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U.S. Department
of Transportation

National Highway
Traffic Safety
Administration

DOT HS 808 236

June 1994

Final Report

Final Report of a 1990 Chevrolet Caprice into a 50% Left Offset Barrier in Support of CRASH3 Damage Algorithm Reformulation

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15. Supplemental Notes

16. Abstract

Five (5) 50% left offset barrier impact tests were conducted for research and development in support of the CRASH3 damage algorithm reformulation. These tests were conducted on a 1990 Chevrolet Caprice, VIN 1G1BL53EXMW115995, at Transportation Research Center Inc. on June 7, 1994. The following five tests were conducted on the vehicle:

TEST NO.	DATE	TIME	SPEED (KPH)	MAXIMUM CUMULATIVE CRUSH (MM)
940607-1	06/07/94	0920	7.7	18
940607-2	06/07/94	1058	15.8	207
940607-3	06/07/94	1222	24.0	456
940607-4	06/07/94	1350	39.9	772
940607-5	06/07/94	1537	55.5	1134

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METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

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

*1 in = 2.54 (exactly). For other exact conversions and more detailed tables, see NBS Misc. Publ. 286, Units of Weights and Measures, Price $2.25, SD Catalog No. C13.10:286.

Approximate Conversions from Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
		LENGTH		
mm	millimeters	0.04	inches	in
cm	centimeters	0.4	inches	in
m	meters	3.3	feet	ft
m	meters	1.1	yards	yd
km	kilometers	0.6	miles	mi
		AREA		
cm^2	square centimeters	0.16	square inches	in^2
m^2	square meters	1.2	square yards	yd^2
km^2	square kilometers	0.4	square miles	mi^2
ha	hectares (10,000 m^2)	2.5	acres	
		MASS (weight)		
g	grams	0.035	ounces	oz
kg	kilograms	2.2	pounds	lb
t	tonnes (1000 kg)	1.1	short tons	
		VOLUME		
ml	milliliters	0.03	fluid ounces	fl oz
l	liters	2.1	pints	pt
l	liters	1.06	quarts	qt
l	liters	0.26	gallons	gal
m^3	cubic meters	35	cubic feet	ft^3
m^3	cubic meters	1.3	cubic yards	yd^3
		TEMPERATURE (exact)		
°C	Celsius temperature	9/5 (then add 32)	Fahrenheit temperature	°F

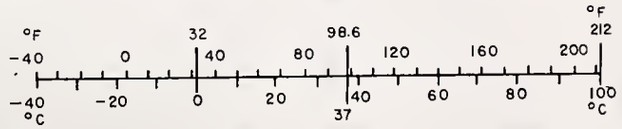


Table Of Contents

Section	Title	Page
1.0	Purpose and Test Procedure	1-1
2.0	Vehicle and Test Data	2-1
3.0	Test No. 940607-1 Summary	3-1
4.0	Test No. 940607-2 Summary	4-1
5.0	Test No. 940607-3 Summary	5-1
6.0	Test No. 940607-4 Summary	6-1
7.0	Test No. 940607-5 Summary	7-1
Appendix A	Photographs	A-1
Appendix B	Data Plots	B-1
Appendix C	Miscellaneous Test Information	C-1

List Of Tables

Number	Description	Page
1	Test Vehicle Information	2-2
2	Profile Measurements at Vehicle Bumper Height	2-5
3	Test No. 940607-1 Test Conditions	3-2
4	Test No. 940607-1 Vehicle Crush at Vehicle Bumper Height	3-3
5	Test No. 940607-1 Vehicle Measurements	3-5
6	Test No. 940607-1 Vehicle Accelerometer Locations and Data Summary	3-6
7	Test No. 940607-1 Camera Information	3-7
8	Test No. 940607-2 Test Conditions	4-2
9	Test No. 940607-2 Vehicle Crush at Vehicle Bumper Height	4-3
10	Test No. 940607-2 Vehicle Measurements	4-5
11	Test No. 940607-2 Vehicle Accelerometer Locations and Data Summary	4-6
12	Test No. 940607-2 Camera Information	4-7
13	Test No. 940607-3 Test Conditions	5-2
14	Test No. 940607-3 Vehicle Crush at Vehicle Bumper Height	5-3
15	Test No. 940607-3 Vehicle Measurements	5-5
16	Test No. 940607-3 Vehicle Accelerometer Locations and Data Summary	5-6

List Of Tables, Cont'd.

Number	Description	Page
17	Test No. 940607-3 Camera Information	5-7
18	Test No. 940607-4 Test Conditions	6-2
19	Test No. 940607-4 Vehicle Crush at Vehicle Bumper Height	6-3
20	Test No. 940607-4 Vehicle Measurements	6-5
21	Test No. 940607-4 Vehicle Accelerometer Locations and Data Summary	6-6
22	Test No. 940607-4 Camera Information	6-7
23	Test No. 940607-5 Test Conditions	7-2
24	Test No. 940607-5 Vehicle Crush at Vehicle Bumper Height	7-3
25	Test No. 940607-5 Vehicle Measurements	7-5
26	Test No. 940607-5 Vehicle Accelerometer Locations and Data Summary	7-6
27	Test No. 940607-5 Camera Information	7-7

List Of Figures

Number	Description	Page
1	Vehicle Accelerometer Placement	2-9
2	Camera Positions	2-10
3	Test 1 - Vehicle Crush Profile	3-4
4	Test 2 - Vehicle Crush Profile	4-4
5	Test 3 - Vehicle Crush Profile	5-4
6	Test 4 - Vehicle Crush Profile	6-4
7	Test 5 - Vehicle Crush Profile	7-4

Section 1.0

Purpose And Test Procedure

Purpose And Test Procedure

The purpose of the five (5) 50% left frontal offset barrier impact tests was for research and development in support of the CRASH3 damage algorithm reformulation.

The 1987 Chevrolet Caprice was equipped with a 5-liter, 8-cylinder, inline, gasoline engine with a 4-speed automatic transmission. The test weight of the vehicle was 1852 killograms.

The vehicle was instrumented with seven (7) accelerometers to measure vehicle X-axis and Y-axis acceleration.

Each crash test event was recorded by three (3) high-speed motion picture cameras operating at approximately 500 frames per second.

Data Acquisition Explanations

Test Number 940607-3:

The left rear sill X-axis accelerometer, LRSXG1, did not return to zero following the impact event. The data not returning to zero affected the velocity and displacement calculations.

Test Number 940607-4:

The vehicle center of gravity Y-axis accelerometer, VCGYG1, did not return to zero following the impact event. The data not returning to zero affected the velocity and displacement calculations and the vehicle center of gravity resultant acceleration calculations.

The vehicle center of gravity Z-axis accelerometer, VCGZG1, exceeded the data acquisition circuits full scale limit at 33 milliseconds. The data exceeding the full scale limit affected the velocity and displacement calculations and the vehicle center of gravity resultant acceleration calculations.

Test Number 940607-5:

The vehicle center of gravity Z-axis accelerometer, VCGZG1, exceeded the data acquisition circuits full scale limit at 48 milliseconds. The data exceeding the full scale limit affected the velocity and displacement calculations and the vehicle center of gravity resultant acceleration calculations.

Section 2.0

Vehicle And Test Data

Table 1 Test Vehicle Information

Vehicle Manufacturer: General Motors Corp. Model Year: 1990

Make/Model: Chevrolet/Caprice VIN: 1G1BL53EXMW115995

Body Style: 4-door sedan Color: Black

Engine Data: Type: Inline Cylinders: 8 Displacement: 5-liter

Transmission Data: 4 Speed, _ Manual, X Automatic, _ Fwd, X Rwd, _4wd

Date Vehicle Received: 06/03/94 Odometer Reading: 52431.5

Dealer's Name And Address: Na

Accessories:

Power Steering	Yes	Automatic Transmission	Yes
Power Brakes	Yes	Automatic Speed Control	Yes
Power Seats	Yes	Tilting Steering Wheel	Yes
Power Windows	Yes	Telescoping Steering Wheel	No
Tinted Glass	Yes	Air Conditioning	Yes
Radio	Yes	Anti-Skid Brake	Yes
Clock	Yes	Rear Window Defroster	Yes
Other	None		

Remarks:

1. Is the vehicle stock throughout? Yes
2. Does vehicle show evidence of prior accident history? No
3. Does vehicle show any significant corrosion? No
4. Condition of the front/rear bumper and frame: Good

Certification Data From Vehicle's Label:

Vehicle Manufactured By: General Motors Corp.
Date Of Manufacture: 03/90 VIN: 1G1BL53EXMW115995
GVWR: 2320 lbs.
GAWR: Front: 1134 lbs., Rear: 1186 lbs.

Table 1 Test Vehicle Information, Cont'd.

Tires On Vehicle (Mfr., Line, Size): Mastercraft A/S, P215/75R15

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

Rear: 241 kPa

Spare Tire (Mfr., Line, Size): Goodyear Temp, T145/80R16

Type Of Seats: Front: Split bench

Rear: Bench

Type Of Front Seat Backs: Manually adjustable

Maximum Width: 1974 mm

Wheelbase: 2955 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: P205/75R15

Recommended Cold Tire Pressure: Front: 30 psi; Rear: 30 psi

Designated Seating Capacity: 3 Front 3 Rear 6 Total

Vehicle Capacity Weight: 1100 lbs.

Test Vehicle Attitude (All Measurements Are In Millimeters):

Delivered Attitude: LF 757, RF 752, LR 564, RR 565

Pre-Test Attitude[1]: LF 897, RF 874, LR 640, RR 622

[1]Pre-test attitude measured with third axle installed.

Table 1 Test Vehicle Information, Cont'd.

Weight Of Test Vehicle As Received (With Maximum Fluids):

Right Front	508	KG	Right Rear	353	KG
Left Front	502	KG	Left Rear	361	KG
Total Front Weight	1010	KG	(58.6% Of Total Vehicle Weight)		
Total Rear Weight	714	KG	(41.4% Of Total Vehicle Weight)		
Total Delivered Weight	1724	KG			

Weight Of Test Vehicle[1]:

Right Front[2]	682	KG	Right Rear	224	KG
Left Front[2]	751	KG	Left Rear	195	KG
Total Front Weight[2]	1433	KG	(77.4% Of Total Vehicle Weight)		
Total Rear Weight	419	KG	(22.6% Of Total Vehicle Weight)		
Total Test Weight[1]	1852	KG			

Weight Of Ballast Secured In Vehicle Cargo Area: None

Components Removed To Meet Target Test Weight: None

CG = 491 MM Rearward Of Third Axle Centerline

[1] Weight Of Third Axle Included In Total Test Weight.

[2] The Front Wheel Weights Are For Third Axle Wheels.

TABLE 2 CRUSH MEASUREMENTS AT VEHICLE BUMPER HEIGHT 600 MM

LOCATION	0		1		2		3		4		5		6		7	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	3029	555	2947	556	2874	555	2800	549	2719	545	2644	552	2566	553	2490	555
POST-TEST 1	3029	555	2947	556	2874	555	2800	549	2719	545	2644	552	2566	553	2490	555
POST-TEST 2	3029	555	2947	556	2874	555	2800	549	2719	545	2644	552	2566	553	2490	555
POST-TEST 3	3022	551	2944	552	2867	552	2794	549	2716	550	2639	554	2562	553	2486	554
POST-TEST 4	3004	571	2927	575	2849	578	2775	575	2698	579	2622	580	2545	581	2467	581
POST-TEST 5	3034	572	3049	526	2967	524	2893	518	2813	515	2736	510	2667	508	2585	501

LOCATION	8		9		10		11		12		13		14		15	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	2414	553	2334	554	2256	552	2180	565	2102	569	2027	569	1950	568	1876	562
POST-TEST 1	2414	553	2334	554	2256	552	2180	565	2102	569	2027	569	1950	568	1876	562
POST-TEST 2	2414	553	2334	554	2256	552	2180	565	2102	569	2027	569	1950	568	1876	562
POST-TEST 3	2407	557	2328	554	2252	559	2172	557	2099	558	2023	562	1947	563	1873	563
POST-TEST 4	2393	581	2314	585	2234	582	2152	581	2079	587	2006	587	1927	584	1857	592
POST-TEST 5	2510	498	2431	502	2354	489	2274	476	2200	491	2126	495	2051	499	1982	509

LOCATION	16		17		18		19		20		21		22		23	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	1800	559	1723	565	1650	582	1582	582	1505	579	1432	581	1355	582	1280	572
POST-TEST 1	1800	559	1723	565	1650	582	1582	582	1505	579	1432	581	1355	582	1280	572
POST-TEST 2	1800	559	1723	565	1650	582	1582	582	1505	579	1432	581	1355	582	1280	572
POST-TEST 3	1796	571	1729	572	1657	568	1601	566	1536	552	1462	547	1391	541	1316	539
POST-TEST 4	1782	592	1748	587	1675	564	1626	566	1583	536	1519	509	1463	482	1402	471
POST-TEST 5	1926	521	1907	524	1877	521	1812	548	1801	504	1770	448	1729	415	1689	378

All meausrements 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 5334 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1524 millimeters from and parallel to the vehicle's longitudinal centerline

TABLE 2 CRUSH MEASUREMENTS AT VEHICLE BUMPER HEIGHT 600 MM CONT'D

LOCATION	24		25		26		27		28		29		30		31	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	1200	575	1120	577	1032	590	970	621	901	625	825	635	745	650	676	660
POST-TEST 1	1200	575	1120	577	1032	590	970	621	901	625	825	635	745	650	676	660
POST-TEST 2	1200	575	1120	577	1032	590	970	621	901	625	825	635	745	650	676	660
POST-TEST 3	1243	540	1168	554	1101	564	1034	578	972	593	902	613	827	641	761	673
POST-TEST 4	1324	456	1297	474	1257	527	1236	583	1234	546	1211	703	1162	762	1120	831
POST-TEST 5	1629	381	1603	381	1601	453	1597	521	1621	597	1614	669	1596	747	1589	811

LOCATION	32		33		34		35		36		37		38		39	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	602	685	530	714	470	745	383	735	320	799	299	870	290	952	280	1029
POST-TEST 1	602	685	530	714	470	745	367	762	315	810	287	882	282	961	274	1036
POST-TEST 2	602	685	530	714	470	745	441	759	401	826	391	896	392	971	395	1049
POST-TEST 3	687	673	684	745	721	804	737	829	693	892	685	966	682	1044	684	1123
POST-TEST 4	1014	846	1057	896	1109	920	1047	877	1016	77	1008	932	997	1006	1006	1078
POST-TEST 5	1511	855	1495	904	1537	949	1466	847	1411	916	1391	995	1378	1066	1362	1142

LOCATION	40		41		42		43		44		45		46		47	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	275	1102	225	1174	218	1247	210	1322	202	1400	198	1475	195	1505	185	1623
POST-TEST 1	263	1102	229	1174	217	1247	216	1322	221	1400	214	1475	201	1505	211	1623
POST-TEST 2	404	1124	383	1207	399	1277	409	1352	440	1425	419	1469	370	1522	353	1441
POST-TEST 3	697	1198	681	1271	688	1342	703	1422	741	1485	725	1498	650	1524	599	1591
POST-TEST 4	1010	1238	997	1316	991	1383	966	1452	931	1520	893	1532	830	1536	754	1547
POST-TEST 5	1381	1215	1358	1288	1352	1357	1349	1429	1327	1496	1327	1496	1277	1549	1214	1552

All meausrements 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 5334 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1524 millimeters from and parallel to the vehicle's longitudinal centerline

TABLE 2 CRUSH MEASUREMENTS AT VEHICLE BUMPER HEIGHT 600 MM CONT'D

LOCATION	48		49		50		51		52		53		54		55	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	205	1698	212	1768	222	1843	245	1916	265	1990	282	2063	302	2143	302	2218
POST-TEST 1	208	1698	216	1768	221	1843	251	1916	273	1990	279	2063	298	2143	305	2218
POST-TEST 2	339	1688	327	1757	321	1823	326	1905	324	1979	326	2057	321	2131	306	2262
POST-TEST 3	547	1650	502	1711	452	1776	422	1851	393	1919	351	1985	324	2050	253	2107
POST-TEST 4	693	1586	621	1616	571	1666	504	1729	448	1792	383	1832	328	1895	260	1927
POST-TEST 5	1150	1585	1077	1600	996	1577	917	1554	842	1528	766	1518	688	1524	613	1517

LOCATION	56		57		58		59		60		61		62		63	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	335	2278	460	2281	525	2328	592	2358	669	2394	750	2406	834	2406	900	2438
POST-TEST 1	332	2278	460	2281	525	2328	592	2358	669	2394	750	2406	834	2406	900	2438
POST-TEST 2	323	2289	460	2281	525	2328	592	2358	669	2394	750	2406	834	2406	900	2438
POST-TEST 3	231	2181	451	2285	518	2333	584	2361	623	2396	750	2418	833	2431	900	2458
POST-TEST 4	224	1997	437	2192	513	2261	587	2300	657	2336	733	2351	808	2372	877	2402
POST-TEST 5	539	1541	667	1971	692	2053	737	2101	757	2129	817	2160	891	2210	957	2244

LOCATION	64		65		66		67		68		69		70		71	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	975	2438	1059	2446	1122	2457	1196	2438	1282	2449	1350	2448	1424	2466	1495	2473
POST-TEST 1	975	2438	1059	2446	1122	2457	1196	2438	1282	2449	1350	2448	1424	2466	1495	2473
POST-TEST 2	975	2438	1059	2446	1122	2457	1196	2438	1282	2449	1350	2448	1424	2466	1495	2473
POST-TEST 3	973	2460	1056	2459	1119	2458	1094	2467	1278	2468	1345	2482	1422	2485	1493	2487
POST-TEST 4	954	2414	1037	2424	1103	2441	1179	2445	1265	2456	1332	2467	1404	2478	1469	2545
POST-TEST 5	1034	2274	1128	2300	1181	2316	1253	2334	1332	2356	1398	2373	1459	2392	1507	2406

All meausrements 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 5334 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1524 millimeters from and parallel to the vehicle's longitudinal centerline

TABLE 2 CRUSH MEASUREMENTS AT VEHICLE BUMPER HEIGHT 600 MM CONT'D

LOCATION	72		73		74		75		76		77		78		79	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	1570	2455	1650	2456	1720	2460	1792	2465	1872	2474	1945	2475	2021	2478	2100	2487
POST-TEST 1	1570	2455	1650	2456	1720	2460	1792	2465	1872	2474	1945	2475	2021	2478	2100	2487
POST-TEST 2	1570	2455	1650	2456	1720	2460	1792	2465	1872	2474	1945	2475	2021	2478	2100	2487
POST-TEST 3	1565	2484	1644	2474	1704	2475	1793	2483	1872	2490	1948	2490	2024	2494	2103	2493
POST-TEST 4	1544	2486	1598	2476	666	2492	1776	2489	1857	2495	1933	2503	2010	2500	2090	2504
POST-TEST 5	1558	2415	1583	2404	1633	2449	1779	2465	1858	2476	1933	2493	2007	2524	2084	2520

LOCATION	80		81		82		83		84		85		86		87	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	2175	2484	2254	2484	2330	2449	2405	2449	2479	2449	2552	2449	2628	2493	2704	2493
POST-TEST 1	2175	2484	2254	2484	2330	2449	2405	2449	2479	2449	2552	2449	2628	2493	2704	2493
POST-TEST 2	2175	2484	2254	2484	2330	2449	2405	2449	2479	2449	2552	2449	2628	2493	2704	2493
POST-TEST 3	2177	2495	2252	2495	2331	2498	2409	2503	2482	2503	2557	2500	2632	2504	2709	2501
POST-TEST 4	2167	2507	2242	2511	2318	2509	2394	2508	2466	2506	2539	2513	2616	2510	2693	2514
POST-TEST 5	2159	2538	2238	2544	2317	2560	2406	2572	2474	2585	2546	2599	2621	2611	2692	2619

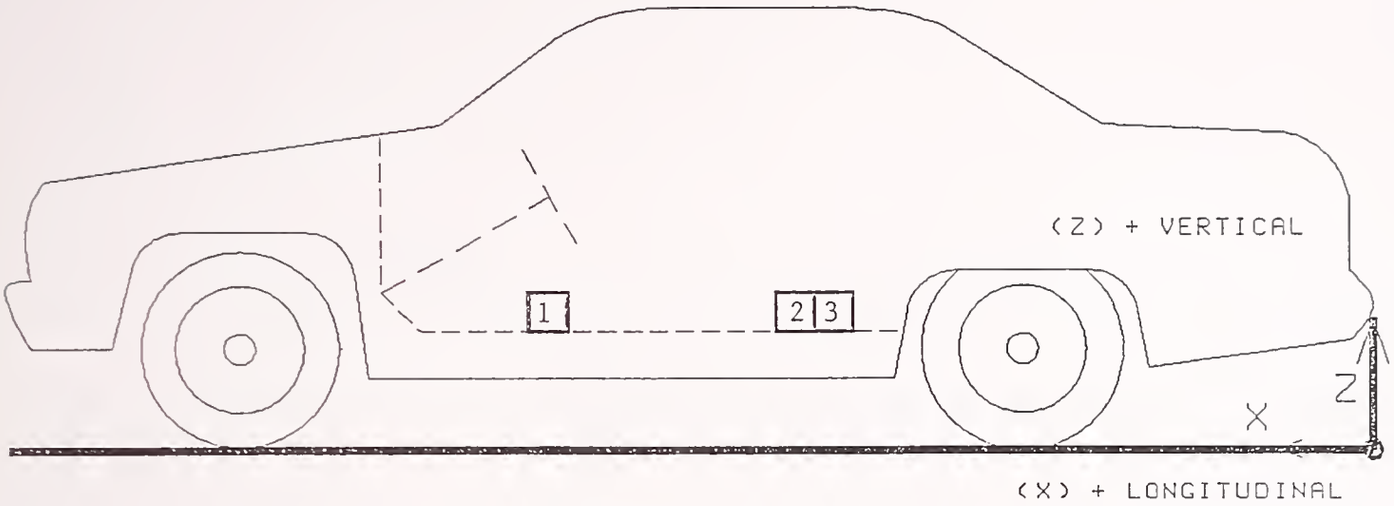
LOCATION	88		89		90		91		92		93		94		95	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	2781	2496	2855	2498	2930	2496	3005	2489								
POST-TEST 1	2781	2496	2855	2498	2930	2496	3005	2489								
POST-TEST 2	2781	2496	2855	2498	2930	2496	3005	2489								
POST-TEST 3	2785	2500	2857	2503	2951	2504	3010	2508								
POST-TEST 4	2769	2511	2843	2512	2919	2510	3001	2513								
POST-TEST 5	2769	2631	2846	2643	2919	2654	3004	2499								

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

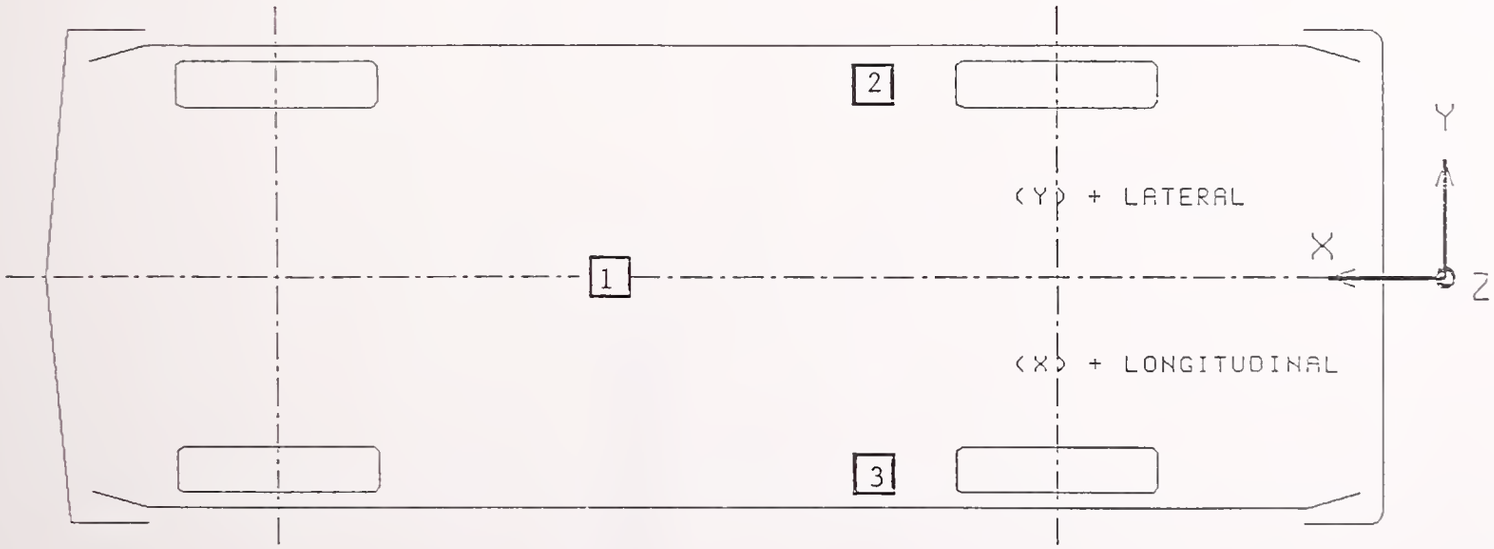
All X-axis measurements taken from a reference plane 5334 millimeters from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 1524 millimeters from and parallel to the vehicle's longitudinal centerline

Figure 1 Vehicle Accelerometer Placement

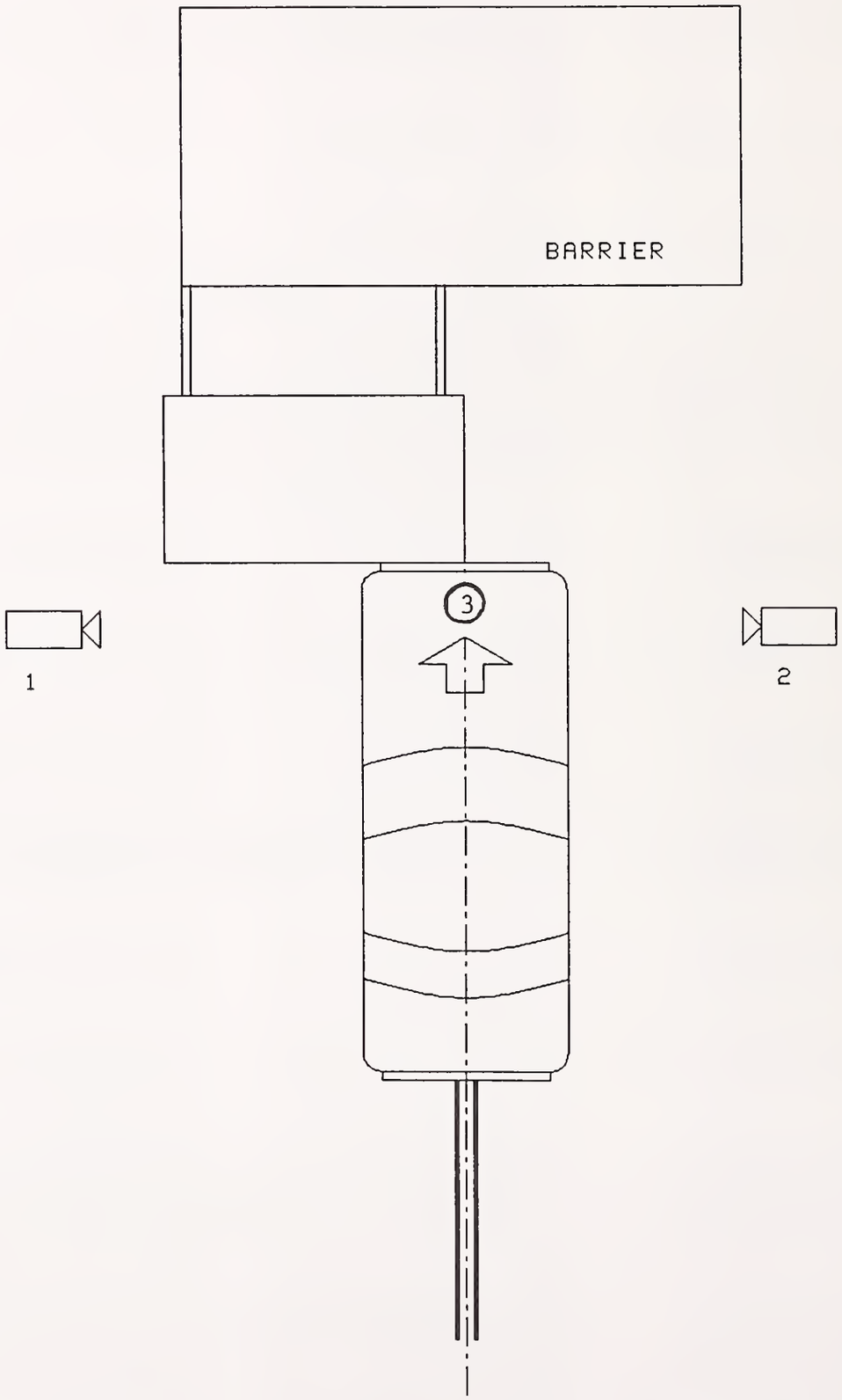


SIDE VIEW



BOTTOM VIEW

Figure 2 Camera Positions



Section 3.0

Test 940607-1 Summary

Table 3 Test Conditions
Test No. 940607-1

Date Of Test: 06/07/94

Time Of Test: 09:20

Ambient Temperature At Impact Area: 24° C

Intended Impact Velocity: 8.0 kph

Actual Impact Velocity:	Primary	= 7.7 kph
	Secondary	= 7.6 kph

Subject Vehicle Data

Length Of Direct Contact Damage: 374 MM

Maximum Cumulative Crush
At Vehicle Bumper Height: 18 MM

Vehicle Attitudes:

Post-Test: LF: 897; RF: 874; LR: 640; RR: 622

All distance measurements are in millimeters.

Table 4 Vehicle Crush At Vehicle Bumper Height

Test No. 940607-1

FL =	969
C1 =	-5
C2 =	-7
C3 =	3
C4 =	16
C5 =	18
C6 =	4

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.

All measurements are in millimeters.

Figure 3
Test 1 - Vehicle Crush Profile

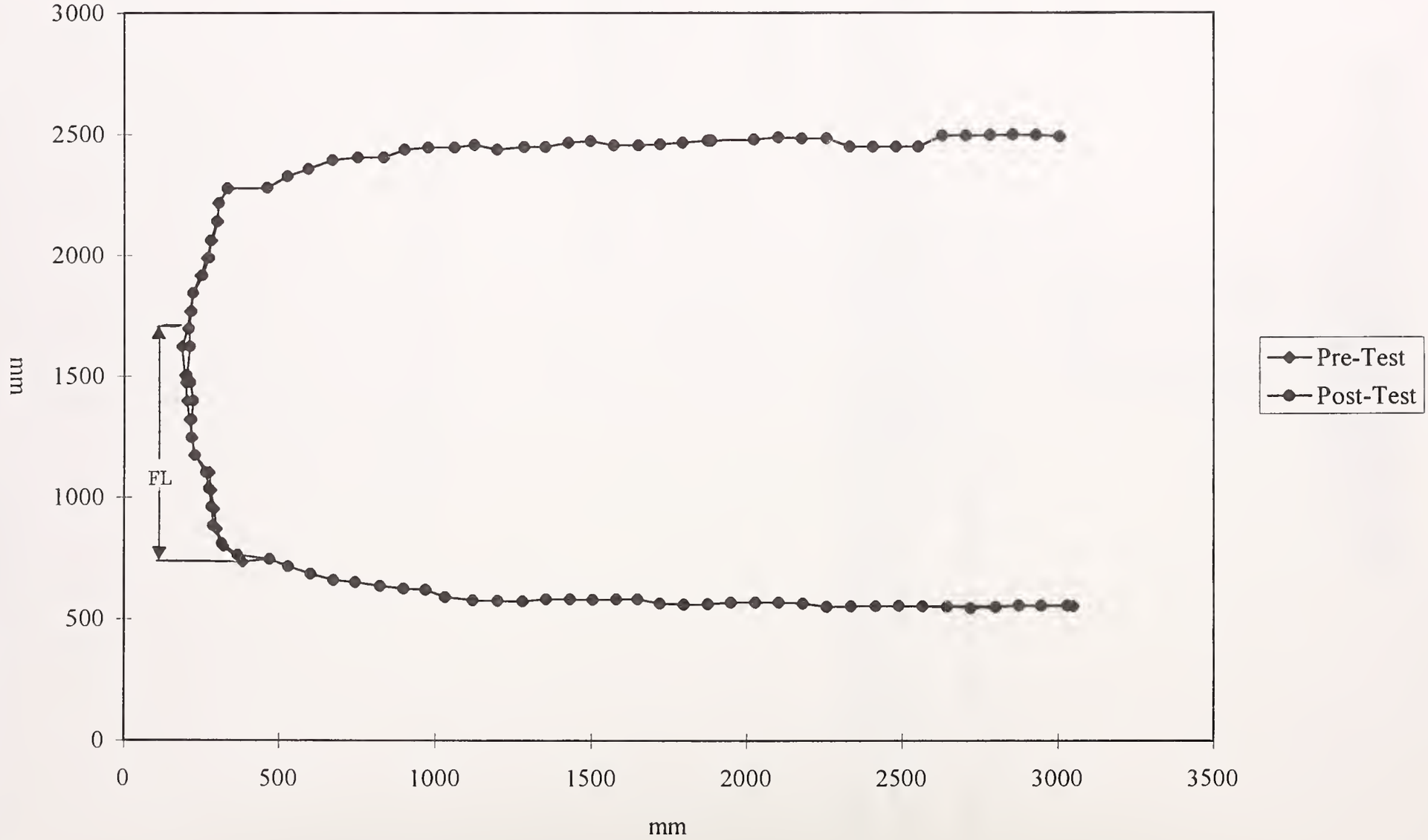


Table 5 Vehicle Measurements

Test No. 940607-1

Vehicle Make/Model: Chevrolet/Caprice

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	5401	5382	19
X2	Rear Surface Of Vehicle To Front Of Engine Block	4385	4385	0
X3	Rear Surface Of Vehicle To Firewall	4080	4080	0
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3807	3807	0
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3809	3809	0
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3778	3778	0
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3775	3775	0
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2591	2591	0
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2595	2595	0
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2610	2610	0
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2606	2606	0
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	Na	Na	Na
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	Na	Na	Na
X14	Rear Surface Of Vehicle To Firewall - Right Side	3985	3985	0
X15	Rear Surface Of Vehicle To Firewall - Left Side	3986	3986	0
X16	Rear Surface Of Vehicle To Steering Wheel Center	3152	3152	0
X17	Center Of Steering Column To "A" Post	329	329	0
X18	Center Of Steering Column To Headliner	397	397	0
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	5236	5274	-38
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	5234	5274	-40
X21	Length Of Engine Block	520	520	0

All distance measurements are in millimeters.

Table 6 Vehicle Accelerometer Locations And Data Summary

Test No. 940607-1

TEST NUMBER: 940607-1 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3220 mm	0 mm	NA mm				
LONGITUDINAL				0.7 g	@ 207.9 ms	4.3 g	@ 44.9 ms
LATERAL				0.9 g	@ 71.3 ms	1.5 g	@ 61.0 ms
VERTICAL				6.3 g	@ 73.4 ms	2.9 g	@ 78.5 ms
RESULTANT				7.4 g	@ 73.4 ms		
2 LEFT REAR SILL	2340 mm	730 mm	NA mm				
LONGITUDINAL				0.4 g	@ 171.3 ms	3.8 g	@ 44.7 ms
LATERAL				0.6 g	@ 6.8 ms	0.4 g	@ 58.3 ms
3 RIGHT REAR SILL	2340 mm	-730 mm	NA mm				
LONGITUDINAL				0.7 g	@ 205.8 ms	3.4 g	@ 62.0 ms
LATERAL				0.4 g	@ 76.6 ms	0.6 g	@ 5.9 ms

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

Table 7 Camera Information

Test No. 940607-1

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	13	508	Impact overall
2	Right tight	Photosonic	13	502	Impact overall
3	Overhead	Photosonic	13	500	Impact overall

Section 4.0

Test 940607-2 Summary

Table 8 Test Conditions

Test No. 940607-2

Date Of Test: 06/07/94

Time Of Test: 10:58

Ambient Temperature At Impact Area: 26° C

Intended Impact Velocity: 16.1 kph

Actual Impact Velocity:	Primary	= 15.8 kph
	Secondary	= 15.8 kph

Subject Vehicle Data

Length Of Direct Contact Damage: 789 mm

Maximum Cumulative Crush
At Vehicle Bumper Height: 207 mm

Vehicle Attitudes:

Post-Test: LF: NA; RF: NA; LR: NA; RR: NA

All distance measurements are in millimeters.

Table 9 Vehicle Crush At Vehicle Bumper Height

Test No. 940607-2

FL =	1519
C1 =	58
C2 =	118
C3 =	207
C4 =	134
C5 =	59
C6 =	0

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.

All measurements are in millimeters.

Figure 4
Test 2 - Vehicle Crush Profile

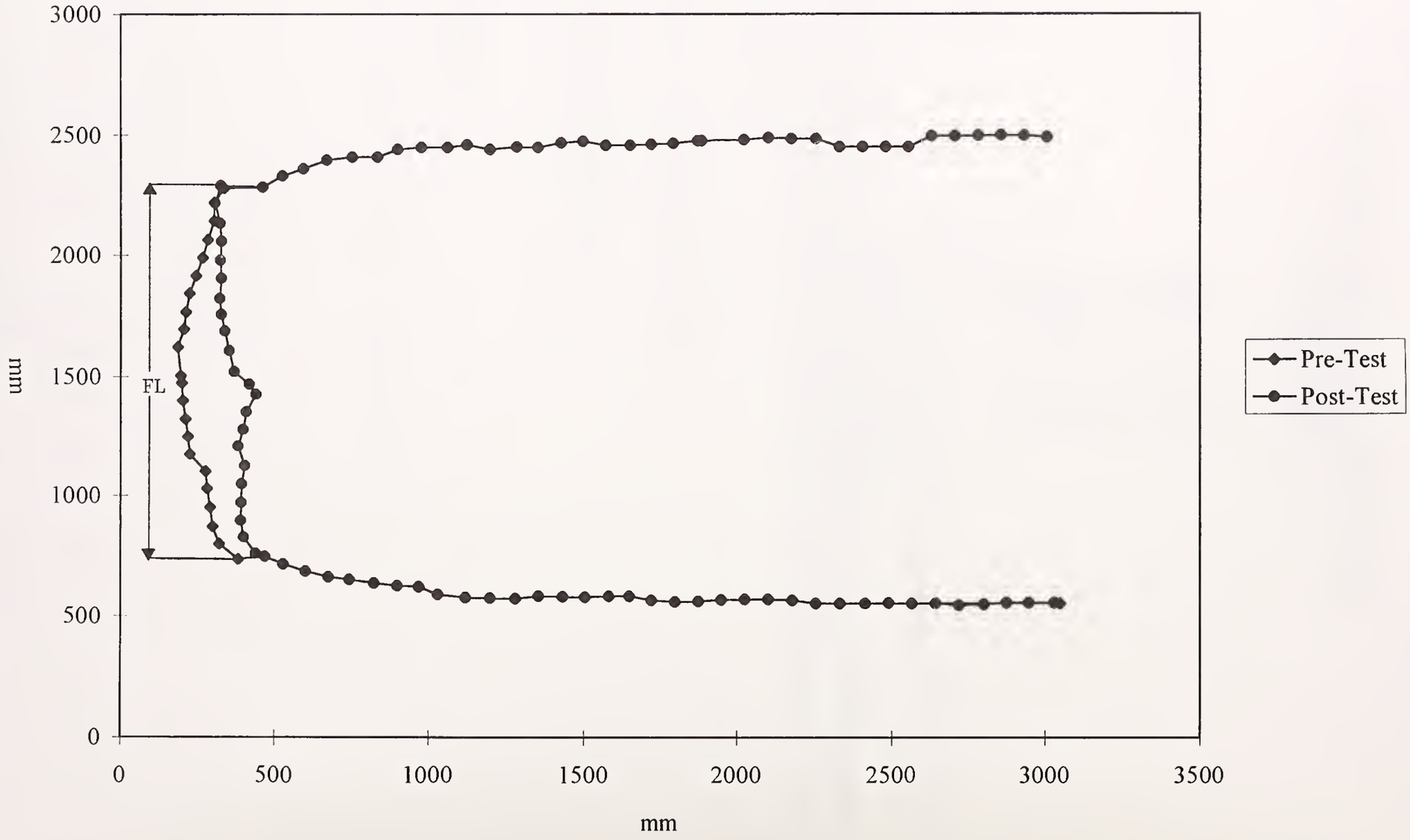


Table 10 Vehicle Measurements

Test No. 940607-2

Vehicle Make/Model: Chevrolet/Caprice

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	5382	5204	178
X2	Rear Surface Of Vehicle To Front Of Engine Block	4385	4385	0
X3	Rear Surface Of Vehicle To Firewall	4080	4080	0
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3807	3807	0
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3809	3809	0
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3778	3778	0
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3775	3775	0
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2591	2591	0
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2595	2595	0
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2610	2610	0
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2606	2606	0
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	Na	Na	Na
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	Na	Na	Na
X14	Rear Surface Of Vehicle To Firewall - Right Side	3985	3985	0
X15	Rear Surface Of Vehicle To Firewall - Left Side	3986	3986	0
X16	Rear Surface Of Vehicle To Steering Wheel Center	3152	3152	0
X17	Center Of Steering Column To "A" Post	329	329	0
X18	Center Of Steering Column To Headliner	397	397	0
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	5274	5232	42
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	5274	5150	124
X21	Length Of Engine Block	520	520	0

All distance measurements are in millimeters.

Table 11 Vehicle Accelerometer Locations And Data Summary

Test No. 940607-2

TEST NUMBER: 940607-2 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3220 mm	0 mm	NA mm				
LONGITUDINAL				2.9 g	@ 53.2 ms	16.7 g	@ 59.3 ms
LATERAL				6.2 g	@ 61.1 ms	5.7 g	@ 56.8 ms
VERTICAL				17.3 g	@ 62.1 ms	11.9 g	@ 87.6 ms
RESULTANT				21.3 g	@ 61.2 ms		
2 LEFT REAR SILL	2340 mm	730 mm	NA mm				
LONGITUDINAL				1.6 g	@ 51.7 ms	15.2 g	@ 57.8 ms
LATERAL				9.5 g	@ 57.1 ms	6.3 g	@ 63.0 ms
3 RIGHT REAR SILL	2340 mm	-730 mm	NA mm				
LONGITUDINAL				1.3 g	@ 54.0 ms	14.5 g	@ 60.2 ms
LATERAL				3.6 g	@ 62.2 ms	3.7 g	@ 68.2 ms

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

Table 12 Camera Information

Test No. 940607-2

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	13	505	Impact overall
2	Right tight	Photosonic	13	502	Impact overall
3	Overhead	Photosonic	13	500	Impact overall

Section 5.0

Test 940607-3 Summary

Table 13 Test Conditions

Test No. 940607-3

Date Of Test: 06/07/94

Time Of Test: 12:22

Ambient Temperature At Impact Area: 27° C

Intended Impact Velocity: 24.0 kph

Actual Impact Velocity:	Primary	= 24.0 kph
	Secondary	= 24.0 kph

Subject Vehicle Data

Length Of Direct Contact Damage: 842 mm

Maximum Cumulative Crush
At Vehicle Bumper Height: 456 mm

Vehicle Attitudes:

Post-Test: LF: NA; RF: NA; LR: NA; RR: NA

All distance measurements are in millimeters.

Table 14 Vehicle Crush At Vehicle Bumper Height

Test No. 940607-3

FL =	1500
C1 =	85
C2 =	386
C3 =	456
C4 =	409
C5 =	199
C6 =	-104

NOTE: FL is post-test length of 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.

All measurements are in millimeters.

Figure 5
Test 3 - Vehicle Crush Profile

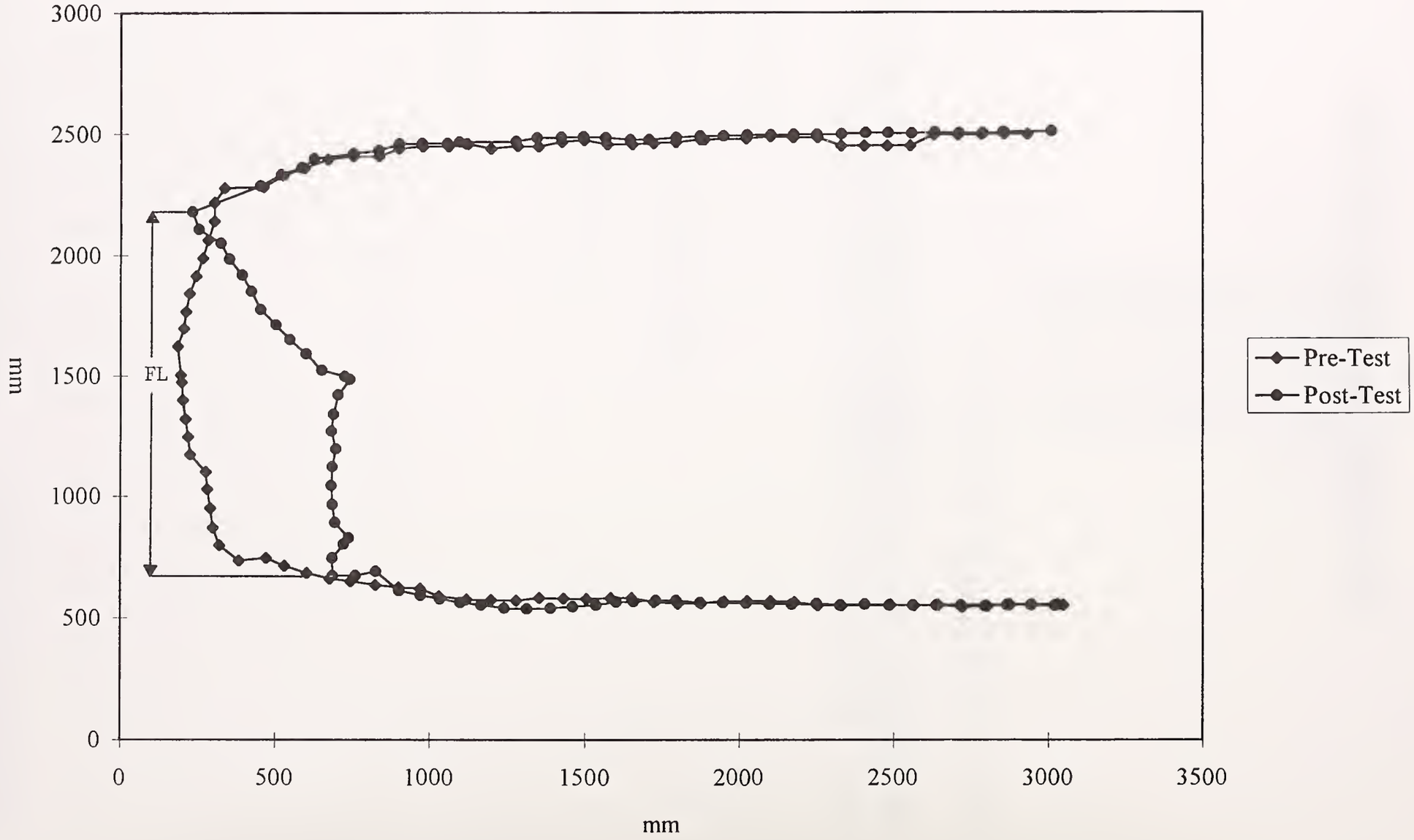


Table 15 Vehicle Measurements

Test No. 940607-3

Vehicle Make/Model: Chevrolet/Caprice

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	5204	4928	276
X2	Rear Surface Of Vehicle To Front Of Engine Block	4385	Na	Na
X3	Rear Surface Of Vehicle To Firewall	4080	Na	Na
X4	Rear Surface Of Vehicle To Upper Leading Edge Of Right Door	3807	3804	3
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3809	3812	-3
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3778	3764	14
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3775	3773	2
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2591	2586	5
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2595	2599	-4
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2610	2596	14
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2606	2601	5
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	Na	Na	Na
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	Na	Na	Na
X14	Rear Surface Of Vehicle To Firewall - Right Side	3985	Na	Na
X15	Rear Surface Of Vehicle To Firewall - Left Side	3986	Na	Na
X16	Rear Surface Of Vehicle To Steering Wheel Center	3152	3152	0
X17	Center Of Steering Column To "A" Post	329	329	0
X18	Center Of Steering Column To Headliner	397	397	0
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	5232	5361	-129
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	5150	4899	251
X21	Length Of Engine Block	520	Na	Na

All distance measurements are in millimeters.

Table 16 Vehicle Accelerometer Locations And Data Summary

Test No. 940607-3

TEST NUMBER: 940607-3 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3220 mm	0 mm	NA mm				
LONGITUDINAL				1.9 g	@ 271.6 ms	12.4 g	@ 81.9 ms
LATERAL				18.4 g	@ 178.3 ms	5.6 g	@ 38.5 ms
VERTICAL				18.4 g	@ 50.6 ms	14.5 g	@ 83.4 ms
RESULTANT				23.1 g	@ 50.6 ms		
2 LEFT REAR SILL	2340 mm	730 mm	NA mm				
LONGITUDINAL[1]				2.4 g	@ 279.7 ms	12.3 g	@ 11.7 ms
LATERAL				4.4 g	@ 10.8 ms	7.7 g	@ 20.0 ms
3 RIGHT REAR SILL	2340 mm	-730 mm	NA mm				
LONGITUDINAL				1.1 g	@ 179.0 ms	11.4 g	@ 91.3 ms
LATERAL				1.8 g	@ 171.8 ms	5.1 g	@ 22.5 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 17 Camera Information

Test No. 940607-3

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	13	505	Impact overall
2	Right tight	Photosonic	13	502	Impact overall
3	Overhead	Photosonic	13	500	Impact overall

Section 6.0

Test 940607-4 Summary

Table 18 Test Conditions

Test No. 940607-4

Date Of Test: 06/07/94

Time Of Test: 13:50

Ambient Temperature At Impact Area: 27° C

Intended Impact Velocity: 40.2 kph

Actual Impact Velocity:	Primary	=	39.9 Kph
	Secondary	=	39.9 Kph

Subject Vehicle Data

Length Of Direct Contact Damage: 947 mm

Maximum Cumulative Crush
At Vehicle Bumper Height: 772 mm

Vehicle Attitudes:

Post-Test: LF: 1041; RF: 912; LR: 615; RR: 597

All distance measurements are in millimeters.

Table 19 Vehicle Crush At Vehicle Bumper Height

Test No. 940607-4

FL =	1101
C1 =	527
C2 =	728
C3 =	772
C4 =	550
C5 =	202
C6 =	-111

NOTE: FL is post-test length of 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.

All measurements are in millimeters.

Figure 6
Test 4 - Vehicle Crush Profile

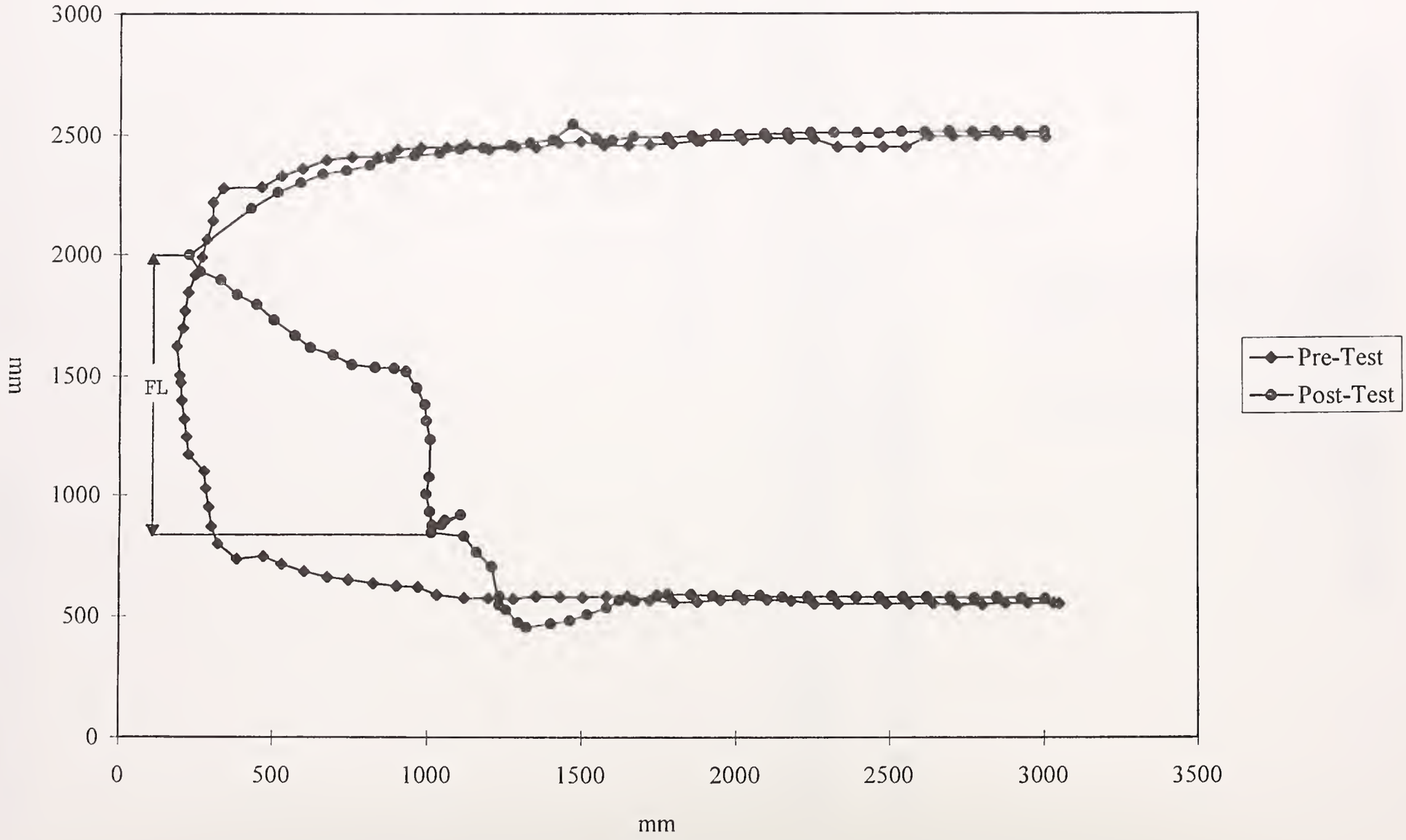


Table 20 Vehicle Measurements

Test No. 940607-4

Vehicle Make/Model: Chevrolet/Caprice

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4928	4766	162
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	3804	3808	-4
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3812	3807	5
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3764	3805	-41
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3773	3612	161
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2586	2589	-3
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2599	2591	8
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2596	2605	-9
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2604	2599	5
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	Na	Na	Na
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	Na	Na	Na
X14	Rear Surface Of Vehicle To Firewall - Right Side	Na	Na	Na
X15	Rear Surface Of Vehicle To Firewall - Left Side	Na	Na	Na
X16	Rear Surface Of Vehicle To Steering Wheel Center	3152	Na	Na
X17	Center Of Steering Column To "A" Post	329	Na	Na
X18	Center Of Steering Column To Headliner	397	Na	Na
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	5361	5382	-21
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	5899	4566	333
X21	Length Of Engine Block	Na	Na	Na

All distance measurements are in millimeters.

Table 21 Vehicle Accelerometer Locations And Data Summary

Test No. 940607-4

TEST NUMBER: 940607-4 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3220 mm	0 mm	NA mm				
LONGITUDINAL				27.4 g	@ 34.3 ms	47.4 g	@ 30.2 ms
LATERAL[1]				20.5 g	@ 36.4 ms	26.1 g	@ 28.3 ms
VERTICAL[1]				38.1 g	@ 72.3 ms	53.4 g	@ 26.2 ms
RESULTANT[1]				60.3 g	@ 26.7 ms		
2 LEFT REAR SILL	2340 mm	730 mm	NA mm				
LONGITUDINAL				3.5 g	@ 162.3 ms	22.3 g	@ 35.0 ms
LATERAL				9.9 g	@ 7.8 ms	17.8 g	@ 13.4 ms
3 RIGHT REAR SILL	2340 mm	-730 mm	NA mm				
LONGITUDINAL				1.4 g	@ 166.1 ms	22.8 g	@ 25.2 ms
LATERAL				4.7 g	@ 96.6 ms	10.0 g	@ 64.8 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 22 Camera Information

Test No. 940607-4

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	13	505	Impact overall
2	Right tight	Photosonic	13	500	Impact overall
3	Overhead	Photosonic	13	500	Impact overall

Section 7.0

Test 940607-5 Summary

Table 23 Test Conditions

Test No. 940607-5

Date Of Test: 06/07/94

Time Of Test: 15:37

Ambient Temperature At Impact Area: 28° C

Intended Impact Velocity: 56.3 kph

Actual Impact Velocity:	Primary	=	55.5 kph
	Secondary	=	55.5 kph

Subject Vehicle Data

Length Of Direct Contact Damage: 1052 mm

Maximum Cumulative Crush
At Vehicle Bumper Height: 1134 mm

Vehicle Attitudes:

Post-Test: LF: 1194; RF: 1062; LR: 597; RR: 538

All distance measurements are in millimeters.

Table 24 Vehicle Crush At Vehicle Bumper Height

Test No. 940607-5

FL =	694
C1 =	1083
C2 =	1091
C3 =	1088
C4 =	1124
C5 =	1134
C6 =	204

NOTE: FL is post-test length of 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.

All measurements are in millimeters.

Figure 7
Test 5 - Vehicle Crush Profile

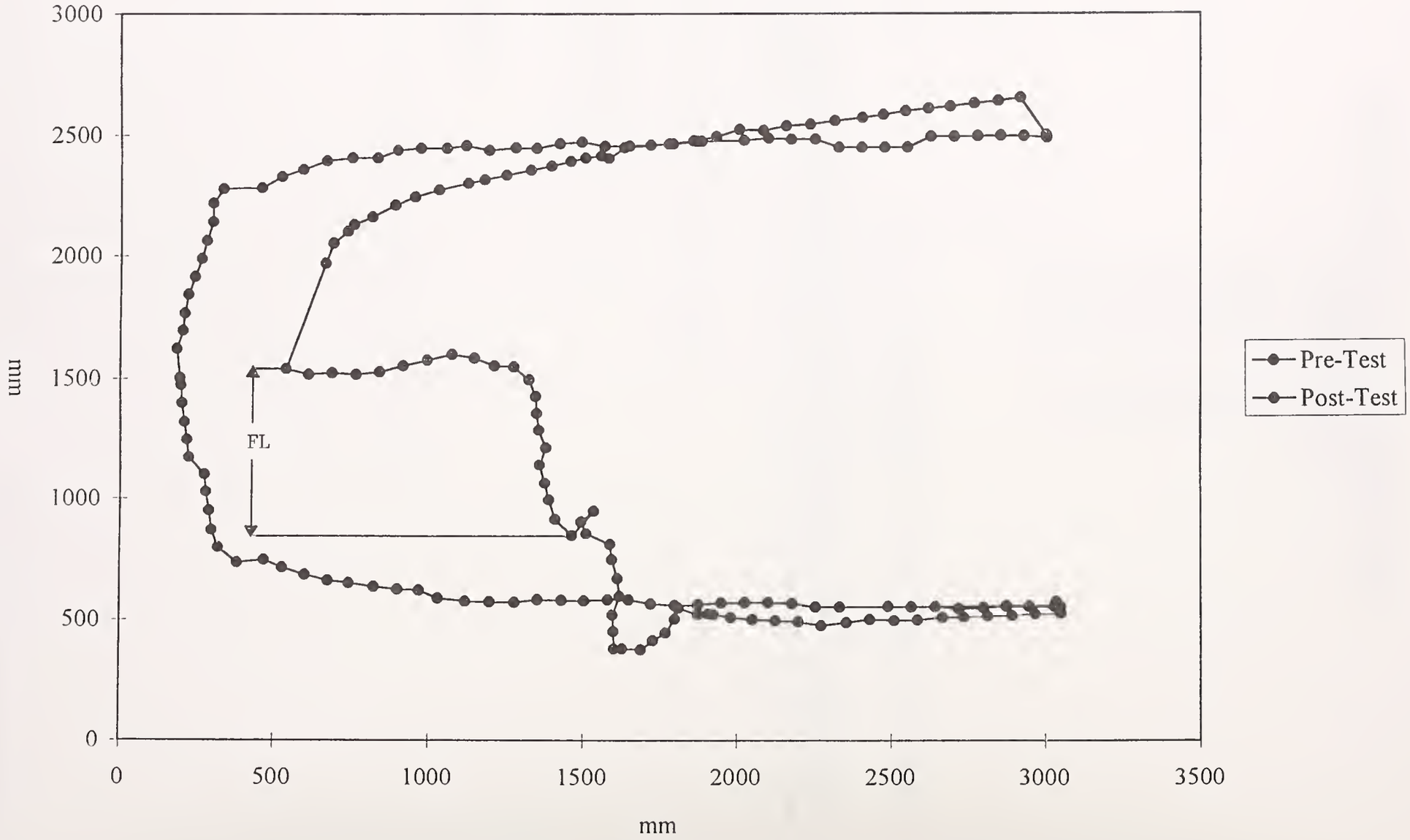


Table 25 Vehicle Measurements

Test No. 940607-5

Vehicle Make/Model: Chevrolet/Caprice

No.	Type Of Measurement	Pre-Test	Post-Test	Diff.
X1	Total Length Of Vehicle At Centerline	4766	2990	1776
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	3808	3818	-10
X5	Rear Surface Of Vehicle To Upper Leading Edge Of Left Door	3807	3651	156
X6	Rear Surface Of Vehicle To Lower Leading Edge Of Right Door	3805	3805	0
X7	Rear Surface Of Vehicle To Lower Leading Edge Of Left Door	3612	3643	-31
X8	Rear Surface Of Vehicle To Upper Trailing Edge Of Right Door	2589	2597	-8
X9	Rear Surface Of Vehicle To Upper Trailing Edge Of Left Door	2591	2505	86
X10	Rear Surface Of Vehicle To Lower Trailing Edge Of Right Door	2605	2635	-30
X11	Rear Surface Of Vehicle To Lower Trailing Edge Of Left Door	2599	2496	103
X12	Rear Surface Of Vehicle To Bottom Of "A" Post On Right Side	Na	Na	Na
X13	Rear Surface Of Vehicle To Bottom Of "A" Post On Left Side	Na	Na	Na
X14	Rear Surface Of Vehicle To Firewall - Right Side	Na	Na	Na
X15	Rear Surface Of Vehicle To Firewall - Left Side	Na	Na	Na
X16	Rear Surface Of Vehicle To Steering Wheel Center	Na	2789	Na
X17	Center Of Steering Column To "A" Post	Na	218	Na
X18	Center Of Steering Column To Headliner	Na	746	Na
X19	Rear Surface Of Vehicle To Right Side Of Front Bumper	5382	5096	286
X20	Rear Surface Of Vehicle To Left Side Of Front Bumper	4566	4112	454
X21	Length Of Engine Block	Na	Na	Na

All distance measurements are in millimeters.

Table 26 Vehicle Accelerometer Locations And Data Summary

Test No. 940607-5

TEST NUMBER: 940607-5 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 VEHICLE CENTER OF GRAVITY	3220 mm	0 mm	NA mm				
LONGITUDINAL				39.0 g	@ 62.3 ms	95.8 g	@ 38.5 ms
LATERAL				31.1 g	@ 61.8 ms	44.1 g	@ 47.1 ms
VERTICAL[1]				93.4 g	@ 48.3 ms	76.0 g	@ 39.1 ms
RESULTANT[1]				121.4 g	@ 38.7 ms		
2 LEFT REAR SILL	2340 mm	730 mm	NA mm				
LONGITUDINAL				3.1 g	@ 182.6 ms	33.8 g	@ 59.2 ms
LATERAL				10.4 g	@ 80.5 ms	19.8 g	@ 51.8 ms
3 RIGHT REAR SILL	2340 mm	-730 mm	NA mm				
LONGITUDINAL				2.8 g	@ 193.0 ms	30.8 g	@ 54.2 ms
LATERAL				6.8 g	@ 103.3 ms	16.3 g	@ 47.5 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 27 Camera Information

Test No. 940607-5

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose Of Camera Data
1	Left tight	Photosonic	13	508	Impact overall
2	Right tight	Photosonic	13	502	Impact overall
3	Overhead	Photosonic	13	500	Impact overall

Appendix A

Photographs

List Of Photographs

Test No. 940607-1

A-1. Pre-Test Right Side View

A-2. Post-Test Right Side View

A-3. Pre-Test Right Front Three-Quarter View

A-4. Post-Test Right Front Three-Quarter View

A-5. Pre-Test Front View

A-6. Post-Test Front View

A-7. Pre-Test Left Front Three-Quarter View

A-8. Post-Test Left Front Three-Quarter View

A-9. Pre-Test Left Side View

A-10. Post-Test Left Side View

A-11. Pre-Test Rear View

A-12. Post-Test Rear View

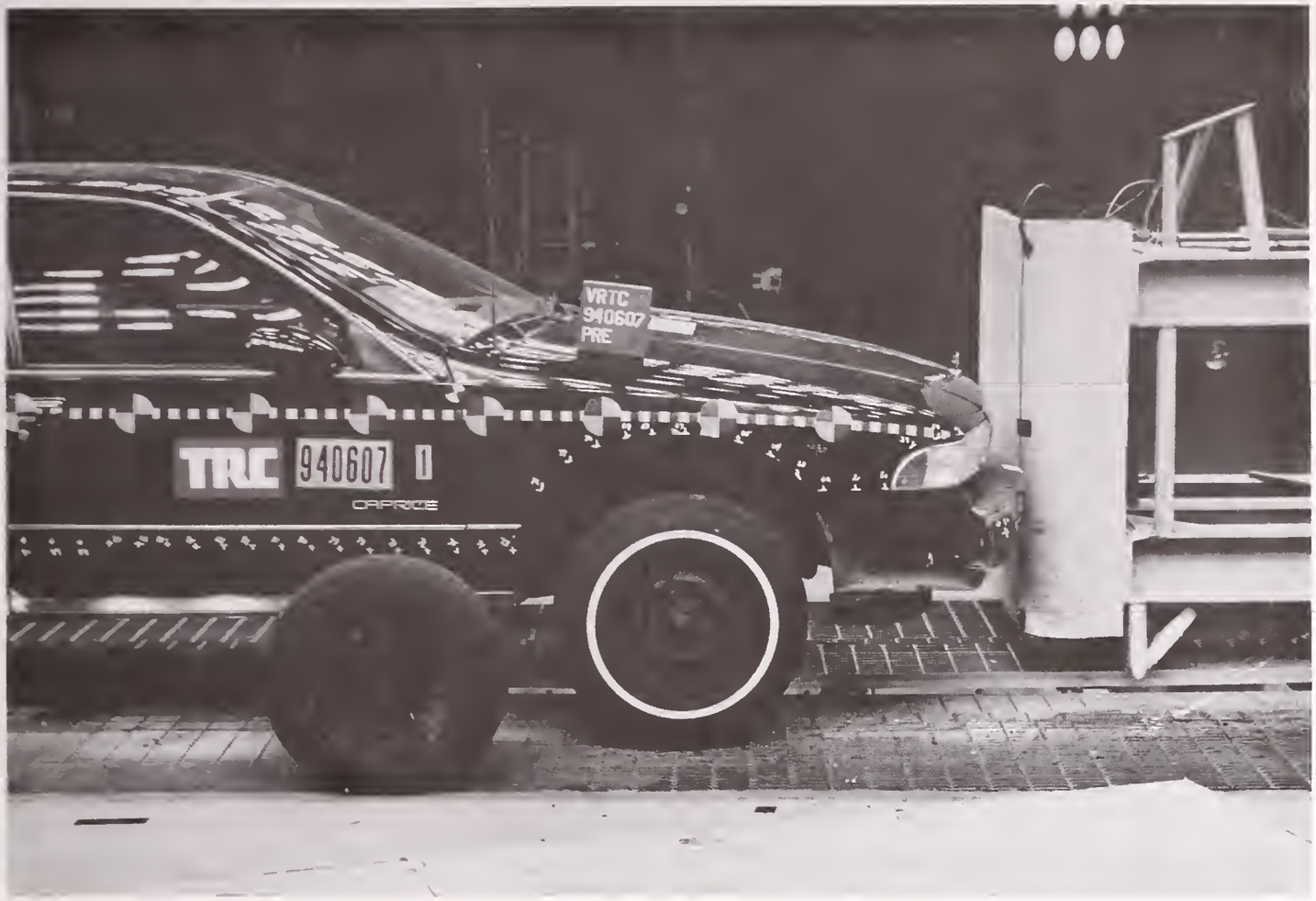


Figure A-1 Pre-Test Right Side View

Figure A-2 Post-Test Right Side View

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

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

Figure A-5 Pre-Test Front View

Figure A-6 Post-Test Front View

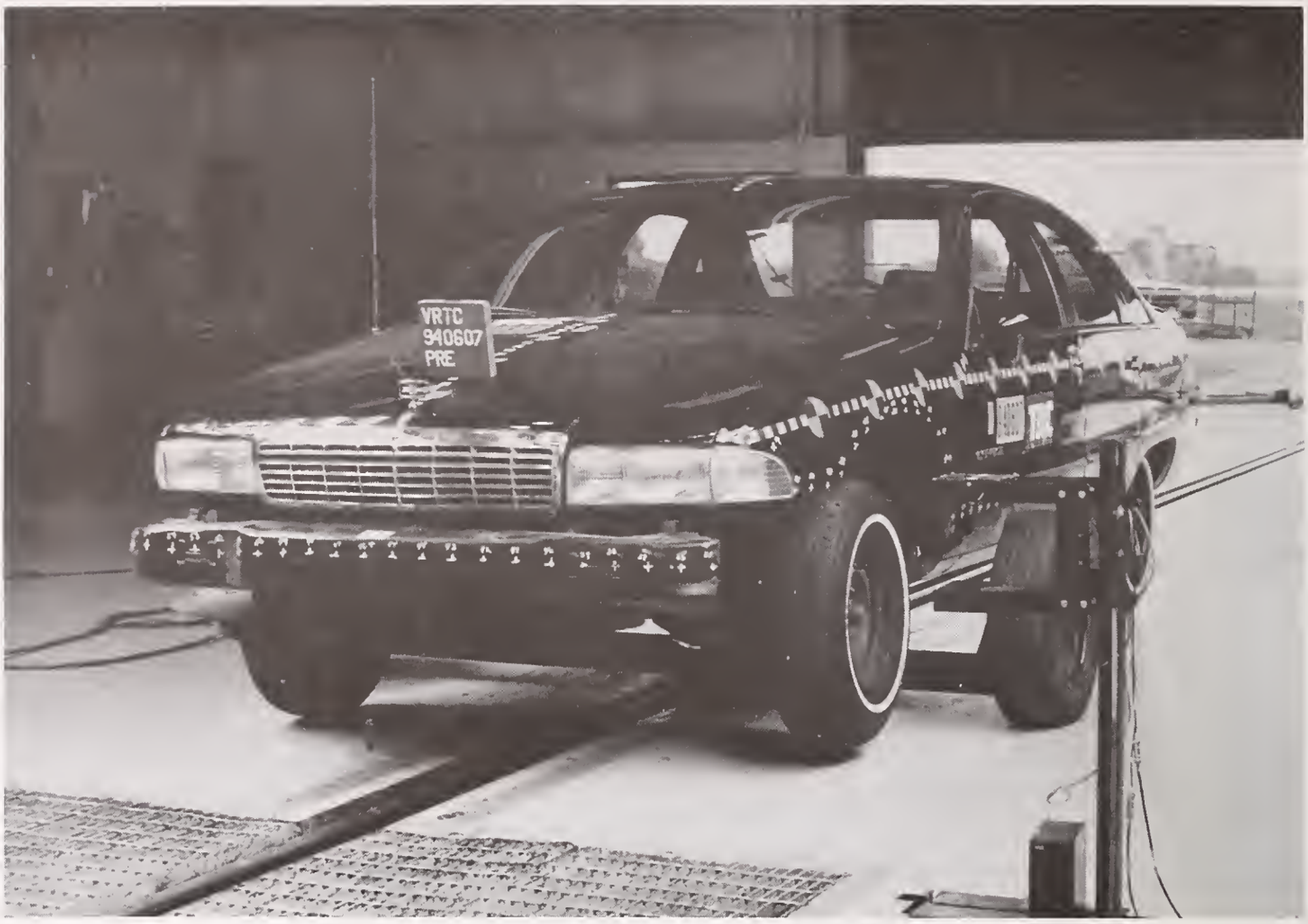


Figure A-7 Pre-Test Left Front Three-Quarter View

Figure A-8 Post-test Left Front Three-Quarter View

Figure A-9 Pre-Test Left Side View

Figure A-10 Post-Test Left Side View

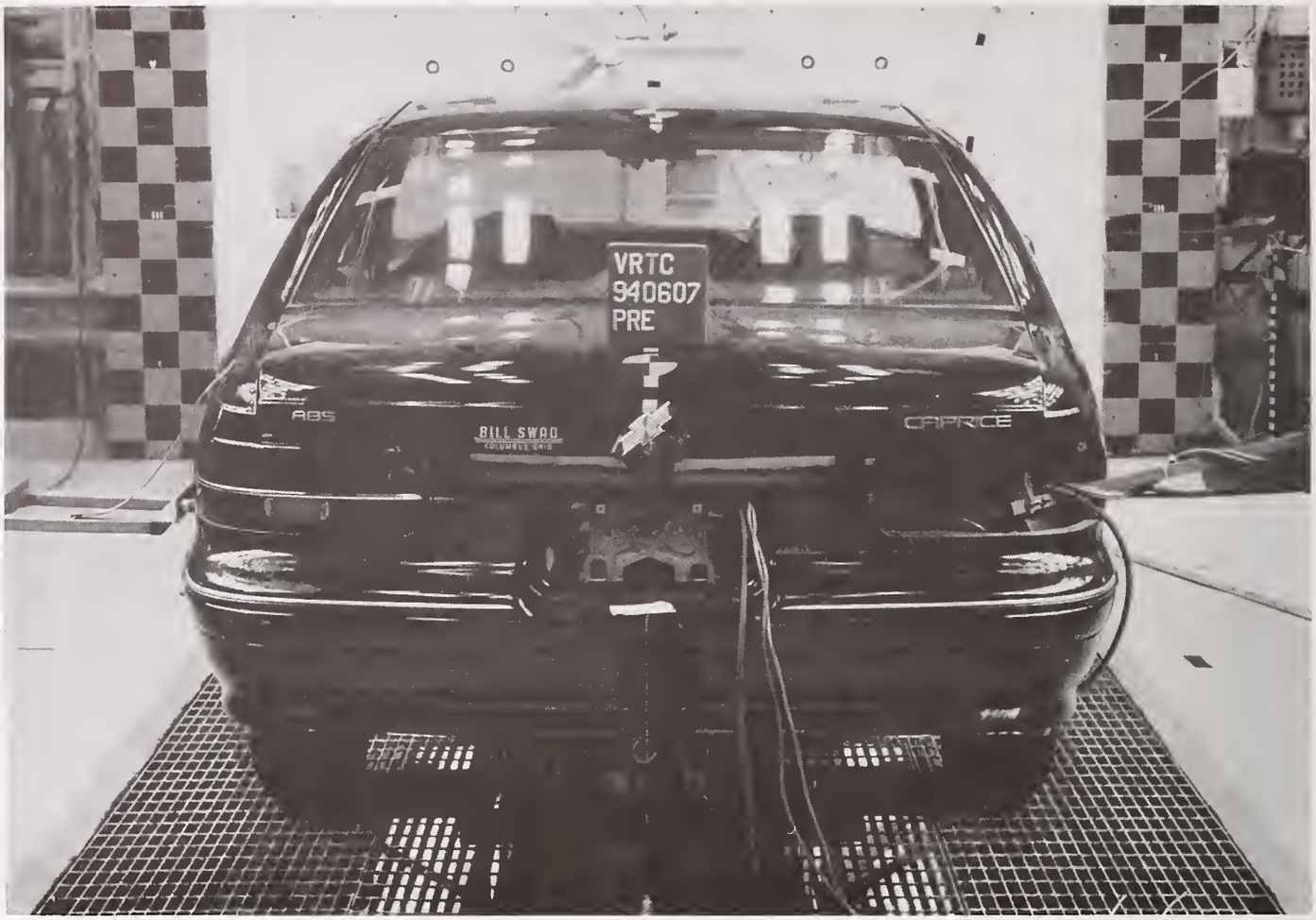


Figure A-11 Pre-Test Rear View

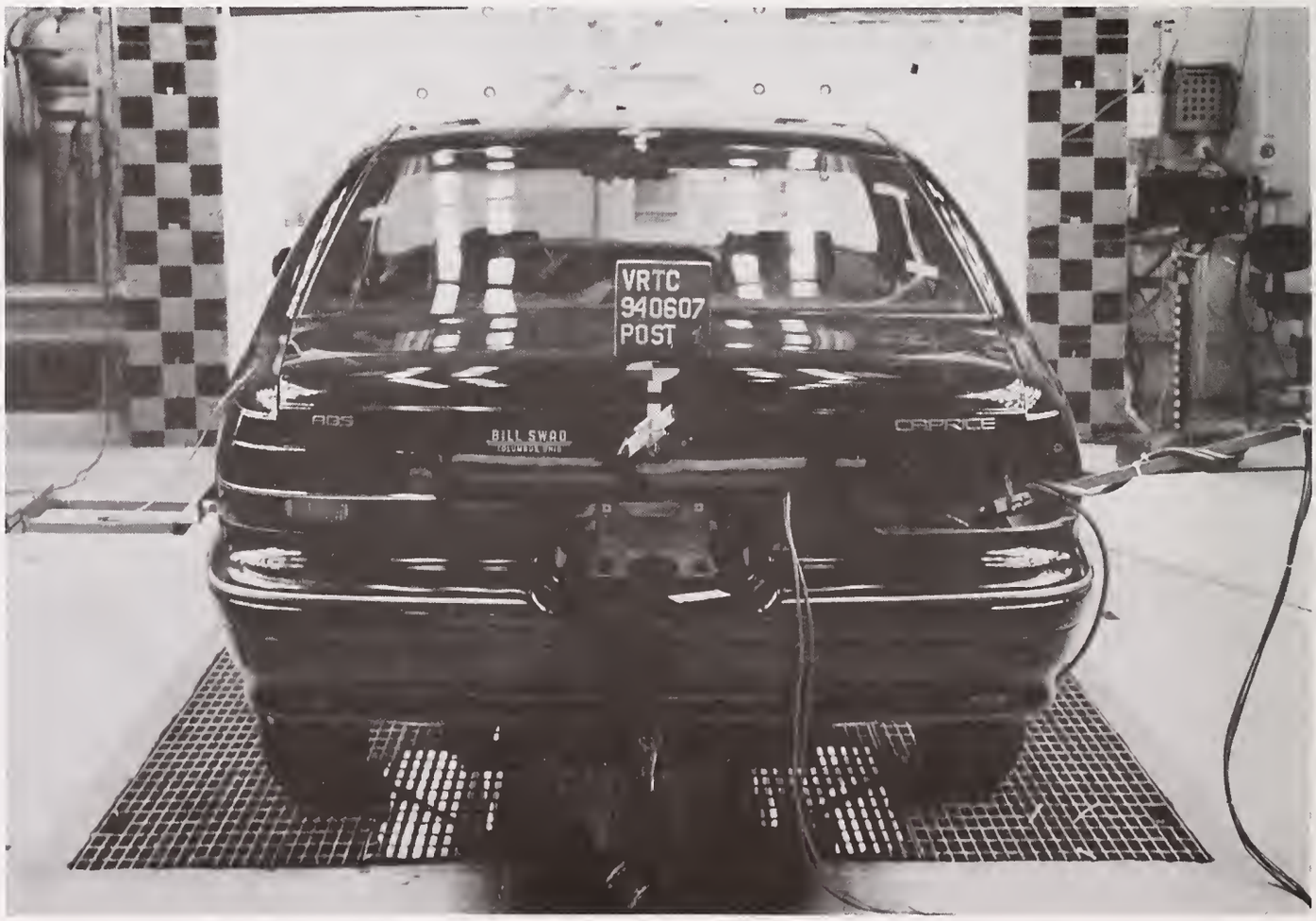


Figure A-12 Post-Test Rear View

List Of Photographs

Test No. 940607-2

A-13. Post-Test Right Side View

A-14. Post-Test Right Front Three-Quarter View

A-15. Post-Test Front View

A-16. Post-Test Left Front Three-Quarter View

A-17. Post-Test Left Side View

A-18. Post-Test Rear View

Figure A-13 Post-Test Right Side View

Figure A-14 Post-Test Right Front Three-Quarter View

Figure A-15 Post-Test Front View

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

Figure A-17 Post-Test Left Side View

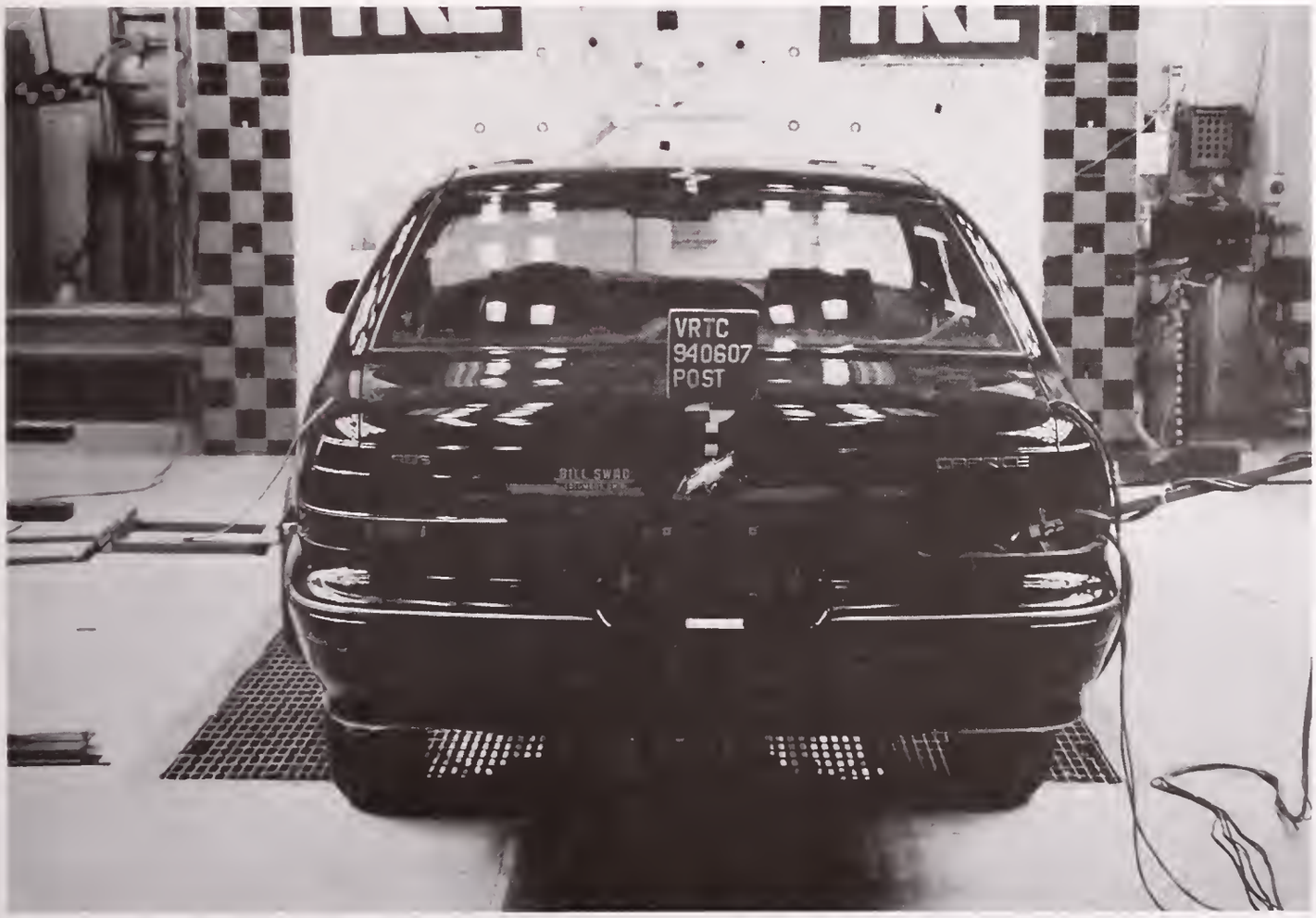


Figure A-18 Post-Test Rear View

List Of Photographs

Test No. 940607-3

A-19. Post-Test Right Side View

A-20. Post-Test Right Front Three-Quarter View

A-21. Post-Test Front View

A-22. Post-Test Left Front Three-Quarter View

A-23. Post-Test Left Side View

A-24. Post-Test Rear View

Figure A-19 Post-Test Right Side View

Figure A-20 Post-Test Right Front Three-Quarter View

Figure A-21 Post-Test Front View

Figure A-22 Post-Test Left Front Three-Quarter View

Figure A-23 Post-Test Left Side View

Figure A-24 Post-Test Rear View

List Of Photographs

Test No. 940607-4

A-25. Post-Test Right Side View

A-26. Post-Test Right Front Three-Quarter View

A-27. Post-Test Front View

A-28. Post-Test Left Front Three-Quarter View

A-29. Post-Test Left Side View

A-30. Post-Test Rear View

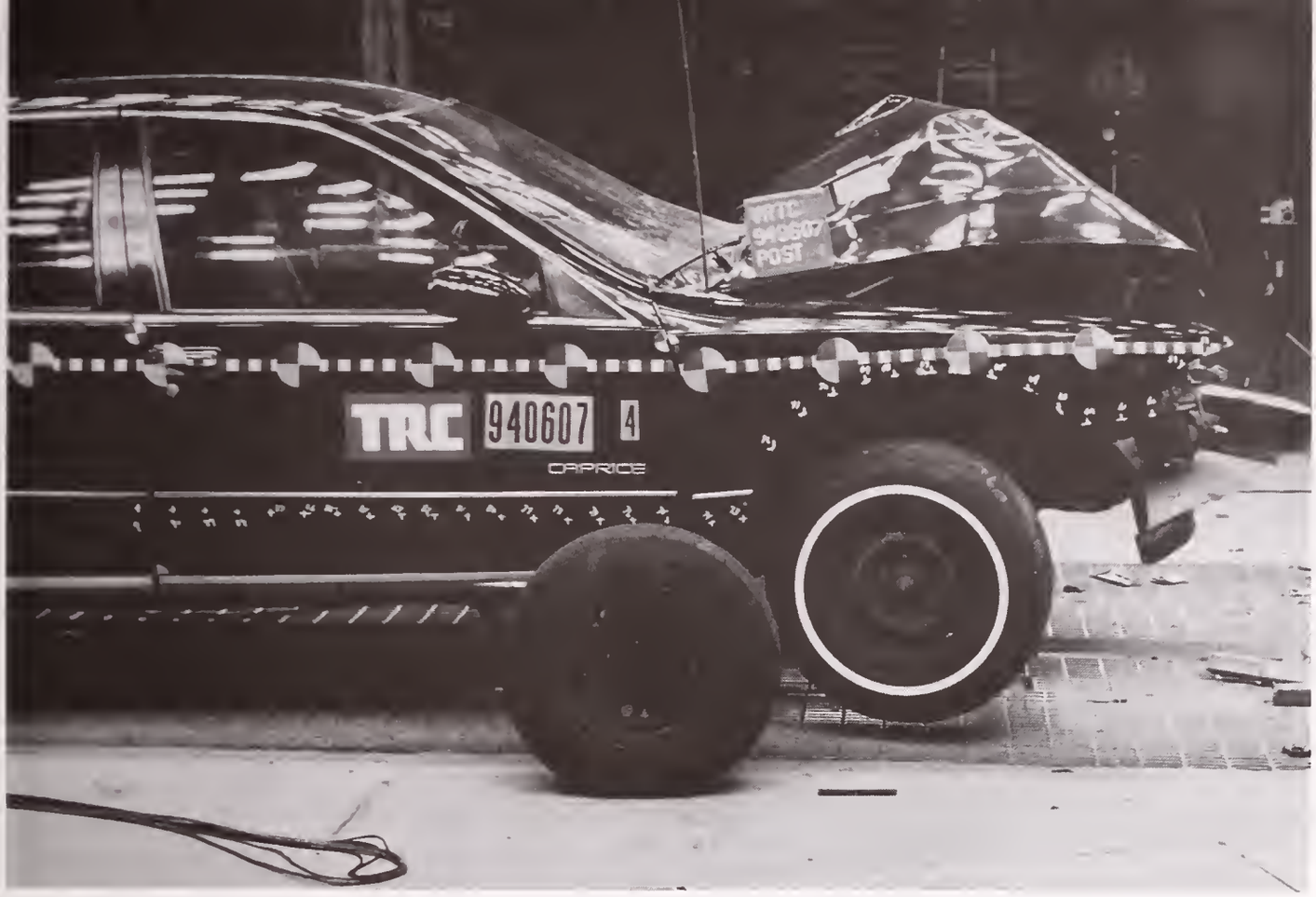


Figure A-25 Post-Test Right Side View

Figure A-26 Post-Test Right Front Three-Quarter View

Figure A-27 Post-Test Front View

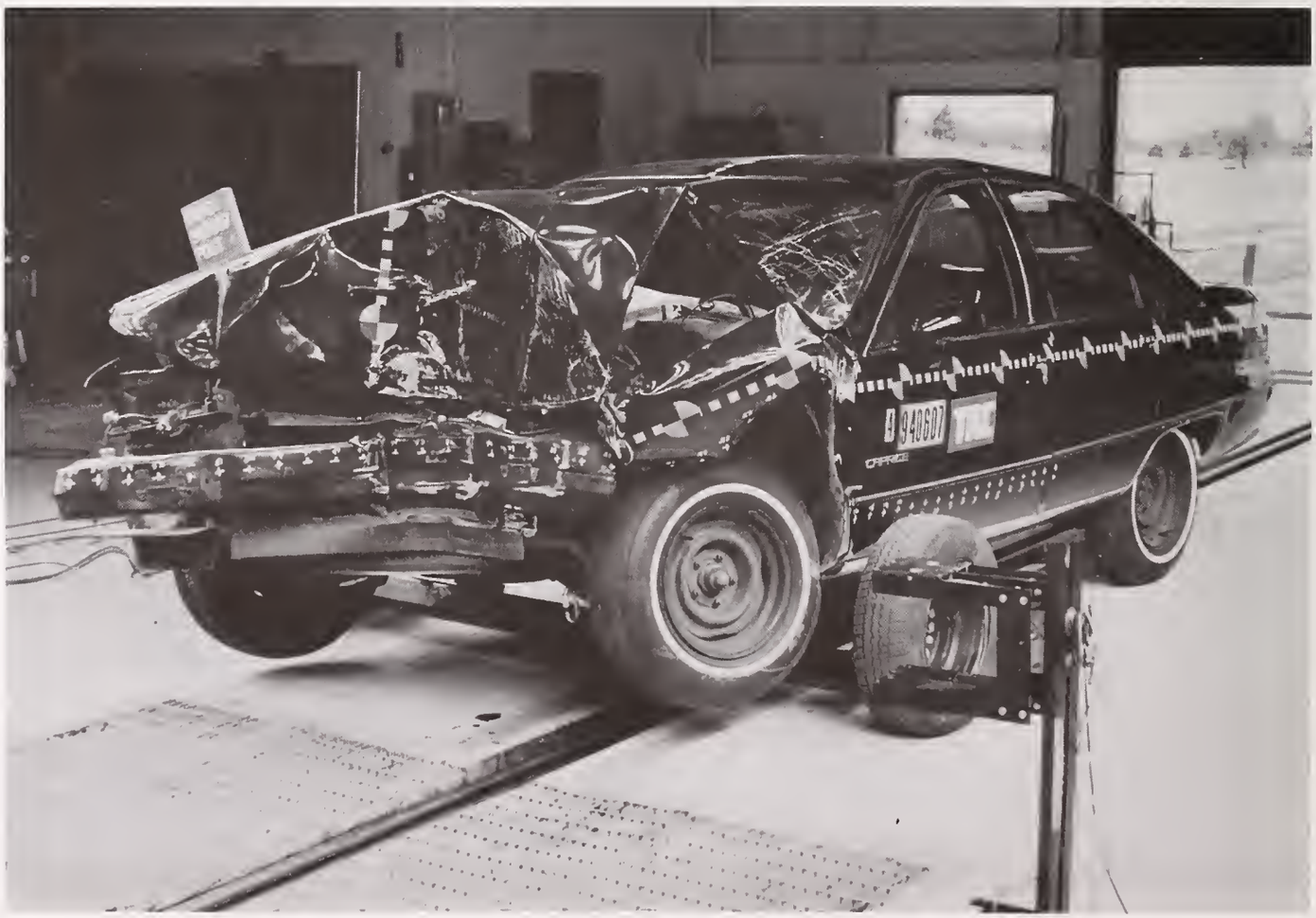


Figure A-28 Post-Test Left Front Three-Quarter View

Figure A-29 Post-Test Left Side View

Figure A-30 Post-Test Rear View

List Of Photographs

Test No. 940607-5

A-31. Post-Test Right Side View

A-32. Post-Test Right Front Three-Quarter View

A-33. Post-Test Front View

A-34. Post-Test Left Front Three-Quarter View

A-35. Post-Test Left Side View

A-36. Post-Test Rear View

Figure A-31 Post-Test Right Side View

Figure A-32 Post-Test Right Front Three-Quarter View

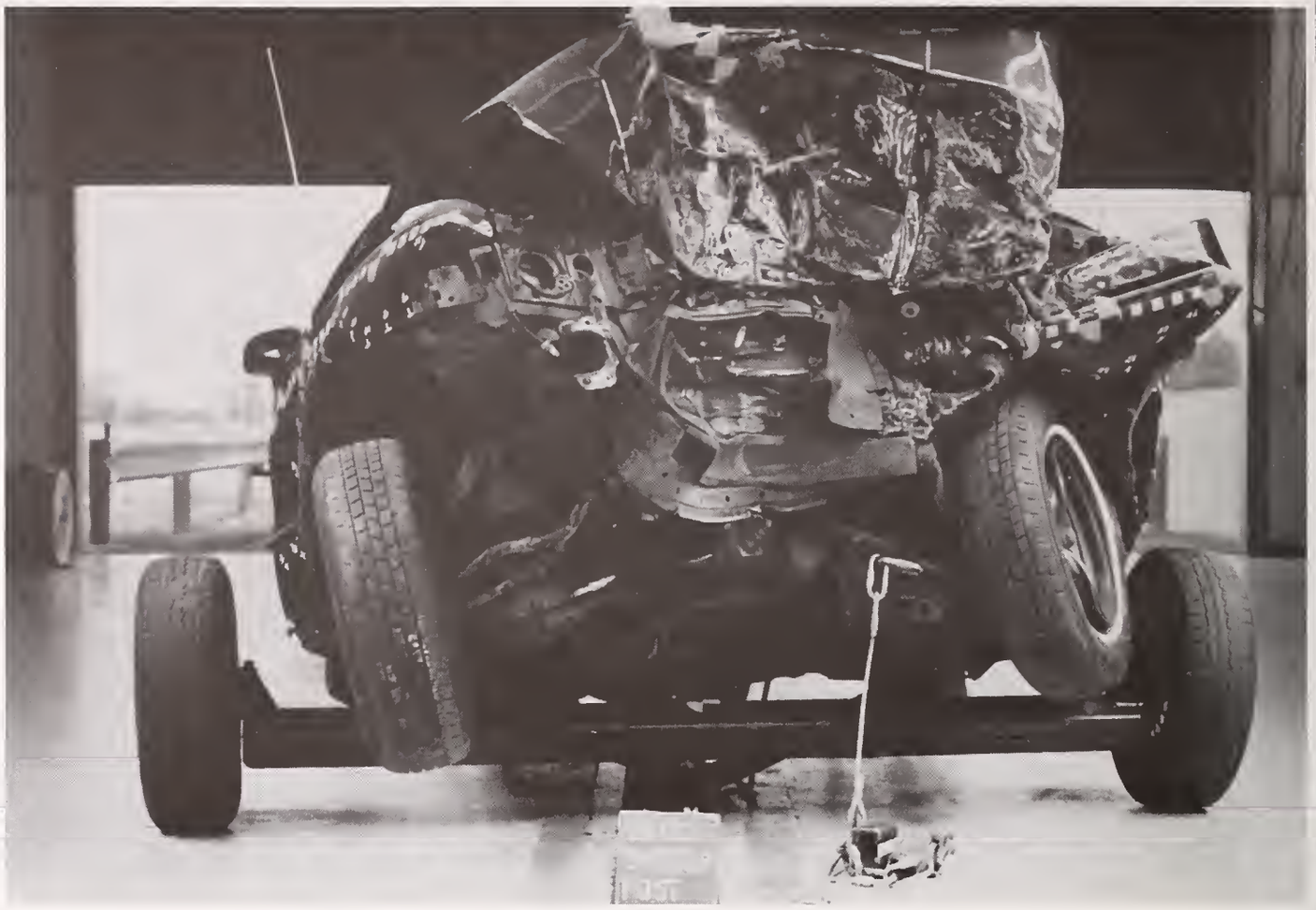


Figure A-33 Post-Test Front View

Figure A-34 Post-Test Left Front Three-Quarter View

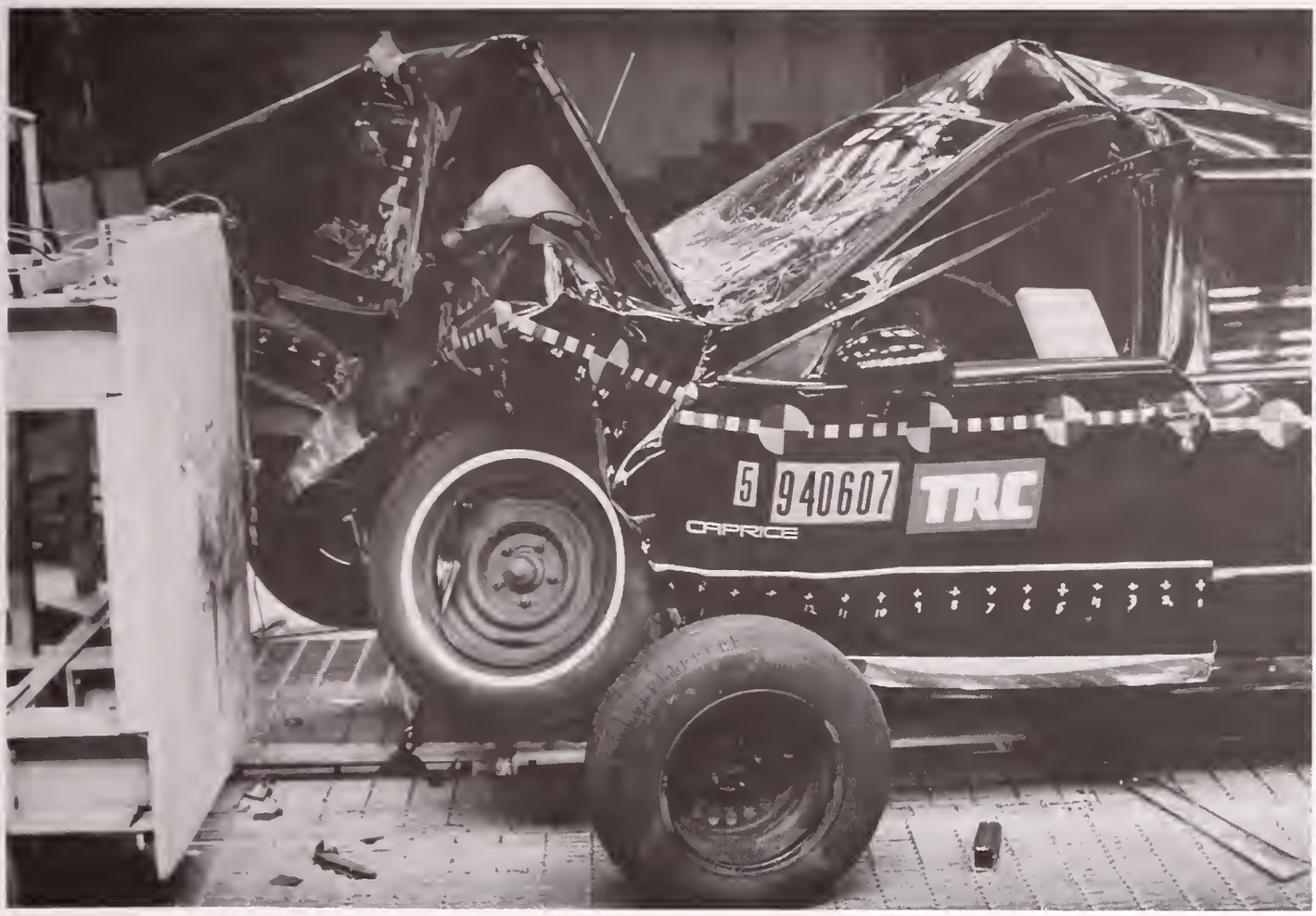


Figure A-35 Post-Test Left Side View

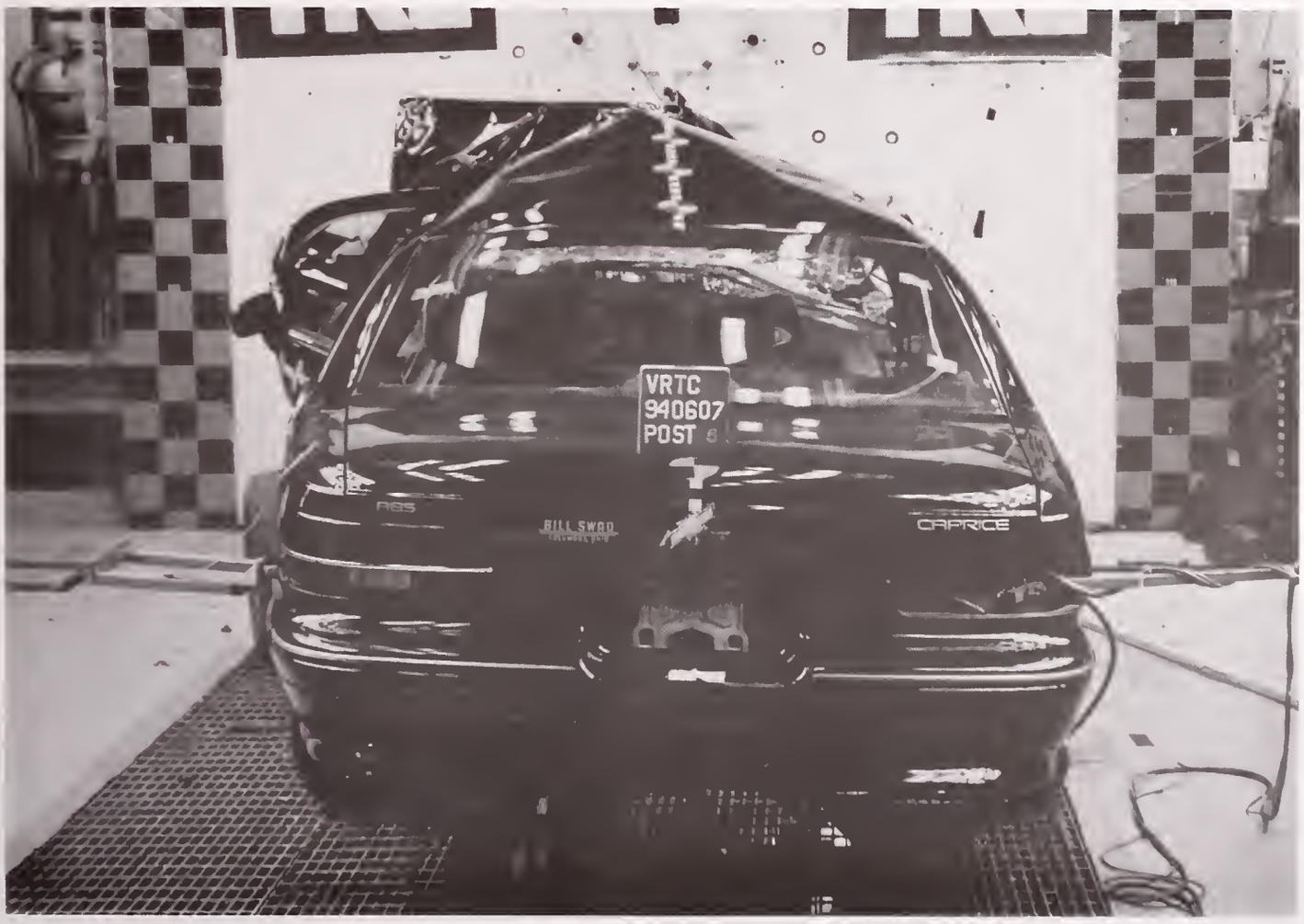


Figure A-36 Post-Test Rear View

Appendix B

Data Plots

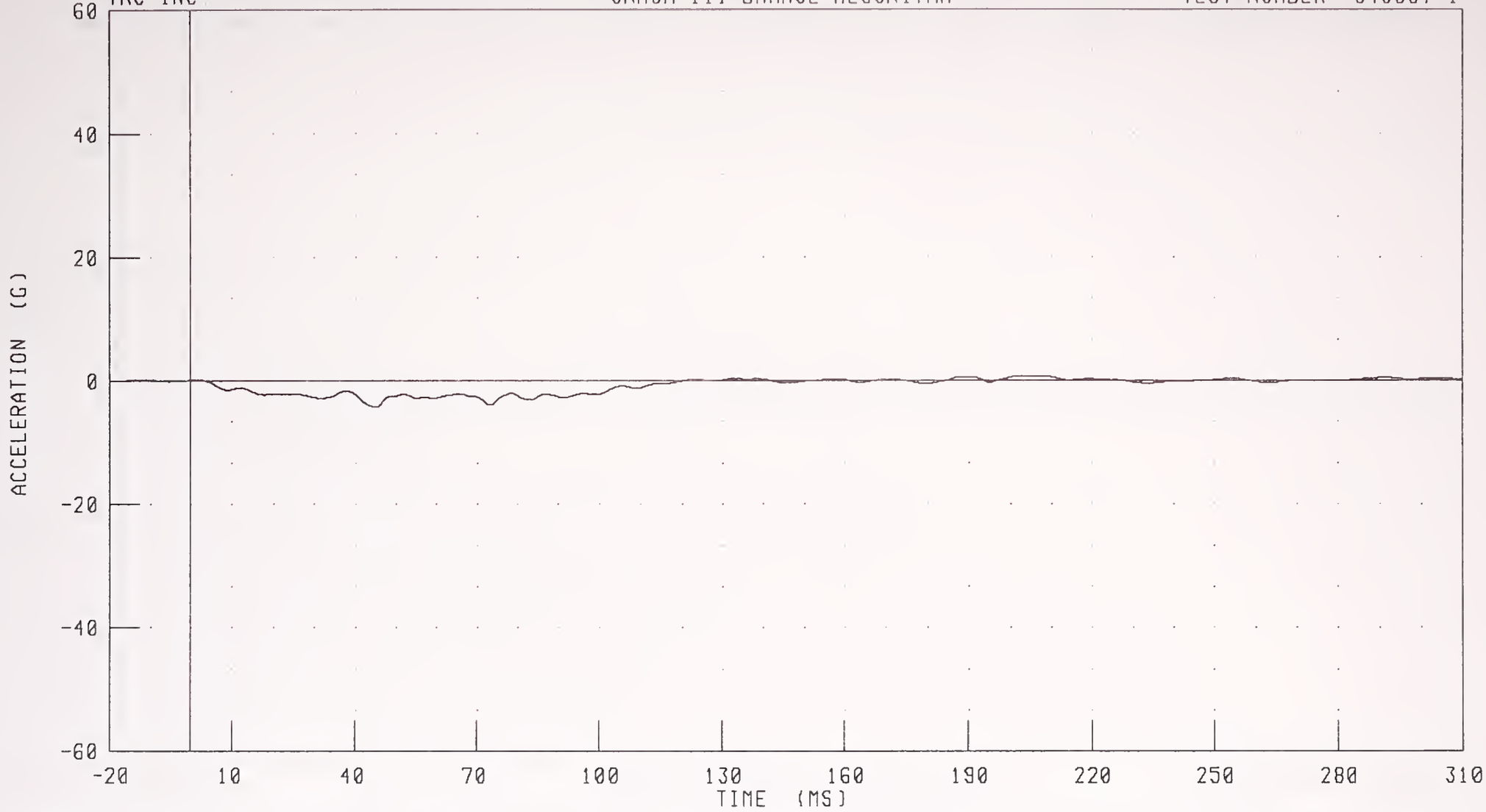
Data Plots

Test No. 940607-1

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

VEHICLE CG X-AXIS ACCELERATION

TRC INC CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-1

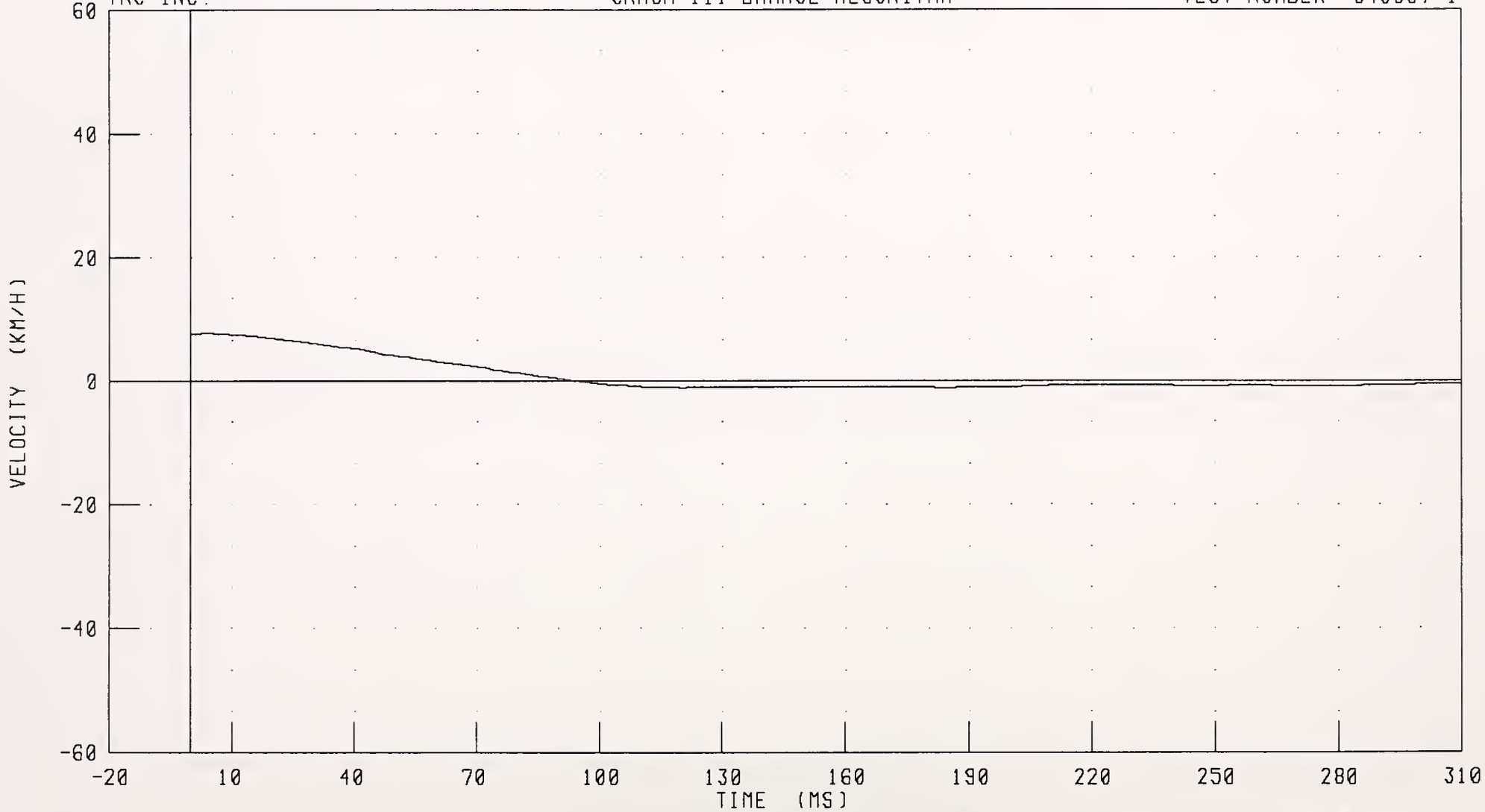


CHANNEL: VCGXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.75 G @ 207.92 MS; -4.25 G @ 44.88 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

VEHICLE CG X-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1

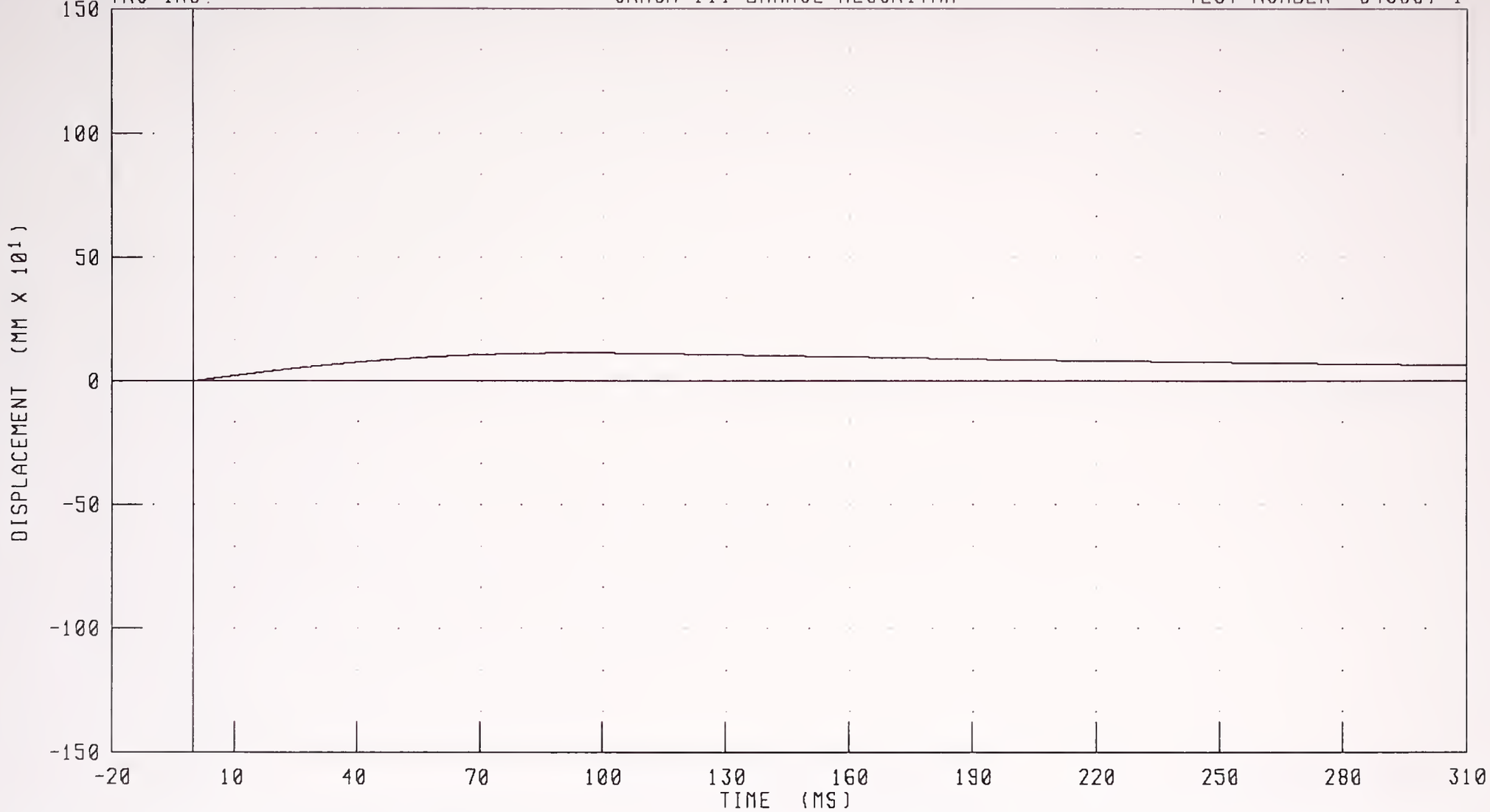


CHANNEL: VCGXV1 FILTER: CH. CLASS 180 PEAK DATA: 7.72 KM/H @ 4.48 MS; -1.12 KM/H @ 185.68 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 1

VEHICLE CG X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1



CHANNEL: VCGX01 FILTER: CH. CLASS 180 PEAK DATA: 113.36 MM @ 94.00 MS; 0.00 MM @ 0.00 MS

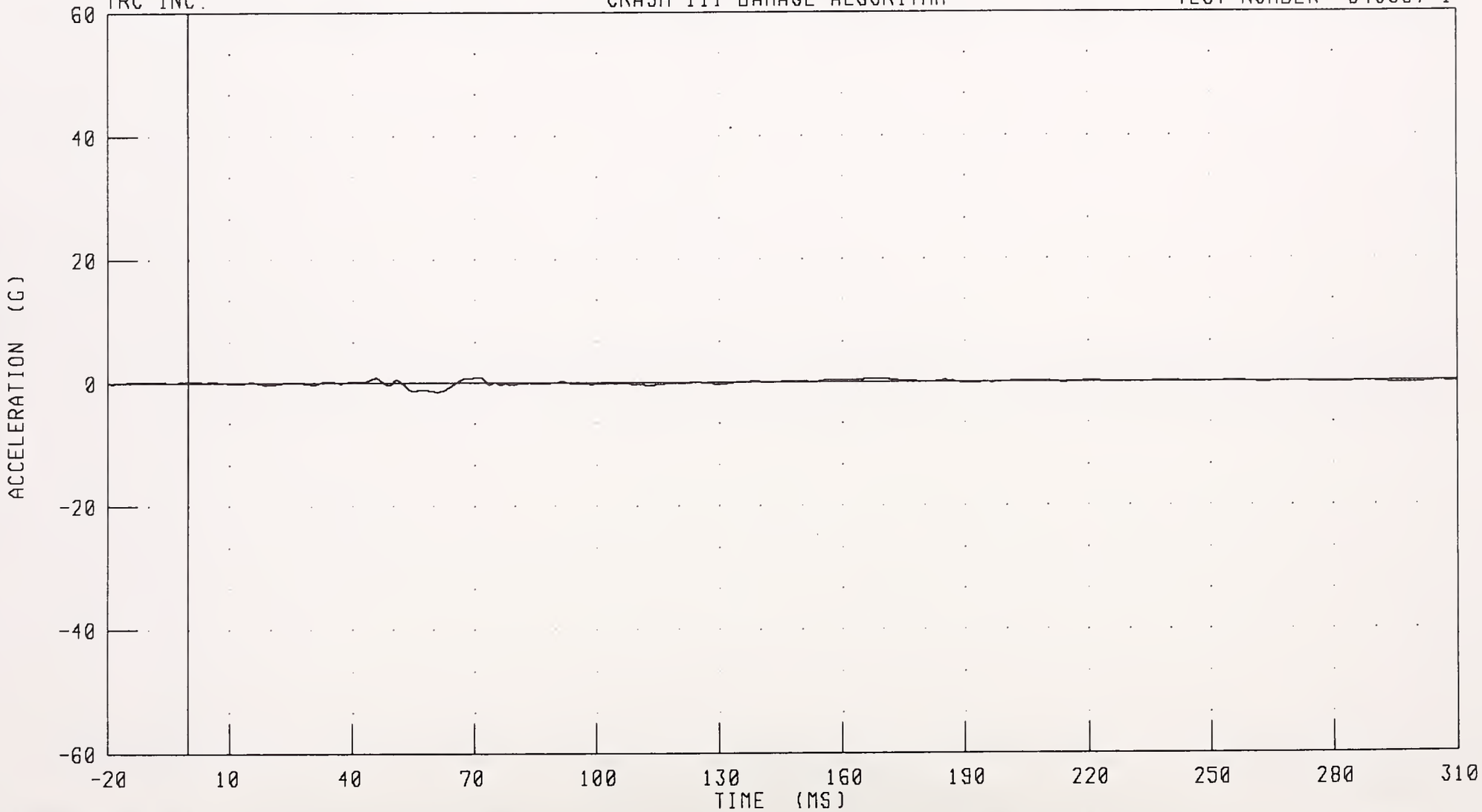
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

VEHICLE CG Y-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-1



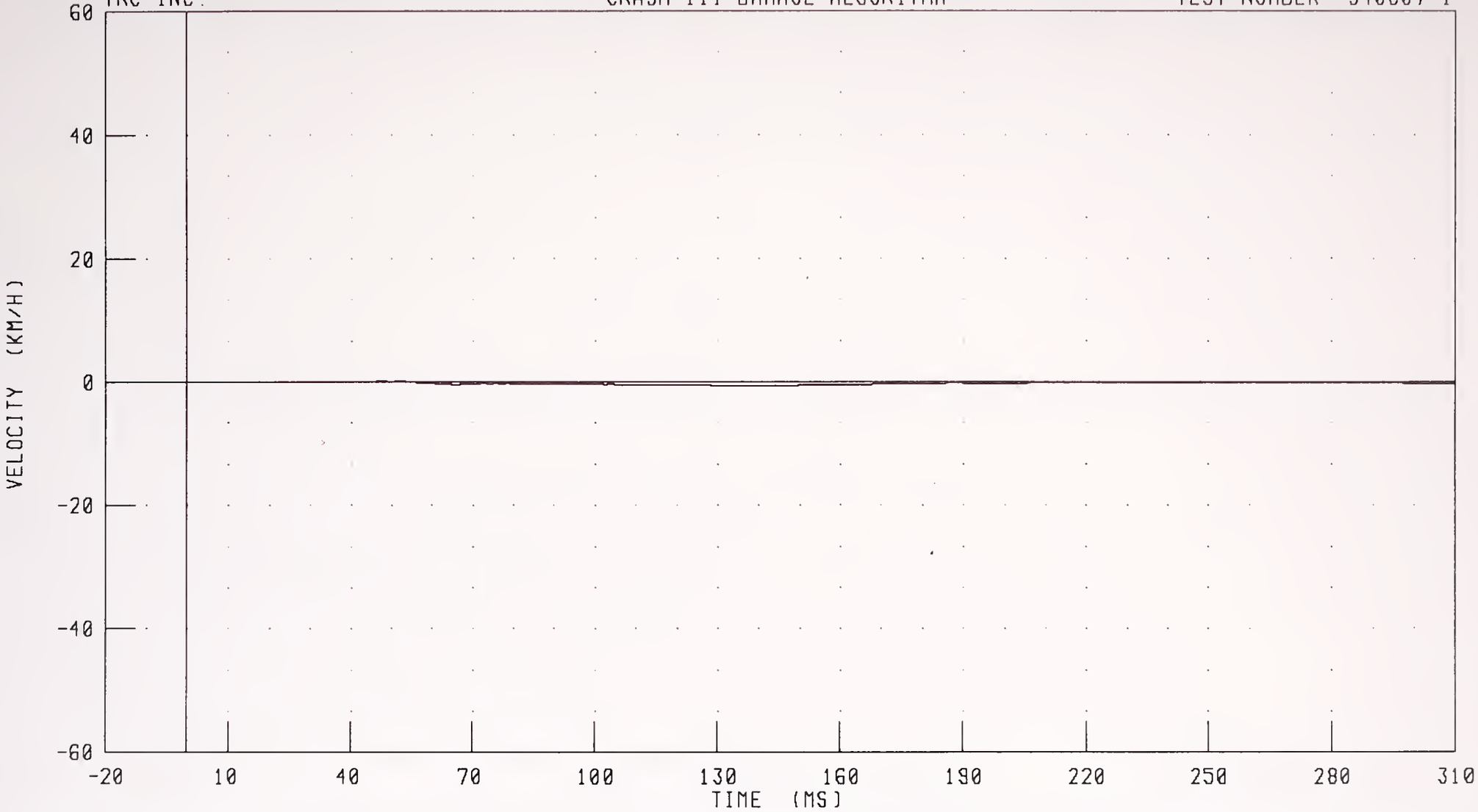
CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 0.88 G @ 71.28 MS, -1.47 G @ 60.96 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

VEHICLE CG Y-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-1

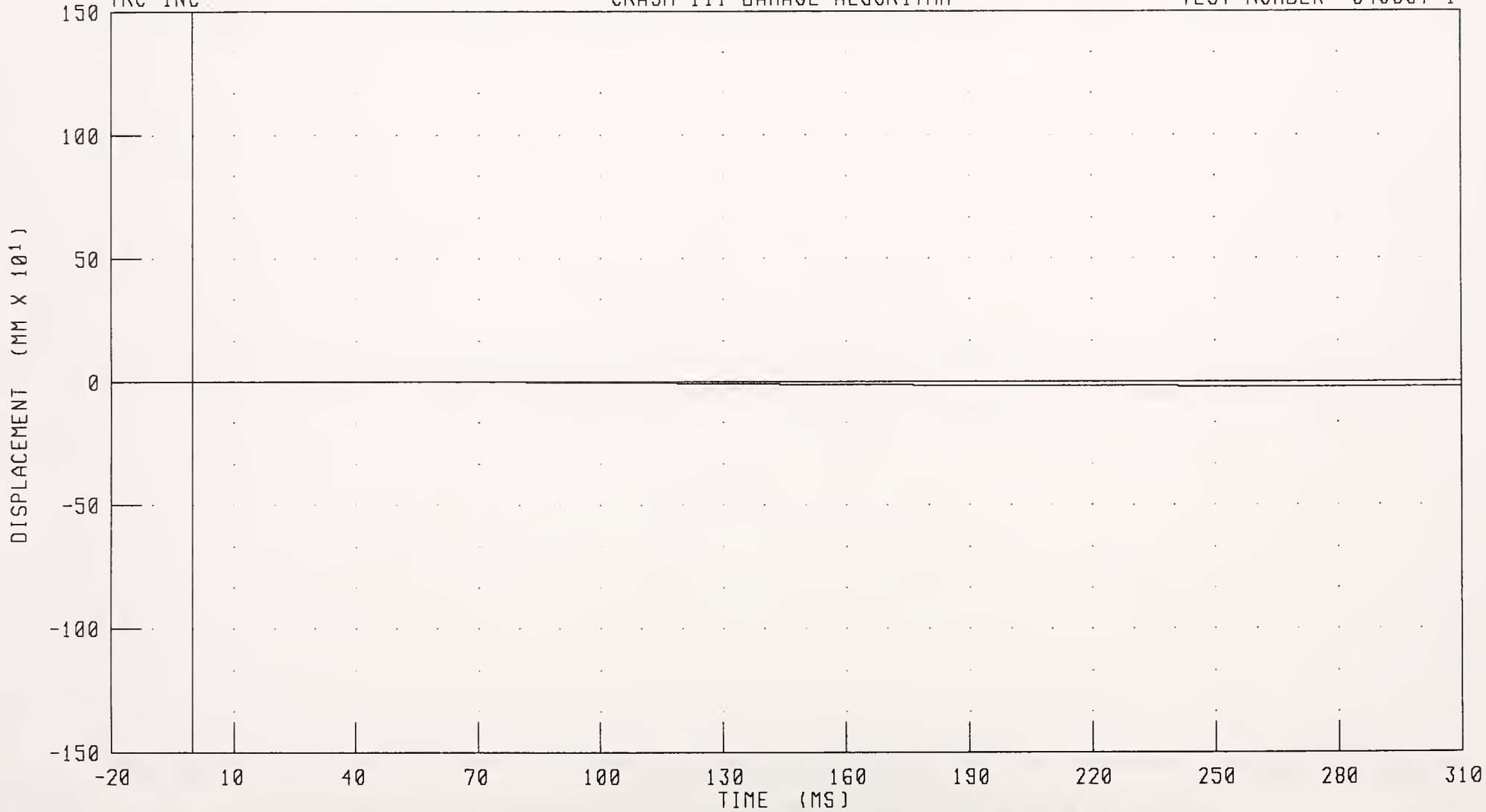


CHANNEL: VCGYV1 FILTER: CH CLASS 180 PEAK DATA: 0.15 KM/H @ 51.44 MS; -0.64 KM/H @ 133.92 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

VEHICLE CG Y-AXIS DISPLACEMENT

TRC INC CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1

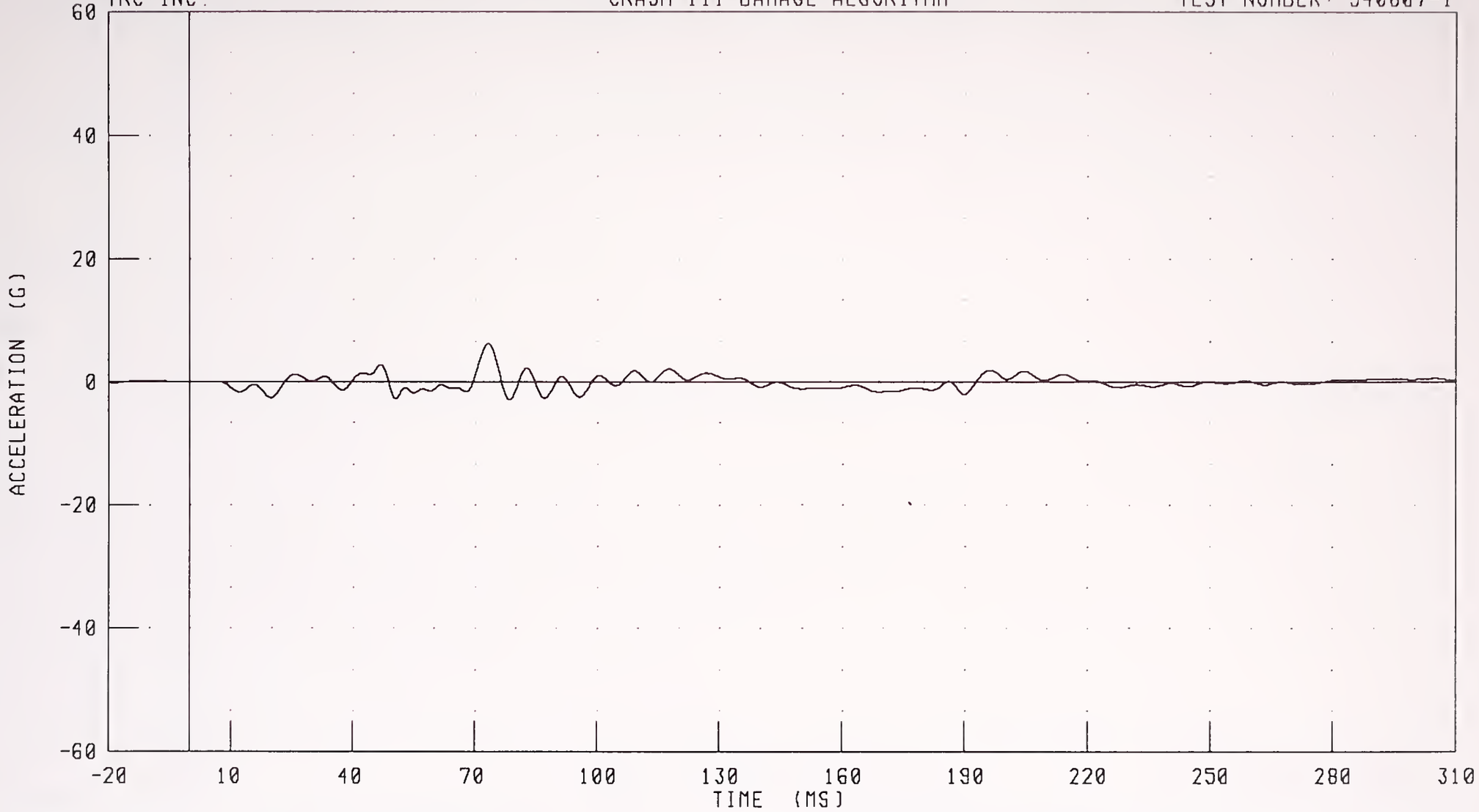


CHANNEL: VCGYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.12 MM @ 54.88 MS; -22.13 MM @ 310.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 1

VEHICLE CG Z-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1

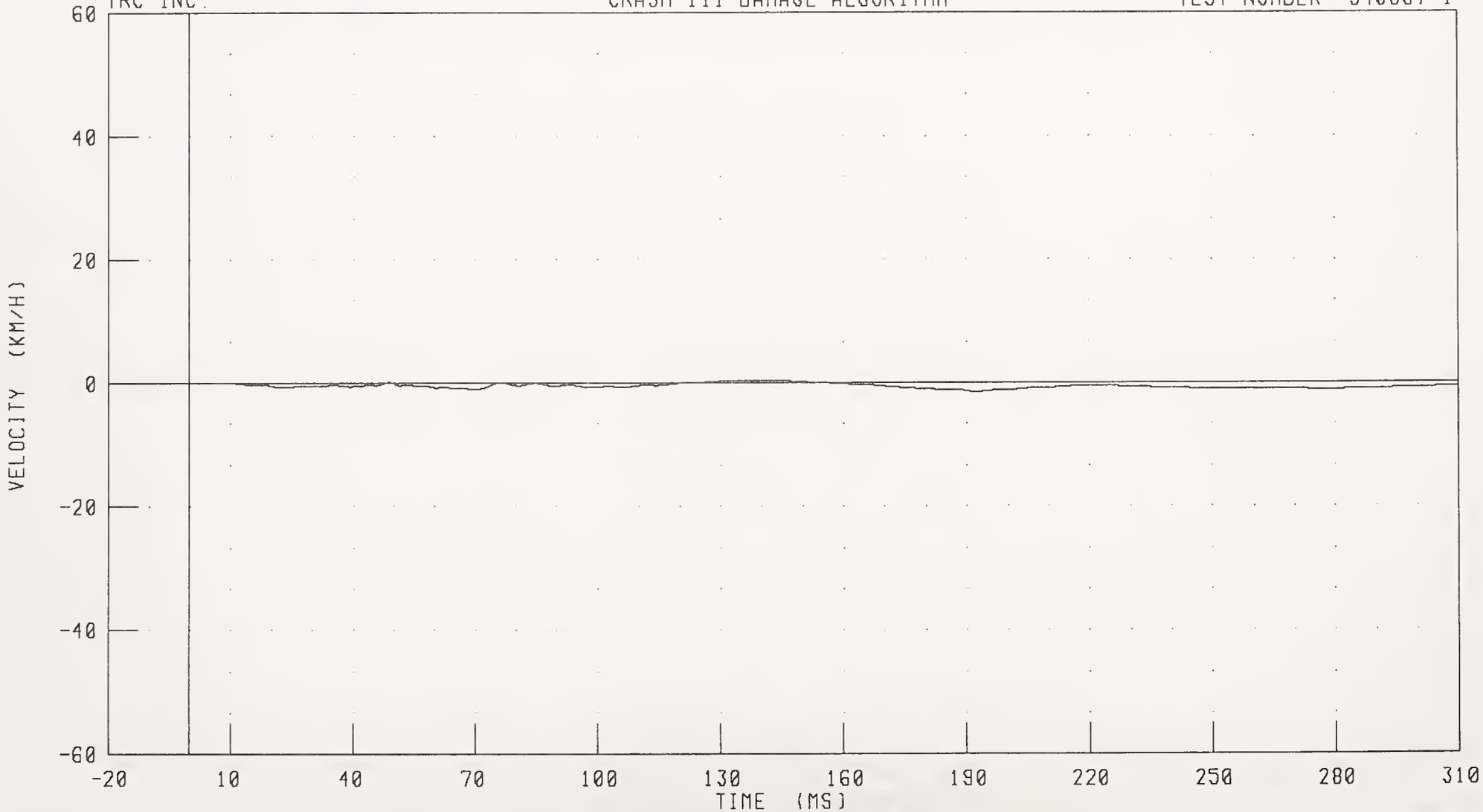


CHANNEL: VCGZG1 FILTER: CH. CLASS 60 PEAK DATA: 6.30 G @ 73.36 MS; -2.90 G @ 78.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

VEHICLE CG Z-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1

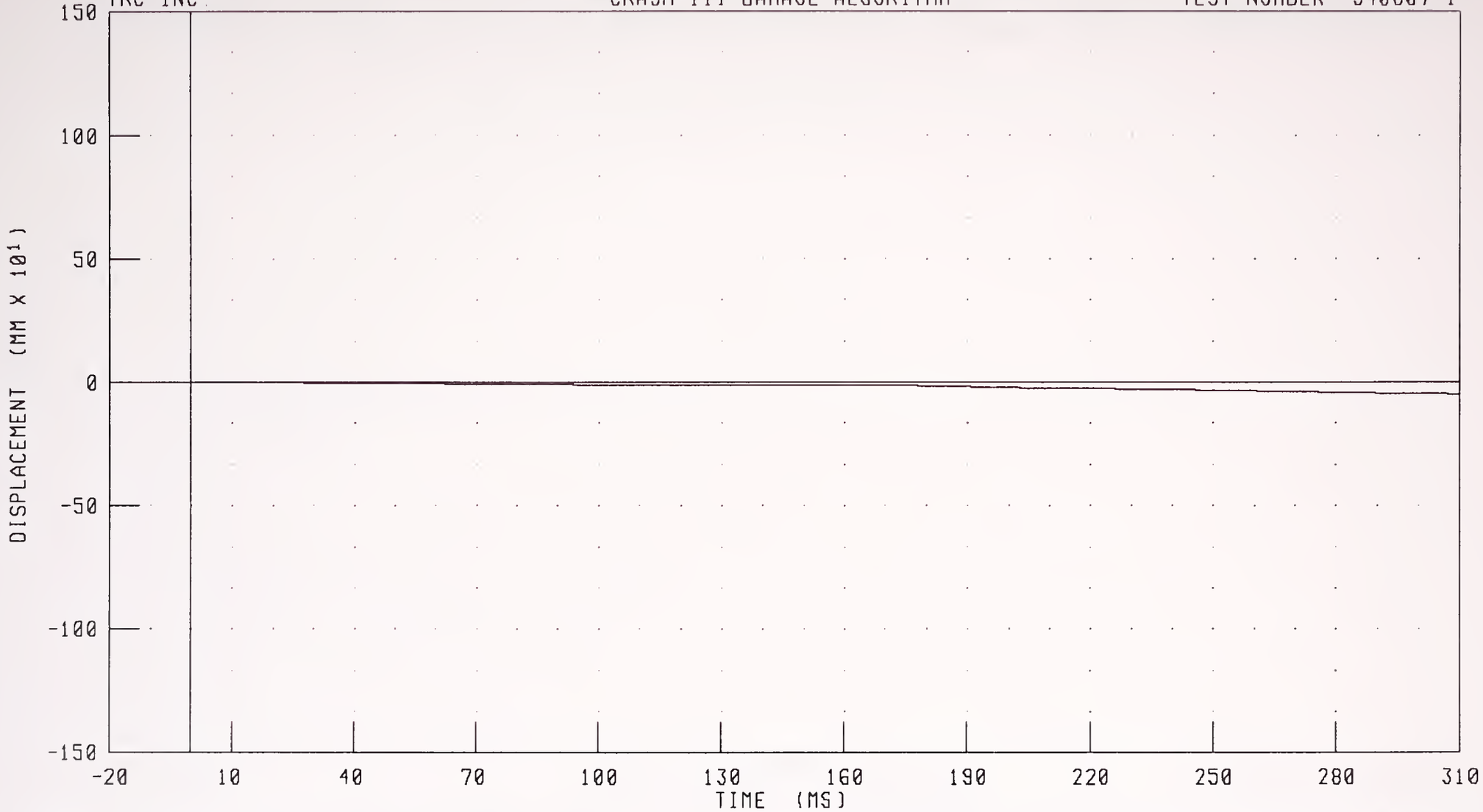


CHANNEL: VCGZV1 FILTER: CH. CLASS 180 PEAK DATA: 0.41 KM/H @ 137.44 MS; -1.46 KM/H @ 192.16 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

VEHICLE CG Z-AXIS DISPLACEMENT

TRC INC CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-1

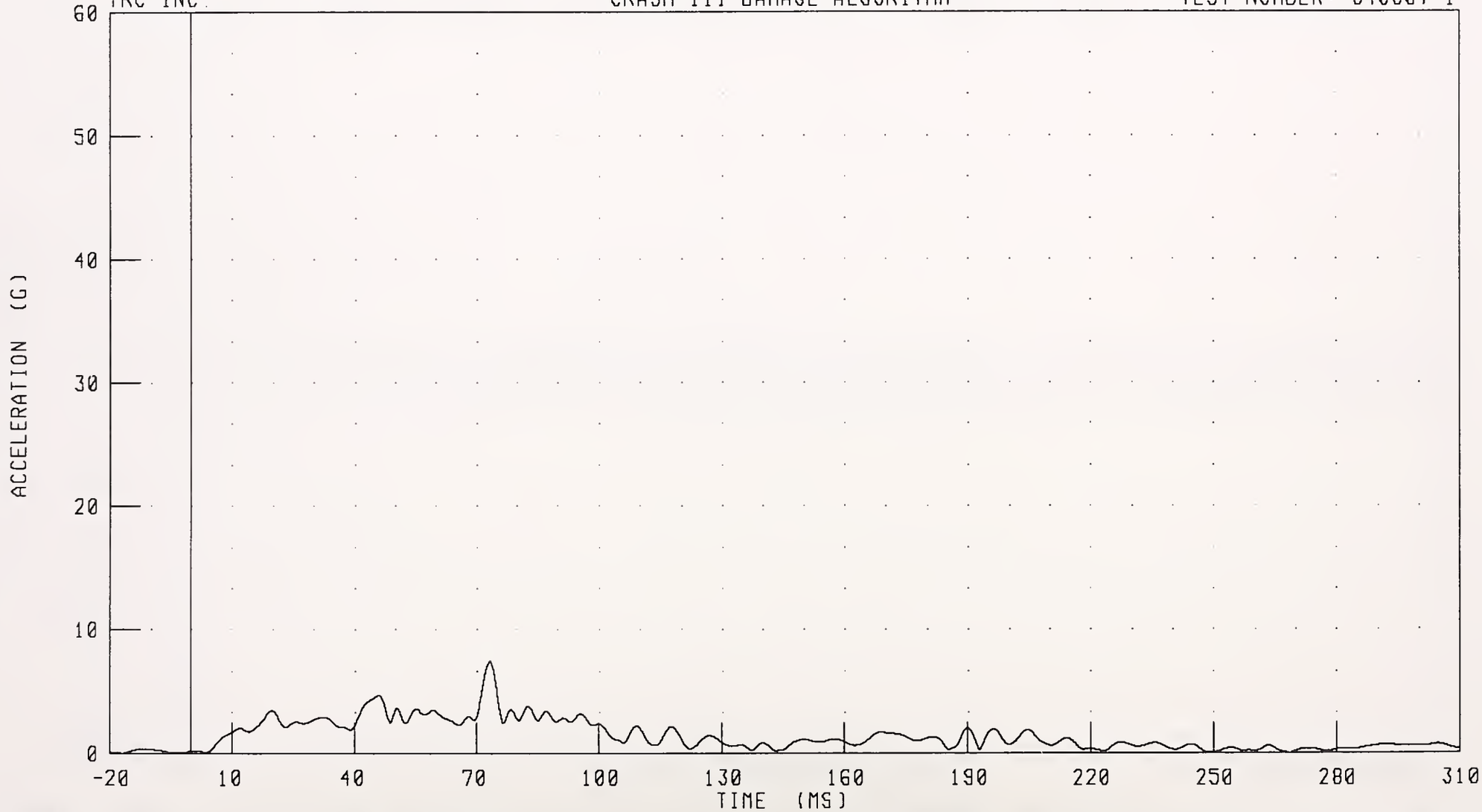


CHANNEL: VCGZD1 FILTER: CH. CLASS 180 PEAK DATA: 0.02 MM @ 9.84 MS; -48.87 MM @ 310.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

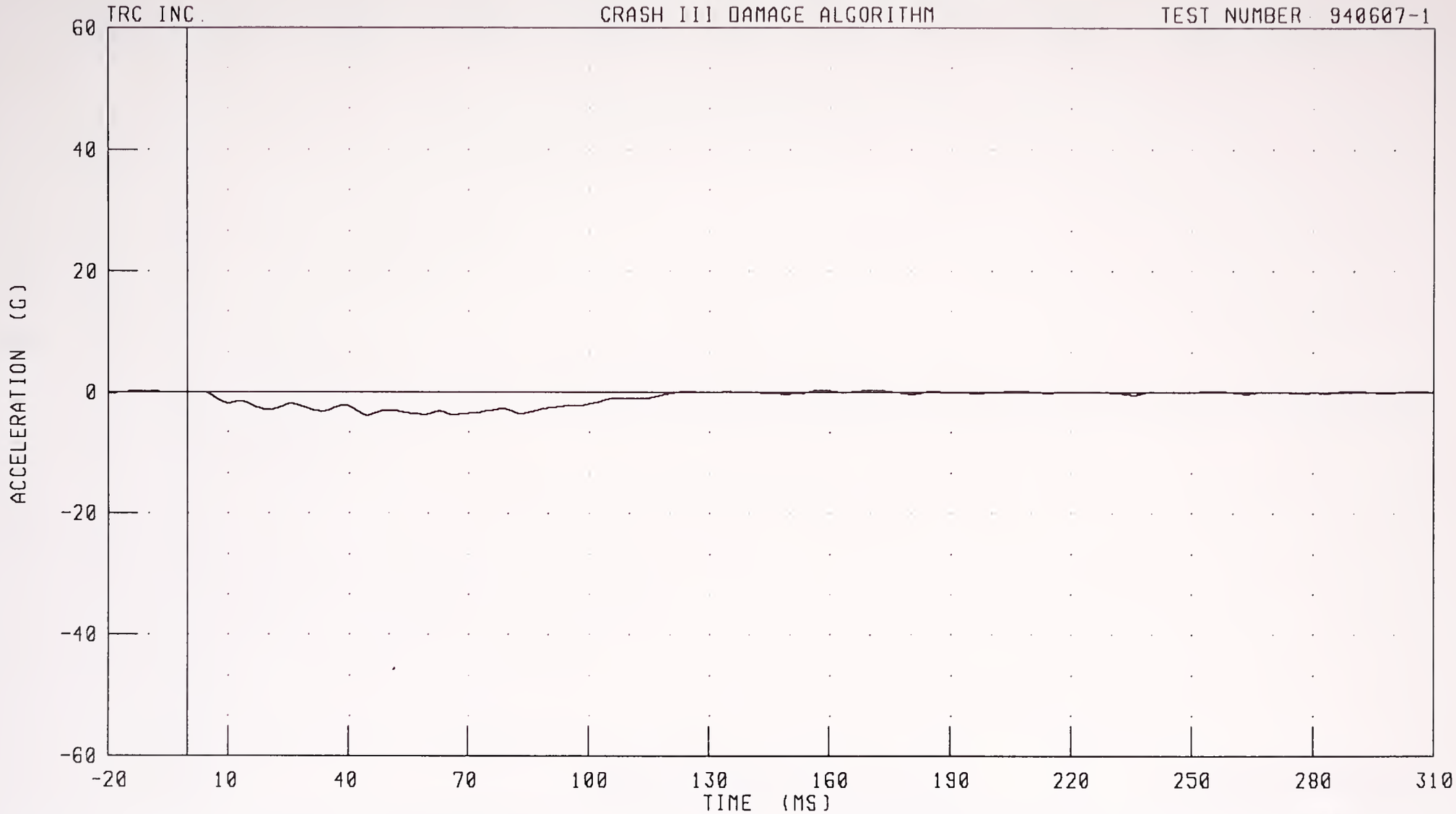
VEHICLE CG RESULTANT ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1



CHANNEL: VCGRG1 FILTER: CH. CLASS 60 PEAK DATA: 7.44 G @ 73.36 MS; 0.03 G @ 268.40 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1
LEFT REAR SILL X-AXIS ACCELERATION



CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.40 G @ 171.28 MS; -3.81 G @ 44.72 MS

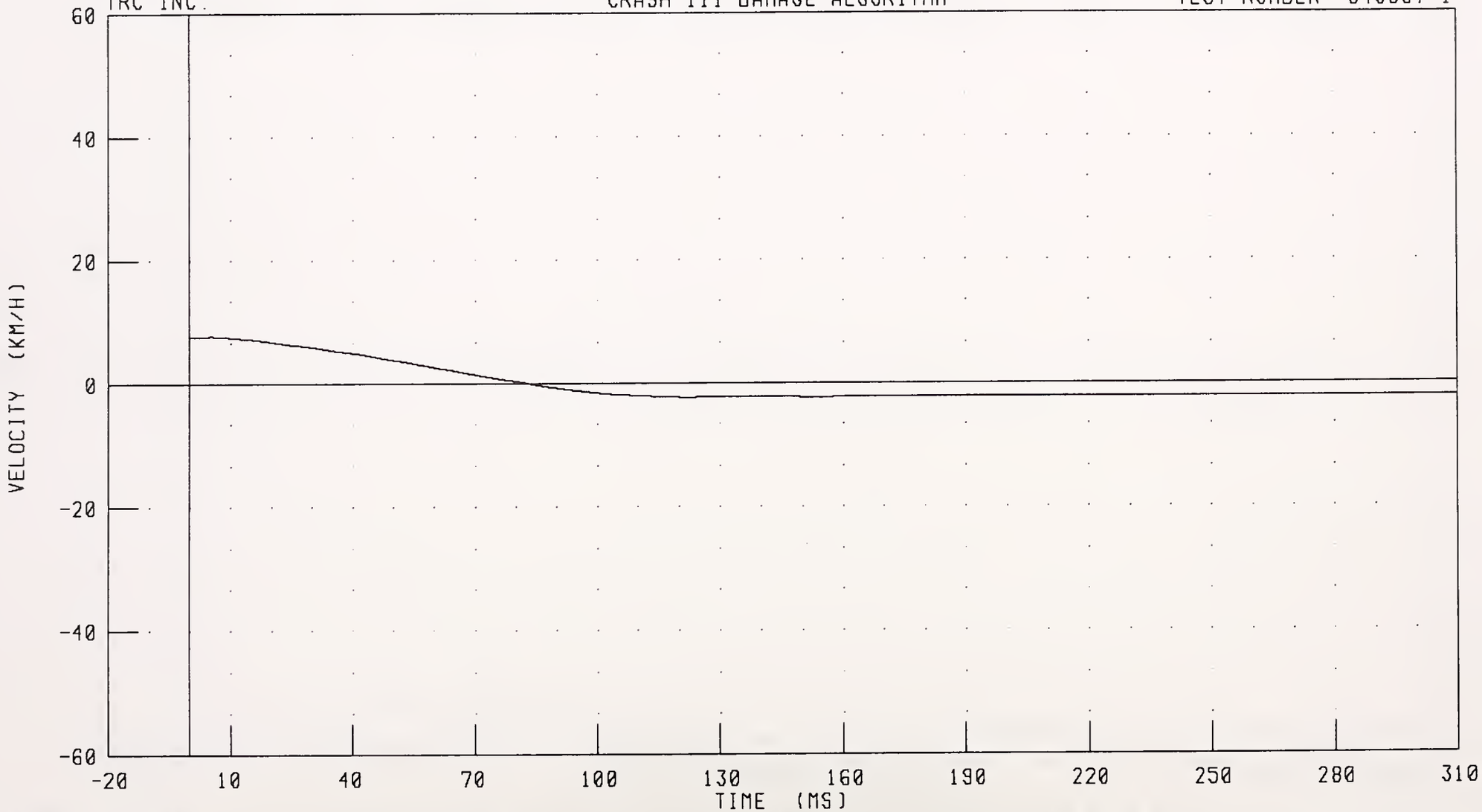
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-1



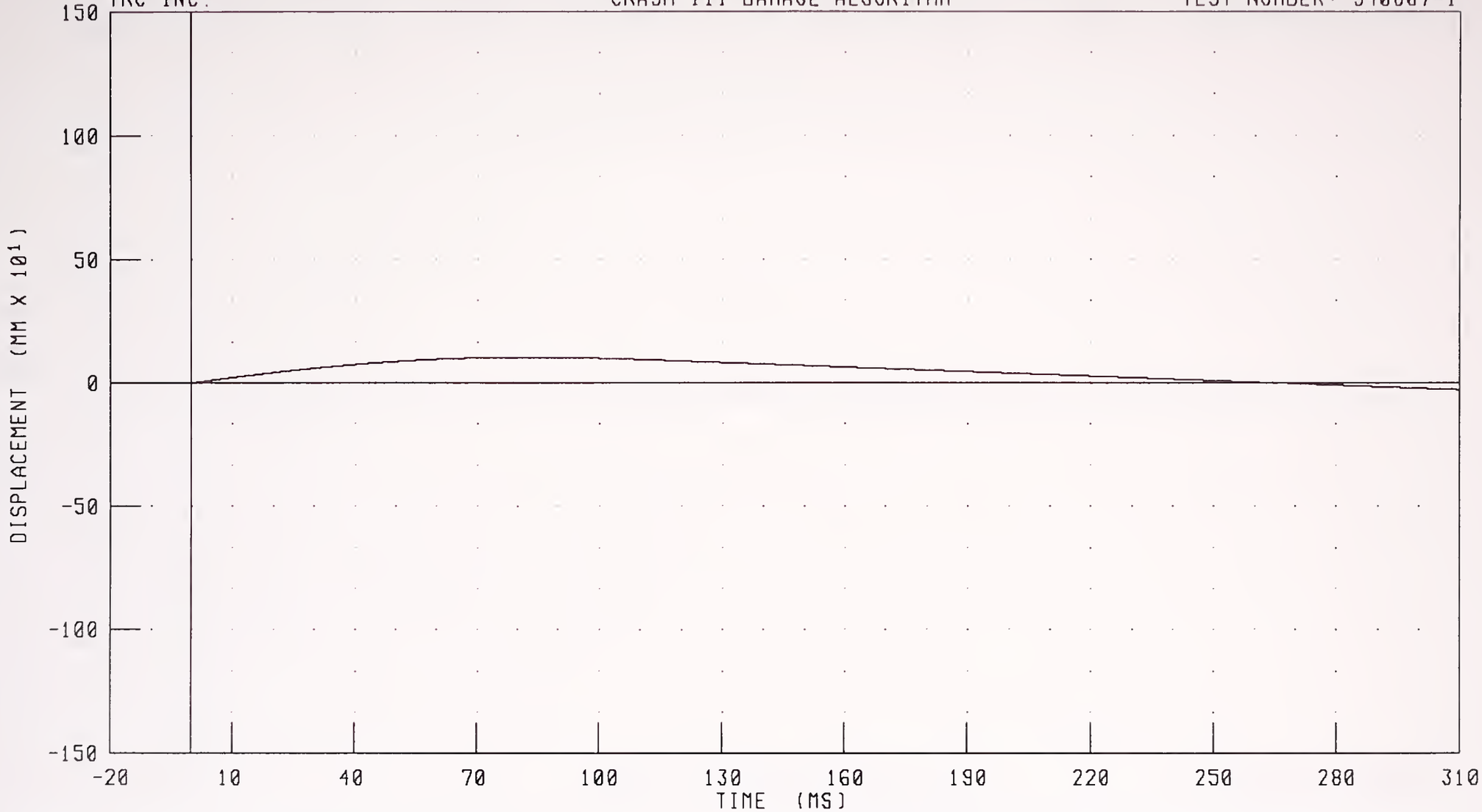
CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 7.72 KM/H @ 5.28 MS; -2.31 KM/H @ 155.04 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

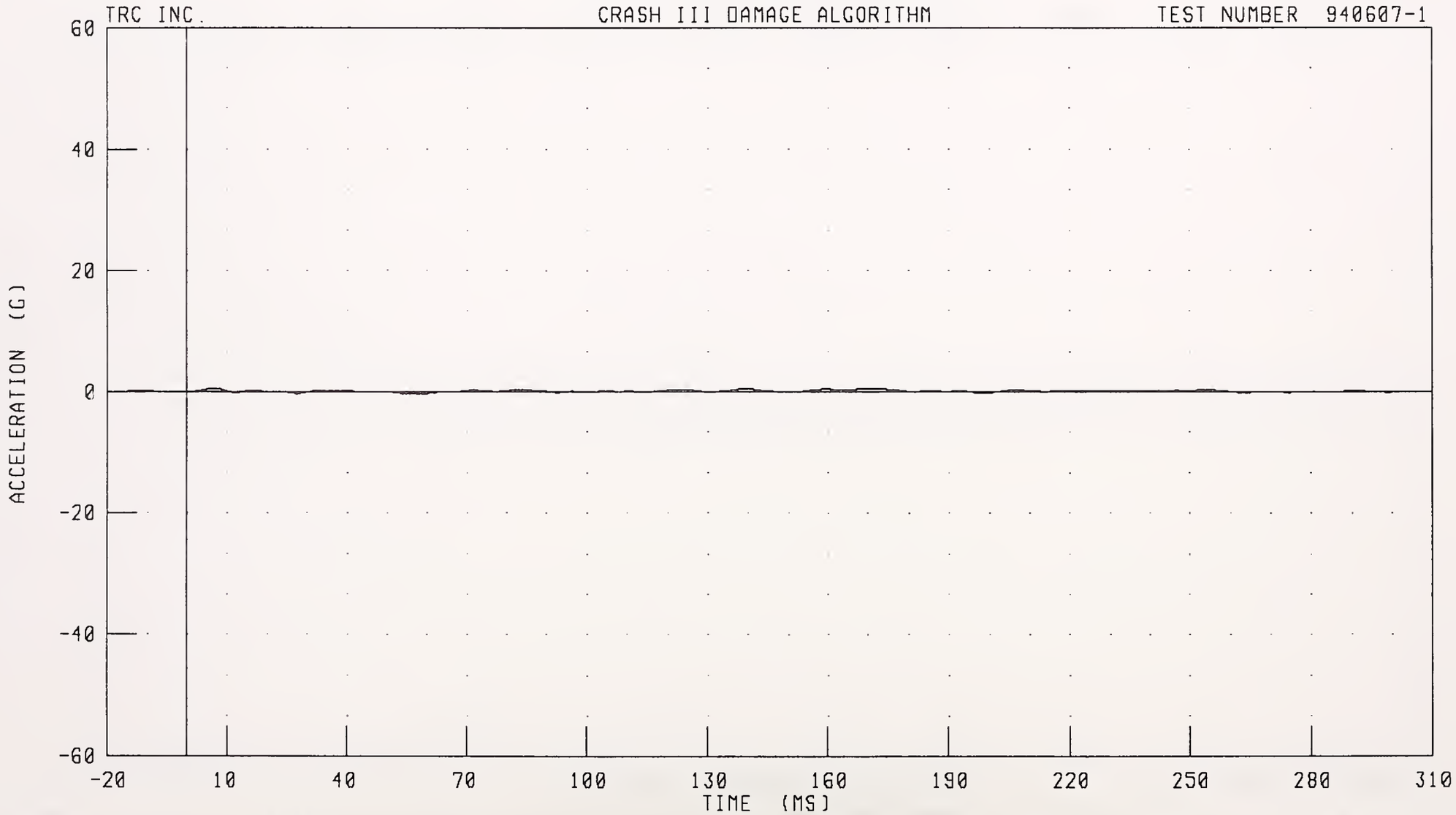
LEFT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1



CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 103.81 MM @ 83.04 MS, -27.84 MM @ 310.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1
LEFT REAR SILL Y-AXIS ACCELERATION



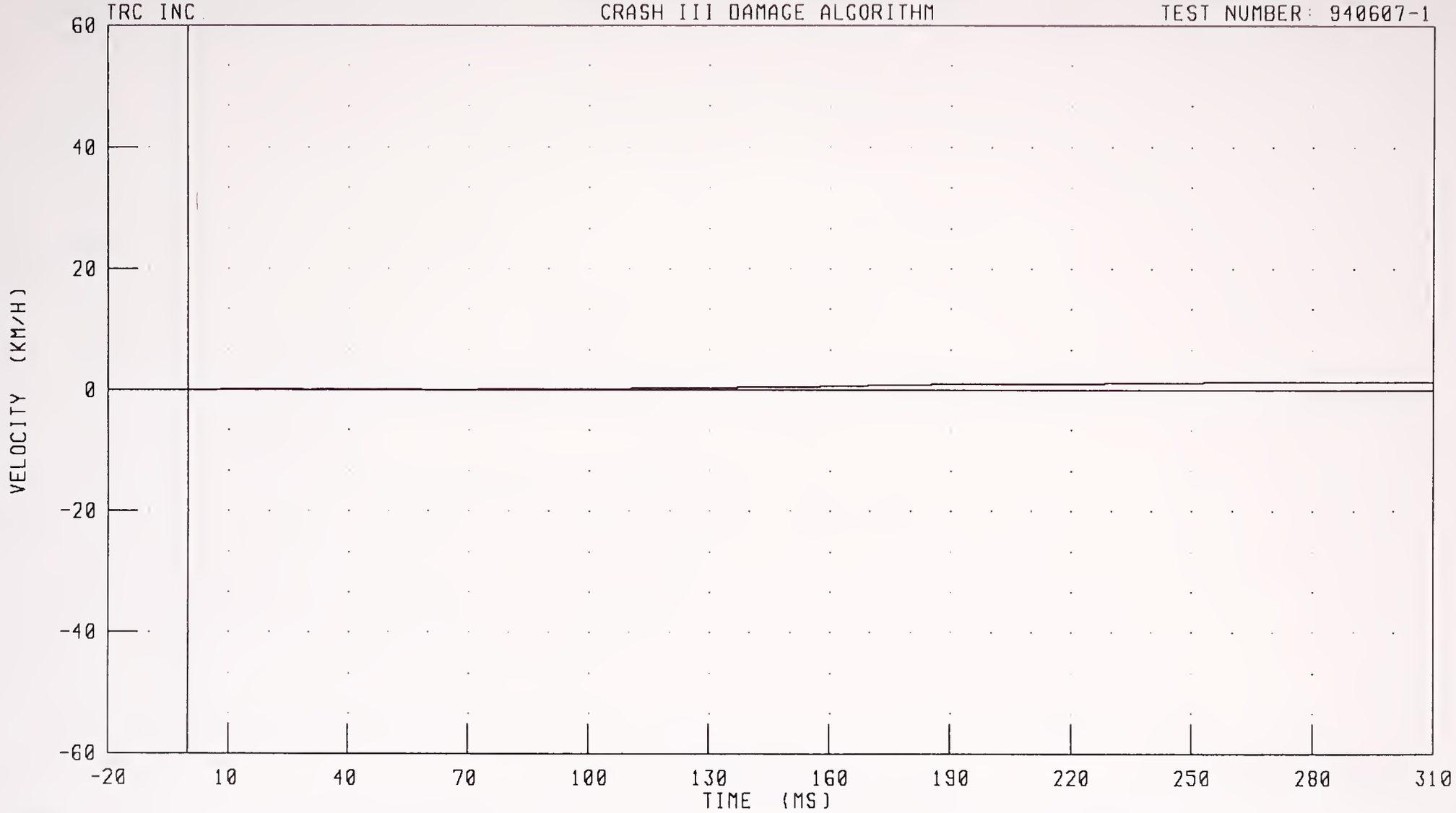
CHANNEL: LRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 0.60 G @ 6.80 MS; -0.38 G @ 58.32 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

LEFT REAR SILL Y-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 940607-1



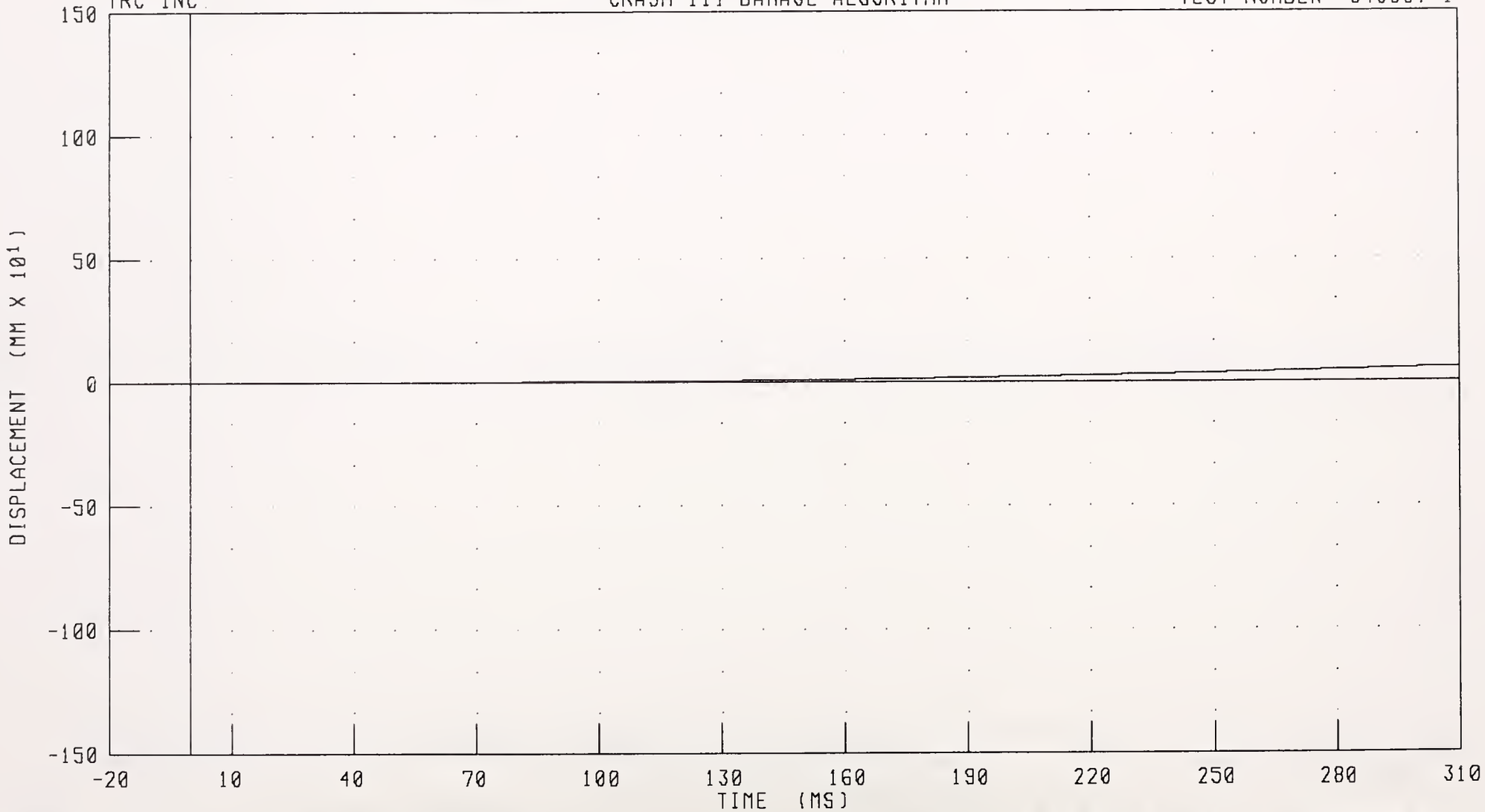
CHANNEL: LRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 1.34 KM/H @ 259.60 MS; 0.00 KM/H @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

LEFT REAR SILL Y-AXIS DISPLACEMENT

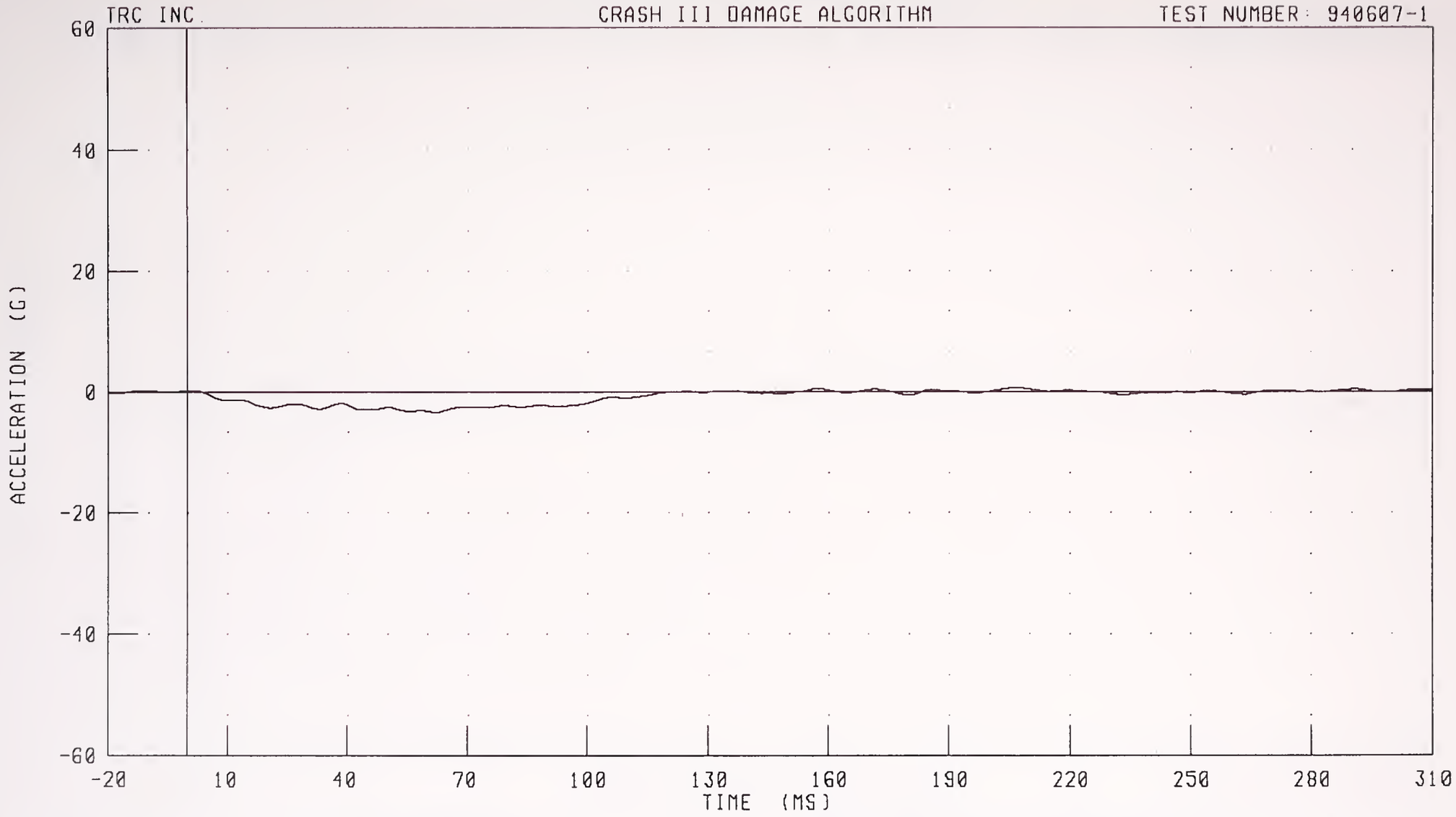
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1



CHANNEL: LRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 56.99 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

RIGHT REAR SILL X-AXIS ACCELERATION

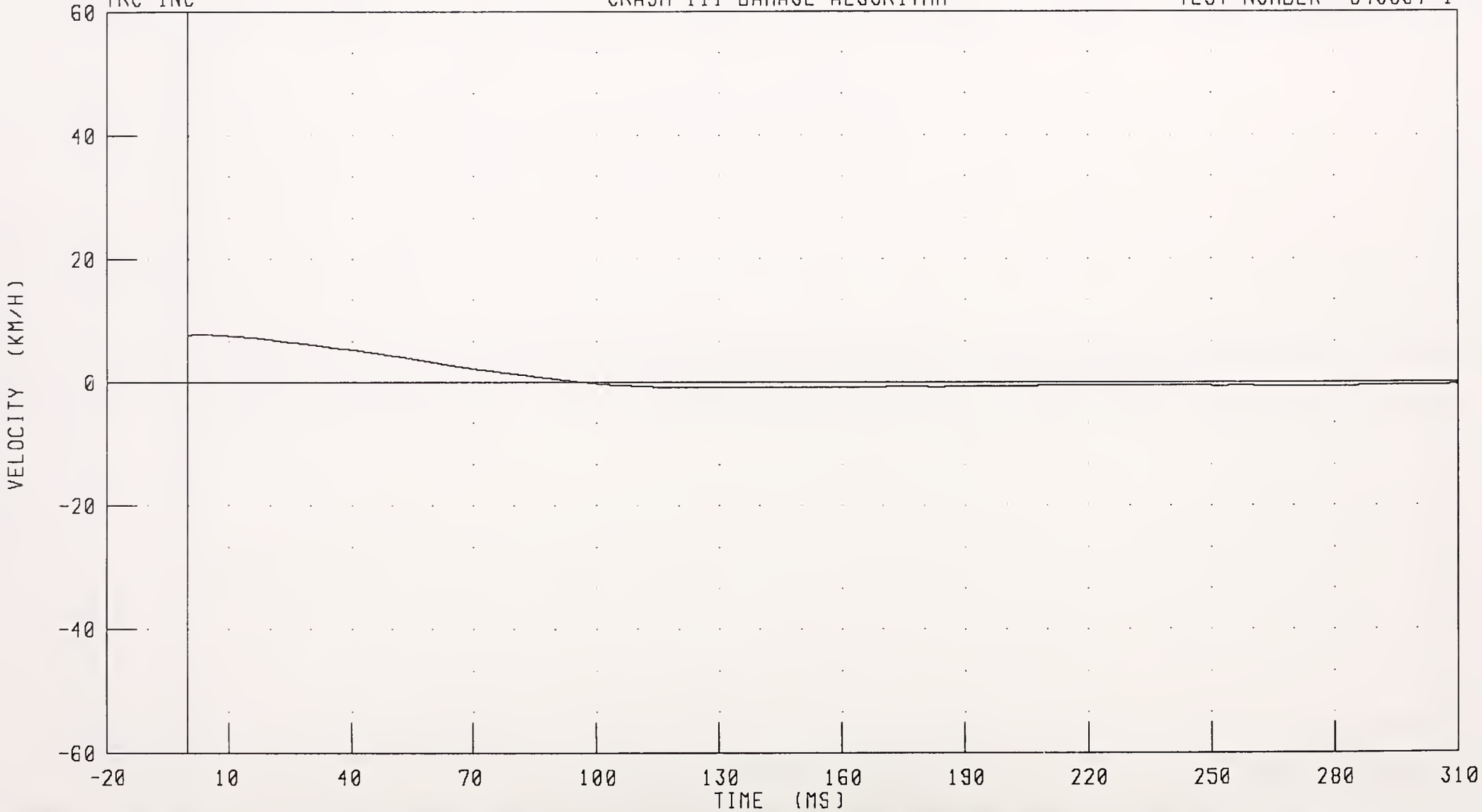


CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.68 G @ 205.84 MS; -3.39 G @ 62.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

RIGHT REAR SILL X-AXIS VELOCITY

TRC INC — CRASH III DAMAGE ALGORITHM — TEST NUMBER: 940607-1

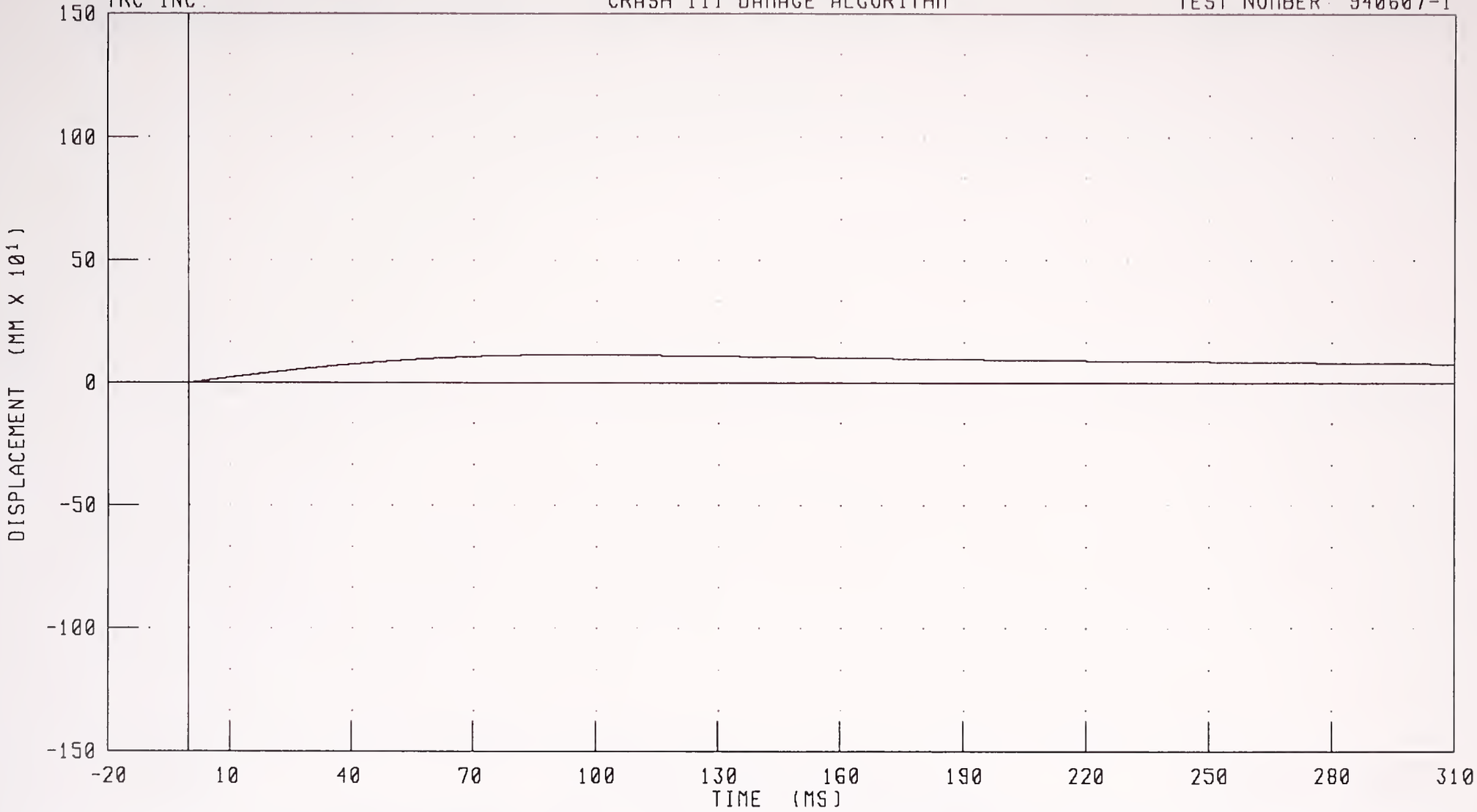


CHANNEL: RRSXV1 FILTER: CH. CLASS 180 PEAK DATA: 7.74 KM/H @ 4.56 MS, -0.86 KM/H @ 154.88 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

RIGHT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-1

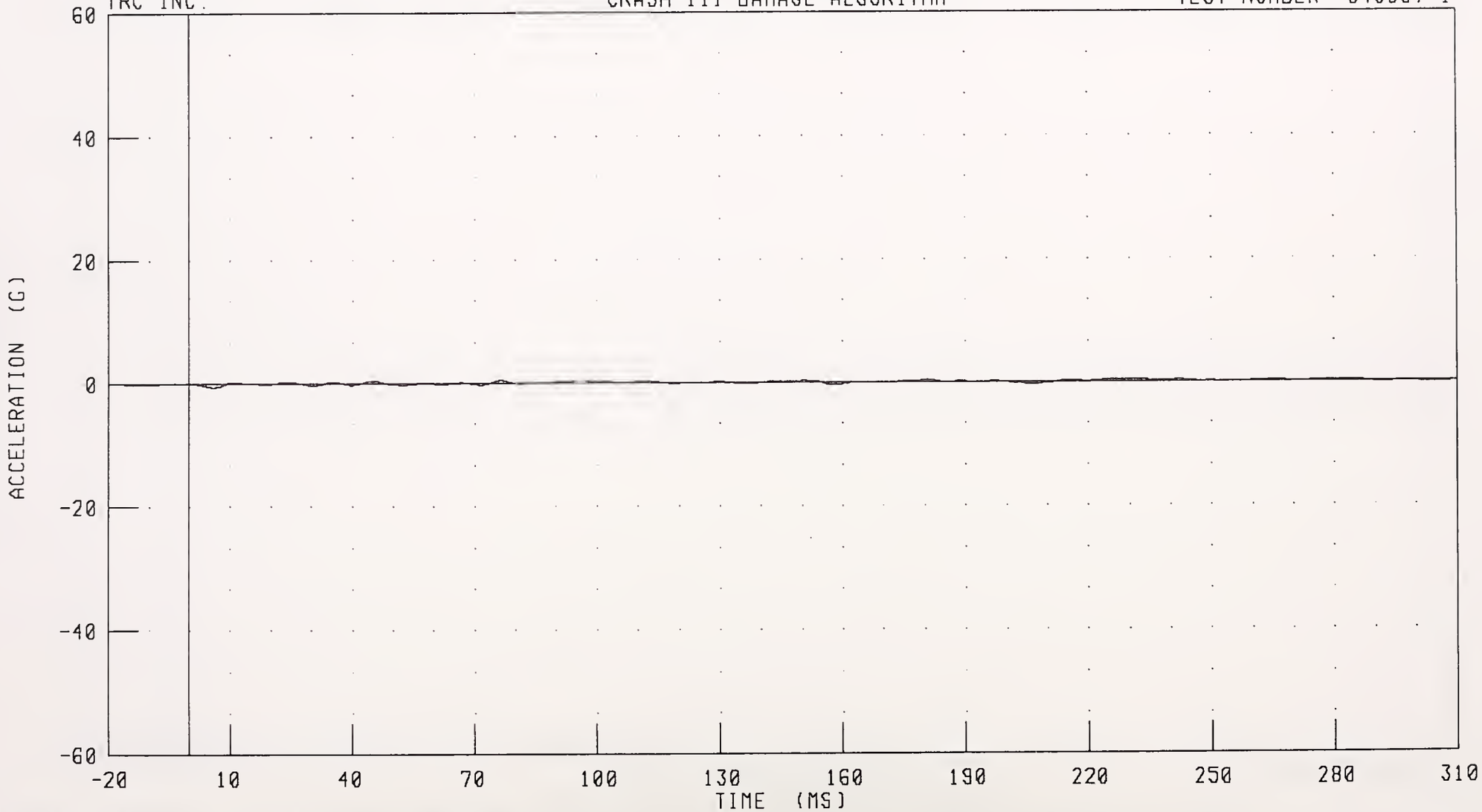


CHANNEL: RRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 115.11 MM @ 96.80 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

RIGHT REAR SILL Y-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1

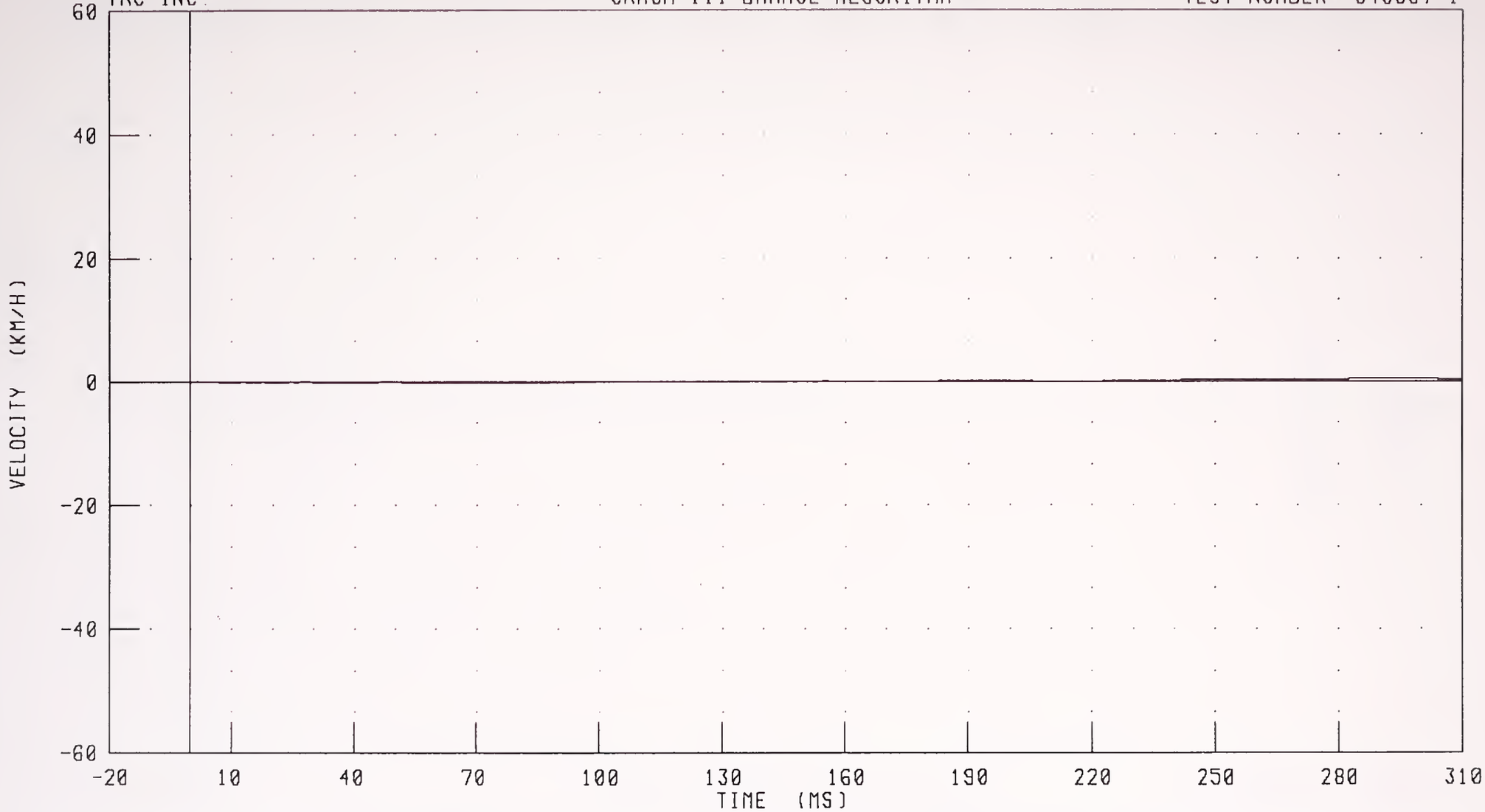


CHANNEL: RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 0.44 G @ 76.56 MS; -0.61 G @ 5.92 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 1

RIGHT REAR SILL Y-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-1

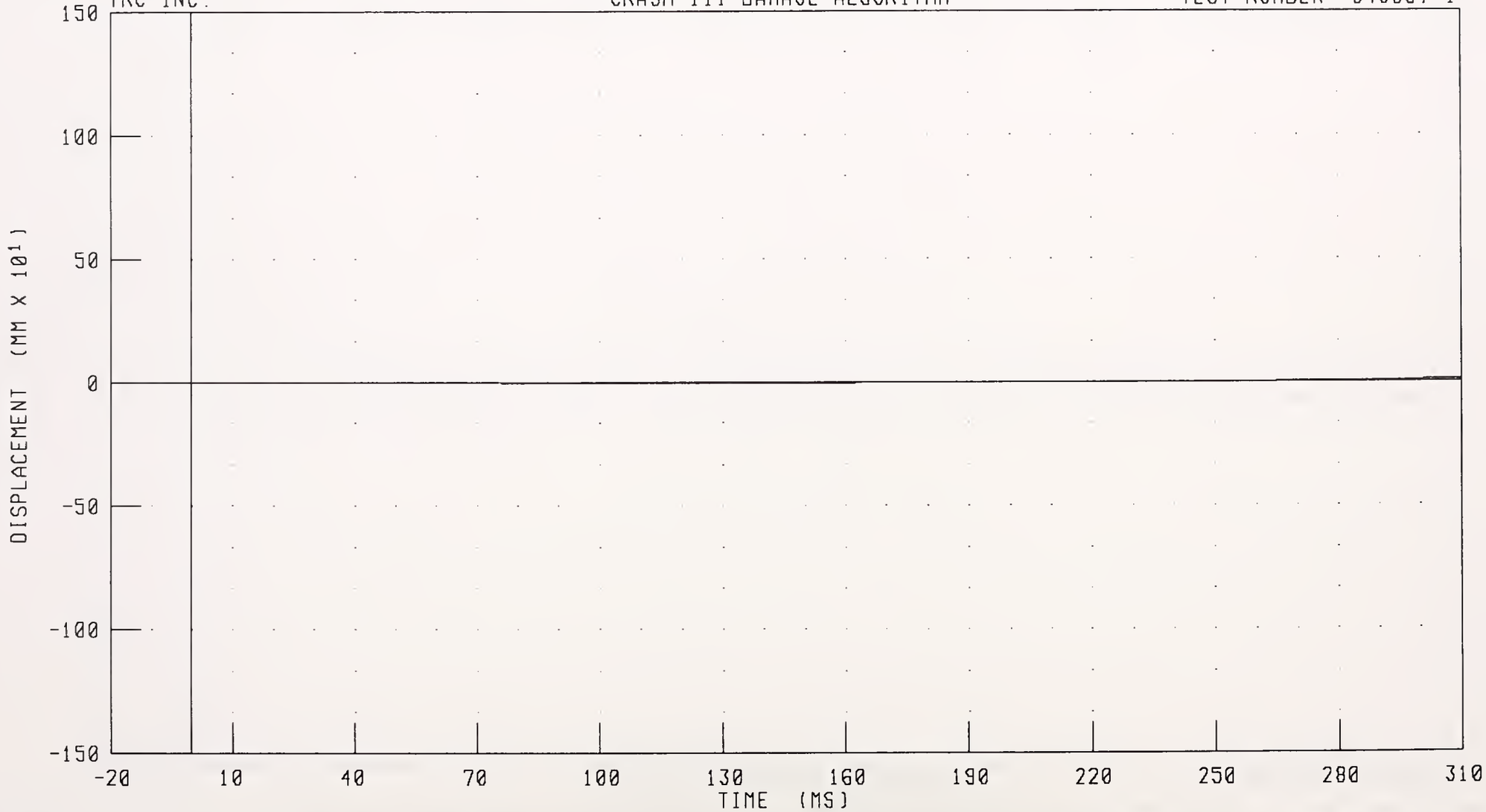


CHANNEL: RRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 0.47 KM/H @ 288.40 MS; -0.16 KM/H @ 74.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.1

RIGHT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-1



CHANNEL: RRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 7.68 MM @ 310.00 MS; -2.48 MM @ 101.92 MS

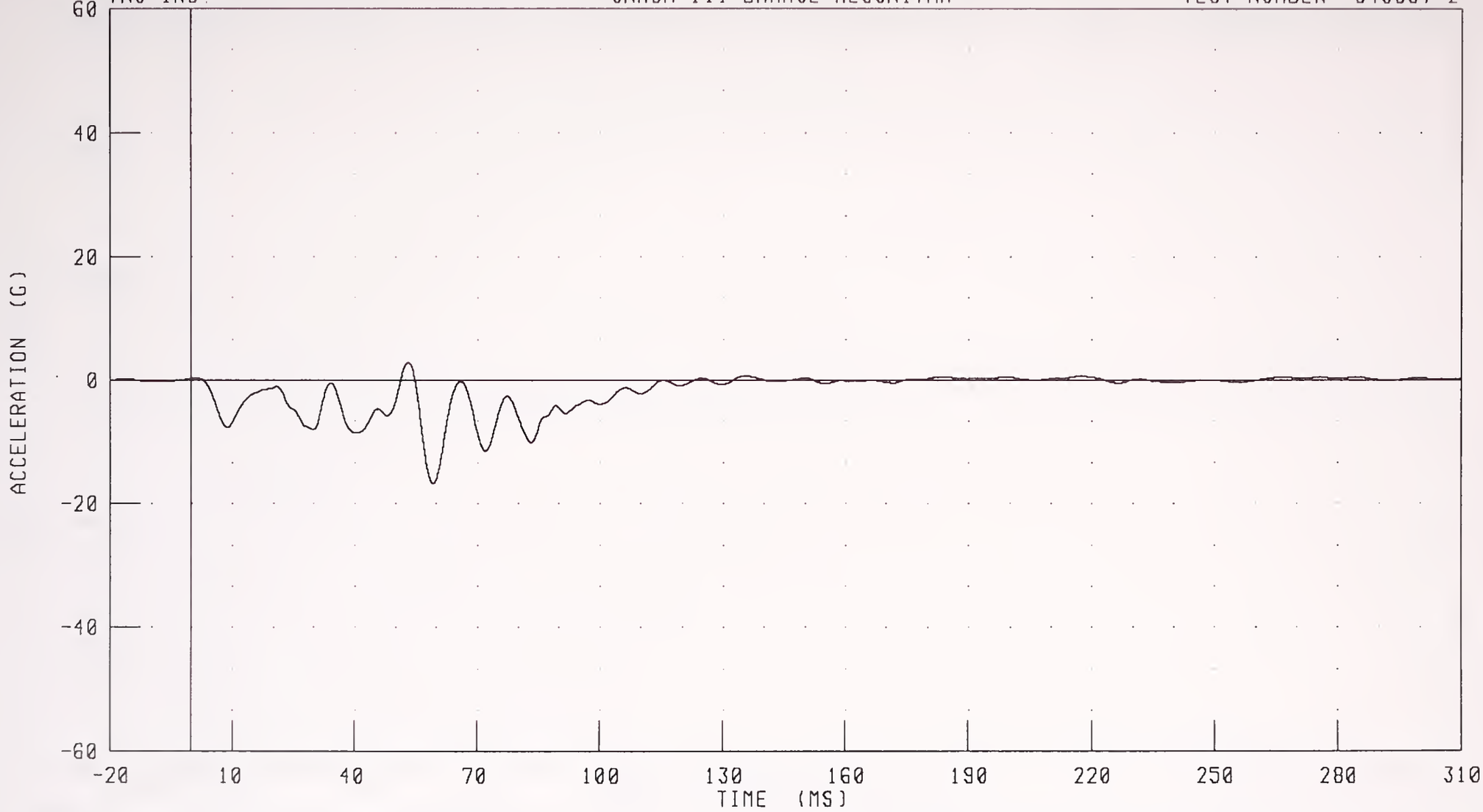
Data Plots

Test No. 940607-2

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2

VEHICLE CG X-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-2

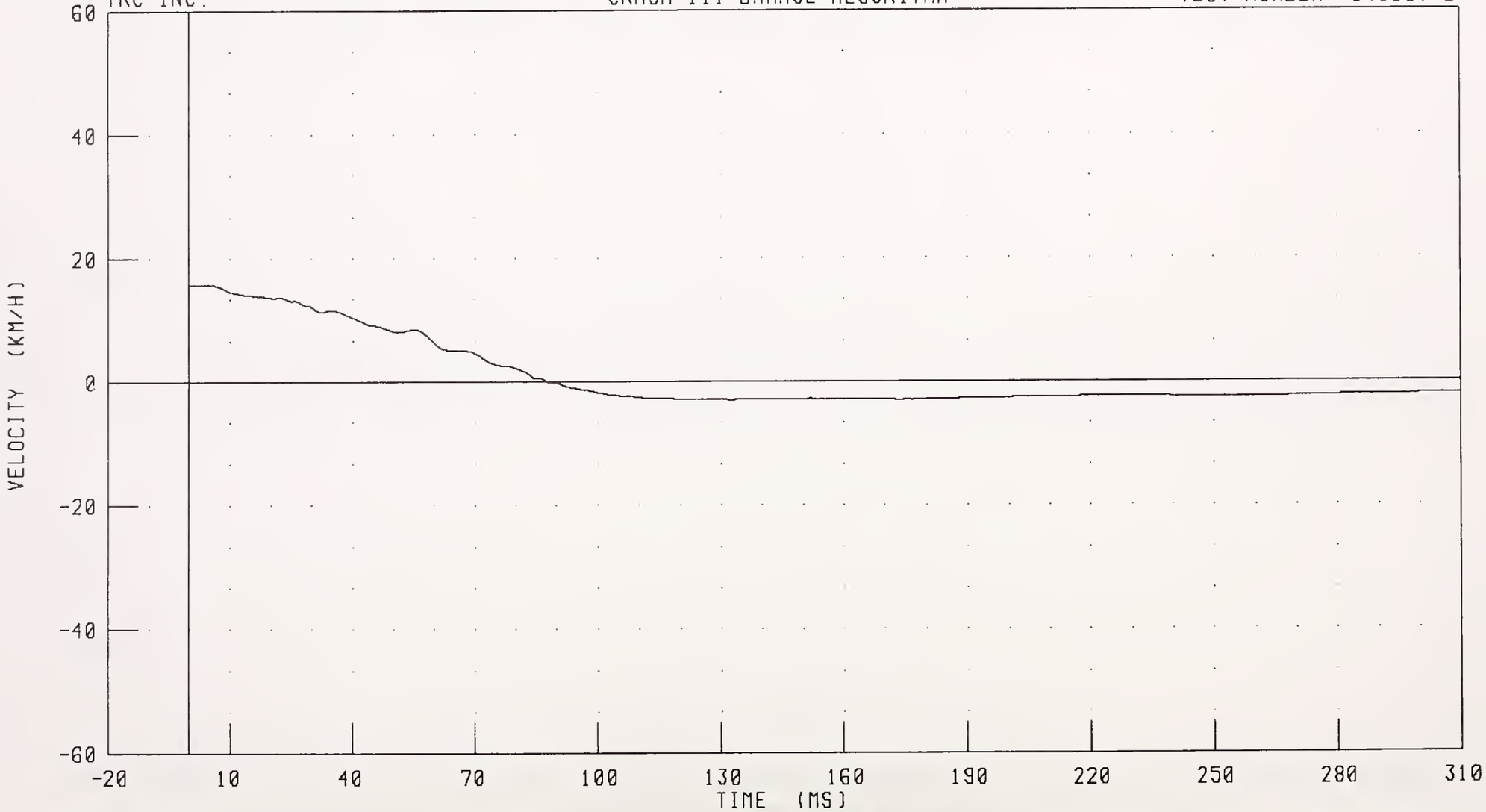


CHANNEL: VCGXG1 FILTER: CH. CLASS 60 PEAK DATA: 2.93 G @ 53.20 MS; -16.74 G @ 59.28 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
VEHICLE CG X-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-2



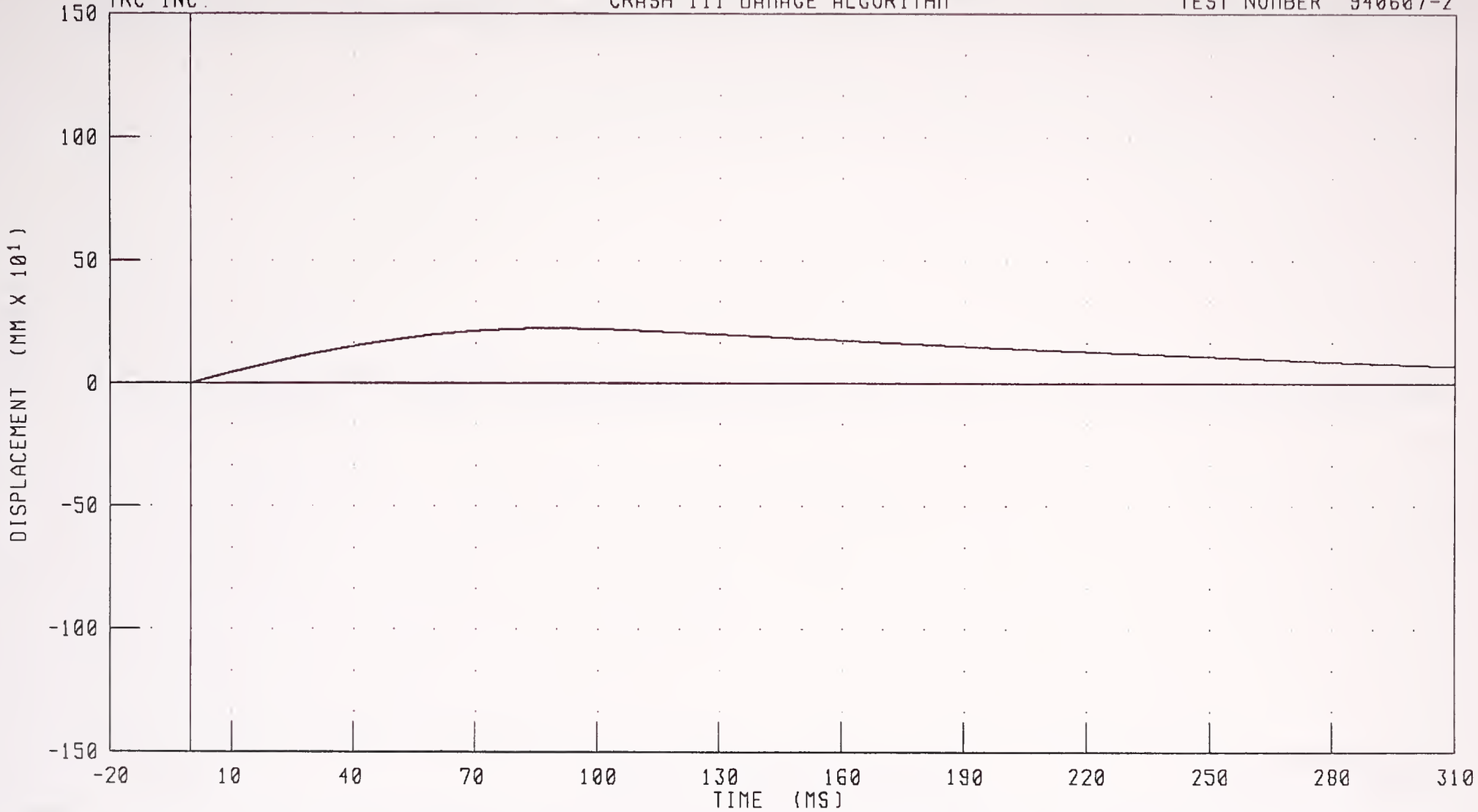
CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 15.83 KM/H @ 3.84 MS; -2.97 KM/H @ 173.52 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 2

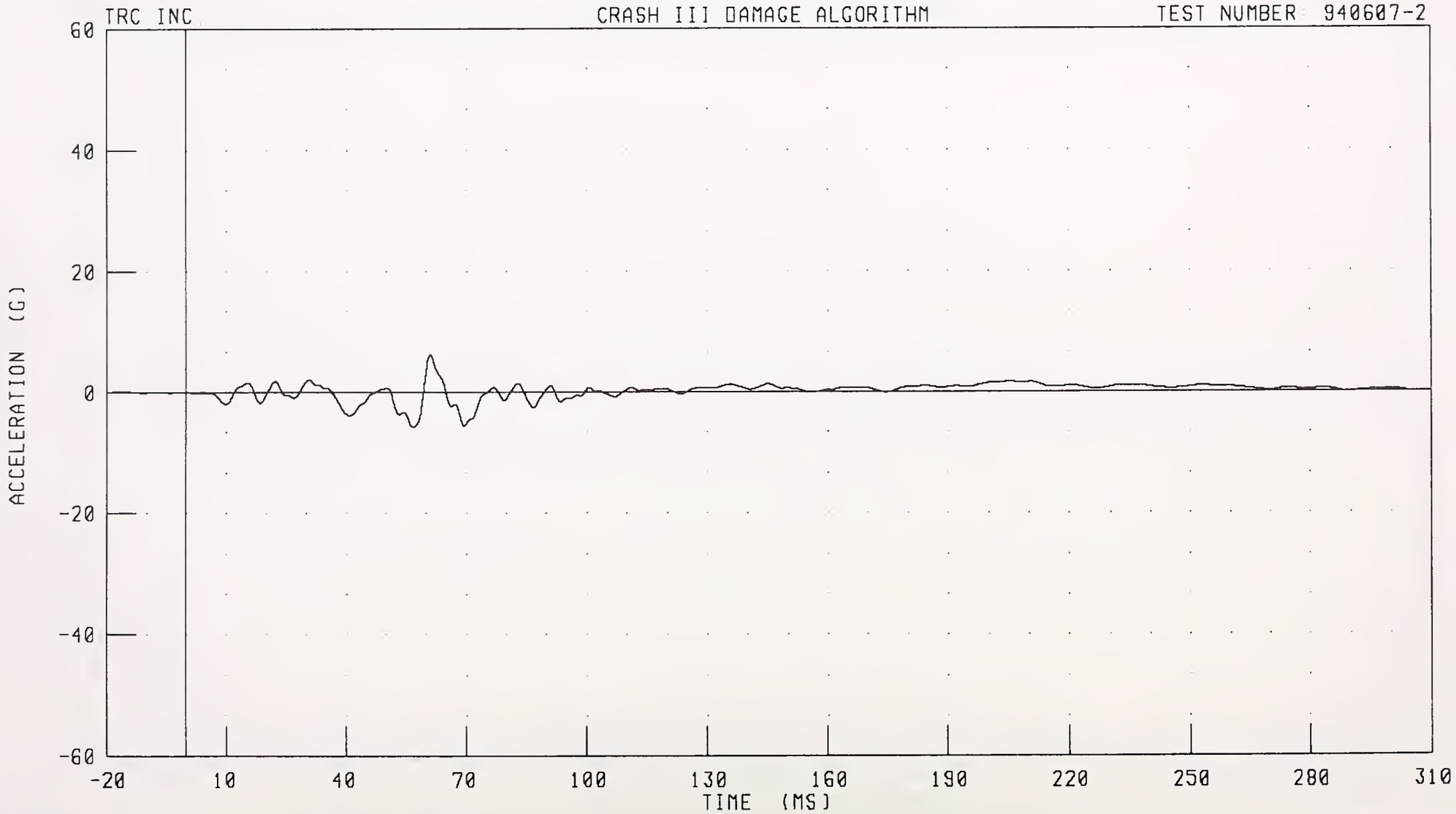
VEHICLE CG X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-2



CHANNEL: VCGXD1 FILTER: CH. CLASS 180 PEAK DATA: 223.52 MM @ 87.76 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
VEHICLE CG Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



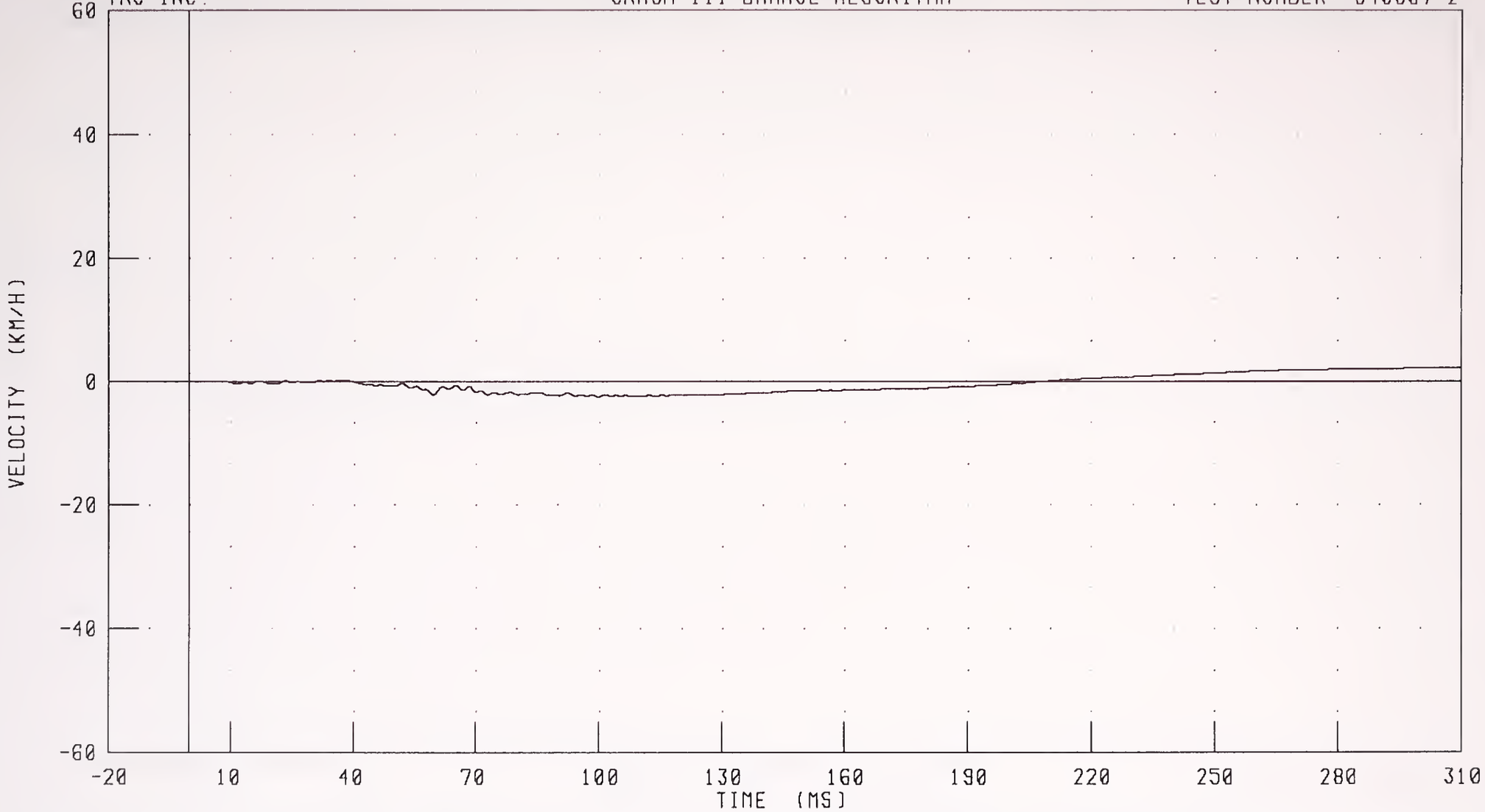
CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 6.21 G @ 61.12 MS; -5.72 G @ 56.80 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2
VEHICLE CG Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TRC INC.

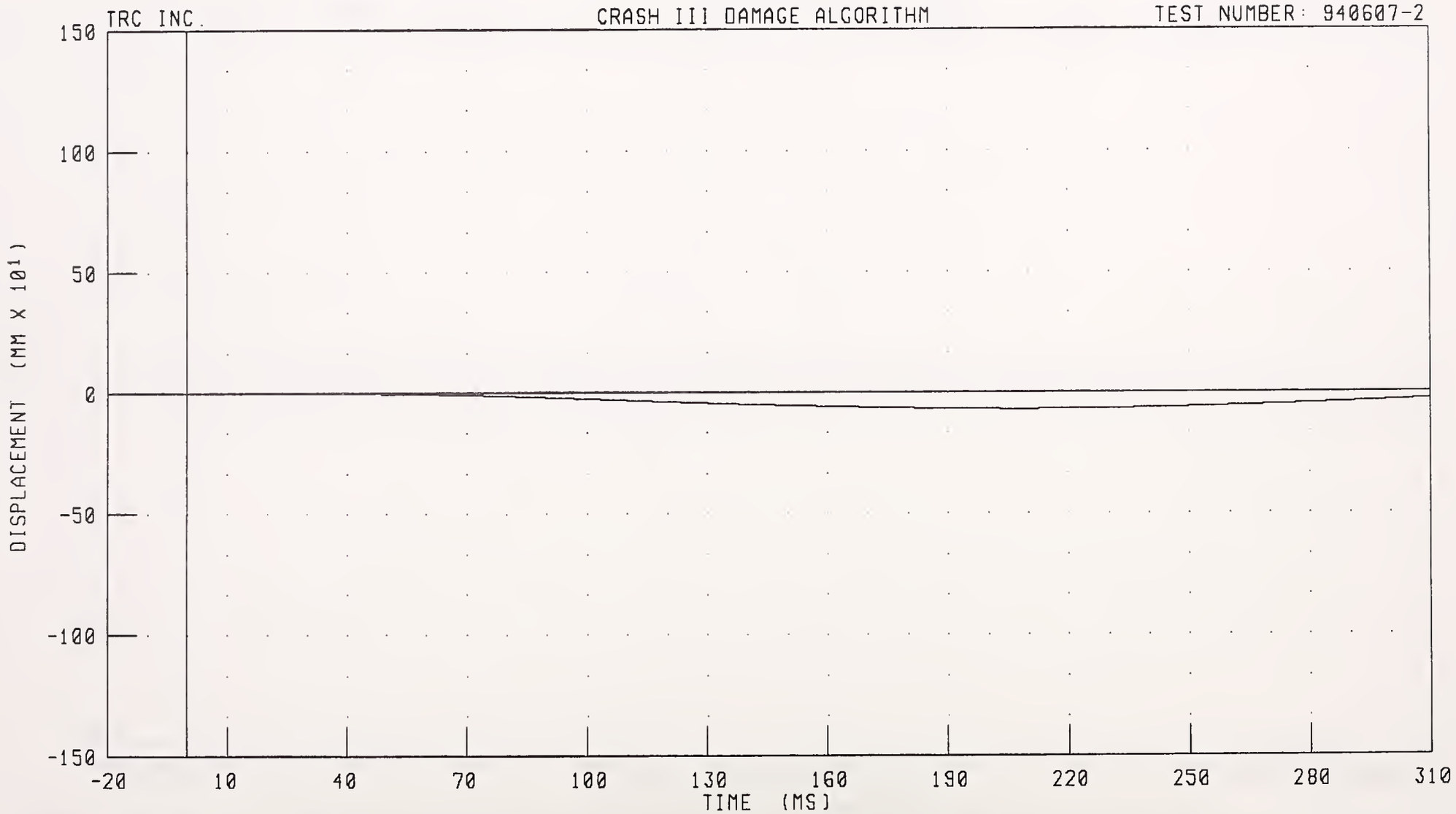
TEST NUMBER: 940607-2



CHANNEL VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 2.22 KM/H @ 303.60 MS; -2.52 KM/H @ 99.84 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
VEHICLE CG Y-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM



CHANNEL: VCGYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.00 MM @ 2.16 MS; -69.76 MM @ 207.92 MS

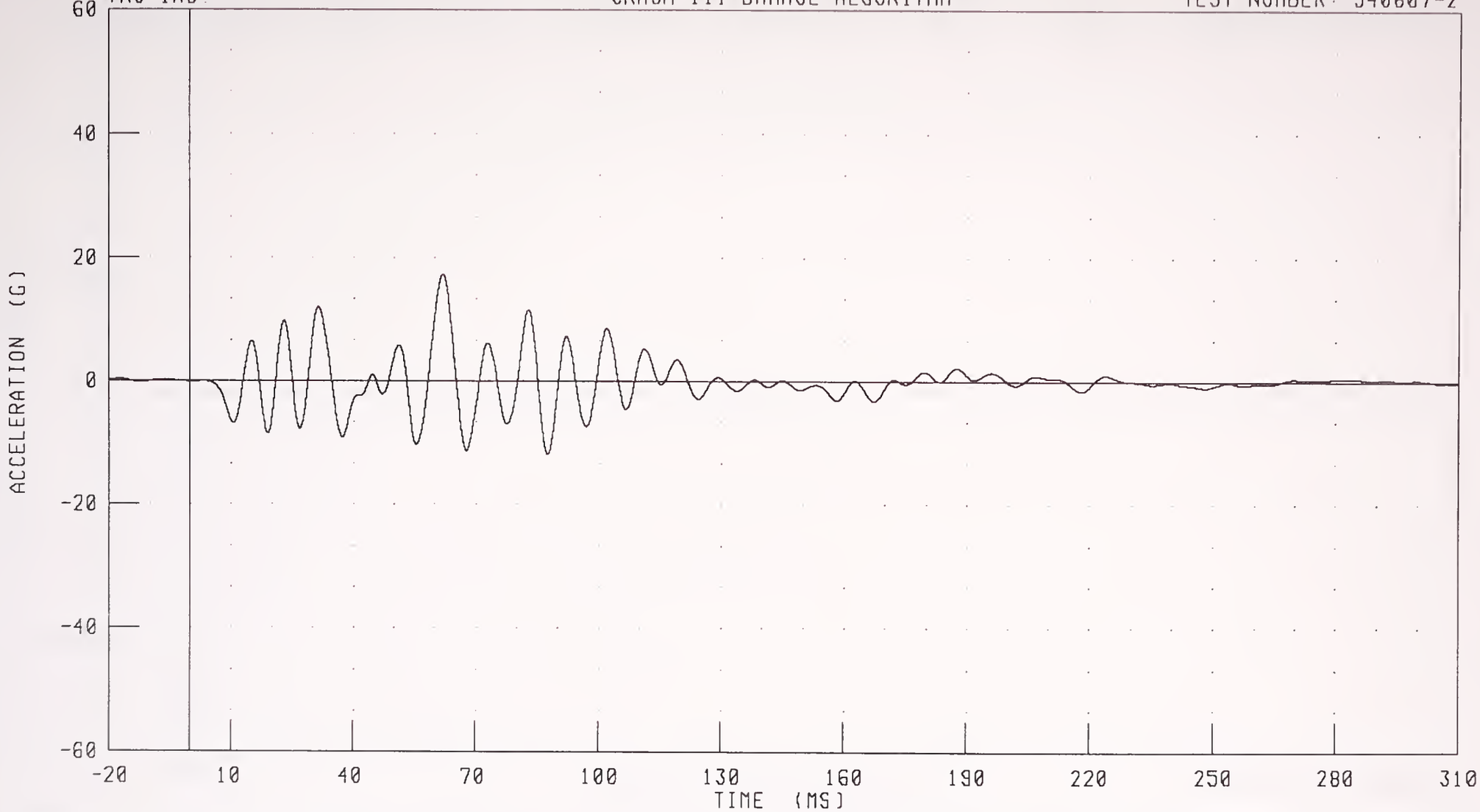
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2

VEHICLE CG Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-2



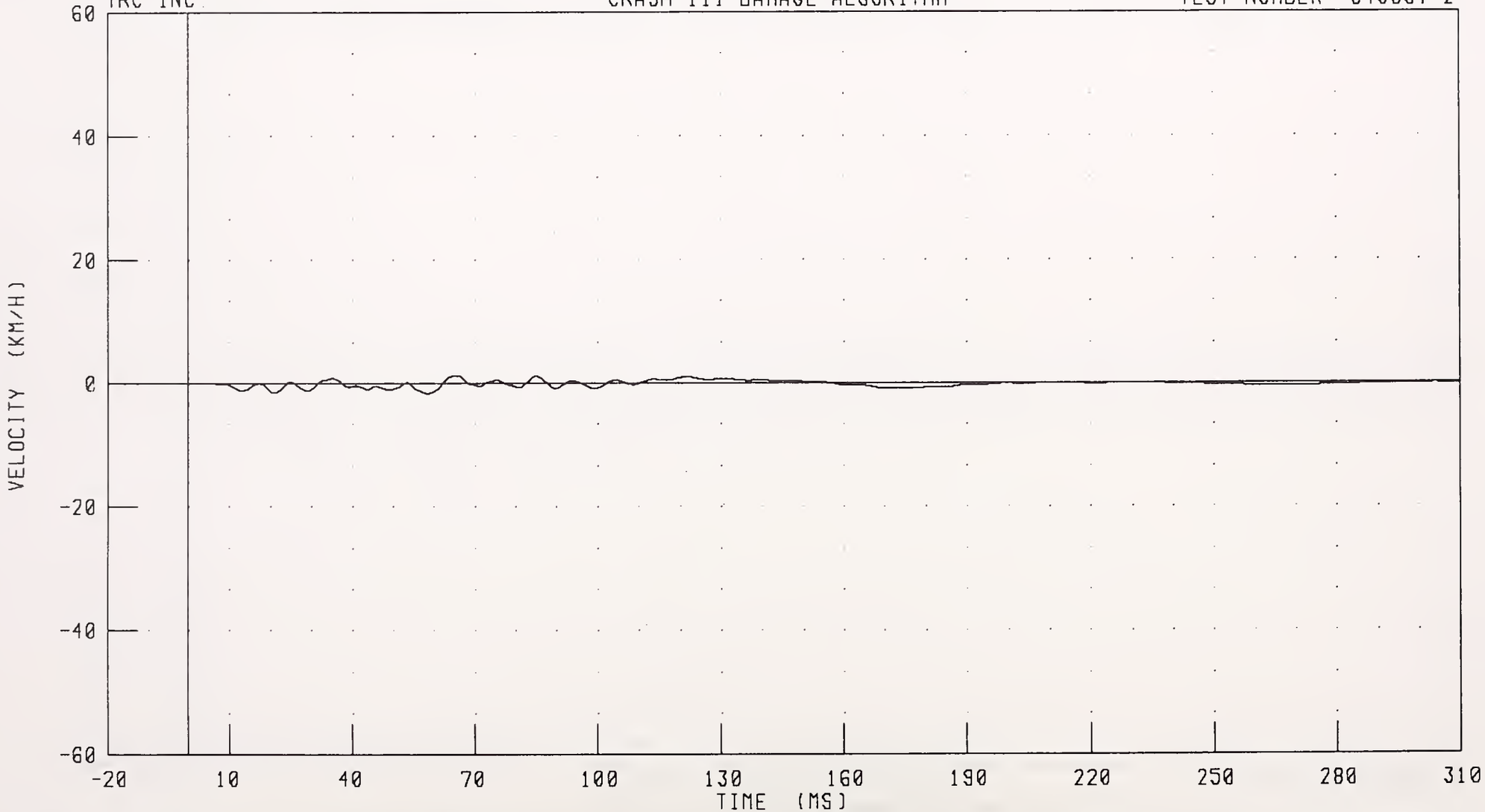
CHANNEL VCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 17.32 G @ 62.08 MS; -11.89 G @ 87.60 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2
VEHICLE CG Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TRC INC

TEST NUMBER: 940607-2



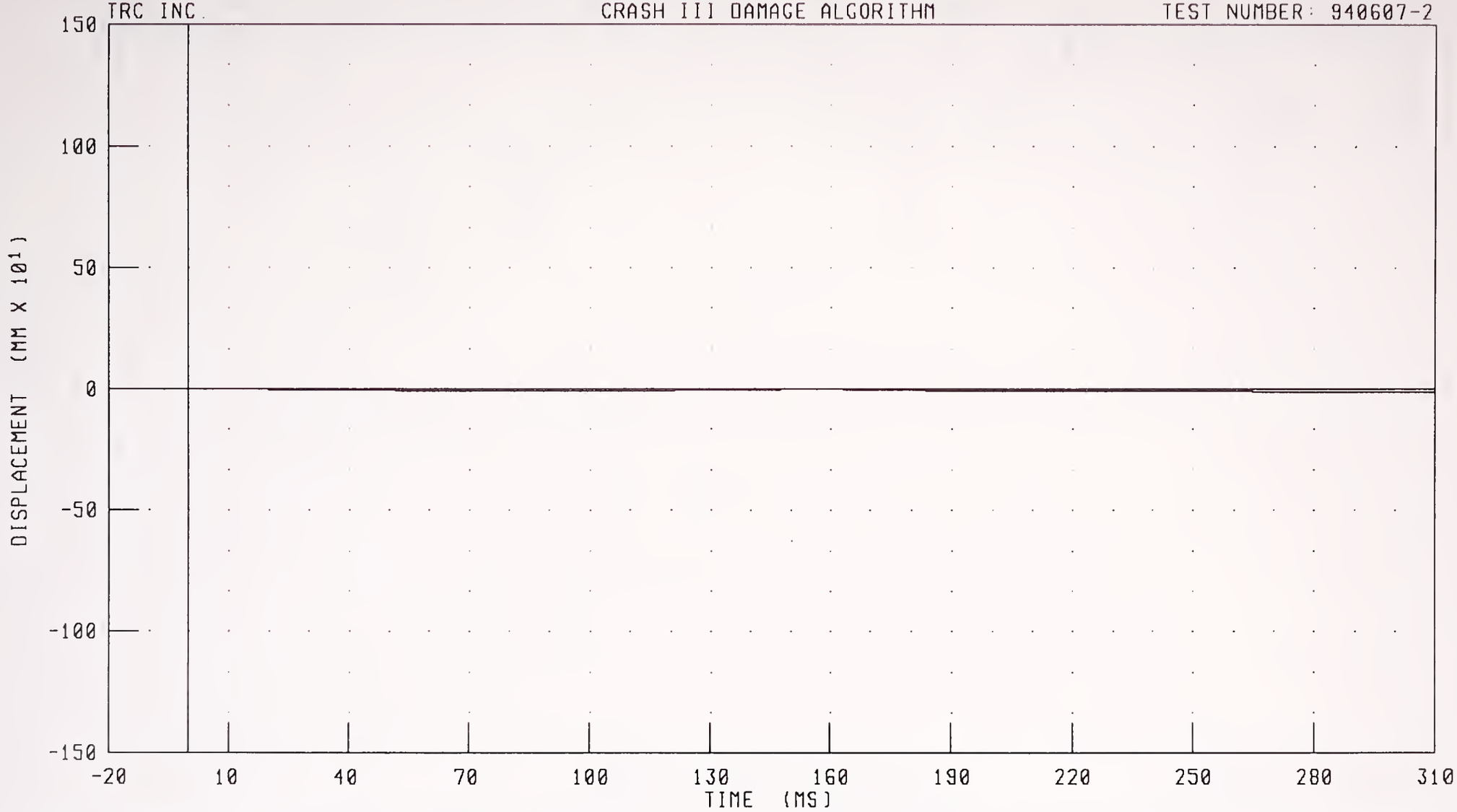
CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.24 KM/H @ 66.00 MS; -1.64 KM/H @ 58.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 2

VEHICLE CG Z-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-2

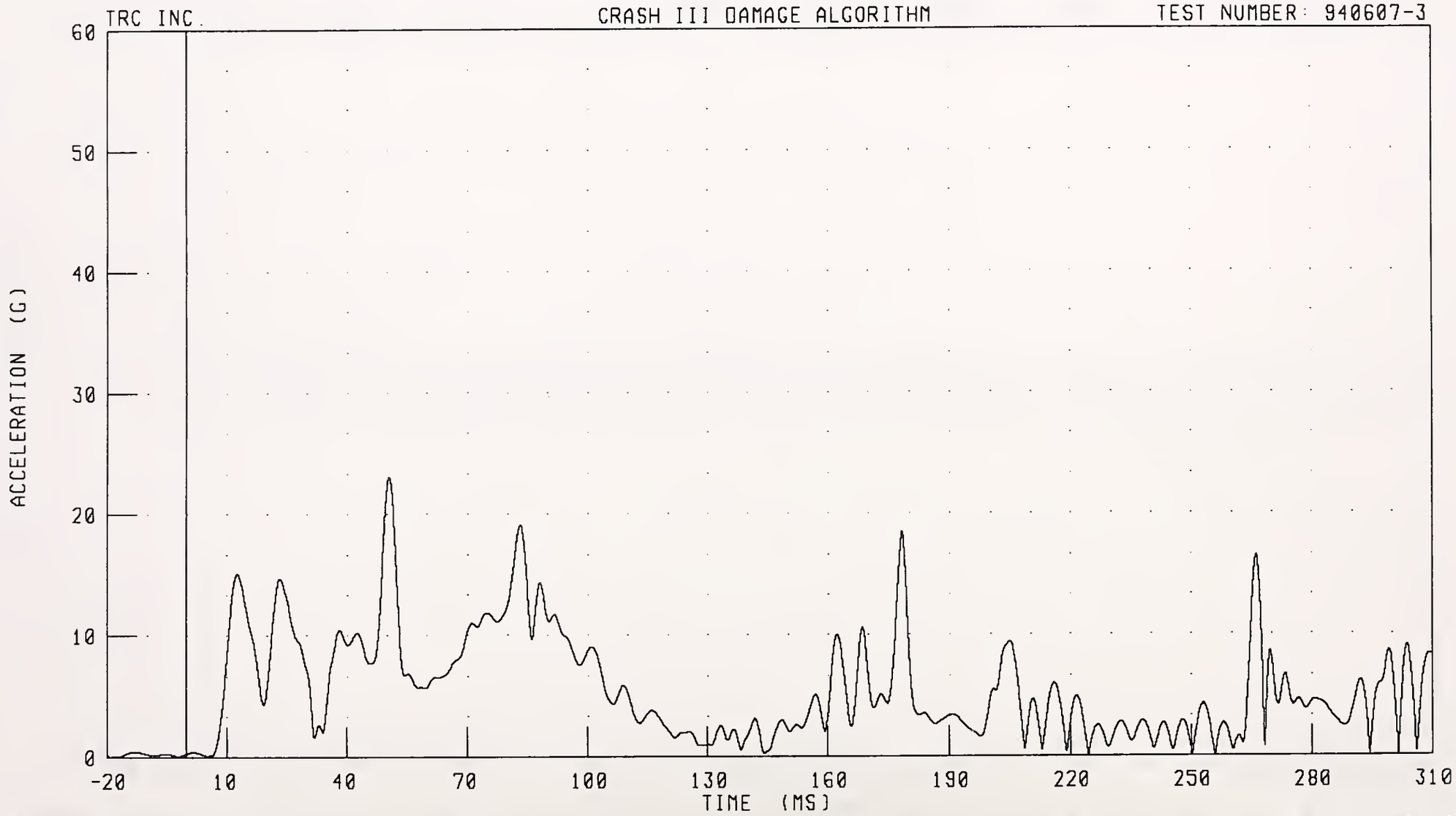


CHANNEL: VCGZ01 FILTER: CH. CLASS 180 PEAK DATA: 0.00 MM @ 1.04 MS; -13.54 MM @ 310.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

VEHICLE CG RESULTANT ACCELERATION

CRASH III DAMAGE ALGORITHM



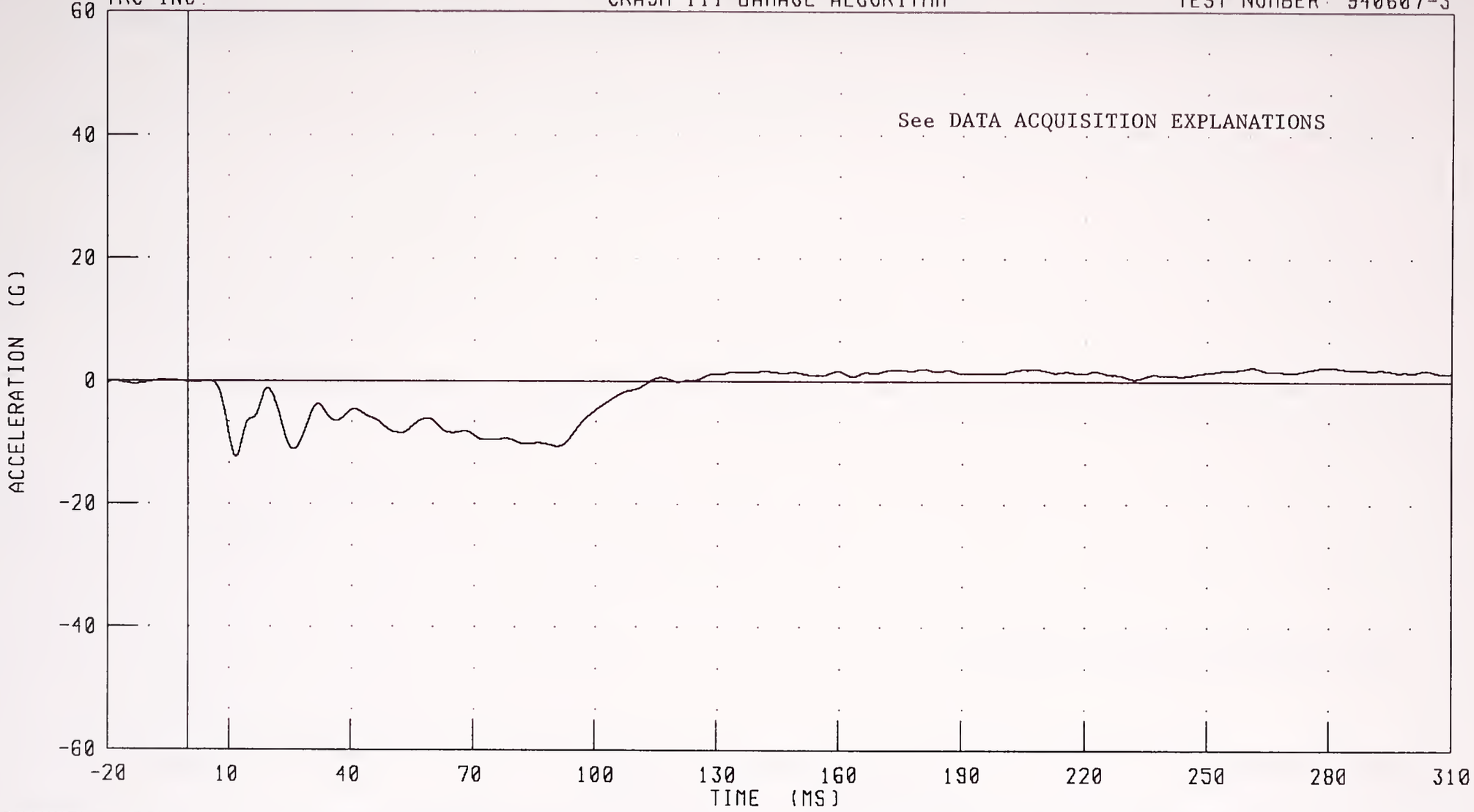
CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 23.07 G @ 50.64 MS; 0.01 G @ -19.04 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

LEFT REAR SILL X-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-3



CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 2.40 G @ 279.68 MS; -12.32 G @ 11.68 MS

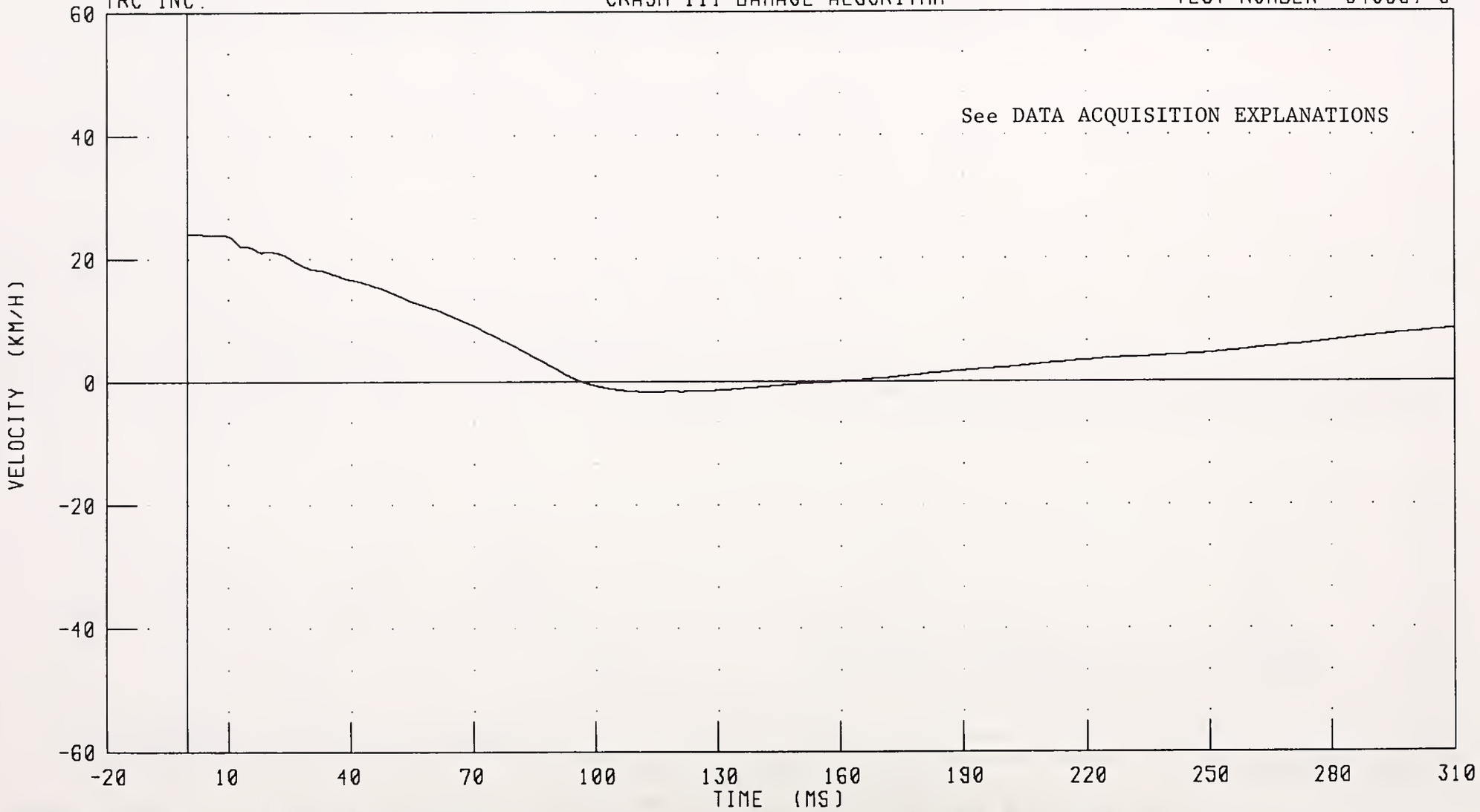
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

LEFT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-3

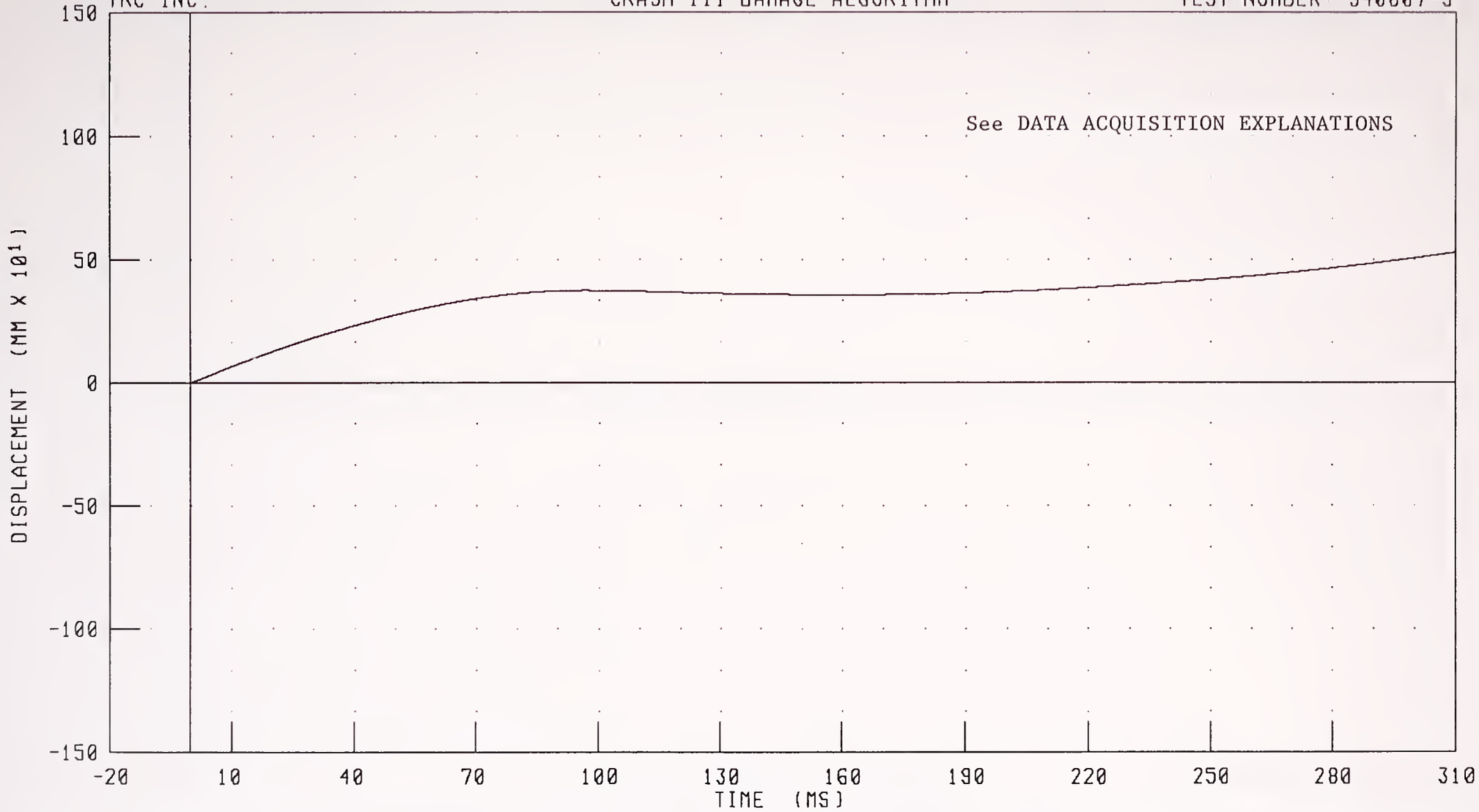


CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 24.00 KM/H @ 0.00 MS; -1.67 KM/H @ 113.36 MS

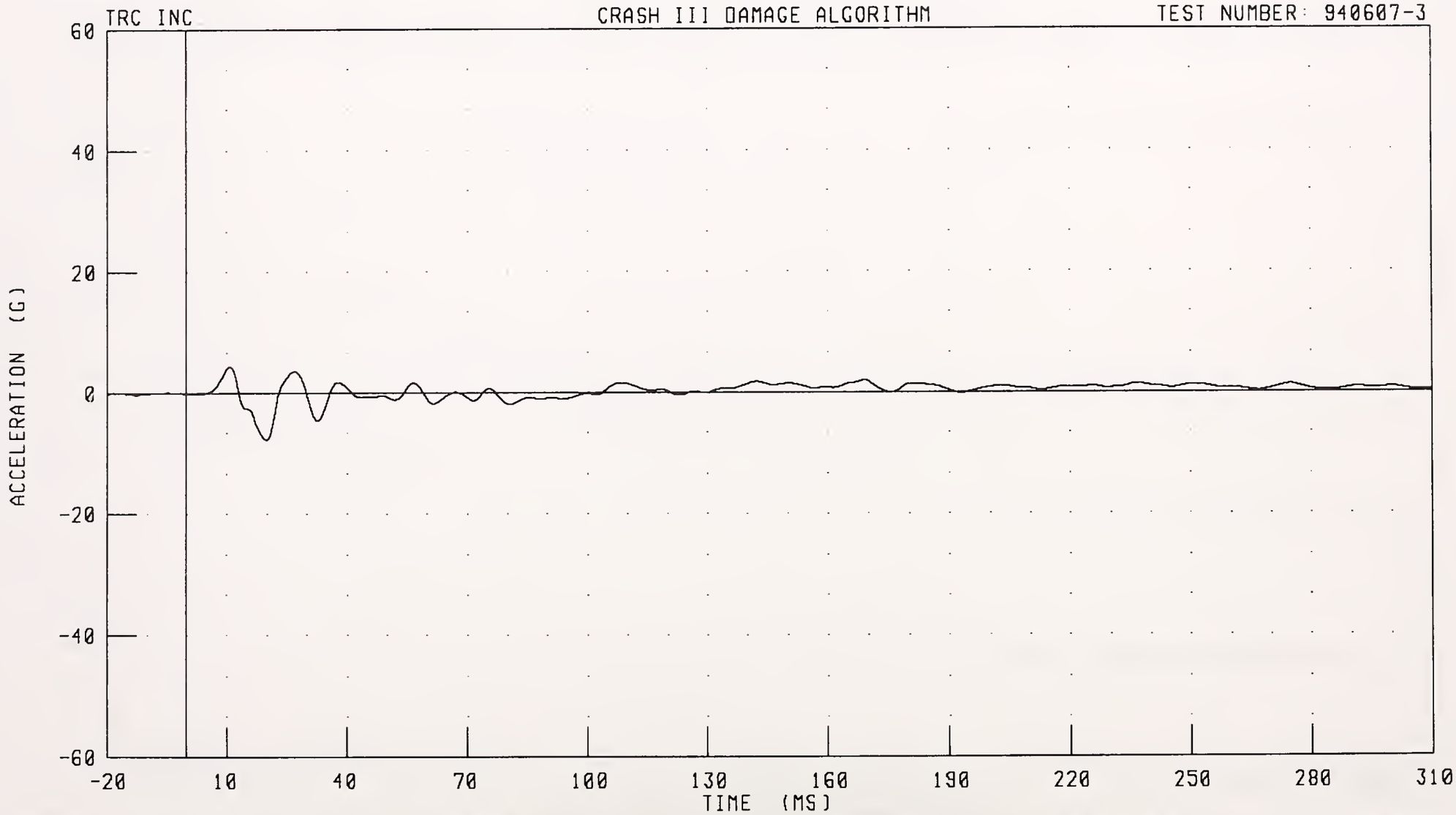
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
LEFT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-3



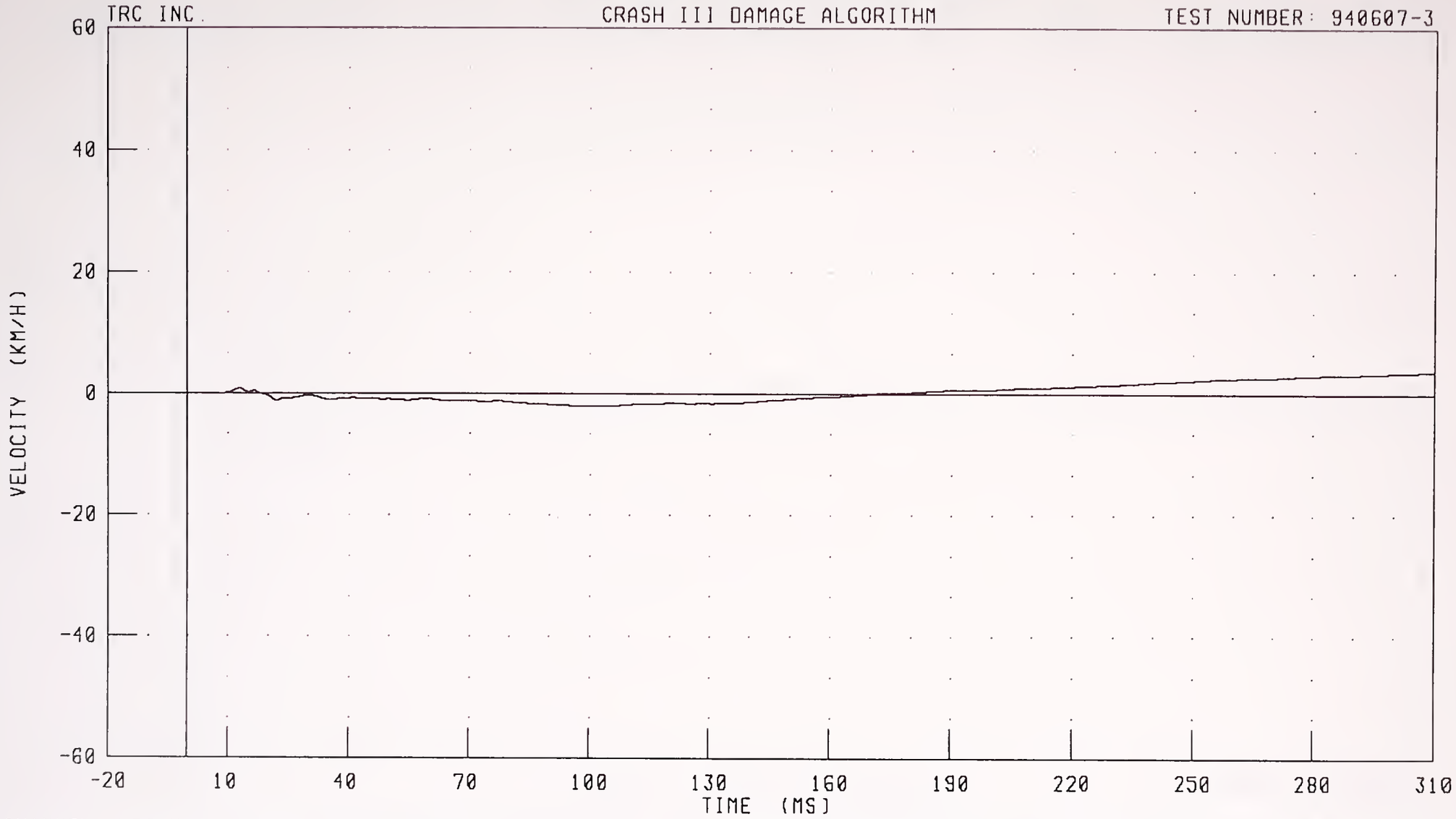
CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 528.80 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
LEFT REAR SILL Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



CHANNEL: LRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 4.37 G @ 10.80 MS; -7.72 G @ 20.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
LEFT REAR SILL Y-AXIS VELOCITY

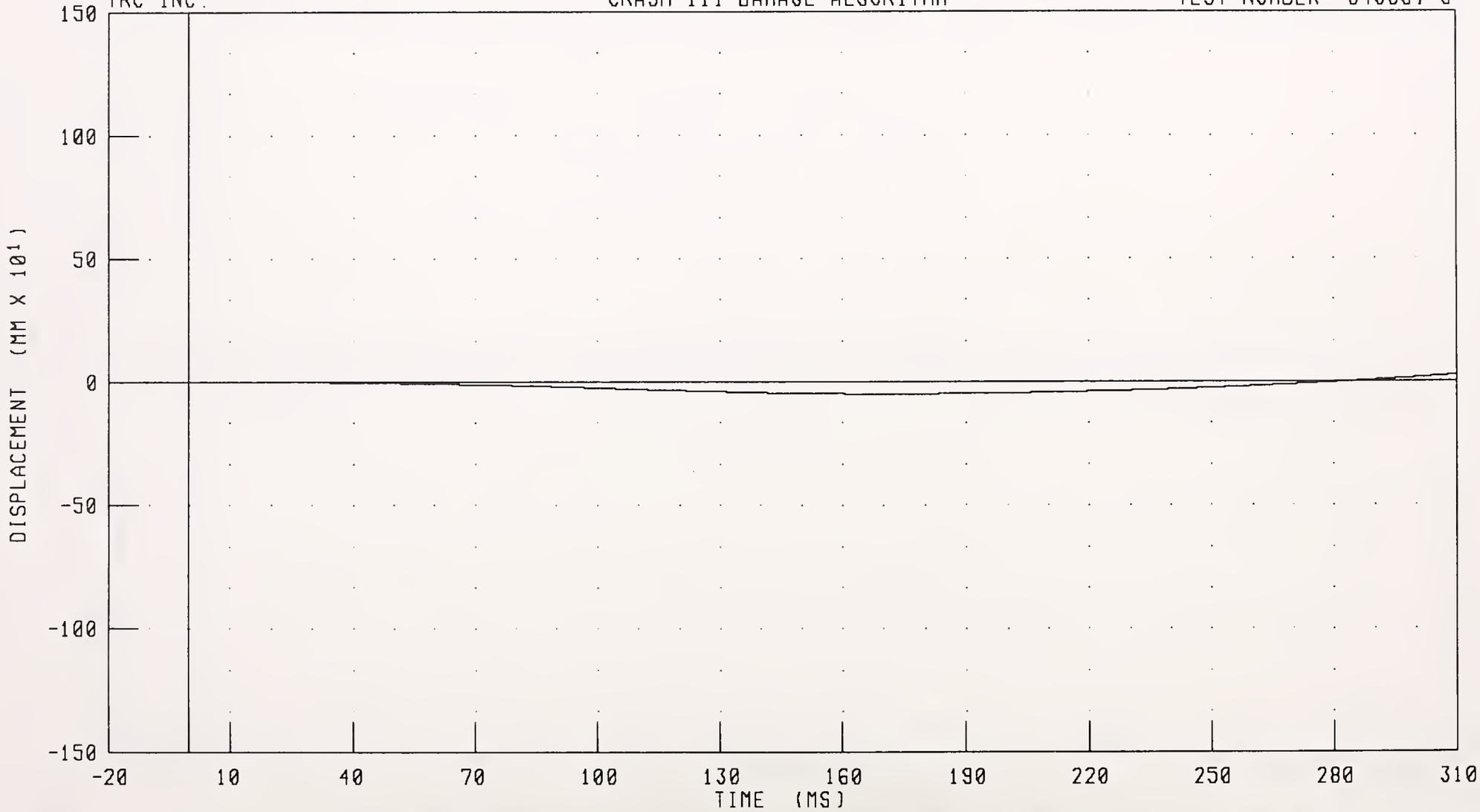


CHANNEL: LRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 3.70 KM/H @ 310.00 MS; -2.08 KM/H @ 104.24 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

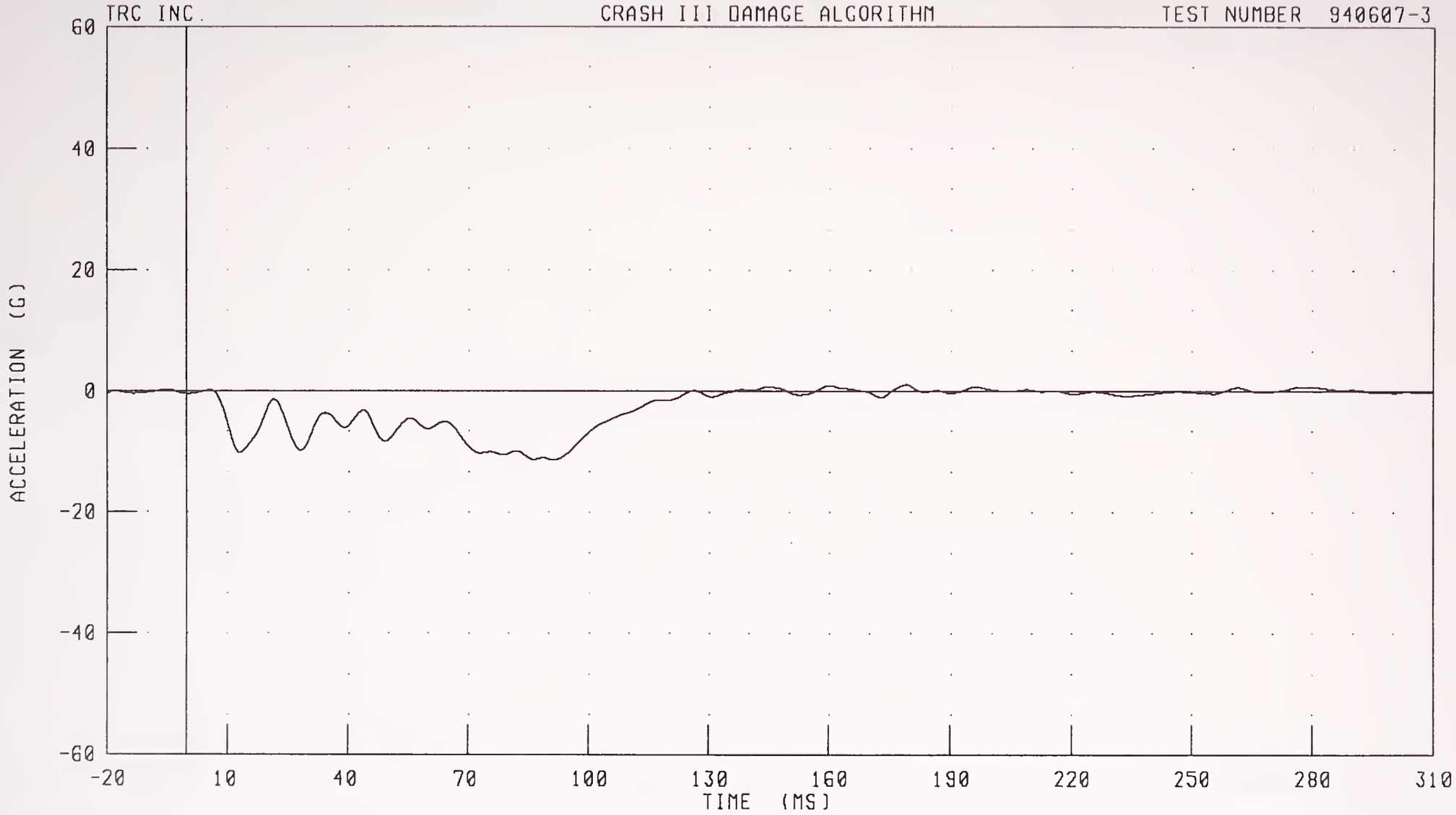
LEFT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-3



CHANNEL: LRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 25.78 MM @ 310.00 MS; -49.05 MM @ 169.84 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 3
RIGHT REAR SILL X-AXIS ACCELERATION

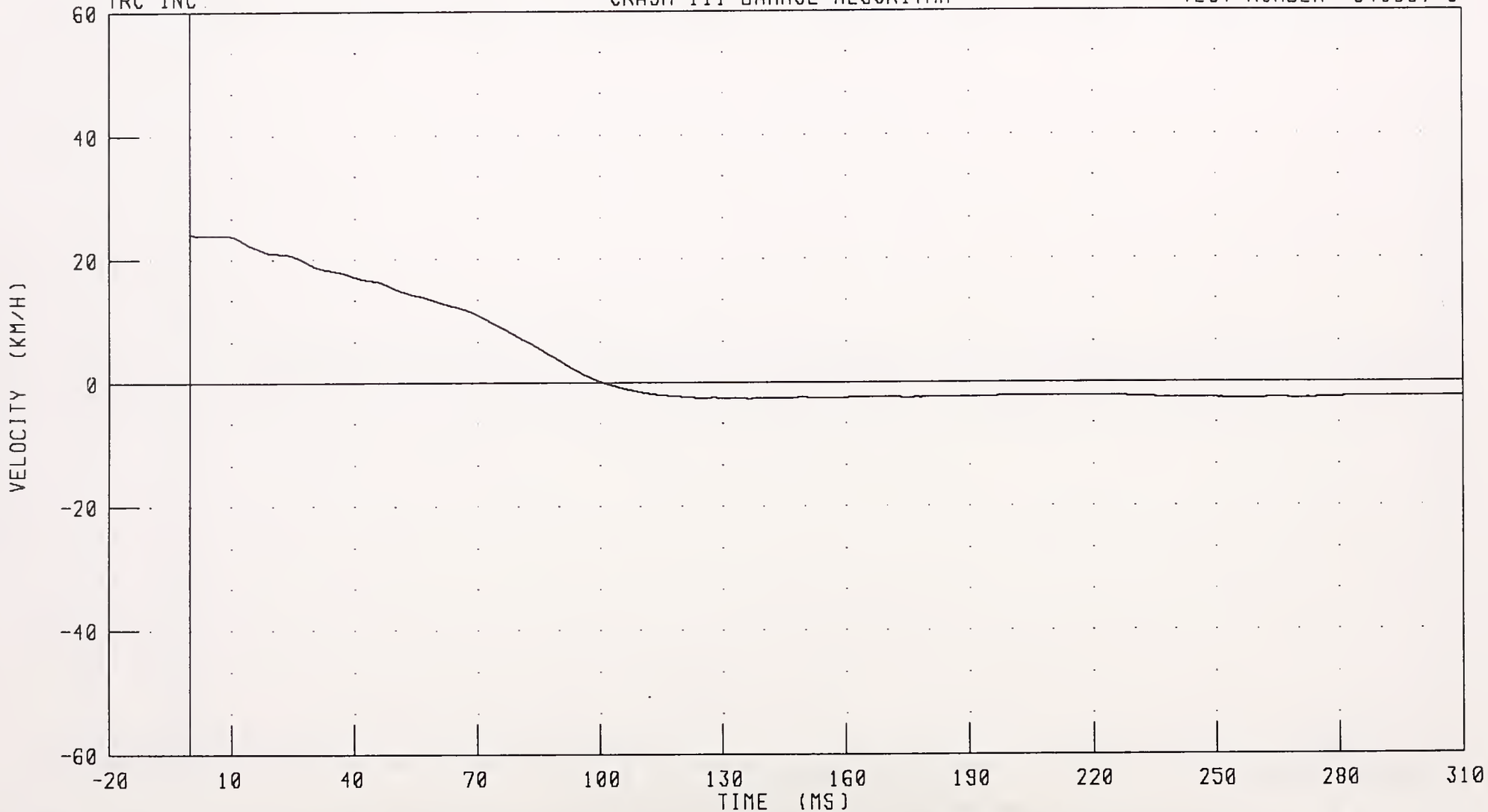


CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.12 G @ 179.04 MS; -11.41 G @ 91.28 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 3

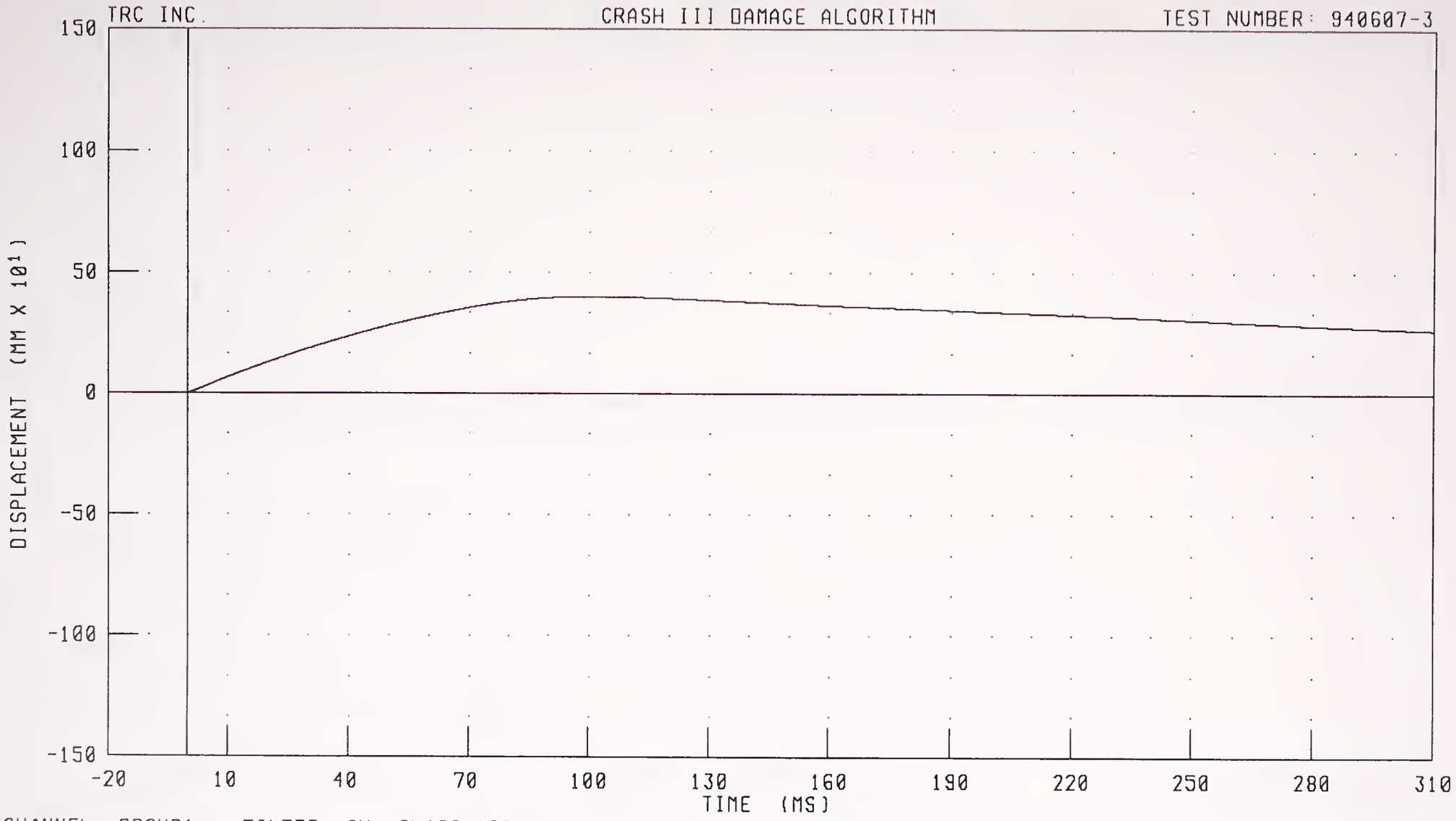
RIGHT REAR SILL X-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-3



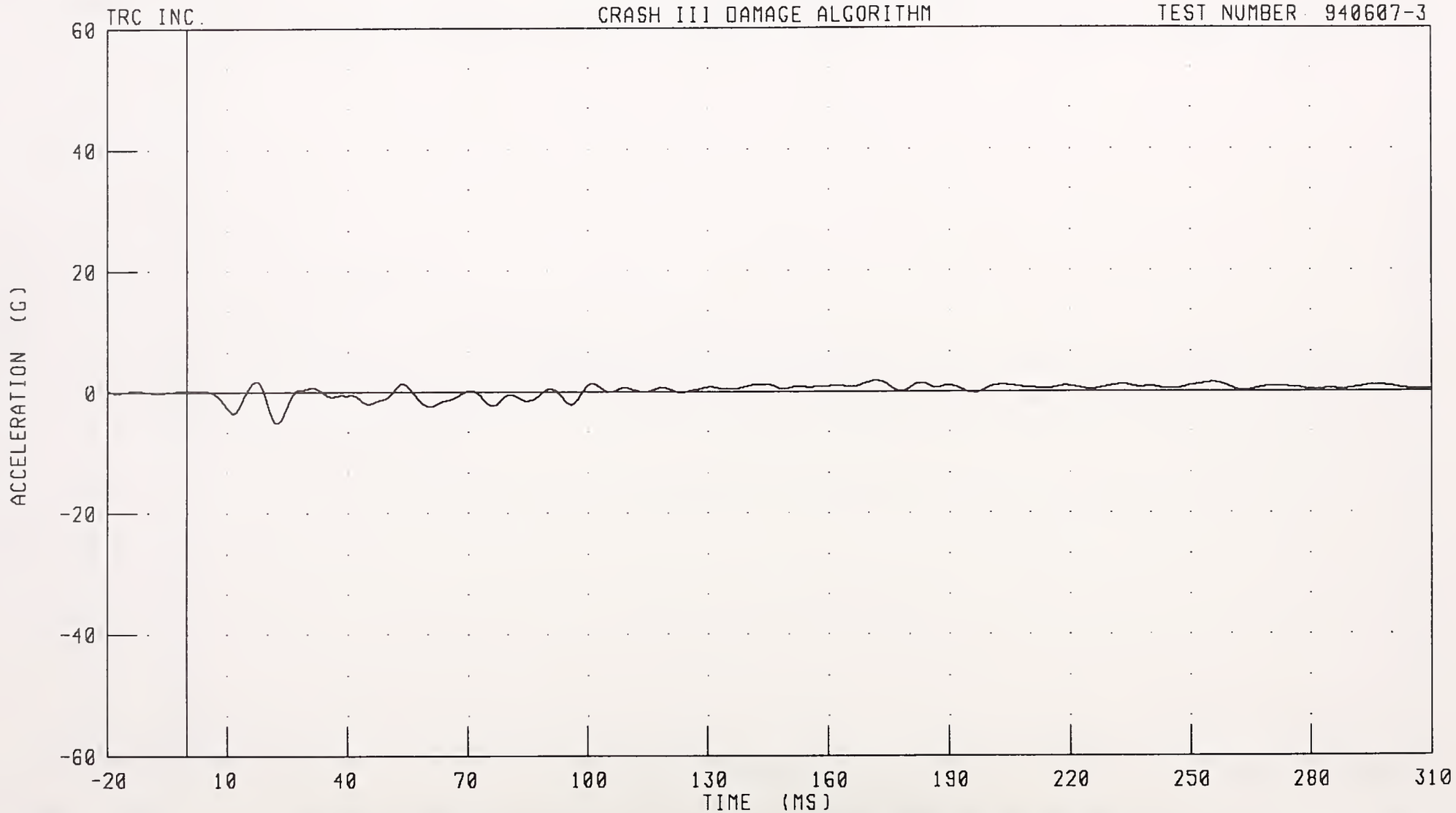
CHANNEL: RRSXV1 FILTER: CH. CLASS 180 PEAK DATA: 24.00 KM/H @ 0.00 MS; -2.70 KM/H @ 257.28 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 3
RIGHT REAR SILL X-AXIS DISPLACEMENT



CHANNEL: RRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 399.91 MM @ 100.88 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
RIGHT REAR SILL Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

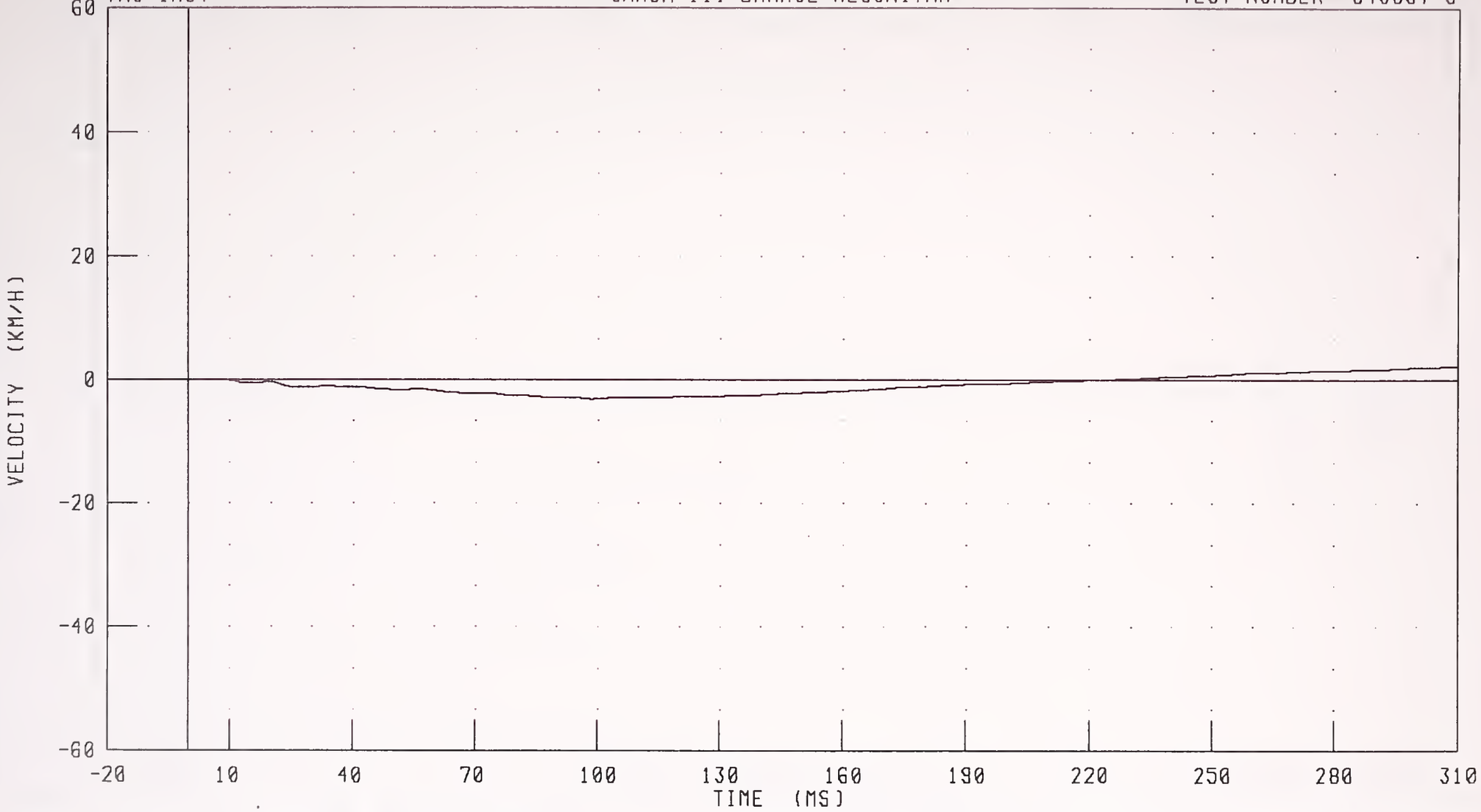


CHANNEL: RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 1.85 G @ 171.84 MS; -5.14 G @ 22.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

RIGHT REAR SILL Y-AXIS VELOCITY

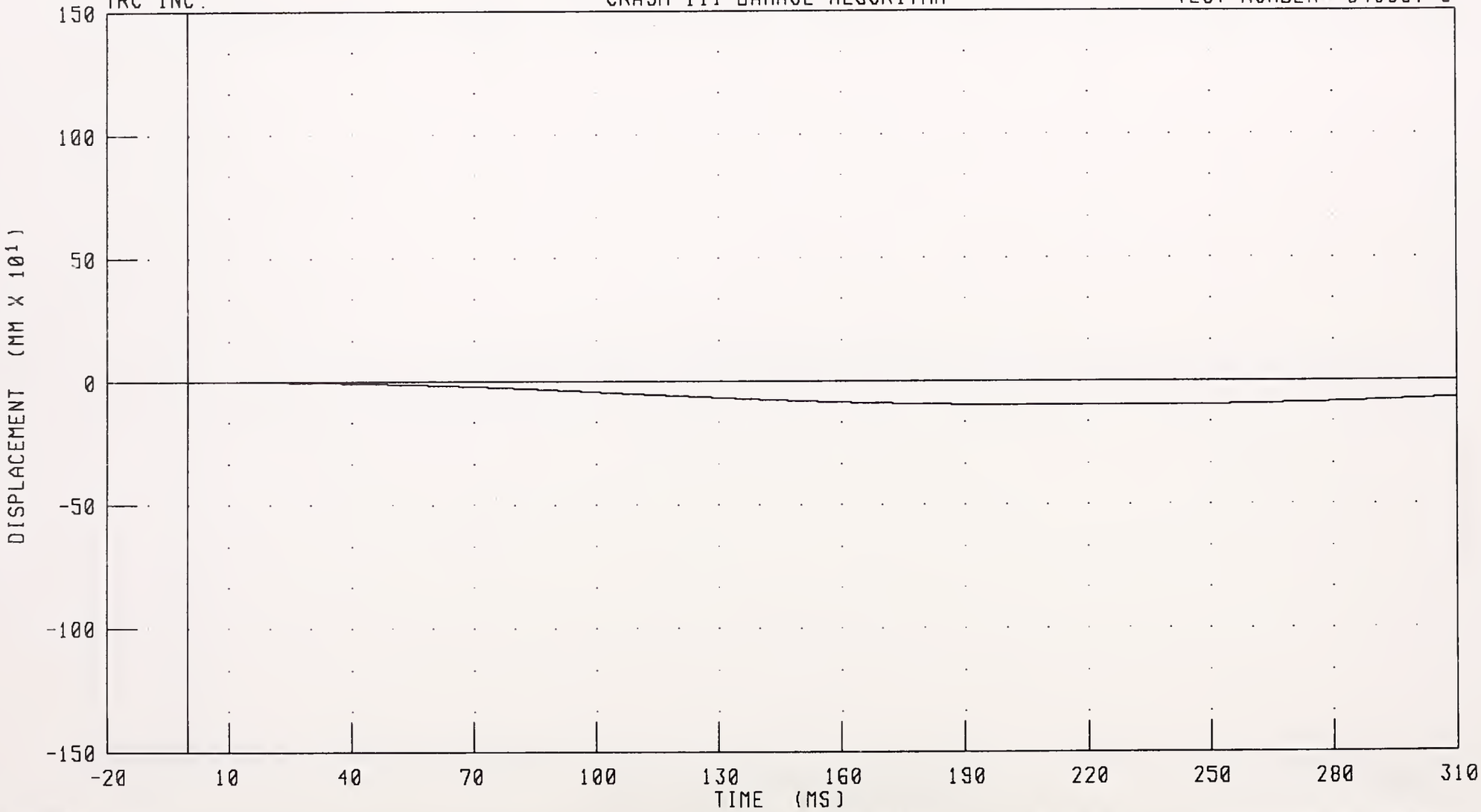
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-3



CHANNEL: RRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 2.18 KM/H @ 310.00 MS; -3.13 KM/H @ 98.56 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
RIGHT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-3



CHANNEL: RRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.05 MM @ 8.32 MS; -99.08 MM @ 220.96 MS

Data Plots

Test No. 940607-4

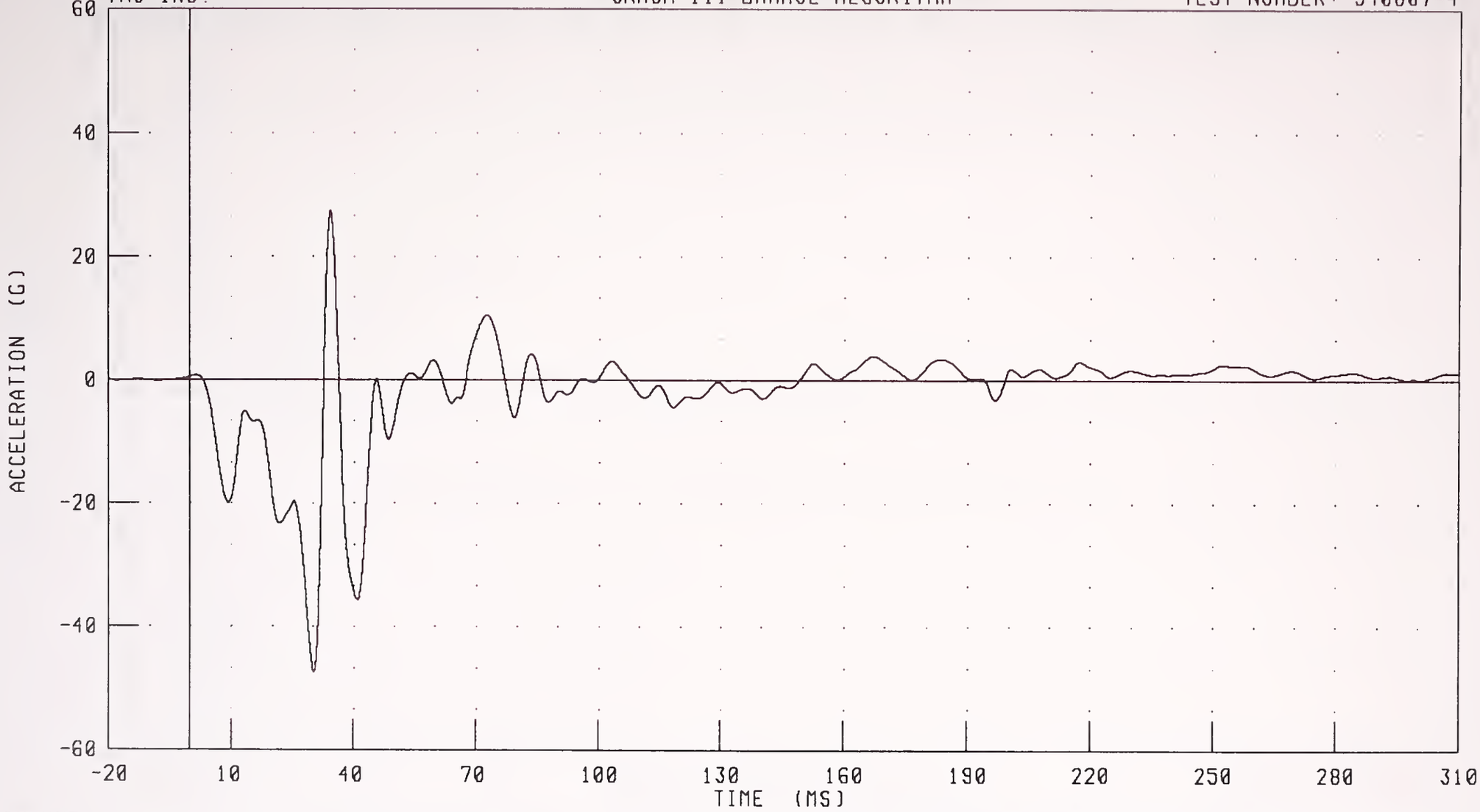
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 4

VEHICLE CG X-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-4



CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 27.43 G @ 34.32 MS; -47.44 G @ 30.24 MS

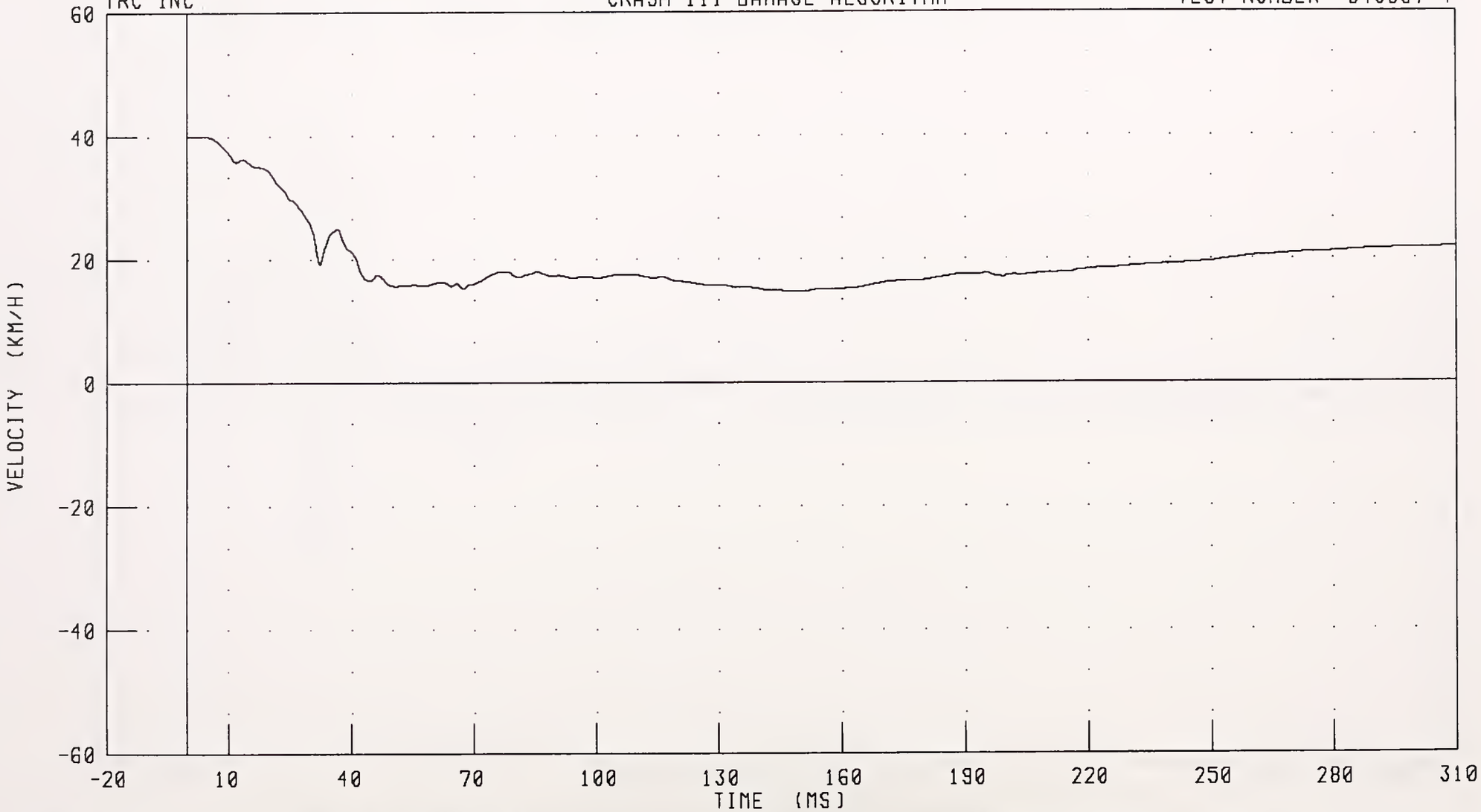
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

VEHICLE CG X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC

TEST NUMBER: 940607-4



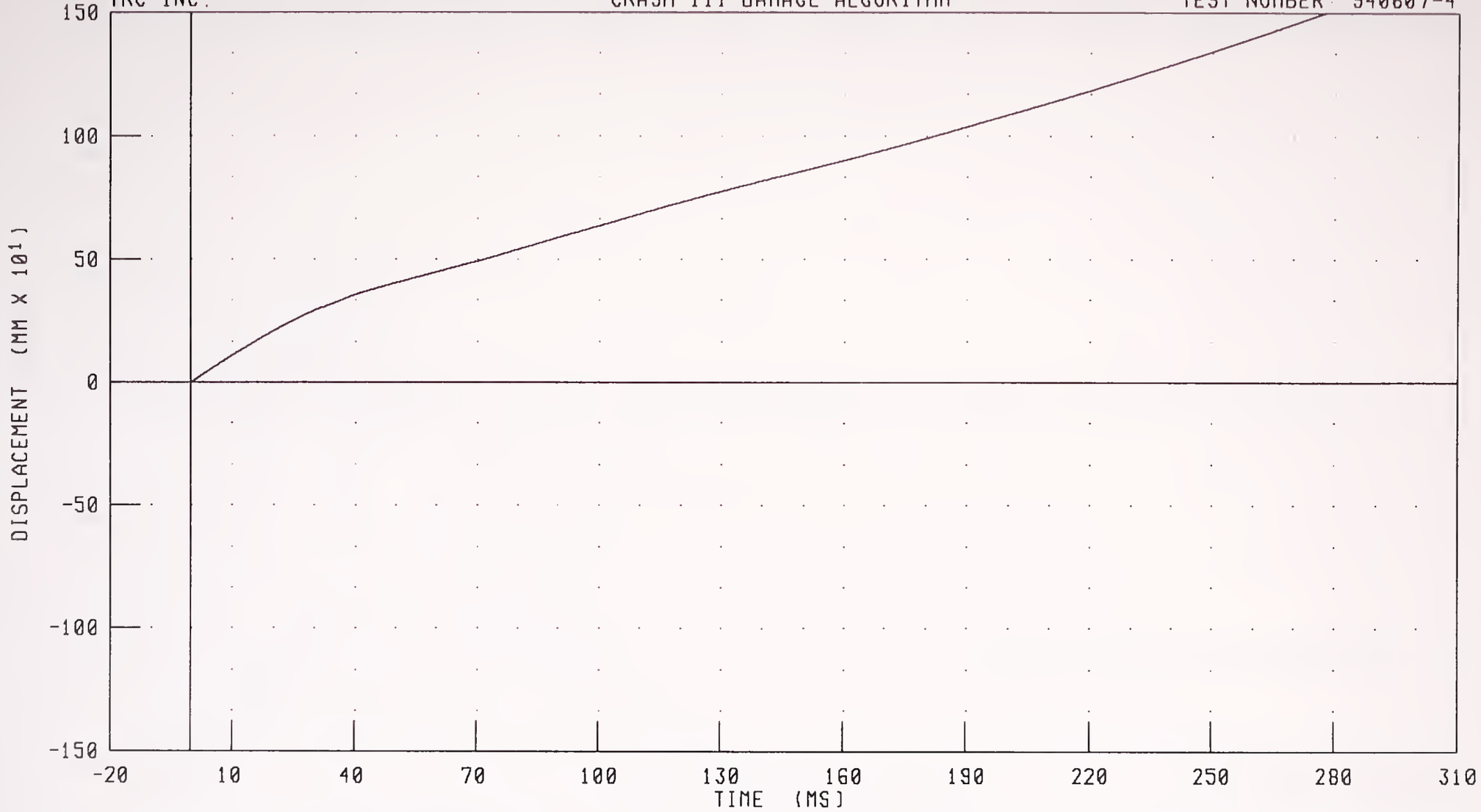
CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 39.94 KM/H @ 3.76 MS; 14.67 KM/H @ 148.72 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

VEHICLE CG X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-4

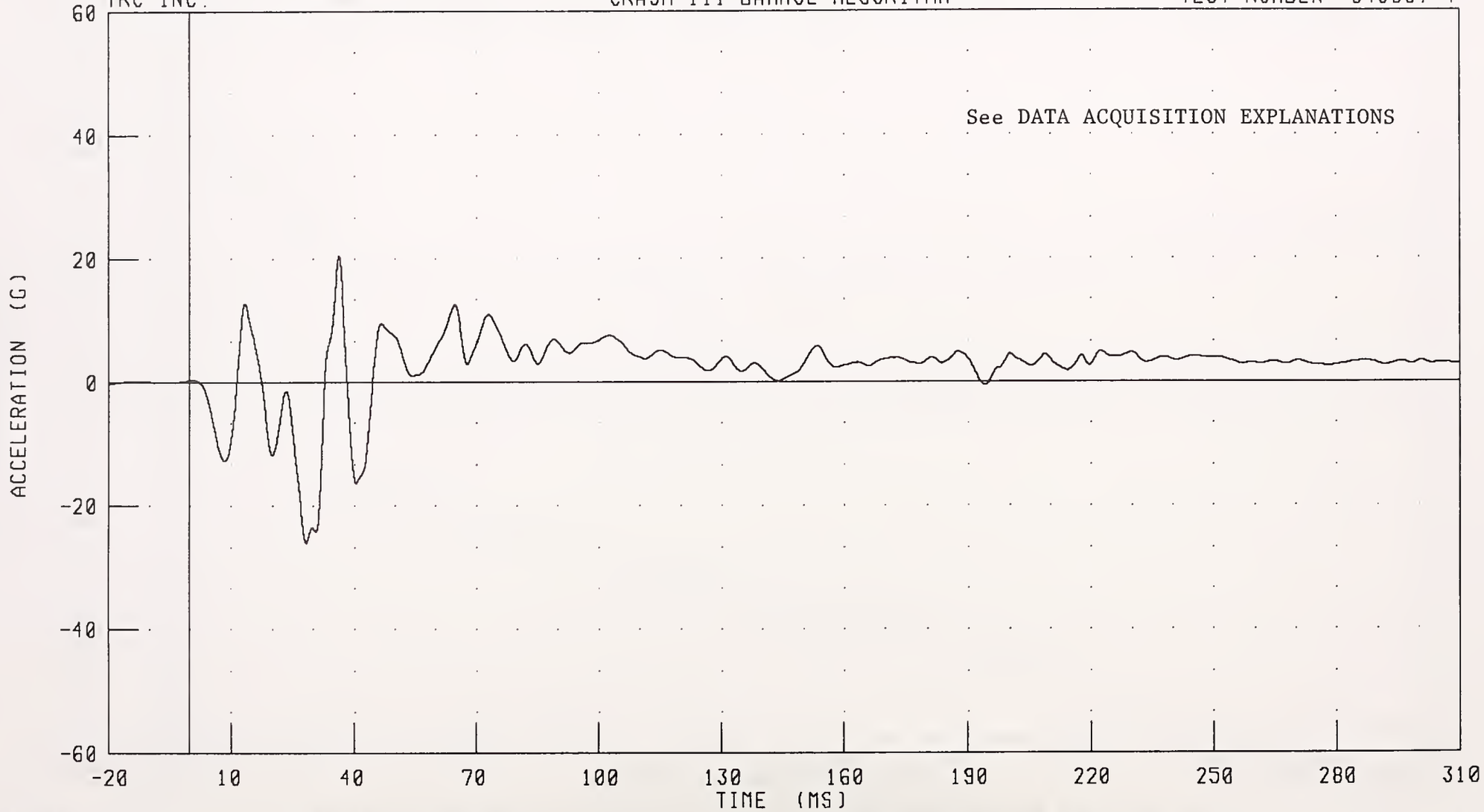


CHANNEL: VCGXD1 FILTER: CH. CLASS 180 PEAK DATA: 1691.66 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4
VEHICLE CG Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-4

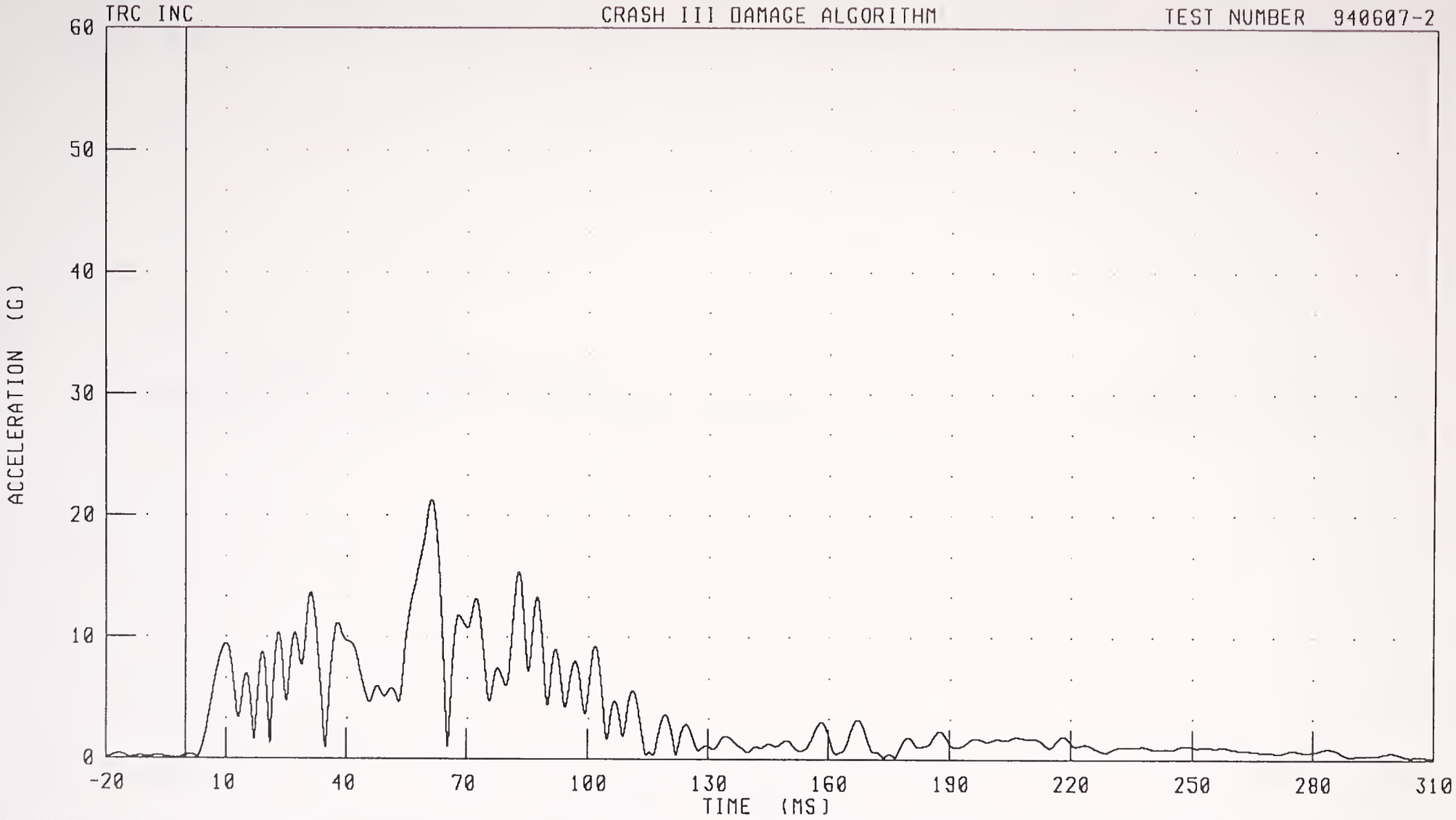


CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 20.52 G @ 36.40 MS; -26.07 G @ 28.32 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2

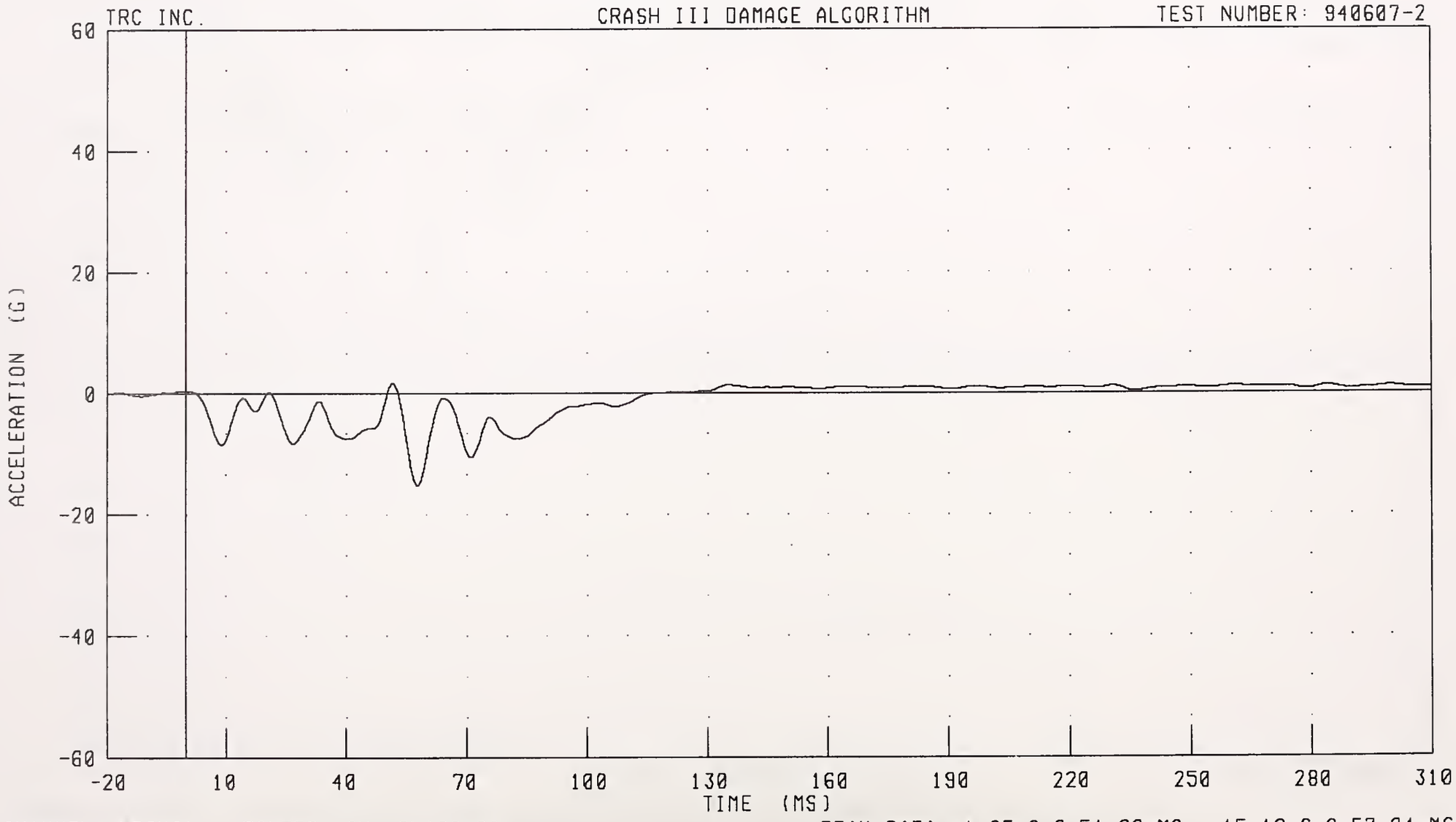
VEHICLE CG RESULTANT ACCELERATION



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 21.27 G @ 61.20 MS; 0.06 G @ -2.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
LEFT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM

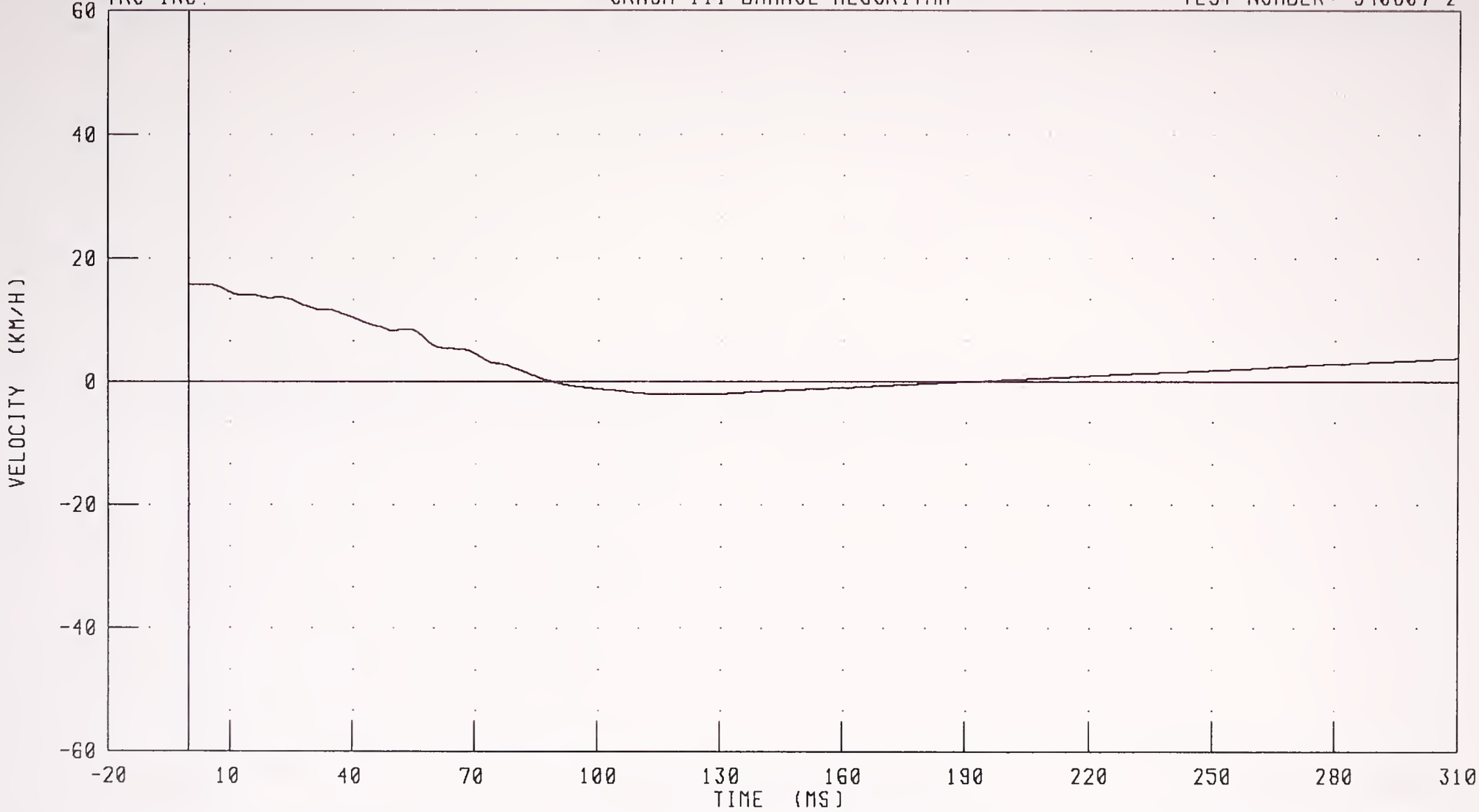


CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.65 G @ 51.68 MS; -15.19 G @ 57.84 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2

LEFT REAR SILL X-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-2

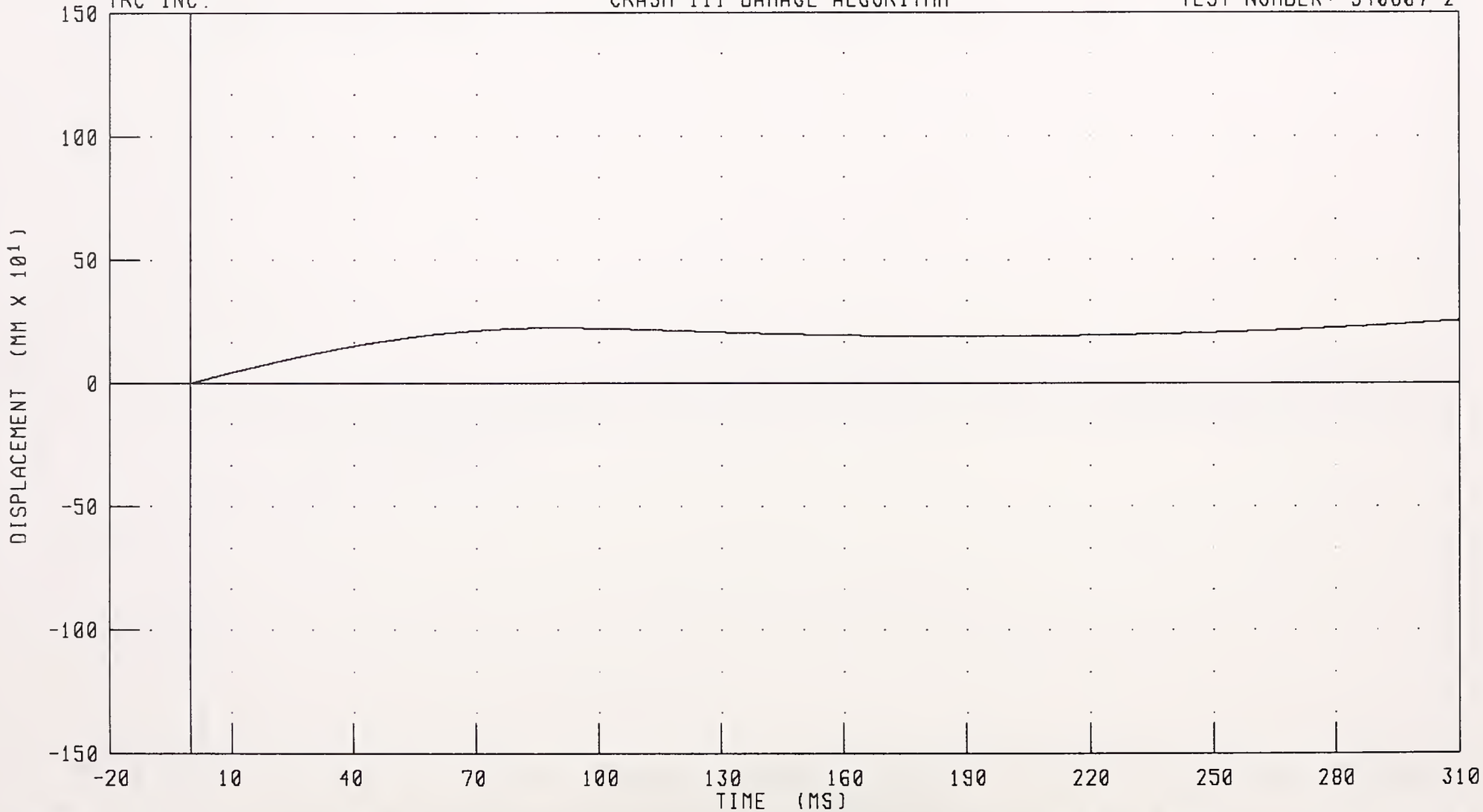


CHANNEL: LRSXV1 FILTER: CH. CLASS 180 PEAK DATA: 15.82 KM/H @ 1.68 MS; -2.02 KM/H @ 118.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2

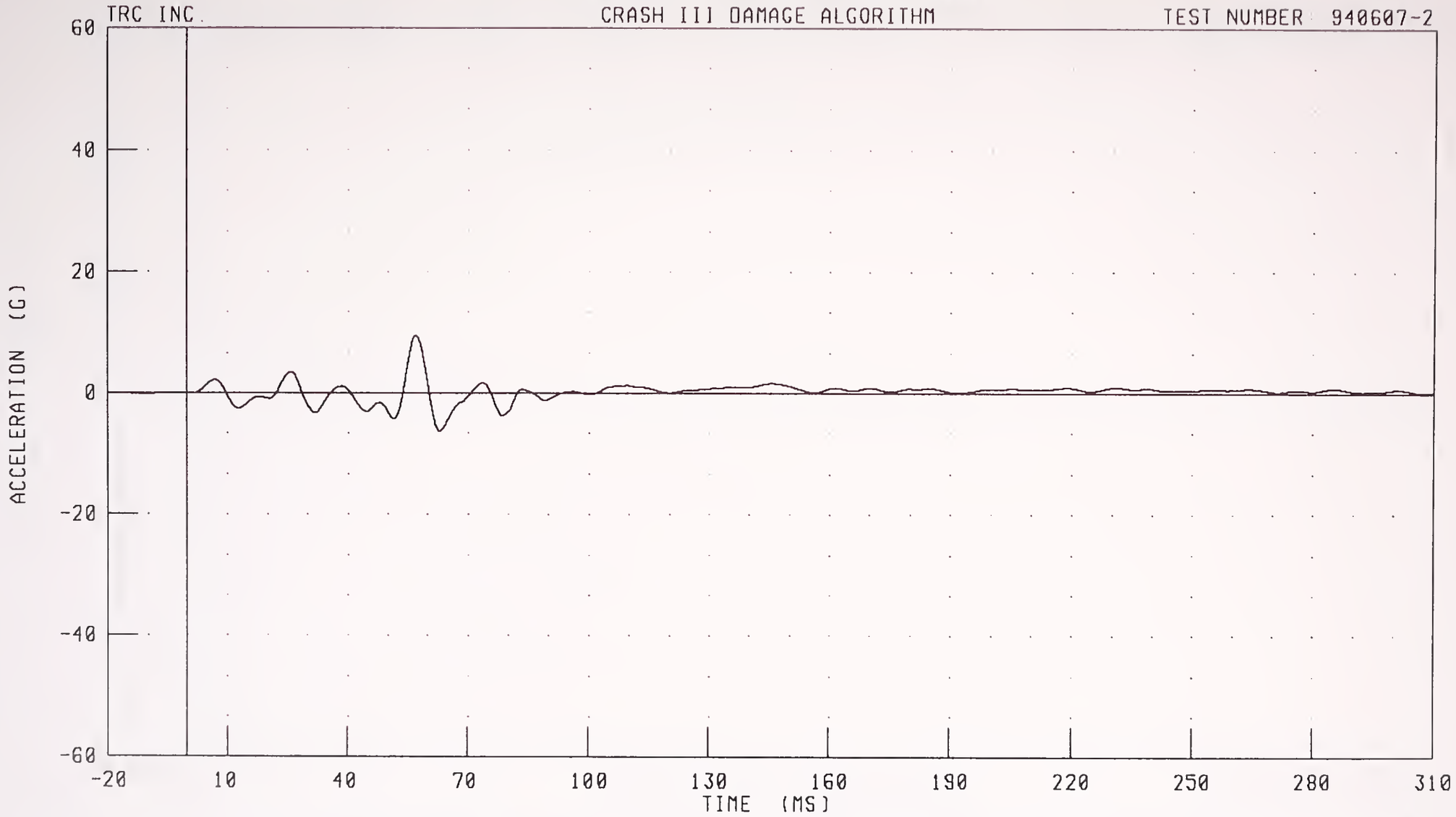
LEFT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-2



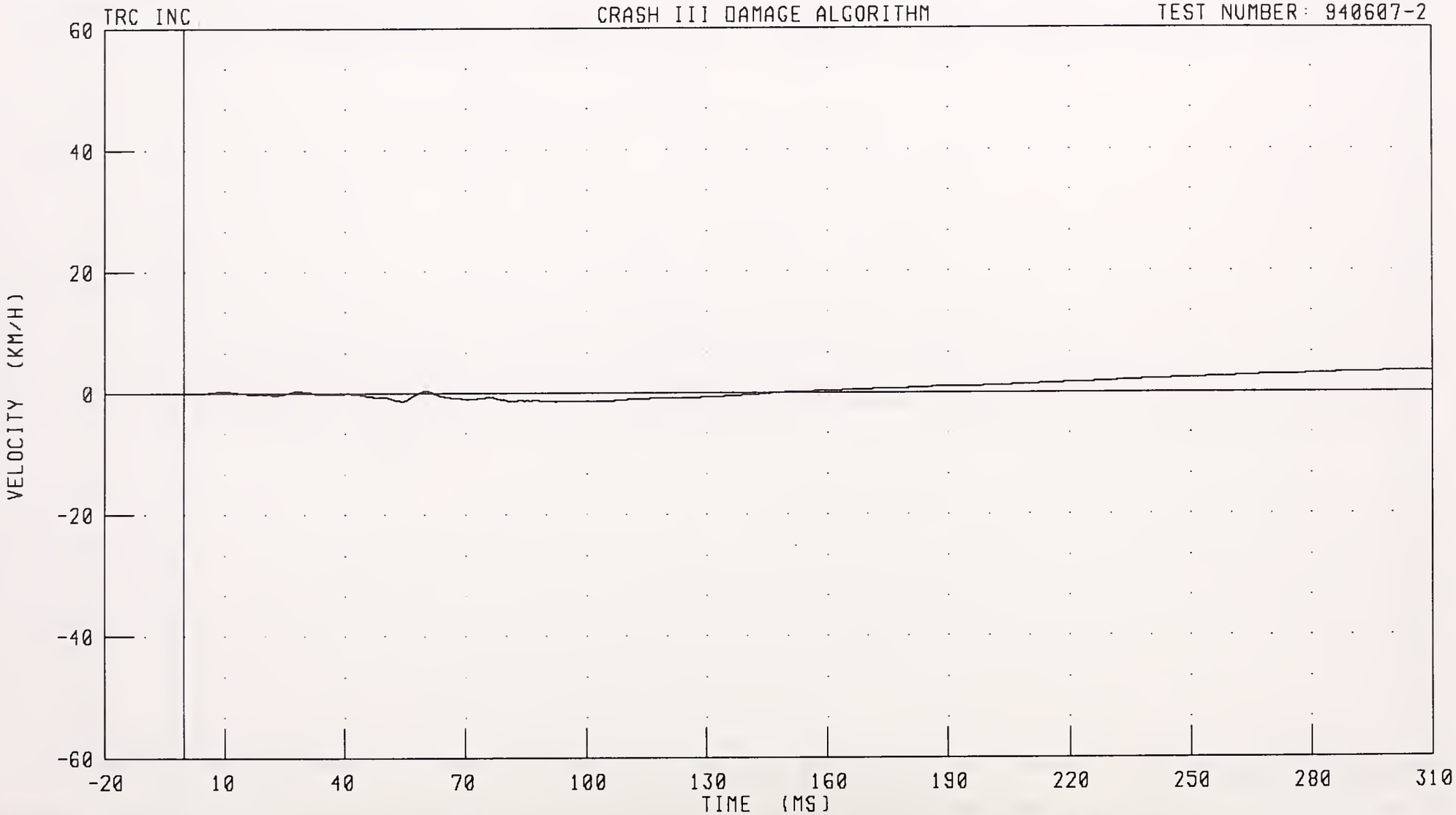
CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 252.54 MM @ 310.00 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
LEFT REAR SILL Y-AXIS ACCELERATION



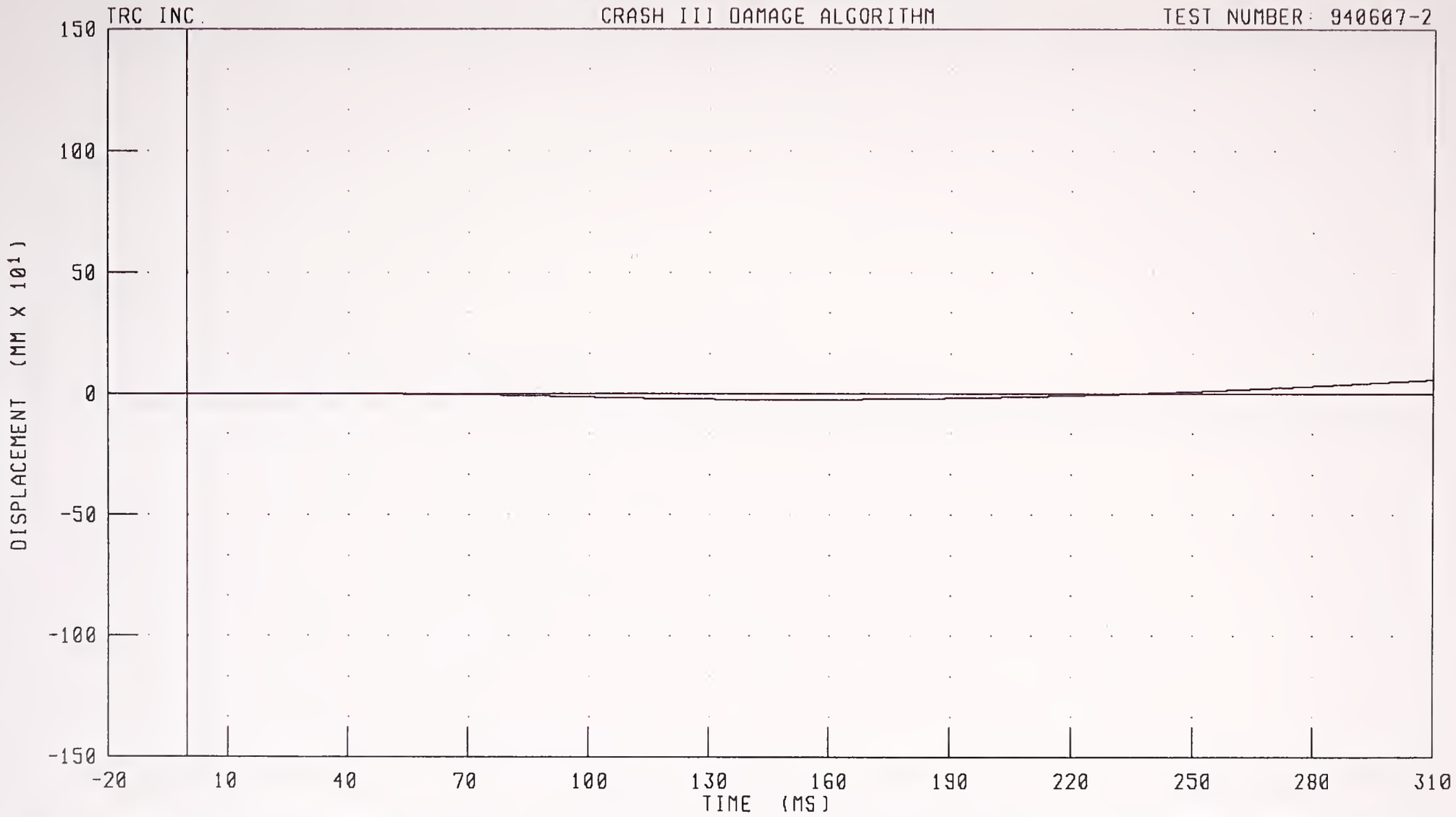
CHANNEL: LRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 9.48 G @ 57.12 MS; -6.28 G @ 63.04 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
LEFT REAR SILL Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM



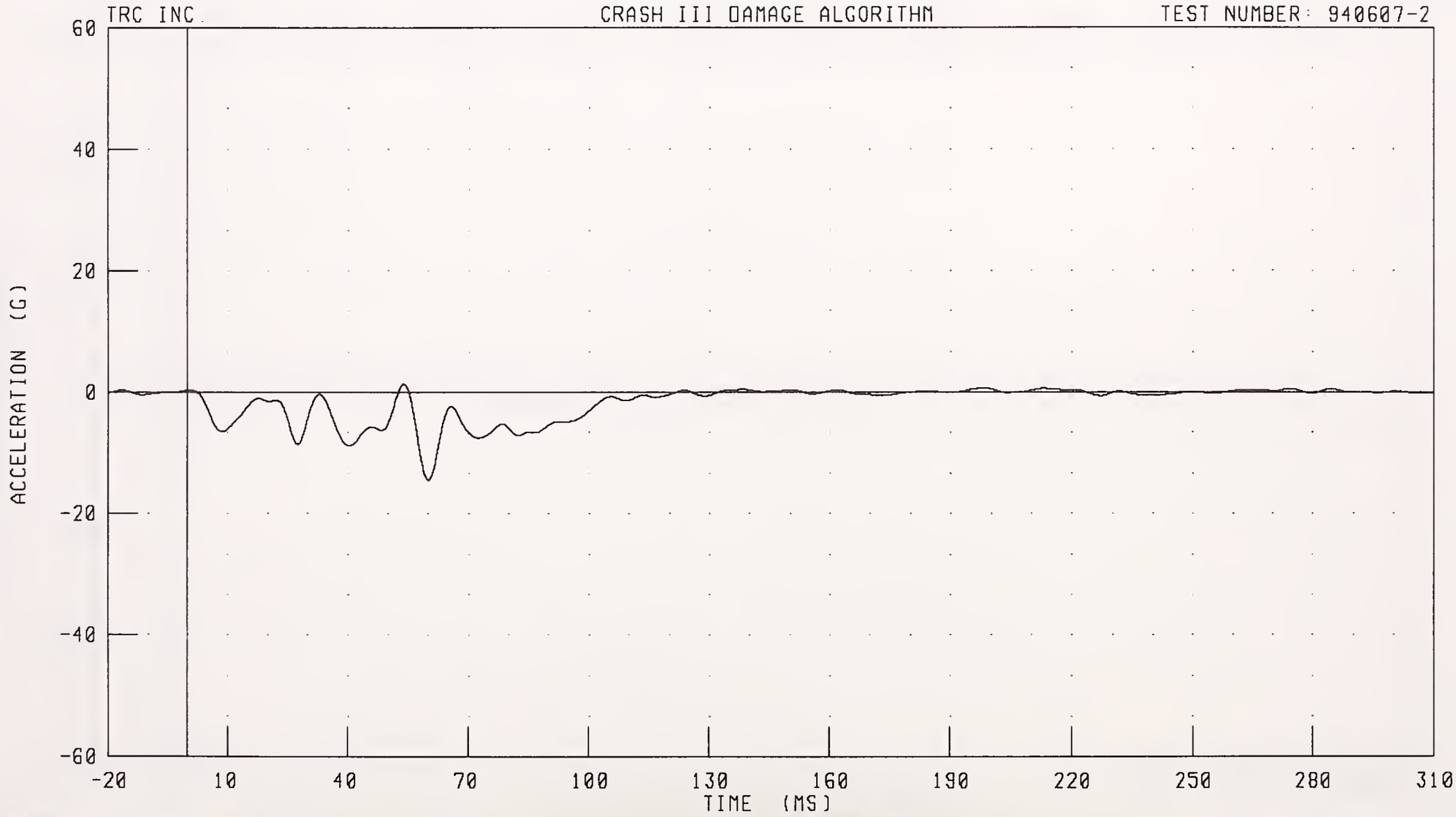
CHANNEL: LRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 3.47 KM/H @ 310.00 MS; -1.43 KM/H @ 92.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
LEFT REAR SILL Y-AXIS DISPLACEMENT



CHANNEL: LRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 59.18 MM @ 310.00 MS; -24.64 MM @ 147.36 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 2
RIGHT REAR SILL X-AXIS ACCELERATION



CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.34 G @ 54.00 MS; -14.49 G @ 60.16 MS

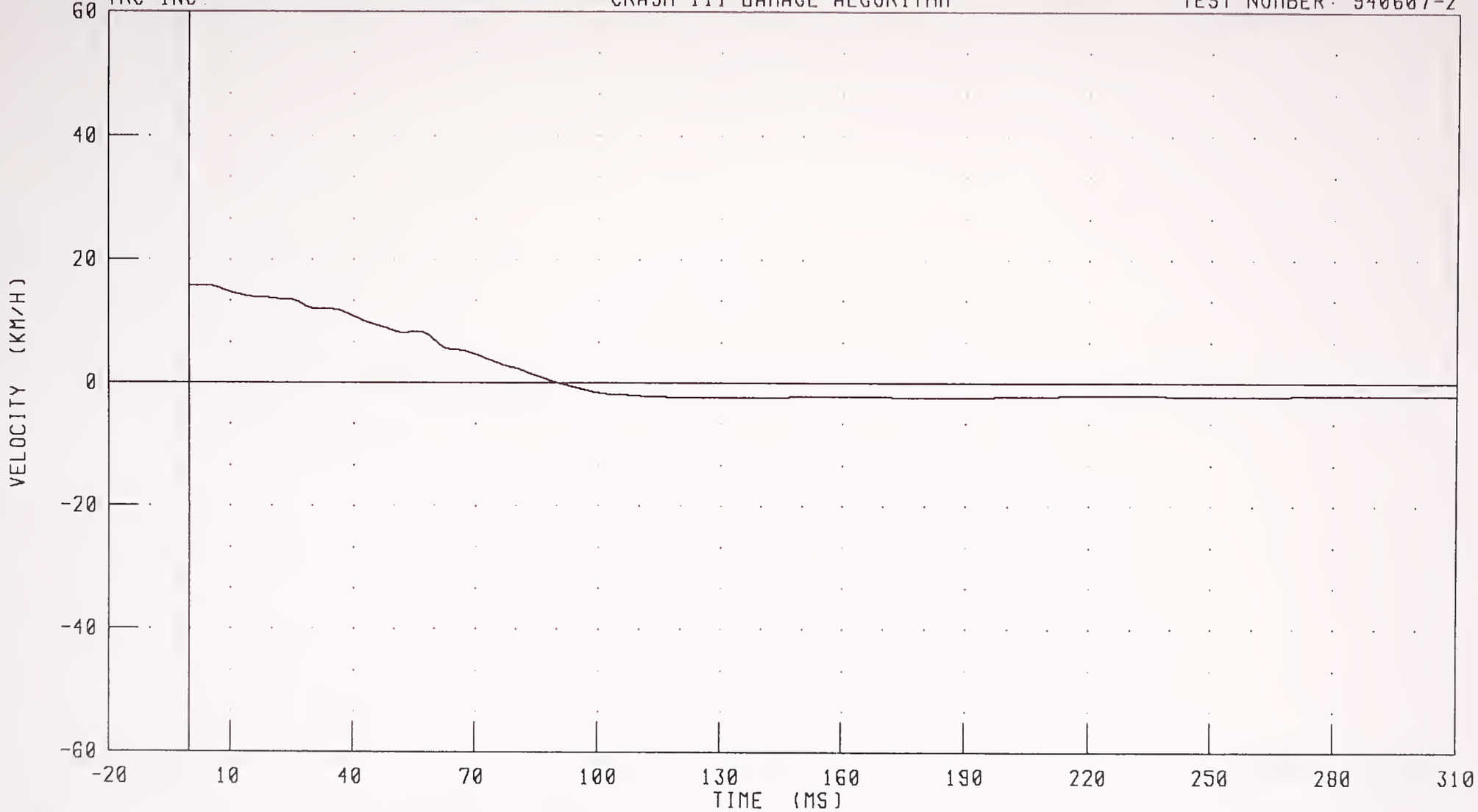
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2

RIGHT REAR SILL X-AXIS VELOCITY

TRC INC

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 940607-2

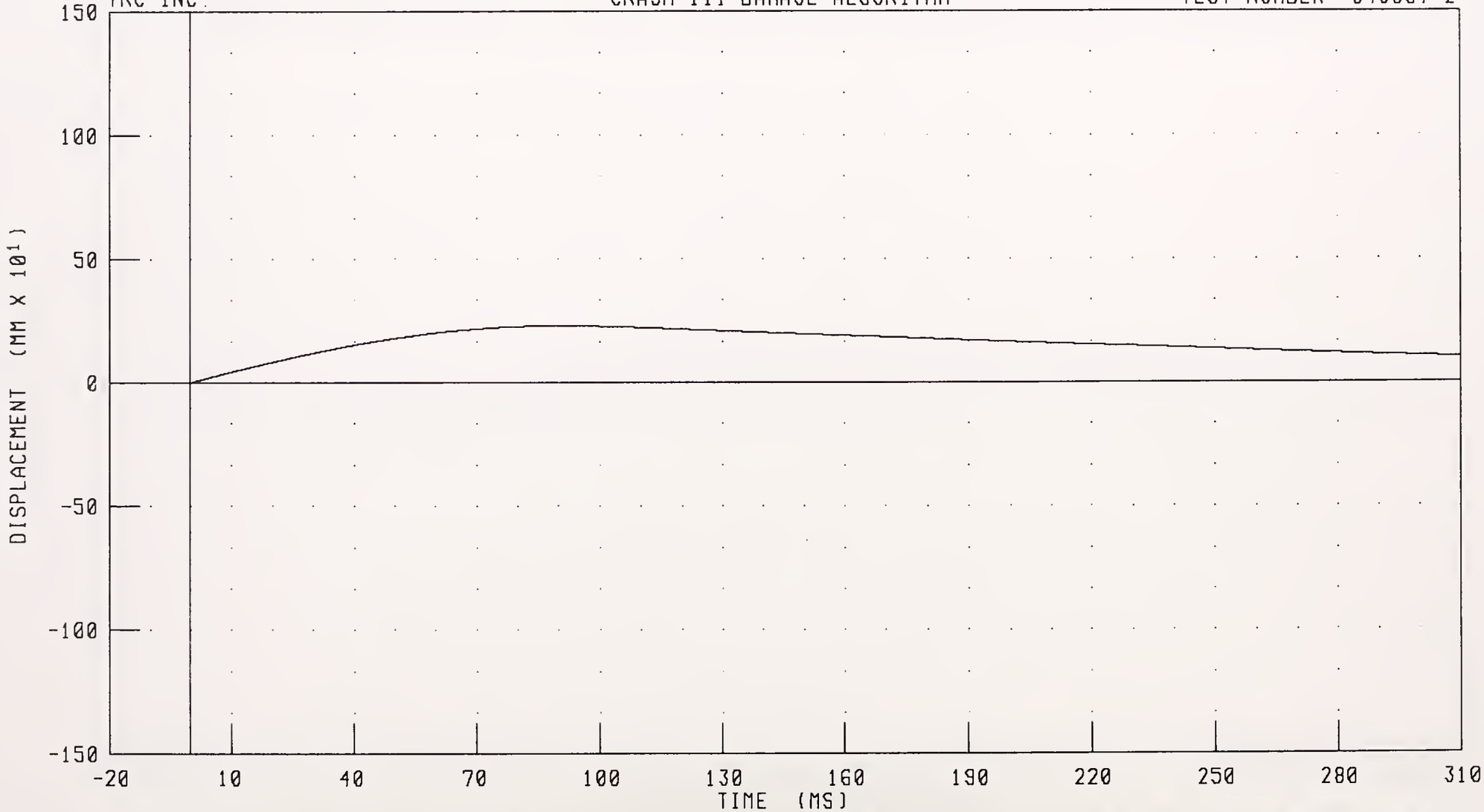


CHANNEL: RRSXV1 FILTER: CH CLASS 180

PEAK DATA: 15.82 KM/H @ 3.76 MS; -2.42 KM/H @ 131.52 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
RIGHT REAR SILL X-AXIS DISPLACEMENT

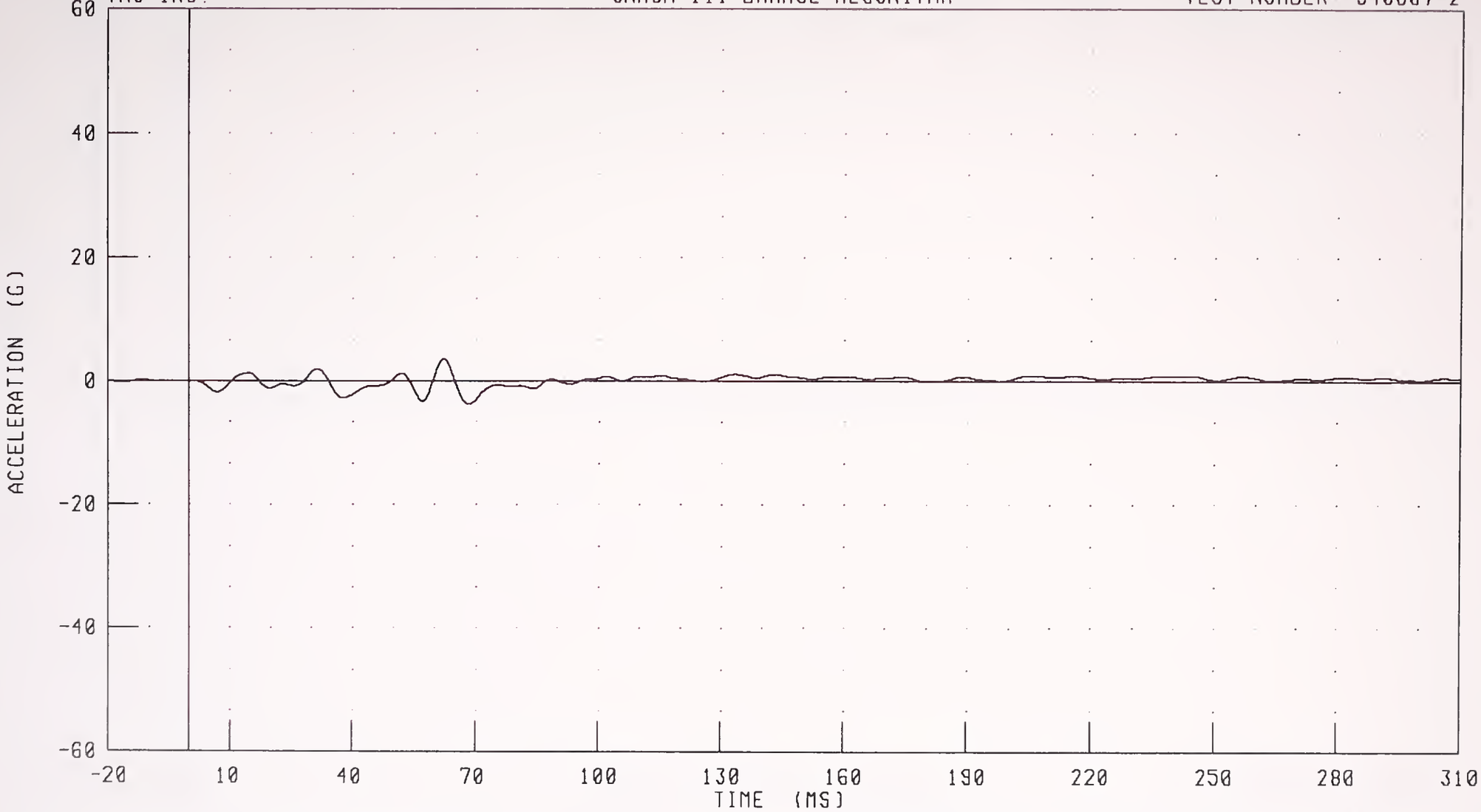
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-2



CHANNEL: RRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 229.05 MM @ 90.24 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2
RIGHT REAR SILL Y-AXIS ACCELERATION

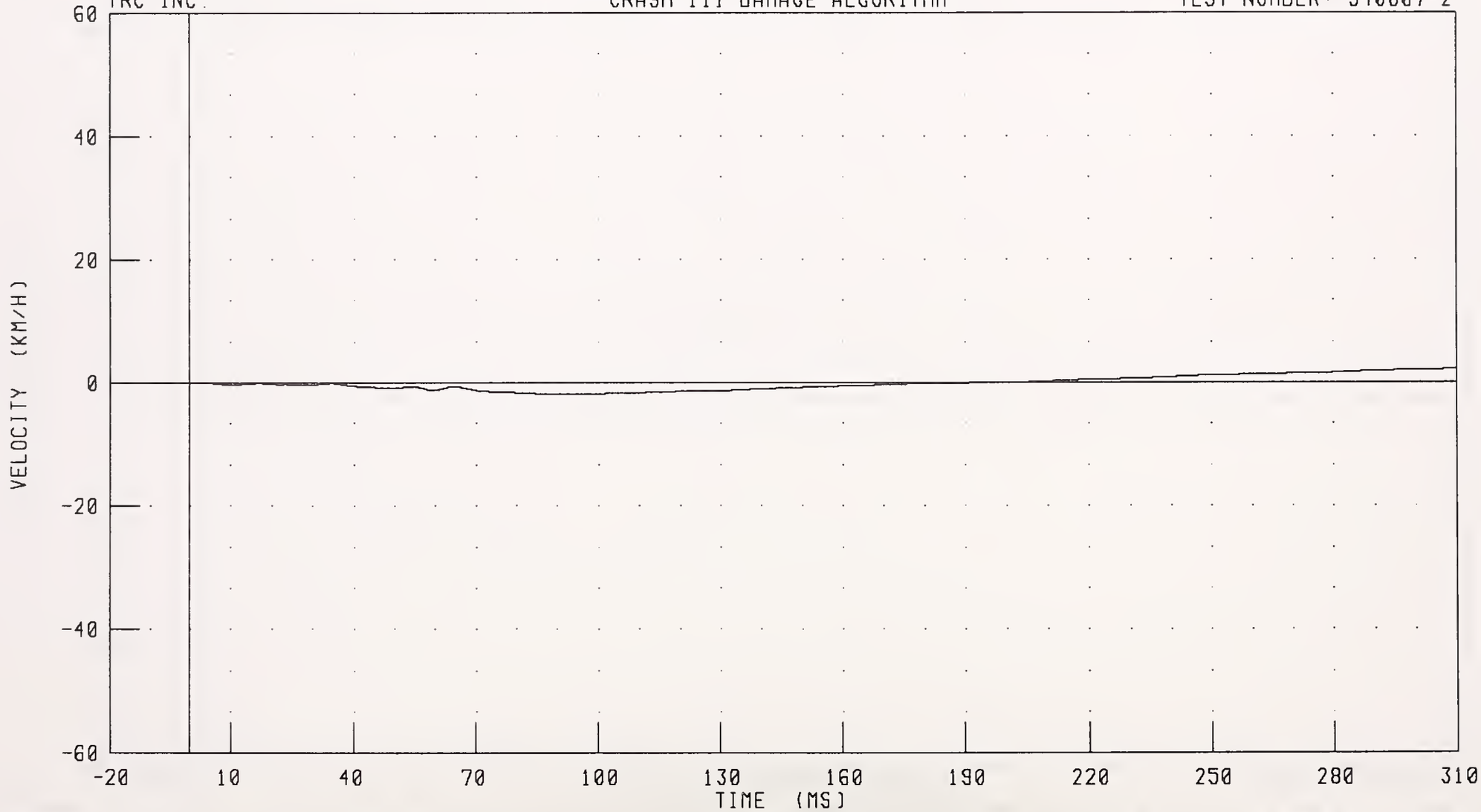
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-2



CHANNEL: RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 3.60 G @ 62.24 MS; -3.73 G @ 68.24 MS

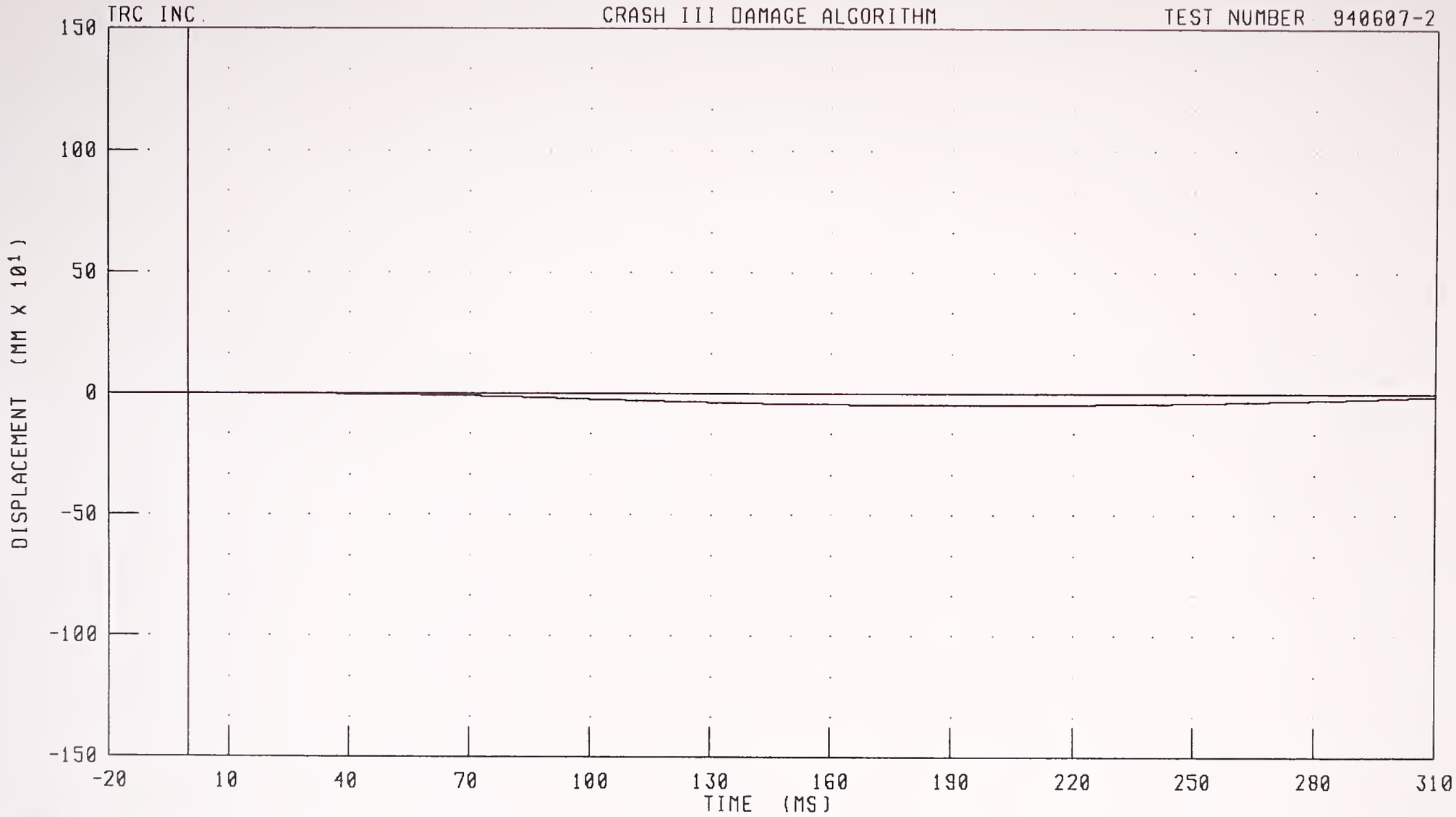
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.2
RIGHT REAR SILL Y-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-2



CHANNEL: RRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 2.18 KM/H @ 310.00 MS; -1.86 KM/H @ 94.56 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 2
RIGHT REAR SILL Y-AXIS DISPLACEMENT



CHANNEL: RRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.00 MM @ 0.00 MS; -46.21 MM @ 202.24 MS

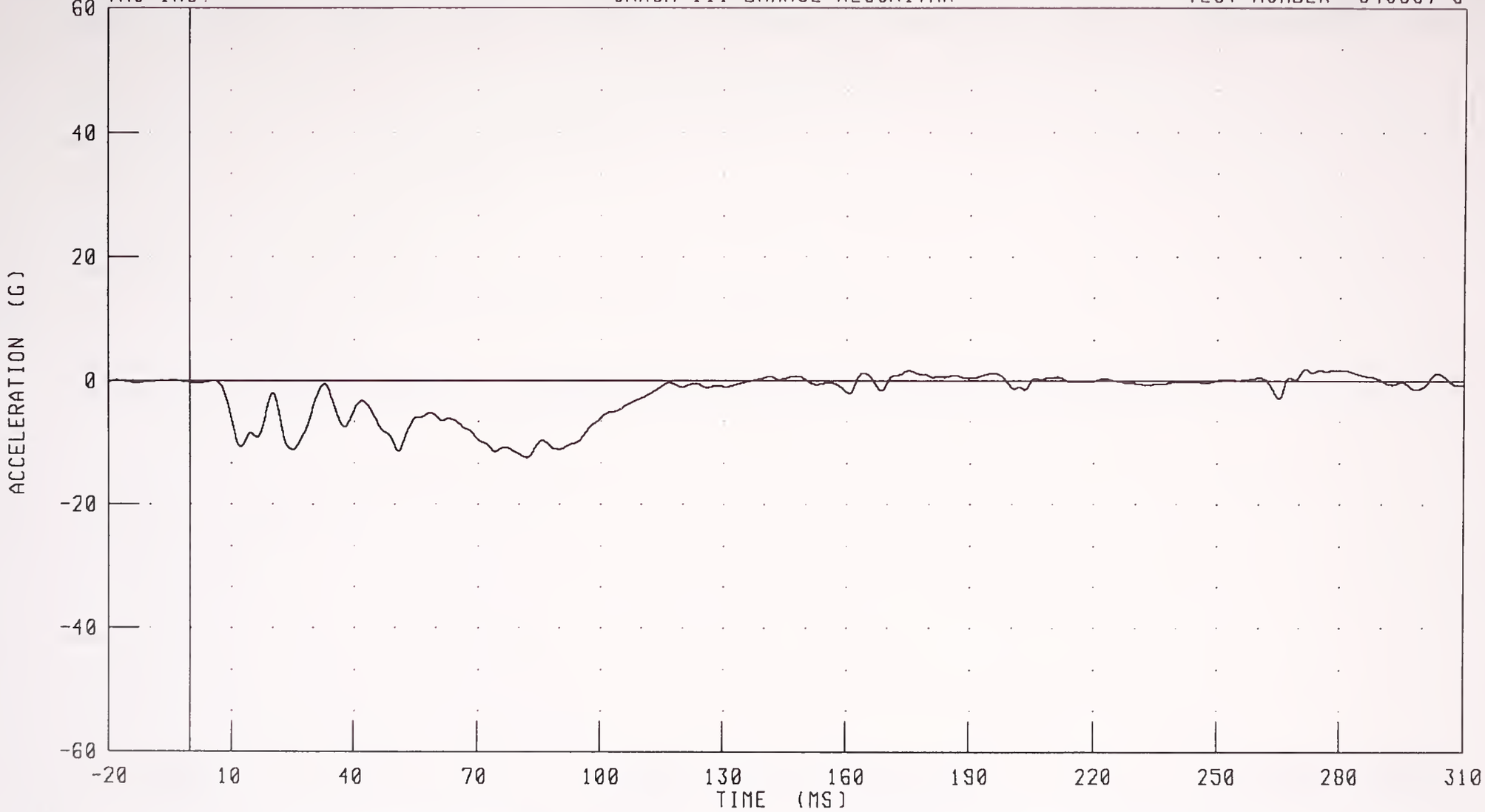
Data Plots

Test No. 940607-3

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 3

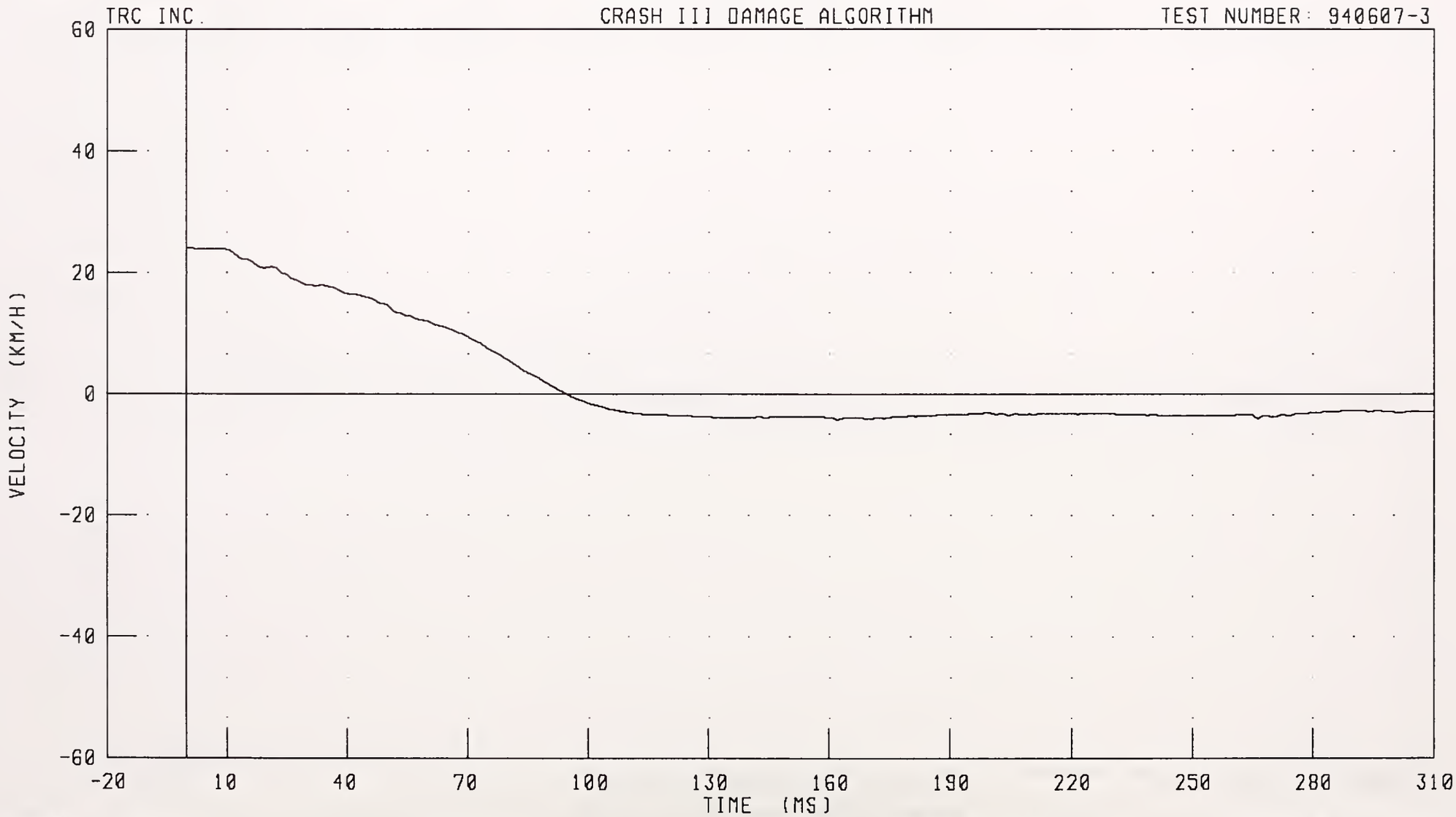
VEHICLE CG X-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-3



CHANNEL: VCGXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.90 G @ 271.60 MS; -12.44 G @ 81.92 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
VEHICLE CG X-AXIS VELOCITY

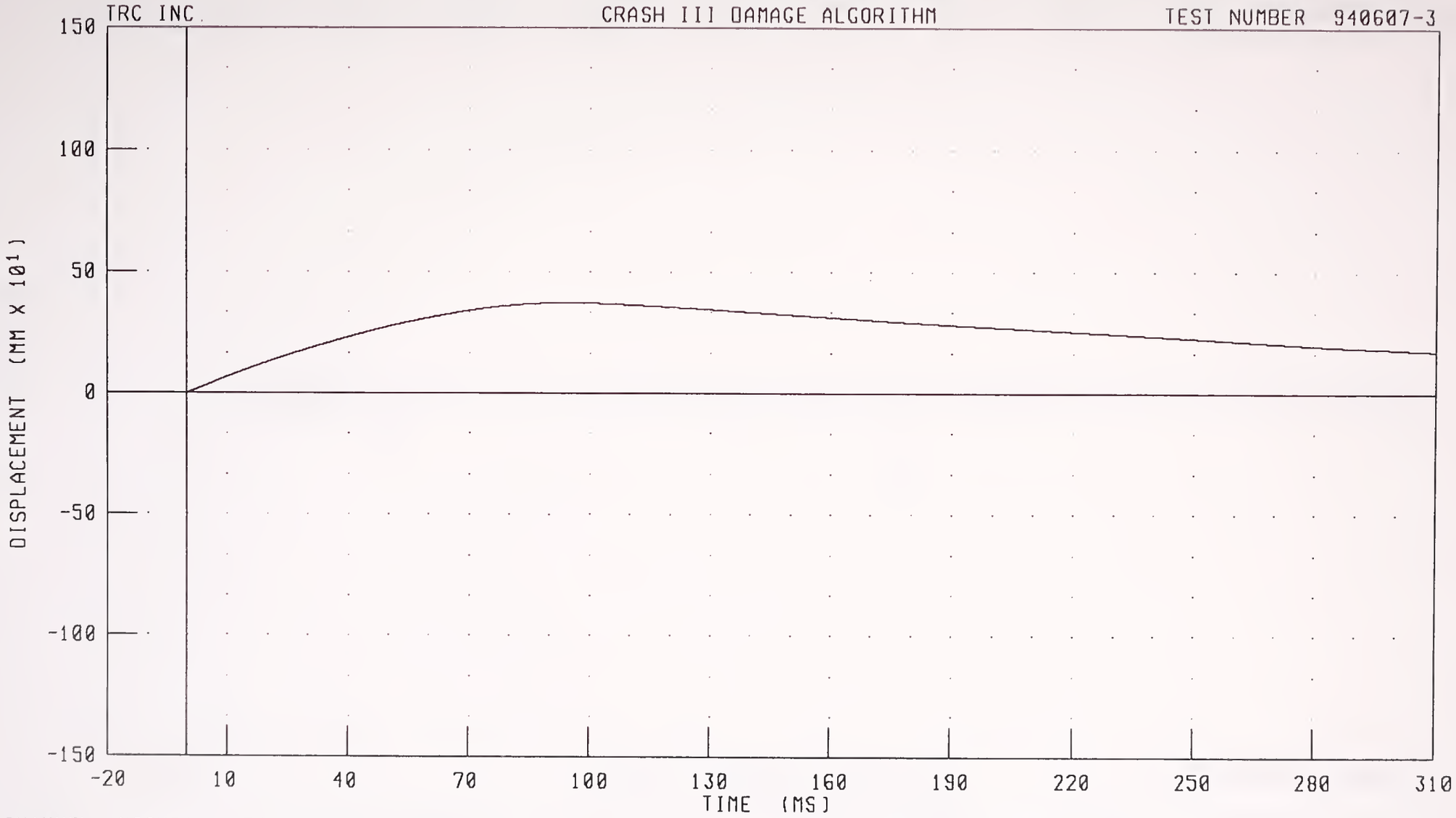


CHANNEL: VCGXV1 FILTER: CH. CLASS 180 PEAK DATA: 24.00 KM/H @ 0.00 MS; -4.19 KM/H @ 162.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

VEHICLE CG X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM



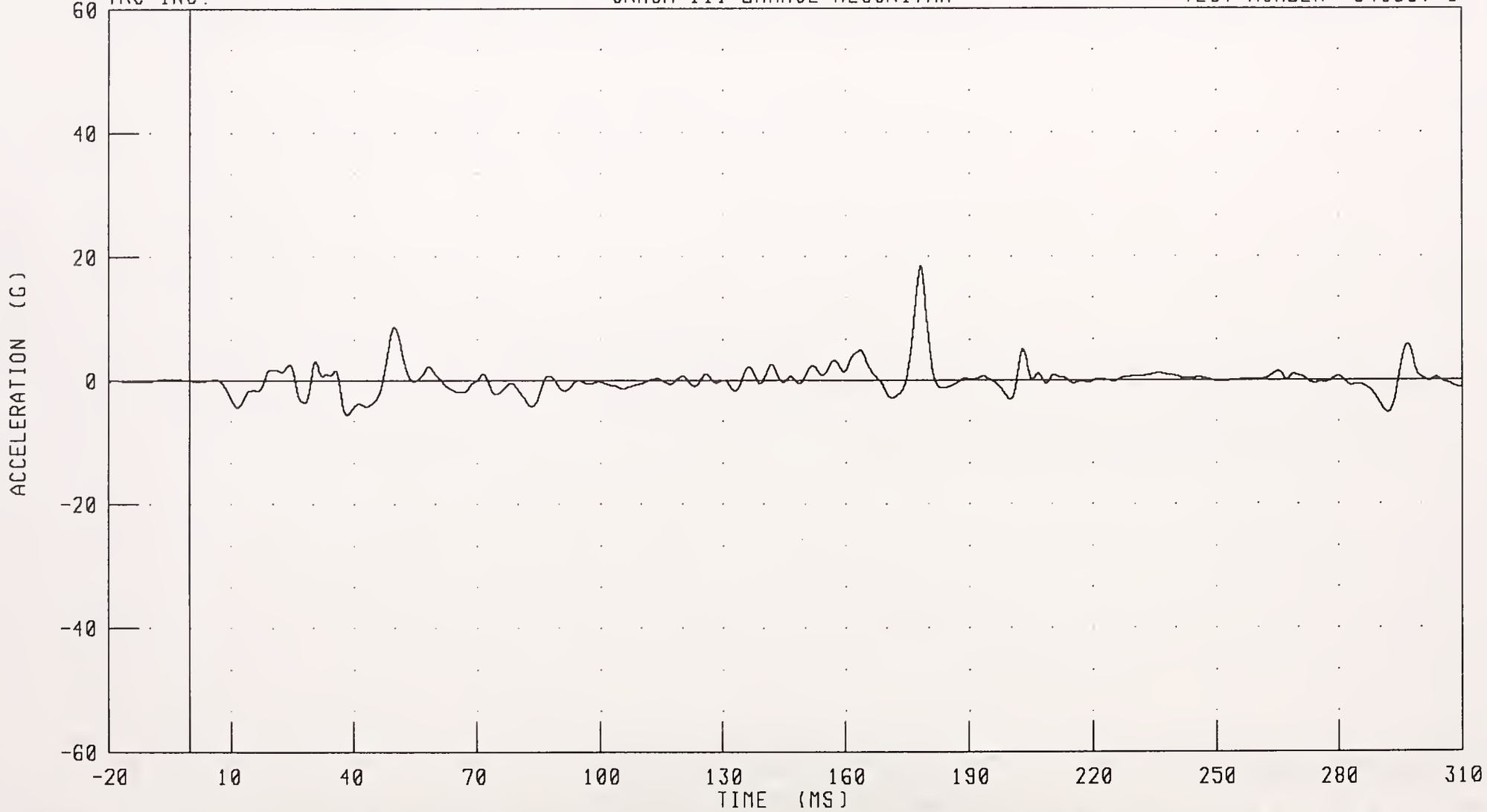
CHANNEL: VCGXD1 FILTER: CH. CLASS 180

PEAK DATA: 372.98 MM @ 94.64 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3

VEHICLE CG Y-AXIS ACCELERATION

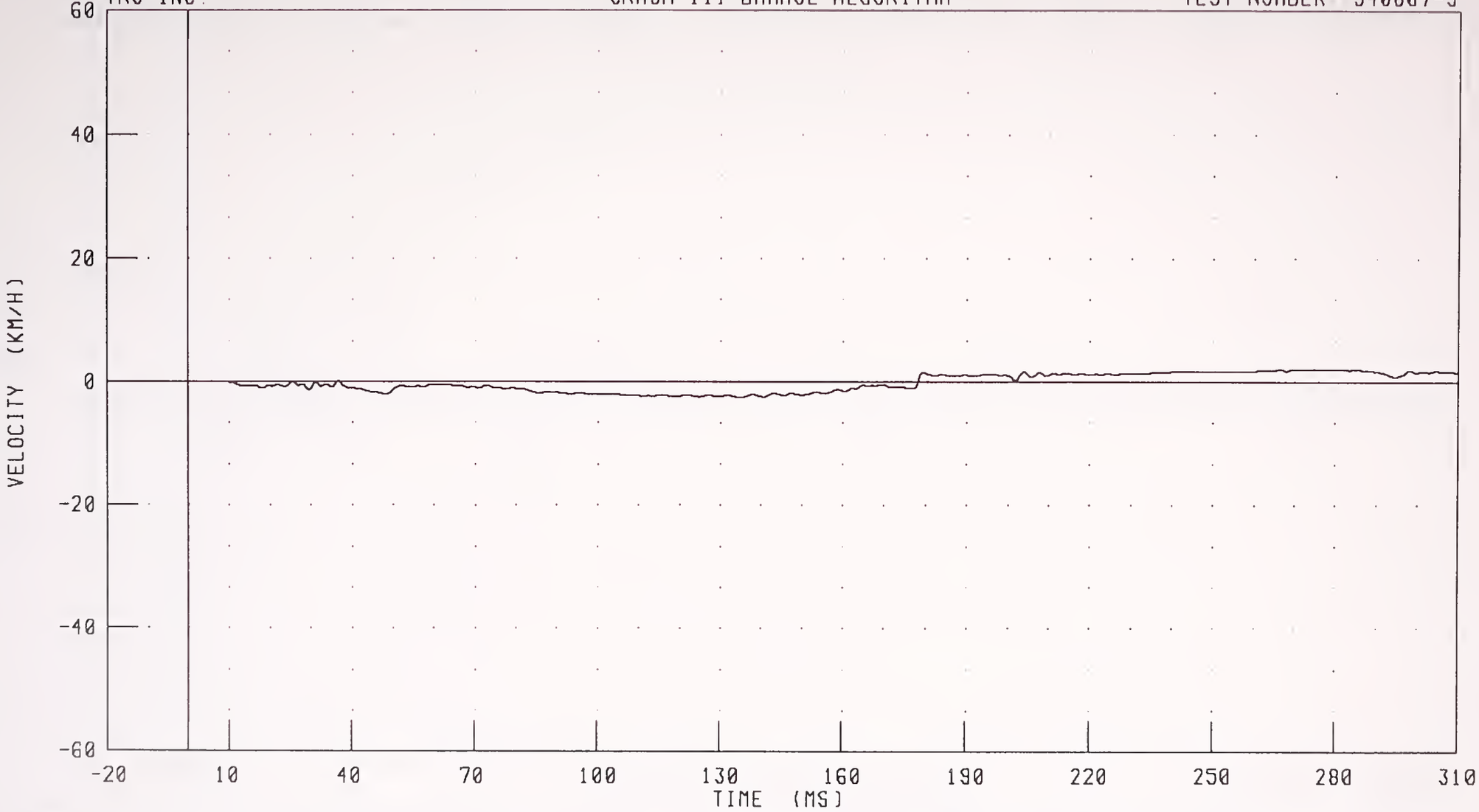
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-3



CHANNEL: VCGYG1 FILTER: CH. CLASS 60 PEAK DATA: 18.40 G @ 178.32 MS; -5.61 G @ 38.48 MS

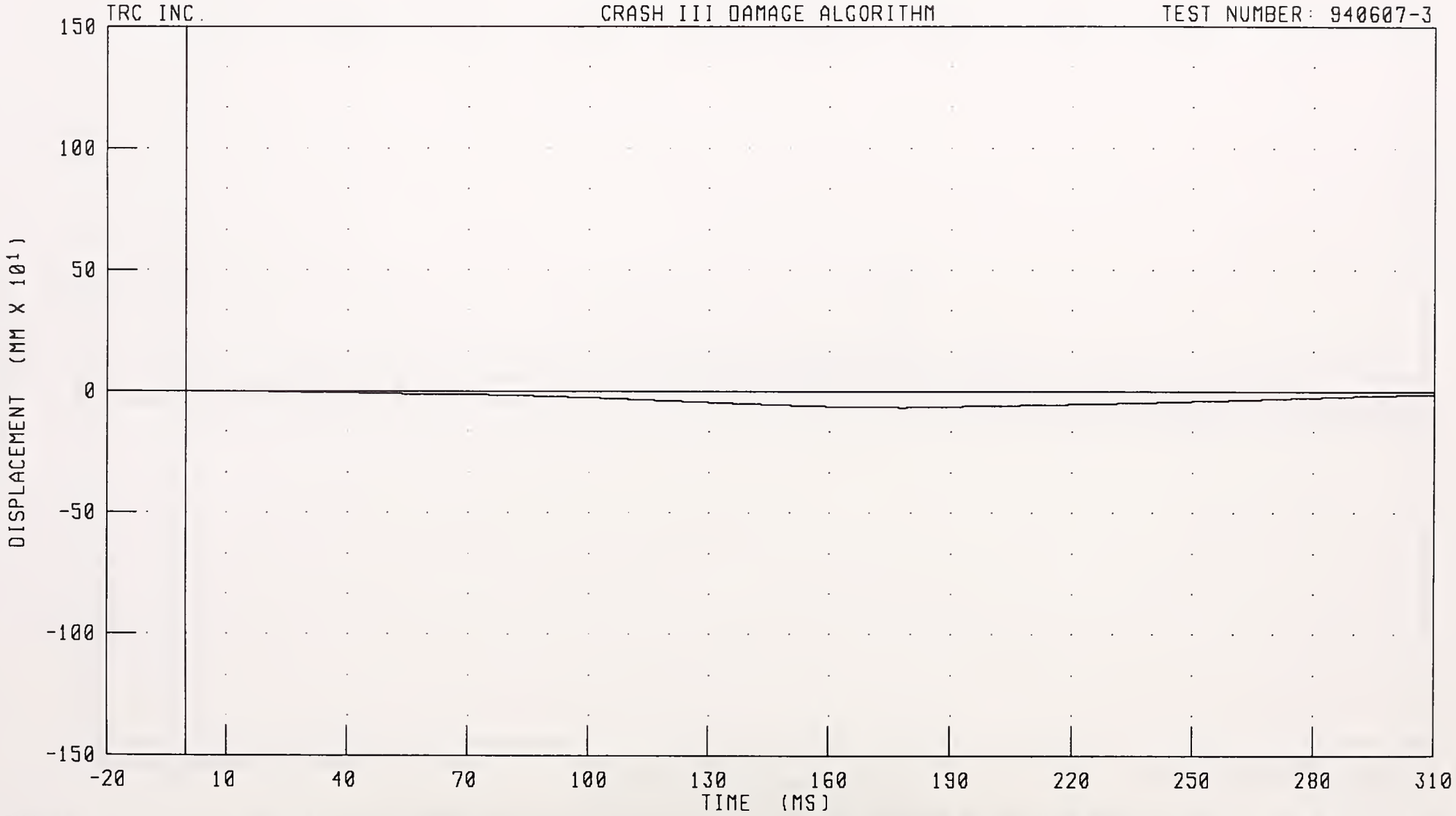
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 3
VEHICLE CG Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TRC INC. TEST NUMBER 940607-3



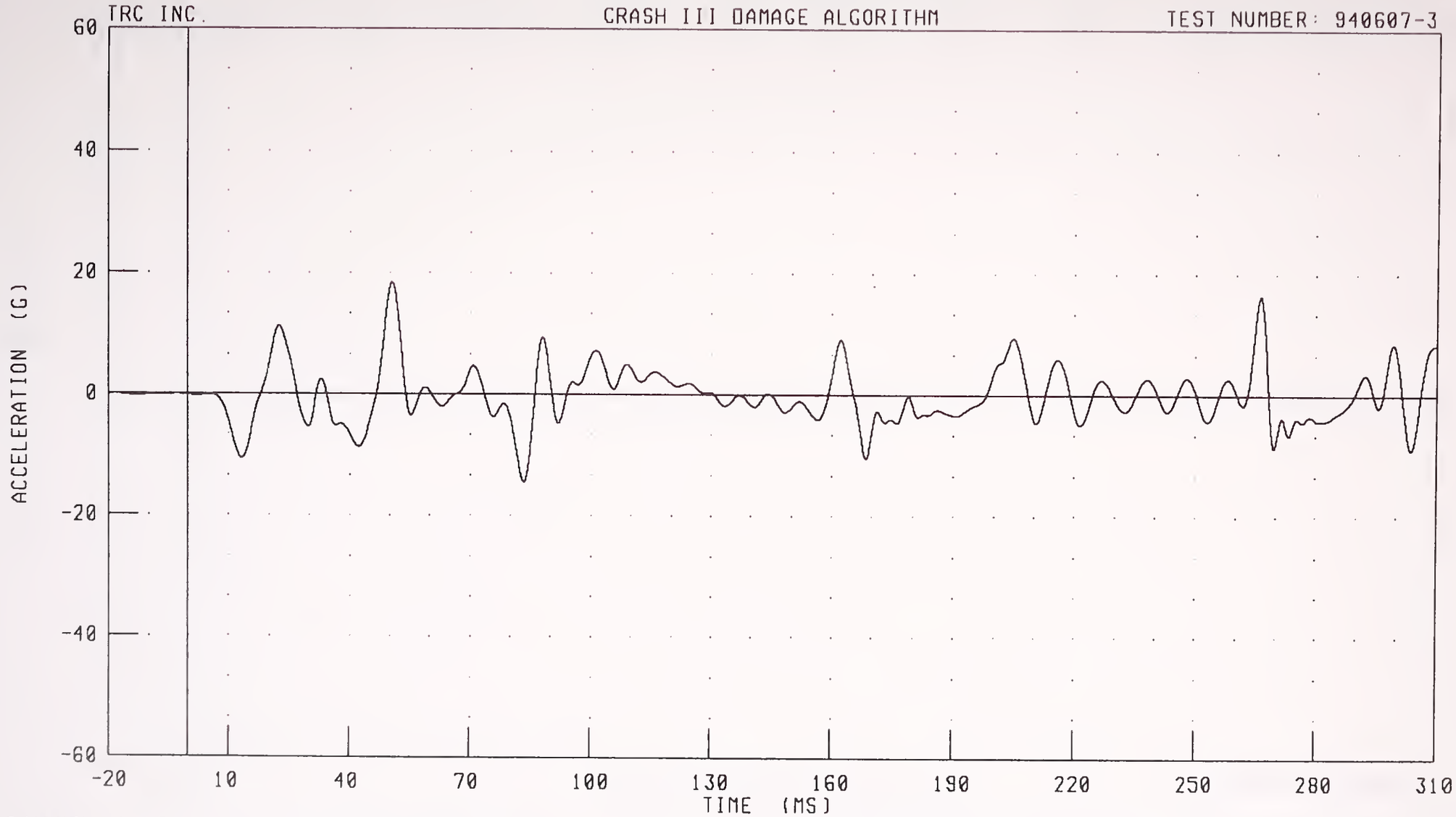
CHANNEL: VCGYV1 FILTER CH. CLASS 180 PEAK DATA: 2.13 KM/H @ 266.48 MS; -2.58 KM/H @ 134.96 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
VEHICLE CG Y-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM



CHANNEL: VCGYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.00 MM @ 0.00 MS; -65.63 MM @ 178.24 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
VEHICLE CG Z-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



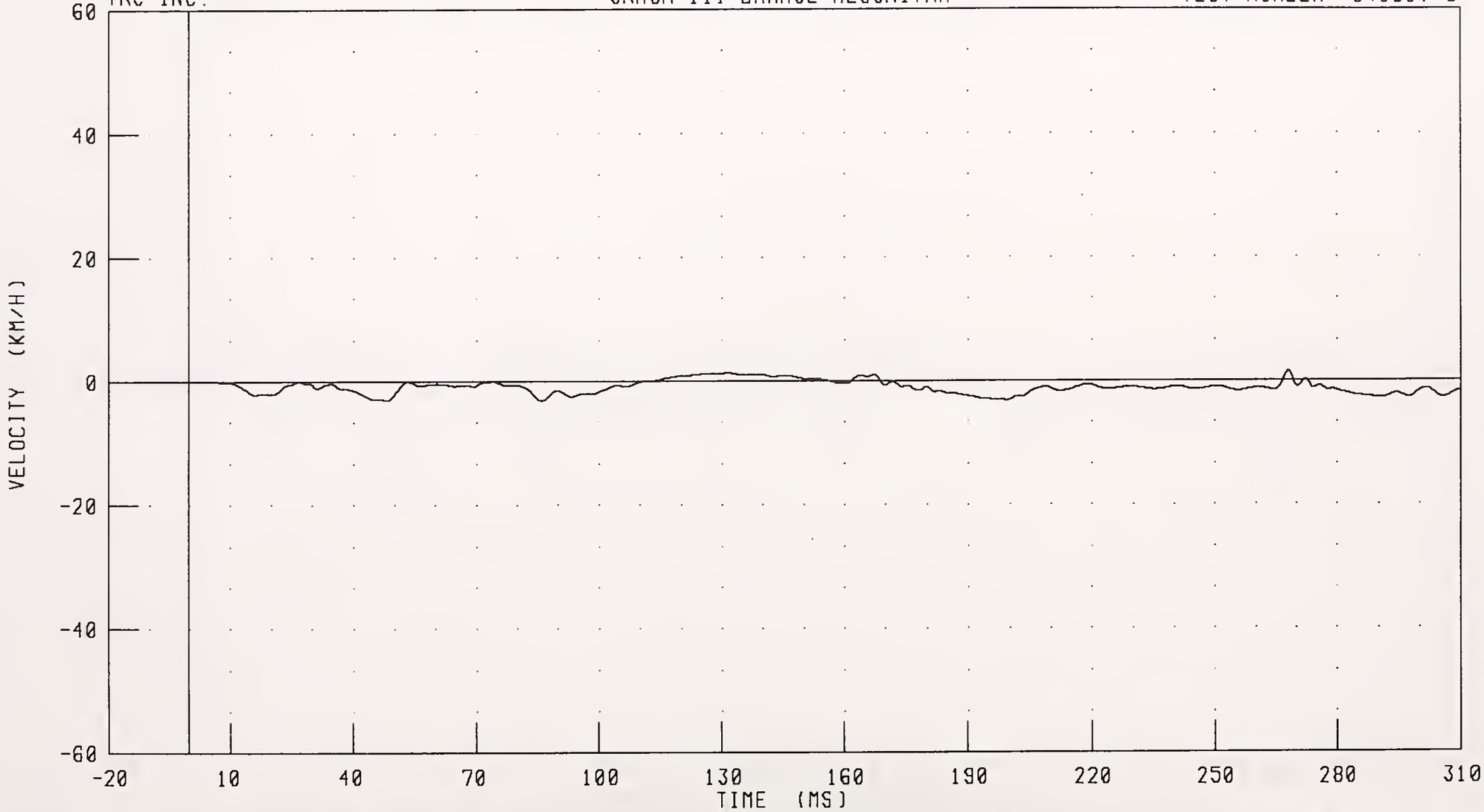
CHANNEL: VCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 18.42 G @ 50.64 MS; -14.51 G @ 83.44 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
VEHICLE CG Z-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TRC INC.

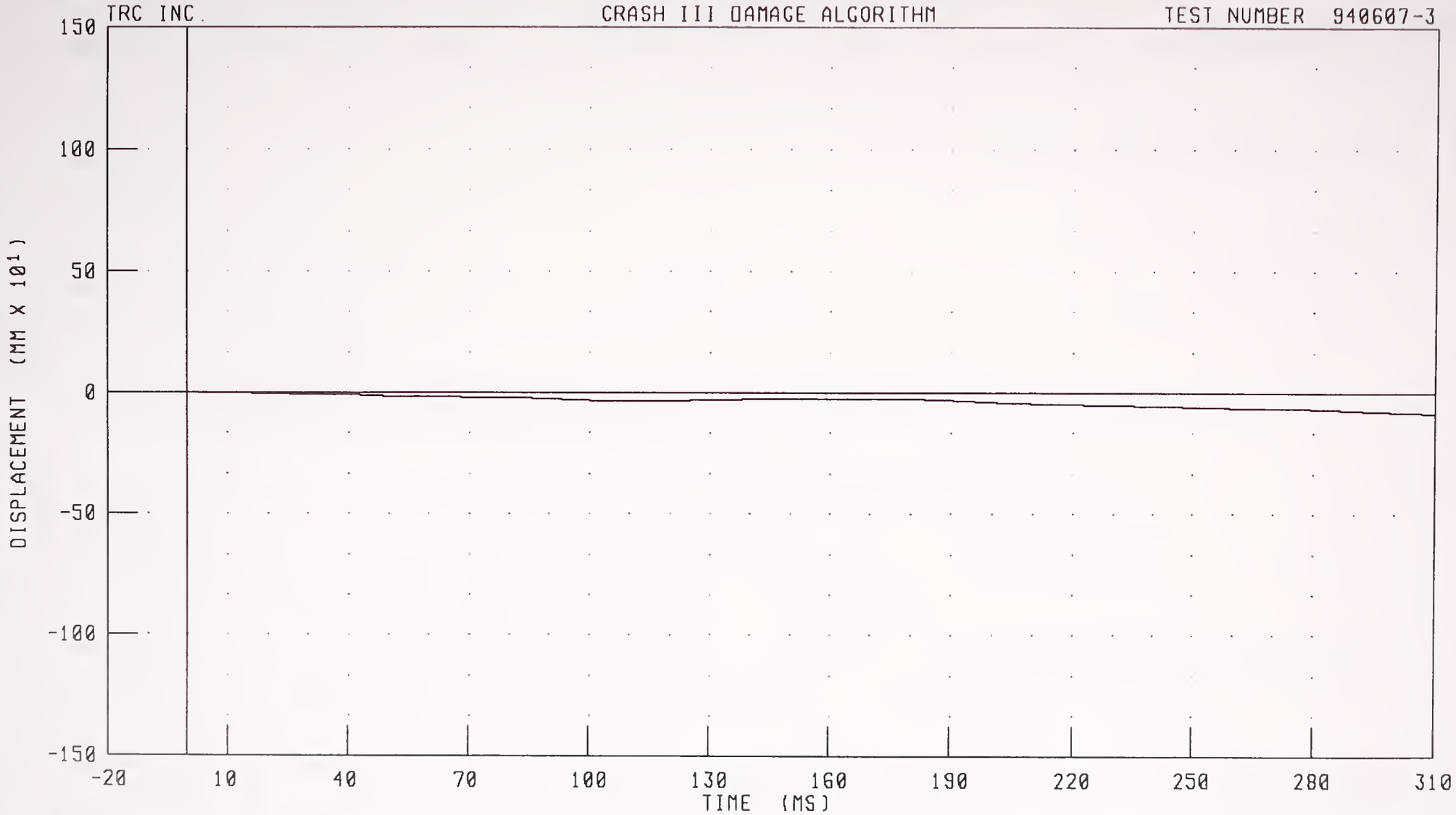
TEST NUMBER: 940607-3



CHANNEL: VCGZV1 FILTER: CH. CLASS 180

PEAK DATA: 1.48 KM/H @ 268.16 MS; -3.14 KM/H @ 199.44 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.3
VEHICLE CG Z-AXIS DISPLACEMENT



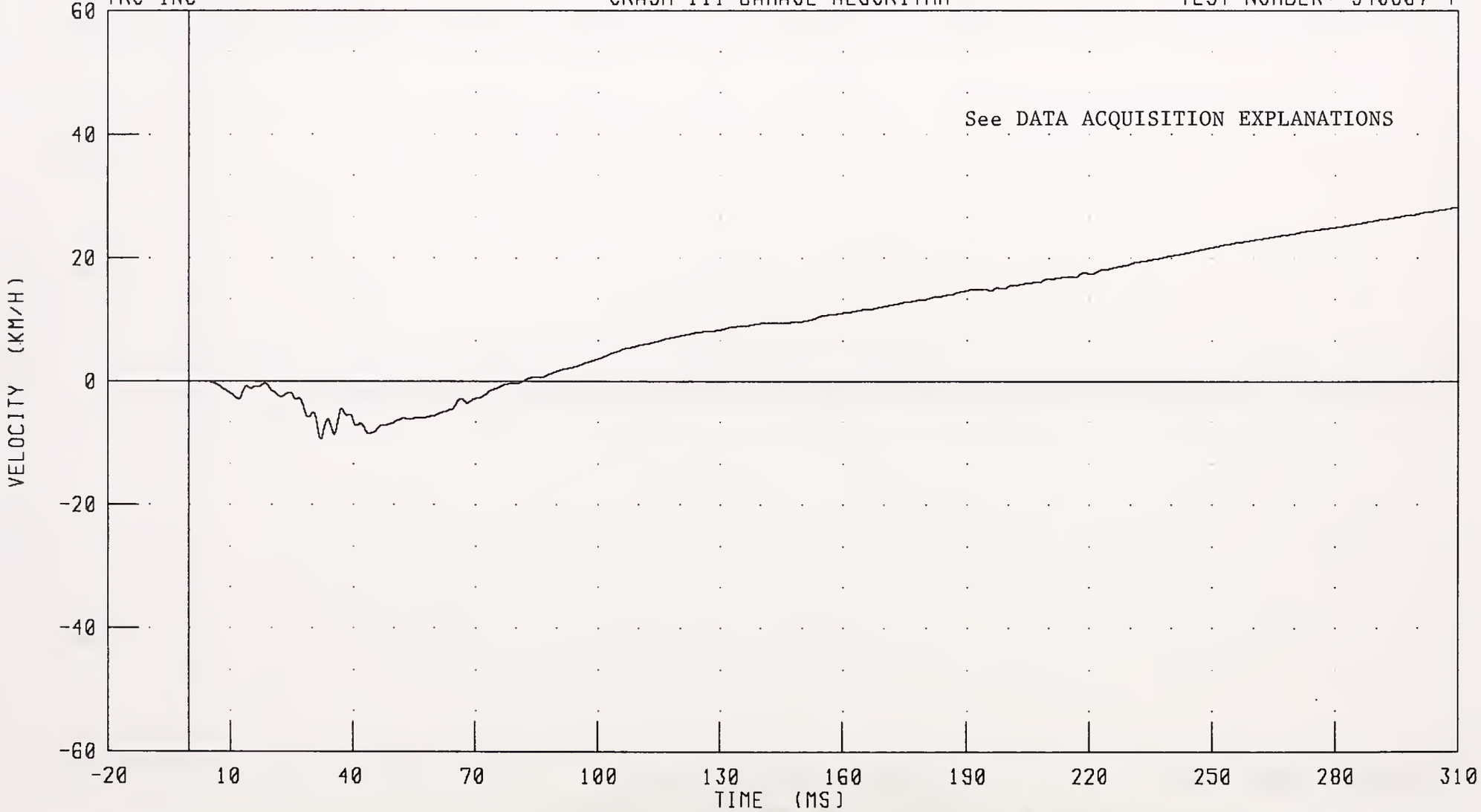
CHANNEL VCGZD1 FILTER CH. CLASS 180

PEAK DATA: 0.00 MM @ 0.00 MS; -84.15 MM @ 310.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4
VEHICLE CG Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM

TRC INC

TEST NUMBER: 940607-4



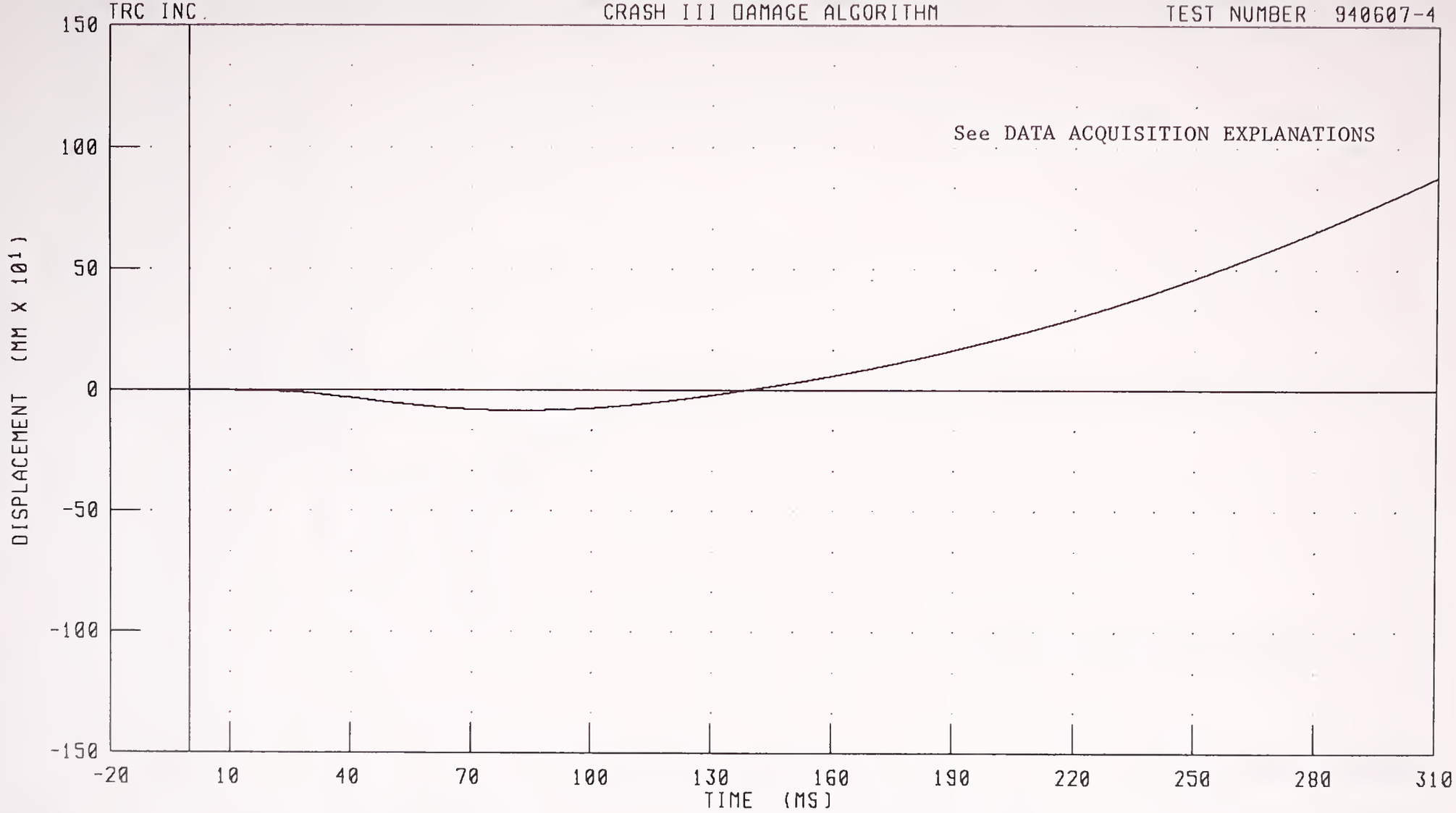
CHANNEL: VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 28.16 KM/H @ 310.00 MS; -9.35 KM/H @ 32.32 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 4

VEHICLE CG Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-4



CHANNEL VCGYD1 FILTER: CH. CLASS 180 PEAK DATA: 879.20 MM @ 310.00 MS; -83.52 MM @ 81.68 MS

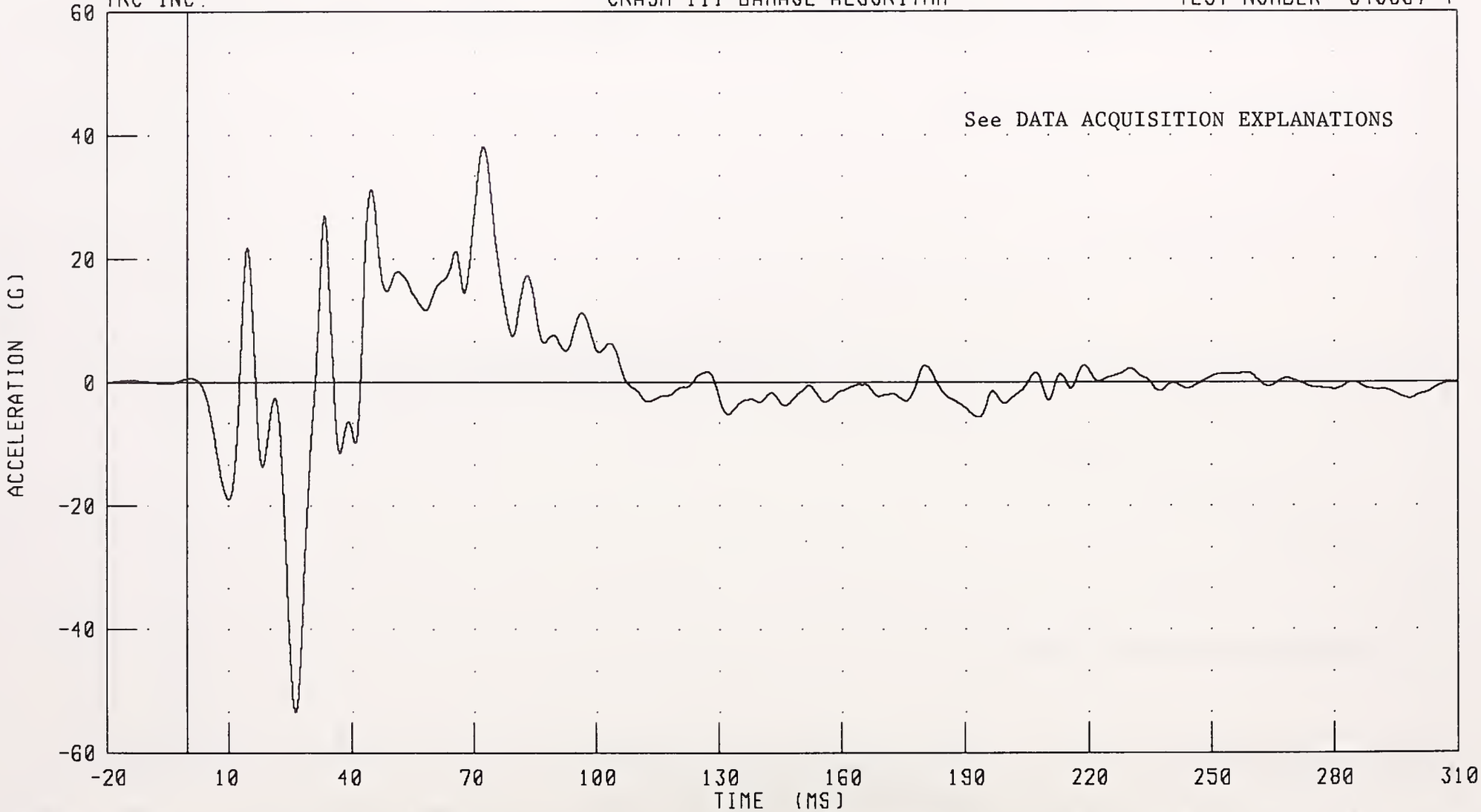
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

VEHICLE CG Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER: 940607-4



CHANNEL: VCGZG1 FILTER: CH. CLASS 60

PEAK DATA: 38.13 G @ 72.32 MS; -53.39 G @ 26.24 MS

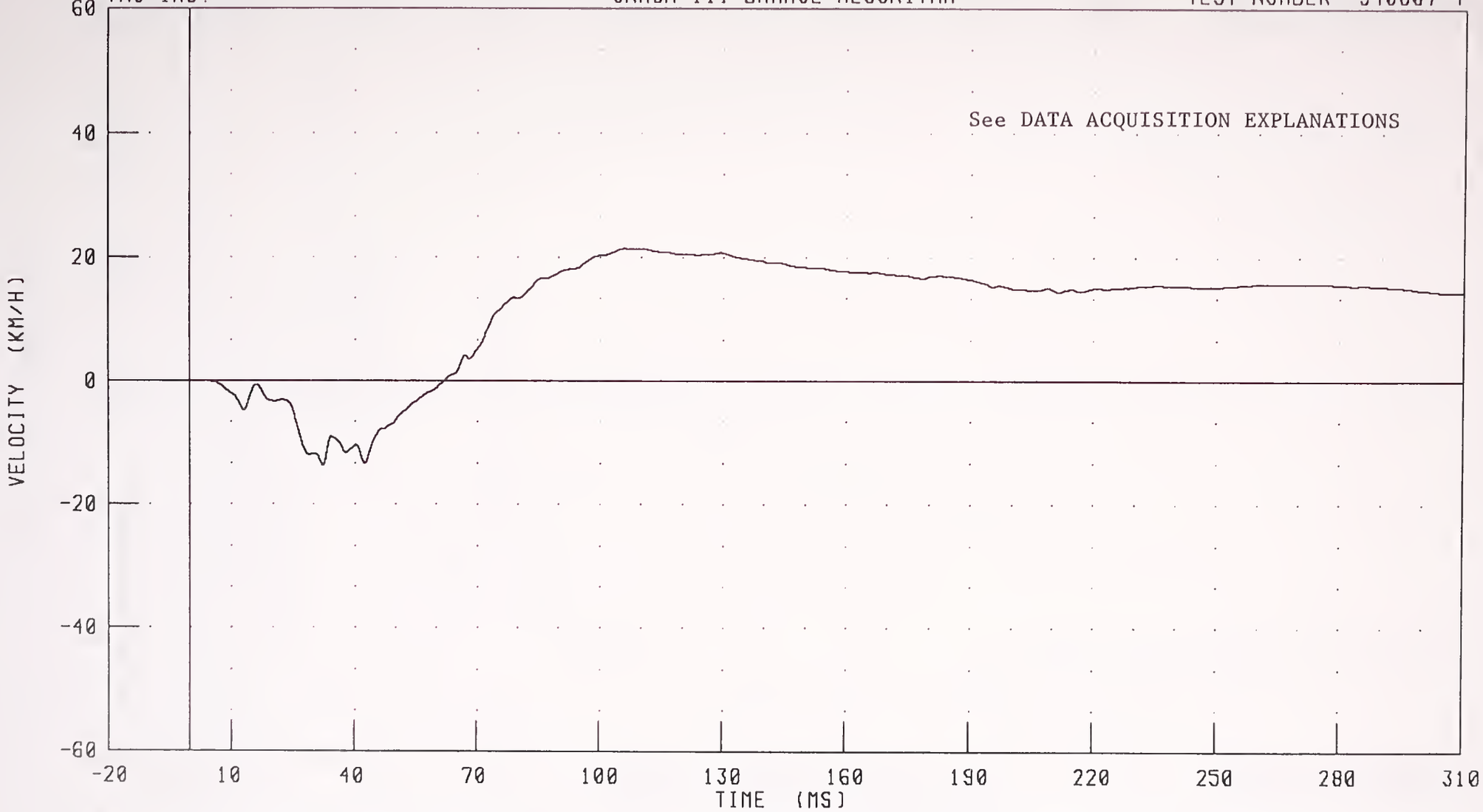
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

VEHICLE CG Z-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM

TRC INC.

TEST NUMBER 940607-4



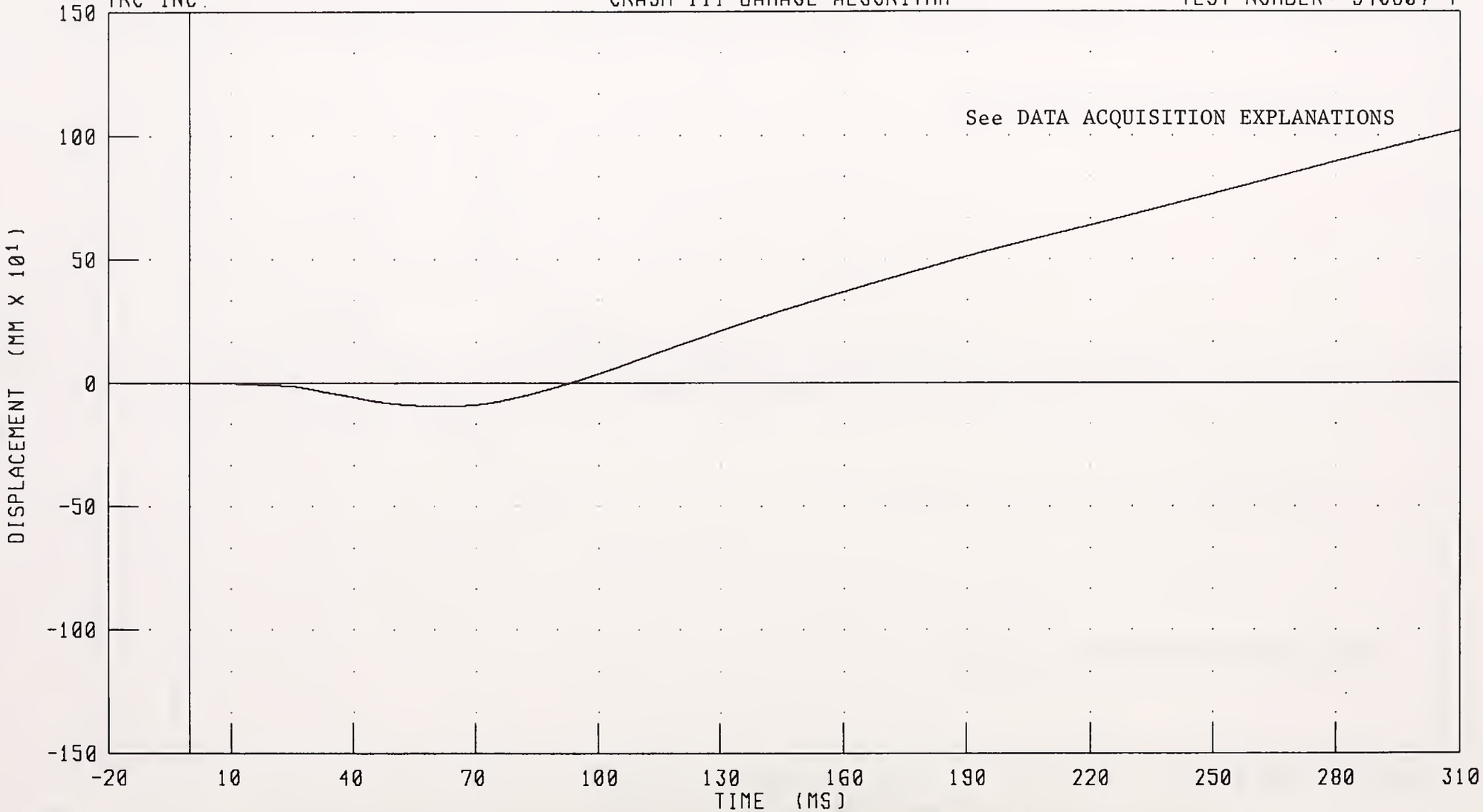
CHANNEL VCGZV1 FILTER CH CLASS 180

PEAK DATA: 21.44 KM/H @ 106.00 MS; -13.78 KM/H @ 32.40 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 4
VEHICLE CG Z-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM

TRC INC.

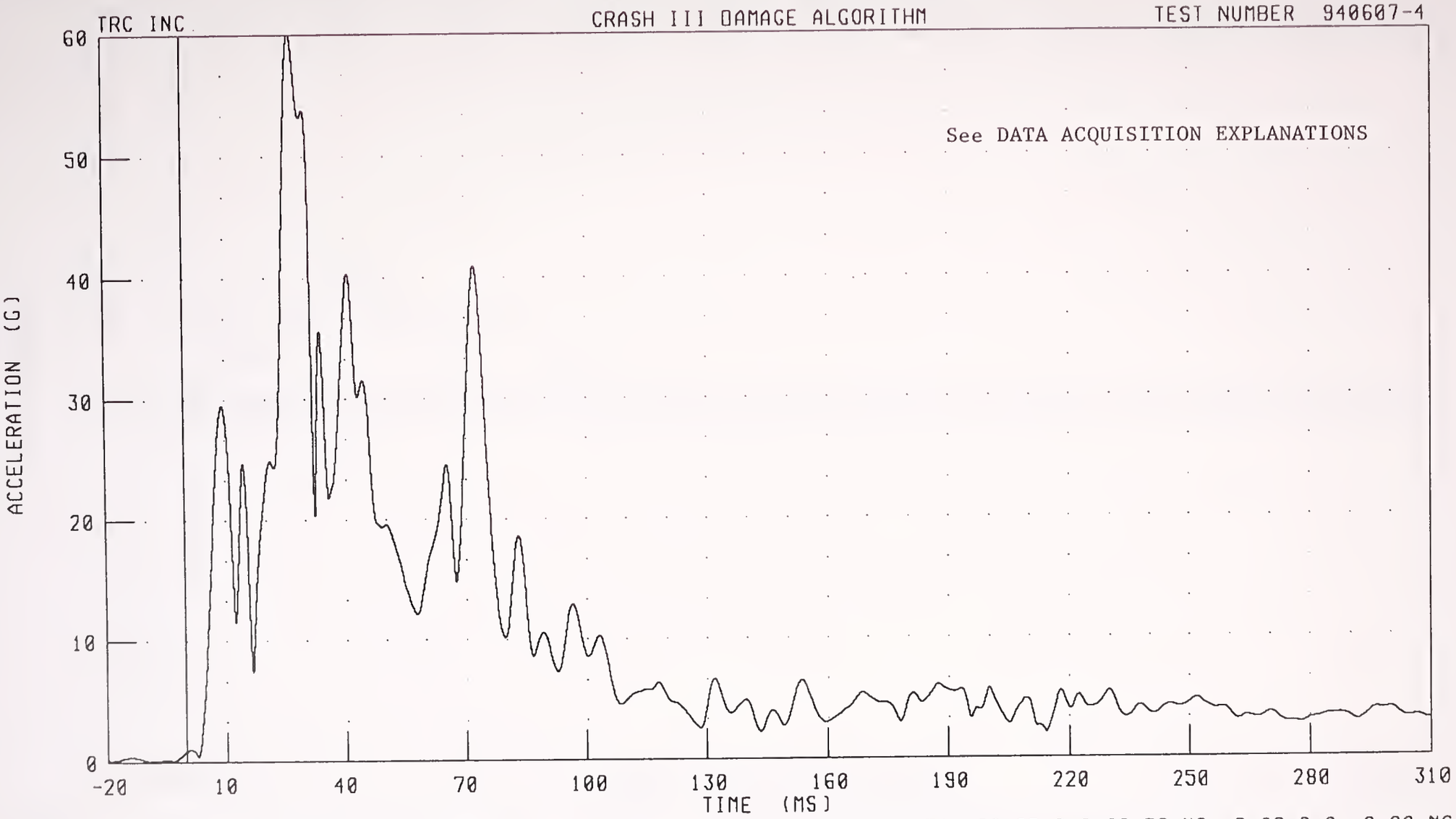
TEST NUMBER: 940607-4



CHANNEL: VCGZD1 FILTER: CH. CLASS 180

PEAK DATA: 1019.63 MM @ 310.00 MS; -93.82 MM @ 61.84 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO. 4
VEHICLE CG RESULTANT ACCELERATION
CRASH III DAMAGE ALGORITHM



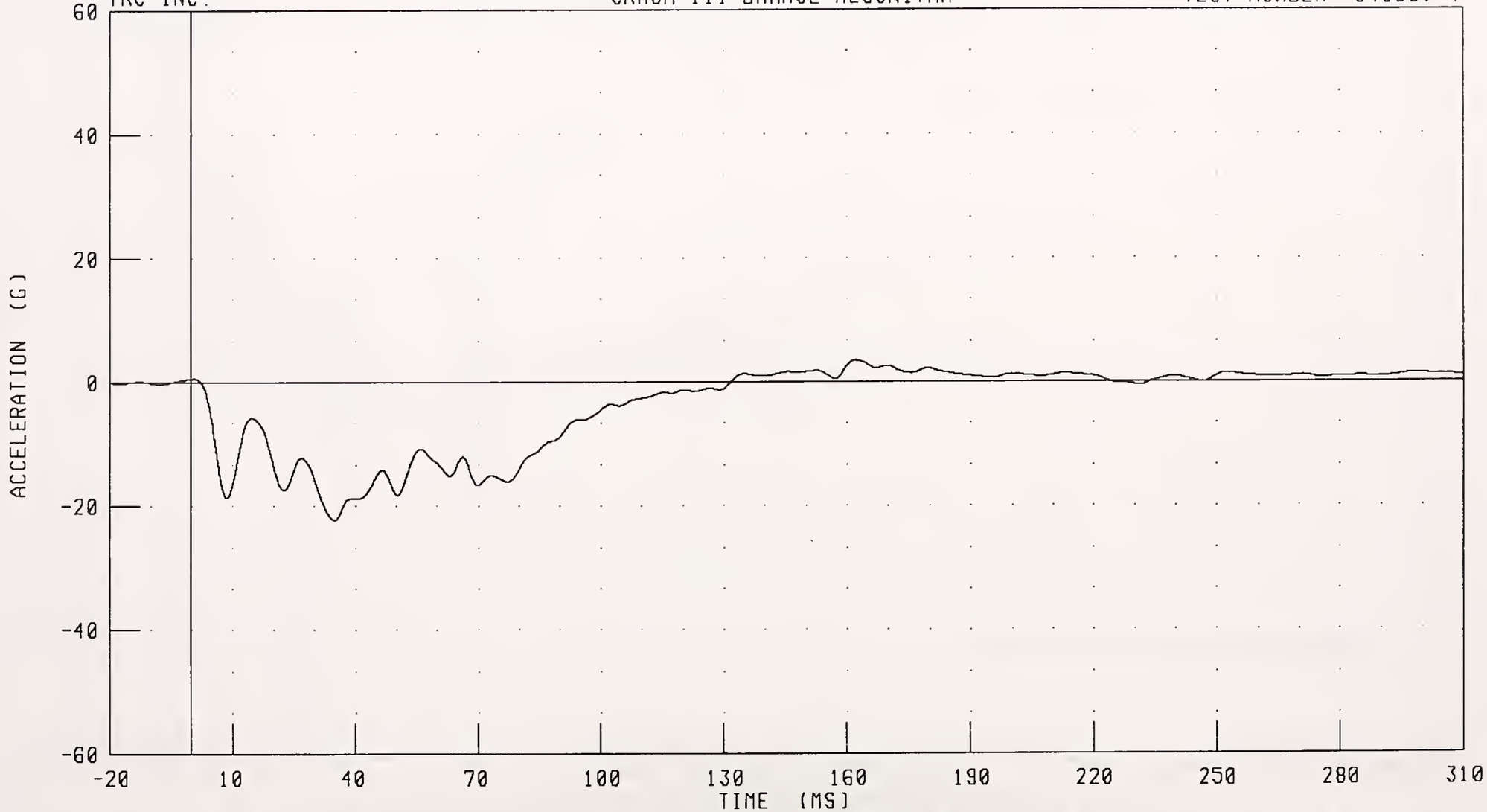
CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 60.27 G @ 26.72 MS; 0.08 G @ -8.80 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

LEFT REAR SILL X-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4

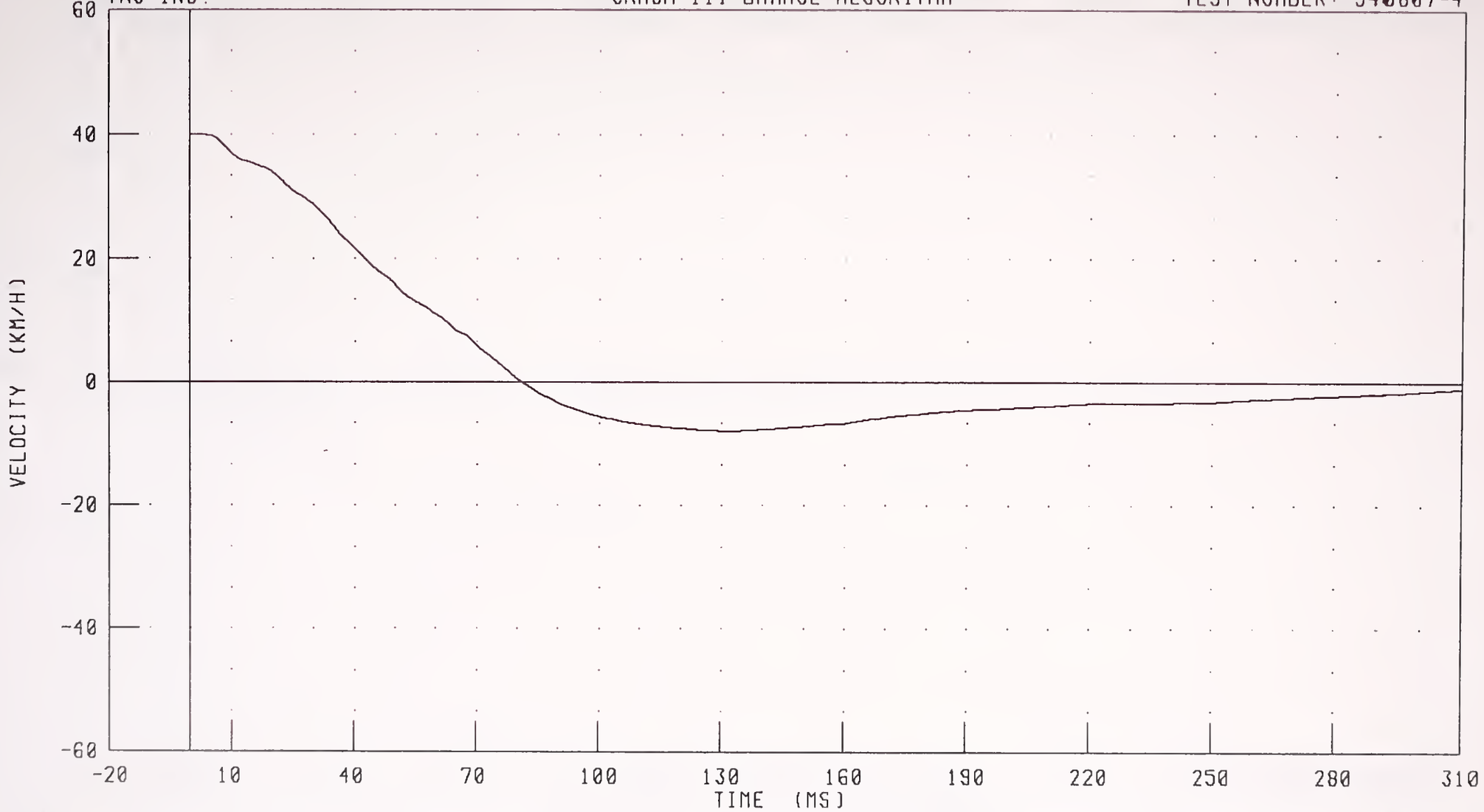


CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 3.49 G @ 162.32 MS; -22.26 G @ 34.96 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

LEFT REAR SILL X-AXIS VELOCITY

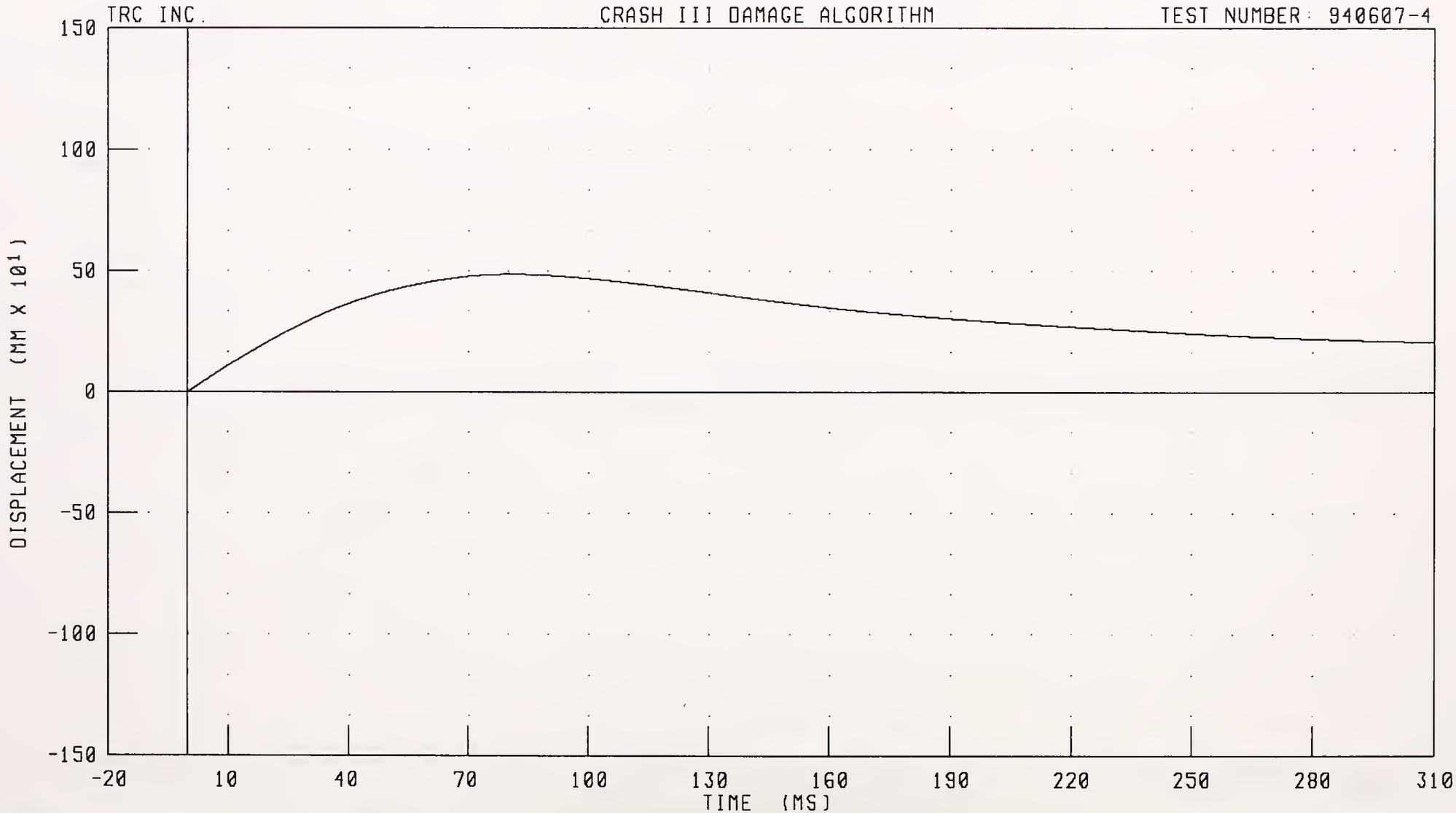
TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4



CHANNEL: LRSXV1 FILTER: CH. CLASS 180 PEAK DATA: 39.91 KM/H @ 1.28 MS; -7.99 KM/H @ 131.92 MS

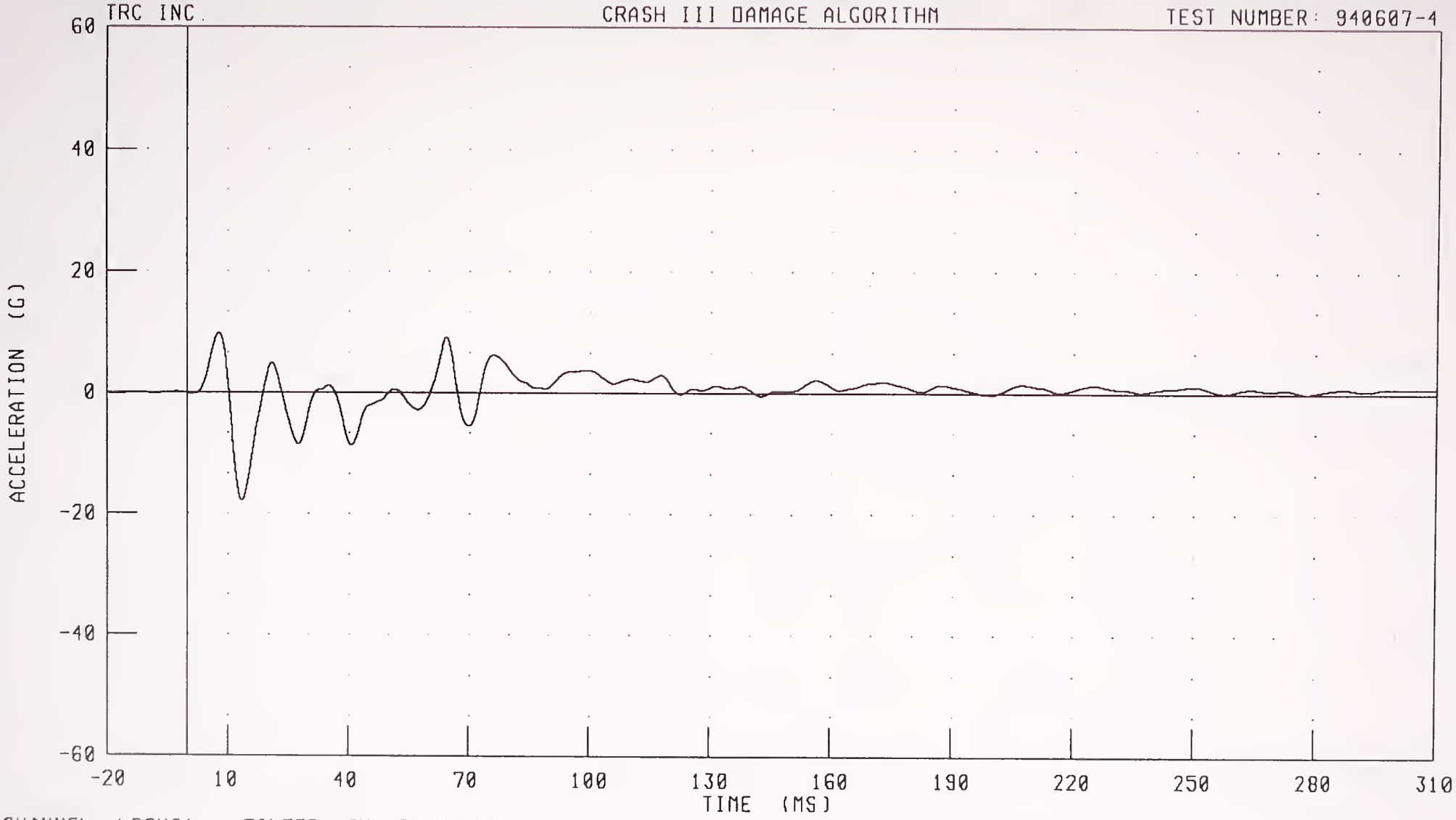
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

LEFT REAR SILL X-AXIS DISPLACEMENT



CHANNEL: LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 485.69 MM @ 81.12 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4
LEFT REAR SILL Y-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



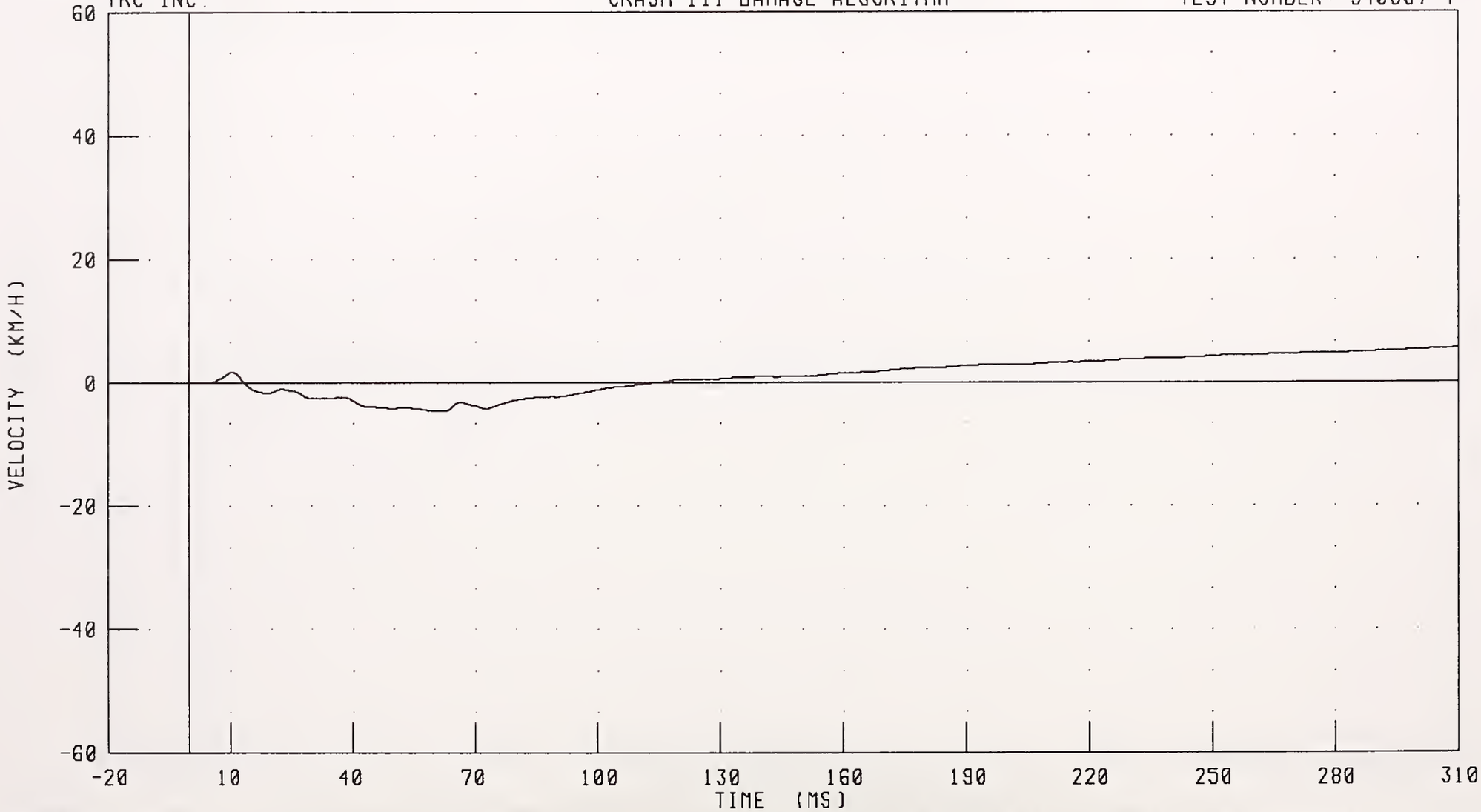
CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 9.87 G @ 7.76 MS; -17.84 G @ 13.44 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

LEFT REAR SILL Y-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4

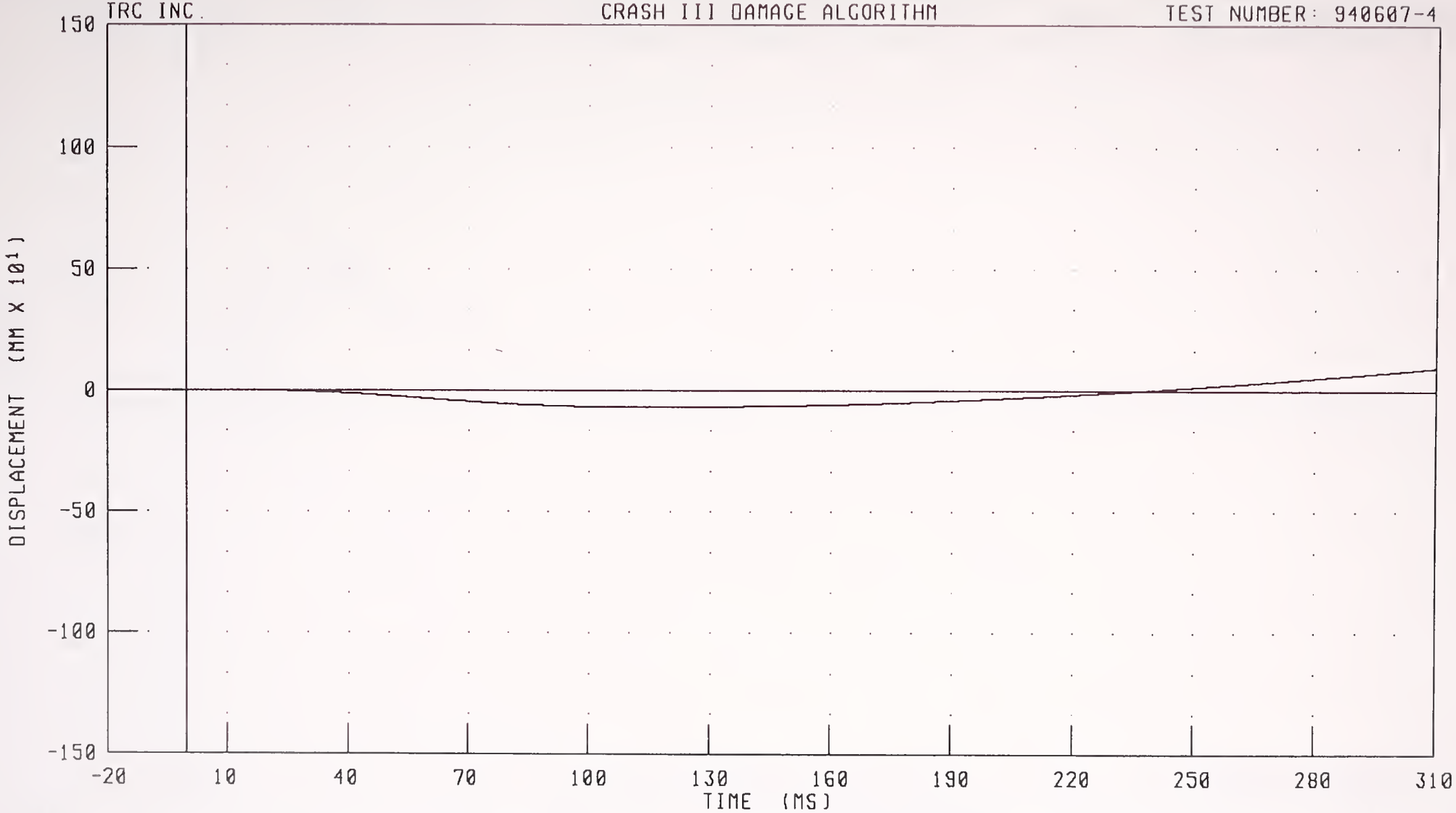


CHANNEL: LRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 5.55 KM/H @ 310.00 MS; -4.59 KM/H @ 59.76 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

LEFT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4

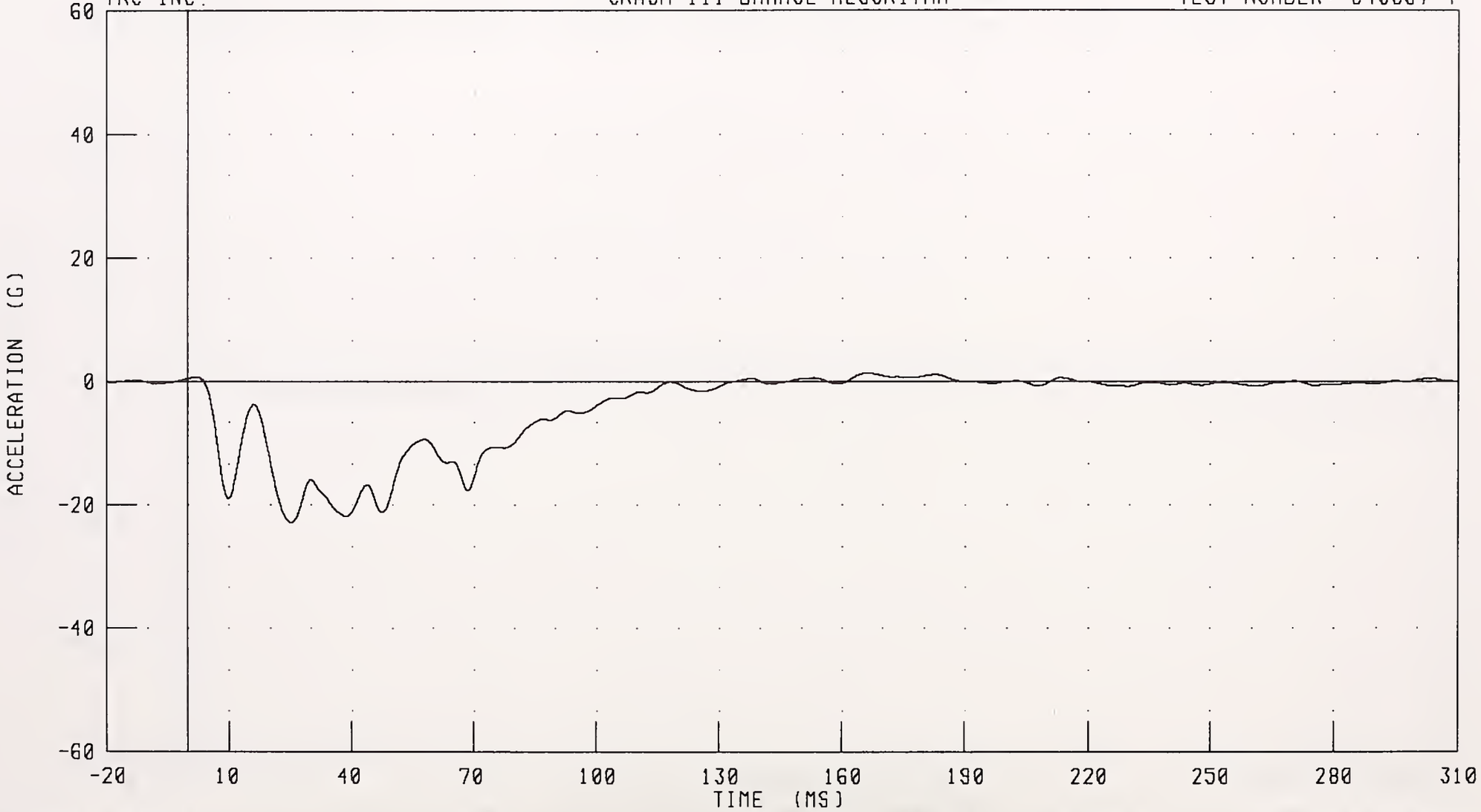


CHANNEL: LRSYD1 FILTER: CH CLASS 180 PEAK DATA: 96.24 MM @ 310.00 MS; -69.05 MM @ 114.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

RIGHT REAR SILL X-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4

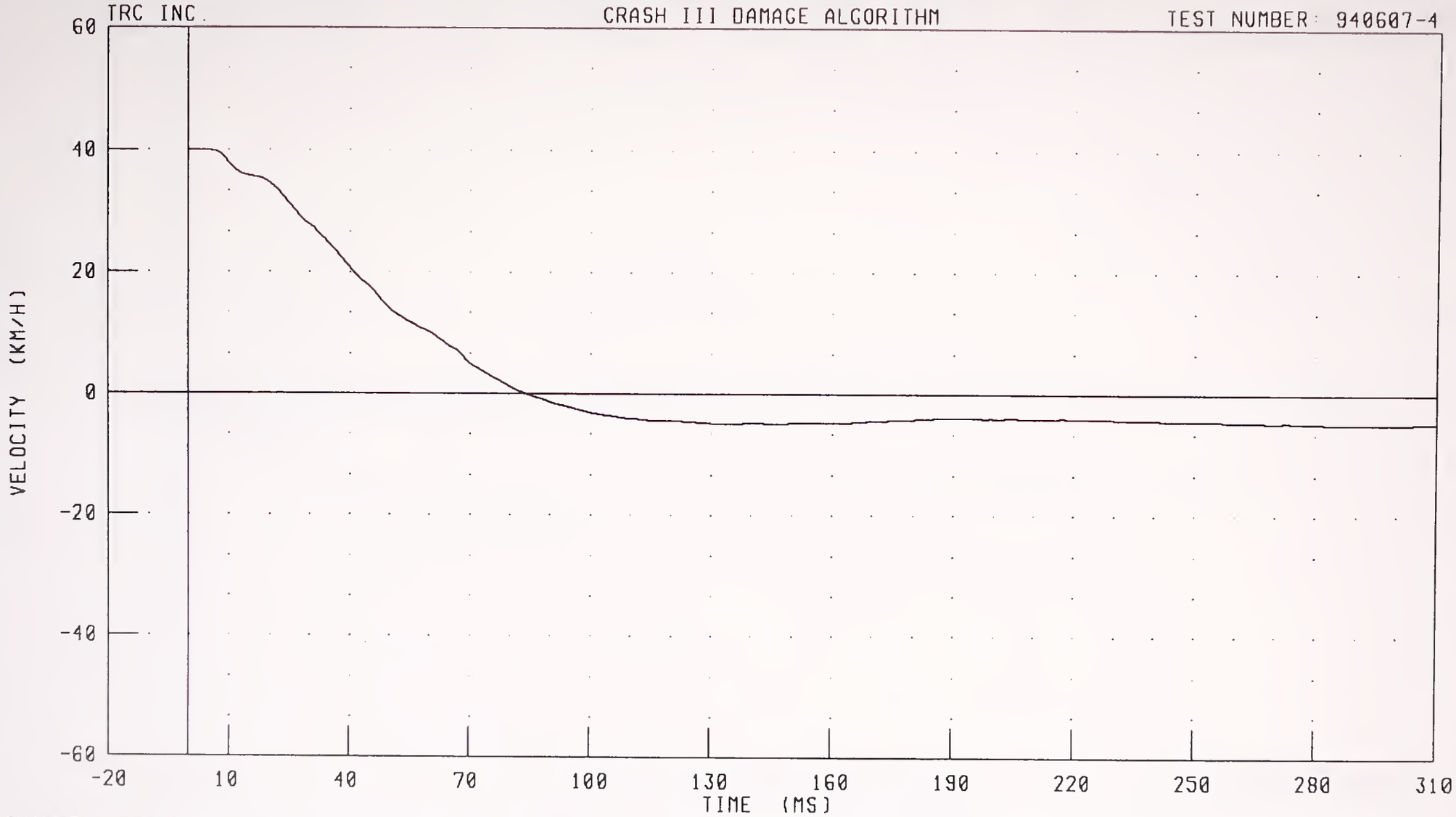


CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.36 G @ 166.08 MS; -22.80 G @ 25.20 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

RIGHT REAR SILL X-AXIS VELOCITY

CRASH III DAMAGE ALGORITHM



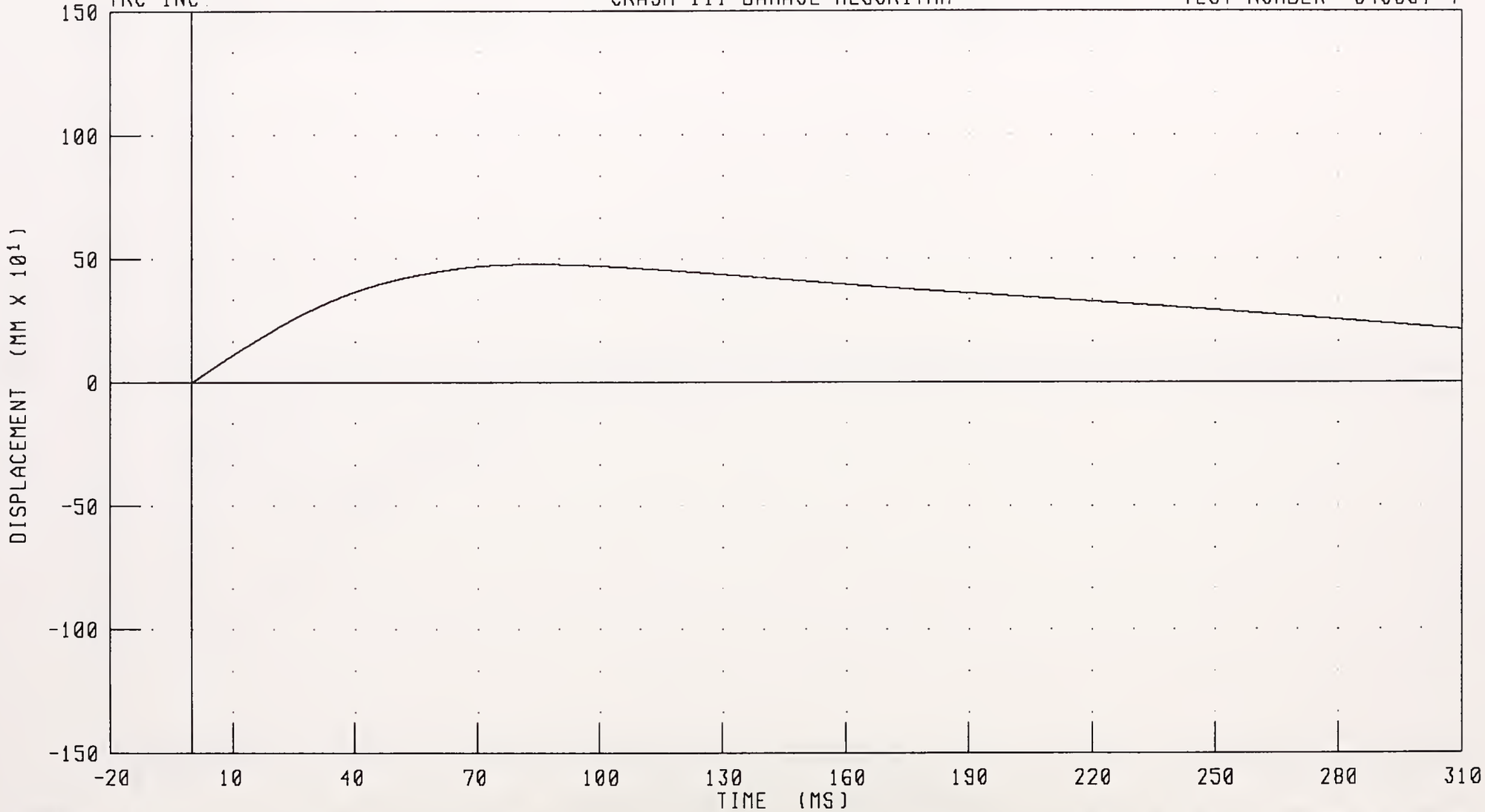
CHANNEL RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 39.94 KM/H @ 4.64 MS, -4.91 KM/H @ 292.72 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

RIGHT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4

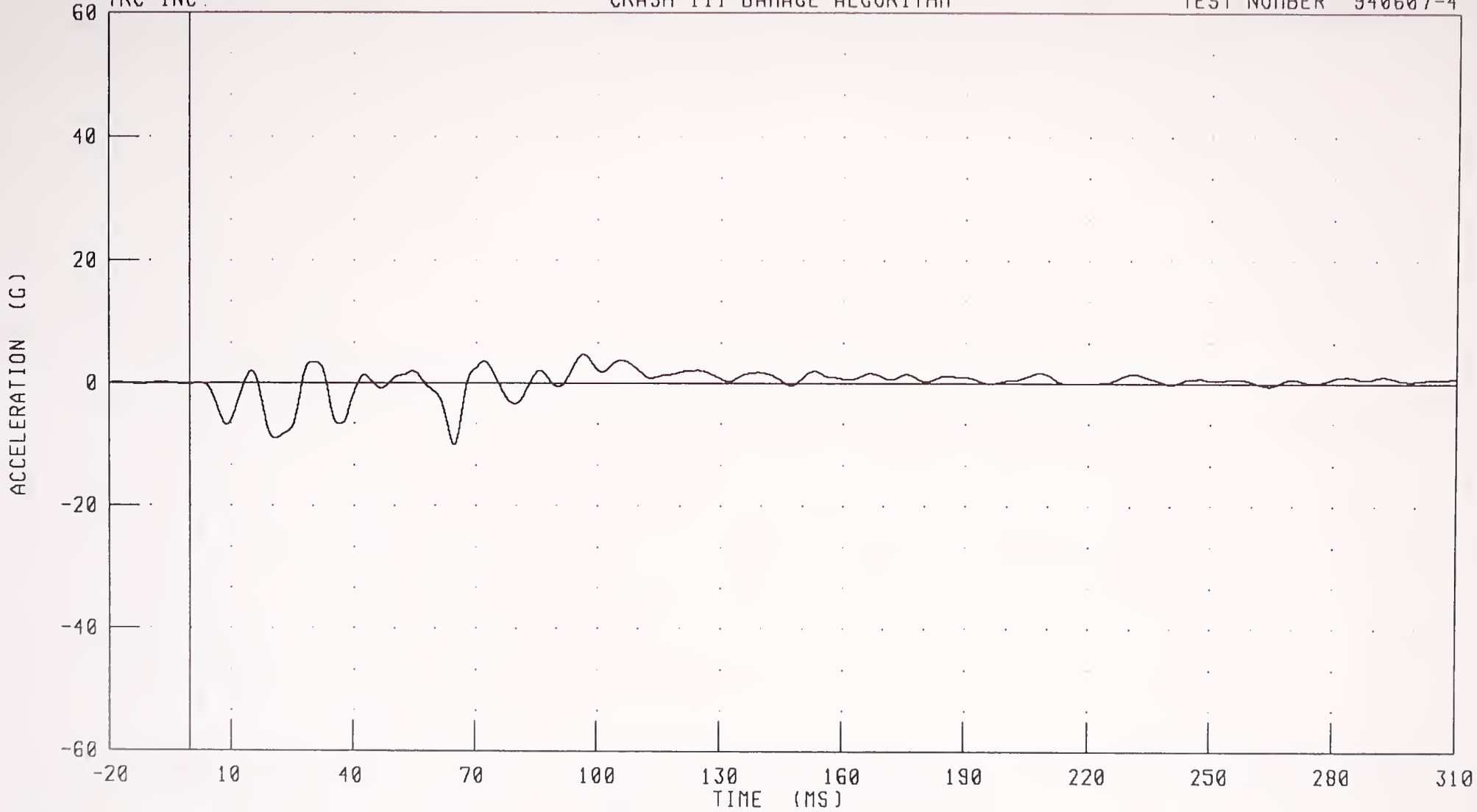


CHANNEL: RRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 477.72 MM @ 84.00 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

RIGHT REAR SILL Y-AXIS ACCELERATION

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-4

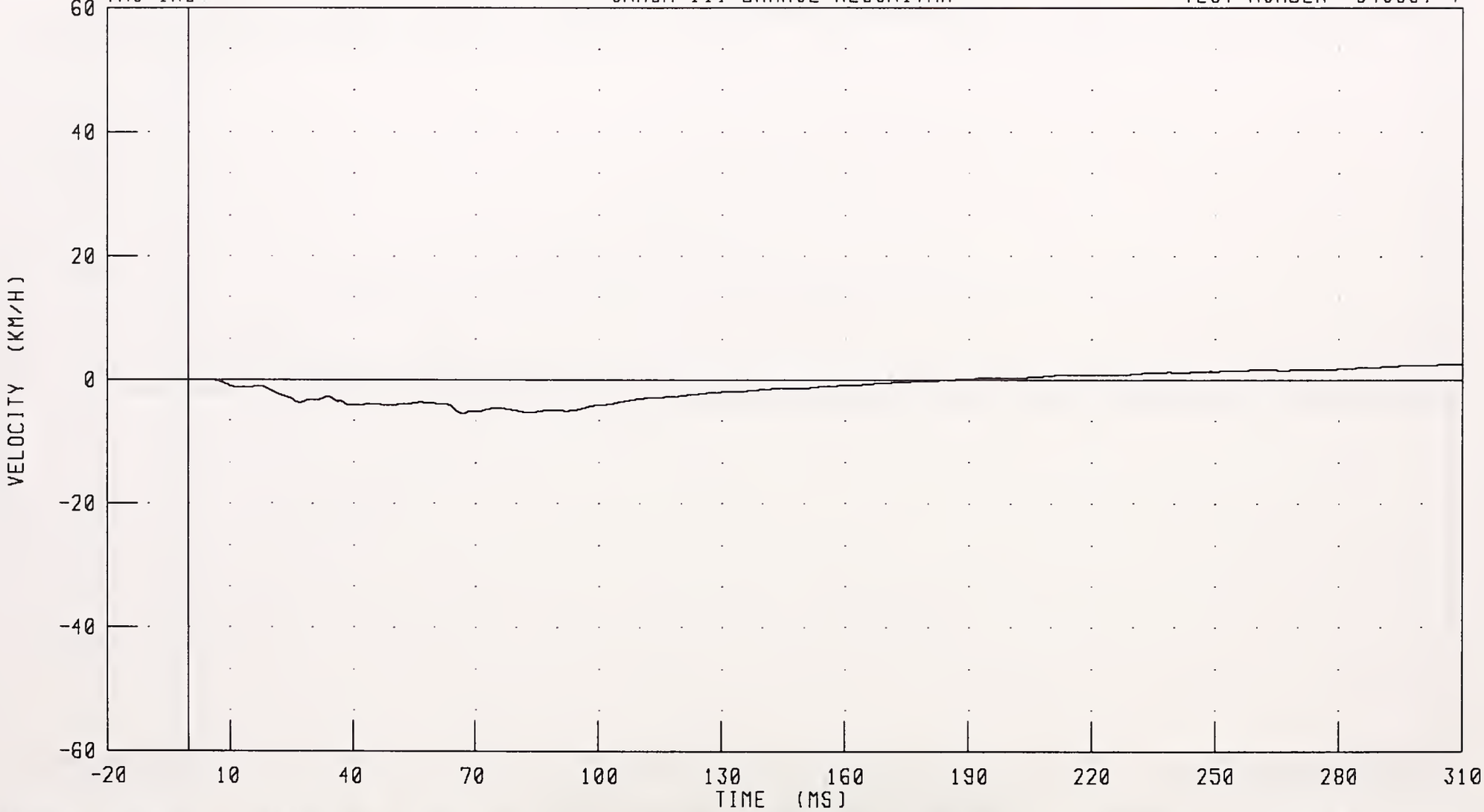


CHANNEL RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 4.71 G @ 96.56 MS; -10.04 G @ 64.80 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.4

RIGHT REAR SILL Y-AXIS VELOCITY

TRC INC CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4

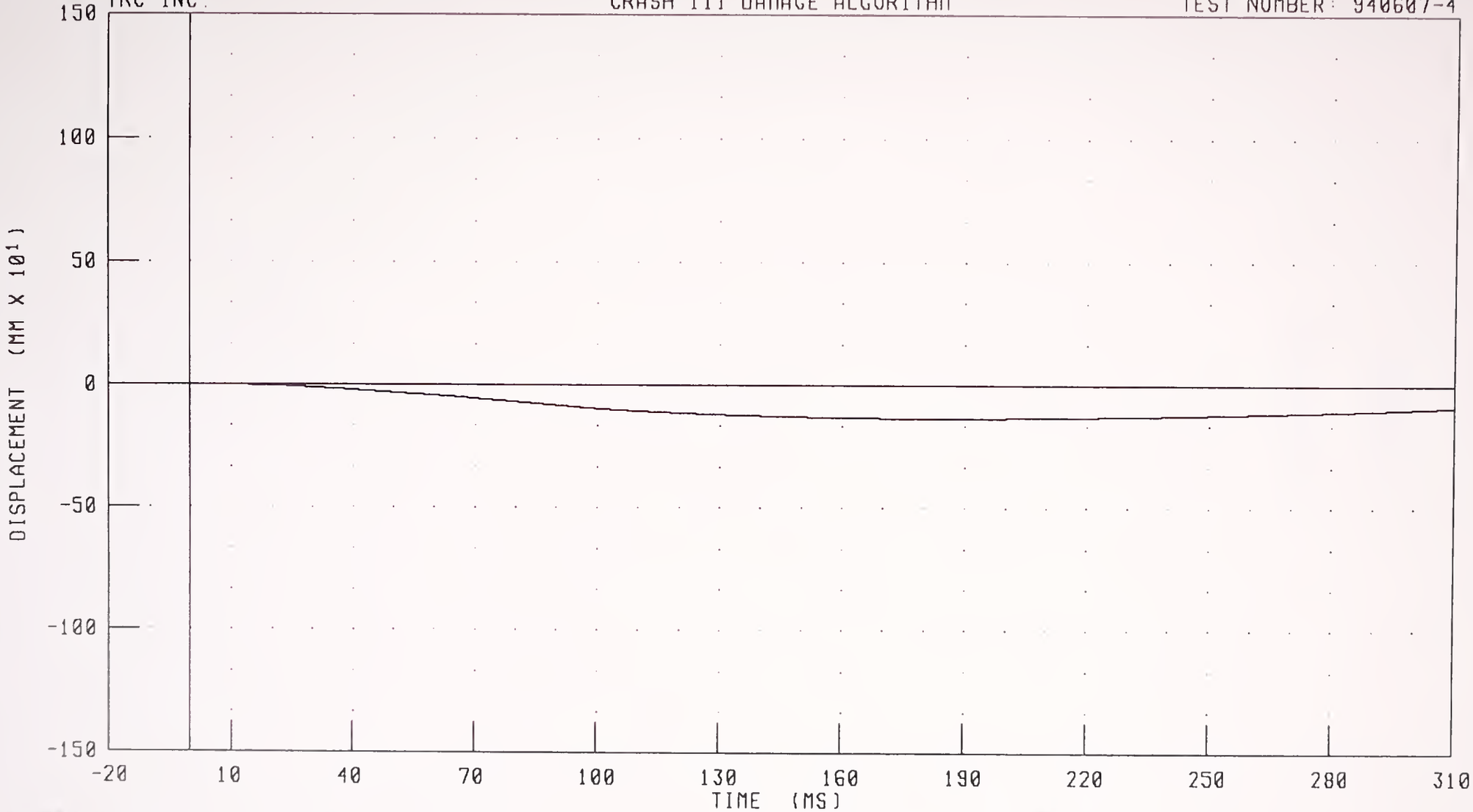


CHANNEL: RRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 2.63 KM/H @ 310.00 MS; -5.39 KM/H @ 66.96 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 4

RIGHT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-4



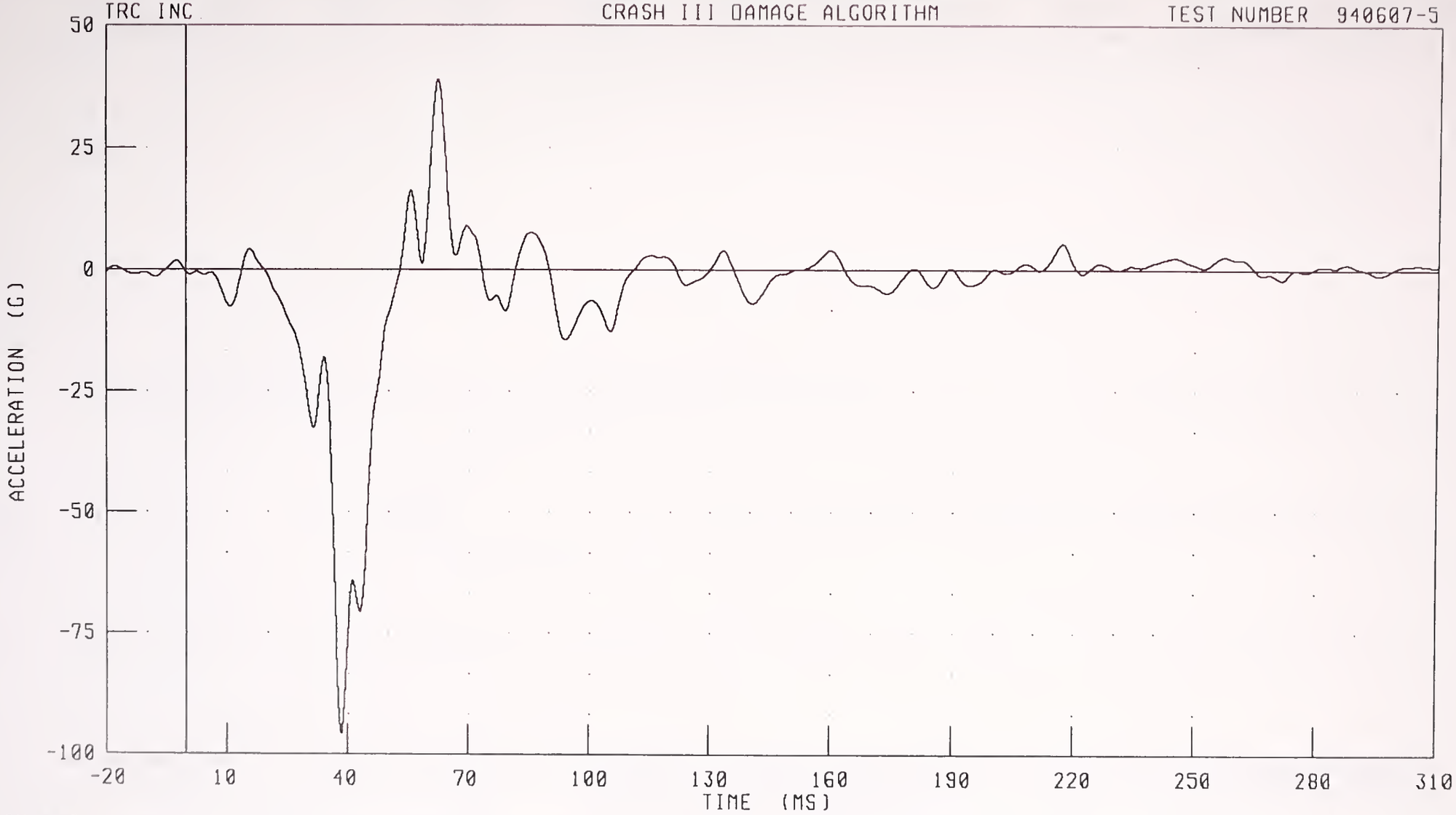
CHANNEL: RRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MM @ 0.00 MS; -134.05 MM @ 184.72 MS

Data Plots

Test No. 940607-5

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5
VEHICLE CG X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



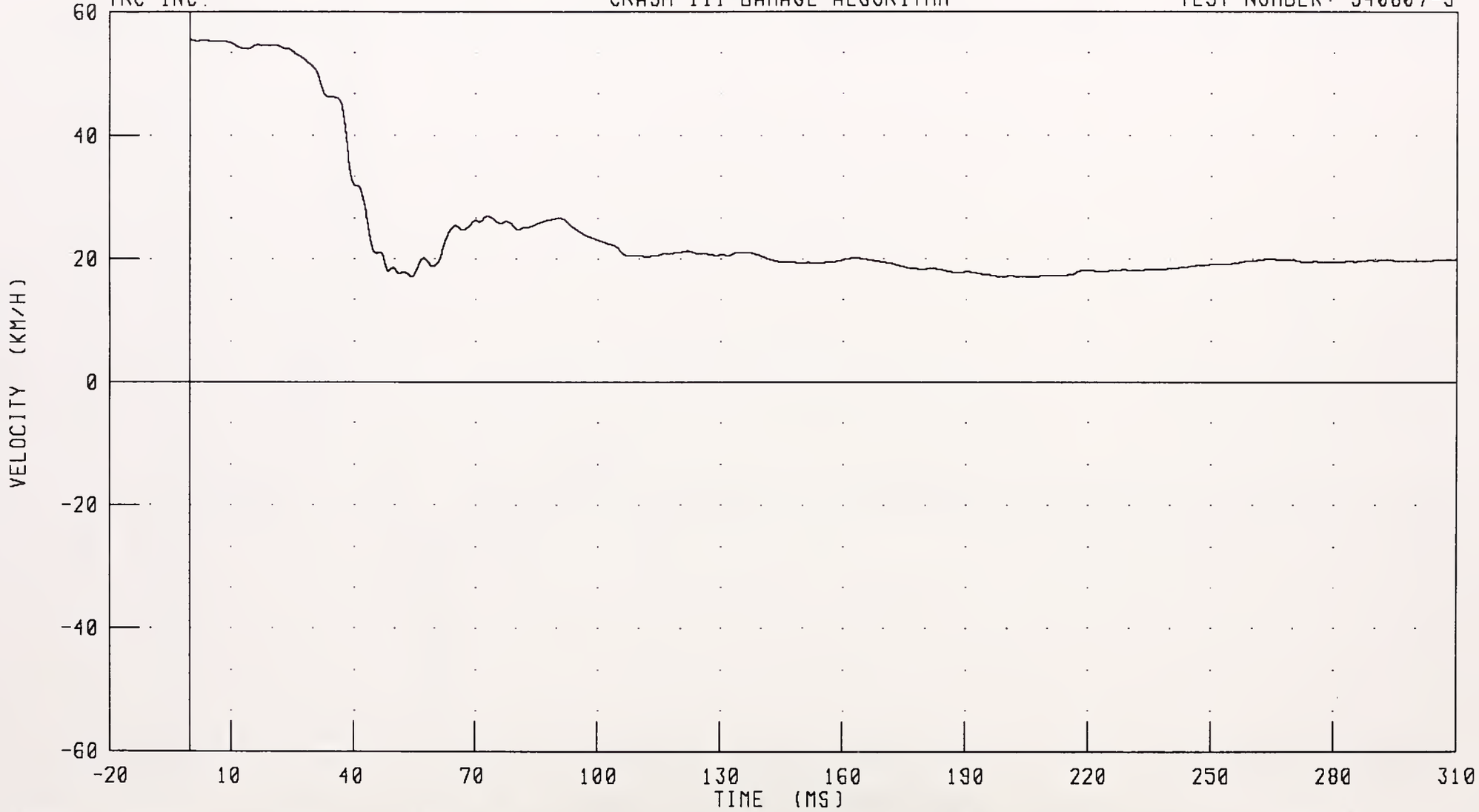
CHANNEL VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 38.97 G @ 62.32 MS; -95.77 G @ 38.48 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

VEHICLE CG X-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



CHANNEL: VCGXV1 FILTER: CH. CLASS 180 PEAK DATA: 55.50 KM/H @ 0.00 MS; 17.05 KM/H @ 54.32 MS

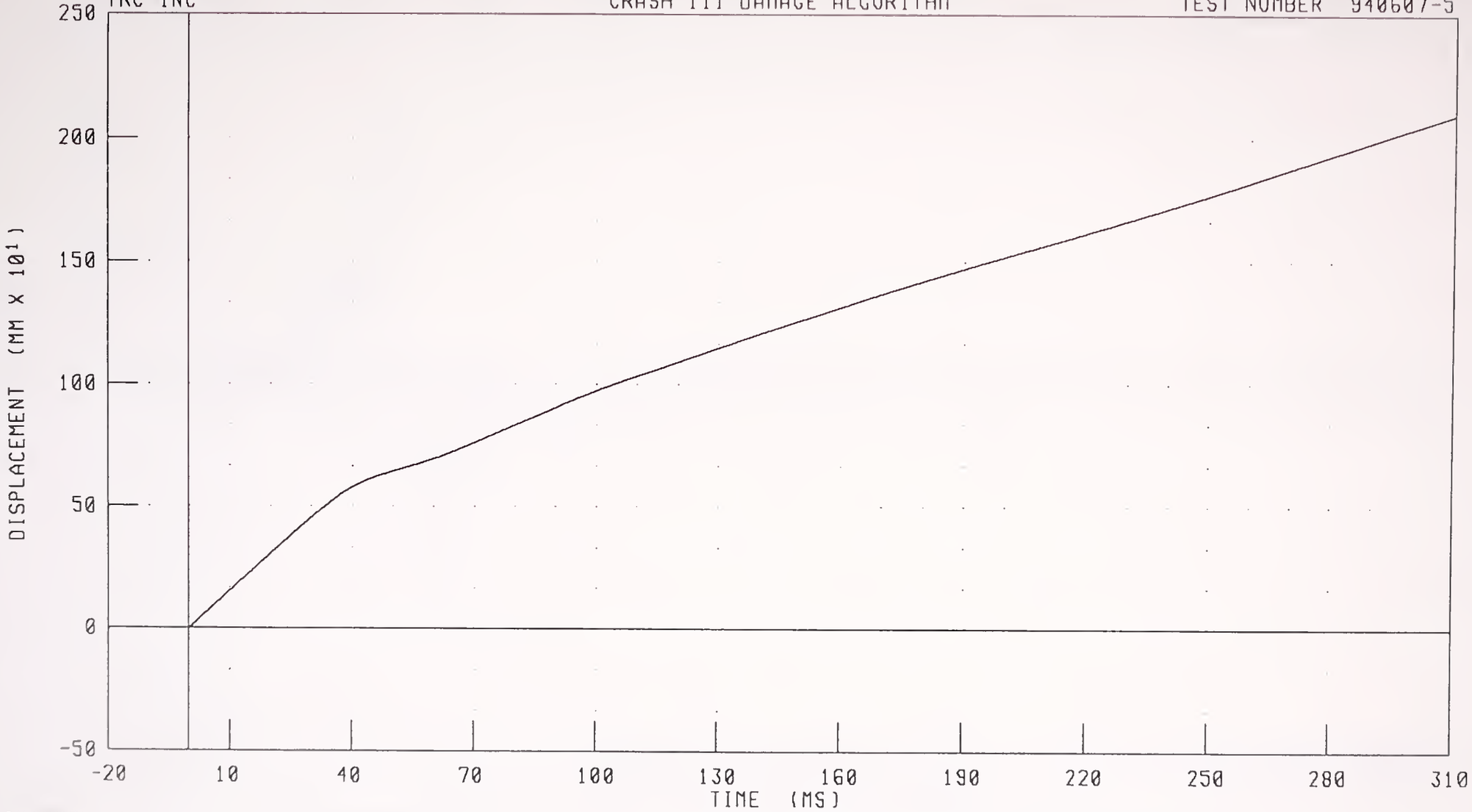
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5

VEHICLE CG X-AXIS DISPLACEMENT

CRASH III DAMAGE ALGORITHM

TRC INC

TEST NUMBER 940607-5

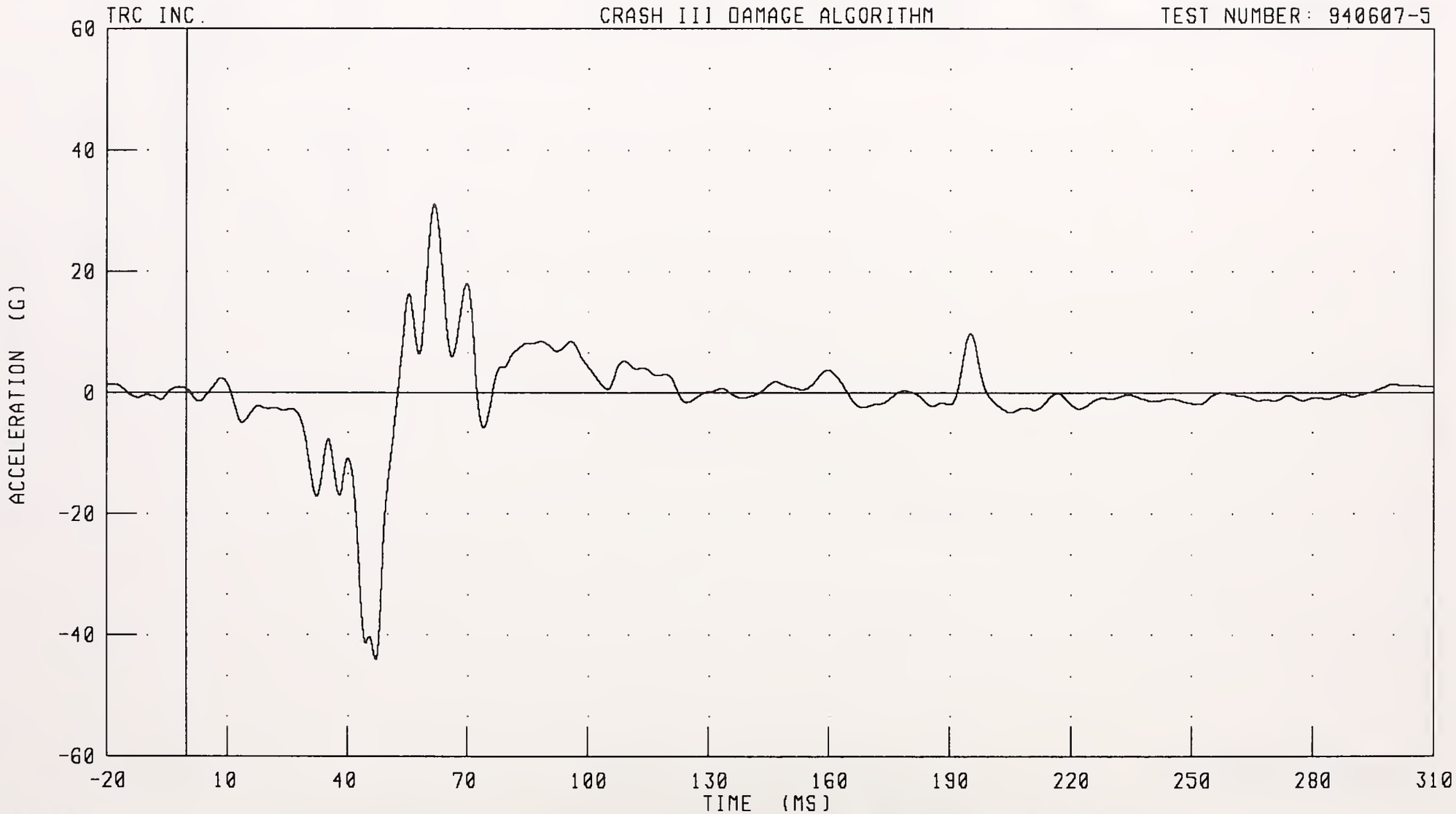


CHANNEL VCGXD1 FILTER CH CLASS 180

PEAK DATA: 2097.25 MM @ 310.00 MS; 0.00 MM @ 0 00 MS

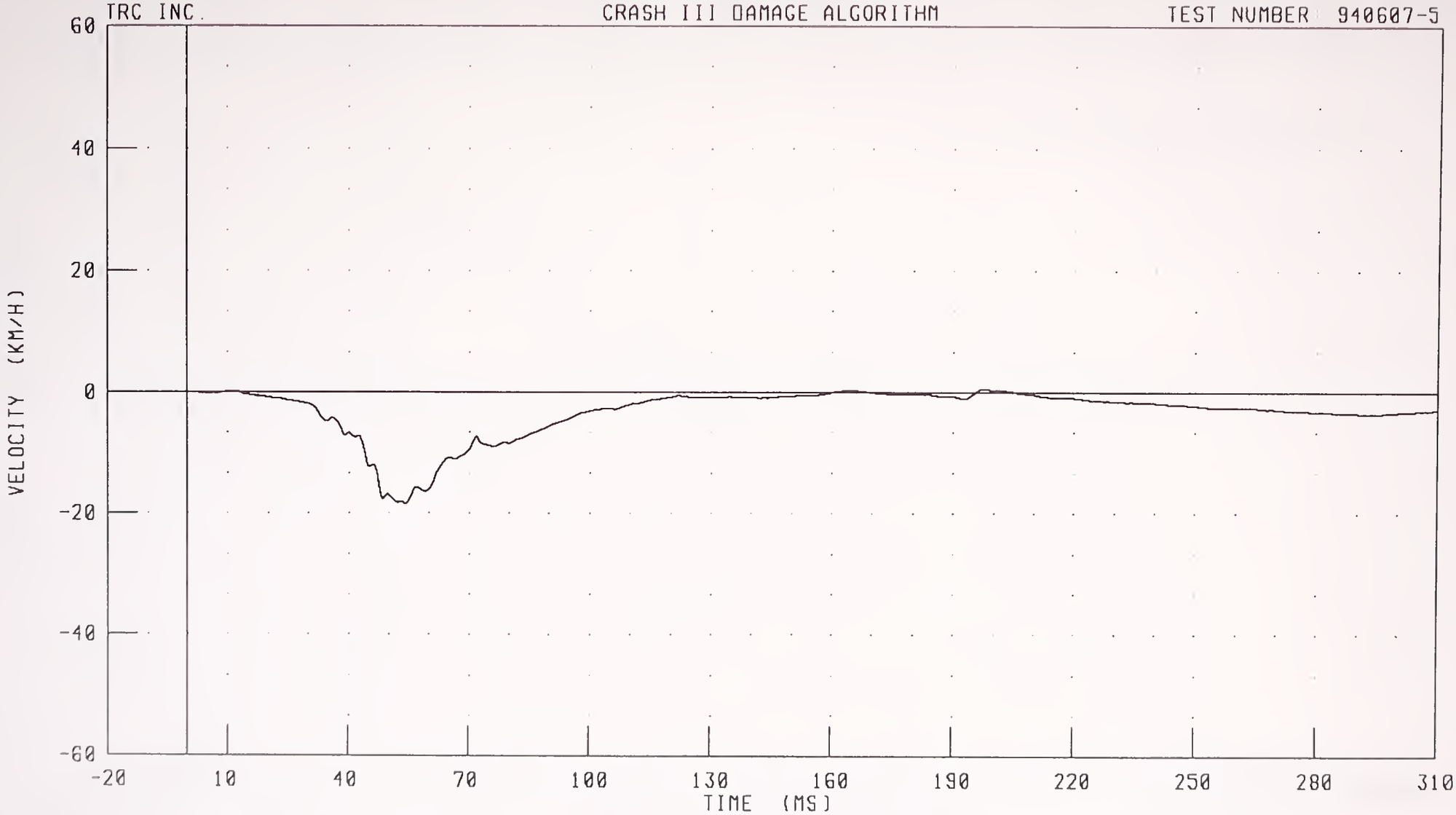
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

VEHICLE CG Y-AXIS ACCELERATION



CHANNEL: VCGYG1 FILTER: CH. CLASS 60 PEAK DATA: 31.12 G @ 61.84 MS; -44.06 G @ 47.12 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5
VEHICLE CG Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM



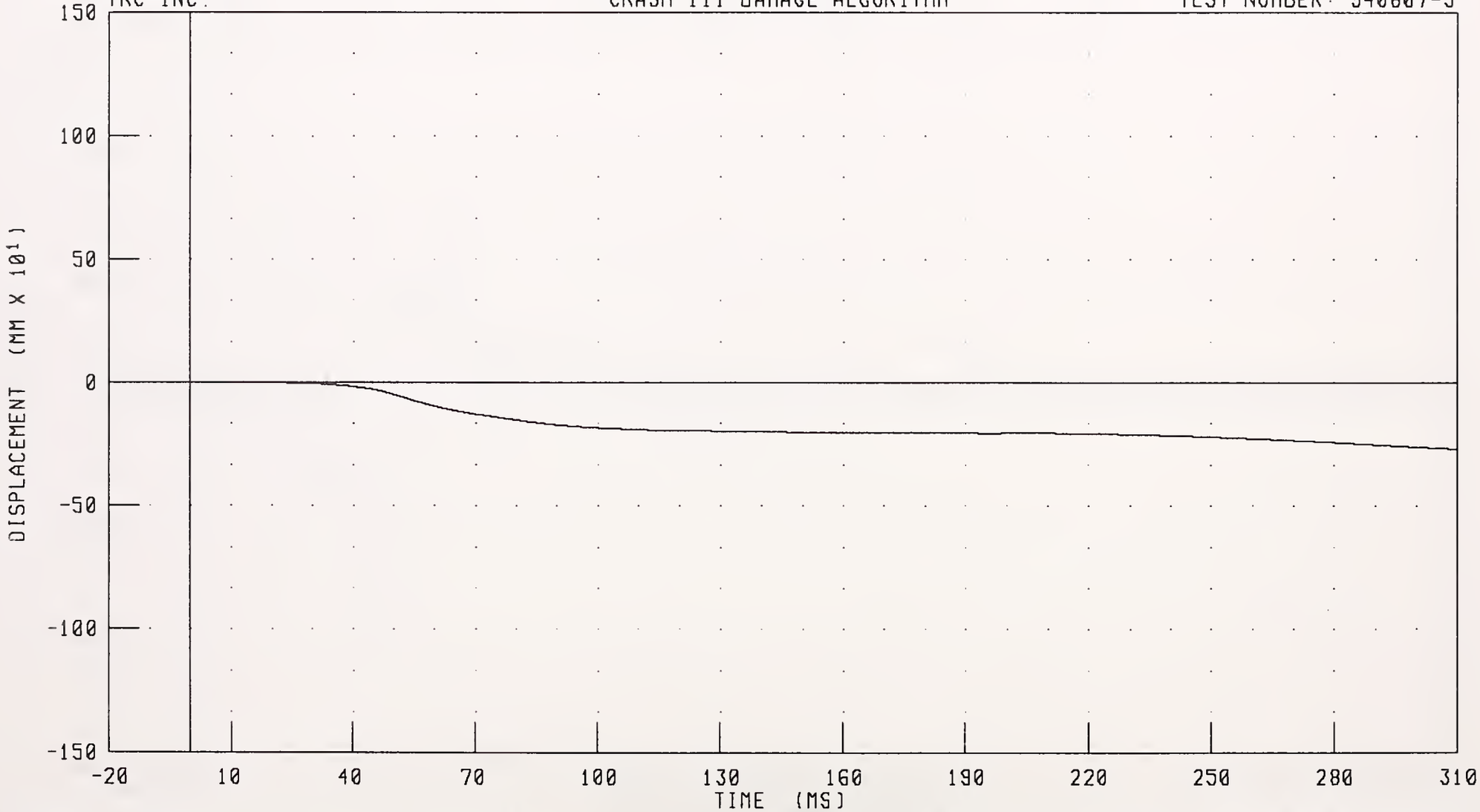
CHANNEL: VCGYV1 FILTER: CH CLASS 180

PEAK DATA: 0.54 KM/H @ 197.28 MS; -18.40 KM/H @ 54.24 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

VEHICLE CG Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



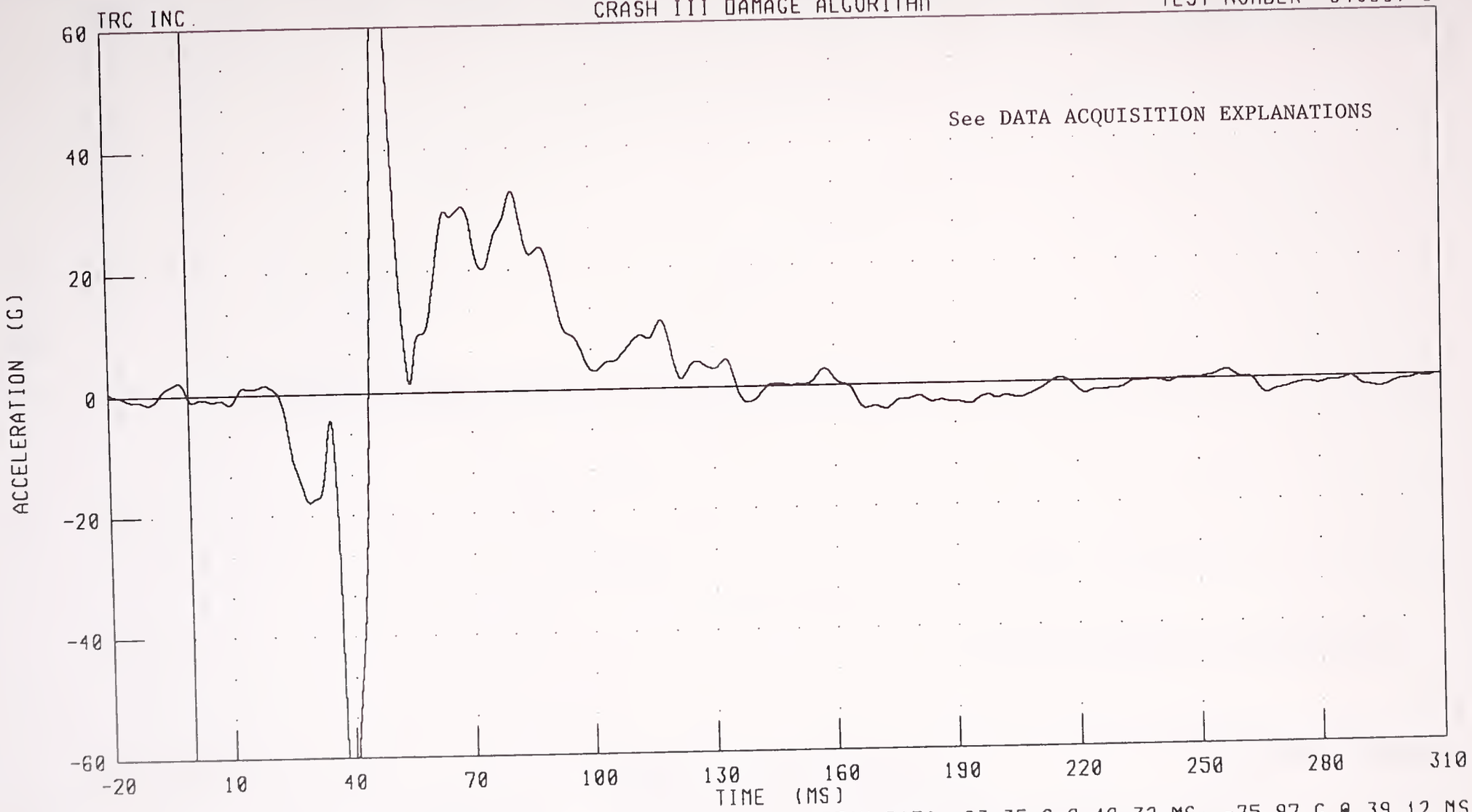
CHANNEL: VCGYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.04 MM @ 13.12 MS; -270.40 MM @ 310.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5

VEHICLE CG Z-AXIS ACCELERATION

CRASH III DAMAGE ALGORITHM

TEST NUMBER: 940607-5



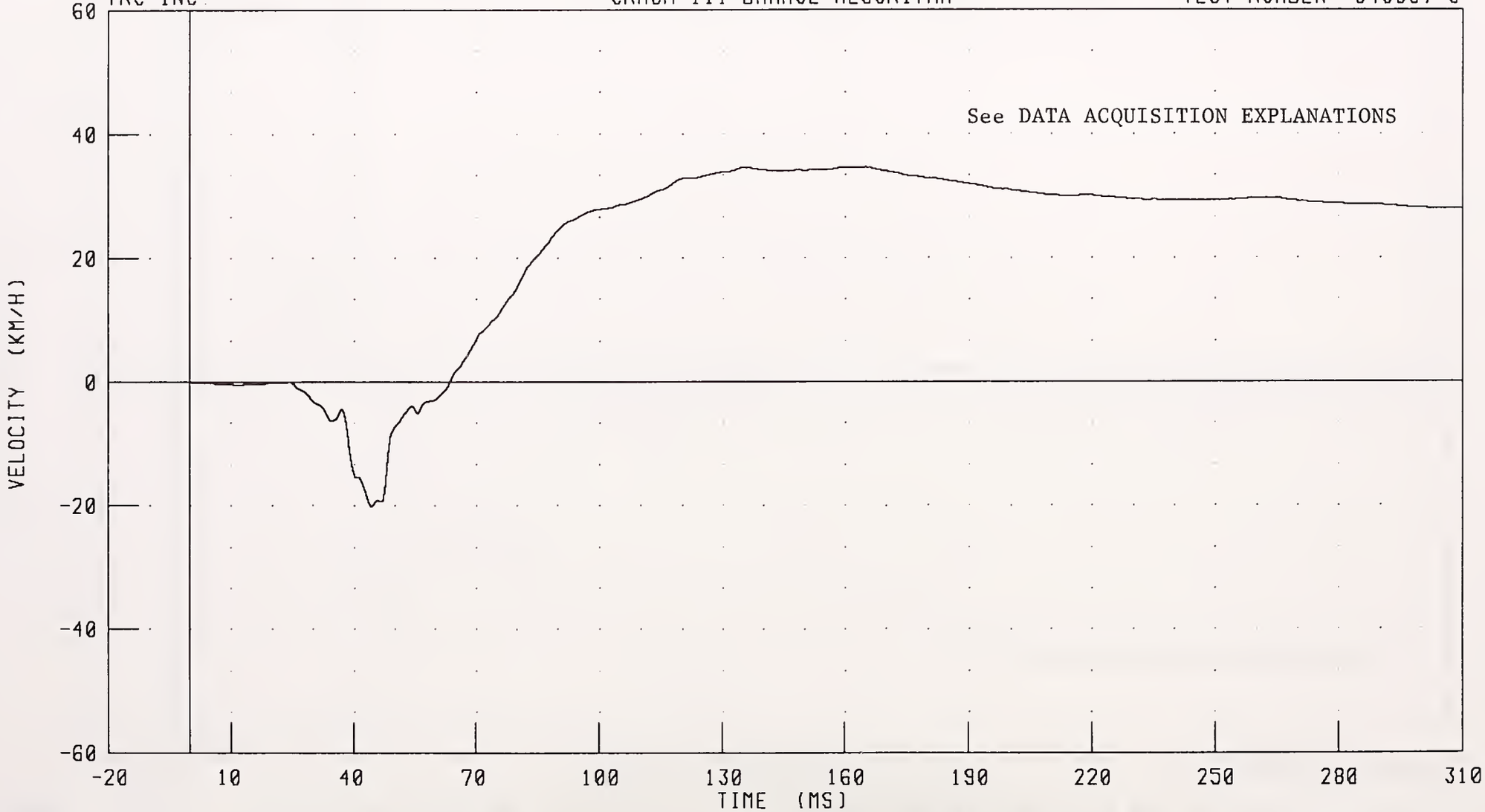
CHANNEL VCGZG1 FILTER: CH CLASS 60

PEAK DATA: 93.35 G @ 48.32 MS; -75.97 G @ 39.12 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

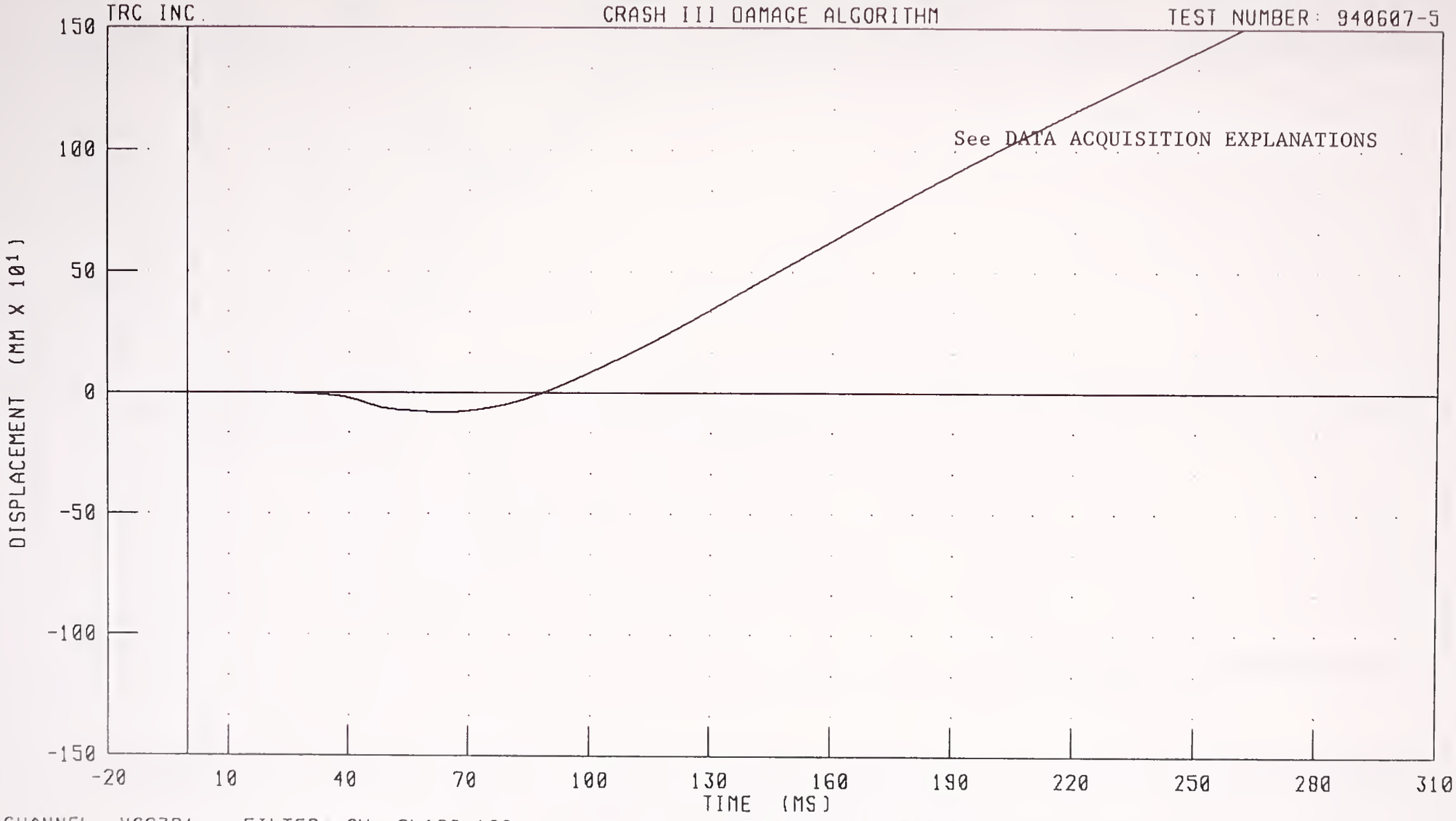
VEHICLE CG Z-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



CHANNEL: VCGZV1 FILTER: CH. CLASS 180 PEAK DATA: 34.64 KM/H @ 165.20 MS; -20.19 KM/H @ 44.40 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5
VEHICLE CG Z-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM



CHANNEL VCGZD1 FILTER CH. CLASS 180

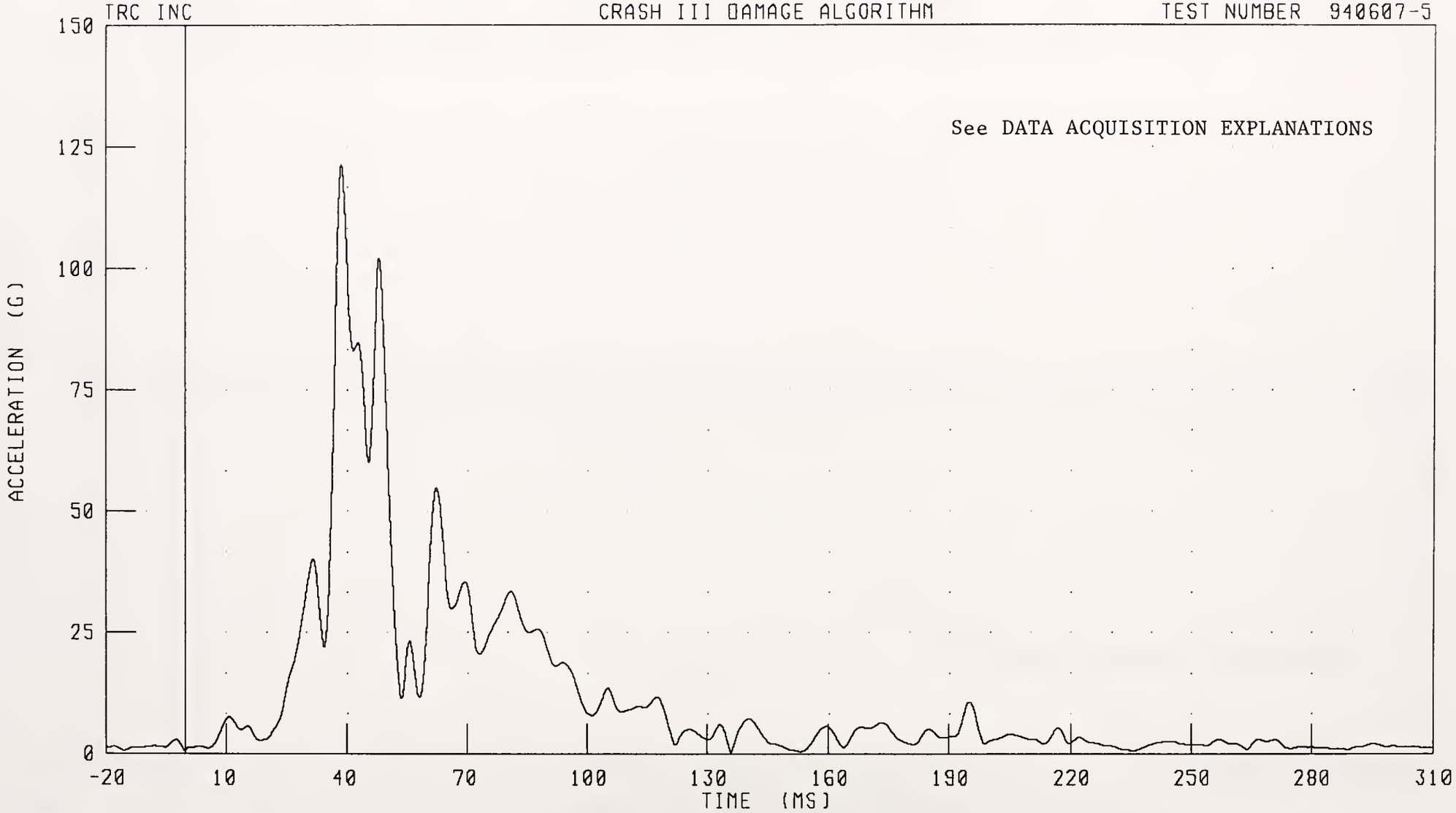
PEAK DATA: 1888.37 MM @ 310 00 MS; -80.13 MM @ 63.68 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5

VEHICLE CG RESULTANT ACCELERATION

CRASH III DAMAGE ALGORITHM

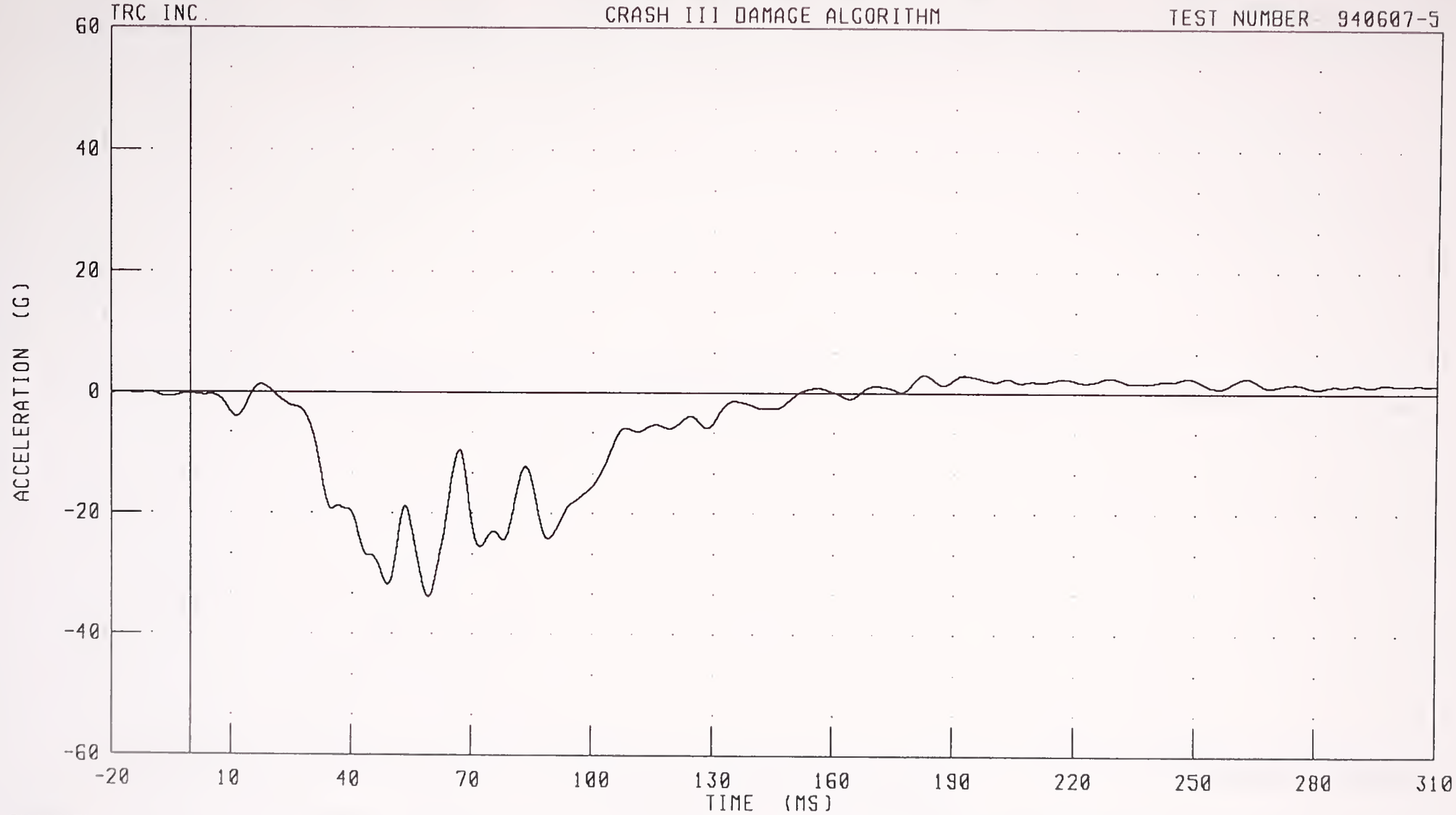
TEST NUMBER 940607-5



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 121.35 G @ 38.72 MS; 0.33 G @ 135.84 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5
LEFT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



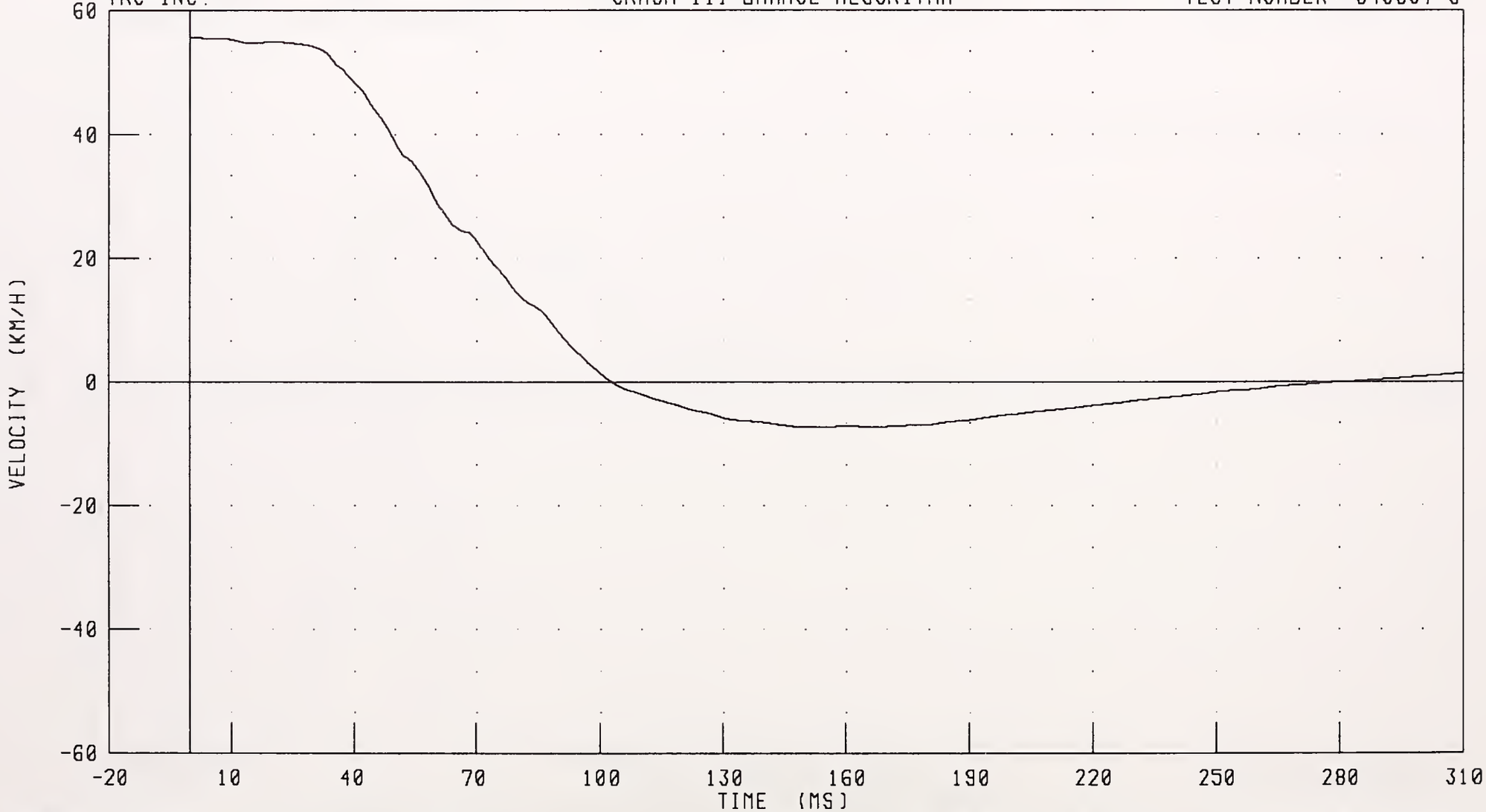
CHANNEL LRSXG1 FILTER: CH CLASS 60

PEAK DATA: 3.06 G @ 182.56 MS; -33.82 G @ 59.20 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

LEFT REAR SILL X-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5

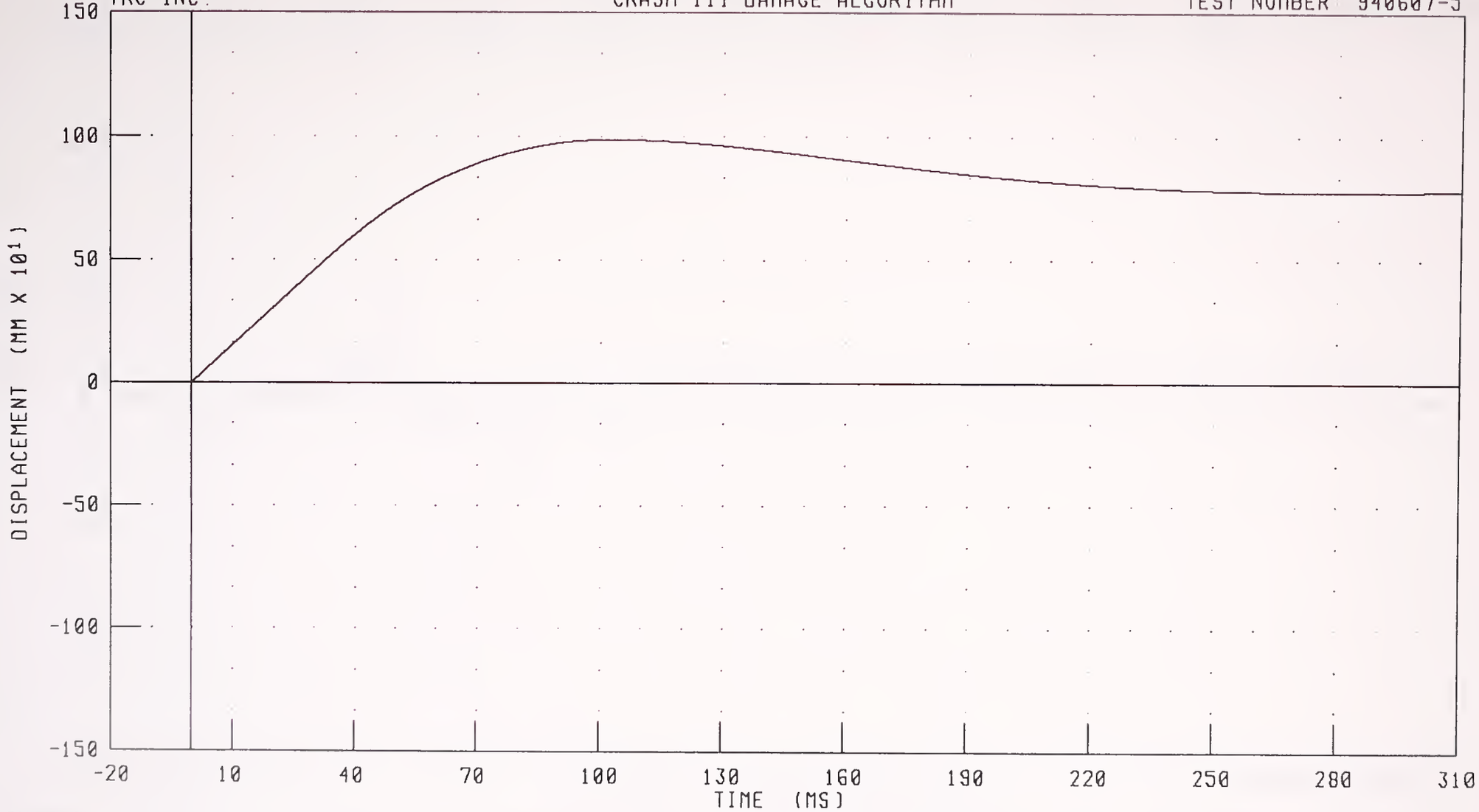


CHANNEL: LRSXV1 FILTER: CH. CLASS 180 PEAK DATA: 55.50 KM/H @ 0.00 MS; -7.34 KM/H @ 150.80 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

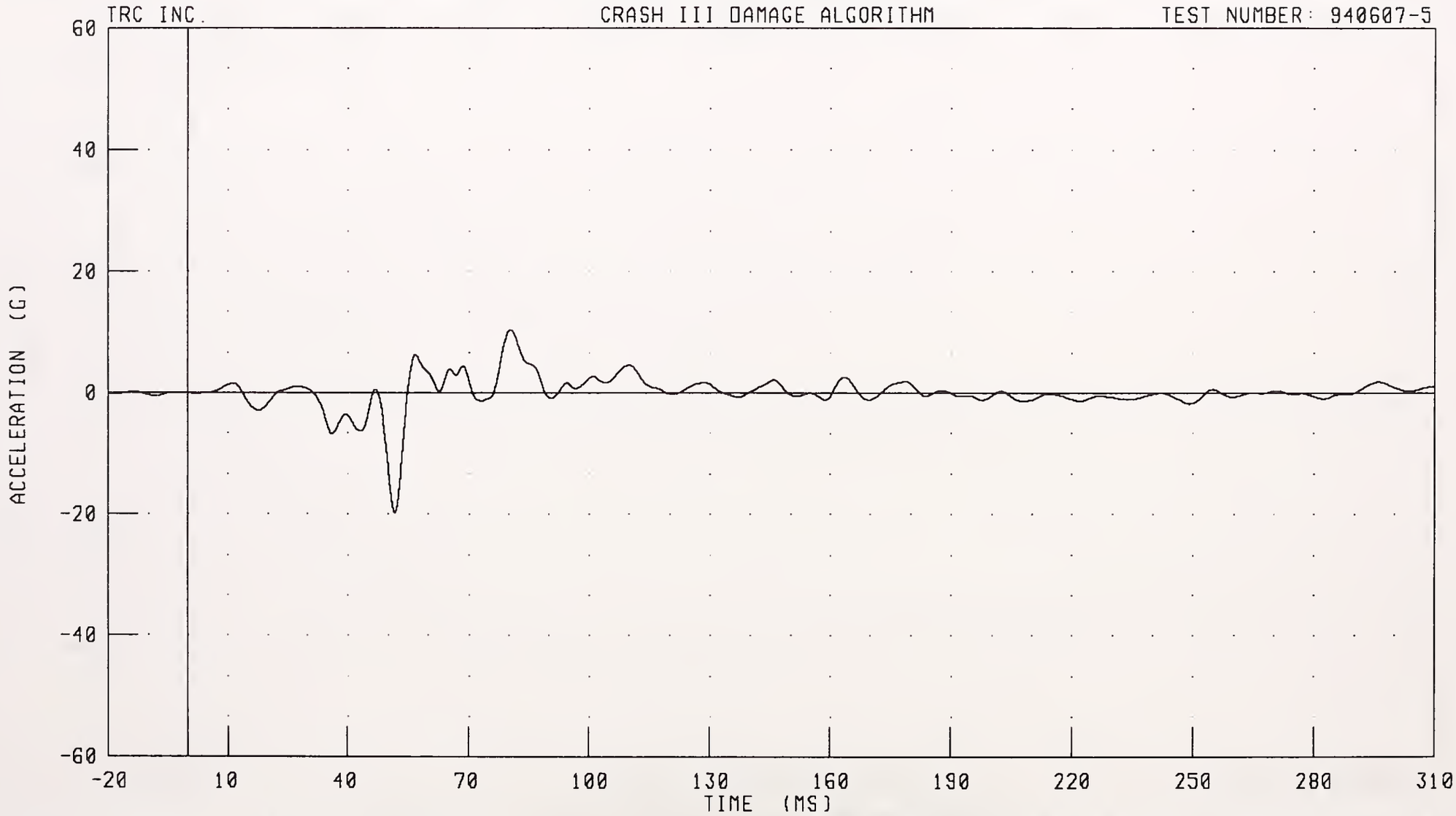
LEFT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



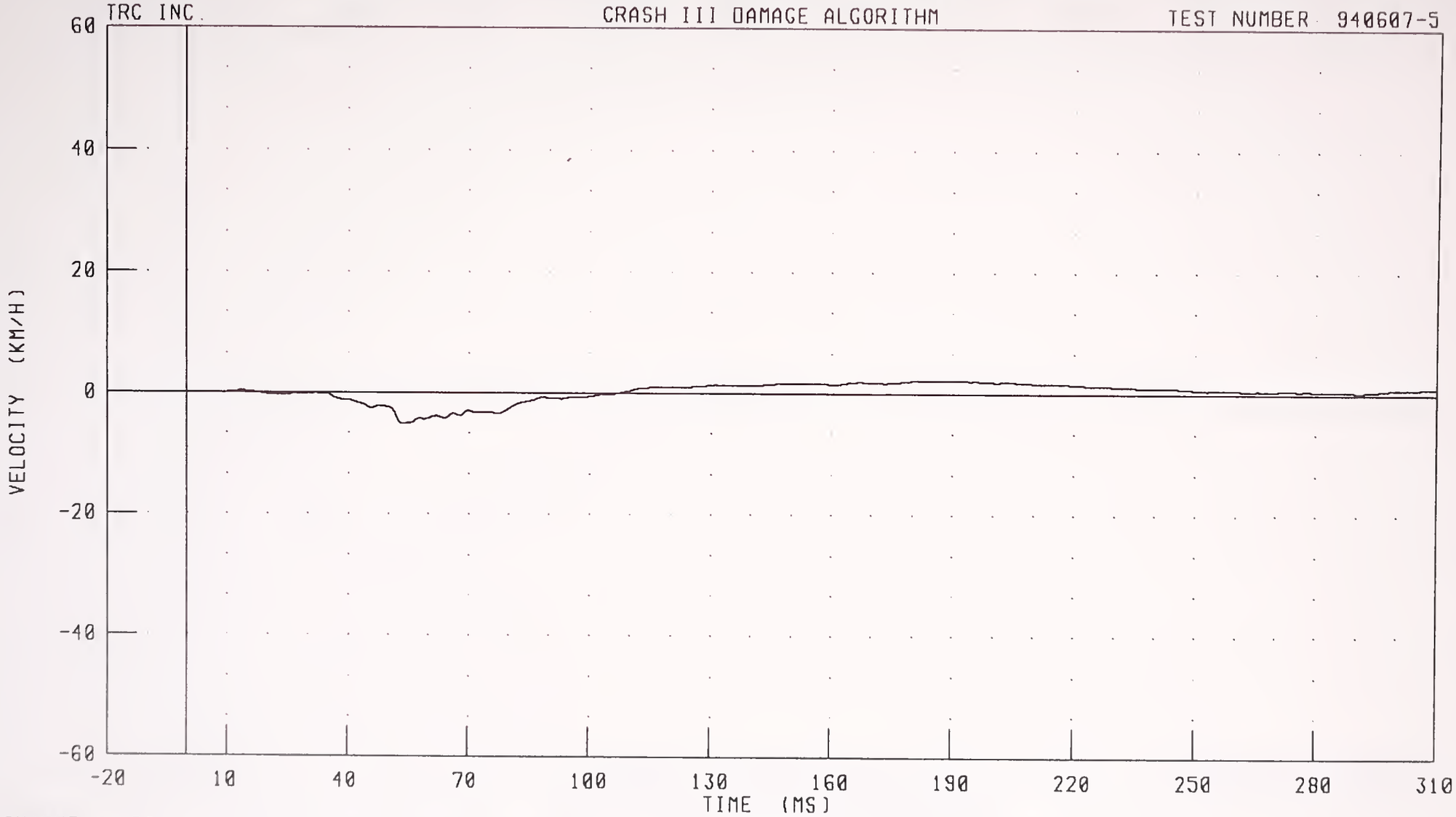
CHANNEL LRSXD1 FILTER: CH. CLASS 180 PEAK DATA: 987.49 MM @ 102.88 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5
LEFT REAR SILL Y-AXIS ACCELERATION



CHANNEL: LRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 10.42 G @ 80.48 MS; -19.83 G @ 51.76 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5
LEFT REAR SILL Y-AXIS VELOCITY
CRASH III DAMAGE ALGORITHM



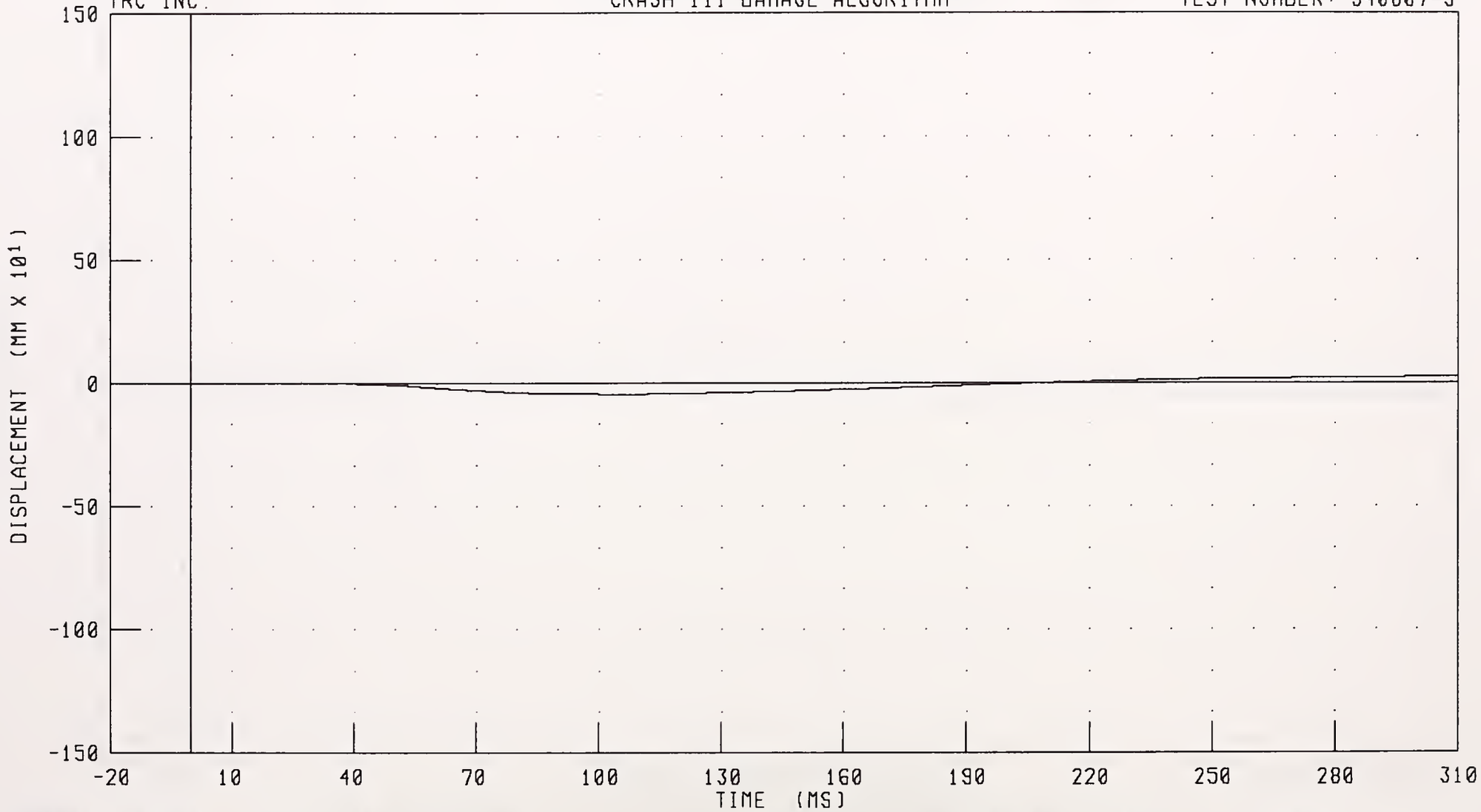
CHANNEL: LRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 2.23 KM/H @ 181.68 MS; -5.14 KM/H @ 53.52 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

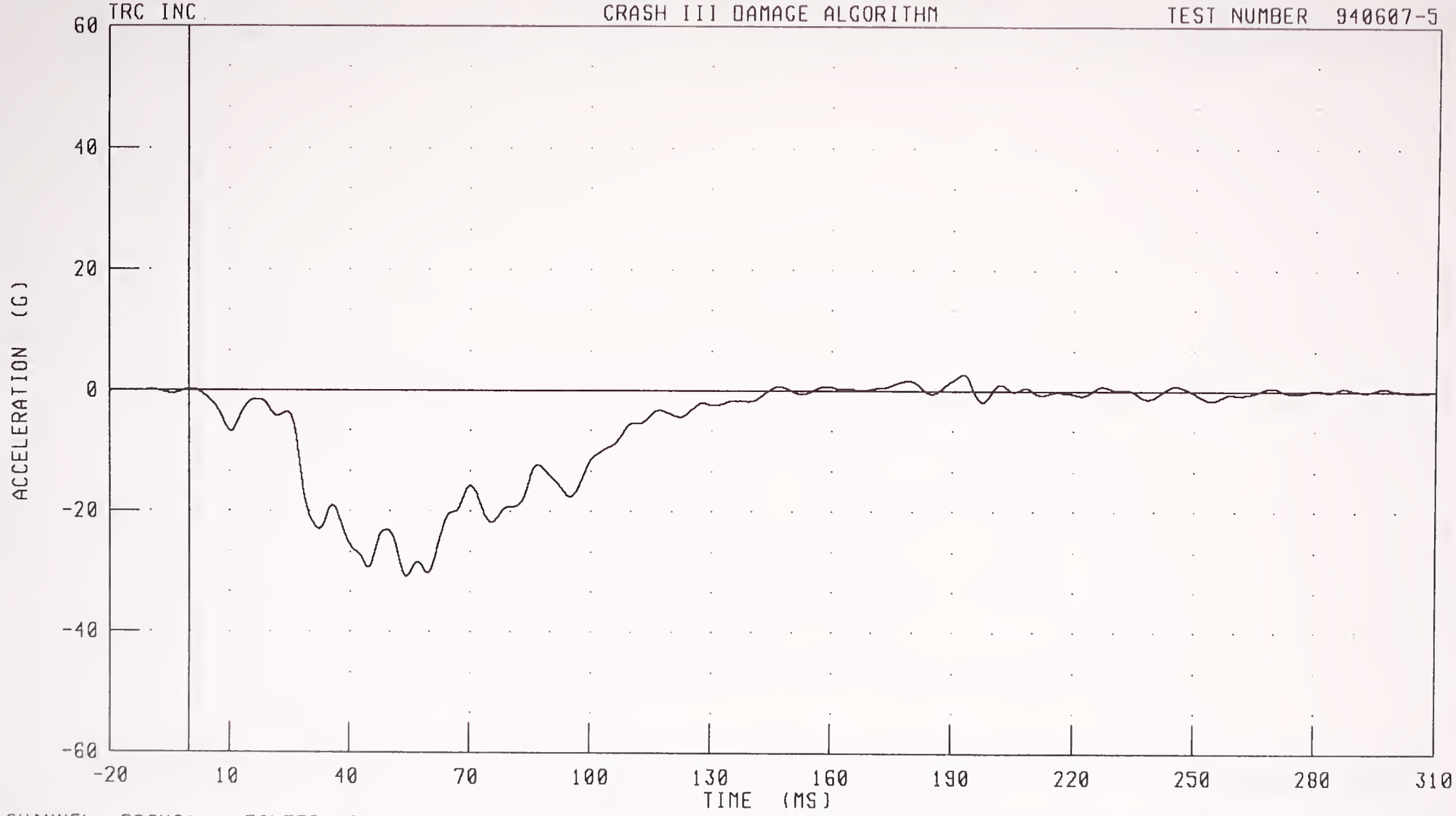
LEFT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



CHANNEL: LRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 26.69 MM @ 310.00 MS; -44.66 MM @ 107.12 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5
RIGHT REAR SILL X-AXIS ACCELERATION
CRASH III DAMAGE ALGORITHM



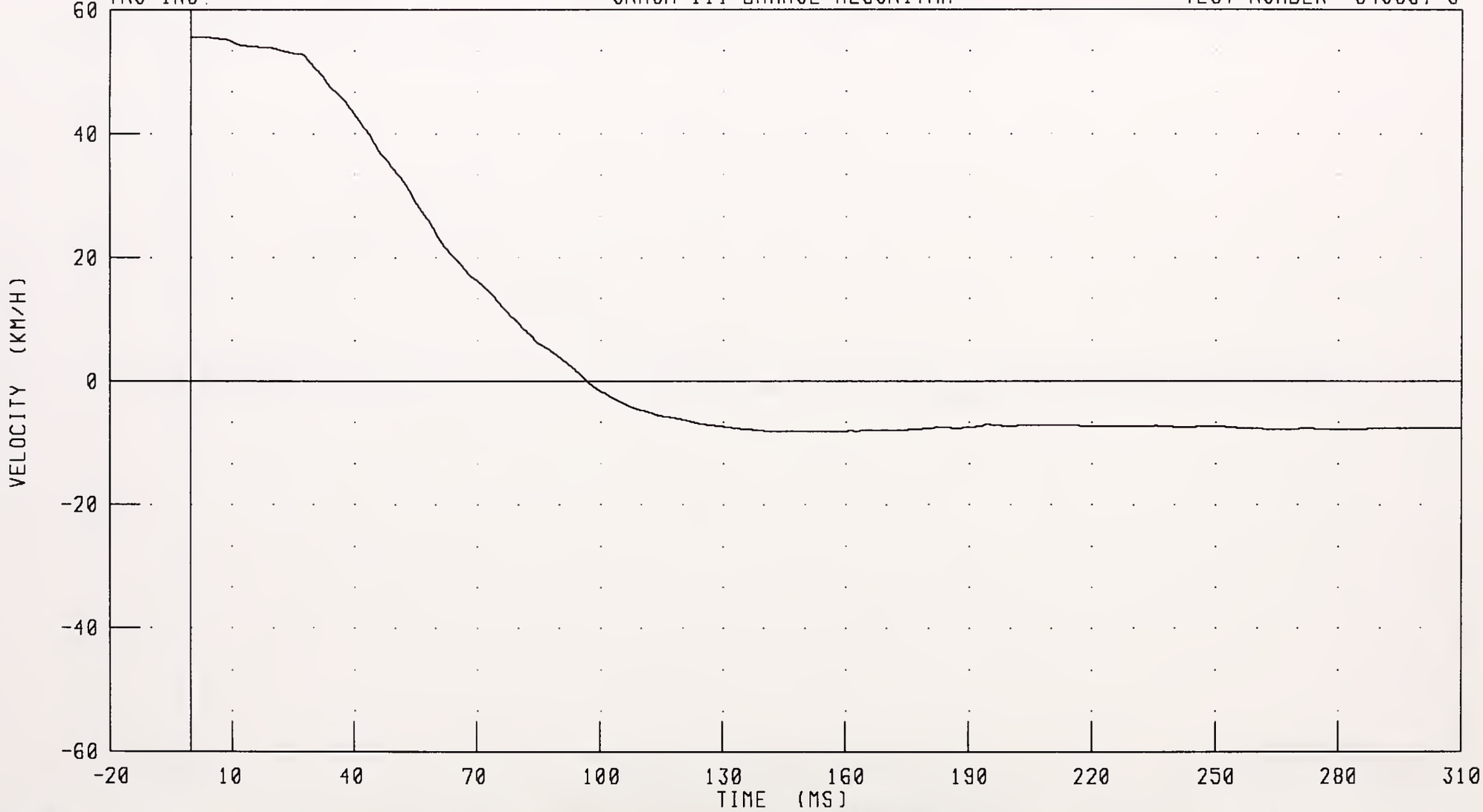
CHANNEL RRSXG1 FILTER: CH CLASS 60

PEAK DATA: 2.79 G @ 192.96 MS; -30.82 G @ 54.24 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

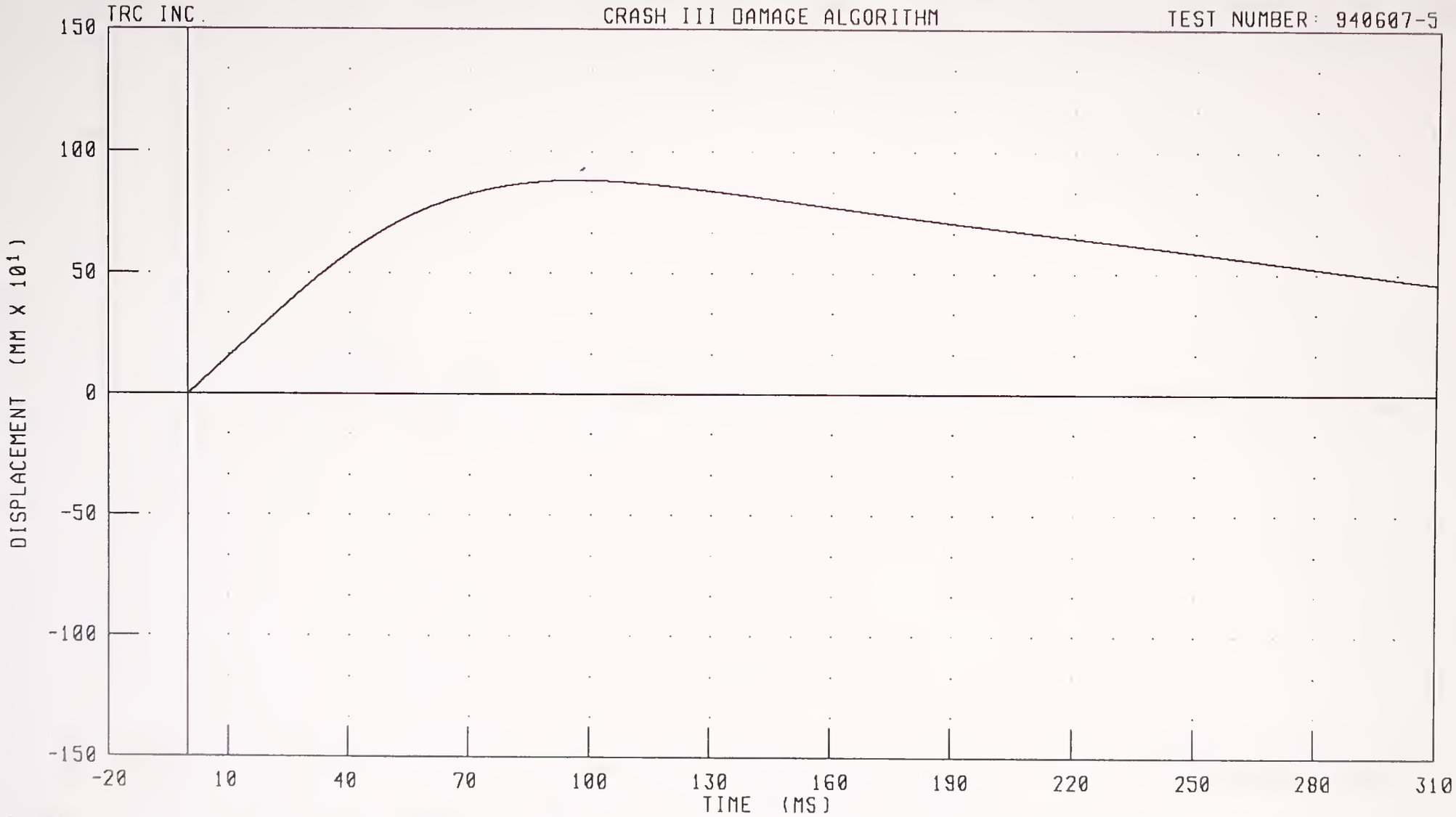
RIGHT REAR SILL X-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



CHANNEL: RRSXV1 FILTER: CH. CLASS 180 PEAK DATA: 55.53 KM/H @ 2.24 MS; -8.20 KM/H @ 144.96 MS

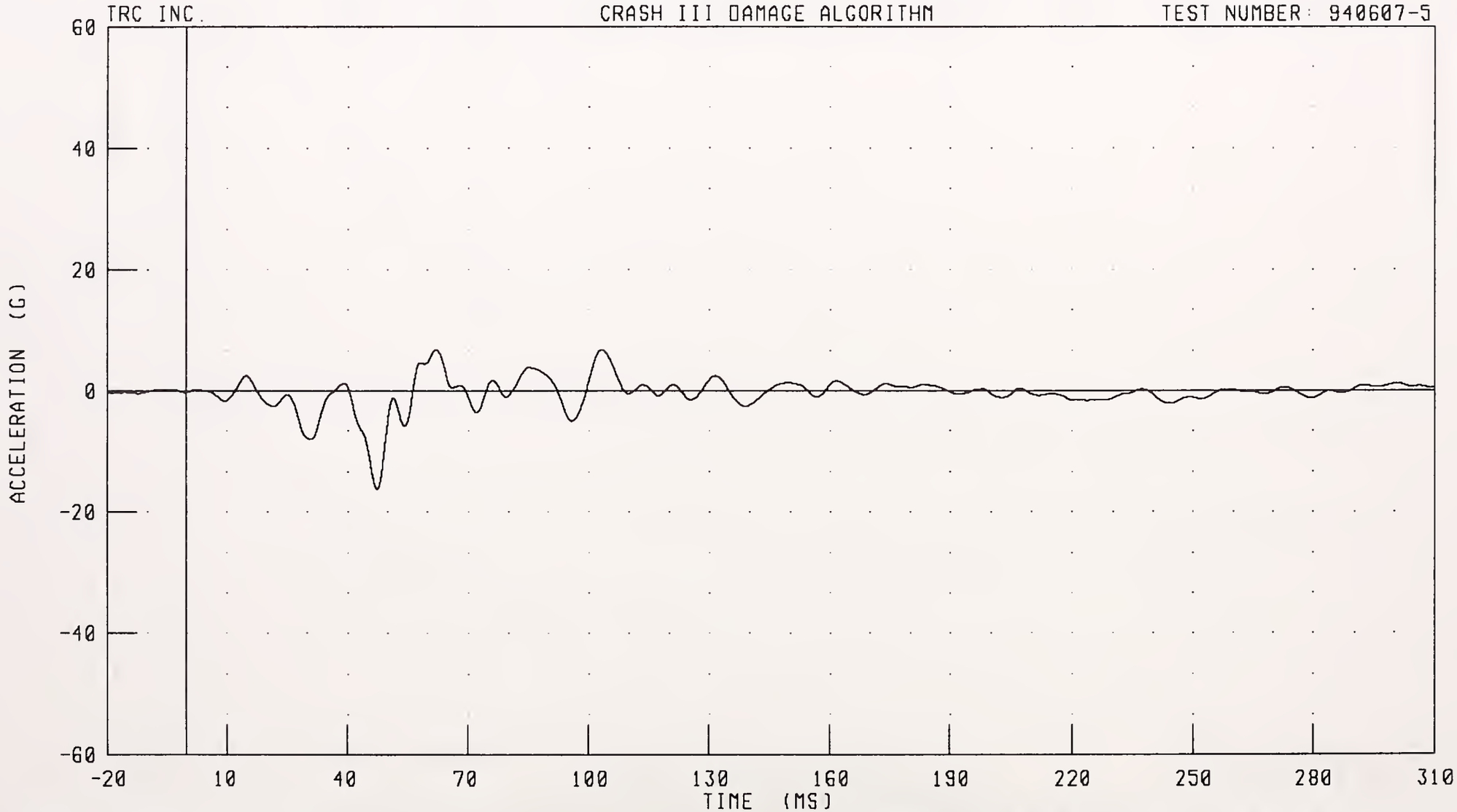
1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5
RIGHT REAR SILL X-AXIS DISPLACEMENT
CRASH III DAMAGE ALGORITHM



CHANNEL RRSXD1 FILTER CH. CLASS 180

PEAK DATA: 882.17 MM @ 96.80 MS; 0.00 MM @ 0.00 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5
RIGHT REAR SILL Y-AXIS ACCELERATION

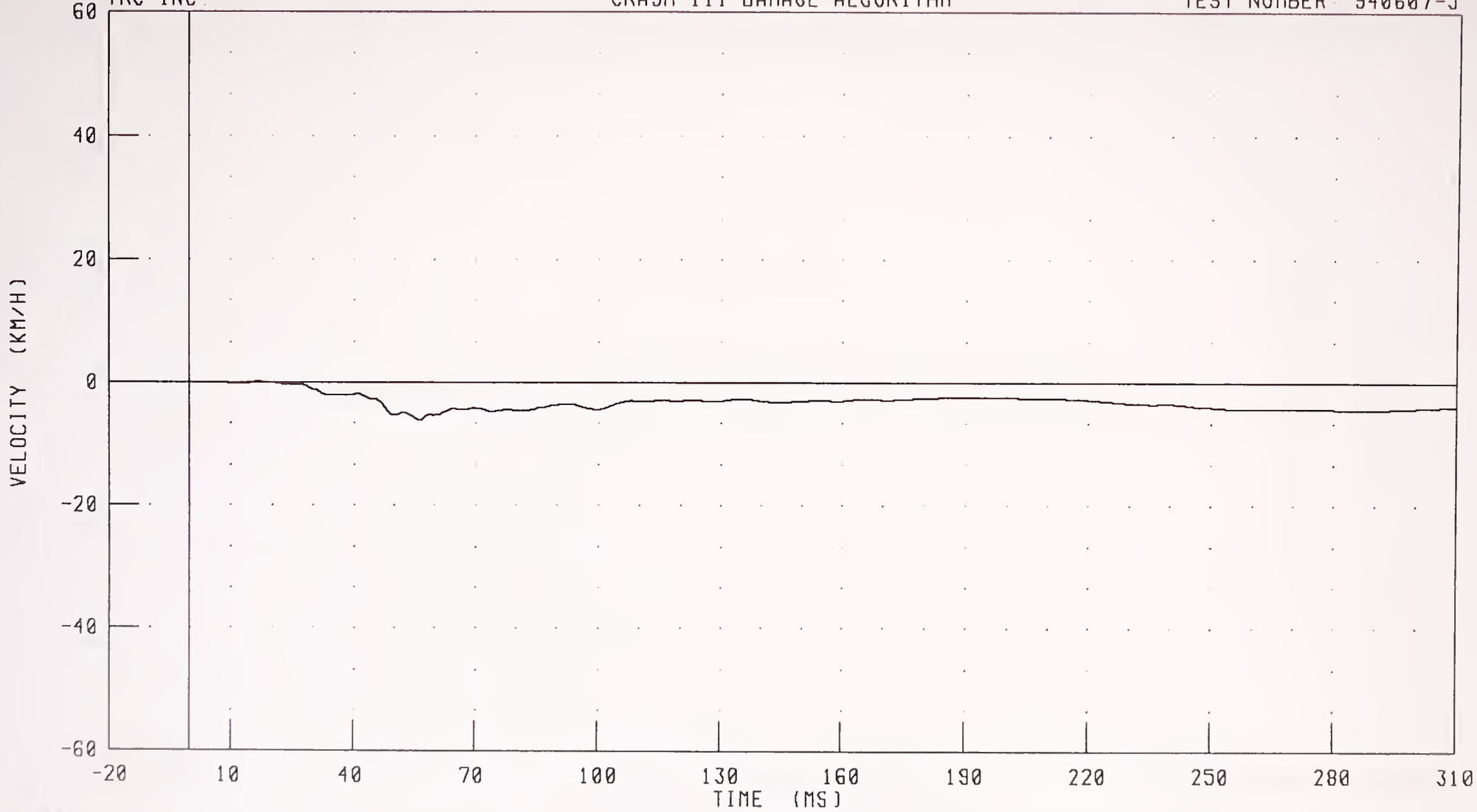


CHANNEL: RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 6.79 G @ 103.28 MS; -16.27 G @ 47.52 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO 5

RIGHT REAR SILL Y-AXIS VELOCITY

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER 940607-5

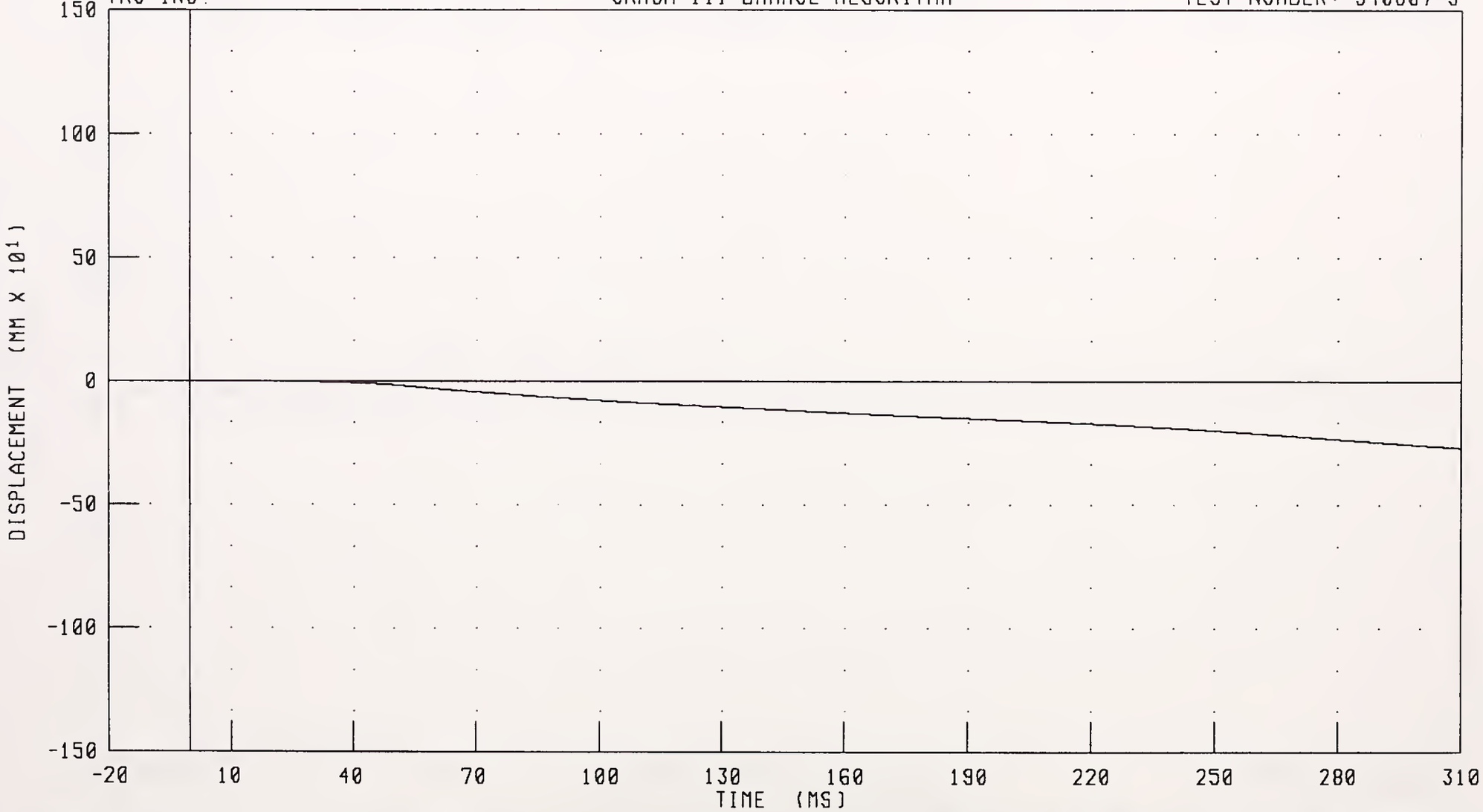


CHANNEL RRSYV1 FILTER: CH. CLASS 180 PEAK DATA: 0.13 KM/H @ 16.56 MS; -6.14 KM/H @ 56.24 MS

1990 CHEVROLET CAPRICE INTO 50% LEFT OFF-SET FRONTAL BARRIER TEST NO.5

RIGHT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH III DAMAGE ALGORITHM TEST NUMBER: 940607-5



CHANNEL: RRSYD1 FILTER: CH. CLASS 180 PEAK DATA: 0.02 MM @ 8.40 MS; -269.07 MM @ 310.00 MS

Appendix C

Miscellaneous Test Information

Vehicle Accelerometer Information

No.	Location	Axis	Manufacturer	Model	Serial Number	Orientation (+ Sensing)
1	Vehicle Center Of Gravity	X	Endevco	7264	DR87J	Front
		Y	Endevco	7264	CL98H	Left
		Z	Endevco	7264	CK32H	Up
2	Left Rear Sill	X	Endevco	7264	AGRJ4	Front
		Y	Endevco	7264	CR83H	Left
3	Right Rear Sill	X	Endevco	7264	DW34JC	Front
		Y	Endevco	7264	CM27H	Right

Sign Convention

All Dummy, Barrier And Vehicle Channels:

+X: Forward

+Y: Leftward

+Z: Upward

+Force: Tension

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