

2440

Report Numbers: TRC-95-V009

Rear Impact Full-Scale Crash Testing
for Upgrade of
FMVSS 301 Test Procedure

Deformable Impactor into Rear of
1996 Geo Prizm
at 80 kph with 70% Left Side Overlap
TRC Test Number: 960418

Prepared by:
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May 16, 1996

Final Report

Prepared for:
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0434

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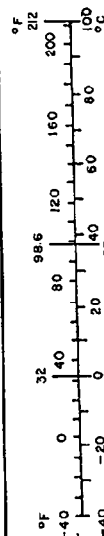
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NHTSA, Office of Vehicle Safety Compliance

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16. Abstract An 80 kph deformable impactor rear crash test with 70% overlap was conducted on a 1996 Geo Prizm 4-door sedan at Transportation Research Center Inc. on April 18, 1996. This test was conducted to determine vehicle and occupant response in the rear 70% left side overlap test mode. The test vehicle's weight was 1326.5 kg. The impactor's velocity was 81.9 kph. The impactor's weight was 1337 kg. The vehicle's maximum crush was 1023 millimeters. The ambient temperature was 21° C. The driver's Head Injury Criteria (HIC) was 829. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 37.2 g. The driver's chest maximum deflection was 1 mm. The driver's left and right femur maximum axial forces were 822 N and 697 N, respectively. The passenger's HIC was 604. The passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 19.6 g. The passenger's chest maximum deflection was 0 mm. The passenger's left and right femur maximum axial forces were 616 N and 584 N, respectively.			
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures				Approximate Conversions from Metric Measures			
Symbol	When You Know	Multiply by	To Find	Symbol	When You Know	Multiply by	To Find
LENGTH				LENGTH			
in	inches	2.54	cm	mm	millimeters	0.04	inches
ft	feet	30	cm	cm	centimeters	0.4	inches
yd	yards	0.9	m	m	meters	3.3	feet
mi	miles	1.6	km	km	kilometers	1.1	yds
						0.5	mi
AREA				AREA			
in ²	square inches	6.5	cm ²	square centimeters	0.16	square inches	in ²
ft ²	square feet	0.09	m ²	square meters	1.2	square yards	yd ²
yd ²	square yards	0.8	m ²	square kilometers	0.4	square miles	mi ²
mi ²	square miles	2.6	km ²	hectares (10,000 m ²)	2.5	acres	ac
	acres	0.4	ha				
MASS (weight)				MASS (weight)			
oz	ounces	28	g	grams	0.035	ounces	oz
lb	pounds	0.45	kg	kilograms	2.2	pounds	lb
	short tons (2000 lb)	0.9	t	tonnes (1000 kg)	1.1	short tons	st
VOLUME				VOLUME			
tsp	teaspoons	5	ml	milliliters	0.03	fluid ounces	fl oz
Tbsp	tablespoons	15	ml	liters	2.1	pints	pt
fl oz	fluid ounces	30	ml	milliliters	1.06	quarts	qt
c	cups	0.24	l	liters	0.26	gallons	gal
pt	pints	0.47	l	cubic meters	35	cubic feet	ft ³
qt	quarts	0.95	l	cubic meters	1.3	cubic yards	yd ³
gal	gallons	3.8	m ³				
ft ³	cubic feet	0.03	m ³				
yd ³	cubic yards	0.76	m ³				
TEMPERATURE (exact)				TEMPERATURE (exact)			
°F	Fahrenheit temperature	5/9 (after subtracting 32)	°C	°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature



* 1 in = 2.54 (exact). 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 crash test was conducted to determine vehicle and occupant response in the 80 kph rear impact with 70% left side overlap test mode. The test was performed on a 1996 Geo Prizm 4-door sedan.

Test Procedure

This test was conducted per Contract No. DTRS57-95-C-00011, Technical Task Directive No. 1, "Rear Impact Full-Scale Crash Testing for Upgrade of FMVSS 301 Test Procedure."

The test vehicle was instrumented with nine (9) accelerometers to measure longitudinal axis accelerations.

The test vehicle contained two (2) Part 572 E 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the dummy placement procedure specified in Appendix C of the Laboratory Test Procedure TP-208-09. Each dummy was restrained by a three-point unbelt.

The deformable impactor was instrumented with five (5) force load cells to measure longitudinal axis forces on the impactor face. The deformable impactor face was positioned 229 mm from ground level. The impactor's right edge was aligned with the point on the subject vehicle 504 millimeters right of the subject vehicle's longitudinal centerline.

The impactor's specified velocity range was 80.1 to 81.8 kph.

Both dummies were instrumented with head center of gravity and Position 1, 2, and 3 accelerometers to measure longitudinal, lateral, and vertical accelerations; neck upper and lower 6-axis load cells to measure longitudinal, lateral, and vertical forces and moments; chest and pelvis accelerometers to measure longitudinal, lateral, and vertical axis accelerations; and with left and right femur load cells to measure axial forces. Each Part 572 E dummy's instrumentation also included a chest potentiometer to measure longitudinal deflection. The driver dummy's lap and shoulder belt were each instrumented with a load cell.

The seventy-six (76) data channels were digitally sampled at 12,500 samples per second and processed per Sections 11.13 through 11.15 of the Laboratory Test Procedure TP-208-09.

The crash event was recorded by thirteen (13) high-speed motion picture cameras.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 301 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the dummy calibration information. Appendix D contains miscellaneous test information

Section 2.0

Rear Deformable Impactor Impact Test Summary

Test Results Summary

This 80 kph rear impact crash test with 70% left side overlap was conducted at TRC on April 18, 1996.

The test vehicle, a 1996 Geo Prizm 4-door sedan, was equipped with airbags and three-point unbelted at the driver's and right front passenger's seating positions. The vehicle's test weight was 1326.5 kg. The vehicle's maximum static crush was 1023 mm. The right edge of the deformable impactor contacted the subject vehicle 490 millimeters right of the subject vehicle's longitudinal centerline.

The driver's HIC was 829. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 37.2 g. The driver's chest maximum deflection was 1 mm. The driver's left and right femur maximum compressive forces were 822 N and 697 N, respectively.

The right front passenger's HIC was 604. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 19.6 g. The right front passenger's chest maximum deflection was 0 mm. The right front passenger's left and right femur maximum compressive forces were 616 N and 584 N, respectively.

A trace amount of fuel system fluid spilled during the impact event. A total of 2228 grams of Stoddard solvent leaked from the fuel system during the static rollover test. The leakage appeared to come from the area where the filler neck enters the fuel tank.

Data Acquisition Explanations

The vehicle's left rear wheel axle X-axis acceleration data channel, RAXXG1, stopped recording data after approximately 78 milliseconds because the accelerometer's cable was cut by vehicle crush.

The vehicle's right rear wheel axle X-axis acceleration data channel, RAXXG2, stopped recording data after approximately 52 milliseconds because the accelerometer's cable was cut by vehicle crush.

Table 1 Crash Test Summary

Test type:	80 kph rear impact with 70% left side overlap
Test date:	04/18/96
Test time:	1326
Ambient temperature at impact area:	21° C
Vehicle year/make/ model/body style:	1996/Geo/Prizm/4-door sedan
Vehicle test weight:	1326.5 kg
Impact angle ¹ :	180°
Impact velocity ² :	
Primary ³ :	NA
Secondary:	81.9 kph
Maximum static crush:	1023 mm
Number of cameras:	
High-speed:	13
Door opening data:	
Left-front:	Easy
Right-front:	Easy

¹ With respect to tow track centerline.

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

³ The primary speed trap failed.

Table 1 Crash Test Summary, Cont'd.

Dummies:	<u>Driver #35</u>	<u>Passenger #34</u>
Type:	Part 572 E	Part 572 E
Location:	Left front	Right front
Restraint:	Airbag/3-point unbelt	Airbag/3-point unbelt
Number of data channels:	30	30
Front seat data:		
Seat track failure:	None	None
Seat back failure:	None	None
Visible dummy contact points:		
Head:	Rear seat back	Rear seat back
Chest:	None	None
Abdomen:	None	None
Left knee:	Steering wheel rim	None
Right knee:	Steering wheel rim	None

Table 2 Test Vehicle Information

Vehicle year/make/
model/body style: 1996/Geo/Prizm/4-door sedan

Color: White

VIN: 1Y1SK5268TZ029033

Engine data:

Placement: Transverse

Cylinders: 4

Displacement: 1.6 liters

Transmission data: 5 speed, X manual, ___ automatic, ___ overdrive

Final drive: X fwd, ___ rwd, ___ 4wd

Date vehicle received: 03/25/96

Odometer reading: 85

Dealer's name
and address: Bowman Chevrolet, Inc.
P. O. Box 808
Hebron, OH 43025-0808

Accessories:

Power steering	No	Automatic transmission	No
Power brakes	Yes	Automatic speed control	No
Power seats	No	Tilting steering wheel	No
Power windows	No	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	No
Radio	No	Anti-skid brake	No
Clock	No	Rear window defroster	No
Power door locks	No		

Certification data from vehicle's label:

Vehicle manufactured by: New United Motor Manufacturing

Date of manufacture: 12/95

VIN: 1Y1SK5268TZ029033

GVWR: 3510 lbs.

GAWR: Front: 1850 lbs.

Rear: 1680 lbs.

Table 2 Test Vehicle Information, Cont'd.

Size of tires on vehicle: P175/65R14
Spare tire: Temporary
Type of front seats: Bucket

Tire & capacity data from vehicle's label:

Recommended tire size: P175/65R14
Recommended cold tire pressure:
Front: 210 kPa
Rear: 210 kPa
Designated Seating Capacity:
Front 2
Rear 3
Total 5
Vehicle Capacity Weight: 850 lbs.

Test vehicle attitudes:

Delivered attitude:	LF: 652 mm	RF: 654 mm	LR: 633 mm	RR: 633 mm
Pre-Test attitude:	LF: 604 mm	RF: 606 mm	LR: 602 mm	RR: 602 mm
Post-Test attitude:	LF: 552 mm	RF: 667 mm	LR: 645 mm	RR: 547 mm

Table 2 Test Vehicle Information, Cont'd.

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

Right front	310.0 kg	Right rear	209.5 kg
Left front	324.5 kg	Left rear	204.0 kg
Total front weight	634.5 kg	(60.5% of total vehicle weight)	
Total rear weight	413.5 kg	(39.5% of total vehicle weight)	
Total delivered weight	1048.0 kg		

Calculation of test vehicle's target test weight:

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (1048.0 kg)

VCW¹ = Vehicle Capacity Weight = 385.5 kg

DSC = Designated Seating Capacity (5)

RCLW = VCW - 68 (DSC) = 385.5 - 68 (5) = 45.5 kg

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

Target test weight = 1048.0 + 45.5 + 152.0 = 1245.5 kg

Weight of test vehicle with required dummies and 126.5 kg of cargo weight:

Right front	394.5 kg	Right rear	260.0 kg
Left front	416.0 kg	Left rear	256.0 kg
Total front weight	810.5 kg	(61.1% of total vehicle weight)	
Total rear weight	516.0 kg	(38.9% of total vehicle weight)	
Total test weight	1326.5 kg	(6.5% over target test weight)	

Weight of ballast secured in vehicle cargo area: 0

Components removed to meet target test weight: Front bumper, radiator, alternator, electric fan, washer bottle, distributor, starter

CG rearward of front wheel centerline: 953 mm

Vehicle Wheelbase: 2450 mm

¹ From vehicle's tire load label.

Table 3 Post-Impact Data

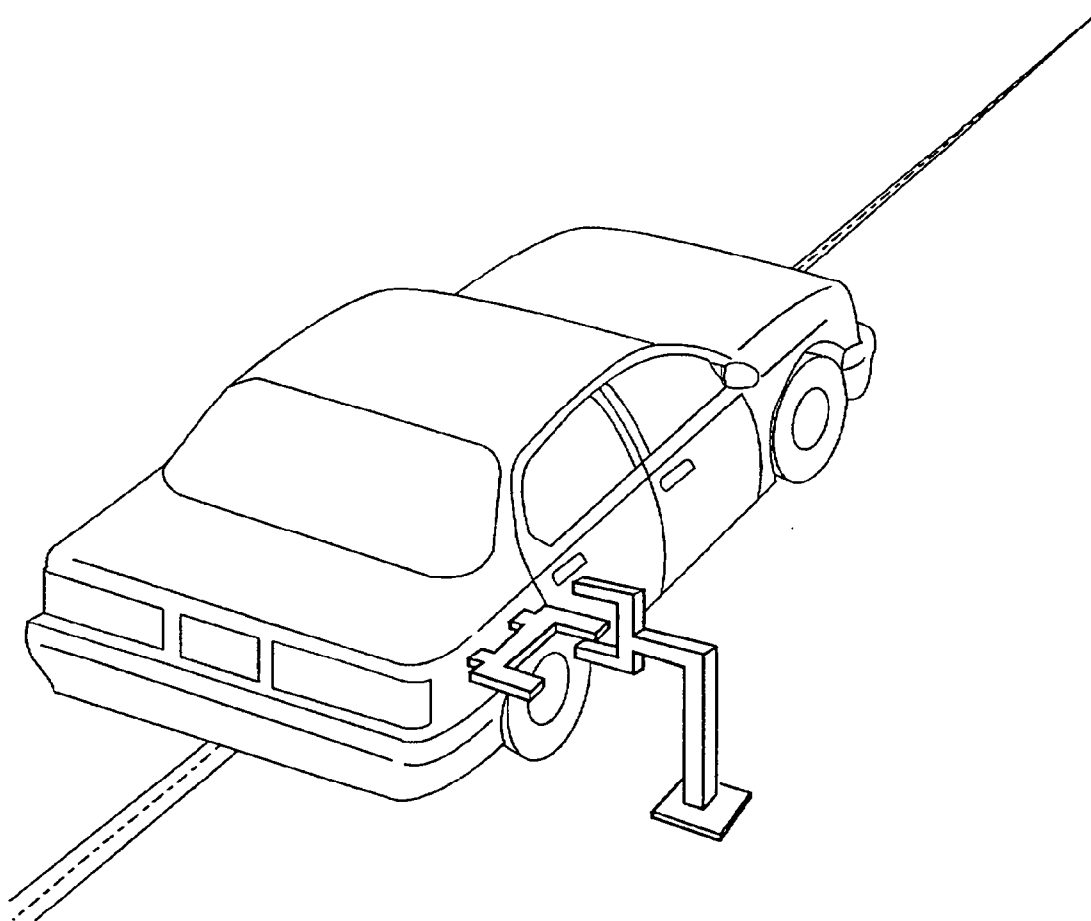
Test number: 960418
Test date: 04/18/96
Test time: 1326
Test type: 80 kph rear impact with 70% left side overlap
Impact angle: 180°
Ambient temperature
at impact area: 21° C
Temperature in
occupant compartment: 23° C
Impact velocity:
Primary: NA
Secondary 81.9 kph
Specified range: 80.1 to 81.8 kph
Distance from vehicle to impactor:
Entering velocity trap: 356 mm
Exiting velocity trap: 51 mm

Test vehicle static crush:

Overall length of test vehicle: ¹
Pre-test: L: 4106 mm C: 4161 mm R: 4094 mm
Post-test: L: 3083 mm C: 3190 mm R: 4026 mm
Total crush: L: 1023 mm C 971 mm R: 68 mm
Average crush: 687 mm

¹ Measurements taken with front bumper and grille removed.

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

Test date: 04/18/96
 Vehicle year/make/model/body style: 1996/Geo/Prizm/4-door sedan
 VIN: 1Y1SK5268TZ029033
 Build date: 12/95
 Test weight: 1326.5 kg
 Vehicle wheelbase: 2450 mm
 Maximum width: 1685 mm
 Front overhang: 1055 mm

Collision Deformation

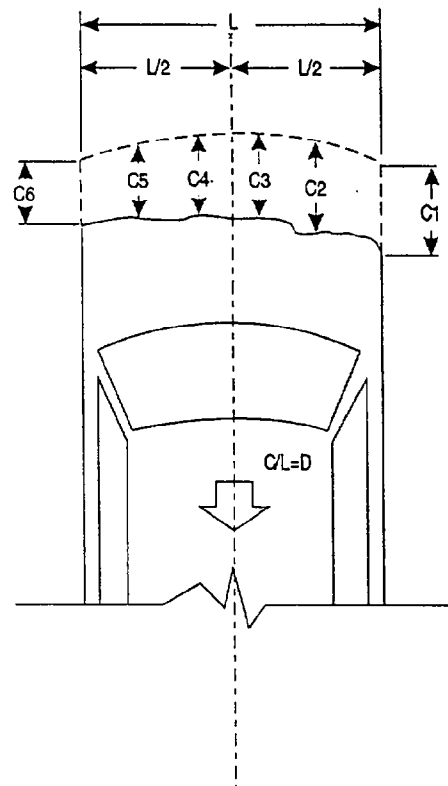
Classification (CDC) Code: 06BDEW5

Crush depth measurements:

C1:	1023 mm
C2:	998 mm
C3:	981 mm
C4:	955 mm
C5:	331 mm
C6:	68 mm

Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1314 mm



Section 3.0

FMVSS 301 Data

Table 4 Dummy Injury Criteria

Maximum Acceleration

	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	75.0 g	3.6 g	-54.6 g	83.4 g	38.2 g	-2.7 g	-9.6 g
Passenger	76.9 g	-19.3 g	-29.4 g	82.4 g	16.4 g	-5.6 g	-10.9 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	822 N	697 N
Passenger	617 N	584 N

Head Injury Criteria¹

	HIC	Time t ₁	Time t ₂
Driver	829	112.2 ms	133.0 ms
Passenger	604	126.5 ms	147.2 ms

Head Maximum Resultant Acceleration²

	Acceleration	Time t ₁	Time t ₂
Driver	80.8 g	119.4 ms	122.4 ms
Passenger	79.1 g	137.6 ms	140.6 ms

Chest Maximum Resultant Acceleration²

	Acceleration	Time t ₁	Time t ₂
Driver	37.2 g	110.9 ms	113.9 ms
Passenger	19.6 g	135.0 ms	138.0 ms

Maximum Chest Deflection

Driver	1 mm
Passenger	0 mm

¹ As defined in FMVSS No. 208

² Defined as equal to or exceeding 0.003 sec. duration

Table 5 Fuel System Data

Vehicle year/make/model/body style:	1996/Geo/Prizm/4-door sedan
Fuel system capacity:	50.0 liters (from owner's manual)
Usable capacity:	50.0 liters (furnished by COTR)
Test volume range:	46.0 liters to 47.0 liters (92-94% of usable)
Actual test volume:	46.5 liters (with entire fuel system filled)
Test fluid type:	Stoddard solvent
Specific gravity:	0.764
Kinematic viscosity:	0.99 centistoke
Test fluid color:	Purple
Type of fuel pump:	Electric
Does the electric fuel pump operate with ignition switch "on" and the engine not operating.	No
Details of fuel system:	The fuel tank is located in front of the rear axle. The fuel filler neck is located on the left side. The fuel lines run along the inside of the left frame rail to the engine compartment.

Table 6 FMVSS 301 Post-Impact Test Data

Test date: 04/18/96

Vehicle year/make/model/body style: 1996/Geo/Prizm/4-door sedan

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 (48 kph)
- ☐ Oblique (48 kph) with ___° impactor face first contacting (driver's/passenger's) side
- ☒ Rear moving impactor (80 kph)
- ☐ Lateral moving impactor (32 kph)

Fuel system fluid spillage measurements:

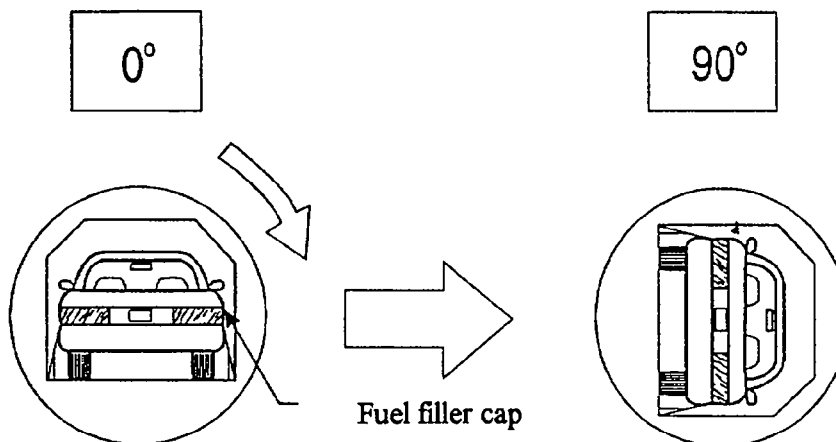
	Test Results	Maximum Allowable
1. From impact until vehicle motion ceases	Trace	28 g
2. 5-Minute period after vehicle motion ceases	0 g	140 g
3. Next 25 minutes after 5-minute period	0 g	28 g/1 min

Fuel system fluid spillage location(s): Trace of fuel system fluid spillage from filler neck and fuel tank intersection area.

Figure 3 FMVSS 301 Static Rollover Test Data

NHTSA number: RT0102

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

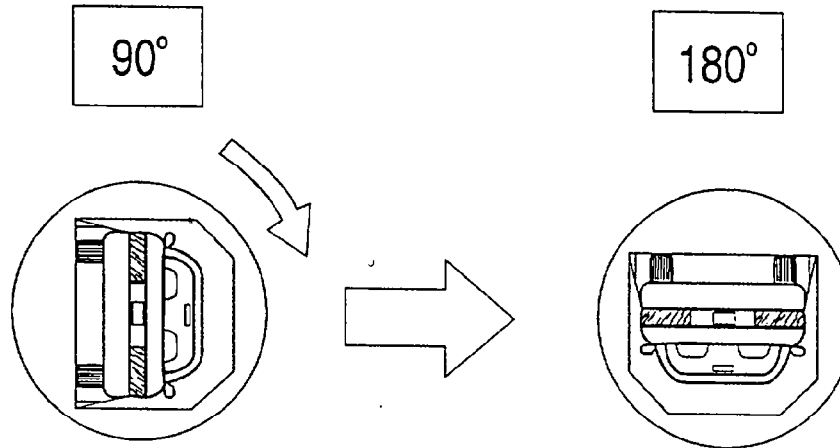
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>0° to 90° rotation (fuel filler cap down)</u>		
1. First five minutes from onset of rotation	281 g	142 g
2. Sixth minute from onset of rotation	82 g	28 g
3. Seventh minute from onset of rotation	82 g	28 g

Fuel system fluid spillage location(s): Filler neck and fuel tank intersection.

Figure 3 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

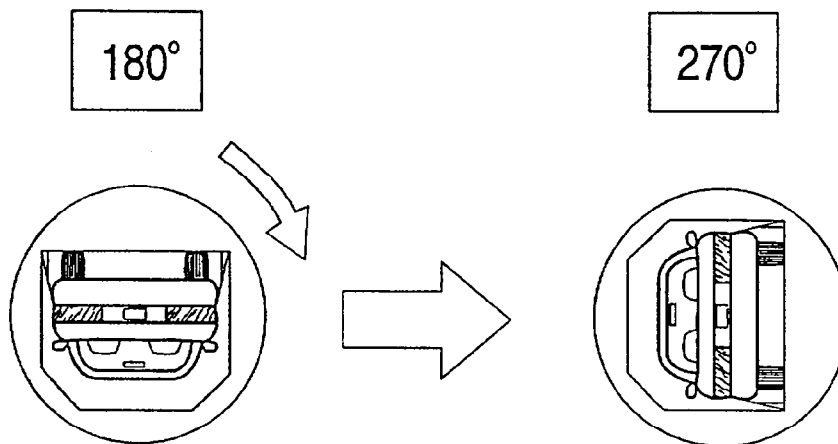
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>90° to 180° rotation</u>		
1. First five minutes from onset of rotation	268 g	142 g
2. Sixth minute from onset of rotation	55 g	28 g
3. Seventh minute from onset of rotation	38 g	28 g

Fuel system fluid spillage location(s): Filler neck and fuel tank intersection

Figure 3 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

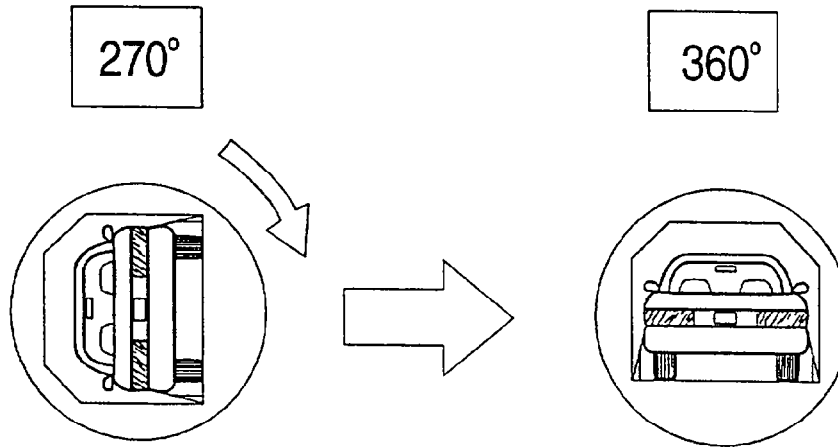
Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>180° to 270° rotation</u>		
1. First five minutes from onset of rotation	677 g	142 g
2. Sixth minute from onset of rotation	116 g	28 g
3. Seventh minute from onset of rotation	86 g	28 g

Fuel system fluid spillage location(s): Filler neck and fuel tank intersection.

Figure 3 FMVSS 301 Static Rollover Test Data, Cont'd.

Test phase



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

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

Fuel system fluid spillage measurements:

	Test Results	Maximum Allowable
<u>270° to 360° rotation</u>		
1. First five minutes from onset of rotation	NA ¹	142 g
2. Sixth minute from onset of rotation	NA ¹	28 g
3. Seventh minute from onset of rotation	NA ¹	28 g

Fuel system fluid spillage location(s): Filler neck and fuel tank intersection.

¹ Static rollover device malfunctioned and did not start 270° to 360° rotation until the 26th minute. A total of 543 grams of fluid was collected between the 21st and 28th minute.

Section 4.0

Vehicle, Moving Deformable Impactor, Occupant, and Camera Measurements

Figure 4 Pre-test and Post-test Measurement Points

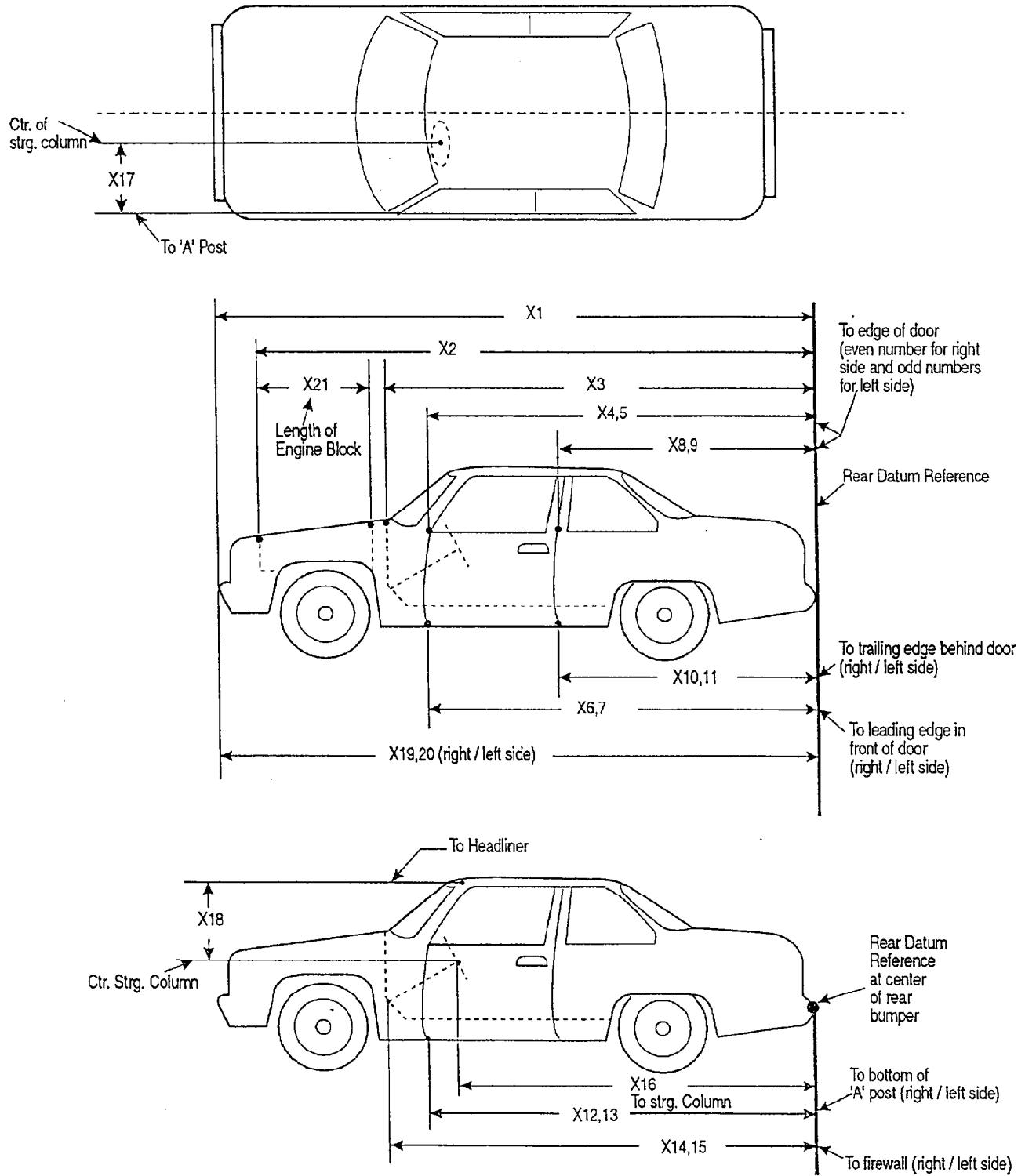


Table 7 Impacted Vehicle Measurements

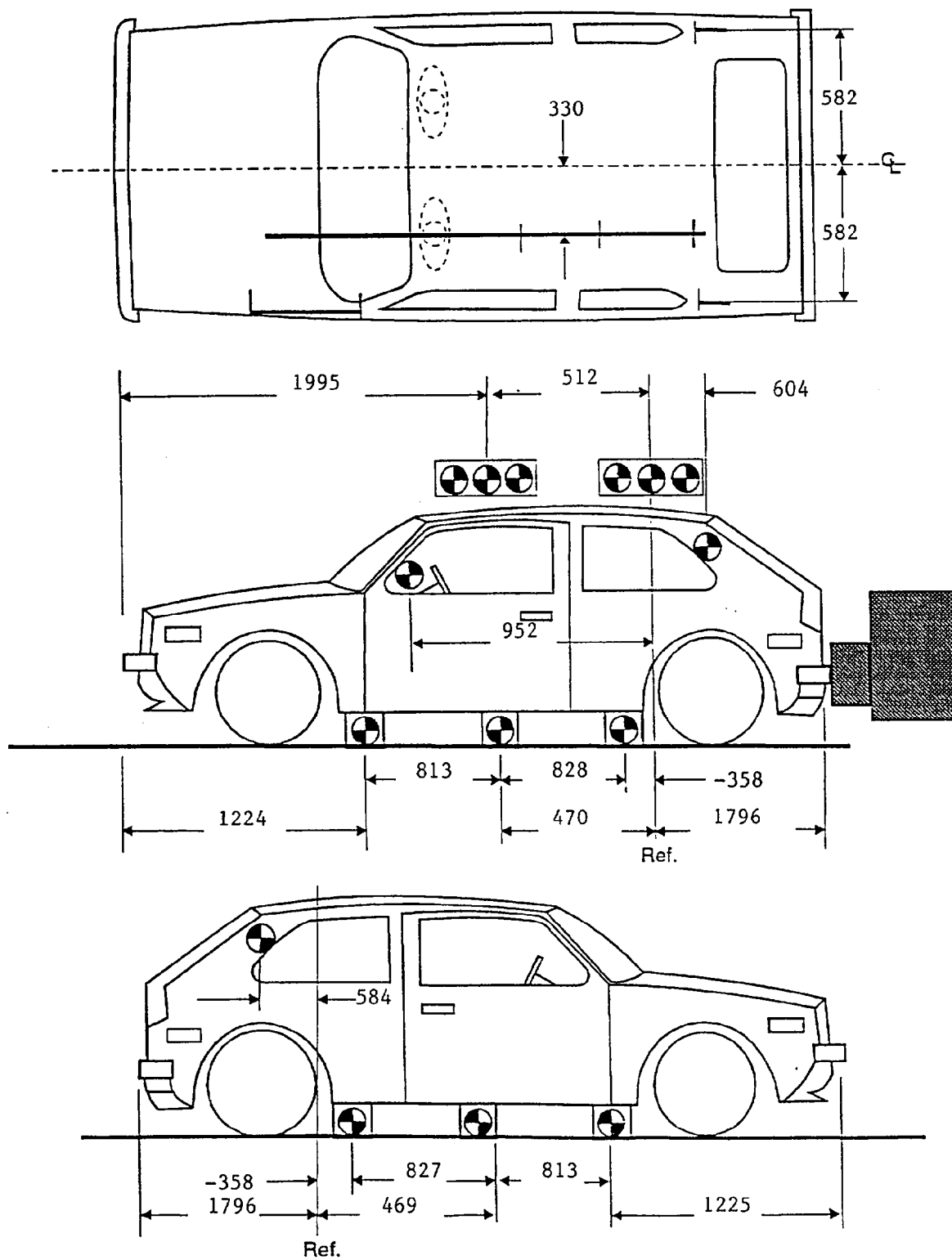
<u>Vehicle year/make/model/body style:</u> 1996/Geo/Prizm/4-door sedan		<u>Test Number:</u> 960418		
No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	4288 mm	3317 mm	971 mm
X2	Rear surface of vehicle to front of engine block	490 mm	502 mm	-12 mm
X3	Rear surface of vehicle to firewall	1010 mm	1015 mm	-5 mm
X4	Rear surface of vehicle to upper leading edge of right door	1295 mm	1297 mm	-2 mm
X5	Rear surface of vehicle to upper leading edge of left door	1292 mm	1291 mm	1 mm
X6	Rear surface of vehicle to lower leading edge of right door	1298 mm	1285 mm	13 mm
X7	Rear surface of vehicle to lower leading edge of left door	1295 mm	1273 mm	22 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2302 mm	2304 mm	-2 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2298 mm	2297 mm	1 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2290 mm	2270 mm	20 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2291 mm	2268 mm	23 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	1325 mm	1315 mm	10 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	1316 mm	1297 mm	19 mm
X14	Rear surface of vehicle to firewall - right side	1062 mm	1070 mm	-8 mm
X15	Rear surface of vehicle to firewall - left side	1063 mm	1070 mm	-7 mm
X16	Rear surface of vehicle to steering wheel center	1745 mm	1666 mm	79 mm
X17	Center of steering column to "A" post	275 mm	293 mm	-18 mm
X18	Center of steering column to headliner	401 mm	412 mm	-11 mm
X19	Rear surface of vehicle to right side of front bumper	4222 mm	4154 mm	68 mm
X20	Rear surface of vehicle to left side of front bumper	4229 mm	3206 mm	1023 mm
X21	Length of engine block	460 mm	460 mm	0 mm

Table 8 Vehicle Measurements

No.	Description of Measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Vehicle at Centerline	4288	3317	971
X2	Front Surface of Vehicle to Bottom of "A" Post of Right Side	1325	1315	10
X3	Front Surface of Vehicle to Bottom of "A" Post of Left Side	1316	1297	19
X4	Front Surface of Vehicle to Right Side of Rear Bumper	4222	4154	68
X5	Front Surface of Vehicle to Left Side of Rear Bumper	4229	3206	1023
X6	Right Front Sill to Ground Plane	150	217	-67
X7	Left Front Sill to Ground Plane	149	147	2
X8	Right Rear Sill to Ground Plane	180	184	-4
X9	Left Rear Sill to Ground Plane	180	92	88
X10	Wheelbase of Vehicle - Left Side	2450	2110	340
X11	Width of Vehicle at Maximum Width Point	1680	1676	4
X12	Front Surface of Vehicle to Engine Target	490	502	-12
X13	Front Surface of Vehicle to Compartment Target	1995	1989	6
X14	Front Surface of Vehicle to Rear Bumper Target	4243	NA ¹	
X15	Wheelbase of Vehicle - Right Side	2450	2491	-41

¹ Rear bumper destroyed.

Figure 5 Vehicle Target Locations



(Dimensions in Millimeters)

Table 9 Test Vehicle Rear Profile Data

X-axis measurements referenced to the vehicle's front frame crossmember. Y-axis measurements are left and right of the original vehicle centerline. Y-axis measurements (6 points) should divide the width of the car and be clearly indicated on the form. Z-axis (height) measurements are from the ground.

		Pre-Test Profile					
		Vehicle Left			Vehicle Right		
		pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of rear bumper	X	4068	4118	4116	4113	4104	4062
	Y	635	374	111	-154	-418	-676
	Z	177	175	166	161	163	176
Top of rear bumper	X	4102	4145	4156	4154	4139	4091
	Y	632	368	103	-158	-422	-680
	Z	367	366	367	368	366	363
Center of trunk	X	4001	4043	4054	4053	4039	3994
	Y	633	373	109	-148	-413	-674
	Z	623	612	611	608	610	619
		Post-Test Profile					
		Vehicle Left			Vehicle Right		
		pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of rear bumper ¹	X	NA	NA	NA	NA	NA	NA
	Y	NA	NA	NA	NA	NA	NA
	Z	NA	NA	NA	NA	NA	NA
Top of rear bumper ¹	X	3083	3151	3180	3203	3813	4026
	Y	555	288	35	-224	-403	-510
	Z	296	296	234	176	120	24
Center of trunk	X	3174	3516	3570	3628	3695	3597
	Y	516	487	228	-18	-269	-378
	Z	408	461	459	504	519	225

¹ Post-test measurements taken to center of bumper beam because pre-test measurement points were on bumper skin and destroyed.

Table 9 Test Vehicle Rear Profile Data, Cont'd.

		Change					
		Vehicle Left			Vehicle Right		
		pt. 1	pt. 2	pt. 3	pt. 4	pt. 5	pt. 6
Bottom of rear bumper ¹	X	NA	NA	NA	NA	NA	NA
	Y	NA	NA	NA	NA	NA	NA
	Z	NA	NA	NA	NA	NA	NA
Top of rear bumper ¹	X	1019	994	976	951	326	65
	Y	-77	-80	-68	-66	19	170
	Z	-71	-70	-133	-192	-246	-339
Center of trunk	X	827	527	484	425	344	397
	Y	-117	114	119	130	144	296
	Z	-215	-151	-152	-104	-91	-394

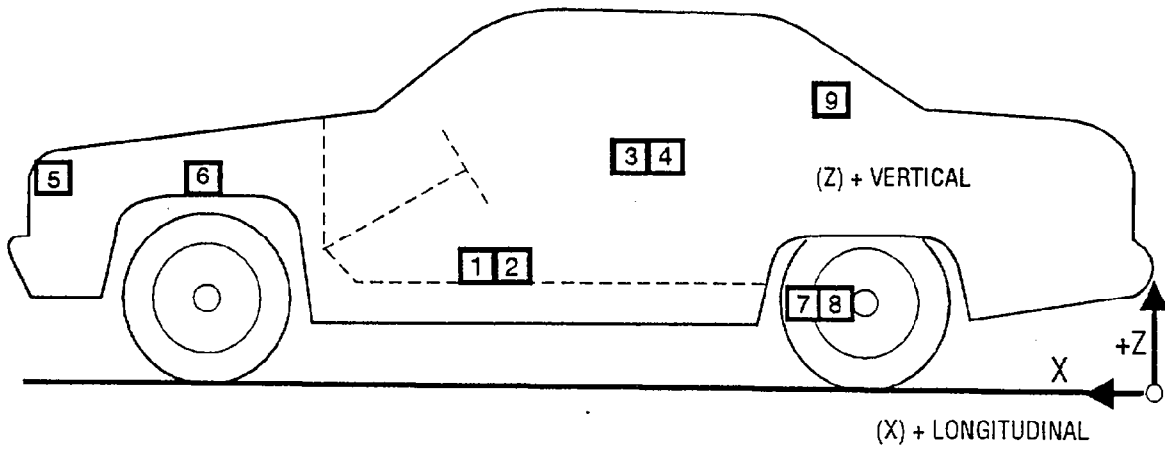
+X: Rearward from a reference plane at front frame crossmember.

+Y: Left from vehicle longitudinal centerline.

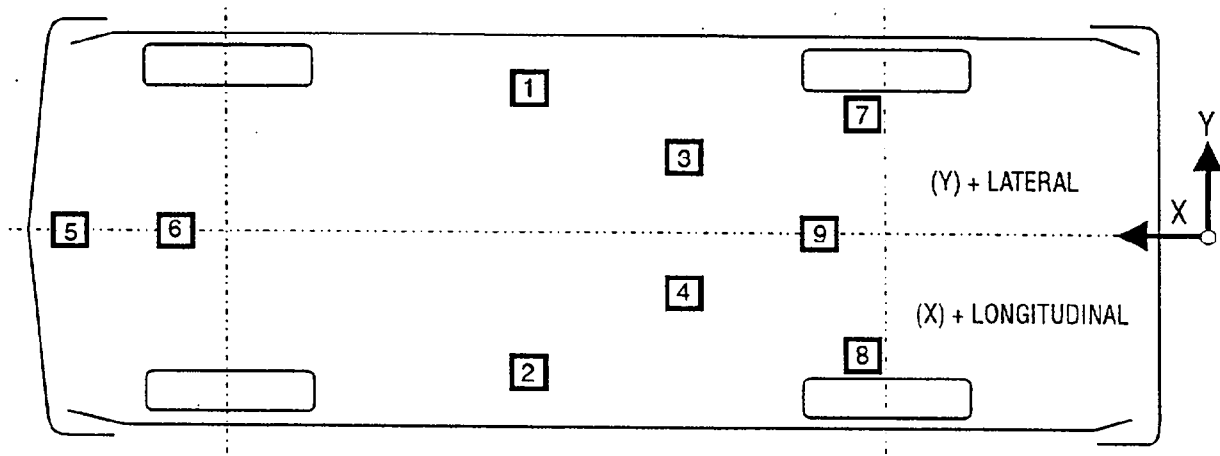
+Z: Up from ground.

¹ Post-test measurements taken to center of bumper beam because pre-test measurement points were on bumper skin and destroyed.

Figure 6 Vehicle Accelerometer Mounting Locations



SIDE VIEW



BOTTOM VIEW

Table 10 Pre- and Post-Test Position of Vehicle Accelerometer Mounting Locations

Accelerometer Description		X, Y, Z Location ¹		
		X	Y	Z
Left front seat outboard mounting rail	Pre	1824 mm	615 mm	270 mm
	Post	1895 mm	620 mm	325 mm
	Change	-71 mm	5 mm	55 mm
Right front seat outboard mounting rail	Pre	1824 mm	615 mm	270 mm
	Post	1890 mm	620 mm	340 mm
	Change	-66 mm	5 mm	70 mm
Left front seat back (mid-point of seat)	Pre	2436 mm	344 mm	834 mm
	Post	2490 mm	328 mm	549 mm
	Change	-54 mm	-16 mm	-285 mm
Right front seat back (mid-point of seat)	Pre	2436 mm	339 mm	834 mm
	Post	2480 mm	283 mm	695 mm
	Change	-44 mm	-56 mm	-139 mm
Radiator support	Pre	217 mm	0 mm	642 mm
	Post	216 mm	0 mm	745 mm
	Change	1 mm	0 mm	103 mm
Top of engine	Pre	575 mm	-52 mm	725 mm
	Post	580 mm	-38 mm	768 mm
	Change	-5 mm	14 mm	43 mm
Left rear wheel axle	Pre	3290 mm	275 mm	276 mm
	Post	2786 mm	376 mm	497 mm
	Change	504 mm	101 mm	221 mm
Right rear wheel axle	Pre	3290 mm	270 mm	287 mm
	Post	3187 mm	424 mm	407 mm
	Change	103 mm	154 mm	120 mm
Rear package shelf (top of rear seat back)	Pre	3523 mm	0 mm	964 mm
	Post	3436 mm	58 mm	929 mm
	Change	87 mm	58 mm	-35 mm

¹ Reference Point: X - vertical plane at front bumper

Y - vehicle centerline

Z - ground

TEST NO. 960418

TABLE 11 MOVING DEFORMABLE IMPACTOR FACE STATIC CRUSH
ZERO DISTANCE AT IMPACTOR CENTERLINE¹

LOCATION	HEIGHT mm	813	711	610	508	406	305	203	102	0	102	203	305	406	508	610	711	813
PRE-TEST PROFILE (DISTANCE IN MILLIMETERS FROM REFERENCE PLANE ²)																		
TOP OF FACE	758	420	420	420	422	422	423	423	423	423	423	423	423	423	422	422	421	420
MID-FACE	552	422	422	422	422	422	422	423	422	422	422	422	422	422	422	421	421	421
BUMPER	428	510	525	526	526	526	526	526	526	526	526	526	526	526	524	523	523	508

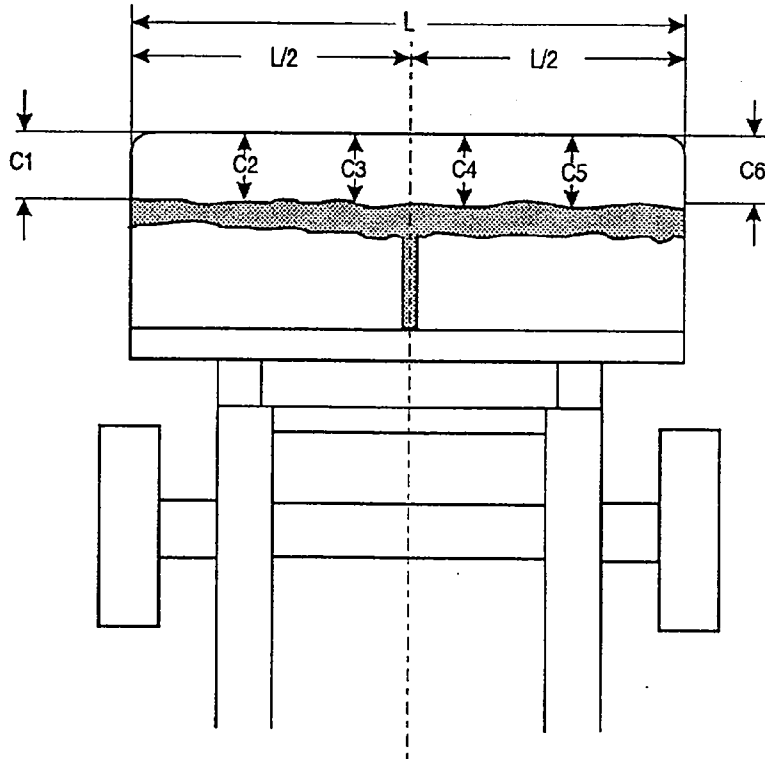
LOCATION	HEIGHT mm	POST-TEST PROFILE (DISTANCE IN MILLIMETERS FROM REFERENCE PLANE ²)																
TOP OF FACE	758	418	419	419	417	399	371	369	375	383	390	405	418	421	422	421	419	417
MID-FACE	552	423	423	423	422	421	419	412	412	393	363	377	384	374	377	372	367	326
BUMPER	428	539	543	532	521	509	497	485	476	459	446	455	444	434	425	405	405	364

LOCATION	HEIGHT mm	STATIC CRUSH (MM)																
TOP OF FACE	758	2	1	1	5	23	52	54	48	40	33	19	5	2	0	1	2	4
MID-FACE	552	-1	-1	-1	0	2	3	11	10	29	60	45	37	48	44	49	54	94
BUMPER	428	-29	-18	-7	5	17	29	41	50	67	80	71	73	82	90	98	118	144

All measurements are in millimeters.

¹Column readings are left to right across barrier face from left to right.²Reference plane is 900 mm forward of the rear surface of the deformable barrier face.

Figure 7 Moving Deformable Impactor Face Crush



Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is moving impactor centerline.

	Pre-test	Post-test	Crush
L	1676 mm		
C1	510 mm	539 mm	-29 mm
C2	526 mm	521 mm	5 mm
C3	526 mm	485 mm	41 mm
C4	526 mm	455 mm	71 mm
C5	524 mm	434 mm	90 mm
C6	508 mm	364 mm	144 mm
CL	526 mm	459 mm	67 mm

Figure 8 Dummy Measurement Locations for Front Seat Occupants

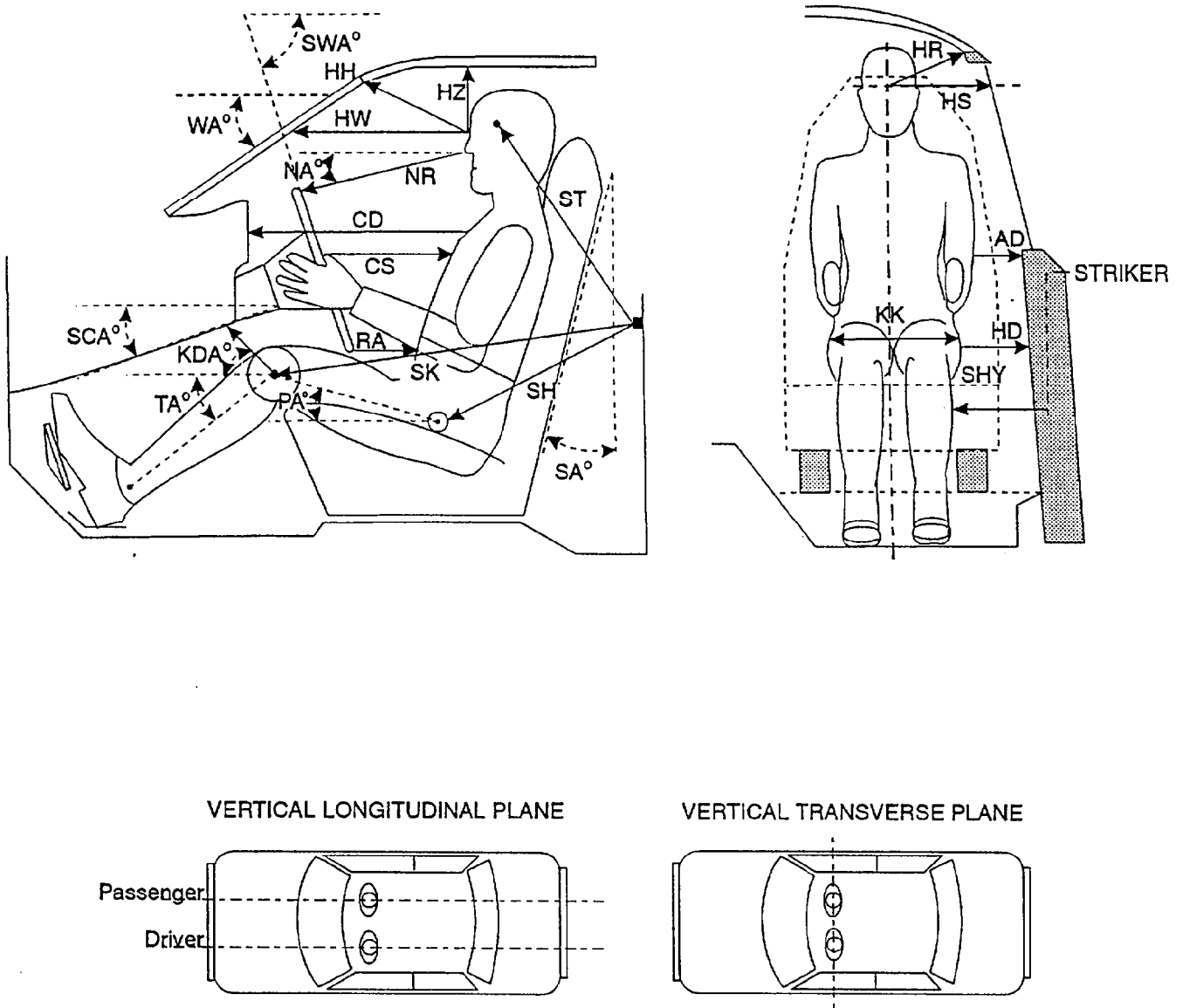
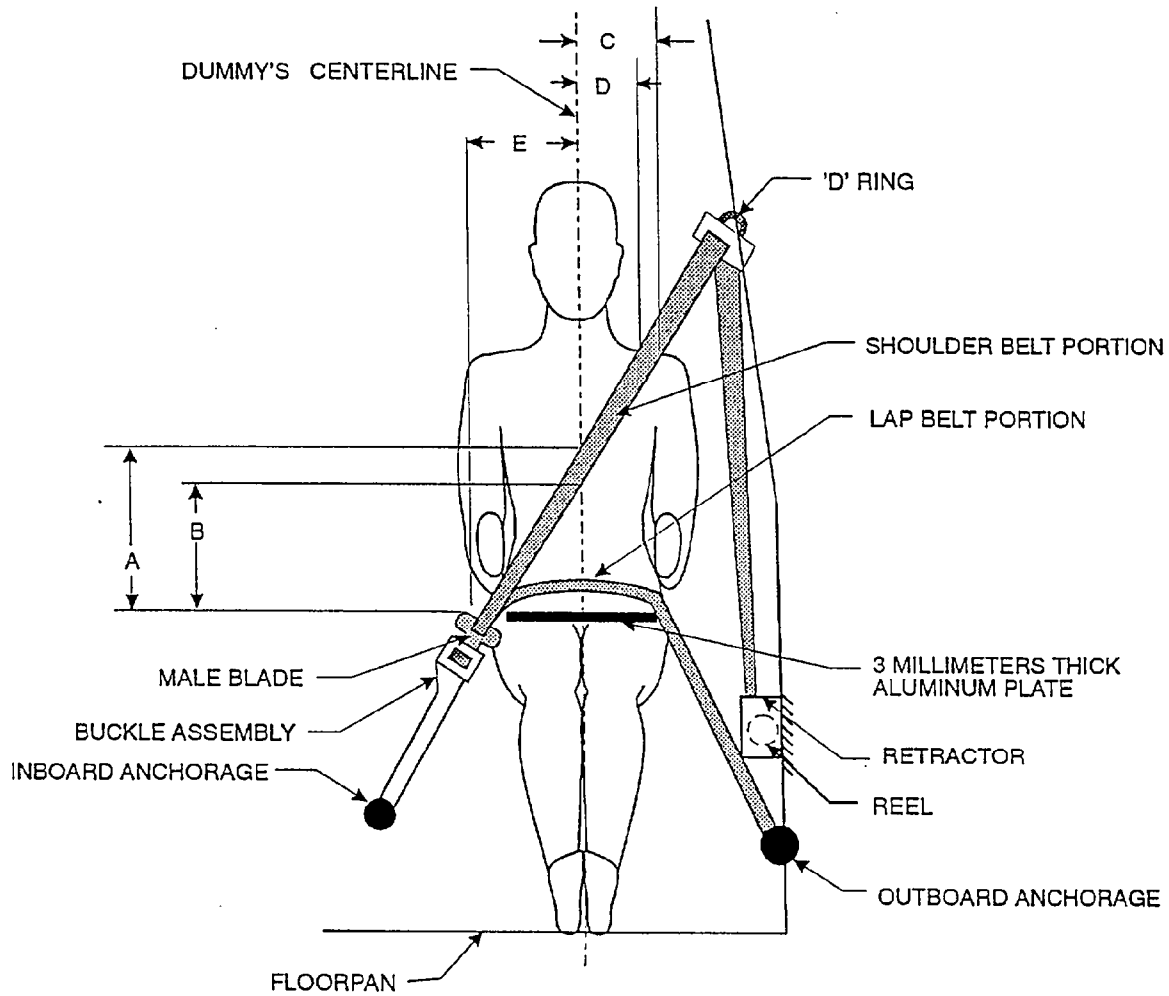


Table 12. Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #35)	Passenger (Serial #34)
WA	Windshield angle	30°	NA
SWA	Steering wheel angle	65°	NA
SCA	Steering column angle	25°	NA
SA	Seat back angle	25°	25°
HZ	Head to roof	180 mm	173 mm
HH	Head to header	319 mm	326 mm
HW	Head to windshield	499 mm	482 mm
HR	Head to side header	191 mm	188 mm
NR	Nose to rim	401 mm	NA
NA	Nose to rim angle	14°	NA
CD	Chest to dash	516 mm	545 mm
CS	Steering wheel to chest	305 mm	NA
RA	Rim to abdomen	173 mm	NA
KDL	Left knee to dash	156 mm	165 mm
KDR	Right knee to dash	157 mm	163 mm
KDA	Outboard knee to dash angle	16°	30°
PA	Pelvic angle	24°	25°
TA	Tibial angle	46°	38°
KK	Knee to knee	310 mm	266 mm
ST ¹	Striker to head	507 mm	527 mm
	Striker to head angle	83°	88°
SK ¹	Striker to knee	579 mm	565 mm
	Striker to knee angle	3°	1°
SH ¹	Striker to H-point	225 mm	211 mm
	Striker to H-point angle	34°	30°
SHY	Striker to H-point (Y dir.)	230 mm	239 mm
HS	Head to side window	286 mm	313 mm
HD	H-point to door	171 mm	135 mm
AD	Arm to door	105 mm	105 mm

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

Figure 9 Seat Belt Positioning Data



		Driver	Passenger
A	Top surface of aluminum plate to belt upper edge	375 mm	342 mm
B	Top surface of aluminum plate to belt lower edge	297 mm	261 mm
C	Dummy centerline to outer edge of belt at chest flesh top	118 mm	155 mm
D	Dummy centerline to inner edge of belt at chest flesh top	56 mm	90 mm
E	Dummy centerline to intersection of upper torso belt and lap belt	278 mm	304 mm

Figure 10 Camera Positions

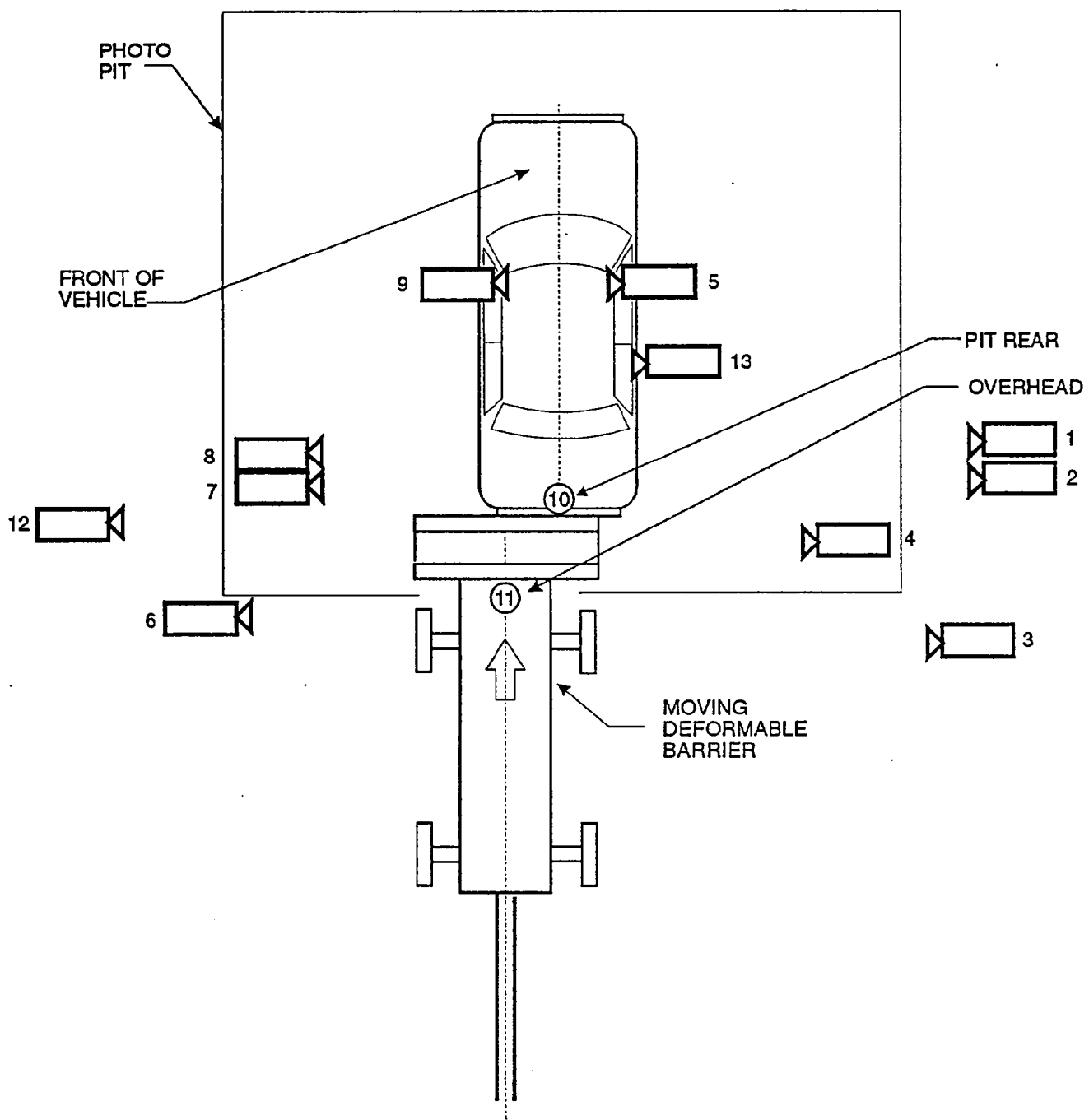


Table 13 Motion Picture Camera Locations

Test number: 960418

Vehicle year/make/model/body style: 1996/Geo/Prizm/4-door sedan

Camera Number	View	Camera Positions ¹			Angle of Inclination ²	Angle of Rotation ³	Camera Lens	Film Speed
		X	Y	Z				
1	Right side vehicle	8839	-6706	1143	0°	0°	25 mm	983 frames/s
2	Right side overall	660	-8128	1118	0°	0°	13 mm	995 frames/s
3	Right moving deformable impactor	-1549	-10693	1105	0°	0°	25 mm	980 frames/s
4	Right close-up	-381	6248	940	-3°	0°	17 mm	1003 frames/s
5	Right front passenger onboard	NA	NA	NA	NA	NA	8 mm	730 frames/s
6	Left side moving deformable impactor	NA	NA	NA	0°	0°	25 mm	980 frames/s
7	Left side close-up	-3099	11938	851	-3°	0°	17 mm	1003 frames/s
8	Left side vehicle	610	11582	876	-2°	0°	25 mm	995 frames/s
9	Driver onboard	NA	NA	NA	NA	NA	8 mm	800 frames/s
10	Underbody vehicle	NA	NA	NA	90°	0°	17 mm	985 frames/s
11	Overhead	NA	NA	10668	90°	0°	13 mm	912 frames/s
12	Left side overall	-711	13792	889	0°	0°	13 mm	1000 frames/s
13	Seat back view	NA	NA	NA	NA	NA	8 mm	763 frames/s

¹ +X: Forward from impact point MDB face

+Y: Rightward from monorail centerline

+Z: Upward from ground level

² +Angle of Inclination: Camera lens (upward from horizontal)³ +Angle of Rotation: Camera lens toward impactor from line perpendicular to monorail centerline

Appendix A

Photographs

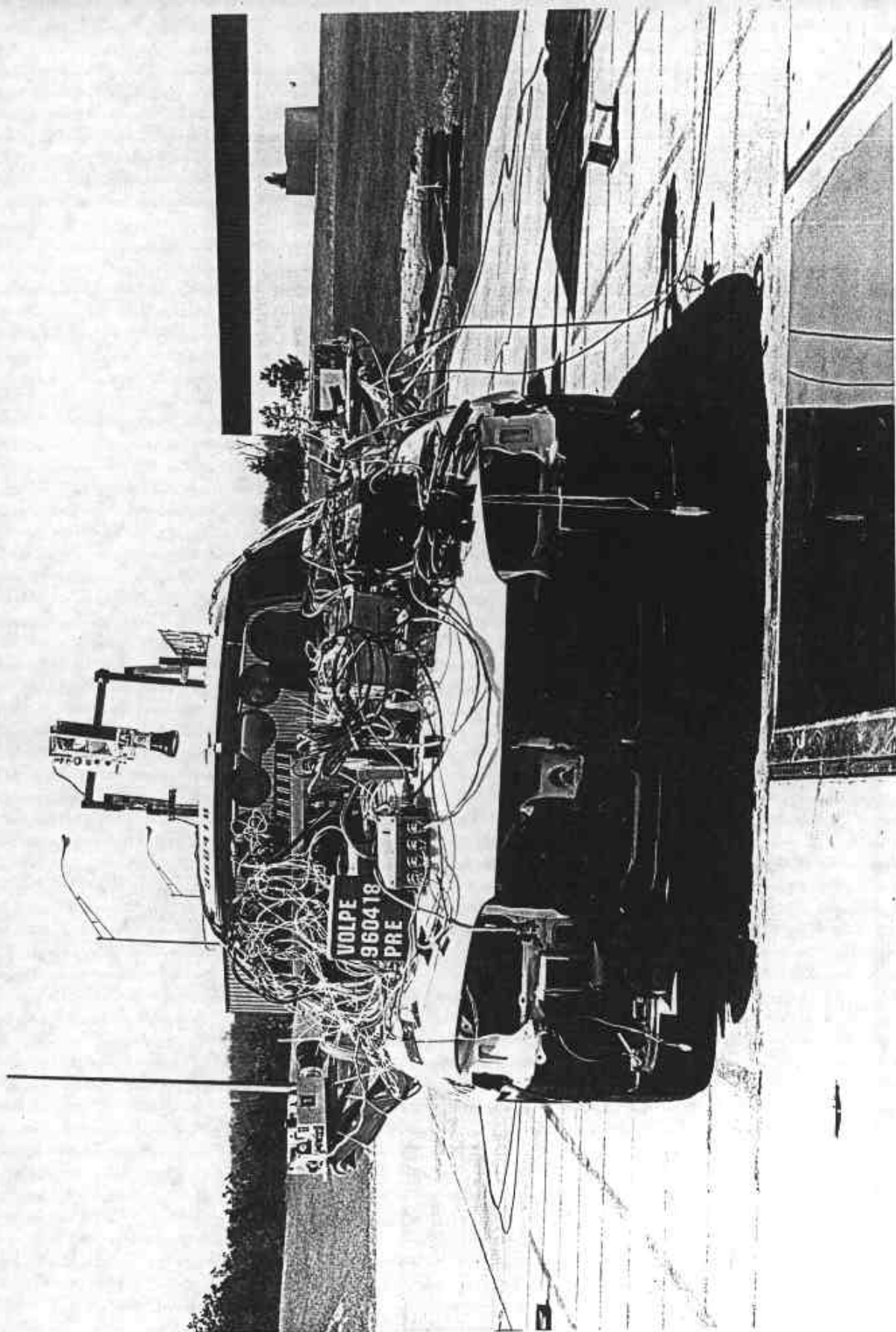


Figure A-1 Pre-Test Front View

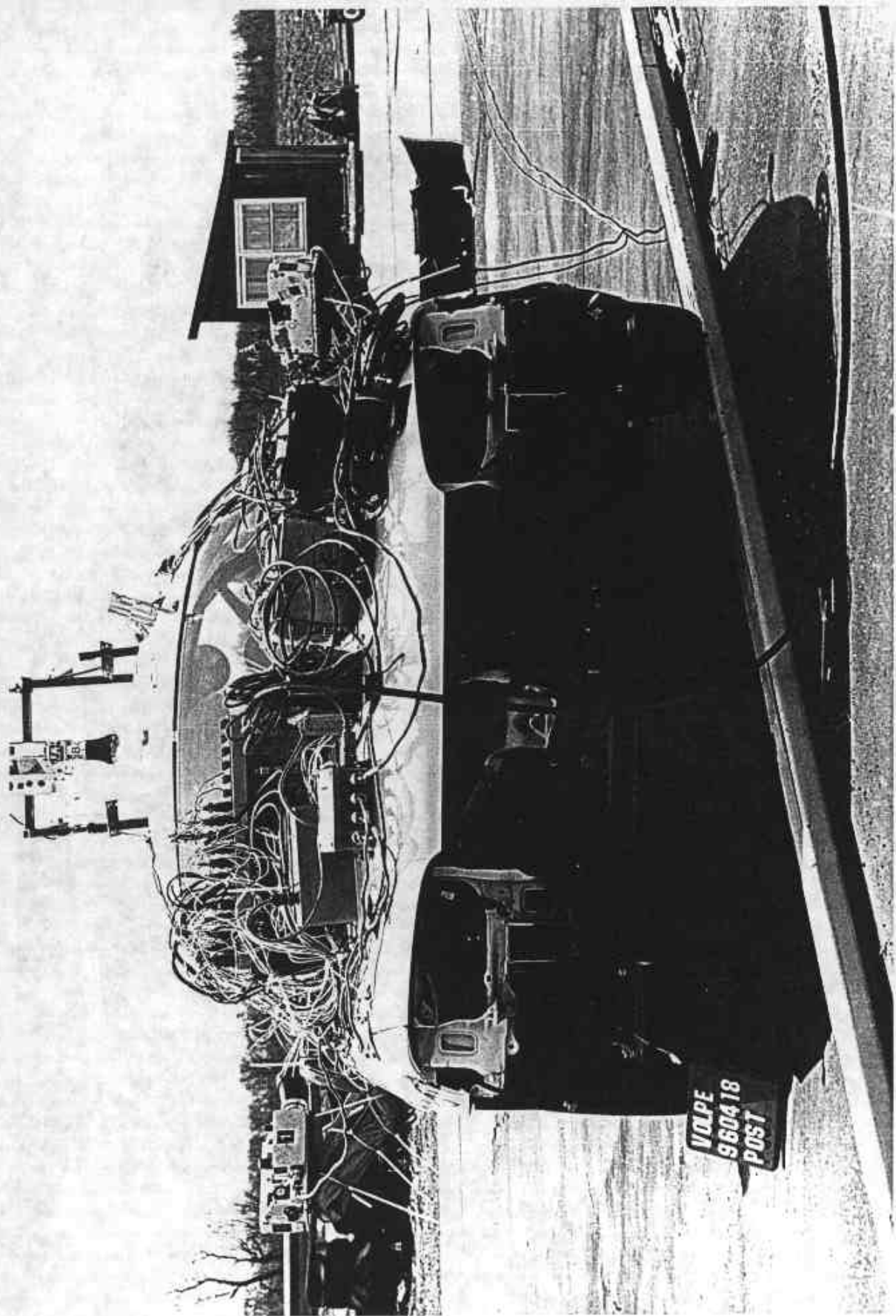


Figure A-2 Post-Test Front View



Figure A-3 Pre-Test Left Front Three-Quarter View



Figure A-4 Post-Test Left Front Three-Quarter View

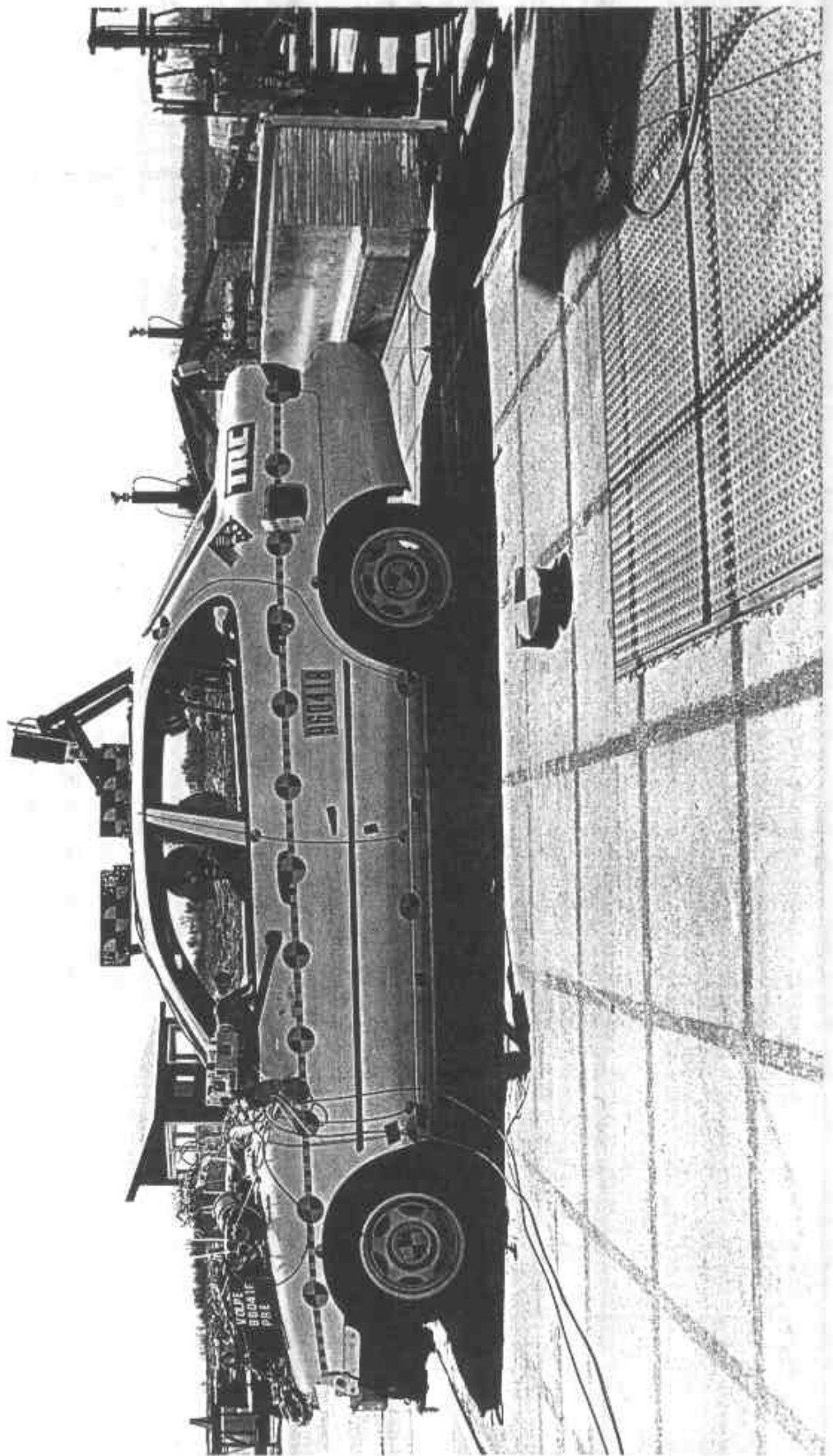


Figure A-5 Pre-Test Left Side View



Figure A-6 Post-Test Left Side View

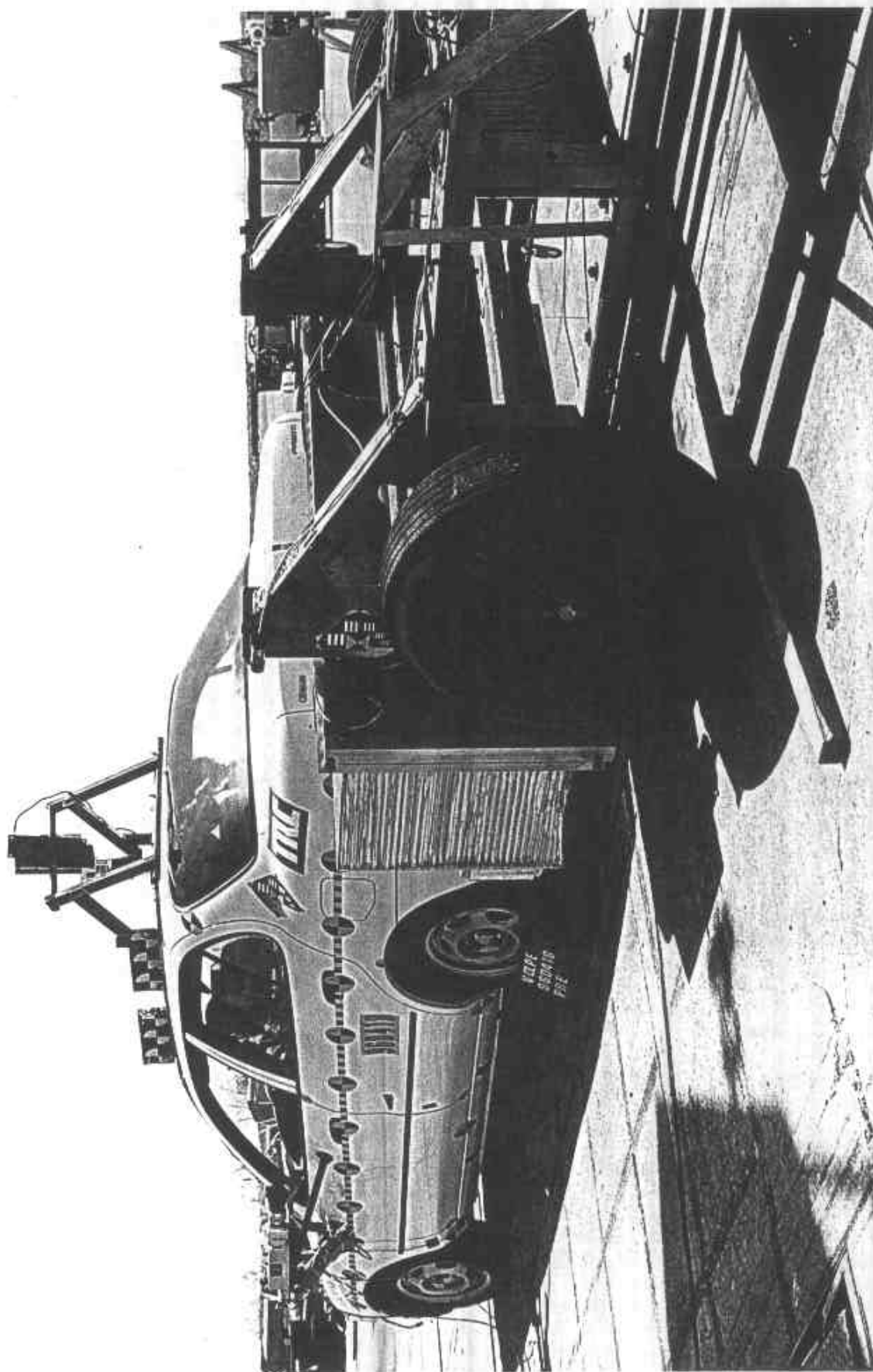


Figure A-7 Pre-Test Left Rear Three-Quarter View

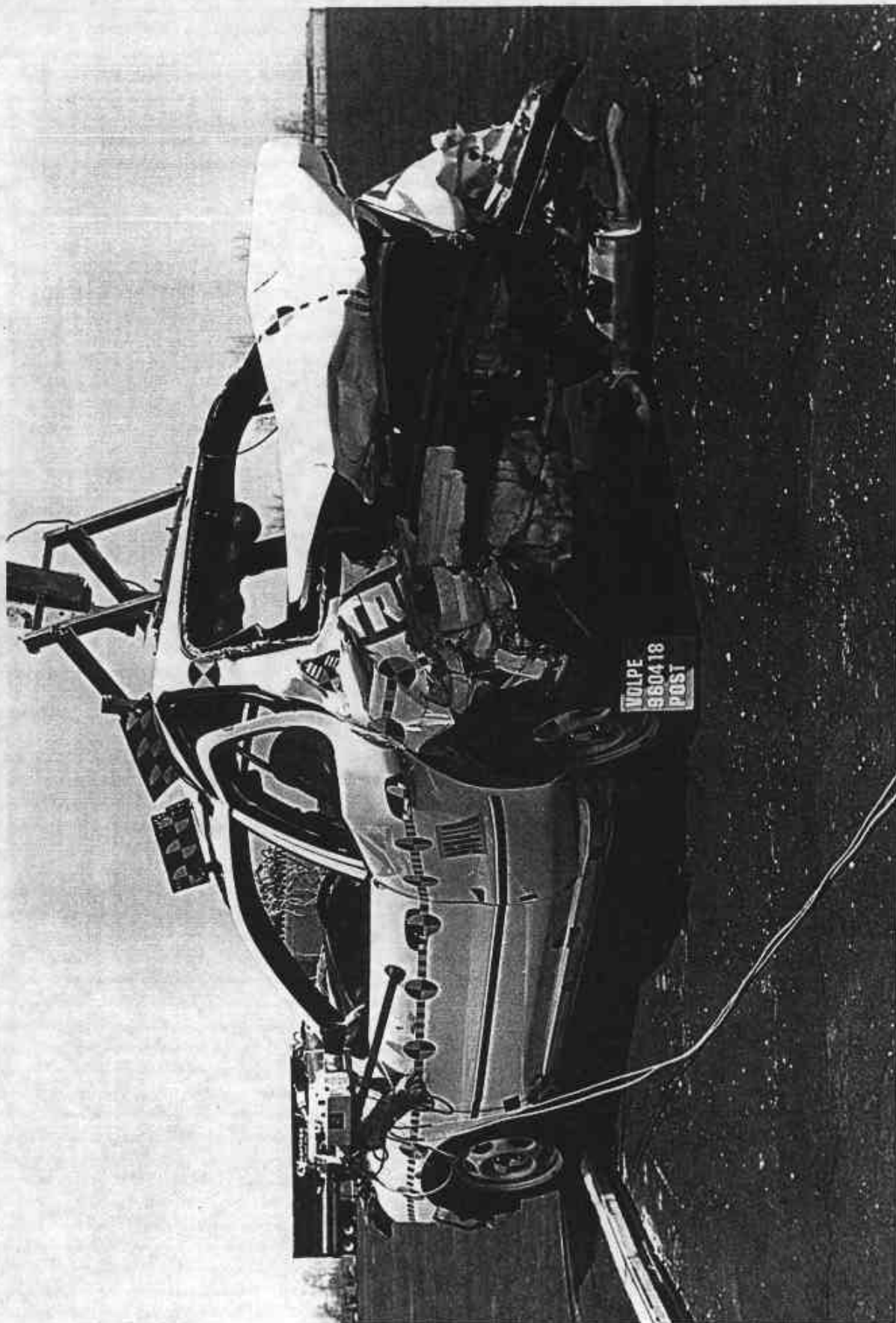


Figure A-8 Post-Test Left Rear Three-Quarter View

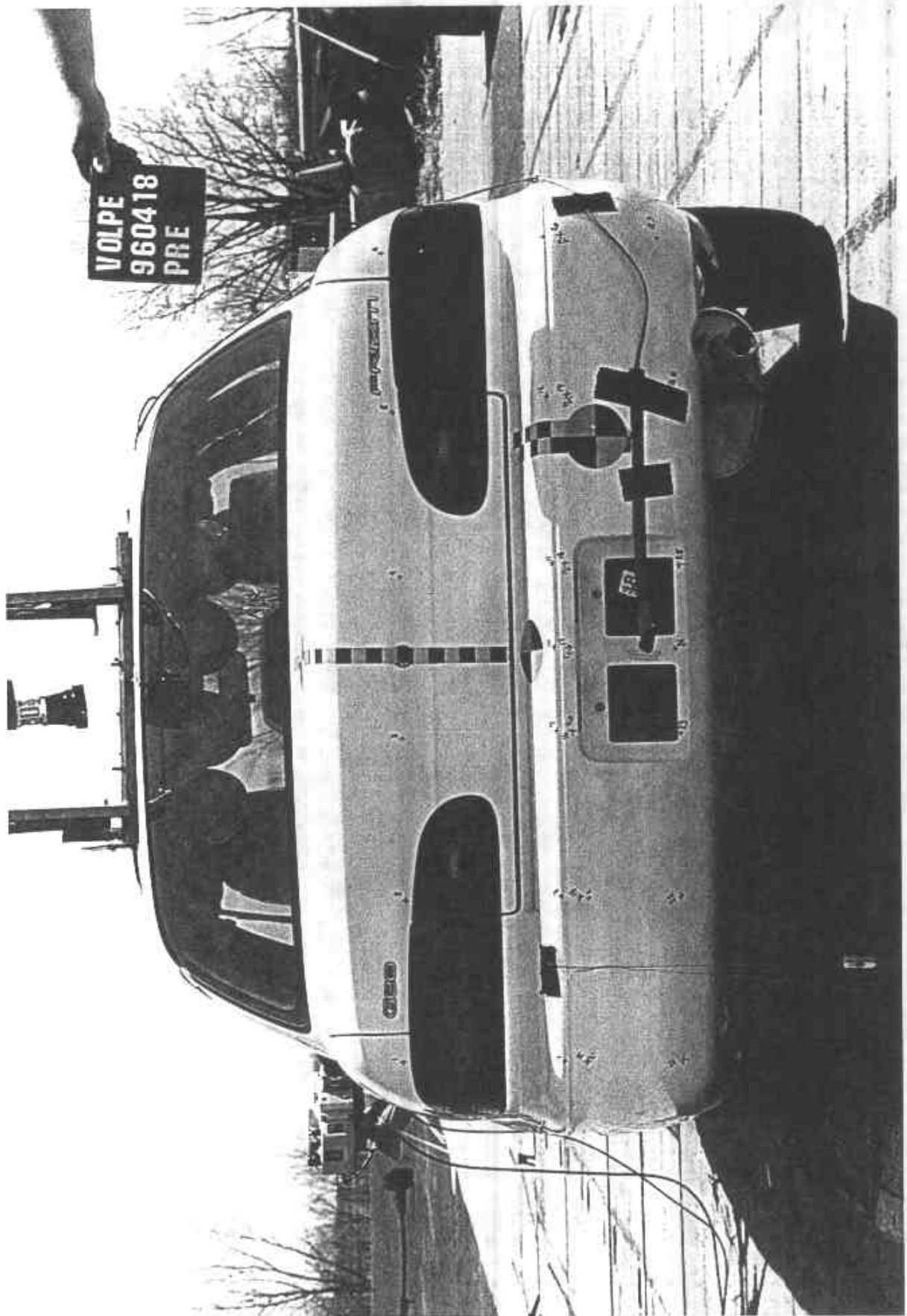


Figure A-9 Pre-Test Rear View

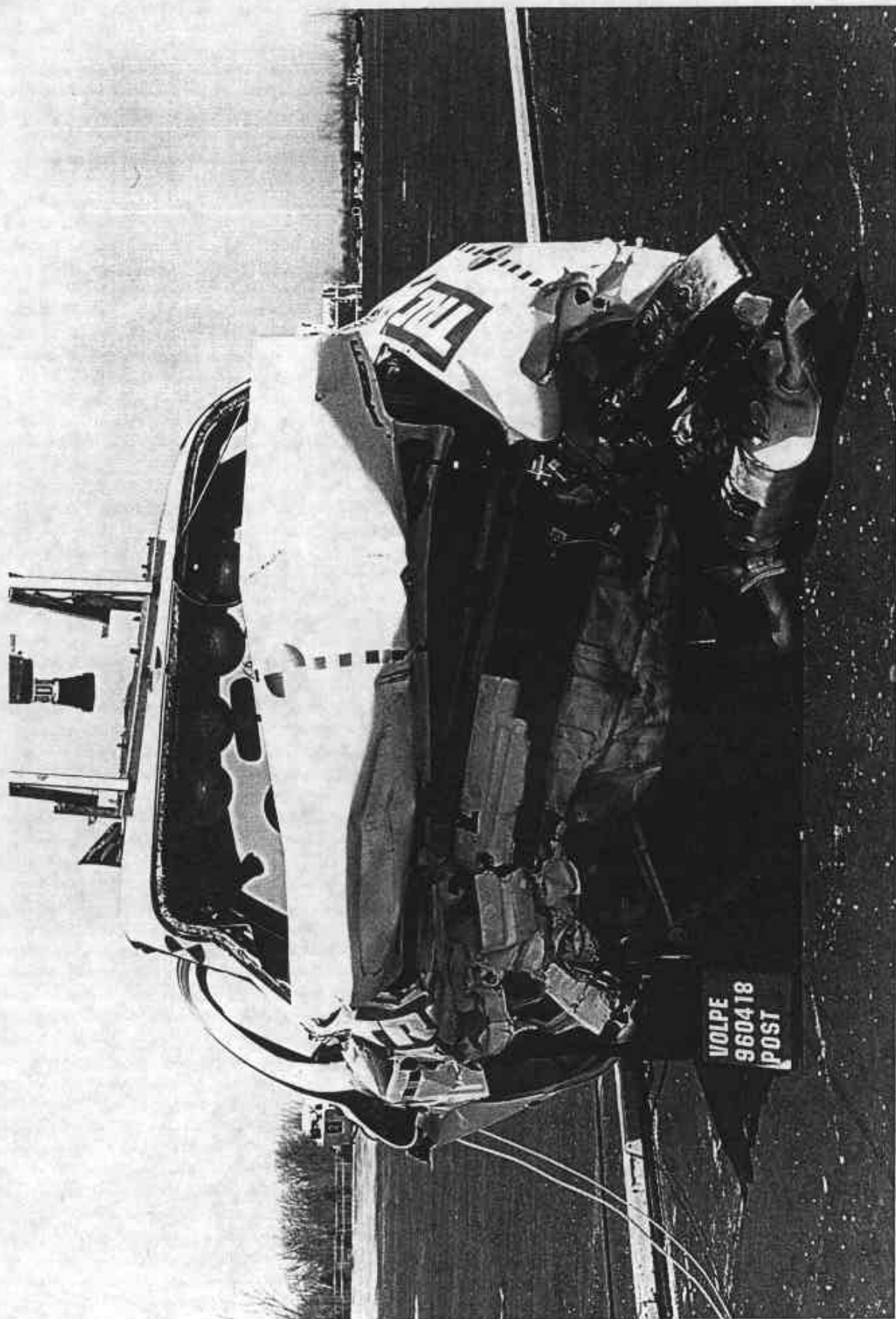


Figure A-10 Post-Test Rear View

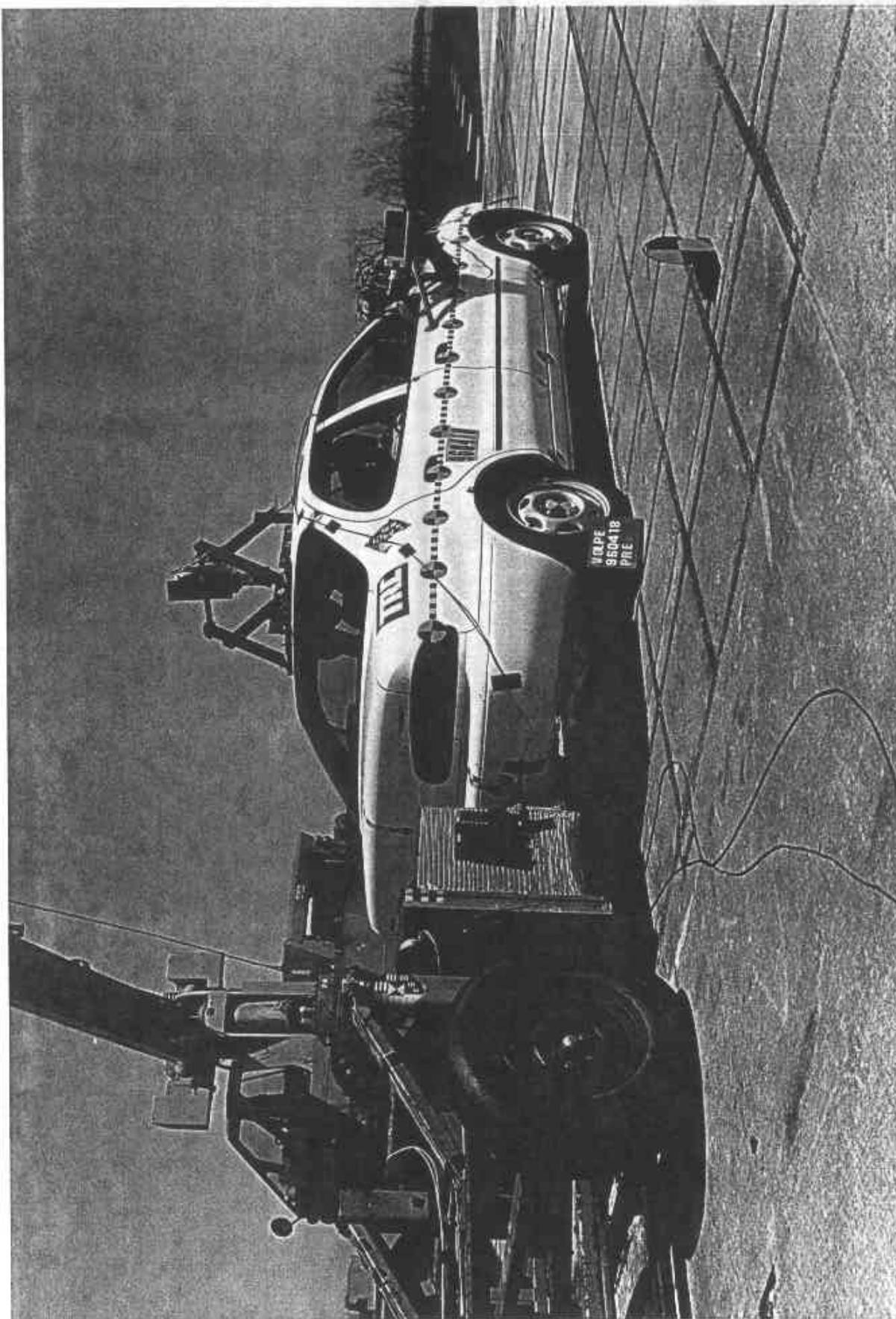


Figure A-11 Pre-Test Right Rear Three-Quarter View

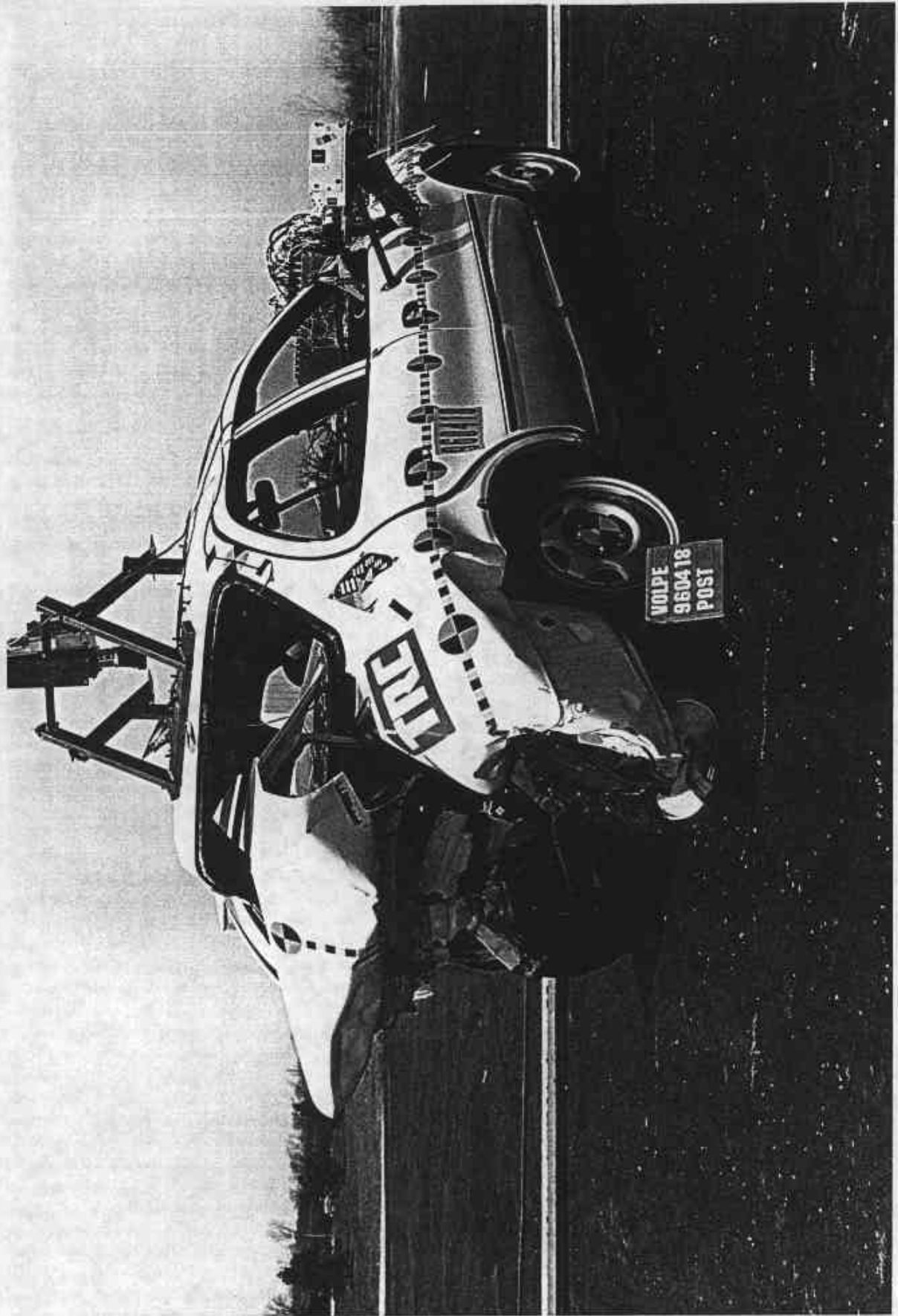


Figure A-12 Post-Test Right Rear Three-Quarter View

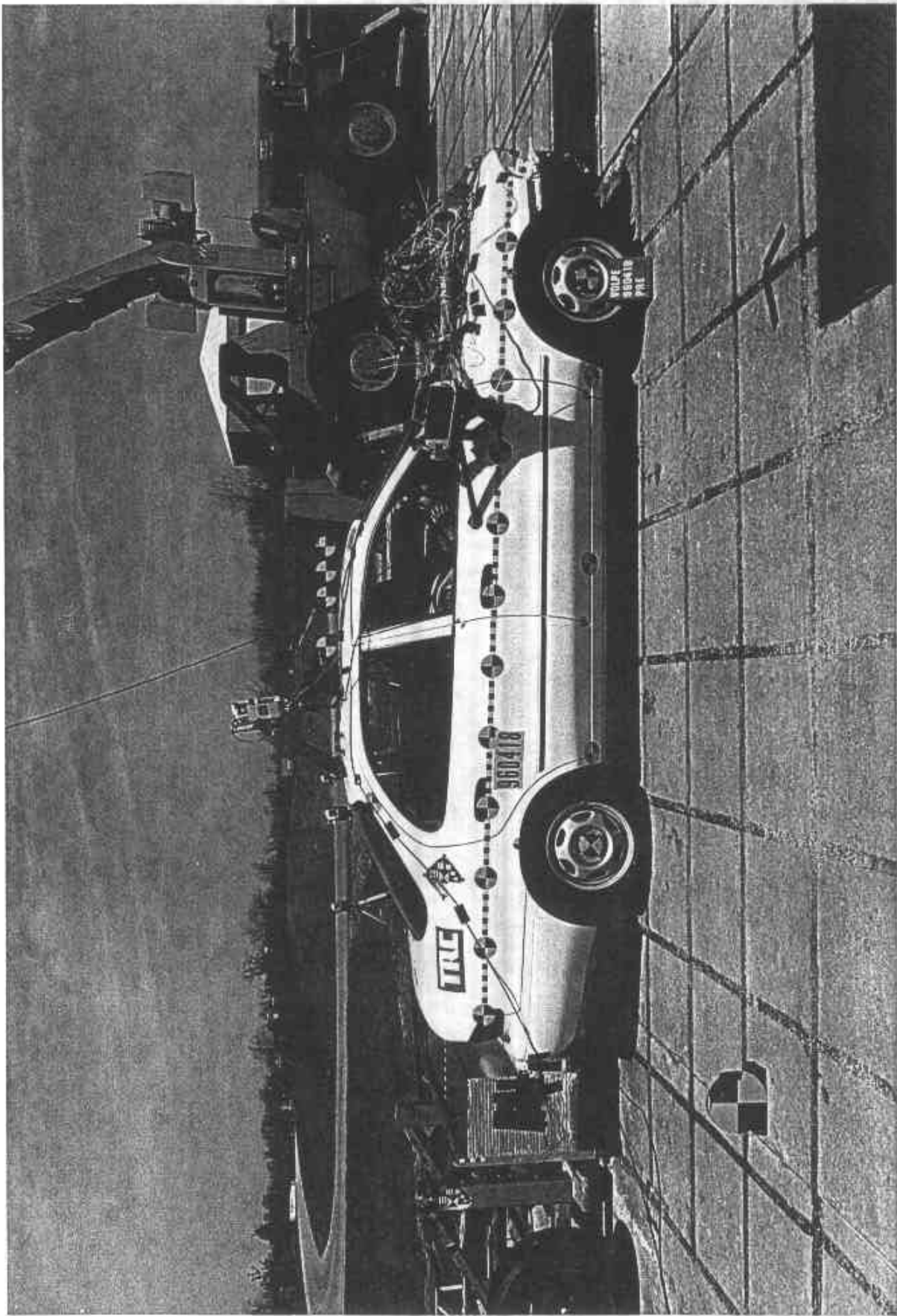


Figure A-13 Pre-Test Right Side View

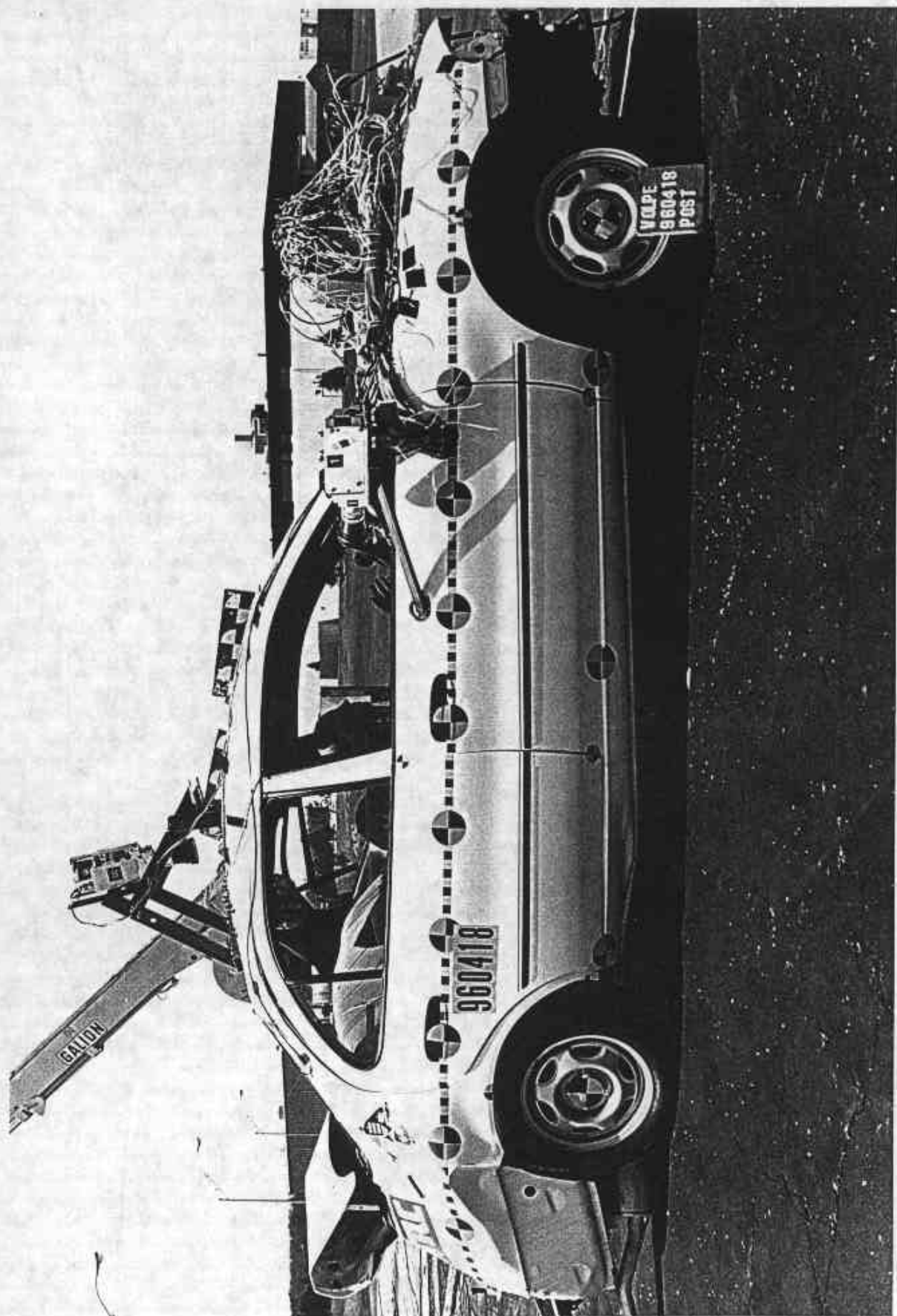


Figure A-14 Post-Test Right Side View

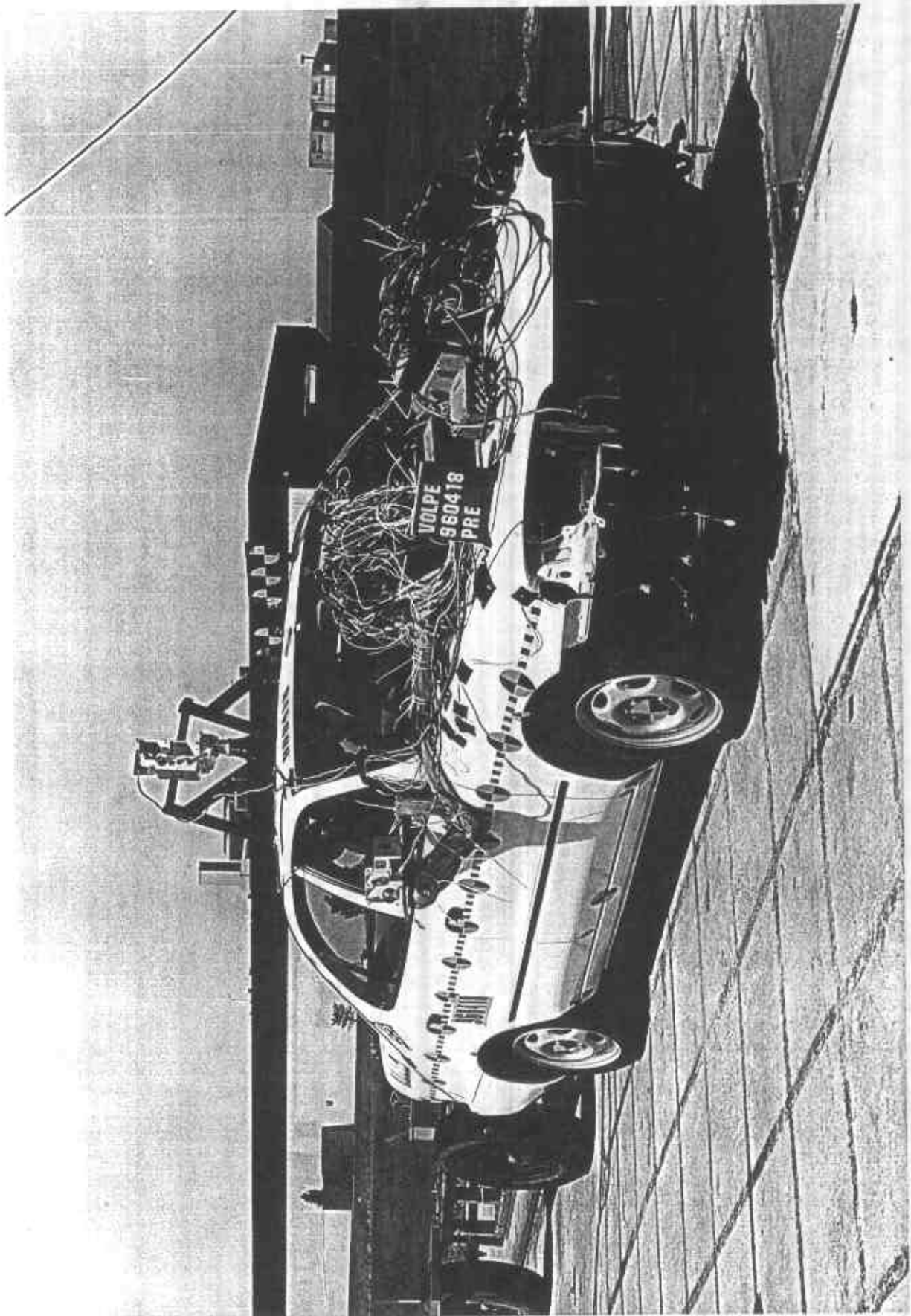


Figure A-15 Pre-Test Right Front Three-Quarter View

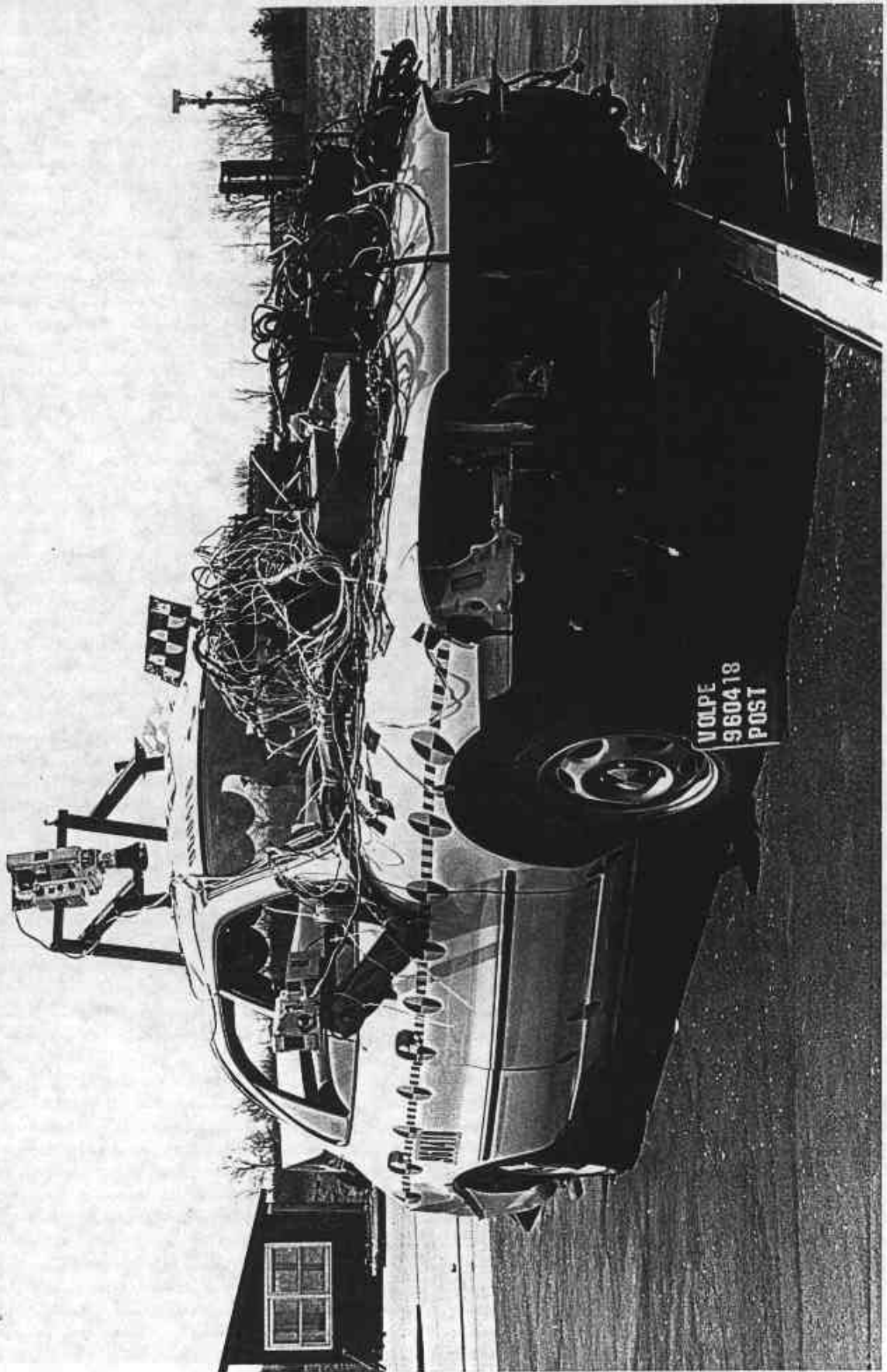


Figure A-16 Post-Test Right Front Three-Quarter View

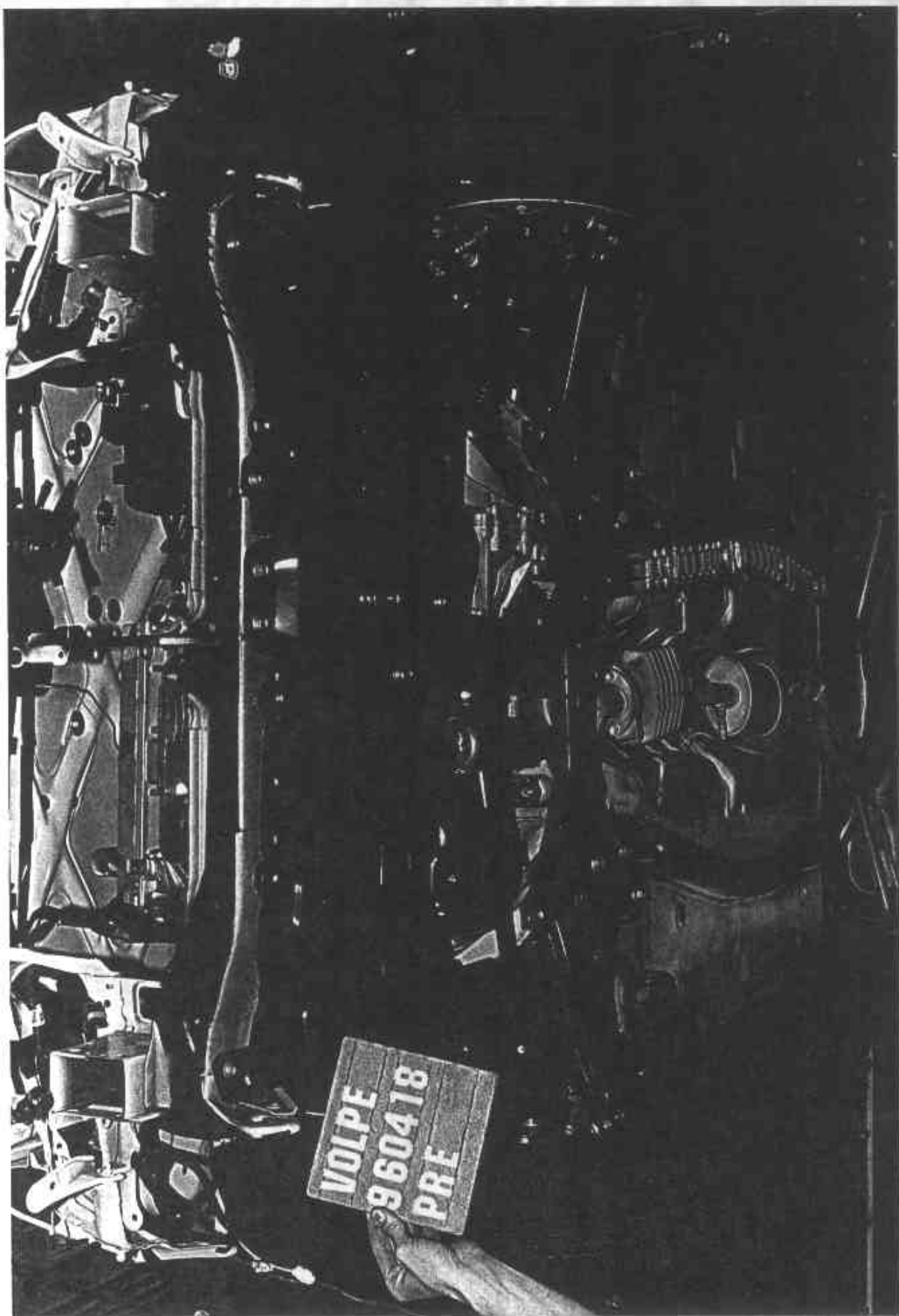


Figure A-17 Pre-Test Front Underbody View

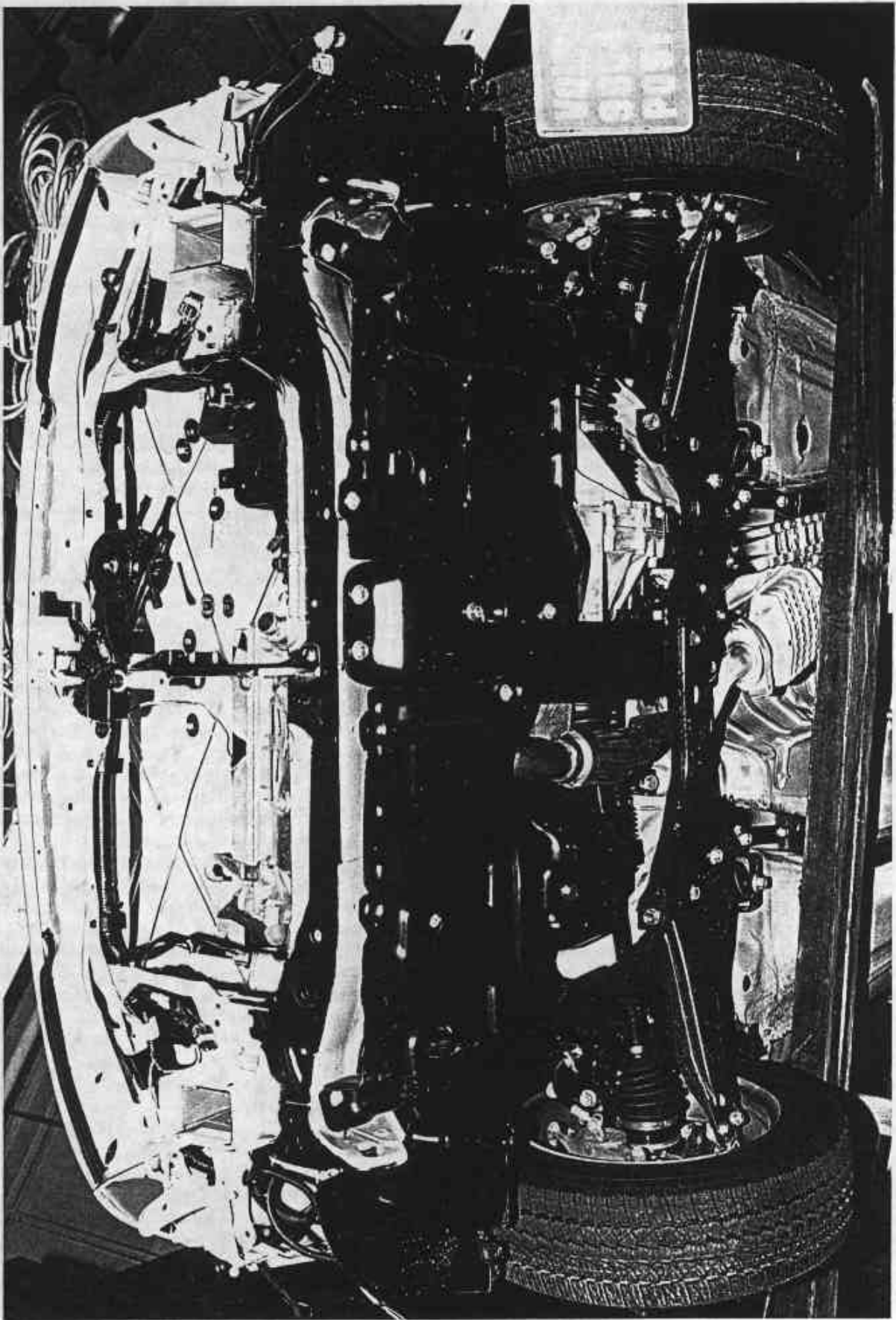


Figure A-18 Post-Test Front Underbody View

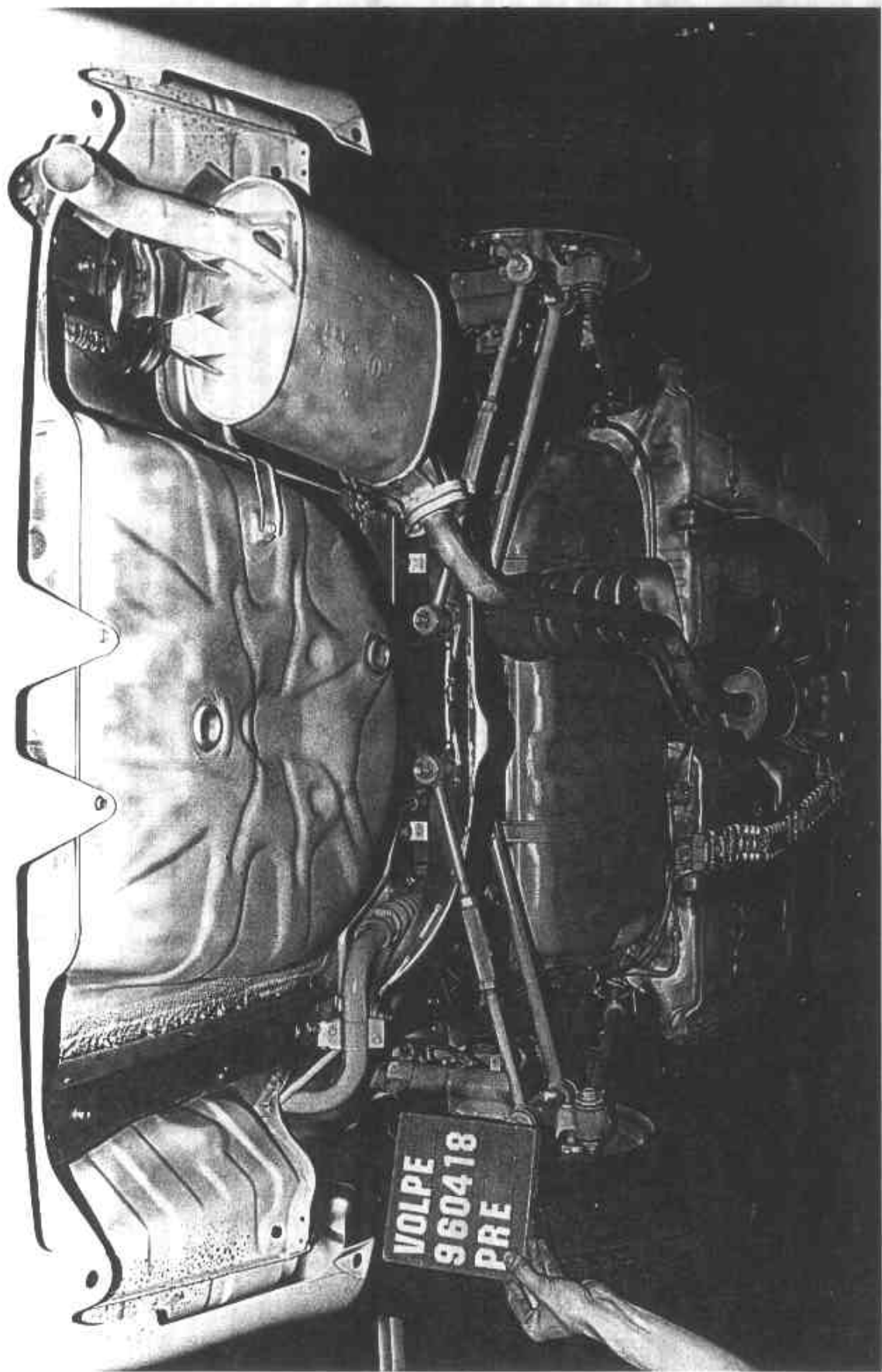


Figure A-19 Pre-Test Rear Underbody View

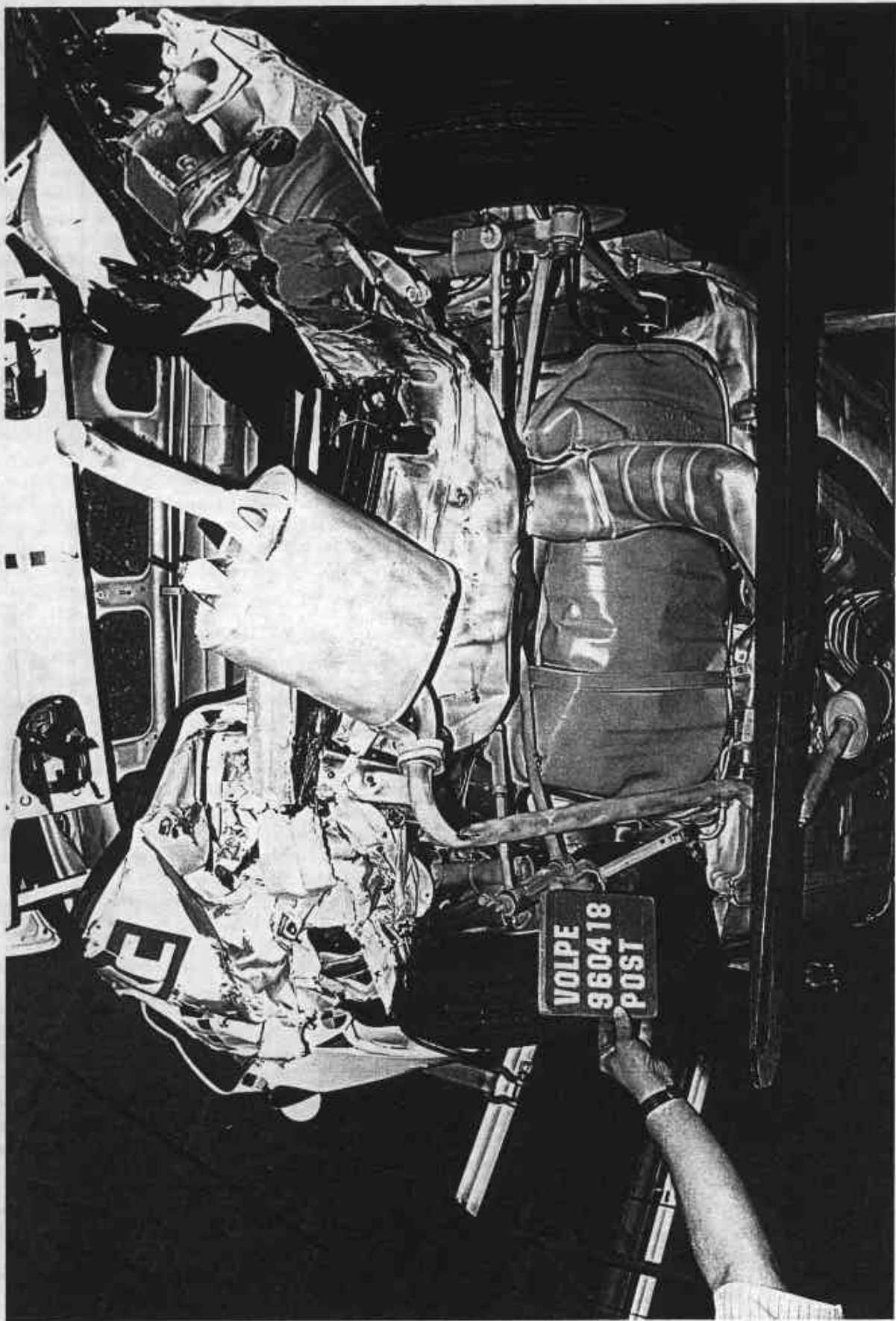


Figure A-20 Post-Test Rear Underbody View

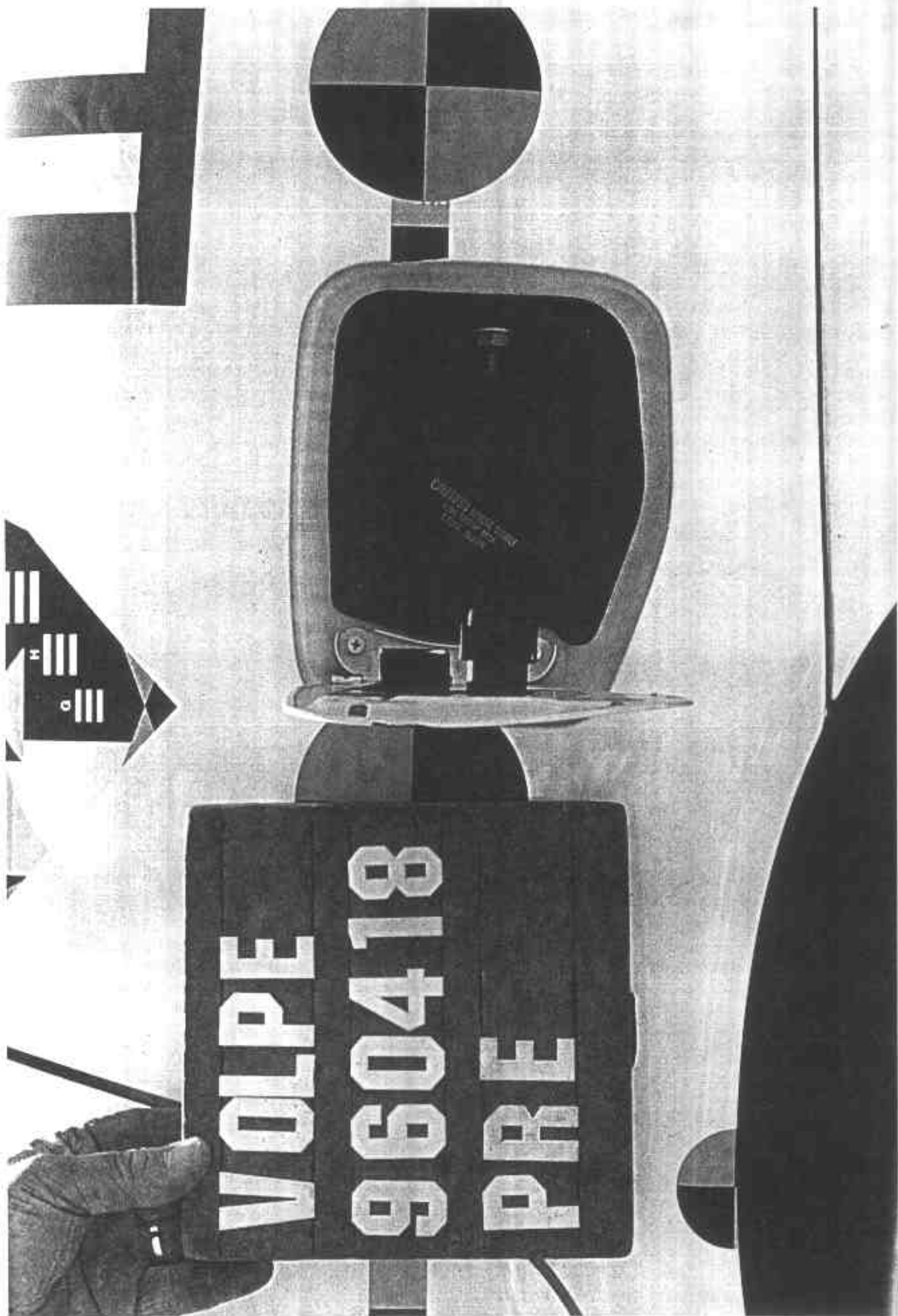


Figure A-21 Pre-Test Fuel Filler Cap View

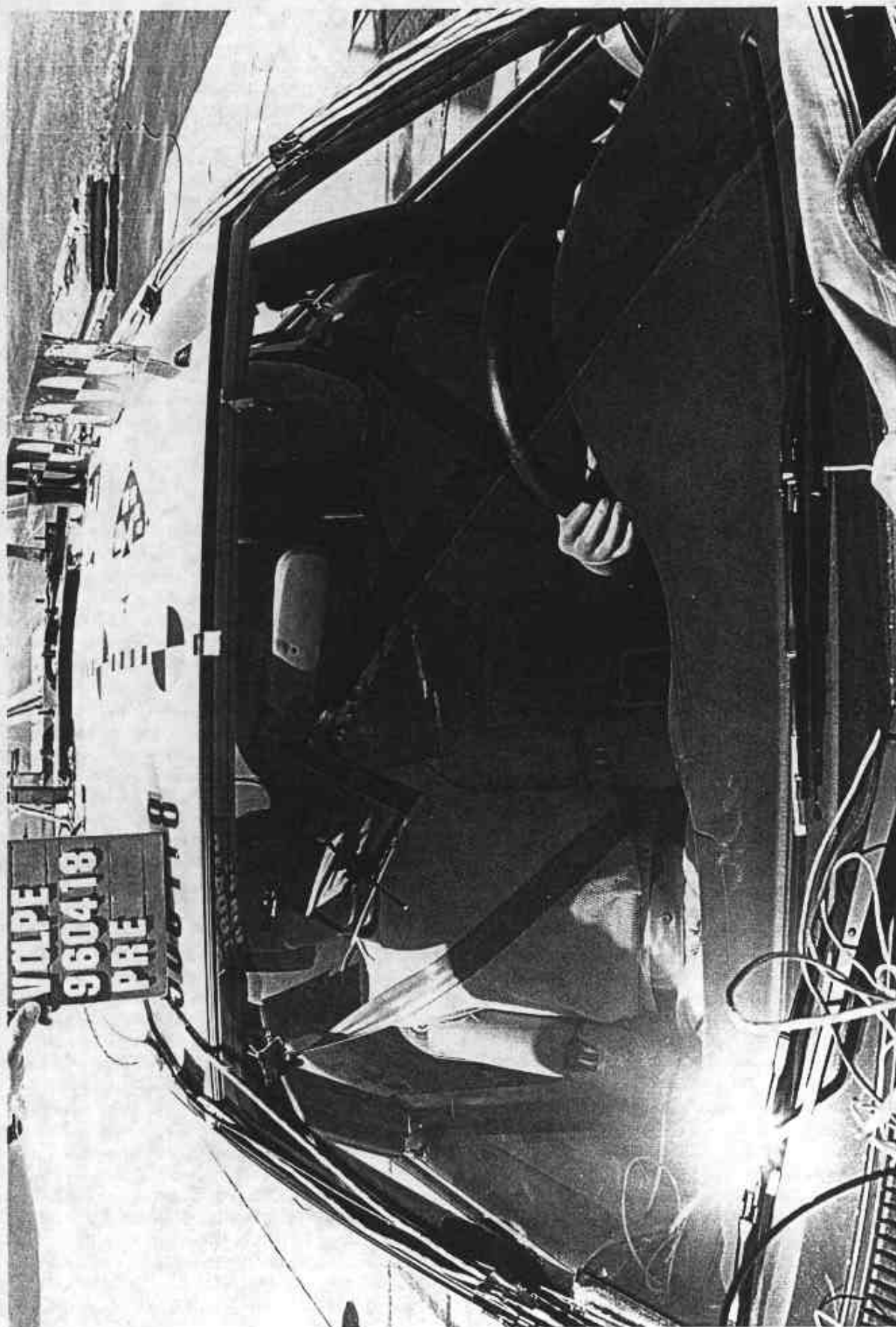


Figure A-22 Pre-Test Windshield View

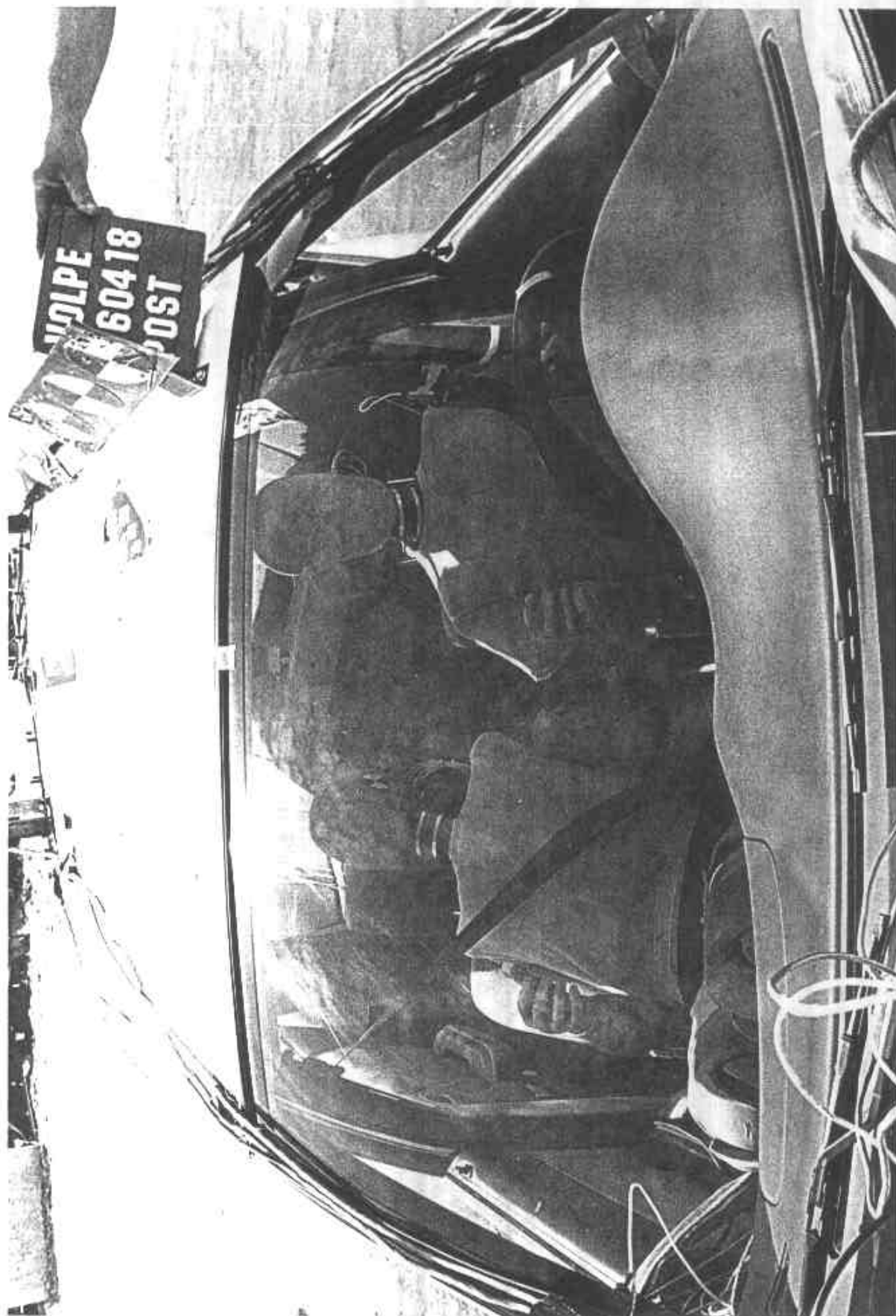


Figure A-23 Post-Test Windshield View

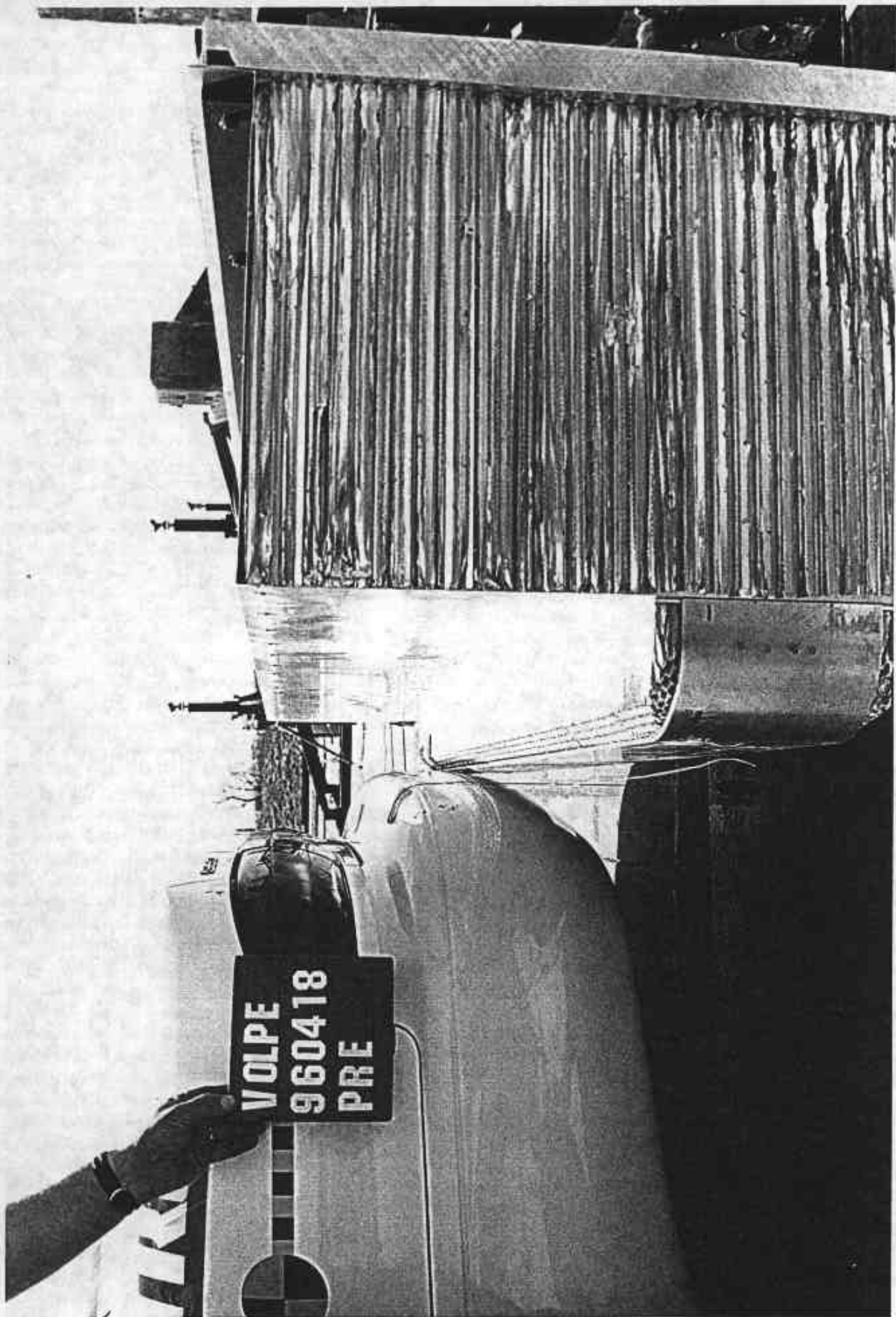


Figure A-24 Pre-Test Impactor to Vehicle Alignment View - Left

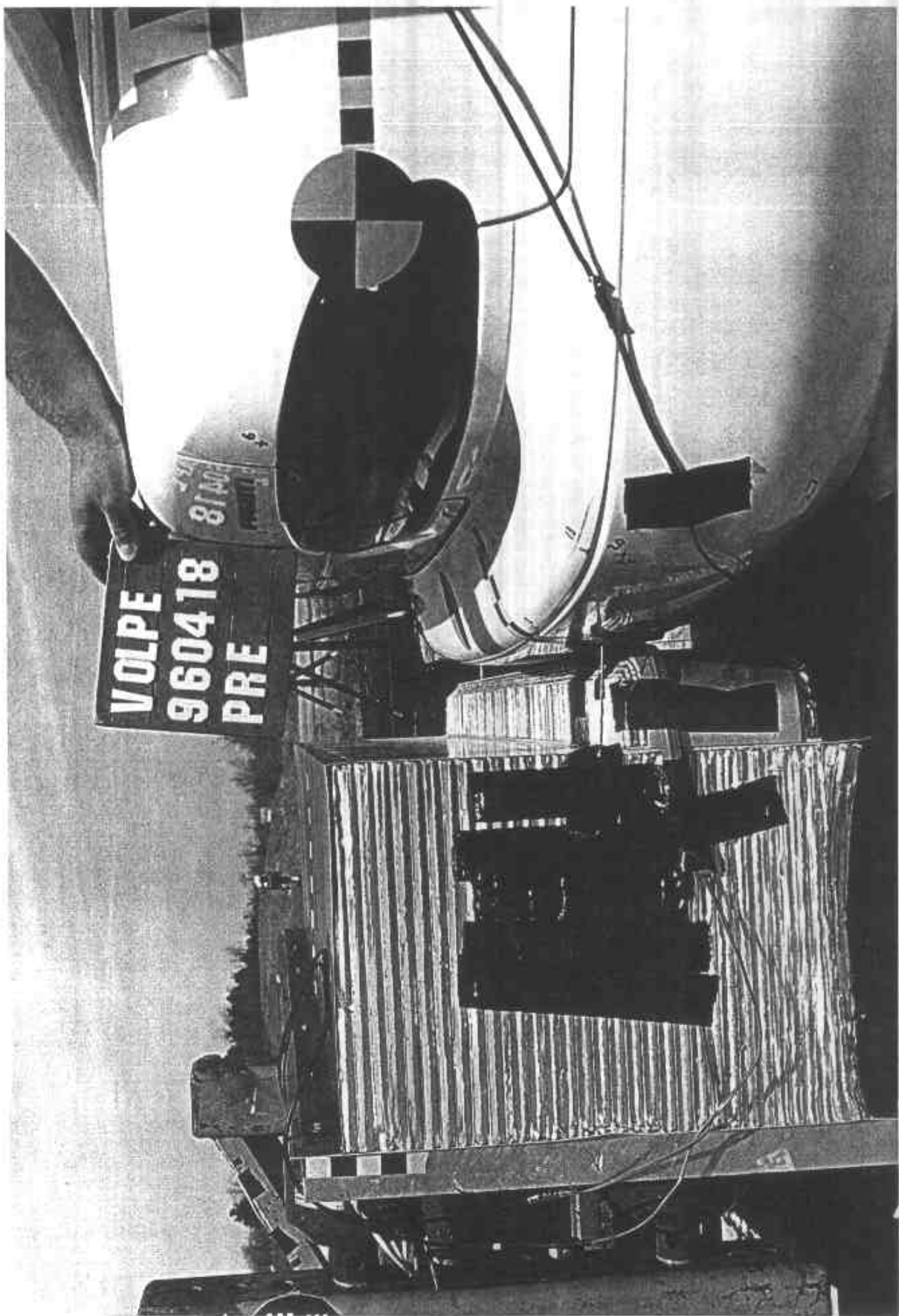


Figure A-25 Pre-Test Impactor to Vehicle Alignment View - Right

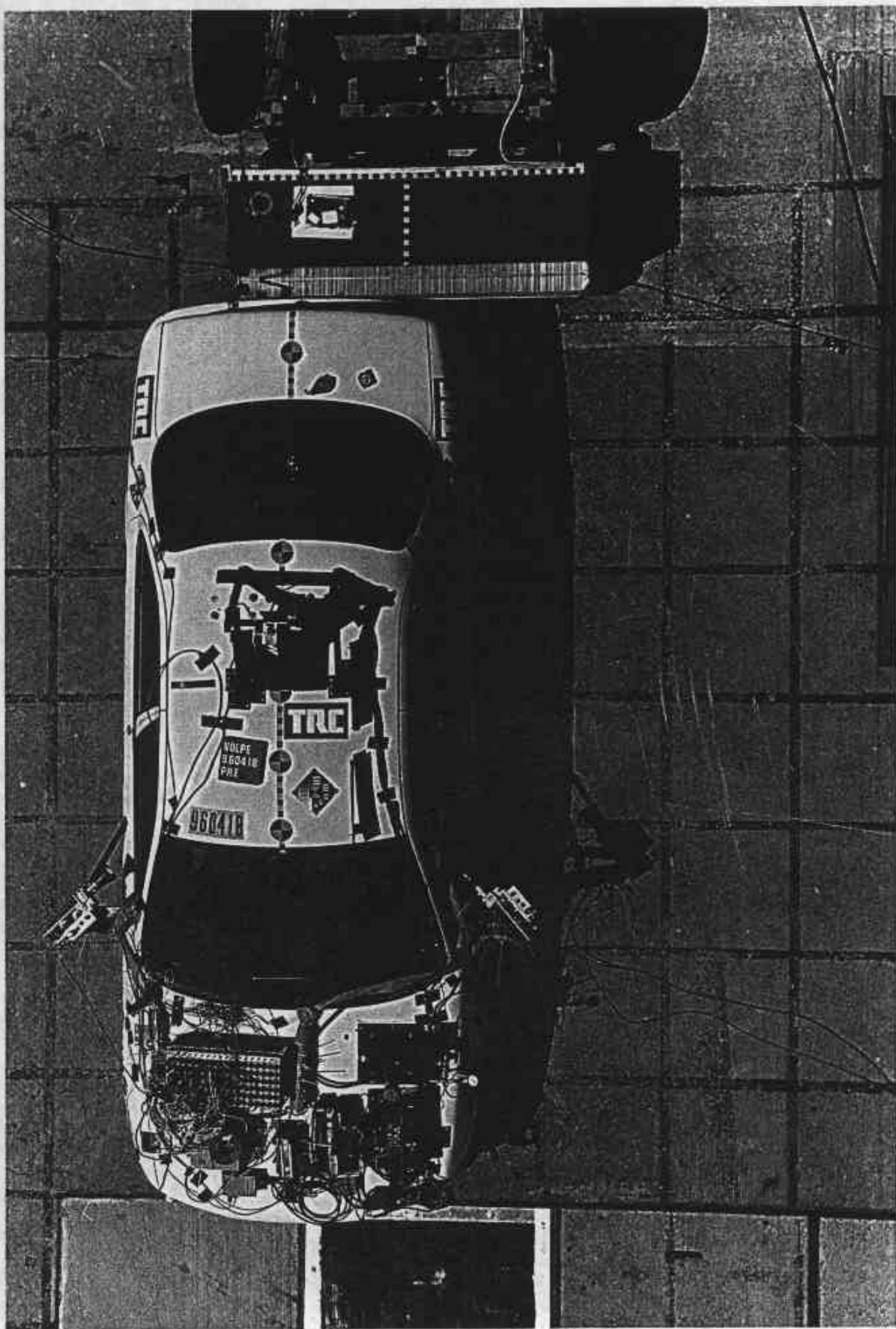


Figure A-26 Pre-Test Impactor to Vehicle Alignment View - Overhead

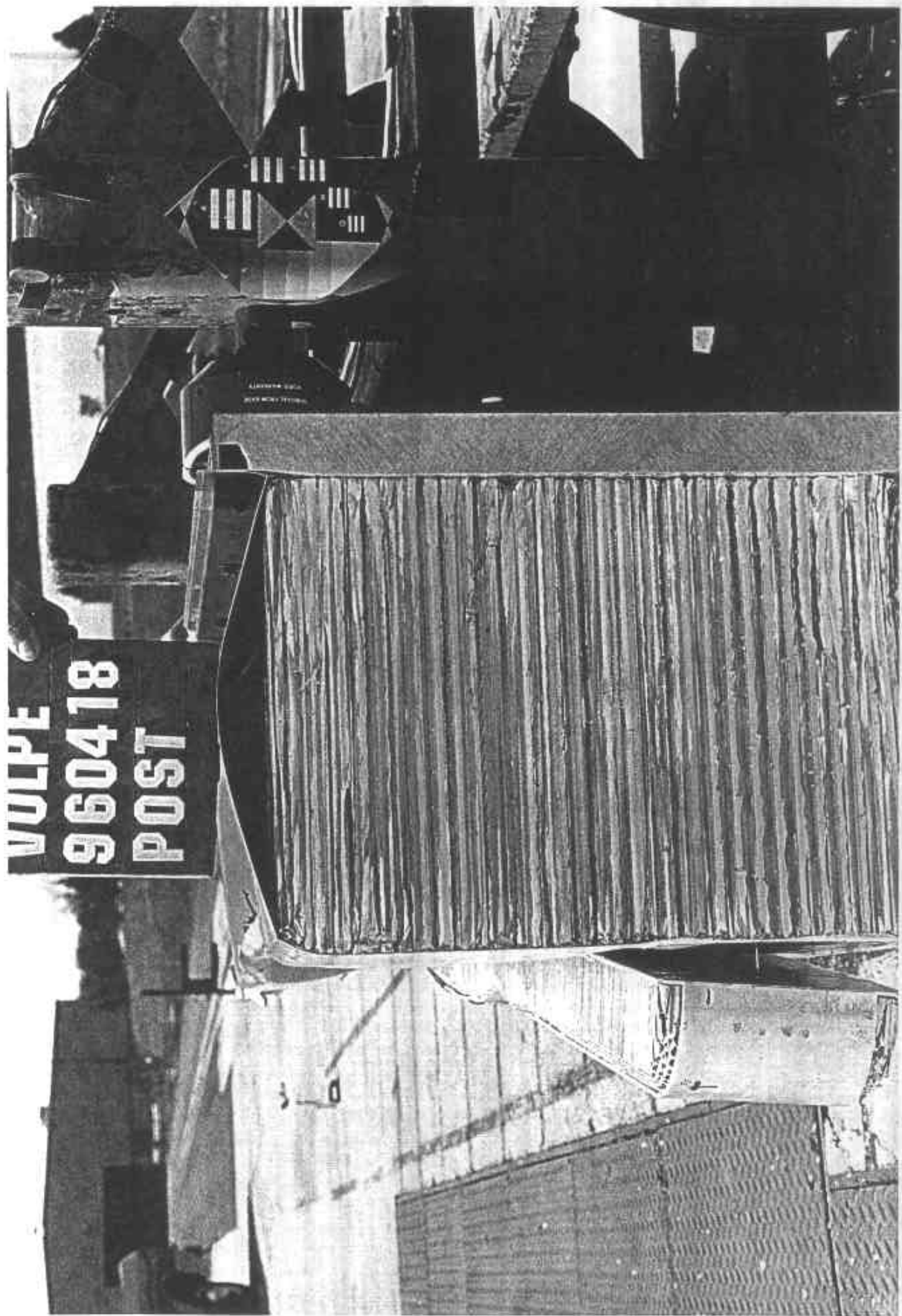


Figure A-27 Post-Test Impactor Face Left Side View

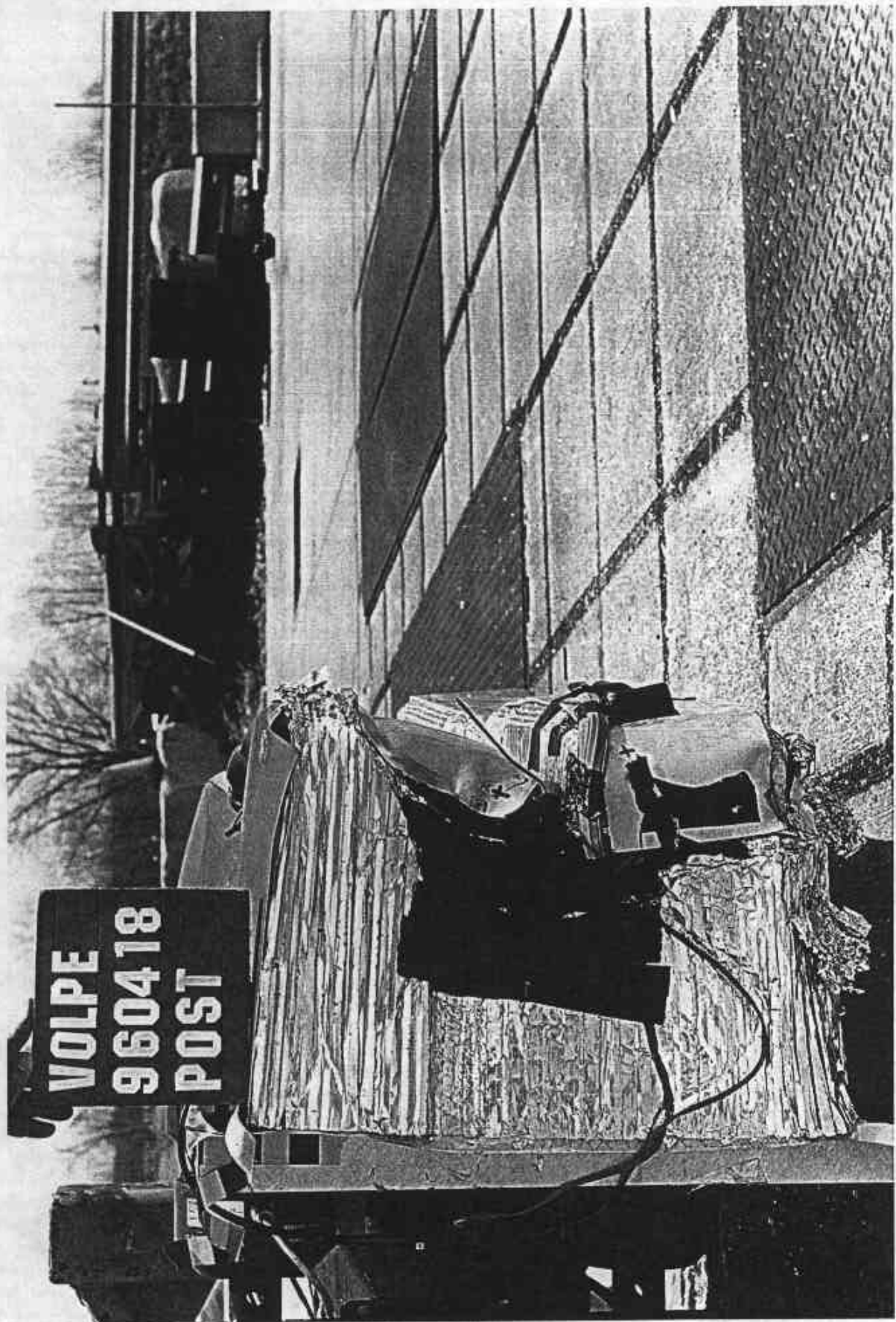


Figure A-28 Post-Test Impactor Face Right Side View

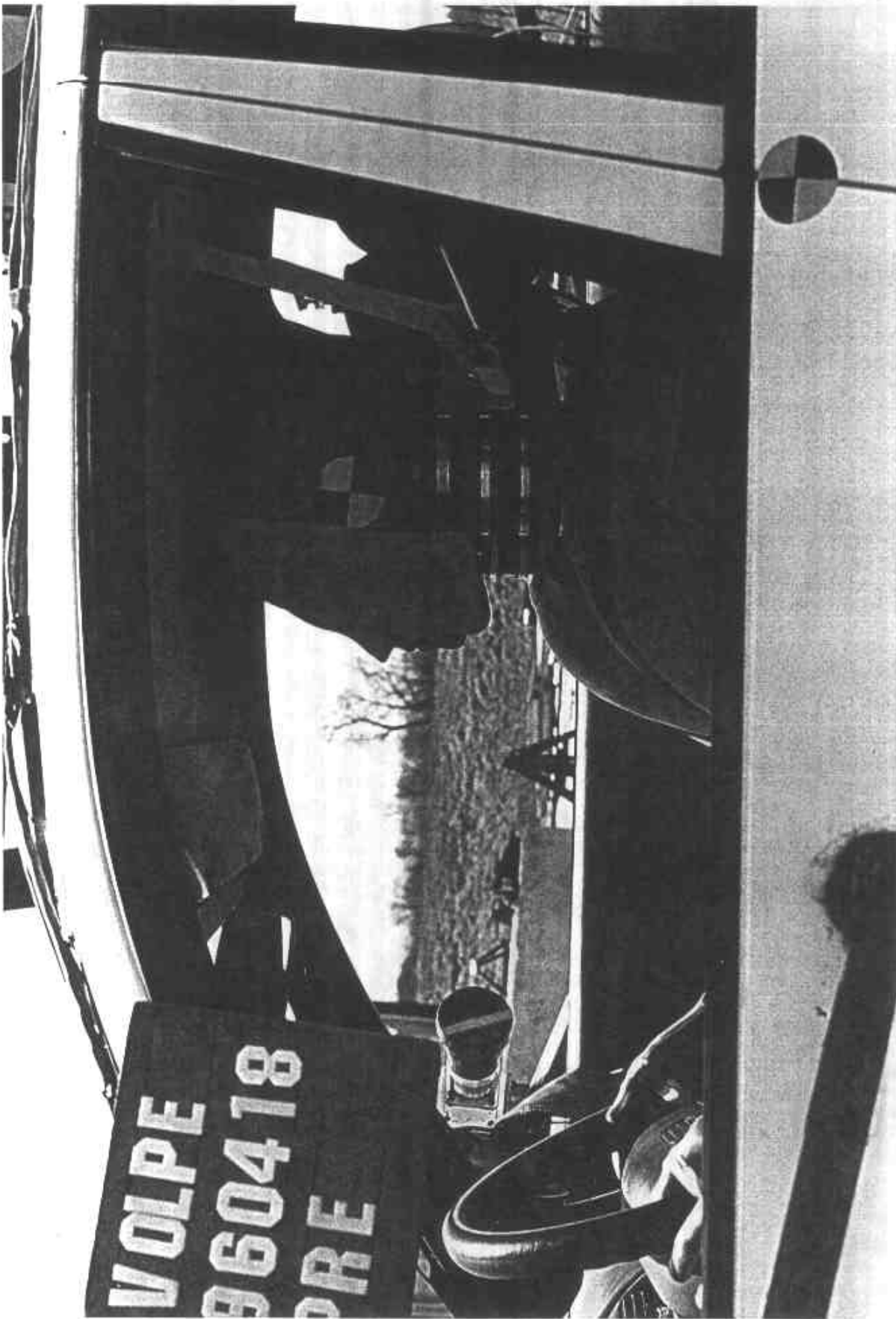


Figure A-29 Pre-Test Driver Dummy Position View

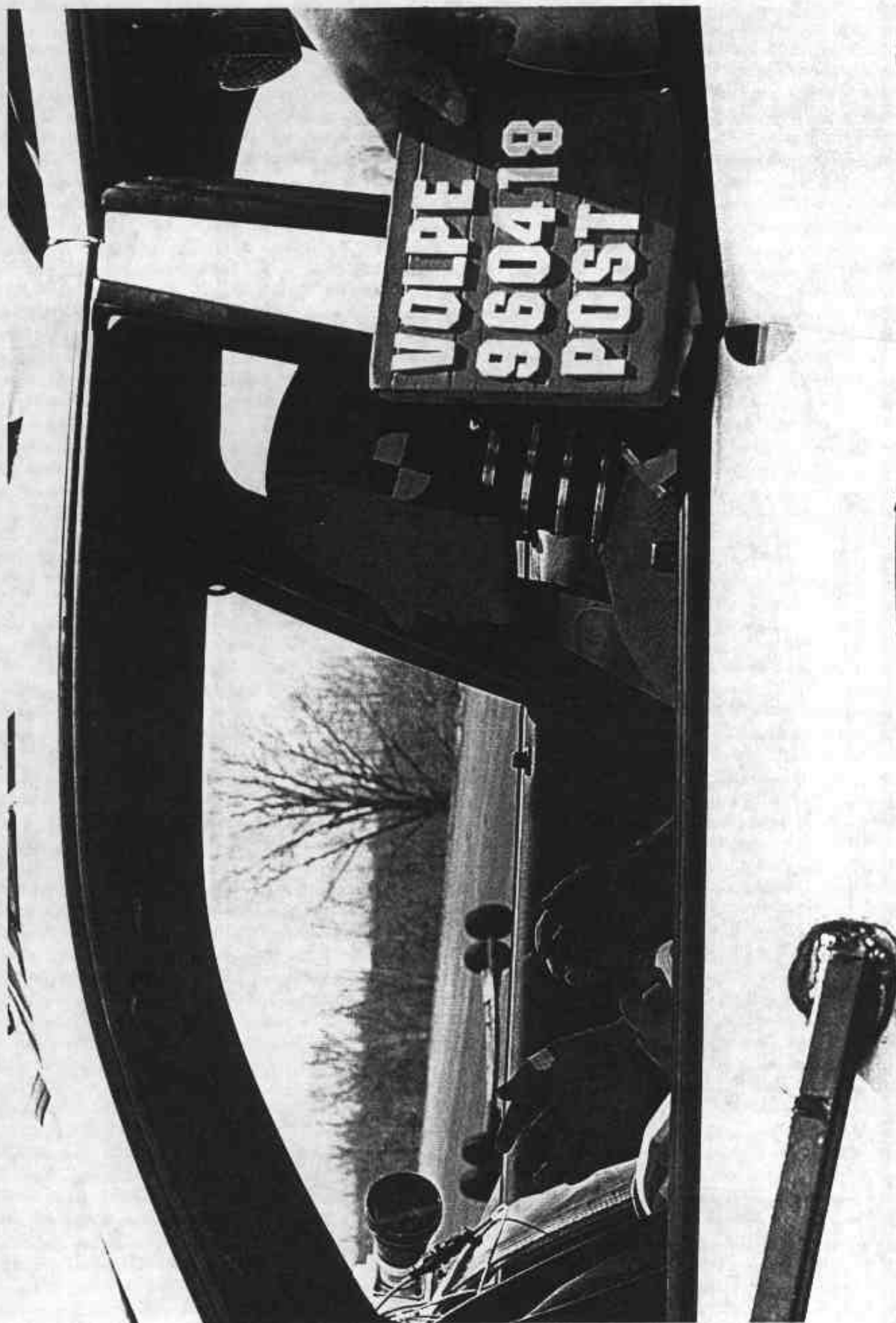


Figure A-30 Post-Test Driver Dummy Position View



Figure A-31 Pre-Test Passenger Dummy Position View



Figure A-32 Post-Test Passenger Dummy Position View



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

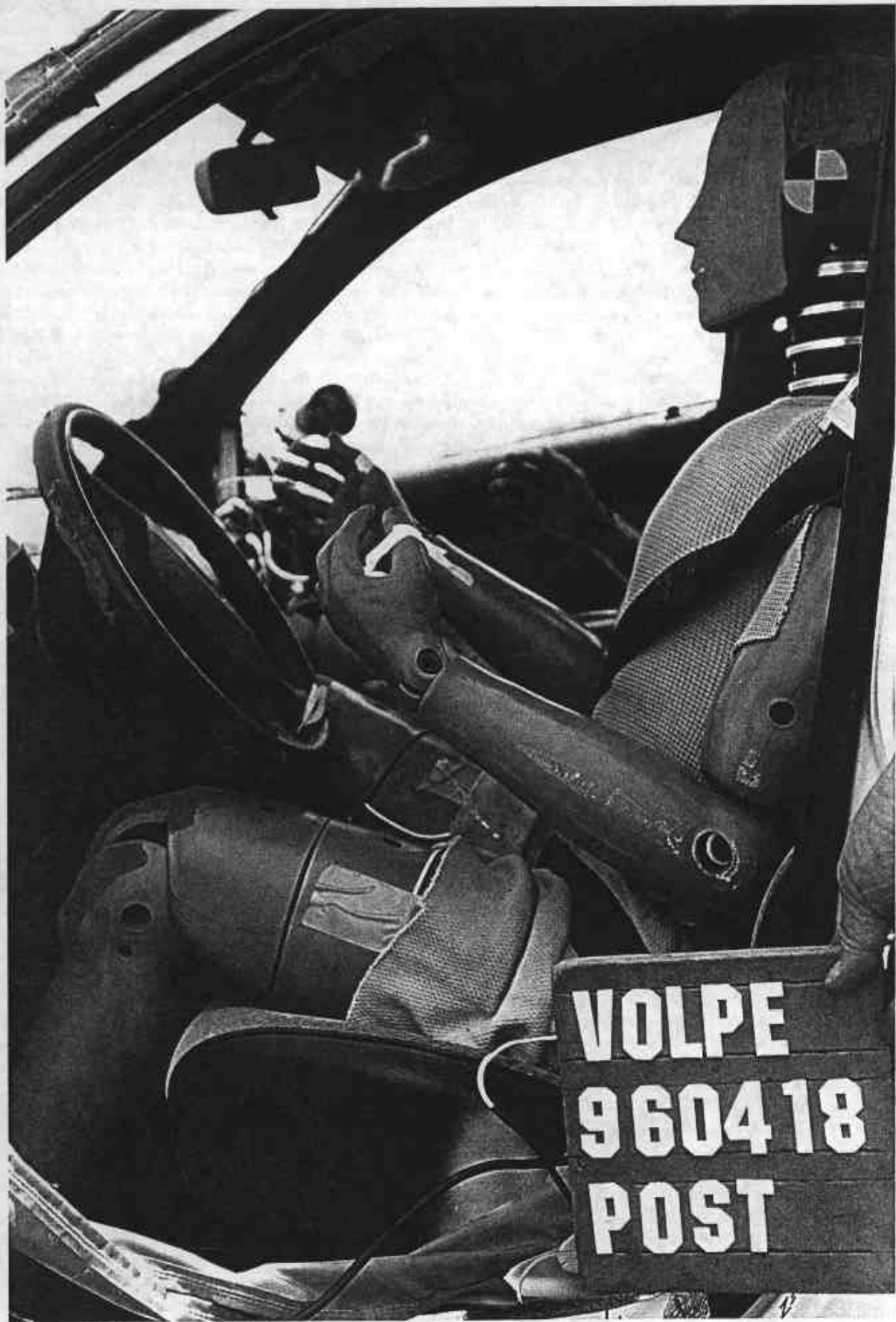


Figure A-34 Post-Test Driver Dummy & Vehicle Interior - View 1



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

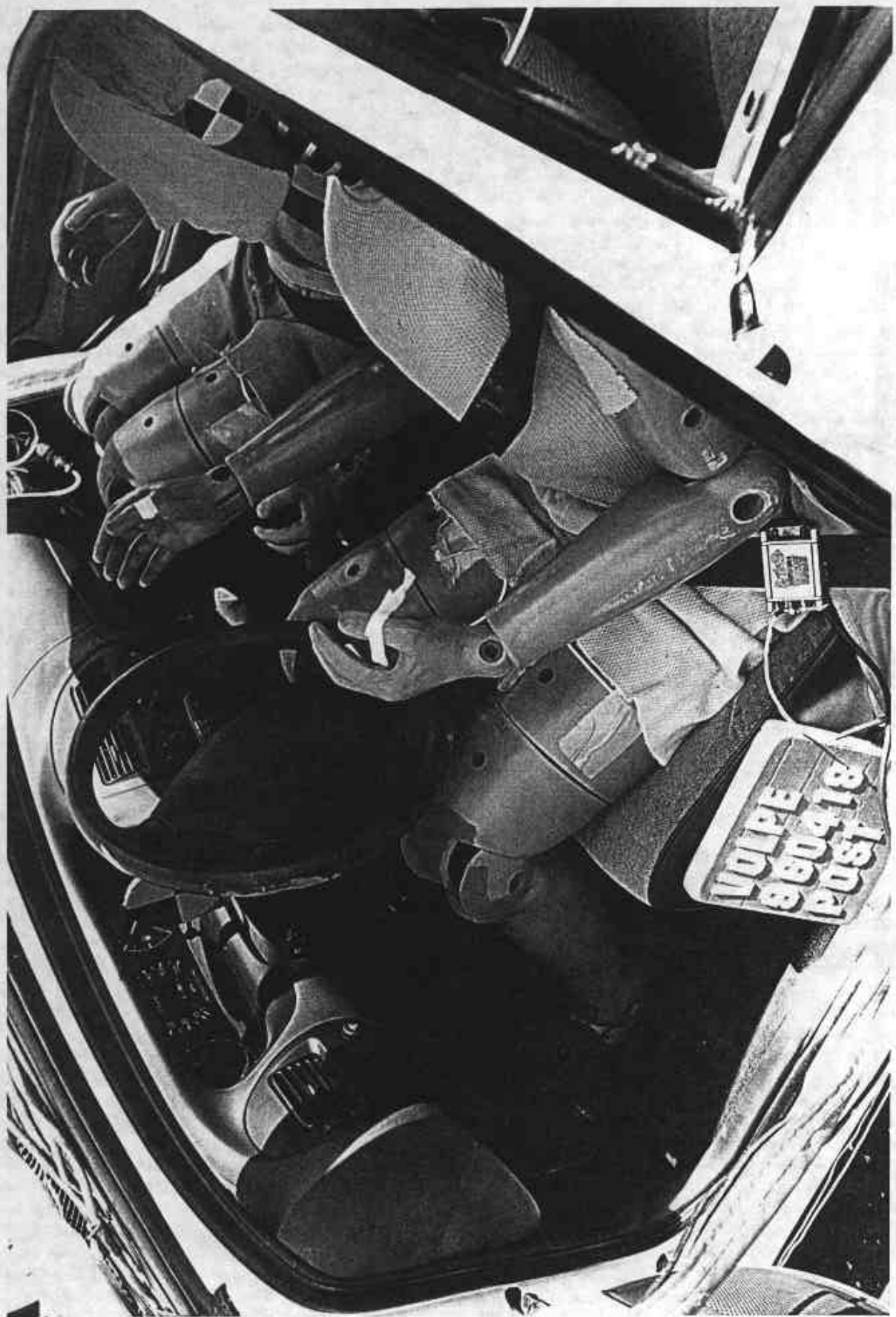


Figure A-36 Post-Test Driver Dummy & Vehicle Interior - View 2



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



Figure A-38 Post-Test Passenger Dummy & Vehicle Interior - View 1



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



Figure A-40 Post-Test Passenger Dummy & Vehicle Interior - View 2

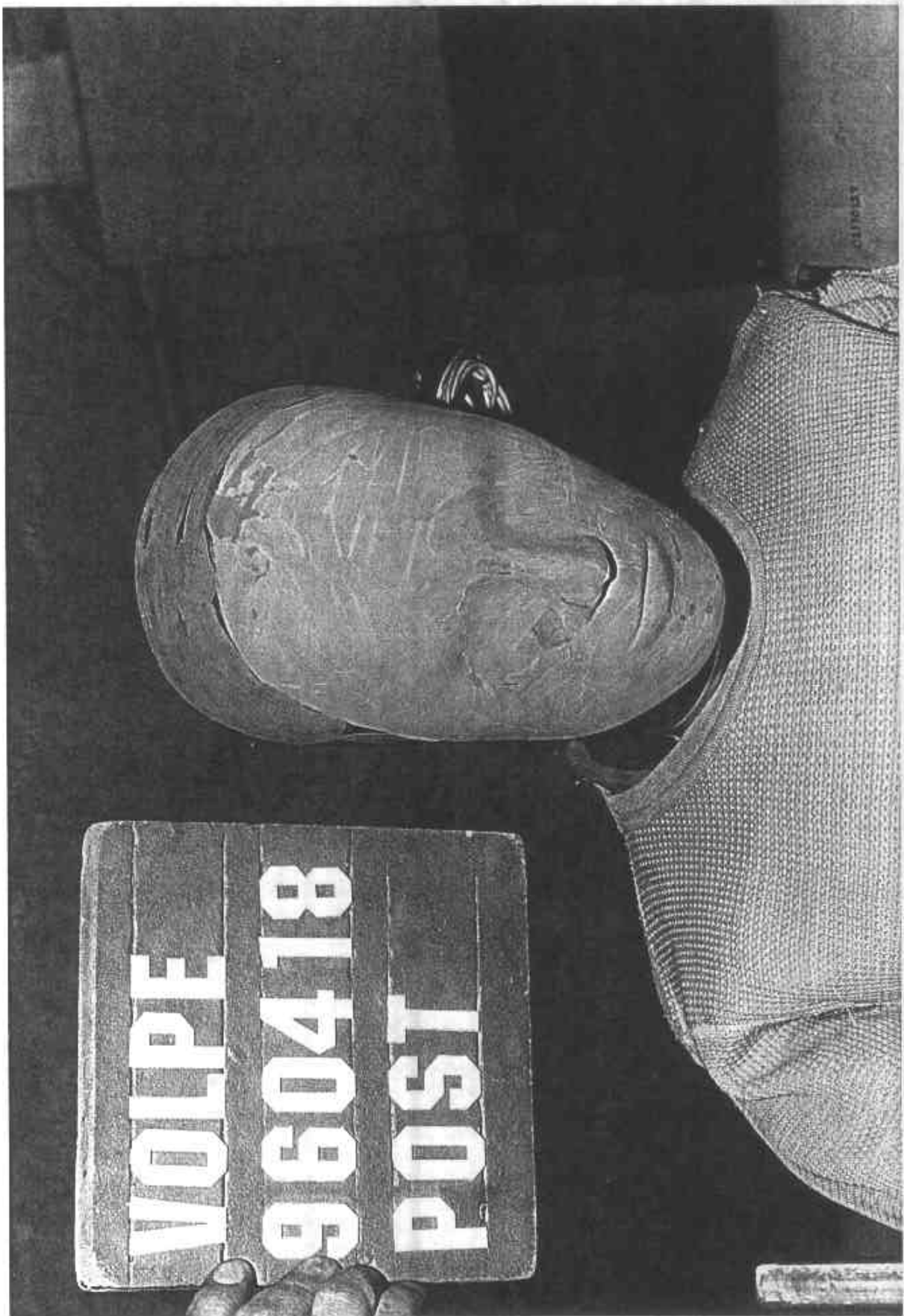


Figure A-41 Post-Test Driver Dummy Head Contact - View 1

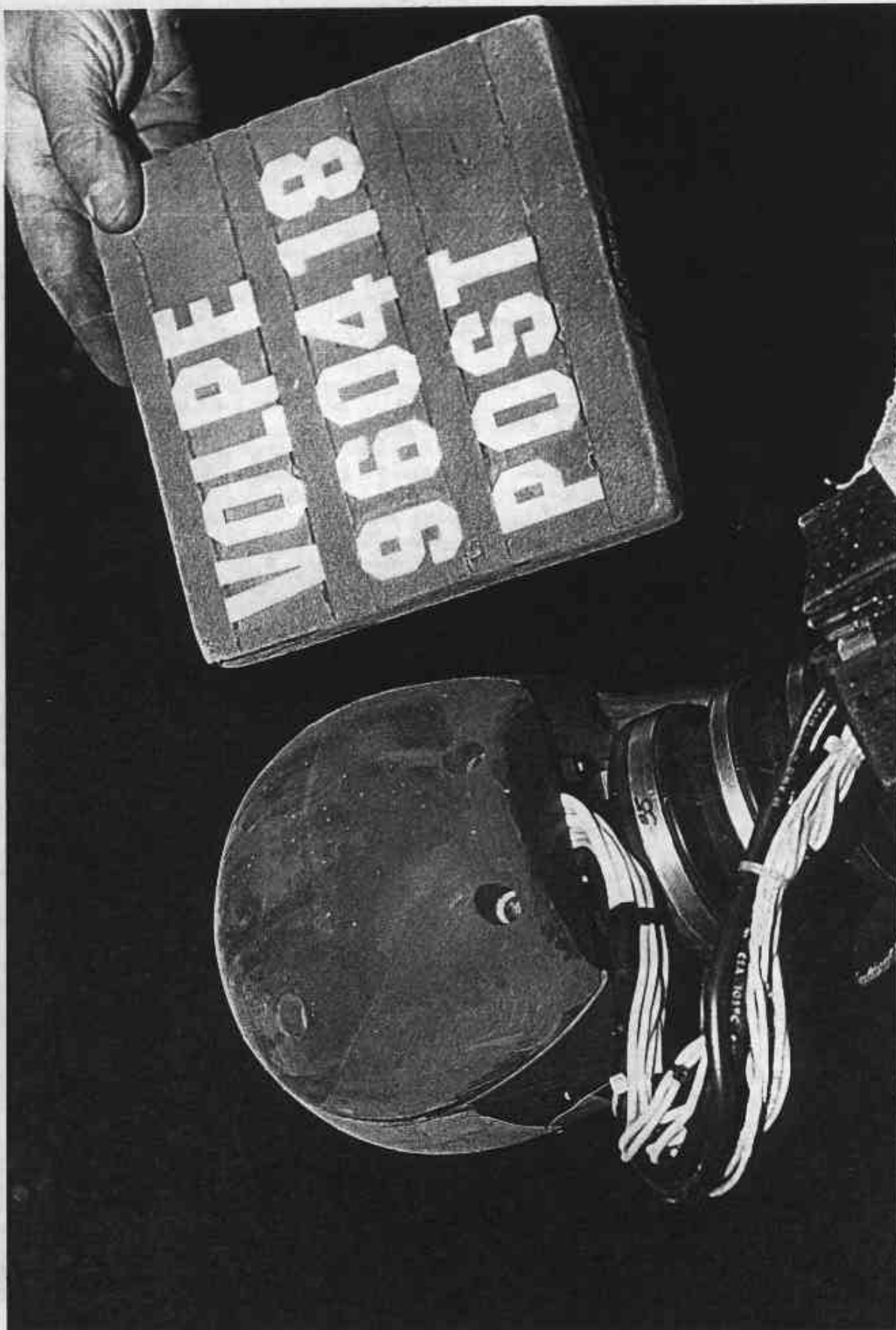


Figure A-42 Post-Test Driver Dummy Head Contact - View 2

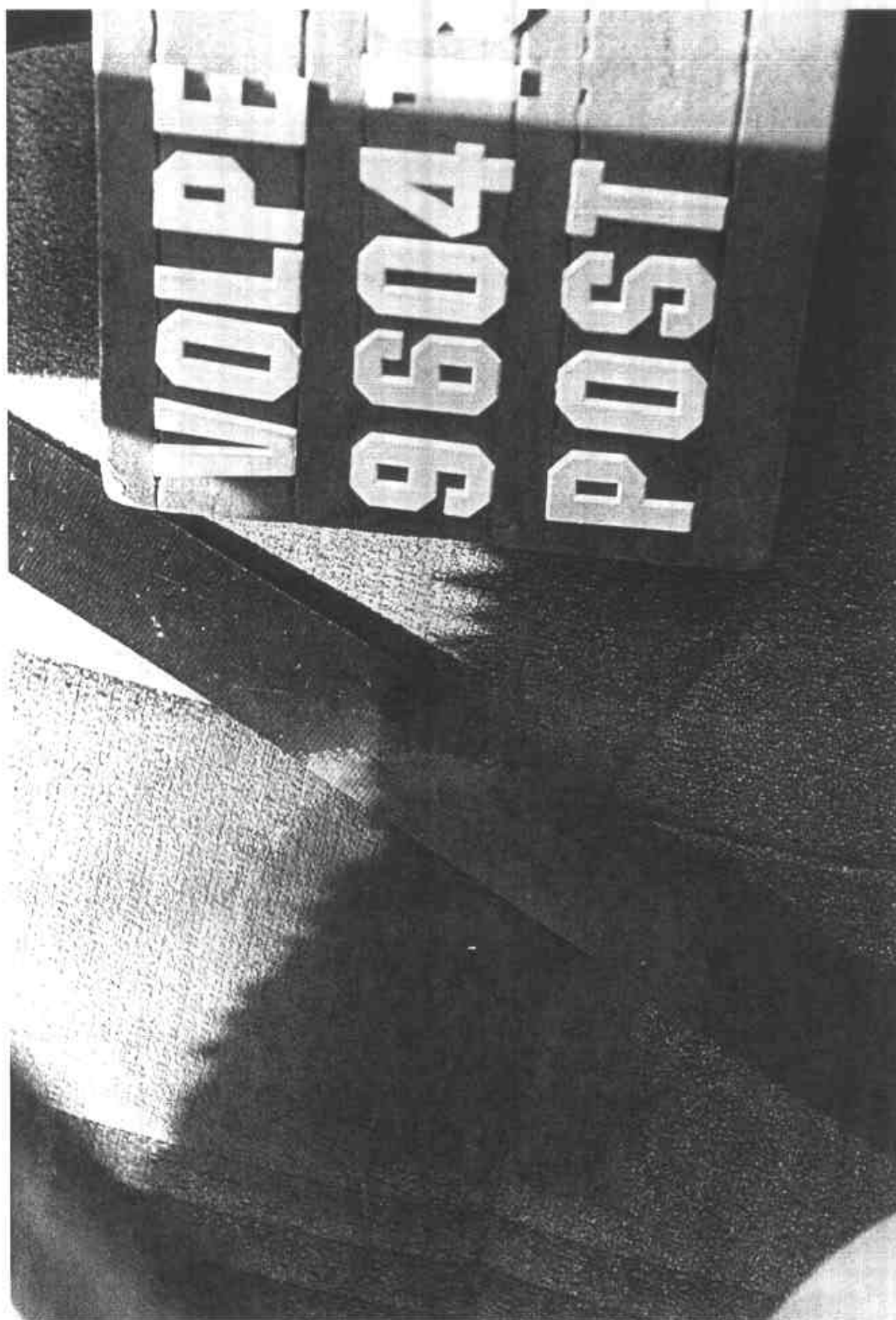


Figure A-43 Post-Test Driver Dummy Head Contact - View 3

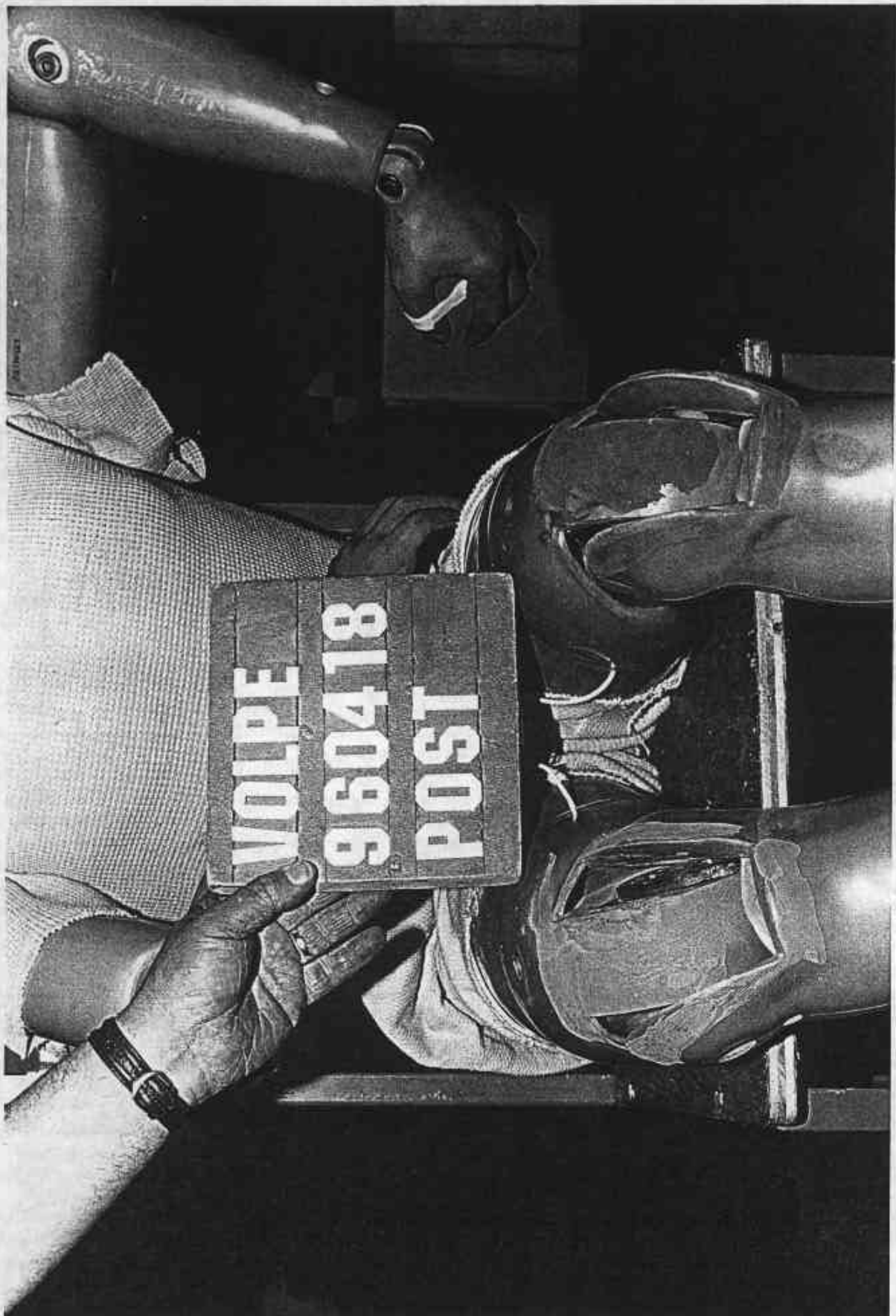


Figure A-44 Post-Test Driver Dummy Knee Contact - View 1

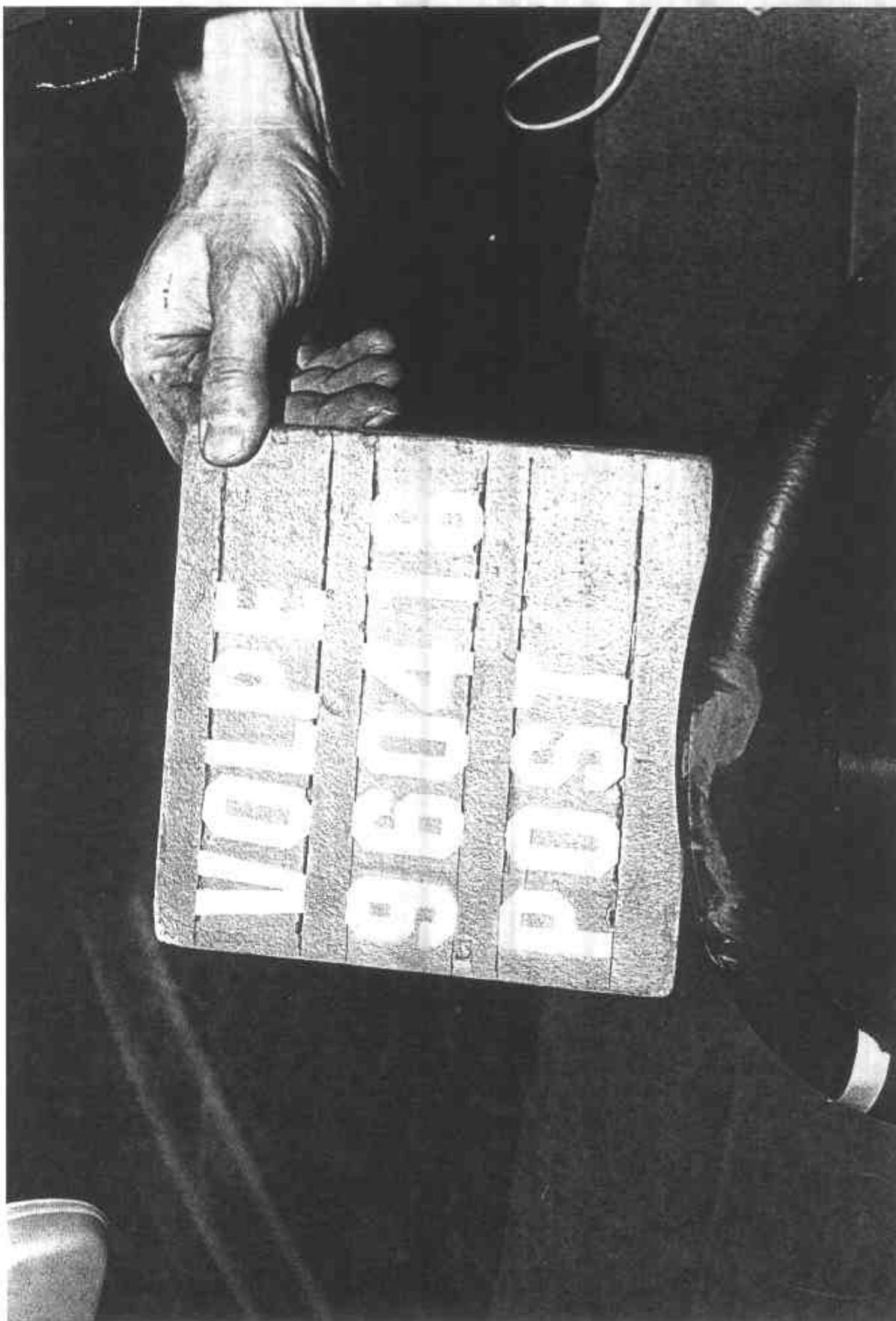


Figure A-45 Post-Test Driver Dummy Knee Contact - View 2

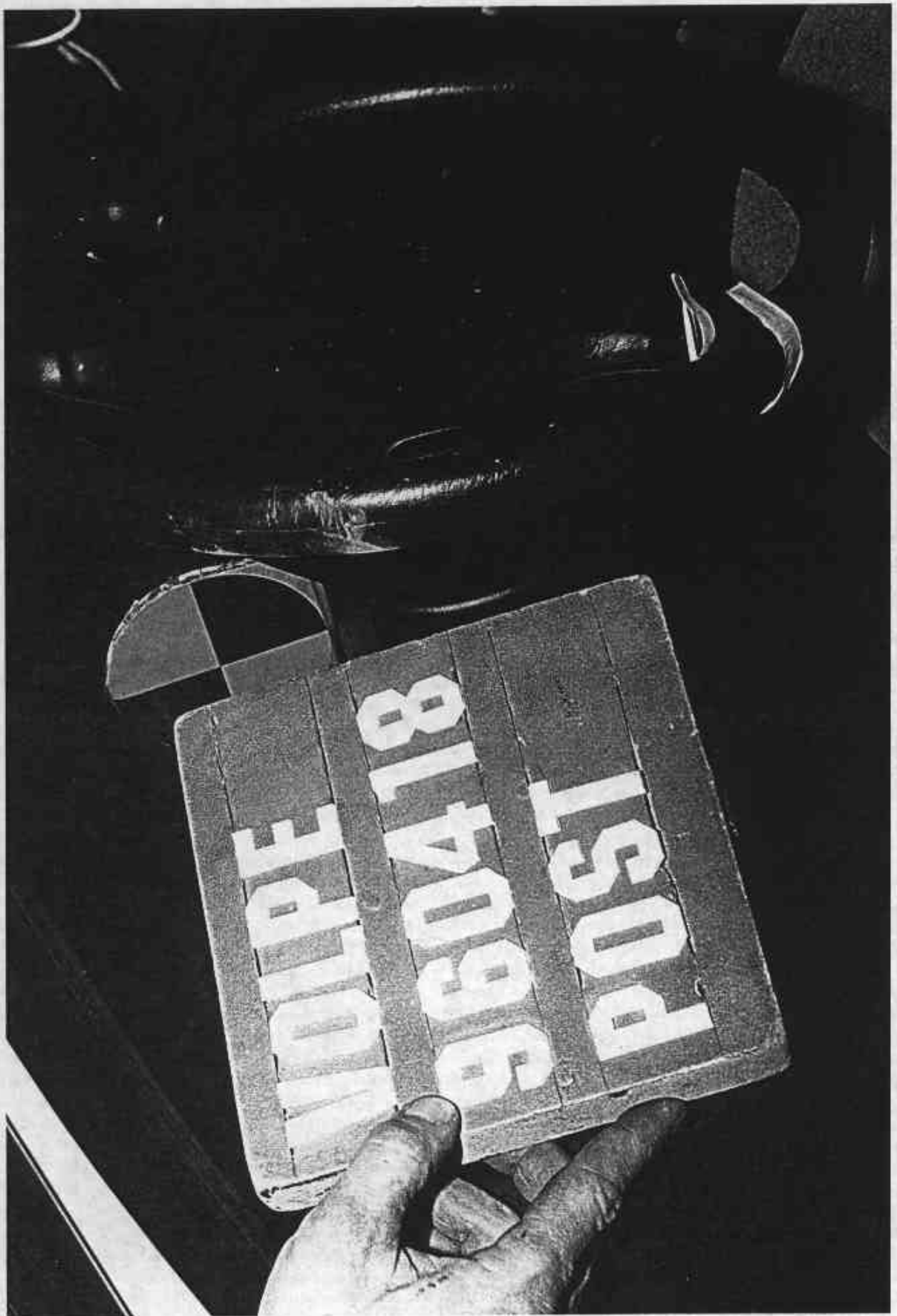


Figure A-46 Post-Test Driver Dummy Knee Contact - View 3

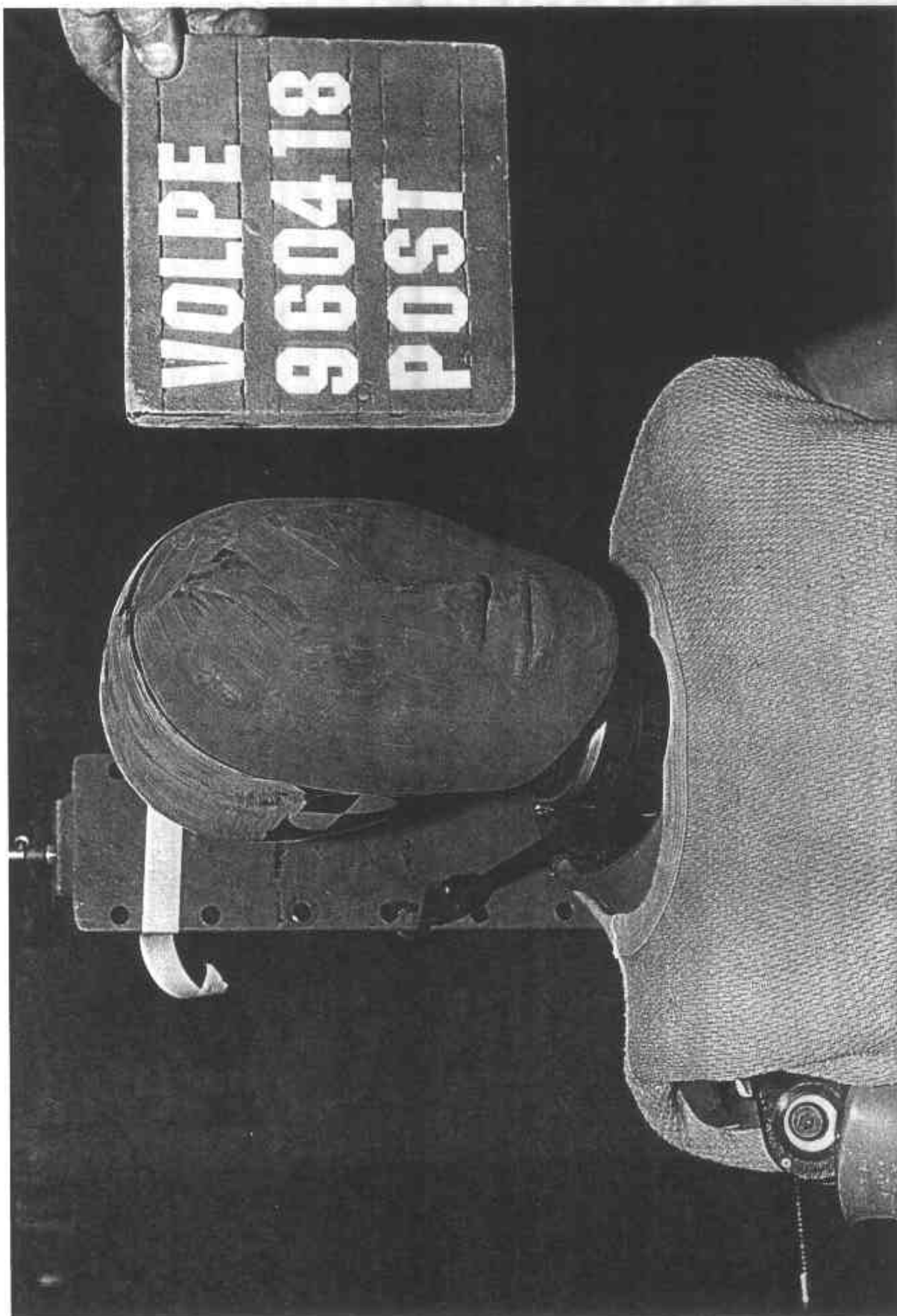


Figure A-47 Post-Test Passenger Dummy Head Contact - View 1

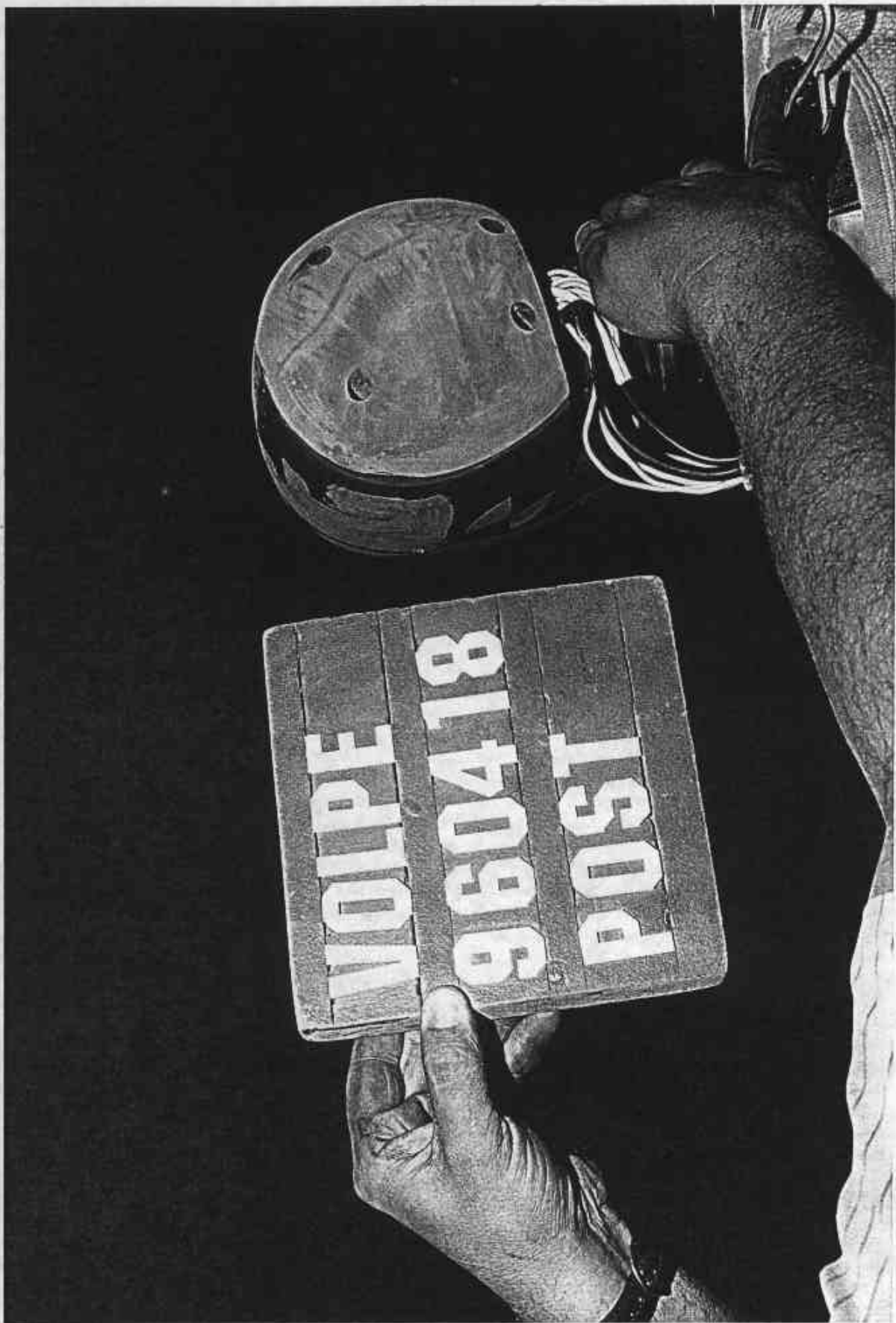


Figure A-48 Post-Test Passenger Dummy Head Contact - View 2

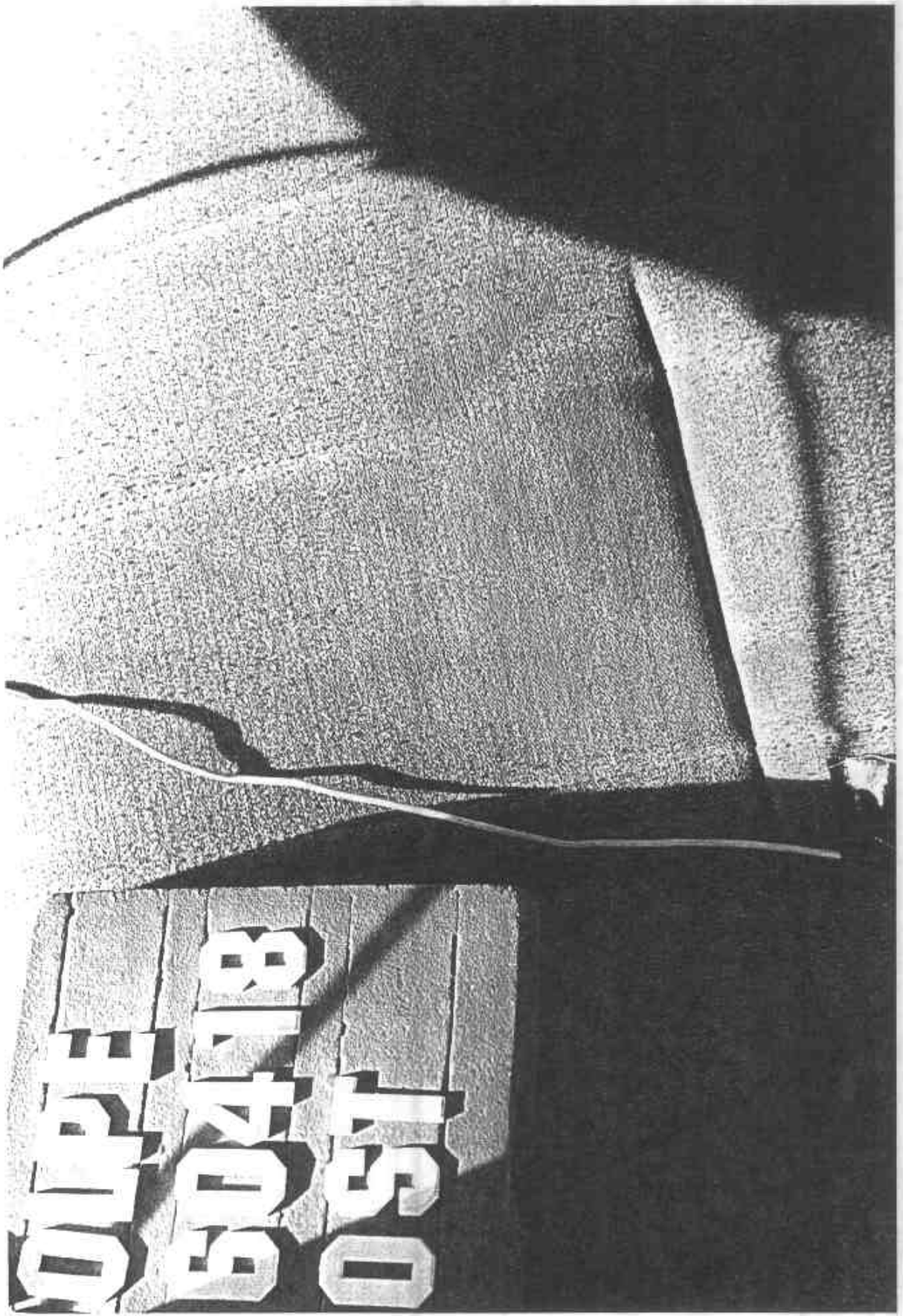


Figure A-49 Post-Test Passenger Dummy Head Contact - View 3



Figure A-50 Post-Test Passenger Dummy Knee Contact View

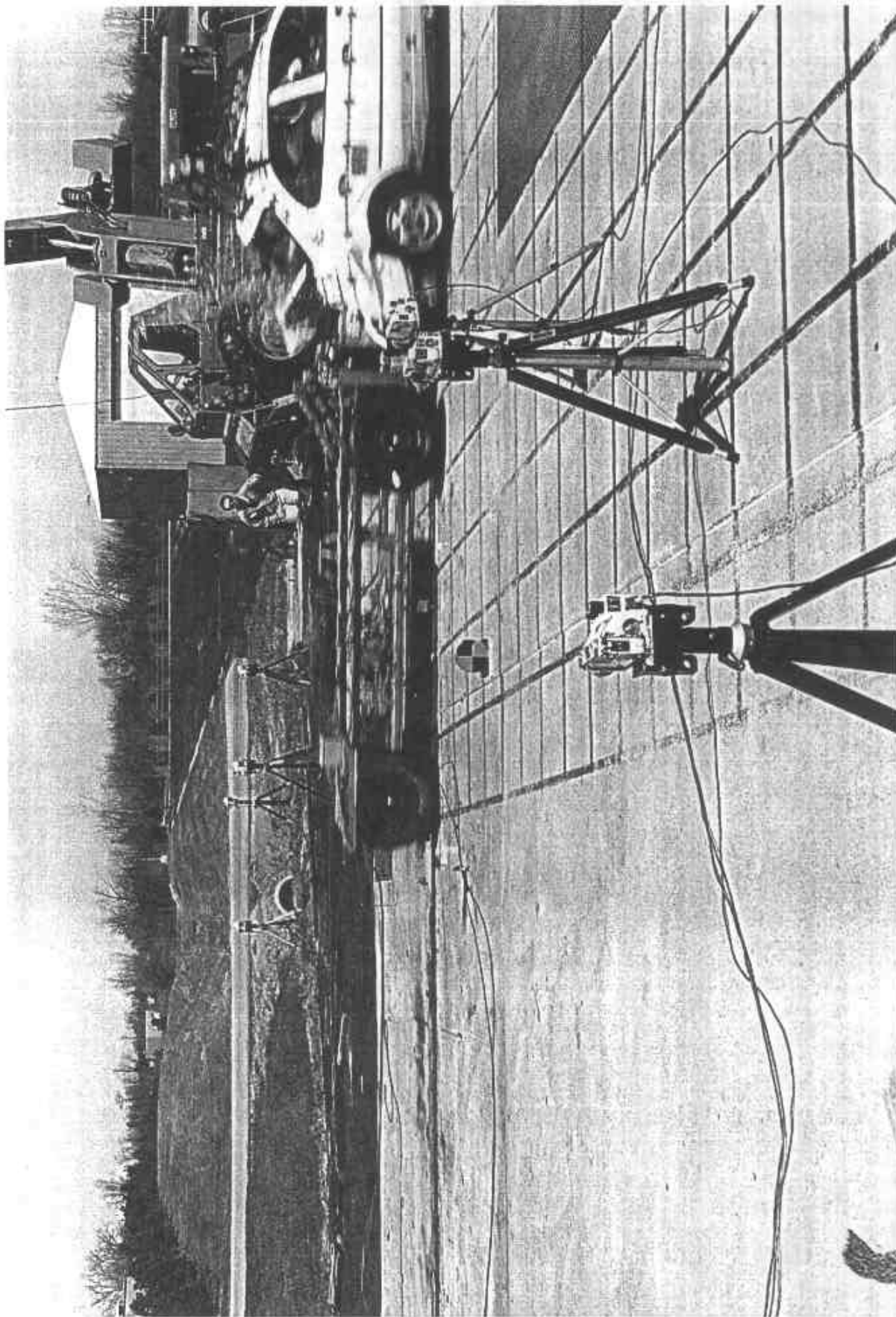


Figure A-51 Impact Event

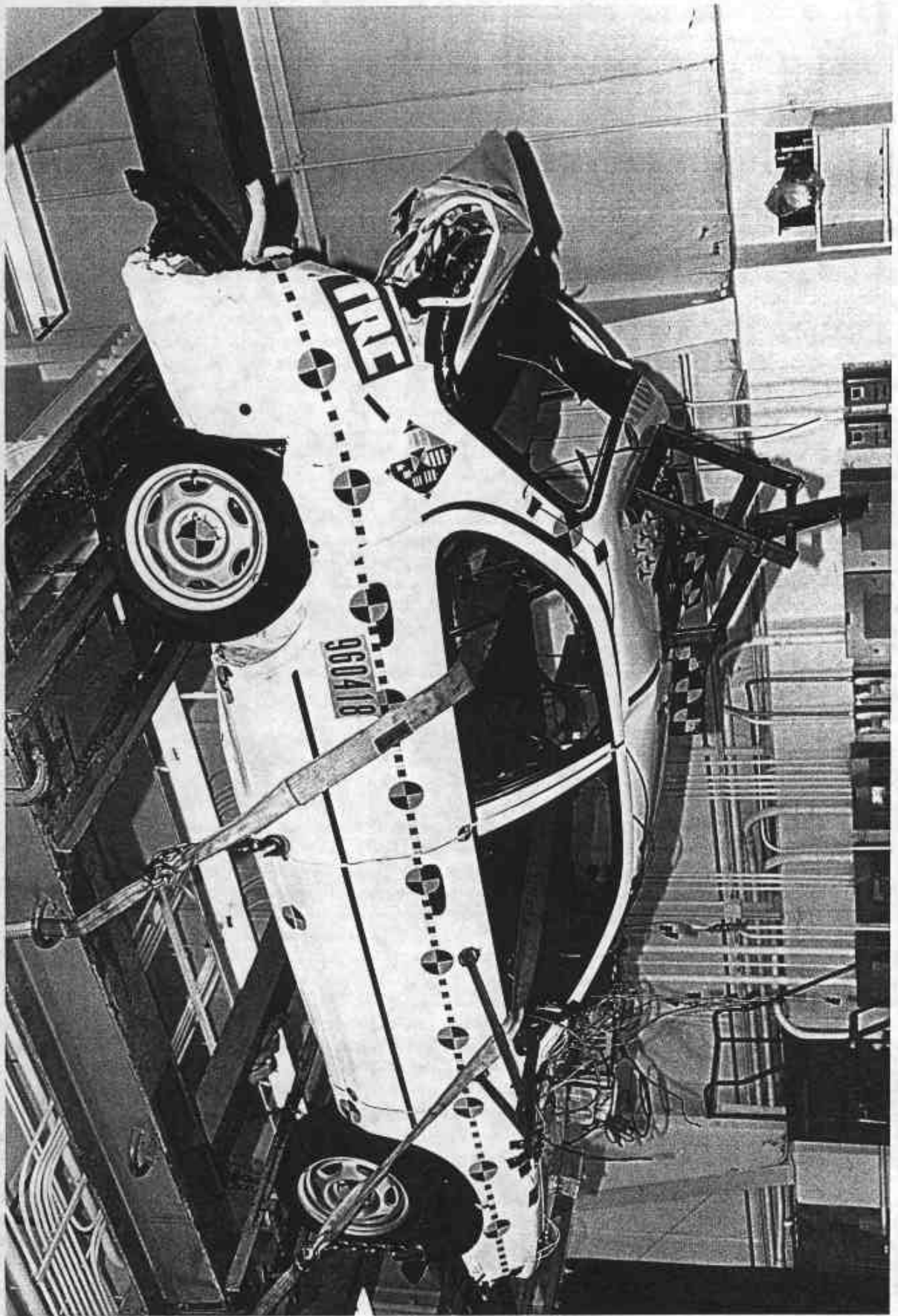


Figure A-52 Post-Test Vehicle on Static Rollover Device

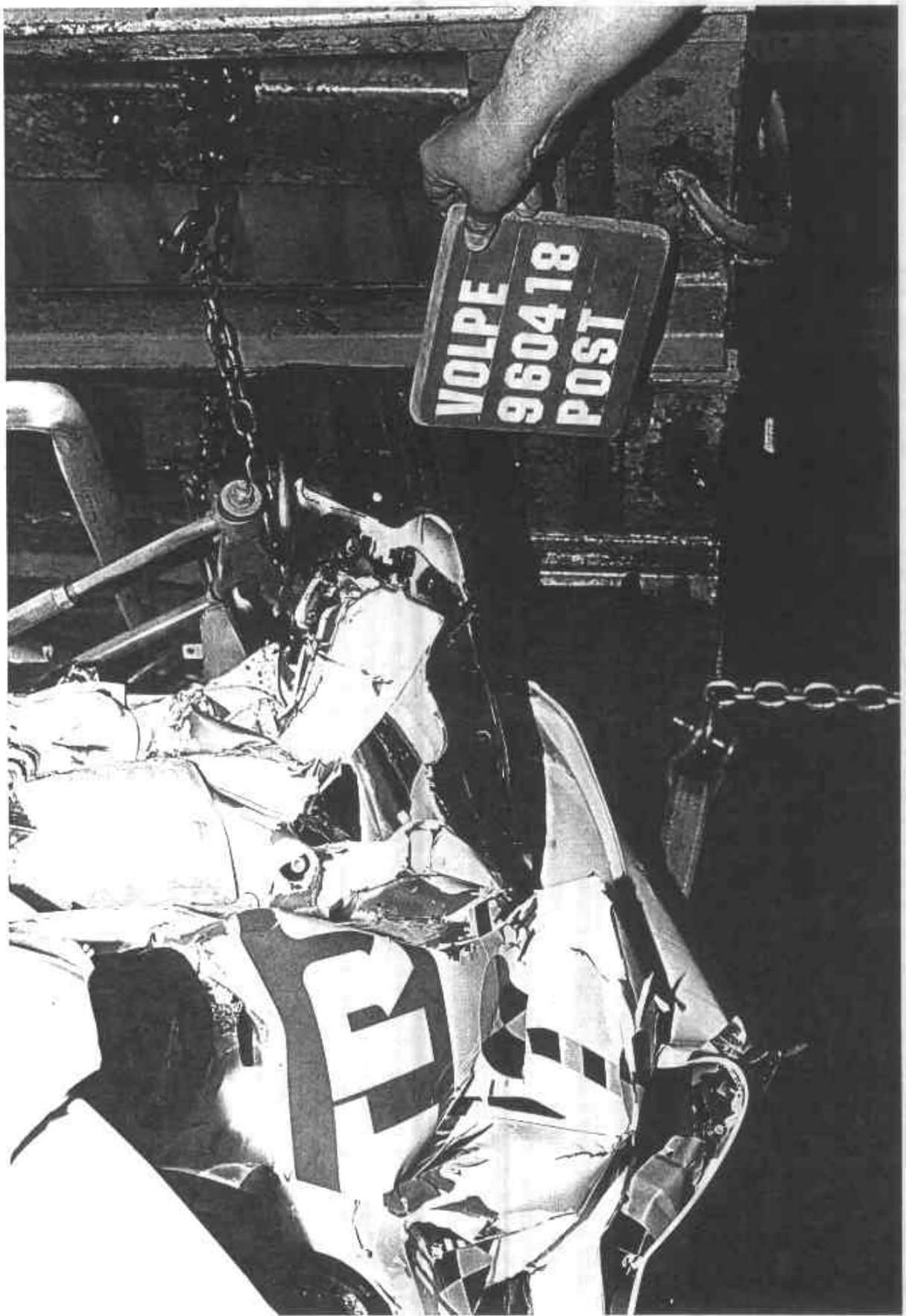


Figure A-53 Post-Test Fuel System Leakage - View 1

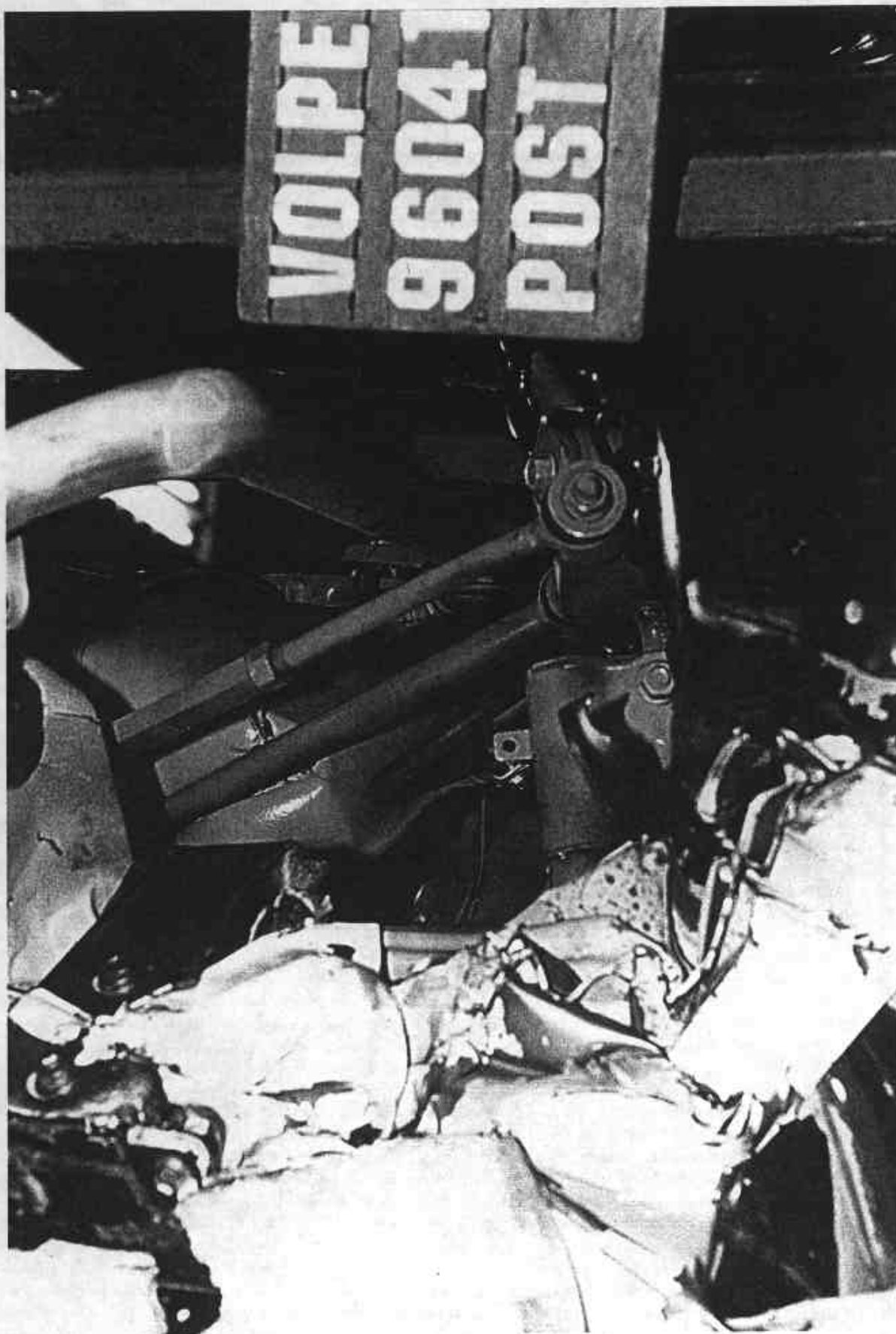


Figure A-54 Post-Test Fuel System Leakage - View 2

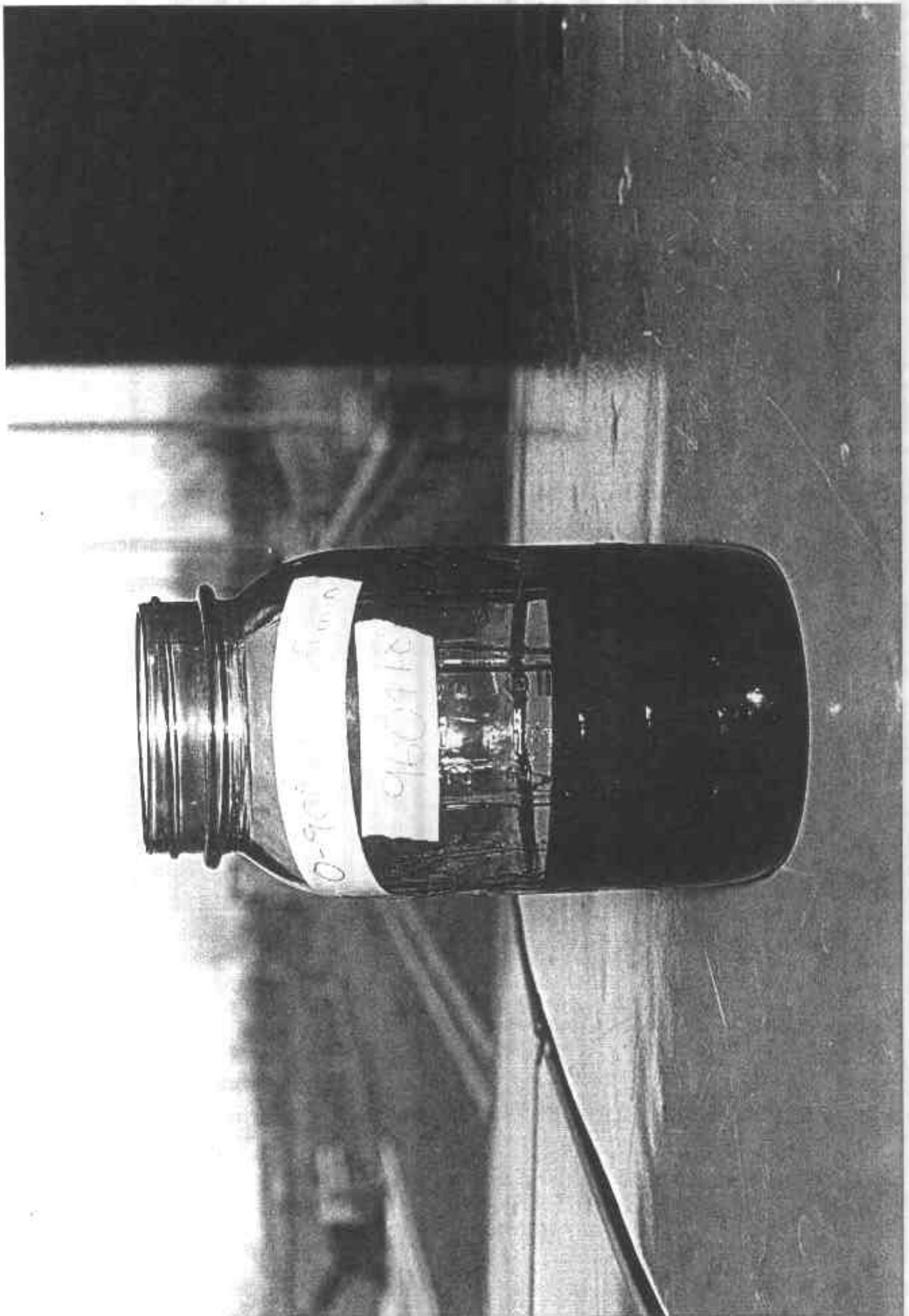


Figure A-55 Static Rollover Fuel System Leakage 0° - 90° First Five Minutes



Figure A-56 Static Rollover Fuel System Leakage 0° - 90° Sixth Minute



Figure A-57 Static Rollover Fuel System Leakage 0° - 90° Seventh Minute

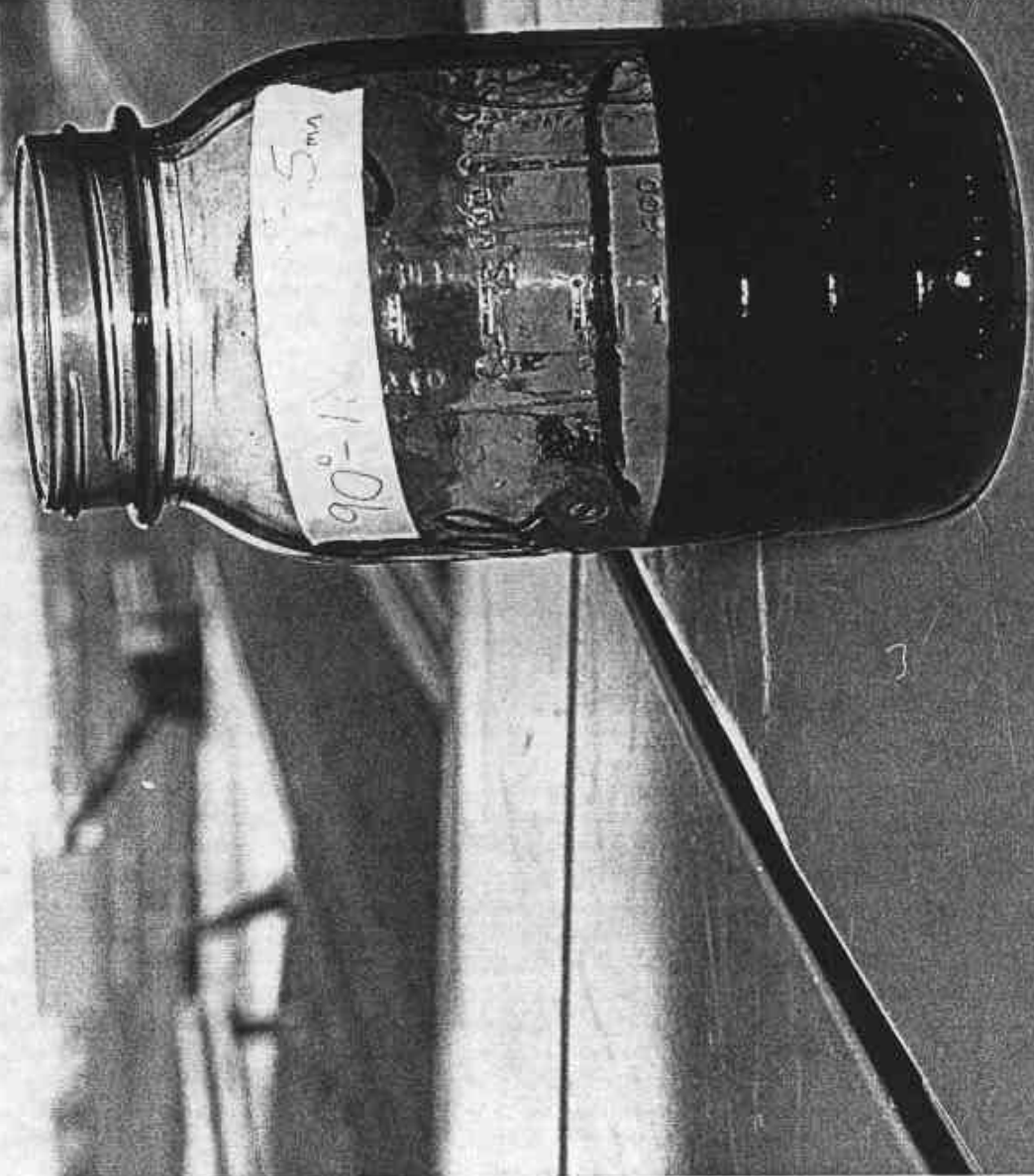


Figure A-58 Static Rollover Fuel System Leakage 90° - 180° First Five Minutes

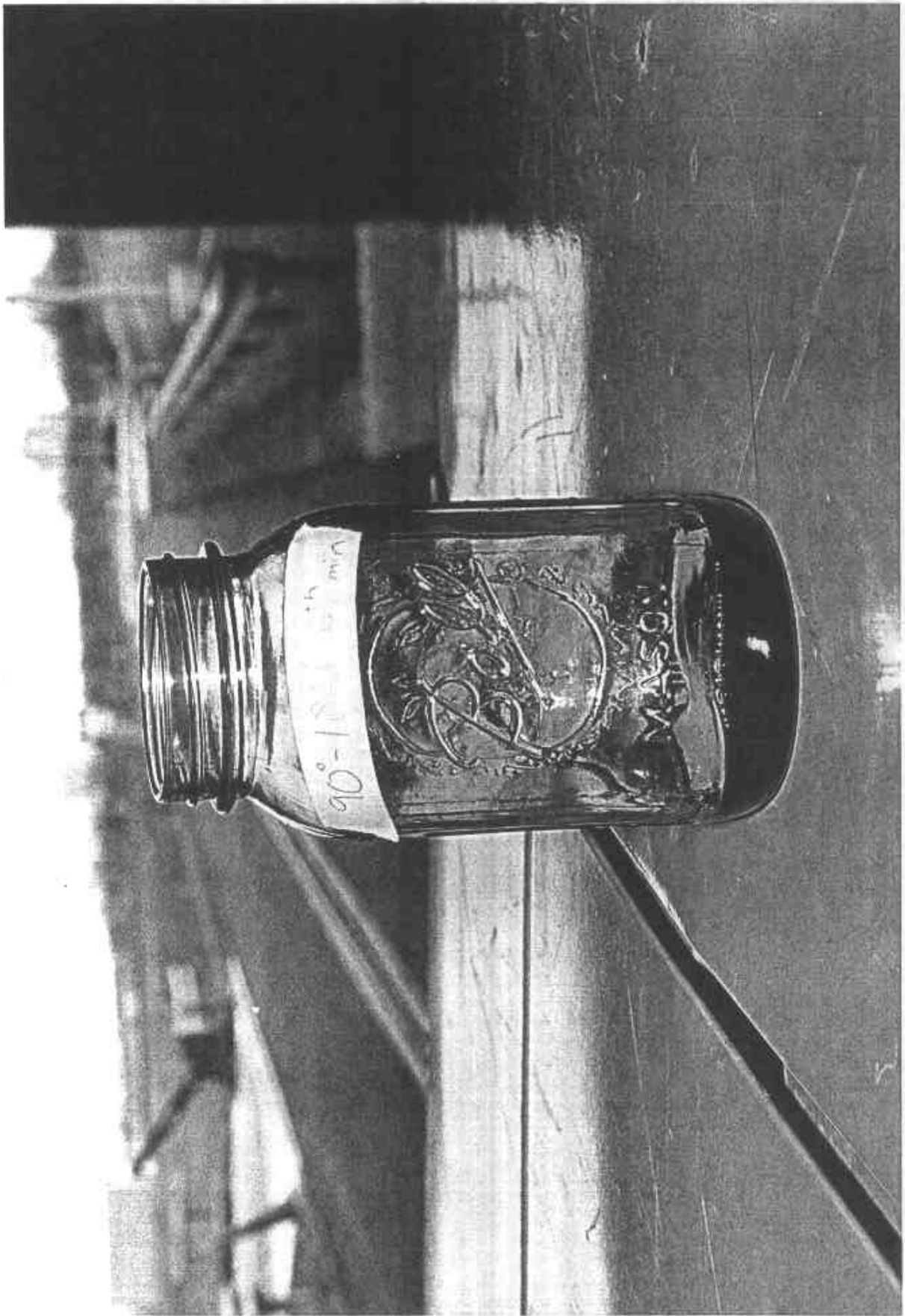


Figure A-59 Static Rollover Fuel System Leakage 90° - 180° Sixth Minute

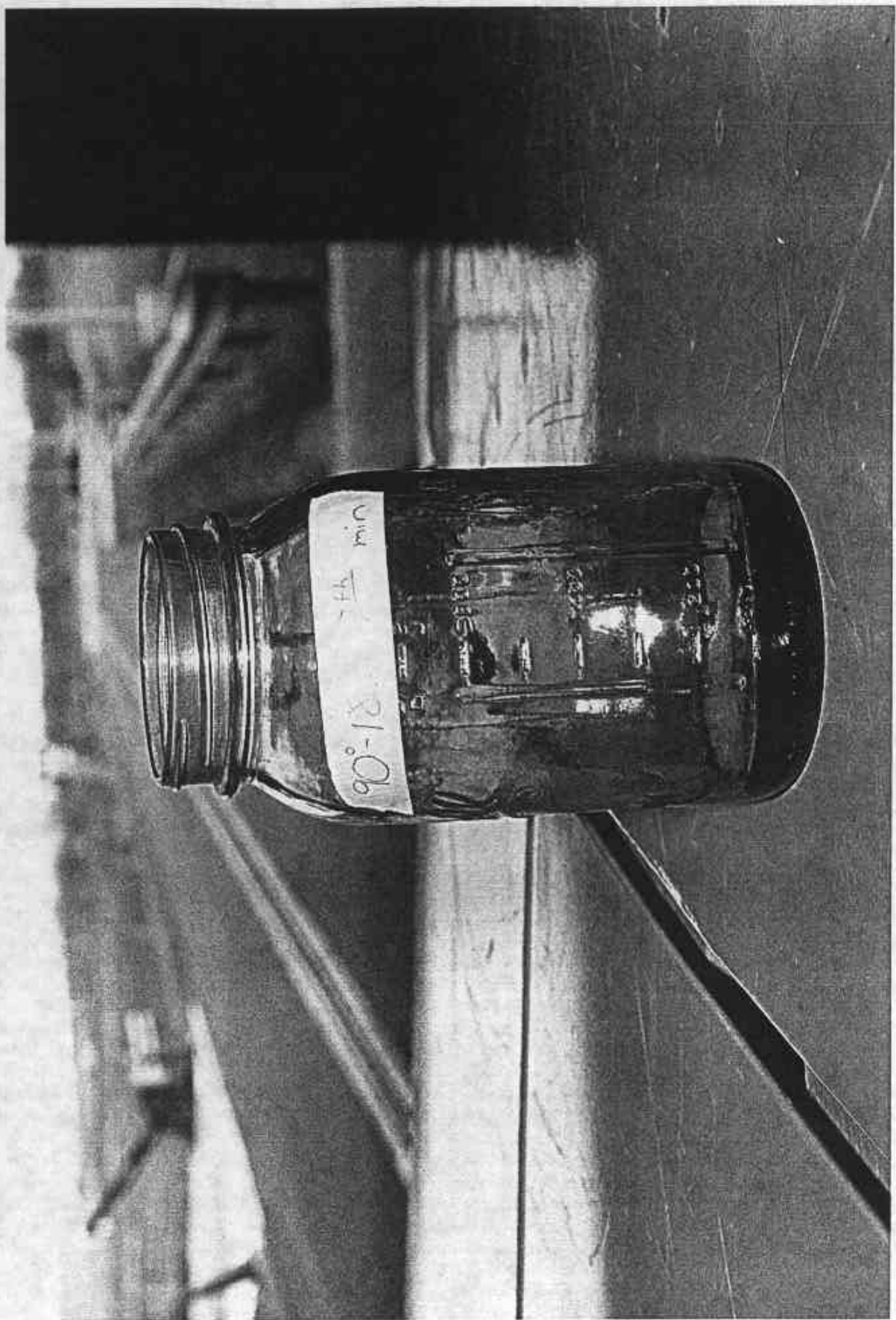


Figure A-60 Static Rollover Fuel System Leakage 90° - 180° Seventh Minute

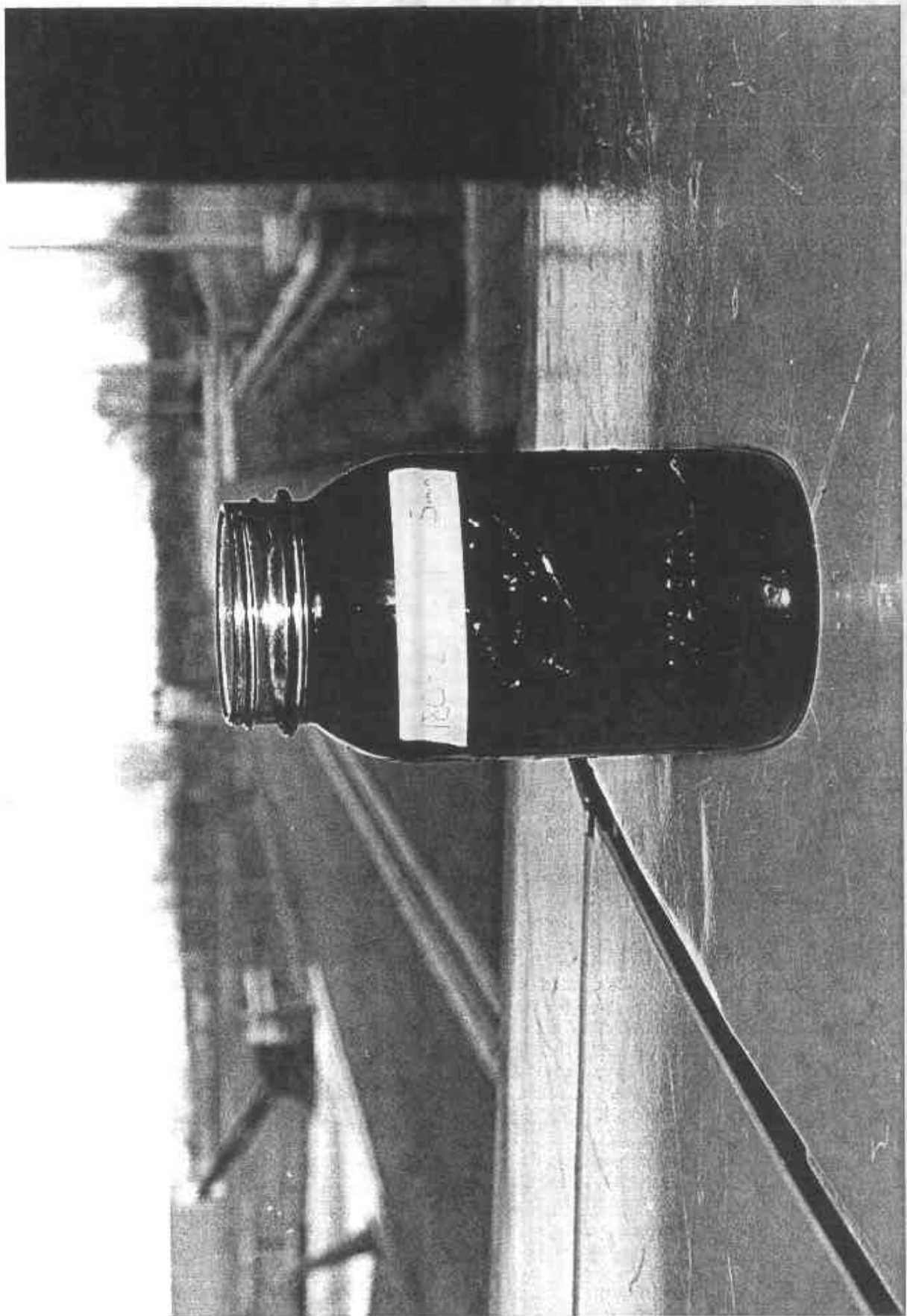


Figure A-61 Static Rollover Fuel System Leakage 180° - 270° First Five Minutes

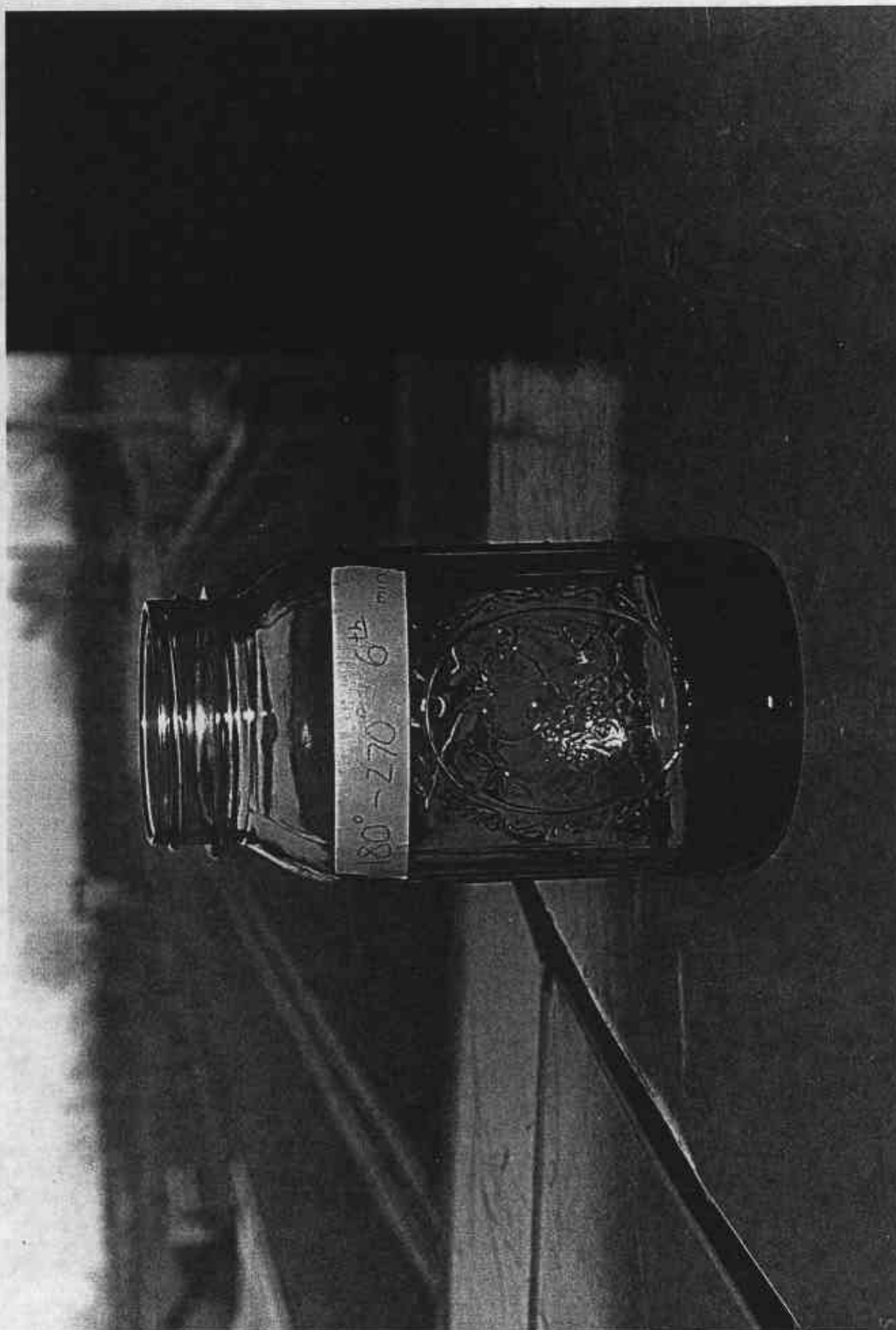


Figure A-62 Static Rollover Fuel System Leakage 180° - 270° Sixth Minute

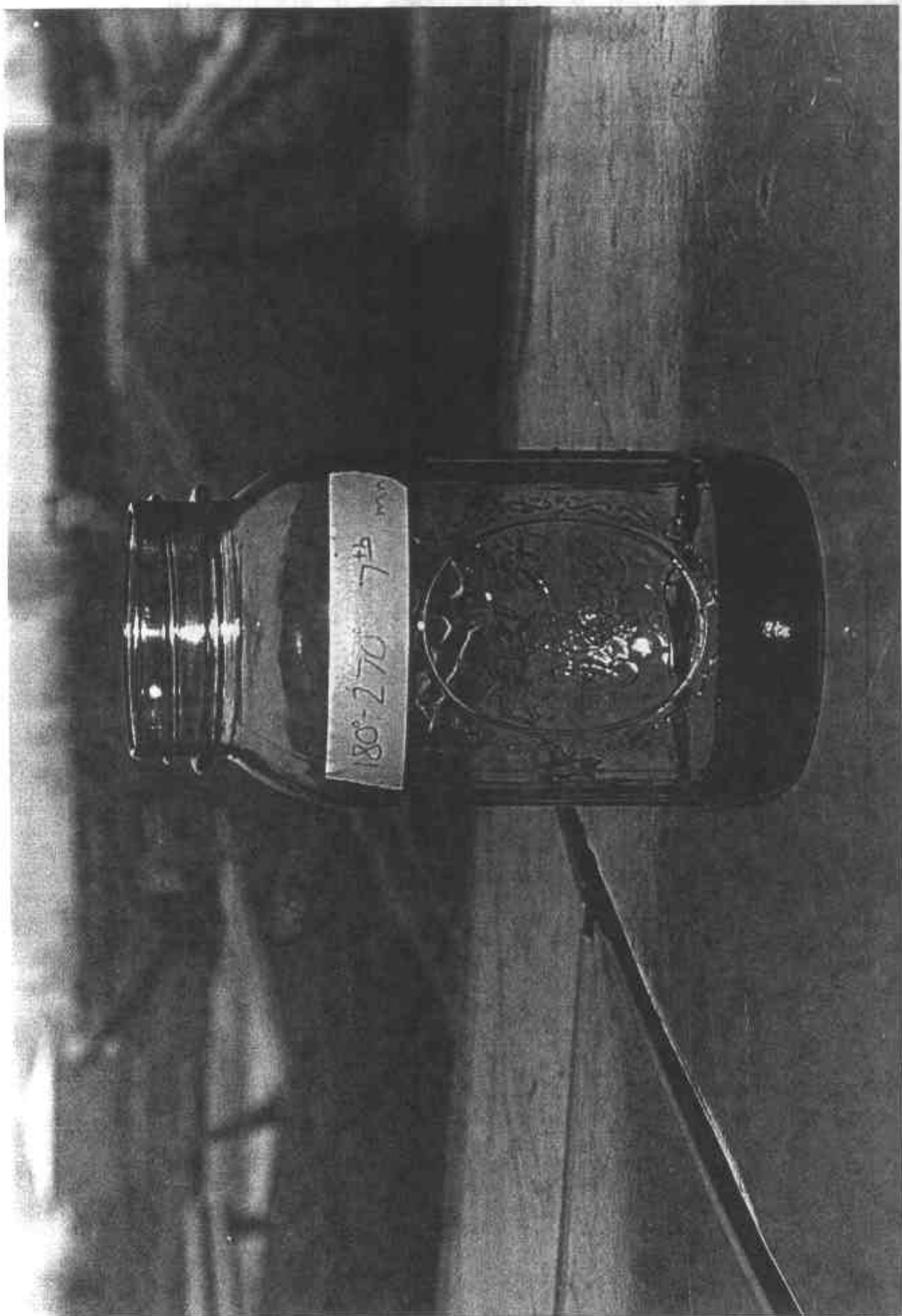


Figure A-63 Static Rollover Fuel System Leakage 180° - 270° Seventh Minute



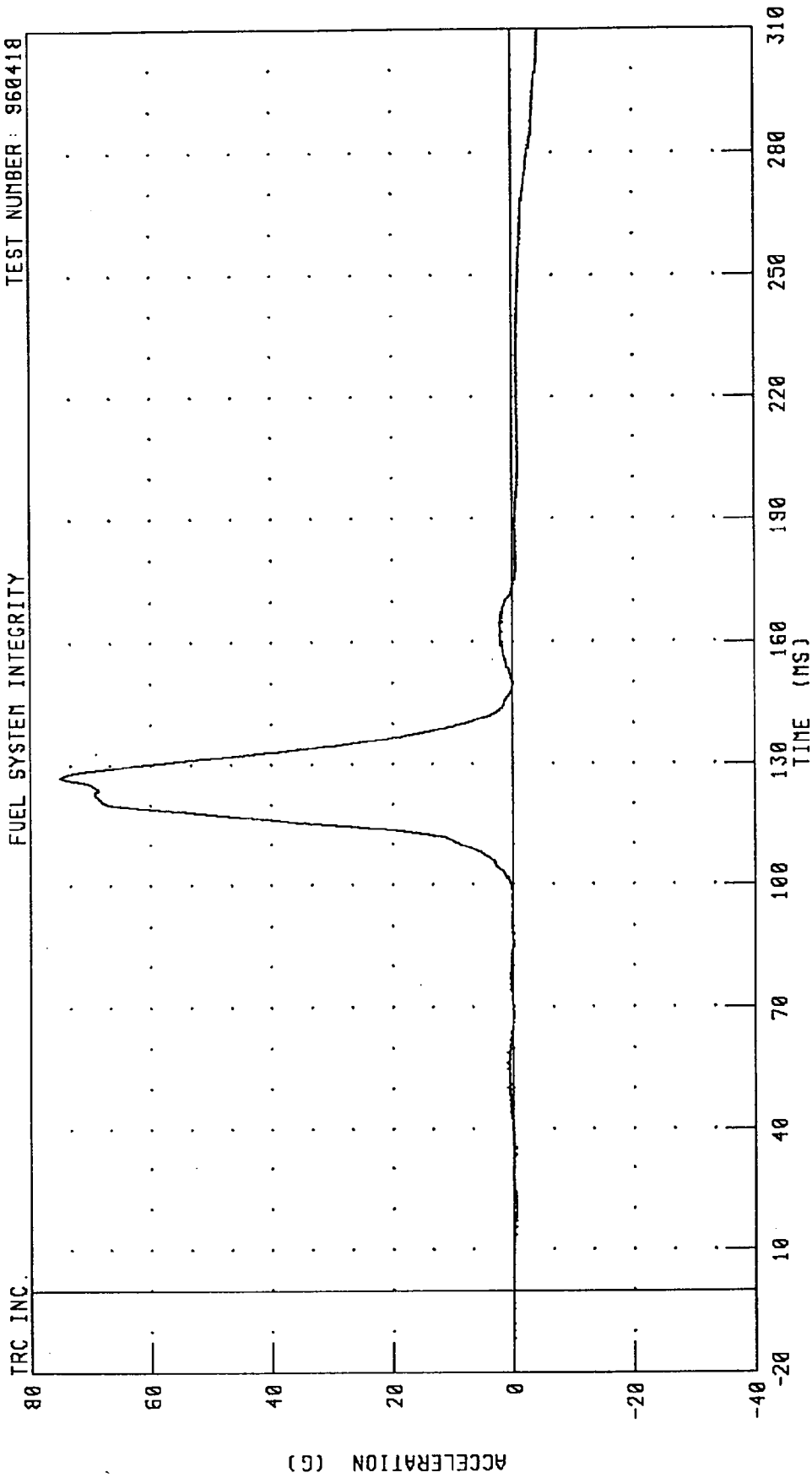
Figure A-64 Static Rollover Fuel System Leakage Final Seven Minutes

Appendix B

Data Plots

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER HEAD X-AXIS ACCELERATION

FUEL SYSTEM INTEGRITY TEST NUMBER: 960418



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

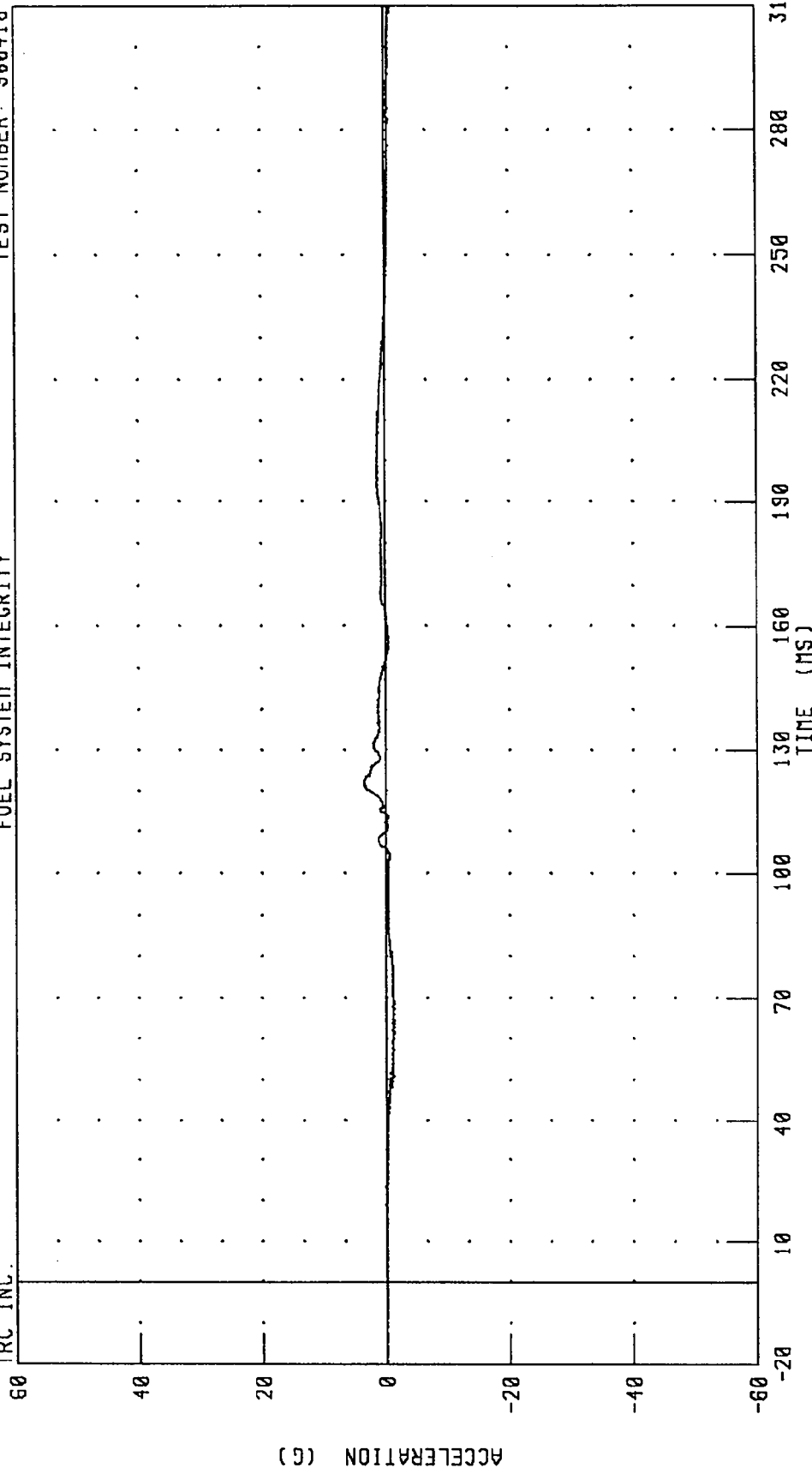
PEAK DATA: 74.97 G @ 126.96 MS; -4.54 G @ 306.16 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

PEAK DATA: 3.60 G @ 121.36 MS; -1.31 G @ 131.36 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

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

CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

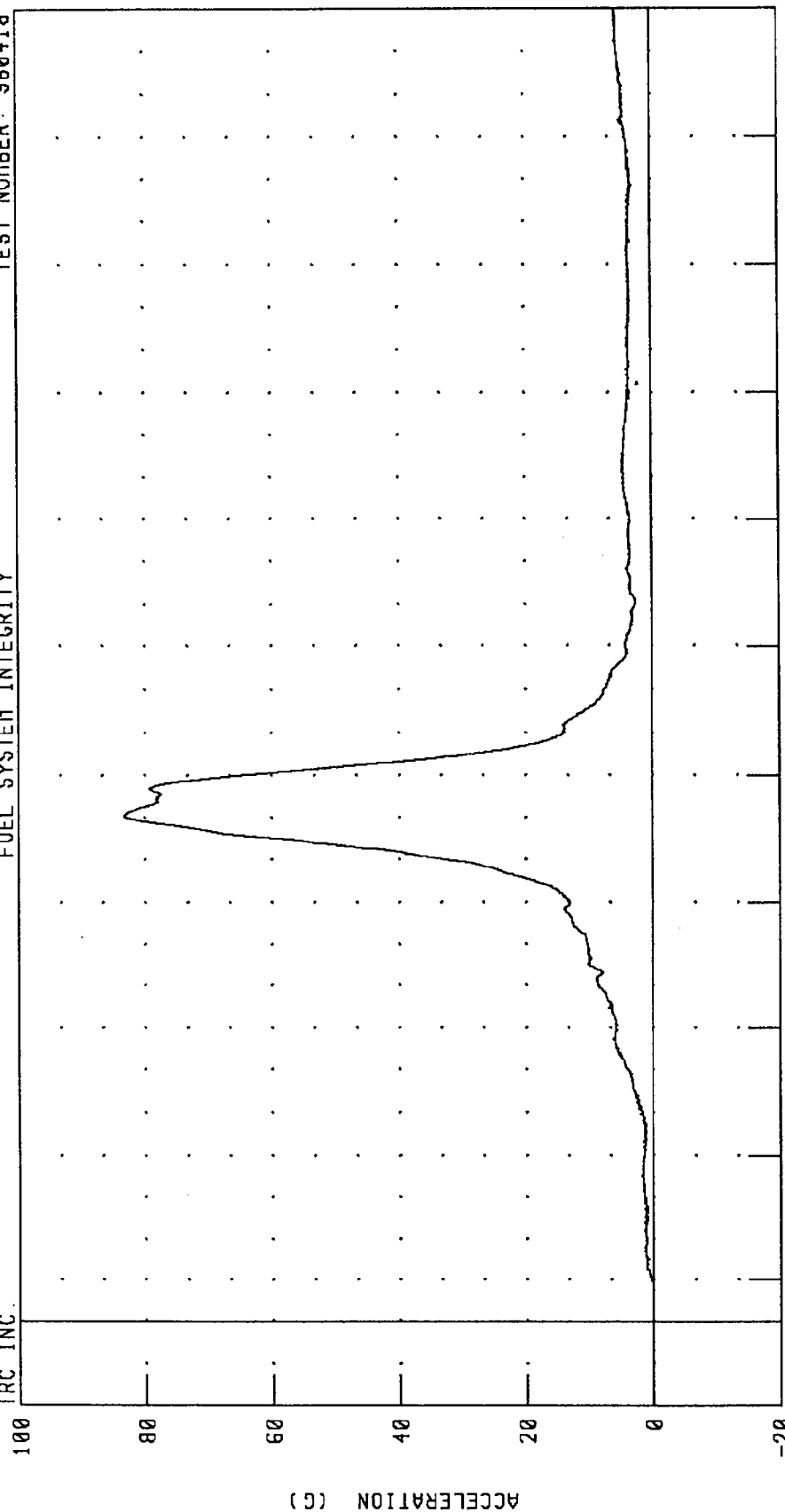
PEAK DATA: 0.01 G @ -20.00 MS; -54.59 G @ 116.32 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER: 950418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

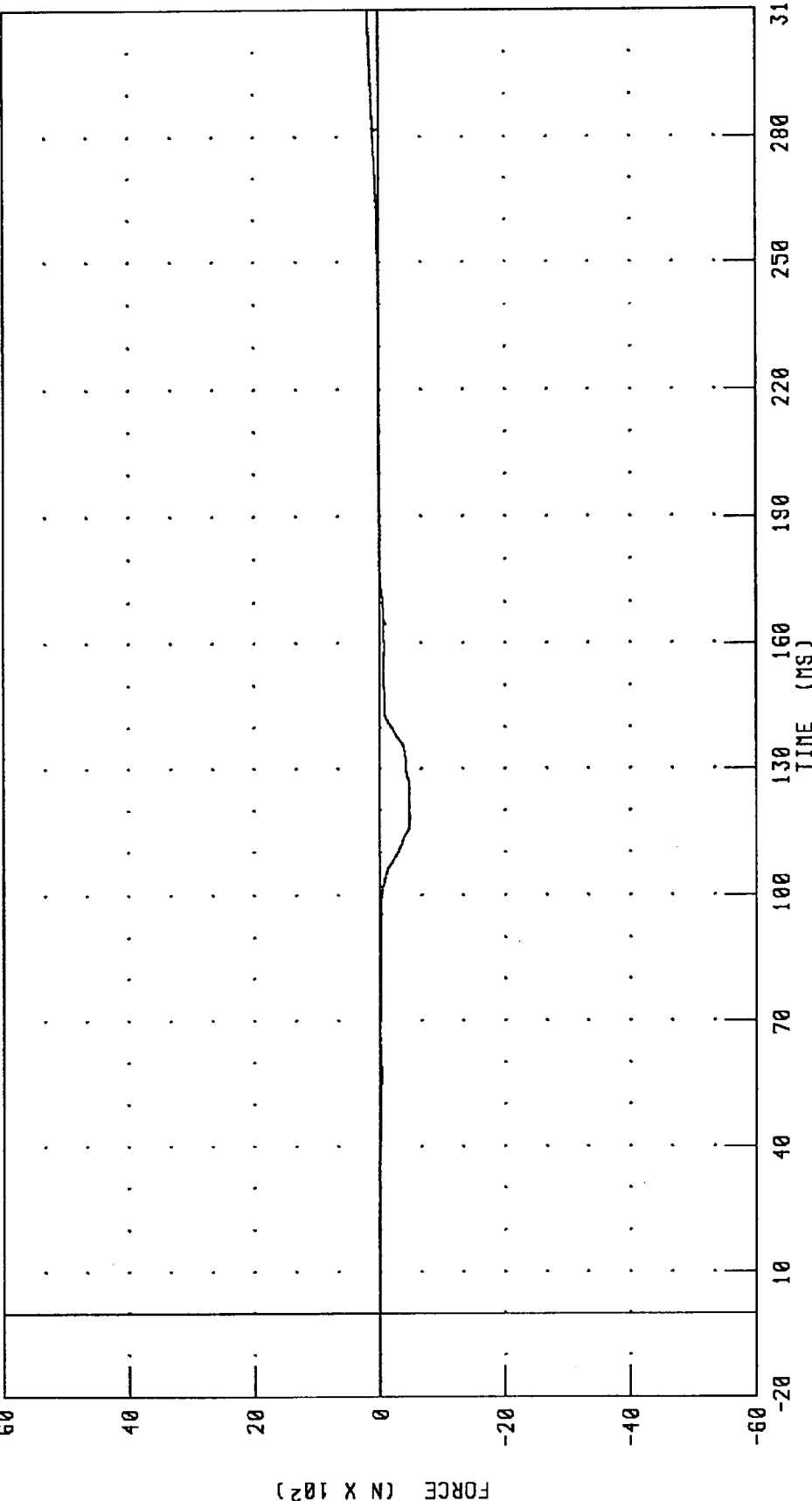
PEAK DATA: 83.35 G @ 120.40 MS; 0.06 G @ -19.76 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER UPPER NECK X-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 167.08 N @ 310.00 MS; -484.82 N @ 118.08 MS

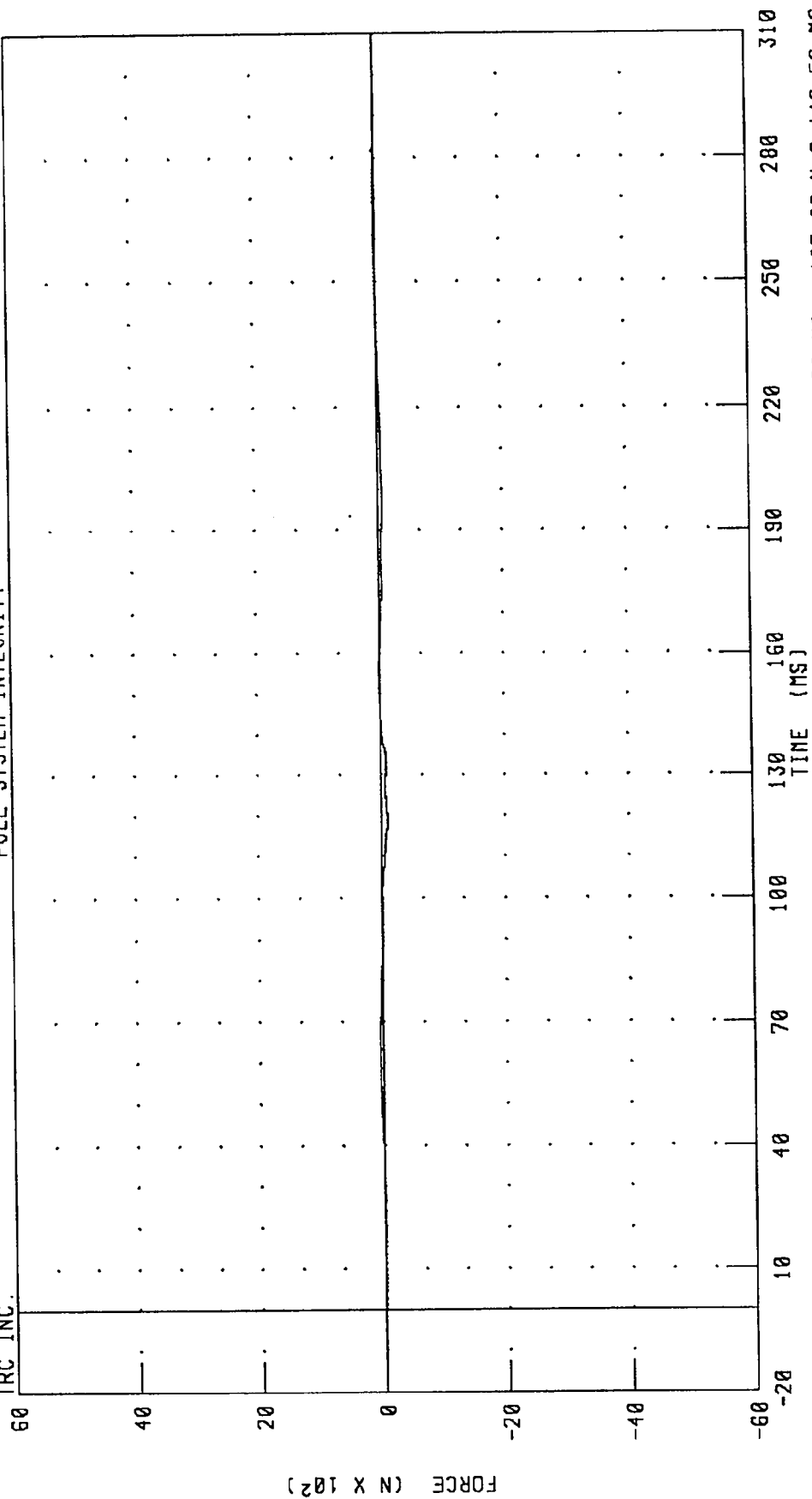
CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER UPPER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

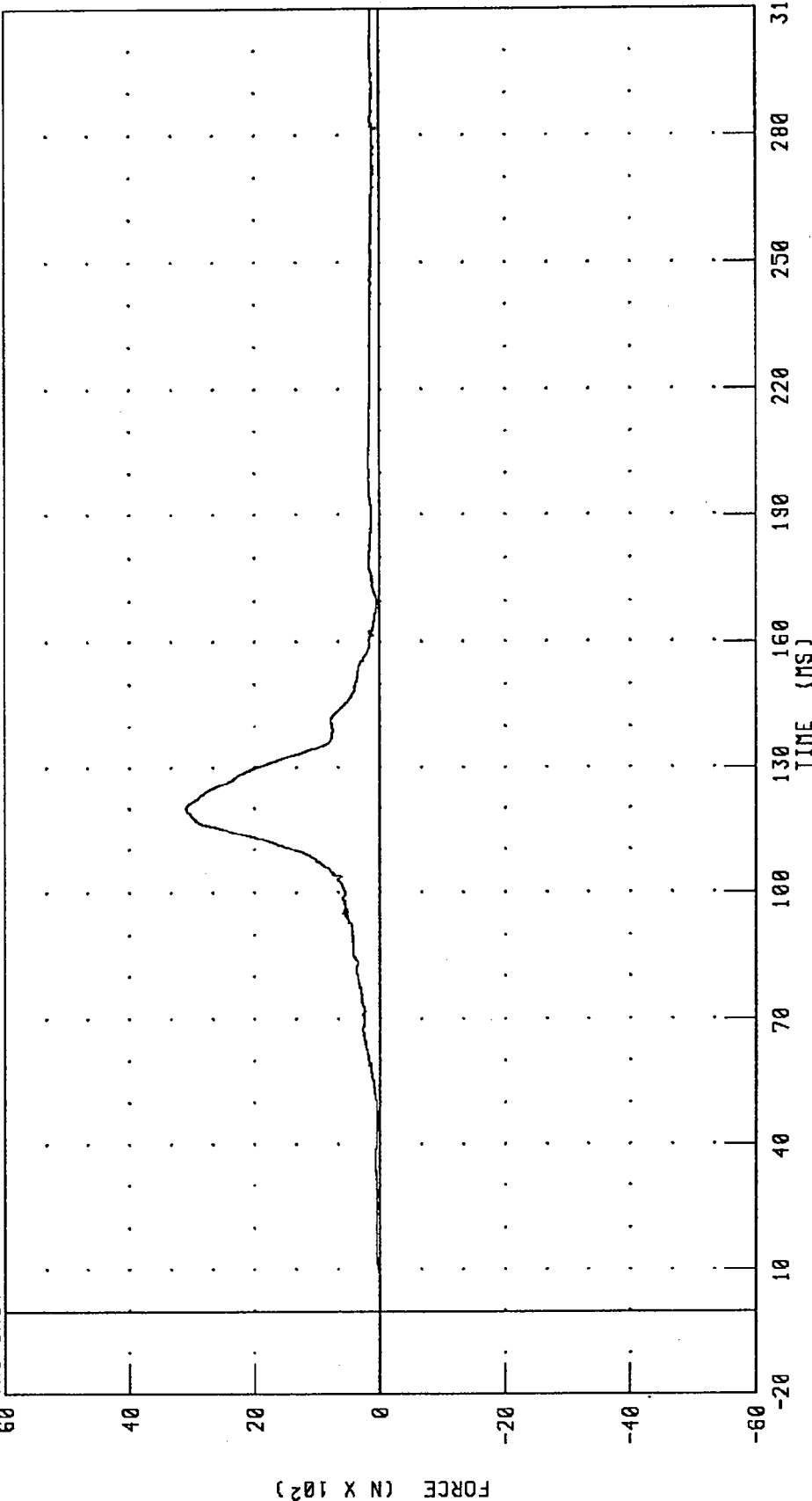
PEAK DATA: 52.84 N @ 63.28 MS; -107.96 N @ 118.56 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER UPPER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

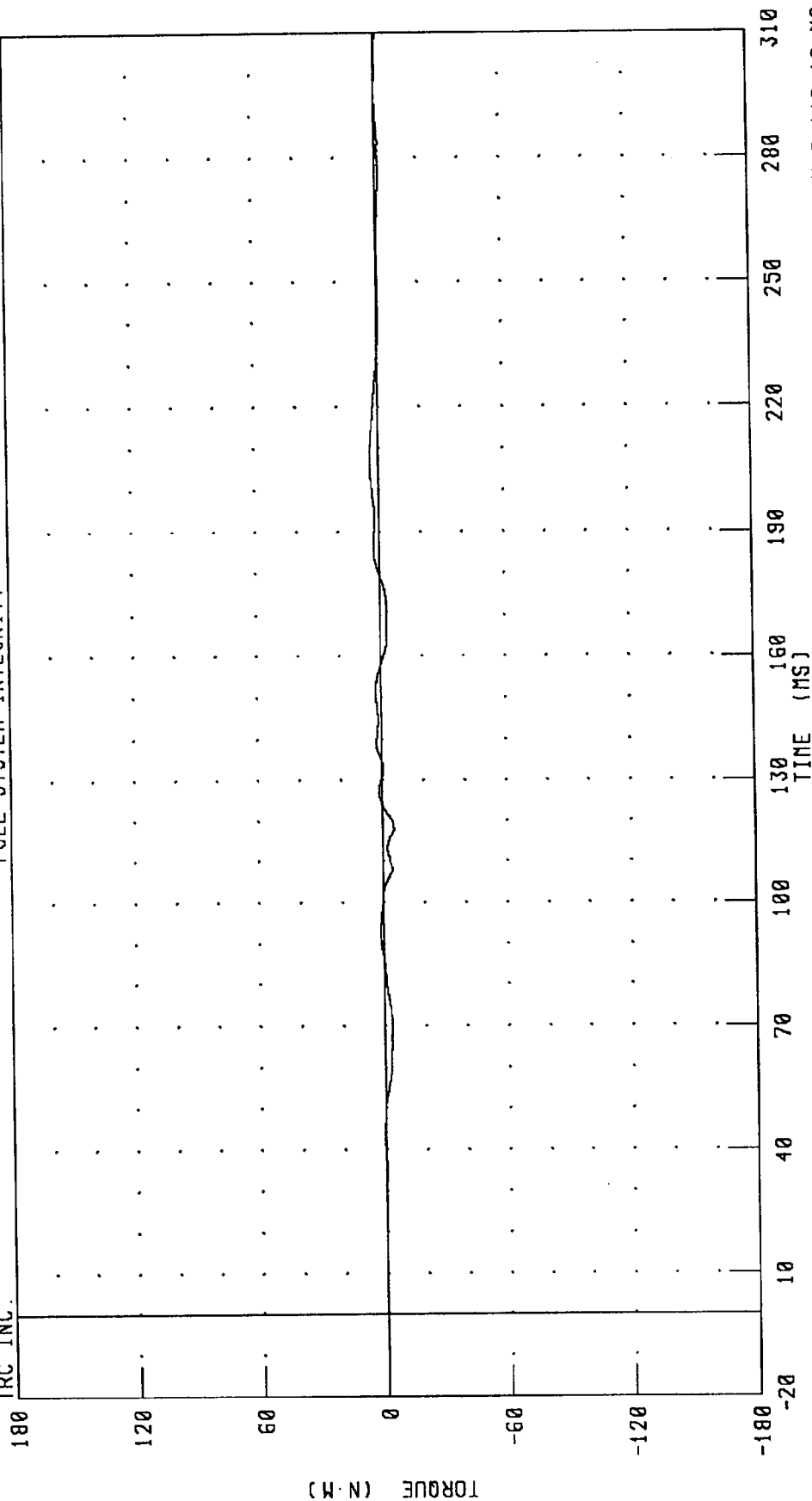
PEAK DATA: 3101.12 N @ 120.08 MS; -6.81 N @ -14.24 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER UPPER NECK MOMENT ABOUT X-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.

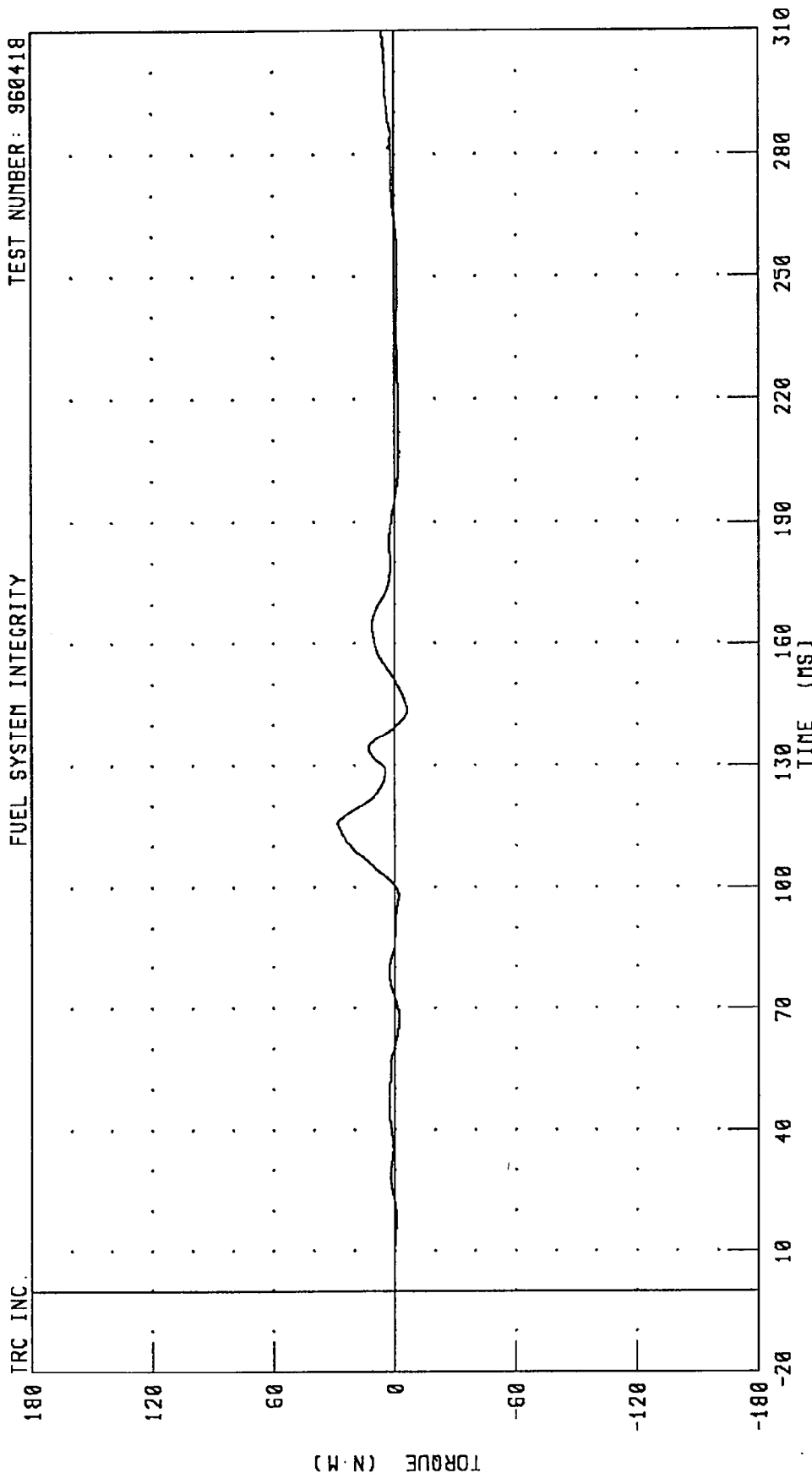


PEAK DATA: 4.28 N·M @ 205.52 MS; -5.48 N·M @ 118.16 MS

CHANNEL: NEKXM1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER UPPER NECK MOMENT ABOUT Y-AXIS
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418



PEAK DATA: 28.27 N.M @ 115.84 MS; -6.10 N.M @ 143.68 MS

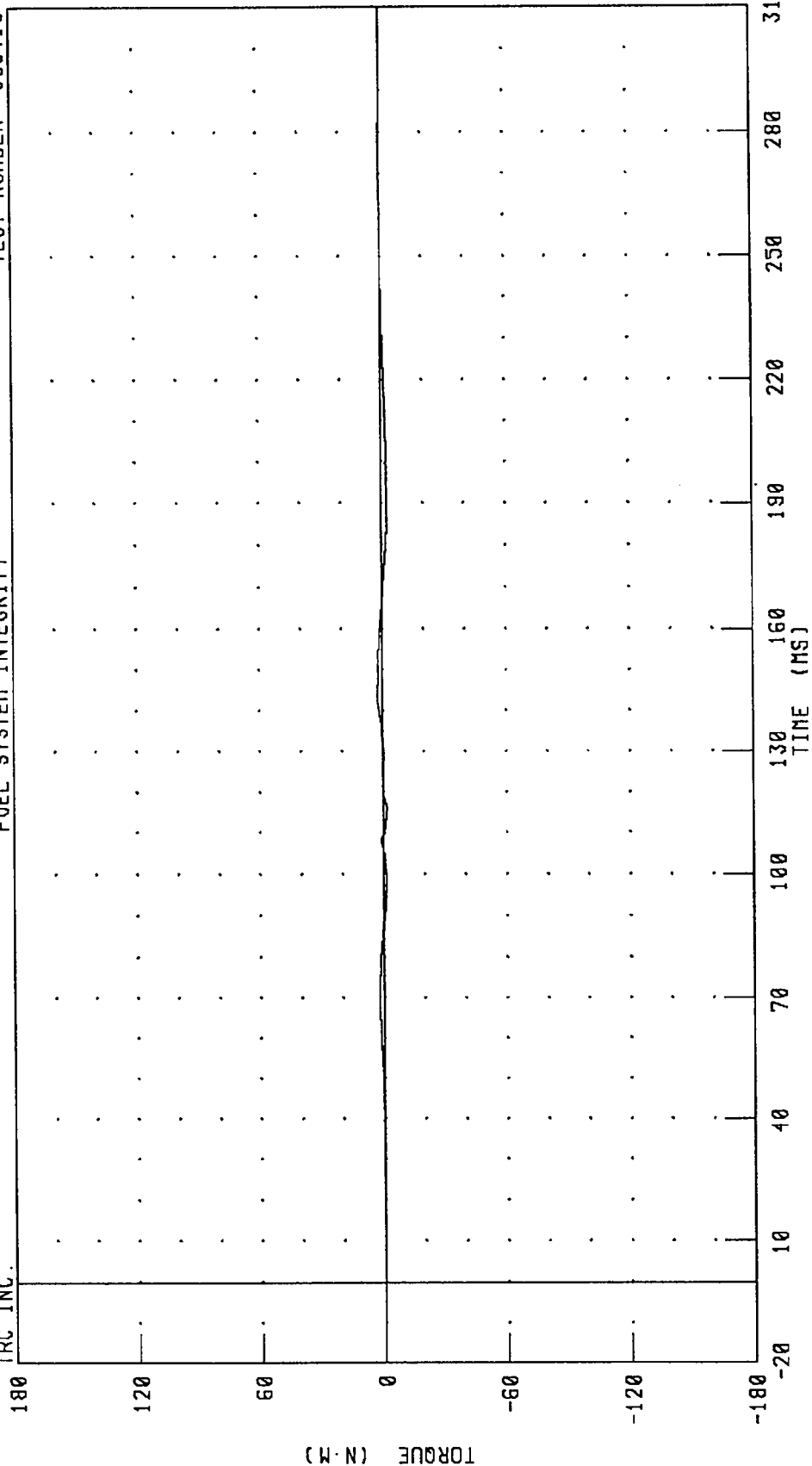
CHANNEL: NEKYM1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER UPPER NECK MOMENT ABOUT Z-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 2.48 N-M @ 143.12 MS; -2.52 N-M @ 189.28 MS

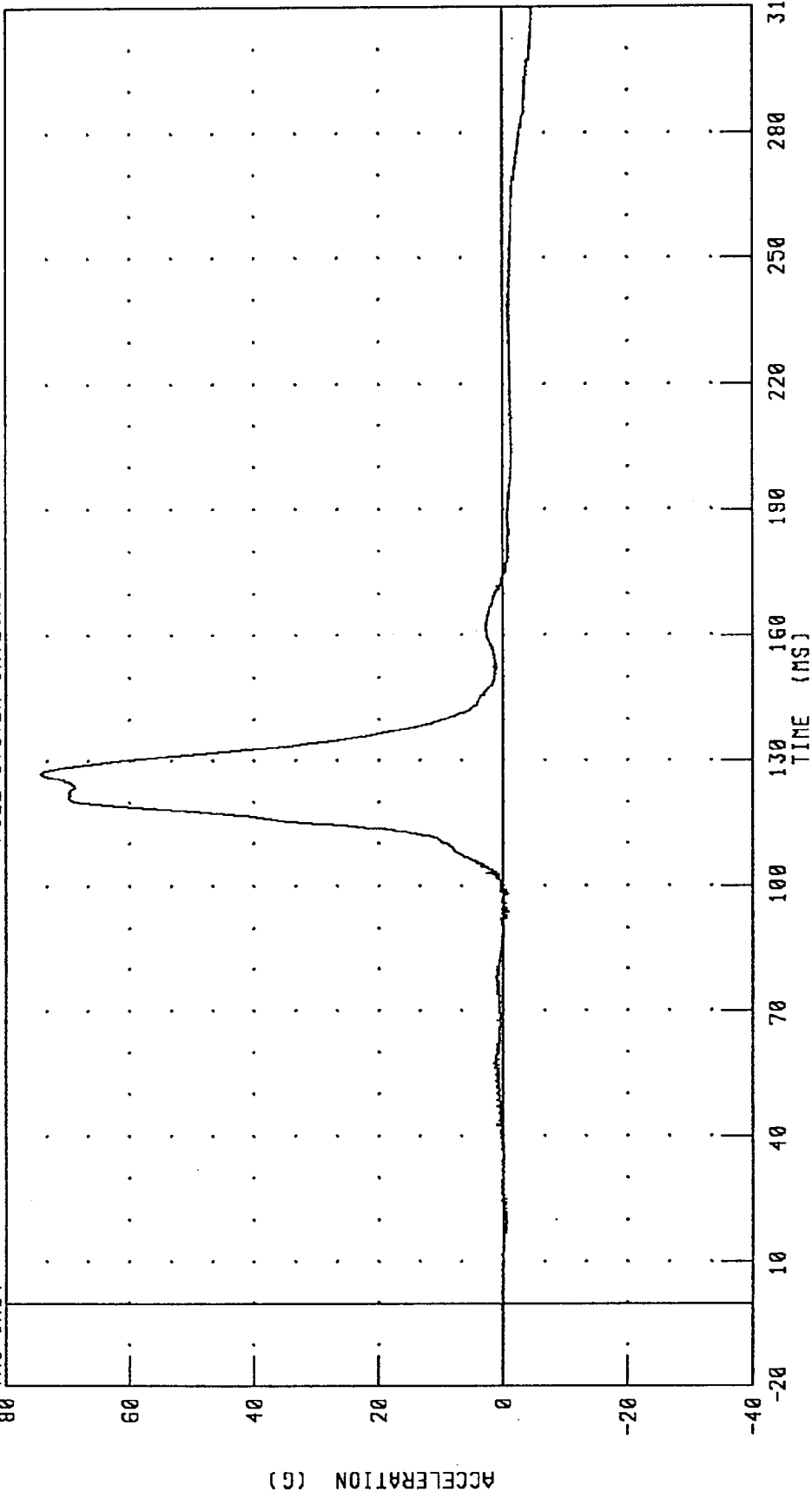
CHANNEL: NEKZM1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER HEAD POSITION 1 X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



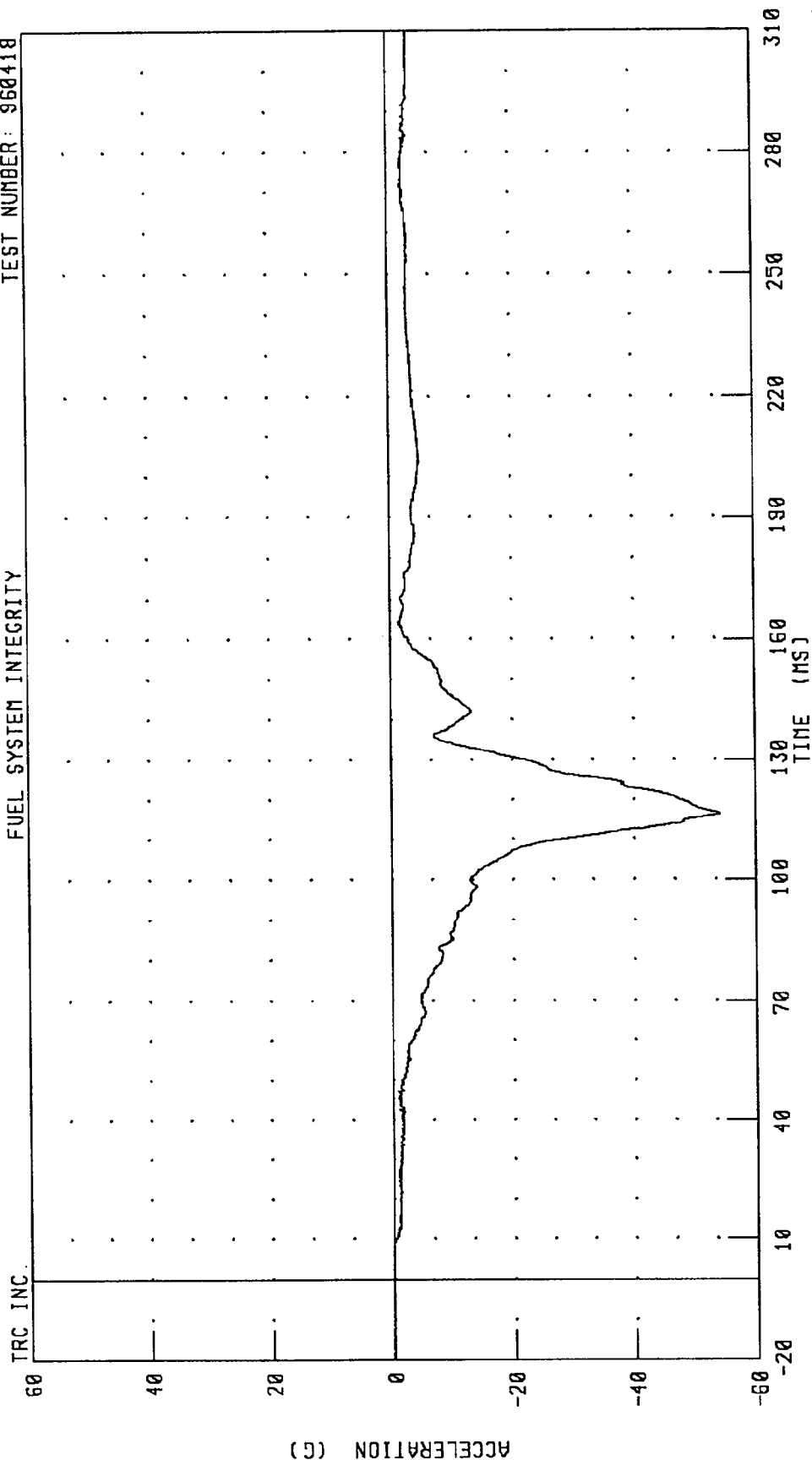
CHANNEL: HD1XG1 FILTER: CH. CLASS 1000

PEAK DATA: 74.39 G @ 126.80 MS; -4.71 G @ 307.28 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER HEAD POSITION 1 Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



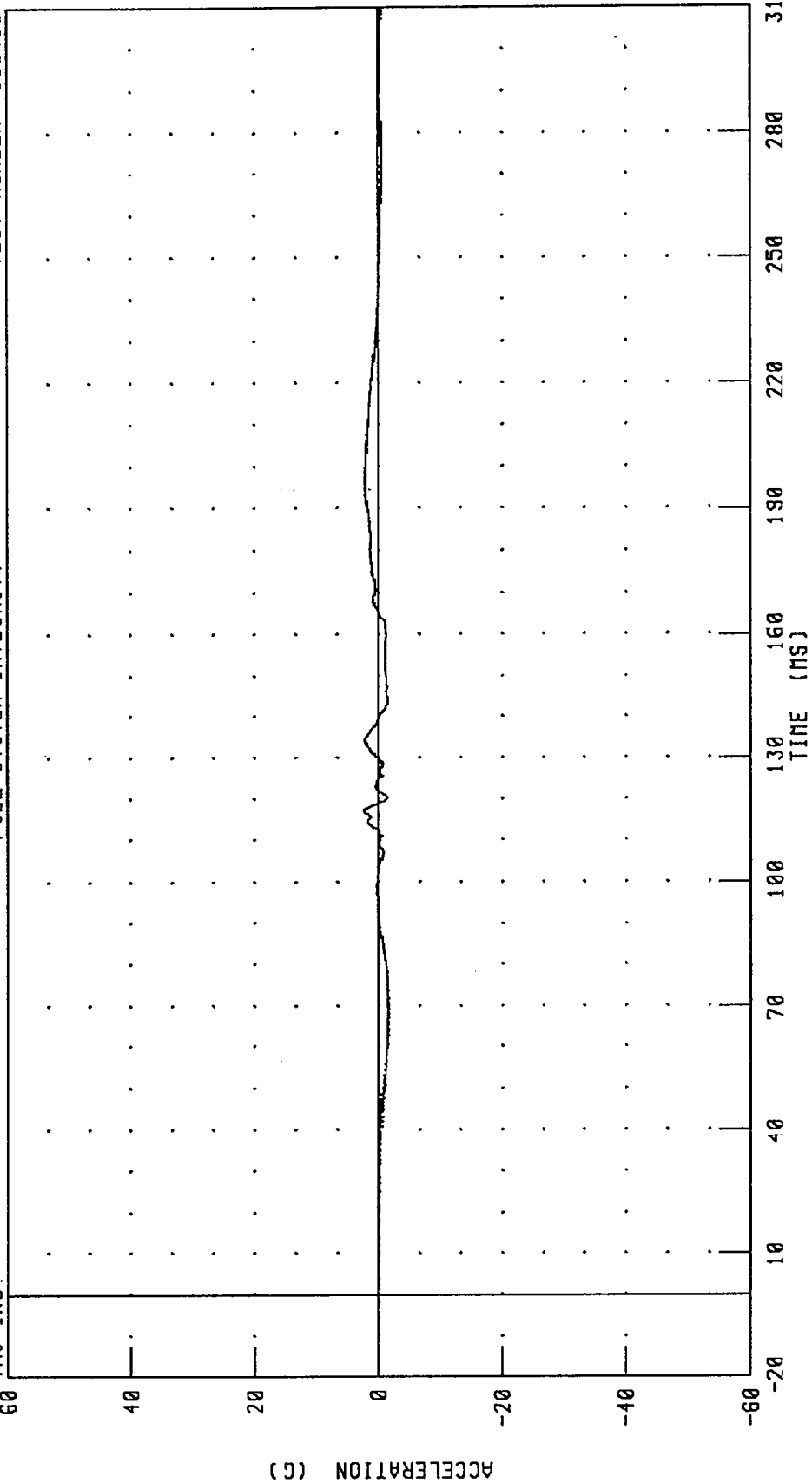
CHANNEL: HD1ZG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER HEAD POSITION 2 Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



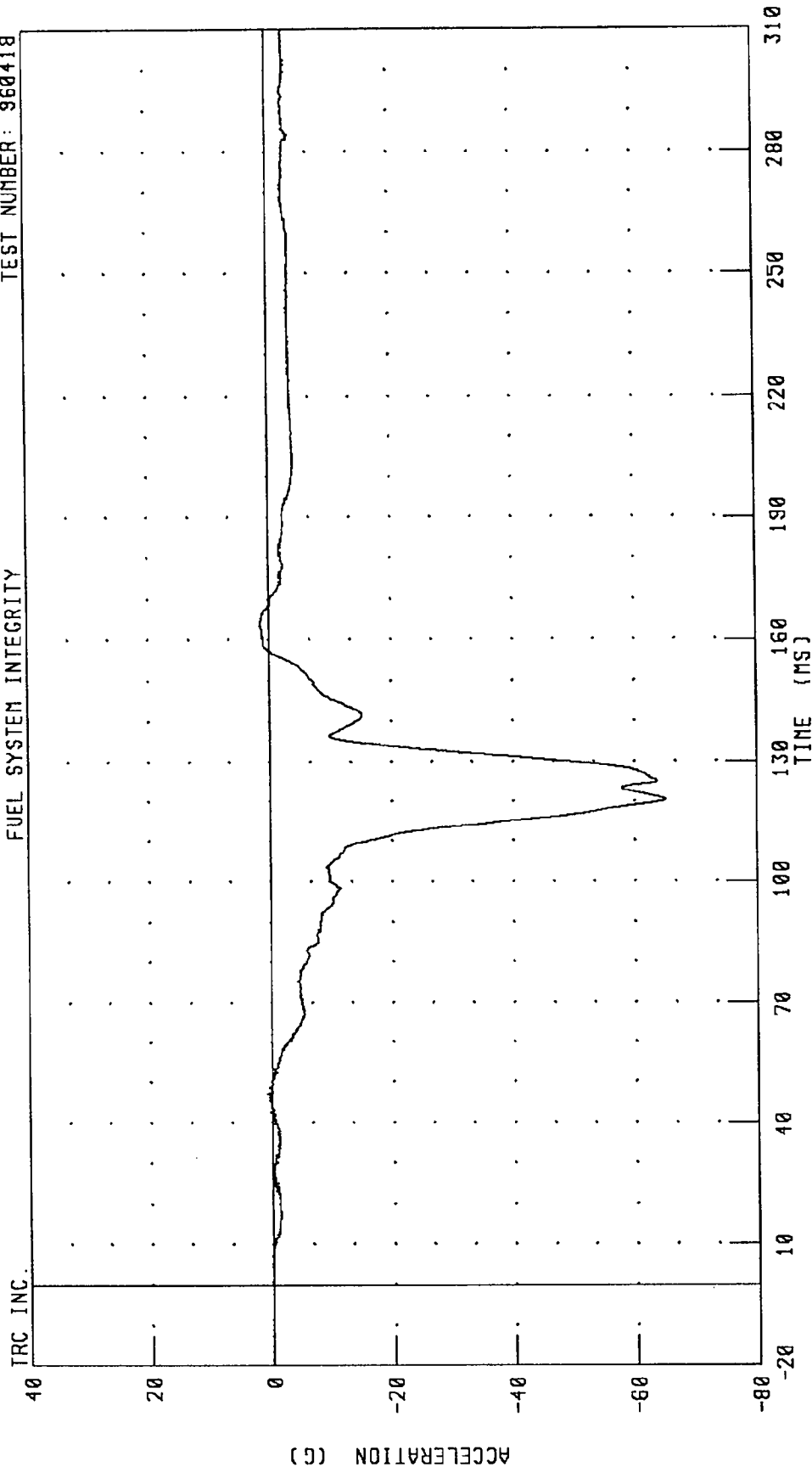
CHANNEL: HD2YG1 FILTER: CH. CLASS 1000

PEAK DATA: 2.36 G @ 116.88 MS; -1.77 G @ 60.56 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER HEAD POSITION 2 Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

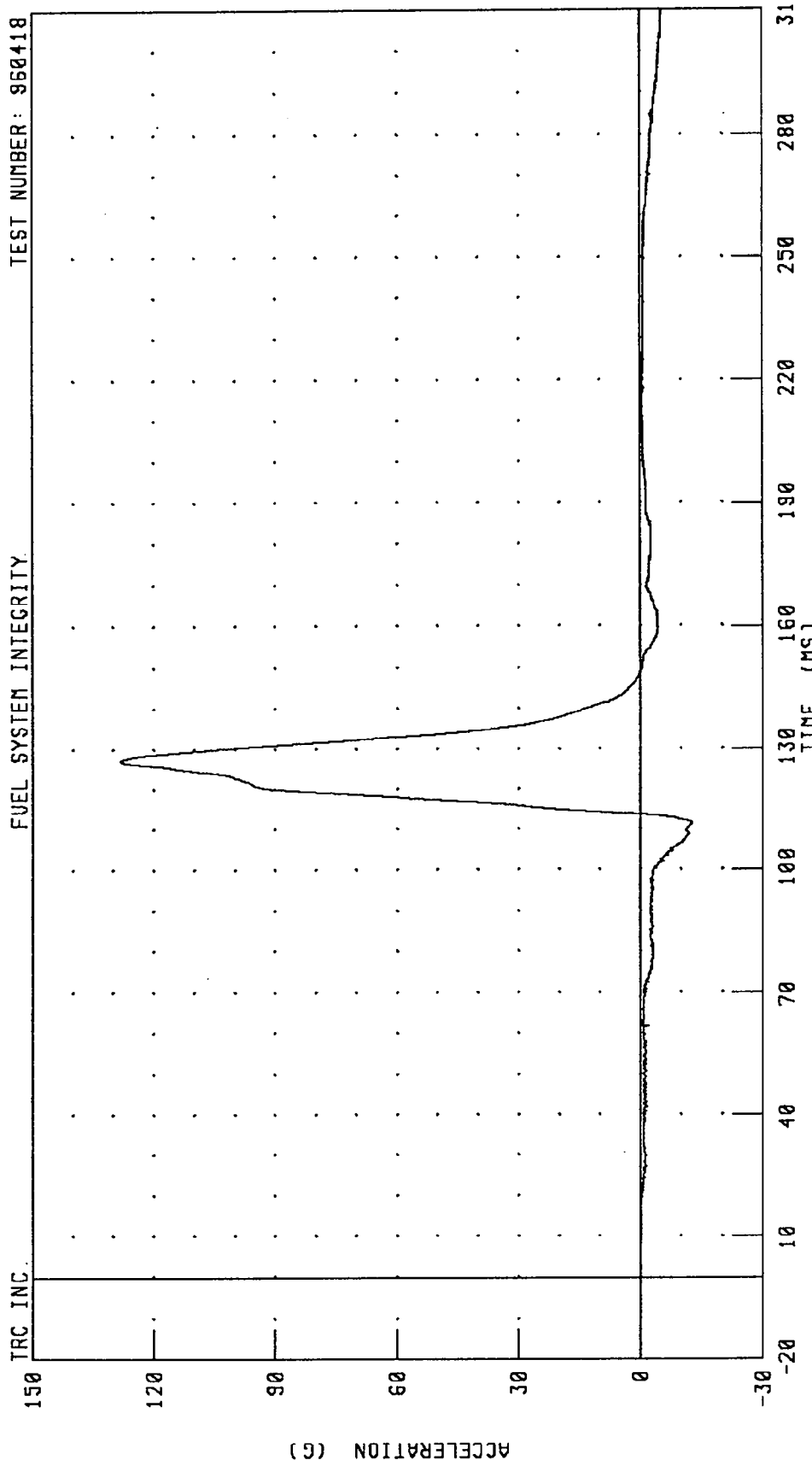


CHANNEL: HD2ZG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER HEAD POSITION 3 X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

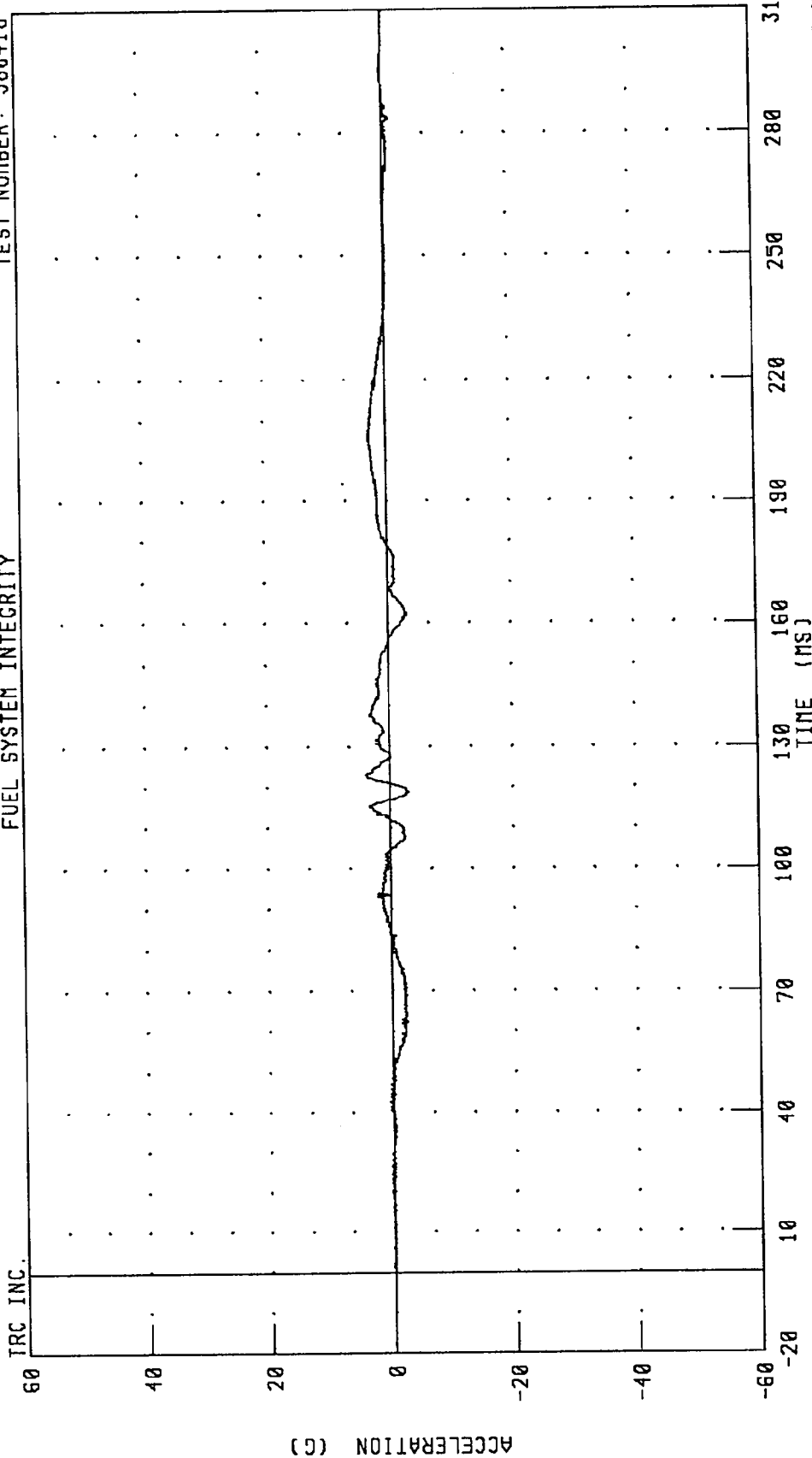


CHANNEL: HD3XG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER HEAD POSITION 3 Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 3.94 G @ 123.04 MS; -2.96 G @ 118.80 MS

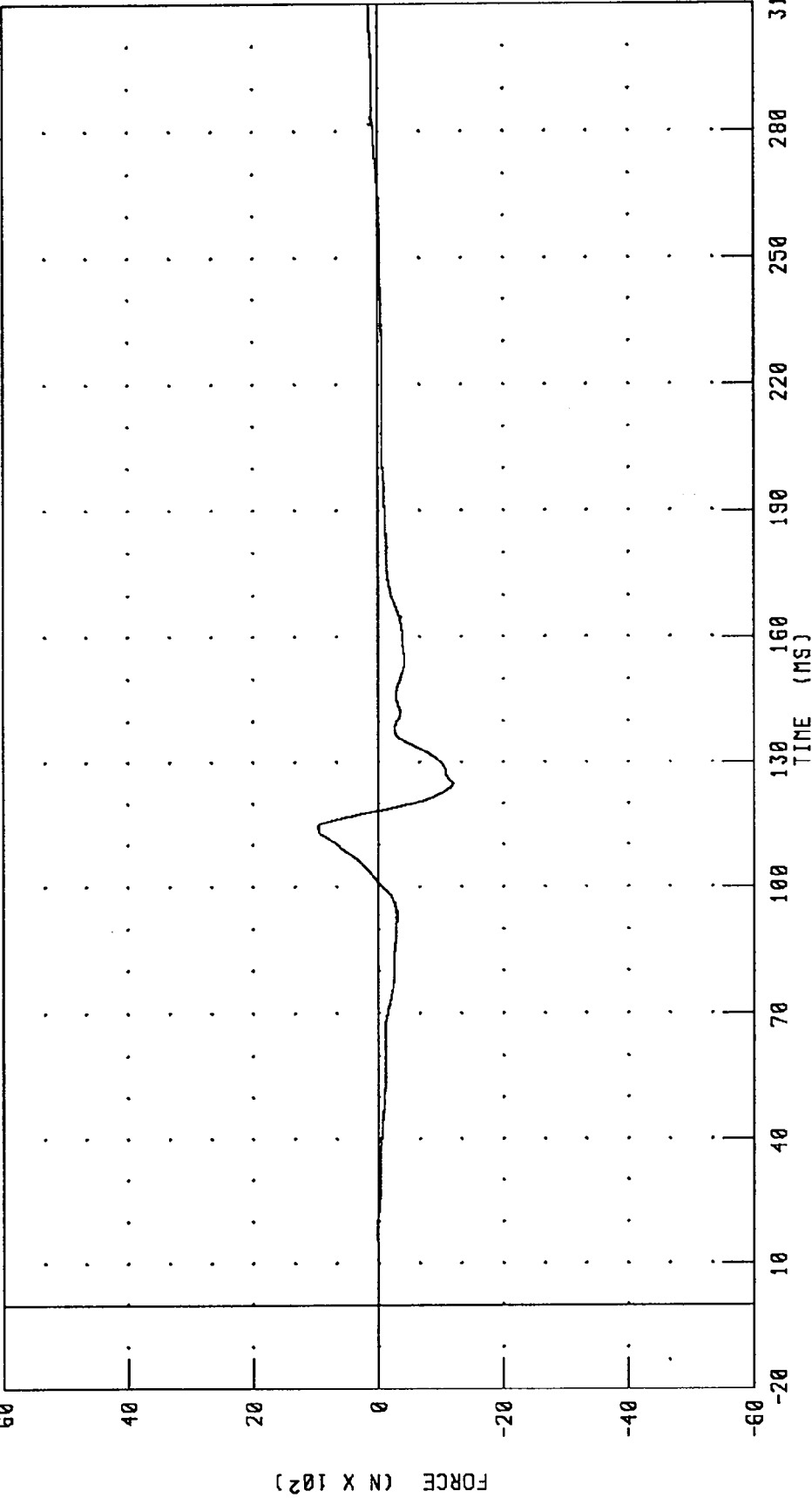
CHANNEL: HD3YG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LOWER NECK X-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



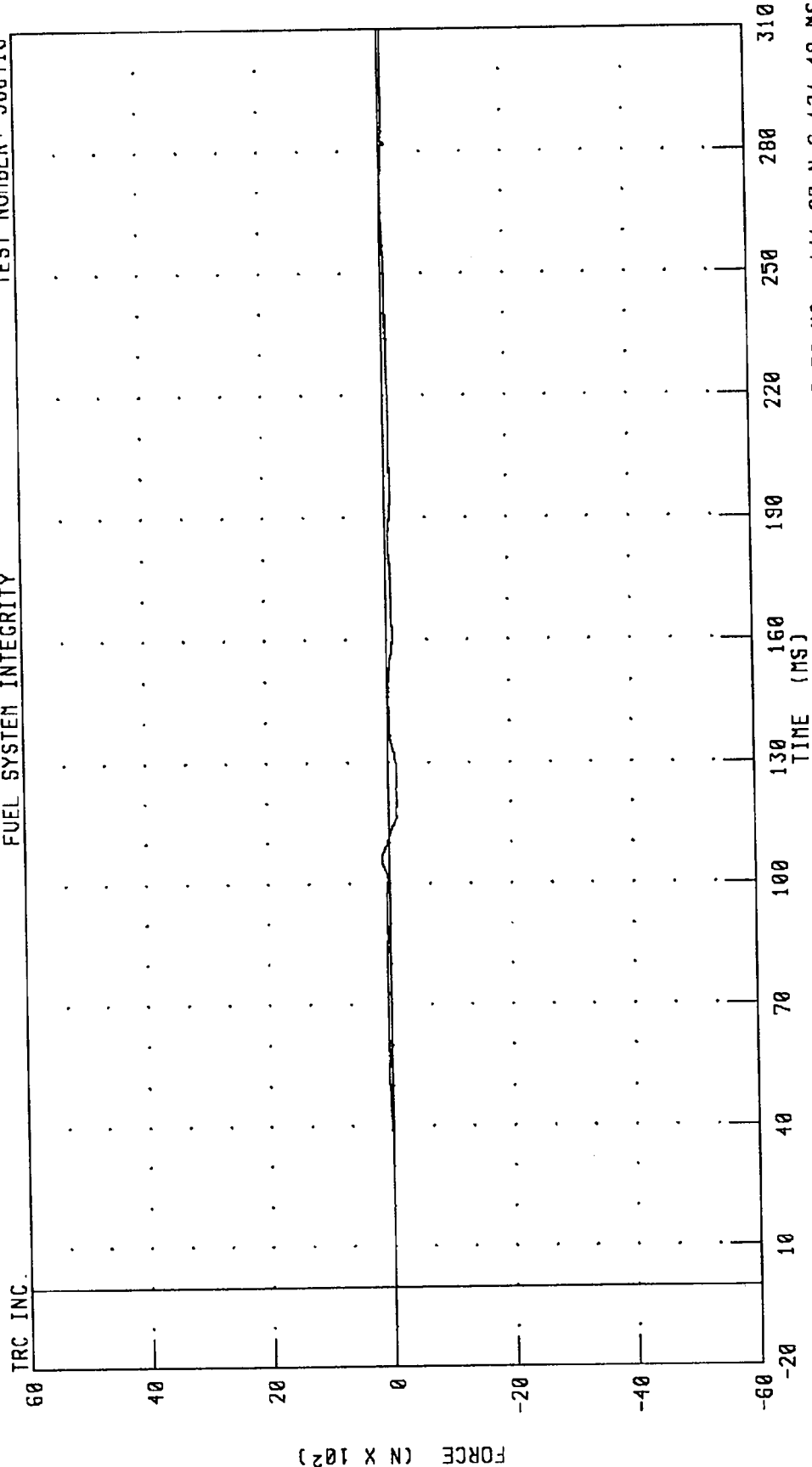
PEAK DATA: 970.76 N @ 114.64 MS; -1195.13 N @ 124.80 MS

CHANNEL: NKLXF1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LOWER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



CHANNEL: NKLYF1 FILTER: CH. CLASS 1000

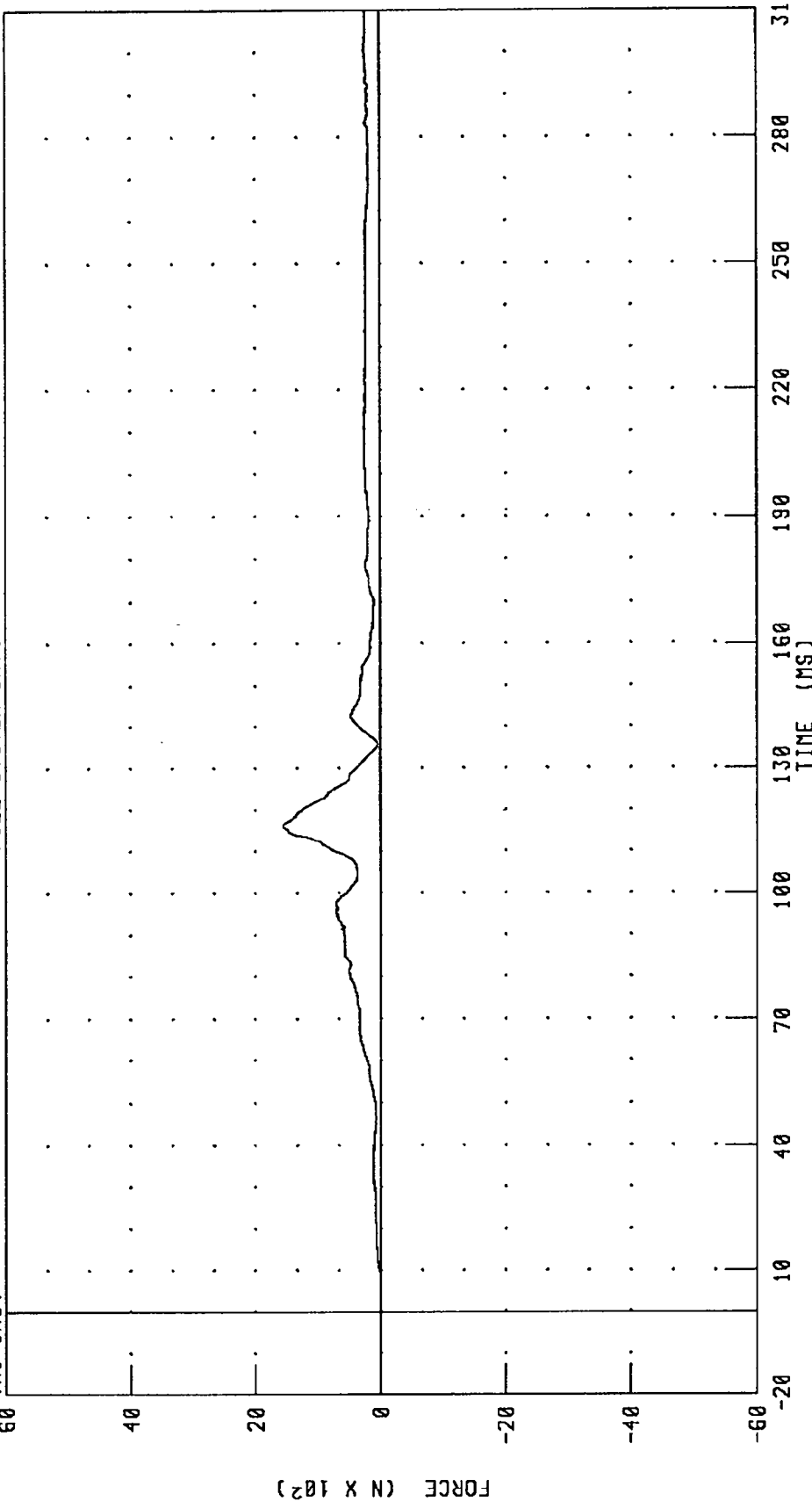
PEAK DATA: 125.37 N @ 105.76 MS, -141.87 N @ 124.48 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LOWER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



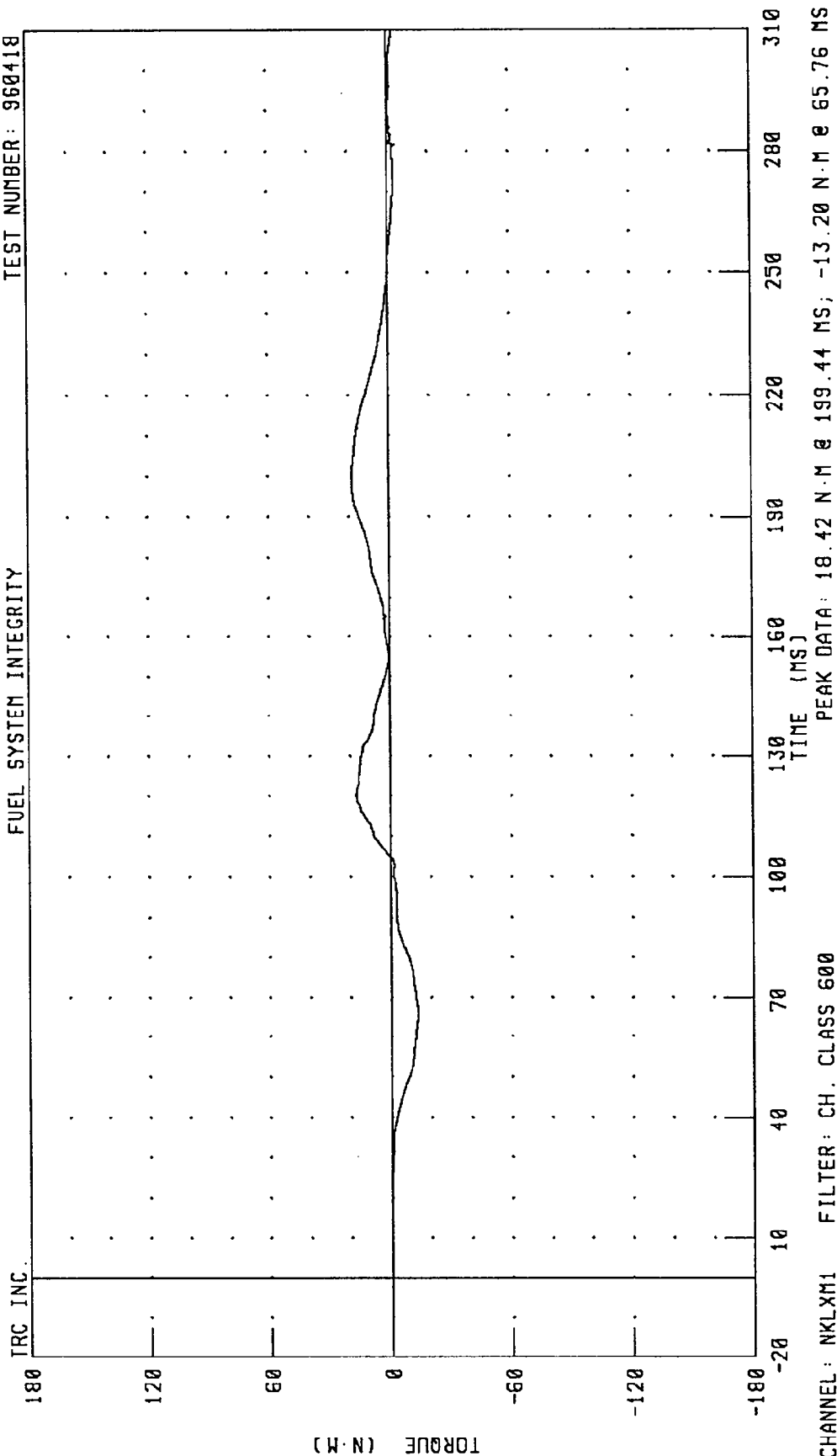
CHANNEL: NKLZF1 FILTER: CH. CLASS 1000

PEAK DATA: 1564.91 N @ 116.24 MS; -4.64 N @ -19.84 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LOWER NECK MOMENT ABOUT X-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



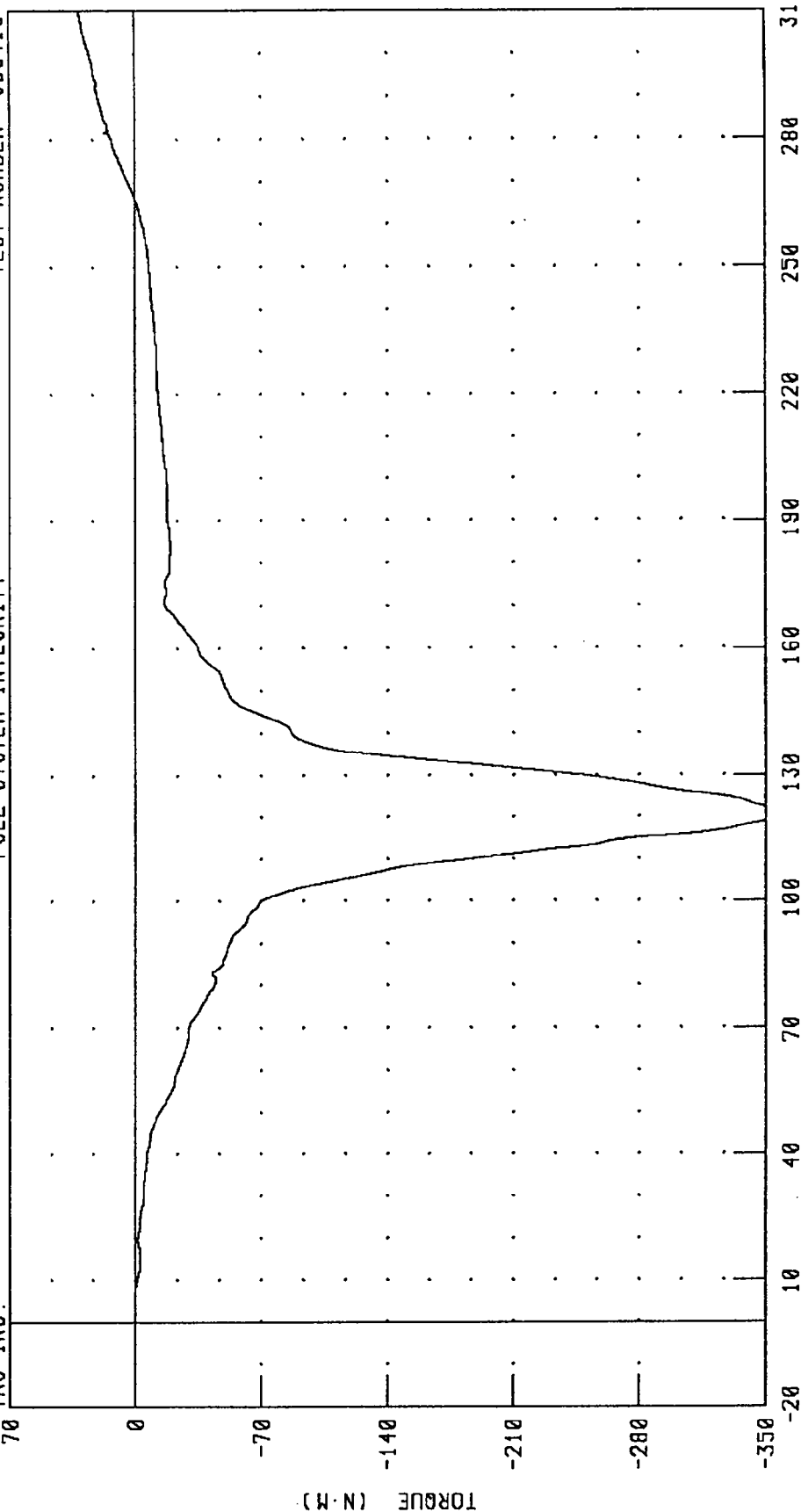
CHANNEL: NKLXM1 FILTER: CH. CLASS 600

PEAK DATA: 18.42 N·M @ 199.44 MS; -13.20 N·M @ 65.76 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LOWER NECK MOMENT ABOUT Y-AXIS
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418

TRC INC.



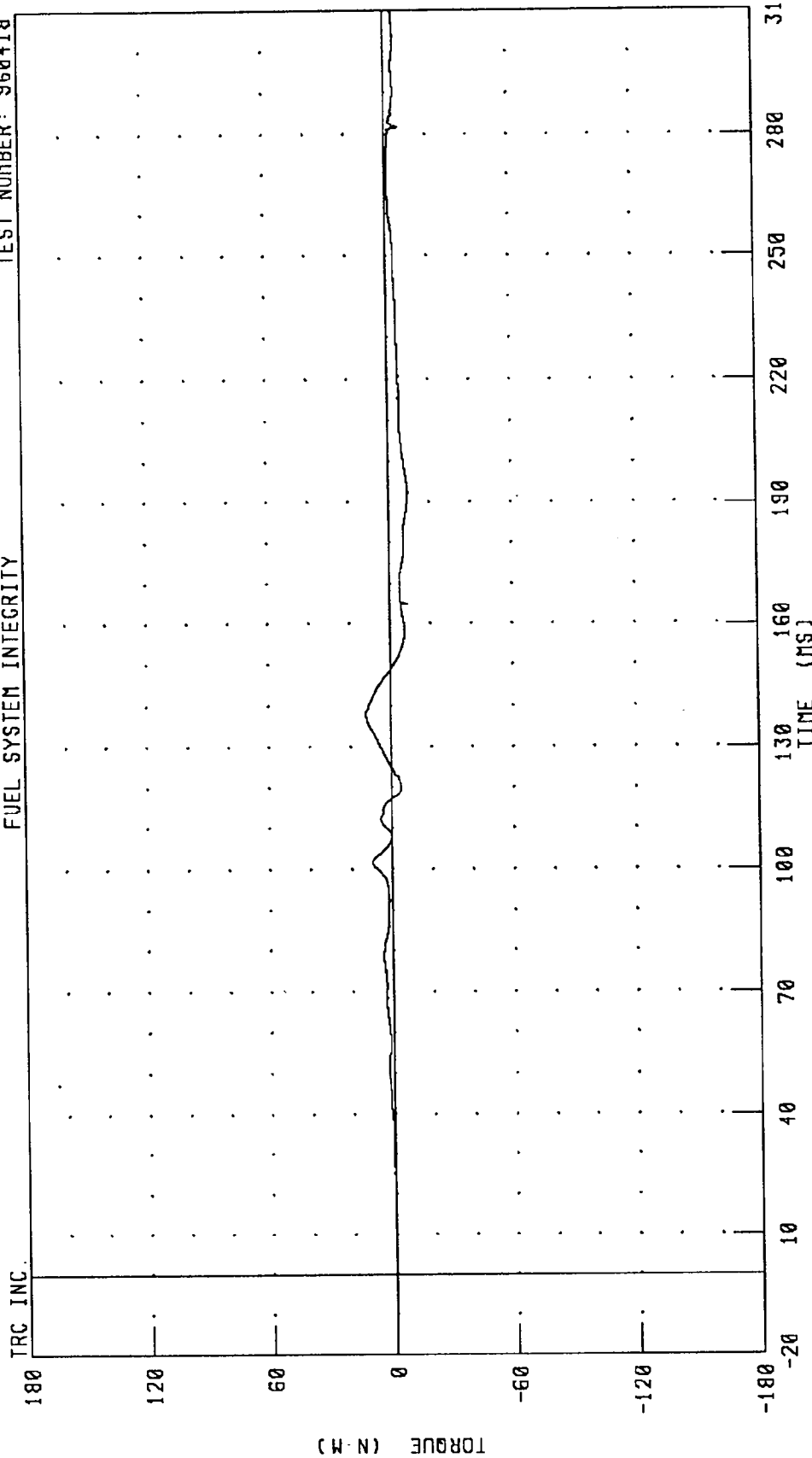
PEAK DATA: 30.59 N-M @ 309.68 MS; -357.00 N-M @ 120.56 MS

CHANNEL: NKLYM1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LOWER NECK MOMENT ABOUT Z-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



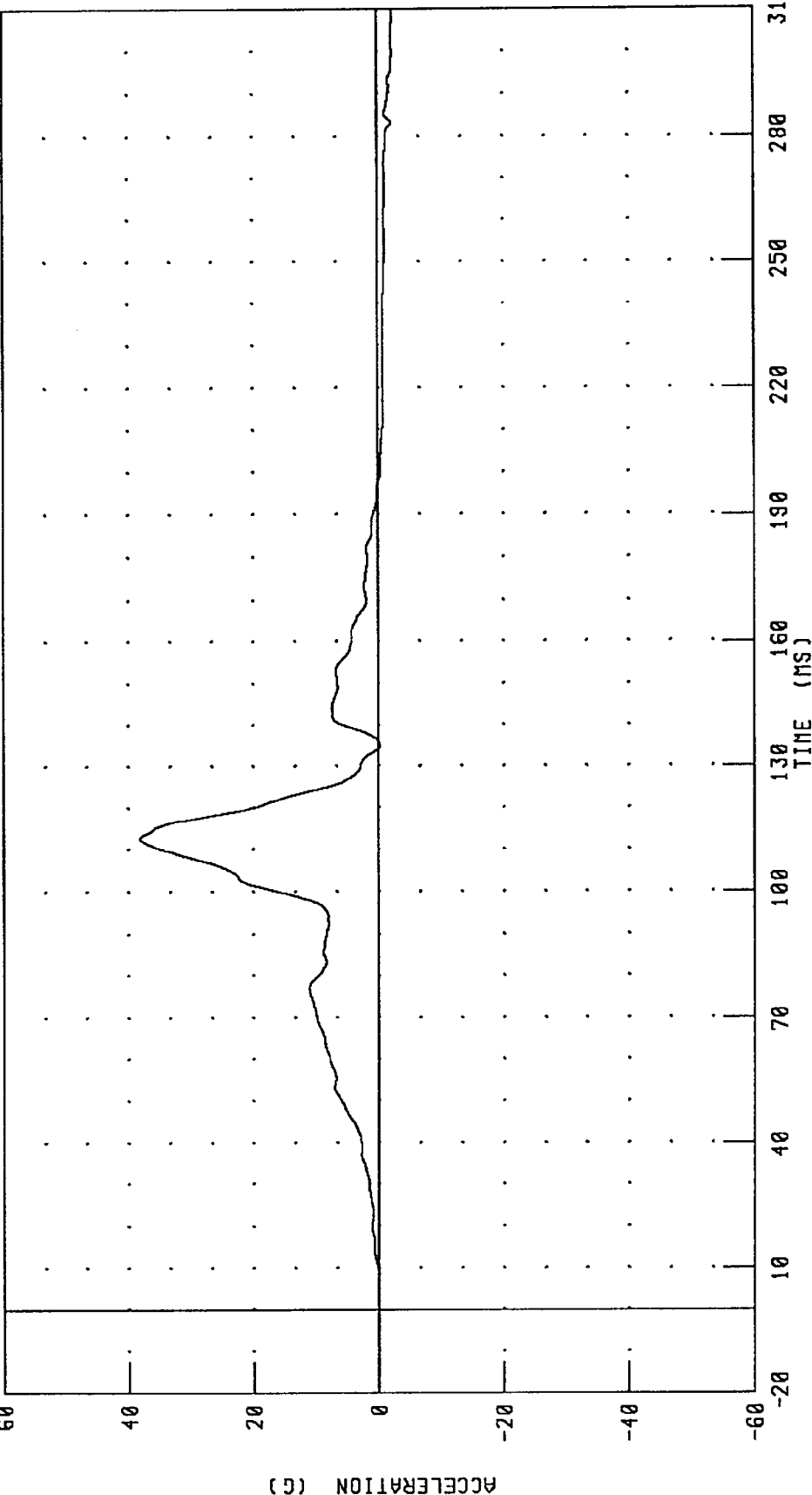
CHANNEL: NKLZM1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER CHEST X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



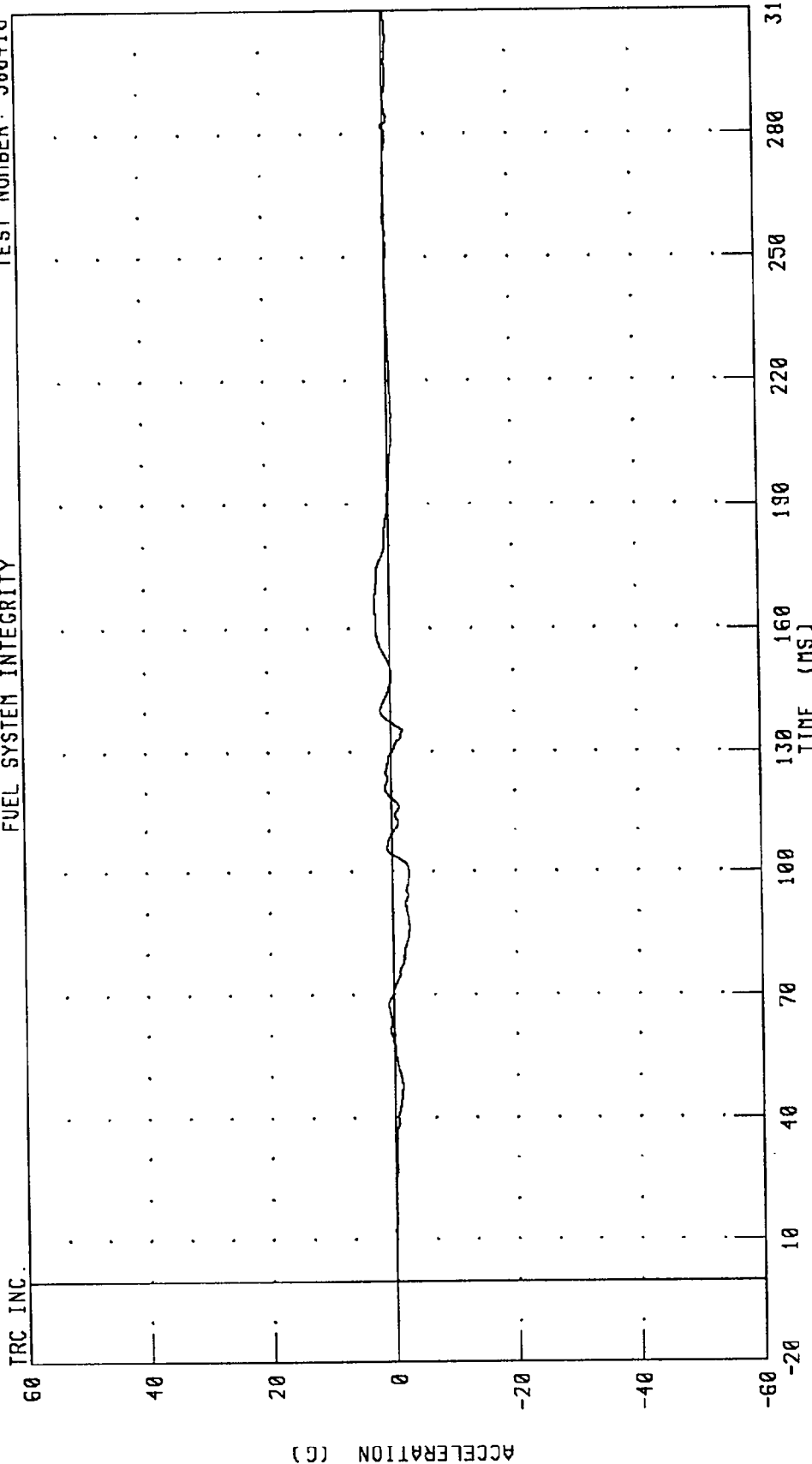
CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 38.15 G @ 112.80 MS; -2.33 G @ 309.44 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
DRIVER CHEST Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 2.36 G @ 166.08 MS, -2.70 G @ 99.52 MS

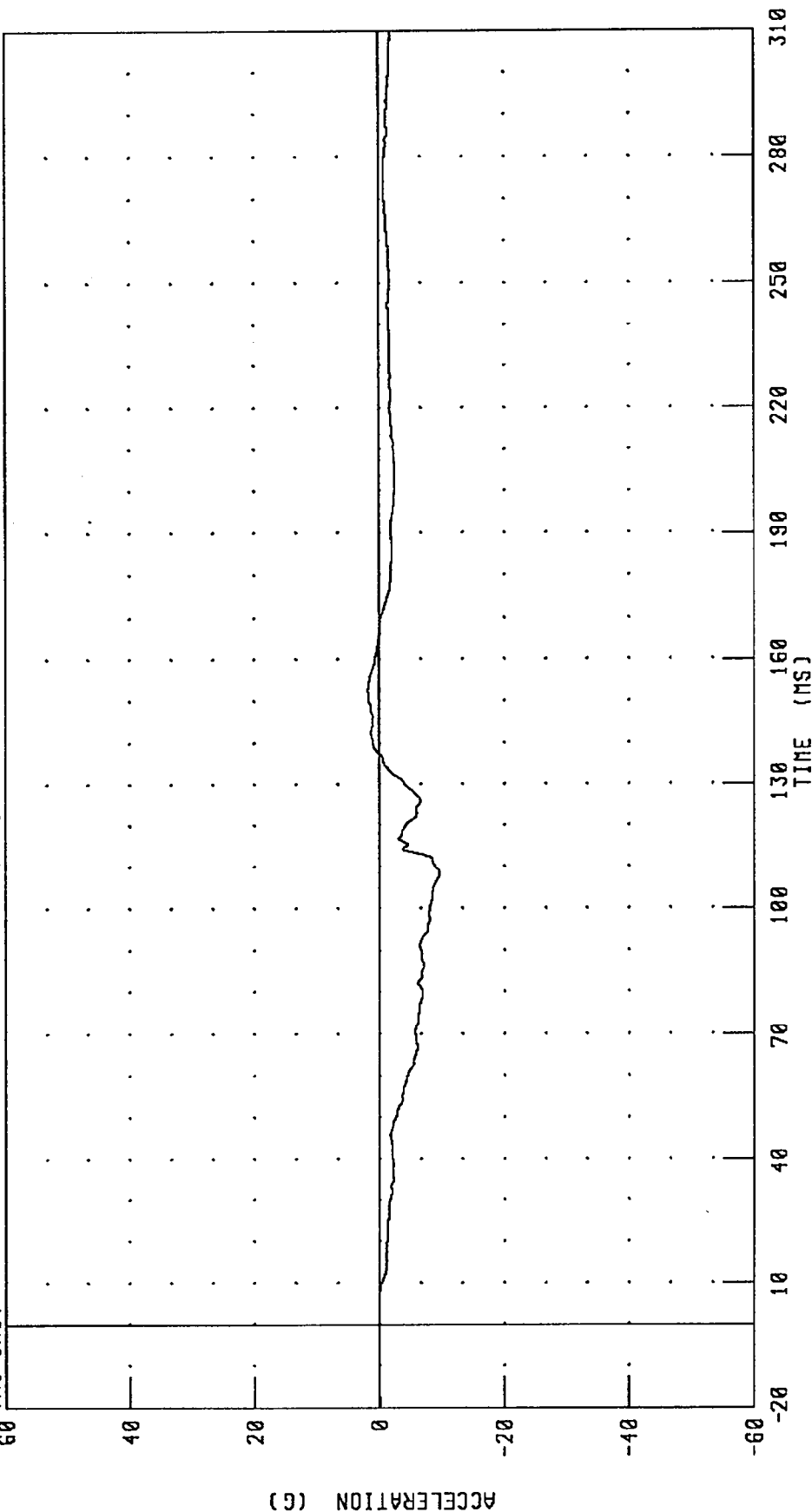
CHANNEL: CSTYG1 FILTER: CH. CLASS 180

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



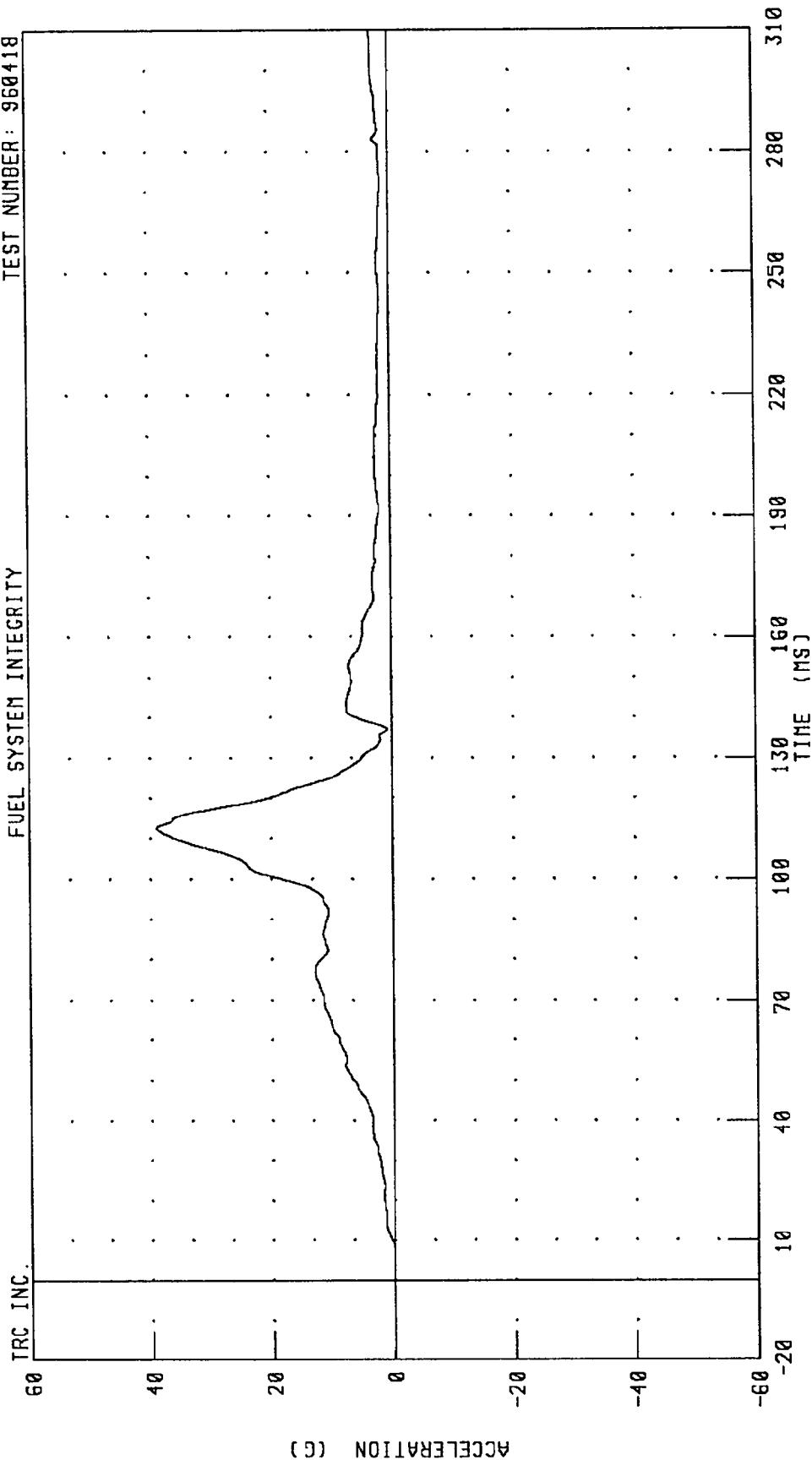
PEAK DATA: 1.80 G @ 152.64 MS; -9.63 G @ 108.32 MS

CHANNEL: CSTZG1 FILTER: CH. CLASS 180

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER CHEST RESULTANT ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

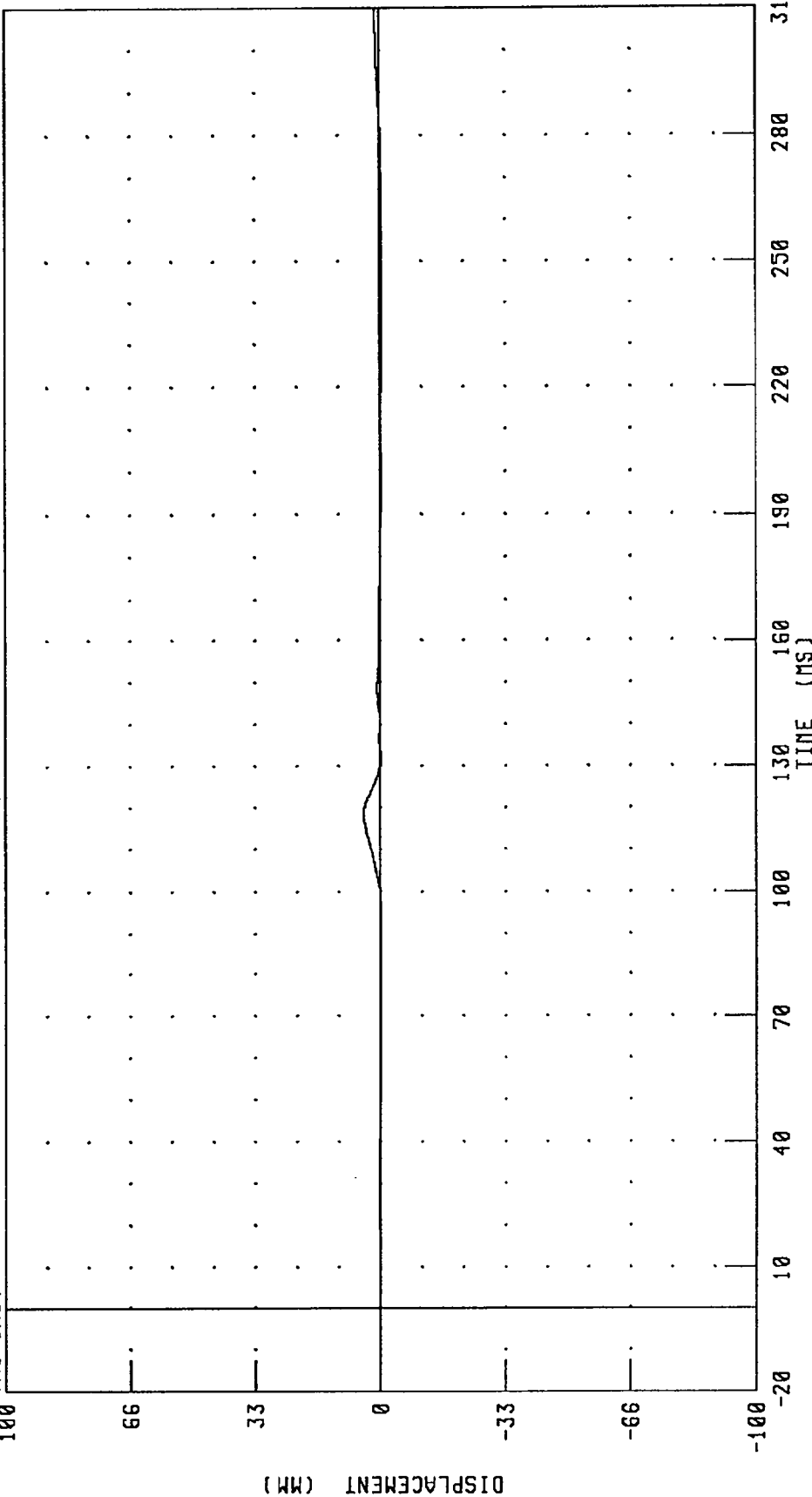
MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZN AT 80 KPH AND 70% OVERLAP

DRIVER CHEST DEFLECTION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

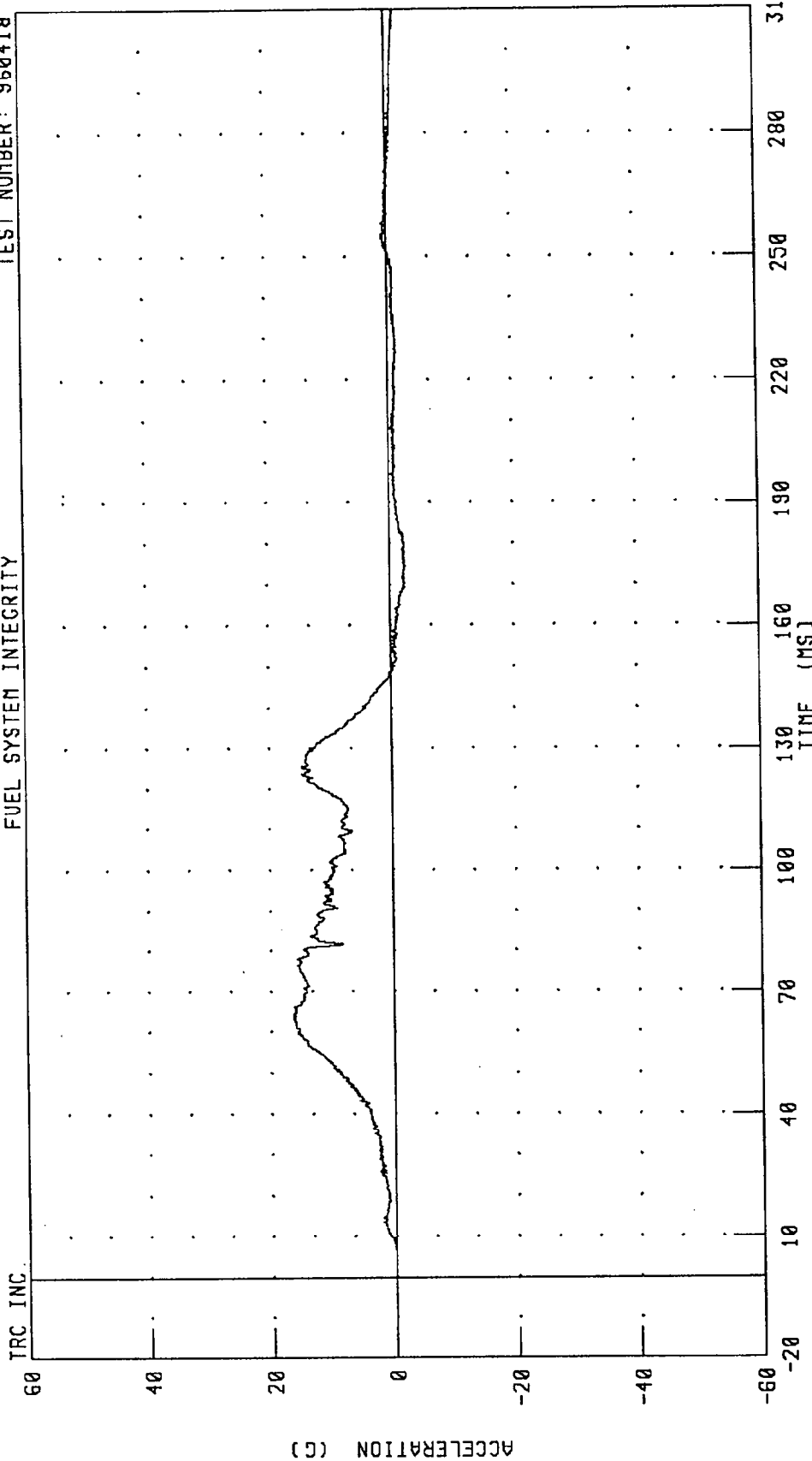
TRC INC.



CHANNEL: CSTX01 FILTER: CH. CLASS 180

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER PELVIS X-AXIS ACCELERATION
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418



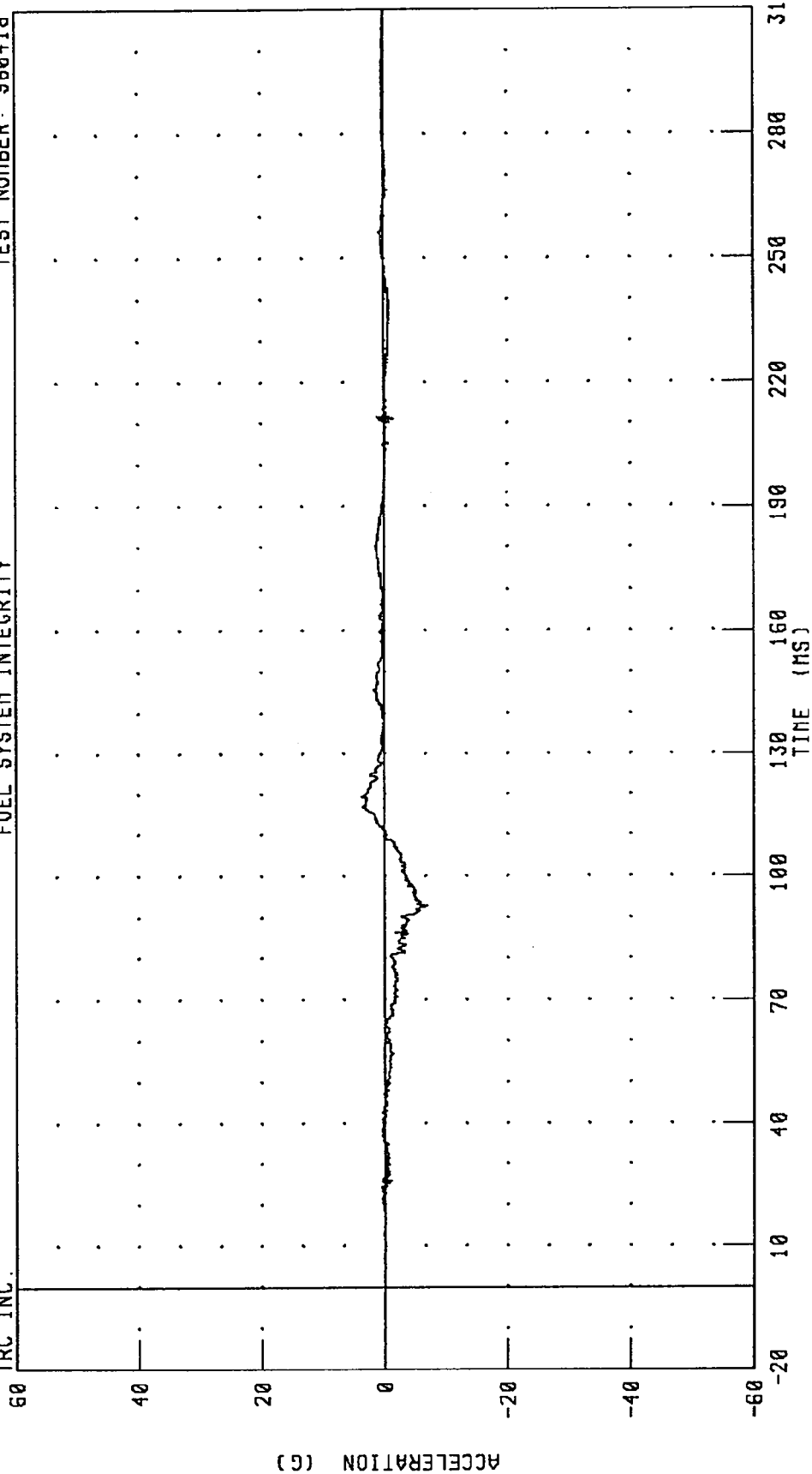
CHANNEL: PEVXG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 3.73 G @ 119.44 MS; -6.86 G @ 92.96 MS

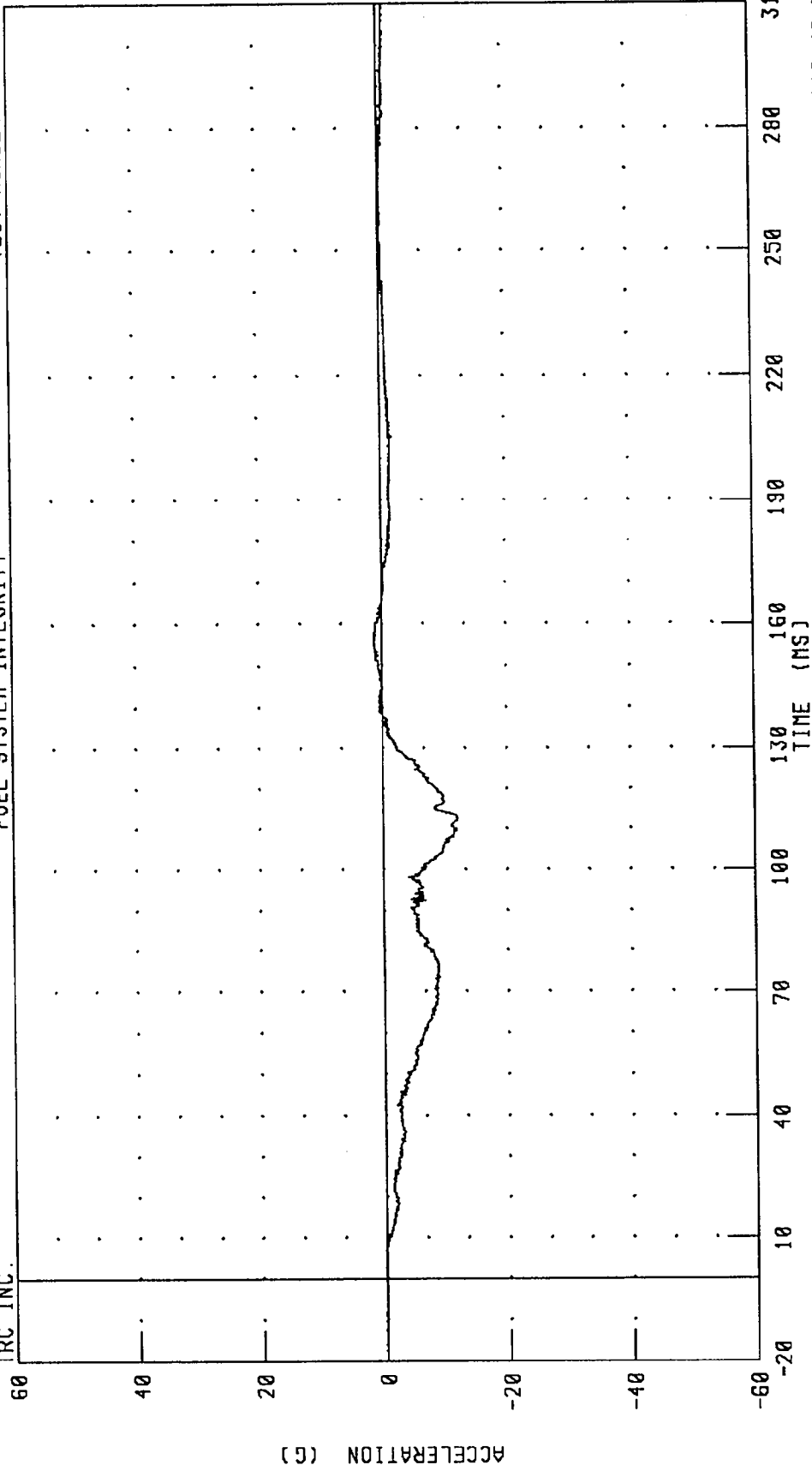
CHANNEL: PEVYG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER PELVIS Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



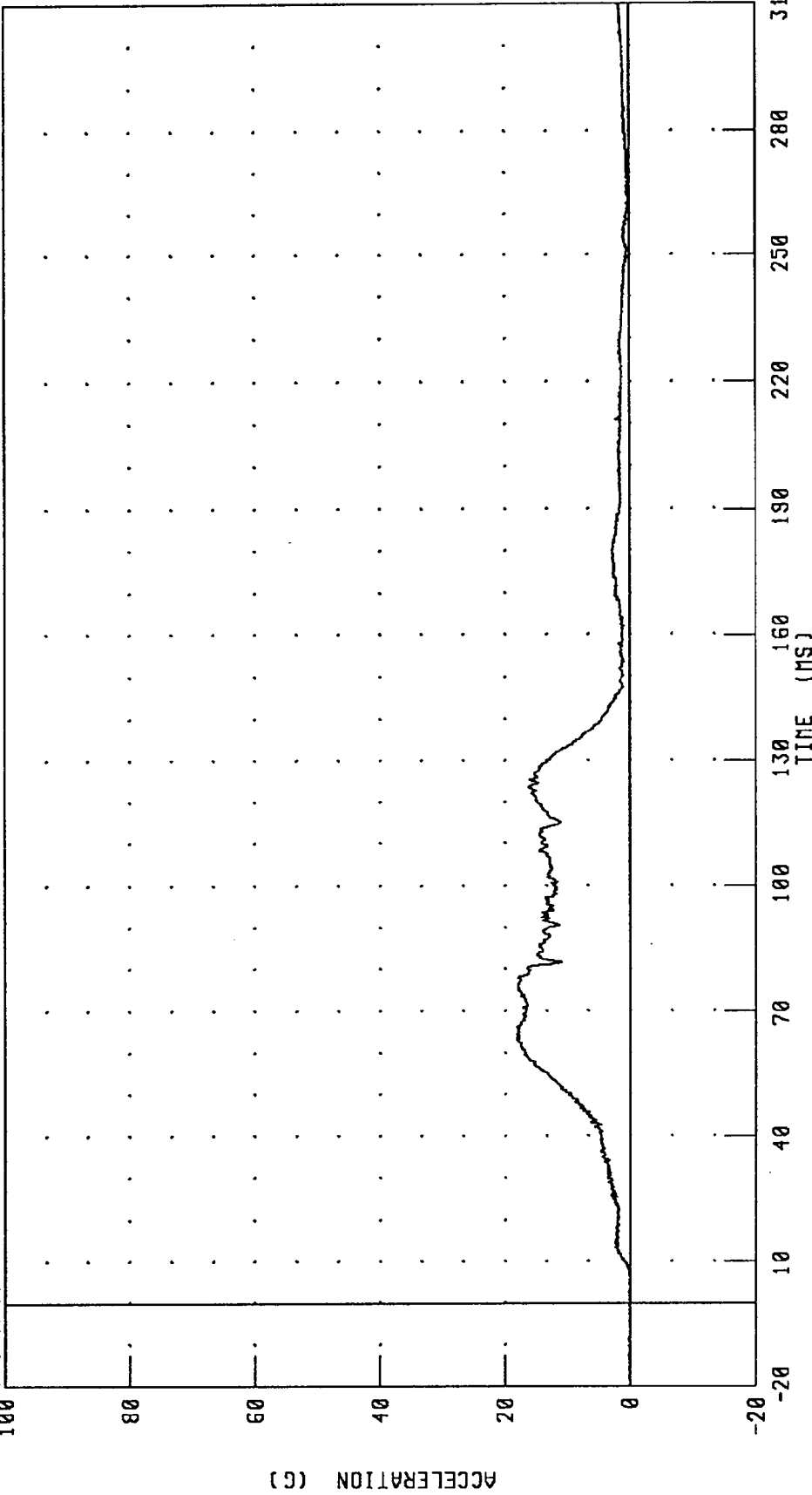
CHANNEL: PEVZG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZN AT 80 KPH AND 70% OVERLAP
 DRIVER PELVIS RESULTANT ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.

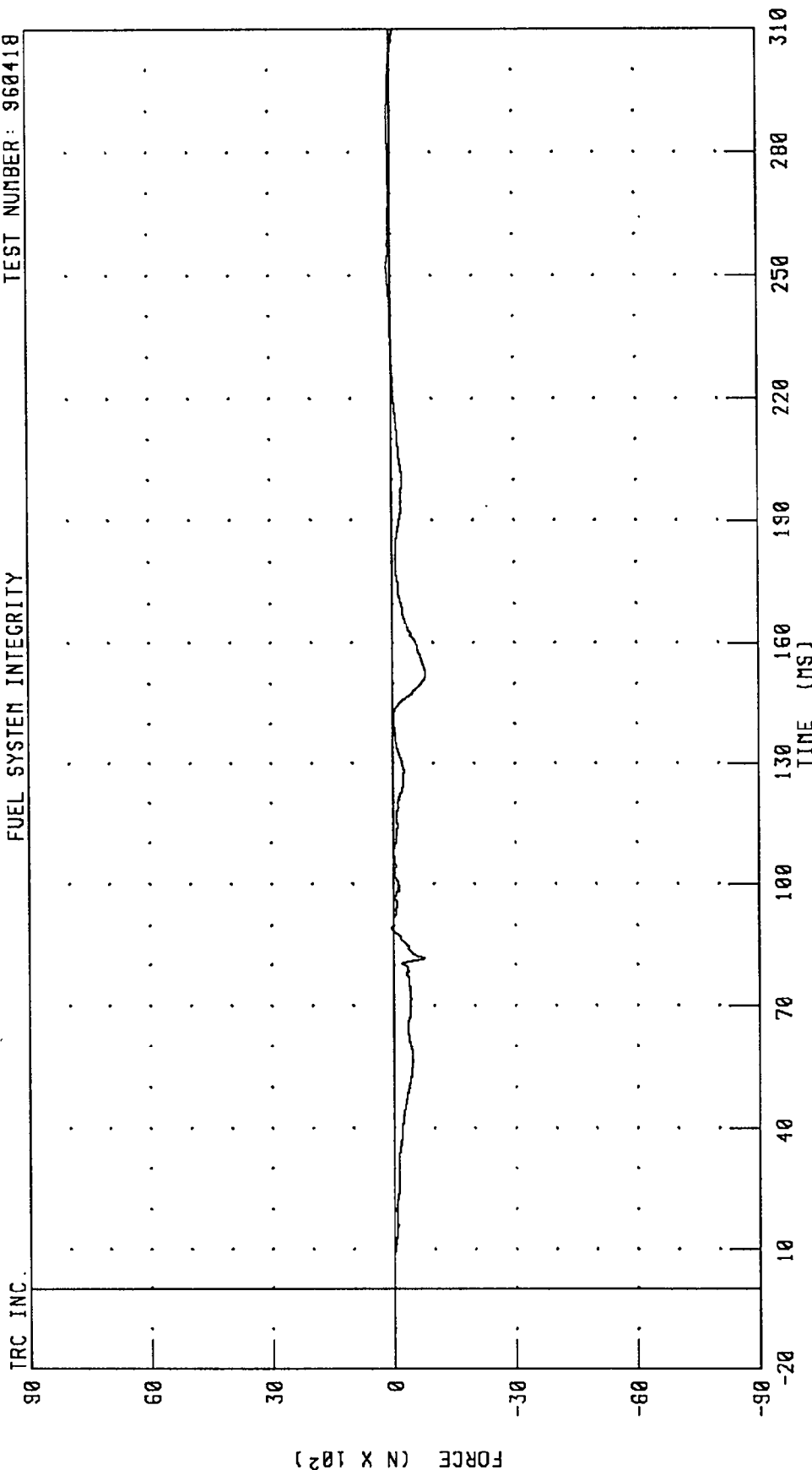


PEAK DATA: 18.25 G @ 64.48 MS; 0.01 G @ -19.84 MS

CHANNEL: PEVRG1 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER LEFT FEMUR FORCE
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418



PEAK DATA: 102.80 N @ 252.16 MS; -822.00 N @ 152.48 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP

DRIVER RIGHT FEMUR FORCE

FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418

TRC INC.

90

60

30

0

-30

-60

-90

FORCE (N X 10²)

TIME (MS)

10 40 70 100 130 160 190 220 250 280 310

PEAK DATA: 143.97 N @ 155.76 MS; -696.69 N @ 99.12 MS

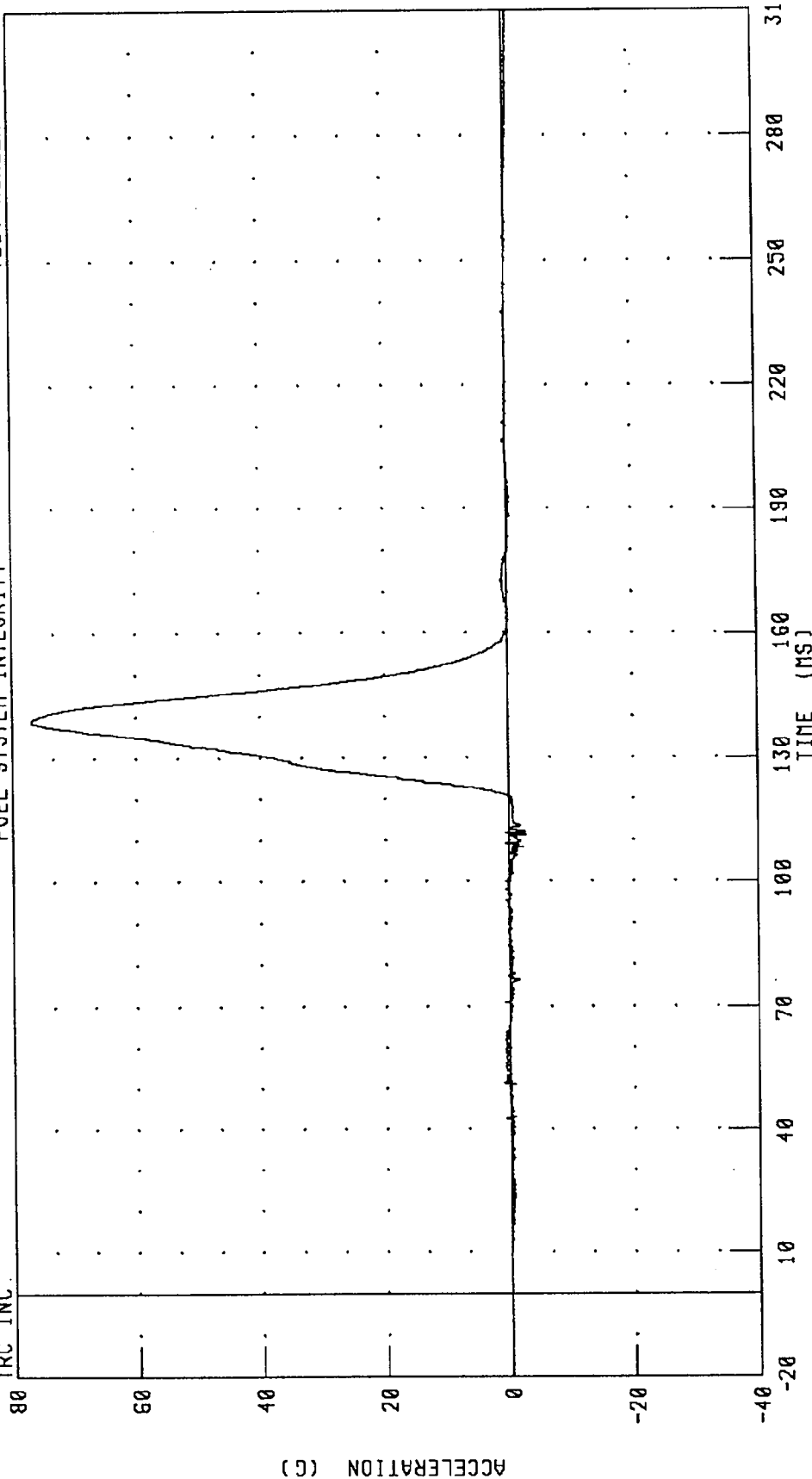
CHANNEL: RFMF1 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



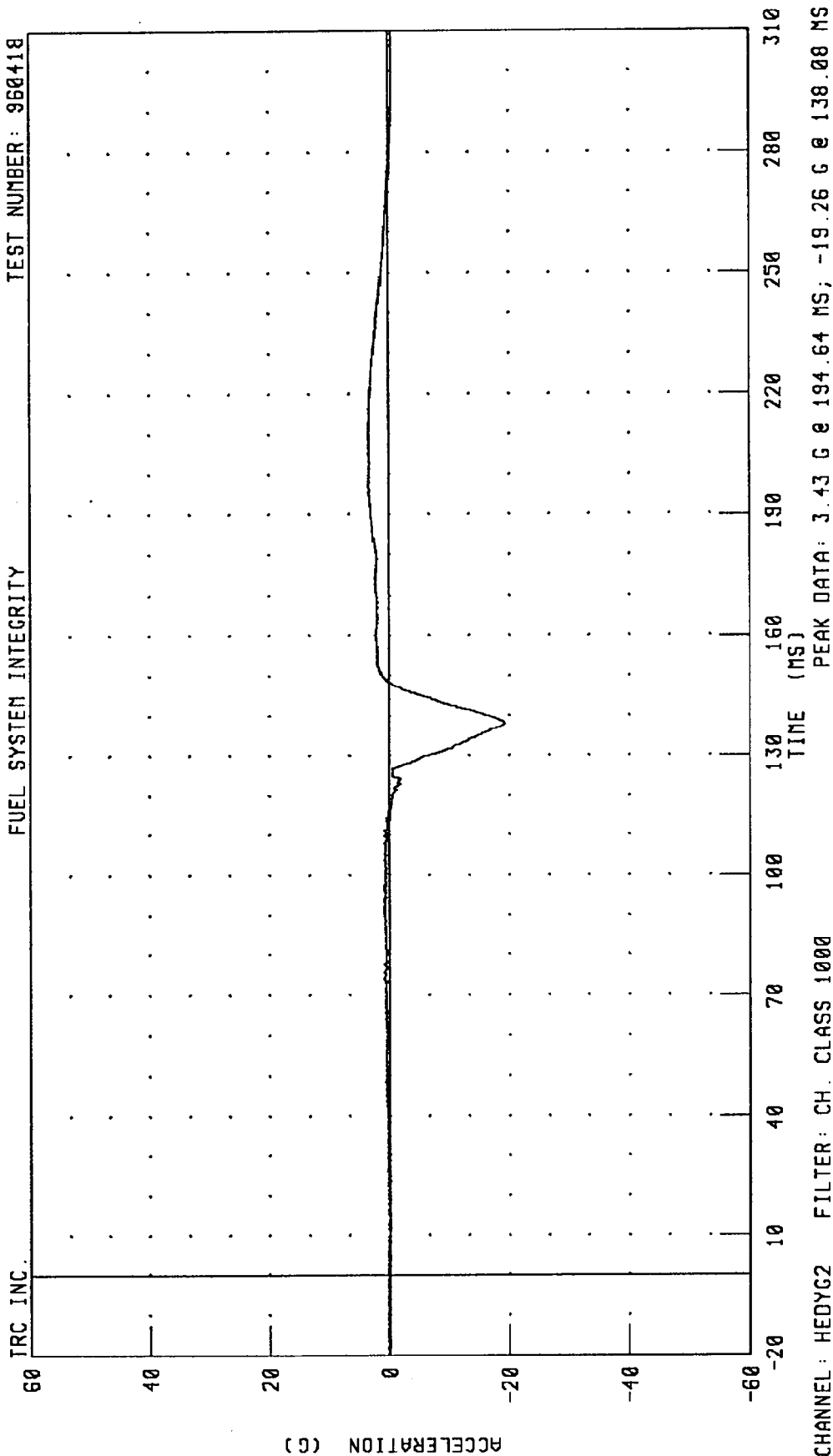
CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

PEAK DATA: 76.88 G @ 138.88 MS; -2.65 G @ 111.52 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

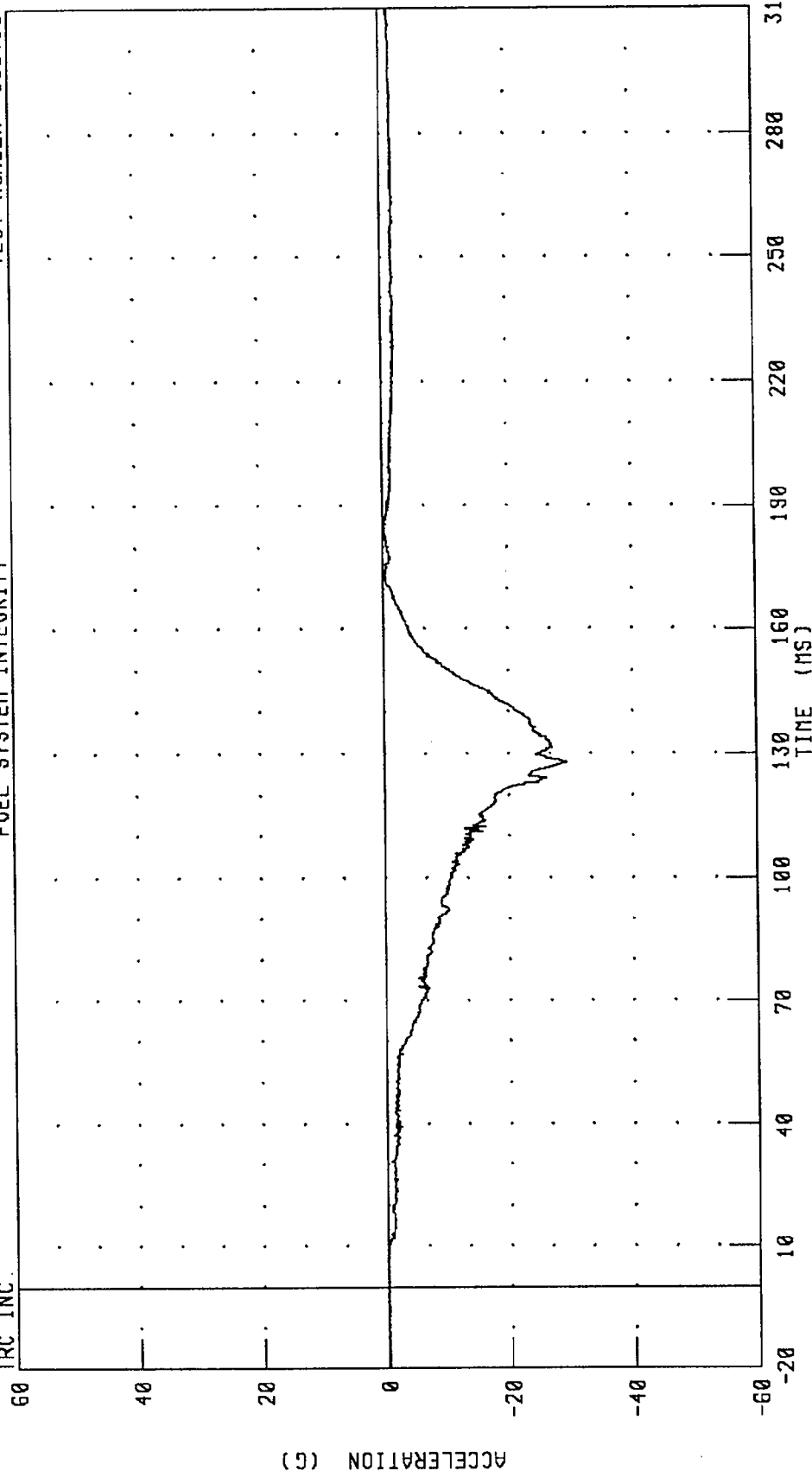
PEAK DATA: 3.43 G @ 194.64 MS; -19.26 G @ 138.08 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.

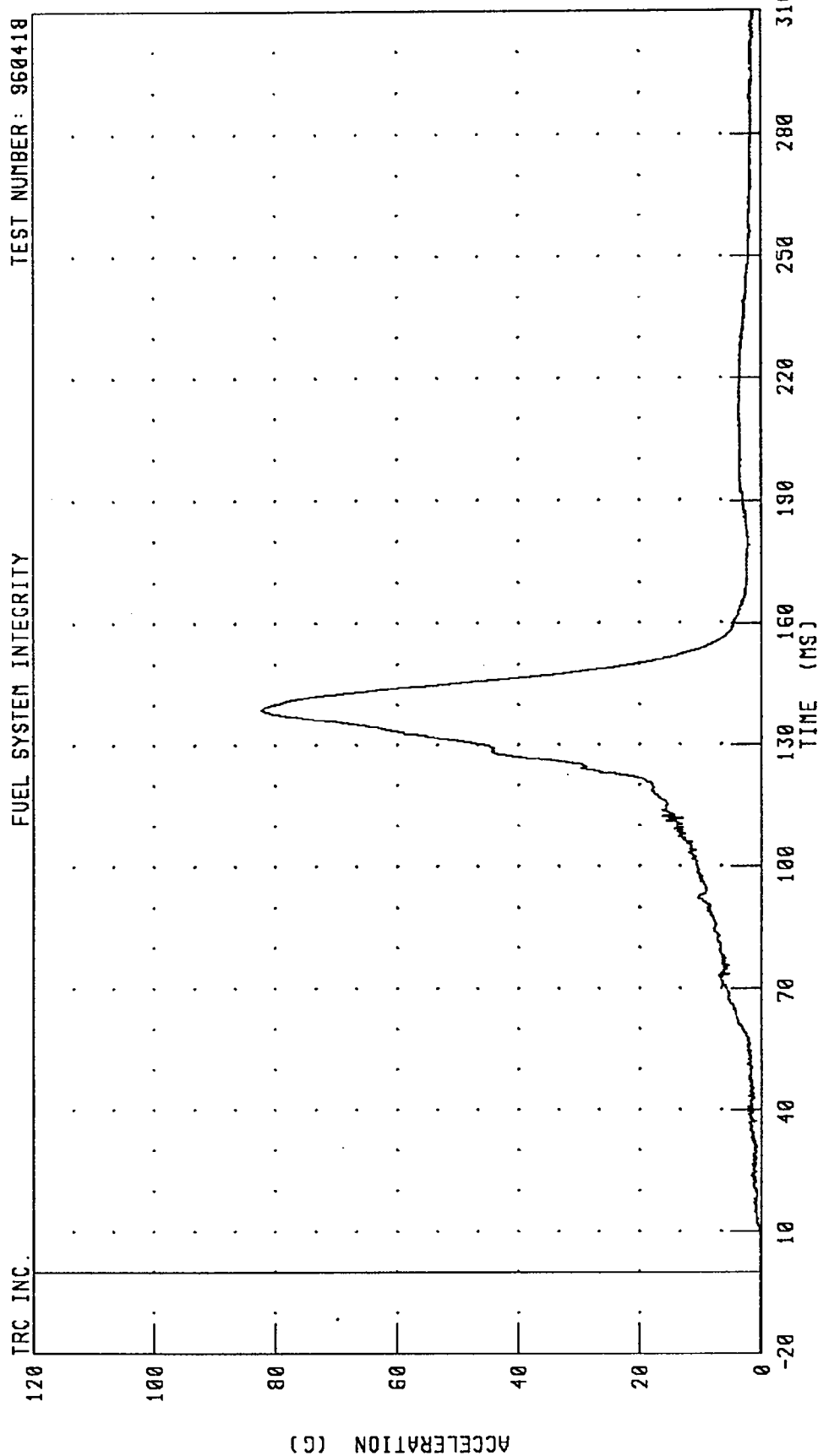


PEAK DATA: 0.05 G @ -19.68 MS; -29.40 G @ 127.92 MS

CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418

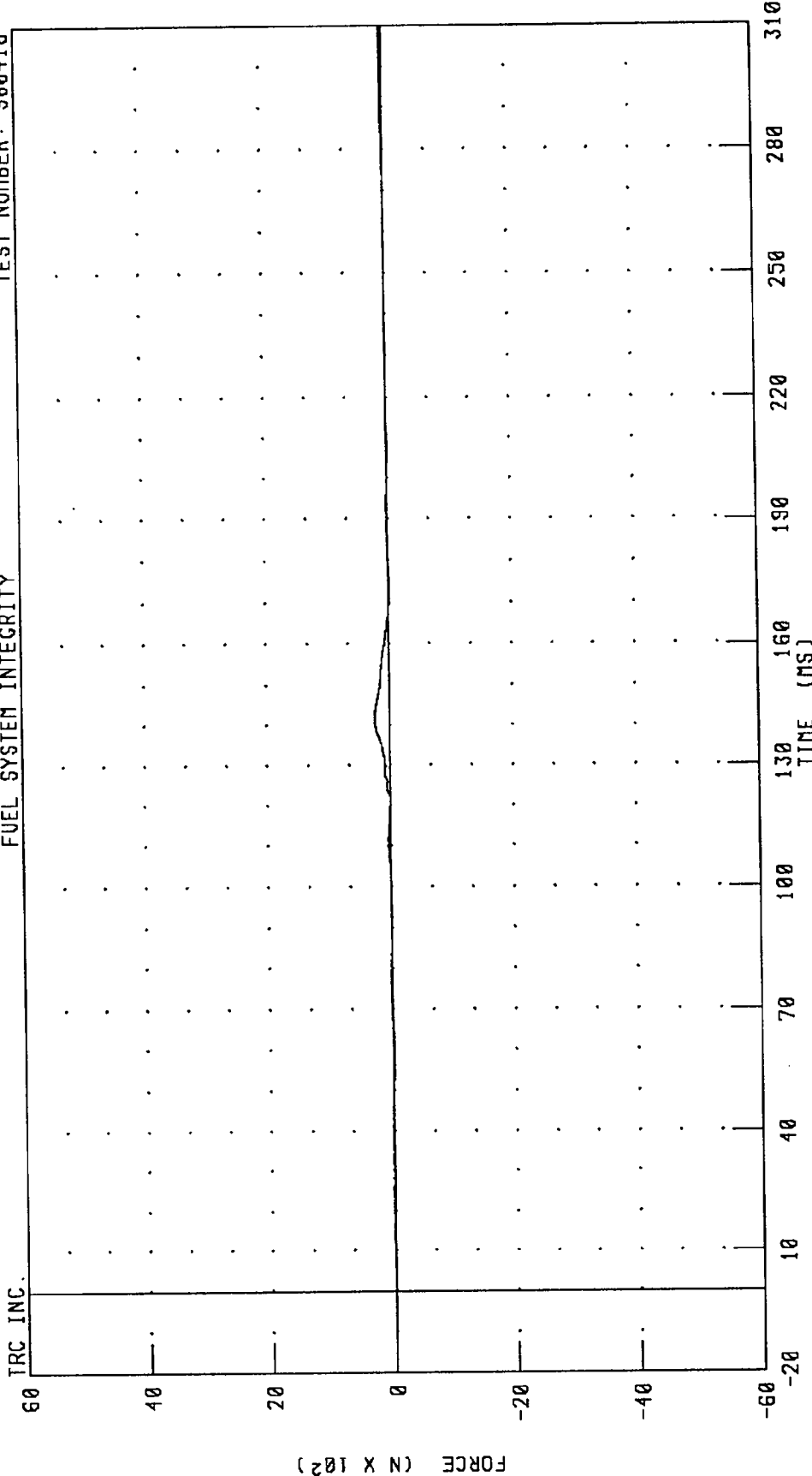


CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER UPPER NECK X-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 237.19 N @ 140.24 MS; -23.45 N @ 57.68 MS

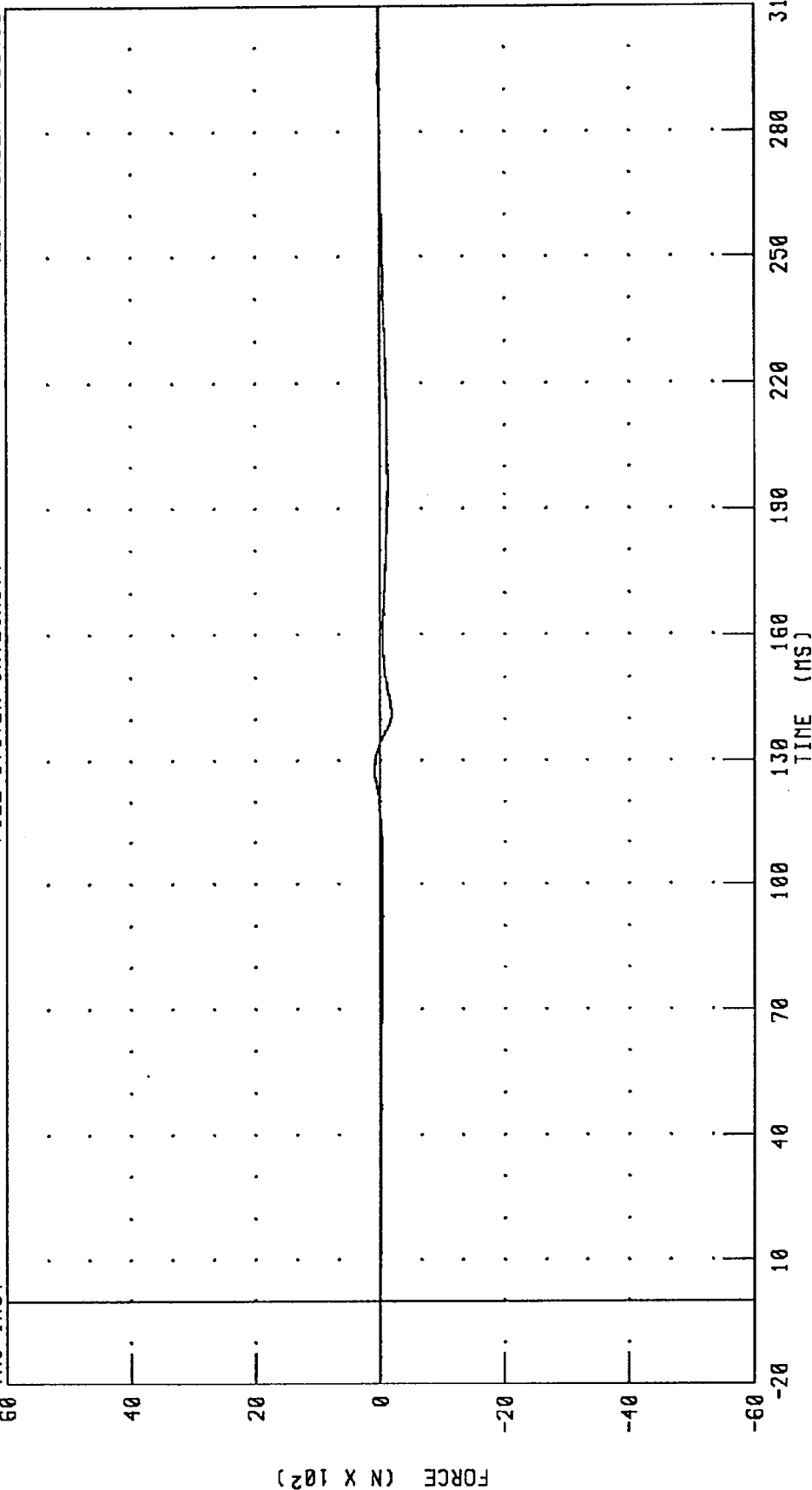
CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER UPPER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 92.06 N @ 126.96 MS; -181.98 N @ 141.12 MS

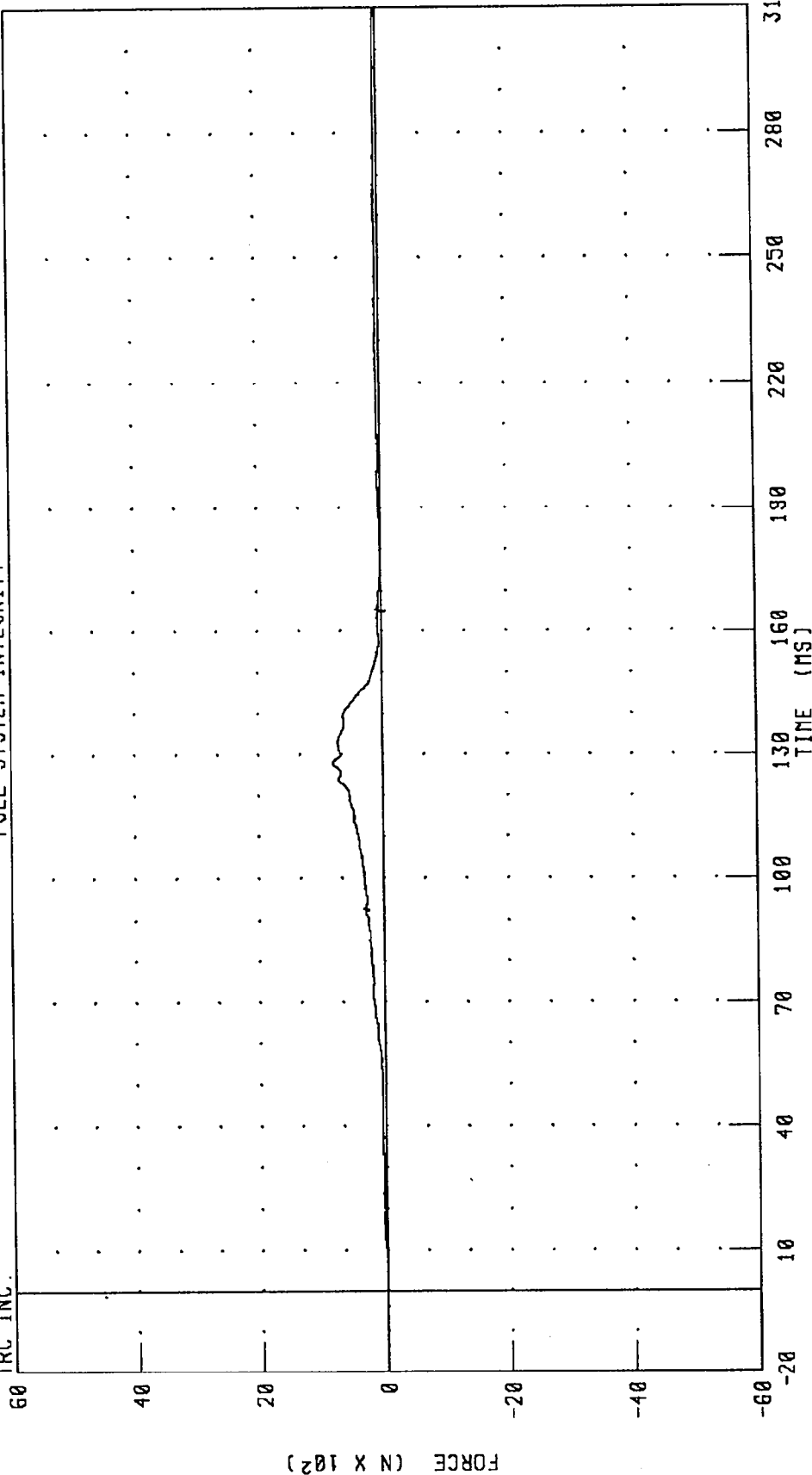
CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 78% OVERLAP
 RIGHT FRONT PASSENGER UPPER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

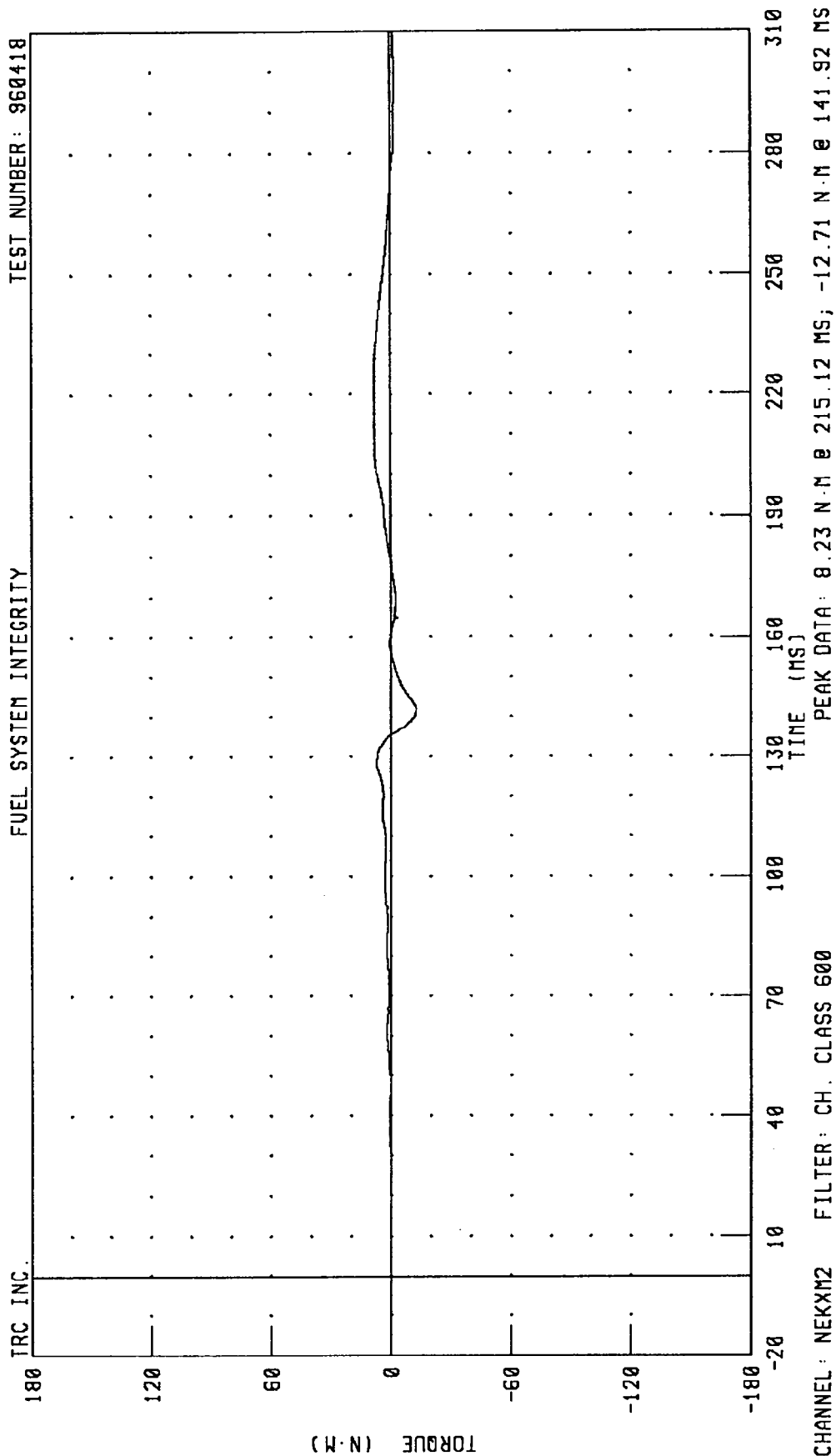
IRC INC.



PEAK DATA: 807.35 N @ 127.92 MS; -70.49 N @ 165.20 MS

CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

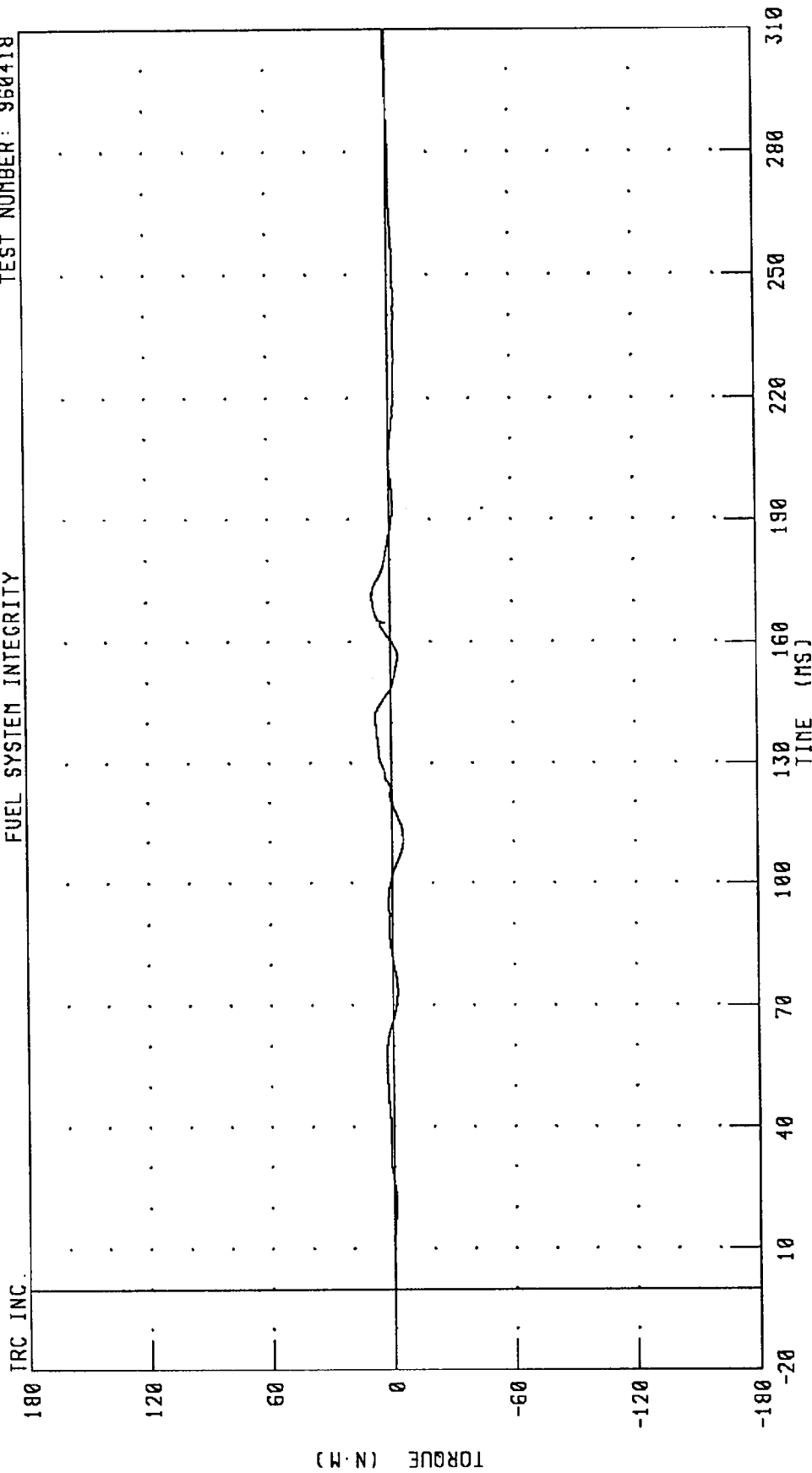
MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT X-AXIS



MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT Y-AXIS

TEST NUMBER: 950418

FUEL SYSTEM INTEGRITY



PEAK DATA: 9.01 N·m @ 171.44 ms; -5.43 N·m @ 110.80 ms

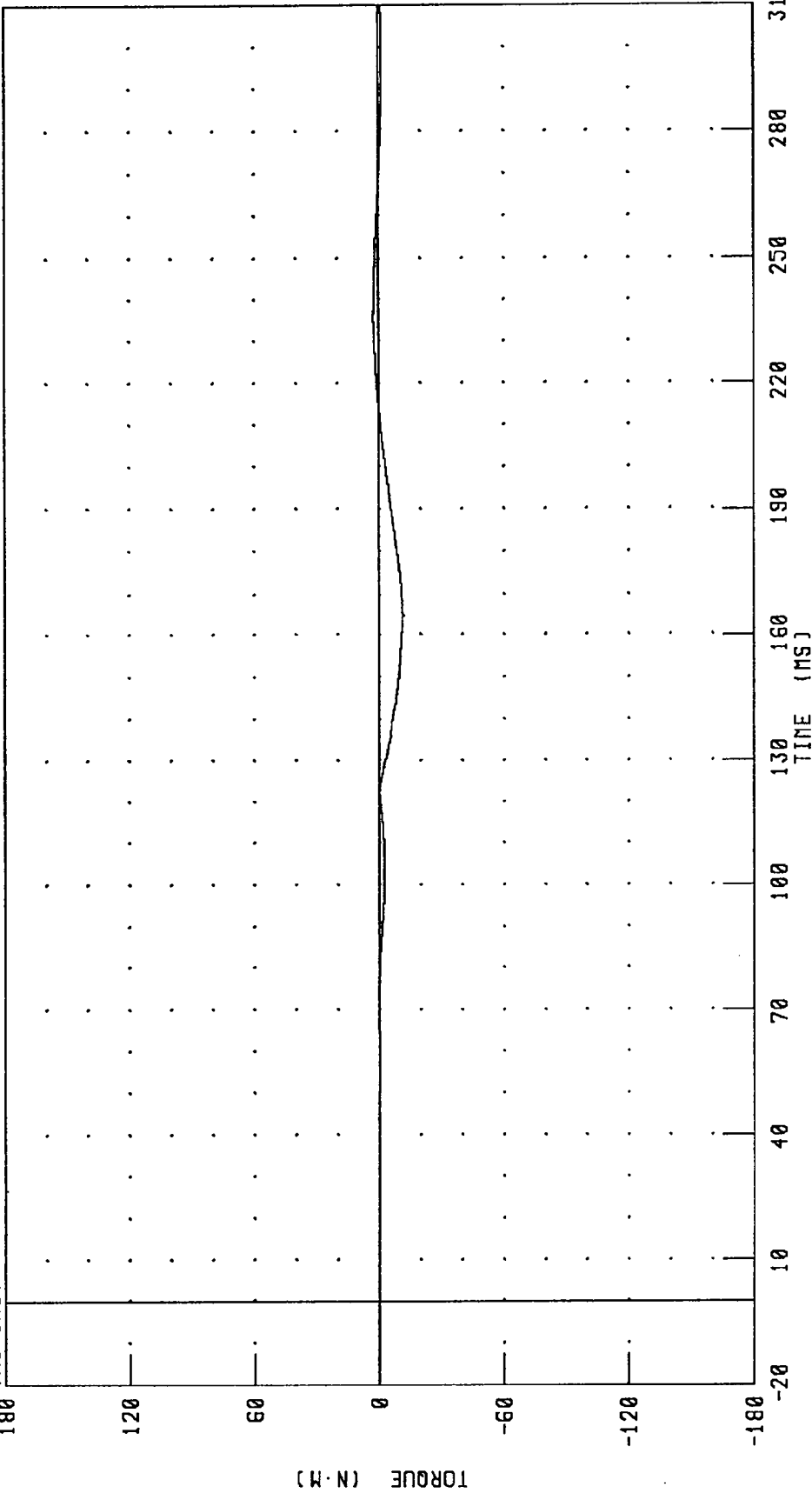
CHANNEL: NEKYM2 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER UPPER NECK MOMENT ABOUT Z-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

IRC INC.



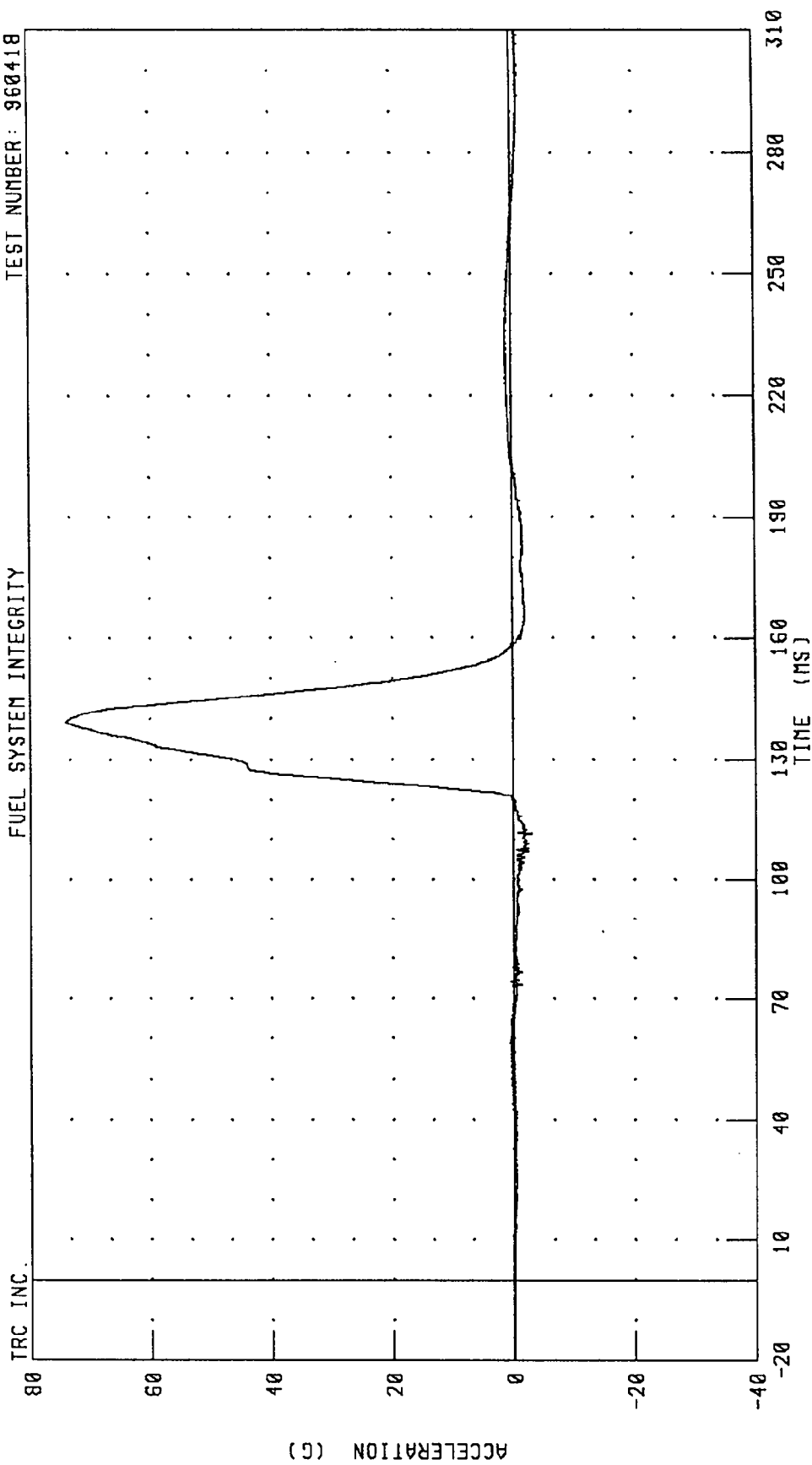
PEAK DATA: 2.33 N·M @ 234.96 MS; -12.00 N·M @ 165.12 MS

CHANNEL: NEKZM2 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 1 X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



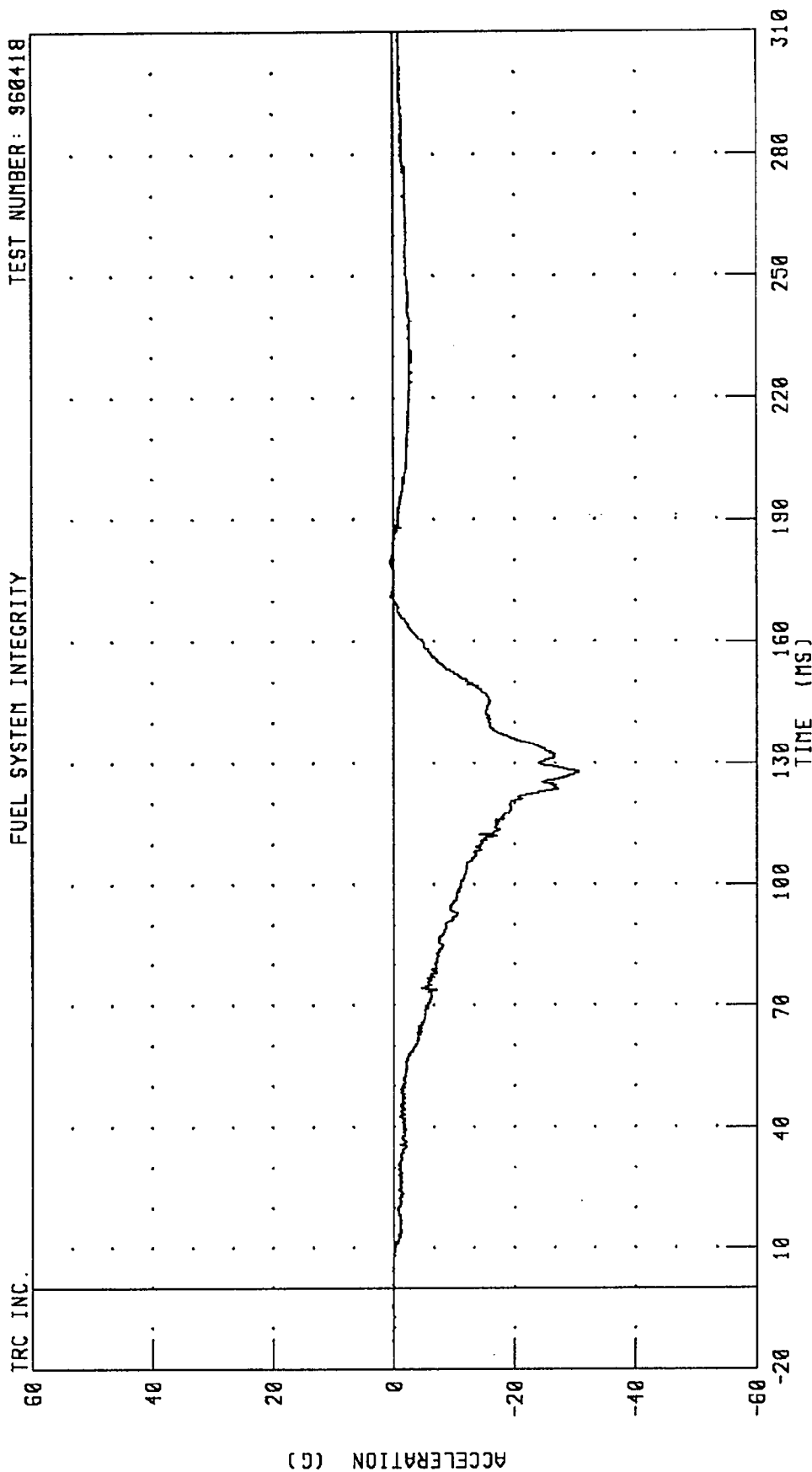
PEAK DATA: 74.00 G @ 139.20 MS; -3.02 G @ 111.52 MS

CHANNEL: HD1XG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER HEAD POSITION 1 Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



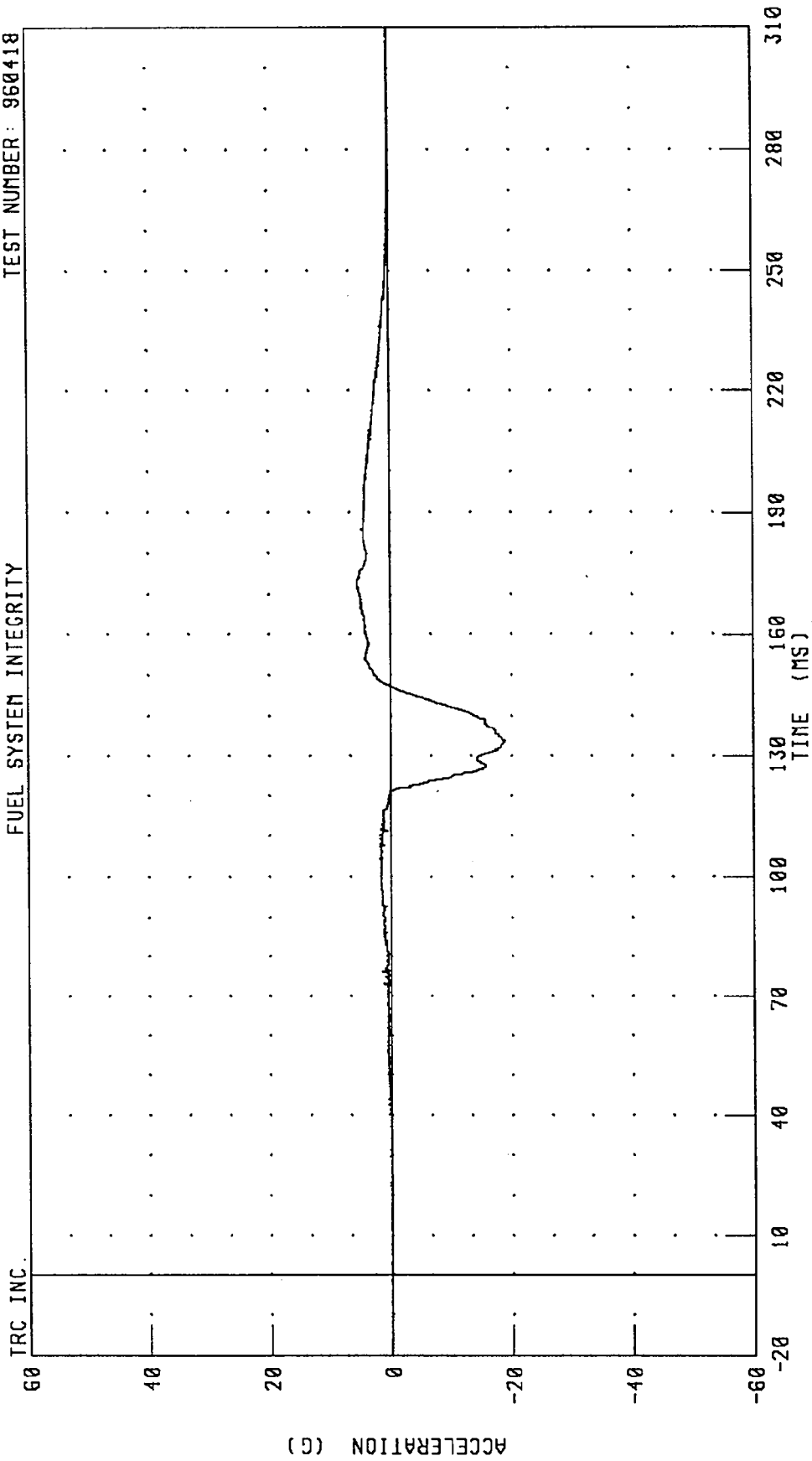
CHANNEL: HD1ZG2 FILTER: CH. CLASS 1000

PEAK DATA: 0.59 G @ 171.20 MS; -30.72 G @ 127.76 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER HEAD POSITION 2 Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 5.47 G @ 171.36 MS; -18.87 G @ 133.52 MS

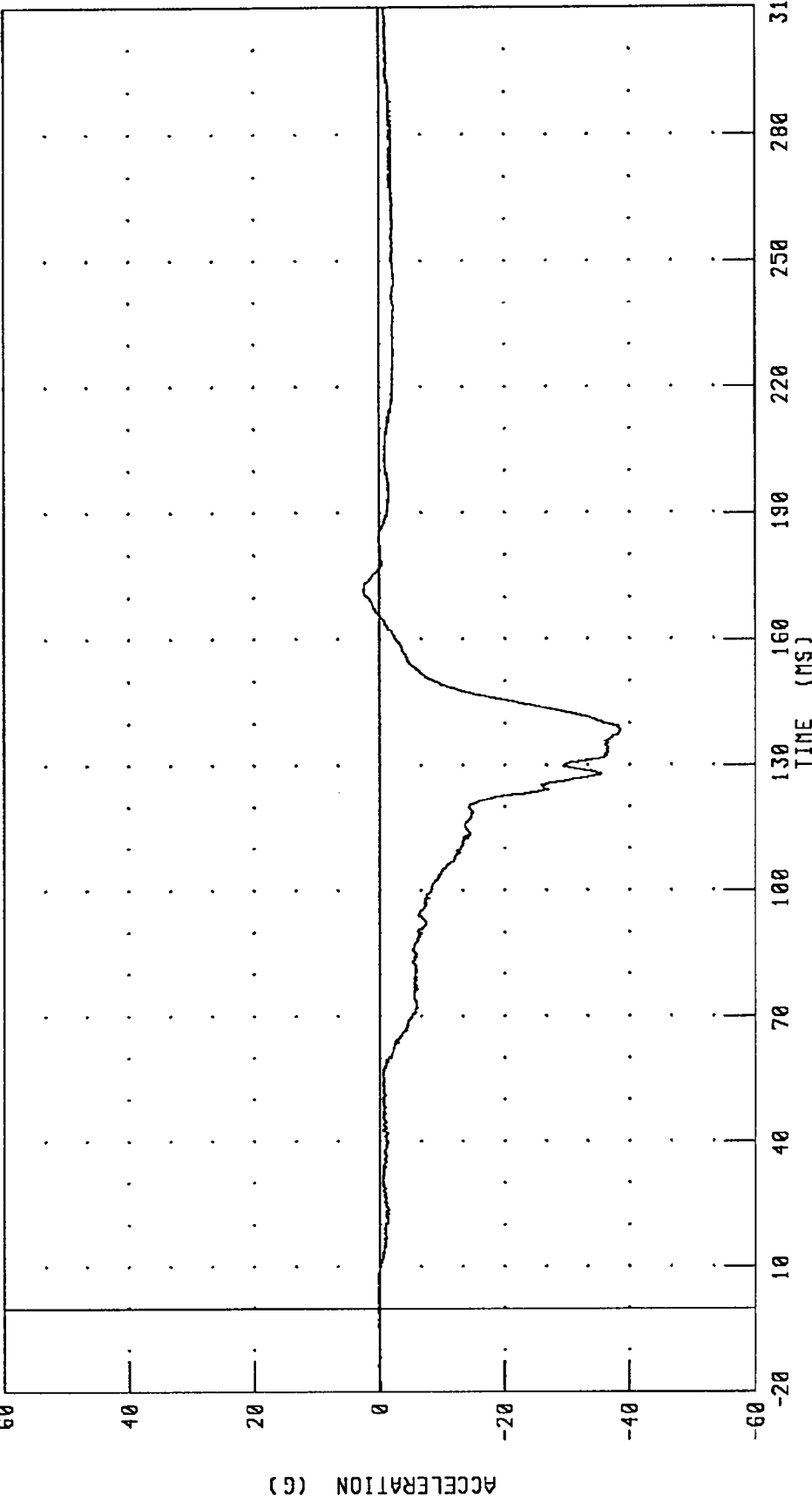
CHANNEL: HD2YG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER HEAD POSITION 2 Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 2.53 G @ 171.28 MS; -38.67 G @ 138.40 MS

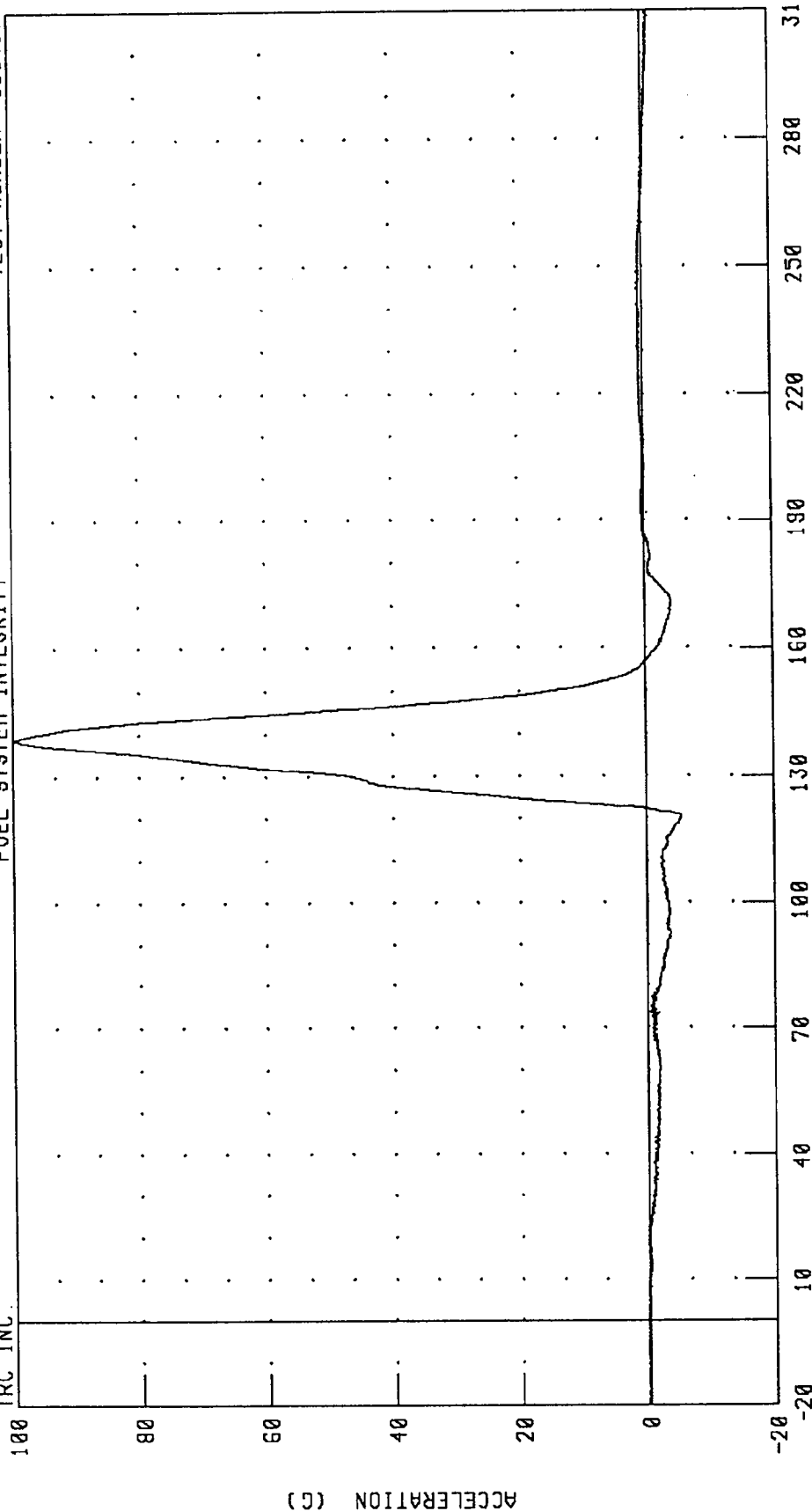
CHANNEL: HD2262 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER HEAD POSITION 3 X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: HD3XG2 FILTER: CH. CLASS 1000

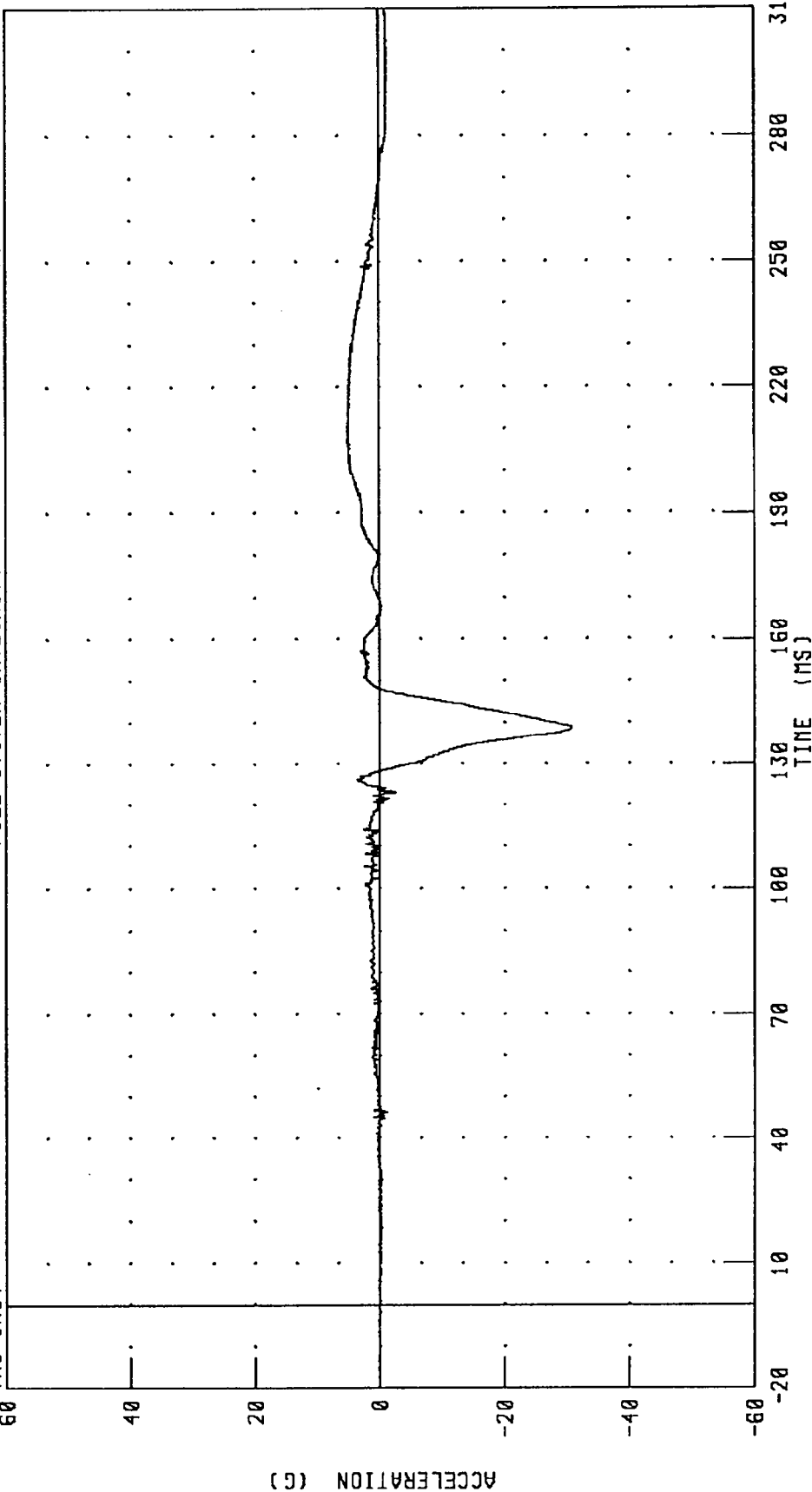
PEAK DATA: 99.68 G @ 138.88 MS; -5.39 G @ 119.92 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER HEAD POSITION 3 Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

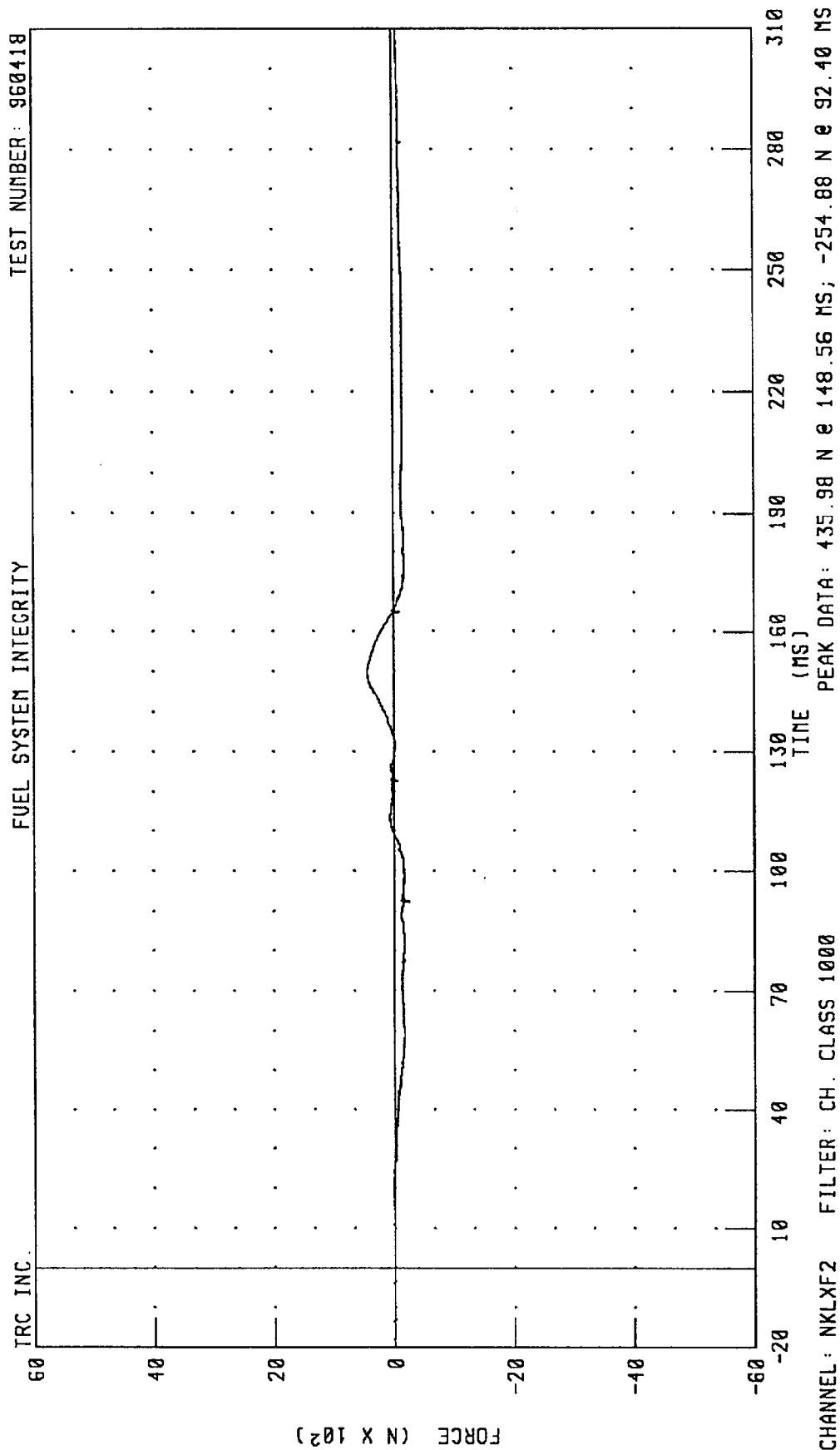
TRC INC.



CHANNEL: HD3YG2 FILTER: CH. CLASS 1000

PEAK DATA: 5.10 G @ 205.92 MS; -30.84 G @ 138.56 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER LOWER NECK X-AXIS SHEAR FORCE

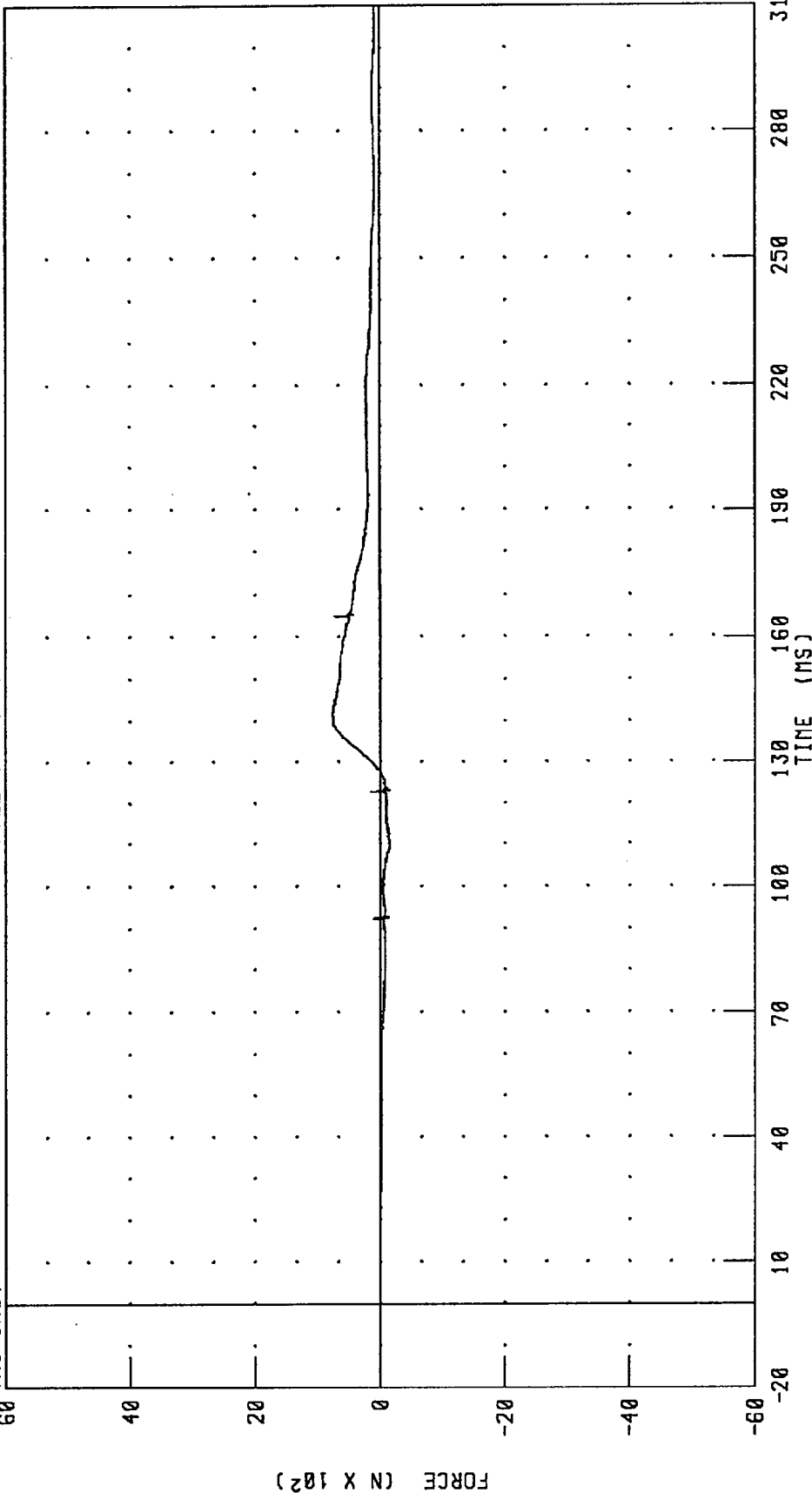


MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER LOWER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



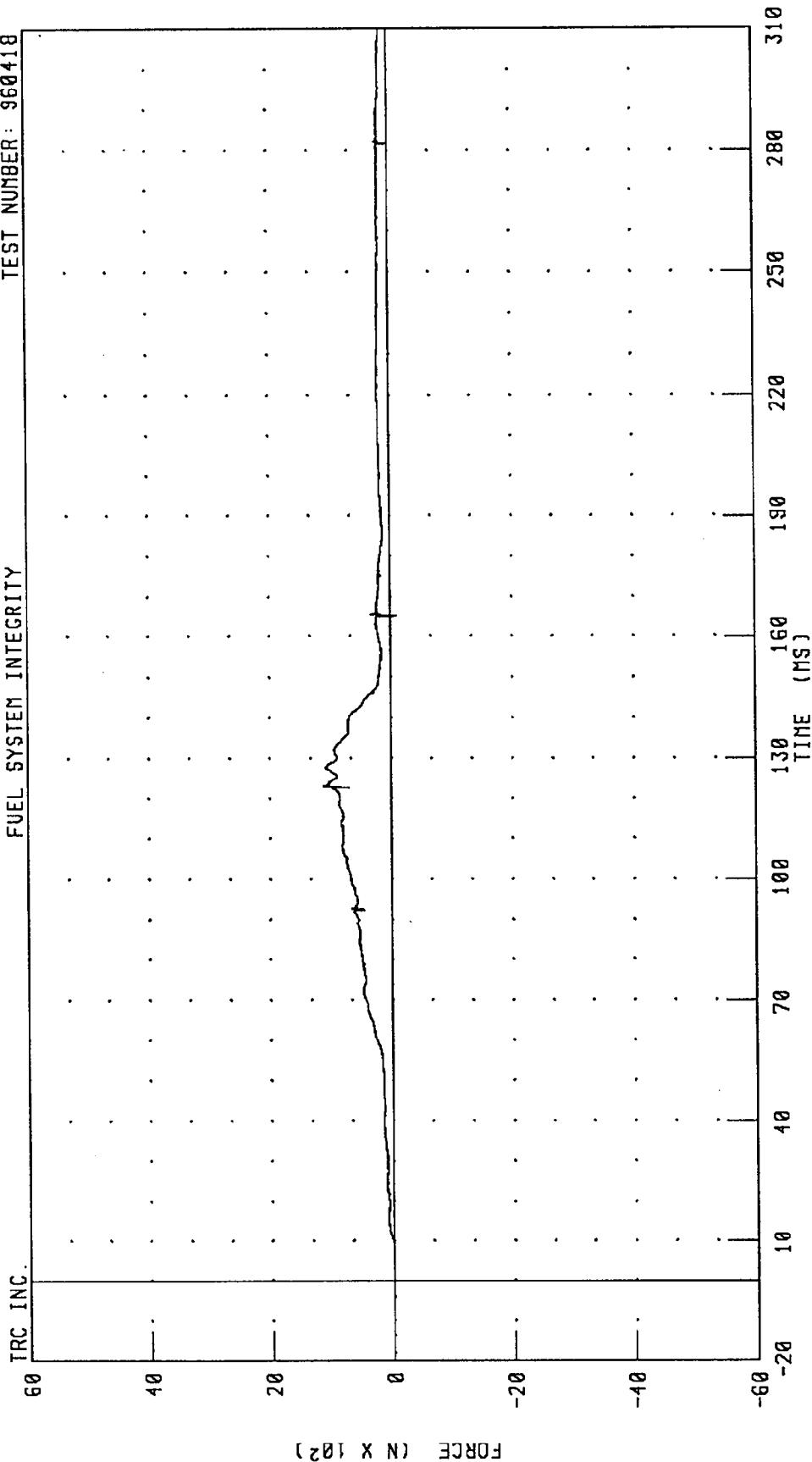
PEAK DATA: 770.50 N @ 141.60 MS; -155.86 N @ 123.12 MS

CHANNEL: NKLYF2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

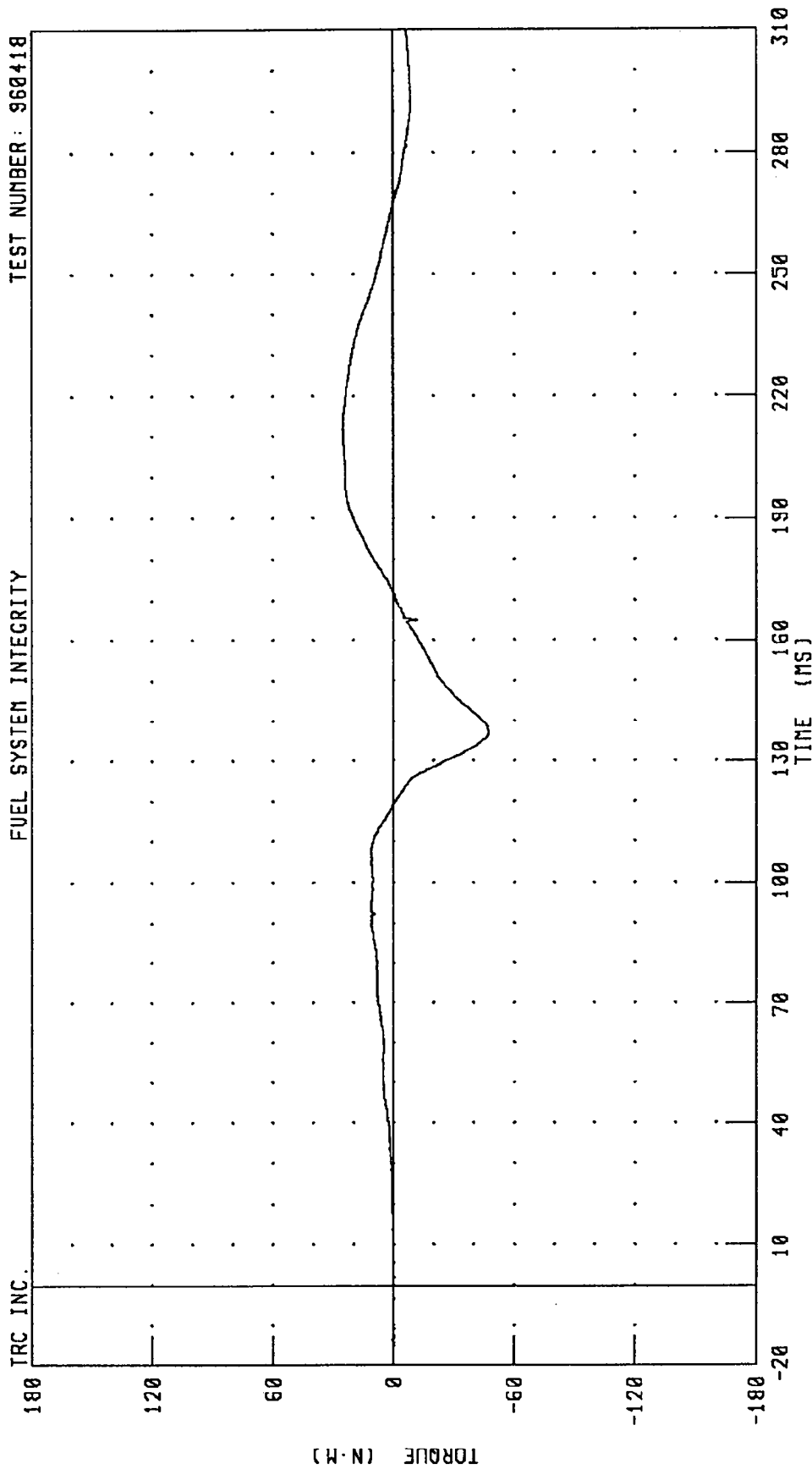


CHANNEL: NKLZF2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT X-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 25.21 N·M @ 211.76 MS; -47.13 N·M @ 137.12 MS

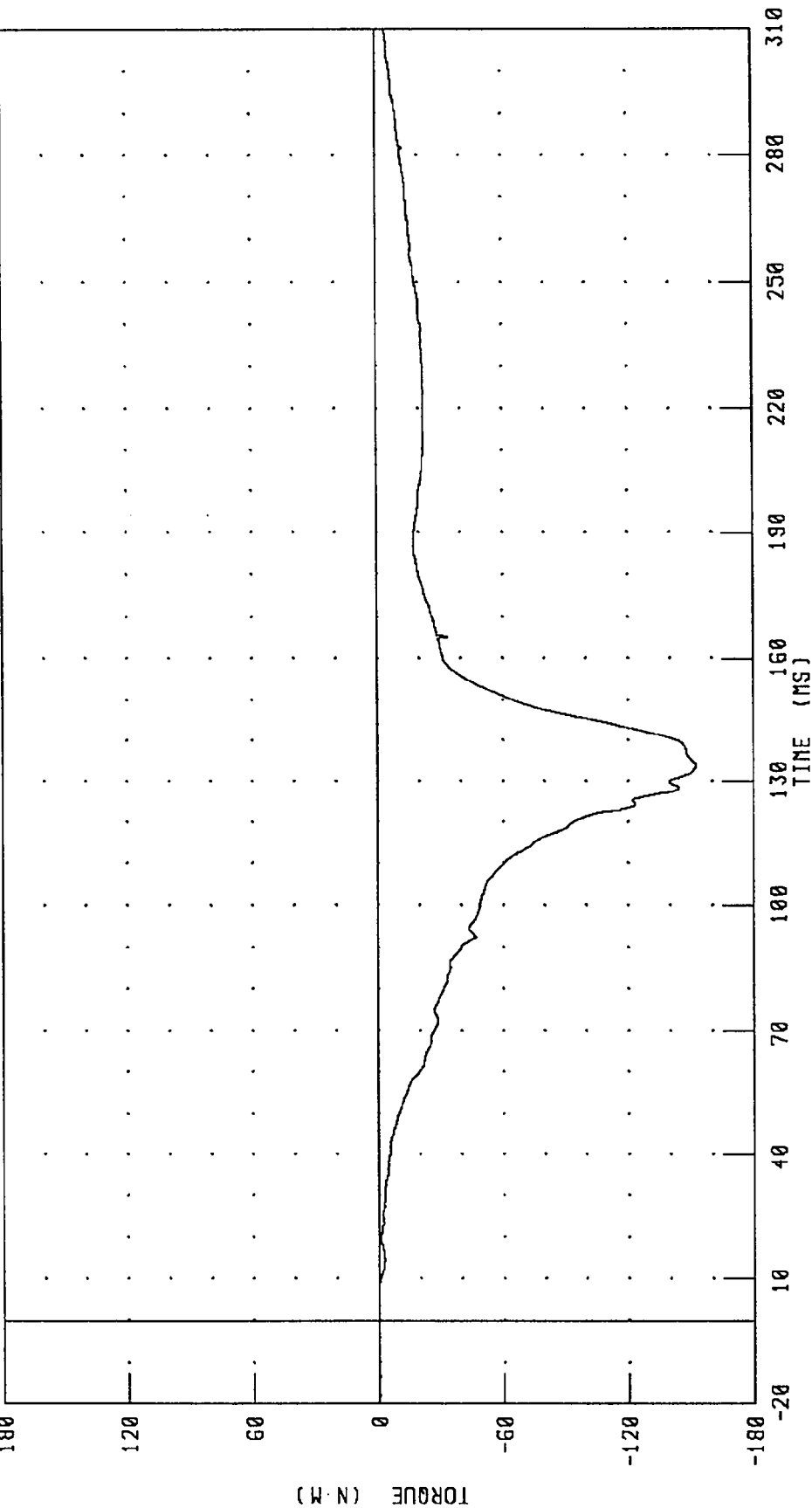
CHANNEL: NKLXM2 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT Y-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: NKLYM2 FILTER: CH. CLASS 600

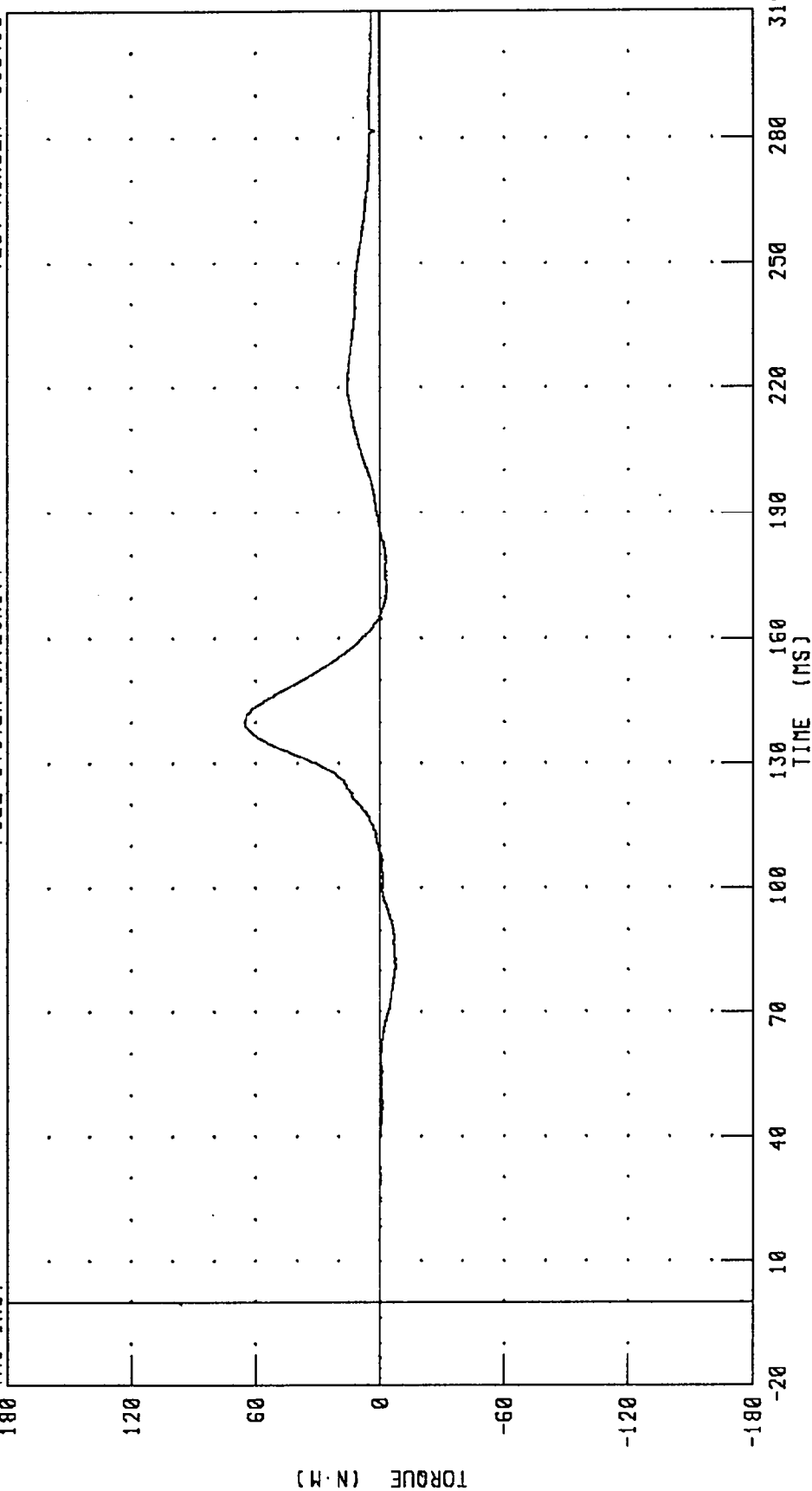
PEAK DATA: 0.18 N.M @ -11.12 MS; -152.36 N.M @ 133.68 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER LOWER NECK MOMENT ABOUT Z-AXIS

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 65.43 N.M @ 140.24 MS; -7.40 N.M @ 81.44 MS

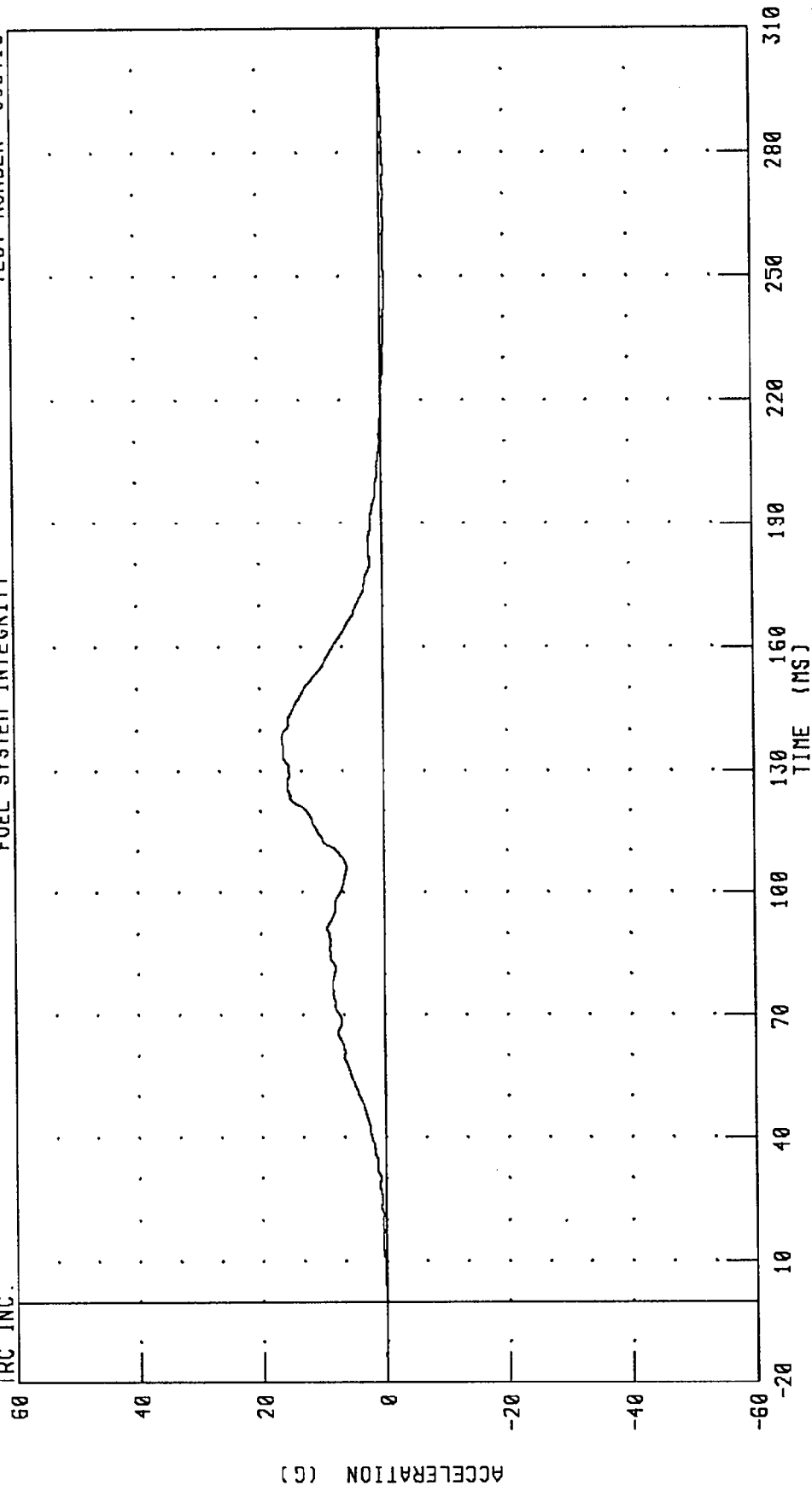
CHANNEL: NKLZM2 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



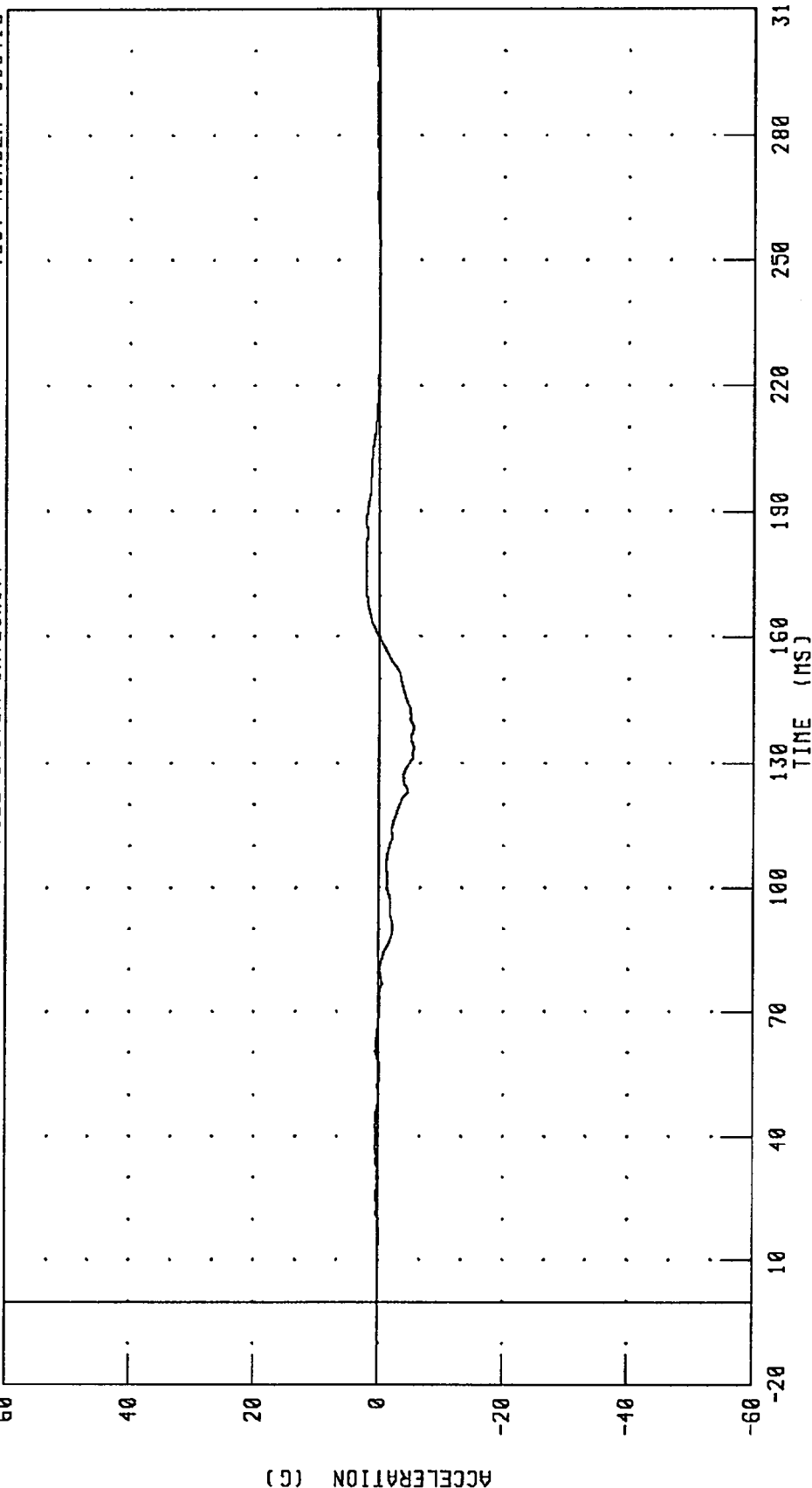
CHANNEL: CSTXG2 FILTER: CH. CLASS 180

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: CSTYG2 FILTER: CH. CLASS 180

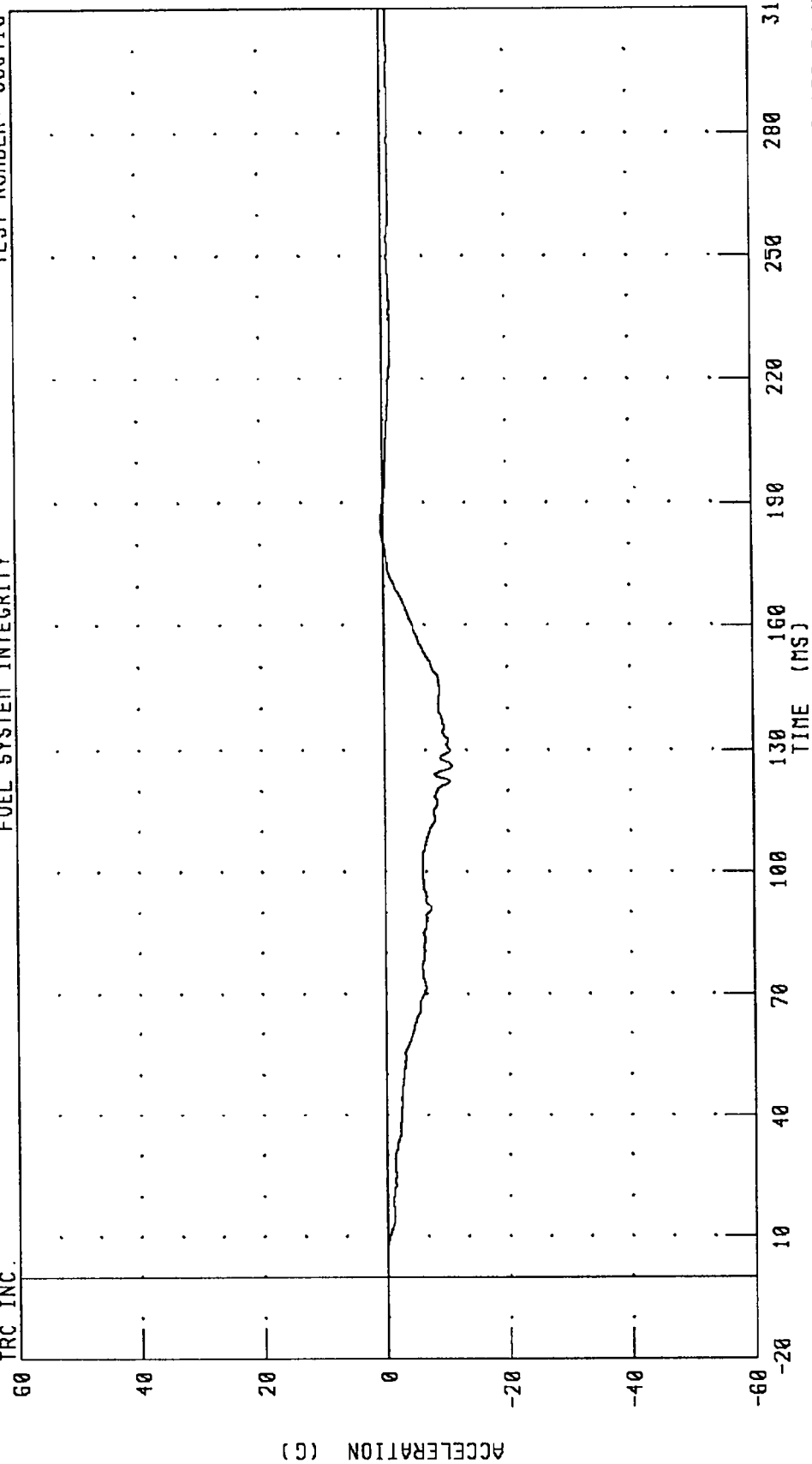
PEAK DATA: 2.06 G @ 188.24 MS; -5.62 G @ 138.48 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 0.38 G @ 184.16 MS; -10.93 G @ 126.24 MS

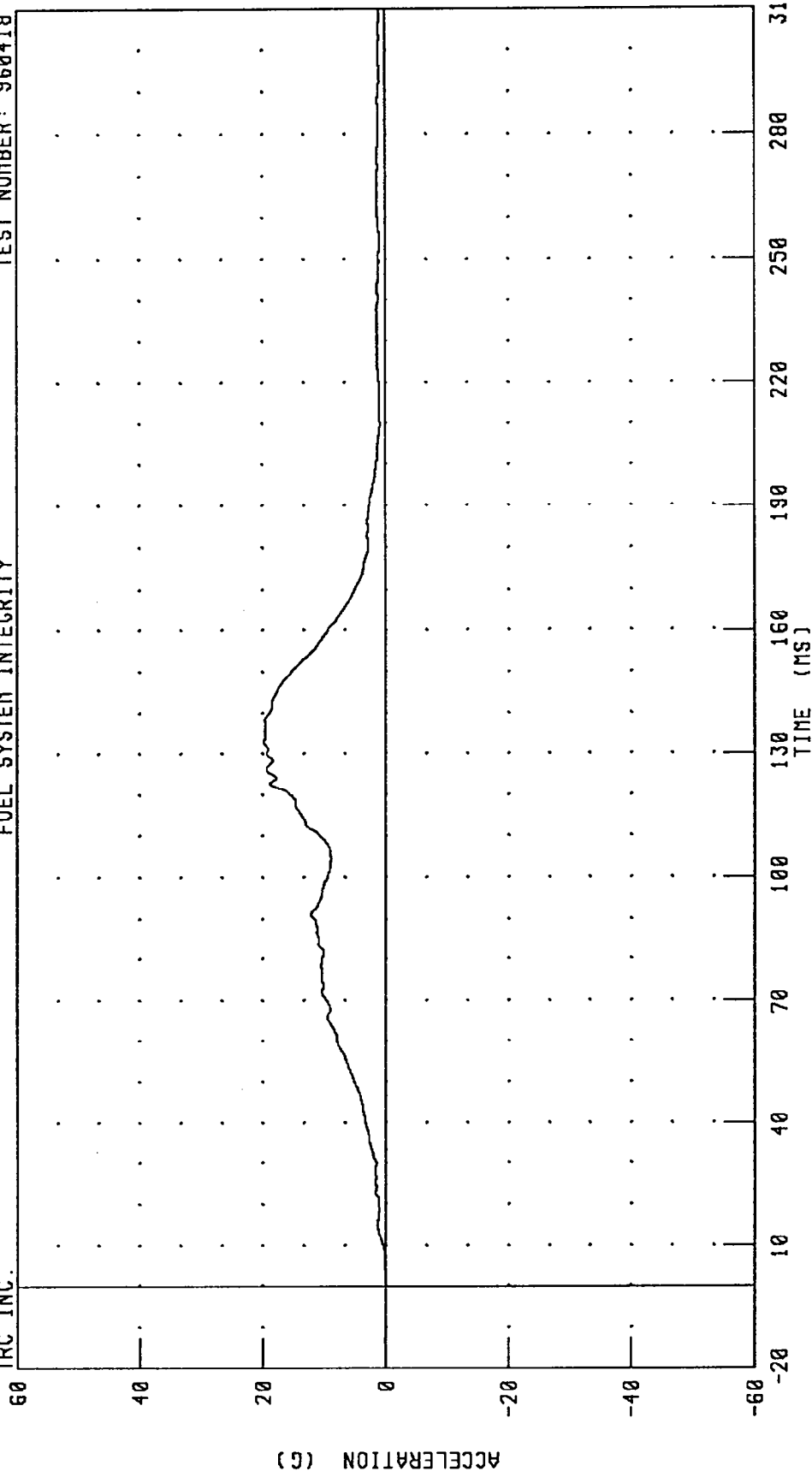
CHANNEL: CSTZG2 FILTER: CH. CLASS 180

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



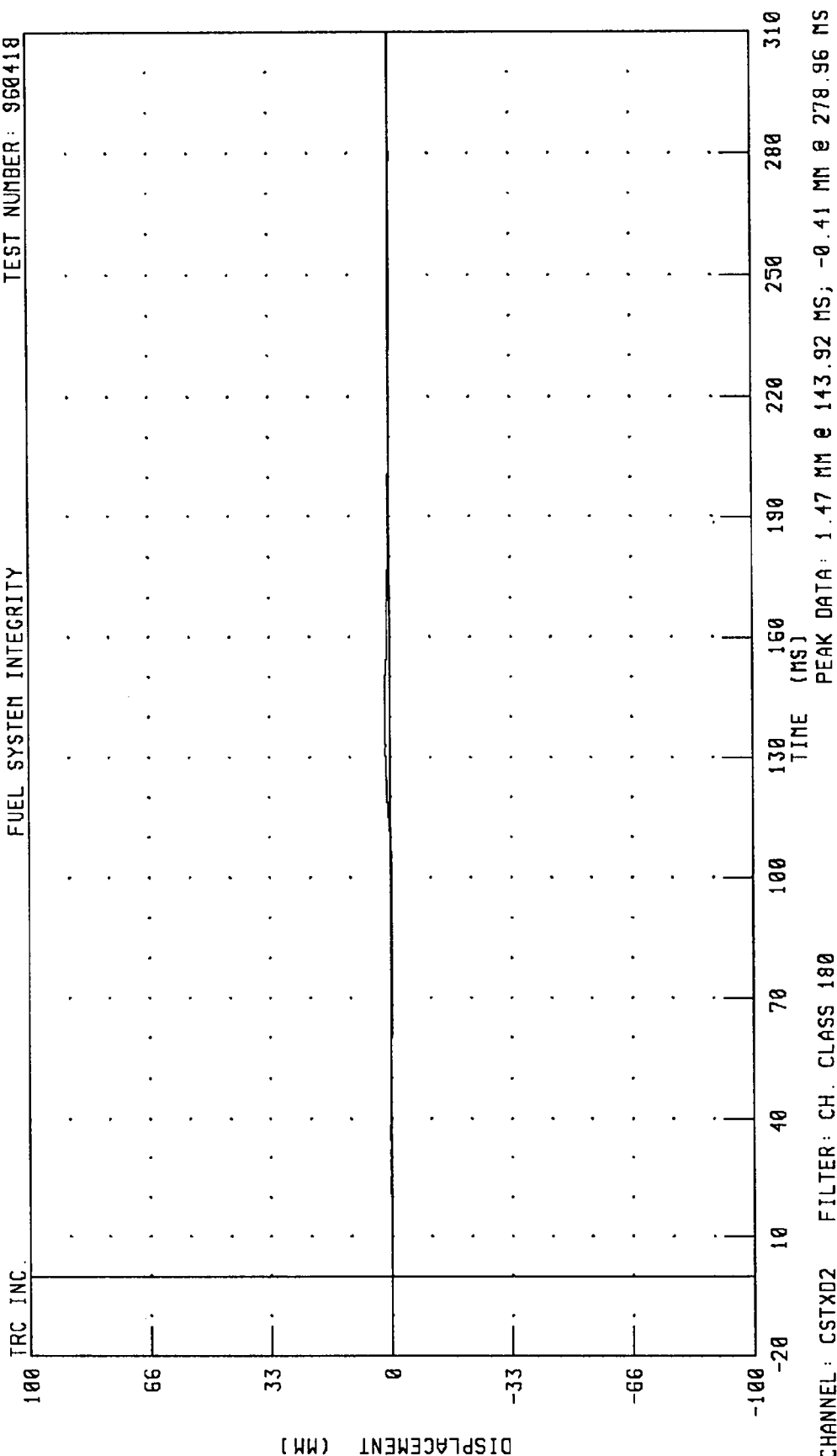
CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 19.84 G @ 132.88 MS; 0.00 G @ -20.00 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER CHEST DEFLECTION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 1.47 MM @ 143.92 MS; -0.41 MM @ 278.96 MS

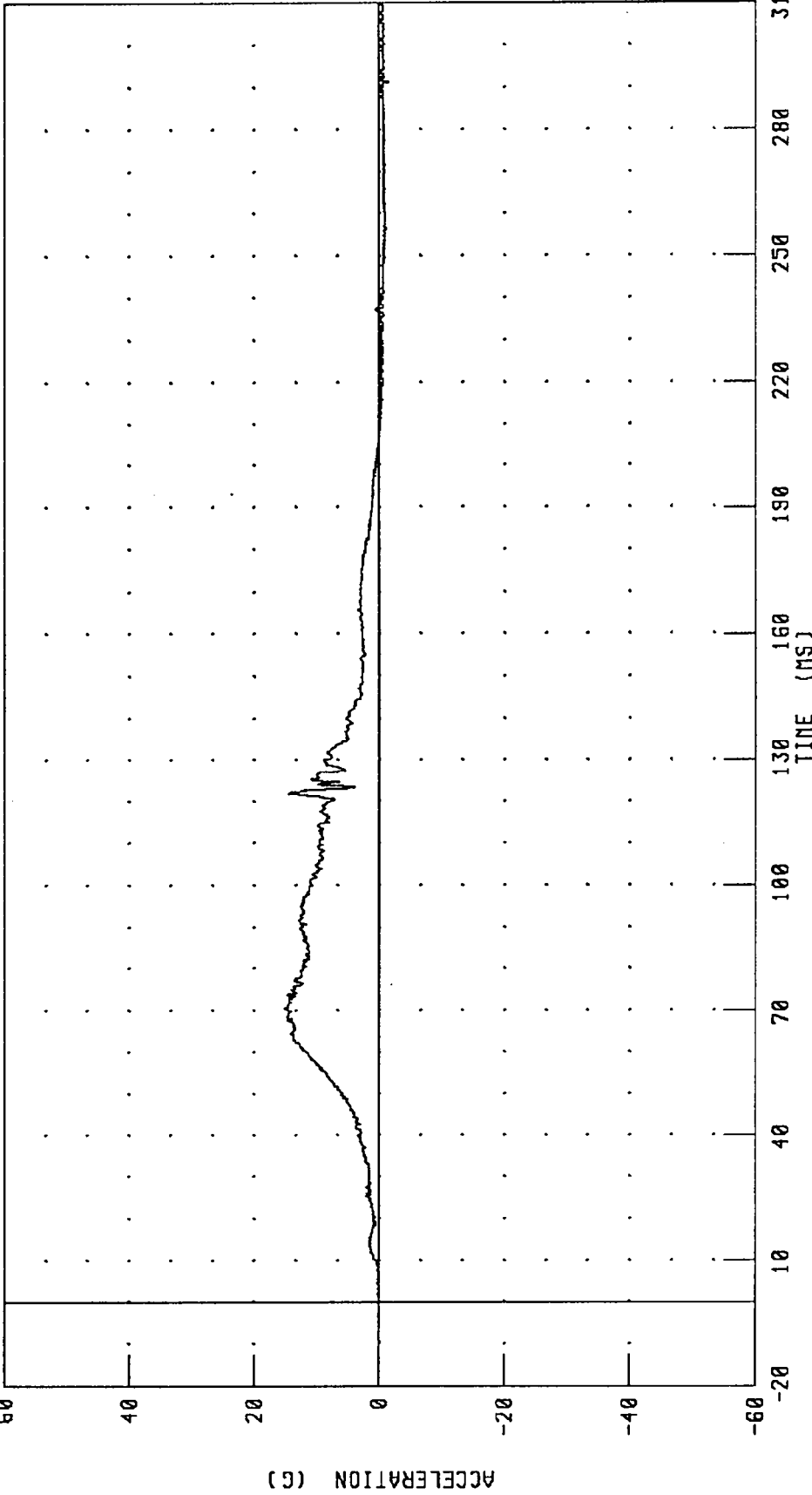
CHANNEL: CSTXD2 FILTER: CH. CLASS 180

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



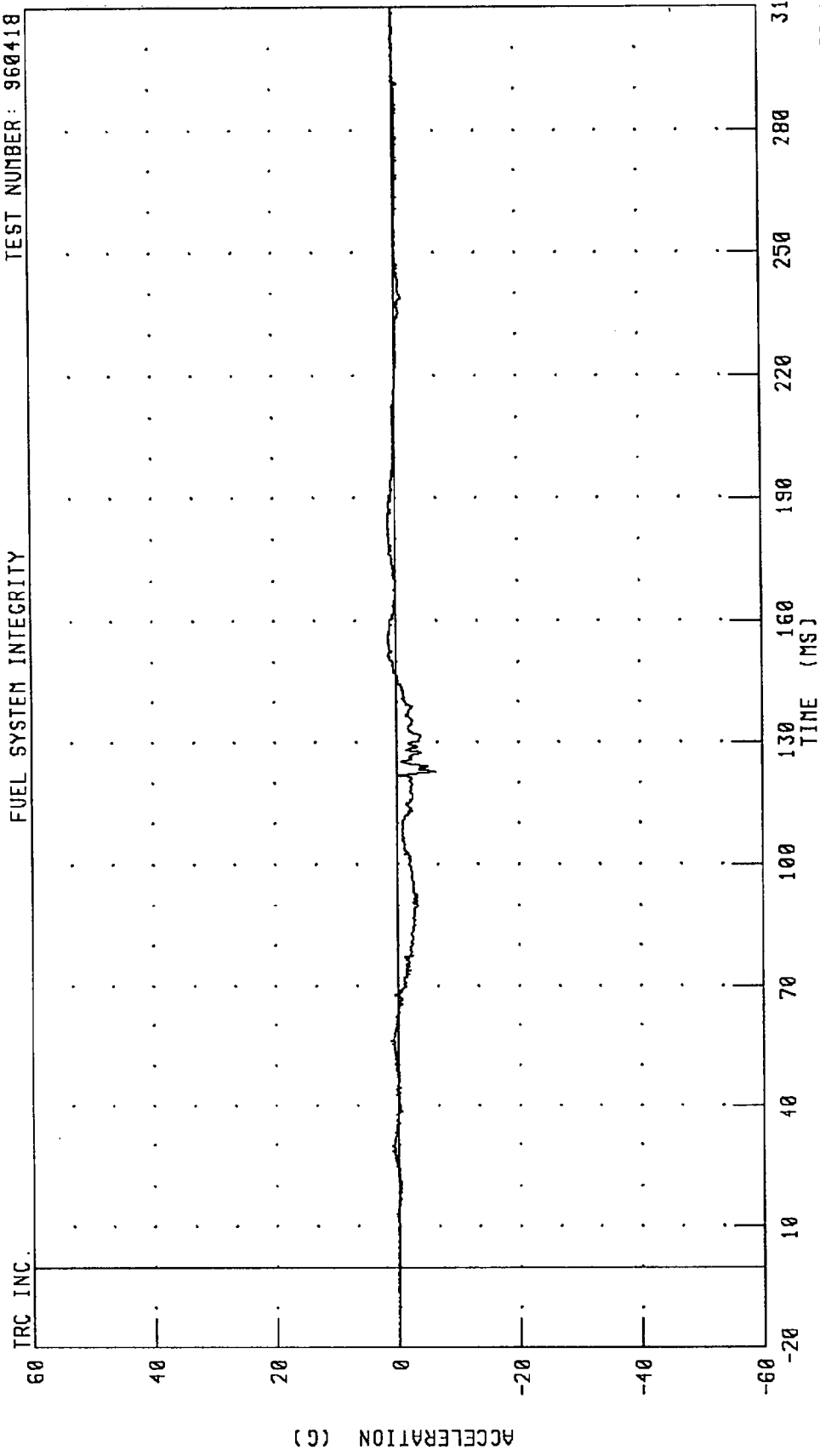
PEAK DATA: 15.11 G @ 70.40 MS; -1.57 G @ 291.36 MS

CHANNEL: PEVXG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 1.35 G @ 151.60 MS; -6.47 G @ 122.88 MS

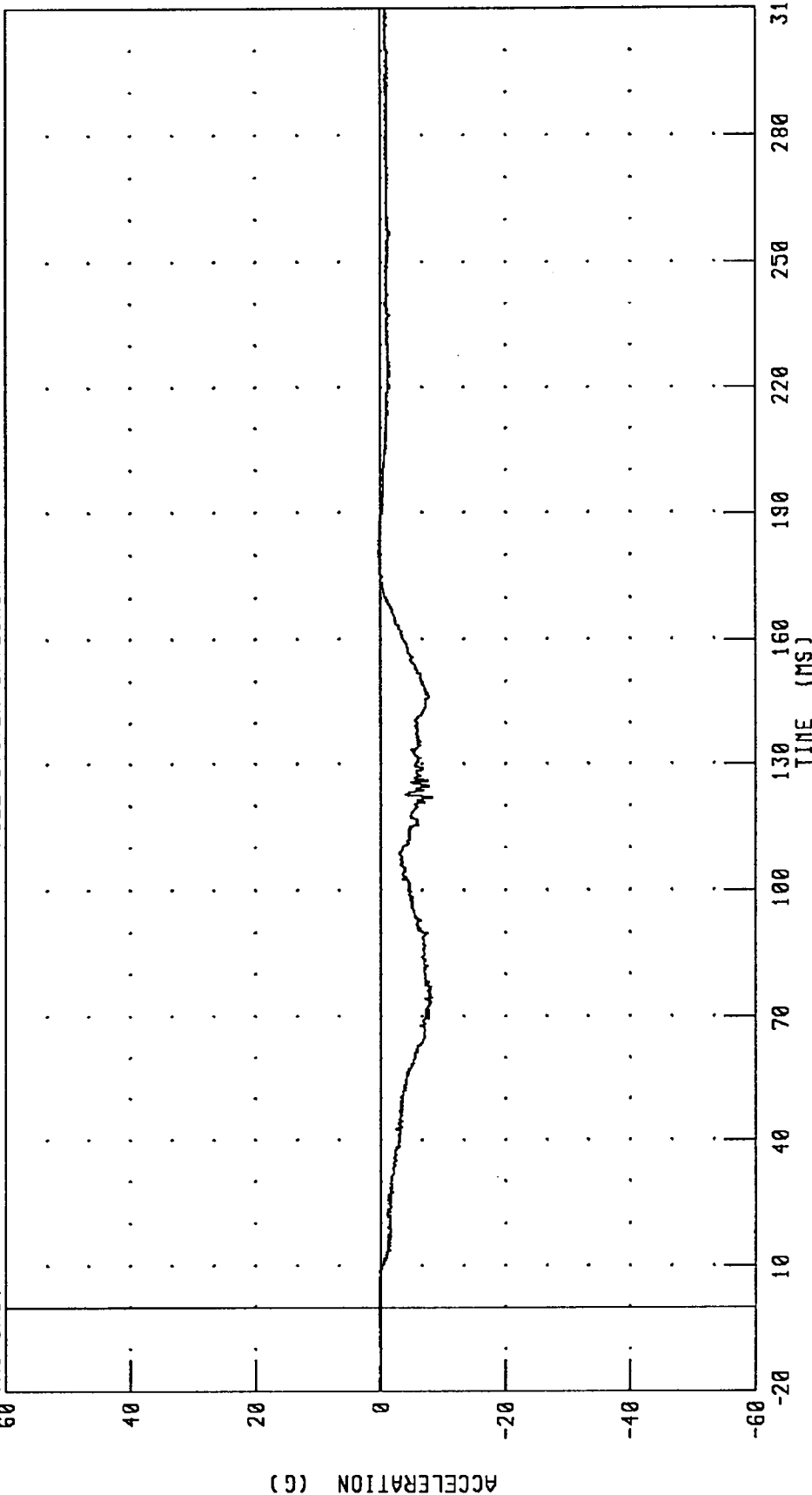
CHANNEL: PEVYG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 0.34 G @ 179.76 MS; -8.32 G @ 74.56 MS

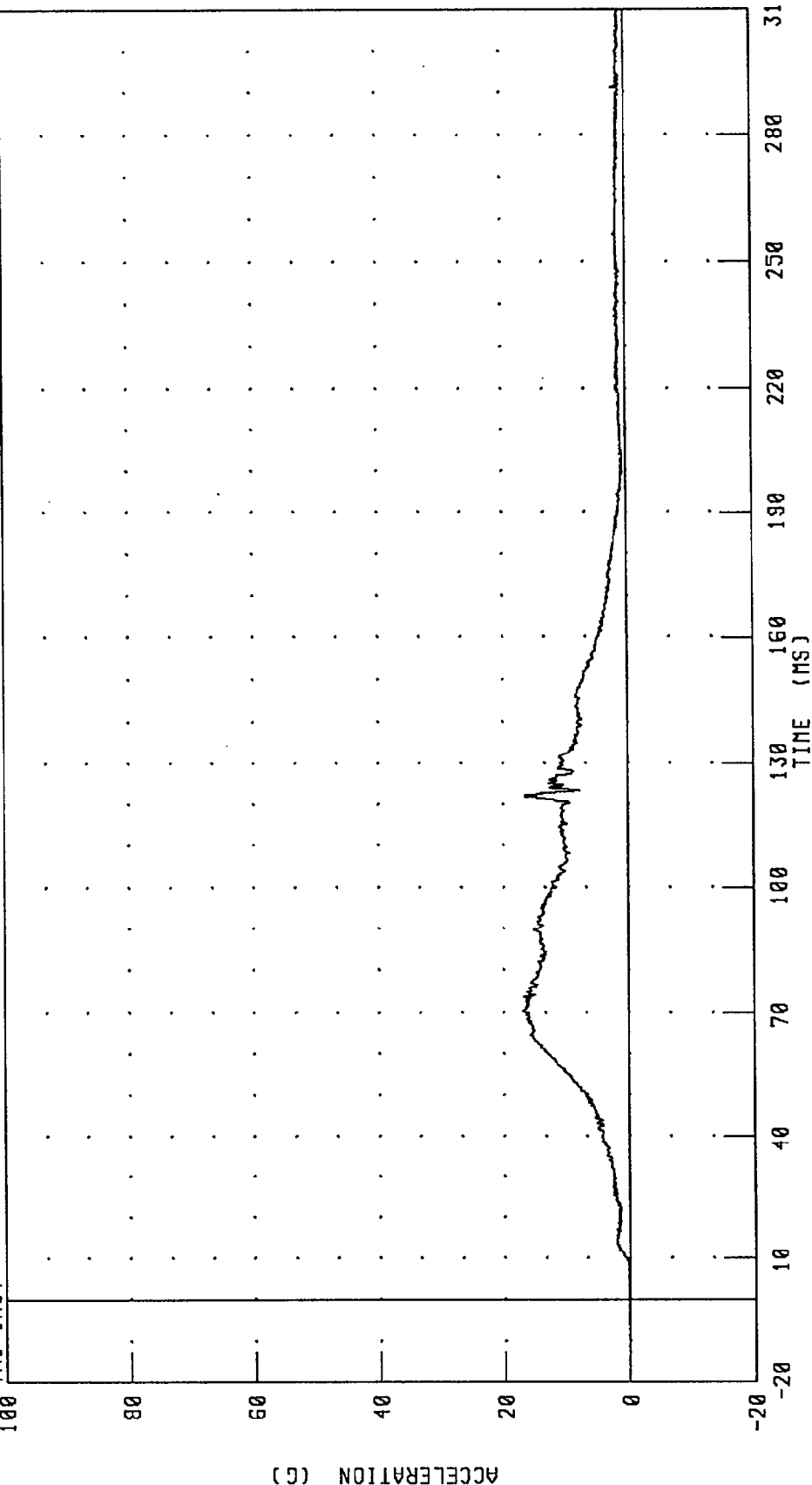
CHANNEL: PEVZG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



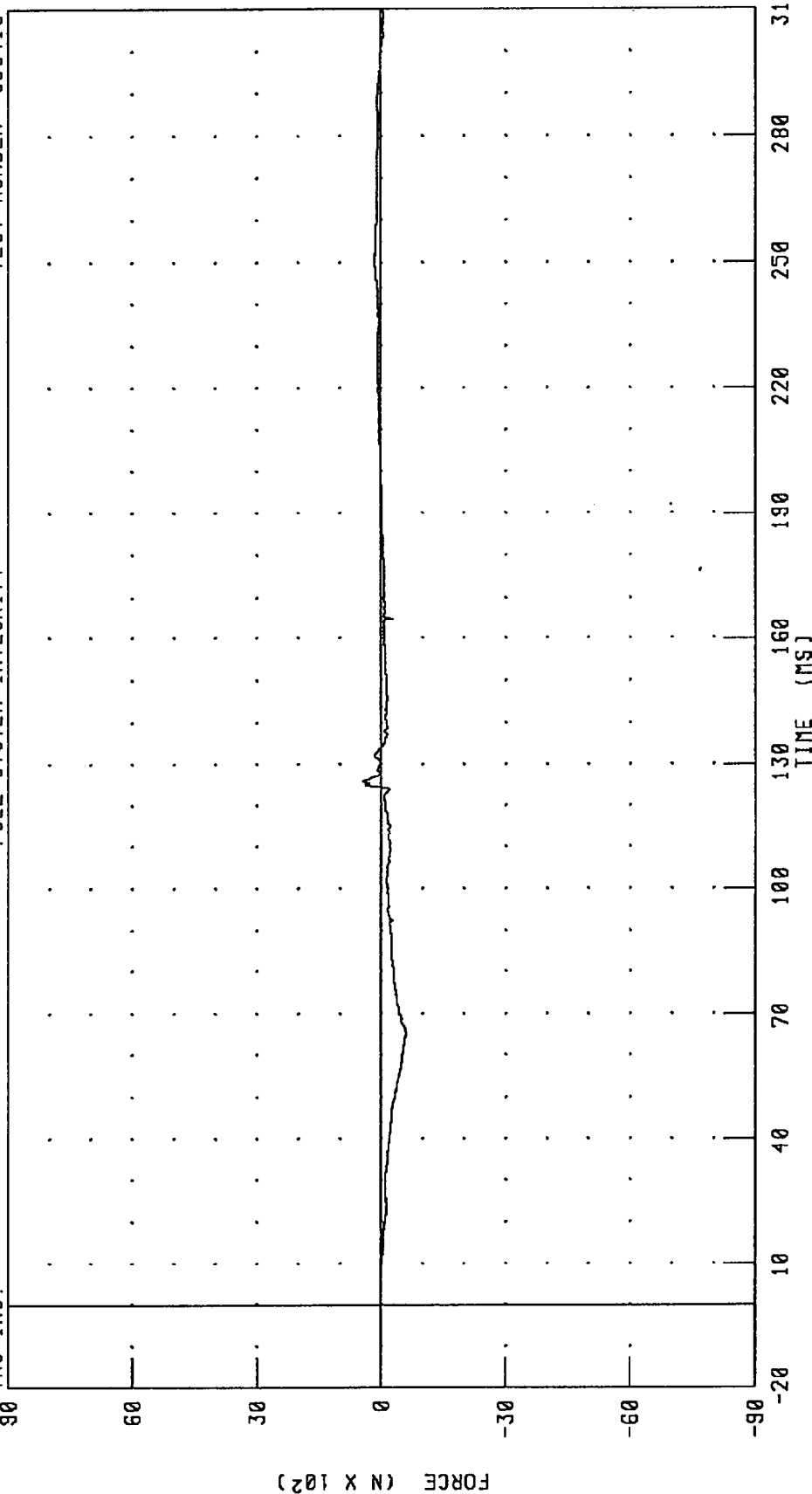
CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
RIGHT FRONT PASSENGER LEFT FEMUR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 443.74 N @ 125.92 MS; -616.51 N @ 65.28 MS

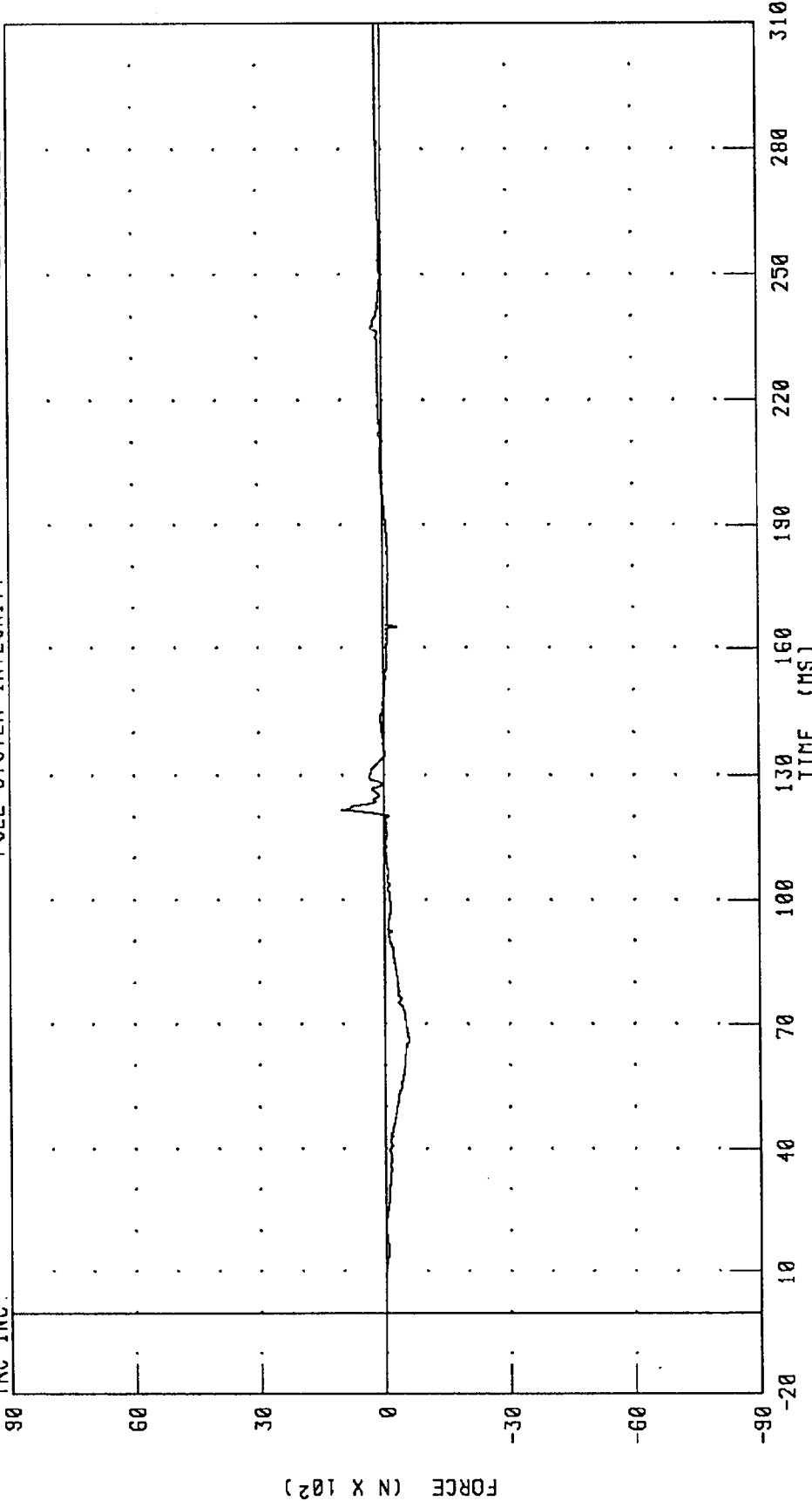
CHANNEL: LFMF2 FILTER: CH. CLASS 600

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 1015.96 N @ 121.68 MS; -584.13 N @ 66.32 MS

FILTER: CH. CLASS 600

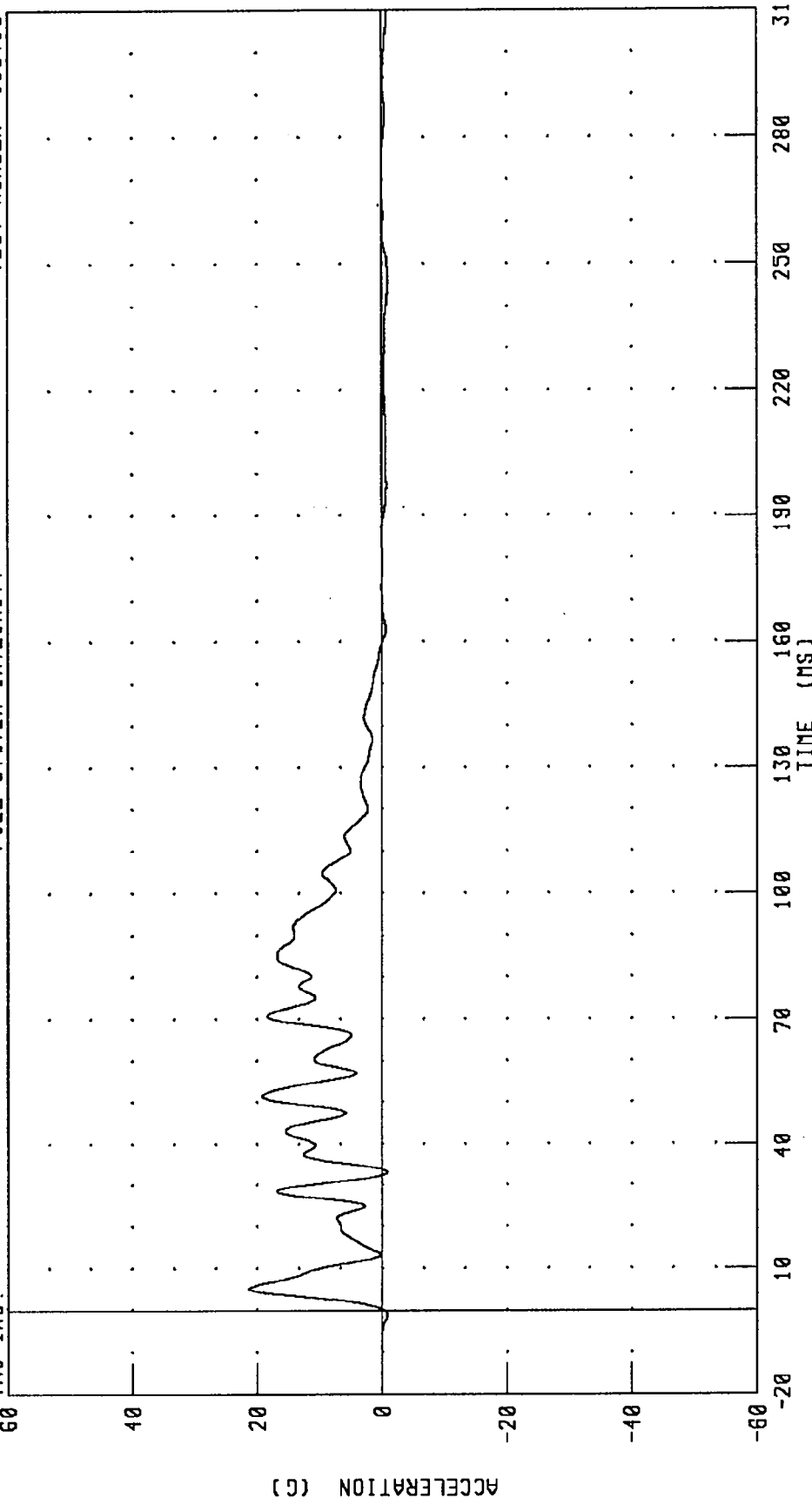
CHANNEL: RFMF2

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
FRONT SEAT OUTBOARD MOUNTING RAIL X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: TLFEXG1 FILTER: CH. CLASS 60

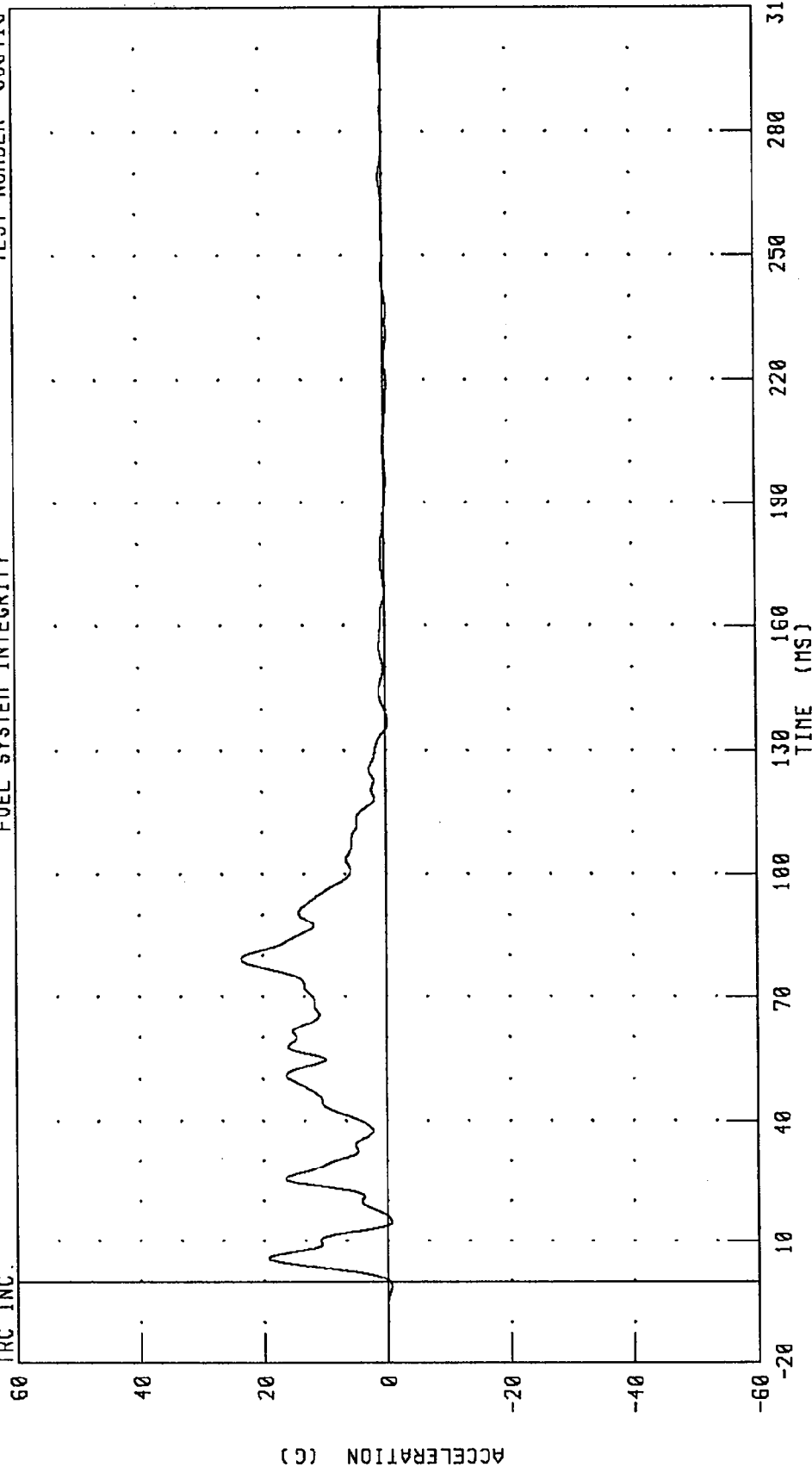
PEAK DATA: 21.29 G @ 5.12 MS; -1.08 G @ 246.32 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
FRONT SEAT OUTBOARD MOUNTING RAIL X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



CHANNEL: TRFXG1 FILTER: CH. CLASS 60

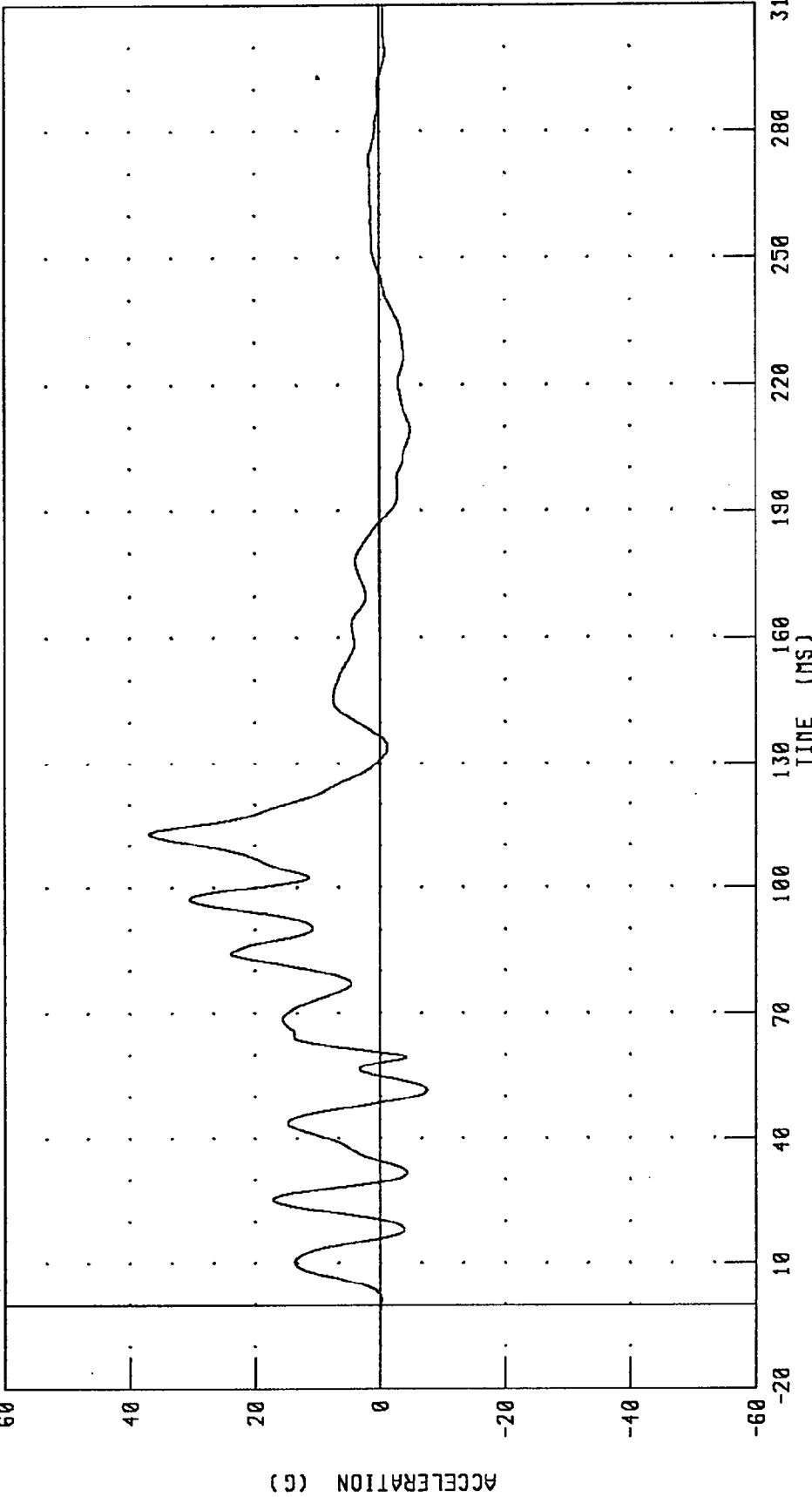
PEAK DATA: 23.62 G @ 79.28 MS; -0.74 G @ 14.80 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
FRONT SEAT BACK MID X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 36.89 G @ 112.96 MS; -7.56 G @ 51.60 MS

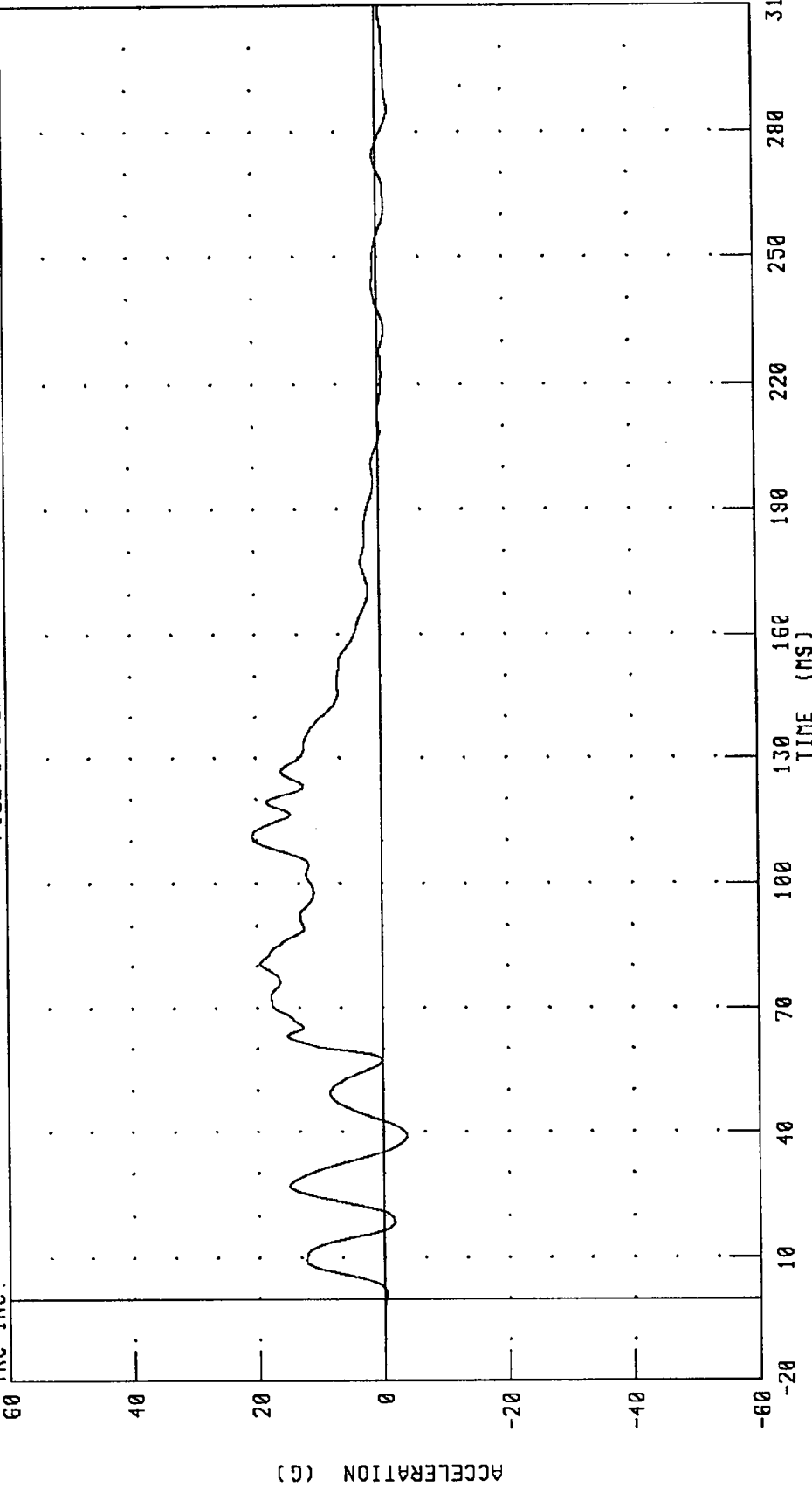
CHANNEL: TLF6G2 FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
FRONT SEAT BACK MID X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

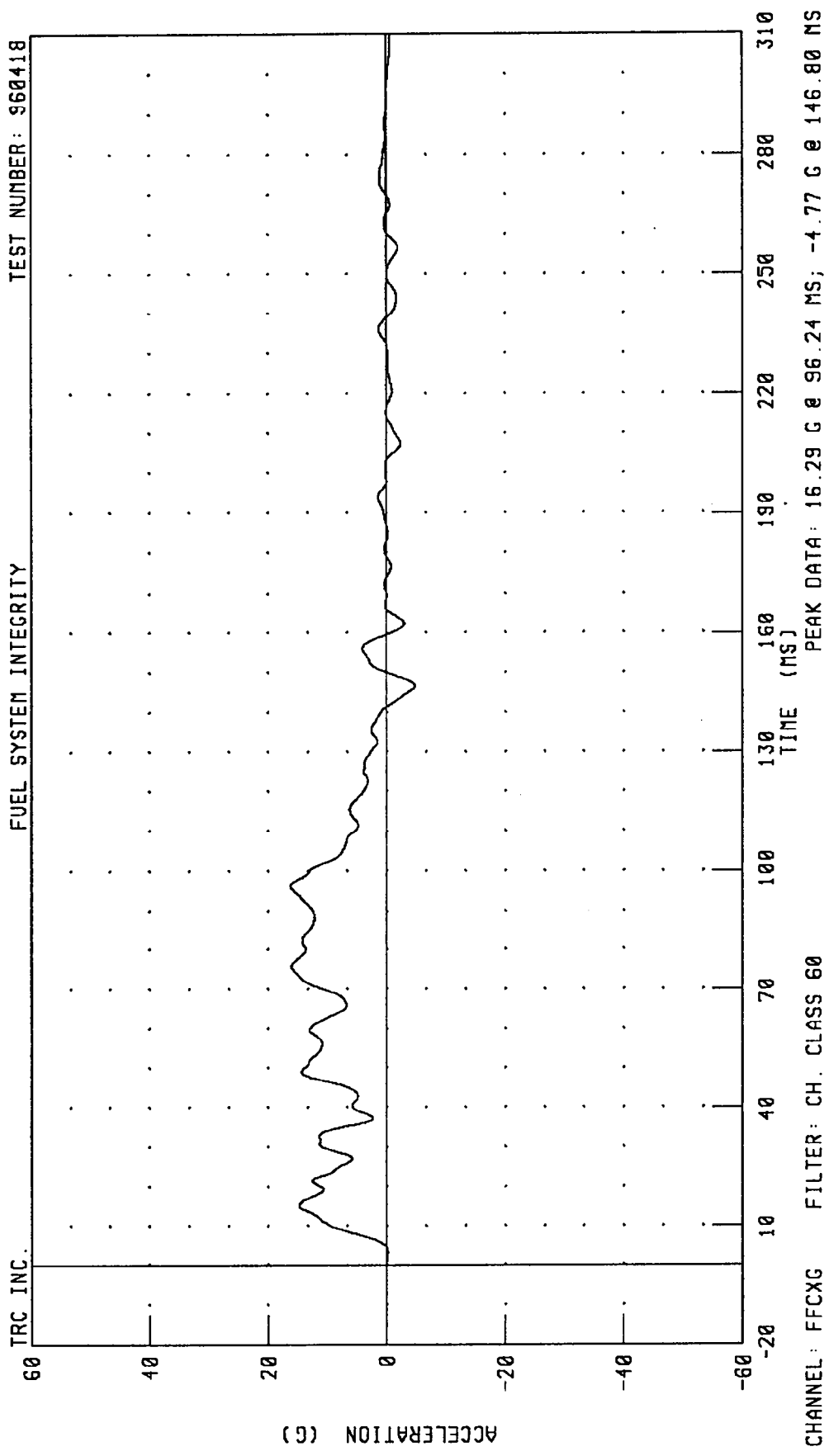
TRC INC.



PEAK DATA: 20.68 G @ 111.04 MS; -3.69 G @ 39.12 MS

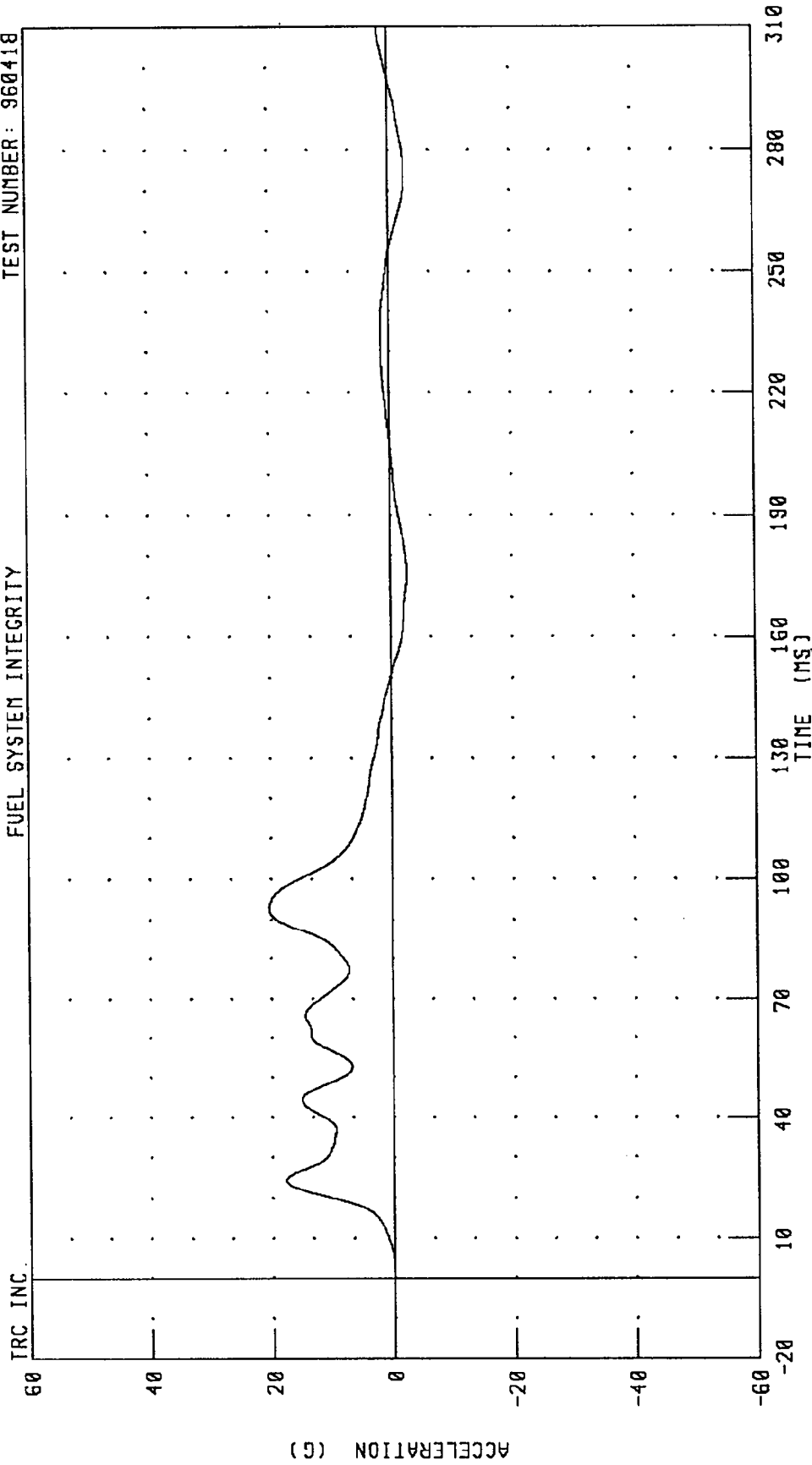
CHANNEL: TRFXG2 FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 RADIATOR SUPPORT X-AXIS ACCELERATION



MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
ENGINE TOP X-AXIS ACCELERATION
FUEL SYSTEM INTEGRITY

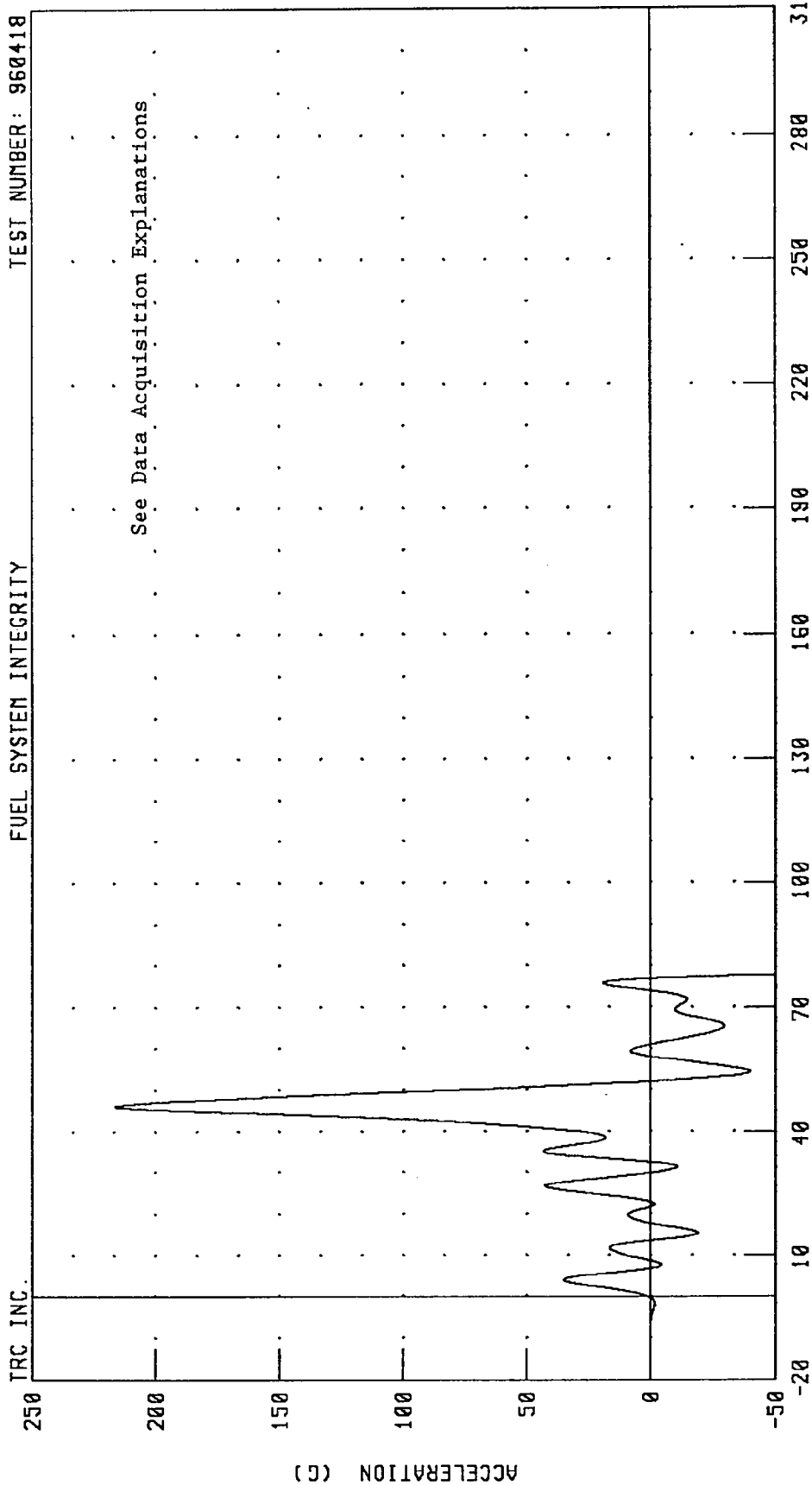
TEST NUMBER: 960418



CHANNEL: ENG XG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 REAR WHEEL AXLE X-AXIS ACCELERATION
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418



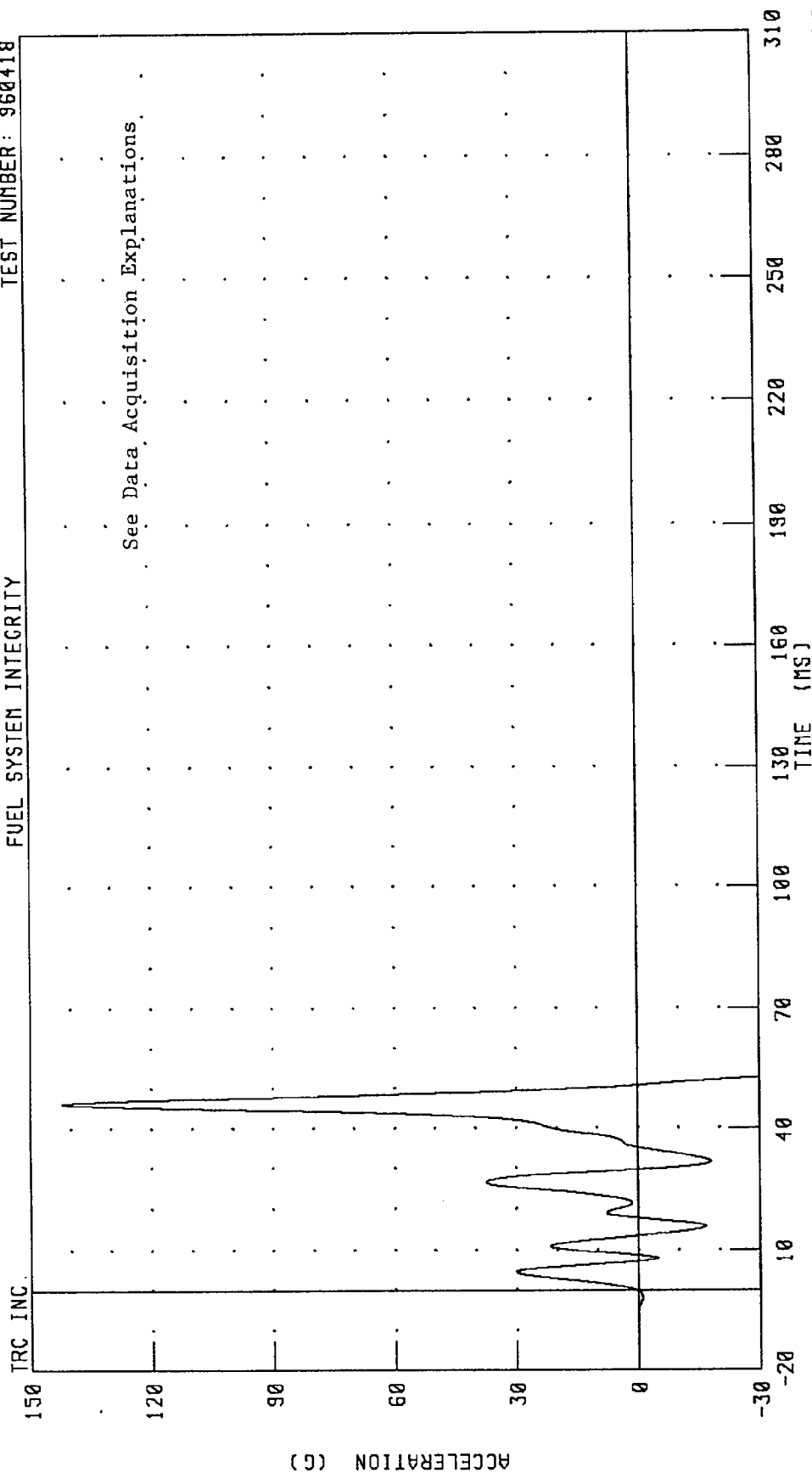
CHANNEL: RAXXG1 FILTER: CH. CLASS 60

PEAK DATA: 216.09 G @ 46.16 MS; -1041.57 G @ 84.32 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 REAR WHEEL AXLE X-AXIS ACCELERATION

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



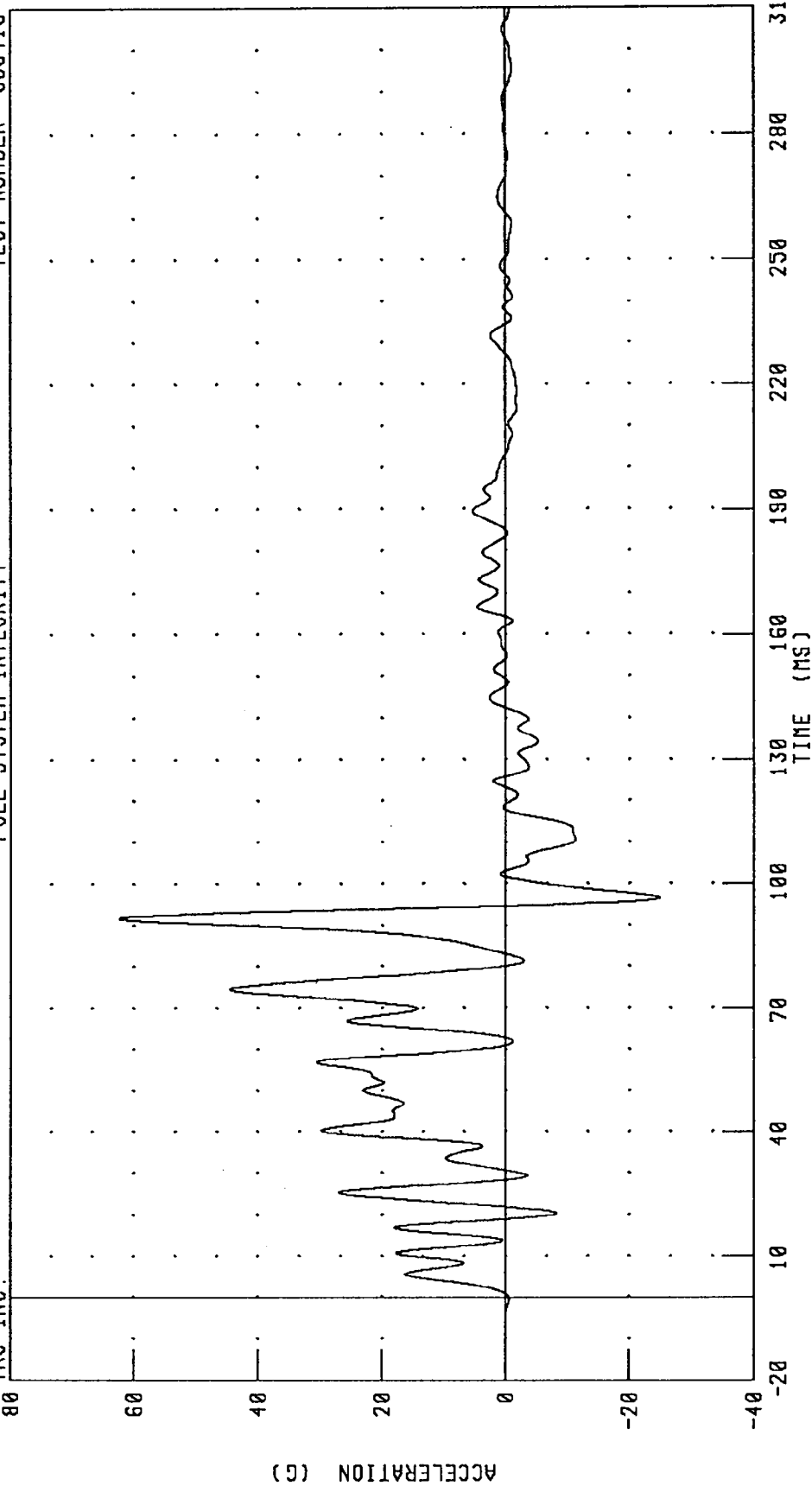
PEAK DATA: 141.96 G @ 46.16 MS; -1015.14 G @ 101.60 MS

CHANNEL: RAXXG2 FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 PACKAGE SHELF X-AXIS ACCELERATION
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 960418

TRC INC.



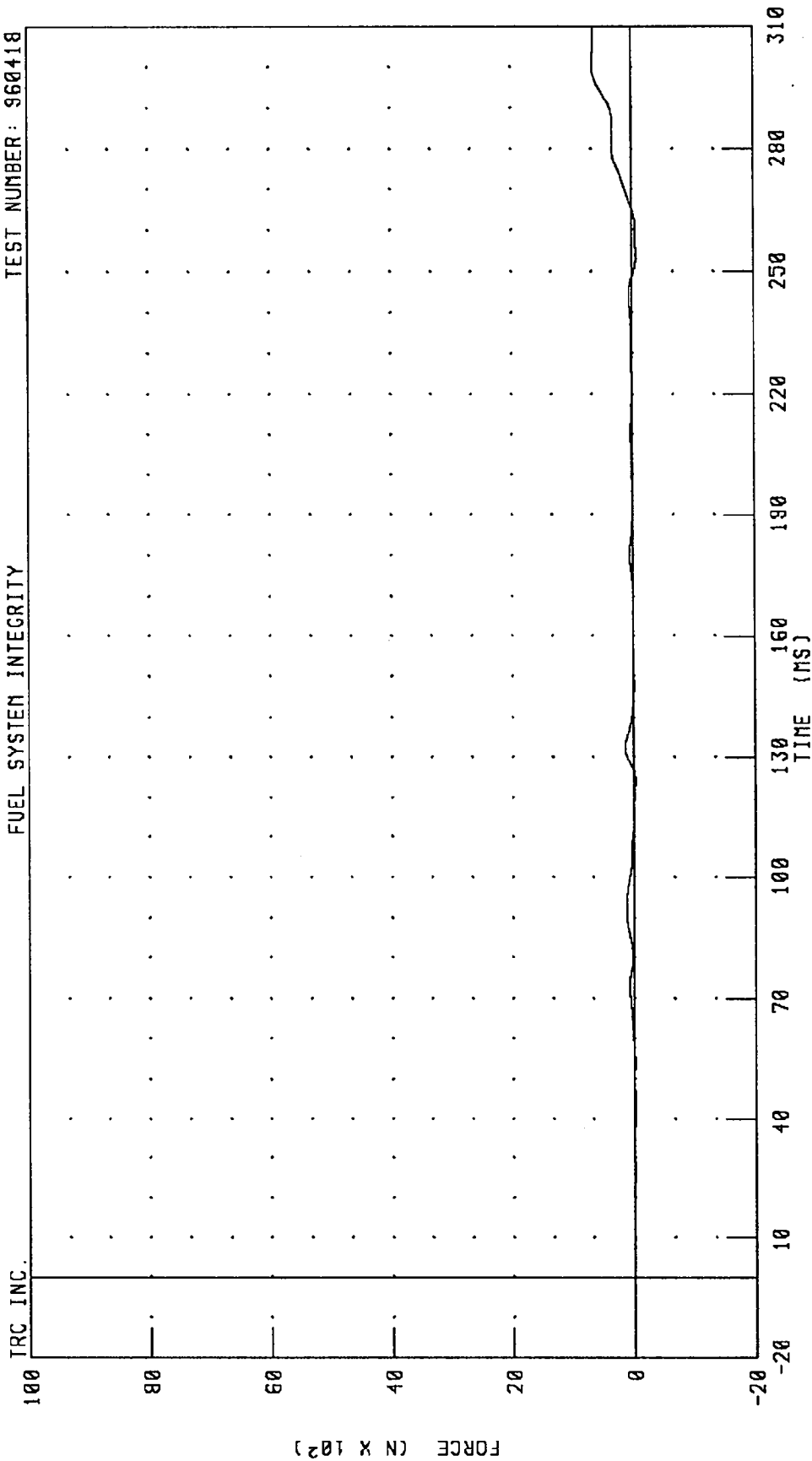
PEAK DATA: 62.43 G @ 91.76 MS; -24.82 G @ 96.56 MS

CHANNEL: TCRXG FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 DRIVER SHOULDER BELT FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



PEAK DATA: 650.63 N @ 300.64 MS; -62.35 N @ 254.00 MS

FILTER: CH. CLASS 60

CHANNEL: SHBF1

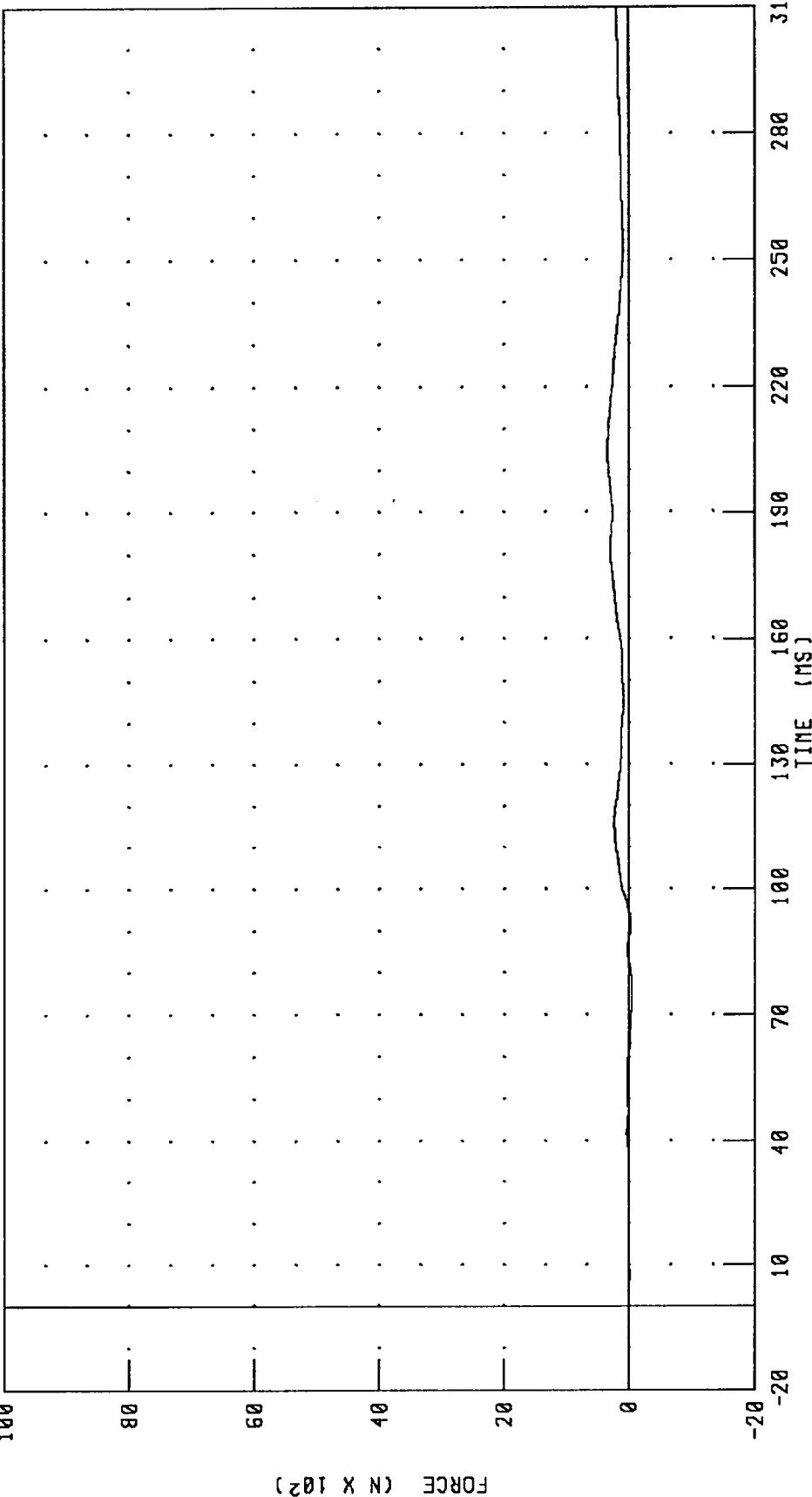
MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP

DRIVER LAP BELT OUTBOARD FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 339.33 N @ 204.80 MS; -44.66 N @ 77.44 MS

FILTER: CH. CLASS 60

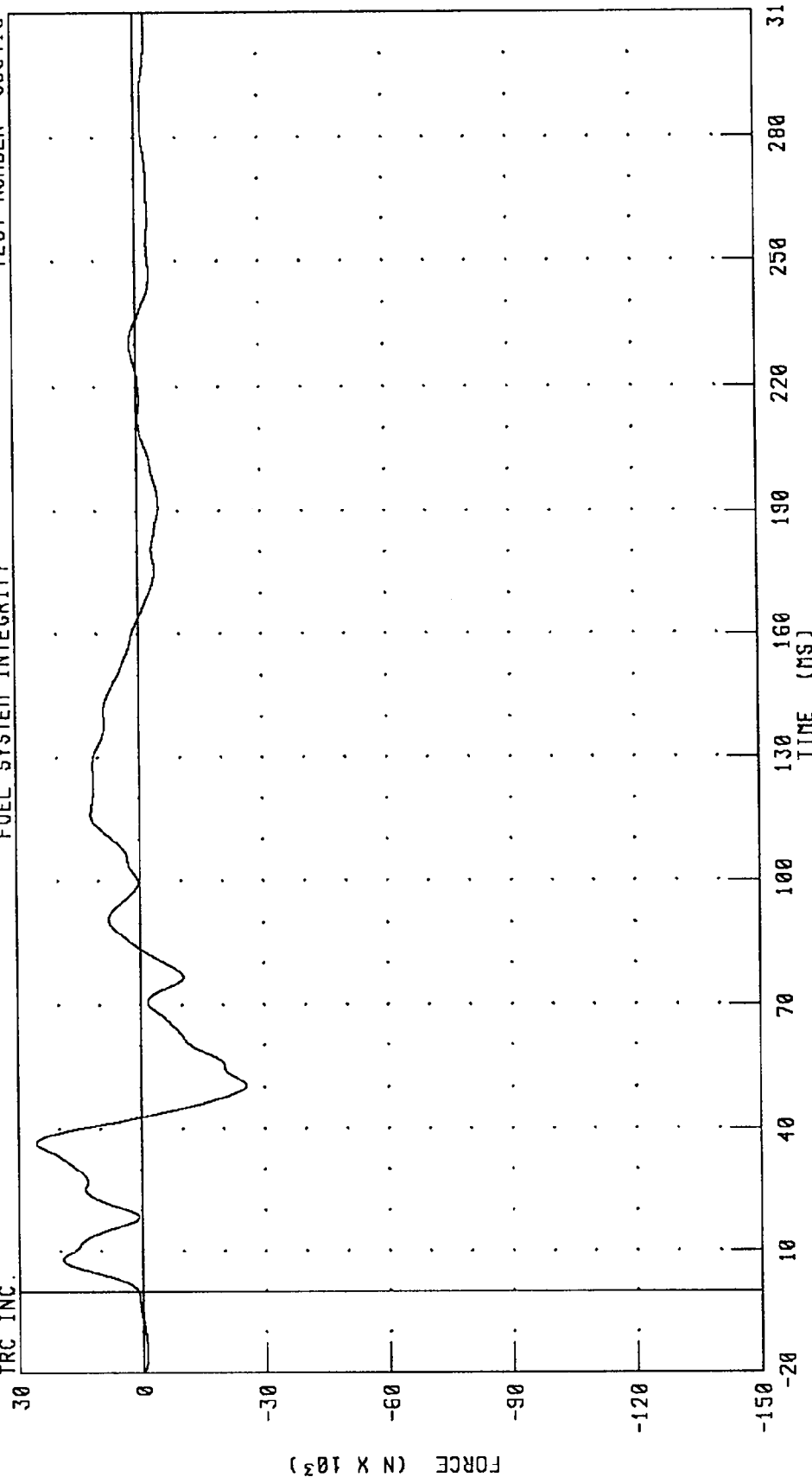
CHANNEL: LBOF1

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 BARRIER FRONT TOP LEFT FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.

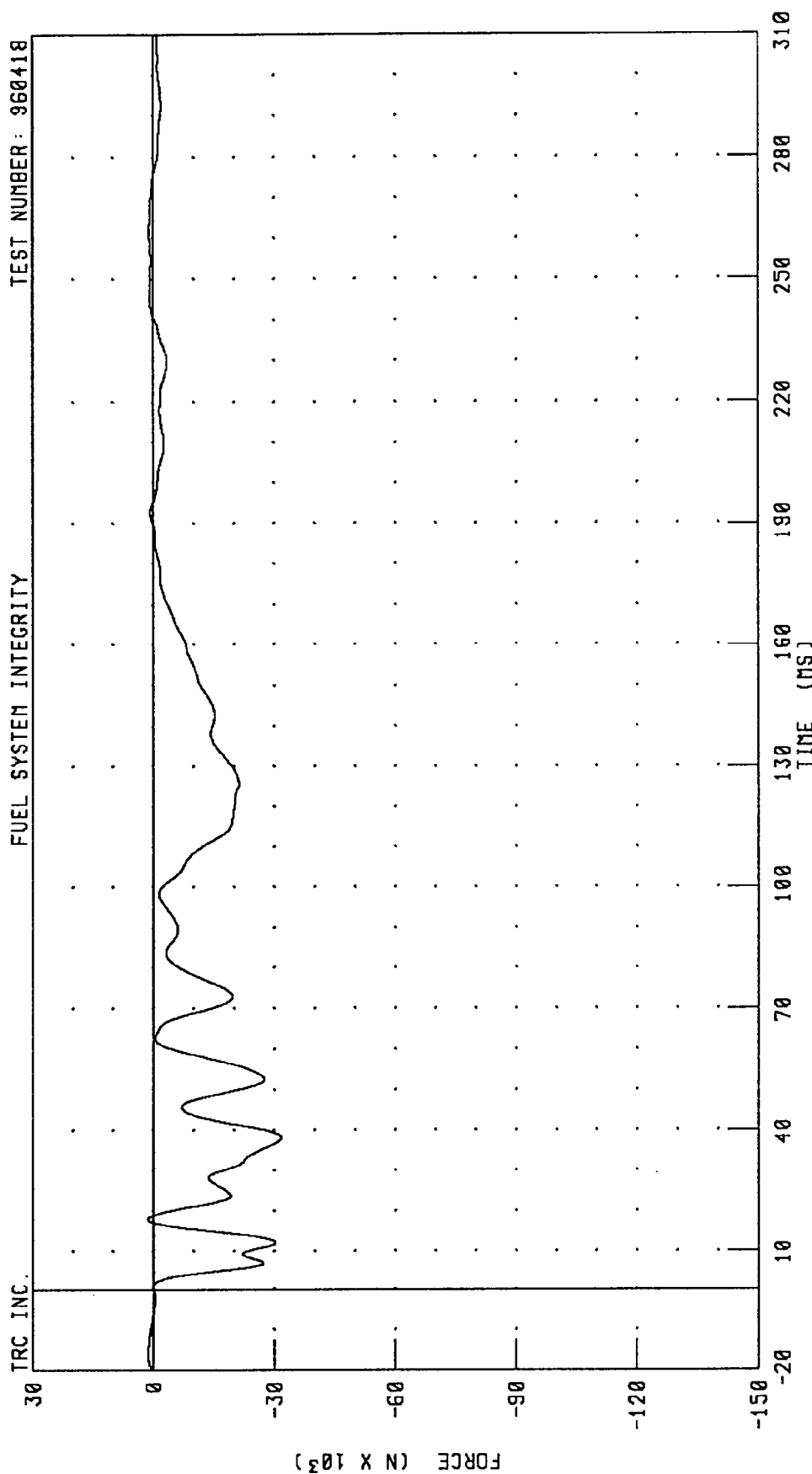


PEAK DATA: 25714.96 N @ 36.72 MS; -25454.55 N @ 50.40 MS

CHANNEL: BFFXF1 FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 BARRIER FRONT BOTTOM LEFT FORCE
 FUEL SYSTEM INTEGRITY

TEST NUMBER: 360418



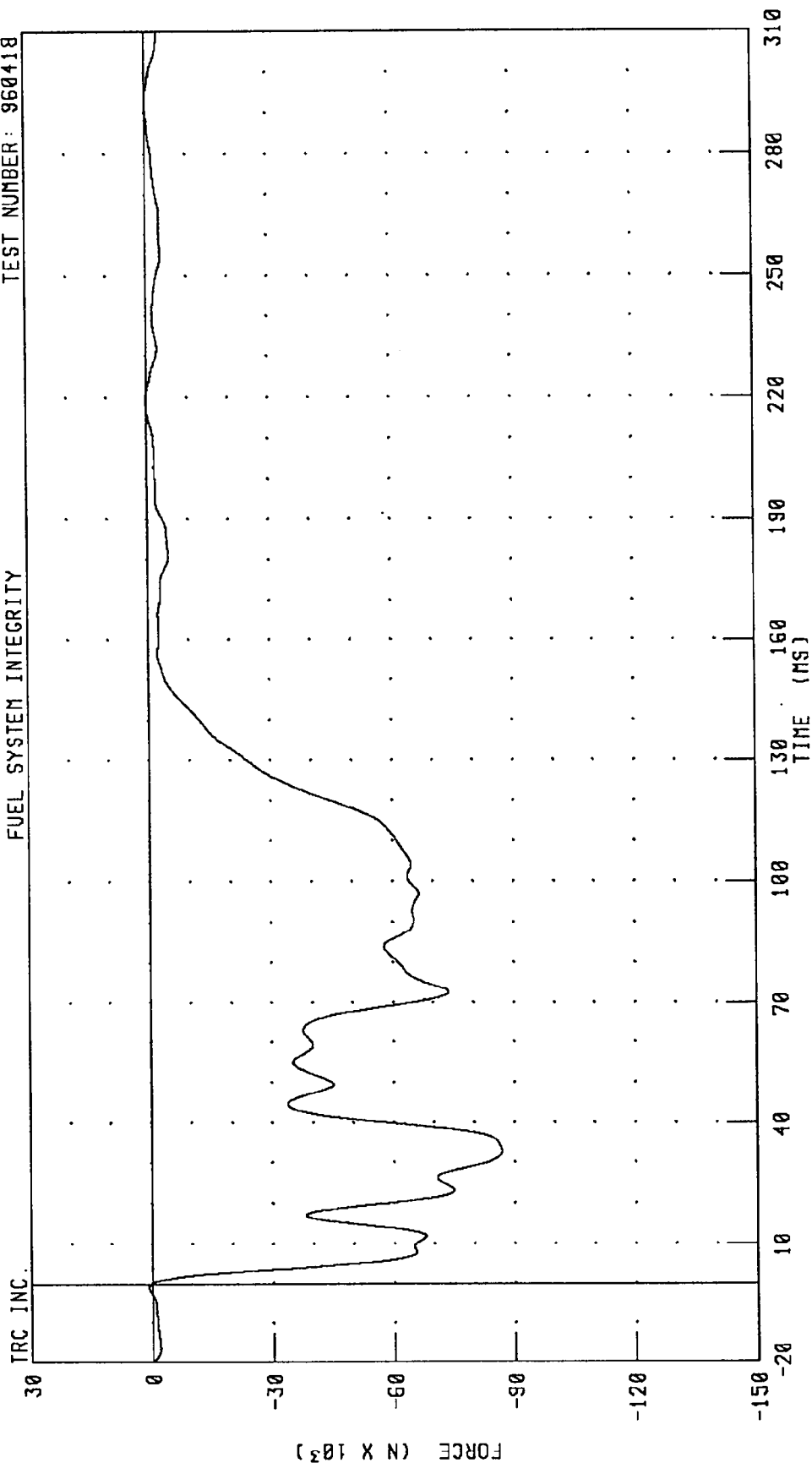
PEAK DATA: 1242.10 N @ 18.00 MS; -31831.10 N @ 38.24 MS

CHANNEL: BFFXF2 FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 BARRIER FRONT BOTTOM RIGHT FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY



CHANNEL: BFFXF3 FILTER: CH. CLASS 60

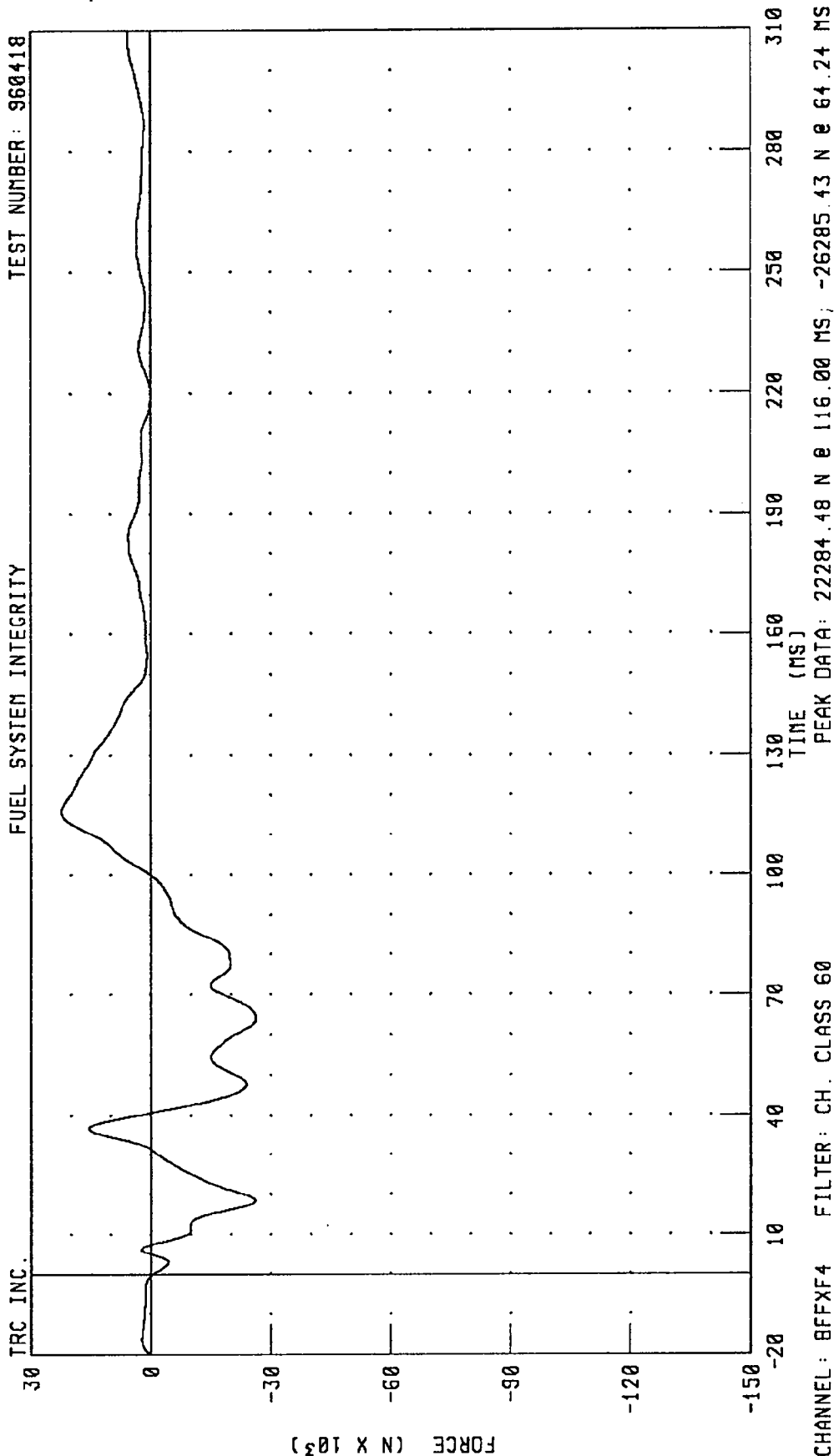
PEAK DATA: 879.99 N @ -0.96 MS; -86845.65 N @ 32.80 MS

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
 BARRIER FRONT TOP RIGHT FORCE

FUEL SYSTEM INTEGRITY

TRC INC.

TEST NUMBER: 960418



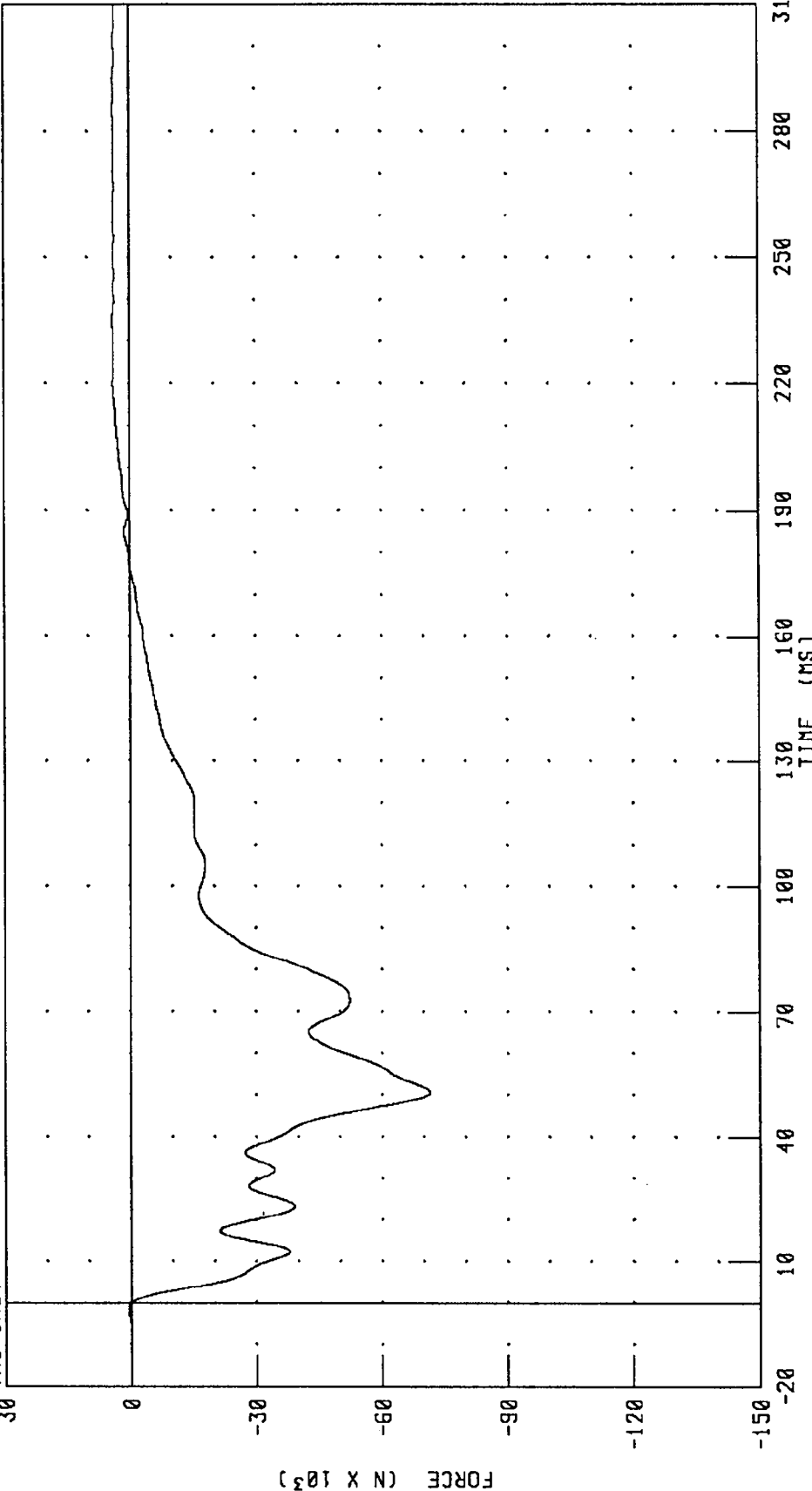
CHANNEL: BFFXF4 FILTER: CH. CLASS 60

MOVING DEFORMABLE BARRIER INTO REAR OF A 1996 GEO PRIZM AT 80 KPH AND 70% OVERLAP
BARRIER FRONT CENTER FORCE

TEST NUMBER: 960418

FUEL SYSTEM INTEGRITY

TRC INC.



PEAK DATA: 4003.44 N @ 234.80 MS; -71501.76 N @ 50.64 MS

CHANNEL: BFFXF5 FILTER: CH. CLASS 60

Appendix C

Dummy Calibration Information

Pre-Test Calibration

Serial Number 35

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III EXTERNAL DIMENSIONS

35 VECTOR

11-JUL-95

TRC INC.

TEST NO: 35C1ED1

572E SN35 EXT.DIMENSION CAL01

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	988. MM
WAIST CIRCUMFERENCE (Z)		836 - 866 MM	848. MM
CHEST DEPTH (O)		213 - 229 MM	218. MM
H-POINT HEIGHT (C)		84 - 89 MM	86. 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	886. MM
THIGH CLEARANCE (F)		140 - 155 MM	152. MM
BUTTOCK KNEE LENGTH (K)		579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH (N)		452 - 478 MM	475. MM
POPLITEAL HEIGHT (L)		429 - 455 MM	442. MM
KNEE PIVOT HEIGHT (M)		485 - 500 MM	500. MM
FOOT LENGTH (P)		252 - 267 MM	254. MM
FOOT BREADTH (W)		91 - 107 MM	94. MM
SHOULDER PIVOT FROM BACKLINE (E)		84 - 94 MM	91. MM
SHOULDER BREADTH (V)		422 - 437 MM	427. MM
SHOULDER PIVOT HEIGHT (B)		506 - 521 MM	511. MM
ELBOW REST HEIGHT (J)		191 - 211 MM	203. MM
SHOULDER-ELBOW LENGTH (I)		330 - 345 MM	343. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290 - 305 MM	297. MM

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Richard L. L...

RUN NUMBER: 071295.1437

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

17-APR-96

TRC INC. TEST NO: 35C1HD8

572E SN35 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	36.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	264.58 G
PEAK LATERAL ACCELERATION	15 G MAX	2.43 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

RUN NUMBER: 041796.1347;1

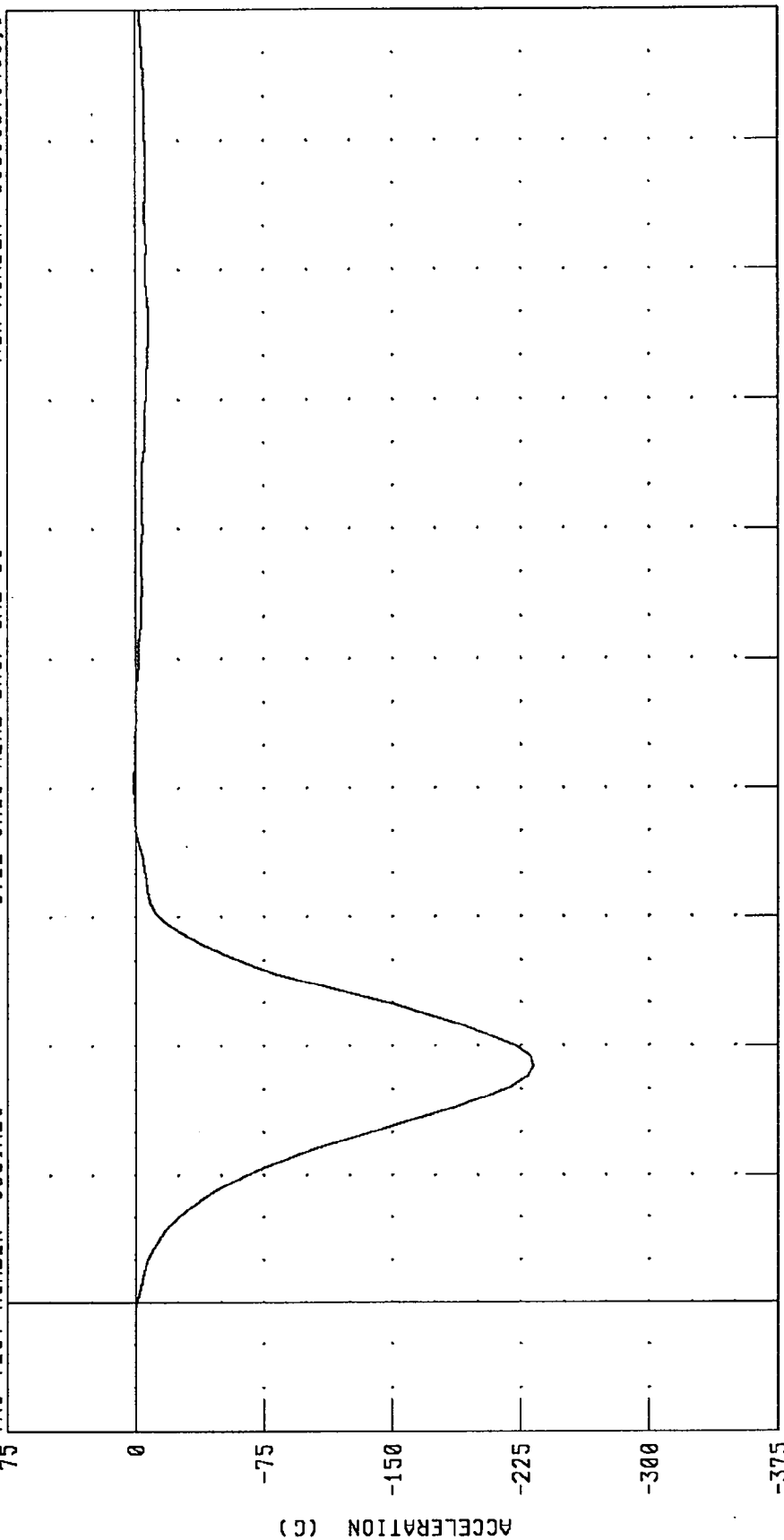
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 35C1H08

572E SN35 HEAD DROP CAL 01

RUN NUMBER: 050196.1416;1

75



PEAK DATA: 1.00 G @ 4.08 MS; -232.79 G @ 1.84 MS

CHANNEL: HEDXG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

572E SN35 HEAD DROP CAL 01

TRC TEST NUMBER: 35C1H08

225

150

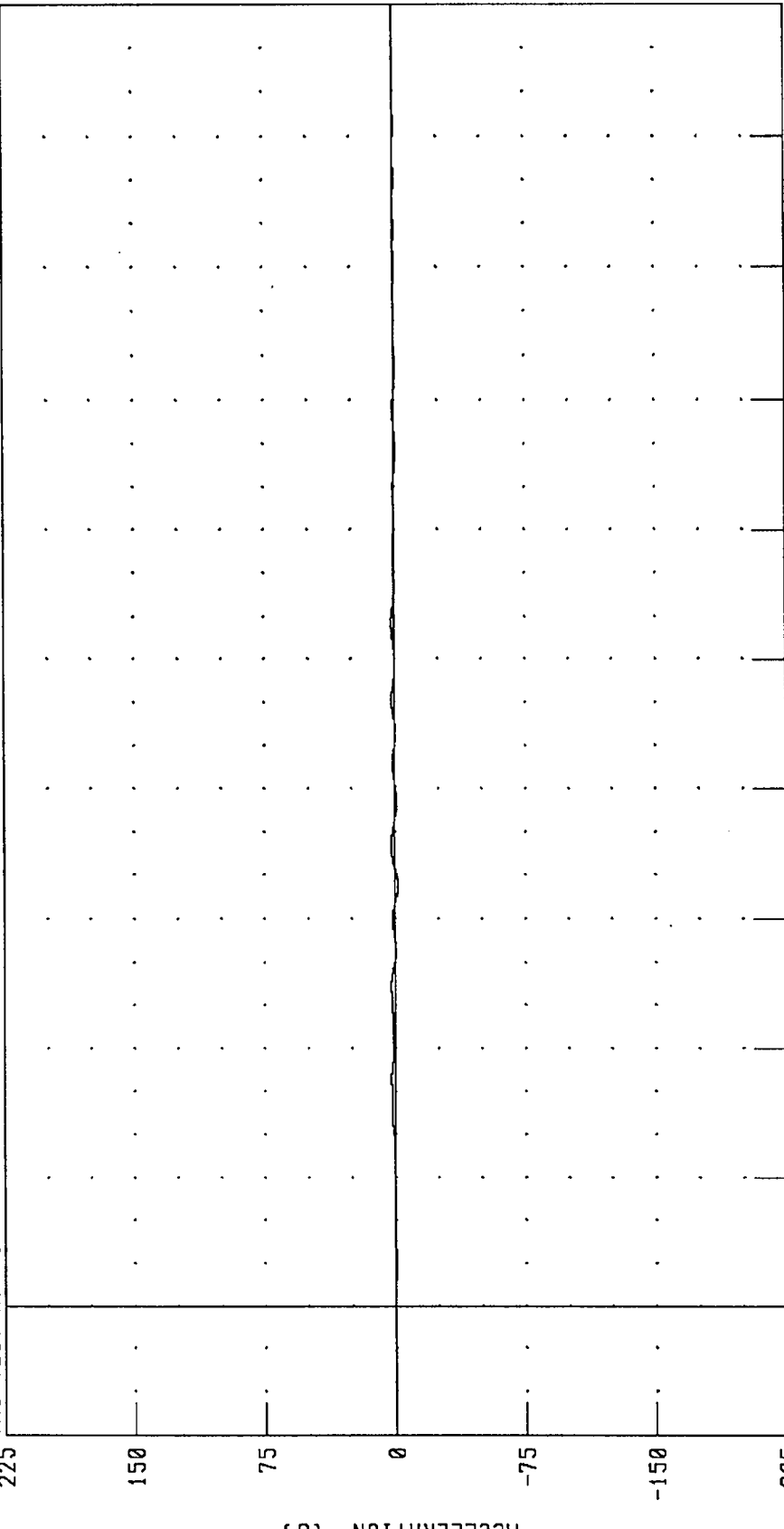
75

0

-75

-150

-225



TIME (MS X 10⁻¹)

PEAK DATA: 2.43 G @ 1.76 MS; -1.92 G @ 3.28 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

RUN NUMBER: 050196.1416;1

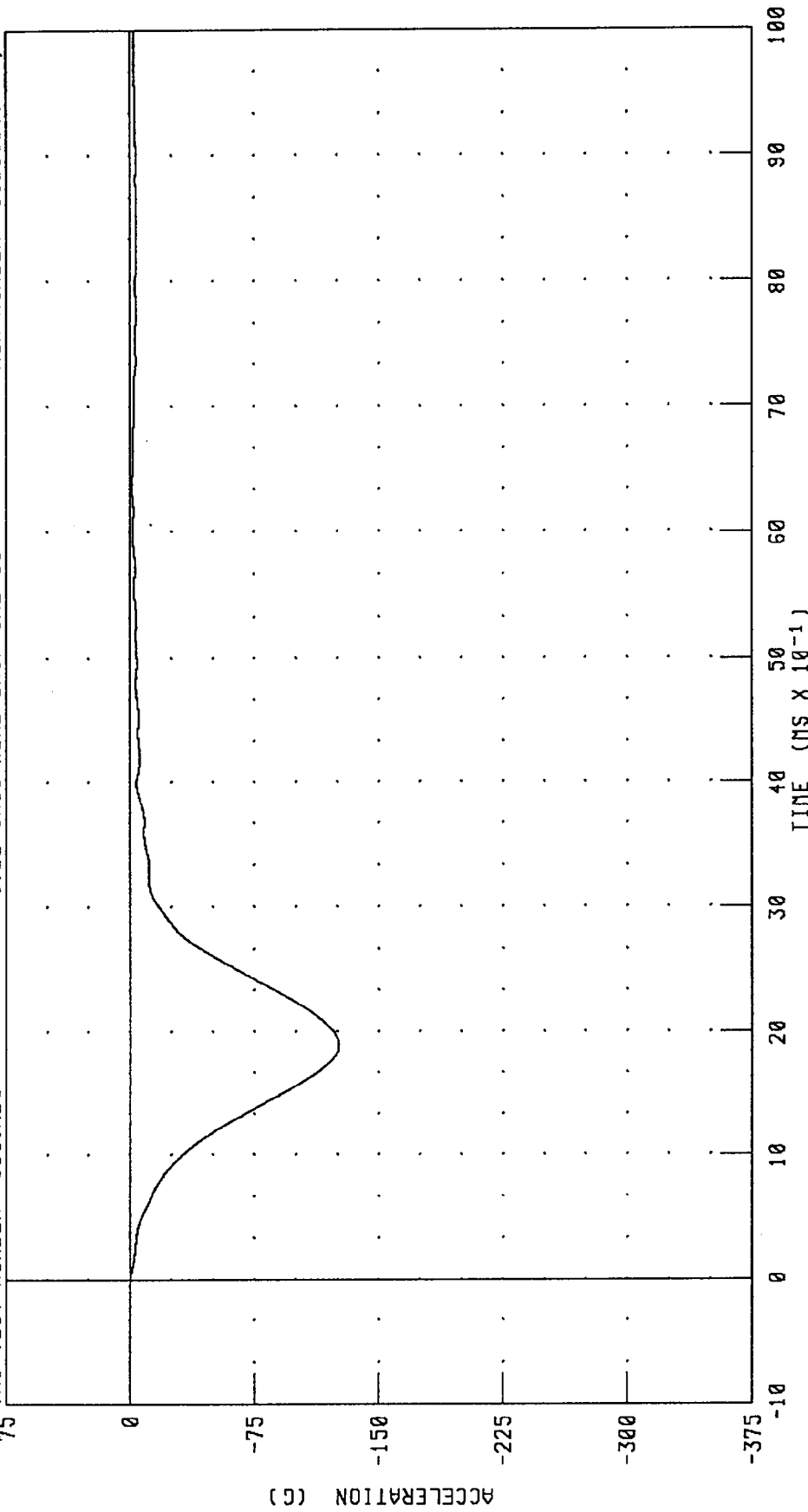
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 35C1H08

572E SN35 HEAD DROP CAL 01

RUN NUMBER: 050196.1416;1



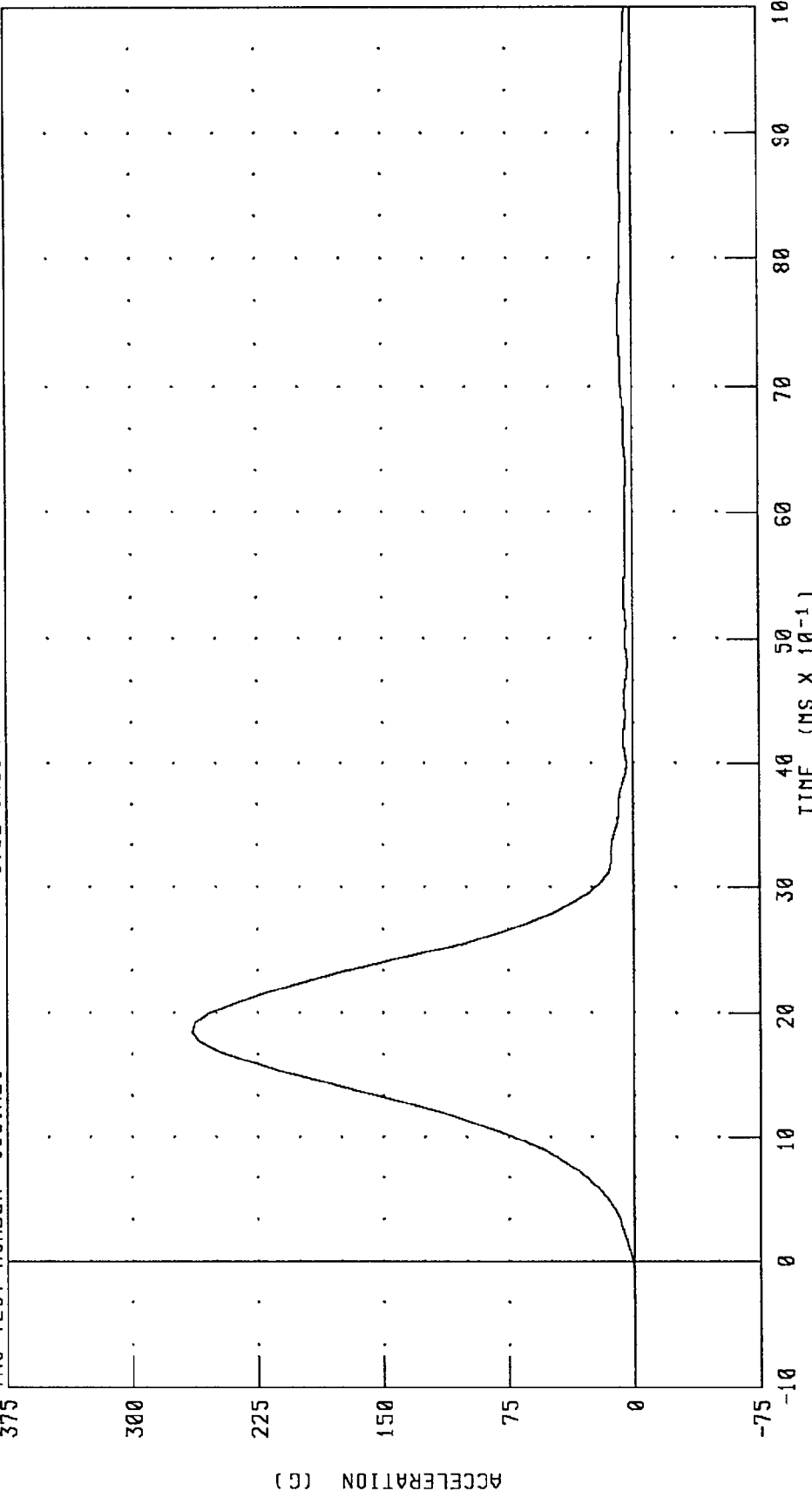
PEAK DATA: -0.10 G @ -0.08 MS; -126.12 G @ 1.92 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD RESULTANT ACCELERATION
 572E SN35 HEAD DROP CAL 01

RUN NUMBER: 050196.1416.1

TRC TEST NUMBER: 35C1H08



PEAK DATA: 264.59 G @ 1.84 MS; 0.13 G @ -0.40 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

11-JUL-95

TRC INC. TEST NO: 35C1NF1 572E SN35 NECK FLEXION CAL01

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.98 G
	20 MS	17.60 - 22.60 G	20.12 G
	30 MS	12.50 - 18.50 G	15.08 G
MAX PENDULUM G		29 G MAX	23.77 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.03 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.36 MS
D PLANE	MAX	64 - 78 DEG.	70.37 DEG.
ROTATION	TIME	57 - 64 MS	58.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	96.89 NM
	TIME	47 - 58 MS	50.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.48 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.60 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

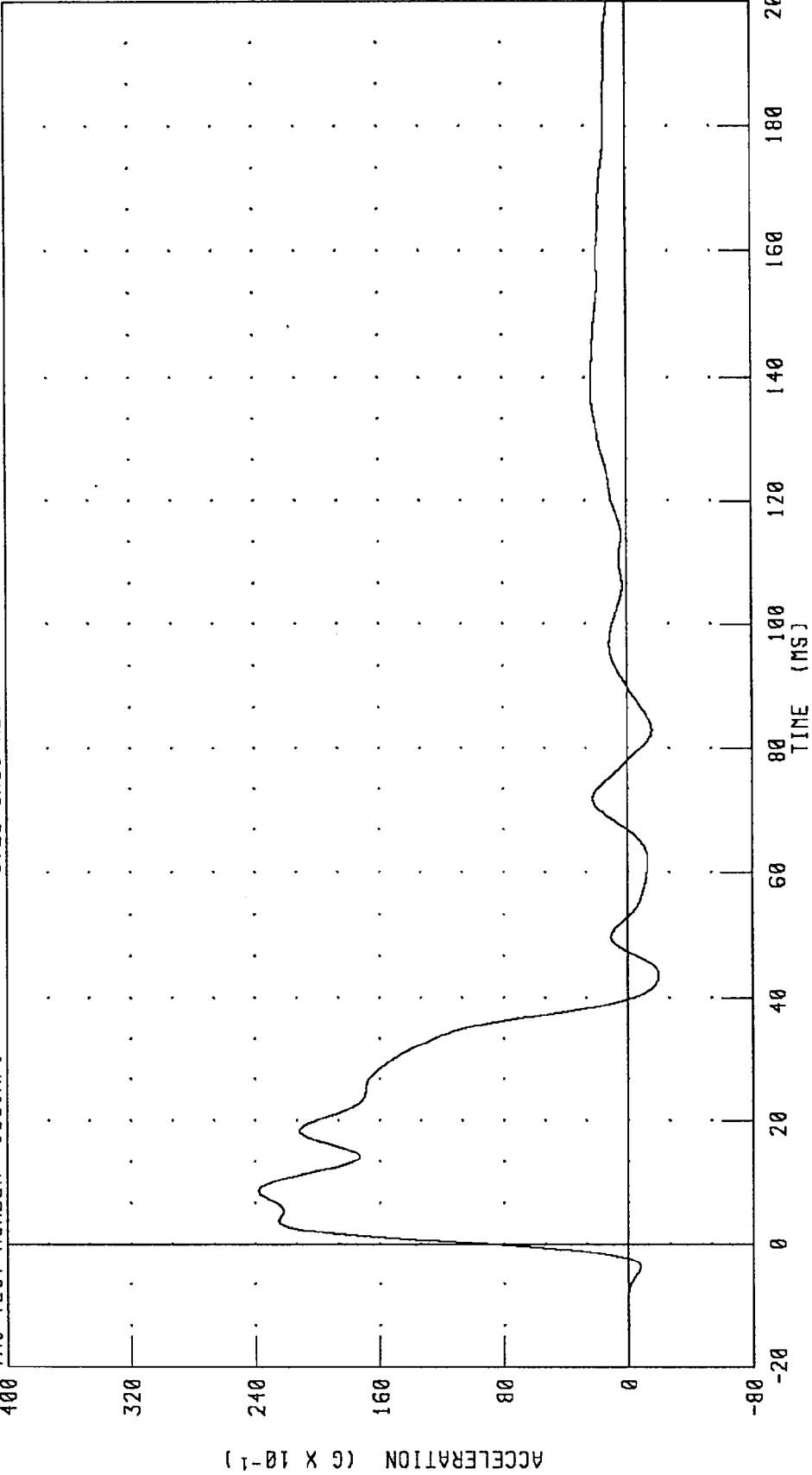
RUN NUMBER: 071195.0843;2

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 35CINF1

572E SN35 NECK FLEXION CAL01

RUN NUMBER: 050196.1416,2



PEAK DATA: 23.78 G @ 8.64 MS; -1.97 G @ 43.76 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

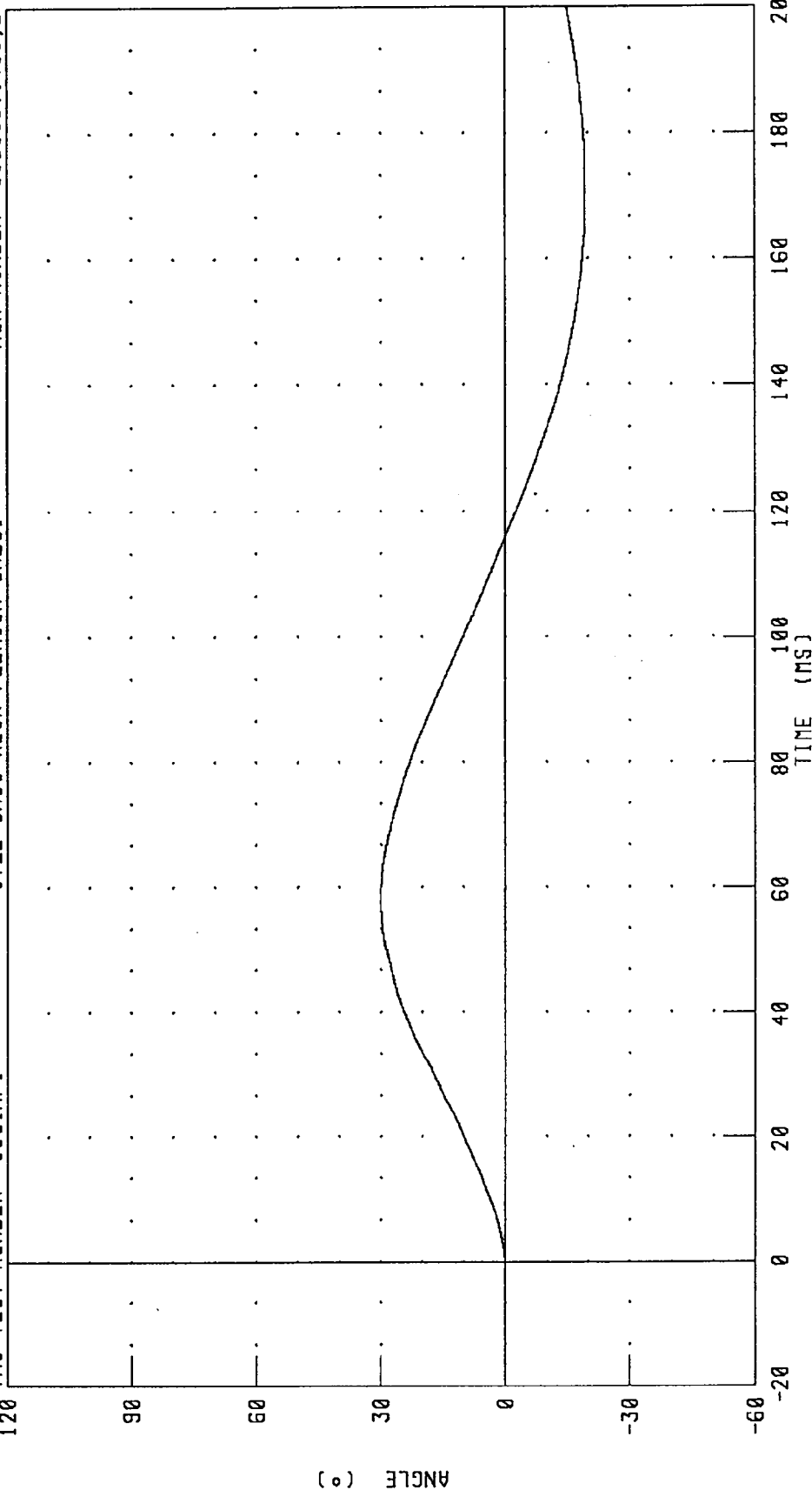
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN35 NECK FLEXION CAL01

TRC TEST NUMBER: 35C1NF1

RUN NUMBER: 050196.1416;2



PEAK DATA: 30.01 ° @ 58.24 MS; -19.33 ° @ 167.52 MS

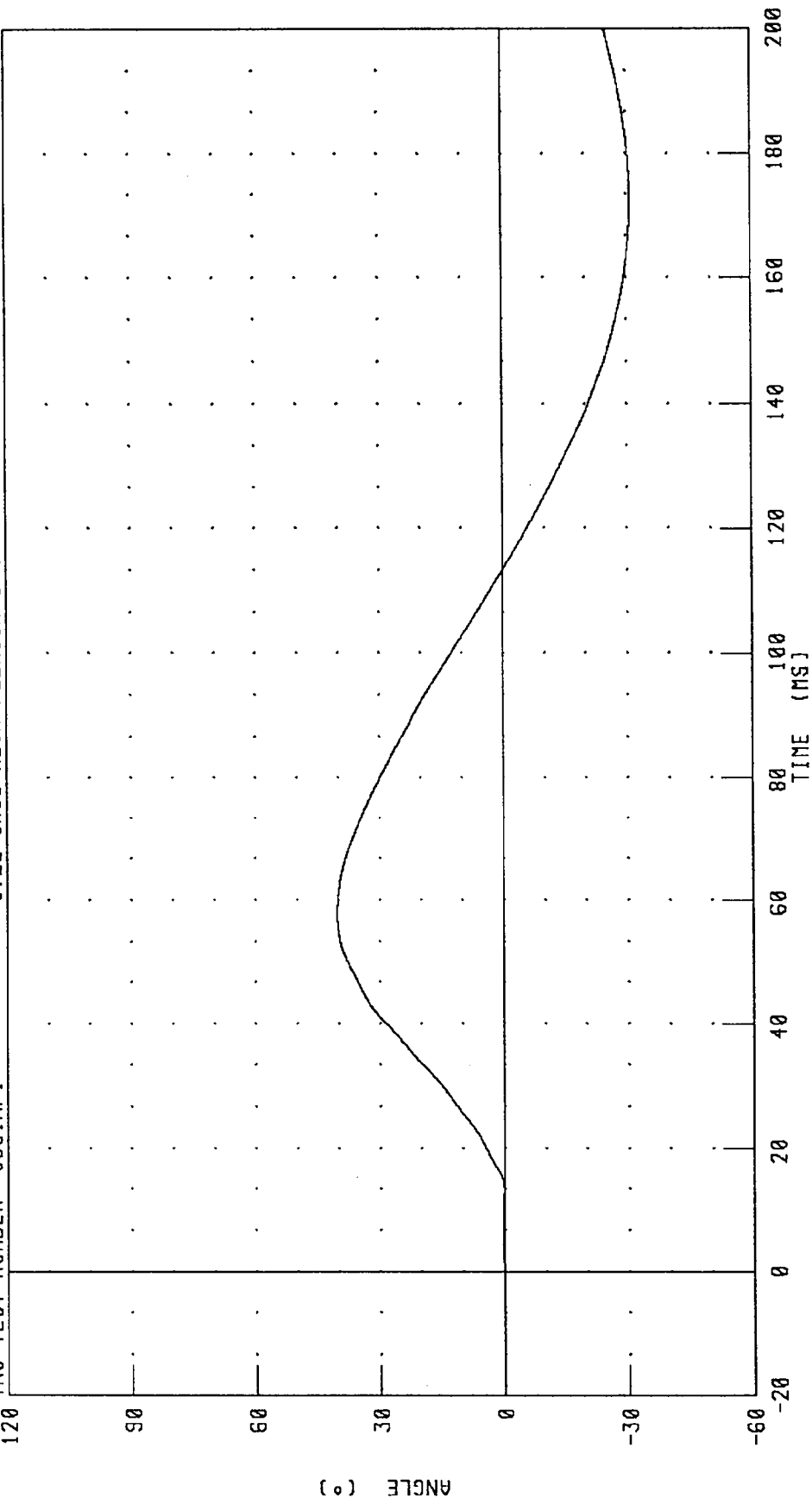
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 35CINF1

572E SN35 NECK FLEXION CAL01

RUN NUMBER: 050196.1416.2



PEAK DATA: 40.37 ° @ 57.76 MS; -30.85 ° @ 169.84 MS

CHANNEL: THETA FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 35C1NF1

572E SN35 NECK FLEXION CAL01

RUN NUMBER: 050196.1416;2

120

90

60

30

0

-30

-60

ANGLE (°)

TIME (MS)

80 100 120 140 160 180 200

CHANNEL: TOTAL

FILTER: CH. CLASS 60

PEAK DATA: 70.38 ° @ 58.00 MS; -50.17 ° @ 169.52 MS

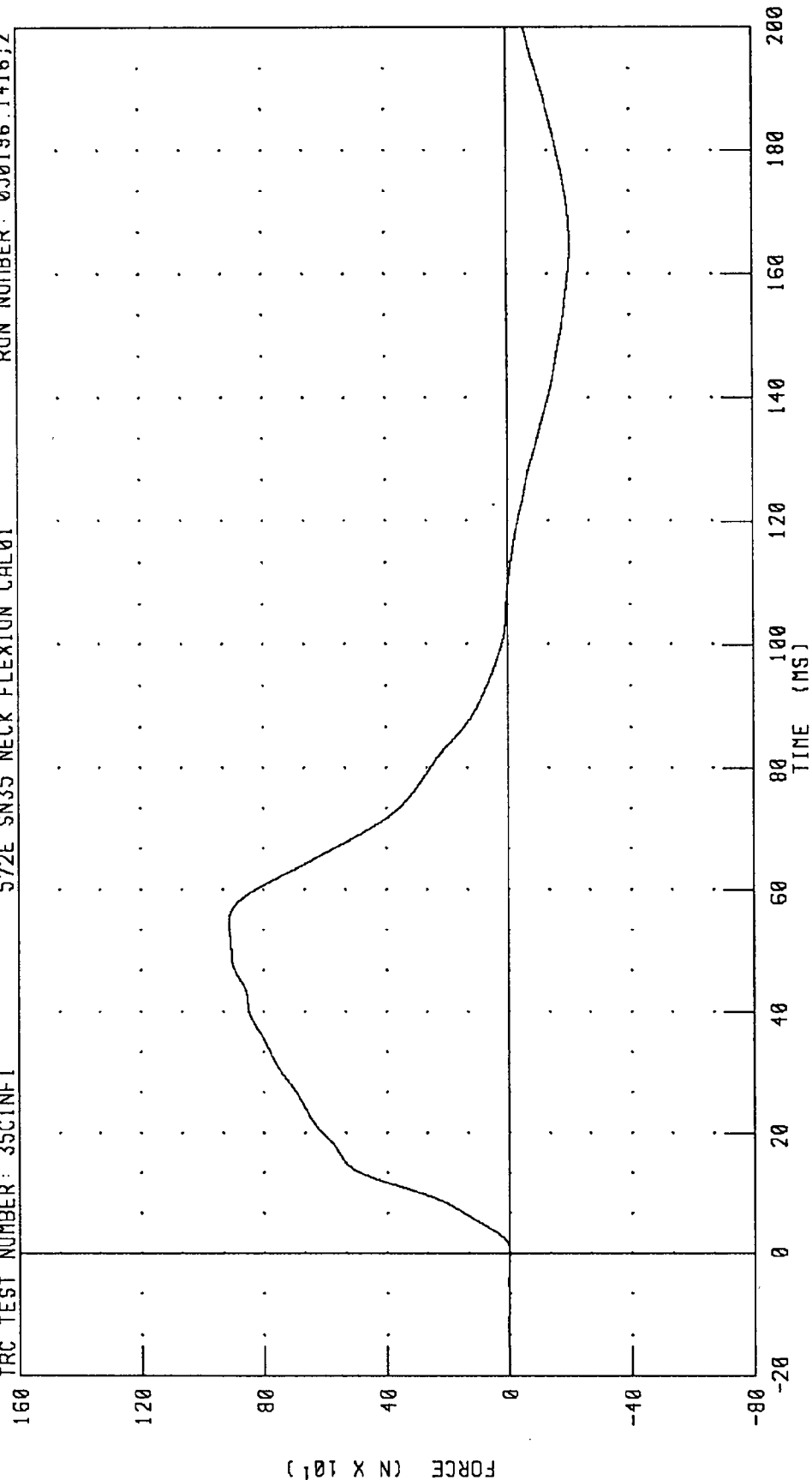
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 35CINF1

572E SN35 NECK FLEXION CAL01

RUN NUMBER: 050196.1416;2



PEAK DATA: 912.76 N @ 54.56 MS; -205.59 N @ 164.80 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

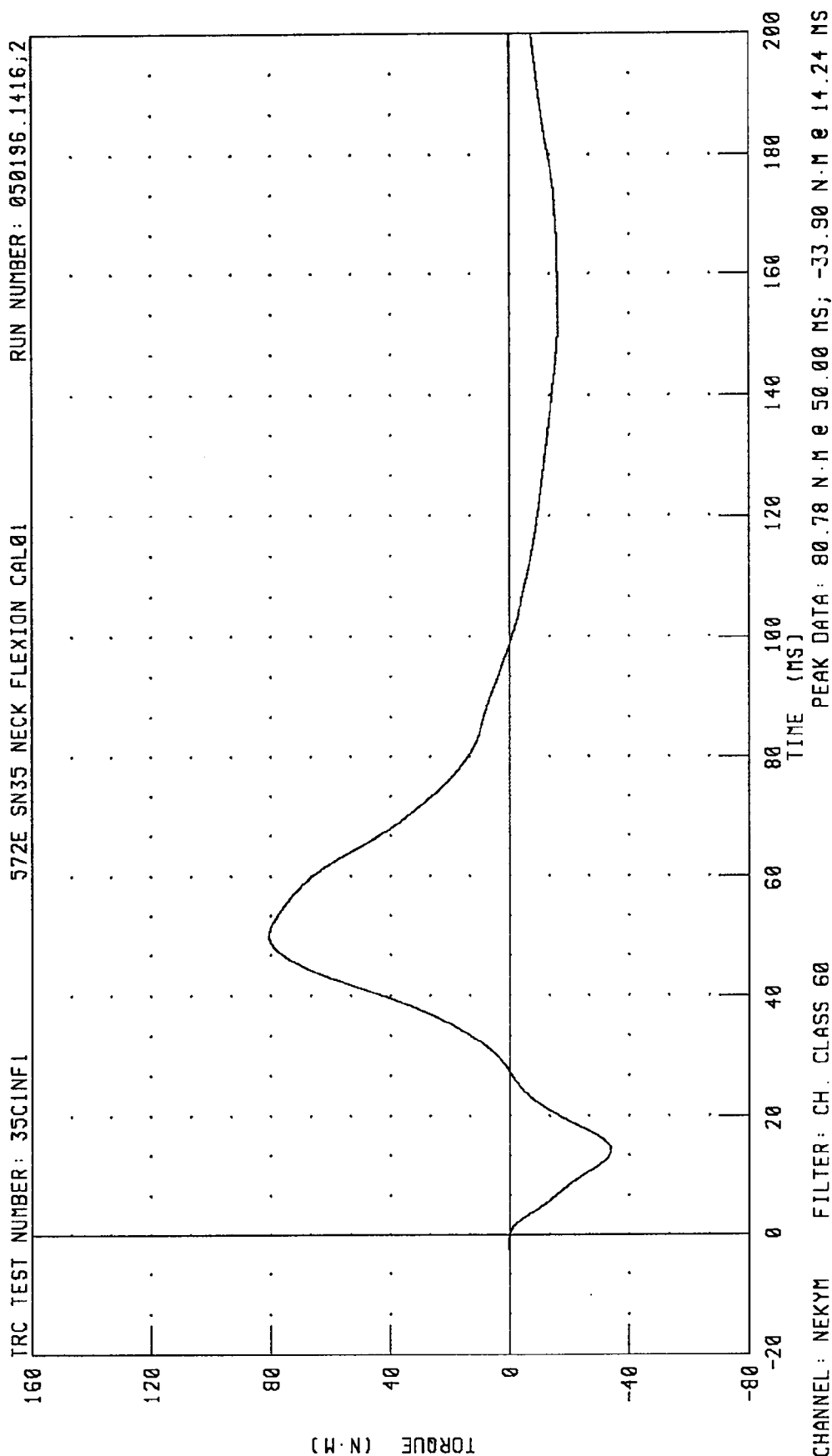
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 35CINF1

572E SN35 NECK FLEXION CAL01

RUN NUMBER: 050196.1416;2



PEAK DATA: 80.78 N-M @ 50.00 MS; -33.90 N-M @ 14.24 MS

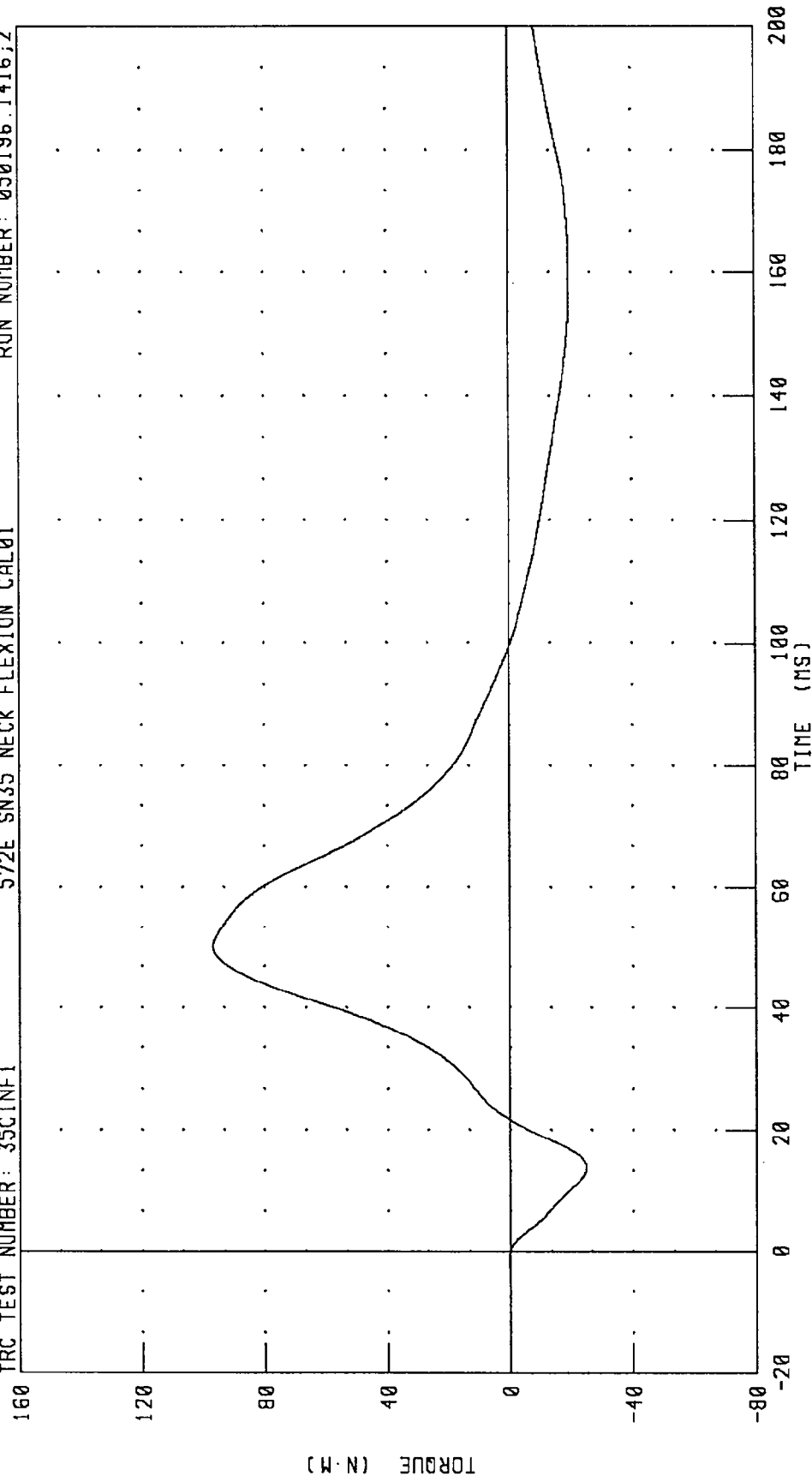
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 35CINF1

572E SN35 NECK FLEXION CAL01

RUN NUMBER: 050196.1416;2



PEAK DATA: 96.89 N-M @ 50.00 MS; -24.77 N-M @ 13.84 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

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

HYBRID III

11-JUL-95

TRC INC. TEST NO: 35C1NE1 572E SN35 NECK EXT. CAL01

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.48 G
	20 MS	14.00 - 19.00 G	15.59 G
	30 MS	11.00 - 16.00 G	14.31 G
MAX PENDULUM G		22 G MAX	18.20 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.27 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.04 MS
D PLANE	MAX	81 - 106 DEG.	96.12 DEG.
ROTATION	TIME	72 - 82 MS	74.08 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-65.59 NM
	TIME	65 - 79 MS	69.76 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.00 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	134.80 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard Le Van

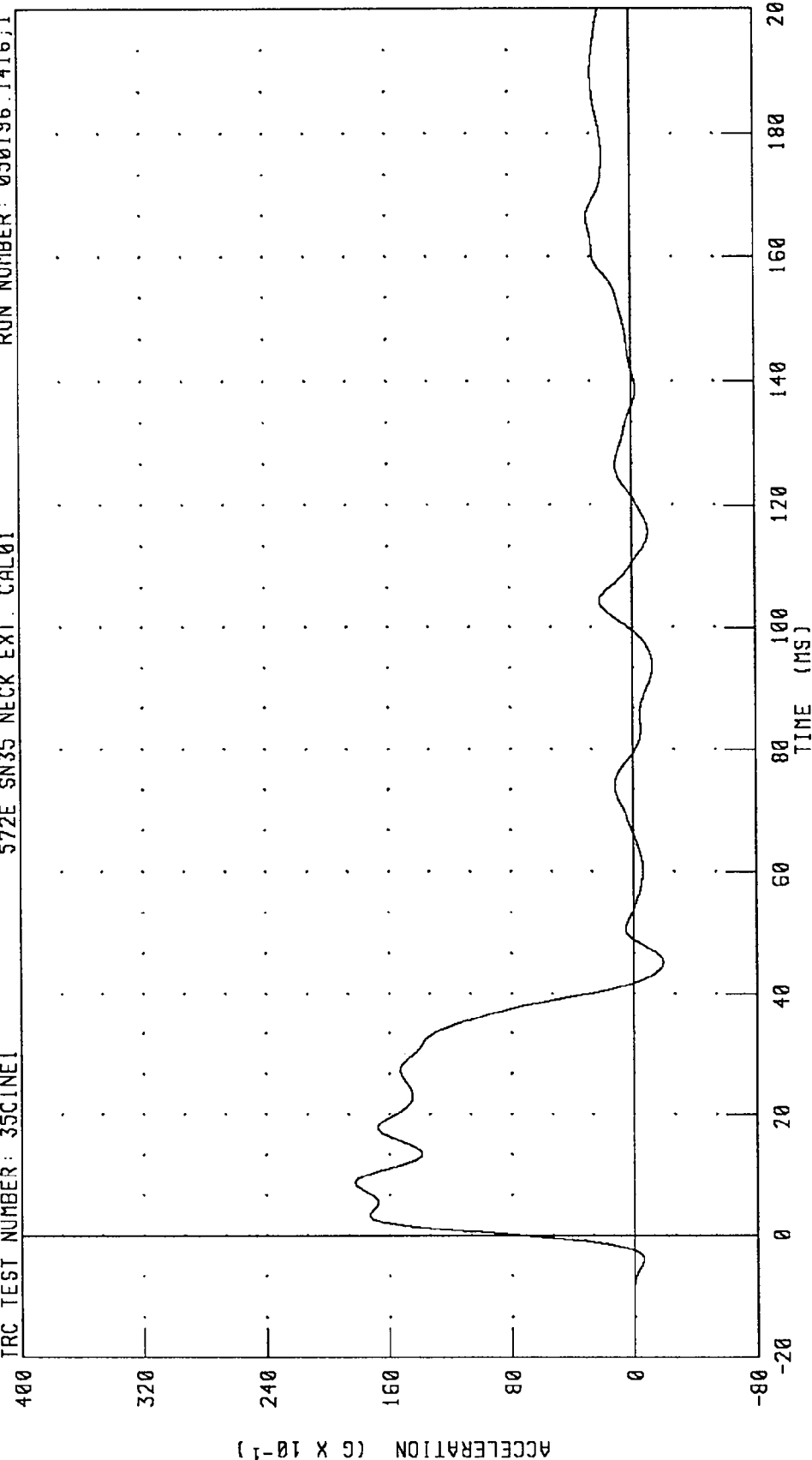
RUN NUMBER: 071195.0855;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 35CINE1

572E SN35 NECK EXT. CAL01

RUN NUMBER: 050196.1416;1



PEAK DATA: 18.21 G @ 8.64 MS; -1.91 G @ 45.20 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

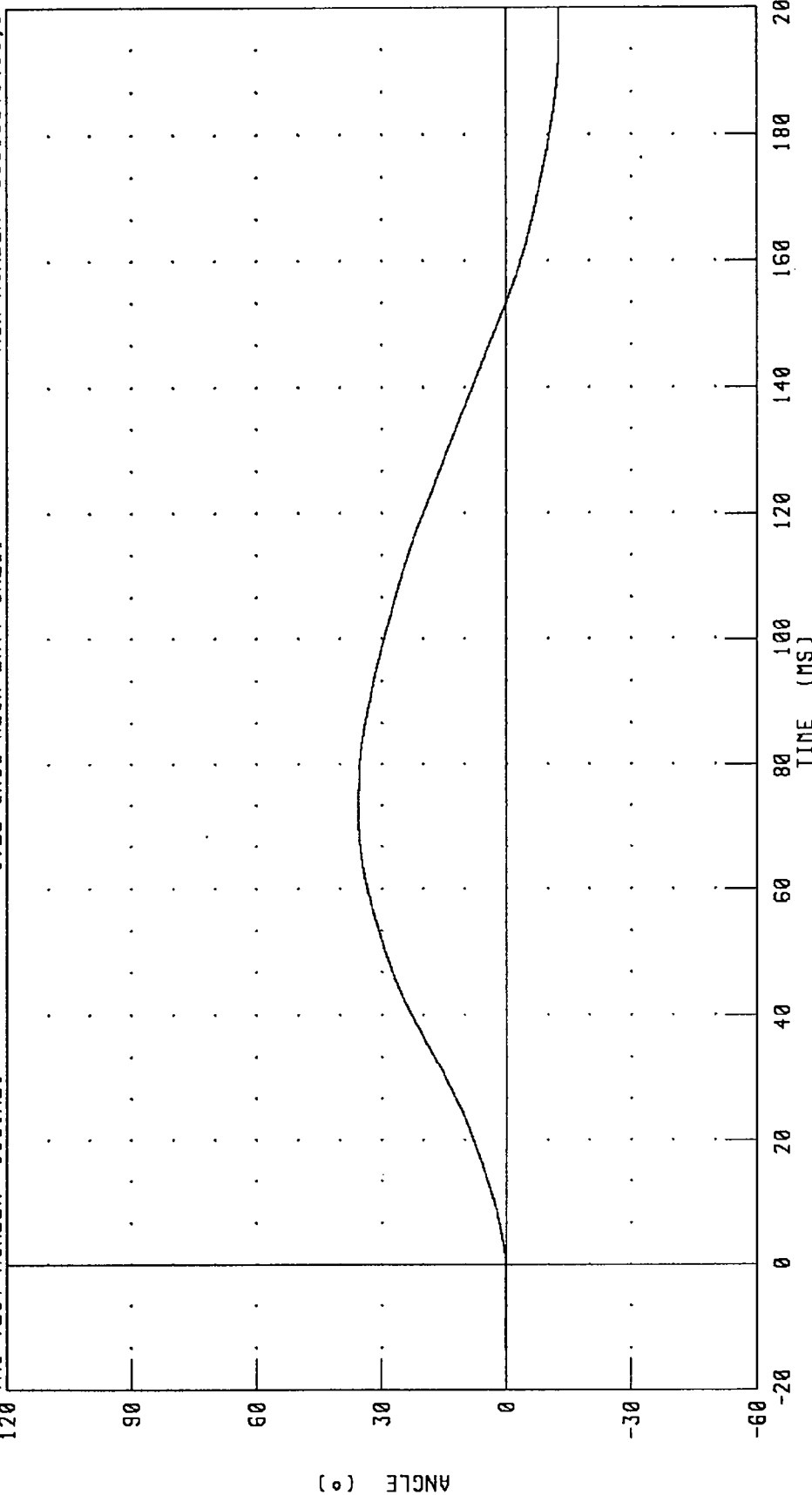
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 35C1NE1

572E SN35 NECK EXT. CAL01

RUN NUMBER: 050196 1416;1



PEAK DATA: 35.65 ° @ 72.64 MS; -12.75 ° @ 197.84 MS

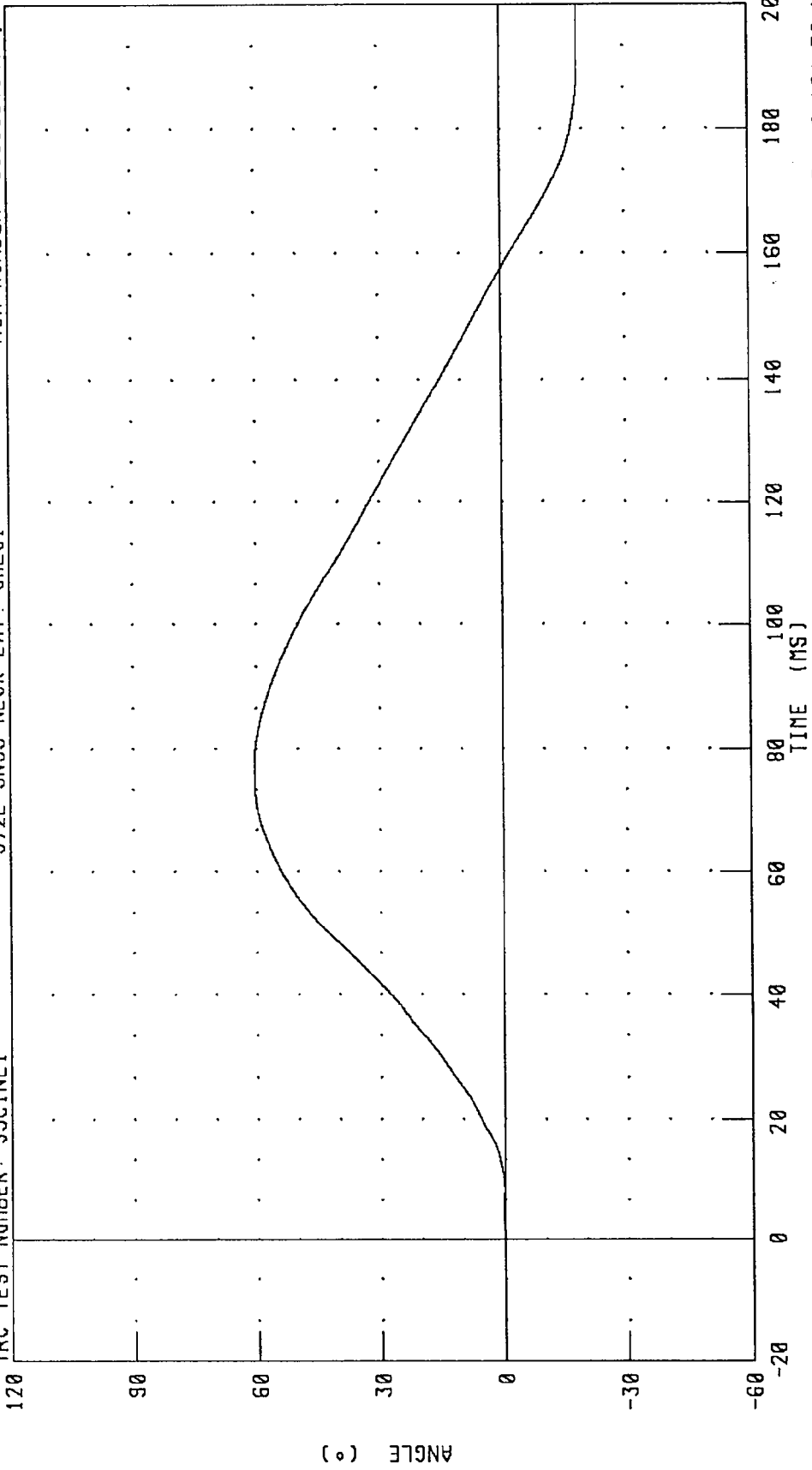
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 35CINE1

572E SN35 NECK EXT. CAL01

RUN NUMBER: 050196.1416;1



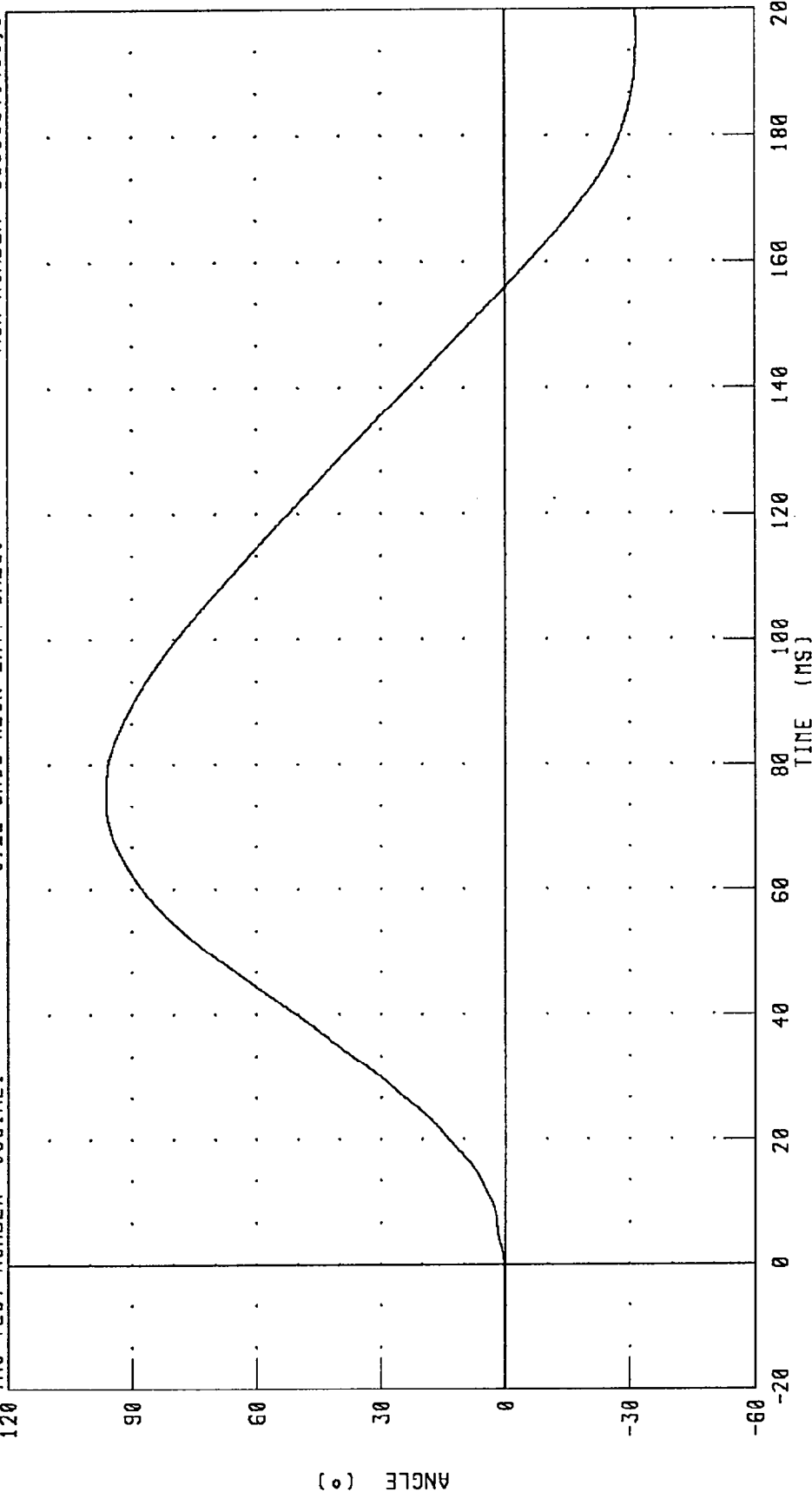
CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 60.59 ° @ 76.32 MS; -18.87 ° @ 194.56 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

IRC TEST NUMBER: 35C1NE1 572E SN35 NECK EXT. CAL01 RUN NUMBER: 050196 1416;1



PEAK DATA: 96.13 ° @ 74.08 MS; -31.61 ° @ 195.20 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

ANGLE (°)

TIME (MS)

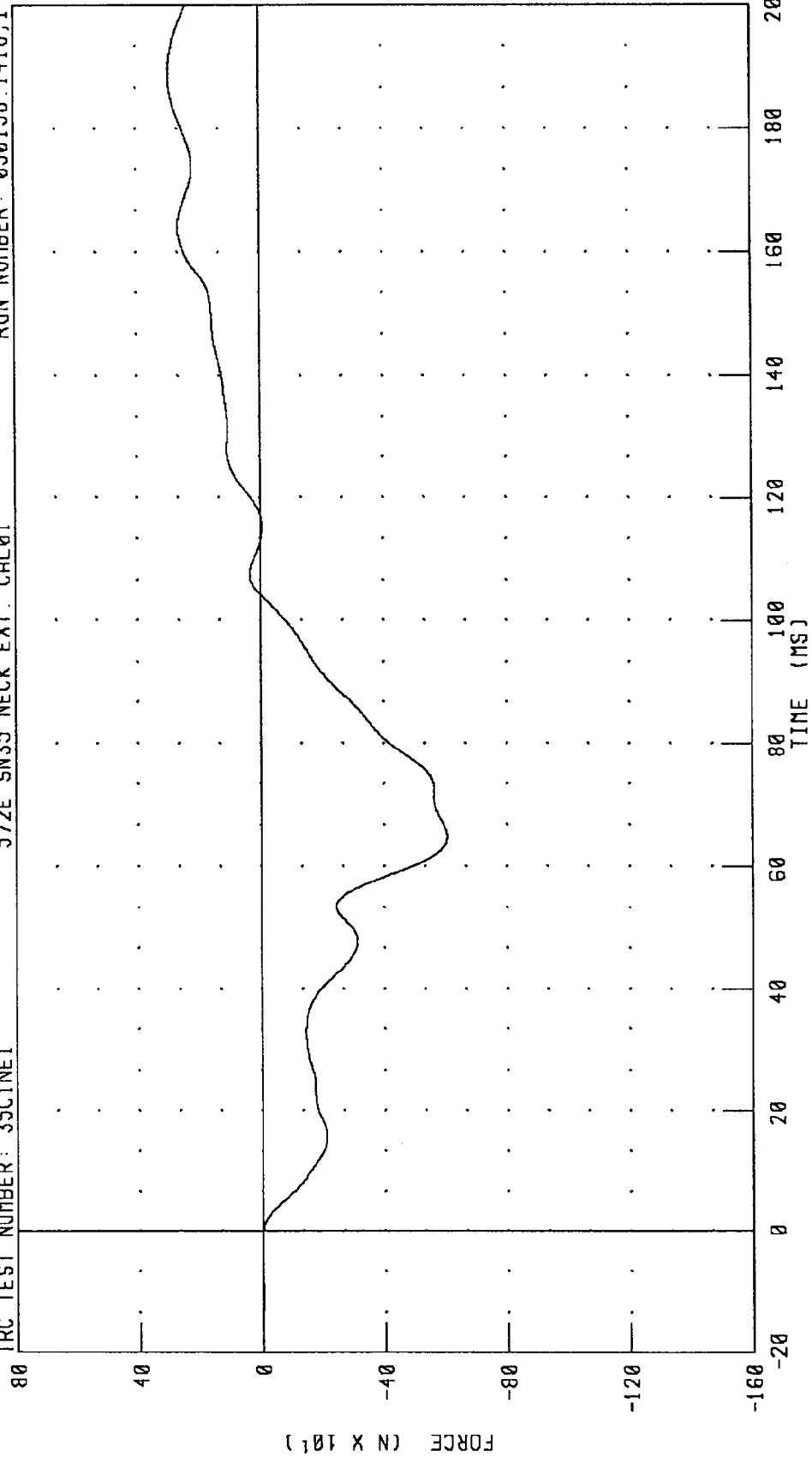
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 35CINE1

572E SN35 NECK EXT. CAL01

RUN NUMBER: 050196.1416,1



PEAK DATA: 294.85 N @ 188.88 MS; -605.24 N @ 64.72 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

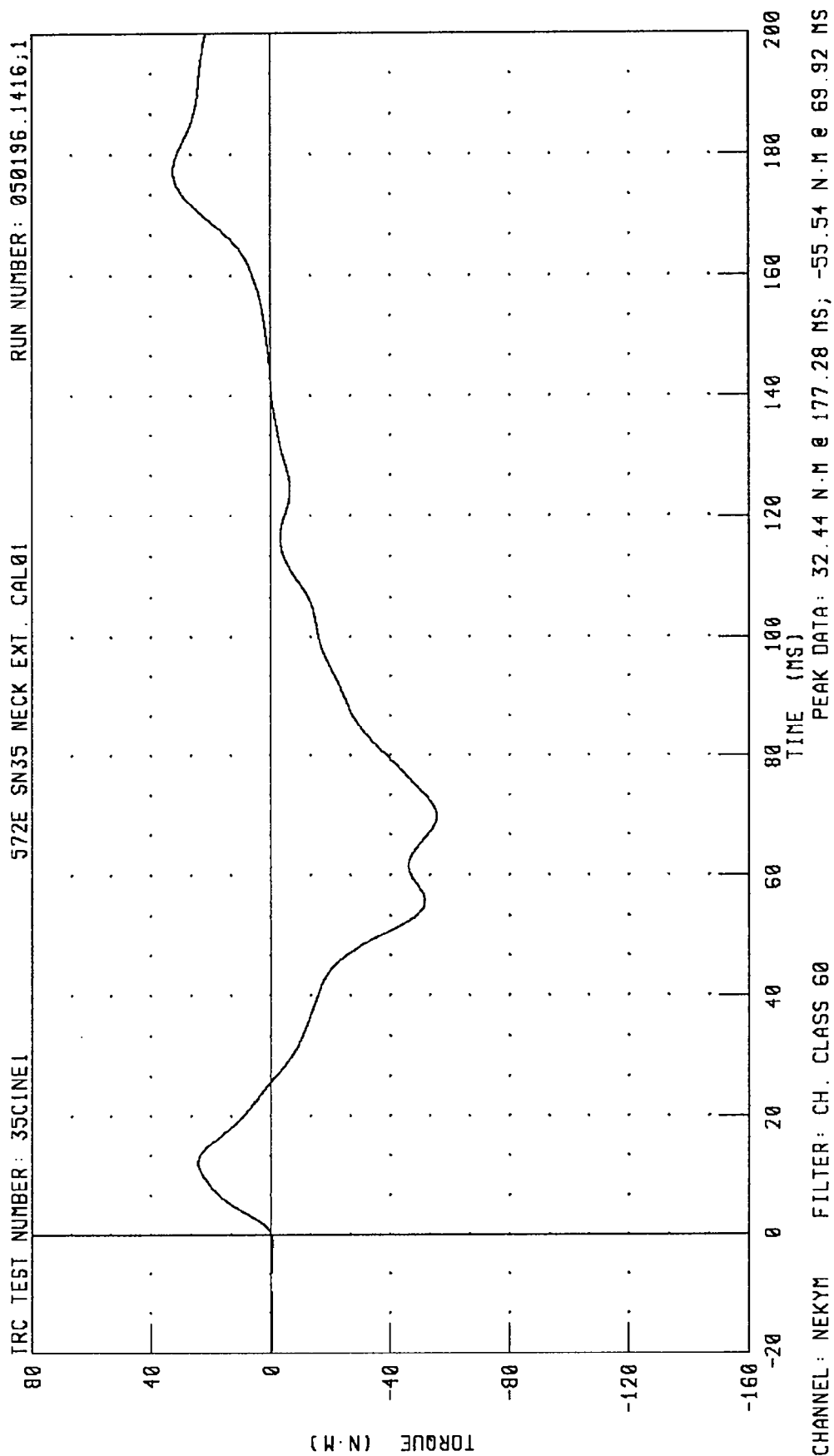
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

IRC TEST NUMBER: 35CINE1

572E SN35 NECK EXT. CAL01

RUN NUMBER: 050196.1416;1



CHANNEL: NEKYM FILTER: CH. CLASS 60

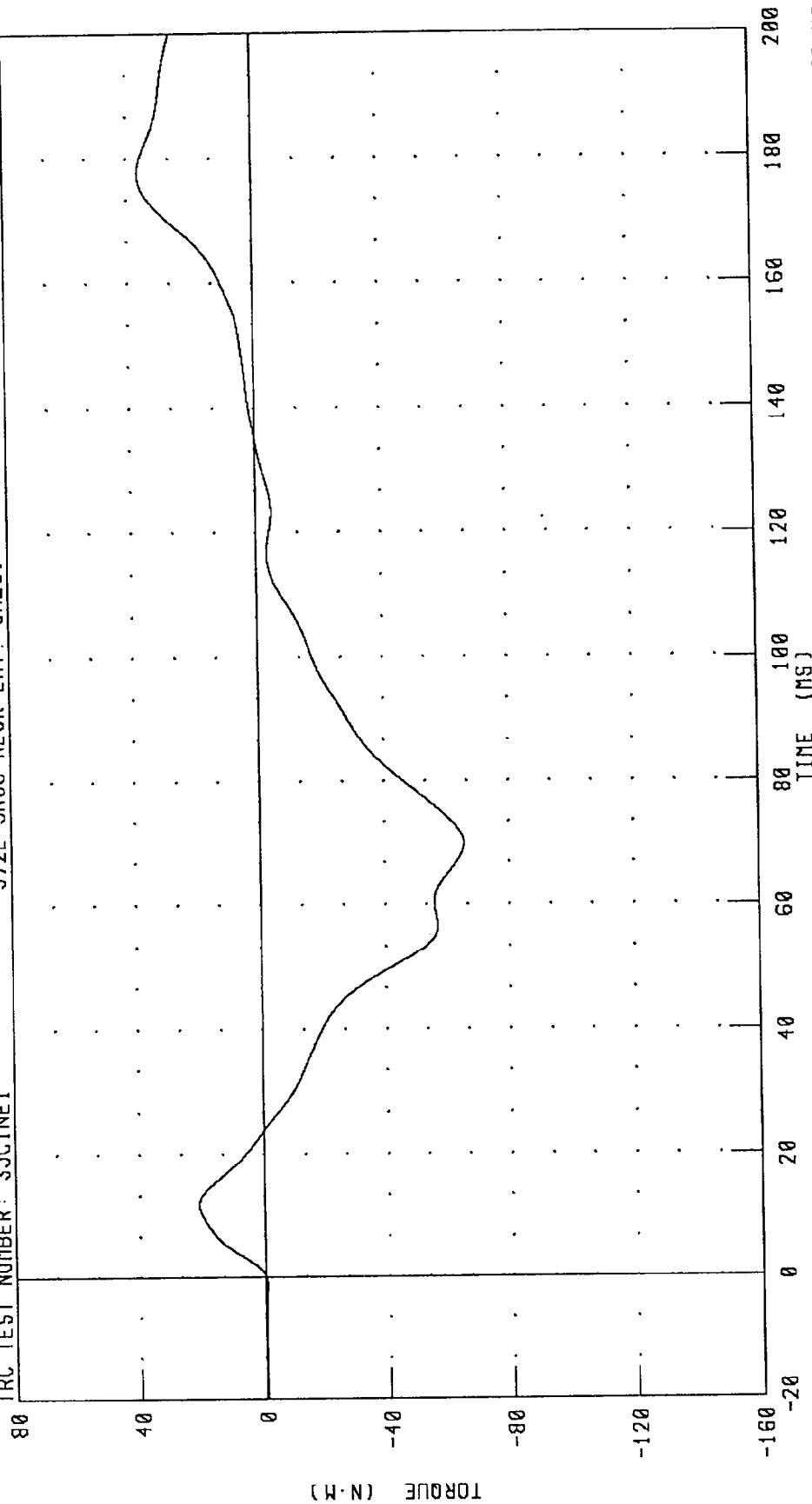
PEAK DATA: 32.44 N-M @ 177.28 MS; -55.54 N-M @ 69.92 MS

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

TRC TEST NUMBER: 35CINE1

572E SN35 NECK EXT. CAL01

RUN NUMBER: 050196.1416;1



CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

11-JUL-95

TRC INC.

TEST NO: 35C1TH1

572E SN35 H.S.THORAX CAL01

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.4 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	66.7 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5608. N
INTERNAL HYSTERESIS	69% - 85%	73.6%

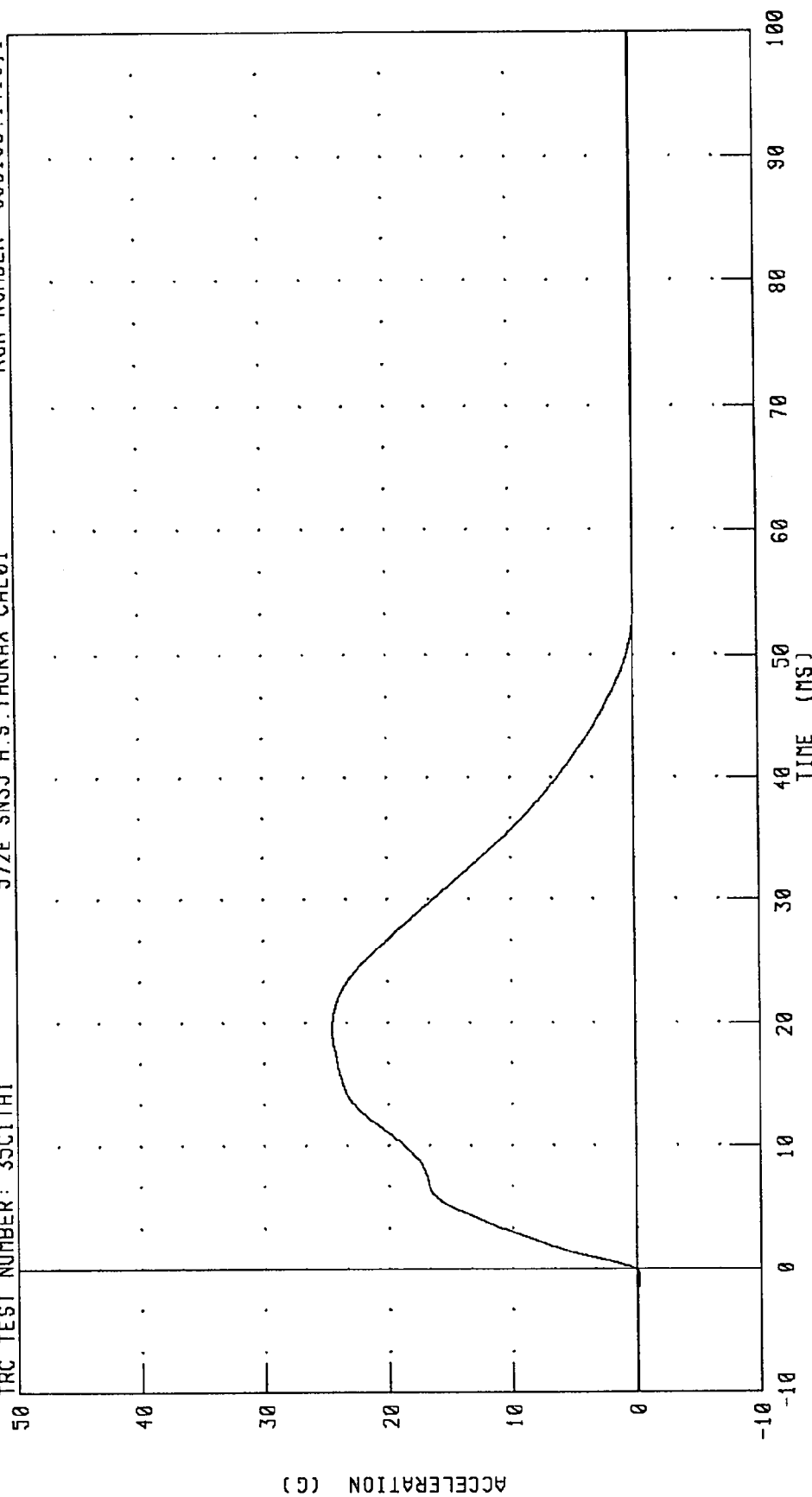
TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Lee

RUN NUMBER: 071195.1433;1

PART 572-E HYBRID III THORAX CALIBRATION PENDULUM DECELERATION

TRC TEST NUMBER: 35C1TH1 572E SN35 H.S.THORAX CAL01 RUN NUMBER: 050196.1416.1



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 24.48 G @ 19.52 MS; -0.19 G @ -0.64 MS

PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

572E SN35 H.S. THORAX CAL01

TRC TEST NUMBER: 35C1TH1

100

80

60

40

20

0

-20

FORCE (N X 10²)

TIME (MS)

0 10 20 30 40 50 60 70 80 90 100

PEAK DATA: 5608.25 N @ 19.52 MS; -42.97 N @ -0.64 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

960418

C-27

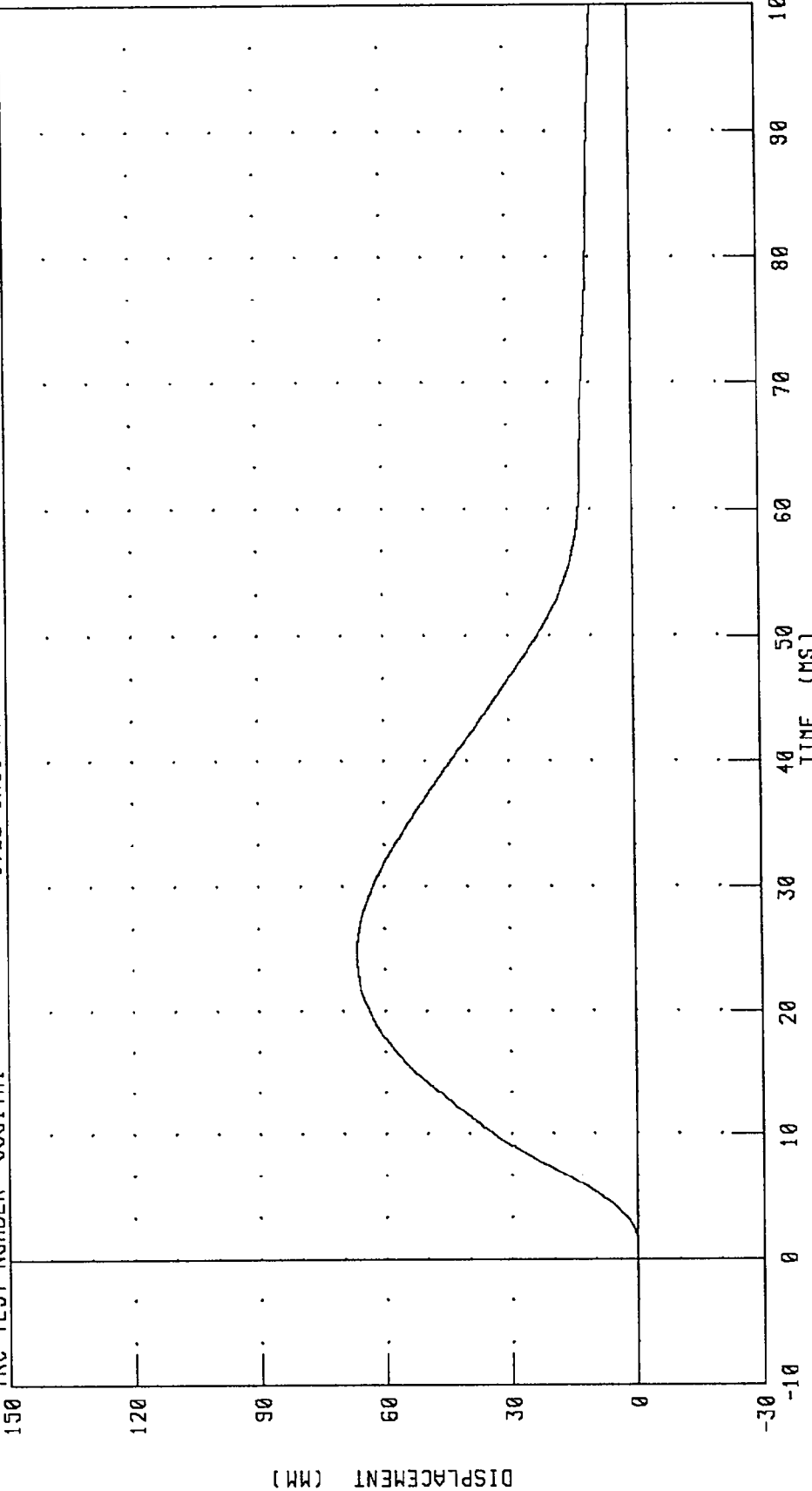
PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

572E SN35 H.S. THORAX CAL01

TRC TEST NUMBER: 35C1TH1

RUN NUMBER: 050196.1416.1



PEAK DATA: 66.71 MM @ 24.64 MS; -0.05 MM @ 0.96 MS

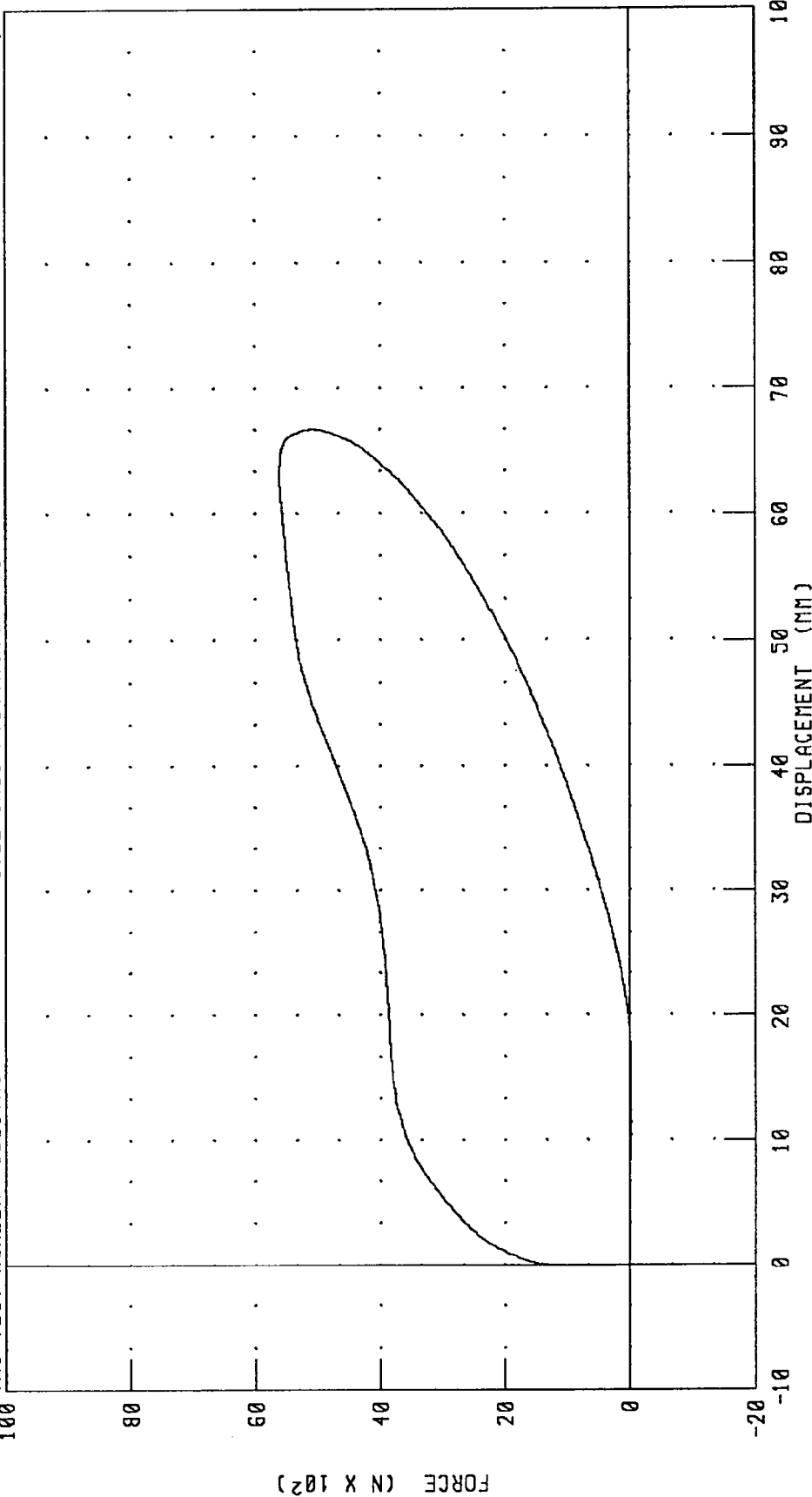
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 35C1TH1

572E SN35 H.S.THORAX CAL01

RUN NUMBER: 050196.1416;1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA:

66.71 MM @ 24.64 MS; -0.05 MM @ 0.96 MS
5608.25 N @ 19.52 MS; -42.97 N @ -0.64 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

11-JUL-95

TRC INC.

TEST NO: 35C1RK1

572E SN35 RIGHT KNEE CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4893.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Loran

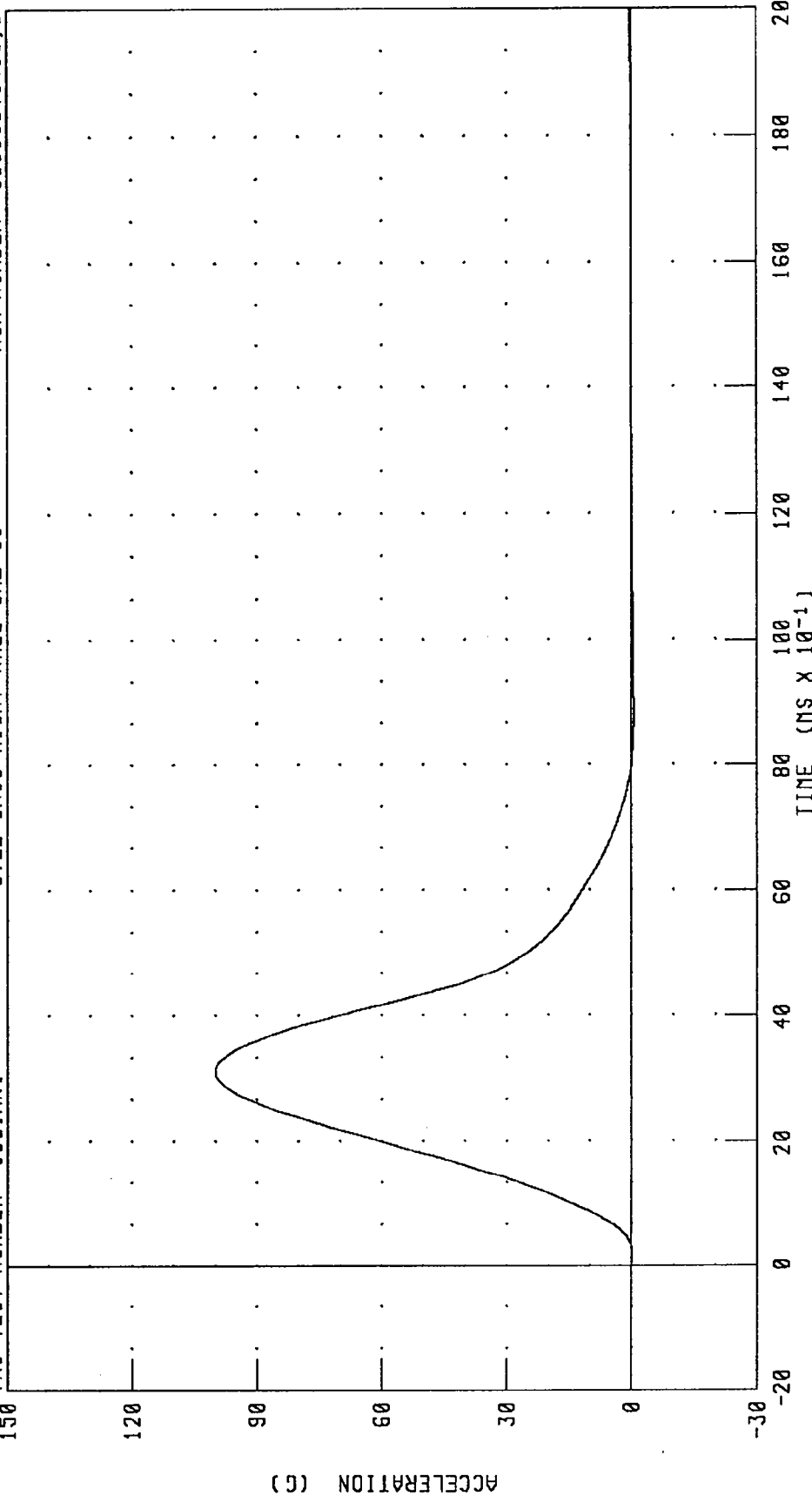
RUN NUMBER: 071195.1336;3

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

TRC TEST NUMBER: 35C1RK1

572E SN35 RIGHT KNEE CAL 01

RUN NUMBER: 050196.1416,3



PEAK DATA: 100.02 G @ 3.12 MS; -0.64 G @ 8.88 MS

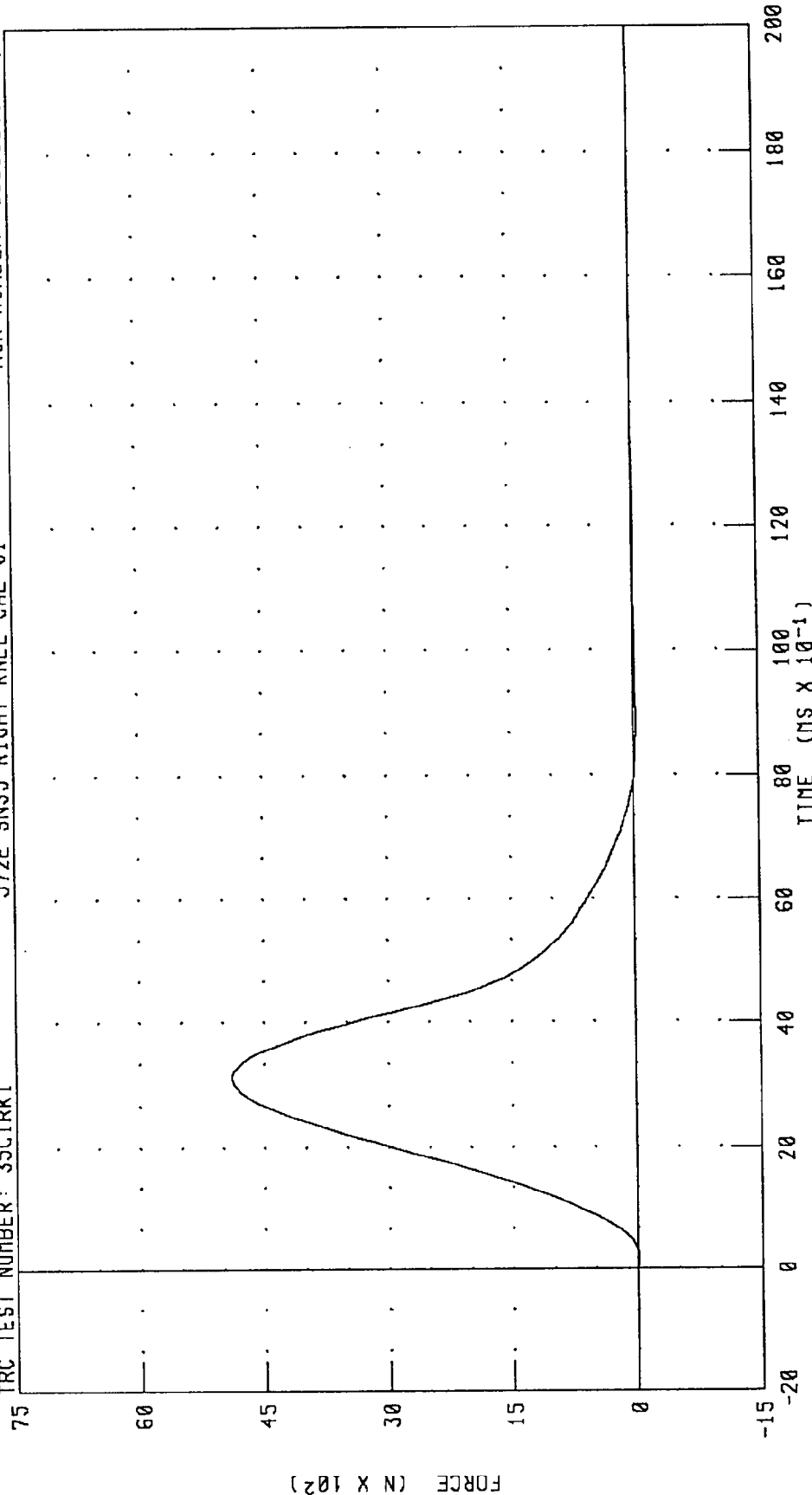
CHANNEL: PENXG FILTER: CH. CLASS 600

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

TRC TEST NUMBER: 35CIRK1

572E SN35 RIGHT KNEE CAL 01

RUN NUMBER: 050196.1416.3



PEAK DATA: 4893.61 N @ 3.12 MS; -31.34 N @ 8.88 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

11-JUL-95

TRC INC.

TEST NO: 35C1LK1

572E SN35 LEFT KNEE CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	4747.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

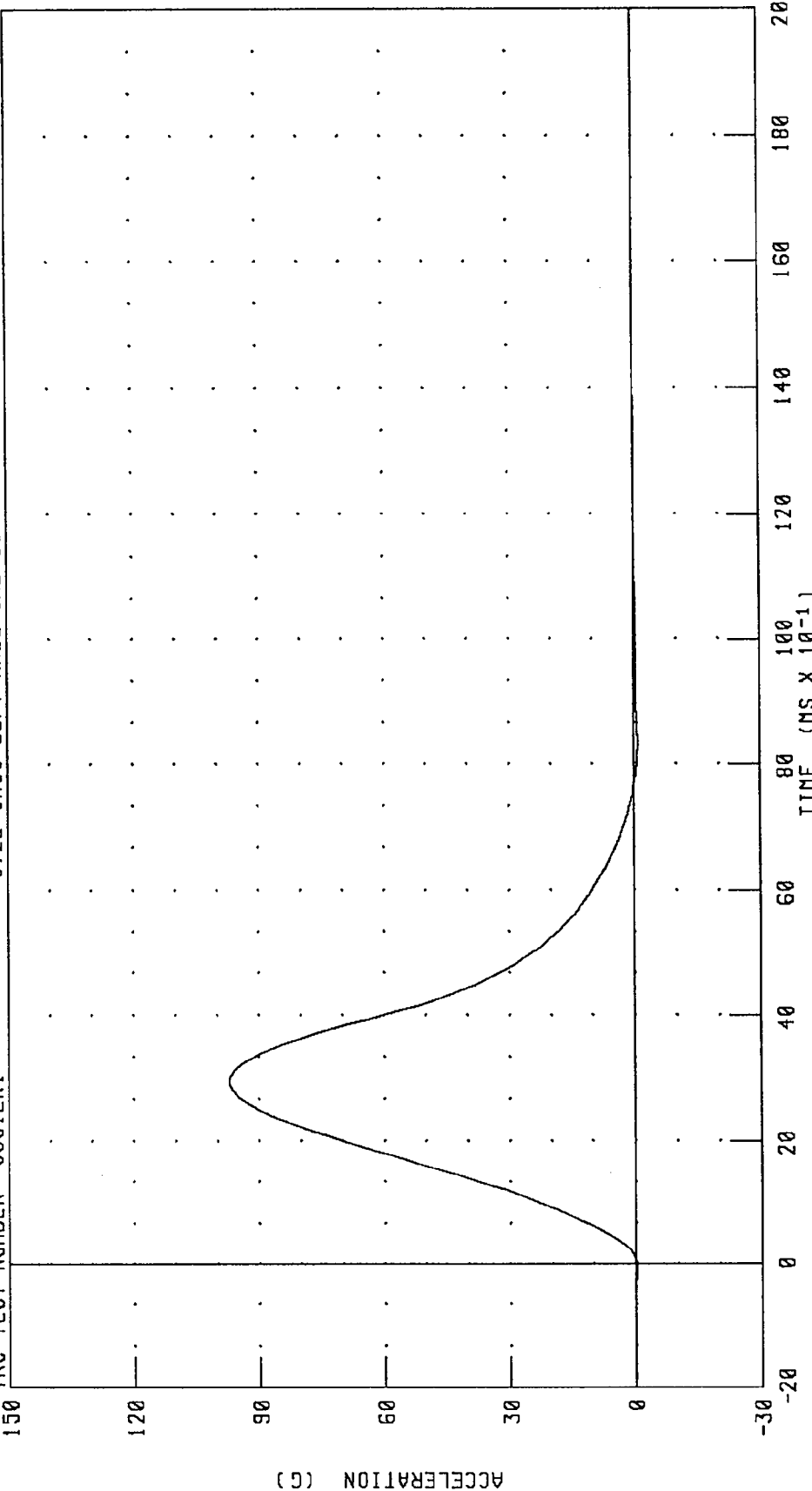
Richard L. L...

RUN NUMBER: 071195.1251;2

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

572E SN35 LEFT KNEE CAL 01 RUN NUMBER: 050196.1416;2

IRC TEST NUMBER: 35C1LK1



CHANNEL: PENXC FILTER: CH. CLASS 600

PEAK DATA: 97.04 G @ 2.96 MS; -0.87 G @ 8.32 MS

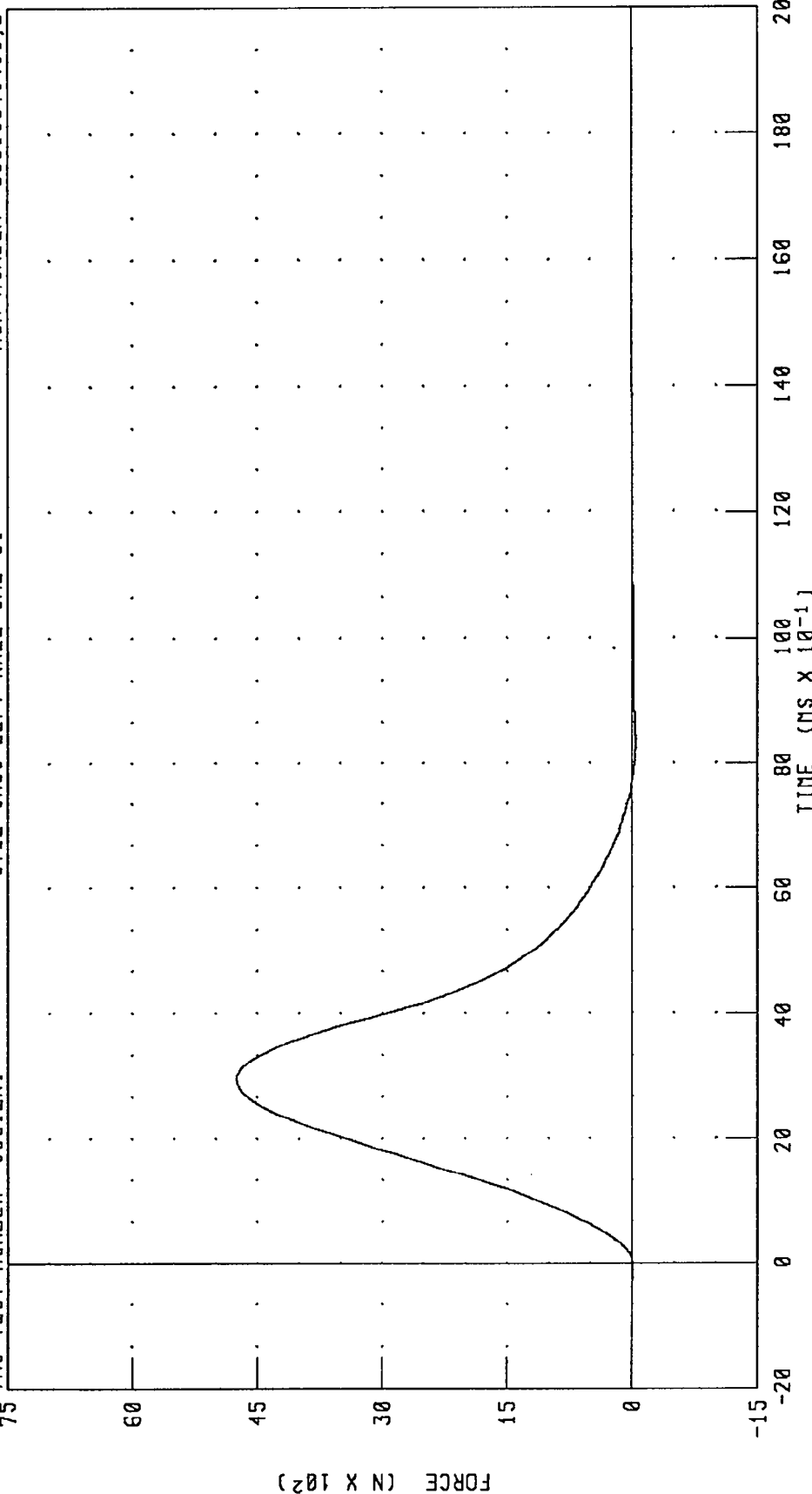
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 35C1LK1

572E SN35 LEFT KNEE CAL 01

RUN NUMBER: 050196.1416;2



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 4747.92 N @ 2.96 MS; -42.49 N @ 8.32 MS

Pre-Test Calibration

Serial Number 34

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS

34 VECTOR

11-JUL-95

TRC INC.

TEST NO: 34C1ED1

572E SN34 EXT.DIMENSION CAL01

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	991. MM
WAIST CIRCUMFERENCE (Z)		836 - 866 MM	856. MM
CHEST DEPTH (O)		213 - 229 MM	218. MM
H-POINT HEIGHT (C)		84 - 89 MM	86. 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	884. MM
THIGH CLEARANCE (F)		140 - 155 MM	155. MM
BUTTOCK KNEE LENGTH (K)		579 - 605 MM	602. MM
BUTTOCK POPLITEAL LENGTH (N)		452 - 478 MM	472. MM
POPLITEAL HEIGHT (L)		429 - 455 MM	439. MM
KNEE PIVOT HEIGHT (M)		485 - 500 MM	498. MM
FOOT LENGTH (P)		252 - 267 MM	254. 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	427. MM
SHOULDER PIVOT HEIGHT (B)		506 - 521 MM	513. MM
ELBOW REST HEIGHT (J)		191 - 211 MM	208. MM
SHOULDER-ELBOW LENGTH (I)		330 - 345 MM	335. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290 - 305 MM	295. MM

DUMMY MEETS SPECIFICATIONS
TECHNICIAN Richard LeVan

RUN NUMBER: 071295.1424

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III

11-APR-96

TRC INC.

TEST NO: 34C1HD4

572E SN34 HEAD DROP CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	30.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	252.78 G
PEAK LATERAL ACCELERATION	15 G MAX	3.88 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. L...

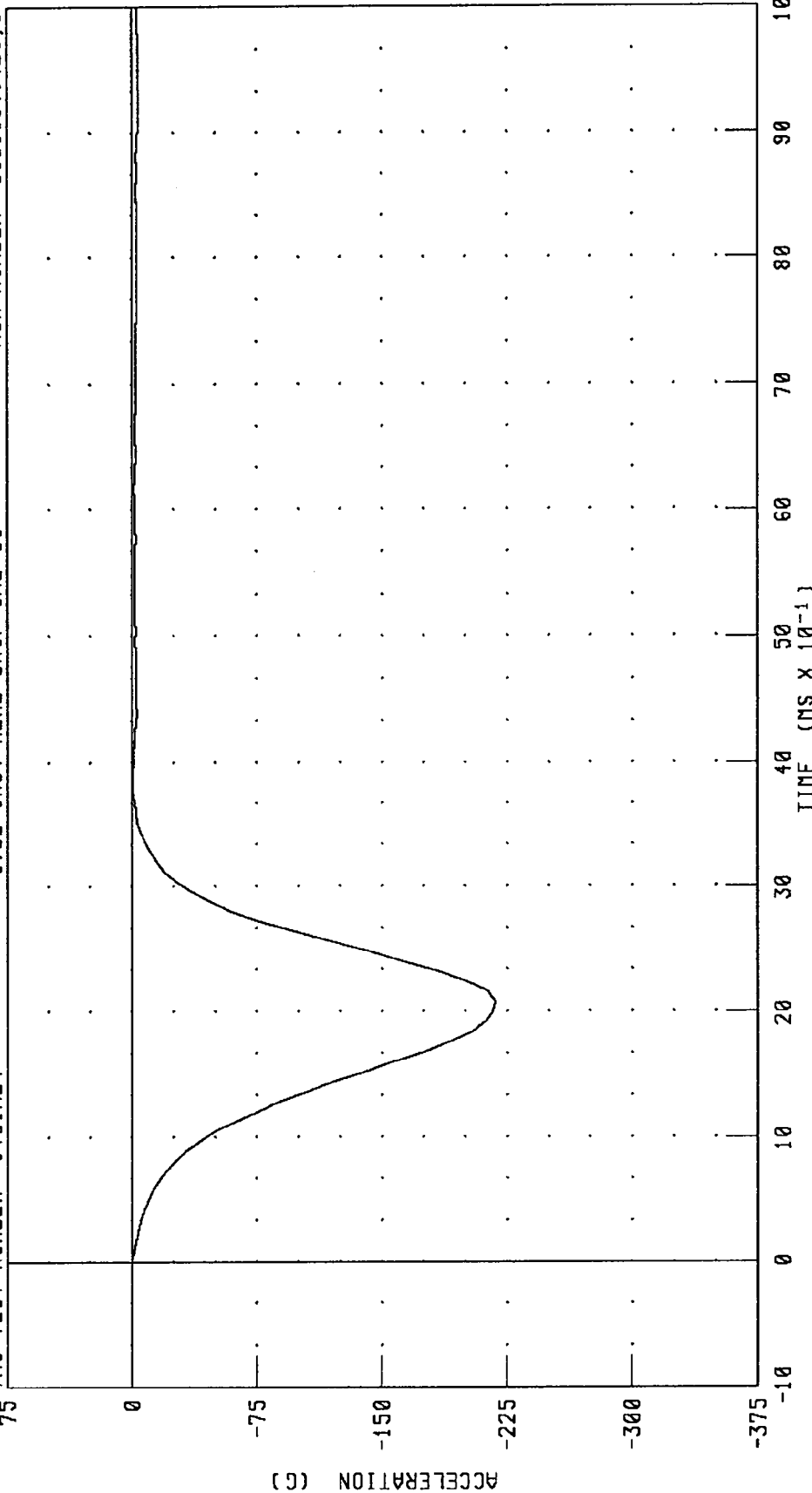
RUN NUMBER: 041196.0809;1

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION X AXIS
 572E SN34 HEAD DROP CAL 01

RUN NUMBER: 050196.1423;1

TRC TEST NUMBER: 34C1H04

75



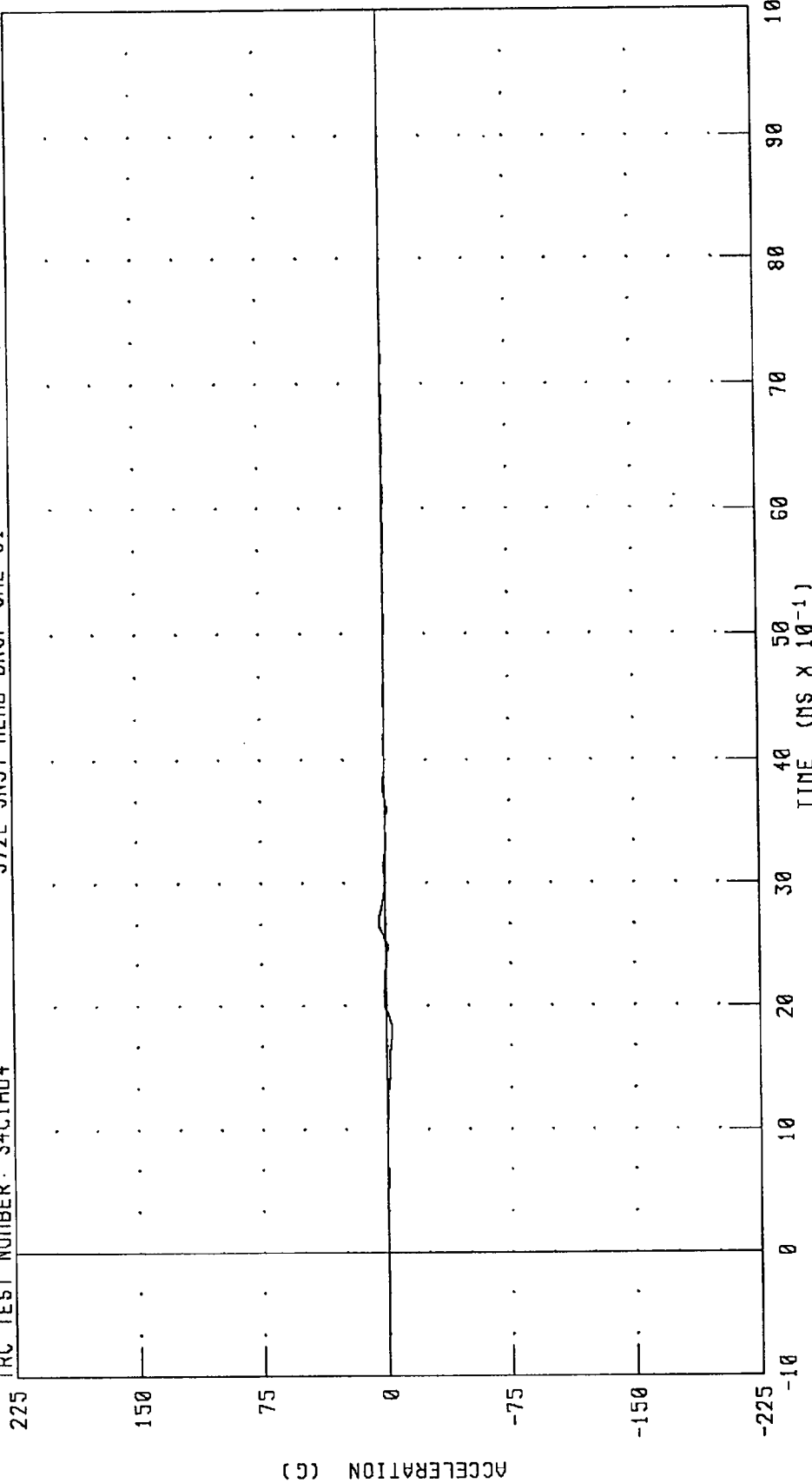
PEAK DATA: 0.07 G @ -0.56 MS; -217.70 G @ 2.08 MS

CHANNEL: HEDXG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION Y AXIS
 572E SN34 HEAD DROP CAL 01

RUN NUMBER: 050196.1423,1

TRC TEST NUMBER: 34C1H04



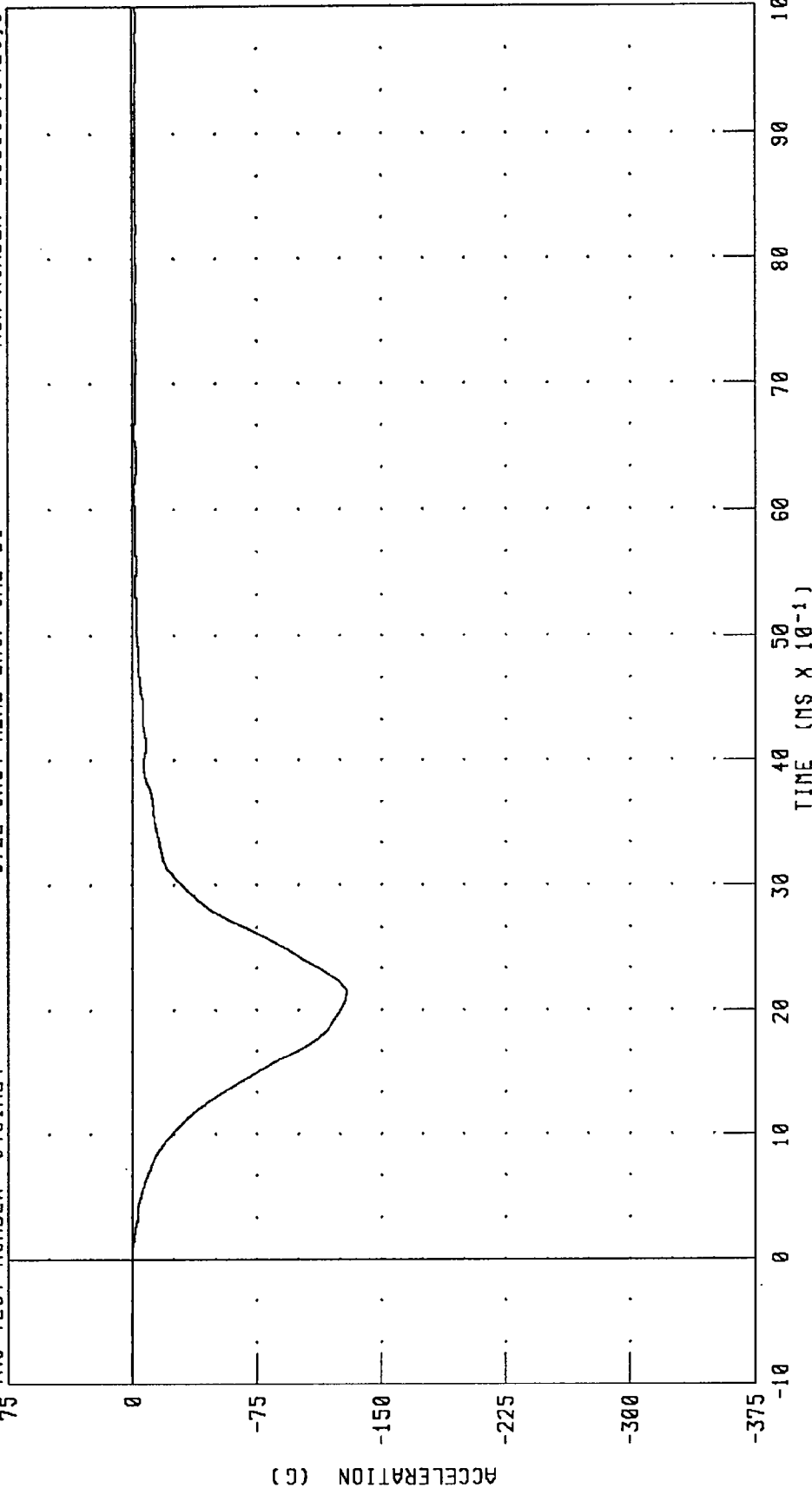
PEAK DATA: 3.88 G @ 2.72 MS; -3.44 G @ 1.76 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION Z AXIS
 572E SN34 HEAD DROP CAL 01

TRC TEST NUMBER: 34C1H04

RUN NUMBER: 050196.1423,1

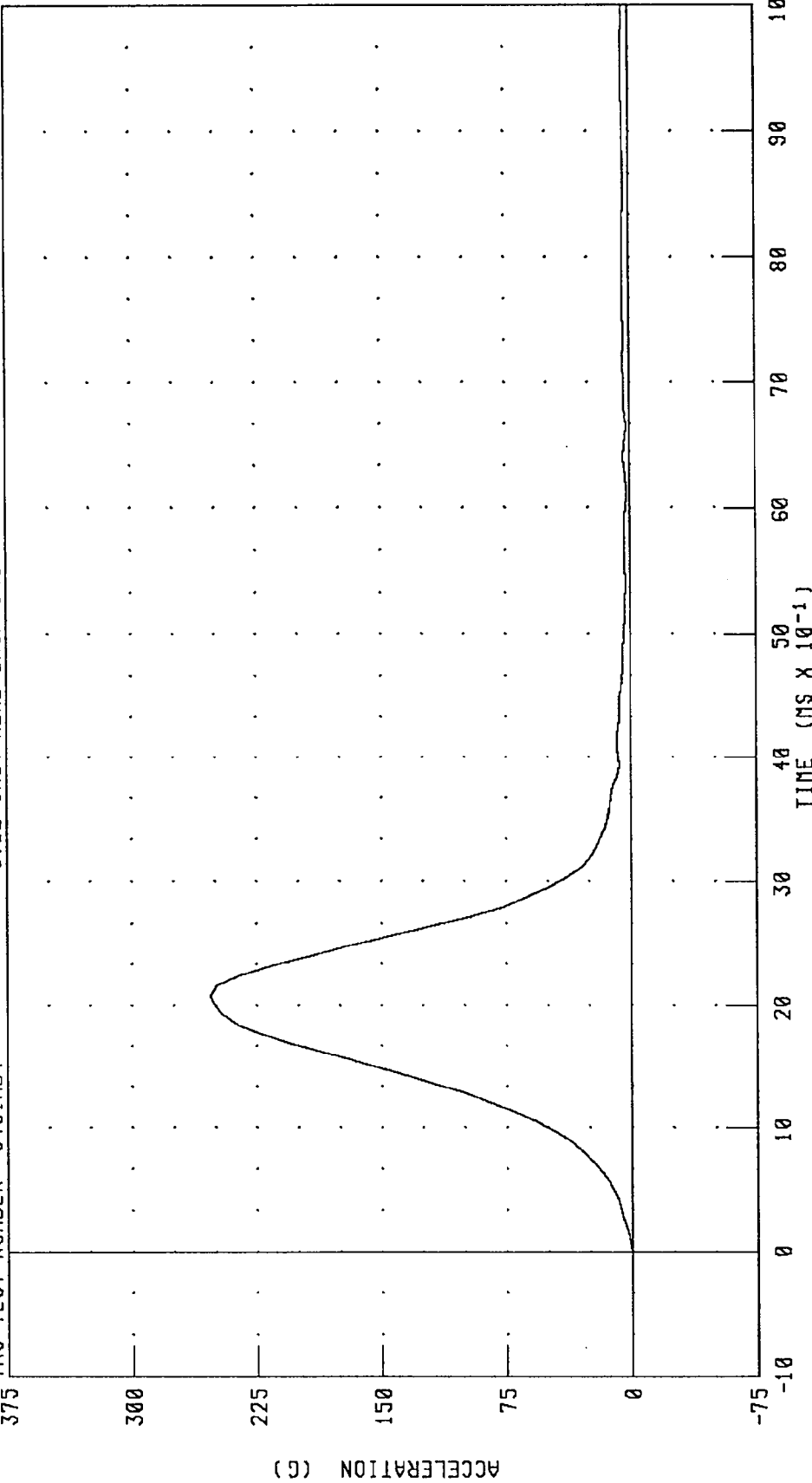


PEAK DATA: 0.46 G @ -0.88 MS; -129.10 G @ 2.16 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 34C1HD4 572E SN34 HEAD DROP CAL 01 RUN NUMBER: 050196.1423;1



PEAK DATA: 252.78 G @ 2.08 MS; 0.12 G @ -0.08 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

HYBRID III

11-JUL-95

TRC INC. TEST NO: 34C1NF1 572E SN34 NECK FLEXION CAL01

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.98 G
	20 MS	17.60 - 22.60 G	19.34 G
	30 MS	12.50 - 18.50 G	14.91 G
MAX PENDULUM G		29 G MAX	23.79 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	14.89 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	38.16 MS
D PLANE	MAX	64 - 78 DEG.	72.72 DEG.
ROTATION	TIME	57 - 64 MS	60.24 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	90.00 NM
	TIME	47 - 58 MS	51.60 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	117.76 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.44 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. L...

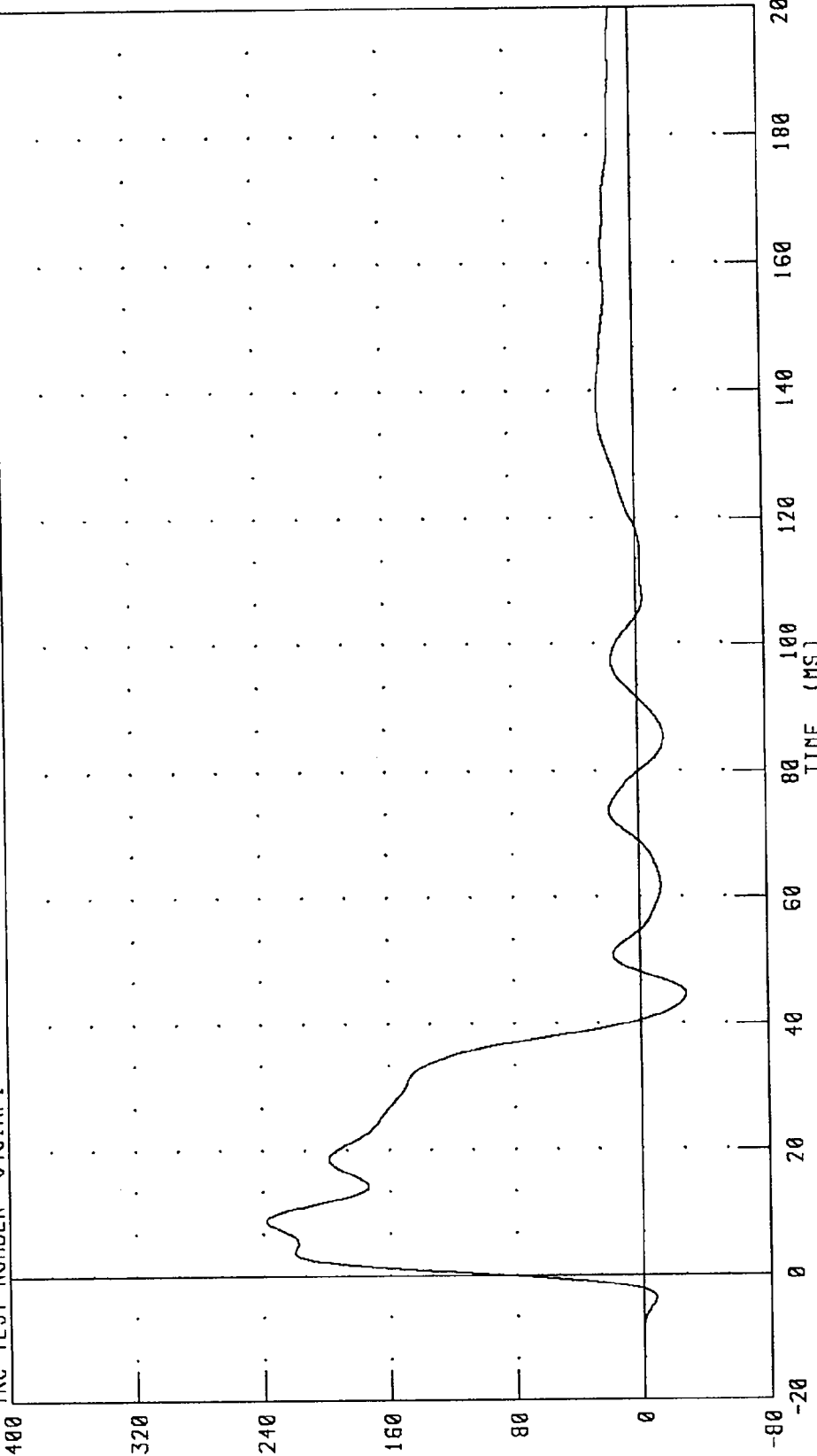
RUN NUMBER: 071195.1004;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 PENDULUM DECELERATION

TRC TEST NUMBER: 34CINF1

572E SN34 NECK FLEXION CAL01

RUN NUMBER: 050196.1423,1



PEAK DATA: 23.79 G @ 8.80 MS; -2.85 G @ 44.48 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

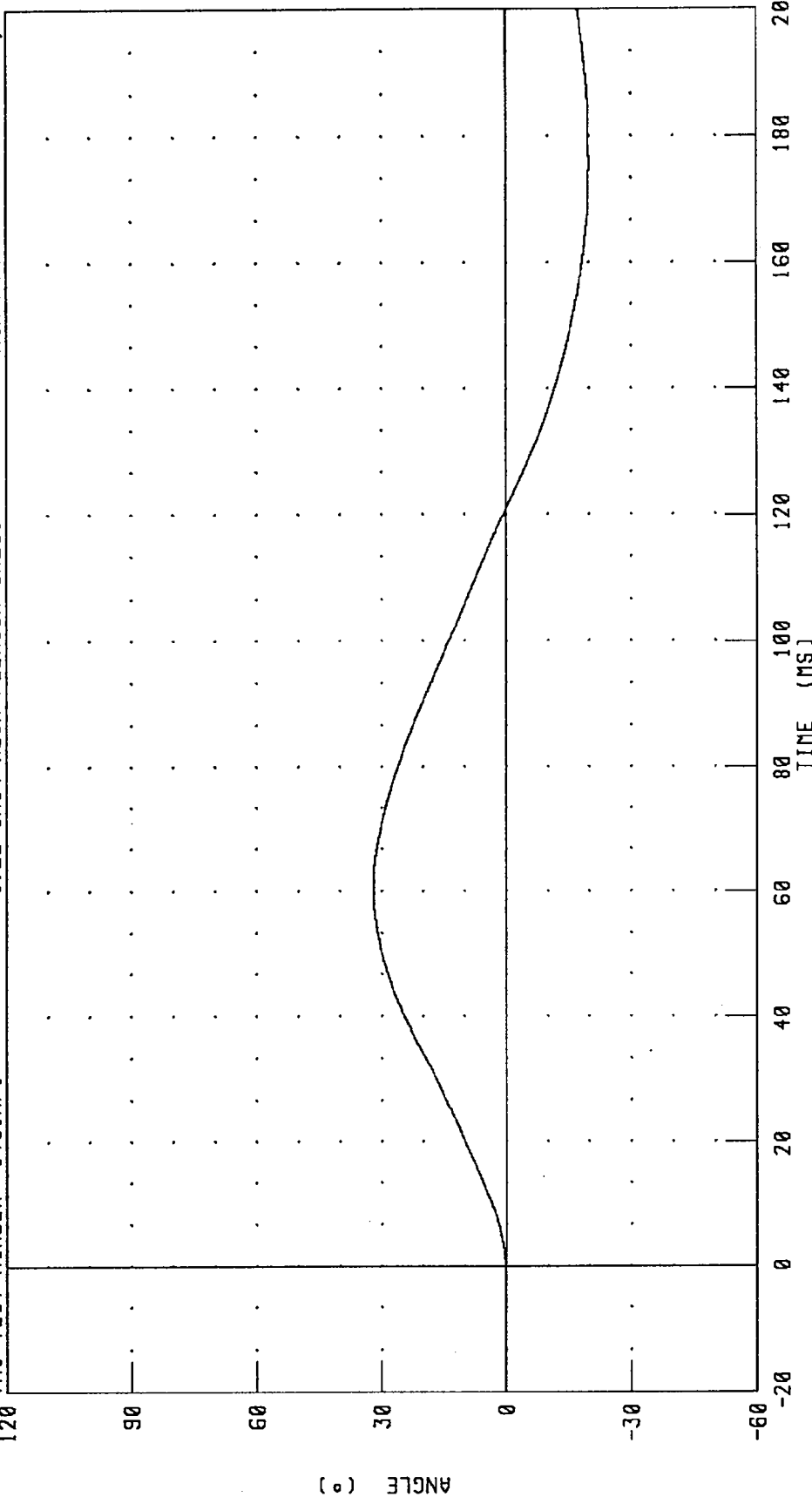
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN34 NECK FLEXION CAL01

IRC TEST NUMBER: 34C1NF1

RUN NUMBER: 050196.1423;1



PEAK DATA: 31.85 ° @ 61.52 MS; -19.92 ° @ 175.76 MS

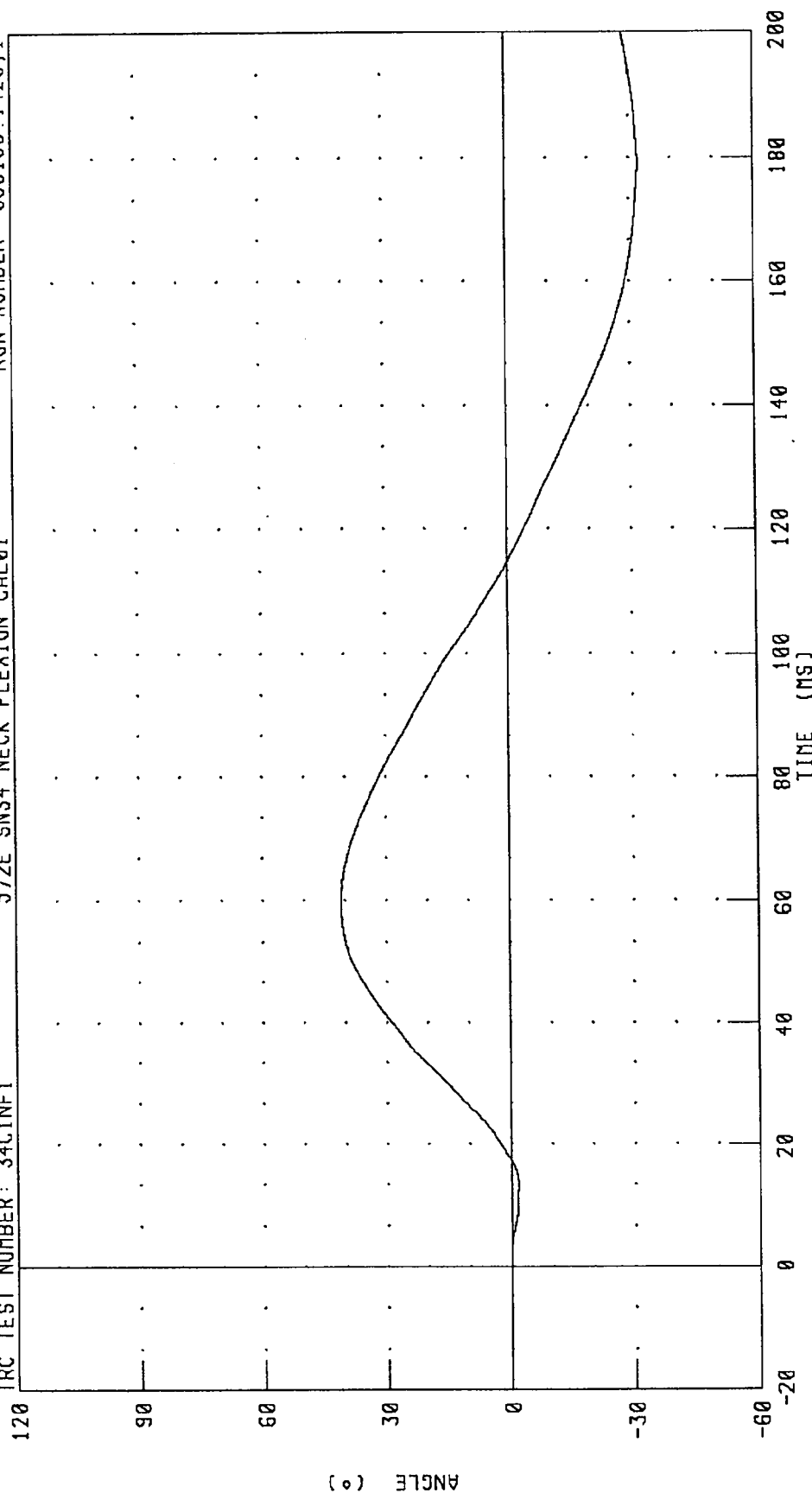
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 34CINF1

572E SN34 NECK FLEXION CAL01

RUN NUMBER: 050196.1423;1



PEAK DATA: 40.90 ° @ 59.60 MS; -32.12 ° @ 179.12 MS

CHANNEL: THETA FILTER: CH. CLASS 60

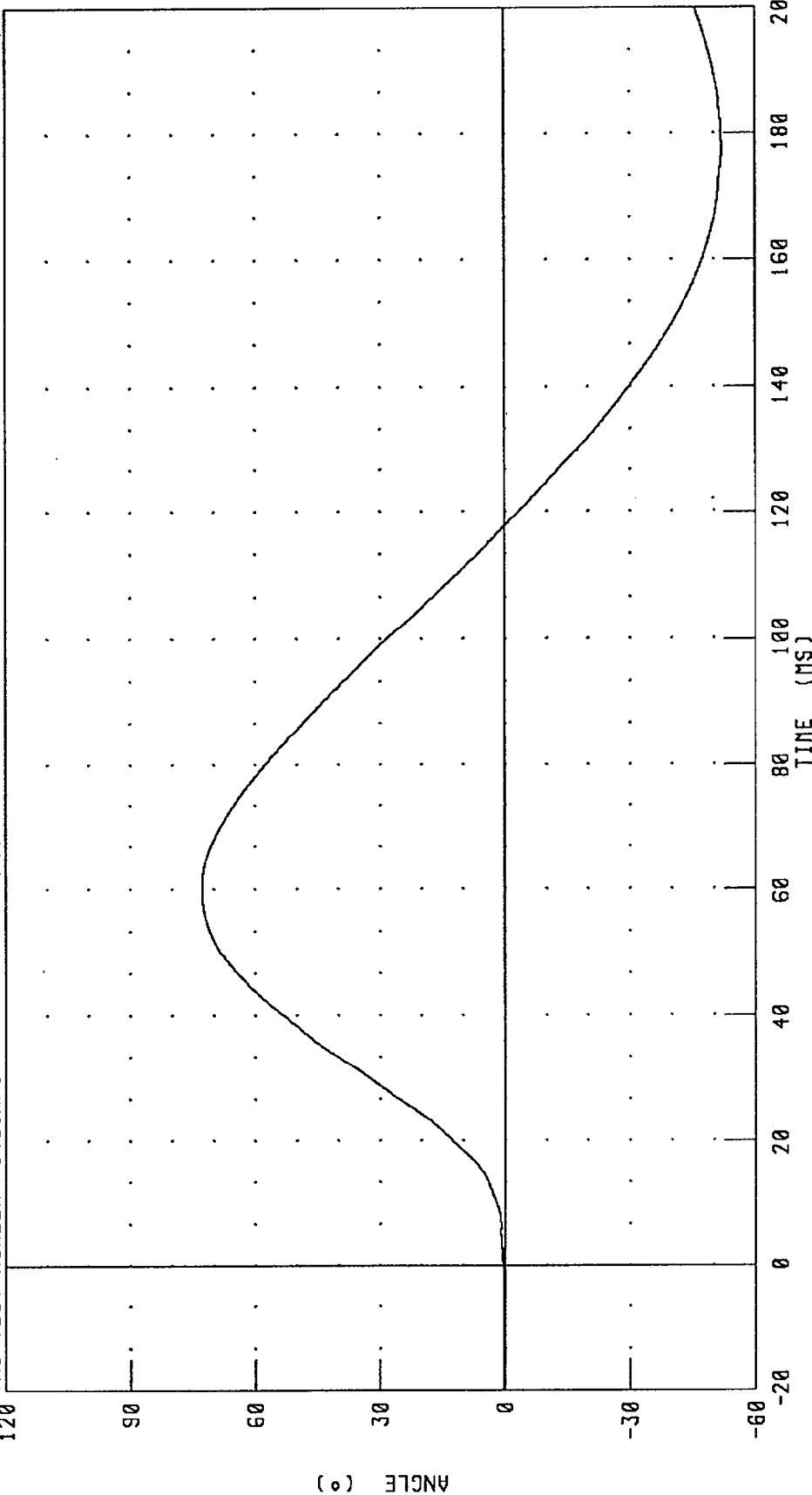
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 34C1NF1

572E SN34 NECK FLEXION CAL01

RUN NUMBER: 050196.1423;1



PEAK DATA: 72.73 ° @ 60.24 MS; -51.93 ° @ 177.44 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

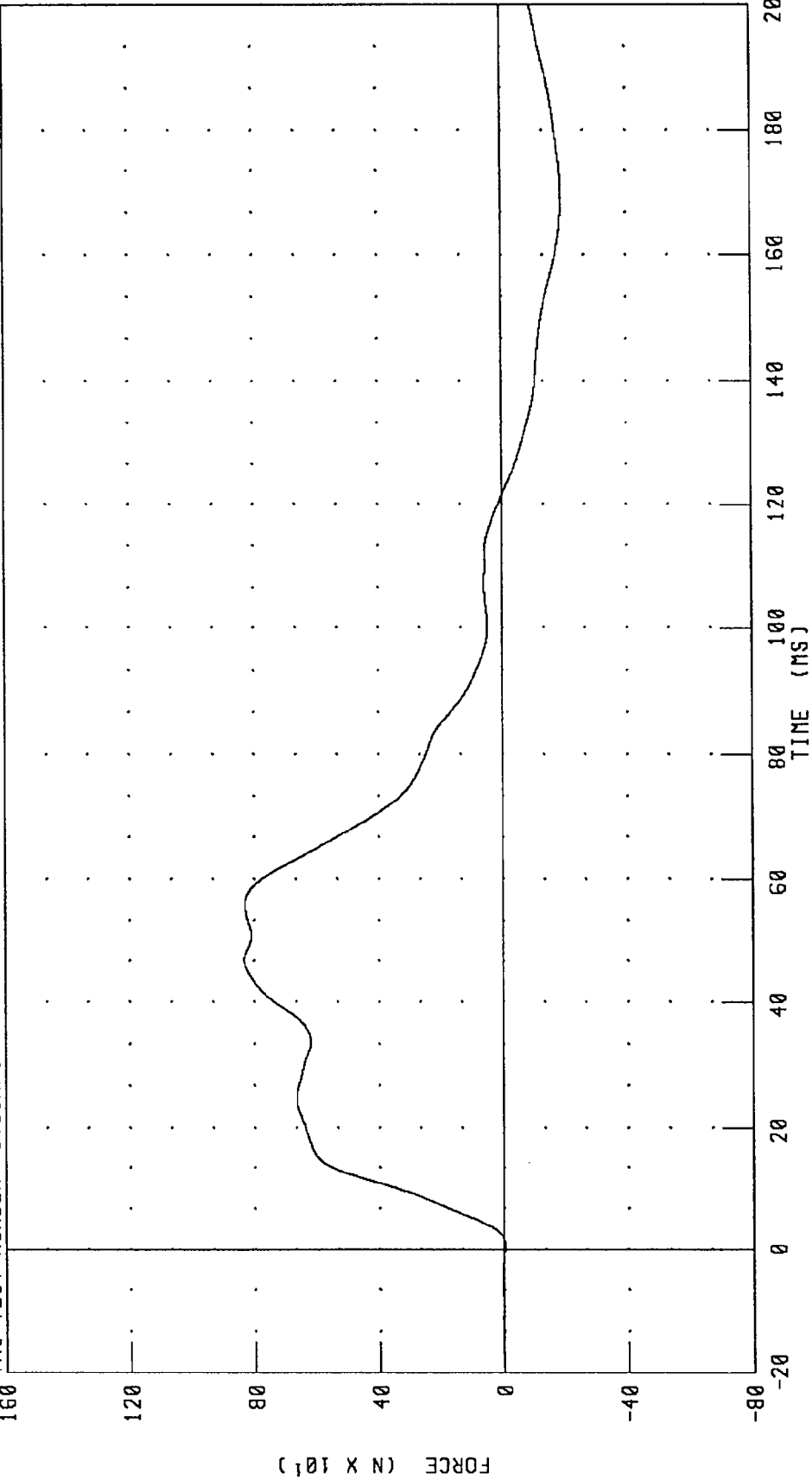
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 34CINF1

572E SN34 NECK FLEXION CAL01

RUN NUMBER: 050196.1423,1



PEAK DATA: 832.72 N @ 46.80 MS; -192.96 N @ 169.52 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

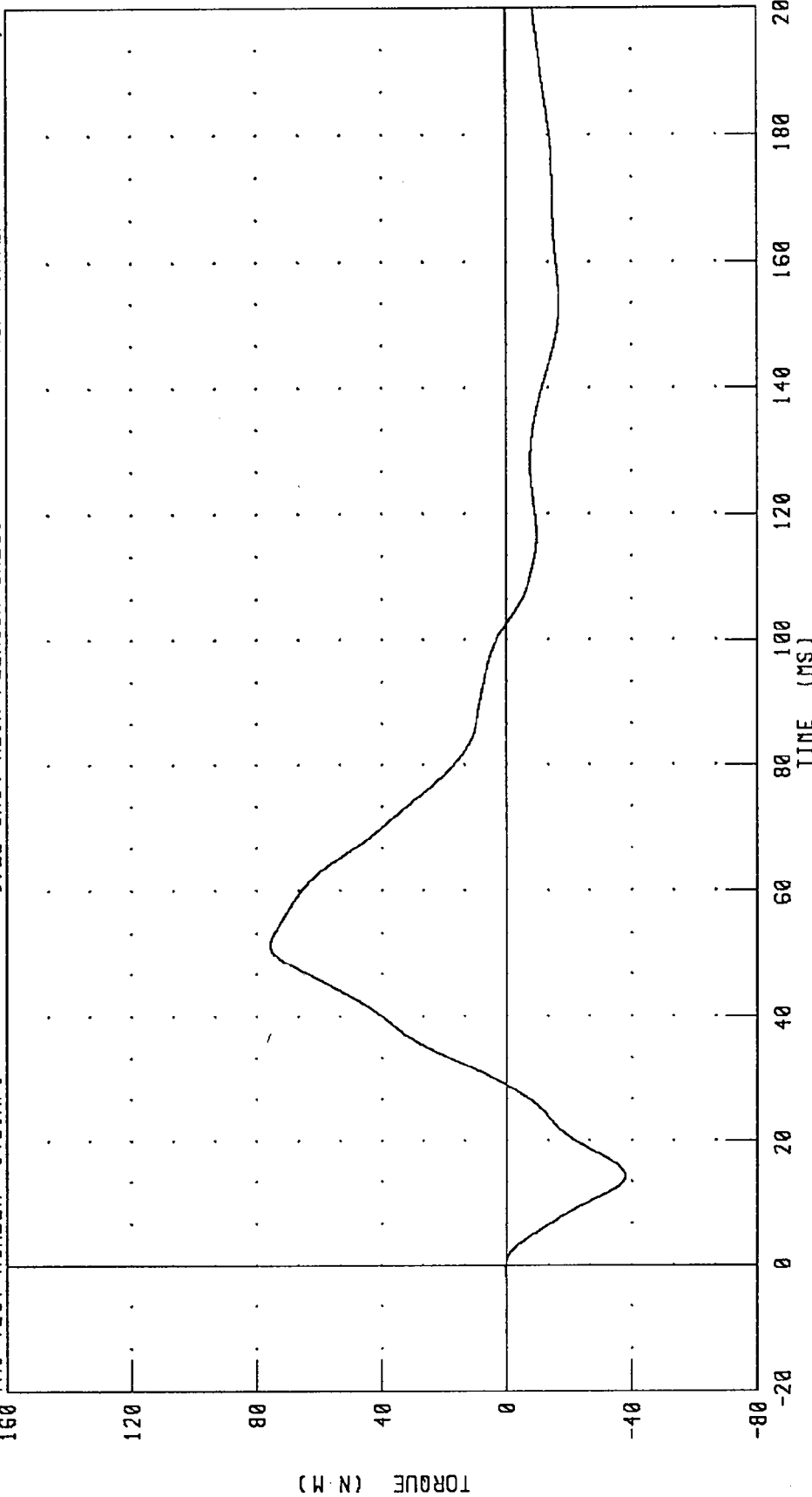
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 34CINF1

572E SN34 NECK FLEXION CAL01

RUN NUMBER: 050196.1423;1



PEAK DATA: 75.60 N.M @ 51.52 MS; -37.99 N.M @ 14.32 MS

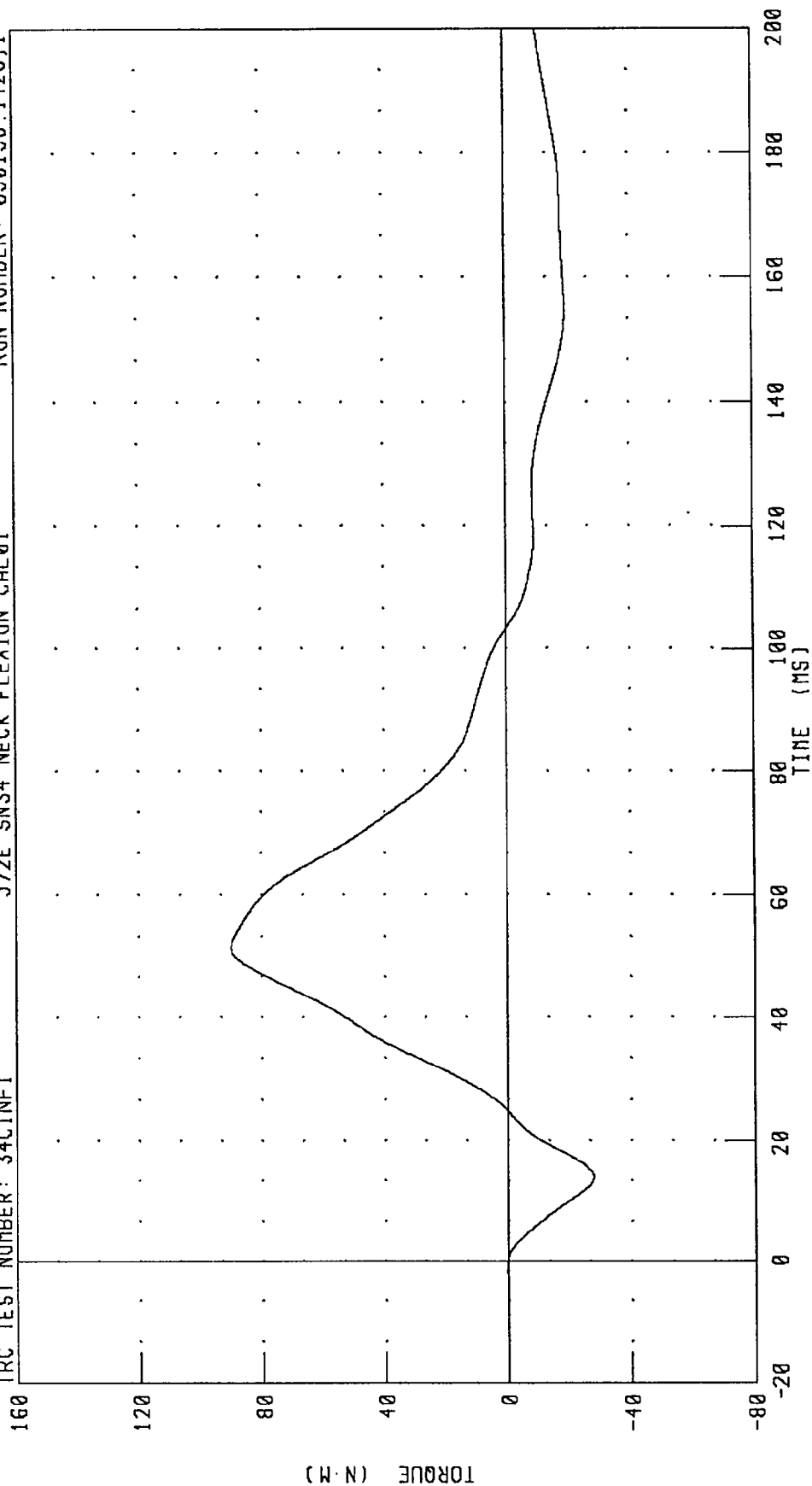
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 34CINF1

572E SN34 NECK FLEXION CAL01

RUN NUMBER: 050196.1423.1



PEAK DATA: 90.00 N·M @ 51.60 MS; -27.68 N·M @ 14.00 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

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

HYBRID III

11-JUL-95

TRC INC. TEST NO: 34C1NE1 572E SN34 NECK EXT. CAL01

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY		10 - 70 %	63.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.10 G
	20 MS	14.00 - 19.00 G	16.16 G
	30 MS	11.00 - 16.00 G	12.32 G
MAX PENDULUM G		22 G MAX	18.73 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	12.28 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.36 MS
D PLANE	MAX	81 - 106 DEG.	97.53 DEG.
ROTATION	TIME	72 - 82 MS	74.80 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-71.59 NM
	TIME	65 - 79 MS	69.76 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	154.56 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	142.80 MS

TEST MEETS SPECIFICATIONS

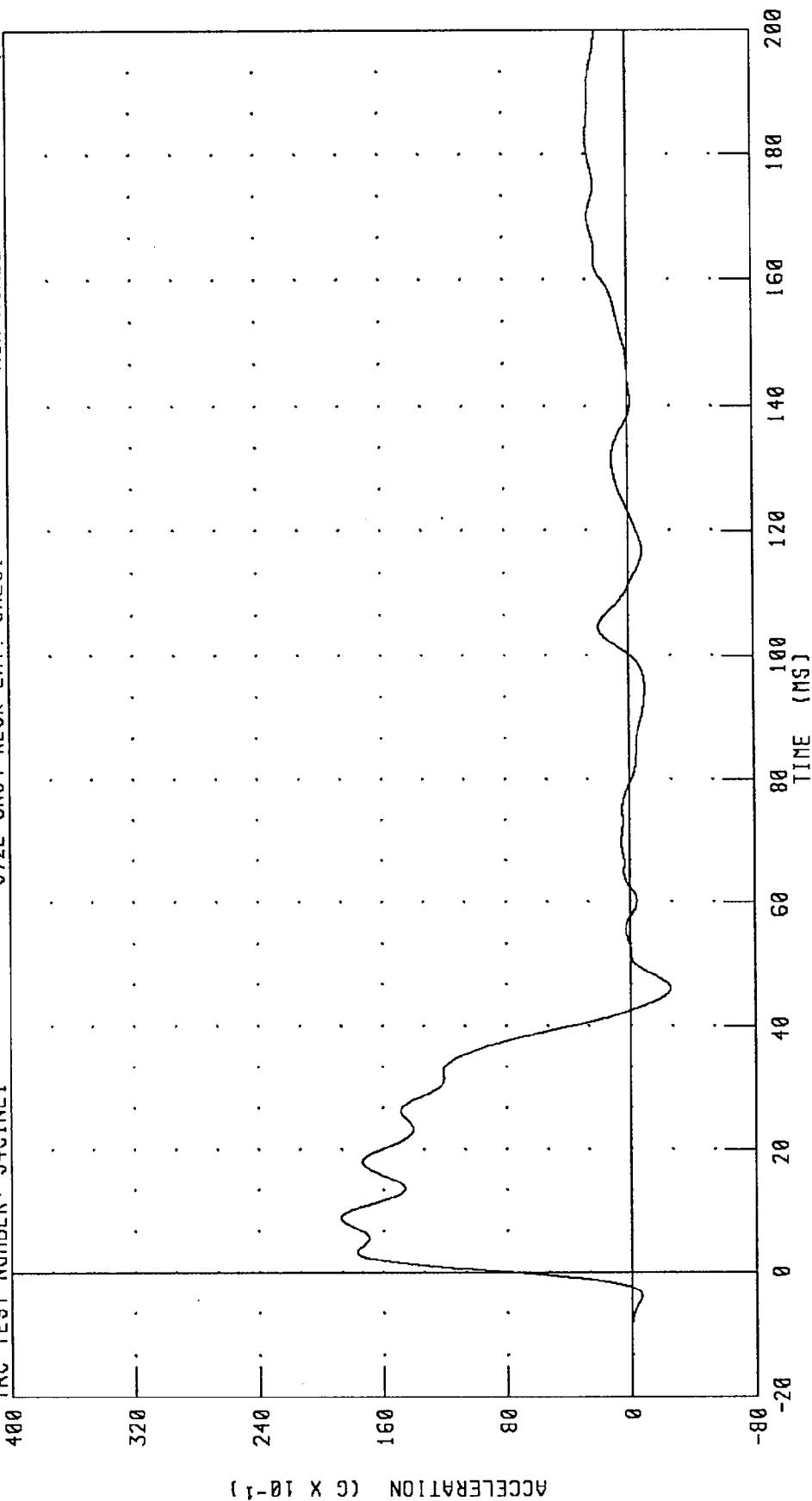
TECHNICIAN Richard L. Van

RUN NUMBER: 071195.1058;2

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

IRC TEST NUMBER: 34CINE1 572E SN34 NECK EXT. CAL01 RUN NUMBER: 050196.1423,2



PEAK DATA: 18.74 G @ 8.80 MS; -2.54 G @ 46.08 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

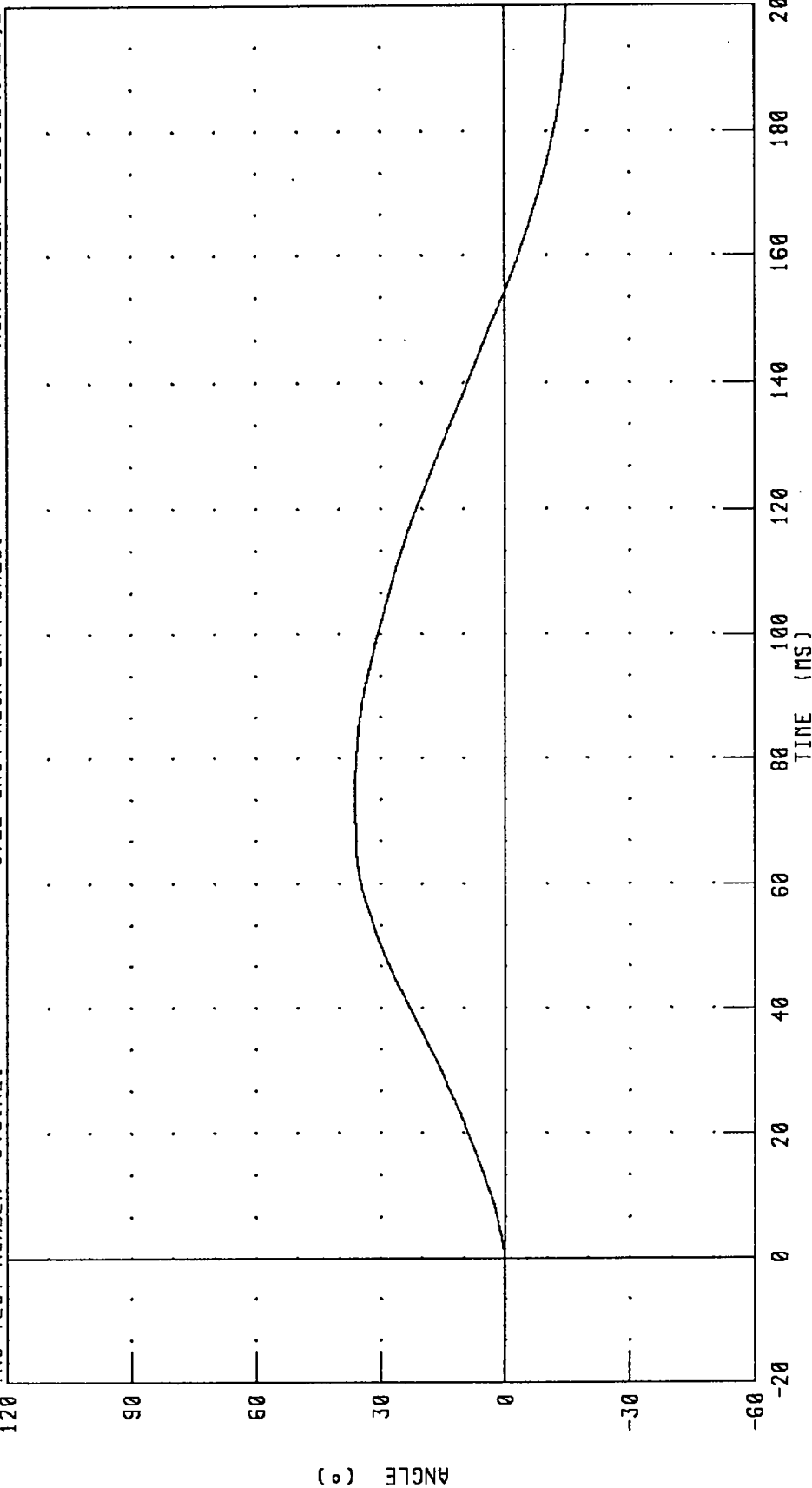
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN34 NECK EXT. CAL01

TRC TEST NUMBER: 34C1NE1

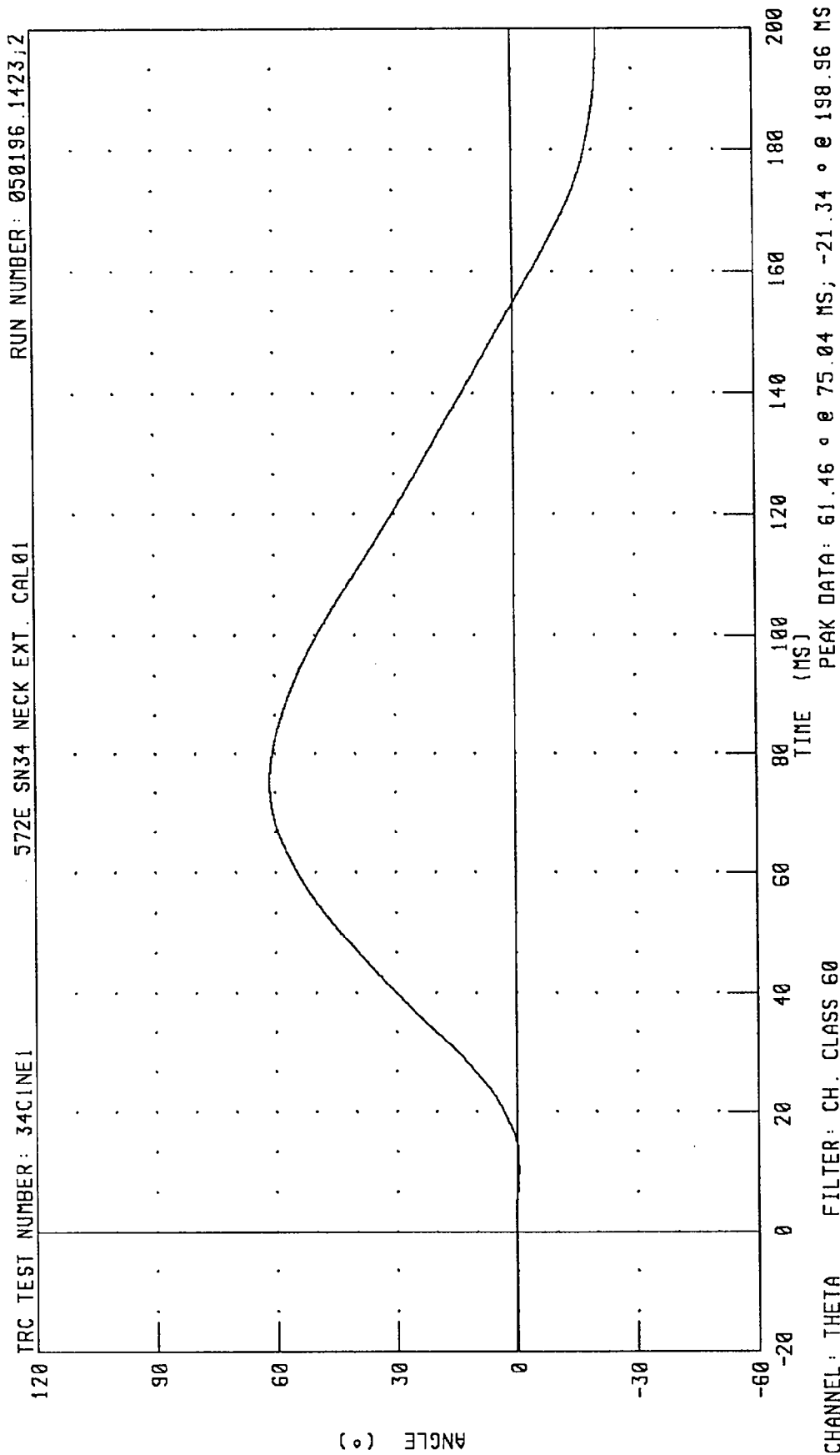
RUN NUMBER: 050196.1423,2



PEAK DATA: 36.08 ° @ 73.76 MS; -14.89 ° @ 200.00 MS

CHANNEL: BETA FILTER: CH. CLASS 60

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



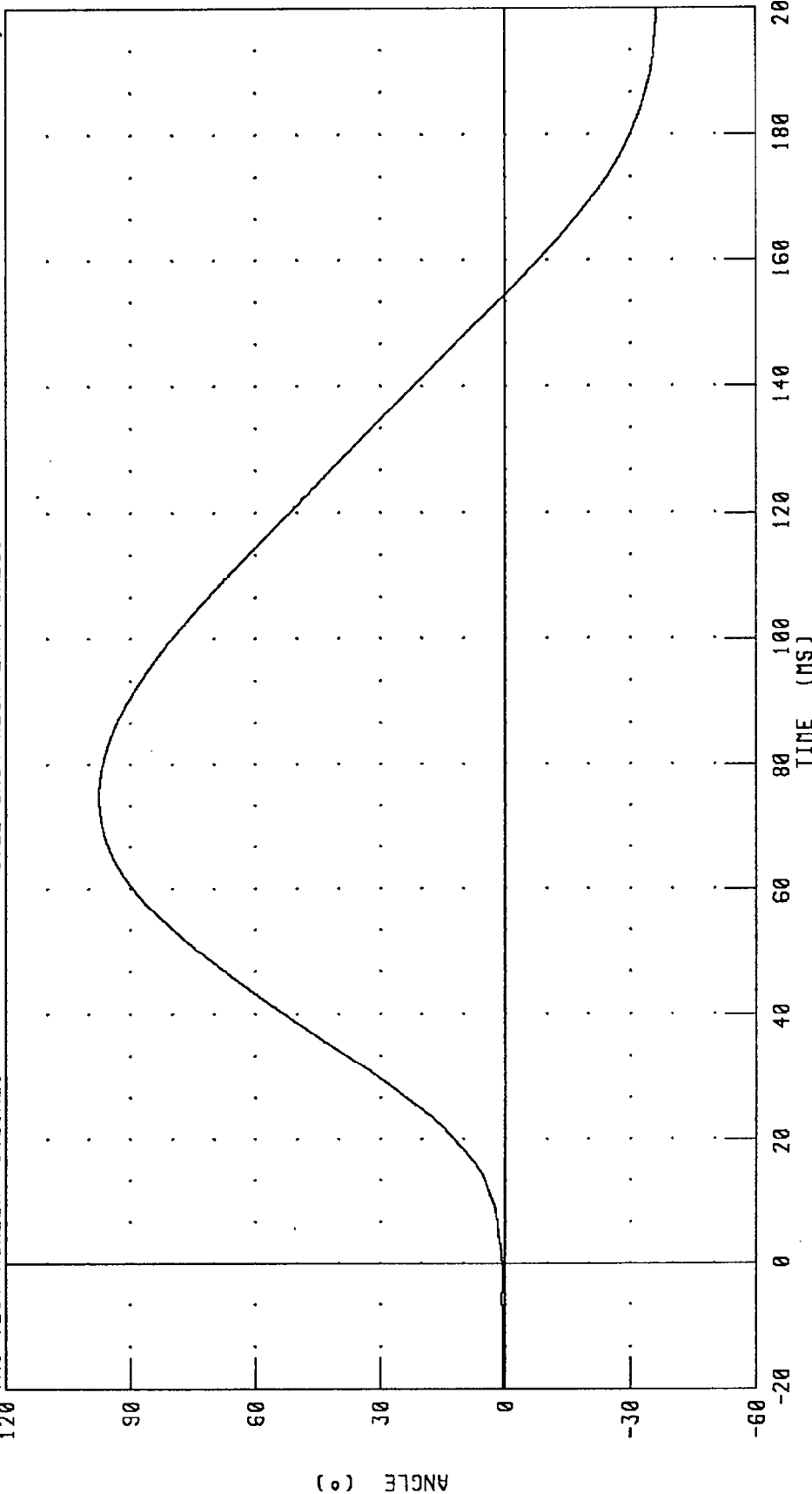
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 34C1NE1

572E SN34 NECK EXT. CAL01

RUN NUMBER: 050196.1423;2



PEAK DATA: 97.53 ° @ 74.80 MS; -36.22 ° @ 199.60 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

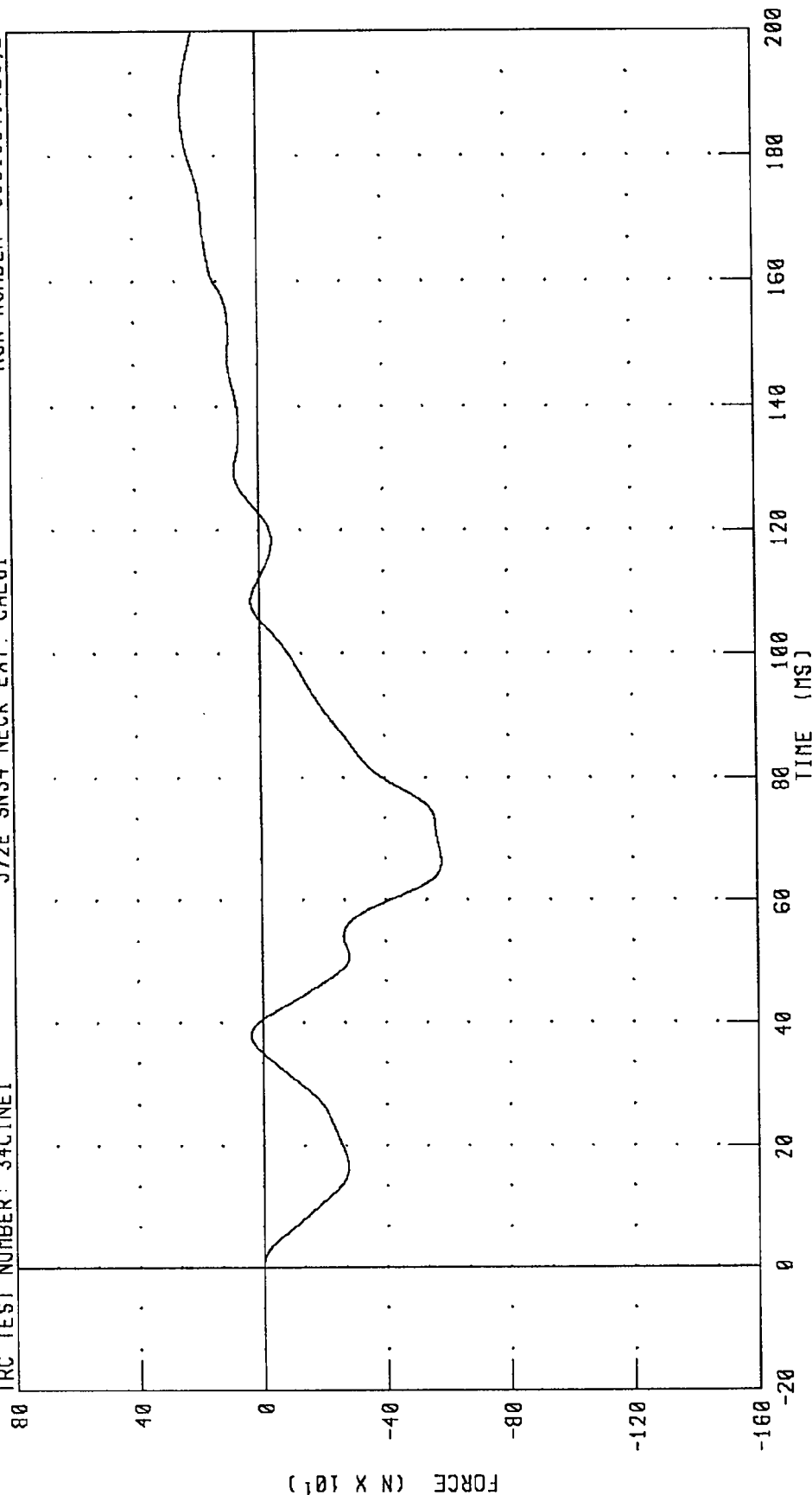
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 34CINE1

572E SN34 NECK EXT. CAL01

RUN NUMBER: 050196.1423;2



PEAK DATA: 242.60 N @ 188.08 MS; -581.96 N @ 66.08 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

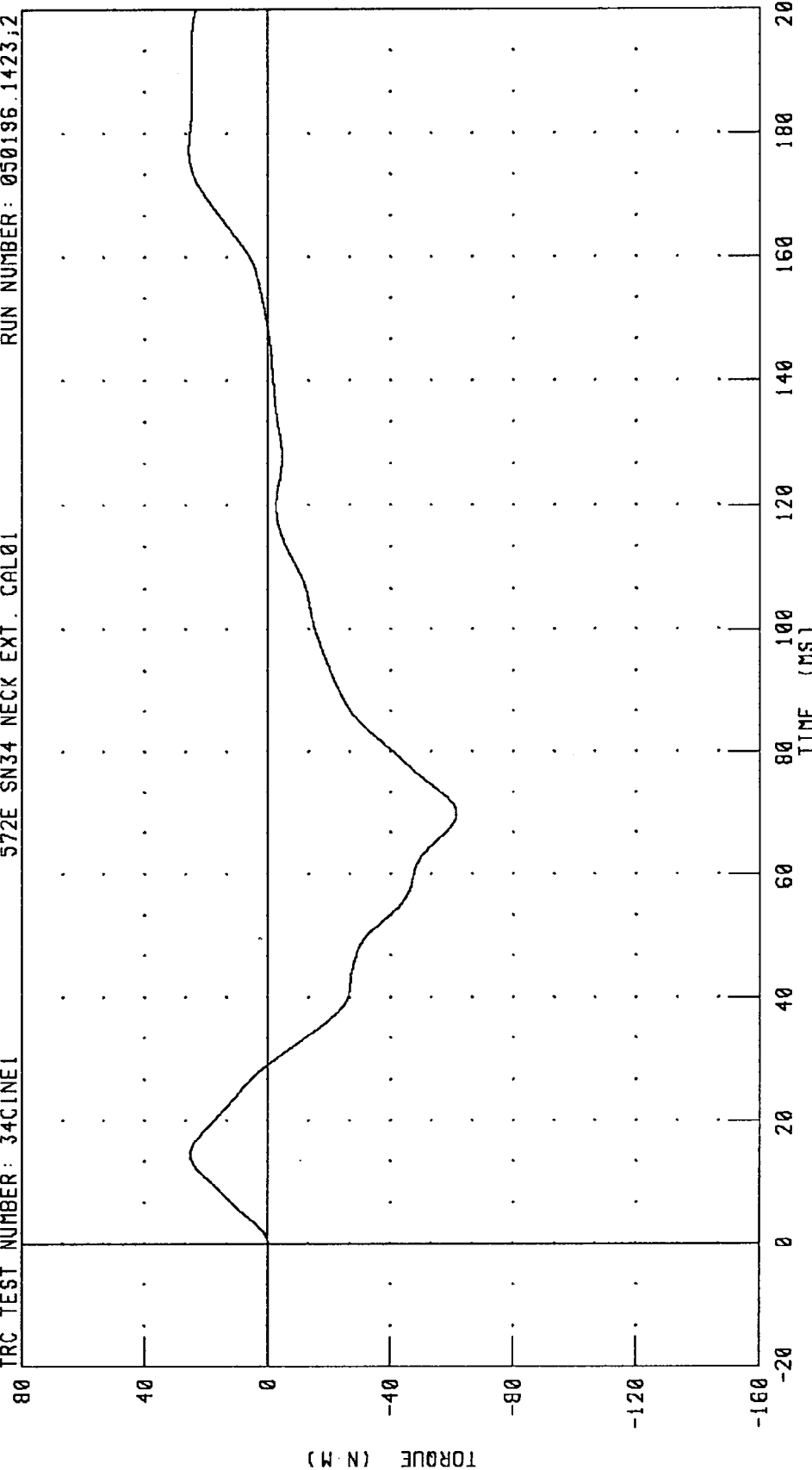
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 34CINEL

572E SN34 NECK EXT. CAL01

RUN NUMBER: 050196.1423;2



PEAK DATA: 25.59 N.M @ 177.36 MS; -61.48 N.M @ 69.84 MS

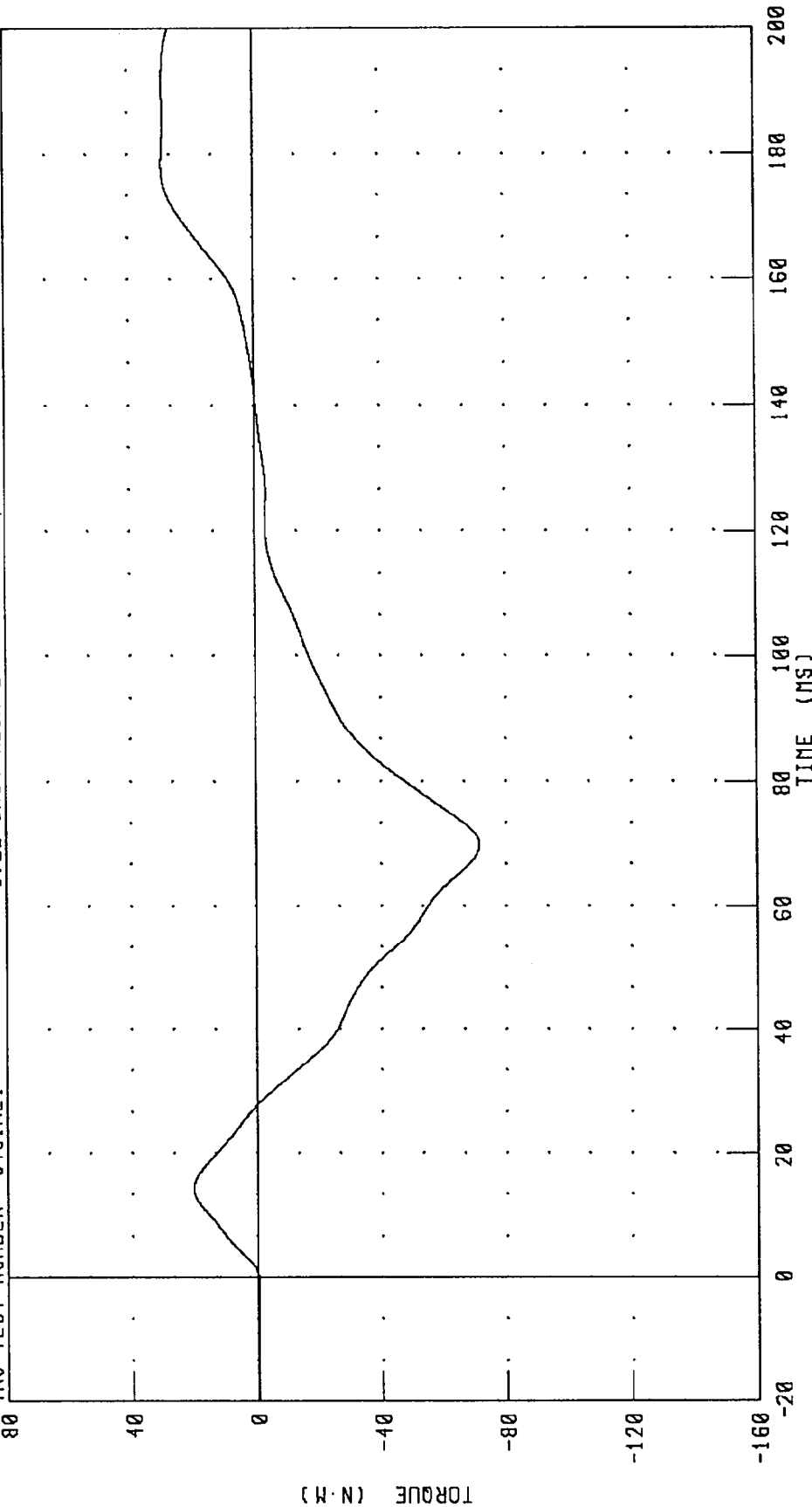
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 34CINE1

572E SN34 NECK EXT. CAL01

RUN NUMBER: 050196.1423.2



PEAK DATA: 29.29 N·M @ 178.48 MS, -71.59 N·M @ 69.76 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III

16-FEB-96

TRC INC.

TEST NO: 34C1TH2

572E SN34 H.S.THORAX CAL01

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	20.8 DEG. C
RELATIVE HUMIDITY	10 - 70 %	26.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.65 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	68.3 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5757. N
INTERNAL HYSTERESIS	69% - 85%	71.1%

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Van

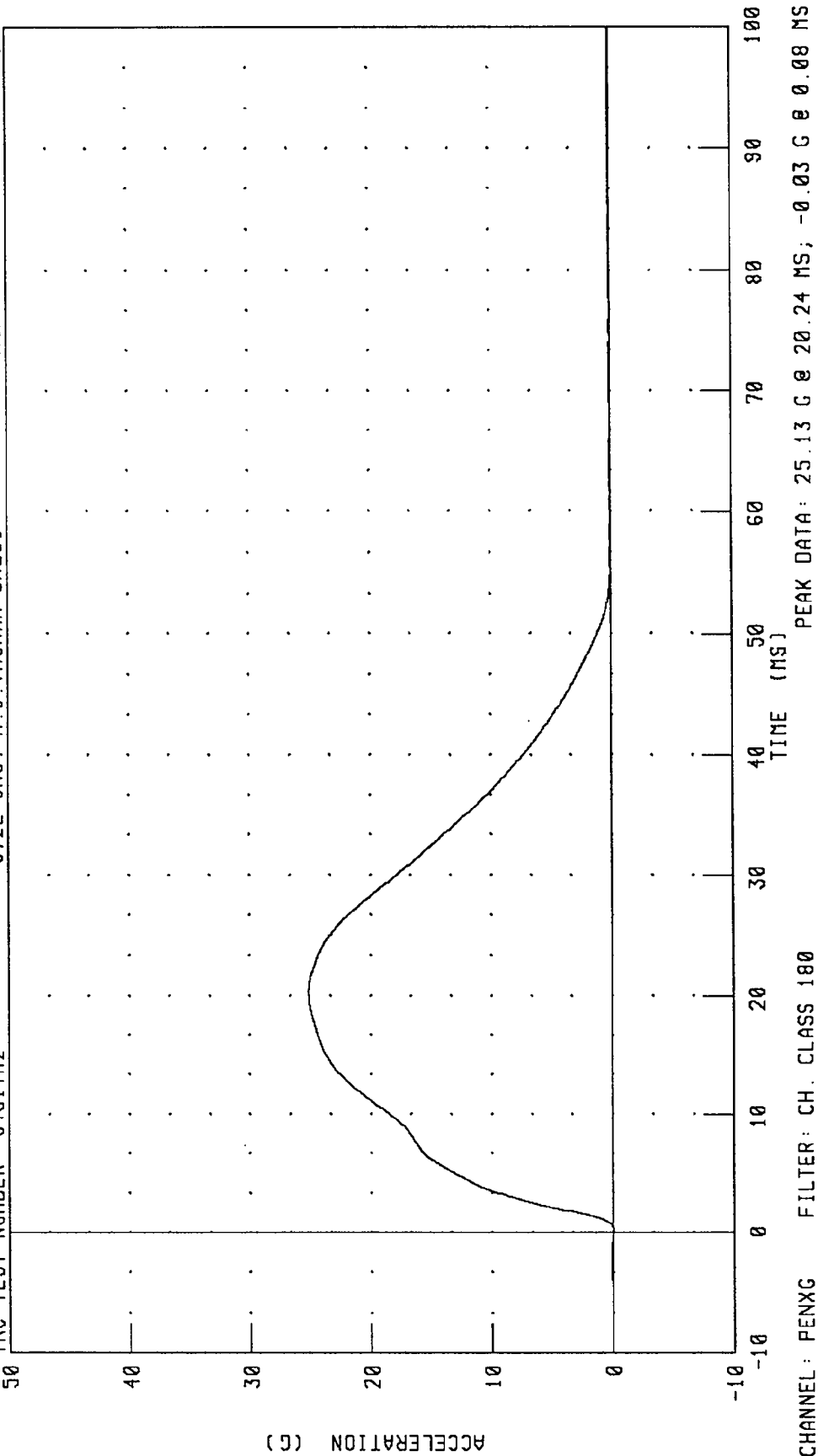
RUN NUMBER: 021696.1507;1

RUN NUMBER: 050196.1423;1

TRC TEST NUMBER: 34C1TH2

572E SN34 H.S. THORAX CALØ1

RUN NUMBER: 050196.1423;1



CHANNEL: PENXG FILTER: CH. CLASS 180

PEAK DATA: 25.13 G @ 20.24 MS; -0.03 G @ 0.08 MS

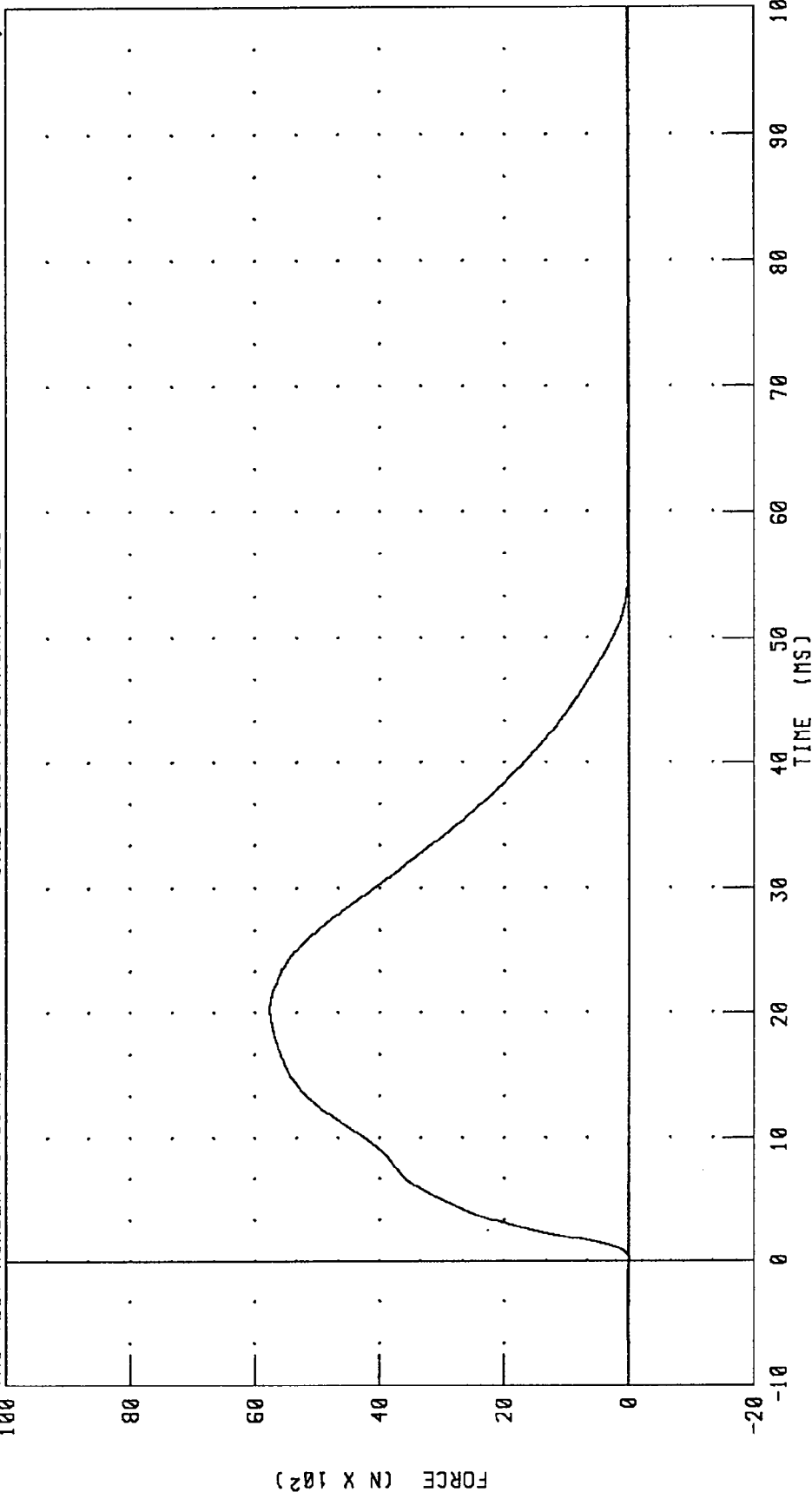
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 34C1TH2

572E SN34 H.S. THORAX CAL01

RUN NUMBER: 050196.1423;1



PEAK DATA: 5757.30 N @ 20.24 MS; -6.72 N @ 0.08 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

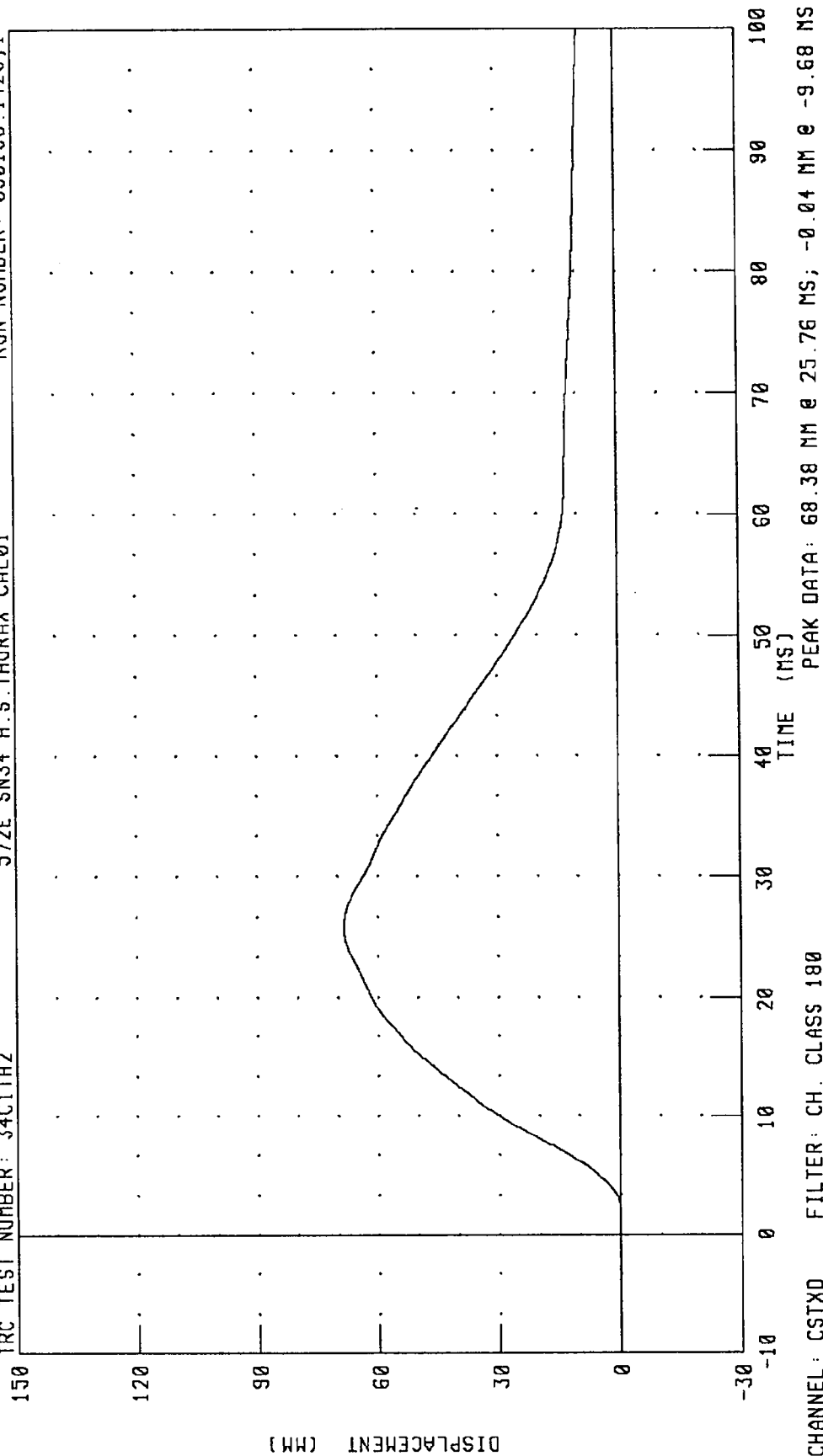
PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

TRC TEST NUMBER: 34C1TH2

572E SN34 H.S. THORAX CAL01

RUN NUMBER: 050196.1423;1



CHANNEL: CSTXD FILTER: CH. CLASS 180

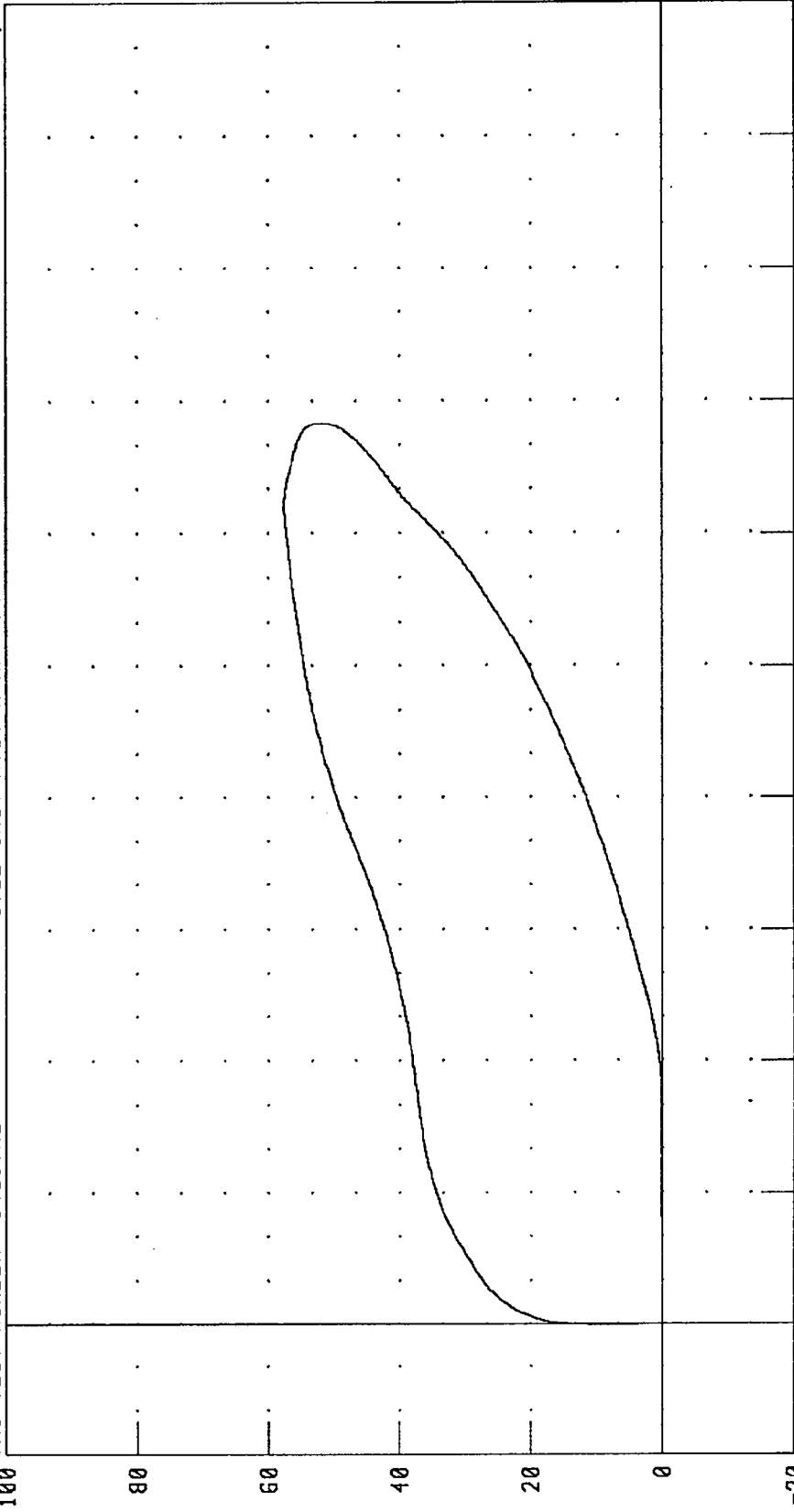
PART 572-E HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 34C1TH2

572E SN34 H.S.THORAX CAL01

RUN NUMBER: 050196.1423;1

100



FORCE (N X 10²)

DISPLACEMENT (MM)

PEAK DATA: 68.38 MM @ 25.76 MS; -0.04 MM @ -9.68 MS
5757.30 N @ 20.24 MS; -6.72 N @ 0.08 MS

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

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III

11-JUL-95

TRC INC.

TEST NO: 34C1RK1

572E SN34 RIGHT KNEE CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5589.1 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Richard L. Loran

RUN NUMBER: 071195.1244;1

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

TRC TEST NUMBER: 34CIRK1

572E SN34 RIGHT KNEE CAL 01

RUN NUMBER: 050196.1423;1

150

120

90

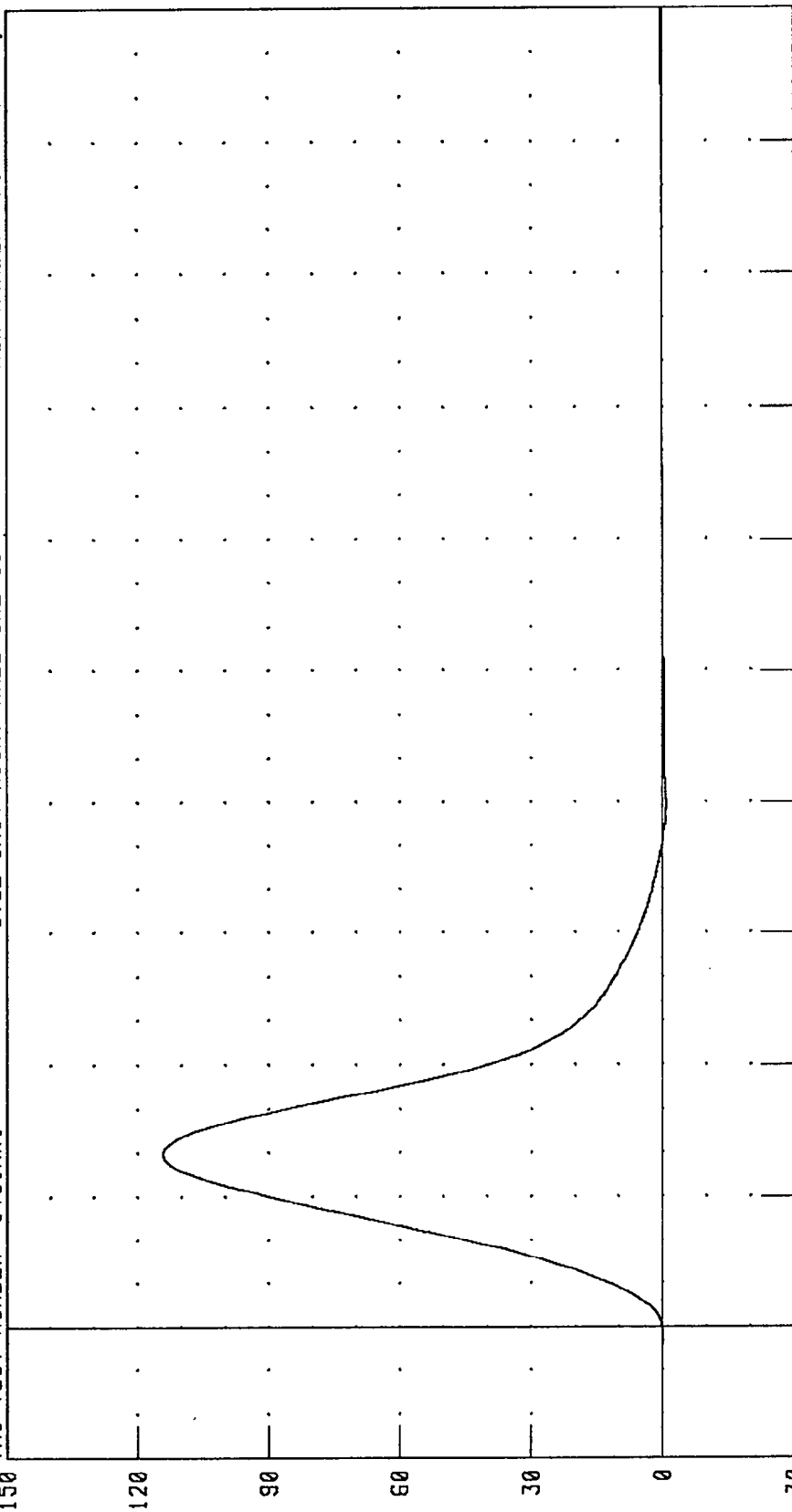
60

30

0

-30

ACCELERATION (G)



TIME (MS X 10⁻¹)

CHANNEL: PENXC FILTER: CH. CLASS 600

PEAK DATA: 114.23 G @ 2.64 MS; -0.86 G @ 7.92 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN34 RIGHT KNEE CAL 01

TRC TEST NUMBER: 34CIRK1

75

60

45

30

15

0

-15

-20

0

20

40

60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

380

400

420

440

460

480

500

520

540

560

580

600

620

640

660

680

700

720

740

760

780

800

820

840

860

880

900

920

940

960

980

1000

1020

1040

1060

1080

1100

1120

1140

1160

1180

1200

1220

1240

1260

1280

1300

1320

1340

1360

1380

1400

1420

1440

1460

1480

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TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III

11-JUL-95

TRC INC.

TEST NO: 34C1LK1

572E SN34 LEFT KNEE CAL01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	20.6 DEG. C
RELATIVE HUMIDITY	10 - 70 %	63.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5684.2 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Richard L. Van

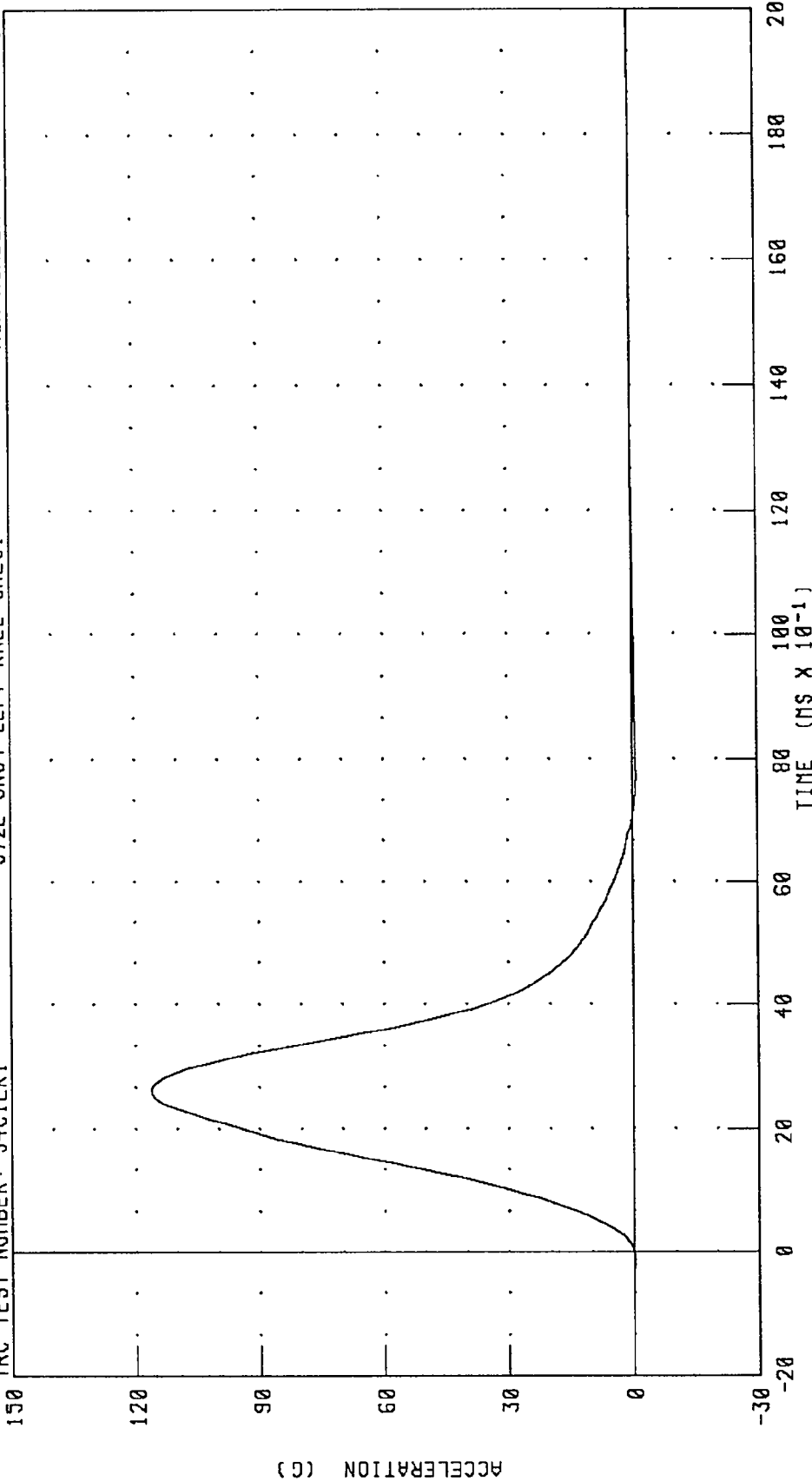
RUN NUMBER: 071195.1240;2

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

TRC TEST NUMBER: 34C1LK1

572E SN34 LEFT KNEE CAL01

RUN NUMBER: 050196.1423;2



PEAK DATA: 116.17 G @ 2.64 MS; -0.84 G @ 7.68 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

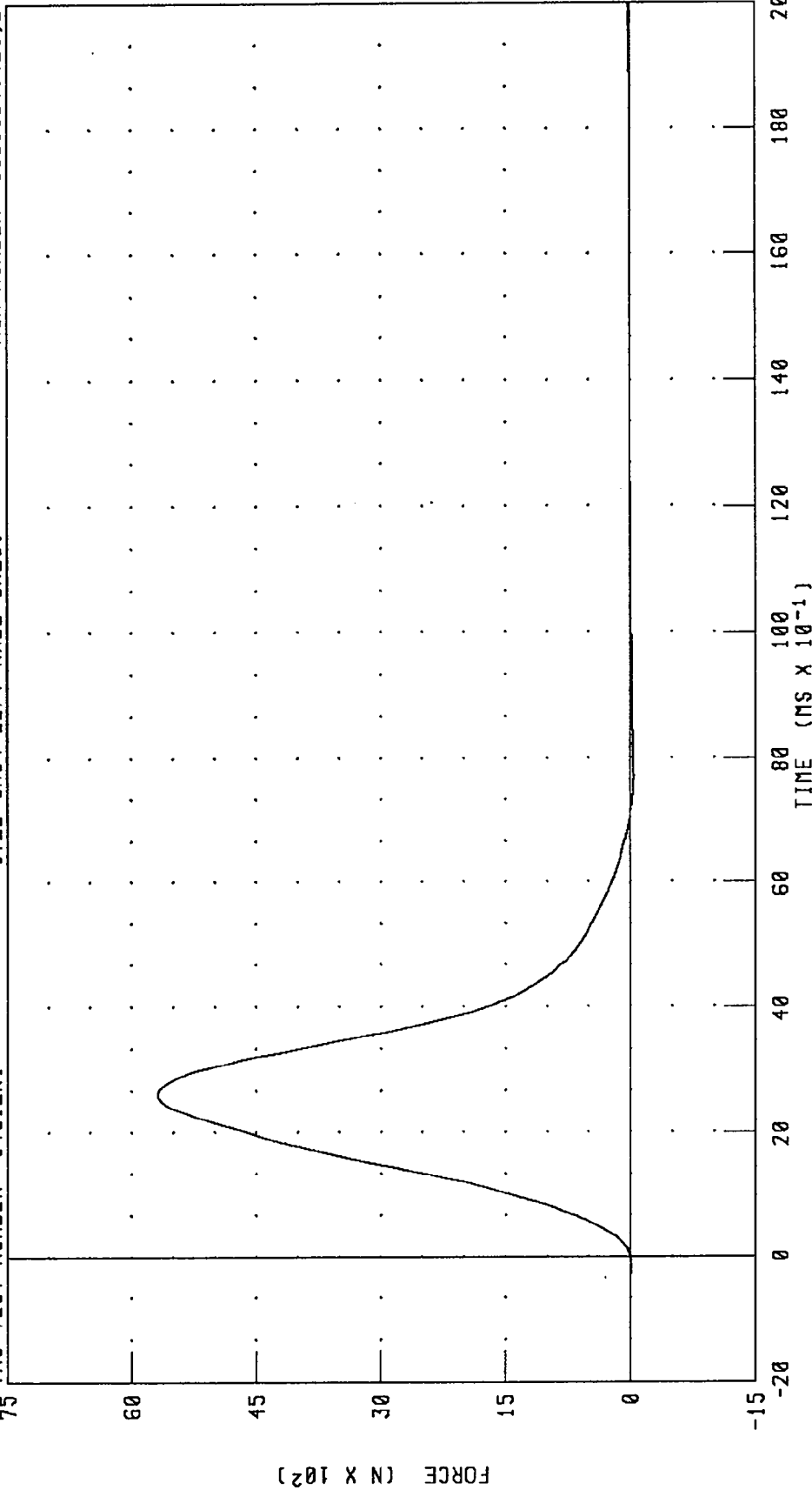
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 34C1LK1

572E SN34 LEFT KNEE CAL01

RUN NUMBER: 050196.1423;2



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5684.20 N @ 2.64 MS; -41.11 N @ 7.68 MS

Appendix D

Miscellaneous Test Information

Sign Convention
NHTSA Data Tape Reference Guide

Accelerometers:

+X: Forward
+Y: Leftward
+Z: Upward

Potentiometers:

+Chest longitudinal deflection: Outward
+Chest lateral deflection: Leftward
+Seat belt displacement: Outward
+Seat belt extension: Elongation
+Knee slider displacement: Distance between femur and tibia increased (in relation to a seated dummy)

Load cells:

+Femur force: Tension
+Seat belt force: Tension
+Impactor force: Tension

Neck load cells:

+X force: Head pushed forward
+y force: Head pushed leftward
+Z force: Head pulled upward (tension on neck)
+X moment: Right ear rotating toward right shoulder
+Y moment: Chin rotating toward chest
+Z moment: Chin rotating toward left shoulder

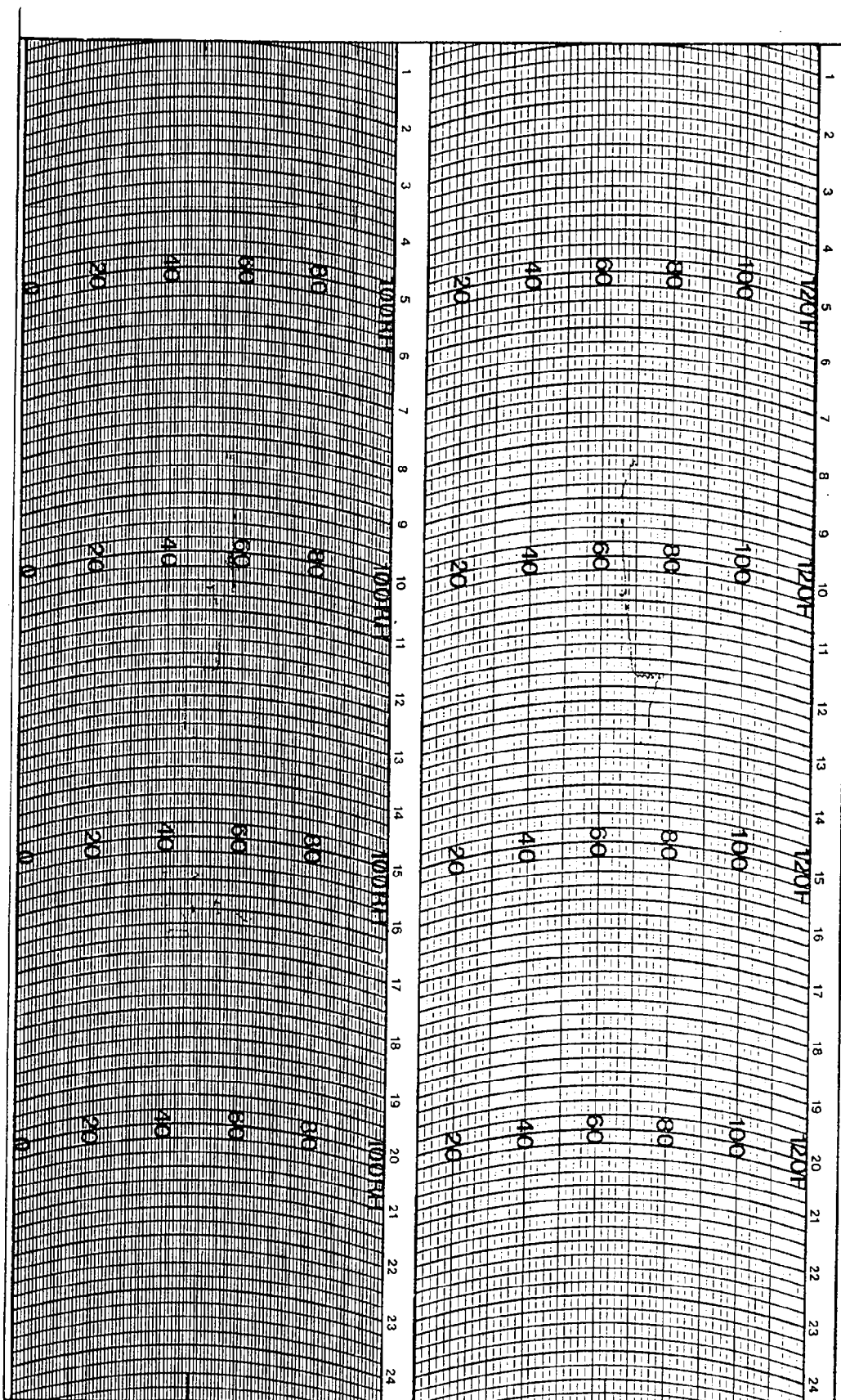
Tibia load cells:

+X force: Tension
+Y force: Tension
+Z force: Tension
+X moment: Bottom of tibia moving leftward
+Y moment: Bottom of tibia moving rearward

Frequency Response Classes

SAE J211 OCT88

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



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

HYGROTHERMOGRAPH
1 DAY

CHART # C311 D HF
PART # 699123

STATION 960418

DATE ON _____ DATE OFF _____