

V3253
THROUGH
V3256

**1991 Dodge Caravan
into 12-Inch Diameter Centered Pole
in Support of
Crash III Damage Algorithm Reformulation**

TRC Test Nos.: 960404-1

960404-2

960404-3

960404-4

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**April - May 1996
Final Report**

**Prepared For:
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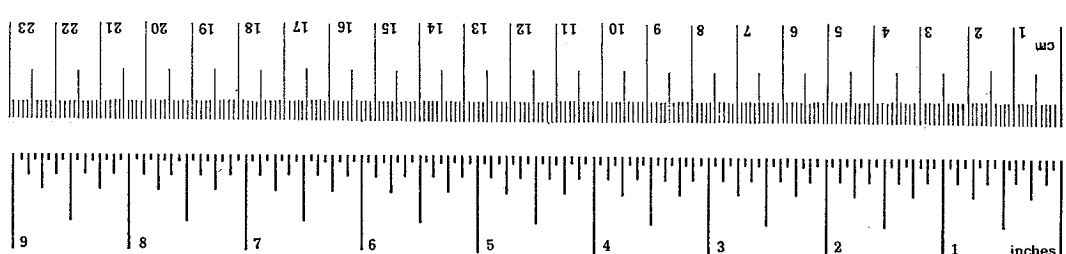
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16. Abstract This test was conducted for research and development in support of the CRASH III damage algorithm reformulation. These tests were conducted on a 1988 Dodge Caravan, VIN 2B4GK25K7MR323484, at Transportation Research Center Inc. on April 4, 1996.																							
<table border="1"> <thead> <tr> <th>Test Number</th> <th>Test Date</th> <th>Impact Speed</th> <th>Maximum Cumulative Crush</th> </tr> </thead> <tbody> <tr> <td>960404-1</td> <td>04/04/96</td> <td>16.1</td> <td>281 mm</td> </tr> <tr> <td>960404-2</td> <td>04/04/96</td> <td>24.2</td> <td>471 mm</td> </tr> <tr> <td>960404-3</td> <td>04/04/96</td> <td>32.4</td> <td>648 mm</td> </tr> <tr> <td>960404-4</td> <td>04/04/96</td> <td>56.5</td> <td>1188 mm</td> </tr> </tbody> </table>				Test Number	Test Date	Impact Speed	Maximum Cumulative Crush	960404-1	04/04/96	16.1	281 mm	960404-2	04/04/96	24.2	471 mm	960404-3	04/04/96	32.4	648 mm	960404-4	04/04/96	56.5	1188 mm
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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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



* 1 in. = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 288, Units of Weights and Measures, Price \$2.25, SD Catalog No. C13.10/288.

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Section 1.0

Purpose and Test Procedure

Purpose and Test Procedure

The purpose of these 12-inch diameter centered pole impact tests was for research and development in support of the CRASH3 damage algorithm reformulation.

The 1991 Dodge Caravan minivan was equipped with a 2.5-liter, 4-cylinder, transverse, gasoline engine with a 3-speed automatic transmission. The test weight of the vehicle was 1723 kilograms.

The vehicle was instrumented with eleven (11) accelerometers to measure vehicle X-axis, Y-axis, and Z-axis accelerations.

The crash test event was recorded by three (3) high-speed motion picture cameras operating at approximately 1000 frames per second.

Data Acquisition Explanations

Test No. 960404-4

The vehicle left front sill x-axis accelerometer, LFSXG1, exceeded the data channel's full scale range at approximately 20 milliseconds. This anomaly affected the velocity and displacement, LFSXV1 and LFSXD1, calculations.

The vehicle left front sill Z-axis accelerometer, LFSZG1, exceeded the data channel's full scale range at approximately 15 milliseconds. This anomaly affected the velocity and displacement, LFSZV1 and LFSZD1, calculations.

The vehicle right front sill X-axis accelerometer, RFSXG1, exceeded the data channel's full scale range at approximately 60 milliseconds. This anomaly affected the velocity and displacement, RFSXV1 and RFSXD1, calculations.

Section 2.0

Vehicle and Test Data

Table 1 Test Vehicle Information, Cont'd.

Tires On Vehicle (Mfr., Line, Size): Supreme A/S, Ultra 875, P195/75R14

Tire Pressure With Maximum Capacity Vehicle Load: Front: 241 kPa

Rear: 241 kPa

Spare Tire (Mfr., Line, Size): Goodyear, Temp, T125/70D15

Type of Seats: Front: Bucket

Rear: Bench

Type of Front Seat Backs: Adjustable

Maximum Width: 1850 mm

Wheelbase: 2855 mm

Distance from 3rd axle centerline to front wheel centerline: 530 mm

Location of Label Stating Tire Data: The label was located on the driver's door.

Tire & Capacity Data From Vehicle's Label:

Recommended Tire Size: P195/75R14

Recommended Cold Tire Pressure:

Front: 241 kPa

Rear: 241 kPa

Designated Seating Capacity:

Front: NA

Rear: NA

Total: NA

Vehicle Capacity Weight: NA

Test Vehicle Attitude:

Delivered Attitude: LF 752 mm; RF 736 mm; LR 810 mm; RR 795 mm

Pre-Test Attitude: LF 833 mm; RF 817 mm; LR 781 mm; RR 772 mm

Post-Test Attitude 1: LF 822 mm; RF 813 mm; LR 778 mm; RR 771 mm

Post-Test Attitude 2: LF 831 mm; RF 810 mm; LR 779 mm; RR 763 mm

Post-Test Attitude 3: LF 851 mm; RF 805 mm; LR 783 mm; RR 756 mm

Post-Test Attitude 4: LF 816 mm; RF 745 mm; LR 816 mm; RR 716 mm

Table 1 Test Vehicle Information, Cont'd.

Weight of Test Vehicle as Received (With Maximum Fluids):

Right Front	453 kg	Right Rear	335 kg
Left Front	457 kg	Left Rear	311 kg
Total Front Weight	910 kg	(58.5% of total vehicle weight)	
Total Rear Weight	646 kg	(41.5% of total vehicle weight)	
Total Delivered Weight	1556 kg		

Weight of Test Vehicle:

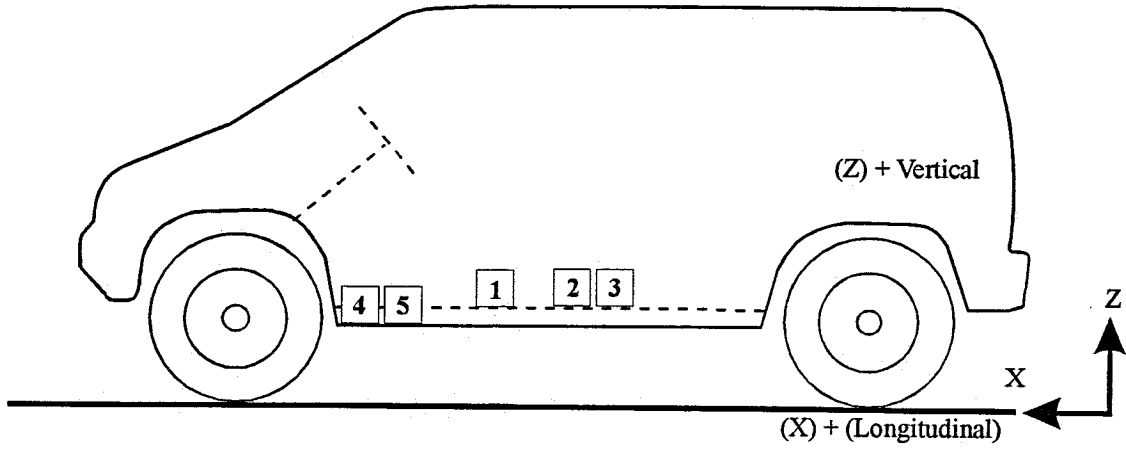
Right Front	608 kg	Right Rear	261 kg
Left Front	616 kg	Left Rear	238 kg
Total Front Weight	1224 kg	(71.0% of total vehicle weight)	
Total Rear Weight	499 kg	(29.0% of total vehicle weight)	
Total Test Weight	1723 kg		

Weight of ballast secured in vehicle cargo area: 0 kg

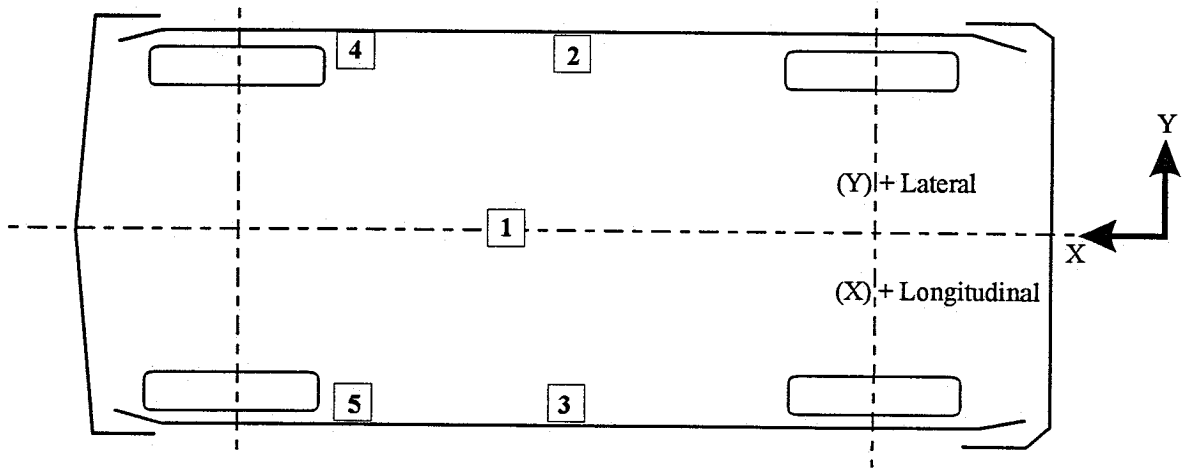
Components removed to meet target test weight: None

CG rearward of front wheel centerline: 827 mm

Figure 1 Vehicle Accelerometer Placement



Side View



Bottom View

Figure 2 Pre-Test And Post-Test Measurement Points

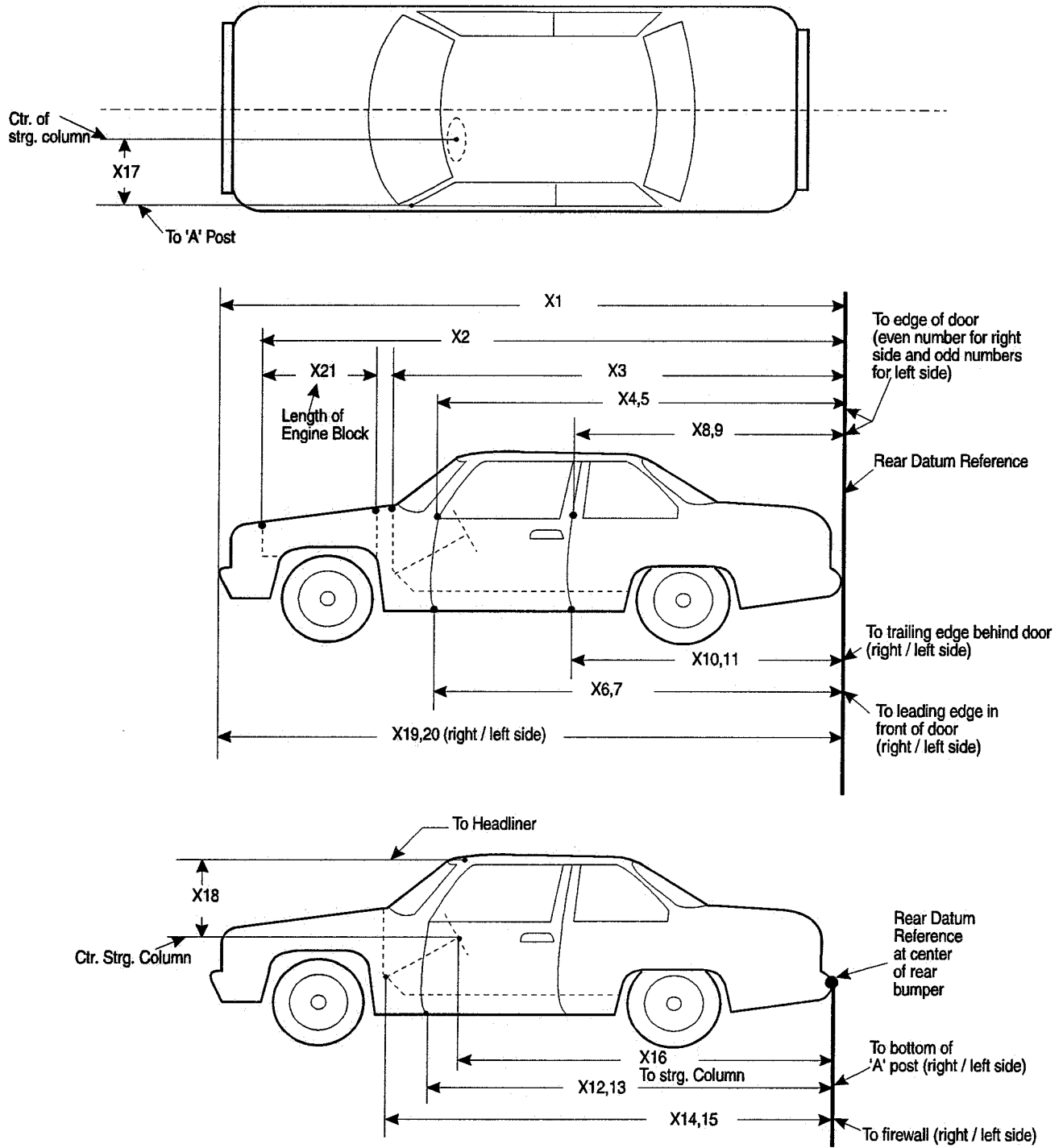


Figure 3 Camera Positions

Test Numbers 960404-1, 960404-2, 960404-3, and 960404-4

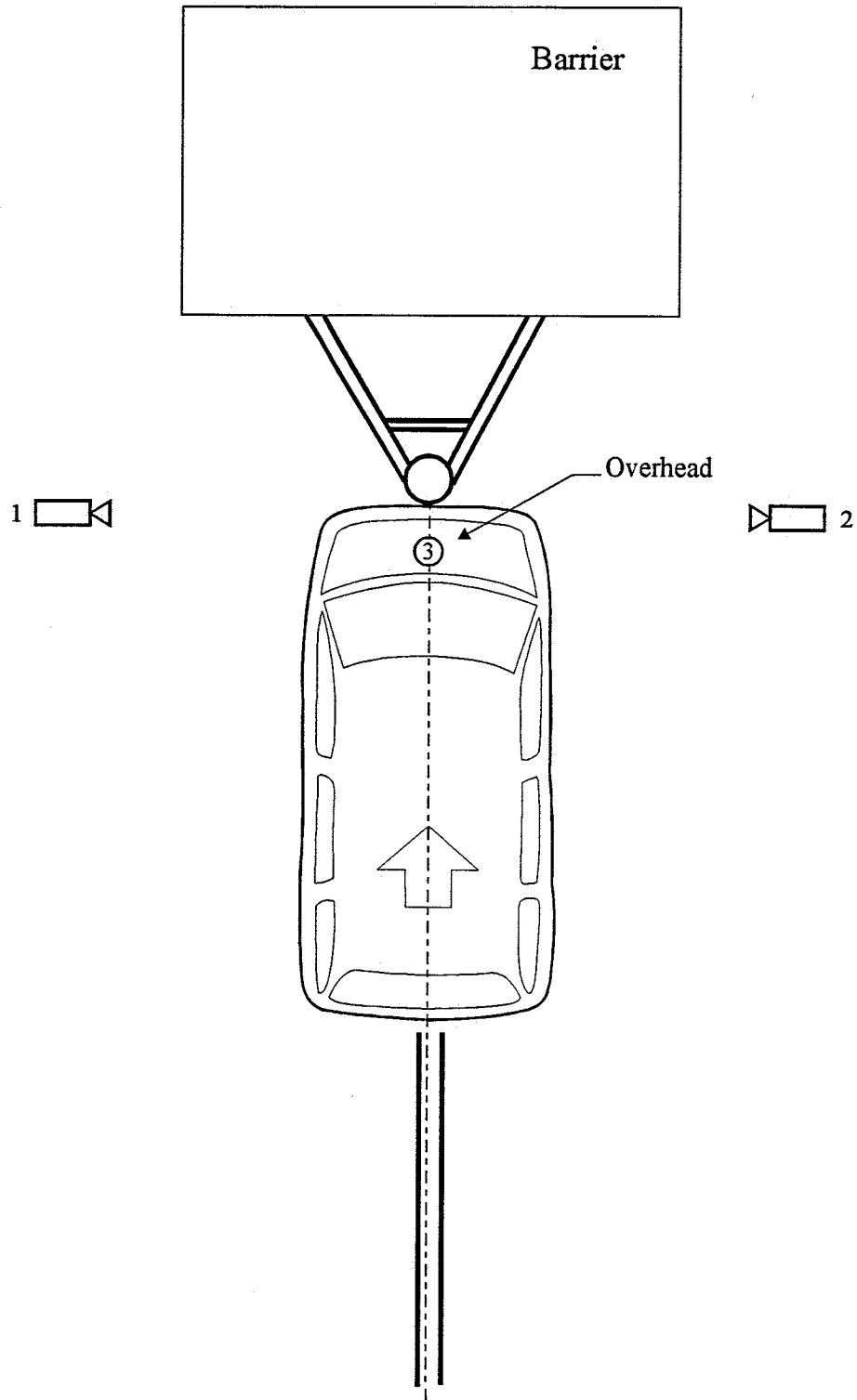


Table 2 Crush Measurements at Vehicle Bumper Height (580 mm), Cont'd.

LOCATION	24	25	26	27	28	29	30	31
	X	Y	X	Y	X	Y	X	Y
PRE-TEST	1010	594	945	615	855	624	780	643
POST-TEST 1	832	427	765	477	709	521	655	565
POST-TEST 2	757	509	710	580	676	642	644	710
POST-TEST 3	713	610	683	659	666	722	655	786
POST-TEST 4	821	1010	856	1086	891	1133	930	1178

LOCATION	32	33	34	35	36	37	38	39
	X	Y	X	Y	X	Y	X	Y
PRE-TEST	535	862	517	936	506	1011	505	1091
POST-TEST 1	579	880	607	944	636	1001	666	1082
POST-TEST 2	685	1028	733	1083	788	1140	839	1189
POST-TEST 3	787	1076	898	1116	913	1150	977	1197
POST-TEST 4	1224	1288	1298	1278	1392	1260	1441	1248

LOCATION	40	41	42	43	44	45	46	47
	X	Y	X	Y	X	Y	X	Y
PRE-TEST	486	1465	487	1548	495	1623	499	1700
POST-TEST 1	768	1408	728	1477	695	1541	664	1598
POST-TEST 2	1005	1404	958	1348	904	1537	850	1590
POST-TEST 3	1182	1352	1135	1406	1092	1461	1017	1495
POST-TEST 4	1620	1441	1655	1475	1492	1430	1404	1426

All measurements are in millimeters. Column readings are 75 millimeters apart starting on the left side of the vehicle.

All X-axis measurements taken from a reference plane 4800 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 915 millimeters from and parallel to the vehicle's right rear bumper edge.

Table 2 Crush Measurements at Vehicle Bumper Height (580 mm), Cont'd.

LOCATION	72	73	74	75	76	77	78	79
	X	Y	X	Y	X	Y	X	Y
PRE-TEST	2222	2330	2370	2445	2520	2330	2670	2750
POST-TEST 1	2222	2330	2370	2445	2520	2330	2670	2750
POST-TEST 2	2222	2330	2370	2445	2520	2330	2670	2750
POST-TEST 3	2230	2294	2389	2453	2528	2299	2678	2755
POST-TEST 4	2216	2301	2366	2440	2515	2303	2665	2745

LOCATION	80	81	82	83	84	85	86	87
	X	Y	X	Y	X	Y	X	Y
PRE-TEST	2819	2331	2370	2445	2520	2330	2670	2750
POST-TEST 1	2819	2331	2370	2445	2520	2330	2670	2750
POST-TEST 2	2819	2331	2370	2445	2520	2330	2670	2750
POST-TEST 3	2825	2303	2389	2453	2528	2299	2678	2755
POST-TEST 4	2813	2302	2366	2440	2515	2303	2665	2745

LOCATION	88	89	90	91	92	93	94	95
	X	Y	X	Y	X	Y	X	Y
PRE-TEST								
POST-TEST 1								
POST-TEST 2								
POST-TEST 3								
POST-TEST 4								

All measurements are in millimeters. Column readings are 75 millimeters apart starting on the left side of the vehicle.

All X-axis measurements taken from a reference plane 4800 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 915 millimeters from and parallel to the vehicle's right rear bumper edge.

Section 3.0

Test Summary of Test No. 960404-1

Table 3 Test Conditions

Test No. 960404-1

Date of Test:	04/04/96
Time of Test:	0959
Ambient Temperature at Impact Area:	23° C
Intended Impact Velocity:	16.1 kph
Actual Impact Velocity:	Primary = 16.1 kph Secondary = NA ¹

Subject Vehicle Data:

Maximum Crush at Bumper Height:	281 mm
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¹ No secondary light trap reading.

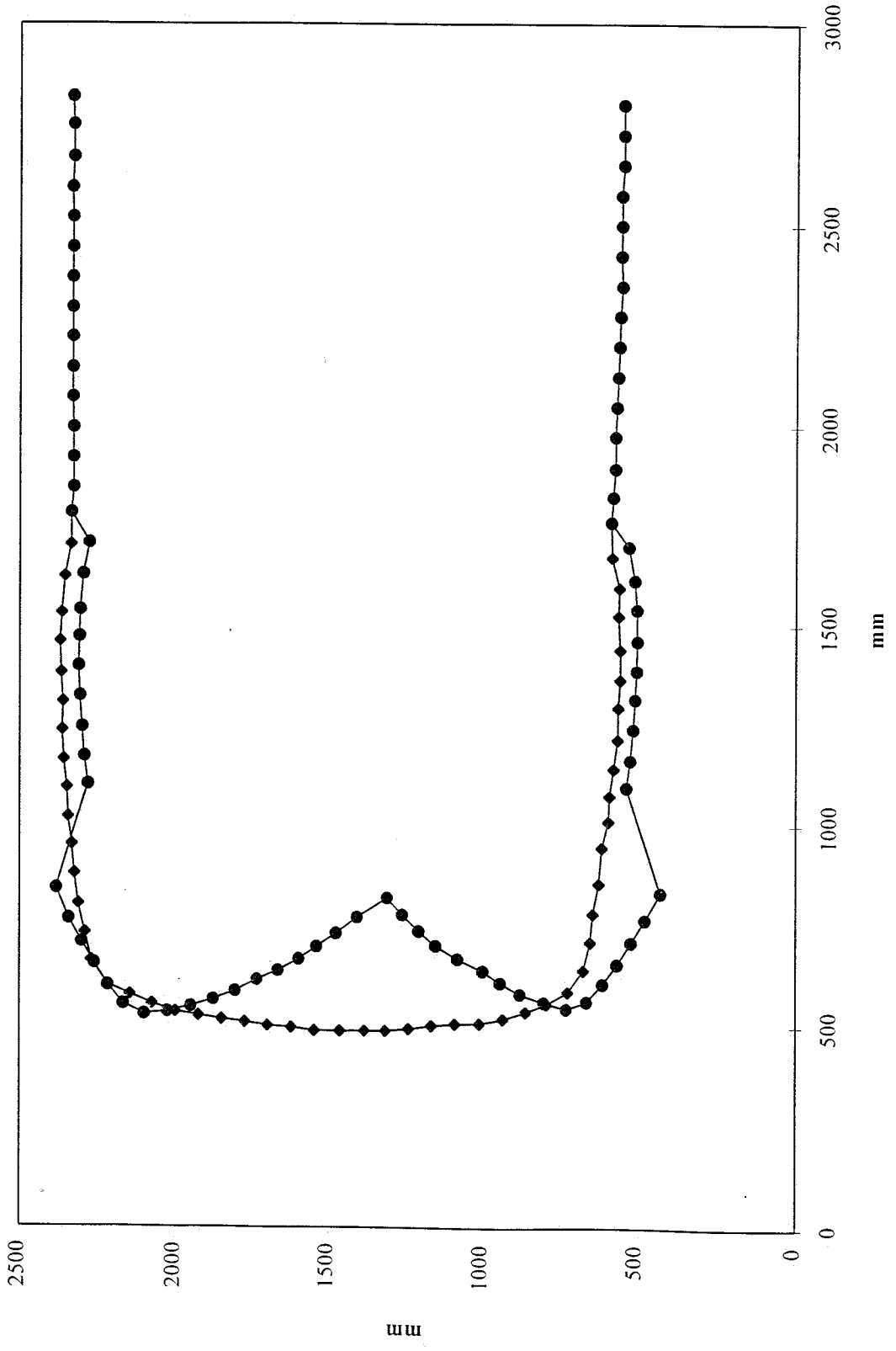
Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 VEHICLE CENTER OF GRAVITY	2544 mm	0 mm	473 mm		
LONGITUDINAL				0.5 g @ 179.7 ms	7.5 g @ 98.8 ms
LATERAL				1.8 g @ 117.9 ms	2.1 g @ 124.4 ms
VERTICAL				4.1 g @ 59.5 ms	2.8 g @ 64.6 ms
RESULTANT				7.5 g @ 98.7 ms	
2 LEFT REAR SILL	2150 mm	572 mm	493 mm		
LONGITUDINAL				0.5 g @ 180.6 ms	7.5 g @ 85.4 ms
VERTICAL				3.7 g @ 94.0 ms	3.7 g @ 15.4 ms
3 RIGHT REAR SILL	2150 mm	-474 mm	493 mm		
LONGITUDINAL				0.7 g @ 177.1 ms	7.3 g @ 98.4 ms
VERTICAL				2.1 g @ 59.1 ms	1.8 g @ 123.4 ms
4 LEFT FRONT SILL	3094 mm	610 mm	452 mm		
LONGITUDINAL				0.5 g @ 180.9 ms	7.6 g @ 84.7 ms
VERTICAL				2.9 g @ 87.8 ms	1.8 g @ 121.4 ms
5 RIGHT FRONT SILL	3095 mm	-625 mm	452 mm		
LONGITUDINAL				0.6 g @ 178.5 ms	7.0 g @ 98.2 ms
VERTICAL				2.0 g @ 102.8 ms	1.6 g @ 132.6 ms

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

Figure 4 Vehicle Crush Profile at Bumper Height

Test No. 960404-1



—◆— pre-test
—●— post-test

Table 6 Vehicle Front Bumper Level (580 mm) Crush

Test No. 960404-1

	Point No.	Pre-test 1	Post-test 1	Crush
C1	29	4160 mm	4238 mm	-78 mm
C2	34	4275 mm	4164 mm	111 mm
C3	38	4306 mm	4025 mm	281 mm
C4	43	4301 mm	4136 mm	165 mm
C5	47	4268 mm	4237 mm	31 mm
C6	51	4141 mm	4249 mm	-108 mm
CL	41	4313 mm	4072 mm	241 mm
FL		1490 mm		

NOTE: FL is the post-test length of the damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

Table 7 Camera Information

Test No. 960404-1

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose of Camera Data</u>
1	Left wide	Photosonic	25	995	Impact overall
2	Right wide	Photosonic	25	1000	Impact overall
3	Overhead	Photosonic	13	998	Impact overall

Section 4.0

Test Summary of Test No. 960404-2

Table 8 Test Conditions

Test No. 960404-2

Date of Test: 04/04/96

Time of Test: 1302

Ambient Temperature at Impact Area: 23° C

Intended Impact Velocity: 24.1 kph

Actual Impact Velocity: Primary = 24.2 kph
Secondary = 24.3 kph

Subject Vehicle Data:

Maximum Crush at Bumper Height: 230 mm

Maximum Cumulative Crush
at Bumper Height: 471 mm

Table 9 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 VEHICLE CENTER OF GRAVITY	2544 mm	0 mm	473 mm		
LONGITUDINAL				0.8 g @ 140.9 ms	15.7 g @ 42.5 ms
LATERAL				6.5 g @ 49.5 ms	6.6 g @ 66.6 ms
VERTICAL				7.4 g @ 51.8 ms	6.1 g @ 11.0 ms
RESULTANT				16.4 g @ 41.5 ms	
2 LEFT REAR SILL	2150 mm	572 mm	493 mm		
LONGITUDINAL				0.9 g @ 140.3 ms	16.5 g @ 41.6 ms
VERTICAL				6.2 g @ 25.0 ms	4.7 g @ 56.6 ms
3 RIGHT REAR SILL	2150 mm	-474 mm	493 mm		
LONGITUDINAL				0.9 g @ 141.9 ms	14.9 g @ 42.2 ms
VERTICAL				4.1 g @ 49.1 ms	3.9 g @ 10.2 ms
4 LEFT FRONT SILL	3094 mm	610 mm	452 mm		
LONGITUDINAL				0.7 g @ 140.8 ms	16.6 g @ 41.6 ms
VERTICAL				4.5 g @ 42.9 ms	5.2 g @ 54.8 ms
5 RIGHT FRONT SILL	3095 mm	-625 mm	452 mm		
LONGITUDINAL				0.9 g @ 141.9 ms	14.1 g @ 42.2 ms
VERTICAL				2.4 g @ 86.2 ms	3.1 g @ 31.6 ms

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

Table 10 Impacted Vehicle Measurements

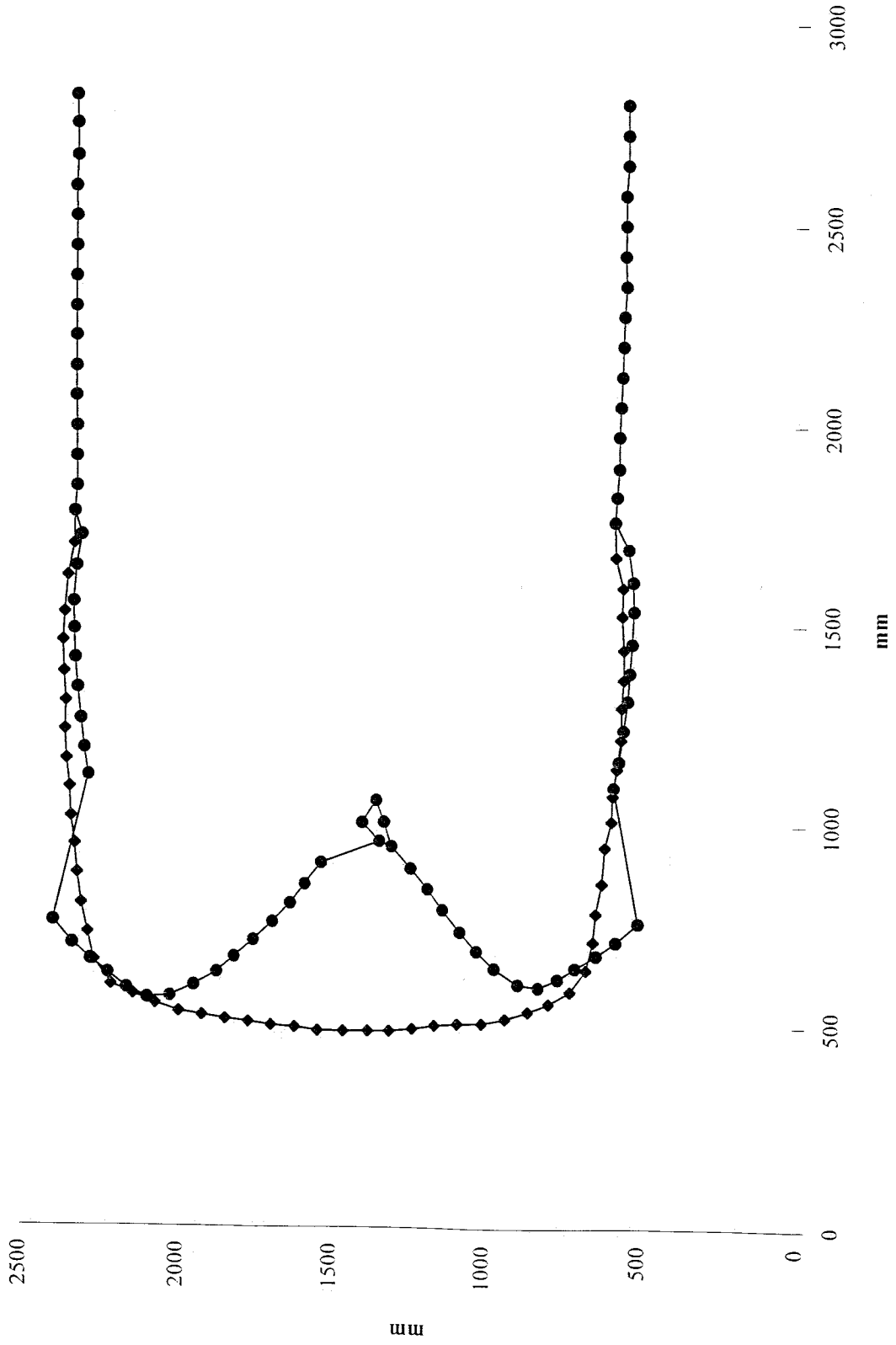
Vehicle Make/Model: Dodge/Caravan

Test Number: 960404-2

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	4265 mm	3993 mm	272 mm
X2	Rear surface of vehicle to front of engine block	NA	NA	NA
X3	Rear surface of vehicle to firewall	NA	NA	NA
X4	Rear surface of vehicle to upper leading edge of right door	3077 mm	3054 mm	23 mm
X5	Rear surface of vehicle to upper leading edge of left door	3070 mm	3067 mm	3 mm
X6	Rear surface of vehicle to lower leading edge of right door	3008 mm	3001 mm	7 mm
X7	Rear surface of vehicle to lower leading edge of left door	3007 mm	3002 mm	5 mm
X8	Rear surface of vehicle to upper trailing edge of right door	1985 mm	1966 mm	19 mm
X9	Rear surface of vehicle to upper trailing edge of left door	1992 mm	1990 mm	2 mm
X10	Rear surface of vehicle to lower trailing edge of right door	1990 mm	1971 mm	19 mm
X11	Rear surface of vehicle to lower trailing edge of left door	1996 mm	1989 mm	7 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3022 mm	3017 mm	5 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3027 mm	3027 mm	0 mm
X14	Rear surface of vehicle to firewall - right side	3284 mm	3275 mm	9 mm
X15	Rear surface of vehicle to firewall - left side	3289 mm	3281 mm	8 mm
X16	Rear surface of vehicle to steering wheel center	2560 mm	2518 mm	42 mm
X17	Center of steering column to "A" post	320 mm	285 mm	35 mm
X18	Center of steering column to headliner	465 mm	498 mm	-33 mm
X19	Rear surface of vehicle to right side of front bumper	4278 mm	4248 mm	30 mm
X20	Rear surface of vehicle to left side of front bumper	4270 mm	4191 mm	79 mm
X21	Length of engine block	NA	NA	NA

Figure 5 Vehicle Crush Profile at Bumper Height

Test No. 960404-2



◆ pre-test
● post-test

Table 11 Vehicle Front Bumper Level (580 mm) Maximum Crush
 Test No. 960404-2

	Point No.	Pre-test 1	Post-test 2	Crush
C1	28	4090 mm	4184 mm	-94 mm
C2	32	4265 mm	4115 mm	150 mm
C3	37	4308 mm	3855 mm	453 mm
C4	44	4293 mm	3998 mm	295 mm
C5	48	4248 mm	4170 mm	78 mm
C6	52	4072 mm	4210 mm	-138 mm
CL	41	4313 mm	3842 mm	471 mm
FL		1365 mm		

NOTE: FL is the post-test length of the damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

Table 12 Camera Information

Test No. 960404-2

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose of Camera Data</u>
1	Left wide	Photosonic	25	995	Impact overall
2	Right wide	Photosonic	25	1000	Impact overall
3	Overhead	Photosonic	13	998	Impact overall

Section 5.0

Test Summary

Test No. 960404-3

Table 13 Test Conditions

Test No. 960404-3

Date of Test:	04/04/96
Time of Test:	1505
Ambient Temperature at Impact Area:	23° C
Intended Impact Velocity:	32.2 kph
Actual Impact Velocity:	Primary = 32.4 kph Secondary = 32.5 kph

Subject Vehicle Data:

Maximum Crush at Bumper Height:	188 mm
Maximum Cumulative Crush at Bumper Height:	648 mm

Table 14 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 960404-3	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
No. LOCATION					
1 VEHICLE CENTER OF GRAVITY	2544 mm	0 mm	473 mm		
LONGITUDINAL				0.8 g @ 126.6 ms	23.9 g @ 34.8 ms
LATERAL				5.4 g @ 11.3 ms	5.6 g @ 67.0 ms
VERTICAL				9.1 g @ 32.6 ms	10.4 g @ 21.3 ms
RESULTANT				24.4 g @ 34.8 ms	
2 LEFT REAR SILL LONGITUDINAL VERTICAL	2150 mm	572 mm	493 mm	0.9 g @ 157.0 ms	24.2 g @ 34.2 ms
				11.6 g @ 53.5 ms	11.6 g @ 43.6 ms
3 RIGHT REAR SILL LONGITUDINAL VERTICAL	2150 mm	-474 mm	493 mm	1.1 g @ 126.0 ms	23.0 g @ 34.6 ms
				8.9 g @ 46.6 ms	6.9 g @ 18.4 ms
4 LEFT FRONT SILL LONGITUDINAL VERTICAL	3094 mm	610 mm	452 mm	0.7 g @ 170.1 ms	23.0 g @ 34.2 ms
				13.0 g @ 53.4 ms	12.6 g @ 18.5 ms
5 RIGHT FRONT SILL LONGITUDINAL VERTICAL	3095 mm	-625 mm	452 mm	1.2 g @ 126.1 ms	22.7 g @ 35.7 ms
				8.3 g @ 79.0 ms	10.3 g @ 19.3 ms

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

Table 15 Impacted Vehicle Measurements

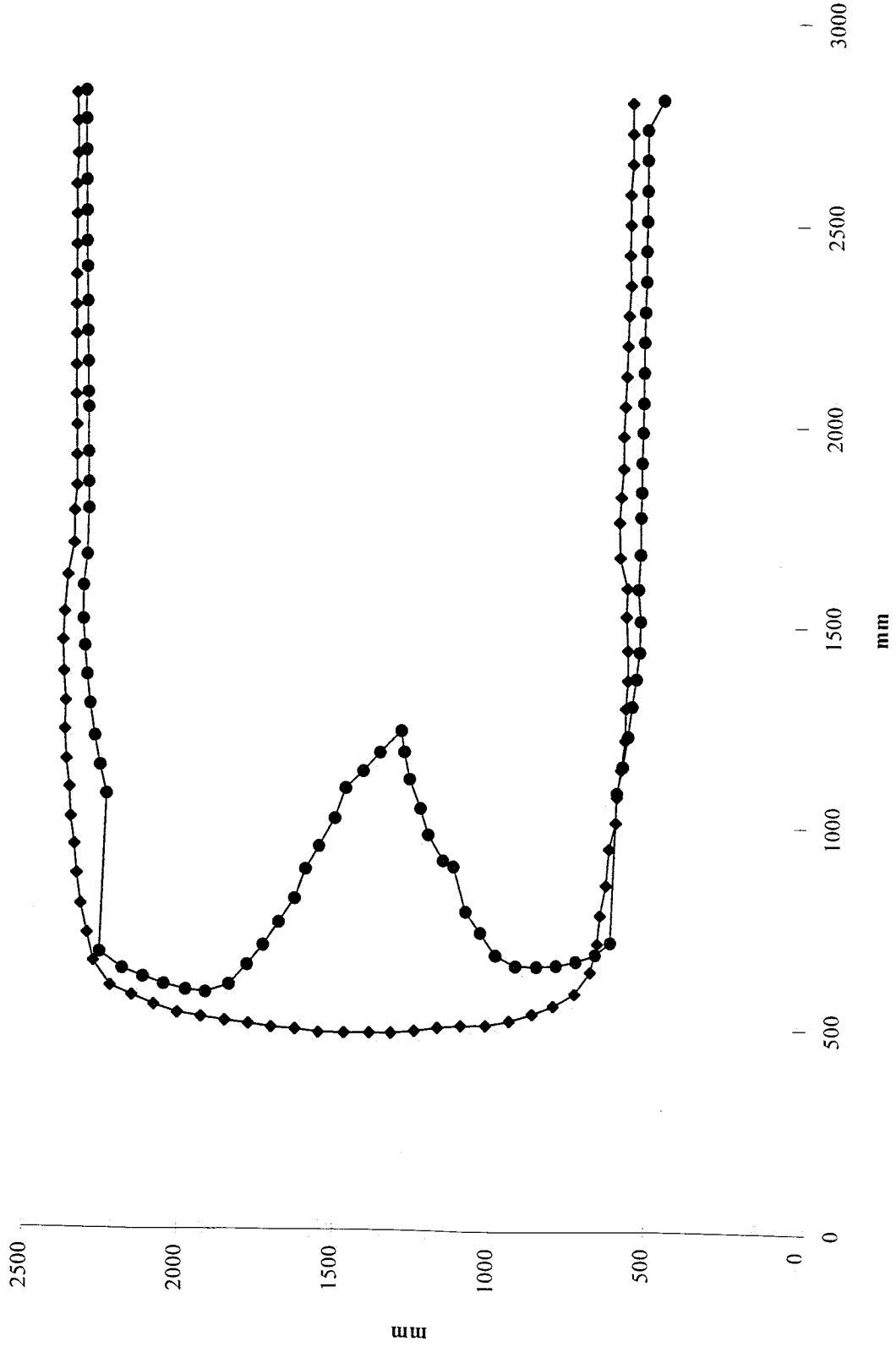
Vehicle Make/Model: Dodge/Caravan

Test Number: 960404-3

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	3993 mm	3882 mm	111 mm
X2	Rear surface of vehicle to front of engine block	NA	NA	NA
X3	Rear surface of vehicle to firewall	NA	NA	NA
X4	Rear surface of vehicle to upper leading edge of right door	3054 mm	3082 mm	-28 mm
X5	Rear surface of vehicle to upper leading edge of left door	3067 mm	3077 mm	-10 mm
X6	Rear surface of vehicle to lower leading edge of right door	3001 mm	3034 mm	-33 mm
X7	Rear surface of vehicle to lower leading edge of left door	3002 mm	3010 mm	-8 mm
X8	Rear surface of vehicle to upper trailing edge of right door	1966 mm	1975 mm	-9 mm
X9	Rear surface of vehicle to upper trailing edge of left door	1990 mm	1995 mm	-5 mm
X10	Rear surface of vehicle to lower trailing edge of right door	1971 mm	1991 mm	-20 mm
X11	Rear surface of vehicle to lower trailing edge of left door	1989 mm	1985 mm	4 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3017 mm	3038 mm	-21 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3027 mm	3471 mm	-444 mm
X14	Rear surface of vehicle to firewall - right side	3275 mm	3253 mm	22 mm
X15	Rear surface of vehicle to firewall - left side	3281 mm	3296 mm	-15 mm
X16	Rear surface of vehicle to steering wheel center	2518 mm	2604 mm	-86 mm
X17	Center of steering column to "A" post	285 mm	293 mm	-8 mm
X18	Center of steering column to headliner	498 mm	444 mm	54 mm
X19	Rear surface of vehicle to right side of front bumper	4248 mm	4248 mm	0 mm
X20	Rear surface of vehicle to left side of front bumper	4191 mm	4140 mm	51 mm
X21	Length of engine block	NA	NA	NA

Figure 6 Vehicle Crush Profile at Bumper Height

Test No. 960404-3



—◆— pre-test
—●— post-test

Table 16 Vehicle Front Bumper Level (580 mm) Crush

Test No. 960404-3

	Point No.	Pre-test 1	Post-test 3	Crush
C1	26	3945 mm	4134 mm	-189 mm
C2	30	4214 mm	4121 mm	93 mm
C3	35	4295 mm	3823 mm	472 mm
C4	42	4305 mm	3708 mm	597 mm
C5	49	4225 mm	4148 mm	77 mm
C6	54	3925 mm	4180 mm	-255 mm
CL	41	4313 mm	3665 mm	648 mm
FL		1339 mm		

NOTE: FL is the post-test length of the damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

Table 17 Camera Information

Test No. 960404-3

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose of Camera Data</u>
1	Left wide	Photosonic	25	995	Impact overall
2	Right wide	Photosonic	25	1000	Impact overall
3	Overhead	Photosonic	13	998	Impact overall

Section 6.0

Test Summary

Test No. 960404-4

Table 18 Test Conditions

Test No. 960404-4

Date of Test:	04/04/96
Time of Test:	1659
Ambient Temperature at Impact Area:	23° C
Intended Impact Velocity:	56.3 kph
Actual Impact Velocity:	Primary = 56.5 kph Secondary = NA ¹

Subject Vehicle Data:

Maximum Crush at Bumper Height:	439 mm
Maximum Cumulative Crush at Bumper Height:	1188 mm

¹ No light trap velocity was acquired. Test speed was determined using drive stand cable speed.

Table 19 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: No. LOCATION	X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 VEHICLE CENTER OF GRAVITY	2544 mm	0 mm	473 mm		
LONGITUDINAL				2.9 g @ 165.9 ms	31.1 g @ 51.2 ms
LATERAL				19.8 g @ 10.9 ms	11.3 g @ 61.3 ms
VERTICAL				23.7 g @ 42.2 ms	23.4 g @ 49.0 ms
RESULTANT				39.7 g @ 49.2 ms	
2 LEFT REAR SILL	2150 mm	572 mm	493 mm		
LONGITUDINAL				2.6 g @ 126.5 ms	29.8 g @ 27.9 ms
VERTICAL				35.1 g @ 17.3 ms	22.9 g @ 13.0 ms
3 RIGHT REAR SILL	2150 mm	-474 mm	493 mm		
LONGITUDINAL				3.4 g @ 168.1 ms	32.9 g @ 45.8 ms
VERTICAL				10.8 g @ 26.8 ms	20.2 g @ 45.4 ms
4 LEFT FRONT SILL	3094 mm	610 mm	452 mm		
LONGITUDINAL ¹				21.9 g @ 42.5 ms	122.4 g @ 20.0 ms
VERTICAL ¹				47.5 g @ 13.6 ms	108.8 g @ 21.7 ms
5 RIGHT FRONT SILL	3095 mm	-625 mm	452 mm		
LONGITUDINAL ¹				6.1 g @ 169.3 ms	43.5 g @ 46.6 ms
VERTICAL				16.2 g @ 66.5 ms	14.9 g @ 33.1 ms

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

¹ See DATA ACQUISITION EXPLANATIONS

Table 20 Impacted Vehicle Measurements

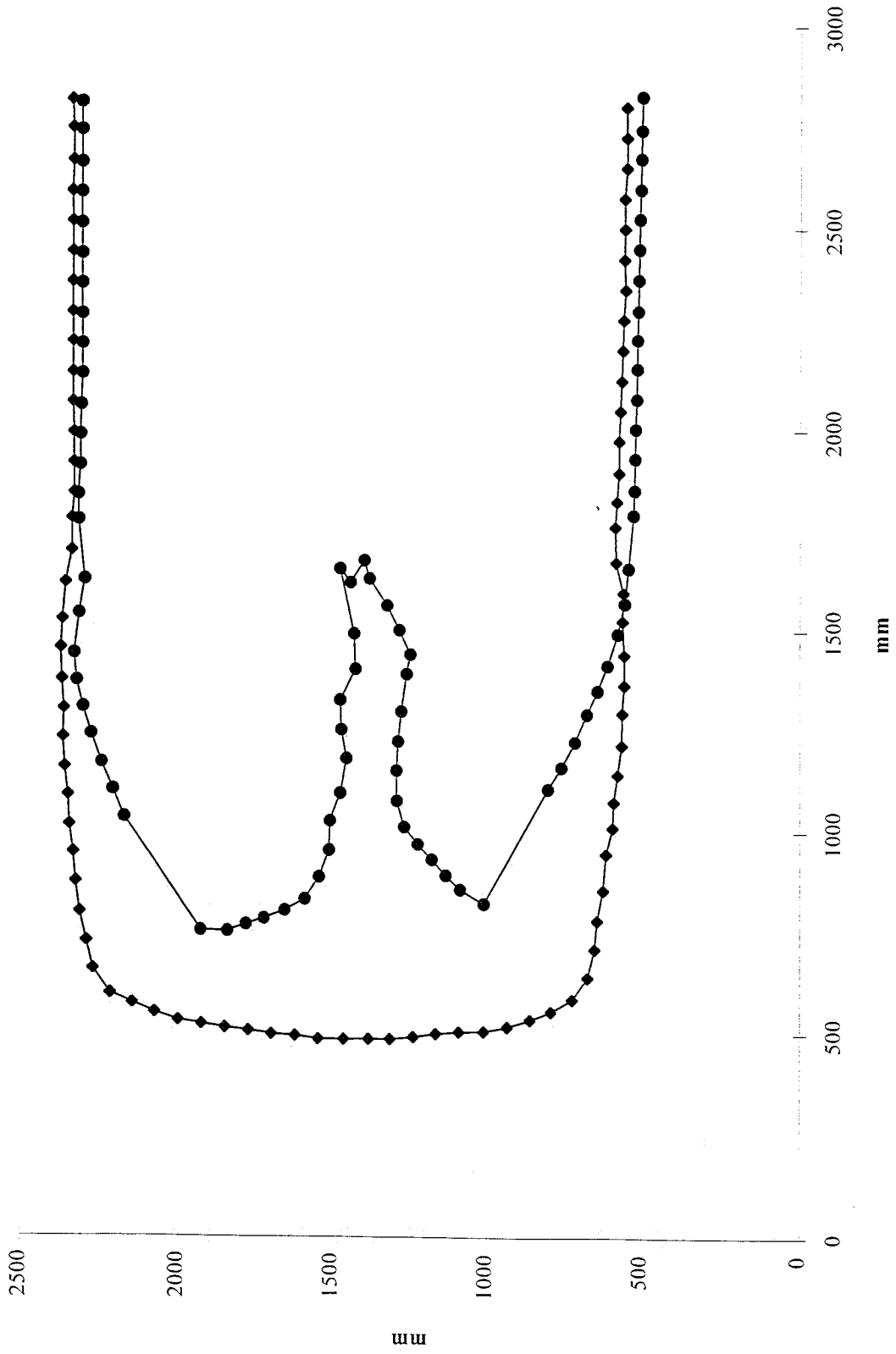
Vehicle Make/Model: Dodge/Caravan

Test Number: 960404-4

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	3882 mm	3348 mm	534 mm
X2	Rear surface of vehicle to front of engine block	3642 mm	3772 mm	-130 mm
X3	Rear surface of vehicle to firewall	3391 mm	3732 mm	-341 mm
X4	Rear surface of vehicle to upper leading edge of right door	3082 mm	3088 mm	-6 mm
X5	Rear surface of vehicle to upper leading edge of left door	3077 mm	3071 mm	6 mm
X6	Rear surface of vehicle to lower leading edge of right door	3034 mm	3017 mm	17 mm
X7	Rear surface of vehicle to lower leading edge of left door	3010 mm	3001 mm	9 mm
X8	Rear surface of vehicle to upper trailing edge of right door	1975 mm	2001 mm	-26 mm
X9	Rear surface of vehicle to upper trailing edge of left door	1995 mm	1972 mm	23 mm
X10	Rear surface of vehicle to lower trailing edge of right door	1991 mm	2010 mm	-19 mm
X11	Rear surface of vehicle to lower trailing edge of left door	1985 mm	1983 mm	2 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3038 mm	3032 mm	6 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3471 mm	3022 mm	449 mm
X14	Rear surface of vehicle to firewall - right side	3253 mm	3138 mm	115 mm
X15	Rear surface of vehicle to firewall - left side	3296 mm	3204 mm	92 mm
X16	Rear surface of vehicle to steering wheel center	2604 mm	2502 mm	102 mm
X17	Center of steering column to "A" post	293 mm	224 mm	69 mm
X18	Center of steering column to headliner	444 mm	357 mm	87 mm
X19	Rear surface of vehicle to right side of front bumper	4248 mm	4108 mm	140 mm
X20	Rear surface of vehicle to left side of front bumper	4140 mm	4097 mm	43 mm
X21	Length of engine block	NA	NA	NA

Figure 7 Vehicle Crush Profile at Bumper Height

Test No. 960404-4



—◆— pre-test
-●- post-test

Table 21 Vehicle Front Bumper Level (580 mm) Crush

Test No. 960404-4

	Point No.	Pre-test 1	Post-test 4	Crush
C1	24	3790 mm	3979 mm	-189 mm
C2	27	4020 mm	3870 mm	150 mm
C3	39	4313 mm	3125 mm	1188 mm
C4	49	4225 mm	3847 mm	378 mm
C5	53	4000 mm	4048 mm	-48 mm
C6	56	3784 mm	4046 mm	-262 mm
CL	39	4313 mm	3125 mm	1188 mm
FL		885 mm		

NOTE: FL is the post-test length of the damaged surface.

Measurements C1 - C6 were spaced equally apart over the post-impact length of the damaged surface. This distance is defined as length "FL" on the vehicle crush profile plot.

Table 22 Camera Information

Test No. 960404-4

<u>Camera Number</u>	<u>Location</u>	<u>Type</u>	<u>Lens (mm)</u>	<u>Speed (fps)</u>	<u>Purpose of Camera Data</u>
1	Left wide	Photosonic	25	1000	Impact overall
2	Right wide	Photosonic	25	1000	Impact overall
3	Overhead	Photosonic	13	1000	Impact overall

Appendix A

Photographs

List of Photographs

Test No. 960404-1

1. Pre-Test Front View
2. Post-Test Front View
3. Pre-Test Left Front View
4. Post-Test Left Front View
5. Pre-Test Left Side View
6. Post-Test Left Side View
7. Pre-Test Left Rear View
8. Post-Test Left Rear View
9. Pre-Test Rear View
10. Post-Test Rear View
11. Pre-Test Right Side View
12. Post-Test Right Side View
13. Pre-Test Overhead Alignment View



Figure A-1 Pre-Test Front View



Figure A-2 Post-Test Front View



Figure A-3 Pre-Test Left Front View



Figure A-4 Post-Test Left Front View



Figure A-5 Pre-Test Left Side View



Figure A-6 Post-Test Left Side View



Figure A-7 Pre-Test Left Rear View



Figure A-8 Post-Test Left Rear View



Figure A-9 Pre-Test Rear View



Figure A-10 Post-Test Rear View



Figure A-11 Pre-Test Right Side View



Figure A-12 Post-Test Right Side View

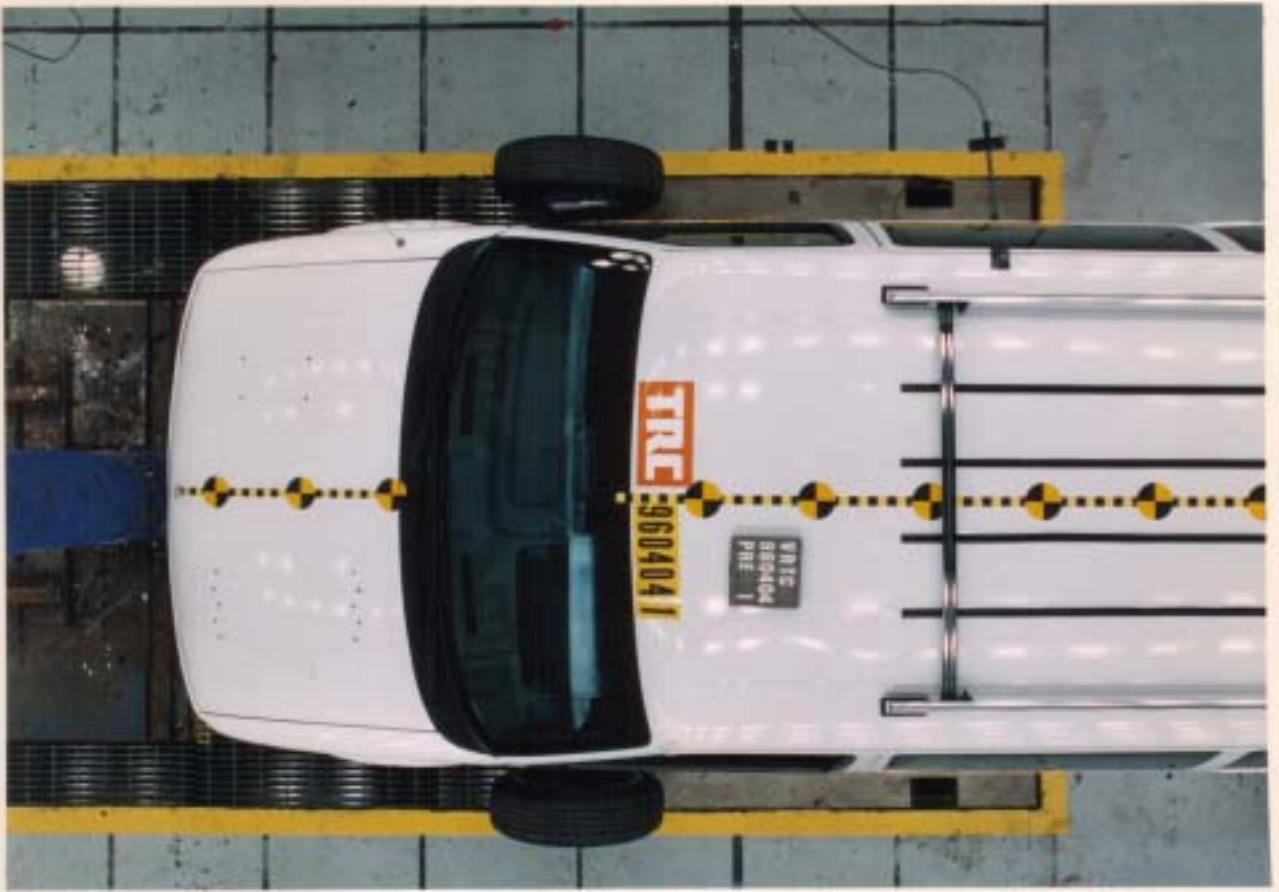


Figure A-13 Pre-Test Overhead Impact Alignment View

List of Photographs

Test No. 960404-2

14. Pre-Test Front View
15. Post-Test Front View
16. Pre-Test Left Front View
17. Post-Test Left Front View
18. Pre-Test Left Side View
19. Post-Test Left Side View
20. Pre-Test Left Rear View
21. Post-Test Left Rear View
22. Pre-Test Rear View
23. Post-Test Rear View
24. Pre-Test Right Side View
25. Post-Test Right Side View
26. Pre-Test Overhead Alignment View



Figure A-14 Pre-Test Front View



Figure A-15 Post-Test Front View



Figure A-16 Pre-Test Left Front View



Figure A-17 Post-Test Left Front View



Figure A-18 Pre-Test Left Side View



Figure A-19 Post-Test Left Side View



Figure A-20 Pre-Test Left Rear View



Figure A-21 Post-Test Left Rear View



Figure A-22 Pre-Test Rear View



Figure A-23 Post-Test Rear View



Figure A-24 Pre-Test Right Side View



Figure A-25 Post-Test Right Side View

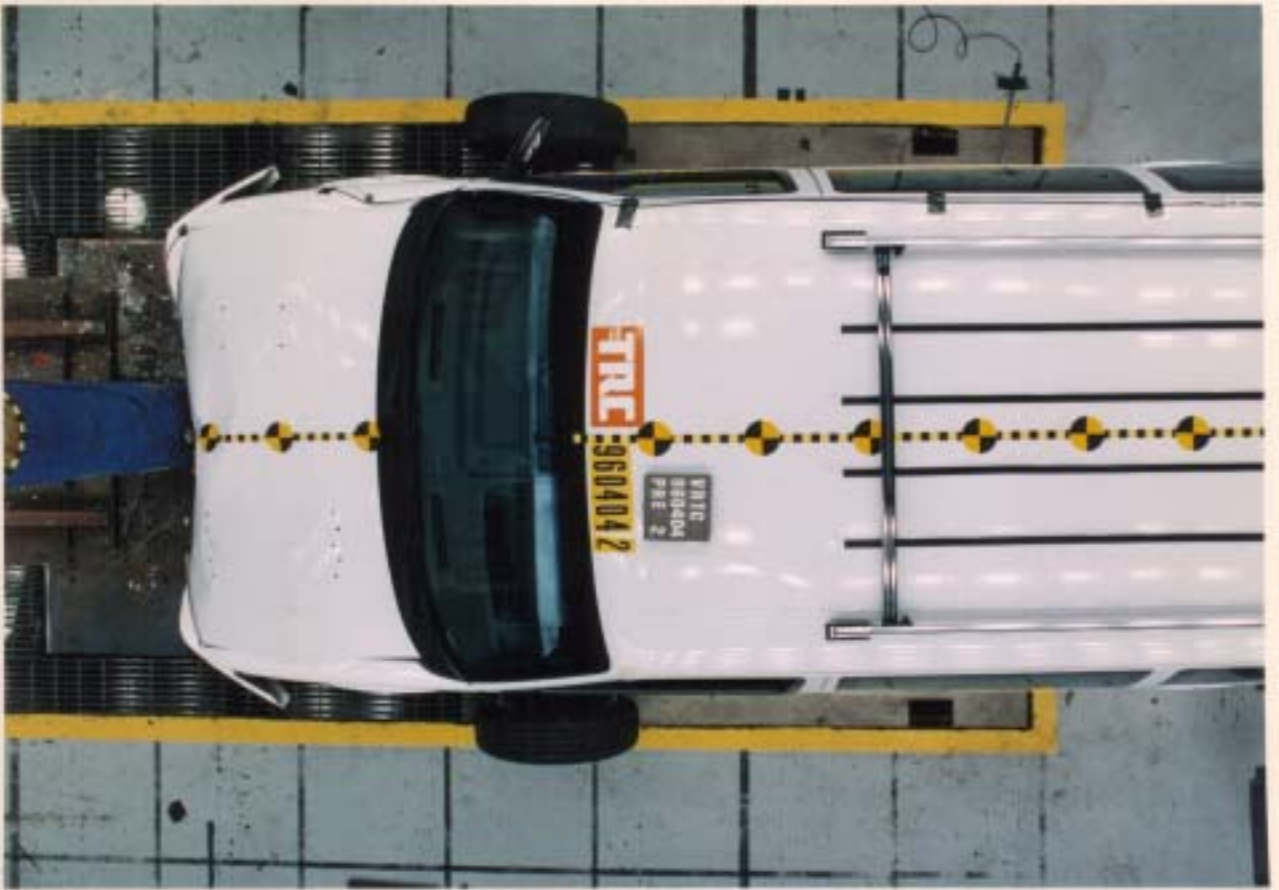


Figure A-26 Pre-Test Overhead Impact Alignment View

List of Photographs

Test No. 960404-3

27. Pre-Test Front View
28. Post-Test Front View
29. Pre-Test Left Front View
30. Post-Test Left Front View
31. Pre-Test Left Side View
32. Post-Test Left Side View
33. Pre-Test Left Rear View
34. Post-Test Left Rear View
35. Pre-Test Rear View
36. Post-Test Rear View
37. Pre-Test Right Side View
38. Post-Test Right Side View
39. Post-Test Overhead Impact Alignment View



Figure A-27 Pre-Test Front View



Figure A-28 Post-Test Front View



Figure A-29 Pre-Test Left Front View



Figure A-30 Post-Test Left Front View



Figure A-31 Pre-Test Left Side View



Figure A-32 Post-Test Left Side View



Figure A-33 Pre-Test Left Rear View



Figure A-34 Post-Test Left Rear View



Figure A-35 Pre-Test Rear View



Figure A-36 Post-Test Rear View



Figure A-37 Pre-Test Right Side View



Figure A-38 Post-Test Right Side View

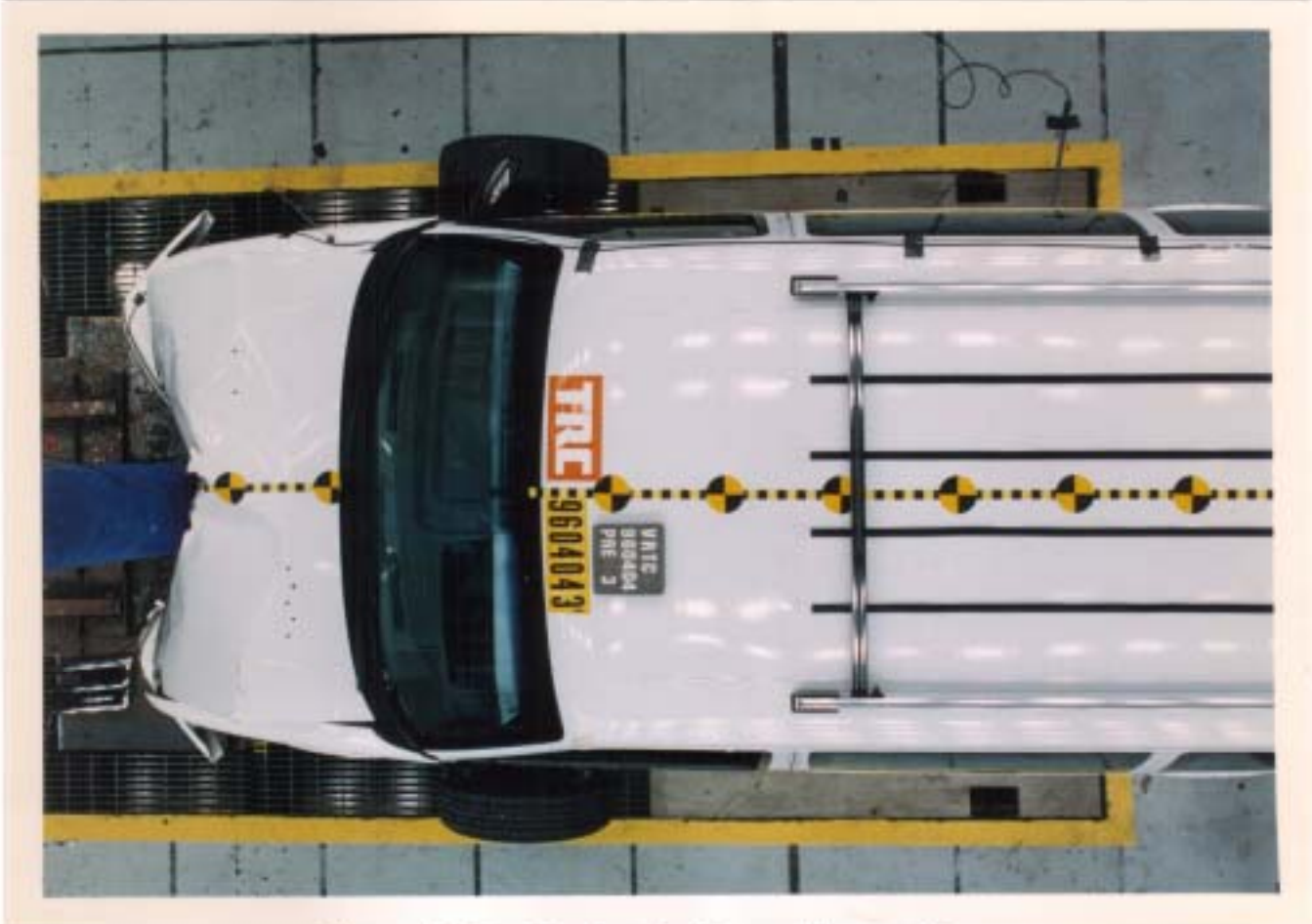


Figure A-39 Pre-Test Overhead Impact Alignment View

List of Photographs

Test No. 960404-4

40. Pre-Test Front View
41. Post-Test Front View
42. Pre-Test Left Front View
43. Post-Test Left Front View
44. Pre-Test Left Side View
45. Post-Test Left Side View
46. Pre-Test Left Rear View
47. Post-Test Left Rear View
48. Pre-Test Rear View
49. Post-Test Rear View
50. Pre-Test Right Side View
51. Post-Test Right Side View



Figure A-40 Pre-Test Front View



Figure A-41 Post-Test Front View



Figure A-42 Pre-Test Left Front View



Figure A-43 Post-Test Left Front View



Figure A-44 Pre-Test Left Side View



Figure A-45 Post-Test Left Side View



Figure A-46 Pre-Test Left Rear View



Figure A-47 Post-Test Left Rear View



Figure A-48 Pre-Test Rear View



Figure A-49 Post-Test Rear View



Figure A-50 Pre-Test Right Side View



Figure A-51 Post-Test Right Side View

Appendix B

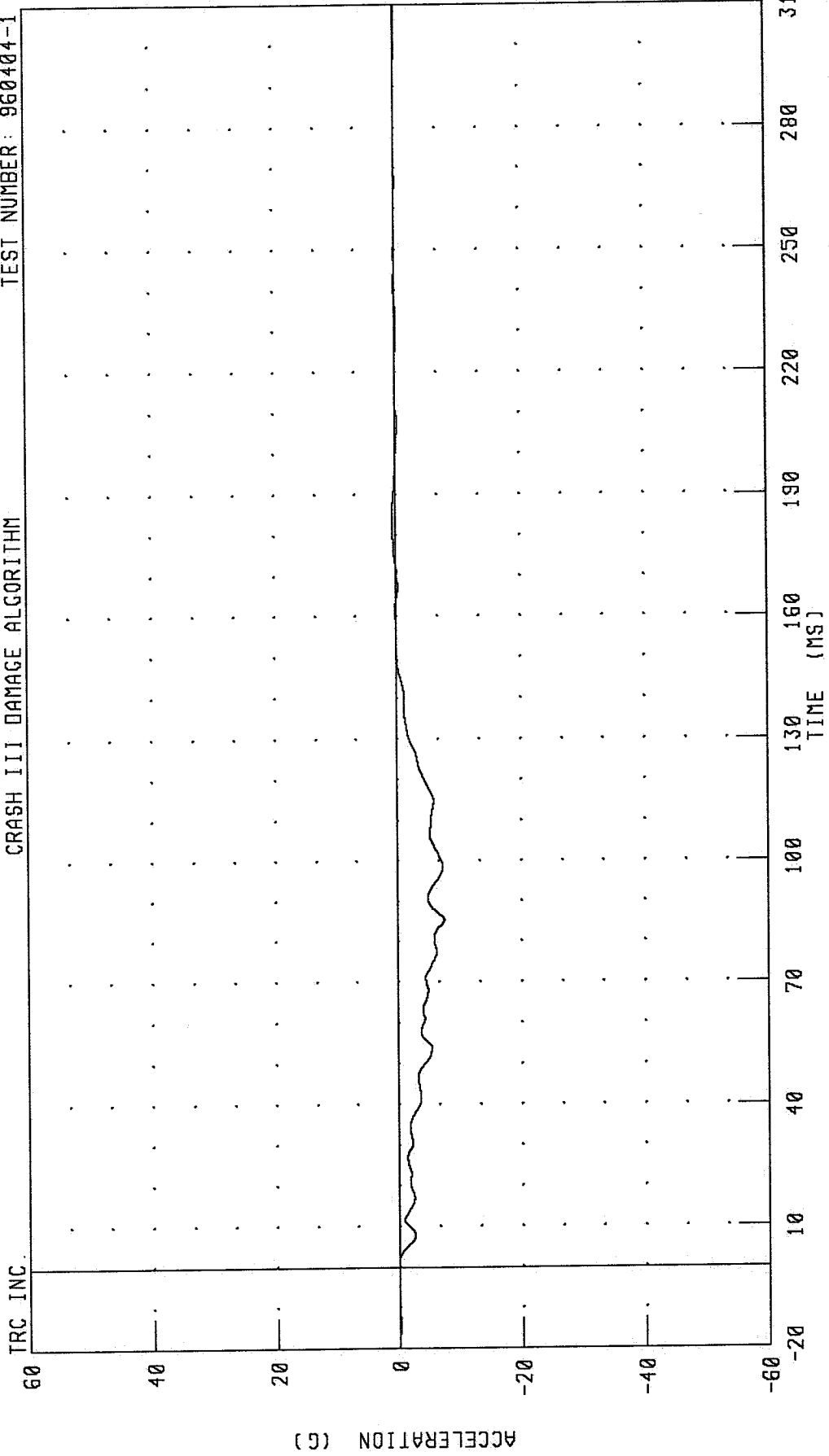
Data Plots

Data Plots

Test No. 960404-1

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



CHANNEL: LRSXG1 FILTER: CH. CLASS 60

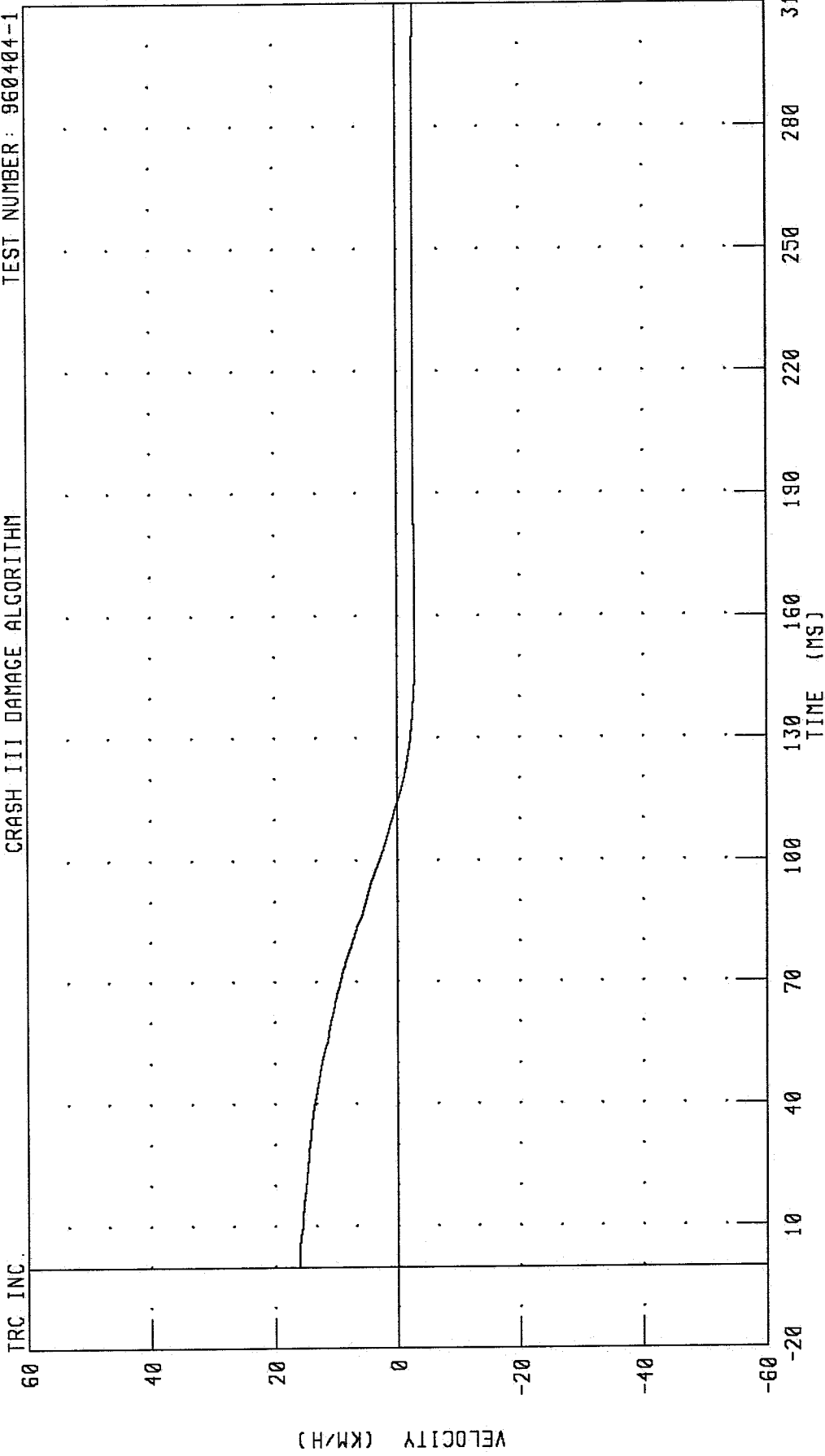
PEAK DATA: 0.52 G @ 180.56 MS; -7.53 G @ 85.36 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

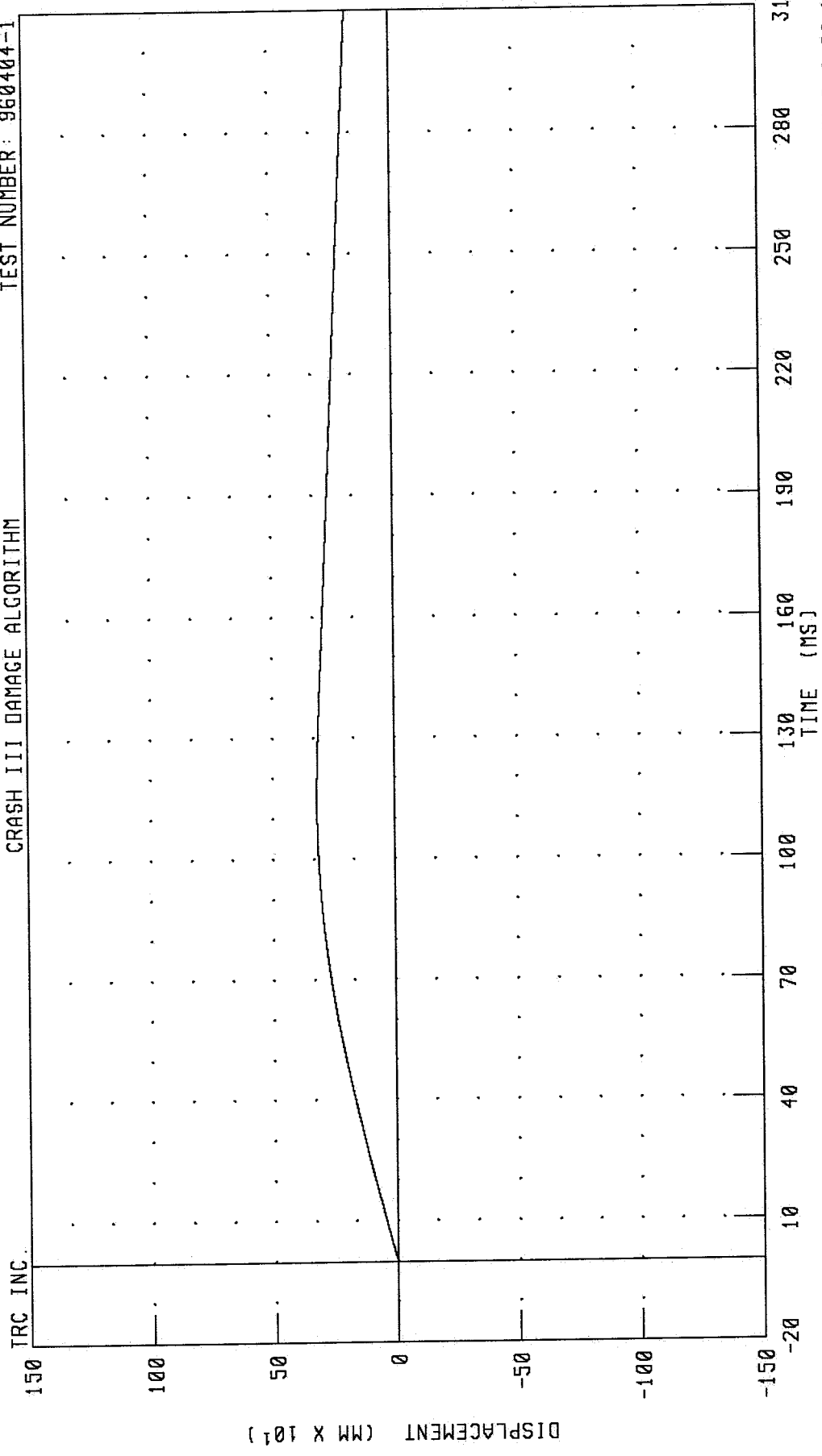


CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 16.10 KM/H @ 0.00 MS; -2.92 KM/H @ 171.92 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

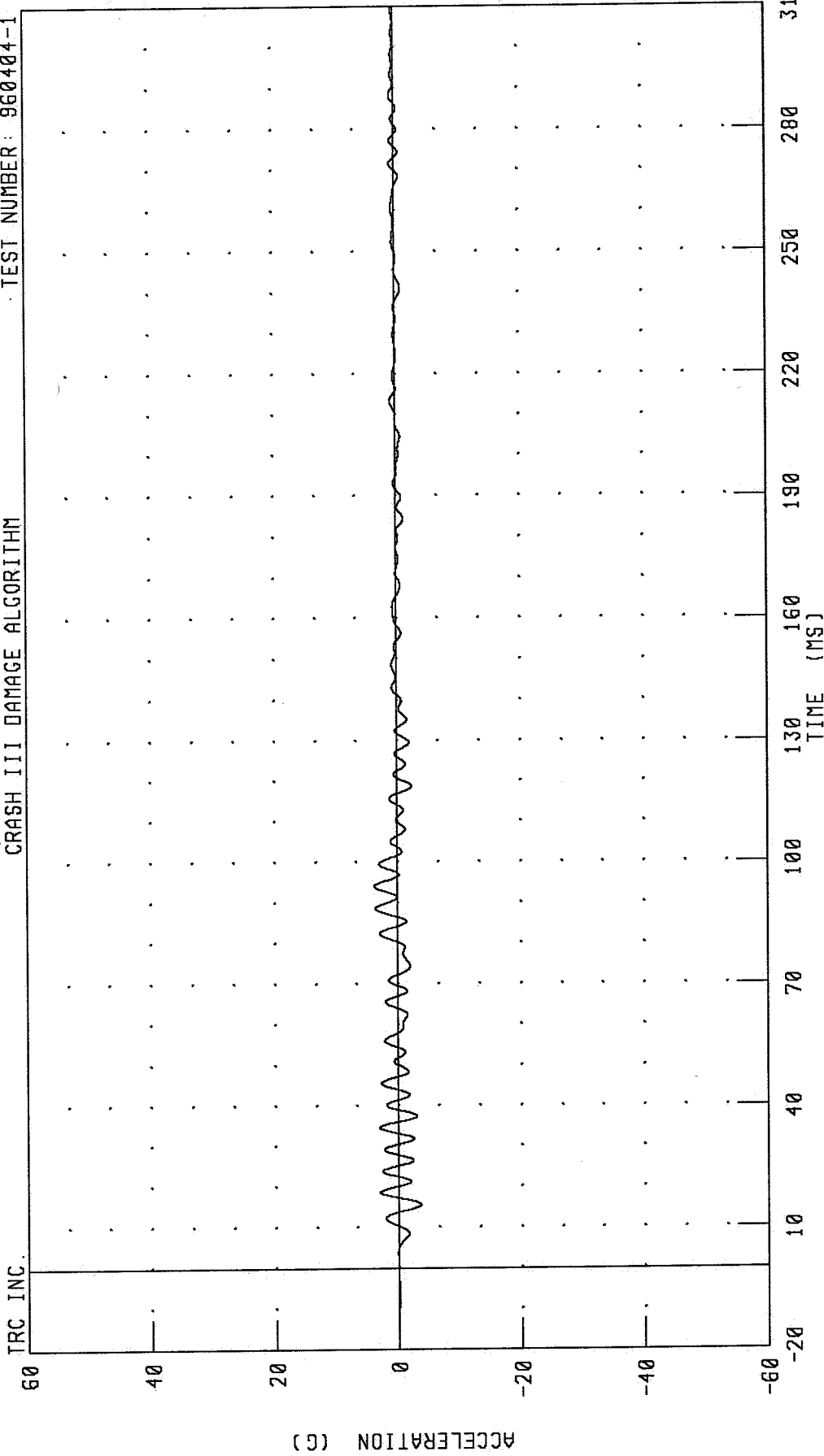
TEST NUMBER: 960404-1



CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 320.66 MM @ 114.40 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

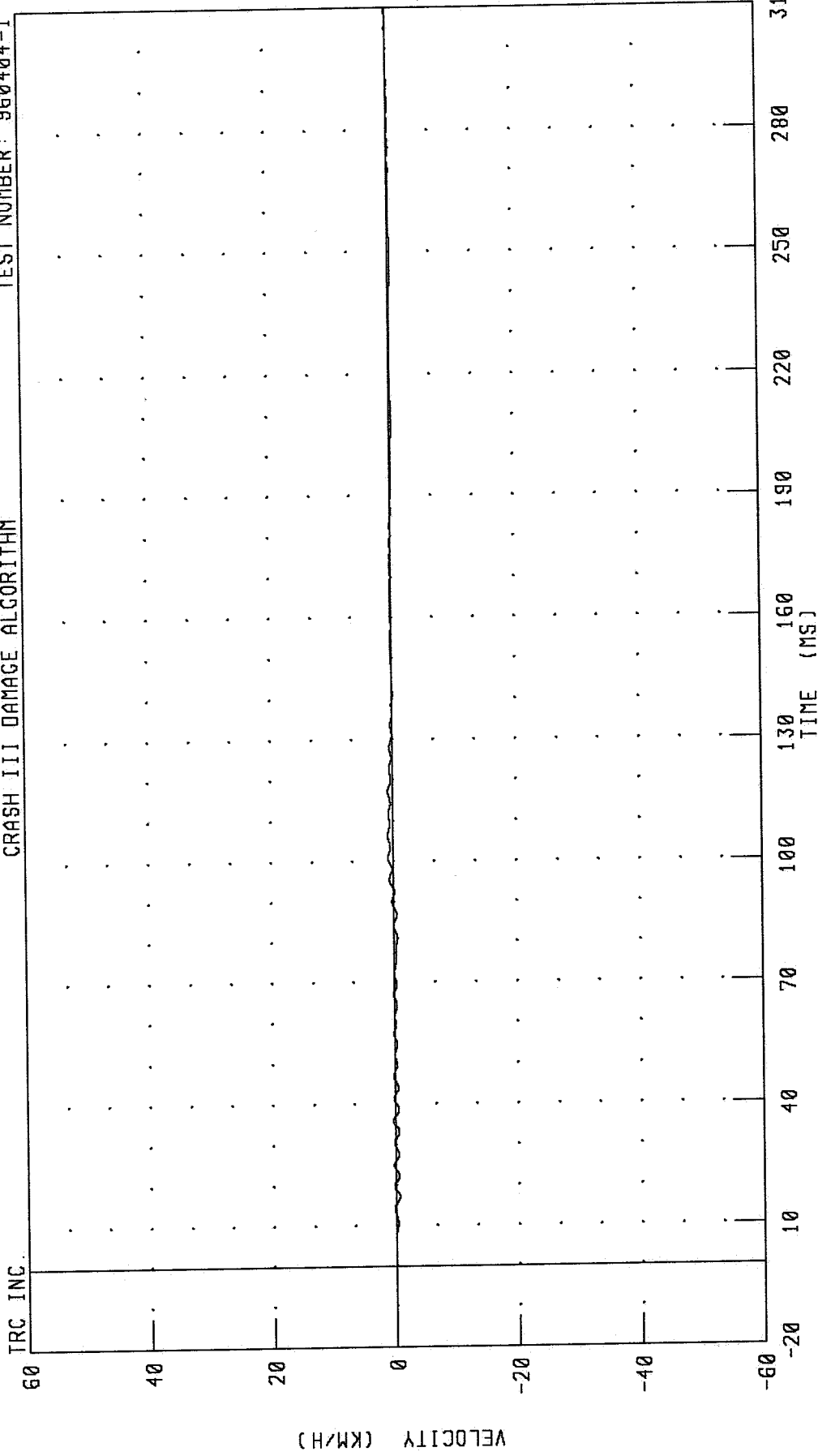
TEST NUMBER: 960404-1



CHANNEL: LRSZG1 FILTER: CH. CLASS 60 PEAK DATA: 3.73 G @ 94.00 MS; -3.68 G @ 15.44 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 LEFT REAR SILL Z-AXIS VELOCITY
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

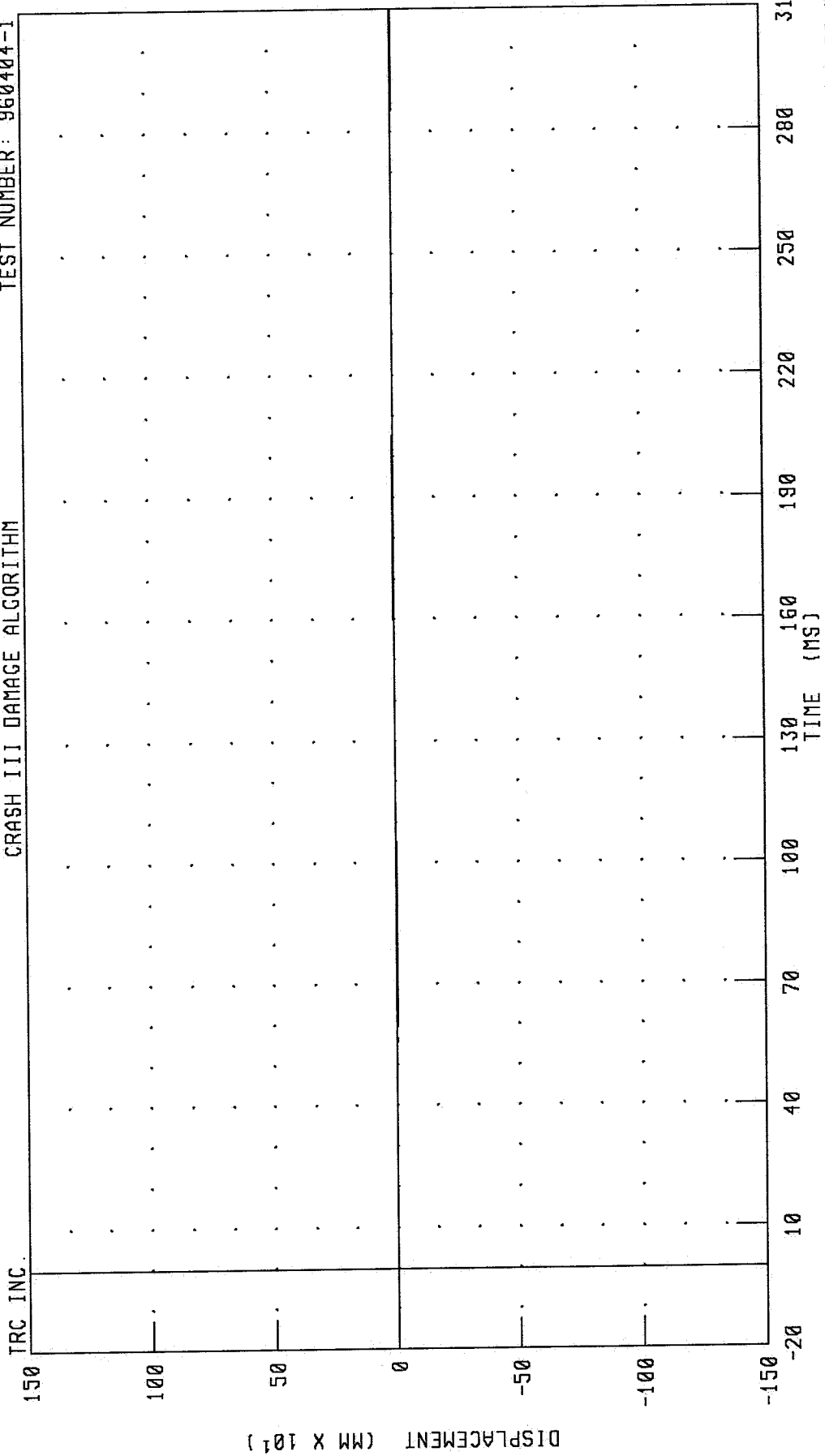


CHANNEL: LRSZV1 FILTER: CH. CLASS 180

PEAK DATA: 0.86 KM/H @ 101.04 MS; -0.66 KM/H @ 17.36 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 LEFT REAR SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

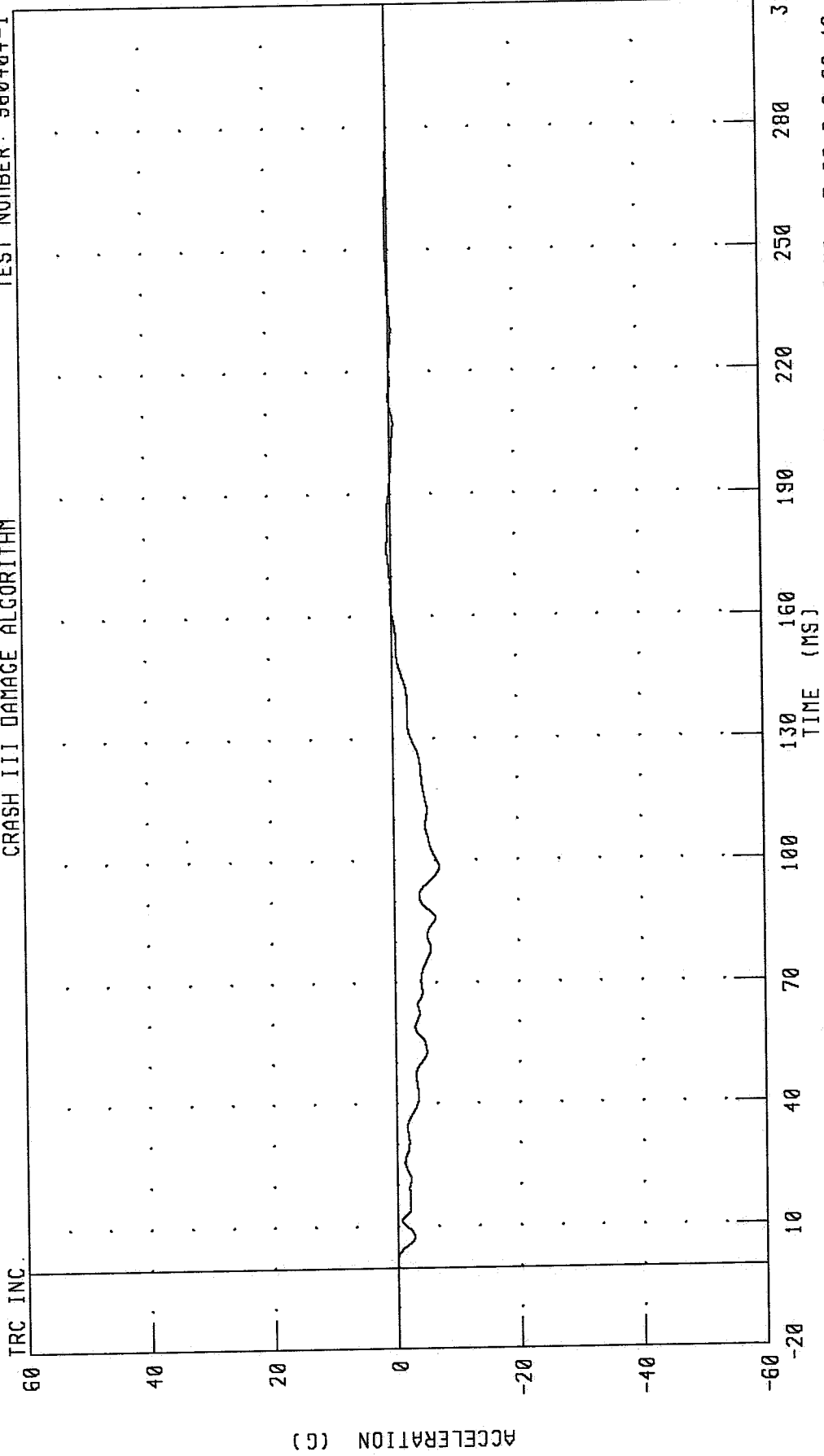


CHANNEL: LRSZD1 FILTER: CH. CLASS 180

PEAK DATA: 3.30 MM @ 184.32 MS; -3.70 MM @ 88.80 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



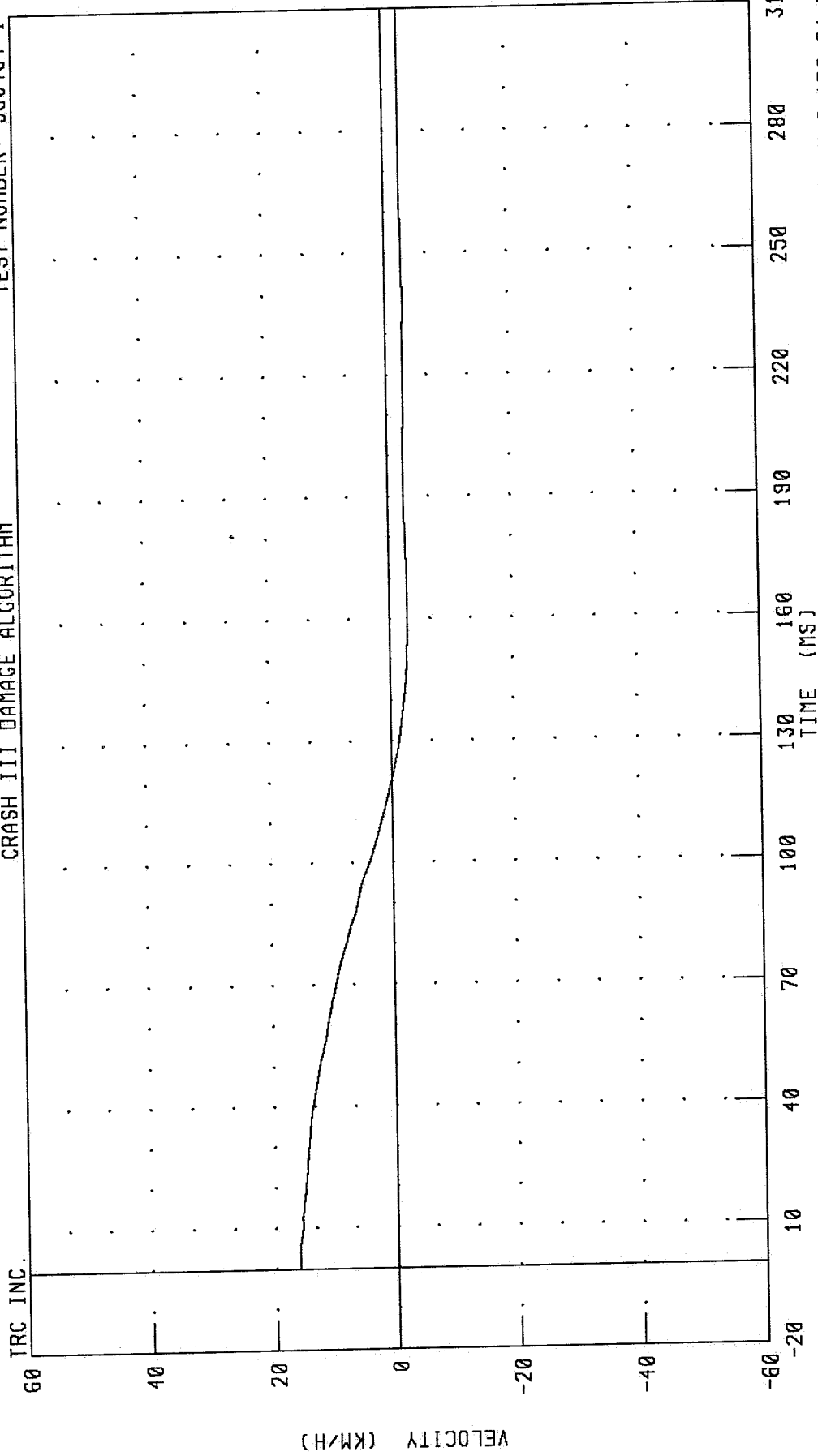
CHANNEL: RRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.67 G @ 177.12 MS; -7.28 G @ 98.40 MS

TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT REAR SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

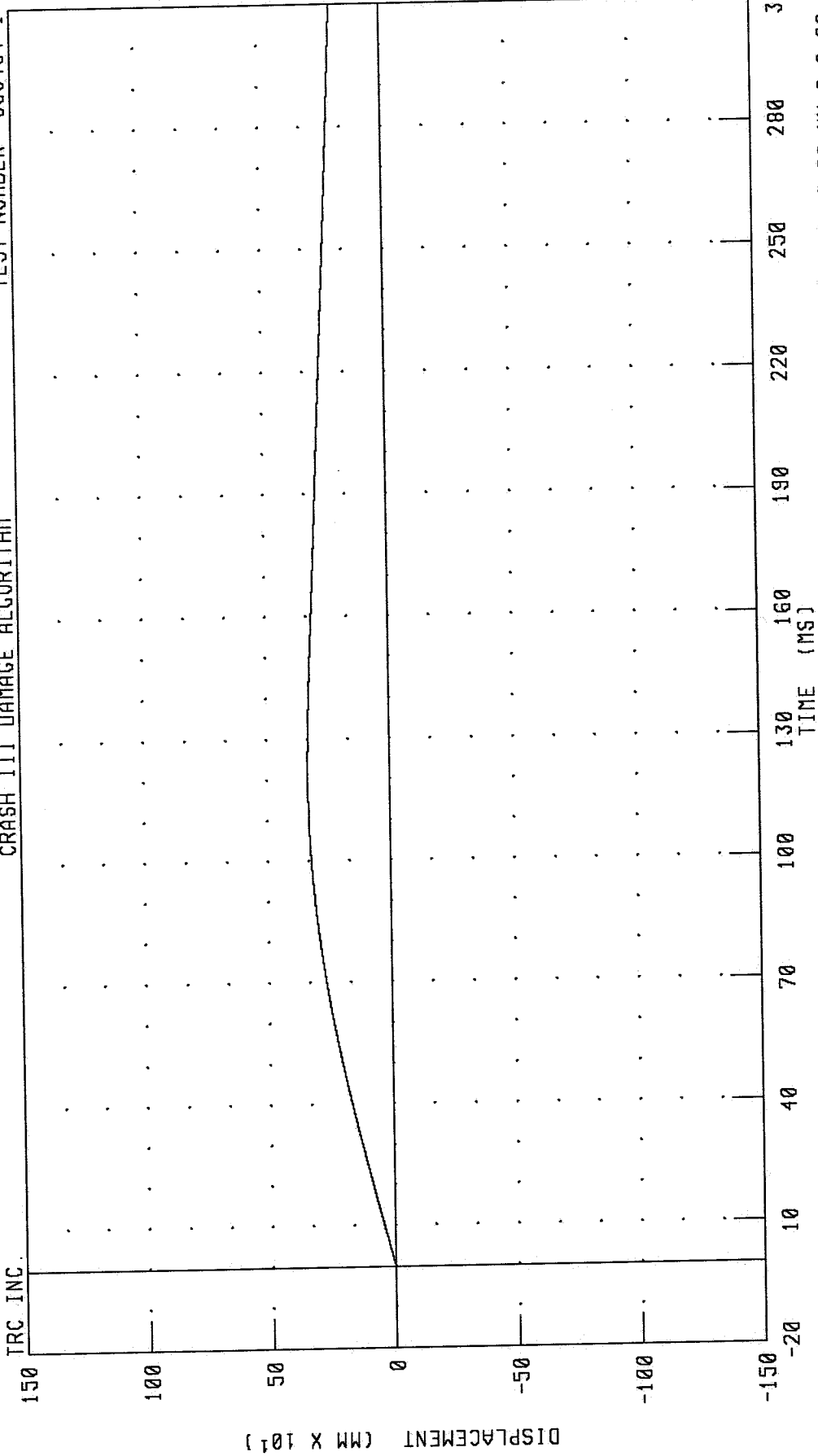
TEST NUMBER: 960404-1



CHANNEL: RRSXV1 FILTER: CH. CLASS 180
PEAK DATA: 16.10 KM/H @ 0.48 MS; -2.90 KM/H @ 159.84 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 RIGHT REAR SILL X-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

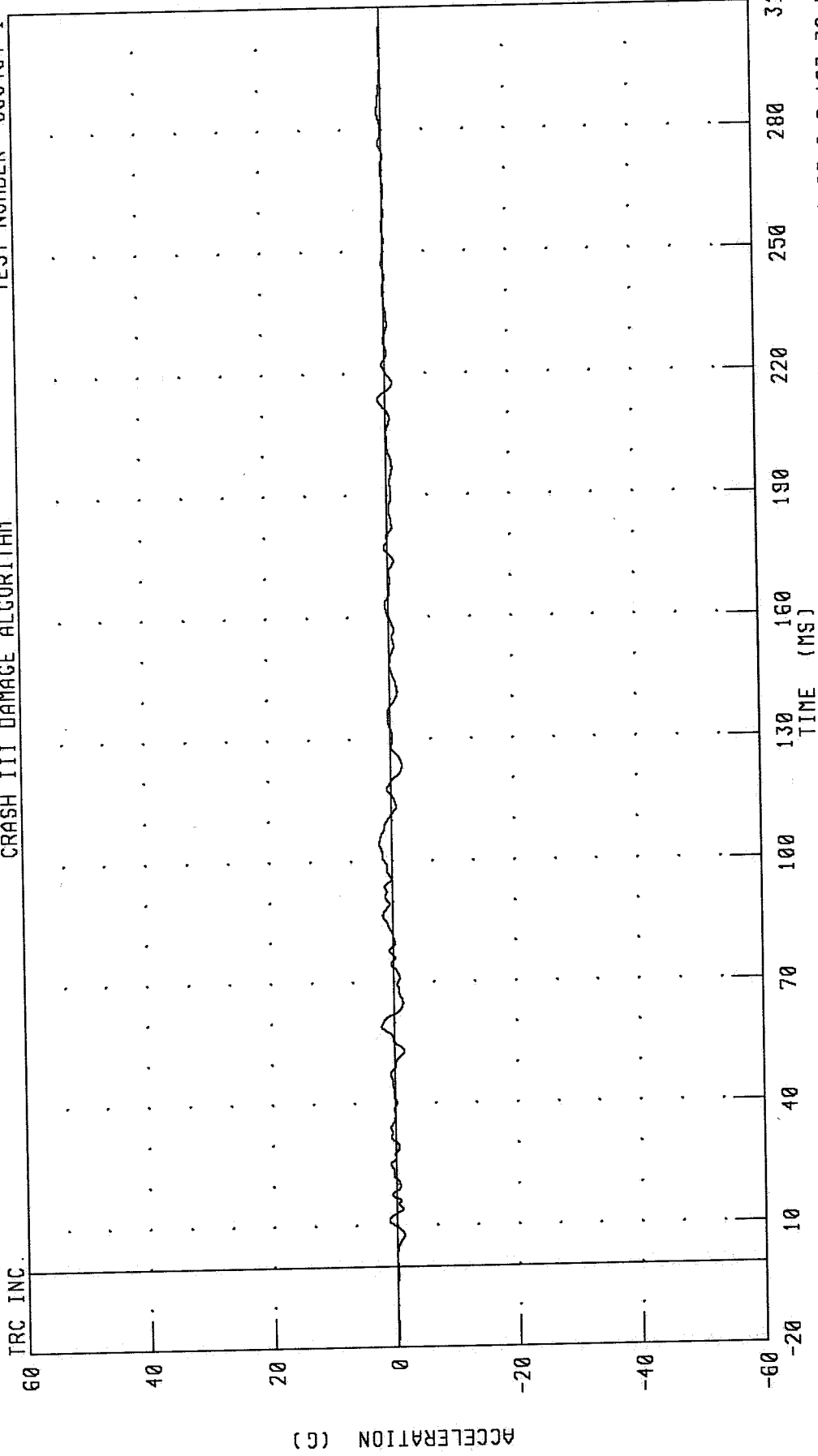


CHANNEL: RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 333.39 MM @ 120.80 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

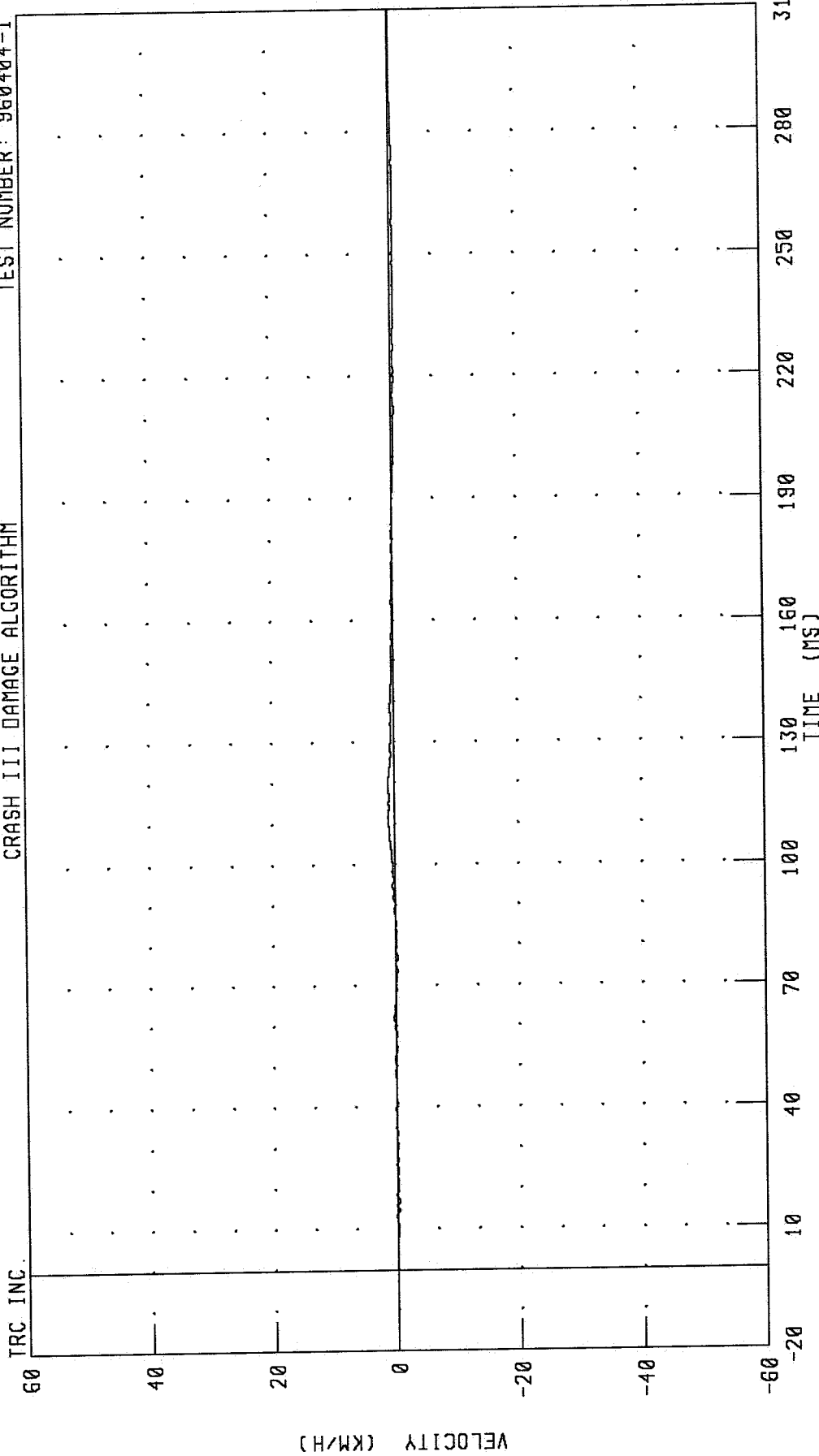
TEST NUMBER: 960404-1



CHANNEL: RRSZG1 FILTER: CH. CLASS 60
PEAK DATA: 2.13 G @ 59.12 MS; -1.83 G @ 123.36 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 RIGHT REAR SILL Z-AXIS VELOCITY
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

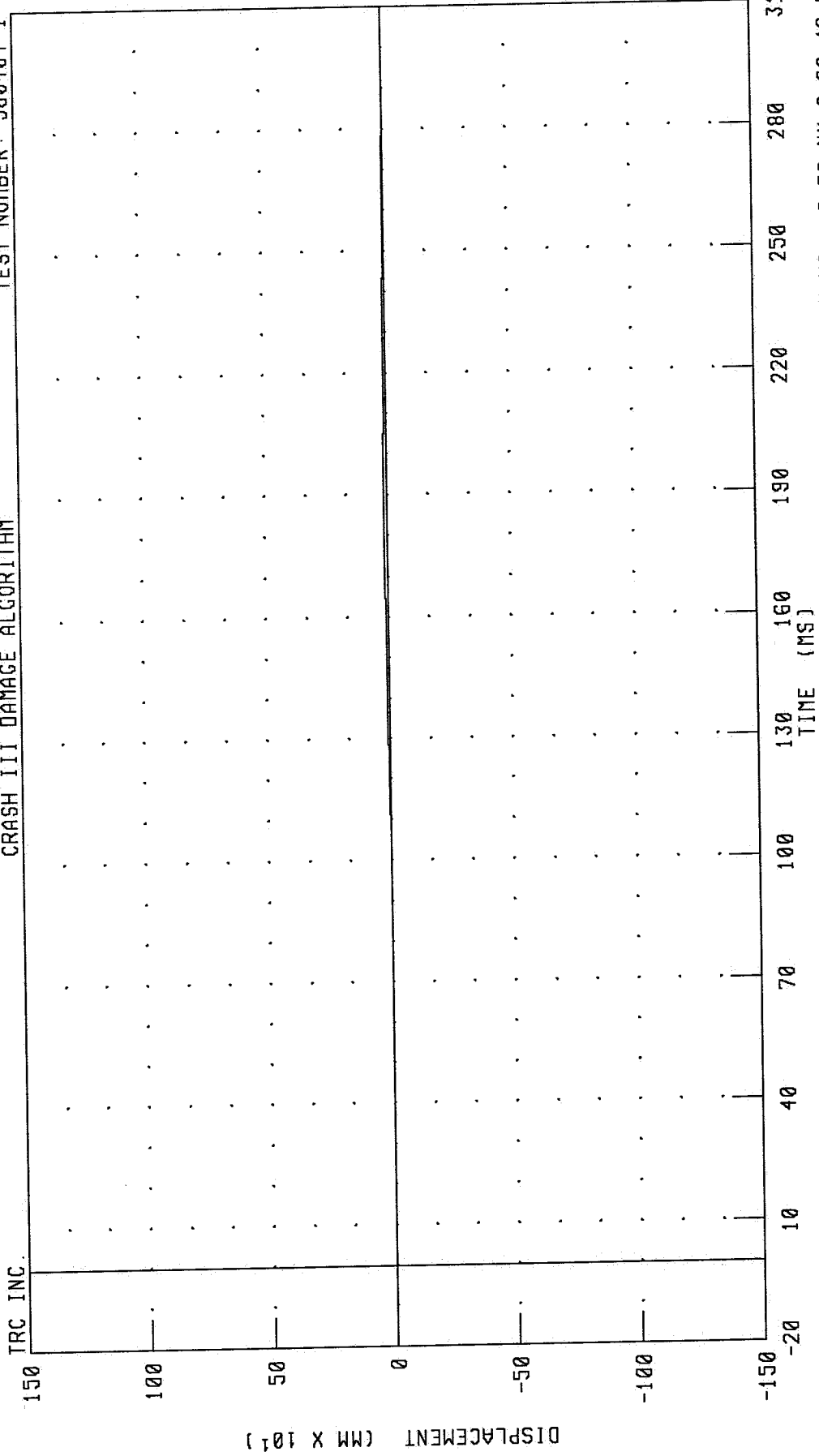


CHANNEL: RRSZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.04 KM/H @ 112.32 MS; -0.49 KM/H @ 236.08 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 RIGHT REAR SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

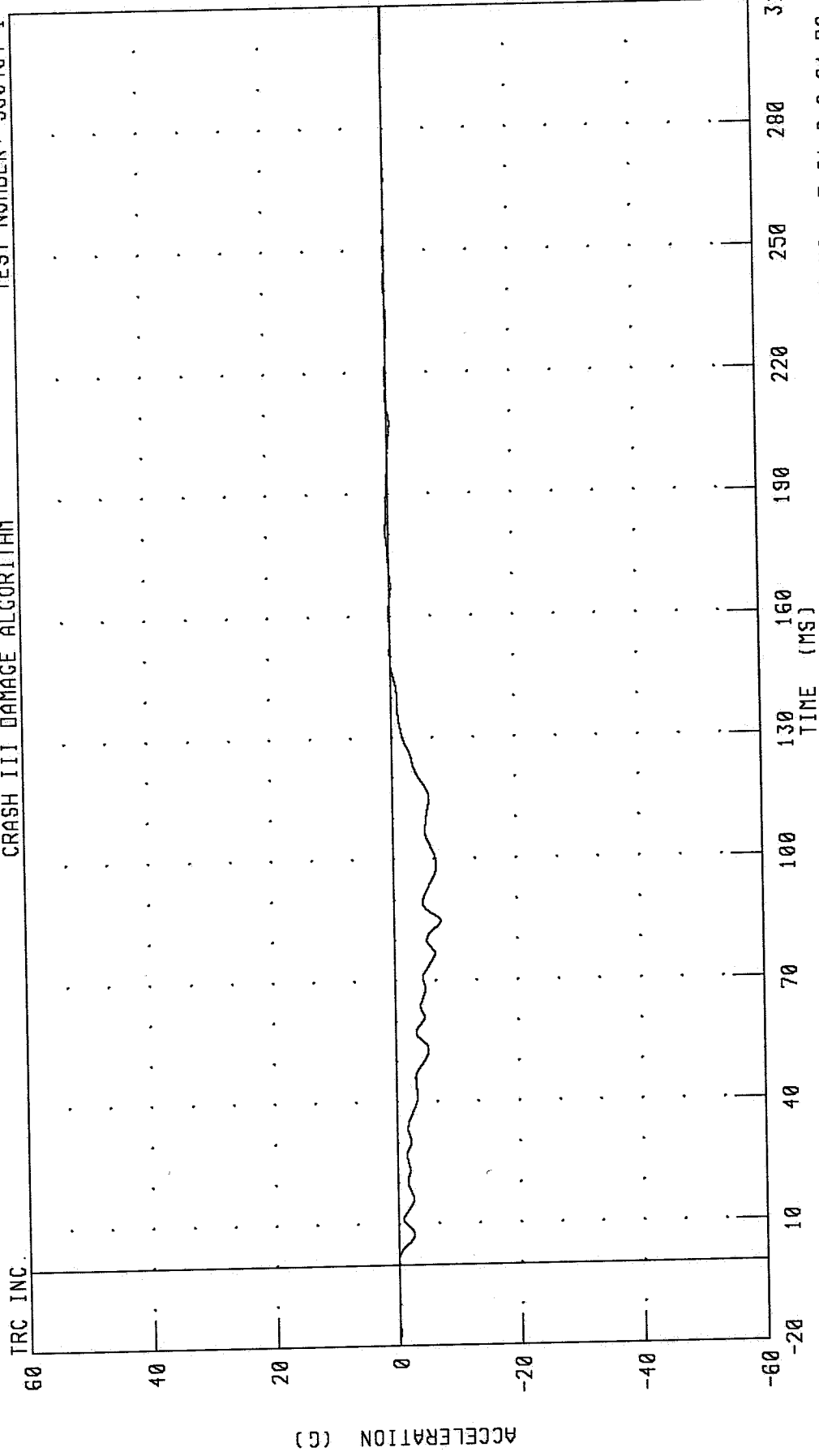


CHANNEL: RRSZ01 FILTER: CH. CLASS 180

PEAK DATA: 11.68 MM @ 188.96 MS; -0.76 MM @ 86.48 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



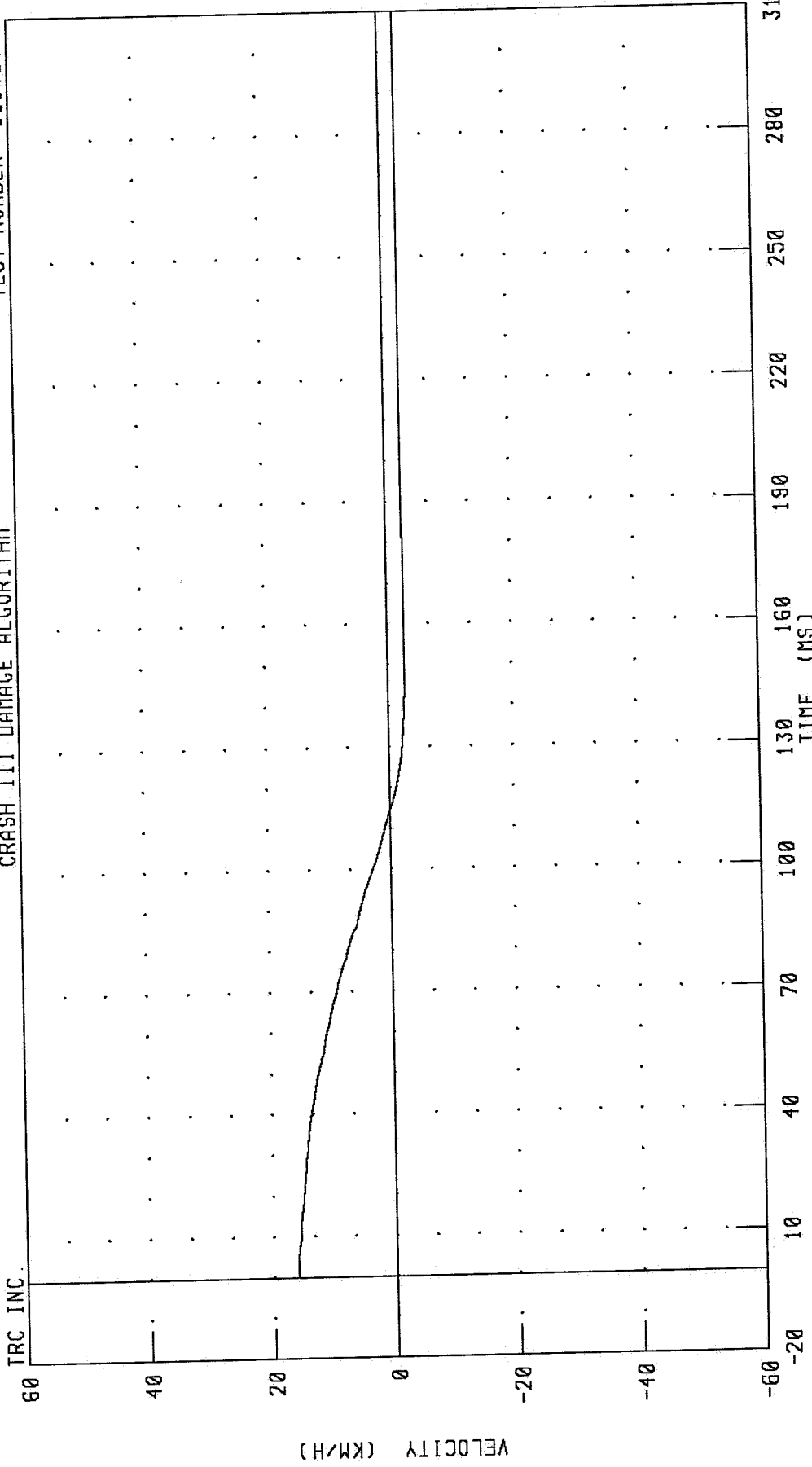
PEAK DATA: 0.51 G @ 180.88 MS; -7.61 G @ 84.72 MS

CHANNEL: LFSXG1 FILTER: CH. CLASS 60

TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

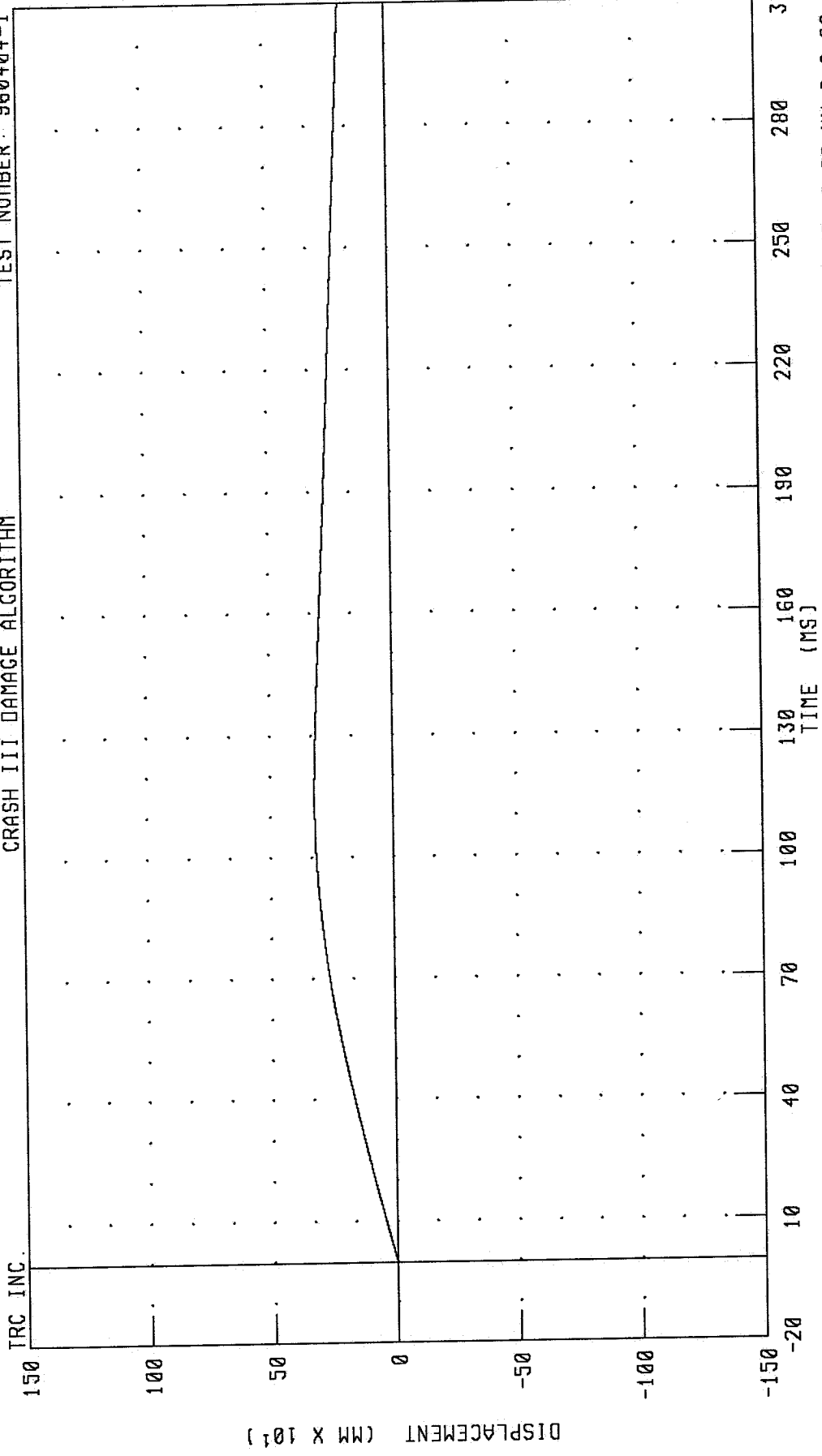


CHANNEL: LFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 16.10 KM/H @ 0.00 MS; -2.72 KM/H @ 172.40 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT FRONT SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

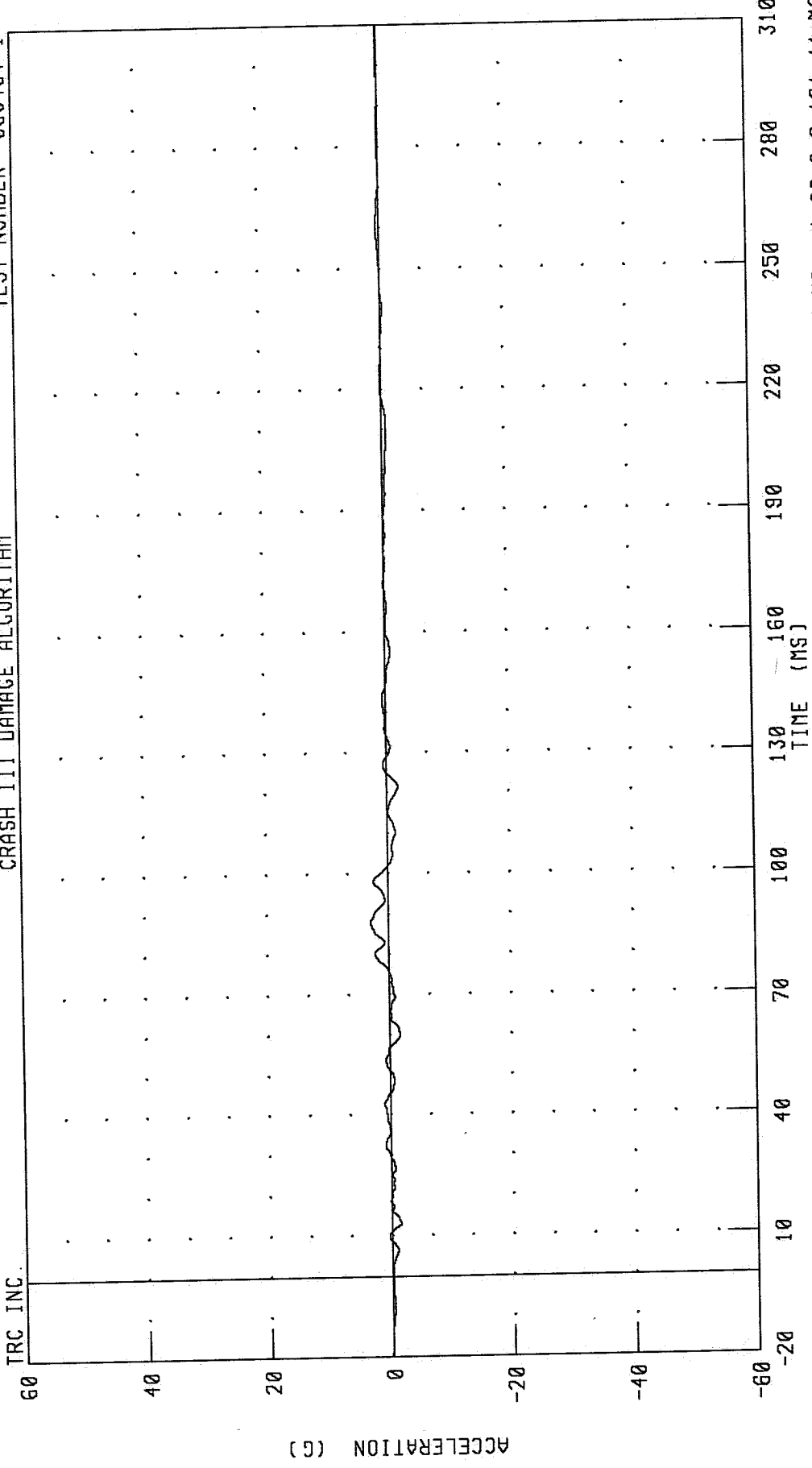
TEST NUMBER: 960404-1



CHANNEL: LFSXD1 FILTER: CH. CLASS 180 PEAK DATA: 320.54 MM @ 114.56 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT FRONT SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

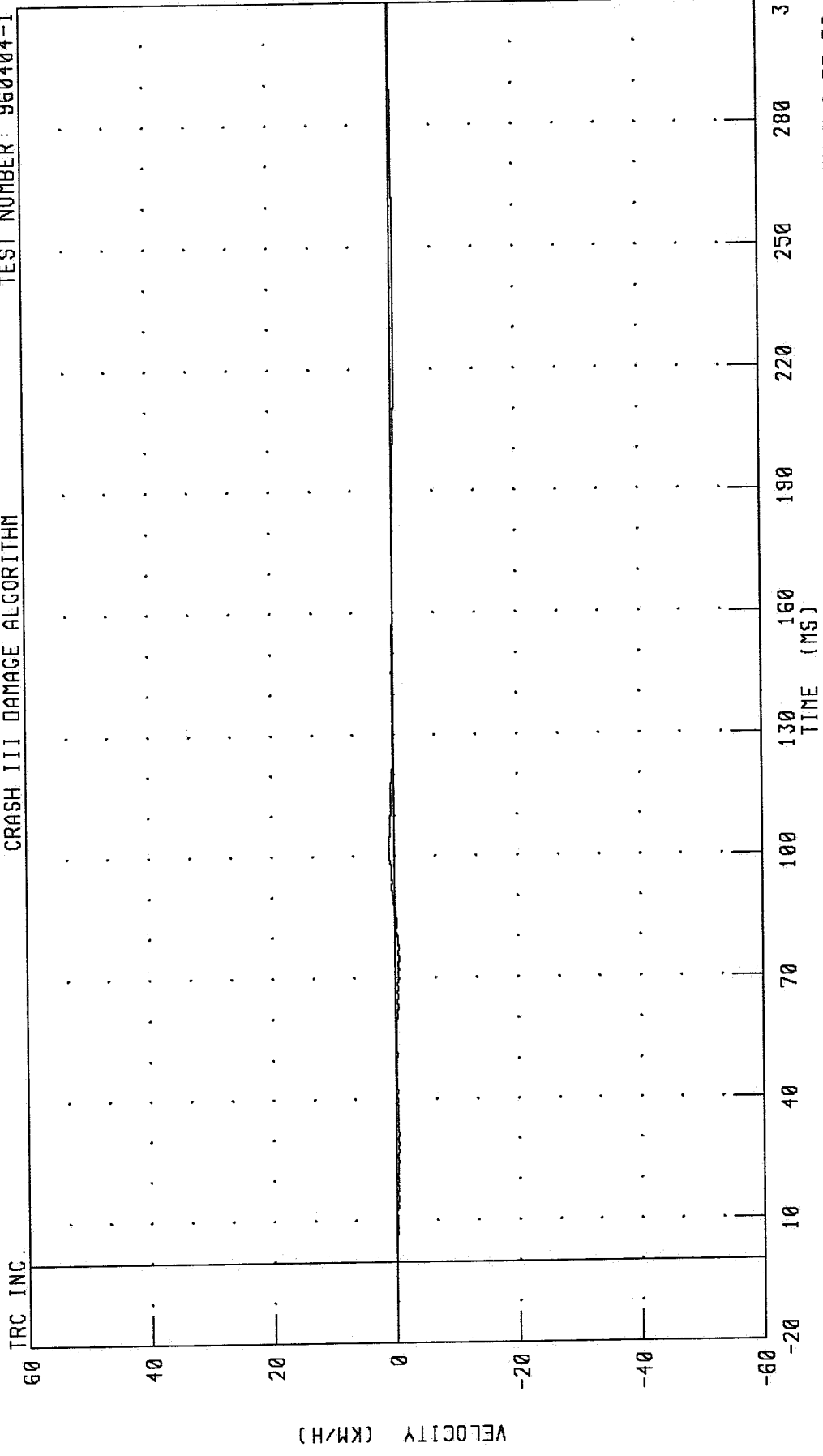


PEAK DATA: 2.90 G @ 87.84 MS; -1.82 G @ 121.44 MS

CHANNEL: LFSZG1 FILTER: CH. CLASS 60

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
LEFT FRONT SILL Z-AXIS VELOCITY

TEST NUMBER: 960404-1

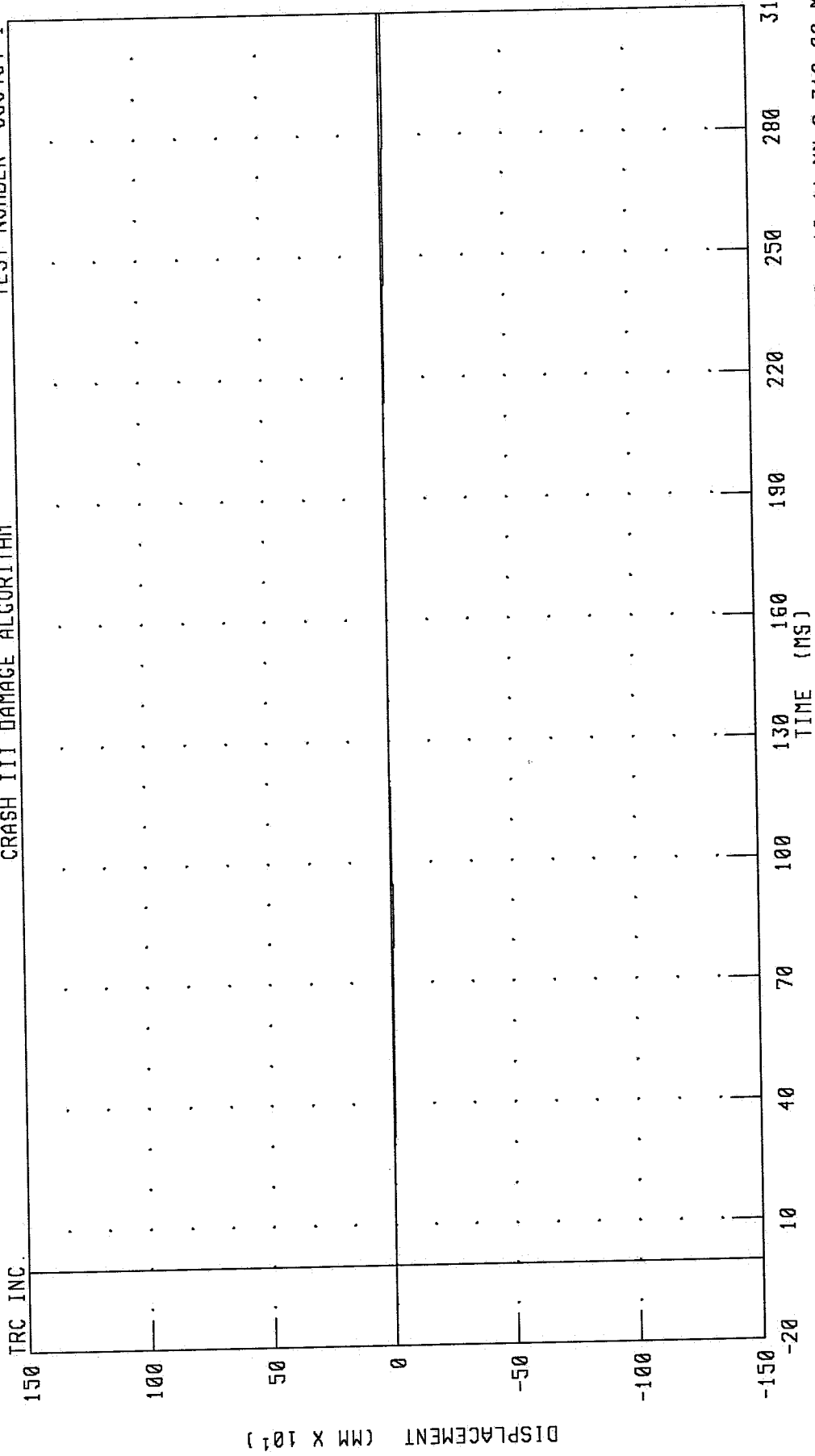


CHANNEL: LFSZV1 FILTER: CH. CLASS 180

PEAK DATA: 0.84 KM/H @ 102.00 MS; -0.63 KM/H @ 77.52 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 LEFT FRONT SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

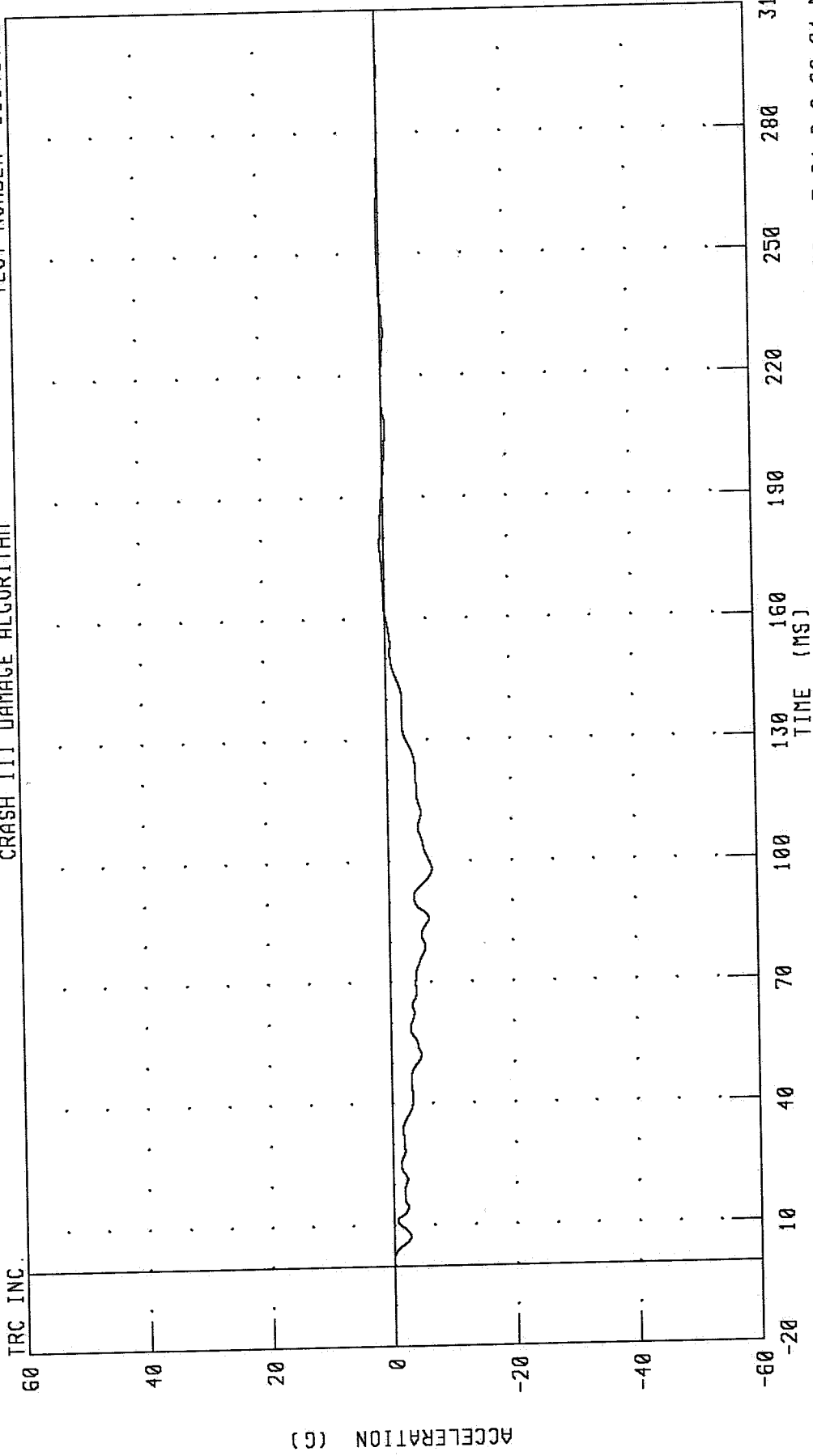
TEST NUMBER: 960404-1



CHANNEL: LFSZD1 FILTER: CH. CLASS 180 PEAK DATA: 0.13 MM @ 166.08 MS; -12.44 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

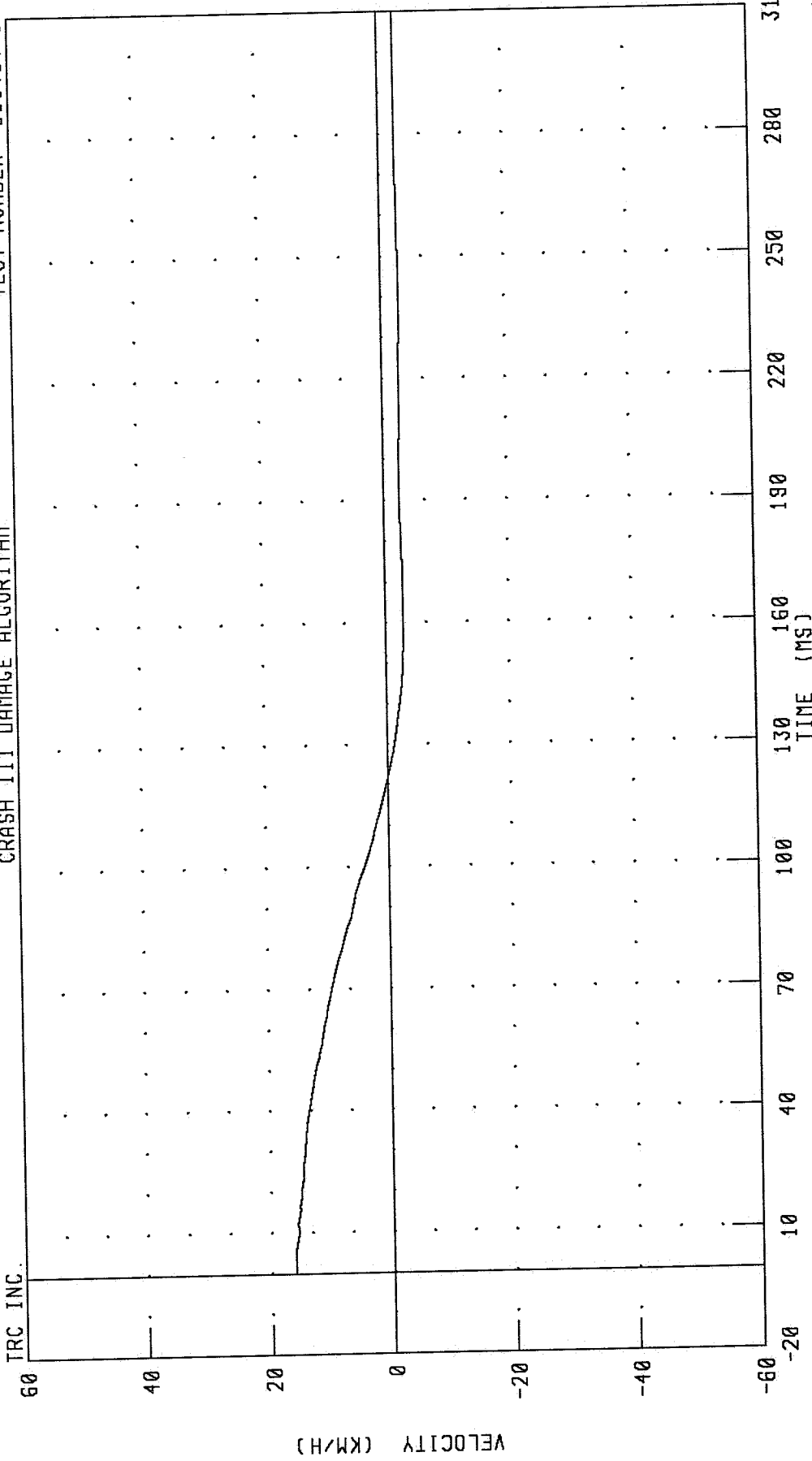
TEST NUMBER: 960404-1



CHANNEL: RFSXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.65 G @ 178.48 MS; -7.04 G @ 178.24 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

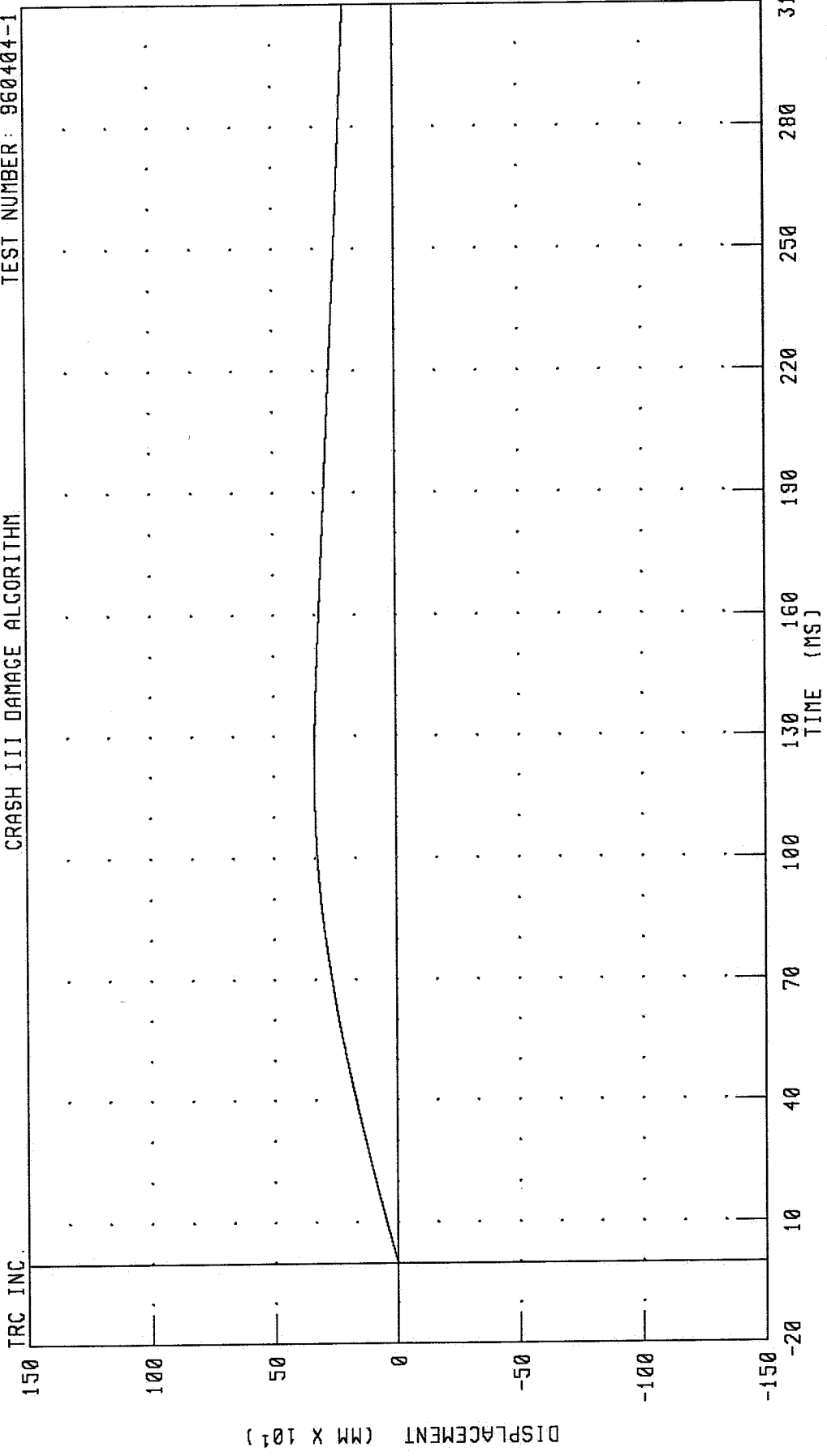


CHANNEL: RFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 16.10 KM/H @ 0.72 MS; -2.92 KM/H @ 161.04 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT FRONT SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

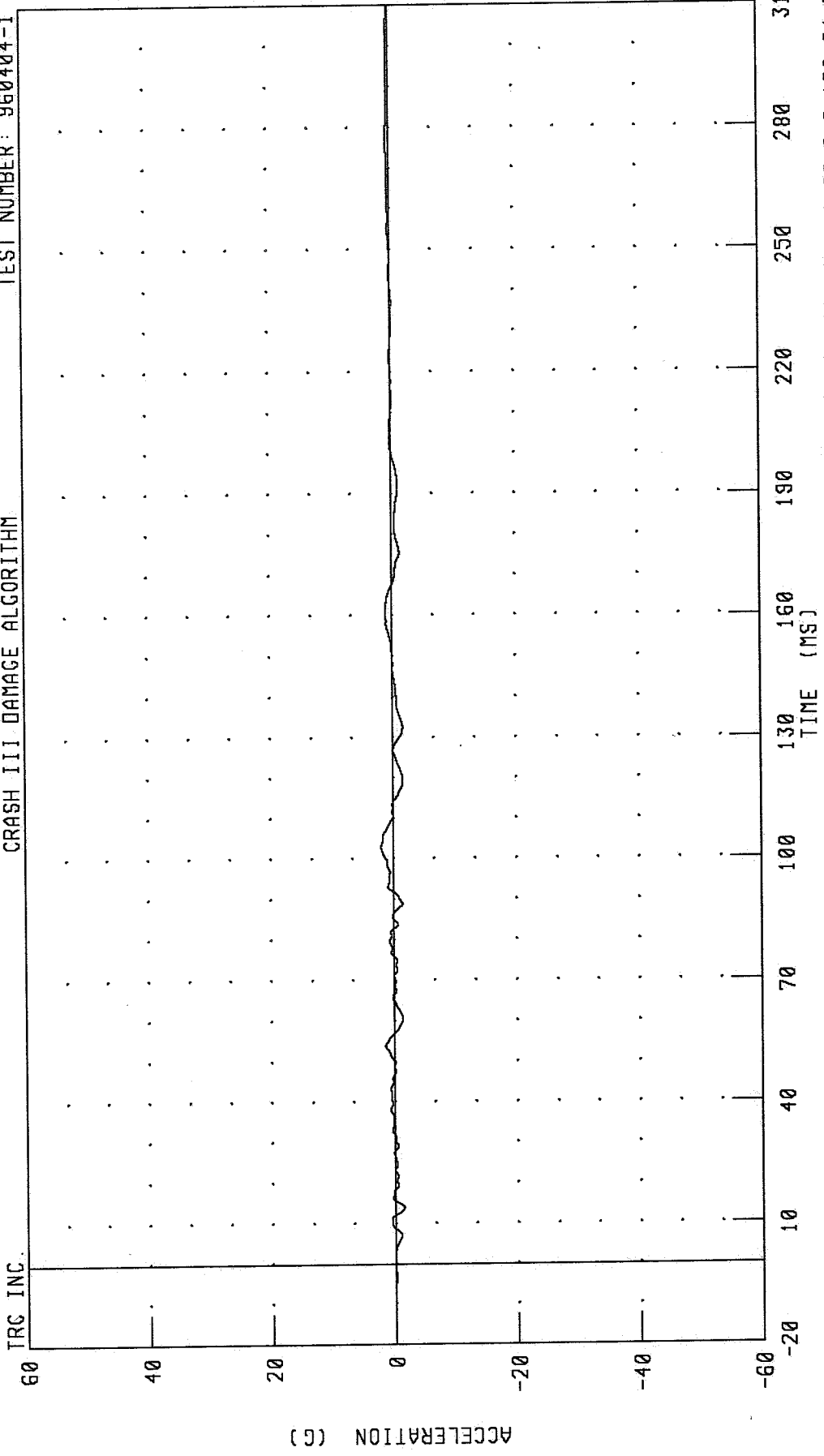


CHANNEL: RFSXD1 FILTER: CH. CLASS 180

PEAK DATA: 335.00 MM @ 122.00 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
RIGHT FRONT SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

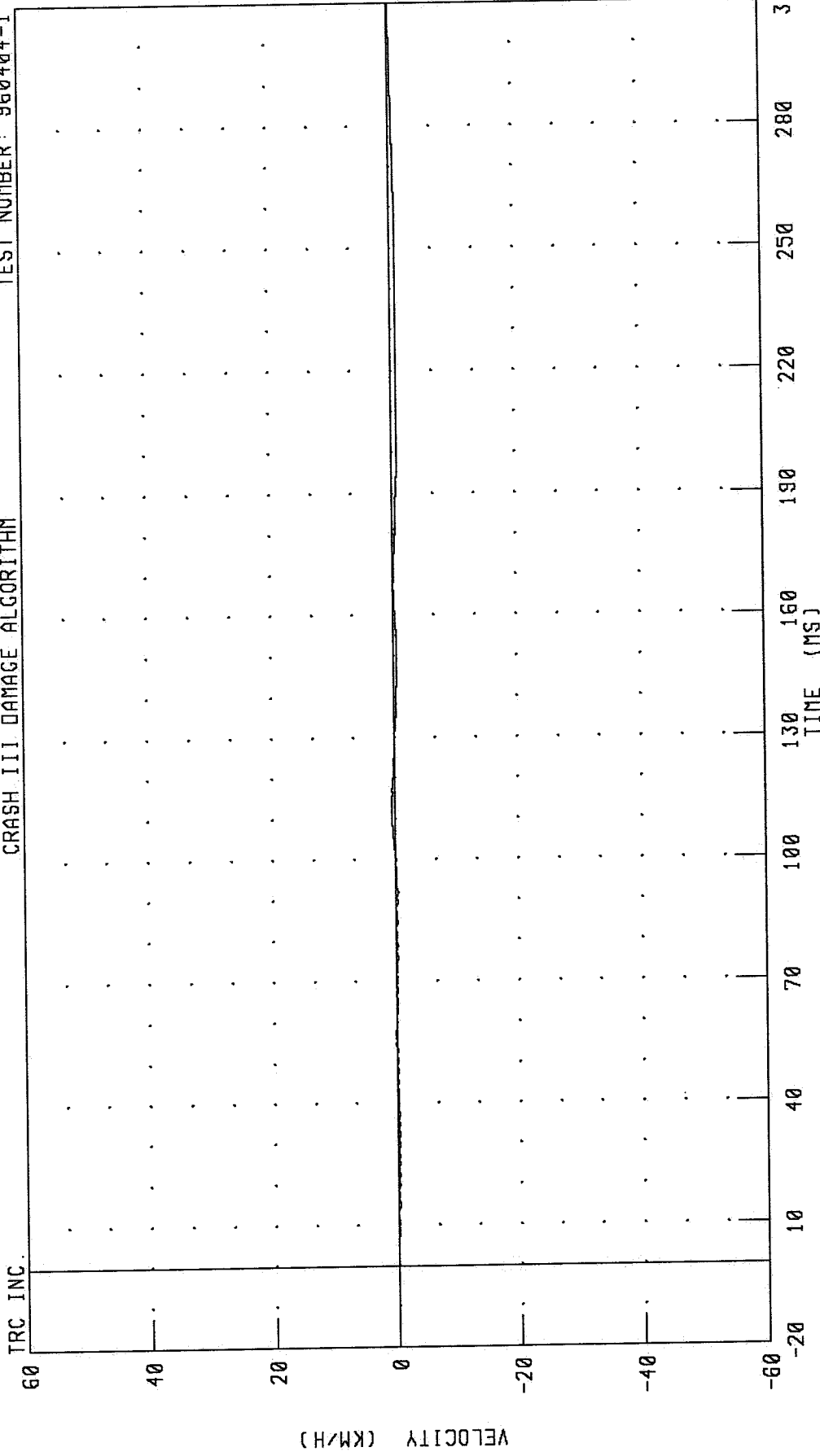


CHANNEL: RFSZG1 FILTER: CH. CLASS 60

PEAK DATA: 2.00 G @ 102.80 MS; -1.62 G @ 132.64 MS

1991 DODGE CARRAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 RIGHT FRONT SILL Z-AXIS VELOCITY
 CRASH III DAMAGE ALGORITHM

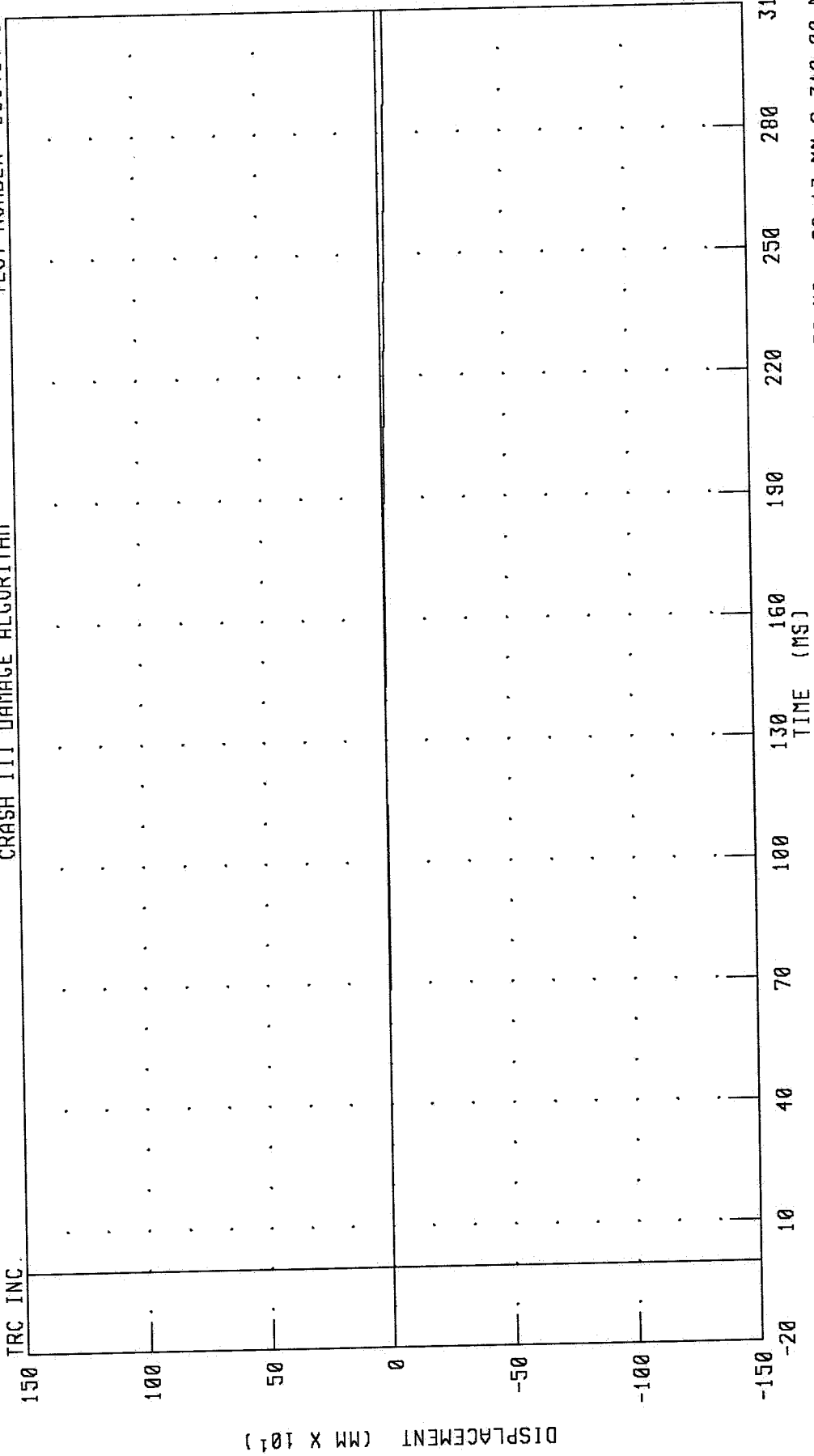
TEST NUMBER: 960404-1



CHANNEL: RFSZV1 FILTER: CH. CLASS 180 PEAK DATA: 0.53 KM/H @ 114.64 MS; -0.92 KM/H @ 240.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 RIGHT FRONT SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

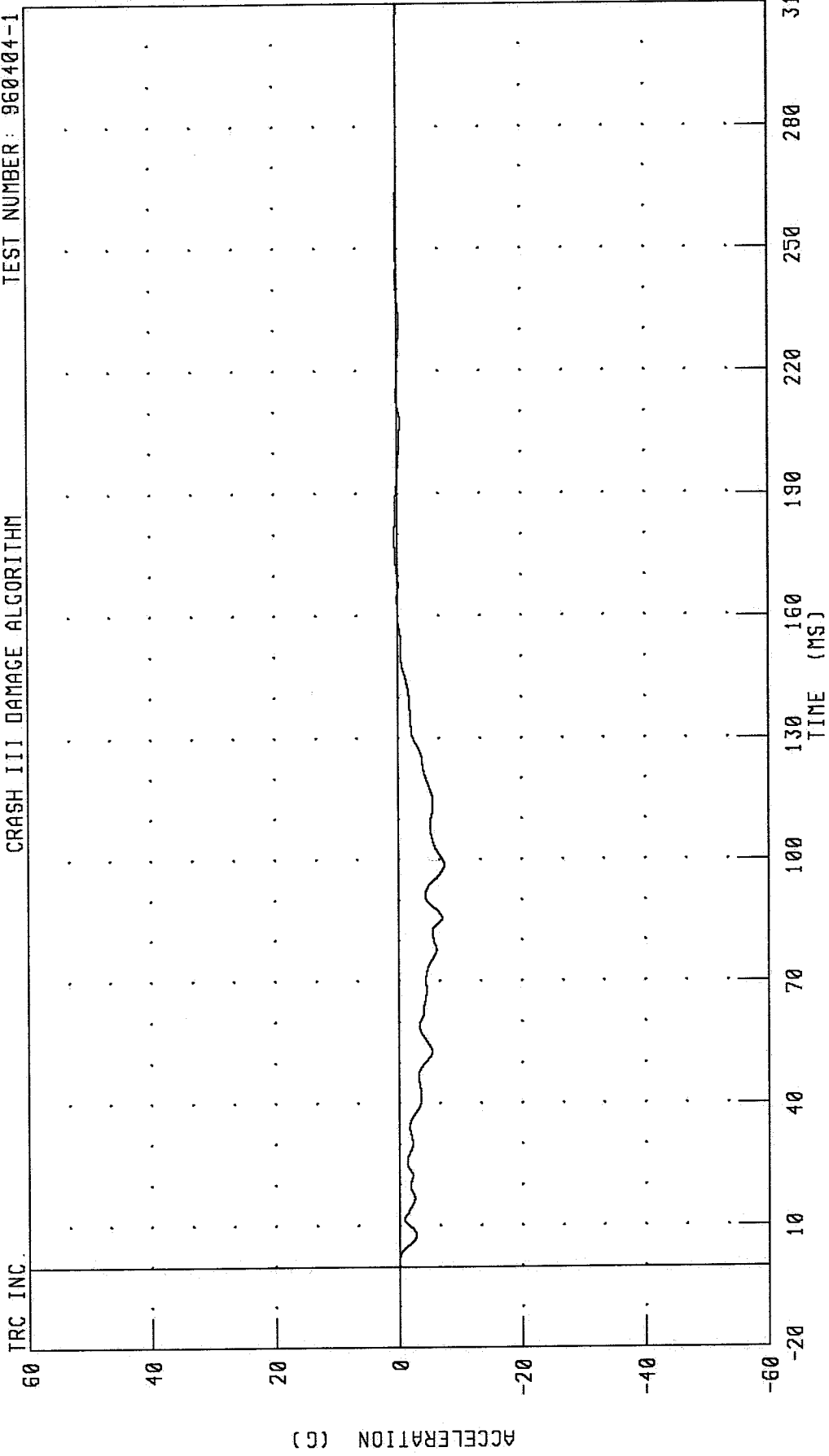


CHANNEL: RFSZD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MM @ 1.36 MS; -29.13 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
VEHICLE CG X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

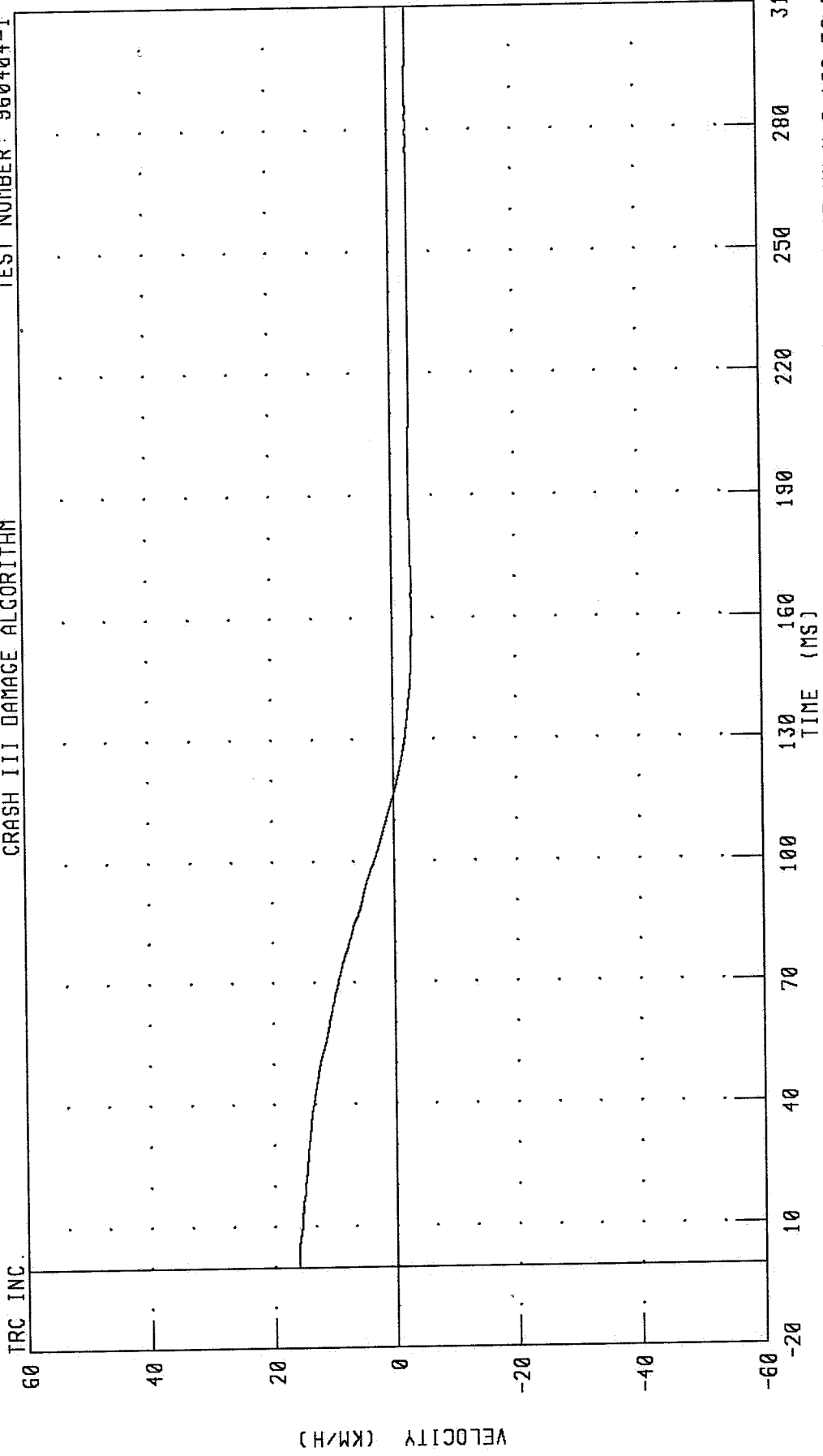


CHANNEL: VCGXG1 FILTER: CH: CLASS 60

PEAK DATA: 0.50 G @ 179.68 MS; -7.46 G @ 98.80 MS

1991 DODGE CARRAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
VEHICLE CG X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

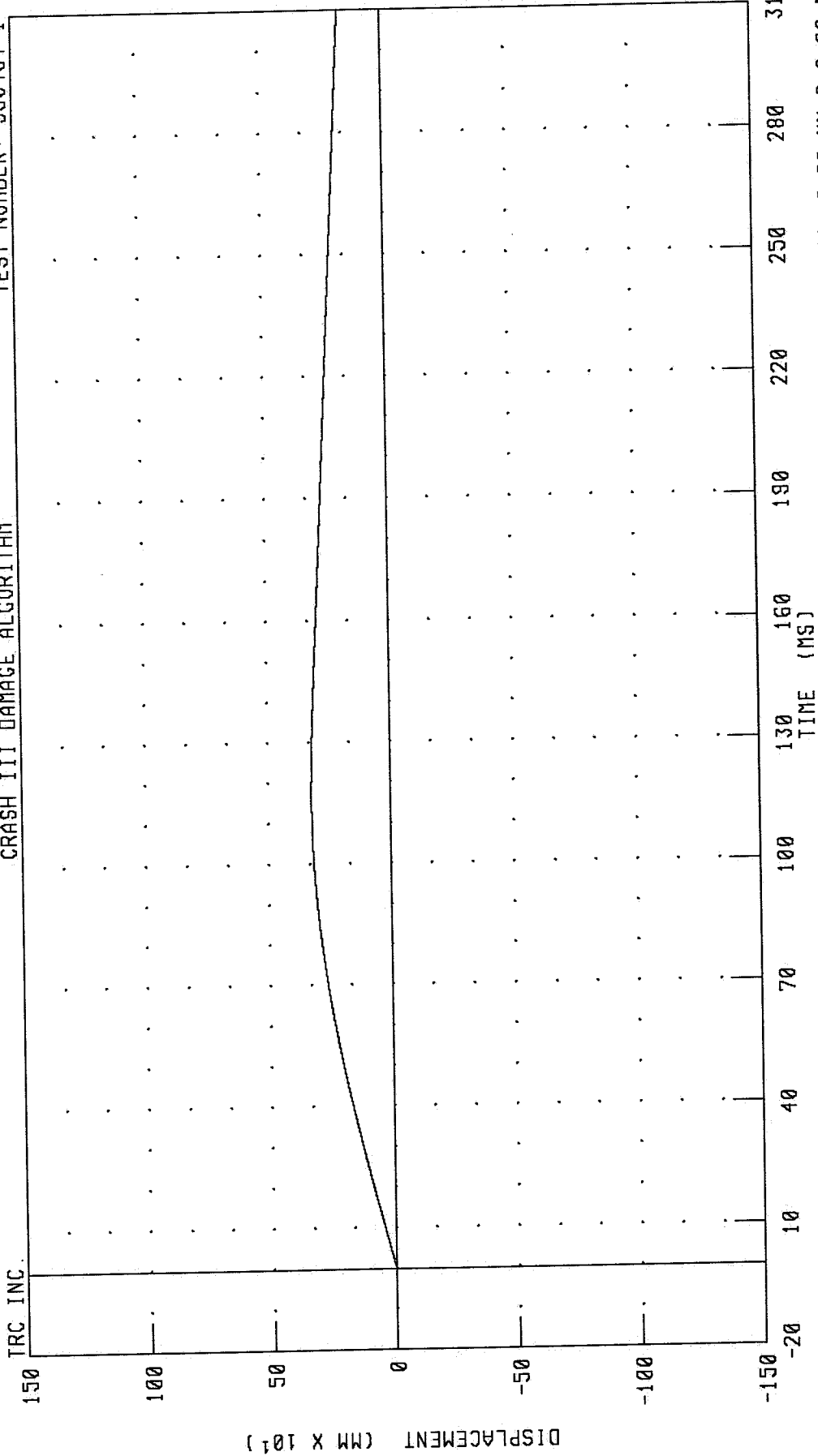


CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 16.10 KM/H @ 0.00 MS; -3.15 KM/H @ 162.56 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
VEHICLE CG X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

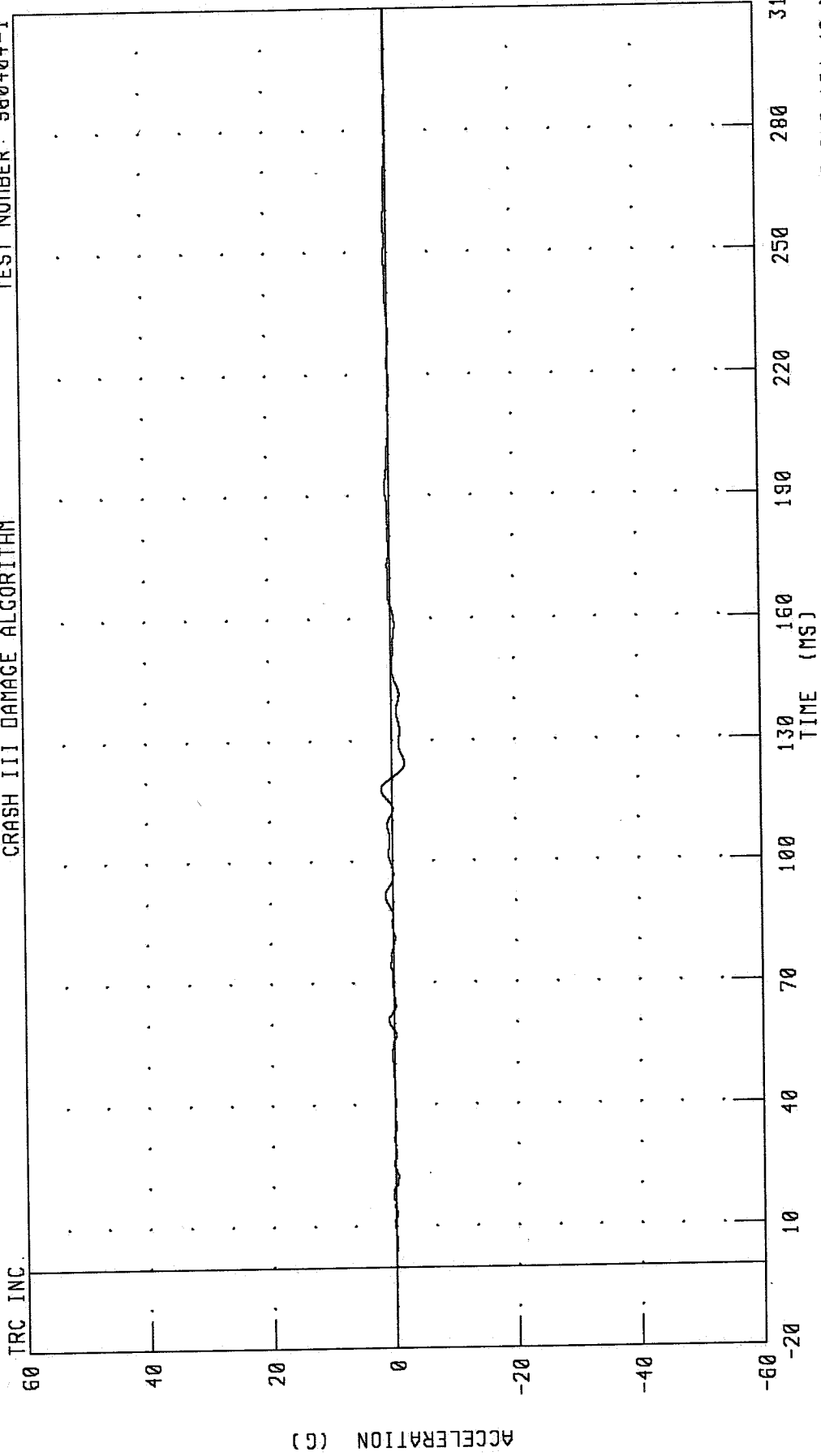


CHANNEL: VCGXD1 FILTER: CH. CLASS 180

PEAK DATA: 324.53 MM @ 116.48 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
VEHICLE CC Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



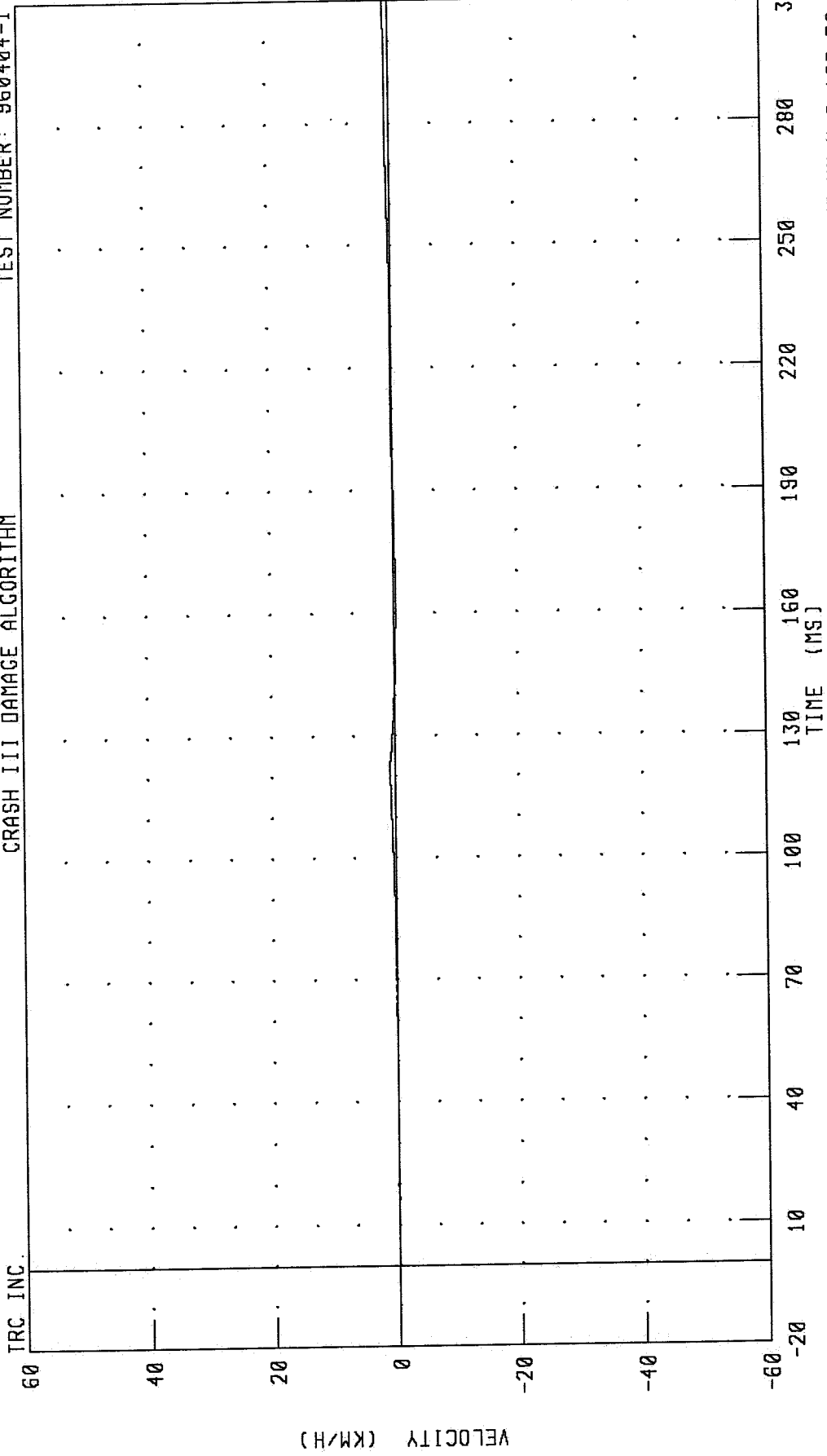
CHANNEL: VCGYGI FILTER: CH. CLASS 60

PEAK DATA: 1.76 G @ 117.92 MS; -2.06 G @ 124.40 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1

VEHICLE CG Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

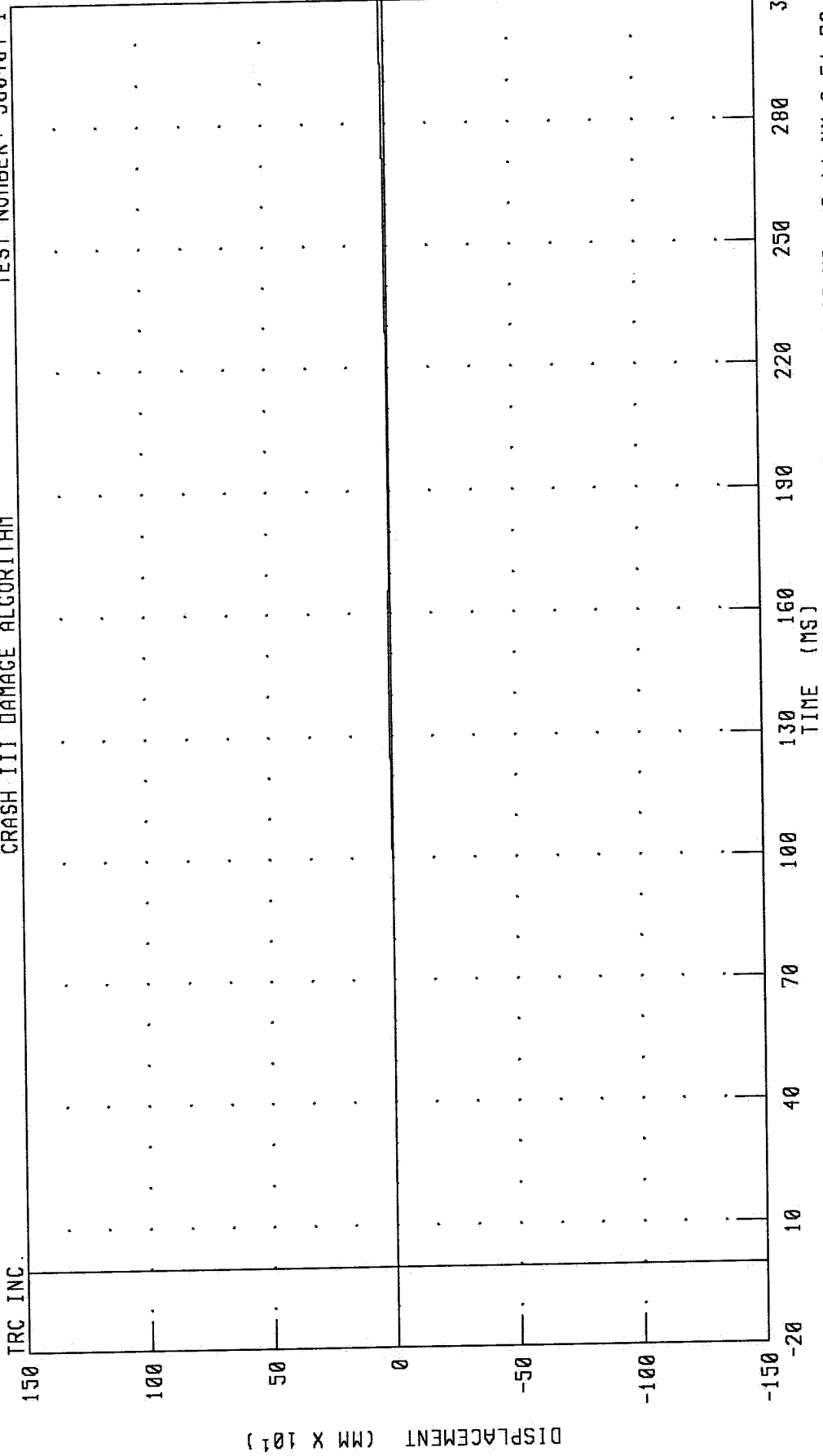


CHANNEL: VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.92 KM/H @ 120.56 MS; -0.37 KM/H @ 163.76 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 VEHICLE CG Y-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

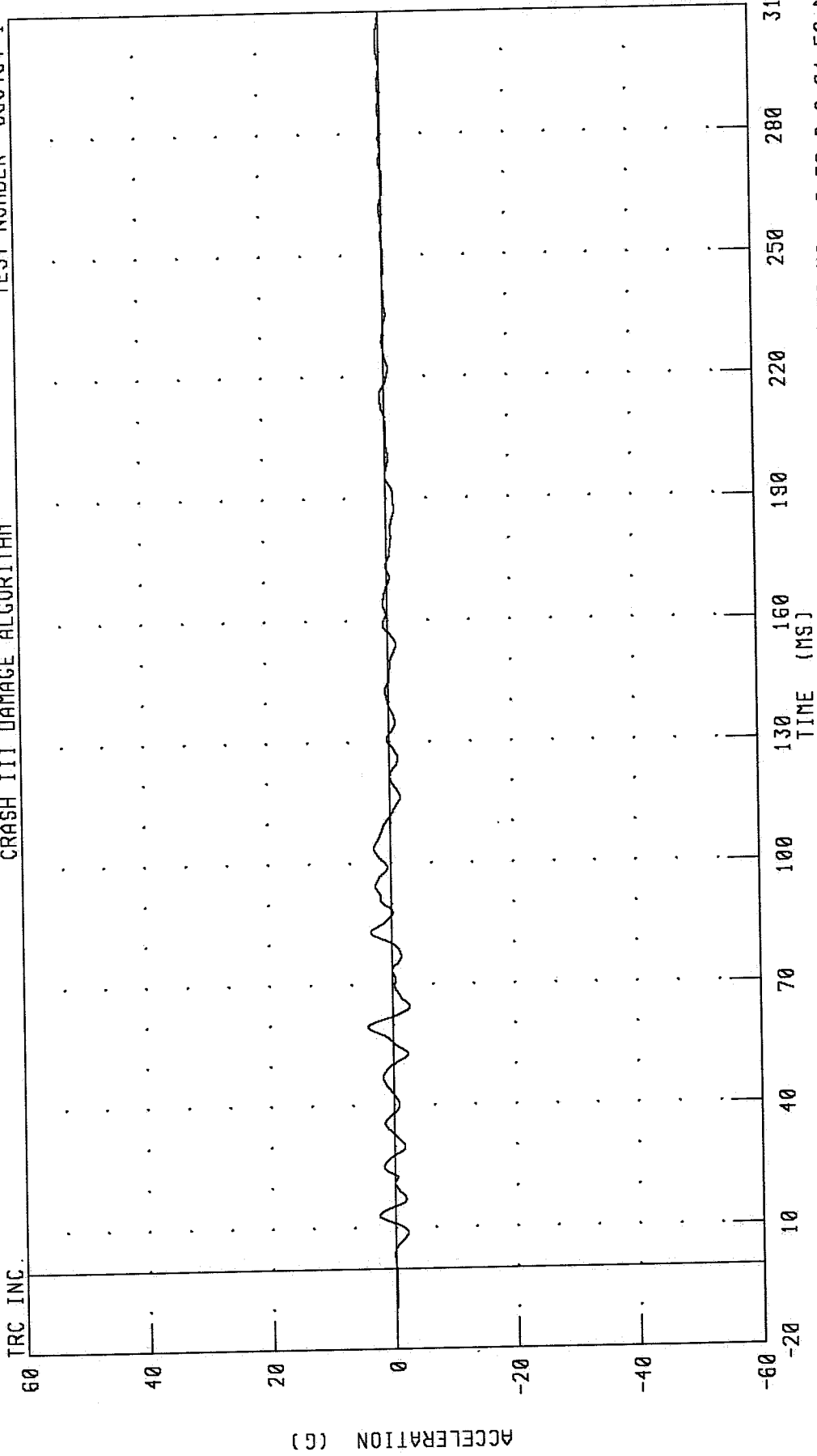


CHANNEL: VCCYD1 FILTER: CH. CLASS 180

PEAK DATA: 18.45 MM @ 310.00 MS; -0.14 MM @ 51.76 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
VEHICLE CG Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



PEAK DATA: 4.06 G @ 59.52 MS; -2.78 G @ 64.56 MS

CHANNEL: VCGZG1 FILTER: CH. CLASS 60

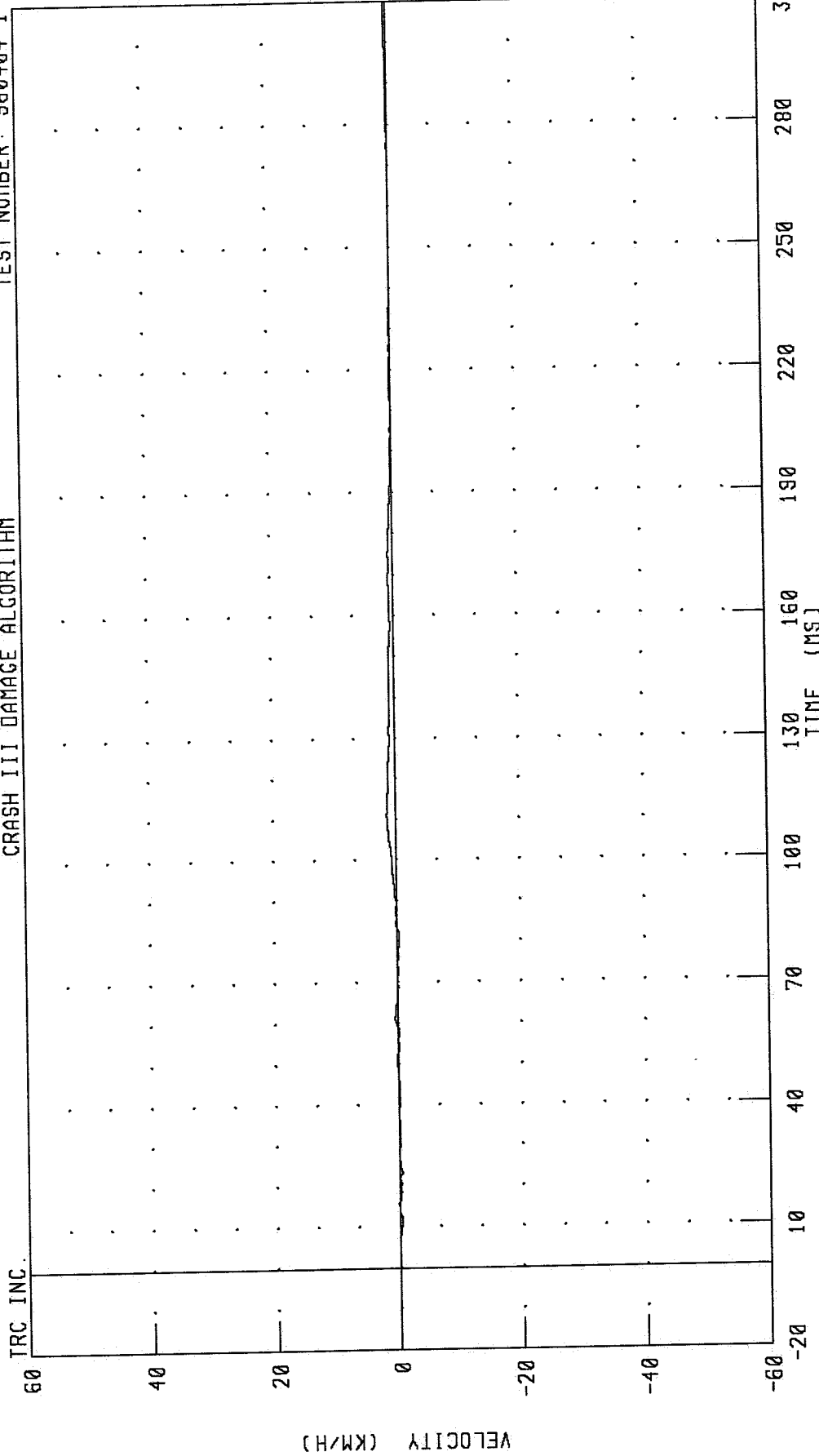
TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

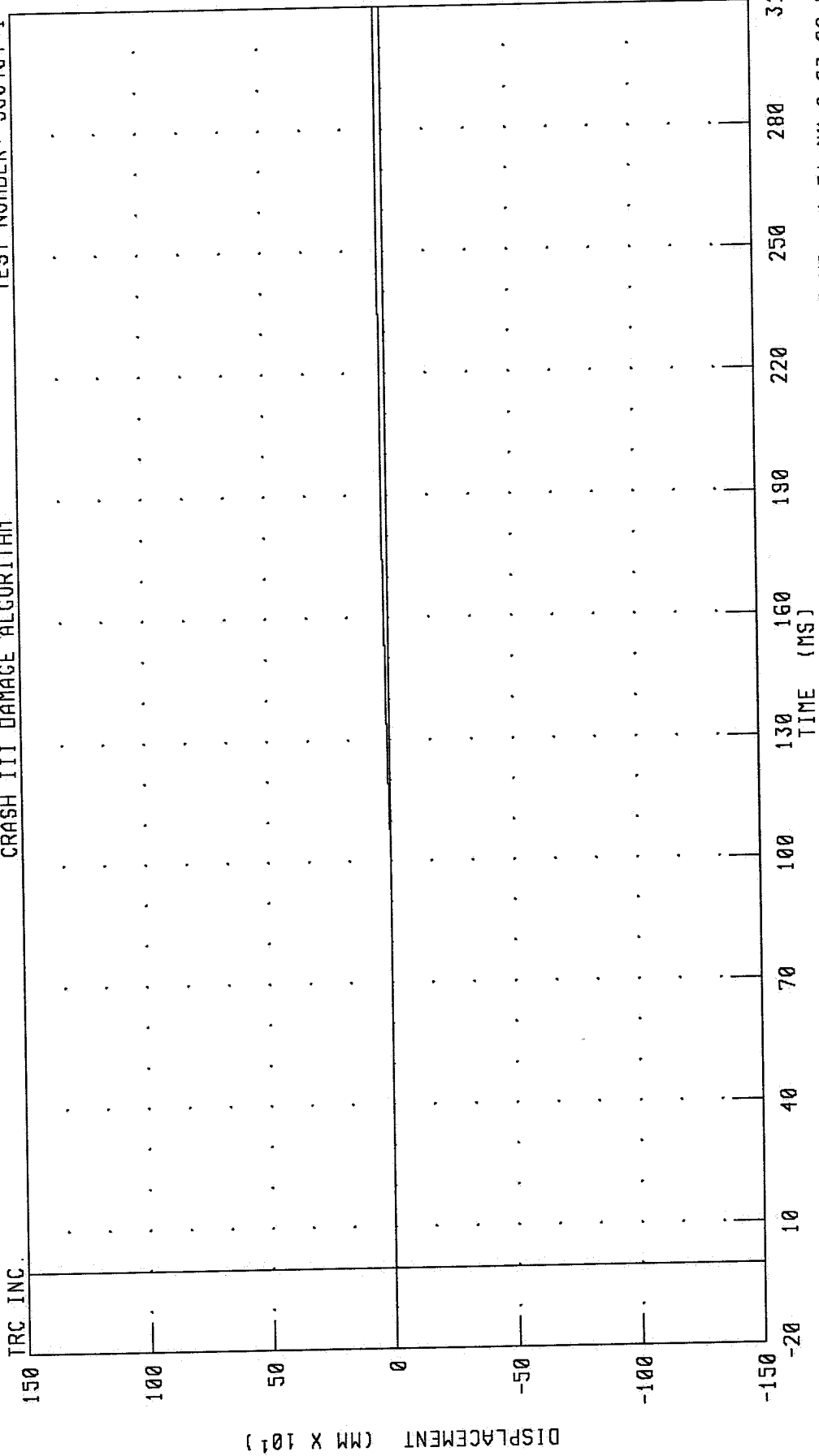


CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.45 KM/H @ 110.88 MS; -0.43 KM/H @ 23.28 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 VEHICLE CG Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

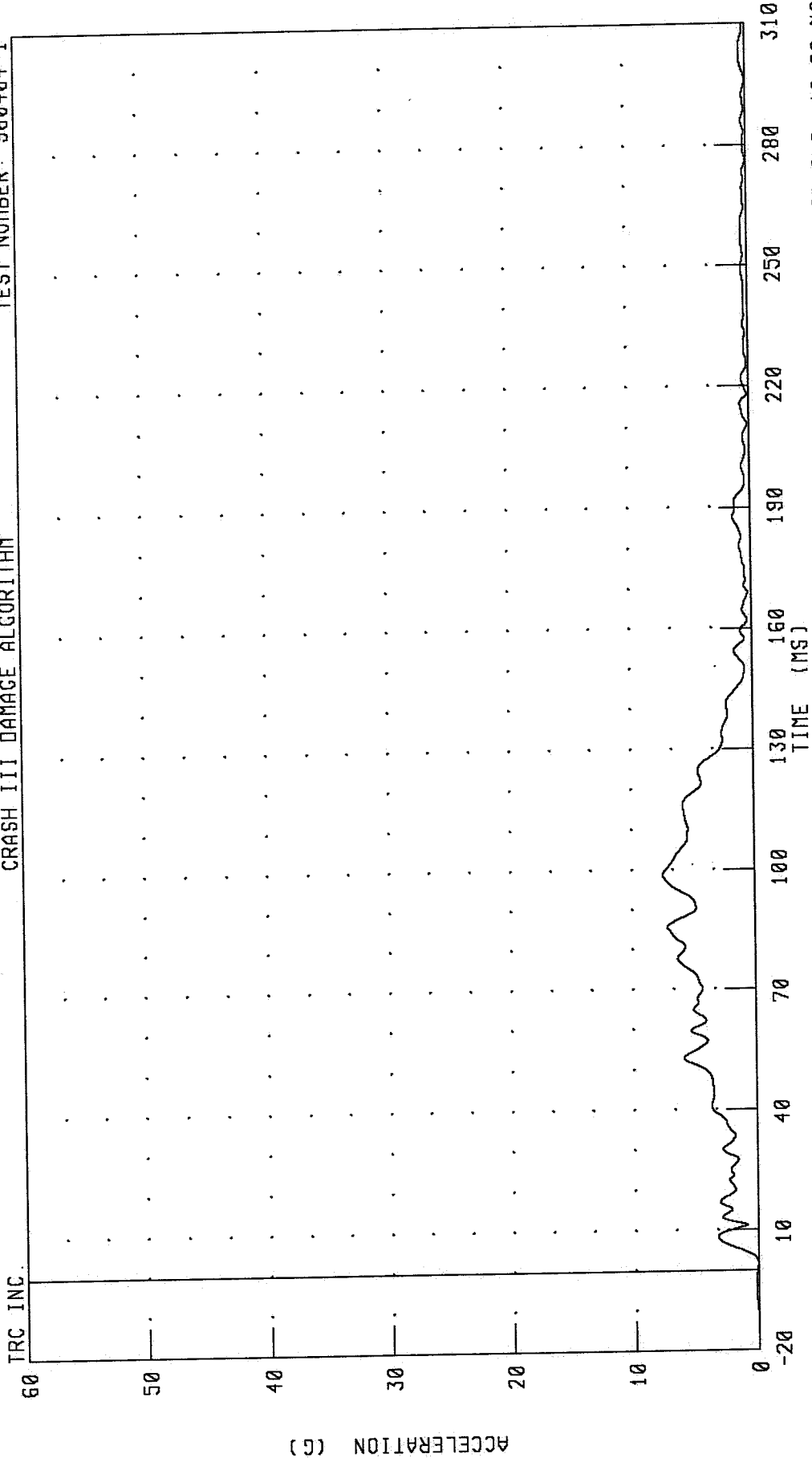


CHANNEL: VCGZD1 FILTER: CH. CLASS 180

PEAK DATA: 26.32 MM @ 310.00 MS; -1.51 MM @ 83.28 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
VEHICLE CG RESULTANT ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

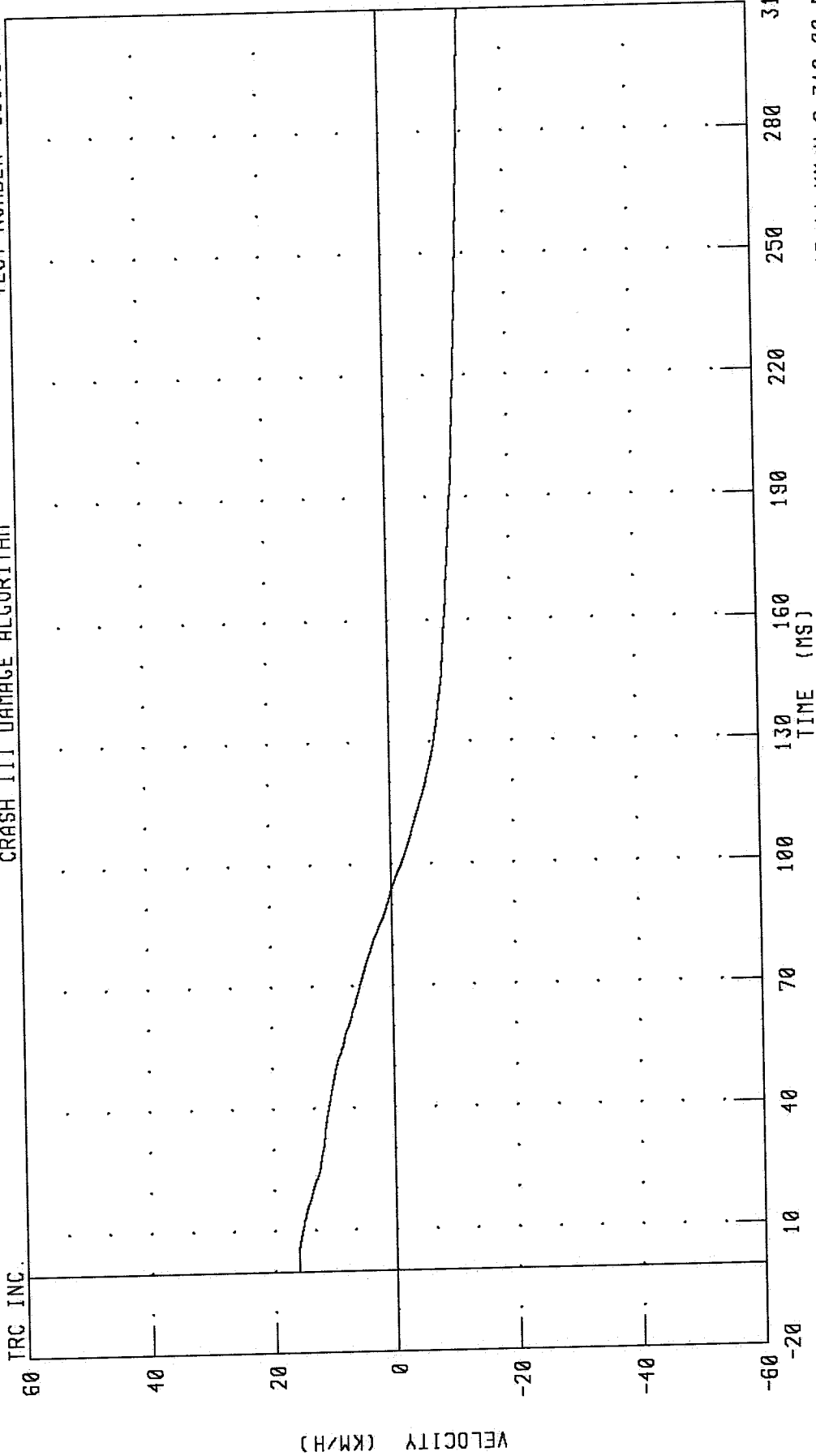
PEAK DATA: 7.48 G @ 98.72 MS; 0.01 G @ -19.68 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1

VEHICLE CG RESULTANT VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1

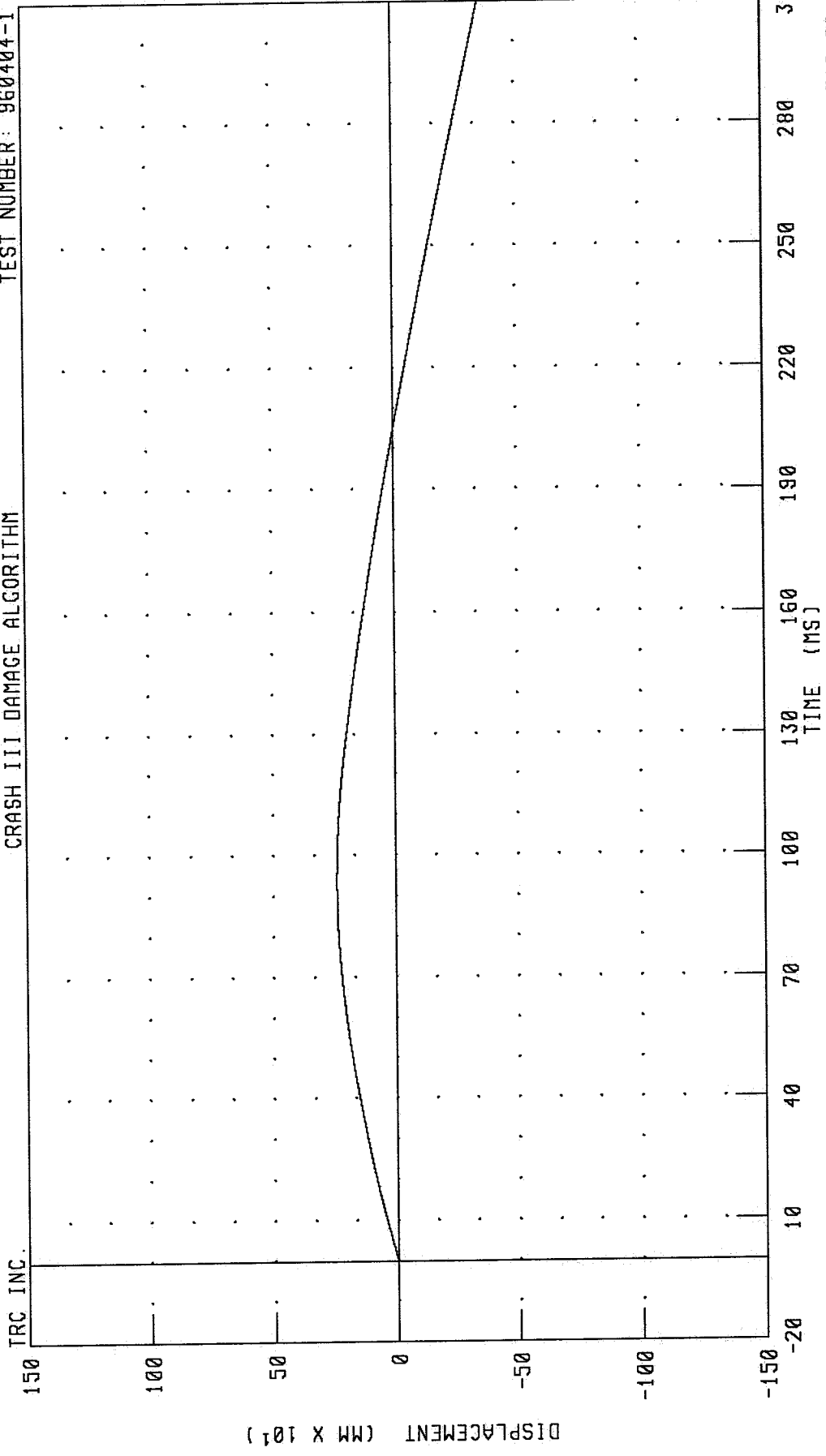


CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 16.10 KM/H @ 0.00 MS; -13.14 KM/H @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 10 MPH TEST NO. 1
 VEHICLE CG RESULTANT DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-1



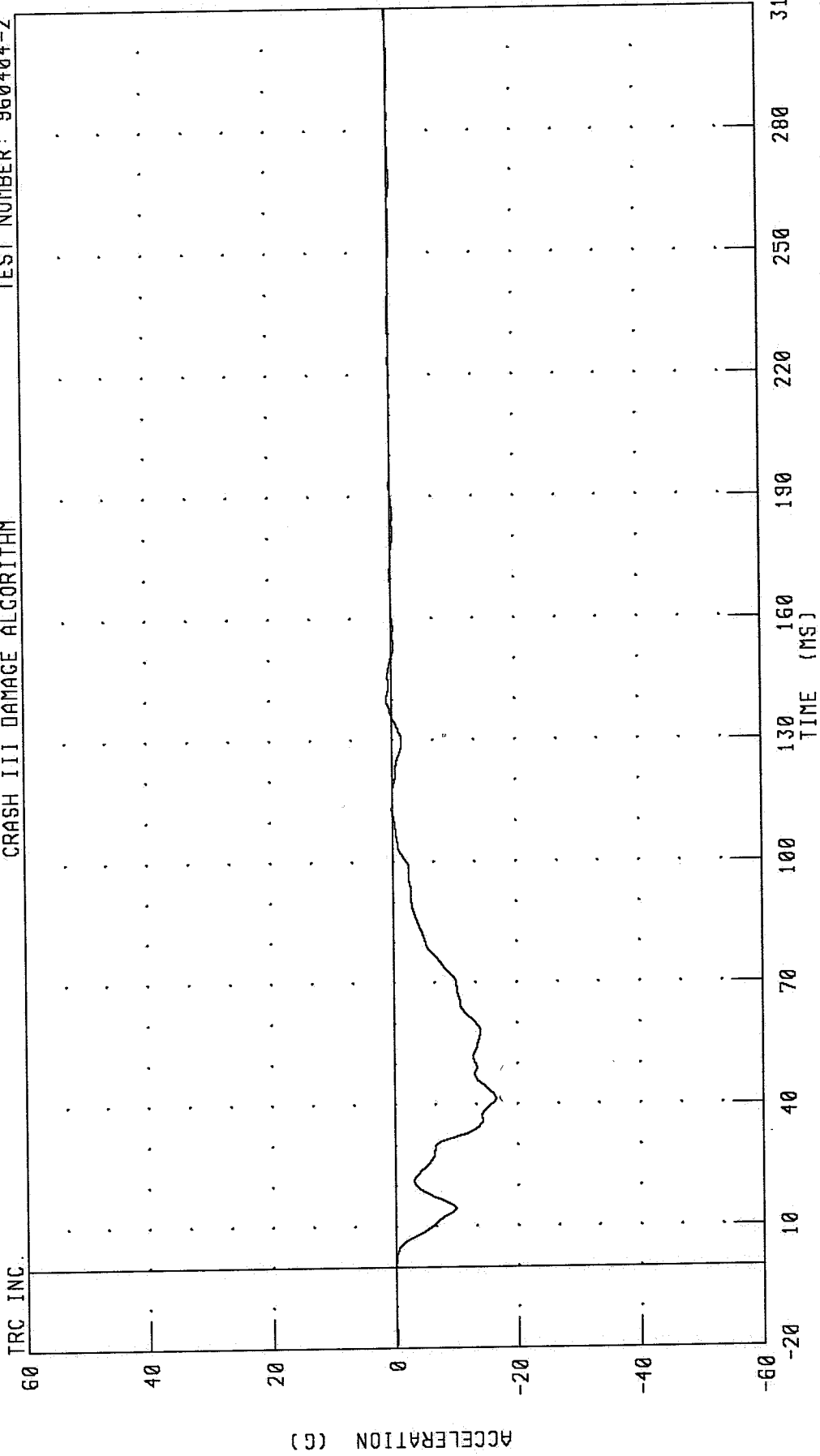
CHANNEL: VCGRD1 FILTER: CH. CLASS 180 PEAK DATA: 239.60 MM @ 93.76 MS; -356.09 MM @ 310.00 MS

Data Plots

Test No. 960404-2

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

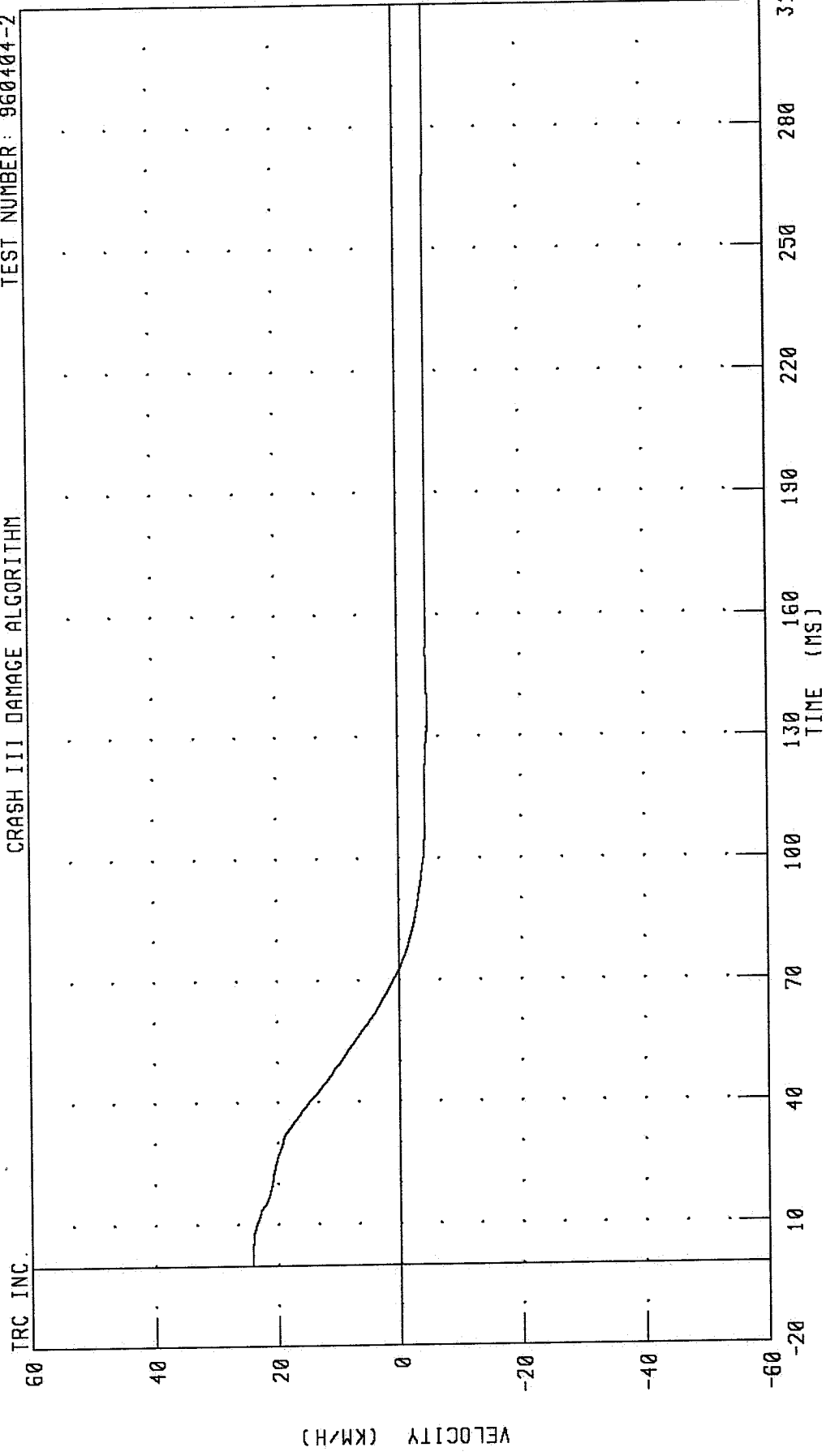
TEST NUMBER: 960404-2



CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.86 G @ 140.32 MS; -16.53 G @ 41.60 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 LEFT REAR SILL X-AXIS VELOCITY
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



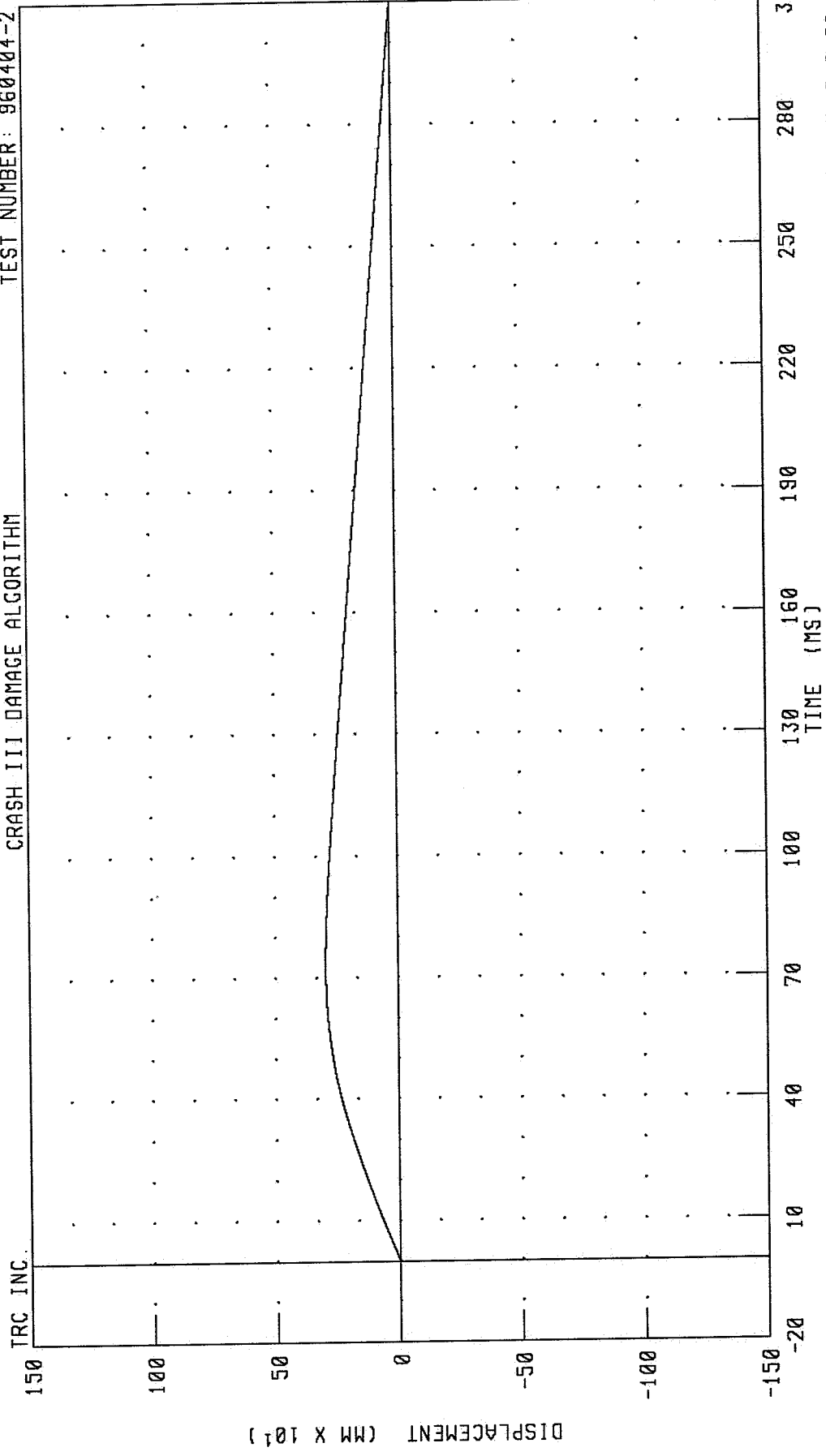
CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 24.20 KM/H @ 0.00 MS; -4.95 KM/H @ 134.64 MS

TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

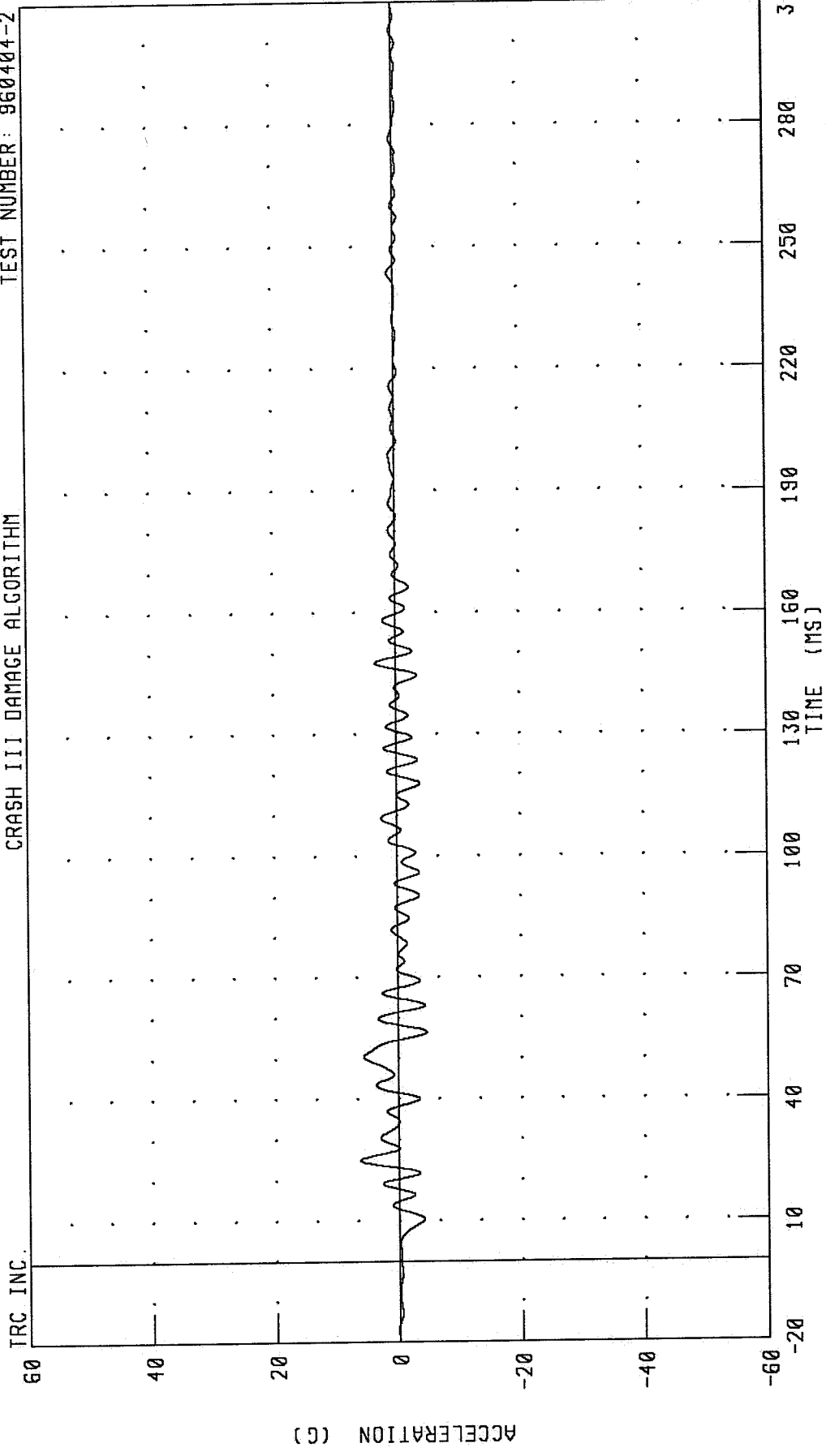
TEST NUMBER: 960404-2



CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 295.33 MM @ 72.80 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

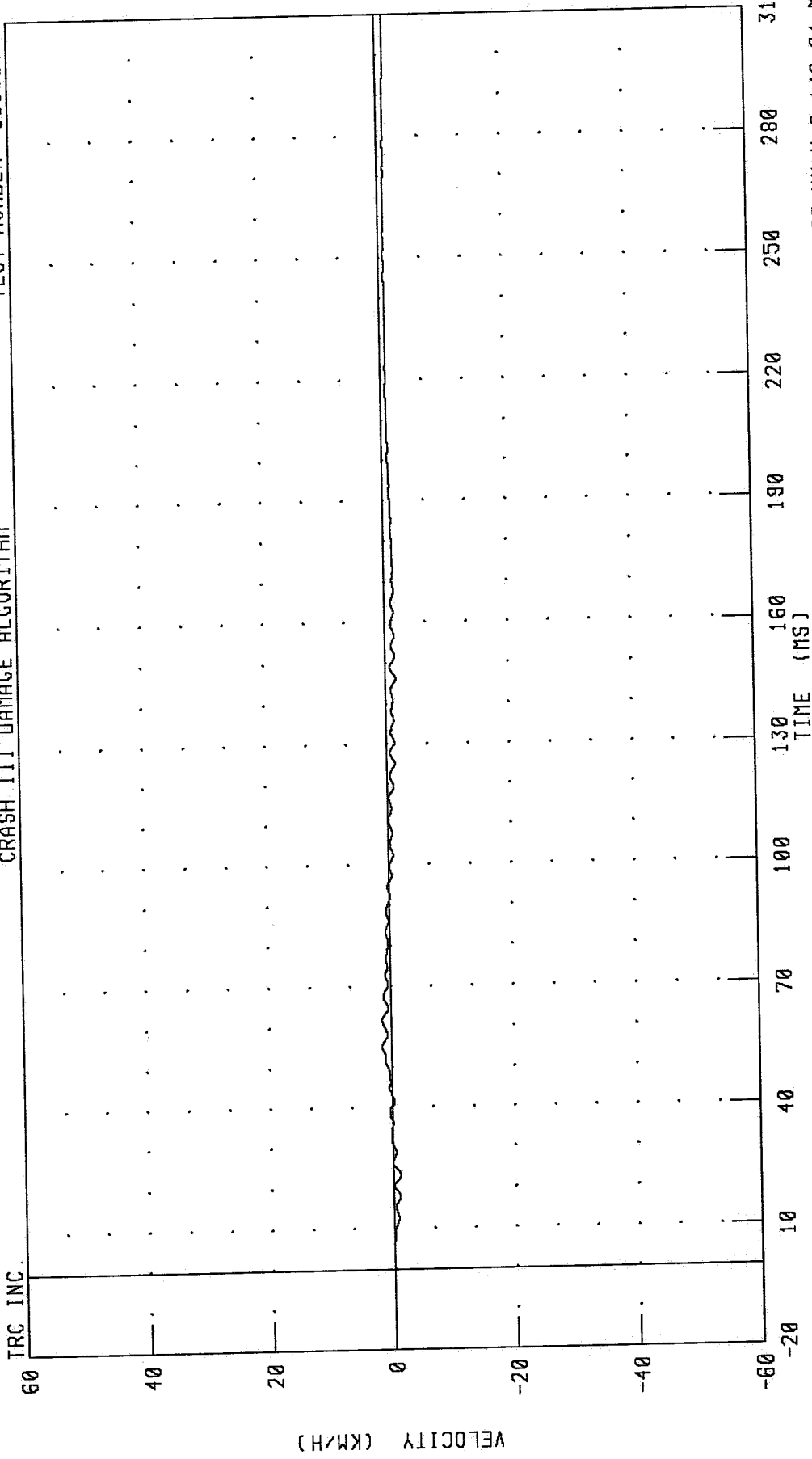


CHANNEL: LRSZG1 FILTER: CH. CLASS 60

PEAK DATA: 6.23 G @ 24.96 MS; -4.66 G @ 56.56 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT REAR SILL Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

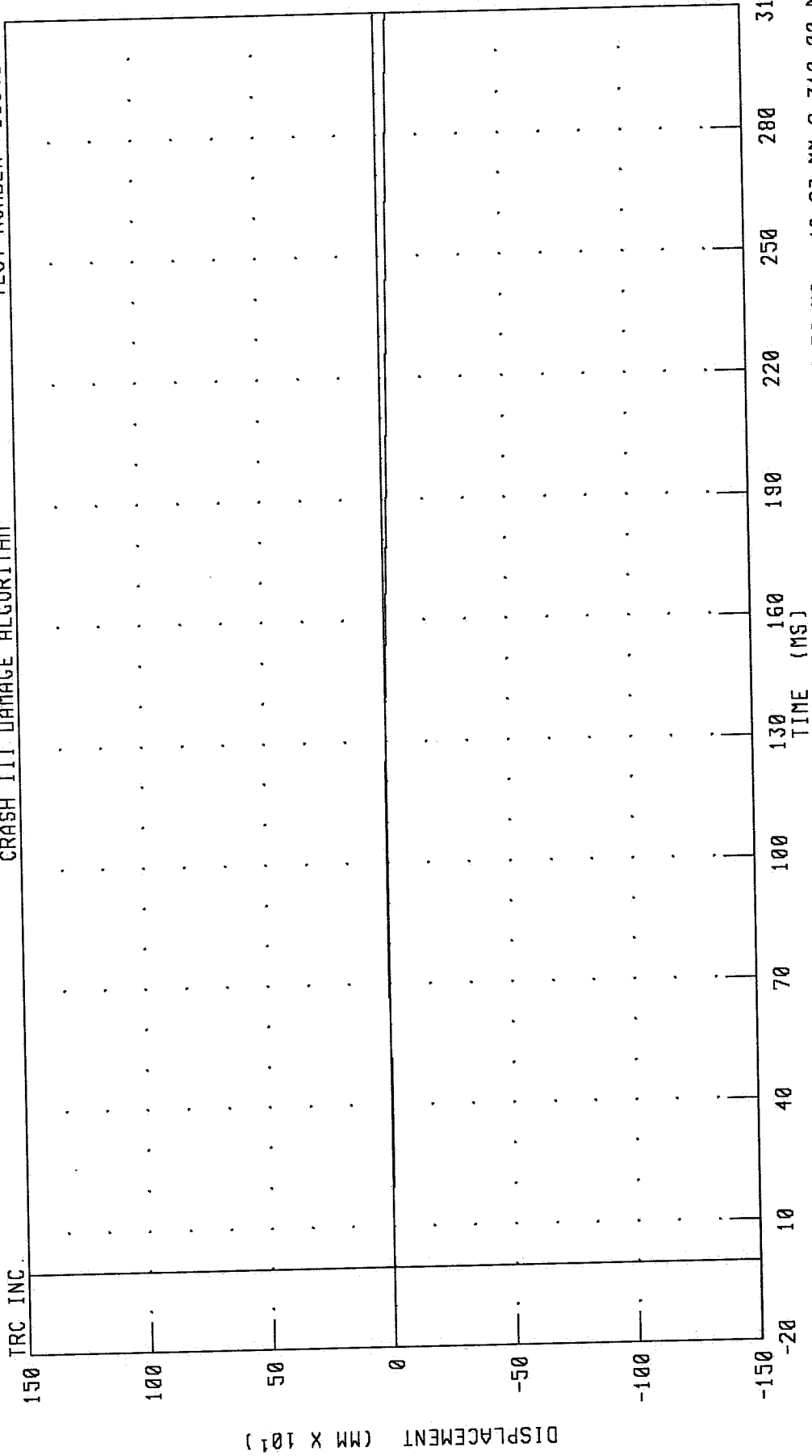
TEST NUMBER: 960404-2



CHANNEL: LRSZV1 FILTER: CH. CLASS 180
PEAK DATA: 1.57 KM/H @ 55.12 MS; -1.63 KM/H @ 146.24 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 LEFT REAR SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

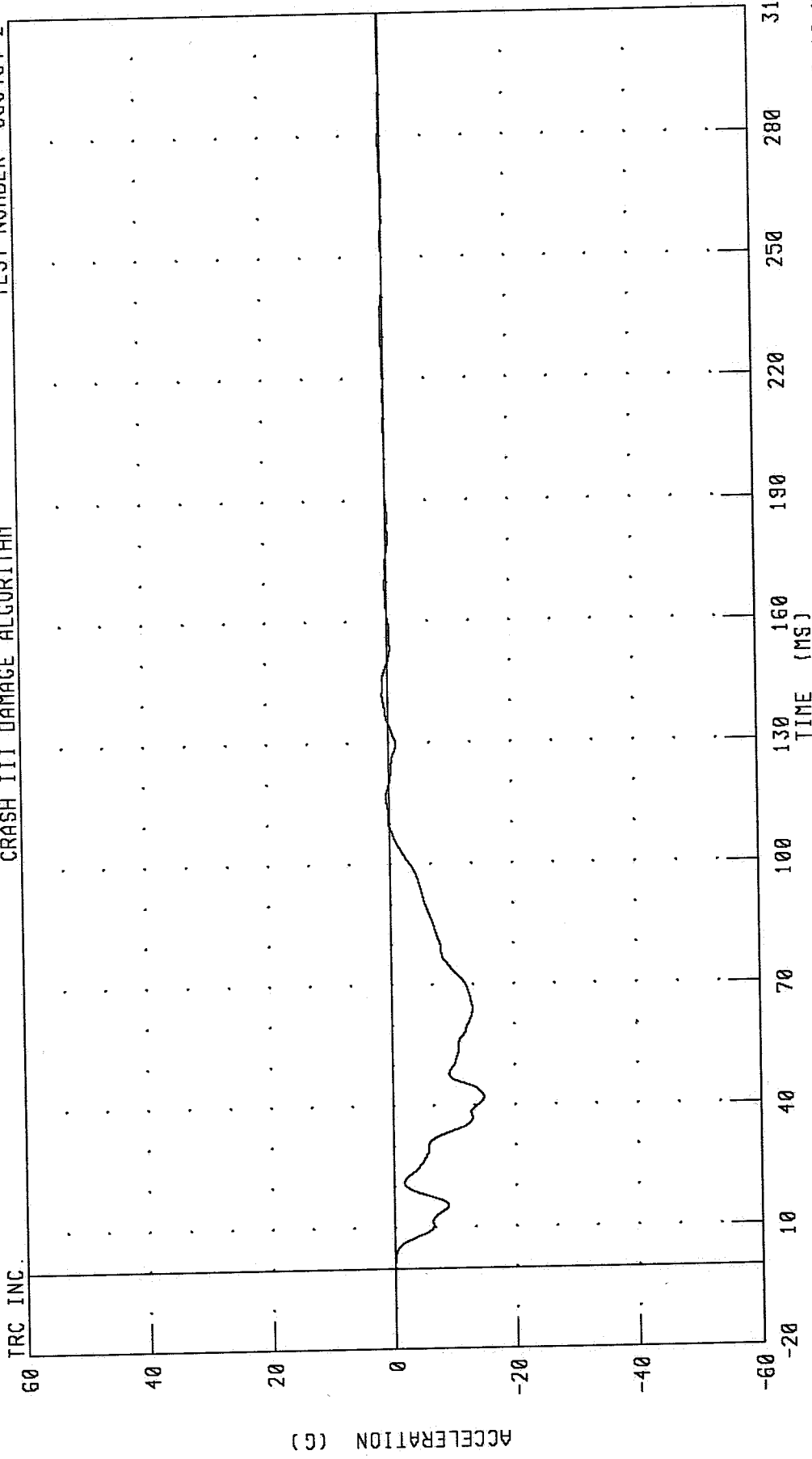


PEAK DATA: 6.48 MM @ 95.76 MS; -48.93 MM @ 310.00 MS

CHANNEL: LRSZD1 FILTER: CH. CLASS 180

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



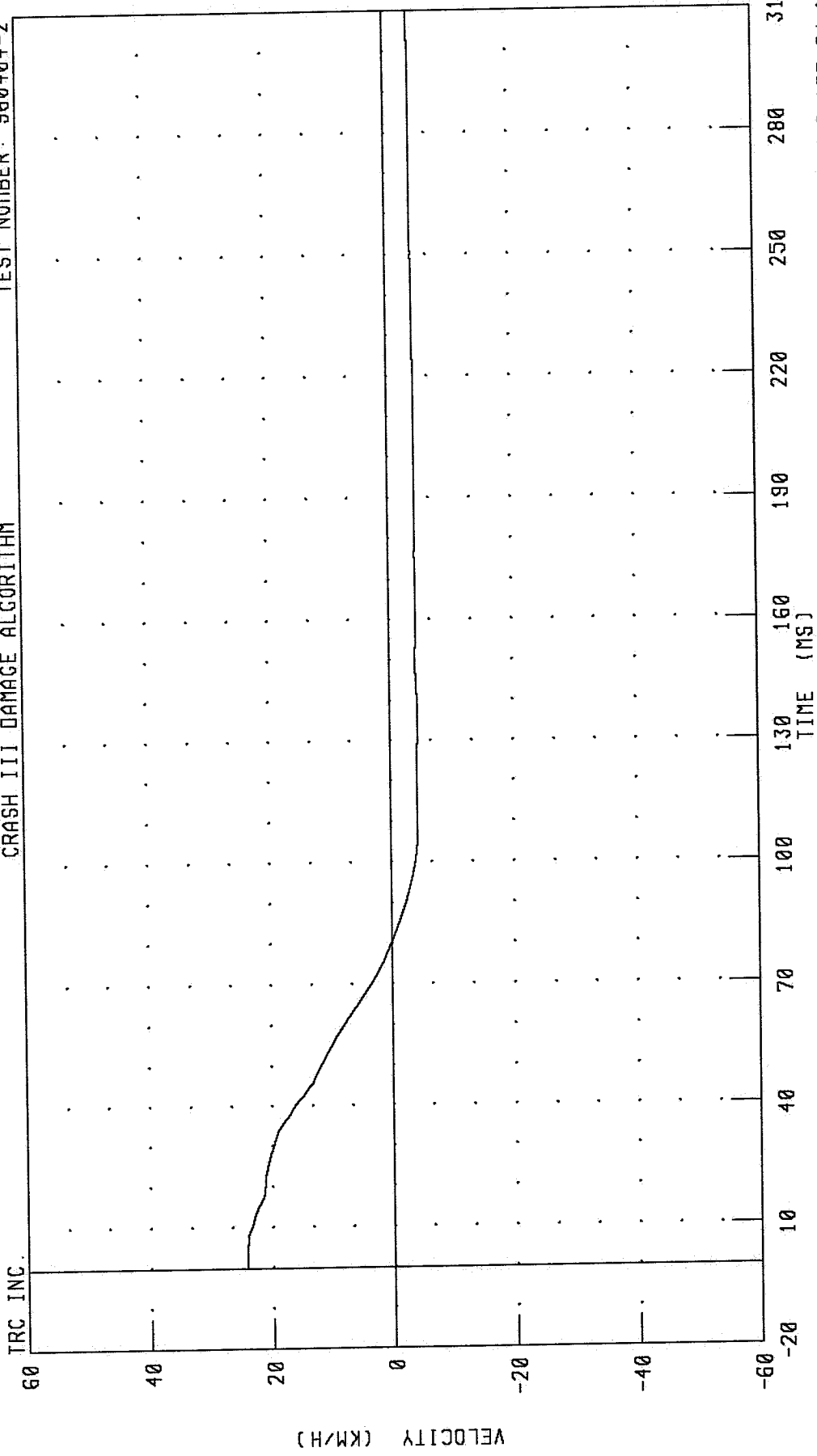
PEAK DATA: 0.95 G @ 141.92 MS; -14.87 G @ 42.16 MS

CHANNEL: RRSXG1 FILTER: CH. CLASS 60

TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT REAR SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

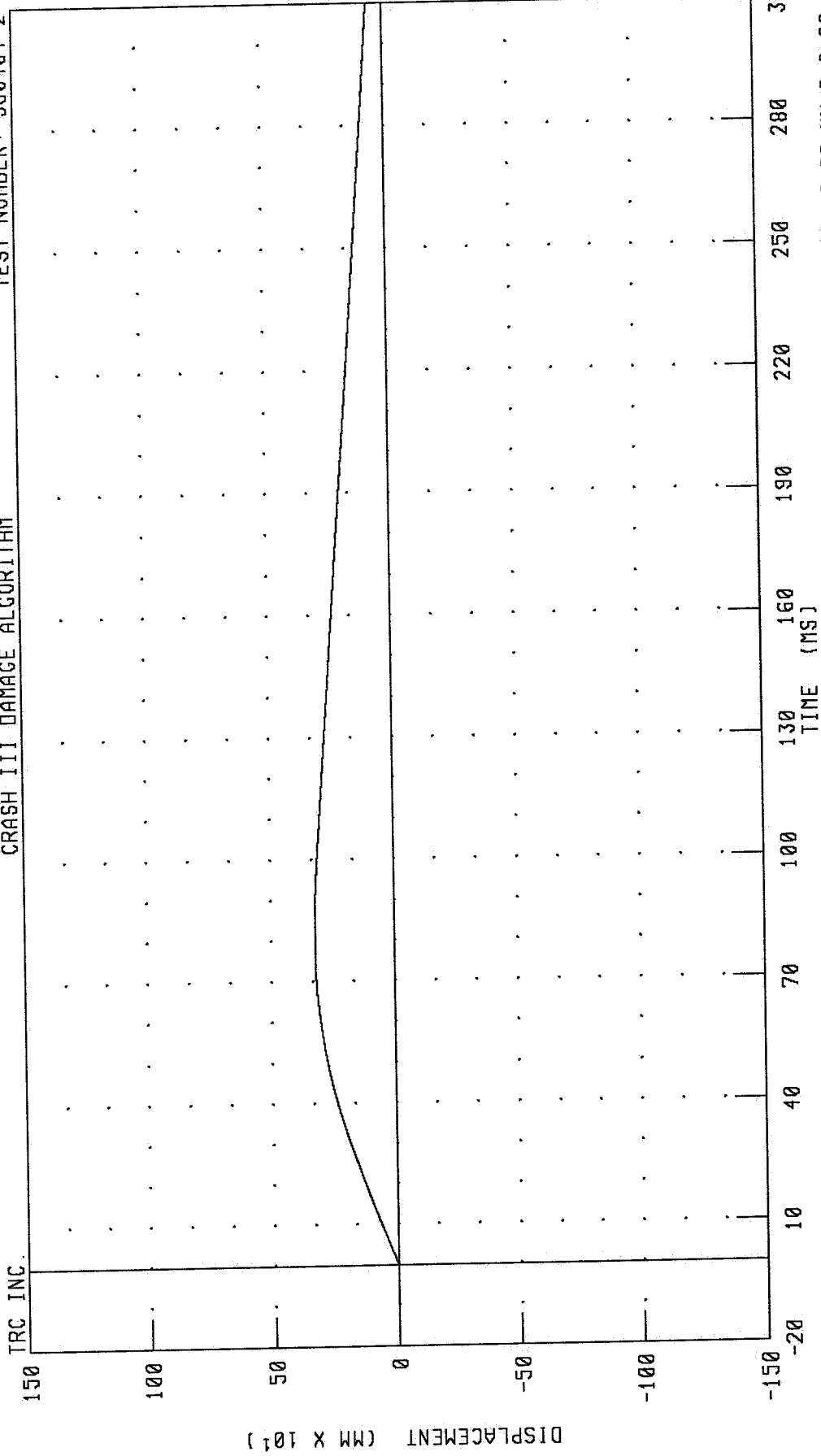


CHANNEL: RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 24.20 KM/H @ 0.00 MS; -4.62 KM/H @ 135.04 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

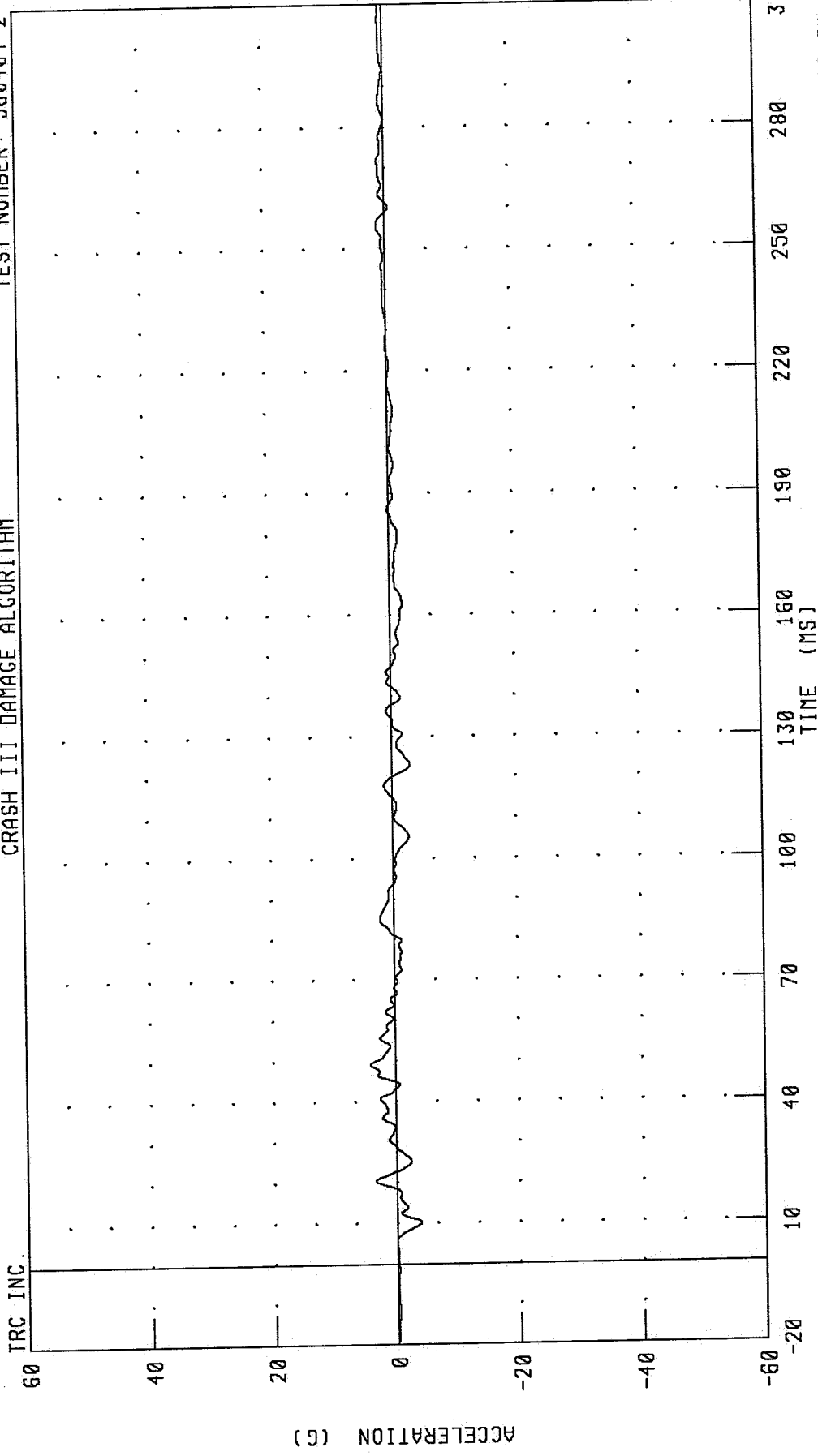


CHANNEL: RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 324.16 MM @ 80.40 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

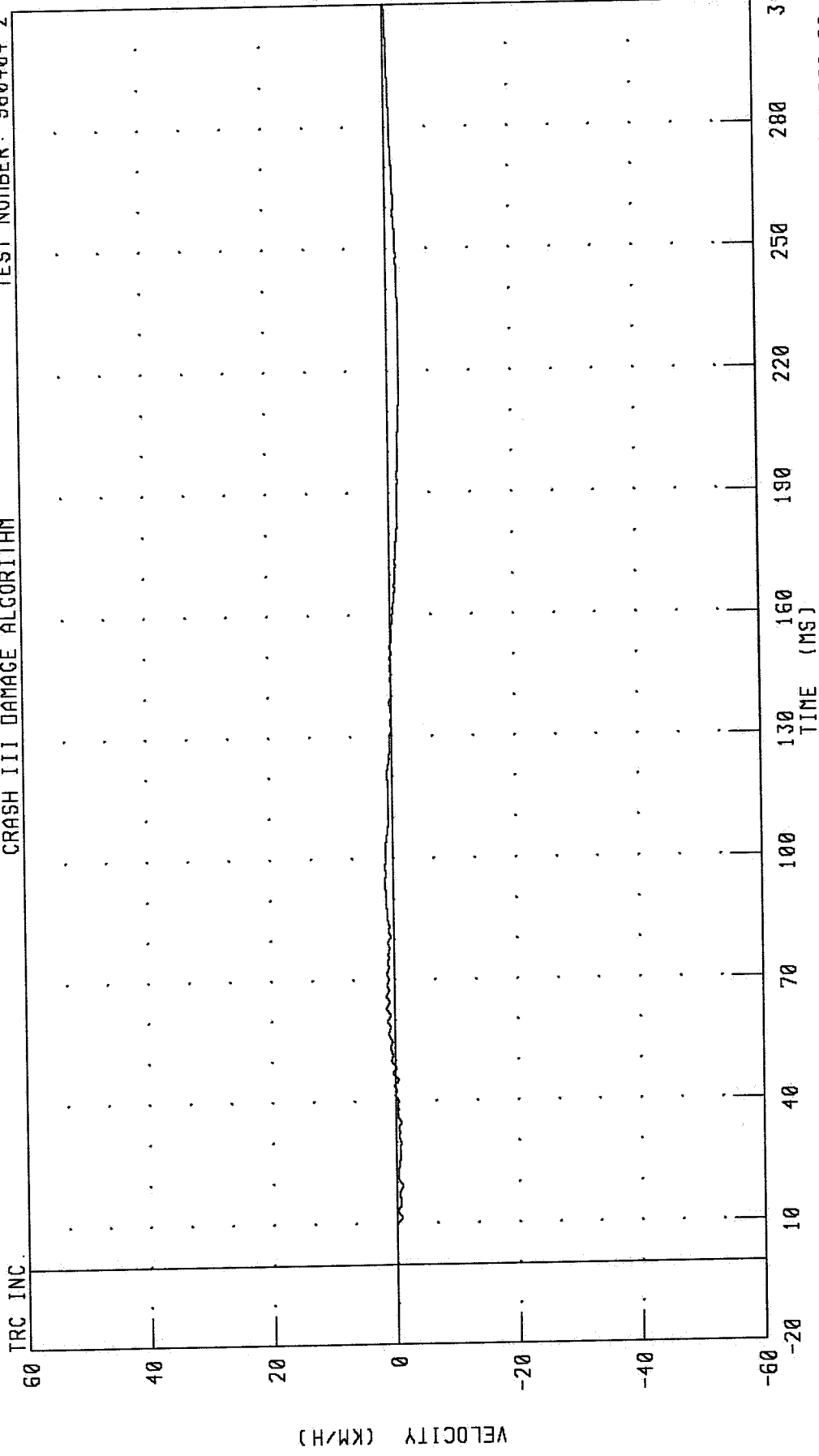


CHANNEL: RRSZG1 FILTER: CH. CLASS 60

PEAK DATA: 4.07 G @ 49.12 MS; -3.90 G @ 10.24 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT REAR SILL Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

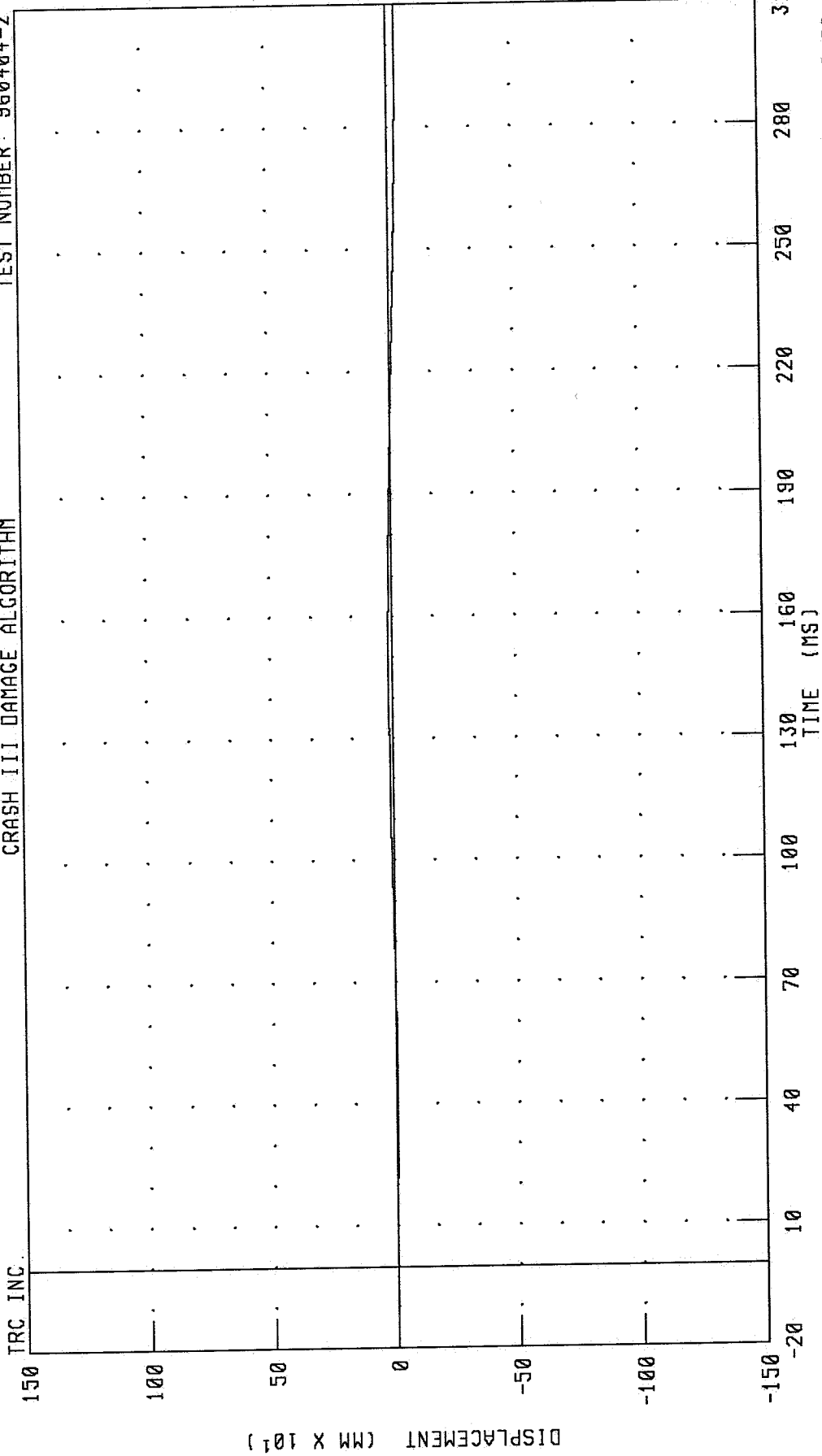
TEST NUMBER: 960404-2



TRC INC. CHANNEL: RRSZV1 FILTER: CH. CLASS 180
PEAK DATA: 1.37 KM/H @ 93.44 MS; -1.89 KM/H @ 222.80 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 RIGHT REAR SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

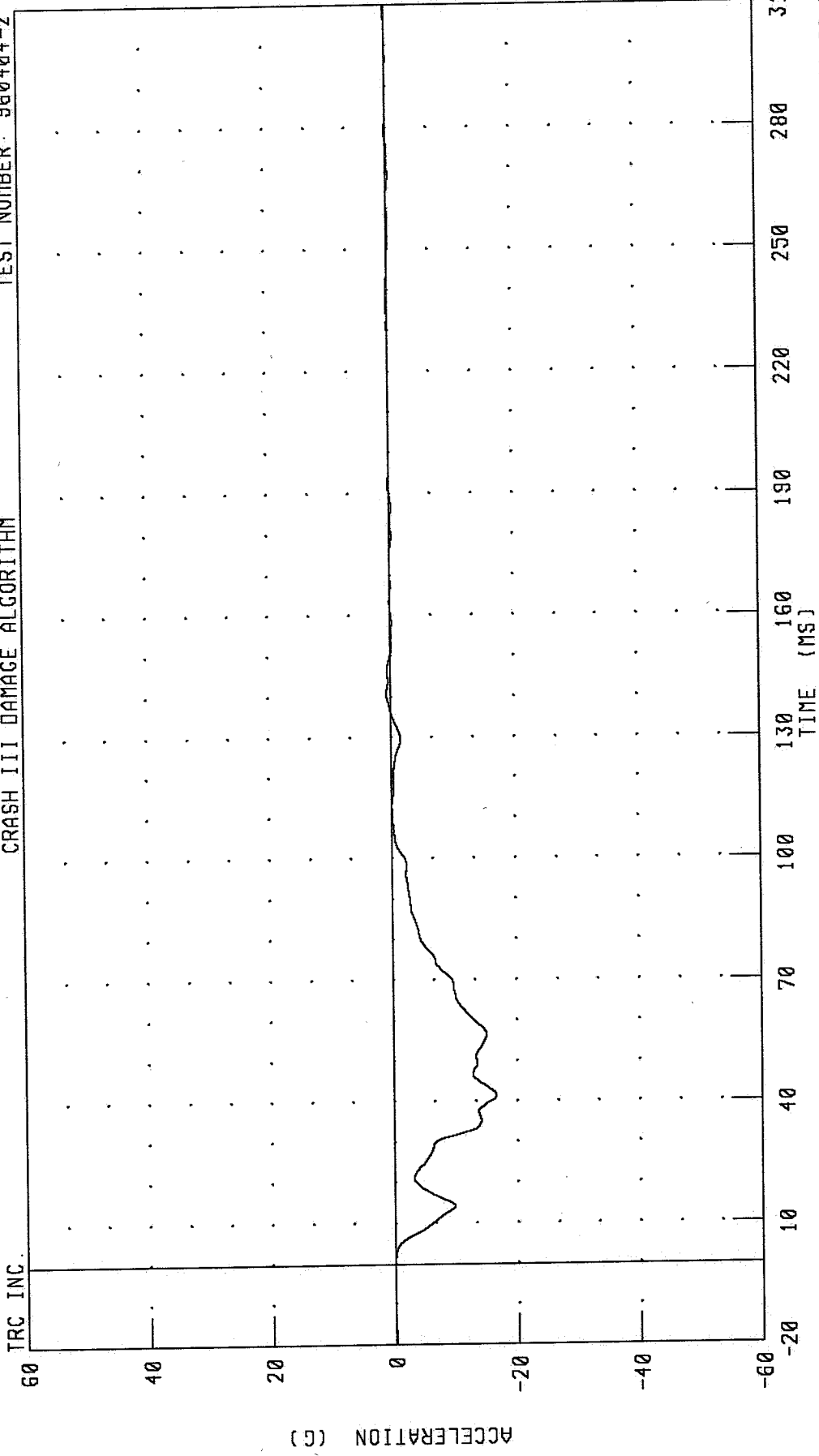
TEST NUMBER: 960404-2



CHANNEL: RRSZ01 FILTER: CH. CLASS 180 PEAK DATA: 15.65 MM @ 152.96 MS; -35.53 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



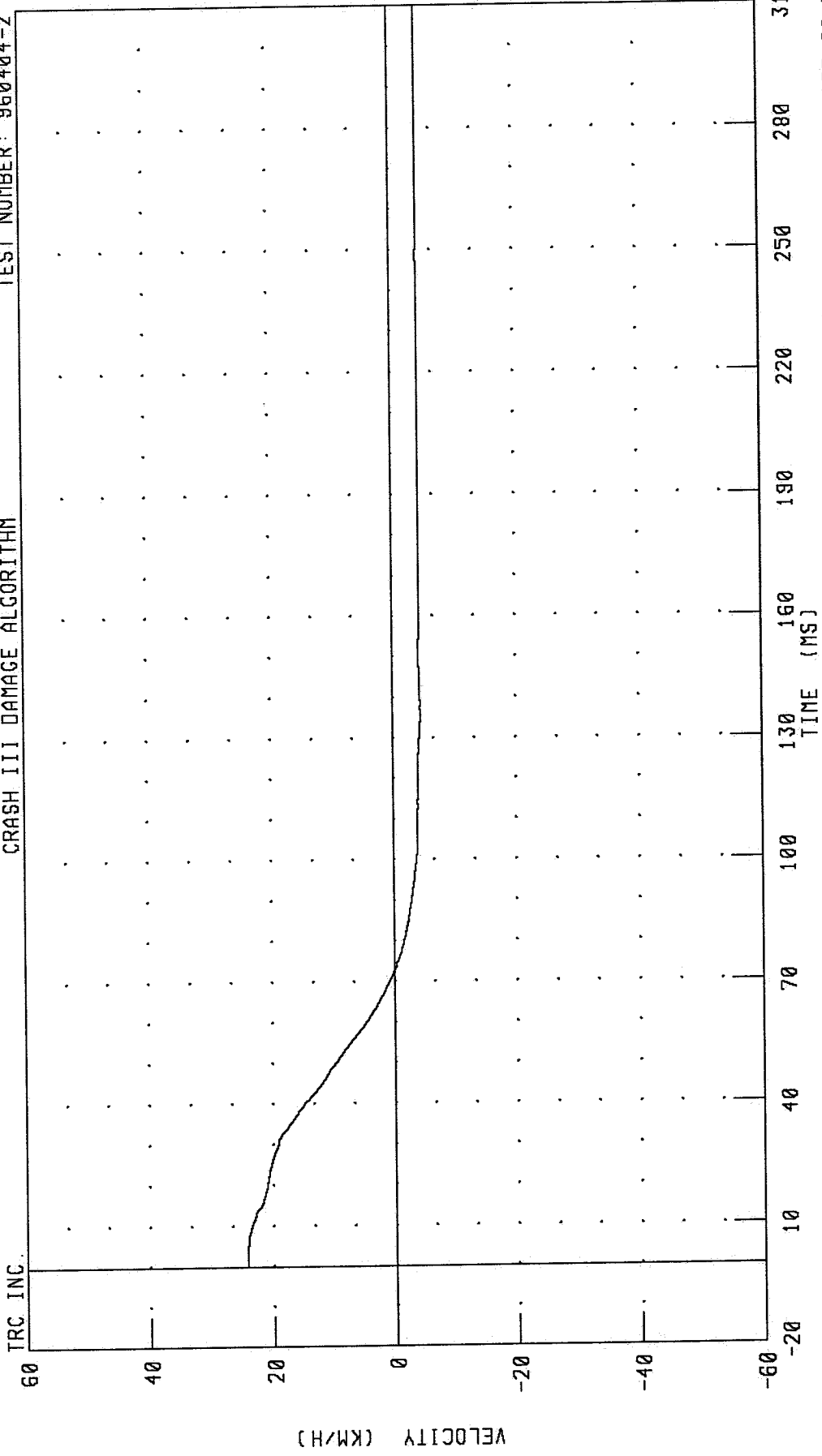
CHANNEL: LFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.69 G @ 140.80 MS; -16.58 G @ 41.60 MS

TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

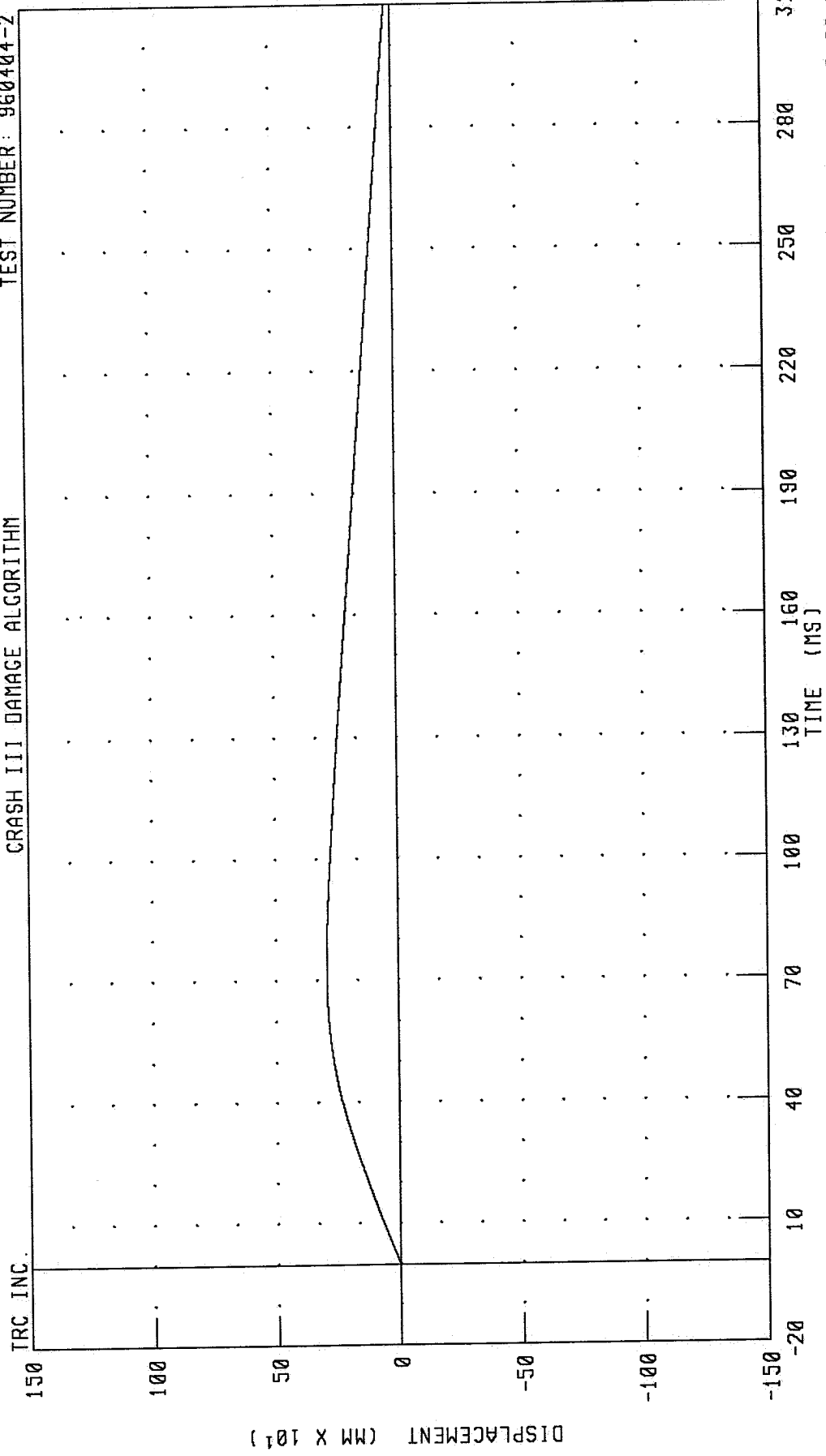


CHANNEL: LFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 24.20 KM/H @ 0.00 MS; -4.49 KM/H @ 135.68 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 LEFT FRONT SILL X-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

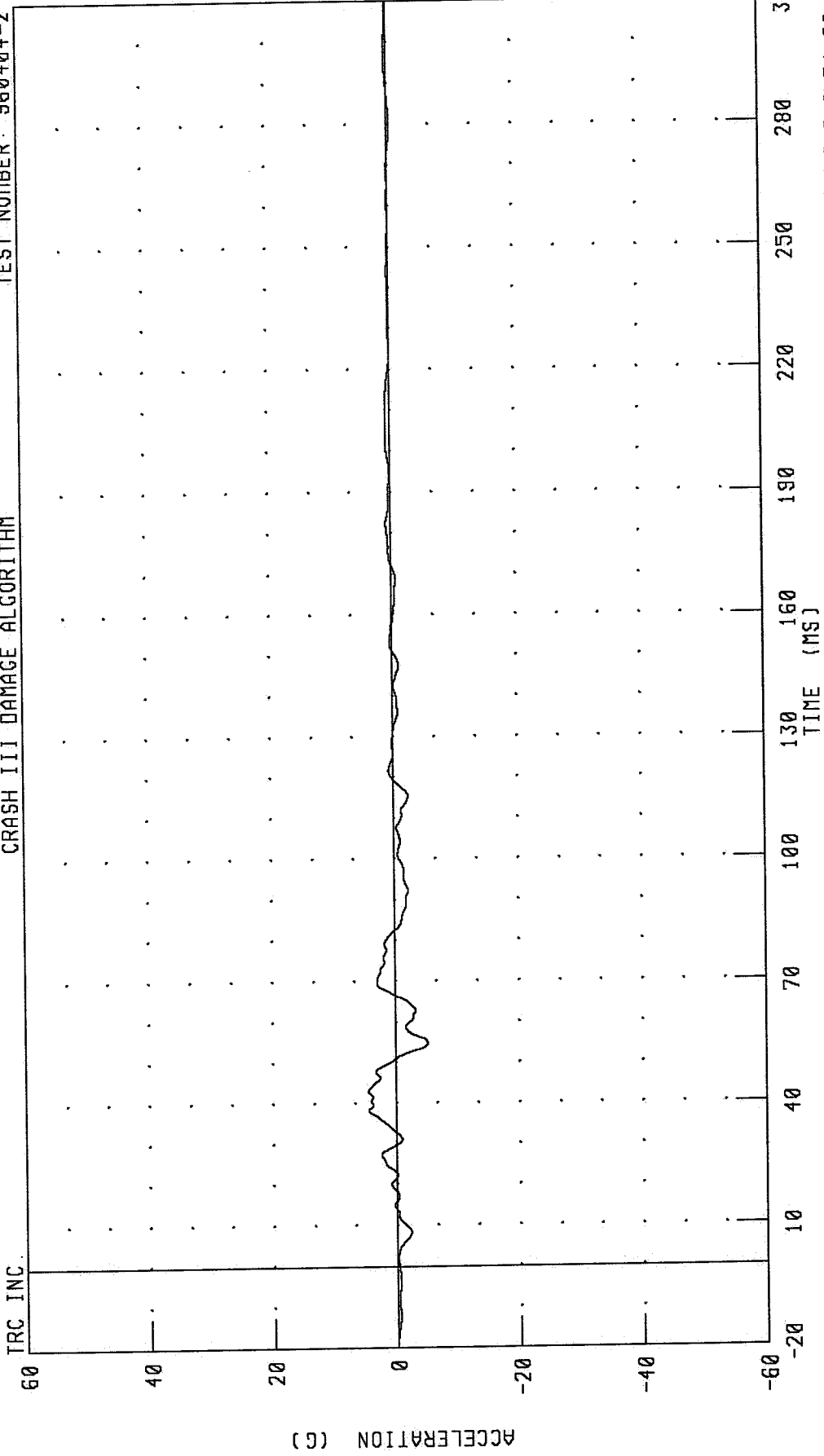


CHANNEL: LFSXD1 FILTER: CH. CLASS 180

PEAK DATA: 293.98 MM @ 72.80 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT FRONT SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



PEAK DATA: 4.52 G @ 42.88 MS; -5.19 G @ 54.80 MS

CHANNEL: LFSZG1 FILTER: CH. CLASS 60

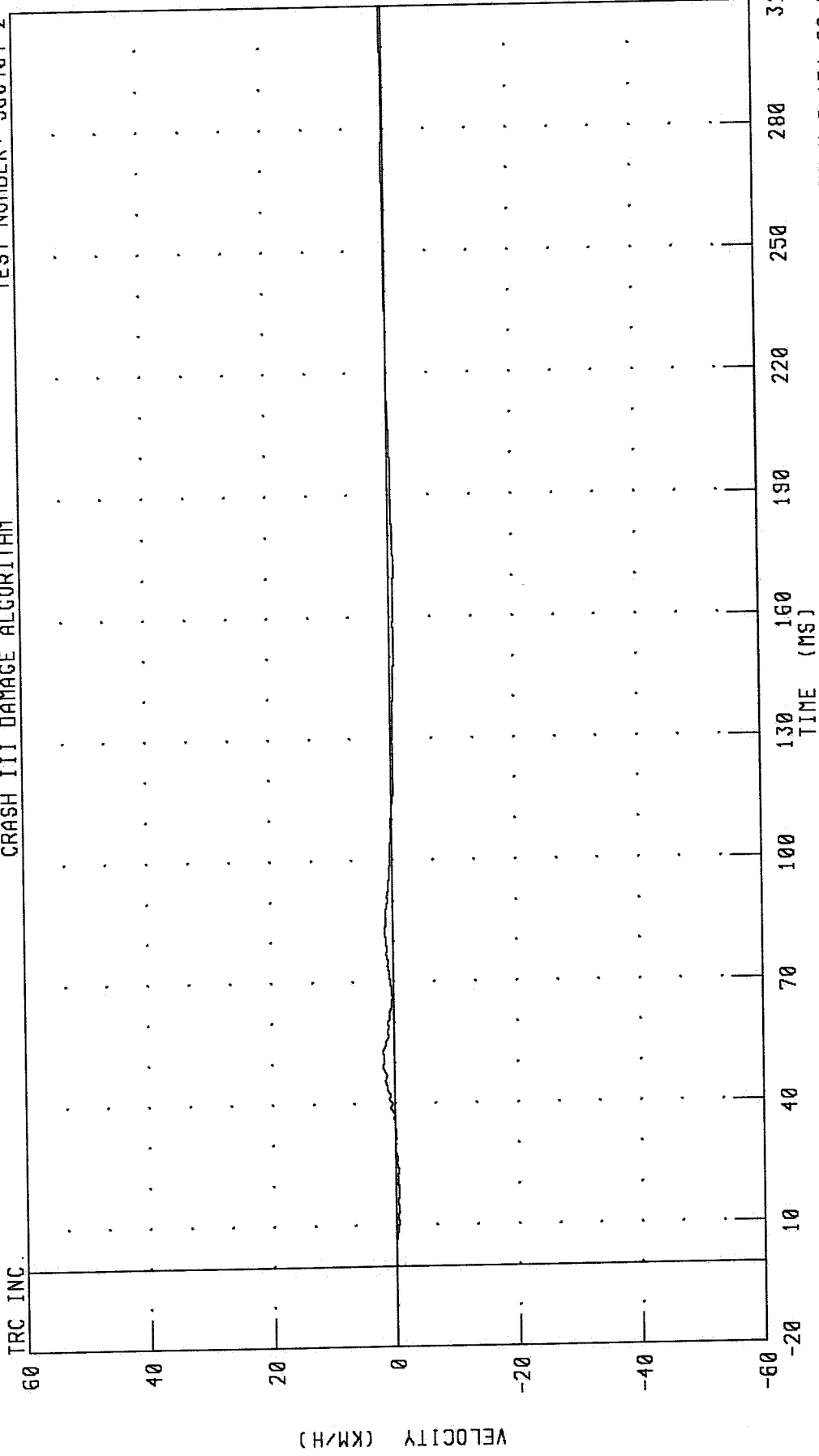
TRC INC.

ACCELERATION (G)

TIME (MS)

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
LEFT FRONT SILL Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



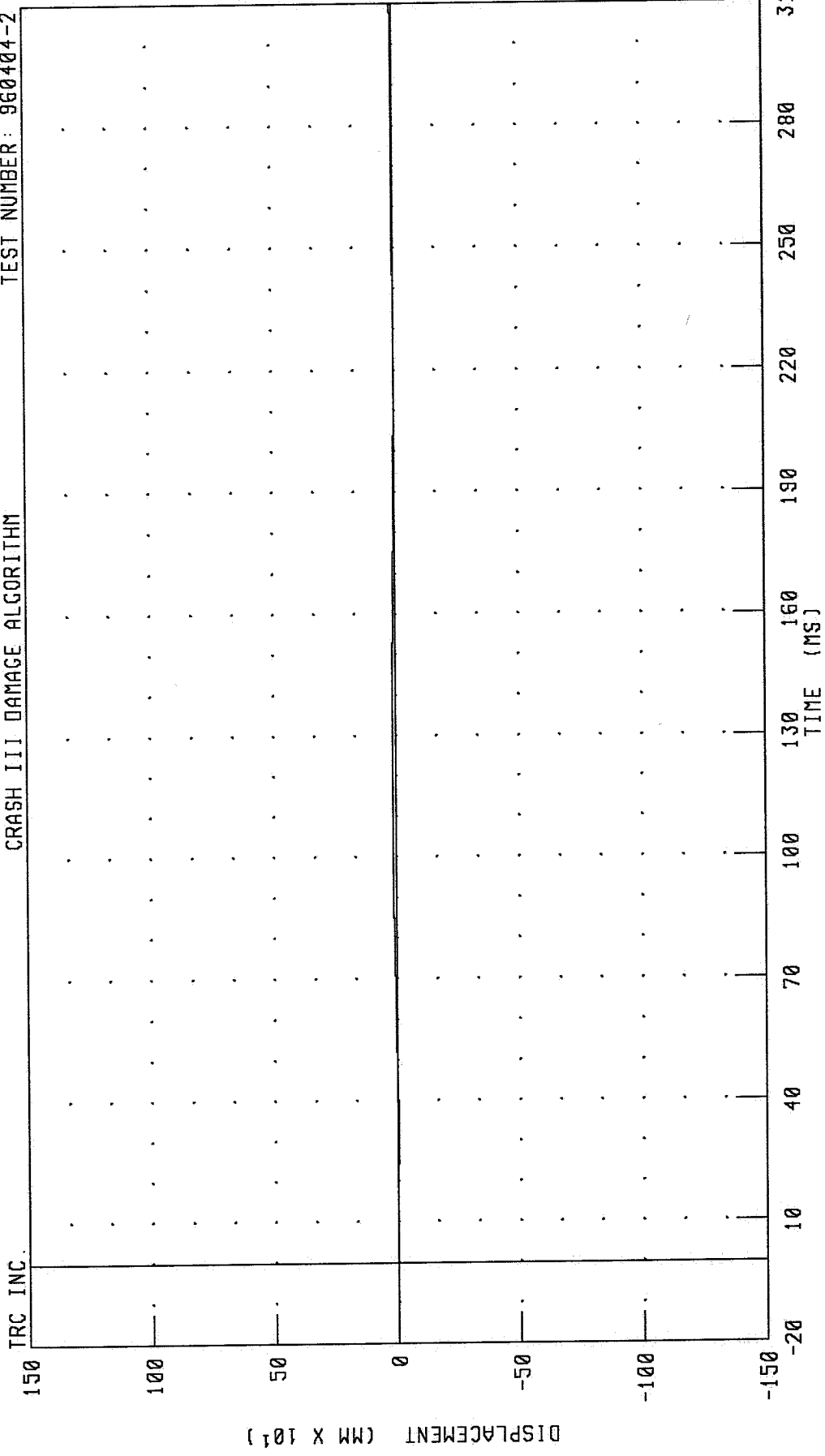
CHANNEL: LFSZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.86 KM/H @ 52.80 MS; -0.80 KM/H @ 171.60 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 LEFT FRONT SILL Z-AXIS DISPLACEMENT

TEST NUMBER: 960404-2

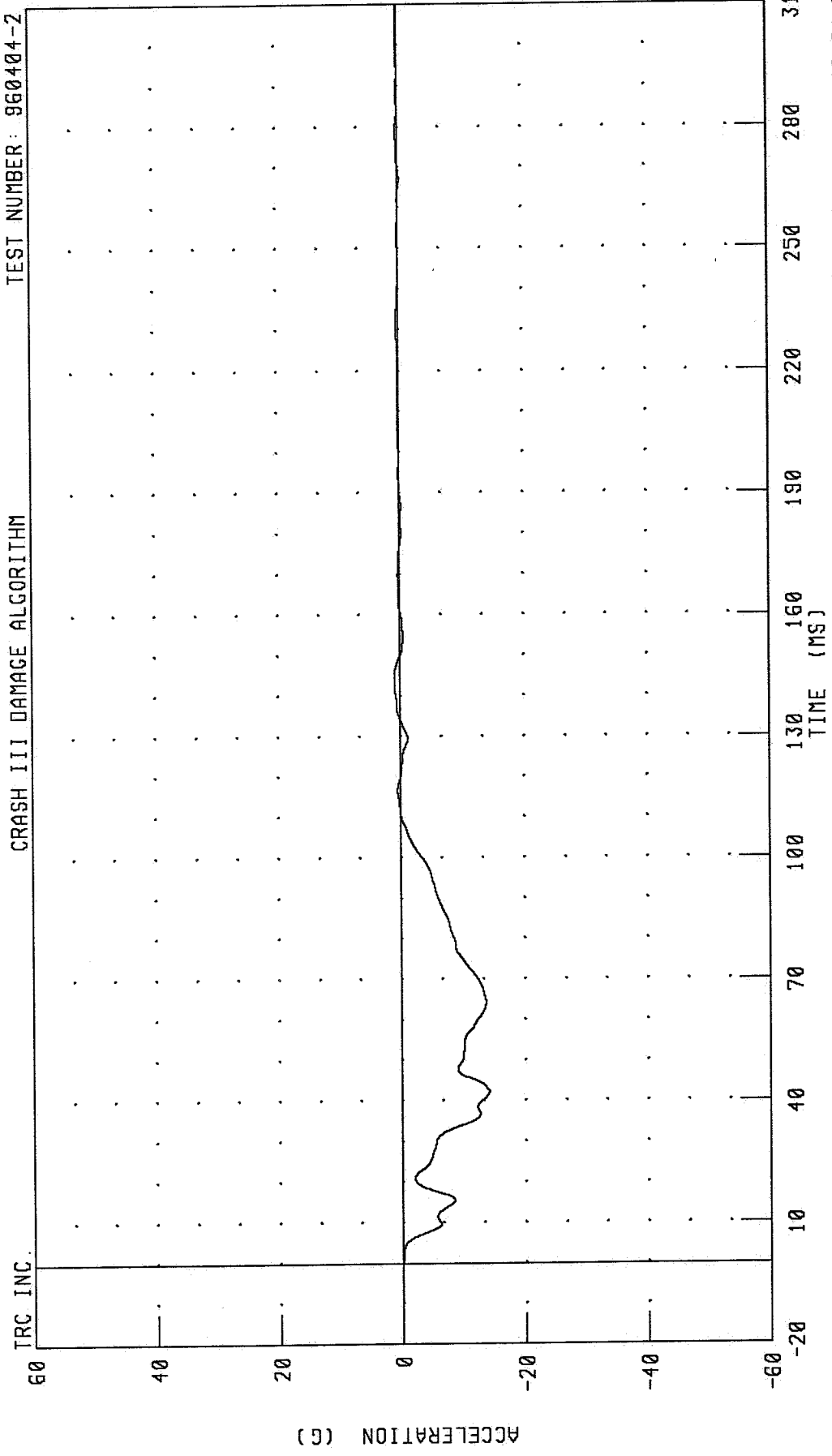
CRASH III DAMAGE ALGORITHM



CHANNEL: LFSZD1 FILTER: CH. CLASS 180 PEAK DATA: 14.89 MM @ 113.36 MS; -2.28 MM @ 35.60 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

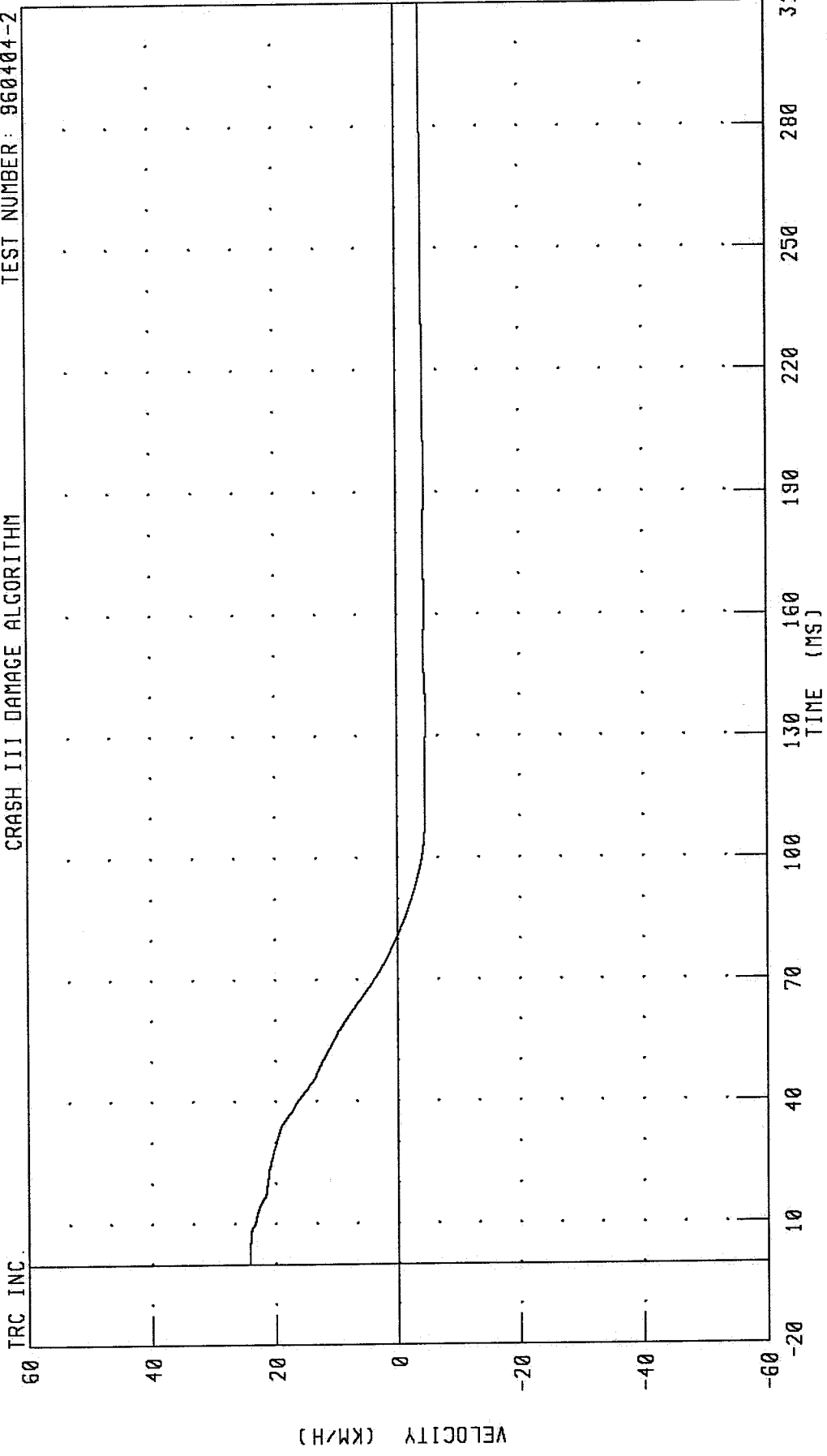


CHANNEL: RFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.89 G @ 141.92 MS; -14.14 G @ 42.24 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

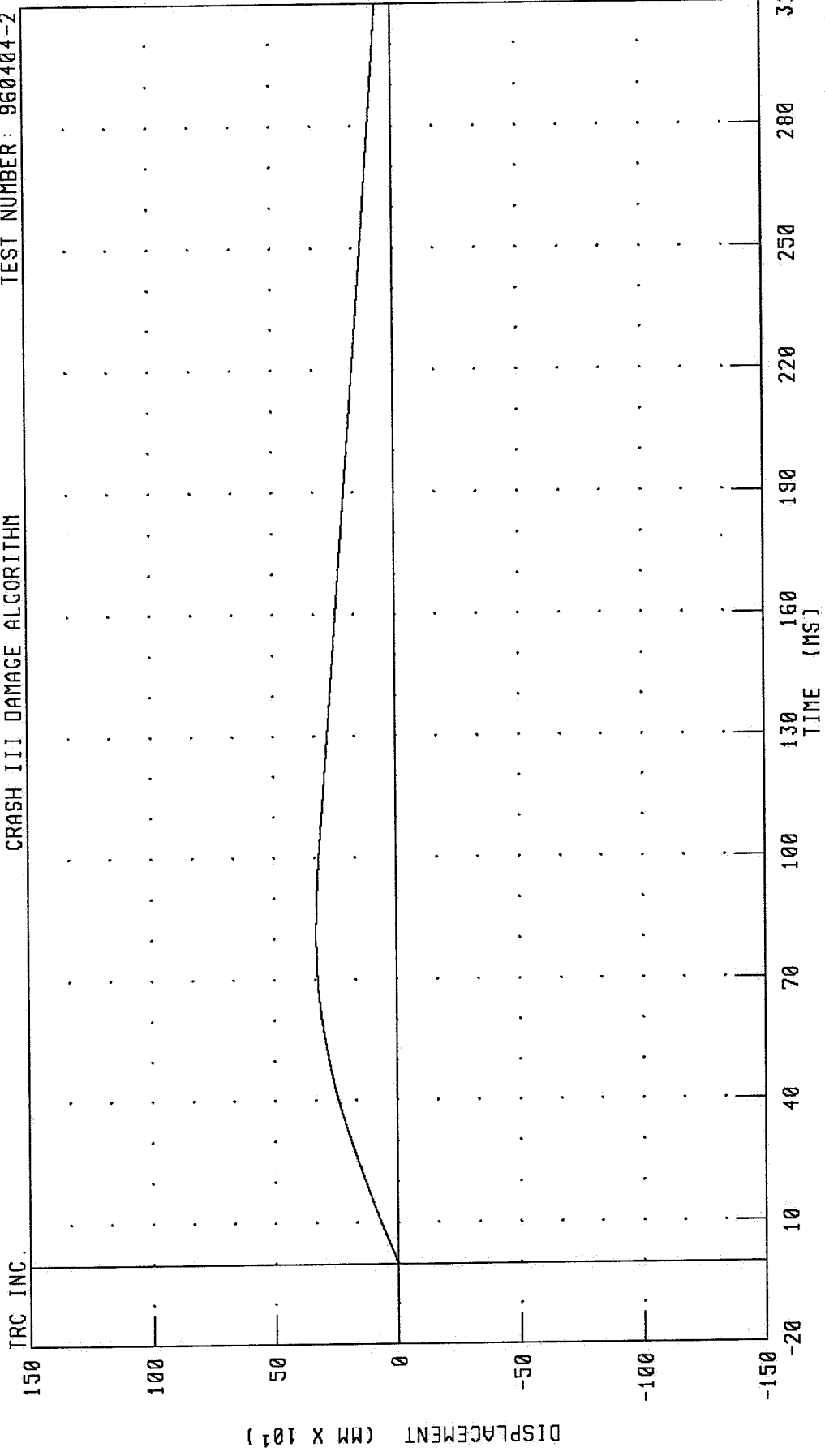


CHANNEL: RFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 24.20 KM/H @ 0.96 MS; -4.74 KM/H @ 134.88 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT FRONT SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



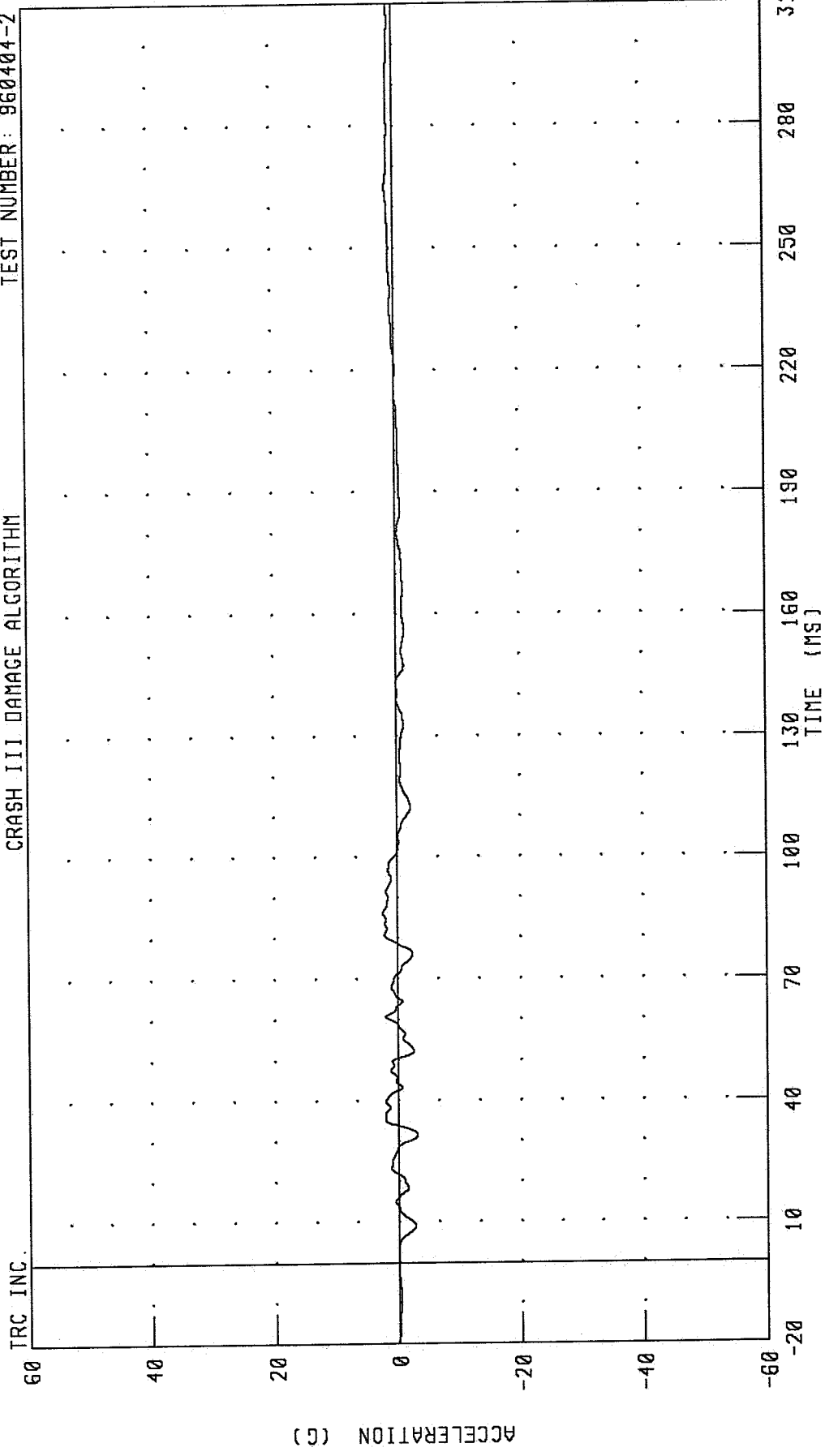
TRC INC.

CHANNEL: RFSXD1 FILTER: CH. CLASS 180

PEAK DATA: 328.71 MM @ 80.96 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT FRONT SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



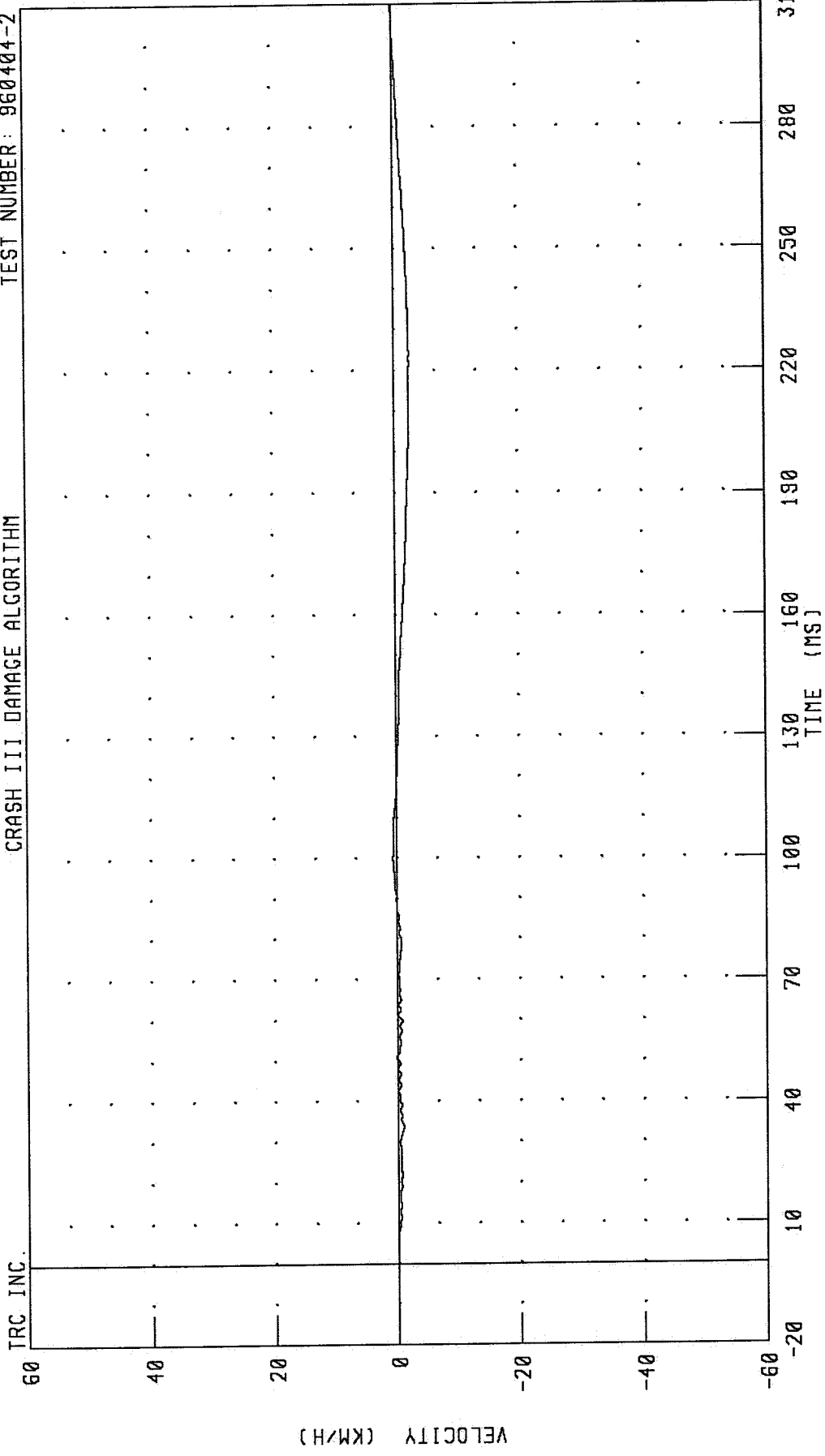
TRC INC.

CHANNEL: RFSZG1 FILTER: CH. CLASS 60

PEAK DATA: 2.40 G @ 86.24 MS; -3.08 G @ 31.60 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
RIGHT FRONT SILL Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM TEST NUMBER: 960404-2

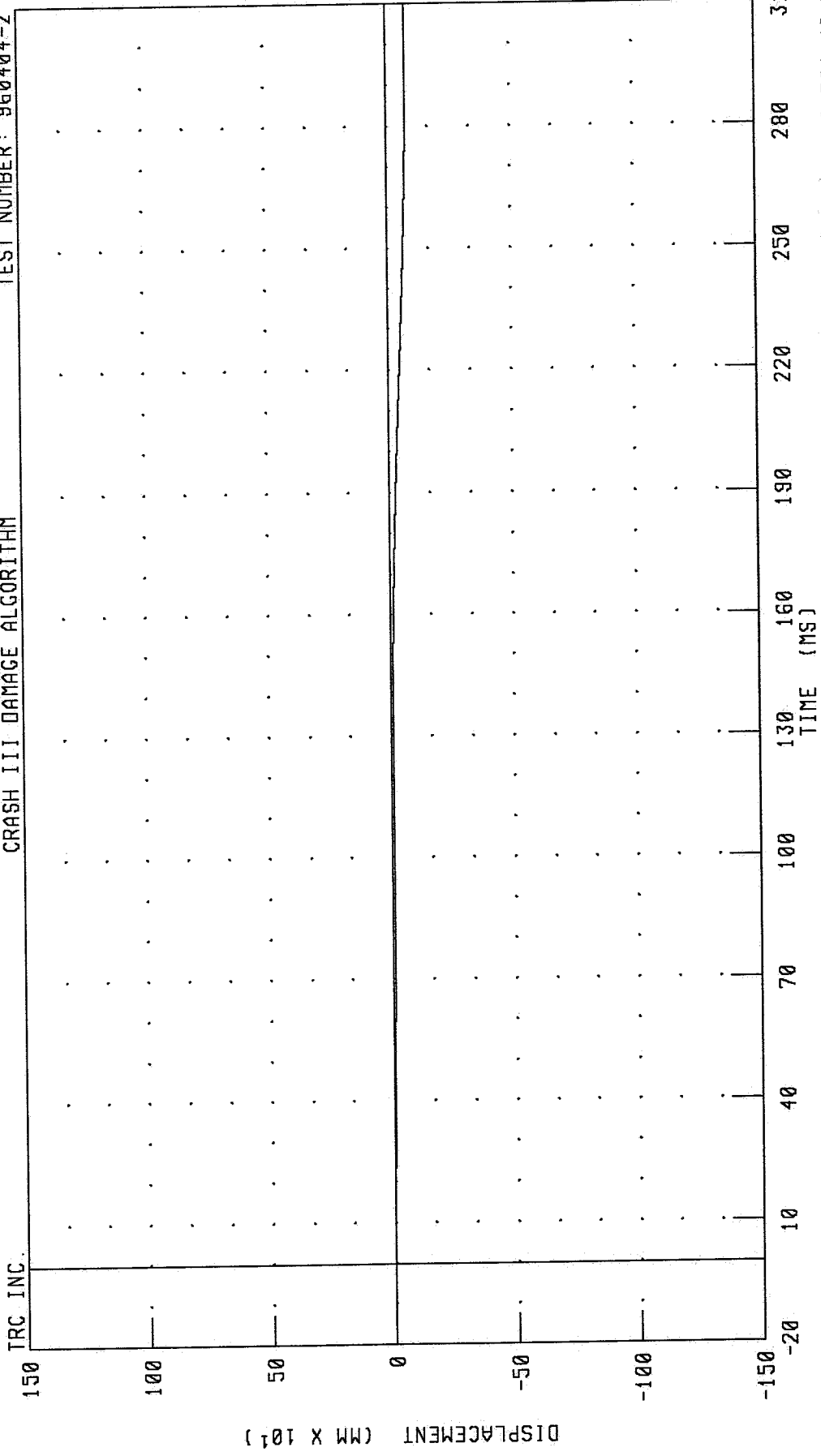


CHANNEL: RFSZV1 FILTER: CH. CLASS 180

PEAK DATA: 0.64 KM/H @ 99.84 MS; -2.45 KM/H @ 221.68 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 RIGHT FRONT SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



CHANNEL: RFSZ01 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MM @ 0.00 MS; -78.00 MM @ 304.40 MS

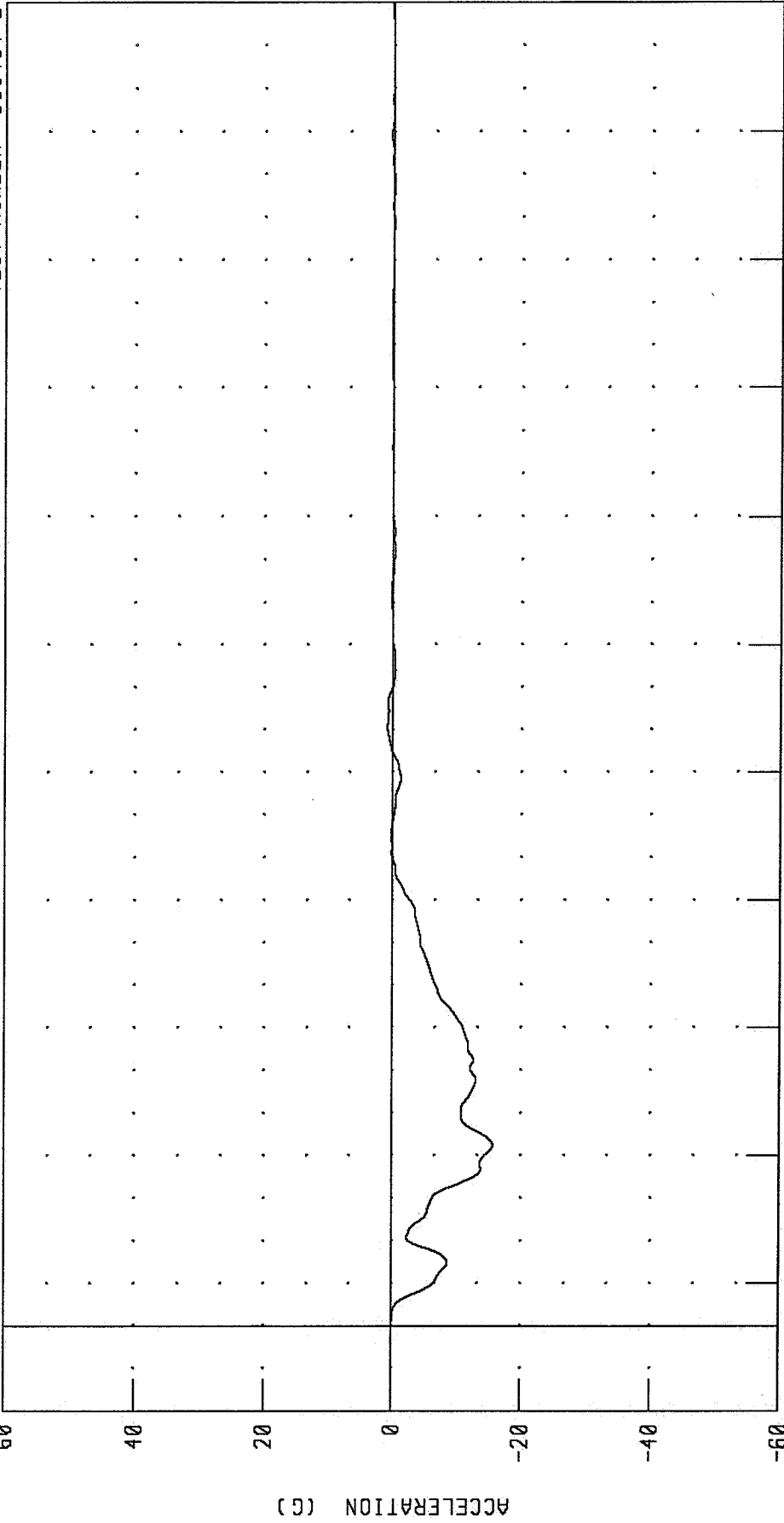
1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2

VEHICLE CG X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-2

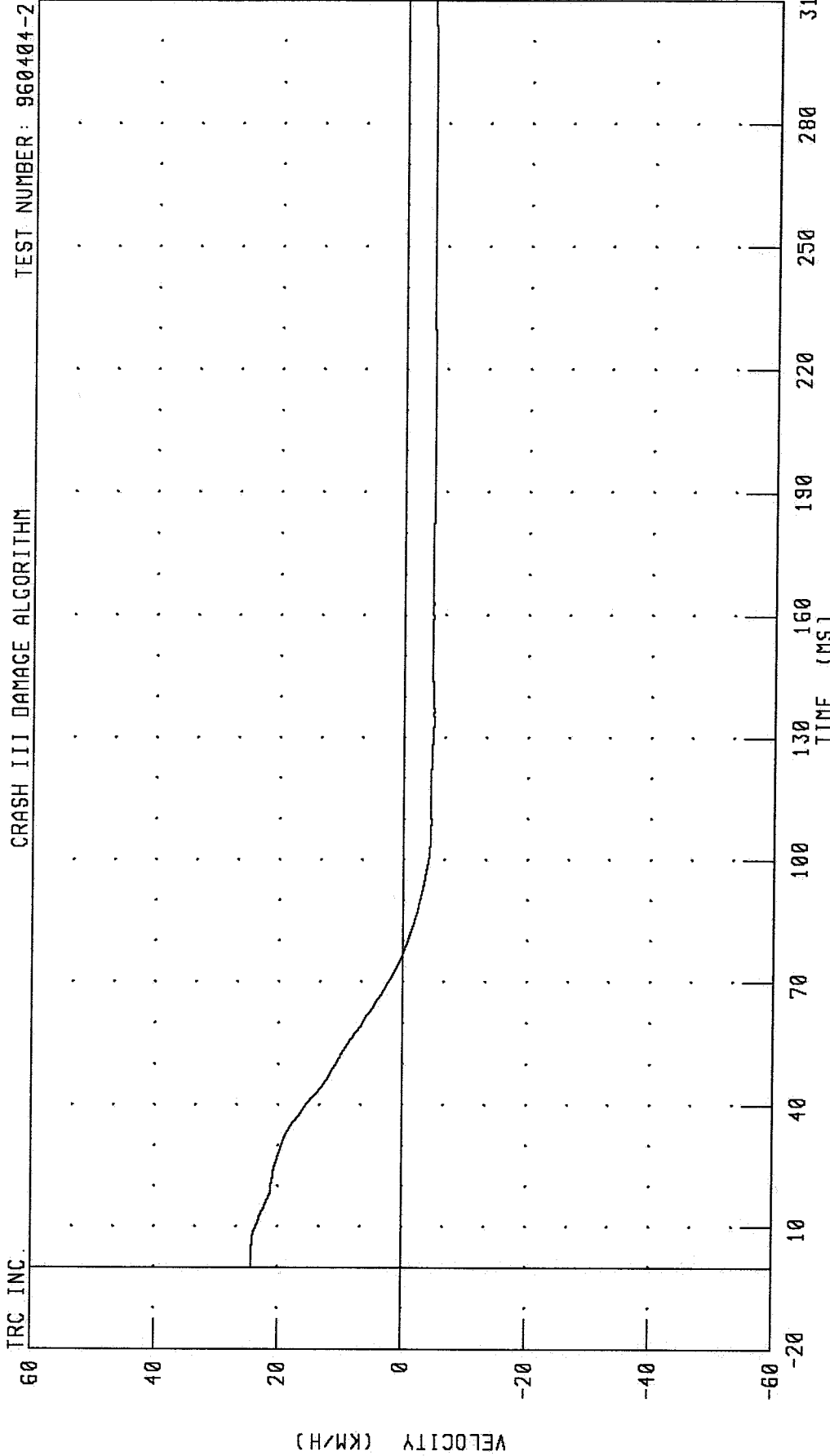


CHANNEL: YCGXG1 FILTER: CH. CLASS 60

TIME (MS)

PEAK DATA: 0.79 G @ 140.88 MS; -15.70 G @ 42.48 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

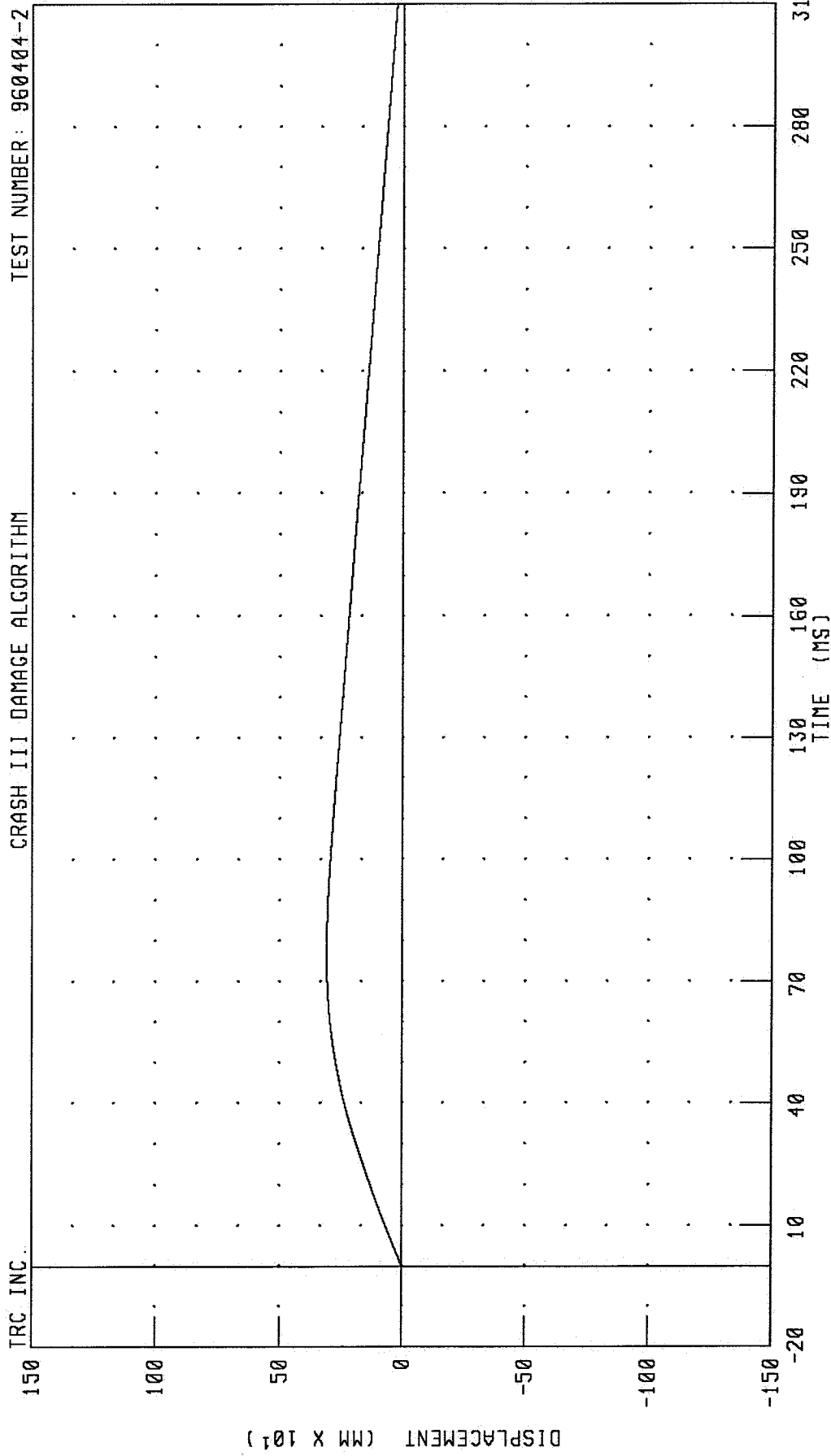


CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 24.20 KM/H @ 0.00 MS; -4.86 KM/H @ 134.08 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



CHANNEL: YCGXD1 FILTER: CH. CLASS 180

PEAK DATA: 309.23 MM @ 76.88 MS; 0.00 MM @ 0.00 MS

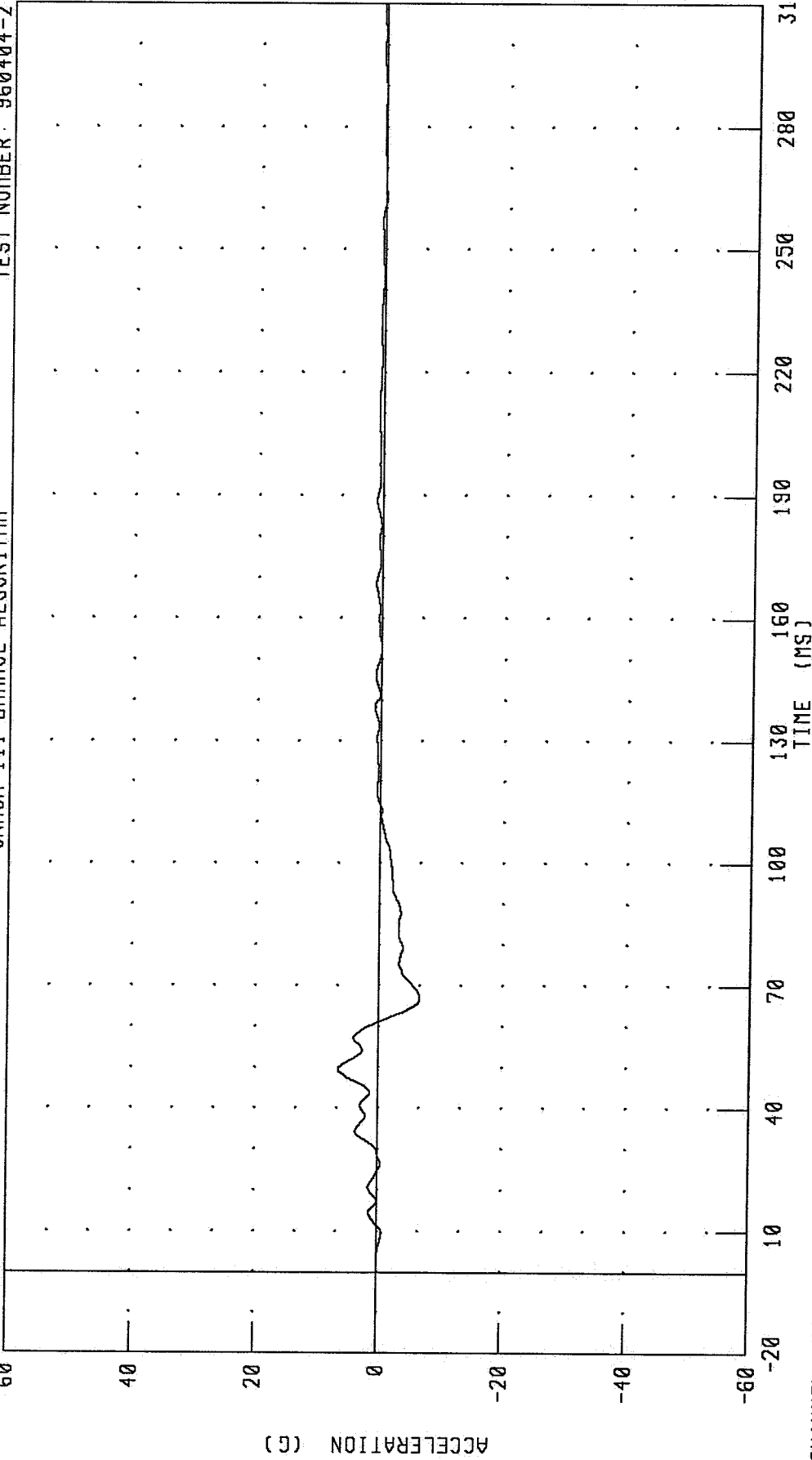
1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2

VEHICLE CG Y-AXIS ACCELERATION

TRC INC.

CRASH III DAMAGE ALGORITHM

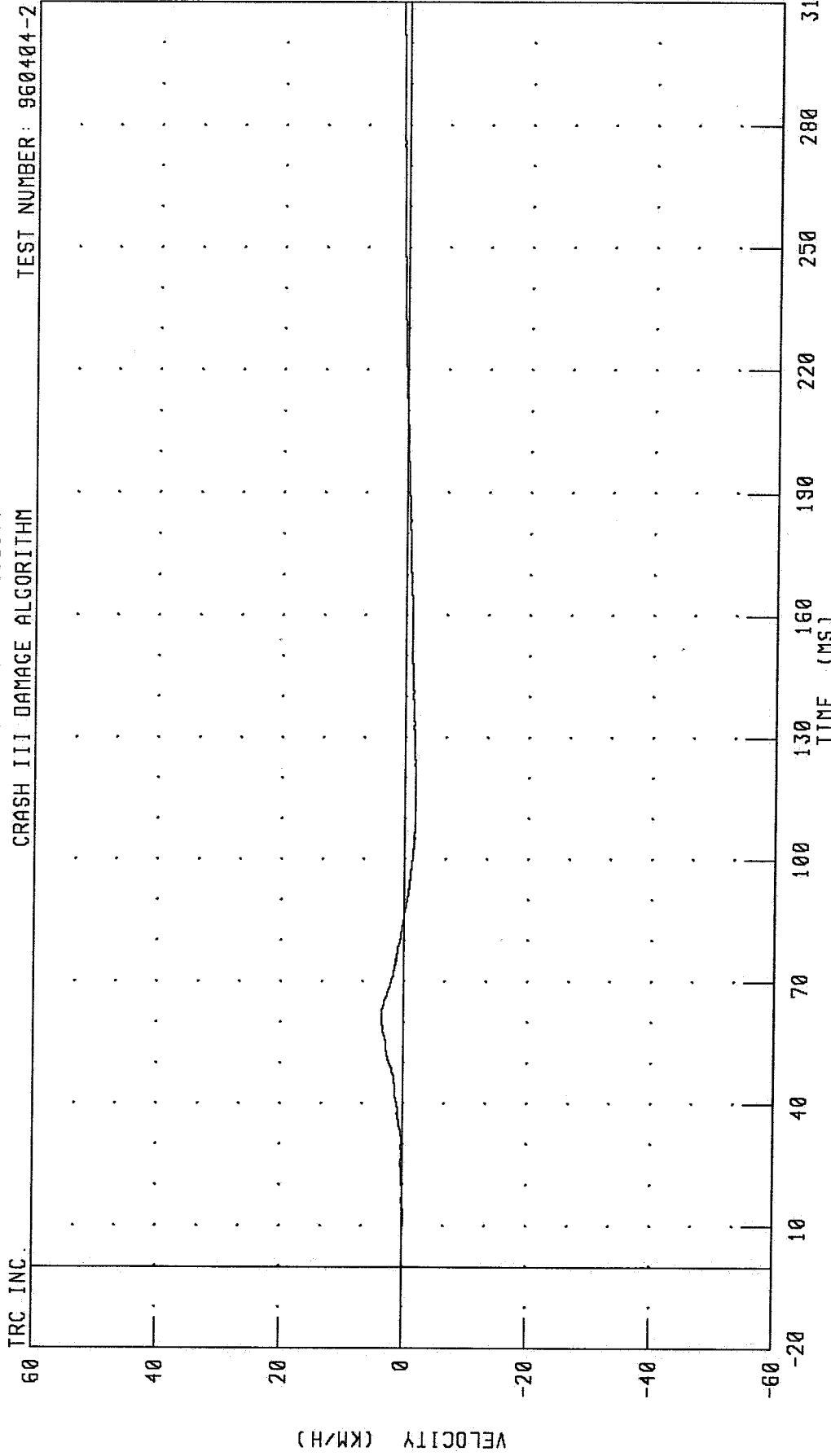
TEST NUMBER: 960404-2



CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 6.50 G @ 49.52 MS; -6.63 G @ 66.64 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM



CHANNEL: VCGYV1 FILTER: CH: CLASS 180

PEAK DATA: 3.61 KM/H @ 60.64 MS; -1.75 KM/H @ 114.16 MS

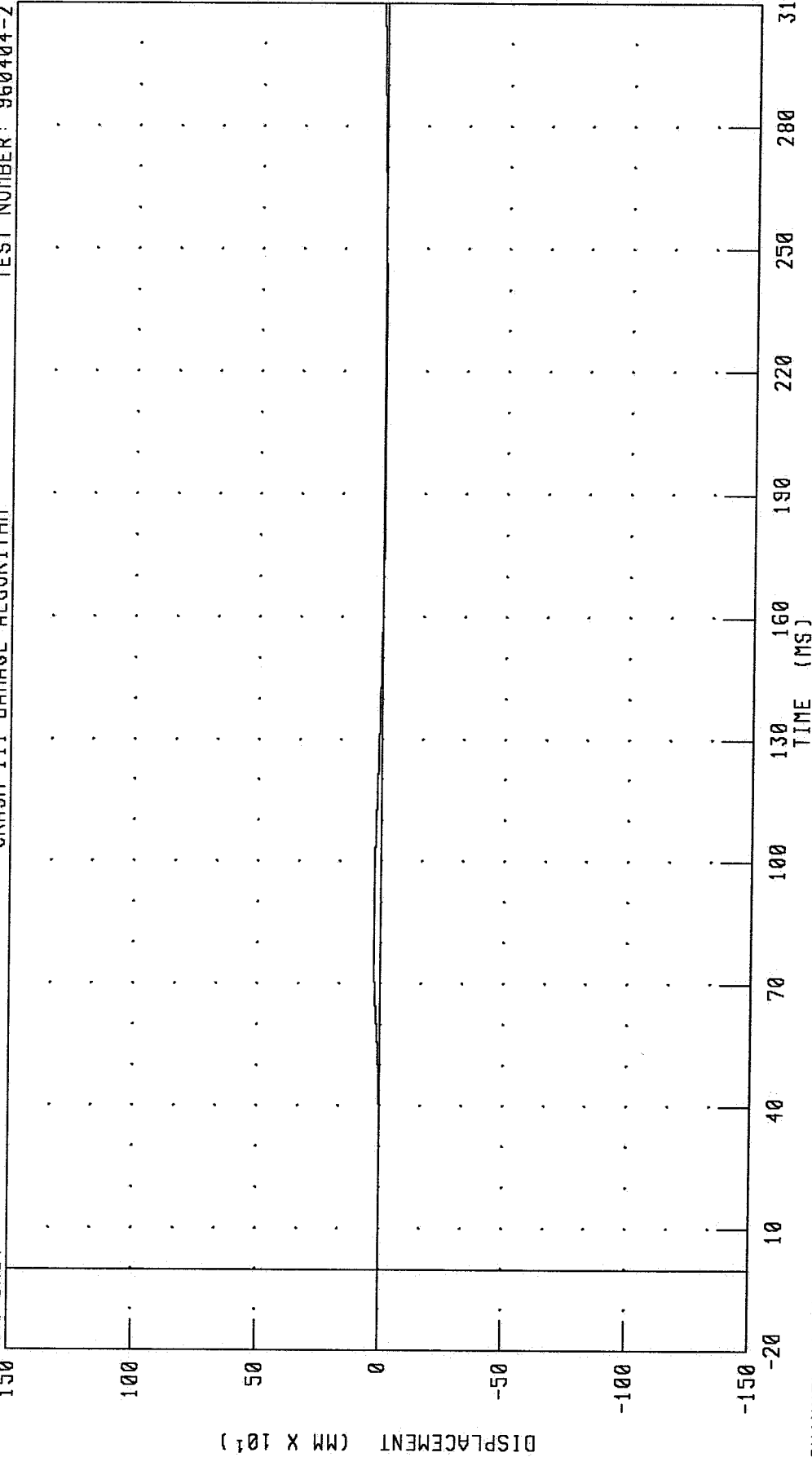
1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2

VEHICLE CG Y-AXIS DISPLACEMENT

TRC INC.

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

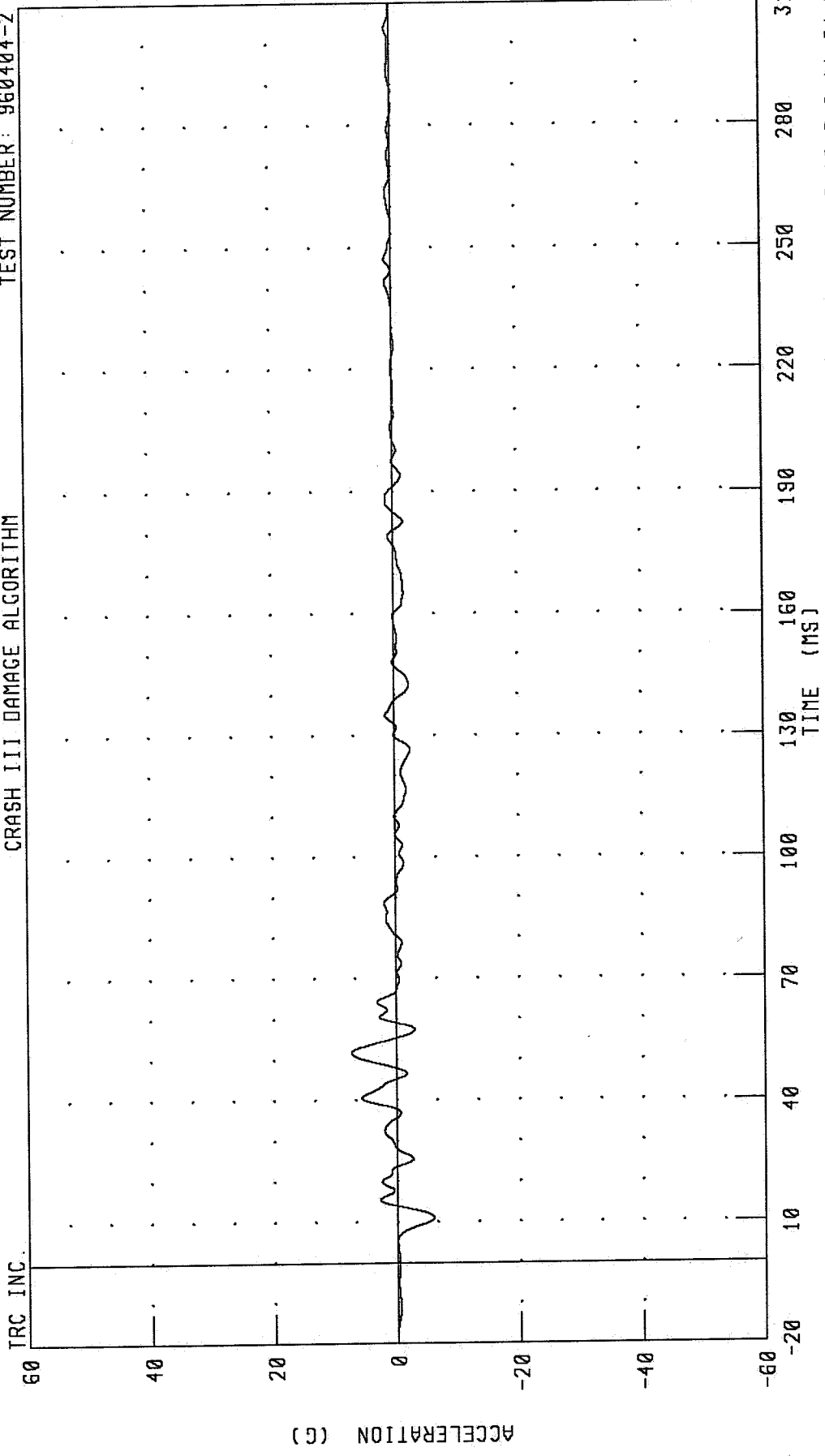


CHANNEL: VCGYD1 FILTER: CH. CLASS 180

PEAK DATA: 27.56 MM @ 85.76 MS; -5.54 MM @ 209.44 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2



CHANNEL: VCGZG1 FILTER: CH. CLASS 60

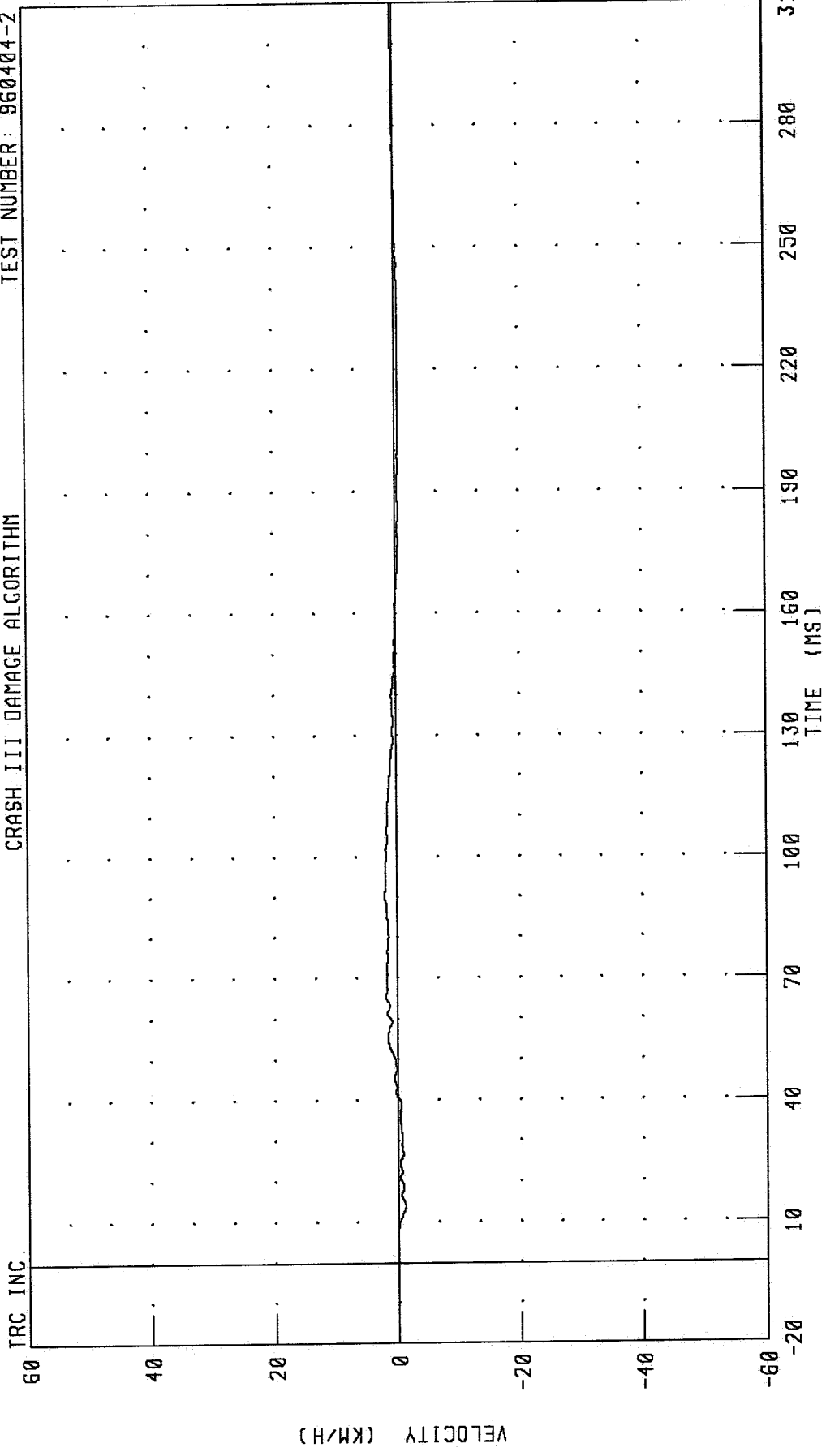
PEAK DATA: 7.35 G @ 51.76 MS; -6.10 G @ 11.04 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

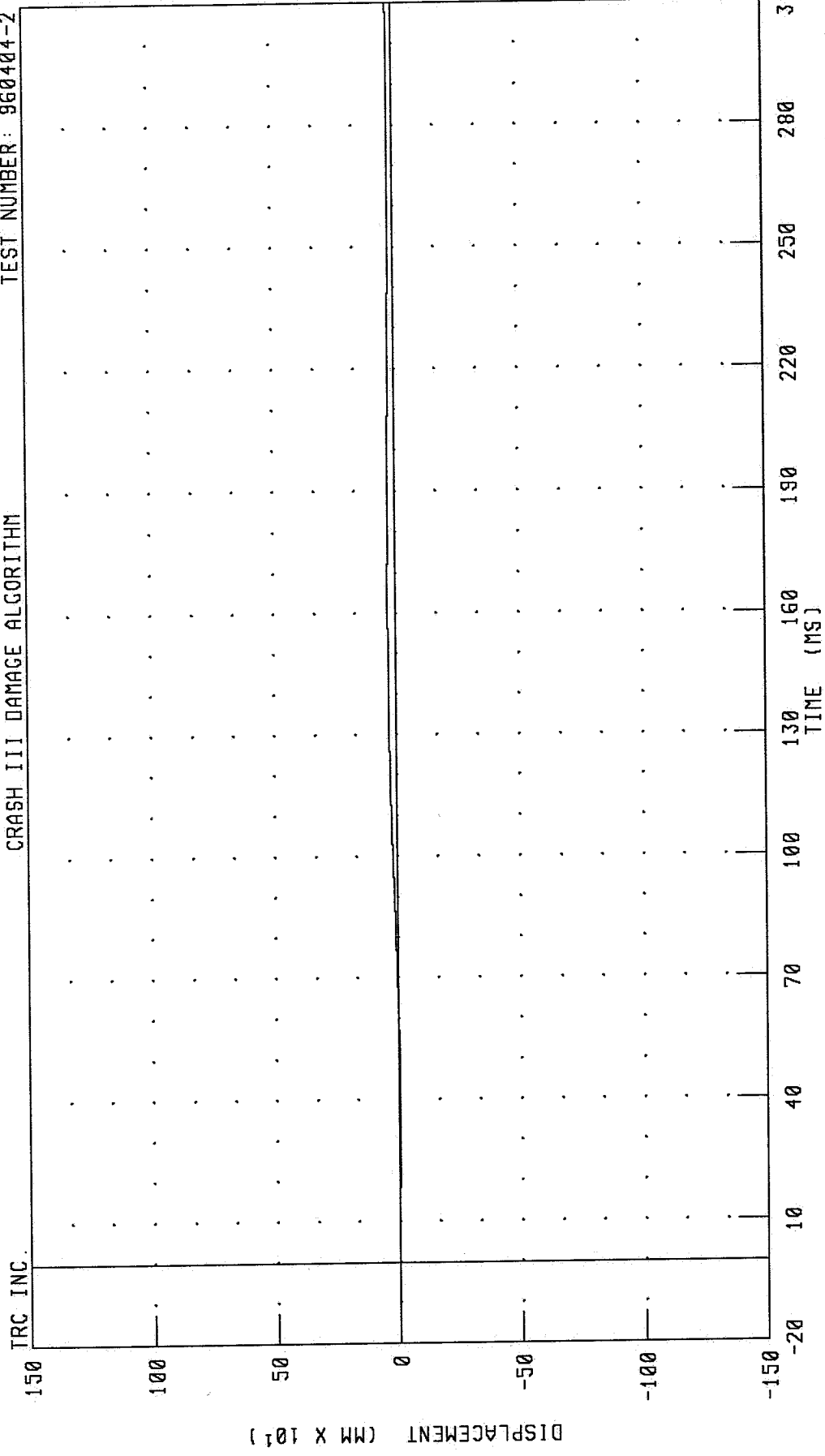


CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 2.01 KM/H @ 90.16 MS; -1.14 KM/H @ 13.84 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
 VEHICLE CG Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

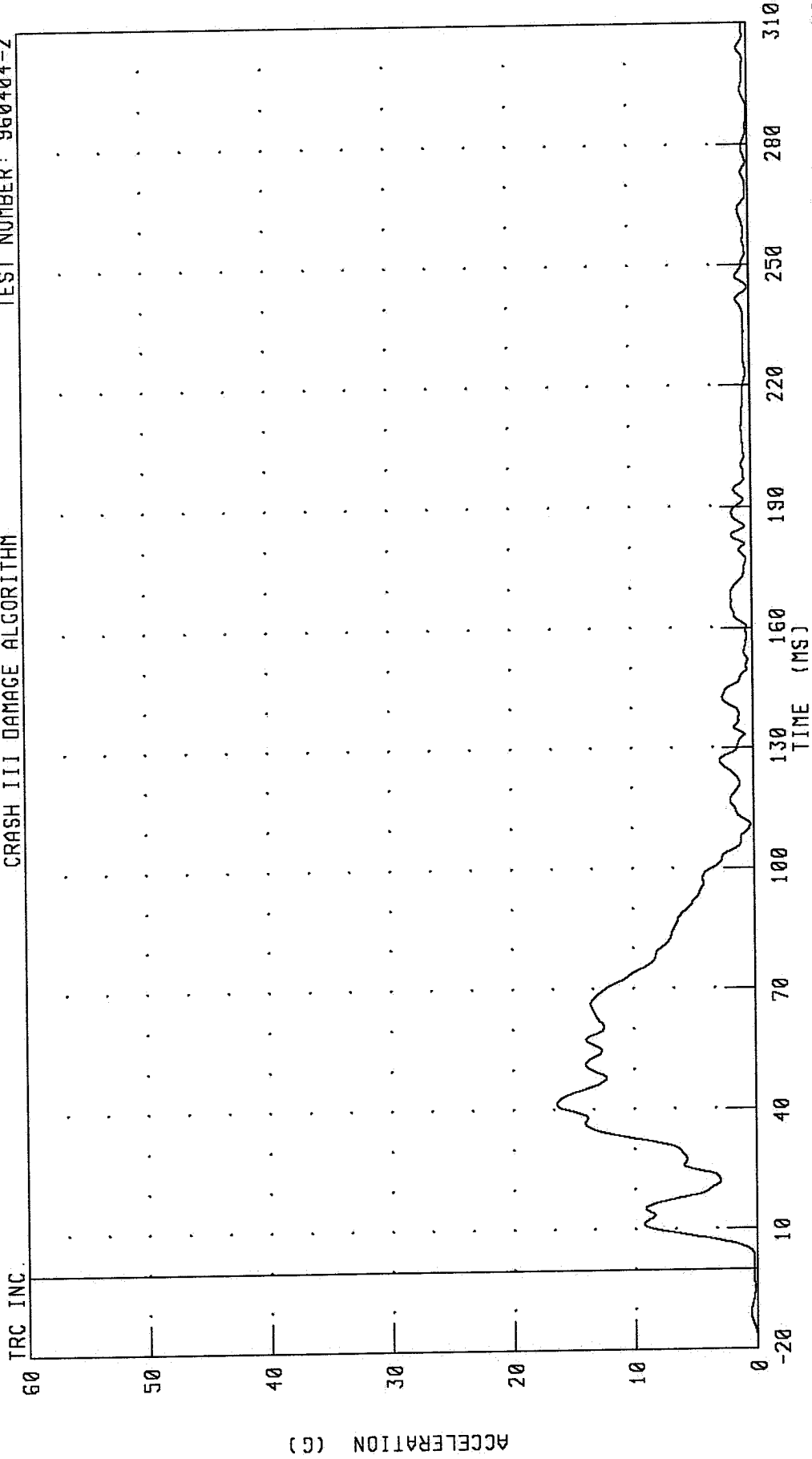


CHANNEL: VCGZD1 FILTER: CH: CLASS 180

PEAK DATA: 32.37 MM @ 165.28 MS; -5.10 MM @ 40.64 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG RESULTANT ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-2

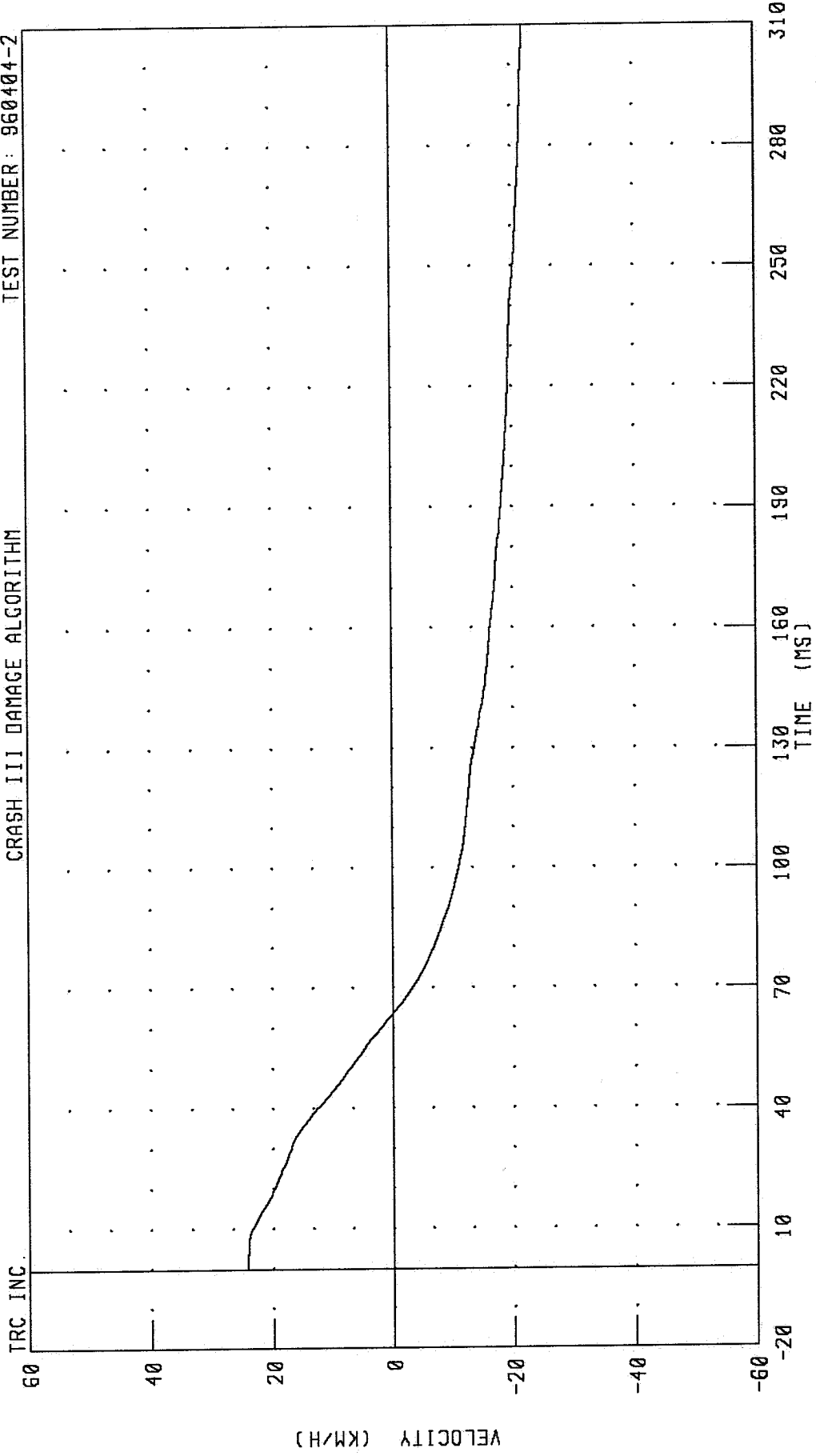


CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 16.41 G @ 41.52 MS; 0.05 G @ -19.28 MS

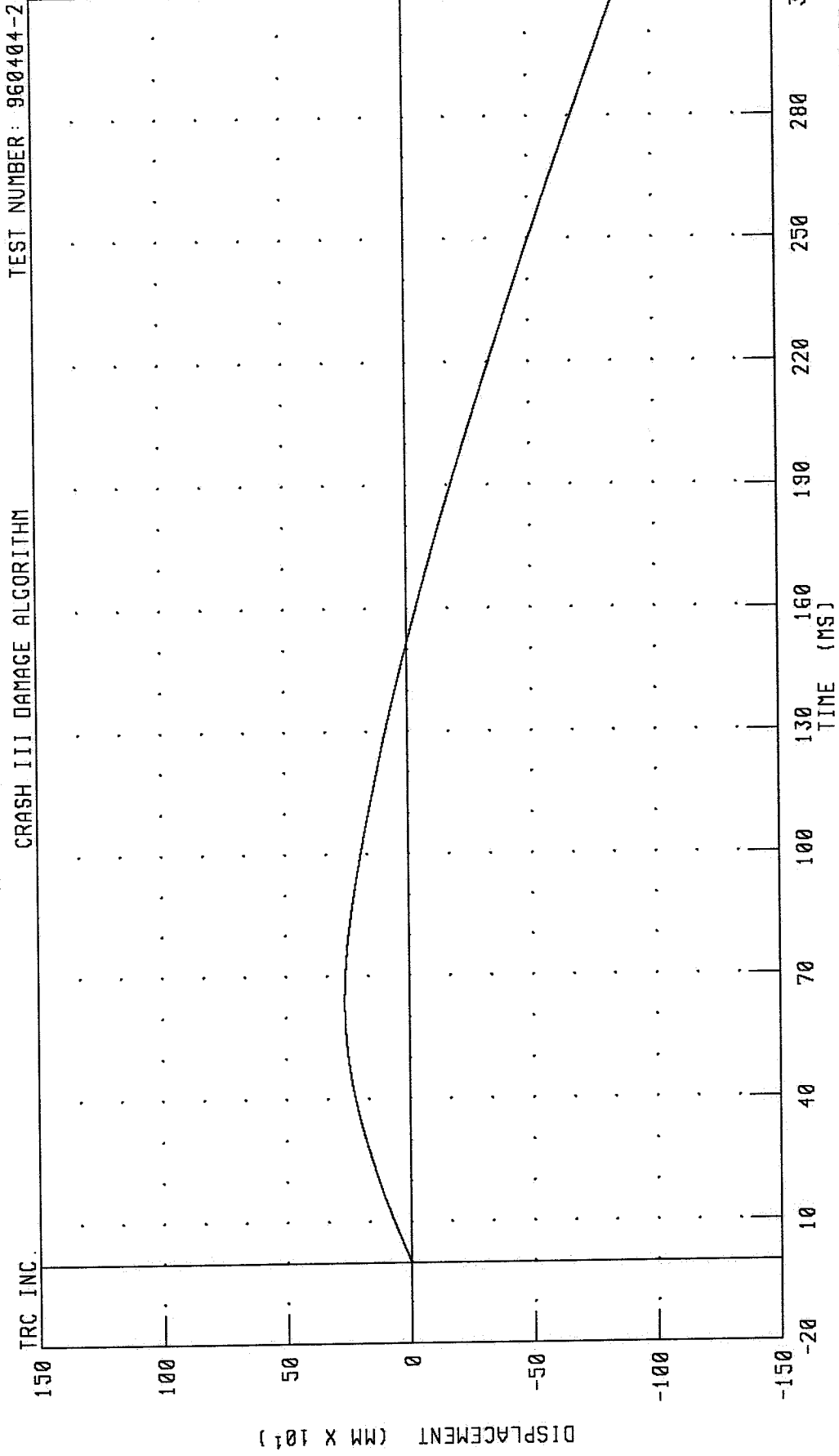
1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG RESULTANT VELOCITY

CRASH III DAMAGE ALGORITHM TEST NUMBER: 960404-2



CHANNEL: VCGRV1 FILTER: CH. CLASS 180 PEAK DATA: 24.20 KM/H @ 0.00 MS; -22.07 KM/H @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 15 MPH TEST NO. 2
VEHICLE CG RESULTANT DISPLACEMENT
CRASH III DAMAGE ALGORITHM



CHANNEL: VCGRD1 FILTER: CH. CLASS 180

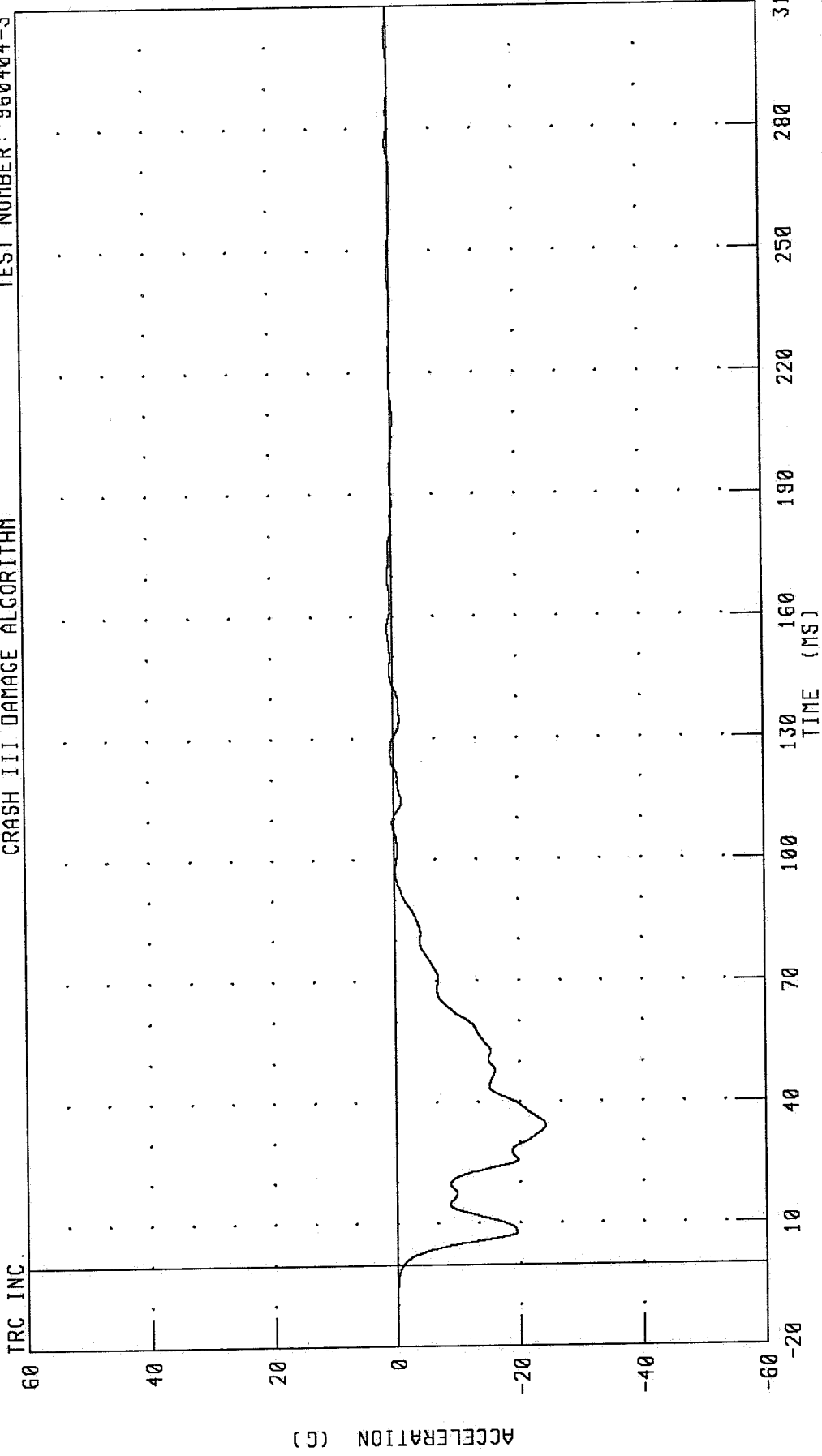
PEAK DATA: 261.02 MM @ 63.68 MS; -858.01 MM @ 310.00 MS

Data Plots

Test No. 960404-3

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

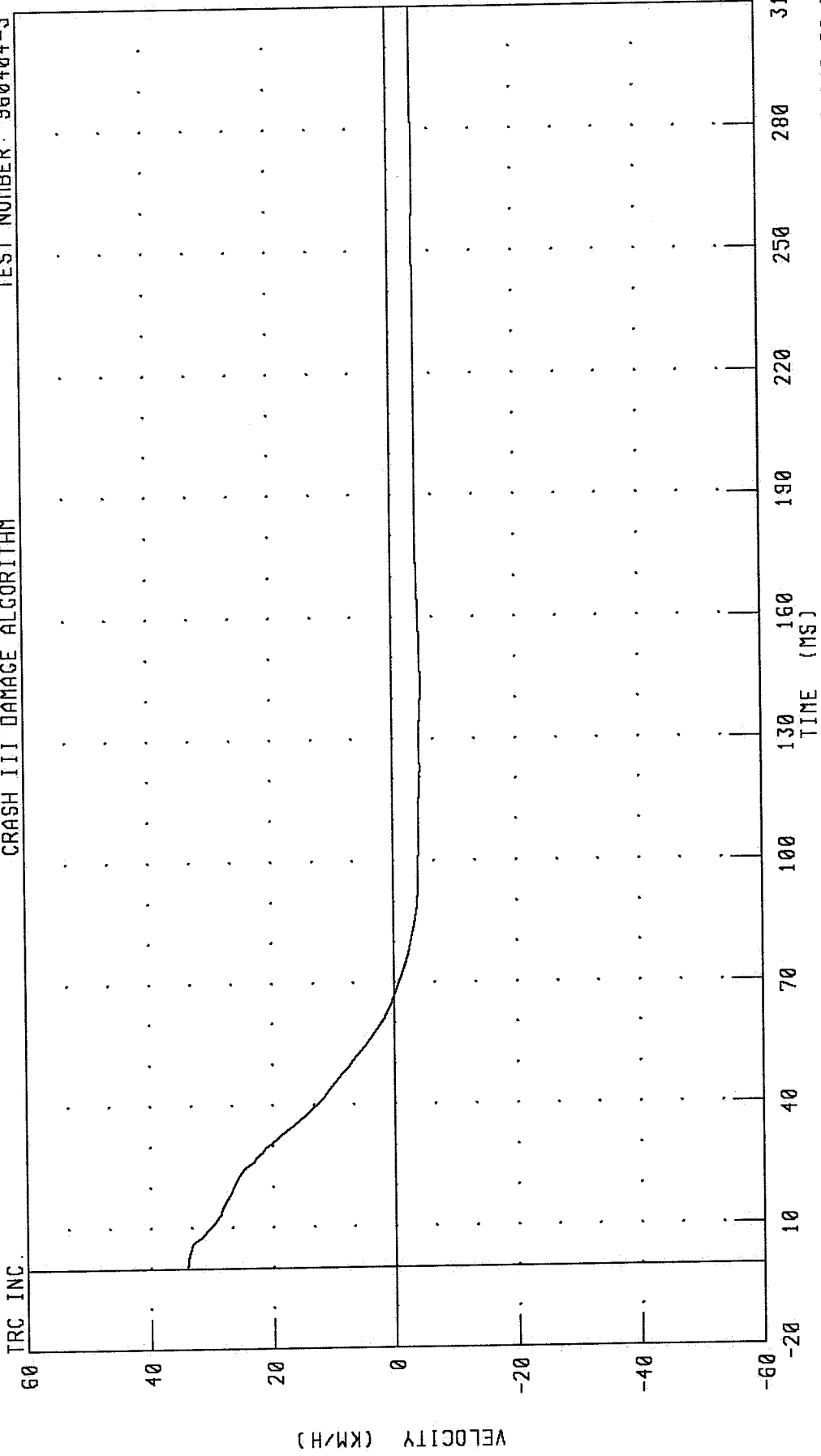


CHANNEL: LRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.88 G @ 157.04 MS; -24.19 G @ 34.24 MS

1991 DODGE CARRAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT REAR SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

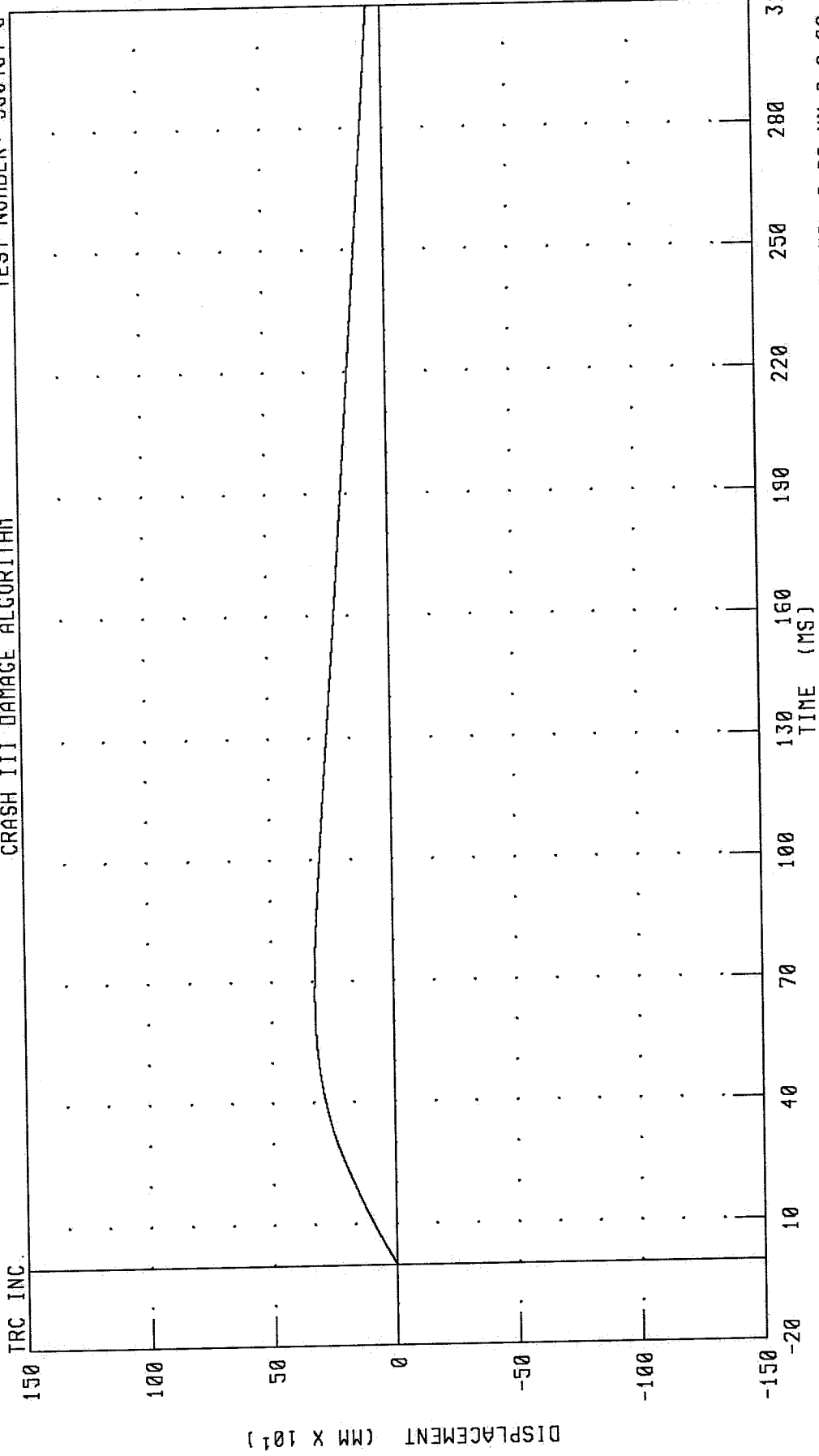


CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 34.00 KM/H @ 0.00 MS; -4.71 KM/H @ 142.08 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

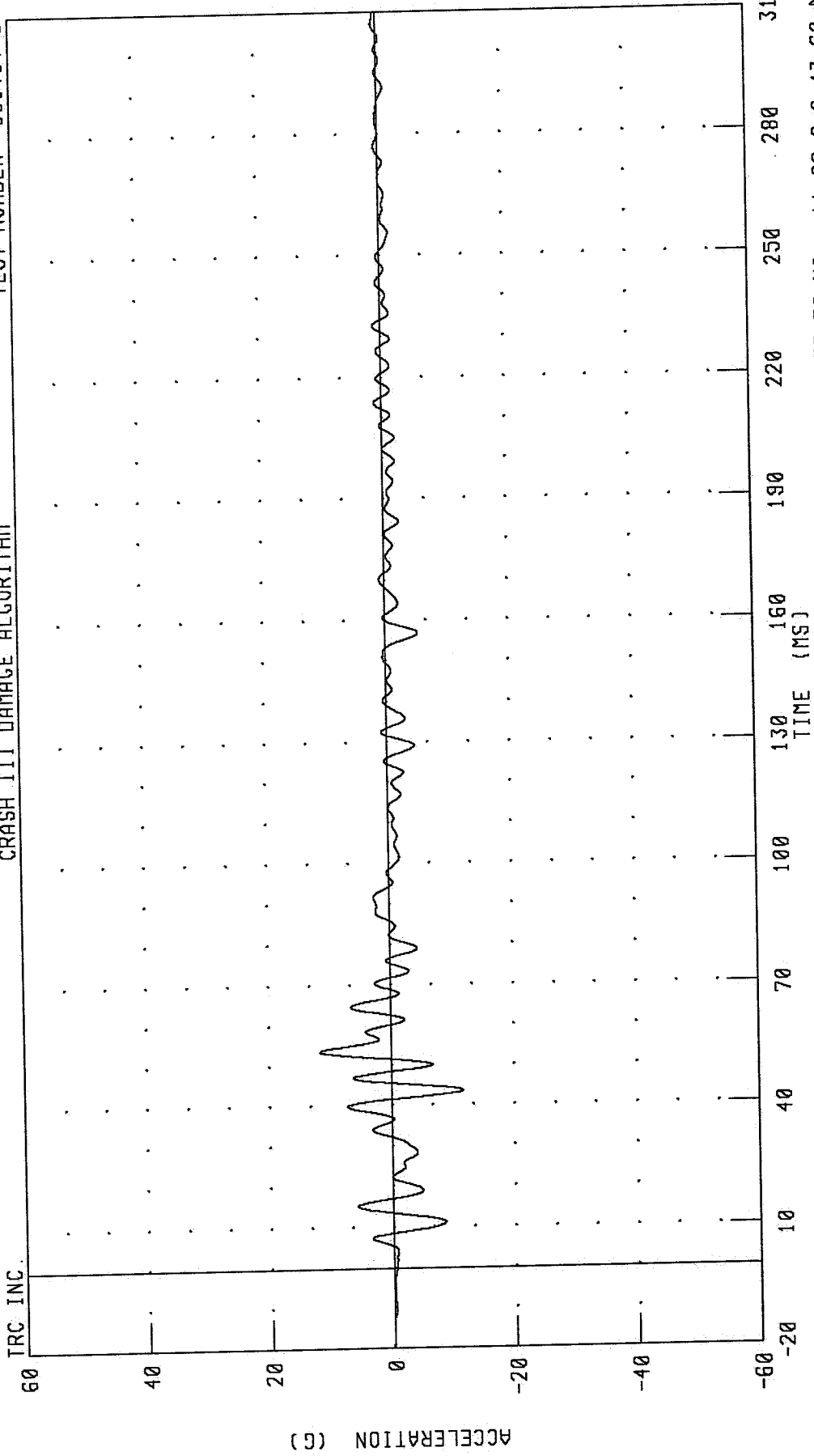
TEST NUMBER: 960404-3



CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 324.30 MM @ 66.80 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



CHANNEL: LRSZG1 FILTER: CH. CLASS 60

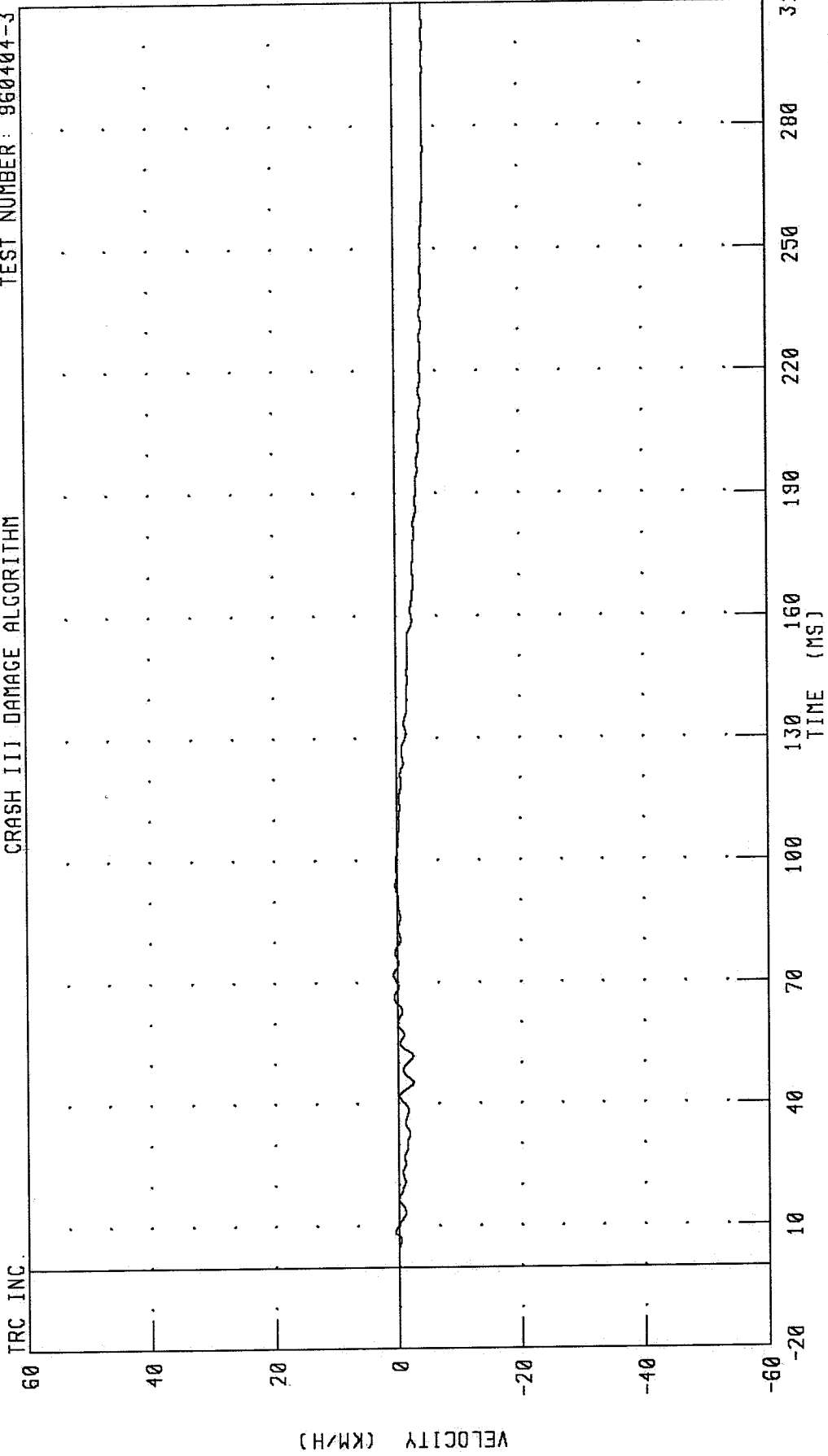
PEAK DATA: 11.62 G @ 53.52 MS; -11.62 G @ 43.60 MS

1991 DODGE CARRAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

LEFT REAR SILL Z-AXIS VELOCITY

CRASH IJJ DAMAGE ALGORITHM

TEST NUMBER: 960404-3

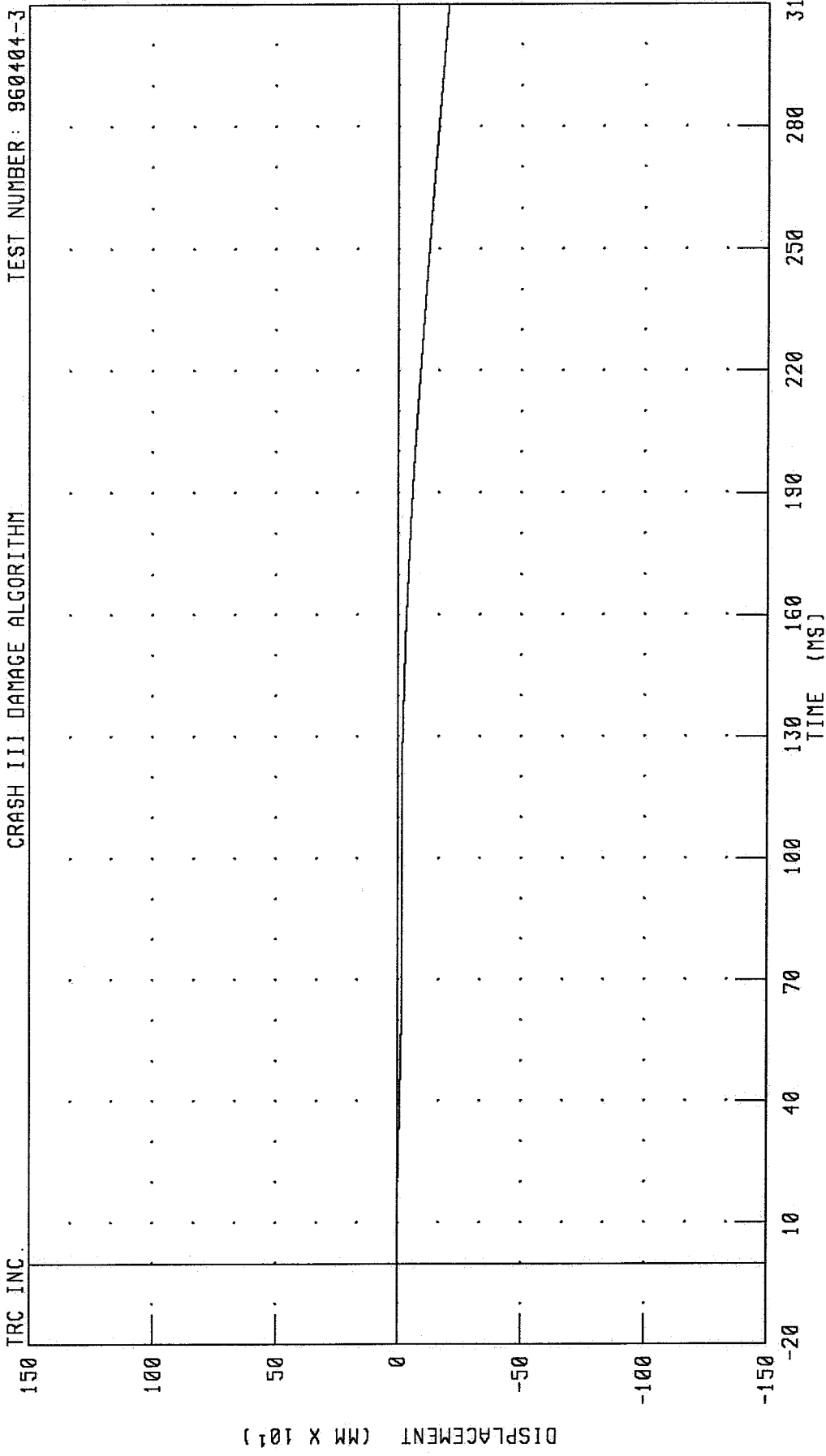


CHANNEL: LRSZY1 FILTER: CH. CLASS 180

PEAK DATA: 0.64 KM/H @ 71.92 MS; -4.85 KM/H @ 304.96 MS

1991 DODGE CARRAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT REAR SILL Z-AXIS DISPLACEMENT

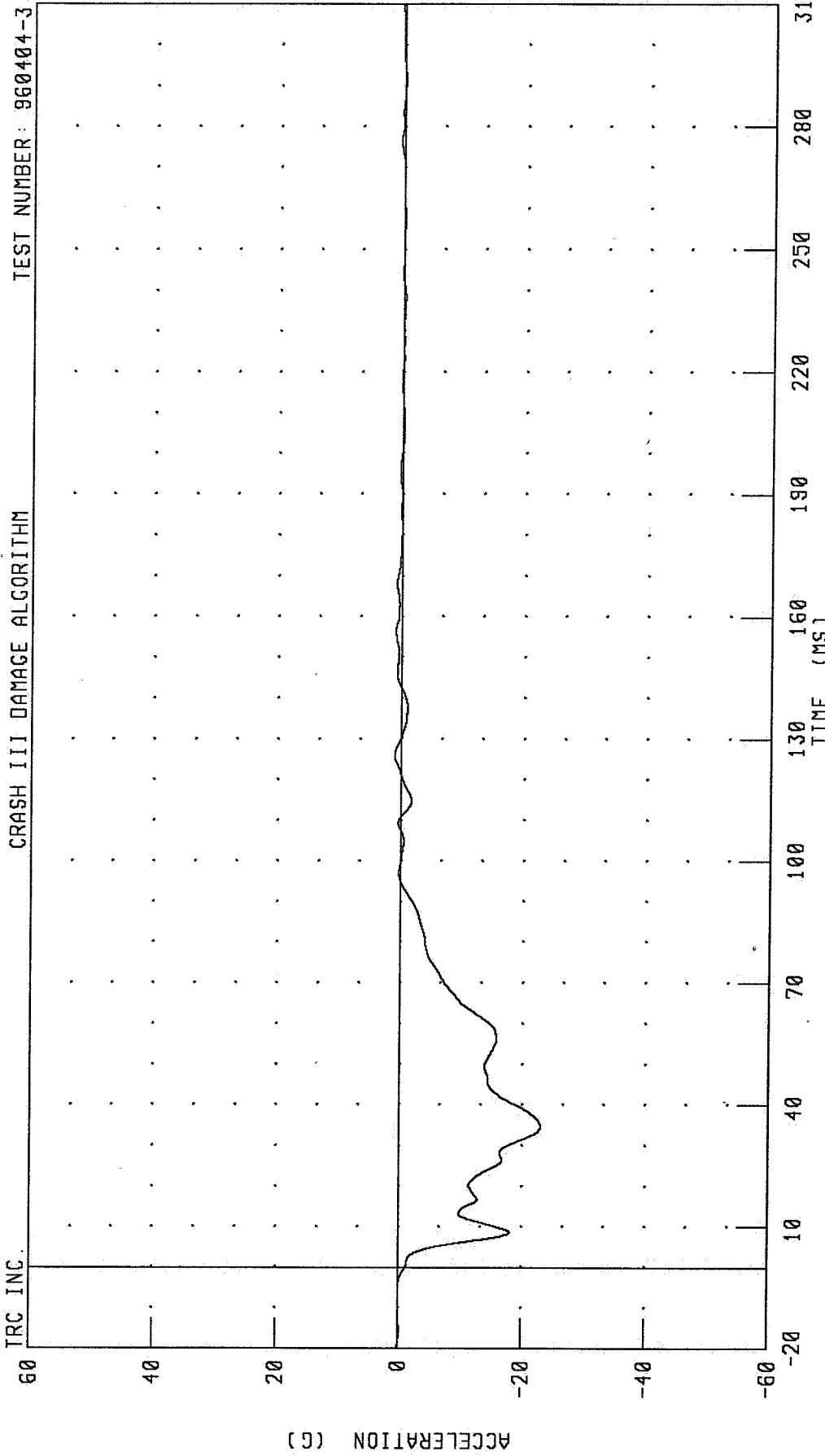
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 960404-3



CHANNEL: LRSZD1 FILTER: CH. CLASS 180

PEAK DATA: 0.01 MM @ 10.00 MS; -203.92 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
RIGHT REAR SILL X-AXIS ACCELERATION



CHANNEL: RRSXG1 FILTER: CH. CLASS 60

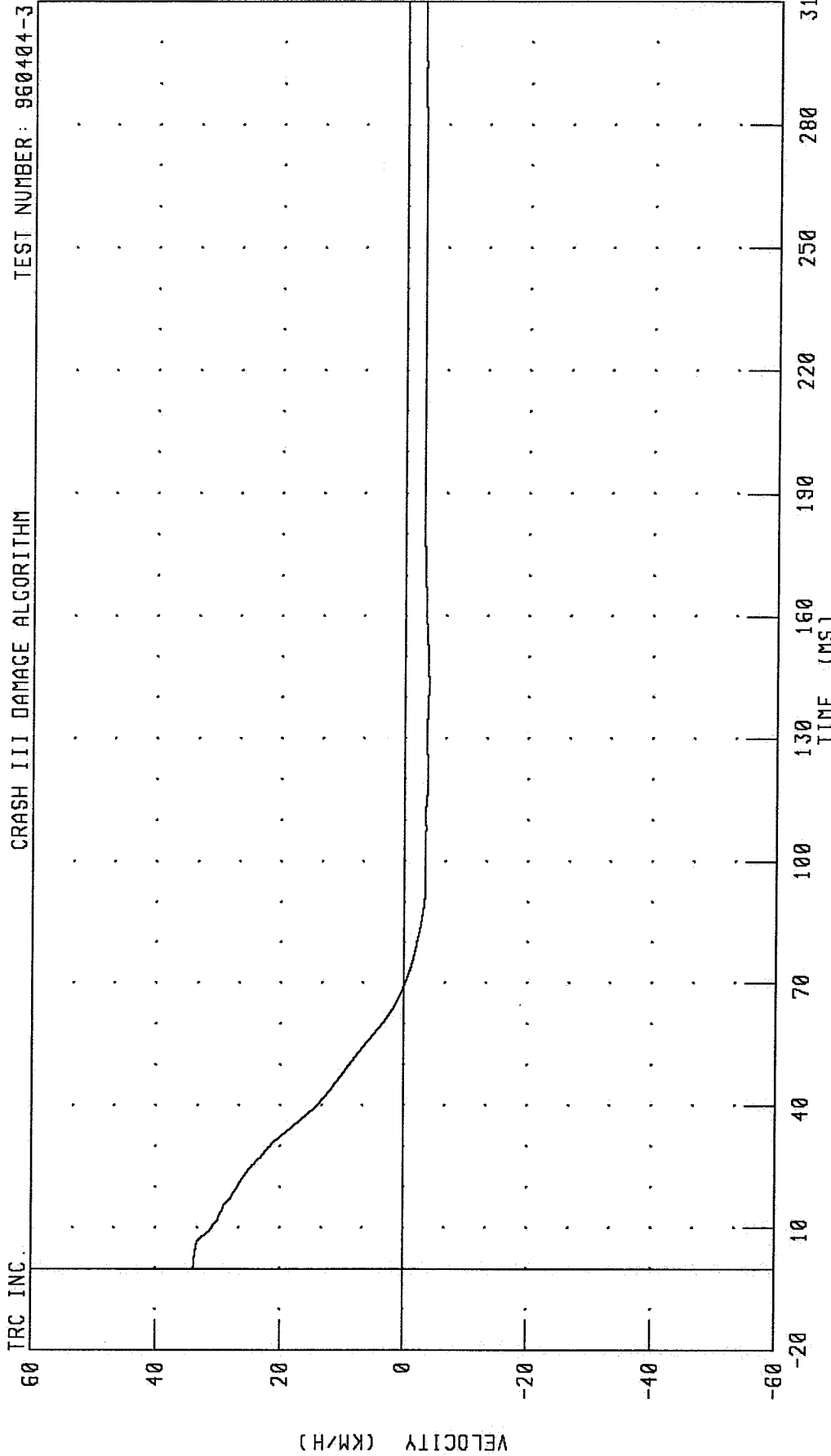
PEAK DATA: 1.08 G @ 126.00 MS; -22.97 G @ 34.64 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



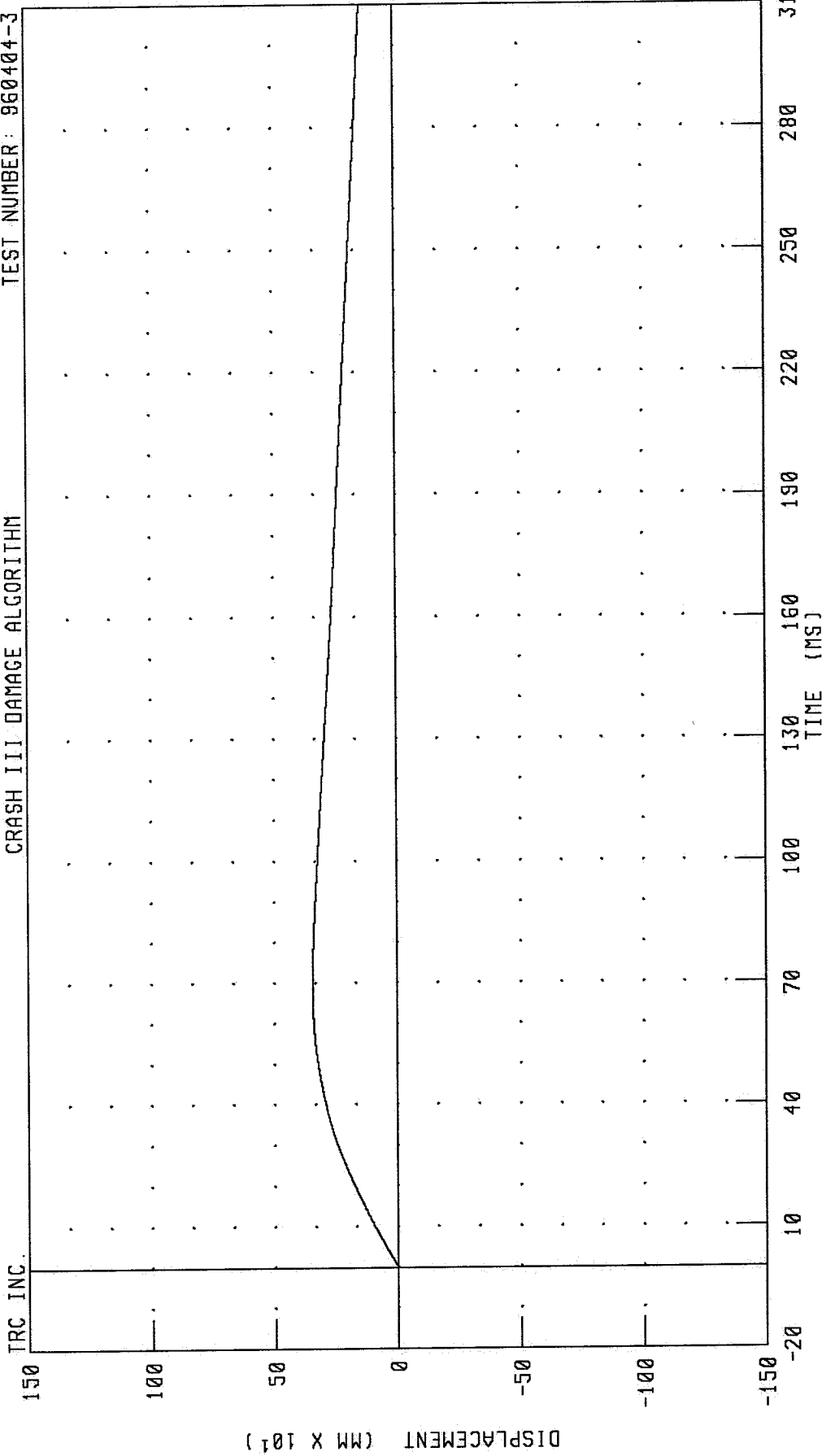
CHANNEL: RRSXV1 FILTER: CH. CLASS 180

TIME (MS)

PEAK DATA: 34.00 KM/H @ 0.00 MS; -3.84 KM/H @ 142.16 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM TEST NUMBER: 960404-3

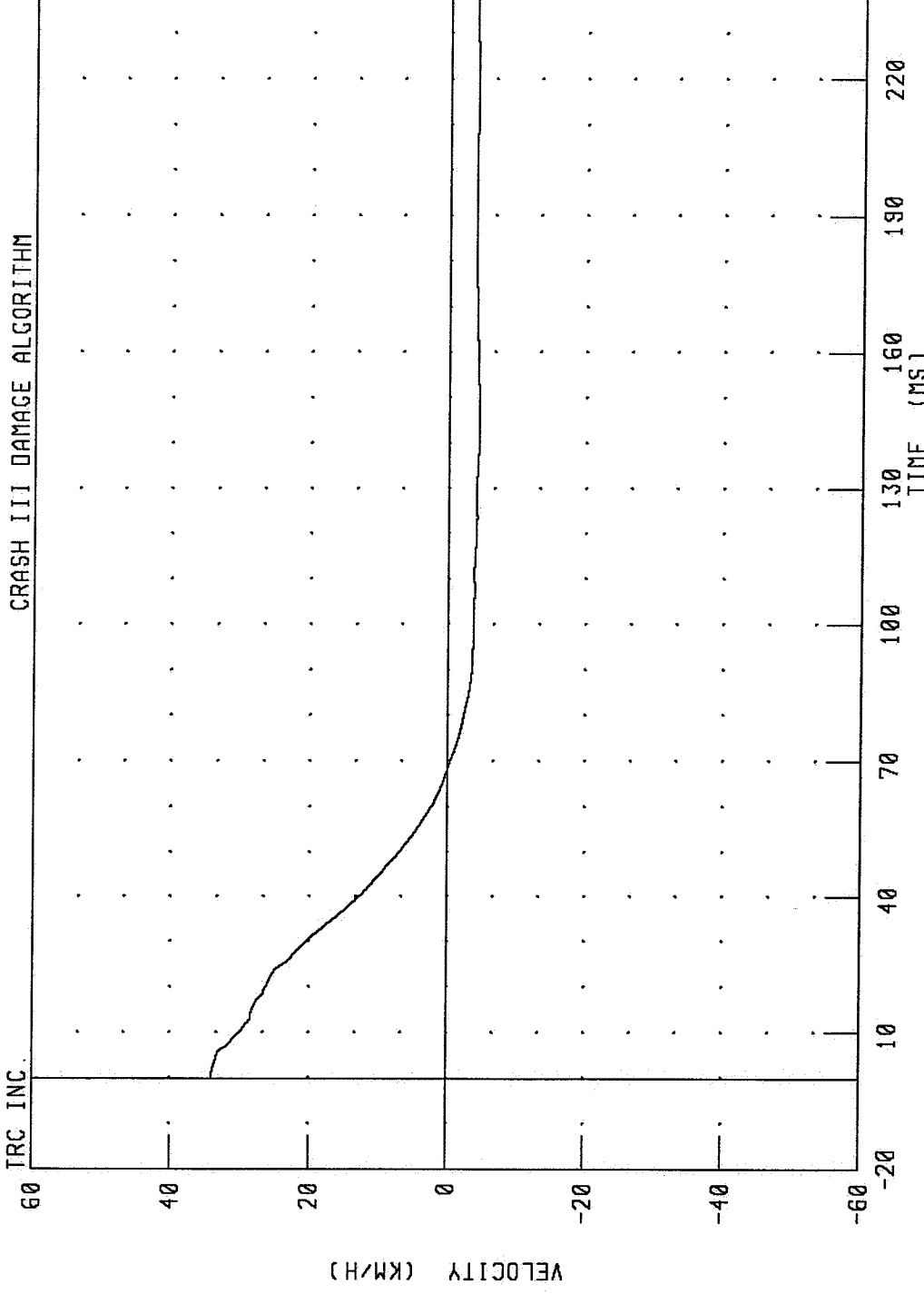


CHANNEL: RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 343.82 MM @ 69.20 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT FRONT SILL X-AXIS VELOCITY

TRC INC. TEST NUMBER: 960404-3

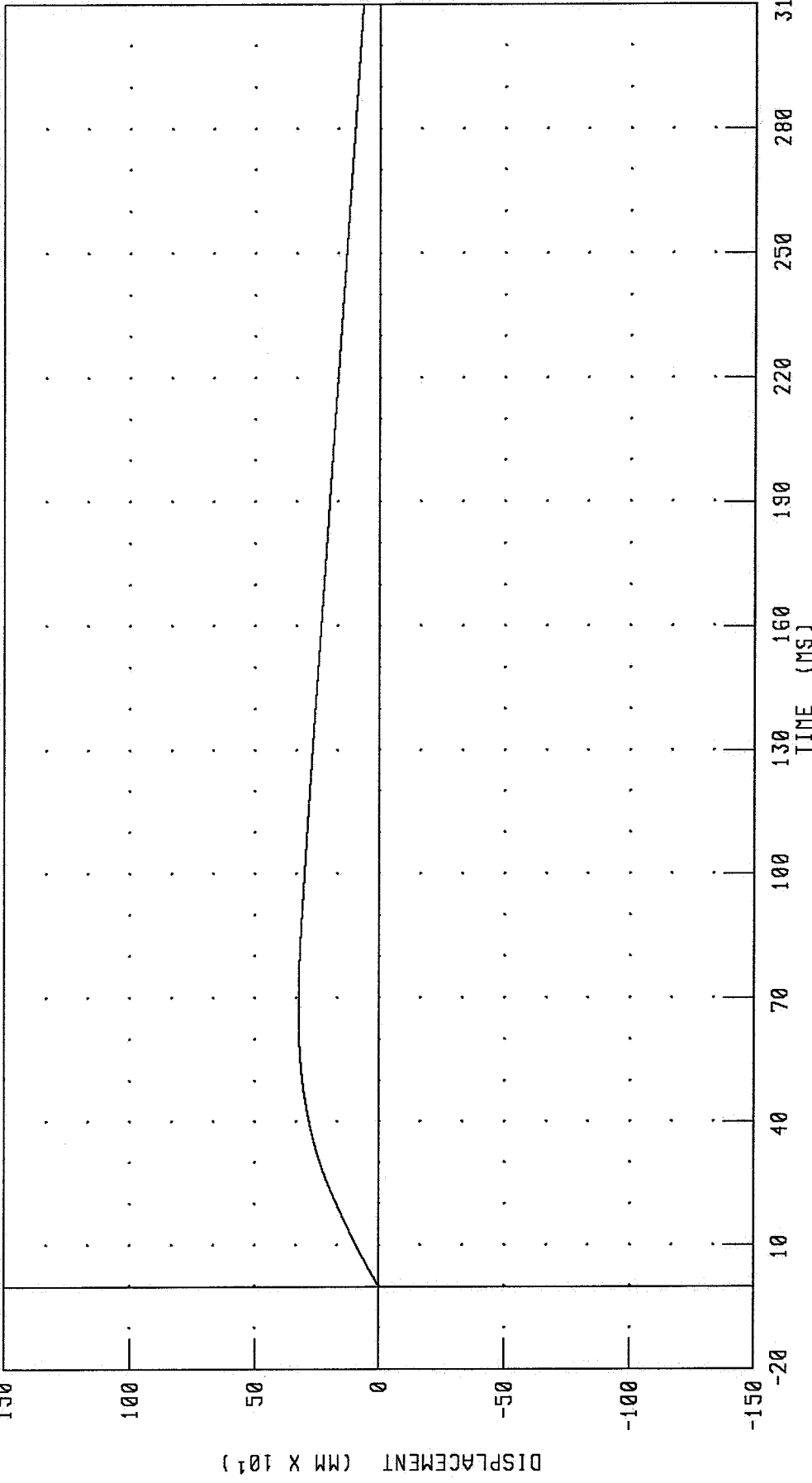


CHANNEL: LFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 34.00 KM/H @ 0.00 MS; -4.43 KM/H @ 143.20 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT FRONT SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 960404-3



CHANNEL: LFSXD1 FILTER: CH. CLASS 180

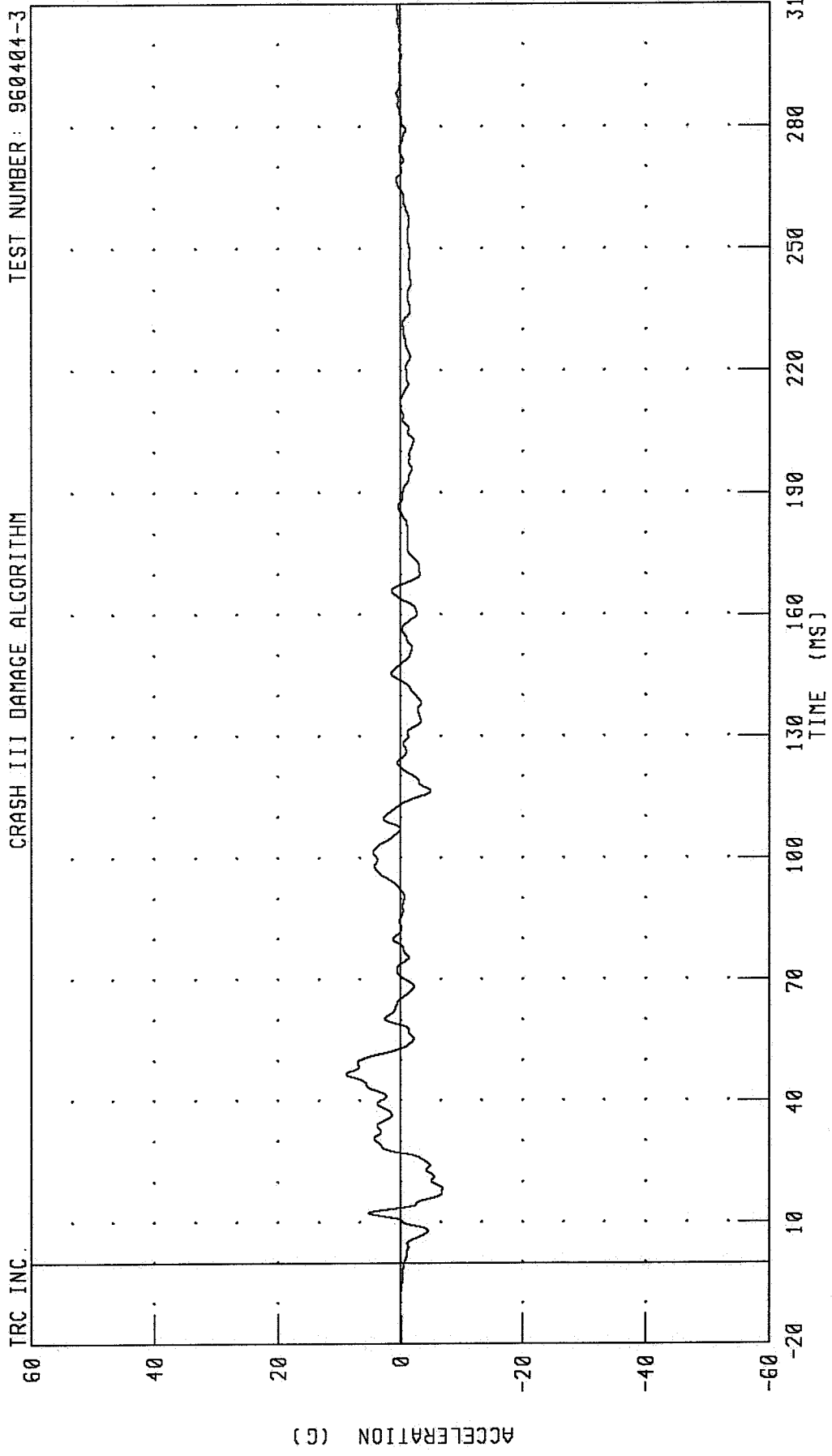
PEAK DATA: 323.50 MM @ 68.24 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT REAR SILL Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



CHANNEL: RRSZG1 FILTER: CH. CLASS 60

PEAK DATA: 8.85 G @ 46.64 MS; -6.92 G @ 18.40 MS

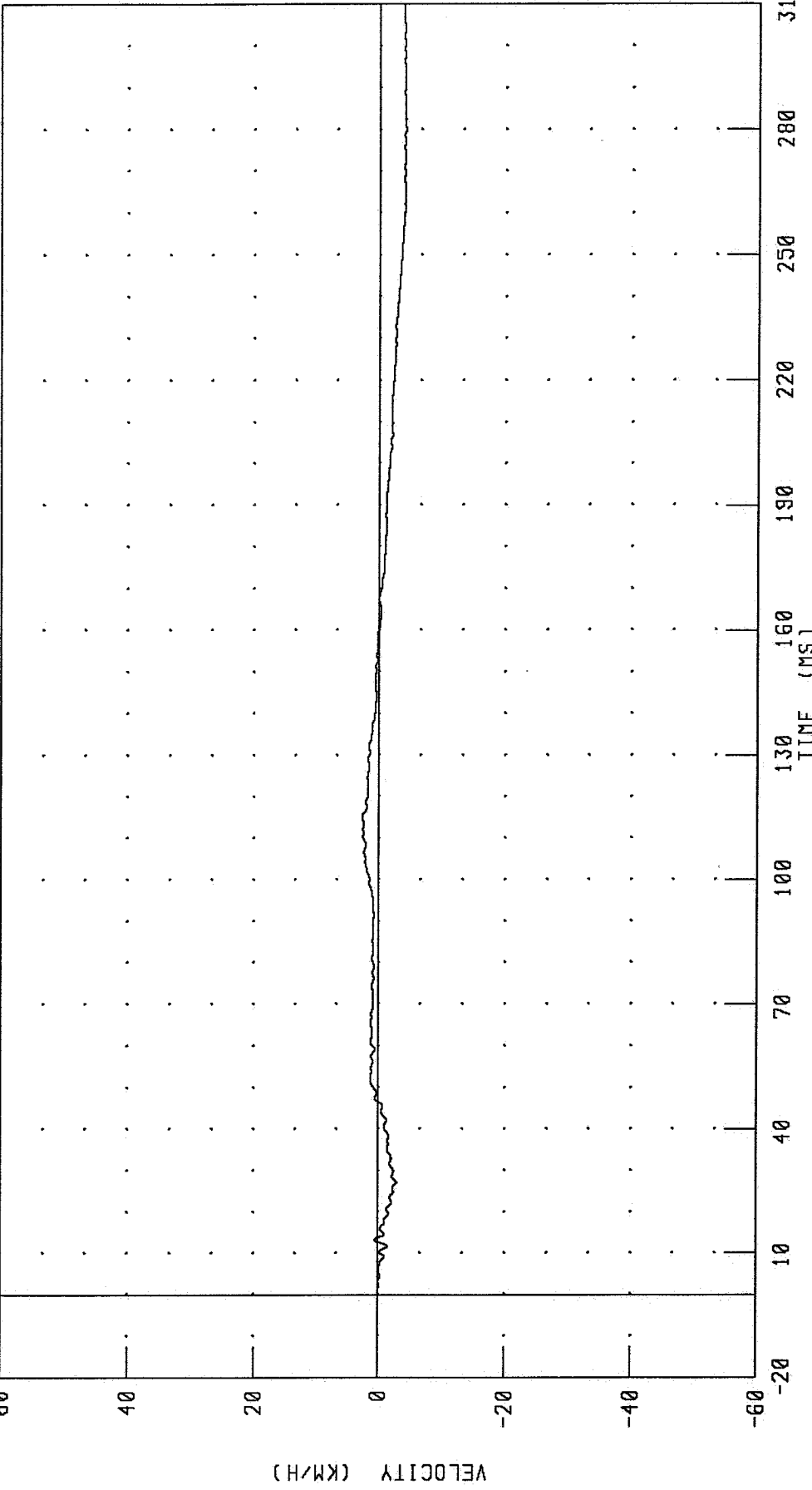
1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT REAR SILL Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-3



CHANNEL: RRSZV1 FILTER: CH. CLASS 180

PEAK DATA: 2.57 KM/H @ 115.28 MS;

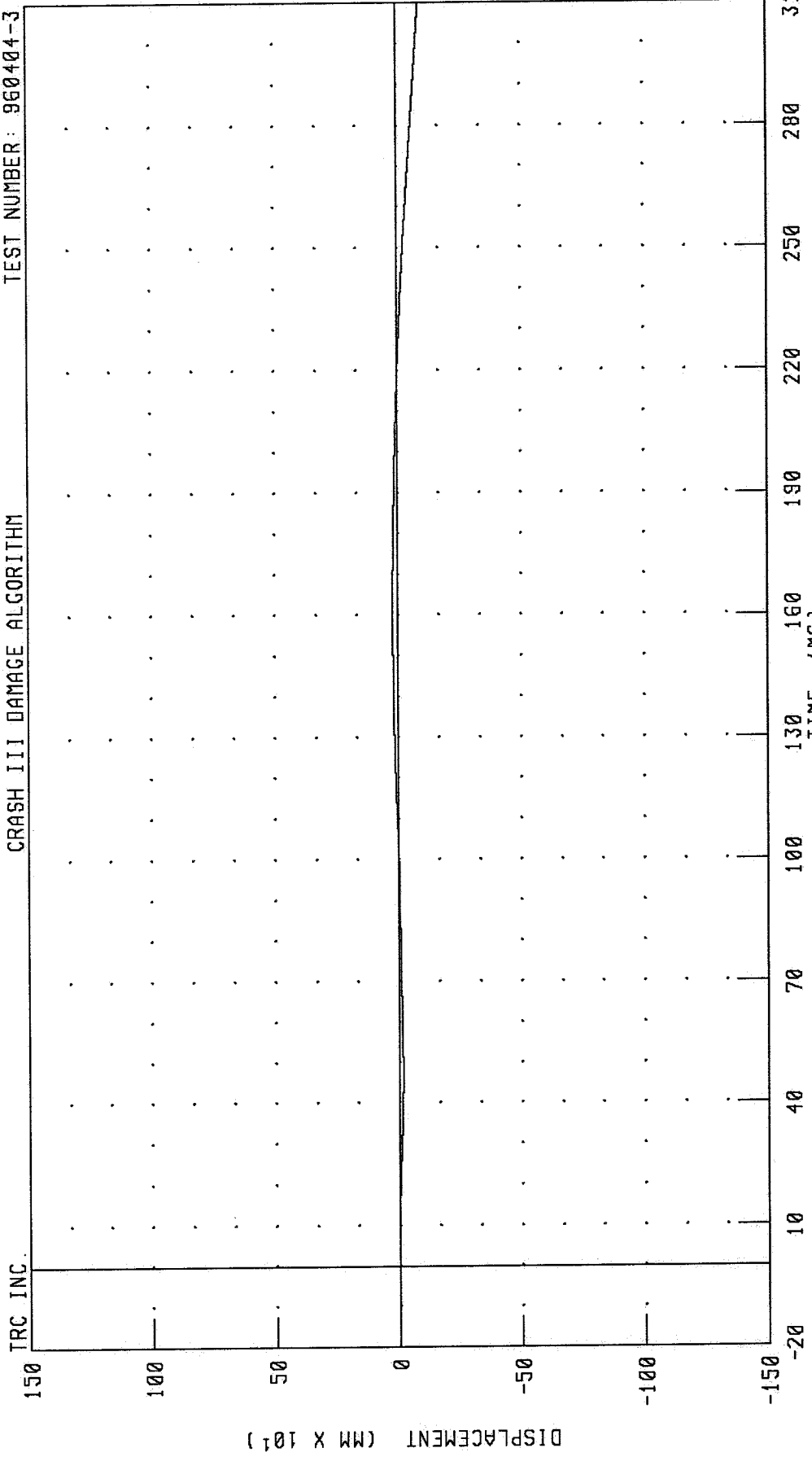
-4.20 KM/H @ 280.08 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT REAR SILL Z-AXIS DISPLACEMENT

TEST NUMBER: 960404-3

CRASH III DAMAGE ALGORITHM

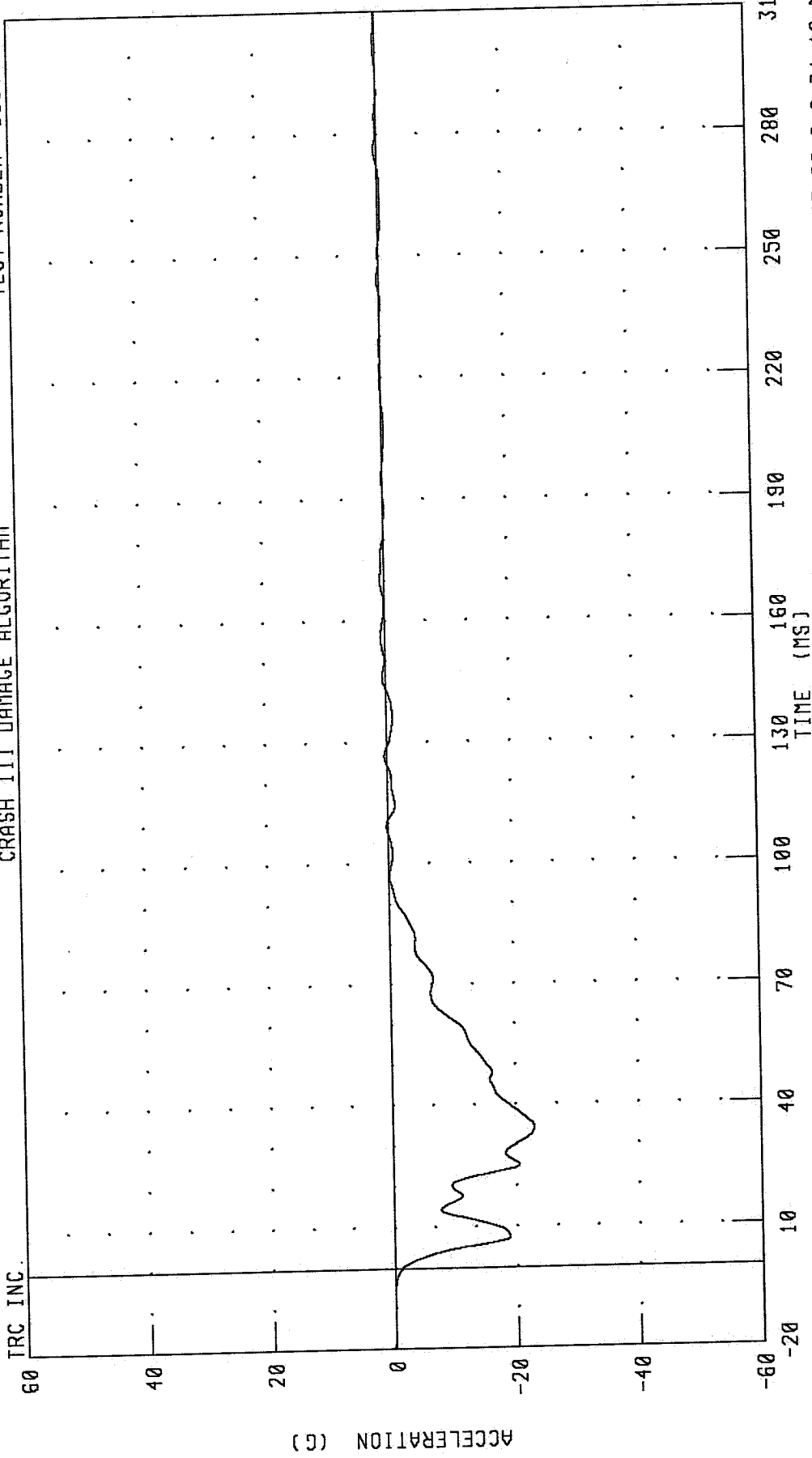


CHANNEL: RRSZD1 FILTER: CH. CLASS 180

PEAK DATA: 19.93 MM @ 160.08 MS; -90.28 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

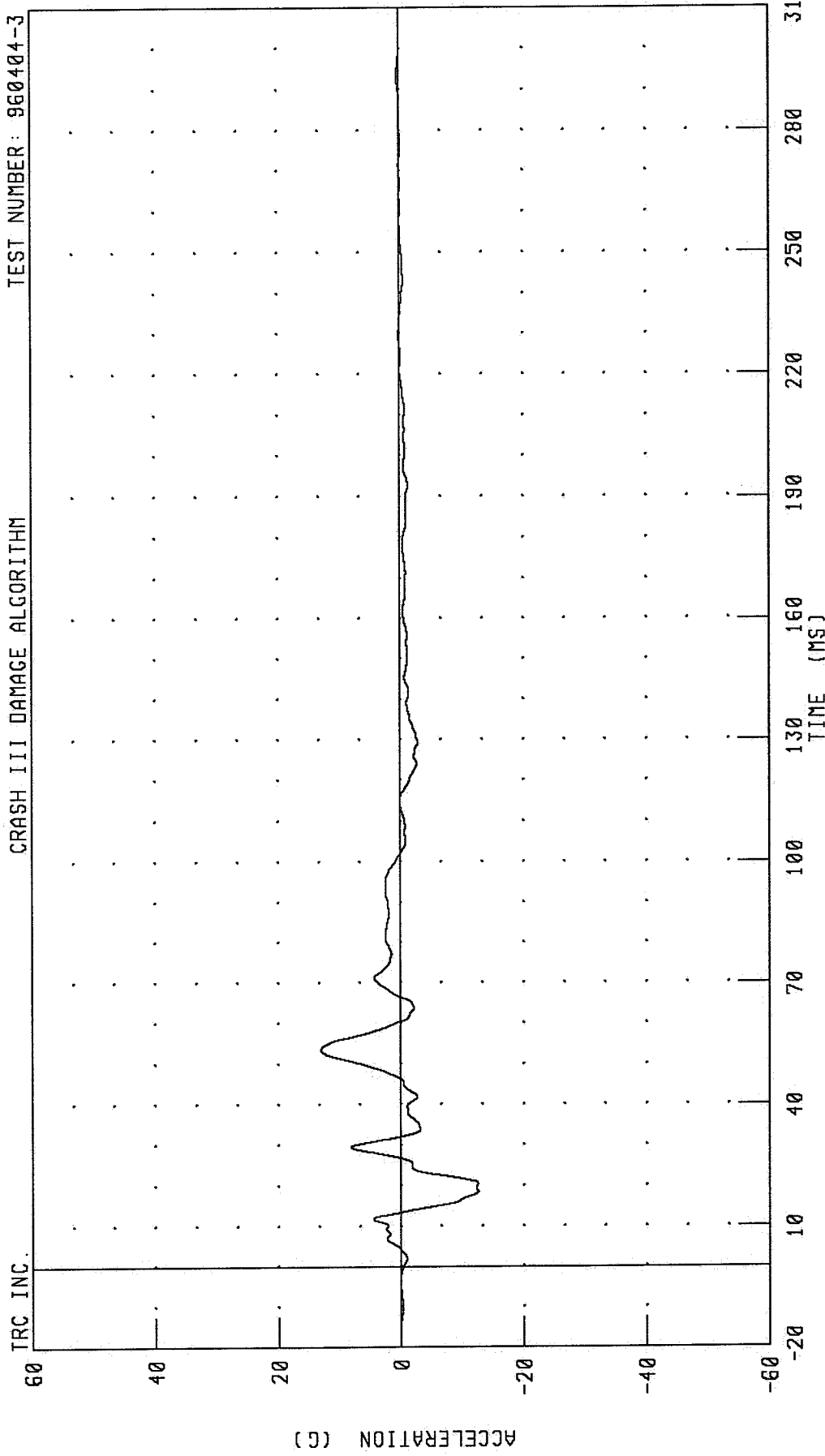
TEST NUMBER: 960404-3



CHANNEL: LFSXG1 FILTER: CH. CLASS 60
PEAK DATA: 0.71 G @ 170.08 MS; -23.00 G @ 34.16 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT FRONT SILL Z-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 960404-3

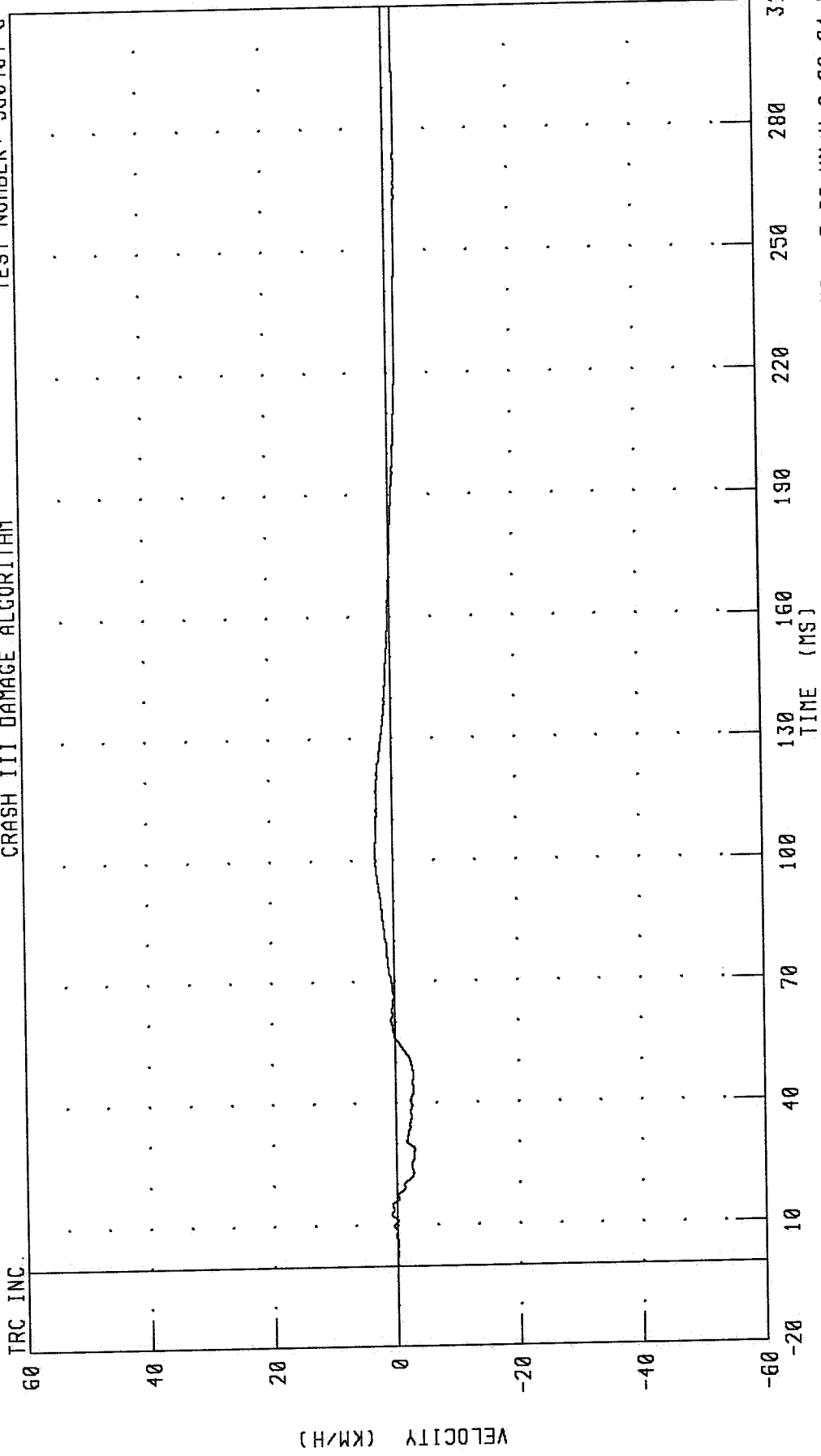


CHANNEL: LFSZG1 FILTER: CH. CLASS 60 PEAK DATA: 13.04 G @ 53.44 MS; -12.62 G @ 18.48 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
LEFT FRONT SILL Z-AXIS VELOCITY

TEST NUMBER: 960404-3

CRASH III DAMAGE ALGORITHM



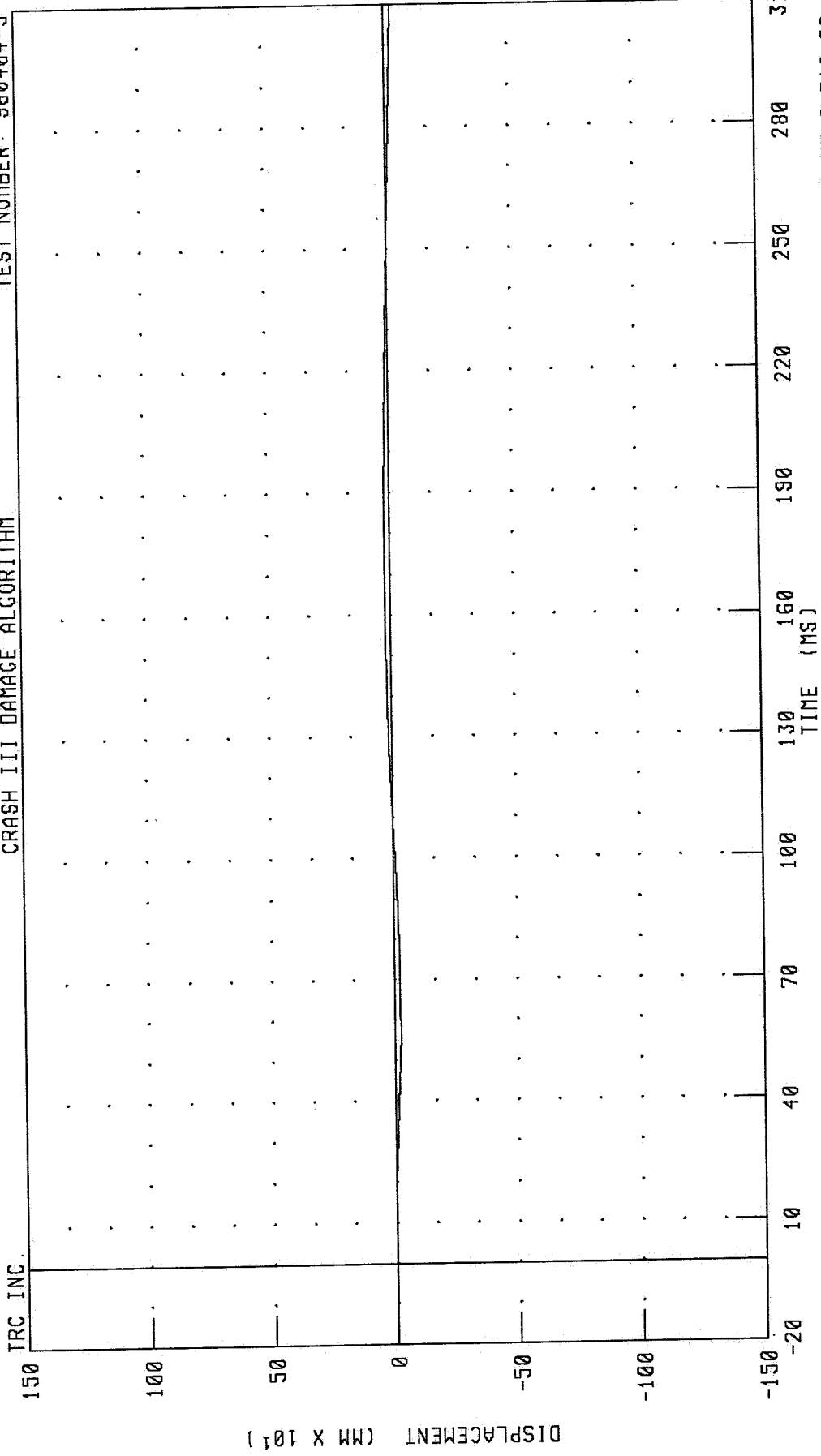
CHANNEL: LFSZV1 FILTER: CH: CLASS 180

PEAK DATA: 2.89 KM/H @ 101.28 MS; -3.00 KM/H @ 28.64 MS

TRC INC.

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
 LEFT FRONT SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



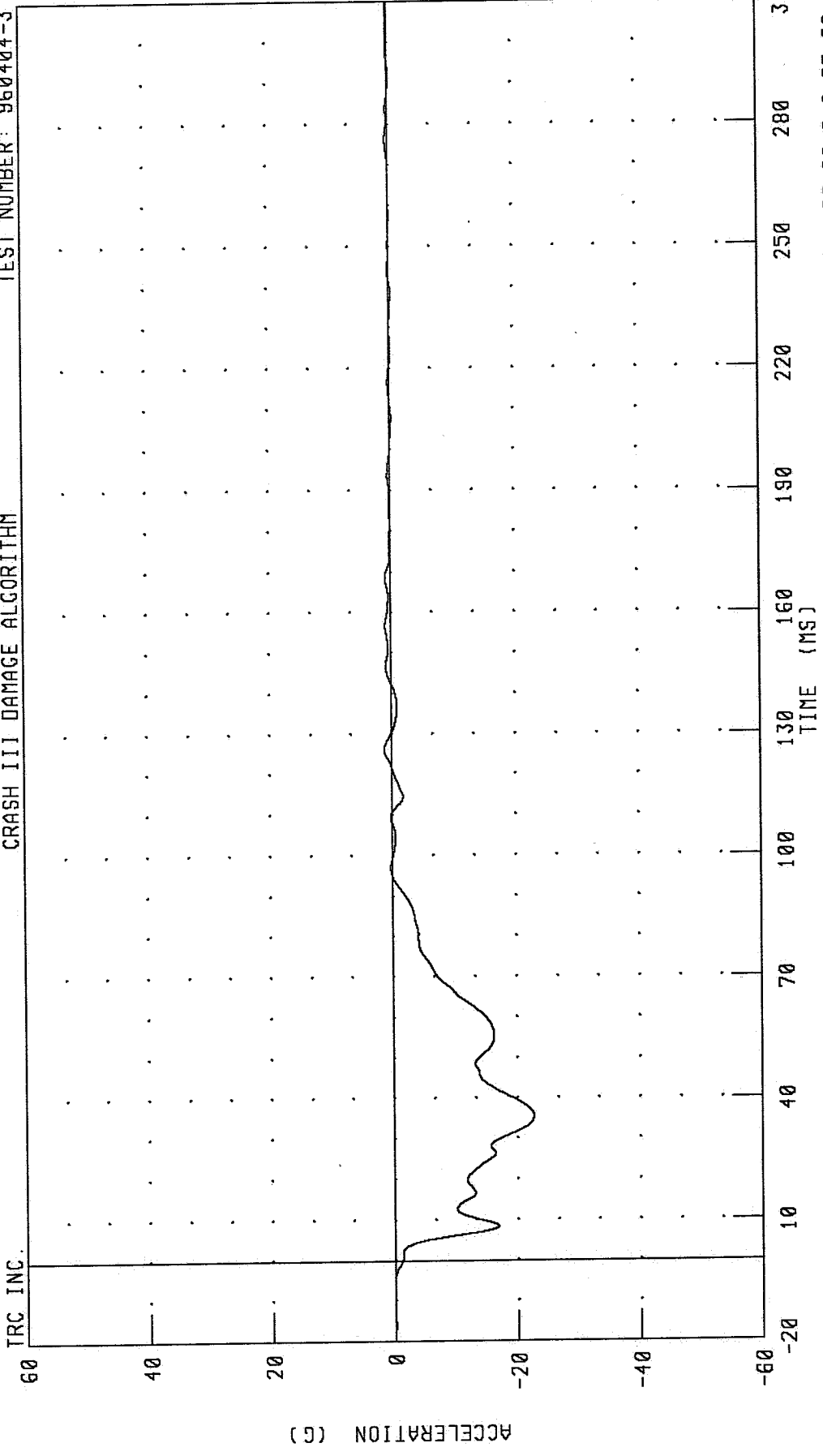
CHANNEL: LFSZD1 FILTER: CH. CLASS 180 PEAK DATA: 21.57 MM @ 172.80 MS; -25.48 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT FRONT SILL X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

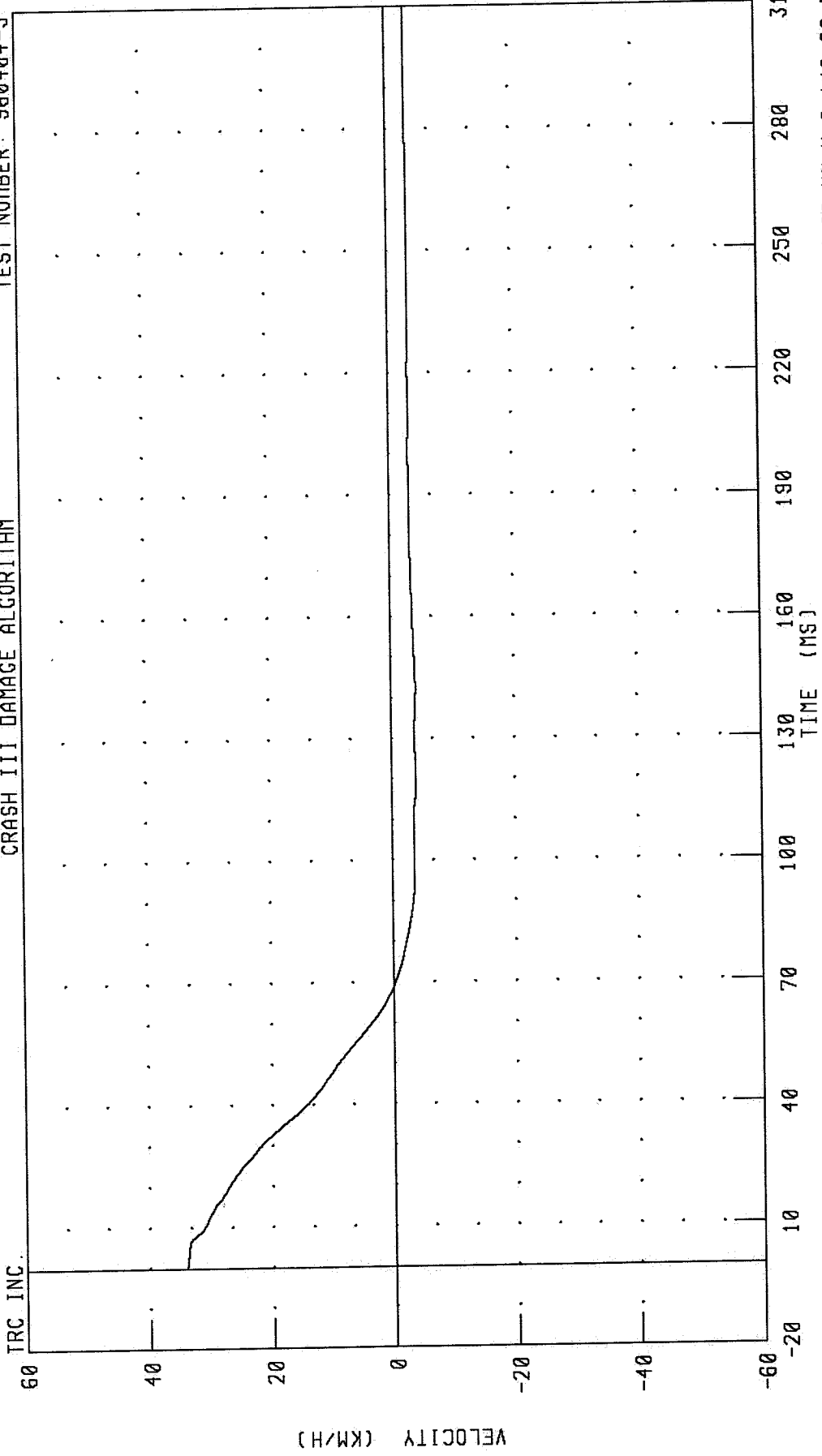


CHANNEL: RFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.25 G @ 126.08 MS; -22.69 G @ 35.68 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
RIGHT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

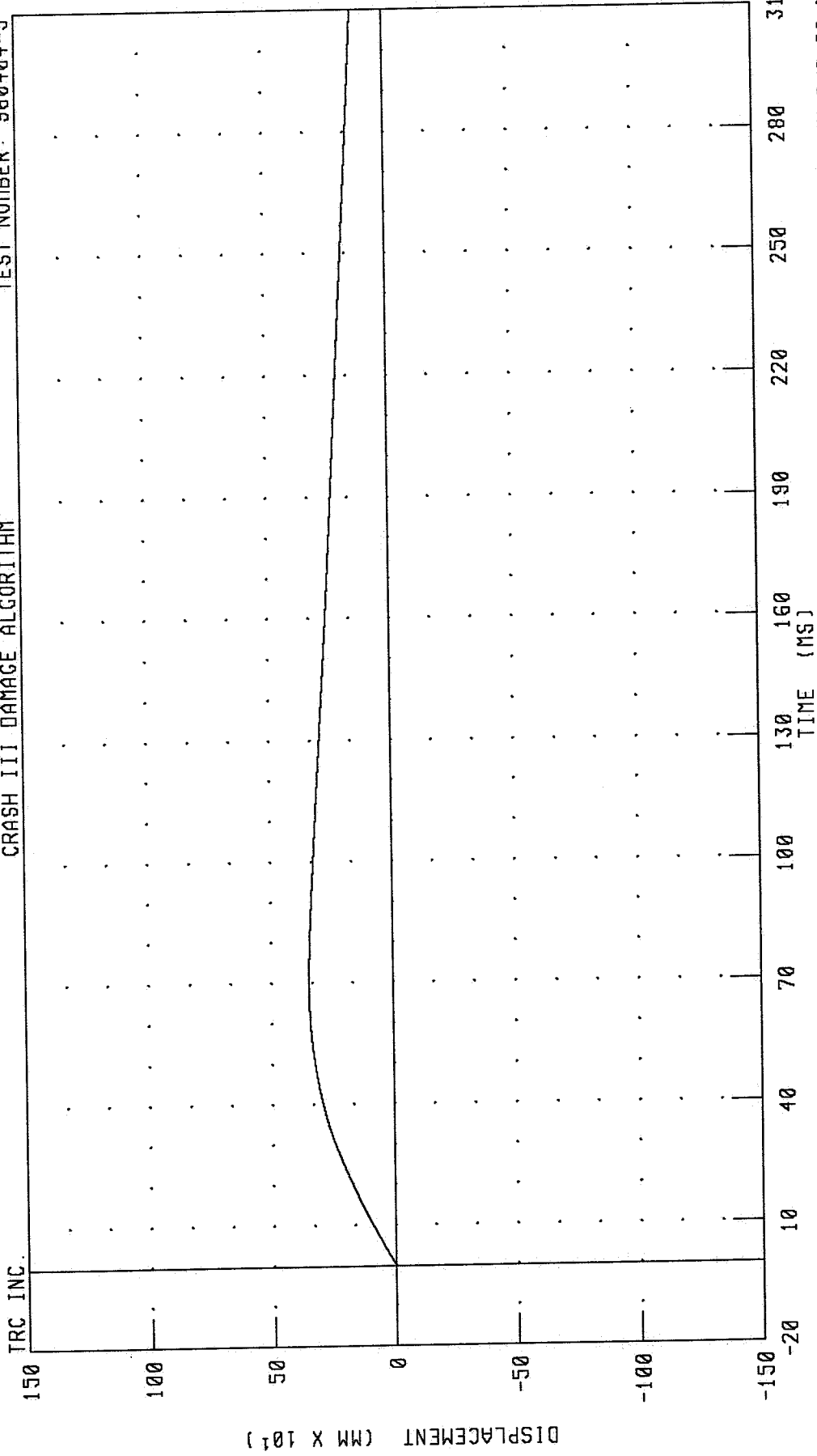


CHANNEL: RFSXV1 FILTER: CH. CLASS 180

PEAK DATA: 34.00 KM/H @ 0.00 MS; -3.98 KM/H @ 142.08 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
RIGHT FRONT SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

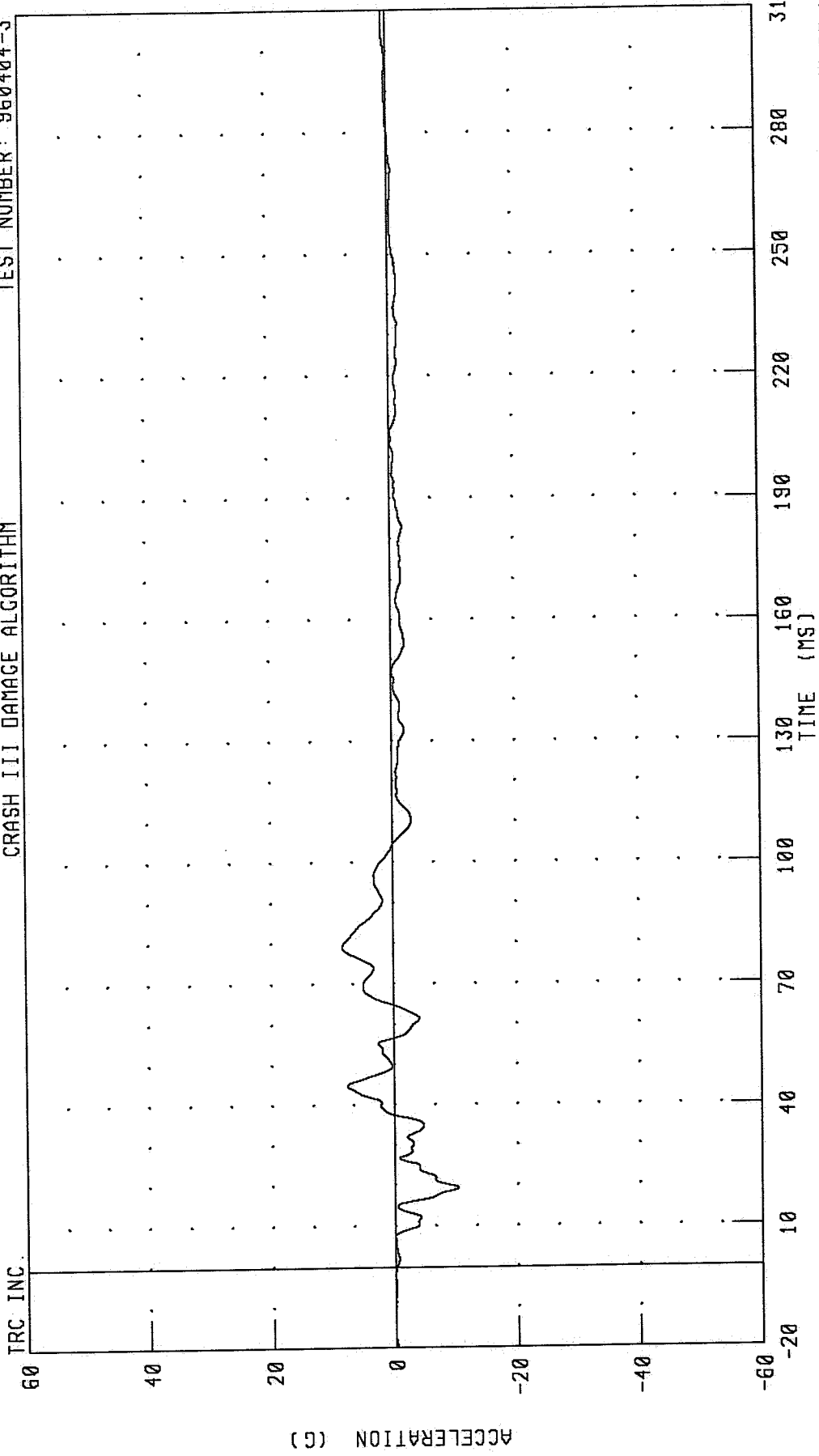


CHANNEL: RFSX01 FILTER: CH. CLASS 180

PEAK DATA: 346.87 MM @ 68.88 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
RIGHT FRONT SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



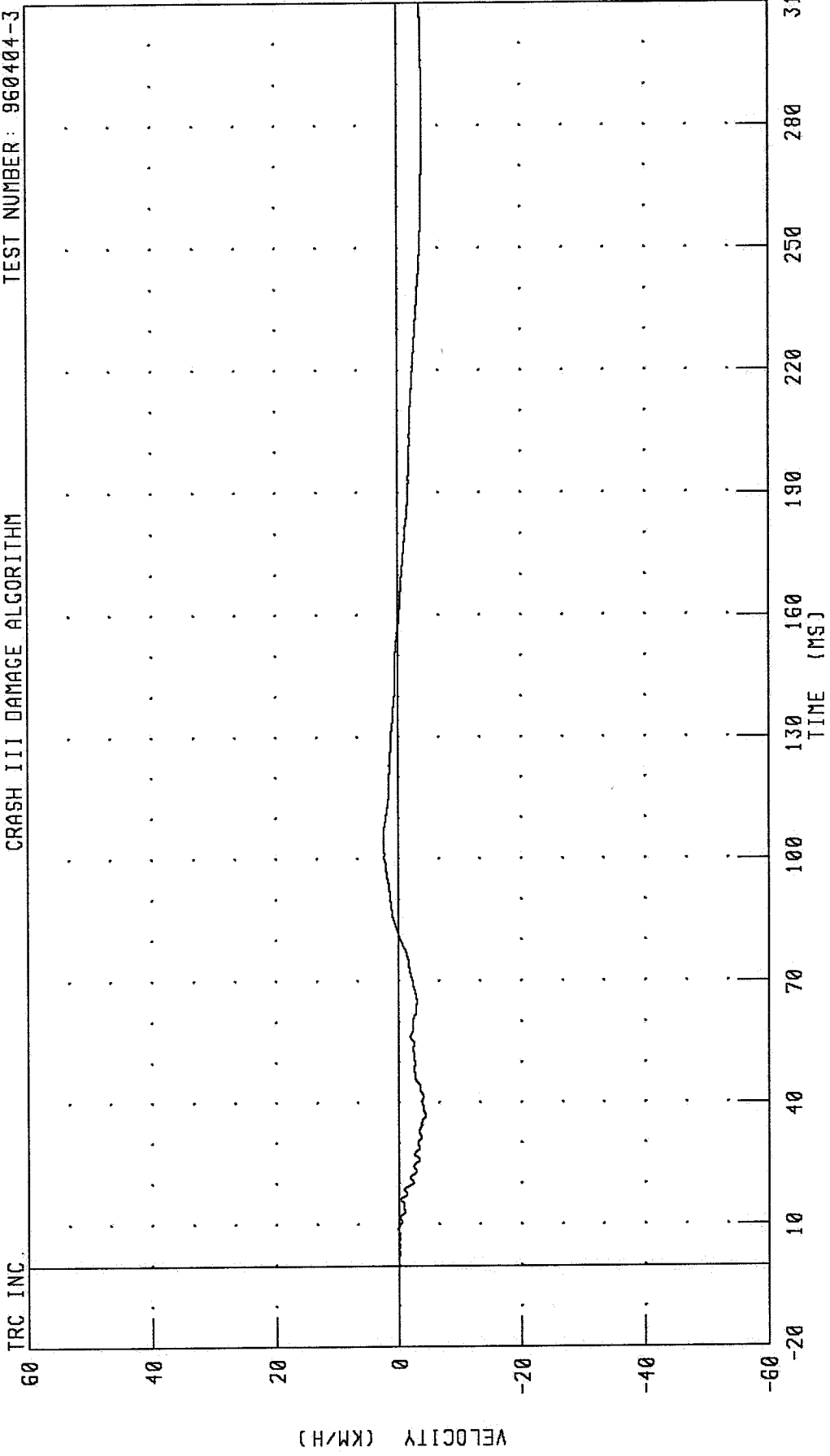
TRC INC. CHANNEL: RFSZG1 FILTER: CH. CLASS 60 PEAK DATA: 8.28 G @ 79.04 MS; -10.28 G @ 19.28 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT FRONT SILL Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



CHANNEL: RFSZV1 FILTER: CH. CLASS 180

PEAK DATA: 2.41 KM/H @ 104.96 MS; -4.40 KM/H @ 36.96 MS

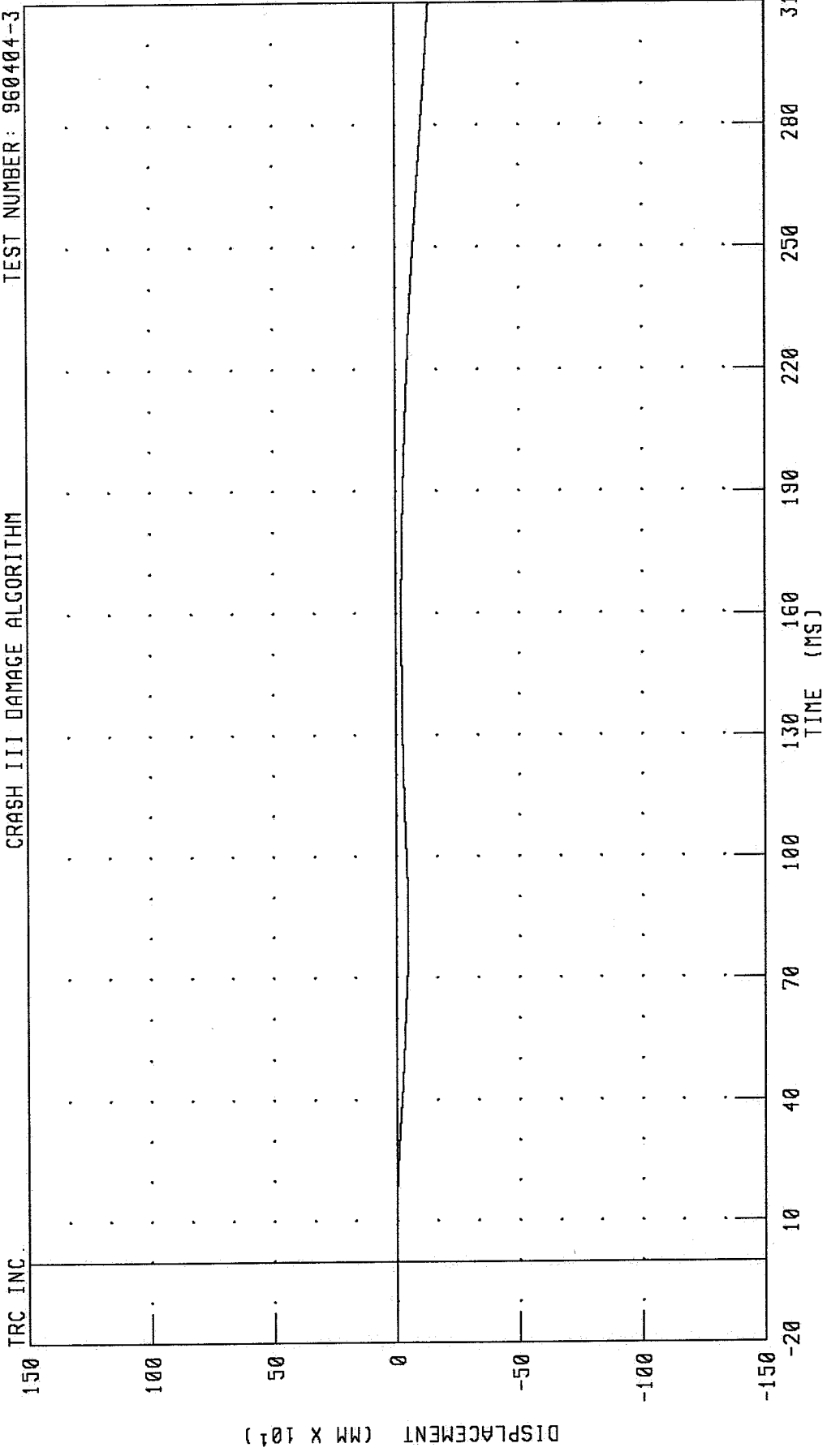
1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

RIGHT FRONT SILL Z-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

TRC INC.

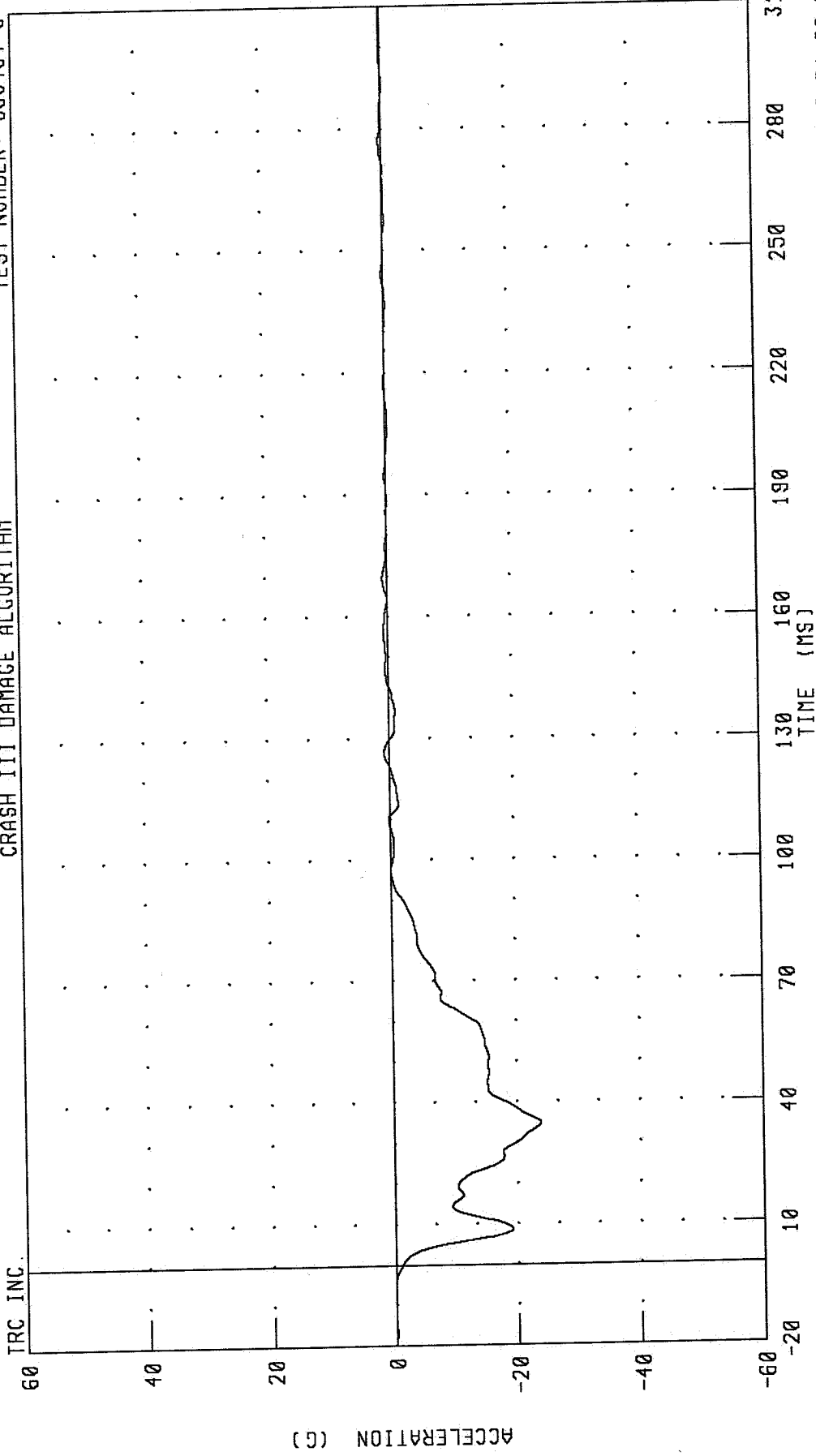


CHANNEL: RFSZD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MM @ 1.12 MS; -137.83 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

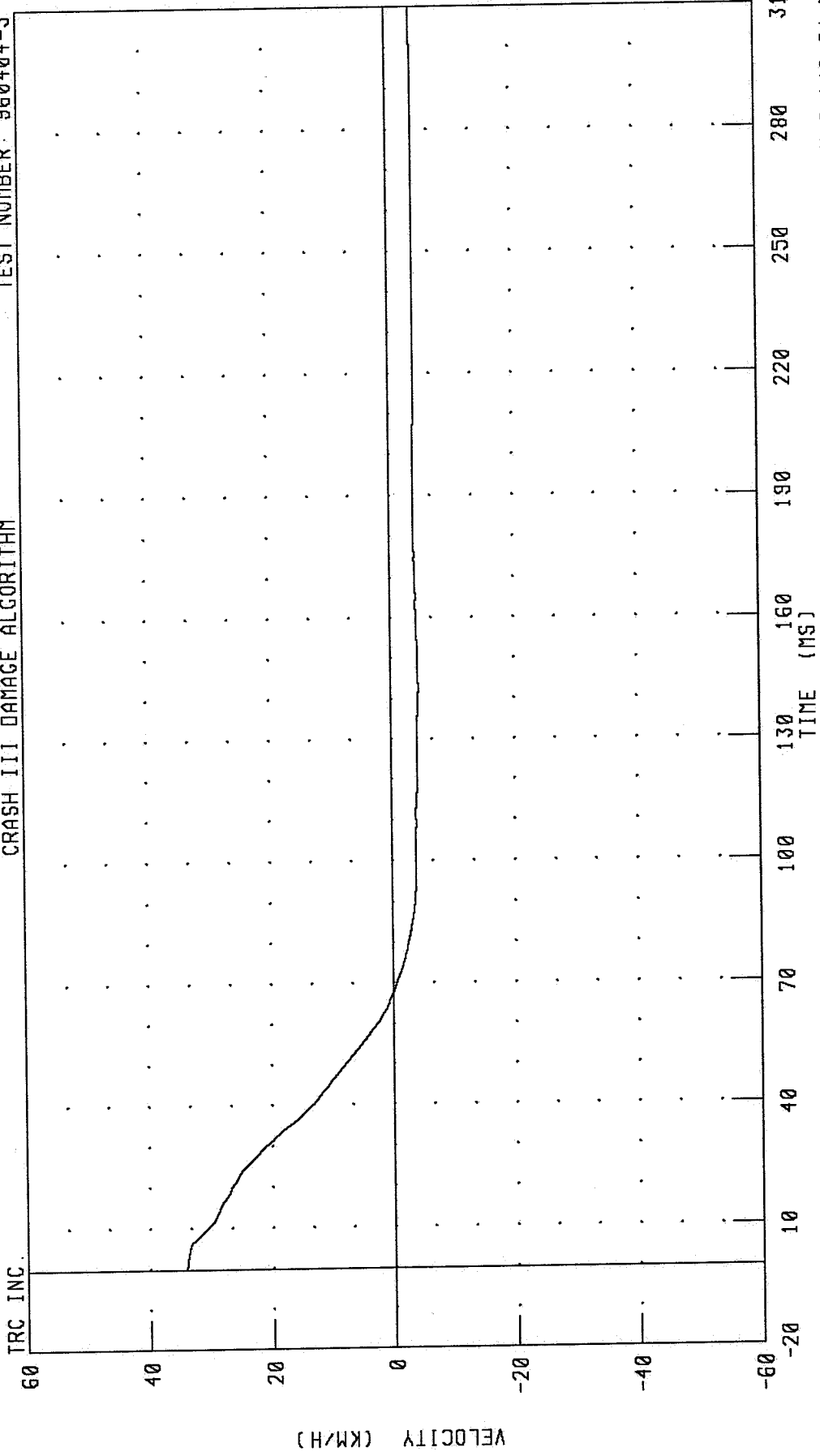


CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.81 G @ 126.56 MS; -23.94 G @ 34.80 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

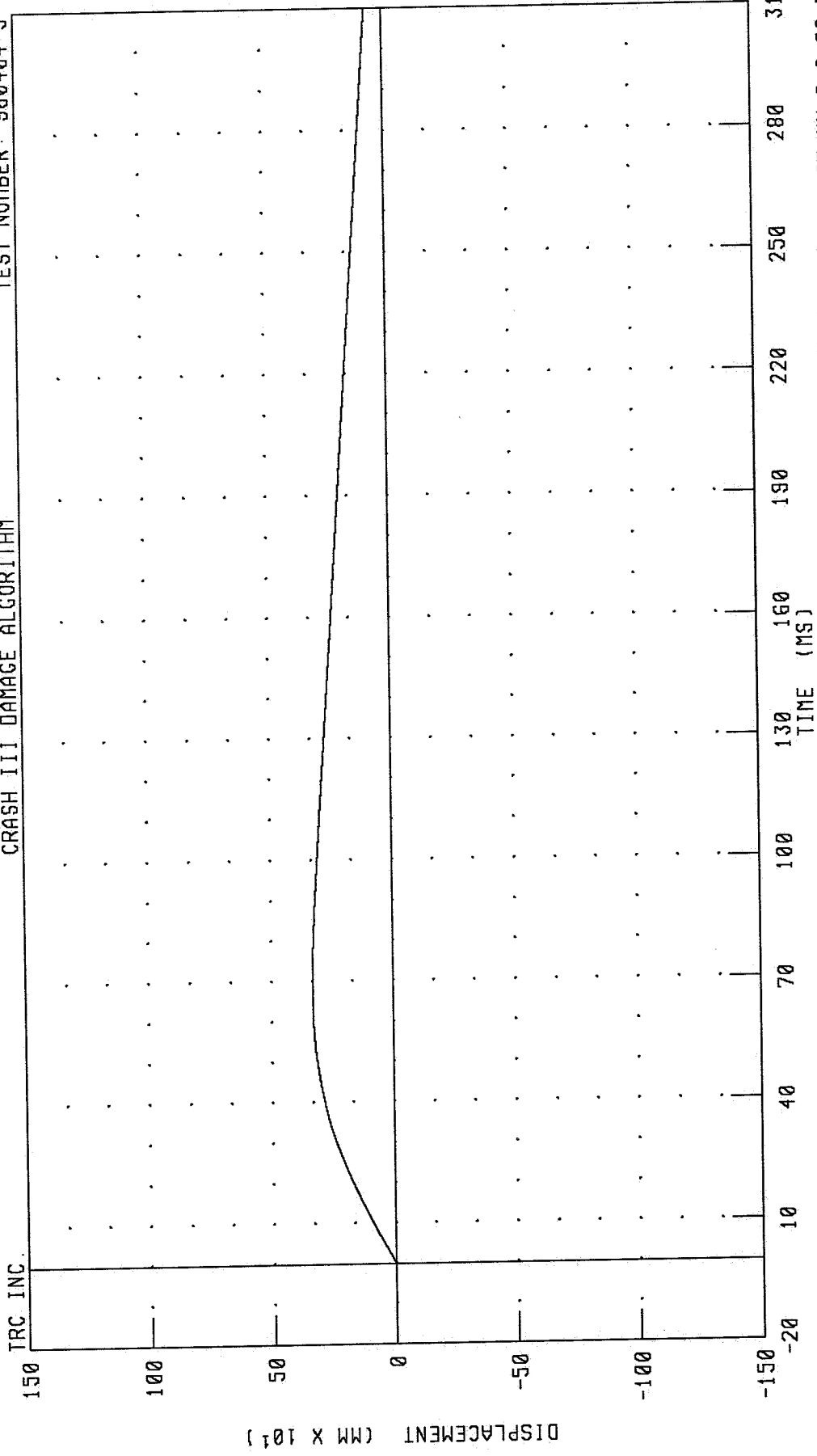
TEST NUMBER: 960404-3



CHANNEL: VCGXV1 FILTER: CH. CLASS 180 PEAK DATA: 34.00 KM/H @ 0.00 MS; -4.51 KM/H @ 142.64 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

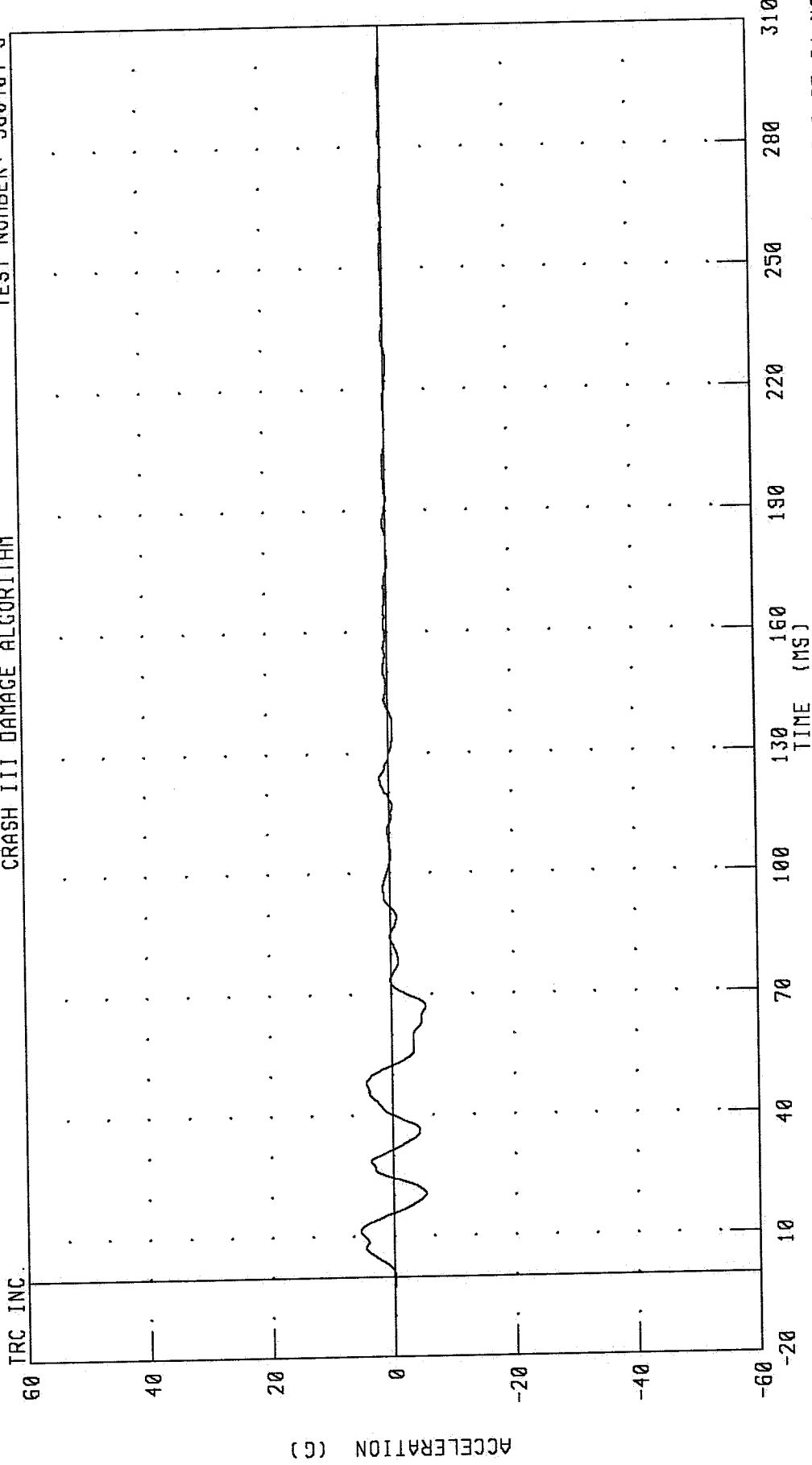
TEST NUMBER: 960404-3



CHANNEL: VCGXD1 FILTER: CH. CLASS 180 PEAK DATA: 332.06 MM @ 67.76 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3



PEAK DATA: 5.44 G @ 11.28 MS; -5.63 G @ 67.04 MS

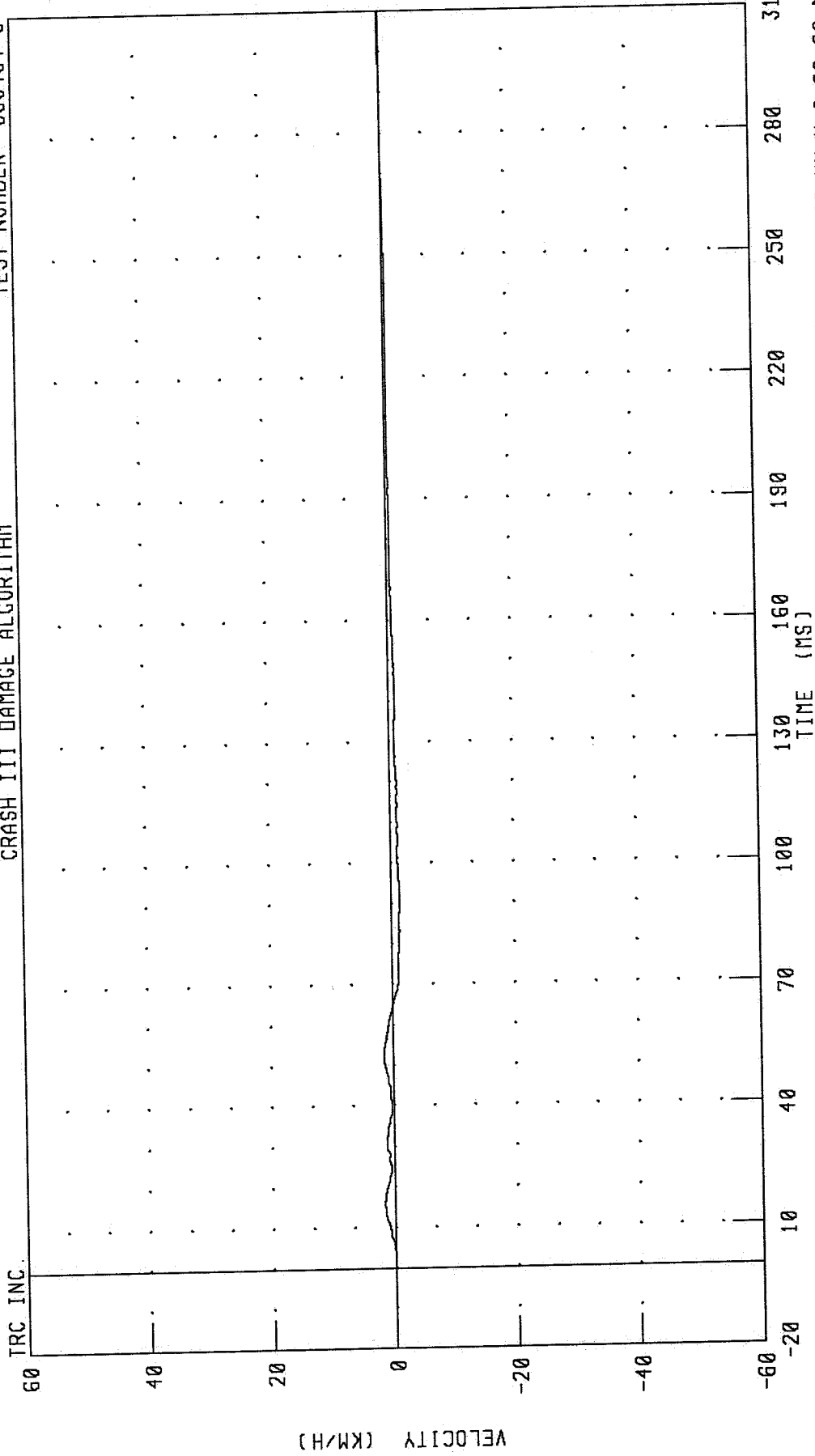
CHANNEL: VCGY01 FILTER: CH. CLASS 60

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3

VEHICLE CG Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

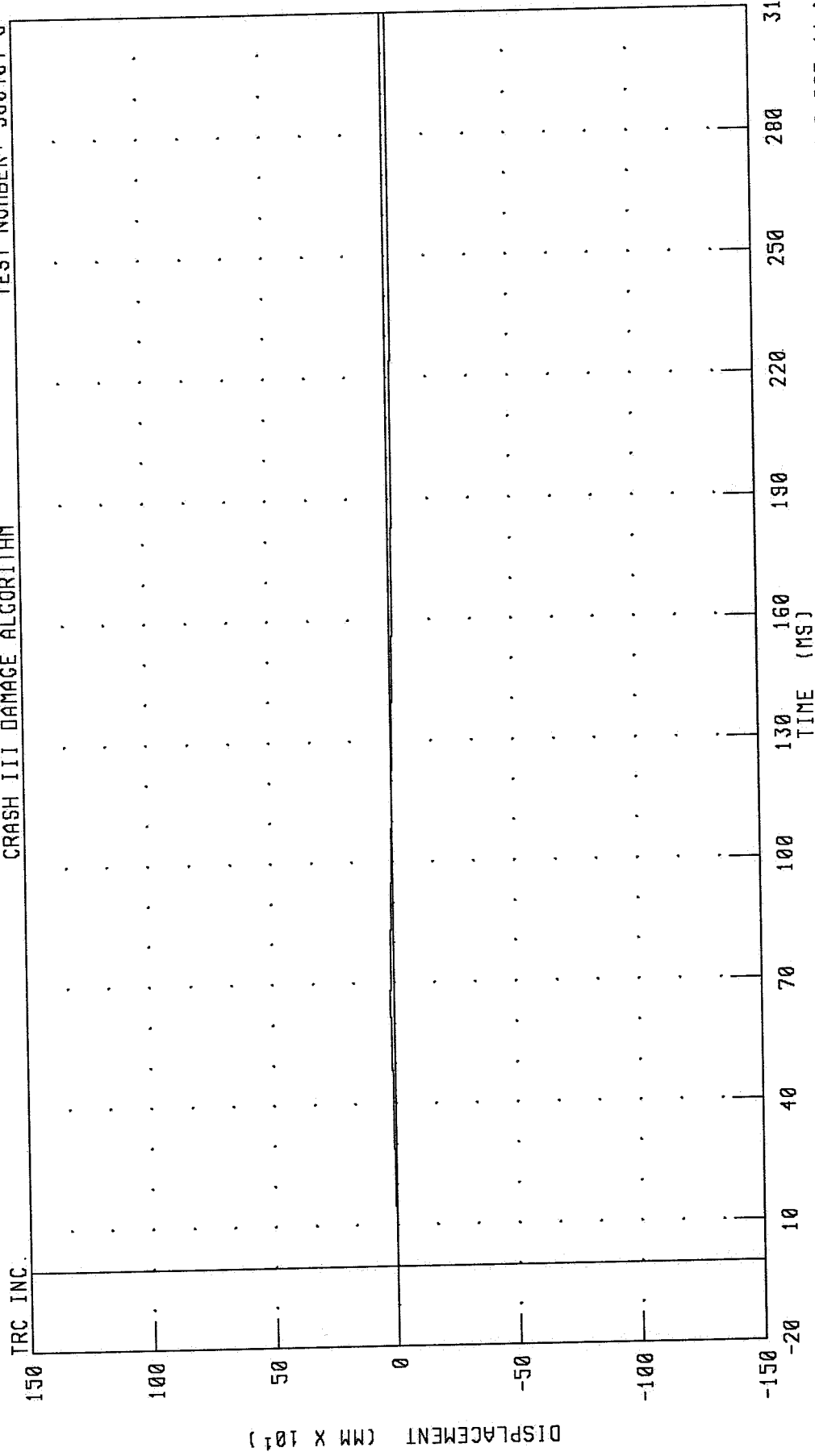
TEST NUMBER: 960404-3



CHANNEL: VCGYV1 FILTER: CH. CLASS 180 PEAK DATA: 1.75 KM/H @ 15.76 MS; -1.42 KM/H @ 92.08 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
 VEHICLE CG Y-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

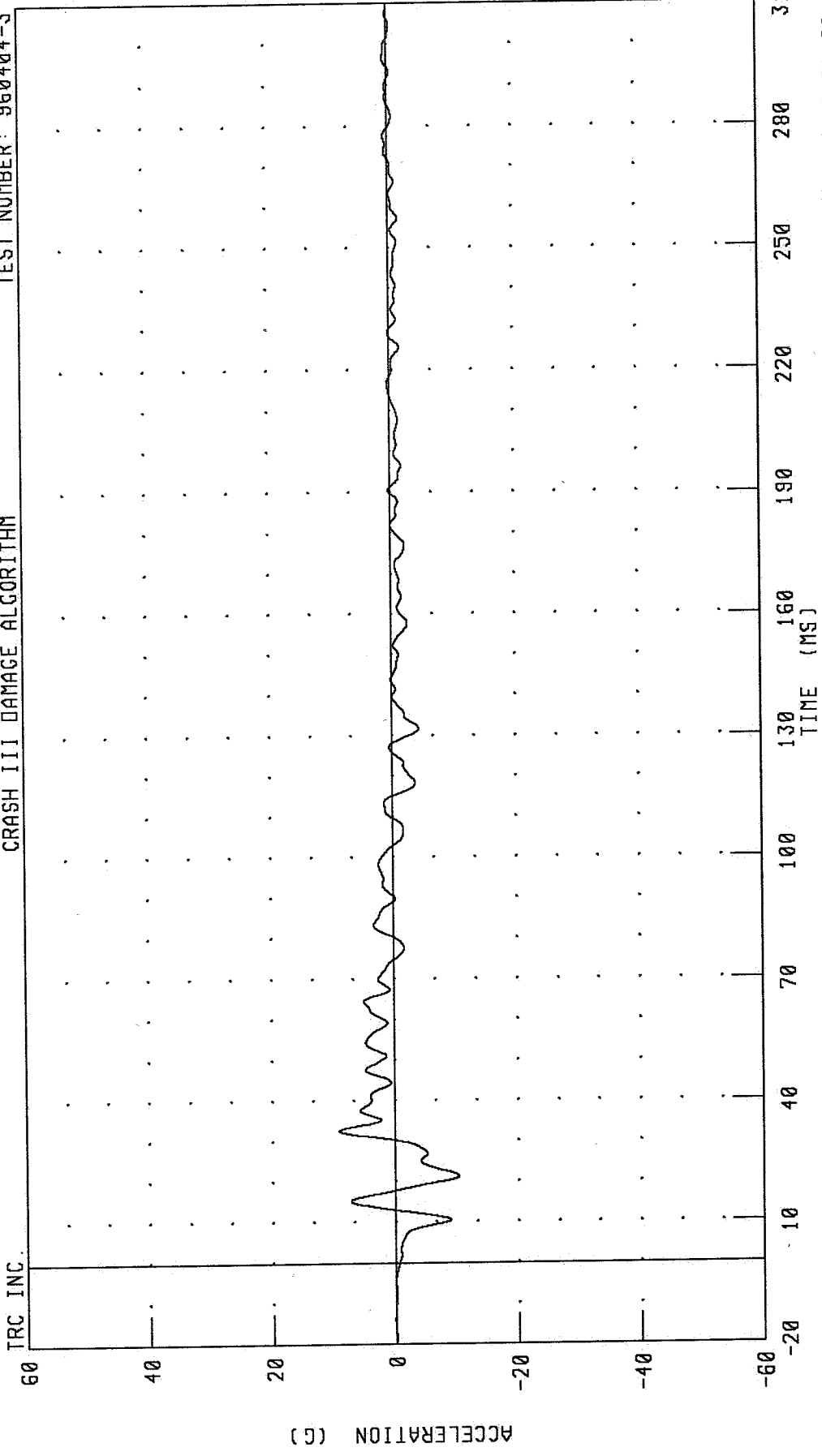
TEST NUMBER: 960404-3



CHANNEL: VCGYD1 FILTER: CH. CLASS 180 PEAK DATA: 15.39 MM @ 64.56 MS; -22.16 MM @ 285.44 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

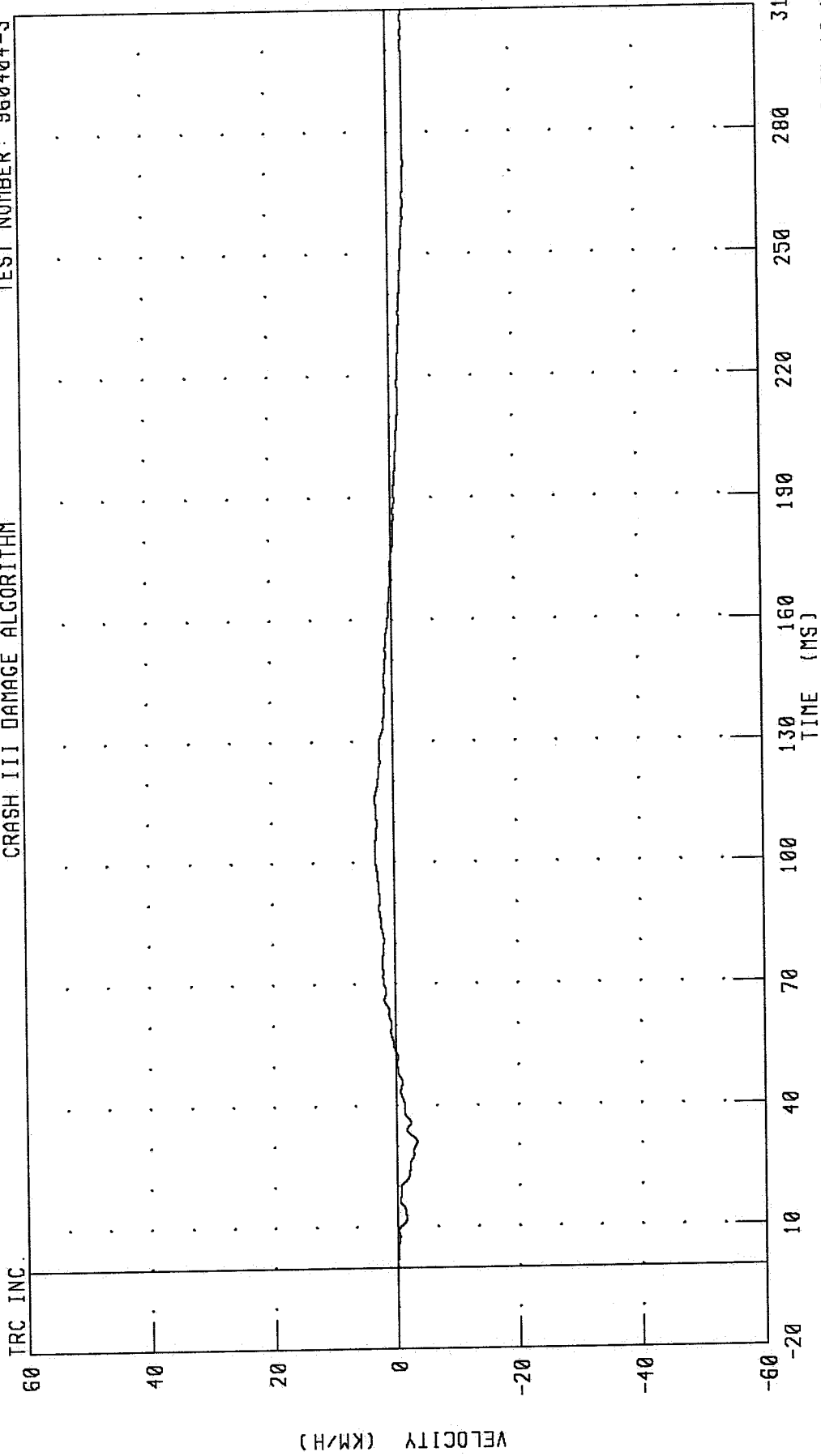


CHANNEL: VCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 9.10 G @ 32.64 MS; -10.39 G @ 21.28 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

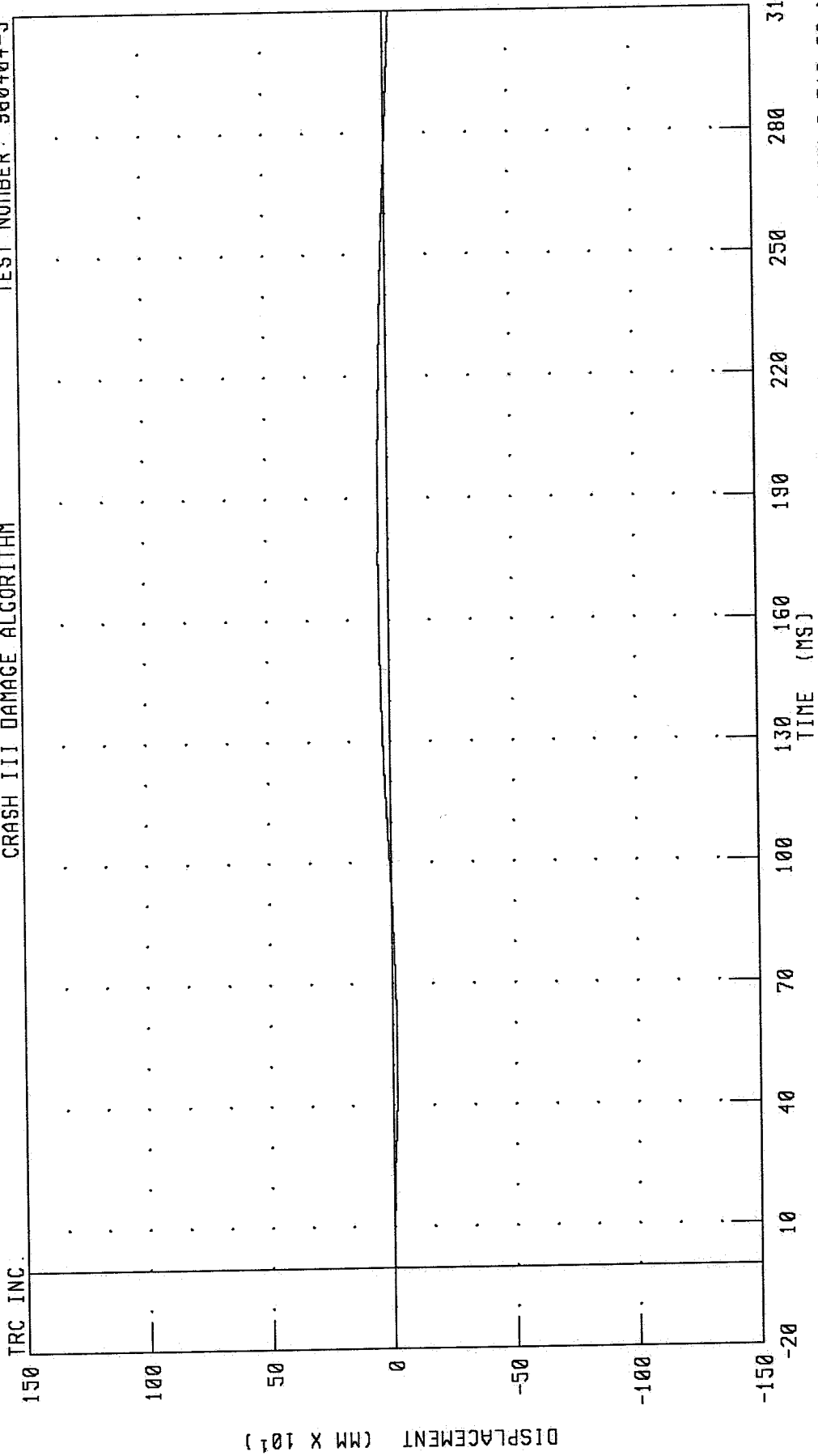
TEST NUMBER: 960404-3



CHANNEL: VCGZV1 FILTER: CH. CLASS 180 PEAK DATA: 3.13 KM/H @ 103.44 MS; -3.36 KM/H @ 31.12 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
 VEHICLE CG Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

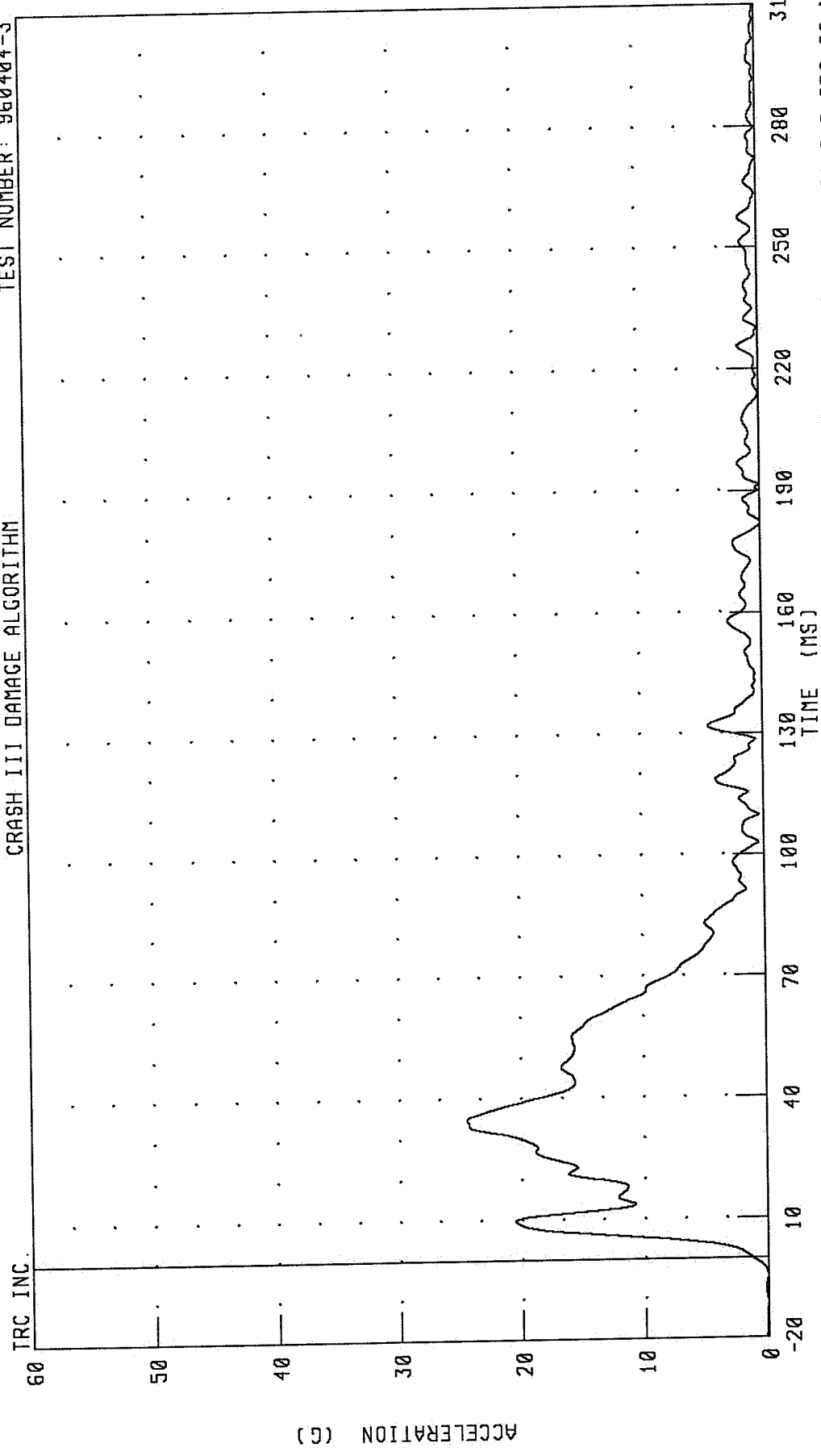
TEST NUMBER: 960404-3



CHANNEL: YCGZ01 FILTER: CH. CLASS 180 PEAK DATA: 40.55 MM @ 175.12 MS; -23.91 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG RESULTANT ACCELERATION
CRASH III DAMAGE ALGORITHM

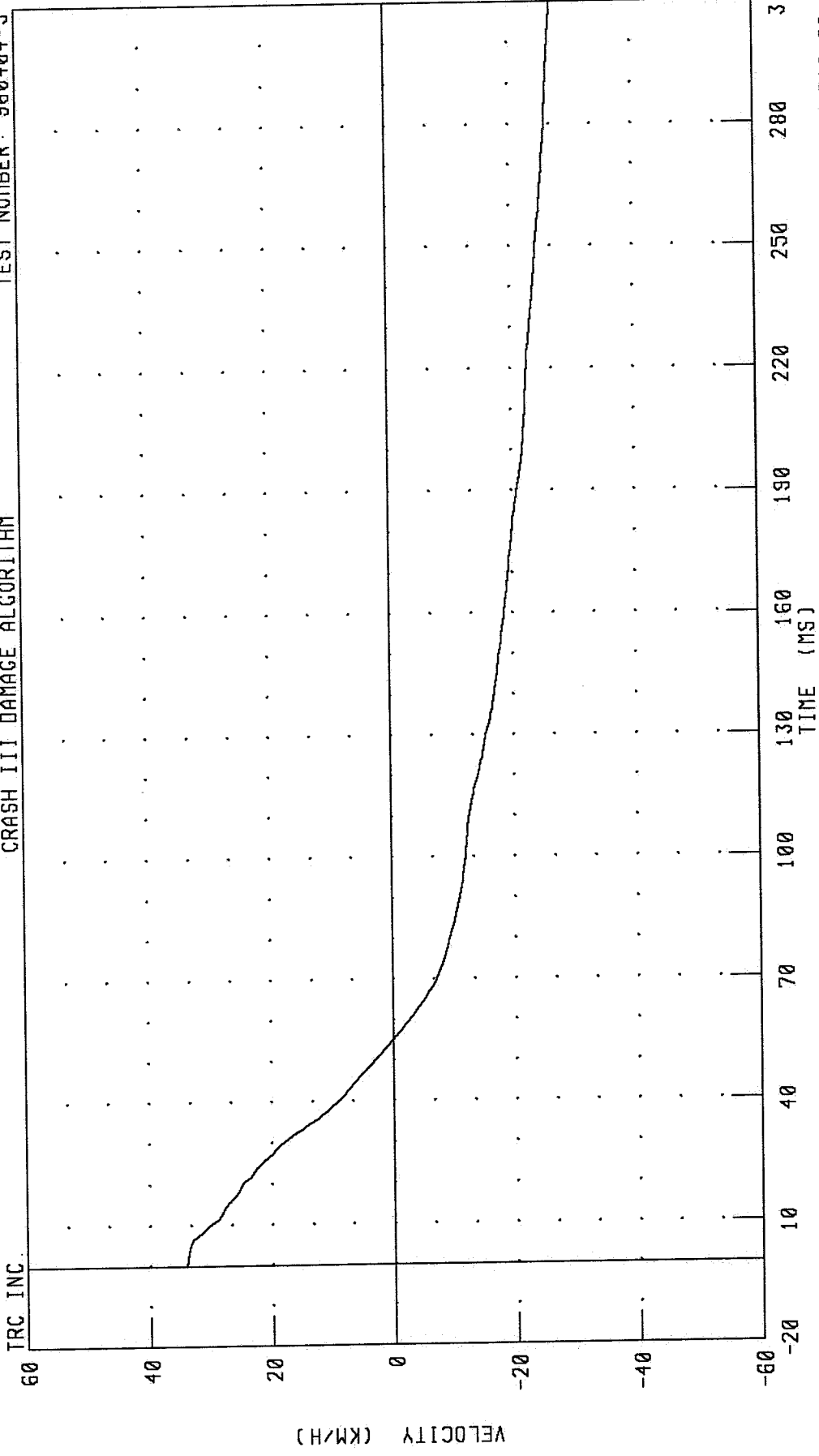
TEST NUMBER: 960404-3



TRC INC. CHANNEL: VCGRG1 FILTER: CH. CLASS 60
PEAK DATA: 24.42 G @ 34.80 MS; 0.01 G @ 272.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CC RESULTANT VELOCITY
CRASH III DAMAGE ALGORITHM

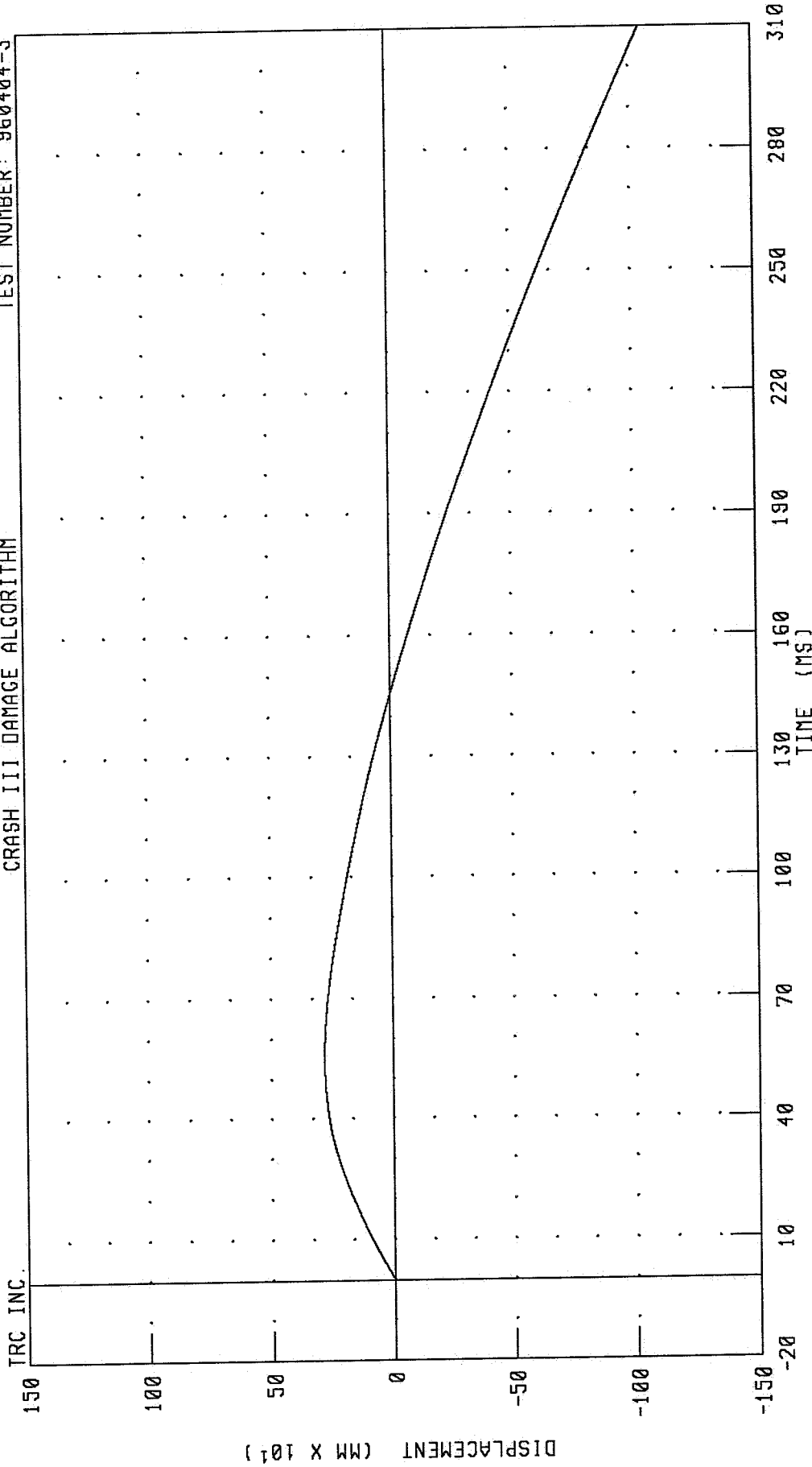
TEST NUMBER: 960404-3



TRC INC. CHANNEL: VCGRV1 FILTER: CH. CLASS 180
PEAK DATA: 34.00 KM/H @ 0.00 MS; -26.99 KM/H @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 20 MPH TEST NO. 3
VEHICLE CG RESULTANT DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-3

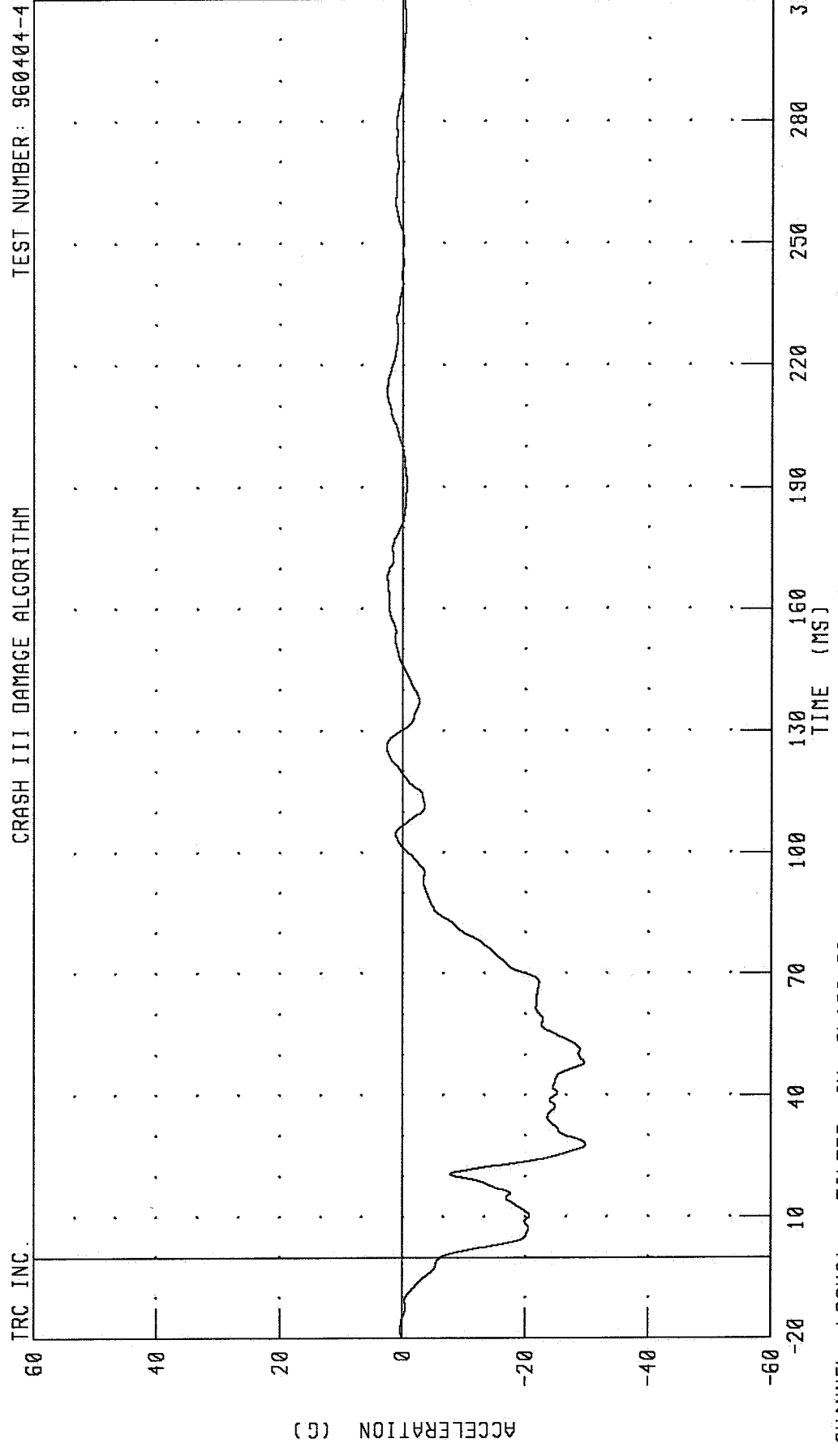


CHANNEL: VCGRD1 FILTER: CH. CLASS 180 PEAK DATA: 283.13 MM @ 55.20 MS; -1042.83 MM @ 310.00 MS

Data Plots

Test No. 960404-4

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

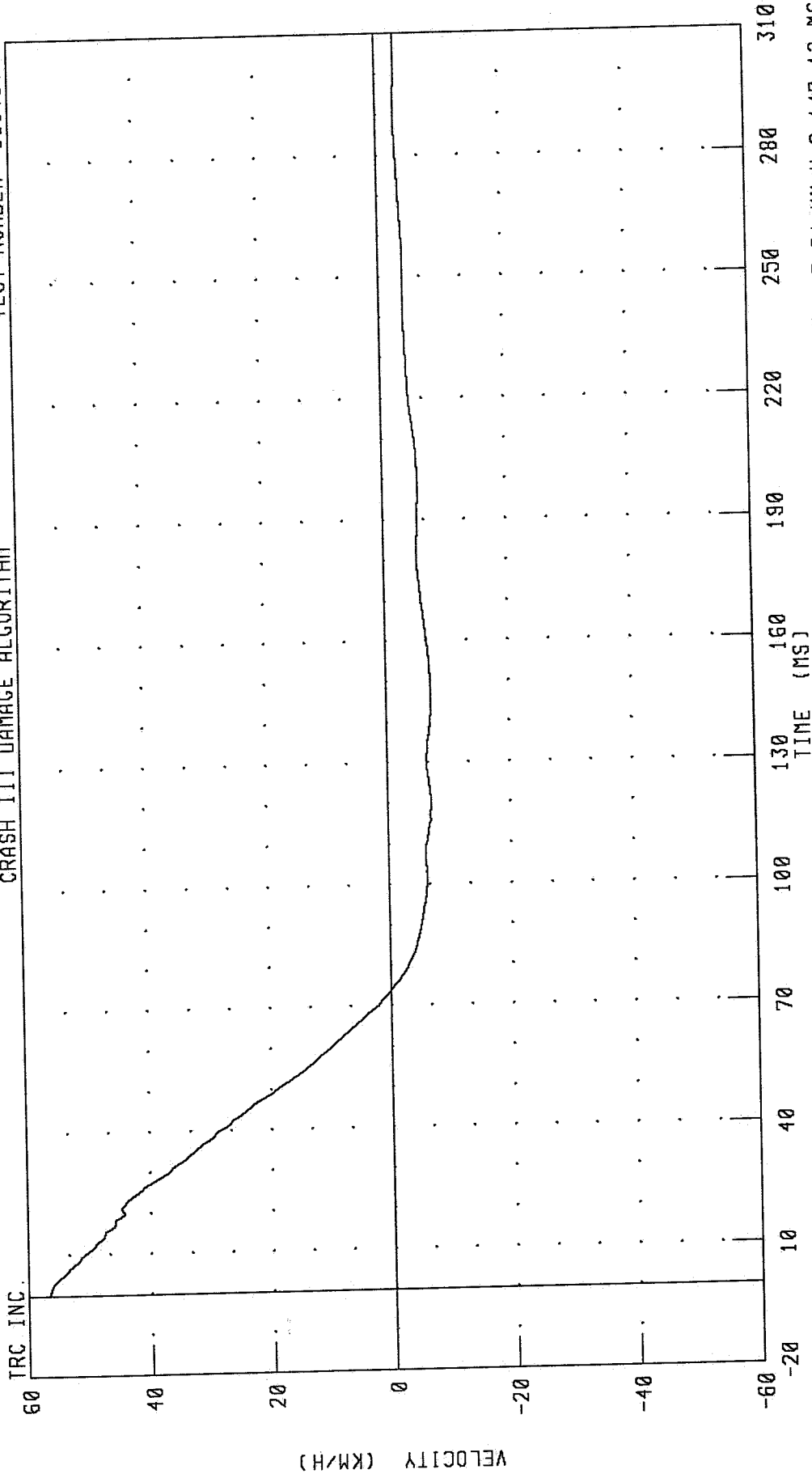


CHANNEL: LRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.62 G @ 126.48 MS; -29.80 G @ 27.92 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT REAR SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

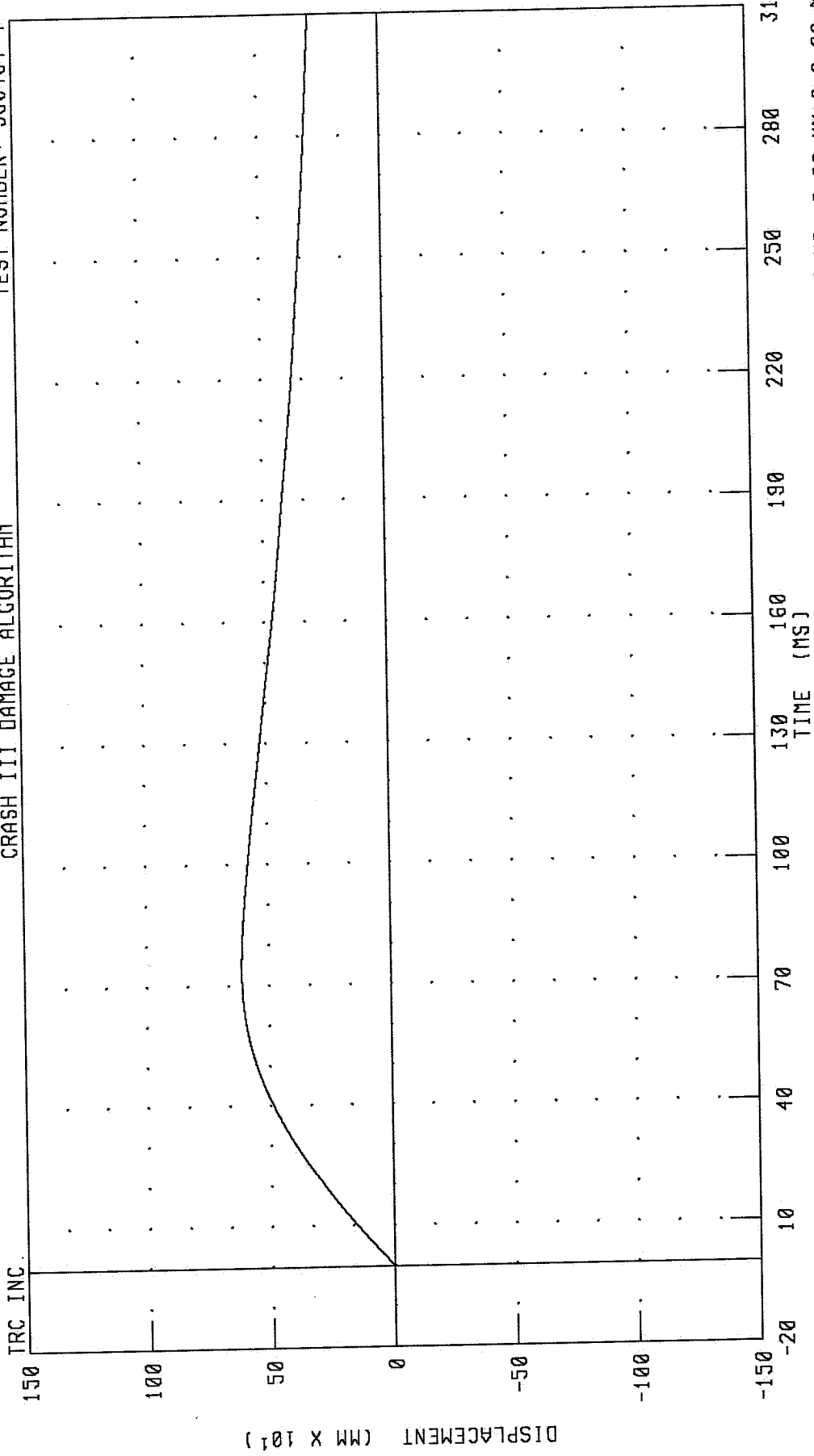
TEST NUMBER: 960404-4



CHANNEL: LRSXV1 FILTER: CH. CLASS 180

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

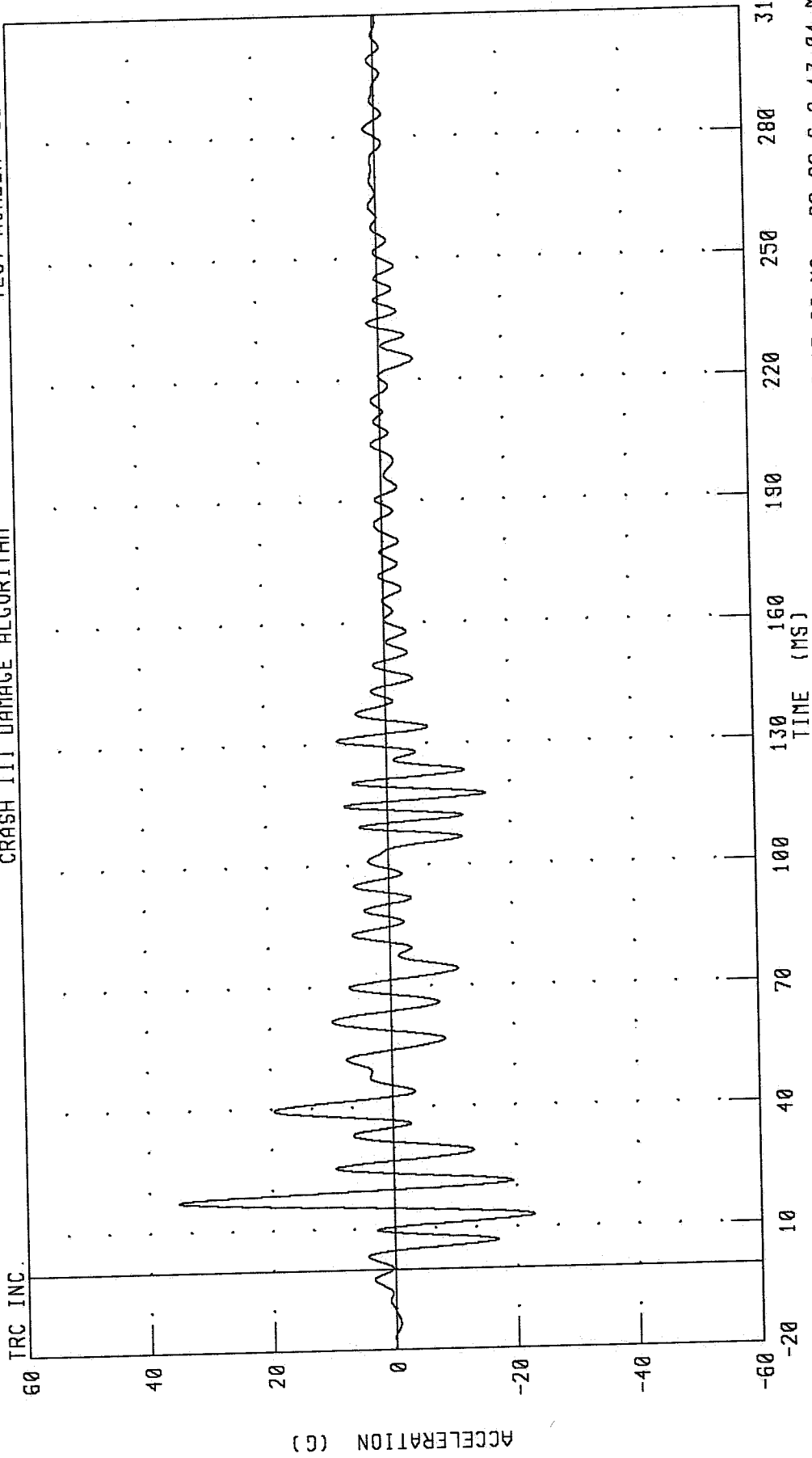
TEST NUMBER: 960404-4



CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 612.74 MM @ 73.76 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

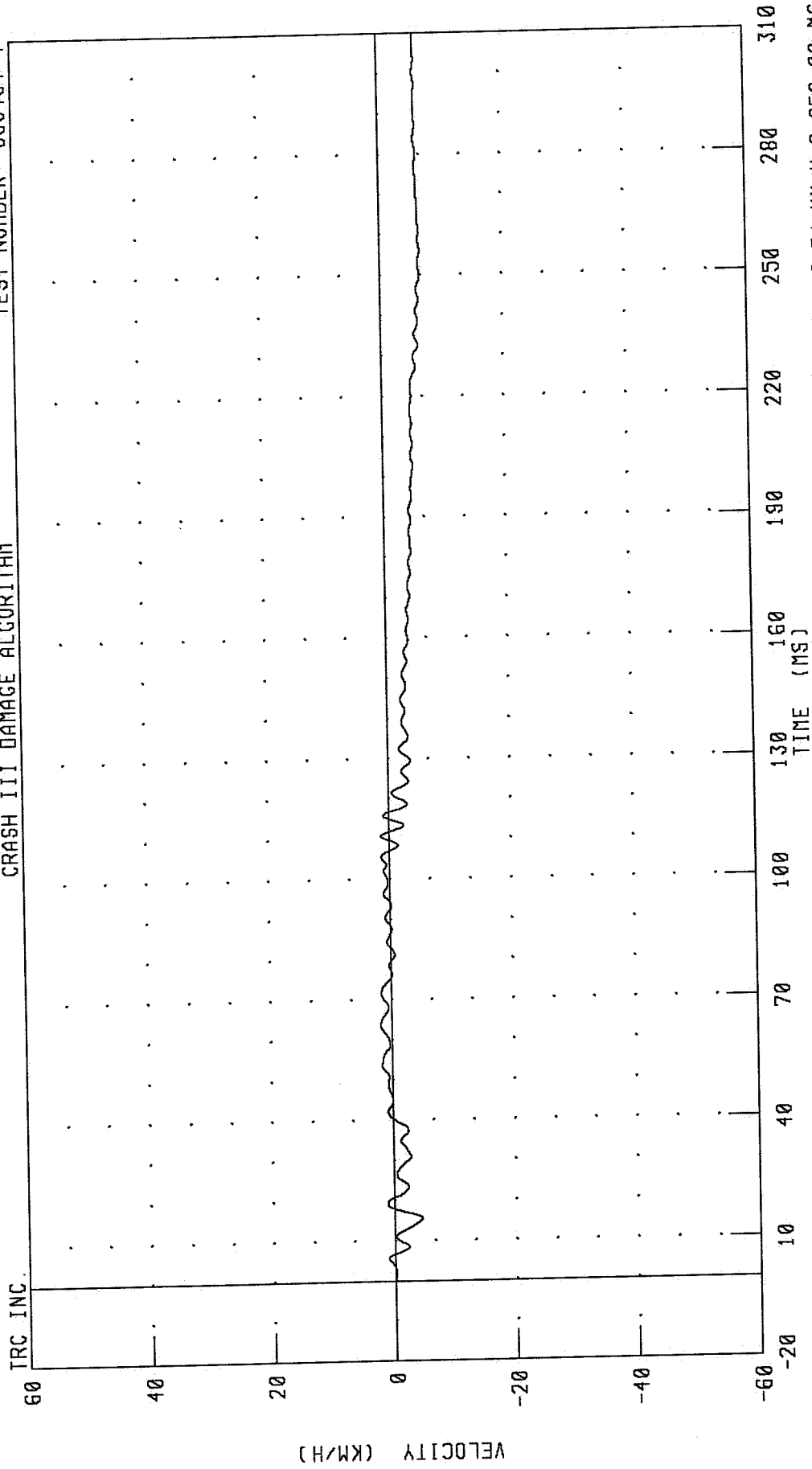
TEST NUMBER: 960404-4



CHANNEL: LRSZG1 FILTER: CH. CLASS 60 PEAK DATA: 35.15 G @ 17.28 MS; -22.86 G @ 13.04 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT REAR SILL Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

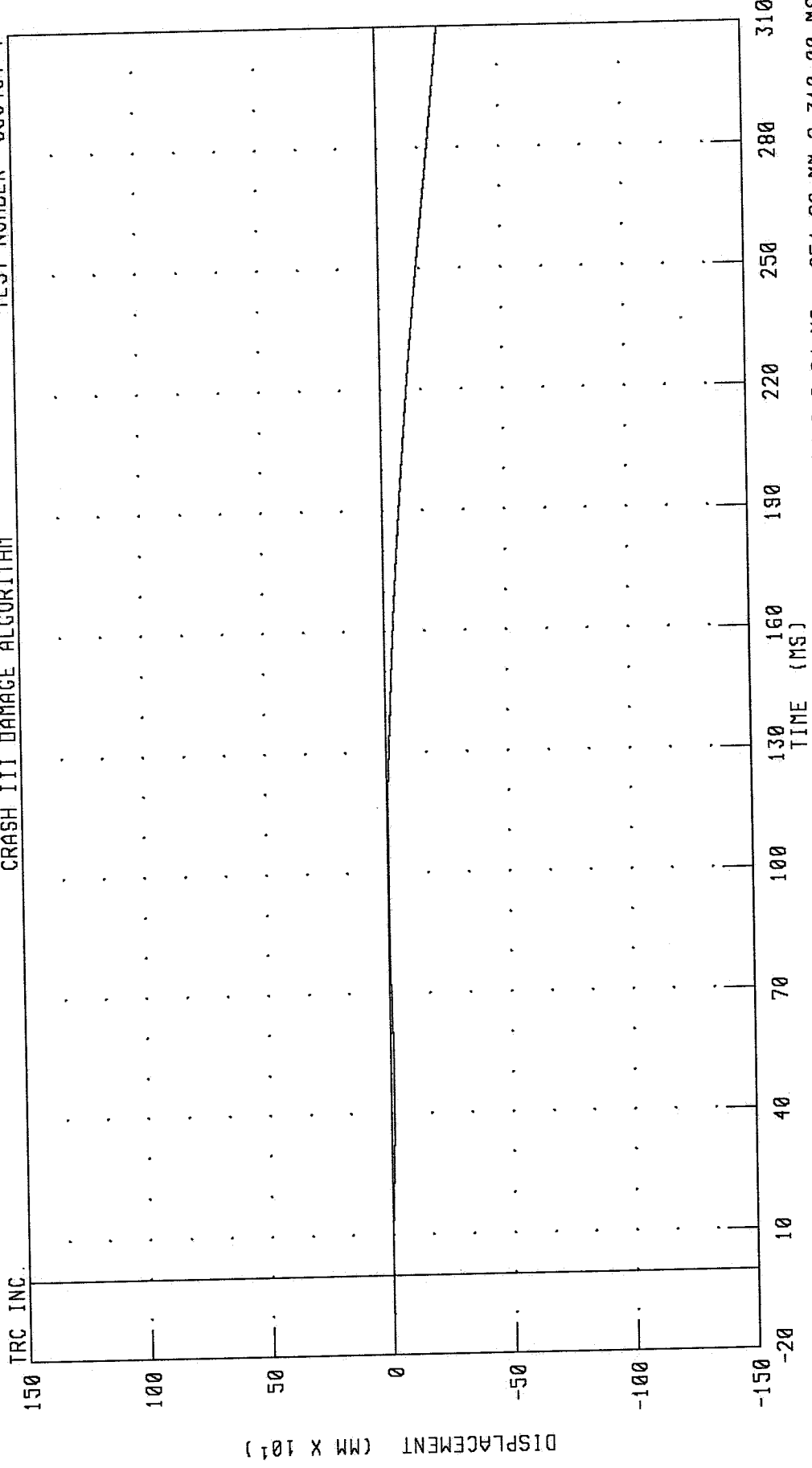
TEST NUMBER: 960404-4



CHANNEL: LRSZY1 FILTER: CH. CLASS 180 PEAK DATA: 1.88 KM/H @ 63.60 MS; -6.54 KM/H @ 256.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT REAR SILL Z-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

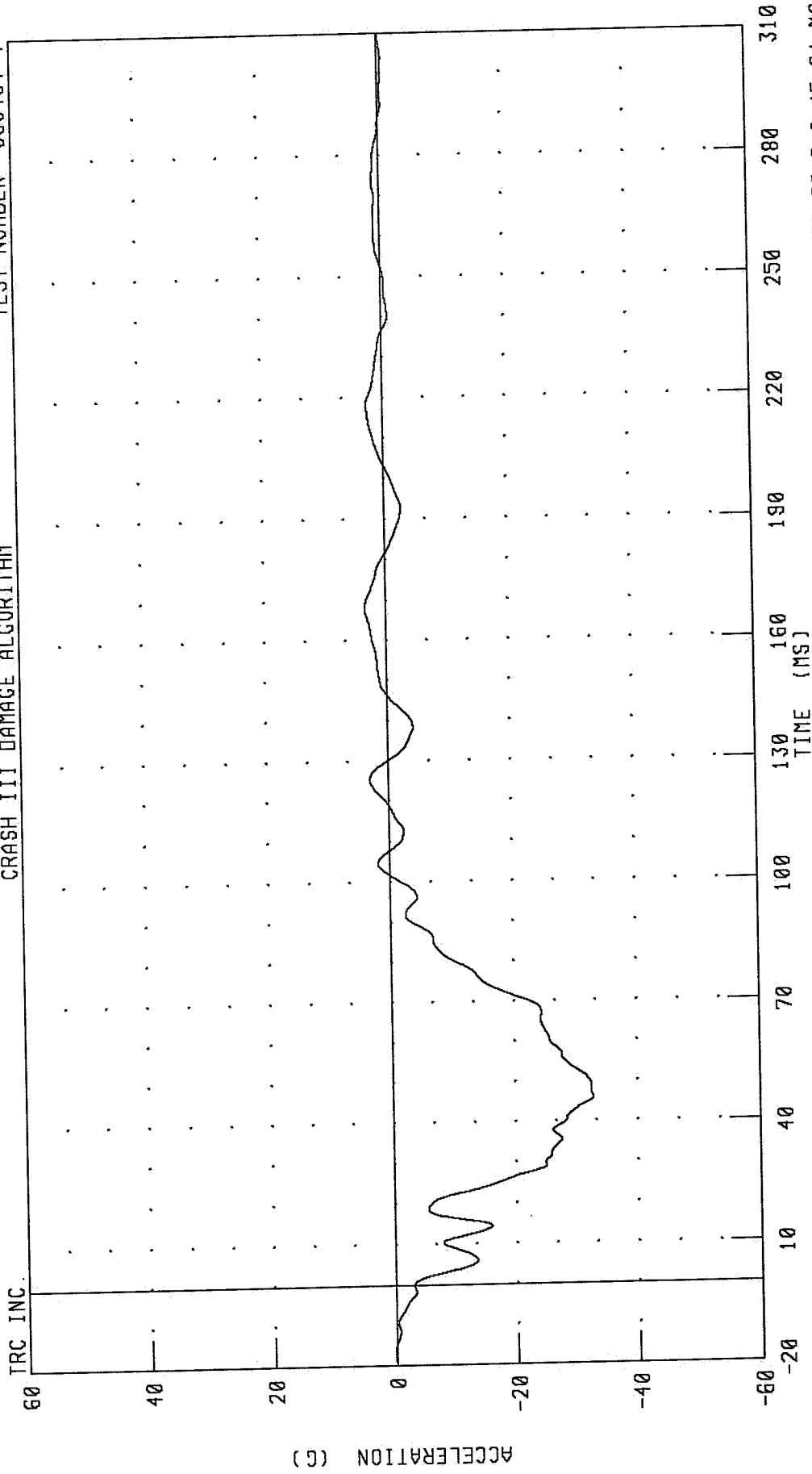
TEST NUMBER: 960404-4



CHANNEL: LRSZ01 FILTER: CH. CLASS 180 PEAK DATA: 0.47 MM @ 6.64 MS, -254.68 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

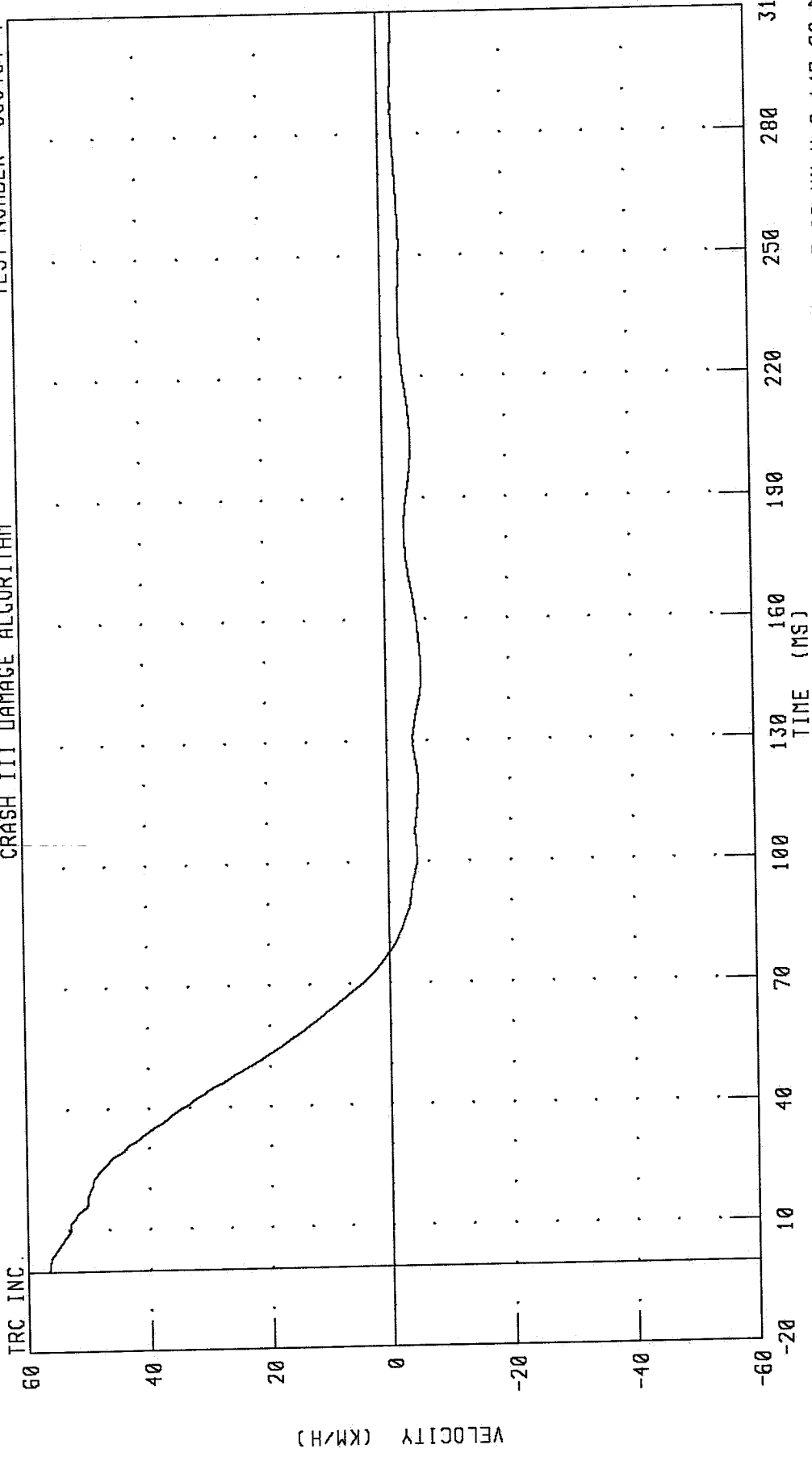
TEST NUMBER: 960404-4



CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 3.40 G @ 168.08 MS; -32.89 G @ 45.84 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT REAR SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4



PEAK DATA: 56.50 KM/H @ 0.00 MS; -5.80 KM/H @ 147.28 MS

CHANNEL: RRSXV1 FILTER: CH. CLASS 180

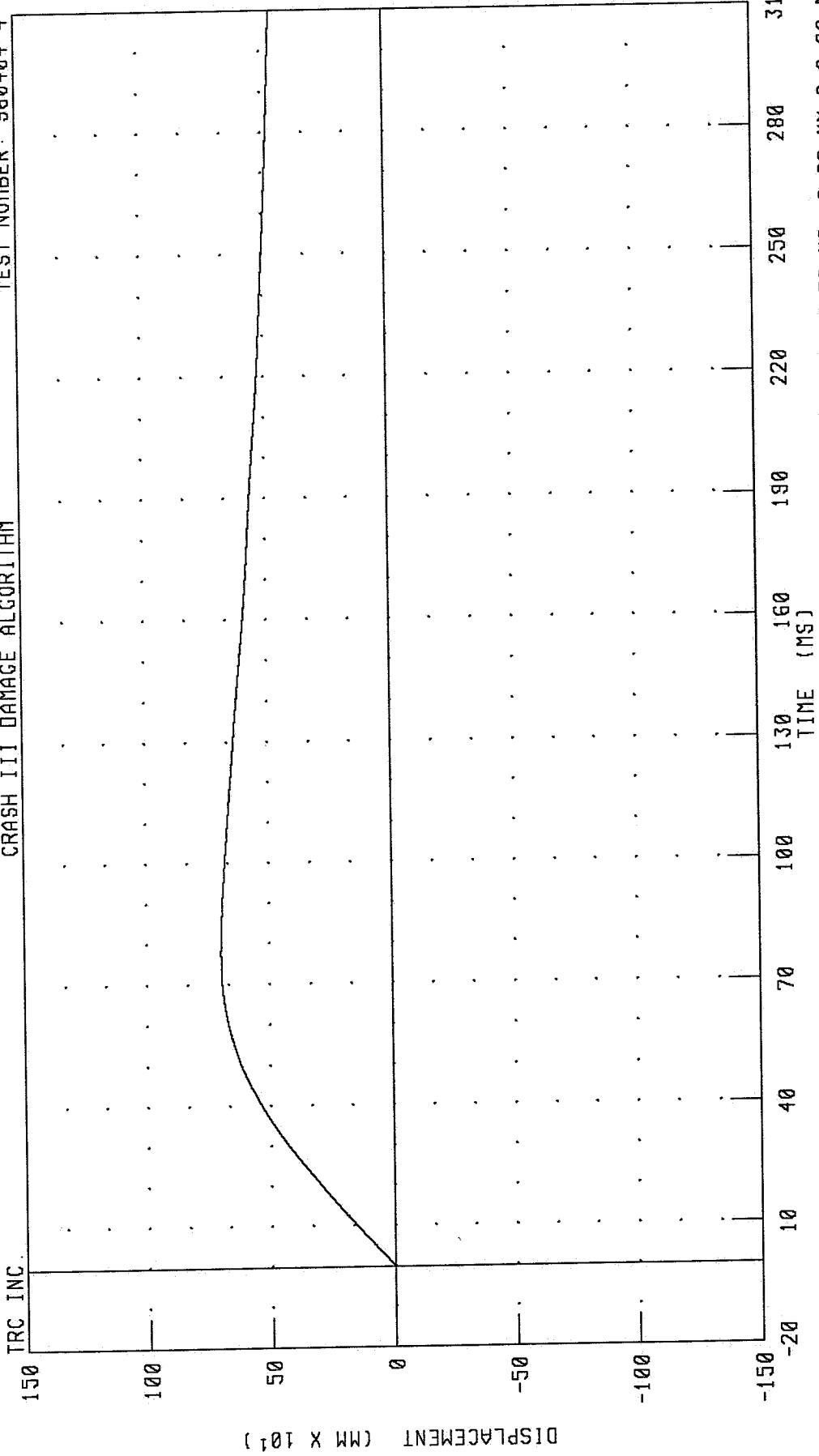
TRC INC.

VELOCITY (KM/H)

TIME (MS)

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

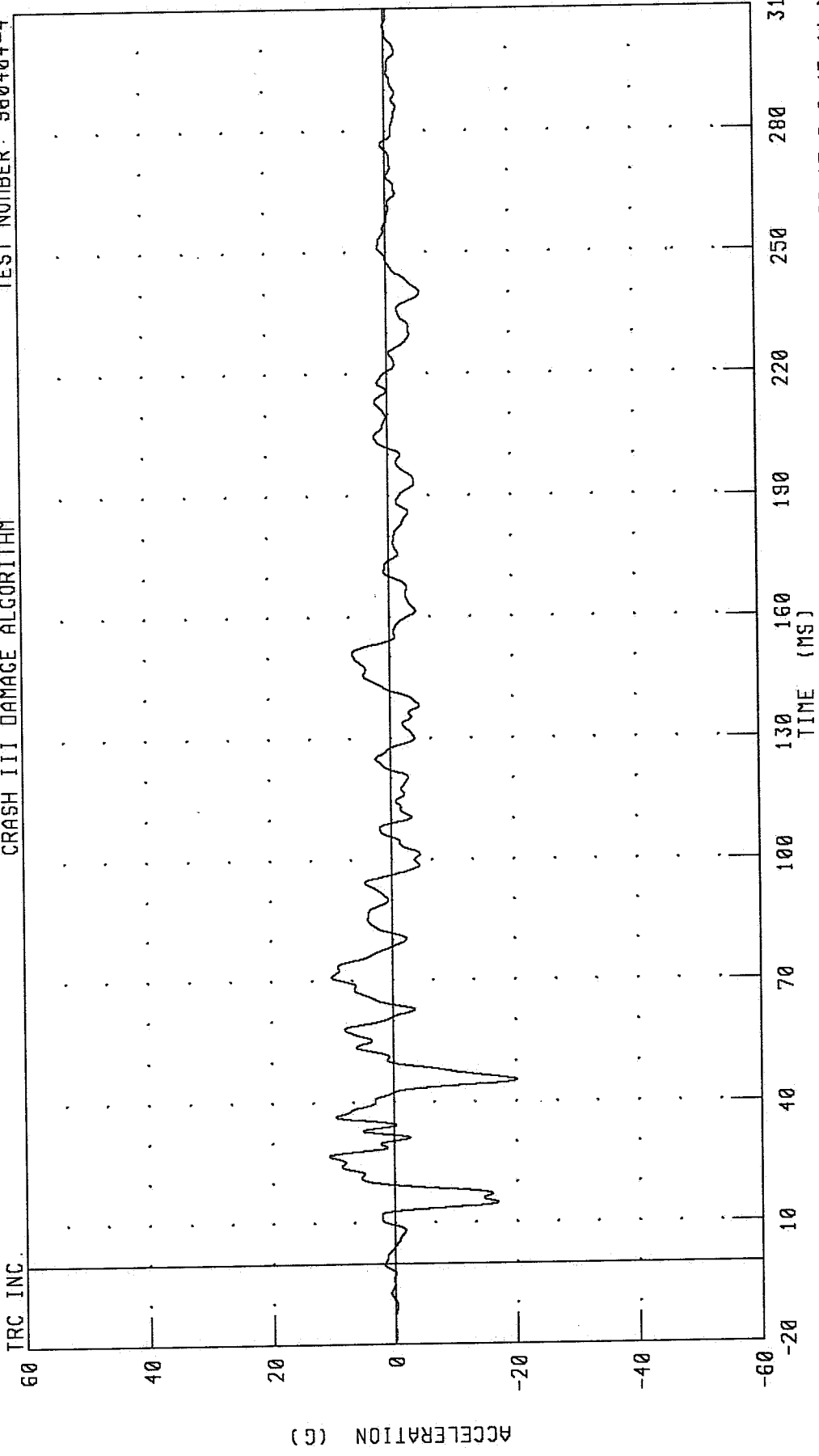
TEST NUMBER: 960404-4



CHANNEL: RRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 696.77 MM @ 77.76 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT REAR SILL Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4

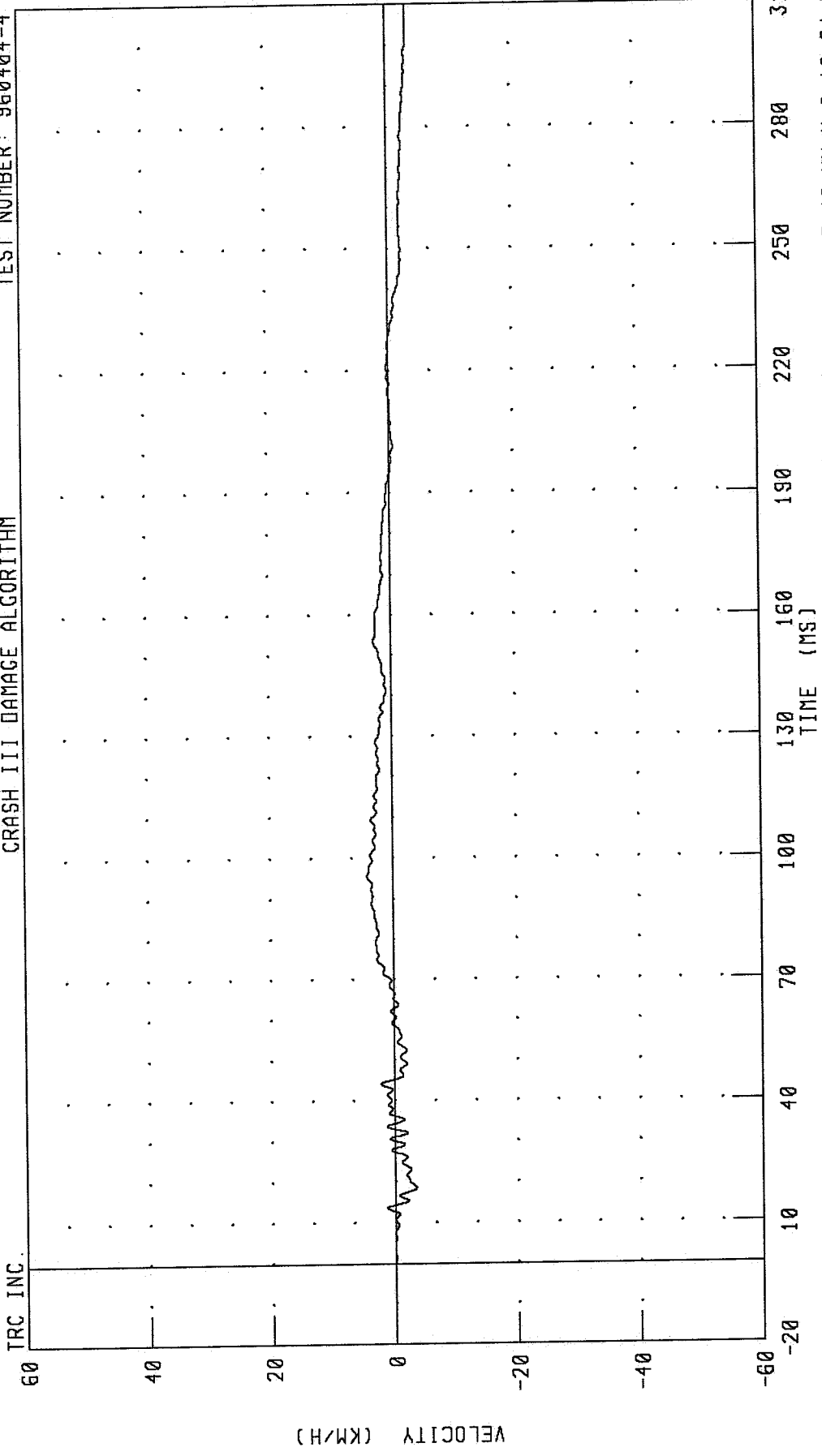


CHANNEL: RRSZG1 FILTER: CH. CLASS 60

PEAK DATA: 10.75 G @ 26.80 MS; -20.17 G @ 45.44 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT REAR SILL Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4

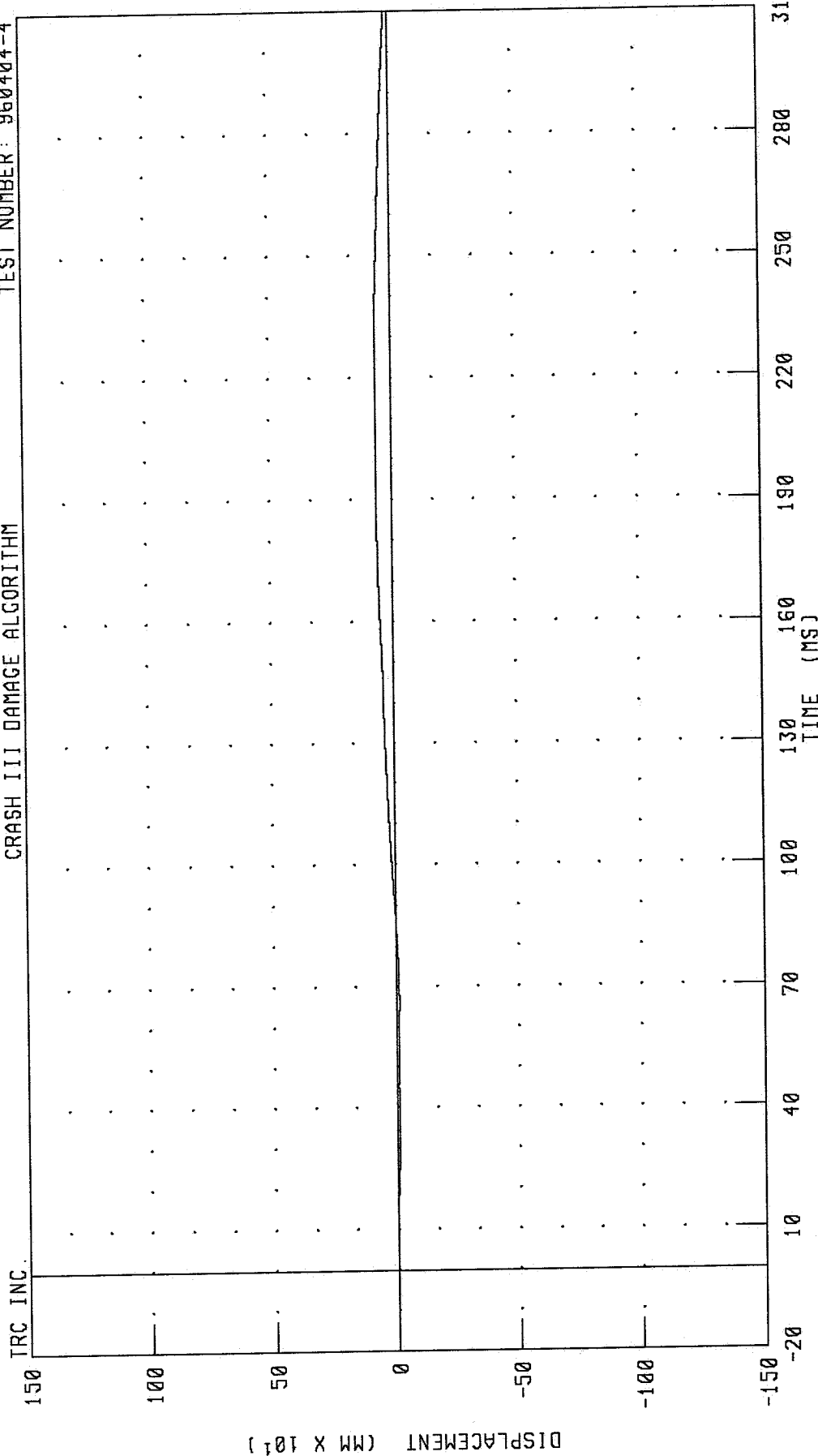


CHANNEL: RRSZV1 FILTER: CH. CLASS 180

PEAK DATA: 4.20 KM/H @ 95.60 MS; -3.46 KM/H @ 18.64 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
 RIGHT REAR SILL Z-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

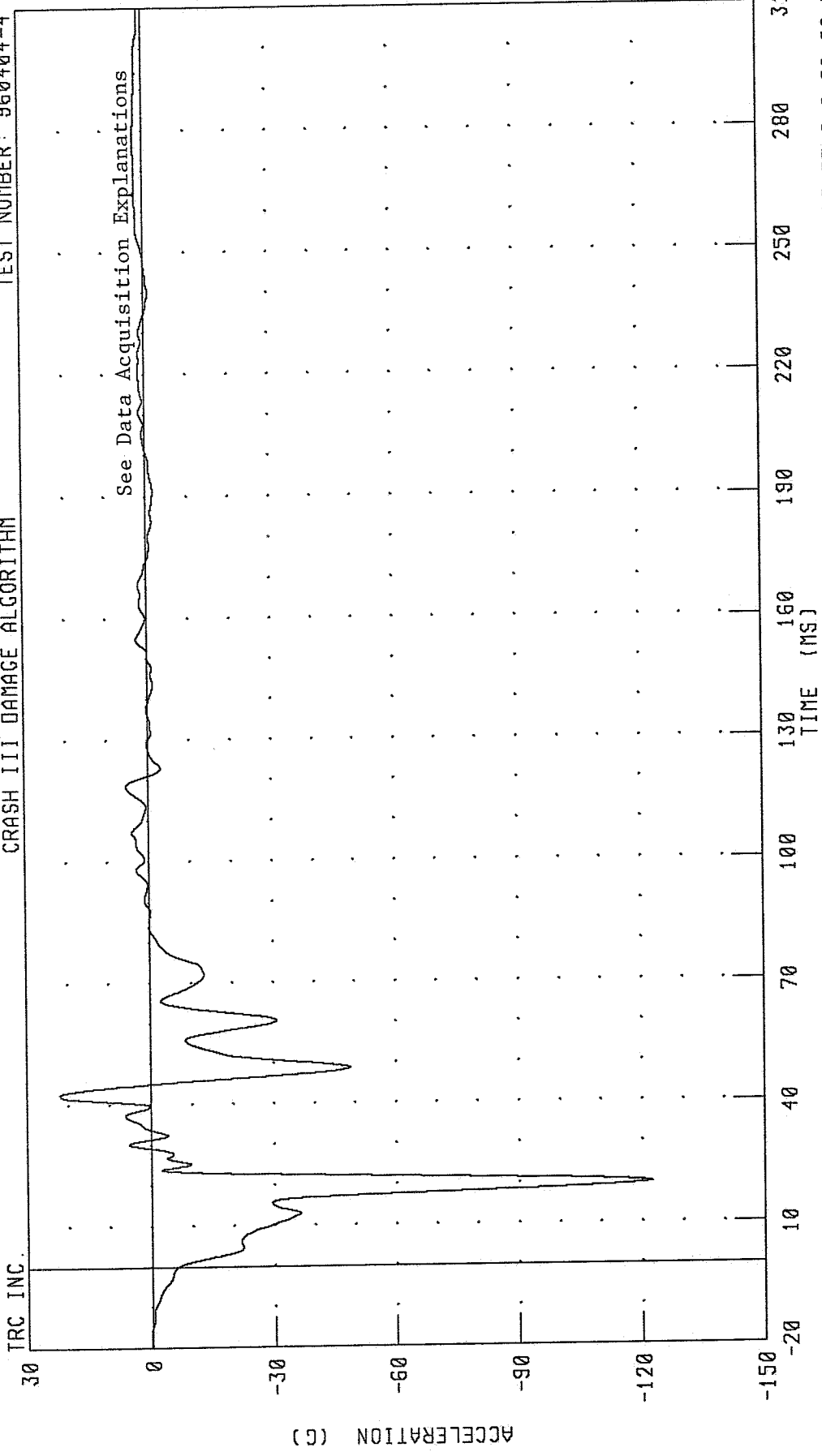
TEST NUMBER: 960404-4



CHANNEL: RRSZD1 FILTER: CH. CLASS 180 PEAK DATA: 64.90 MM @ 194.96 MS; -10.34 MM @ 67.04 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4

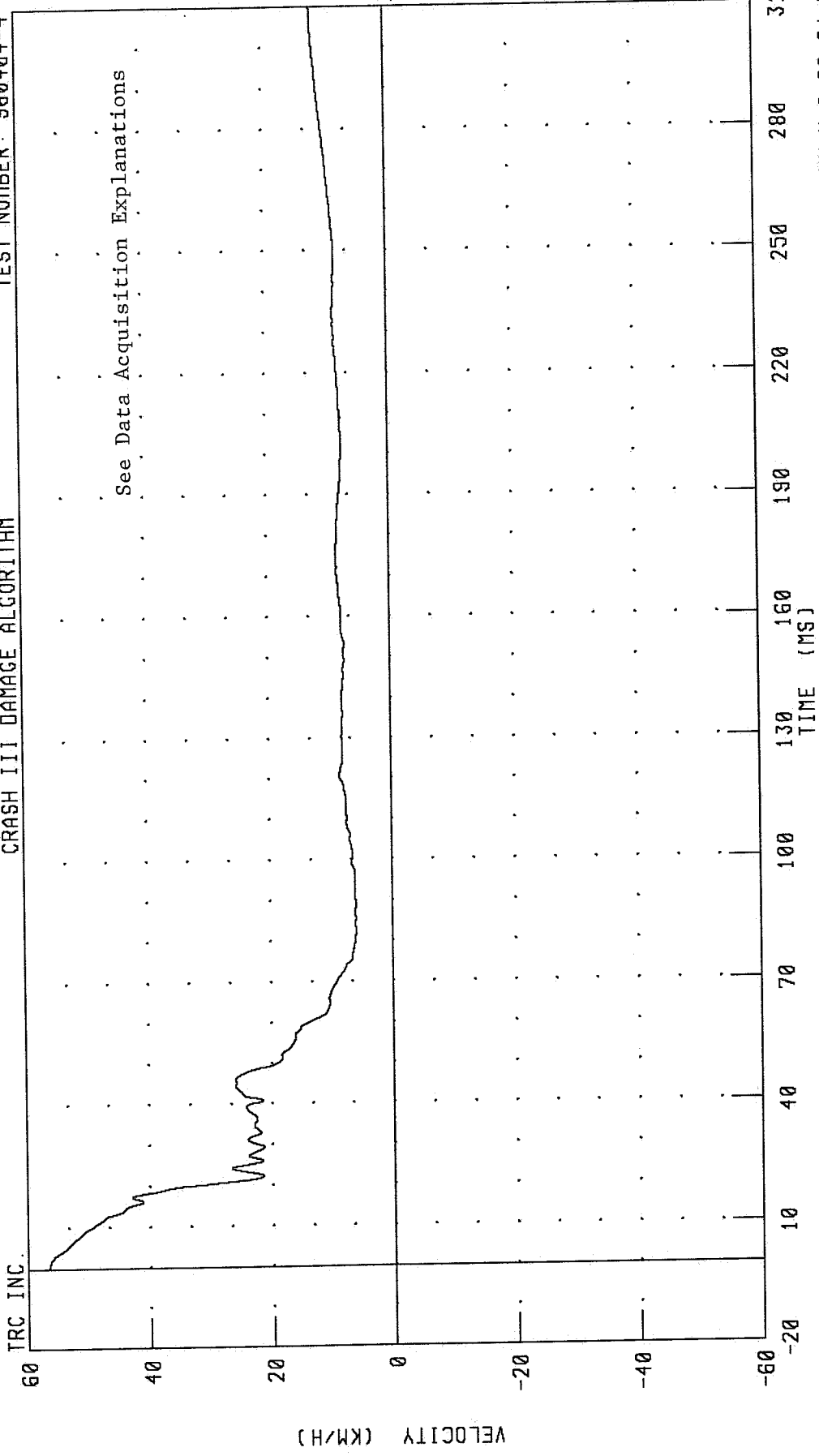


CHANNEL: LFSXG1 FILTER: CH. CLASS 60

PEAK DATA: 21.93 G @ 42.48 MS; -122.37 G @ 20.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

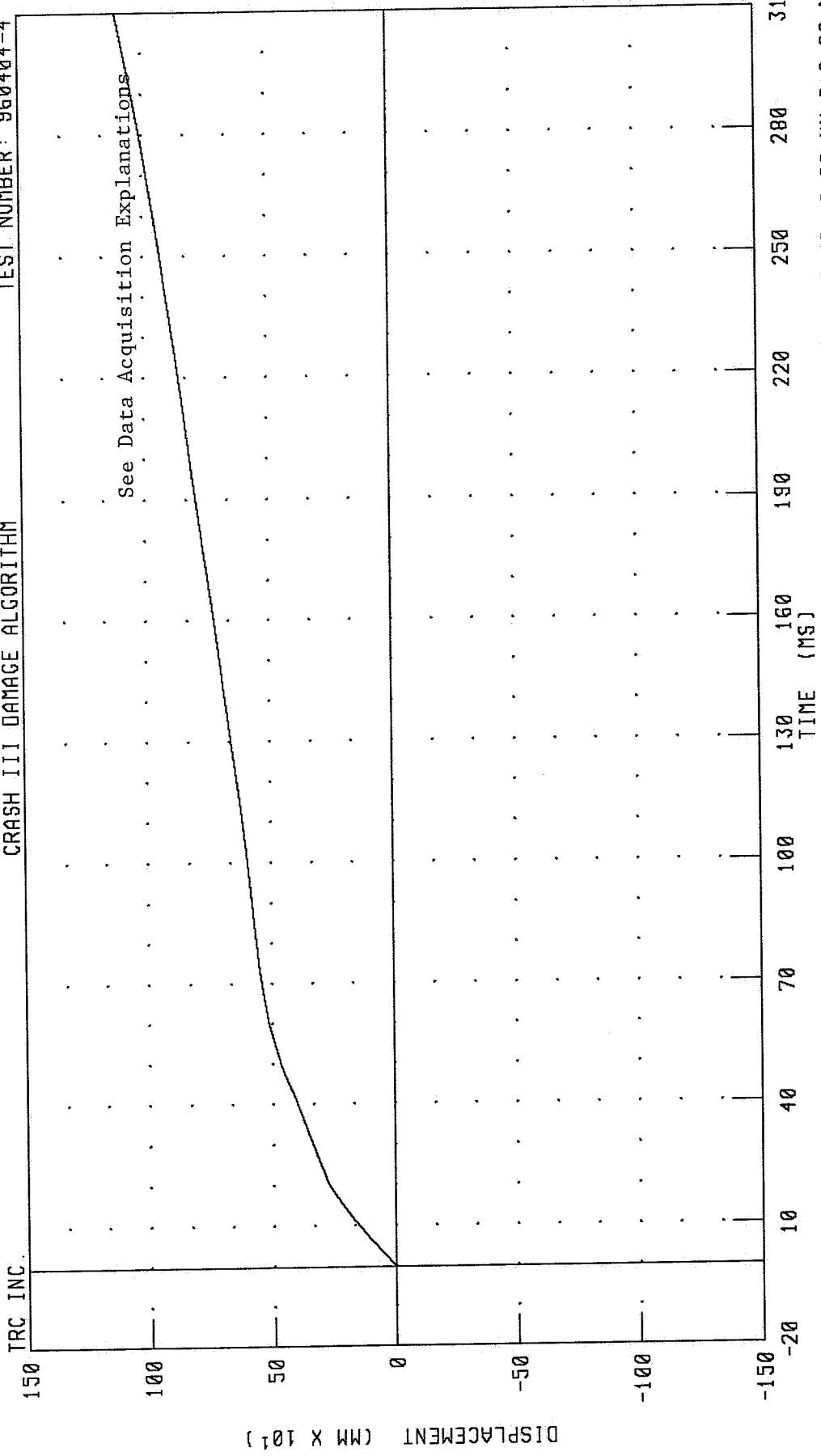
TEST NUMBER: 960404-4



CHANNEL: LFSXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.50 KM/H @ 0.00 MS; 5.89 KM/H @ 89.04 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT FRONT SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4

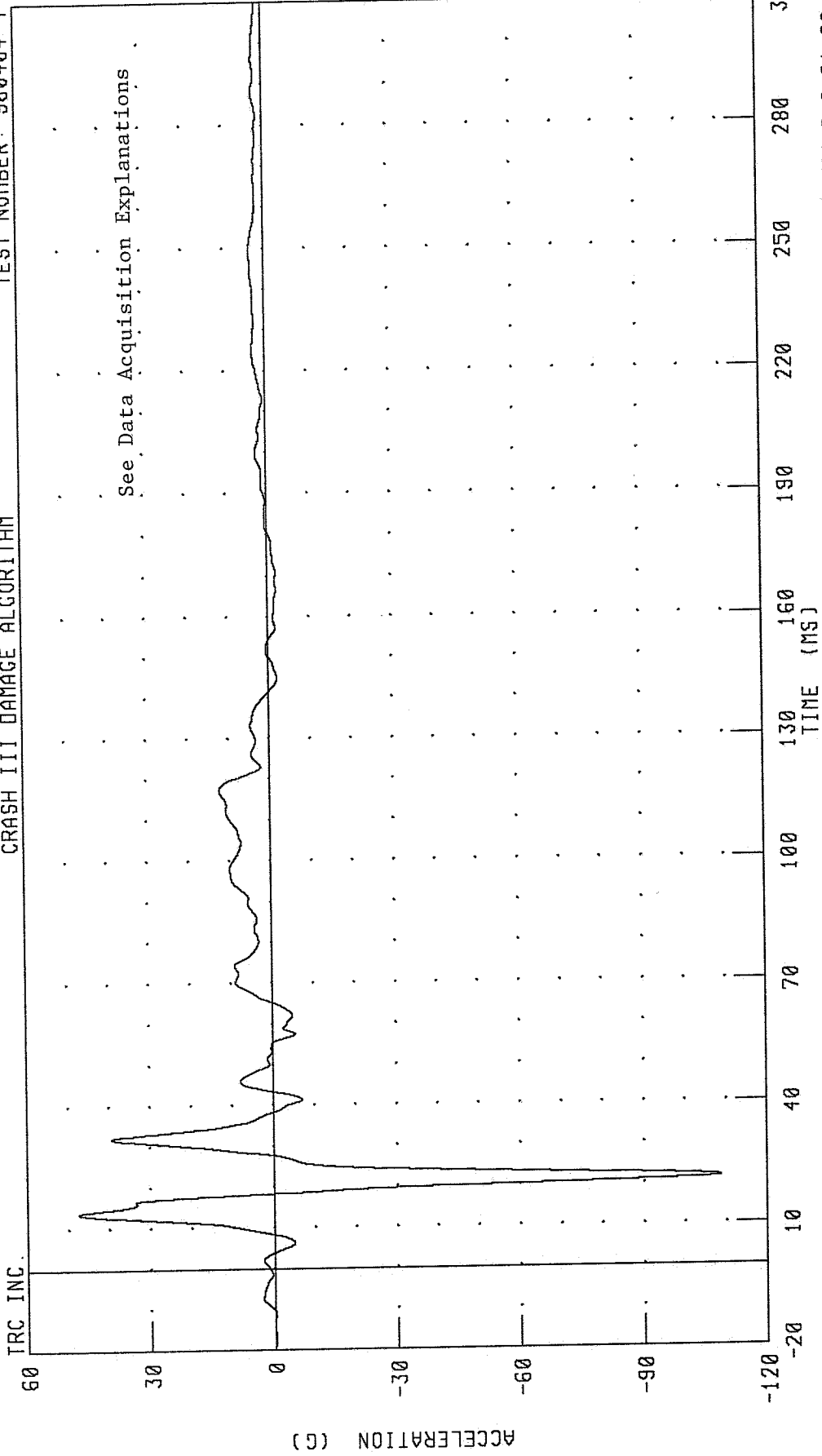


CHANNEL: LFSXD1 FILTER: CH. CLASS 180 PEAK DATA: 1104.49 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT FRONT SILL Z-AXIS ACCELERATION

TEST NUMBER: 960404-4

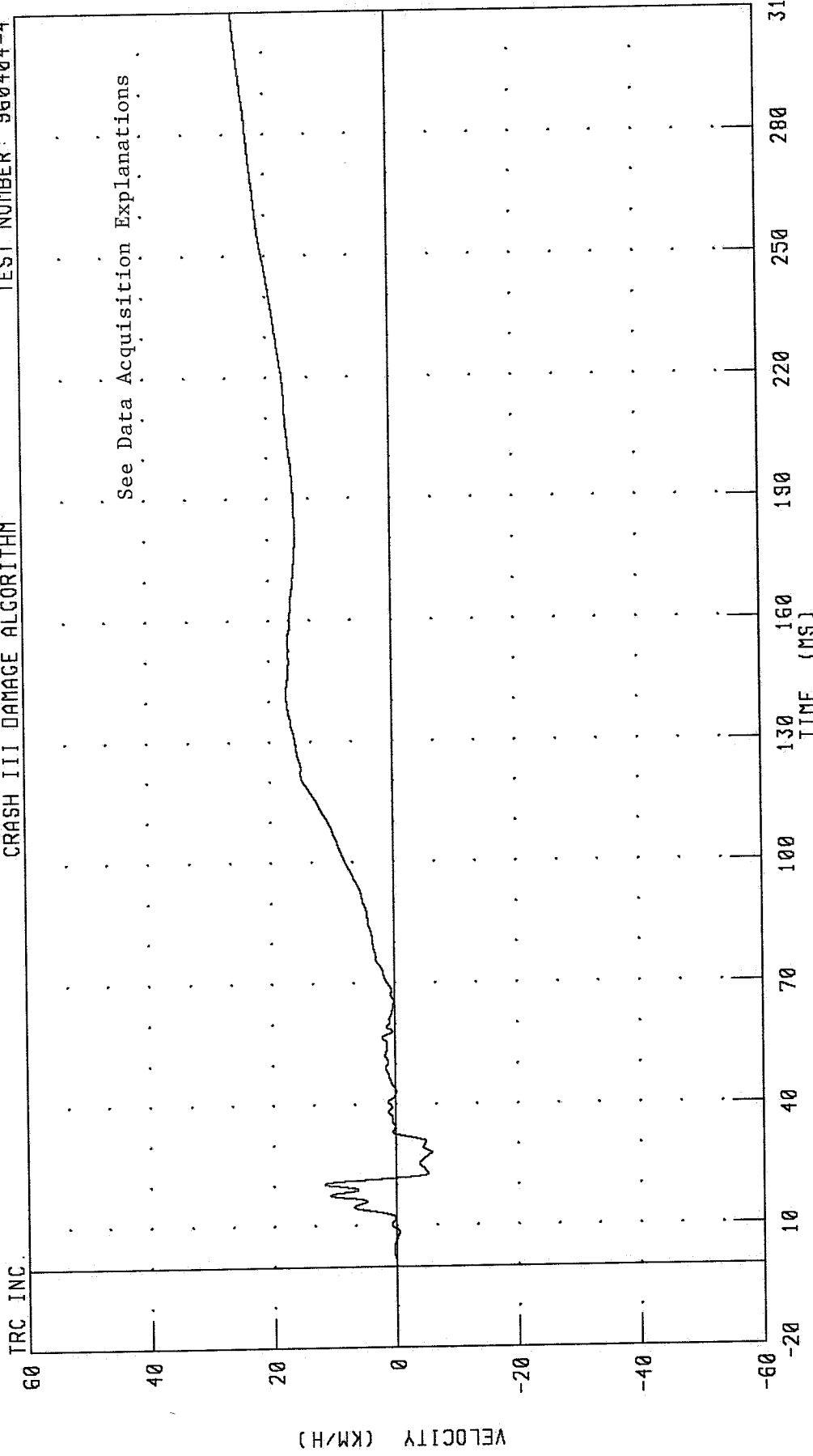
CRASH III DAMAGE ALGORITHM



CHANNEL: LFSZG1 FILTER: CH. CLASS 60 PEAK DATA: 47.53 G @ 13.60 MS; -108.84 G @ 21.68 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT FRONT SILL Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4



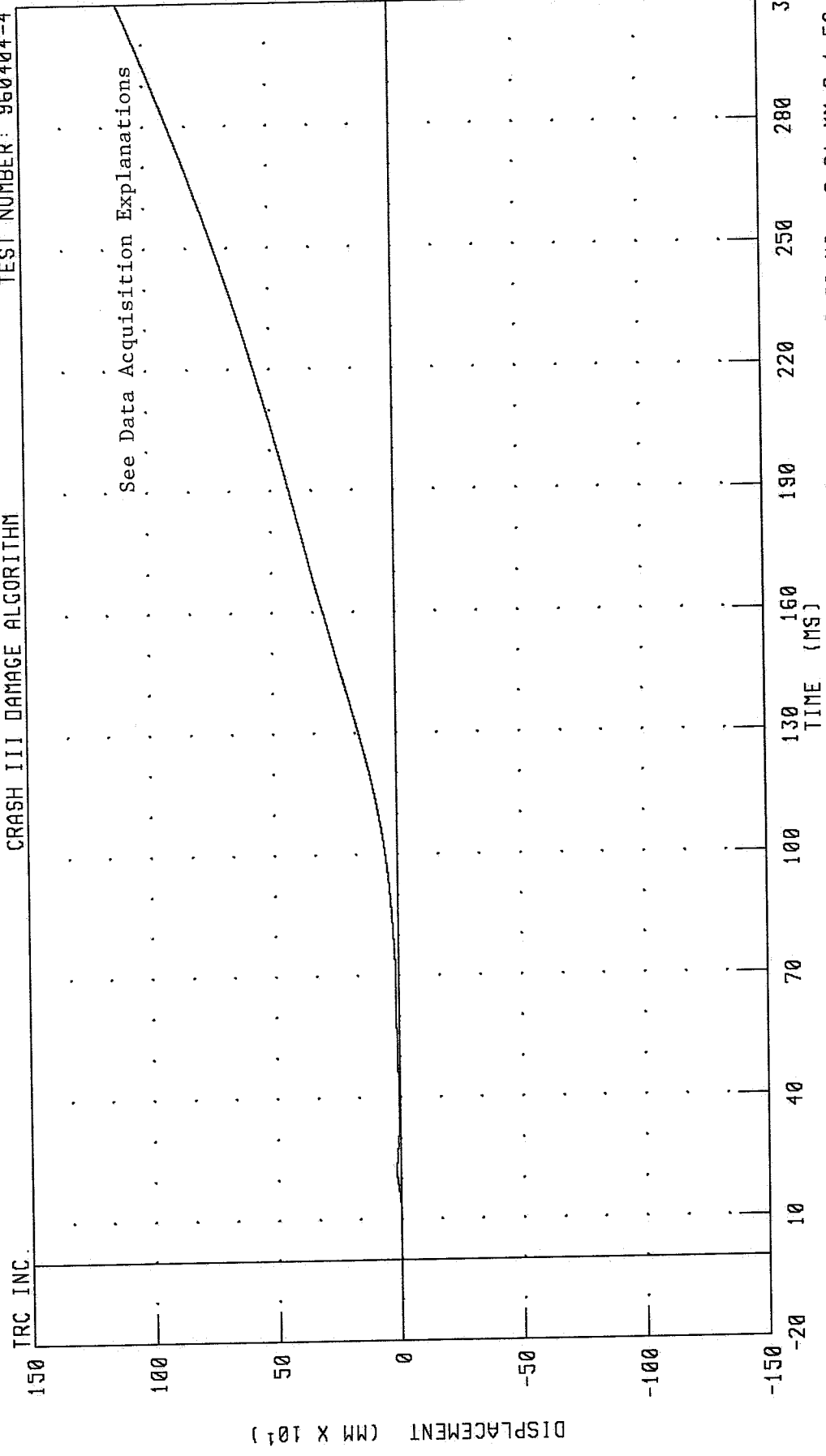
See Data Acquisition Explanations

CHANNEL: LFSZV1 FILTER: CH. CLASS 180

PEAK DATA: 25.05 KM/H @ 310.00 MS; -5.84 KM/H @ 28.16 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
LEFT FRONT SILL Z-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

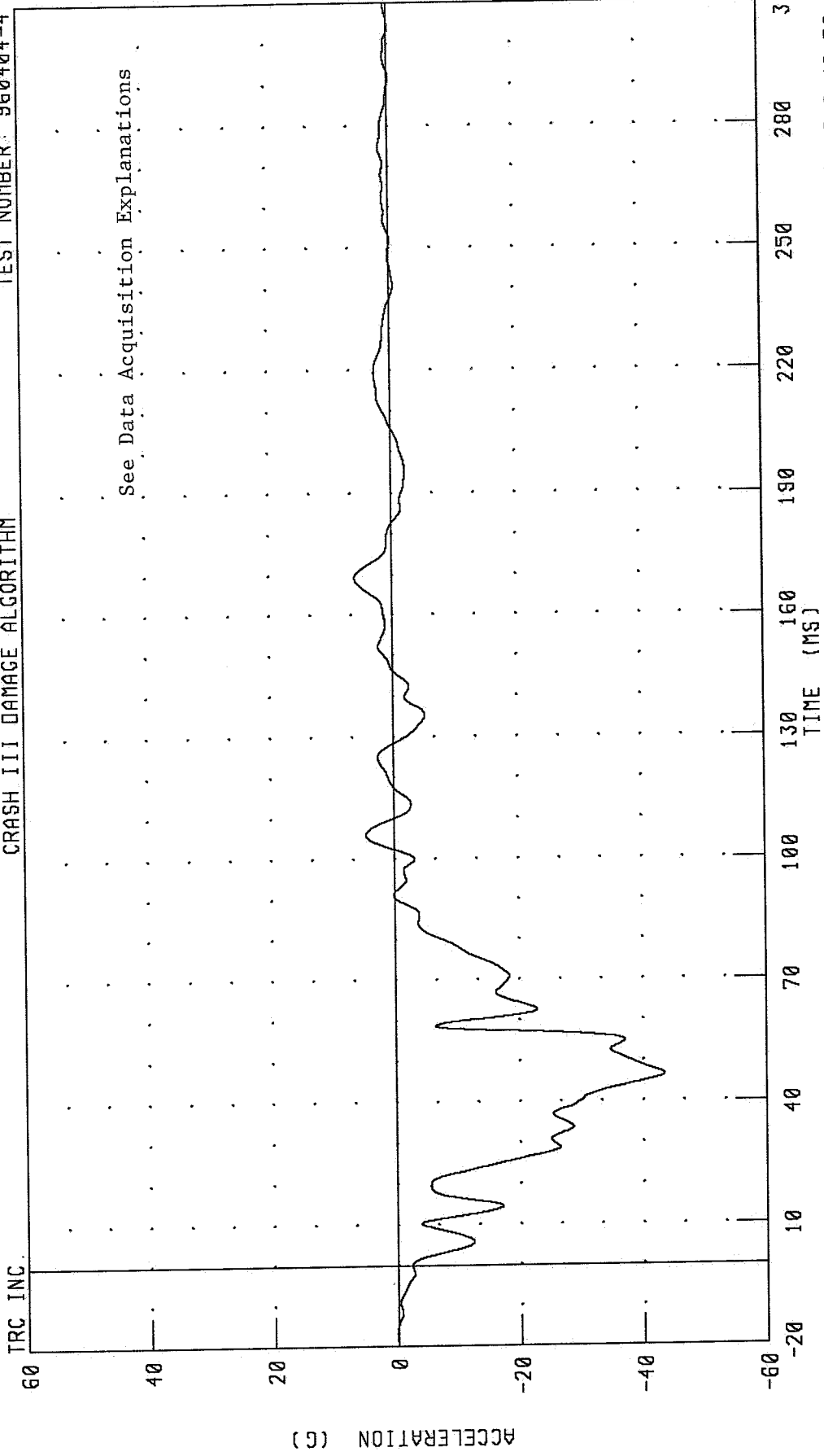
TEST NUMBER: 960404-4



CHANNEL: LFSZD1 FILTER: CH. CLASS 180 PEAK DATA: 1103.59 MM @ 310.00 MS; -0.01 MM @ 1.52 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT FRONT SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4

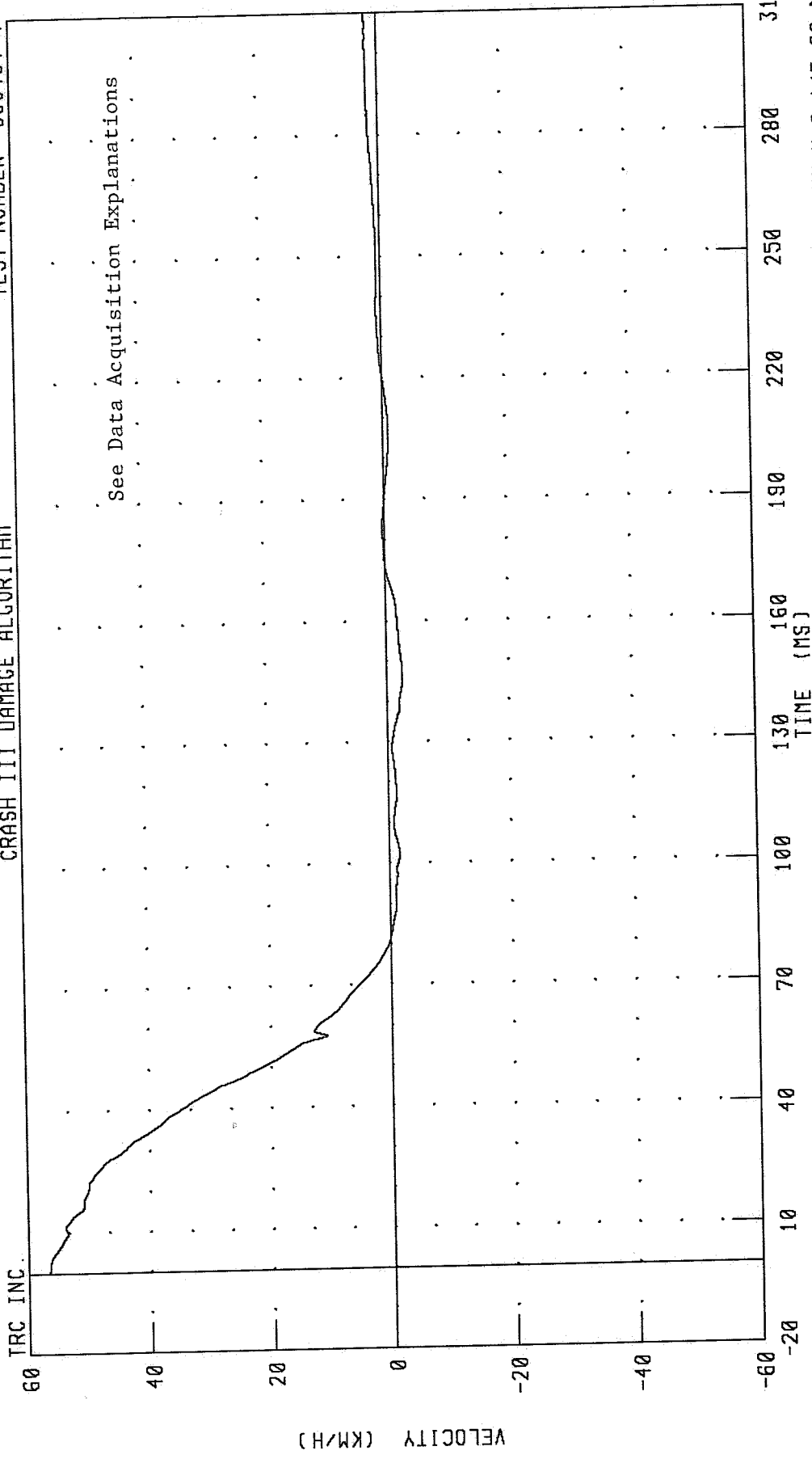


TRC INC.

CHANNEL: RFSXG1 FILTER: CH. CLASS 60 PEAK DATA: 6.06 G @ 169.28 MS; -43.52 G @ 46.56 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT FRONT SILL X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

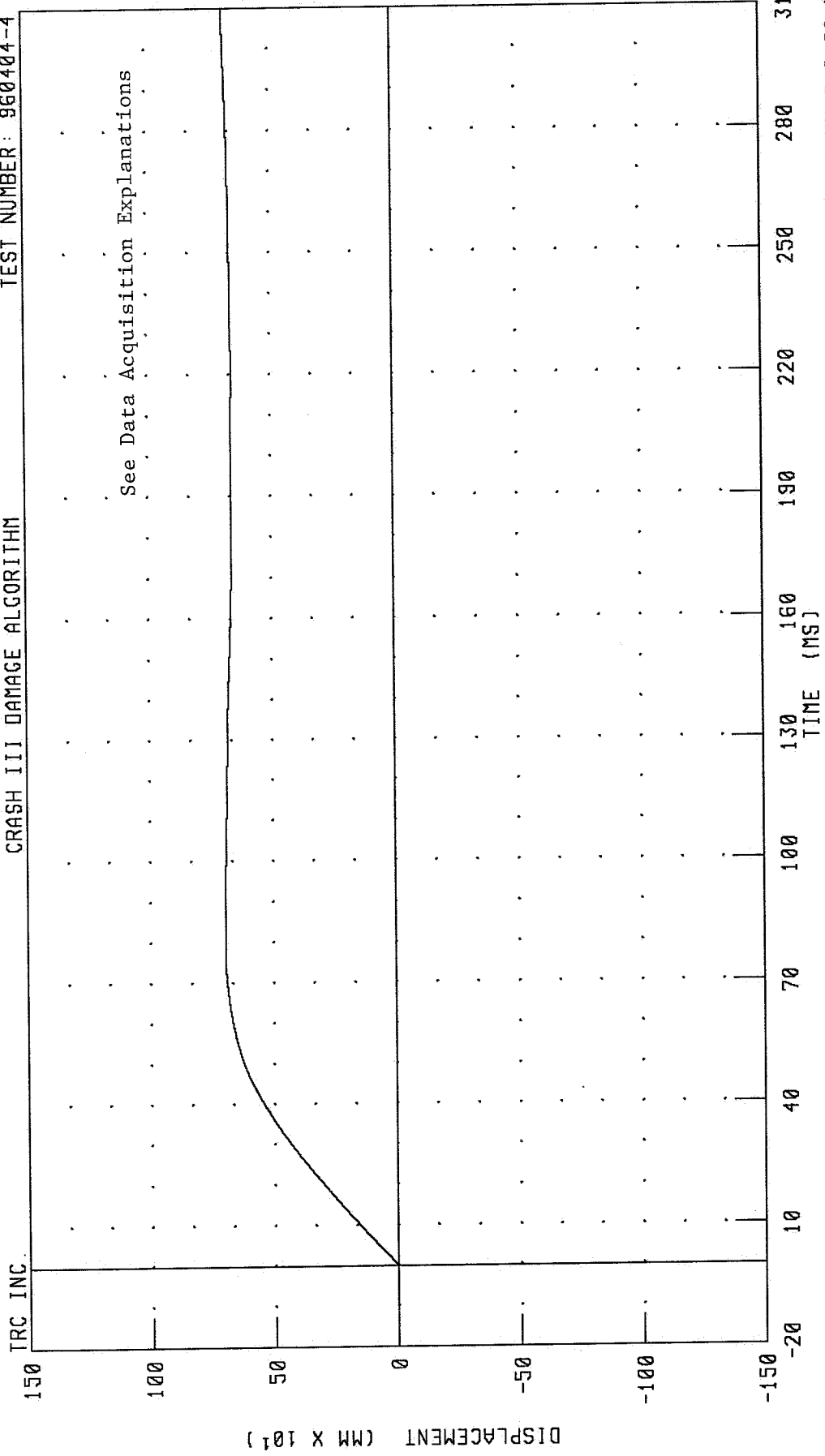
TEST NUMBER: 960404-4



CHANNEL: RFSXV1 FILTER: CH. CLASS 180
PEAK DATA: 56.50 KM/H @ 0.00 MS; -2.52 KM/H @ 145.60 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
 RIGHT FRONT SILL X-AXIS DISPLACEMENT
 CRASH III DAMAGE ALGORITHM

TEST NUMBER: 960404-4



CHANNEL: RFSXD1 FILTER: CH. CLASS 180 PEAK DATA: 696.45 MM @ 81.60 MS; 0.00 MM @ 0.00 MS

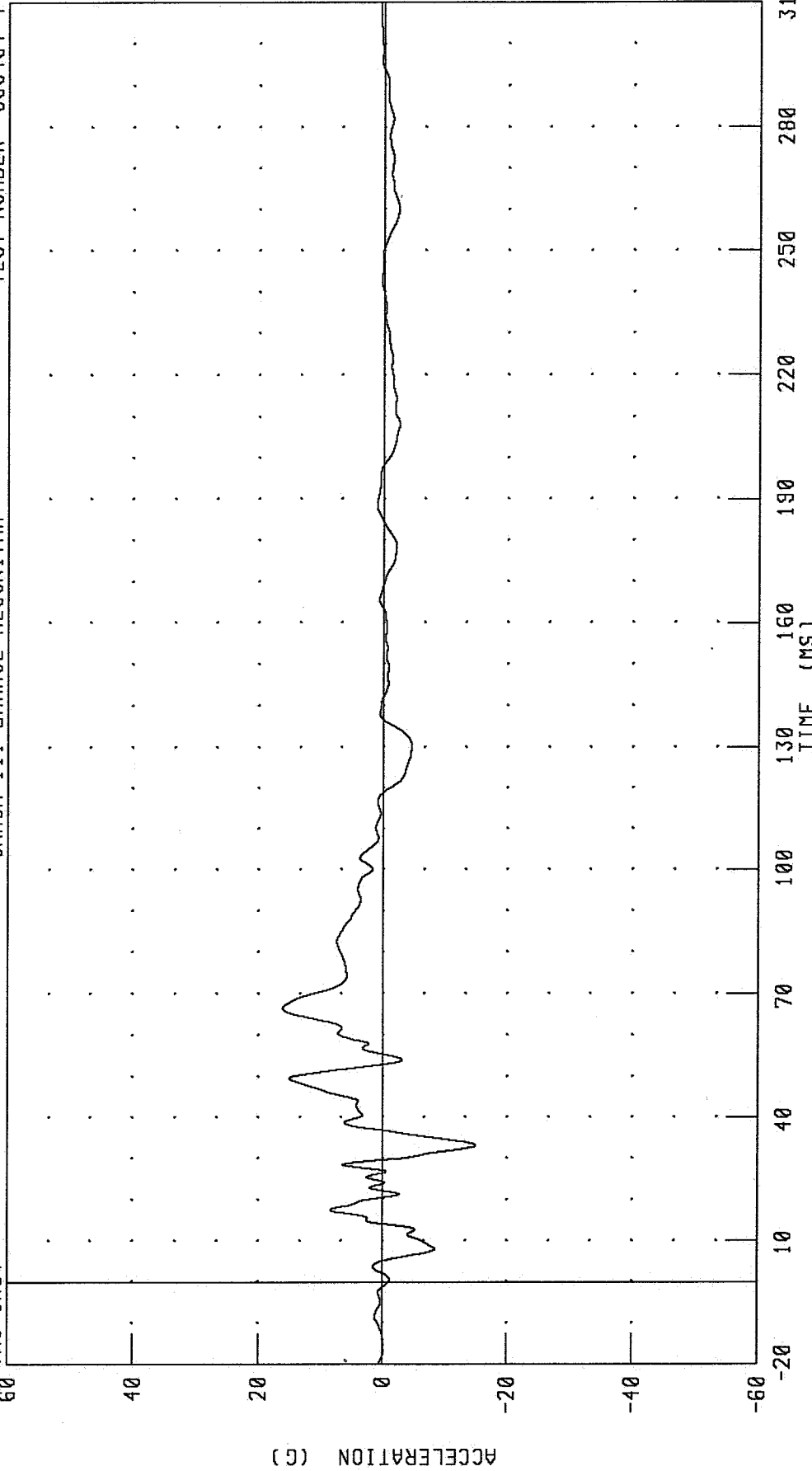
1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

RIGHT FRONT SILL Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-4



CHANNEL: RFSZG1 FILTER: CH. CLASS 60

PEAK DATA: 16.18 G @ 66.48 MS; -14.93 G @ 33.12 MS

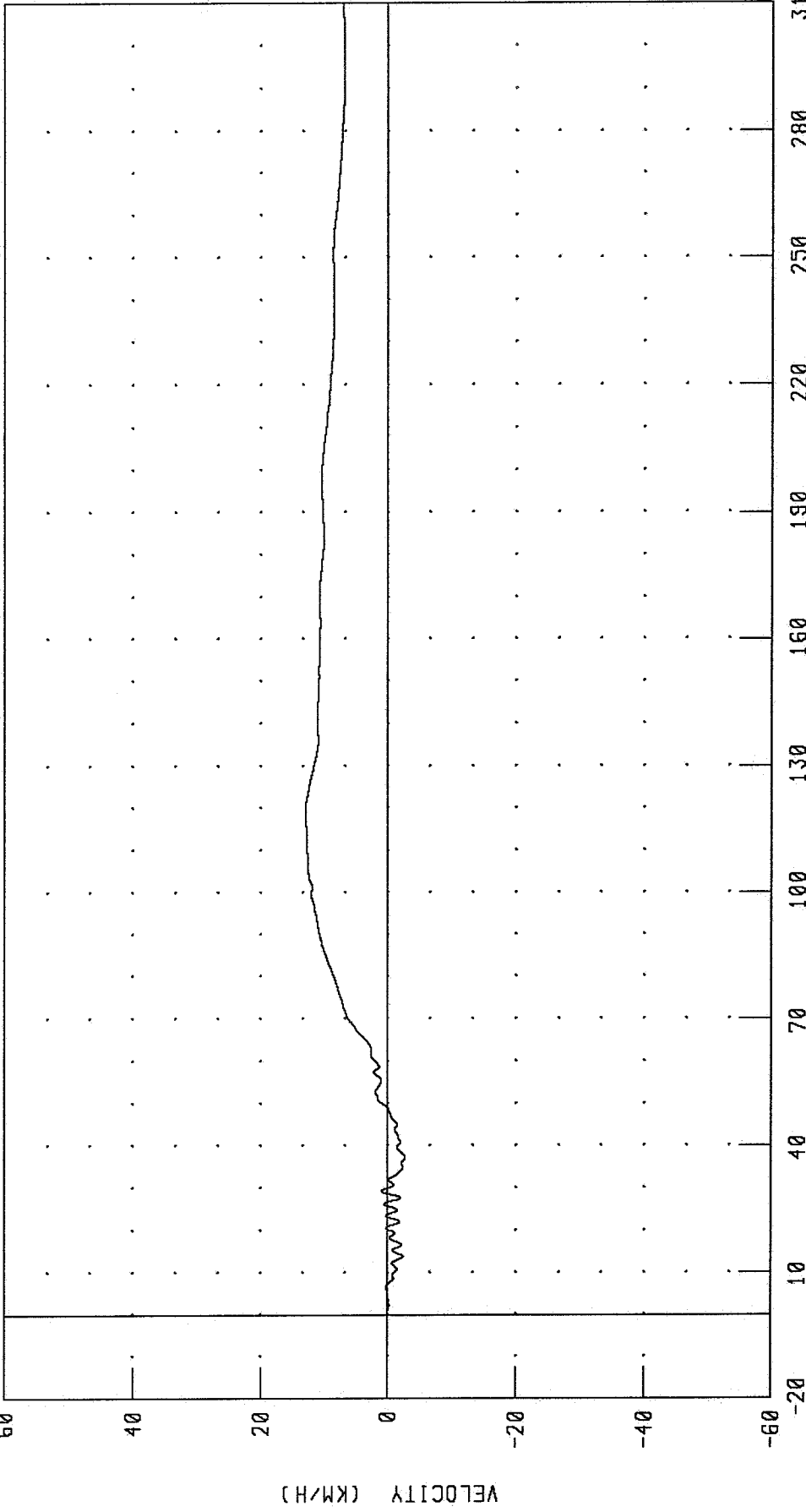
1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

RIGHT FRONT SILL Z-AXIS VELOCITY

TRC INC.

CRASH III DAMAGE ALGORITHM

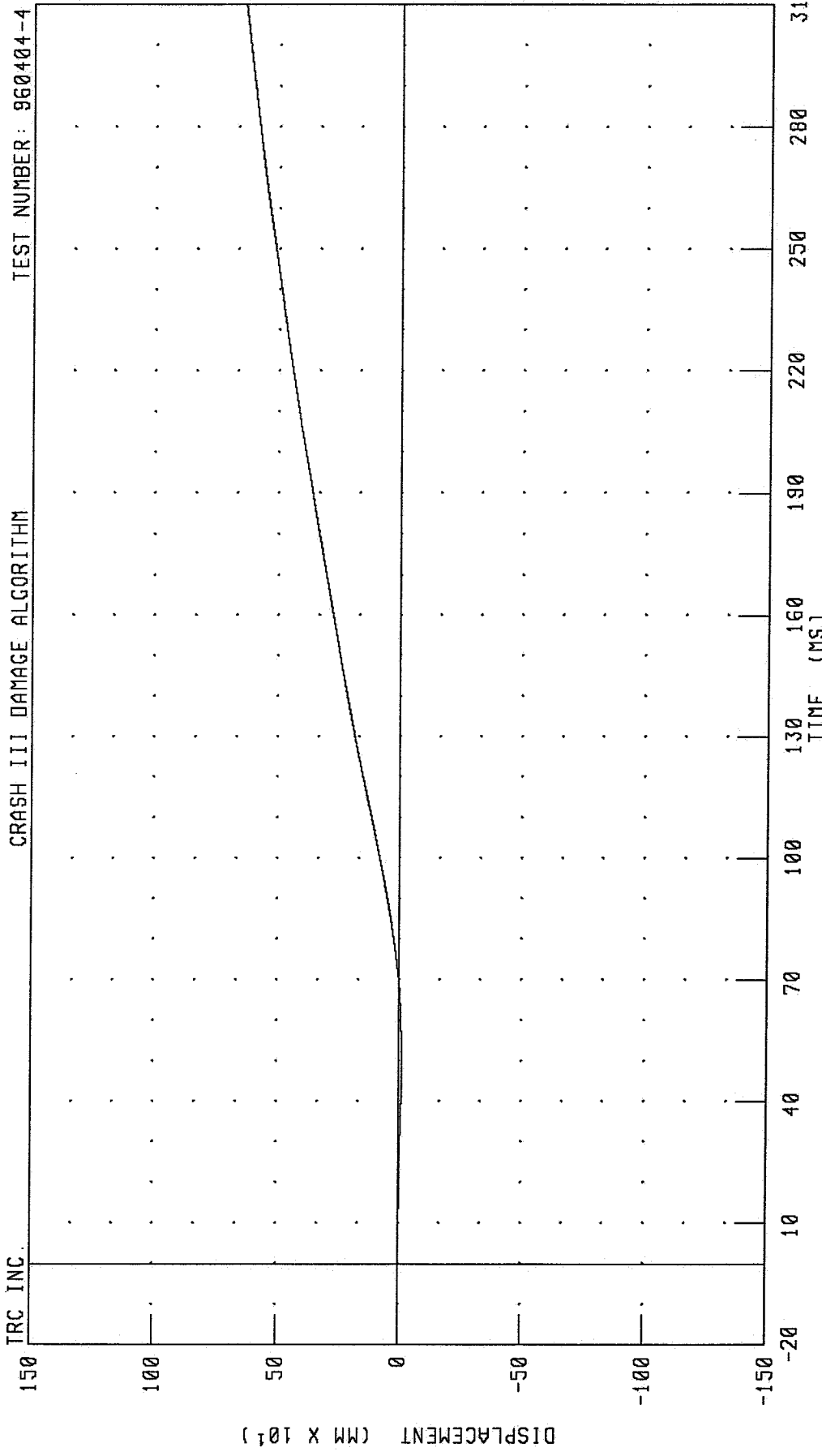
TEST NUMBER: 960404-4



CHANNEL: RFSZY1 FILTER: CH. CLASS 180

PEAK DATA: 12.91 KM/H @ 119.52 MS; -2.77 KM/H @ 37.20 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
RIGHT FRONT SILL Z-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM



CHANNEL: RFSZD1 FILTER: CH. CLASS 180

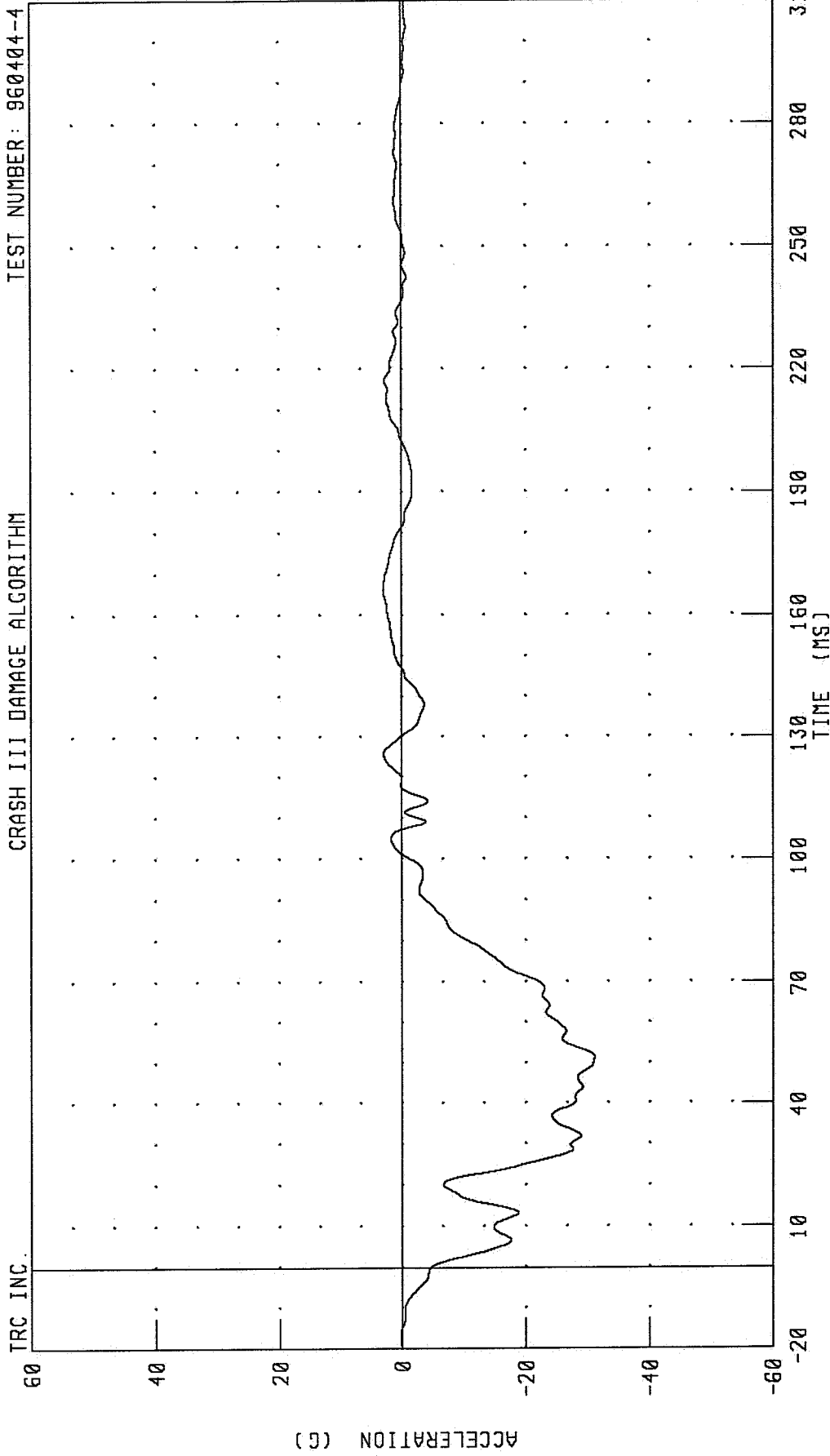
PEAK DATA: 638.30 MM @ 310.00 MS; -13.35 MM @ 49.12 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

VEHICLE CG X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

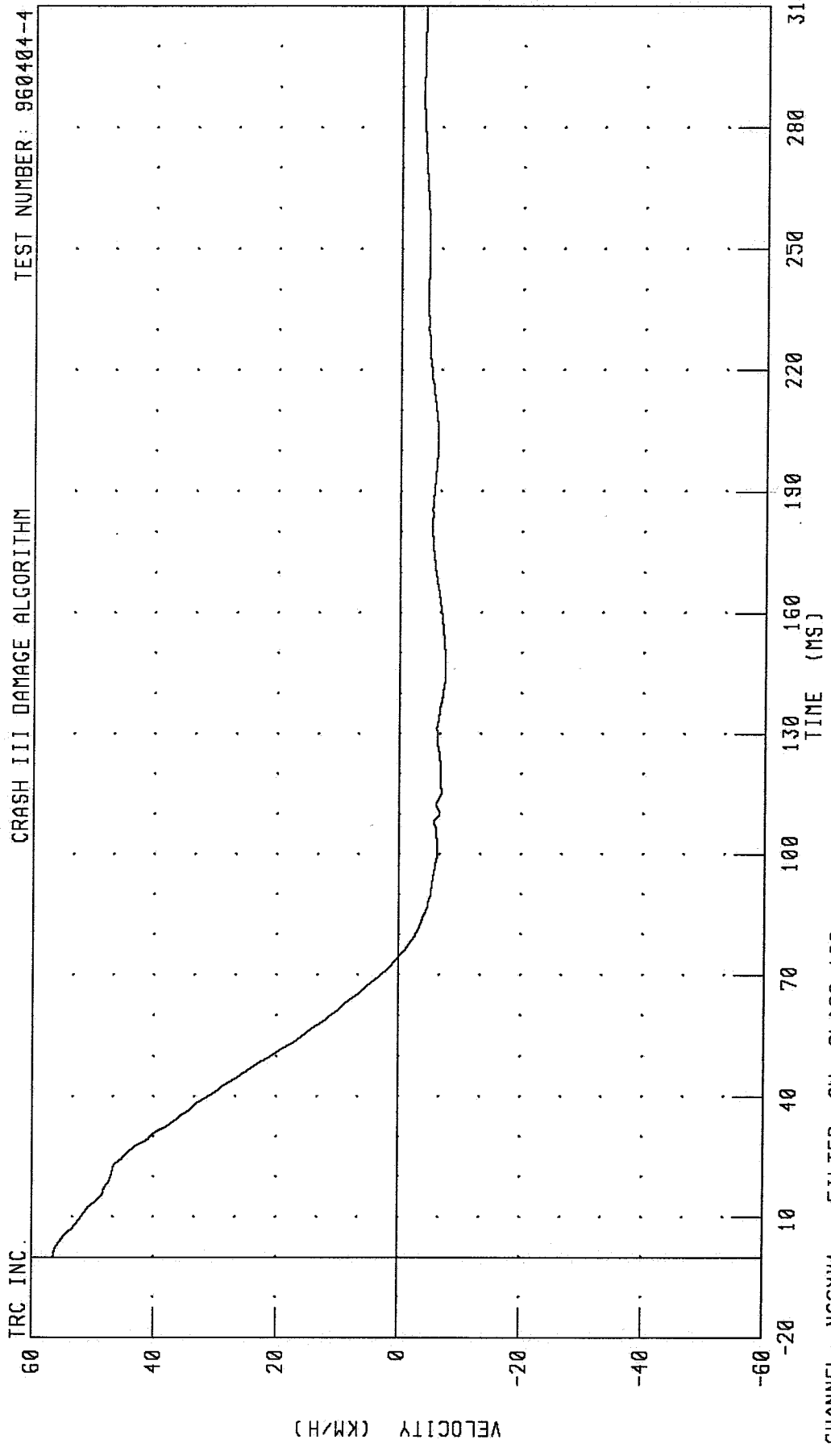
TEST NUMBER: 960404-4



CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.92 G @ 165.92 MS; -31.10 G @ 51.20 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
VEHICLE CG X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM



CHANNEL: VCGXV1 FILTER: CH. CLASS 180 PEAK DATA: 56.50 KM/H @ 0.00 MS; -7.51 KM/H @ 147.36 MS

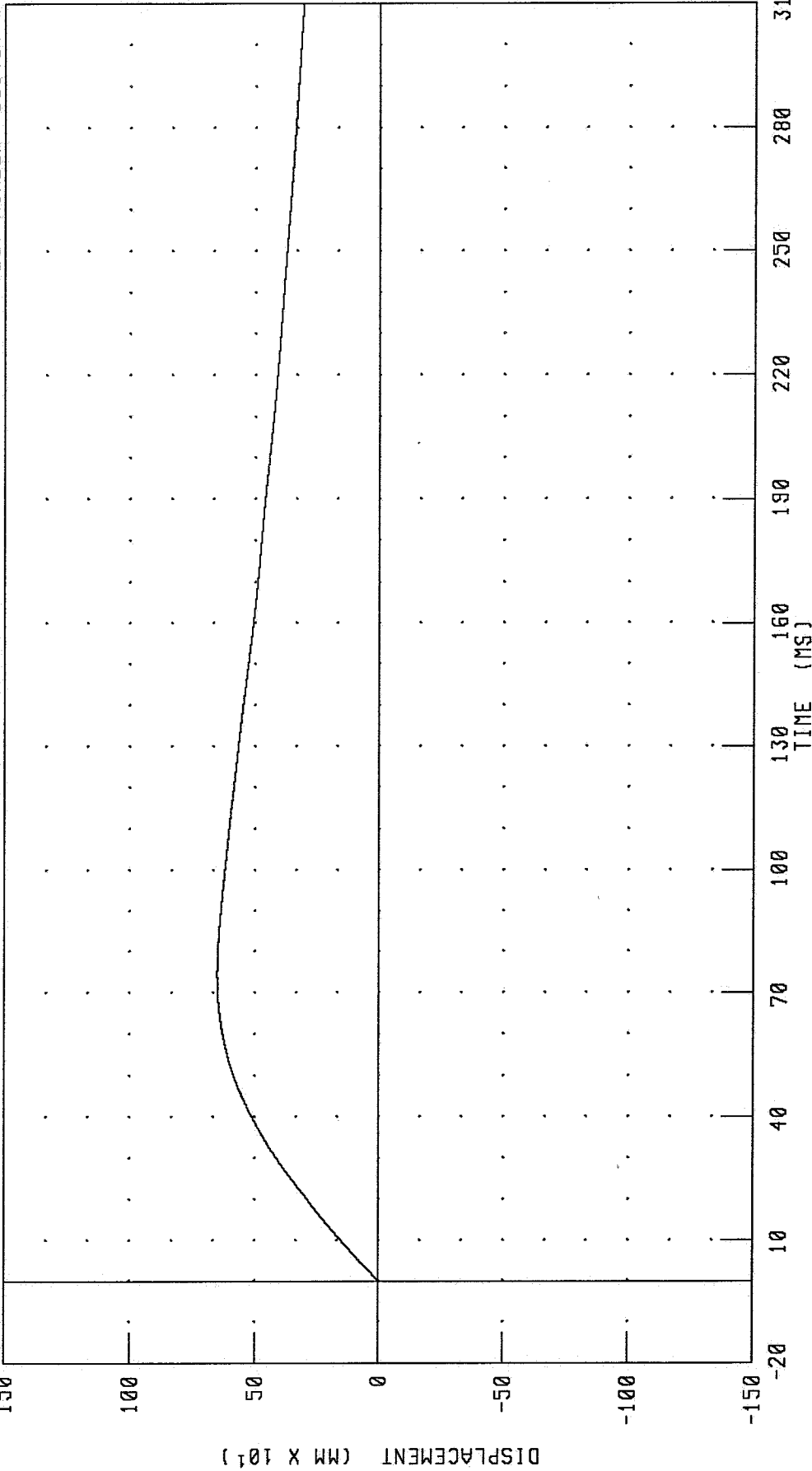
1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

VEHICLE CG X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-4

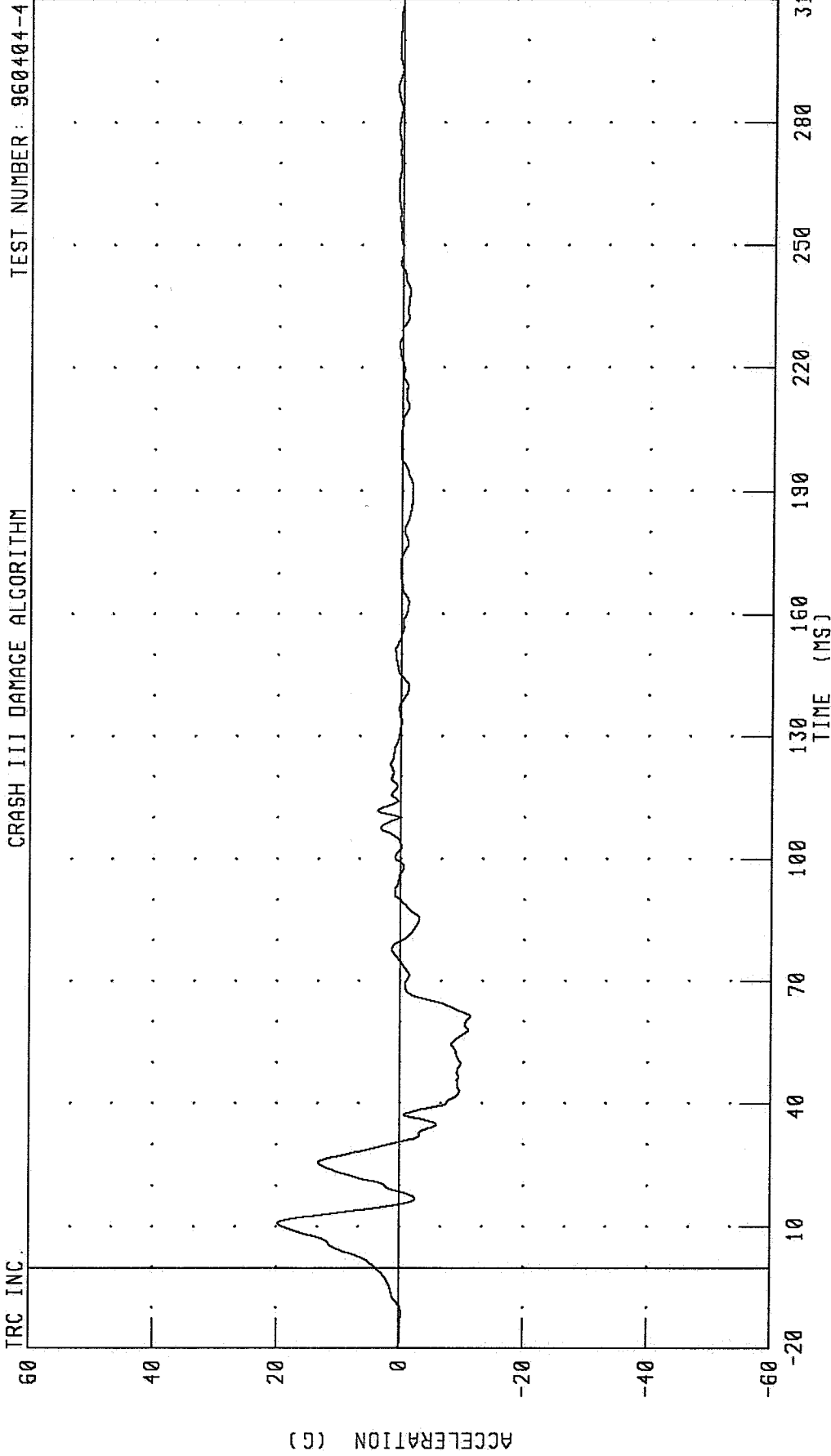


CHANNEL: VCGXD1 FILTER: CH. CLASS 180

TIME (MS)

PEAK DATA: 650.15 MM @ 74.56 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
VEHICLE CG Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 19.81 G @ 10.88 MS; -11.31 G @ 61.28 MS

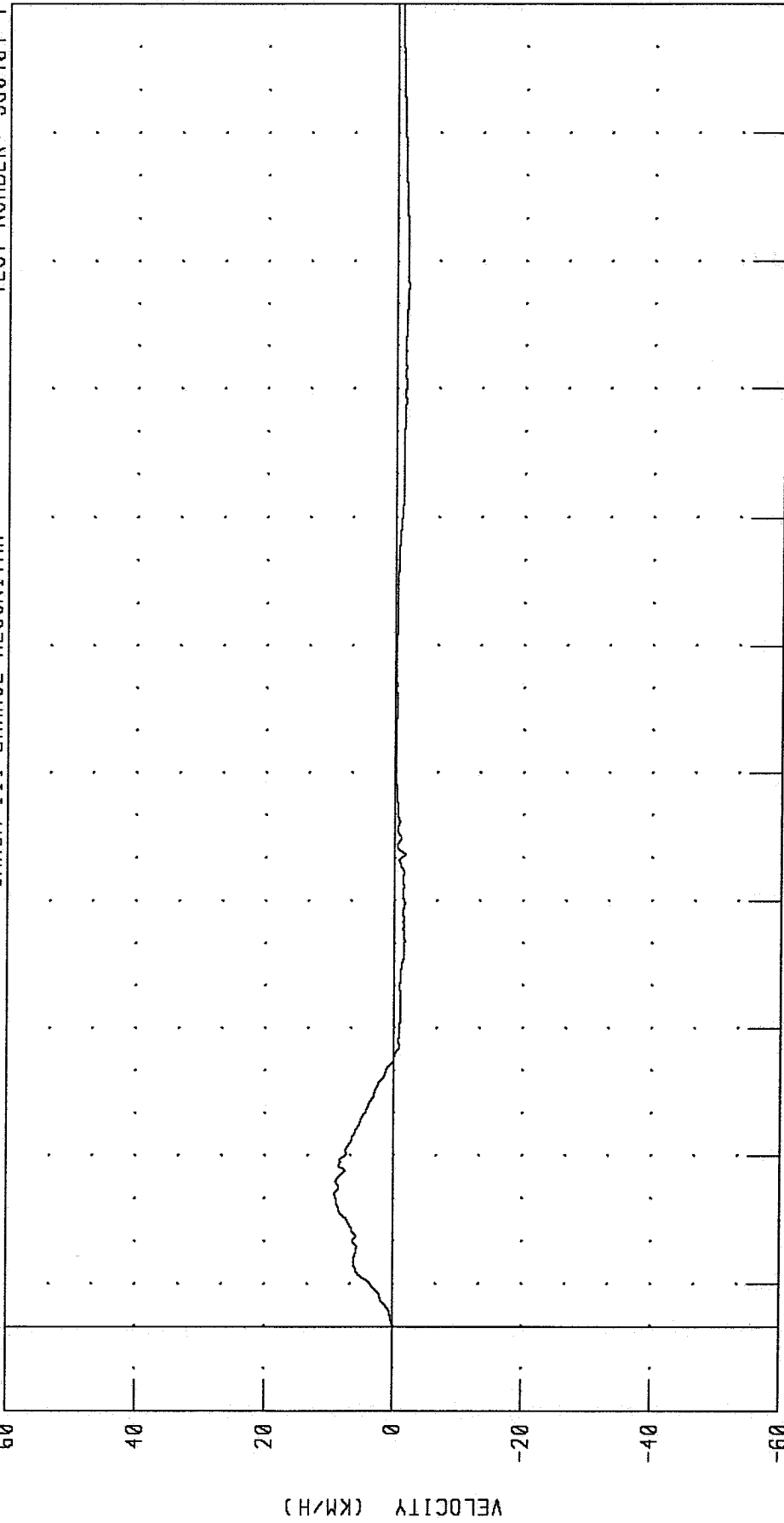
1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

VEHICLE CG Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-4



60
40
20
0
-20
-40
-60
-20 10 40 70 100 130 160 190 220 250 280 310
TIME (MS)

CHANNEL: VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 9.11 KM/H @ 31.12 MS; -1.84 KM/H @ 244.32 MS

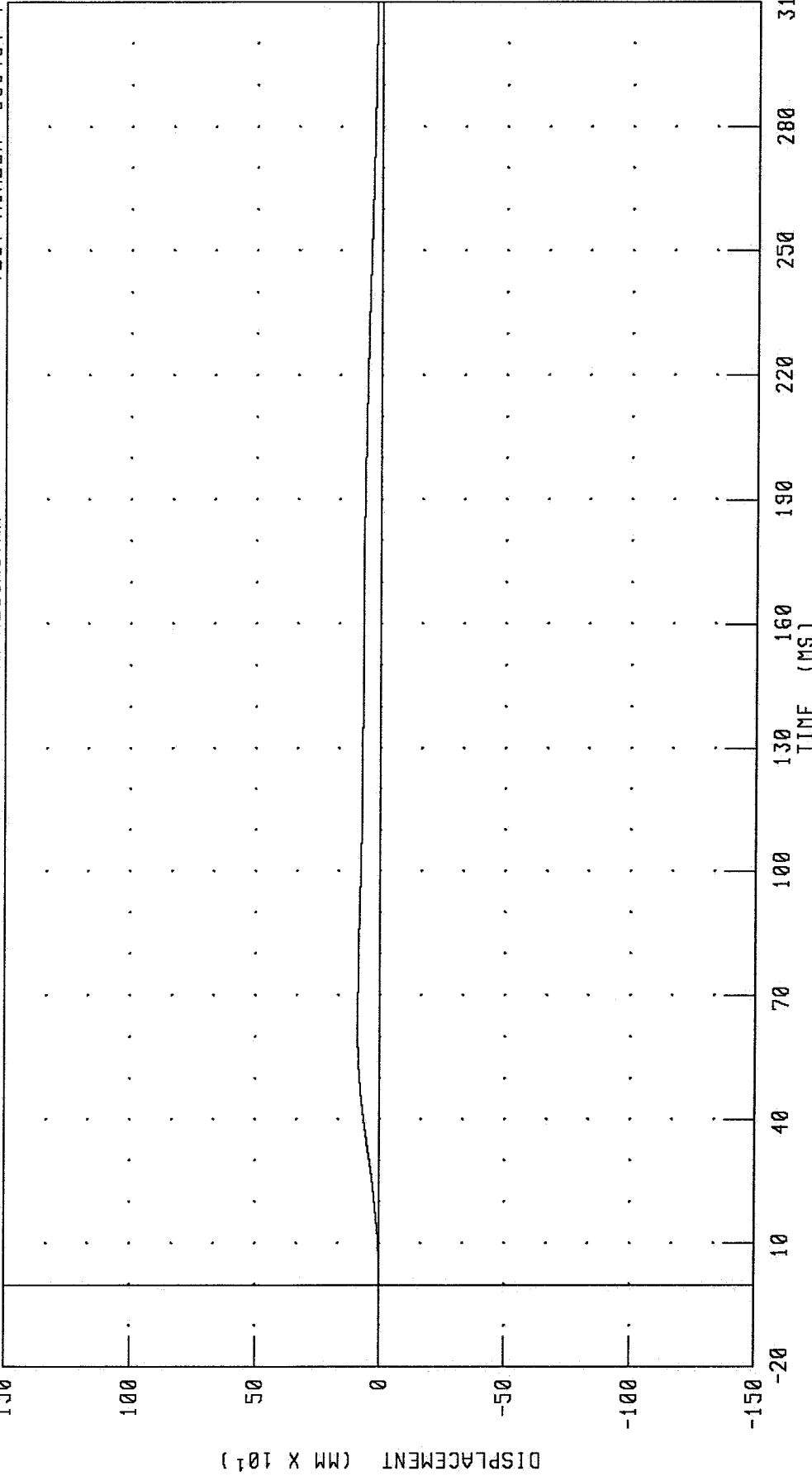
1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

VEHICLE CG Y-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-4

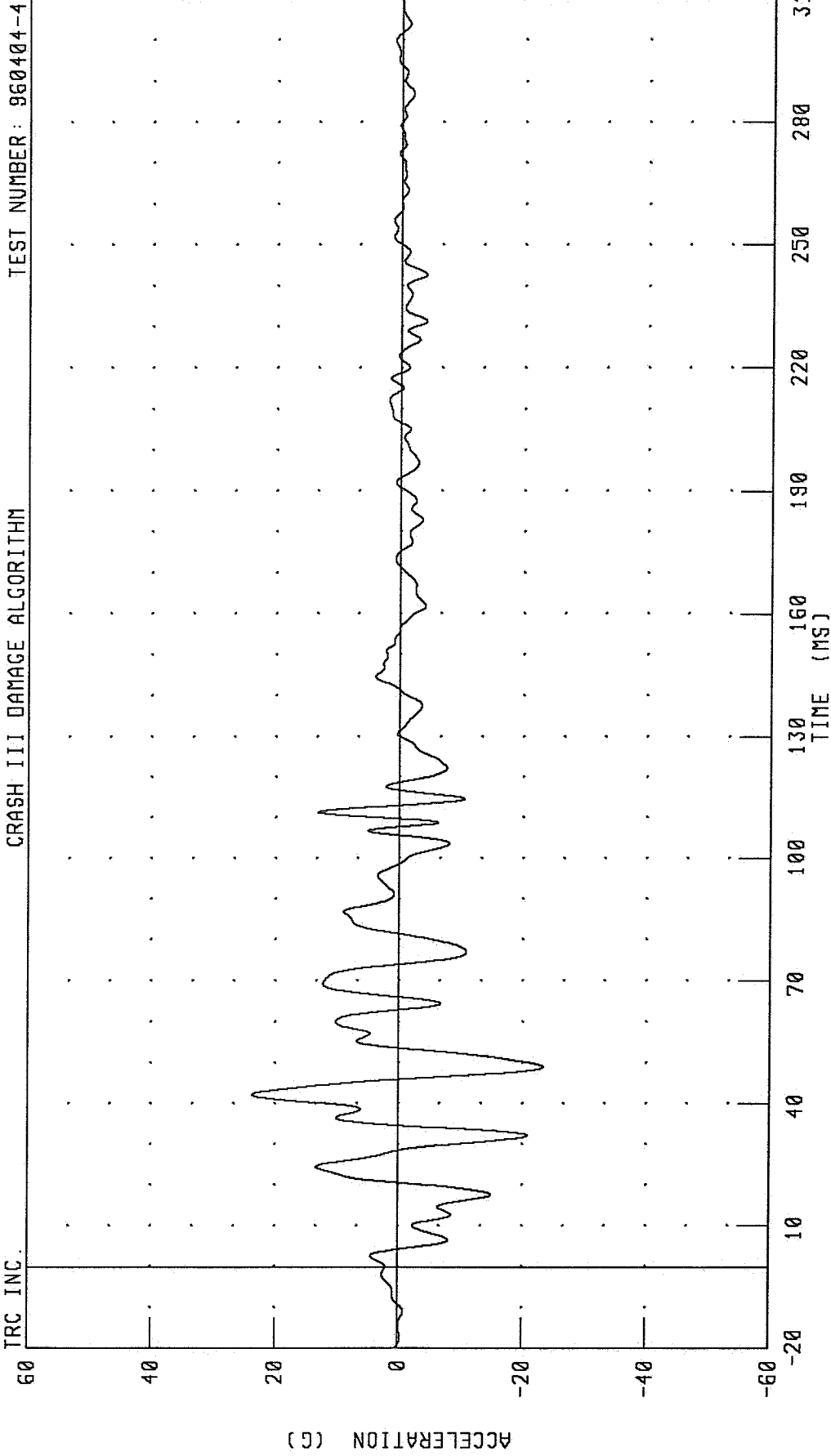


CHANNEL: VCGYD1 FILTER: CH. CLASS 180

TIME (MS)

PEAK DATA: 88.57 MM @ 62.72 MS; 0.00 MM @ 0.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
VEHICLE CG Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



CHANNEL: YCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 23.68 G @ 42.24 MS; -23.42 G @ 48.96 MS

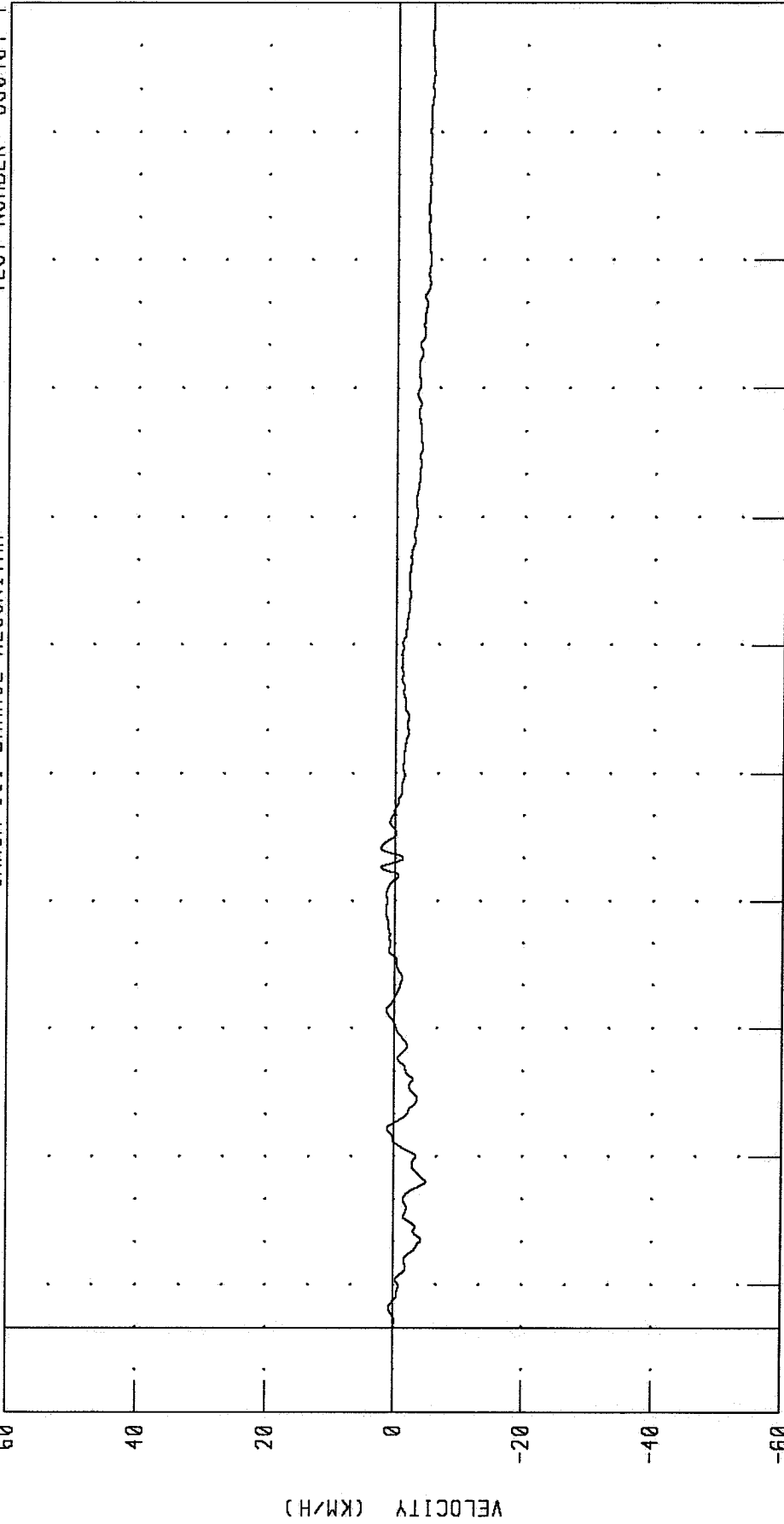
1991 DODGE CARRAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 960404-4

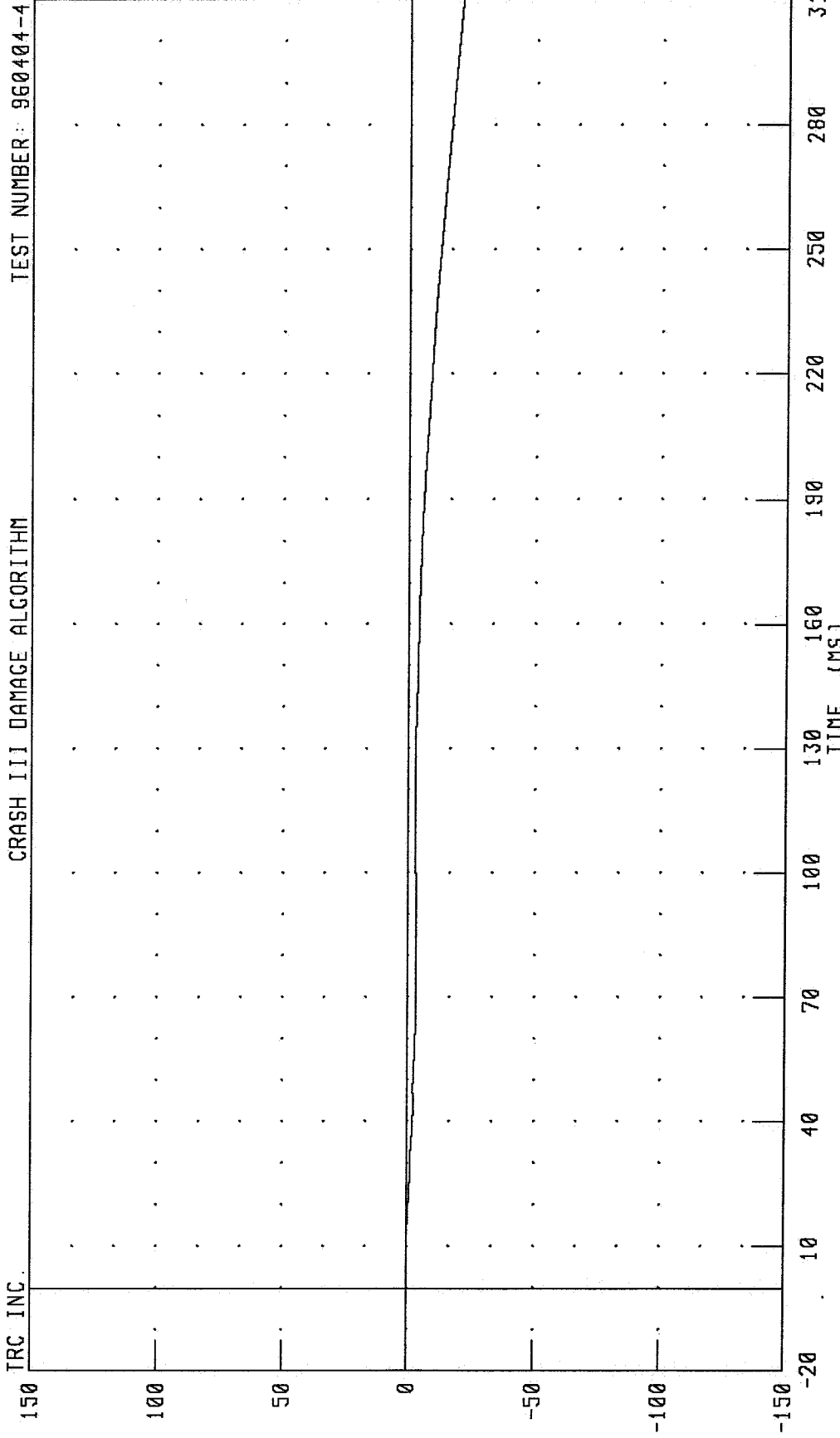


CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 2.19 KM/H @ 107.84 MS; -5.51 KM/H @ 293.76 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
VEHICLE CG Z-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

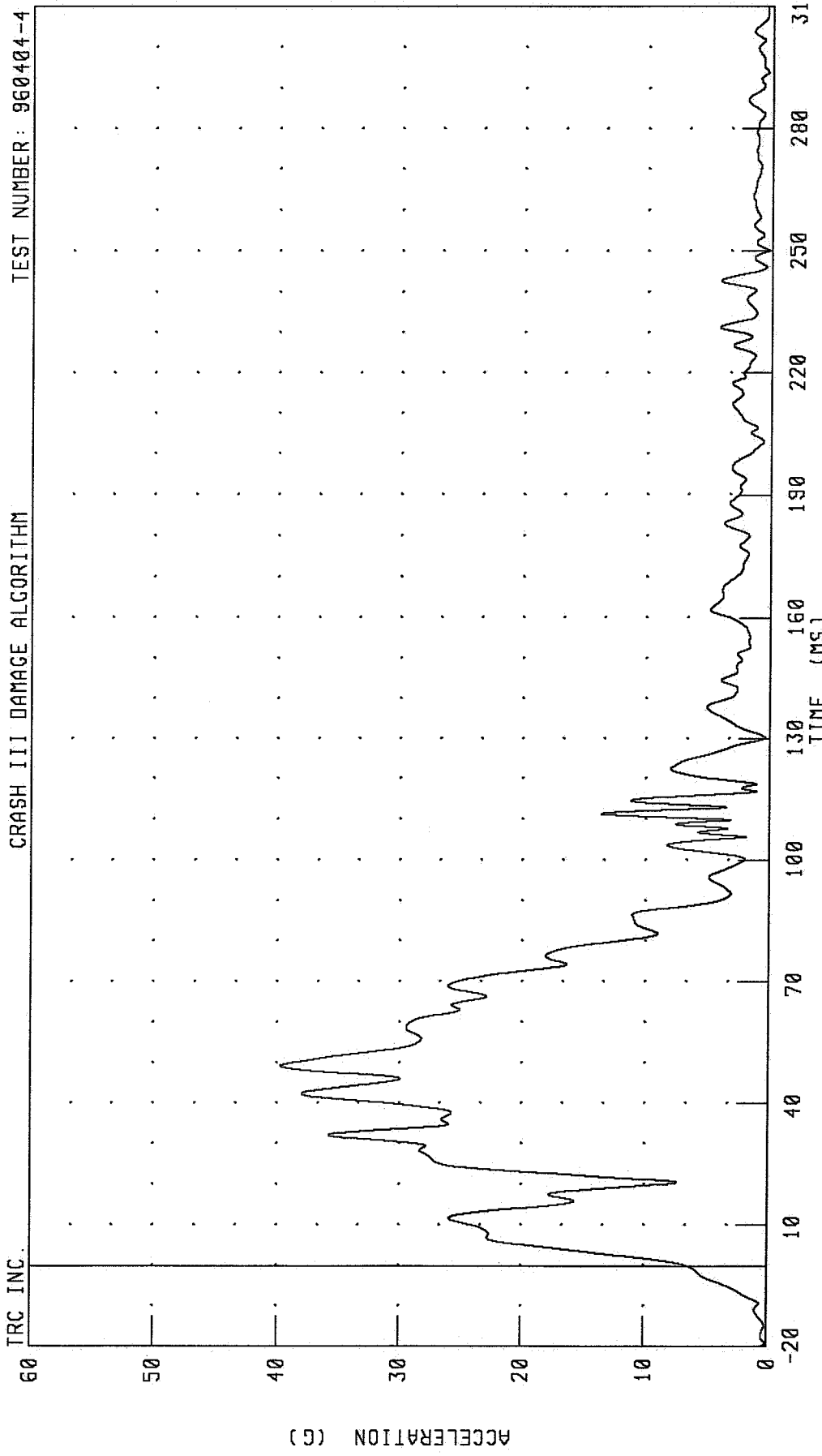
TEST NUMBER: 960404-4



CHANNEL: VCGZD1 FILTER: CH. CLASS 180

PEAK DATA: 0.41 MM @ 6.24 MS; -208.28 MM @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
VEHICLE CG RESULTANT ACCELERATION



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 39.72 G @ 49.20 MS; 0.09 G @ -19.28 MS

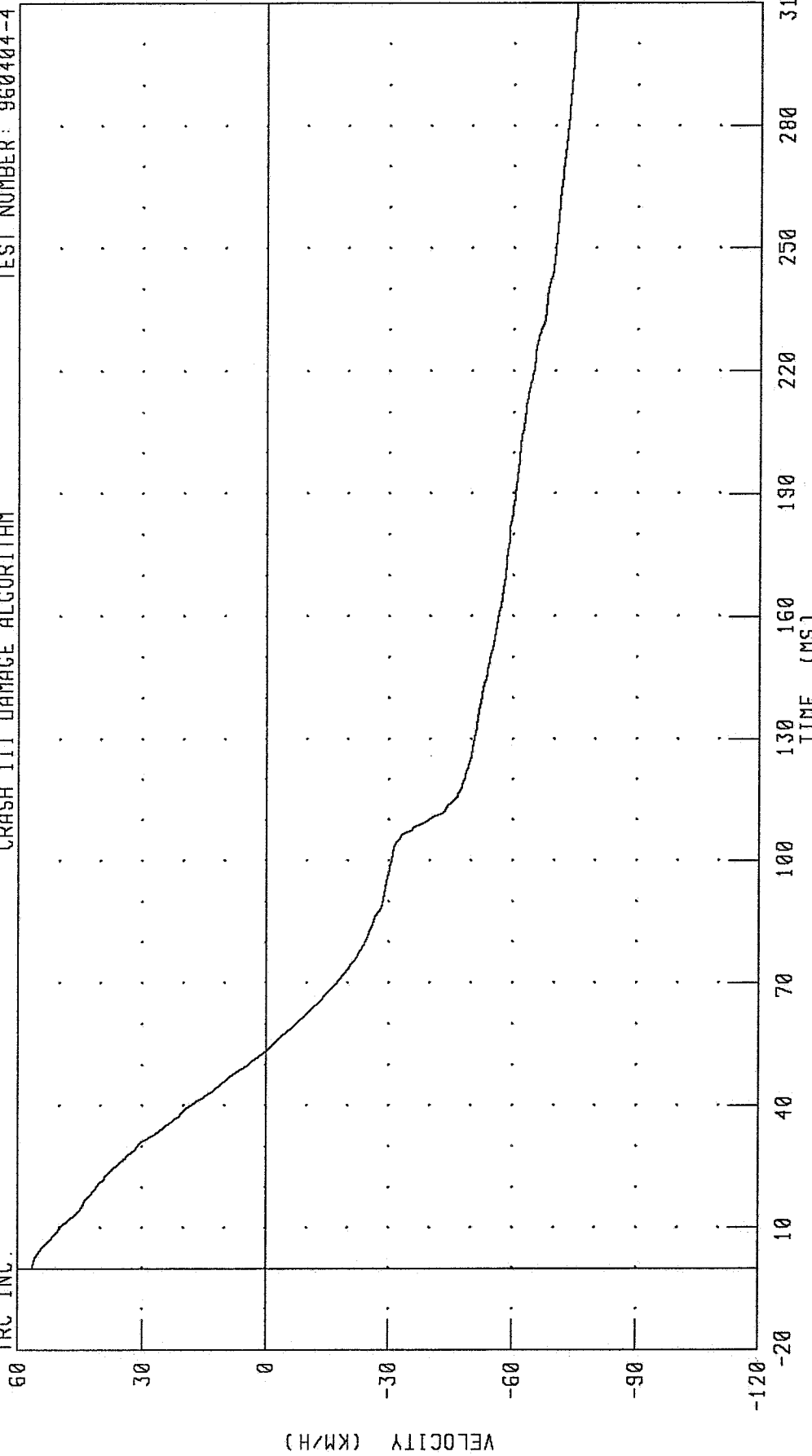
1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4

VEHICLE CG RESULTANT VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

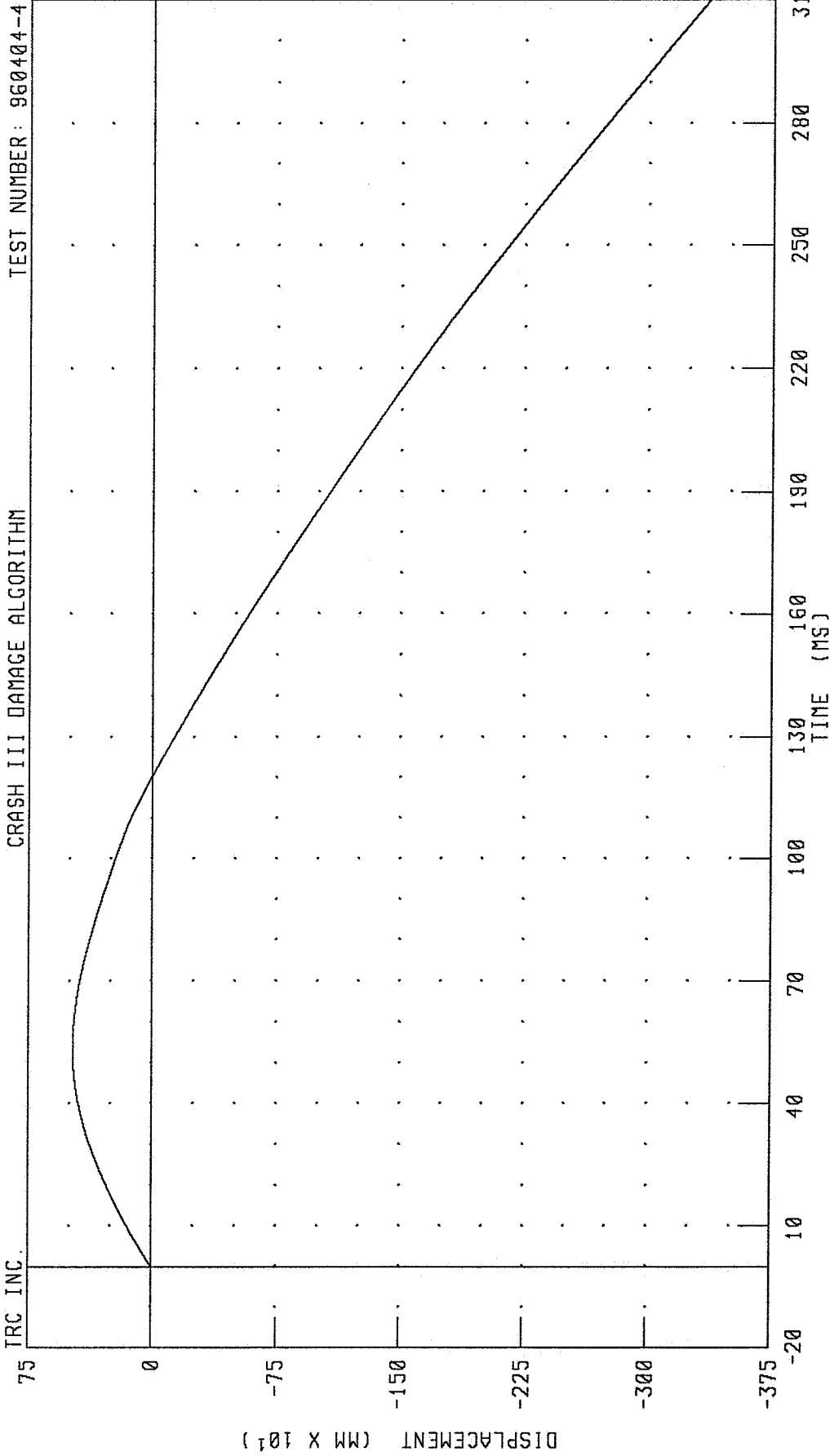
TEST NUMBER: 960404-4



CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 56.50 KM/H @ 0.00 MS; -75.20 KM/H @ 310.00 MS

1991 DODGE CARAVAN INTO POLE BARRIER AT 35 MPH TEST NO. 4
 VEHICLE CG RESULTANT DISPLACEMENT
 CRASH III DAMAGE ALGORITHM



CHANNEL: VCGRD1 FILTER: CH. CLASS 180

PEAK DATA: 477.08 MM @ 53.44 MS; -3368.07 MM @ 310.00 MS

Appendix C

Miscellaneous Test Information

Vehicle Accelerometer Information
 960404-1, 960404-2, 960404-3, and 960404-4

No.	Location	Axis	Manufacturer	Model	Serial Number	Orientation (+ Sensing)
1	Vehicle Center of Gravity	X	Endevco	7264	CH86H	Forward
		Y	Endevco	7264	CY78H	Right
		Z	Endevco	7264	DW19J	Up
2	Left Rear Sill	X	Endevco	7264	J11060	Forward
		Z	Endevco	7264	J10789	Up
3	Right Rear Sill	X	Endevco	7264	J10853	Forward
		Z	Endevco	7264	AHRN6	Up
4	Left Front Sill	X	Endevco	7264	AMTA9	Forward
		Z	Endevco	7264	J11342	Up
5	Right Front Sill	X	Endevco	7264	DK71J	Forward
		Z	Endevco	7264	CH75H	Up

Sign Convention

All Dummy and Vehicle Channels:

+X: Forward

+Y: Leftward

+Z: Upward

+Force: Tension