5 FORCE
NEW CAR ASSESSMENT PROGRAM

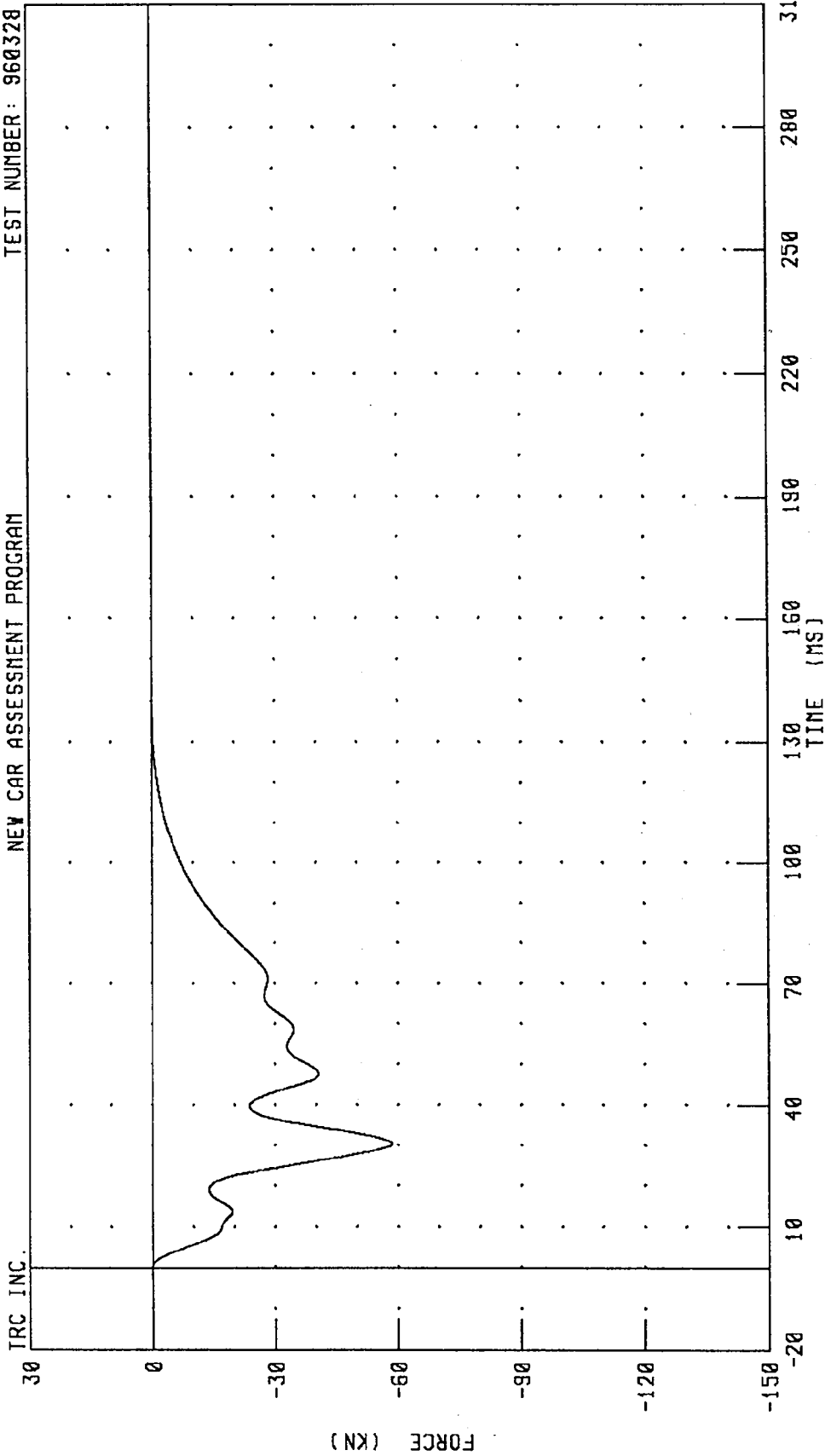
TEST NUMBER: 960328



CHANNEL: BC5F FILTER: CH. CLASS 60
PEAK DATA: 0.15 KN @ -2.16 MS; -194.20 KN @ 31.44 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C6 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



PEAK DATA: 0.21 KN @ -0.96 MS; -58.54 KN @ 30.56 MS

CHANNEL: BCGF FILTER: CH. CLASS 60

TRC INC.

FORCE (KN)

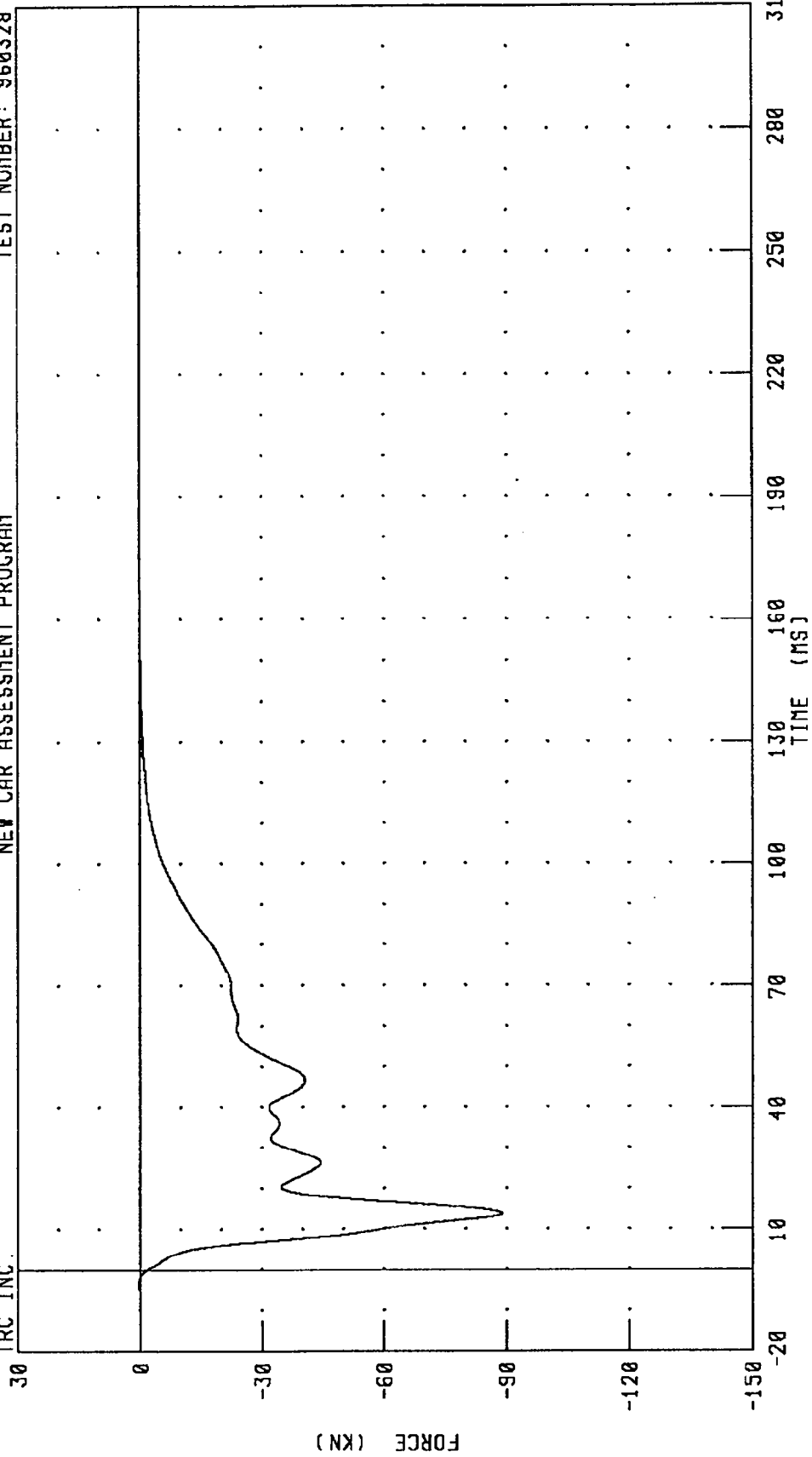
TIME (MS)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION C7 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC

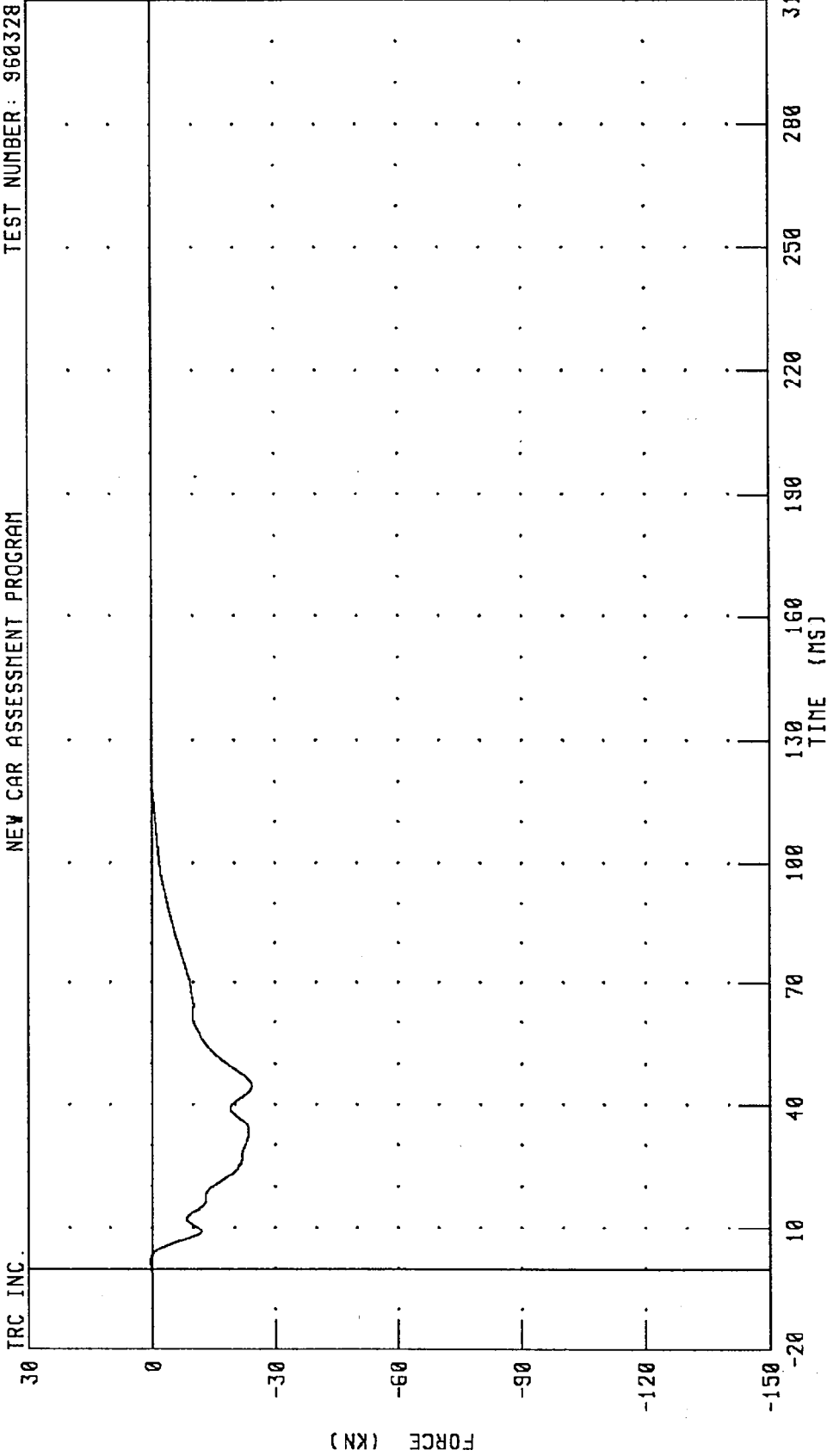


PEAK DATA: 0.18 KN @ -3.36 MS; -88.91 KN @ 13.92 MS

CHANNEL: BC7F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C8 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



PEAK DATA: 0.39 KN @ 1.84 MS; -24.21 KN @ 44.72 MS

CHANNEL: BC8F FILTER: CH. CLASS 60

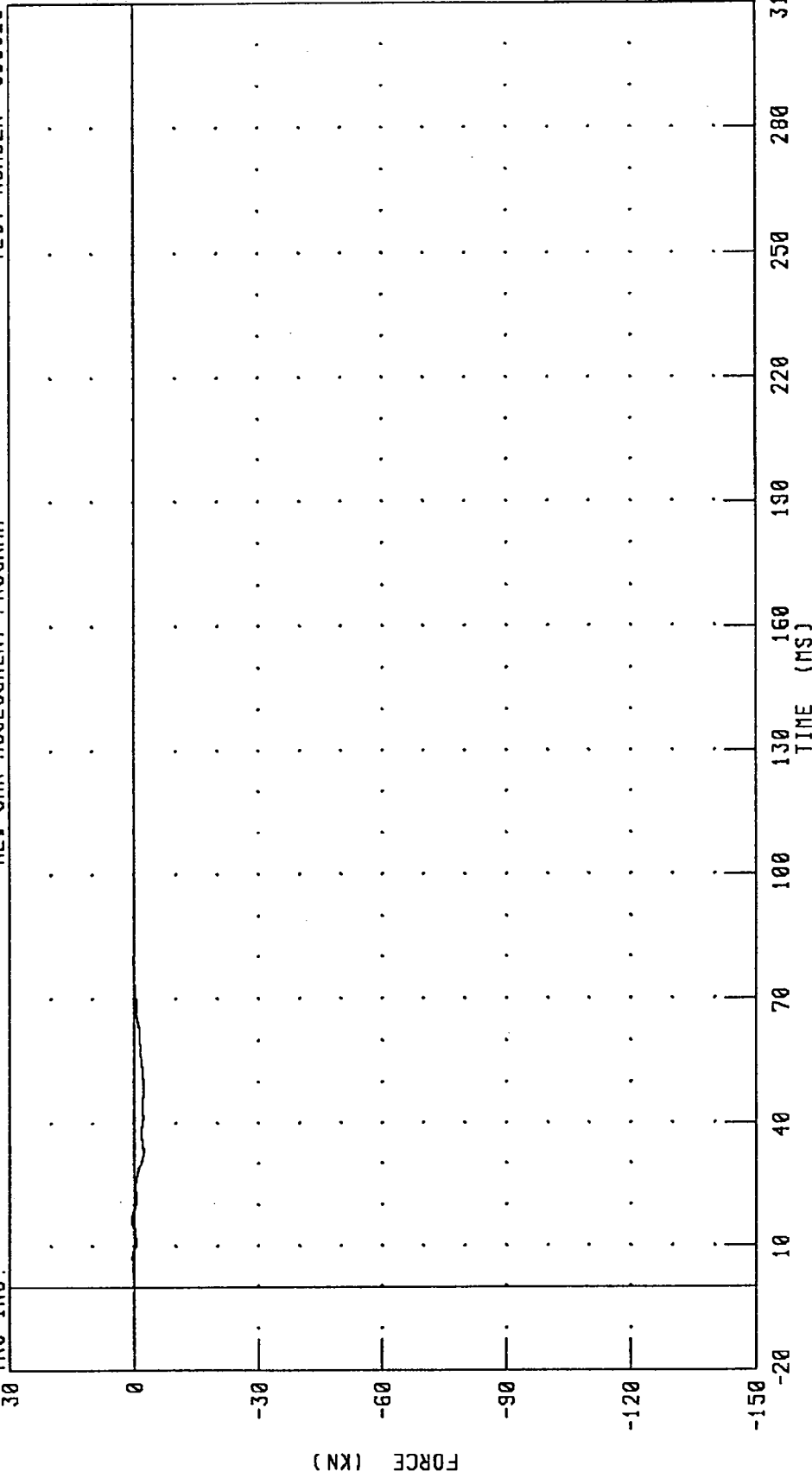
TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION C9 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



PEAK DATA: 0.51 KN @ 16.56 MS; -2.27 KN @ 48.80 MS

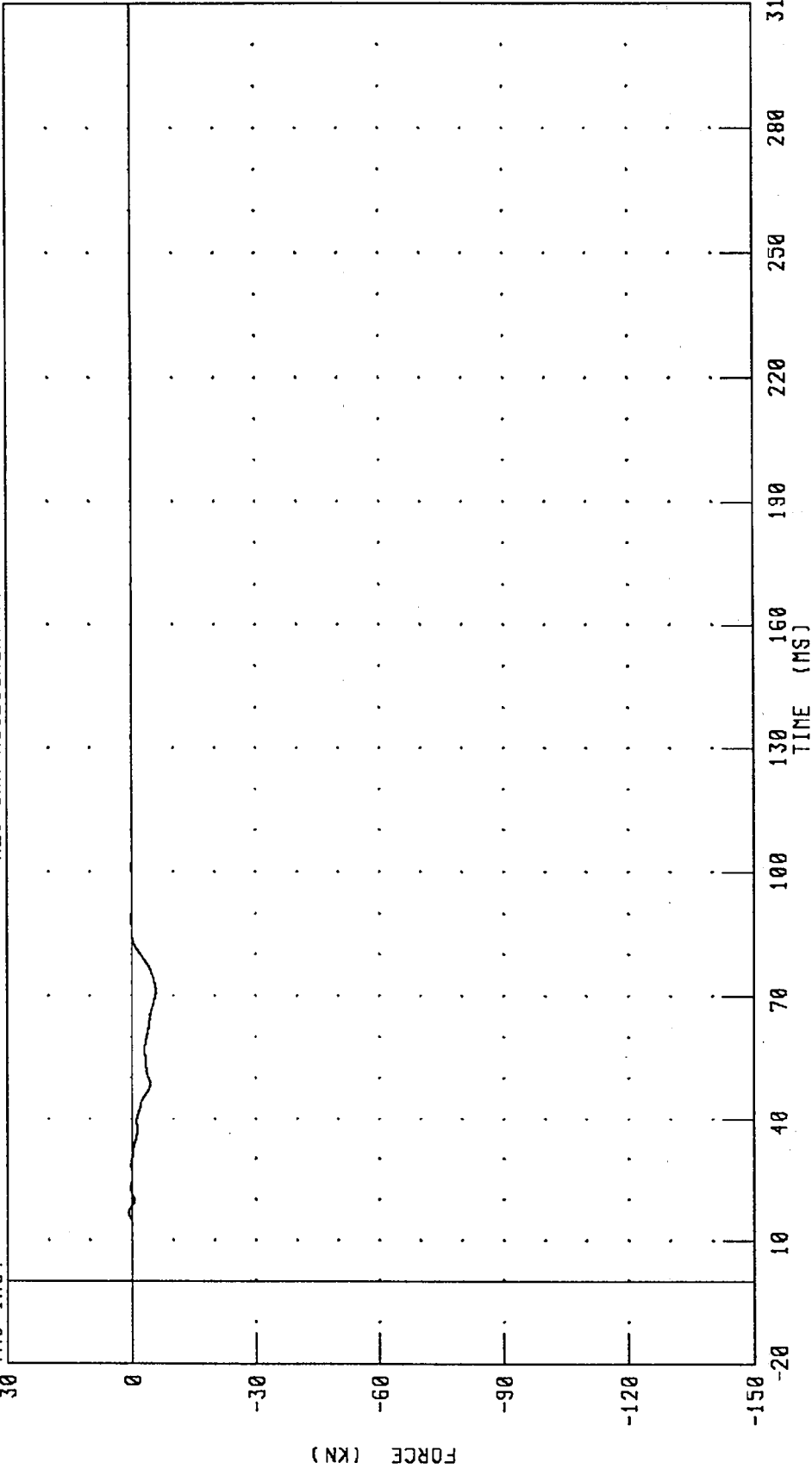
CHANNEL: BC9F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D1 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



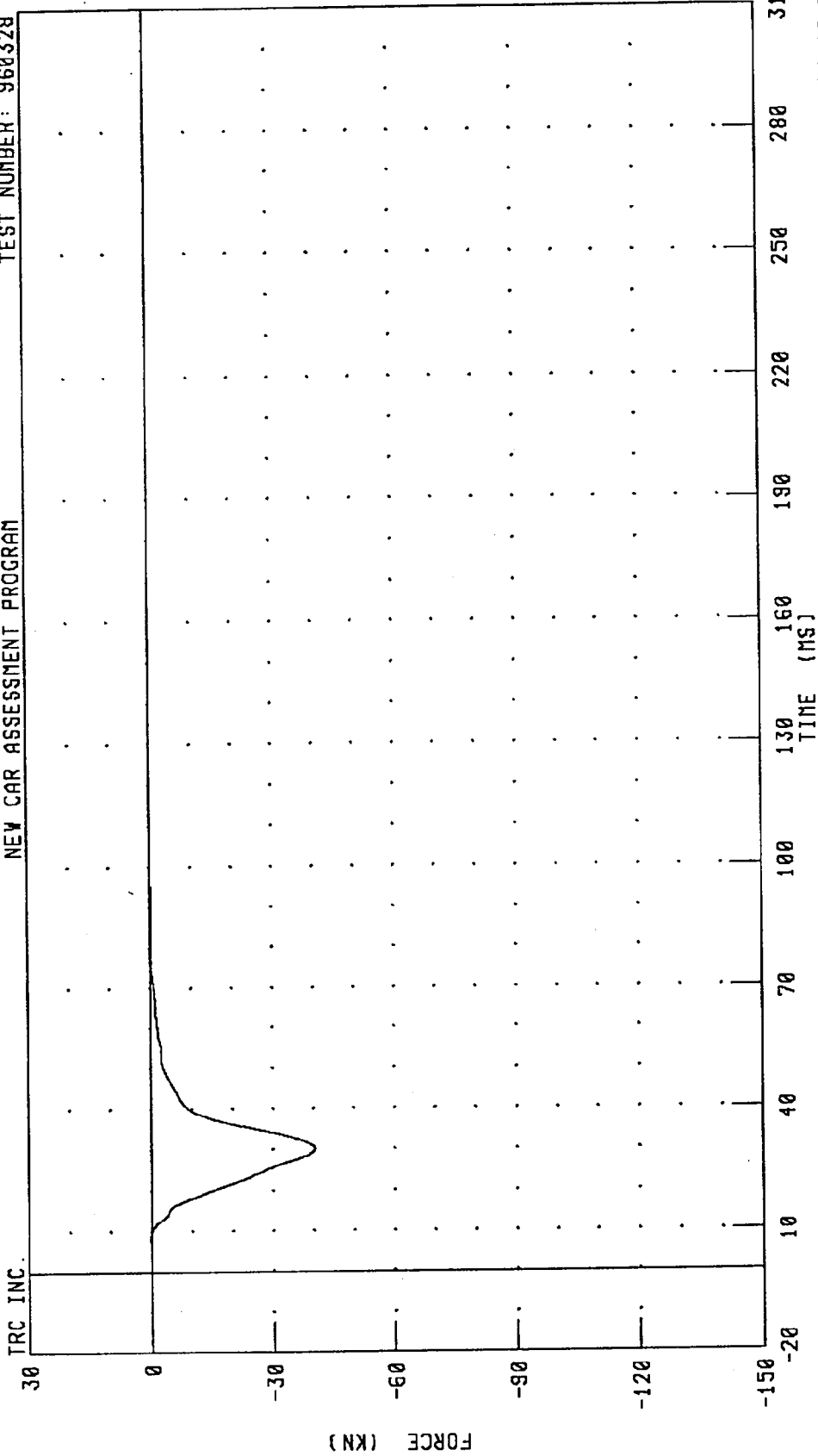
PEAK DATA: 0.86 KN @ 16.88 MS; -5.82 KN @ 71.28 MS

CHANNEL: BD1F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D2 FORCE

NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



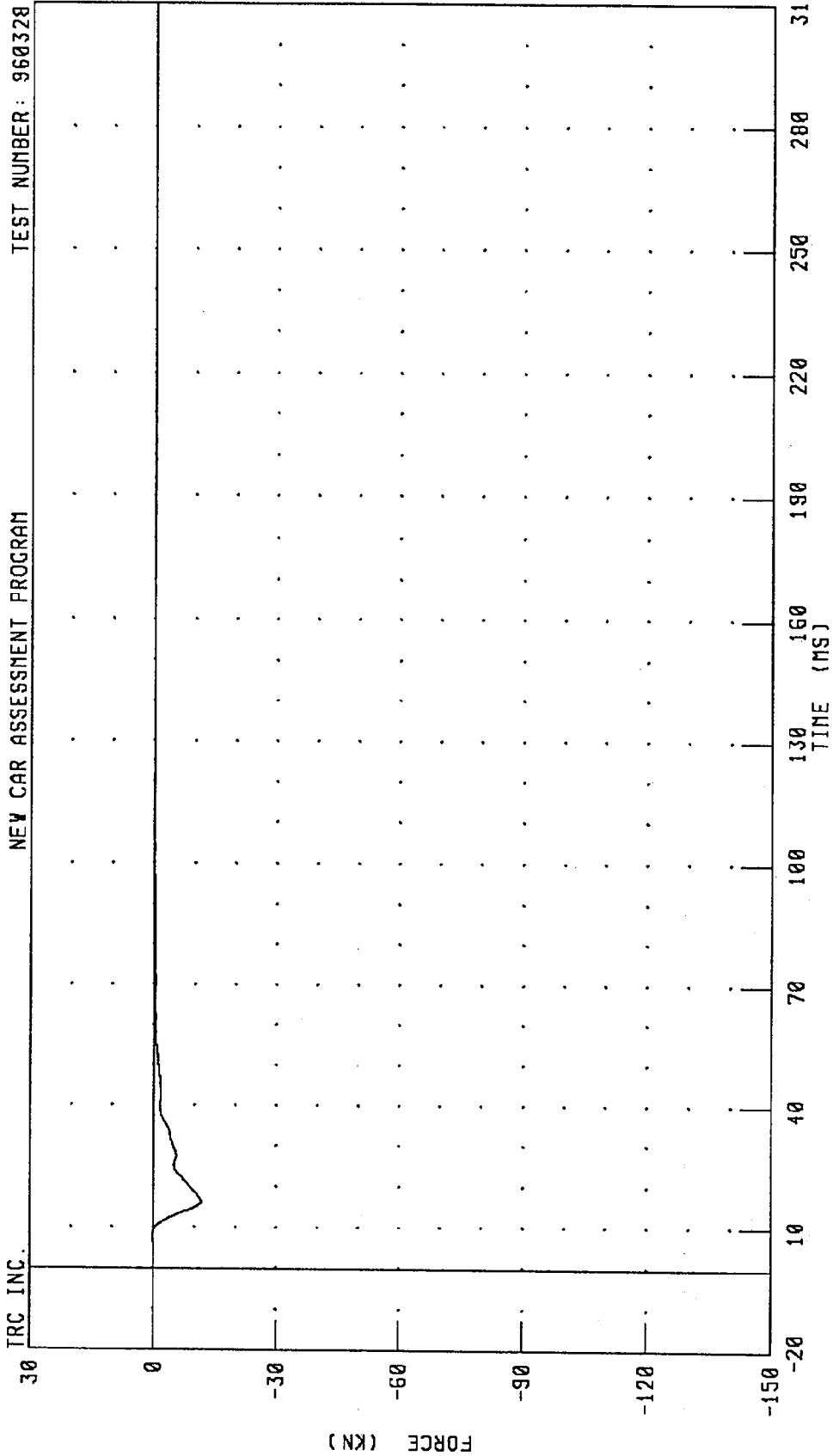
PEAK DATA: 0.12 KN @ 8.24 MS; -40.31 KN @ 30.16 MS

CHANNEL: 802F FILTER: CH. CLASS 60

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D3 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



TRC INC.

CHANNEL: BD3F FILTER: CH. CLASS 60

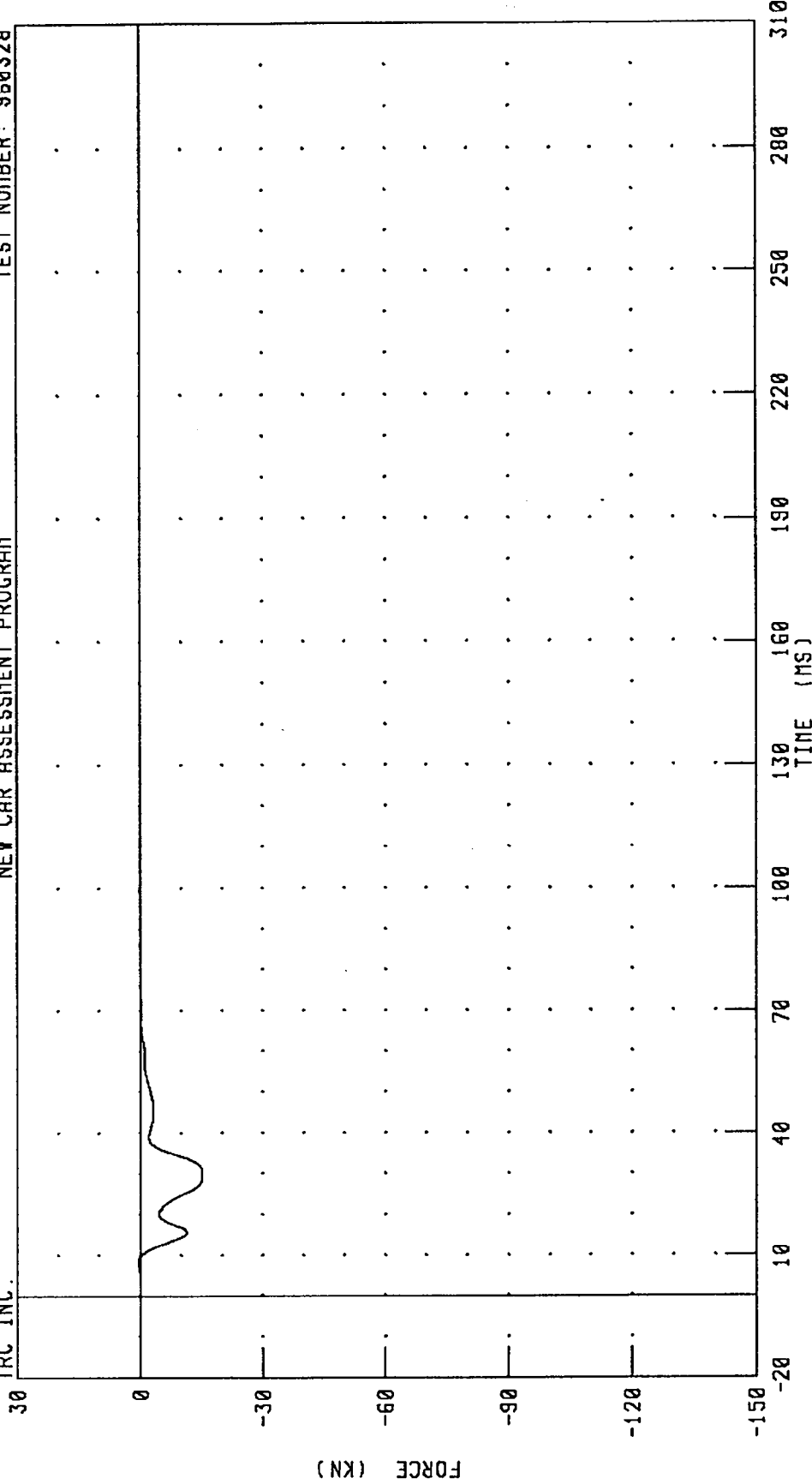
960328

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D4 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

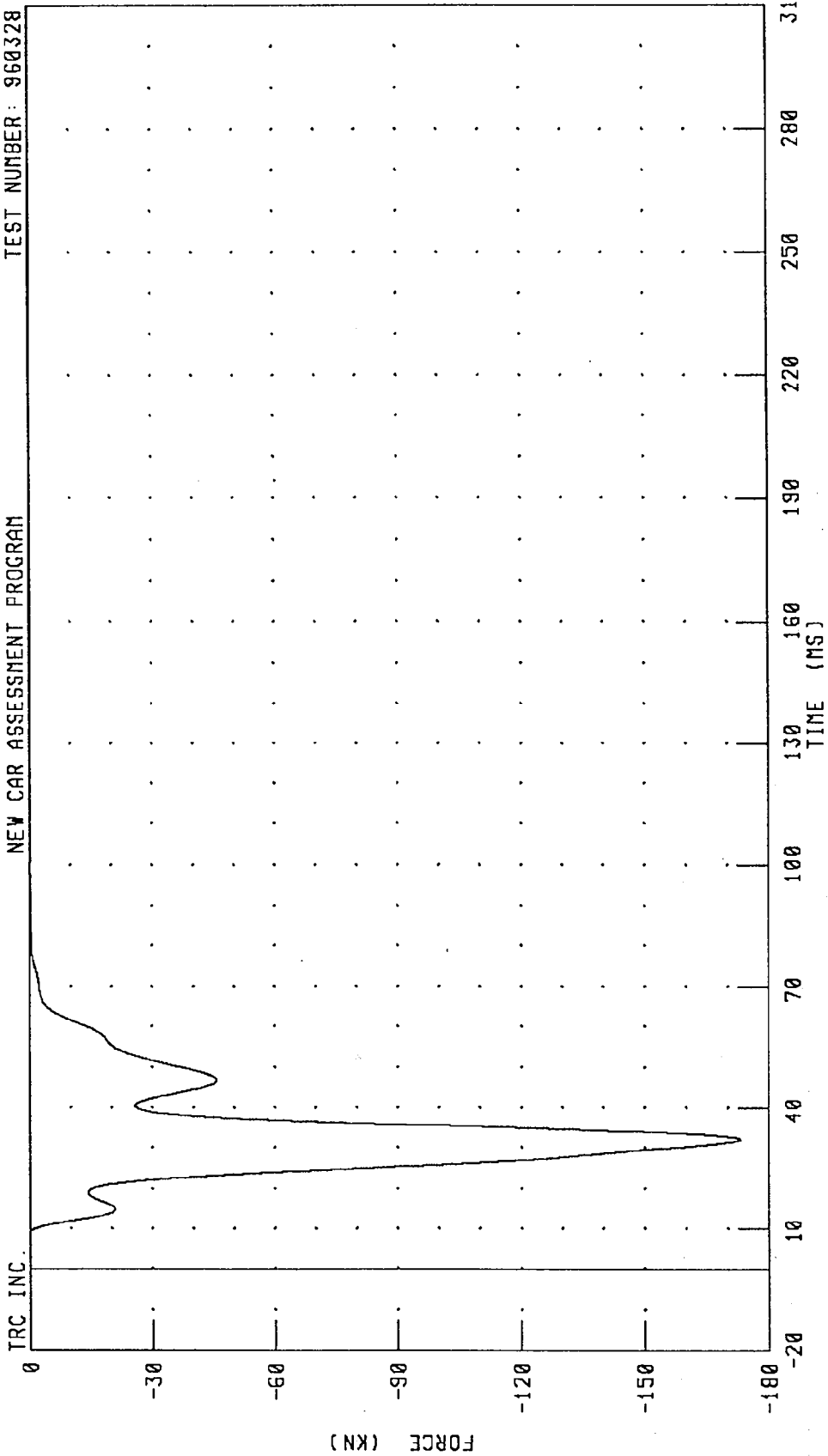


PEAK DATA: 0.40 KN @ 8.32 MS; -15.00 KN @ 30.96 MS

CHANNEL: BD4F FILTER: CH. CLASS 60

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D5 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

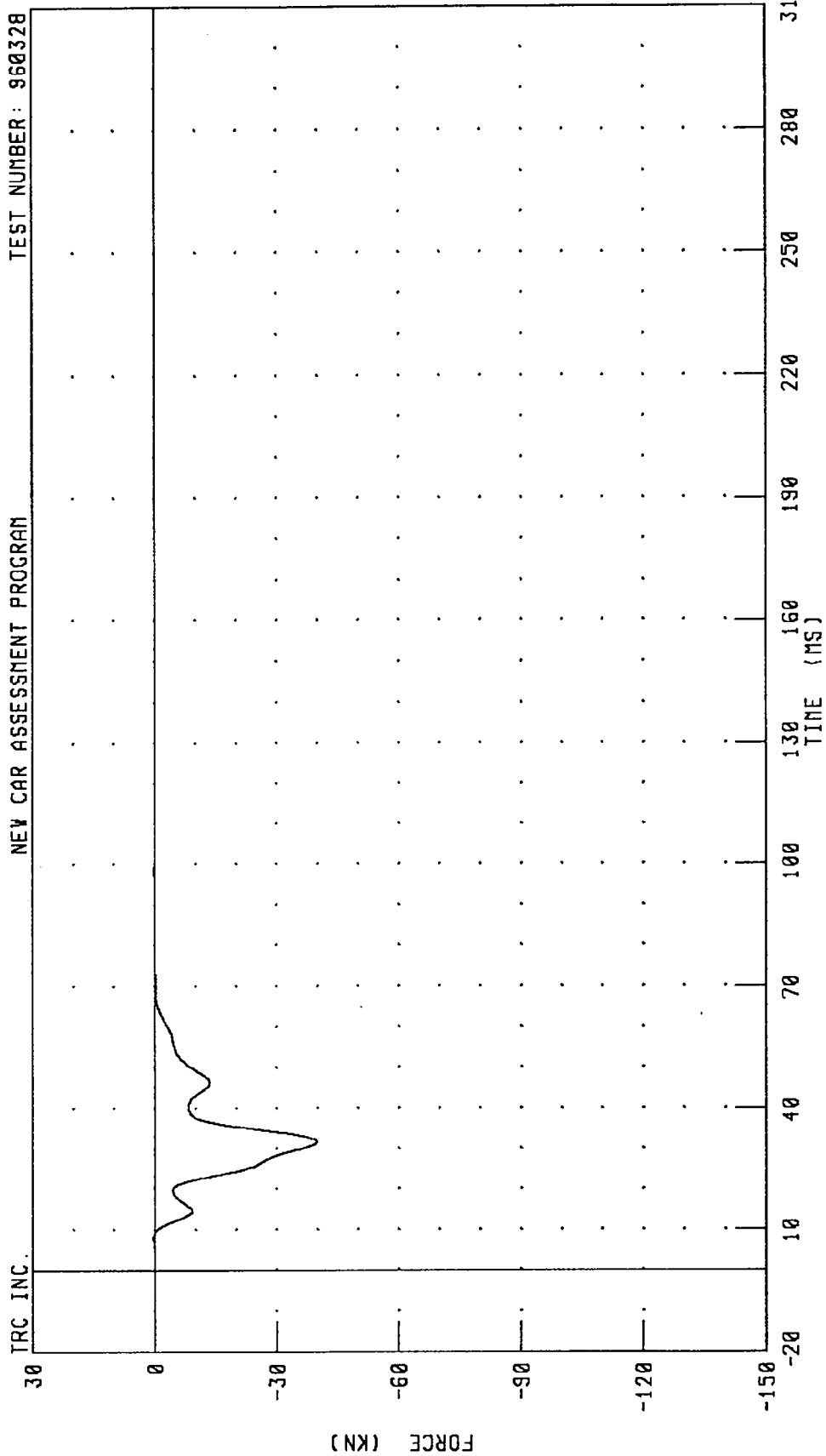


CHANNEL: B05F FILTER: CH. CLASS 60

PEAK DATA: 0.76 KN @ 7.92 MS; -173.05 KN @ 32.08 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D6 FORCE
NEV CAR ASSESSMENT PROGRAM

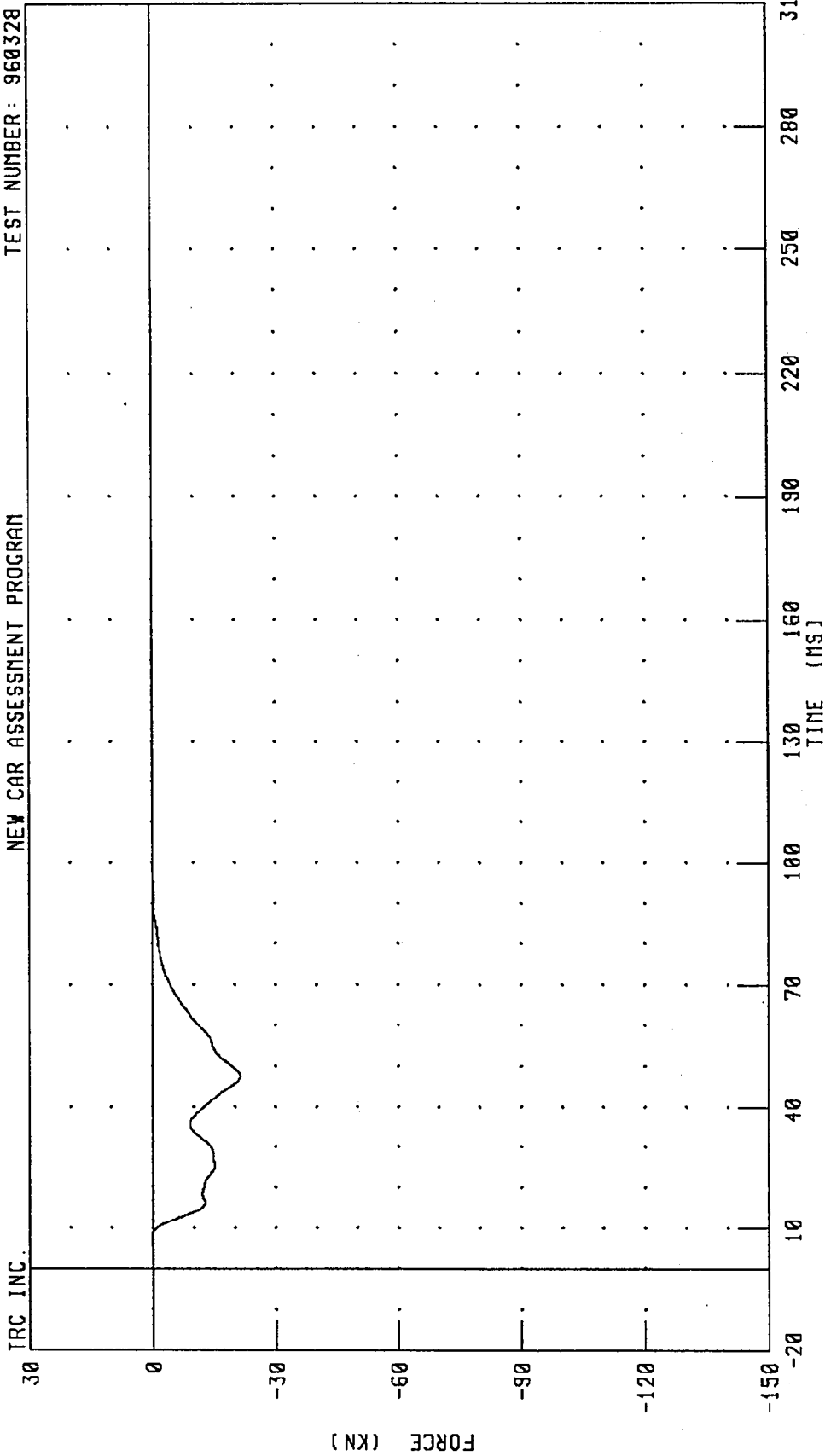
TEST NUMBER: 960328



CHANNEL: BDGF FILTER: CH. CLASS 60 PEAK DATA: 0.35 KN @ 7.92 MS; -39.95 KN @ 31.84 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER POSITION D7 FORCE
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



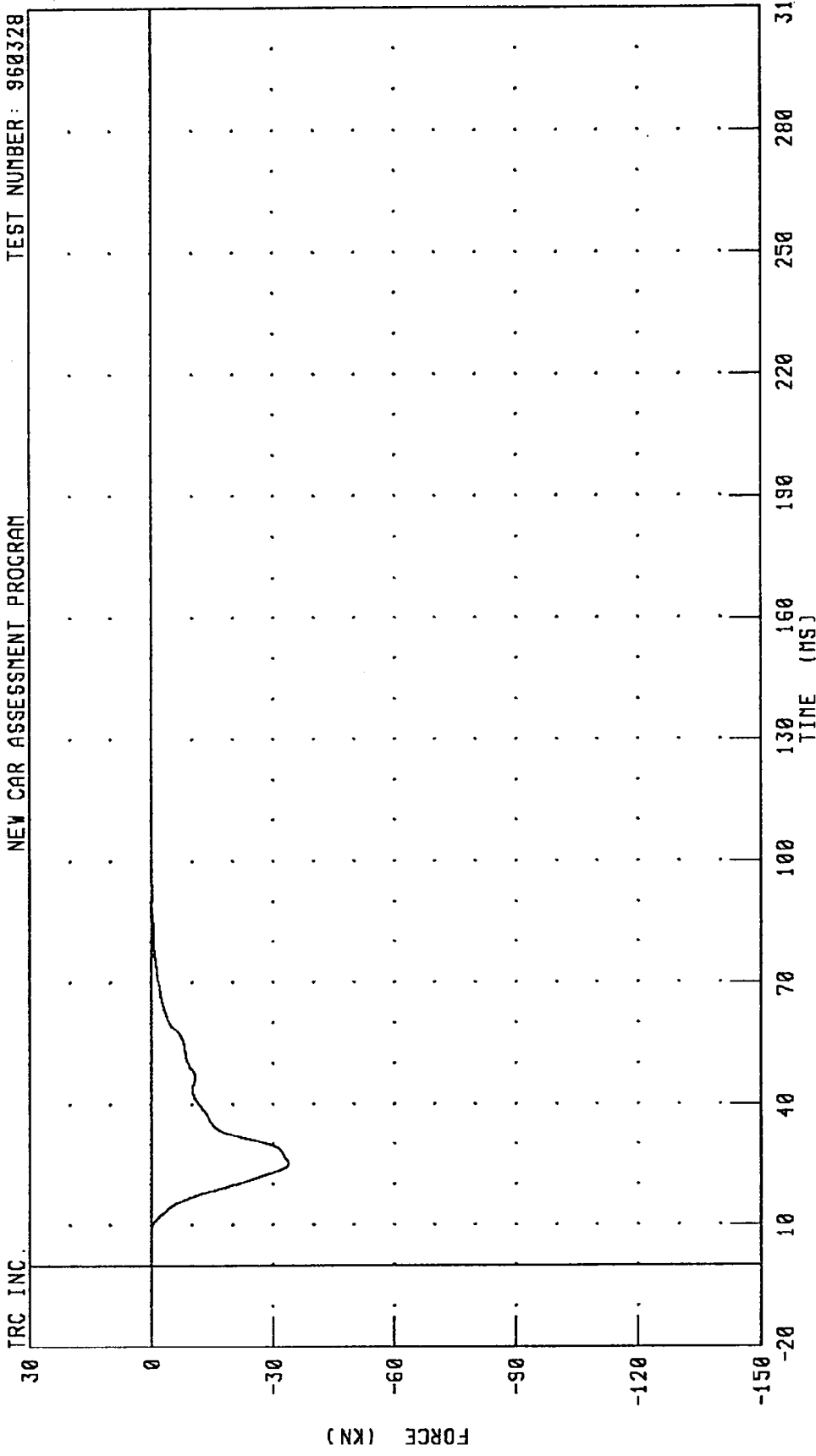
CHANNEL: BD7F FILTER: CH. CLASS 60
PEAK DATA: 0.26 KN @ 7.60 MS; -21.28 KN @ 47.52 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D8 FORCE

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM



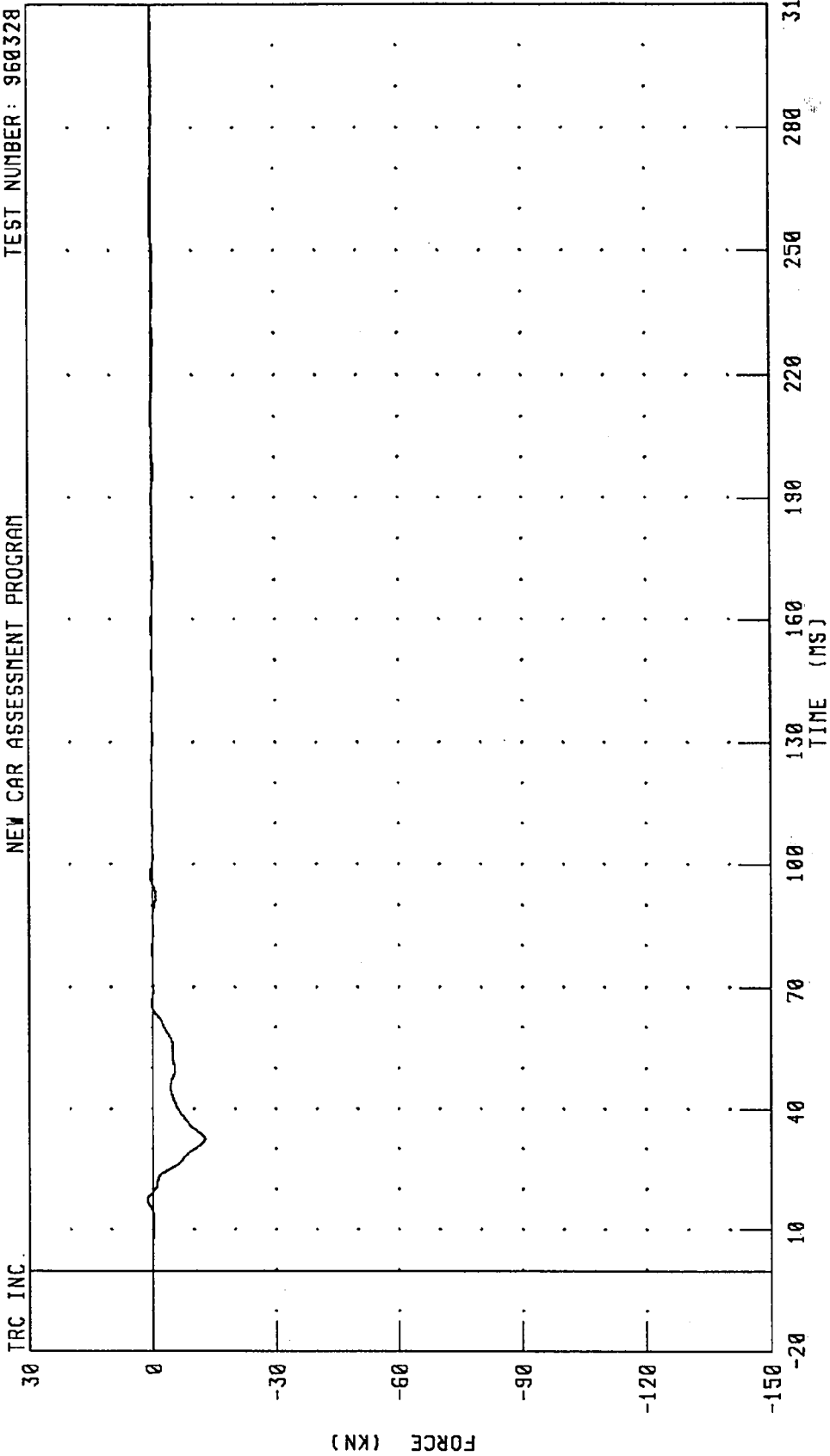
PEAK DATA: 0.08 KN @ 257.12 MS; -33.75 KN @ 25.20 MS

CHANNEL: BD8F FILTER: CH. CLASS 60

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 LOAD CELL BARRIER POSITION D9 FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: BD9F FILTER: CH. CLASS 60
 PEAK DATA: 1.29 KN @ 17.36 MS; -12.65 KN @ 32.48 MS

TRC INC.

FORCE (KN)

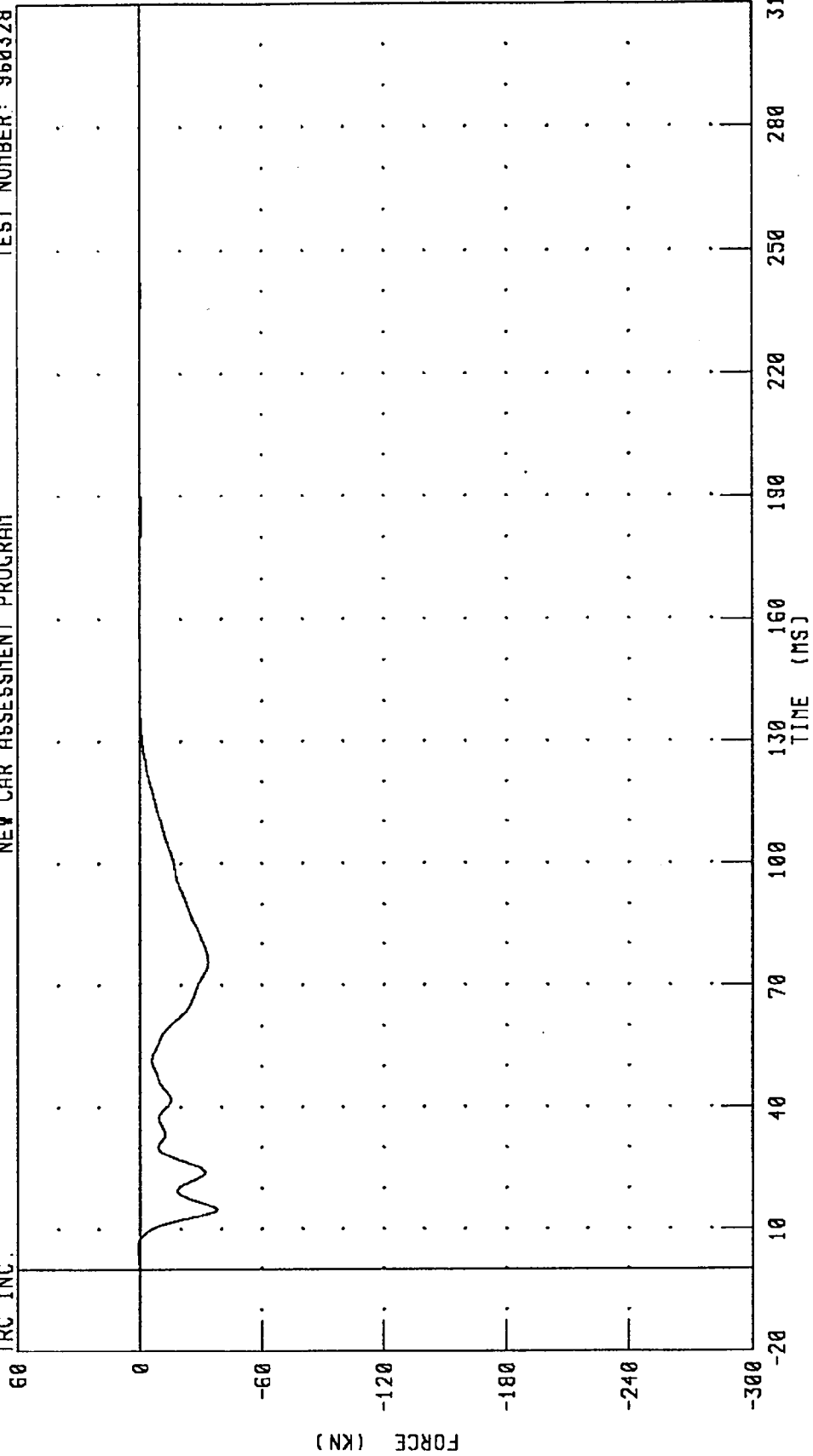
TIME (MS)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 1 FORCE TOTAL

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.

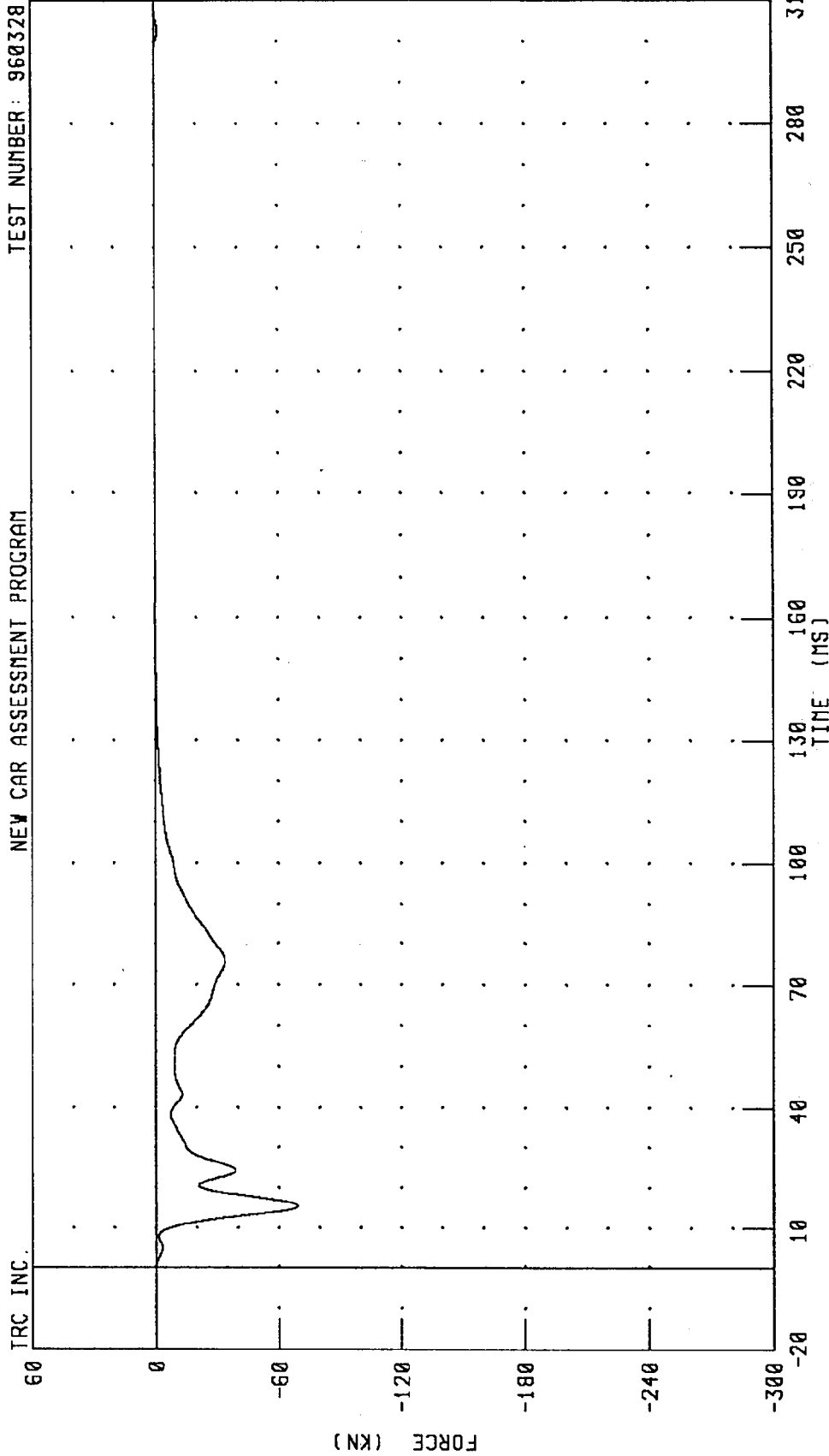


CHANNEL: LCBGIF FILTER: CH. CLASS 60

PEAK DATA: 1.15 KN @ 5.36 MS; -37.69 KN @ 14.88 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 2 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



TRC INC.

CHANNEL: LCBG2F FILTER: CH. CLASS 60

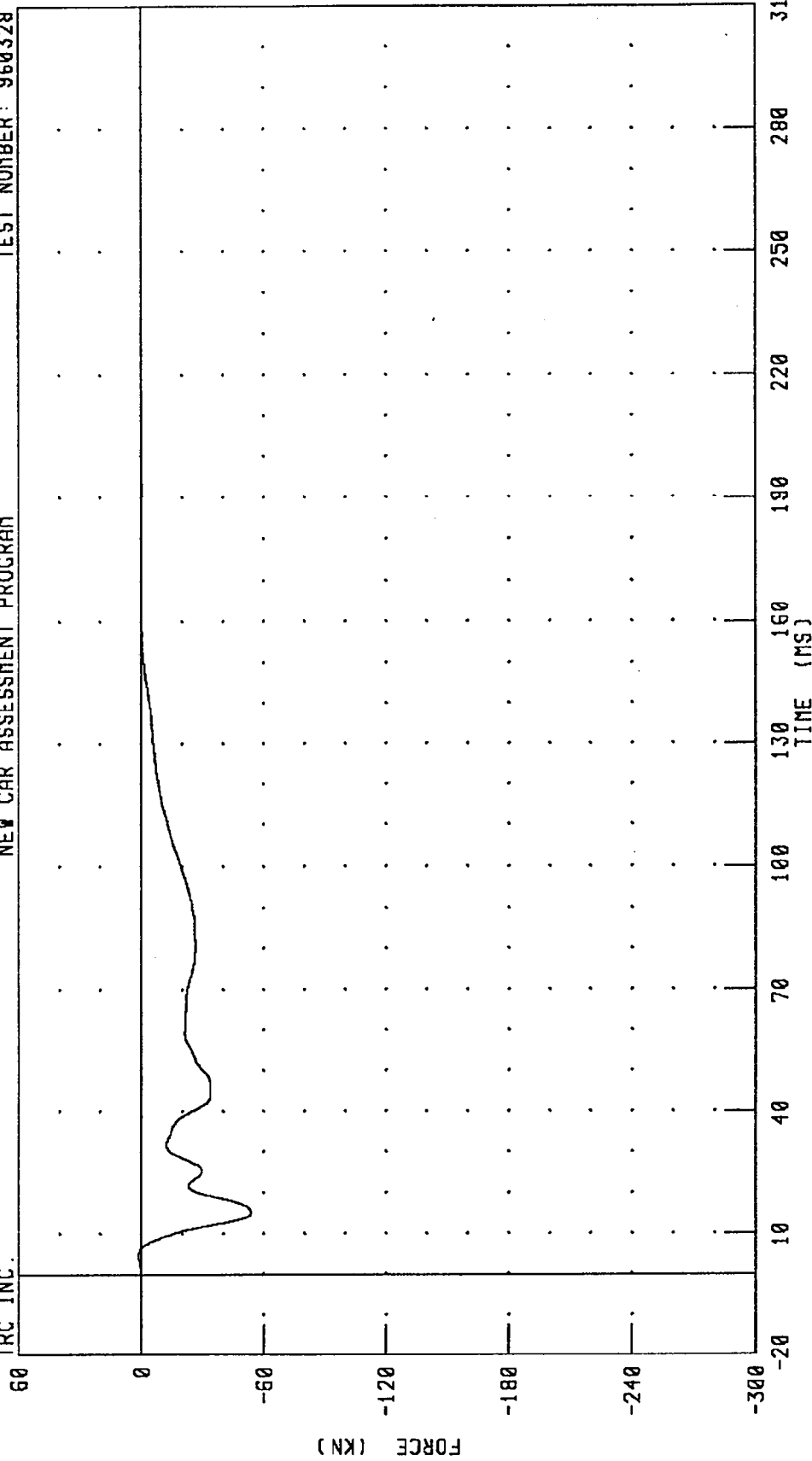
960328

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 3 FORCE TOTAL

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

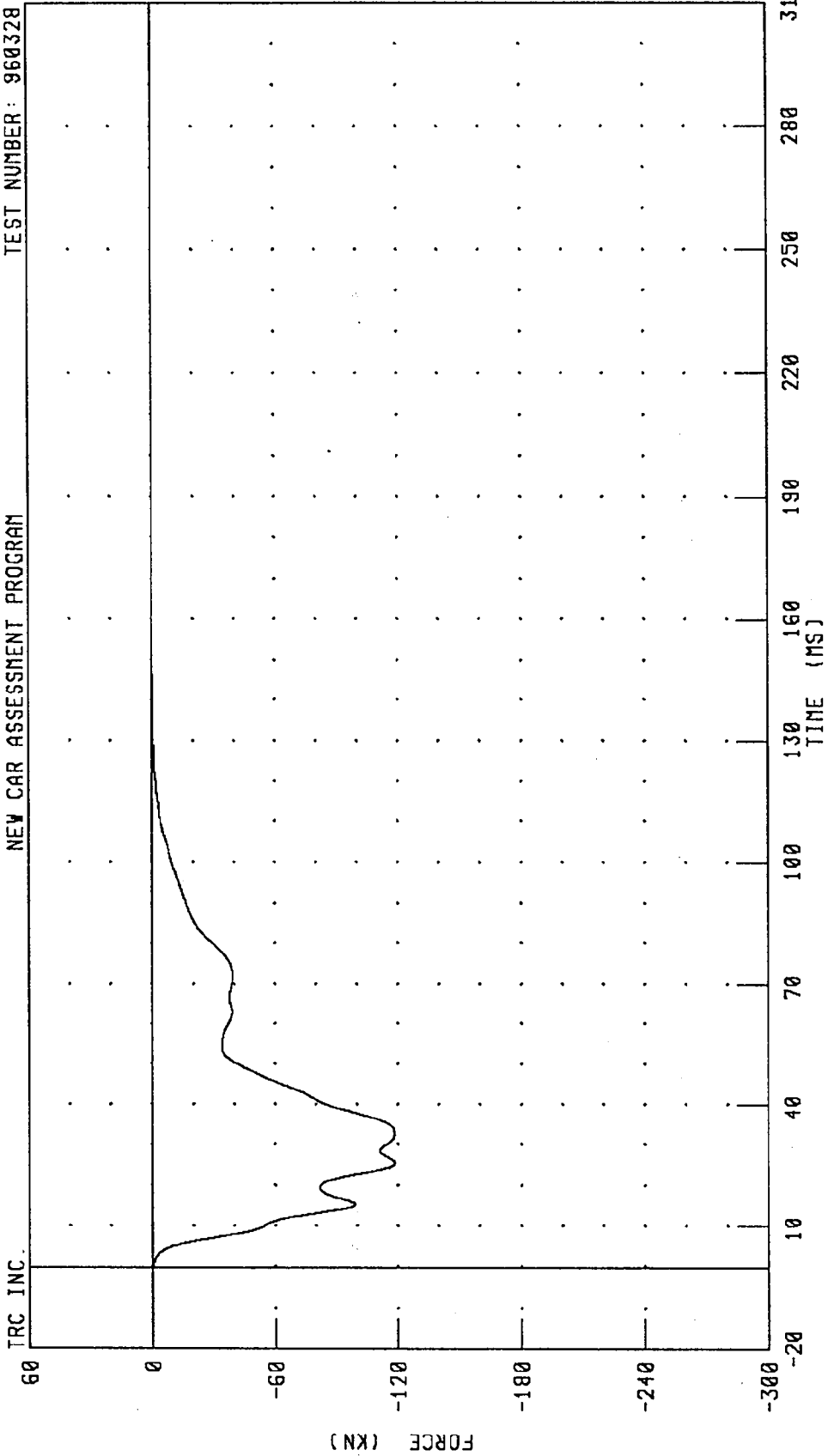
TRC INC.



CHANNEL: LCBG3F FILTER: CH. CLASS 60 PEAK DATA: 1.44 KN @ 4.48 MS; -53.70 KN @ 15.28 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 4 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



CHANNEL: LCBC4F FILTER: CH. CLASS 60
PEAK DATA: 0.08 KN @ -1.76 MS; -118.69 KN @ 25.44 MS

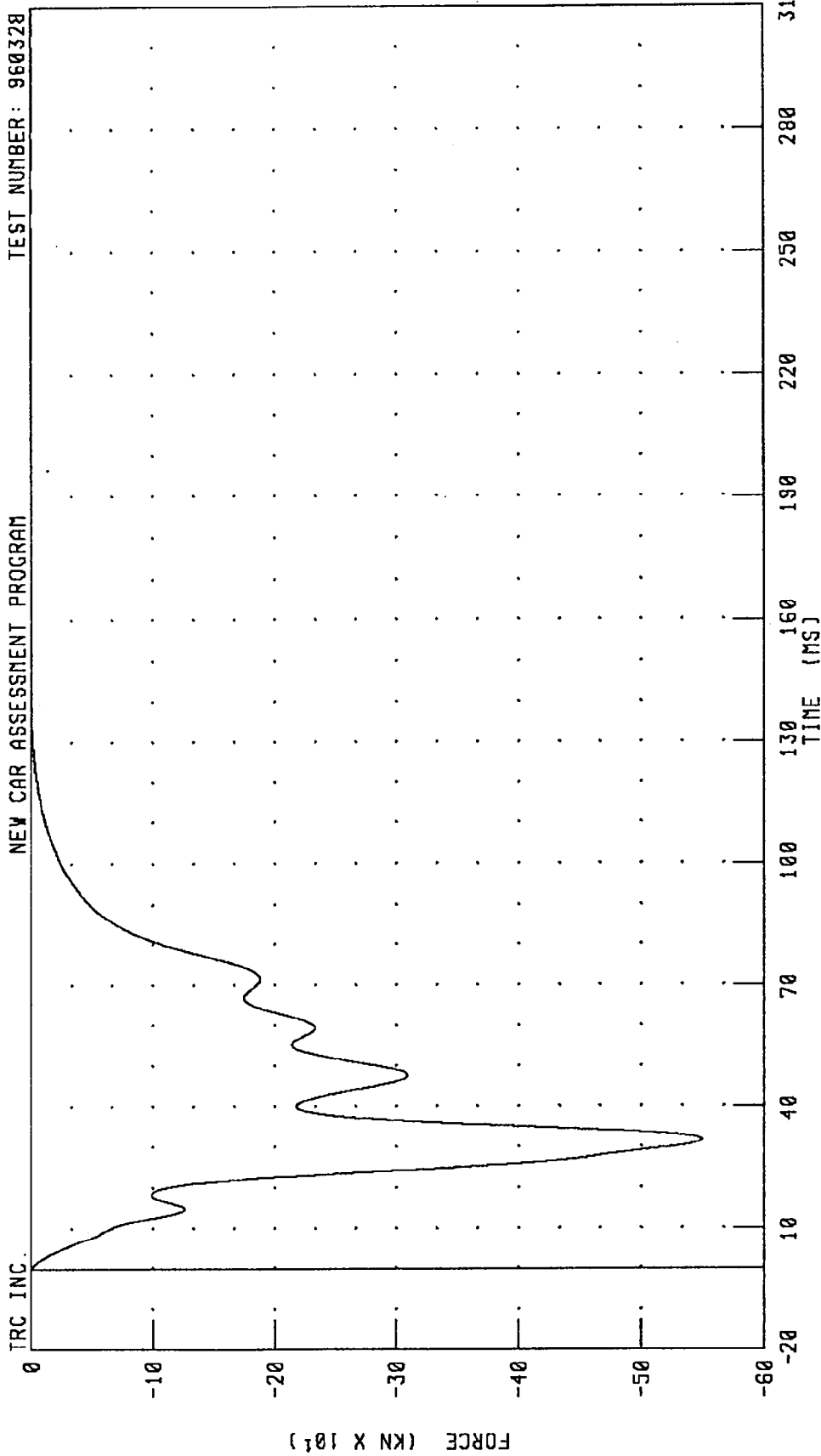
TRC INC.

FORCE (KN)

TIME (MS)

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 5 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

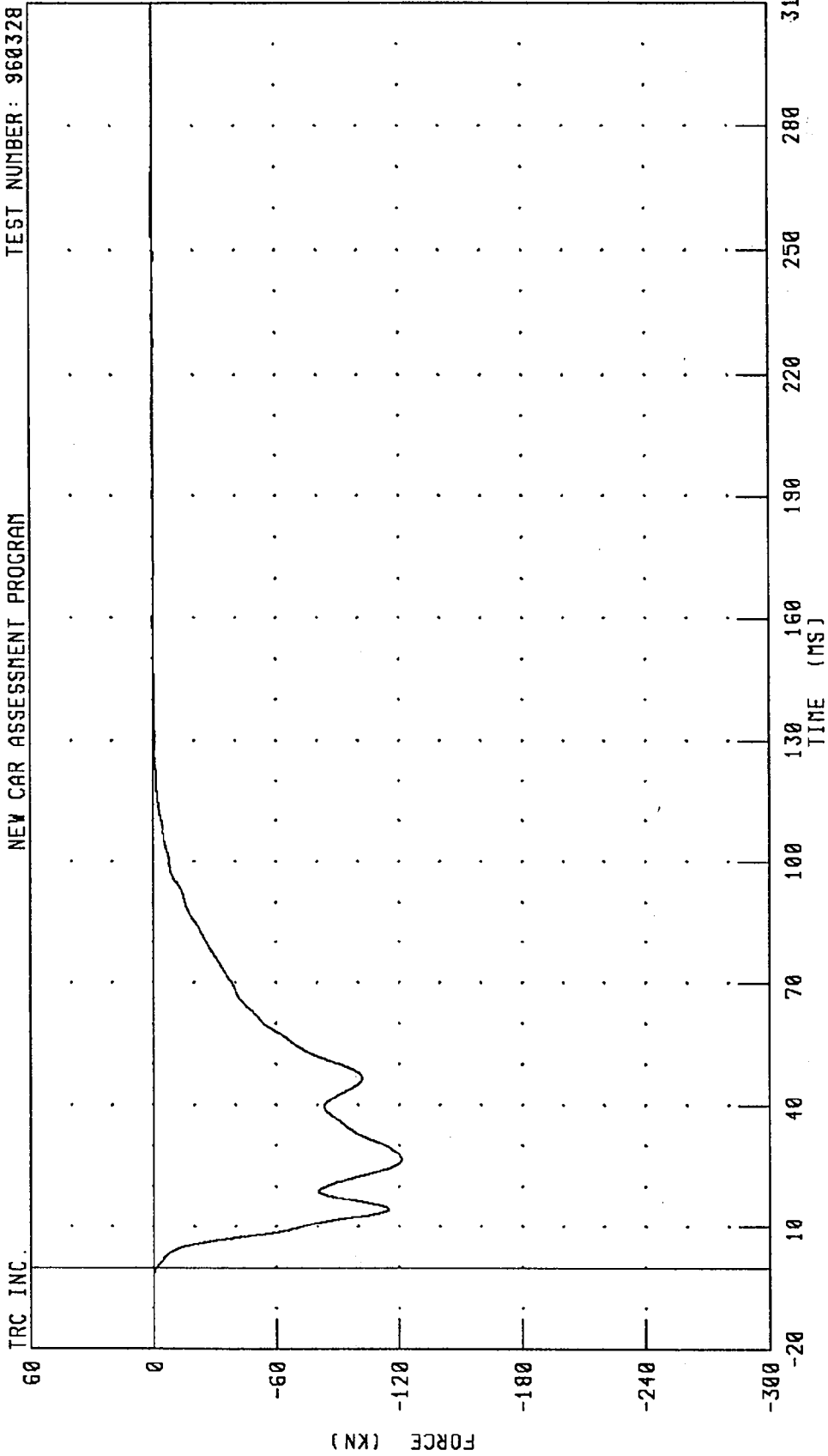
TEST NUMBER: 960328



CHANNEL: LCBG5F FILTER: CH. CLASS 60 PEAK DATA: 0.46 KN @ -2.08 MS, -549.56 KN @ 31.68 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
LOAD CELL BARRIER GROUP # 6 FORCE TOTAL
NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328

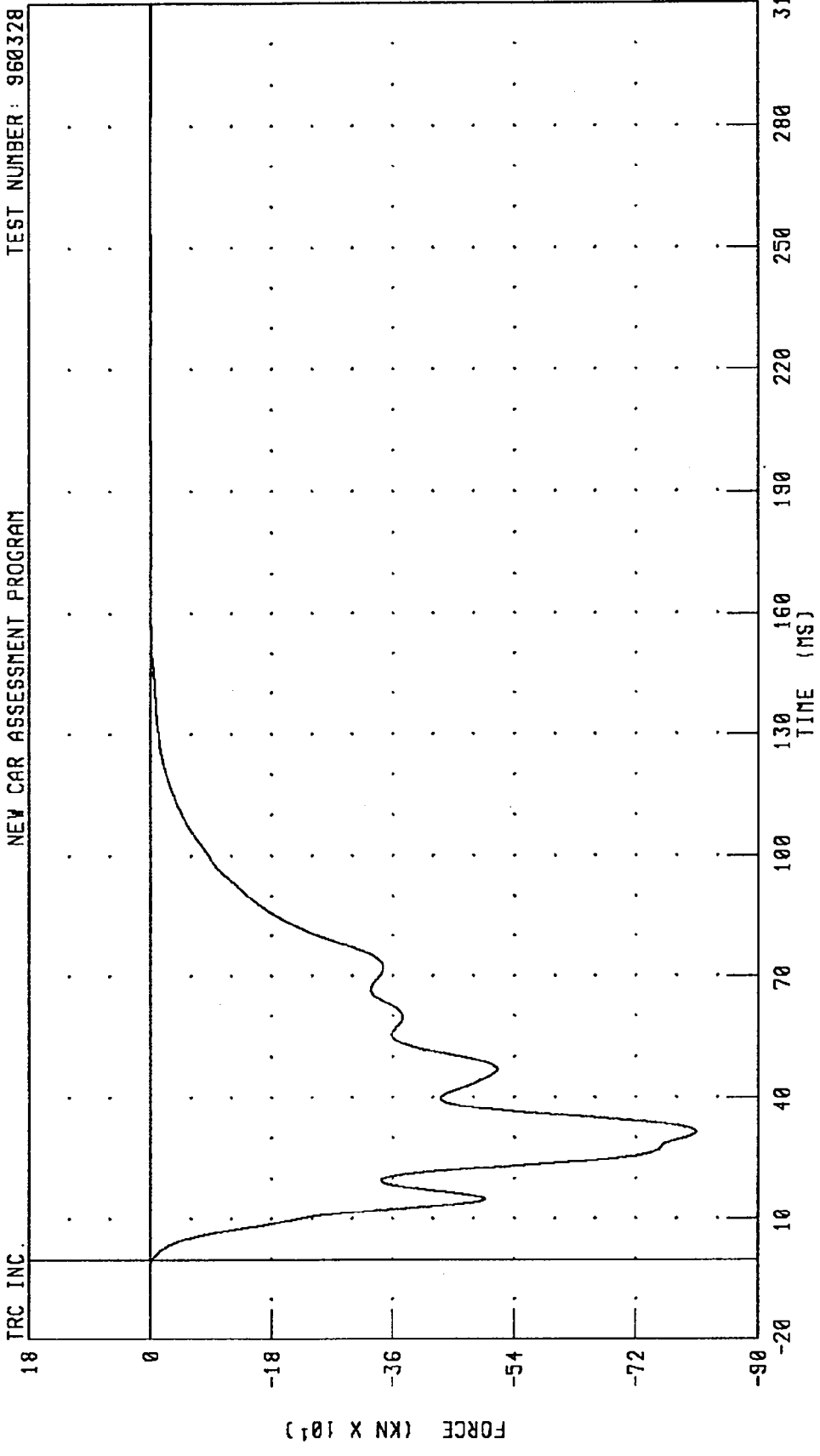


CHANNEL: LCBG6F FILTER: CH. CLASS 60
PEAK DATA: 0.51 KN @ 256.24 MS; -121.29 KN @ 26.72 MS

TRC INC.

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE
 NEW CAR ASSESSMENT PROGRAM

TEST NUMBER: 960328



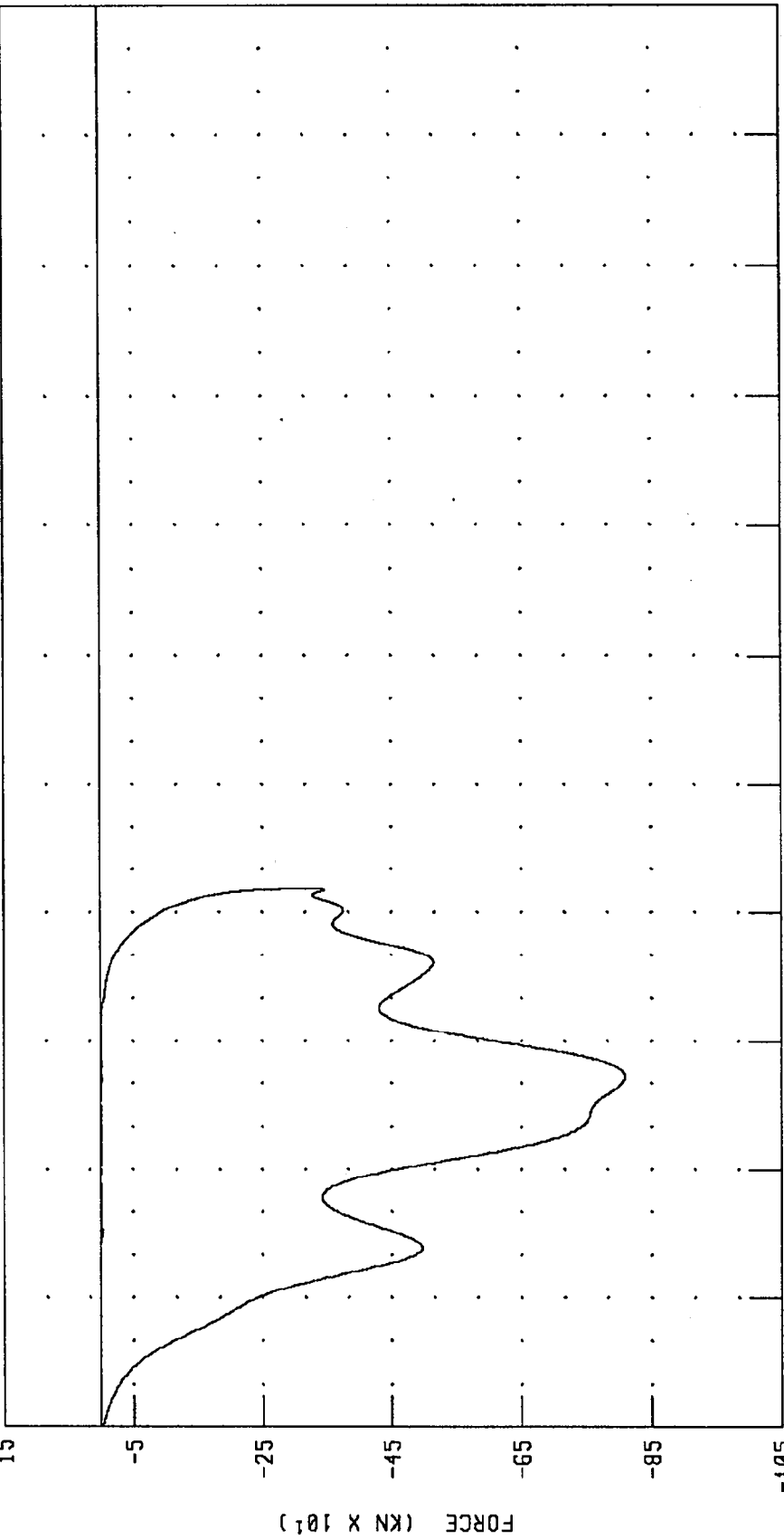
CHANNEL: LCBGT FILTER: CH. CLASS 60
 PEAK DATA: 0.59 KN @ -2.48 MS; -809.10 KN @ 31.52 MS

1996 JEEP GRAND CHEROKEE INTO FRONTAL LOAD CELL BARRIER
 TOTAL LOAD CELL BARRIER FORCE VS AVERAGE VEHICLE X-AXIS DISPLACEMENT

TEST NUMBER: 960328

NEW CAR ASSESSMENT PROGRAM

TRC INC.



DISPLACEMENT (MM X 10¹)

CHANNEL: 0THXD FILTER: CH. CLASS 180
 LCBGT CH. CLASS 60

PEAK DATA: 684.70 MM @ 76.00 MS; 0.00 MM @ 0.00 MS
 0.01 KN @ 265.84 MS; -809.10 KN @ 31.52 MS

Appendix C

Dummy Certification Data

Pre-test Certification Data

Driver Dummy S/N: 142

TRANSPORTATION RESEARCH CENTER INC.
 HYBRID III EXTERNAL DIMENSIONS
 142 HUMANOID

19-MAR-96

TRC INC. TEST NO: 142C33ED1 572E SN142 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	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 LeVan

RUN NUMBER: 032196.0811

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

19-MAR-96

TRC INC.

TEST NO: 142C33HD1

572E SN142 HEAD DROP CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	35.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	263.67 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.34 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard LeVan

RUN NUMBER: 031996.0734;1

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

TRC TEST NUMBER: 142C33HD1

572E SN142 HEAD DROP CAL 33

RUN NUMBER: 042296.1126;1

75

0

-75

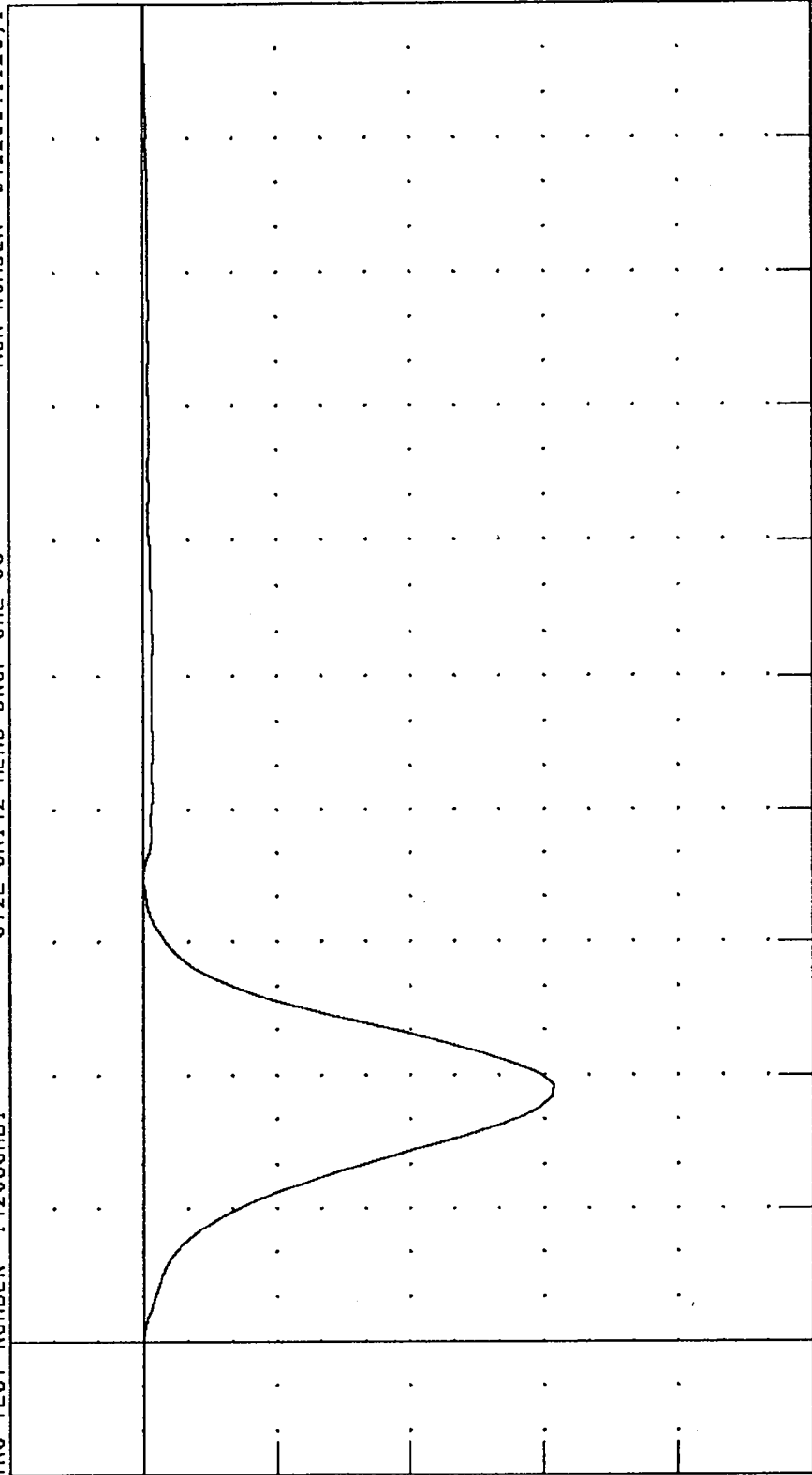
-150

-225

-300

-375

ACCELERATION (G)



100

90

80

70

60

50

40

30

20

10

0

-10

-375

-300

-225

-150

-75

0

75

150

225

300

375

450

525

600

675

750

825

900

975

1050

1125

1200

1275

1350

1425

1500

1575

1650

1725

1800

1875

1950

2025

2100

2175

2250

2325

2400

2475

2550

2625

2700

2775

2850

2925

3000

3075

3150

3225

3300

3375

3450

3525

3600

3675

3750

3825

3900

3975

4050

4125

4200

4275

4350

4425

4500

4575

4650

4725

4800

4875

4950

5025

5100

5175

5250

5325

5400

5475

5550

5625

5700

5775

5850

5925

6000

6075

6150

6225

6300

6375

6450

6525

6600

6675

6750

6825

6900

6975

7050

7125

7200

7275

7350

7425

7500

7575

7650

7725

7800

7875

7950

8025

8100

8175

8250

8325

8400

8475

8550

8625

8700

8775

8850

8925

9000

9075

9150

9225

9300

9375

9450

9525

9600

9675

9750

9825

9900

9975

10000

10075

10800

10875

11000

11075

11200

11275

11400

11475

11600

11675

11800

11875

12000

12075

12200

12275

12400

12475

12600

12675

12800

12875

13000

13075

13200

13275

13400

13475

13600

13675

13800

13875

14000

14075

14200

14275

14400

14475

14600

14675

14800

14875

15000

15075

15200

15275

15400

15475

15600

15675

15800

15875

16000

16075

16200

16275

16400

16475

16600

16675

16800

16875

17000

17075

17200

17275

17400

17475

17600

17675

17800

17875

18000

18075

18200

18275

18400

18475

18600

18675

18800

18875

19000

19075

19200

19275

19400

19475

19600

19675

19800

19875

20000

20075

20200

20275

20400

20475

20600

20675

20800

20875

21000

21075

21200

21275

21400

21475

21600

21675

21800

21875

22000

22075

22200

22275

22400

22475

22600

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22875

23000

23075

23200

23275

23400

23475

23600

23675

23800

23875

24000

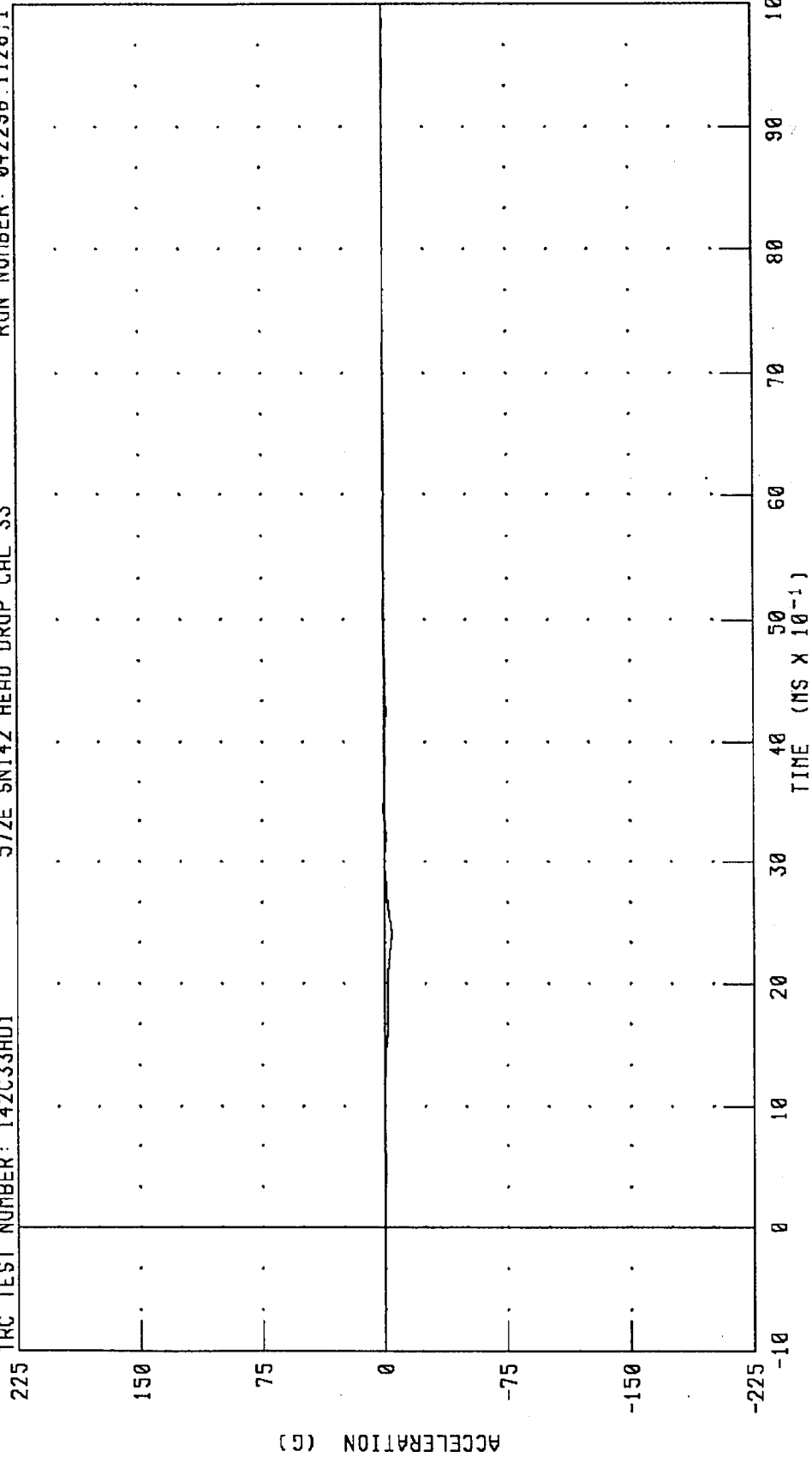
24075

24200

24275</

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

TRC TEST NUMBER: 142C33HD1 572E SN142 HEAD DROP CAL 33 RUN NUMBER: 042296.1126.1



PEAK DATA: 0.98 G @ 6.80 MS; -4.34 G @ 2.40 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

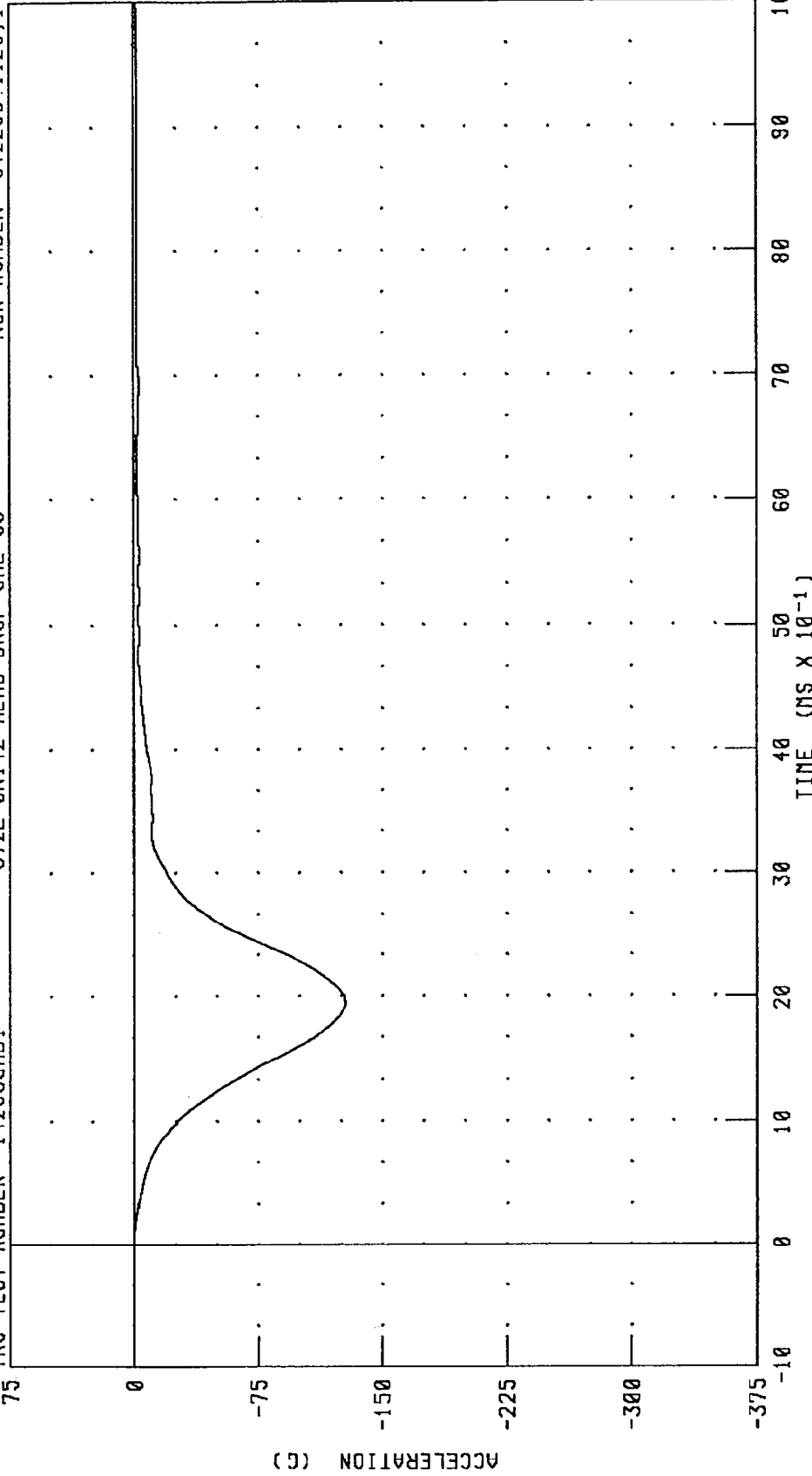
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 142C33HD1

572E SN142 HEAD DROP CAL 33

RUN NUMBER: 042296.1126;1

75



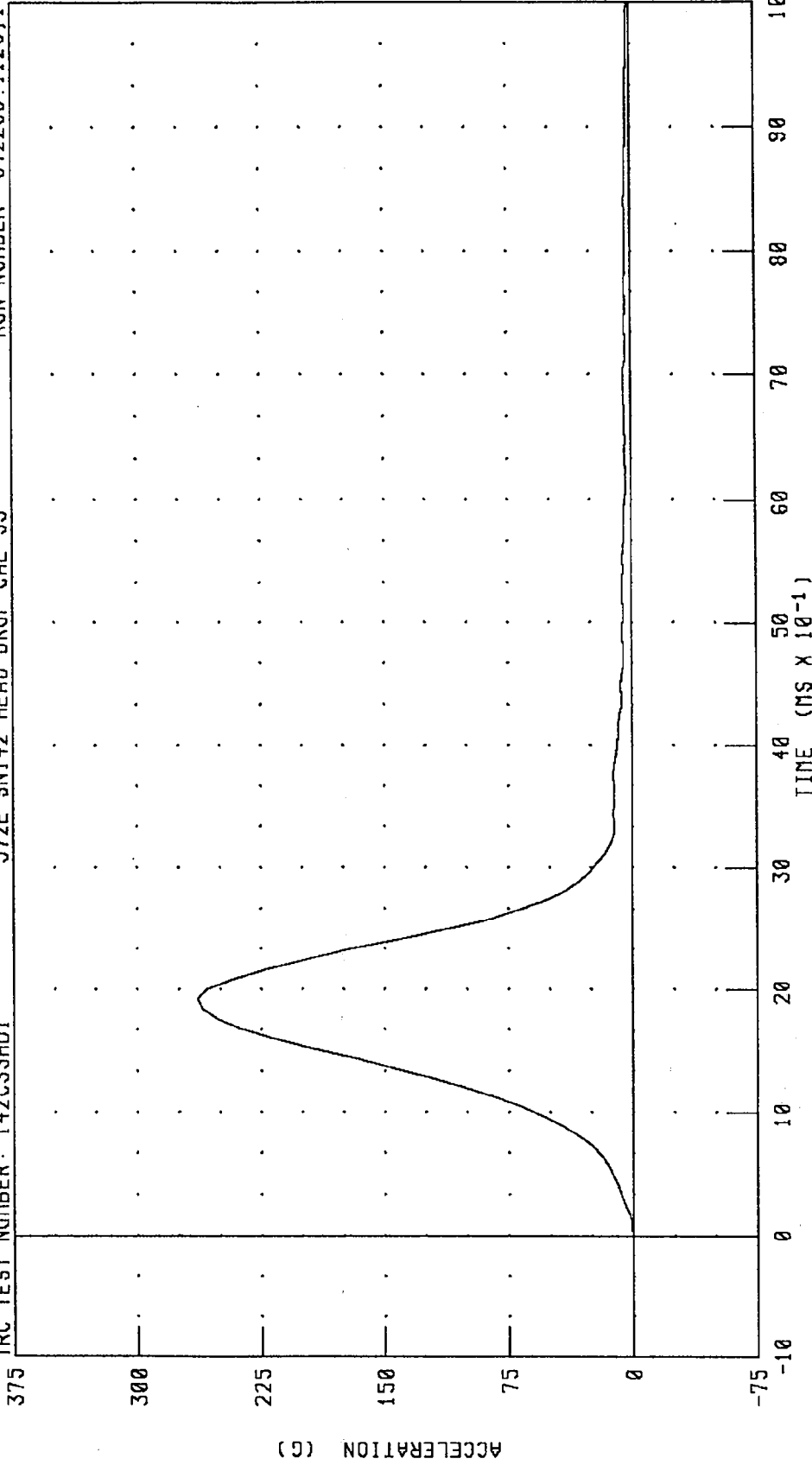
CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 0.05 G @ -0.96 MS; -127.87 G @ 1.92 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 142C33HD1

572E SN142 HEAD DROP CAL 33

RUN NUMBER: 042296.1126;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 263.68 G @ 1.92 MS; 0.02 G @ -0.56 MS

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

HYBRID III

19-MAR-96

TRC INC. TEST NO: 142C33NF1 572E SN142 NECK FLEXION CAL33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	36.0 %
IMPACT VELOCITY	6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS 22.50 - 27.50 G	23.29 G
	20 MS 17.60 - 22.60 G	19.16 G
	30 MS 12.50 - 18.50 G	13.06 G
MAX PENDULUM G	29 G MAX	24.21 G
MAX PENDULUM G ABOVE 30 MS	29 G MAX	13.03 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G	34 - 42 MS	40.72 MS
D PLANE	MAX 64 - 78 DEG.	74.82 DEG.
ROTATION	TIME 57 - 64 MS	60.48 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX 88.2 - 108.5 NM	96.03 NM
	TIME 47 - 58 MS	54.48 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO	113 - 128 MS	115.92 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO	97 - 107 MS	103.92 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

RUN NUMBER: 031996.0838;2

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C33NF1

572E SN142 NECK FLEXION CAL33

RUN NUMBER: 042296.1126;2

400

320

ACCELERATION (G X 10⁻¹)

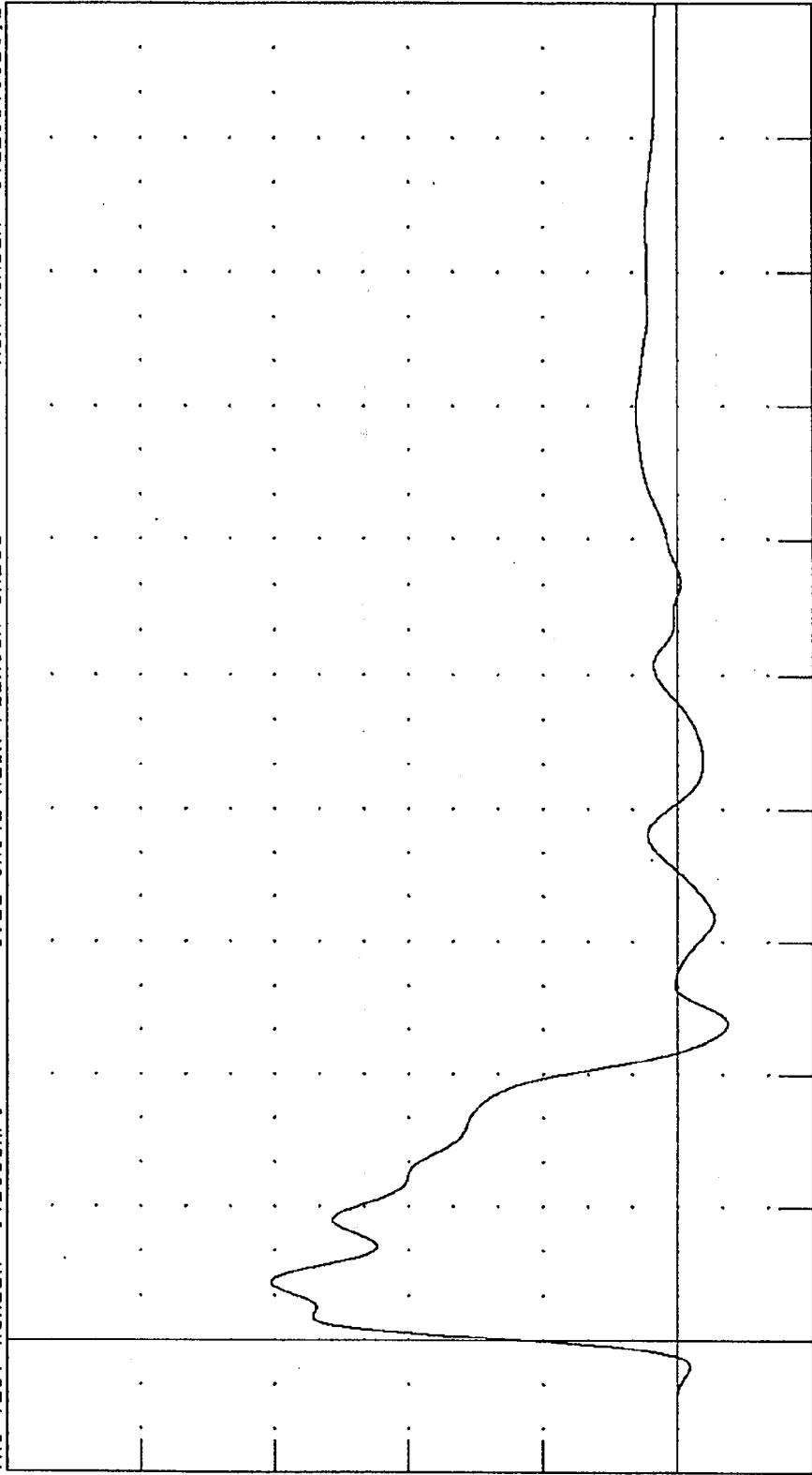
240

160

80

0

-80



200 180 160 140 120 100 80 60 40 20 0

TIME (MS)

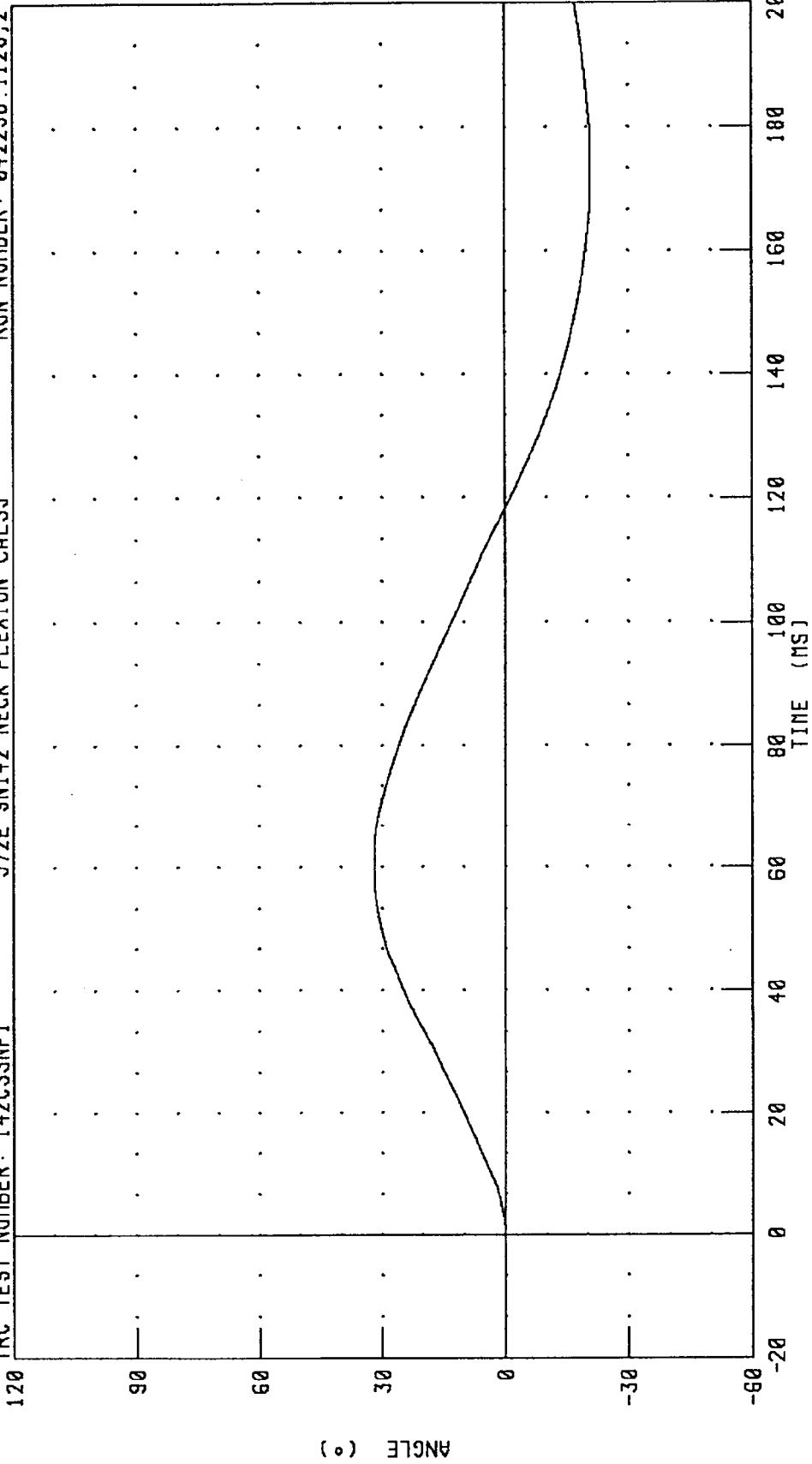
CHANNEL: PENXC FILTER: CH. CLASS 60

PEAK DATA: 24.22 G @ 8.72 MS; -2.96 G @ 47.68 MS

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

TRC TEST NUMBER: 142C33NF1 RUN NUMBER: 042296.1126;2

572E SN142 NECK FLEXION CAL33



PEAK DATA: 31.89 ° @ 61.04 MS; -20.77 ° @ 169.36 MS

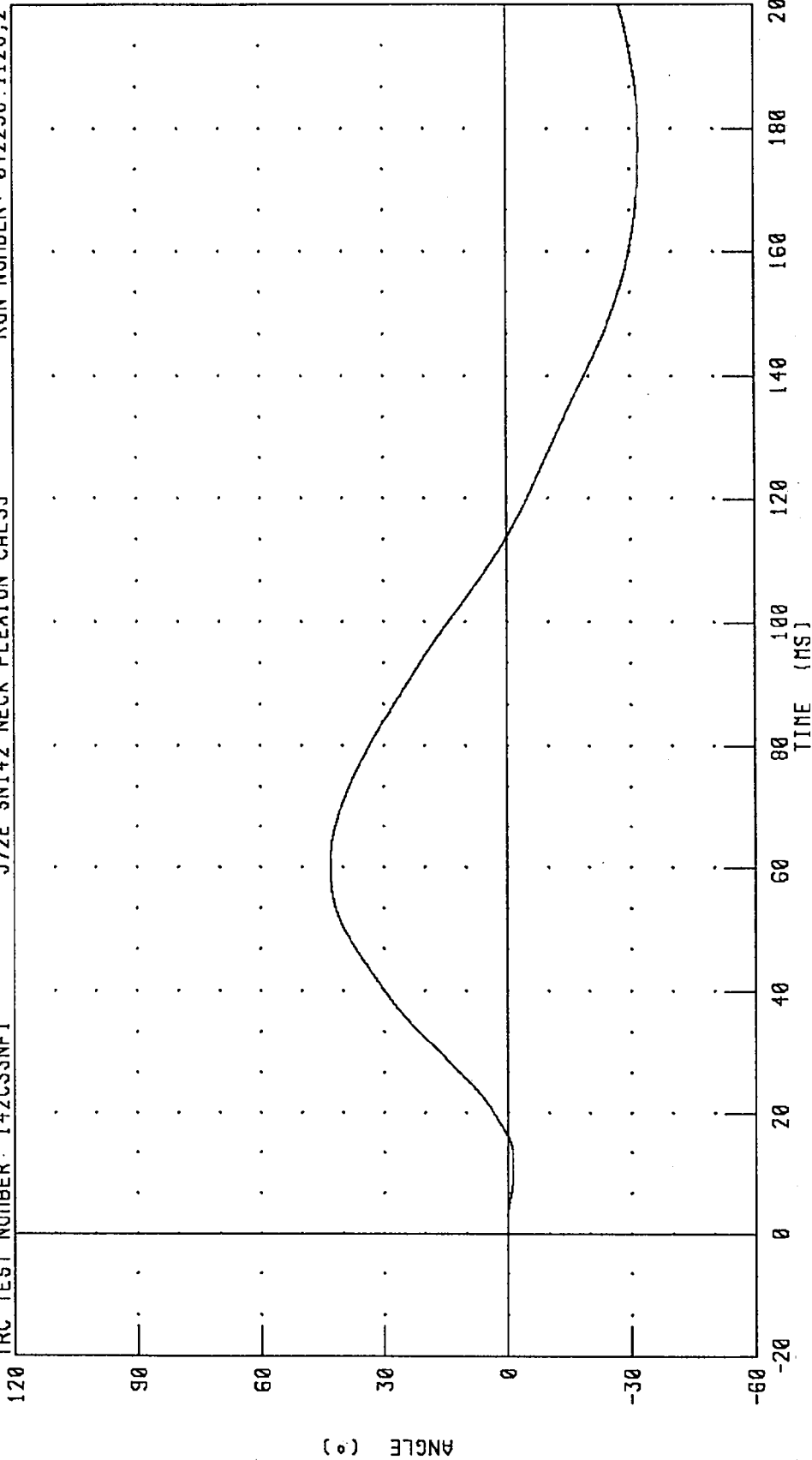
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 142C33NF1

572E SN142 NECK FLEXION CAL33

RUN NUMBER: 042296.1126;2



PEAK DATA: 42.93 ° @ 60.24 MS; -32.11 ° @ 177.44 MS

CHANNEL: THETA FILTER: CH. CLASS 60

ANGLE (°)

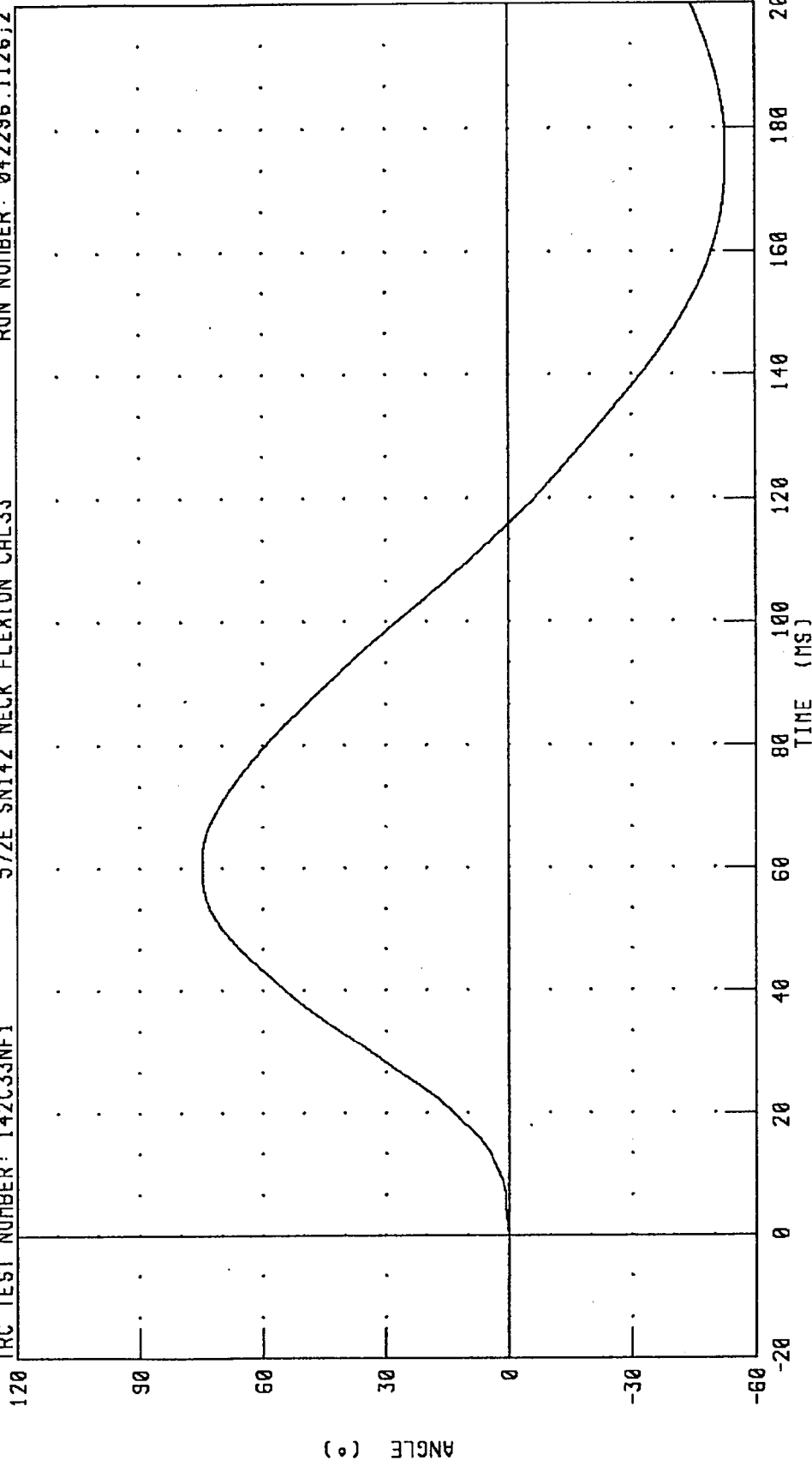
TIME (MS)

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION

TRC TEST NUMBER: 142C3JNF1

572E SN142 NECK FLEXION CAL33

RUN NUMBER: 042296.1126;2



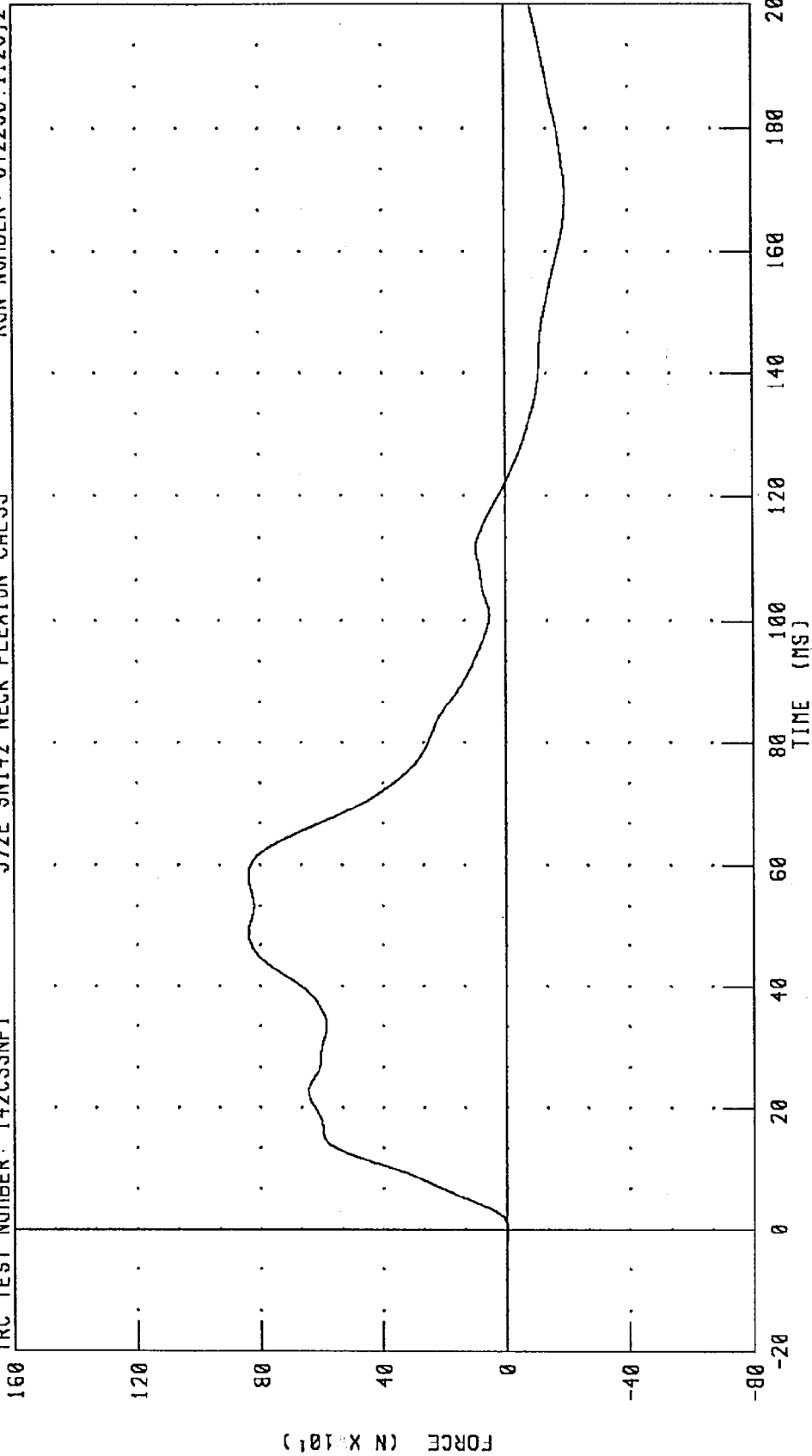
CHANNEL: TOTAL FILTER: CH. CLASS 60 PEAK DATA: 74.83 ° @ 60.48 MS; -52.88 ° @ 177.44 MS

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

TRC TEST NUMBER: 142C33NF1

572E SNI42 NECK FLEXION CAL33

RUN NUMBER: 042296.1126;2



CHANNEL: NEKXF FILTER: CH. CLASS 60

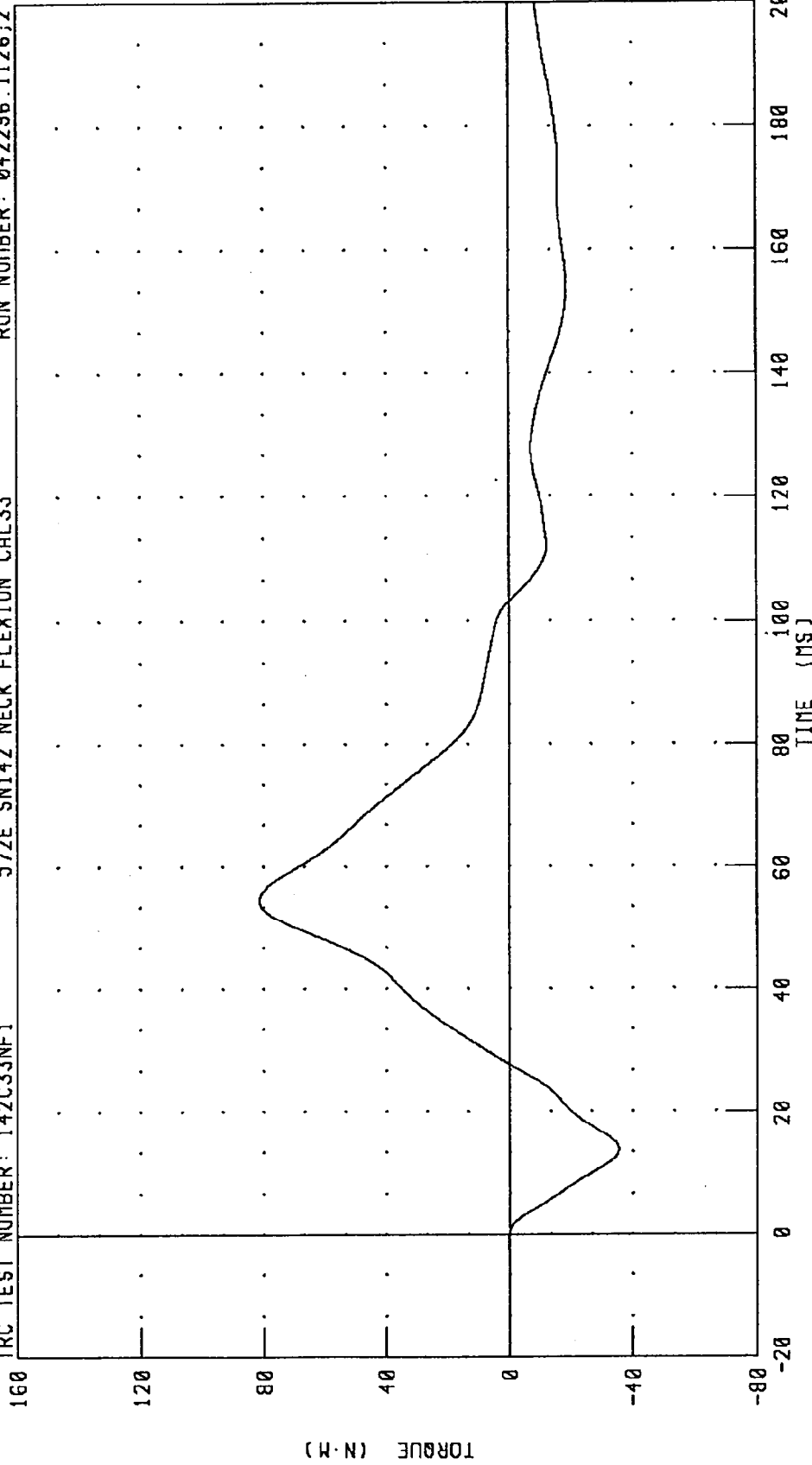
PEAK DATA: 838.52 N @ 58.32 MS; -194.77 N @ 168.96 MS

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

TRC TEST NUMBER: 142C33NF1

572E SN142 NECK FLEXION CAL33

RUN NUMBER: 042296.1126;2



CHANNEL: NEKYM FILTER: CH. CLASS 60

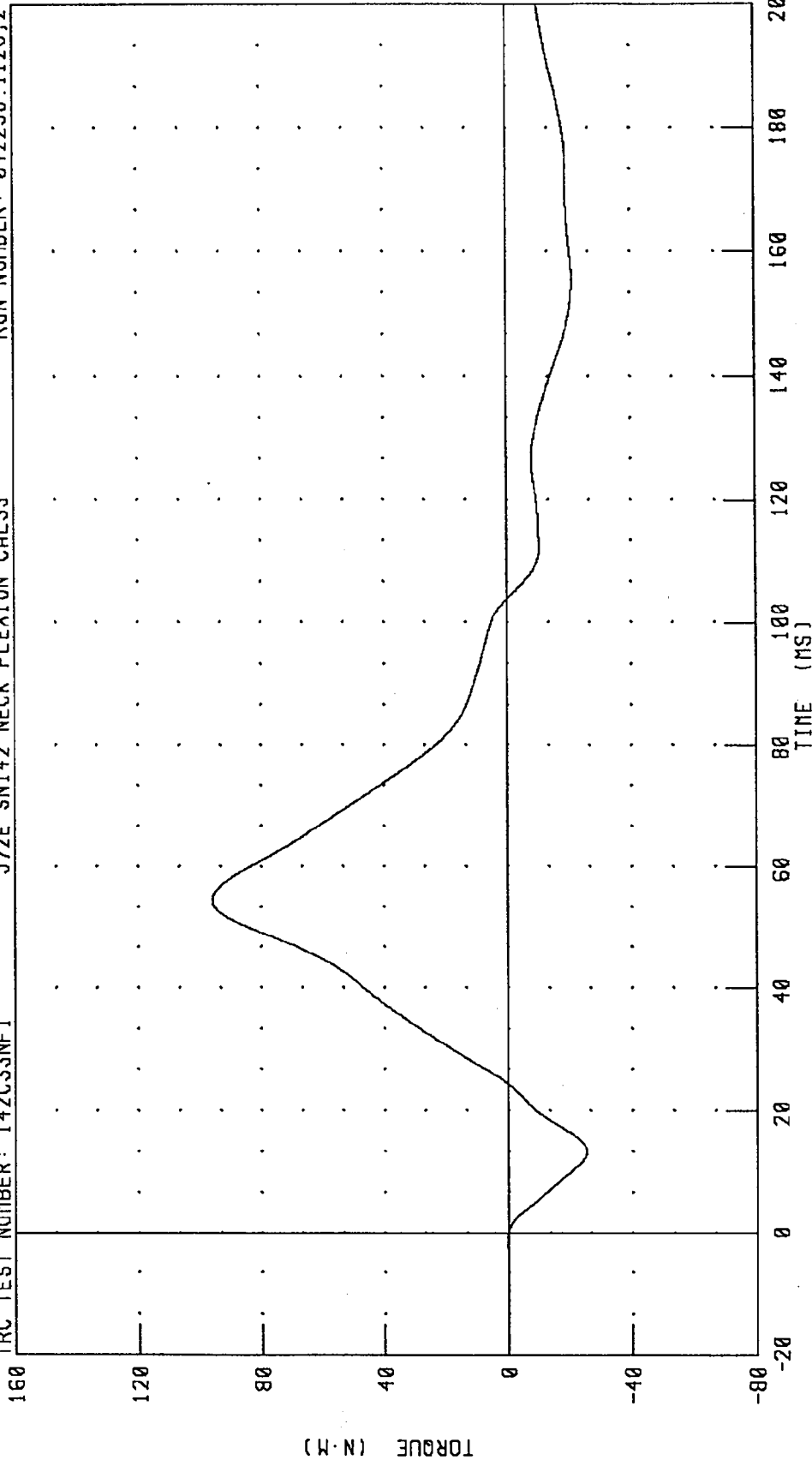
PEAK DATA: 81.38 N·M @ 54.40 MS; -35.38 N·M @ 13.76 MS

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

TRC TEST NUMBER: 142C33NF1

572E SN142 NECK FLEXION CAL33

RUN NUMBER: 042296.1126;2



PEAK DATA: 96.03 N·M @ 54.48 MS; -25.34 N·M @ 13.36 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TORQUE (N·M)

TIME (MS)

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

19-MAR-96

TRC INC. TEST NO: 142C33NE1 572E SN142 NECK EXT. CAL33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	35.0 %
IMPACT VELOCITY	5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS 17.20 - 21.20 G	18.15 G
	20 MS 14.00 - 19.00 G	14.84 G
	30 MS 11.00 - 16.00 G	12.19 G
MAX PENDULUM G	22 G MAX	18.75 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	12.15 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G	38 - 46 MS	42.48 MS
D PLANE	MAX 81 - 106 DEG.	97.08 DEG.
ROTATION	TIME 72 - 82 MS	75.68 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN -80.0/-52.9 NM	-71.93 NM
	TIME 65 - 79 MS	71.12 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO	147 - 174 MS	154.00 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO	120 - 148 MS	138.40 MS

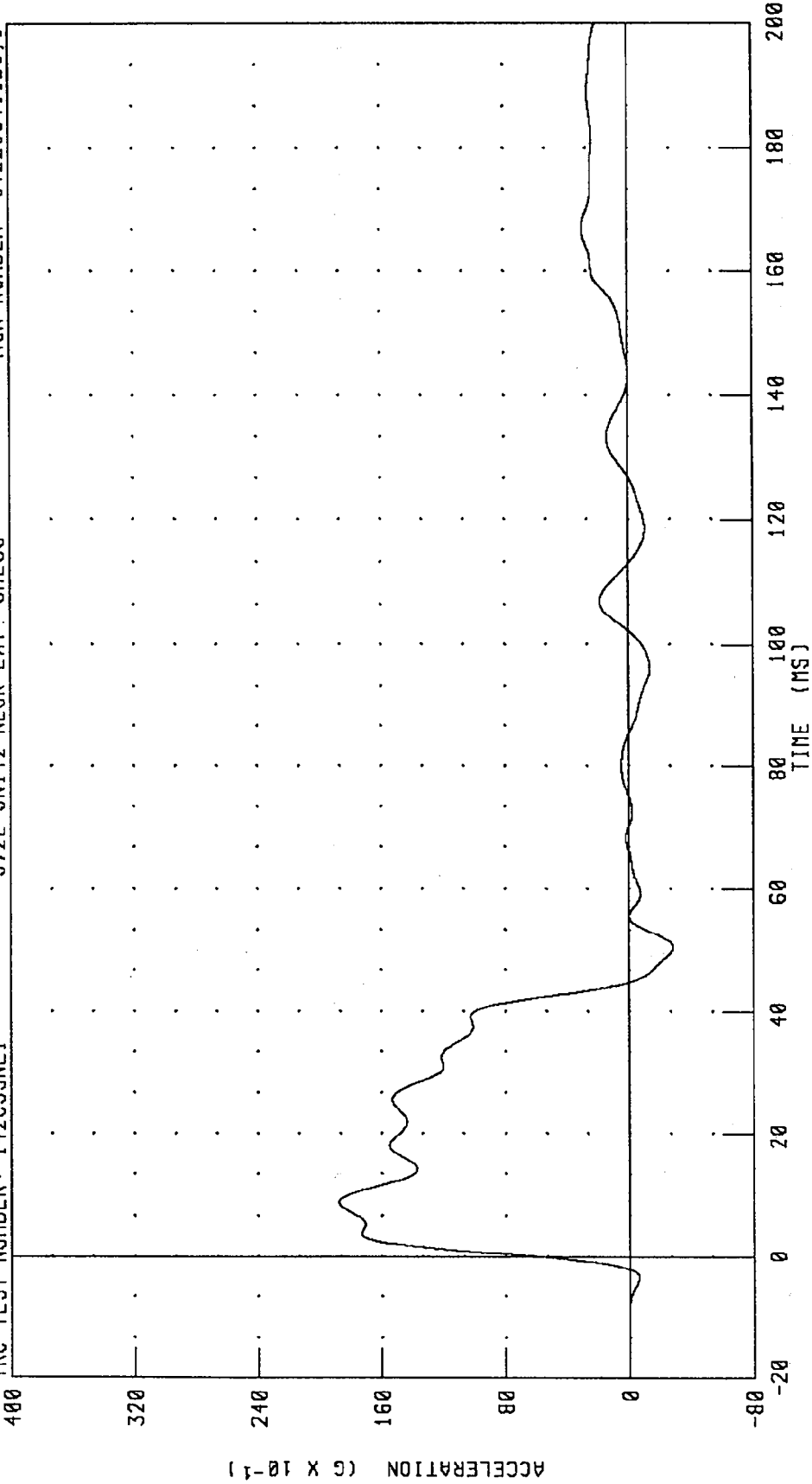
TEST MEETS SPECIFICATIONS

TECHNICIAN Richard LaVone

RUN NUMBER: 031996.0914;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C33NE1 572E SN142 NECK EXT. CAL33 RUN NUMBER: 042296.1126j1



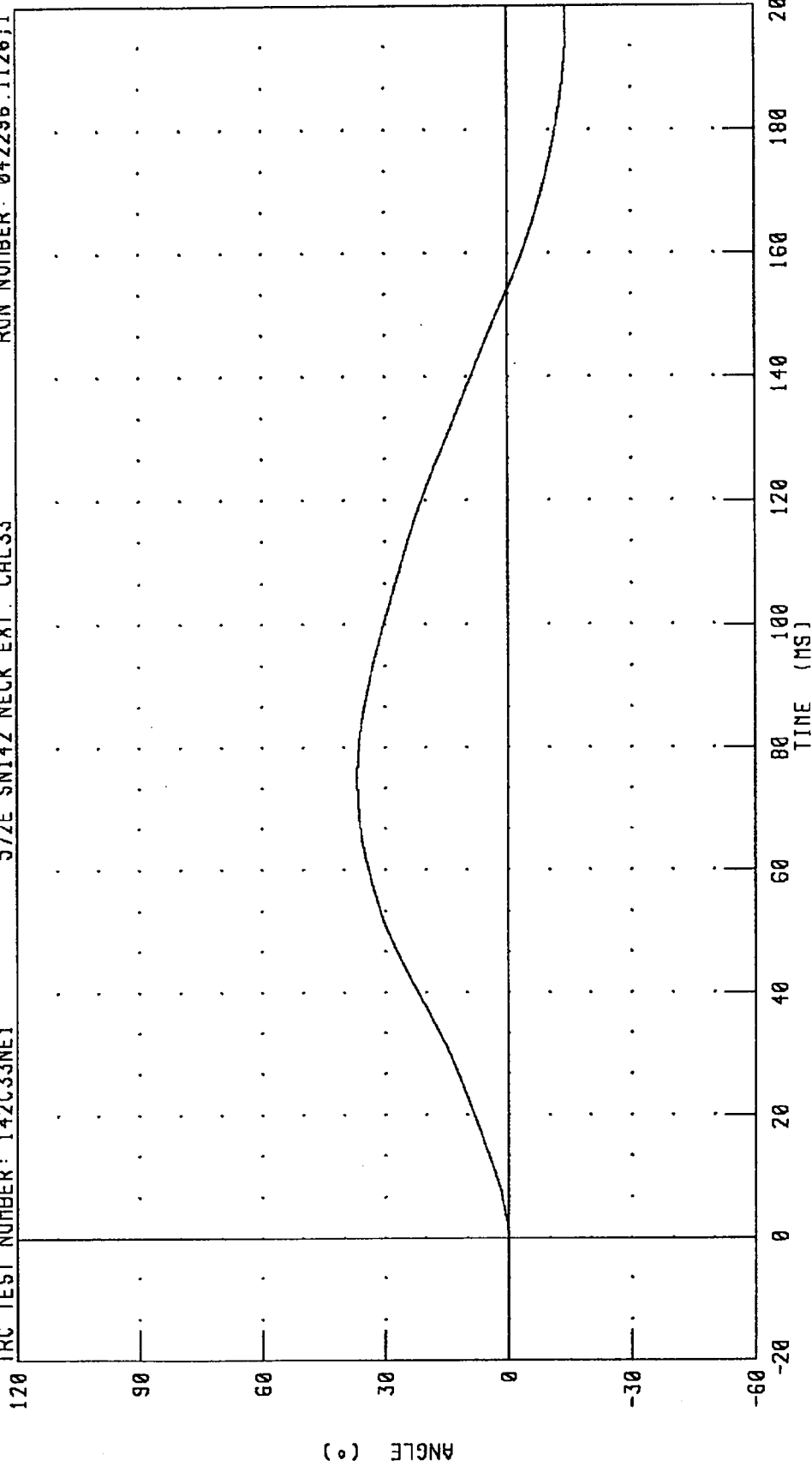
CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 18.75 G @ 8.80 MS; -2.83 G @ 50.40 MS

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

TRC TEST NUMBER: 142C33NE1

572E SN142 NECK EXT. CAL33

RUN NUMBER: 042296.1126;1



PEAK DATA: 36.86 ° @ 75.12 MS; -14.13 ° @ 197.92 MS

CHANNEL: BETA FILTER: CH. CLASS 60

ANGLE (°)

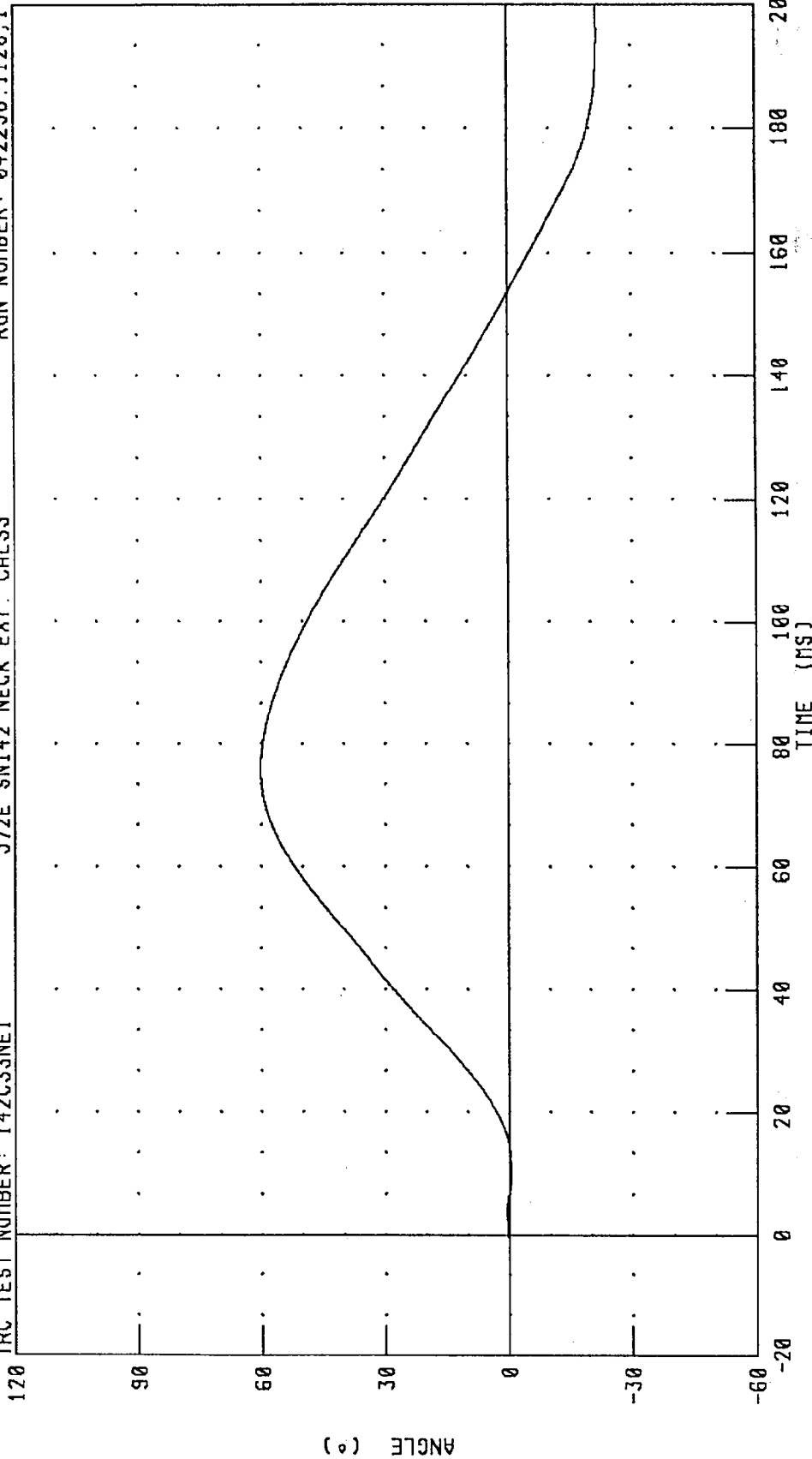
TIME (MS)

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

TRC TEST NUMBER: 142C33NE1

572E SN142 NECK EXT. CAL33

RUN NUMBER: 042296.1126.1



CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 60.25 ° @ 76.00 MS; -21.71 ° @ 195.04 MS

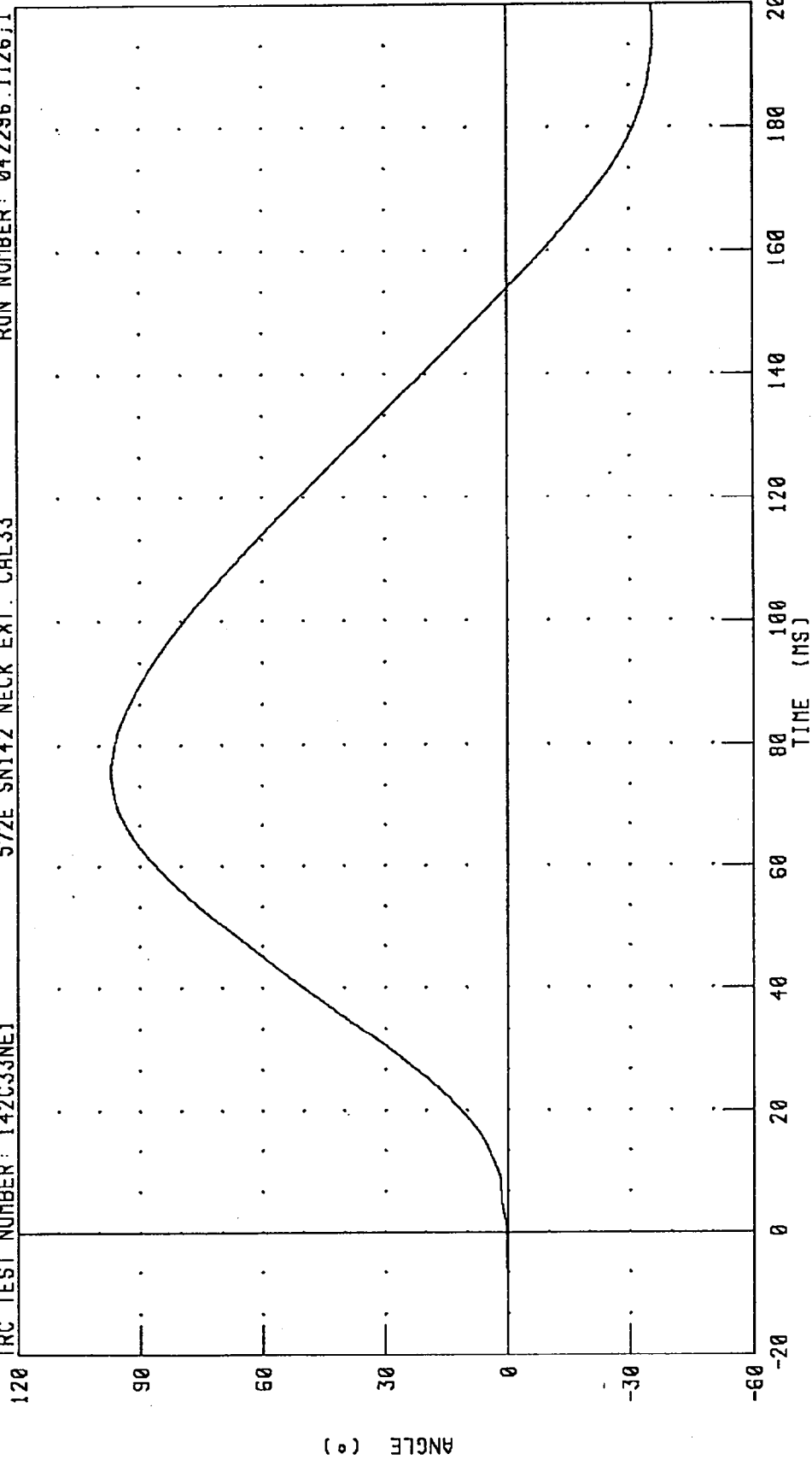
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 142C33NE1

572E SN142 NECK EXT. CAL33

RUN NUMBER: 042296.1126,1

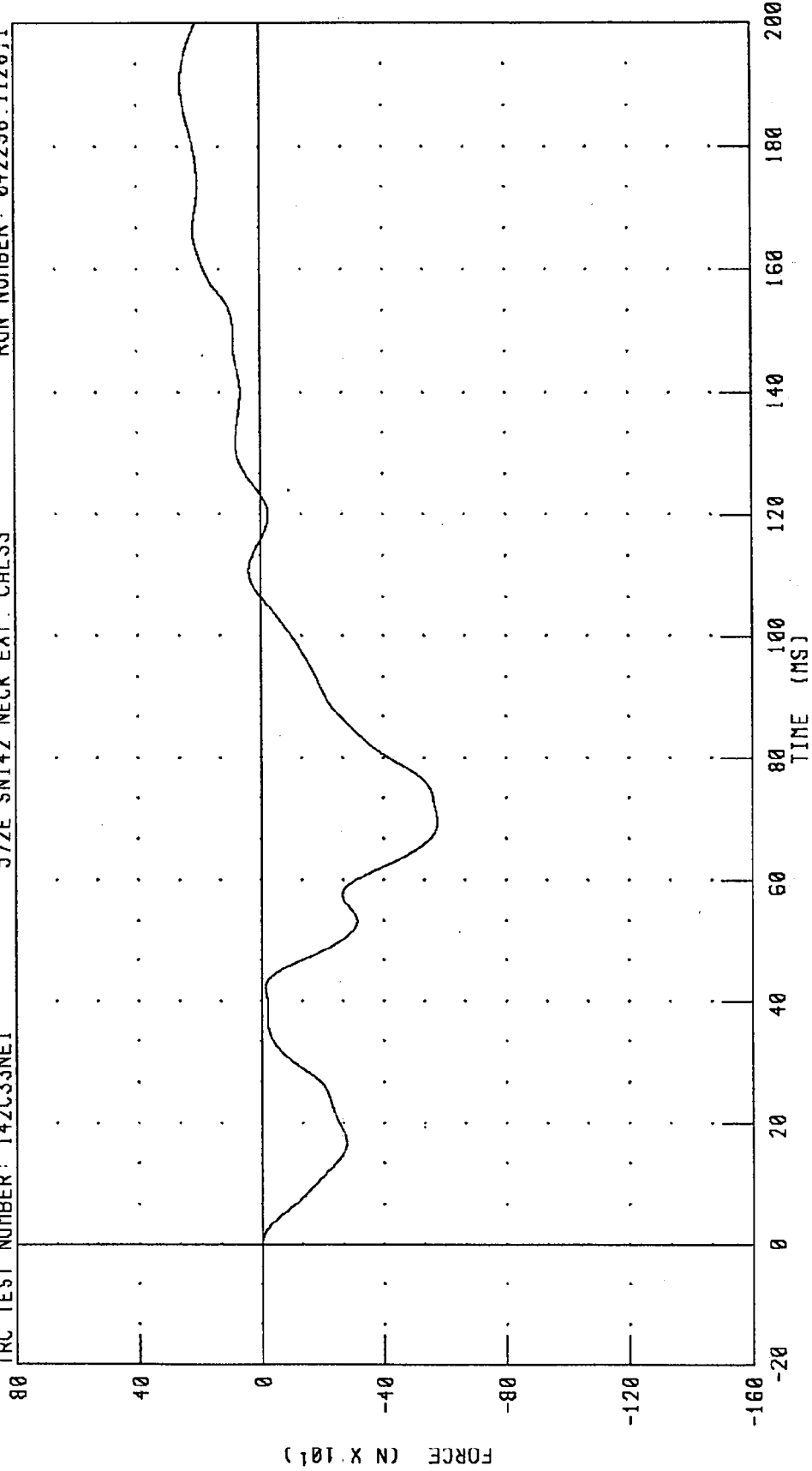


CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 97.09 ° @ 75.68 MS; -35.83 ° @ 195.20 MS

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

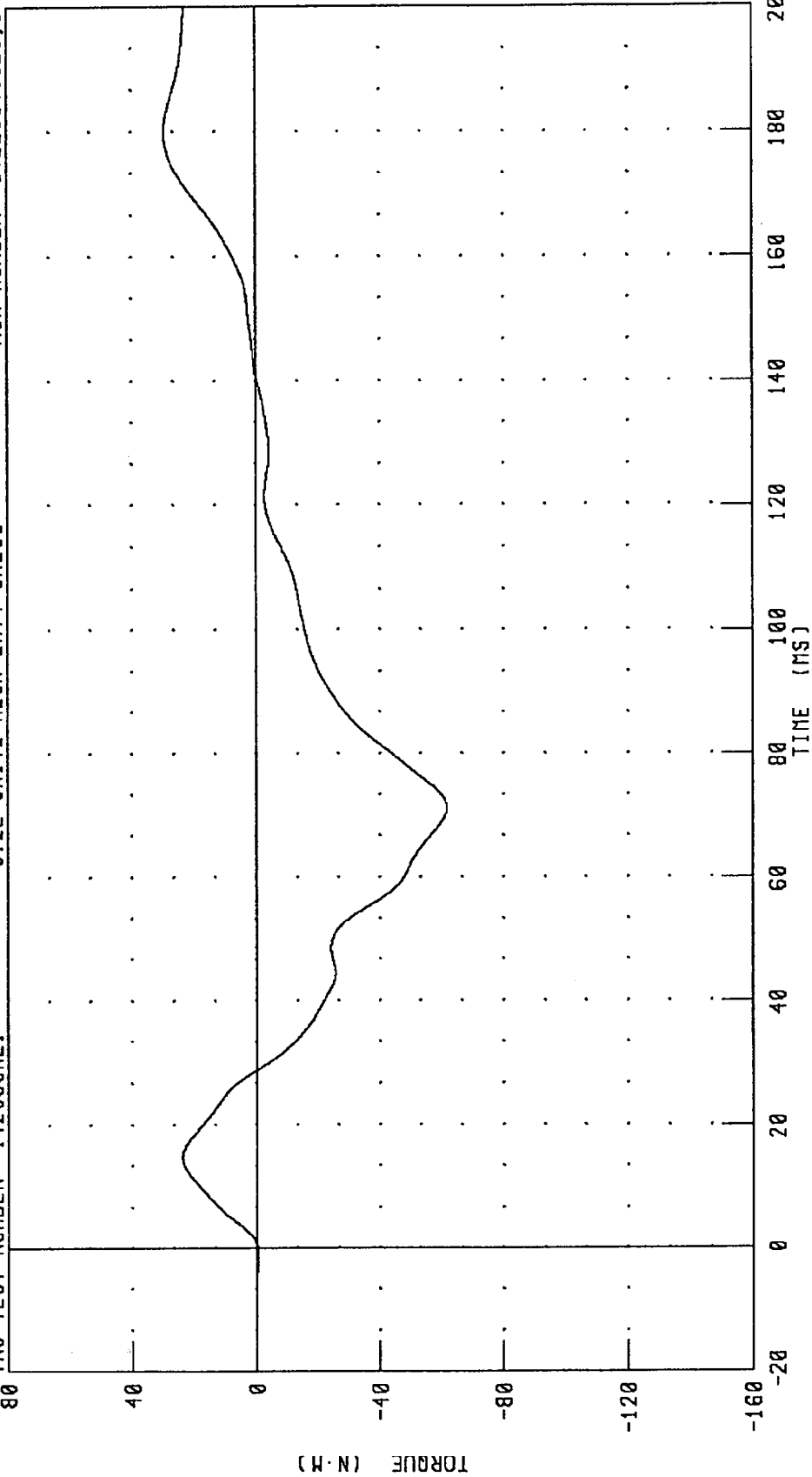
TRC TEST NUMBER: 142C33NE1 572E SN142 NECK EXT. CAL33 RUN NUMBER: 042296.1126j1



CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 257.88 N @ 190.16 MS; -576.09 N @ 69.36 MS

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

TRC TEST NUMBER: 142C33NEJ 572E SN142 NECK EXT. CAL33 RUN NUMBER: 042296.1126j.1

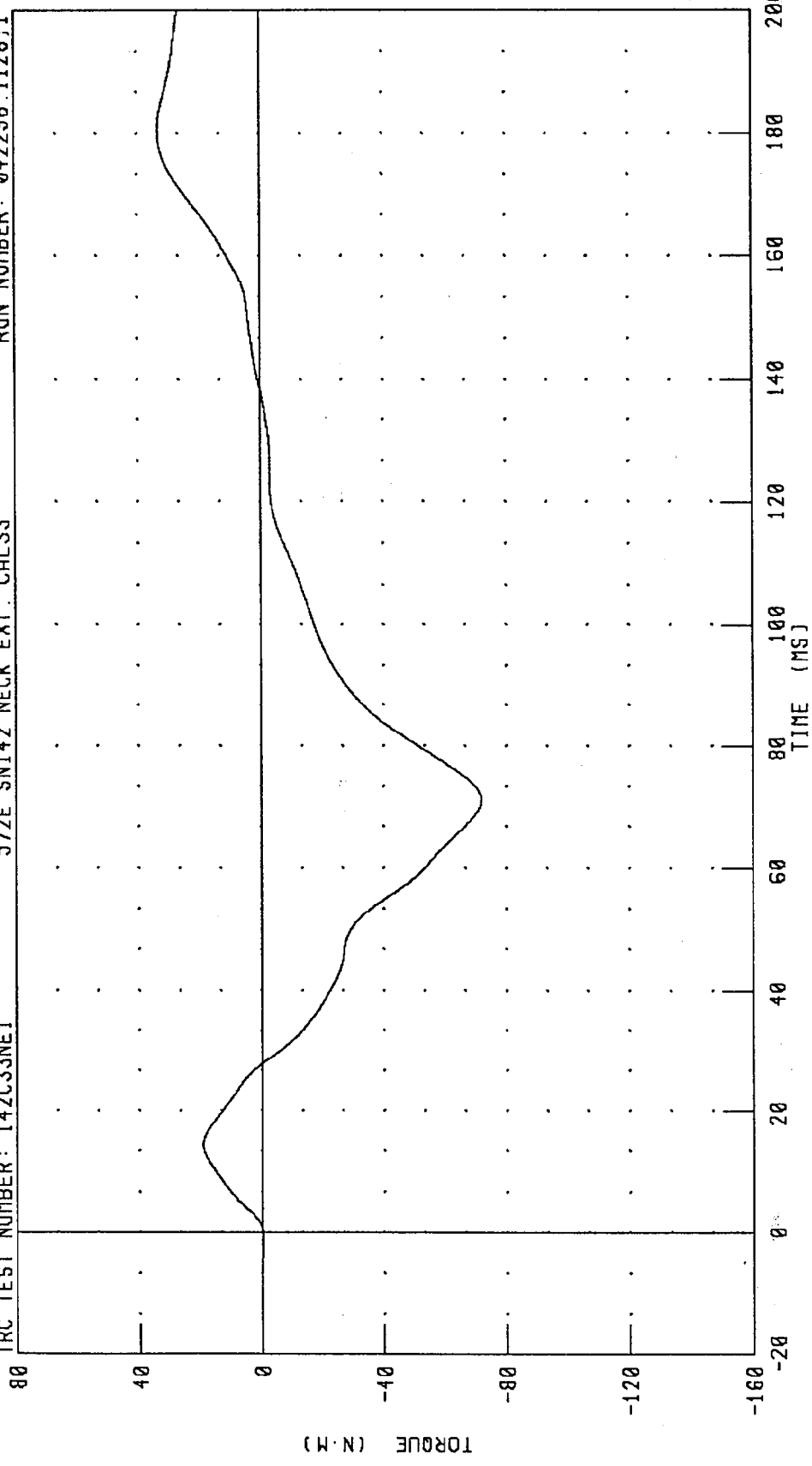


CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 29.43 N·M @ 179.92 MS; -61.77 N·M @ 71.20 MS

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

TRC TEST NUMBER: 142C33NE1 RUN NUMBER: 042296.1126.1

572E SN142 NECK EXT. CAL33



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 33.32 N.M @ 180.48 MS; -71.93 N.M @ 71.12 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

19-MAR-96

TRC INC.

TEST NO: 142C33TH1

572E SN142 H.S.THORAX CAL33

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	35.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.71 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	70.9 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5607. N
INTERNAL HYSTERESIS	69% - 85%	71.2%

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard Le Van

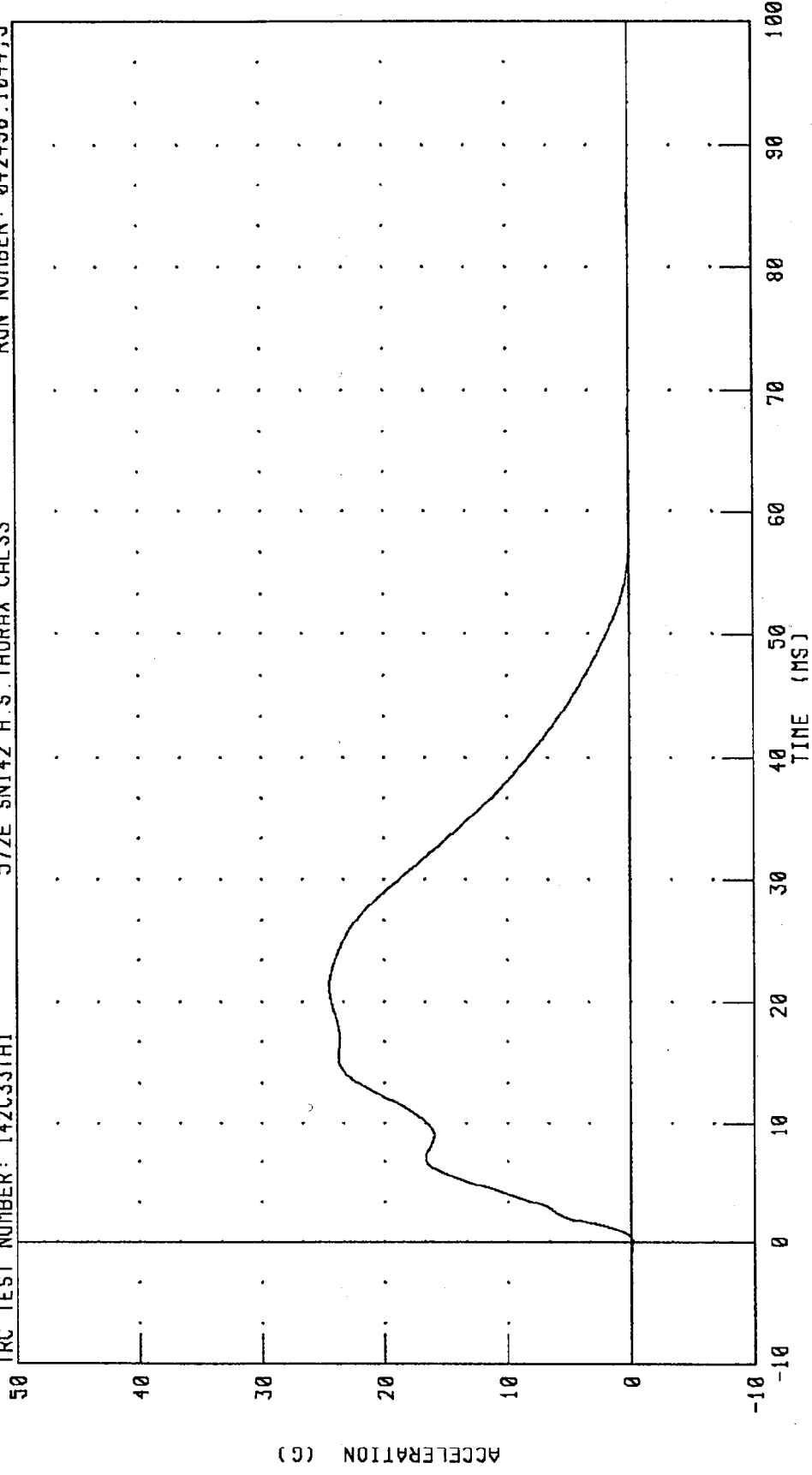
RUN NUMBER: 031996.1345;5

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 142C33TH1

572E SN142 H. S. THORAX CAL33

RUN NUMBER: 042496.1044j5



PEAK DATA: 24.48 G @ 21.28 MS; -0.11 G @ 0.00 MS

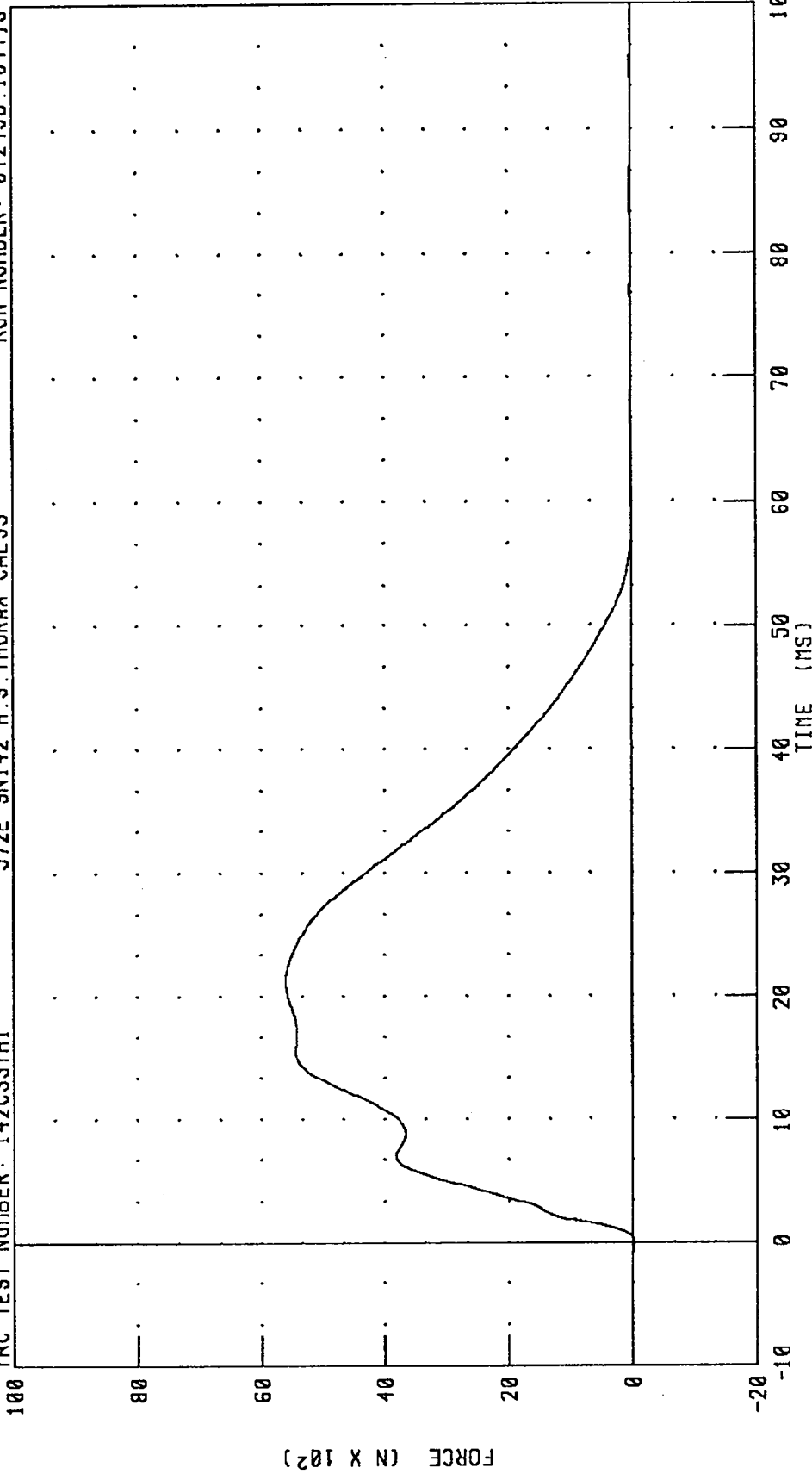
CHANNEL: PENXG FILTER: CH. CLASS 180

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 142C33TH1

572E SN142 H.S. THORAX CAL33

RUN NUMBER: 042496.1044;5



CHANNEL: PENXF FILTER: CH. CLASS 180

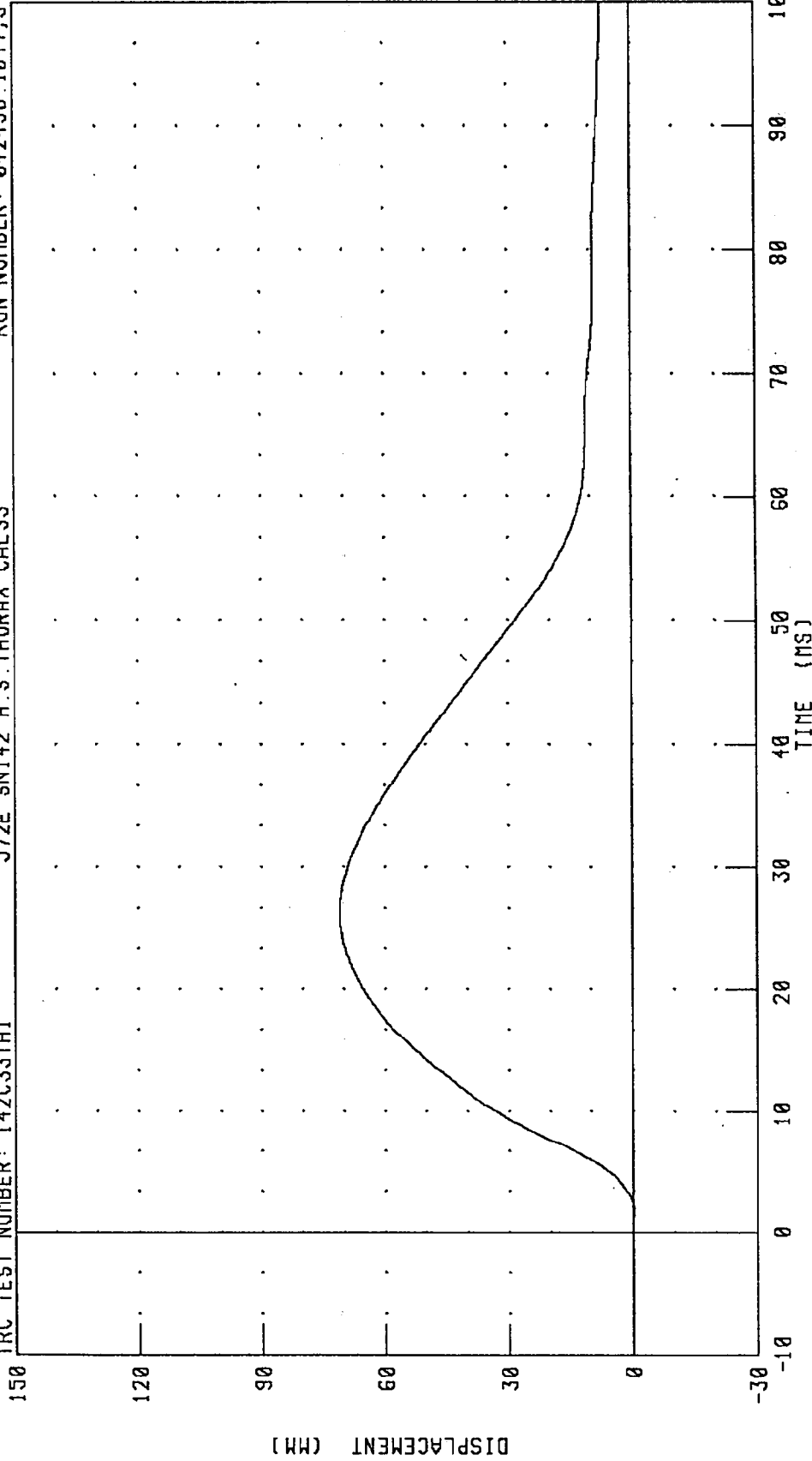
PEAK DATA: 5607.35 N @ 21.28 MS; -24.78 N @ 0.00 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 142C33TH1

572E SN142 H.S. THORAX CAL33

RUN NUMBER: 042496.1044;5

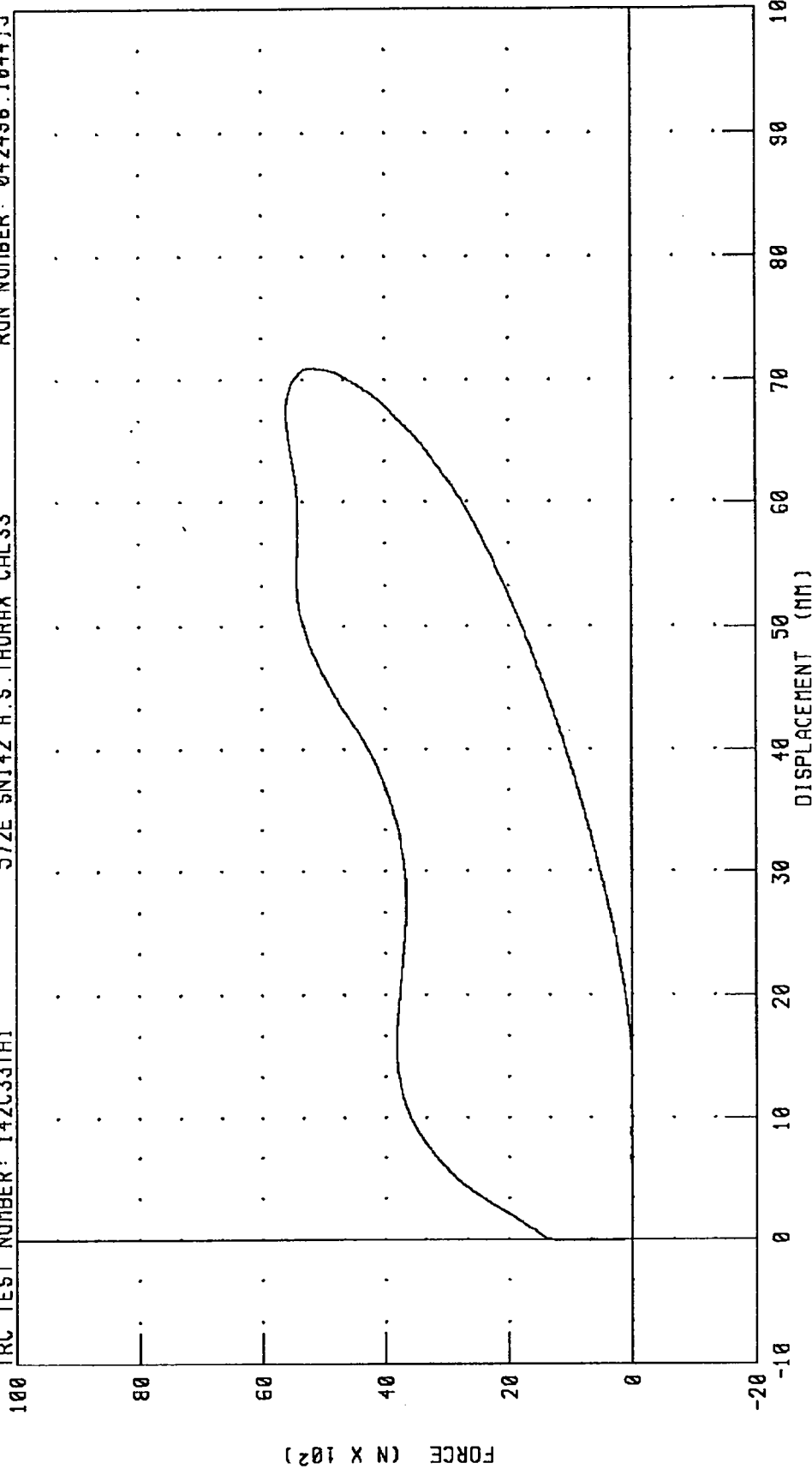


PEAK DATA: 70.95 MM @ 26.00 MS; -0.08 MM @ 1.76 MS

CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 142C33TH1 572E SN142 H.S. THORAX CAL33 RUN NUMBER: 042496.1044.5



CHANNEL: CSTXD FILTER: CH. CLASS 180
 PENXF CH. CLASS 180
 PEAK DATA: 70.95 MM @ 26.00 MS; -0.08 MM @ 1.76 MS
 5607.35 N @ 21.28 MS; -24.78 N @ 0.00 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

19-MAR-96

TRC INC.

TEST NO: 142C33RK1

572E SN142 RIGHT KNEE CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	35.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4982.1 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

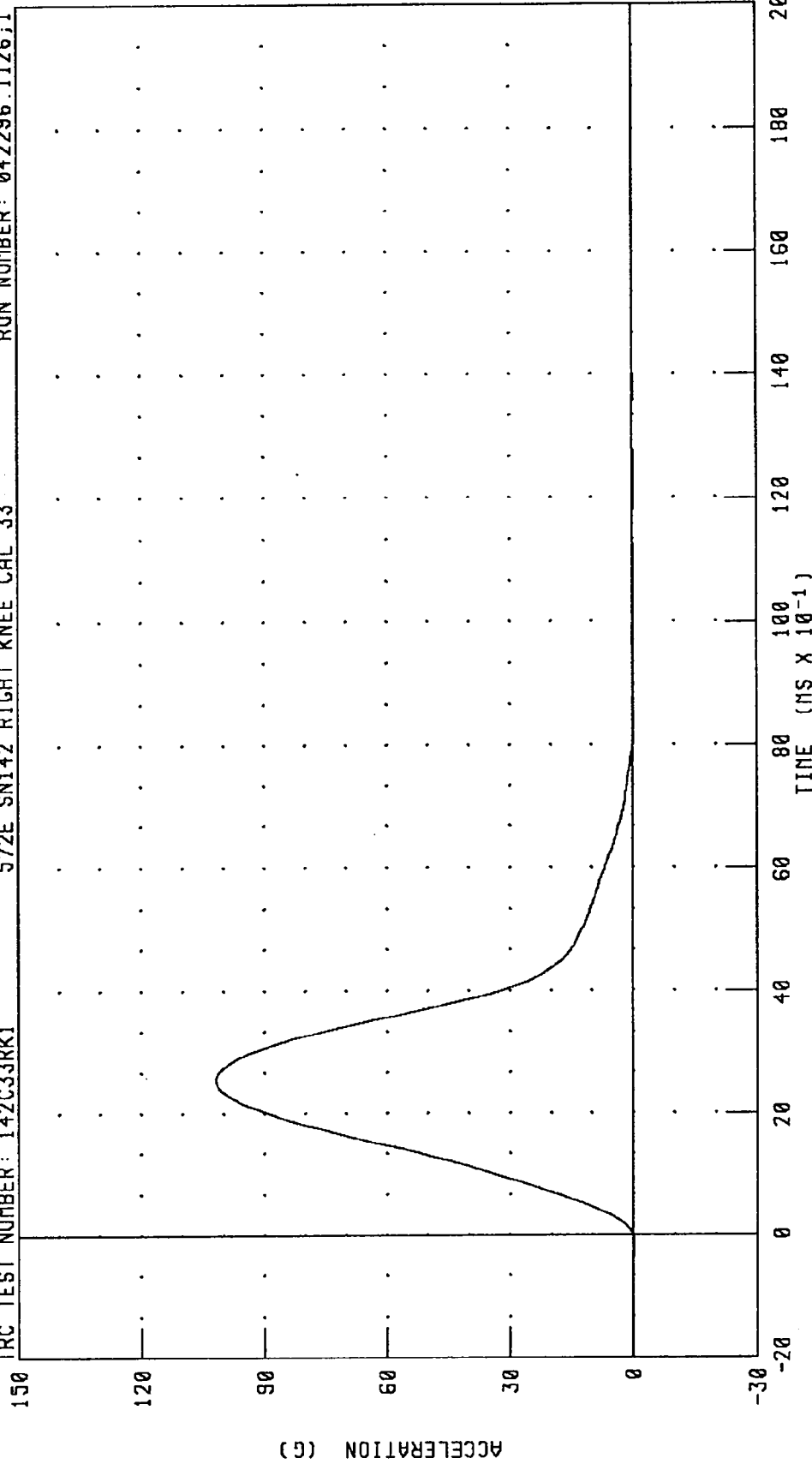
RUN NUMBER: 031996.1439;1

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

TRC TEST NUMBER: 142C33RK1

572E SN142 RIGHT KNEE CAL 33

RUN NUMBER: 042296.1126;1



CHANNEL: PENXC FILTER: CH. CLASS 600

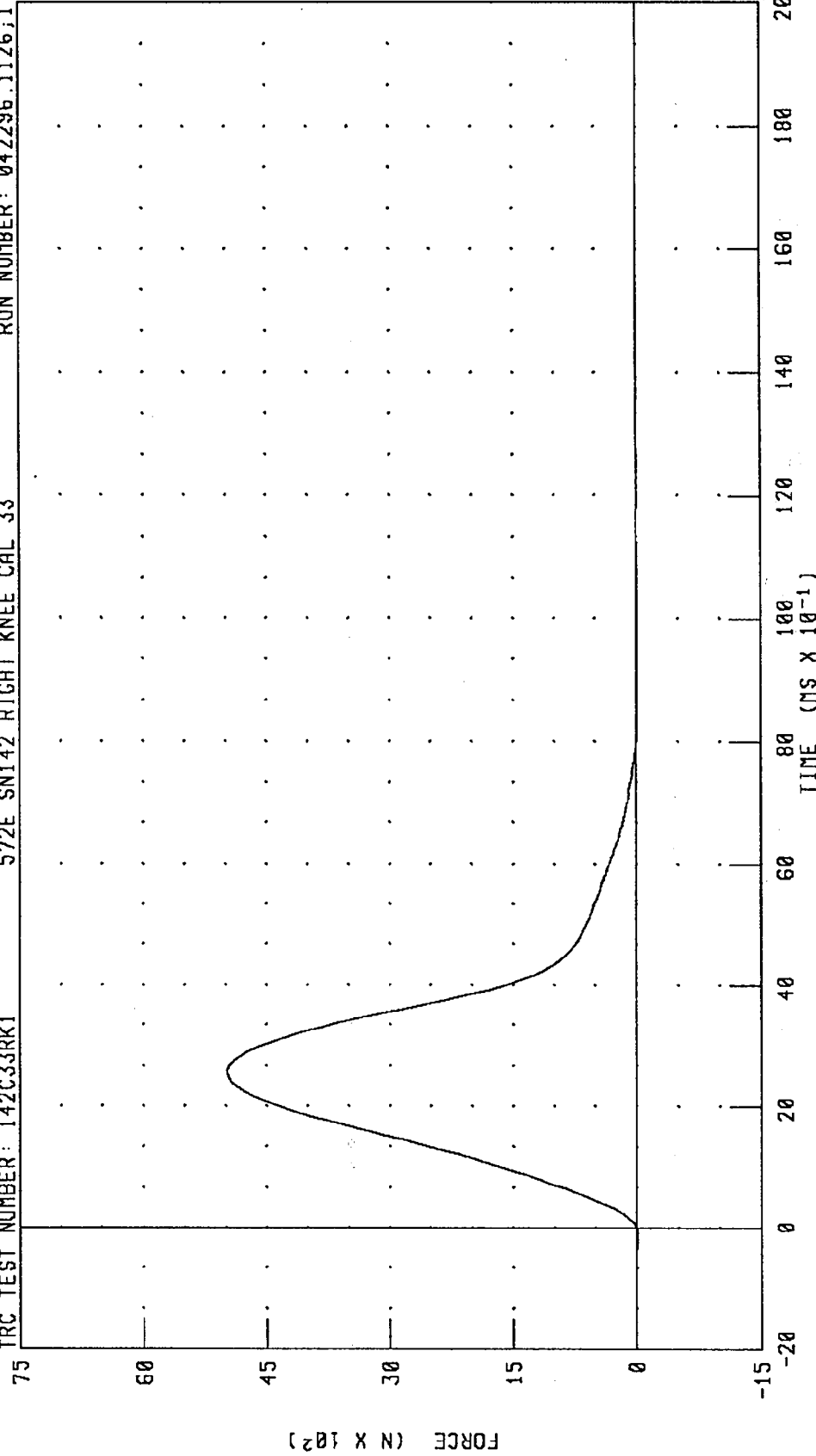
PEAK DATA: 101.83 G @ 2.56 MS; -0.29 G @ 9.28 MS

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

TRC TEST NUMBER: 142C33RK1

572E SN142 RIGHT KNEE CAL 33

RUN NUMBER: 042296.1126;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 4982.16 N @ 2.56 MS; -13.98 N @ 9.28 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

19-MAR-96

TRC INC.

TEST NO: 142C33LK1

572E SN142 LEFT KNEE CAL 33

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	35.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5156.3 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Leman

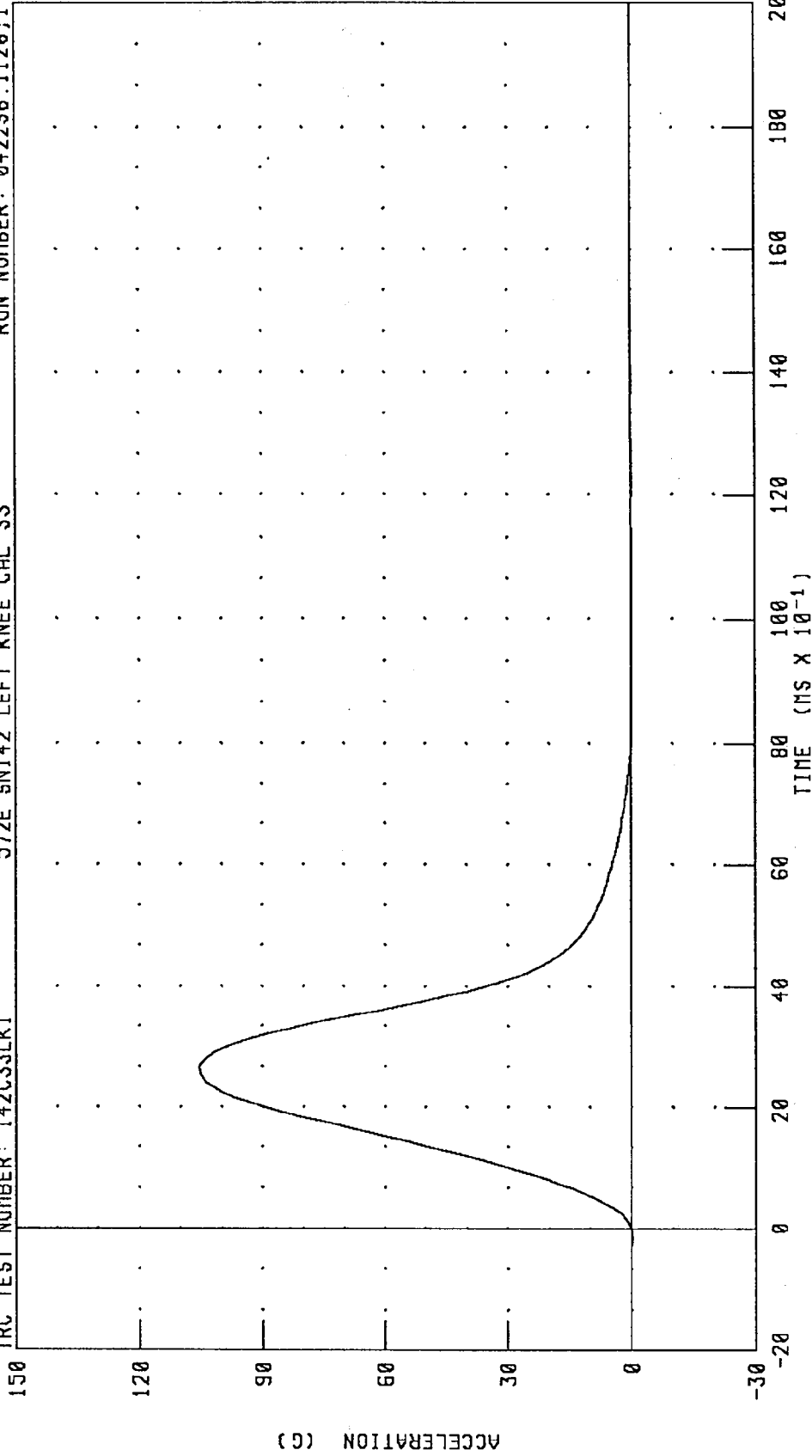
RUN NUMBER: 031996.1436;1

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

TRC TEST NUMBER: 142C33LK1

572E SNI42 LEFT KNEE CAL 33

RUN NUMBER: 042296.1126;1



CHANNEL: PENXG FILTER: CH. CLASS 600

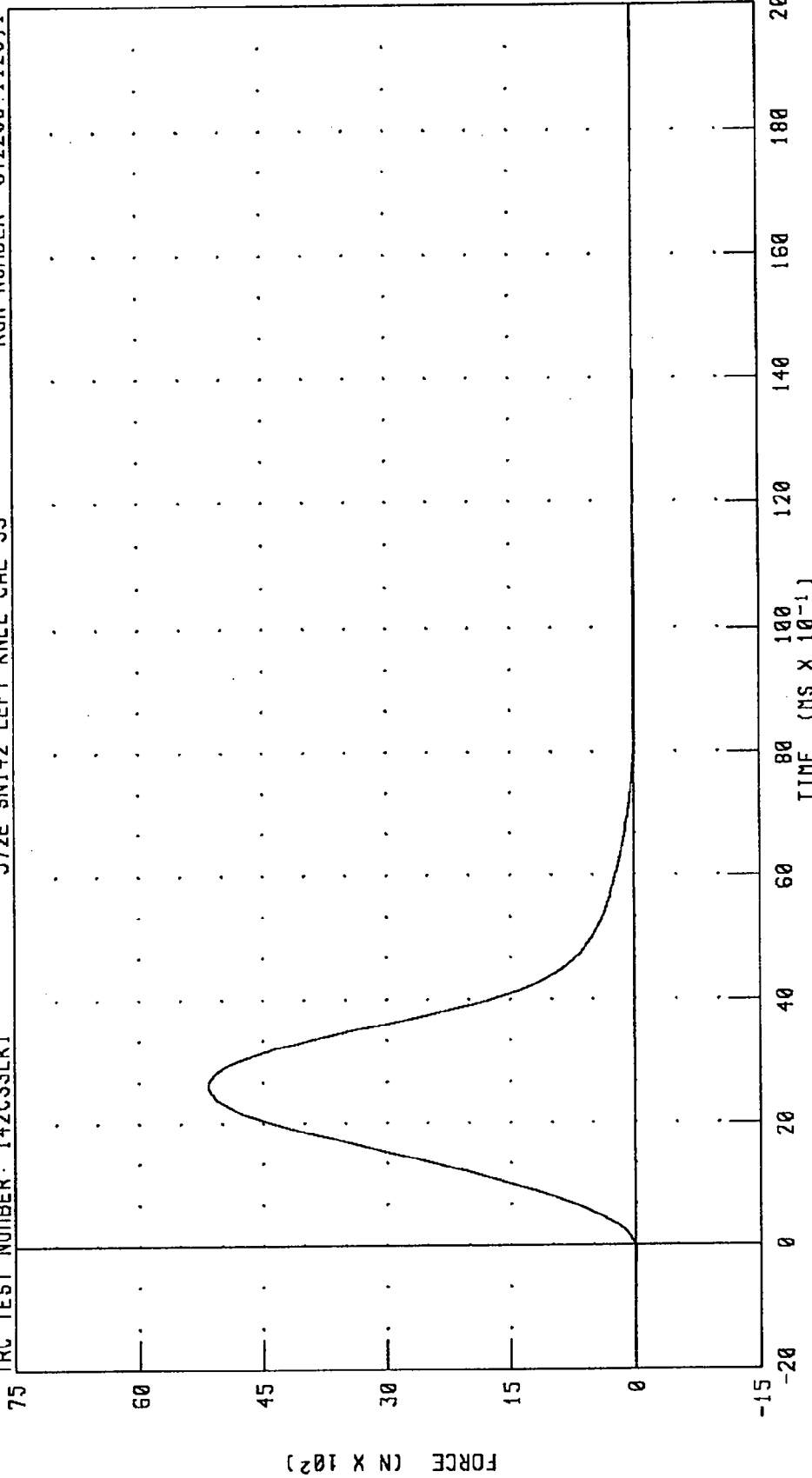
PEAK DATA: 105.39 G @ 2.64 MS; -0.26 G @ 8.32 MS

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

TRC TEST NUMBER: 142C33LK1

572E SN142 LEFT KNEE CAL 33

RUN NUMBER: 042296.1126.1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5156.39 N @ 2.64 MS; -12.59 N @ 8.32 MS

Pre-test Certification Data

Passenger Dummy S/N: 192

TRANSPORTATION RESEARCH CENTER INC.
 HYBRID III EXTERNAL DIMENSIONS
 192 ALDERSON

26-FEB-96

TRC INC. TEST NO: 192C32ED1 572E SN192 EXT.DIMENSION CAL32

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 Larson

RUN NUMBER: 022996.0833

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

27-FEB-96

TRC INC.

TEST NO: 192C32HD1

572E SN192 HEAD DROP CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	251.83 G
PEAK LATERAL ACCELERATION	15 G MAX	-1.57 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

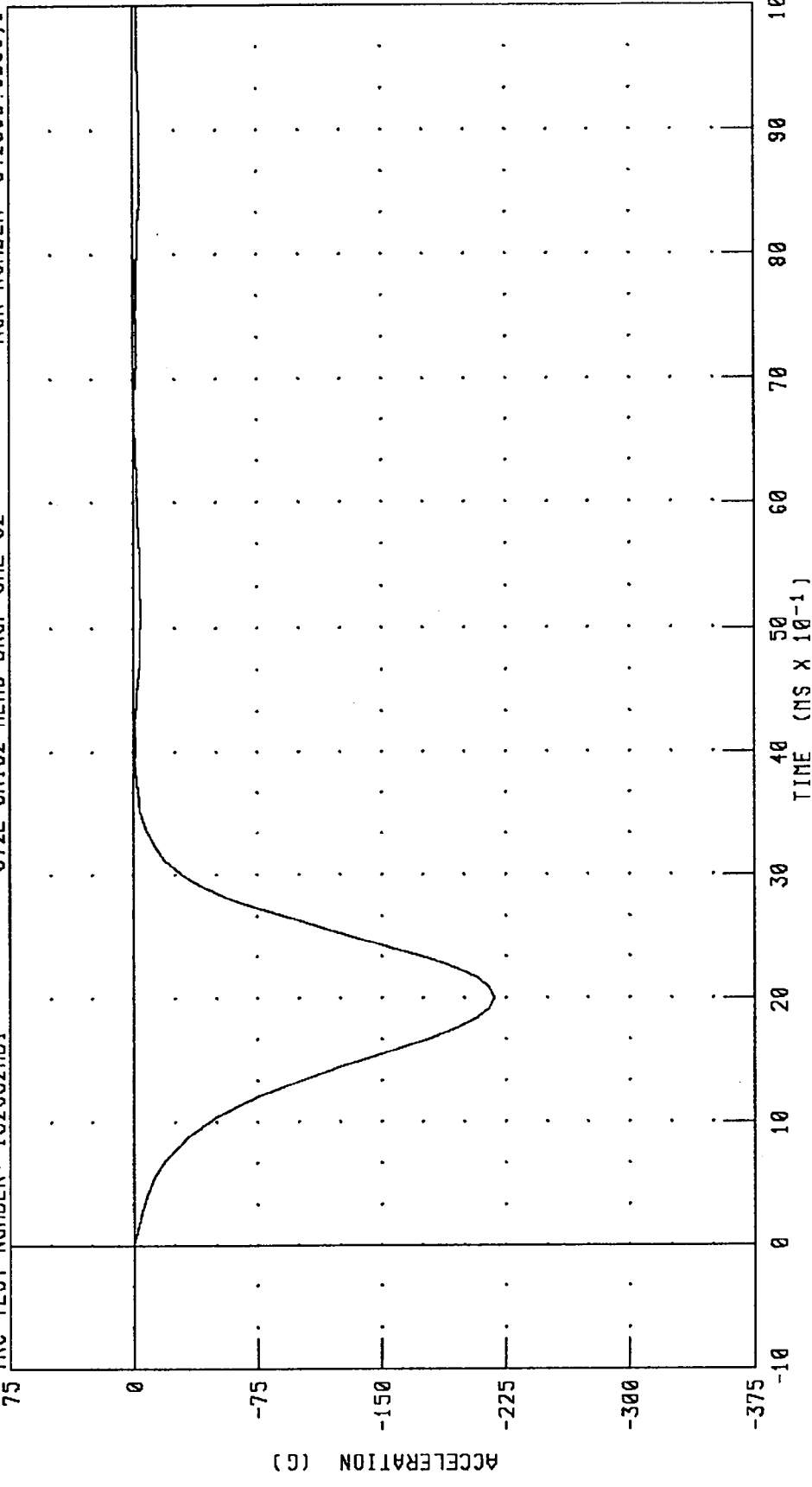
TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

RUN NUMBER: 022796.0836;1

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

TRC TEST NUMBER: 192C32HD1 572E SN192 HEAD DROP CAL 32 RUN NUMBER: 042396.0835;1



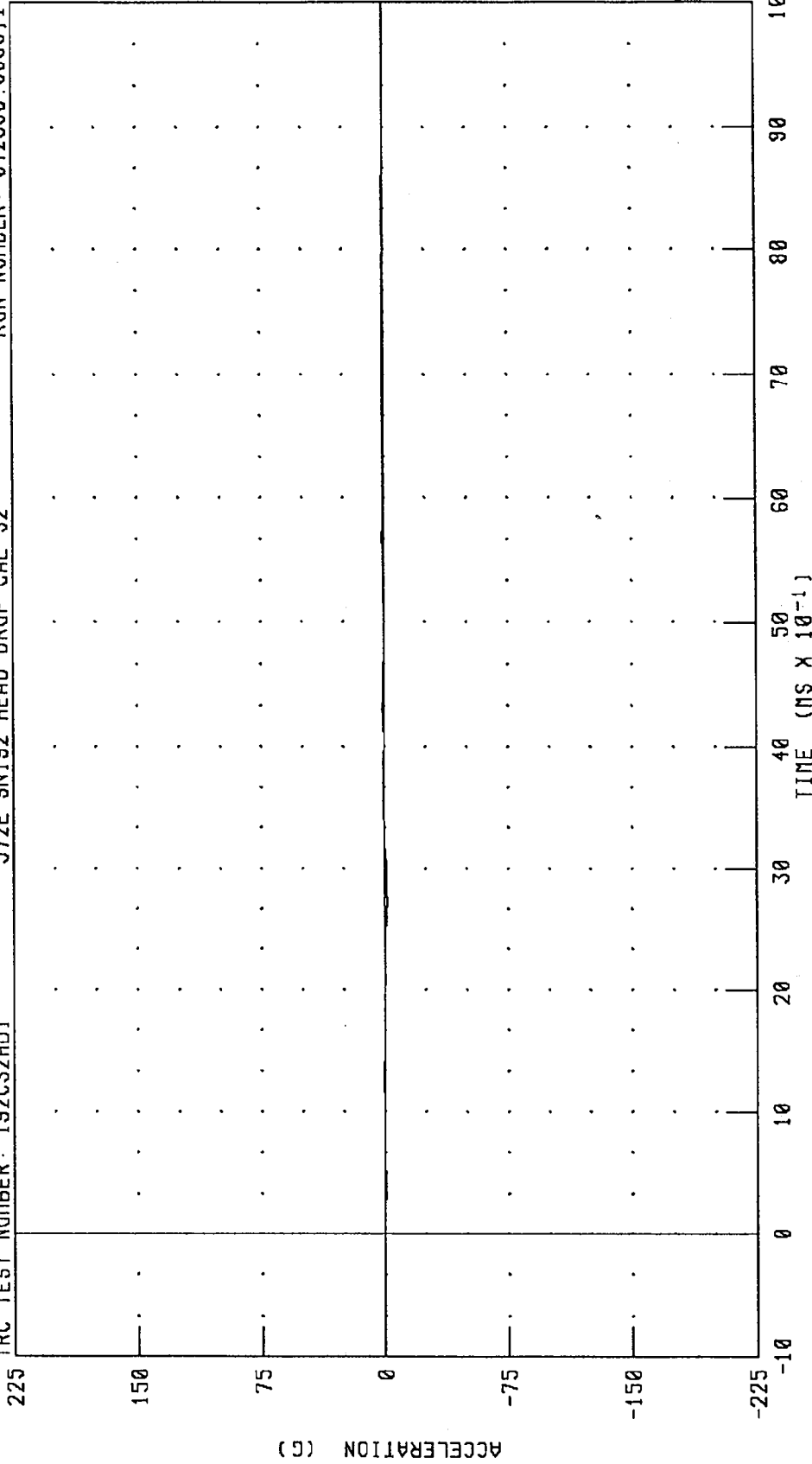
CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 0.08 G @ -0.16 MS; -217.72 G @ 2.00 MS

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

TRC TEST NUMBER: 192C32HD1

572E SN192 HEAD DROP CAL 32

RUN NUMBER: 042396.0835;1



PEAK DATA: 1.01 G @ 4.32 MS; -1.57 G @ 2.72 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

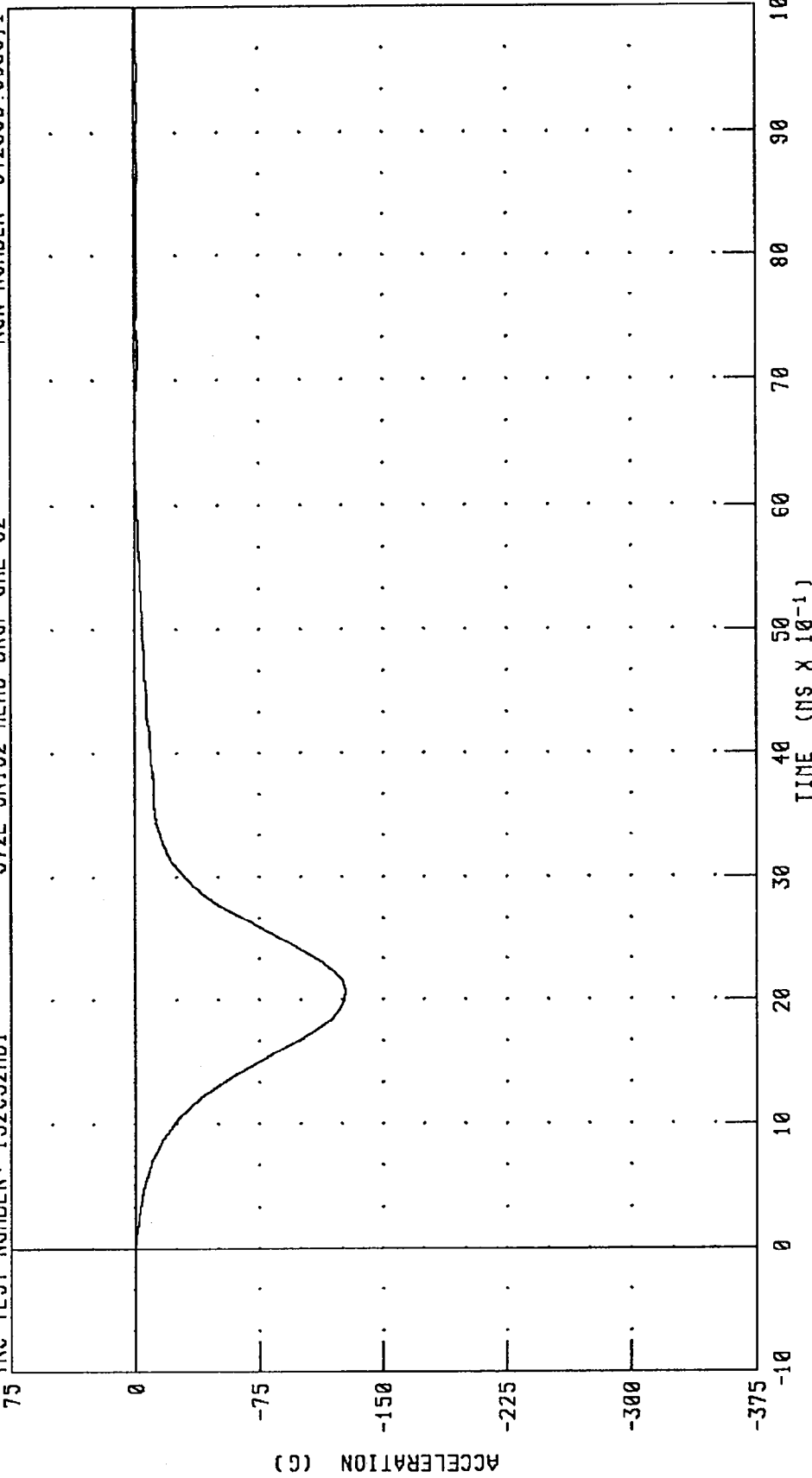
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 192C32HD1

572E SN192 HEAD DROP CAL 32

RUN NUMBER: 042396.0835;1

75



PEAK DATA: 0.03 G @ -0.08 MS; -126.86 G @ 2.08 MS

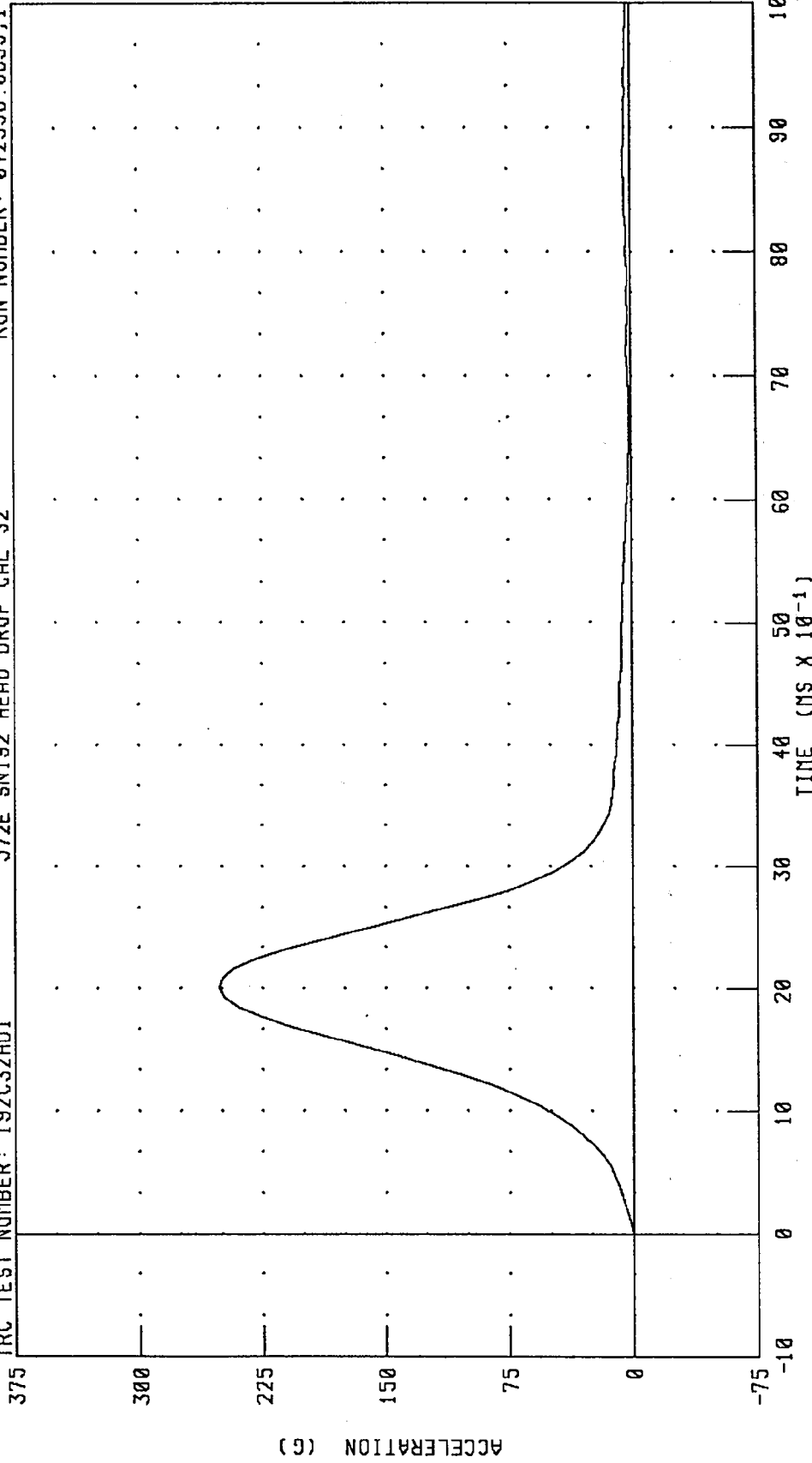
CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 192C32HD1

572E SN192 HEAD DRQP CAL 32

RUN NUMBER: 042396.0B35;1



CHANNEL: HEORG FILTER: CH. CLASS 1000

PEAK DATA: 251.83 G @ 2.00 MS; 0.02 G @ -0.80 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

27-FEB-96

TRC INC. TEST NO: 192C32NF1 572E SN192 NECK FLEXION CAL32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
IMPACT VELOCITY	6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS 22.50 - 27.50 G	23.60 G
	20 MS 17.60 - 22.60 G	19.24 G
	30 MS 12.50 - 18.50 G	15.71 G
MAX PENDULUM G	29 G MAX	24.54 G
MAX PENDULUM G ABOVE 30 MS	29 G MAX	15.66 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G	34 - 42 MS	38.24 MS
D PLANE	MAX 64 - 78 DEG.	70.78 DEG.
ROTATION	TIME 57 - 64 MS	59.36 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX 88.2 - 108.5 NM	96.56 NM
	TIME 47 - 58 MS	51.36 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO	113 - 128 MS	114.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO	97 - 107 MS	102.72 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

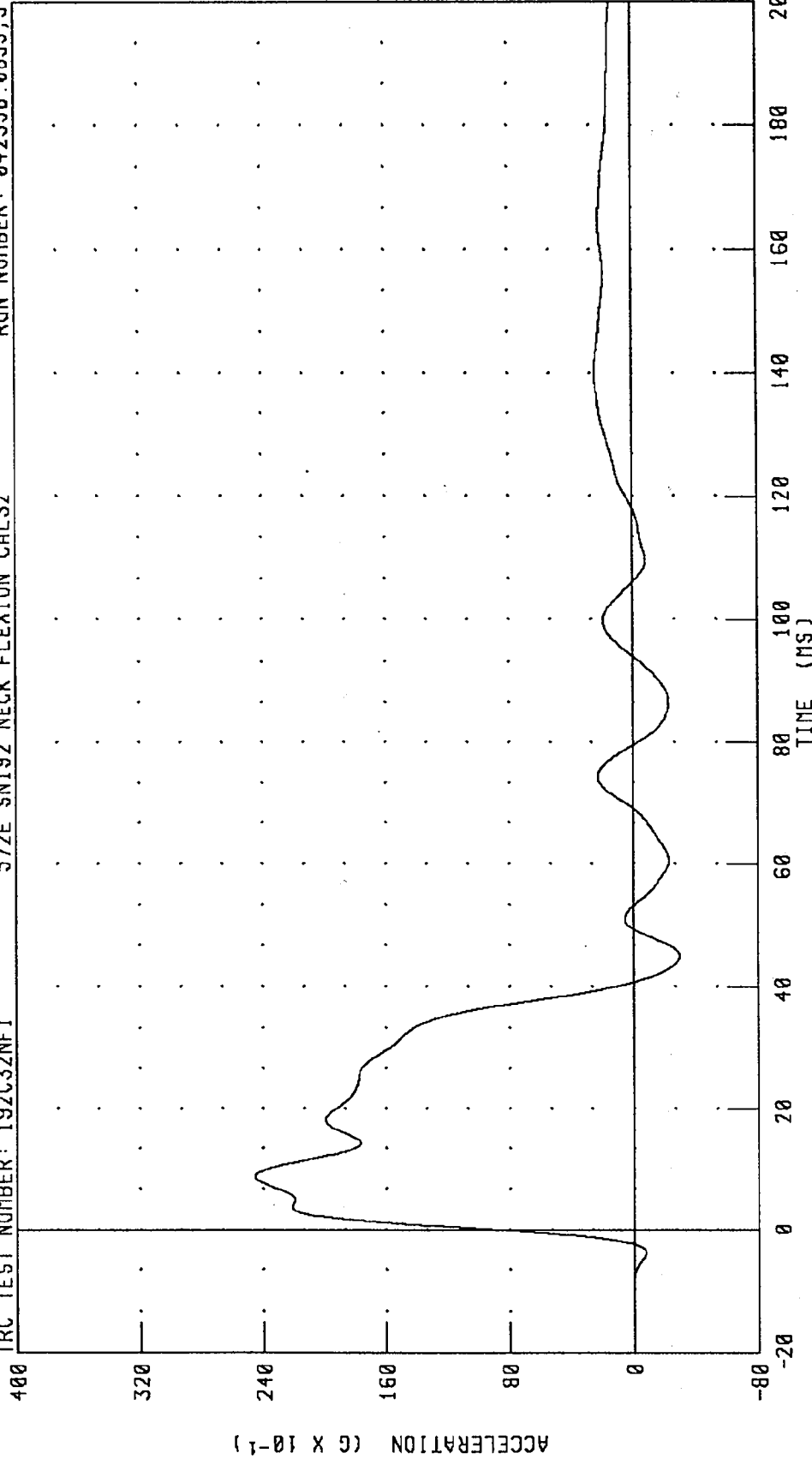
RUN NUMBER: 022796.1232;3

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192032NF1

572E SN192 NECK FLEXION CAL32

RUN NUMBER: 042396.0835,3



PEAK DATA: 24.54 G @ 8.64 MS; -2.95 G @ 44.96 MS

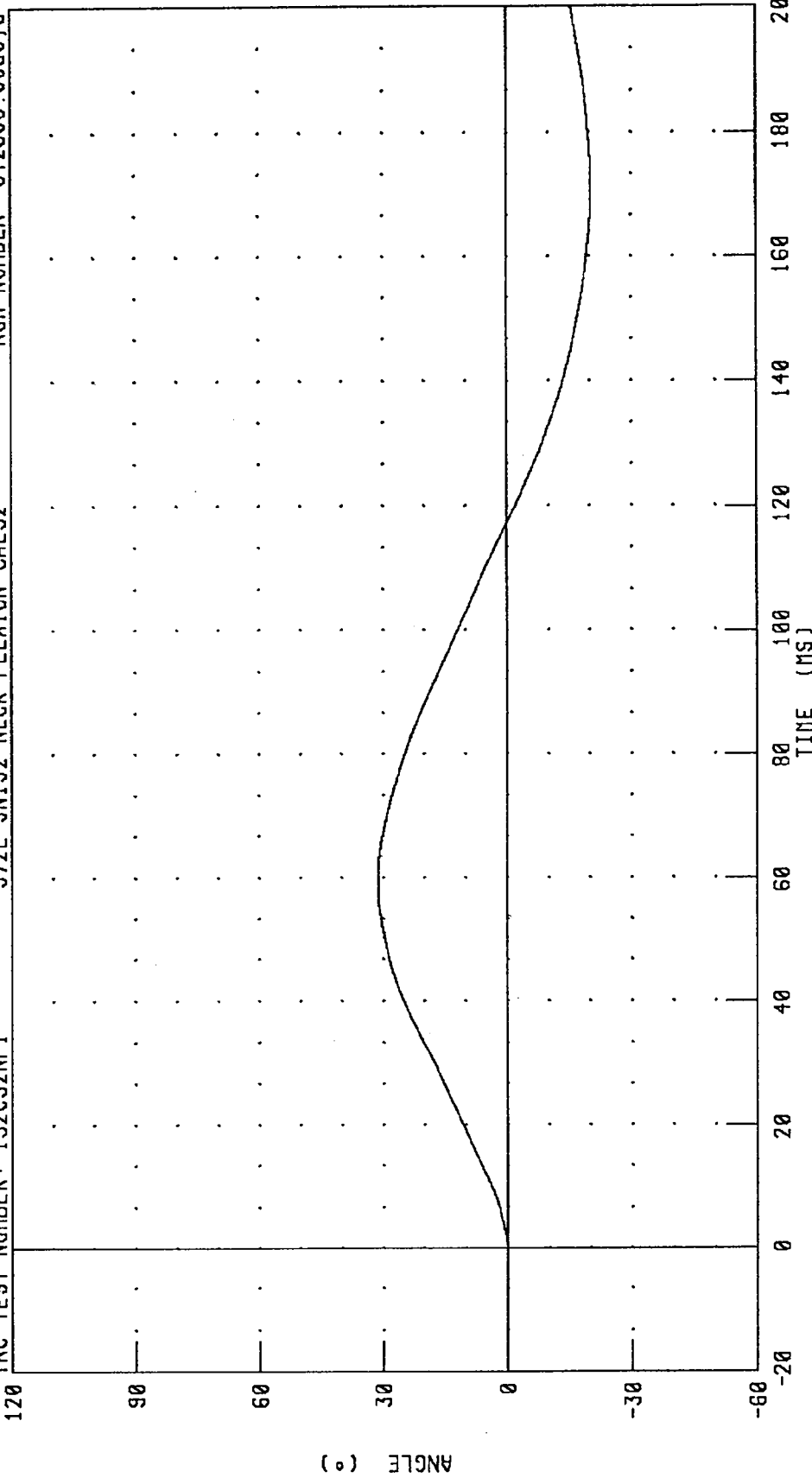
CHANNEL: PENXG FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C32NF1

572E SN192 NECK FLEXION CAL32

RUN NUMBER: 042396.0835,3



PEAK DATA: 31.10 ° @ 59.36 MS; -20.19 ° @ 168.08 MS

CHANNEL: BETA FILTER: CH. CLASS 60

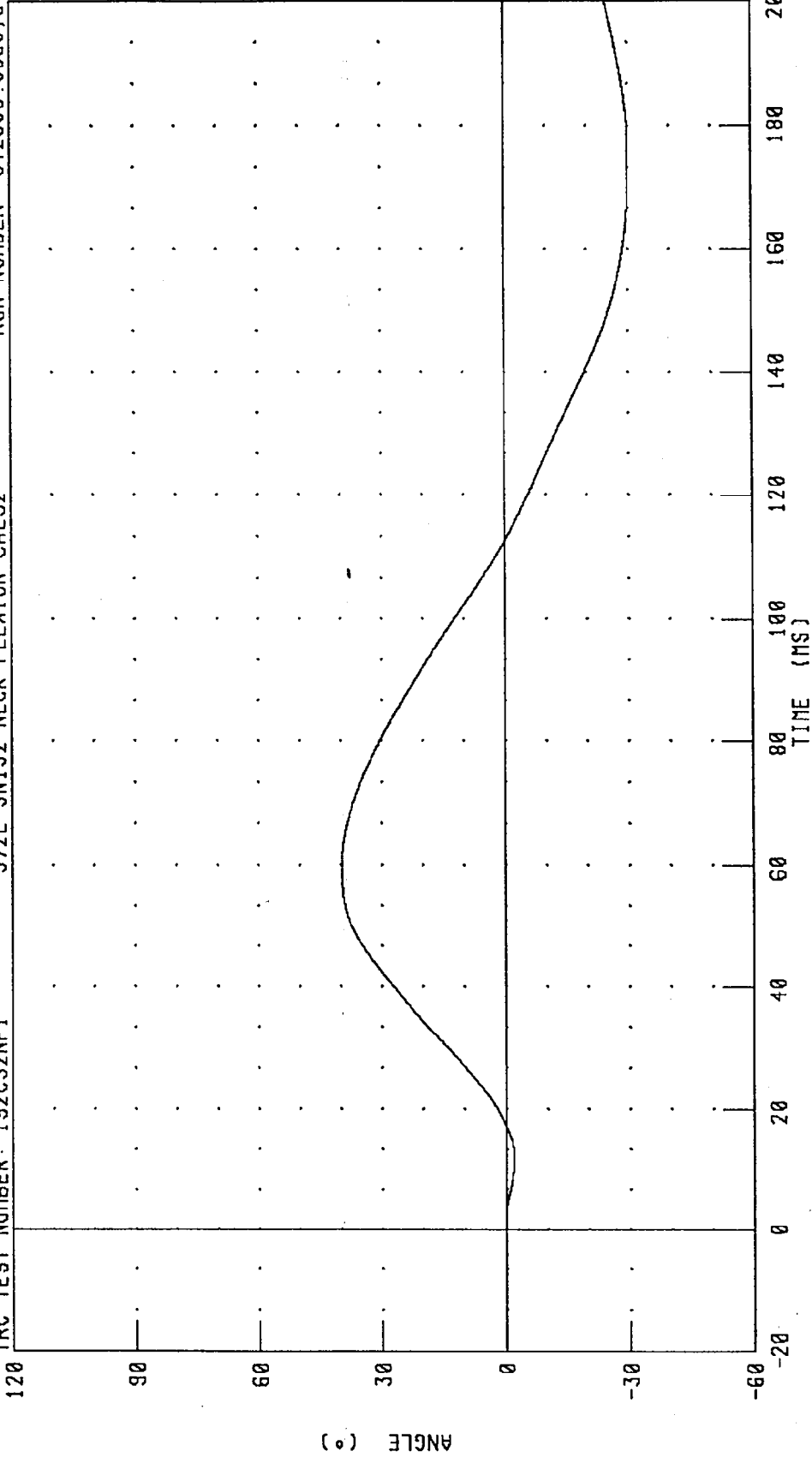
ANGLE (°)

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

TRC TEST NUMBER: 192C32NF1

572E SN192 NECK FLEXION CAL32

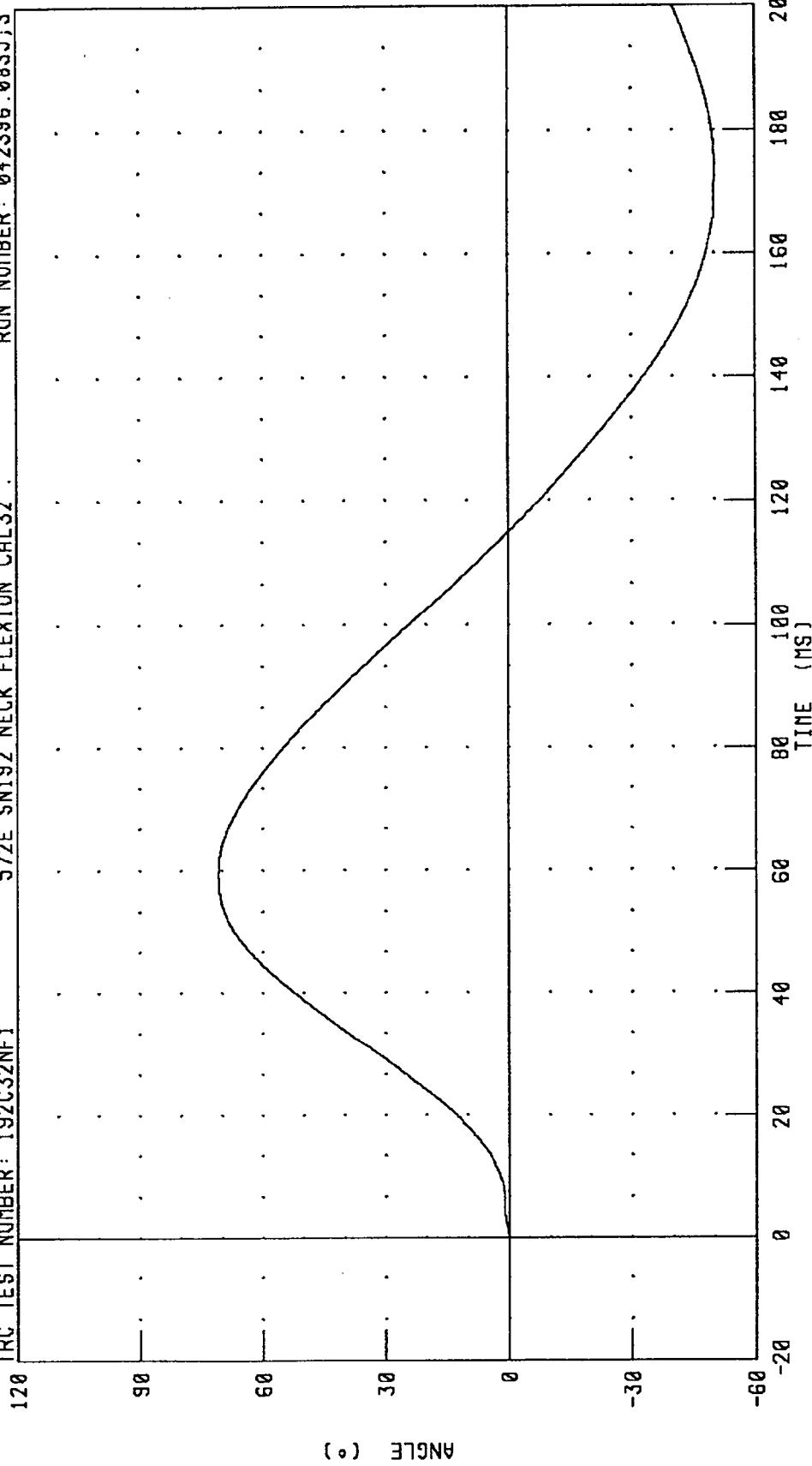
RUN NUMBER: 042396.0835;3



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 39.69 ° @ 59.28 MS; -29.98 ° @ 174.40 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL ROTATION

TRC TEST NUMBER: 192C32NF1 572E SN192 NECK FLEXION CAL32 RUN NUMBER: 042396.0835;3



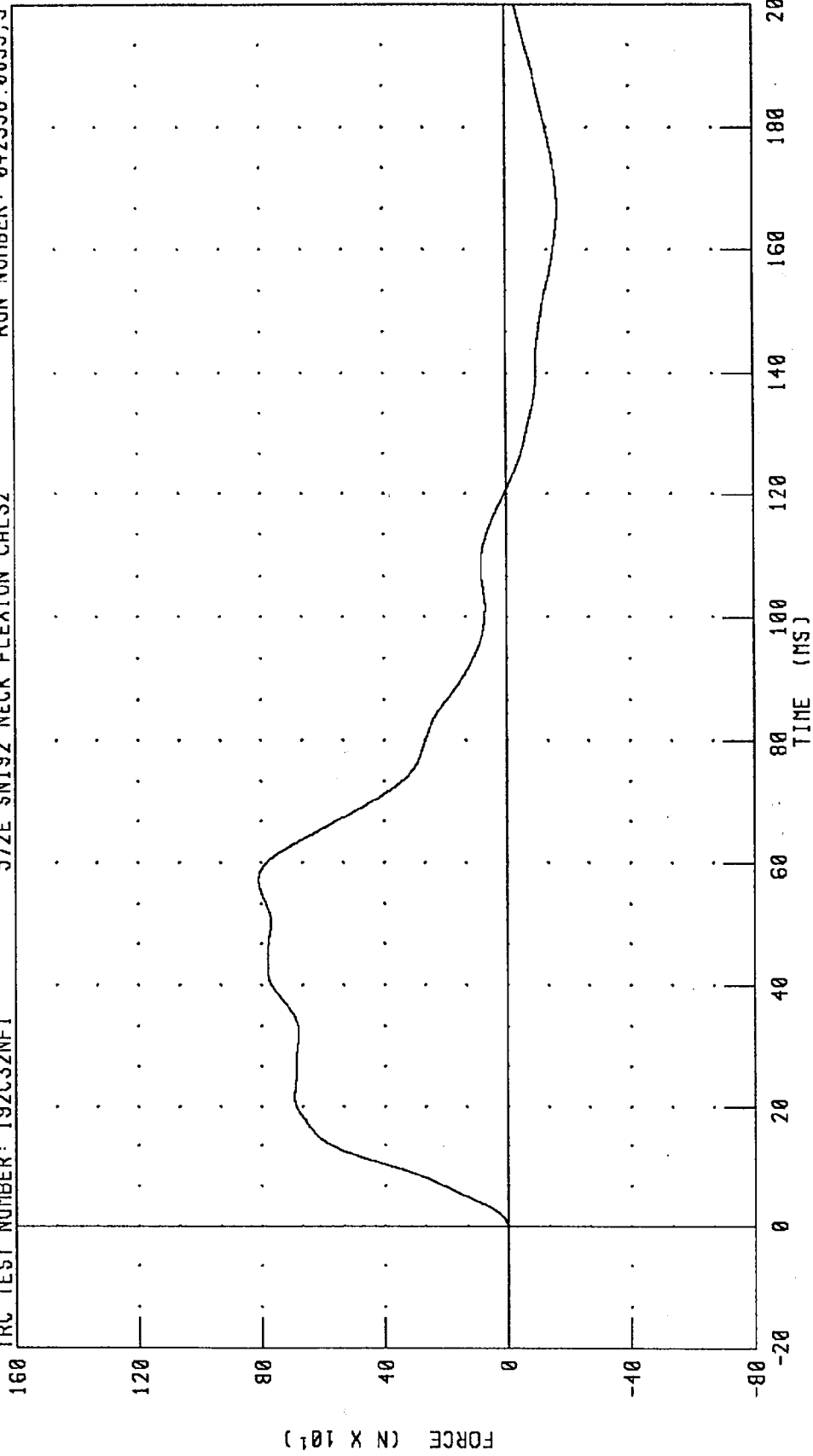
CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 70.79 ° @ 59.36 MS; -50.17 ° @ 174.24 MS

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

TRC TEST NUMBER: 192C32NF1

572E SN192 NECK FLEXION CAL32

RUN NUMBER: 042396.0835,3

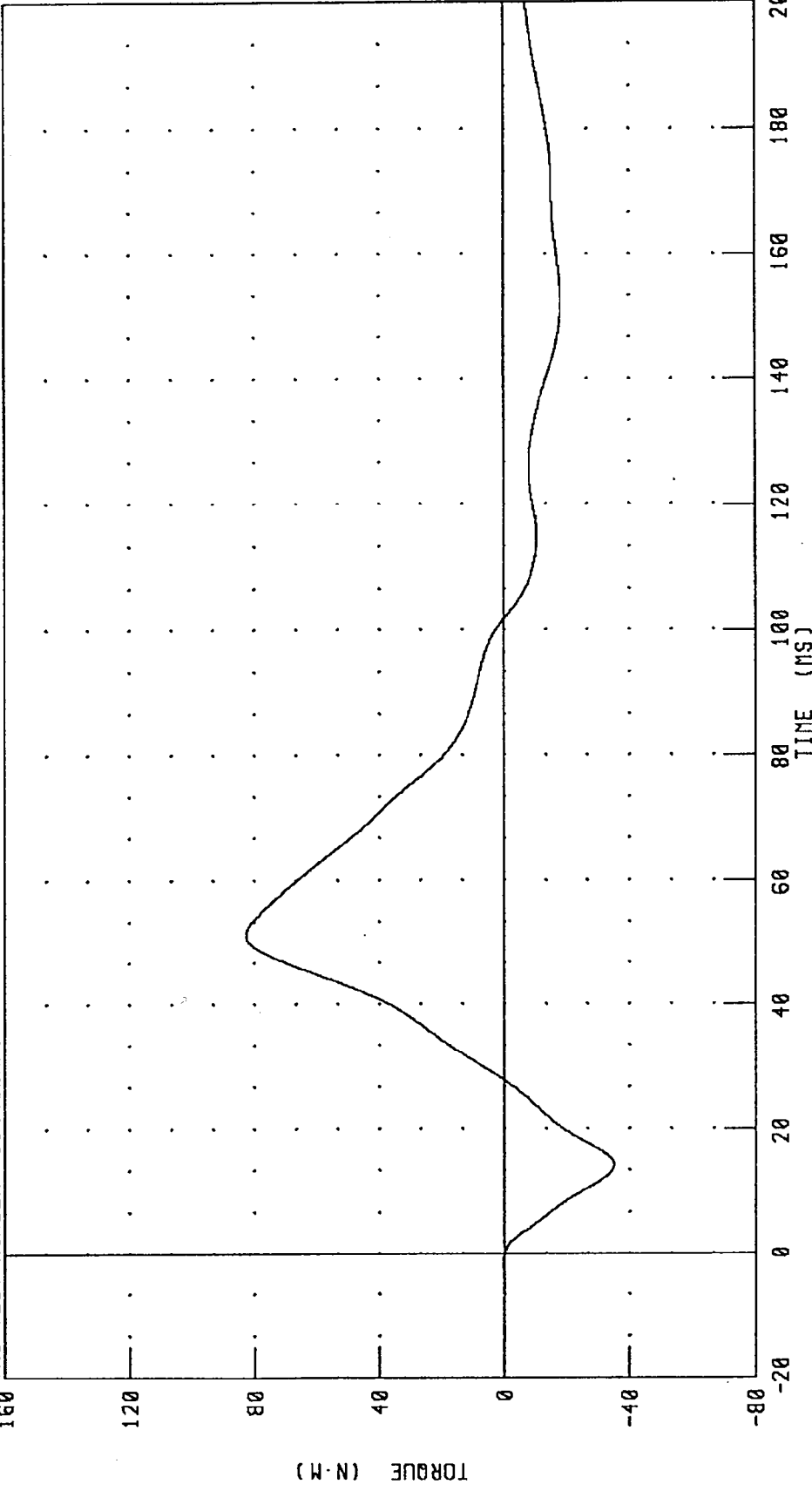


CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 809.08 N @ 57.28 MS; -168.23 N @ 166.64 MS

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

TRC TEST NUMBER: 192C32NF1 572E SN192 NECK FLEXION CAL32 RUN NUMBER: 042396.0835;3

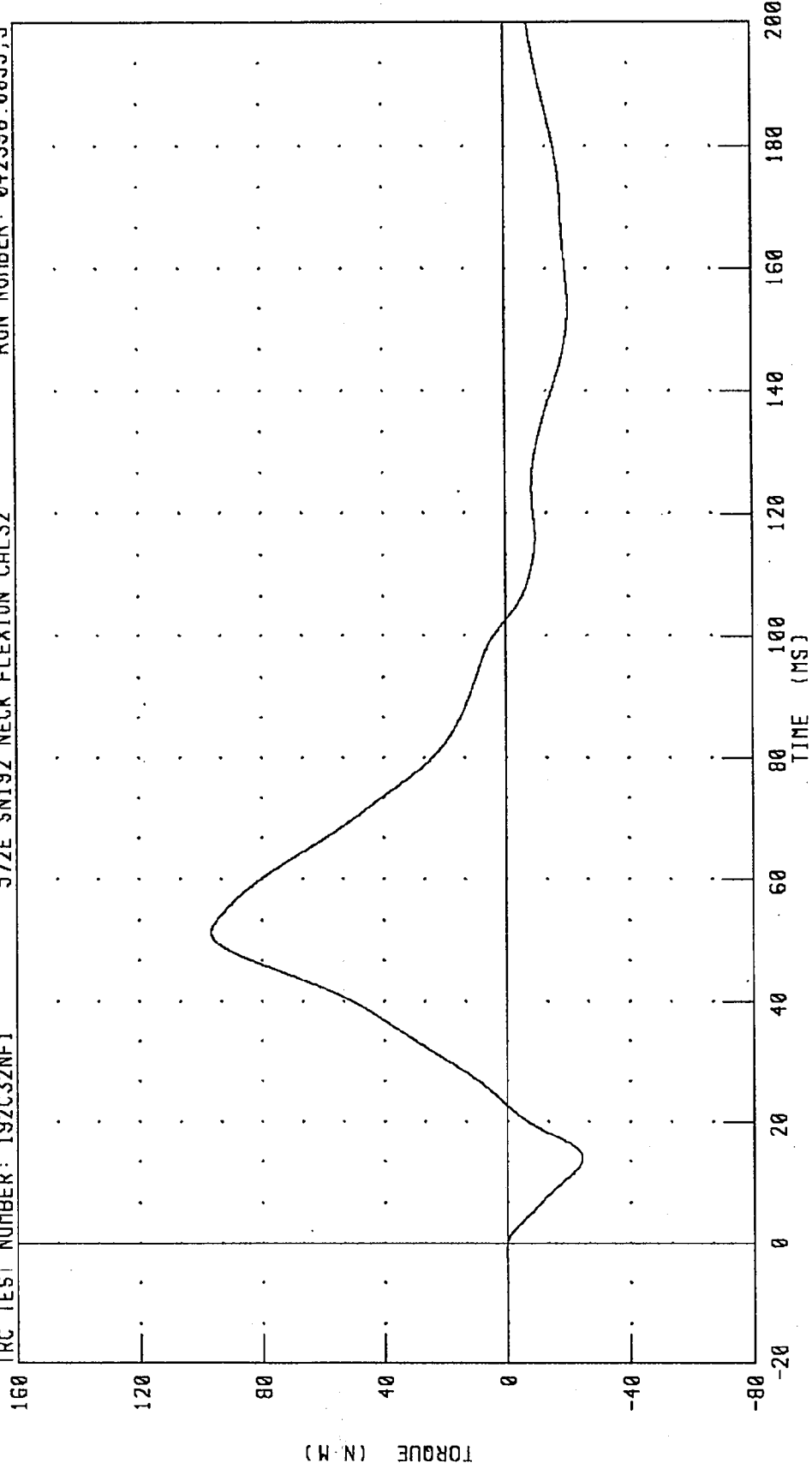


CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 82.86 N·M @ 51.28 MS; -35.06 N·M @ 14.24 MS

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

TRC TEST NUMBER: 192C32NF1 RUN NUMBER: 042396.0835;3

572E SN192 NECK FLEXION CAL32



CHANNEL: NEKOM FILTER: CH. CLASS 60 PEAK DATA: 96.56 N.M @ 51.36 MS; -24.47 N.M @ 13.92 MS

TRANSPORTATION RESEARCH CENTER INC.

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

27-FEB-96

TRC INC. TEST NO: 192C32NE1 572E SN192 NECK EXT. CAL32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
IMPACT VELOCITY	5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS 17.20 - 21.20 G	17.42 G
	20 MS 14.00 - 19.00 G	16.50 G
	30 MS 11.00 - 16.00 G	11.14 G
MAX PENDULUM G	22 G MAX	17.69 G
MAX PENDULUM G ABOVE 30 MS	22 G MAX	11.06 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G	38 - 46 MS	45.20 MS
D PLANE	MAX 81 - 106 DEG.	94.15 DEG.
ROTATION	TIME 72 - 82 MS	76.80 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN -80.0/-52.9 NM	-62.27 NM
	TIME 65 - 79 MS	68.24 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO	147 - 174 MS	157.44 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO	120 - 148 MS	138.72 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

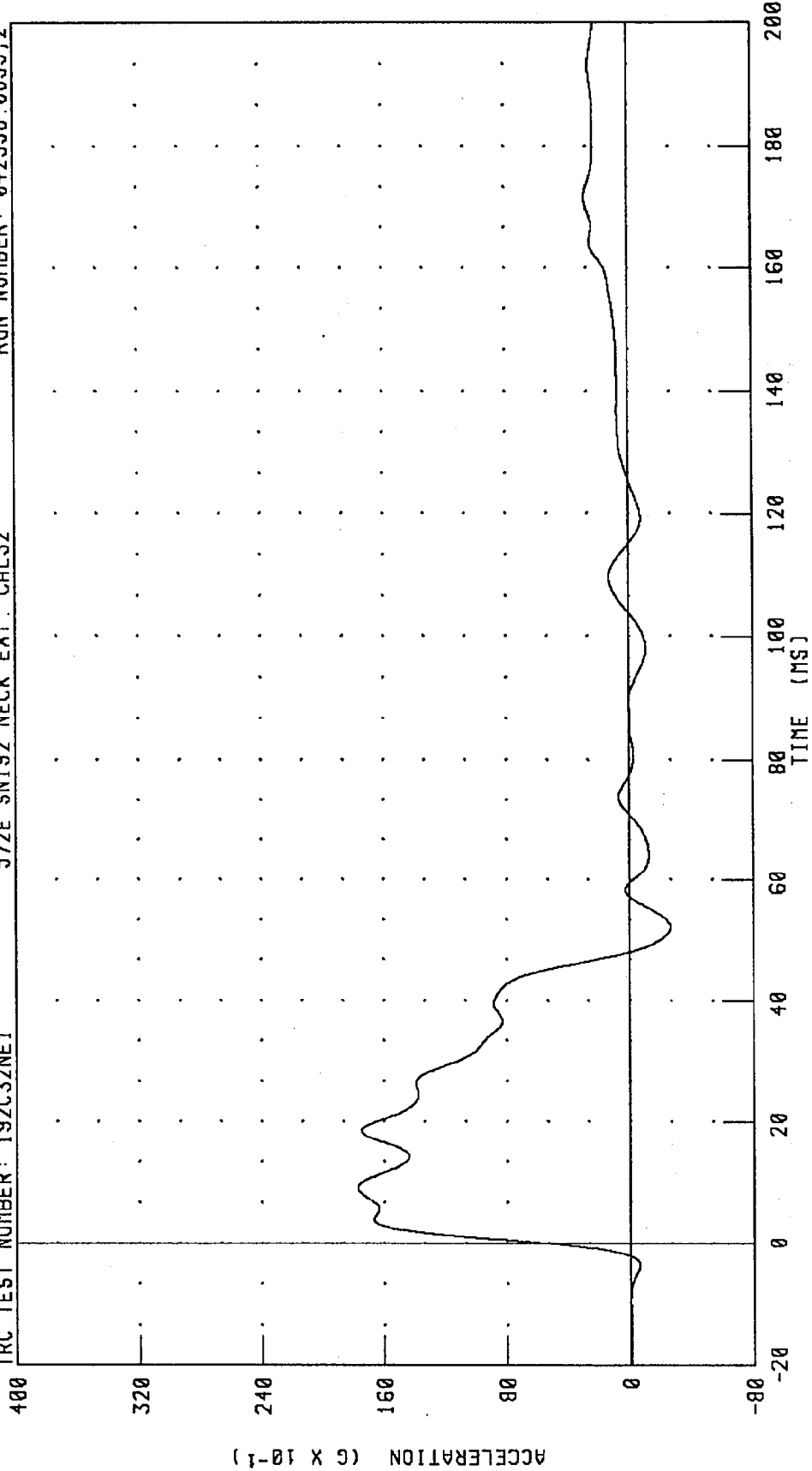
RUN NUMBER: 022796.1317;2

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192C32NE1

572E SN192 NECK EXT. CAL32

RUN NUMBER: 042396.0835;2



PEAK DATA: 17.70 G @ 9.04 MS; -2.64 G @ 52.00 MS

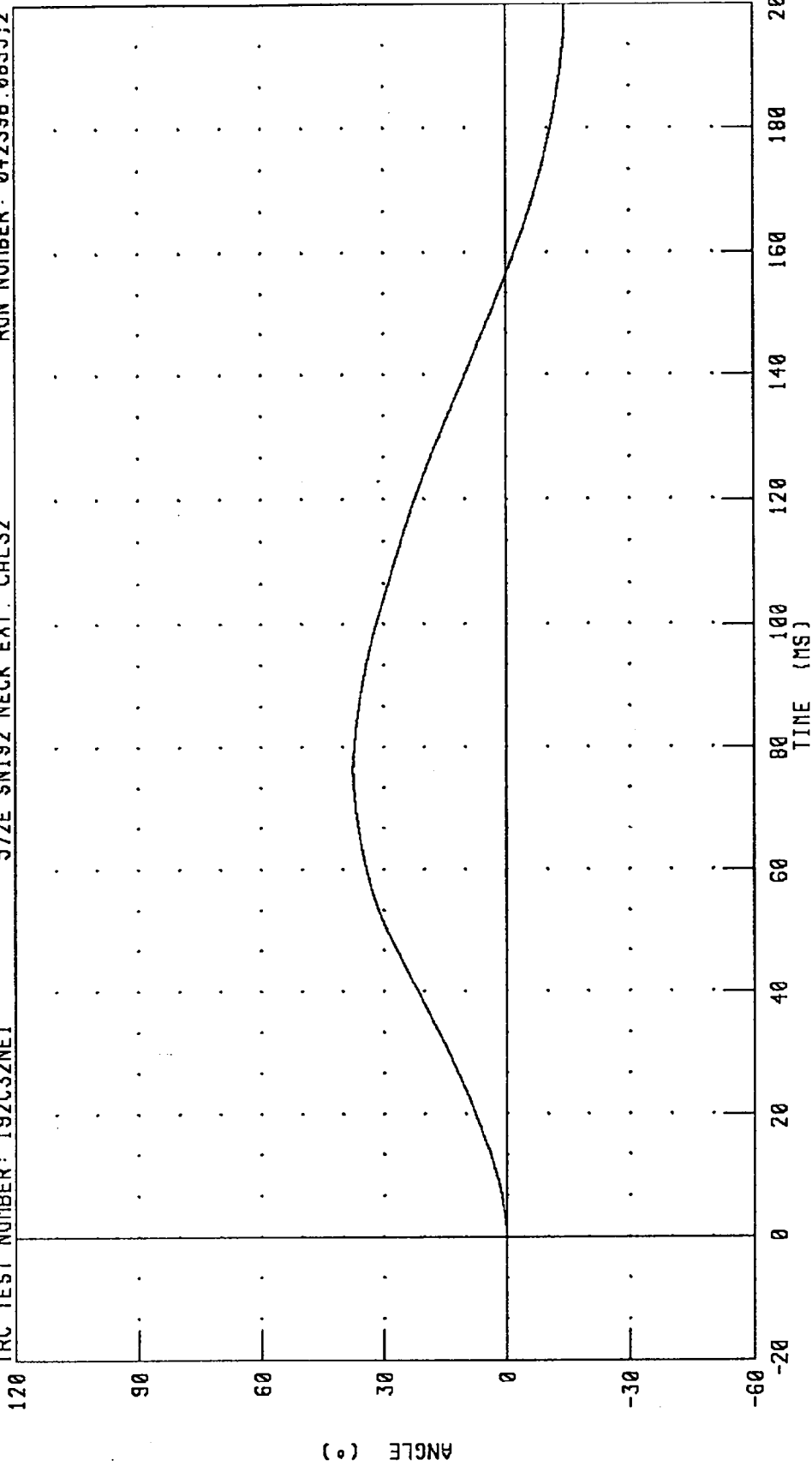
CHANNEL: PENXG FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192032NE1

572E SNI92 NECK EXT. CAL32

RUN NUMBER: 042396.0835;2



PEAK DATA: 37.53 @ 76.24 MS; -14.23 @ 200.00 MS

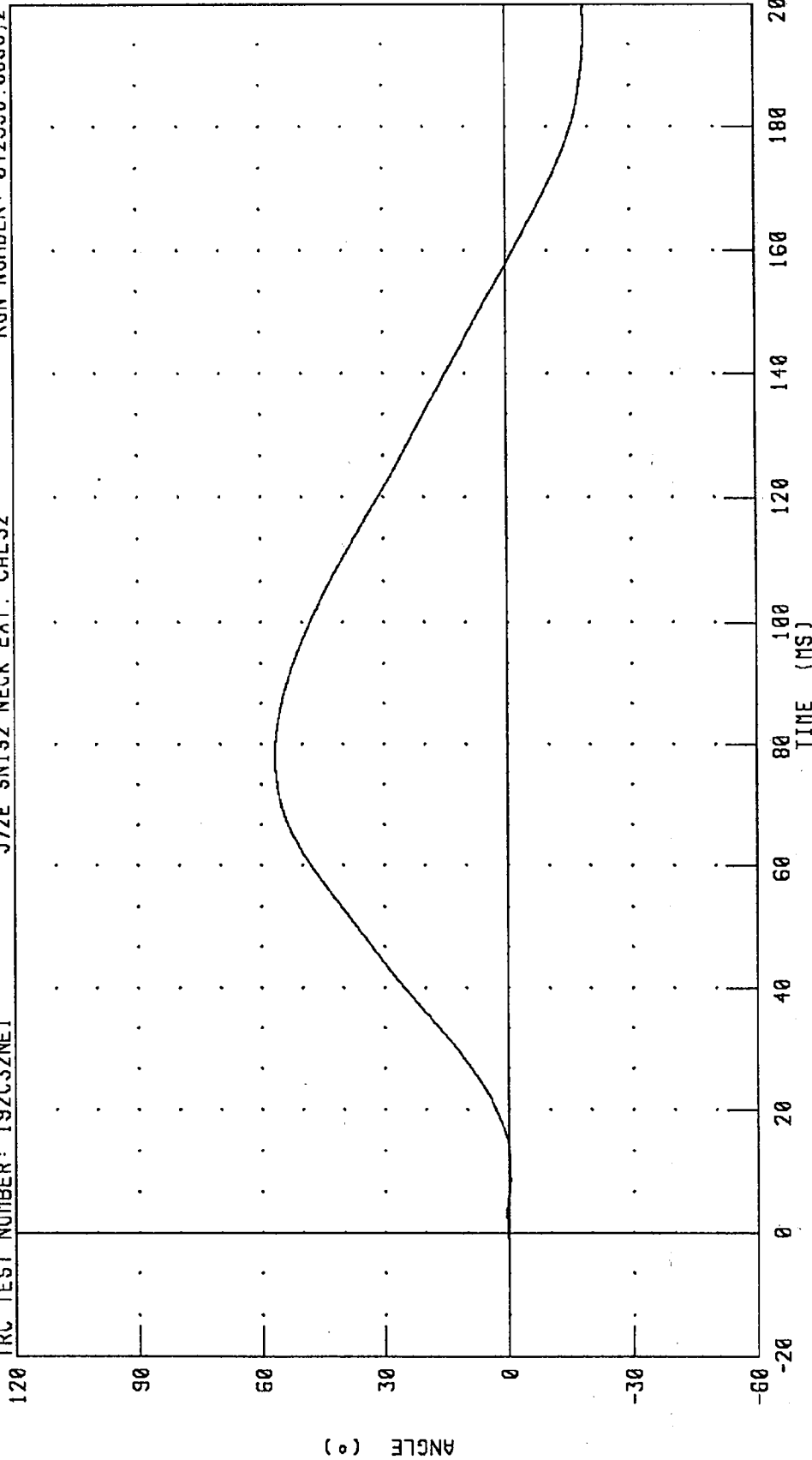
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 192C32NE1

572E SN192 NECK EXT. CAL32

RUN NUMBER: 042396.0835;2

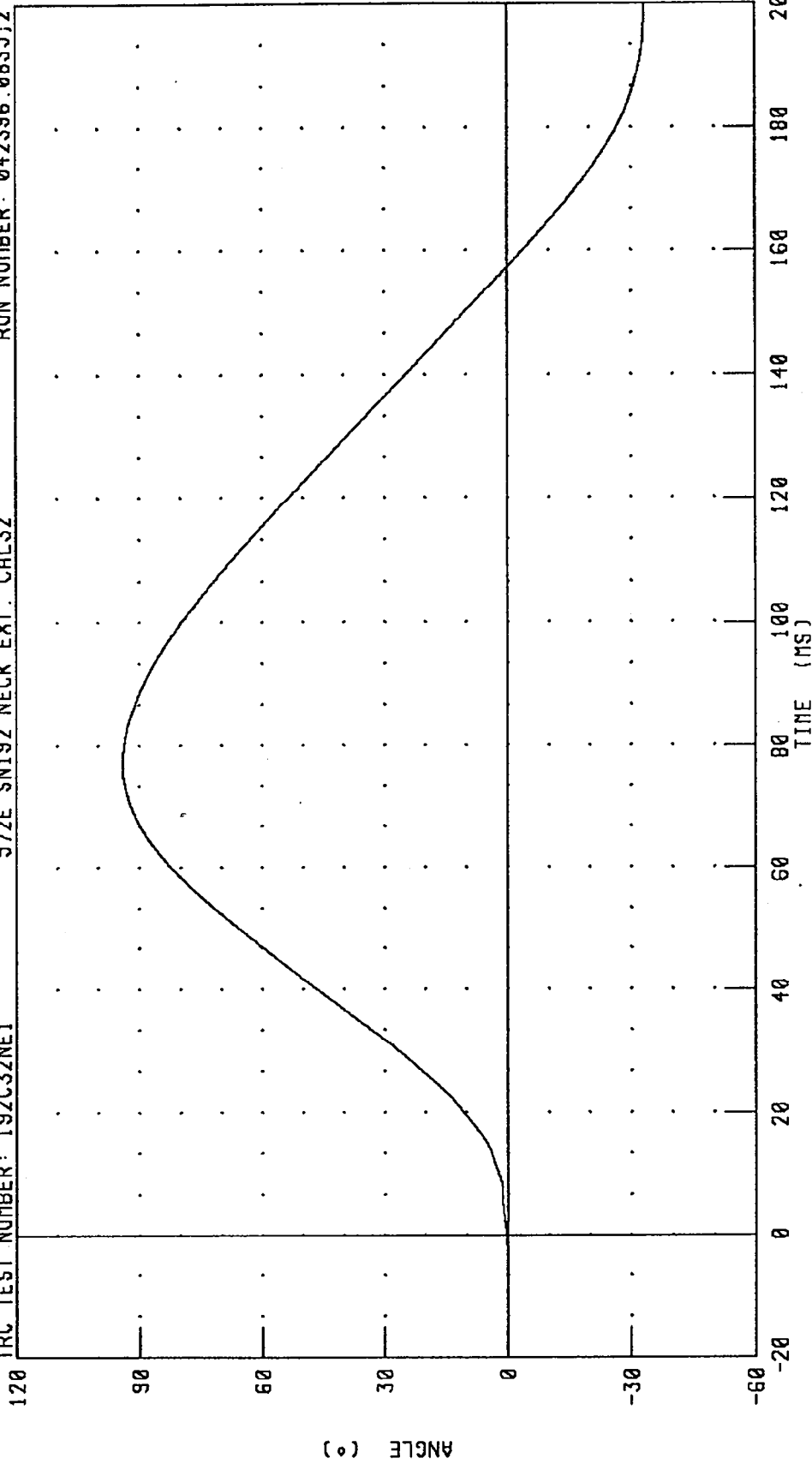


CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 56.65 @ 78.00 MS; -18.90 @ 194.48 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION

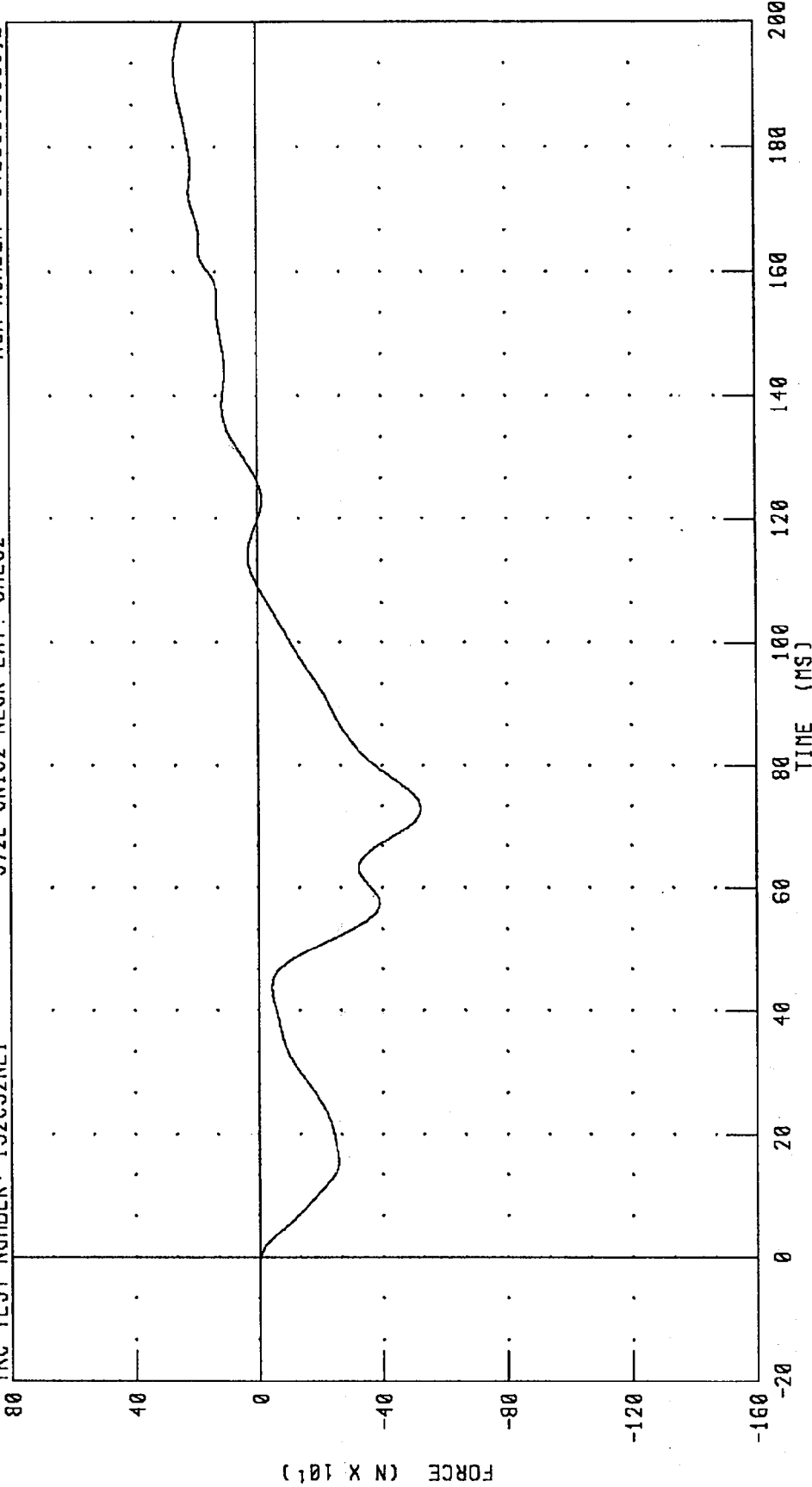
TRC TEST NUMBER: 192C32NE1 572E SN192 NECK EXT. CAL32 RUN NUMBER: 042396.0835;2



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 94.15 ° @ 76.80 MS; -33.11 ° @ 200.00 MS

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

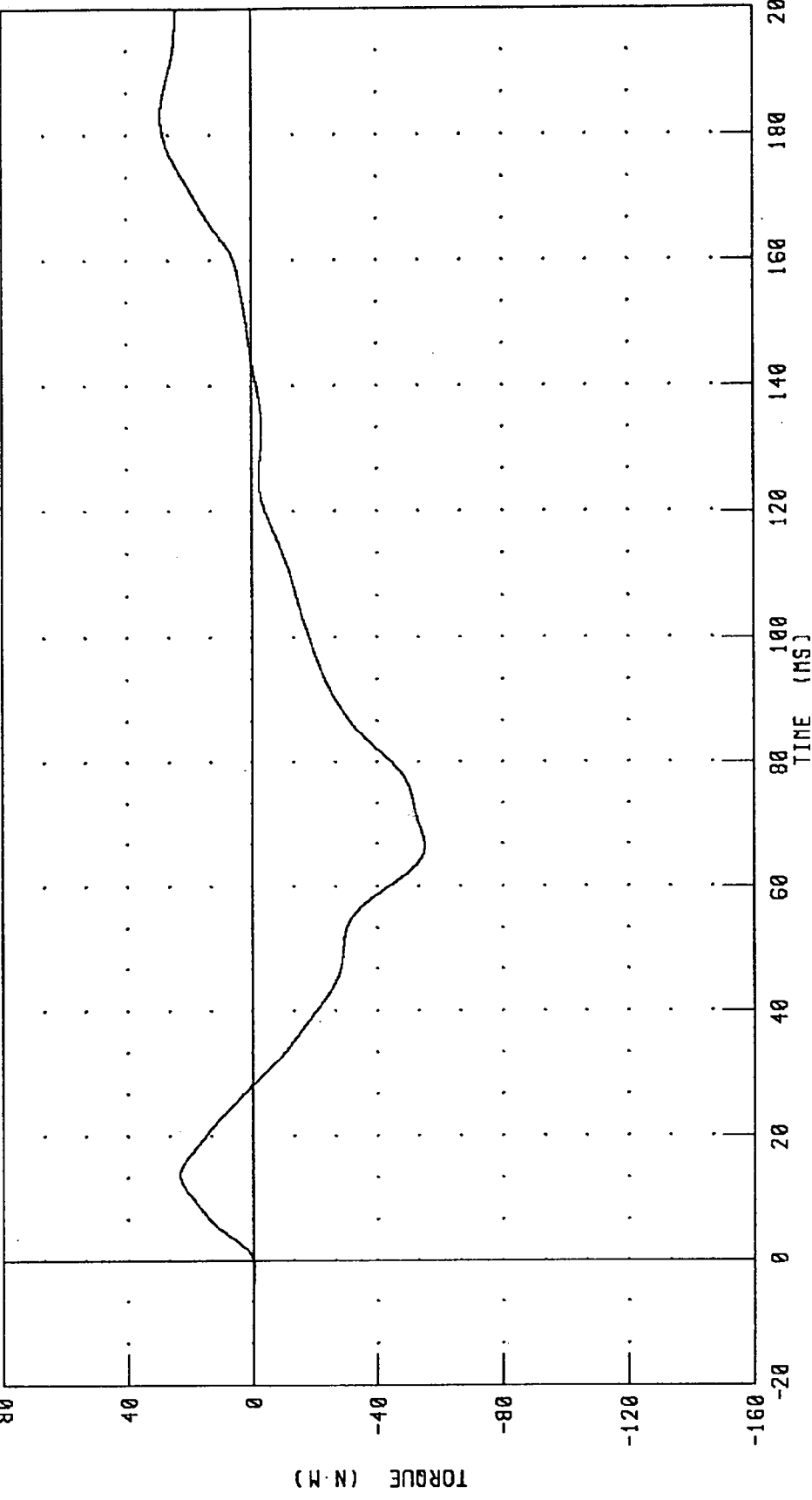
TRC TEST NUMBER: 192C32NE1 572E SN192 NECK EXT. CAL32 RUN NUMBER: 042396.0835J2



CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 263.78 N e 192.88 MS; -524.15 N e 72.96 MS

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

TRC TEST NUMBER: 192C32NE1 572E SN192 NECK EXT. CAL32 RUN NUMBER: 042396.0835;2



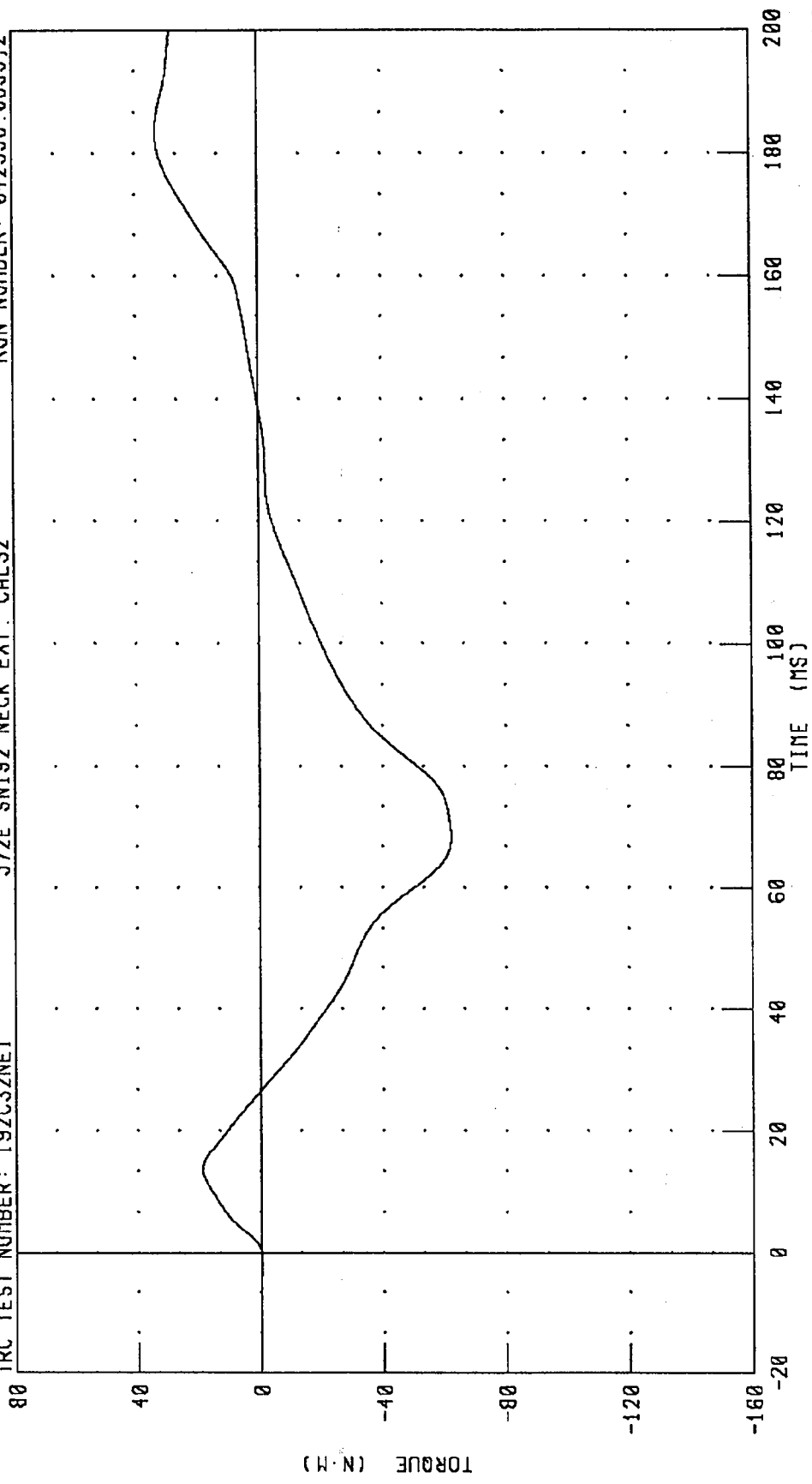
CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 29.07 N.M @ 183.04 MS; -55.19 N.M @ 66.40 MS

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

TRC TEST NUMBER: 192C32NE1

572E SN192 NECK EXT. CAL32

RUN NUMBER: 042396.0835;2



PEAK DATA: 33.20 N-M @ 183.52 MS; -62.27 N-M @ 68.24 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

27-FEB-96

TRC INC.

TEST NO: 192C32TH1

572E SN192 H.S.THORAX CAL32

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.4 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	65.7 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5730. N
INTERNAL HYSTERESIS	69% - 85%	71.8%

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard Le Van

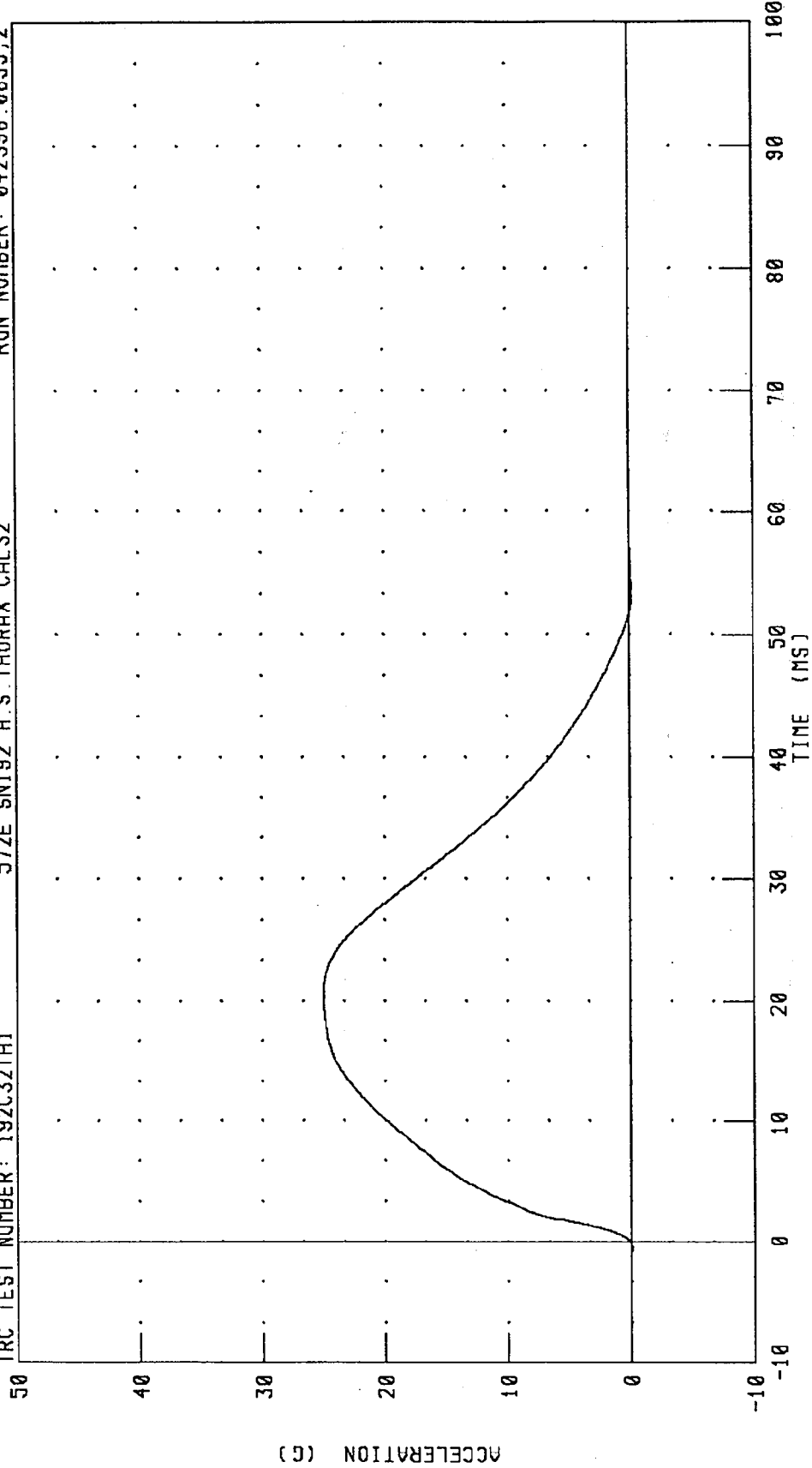
RUN NUMBER: 032896.1406;2

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 192C32TH1

572E SN192 H.S. THORAX CAL32

RUN NUMBER: 042396.0835.2



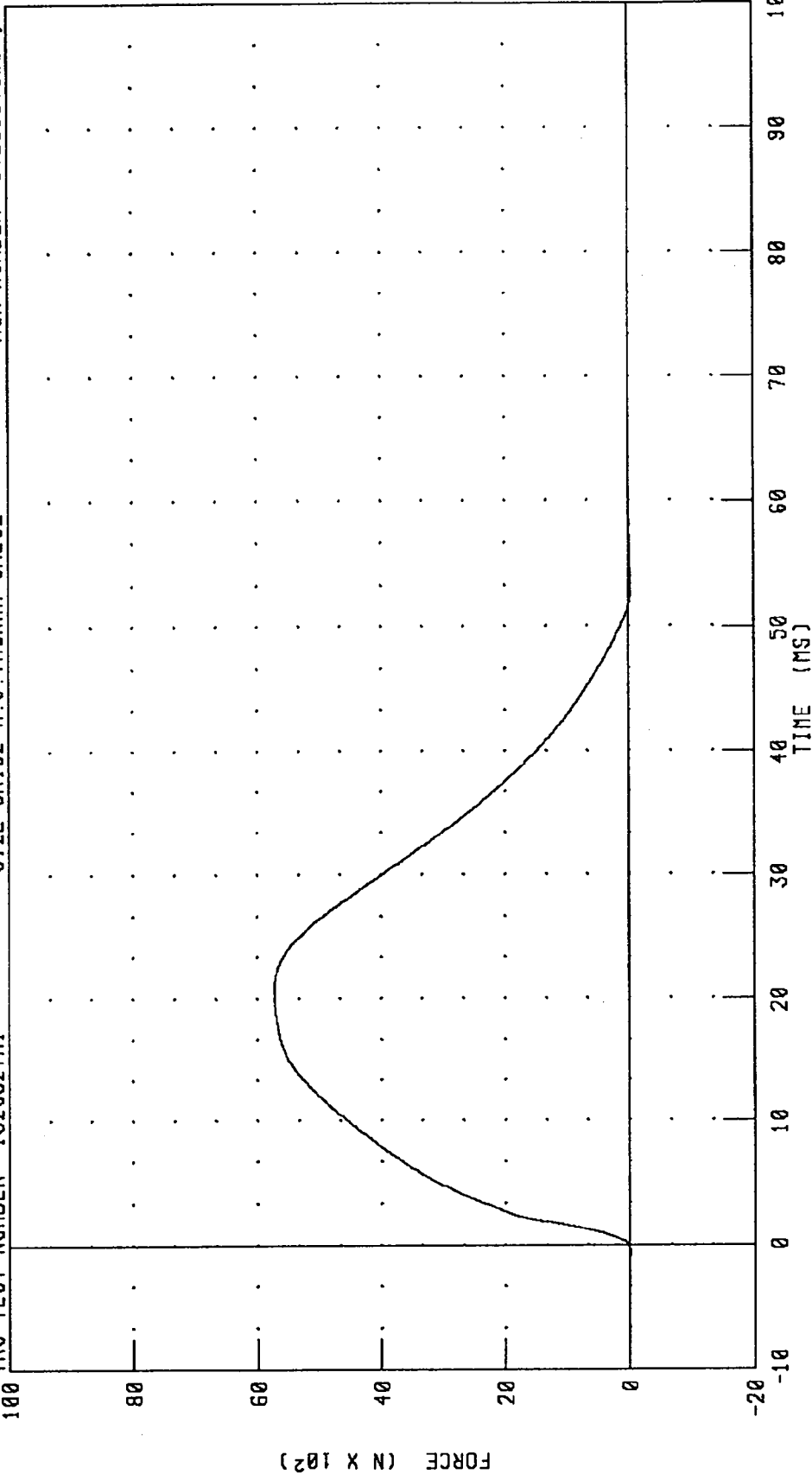
CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 25.01 G @ 20.40 MS; -0.16 G @ 53.28 MS

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 192C32TH1

572E SN192 H.S. THORAX CAL32

RUN NUMBER: 042396 0835;2



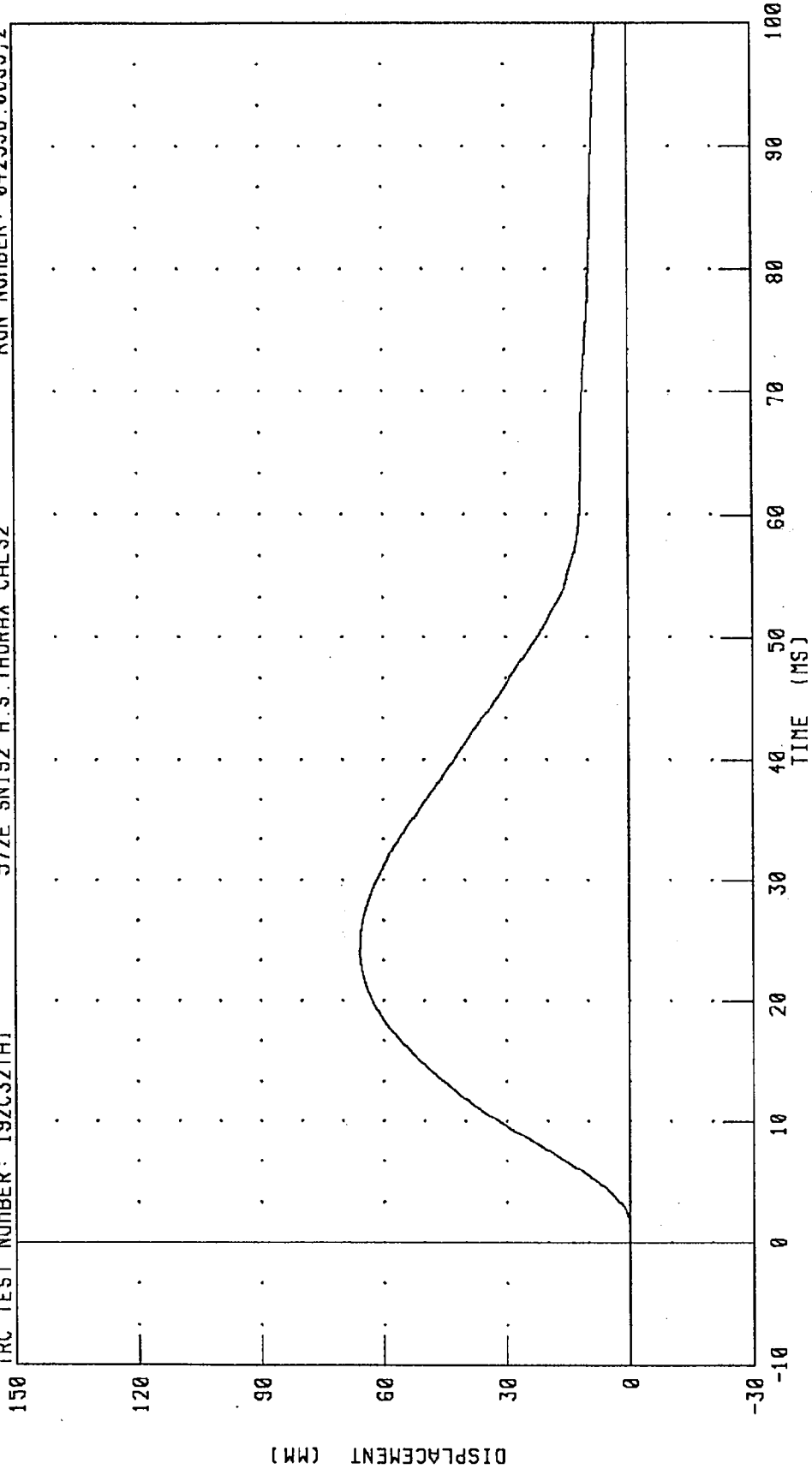
CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5730.00 N @ 20.40 MS; -36.46 N @ 53.28 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 192C32TH1

572E SN192 H.S. THORAX CAL32

RUN NUMBER: 042396.0835J2



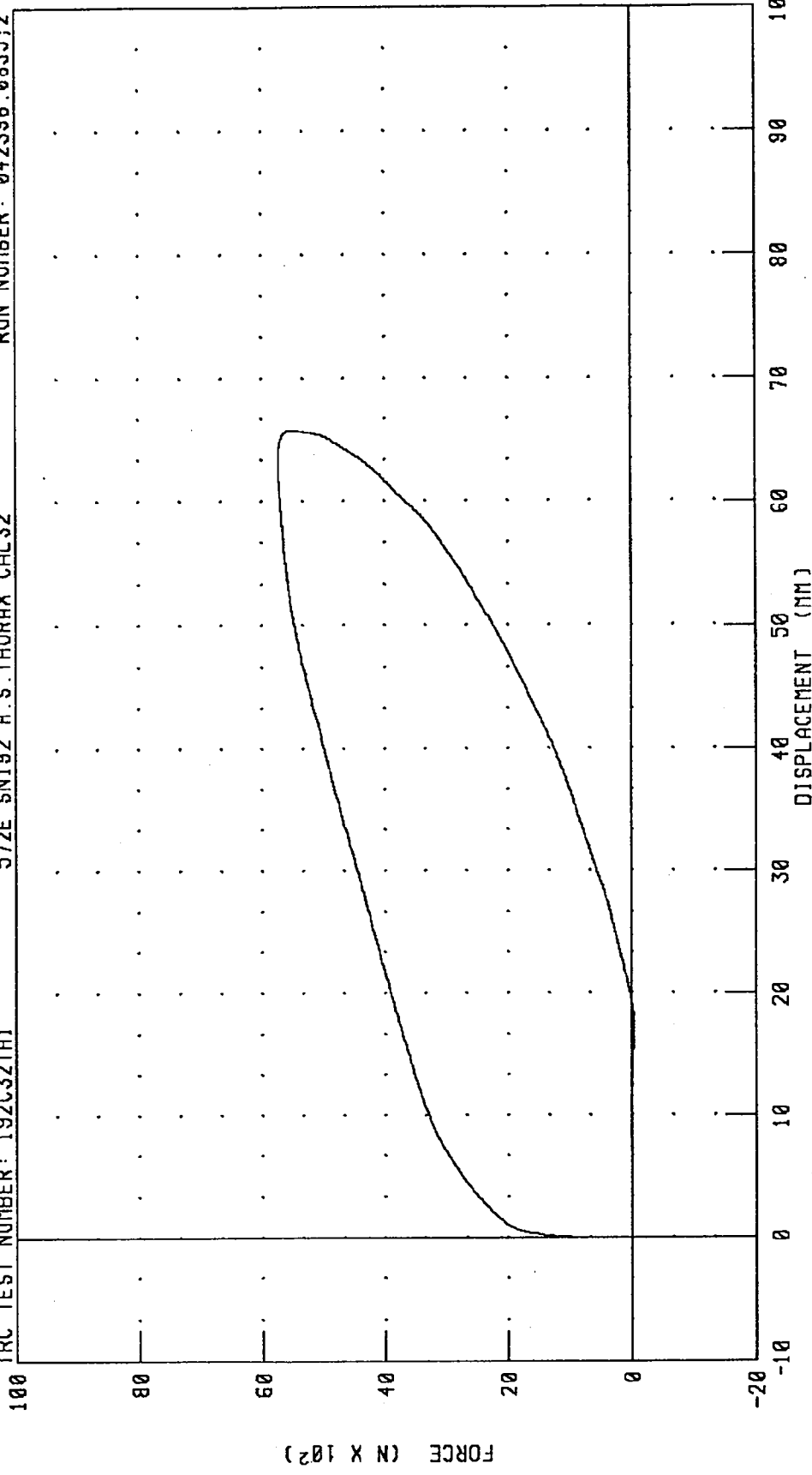
CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 65.74 MM @ 23.92 MS; -0.02 MM @ 0.64 MS

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

TRC TEST NUMBER: 192C32TH1

572E SN192 H.S. THORAX CAL32

RUN NUMBER: 042396.0835;2



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

DISPLACEMENT (MM)
PEAK DATA:

65.74 MM @ 23.92 MS; -0.02 MM @ 0.64 MS
5730.08 N @ 20.40 MS; -36.46 N @ 53.28 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

26-FEB-96

TRC INC.

TEST NO: 192C32RK1

572E SN192 RIGHT KNEE CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	48.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5335.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

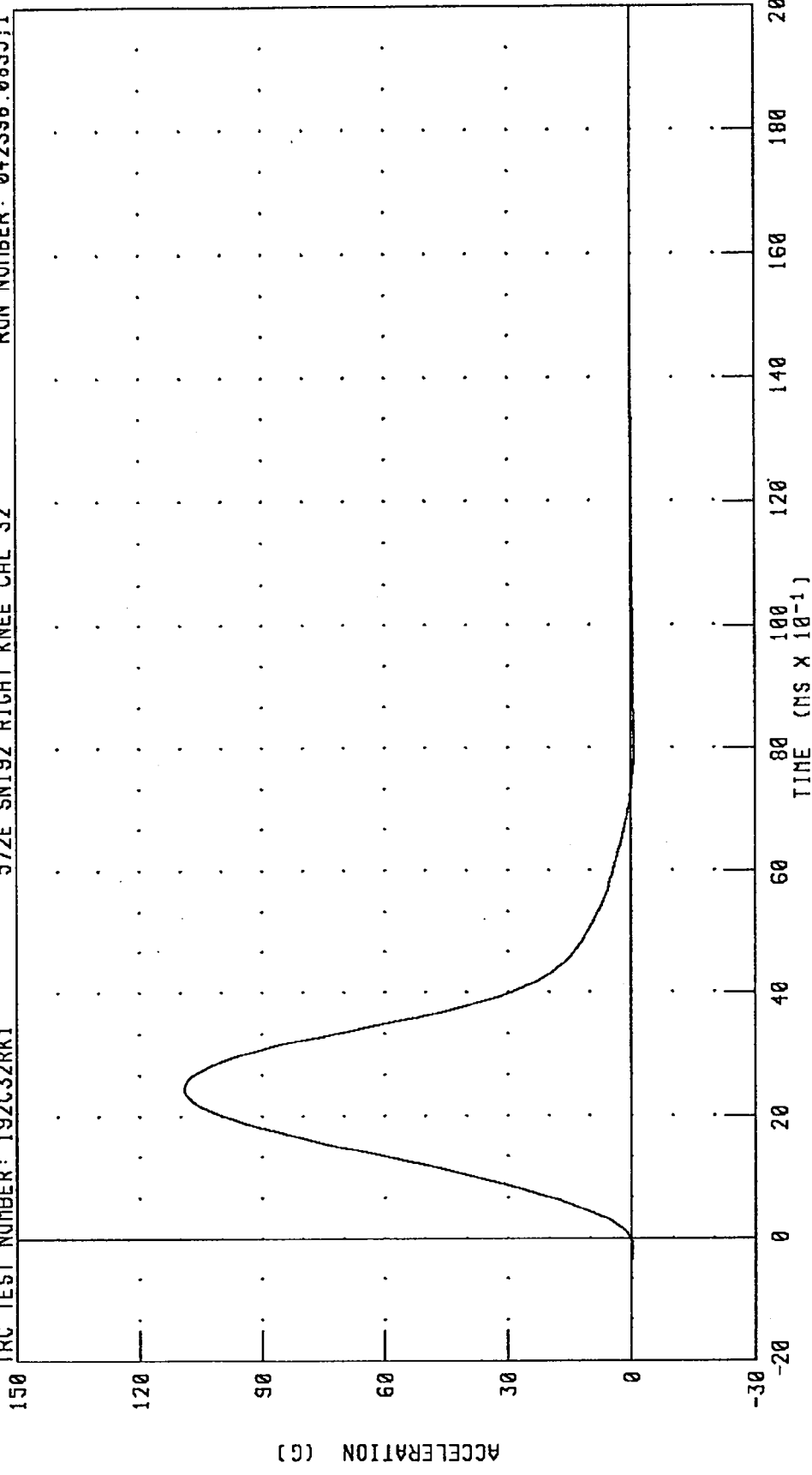
RUN NUMBER: 022696.1327;1

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

TRC TEST NUMBER: 192C32RK1

572E SN192 RIGHT KNEE CAL 32

RUN NUMBER: 042396.0835;1



CHANNEL: PENXC FILTER: CH. CLASS 600

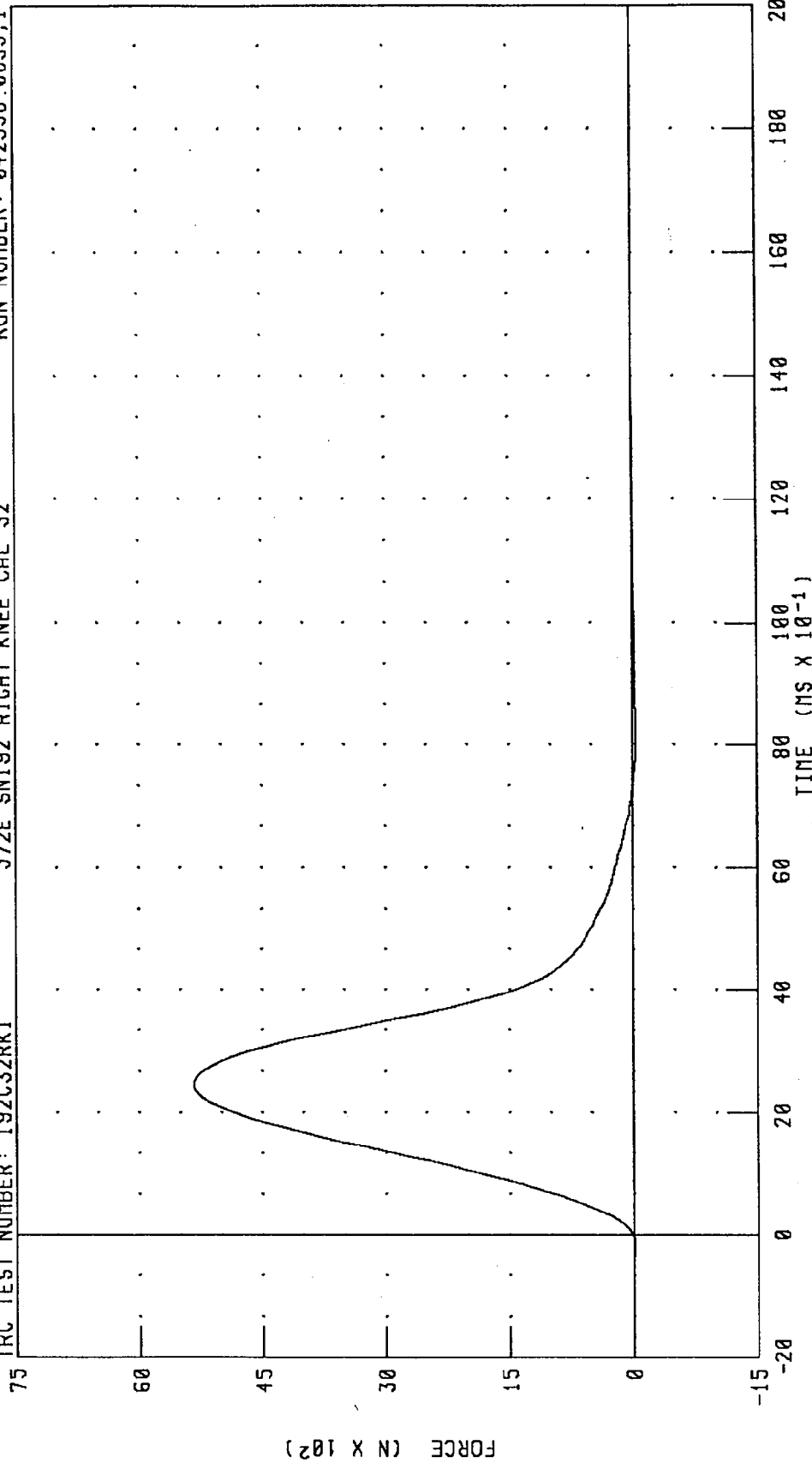
PEAK DATA: 109.06 G @ 2.48 MS; -0.73 G @ 8.00 MS

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

TRC TEST NUMBER: 192C32RK1

572E SNI92 RIGHT KNEE CAL 32

RUN NUMBER: 042396.0835;1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5335.95 N @ 2.48 MS; -35.91 N @ 8.00 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

26-FEB-96

TRC INC.

TEST NO: 192C32LK1

572E SN192 LEFT KNEE CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	48.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.13 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5274.4 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

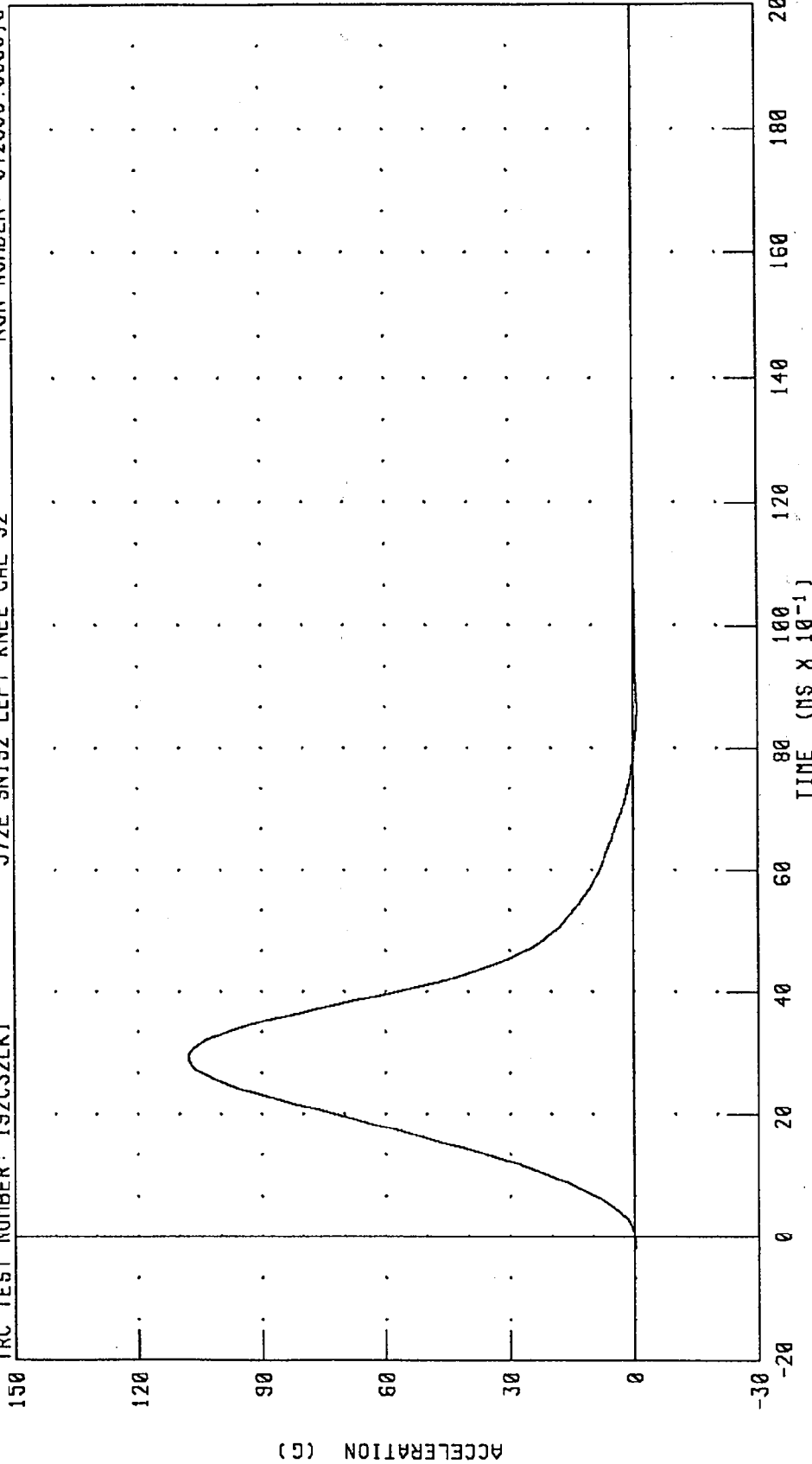
RUN NUMBER: 022696.1337;3

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

TRC TEST NUMBER: 192C32LK1

572E SN192 LEFT KNEE CAL 32

RUN NUMBER: 042396.0835;3



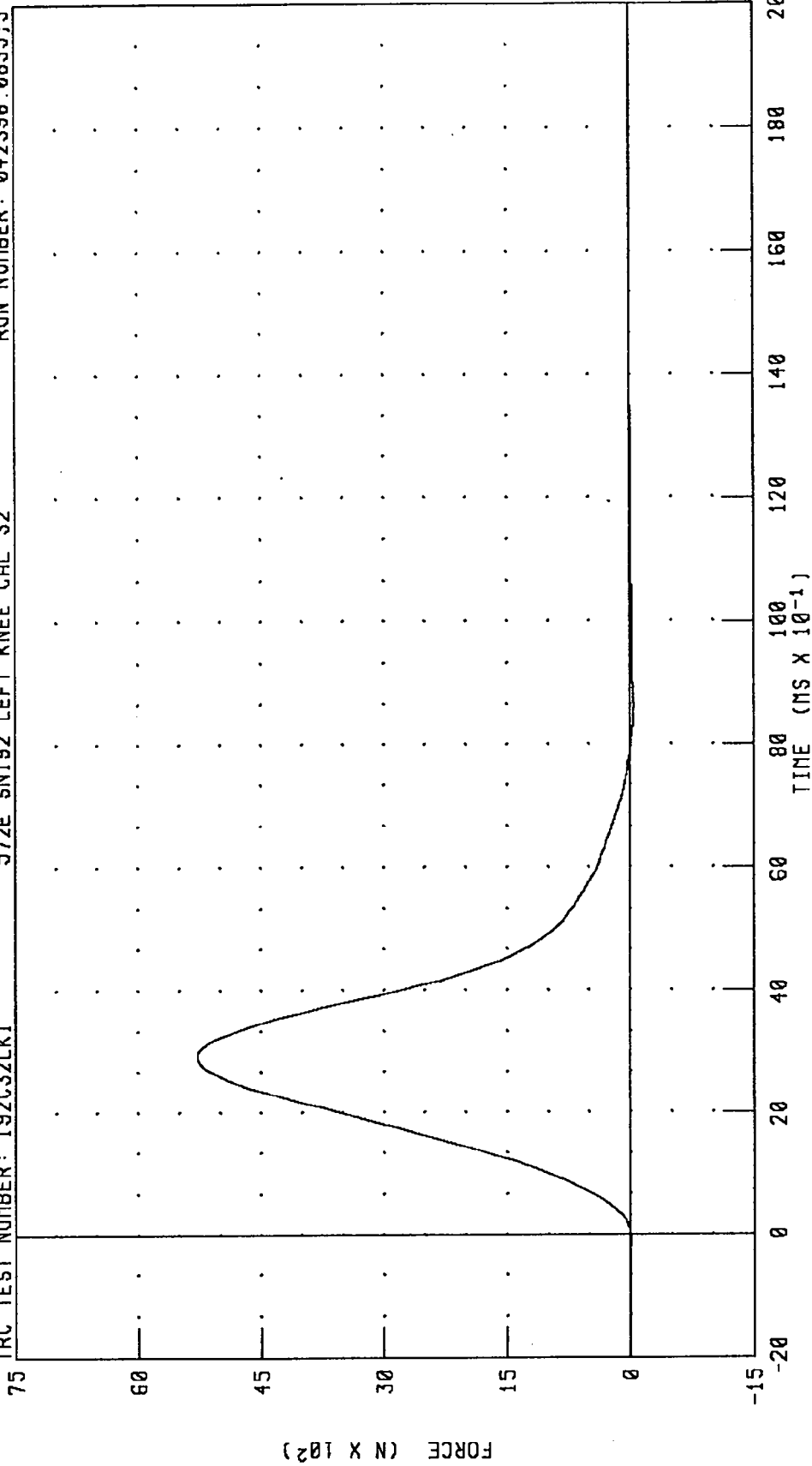
CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 107.80 G @ 2.88 MS; -0.84 G @ 8.64 MS

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

TRC TEST NUMBER: 192C32LK1

572E SN192 LEFT KNEE CAL 32

RUN NUMBER: 042396.0835;3



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5274.43 N @ 2.88 MS; -41.15 N @ 8.64 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	A74JJ	7264	Endevco	02/26/96	08/26/96
Head X-axis accelerometer-redundant	AC8L5	7264	Endevco	02/26/96	08/26/96
Head Y-axis accelerometer	ACCR7	7264	Endevco	02/26/96	08/26/96
Head Y-axis accelerometer-redundant	AJ8L6	7264	Endevco	02/26/96	08/26/96
Head Z-axis accelerometer	ACCJ1	7264	Endevco	02/26/96	08/26/96
Head Z-axis accelerometer-redundant	A68JJ	7264	Endevco	02/26/96	08/26/96
Chest X-axis accelerometer	AC721	7264	Endevco	02/26/96	08/26/96
Chest X-axis accelerometer-redundant	A65JJ	7264	Endevco	02/26/96	08/26/96
Chest Y-axis accelerometer	CY47H	7264	Endevco	02/26/96	08/26/96
Chest Y-axis accelerometer-redundant	FH14J	7264	Endevco	02/26/96	08/26/96
Chest Z-axis accelerometer	AAL44	7264	Endevco	02/26/96	08/26/96
Chest Z-axis accelerometer-redundant	AC745	7264	Endevco	02/26/96	08/26/96
Left femur force load cell	903	2430	GSE	02/26/96	08/26/96
Right femur force load cell	904	2430	GSE	02/26/96	08/26/96
Neck X-axis force load cell ¹	280	1716	Denton	02/26/96	08/26/96
Neck Y-axis force load cell ¹	280	1716	Denton	02/26/96	08/26/96
Neck Z-axis force load cell ¹	280	1716	Denton	02/26/96	08/26/96
Neck Moment about X-axis load cell ¹	280	1716	Denton	02/26/96	08/26/96
Neck Moment about Y-axis load cell ¹	280	1716	Denton	02/26/96	08/26/96
Neck Moment about Z-axis load cell ¹	280	1716	Denton	02/26/96	08/26/96
Pelvis X-axis accelerometer	CY63H	7264	Endevco	02/26/96	08/26/96
Pelvis Y-axis accelerometer	AMWA9	7264	Endevco	02/26/96	08/26/96
Pelvis Z-axis accelerometer	ANA55	7264	Endevco	02/26/96	08/26/96
Chest deflection potentiometer ¹	142	14CB1-2981	Vernitech	02/26/96	08/26/96
Lap belt force load cell	249	3419	Lebow	01/19/96	07/19/96
Shoulder belt force load cell	616	3419	Lebow	01/19/96	07/19/96

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	297	1583	Denton	01/23/96	07/23/96
Left upper tibia moment about Y-axis load cell	297	1583	Denton	01/23/96	07/23/96
Right upper tibia moment about X-axis load cell	298	1583	Denton	01/23/96	07/23/96
Right upper tibia moment about Y-axis load cell	298	1583	Denton	01/23/96	07/23/96
Left Lower tibia X-axis force load cell	286	1584	Denton	01/23/96	07/23/96
Left Lower tibia Z-axis force load cell	286	1584	Denton	01/23/96	07/23/96
Left Lower tibia moment about Y-axis load cell	286	1584	Denton	01/23/96	07/23/96
Right Lower tibia X-axis force load cell	287	1584	Denton	01/23/96	07/23/96
Right Lower tibia Z-axis force load cell	287	1584	Denton	01/23/96	07/23/96
Right Lower tibia moment about Y-axis load cell	287	1584	Denton	01/23/96	07/23/96
Left foot X-axis accelerometer	APOA1	7264	Endevco	10/16/95	04/16/96
Left foot heel Z-axis accelerometer	10102	7264	Endevco	10/16/95	04/16/96
Left foot toe Z-axis accelerometer	10074	7264	Endevco	10/16/95	04/16/96
Right foot X-axis accelerometer	10088	7264	Endevco	10/16/95	04/16/96
Right foot heel Z-axis accelerometer	10089	7264	Endevco	10/16/95	04/16/96
Right foot toe Z-axis accelerometer	10087	7264	Endevco	10/17/95	04/17/96

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

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Head X-axis accelerometer	AAL82	7264	Endevco	02/26/96	08/26/96
Head X-axis accelerometer-redundant	AJ8J7	7264	Endevco	02/27/96	08/27/96
Head Y-axis accelerometer	A84JJ	7264	Endevco	02/26/96	08/26/96
Head Y-axis accelerometer-redundant	AJ8A6	7264	Endevco	02/27/96	08/27/96
Head Z-axis accelerometer	FH87J	7264	Endevco	02/26/96	08/26/96
Head Z-axis accelerometer-redundant	AC8W6	7264	Endevco	02/27/96	08/27/96
Chest X-axis accelerometer	CT22H	7264	Endevco	02/26/96	08/26/96
Chest X-axis accelerometer-redundant	A79GJ	7264	Endevco	02/27/96	08/27/96
Chest Y-axis accelerometer	AC708	7264	Endevco	02/26/96	08/26/96
Chest Y-axis accelerometer-redundant	AGR69	7264	Endevco	02/27/96	08/27/96
Chest Z-axis accelerometer	CW59H	7264	Endevco	02/26/96	08/26/96
Chest Z-axis accelerometer-redundant	DB74H	7264	Endevco	02/27/96	08/27/96
Left femur force load cell	986	2430	GSE	02/26/96	08/26/96
Right femur force load cell	987	2430	GSE	02/26/96	08/26/96
Neck X-axis force load cell ¹	85	1716	Denton	02/26/96	08/26/96
Neck Y-axis force load cell ¹	85	1716	Denton	02/26/96	08/26/96
Neck Z-axis force load cell ¹	85	1716	Denton	02/26/96	08/26/96
Neck Moment about X-axis load cell ¹	85	1716	Denton	02/26/96	08/26/96
Neck Moment about Y-axis load cell ¹	85	1716	Denton	02/26/96	08/26/96
Neck Moment about Z-axis load cell ¹	85	1716	Denton	02/26/96	08/26/96
Pelvis X-axis accelerometer	AJ694	7264	Endevco	02/26/96	08/26/96
Pelvis Y-axis accelerometer	AJ656	7264	Endevco	02/26/96	08/26/96
Pelvis Z-axis accelerometer	AJ788	7264	Endevco	02/26/96	08/26/96
Chest deflection potentiometer	87313-96	14CB1-2981	Vernitech	02/26/96	08/26/96
Lap belt force load cell	234	3419	Lebow	01/22/96	07/22/96
Shoulder belt force load cell	615	3419	Lebow	01/22/96	07/22/96

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	82	1583	Denton	01/16/96	07/16/96
Left upper tibia moment about Y-axis load cell	82	1583	Denton	01/16/96	07/16/96
Right upper tibia moment about X-axis load cell	83	1583	Denton	01/16/96	07/16/96
Right upper tibia moment about Y-axis load cell	83	1583	Denton	01/16/96	07/16/96
Left Lower tibia X-axis force load cell	77	1584	Denton	01/16/96	07/16/96
Left Lower tibia Z-axis force load cell	77	1584	Denton	01/16/96	07/16/96
Left Lower tibia moment about Y-axis load cell	77	1584	Denton	01/16/96	07/16/96
Right Lower tibia X-axis force load cell	76	1584	Denton	01/16/96	07/16/96
Right Lower tibia Z-axis force load cell	76	1584	Denton	01/16/96	07/16/96
Right Lower tibia moment about Y-axis load cell	76	1584	Denton	01/16/96	07/16/96
Left foot X-axis accelerometer	10073	7264	Endevco	10/17/95	04/17/96
Left foot heel Z-axis accelerometer	10263	7264	Endevco	10/16/95	04/16/96
Left foot toe Z-axis accelerometer	10101	7264	Endevco	10/17/95	04/17/96
Right foot X-axis accelerometer	APYT4	7264	Endevco	10/17/95	04/17/96
Right foot heel Z-axis accelerometer	APOR8	7264	Endevco	10/17/95	04/17/96
Right foot toe Z-axis accelerometer	10076	7264	Endevco	10/16/95	04/16/96

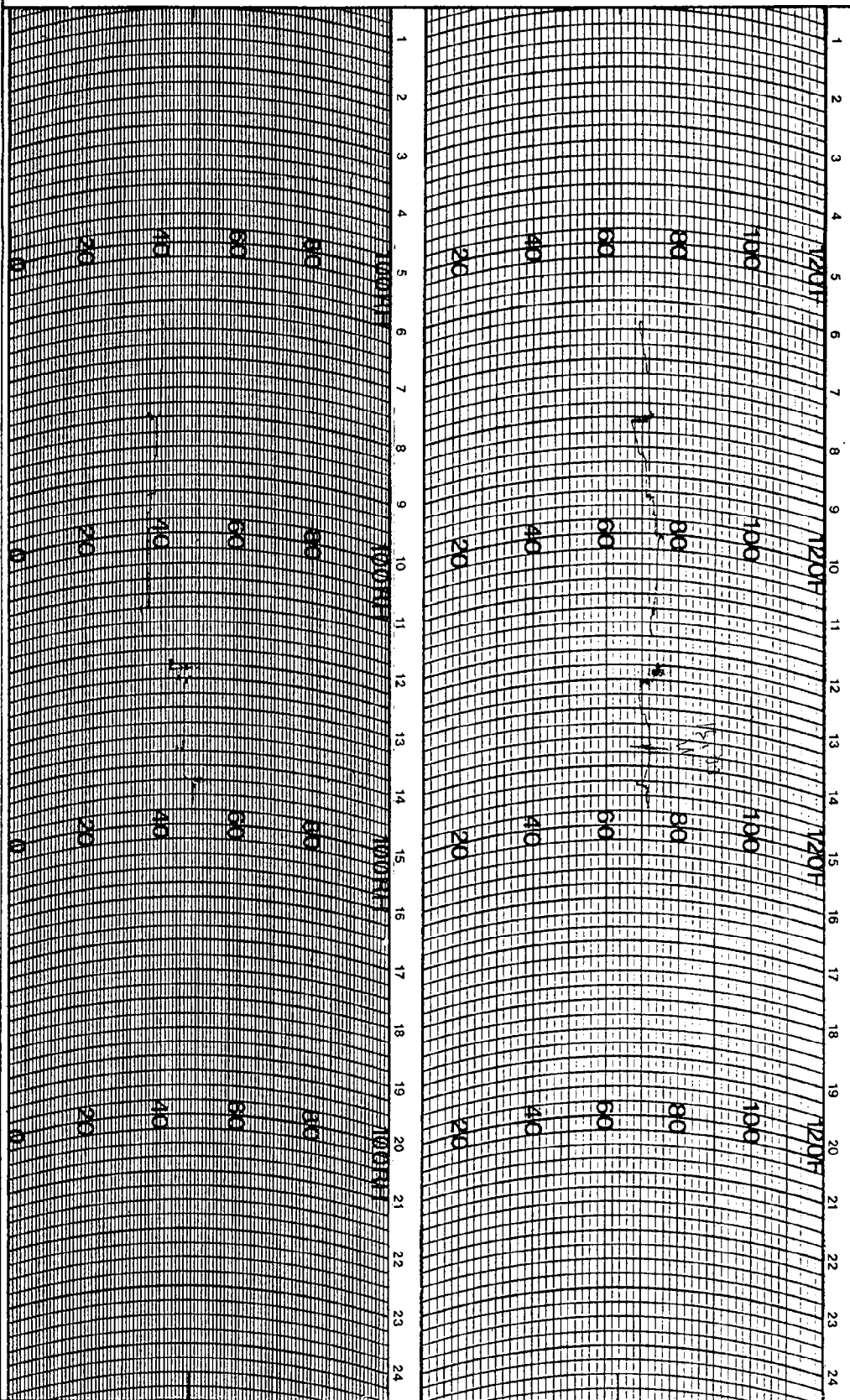
Vehicle and Calibration Laboratory Instrument Calibrations

Vehicle Accelerometers

	Serial Number	Model Number	Manufacturer	Calibration Date	
				Last	Due
Left rear seat crossmember X-axis	J10992	7264	Endevco	11/30/95	05/30/96
Left rear seat crossmember X-axis redundant	J10458	7264	Endevco	01/02/96	07/02/96
Right rear seat crossmember X-axis	AMR92	7264	Endevco	12/27/95	06/27/96
Right rear seat crossmember X-axis redundant	AGR58	7264	Endevco	12/27/95	06/27/96
Engine top X-axis	AMTA6	7264	Endevco	01/17/96	07/17/96
Engine bottom X-axis	J10761	7264	Endevco	11/30/95	05/30/96
Right brake caliper X-axis	AMTP5	7264	Endevco	01/24/96	07/24/96
Left brake caliper X-axis	ANB43	7264	Endevco	01/16/96	07/16/96
Instrument panel center X-axis	J11308	7264	Endevco	02/21/96	08/21/96

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



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

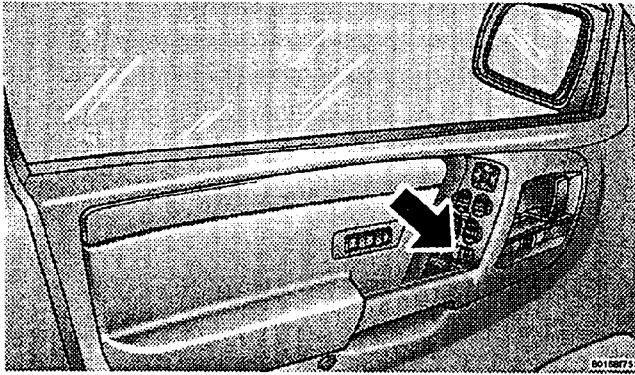
HYGROTHERMOGRAPH
 1 DAY

CHART # C311 D HF
 PART # 699123

STATION 960328 DATE ON _____ DATE OFF _____

Appendix E

Restraint System Instructions from Owner's Manual



2. The driver's door is open while the headlights switch is ON.

Once locked, the rear doors cannot be opened from the inside until the lock lever has been released. However, both the front doors can be opened using the inside door handle.

Automatic Door Locks

If this feature is selected your door locks will lock automatically if the vehicle speed is above 15 mph and all doors are closed.

This feature is selectable and can be turned on or off by your authorized dealer.

ILLUMINATED ENTRY

All interior lamps will illuminate the vehicle when the doors are unlocked using the Keyless Entry transmitter or when a door is opened. These lamps will stay on for about 30 seconds or until the ignition is turned to the ON position.

OCCUPANT RESTRAINTS

One of the most important safety features in your vehicle is the restraint system. This system includes the front and rear seat belts, and airbags for the driver and right front passenger. Your seat belts can also be used to hold infant and child restraint systems if you will be carrying children too small for adult-size belts.

Please pay careful attention to the information in this section. It tells you how to use your restraint system properly to keep you and your passengers as safe as possible.

Seat Belt Warning Light



A warning chime and an indicator light will alert you to buckle the seat belts.

WARNING!

In a collision, you and your passengers can suffer much greater injuries if you are not properly buckled up. You can strike parts of the inside of your vehicle or other passengers, or you can be thrown out of the vehicle. Always be sure you and others in your vehicle are buckled up properly.

Buckle up even though you are an excellent driver, even on short trips. Someone on the road may be a poor driver and cause a collision which includes you. This can happen far away from home or on your own street.

Research has shown that seat belts save lives. And they can reduce the seriousness of injuries in a collision. Some of the worst injuries happen when people are thrown from the vehicle. Seat belts provide protection against that, and they reduce the risk of injury caused by striking the inside of the vehicle. Everyone in a motor vehicle needs to be buckled up all the time.

2

Unibelts

The seats next to the front and rear doors of your vehicle are equipped with UNIBELTS.

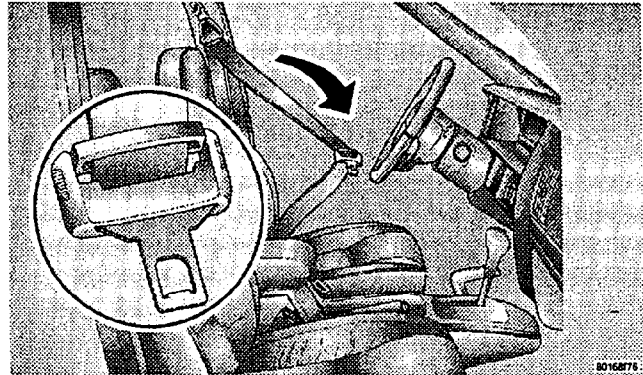
Each unibelt is a combined lap/shoulder belt system. The belt webbing retractor will lock only during very sudden stops or impacts. This feature allows the shoulder part of the belt to move freely with you under normal conditions. But in a collision, the belt will lock and reduce the risk of you striking the inside of the vehicle or being thrown out.

WARNING!

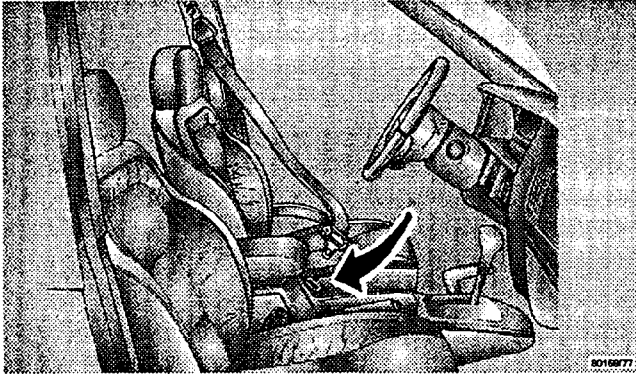
- Wearing a seat belt incorrectly is dangerous. Seat belts are designed to go around the large bones of your body. These are the strongest parts of your body and can take the forces of a collision the best. Wearing your belt in the wrong place could make your injuries in a collision much worse. You might suffer internal injuries, or you could even slide out of part of the belt. Follow these instructions to wear your seat belt safely and to keep your passengers safe, too.
- Belting two people into one seat belt can lead to greater injury. People belted together can crash into one another in an accident, hurting one another badly. Never use a unbelt or a lap belt for more than one person, no matter what their size.

Unibelt Operating Instructions

1. Enter the vehicle and close the door. Sit back and adjust the seat.
2. The seat belt latch plate is above the back of your seat. Grasp the latch plate and pull out the belt. Slide the latch plate up the webbing as far as necessary to make the belt go around your lap.



3. When the belt is long enough to fit, insert the latch plate into the buckle until you hear a "click".



WARNING!

2

A belt that is buckled into the wrong buckle will not protect you properly. The lap portion could ride too high on your body, possibly causing internal injuries. Always buckle your belt into the buckle nearest you.

A belt that is too loose will not protect you as well. In a sudden stop you could move too far forward, increasing the possibility of injury. Wear your seat belt snugly.

A belt that is worn under your arm is very dangerous. Your body could fall into the inside surfaces of the vehicle in a collision, increasing head and neck injury. And a belt worn under the arm can cause internal injuries.

Wear the belt over your shoulder so that your strongest bones will take the force in a collision.

4. Position the lap belt across your thighs, below your abdomen. To remove slack in the lap portion, pull up a bit on the shoulder belt. To loosen the lap belt if it is too tight, tilt the latch plate and pull on the lap belt. A snug belt reduces the risk of sliding under the belt in a collision.

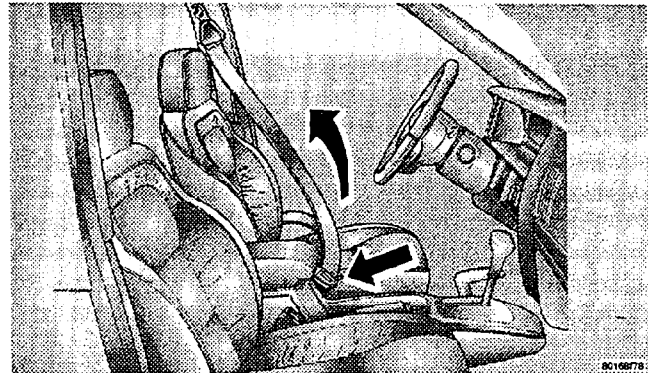
WARNING!

A lap belt worn too high can increase the risk of injury in a collision. The belt forces won't be at the strong hip and pelvic bones, but across your abdomen. Always wear the lap part of your seat belt as low as possible and keep it snug.

5. Position the shoulder belt on your chest so that it is comfortable and not resting on your neck. The retractor will withdraw any slack in the belt.

WARNING!

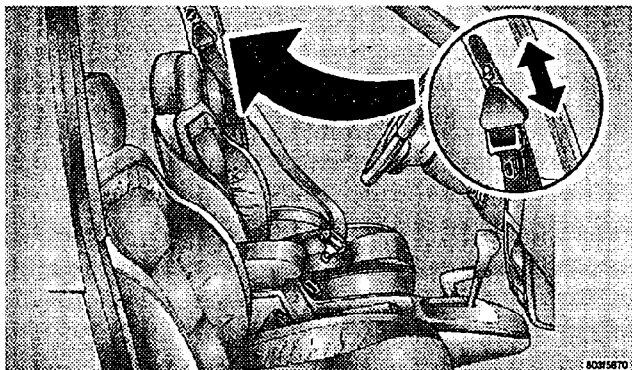
A twisted belt can't do its job as well. In a collision it could even cut into you. Be sure the belt is straight. If you can't straighten a belt in your vehicle, take it to your dealer and have it fixed.



6. To release the belt, push the red button marked PRESS on the buckle. The belt will automatically retract to its stowed position. If necessary, slide the latch plate down the webbing to allow it to retract fully.

Adjustable Upper Shoulder Belt Anchorage

In the front seat and the outboard rear seating positions, the shoulder belt can be adjusted upward or downward to position the belt away from your neck. Push on the release lever to release the anchorage, and then move it up or down to the position that serves you best.



As a guide, if you are shorter than average, you will prefer a lower position, and if you are taller than average, you'll prefer a higher position. When you release the anchorage, try to move it up or down to make sure that it is locked in position.

Seat Belts and Pregnant Women

We recommend that pregnant women use seat belts throughout their pregnancy. Keeping the mother safe is the best way to keep the baby safe.

Pregnant women should wear the lap part of the belt across the thighs and as snug across the hips as possible. Keep the belt low so that it does not come across the abdomen. That way the strong bones of the hips will take the force if there is a collision.

Rear Center Lap Belt

The rear center seating position has a lap belt only. To fasten a lap belt, slip the latch plate into the buckle.

To lengthen the lap belt, tilt the latch plate and pull. To remove slack, pull the loose end of the webbing. Wear the belt snug against the hips. Sit back and erect in the seat, then adjust the belt as tightly as is comfortable.

2

WARNING!

A lap belt worn too loose or too high is dangerous. A belt worn too loose can allow you to slip down and under the belt in a collision. A belt that is too high will apply crash forces to the abdomen, not to the stronger hip bones. In either case, the risk of internal injuries is greater. Wear a lap belt low and snug.

WARNING!

A frayed or torn belt could rip apart in a collision and leave you with no protection. Inspect the belt system periodically, checking for cuts, frays, or loose parts. Damaged parts must be replaced immediately. Do not disassemble or modify the system. Seat belt assemblies must be replaced after an accident if they have been damaged (bent retractor, torn webbing, etc.).

Seat Belt Extender

If a seat belt is too short, even when fully extended, your dealer can provide you with a seat belt extender. This

extender should be used only if the existing belt is not long enough. When it is not required, remove the extender and stow it.

WARNING!

Using a seat belt extender when not needed can increase the risk of injury in a collision. Only use when the lap belt is not long enough when it is worn low and snug, and in the recommended seating positions. Remove and stow when not needed.

Chrysler Integrated Child Safety Seat—Optional

Operating instructions for this seat are included with the seat. If the instructions are not with the seat or in the Owner's Manual Package, replacement instructions can be obtained.

To obtain replacement instructions:

Use the order form at the end of this manual and specify publication number 81-016-9540.

22 THINGS TO KNOW BEFORE STARTING YOUR VEHICLE

- If possible, install the restraint in the rear seat. According to accident statistics, children are safer when properly restrained in the rear seats than in the front.
- Carefully follow the instructions that come with the restraint. If you install the restraint improperly, it may not work when you need it.

WARNING

- A rearward facing infant restraint should only be used in a rear seat. A rearward facing infant restraint in the front seat may be struck by a deploying passenger airbag which may cause severe or fatal injury to the infant.
 - Improper installation can lead to failure of an infant or child restraint. It could come loose in a collision. The child could be badly injured or killed. Follow the manufacturer's directions exactly when installing an infant or child restraint.
- Infant and child restraints are secured in the vehicle seats by the lap belt or the lap part of the lap/shoulder

belt. In the rear seats, you may have trouble tightening the belt on the child restraint because the buckle or latch plate interferes with the belt path opening on the restraint. Disconnect the latch plate from the buckle and twist the short buckle-end belt several turns to shorten it. Reassemble the latch plate to the buckle with the release button facing out.

In the front seat, move the seat forward to reposition the buckle against the side of the child restraint.

In the center rear seat if the belt can't be tightened, or if by pulling and pushing on the restraint loosens the belt, you may need to do something more. Disconnect the latch plate from the buckle, turn it over, and reconnect it to the buckle. If you still can't make the child restraint secure, try a different seating position.

- Some child seat manufacturers recommend the use of a top anchorage (tether) strap in addition to the lap belt. Your vehicle has tether strap anchorages behind the rear seating positions for use with these child seats. Your dealer can provide you with anchorage hardware and installation instructions.

WARNING

An incorrectly anchored tether strap could lead to seat failure and injury to the child. In a collision, the seat could come loose and allow the child to crash into the inside of the vehicle or other passengers, or even be thrown from the vehicle. Use only the specified anchor positions to secure a child restraint requiring top tether strap(s).

- Buckle the child into the seat exactly as the seat manufacturer's directions tell you. The cinching latch plate will keep the belt tight.
- When your infant carrier or child seat is not in use, secure it with the seat belt or remove it from the vehicle. Don't leave it loose in the vehicle. In a sudden stop or collision, it could strike occupants and injure them.

Children Too Large For Child Seats

Children who are too large for child seats and who can sit upright by themselves should use the available lap/shoulder belts for best protection.

- Make sure that the child is seated upright in the seat.
- The lap belt should be fastened low on the hips and as snug as possible.
- Check belt fit periodically. A child's squirming or slouching can move the belt out of position.

2

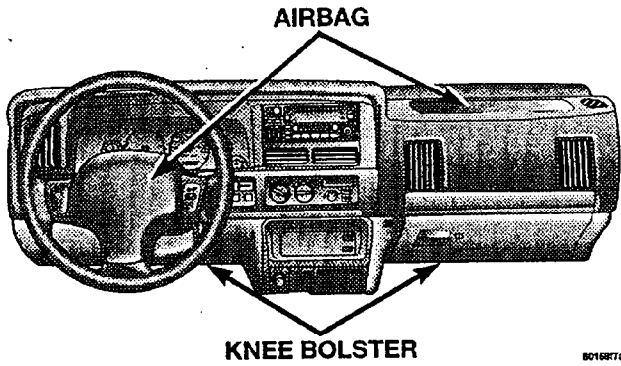
If the shoulder belt contacts the face or neck, move the child closer to the middle of the vehicle. If this doesn't solve the problem, move the child to the center rear seating position and use the lap belt.

Booster seats that may help overcome this problem are also available for use with lap/shoulder belts. Before buying a booster seat, make sure that it has a label certifying that it meets applicable Motor Vehicle Safety Standards. Make sure it is satisfactory for use in this vehicle.

Driver And Right Front Passenger Supplemental Restraint System (SRS) — AIRBAG

This vehicle has airbags for the driver and right front passenger as a supplement to the seat belt restraint system. The driver's airbag is mounted in the steering wheel. The passenger side airbag is mounted in the

instrument panel, above the glove compartment. These airbags inflate in higher speed impacts. They work with the instrument panel knee bolsters and the seat belts to provide improved protection for the driver and right front passenger.



WARNING!

- Relying on the airbags alone could lead to more severe injuries. Wear your seat belt even though you have an airbag.
- Being too close to the steering wheel or instrument panel during airbag deployment could cause serious injury. Airbags need room to inflate. Sit back, comfortably extending your arms to reach the steering wheel or instrument panel.

The seat belt is designed to protect you in many types of collisions. The airbag deploys only in frontal collisions. And it will not deploy in collisions at slow speed. But even in collisions where the airbag does work, you need the seat belt to keep you in the right position for the airbag to protect you properly.

WARNING!

Ignoring the AIRBAG light in your instrument panel could mean you won't have the airbags to protect you in a collision. If the light does not come on, stays on after you start the vehicle, or if it comes on as you drive, have the airbag system checked right away.

The airbag system consists of the following:

- Crash Sensors
- Diagnostic Unit
- AIRBAG Light
- Airbag/Inflator Unit
- Unique Steering Wheel and Column
- Interconnecting Wiring
- Knee Impact Bolster

How The Airbag System Works

- Crash Sensors in the front of the vehicle and in the occupant compartment determine if a frontal impact is

severe enough to require the airbag. The sensors will not detect side, rollover, or rear impacts. Switches in the sensors are connected to the diagnostic unit and to the airbag/inflator unit.

- The Diagnostic Unit monitors the readiness of the electronic parts of the system whenever the ignition switch is in the START or ON position. These include all of the items listed above except the steering wheel and column and the knee bolsters.

The Diagnostic Unit also turns on the AIRBAG light in the instrument panel for 6 to 8 seconds when the ignition is first turned on, then turns the light off. If it detects a malfunction in any part of the system, it turns on the light either momentarily or continuously. If the instrument cluster detects an airbag lamp failure it turns on the seat belt light either momentarily or continuously.

- The Airbag/Inflator Units are located in the center of the steering wheel for the driver and in the upper right side of the instrument panel for the front seat passenger. When the crash sensors detect an impact requiring the airbags, they signal the inflator units. A large

quantity of non-toxic nitrogen and/or argon gas is generated to inflate the airbag. The steering wheel hub trim cover and the upper right side of the instrument panel separate and fold out of the way as the bag inflates to their full size. The bags fully inflate in about 50–70 milliseconds. This is about half of the time it takes to blink your eyes. The bags then quickly deflate by venting the gas through holes and/or pores in the airbag fabric toward the instrument panel. In this way the bags do not interfere with your control of the vehicle.

If A Deployment Occurs

The airbag system is designed to deploy when the impact sensors detect a moderate-to-severe frontal collision, and then immediately deflate.

NOTE: A frontal collision that is not severe enough to need airbag protection will not activate the system. This does not mean something is wrong with the airbag system.

If you do have a collision which deploys the airbags, any or all of the following may occur:

- The nylon airbag material may sometimes cause abrasions and/or skin reddening to the occupants as the airbag deploys and unfolds itself from the steering wheel and the upper right side of the instrument panel.

The abrasions are similar to friction rope burns or those you might get sliding along a carpet or gymnasium floor. They are not caused by contact with chemicals. They are not permanent and normally heal quickly. However, if you haven't healed significantly within a few days, or if you have any blistering, see your doctor immediately.

- As the airbags deflate you may see some smoke-like particles. The particles are a normal by-product of the process that generates the non-toxic gas used for airbag inflation. These airborne particles may irritate the skin, eyes, nose, or throat. If you have skin or-eye irritation, rinse the area with cool water. For nose or throat irritation, move to fresh air. If the irritation continues, see your doctor.

If these particles settle on your clothing, follow the garment manufacturer's instructions for cleaning.

- Your vehicle may be driveable after the airbags deploy. If so, you can tuck the deployed driver side airbag inside the opening in the steering wheel hub trim cover to make driving somewhat easier. You may tuck the passenger side airbag under the trim cover in the right side of the instrument panel.

WARNING!

Deployed airbags can't protect you in another collision. Have the airbags replaced by an authorized dealer as soon as possible.

WARNING!

Do not attach a snow plow, winches or any other aftermarket equipment to the front end of your Grand Cherokee. Change in the front end structure may interfere with the airbag crash sensors. Your airbags may not function properly and you could be injured.

Maintaining Your Airbag System

WARNING!

- Modifications to any part of the airbag system could cause it to fail when you need it. You could be injured if the airbag system is not there to protect you. Do not modify the components or wiring, including adding any kind of badges or stickers to the steering wheel hub trim cover or the upper right side of the instrument panel. Do not modify the front bumper or vehicle body structure.
- You need proper knee impact protection in a collision. Do not mount or locate any aftermarket equipment on or behind the knee bolsters.
- It is dangerous to try to repair any part of the airbag system yourself. Don't try to repair the airbag system. Be sure to tell anyone who works on your vehicle that it has an airbag system.

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Airbag Light

You will want to have the airbag system ready to inflate for your protection in an impact. The airbag system is designed to be maintenance free. If any of the following occurs, have an authorized dealer service the system promptly:

- The AIRBAG light does not come on or flickers during the 6 to 8 seconds when the ignition switch is first turned on.
- The light remains on or flickers after the 6 to 8 second interval.
- The light flickers or comes on and remains on while driving.
- The seat belt light remains on or flickers after the 6 to 8 second interval after the vehicle has been started or comes on while driving. The seat belt light is used in place of the airbag light when there is an airbag lamp malfunction.

NOTE: The above mentioned conditions may be caused by a blown fuse. In this case the airbag system will not be ready to inflate for your protection. Promptly check and replace fuse number 4 in the fuse block.

NEW VEHICLE BREAK-IN RECOMMENDATIONS

Your new Jeep engine is ready for the road. To provide the longest engine life, follow these guidelines for the first few hundred miles (or kilometers).

- Check the fluid and engine oil levels regularly and be alert for indications of overheating in any component of the vehicle. Engines tend to use more fuel and oil until they are broken in, so don't expect top economy for the first 1,200 miles (1 900 km).
- After starting a cold engine, let it warm up for 15 seconds or so before shifting into gear.
- Drive at varying speeds below 50 mph (80 km/h) for first 100 miles (160 km) and below 55 mph (88 km/h) for first 500 miles (800 km). Avoid driving at full throttle or top speeds, steady speeds, or excessive idling during this period. Avoid fast starts and quick stops.