

VZ918

**Vehicle Research and Test Center
1997 Dodge Caravan into Left Side of a
1997 Honda Accord
TRC Test Number 980427**

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Final Report**

**Prepared for:
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Table of Contents

<u>Section</u>	<u>Description</u>	<u>Page</u>
1.0	Purpose and Test Procedure	1-1
2.0	Left Side Impact Test Summary	2-1
3.0	Summary of FMVSS 214 and 208 Data	3-1
4.0	Vehicle, Occupant, and Camera Measurements	4-1
Appendix A	Photographs	A-1
Appendix B	Data Plots	B-1
Appendix C	Dummy Calibration	C-1
Appendix D	Miscellaneous Test Information	D-1

List of Tables

<u>Number</u>	<u>Description</u>	<u>Page</u>
1	Crash Test Summary	2-5
2	Target Test Vehicle Information	2-6
3	Bullet Test Vehicle Information	2-9
4	Post-Impact Data	2-12
5	Target Vehicle Accelerometer Locations and Data Summary	2-15
6	Bullet Vehicle Accelerometer Locations and Data Summary	2-19
7	Target Vehicle Dummy Injury Criteria	3-2
8	Bullet Vehicle Dummy Injury Criteria	3-3
9	Target Vehicle - Post-Impact Dummy and Vehicle Data	3-4
10	Bullet Vehicle - Post-Impact Dummy and Vehicle Data	3-5
11	Bullet Vehicle Dummy Measurement Data for Front Seat Occupants	4-7
12	Target Vehicle Exterior Crush Profiles-All Levels	4-11
13	Bullet Vehicle Measurements	4-16
14	Camera Information	4-18

List of Figures

<u>Number</u>	<u>Description</u>	<u>Page</u>
1	Impact Velocity Measurement System	2-13
2	Target Vehicle Accelerometer Placement	2-14
3	Bullet Vehicle Accelerometer Placement	2-18
4	Target Vehicle Dummy Longitudinal Clearance Measurements	4-4
5	Target Vehicle Dummy Lateral Clearance Measurements	4-5
6	Bullet Vehicle Dummy Measurement Locations for Front Seat Occupants	4-6
7	Seat Belt Positioning Data	4-8
8	Target Vehicle Side Measurements	4-9
9	Vehicle Damage Profile Distances	4-13
10	Bullet Vehicle Crush	4-14
11	Pre-Test and Post-Test Measurement Points	4-15
12	Camera Positions	4-17

List of Photographs

<u>Description</u>	<u>Figure</u>
Pre-Test Target Vehicle Front View	A-1
Post-Test Target Vehicle Front View	A-2
Pre-Test Target Vehicle Left Front Three-Quarter View	A-3
Post-Test Target Vehicle Left Front Three-Quarter View	A-4
Pre-Test Target Vehicle Left Side View	A-5
Post-Test Target Vehicle Left Side View	A-6
Pre-Test Target Vehicle Rear View	A-7
Post-Test Target Vehicle Rear View	A-8
Pre-Test Target Vehicle Overhead View	A-9
Pre-Test Bullet Vehicle Front View	A-10
Post-Test Bullet Vehicle Front View	A-11
Post-Test Bullet Vehicle Left Side View	A-12
Post-Test Bullet Vehicle Right Side View	A-13
Pre-Test Bullet Vehicle Rear View	A-14
Post-Test Bullet Vehicle Rear View	A-15
Pre-Test Bullet Vehicle Engine View	A-16
Post-Test Bullet Vehicle Engine View	A-17
Pre-Test Bullet Vehicle Underbody View	A-18
Post-Test Bullet Vehicle Underbody View	A-19
Pre-Test Bullet Vehicle Windshield View	A-20
Post-Test Bullet Vehicle Windshield View	A-21
Pre-Test Target Vehicle Driver Dummy - View 1	A-22
Post-Test Target Vehicle Driver Dummy - View 1	A-23
Pre-Test Target Vehicle Driver Dummy - View 2	A-24
Pre-Test Target Vehicle Driver Dummy - View 3	A-25
Post-Test Target Vehicle Driver Dummy - View 4	A-26
Pre-Test Target Vehicle Passenger Dummy - View 1	A-27
Post-Test Target Vehicle Passenger Dummy - View 1	A-28
Pre-Test Target Vehicle Passenger Dummy - View 2	A-29

List of Photographs Cont'd.

<u>Description</u>	<u>Figure</u>
Pre-Test Target Vehicle Passenger Dummy - View 3	A-30
Post-Test Target Vehicle Passenger Dummy - View 4	A-31
Pre-Test Bullet Vehicle Driver Dummy - View 1	A-32
Post-Test Bullet Vehicle Driver Dummy - View 1	A-33
Pre-Test Bullet Vehicle Driver Dummy - View 2	A-34
Post-Test Bullet Vehicle Driver Dummy - View 2	A-35
Pre-Test Bullet Vehicle Driver Dummy - View 3	A-36
Post-Test Bullet Vehicle Driver Dummy - View 3	A-37
Pre-Test Bullet Vehicle Passenger Dummy - View 1	A-38
Post-Test Bullet Vehicle Passenger Dummy - View 1	A-39
Pre-Test Bullet Vehicle Passenger Dummy - View 2	A-40
Post-Test Bullet Vehicle Passenger Dummy - View 2	A-41
Pre-Test Bullet Vehicle Passenger Dummy - View 3	A-42
Post-Test Bullet Vehicle Passenger Dummy - View 3	A-43
Post-Test Target Vehicle Driver Dummy	A-44
Post-Test Target Vehicle Driver Dummy Body Contact View	A-45
Post-Test Target Vehicle Driver Dummy Head View	A-46
Post-Test Target Vehicle Driver Dummy Head Contact View	A-47
Post-Test Target Vehicle Passenger Dummy	A-48
Post-Test Target Vehicle Passenger Dummy Body Contact View	A-49
Post-Test Target Vehicle Passenger Dummy Head View	A-50
Post-Test Target Vehicle Passenger Dummy Head Contact View	A-51
Post-Test Bullet Vehicle Driver Dummy	A-52
Post-Test Bullet Vehicle Driver Dummy Head Contact - View 1	A-53
Post-Test Bullet Vehicle Driver Dummy Head Contact - View 2	A-54
Post-Test Bullet Vehicle Driver Dummy Head Contact - View 3	A-55
Post-Test Bullet Vehicle Driver Dummy Leg Contact - View 1	A-56
Post-Test Bullet Vehicle Driver Dummy Leg Contact - View 2	A-57
Post-Test Bullet Vehicle Driver Dummy Leg Contact - View 3	A-58

List of Photographs Cont'd.

<u>Description</u>	<u>Figure</u>
Post-Test Bullet Vehicle Passenger Dummy	A-59
Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 1	A-60
Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 2	A-61
Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 3	A-62
Post-Test Bullet Vehicle Passenger Dummy Leg Contact - View 1	A-63
Post-Test Bullet Vehicle Passenger Dummy Leg Contact - View 2	A-64
Target Vehicle Certification Label	A-65
Target Vehicle Tire Load Label	A-66
Bullet Vehicle Certification Label	A-67
Impact Event	A-68
Vehicle Crabbing Device	A-69

Purpose

This 48/24 kph 90° left side vehicle-to-stationary vehicle impact test was conducted for National Highway Transportation and Safety Administration (NHTSA) and Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC). The purpose of this test was to determine the response of the subject vehicle, a 1997 Honda Accord in the 48/24 kph 90° left side vehicle to stationary vehicle impact mode.

Test Procedure

This test was conducted per NHTSA and VRTC instructions. Data was obtained relative to FMVSS 208, "Occupant Protection," and FMVSS 214, "Dynamic Side Impact Protection," performance in the left side impact mode.

The target vehicle was instrumented with twelve (12) lateral axis accelerometers, four (4) longitudinal axis accelerometers, and four (4) vertical axis accelerometers.

The bullet vehicle was instrumented with eight (8) longitudinal axis accelerometers and one (1) vertical axis accelerometer and its specified impact velocity range was 52.1 to 53.7 kph.

The bullet vehicle's left edge was aligned with the target vehicle's impact point, which is 940 mm forward of the target vehicle's wheelbase. The impact angle was 90°. The bullet vehicle's front wheels were turned 27° clockwise and the vehicle's rear wheels were crabbed 27° clockwise using wheel crabbing devices attached to the rear axle (see Figure A-69). The bullet vehicle was ballasted to its target test weight to determine its target attitudes. The wheel crabbing devices were attached to the rear axle to match these target attitudes as closely as the vehicle's front suspension would allow with the front wheels turned to 27°.

Two (2) 50th percentile adult male SIDs (dummies) with Hybrid III heads and necks were placed in target vehicle's front designated and rear outboard seating positions. Each dummy had accelerometers in the head, pelvis, upper and lower ribs, and spine to measure longitudinal, lateral, and vertical accelerations, shear and force load cells in the neck, and a potentiometer in the chest to measure chest deflection. Each dummy was restrained with a 3-point unbelt.

The bullet vehicle had a 50th percentile adult male Hybrid III and a 5th percentile female Hybrid III anthropomorphic test device (dummy) seated in the left and right front designated outboard seating positions, respectively. The driver dummy was instrumented with accelerometers in the head and chest to measure longitudinal, lateral, and vertical accelerations, a potentiometer in the chest to measure displacement, shear and force load cells in the neck, and

load cells in the femurs. The right front passenger was instrumented with accelerometers in the head, chest, neck, sternum, spine, and pelvis to measure longitudinal, lateral, and vertical accelerations, chest potentiometer in the chest, shear and force load cells in the neck, and load cells in the femurs.

The one hundred nineteen (119) data channels were digitally sampled and recorded at 12,500 samples per second and processed per SAE J211 October 1988.

The crash event was recorded by one (1) real-time panning motion picture camera and eleven (11) high-speed motion picture cameras.

The vehicle data are summarized in Section 2.0. The FMVSS 208 and FMVSS 214 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 vehicle data plots. Appendix C contains dummy calibrations. Appendix D contains miscellaneous test information.

Test Results Summary

This 48/24 kph 90° left side vehicle-to-stationary vehicle impact test was conducted at TRC on April 27, 1998.

The target test vehicle, a 1997 Honda Accord, was equipped with a 4-cylinder, transverse engine, automatic transmission, power steering, and power brakes. The target vehicle's test weight was 1526.3 kg. The bullet vehicle, a 1996 Dodge Grand Caravan, was equipped with a 6-cylinder, transverse engine, automatic transmission, power steering, and power brakes. The bullet vehicle's test weight was 2073.8 kg and its impact speed was 32.9 kph. The target vehicle's maximum static crush was 553 millimeters. The bullet vehicle's maximum crush was 128 millimeters.

The target vehicle driver dummy's Head Injury Criteria (HIC) was 193 g. The target vehicle driver dummy's Standard Thoracic Trauma Index (TTI) was 88.8. The target vehicle driver dummy's chest deflection was 34 mm. The target vehicle driver dummy's lateral pelvis was 127.9 g.

The target vehicle left rear passenger dummy's HIC was 260 g. The target vehicle left rear passenger dummy's TTI was 39.0. The target vehicle left rear passenger dummy's chest deflection was 43 mm. The target vehicle left rear passenger dummy's maximum lateral pelvis was 49.1 g.

The bullet vehicle driver dummy's HIC was 175 g. The bullet vehicle driver dummy's three millisecond chest deceleration was 22.1 g. The bullet vehicle driver dummy's chest deflection was 23 mm. The bullet vehicle driver dummy's left and right femur forces were 1583 N and 1265 N, respectively.

The bullet vehicle passenger dummy's HIC was 98 g. The bullet vehicle passenger dummy's three millisecond chest deceleration was 41.5 g. The bullet vehicle passenger

dummy's chest deflection was 17 mm. The bullet vehicle passenger dummy's left and right femur forces were 976 N and 1014 N, respectively.

Data Acquisition Explanation

The target vehicle's left lower A-pillar accelerometer, LLAYG1, lost data after approximately 30 milliseconds.

The target vehicle's left rear passenger head Y-axis data channel, HEDYG4, overranged after approximately 163 milliseconds. This affected the resultant and HIC calculation. The HIC was recalculated from 0 to 160 milliseconds.

The bullet vehicle's right front passenger chest Z-axis data channel, CSTZG2, recorded questionable data after approximately 160 milliseconds. This affected the resultant and clip calculation. The clip was recalculated using the time from 0 to 160 milliseconds.

Table 1 Crash Test Summary

Test type:	Left Side Impact	
Test date:	04/27/98	
Test time:	1637	
Ambient temperature:	22° C	
Target vehicle:	1997 Honda Accord	
Target vehicle test weight:	1526.3 kg	
Bullet vehicle:	1996 Dodge Grand Caravan	
Bullet vehicle test weight:	2073.8 kg	
Impact angle: ¹	90°	
Impact velocity: ²	Primary = 32.9 kph Secondary = 32.9 kph	
Target vehicle's maximum static crush:	553 mm	
Bullet vehicle's maximum static crush:	128 mm	
Primary impact point:	X: 20 mm left Z: 11 mm up	
Target vehicle dummies:	Driver #191	Passenger #199
Type:	572F(SID)	572F(SID)
Location:	Left front	Left rear
Restraint:	3-point unbelt	3-point unbelt
Bullet vehicle dummies:	Driver #168	Passenger #289
Type:	572E(50% Male)	Hybrid III(5% Female)
Location:	Left front	Right front
Restraint:	3-point unbelt/airbag	3-point unbelt/airbag
Total number of data channels:	118	
Number of cameras:		
High-speed	11	
Real-time	1	

¹ With respect to tow track centerline.

² Speed trap measurement (± .08 kph accuracy)

Table 2 Target Test Vehicle Information

Vehicle manufacturer:	Honda of America, Mfg.		
Make/model:	Honda/Accord LX		
VIN:	1HGCD563XVA077459		
Model year:	1997		
Body style:	4-door		
Color:	Med Blue		
Engine data:			
Type:	Transverse		
Cylinders:	4		
Displacement:	2.3		
Transmission data:	<u>4</u> Speed, <u> </u> Manual, <u> X</u> Automatic, <u> X</u> FWD, <u> </u> RWD, <u> </u> 4WD		
Date vehicle received:	04/01/98		
Odometer reading:	27,845		
Dealer's name and address:	NA		
<u>Accessories:</u>			
Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	No	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None		
<u>Certification data from vehicle's label:</u>			
Vehicle manufactured by:	Honda of America Mfg., Inc.		
Date of manufacture:	11/96		
VIN:	1HGCD563XVA077459		
VWR:	3915 lbs.		
GAWR: Front:	2140 lbs.		
Rear:	1810 lbs.		

Table 2 Target Test Vehicle Information, Cont'd.

Tires on vehicle (mfr., line, size): MX4, P185/65R15

Tire pressure with maximum capacity vehicle load:	Front: 241 kPa
	Rear: 241 kPa

Spare tire (mfr., line, size): N/A

Type of seats:	Front: Bucket
	Rear: Bench

Type of front seat backs: Manually adjustable

Maximum width: 1780 mm

Wheelbase: 2713 mm

Location of "Recommended Tire Pressure" label:

The label was located on the driver's door.

Data from vehicle's "Recommended Tire Pressure" label:

Recommended tire size: P185/65R15

Recommended cold tire pressure:	Front: 32 psi
	Rear: 32 psi

Seating capacity:	Front: 2
	Rear: 3
	Total: 5

Cargo load: 100 lbs

Test vehicle attitude:

Delivered attitude:	LF 705 mm;	RF 705 mm;	LR 695 mm;	RR 697 mm
Fully load attitude:	LF 683 mm;	RF 700 mm;	LR 645 mm;	RR 662 mm
Pre-test attitude:	LF 680 mm;	RF 692 mm;	LR 642 mm;	RR 650 mm
Post-test attitude:	LF 671 mm;	RF 690 mm;	LR 650 mm;	RR 625 mm

Table 2 Target Test Vehicle Information, Cont'd.

Delivered Weight:

Right Front:	407.8 kg	Right Rear:	253.1 kg
Left Front:	415.0 kg	Left Rear:	252.6 kg
Total Front Weight:	822.8 kg	(62.9% of total vehicle weight)	
Total Rear Weight:	505.7 kg	(38.1% of total vehicle weight)	
Total Delivered Weight:	1328.5 kg		

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight

UDW = Unloaded delivered weight (1328.5 kg)

VCW = Vehicle capacity weight (385.6 kg)

DSC = Designated seating capacity (5)

$RCLW = VCW - 68.0 (5) = 45.6 \text{ kg}$

Target test weight = $UDW + RCLW + (\text{No. of Hybrid III dummies} \times 79.4 \text{ kg})$

Target test weight = $1328.5 + 45.6 \text{ kg} + 2(79.4 \text{ kg})$

Target test weight = 1532.9 kg

Weight of test vehicle with required dummies and 39.1 kg cargo weight:

Right front	394.2 kg	Right rear	331.1 kg
Left front	449.1 kg	Left rear	352.0 kg
Total front weight	843.3 kg	(55.2% of total vehicle weight)	
Total rear weight	683.1 kg	(44.8% of total vehicle weight)	
Total test weight	1526.4 kg		

Weight of ballast secured in cargo area: 5 lbs. in trunk, 18 lbs. on engine

Components removed to meet target test weight: Alternator, distributor, and
power steering pump

CG rearward of front wheel centerline: 1214 mm

Table 3 Bullet Test Vehicle Information

Vehicle manufacturer:	Chrysler Corporation
Make/model:	Dodge/Grand Caravan
VIN:	1B4GP54R2VB268718
Model year:	1997
Body style:	MPV
Color:	Perrywinkle
Engine data:	
Type:	Transverse
Cylinders:	6
Displacement:	3.3 liter
Transmission data:	<u>4</u> Speed, <u> </u> Manual, <u> X </u> Automatic, <u> X </u> FWD, <u> </u> RWD, <u> </u> 4WD
Date vehicle received:	03/31/98
Odometer reading:	23,000
Dealer's name and address:	N/A

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	Yes	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by:	Chrysler Corporation
Date of manufacture:	09/96
VIN:	1B4GP54R2VB268718
GVWR:	5350 lbs.
GAWR: Front:	2746 lbs.
Rear:	2746 lbs.

Table 3 Bullet Test Vehicle Information, Cont'd.

Tires on vehicle (mfr., line, size): P215/65R15

Tire pressure with maximum capacity vehicle load:	Front: NA
	Rear: NA

Spare tire (mfr., line, size): Space Saver

Type of seats: Front: Bucket

Type of front seat backs: Manually adjustable

Maximum width: 1922 mm

Wheelbase: 3032 mm

Location of "Recommended Tire Pressure" label:

The label was located on the driver's door.

Data from vehicle's "Recommended Tire Pressure" label:

Recommended tire size: P215/65R15

Recommended cold tire pressure:	Front: 35 psi
	Rear: 35 psi

Seating capacity:	Front: 2
	Rear: 5
	Total: 7

Vehicle cargo load: NA

Test vehicle attitude:

Delivered attitude:	LF 747 mm;	RF 757 mm;	LR 758 mm;	RR 770 mm
Pre-test attitude:	LF 728 mm;	RF 733 mm;	LR 719 mm;	RR 731 mm
Post-test attitude:	LF 720 mm;	RF 813 mm;	LR 727 mm;	RR 722 mm

Note: Dodge Grand Caravan had different wheels on rear axle, after TRC crabbed the wheels. There was 52 psi in the rear tires.

Table 3 Bullet Test Vehicle Information, Cont'd.

Delivered Weight:

Right Front:	544.3 kg	Right Rear:	385.6 kg
Left Front:	503.5 kg	Left Rear:	381.0 kg
Total Front Weight:	1047.8 kg		(57.7% of total vehicle weight)
Total Rear Weight:	766.6 kg		(42.3% of total vehicle weight)
Total Delivered Weight:	1814.4 kg		

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight

GVWR = Gross vehicle weight rating (2426.7 kg)

UDW = Unloaded delivered weight (1814.4 kg)

VCW = Vehicle capacity weight = GVWR - UDW = 2426.7 - 1814.4 = 612.3 kg

DSC = Designated seating capacity (7)

RCLW = GVWR - UDW - 68.0(7) = 2426.7 - 1814.4 - 68.0(7) = 136.3 kg

Target test weight = UDW + RCLW + (No. of Hybrid III dummies x 75.8 kg +
No. of Hybrid III dummies x 47.6 kg)

Target test weight = 1814.4 + 136.0 + 75.8 + 47.6

Target test weight = 2073.8 kg

Weight of test vehicle with required dummies and 135.6 kg cargo weight:

Right front	558.4 kg	Right rear	467.7 kg
Left front	586.0 kg	Left rear	461.3 kg
Total front weight	1144.4 kg		(55.2% of total vehicle weight)
Total rear weight	929.0 kg		(44.8% of total vehicle weight)
Total test weight	2073.4 kg		

Weight of ballast secured in cargo area: None

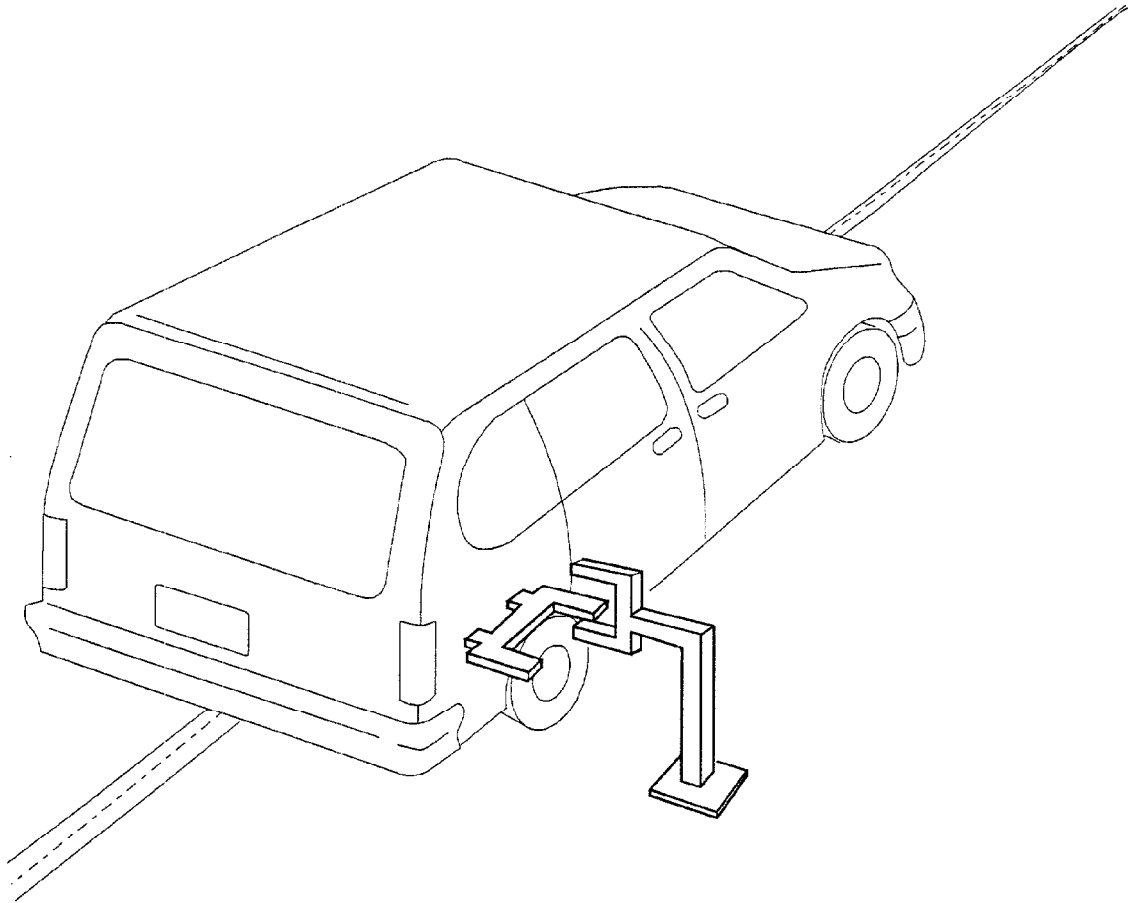
Components removed to meet target test weight: Vehicle's wheels were modified to be
crabbed at 27° Spare tire, both rear
taillights, rear door liner.

CG rearward of front wheel centerline: 1359.0 mm

Table 4 Post-Impact Data

Test number:	980427
Date of test:	04/27/98
Time of test:	1637
Type of test:	Left Side Impact
Impact angle:	90°
Ambient temperature at impact area:	22° C
Impact velocity:	
Primary	53.0 kph
Secondary	52.9 kph
	(Specified range = 52.0 to 53.8 kph)
Distance from vehicle to vehicle:	
Entering trap	355 mm
Exiting trap	51 mm

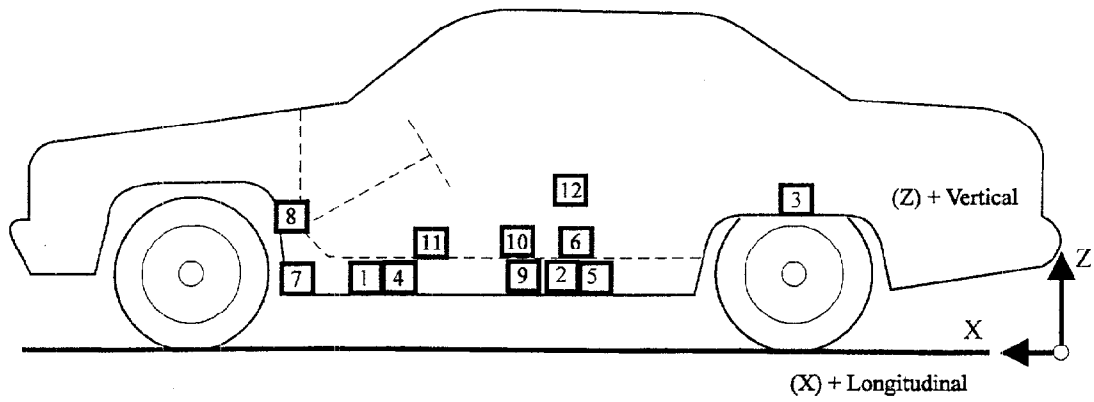
Figure 1 Impact Velocity Measurement System



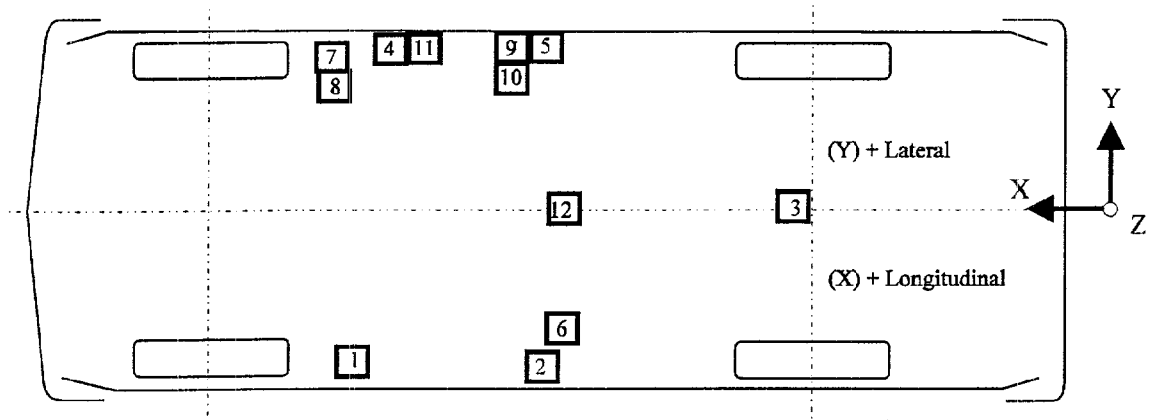
The final vane clears the final emitter/receiver pair 51 millimeters before impact.

The vanes have 305-millimeter spacing.

Figure 2 Target Vehicle Accelerometer Placement



Side View



Bottom View

Table 5 Target Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 980427						POSITIVE DIRECTION		NEGATIVE DIRECTION	
No. LOCATION		X		Y		Z			
1	RIGHT SIDE SILL	PRE	2952 mm	650 mm	275 mm				
	AT FRONT SEAT	POST	2952 mm	650 mm	250 mm				
	LONGITUDINAL					2.7 g	@ 40.4 ms	4.3 g	@ 24.2 ms
	LATERAL					1.7 g	@ 152.6 ms	18.8 g	@ 36.0 ms
	VERTICAL					5.1 g	@ 40.8 ms	3.2 g	@ 57.6 ms
	RESULTANT					19.0 g	@ 36.0 ms		
2	RIGHT SIDE SILL	PRE	2090 mm	650 mm	233 mm				
	AT REAR SEAT	POST	2090 mm	650 mm	344 mm				
	LONGITUDINAL					2.4 g	@ 40.2 ms	3.9 g	@ 23.3 ms
	LATERAL					2.1 g	@ 219.6 ms	16.9 g	@ 36.5 ms
	VERTICAL					6.7 g	@ 42.4 ms	2.9 g	@ 104.6 ms
	RESULTANT					16.9 g	@ 36.5 ms		
3	REAR FLOORPAN	PRE	1185 mm	0 mm	363 mm				
	ABOVE AXLE	POST	1185 mm	0 mm	468 mm				
	LONGITUDINAL					10.6 g	@ 65.3 ms	16.2 g	@ 57.4 ms
	LATERAL					2.2 g	@ 164.2 ms	17.9 g	@ 51.2 ms
	VERTICAL					6.5 g	@ 57.8 ms	8.1 g	@ 64.3 ms
	RESULTANT					23.4 g	@ 58.1 ms		
4	LEFT SIDE SILL	PRE	3084 mm	-650 mm	245 mm				
	AT FRONT SEAT	POST	2851 mm	-600 mm	283 mm				
	LATERAL					2.8 g	@ 83.1 ms	30.4 g	@ 33.4 ms

Table 5 Target Vehicle Accelerometer Locations and Data Summary, Cont'd.

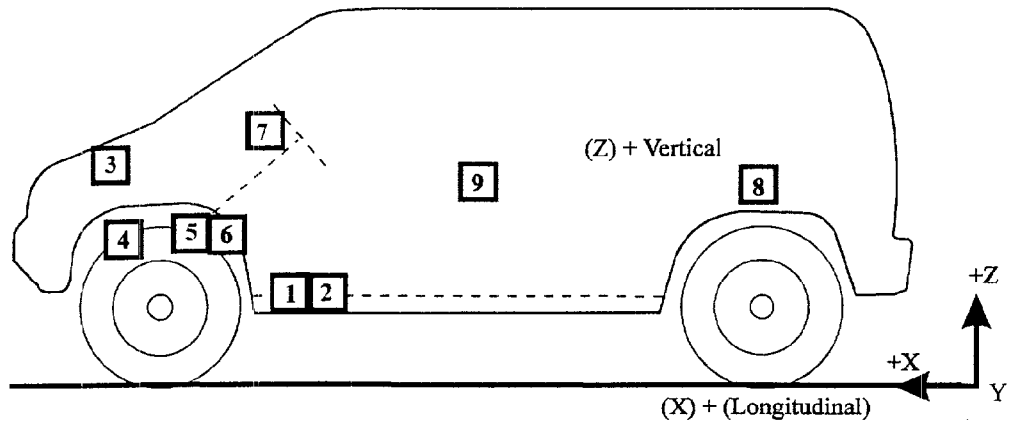
TEST NUMBER: 980427											
No. LOCATION		X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION				
5 LEFT SIDE SILL AT REAR SEAT LATERAL	PRE 2088 mm	-650 mm	233 mm								
	POST 1982 mm	-555 mm	250 mm	14.9 g @ 41.0 ms	48.8 g @ 34.2 ms						
6 RIGHT REAR OCCUPANT COMPARTMENT LATERAL	PRE 1892 mm	485 mm	256 mm								
	POST 1892 mm	485 mm	311 mm	2.0 g @ 200.6 ms	17.9 g @ 36.5 ms						
7 MIDDLE A-POST LATERAL	PRE 3224 mm	-785 mm	590 mm								
	POST 3102 mm	-730 mm	500 mm	33.0 g @ 19.8 ms	1056.4 g @ 43.8 ms						
8 UPPER A-POST LATERAL	PRE 3170 mm	-785 mm	803 mm								
	POST 3100 mm	-743 mm	760 mm	73.6 g @ 23.3 ms	31.2 g @ 38.2 ms						
9 LOWER B-POST LATERAL	PRE 2230 mm	-704 mm	515 mm								
	POST 2042 mm	-470 mm	545 mm	29.8 g @ 39.7 ms	132.6 g @ 20.2 ms						

Table 5 Target Vehicle Accelerometer Locations and Data Summary, Cont'd.

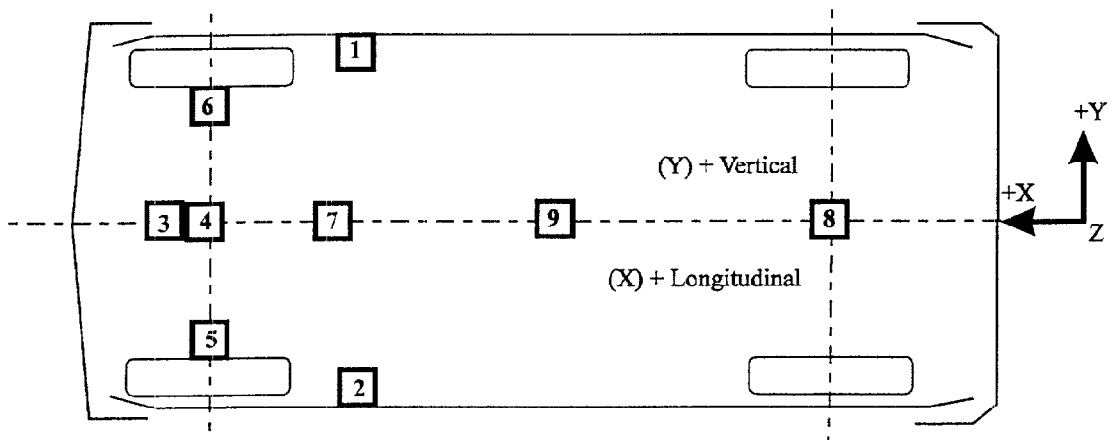
TEST NUMBER: 980427 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
10 MIDDLE B-POST	PRE 2200 mm POST 2042 mm	-704 mm -484 mm	660 mm 750 mm		
LATERAL				32.1 g @ 41.4 ms	101.2 g @ 20.2 ms
11 FRONT SEAT TRACK	PRE 2490 mm POST 2574 mm	-650 mm -653 mm	206 mm 292 mm		
LATERAL				10.6 g @ 77.0 ms	37.7 g @ 26.1 ms
12 VEHICLE CENTER OF GRAVITY	PRE 2555 mm POST 2555 mm	25 mm 30 mm	347 mm 394 mm		
LONGITUDINAL				3.0 g @ 39.9 ms	5.2 g @ 19.6 ms
LATERAL				1.7 g @ 177.4 ms	29.3 g @ 34.7 ms
VERTICAL				6.5 g @ 55.6 ms	10.8 g @ 72.1 ms
RESULTANT				29.5 g @ 34.7 ms	

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

Figure 3 Bullet Vehicle Accelerometer Placement



Side View



Bottom View

Table 6 Bullet Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 980427		X		Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
No. LOCATION									
1	LEFT REAR SEAT	PRE	2270 mm	642 mm	405 mm	1.0 g	@ 174.6 ms	10.4 g	@ 75.3 ms
	CROSSMEMBER LONGITUDINAL	POST	2270 mm	642 mm	463 mm				
2	RIGHT REAR SEAT	PRE	2270 mm	-642 mm	408 mm	0.8 g	@ 177.4 ms	7.8 g	@ 39.9 ms
	CROSSMEMBER LONGITUDINAL	POST	2270 mm	-642 mm	461 mm				
3	ENGINE TOP	PRE	5040 mm	-15 mm	751 mm	3.0 g	@ 155.4 ms	16.8 g	@ 54.1 ms
	LONGITUDINAL	POST	4610 mm	-15 mm	760 mm				
4	ENGINE BOTTOM	PRE	4505 mm	-123 mm	135 mm	6.2 g	@ 92.1 ms	37.5 g	@ 47.6 ms
	LONGITUDINAL	POST	4500 mm	-123 mm	169 mm				
5	RIGHT BRAKE CALIPER	PRE	4420 mm	-730 mm	318 mm	1.9 g	@ 141.5 ms	14.4 g	@ 74.6 ms
	LONGITUDINAL	POST	4401 mm	-730 mm	292 mm				

Table 6 Bullet Vehicle Accelerometer Locations and Data Summary, Cont'd.

TEST NUMBER: 980427 No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
6 LEFT BRAKE CALIPER	PRE 4350 mm POST 4355 mm	680 mm 680 mm	280 mm 269 mm		
LONGITUDINAL				2.4 g @ 120.9 ms	15.2 g @ 38.1 ms
7 INSTRUMENT PANEL	PRE 3892 mm POST 3892 mm	0 mm 0 mm	1108 mm 1131 mm		
LONGITUDINAL				33.5 g @ 81.2 ms	57.3 g @ 55.8 ms
8 VEHICLE REAR CENTER	PRE 490 mm POST 490 mm	0 mm 0 mm	456 mm 456 mm		
VERTICAL				4.9 g @ 80.9 ms	4.9 g @ 71.6 ms
9 VEHICLE CENTER OF GRAVITY	PRE 3166 mm POST NA	0 mm NA	367 mm NA		
LONGITUDINAL				0.7 g @ 175.8 ms	8.8 g @ 38.0 ms

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

Table 7 Target Vehicle Dummy Injury Criteria

<u>Maximum Acceleration</u>				
	Upper Rib		Lower Rib	
	Y	R	Y	R
Driver	-70.8 g	-75.1 g	-73.6 g	-78.8 g
Passenger	-41.6 g	-41.0 g	-40.4 g	-40.1 g

	Lower Spine		Pelvis	
	Y	R	Y	R
Driver	-104.0 g	-102.6 g	-127.9 g	-129.3 g
Passenger	-36.5 g	-36.2 g	-49.1 g	-39.5 g

Standard Thoracic Trauma Index¹

Driver	88.8
Passenger	39.0

Head Injury Criteria²

	HIC	Time t ₁	Time t ₂
Driver	193	45.2 ms	81.2 ms
Passenger ³	260	64.8 ms	91.4 ms

¹ As defined in FMVSS No. 214

² As defined in FMVSS No. 208

³ See Data Acquisition Explanations

Table 8 Bullet Vehicle Dummy Injury Criteria

	<u>Maximum Acceleration</u>						
	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	-31.9 g	-22.8 g	-7.4 g	36.2 g	-22.2 g	4.3 g	-1.8 g
Passenger	-80.8 g	-16.0 g	-28.0 g	81.5 g	-47.2 g	13.4 g	-90.5 g

	<u>Maximum Femur Compressive Force</u>	
	Left Femur	Right Femur
Driver	1583 N	1265 N
Passenger	976 N	1014 N

	<u>Head Injury Criteria¹</u>		
	HIC	Time t ₁	Time t ₂
Driver	175	81.0 ms	117.0 ms
Passenger ³	98	57.6 ms	62.6 ms

	<u>Chest Maximum Resultant Acceleration²</u>		
	Acceleration	Time t ₁	Time t ₂
Driver	22.1 g	98.0 ms	101.0 ms
Passenger ³	43.0 g	59.4 ms	62.3 ms

	<u>Maximum Chest Deflection</u>
Driver	23.2 mm
Passenger	17.5 mm

¹ As defined in FMVSS No. 208

² Defined as equal to or exceeding 0.003 sec. duration

³ See Data Acquisition Explanations

Table 9 Target Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver</u>	<u>Passenger</u>
Head	Passenger seat's headrest	Side header
Chest	None	None
Abdomen	None	None
Left knee	Dash	None
Right knee	Center console	None

Door opening:

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

Seat movement:

	<u>Seat back failure</u>	<u>Seat shift</u>
Front	None	To the right
Rear	None	None

Glazing damage:

The side windows did not shatter during impact. The windshield was cracked in the upper left hand side.

Other notable impact effects:

None

Table 10 Bullet Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver</u>	<u>Passenger</u>
Head	Airbag	Airbag
Chest	Airbag	Airbag
Abdomen	Steering wheel	None
Left knee	Dash	Dash
Right knee	Dash	Dash

Door opening:

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

Seat movement:

	<u>Seat back failure</u>	<u>Seat shift</u>
Front	None	None
Rear	NA	NA

Glazing damage: None

Other notable impact effects: None

Section 4.0

Vehicle, Occupant, and Camera Measurements

Target Vehicle Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy's upper body translated away from the impacting vehicle impacting both knees into the instrument panel. The dummy's head rotated back to the left and twisted forward in the seat and then fell between the seats, hitting its head on the passenger side head rest. The dummy's chest was restrained by a 3-point unbelt. The driver dummy came to rest seated in the driver's seat at a slight angle.

Left Rear Passenger Dummy

Upon impact, the passenger dummy's upper body translated away from the impacting vehicle impacting the left knee into the door panel. The dummy's head rotated back to the left and hit the side header and then rebounded into the seat back hitting the head restraint. The dummy's chest was restrained by a 3-point unbelt. The passenger dummy came to rest seated in the passenger's seat at a slight angle.

Bullet Vehicle Dummy Kinematic Summary

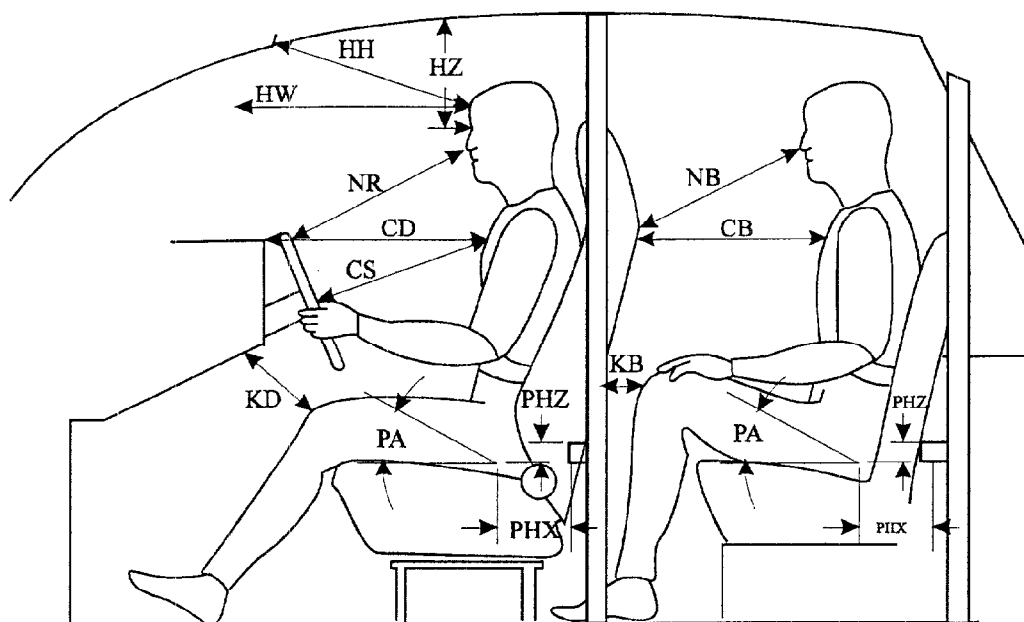
Driver Dummy

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

Right Front Passenger Dummy

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy's head and chest were restrained by the airbag. The dummy's head and upper torso rotated rearward as the dummy rebounded into the seat back. The dummy's head contacted the head restraint. The passenger dummy came to rest seated in the passenger's seat.

Figure 4 Target Vehicle Dummy Longitudinal Clearance Measurements



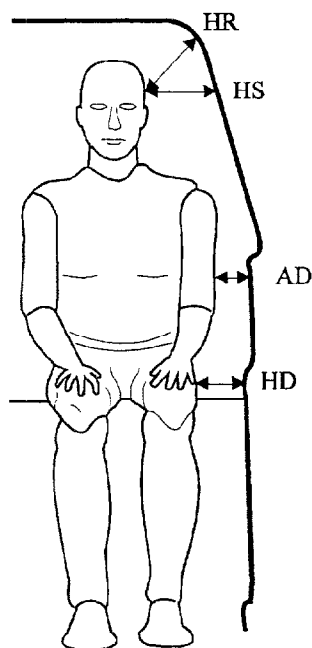
	Left Rear	
	Driver #191	Passenger #199
HH	380	NA
HW	631	NA
CD	595	NA
CS	367	NA
KDL	141	NA
KDR	151	NA
NR	513	NA
HZ	192	NA
PA	20°	24°
PHX ¹	167	262
PHZ ¹	168	324
NB	NA	620
CB	NA	507
KBL	NA	120
KBR	NA	113

Note: For 2-door vehicles, the rear passenger's PHX and PHZ measurements are referenced to the front door striker.

All distance measurements are in millimeters. All angles are referenced to horizontal.

¹ Front referenced to front door striker, rear referenced to rear striker.

Figure 5 Target Vehicle Dummy Lateral Clearance Measurements



	Driver #191	Left Rear Passenger #199
HR	165	131
HS	240	139
AD	103	70
HD	136	143

	Driver #191	Left Rear Passenger #199
Head to ground:	1085	1122
H-point to ground:	420	509
Upper rib to ground:	771	776
Lower rib to ground:	669	660

All distance measurements are in millimeters.

Figure 6 Bullet Vehicle Dummy Measurement Locations for Front Seat Occupants

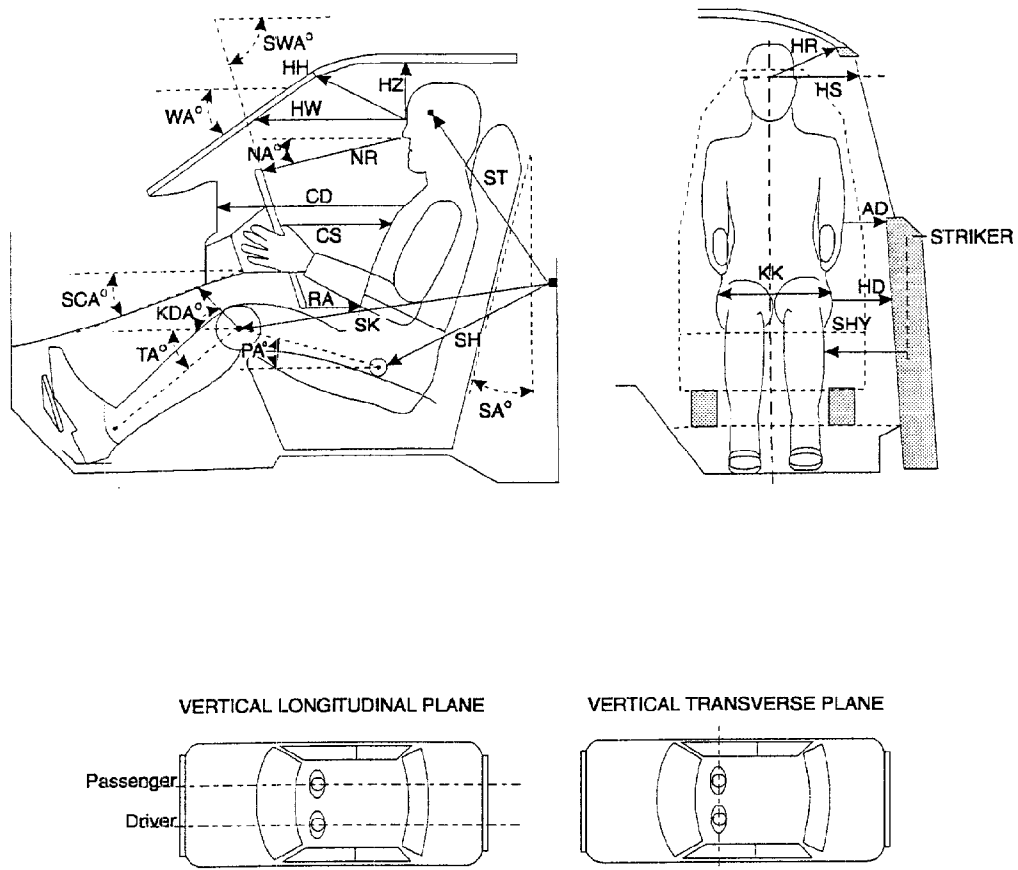


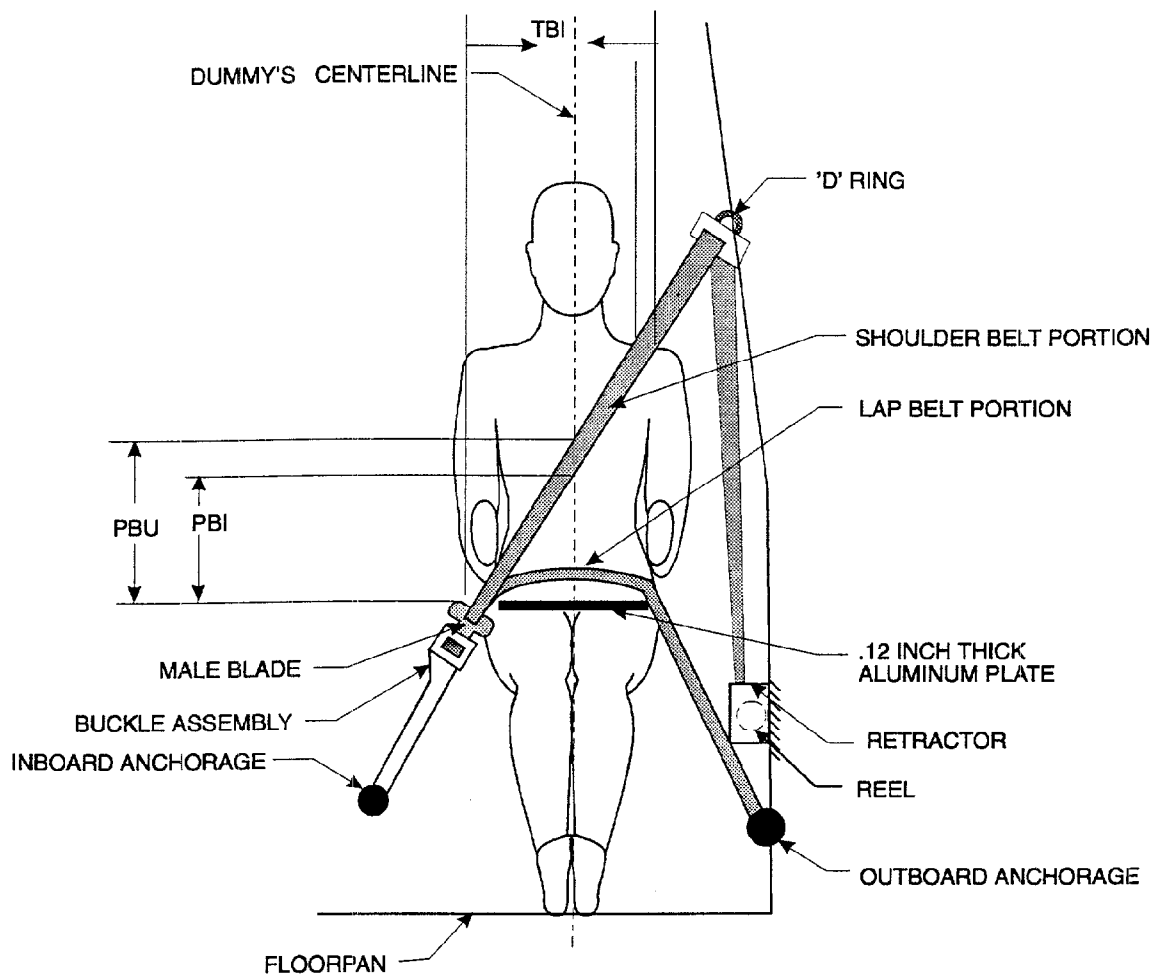
Table 11 Bullet Vehicle Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #168)	Passenger (Serial #289)
WA	Windshield angle	28°	28°
SWA	Steering wheel angle	65°	NA
SCA	Steering column angle	25°	NA
SA	Seat back angle	24°	19°
HZ	Head to roof	207 mm	206 mm
HH	Head to header	328 mm	283 mm
HW	Head to windshield	543 mm	598 mm
HR	Head to side header	246 mm	255 mm
NR	Nose to rim	326 mm	NA
NA	Nose to rim angle	16°	NA
CD	Chest to dash	535 mm	433 mm
CS	Steering wheel to chest	265 mm	NA
RA	Rim to abdomen	159 mm	NA
KDL	Left knee to dash	187 mm	126 mm
KDR	Right knee to dash	203 mm	114 mm
KDA	Outboard knee to dash angle	21°	29°
PA	Pelvic angle	22°	23°
TA	Tibial angle	50°	72°
KK	Knee to knee	340 mm	235 mm
ST ¹	Striker to head	649 mm	643 mm
	Striker to head angle	-80°	-69°
SK ¹	Striker to knee	620 mm	722 mm
	Striker to knee angle	-11°	-7°
SH	Striker to H-point	254 mm	356 mm
	Striker to H-point angle	2°	9°
SHY	Striker to H-point (Y dir.)	245 mm	255 mm
HS	Head to side window	356 mm	338 mm
HD	H-point to door	134 mm	141 mm
AD	Arm to door	114 mm	138 mm

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

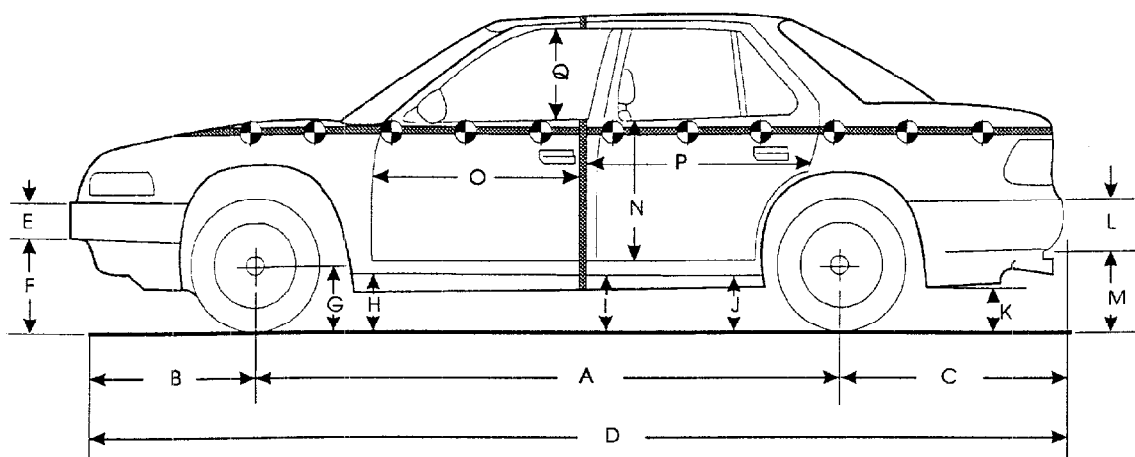
¹ A negative angle indicates the measurement point was above the striker.

Figure 7 Seat Belt Positioning Data



		Driver Dummy	Passenger Dummy
PBU	- Top surface of aluminum plate to belt upper edge	330 mm	260 mm
PBI	- Top surface of aluminum plate to belt lower edge	250 mm	175 mm
TBI	- Dummy centerline to intersection of upper torso belt and lap belt	315 mm	300 mm

Figure 8 Target Vehicle Side Measurements



LEFT SIDE VIEW

Note: All dimensions are in millimeters with tolerance of ± 3 mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2713	2713	2622	91
B	920	920	929	-9
C	1055	1055	1046	9
D	4702	4702	4597	105
E	160	160	160	0
F	357	223	256	-33
G	290	285	293	-8
H	218	254	263	-9
I	216	244	273	-29
J1	202	190	170	20
J2	216	158	200	-42
K	266	238	245	-7
L	165	165	165	0
M	435	256	256	0
N	700	700	555	145
O	763	763	745	18
P	1310	1310	1262	48
Q	426	426	432	-6
R	4436	4436	4456	-20
S	4435	4435	4333	102
T	1233	1233	928	305

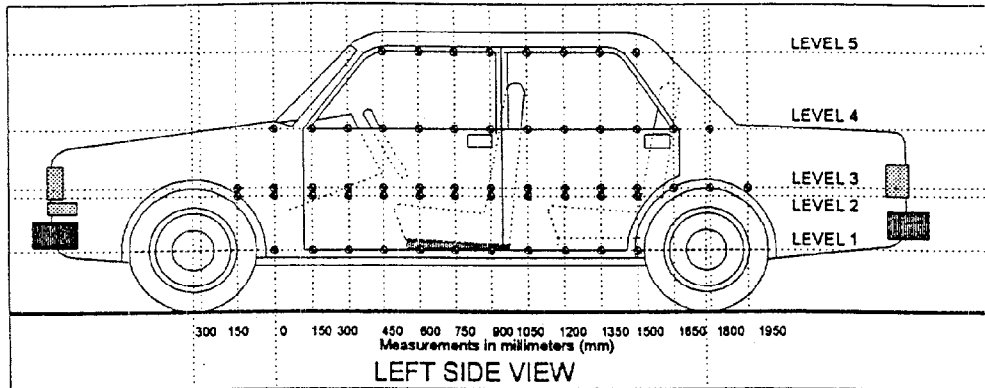
D = Length at centerline
T = Width at B-pillar

E&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

S = Left Side Length

Figure 8 Target Vehicle Side Measurements, Cont'd.



LEVEL 5 - WINDOW TOP
 LEVEL 4 - WINDOW SILL
 LEVEL 3 - MID-DOOR
 LEVEL 2 - OCCUPANT H-POINT
 LEVEL 1 - AXLE CENTERLINE HEIGHT OR SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION

Measurements along the vertical 750 mm line shown above:

Level 5 @ Window Top	=	<u>1400</u>	millimeters
Level 4 @ Window Sill	=	<u>890</u>	millimeters
Level 3 @ Mid Door	=	<u>600</u>	millimeters
Level 2 @ Occupant H-Point	=	<u>476</u>	millimeters
Level 1 @ Axle Centerline Height	=	<u>275</u>	millimeters

(or Sill Top Height)

Table 12 Target Vehicle Exterior Crush Profiles - All Levels

		(mm) From Impact Point														
		-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	
Level 1 Side Sill	275	Pre	NA	424	392	NA	NA	NA	NA	NA	368	382	380	382	383	382
		Post	NA	434	400	NA	NA	NA	NA	NA	469	530	579	629	656	701
		Crush	NA	-10	-8	NA	NA	NA	NA	NA	-101	-148	-199	-247	-273	-319
Level 2 H-Point	476	Pre	NA	387	365	NA	NA	NA	NA	NA	335	337	333	336	336	337
		Post	NA	379	361	NA	NA	NA	NA	NA	484	588	724	792	828	861
		Crush	NA	8	4	NA	NA	NA	NA	NA	-149	-551	-391	-456	-492	-524
Level 3 Mid-Door	600	Pre	NA	NA	399	366	NA	NA	NA	NA	337	338	340	340	340	342
		Post	NA	NA	404	382	NA	NA	NA	418	452	582	668	701	748	763
		Crush	NA	NA	-5	-16	NA	NA	NA	-81	-114	-242	-328	-361	-408	-421
Level 4 Window Sill	890	Pre	NA	NA	465	450	432	432	422	416	410	411	345	412	410	412
		Post	NA	NA	440	456	461	464	469	474	484	532	574	618	653	691
		Crush	NA	NA	25	-6	-29	-32	-47	-58	-74	-121	-229	-206	-243	-279
Level 5 Window Top	1400	Pre	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	690
		Post	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	800
		Crush	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-110

¹ Column readings are front to rear from left to right.

² Reference plane is parallel to and 1200 mm from the vehicle's longitudinal centerline.
All measurements are in millimeters.

Table 12 Target Vehicle Exterior Crush Profiles - All Levels, Cont'd.

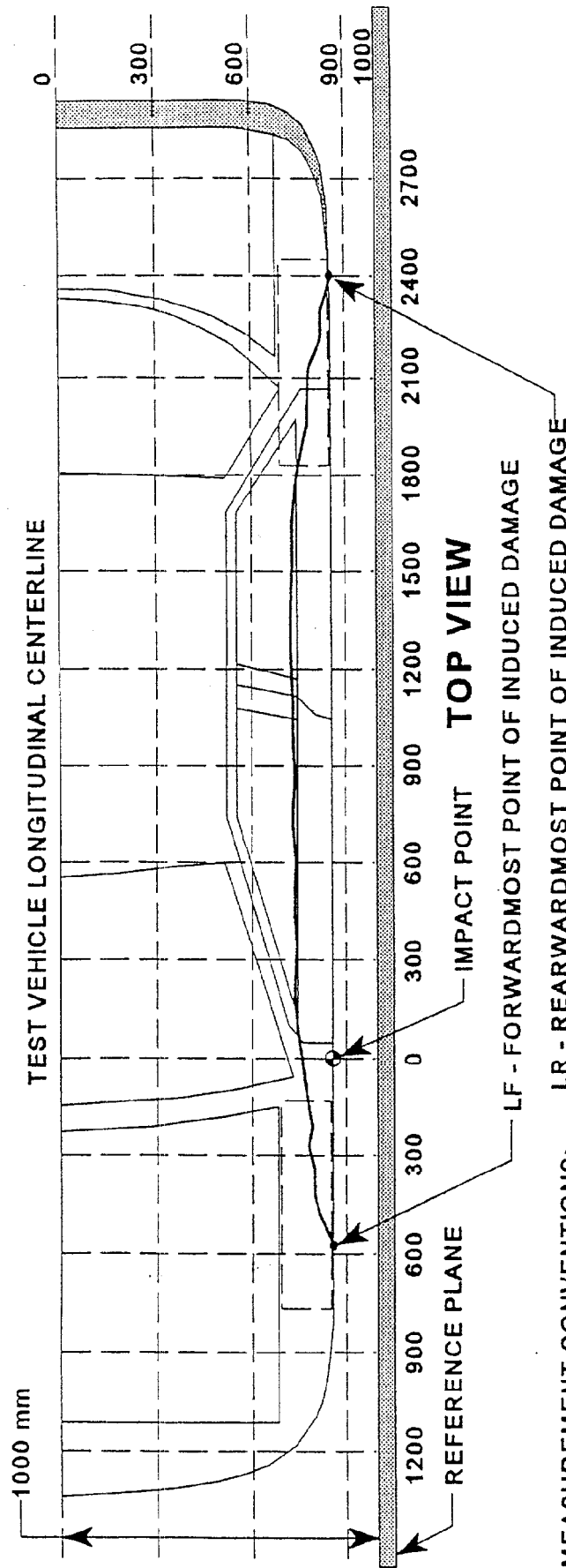
		(mm) From Impact Point													
Location	Height	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	
Level 1 Side Sill	275	Pre	381	381	386	385	384	385	387	NA	NA	NA	NA	NA	
		Post	712	729	729	691	643	577	512	NA	NA	NA	NA	NA	
		Crush	-331	-348	-343	-306	-259	-192	-125	NA	NA	NA	NA	NA	
Level 2 H-Point	476	Pre	335	335	340	339	338	340	342	345	NA	NA	NA	373	
		Post	881	888	836	821	791	696	567	461	NA	NA	NA	400	
		Crush	-546	-553	-496	-482	-453	-356	-225	-116	NA	NA	NA	NA	-27
Level 3 Mid-Door	600	Pre	338	336	340	337	335	337	340	335	NA	NA	NA	373	
		Post	812	842	818	782	748	685	618	488	NA	NA	NA	402	
		Crush	-474	-506	-478	-445	-413	-348	-278	-153	NA	NA	NA	NA	-29
Level 4 Window Sill	890	Pre	410	409	418	416	415	415	417	415	421	426	425	438	
		Post	735	769	813	781	744	700	636	567	484	444	422	469	
		Crush	-325	-360	-395	-365	-329	-285	-219	-152	-63	-18	3	-51	-31
Level 5 Window Top	1400	Pre	690	688	680	680	680	689	687	699	NA	NA	NA	NA	
		Post	842	882	930	912	851	823	788	785	NA	NA	NA	NA	
		Crush	-152	-194	-250	-232	-171	-134	-101	-86	NA	NA	NA	NA	NA

¹ Column readings are front to rear from left to right.

² Reference plane is parallel to and 1200 mm from the vehicle's longitudinal centerline.
All measurements are in millimeters.

Figure 9 Vehicle Damage Profile Distances

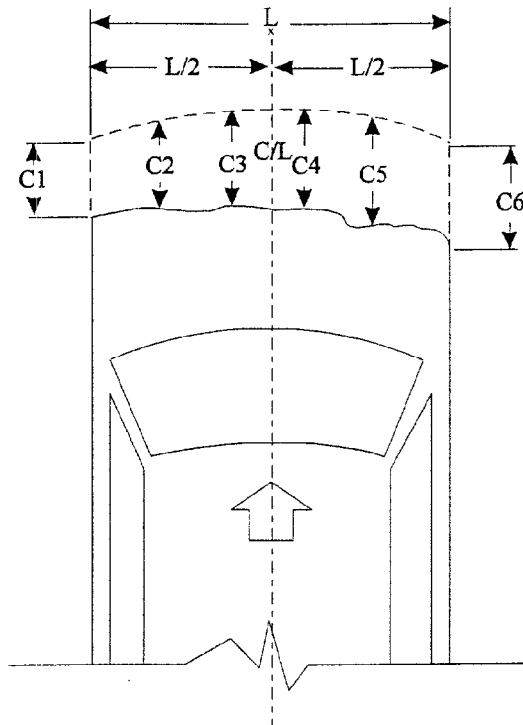
NOTE: All measurements are in millimeters (mm) and should be accurate to ± 3 mm.



MEASUREMENT CONVENTIONS:
 Forward of the impact point (towards front of vehicle) is considered negative (—).
 Rearward of the impact point (toward rear of vehicle) is considered positive (+).

DPD Measurements	Post-Test (mm)	Pre-Test (mm)	Static Crush (mm)
1 (LF = 0 mm)	484	335	149
2 390	764	334	430
3 780	865	337	528
4 1170	846	339	507
5 1560	753	339	414
6 (LR = 1950 mm)	461	345	116

Figure 10 Bullet Vehicle Crush



Notes: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.
Measurements taken from a plane perpendicular to the vehicle centerline and
4800 mm rearward of the front door body gauge hole at sill
Measurements taken with bumper

Vehicle: 1997 Dodge Caravan

	Pre-Test		Post-Test		Crush	
	X	Y	X	Y	X	Y
L	1524 mm	N/A				
C1	5033 mm	795 mm	4905 mm	767 mm	128 mm	-2 mm
C2	5150 mm	461 mm	5052 mm	464 mm	98 mm	-3 mm
C3	5192 mm	160 mm	5100 mm	160 mm	92 mm	0 mm
C4	5192 mm	152 mm	5110 mm	152 mm	82 mm	0 mm
C5	5147 mm	455 mm	5065 mm	456 mm	82 mm	-1 mm
C6	5030 mm	763 mm	4962 mm	762 mm	68 mm	1 mm
CL	5200 mm	0 mm	5120 mm	0 mm	80 mm	0 mm

Figure 11 Pre-test and Post-test Measurement Points

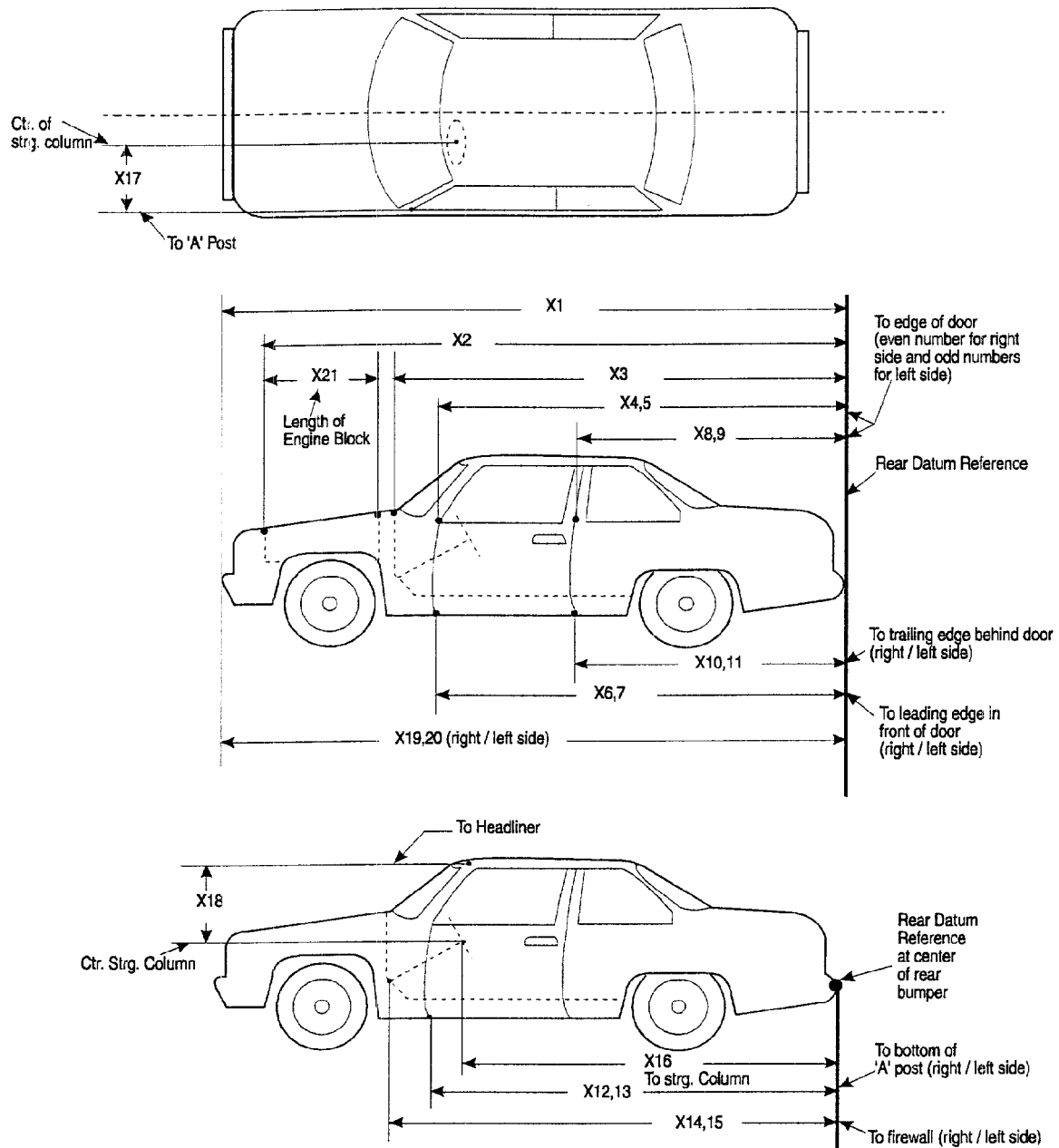


Table 13 Bullet Vehicle Measurements

Vehicle Make/Model: 1997 Dodge Caravan

Test Number: 980427

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	5200 mm	5120 mm	80 mm
X2	Rear surface of vehicle to front of engine block	4665 mm	4645 mm	20 mm
X3	Rear surface of vehicle to firewall	4730 mm	4653 mm	77 mm
X4	Rear surface of vehicle to upper leading edge of right door	3788 mm	3786 mm	2 mm
X5	Rear surface of vehicle to upper leading edge of left door	3784 mm	3782 mm	2 mm
X6	Rear surface of vehicle to lower leading edge of right door	3760 mm	3744 mm	16 mm
X7	Rear surface of vehicle to lower leading edge of left door	3755 mm	3728 mm	27 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2813 mm	2815 mm	-2 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2813 mm	2818 mm	-5 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2803 mm	2782 mm	21 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2805 mm	2782 mm	23 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3757 mm	3760 mm	-3 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3755 mm	3759 mm	-4 mm
X14	Rear surface of vehicle to firewall - right side	4375 mm	4387 mm	-12 mm
X15	Rear surface of vehicle to firewall - left side	4396 mm	4392 mm	4 mm
X16	Rear surface of vehicle to steering wheel center	3373 mm	3383 mm	-10 mm
X17	Center of steering column to "A" post	305 mm	312 mm	-7 mm
X18	Center of steering column to headliner	450 mm	422 mm	28 mm
X19	Rear surface of vehicle to right side of front bumper	5030 mm	4962 mm	68 mm
X20	Rear surface of vehicle to left side of front bumper	5033 mm	4905 mm	128 mm
X21	Length of engine block	400 mm	400 mm	0 mm

Figure 12 Camera Positions

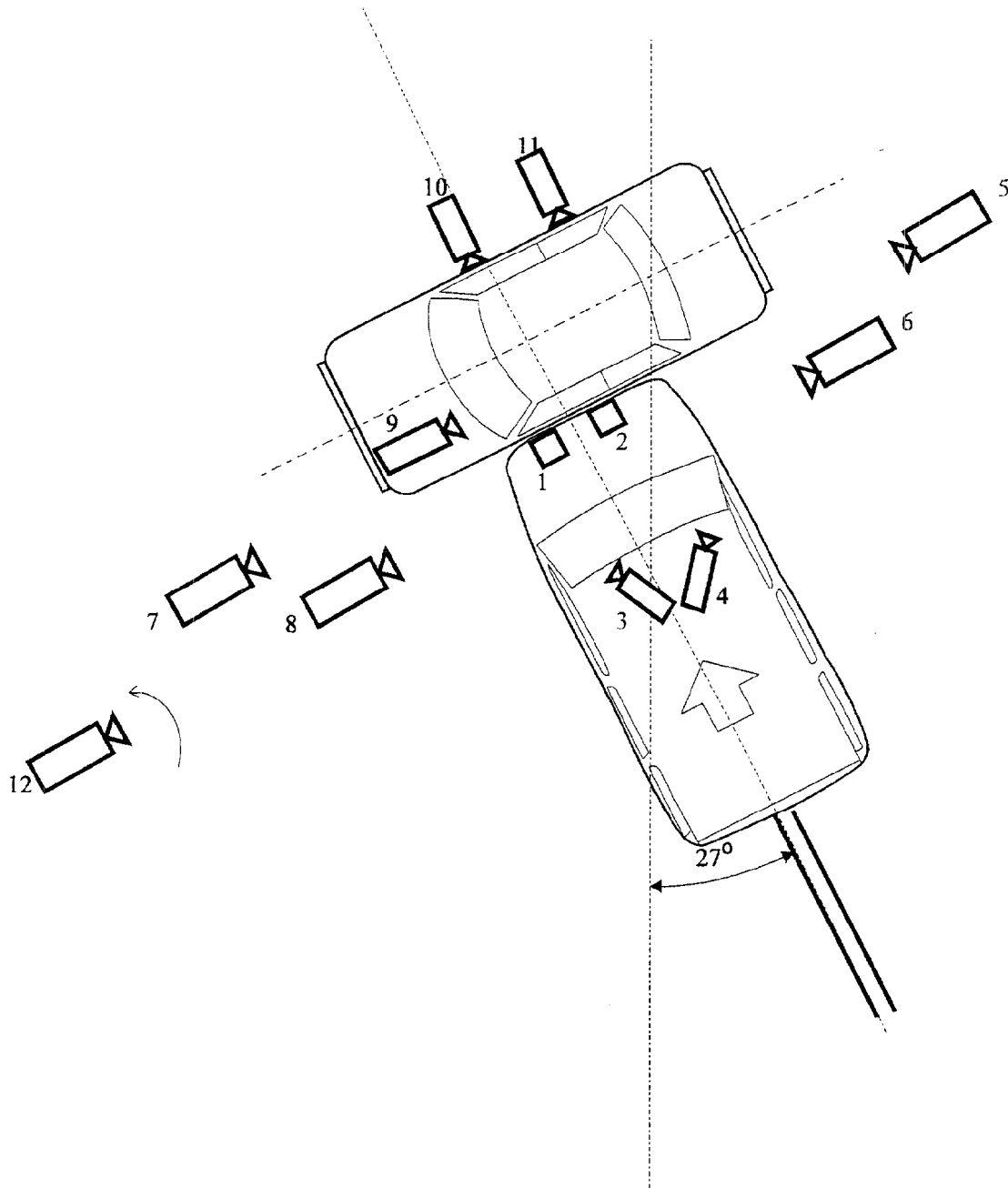


Table 14 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of camera data
1	Overhead wide	Photosonic	8.5	992	Vehicle crush
2	Overhead tight	Photosonic	17	973	Vehicle crush
3	Onboard bullet vehicle driver	Photosonic	8	843	Dummy kinematics
4	Onboard bullet vehicle passenger	Photosonic	8	850	Dummy kinematics
5	Right wide	Photosonic	13	1002	Vehicle dynamics
6	Right medium tight	Photosonic	25	960	Vehicle crush
7	Left wide	Photosonic	13	985	Vehicle dynamics
8	Left medium tight	Photosonic	17	868	Vehicle crush
9	Onboard target driver front	Photosonic	8	998	Dummy kinematics
10	Onboard target driver side	Photosonic	8	928	Dummy kinematics
11	Onboard target passenger side	Photosonic	8	958	Dummy kinematics
12	Panning	Bolex	16	24	Vehicle dynamics

Description Of Timing Marks On TRC High-Speed Film

All TRC high-speed cameras are equipped with red leds which put timing marks on the right edge of the film. TRC uses a single timing generator to generate the timing for all cameras. This allows the timing marks to be common to all cameras. The timing marks can be used to measure camera speed (frames per second) or to locate a point in time before or after the time-zero event.

The timing marks appear on the film as small red marks on the right edge of the film. Round marks are left by the Photo-Sonics and Stalex cameras while horizontal bars are left by the Hycam, Locam, and Fastax II cameras.

The timing generator puts out a pulse for every millisecond plus it generates additional pulses for hundredths and tenths of seconds. To explain this further, we can use an example of a camera running at 1000 frames per second.

1. Every frame will have **one** led appear in it. This indicates a *millisecond* pulse.
 2. Every ten frames will have **two** leds appear in it. These indicate a *millisecond* pulse plus a *hundredth of a second* pulse.
 3. Every one hundred frames will have **three** leds appear in it. These indicate a *millisecond* pulse, a *hundredth of a second* pulse, and a *tenth of a second* pulse.
-

Appendix A

Photographs



Figure A-1 Pre-Test Target Vehicle Front View



Figure A-2 Post-Test Target Vehicle Front View

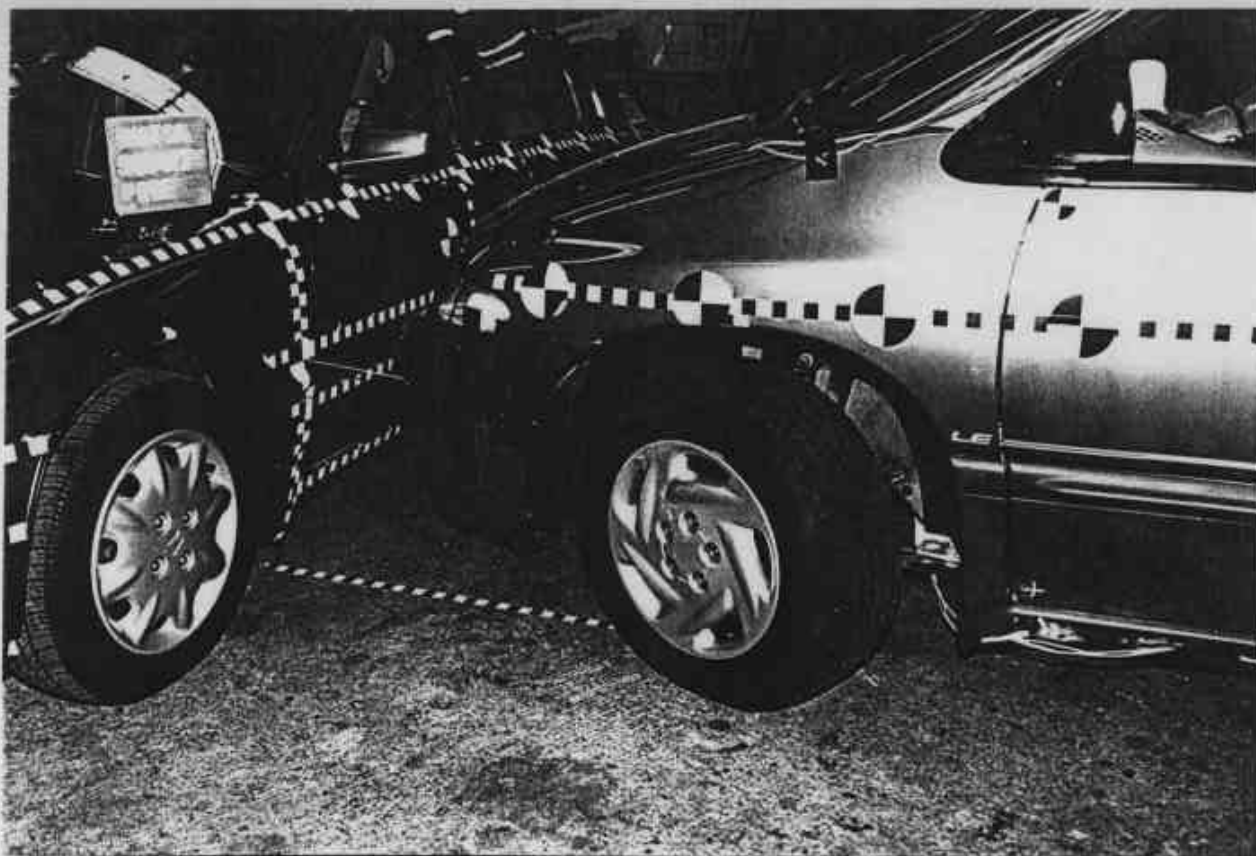


Figure A-3 Pre-Test Target Vehicle Left Front Three-Quarter View



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



Figure A-5 Pre-Test Target Vehicle Left Side View

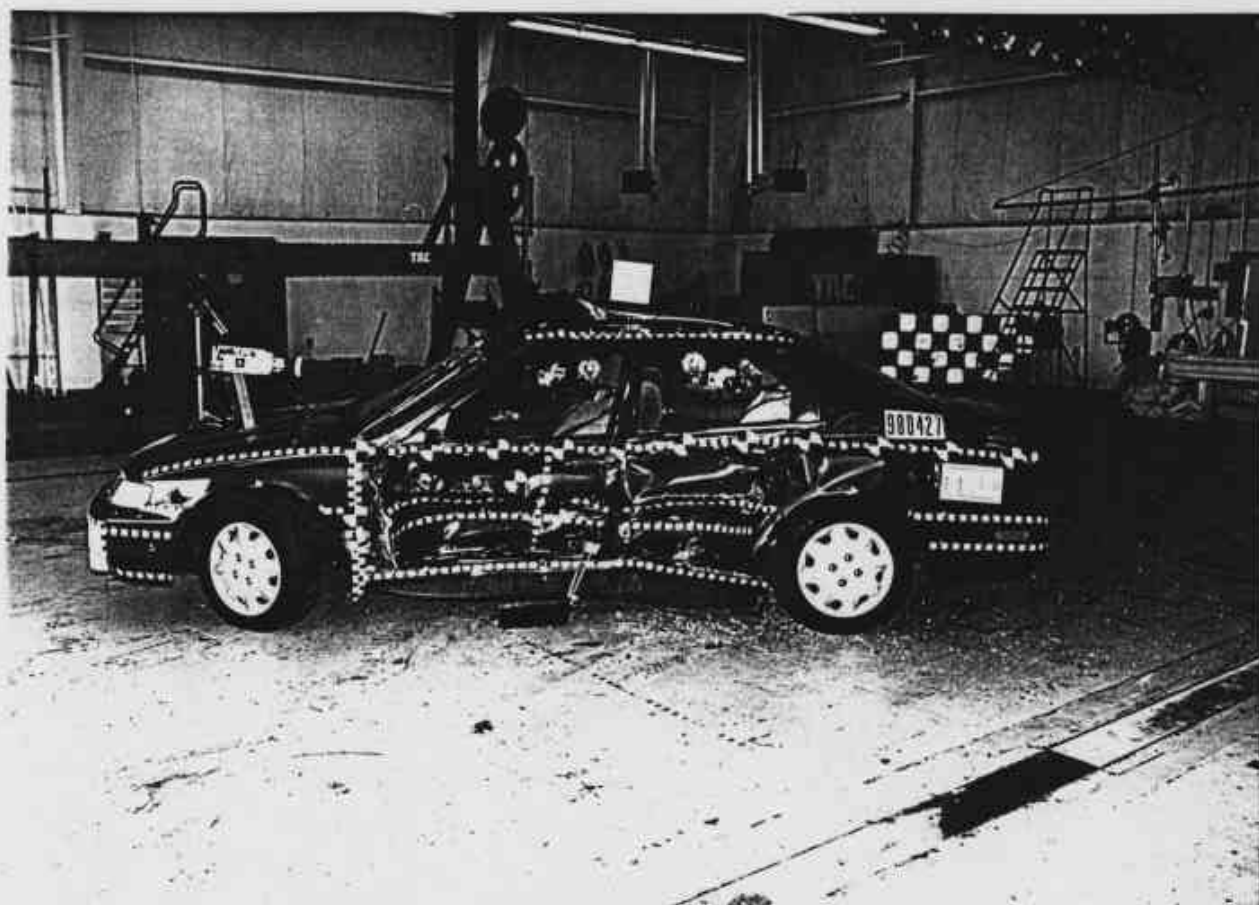


Figure A-6 Post-Test Target Vehicle Left Side View

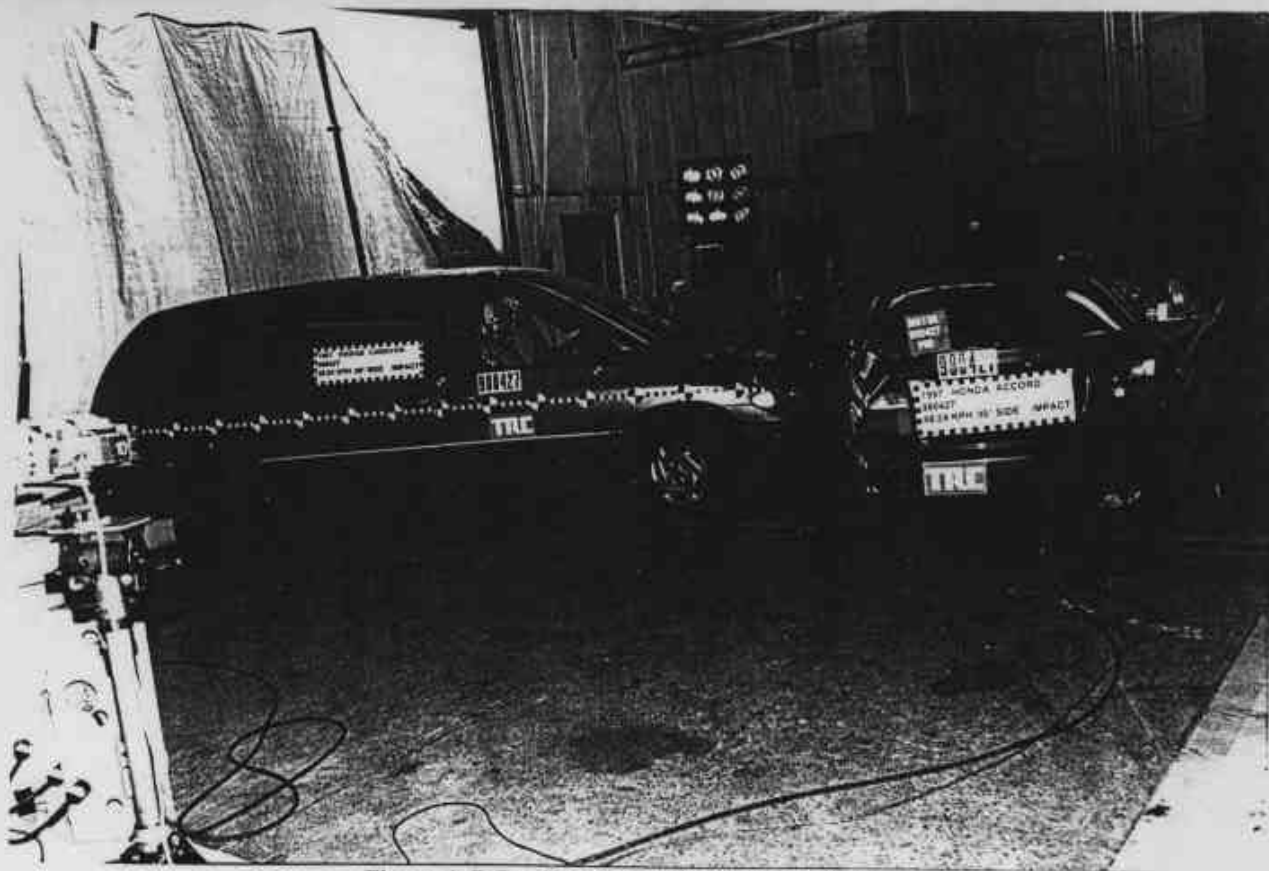


Figure A-7 Pre-Test Target Vehicle Rear View



Figure A-8 Post-Test Target Vehicle Rear View

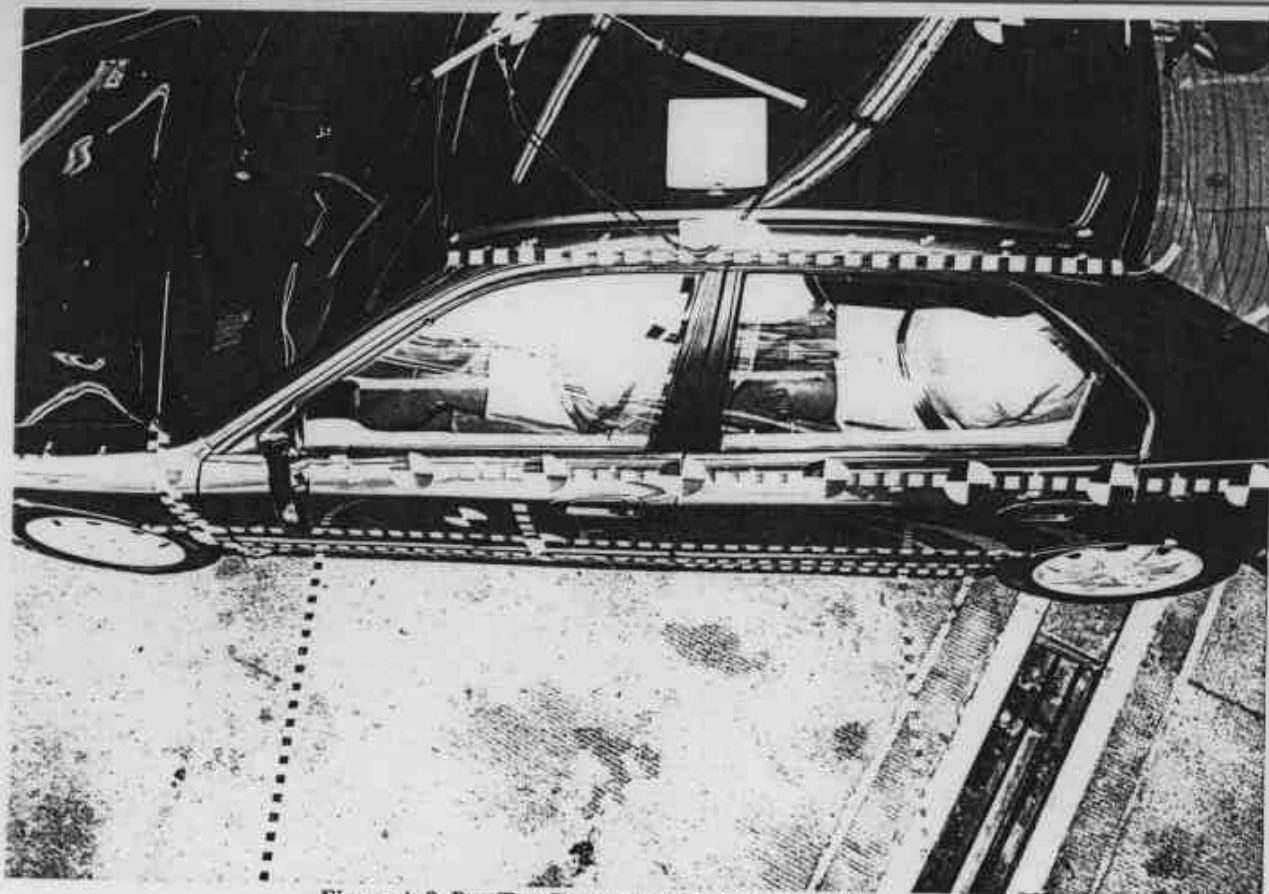


Figure A-9 Pre-Test Target Vehicle Overhead View

Intentionally Left Blank



Figure A-10 Pre-Test Bullet Vehicle Front View



Figure A-11 Post-Test Bullet Vehicle Front View



Figure A-12 Post-Test Bullet Vehicle Left Side View

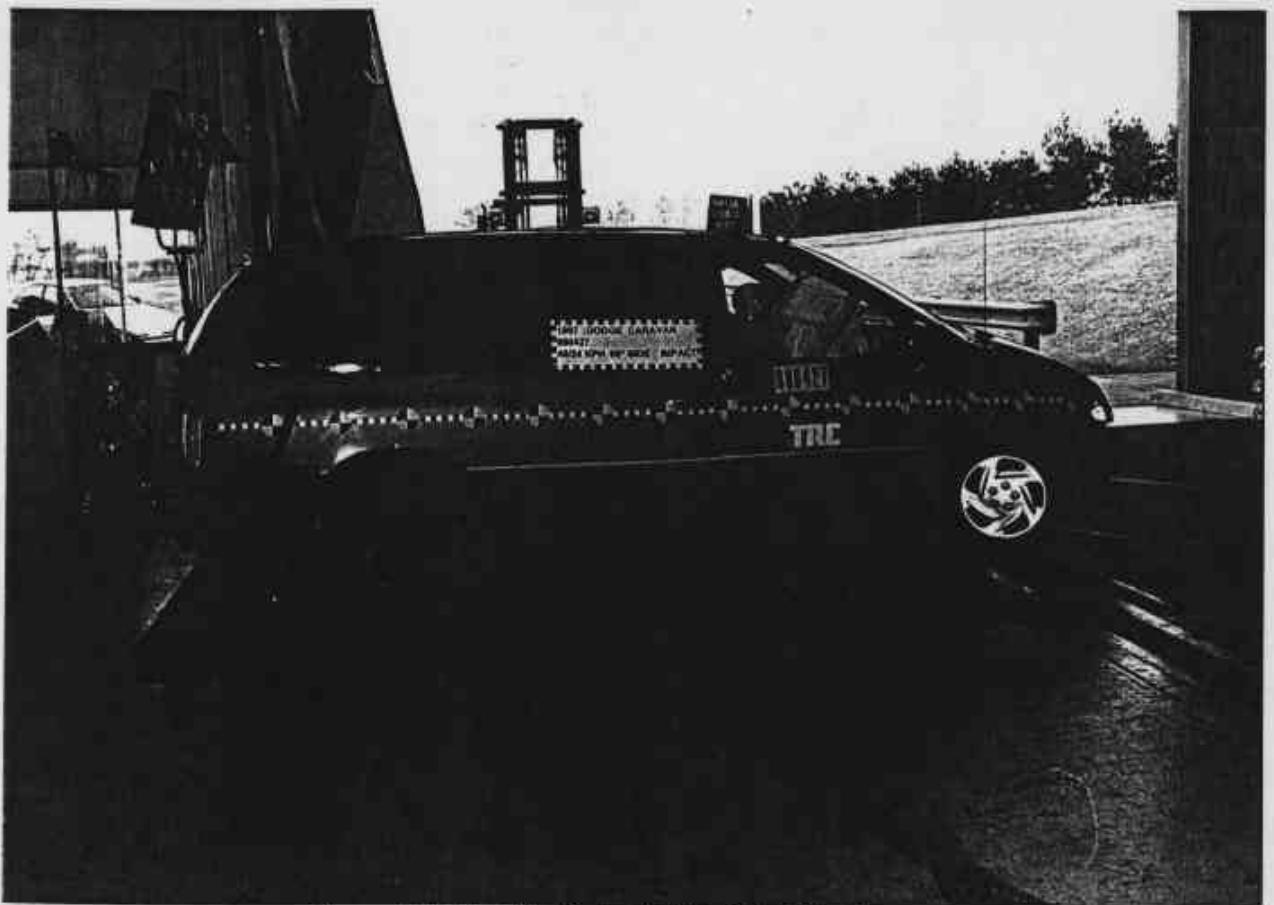


Figure A-13 Post-Test Bullet Vehicle Right Side View

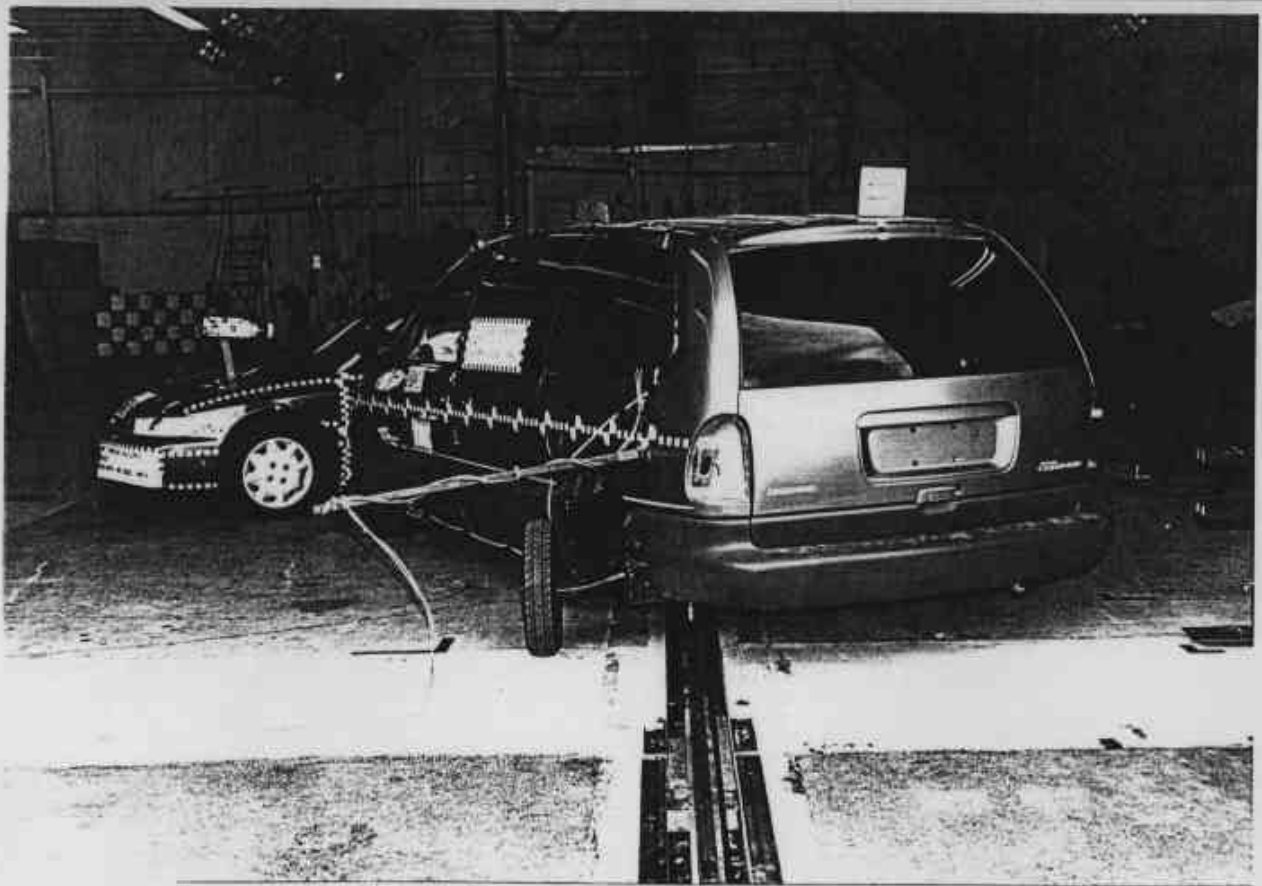


Figure A-14 Pre-Test Bullet Vehicle Rear View



Figure A-15 Post-Test Bullet Vehicle Rear View

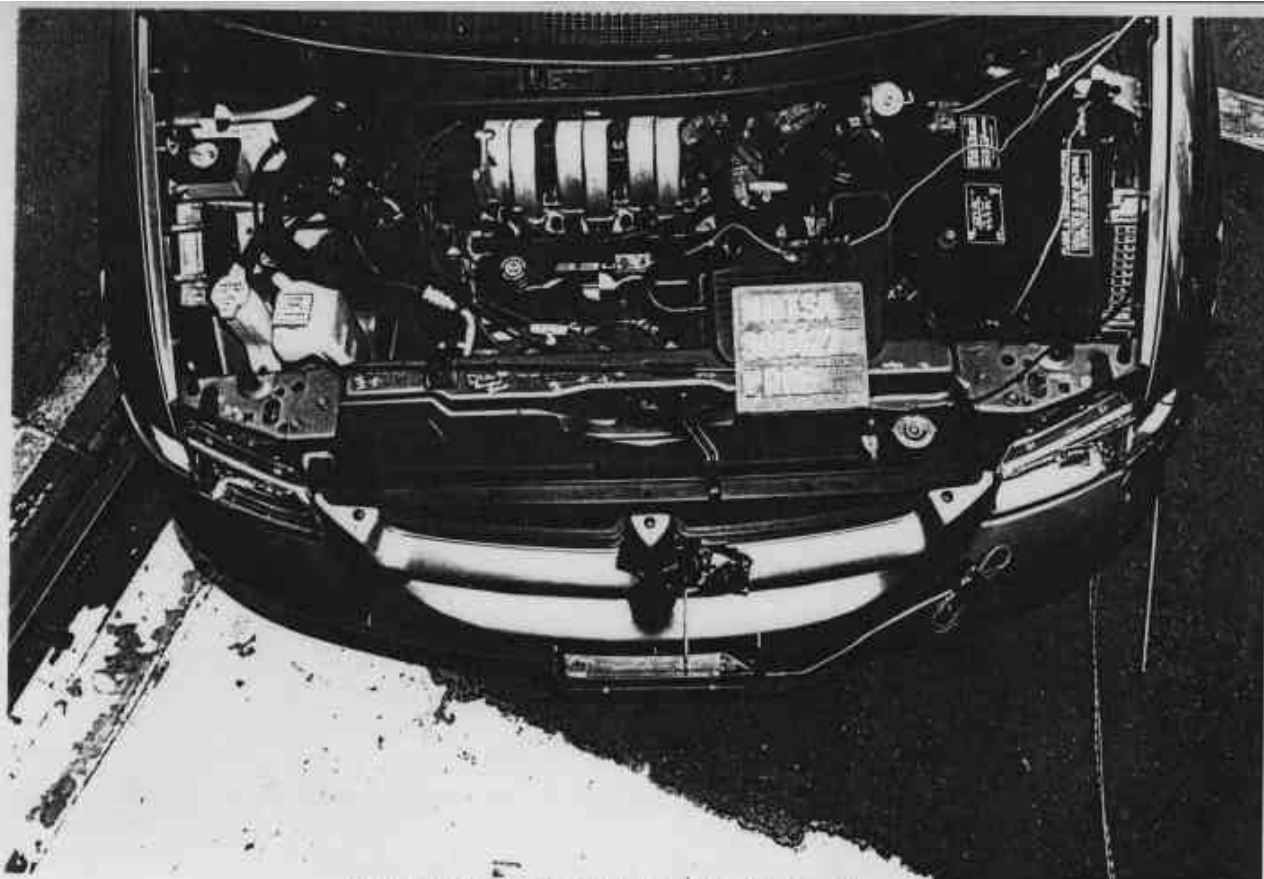


Figure A-16 Pre-Test Bullet Vehicle Engine View

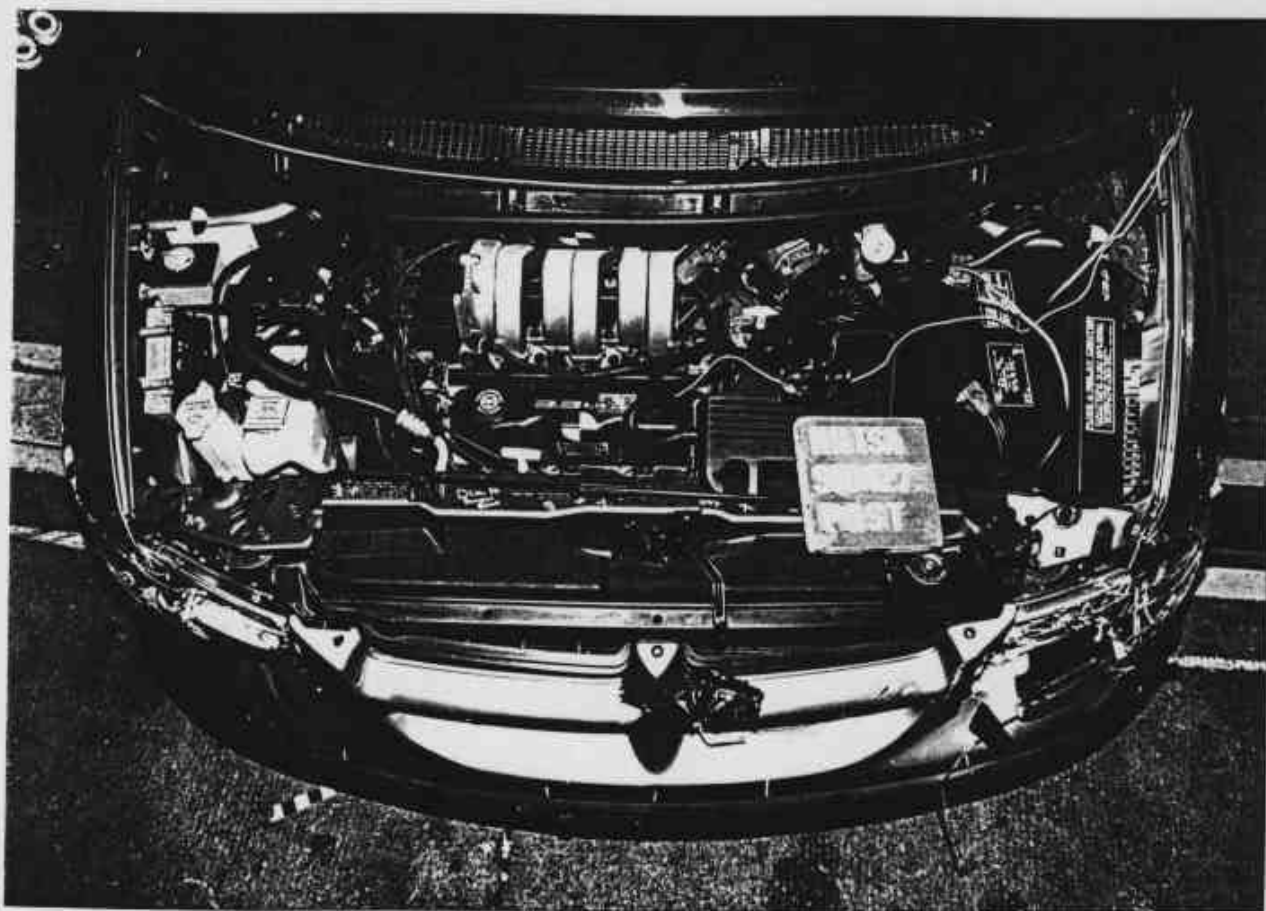


Figure A-17 Post-Test Bullet Vehicle Engine View

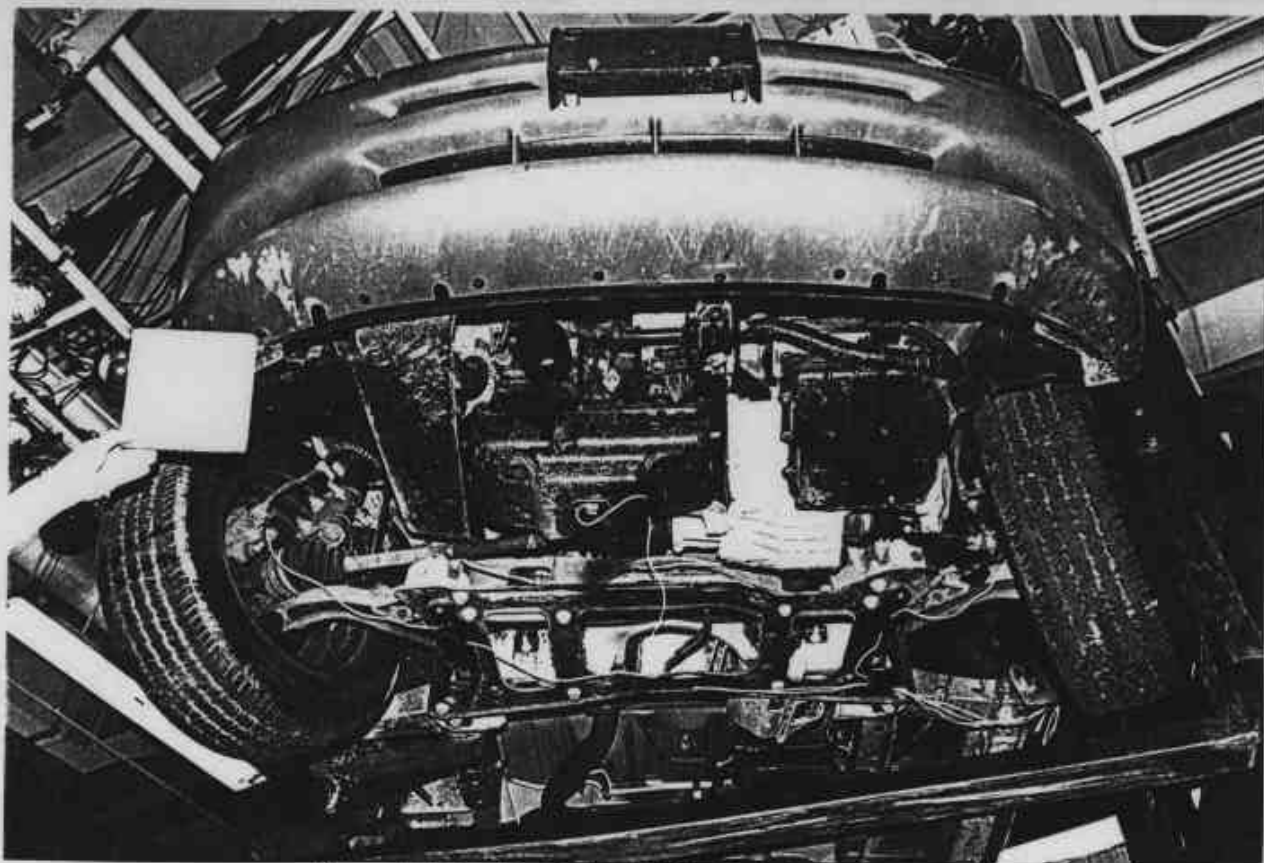


Figure A-18 Pre-Test Bullet Vehicle Underbody View

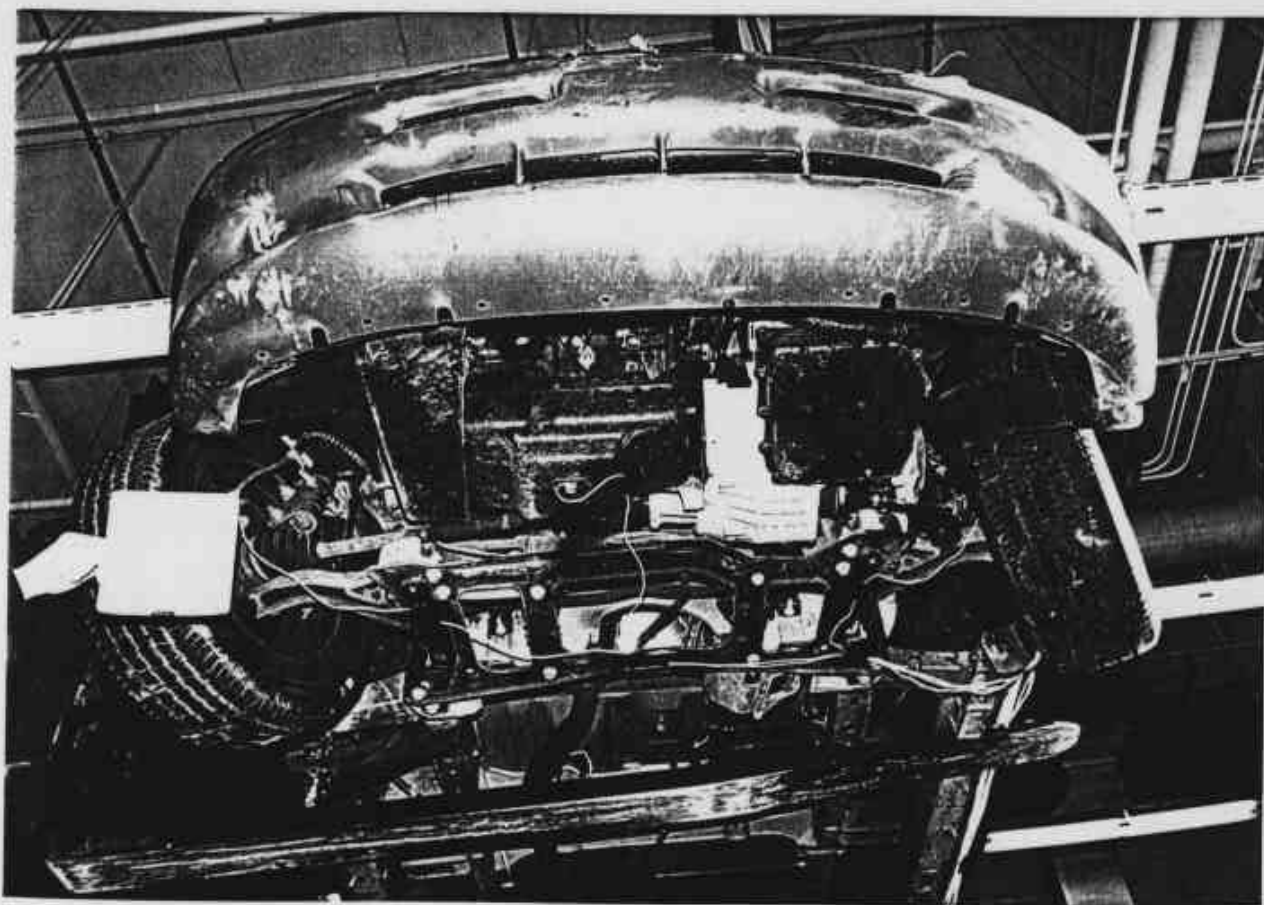


Figure A-19 Post-Test Bullet Vehicle Underbody View



Figure A-20 Pre-Test Bullet Vehicle Windshield View

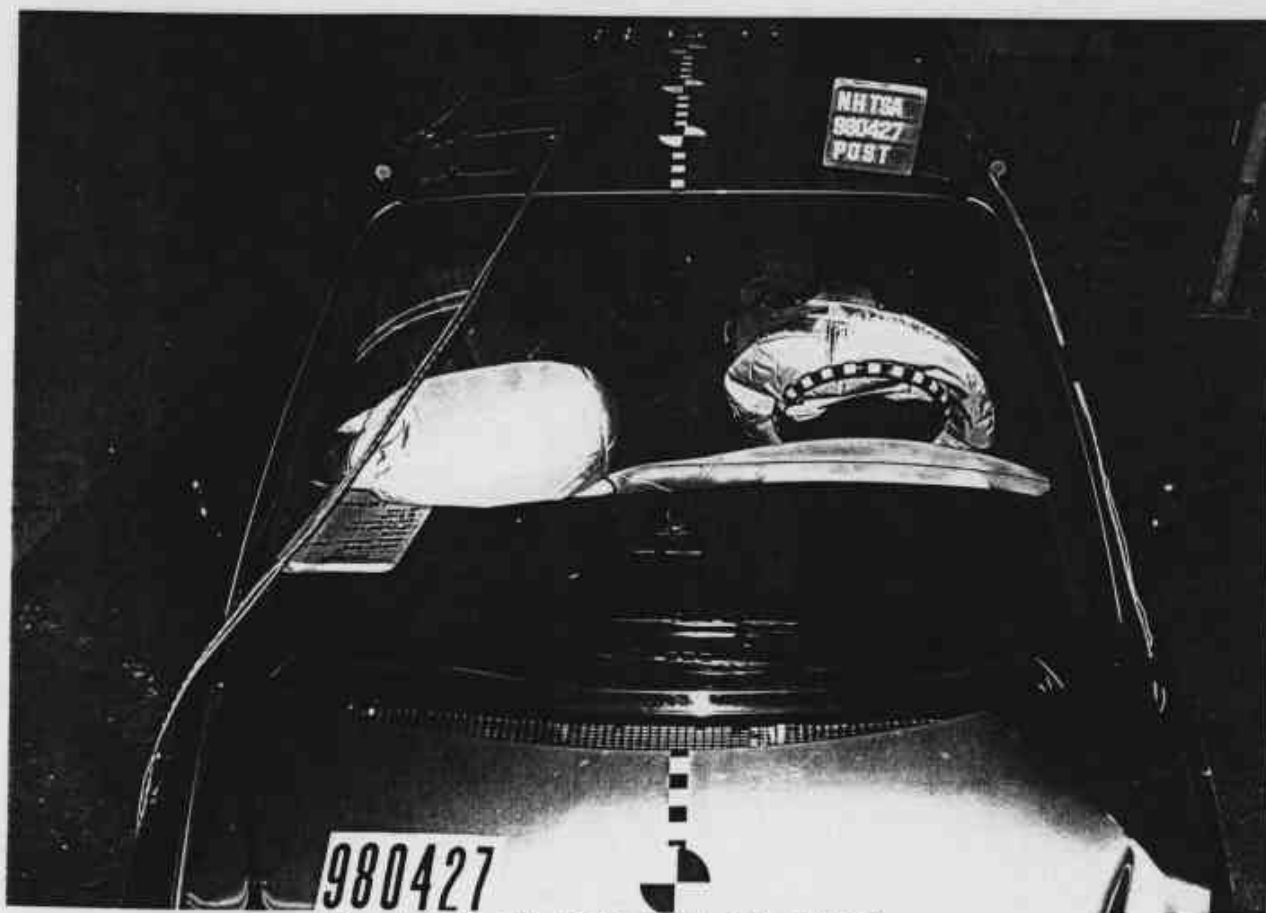


Figure A-21 Post-Test Bullet Vehicle Windshield View



Figure A-22 Pre-Test Target Vehicle Driver Dummy - View 1



Figure A-23 Post-Test Target Vehicle Driver Dummy - View 1

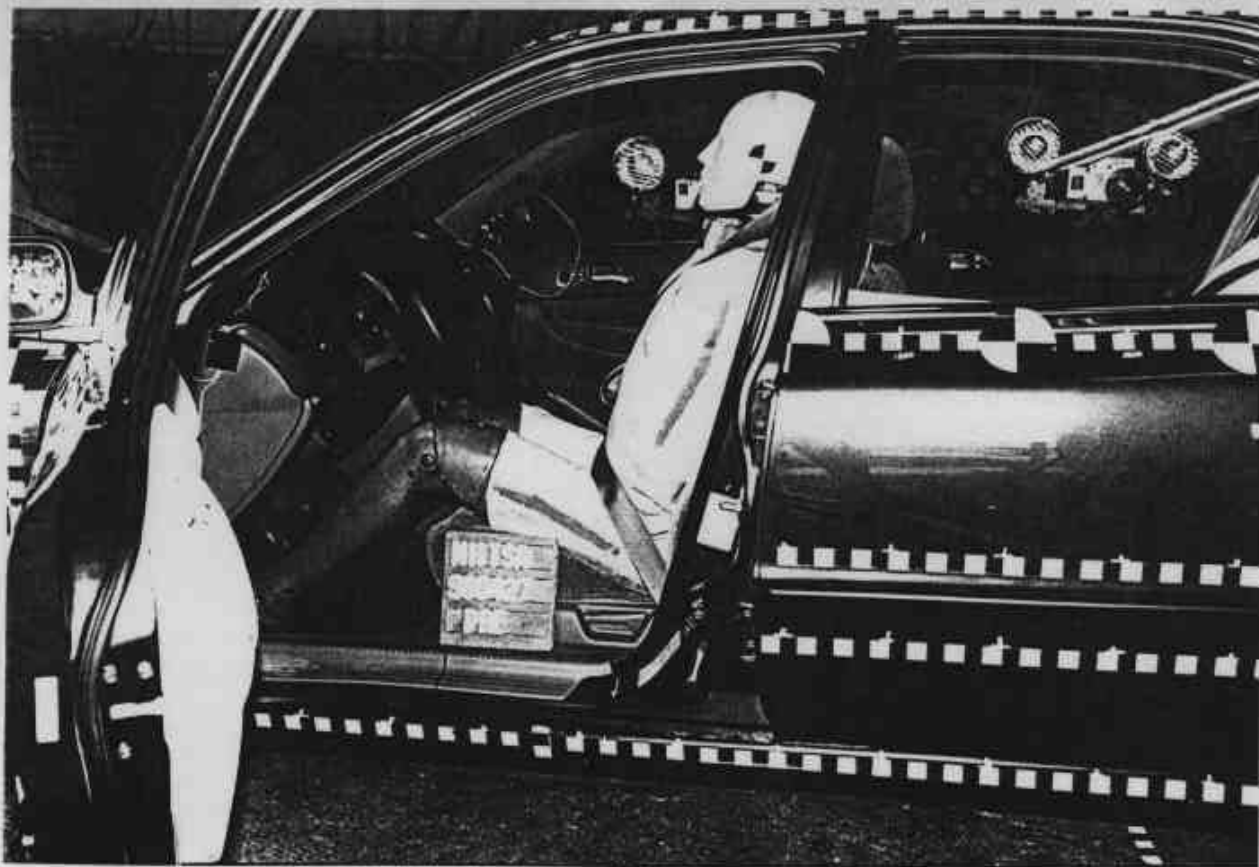


Figure A-24 Pre-Test Target Vehicle Driver Dummy - View 2

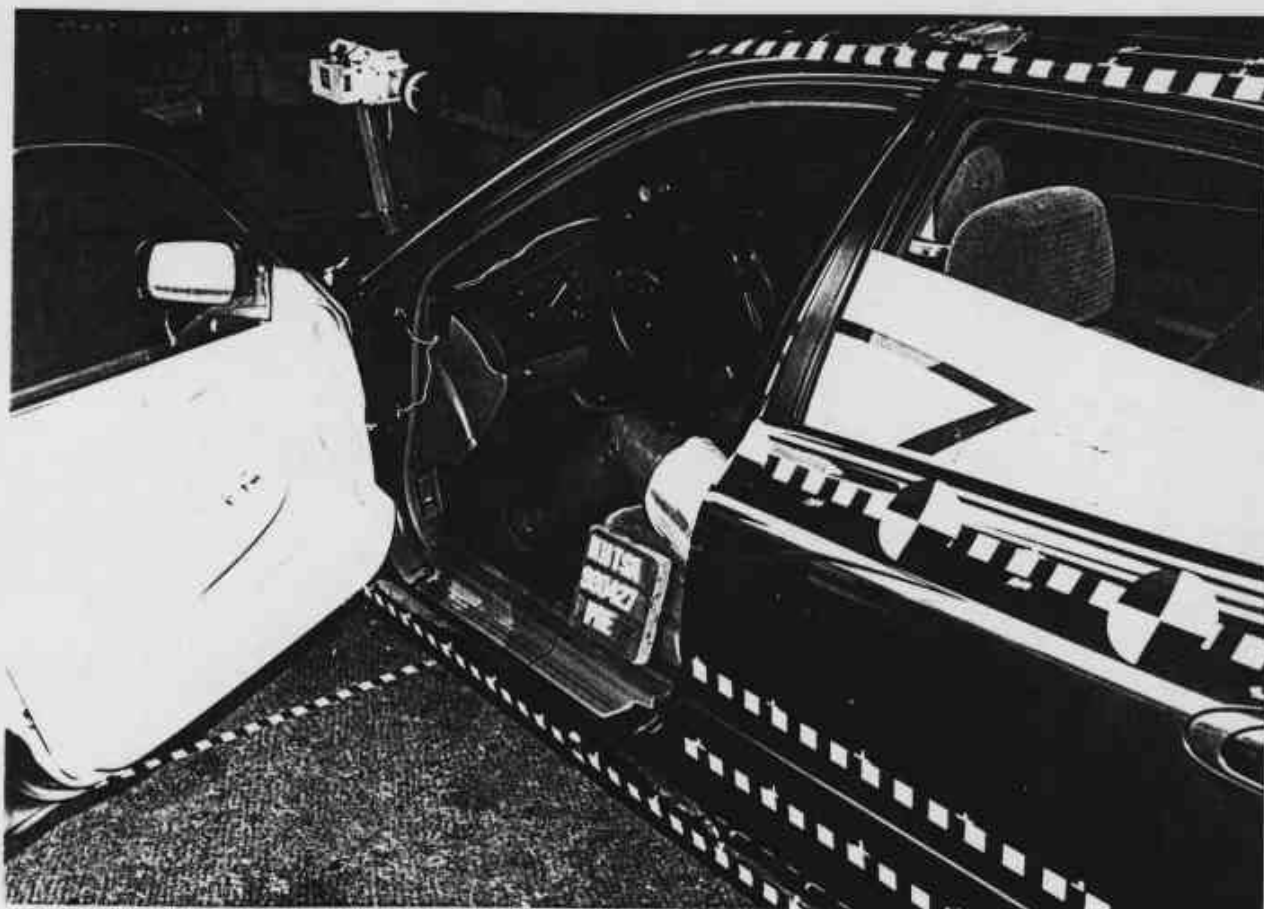


Figure A-25 Pre-Test Target Vehicle Driver Dummy - View 3

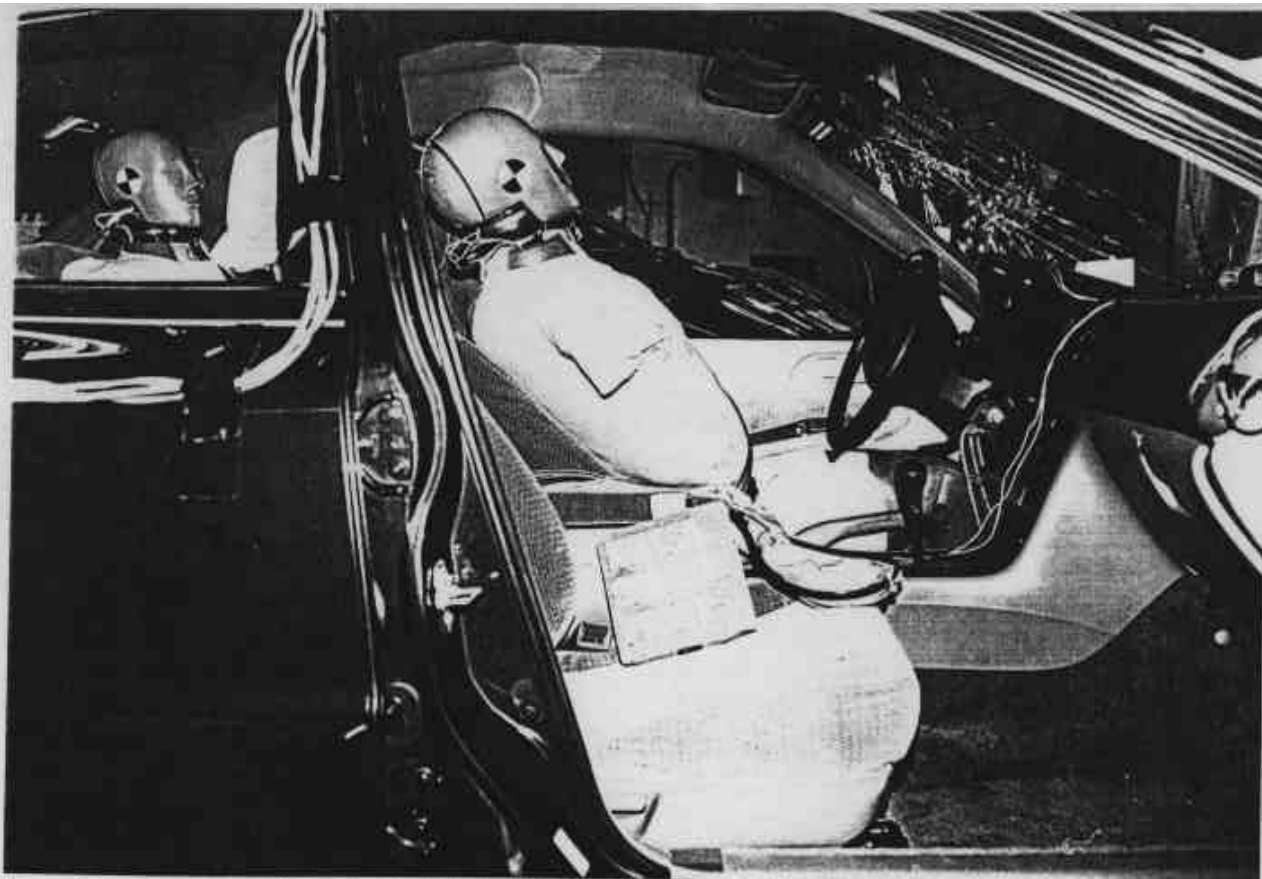


Figure A-26 Post-Test Target Vehicle Driver Dummy - View 4

Intentionally Left Blank



Figure A-27 Pre-Test Target Vehicle Passenger Dummy - View 1

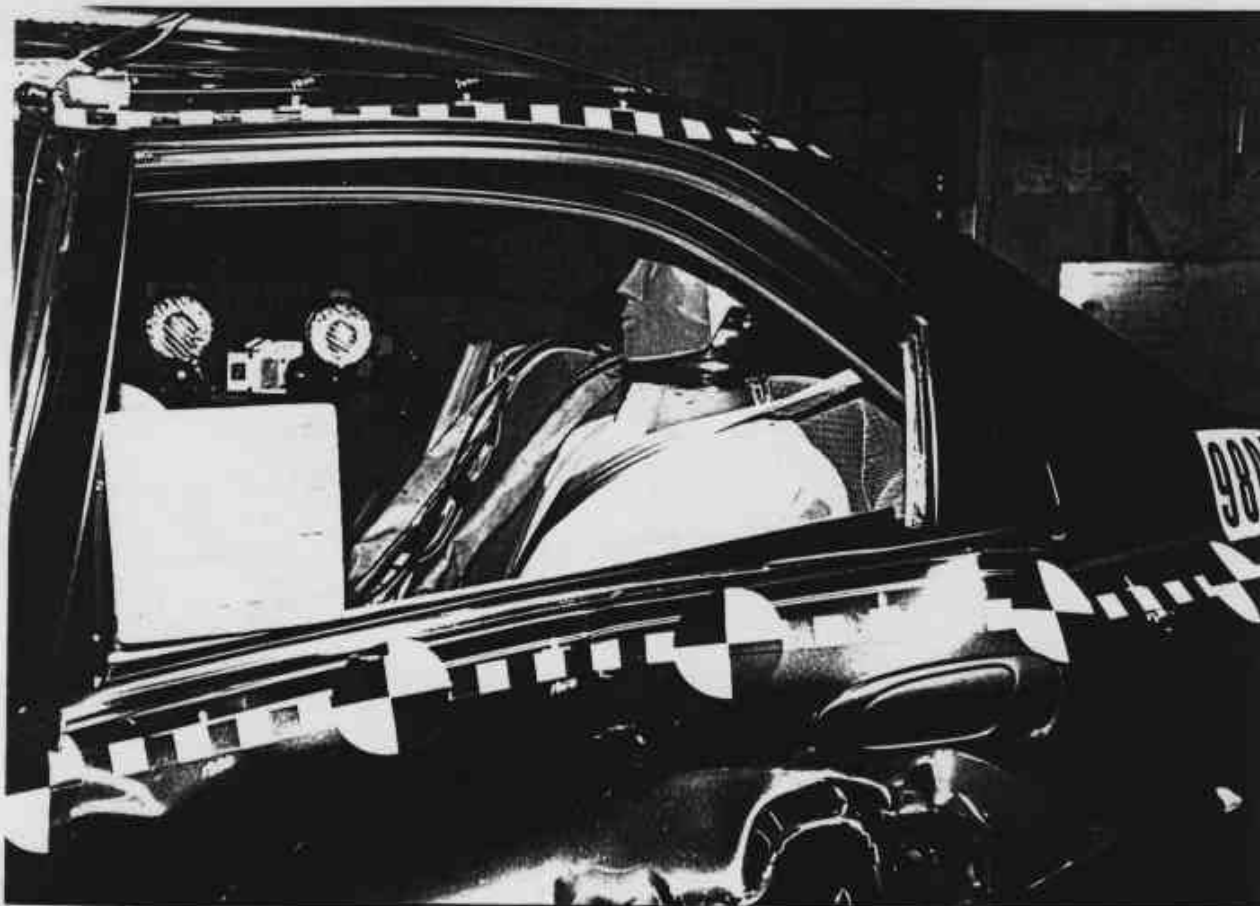


Figure A-28 Post-Test Target Vehicle Passenger Dummy - View 1



Figure A-29 Pre-Test Target Vehicle Passenger Dummy - View 2

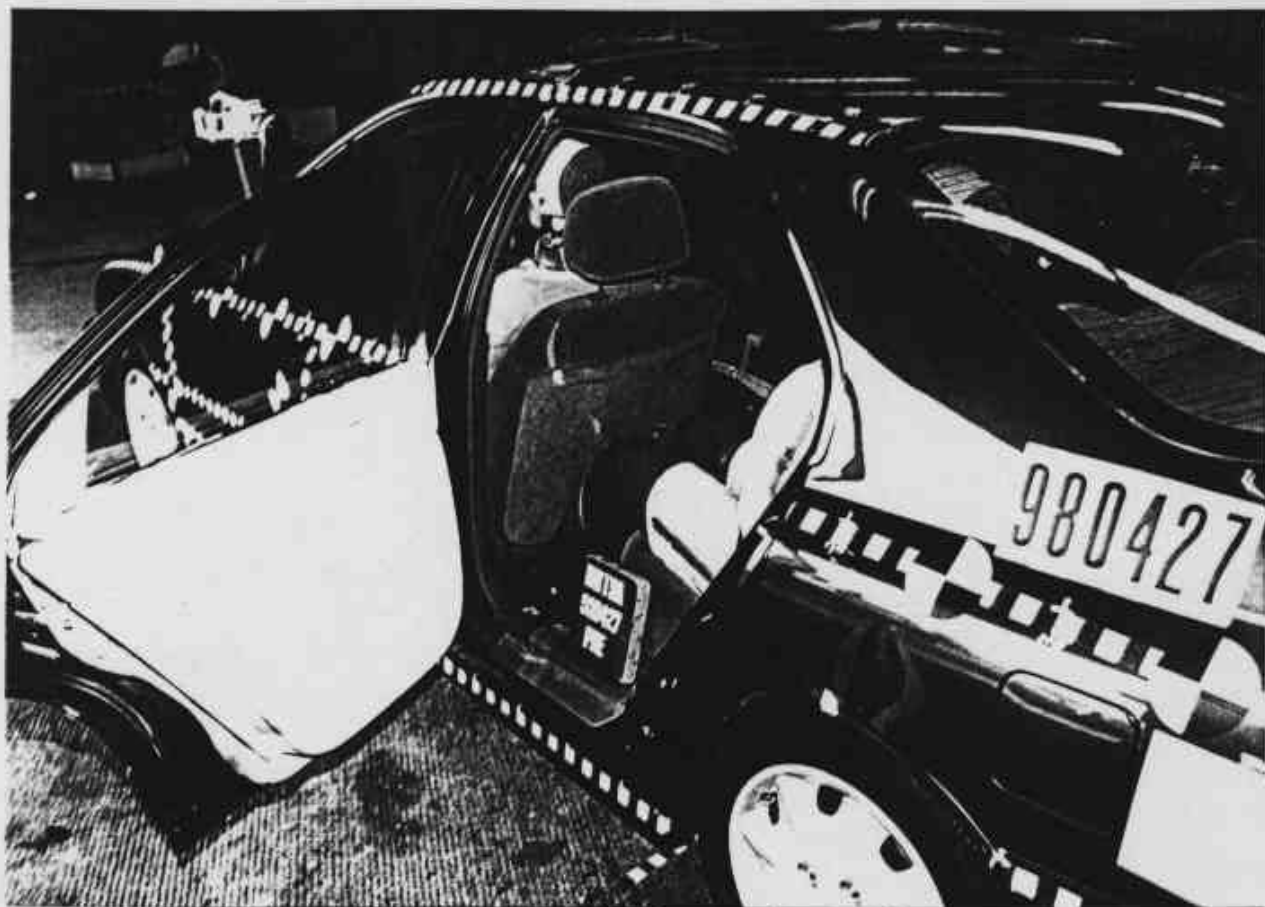


Figure A-30 Pre-Test Target Vehicle Passenger Dummy - View 3

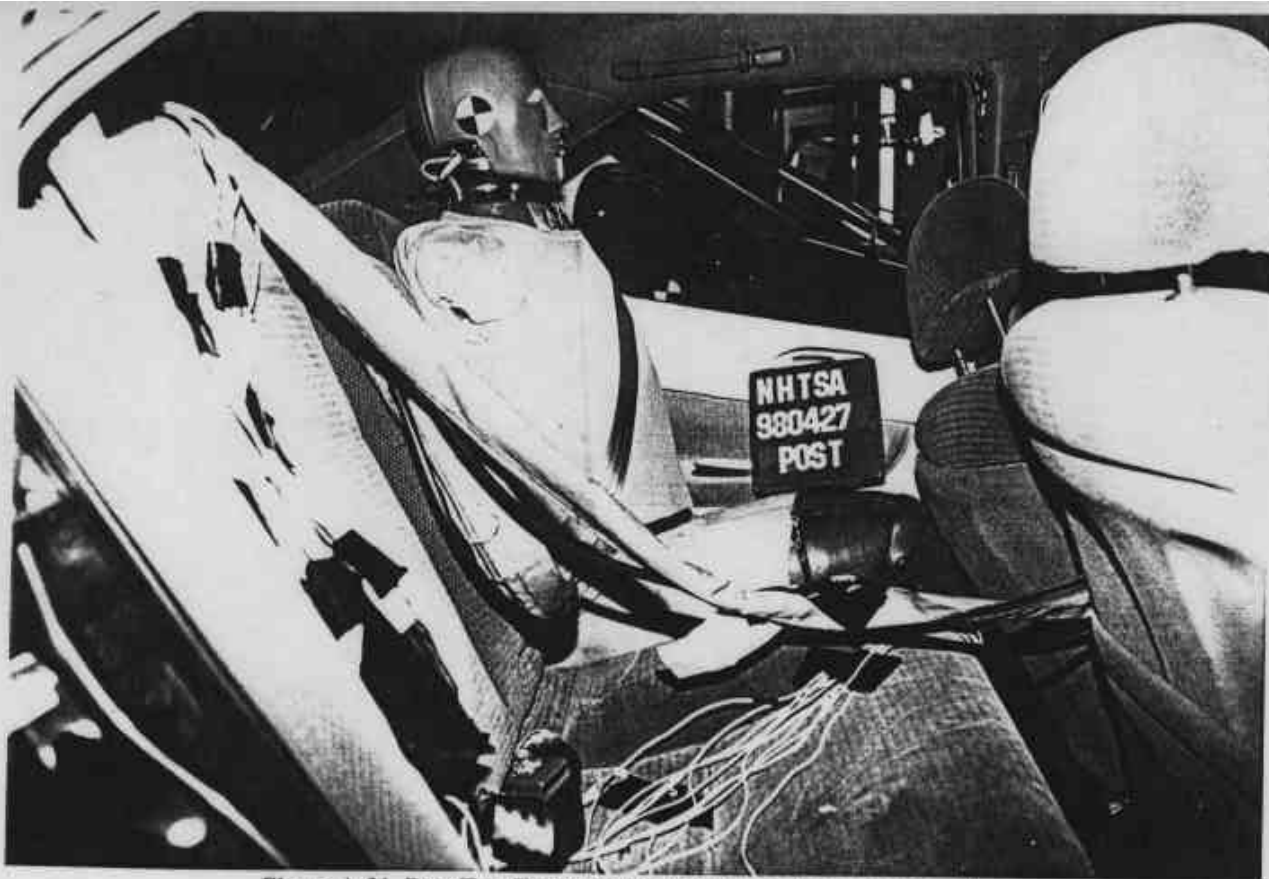


Figure A-31 Post-Test Target Vehicle Passenger Dummy - View 4

Intentionally Left Blank



Figure A-32 Pre-Test Bullet Vehicle Driver Dummy - View 1



Figure A-33 Post-Test Bullet Vehicle Driver Dummy - View 1

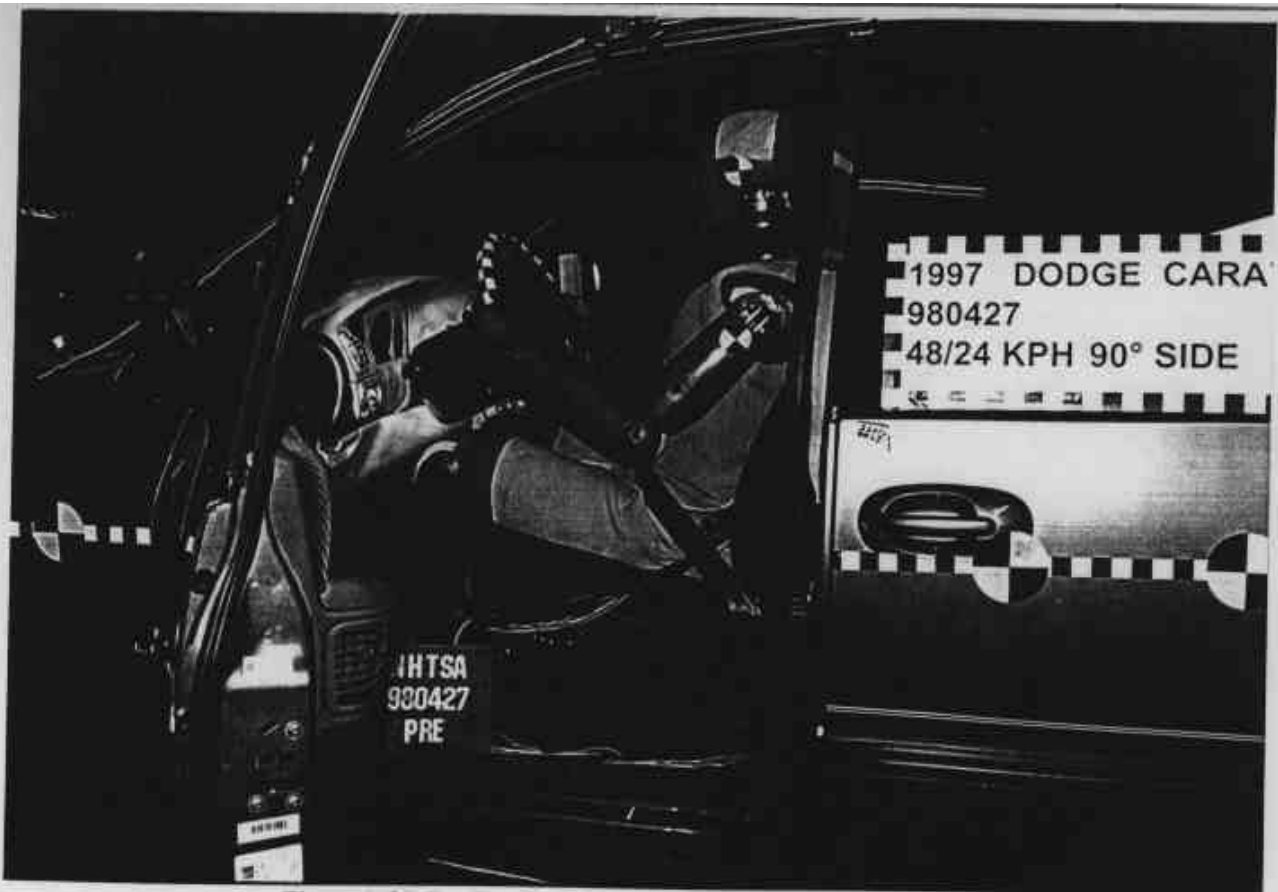


Figure A-34 Pre-Test Bullet Vehicle Driver Dummy - View 2

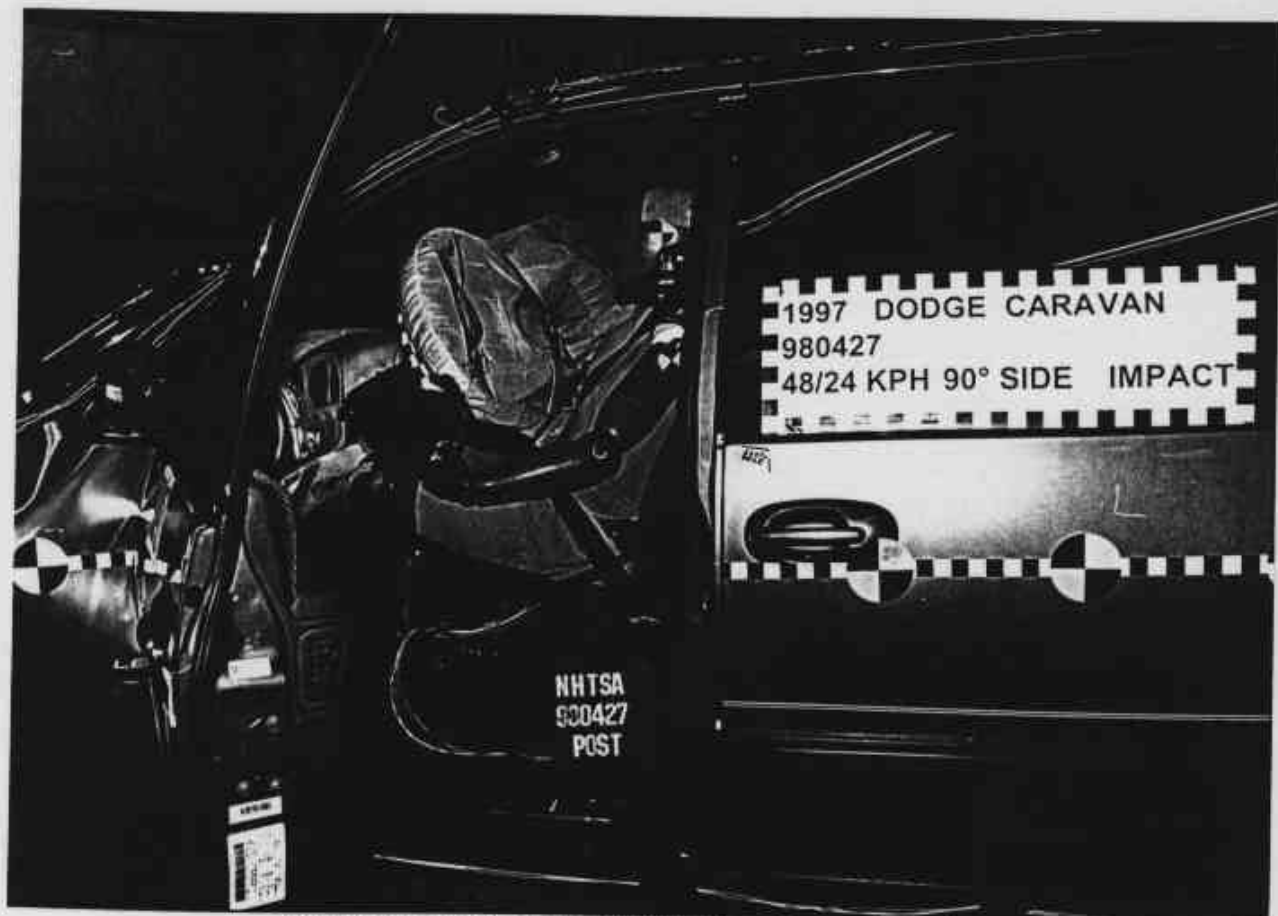


Figure A-35 Post-Test Bullet Vehicle Driver Dummy - View 2

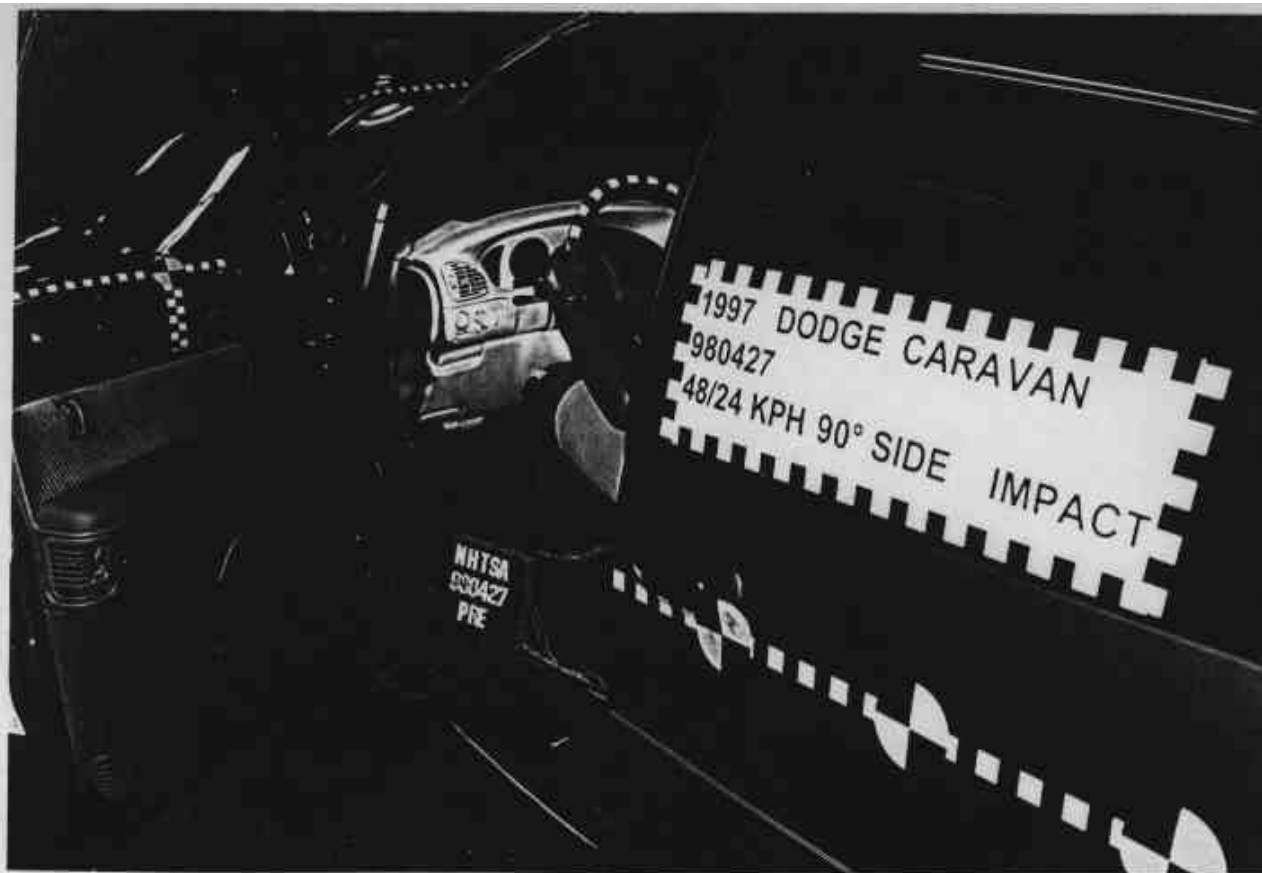


Figure A-36 Pre-Test Bullet Vehicle Driver Dummy - View 3



Figure A-37 Post-Test Bullet Vehicle Driver Dummy - View 3



Figure A-38 Pre-Test Bullet Vehicle Passenger Dummy - View 1



Figure A-39 Post-Test Bullet Vehicle Passenger Dummy - View 1

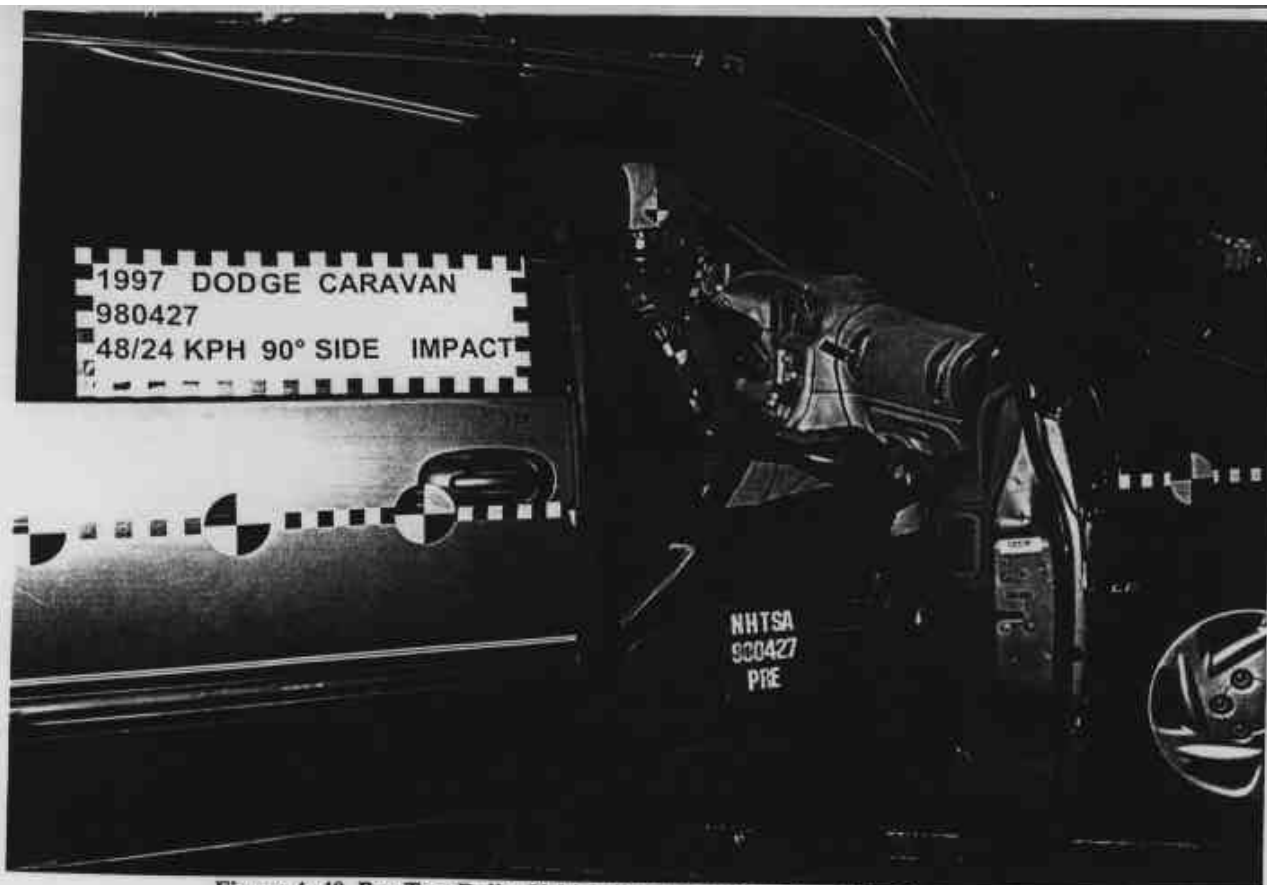


Figure A-40 Pre-Test Bullet Vehicle Passenger Dummy - View 2



Figure A-41 Post-Test Bullet Vehicle Passenger Dummy - View 2

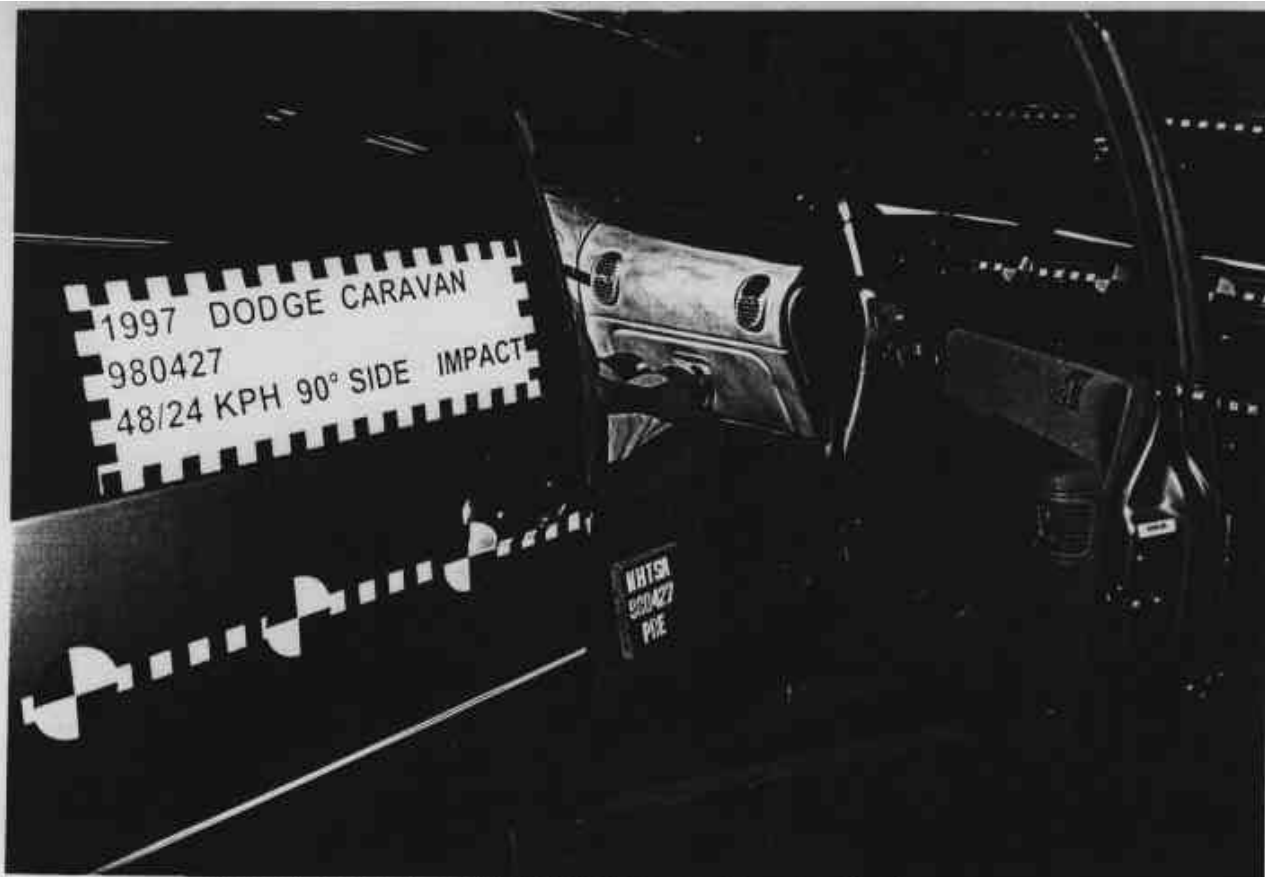


Figure A-42 Pre-Test Bullet Vehicle Passenger Dummy - View 3



Figure A-43 Post-Test Bullet Vehicle Passenger Dummy - View 3

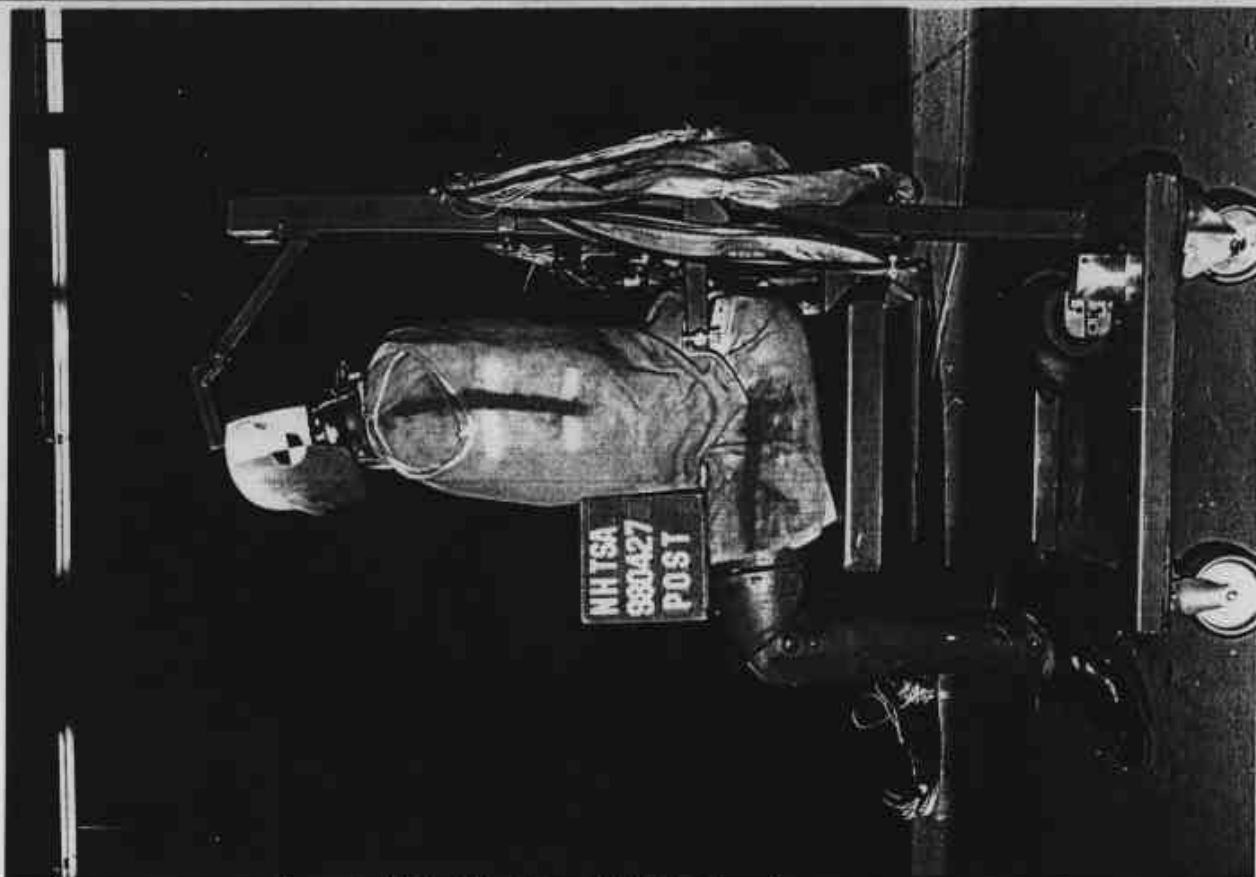


Figure A-44 Post-Test Target Vehicle Driver Dummy



Figure A-45 Post-Test Target Vehicle Driver Dummy Body Contact View

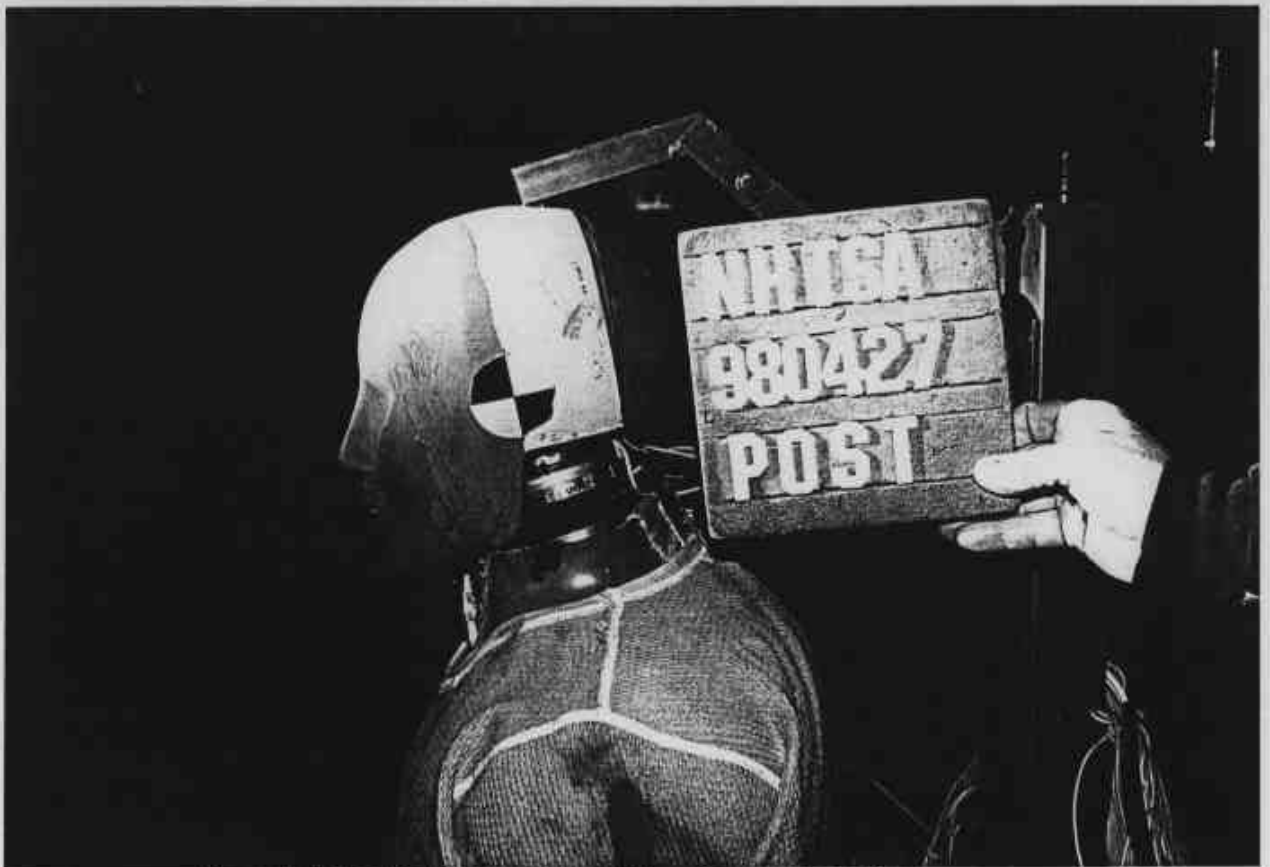


Figure A-46 Post-Test Target Vehicle Driver Dummy Head View



Figure A-47 Post-Test Target Vehicle Driver Dummy Head Contact View

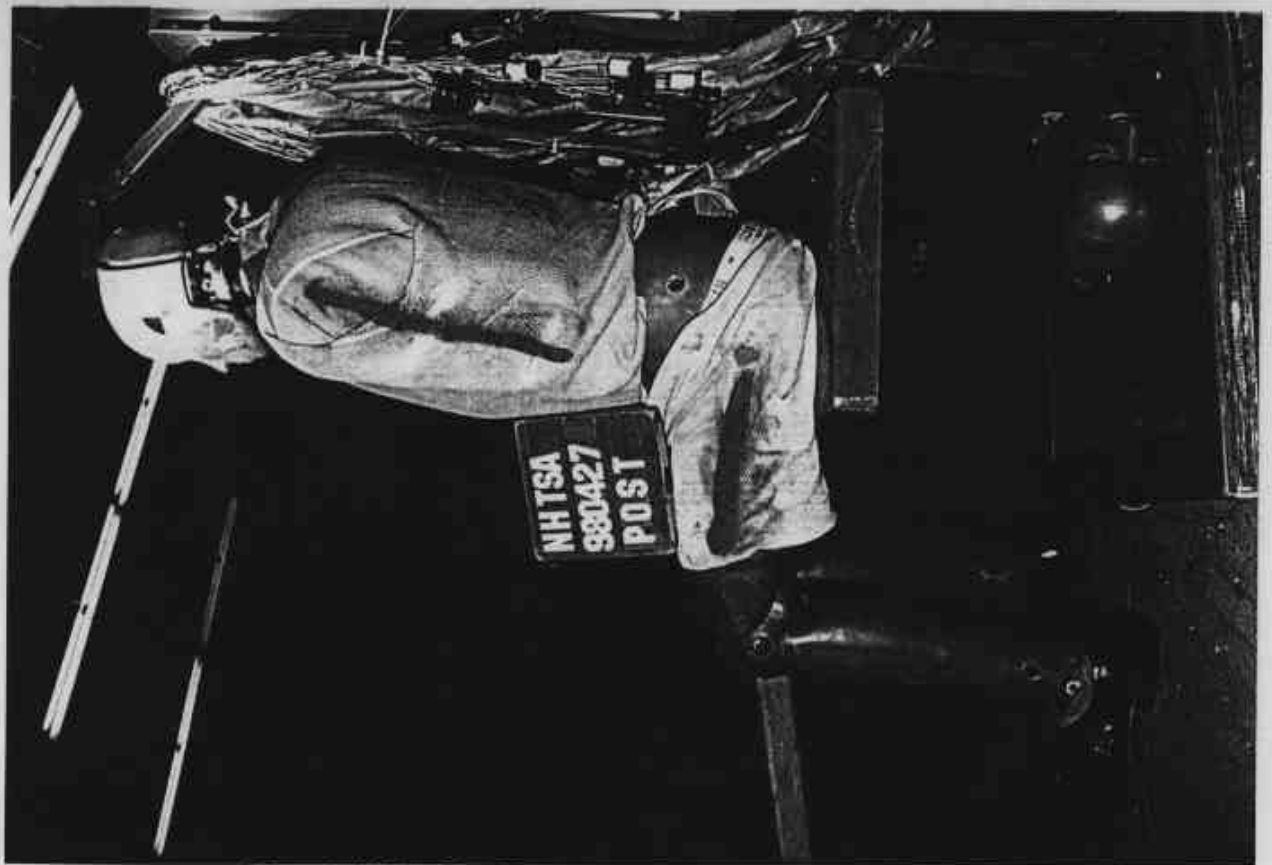


Figure A-48 Post-Test Target Vehicle Passenger Dummy



Figure A-49 Post-Test Target Vehicle Passenger Dummy Contact View

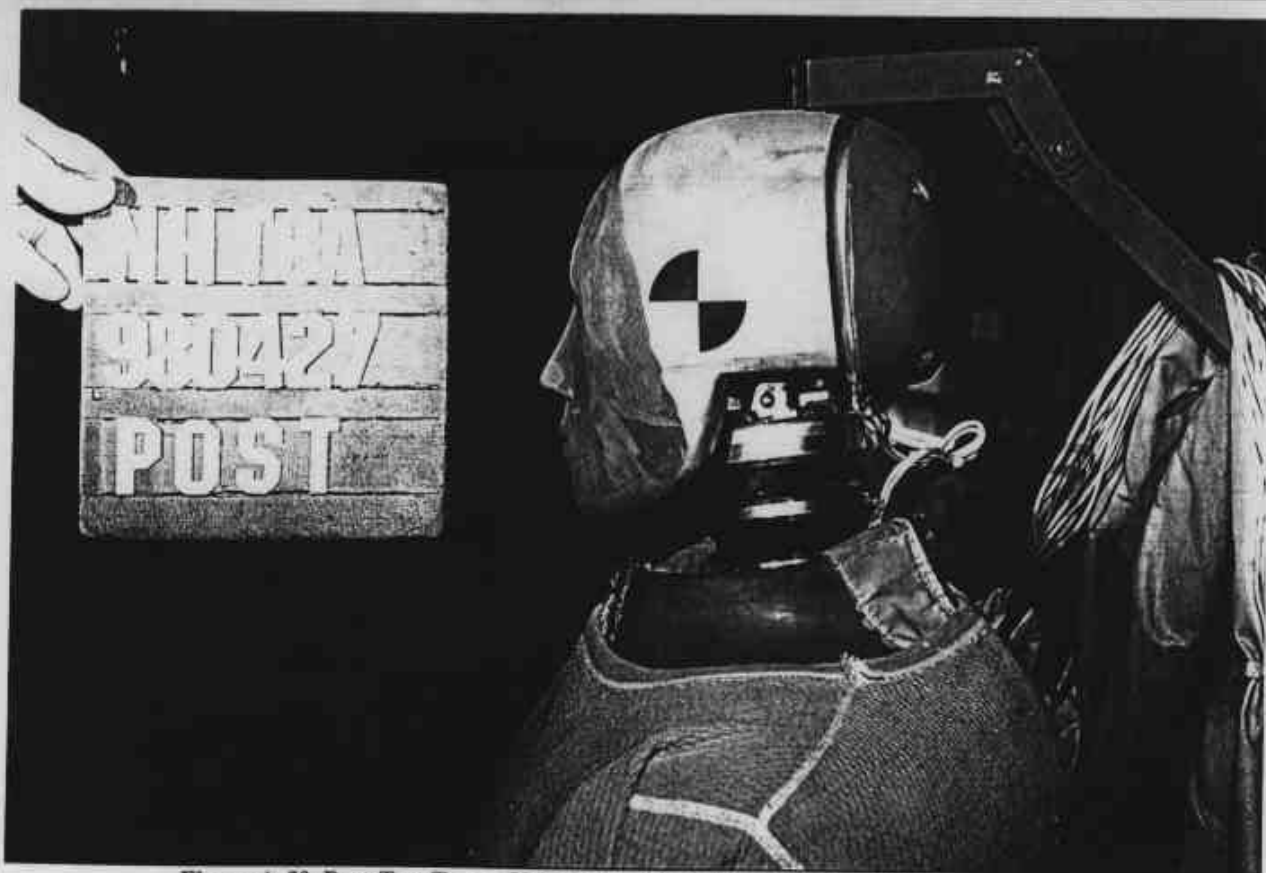


Figure A-50 Post-Test Target Vehicle Passenger Dummy Head View



Figure A-51 Post-Test Target Vehicle Passenger Dummy Head Contact View



Figure A-52 Post-Test Bullet Vehicle Driver Dummy

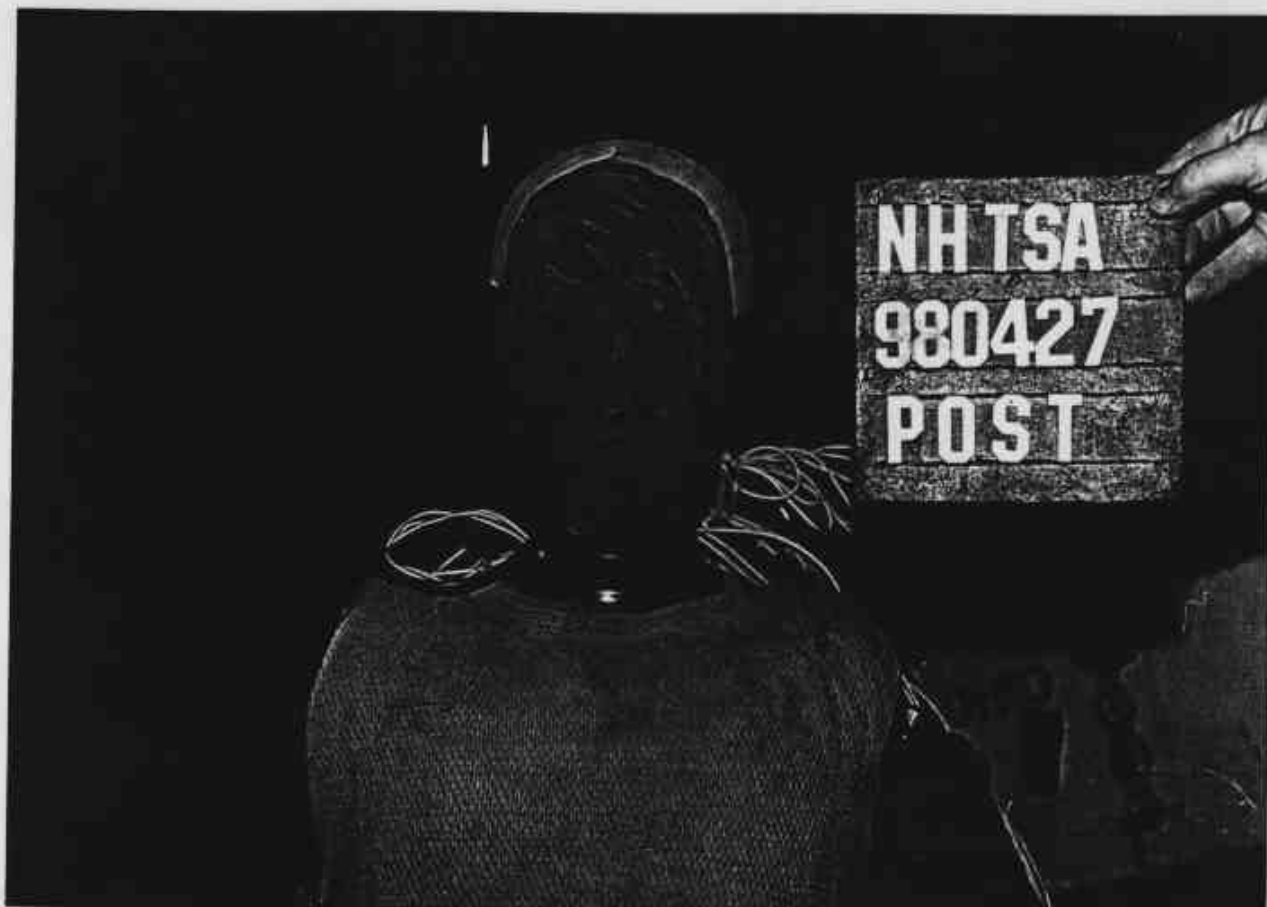


Figure A-53 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 1



Figure A-54 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 2



Figure A-55 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 3



Figure A-56 Post-Test Bullet Vehicle Driver Dummy Leg Contact - View 1



Figure A-57 Post-Test Bullet Vehicle Driver Dummy Leg Contact - View 2

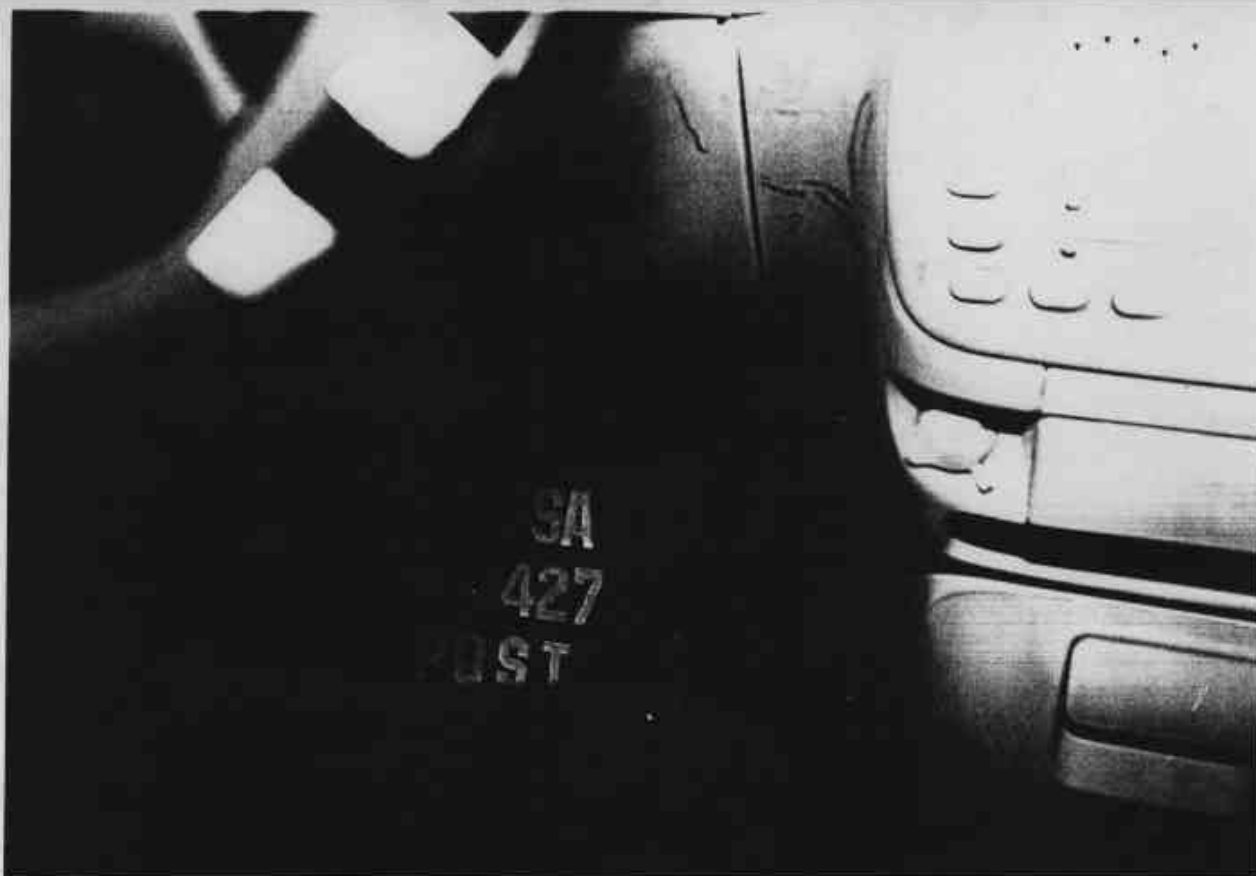


Figure A-58 Post-Test Bullet Vehicle Driver Dummy Leg Contact - View 3

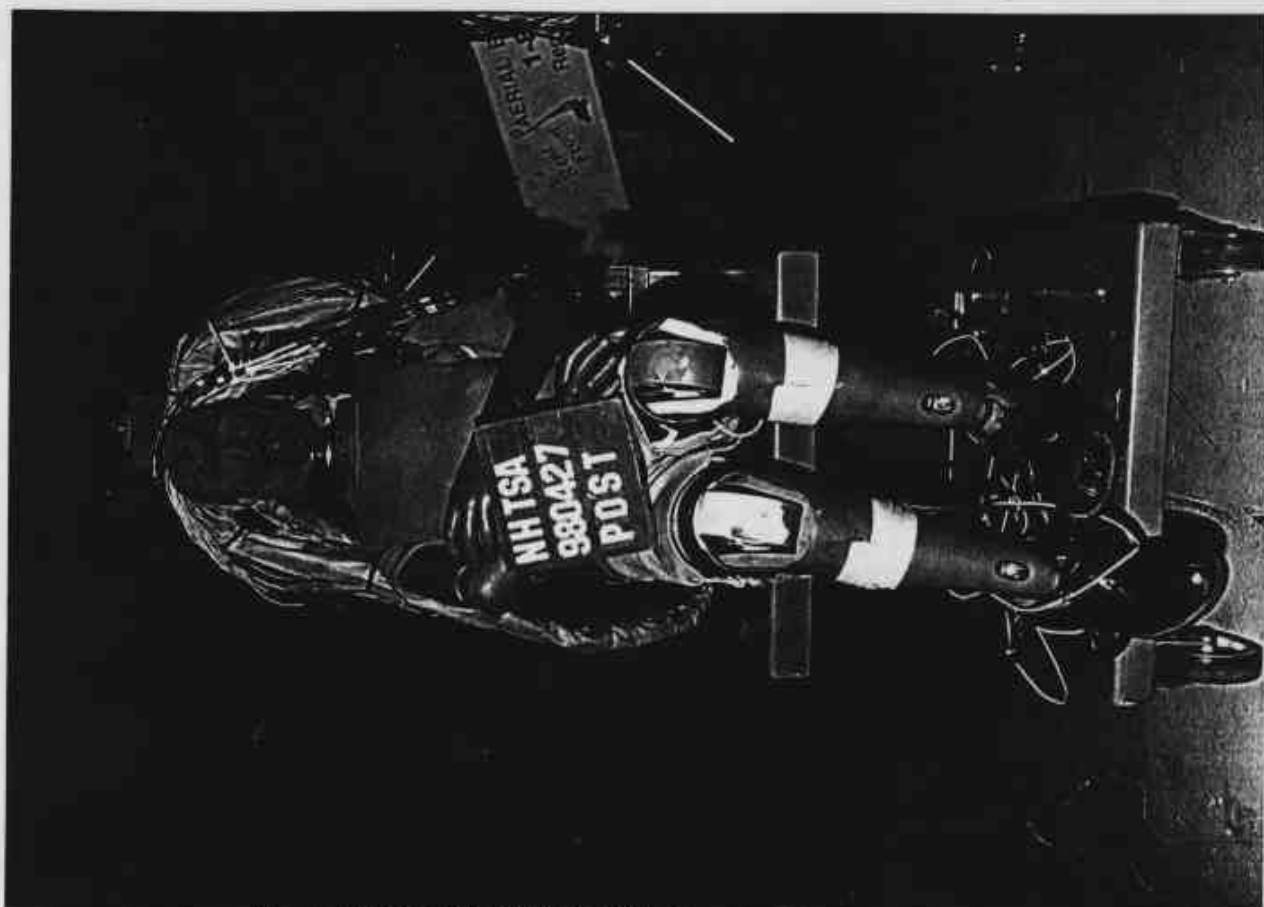


Figure A-59 Post-Test Bullet Vehicle Passenger Dummy



Figure A-60 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 1



Figure A-61 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 2



Figure A-62 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 3



Figure A-63 Post-Test Bullet Vehicle Passenger Dummy Leg Contact - View 1



Figure A-64 Post-Test Bullet Vehicle Passenger Dummy Leg Contact - View 2



Figure A-65 Target Vehicle Certification Label



Figure A-66 Target Vehicle Tire Load Label



Figure A-67 Bullet Vehicle Certification Label



Figure A-68 Impact Event

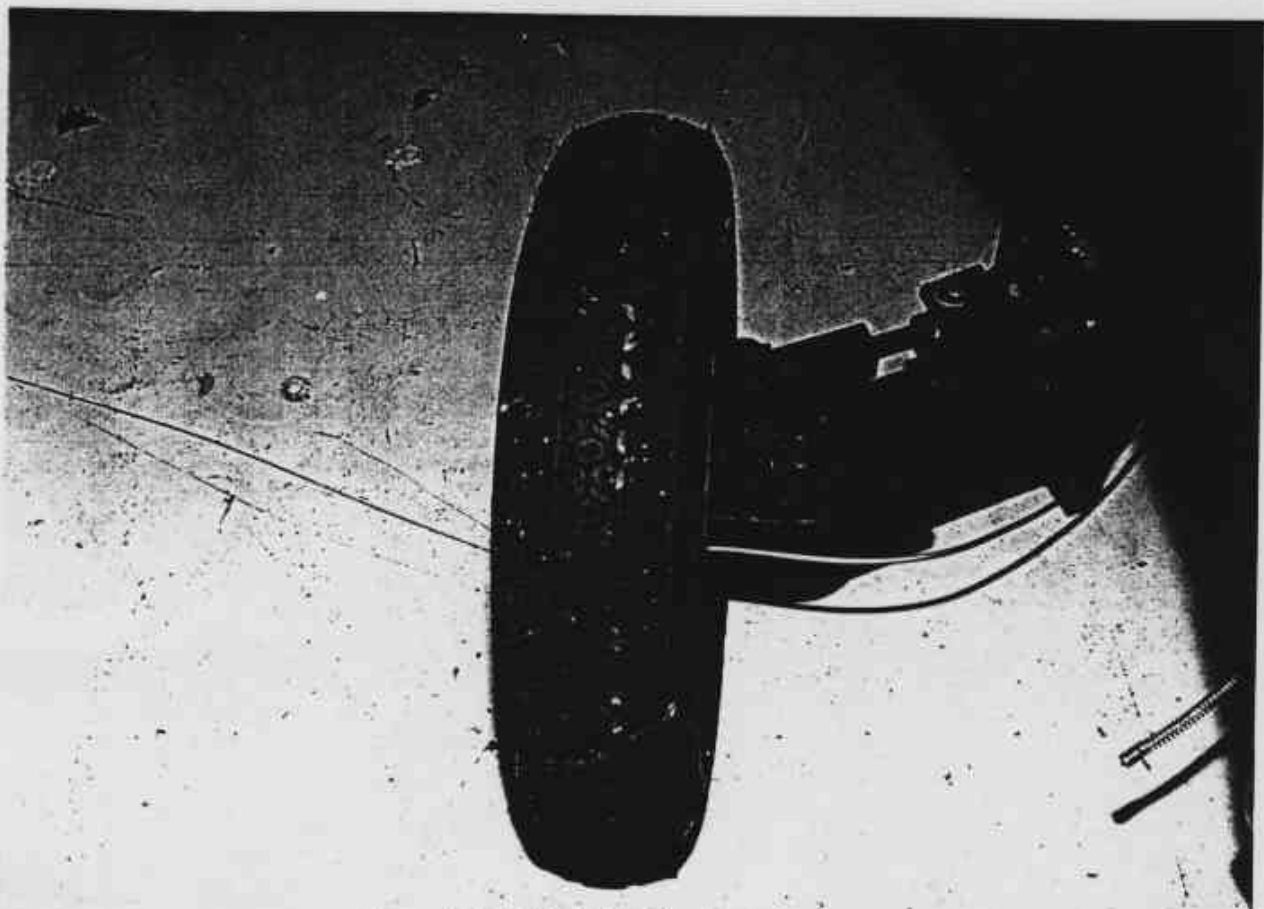


Figure A-69 Vehicle Crabbing Device

Appendix B

Data Plots

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER HEAD X-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

90

60

30

0

-30

-60

-90

ACCELERATION (G)

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

PEAK DATA: 20.33 G @ 48.24 MS, -45.78 G @ 66.72 MS

CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

TIME (MS)

10

40

70

100

130

160

190

220

250

280

310

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER HEAD Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

90

60

30

0

-30

-60

-90

ACCELERATION (G)

TIME (MS)

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290 300 310

CHANNEL: HEDYC1 FILTER: CH. CLASS 1000

PEAK DATA: 10.69 G @ 184.48 MS; -45.47 G @ 48.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER HEAD Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

90

60

30

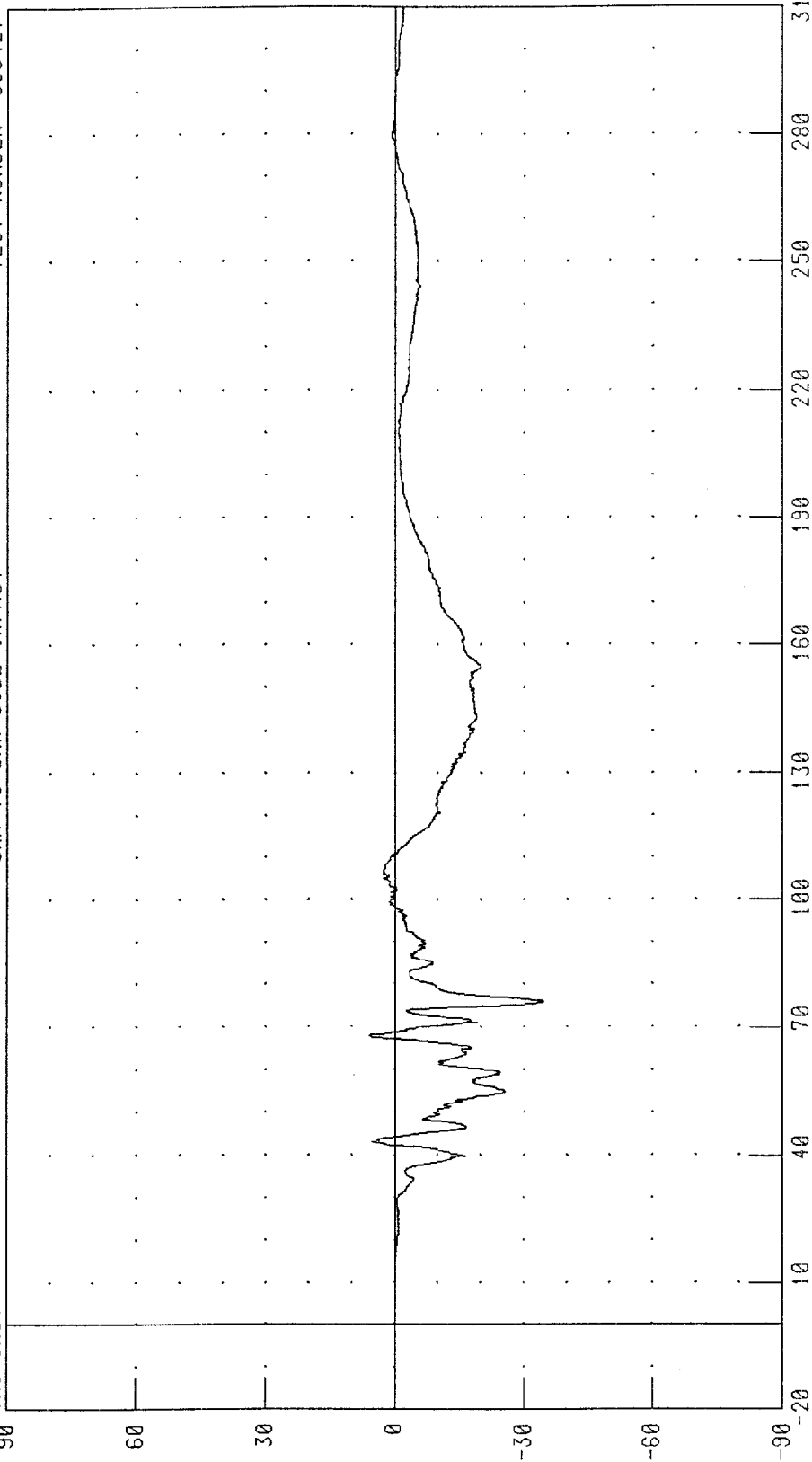
0

-30

-60

-90

ACCELERATION (G)



TIME (MS)

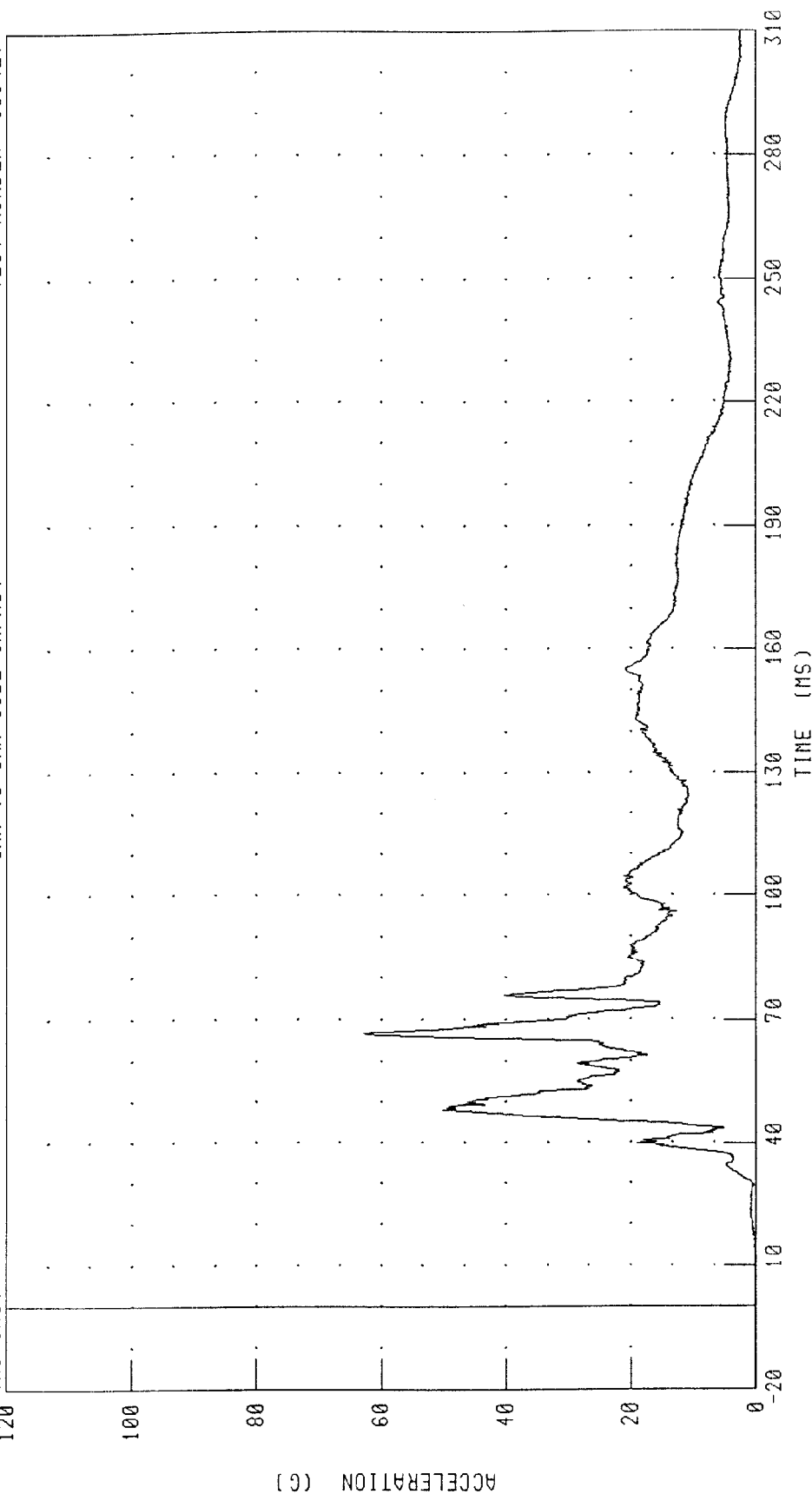
CHANNEL: HED701 FILTER: CH. CLASS 1000

PEAK DATA: 5.90 G @ 68.00 MS; -34.78 G @ 75.92 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER HEAD RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



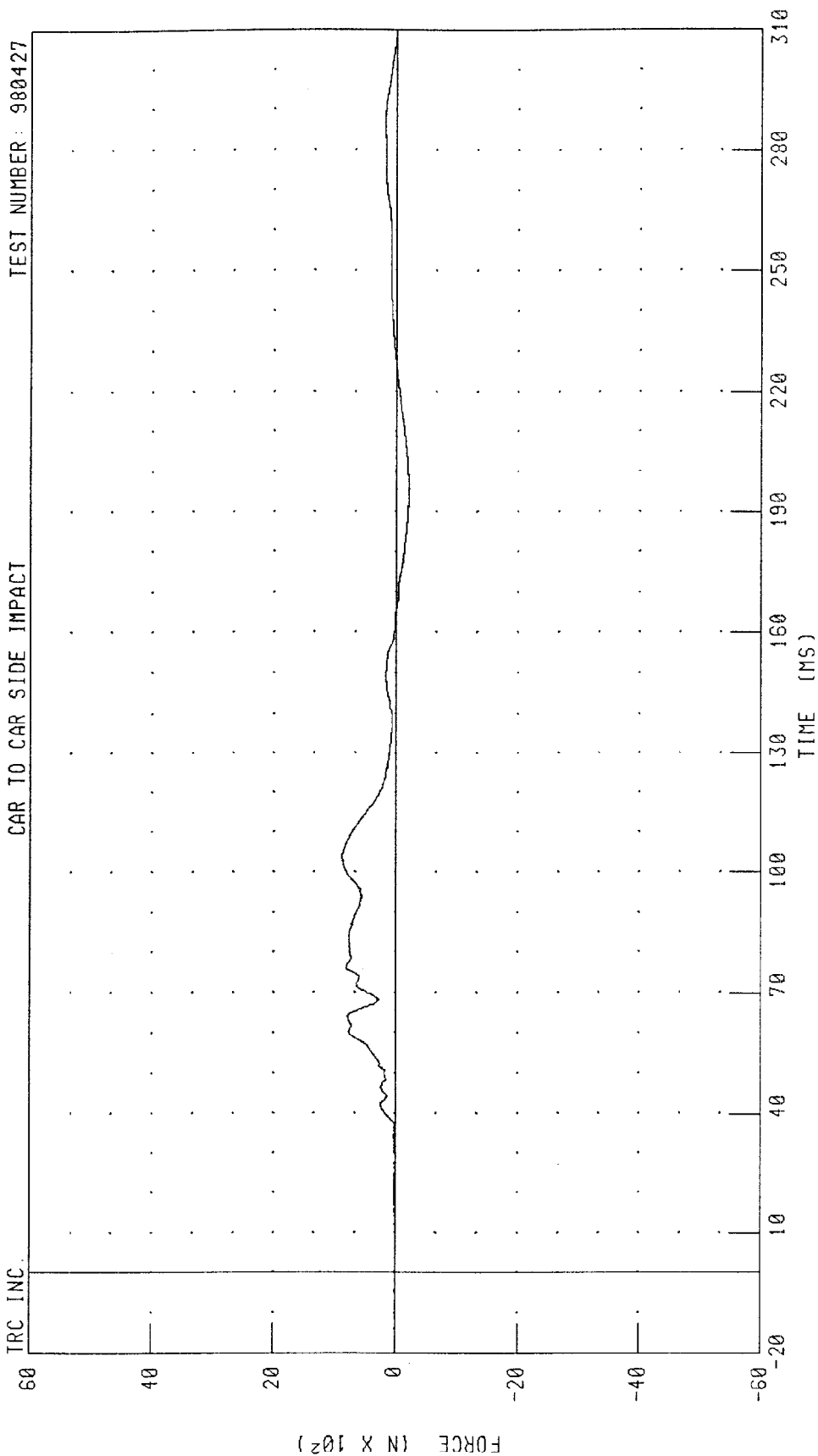
CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 62.82 G @ 66.80 MS; 0.09 G @ -19.92 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER NECK X-AXIS SHEAR FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



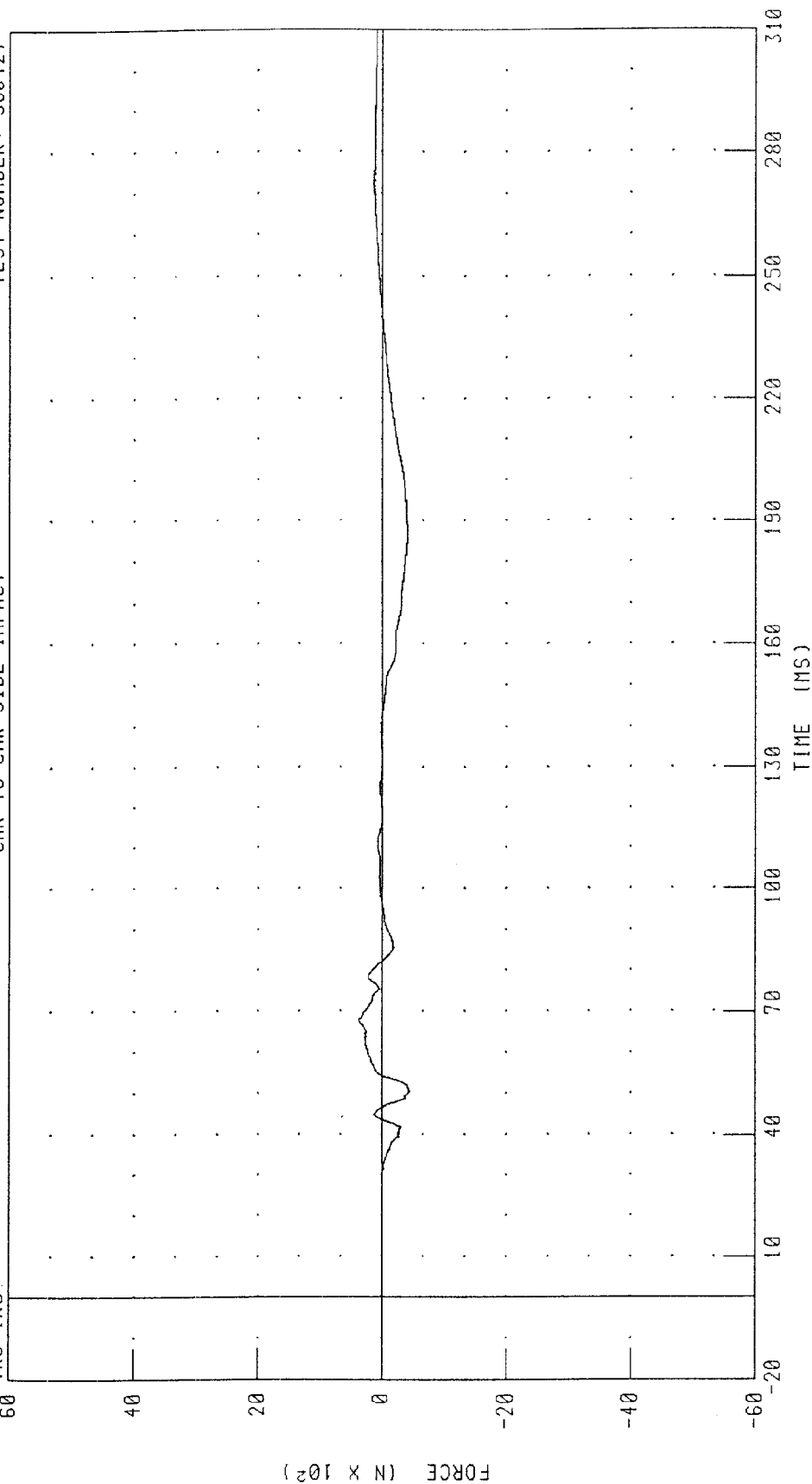
PEAK DATA: 869.16 N @ 103.52 MS, -213.02 N @ 193.76 MS

CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER NECK Y-AXIS SHEAR FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

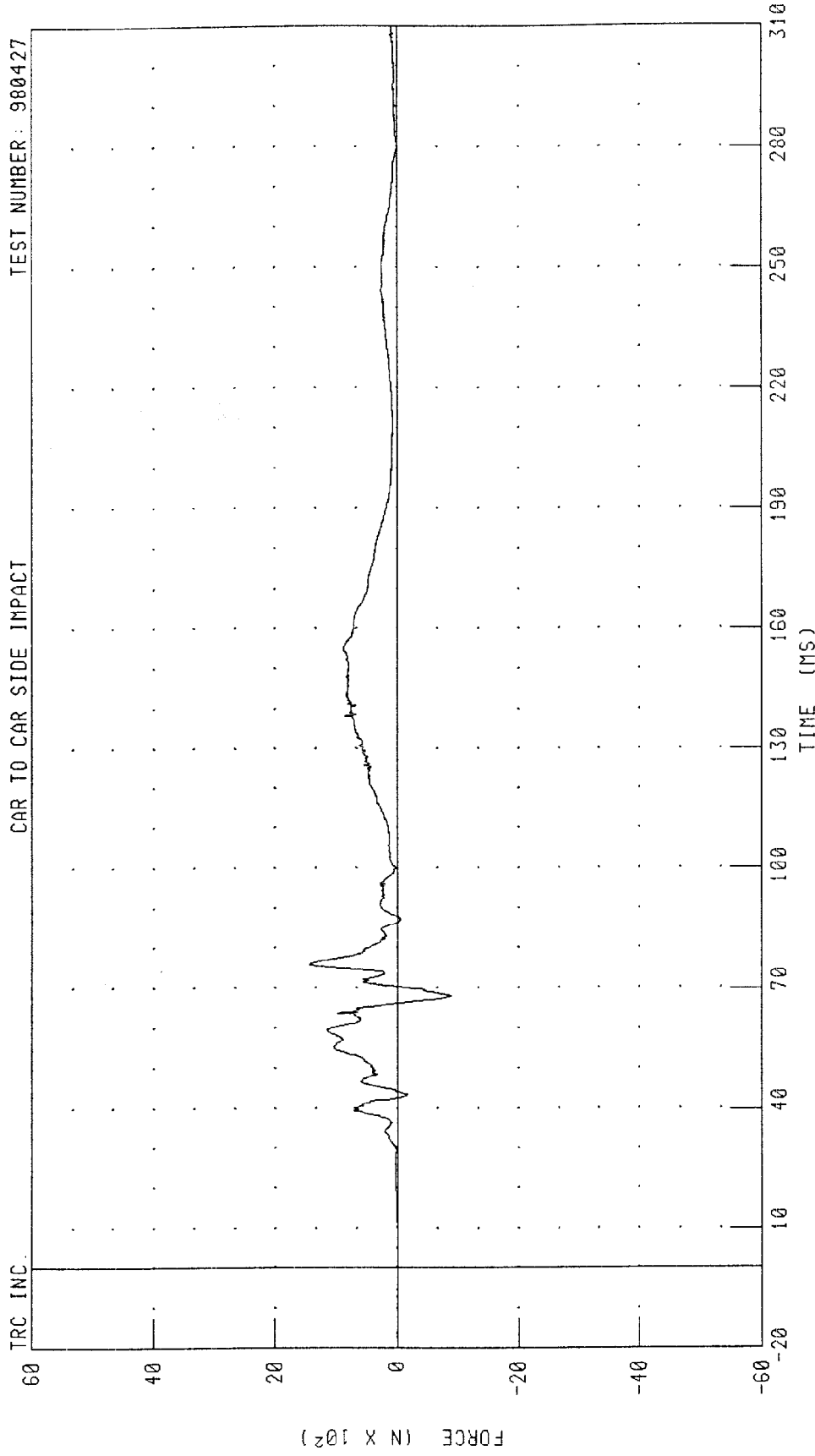


CHANNEL: NEKYF1 FILTER: CH. CLASS 1000

PEAK DATA: 369.36 N @ 67.76 MS; -447.57 N @ 50.32 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER NECK Z-AXIS AXIAL FORCE

TRC INC. CAR TO CAR SIDE IMPACT TEST NUMBER: 980427

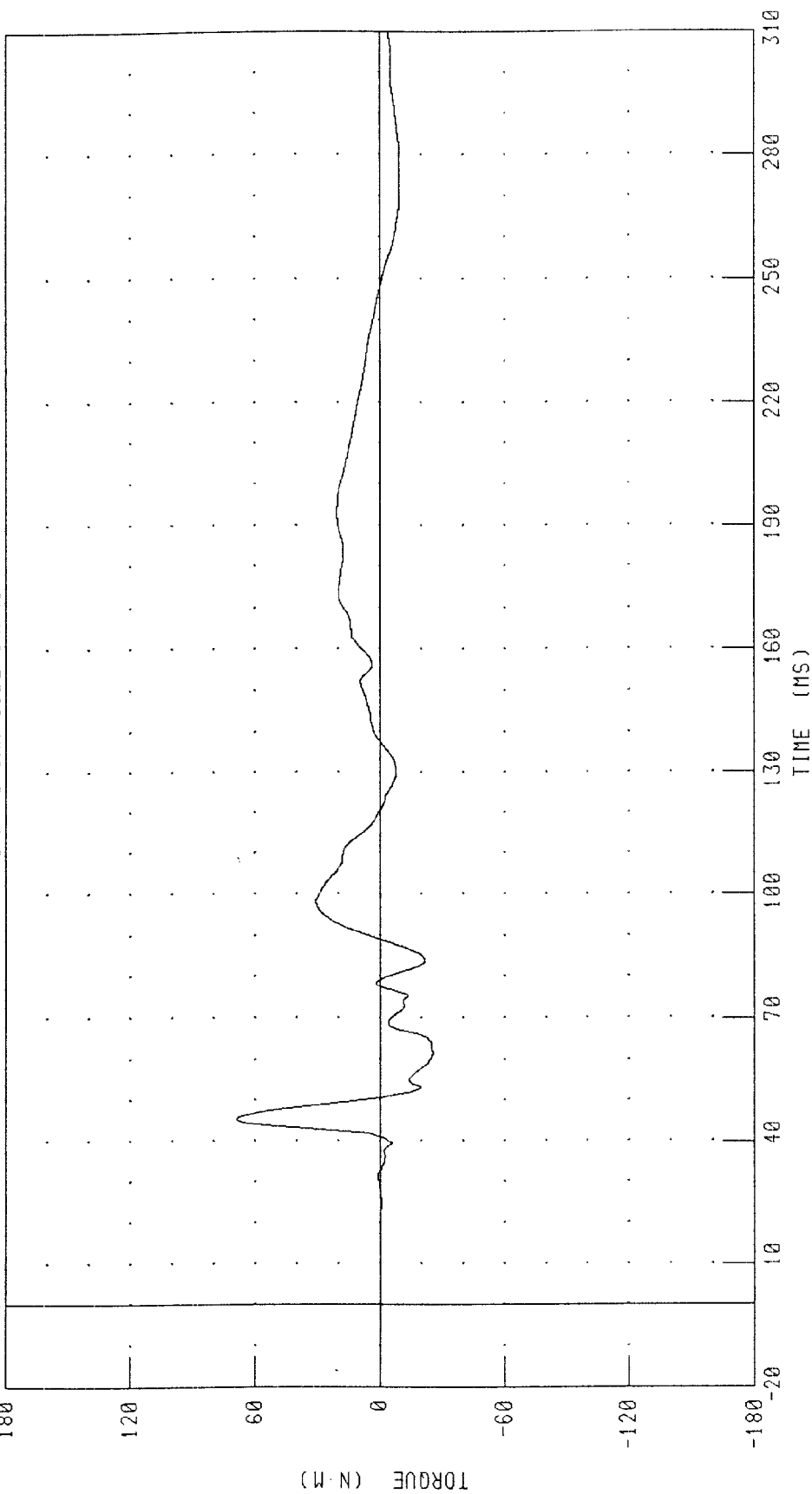


CHANNEL: NEKZF1 FILTER: CH. CLASS 1000 PEAK DATA: 1440.00 N @ 75.84 MS; -880.03 N @ 68.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER NECK MOMENT ABOUT X AXIS
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

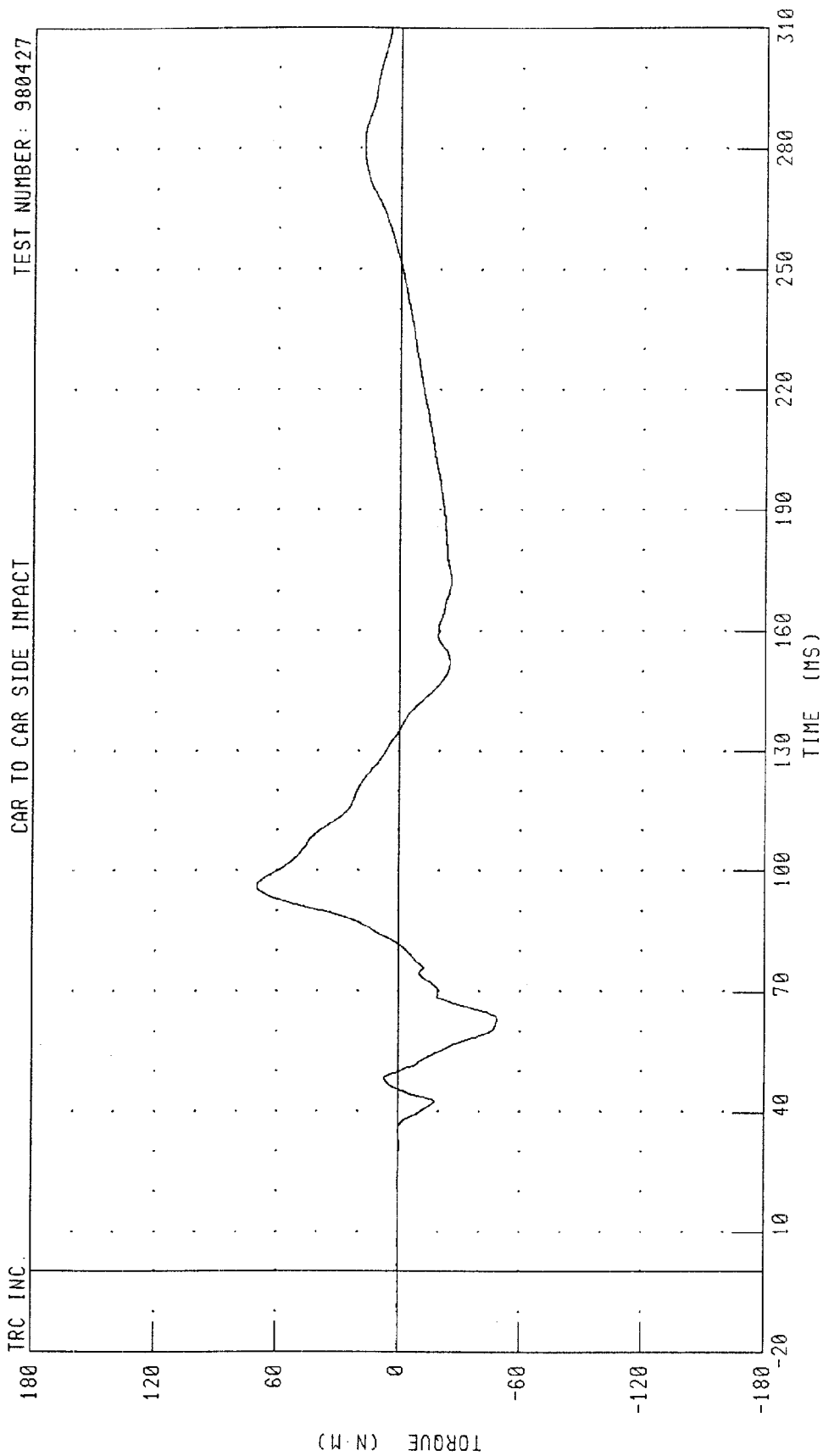
TRC INC.



CHANNEL: NEKXMI FILTER: CH. CLASS 600

PEAK DATA: 68.87 N-M @ 45.44 MS; -25.45 N-M @ 61.44 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER NECK MOMENT ABOUT Y AXIS



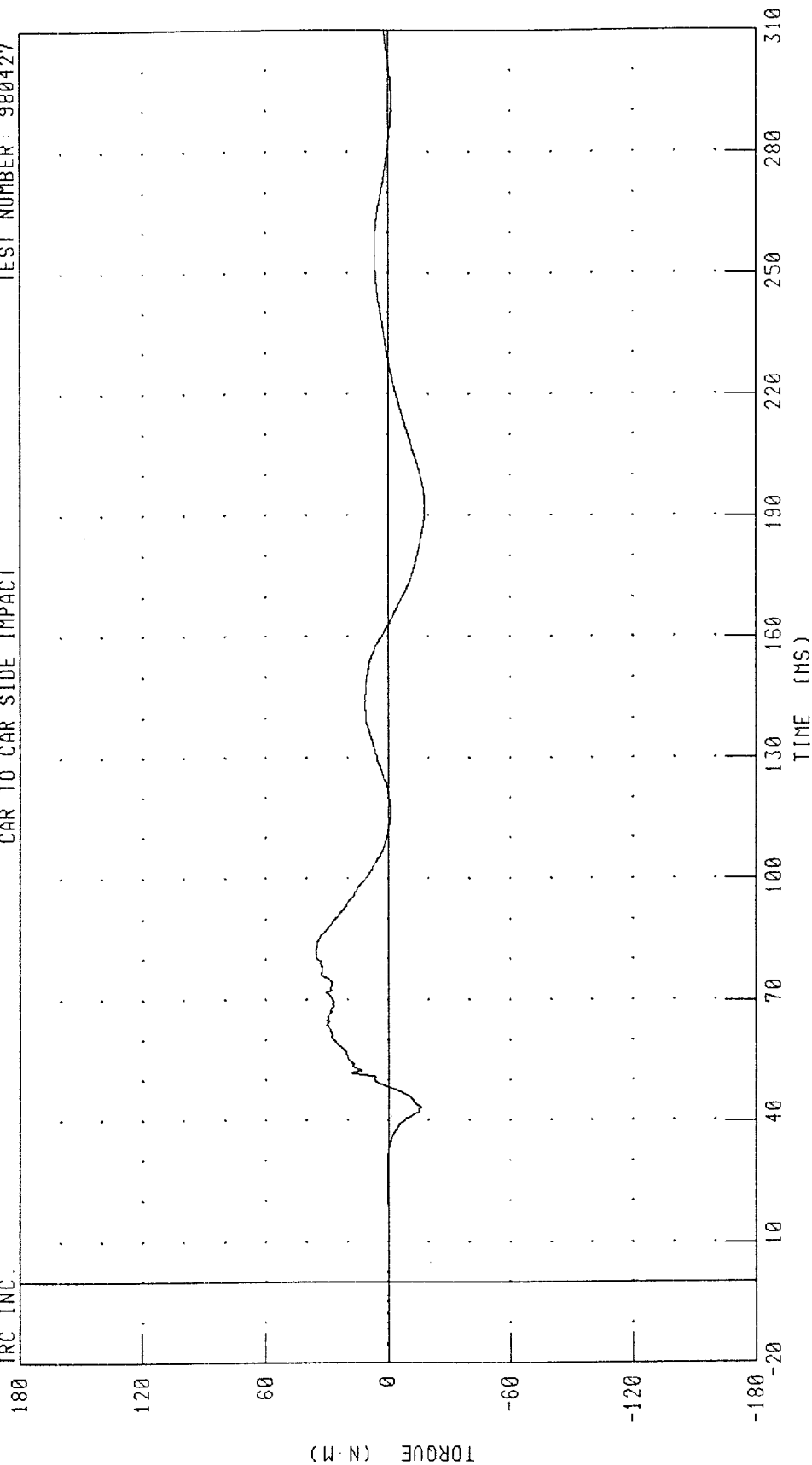
CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA: 70.07 N·M @ 96.24 MS; -48.81 N·M @ 63.20 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER NECK MOMENT ABOUT Z AXIS
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



PEAK DATA: 35.57 N-M @ 81.36 MS; -18.22 N-M @ 191.60 MS

CHANNEL: NEK2M1 FILTER: CH. CLASS 600

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE DRIVER NECK OCCIPITAL CONDYLE
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

180

120

60

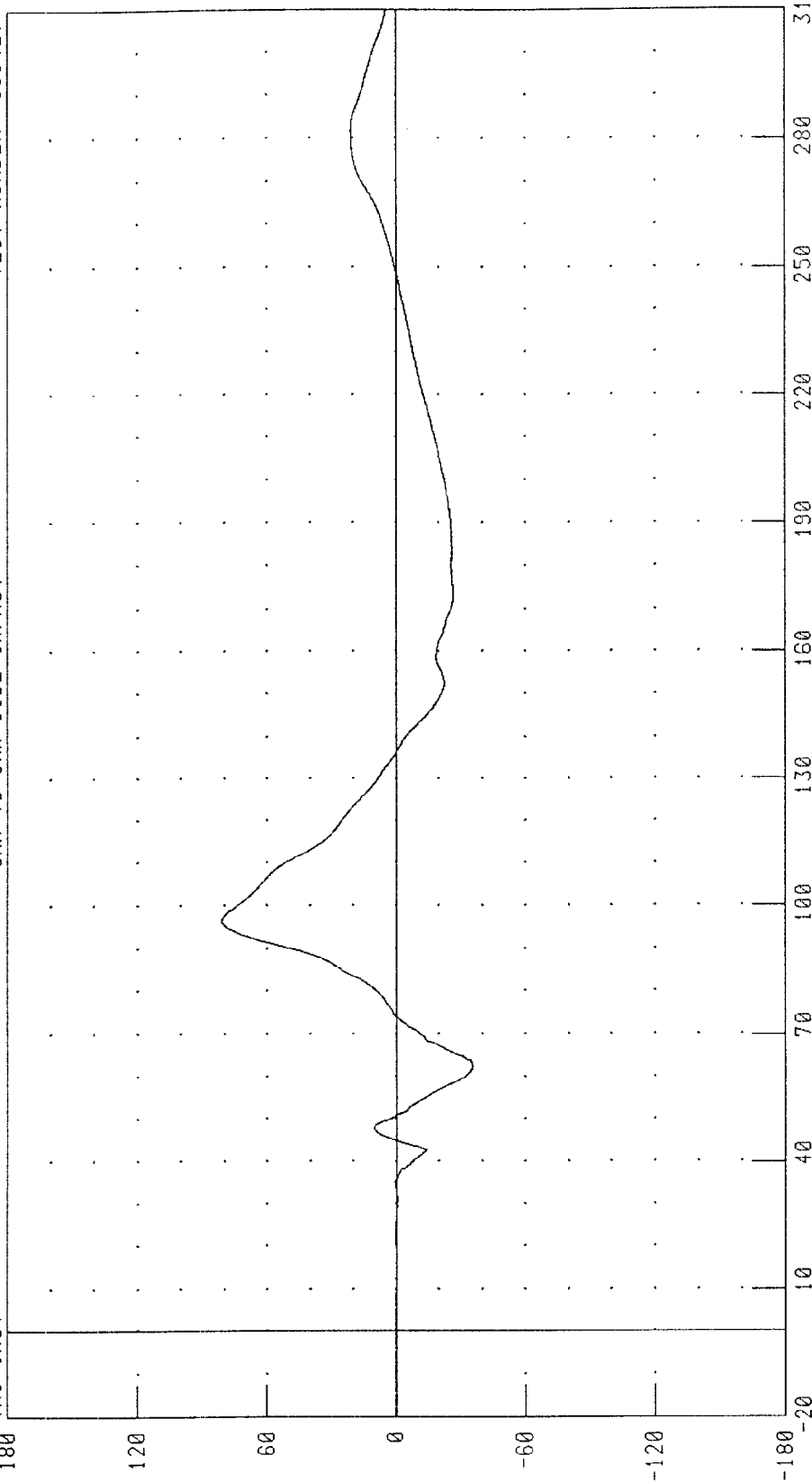
0

-60

-120

-180

TORQUE (N·M)



TIME (MS)

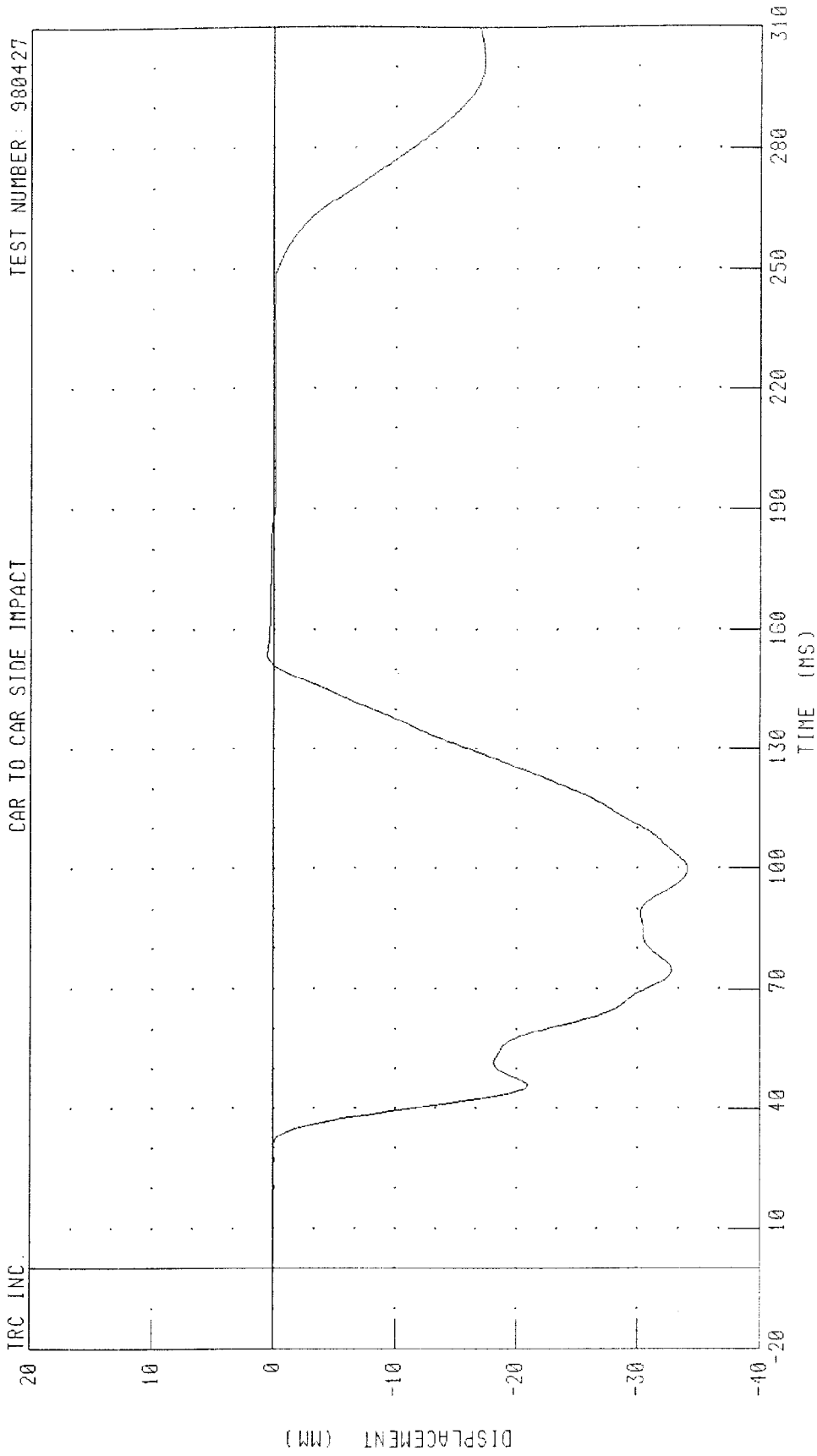
PEAK DATA: 81.04 N·M @ 96.24 MS; -35.55 N·M @ 62.56 MS

CHANNEL: NEKOM1 FILTER: CH CLASS 600

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER CHEST DEFLECTION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



PEAK DATA: 0.51 MM @ 154.38 MS; -34.11 MM @ 100.00 MS

CHANNEL: CSTYD1 FILTER: FIR 100

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER PELVIS X-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

60

40

20

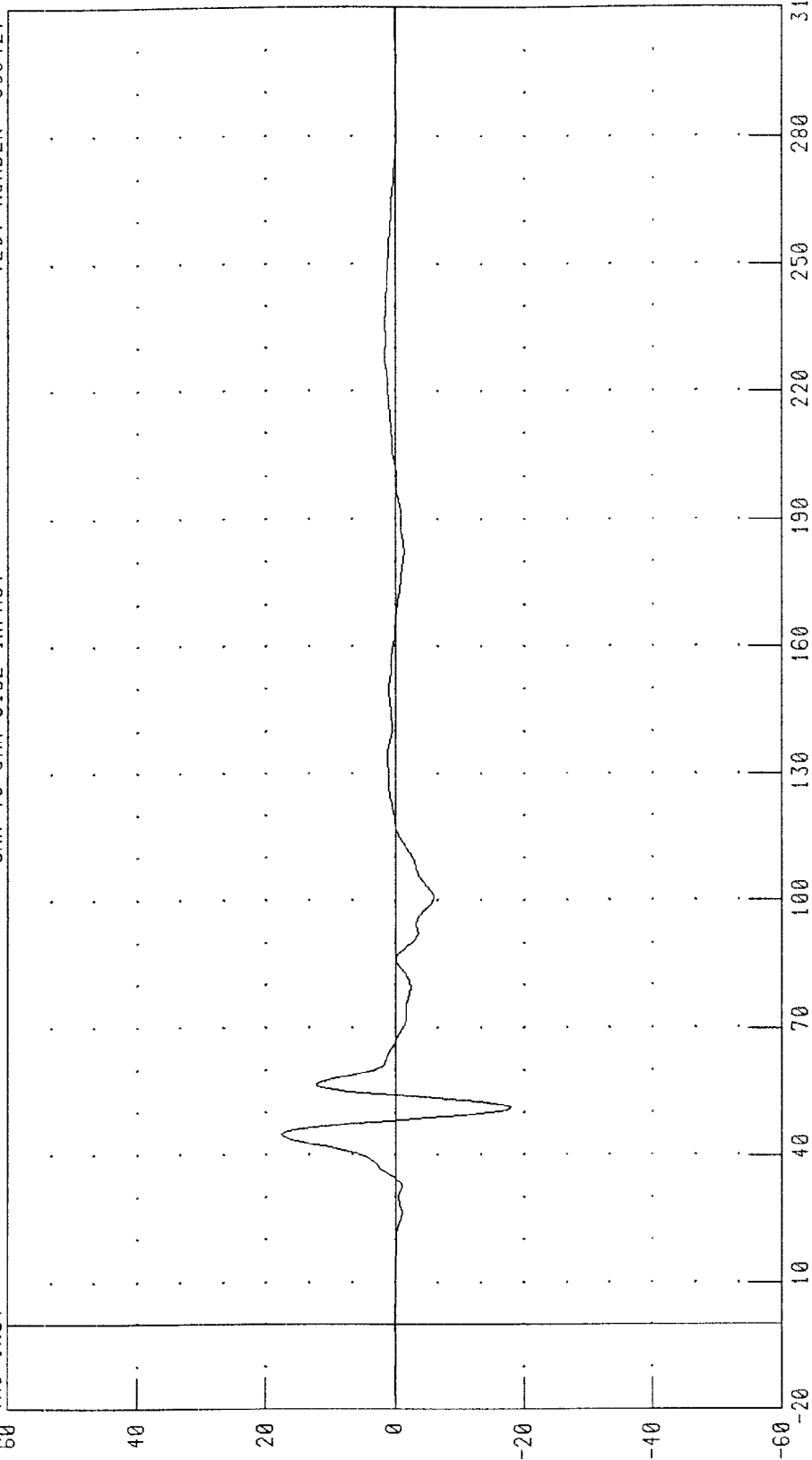
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

CHANNEL: PEVXG1 FILTER: FIR 100

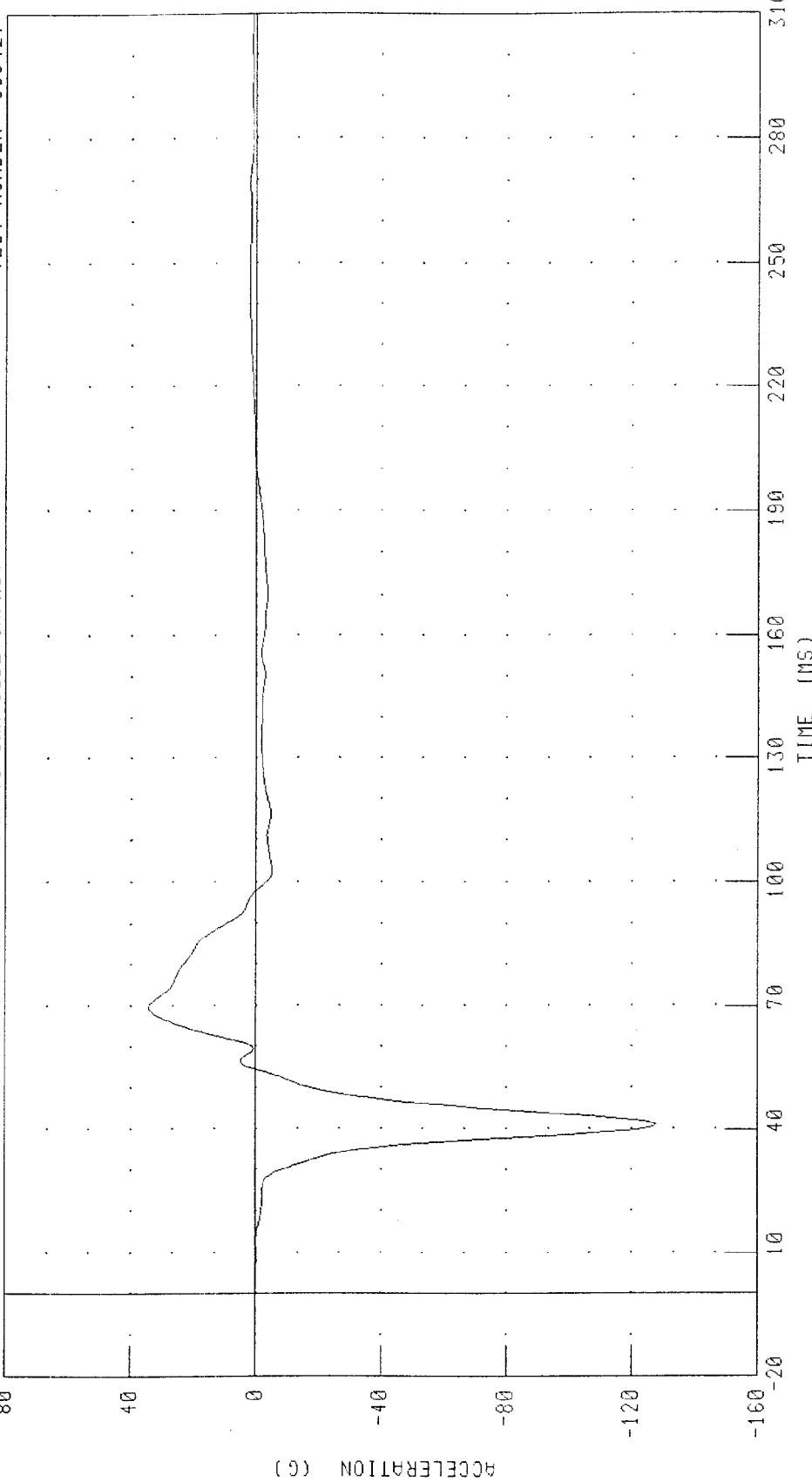
PEAK DATA: 17.64 G @ 45.00 MS, -18.00 G @ 51.25 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER PELVIS Y-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



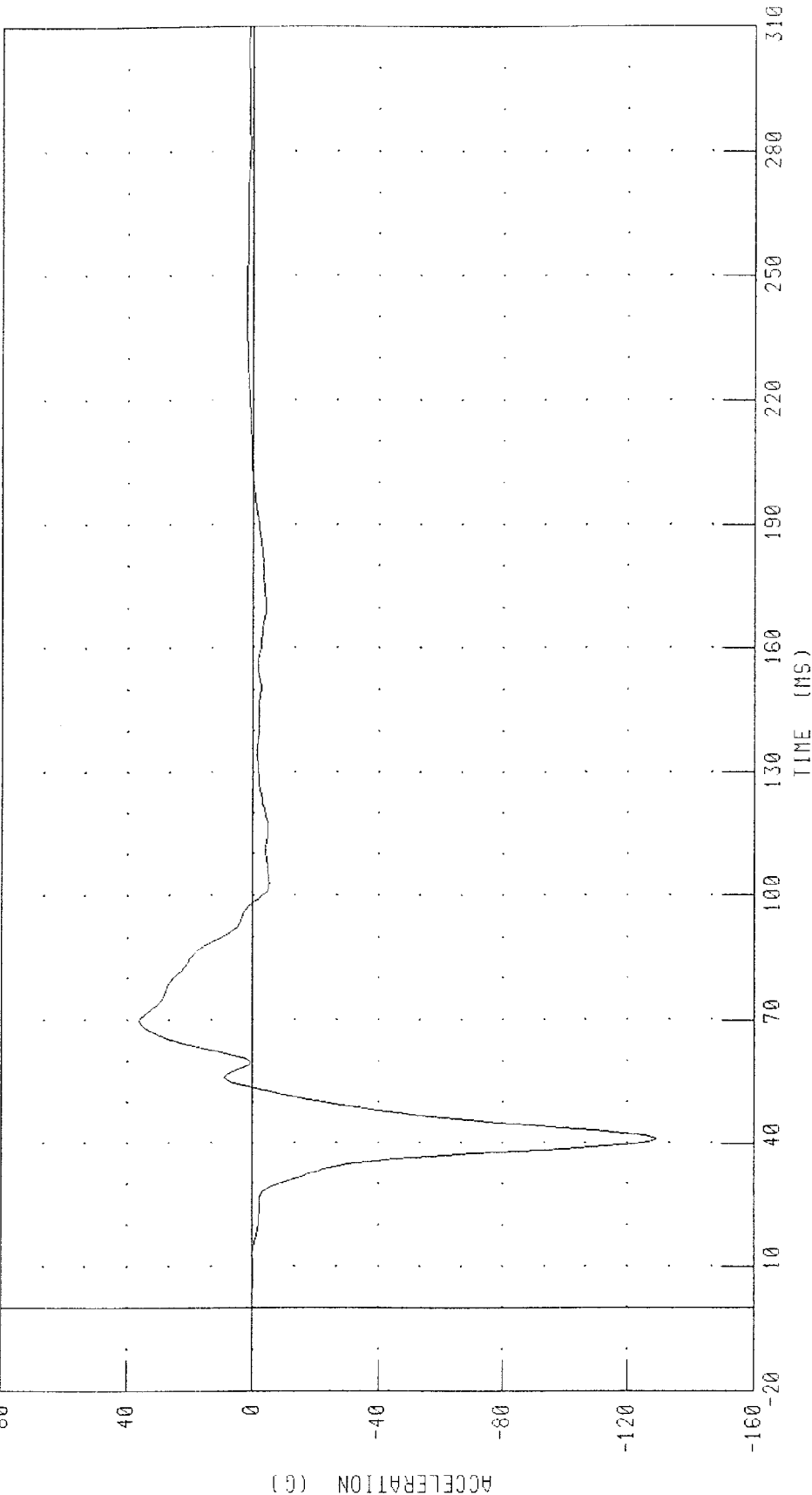
CHANNEL: PEVYG1 FILTER: FIR 100

PEAK DATA: 34.47 G @ 70.00 MS, -127.87 G @ 41.25 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER PELVIS Y-AXIS REDUNDANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: PEVYR1 FILTER: FIR 100

PEAK DATA: 35.96 G @ 70.00 MS, -129.34 G @ 41.25 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER PELVIS Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

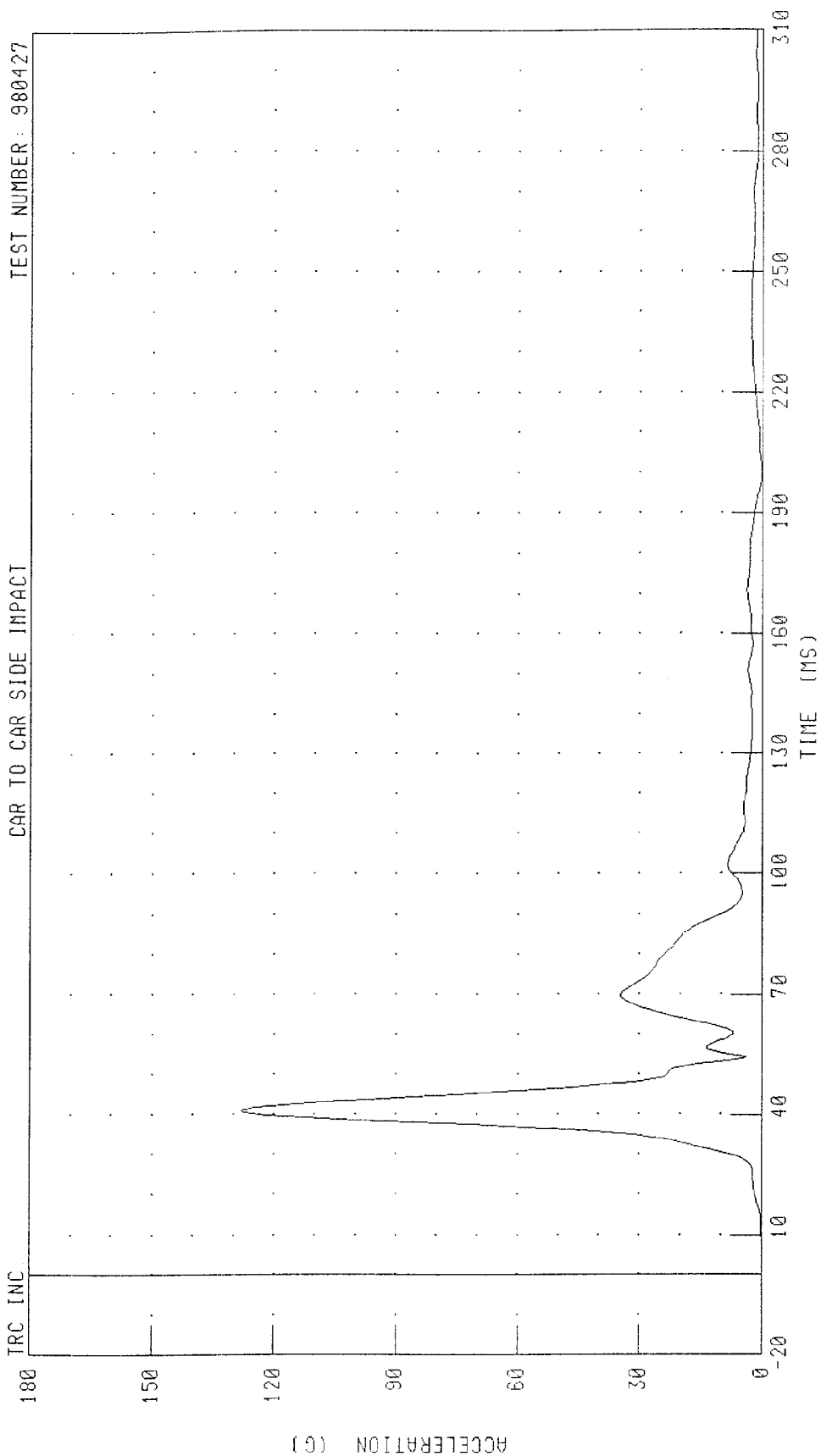
10

CHANNEL: PEVZG1 FILTER: FIR 100

PEAK DATA: 6.56 G @ 73.13 MS; -4.30 G @ 105.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER PELVIS RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

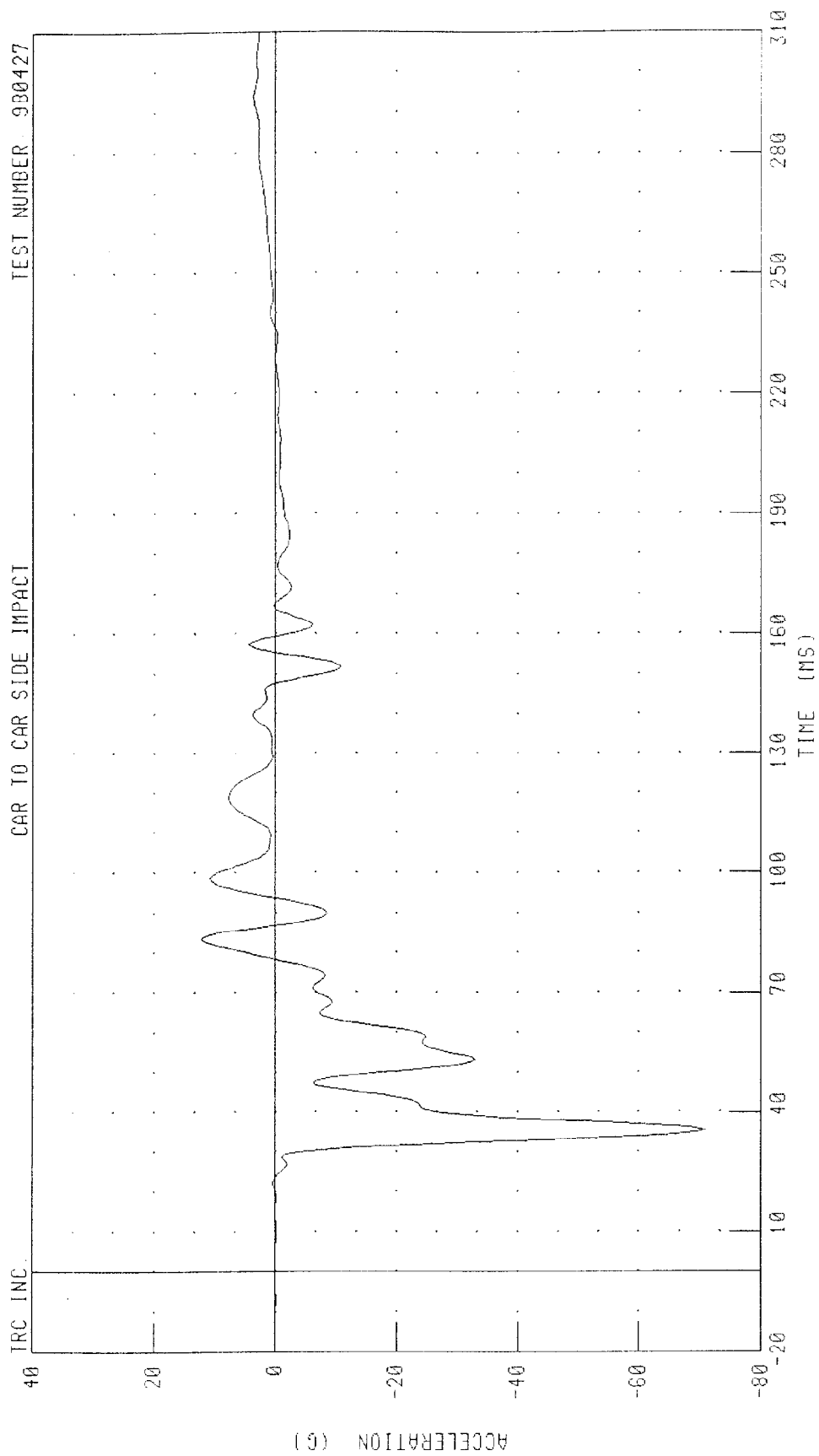
TEST NUMBER: 980427



CHANNEL: PEVRG1 FILTER: FIR 100

PEAK DATA: 120.18 G @ 41.25 MS, 0.01 G @ 6.88 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT



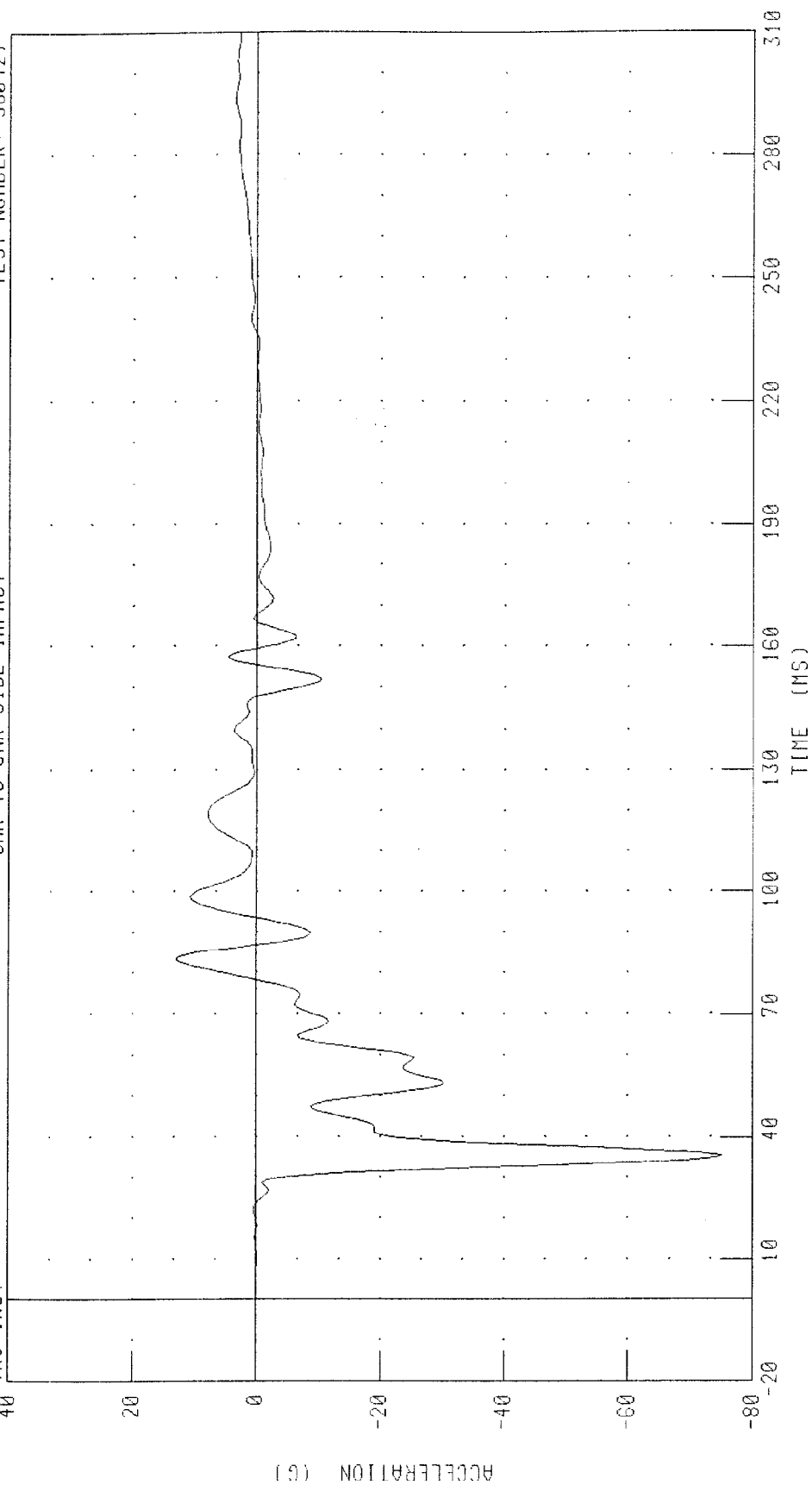
CHANNEL: LURYG1 FILTER: FIR 100

PEAK DATA: 12.17 G @ 83.75 MS, -70.81 G @ 35.63 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



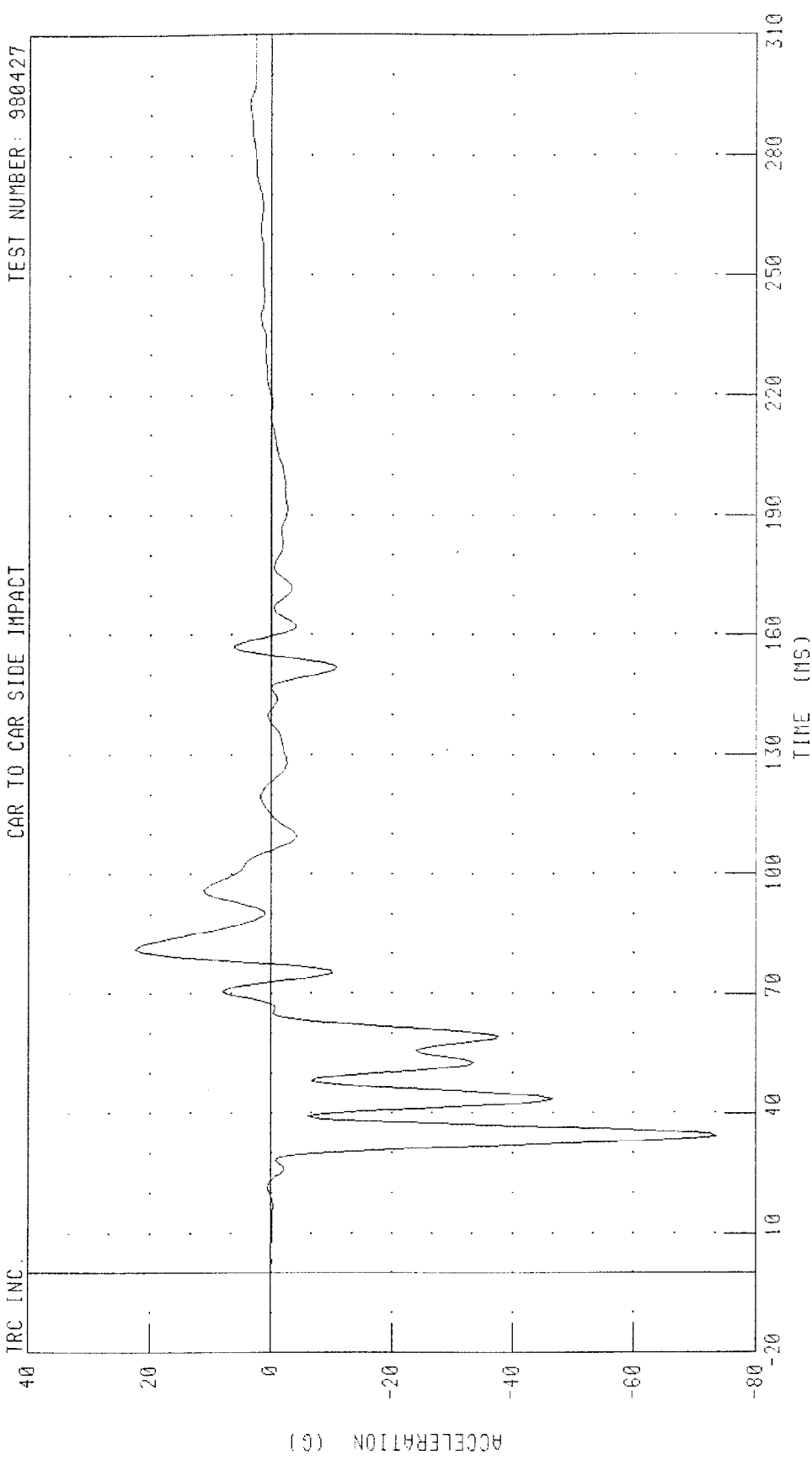
CHANNEL: LURYR1 FILTER: FIR 100

PEAK DATA: 12.89 G @ 83.12 MS; -75.06 G @ 35.63 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

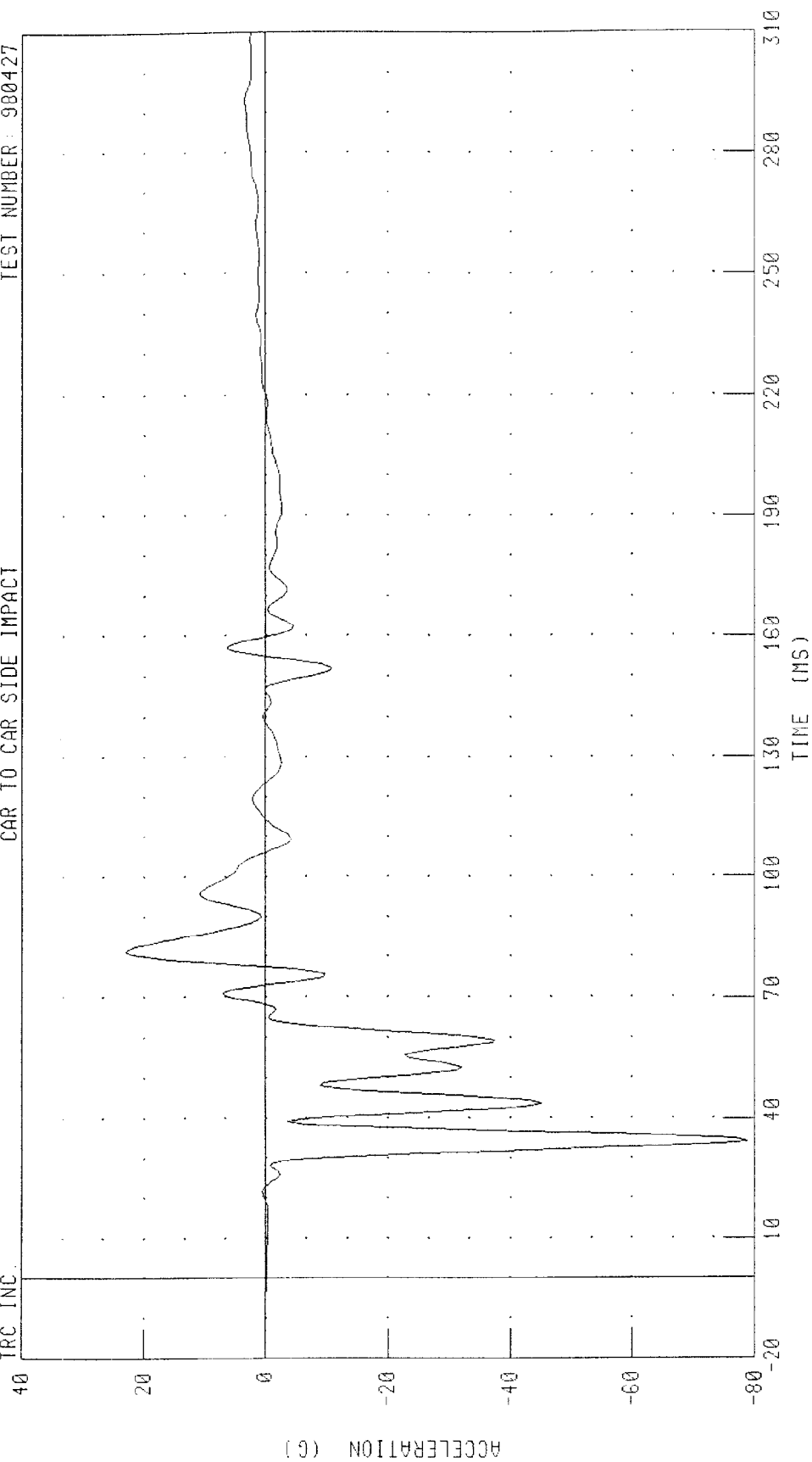


CHANNEL: LLRYG1 FILTER: FIR 100 PEAK DATA: 22.47 G @ 81.25 MS, -73.59 G @ 34.38 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE DRIVER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

IRC INC.



CHANNEL: LLRYR1 FILTER: FIR 100

PEAK DATA: 22.89 G @ 81.25 MS, -78.75 G @ 34.38 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LOWER SPINE X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

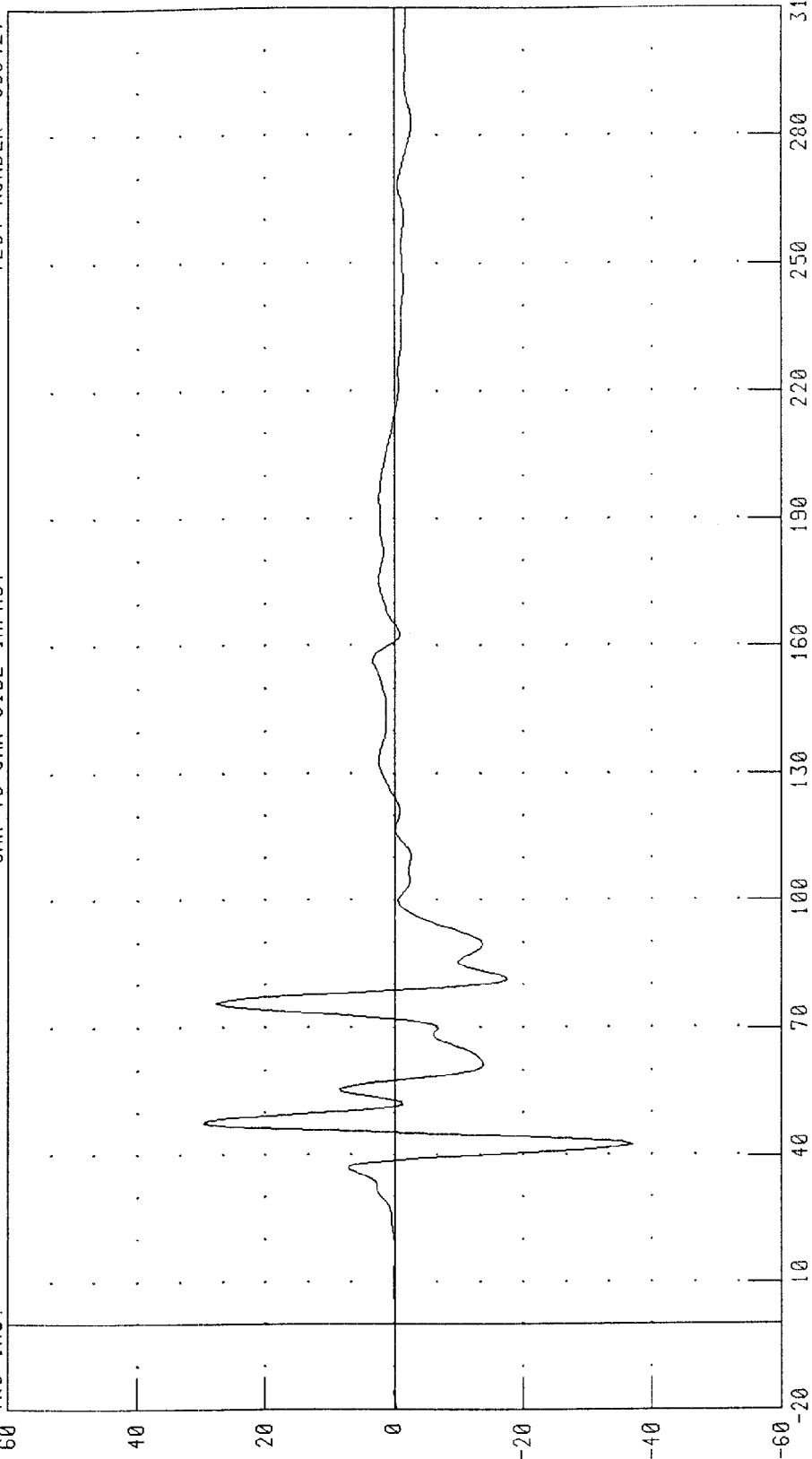
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

CHANNEL: T12XC1

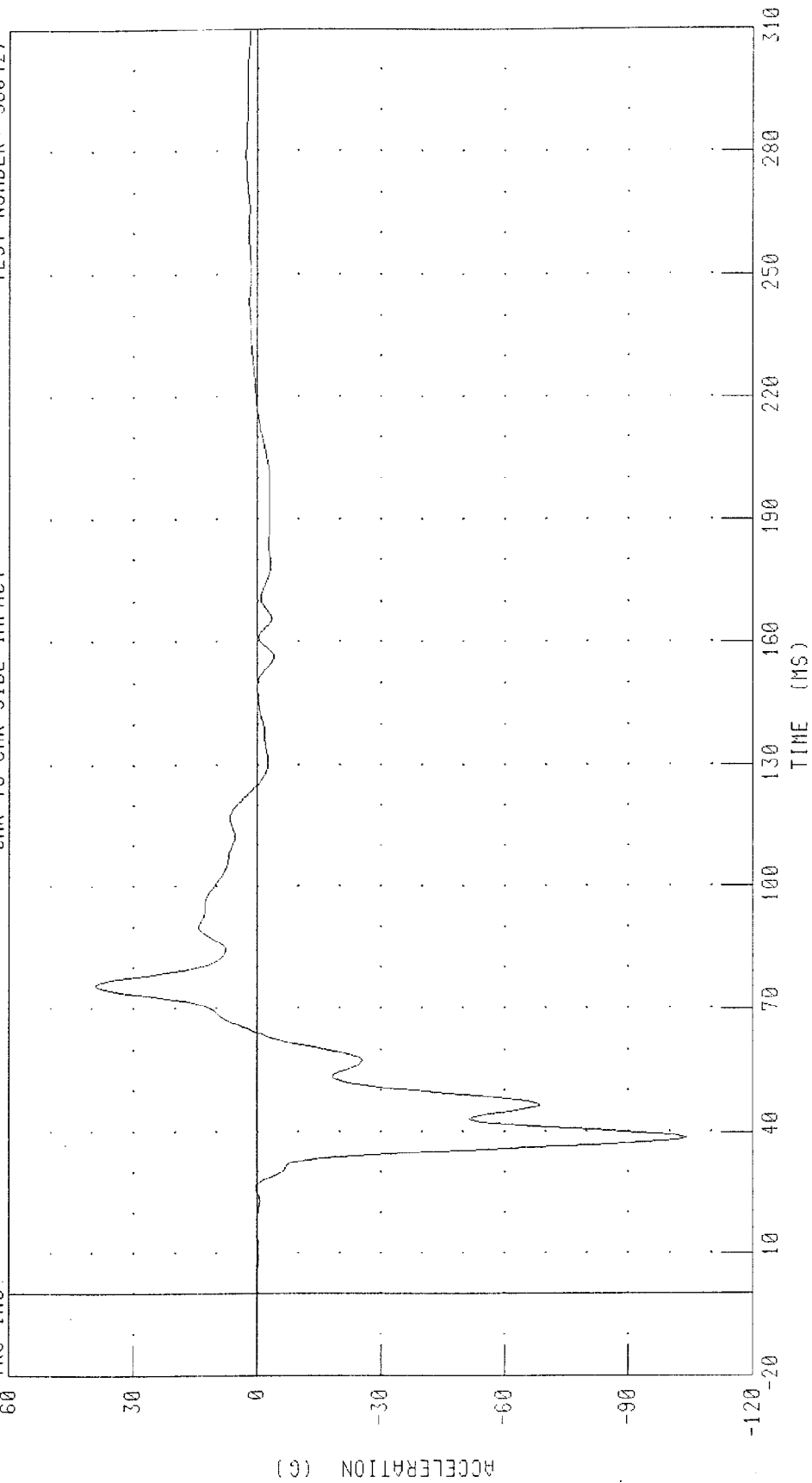
FILTER: FIR 100

PEAK DATA: 29.72 G @ 47.50 MS, -36.93 G @ 42.50 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LOWER SPINE Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

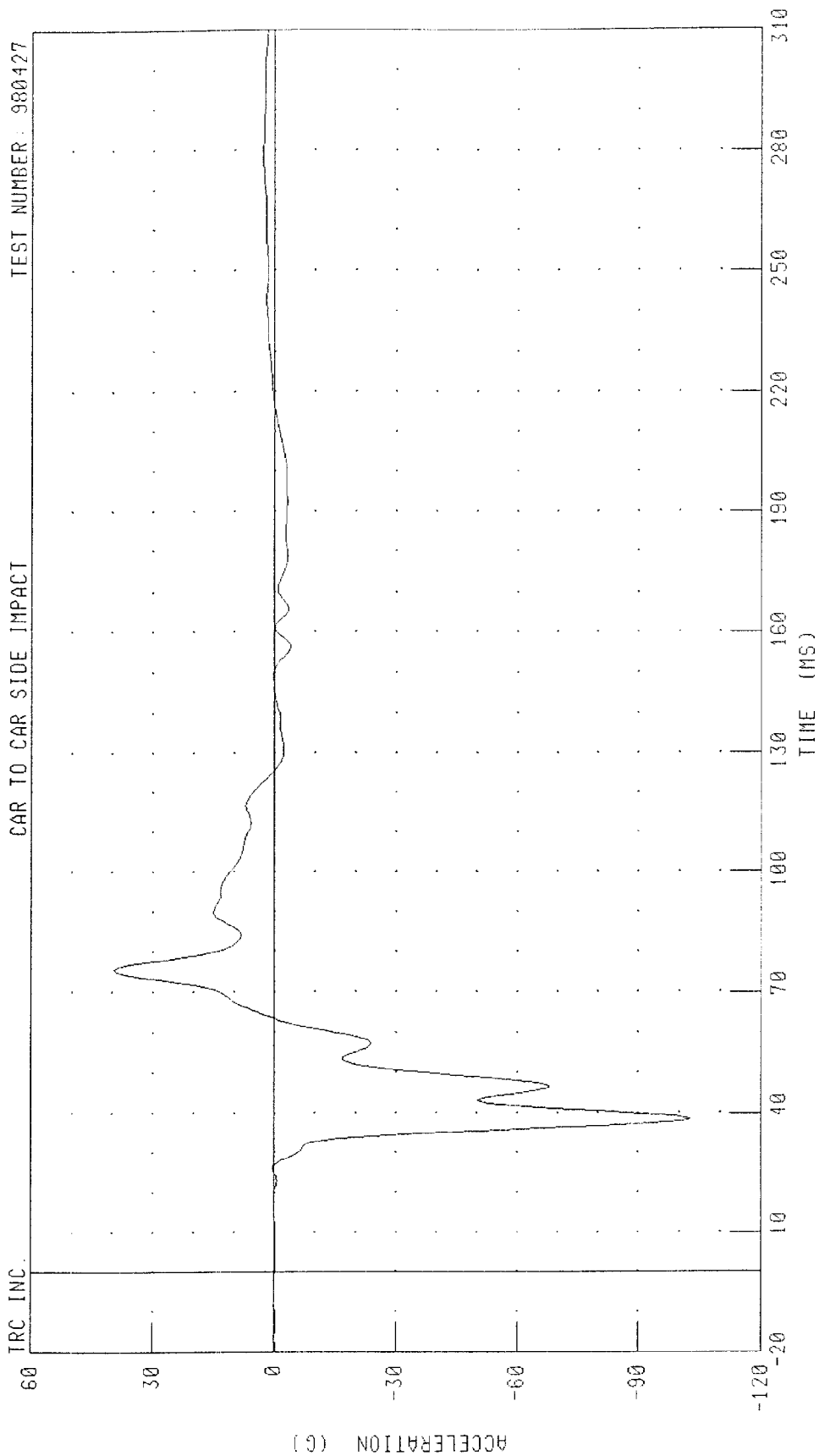
TRC INC.



CHANNEL: T12Y61 FILTER: FIR 100

PEAK DATA: 39.31 G @ 75.62 MS, -104.00 G @ 38.75 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION
CAR TO CAR SIDE IMPACT



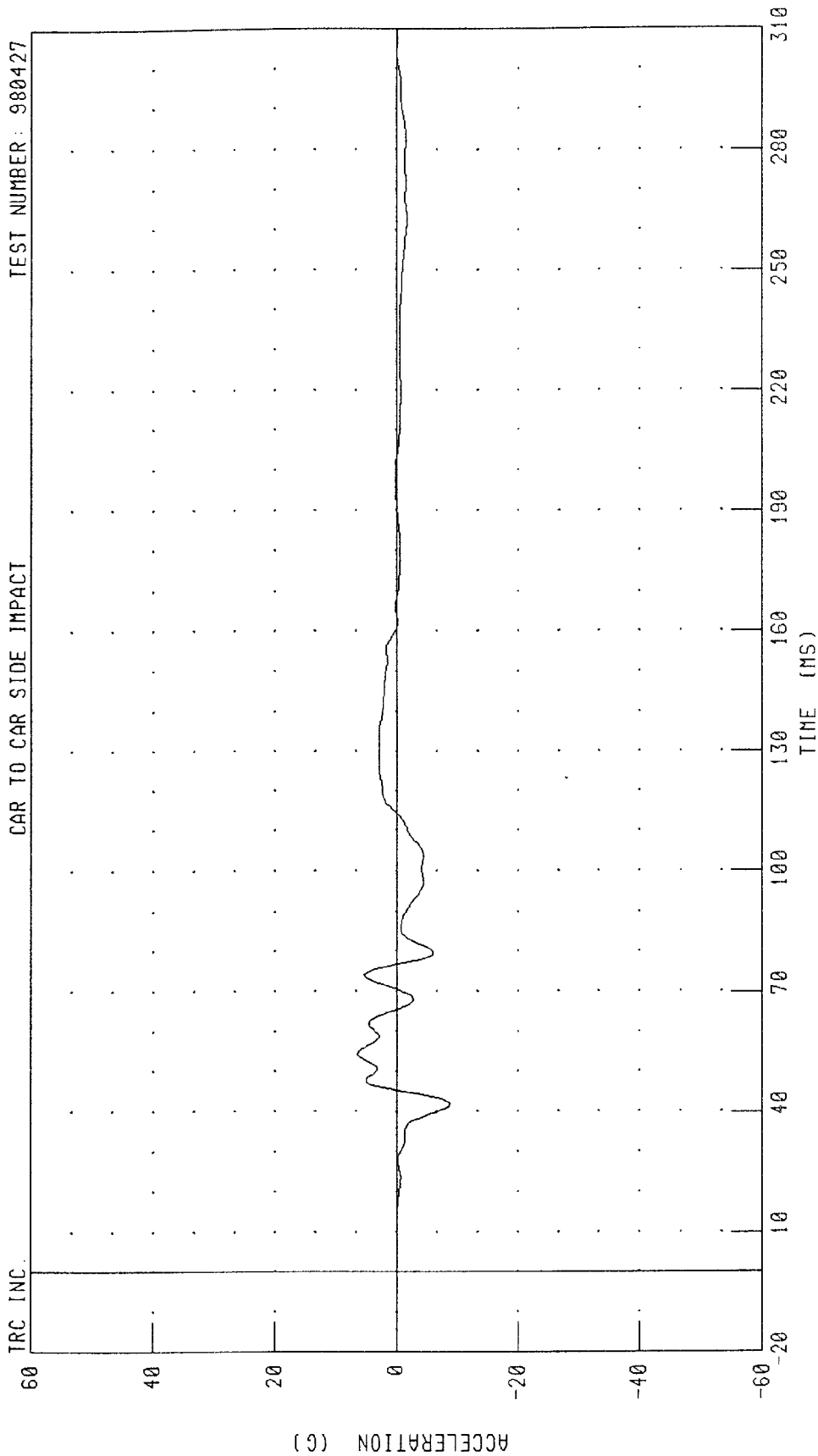
CHANNEL: T12YR1 FILTER: FIR 100

PEAK DATA: 39.80 G @ 75.62 MS, -102.63 G @ 38.75 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LOWER SPINE Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

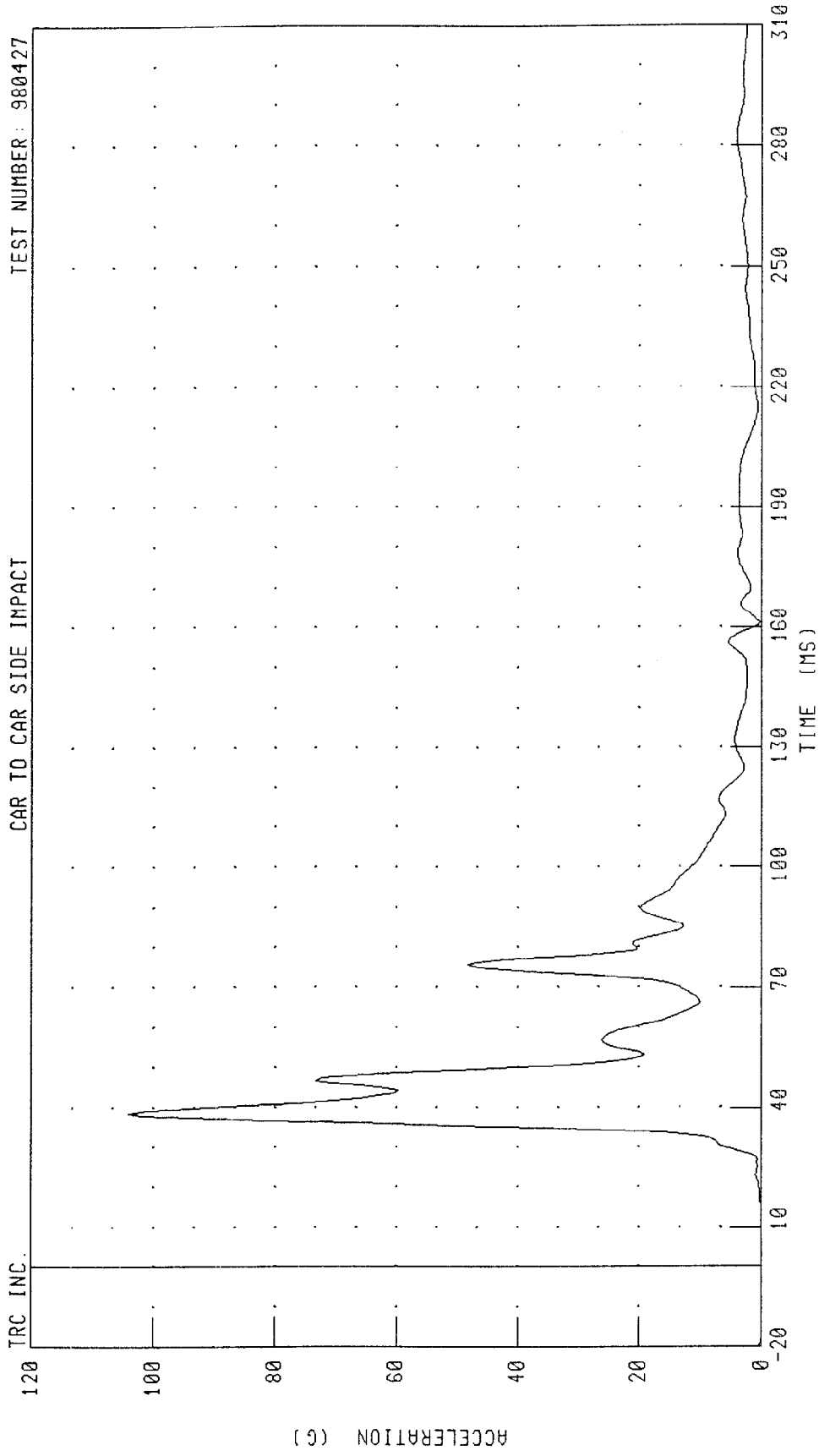
TRC INC.



CHANNEL: T12ZC1 FILTER: FIR 100

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER LOWER SPINE RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: T12RC1 FILTER: FIR 100 PEAK DATA: 104.09 G @ 38.75 MS; 0.00 G @ -8.75 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER UPPER SPINE X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

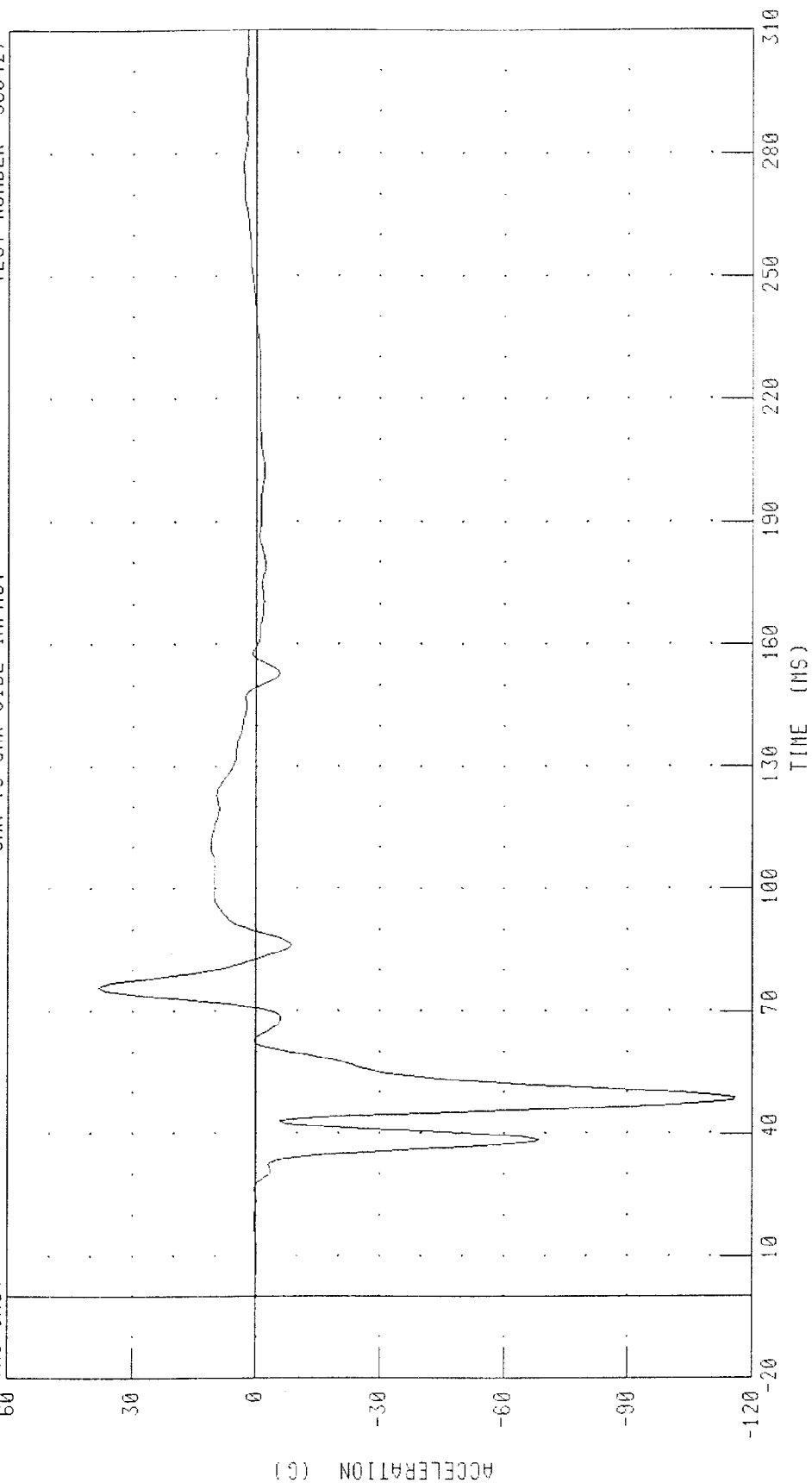
CHANNEL: T01XC1 FILTER: FIR 100

PEAK DATA: 27.74 G @ 43.75 MS; -20.85 G @ 78.13 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE DRIVER UPPER SPINE Y-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



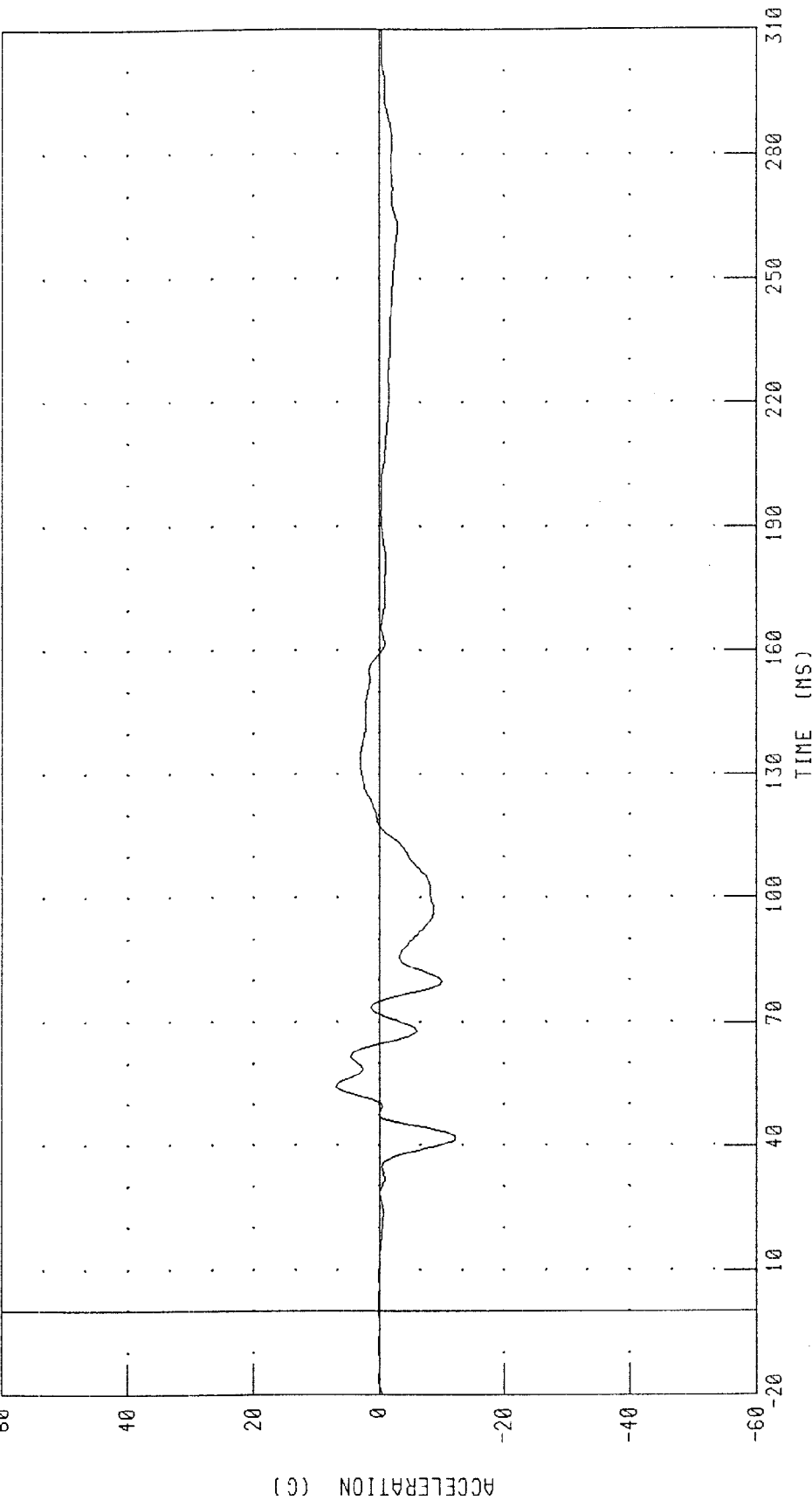
CHANNEL: T01YG1 FILTER: FIR 100

PEAK DATA: 38.34 G @ 75.62 MS, -116.07 G @ 48.75 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER UPPER SPINE Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



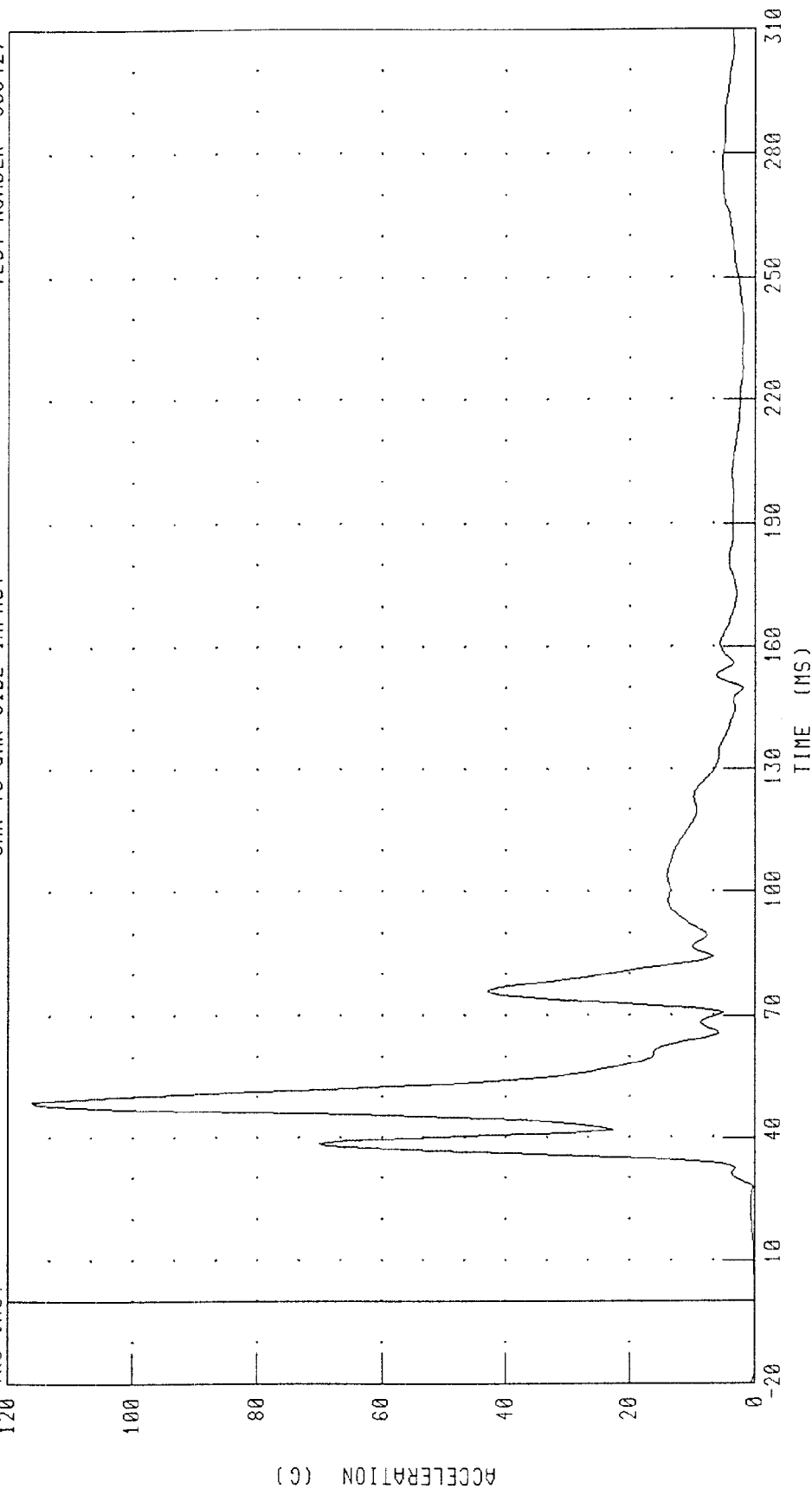
CHANNEL: T01ZG1 FILTER: FIR 100

PEAK DATA: 6.91 G @ 54.38 MS, -12.34 G @ 41.87 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE DRIVER UPPER SPINE RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



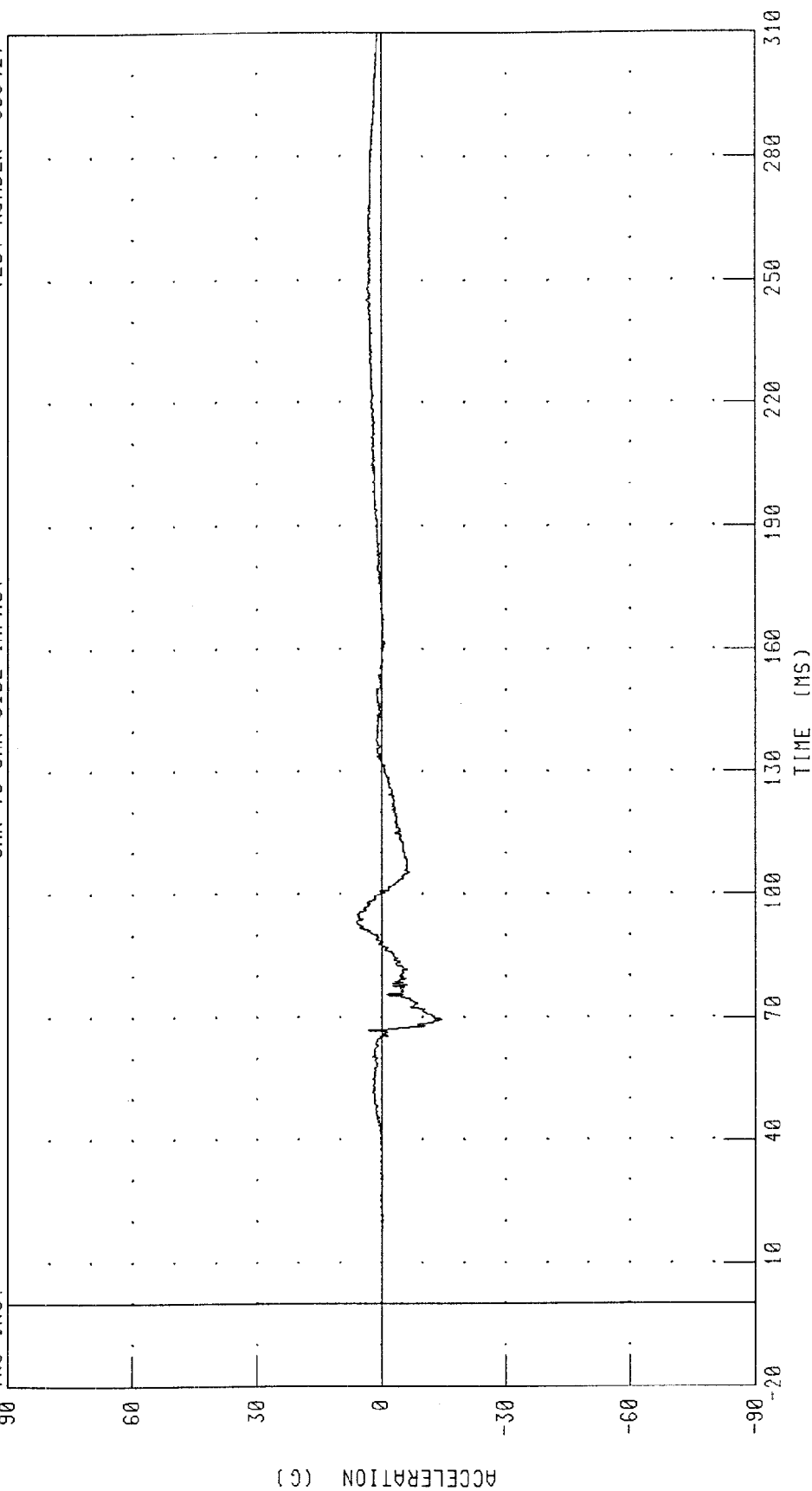
PEAK DATA: 116.07 G @ 48.75 MS; 0.00 G @ -14.37 MS

CHANNEL: T01RC1 FILTER: FIR 100

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

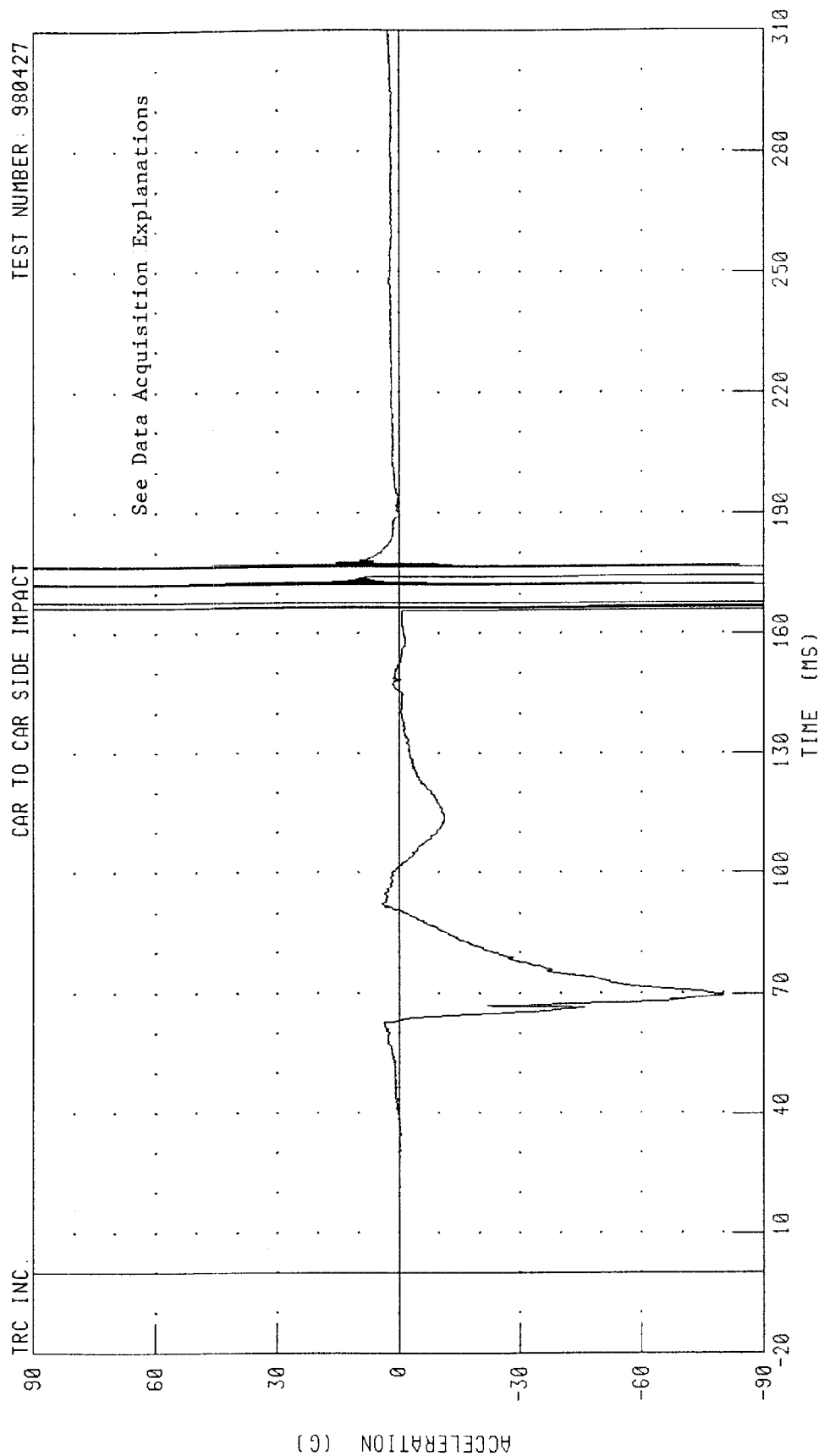
TEST NUMBER: 980427

TRC INC.



CHANNEL: HEDXC4 FILTER: CH. CLASS 1000

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION

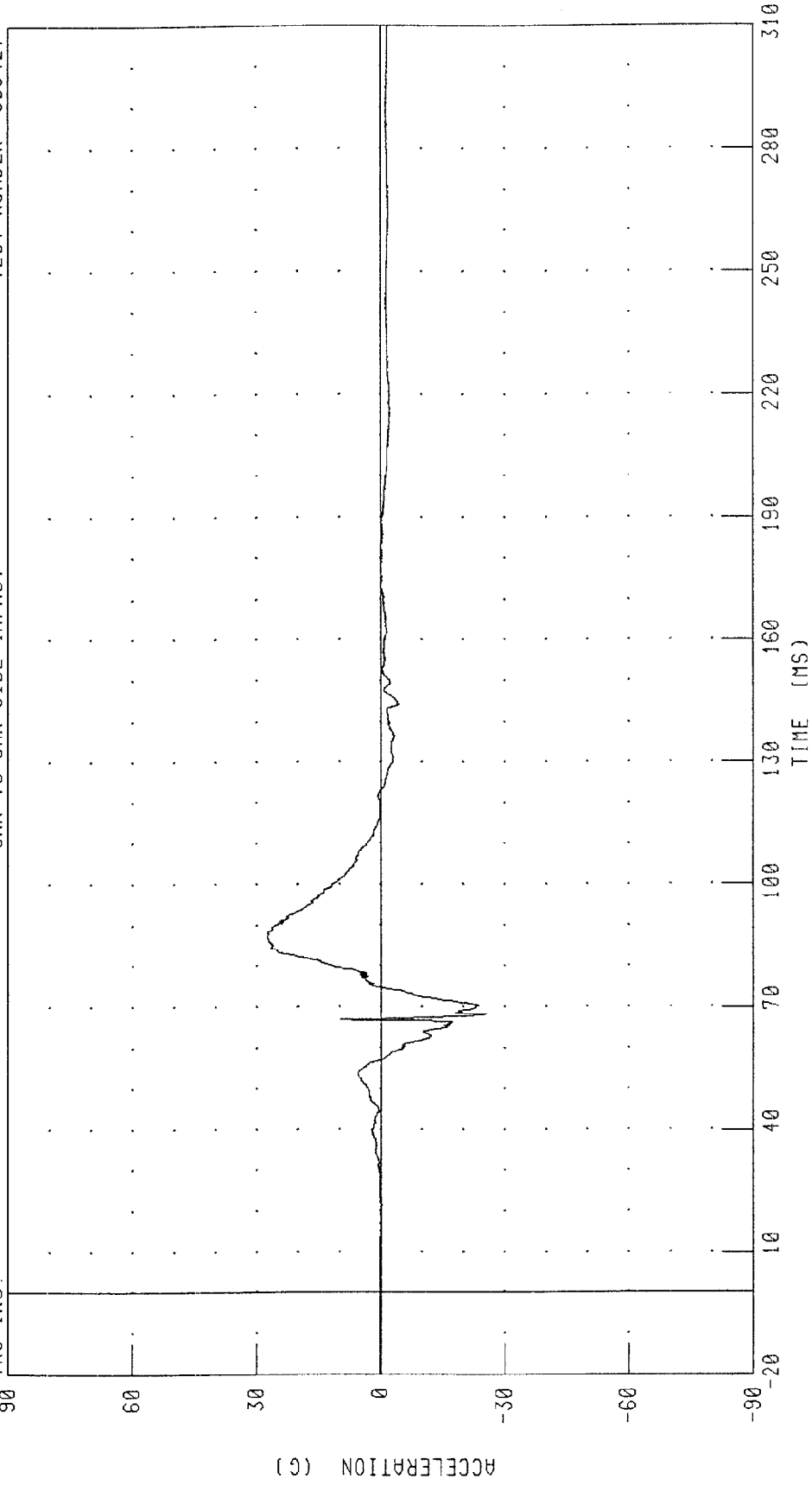


CHANNEL: HEDYC4 FILTER: CH. CLASS 1000 PEAK DATA: 220.21 G @ 172.32 MS, -402.87 G @ 166.24 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: HEDZG4 FILTER: CH. CLASS 1000

PEAK DATA: 27.40 G @ 87.04 MS; -25.61 G @ 68.24 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

120

100

80

60

40

20

0

-20

ACCELERATION (G)

See Data Acquisition Explanations

TIME (MS)

10 40 70 100 130 160 190 220 250 280 310

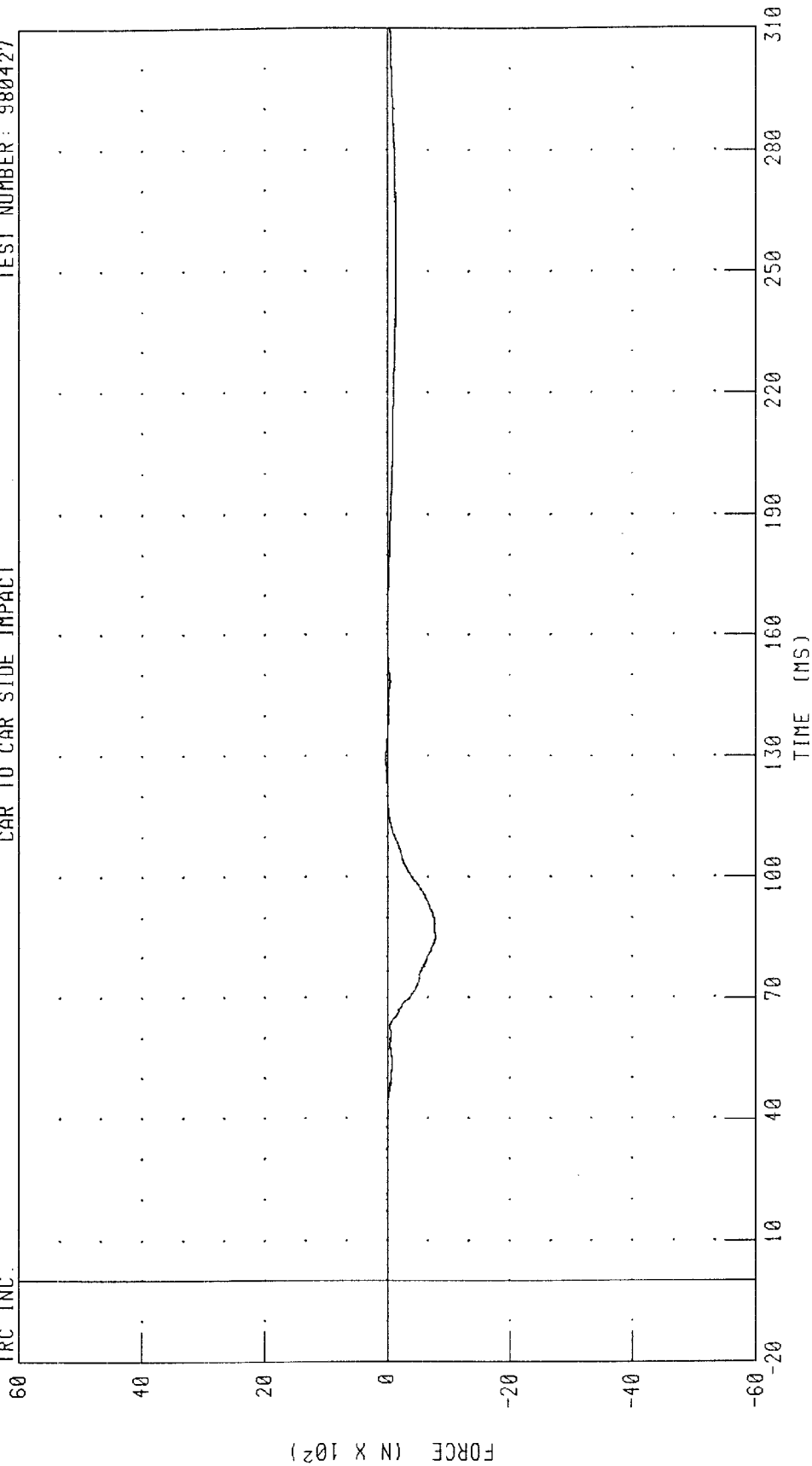
PEAK DATA: 402.87 G @ 166.24 MS, 0.02 G @ -20.00 MS

CHANNEL: HEDRC4 FILTER: CH. CLASS 1000

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER NECK X-AXIS SHEAR FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



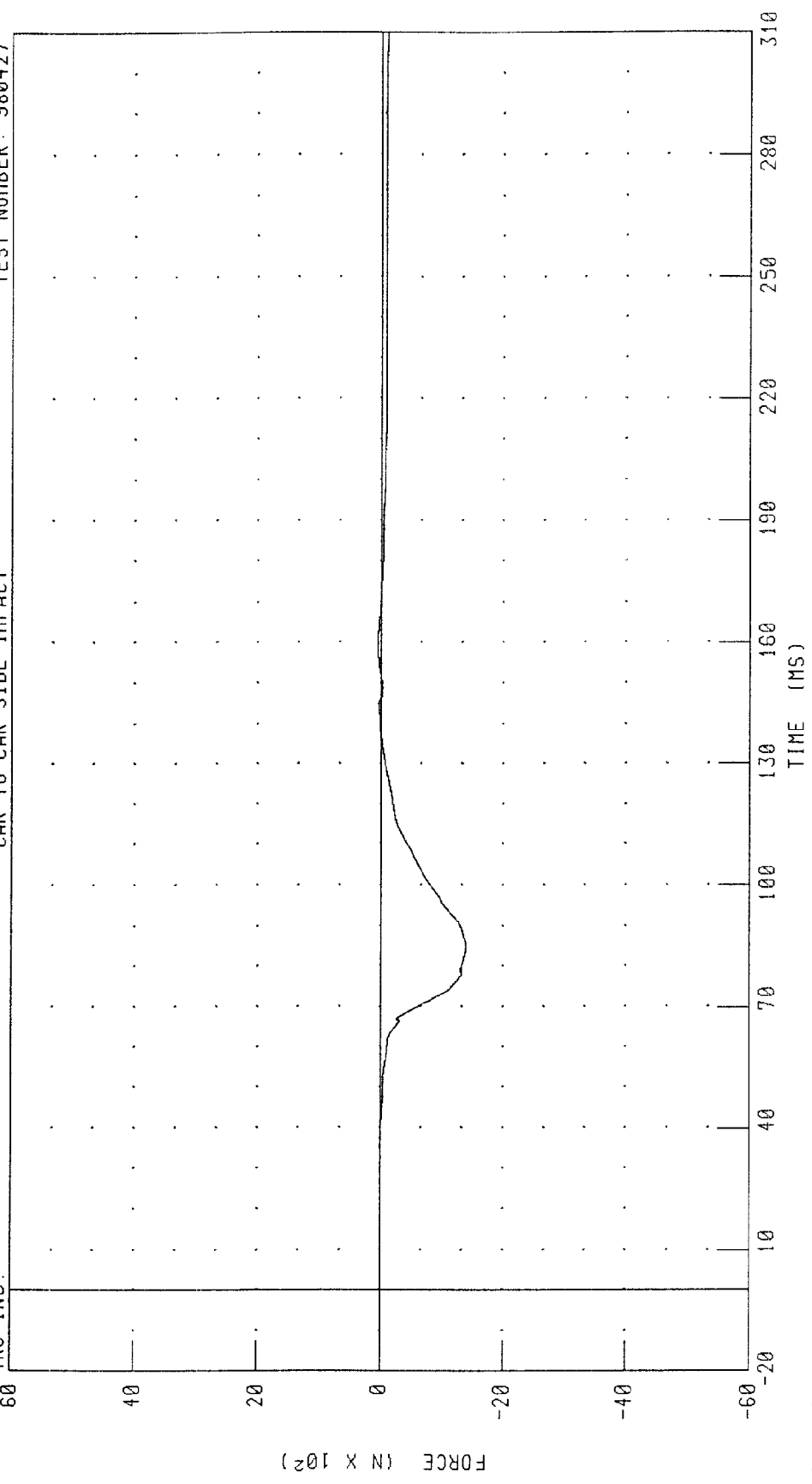
PEAK DATA: 26.06 N @ 129.44 MS; -790.70 N @ 85.20 MS

CHANNEL: NEKXF4 FILTER: CH. CLASS 1000

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT REAR PASSENGER NECK Y-AXIS SHEAR FORCE
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: NEKYF4 FILTER: CH. CLASS 1000 PEAK DATA: 43.70 N @ 156.88 MS, -1400.12 N @ 84.32 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER NECK Z-AXIS AXIAL FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

0

-20

-40

-60

FORCE (N X 10²)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

CHANNEL: NEKZF4 FILTER: CH. CLASS 1000

PEAK DATA: 482.47 N @ 62.88 MS, -1603.62 N @ 73.76 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER NECK MOMENT ABOUT X AXIS

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

180

120

60

0

-60

-120

-180

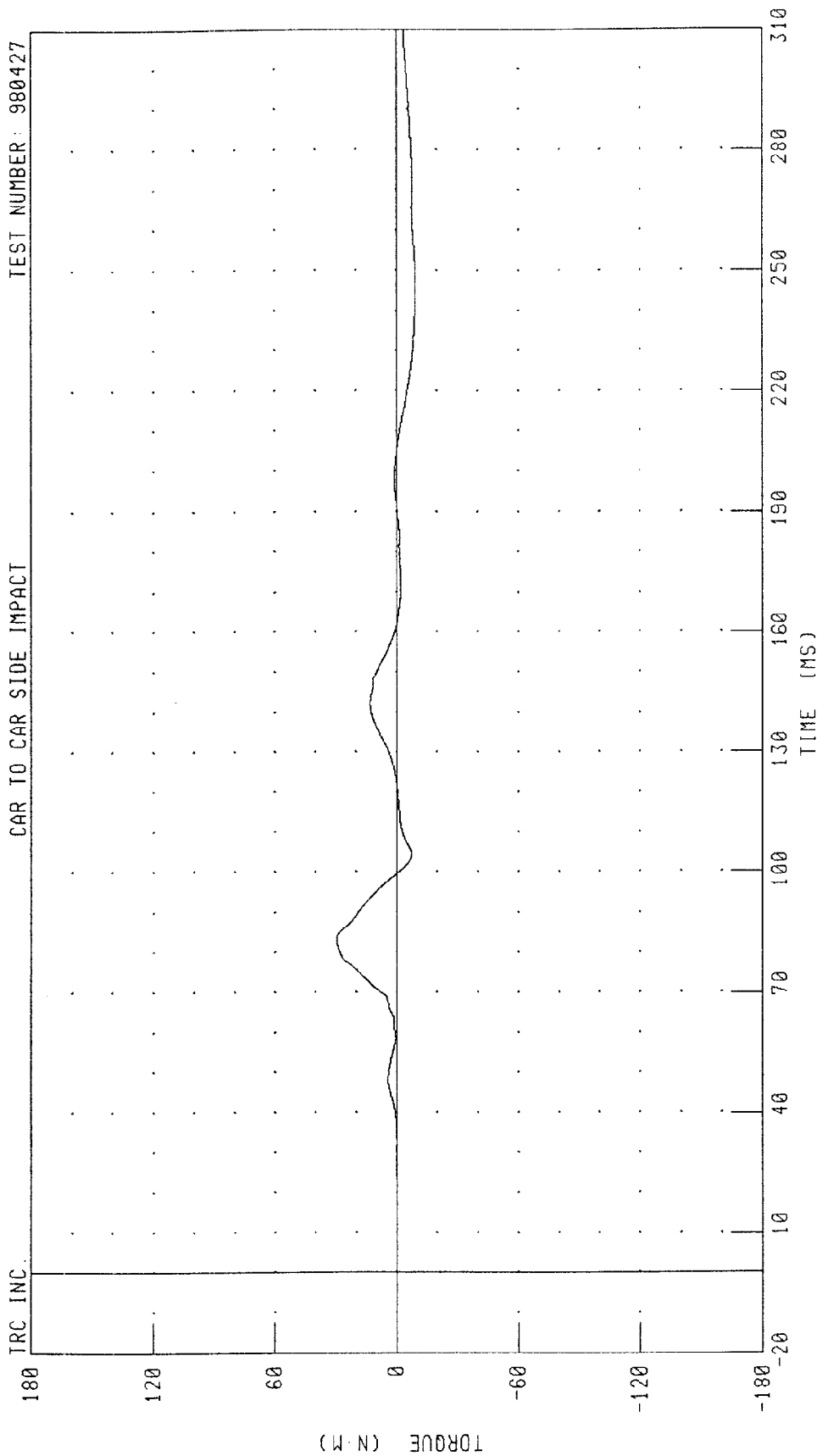
TORQUE (N·M)

TIME (MS)

CHANNEL: NEKX14 FILTER: CH. CLASS 600

PEAK DATA: 23.05 N·M @ 70.24 MS, -17.81 N·M @ 148.56 MS

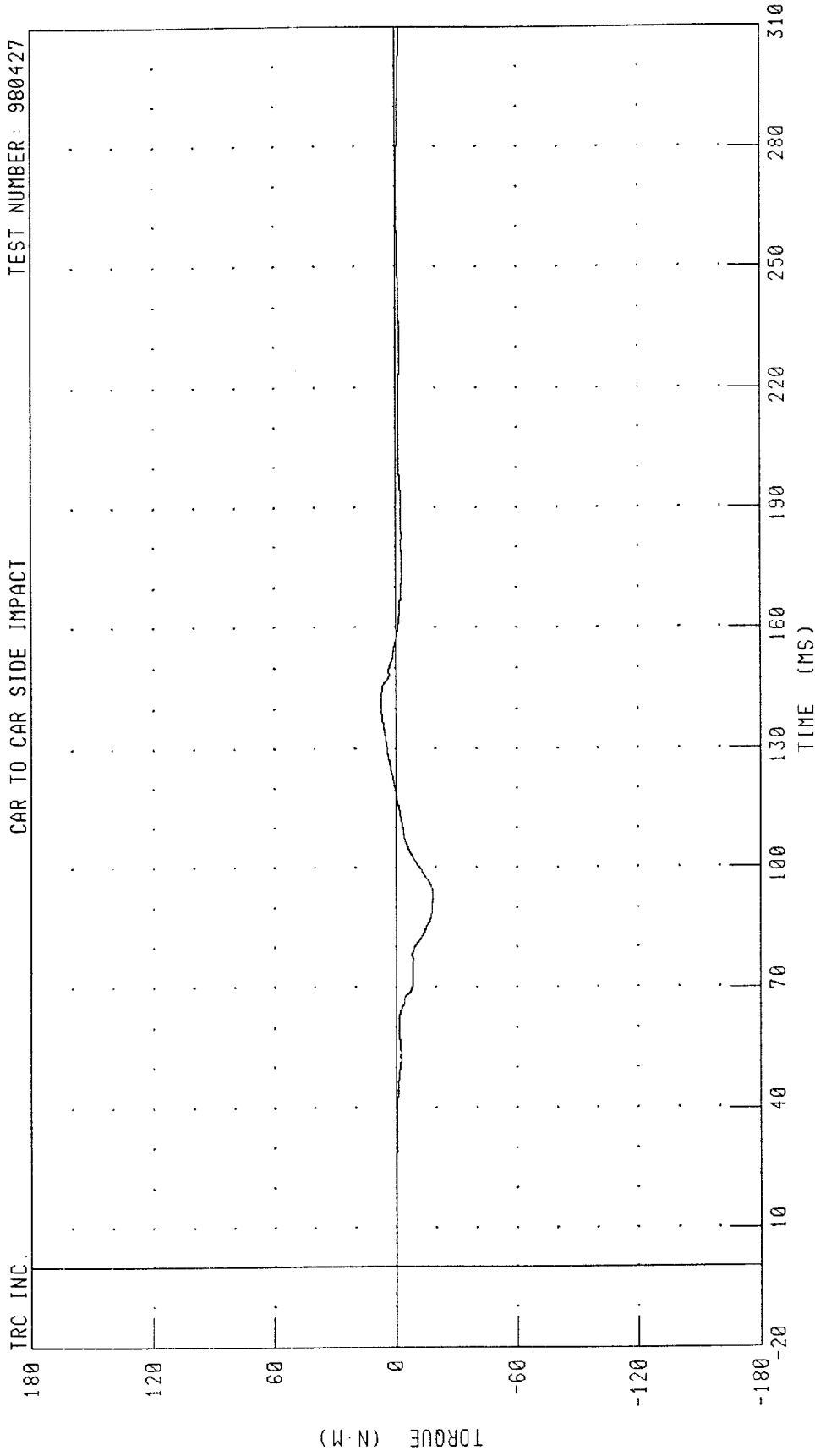
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER NECK MOMENT ABOUT Y AXIS



CHANNEL: NEKYM4 FILTER: CH. CLASS 600

PEAK DATA: 29.27 N-M @ 82.16 MS, -9.52 N-M @ 245.36 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT REAR PASSENGER NECK MOMENT ABOUT Z AXIS

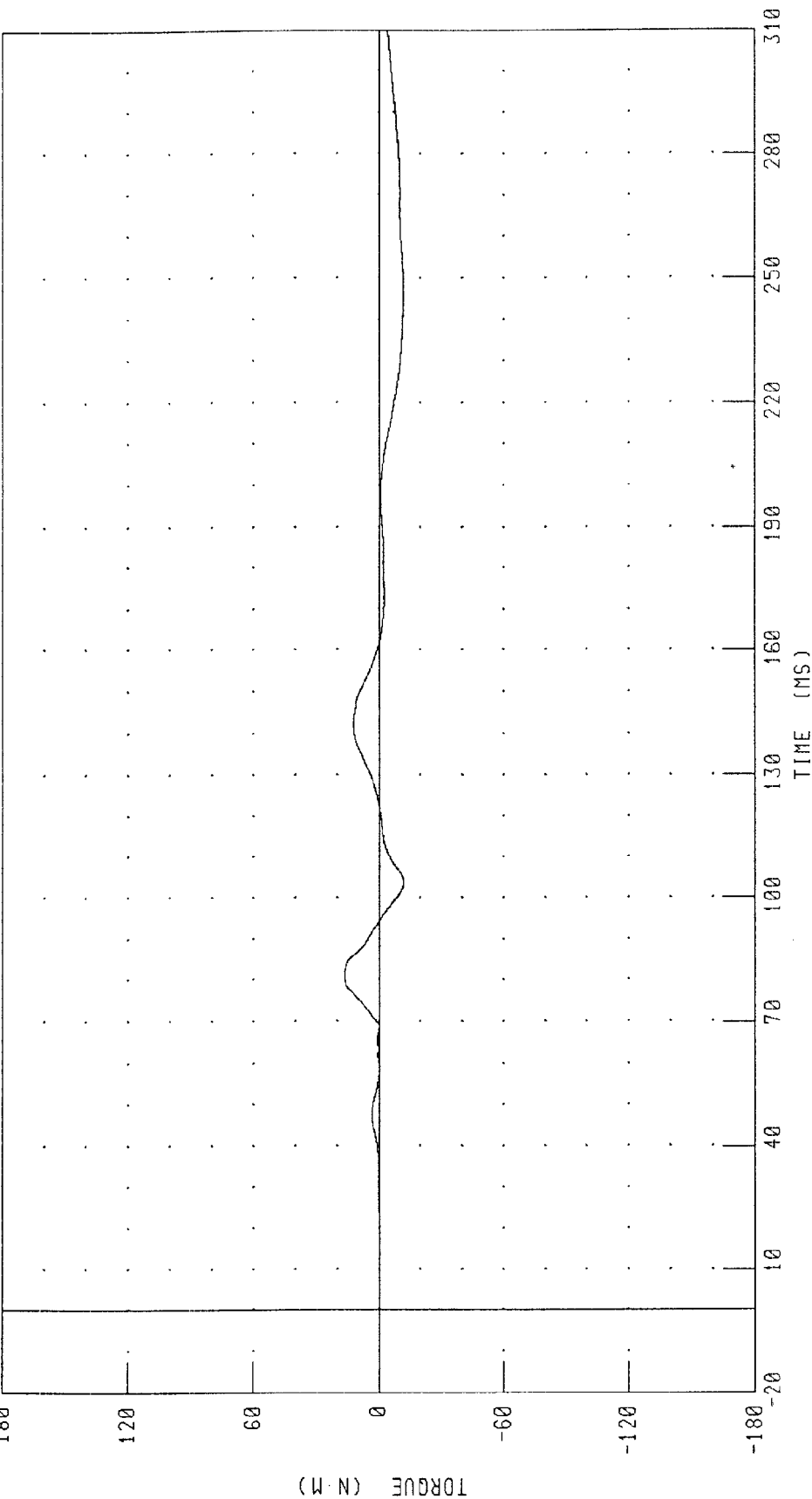


CHANNEL: NEKZM4 FILTER: CH. CLASS 600

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER NECK OCCIPITAL CONDYLE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



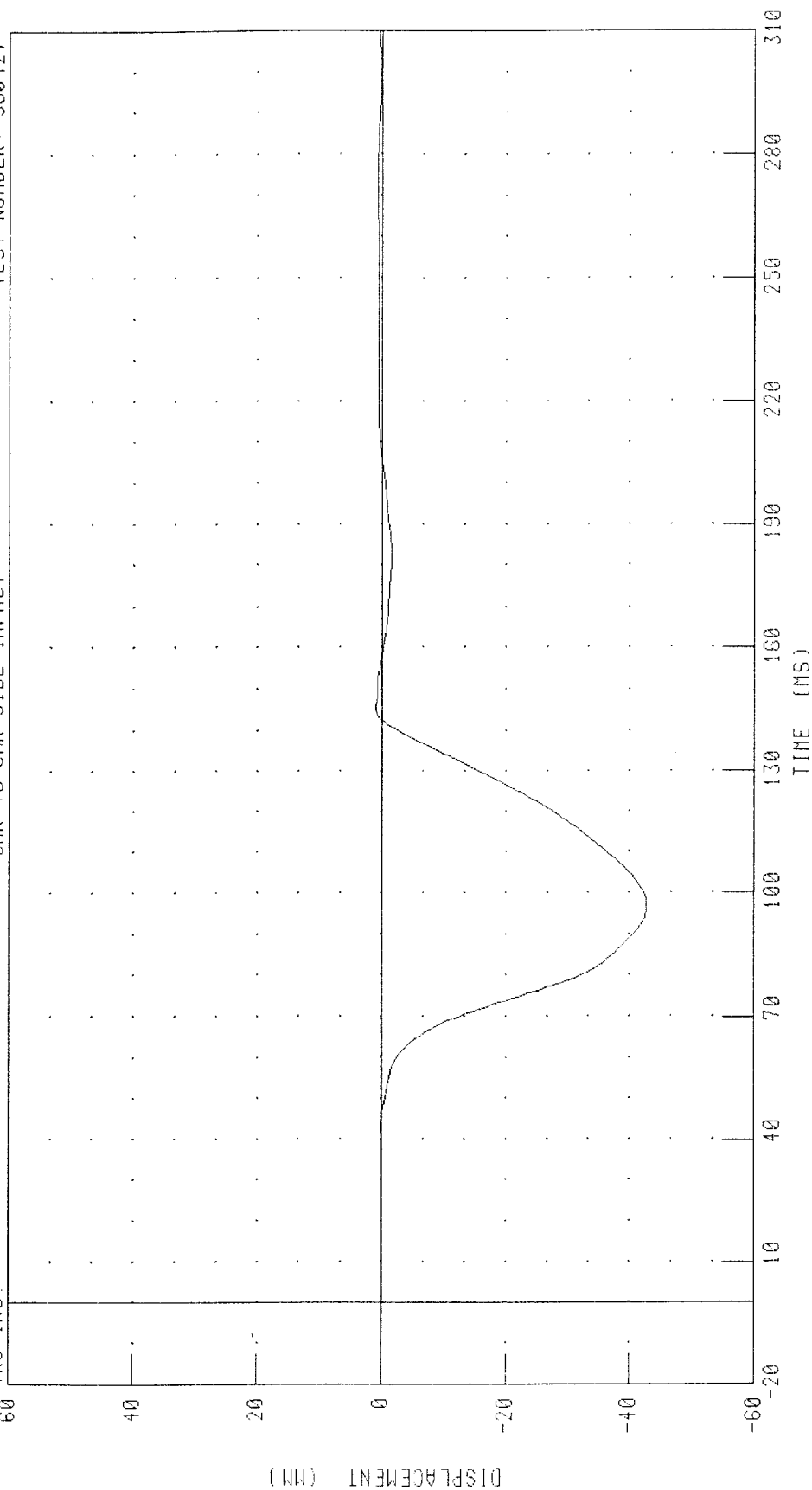
CHANNEL: NEKOM4 FILTER: CH. CLASS 600

PEAK DATA: 16.61 N-M @ 80.96 MS, -12.08 N-M @ 103.60 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER CHEST DEFLECTION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

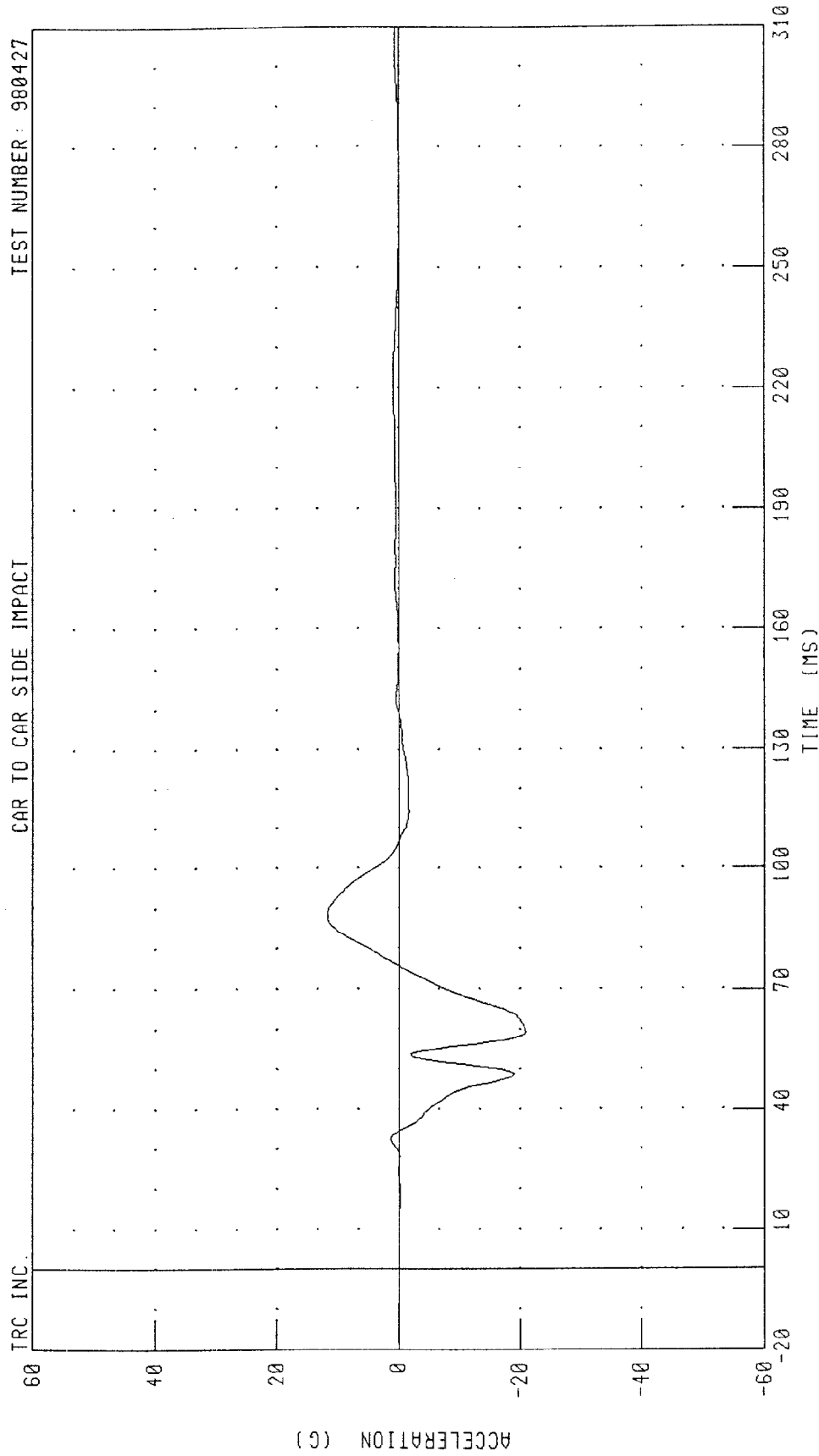
TRC INC.



CHANNEL: CSTYD4 FILTER: FIR 100

PEAK DATA: 0.94 MM @ 145.63 MS, -42.83 MM @ 96.88 MS

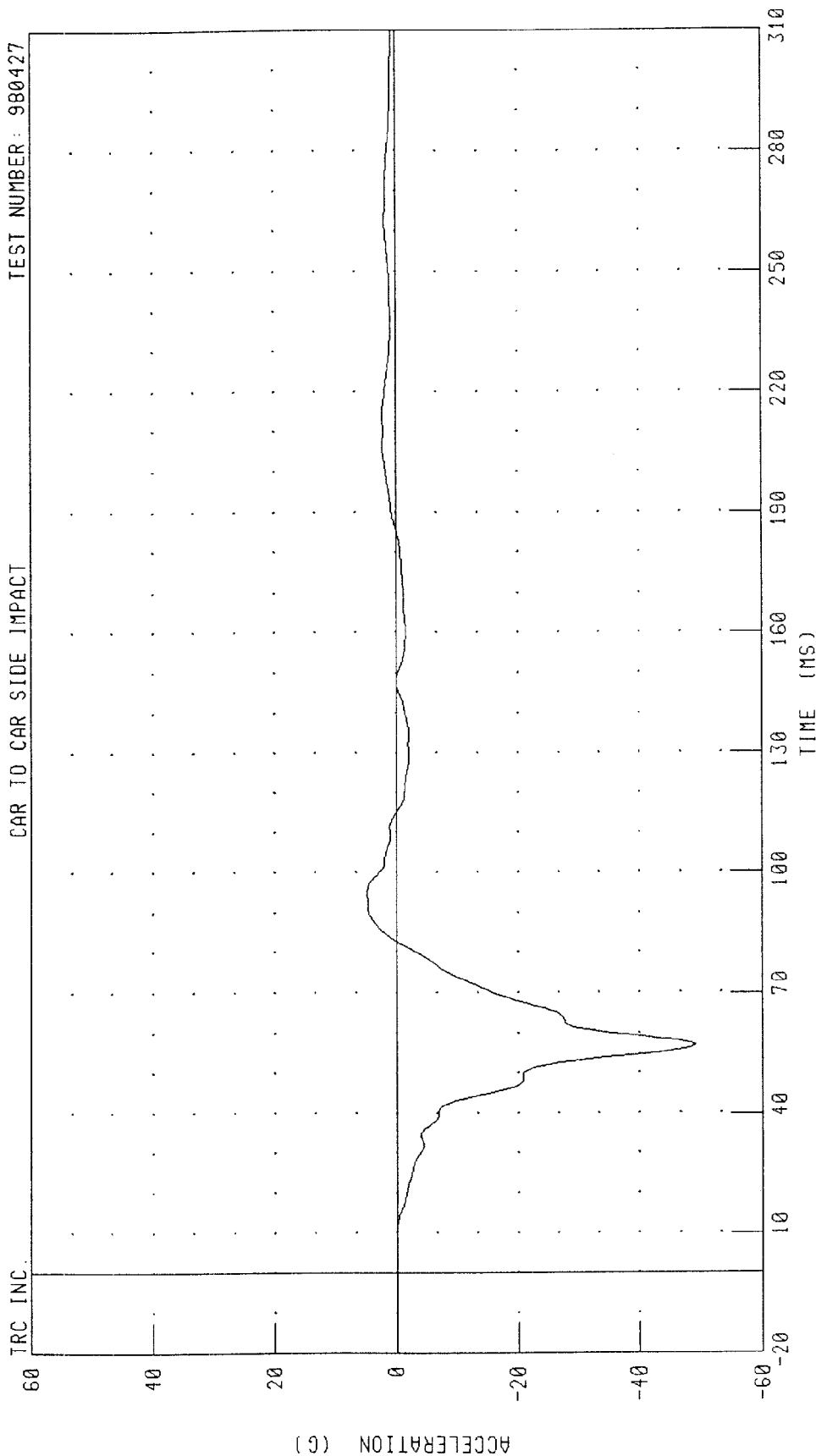
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER PELVIS X-AXIS ACCELERATION



CHANNEL: PEVXC4 FILTER: FIR 100

PEAK DATA: 11.67 G @ 88.13 MS, -21.03 G @ 59.38 MS

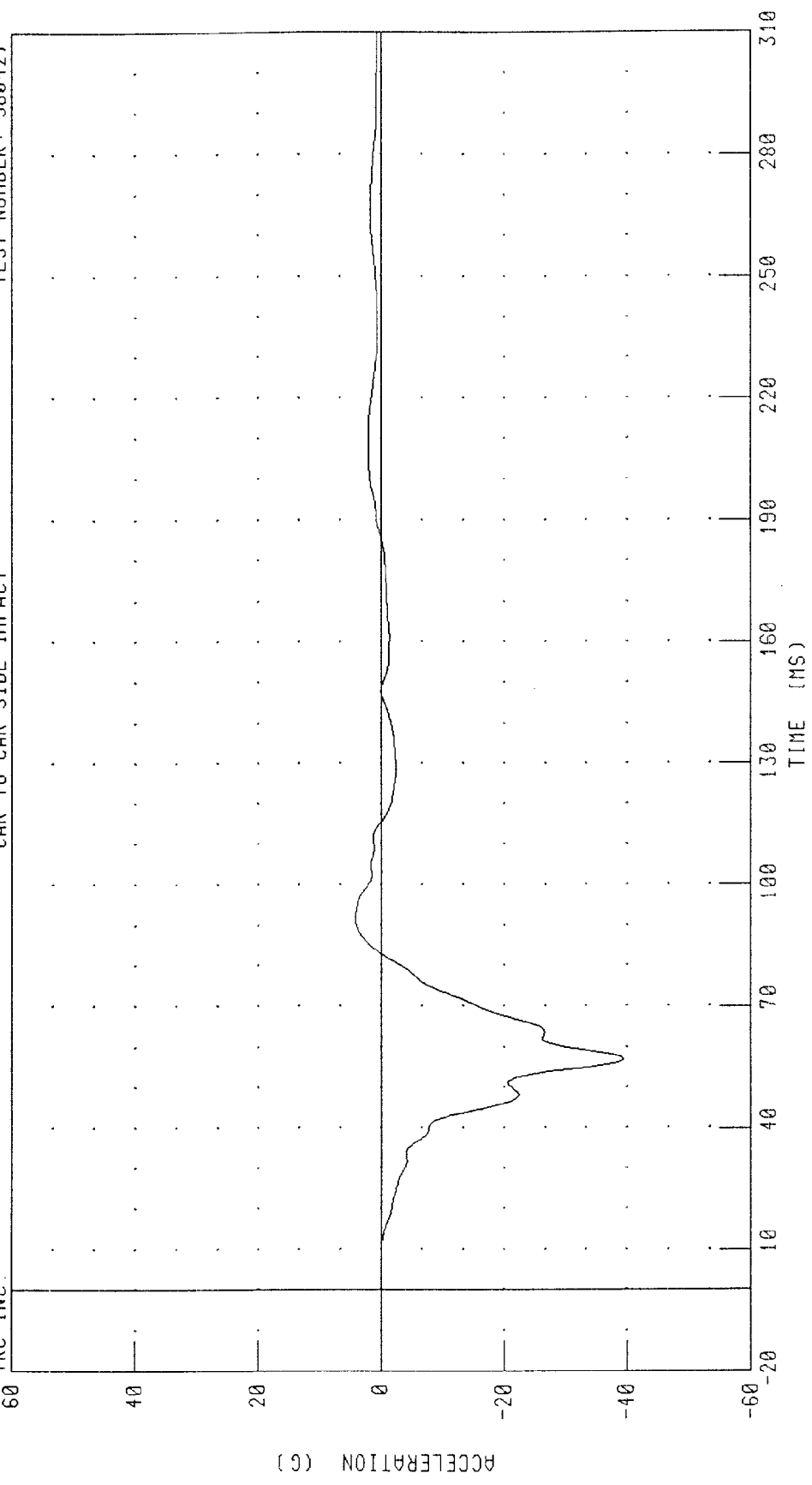
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION



1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER PELVIS Y-AXIS REDUNDANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: PEVYR4 FILTER: FIR 100 PEAK DATA: 4.21 G @ 91.25 MS; -39.53 G @ 56.87 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT REAR PASSENGER PELVIS Z-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

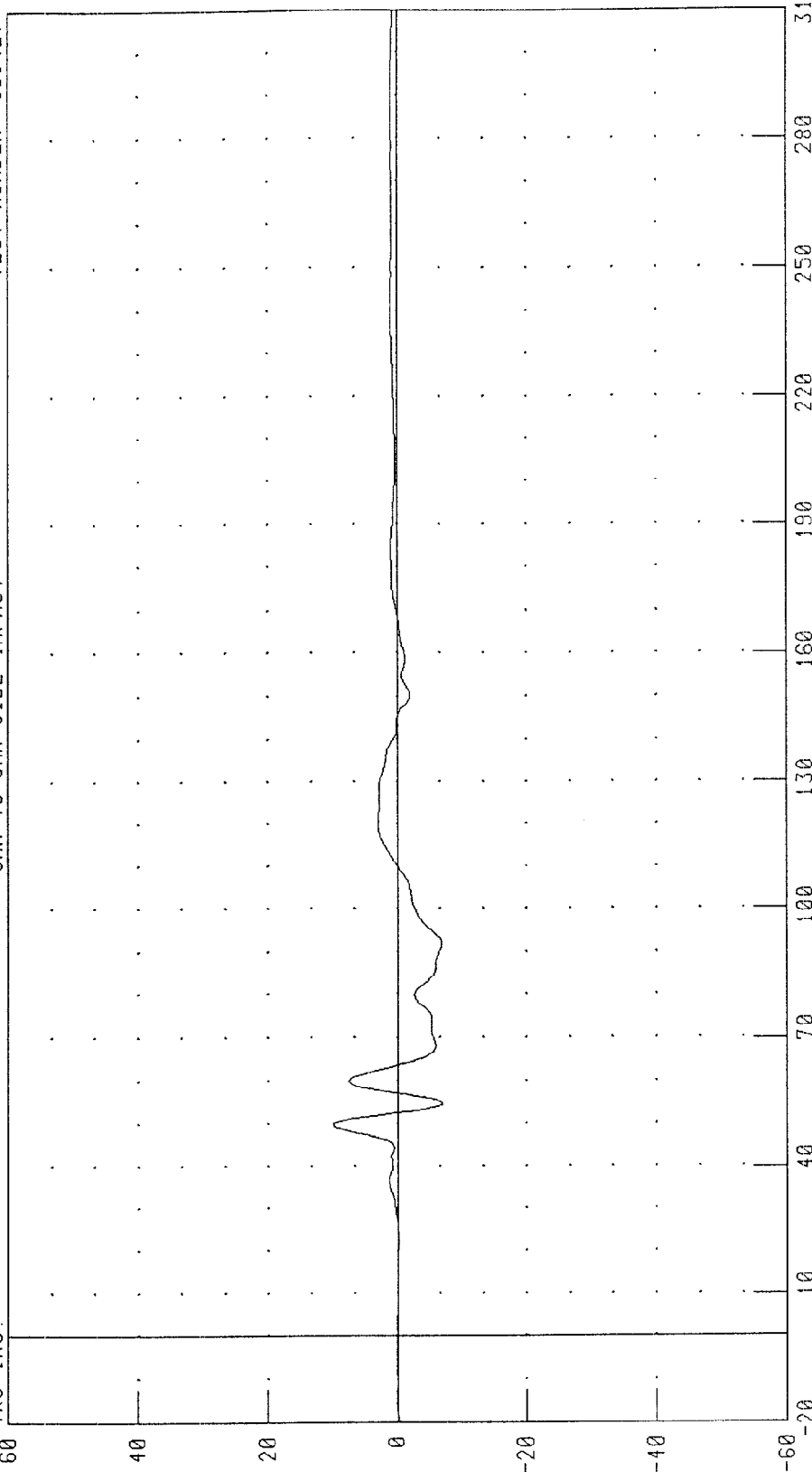
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

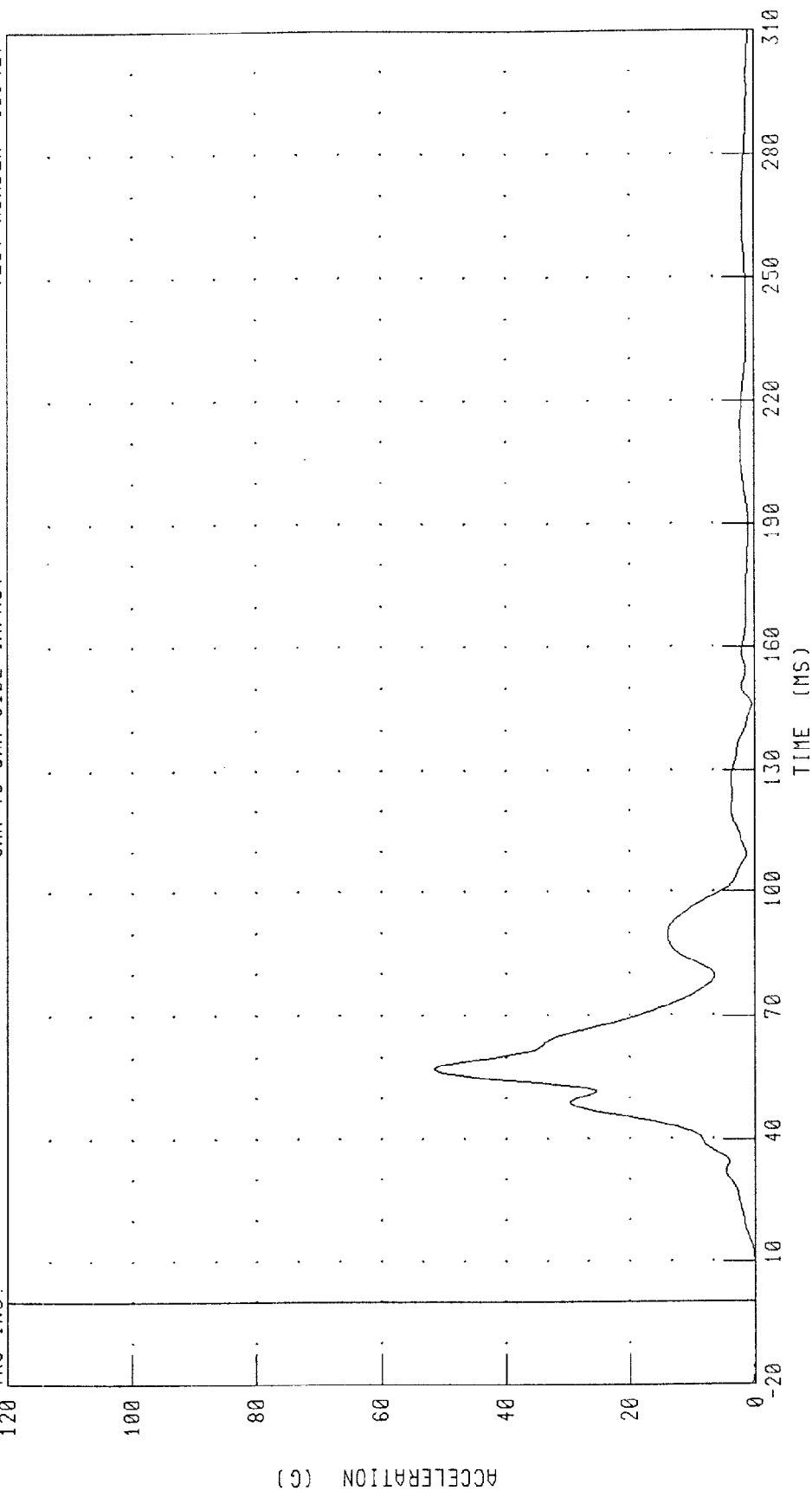
PEAK DATA: 9.89 G @ 50.00 MS; -7.09 G @ 55.00 MS

CHANNEL: PEVZC4 FILTER: FIR 100

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER PELVIS RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: PEVRC4 FILTER: FIR 100

PEAK DATA: 51.54 G @ 57.50 MS, 0.01 G @ 5.62 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

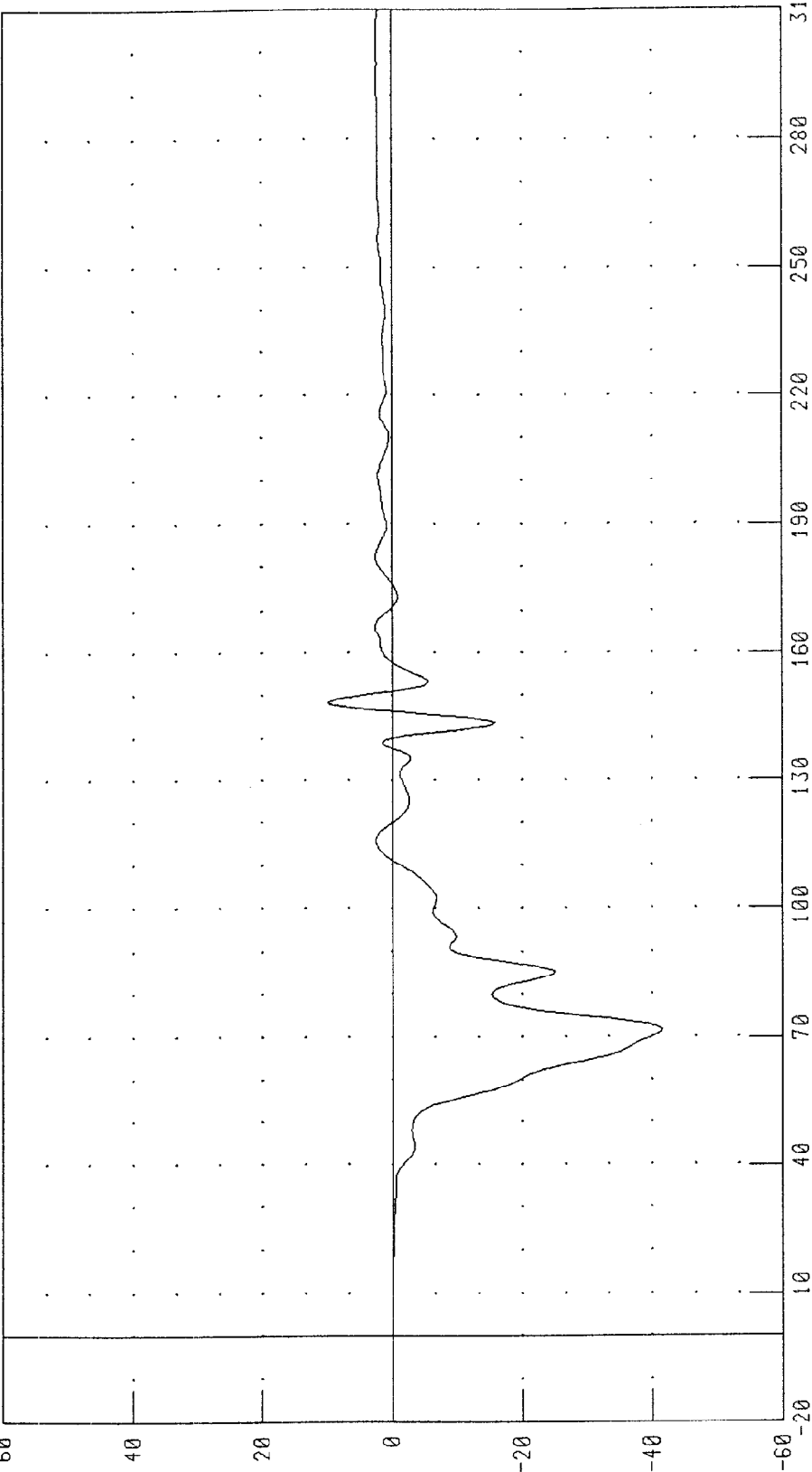
0

-20

-40

-60

ACCELERATION (G)

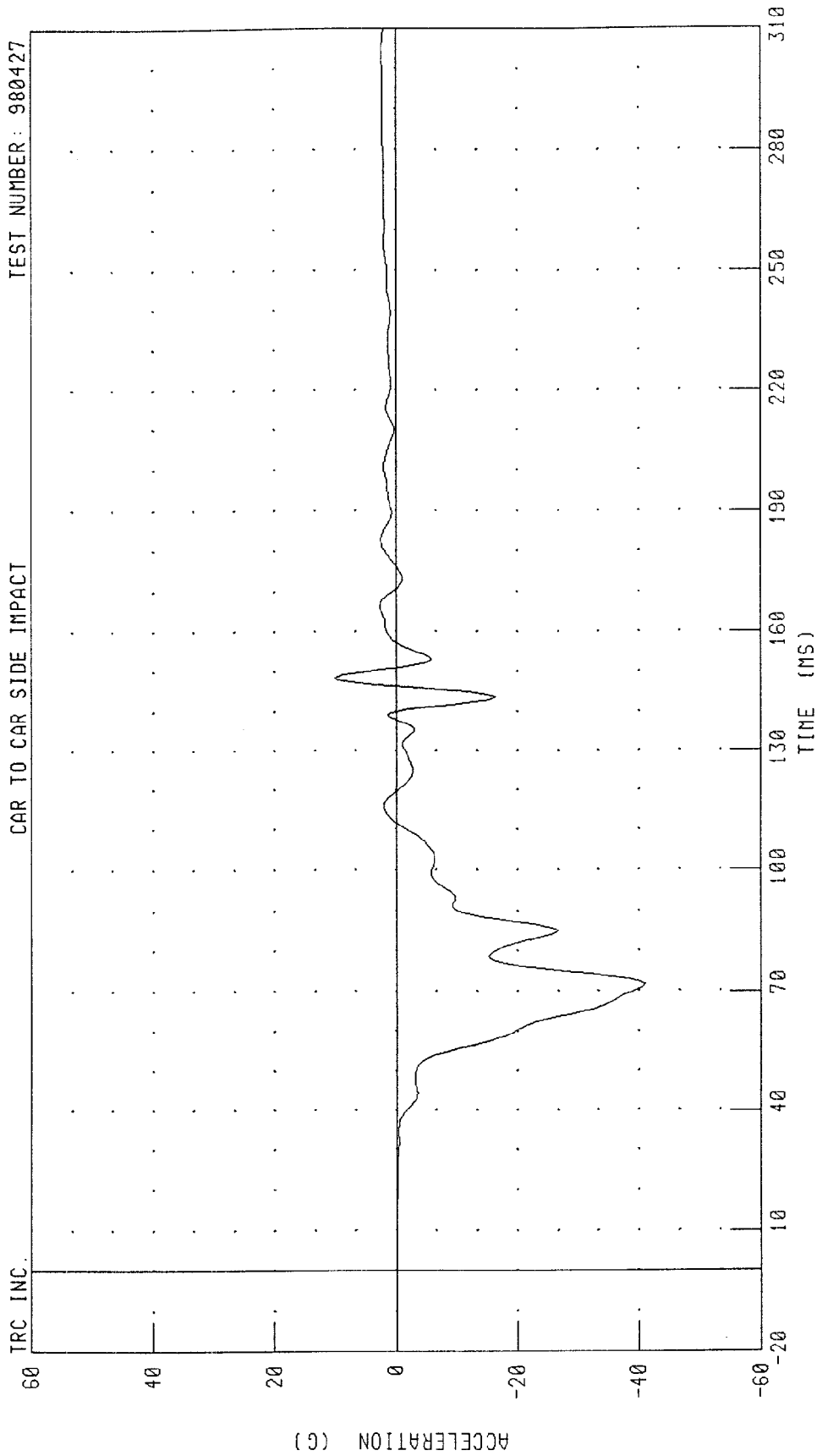


TIME (MS)

CHANNEL: LURYG4 FILTER: FIR 100

PEAK DATA: 9.81 G @ 148.75 MS; -41.59 G @ 71.88 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT REAR PASSENGER LEFT UPPER THORAX RIB Y-AXIS REDUNDANT ACCELERATION
 CAR TO CAR SIDE IMPACT
 TEST NUMBER: 980427

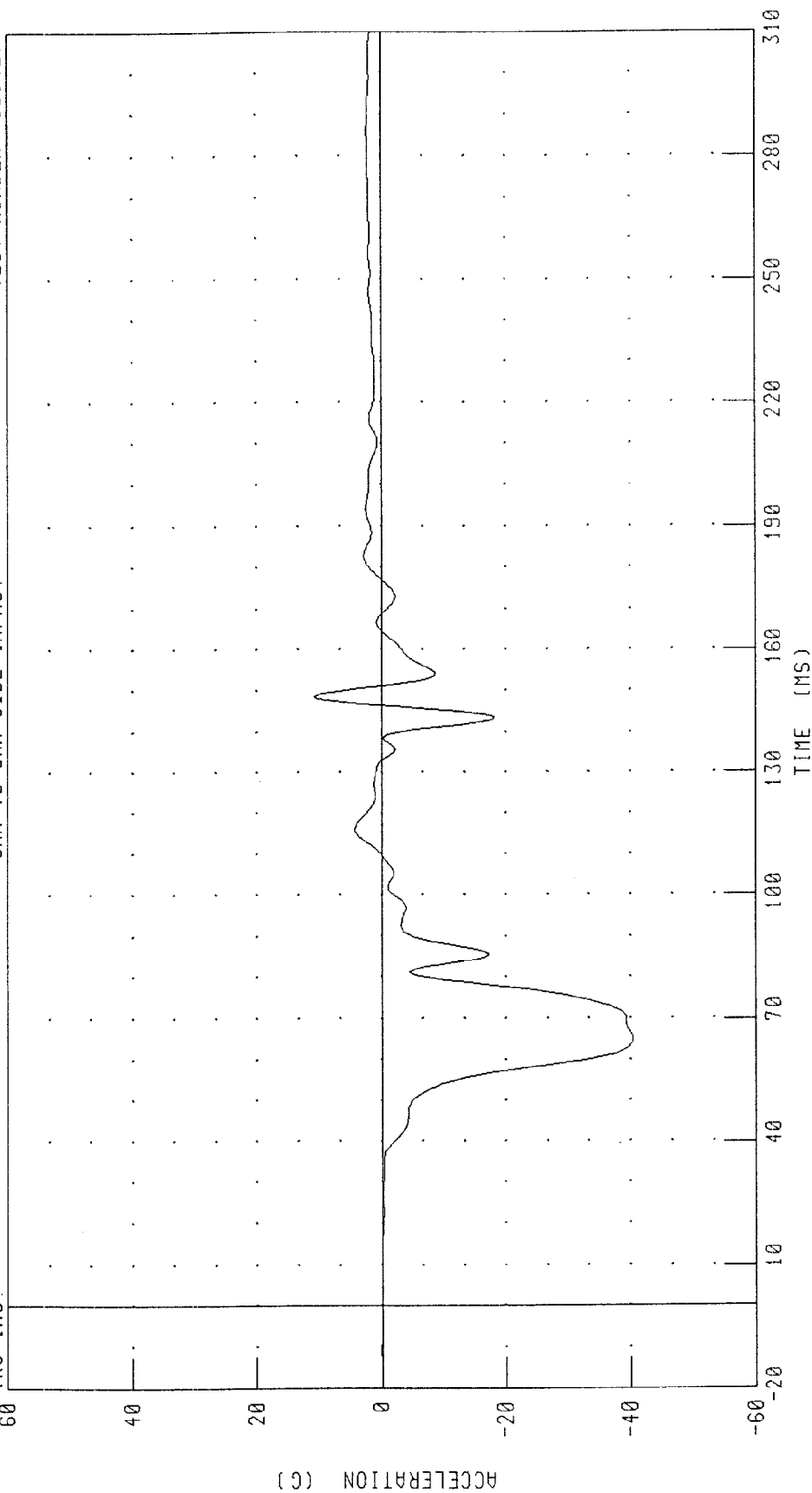


CHANNEL: LURYR4 FILTER: FIR 100 PEAK DATA: 10.09 G @ 148.75 MS; -40.97 G @ 71.88 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



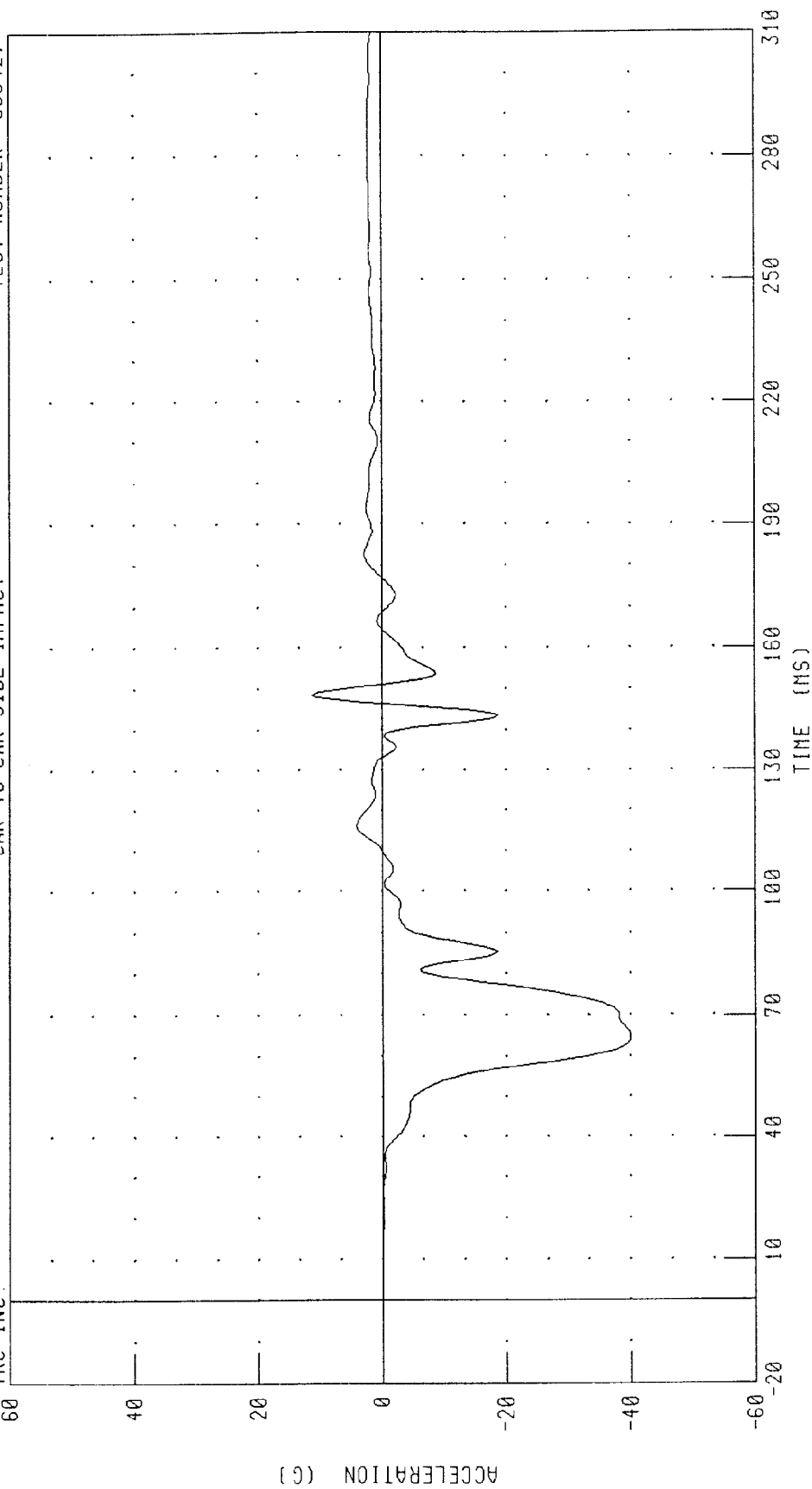
CHANNEL: LLRYC4 FILTER: FIR 100

PEAK DATA: 10.78 G @ 148.75 MS; -40.42 G @ 65.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LEFT LOWER THORAX RIB Y-AXIS REDUNDANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

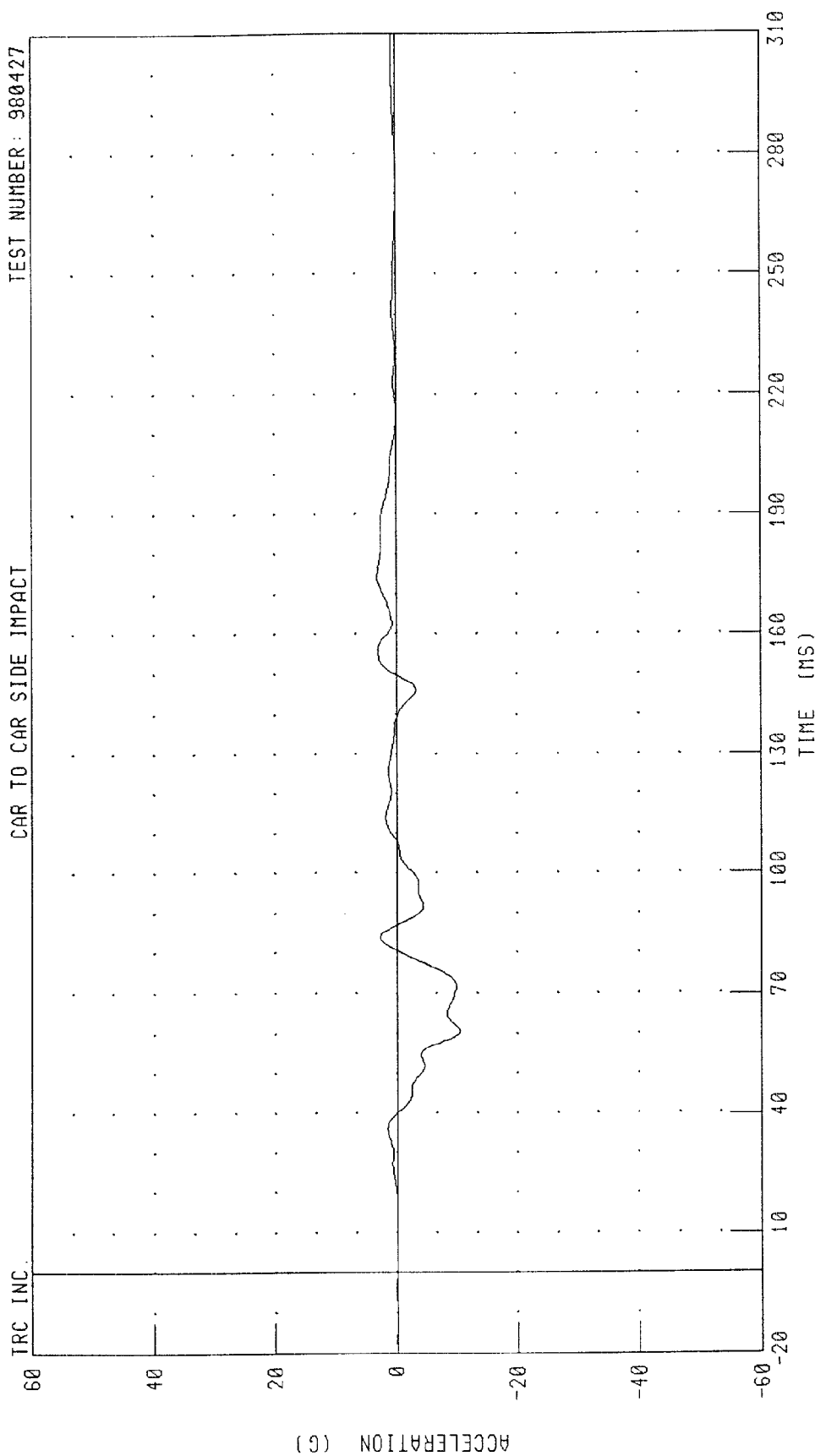
TRC INC.



CHANNEL: LLRYR4 FILTER: FIR 100

PEAK DATA: 11.21 G @ 148.75 MS, -40.08 G @ 65.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LOWER SPINE X-AXIS ACCELERATION

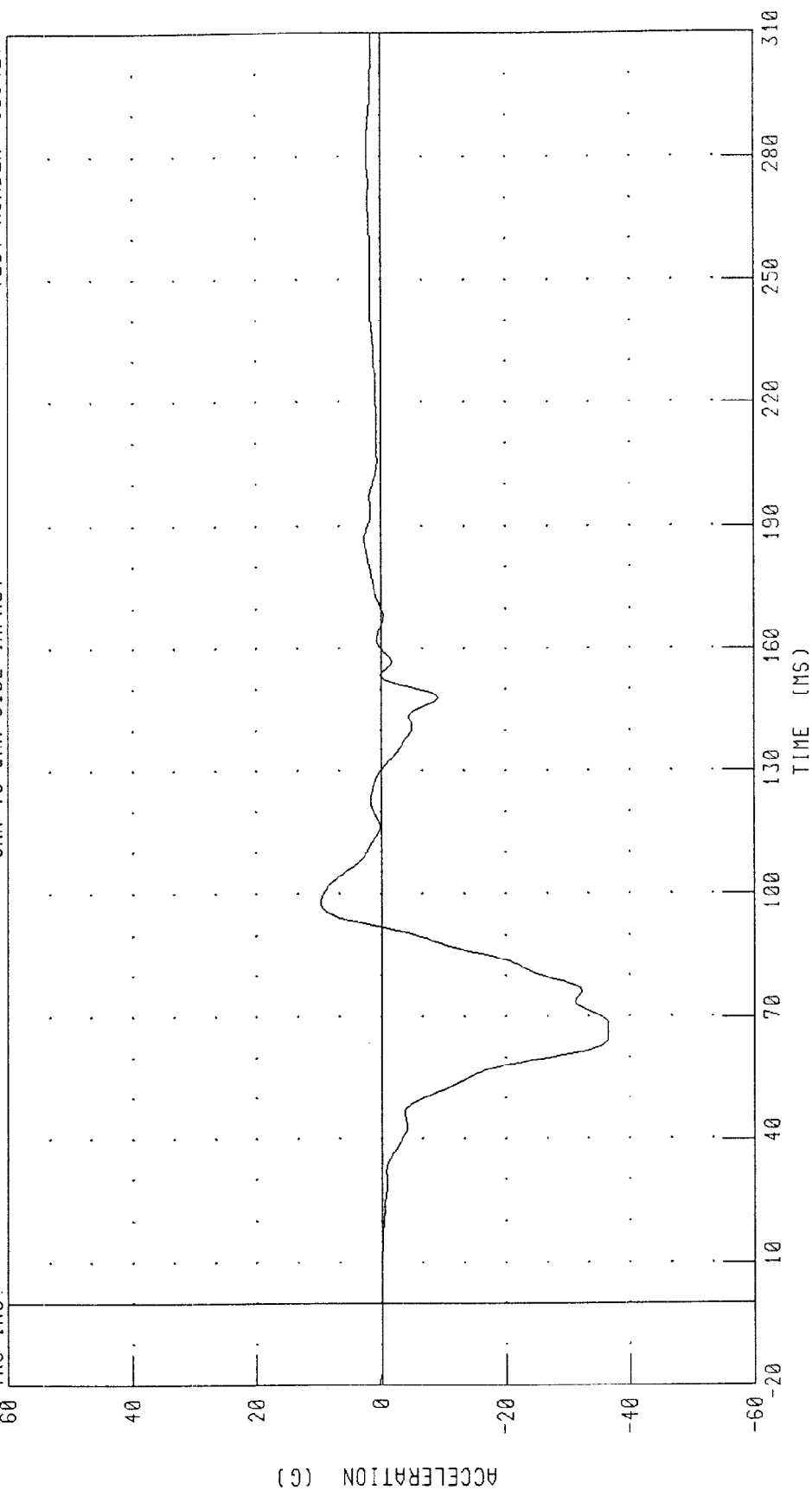


CHANNEL: T12X04 FILTER: FIR 100

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



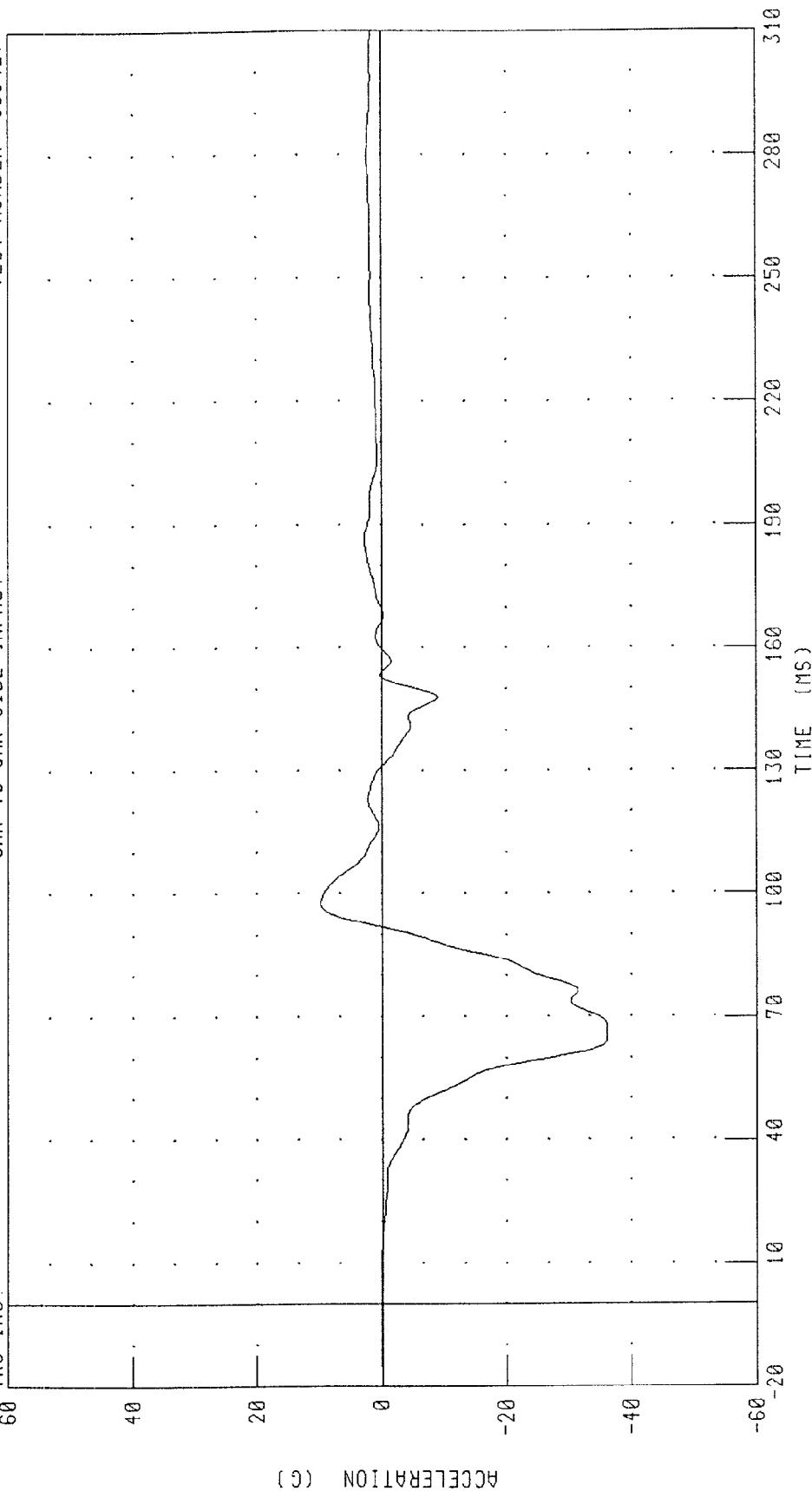
CHANNEL: T12YC4 FILTER: FIR 100

PEAK DATA: 9.63 G @ 98.12 MS, -36.49 G @ 68.13 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: T12YR4 FILTER: FIR 100

PEAK DATA: 9.75 G @ 97.50 MS, -36.18 G @ 65.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LOWER SPINE Z-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

60

40

20

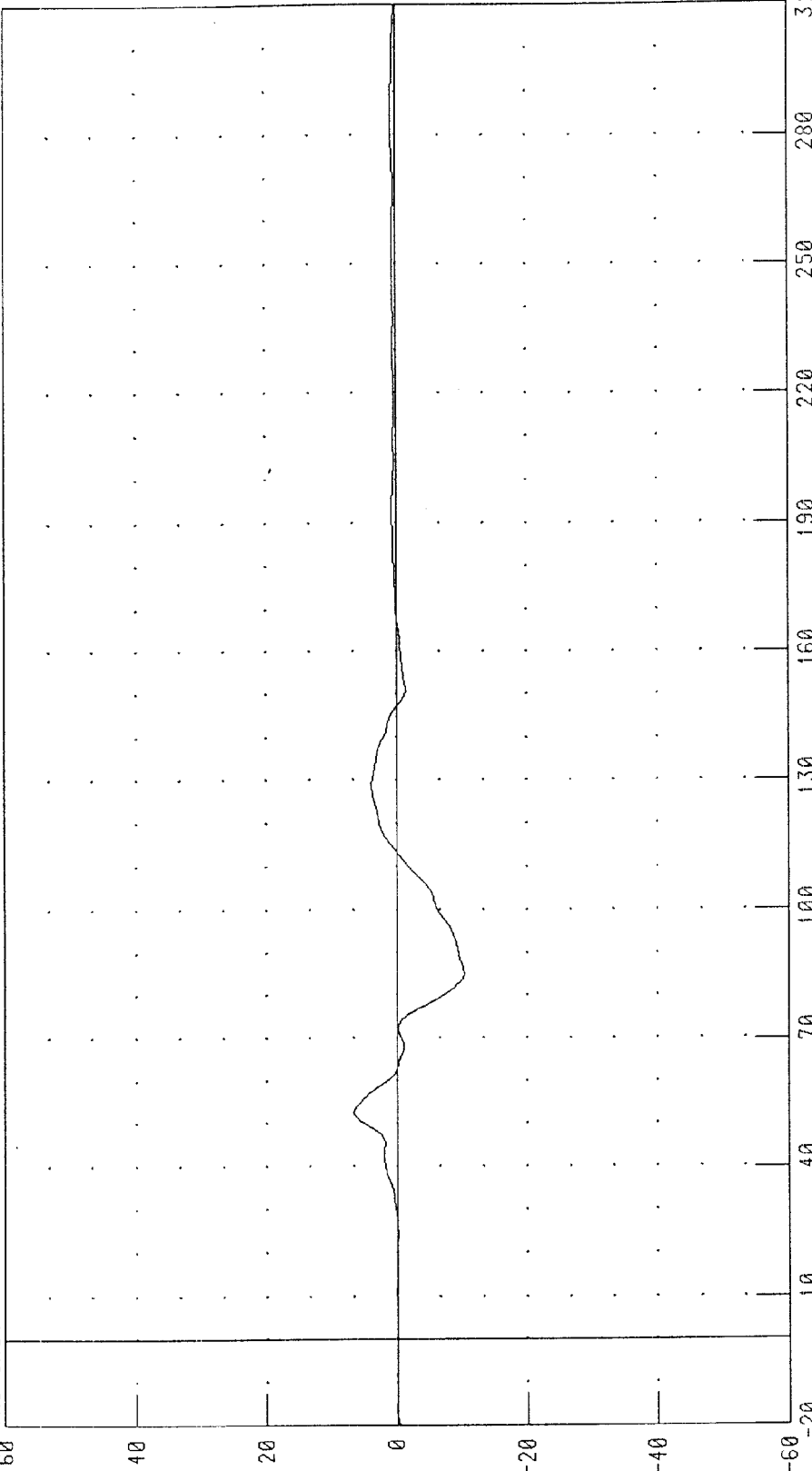
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

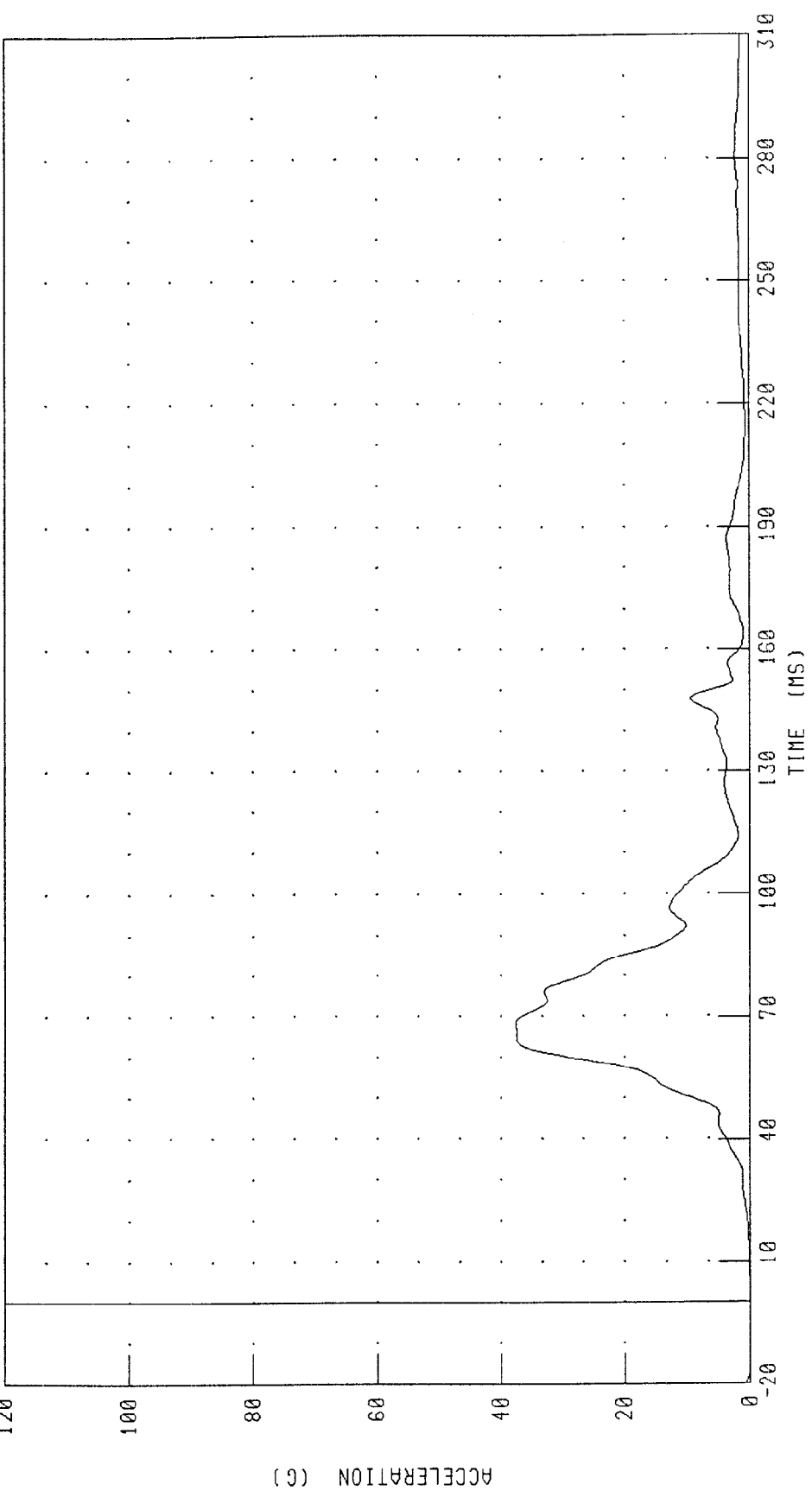
CHANNEL: T12ZG4 FILTER: FIR 100

PEAK DATA: 6.62 G @ 52.50 MS; -10.35 G @ 85.63 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER LOWER SPINE RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

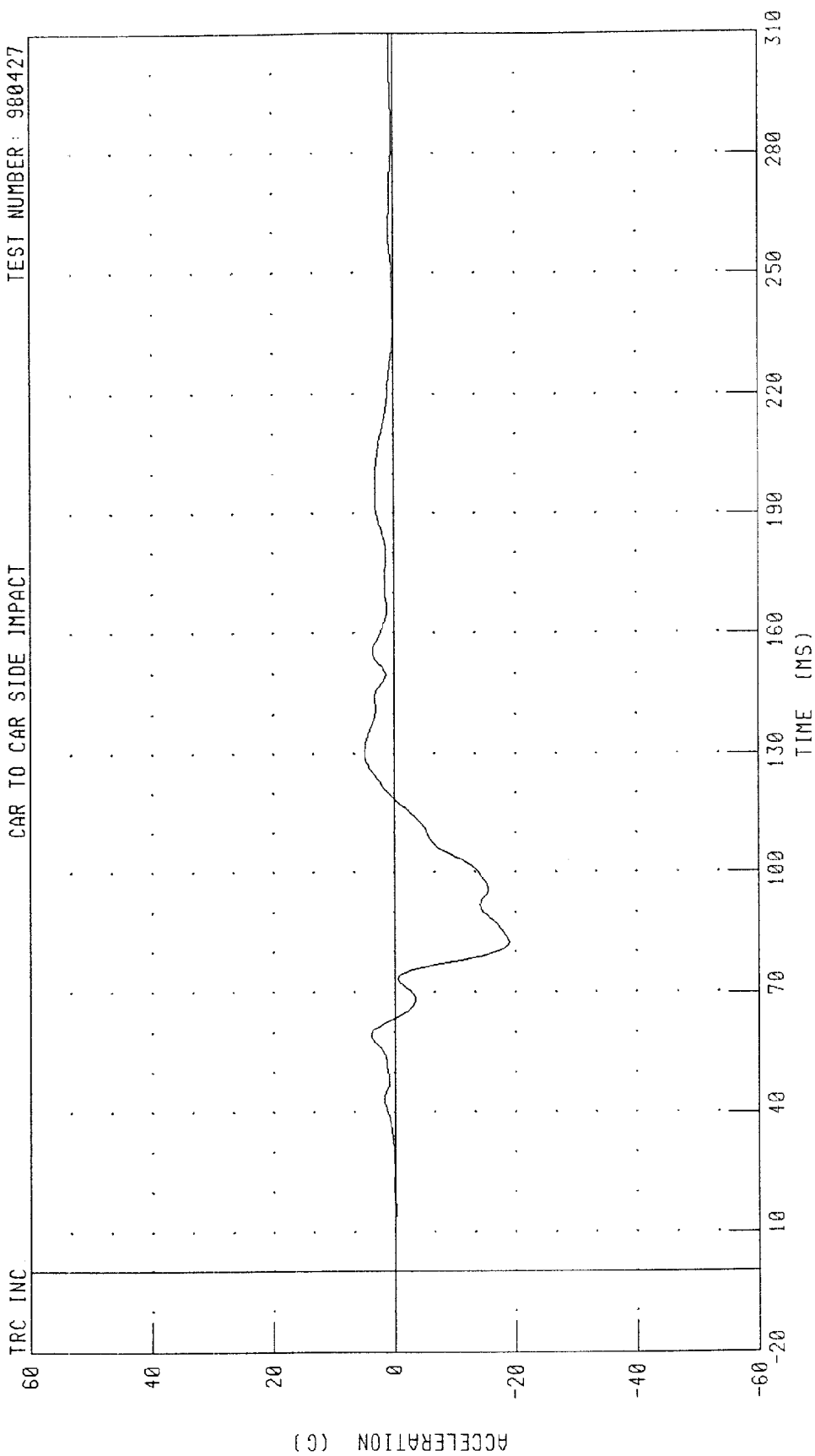


PEAK DATA: 37.64 G @ 68.13 MS; 0.01 G @ -7.50 MS

CHANNEL: T12RC4 FILTER: FIR 100

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT REAR PASSENGER UPPER SPINE X-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: T01XC4 FILTER: FIR 100

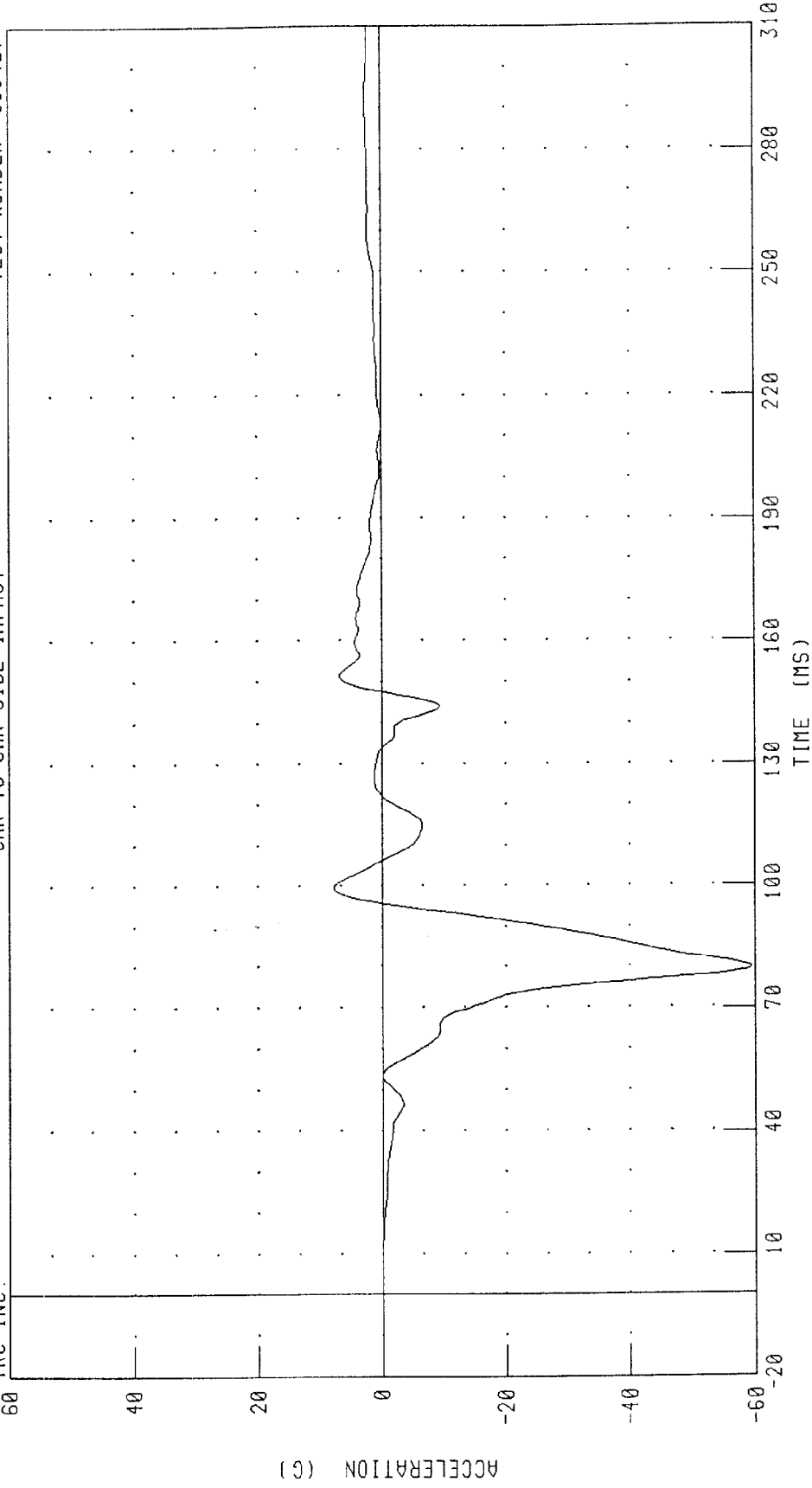
PEAK DATA: 4.82 G @ 130.00 MS, -18.96 G @ 82.50 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER UPPER SPINE Y-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



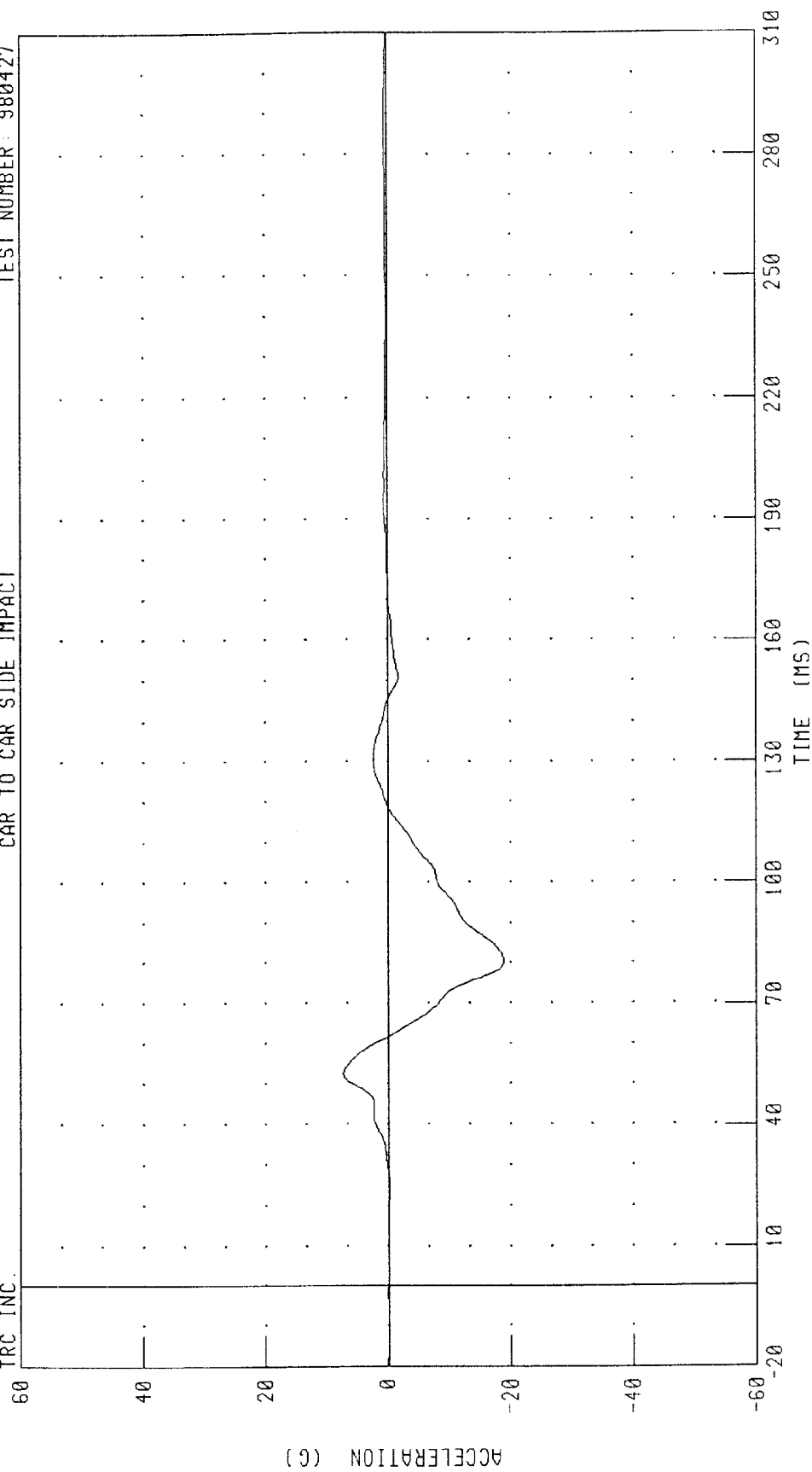
CHANNEL: T01V04 FILTER: FIR 100

PEAK DATA: 7.79 G @ 99.37 MS; -59.46 G @ 80.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER UPPER SPINE Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: T01Z04 FILTER: FIR 100

PEAK DATA: 7.37 G @ 52.50 MS; -18.93 G @ 80.63 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR PASSENGER UPPER SPINE RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

120

100

80

60

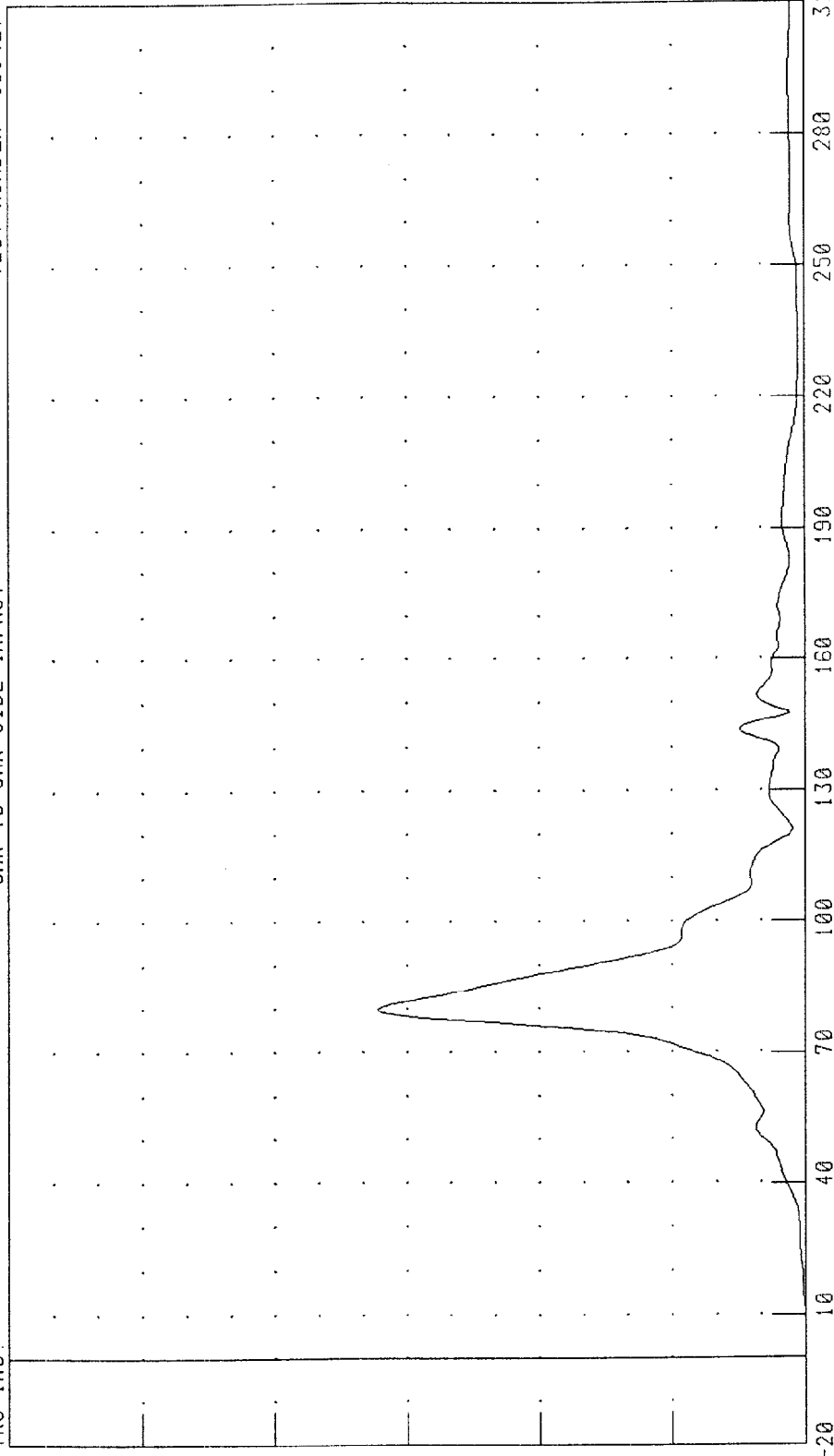
40

20

0

-20

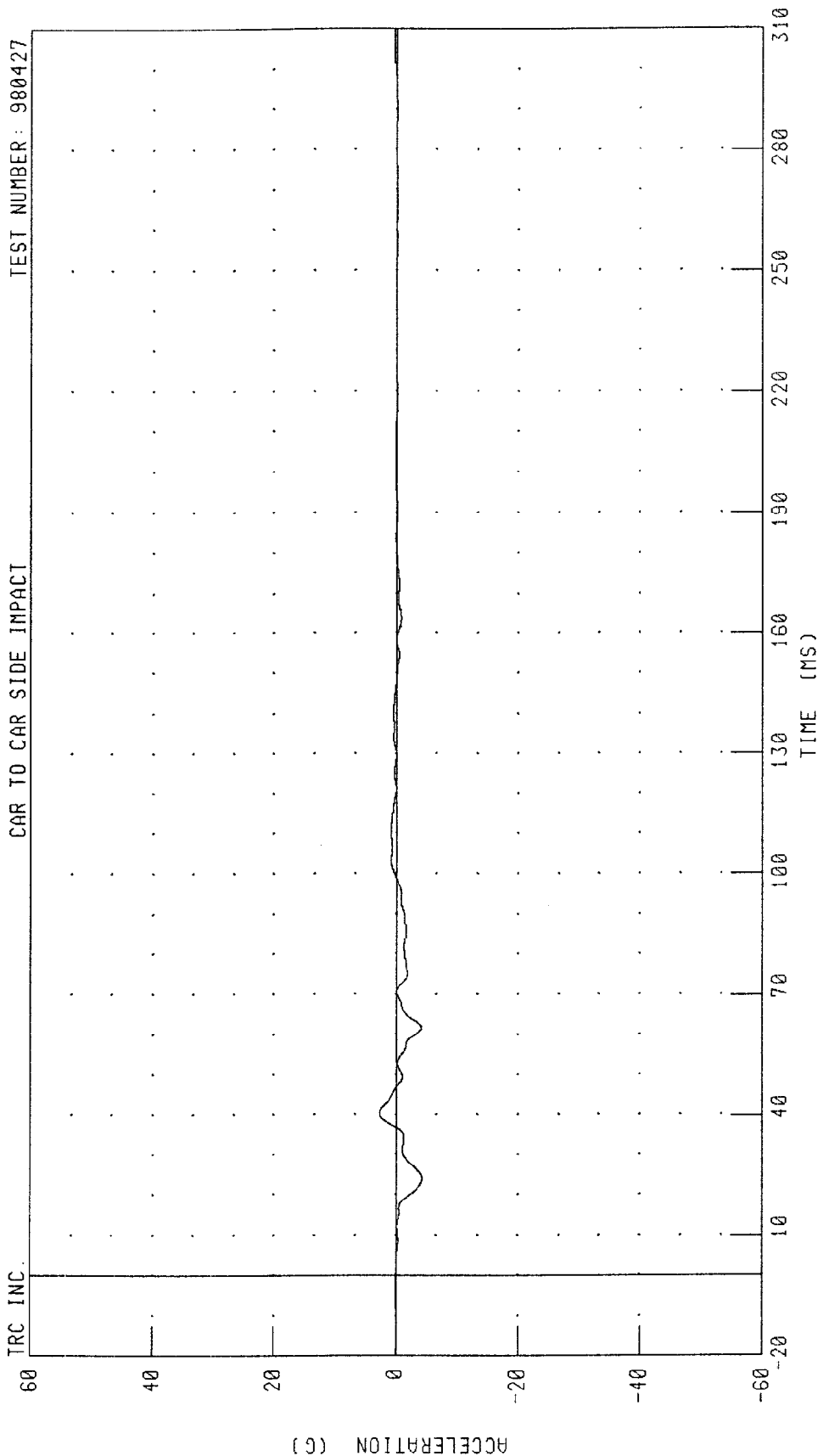
ACCELERATION (G)



CHANNEL: T01RC4 FILTER: FIR 100

PEAK DATA: 64.54 G @ 80.00 MS; 0.01 G @ 0.63 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE RIGHT FRONT SILL X-AXIS ACCELERATION



CHANNEL: RFSXC1 FILTER: CH. CLASS 60

PEAK DATA: 2.69 G @ 40.40 MS, -4.26 G @ 24.16 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE RIGHT FRONT SILL Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

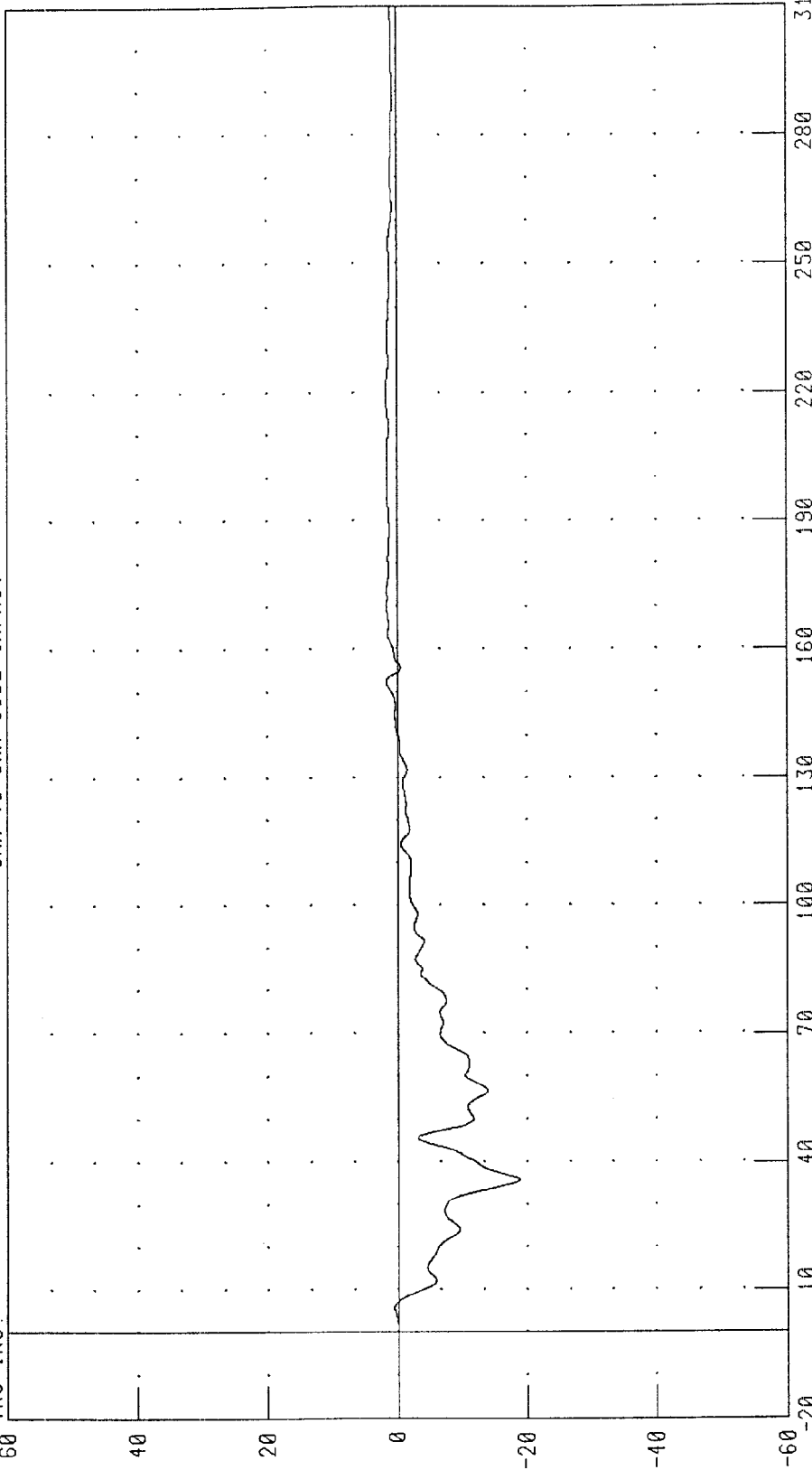
0

-20

-40

-60

ACCELERATION (G)

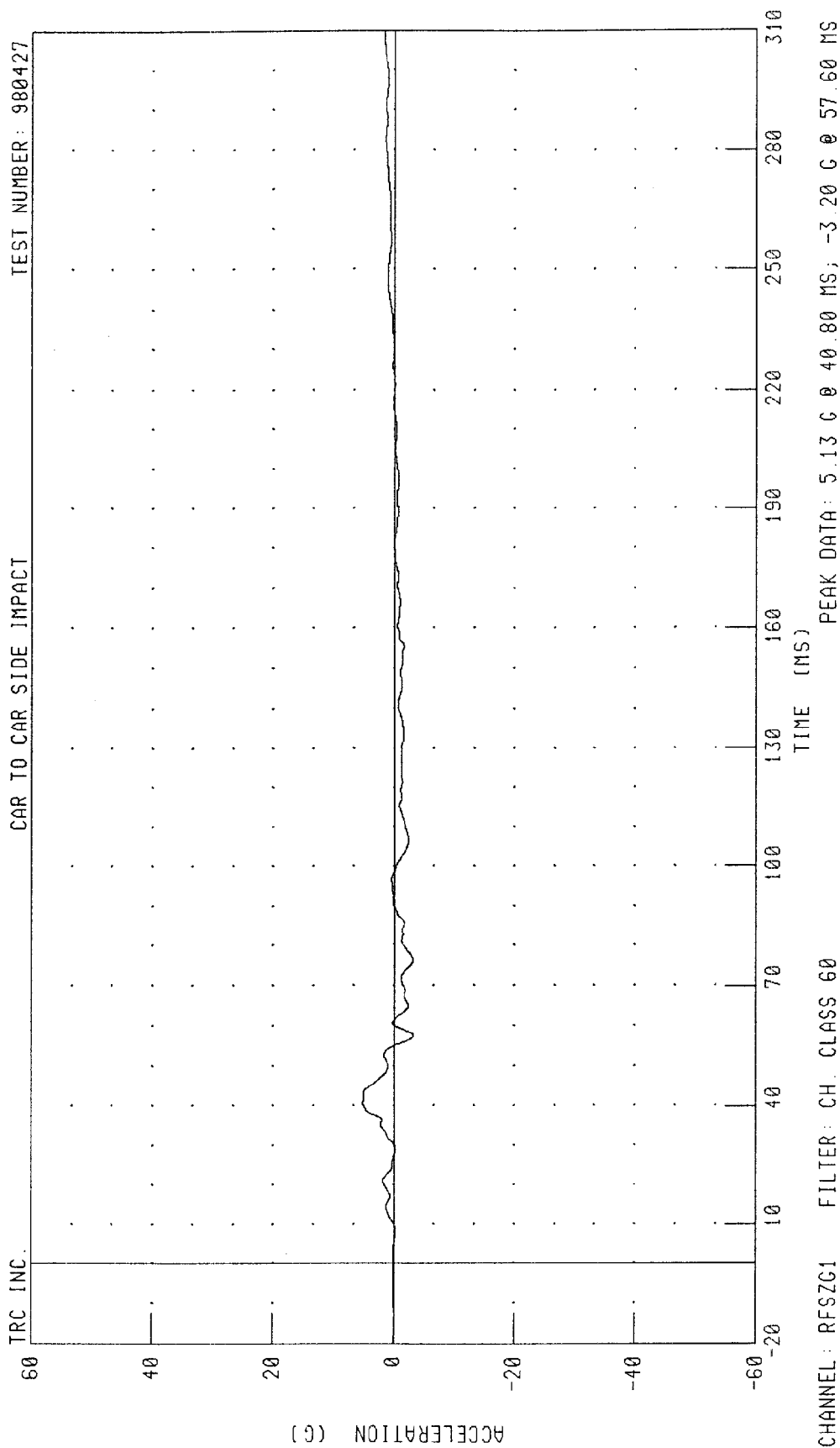


TIME (MS)

CHANNEL: RESYC1 FILTER: CH. CLASS 60

PEAK DATA: 1.69 G @ 152.56 MS; -18.84 G @ 36.00 MS

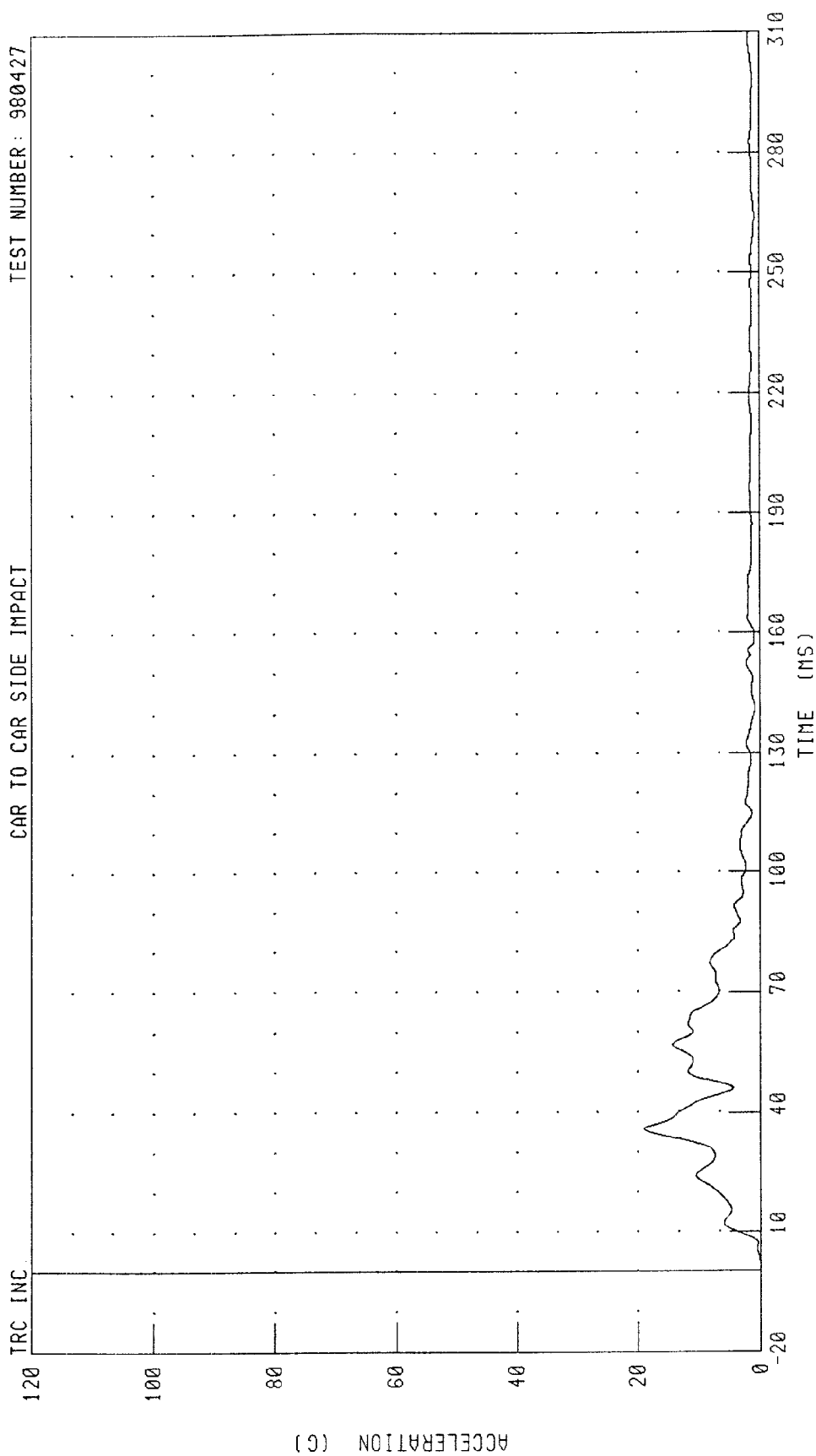
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE RIGHT FRONT SILL Z-AXIS ACCELERATION



1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE RIGHT FRONT SILL RESULTANT ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: RFSRC1 FILTER: CH. CLASS 60

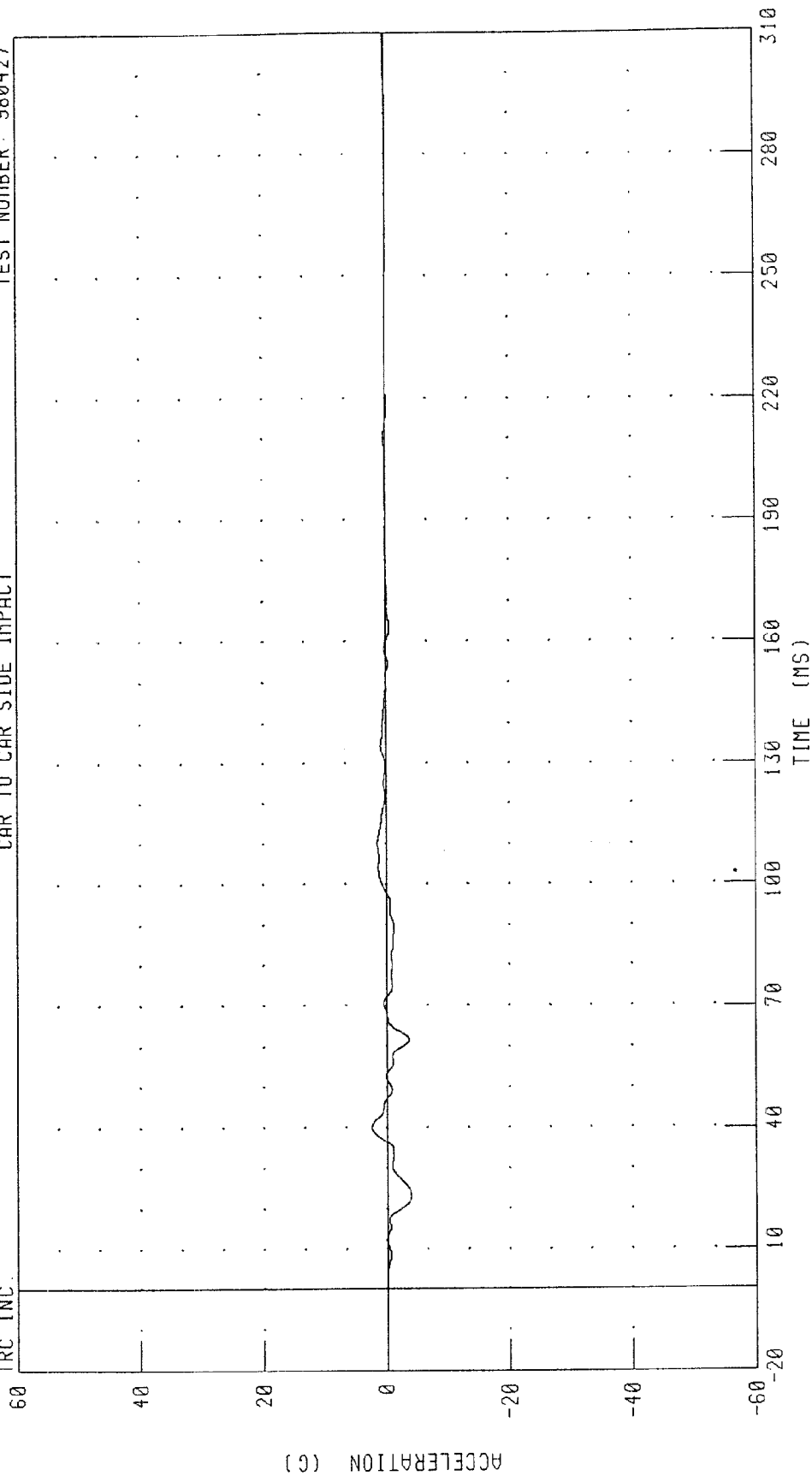
PEAK DATA: 18.98 G @ 36.00 MS; 0.00 G @ -17.04 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE RIGHT REAR SILL X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



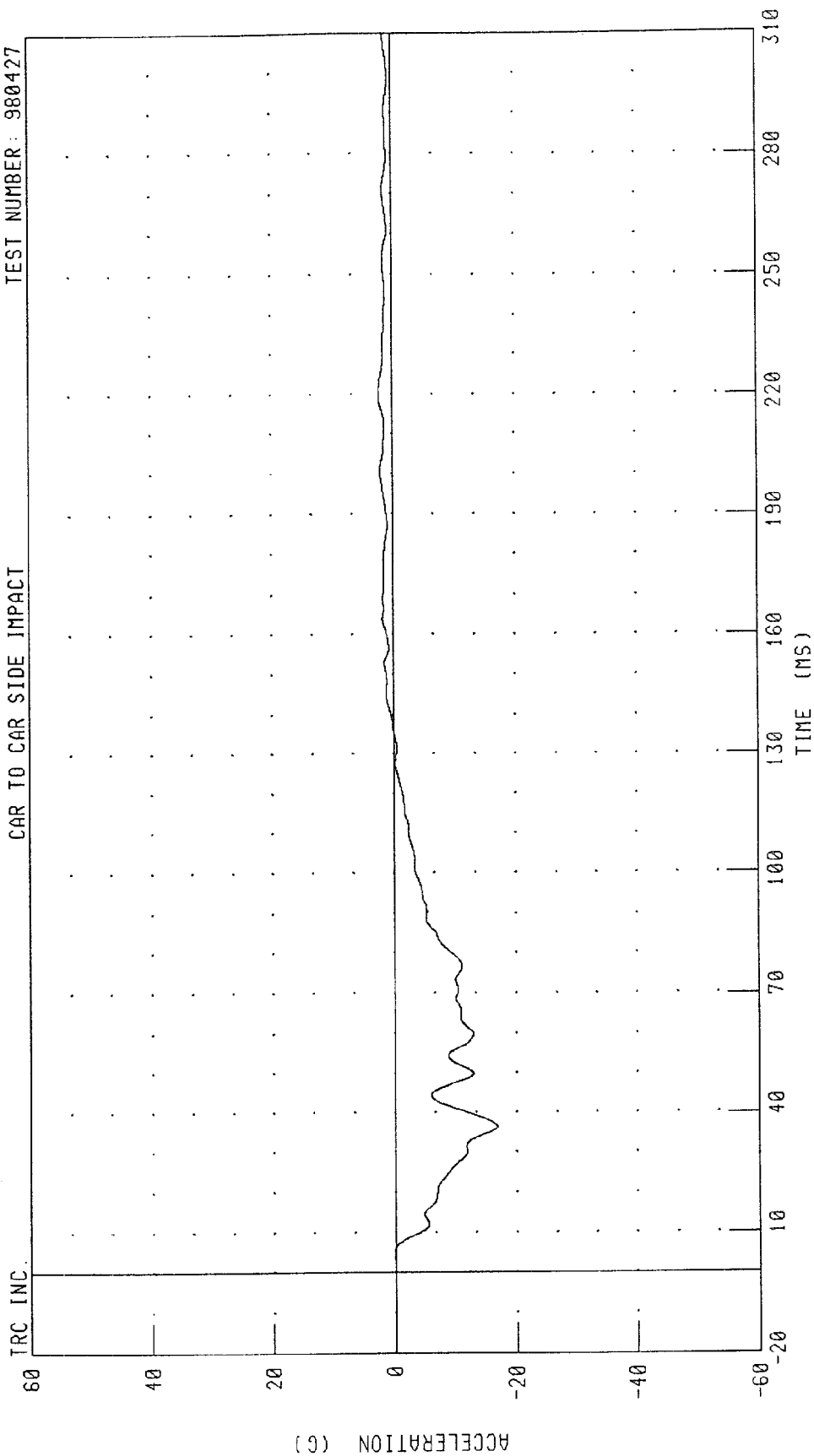
CHANNEL: RRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.44 G @ 40.16 MS; -3.95 G @ 23.28 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE RIGHT REAR SILL Y-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

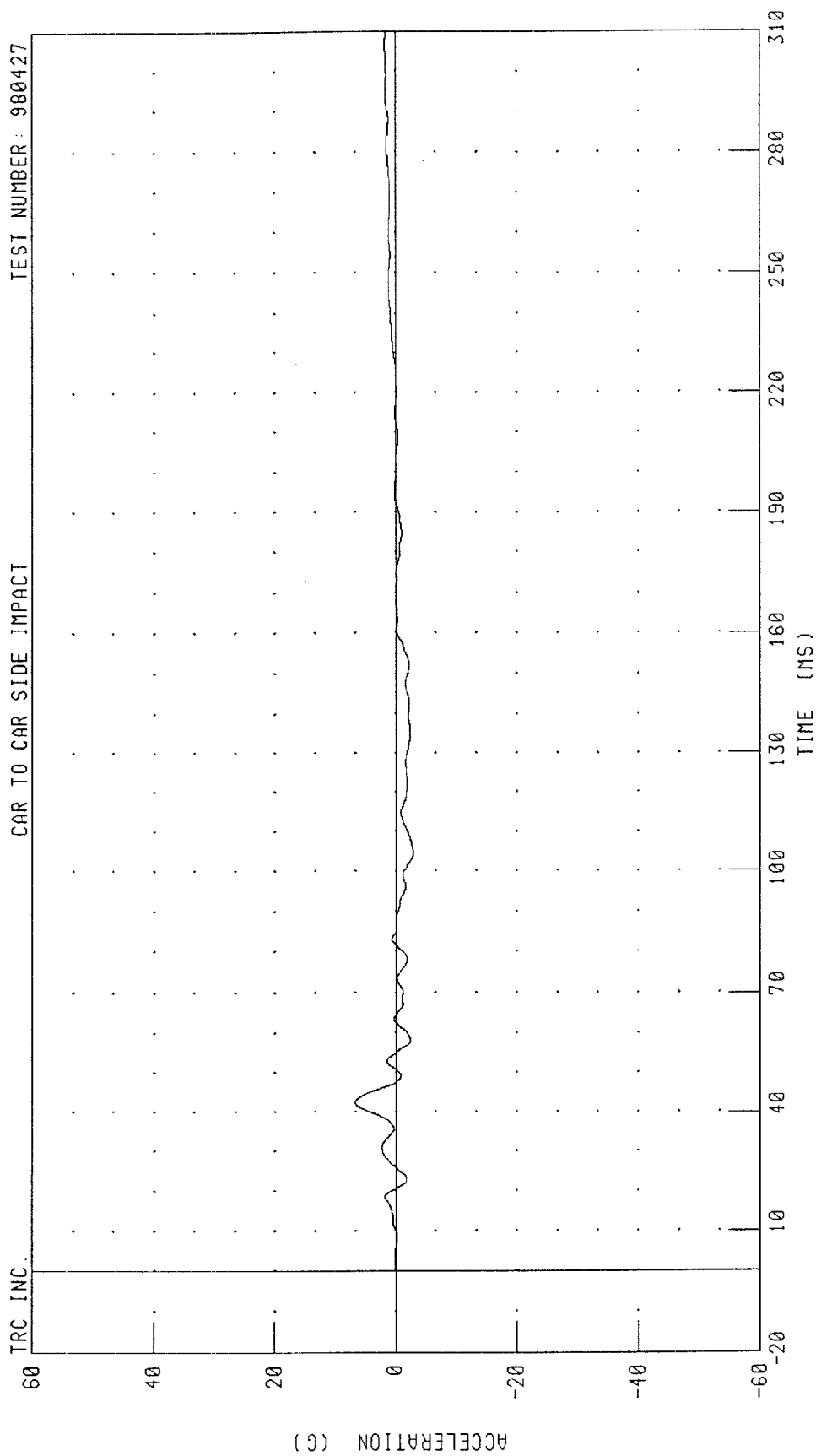
TEST NUMBER: 980427



CHANNEL: RRSYC1 FILTER: CH. CLASS 60

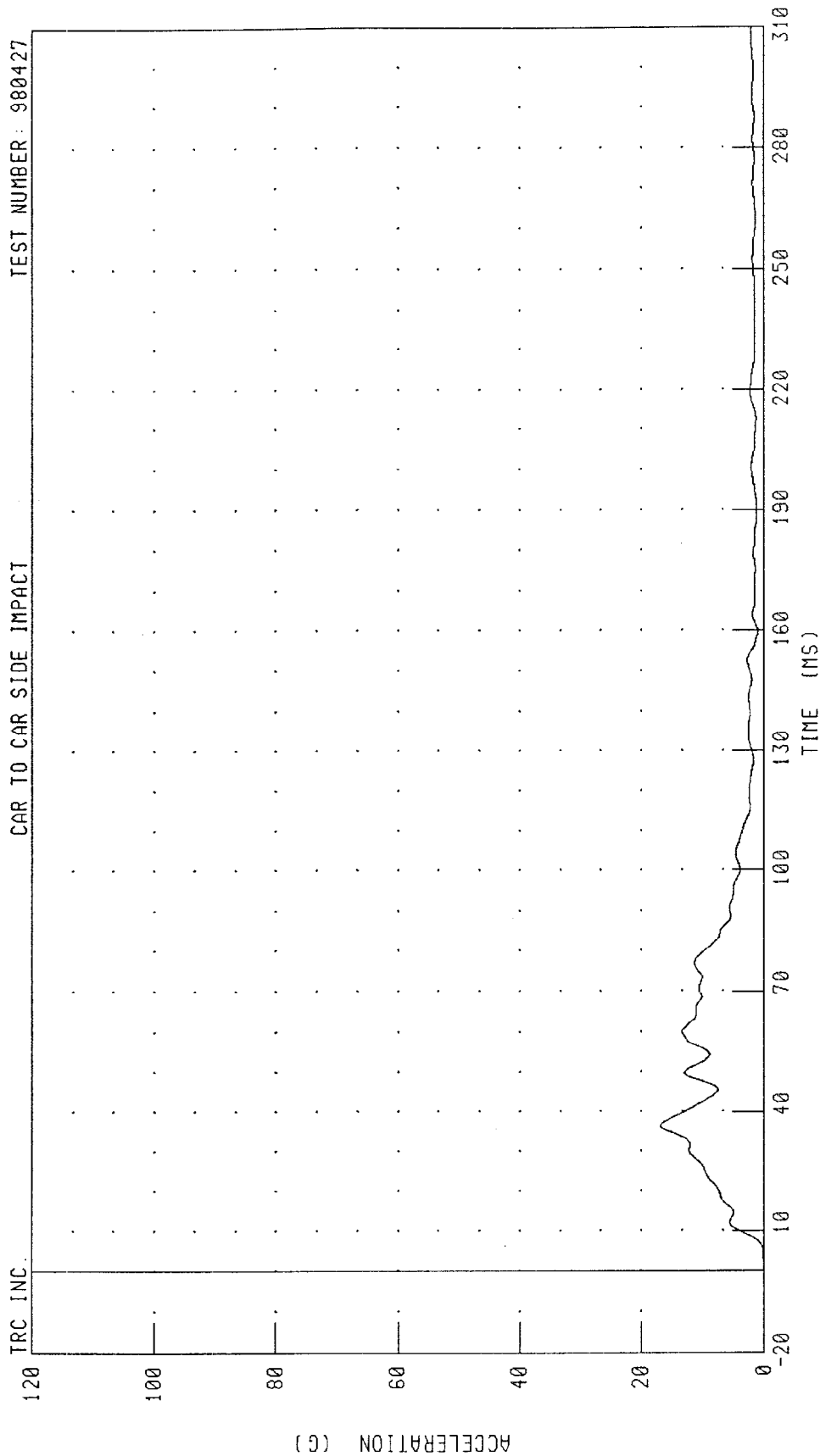
PEAK DATA: 2.14 G @ 219.60 MS; -16.86 G @ 36.48 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE RIGHT REAR SILL Z-AXIS ACCELERATION



CHANNEL: RRSZ01 FILTER: CH. CLASS 60 PEAK DATA: 6.70 G @ 42.40 MS; -2.93 G @ 104.64 MS

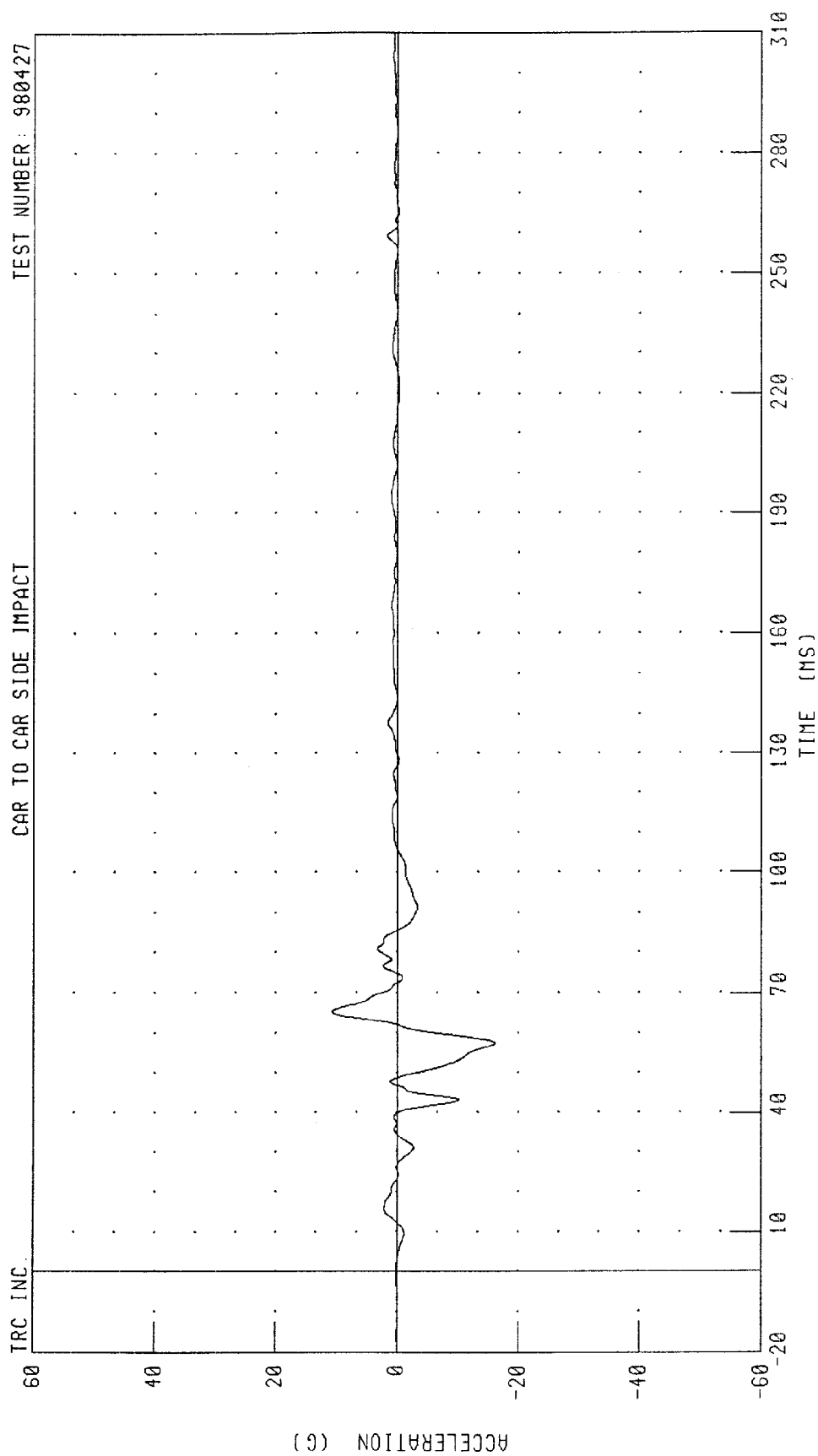
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE RIGHT REAR SILL RESULTANT ACCELERATION



CHANNEL: RRSRG1 FILTER: CH CLASS 60

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE REAR FLOORPAN SILL X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

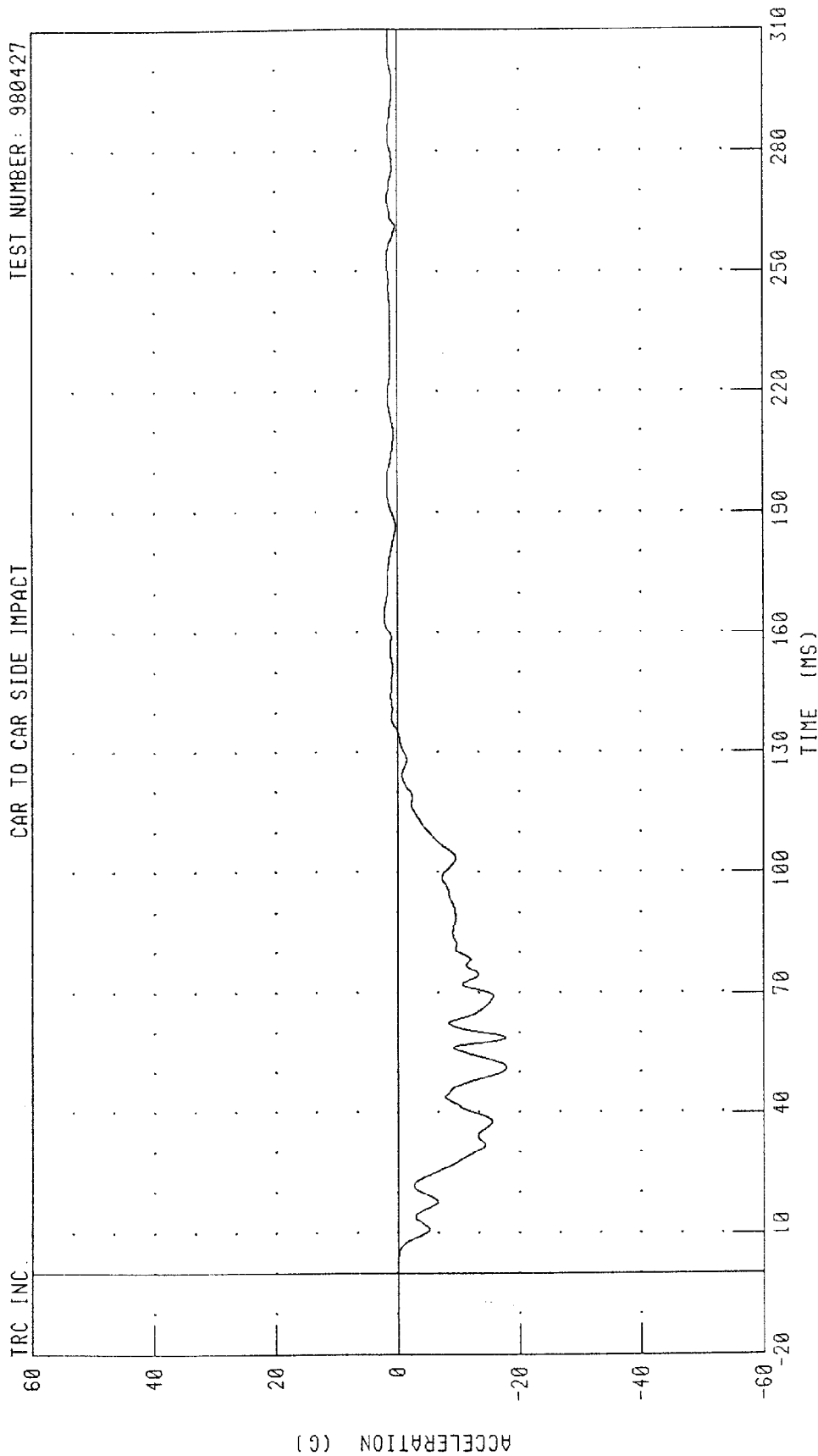


CHANNEL: RDKXG1 FILTER: CH. CLASS 60

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE REAR FLOORPAN SILL Y-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

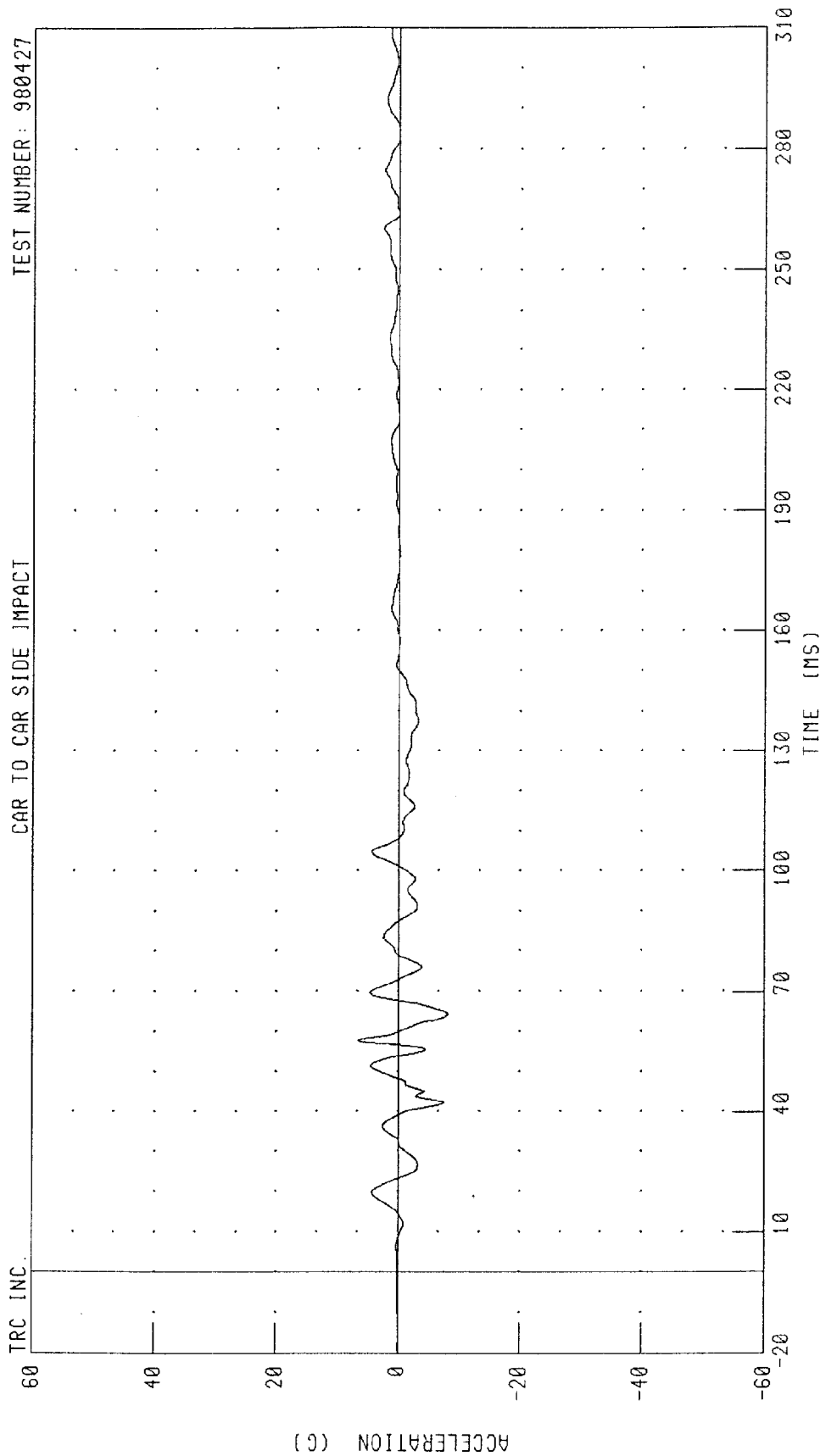
TEST NUMBER: 980427



CHANNEL: RDKYGI FILTER: CH. CLASS 60

PEAK DATA: 2.20 G @ 164.16 MS; -17.92 G @ 179.20 MS

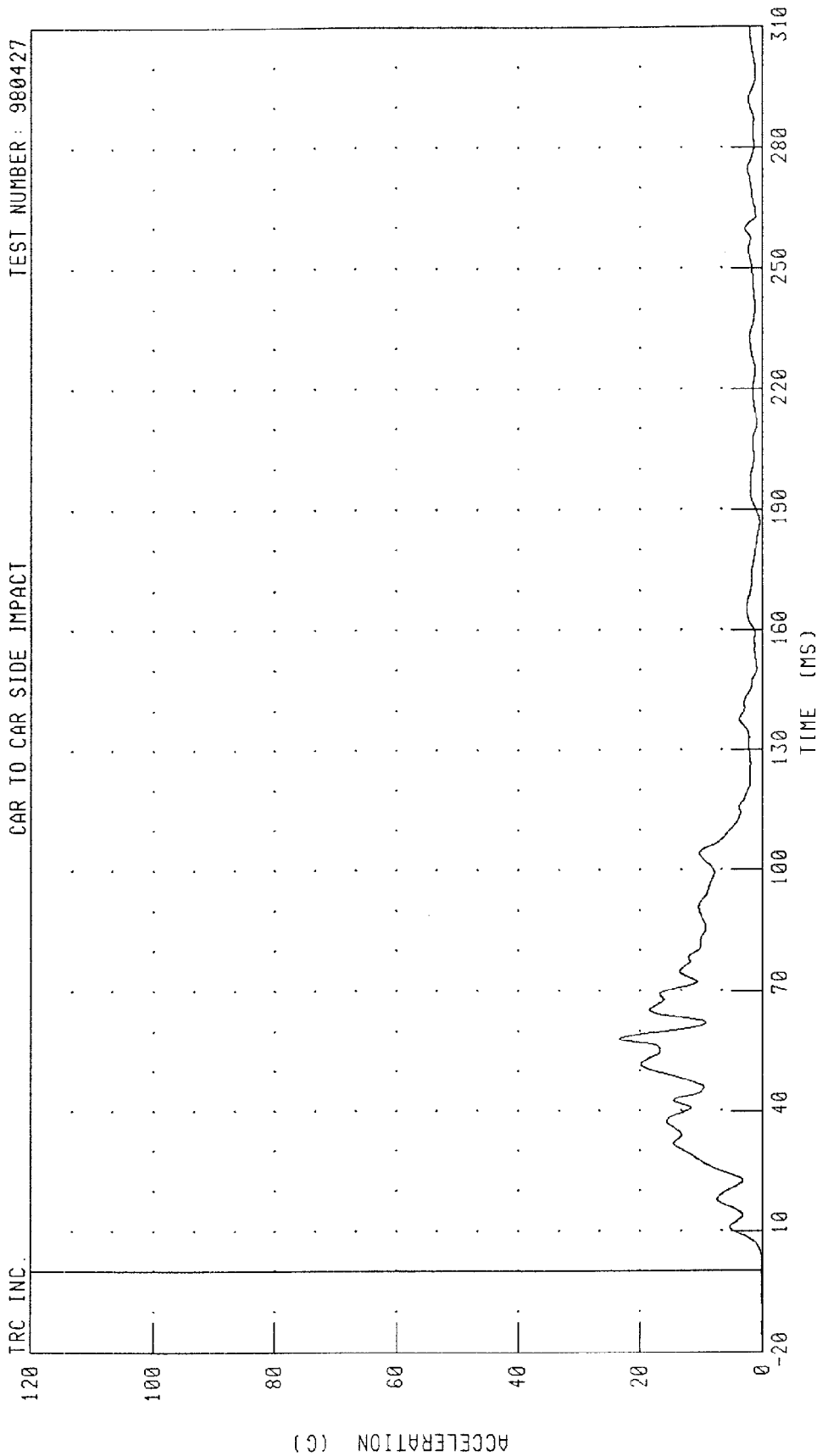
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE REAR FLOORPAN SILL Z-AXIS ACCELERATION



CHANNEL: ROKZC1 FILTER: CH. CLASS 60

PEAK DATA: 6.53 G @ 57.76 MS, -8.14 G @ 64.32 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE REAR FLOORPAN SILL RESULTANT ACCELERATION



CHANNEL: RDKRC1 FILTER: CH. CLASS 60

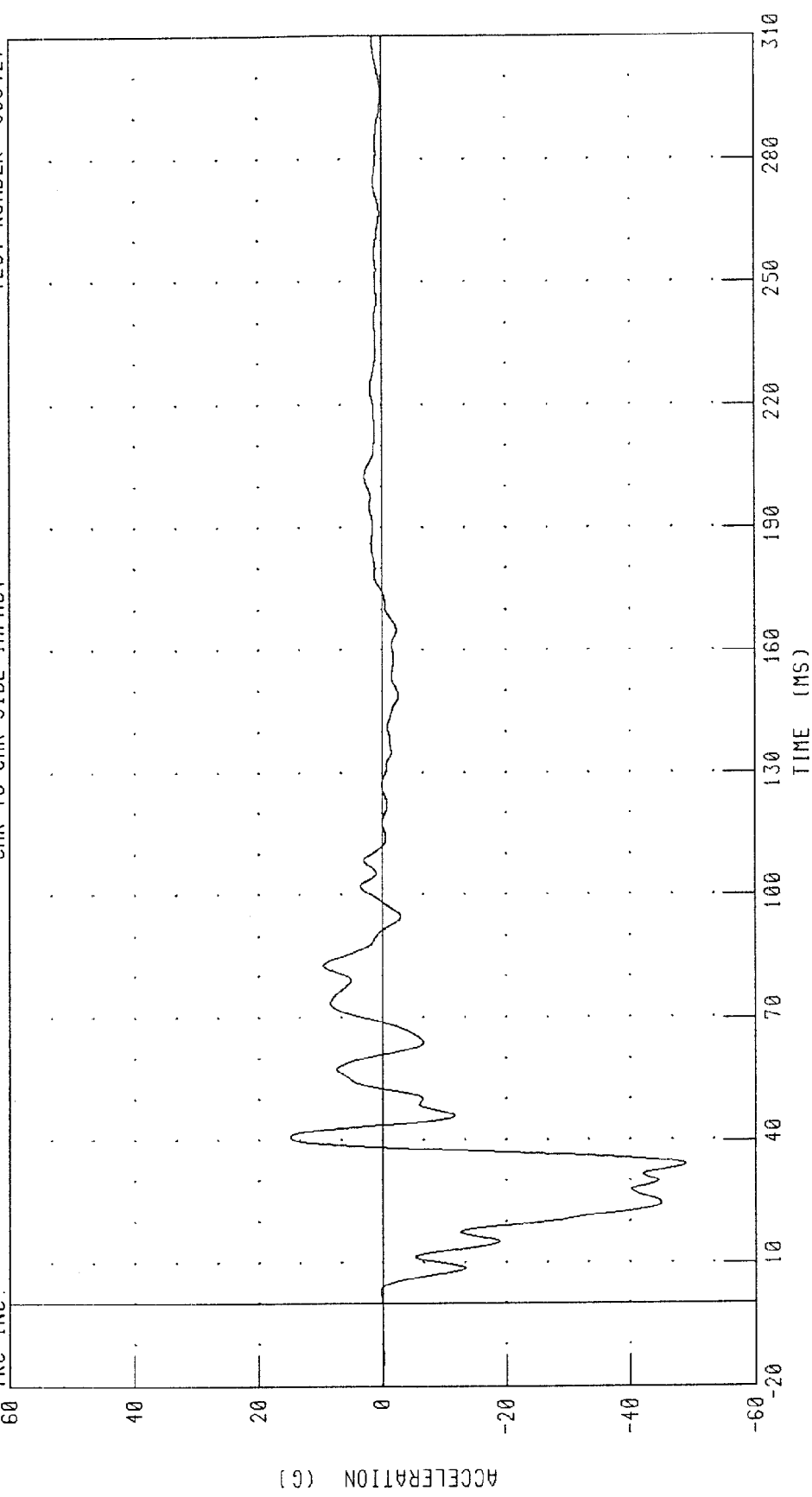
PEAK DATA: 23.37 G @ 58.08 MS, 0.02 G @ -19.60 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR SILL Y-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

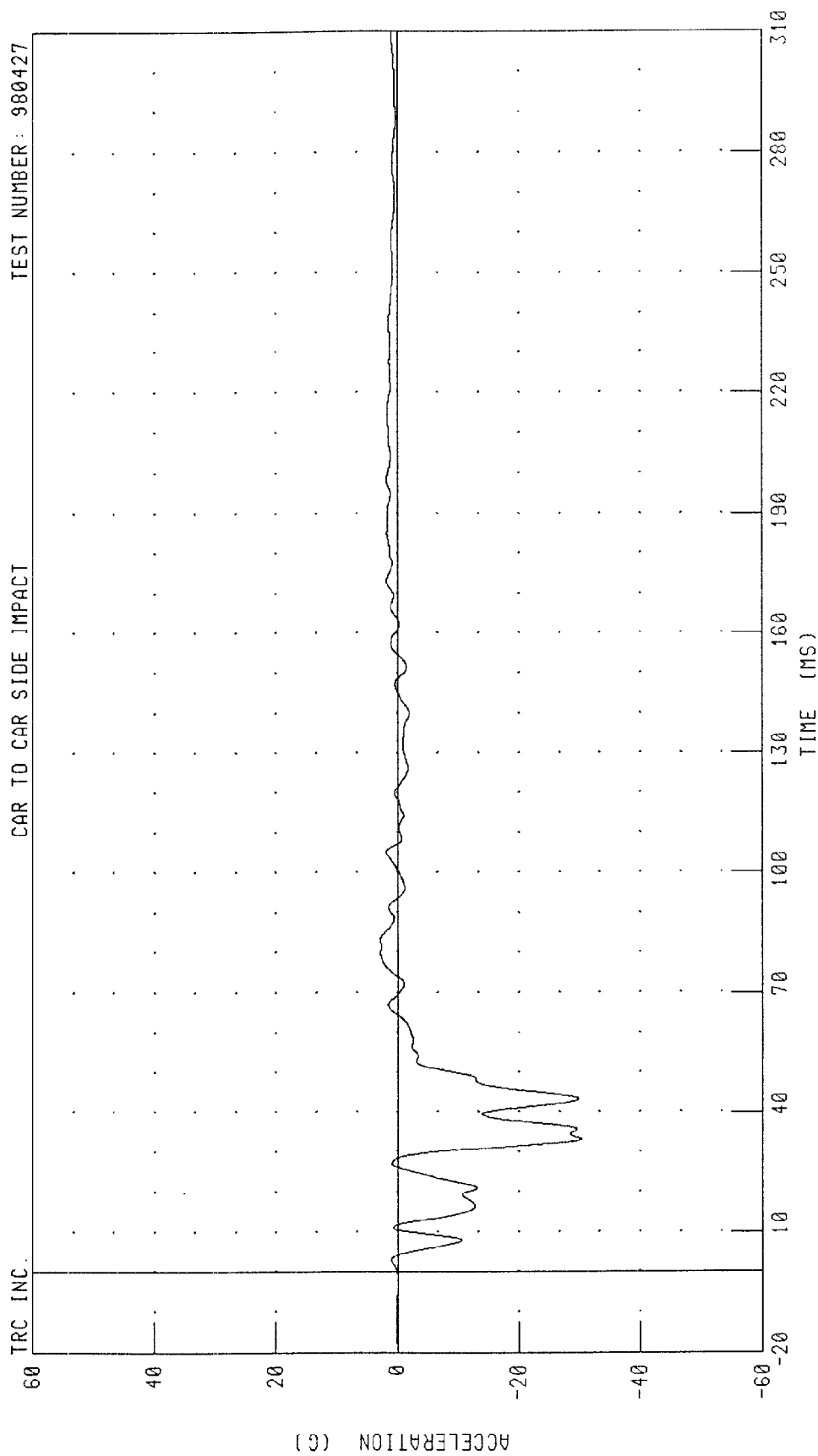


CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 14.89 G @ 40.96 MS; -48.81 G @ 34.16 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT FRONT SILL Y-AXIS ACCELERATION

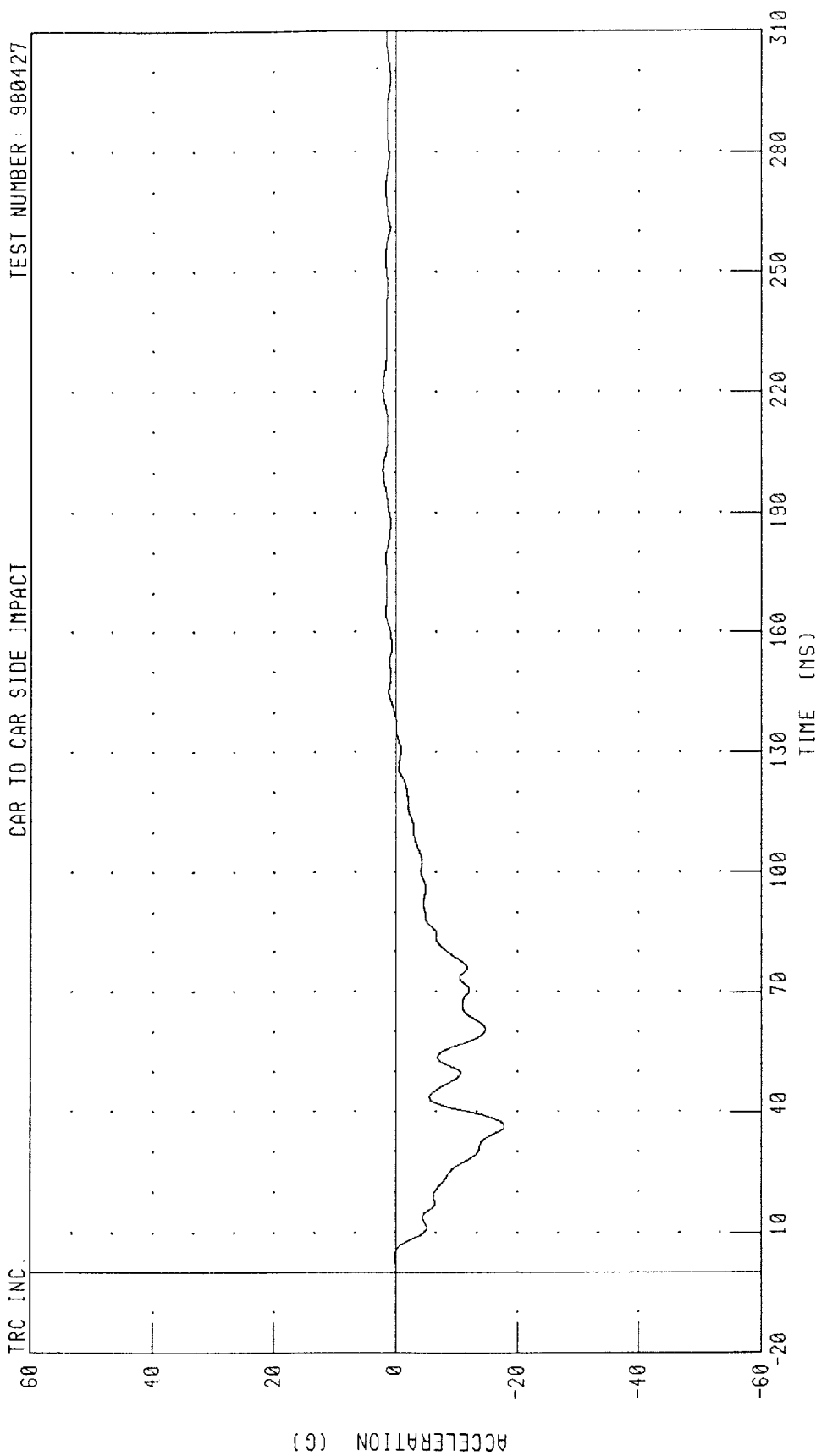
TRC INC. CAR TO CAR SIDE IMPACT TEST NUMBER: 980427



CHANNEL: LFSYC1 FILTER: CH. CLASS 60

PEAK DATA: 2.81 G @ 83.12 MS; -30.35 G @ 33.36 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE RIGHT REAR SEAT Y-AXIS ACCELERATION



CHANNEL: RRTYC1 FILTER: CH. CLASS 60

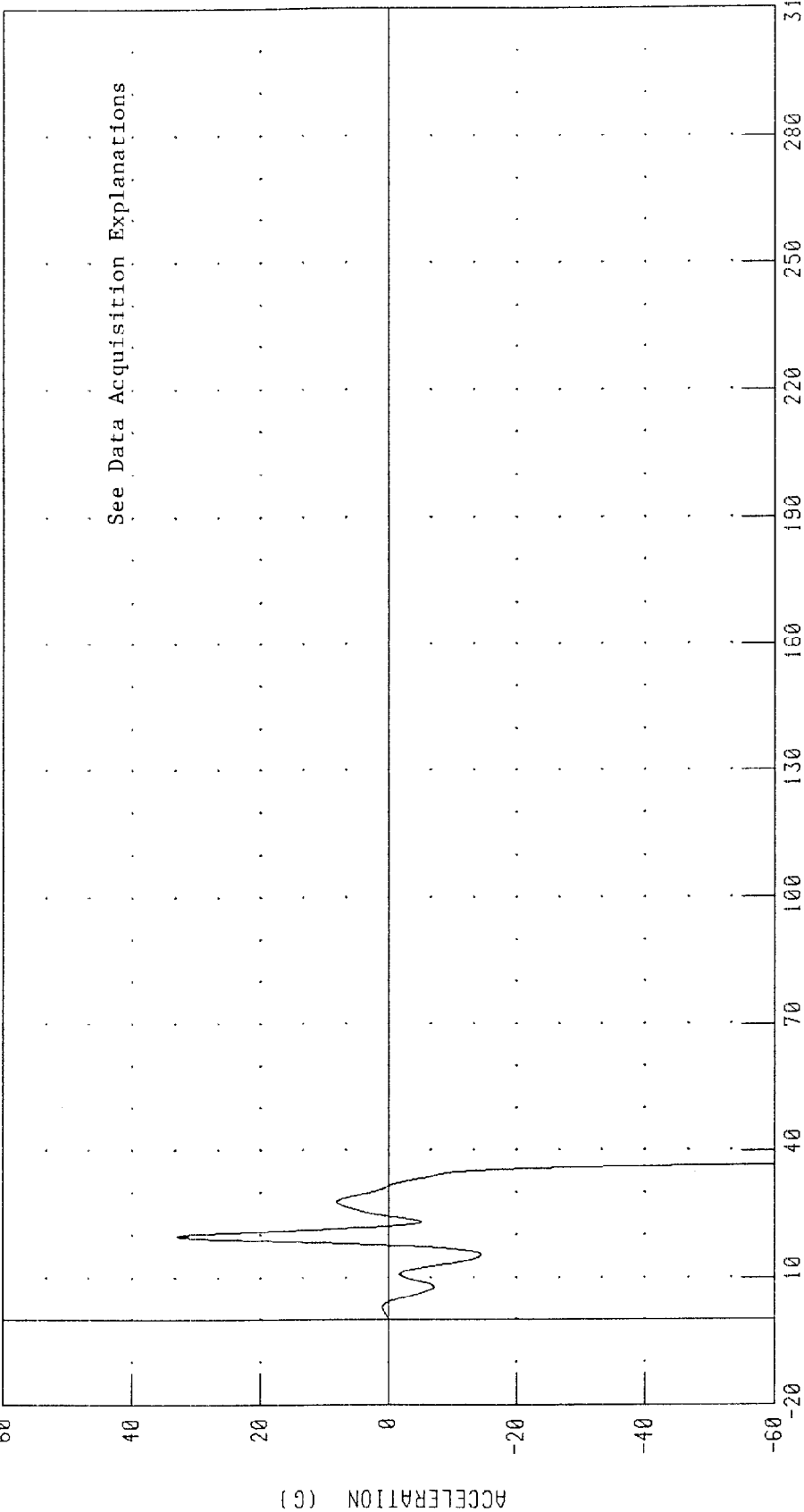
PEAK DATA: 2.04 G @ 200.64 MS; -17.86 G @ 36.48 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT SIDE LOWER A-PILLAR Y-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

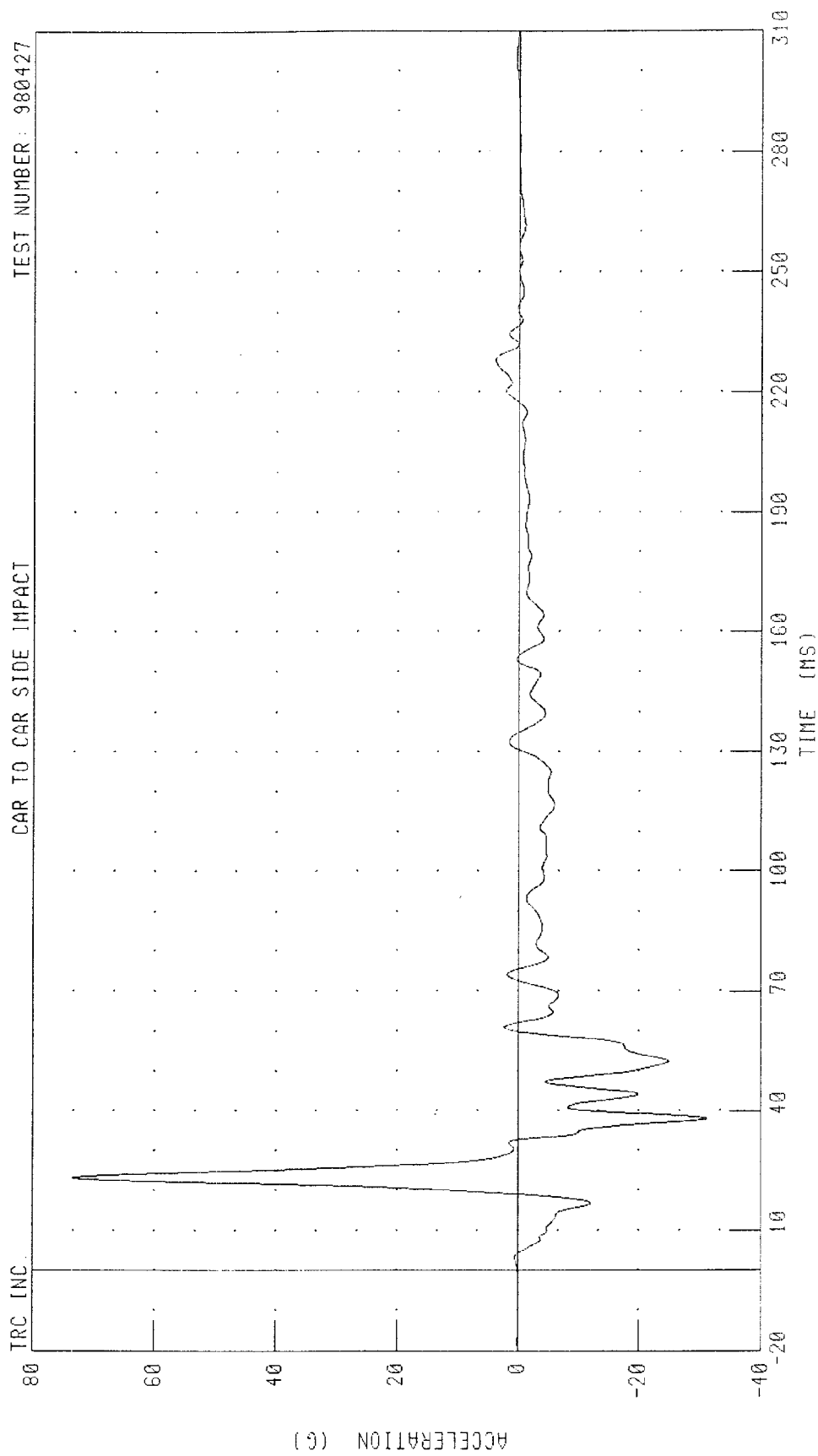


CHANNEL: LLAYC1 FILTER: CH. CLASS 60

PEAK DATA: 33.04 G @ 19.84 MS; -1056.43 G @ 43.84 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT SIDE MIDDLE A-PILLAR Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



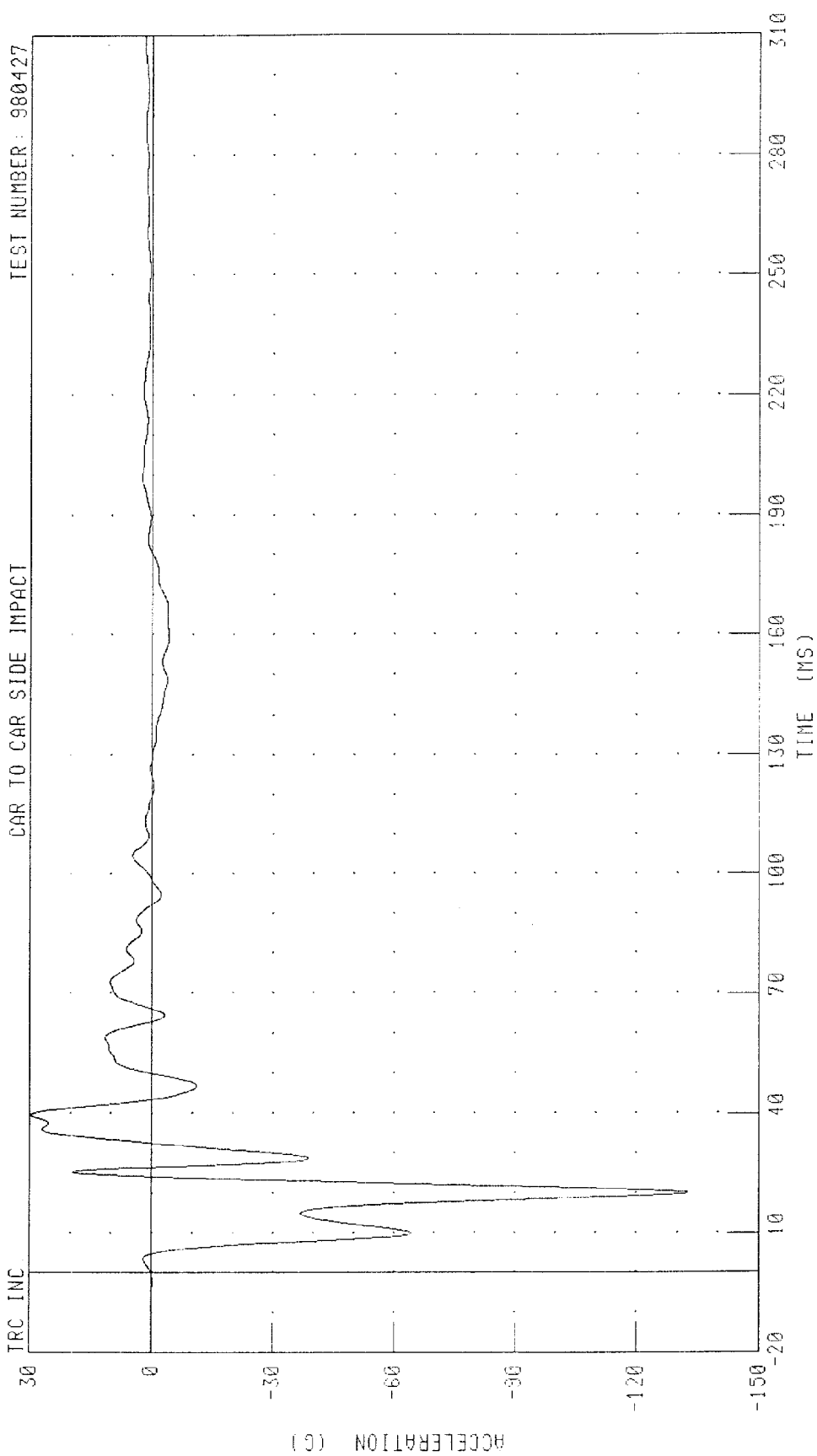
CHANNEL: LMAYG1 FILTER: CH. CLASS 60

PEAK DATA: 73.63 G @ 23.28 MS, -31.19 G @ 38.16 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT SIDE LOWER B-PILLAR Y-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: LLBYG1 FILTER: CH. CLASS 60

PEAK DATA: 29.81 G @ 39.68 MS, -132.61 G @ 20.16 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT SIDE MIDDLE B-PILLAR Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

30

ACCELERATION (G)

-30

-60

-90

-120

TIME (MS)

310

280

250

220

190

160

130

100

70

40

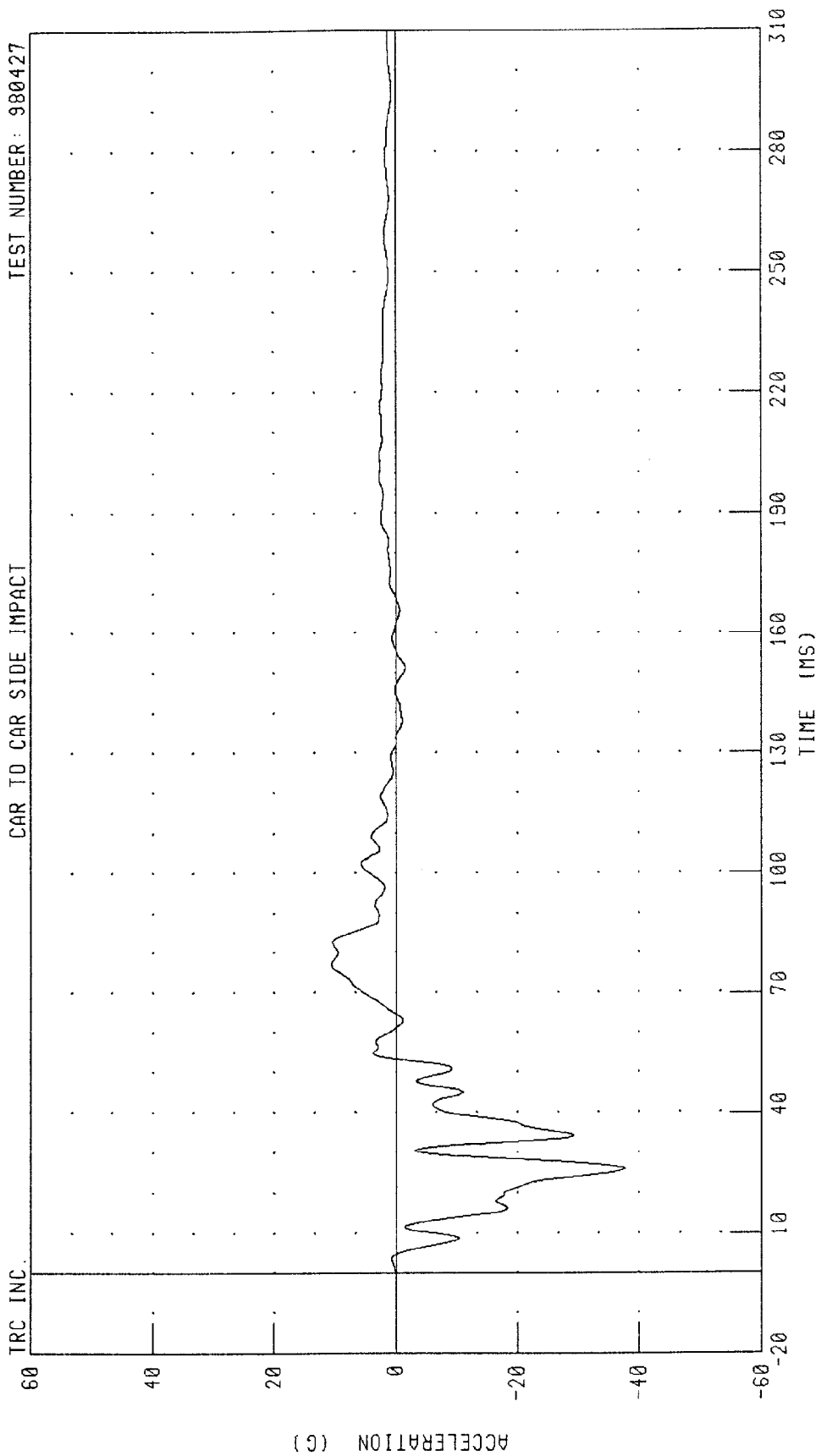
10

-20

CHANNEL: LMBY01 FILTER: CH. CLASS 60

PEAK DATA: 32.08 G @ 41.36 MS, -101.19 G @ 20.24 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT SIDE FRONT SEAT TRACK AT H-POINT Y-AXIS ACCELERATION



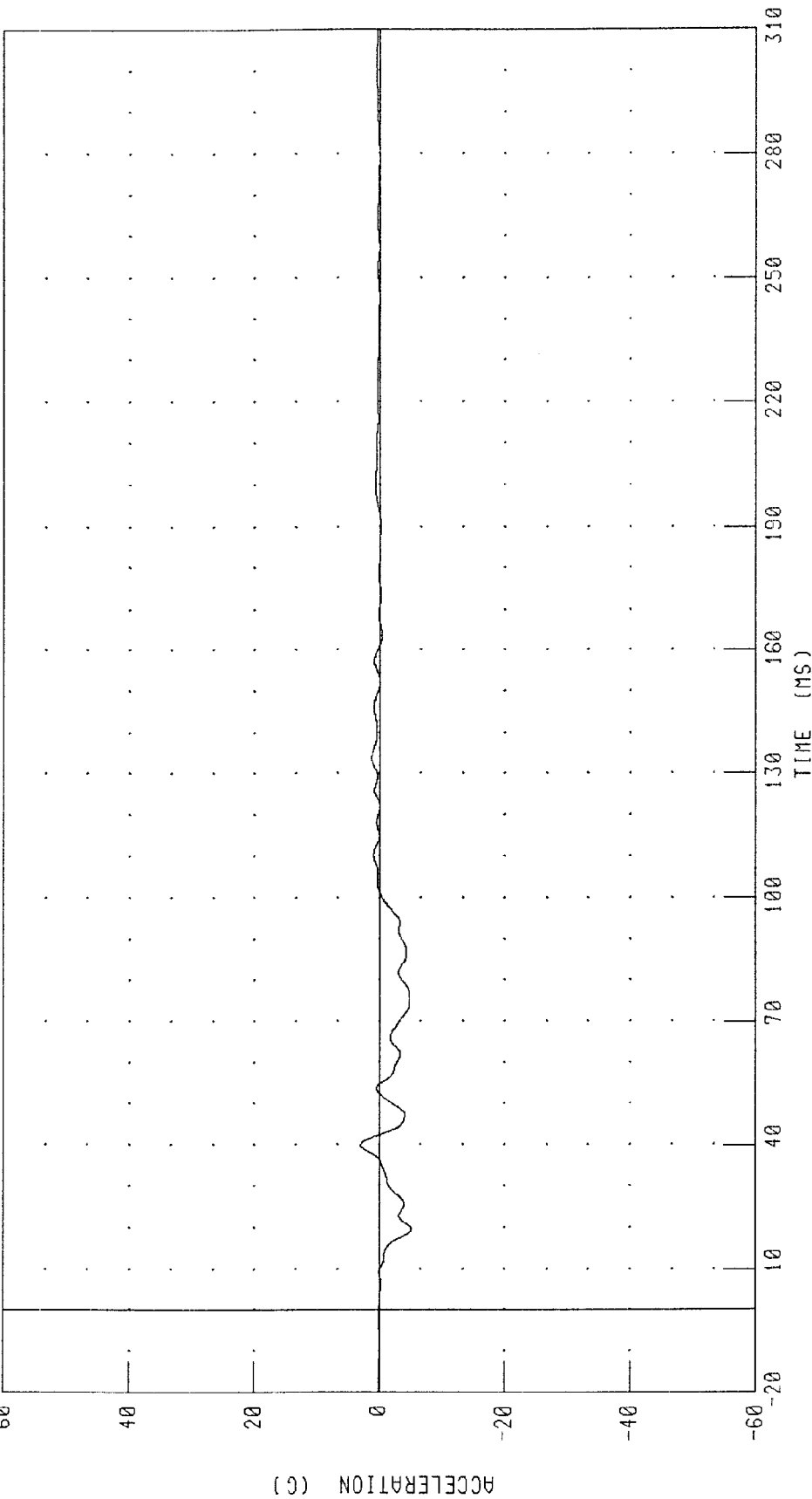
CHANNEL: LFTYCI FILTER: CH. CLASS 60 PEAK DATA: 10.56 G @ 77.04 MS, -37.69 G @ 26.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



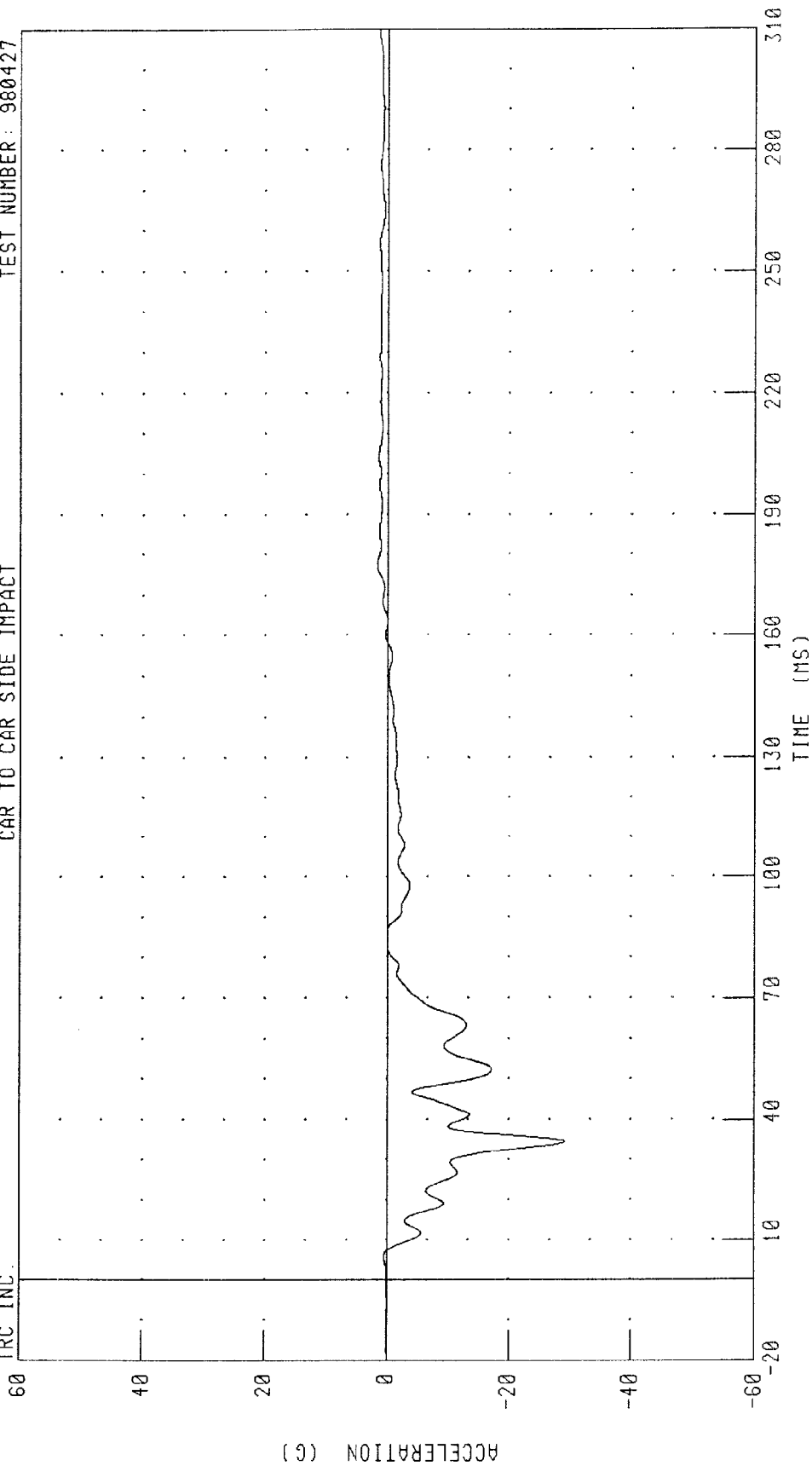
CHANNEL: VCCXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.96 G @ 39.92 MS, -5.17 G @ 19.60 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

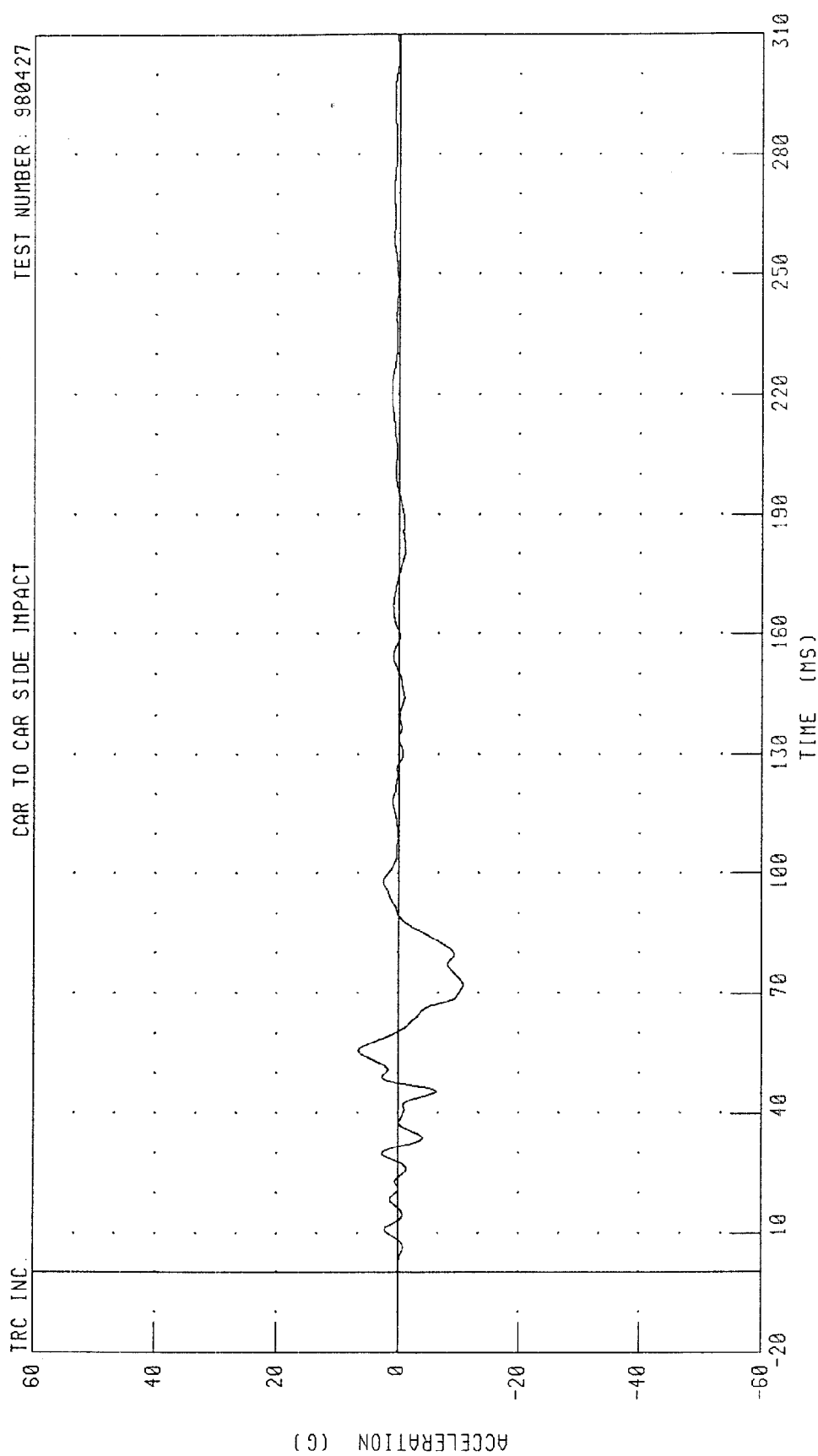
TRC INC.



CHANNEL: VCCYG1 FILTER: CH. CLASS 60

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



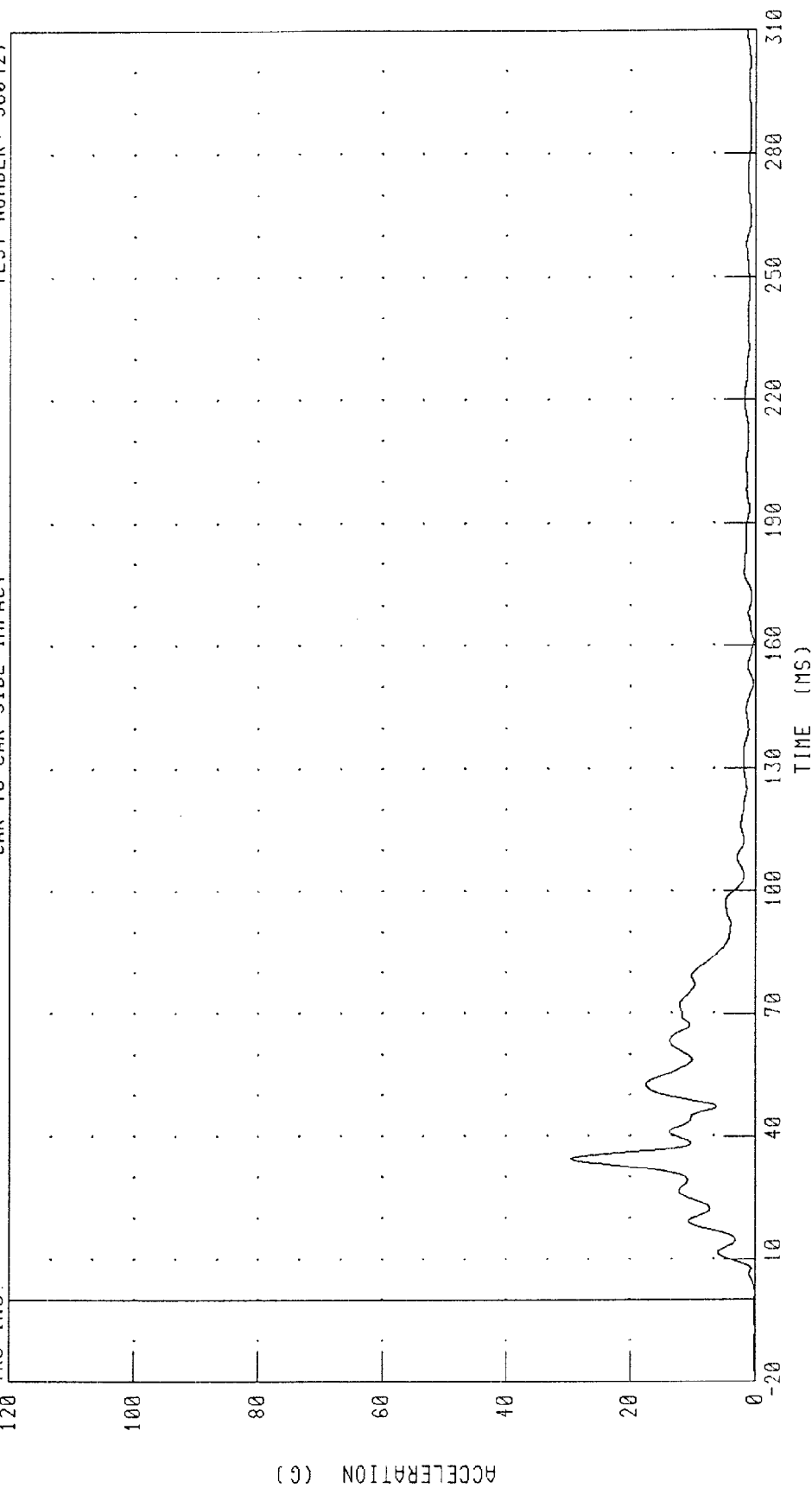
CHANNEL: VCCZG1 FILTER: CH. CLASS 60

PEAK DATA: 6 48 G @ 55.60 MS; -10.77 G @ 72.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TRC INC.

TEST NUMBER: 980427



CHANNEL: VCCRC1 FILTER: CH. CLASS 60

PEAK DATA: 29.49 G @ 34.72 MS, 0.02 G @ -19.12 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT FRONT SILL Y-AXIS VELOCITY

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

10

0

-10

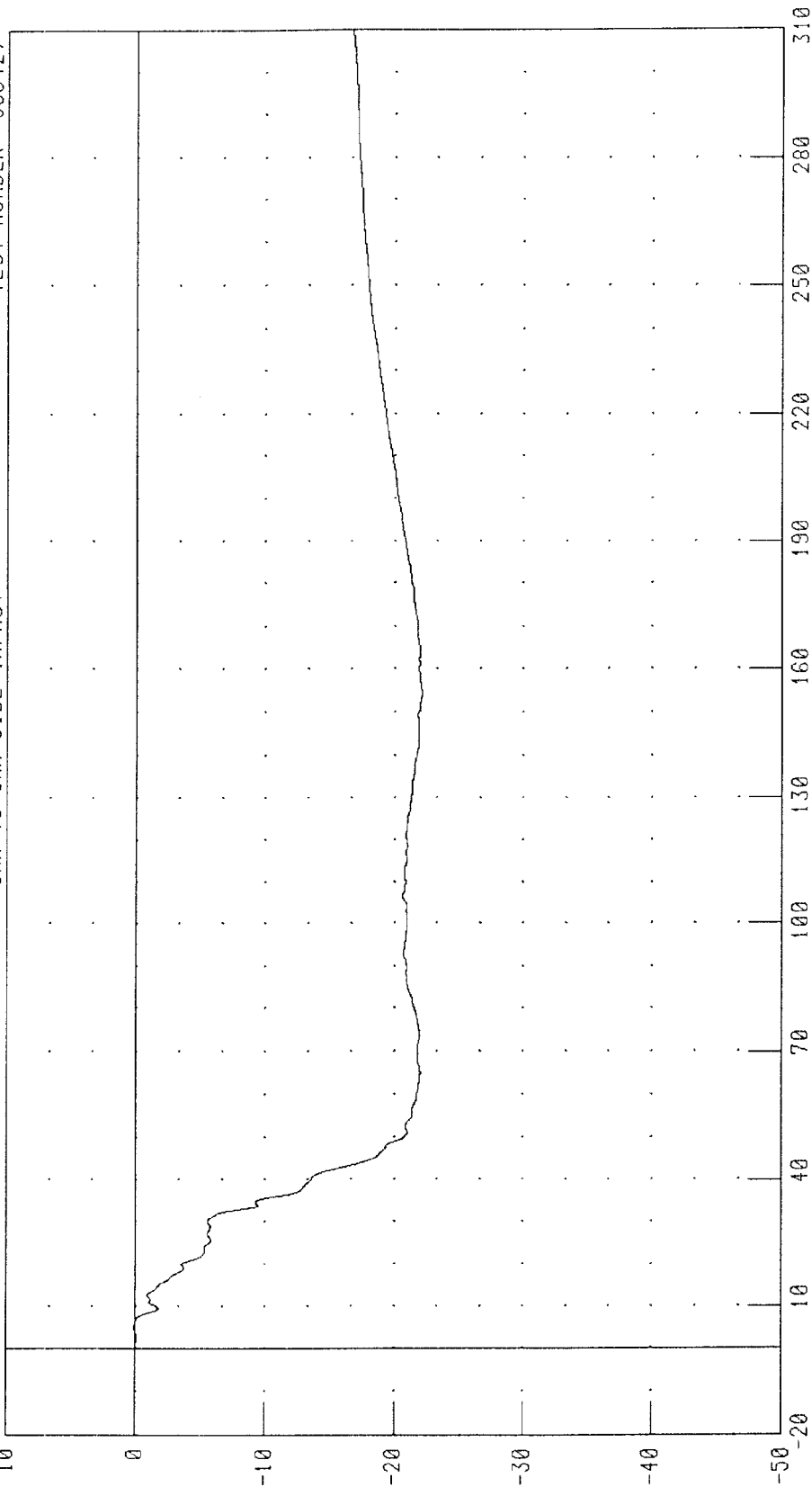
-20

-30

-40

-50

VELOCITY (KM/H)



TIME (MS)

CHANNEL: LFSYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.12 KM/H @ 4.96 MS, -22.14 KM/H @ 154.48 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT REAR SILL Y-AXIS VELOCITY
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

10

0

-10

-20

-30

-40

-50

VELOCITY (KM/H)

TIME (MS)

310

280

250

220

190

160

130

100

70

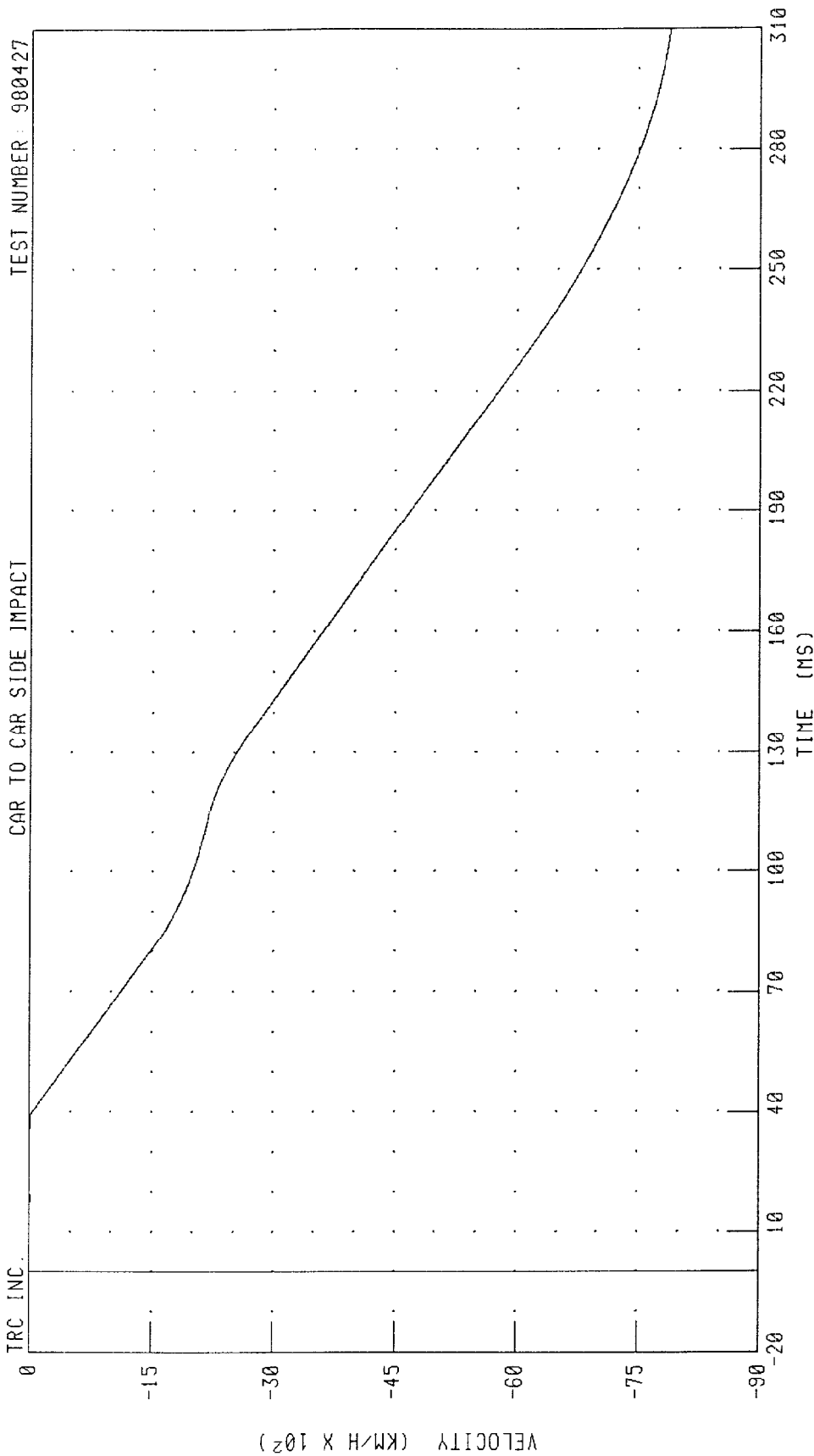
40

10

PEAK DATA: 0.00 KM/H @ 0.00 MS; -32.13 KM/H @ 37.76 MS

CHANNEL: LRSYV1 FILTER: CH CLASS 180

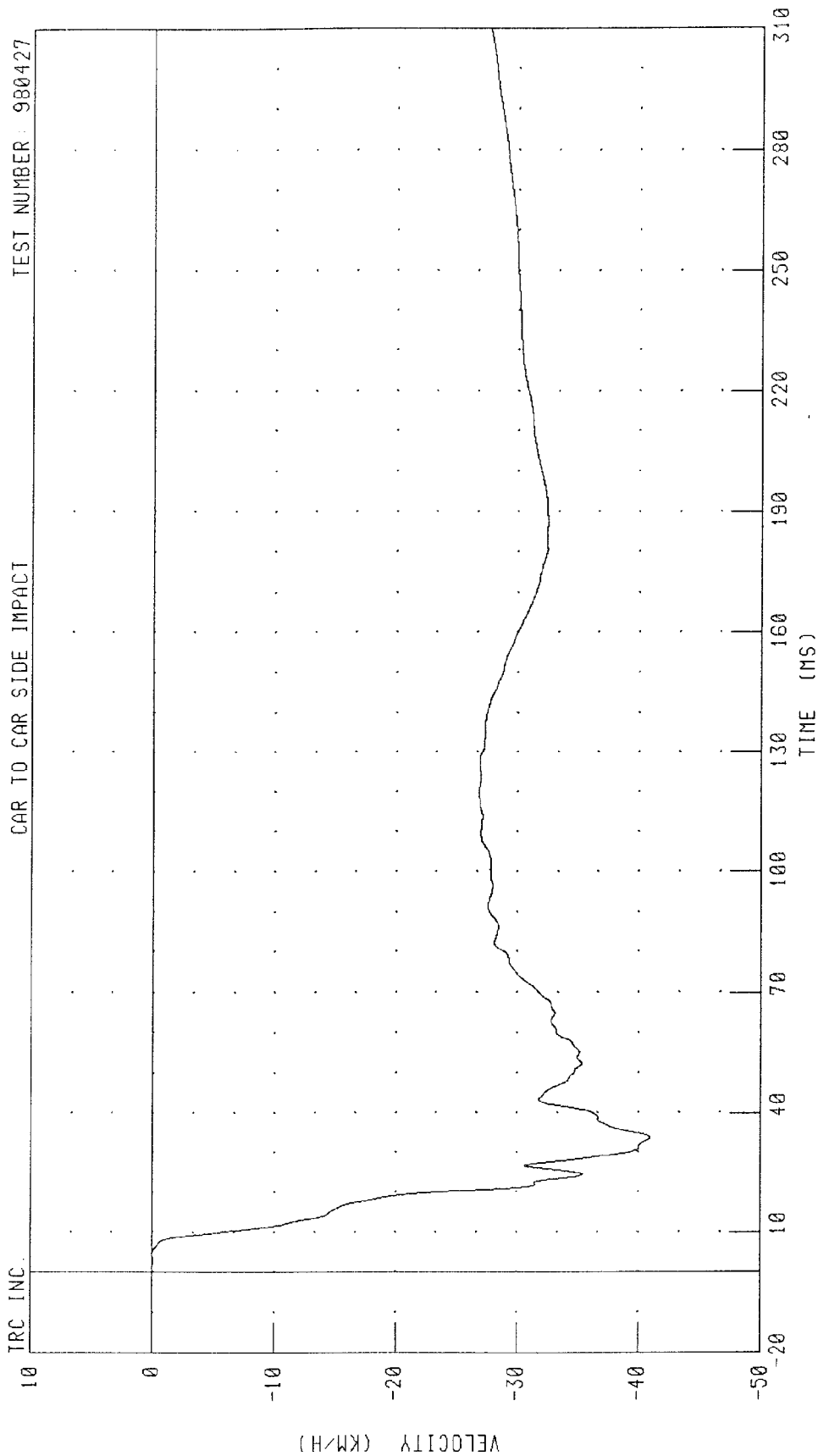
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 TARGET VEHICLE LEFT SIDE LOWER A-PILLAR Y-AXIS VELOCITY



CHANNEL: LLAYV1 FILTER: CH. CLASS 180

PEAK DATA: 1.41 KM/H @ 20.88 MS; -7887.82 KM/H @ 310.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
TARGET VEHICLE LEFT SIDE MIDDLE B-PILLAR Y-AXIS VELOCITY



CHANNEL: LMBYV1 FILTER: CH. CLASS 180

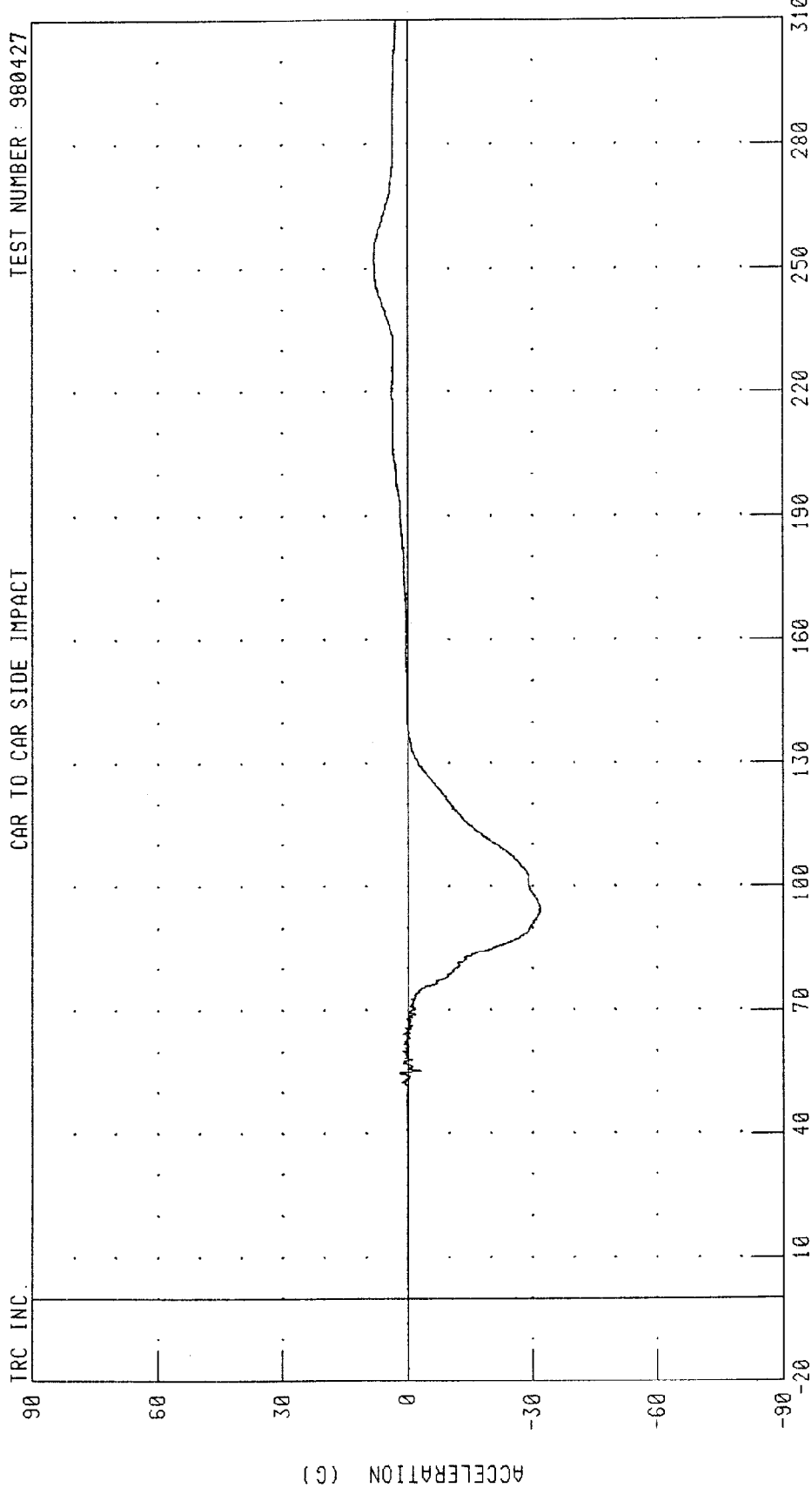
PEAK DATA: 0.01 KM/H @ 4.48 MS, -40.97 KM/H @ 33.76 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER HEAD X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

PEAK DATA: 8 05 G @ 251.12 MS, -31.90 G @ 93.84 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER HEAD Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

90

60

30

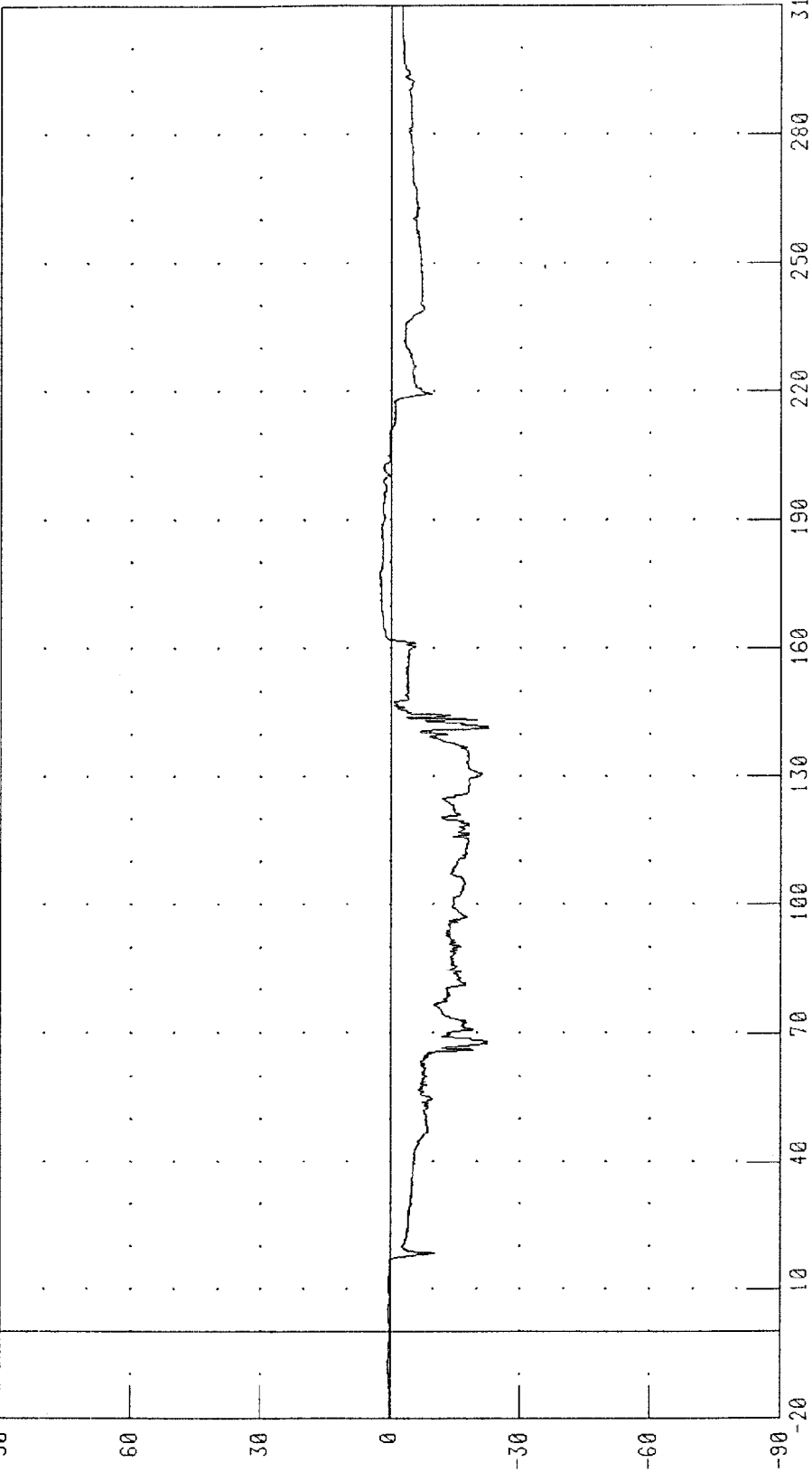
0

-30

-60

-90

ACCELERATION (G)



TIME (MS)

CHANNEL: HEDYC1 FILTER: CH. CLASS 1000

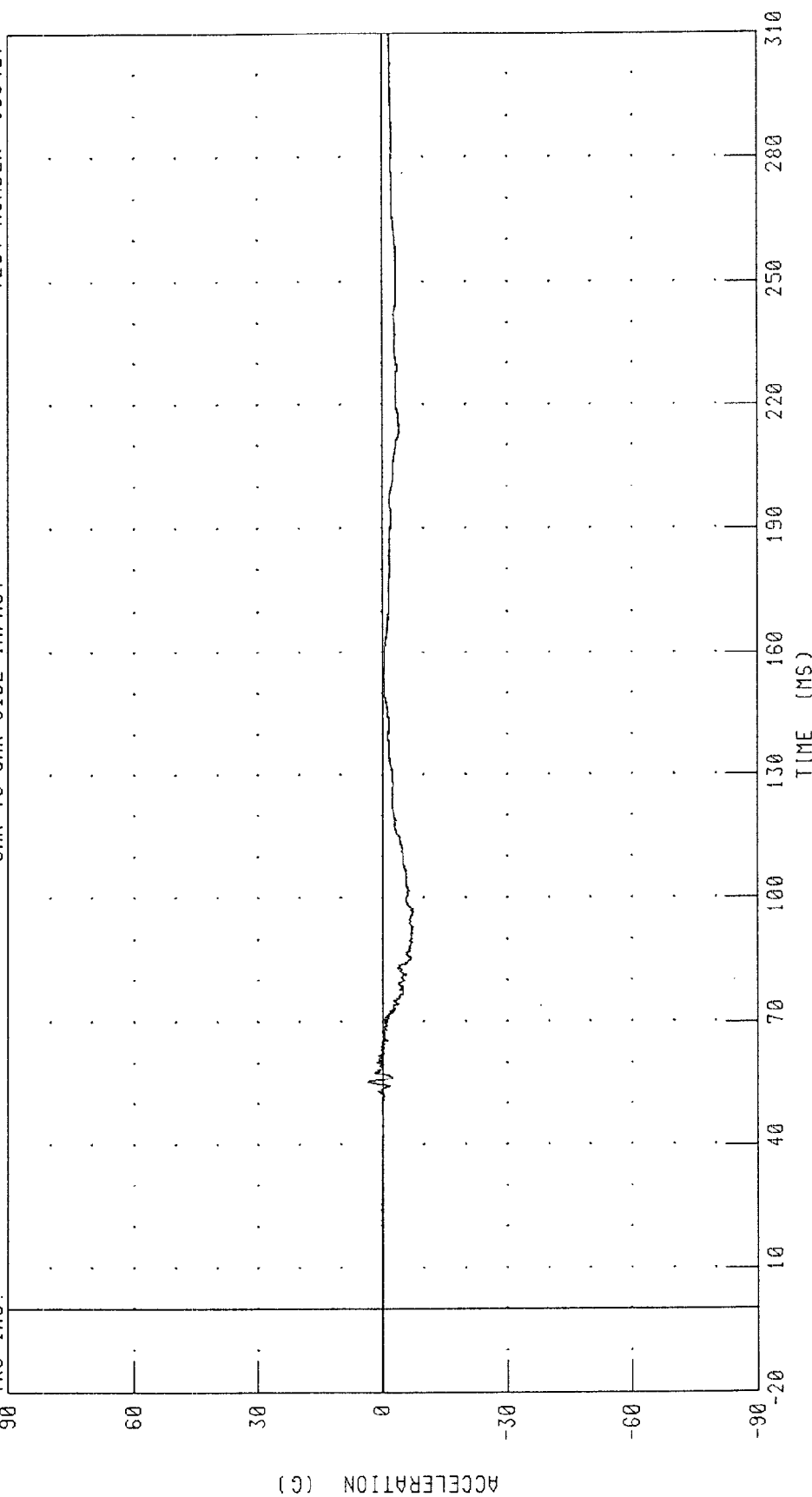
PEAK DATA: 2.37 G @ 171.36 MS, -22.76 G @ 141.60 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

PEAK DATA: 3.56 G @ 55.20 MS; -7.39 G @ 93.04 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER HEAD RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

120

100

80

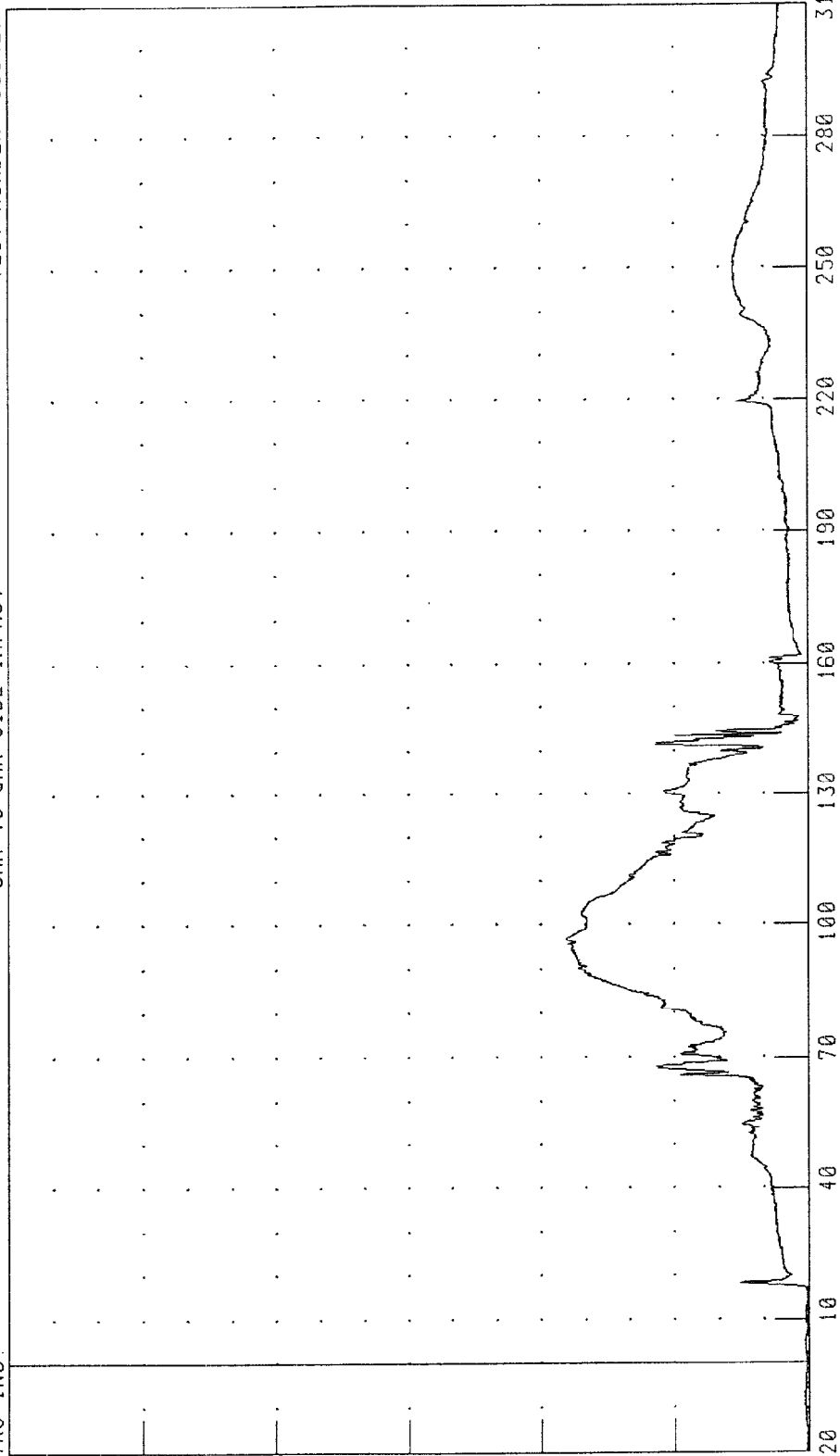
60

40

20

0

ACCELERATION (G)

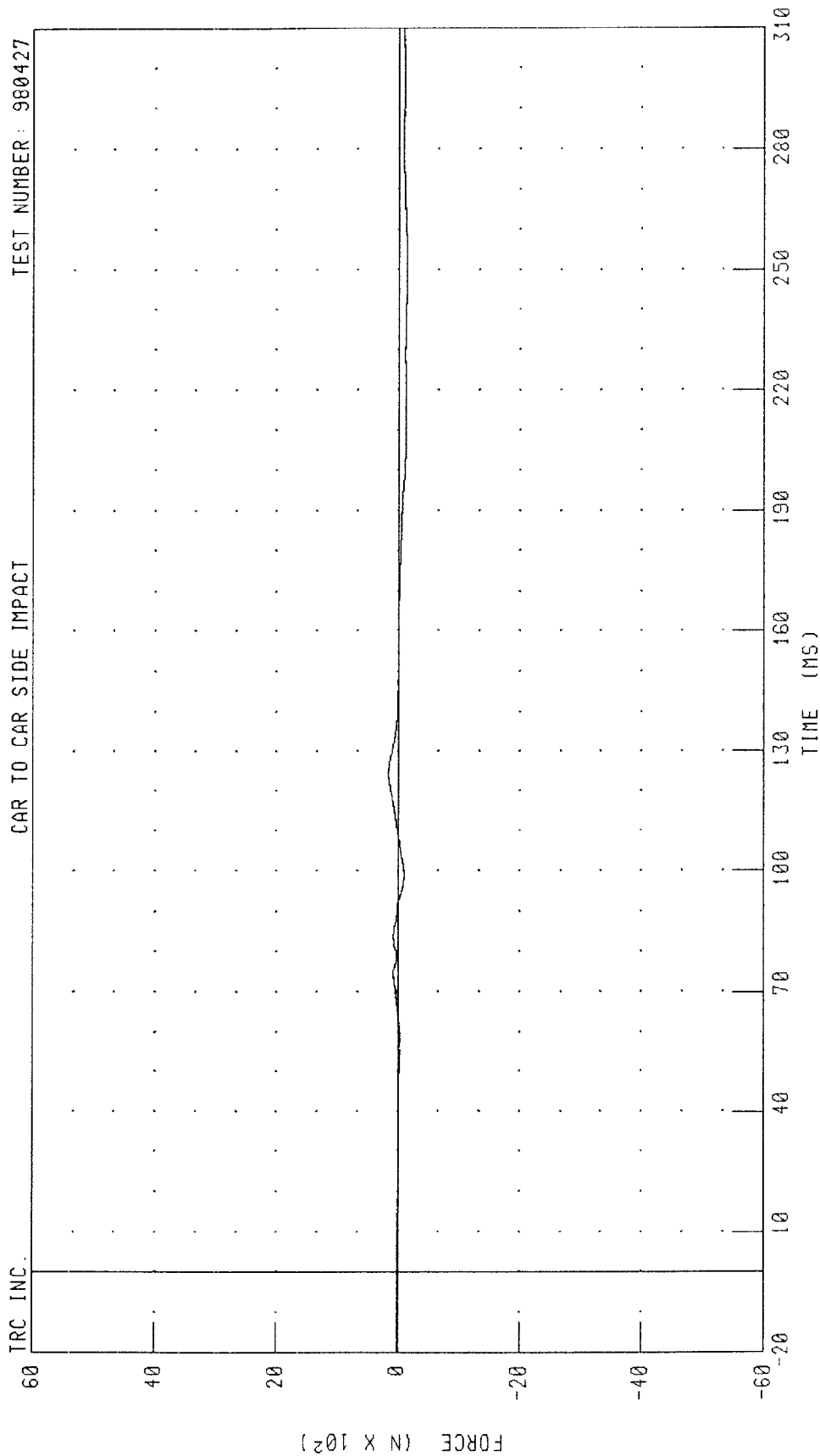


TIME (MS)

CHANNEL: HEDRC1 FILTER: CH. CLASS 1000

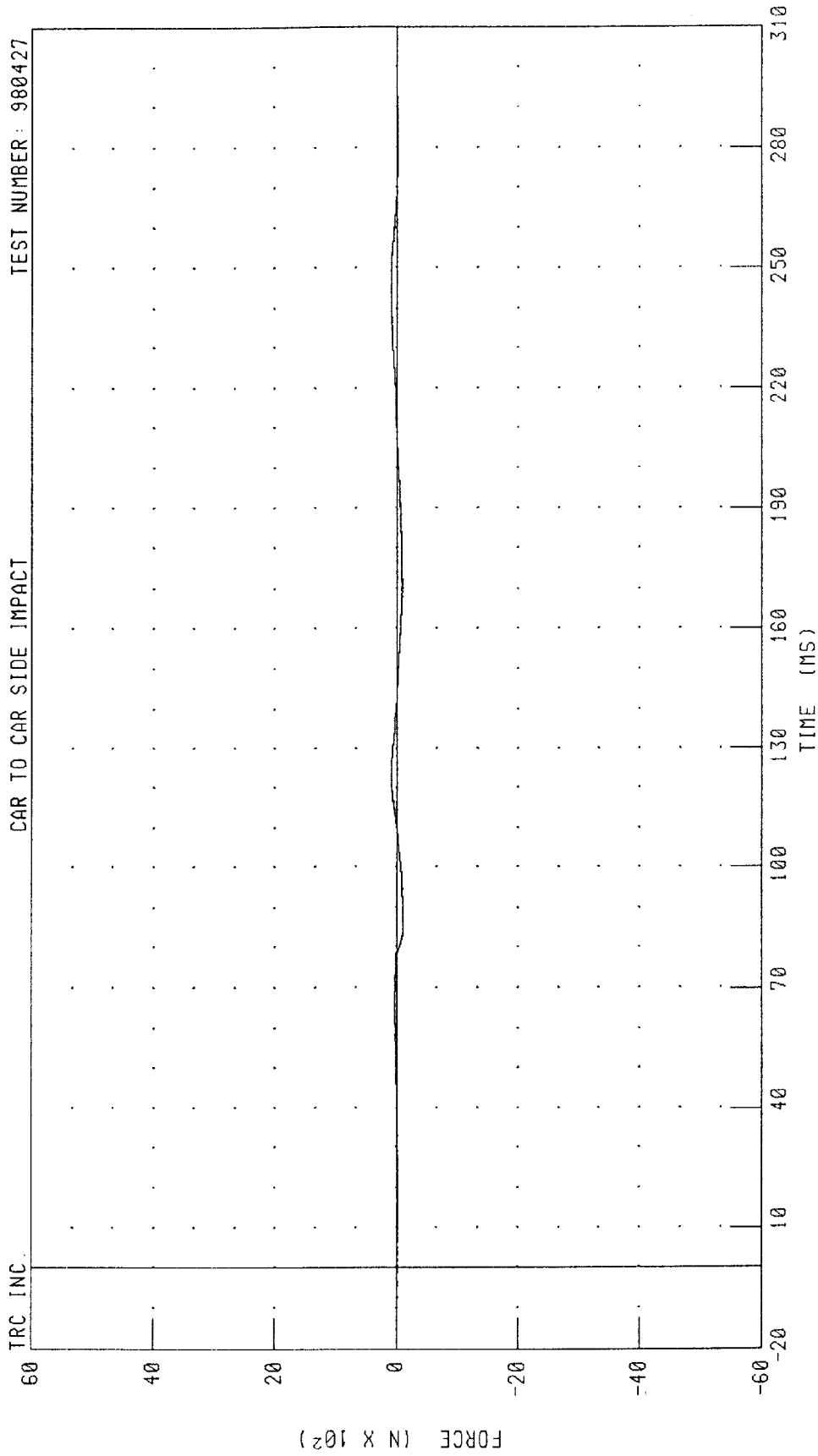
PEAK DATA: 36.23 G @ 96.96 MS; 0.05 G @ -18.40 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE DRIVER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 158.61 N @ 124.32 MS, -150.01 N @ 249.20 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE DRIVER NECK Y-AXIS SHEAR FORCE



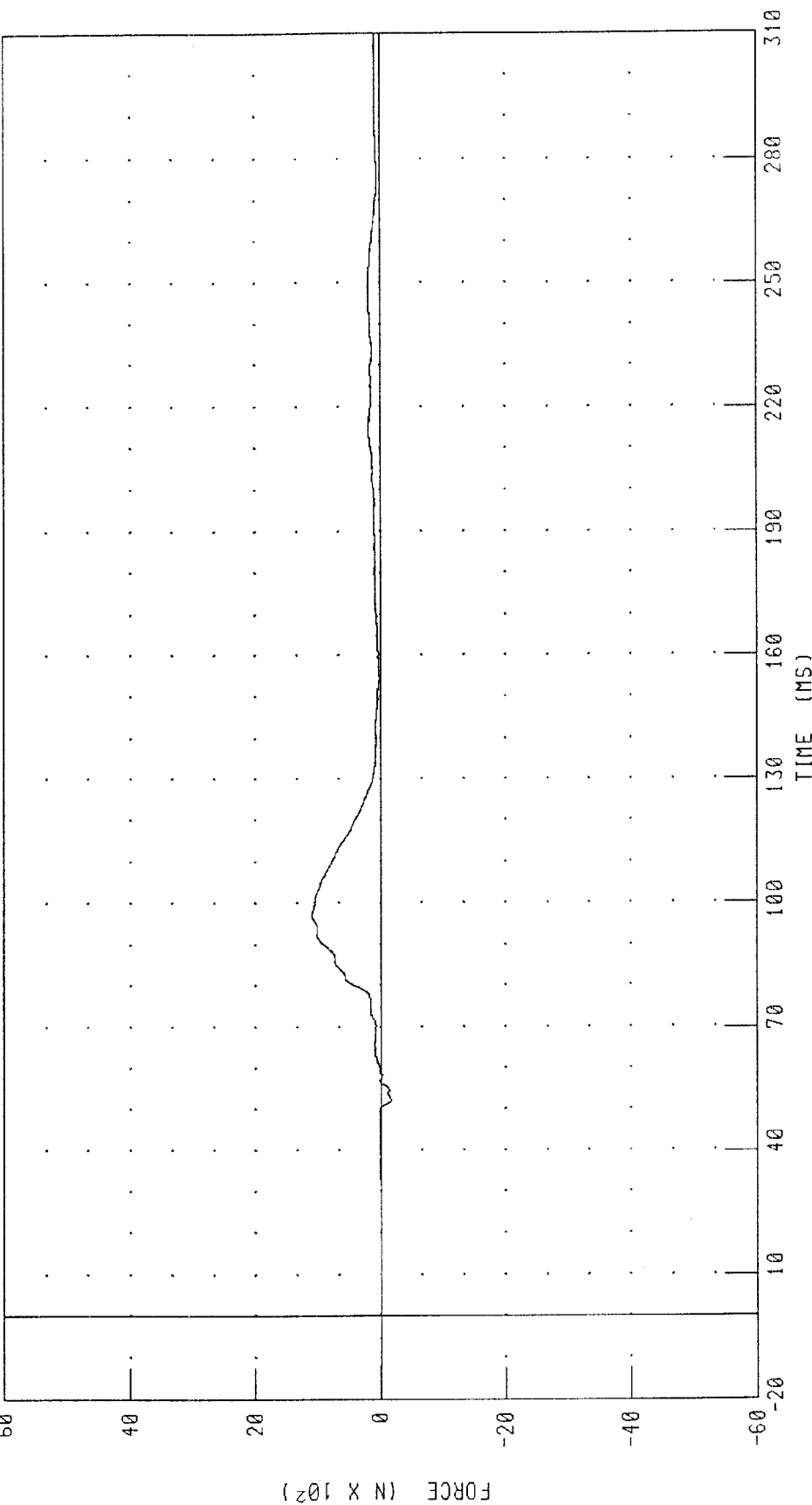
CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 81.94 N @ 122.80 MS; -113.73 N @ 85.12 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE DRIVER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



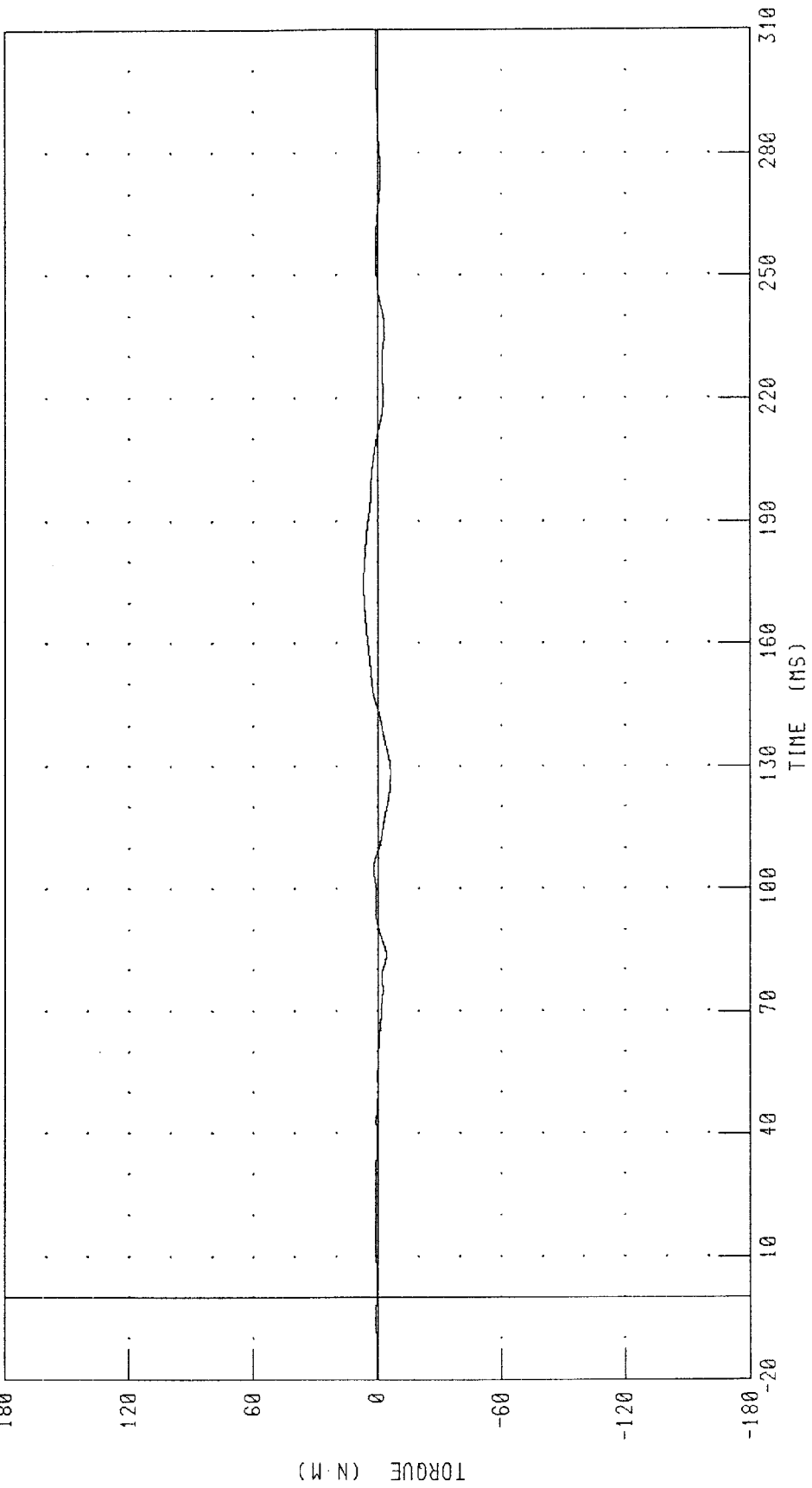
PEAK DATA: 1092.83 N @ 96.64 MS, -172.08 N @ 52.00 MS

CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER NECK MOMENT ABOUT X AXIS
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



PEAK DATA: 6.82 N-M @ 174.88 MS, -6.15 N-M @ 128.16 MS

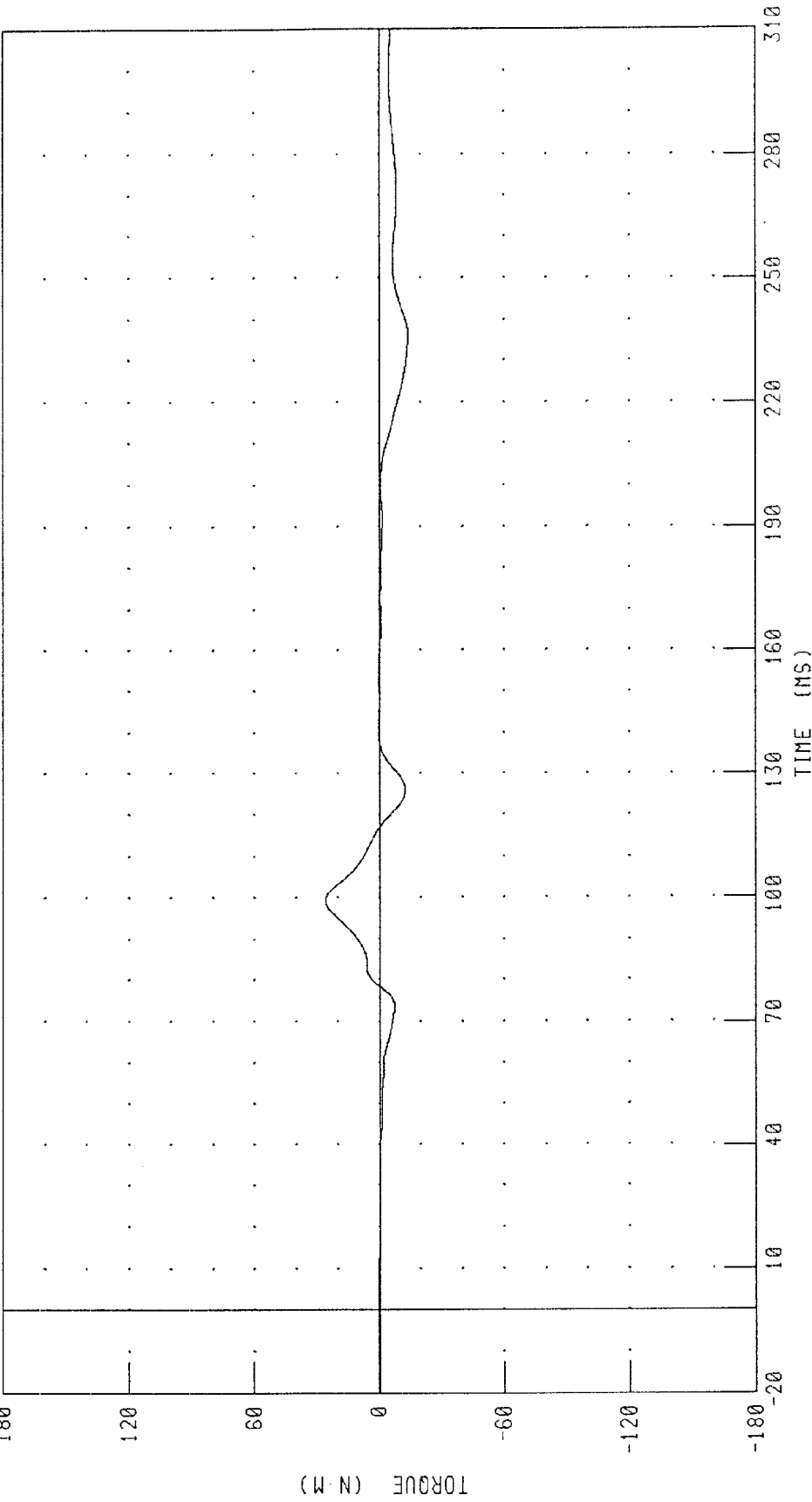
FILTER: CH. CLASS 60

CHANNEL: NEKXM1

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE DRIVER NECK MOMENT ABOUT Y AXIS
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: NEKYM1 FILTER: CH. CLASS 60

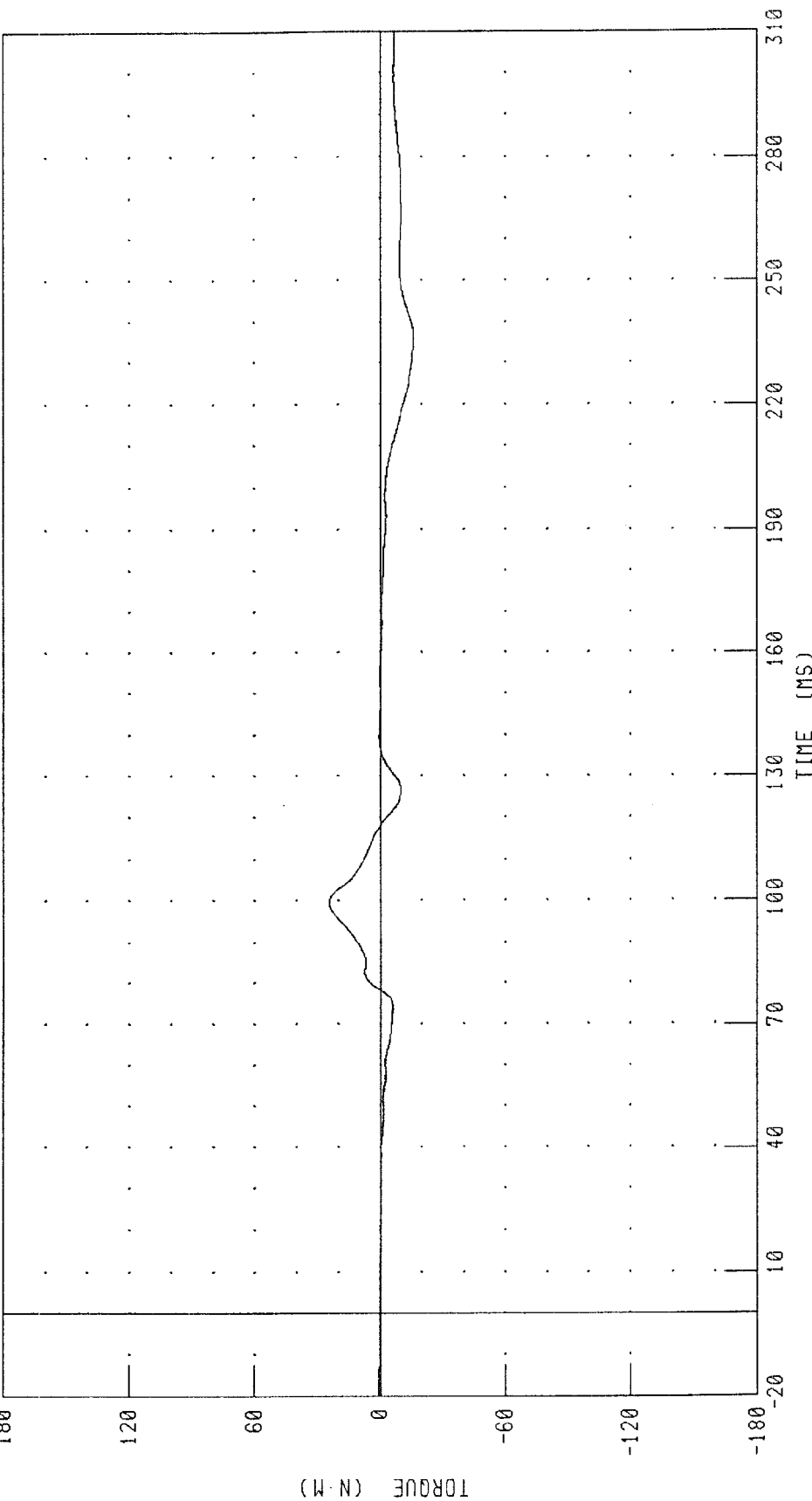
PEAK DATA: 25.83 N-M @ 99.36 MS; -13.87 N-M @ 236.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER NECK OCCIPITAL CONDYLE

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



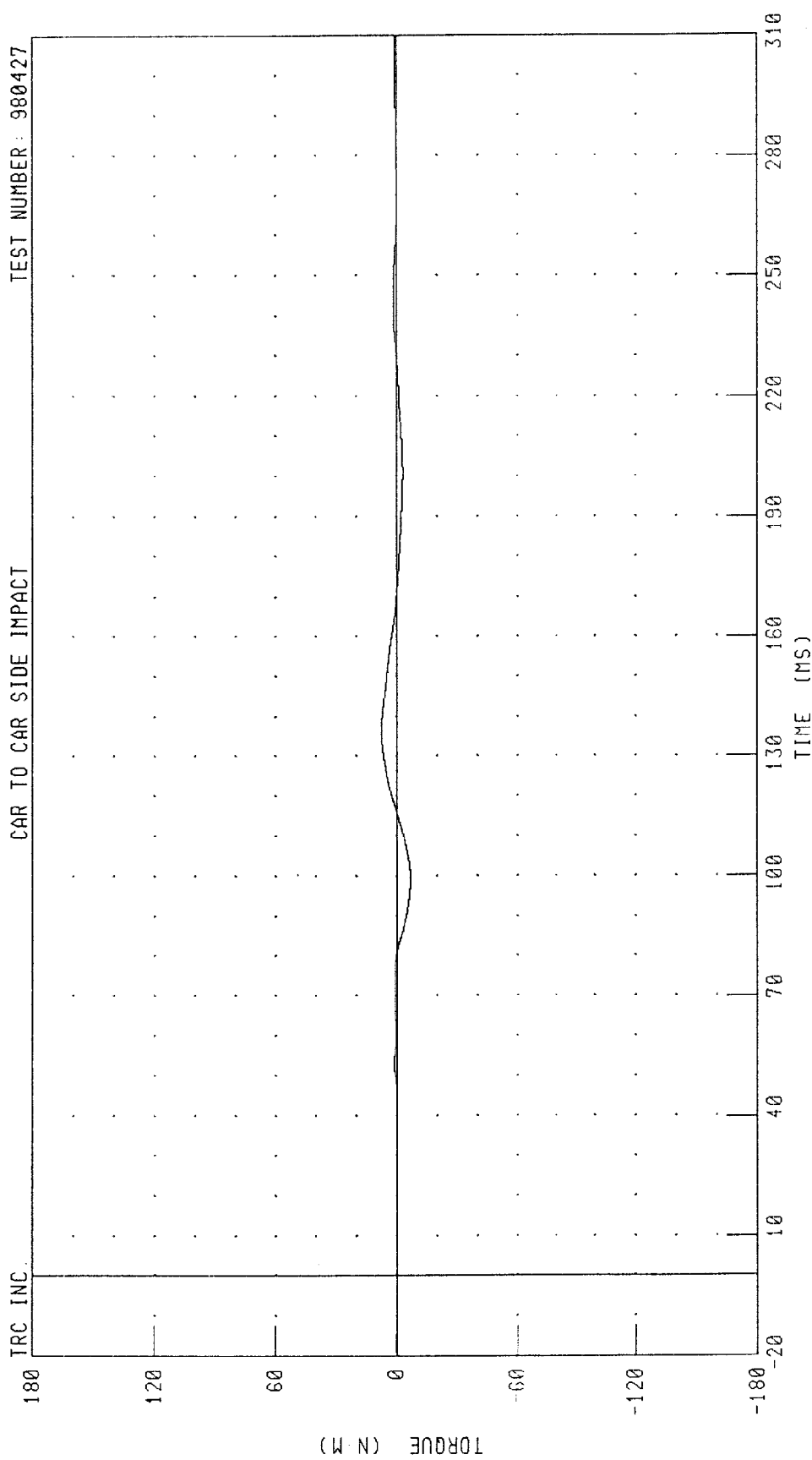
CHANNEL: NEXOM1 FILTER: CH. CLASS 600

PEAK DATA: 24.25 N·M @ 99.68 MS, -16.02 N·M @ 234.96 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE DRIVER NECK MOMENT ABOUT Z AXIS

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: NEKZM1 FILTER: CH. CLASS 60

PEAK DATA: 7.40 N-M @ 136.24 MS, -6.78 N-M @ 99.36 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER CHEST X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

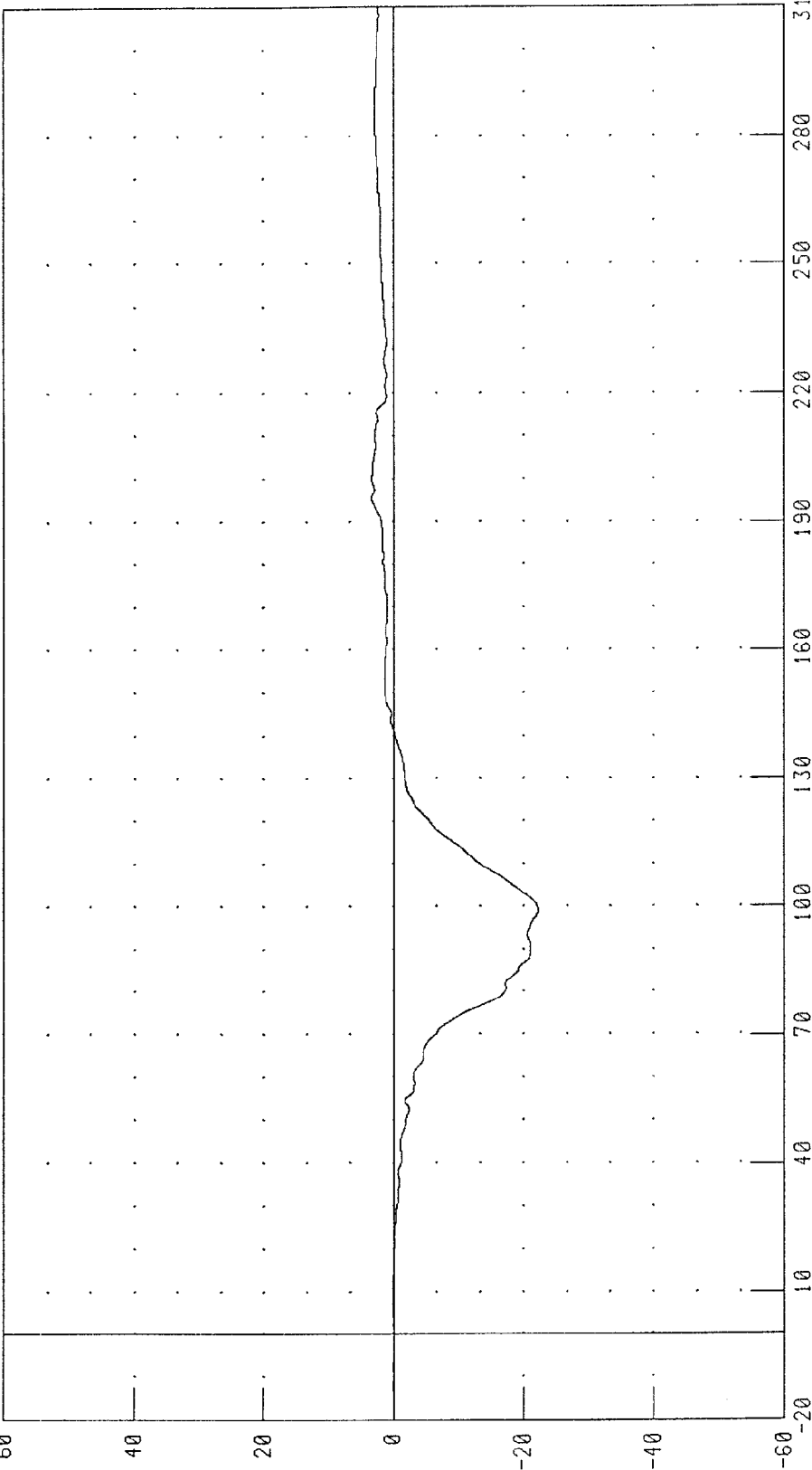
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

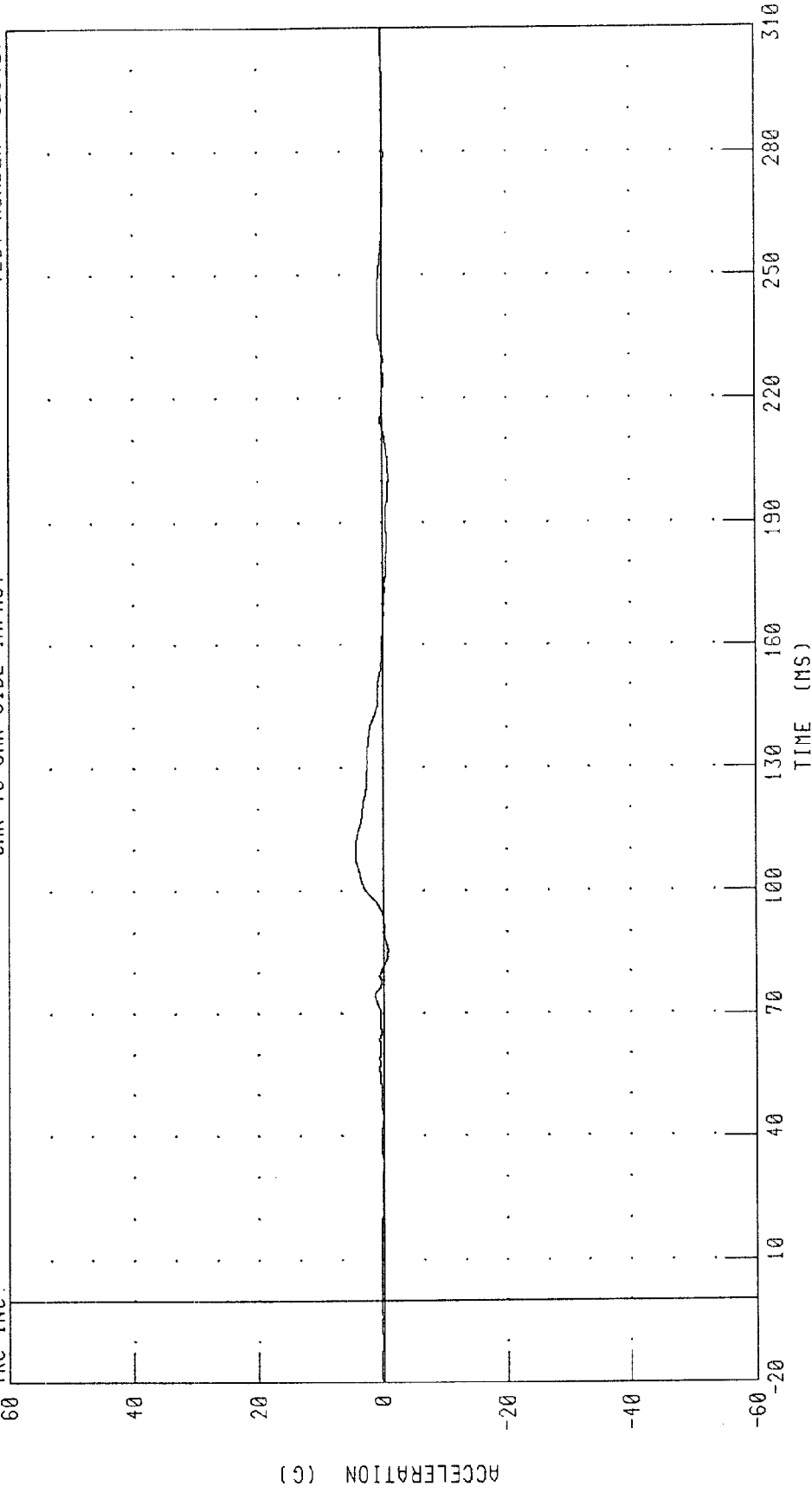
CHANNEL: CSTXC1 FILTER: CH. CLASS 180

PEAK DATA: 3.39 G @ 195.52 MS; -22.22 G @ 99 20 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER CHEST Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



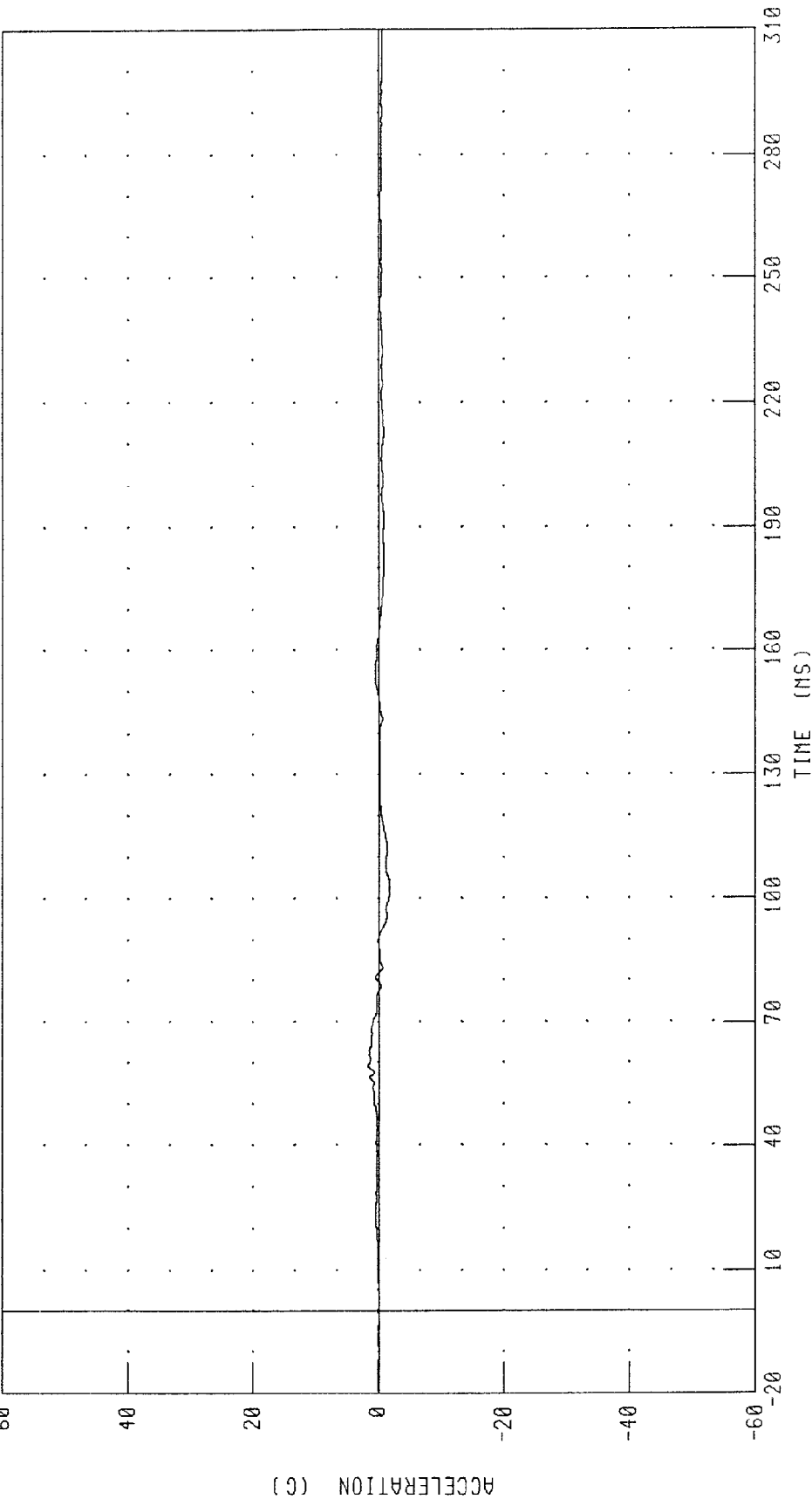
CHANNEL: CSTYC1 FILTER: CH. CLASS 180

PEAK DATA: 4.31 G @ 111.36 MS; -1.11 G @ 200.80 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER CHEST Z-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



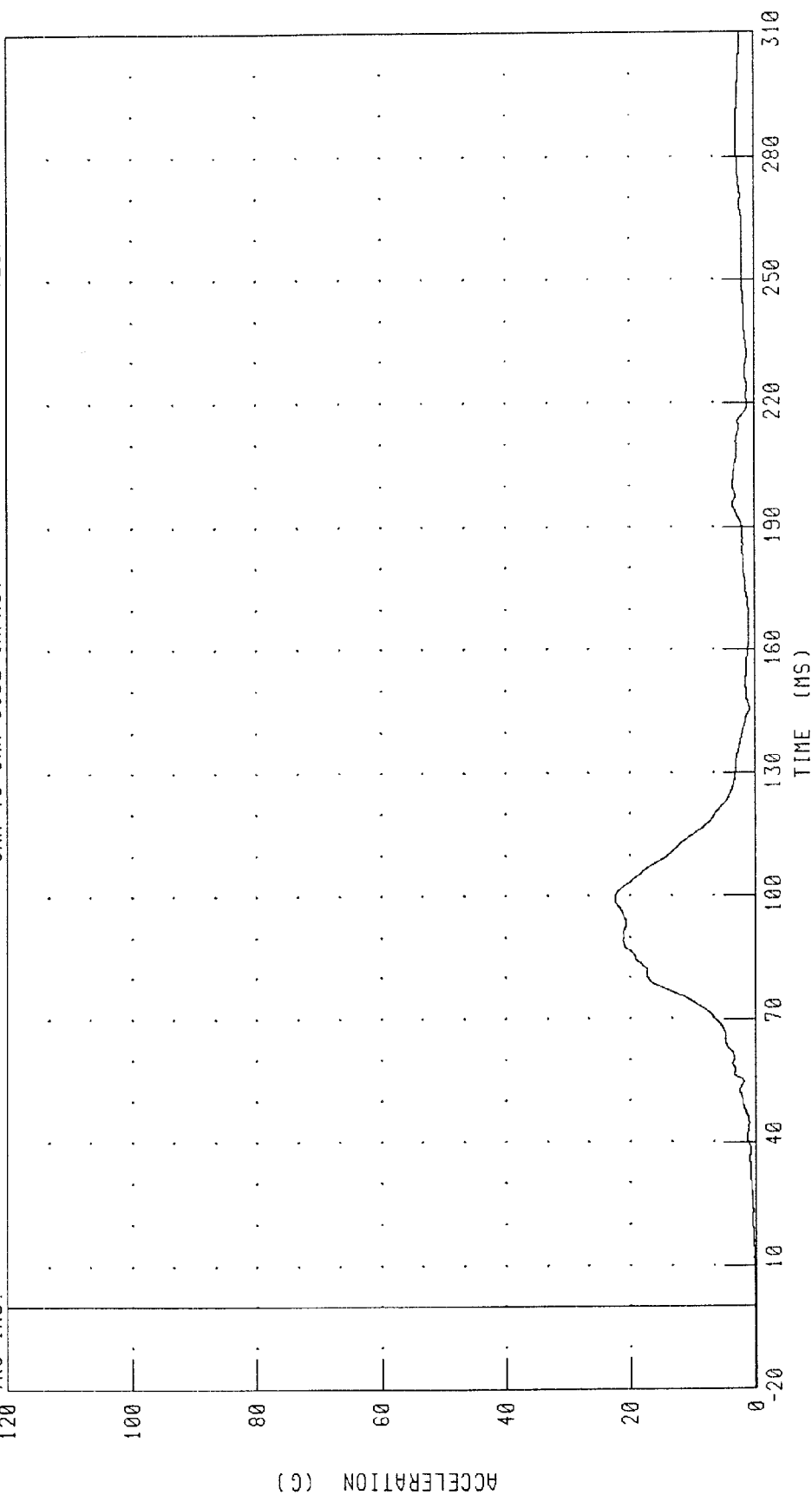
CHANNEL: CSTZC1 FILTER: CH. CLASS 180

PEAK DATA: 1.64 G @ 59.36 MS; -1.79 G @ 101.68 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER CHEST RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: CSTRC1 FILTER: CH. CLASS 180

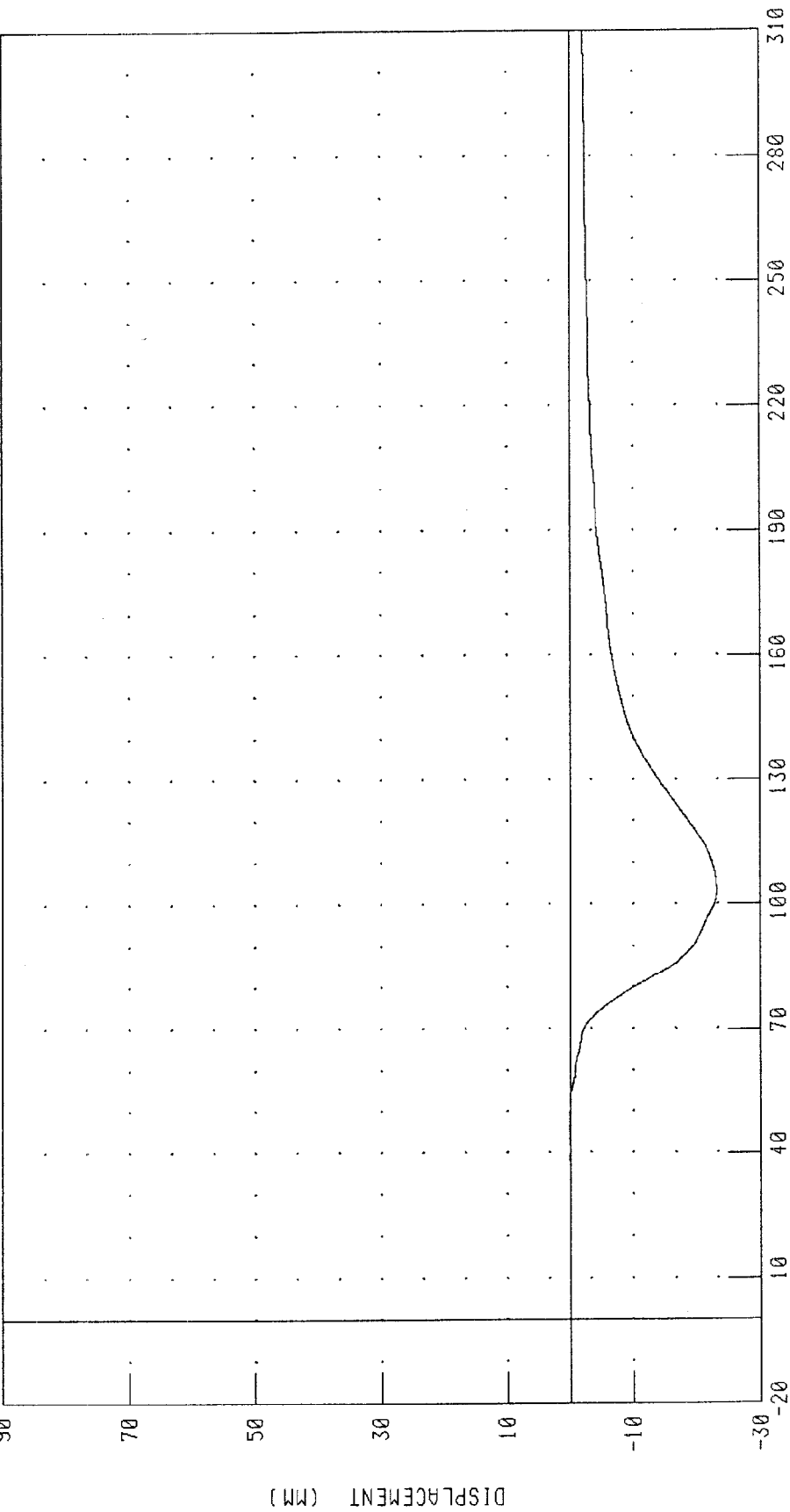
PEAK DATA: 22.39 G @ 99.52 MS; 0.02 G @ -20.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER CHEST DEFLECTION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



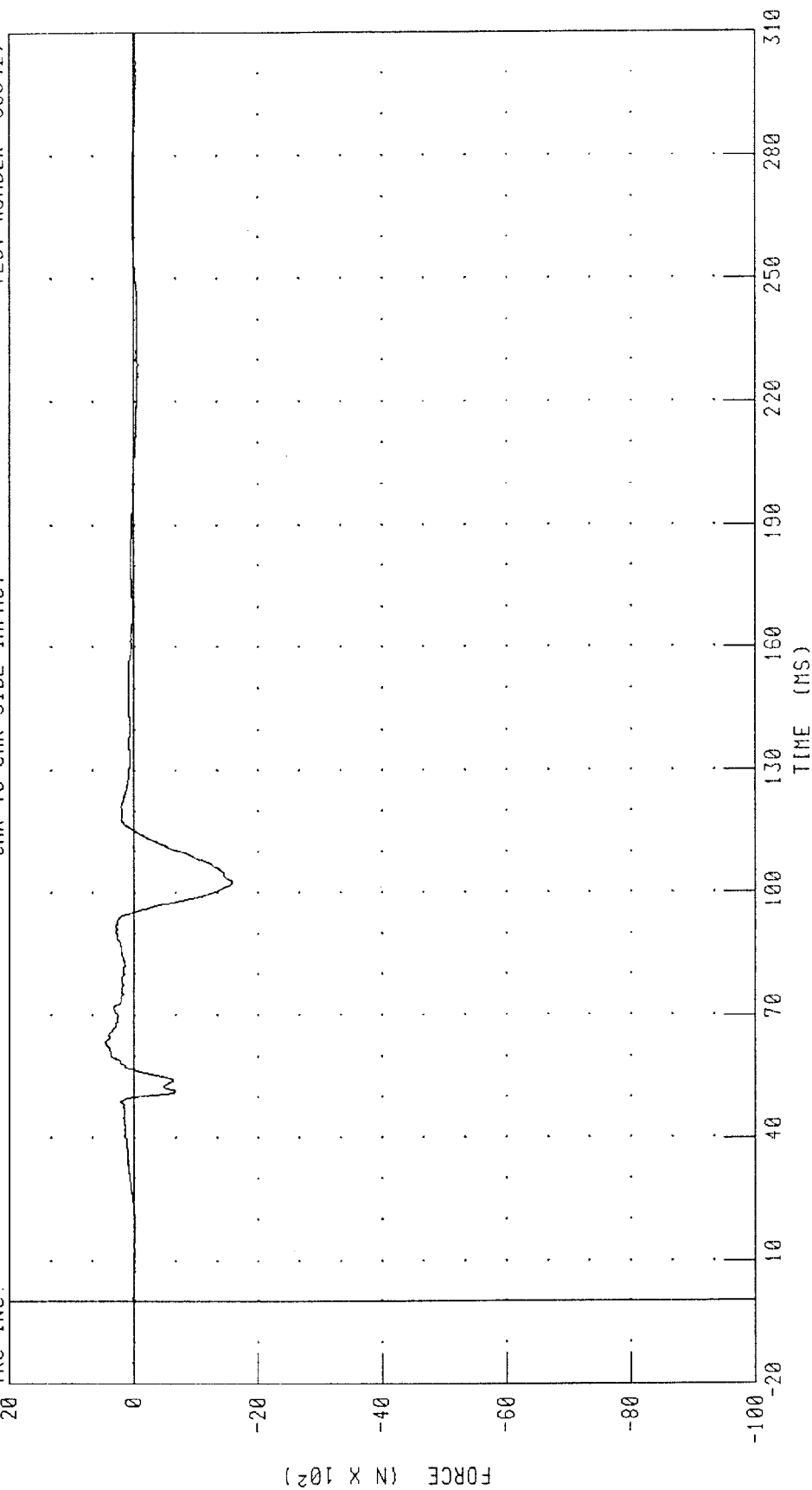
CHANNEL: CSTXD1 FILTER: CH. CLASS 180

PEAK DATA: 0.06 MM @ 45.28 MS, -23.19 MM @ 102.96 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER LEFT FEMUR FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

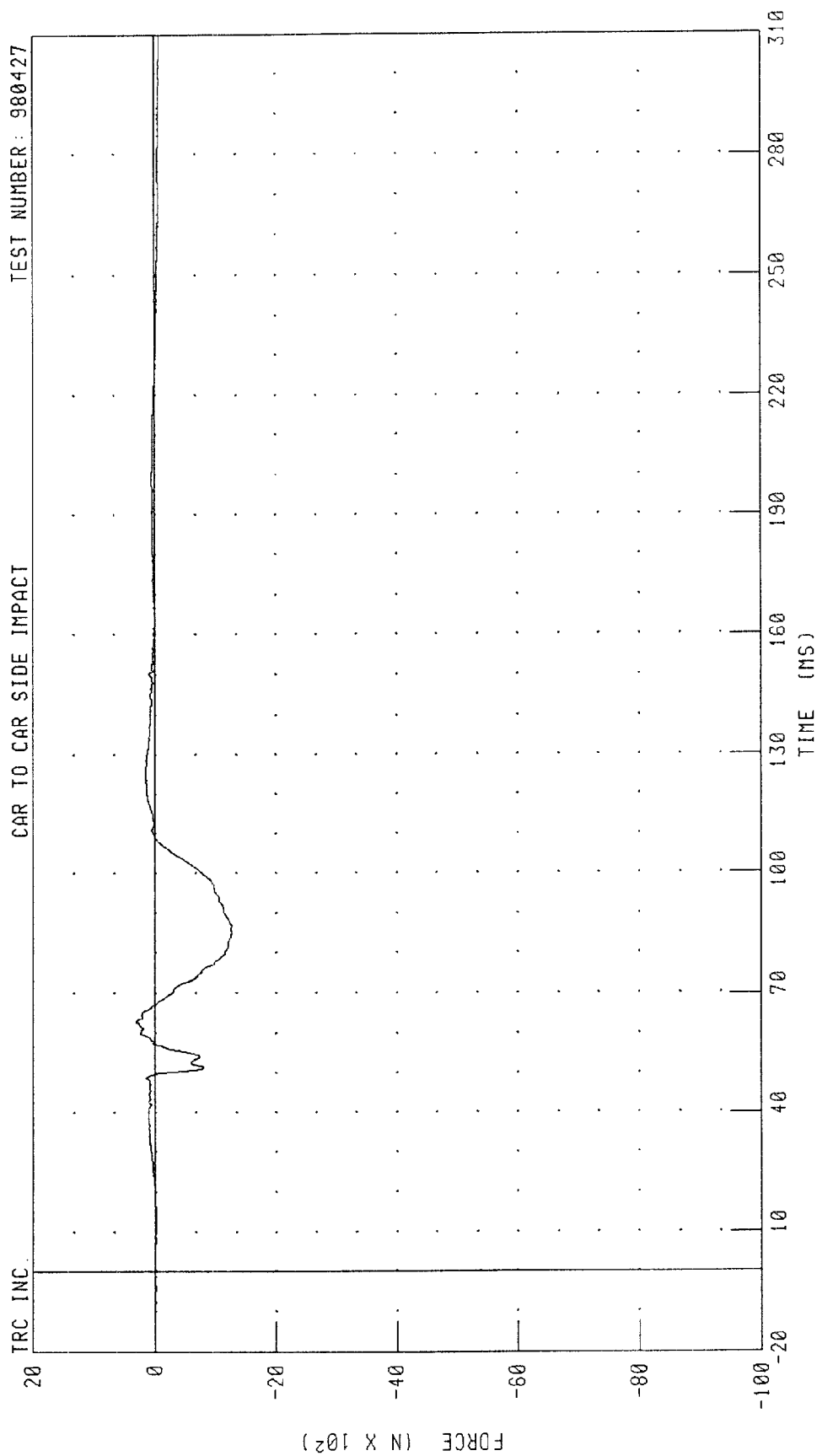


PEAK DATA: 467.37 N @ 63.60 MS; -1583.19 N @ 102.72 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE DRIVER RIGHT FEMUR FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



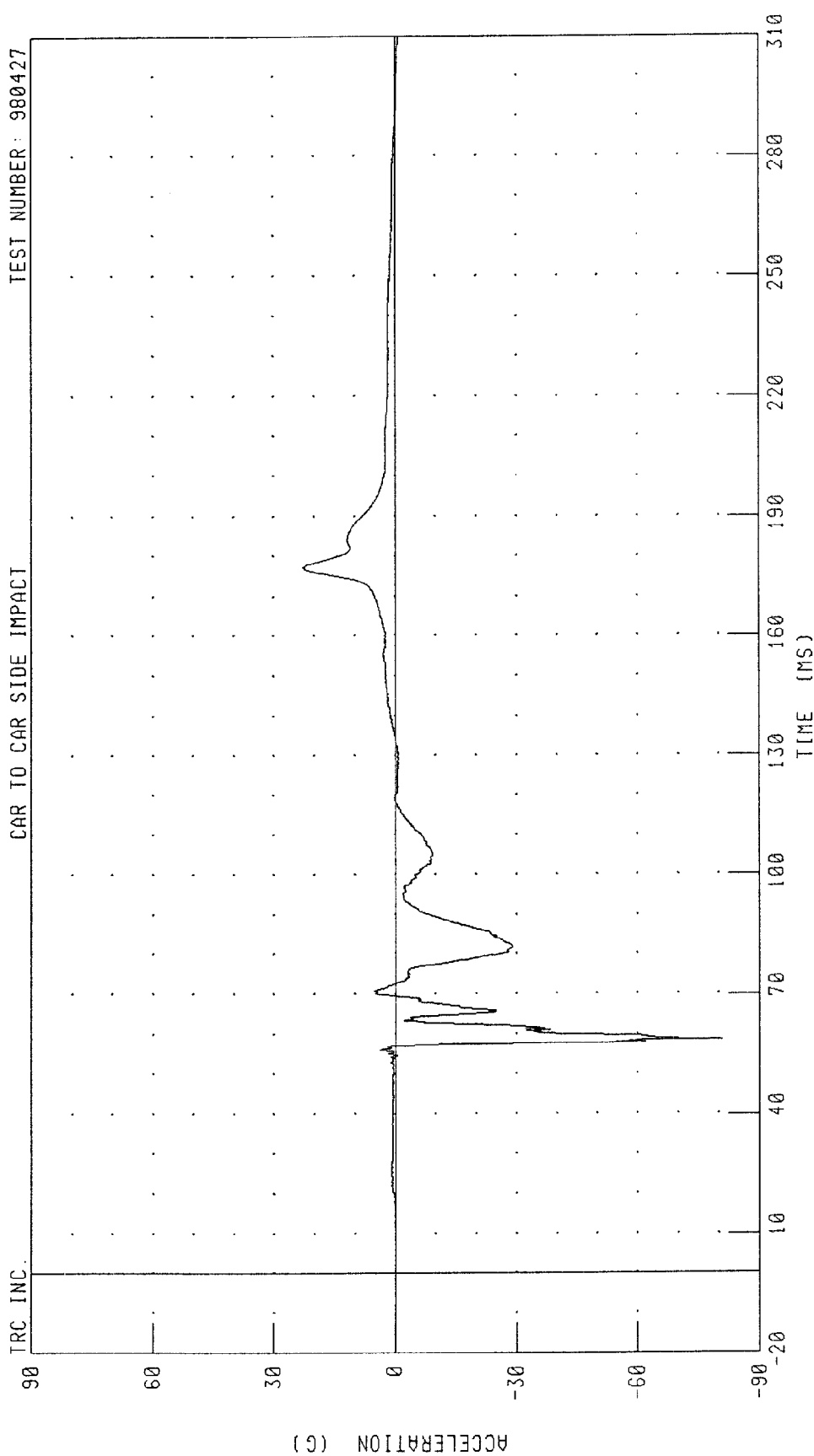
CHANNEL: RFMF1 FILTER: CH. CLASS 600

PEAK DATA: 313.83 N @ 62.96 MS, -1265.41 N @ 85.28 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

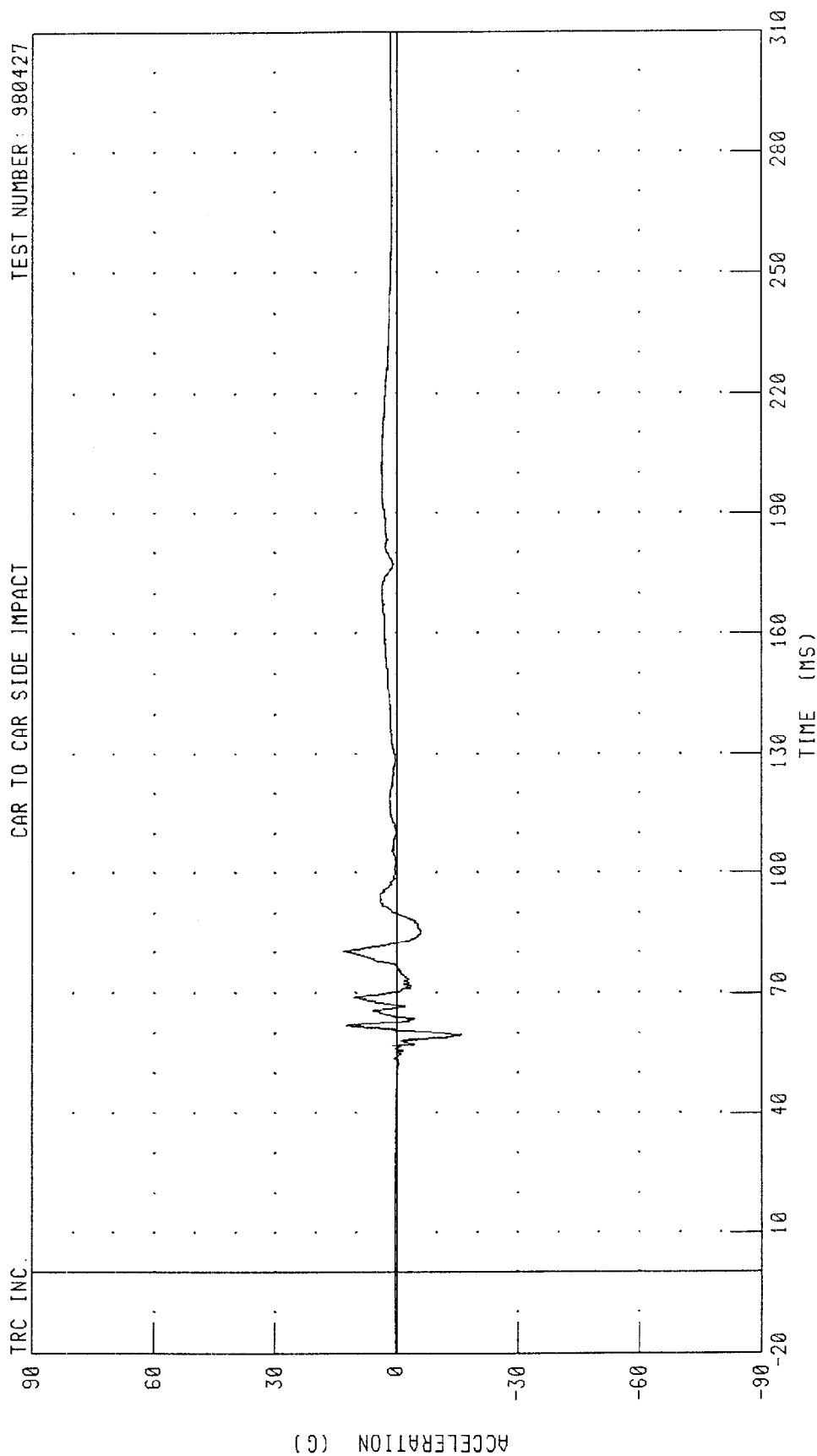
TEST NUMBER: 980427



CHANNEL: HEDXC2 FILTER: CH. CLASS 1000

PEAK DATA: 22.64 G @ 177.20 MS, -80.80 G @ 59.56 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYC2 FILTER: CH. CLASS 1000 PEAK DATA: 13.13 G @ 80.40 MS; -16.04 G @ 59.60 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

90

60

30

0

-30

-60

-90

ACCELERATION (G)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

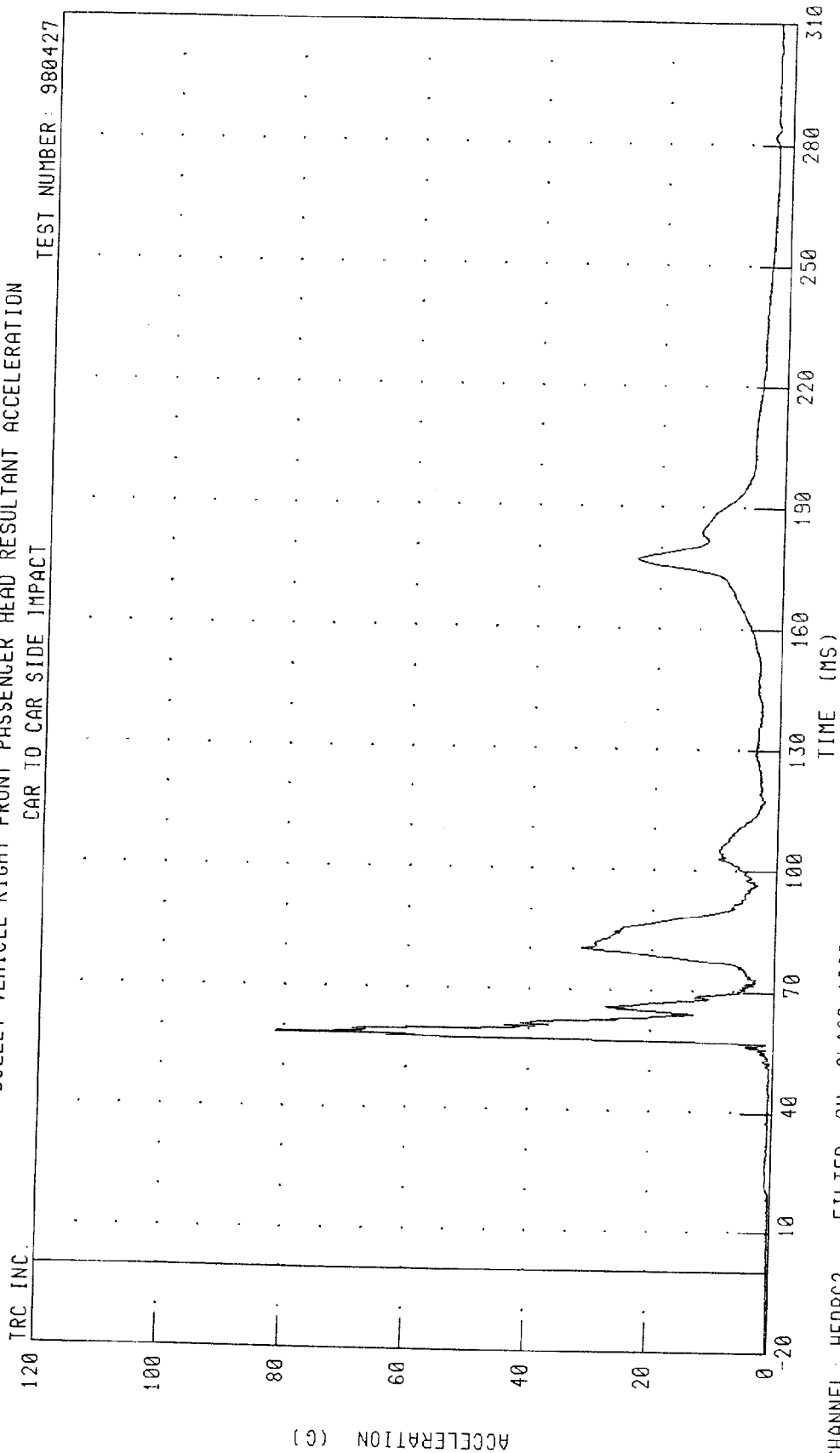
10

CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

PEAK DATA: 14 16 G @ 66.64 MS, -27.95 G @ 59.76 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



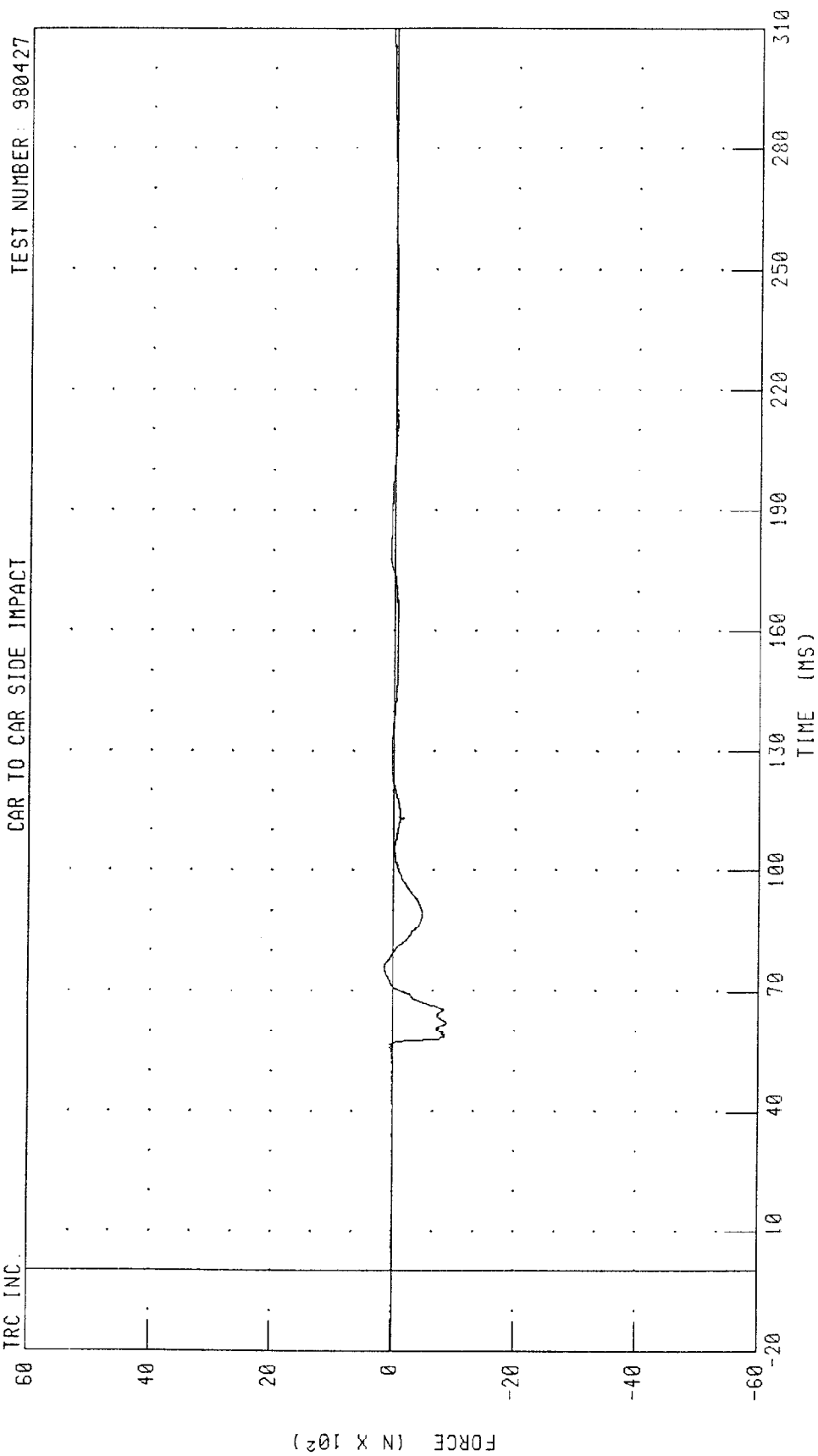
CHANNEL: HEDRC2 FILTER: CH. CLASS 1000

PEAK DATA: 81.49 G @ 58.56 MS; 0.17 G @ -19.20 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

PEAK DATA: 140 66 N @ 76.08 MS; -894.42 N @ 62.24 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

60

40

20

0

-20

-40

-60

FORCE (N X 10²)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

10

CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

PEAK DATA: 152.58 N @ 80.48 MS, -155.89 N @ 192.32 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.

60

40

20

FORCE (N X 10²)

-20

-40

-60

-20

0

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80

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120

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160

180

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220

240

260

280

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360

370

380

390

400

410

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430

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770

780

790

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830

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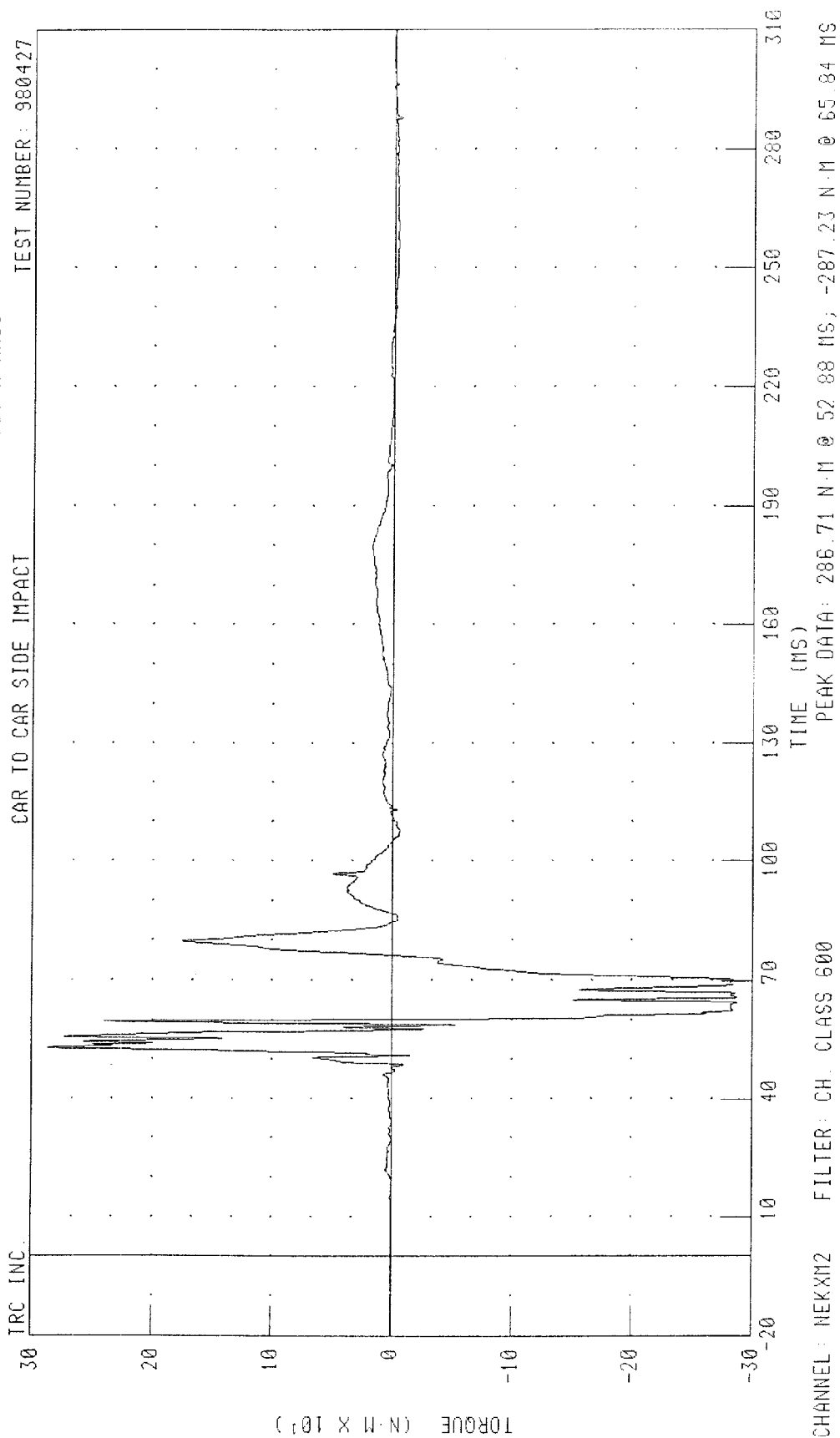
3180

3190

3200

3210

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS
CAR TO CAR SIDE IMPACT

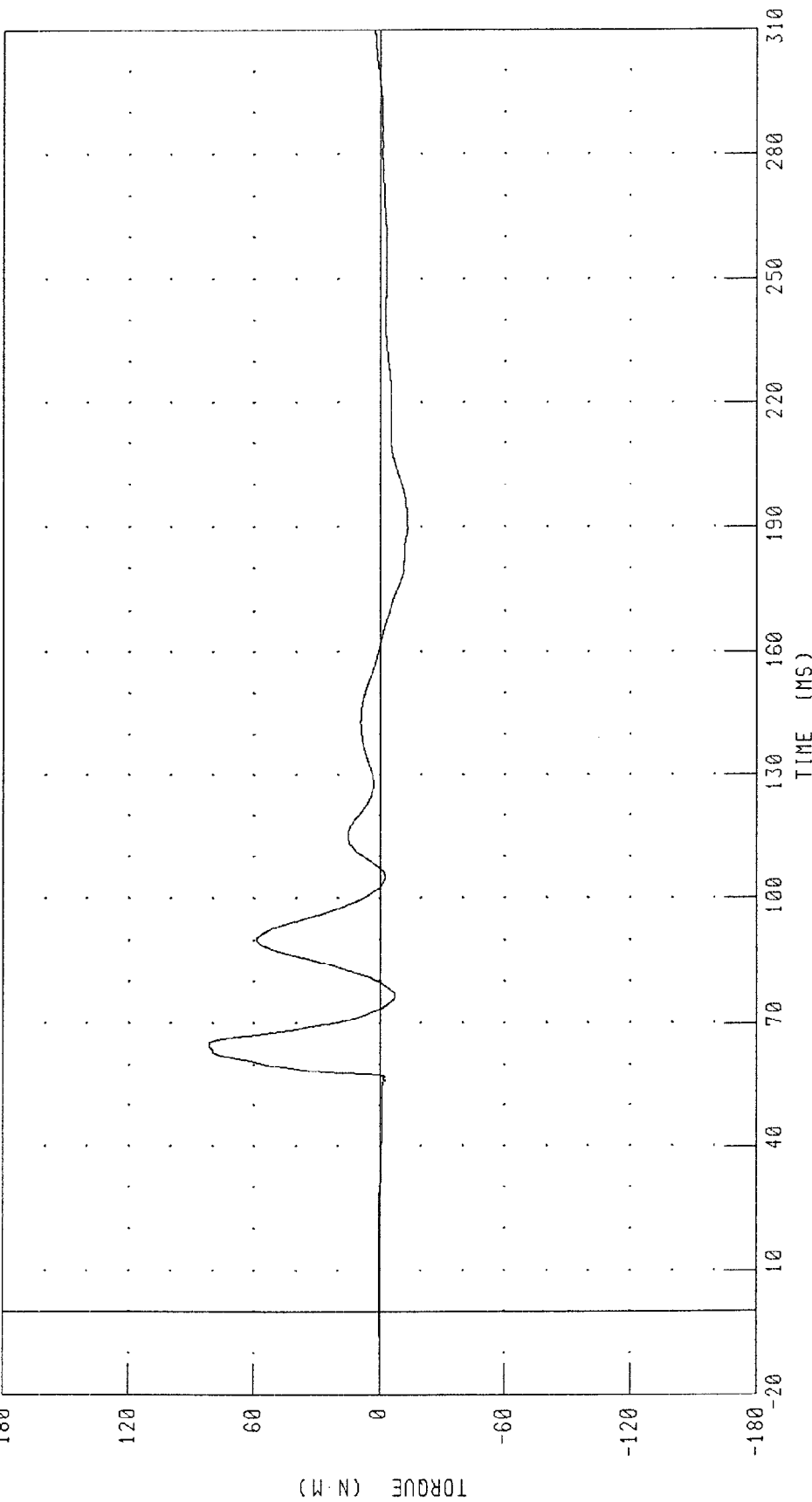


1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



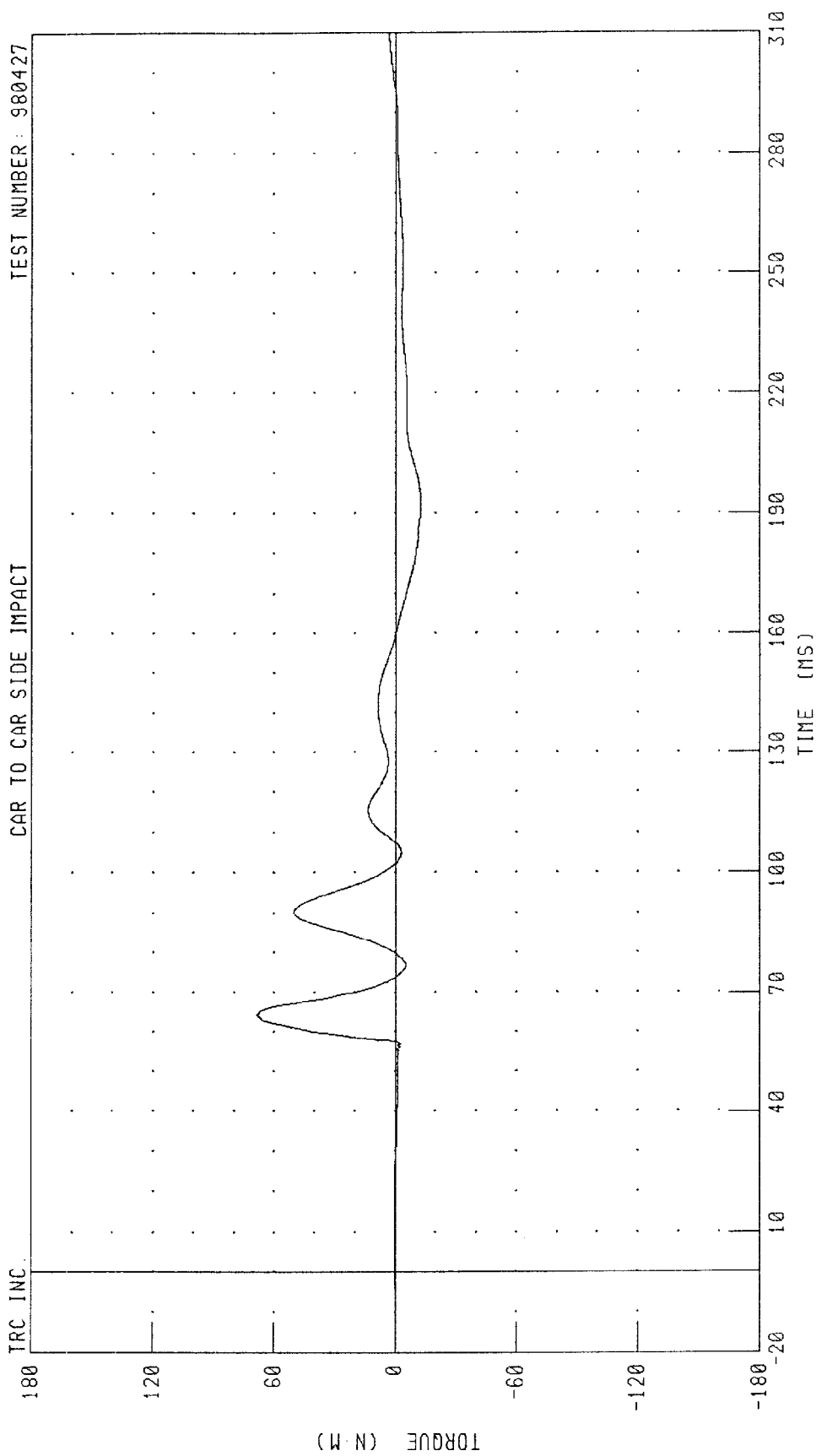
CHANNEL: NEKYM2 FILTER: CH. CLASS 600

PEAK DATA: 81.80 N-M @ 65.28 MS, -13.20 N-M @ 189.84 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER NECK OCCIPITAL CONDYLE

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: NEKOM2 FILTER: CH. CLASS 600

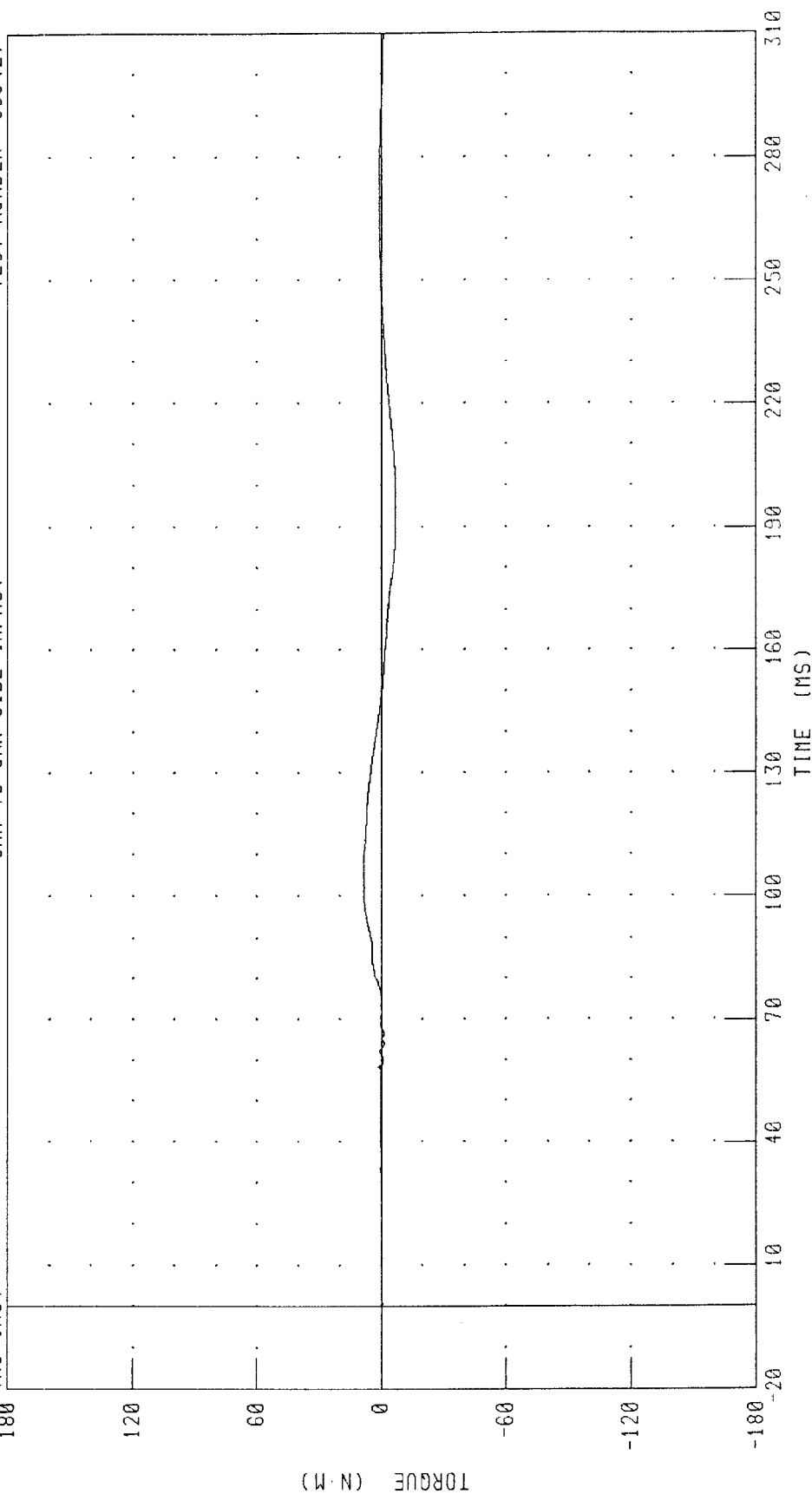
PEAK DATA: 68.30 N-M @ 64.32 MS, -12.47 N-M @ 190.96 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: NEK2M2 FILTER: CH. CLASS 600

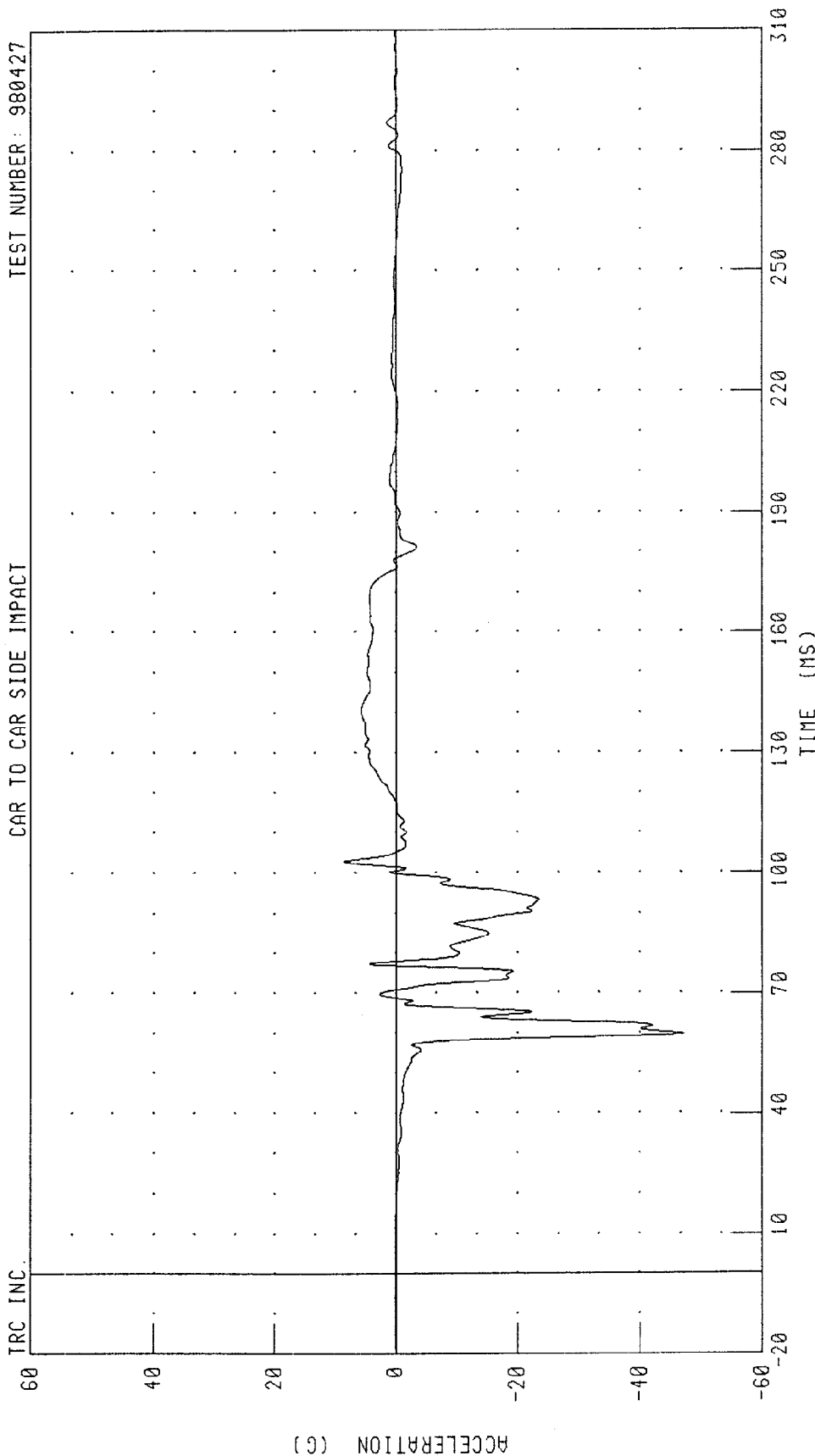
PEAK DATA: 8.59 N-M @ 100.88 MS; -6.95 N-M @ 200.80 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: CSTXG2 FILTER: CH. CLASS 180

PEAK DATA: 8.54 G @ 102.88 MS, -47.17 G @ 59.76 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

IRC INC.

60

40

20

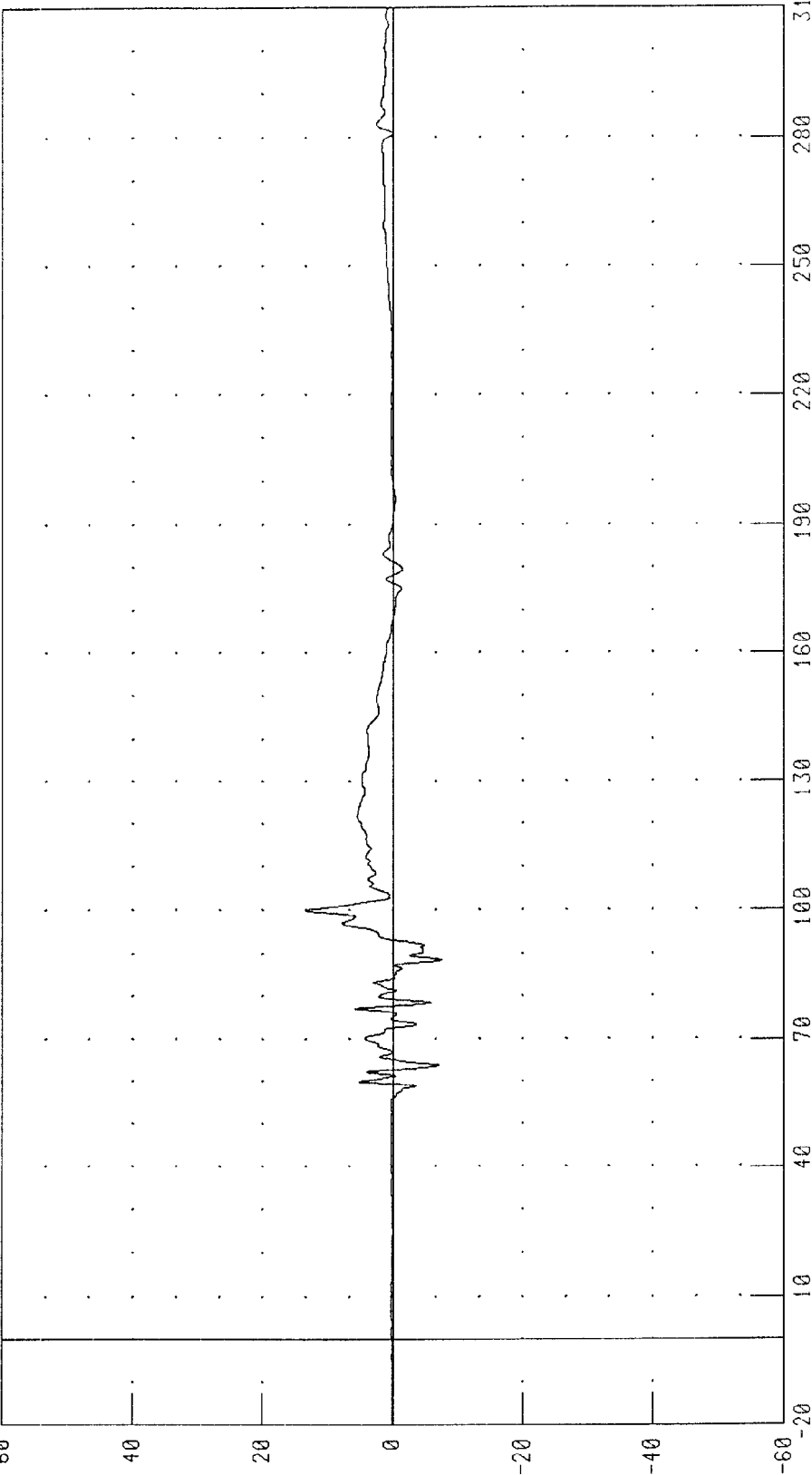
0

-20

-40

-60

ACCELERATION (G)

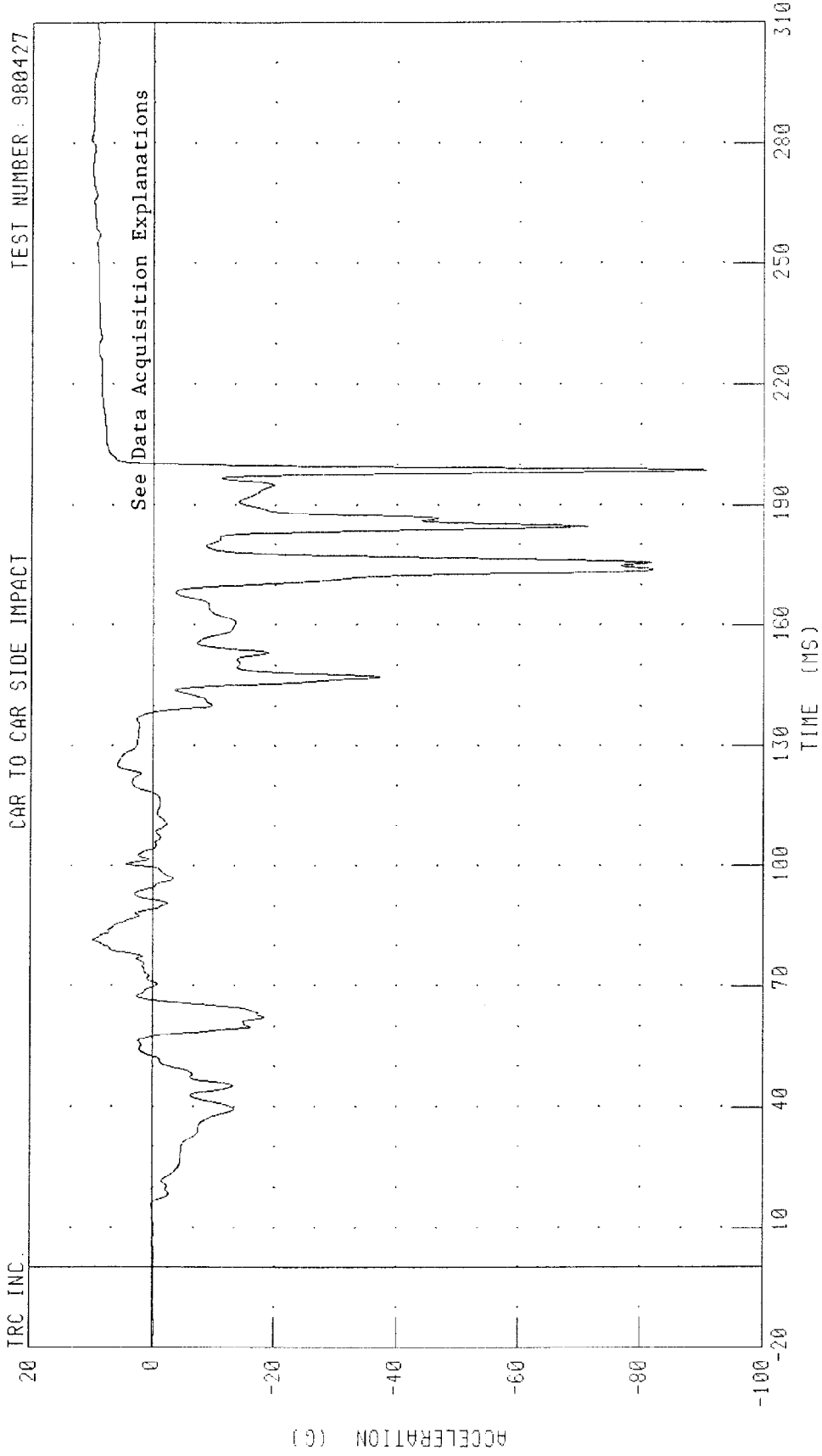


TIME (MS)

CHANNEL: CSTYC2 FILTER: CH. CLASS 180

PEAK DATA: 13.41 G @ 100.00 MS, -7.48 G @ 88.64 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT



TEST NUMBER: 980427

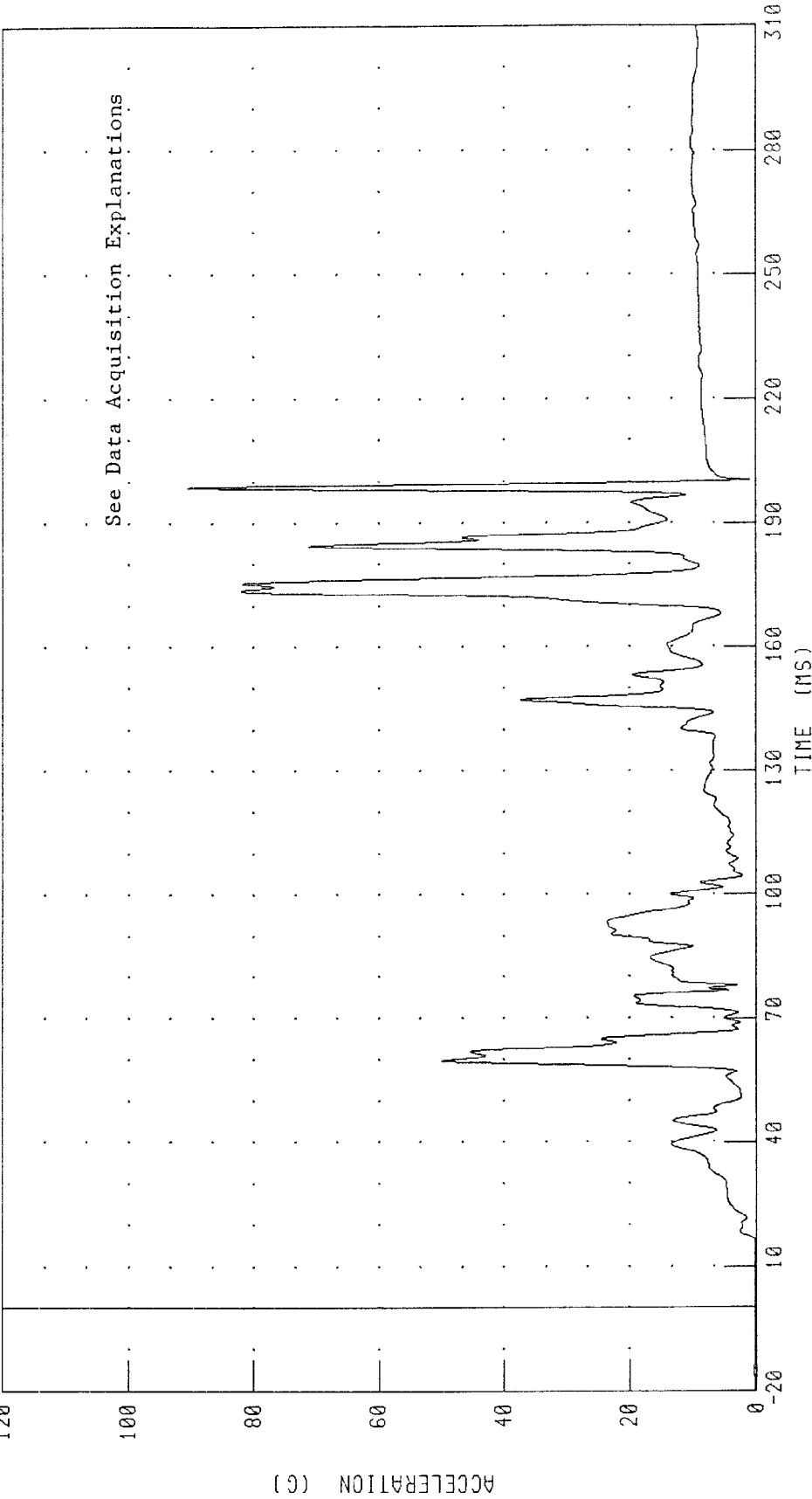
CHANNEL: CSTZG2 FILTER: CH. CLASS 180

PEAK DATA: 10 32 G @ 280.96 MS; -90 51 G @ 198.72 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

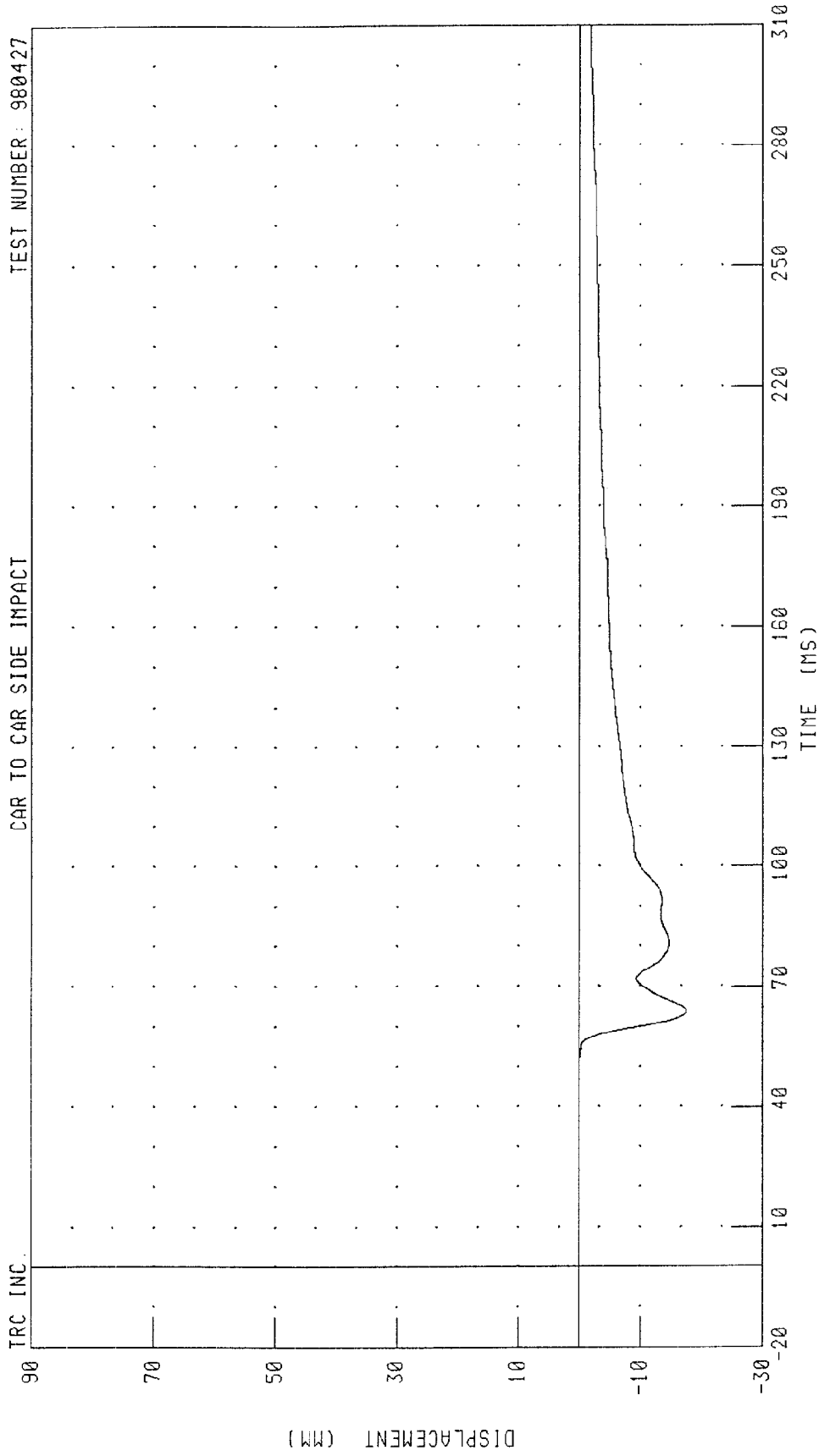
TRC INC.



CHANNEL: CSTRC2 FILTER: CH. CLASS 180

PEAK DATA: 90.51 G @ 198.72 MS, 0.01 G @ -20.00 MS

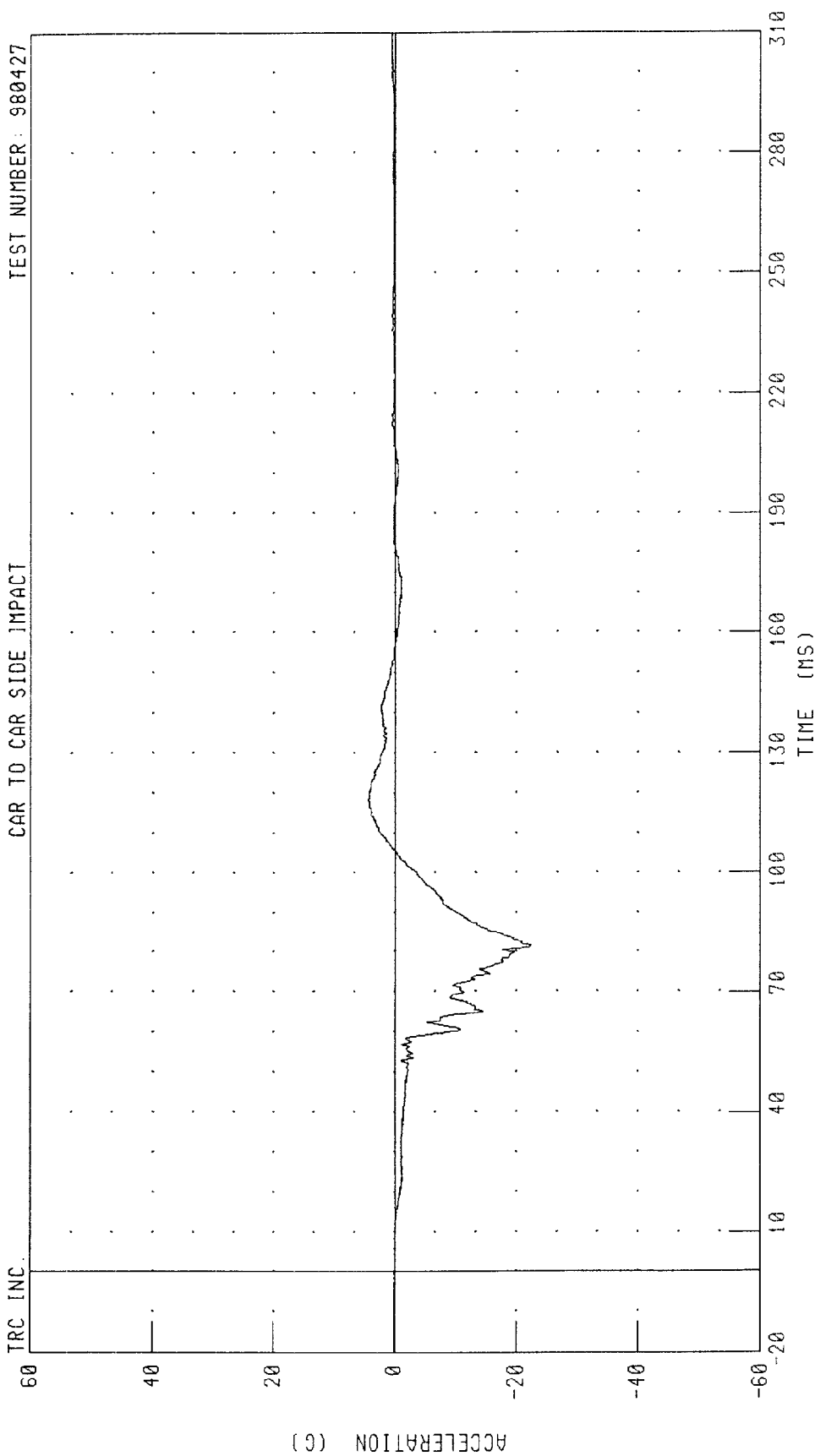
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER CHEST DEFLECTION



CHANNEL: CSTXD2 FILTER: CH. CLASS 180 PEAK DATA: 0.00 MM @ 30.56 MS, -17.51 MM @ 63.92 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



CHANNEL: PEVXC2 FILTER: CH. CLASS 1000

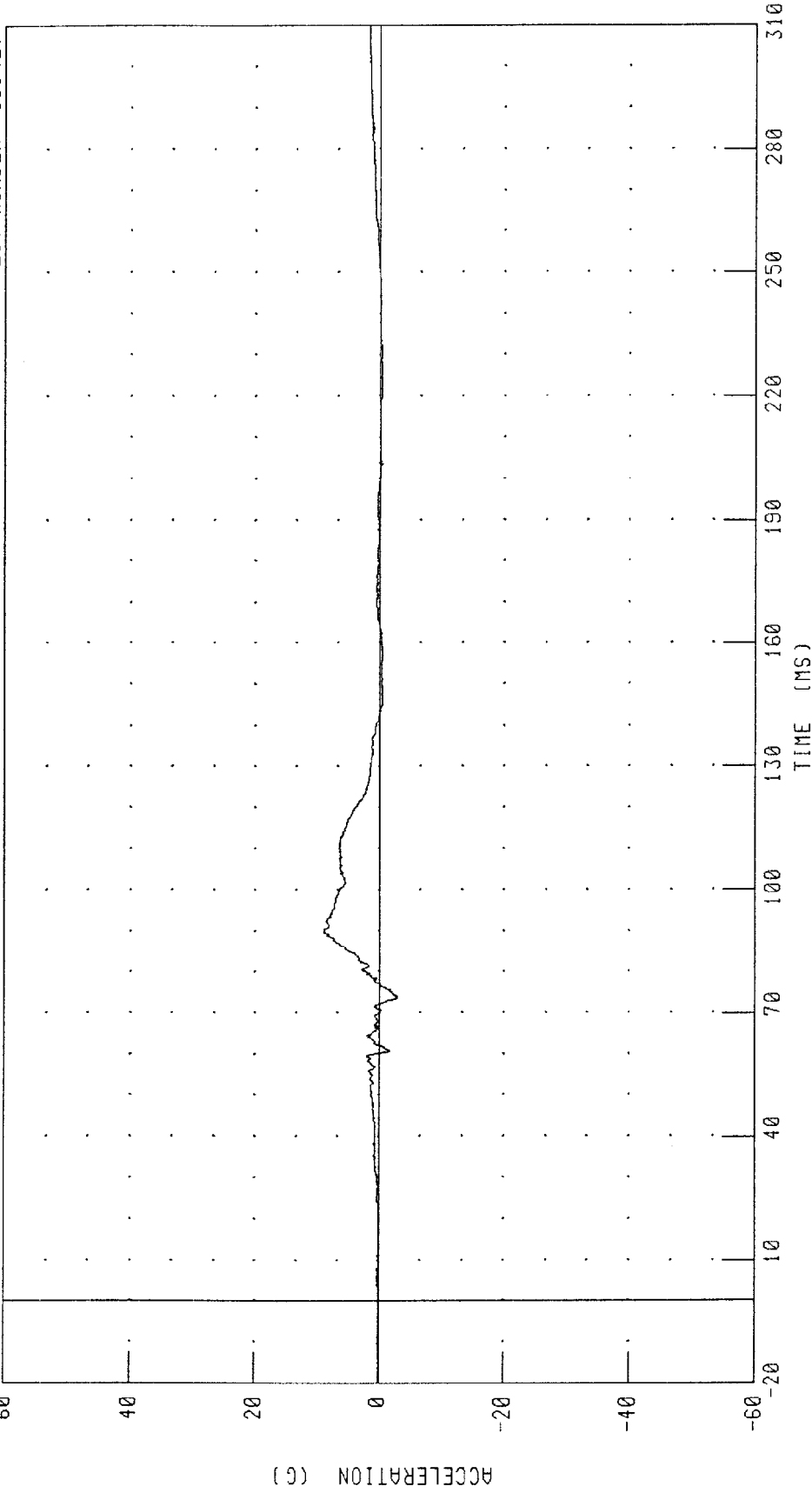
PEAK DATA: 4.28 G @ 118.16 MS, -22.43 G @ 81.44 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

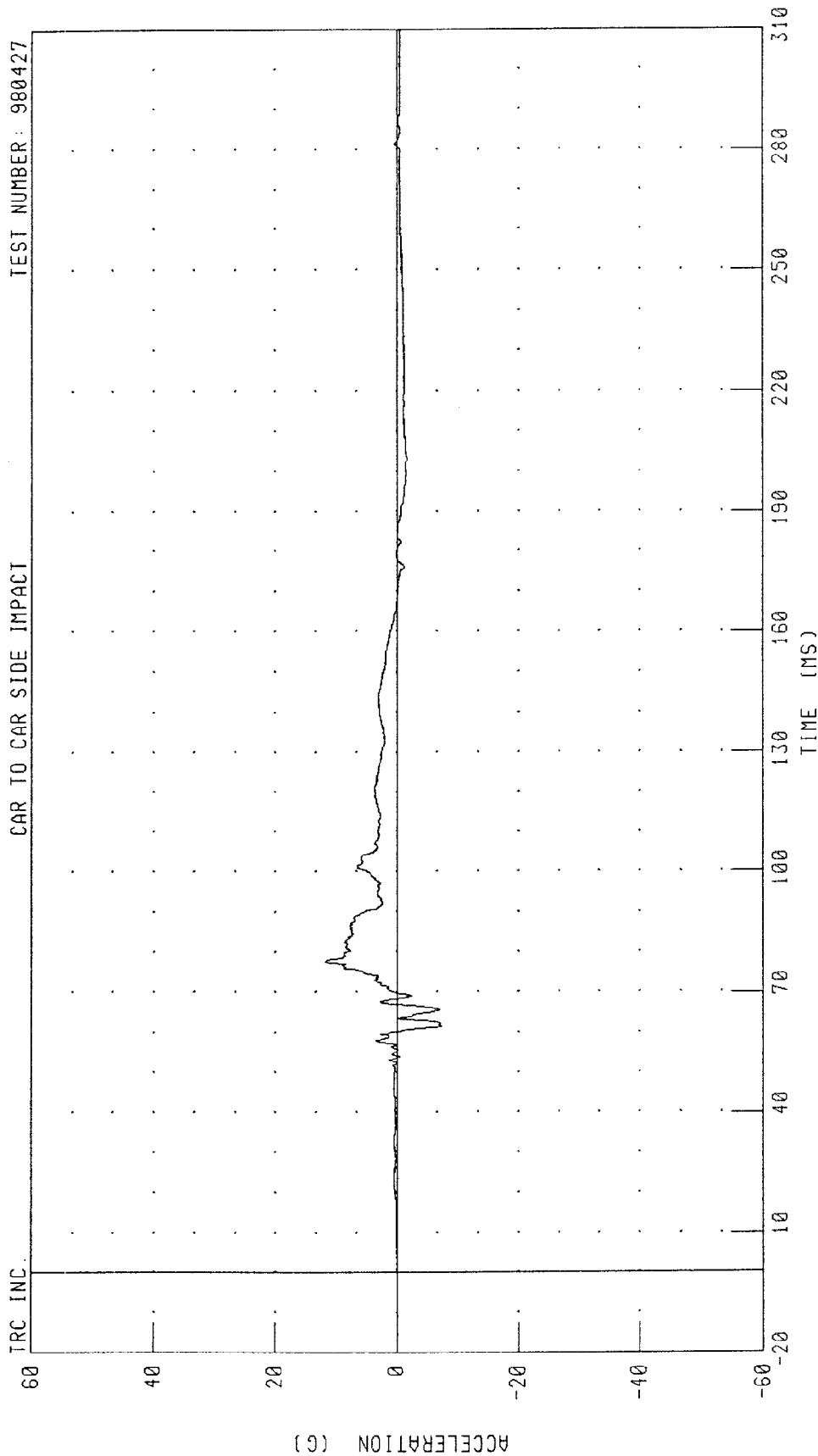
TRC INC.



CHANNEL: PEVYC2 FILTER: CH. CLASS 1000

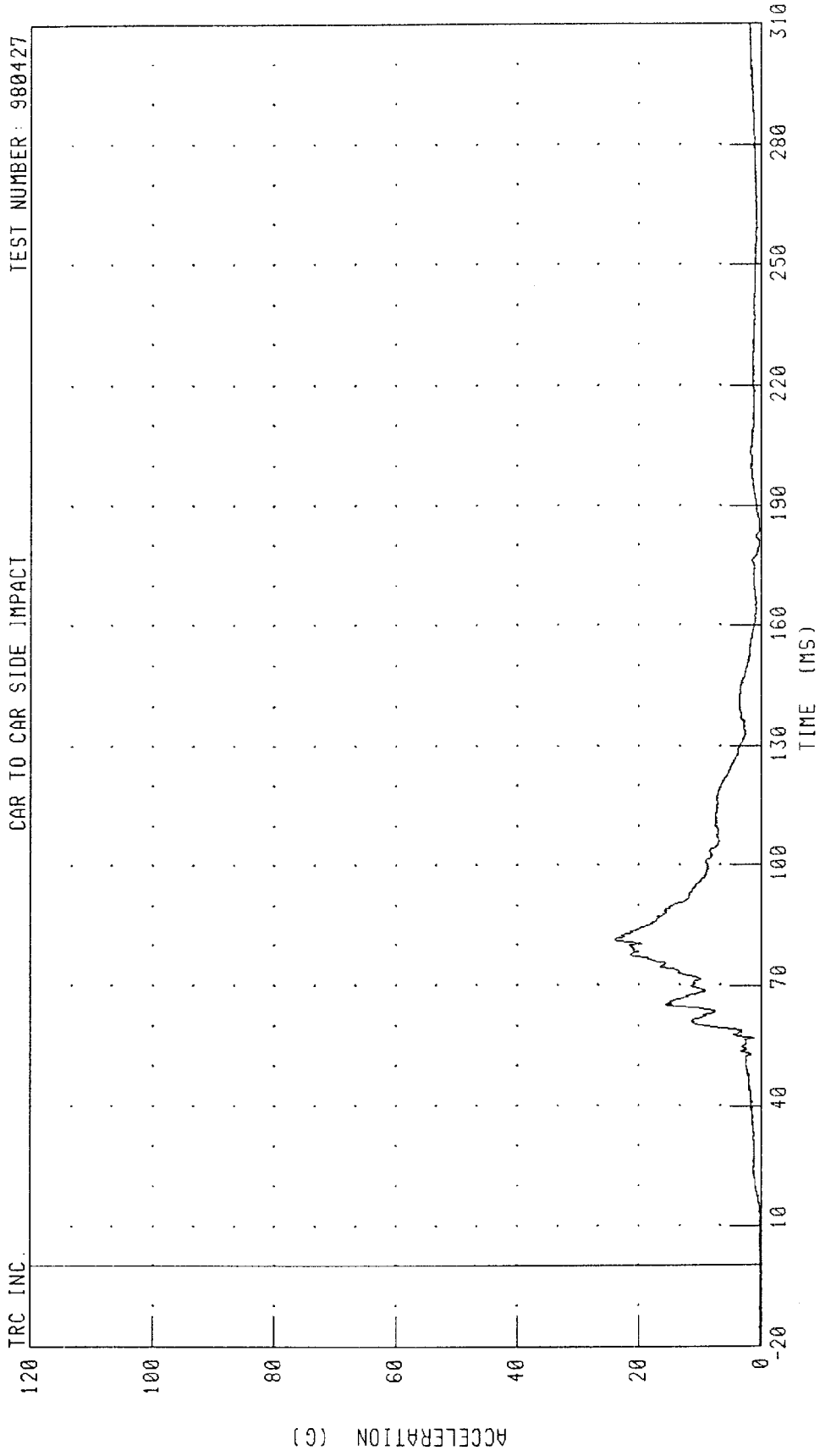
PEAK DATA: 8.95 G @ 89.84 MS, -2.91 G @ 73.68 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION



CHANNEL: PEVZG2 FILTER: CH. CLASS 1000 PEAK DATA: 11.79 G @ 77.60 MS, -7.36 G @ 61.60 MS

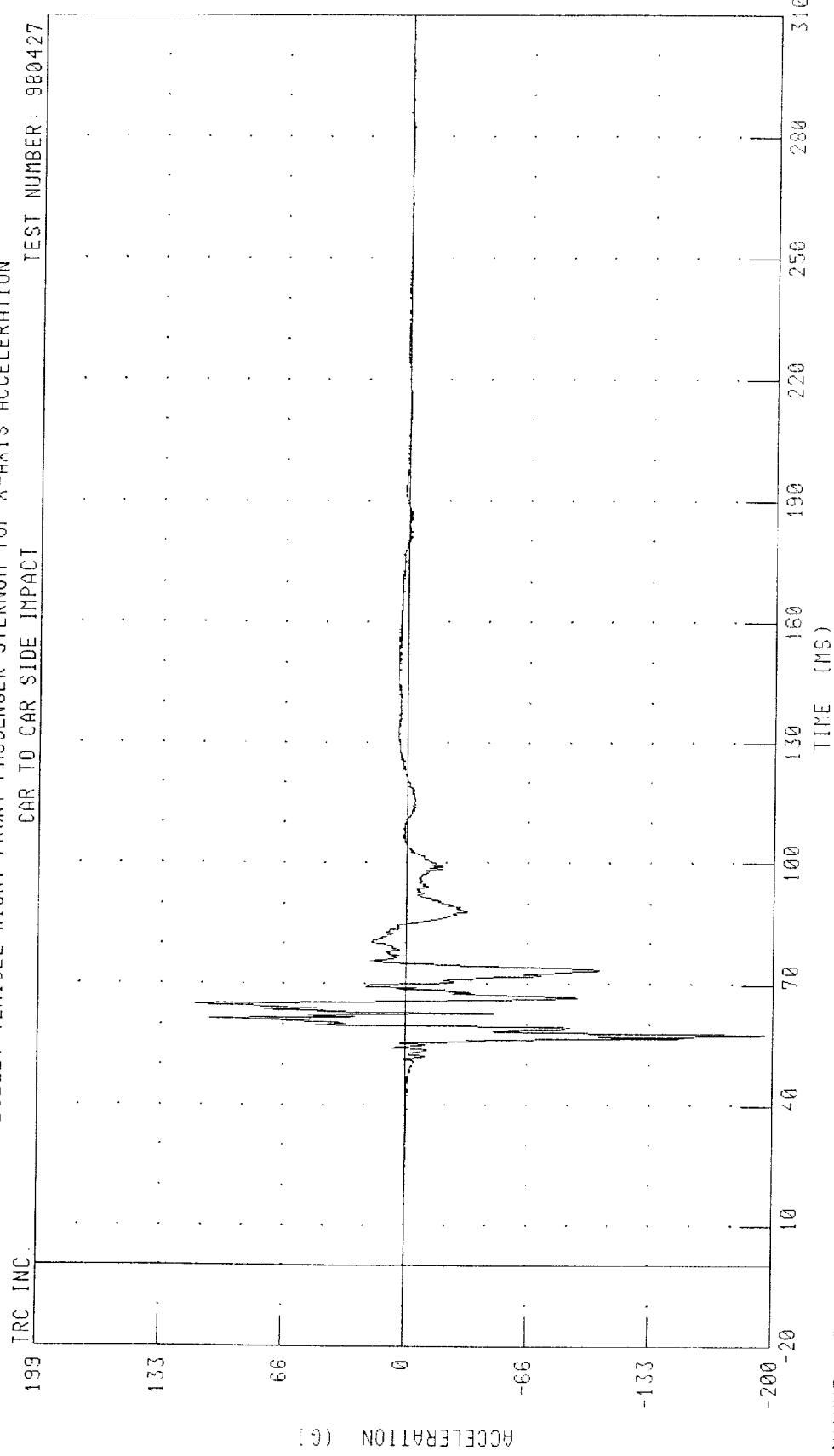
1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION



CHANNEL: PEVRG2 FILTER: CH. CLASS 1000

PEAK DATA: 23.92 G @ 81.44 MS, 0.05 G @ -6.64 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER STERNUM TOP X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT



TEST NUMBER: 980427

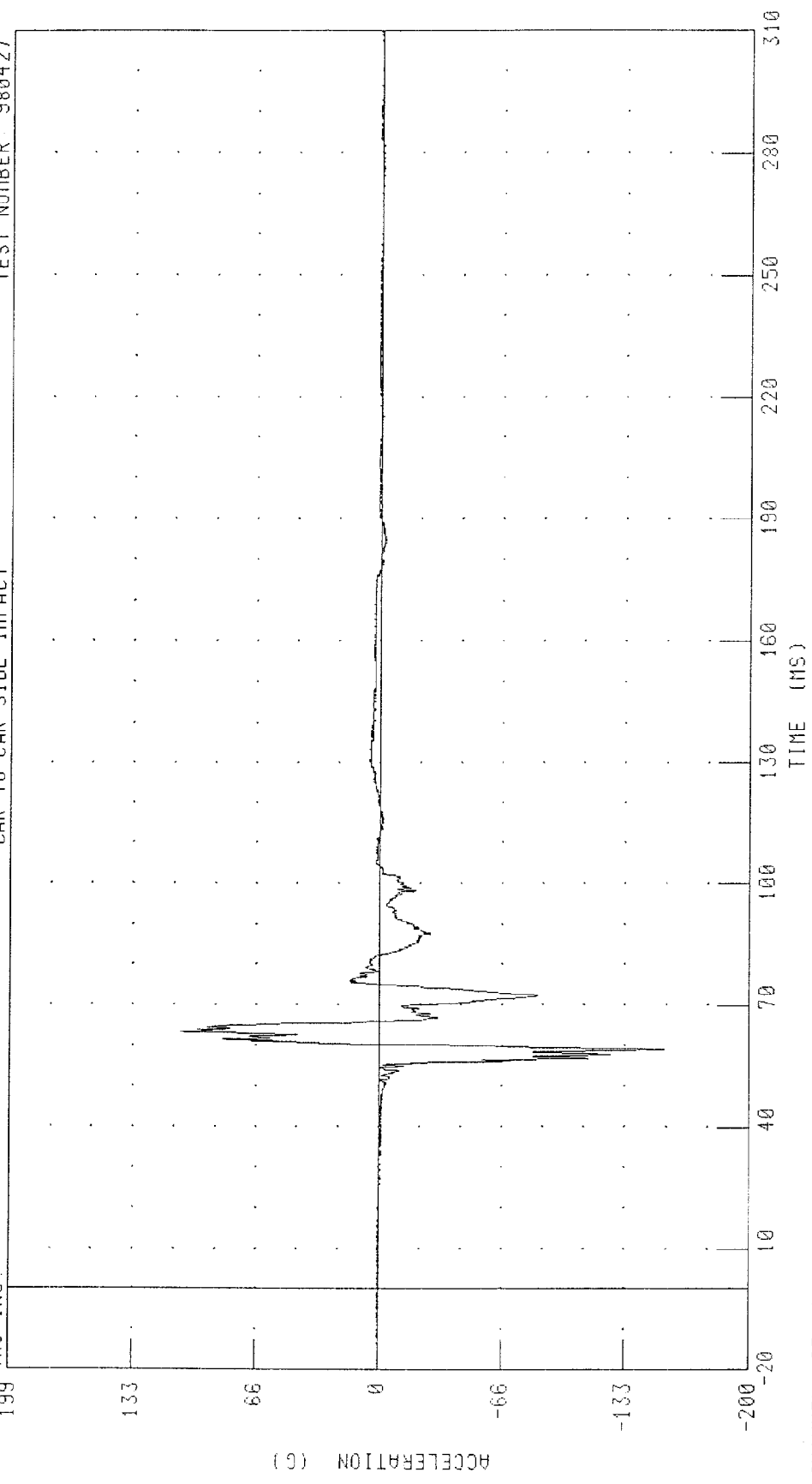
CHANNEL: STTX02 FILTER: CH CLASS 1000

PEAK DATA: 114.68 G @ 65.04 MS, -195.74 G @ 57.36 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER STERNUM MIDDLE X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: STMXG2 FILTER: CH. CLASS 1000

PEAK DATA: 107.47 G @ 63.44 MS, -154.16 G @ 58.96 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER STERNUM BOTTOM X-AXIS ACCELERATION

TEST NUMBER 980427

CAR TO CAR SIDE IMPACT

TRC INC.

199

133

66

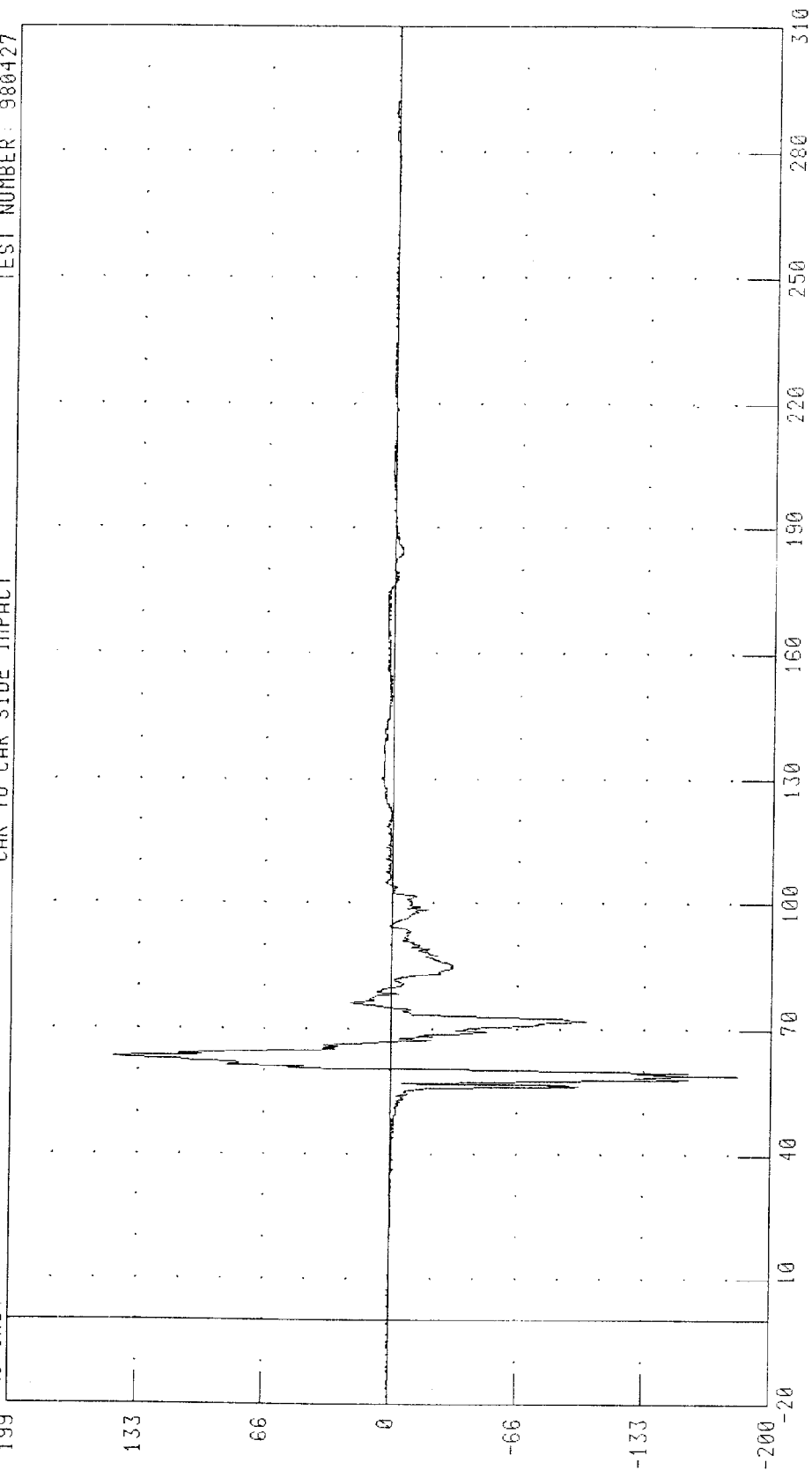
0

-66

-133

-200

ACCELERATION (G)



TIME (MS)

CHANNEL: STBXG2 FILTER: CH. CLASS 1000

PEAK DATA: 146.36 G @ 63.52 MS, -182.79 G @ 59.04 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER SPINE TOP X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

0

-20

-40

-60

ACCELERATION (G)

-20

0

20

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60

80

100

120

140

160

180

200

220

240

260

280

300

320

340

360

380

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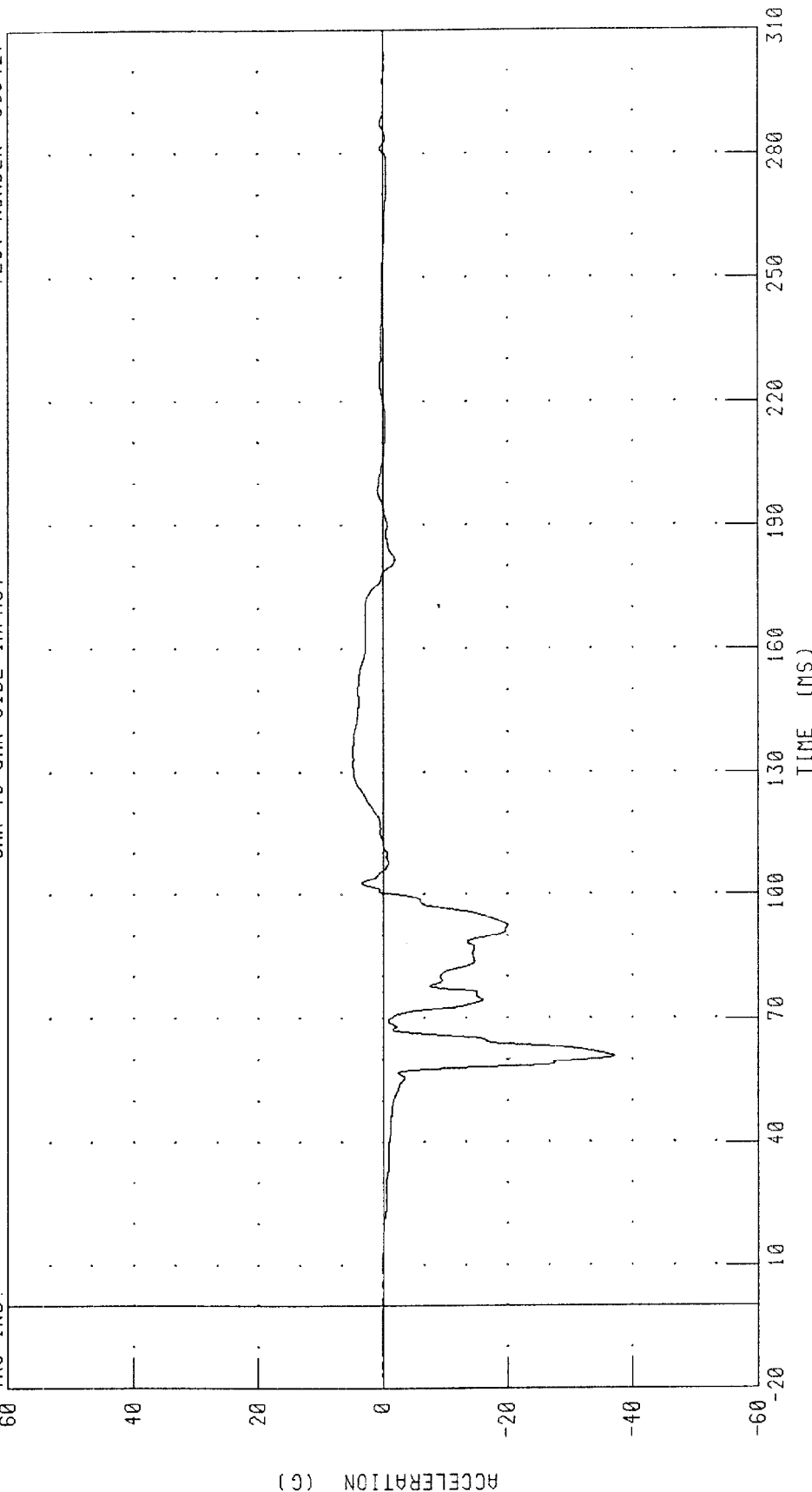
6920

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT FRONT PASSENGER SPINE MIDDLE X-AXIS ACCELERATION

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

TRC INC.



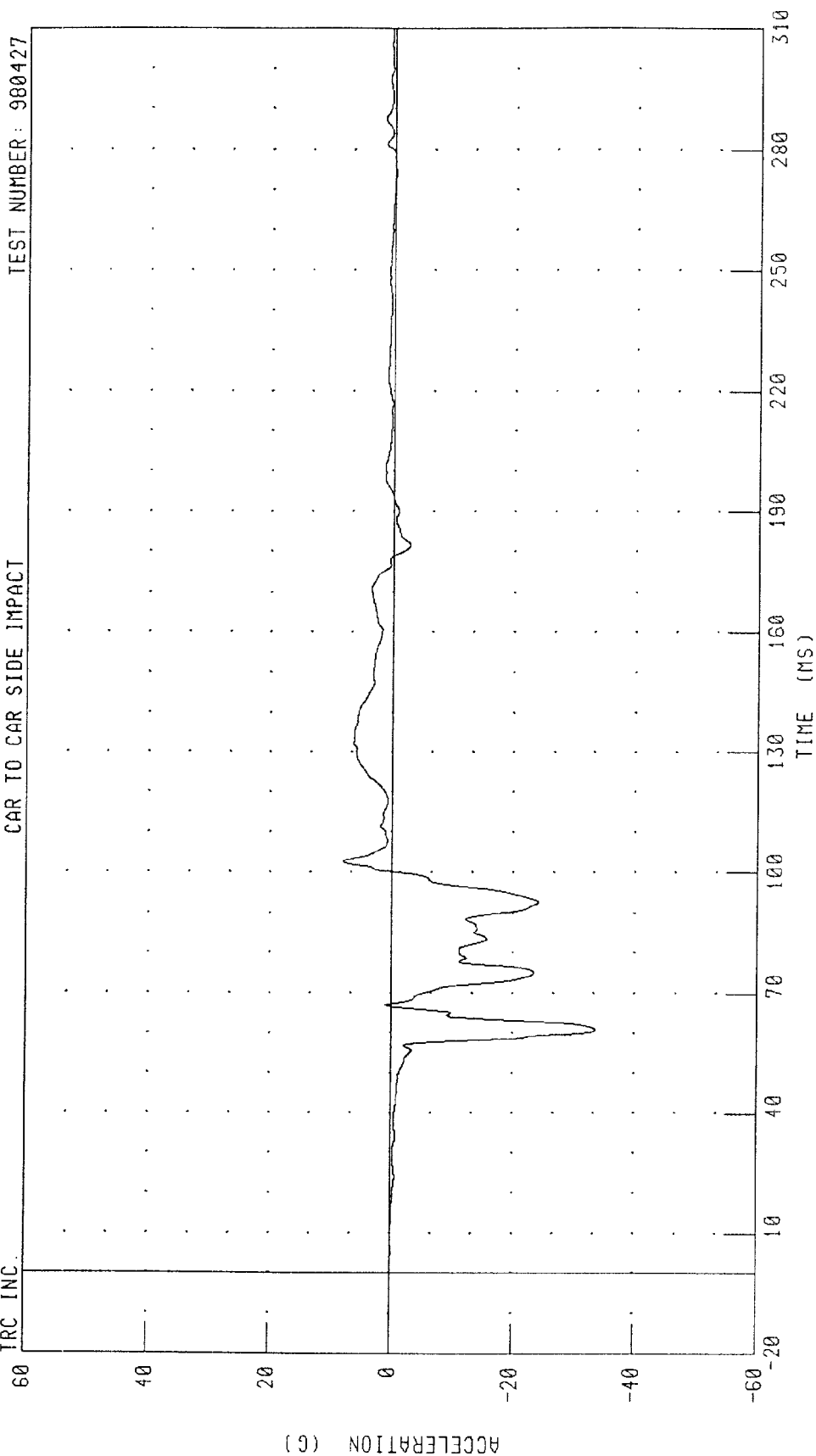
CHANNEL: SPMXC2 FILTER: CH. CLASS 180

PEAK DATA: 4.92 G @ 132.00 MS; -37.12 G @ 60.88 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER SPINE BOTTOM X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

IRC INC.



CHANNEL: SPBXC2 FILTER: CH. CLASS 180

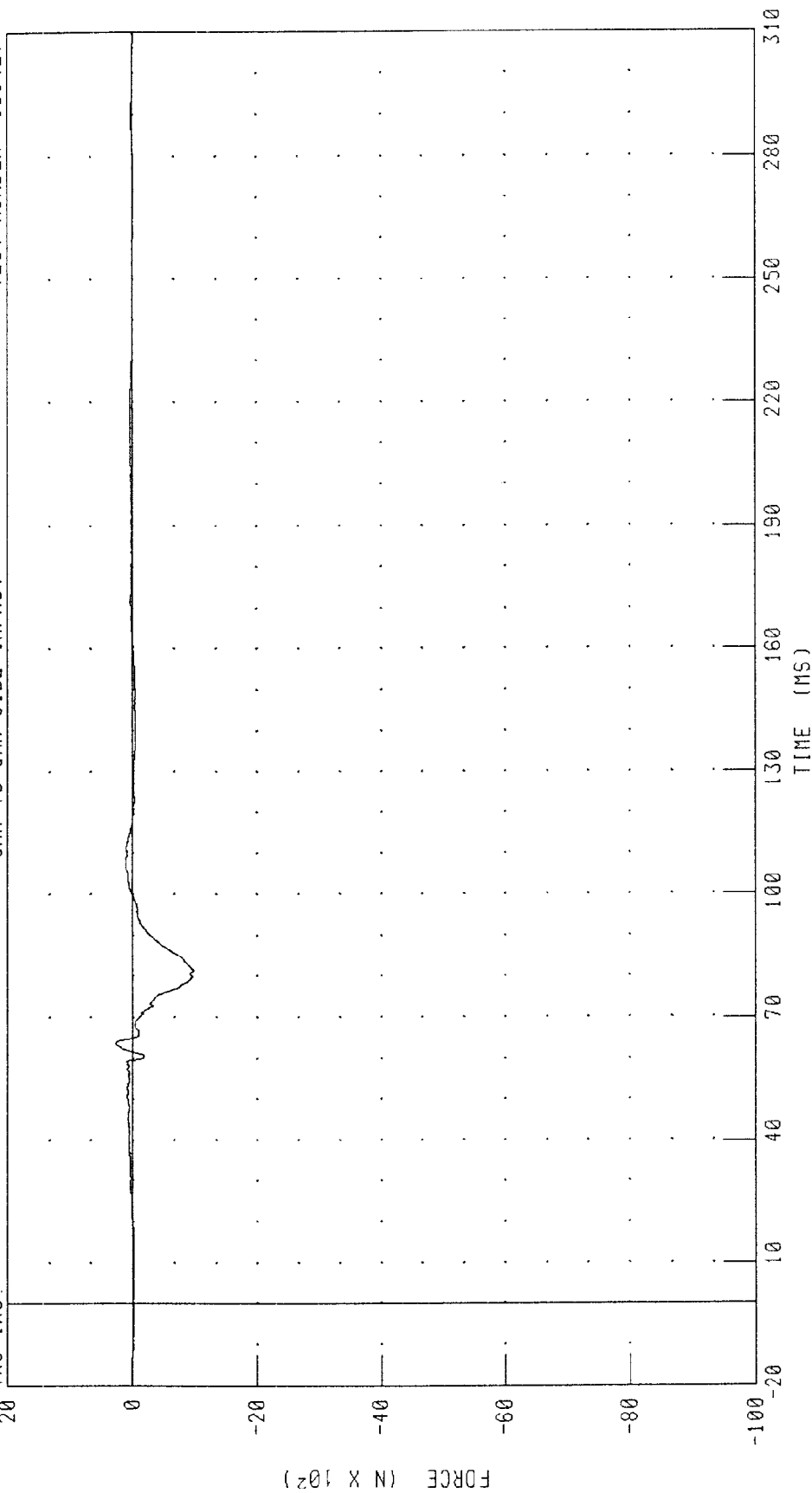
PEAK DATA: 7.90 G @ 102.72 MS, -33.57 G @ 60.96 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER LEFT FEMUR FORCE

TEST NUMBER: 980427

CAR TO CAR SIDE IMPACT

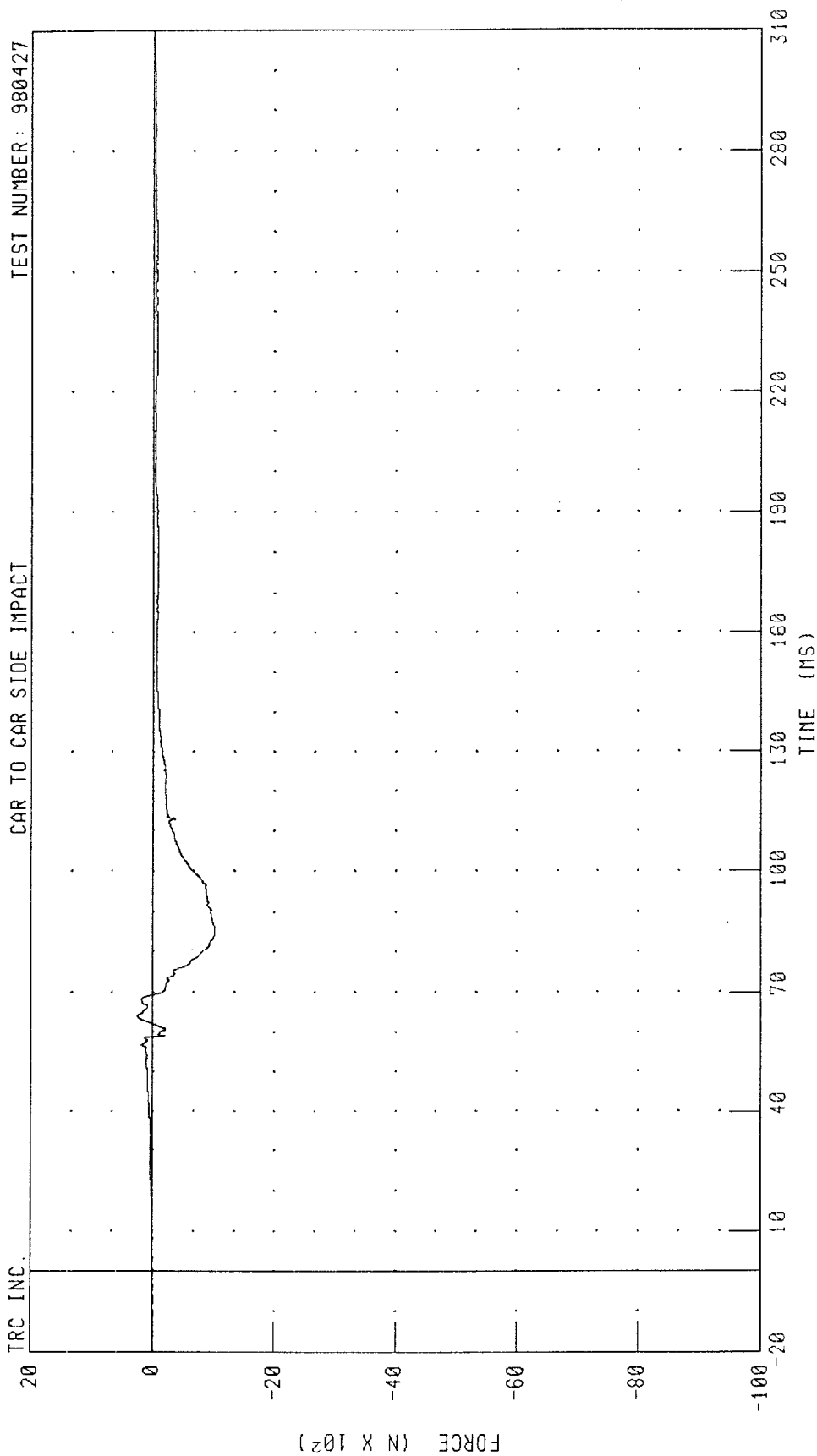
TRC INC.



CHANNEL: LFMF2 FILTER: CH. CLASS 600

PEAK DATA: 274.82 N @ 63.76 MS, -976.19 N @ 81.44 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



CHANNEL: RFMF2 FILTER: CH. CLASS 600 PEAK DATA: 265.70 N @ 64.16 MS, -1014.25 N @ 86.00 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE LEFT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

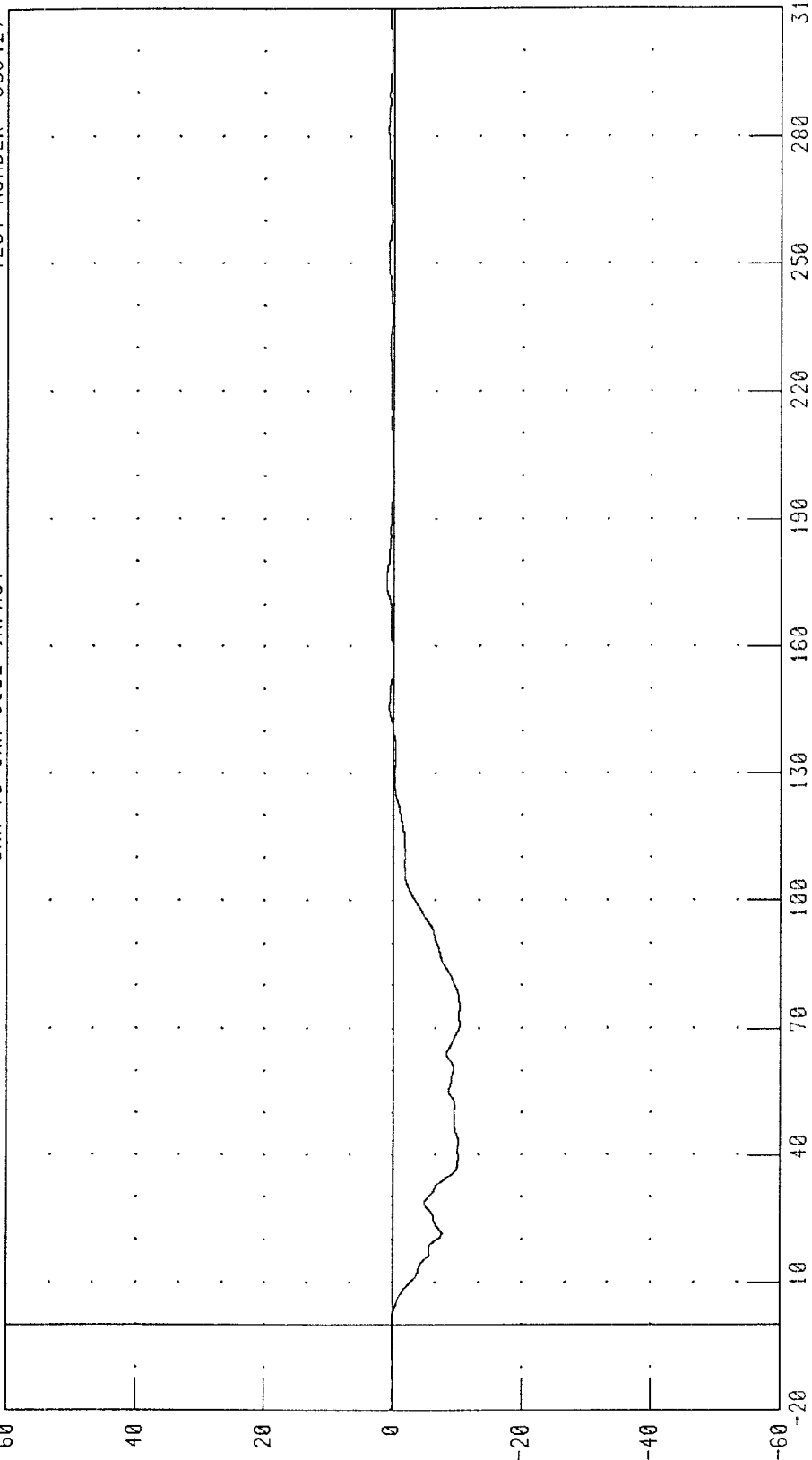
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

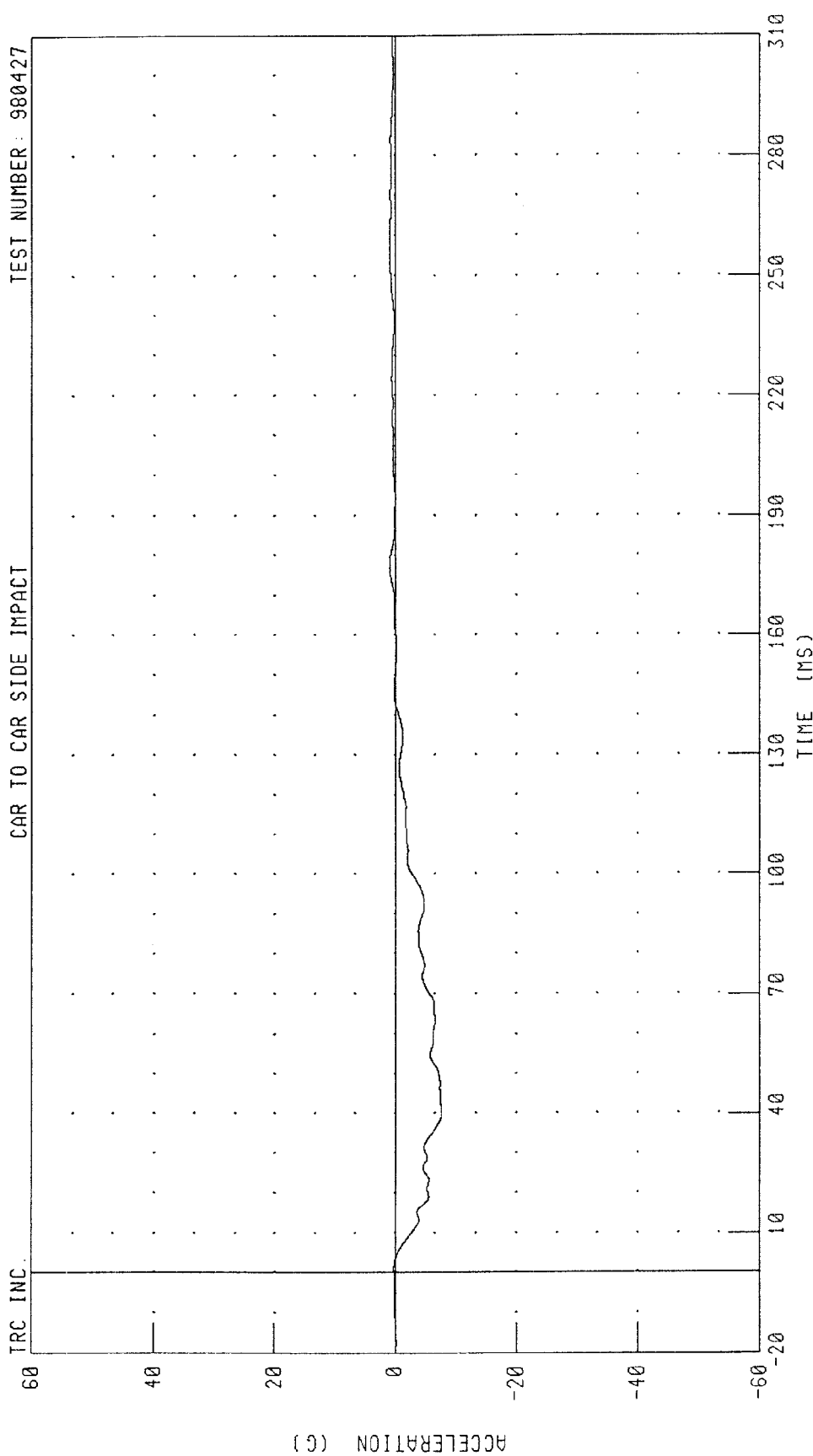
CHANNEL: TLRXC1 FILTER: CH. CLASS 60

PEAK DATA: 0.97 G @ 174.56 MS, -10.43 G @ 75.28 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE RIGHT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427



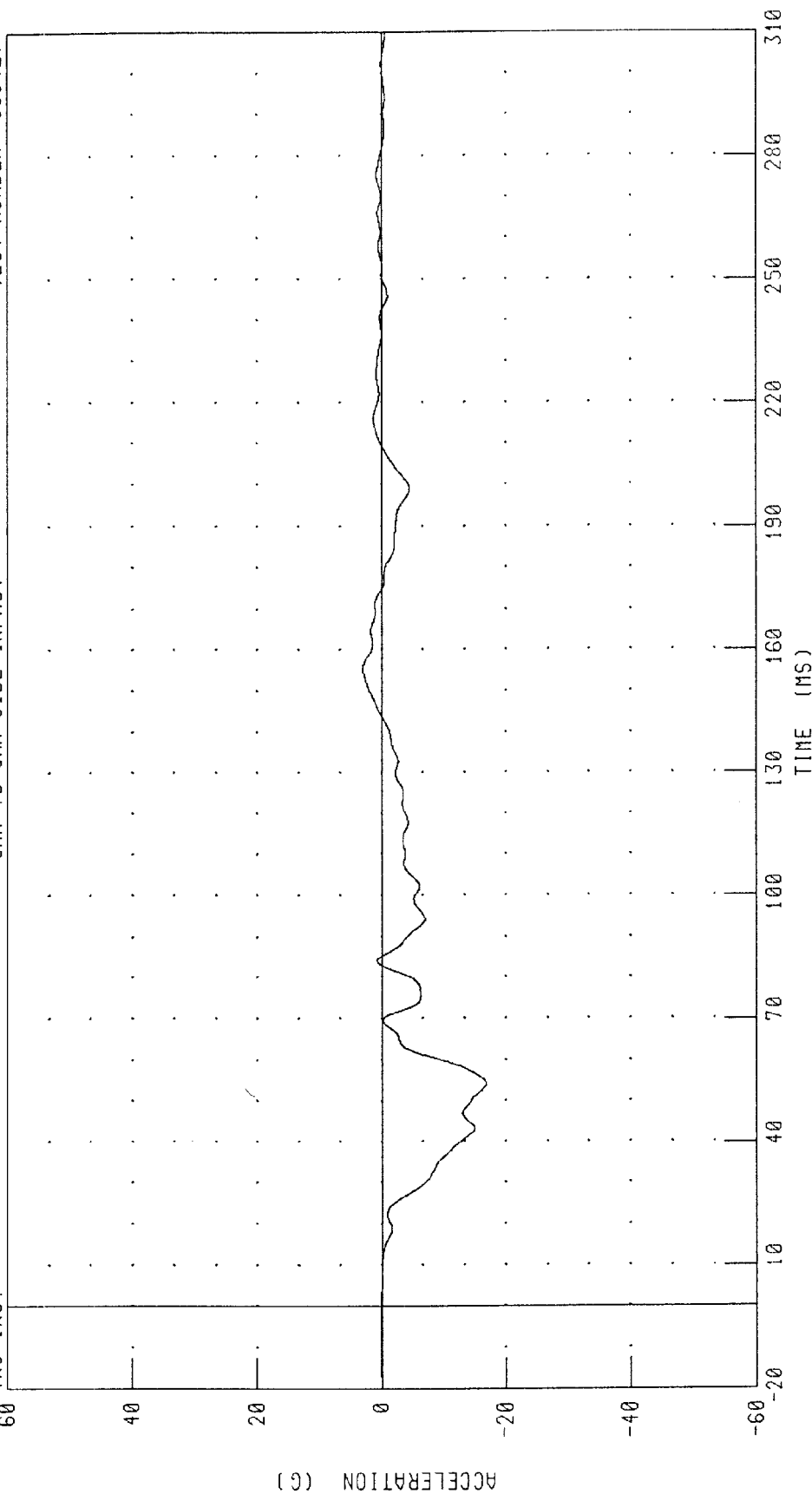
CHANNEL: TRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.82 G @ 177.36 MS, -7.76 G @ 39.92 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE ENGINE TOP X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: ENCXC1

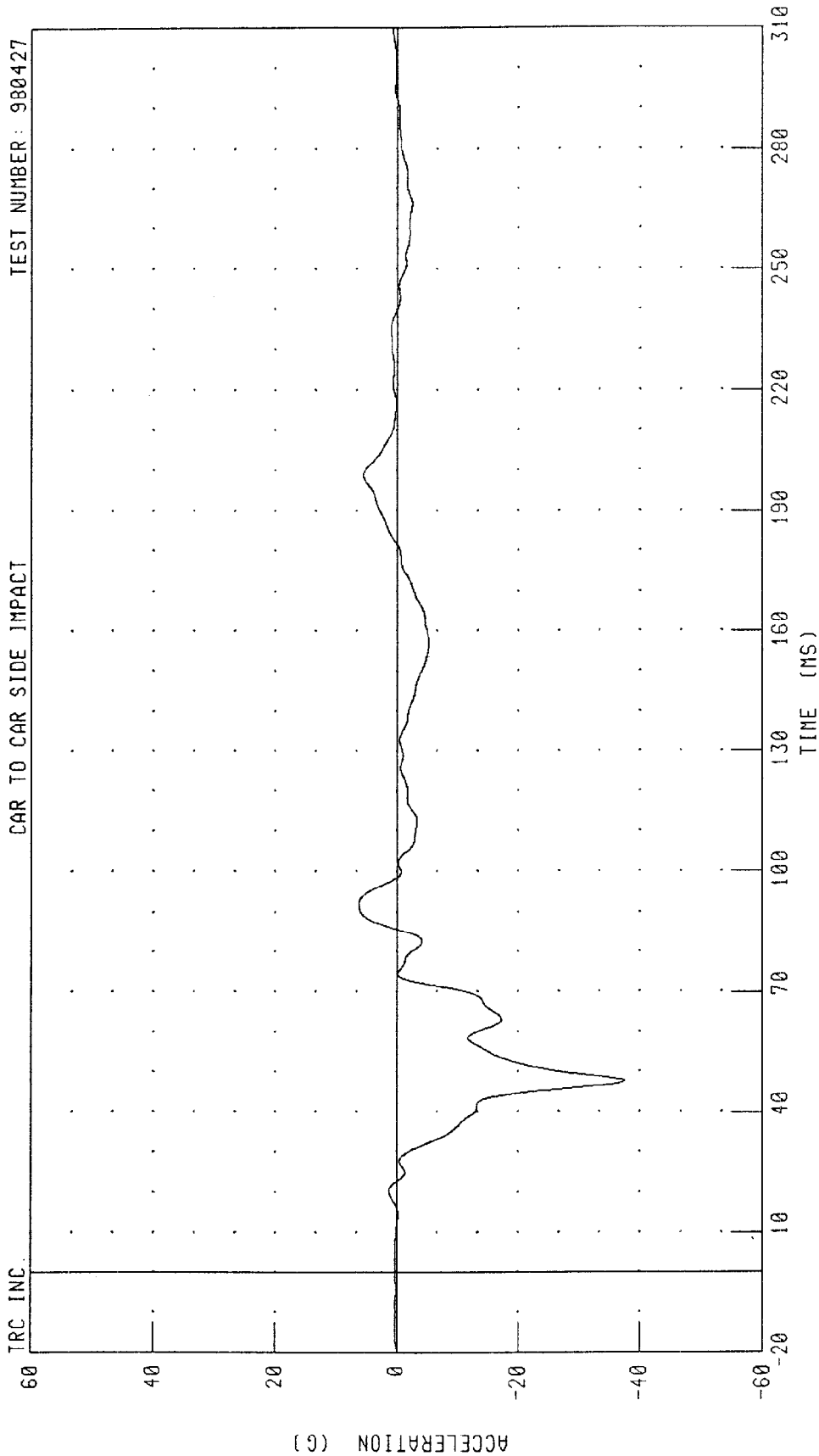
FILTER: CH. CLASS 60

PEAK DATA: 2.96 G @ 155.36 MS; -16.84 G @ 54.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE ENGINE BOTTOM X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: ENGXC2 FILTER: CH. CLASS 60

PEAK DATA: 6.24 G @ 92.08 MS, -37.52 G @ 47.60 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE RIGHT BRAKE CALIPER X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

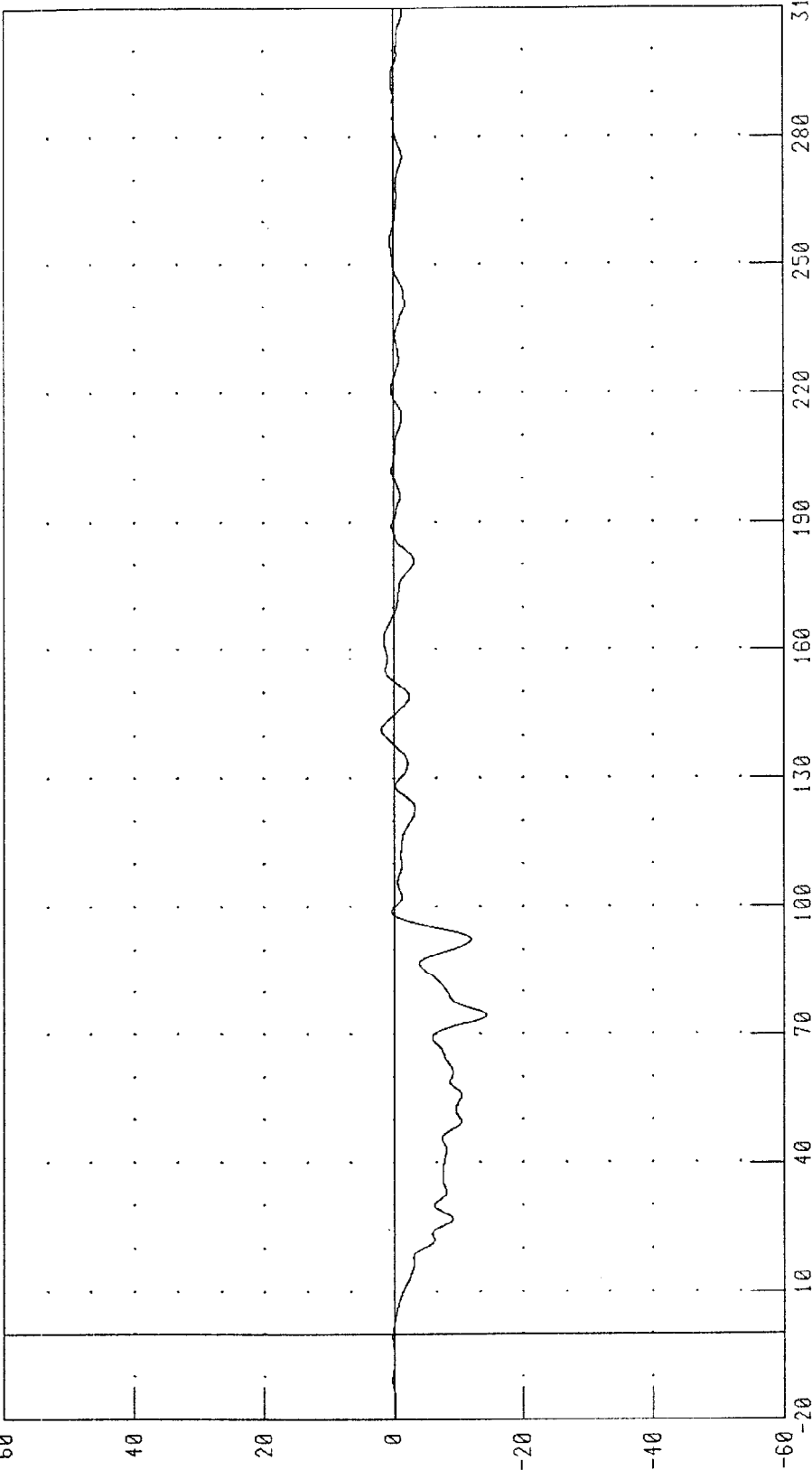
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

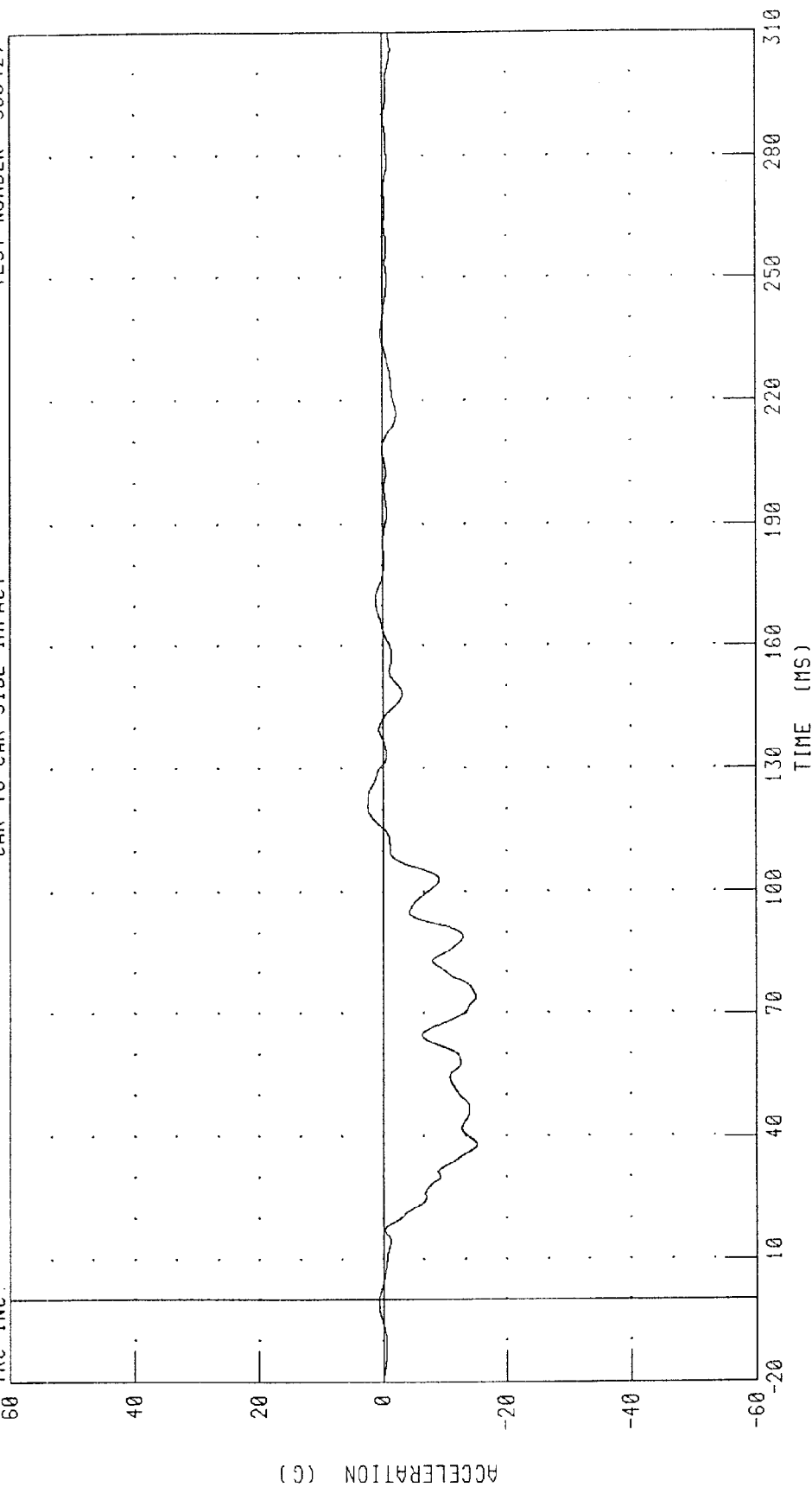
CHANNEL: BCRXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.88 G @ 141.52 MS; -14.35 G @ 74.56 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE LEFT BRAKE CALIPER X-AXIS ACCELERATION
CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.



CHANNEL: BCLXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.39 G @ 120.88 MS, -15.20 G @ 38.08 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
BULLET VEHICLE INSTRUMENT PANEL X-AXIS ACCELERATION

CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

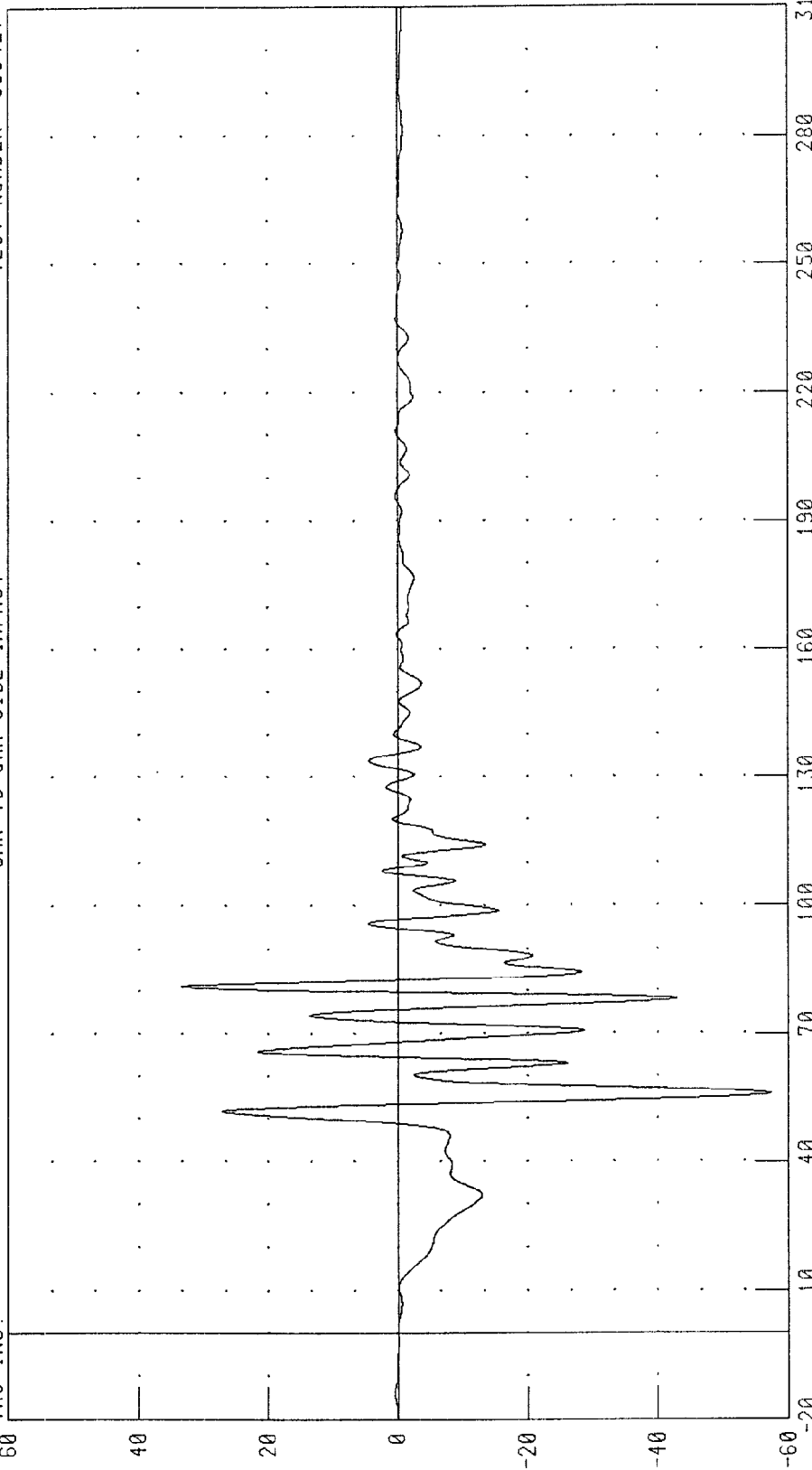
0

-20

-40

-60

ACCELERATION (G)

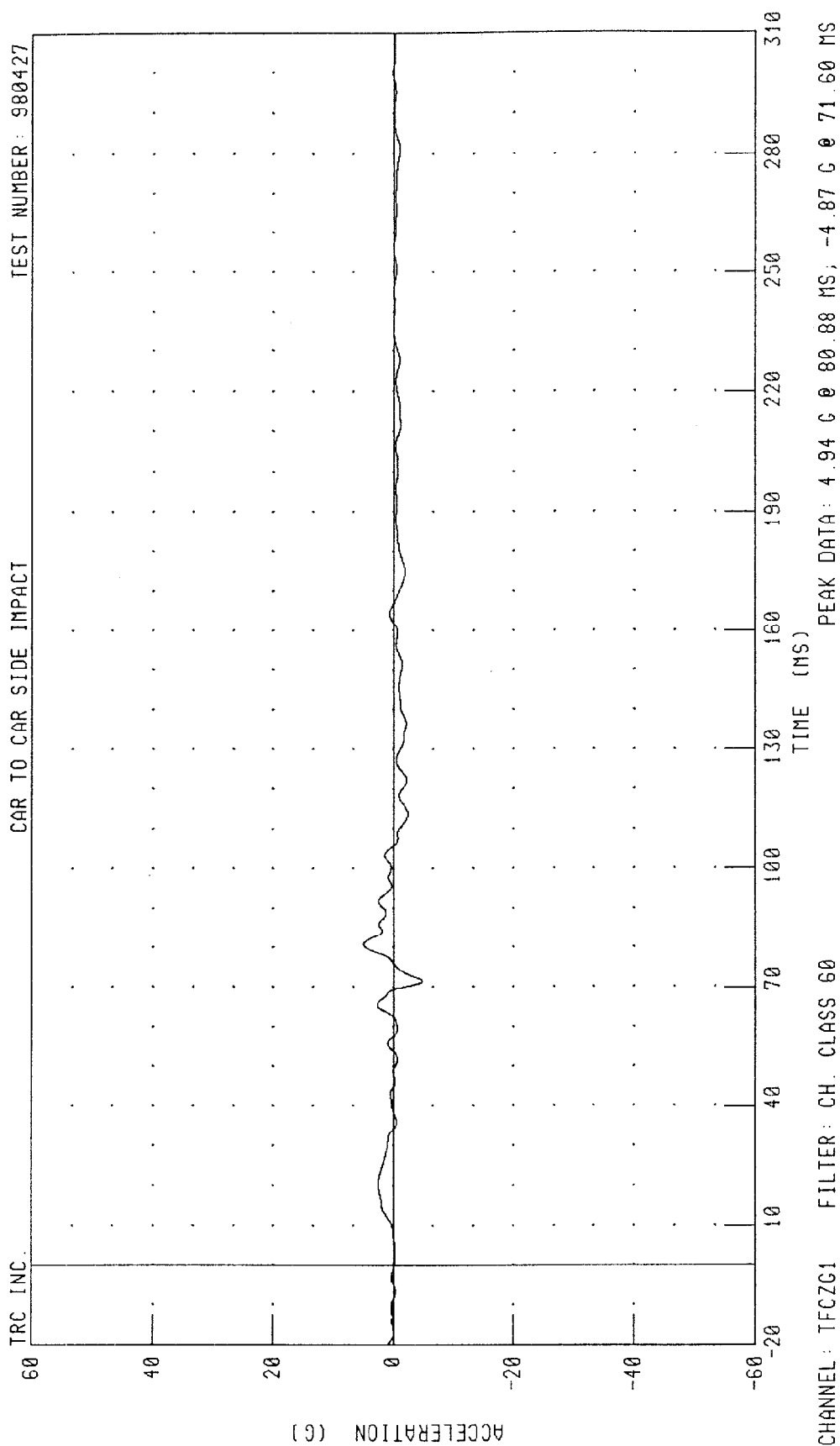


TIME (MS)

CHANNEL: DPCXC1 FILTER: CH. CLASS 60

PEAK DATA: 33.51 G @ 81.20 MS, -57.31 G @ 55.76 MS

1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE REAR CENTER Z-AXIS ACCELERATION



1997 DODGE CARAVAN INTO DRIVER'S SIDE OF 1997 HONDA ACCORD
 BULLET VEHICLE CC X-AXIS ACCELERATION
 CAR TO CAR SIDE IMPACT

TEST NUMBER: 980427

TRC INC.

60

40

20

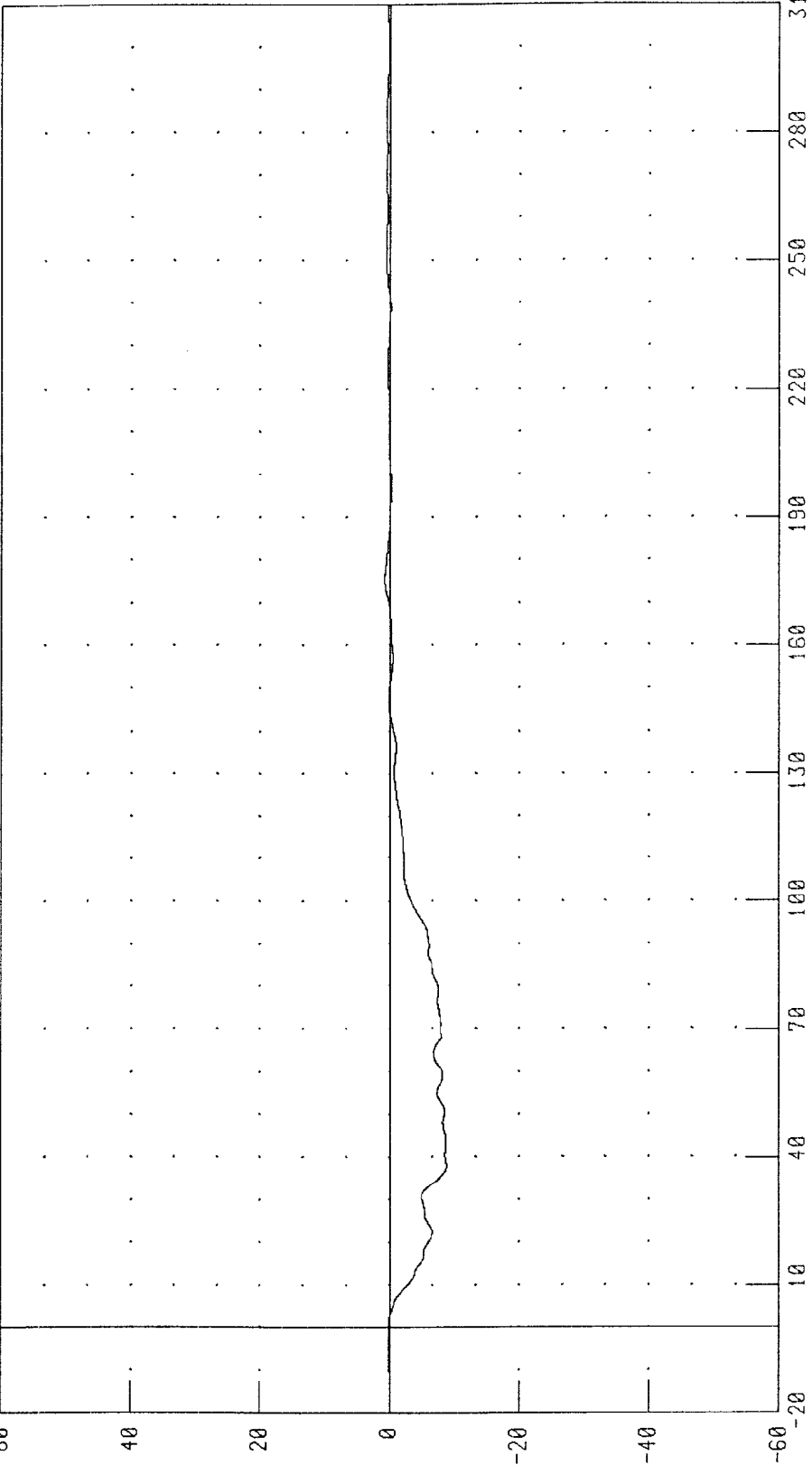
0

-20

-40

-60

ACCELERATION (G)



TIME (MS)

CHANNEL: RRAXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.70 G @ 175.84 MS; -8.84 G @ 38.00 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

01-APR-98

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL19150

572F SN191 LEFT THORAX CAL50

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PENDULUM VELOCITY	4.27 - 4.33 M/S	4.30 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	-44.2 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	-44.9 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	-19.2 G

TEST MEETS SPECIFICATIONS

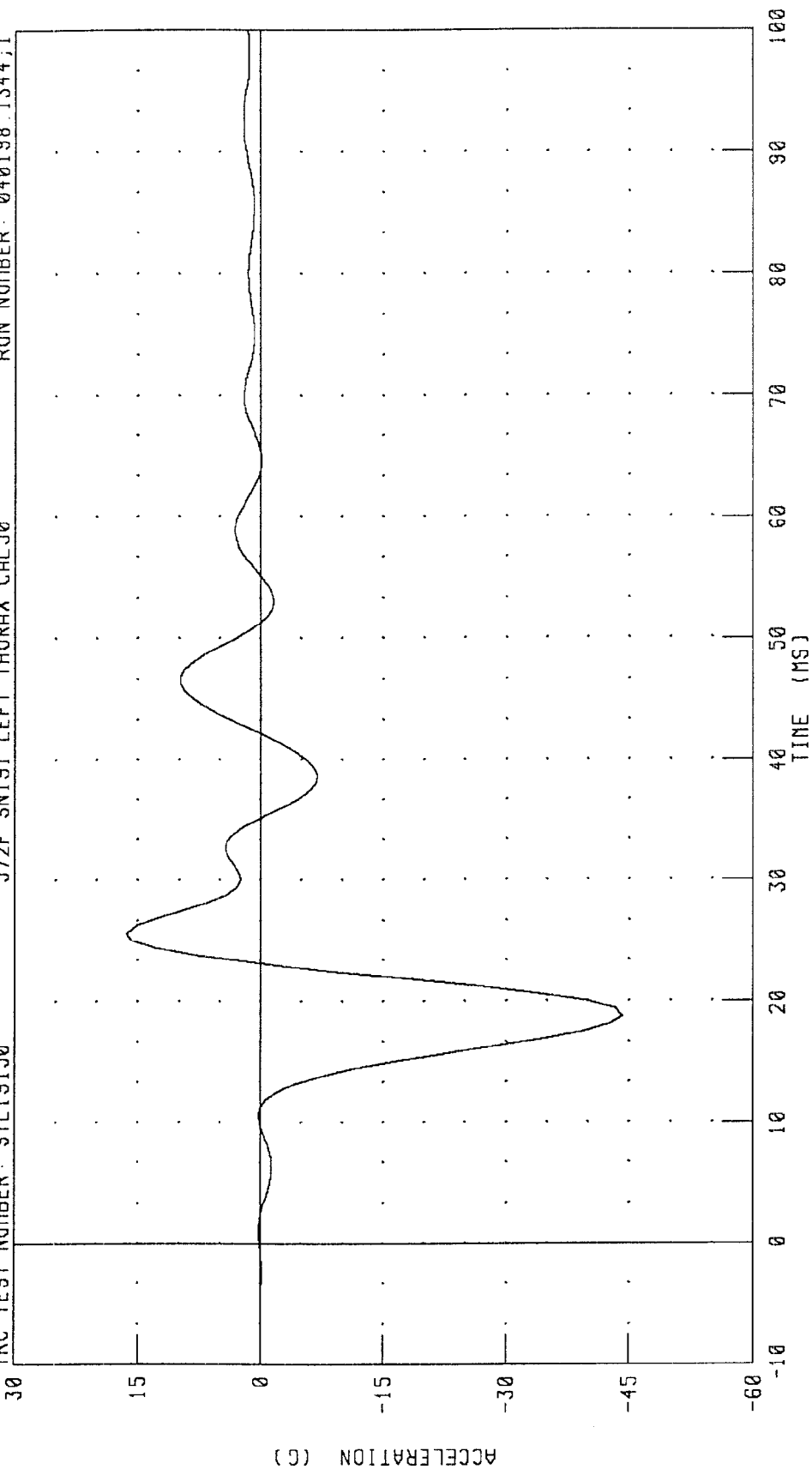
TECHNICIAN

By Calit

RUN NUMBER: 040198.1343;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
LEFT UPPER RIB ACCELERATION Y AXIS

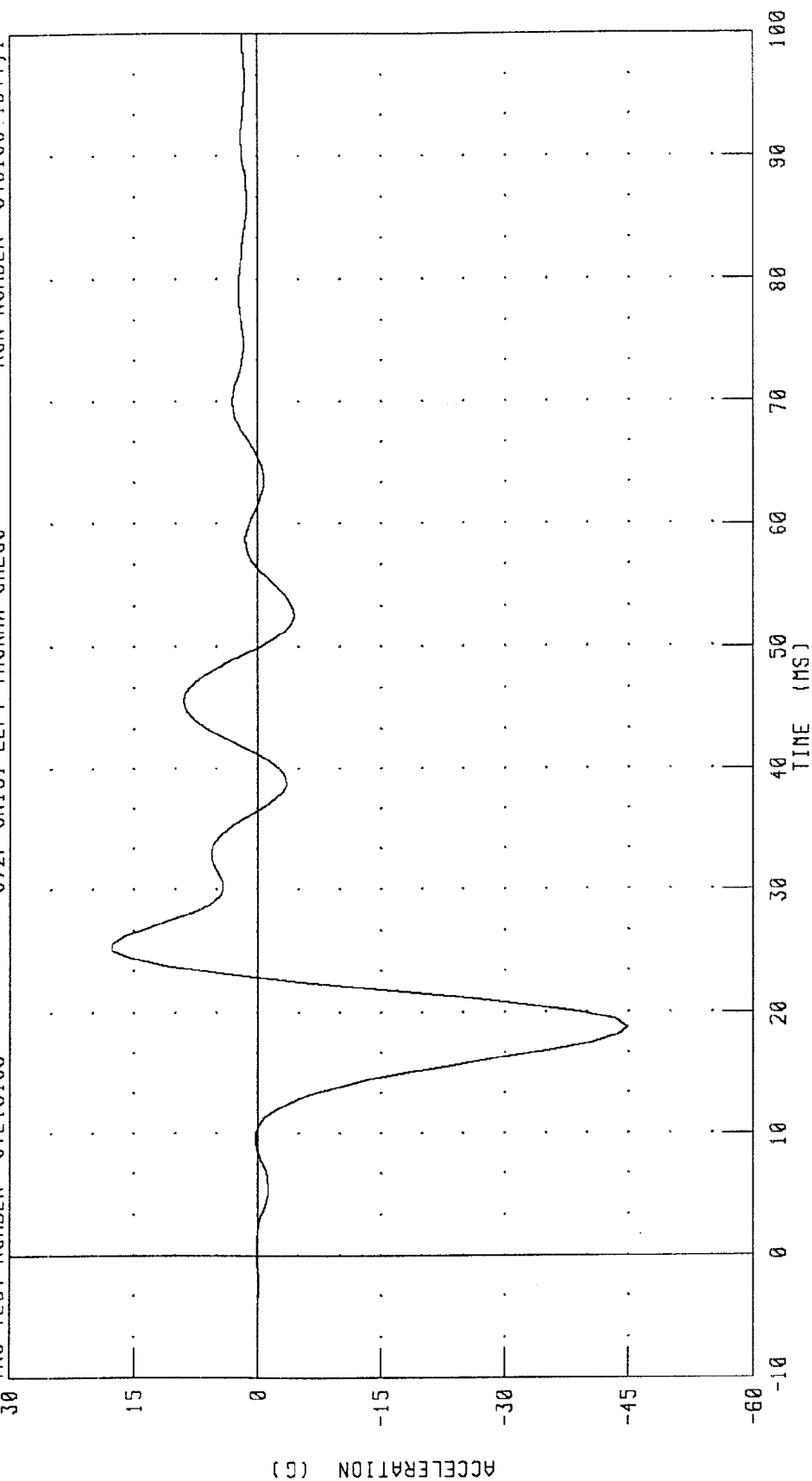
TRC TEST NUMBER: STL19150 572F SN191 LEFT THORAX CAL50 RUN NUMBER: 040198.1344.1



CHANNEL: LURYG FILTER: FIR 100 PEAK DATA: 16.37 G @ 25.63 MS, -44.22 G @ 18.75 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
LEFT LOWER RIB ACCELERATION Y AXIS

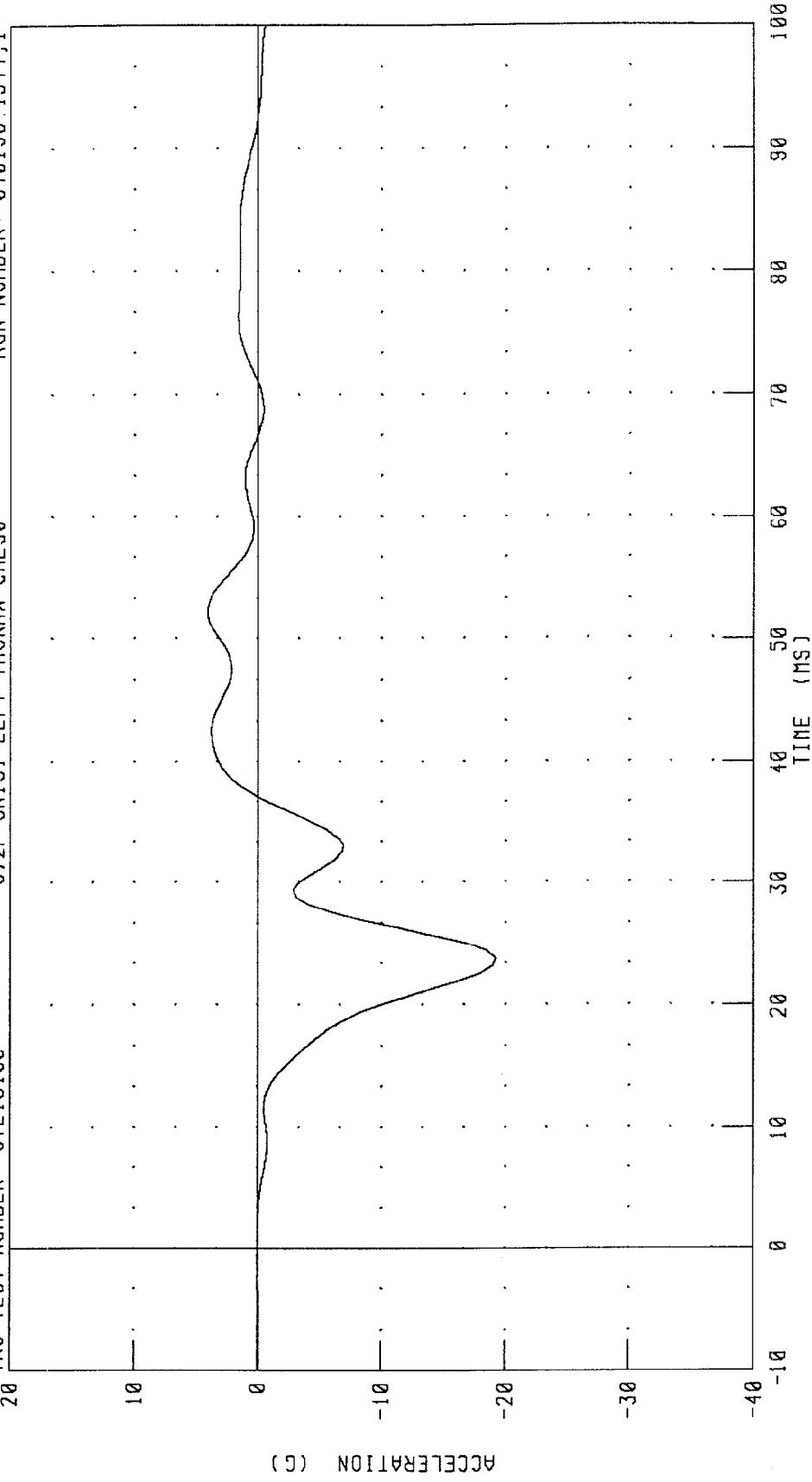
IRC TEST NUMBER: STL19150 572F SN191 LEFT THORAX CAL50 RUN NUMBER: 040198.1344.1



CHANNEL: LLRYG FILTER: FIR 100 PEAK DATA: 17.66 G @ 25.00 MS; -44.87 G @ 18.75 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL19150 572F SN191 LEFT THORAX CAL50 RUN NUMBER: 040198.1344;1



PEAK DATA: 4.09 G @ 52.50 MS; -19.19 G @ 23.75 MS

CHANNEL: T12YG FILTER: FIR 100

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

01-APR-98

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL19150

572F SN191 LEFT PELVIS CAL50

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PENDULUM VELOCITY	4.27 - 4.33 M/S	4.29 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	-48.8 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.4 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

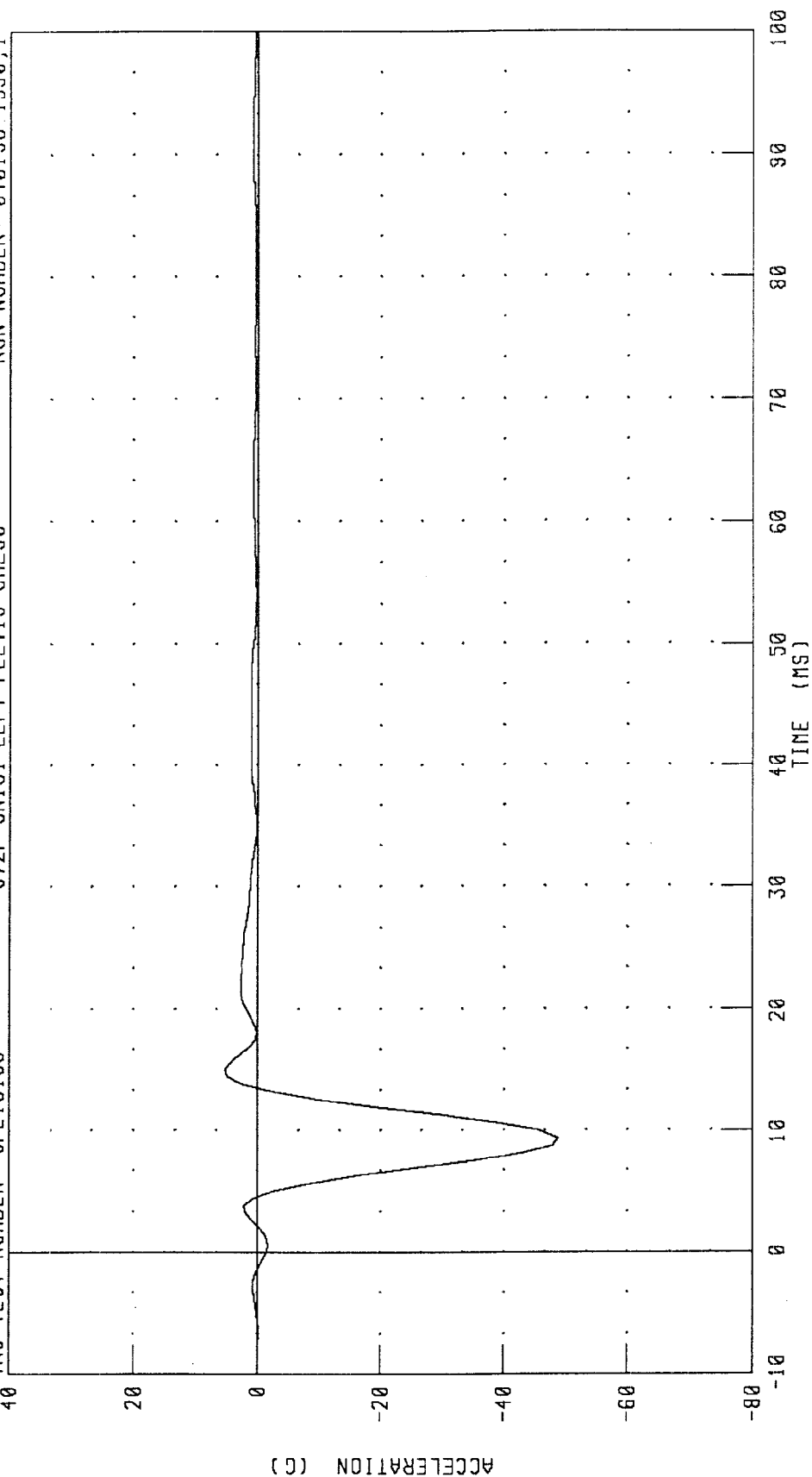
TECHNICIAN

B. Calt

RUN NUMBER: 040198.1350;1

PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)
PELVIS ACCELERATION Y AXIS

IRC TEST NUMBER: SPL19150 572F SN191 LEFT PELVIS CAL50 RUN NUMBER: 040198.1350,1



CHANNEL: PEVYG FILTER: FIR 100 PEAK DATA: 5.29 G @ 15.00 MS, -48.76 G @ 9.37 MS

Pre-Test Calibration

Target Vehicle Passenger Dummy S/N 199

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

01-APR-98

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: STL19950

572F SN199 LEFT THORAX CAL50

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PENDULUM VELOCITY	4.27 - 4.33 M/S	4.30 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	-41.5 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	-39.7 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	-17.1 G

TEST MEETS SPECIFICATIONS

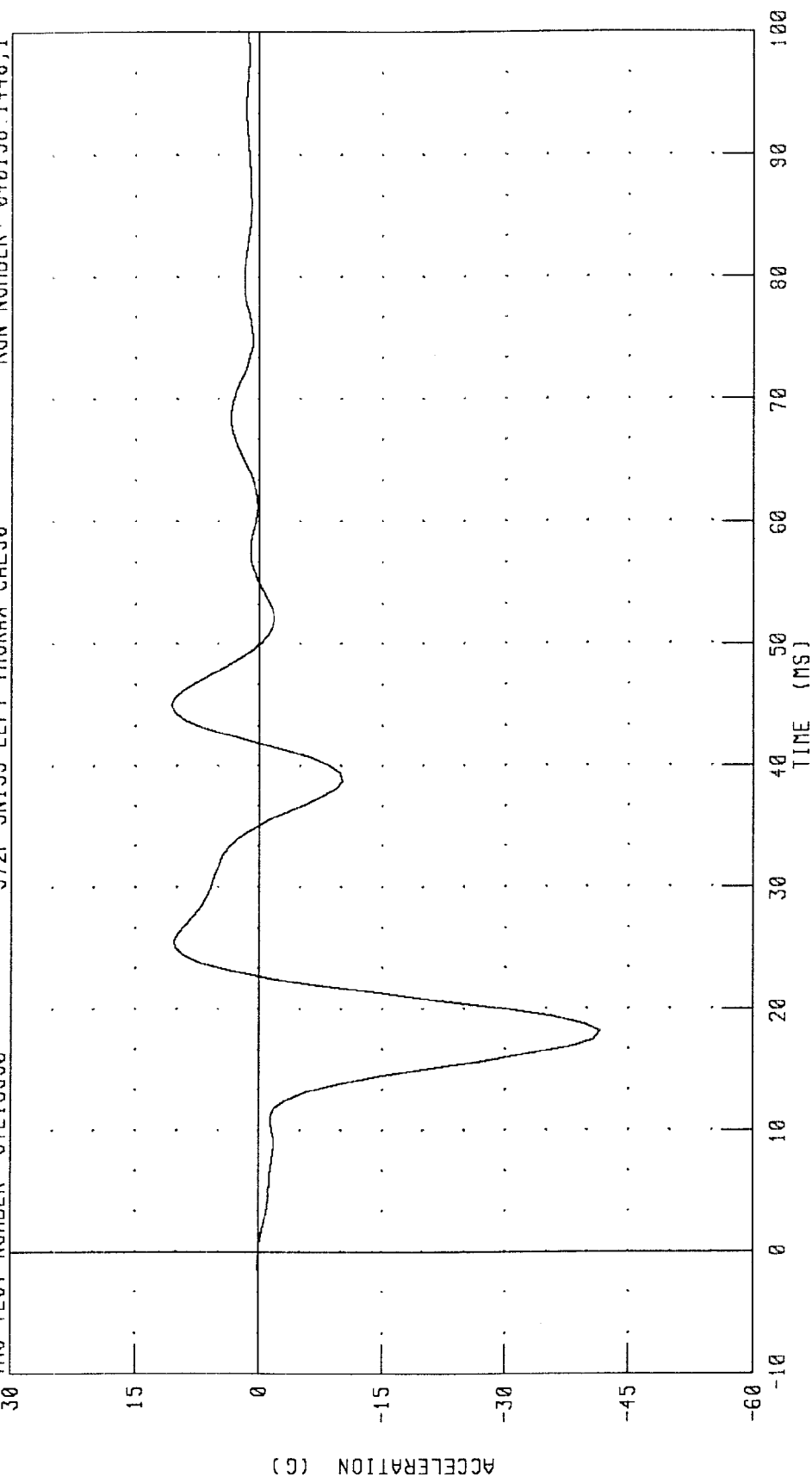
TECHNICIAN

Bj cilt

RUN NUMBER: 040198.1447;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL19950 572F SN199 LEFT THORAX CAL50 RUN NUMBER: 040198.1448,1

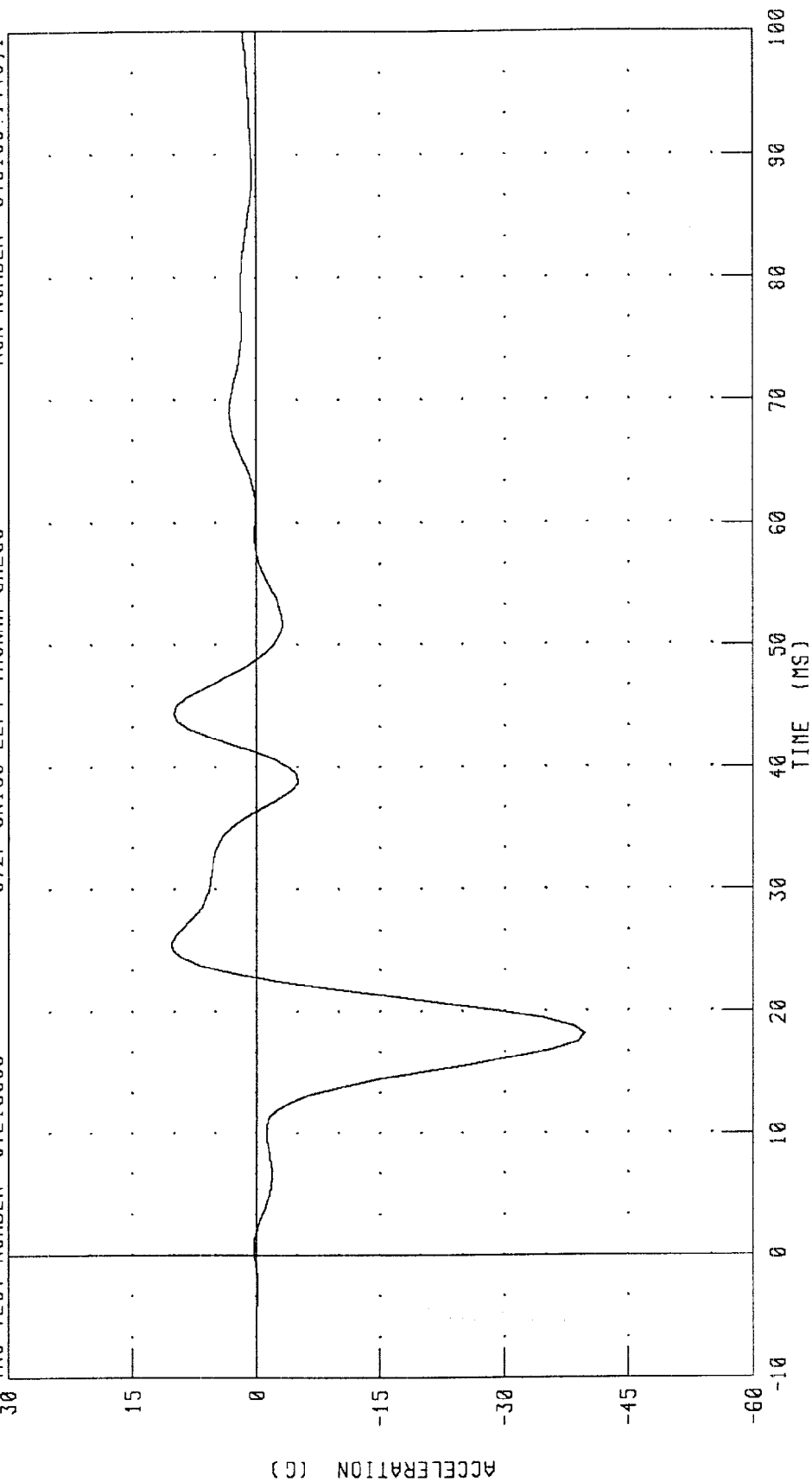


CHANNEL: LURYG FILTER: FIR 100

PEAK DATA: 10.63 G @ 45.00 MS; -41.53 G @ 18.13 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
LEFT LOWER RIB ACCELERATION Y AXIS

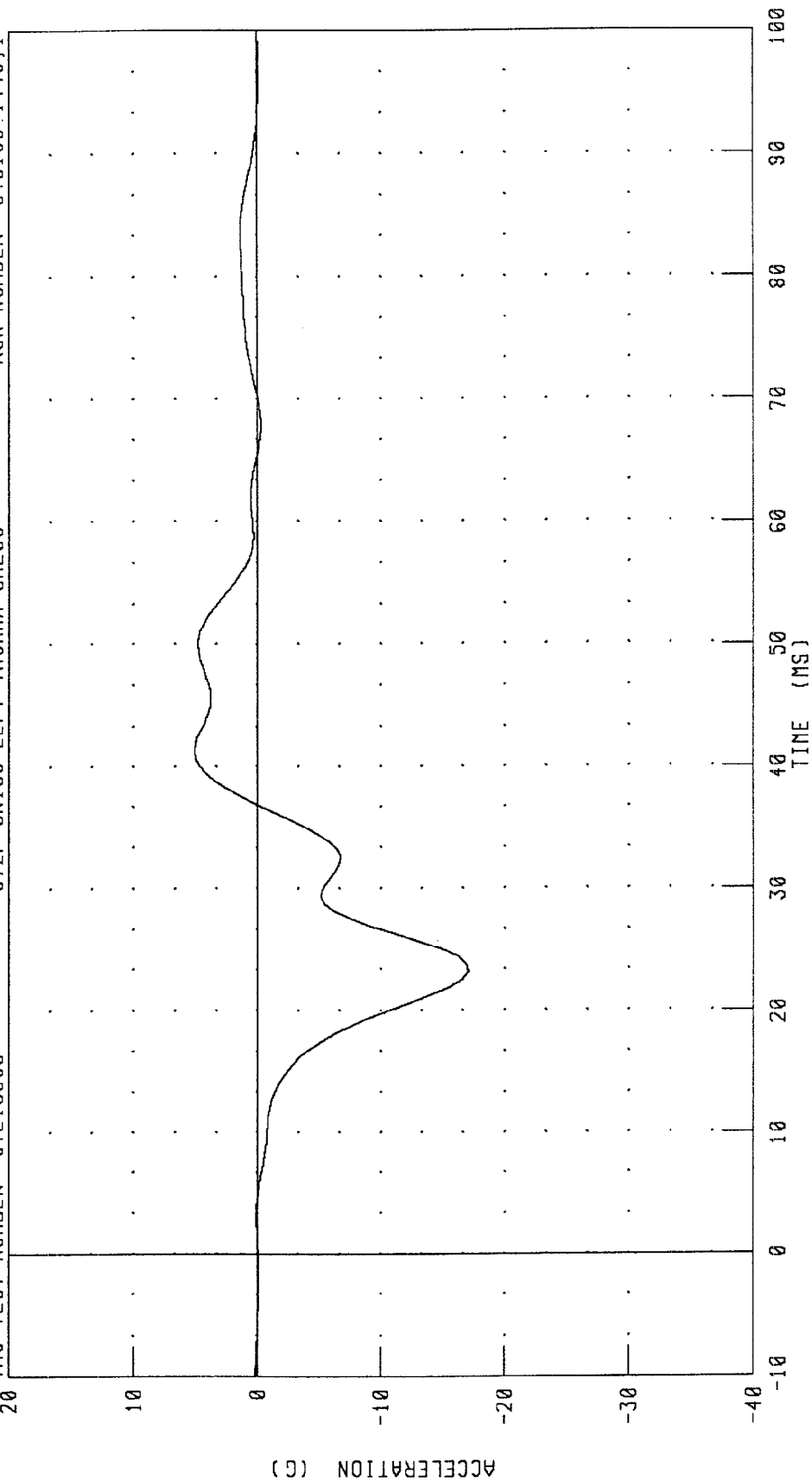
TRC TEST NUMBER: STL19950 572F SN199 LEFT THORAX CAL50 RUN NUMBER: 040198.1448;1



CHANNEL: LLRYG FILTER: FIR 100 PEAK DATA: 10.27 G @ 25.63 MS; -39.70 G @ 18.13 MS

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL19950 572F SN199 LEFT THORAX CAL50 RUN NUMBER: 040198.1448;1



CHANNEL: T12YG FILTER: FIR 100 PEAK DATA: 5.08 G @ 41.25 MS; -17.09 G @ 23.13 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

01-APR-98

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL19950

572F SN199 LEFT PELVIS CAL50

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PENDULUM VELOCITY	4.27 - 4.33 M/S	4.30 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	-48.8 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	5.9 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

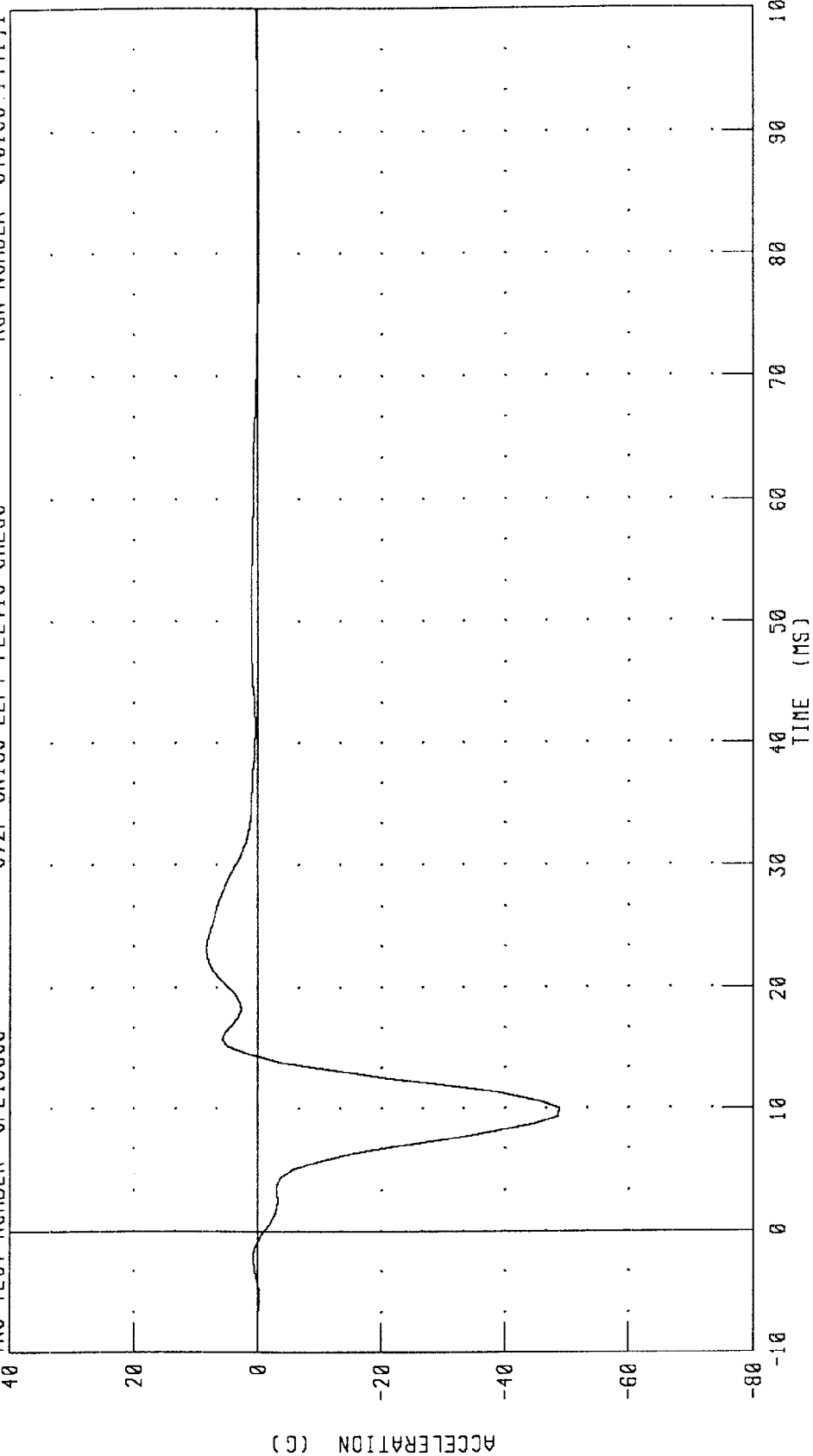
TEST MEETS SPECIFICATIONS

TECHNICIAN B. Calt

RUN NUMBER: 040198.1440;1

PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)
PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL19950 572F SN199 LEFT PELVIS CAL50 RUN NUMBER: 040198.1441.1



CHANNEL: PEVYG FILTER: FIR 100

PEAK DATA: 8.27 G @ 23.13 MS, -48.77 G @ 10.00 MS

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th

19-FEB-98

TRC INC.

TEST NO: 168C4HD1

572E SN168 HEAD DROP CAL 04

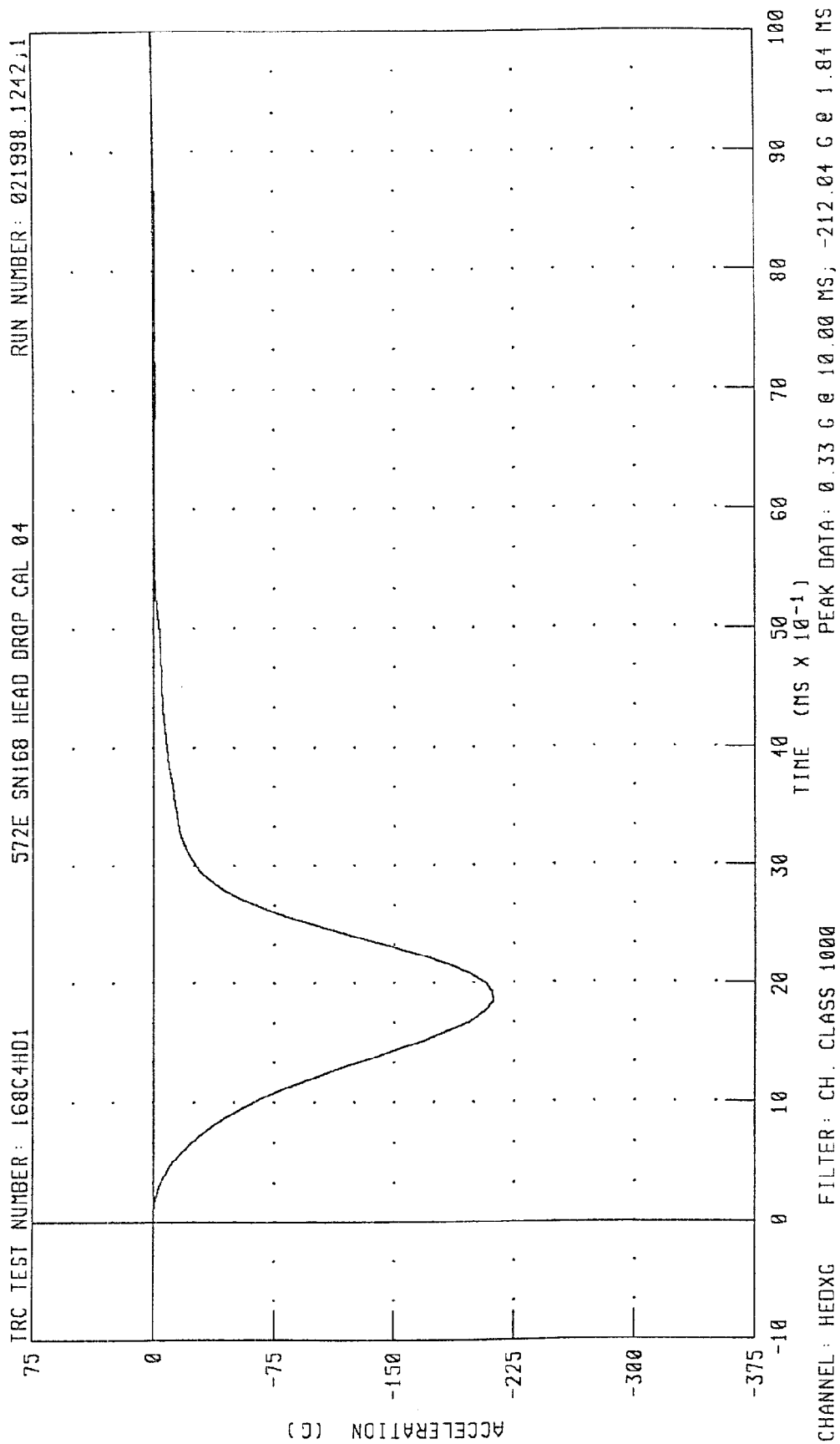
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	240.93 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.22 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN Ray C. Holt

RUN NUMBER: 021998.1241;1

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



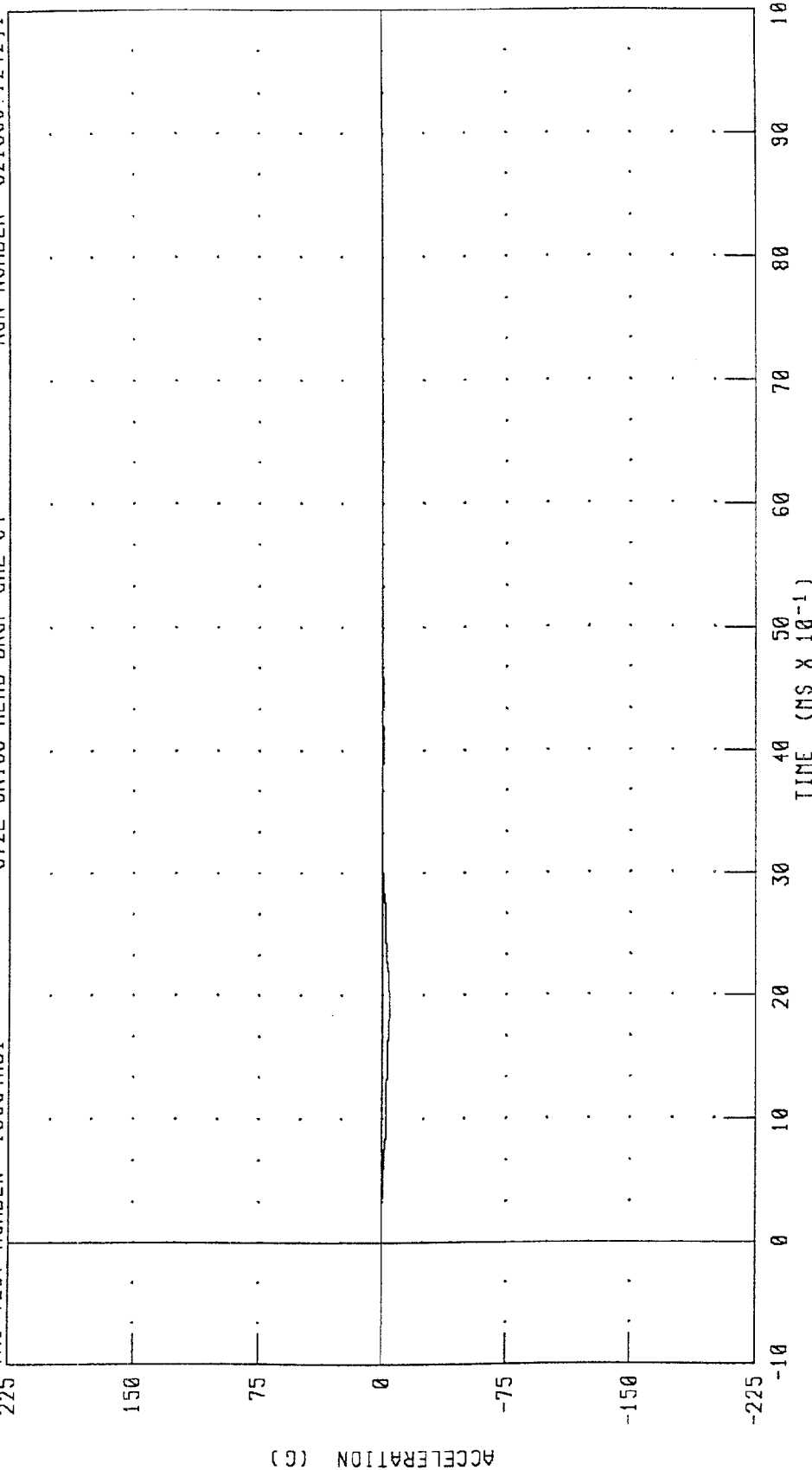
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 168C4HD1

572E SN168 HEAD DROP CAL 04

RUN NUMBER: 021998.1242.1



CHANNEL: HEDYG FILTER: CH. CLASS 1000

PEAK DATA: 0.29 G @ 3.36 MS; -4.22 G @ 1.92 MS

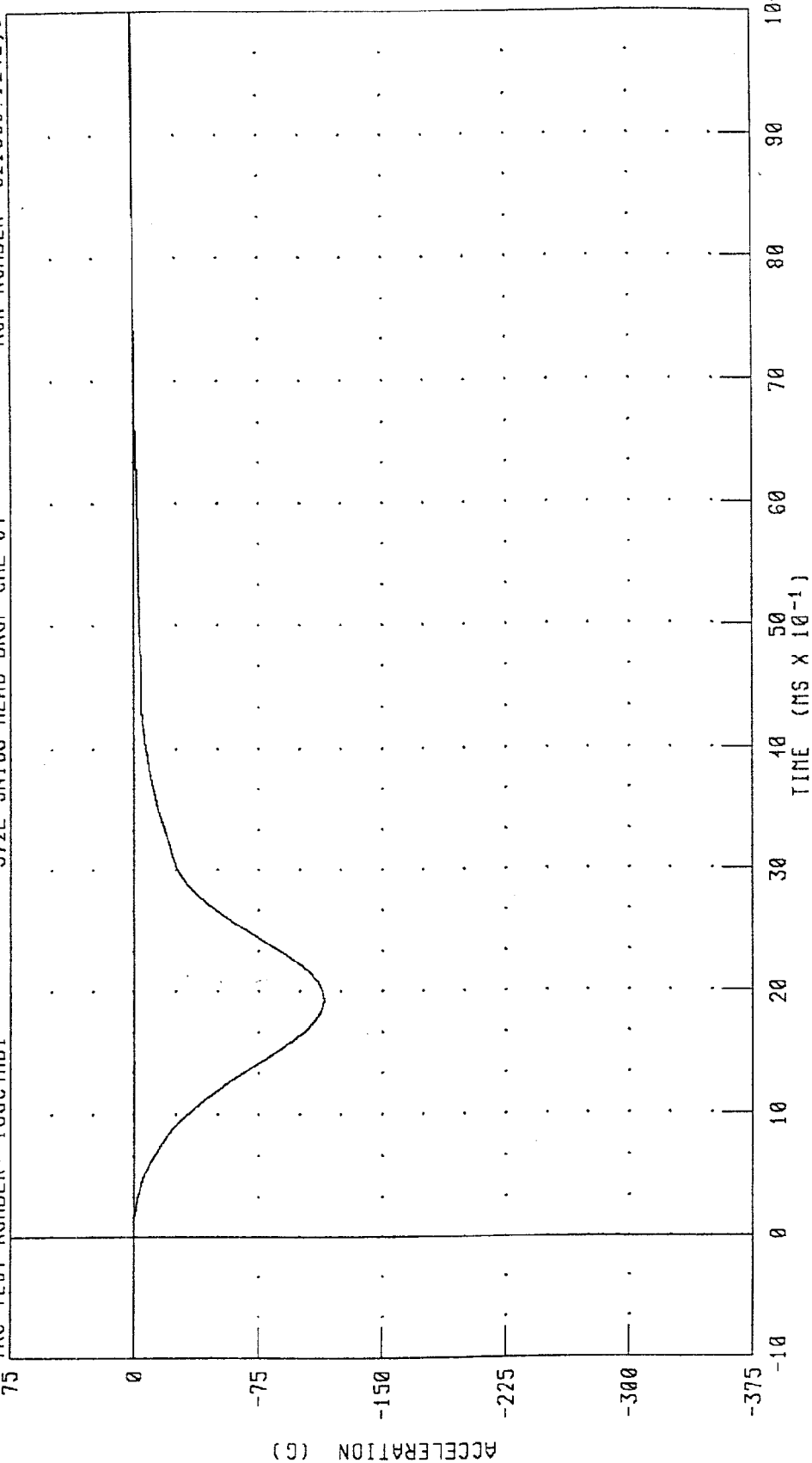
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 168C4HD1

572E SN168 HEAD DROP CAL 04

RUN NUMBER: 021998.1242,1



CHANNEL: HEDZG FILTER: CH. CLASS 1000

PEAK DATA: 0.77 G @ 10.00 MS; -114.78 G @ 1.92 MS

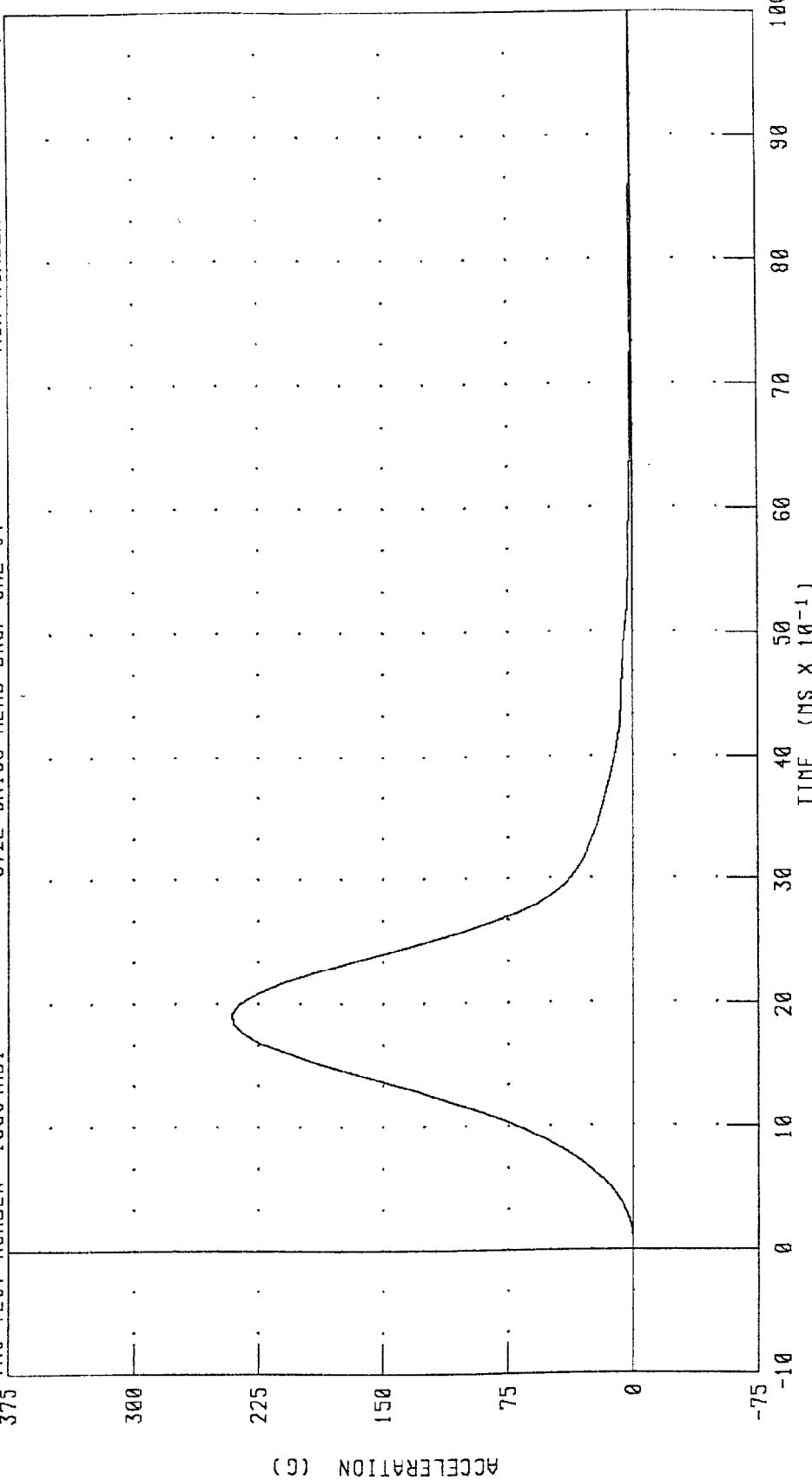
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 168C4HD1

572E SN168 HEAD DROP CAL 04

RUN NUMBER: 021998.1242;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 248.93 G @ 1.92 MS; 0.08 G @ 0.08 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

19-FEB-98

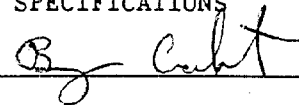
NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 168C4NF2 572E SN168 NECK FLEXION CAL04

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.93 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	22.95 G
	20 MS	17.60 - 22.60 G	22.57 G
	30 MS	12.50 - 18.50 G	18.38 G
MAX PENDULUM G		29 G MAX	23.89 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	18.33 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	35.12 MS
D PLANE	MAX	64 - 78 DEG.	74.83 DEG.
ROTATION	TIME	57 - 64 MS	59.36 MS
MOMENT ABOUT OCCIPITAL	MAX	88.2 - 108.5 NM	99.54 NM
CONDYLE	TIME	47 - 58 MS	47.52 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	115.68 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.92 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 021998.1609;2

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

IRC TEST NUMBER: 168C4NF2

572E SNI68 NECK FLEXION CAL04

RUN NUMBER: 021998.1609.2

400

320

ACCELERATION (G X 10⁻¹)

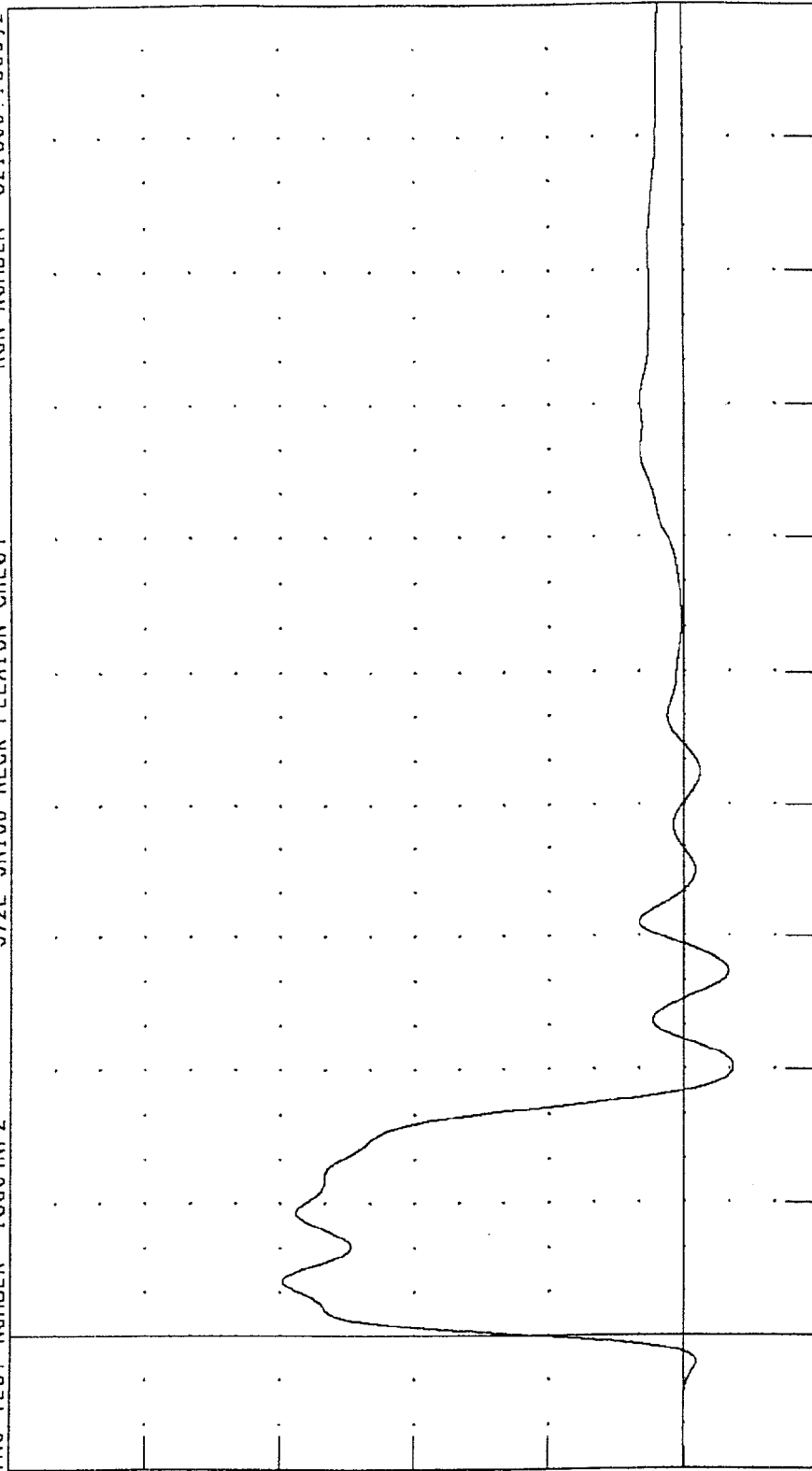
240

160

80

0

-80



PEAK DATA: 23.89 G @ 8.40 MS; -2.92 G @ 40.16 MS

CHANNEL: PENXG FILTER: CH. CLASS 60

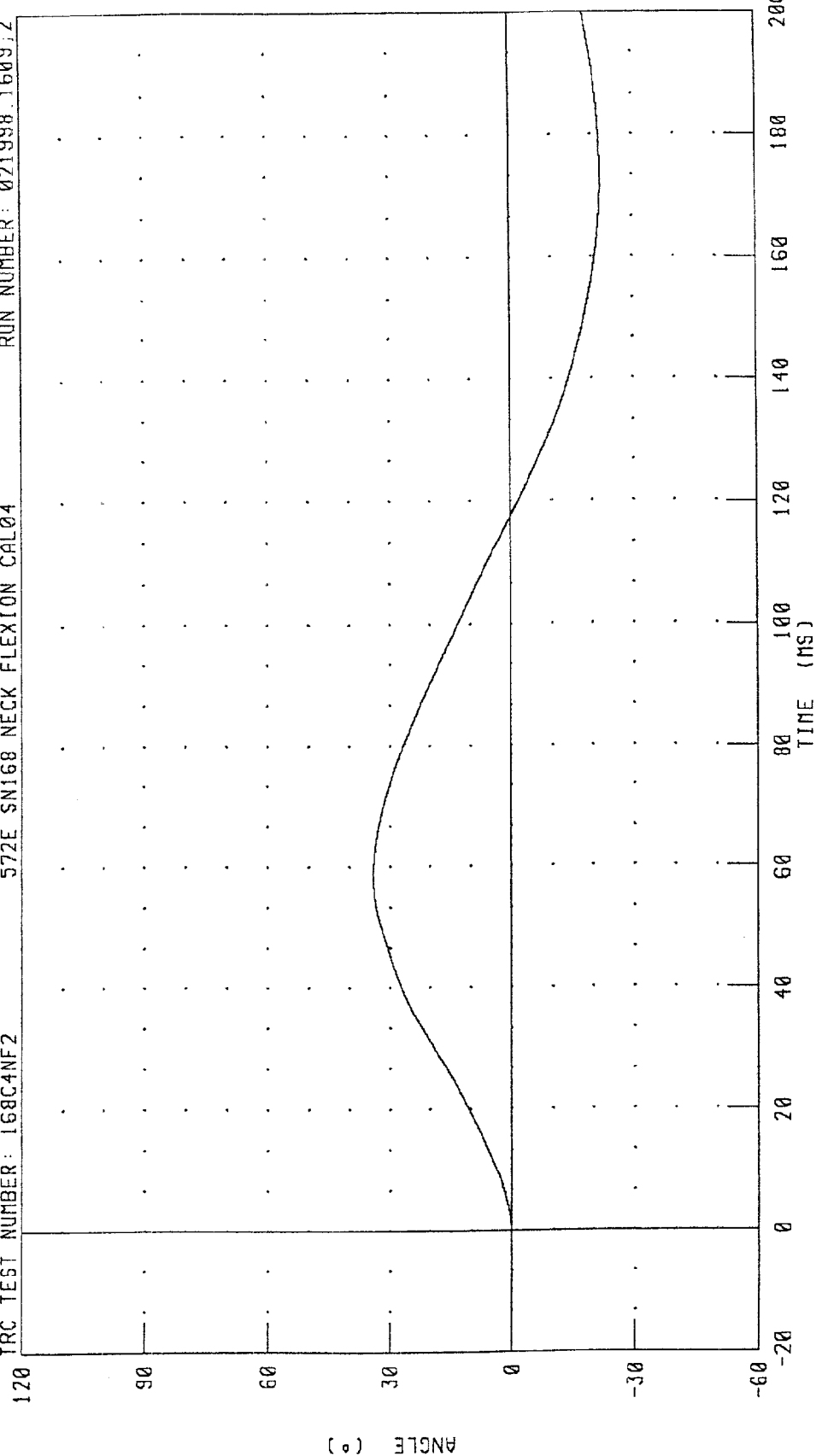
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN168 NECK FLEXION CAL04

TRC TEST NUMBER: 168C4NF2

RUN NUMBER: 021998.1609,2

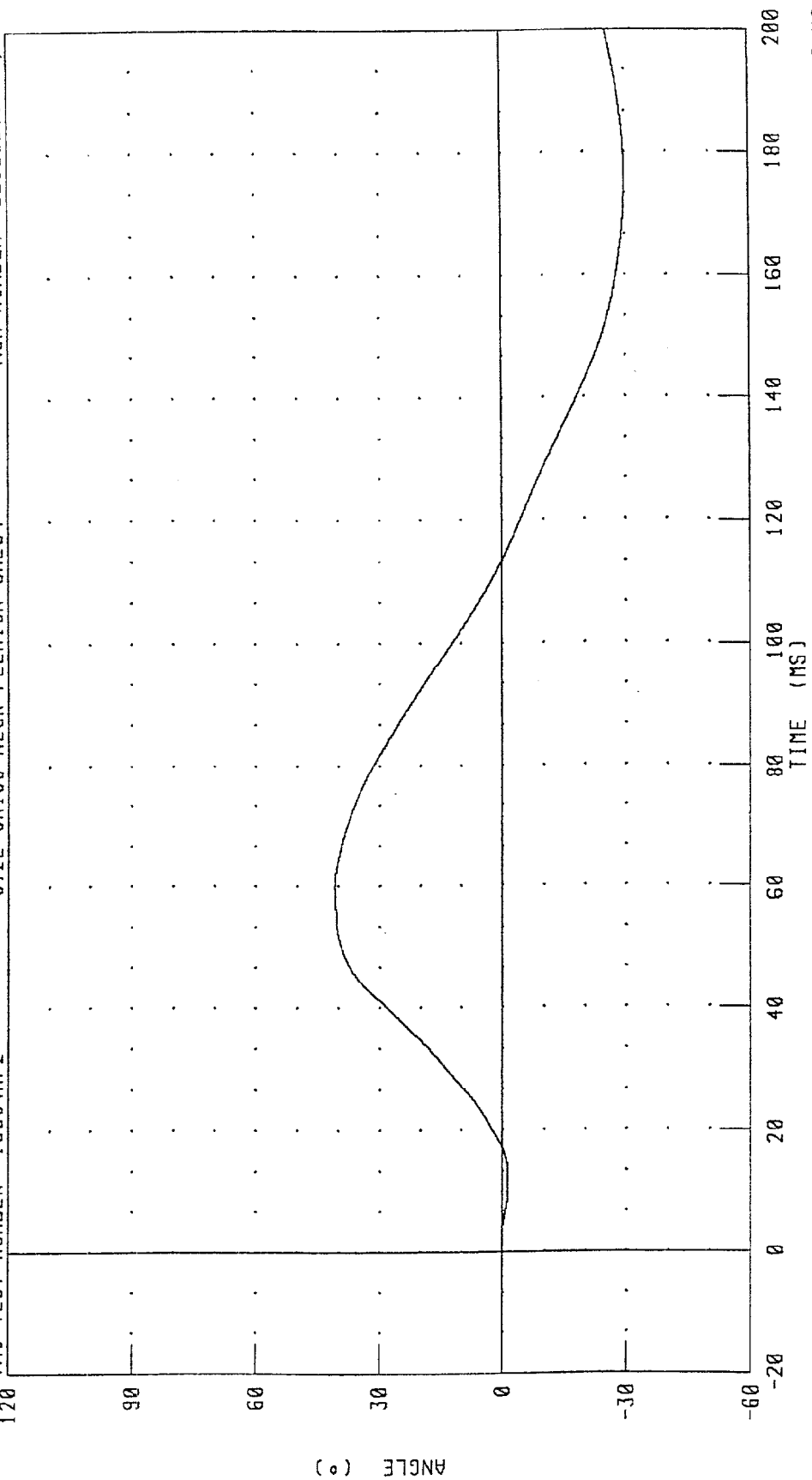


CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 34.04 ° @ 58.56 MS; -22.24 ° @ 173.44 MS

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

IRC TEST NUMBER: 168C4NF2 572E SN168 NECK FLEXION CAL04 RUN NUMBER: 021998.1609;2



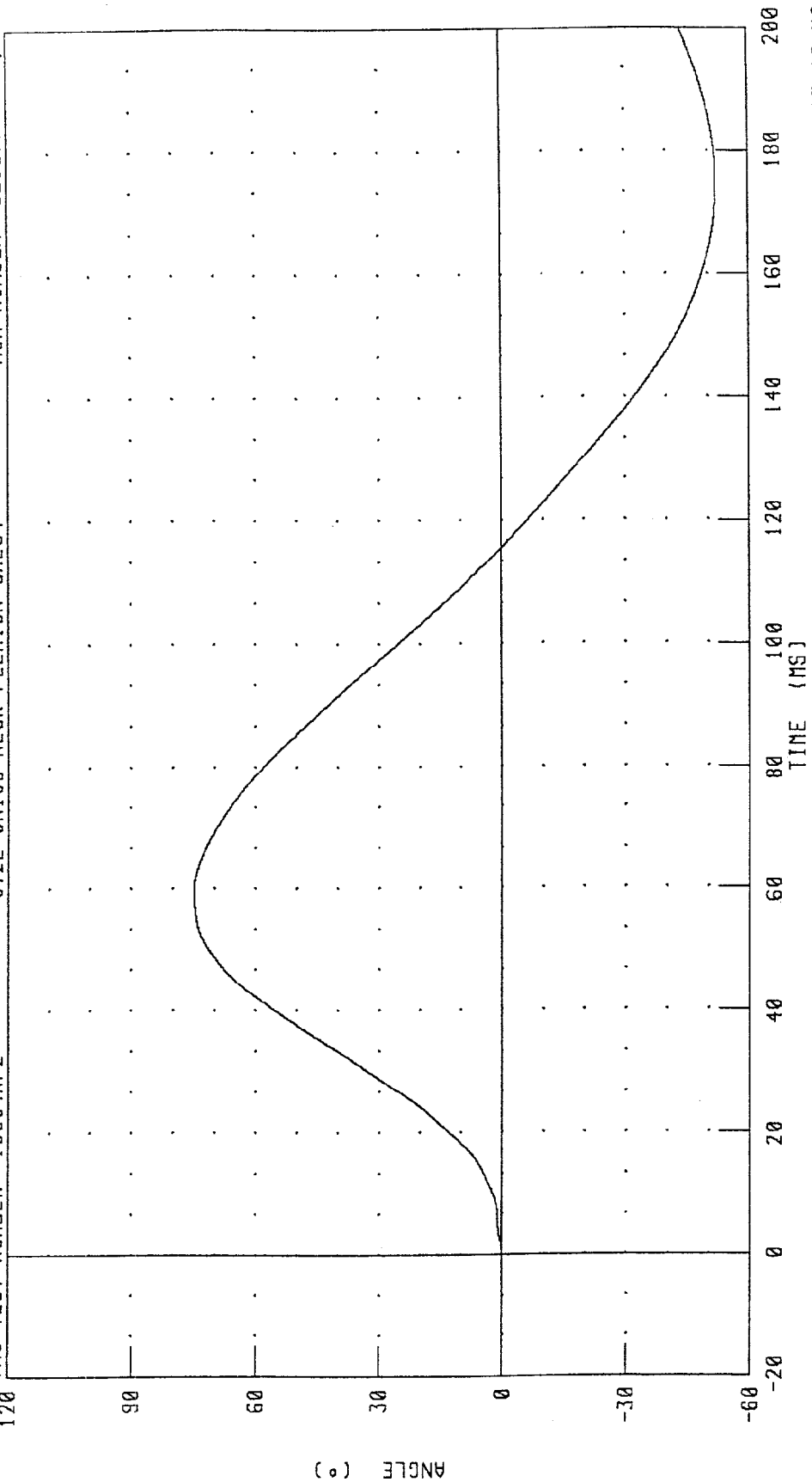
CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 40.81 ° @ 59.84 MS; -29.91 ° @ 176.40 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

IRC TEST NUMBER: 168C4NF2 572E SN160 NECK FLEXION CAL04 RUN NUMBER: 021998.1609,2

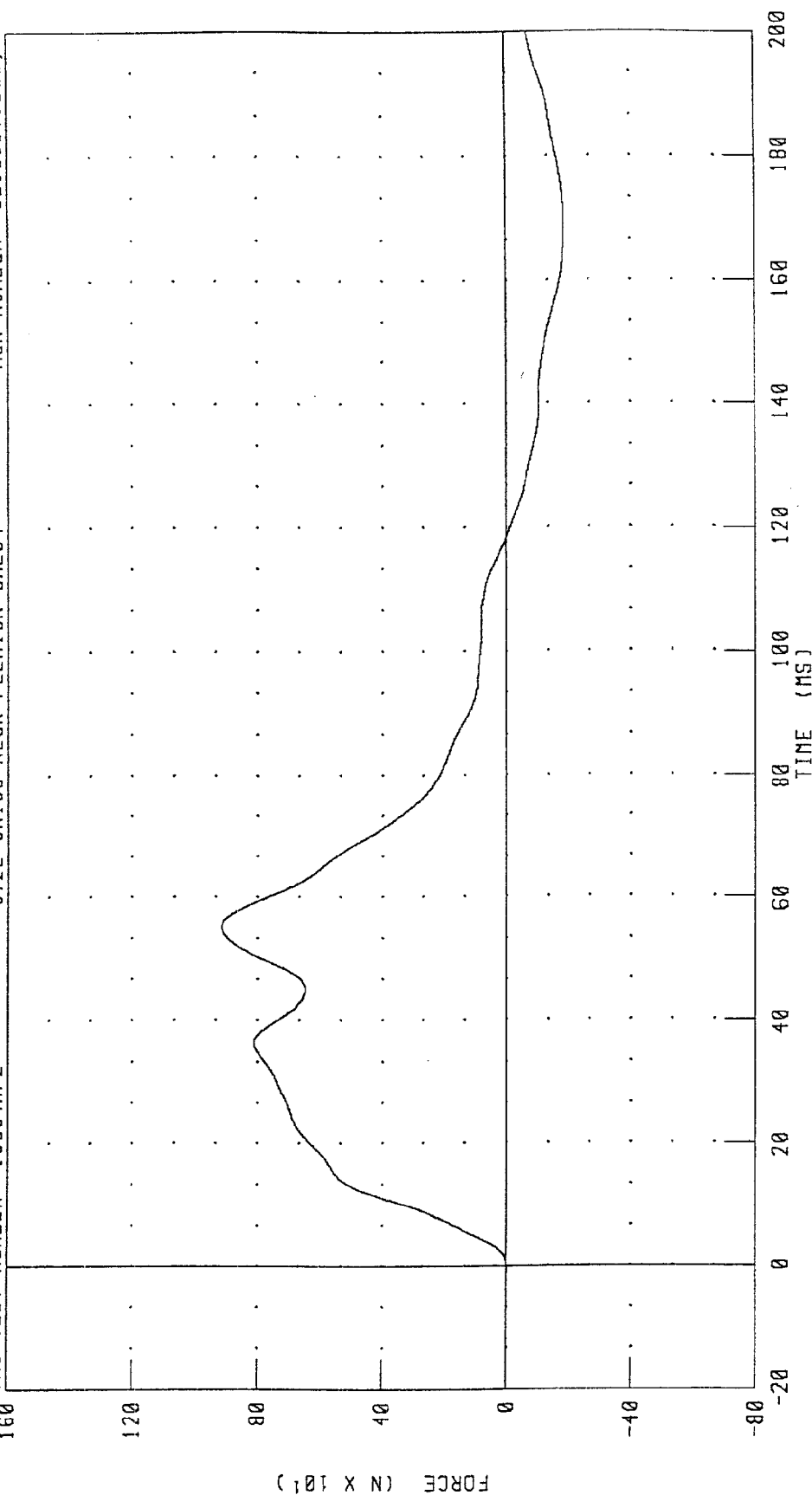


CHANNEL: TOTAL FILTER: CH. CLASS 60

PEAK DATA: 74.83 ° @ 59.36 MS, -52.11 ° @ 175.12 MS

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

IRC TEST NUMBER: 168C4NF2 572E SN168 NECK FLEXION CAL04 RUN NUMBER: 021998.1609;2

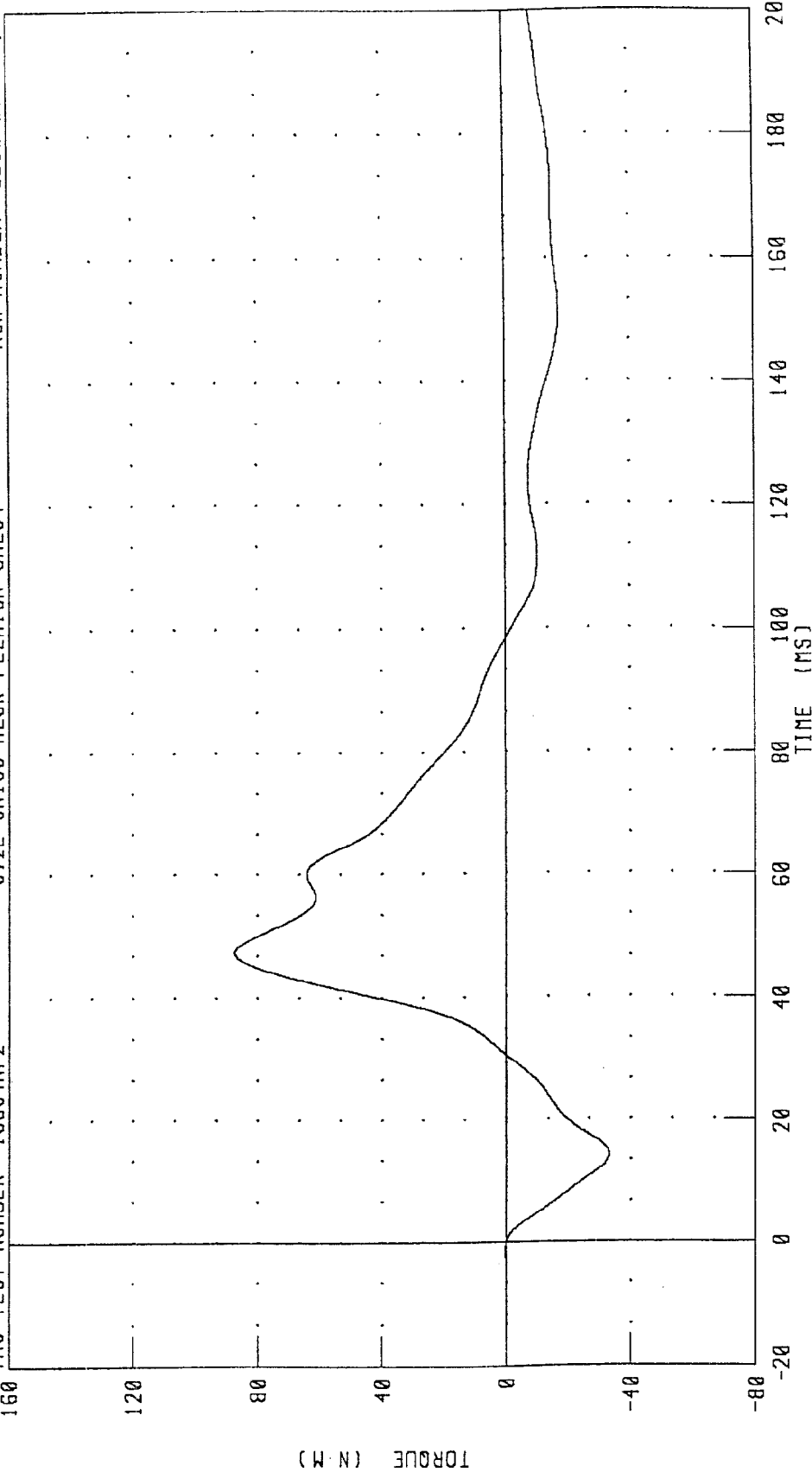


CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 914.03 N @ 55.12 MS; -185.69 N @ 169.28 MS

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

TRC TEST NUMBER: 168C4NF2 572E SN168 NECK FLEXION CAL04 RUN NUMBER: 021998.1609,2



CHANNEL: NEKYH FILTER: CH. CLASS 60

PEAK DATA: 87.46 N.M @ 47.28 MS; -33.03 N.M @ 14.24 MS

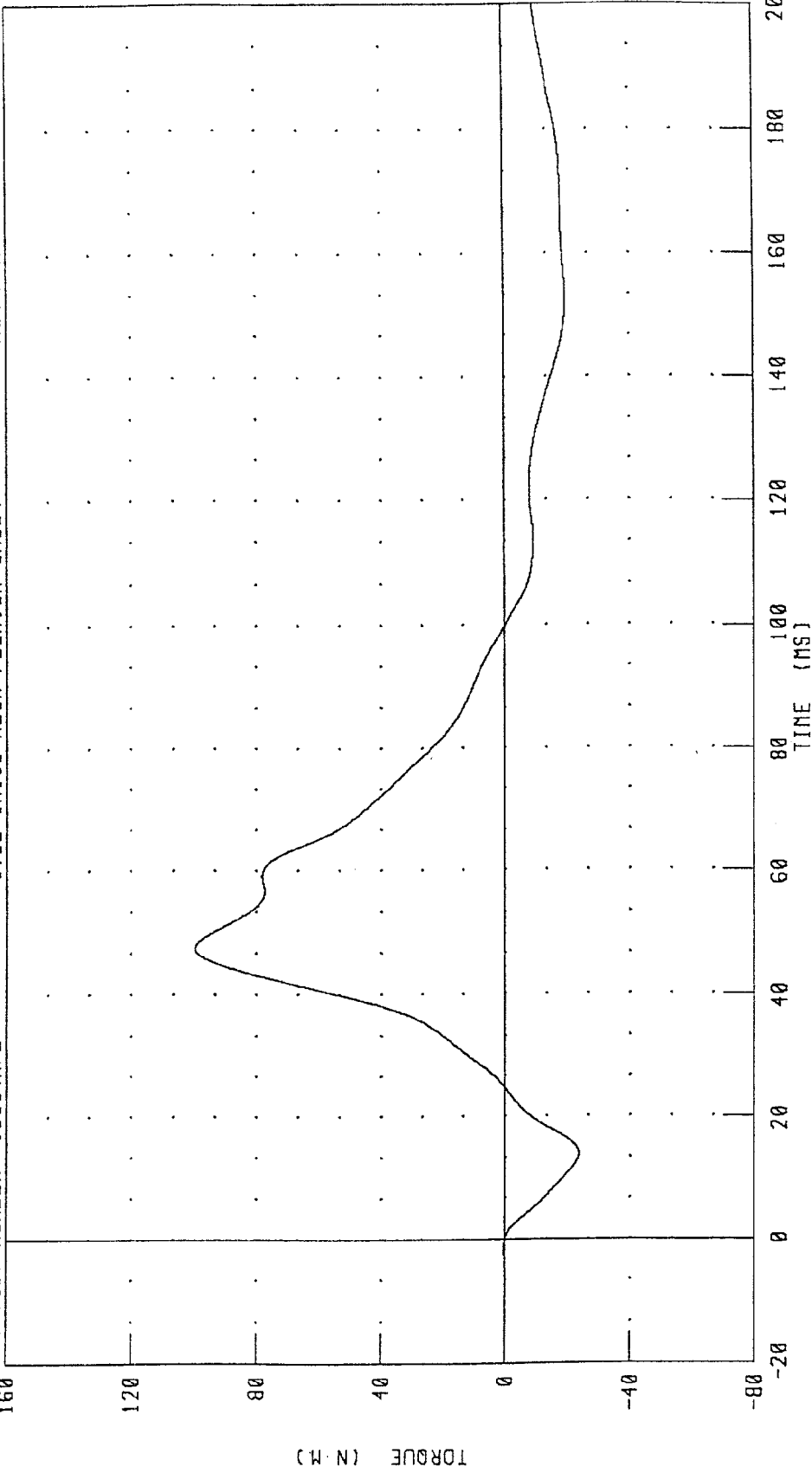
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 168C4NF2

572E SN168 NECK FLEXION CAL04

RUN NUMBER: 021998.1609.2



CHANNEL: NEKOM FILTER: CH. CLASS 60

PEAK DATA: 99.54 N-M @ 47.52 MS; -23.57 N-M @ 13.92 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

19-FEB-98

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 168C4NE1 572E SN168 NECK EXT. CAL04

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	17.52 G
	20 MS	14.00 - 19.00 G	17.68 G
	30 MS	11.00 - 16.00 G	15.96 G
MAX PENDULUM G		22 G MAX	18.14 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	15.92 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.52 MS
D PLANE	MAX	81 - 106 DEG.	97.87 DEG.
ROTATION	TIME	72 - 82 MS	76.96 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-63.06 NM
	TIME	65 - 79 MS	70.72 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	158.32 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	143.68 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN By *elt*

RUN NUMBER: 021998.1636;2

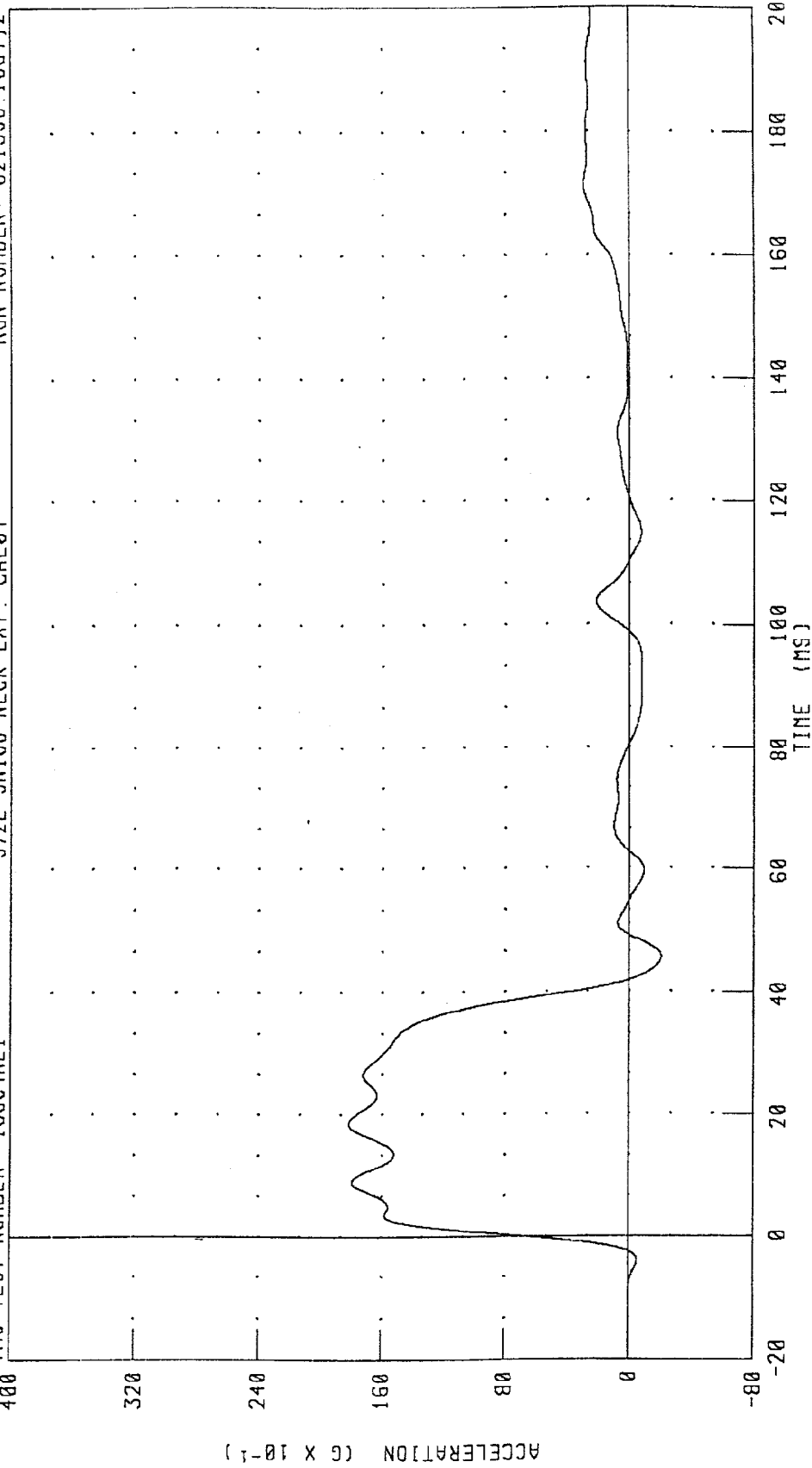
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 168C4NE1

572E SN168 NECK EXT. CAL04

RUN NUMBER: 021998.1637,2



CHANNEL: PENXG FILTER: CH. CLASS 60

PEAK DATA: 18.15 G @ 18.48 MS; -2.05 G @ 45.76 MS

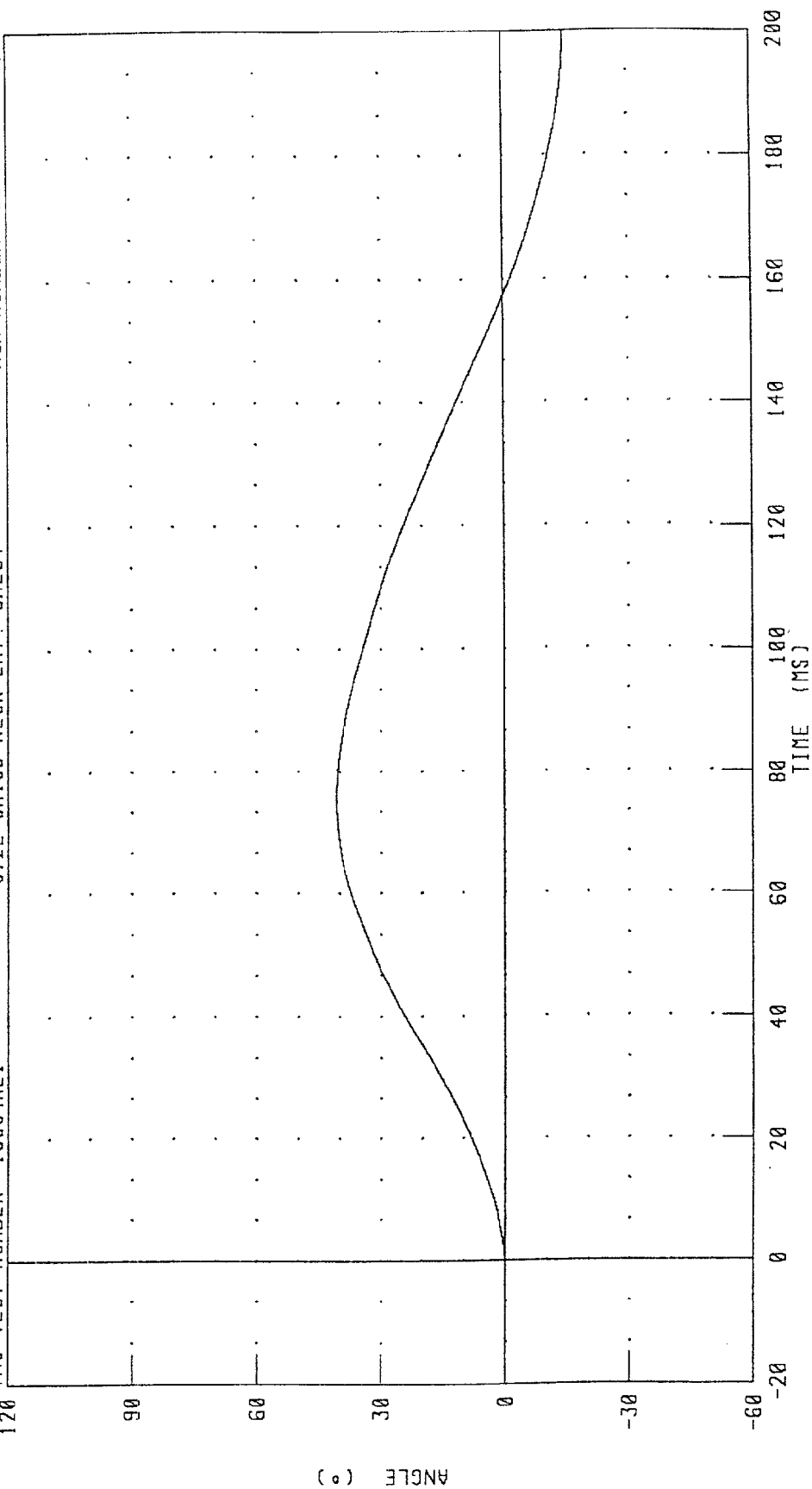
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 168C4NE1

572E SNI68 NECK EXT. CAL04

RUN NUMBER: 021998.1637,2



CHANNEL: BETA FILTER: CH. CLASS 60

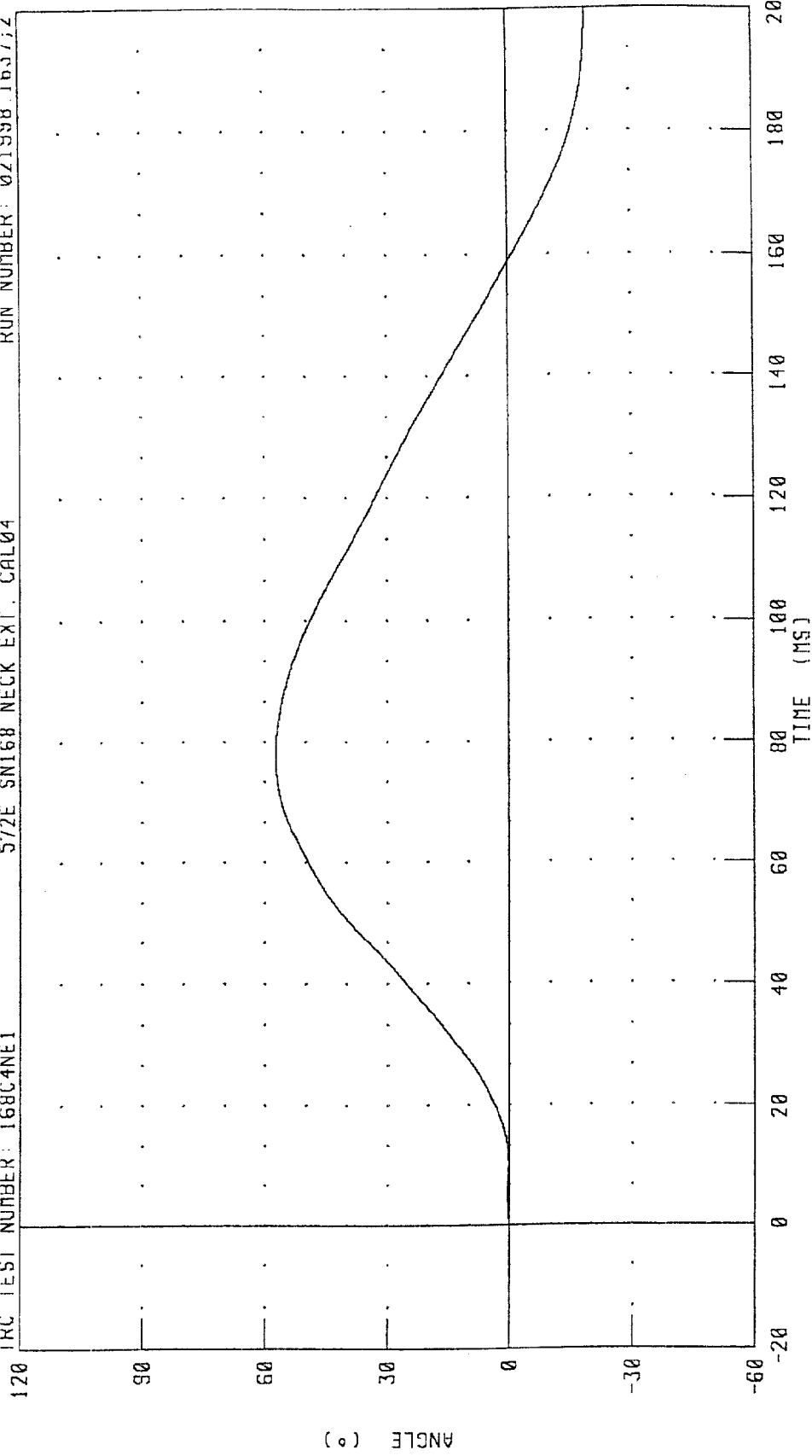
PEAK DATA: 40.62 ° @ 75.36 MS; -14.68 ° @ 199.92 MS

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

TRC TEST NUMBER: 168C4NE1

572E SN168 NECK EXT. CAL04

RUN NUMBER: 021998.1637;2



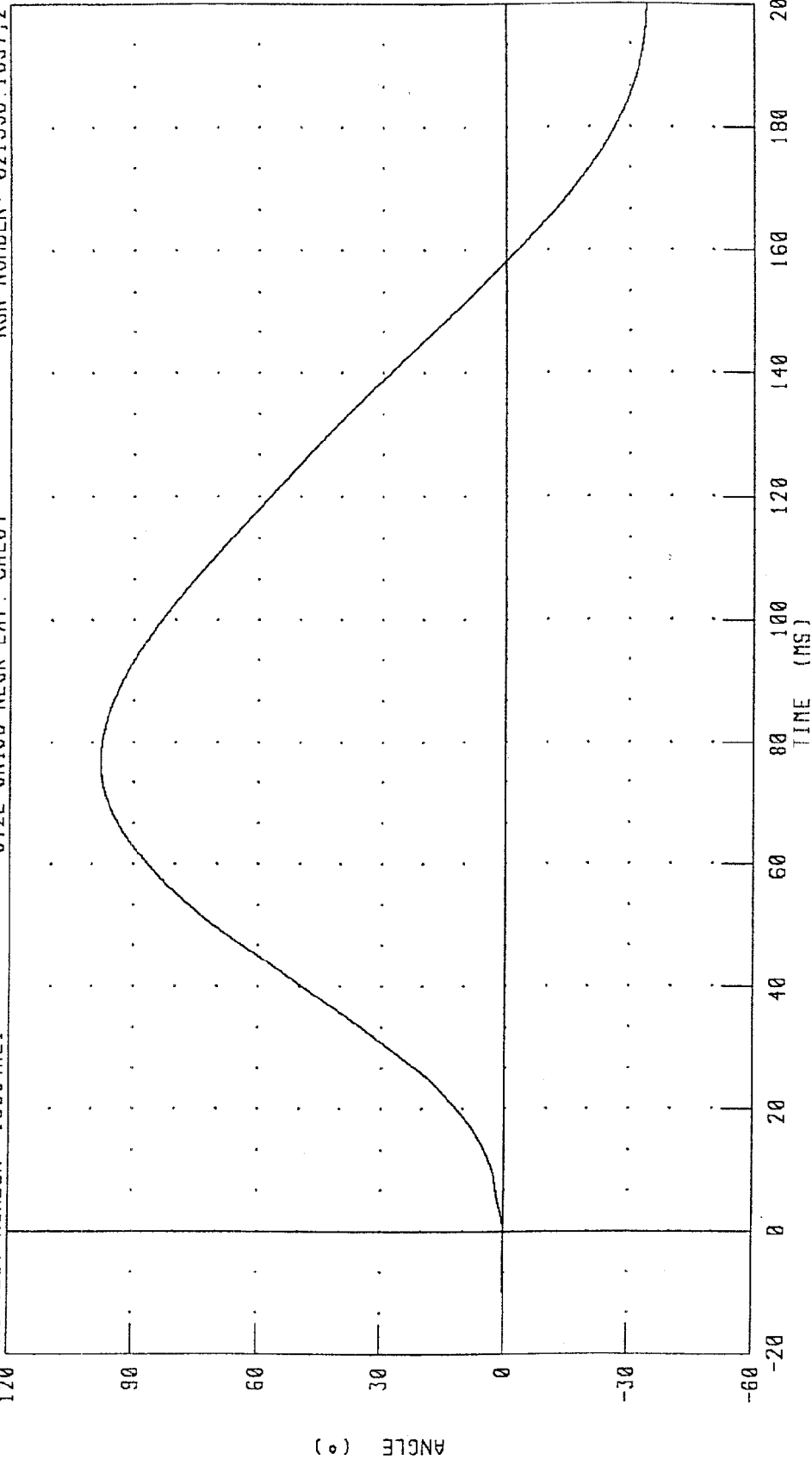
CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 57.30 ° @ 77.92 MS; -19.20 ° @ 198.96 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

IRC TEST NUMBER: 168C4NE1 572E SN168 NECK EXT. CAL04 RUN NUMBER: 021998.1637.2



CHANNEL: TOTAL FILTER: CH. CLASS 60

PEAK DATA: 97.87 ° @ 76.96 MS; -33.87 ° @ 199.36 MS

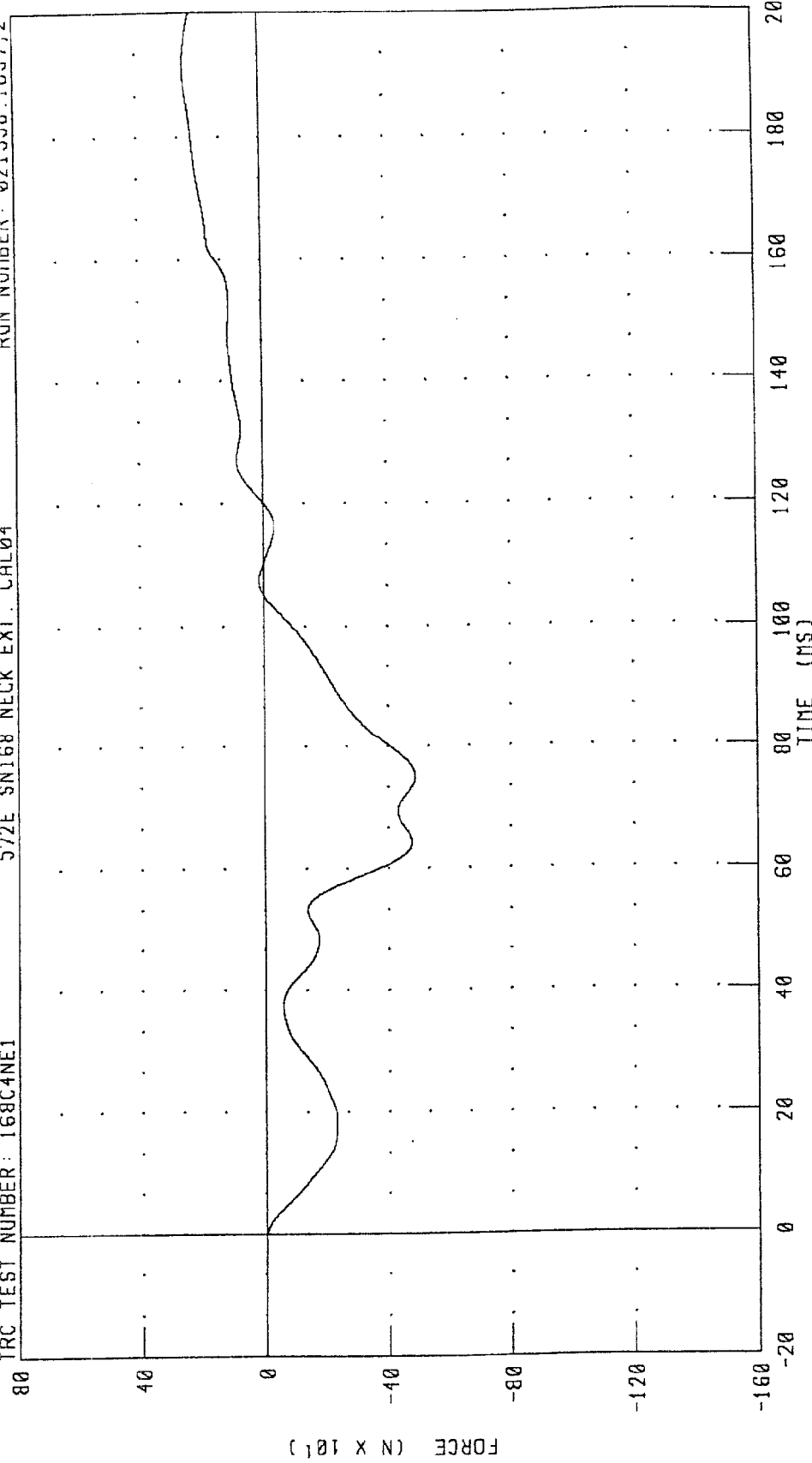
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 168C4NE1

572E SN168 NECK EXT. CAL04

RUN NUMBER: 021998.1637.2



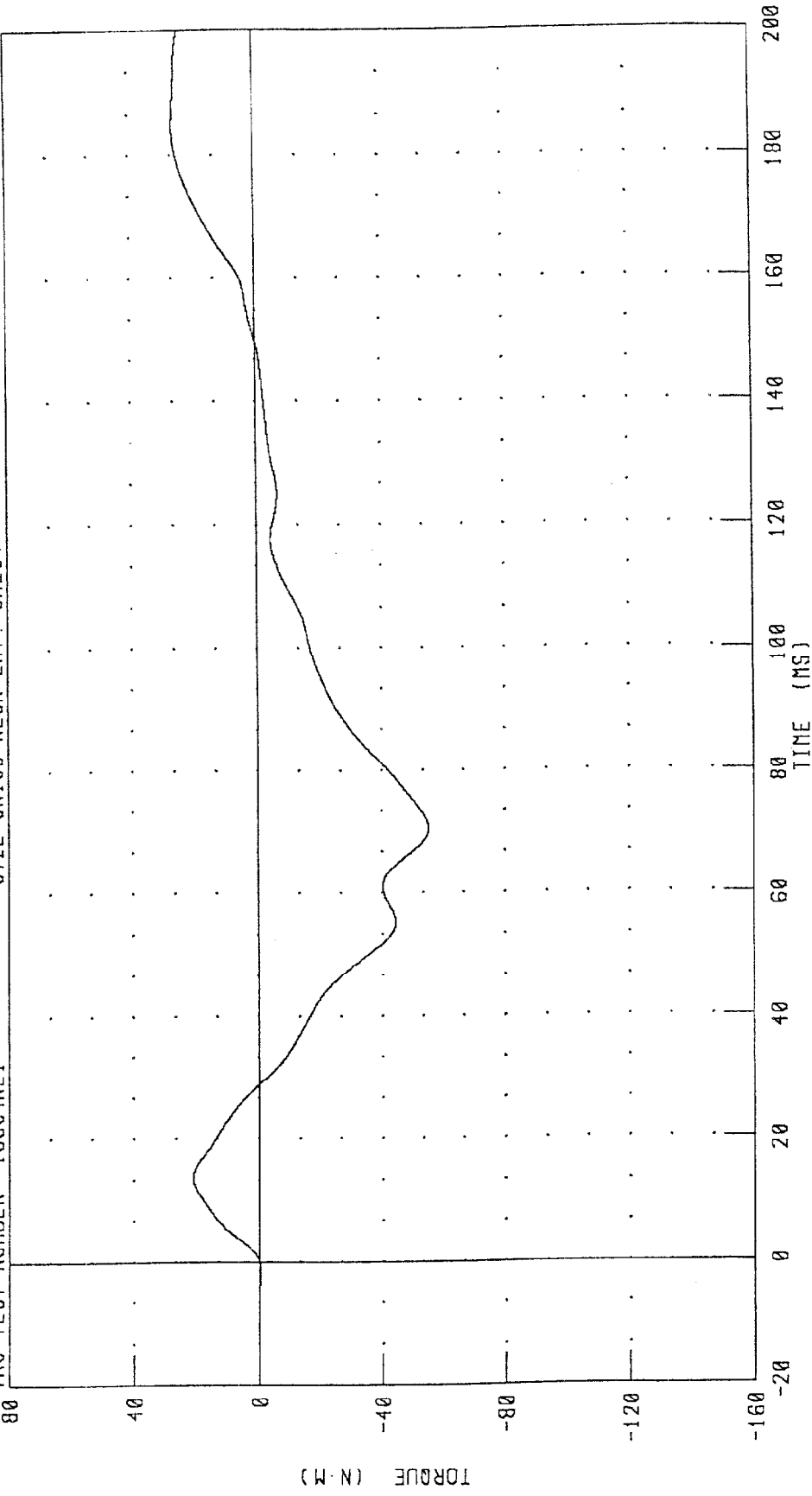
CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 246.90 N @ 191.36 MS, -489.16 N @ 75.04 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 168C4NE1 572E SN168 NECK EXT. CAL04 RUN NUMBER: 021998 1637;2



CHANNEL: NEKYH FILTER: CH. CLASS 60

PEAK DATA: 25.94 N-M @ 184.64 MS; -55.25 N-M @ 70.48 MS

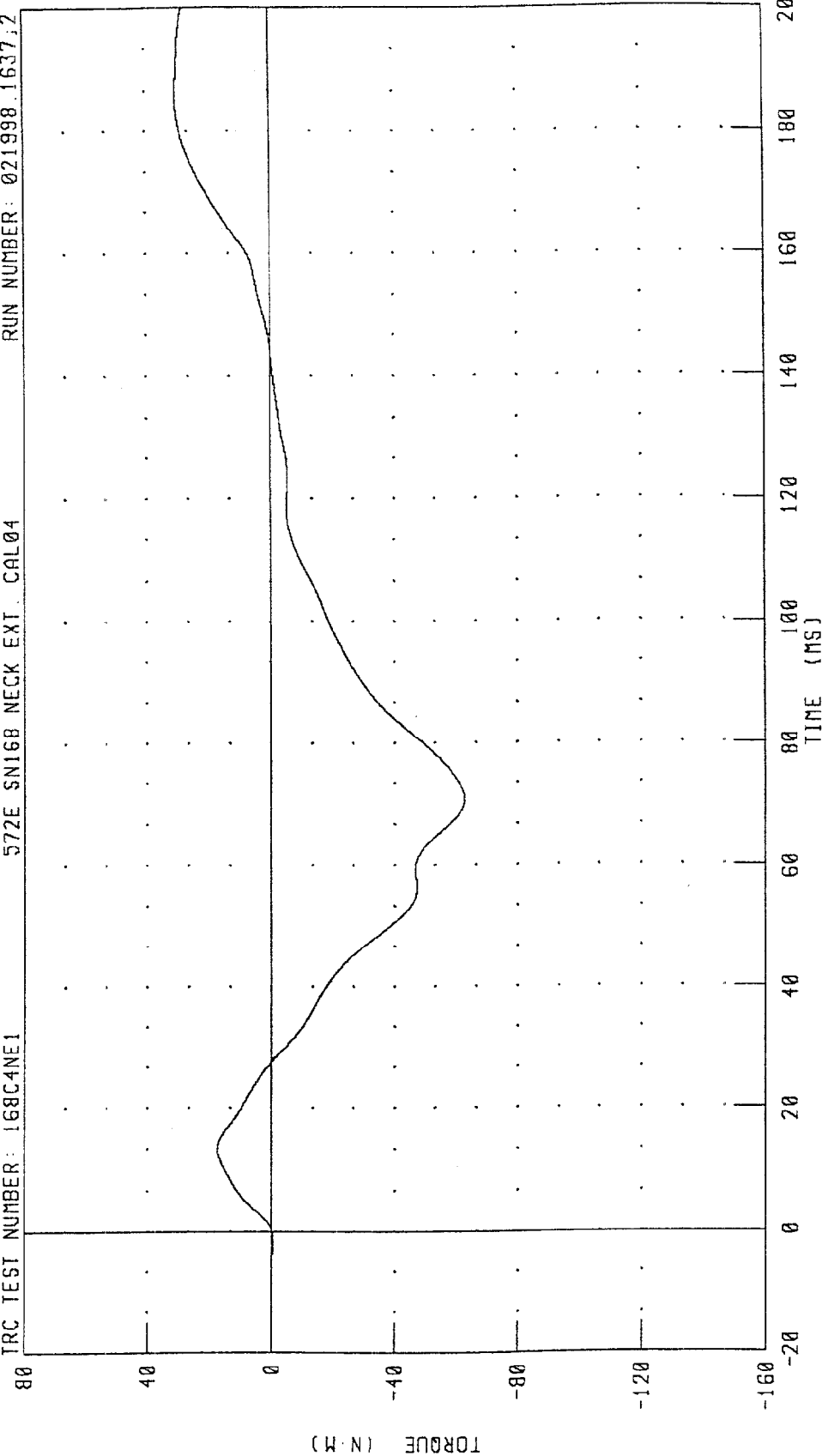
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 168C4NE1

572E SNI6B NECK EXT. CAL04

RUN NUMBER: 021998.1637.2



CHANNEL: NEKOM FILTER: CH. CLASS 60

PEAK DATA: 30.10 N-M @ 185.68 MS; -63.06 N-M @ 70.72 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th

19-FEB-98

TRC INC.

TEST NO: 168C4TH1

572E SN168 H.S.THORAX CAL04

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.80 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	66.1 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5788. N
INTERNAL HYSTERESIS	69% - 85%	71.7%

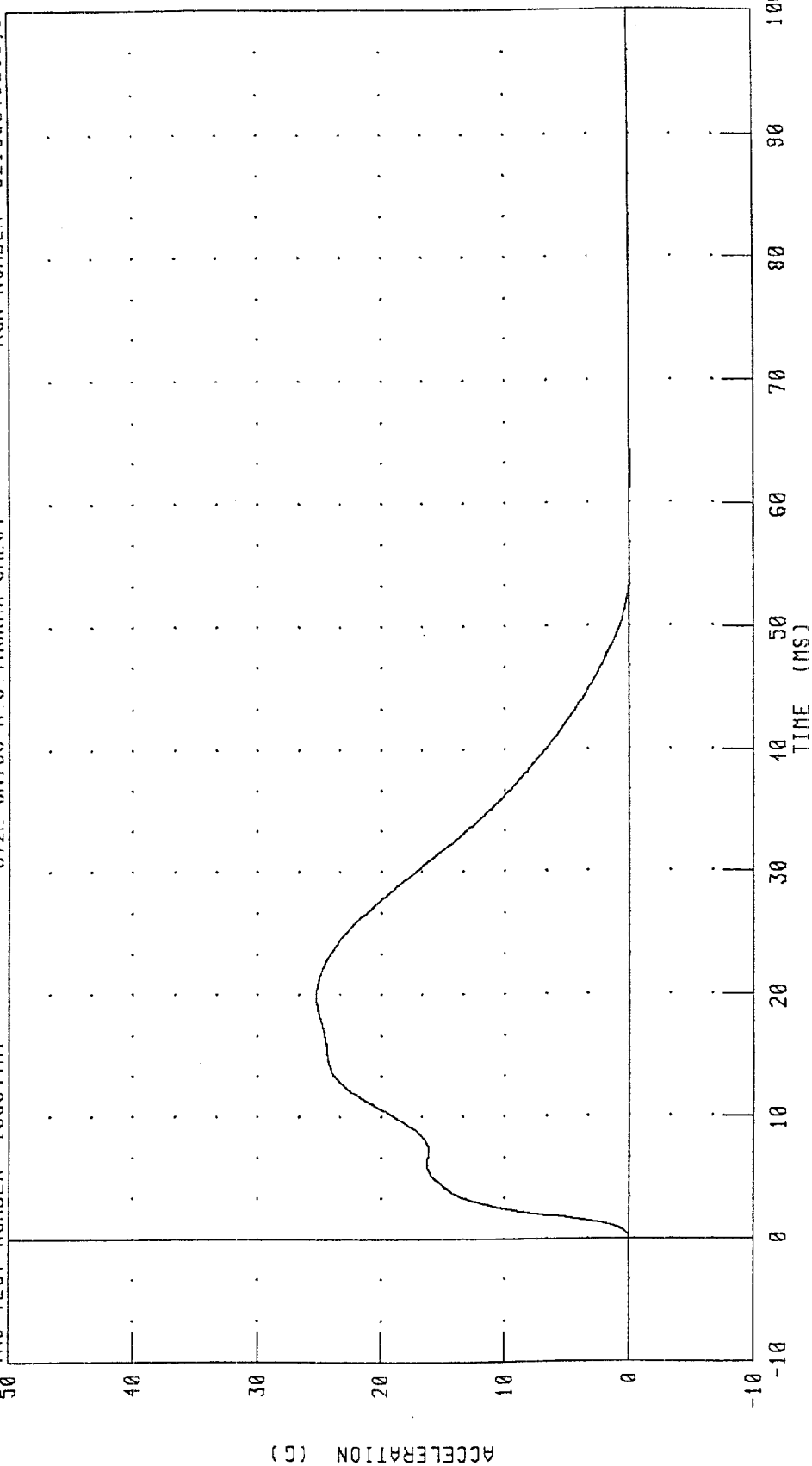
TEST MEETS SPECIFICATIONS

TECHNICIAN By Calt

RUN NUMBER: 021998.0909;1

PART 572-E HYBRID III THORAX CALIBRATION
 PENDULUM DECELERATION

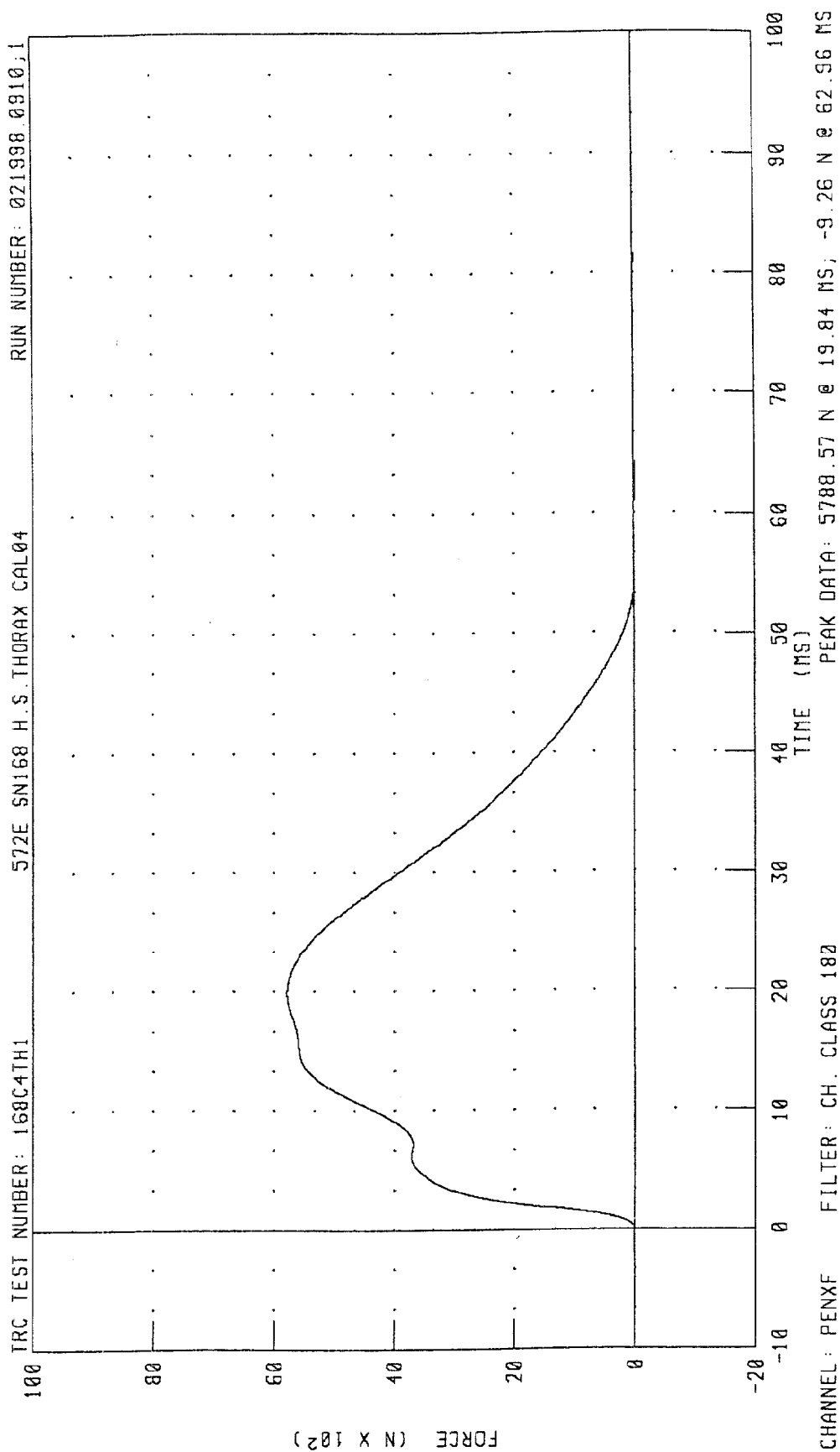
IRC TEST NUMBER: 168C4TH1 572E SN168 H.S. THORAX CAL04 RUN NUMBER: 021998.0910.1



CHANNEL: PENXG FILTER: CH. CLASS 180

PEAK DATA: 25.27 G @ 19.84 MS; -0.04 G @ 62.96 MS

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE



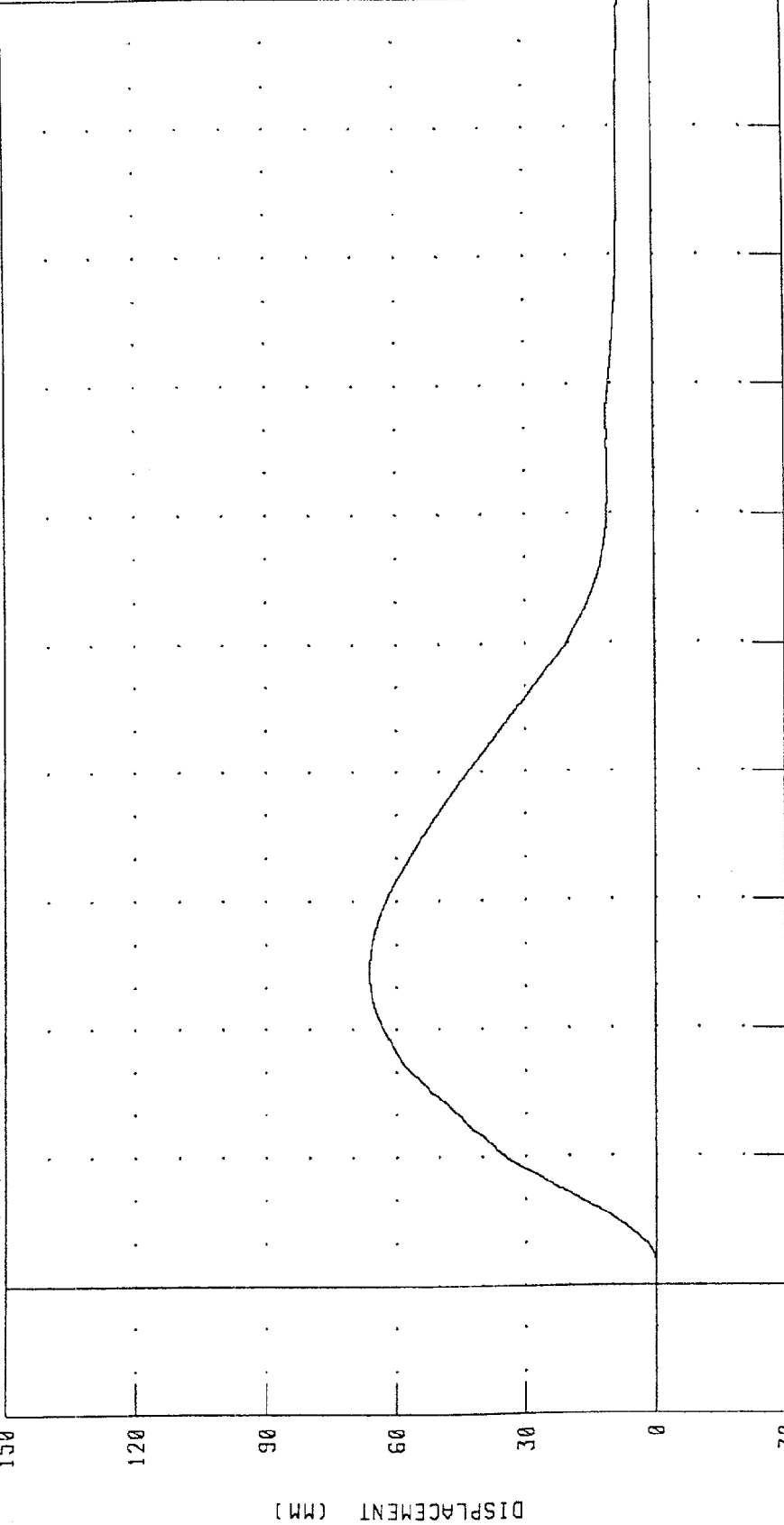
PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

TRC TEST NUMBER: 168C4TH1

572E SN168 H.S. THORAX CAL04

RUN NUMBER: 021998.0910.1



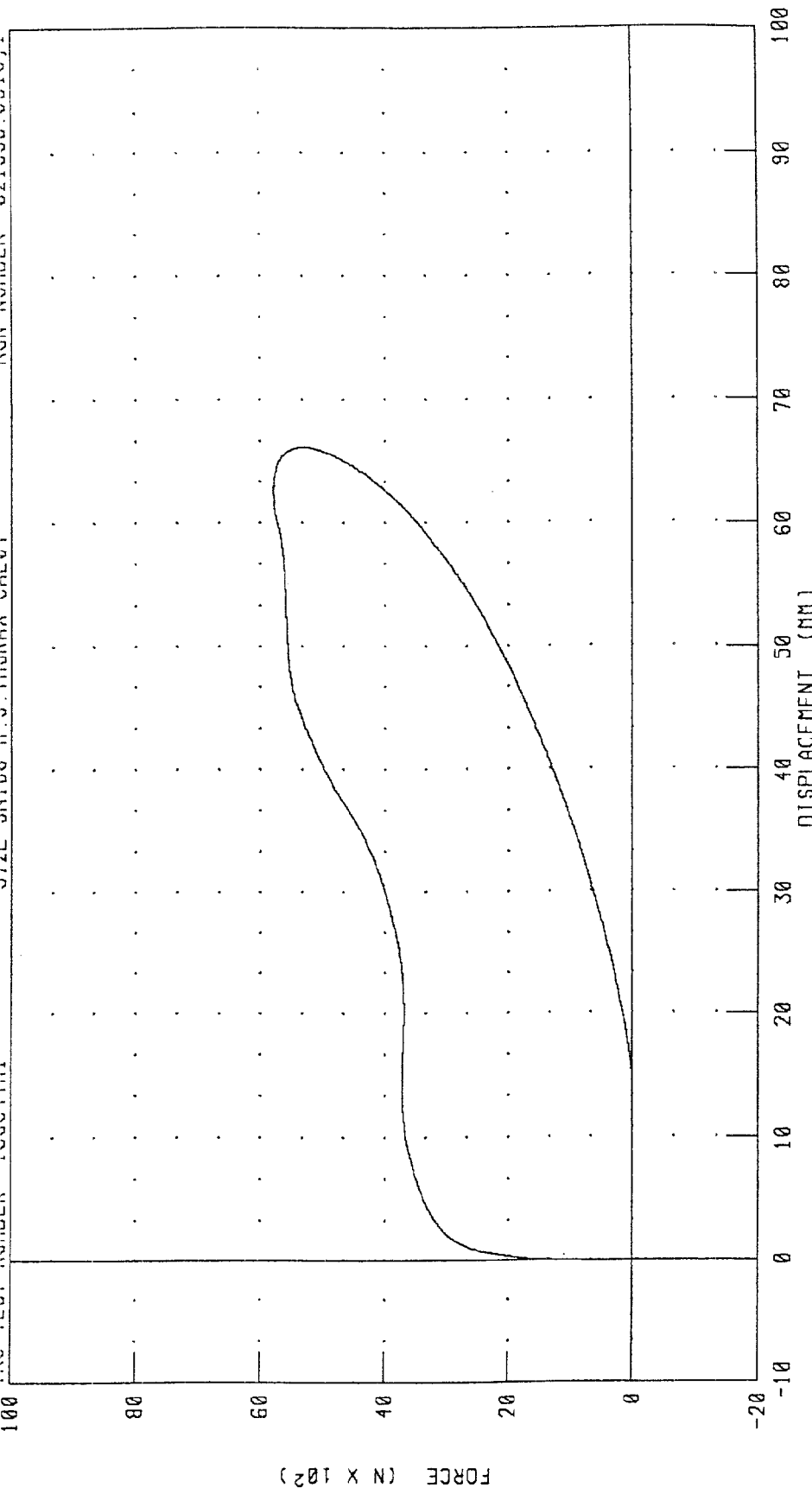
CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 66.16 MM @ 24.64 MS; -0.04 MM @ 1.12 MS

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

TRC TEST NUMBER: 168C4TH1

572E SN168 H.S. THORAX CAL04

RUN NUMBER: 021998.0910.1



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA: 66.16 MM @ 24.64 MS; -0.04 MM @ 1.12 MS
5788.57 N @ 19.84 MS; -9.26 N @ 62.96 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th

19-FEB-98

TRC INC.

TEST NO: 168C4RK1

572E SN168 RIGHT KNEE CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5651.9 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Bj Calh

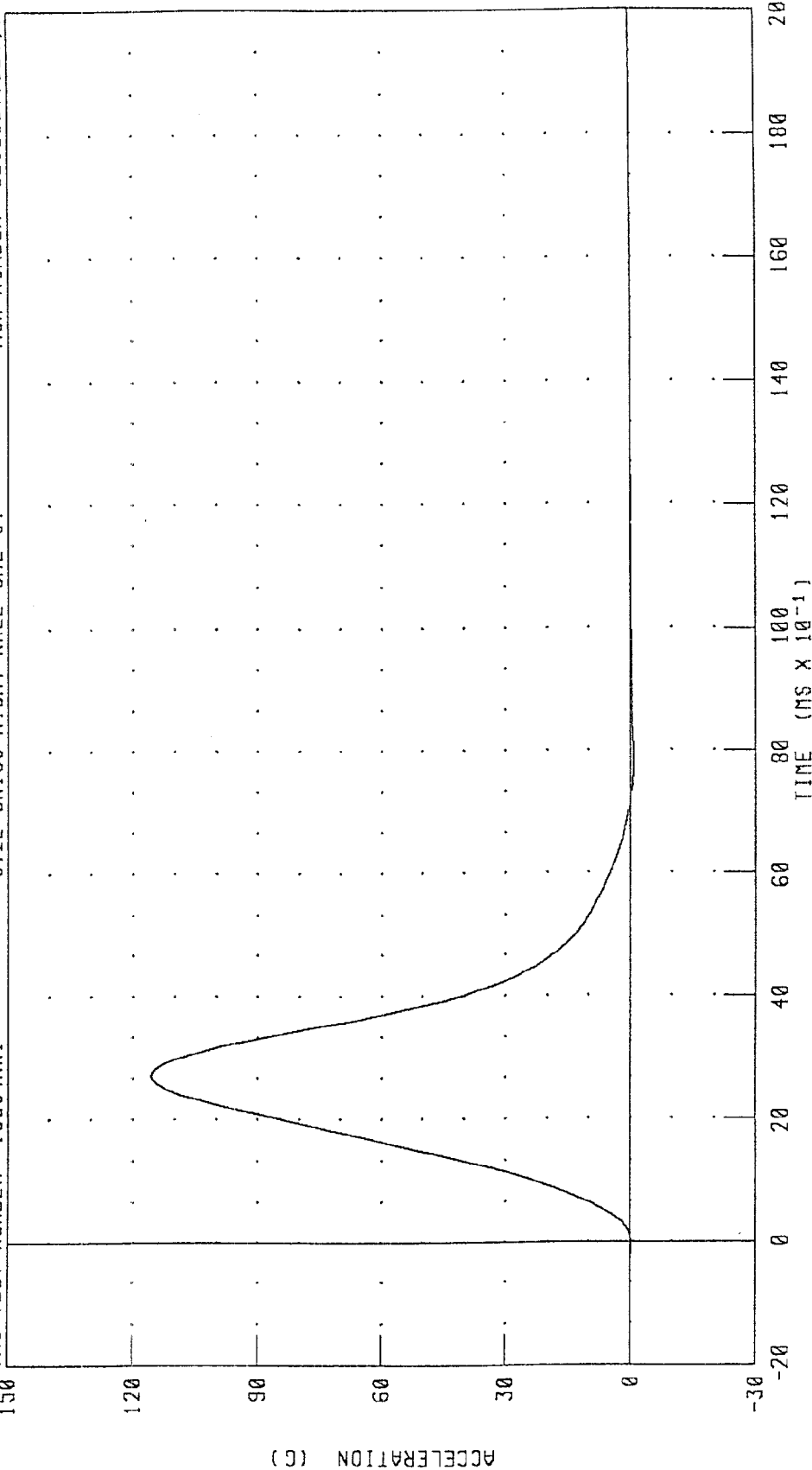
RUN NUMBER: 021998.1123;1

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

IRC TEST NUMBER: 168C4RK1

572E SN168 RIGHT KNEE CAL 04

RUN NUMBER: 021998.1124;1



CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 115.52 G @ 2.72 MS; -0.97 G @ 7.84 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th

19-FEB-98

TRC INC.

TEST NO: 168C4LK1

572E SN168 LEFT KNEE CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5560.3 N

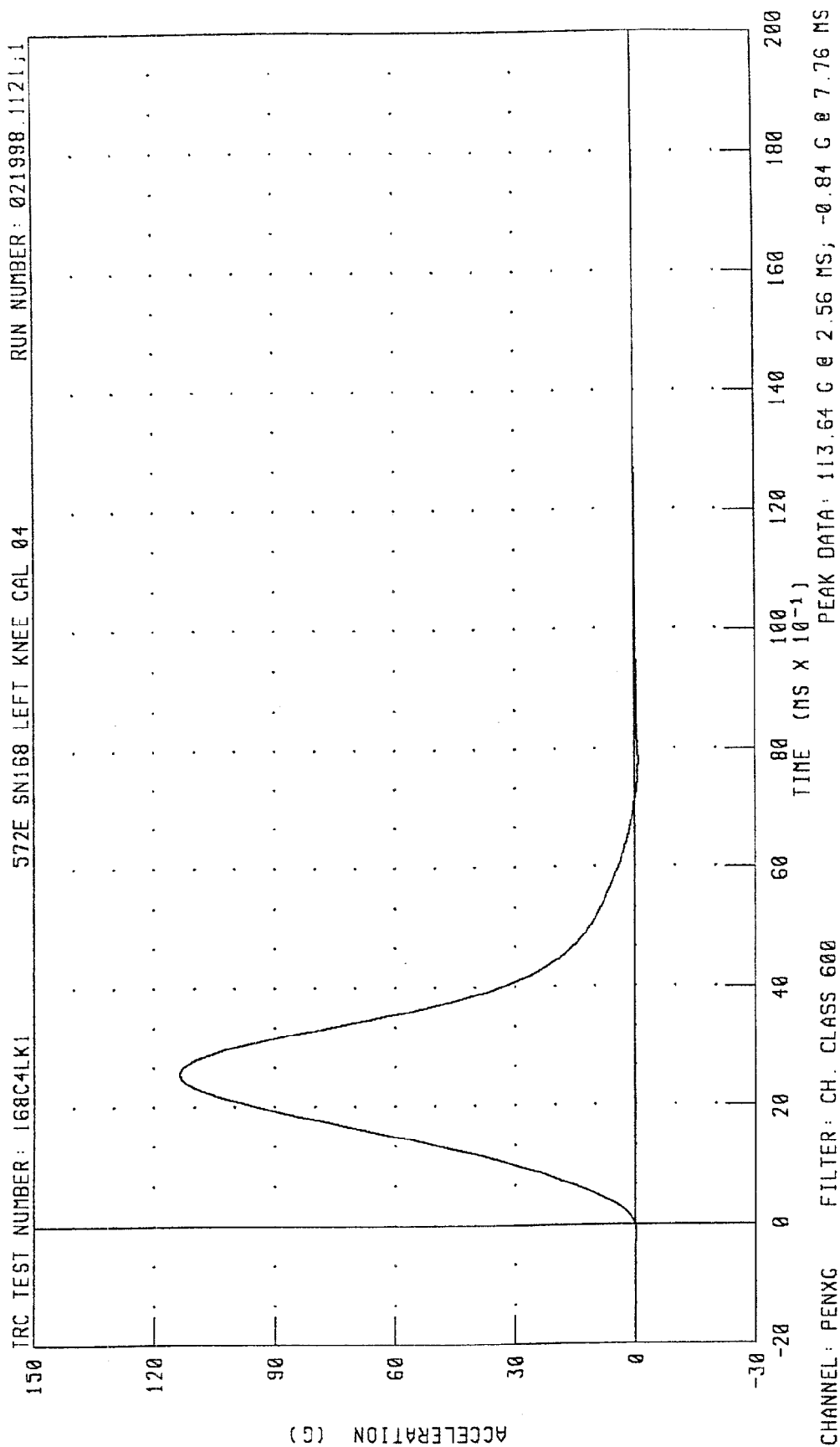
TEST MEETS SPECIFICATIONS

TECHNICIAN

By cult

RUN NUMBER: 021998.1120;1

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



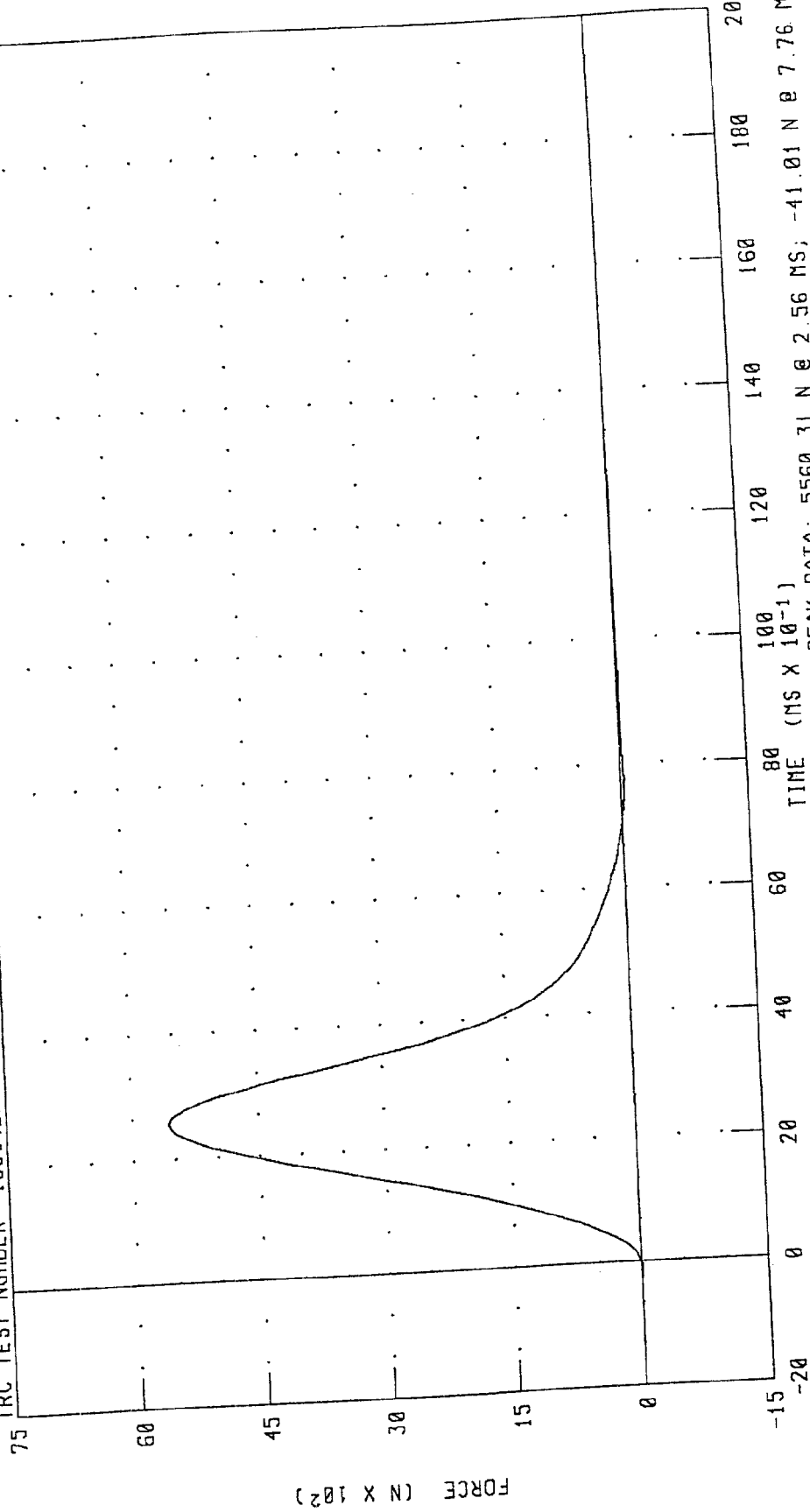
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN168 LEFT KNEE CAL 04

RUN NUMBER: 021998.1121.1

TRC TEST NUMBER: 168C4LK1



PEAK DATA: 5560.31 N @ 2.56 MS; -41.01 N @ 7.76 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III SMALL FEMALE

30-JAN-98

TRC INC.

TEST NO: 289C3HD1

H3 SM FEMALE SN289 HEAD DROP

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PEAK RESULTANT ACCELERATION	240 - 295 G	269.68 G
PEAK LATERAL ACCELERATION	15 G MAX	-6.79 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

Kevin Jenkins

RUN NUMBER: 040298.1050;2

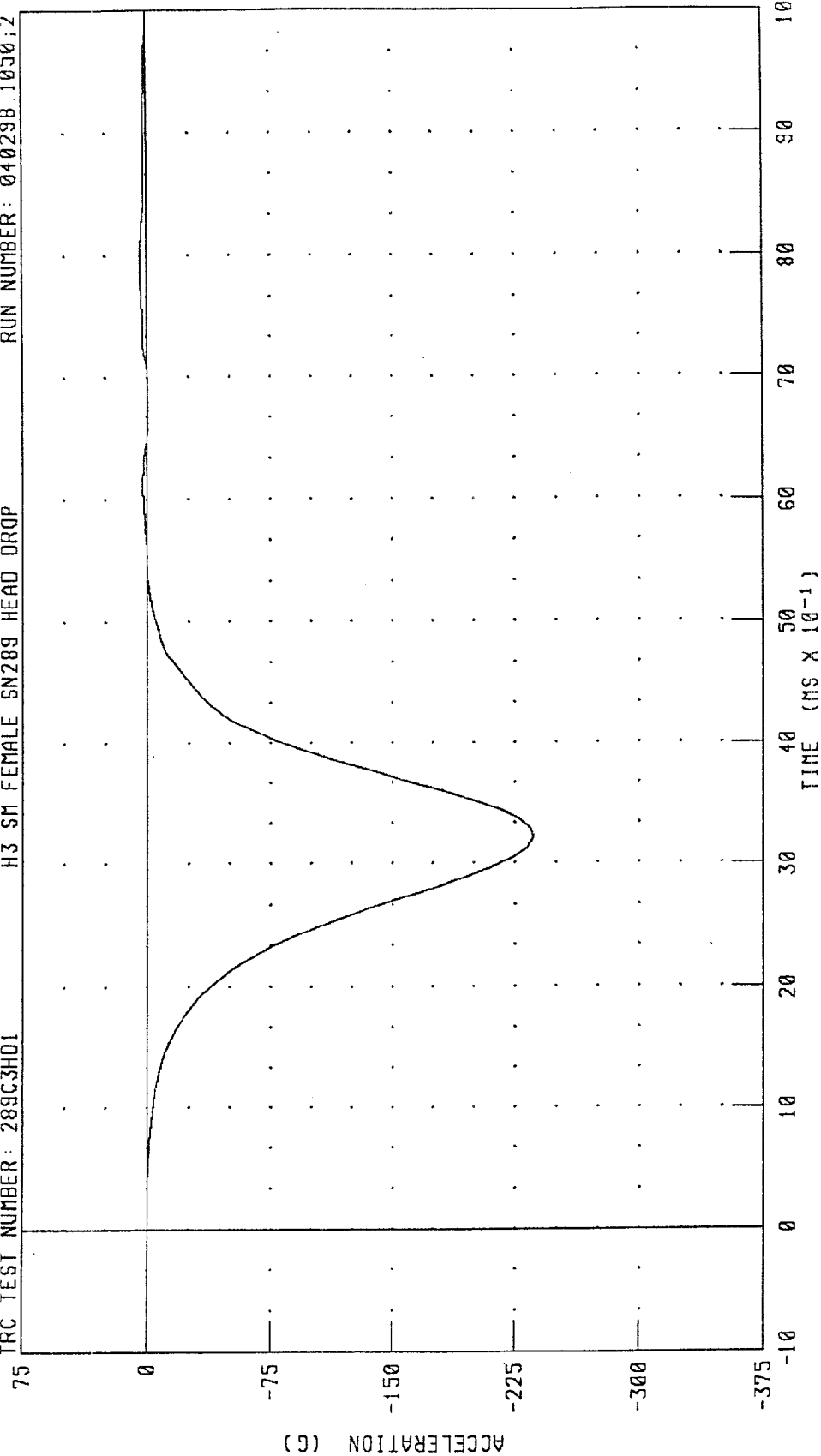
HYBRID III SMALL FEMALE HEAD CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: 289C3HD1

H3 SM FEMALE SN289 HEAD DROP

RUN NUMBER: 040298.1050;2



CHANNEL: HEDXC FILTER: CH. CLASS 1000

PEAK DATA: 3.66 G @ 7.92 MS; -236.35 G @ 3.20 MS

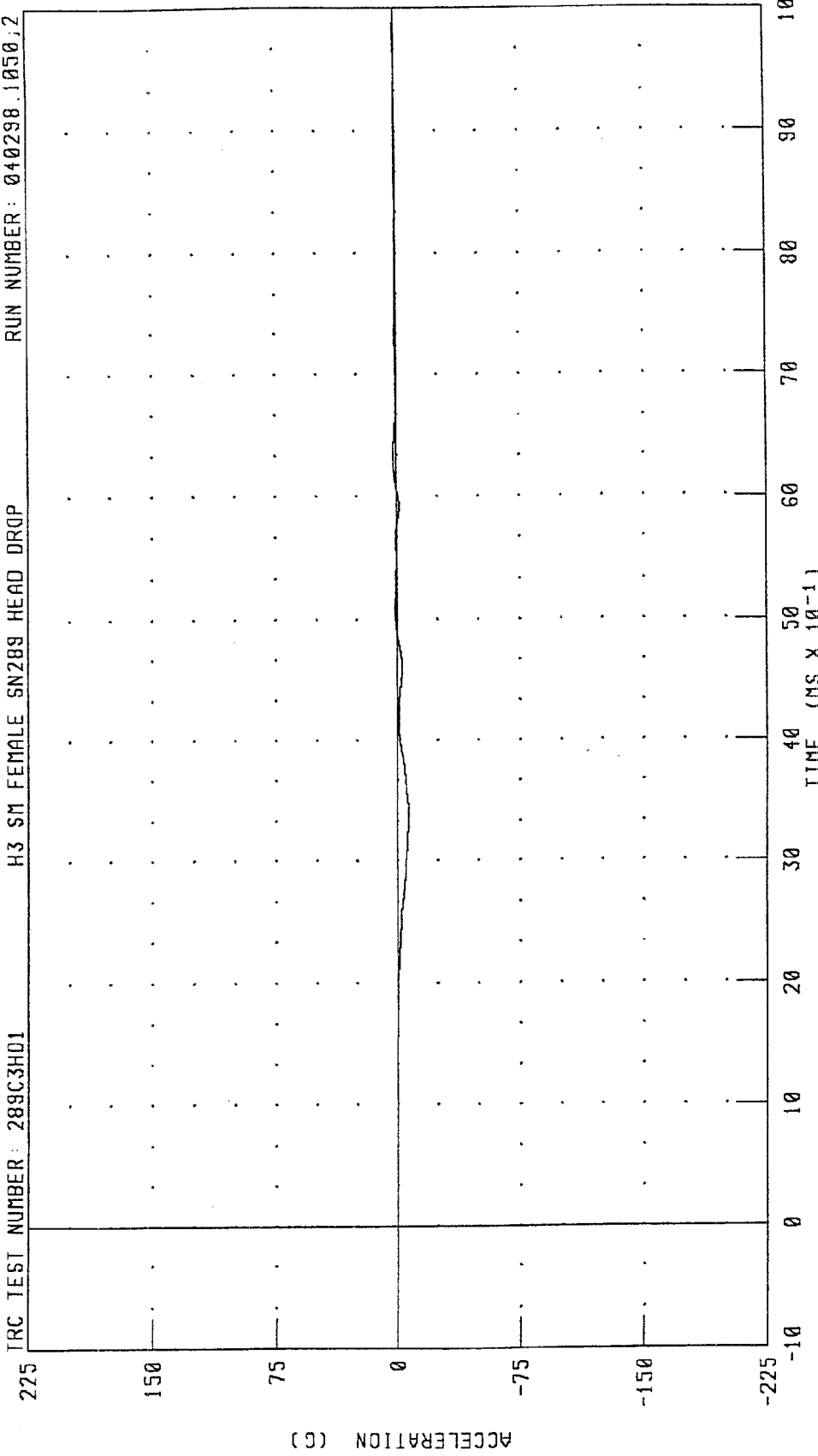
HYBRID III SMALL FEMALE HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

H3 SM FEMALE SN289 HEAD DROP

TRC TEST NUMBER: 289C3H01

RUN NUMBER: 040298.1050;2



PEAK DATA: 1.93 G @ 6.24 MS; -6.79 G @ 3.36 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

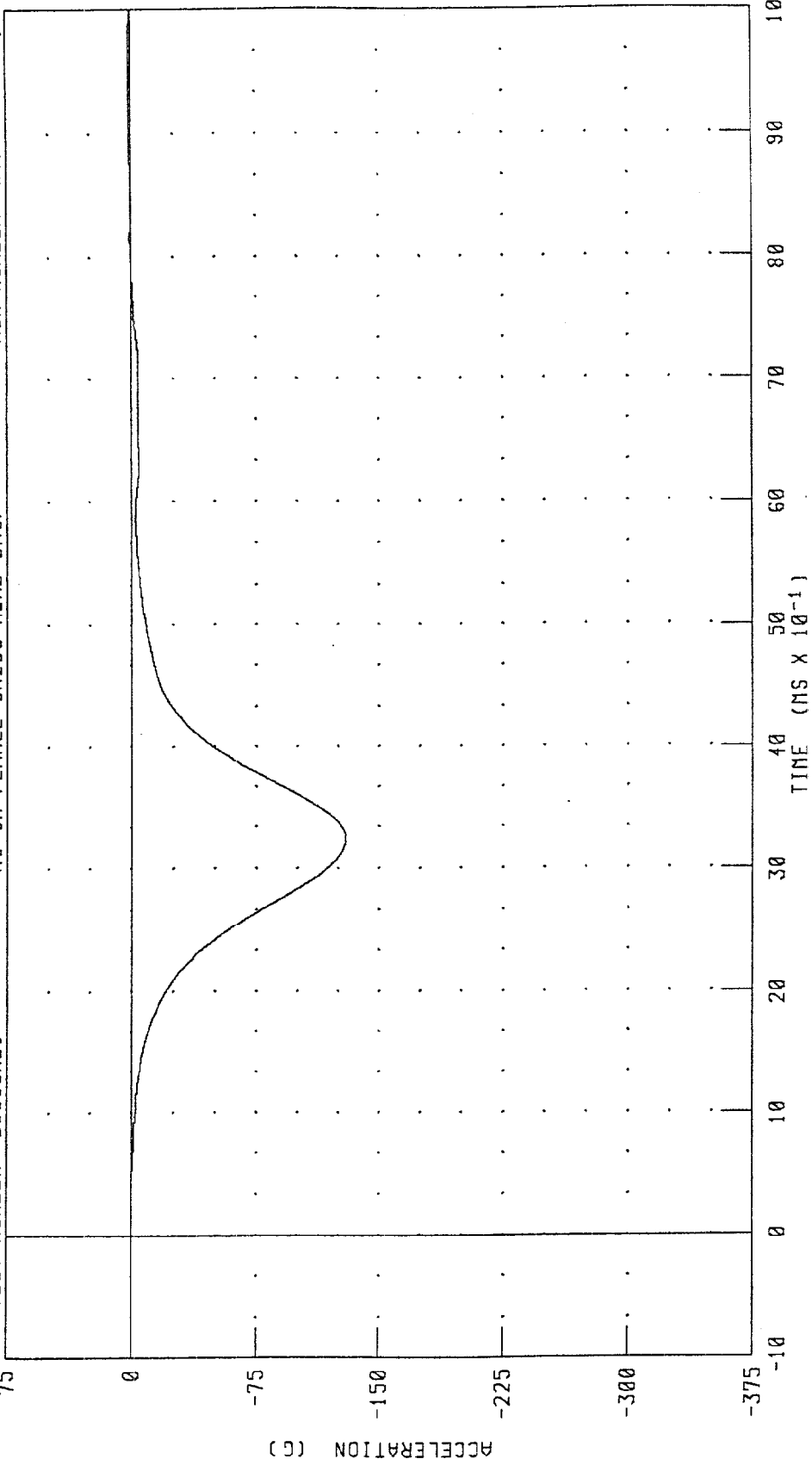
HYBRID III SMALL FEMALE HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

IRC TEST NUMBER: 289C3HD1

H3 SM FEMALE SN289 HEAD DROP

RUN NUMBER: 040298.1050;2



CHANNEL: HEDZG FILTER: CH. CLASS 1000

PEAK DATA: 1.32 G @ 9.44 MS; -129.71 G @ 3.20 MS

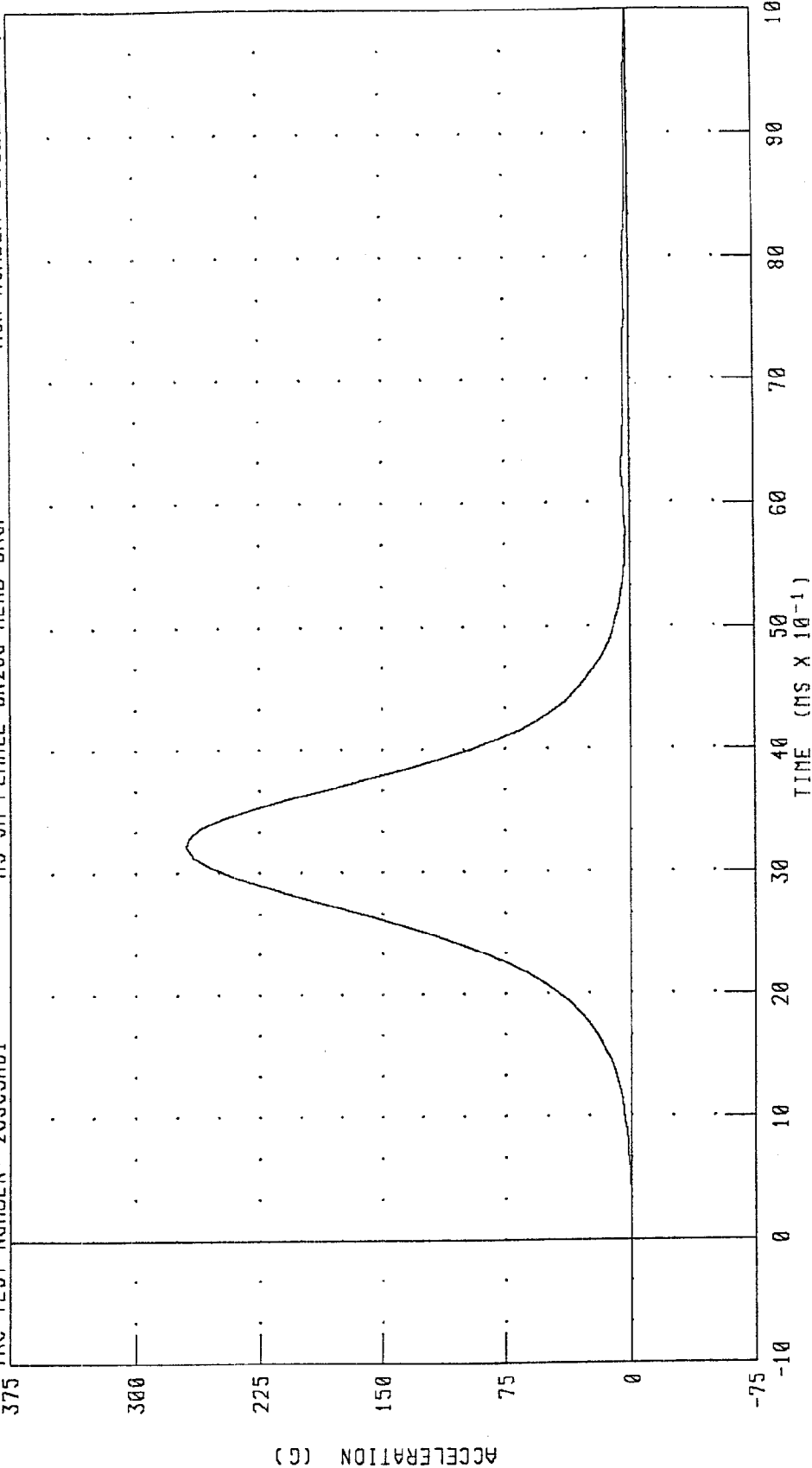
HYBRID III SMALL FEMALE HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

H3 SM FEMALE SN289 HEAD DROP

TRC TEST NUMBER: 289C3H01

RUN NUMBER: 040298.1050,2



CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 269.68 G @ 3.20 MS; 0.14 G @ -0.96 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III SMALL FEMALE

19-FEB-98

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 289C3NF5 H3 SM FEMALE SN289 NECK FLEX.

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
IMPACT VELOCITY	6.89 - 7.13 M/S	7.12 M/S
INTEGRATED PENDULUM VELOCITY	10 MS 2.1 - 2.5 M/S	2.13 M/S
	20 MS 4.0 - 5.0 M/S	4.32 M/S
	30 MS 5.8 - 7.0 M/S	6.42 M/S
PEAK D-PLANE ROTATION	78 - 96 DEG.	89.26 DEG.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO	57 - 69 MS	62.40 MS
PEAK MOMENT ABOUT OCCIPITAL CONDYLE	69 - 84 NM	79.40 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO	41 - 50 MS	40.24 MS *
TIME OF PEAK ROTATION AFTER PEAK MOMENT	2 - 12 MS	6.08 MS

* TEST DOES NOT MEET SPECIFICATIONS

TECHNICIAN

By Calt

RUN NUMBER: 040298.1059;3

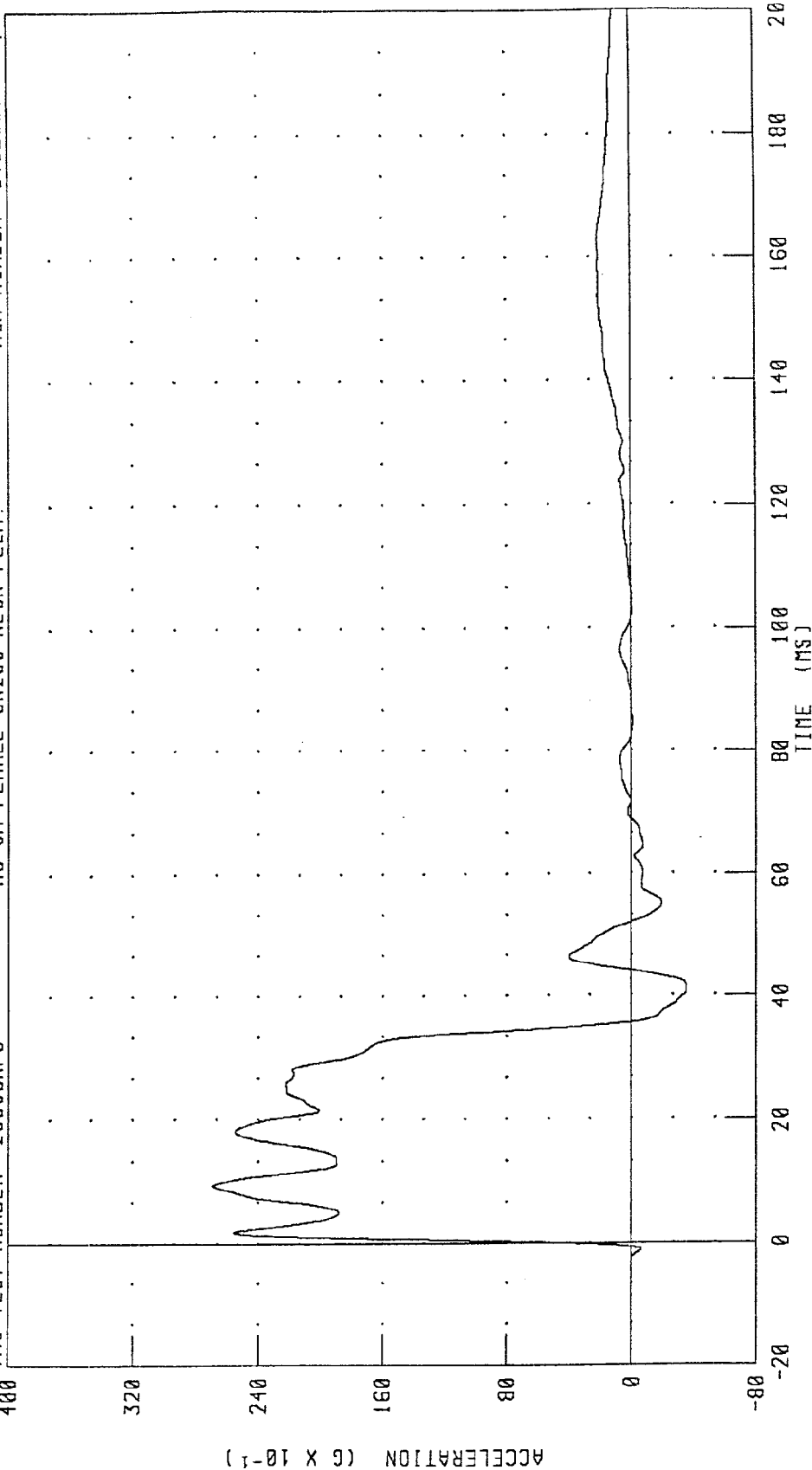
HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 289C3NF5

H3 SM FEMALE SN289 NECK FLEX.

RUN NUMBER: 040298.1124.3



CHANNEL: PENXC FILTER: CH. CLASS 180

PEAK DATA: 26.89 G @ 9.28 MS; -3.51 G @ 40.72 MS

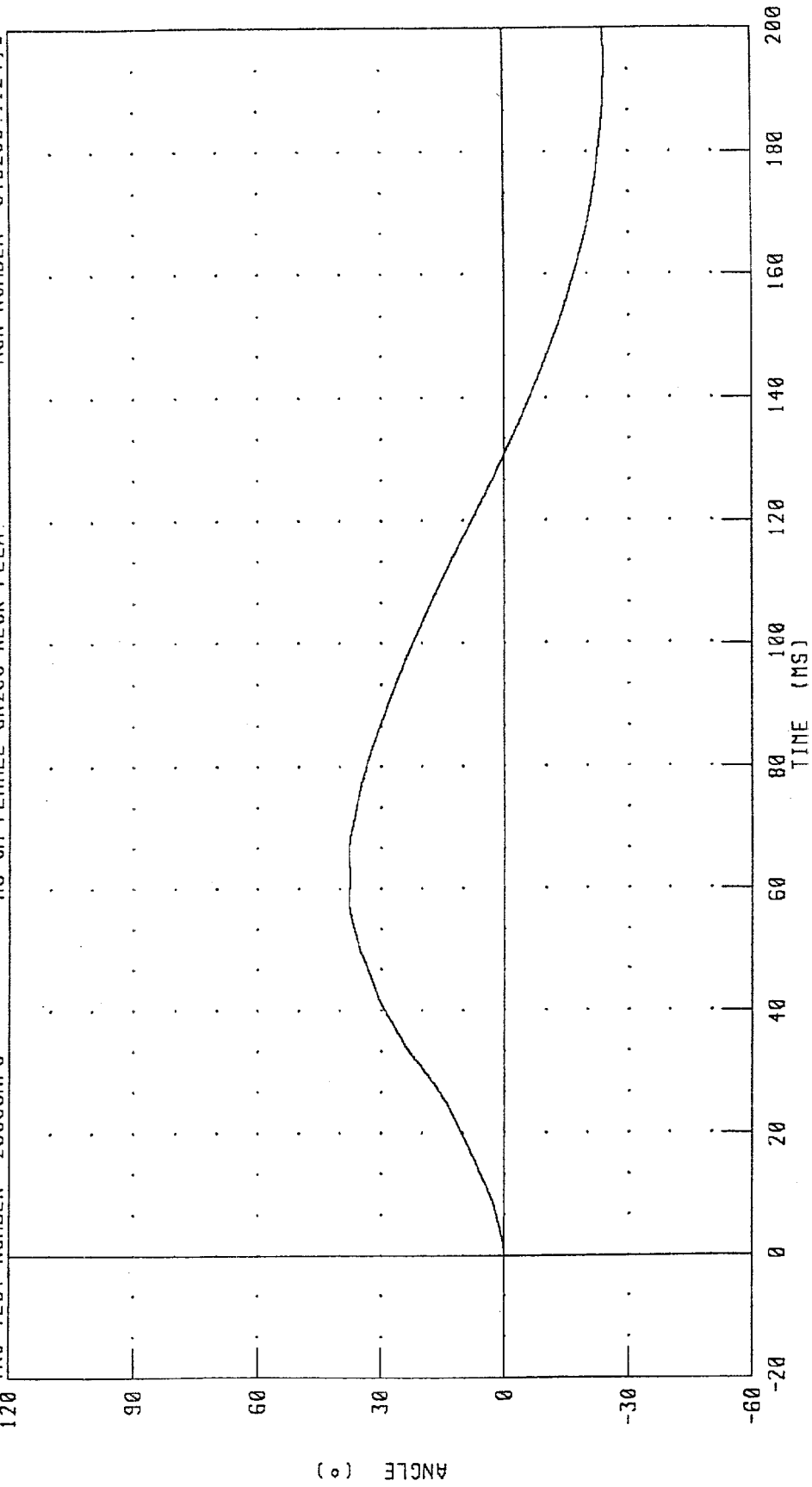
HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

H3 SM FEMALE SN289 NECK FLEX.

TRC TEST NUMBER: 289C3NF5

RUN NUMBER: 040298.1124,3



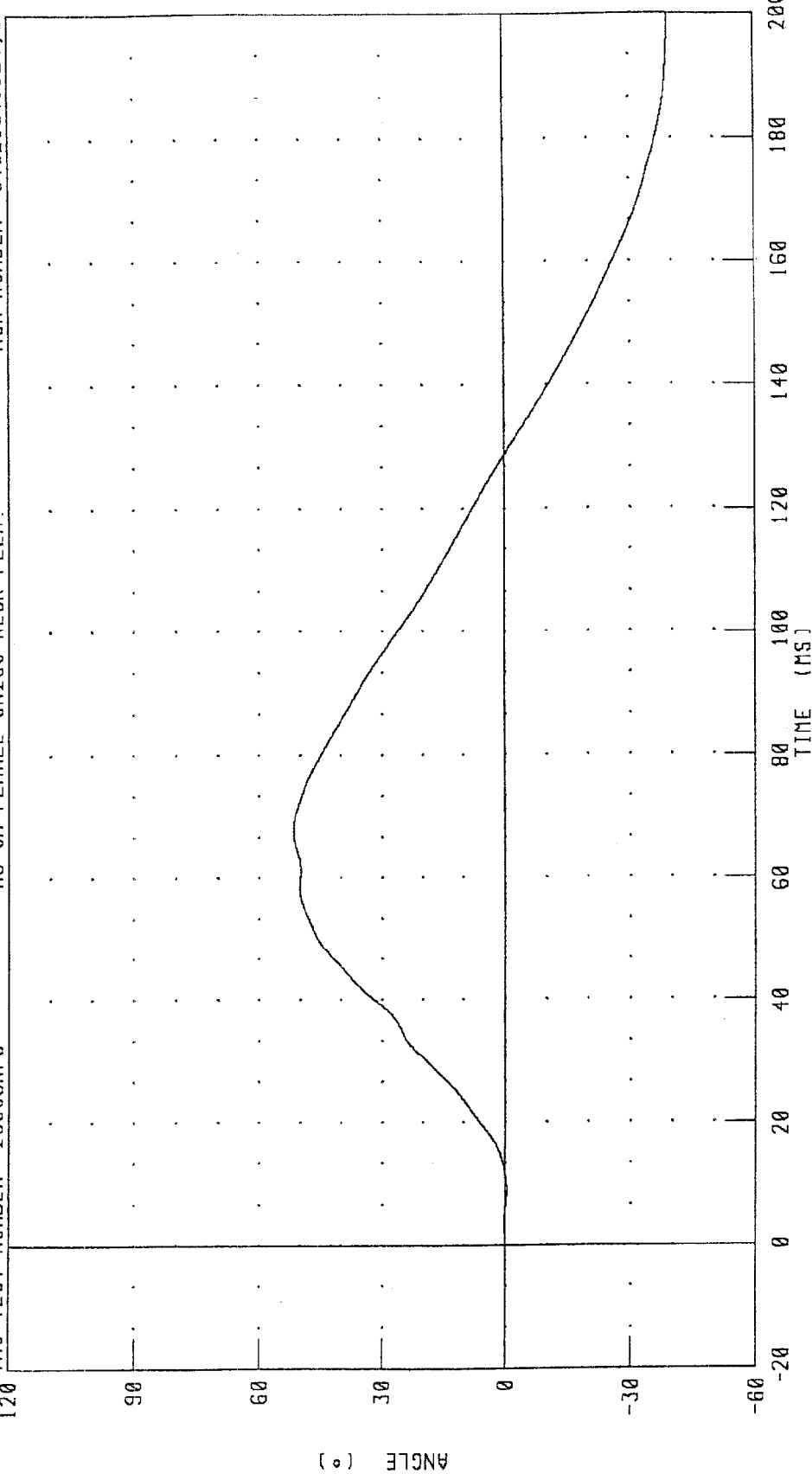
PEAK DATA: 37.64 ° @ 65.92 MS; -24.24 ° @ 194.72 MS

FILTER: CH. CLASS 60

CHANNEL: BETA

HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

IRC TEST NUMBER: 289C3NF5 H3 SM FEMALE SN289 NECK FLEX. RUN NUMBER: 040290.1124,3



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 51.73 ° @ 67.92 MS, -39.23 ° @ 197.76 MS

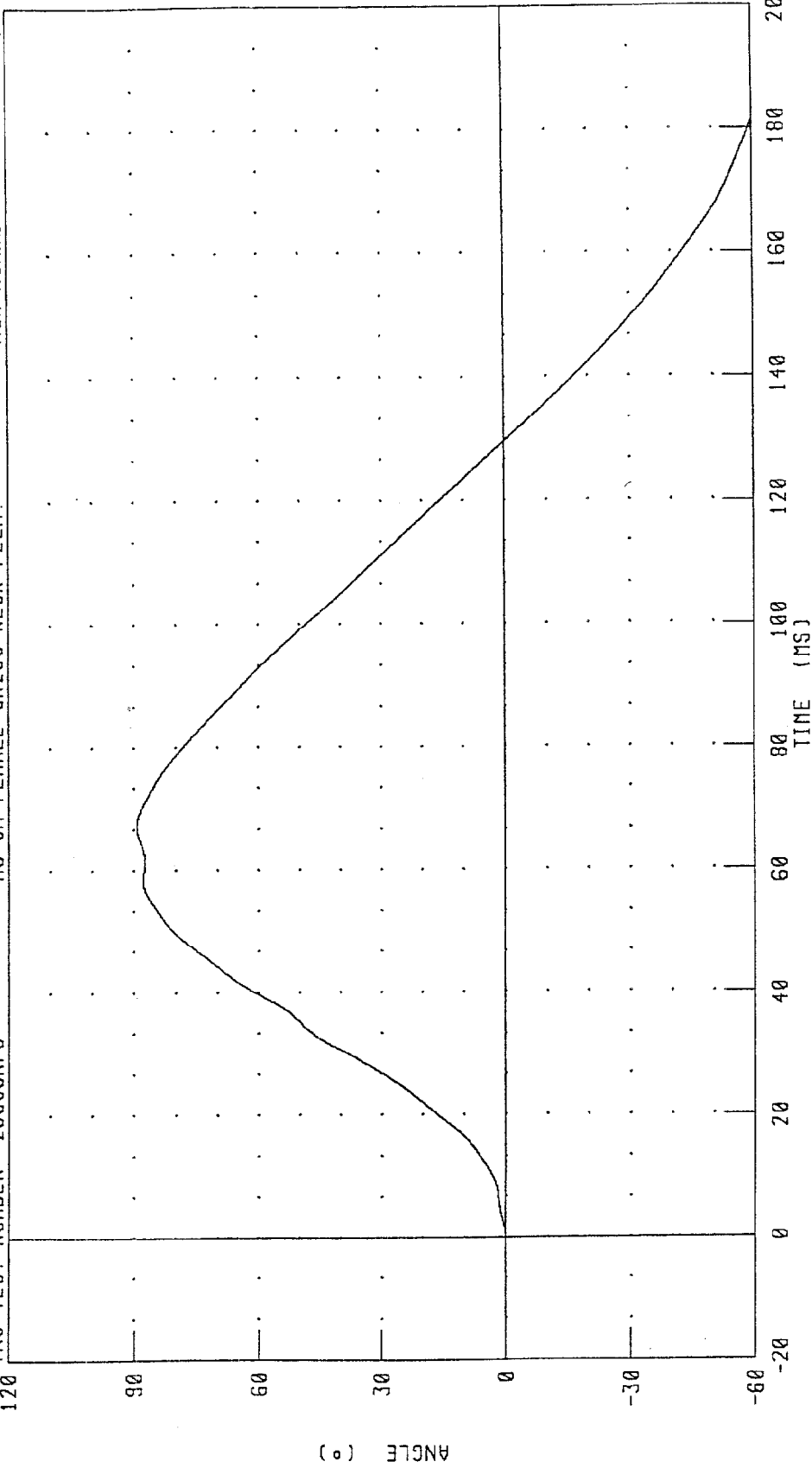
HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 289C3NF5

H3 SM FEMALE SN289 NECK FLEX.

RUN NUMBER: 040298.1124;3



PEAK DATA: 89.26 ° @ 67.28 MS; -63.44 ° @ 196.40 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 289C3NF5

H3 SM FEMALE SN289 NECK FLEX.

RUN NUMBER: 040298.11124.3

160

120

80

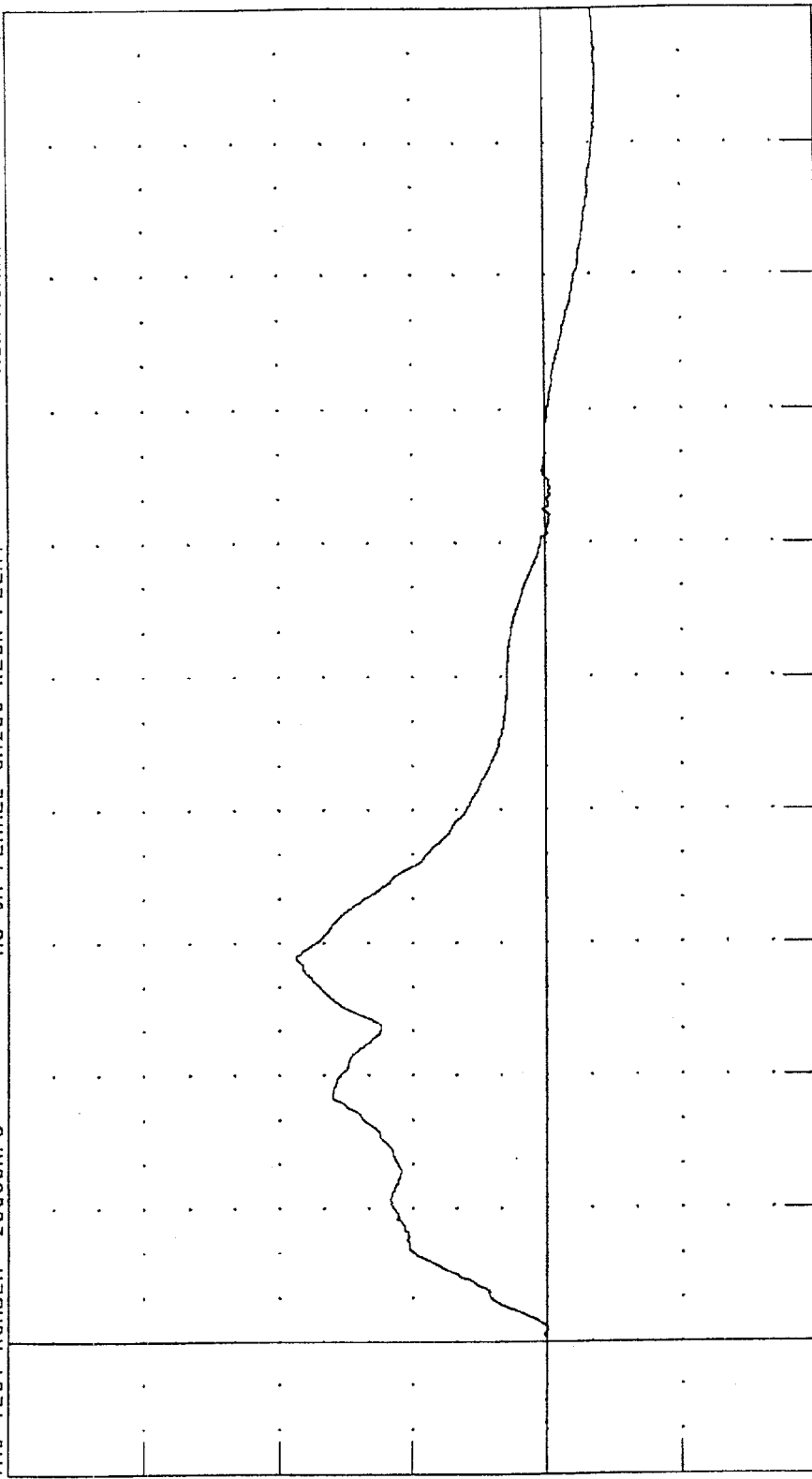
40

0

-40

-80

FORCE (N X 10¹)

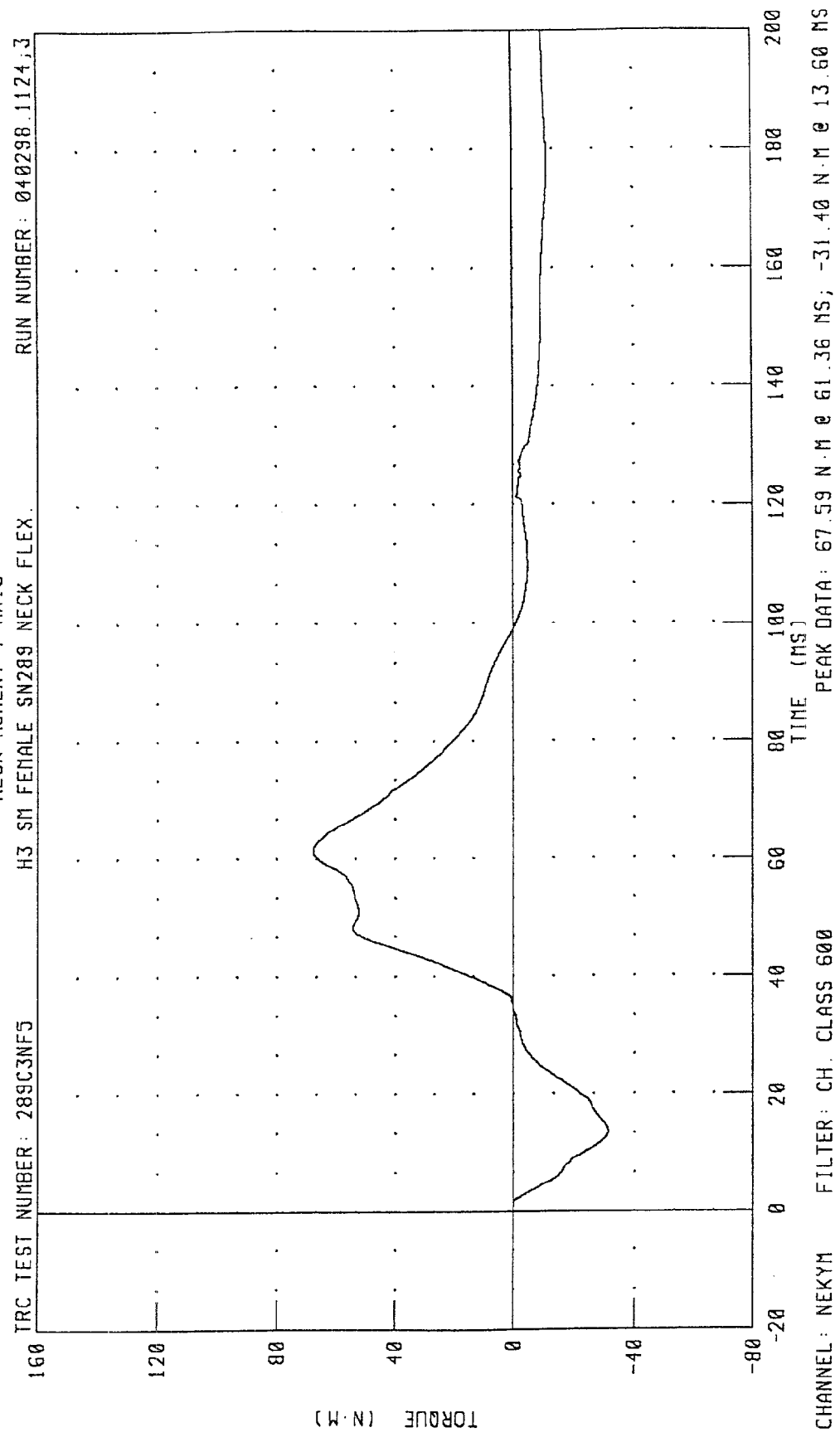


TIME (MS)

PEAK DATA: 749.92 N @ 57.92 MS; -155.85 N @ 188.72 MS

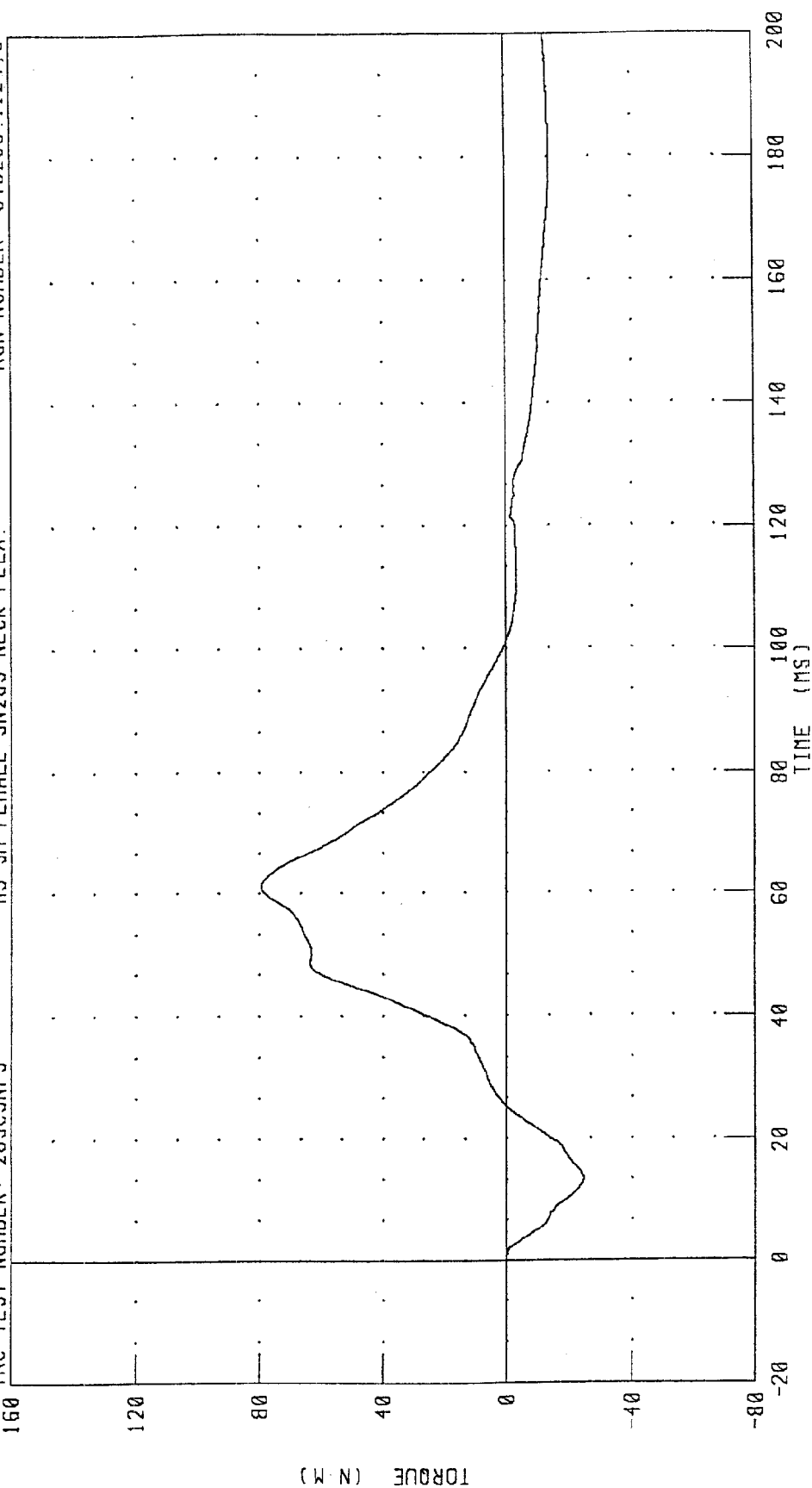
CHANNEL: NEKXF FILTER: CH. CLASS 1000

HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS



HYBRID III SMALL FEMALE NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 289C3NF5 H3 SM FEMALE SN289 NECK FLEX. RUN NUMBER: 040298.1124.3



CHANNEL: NEKOM FILTER: CH. CLASS 600 PEAK DATA: 79.40 N-M @ 61.20 MS; -24.34 N-M @ 13.60 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III SMALL FEMALE

19-FEB-98

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 289C3NE2 H3 SM FEMALE SN289 NECK EXT.

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	58.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
INTEGRATED PENDULUM VELOCITY	10 MS	1.5 - 1.9 M/S	1.61 M/S
	20 MS	3.1 - 3.9 M/S	3.30 M/S
	30 MS	4.6 - 5.6 M/S	4.96 M/S
PEAK D-PLANE ROTATION		97 - 119 DEG.	106.38 DEG.
ROTATION ANGLE DECAY AT THE 10 NM MOMENT LEVEL		80 - 96 DEG.	81.07 DEG.
PEAK MOMENT ABOUT OCCIPITAL CONDYLE		54 - 67 NM	-63.89 NM
NEGATIVE MOMENT DECAY TIME FROM PEAK TO 10 NM LEVEL		28 - 38 MS	34.24 MS
TIME OF PEAK ROTATION AFTER PEAK MOMENT		0 - 10 MS	2.40 MS

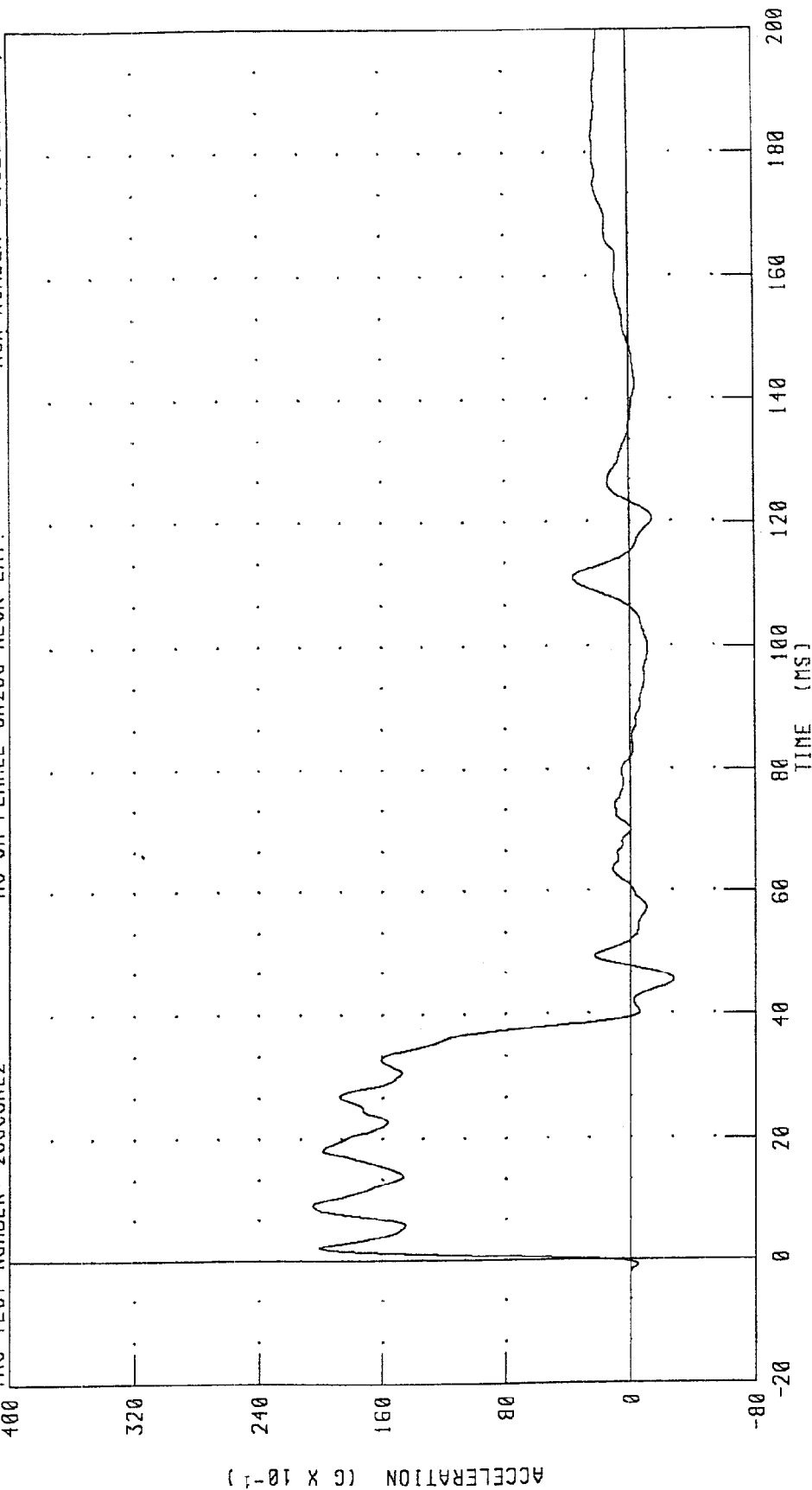
TEST MEETS SPECIFICATIONS

TECHNICIAN Kevin Watkins

RUN NUMBER: 040298.1055;3

HYBRID III SMALL FEMALE NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 289C3NE2 H3 SM FEMALE SN289 NECK EXT. RUN NUMBER: 040298.1056;3



CHANNEL: PENXG FILTER: CH. CLASS 180

PEAK DATA: 20.51 G @ 8.96 MS; -2.75 G @ 45.52 MS

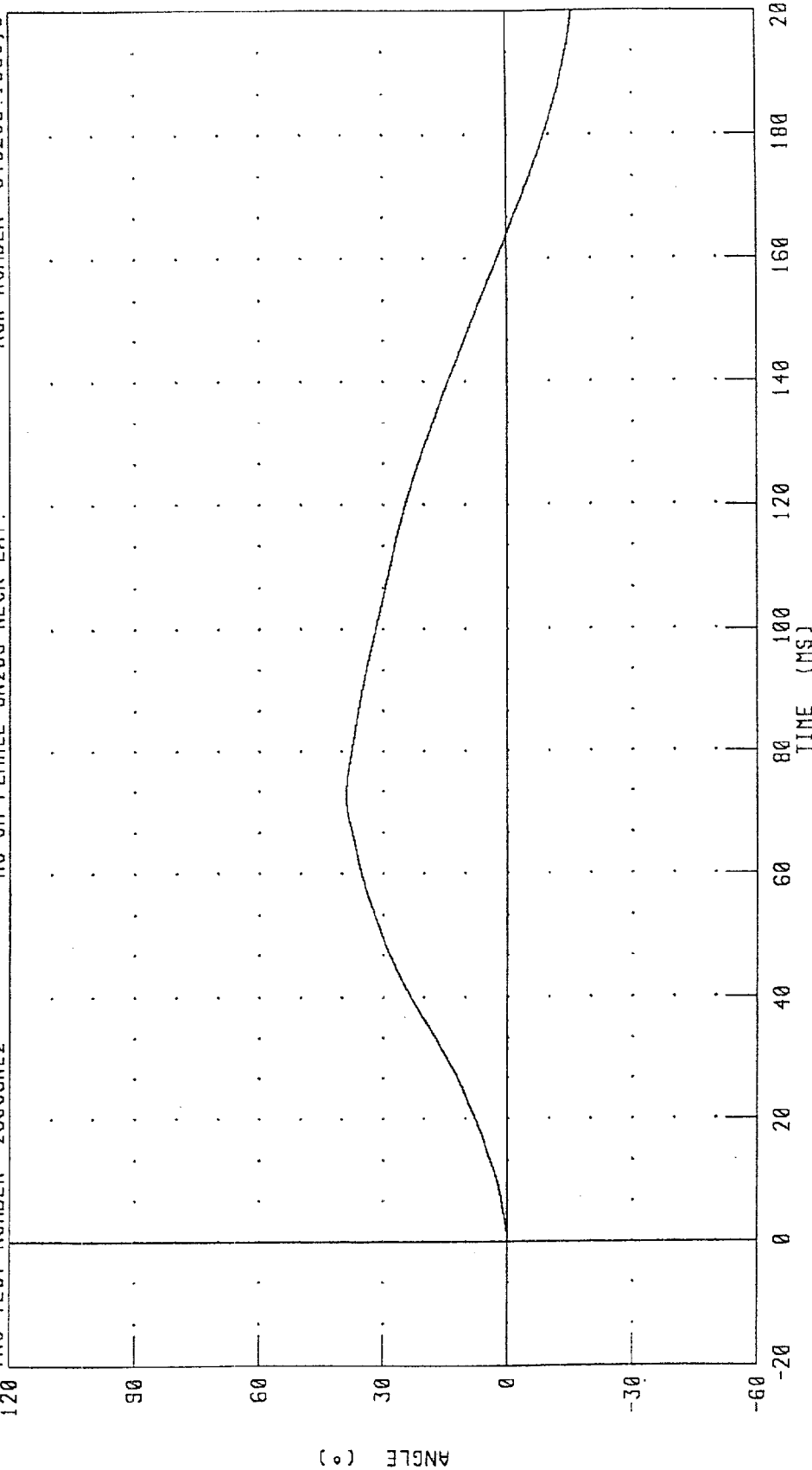
HYBRID III SMALL FEMALE NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 289C3NE2

H3 SM FEMALE SN289 NECK EXT.

RUN NUMBER: 040298.1056;3

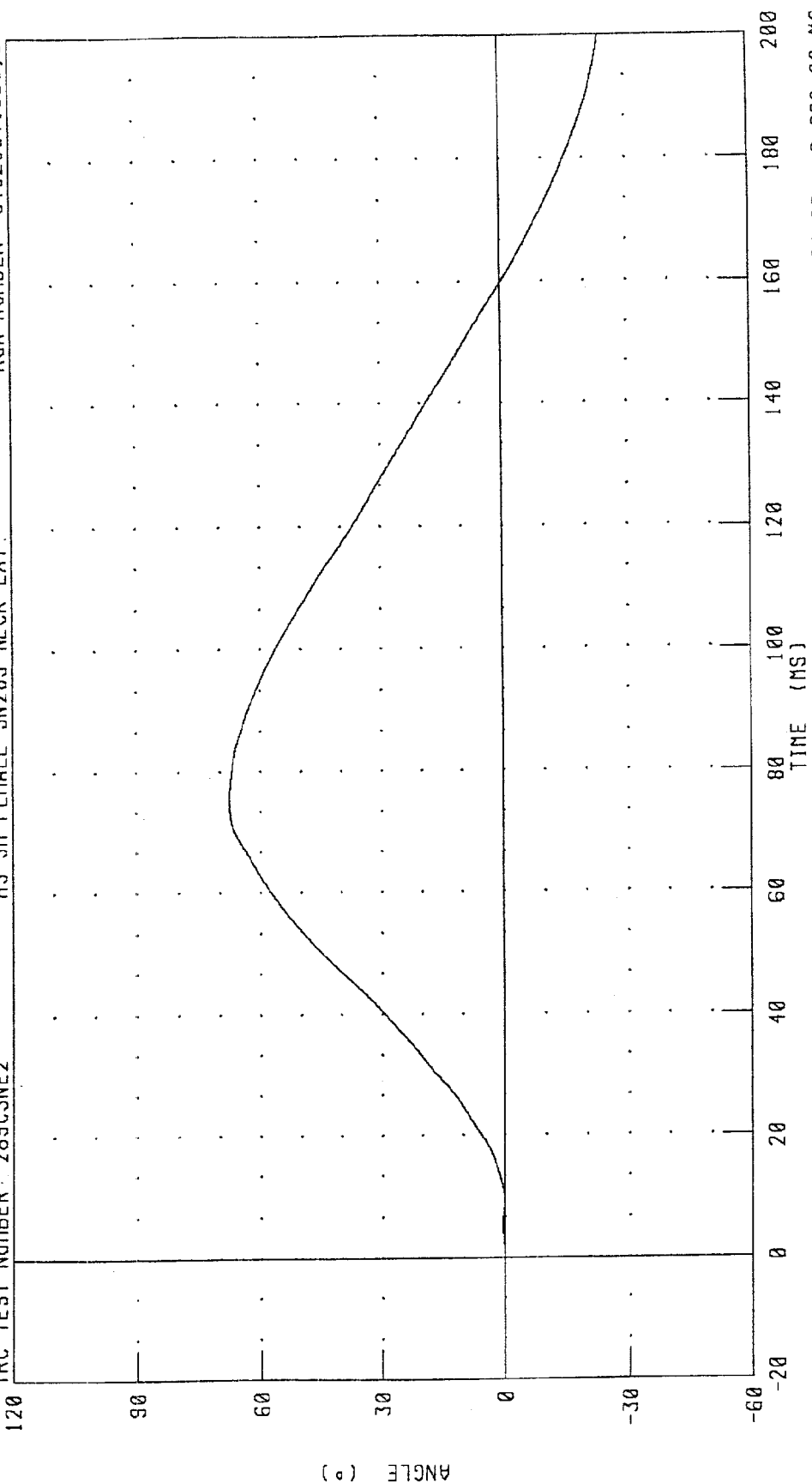


PEAK DATA: 38.88 ° @ 72.64 MS; -15.86 ° @ 200.00 MS

CHANNEL: BETA FILTER: CH. CLASS 60

HYBRID III SMALL FEMALE NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 289C3NE2 H3 SM FEMALE SN289 NECK EXT RUN NUMBER: 040298.1056;3



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 67.61 ° @ 75.20 MS; -24.06 ° @ 200.00 MS

HYBRID III SMALL FEMALE NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 289C3NE2

H3 SM FEMALE SN289 NECK EXT.

RUN NUMBER: 040298.1056;3

120

90

60

30

0

-30

-60

ANGLE (°)

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

0

20

40

60

80

100

120

140

160

180

200

TIME (MS)

PEAK DATA: 106.38 ° @ 73.92 MS; -39.92 ° @ 200.00 MS

CHANNEL: TOTAL

FILTER: CH. CLASS 60

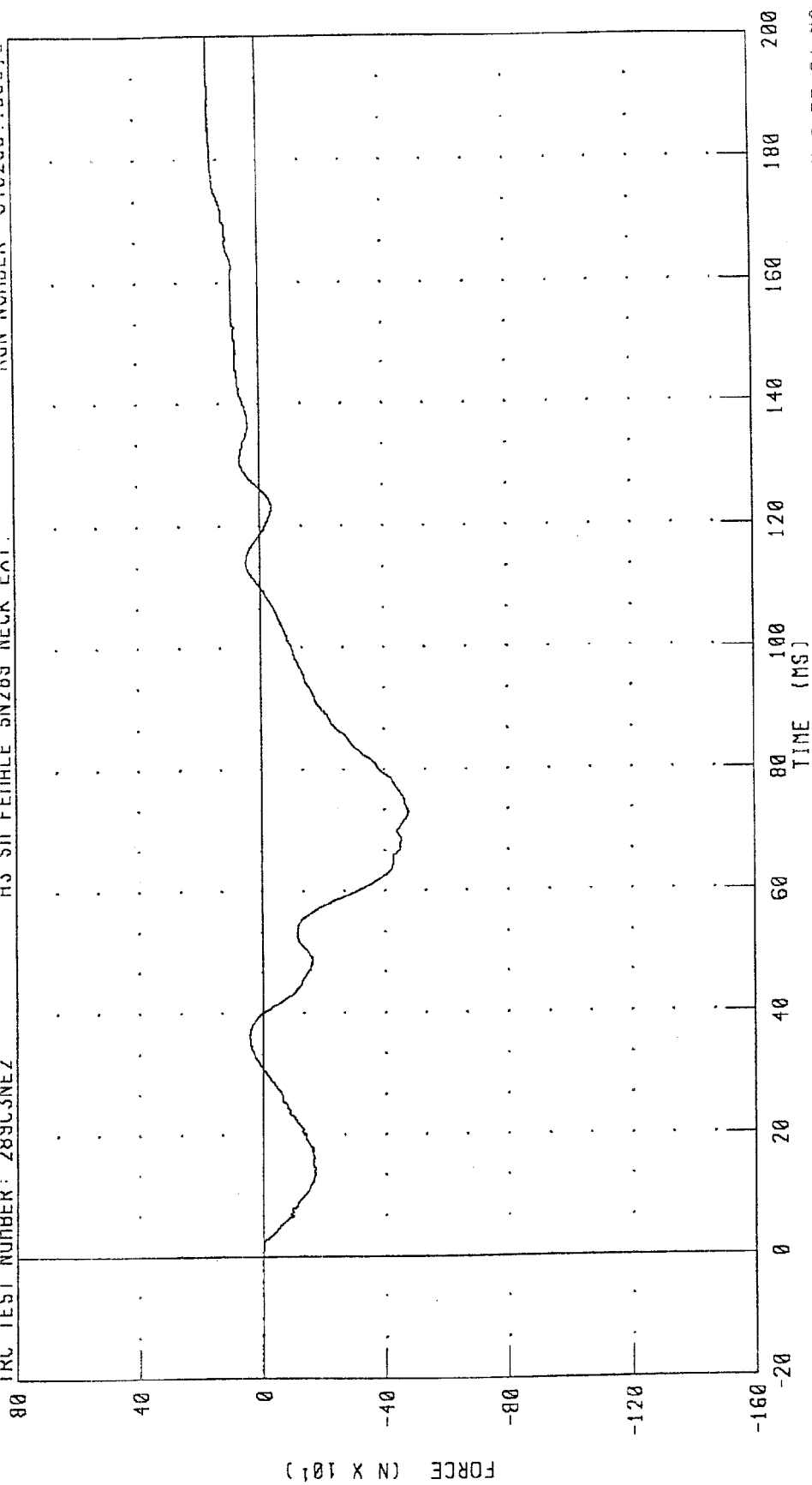
0

20

HYBRID III SMALL FEMALE NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

IRC TEST NUMBER: 289C3NE2 H3 SM FEMALE SN289 NECK EXT. RUN NUMBER: 040298.105613



PEAK DATA: 160.73 N @ 195.28 MS; -480.90 N @ 73.04 MS

CHANNEL: NEKXF FILTER: CH. CLASS 1000

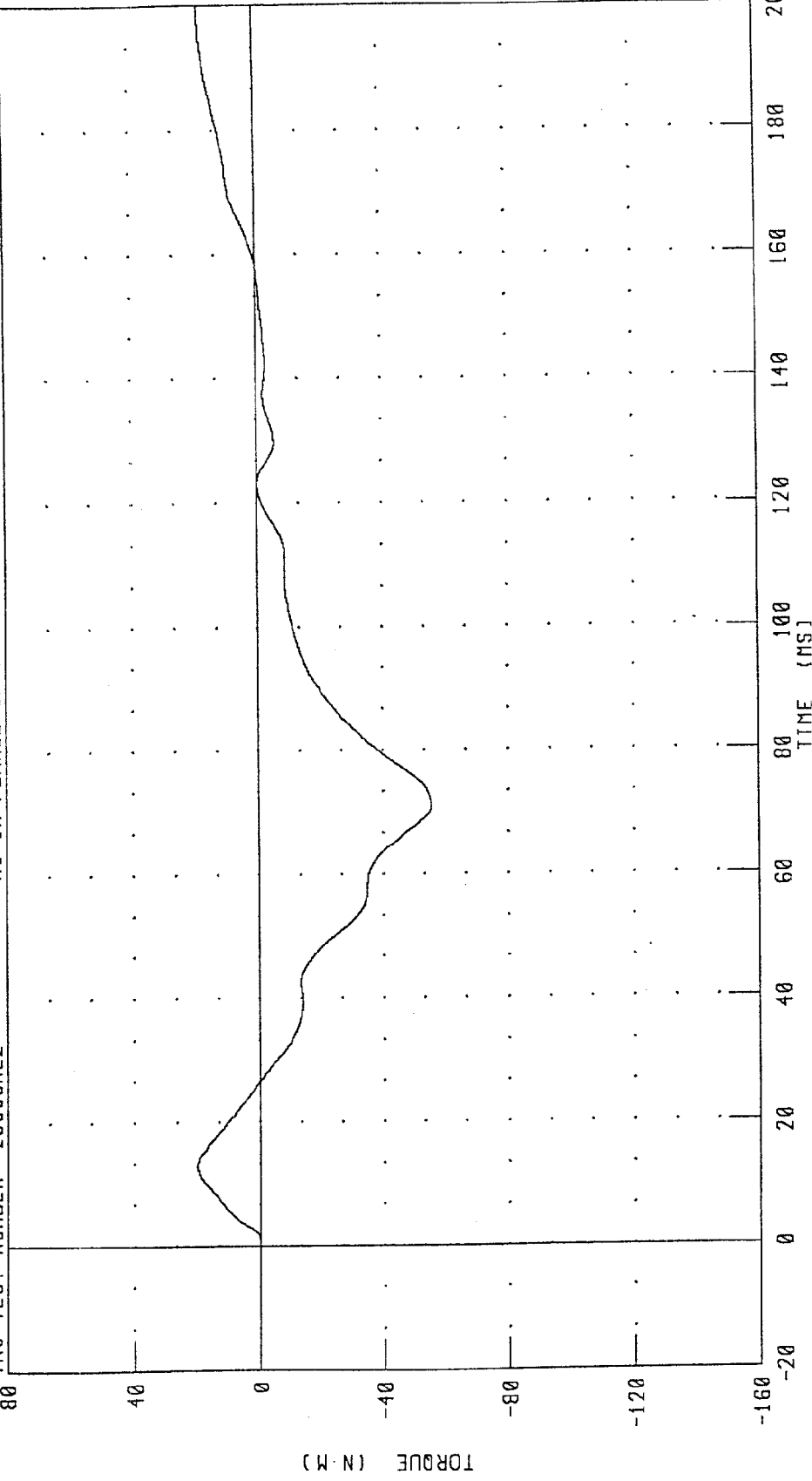
HYBRID, III SMALL FEMALE NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 289C3NE2

H3 SM FEMALE SN289 NECK EXT.

RUN NUMBER: 040298.1056;3



PEAK DATA: 20.15 N·M @ 12.88 MS; -55.66 N·M @ 71.36 MS

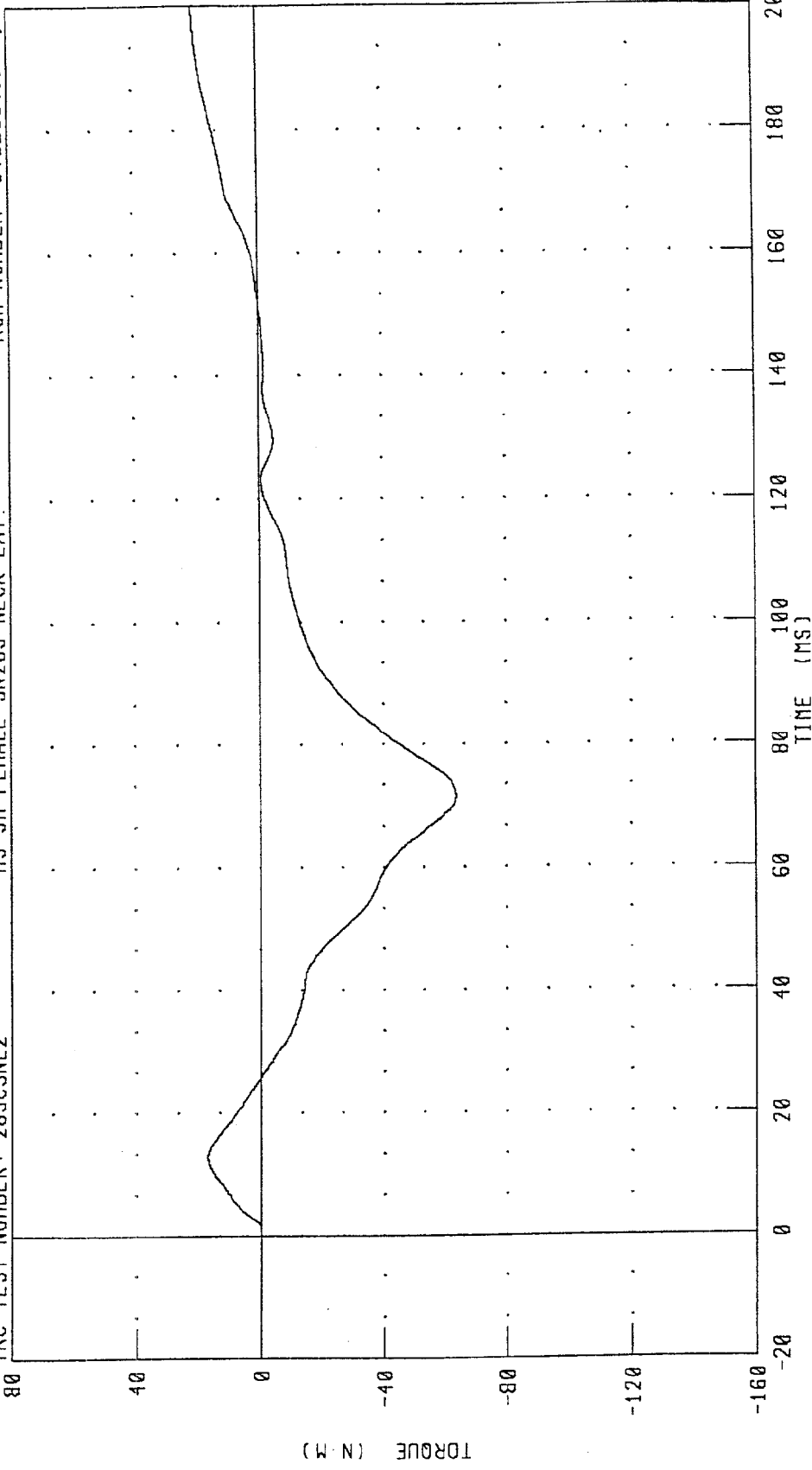
CHANNEL: NEKYM FILTER: CH. CLASS 600

HYBRID III SMALL FEMALE NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 289C3NE2

H3 SM FEMALE SN289 NECK EXT.

RUN NUMBER: 040298.1056;3



CHANNEL: NEKOM

FILTER: CH. CLASS 600

PEAK DATA: 20.59 N-M @ 199.76 MS; -63.89 N-M @ 71.52 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III SMALL FEMALE

13-FEB-98

TRC INC.

TEST NO: 289C3TH2

H3 SM FEMALE SN289 H.S.THORAX

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	52.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.83 M/S
MAXIMUM DEFLECTION	51 - 58 MM	53.0 MM
MAXIMUM RESISTIVE FORCE	3800 - 4300 N	4348. N 3977 *
INTERNAL HYSTERESIS	69% - 85%	75.4%

* TEST DOES NOT MEET SPECIFICATIONS

TECHNICIAN Kevin W. Jenkins

RUN NUMBER: 040298.1059;2

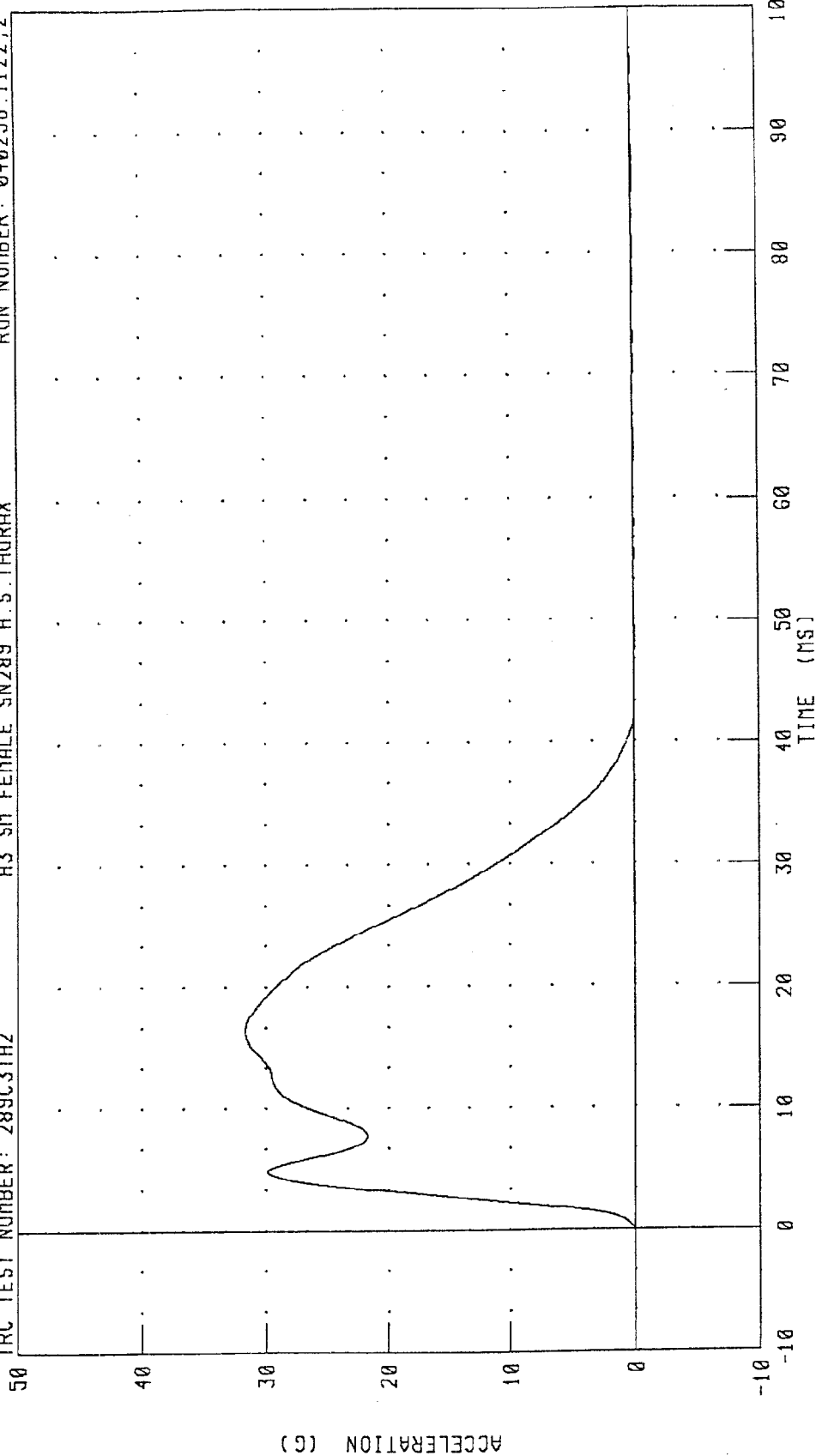
HYBRID III SMALL FEMALE THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 289C3TH2

H3 SM FEMALE SN289 H.S.THORAX

RUN NUMBER: 040298.1122.2



PEAK DATA: 31.69 G @ 16.40 MS; -0.07 G @ 80.32 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

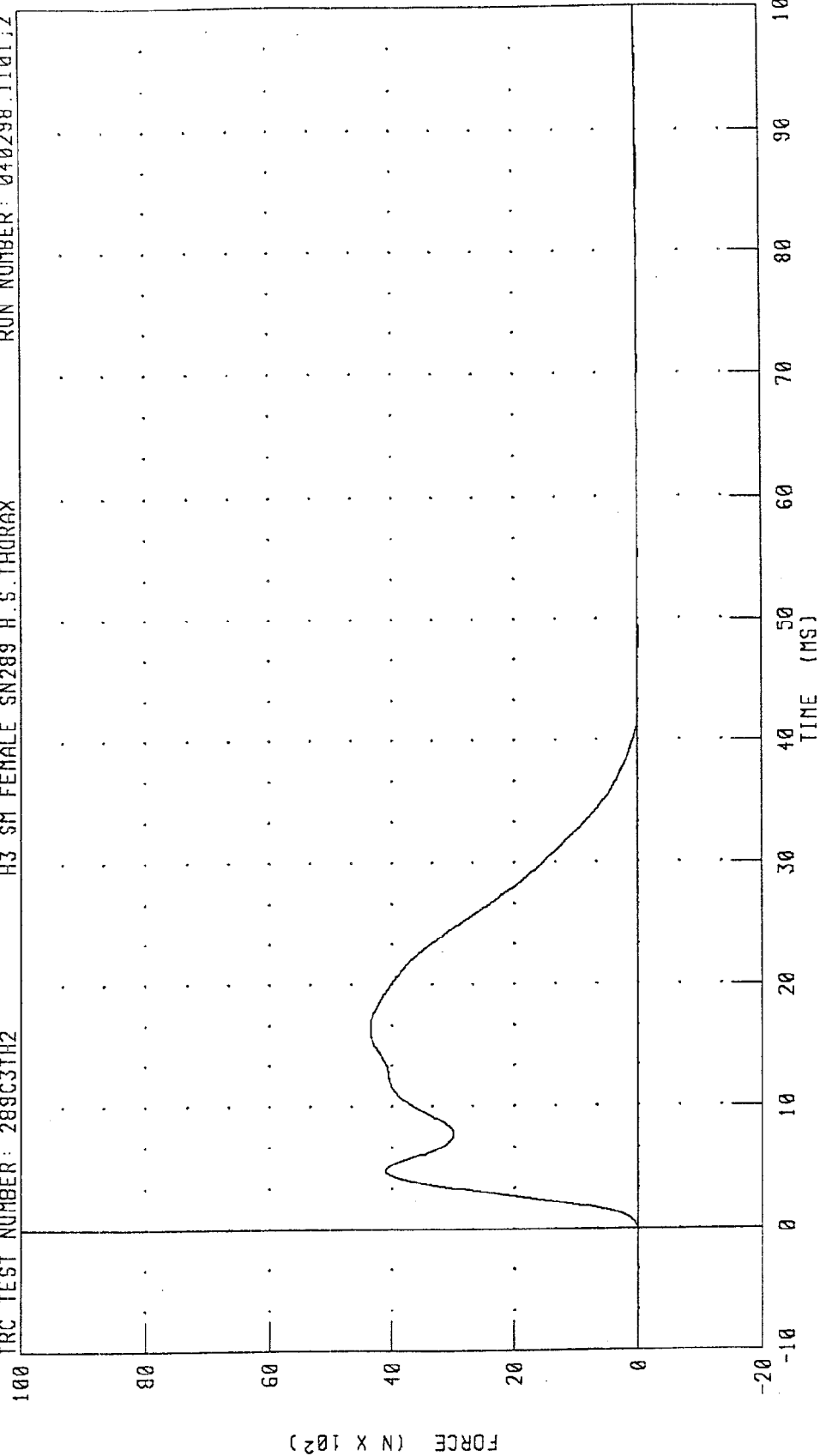
HYBRID III SMALL FEMALE THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 289C3IH2

H3 SM FEMALE SN289 H.S.THORAX

RUN NUMBER: 040298.1101.2



CHANNEL: PENXF FILTER: CH. CLASS 180

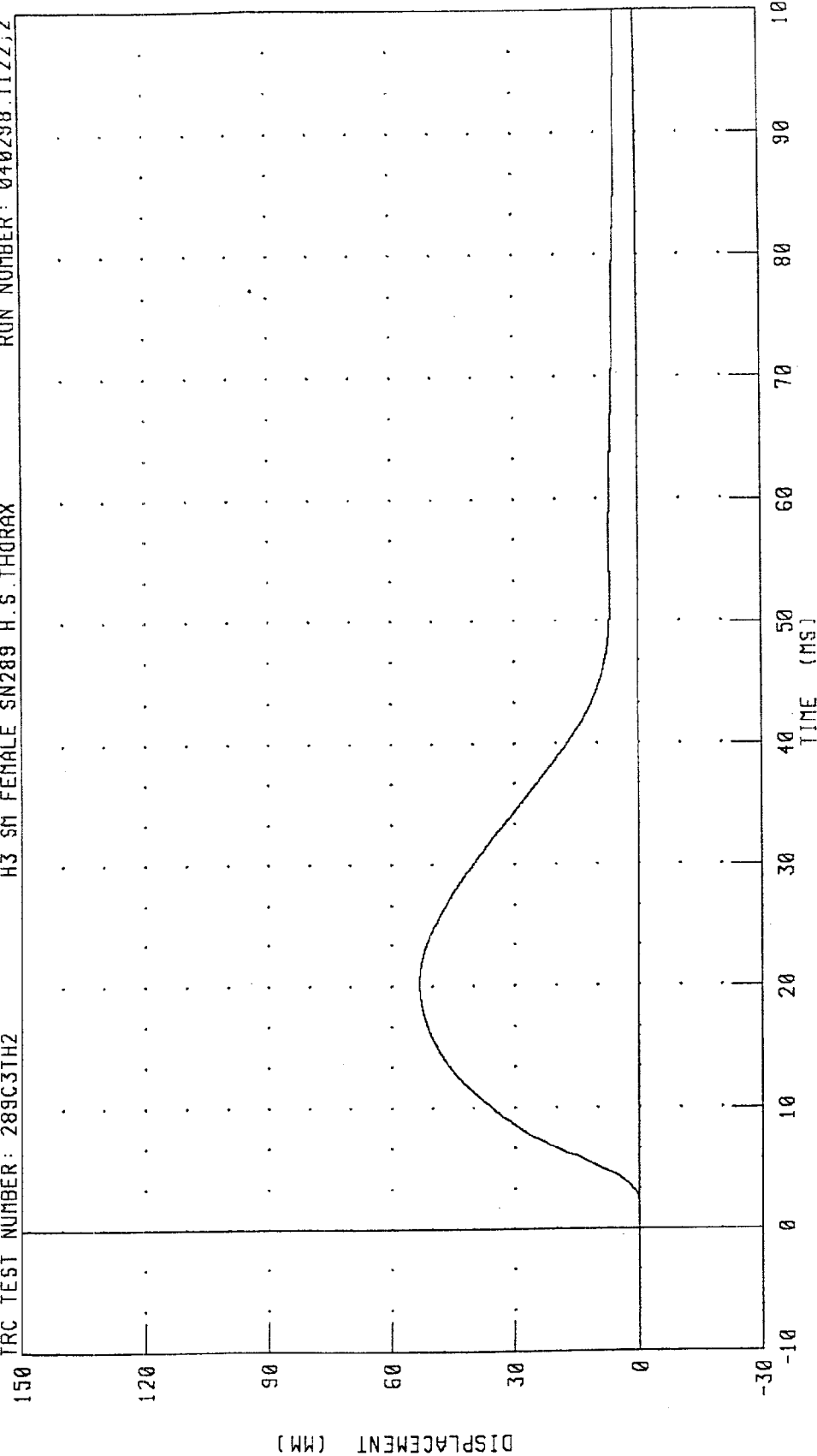
PEAK DATA: 4348.28 N @ 16.40 MS; -10.07 N @ 80.32 MS

HYBRID III SMALL FEMALE THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 289C3TH2

H3 SM FEMALE SN289 H.S.THORAX

RUN NUMBER: 040298.1122;2



CHANNEL: CSTXD FILTER: CH. CLASS 180

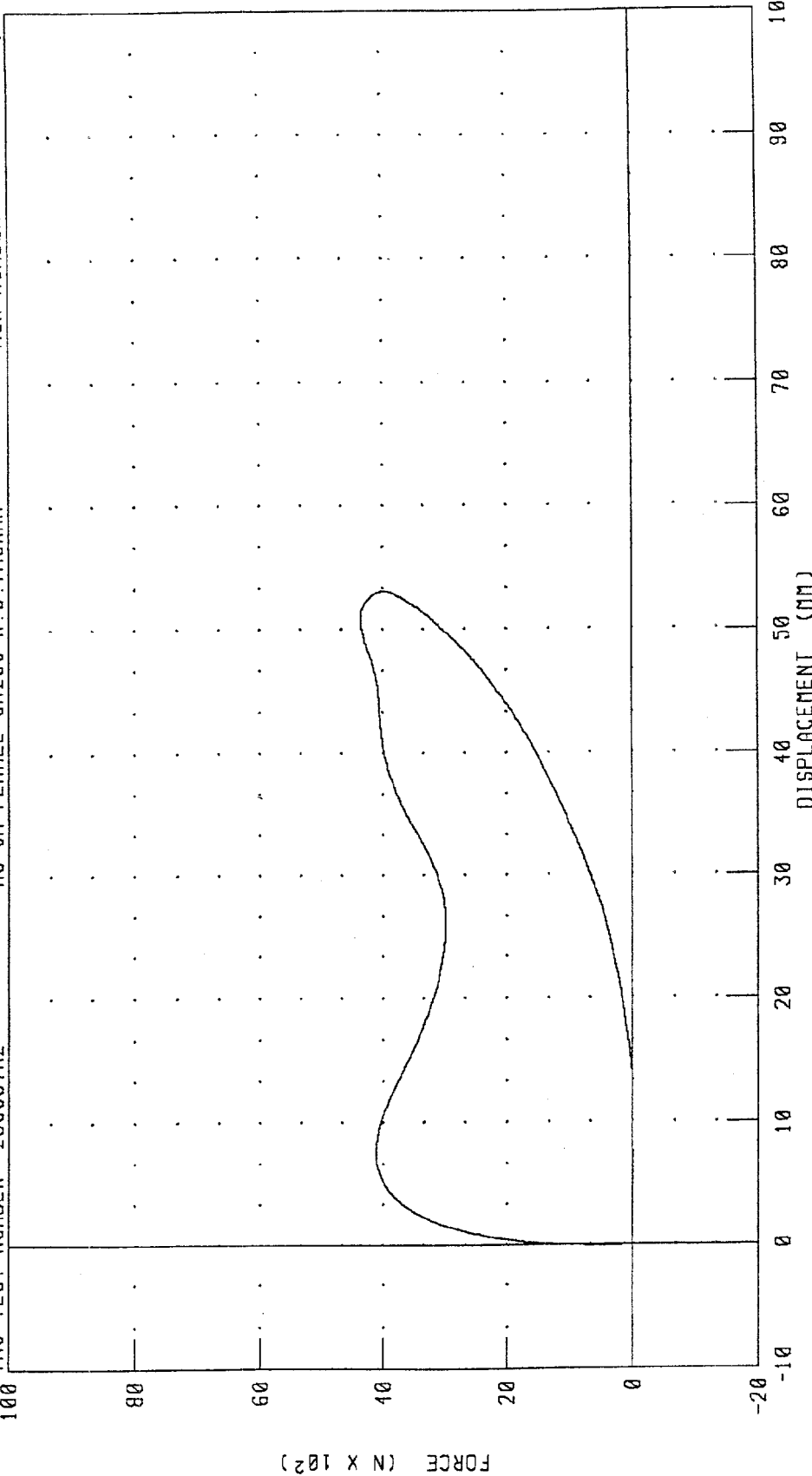
PEAK DATA: 53.10 MM @ 20.24 MS; -0.04 MM @ 1.44 MS

HYBRID III SMALL FEMALE THORAX CALIBRATION CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 289C3TH2

H3 SM FEMALE SN289 H.S.THORAX

RUN NUMBER: 040298.1122.2



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

DISPLACEMENT (MM)
PEAK DATA: 53.10 MM @ 20.24 MS; -0.04 MM @ 1.44 MS
4348.28 N @ 16.40 MS; -10.07 N @ 80.32 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III SMALL FEMALE

30-JAN-98

TRC INC.

TEST NO: 289C3RK1

H3 SM FEMALE SN289 R.KNEE IMP.

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.13 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3400 - 4200 N	3894.2 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Byg cult

RUN NUMBER: 040298.1230;11

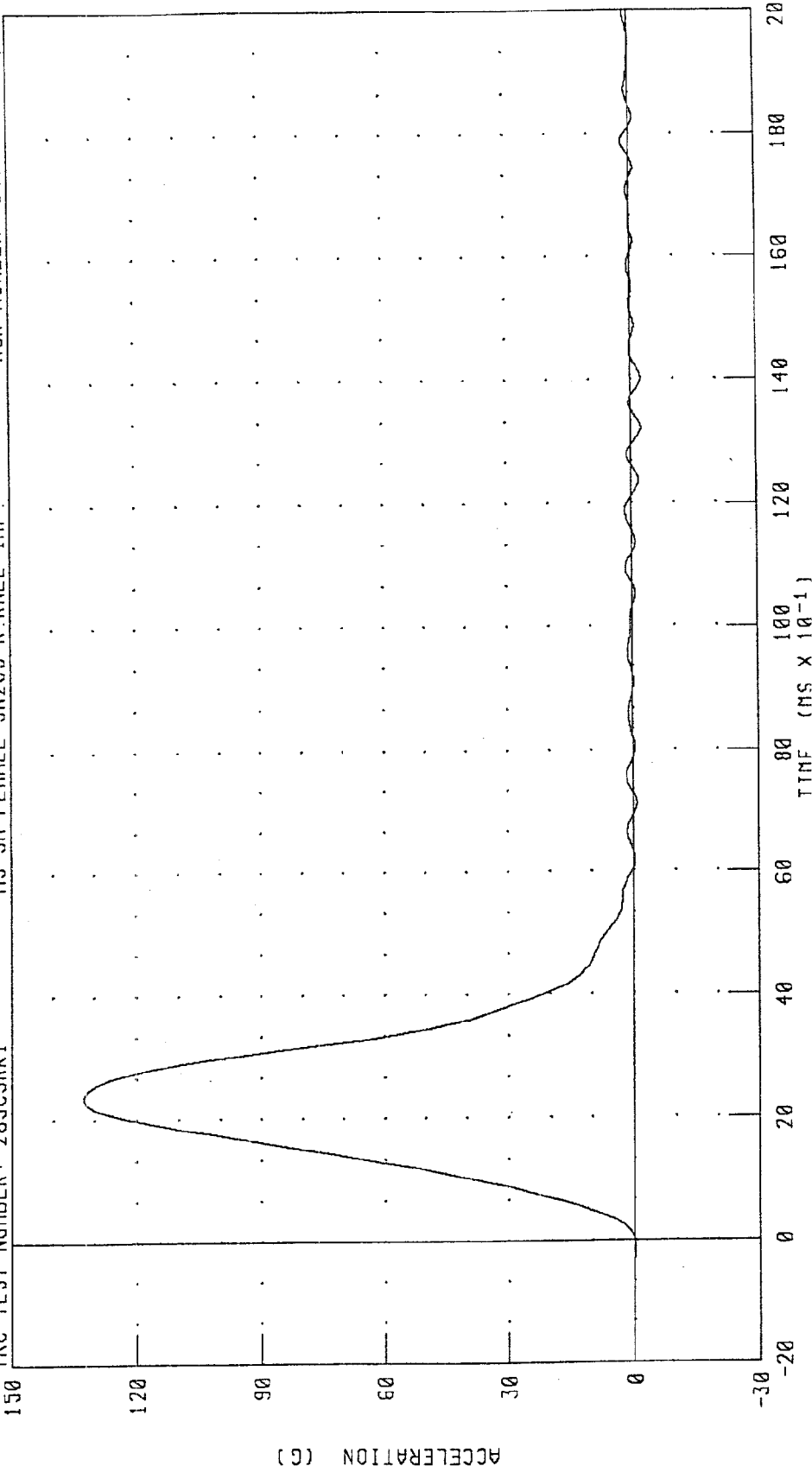
HYBRID III SMALL FEMALE RIGHT KNEE CALIBRATION

PENDULUM DECELERATION (3 KC PEND.)

TRC TEST NUMBER: 289C3RK1

H3 SM FEMALE SN289 R KNEE IMP

RUN NUMBER: 040298.1230.11



CHANNEL: PENXC FILTER: CH. CLASS 600

PEAK DATA: 132.65 G @ 2.32 MS; -2.41 G @ 13.20 MS

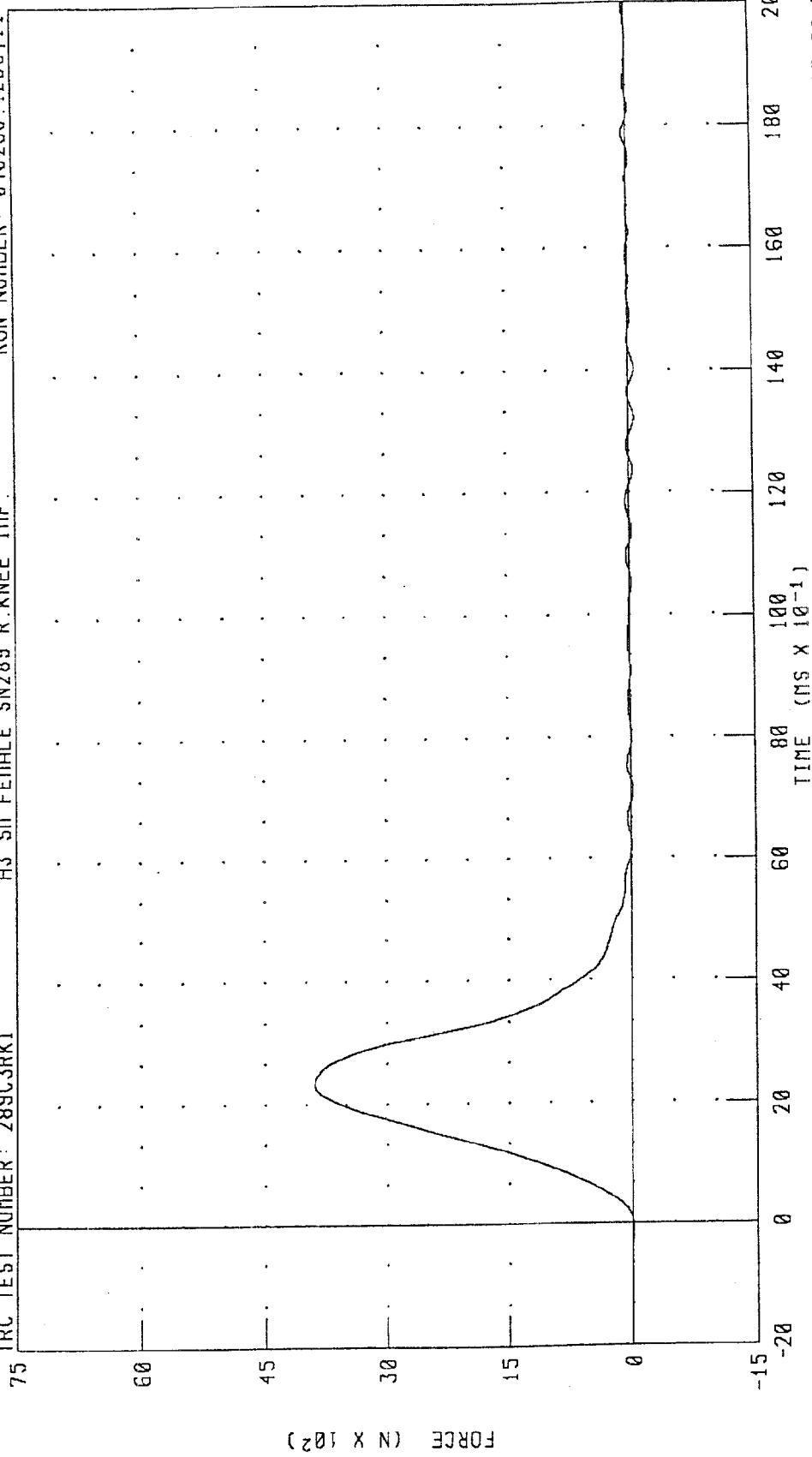
HYBRID III SMALL FEMALE RIGHT KNEE CALIBRATION

PENDULUM FORCE (3 KG PEND.)

TRC TEST NUMBER: 289C3RK1

H3 SM FEMALE SN289 R.KNEE IMP.

RUN NUMBER: 040298.1230.11



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 3894 27 N @ 2.32 MS; -70.86 N @ 13.20 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III SMALL FEMALE

18-FEB-98

TRC INC.

TEST NO: 289C3LK1

H3 SM FEMALE SN289 L.KNEE IMP.

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.13 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3400 - 4200 N	3638.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN By Cult

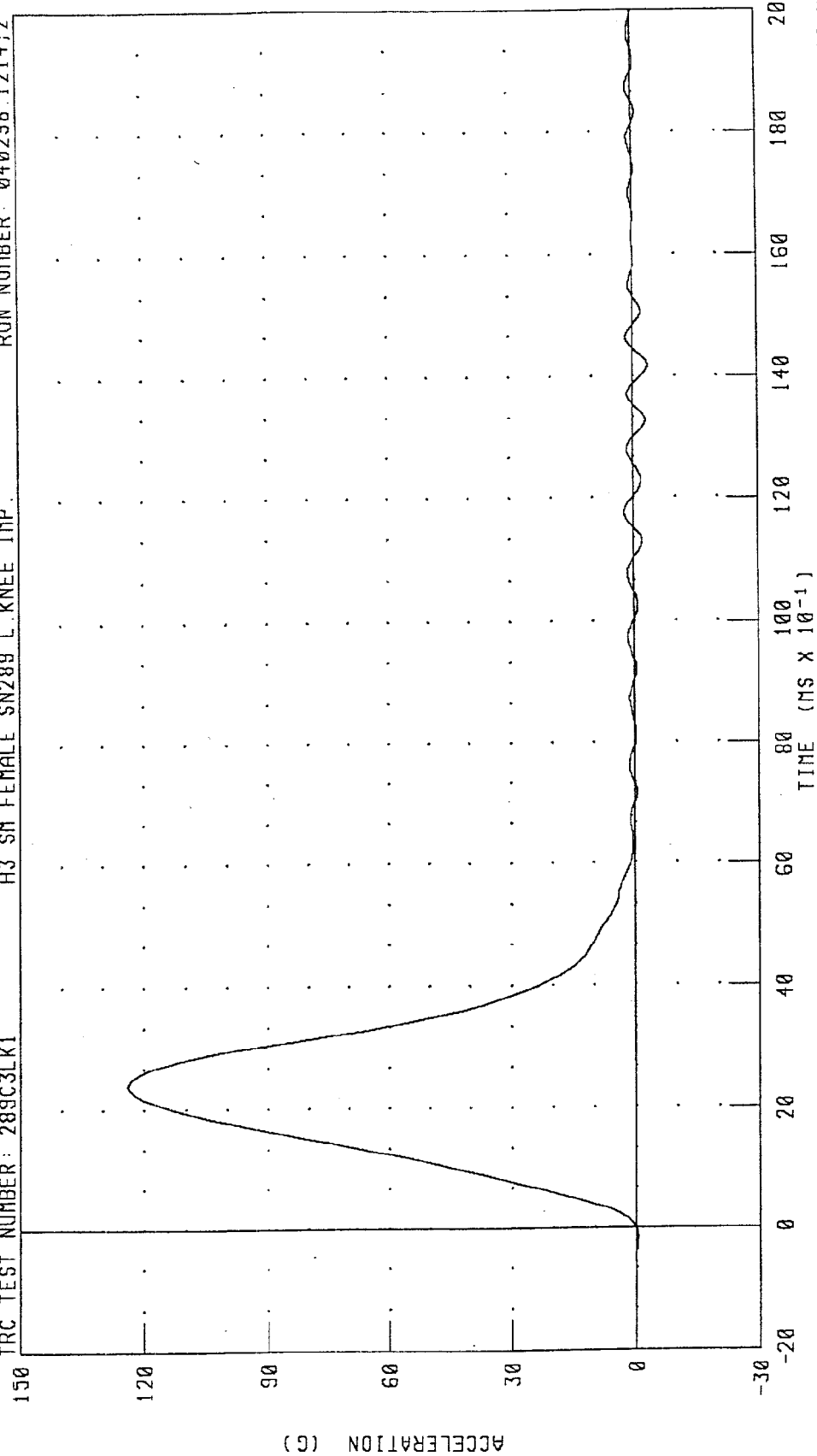
RUN NUMBER: 040298.1213;2

HYBRID III SMALL FEMALE LEFT KNEE CALIBRATION
PENDULUM DECELERATION (3 KG PEND.)

TRC TEST NUMBER: 289C3LK1

H3 SM FEMALE SN289 L KNEE IMP.

RUN NUMBER: 040298.1214;2



CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 123.94 G @ 2.40 MS; -3.49 G @ 14.16 MS

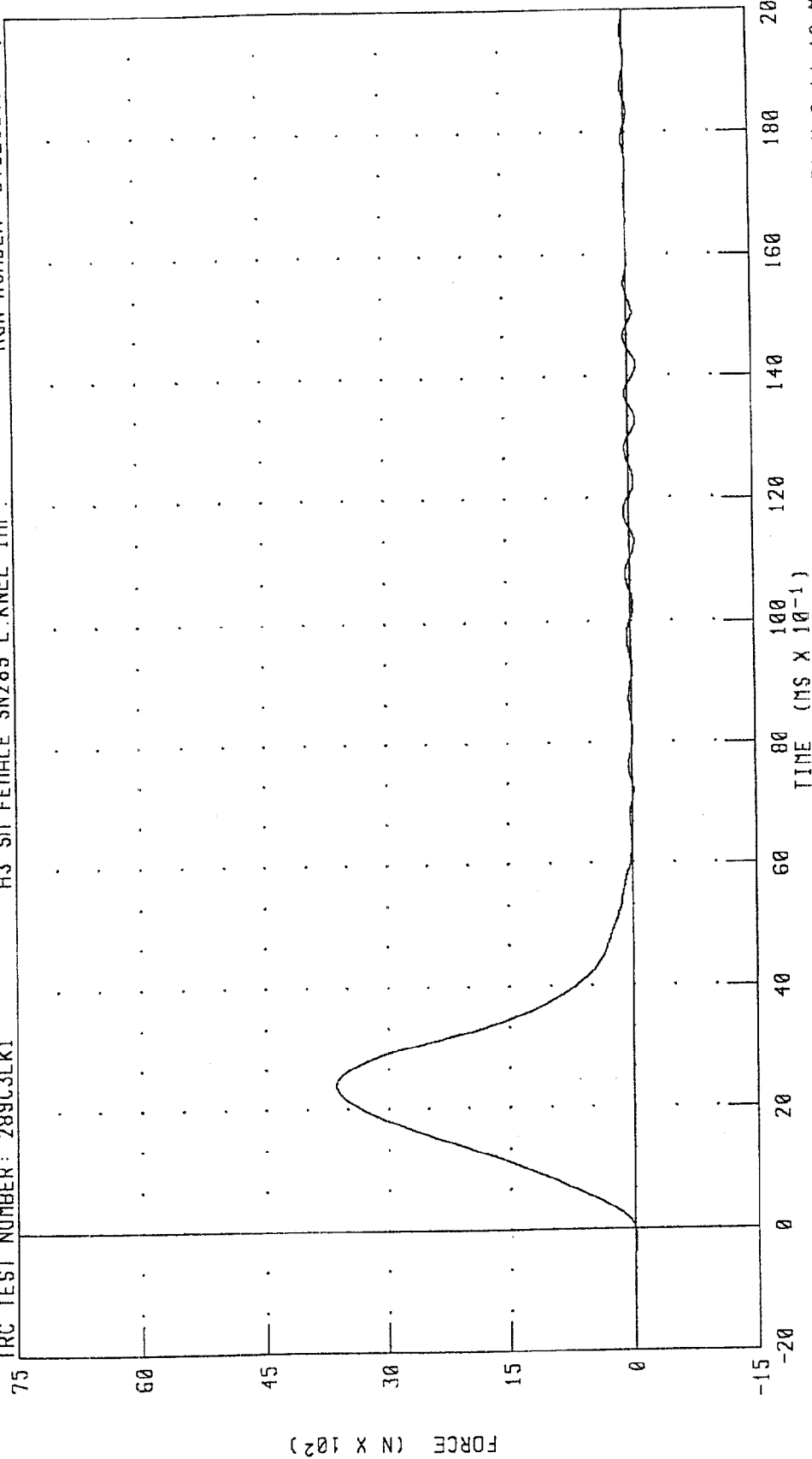
HYBRID III SMALL FEMALE LEFT KNEE CALIBRATION

PENDULUM FORCE (3 KG PEND.)

H3 SN FEMALE SN289 L KNEE IMP.

RUN NUMBER: 040298.1214.2

TRC TEST NUMBER: 289C3LK1



PEAK DATA: 3638.62 N @ 2.40 MS; -102.31 N @ 14.16 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

KNEE SLIDER TEST

HYBRID III SMALL FEMALE

18-FEB-98

RIGHT KNEE
TRC INC.

TEST NO: 289C3RS2

H3 FEMALE SN289 RIGHT SLIDER

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	58.0 %
PENDULUM VELOCITY	2.70-2.80 M/S	2.79 M/S
PEAK DISPLACEMENT	12.7 - 15.5 MM	12.6 MM *

* TEST DOES NOT MEET SPECIFICATIONS

TECHNICIAN By Cult

RUN NUMBER: 040298.1234;2

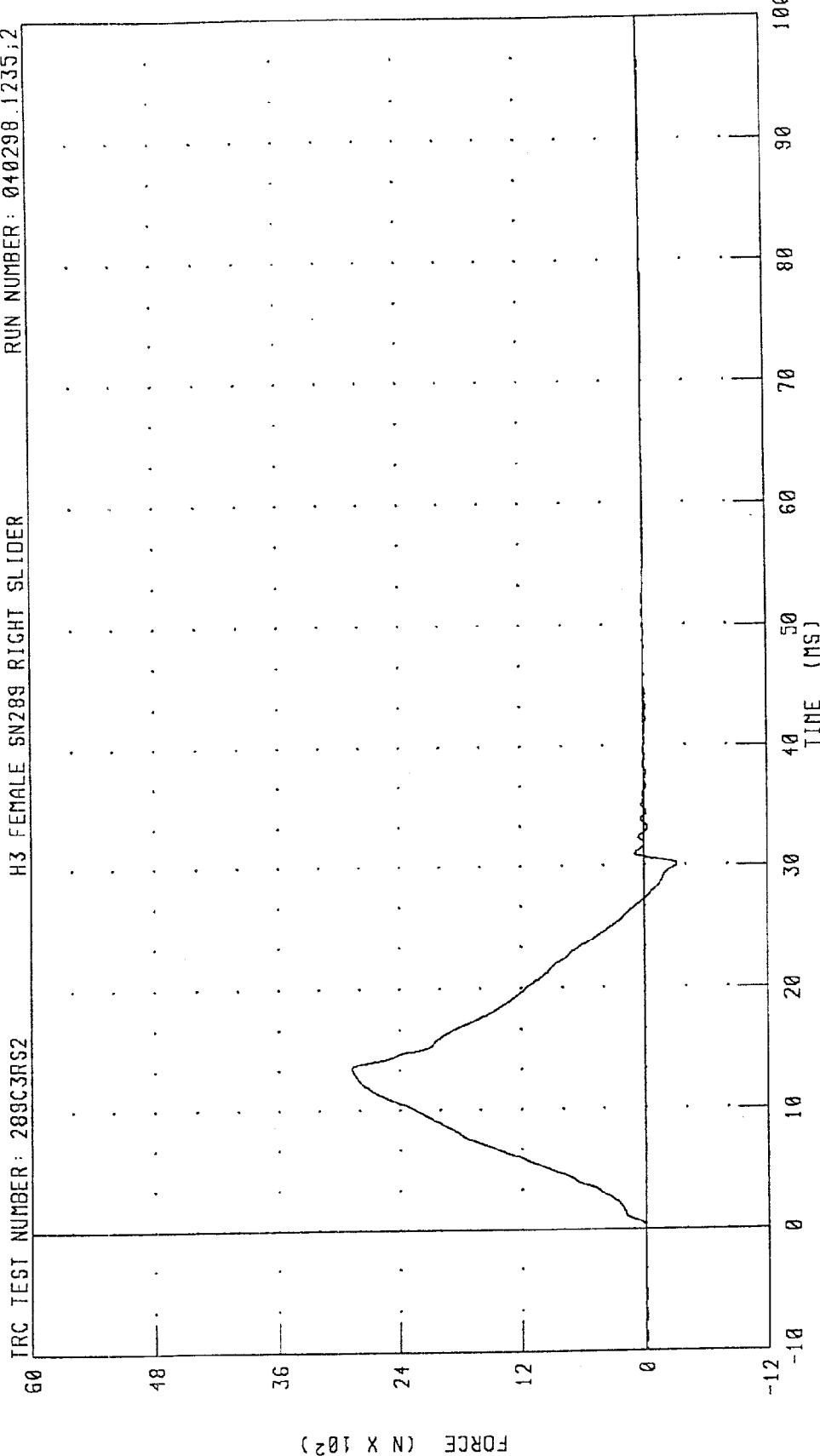
HYBRID III SMALL FEMALE RIGHT KNEE SLIDER CALIBRATION

RIGHT FEMUR FORCE

TRC TEST NUMBER: 289C3RS2

H3 FEMALE SN289 RIGHT SLIDER

RUN NUMBER: 040298.1235;2



PEAK DATA: 2875.71 N @ 13.44 MS; -316.36 N @ 30.08 MS

CHANNEL: RFMF FILTER: CH. CLASS 600

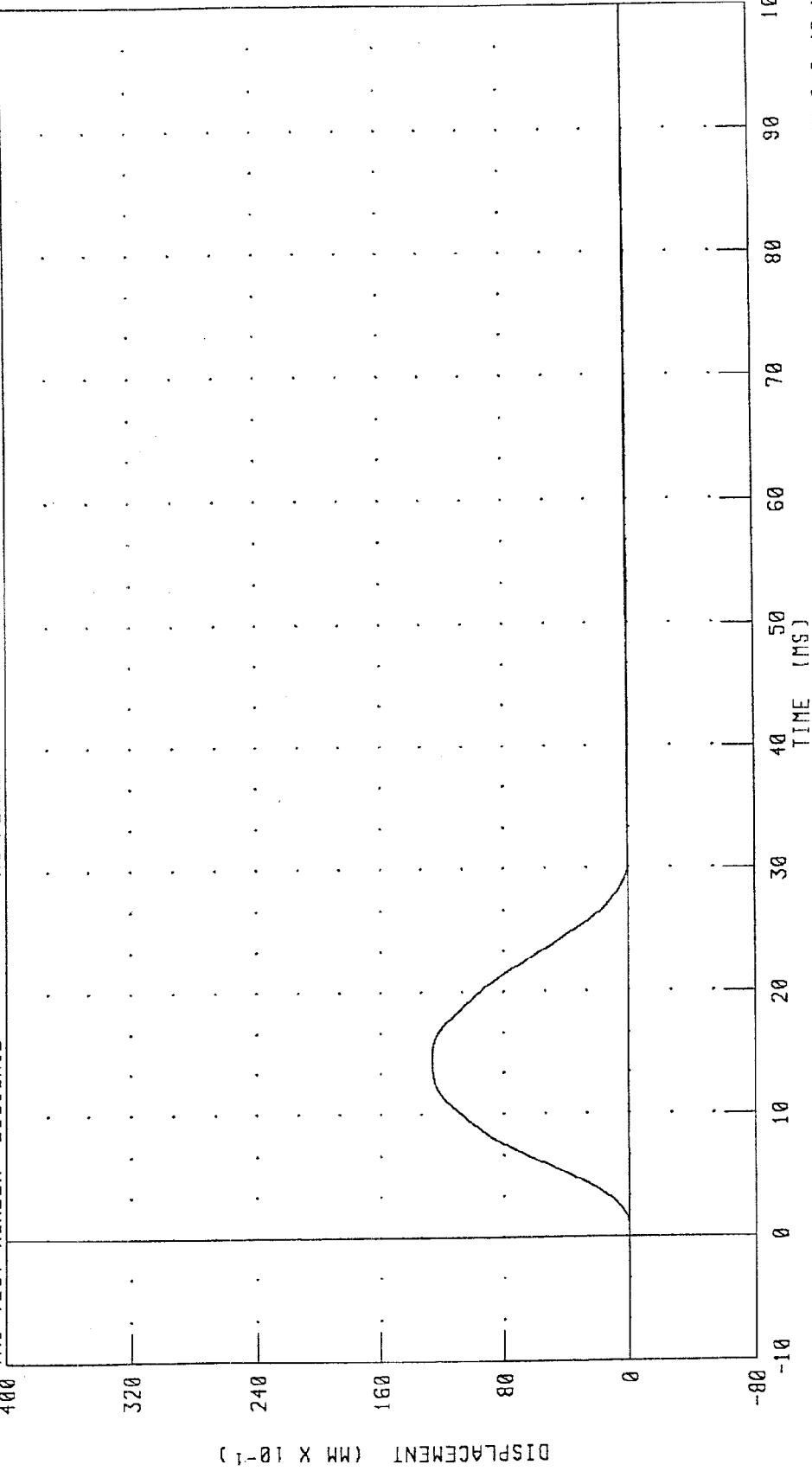
HYBRID III SMALL FEMALE RIGHT KNEE SLIDER CALIBRATION

RIGHT KNEE DISPLACEMENT

TRC TEST NUMBER: 289C3RS2

H3 FEMALE SN289 RIGHT SLIDER

RUN NUMBER: 040298.123512



CHANNEL: KNRXD FILTER: CH. CLASS 180

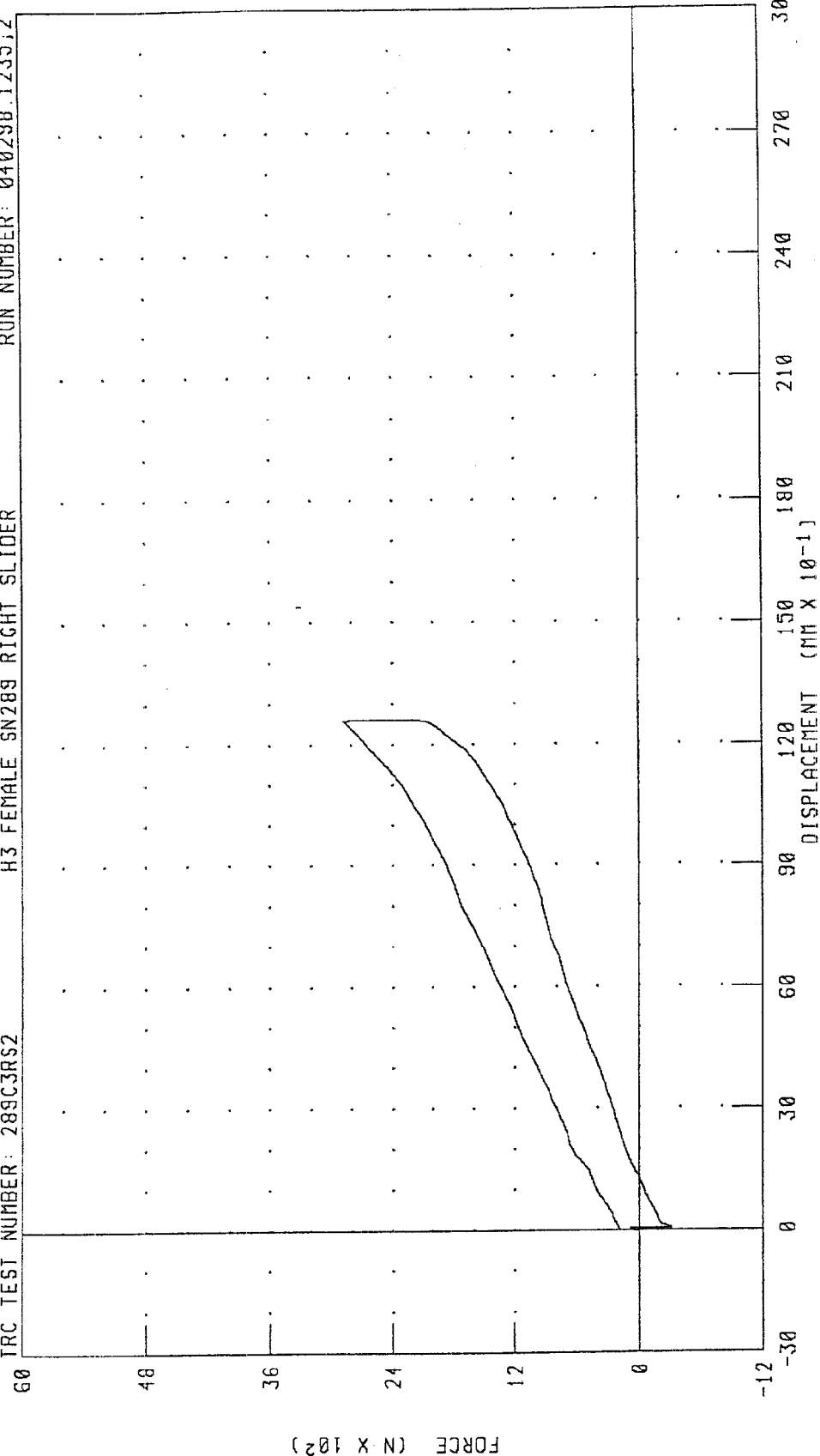
PEAK DATA: 12.63 MM @ 14.48 MS; -0.01 MM @ 0.40 MS

HYBRID III SMALL FEMALE RIGHT KNEE SLIDER CALIBRATION RIGHT KNEE DISPLACEMENT VS FEMUR FORCE

TRC TEST NUMBER: 289C3RS2

H3 FEMALE SN289 RIGHT SLIDER

RUN NUMBER: 040298.1235,2



CHANNEL: KNRXD
RFMF

FILTER: CH. CLASS 180
CH. CLASS 600

PEAK DATA: 12.63 MM @ 14.48 NS;
2875.71 N @ 13.44 NS;
-0.01 MM @ 0.40 NS;
-316.36 N @ 30.08 NS

TRANSPORTATION RESEARCH CENTER INC.

KNEE SLIDER TEST

HYBRID III SMALL FEMALE

18-FEB-98

LEFT KNEE
TRC INC.

TEST NO: 289C3LS1

H3 FEMALE SN289 LEFT SLIDER

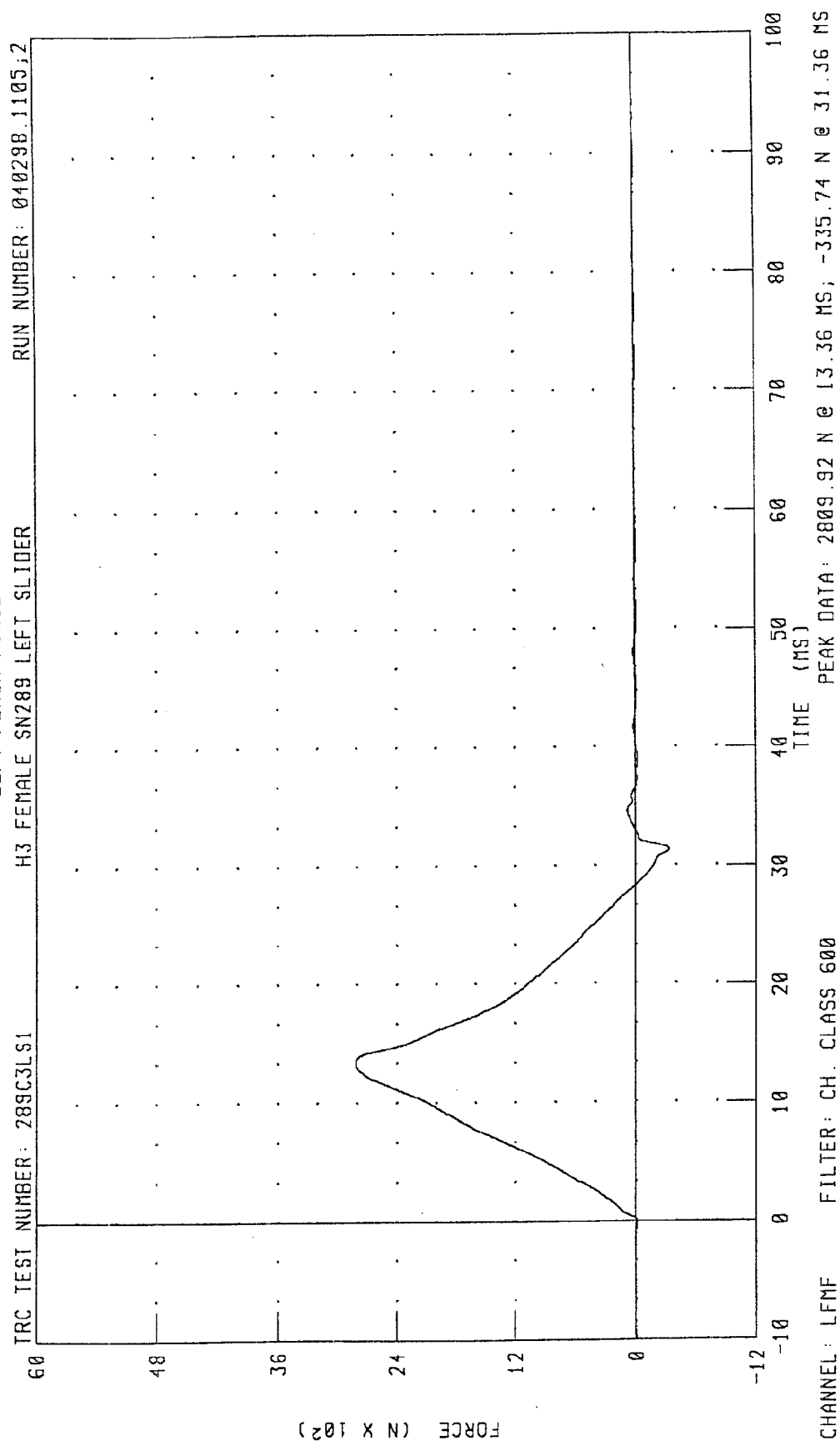
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PENDULUM VELOCITY	2.70-2.80 M/S	2.78 M/S
PEAK DISPLACEMENT	12.7 - 15.5 MM	13.5 MM

TEST MEETS SPECIFICATIONS

TECHNICIAN Kevin Watkins

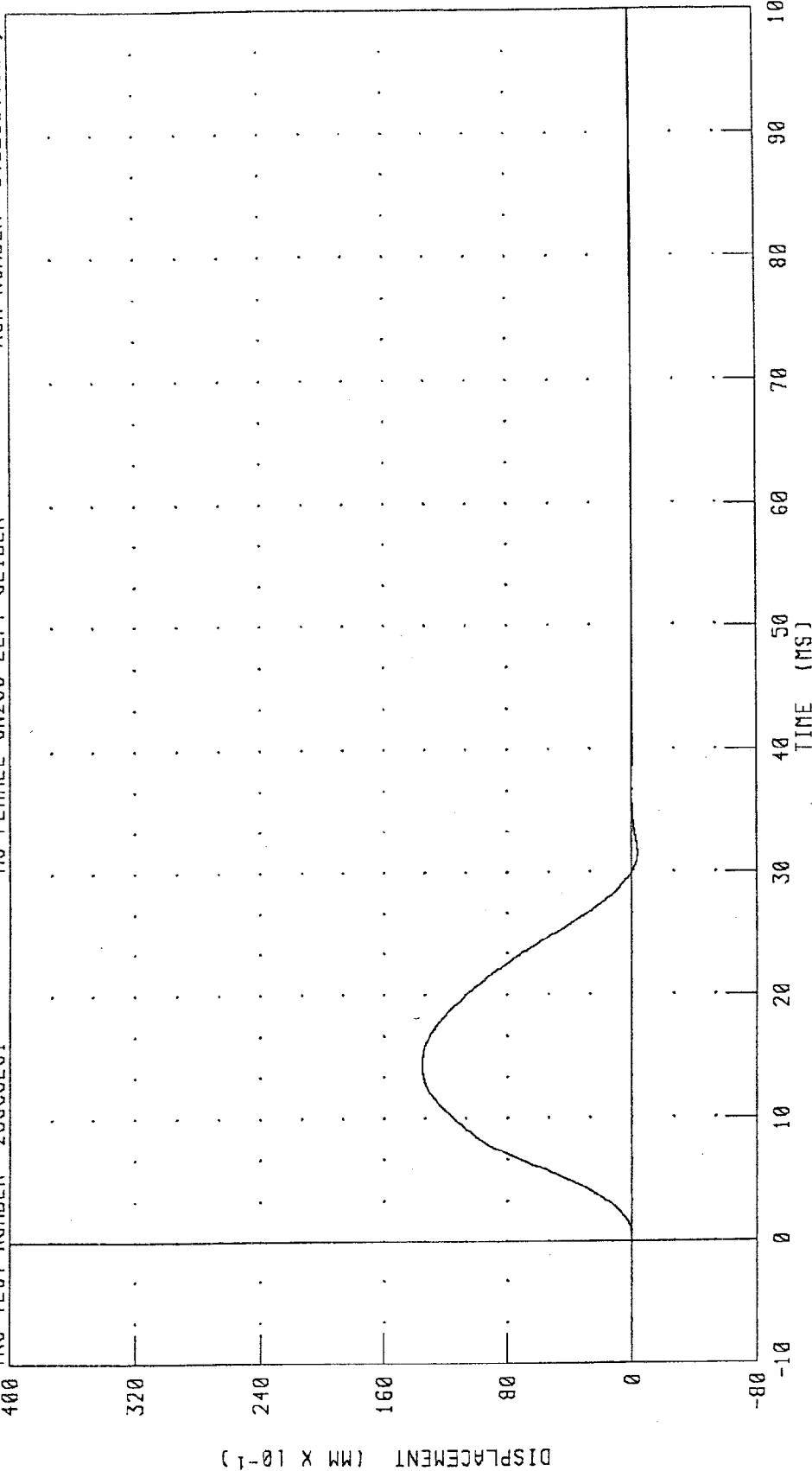
RUN NUMBER: 040298.1104;2

HYBRID III SMALL FEMALE LEFT KNEE SLIDER CALIBRATION
LEFT FEMUR FORCE



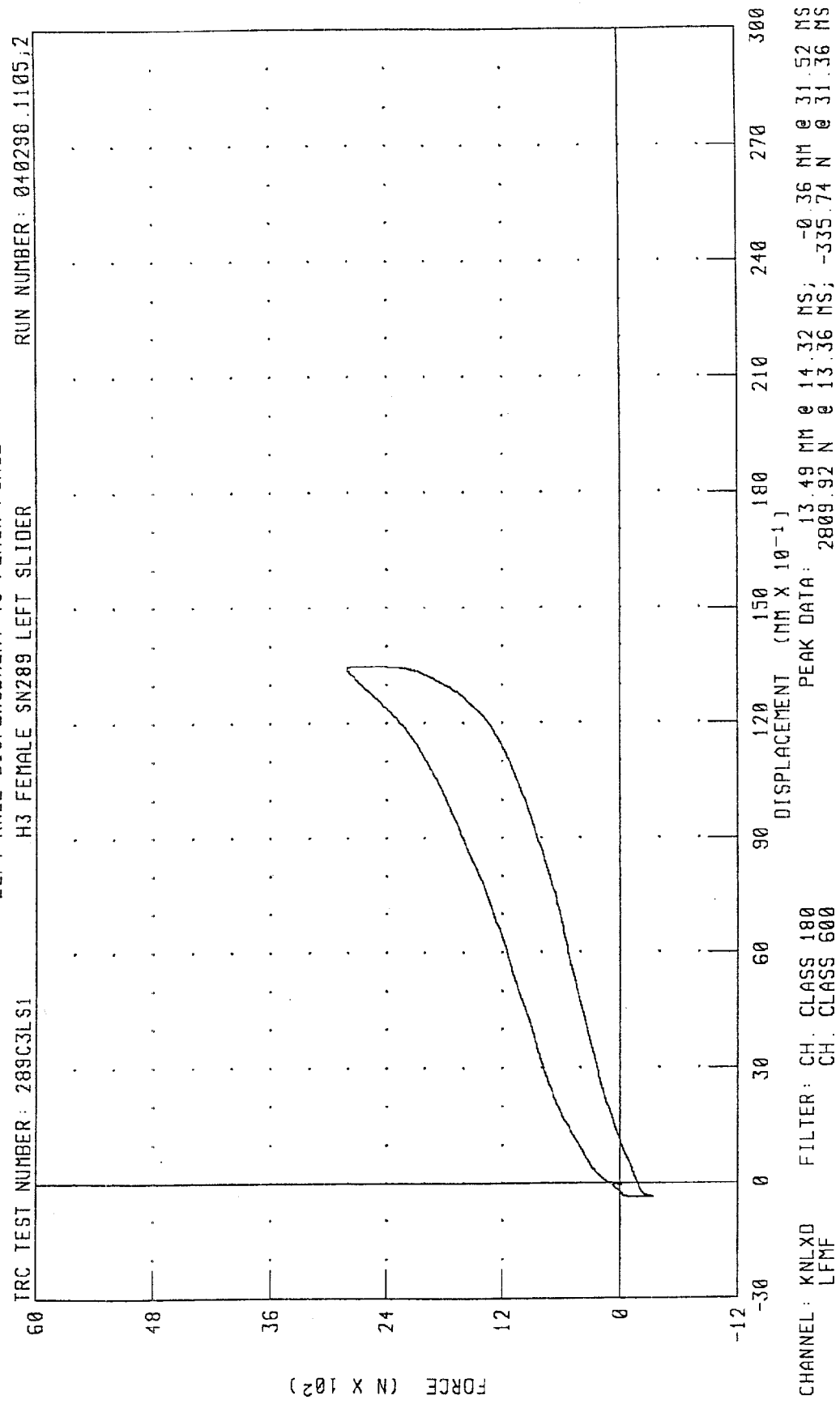
HYBRID III SMALL FEMALE LEFT KNEE SLIDER CALIBRATION LEFT KNEE DISPLACEMENT

TRC TEST NUMBER: 289C3LS1 H3 FEMALE SN289 LEFT SLIDER RUN NUMBER: 040298.1105,2



CHANNEL: KNLXD FILTER: CH. CLASS 180 PEAK DATA: 13.49 MM @ 14.32 MS; -0.36 MM @ 31.52 MS

HYBRID III SMALL FEMALE LEFT KNEE SLIDER CALIBRATION LEFT KNEE DISPLACEMENT VS FEMUR FORCE



Dummy Sign Convention

Accelerometers:

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

Potentiometers:

+Chest longitudinal deflection: Inward

Load cells:

+Femur force: Compression

Neck load cells:

+X force: Head forward
+Y force: Head leftward
+Z force: Head 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

Target Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: First Technologies/191

Seating position: Driver

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXG1	Head	X	Endevco	7231	A51JJ	Rear
HEDYG1	Head	Y	Endevco	7231	A75JJ	Left
HEDZG1	Head	Z	Endevco	7231	CY31H	Up
NEKXF1 ¹	Neck	X	Denton	1716	0852FX	N/A
NEKYF1 ¹	Neck	Y	Denton	1716	0852FY	N/A
NEKZF1 ¹	Neck	Z	Denton	1716	0852FZ	N/A
NEKXM1 ¹	Neck	X	Denton	1716	0852MX	N/A
NEKYM1 ¹	Neck	Y	Denton	1716	0852MY	N/A
NEKZM1 ¹	Neck	Z	Denton	1716	0852MZ	N/A
CSTXD1	Chest	X	Servo	18TC1-2778	1191-006	Inward
PEVXG1	Pelvis	X	Endevco	7264	A83JJ	Rearward
PEVYG1	Pelvis	Y	Endevco	7264	A85JJ	Left
PEVYR1	Pelvis	Y	Endevco	7264	CH67H	Right
PEVZG1	Pelvis	Z	Endevco	7264	AGTM4	Up
T01XG1	Upper spine	X	Endevco	7264	A34FJ	Rear
T01YG1	Upper spine	Y	Endevco	7264	CL95H	Left
T01ZG1	Upper spine	Z	Endevco	7264	A72JJ	Up
T12XG1	Lower spine	X	Endevco	7264	A01EJ	Forward
T12YG1	Lower spine	Y	Endevco	7264	A81JJ	Left
T12YR1	Lower spine	Y	Endevco	7264	A56JJ	Left
T12ZG1	Lower spine	Z	Endevco	7264	DK56J	Up
LURYG1	Left upper rib	Y	Endevco	7264	A20FJ	Left
LURYR1	Left upper rib	Y	Endevco	7264	AGRG5	Left
LLRYR1	Left lower rib	Y	Endevco	7264	AGR49	Left
LLRYG1	Left lower rib	Y	Endevco	7264	A31FJ	Left

¹ See Dummy Sign Convention sheet for polarity.

Target Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: First Technologies/199

Seating position: Passenger

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXG4	Head	X	Endevco	7264	DW81JC	Rear
HEDYG4	Head	Y	Endevco	7264	CW68H	Left
HEDZG4	Head	Z	Endevco	7264	DT91JT	Up
NEKXF4 ¹	Neck	X	Denton	1716	0851FX	N/A
NEKYF4 ¹	Neck	Y	Denton	1716	0851FY	N/A
NEKZF4 ¹	Neck	Z	Denton	1716	0851FZ	N/A
NEKXM4 ¹	Neck	X	Denton	1716	0851MX	N/A
NEKYM4 ¹	Neck	Y	Denton	1716	0851MY	N/A
NEKZM4 ¹	Neck	Z	Denton	1716	0851MZ	N/A
CSTXD4	Chest	X	Servo	08TC1-2778	64	Inward
PEVXG4	Pelvis	X	Endevco	7264	J10958	Rearward
PEVYG4	Pelvis	Y	Endevco	7264	ANBH3	Left
PEVYR4	Pelvis	Y	Endevco	7264	CC11H	Right
PEVZG4	Pelvis	Z	Endevco	7264	DK66J	Up
T01XG4	Upper spine	X	Endevco	7264	CL89H	Rear
T01YG4	Upper spine	Y	Endevco	7264	CY53H	Left
T01ZG4	Upper spine	Z	Endevco	7264	CN29H	Up
T12XG4	Lower spine	X	Endevco	7264	EA79J	Forward
T12YG4	Lower spine	Y	Endevco	7264	CR21H	Left
T12YR4	Lower spine	Y	Endevco	7264	AGRG8	Left
T12ZG4	Lower spine	Z	Endevco	7264	CW60H	Up
LURYG4	Left upper rib	Y	Endevco	7264	AMWB5	Up
LURYR4	Left upper rib	Y	Endevco	7264	CY39H	Left
LLRYG4	Left lower rib	Y	Endevco	7264	CY62H	Left
LLRYR4	Left lower rib	Y	Endevco	7264	CC91H	Left

¹ See Dummy Sign Convention sheet for polarity.

Bullet Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: Applied Safety Technologies/168

Seating position: Driver

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXG1	Head	X	Endevco	7264	J19535	Rear
HEDYG1	Head	Y	Endevco	7264	J19548	Left
HEDZG1	Head	Z	Endevco	7264	J20026	Up
NEKXF1 ¹	Neck	X	Denton	1716	0853FX	N/A
NEKYF1 ¹	Neck	Y	Denton	1716	0853FY	N/A
NEKZF1 ¹	Neck	Z	Denton	1716	0853FZ	N/A
NEKXM1 ¹	Neck	X	Denton	1716	0853MX	N/A
NEKYM1 ¹	Neck	Y	Denton	1716	0853MY	N/A
NEKZM1 ¹	Neck	Z	Denton	1716	0853MZ	N/A
CSTXG1	Chest	X	Endevco	7264	J20011	Forward
CSTYG1	Chest	Y	Endevco	7264	J20001	Left
CSTZG1	Chest	Z	Endevco	7264	J20438	Down
CSTXD1	Chest	X	Servo	14CB1-2897	168	Inward
LFMF1	Left femur	Z	Denton	1914	383	Compression
RFMF1	Right femur	Z	Denton	1914	376	Compression

¹ See Dummy Sign Convention sheet for polarity.

Bullet Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: Applied Safety Technologies/289

Seating position: Passenger

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXG2	Head	X	Endevco	7264	J20165	Rear
HEDYG2	Head	Y	Endevco	7264	J19865	Left
HEDZG2	Head	Z	Endevco	7264	J19934	Up
NEKXF2 ¹	Neck	X	Denton	1716	0425FX	N/A
NEKYF2 ¹	Neck	Y	Denton	1716	0425FY	N/A
NEKZF2 ¹	Neck	Z	Denton	1716	0425FZ	N/A
NEKXM2 ¹	Neck	X	Denton	1716	0425MX	N/A
NEKYM2 ¹	Neck	Y	Denton	1716	0425MY	N/A
NEKZM2 ¹	Neck	Z	Denton	1716	0425MZ	N/A
CSTXG2	Chest	X	Endevco	7264	J20599	Forward
CSTYG2	Chest	Y	Endevco	7264	J20580	Left
CSTZG2	Chest	Z	Endevco	7264	EH88J	Up
CSTXD2	Chest	X	Denton	019	289	Inward
PEVXG2	Pelvis	X	Endevco	7264	CY06H	Rearward
PEVYG2	Pelvis	Y	Endevco	7264	AGAC4	Left
PEVZG2	Pelvis	Z	Endevco	7264	BF65J	Up
LFMF2	Left femur	Z	Denton	1914	259	Compression
RFMF2	Right femur	Z	Denton	1914	257	Compression
STTXG2	Sternum top	X	Endevco	7264	J20569	Forward
STMXG2	Sternum middle	X	Endevco	7264	J20064	Forward
STBXG2	Sternum bottom	X	Endevco	7264	J20570	Forward
SPTXG2	Spine top	X	Endevco	7264	J19872	Rear
SPMXG2	Spine middle	X	Endevco	7264	J19877	Rear
SPBXG2	Spine bottom	X	Endevco	7264	J19890	Rear

¹ See Dummy Sign Convention sheet for polarity

Target Vehicle Instrumentation Placement

Number	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
1	Right side sill at front seat	X	Endevco	7264	J20124	Forward
		Y	Endevco	7264	J19847	Left
		Z	Endevco	7264	J19905	Down
2	Right side sill at rear seat	X	Endevco	7264	DM66J	Forward
		Y	Endevco	7264	J19897	Left
		Z	Endevco	7264	J20158	Up
3	Rear floorpan above axle	X	Endevco	7264	J20625	Forward
		Y	Endevco	7264	J19885	Left
		Z	Endevco	7264	AJ788	Up
4	Left side sill at front seat	Y	Endevco	7264	J19982	Right
5	Left side sill at rear seat	Y	Endevco	7264	J19868	Right
6	Right rear occupant compartment	Y	Endevco	7264	J21619	Right
7	Lower A-post	Y	Endevco	7264	CJ134	Left
8	Upper A-post	Y	Endevco	7264	BB85	Left
9	Lower B-post	Y	Endevco	7264	J21757	Right
10	Upper B-post	Y	Endevco	7264	AAL82	Right
11	Front seat track at H-point	Y	Endevco	7264	AY66	Right
12	Vehicle center of gravity	X	Endevco	7264	J20015	Forward
		Y	Endevco	7264	J20329	Right
		Z	Endevco	7264	J19639	Up

Bullet Vehicle Instrumentation Placement

Number	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
1	Left rear seat crossmember	X	Endevco	7264	J20394	Forward
2	Right rear seat crossmember	X	Endevco	7264	J19884	Forward
3	Engine top	X	Endevco	7264	J19911	Forward
4	Engine bottom	X	Endevco	7264	J19547	Forward
5	Right brake caliper	X	Endevco	7264	J20085	Forward
6	Left brake caliper	X	Endevco	7264	J19557	Forward
7	Instrument panel center	X	Endevco	7264	J20294	Forward
8	Vehicle rear center	Z	Endevco	7264	J20582	Up
9	Vehicle center of gravity	X	Endevco	7264	J19562	Forward

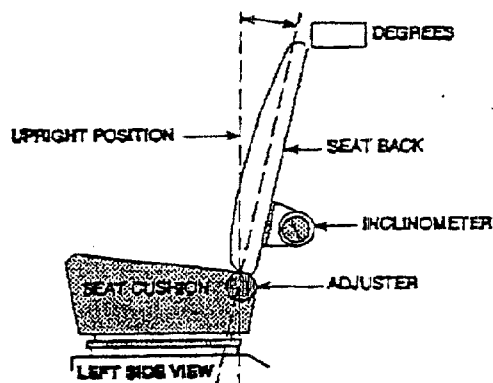
Figure 1

TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 1997 Vehicle Model: Honda Accord DX Body Style : 4-door sedan

1. Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



FRONT SEAT ASSEMBLY

Seat back angle for driver's seat : -

Measurement instructions : Seat back adjusted to 5th latch position from first locking position (zero). 0-4

Seat back angle for passenger's seat : -

Measurement instructions : Same as driver seating position.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat : Seat set at 10th (mid) position from foremost locking position (zero). There are 21 total detents.

Positioning of the passenger's seat (if applicable) : Same as driver seating position.

3. Fuel Tank Capacity Data

A. "Usable Capacity" of the standard equipment fuel tank is 17.0 gallons

B. "Usable Capacity" of the optional equipment fuel tank is N/A gallons

4. Steering Column Position :

Steering column set at mid-position.

5. Other:

None

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1998 Dodge CaravanVehicle Model & Body Style: Minivan

1. NOMINAL DESIGN RIDING POSITION --

For adjustable driver and passenger seat backs.
Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable. Indicate, if applicable, how the detents are numbered (Is the first detent "0" or "1"?). Indicate if the seat back angle is measured with the dummy in the seat.

Seat back angle for driver's seat = X degrees.

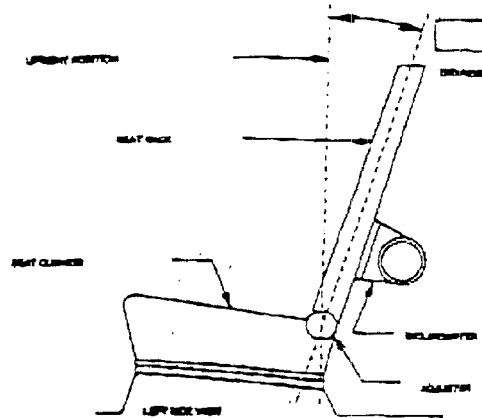
Measurement Instructions:

Set seatback without dummy in seat. Fully incline seatback. Hold inclinometer against frame of seatback approximately 55 mm above pivot point. Recline seat four degrees.

Seat back angle for passenger's seat = X degrees.

Measurement Instructions:

Same as driver.



2. SEAT FORE & AFT POSITIONS --

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, indicate how the detents are numbered (Is the first detent "0" or "1"?). Provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:

Ensure seat is completely lowered. Only power seat has vertical adjustment. Locate full-forward and full-rear positions. Mark the seat at those positions. Distance should be 200 mm. Place seat mid-way between forward and rear. -- or -- For seat with manual adjuster, front latched position is number one. Move seat rearward ten clicks to eleventh latched position.

Positioning of the passenger's seat (if applicable):

Same as driver seat.

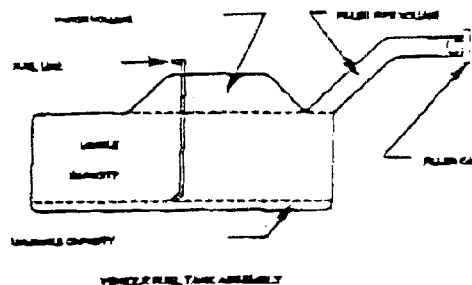
3. FUEL TANK CAPACITY DATA --

3.1 A. "Usable Capacity" of standard equipment fuel tank = 20.0 gallons.

B. "Usable Capacity" of optional equipment fuel tank = N/A gallons.

C. "Usable Capacity" of vehicle(s) used for certification testing to requirements of FMVSS 301 = 20.0 gallons.

Operational Instructions:



3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 19.0 gallons

Continued

VEHICLE INFORMATION

Vehicle equipped with electric fuel pump? ☒ YES ☐ NOIf YES, does pump normally operate when vehicle's electrical system is activated? ☒ YES ☐ NO

Turn key in ignition. Turn key to "run" position. Fuel pump will operate briefly, pressurizing fuel lines.

ADJUSTABLE UPPER ANCHORAGE POSITION:

Highest latched position is one. Lower turning loop two clicks to position number three. Verify it is securely latched.

8. STEERING COLUMN ADJUSTMENTS . .

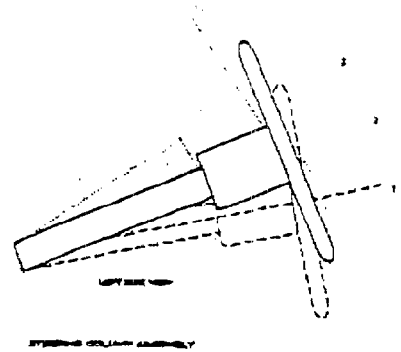
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.

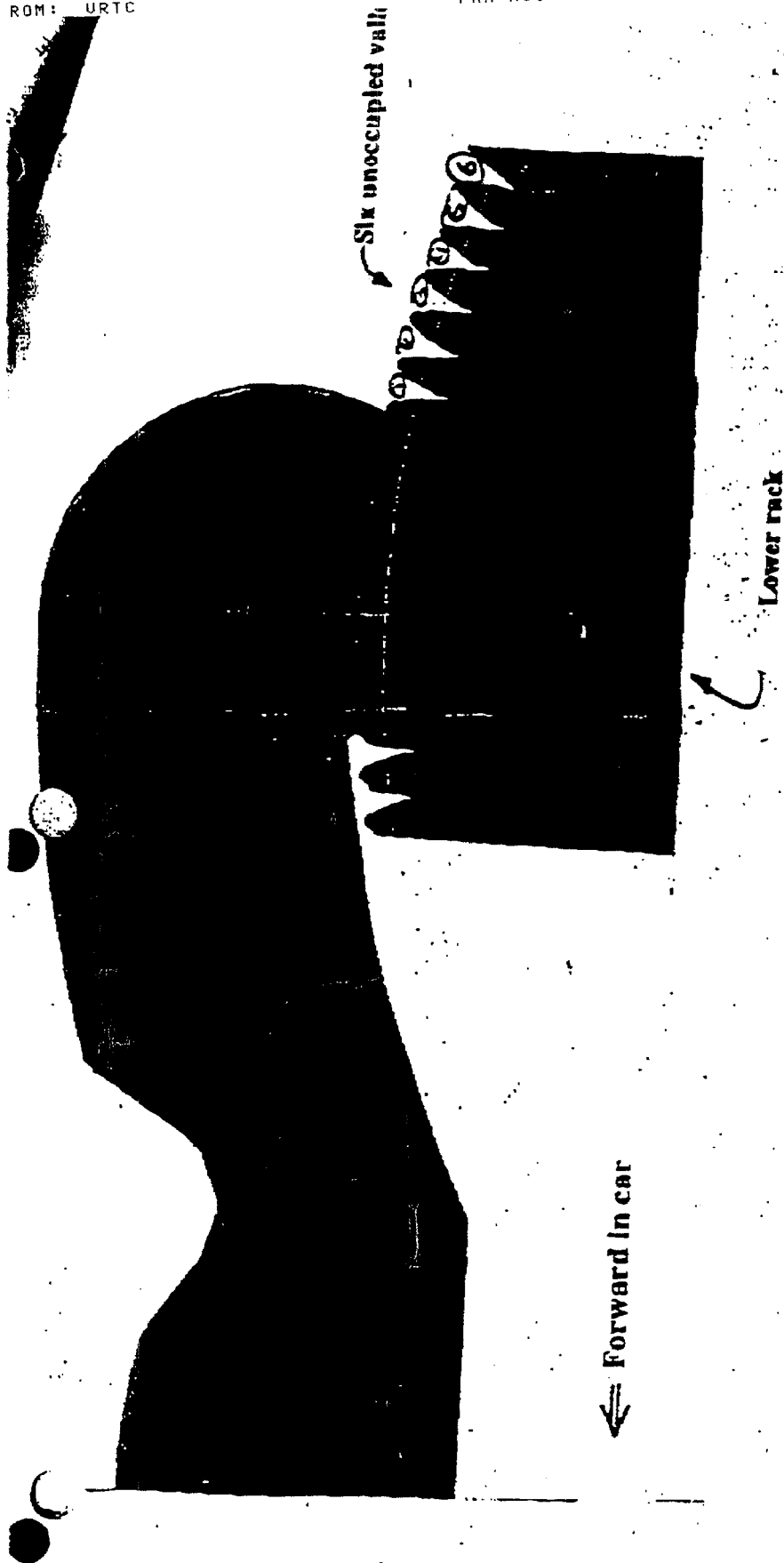
If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions:

Place tilt column in highest locked position. Verify tilt mechanism is engaged. This is position one. Lower steering wheel five clicks to position number six.

- or - Remove steering column shrouds to expose the tilt mechanism. A tilt pawl (pivots on fixed portion of column) engages a lower rack (resides on non-fixed portion of column). When column is correctly placed in "neutral" six unoccupied valleys are visible in the lower rack, rearward-in-car of the tilt pawl. See attachment.





Left Side View

NS-Body Tilt Steering Column: Proper Position for Impact

Achieve proper tilt head position for impact by:

- Locking tilt head in the full-up position. Ensure teeth are engaged.
- Lower tilt head (5) clicks.

This is also achieved by removing the shroud and visually inspecting the tilt mechanism. There should be six unoccupied valleys in the lower rack.

MWC
6/20/97

FORM NO. 1

TEST VEHICLE INFORMATION

Vehicle Model Year & Make: 1996 Dodge
 Vehicle Model & Body Style: Caravan (MPV)

1. NOMINAL DESIGN RIDING POSITION - -

For adjustable driver and passenger seat backs.
 Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent if applicable.

Seat back angle for driver's seat = 18.0 degrees.

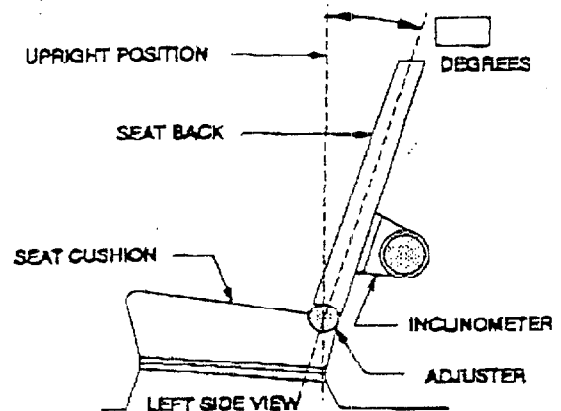
Measurement Instructions:

Adjust the seat back to full upright position (which is 14 degrees from full upright). Utilizing an inclinometer recline seat back 4 degrees.

Seat back angle for passenger's seat = degrees.

Measurement Instructions:

Same as above



2. SEAT FORE & AFT POSITIONS - -

Provide instructions for positioning the driver and front outboard passenger seat(s) in the center of fore and aft travel. For example, provide information to locate the detent in which the seat track is to be locked.

Positioning of the driver's seat:

Adjust seat to full forward and down position, move seat rearward to full rearmost locking position and measure travel of the seat assembly. Travel should be 200 mm, move seat 100 mm or to the center of the travel of the seat on the track.

Positioning of the passenger's seat (if applicable):

See above

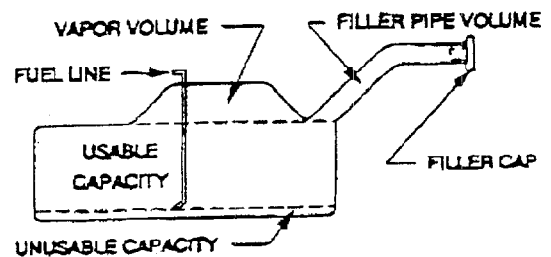
3. FUEL TANK CAPACITY DATA - -

- 3.1 A. "Usable Capacity" of standard equipment fuel tank = 20.0 gallons.

- B. "Usable Capacity" of optional equipment fuel tank = N/A gallons.

- C. Capacity used when certification testing to requirements of FMVSS 301 = 19.0 gallons.

Operational Instructions:



VEHICLE FUEL TANK ASSEMBLY

- 3.2 Amount of Stoddard solvent added to vehicle for certification test = 19.0 gallons
- 3.3 Is vehicle equipped with electric fuel pump? x YES NO
 If YES, does pump normally operate when vehicle's electrical system is activated? x YES NO

FORM NO. 1 Continued

FUEL PUMP WILL RUN IN EITHER THE "IGNITION START" OR "IGNITION RUN" KEY POSITIONS.
NOTE: PUMP STOPS IF ENGINE DOES NOT RUN FOR ONE SECOND.

TEST VEHICLE INFORMATION

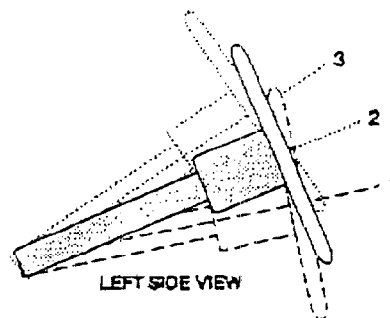
4. STEERING COLUMN ADJUSTMENTS - -

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions.

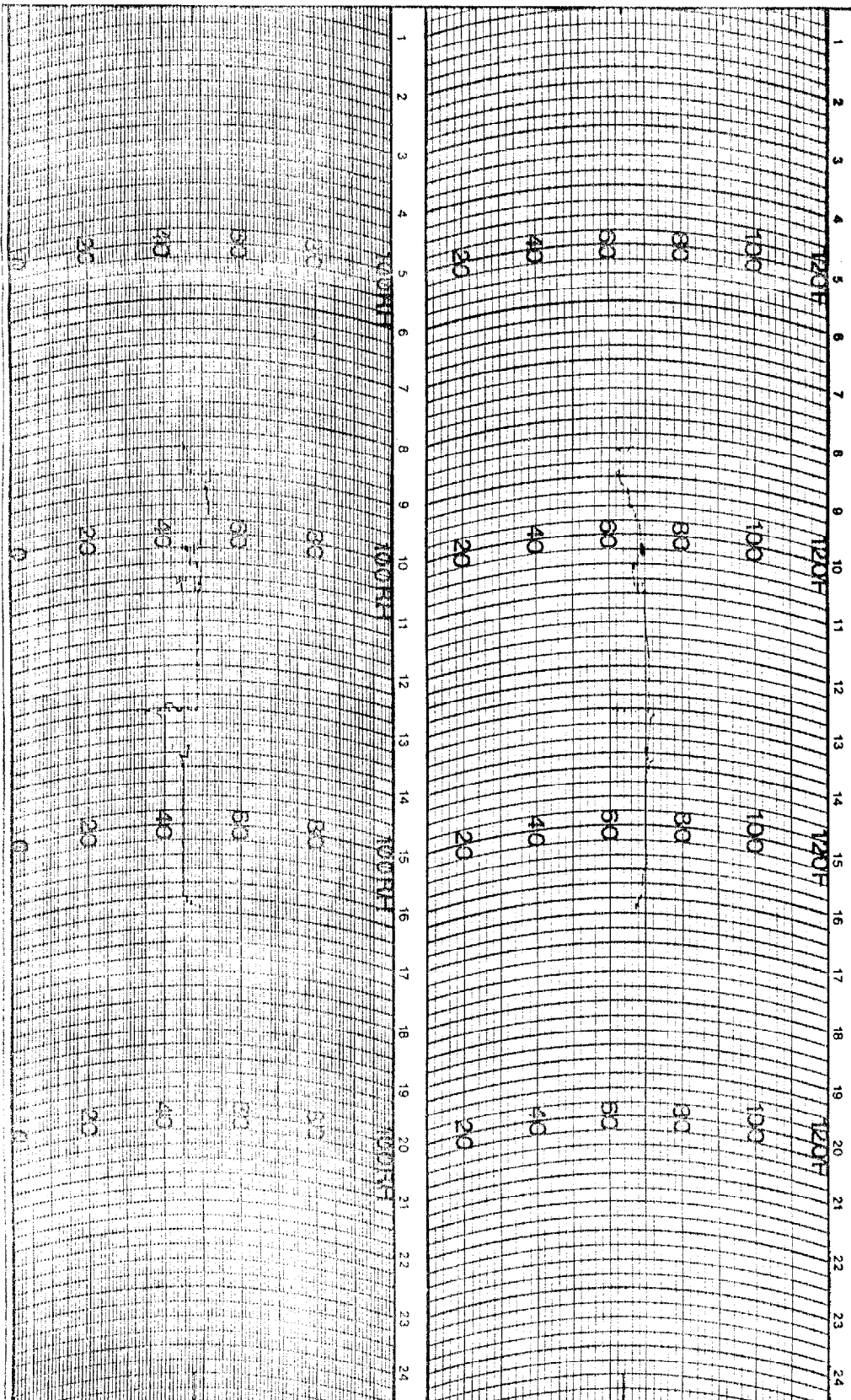
If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions:

Tilt adjustable steering columns are provided as optional equipment on certain models of the 1996 Dodge Caravan. For testing with an adjustable tilt steering column: 1) The adjustable steering wheel is positioned to the highest position. 2) Tilt wheel is then adjusted 5 detents (clicks) downward from the highest position to achieve the geometric center of locus.



STEERING COLUMN ASSEMBLY



WEATHER MEASURE
P.O. BOX 41257
SACRAMENTO, CA 95841
PHONE (916) 481-7555

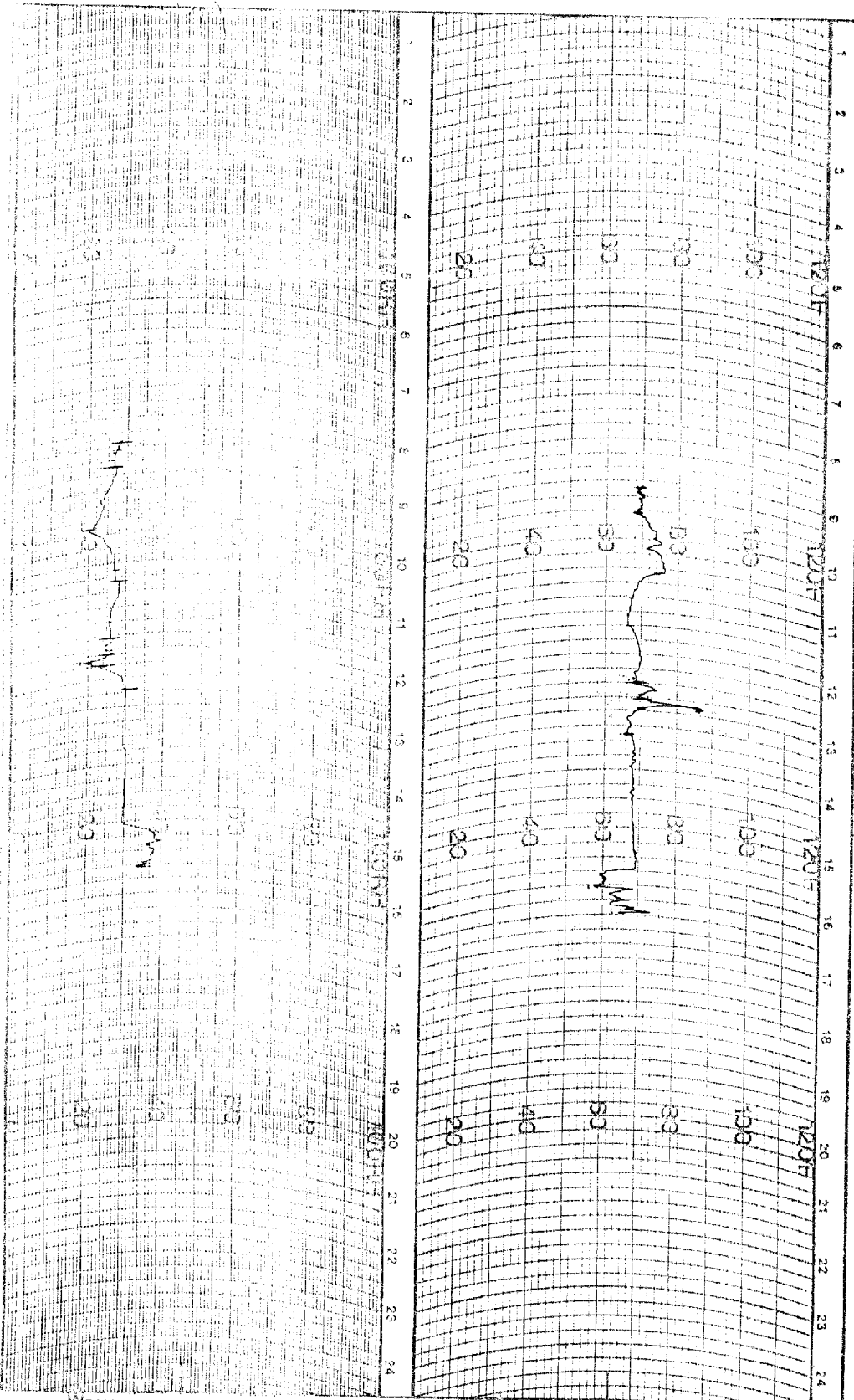
HYGROTHERMOGRAPH
1 DAY

CHART # C311 D HF
PART # 699123

STATION BA

DATE ON 4-27-98

DATE OFF



WEATHER MAN
P.O. BOX 41257
SACRAMENTO, CA 95841
PHONE (916) 481-7000

INT. THERMOGRAPH
1 DAY

CHART # C311 D 1E
PART # 699123

STATION

DATE ON

4-27-98

DATE OFF