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U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

DOT HS 808 228

June 1993

Final Report

Final Report of a 1993 Honda Civic DX into Heavy Truck Rigid Rear Underride Guard in Support of Crash3 Damage Algorithm Reformulation

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16. Abstract Five (5) heavy truck rigid rear underride guard impact tests were conducted for research and development in support of the CRASH3 damage algorithm reformulation. These tests were conducted on a 1993 Honda Civic DX 3-door hatchback, VIN 2HGEH2363PH525832 at Transportation Research Center Inc. on May 12 and 13, 1993. The following five tests were conducted on the vehicle: <table border="1"> <thead> <tr> <th>TEST NO.</th> <th>DATE</th> <th>TIME</th> <th>SPEED (MPH)</th> </tr> </thead> <tbody> <tr> <td>930512-1</td> <td>05/12/93</td> <td>1002</td> <td>4.7</td> </tr> <tr> <td>930512-2</td> <td>05/12/93</td> <td>1127</td> <td>14.9</td> </tr> <tr> <td>930512-3</td> <td>05/12/93</td> <td>1326</td> <td>14.8</td> </tr> <tr> <td>930512-4</td> <td>05/12/93</td> <td>1500</td> <td>19.9</td> </tr> <tr> <td>930513-1</td> <td>05/13/93</td> <td>0730</td> <td>35.0</td> </tr> </tbody> </table>			TEST NO.	DATE	TIME	SPEED (MPH)	930512-1	05/12/93	1002	4.7	930512-2	05/12/93	1127	14.9	930512-3	05/12/93	1326	14.8	930512-4	05/12/93	1500	19.9	930513-1	05/13/93	0730	35.0
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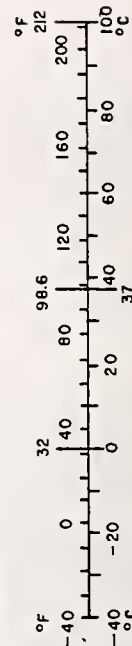
METRIC CONVERSION FACTORS

Approximate Conversions to Metric Measures

Symbol	When You Know	Multiply by	To Find	Symbol
LENGTH				
in	inches	2.54	centimeters	cm
ft	feet	30.48	centimeters	cm
yd	yards	0.9144	meters	m
mi	miles	1.60934	kilometers	km
AREA				
in ²	square inches	6.4516	square centimeters	cm ²
ft ²	square feet	0.092903	square meters	m ²
yd ²	square yards	0.836127	square meters	m ²
mi ²	square miles	2.599987	square kilometers	km ²
	acres	0.404686	hectares	ha
MASS (weight)				
oz	ounces	28.3495	grams	g
lb	pounds	0.453592	kilograms	kg
	short tons (2000 lb)	0.907185	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

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



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

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PURPOSE AND TEST PROCEDURE

The purpose of the five (5) heavy truck rigid rear underride guard impact tests was for research and development in support of the CRASH3 damage algorithm reformulation.

The 1993 Honda Civic DX was equipped with a 1.5-liter, 4-cylinder, transverse, gasoline engine with a 5-speed manual transmission. The test weight of the vehicle was 2387 pounds.

The vehicle was instrumented with six (6) accelerometers to measure vehicle X-axis and Y-axis acceleration.

Each crash test event was recorded by two (2) high-speed motion picture cameras operating at approximately 1000 frames per second.

SECTION 2.0

VEHICLE AND TEST DATA

TABLE 1 TEST VEHICLE INFORMATION

VEHICLE MANUFACTURER: Honda of Canada Mfg.

MAKE/MODEL: Honda/Civic DX

VIN: 2HGEH2363PH525832

BODY STYLE: 3-door hatchback

MODEL YEAR: 1993

COLOR: Blue

ENGINE DATA: TYPE: transverse CYLINDERS: 4 DISPLACEMENT: 1.5-liter

TRANSMISSION DATA: 5 SPEED X MANUAL AUTOMATIC
X FWD RWD, 4WD

DATE VEHICLE RECEIVED: 05/03/93

ODOMETER READING: 25.0

DEALER'S NAME AND ADDRESS: NA

ACCESSORIES:

POWER STEERING	Yes	AUTOMATIC TRANSMISSION	No
POWER BRAKES	Yes	AUTOMATIC SPEED CONTROL	No
POWER SEATS	No	TILTING STEERING WHEEL	Yes
POWER WINDOWS	No	TELESCOPING STEERING WHEEL	No
TINTED GLASS	Yes	AIR CONDITIONING	No
RADIO	No	ANTI-SKID BRAKE	No
CLOCK	No	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: Honda of Canada Mfg.

DATE OF MANUFACTURE: 03/93

VIN: 2HGEH2363PH525832

GVWR: 3090 LBS.

GAWR: FRONT: 1635 LBS., REAR: 1510 LBS.

TABLE 1 TEST VEHICLE INFORMATION, CONT'D.

TIRES ON VEHICLE (MFR., LINE, SIZE): Goodyear, Invicta GLR, P175/70R13

TIRE PRESSURE WITH MAXIMUM CAPACITY VEHICLE LOAD: FRONT: 44 PSI
REAR: 44 PSI

SPARE TIRE (MFR., LINE, SIZE): Goodyear, Temporary, T105/80D16

TYPE OF SEATS: FRONT: Bucket
REAR: Bench

TYPE OF FRONT SEAT BACKS: Manually-adjustable

MAXIMUM WIDTH: 66.5 IN.

WHEELBASE: 101.5 IN.

LOCATION OF LABEL STATING TIRE DATA:

The label was located in the glove box.

TIRE & CAPACITY DATA FROM VEHICLE'S LABEL:

RECOMMENDED TIRE SIZE: P175/70R13

RECOMMENDED COLD TIRE PRESSURE: FRONT: 32 PSI; REAR: 32 PSI

DESIGNATED SEATING CAPACITY: 2 FRONT 3 REAR 5 TOTAL

VEHICLE CAPACITY WEIGHT: 850 LBS.

TEST VEHICLE ATTITUDE (ALL MEASUREMENTS ARE IN INCHES):

DELIVERED ATTITUDE: LF 25.8; RF 25.8; LR 25.5; RR 25.2

PRE-TEST ATTITUDE: LF 29.4; RF 29.5; LR 25.5; RR 26.0

TABLE 1 TEST VEHICLE INFORMATION, CONT'D.

WEIGHT OF TEST VEHICLE AS RECEIVED (WITH MAXIMUM FLUIDS):

RIGHT FRONT	655 LBS.	RIGHT REAR	367 LBS.
LEFT FRONT	650 LBS.	LEFT REAR	390 LBS.
TOTAL FRONT WEIGHT	1305 LBS.	(63.3% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	757 LBS.	(36.7% OF TOTAL VEHICLE WEIGHT)	
TOTAL DELIVERED WEIGHT	2062 LBS.		

WEIGHT OF TEST VEHICLE:

RIGHT FRONT	892 LBS. **	RIGHT REAR	280 LBS.
LEFT FRONT	904 LBS. **	LEFT REAR	311 LBS.
TOTAL FRONT WEIGHT	1796 LBS. *	(75.2% OF TOTAL VEHICLE WEIGHT)	
TOTAL REAR WEIGHT	591 LBS.	(24.8% OF TOTAL VEHICLE WEIGHT)	
TOTAL TEST WEIGHT	2387 LBS. *		

WEIGHT OF BALLAST SECURED IN VEHICLE CARGO AREA: 0 LBS.

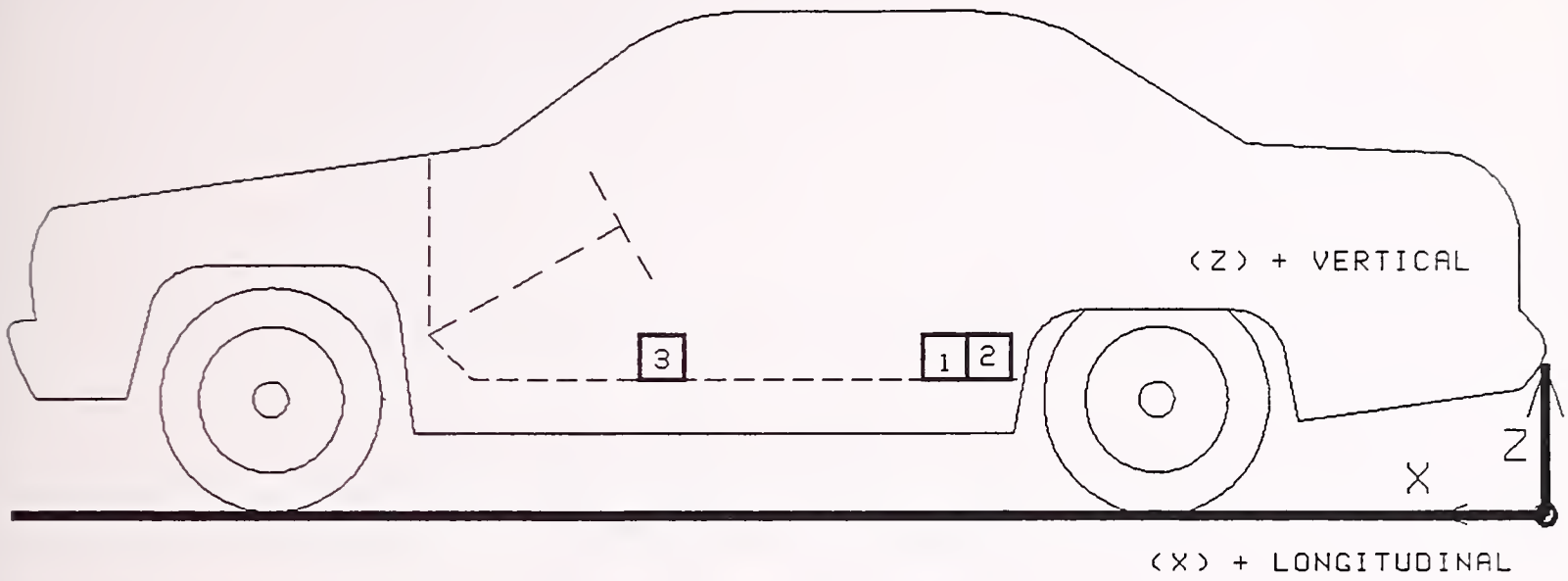
COMPONENTS REMOVED TO MEET TARGET TEST WEIGHT: None

CG = 20.8 INCHES REARWARD OF THIRD AXLE CENTERLINE

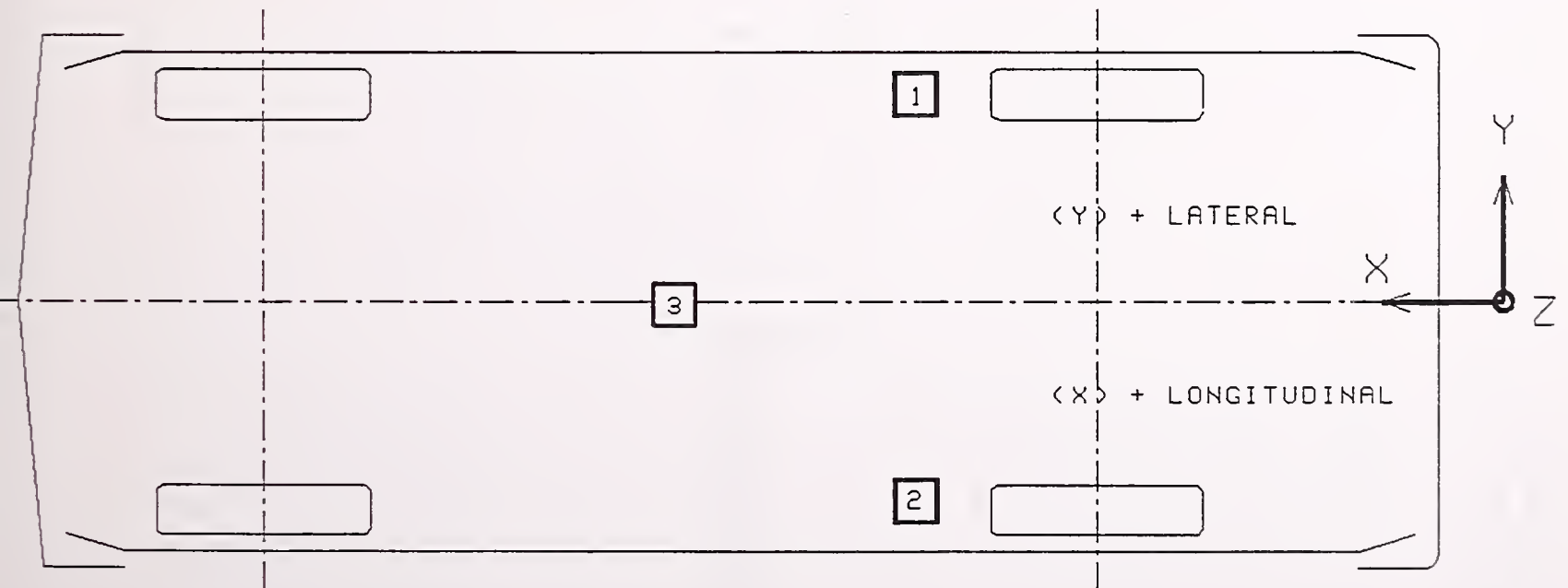
*Weight of third axle included in total test weight.

**The front wheel weights are for third axle wheels.

FIGURE 1 VEHICLE ACCELEROMETER PLACEMENT



SIDE VIEW



BOTTOM VIEW

FIGURE 2 CAMERA POSITIONS

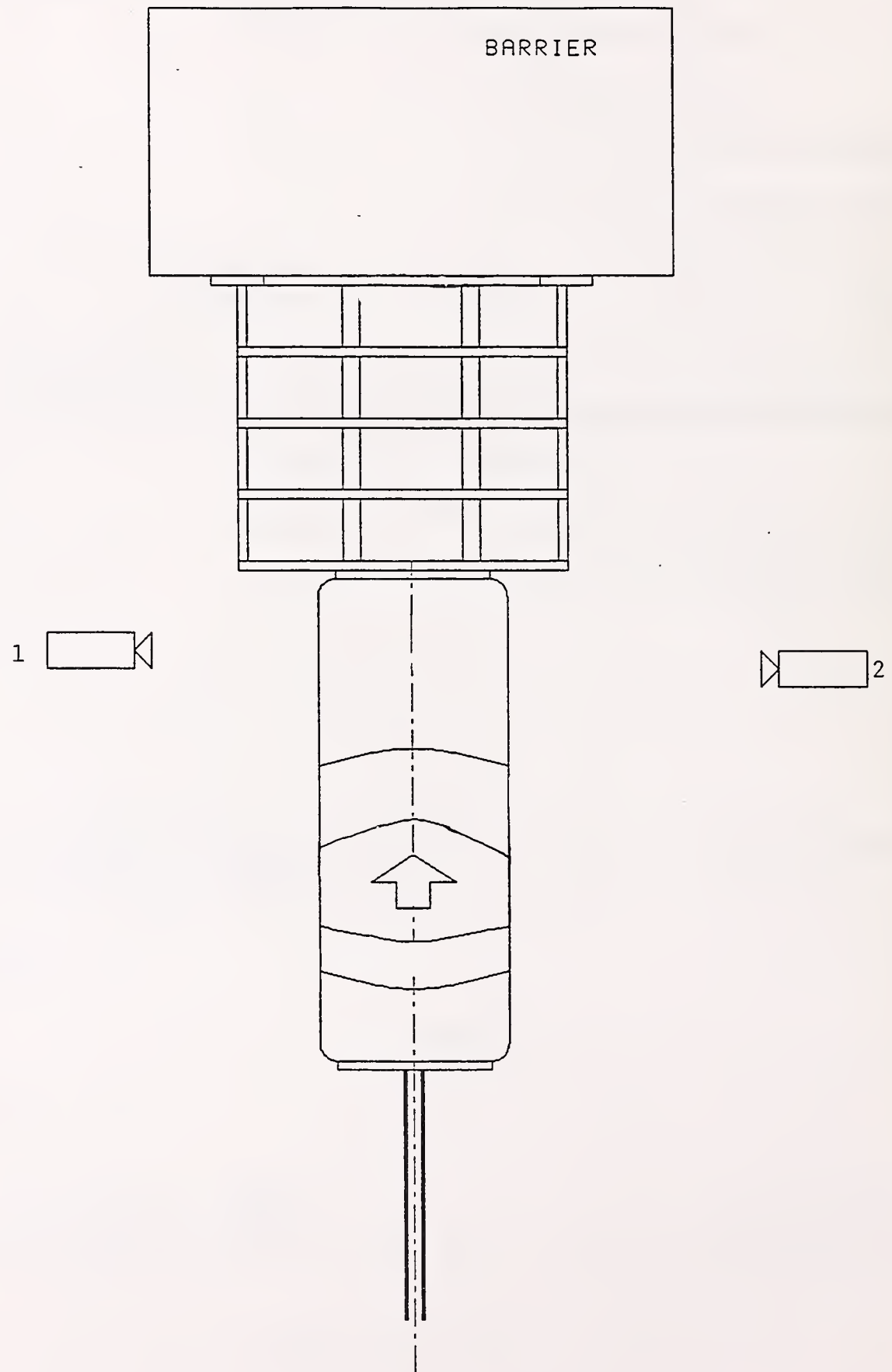


TABLE 2 PROFILE MEASUREMENTS AT VEHICLE BUMPER HEIGHT (24.7 IN)

LOCATION	0	1	2	3	4	5	6	7	8
	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	118.8	26.2	115.8	26.1	112.8	26.0	109.8	26.1	106.9
POST-TEST 1	118.8	26.2	115.8	26.1	112.8	26.0	109.8	26.1	106.9
POST-TEST 2	118.8	26.2	115.8	26.1	112.8	26.0	109.8	26.1	106.9
POST-TEST 3	117.8	27.2	115.0	27.2	112.0	27.1	109.0	27.1	105.9
POST-TEST 4	118.1	26.8	115.4	26.7	112.5	26.6	109.5	26.6	106.4
POST-TEST 5	118.4	26.8	115.7	26.5	112.8	26.3	109.8	26.1	107.2
LOCATION	9	10	11	12	13	14	15	16	17
	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	91.8	26.0	88.8	25.9	85.8	26.0	82.7	26.0	79.8
POST-TEST 1	91.8	26.0	88.8	25.9	85.8	26.0	82.7	26.0	79.8
POST-TEST 2	91.8	26.0	88.6	24.2	85.6	24.4	82.5	24.2	79.6
POST-TEST 3	91.0	27.0	88.0	27.1	84.9	27.1	82.0	27.1	78.9
POST-TEST 4	91.4	26.4	88.4	26.4	85.4	26.4	82.3	26.4	79.4
POST-TEST 5	91.9	25.1	88.9	25.0	86.1	24.9	83.1	24.8	79.9

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 2 PROFILE MEASUREMENTS AT VEHICLE BUMPER HEIGHT (24.7 IN)

LOCATION	18	19	20	21	22	23	24	25	26
	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	64.8	25.8	61.8	25.5	58.8	25.5	52.8	25.4	49.8
POST-TEST 1	64.8	25.8	61.8	25.5	58.8	25.5	52.8	25.4	49.8
POST-TEST 2	64.4	24.1	61.3	24.0	58.5	23.8	52.6	23.6	49.7
POST-TEST 3	63.6	28.1	60.6	28.4	57.8	28.4	52.0	28.4	49.1
POST-TEST 4	63.6	27.2	60.8	27.5	58.2	27.9	53.1	27.3	50.6
POST-TEST 5	65.6	28.0	62.9	28.4	61.0	29.4	59.8	28.9	57.2
LOCATION	27	28	29	30	31	32	33	34	35
	X	Y	X	Y	X	Y	X	Y	X
PRE-TEST	37.7	25.4	35.1	25.9	32.1	26.9	29.1	27.6	26.6
POST-TEST 1	37.4	26.6	34.6	26.6	31.6	27.6	28.8	28.3	26.9
POST-TEST 2	34.4	22.8	29.4	23.9	26.6	24.0	26.6	24.8	23.6
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 5	NA	NA	NA	NA	NA	NA	NA	NA	NA

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 2 PROFILE MEASUREMENTS AT VEHICLE BUMPER HEIGHT (24.7 IN)

LOCATION	36		37		38		39		40		41		42		43		44	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	18.1	40.6	17.1	43.5	16.4	46.4	16.1	49.4	16.0	52.1	15.9	55.0	15.7	58.1	15.5	61.2	15.6	64.2
POST-TEST 1	17.9	41.5	17.1	44.2	16.6	46.8	16.2	50.0	16.1	53.0	16.0	56.0	16.0	59.0	16.0	62.8	16.1	65.8
POST-TEST 2	15.2	37.8	14.4	40.6	13.8	43.6	13.4	46.0	13.1	49.6	12.9	52.4	12.8	55.5	12.8	58.8	12.8	61.8
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 5	NA	NA	26.3	39.2	25.6	42.6	25.2	45.3	24.3	48.3	23.6	51.3	24.3	54.5	22.4	57.6	22.2	60.5
LOCATION	45		46		47		48		49		50		51		52		53	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	16.0	67.6	16.3	70.1	16.8	73.1	18.0	75.9	19.0	78.7	20.2	81.2	21.4	83.8	23.2	86.1	25.8	87.9
POST-TEST 1	16.3	68.8	16.6	71.8	17.1	74.8	17.8	77.8	18.8	80.5	19.9	83.3	21.2	86.0	23.2	88.1	25.6	89.6
POST-TEST 2	12.9	64.8	13.1	67.7	13.8	70.6	14.4	73.5	15.2	76.4	16.2	79.2	17.6	81.9	19.5	84.1	22.0	85.5
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
POST-TEST 5	22.2	63.4	22.2	66.4	22.6	69.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 2 PROFILE MEASUREMENTS AT VEHICLE BUMPER HEIGHT (24.7 IN)

LOCATION	54	55	56	57	58	59	60	61	62									
	X	Y	Y	X	Y	X	Y	X	Y									
PRE-TEST	28.8	88.9	31.6	90.1	34.4	91.0	37.2	91.4	40.2	91.2	43.2	91.6	46.2	92.0	49.2	92.1	52.2	91.9
POST-TEST 1	28.5	90.6	31.3	91.4	34.1	92.4	36.1	92.7	40.2	93.0	43.1	93.1	46.1	93.1	49.2	92.1	52.2	91.9
POST-TEST 2	24.9	86.9	27.6	88.0	30.2	88.0	32.6	89.3	38.4	89.6	41.5	89.8	44.4	89.9	47.5	90.0	50.5	90.0
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	40.0	93.6	43.2	93.6	46.2	93.4	49.1	93.2	51.9	93.1
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	42.3	92.6	44.6	94.4	47.2	93.5	49.8	92.8	52.4	92.1
POST-TEST 5	NA	NA	NA	NA	NA	NA	NA	NA	52.5	91.4	53.4	93.6	56.2	93.8	58.6	92.8	59.5	91.4
LOCATION	63	64	65	66	67	68	69	70	71									
	X	Y	Y	X	Y	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	55.2	92.1	58.1	92.1	61.0	92.0	64.0	92.0	67.0	92.0	70.0	92.0	73.0	91.9	76.1	92.1	79.1	92.1
POST-TEST 1	55.2	92.1	58.1	92.1	61.0	92.0	64.0	92.0	67.0	92.0	70.0	92.0	73.0	91.9	76.1	92.1	79.1	92.1
POST-TEST 2	53.5	90.0	56.3	90.3	59.3	90.2	62.3	90.4	65.6	90.5	68.6	90.8	71.5	91.9	74.6	90.9	77.5	91.0
POST-TEST 3	55.0	93.1	57.9	93.2	60.9	93.4	63.9	93.8	67.3	93.8	70.2	93.9	73.2	93.7	76.2	93.5	79.2	93.4
POST-TEST 4	55.1	92.0	57.7	92.1	60.6	92.8	63.5	93.0	67.2	94.0	70.2	94.0	73.2	94.0	76.2	93.9	79.3	93.9
POST-TEST 5	59.6	90.2	61.2	90.3	63.1	90.9	65.3	92.9	67.8	94.8	70.8	94.3	73.8	94.5	76.8	95.4	79.8	95.2

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 2 PROFILE MEASUREMENTS AT VEHICLE BUMPER HEIGHT (24.7 IN)

LOCATION	72	73	74	75	76	77	78	79	80									
	X	Y	X	Y	X	Y	X	Y	X									
PRE-TEST	82.1	92.1	85.1	92.1	88.1	92.1	91.1	92.4	94.2	91.4	97.2	92.5	100.2	92.6	103.2	92.6	106.3	92.7
POST-TEST 1	82.1	92.1	85.1	92.1	88.1	92.1	91.1	92.4	94.2	91.4	97.2	92.5	100.2	92.6	103.2	92.6	106.3	92.7
POST-TEST 2	80.6	91.1	83.6	91.2	88.1	92.1	91.1	92.4	94.2	91.4	97.2	92.5	100.2	92.6	103.2	92.6	106.3	92.7
POST-TEST 3	82.2	93.6	85.2	93.6	88.2	93.6	91.2	93.6	94.2	93.5	97.2	93.6	100.2	93.6	103.2	93.5	106.3	93.3
POST-TEST 4	82.2	93.9	85.2	93.9	88.2	93.9	91.2	93.9	94.2	93.8	97.2	93.8	100.2	93.8	103.2	93.8	106.2	93.7
POST-TEST 5	82.9	95.1	86.0	95.0	88.8	94.9	91.8	94.8	94.9	94.8	97.9	94.6	101.0	94.4	103.8	94.2	106.8	94.1
LOCATION	81	82	83	84														
	X	Y	X	Y	X	Y	X	Y										
PRE-TEST	109.2	92.5	112.3	92.6	115.4	92.6	118.4	92.9										
POST-TEST 1	109.2	92.5	112.3	92.6	115.4	92.6	118.4	92.9										
POST-TEST 2	109.2	92.5	112.3	92.6	115.4	92.6	118.4	92.9										
POST-TEST 3	109.3	93.3	112.2	93.3	115.3	93.1	118.2	93.1										
POST-TEST 4	109.2	93.7	112.1	93.6	115.1	93.1	118.0	93.6										
POST-TEST 5	109.8	94.0	112.8	93.7	115.8	93.5	118.7	93.4										

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 3 PROFILE MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT (28.2 IN)

LOCATION	0		1		2		3		4		5		6		7		8	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	118.8	26.2	115.8	26.1	112.8	26.0	109.8	26.1	106.9	26.1	103.8	26.1	100.8	26.0	97.8	25.9	94.8	25.9
POST-TEST 1	118.8	26.2	115.8	26.1	112.8	26.0	109.8	26.1	106.9	26.1	103.8	26.1	100.8	26.0	97.8	25.9	94.8	25.9
POST-TEST 2	118.8	26.2	115.8	26.1	112.8	26.0	109.8	26.1	106.9	26.1	103.8	26.1	100.8	26.0	97.8	25.9	94.8	25.9
POST-TEST 3	117.8	27.2	115.0	27.2	112.0	27.1	109.0	27.1	105.9	27.1	103.0	27.0	99.9	27.0	97.0	27.0	94.0	27.1
POST-TEST 4	118.1	26.8	115.4	26.7	112.5	26.6	109.5	26.6	106.4	26.4	103.4	26.4	100.4	26.4	97.4	26.4	94.4	26.4
POST-TEST 5	118.4	26.8	115.7	26.5	112.8	26.3	109.8	26.1	107.2	25.9	103.8	25.8	100.7	25.6	97.8	25.4	94.9	25.2
LOCATION	9		10		11		12		13		14		15		16		17	
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	91.8	26.0	88.8	25.9	85.8	26.0	82.7	26.0	79.8	26.0	76.8	26.0	73.8	25.9	70.8	25.8	67.8	25.8
POST-TEST 1	91.8	26.0	88.8	25.9	85.8	26.0	82.7	26.0	79.8	26.0	76.8	26.0	73.8	25.9	70.8	25.8	67.8	25.8
POST-TEST 2	91.8	26.0	88.6	24.2	85.6	24.4	82.5	24.2	79.6	24.2	76.5	24.2	73.5	24.2	70.6	24.0	67.5	24.0
POST-TEST 3	91.0	27.0	88.0	27.1	84.9	27.1	82.0	27.1	78.9	27.2	75.8	27.2	72.9	27.3	69.9	27.4	67.0	27.6
POST-TEST 4	91.4	26.4	88.4	26.4	85.4	26.4	82.3	26.4	79.4	26.4	76.3	26.4	73.3	26.2	70.3	26.1	67.3	26.0
POST-TEST 5	91.9	25.1	88.9	25.0	86.1	24.9	83.1	24.8	79.9	24.6	76.9	24.5	73.8	24.8	70.7	24.5	67.7	24.0

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 3 PROFILE MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT (28.2 IN)

LOCATION	18	19	20	21	22	23	24	25	26									
	X	Y	X	Y	X	Y	X	Y	X									
PRE-TEST	64.8	25.8	61.8	25.5	58.8	25.5	52.8	25.4	49.8	25.4	46.7	25.2	43.8	25.6	40.8	25.2		
POST-TEST 1	64.8	25.8	61.8	25.5	58.8	25.5	52.8	25.4	49.8	25.4	46.5	26.0	43.5	26.2	40.5	26.4		
POST-TEST 2	64.4	24.1	61.3	24.0	58.5	23.8	52.6	23.6	49.7	23.4	47.6	22.8	43.6	22.8	36.5	22.5		
POST-TEST 3	63.6	28.1	60.6	28.4	57.8	28.4	52.0	28.4	49.1	28.0	46.1	27.6	43.2	27.6	40.1	27.0		
POST-TEST 4	63.6	27.2	60.8	27.5	58.2	27.9	53.1	27.3	50.6	26.8	47.9	26.1	45.2	25.3	42.5	25.8		
POST-TEST 5	65.6	28.0	62.9	28.4	61.0	29.4	58.8	28.9	57.2	28.0	55.2	27.4	52.2	27.2	49.8	28.2		
LOCATION	27	28	29	30	31	32	33	34	35									
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y		
PRE-TEST	37.7	25.4	35.1	25.9	32.1	26.9	29.1	27.6	26.6	28.8	24.0	30.0	27.4	32.4	25.8	34.9	24.3	36.8
POST-TEST 1	37.4	26.6	34.6	26.6	31.6	27.6	28.8	28.3	26.9	29.8	23.4	31.0	27.2	33.6	25.5	36.6	24.1	39.9
POST-TEST 2	34.4	22.8	29.4	23.9	26.6	24.0	26.6	24.8	23.6	26.0	21.1	27.4	27.6	28.8	32.4	33.1	32.9	36.2
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	27.6	31.1	34.1	33.1	34.5	37.6
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35.7	37.0	39.5	36.2	39.8	39.3
POST-TEST 5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	44.5	40.6	51.2	36.6	52.1	39.8

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 3 PROFILE MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT (28.2 IN)

LOCATION	36	37	38	39	40	41	42	43	44									
	X	Y	X	Y	X	Y	X	Y	X									
PRE-TEST	23.4	40.6	21.4	43.5	19.8	46.4	19.6	49.4	19.4	52.1	19.3	55.0	19.1	58.1	18.9	61.2	19.0	64.2
POST-TEST 1	23.1	42.9	21.6	44.0	20.3	48.0	20.1	50.6	20.1	53.6	20.0	56.8	20.0	59.6	19.9	62.5	20.0	65.6
POST-TEST 2	32.8	38.9	32.2	41.3	30.7	44.8	30.4	47.4	30.1	50.4	29.9	53.6	29.8	56.4	29.8	60.6	29.8	62.2
POST-TEST 3	35.2	40.9	35.2	43.8	34.5	45.9	34.4	49.5	34.2	52.4	34.4	55.0	34.4	58.1	34.5	61.0	34.6	63.6
POST-TEST 4	40.2	42.2	40.4	44.5	39.9	47.9	39.6	50.5	39.3	53.5	39.3	56.6	39.1	59.2	39.2	62.9	39.1	65.7
POST-TEST 5	52.6	42.7	53.8	45.0	54.8	48.3	54.8	50.9	54.9	53.9	55.1	57.1	53.4	60.0	55.6	63.6	55.5	66.4
LOCATION	45	46	47	48	49	50	51	52	53									
	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	19.4	67.6	19.7	70.1	20.5	73.1	23.4	75.9	24.6	78.7	25.8	81.2	26.9	83.8	23.2	86.1	25.8	87.9
POST-TEST 1	20.2	68.6	20.2	71.7	21.1	74.3	23.1	77.6	24.2	80.2	25.1	82.8	26.5	85.9	23.2	88.1	25.6	89.6
POST-TEST 2	29.8	65.4	29.9	68.5	30.6	71.4	31.5	74.2	31.1	76.8	30.6	79.1	26.2	82.1	19.5	84.1	22.0	85.5
POST-TEST 3	34.6	66.7	34.6	69.7	34.9	72.8	35.5	75.4	34.6	78.9	34.2	81.4	34.4	84.0	NA	NA	NA	NA
POST-TEST 4	39.1	68.9	39.1	71.9	39.4	74.7	39.4	77.7	38.8	80.3	38.3	83.0	36.6	84.8	NA	NA	NA	NA
POST-TEST 5	55.6	69.5	55.9	72.5	56.1	75.5	55.6	78.2	55.4	81.0	55.1	83.8	50.0	82.1	NA	NA	NA	NA

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 3 PROFILE MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT (28.2 IN)

LOCATION	54	55	56	57	58	59	60	61	62
	X	Y	X	Y	X	Y	X	Y	X
	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	28.8	88.9	31.6	90.1	34.4	91.0	37.2	91.4	40.2
POST-TEST 1	28.5	90.6	31.3	91.4	34.1	92.4	36.1	92.7	40.2
POST-TEST 2	24.9	86.9	27.6	88.0	30.2	88.0	32.6	89.3	38.4
POST-TEST 3	NA	NA	NA	NA	NA	NA	NA	NA	40.0
POST-TEST 4	NA	NA	NA	NA	NA	NA	NA	NA	42.3
POST-TEST 5	NA	NA	NA	NA	NA	NA	NA	NA	52.5
LOCATION	63	64	65	66	67	68	69	70	71
	X	Y	X	Y	X	Y	X	Y	X
	Y	X	Y	X	Y	X	Y	X	Y
PRE-TEST	55.2	92.1	58.1	92.1	61.0	92.0	64.0	92.0	67.0
POST-TEST 1	55.2	92.1	58.1	92.1	61.0	92.0	64.0	92.0	67.0
POST-TEST 2	53.5	90.0	56.3	90.3	59.3	90.2	62.3	90.4	65.6
POST-TEST 3	55.0	93.1	57.9	93.2	60.9	93.4	63.9	93.8	67.3
POST-TEST 4	55.1	92.0	57.7	92.1	60.6	92.8	63.5	93.0	67.2
POST-TEST 5	59.6	90.2	61.2	90.3	63.1	90.9	65.3	92.9	67.8

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

TABLE 3 PROFILE MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT (28.2 IN)

LOCATION	72	73	74	75	76	77	78	79	80									
	X	Y	X	Y	X	Y	X	Y	X									
PRE-TEST	82.1	92.1	85.1	92.1	88.1	92.1	91.1	92.4	94.2	91.4	97.2	92.5	100.2	92.6	103.2	92.6	106.3	92.7
POST-TEST 1	82.1	92.1	85.1	92.1	88.1	92.1	91.1	92.4	94.2	91.4	97.2	92.5	100.2	92.6	103.2	92.6	106.3	92.7
POST-TEST 2	80.6	91.1	83.6	91.2	88.1	92.1	91.1	92.4	94.2	91.4	97.2	92.5	100.2	92.6	103.2	92.6	106.3	92.7
POST-TEST 3	82.2	93.6	85.2	93.6	88.2	93.6	91.2	93.6	94.2	93.6	97.2	93.6	100.2	93.6	103.2	93.5	106.3	93.3
POST-TEST 4	82.2	93.9	85.2	93.9	88.2	93.9	91.2	93.9	94.2	93.8	97.2	93.8	100.2	93.8	103.2	93.8	106.2	93.7
POST-TEST 5	82.9	95.1	86.0	95.0	88.8	94.9	91.8	94.8	94.9	94.8	97.9	94.6	101.0	94.4	103.8	94.2	106.8	94.1
LOCATION	81	82	83	84														
	X	Y	X	Y	X	Y	X	Y										
PRE-TEST	109.2	92.5	112.3	92.6	115.4	92.6	118.4	92.9										
POST-TEST 1	109.2	92.5	112.3	92.6	115.4	92.6	118.4	92.9										
POST-TEST 2	109.2	92.5	112.3	92.6	115.4	92.6	118.4	92.9										
POST-TEST 3	109.3	93.3	112.2	93.3	115.3	93.1	118.2	93.1										
POST-TEST 4	109.2	93.7	112.1	93.6	115.1	93.1	118.0	93.6										
POST-TEST 5	109.8	94.0	112.8	93.7	115.8	93.5	118.7	93.4										

All measurements are in inches. Column readings are three inches apart from front to rear on vehicle.

All X-axis measurements taken from a reference plane 175.9 inches from and parallel to the rear bumper.

All Y-axis measurements taken from a reference plane 60 inches from and parallel to the vehicle longitudinal centerline.

SECTION 3.0

TEST 930512-1 SUMMARY

TABLE 4
TEST NO. 930512-1 TEST CONDITIONS

DATE OF TEST: 05/12/93

TIME OF TEST: 1002

AMBIENT TEMPERATURE AT IMPACT AREA: 70° F

INTENDED IMPACT VELOCITY: 5.0 MPH

ACTUAL IMPACT VELOCITY: PRIMARY = 4.7 MPH
SECONDARY = 4.7 MPH

SUBJECT VEHICLE DATA

LENGTH OF DIRECT CONTACT DAMAGE: 26.5 IN.

MAXIMUM CUMULATIVE CRUSH
AT VEHICLE BUMPER HEIGHT: 0.5 IN.

MAXIMUM CUMULATIVE CRUSH AT
UNDERRIDE GUARD BUMPER HEIGHT: 1.0 IN.

VEHICLE ATTITUDES:

POST-TEST: LF: 29.5; RF: 29.5; LR: 25.5; RR: 26.1

All distance measurements are in inches.

TABLE 5
TEST NO. 930512-1 VEHICLE CRUSH MEASUREMENTS

VEHICLE BUMPER HEIGHT MEASUREMENTS

FL	<u>59.6</u>
C1	<u>-0.6</u>
C2	<u>0.0</u>
C3	<u>0.1</u>
C4	<u>0.5</u>
C5	<u>-0.2</u>
C6	<u>-0.3</u>

UNDERRIDE GUARD BUMPER HEIGHT MEASUREMENTS

FL	<u>50.0</u>
C1	<u>-0.3</u>
C2	<u>0.2</u>
C3	<u>0.7</u>
C4	<u>1.0</u>
C5	<u>0.6</u>
C6	<u>-0.7</u>

NOTE: FL is post-test length of damage surface.

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

All measurements are in inches.

FIGURE 3
TEST 1 - VEHICLE CRUSH PROFILE AT VEHICLE BUMPER HEIGHT

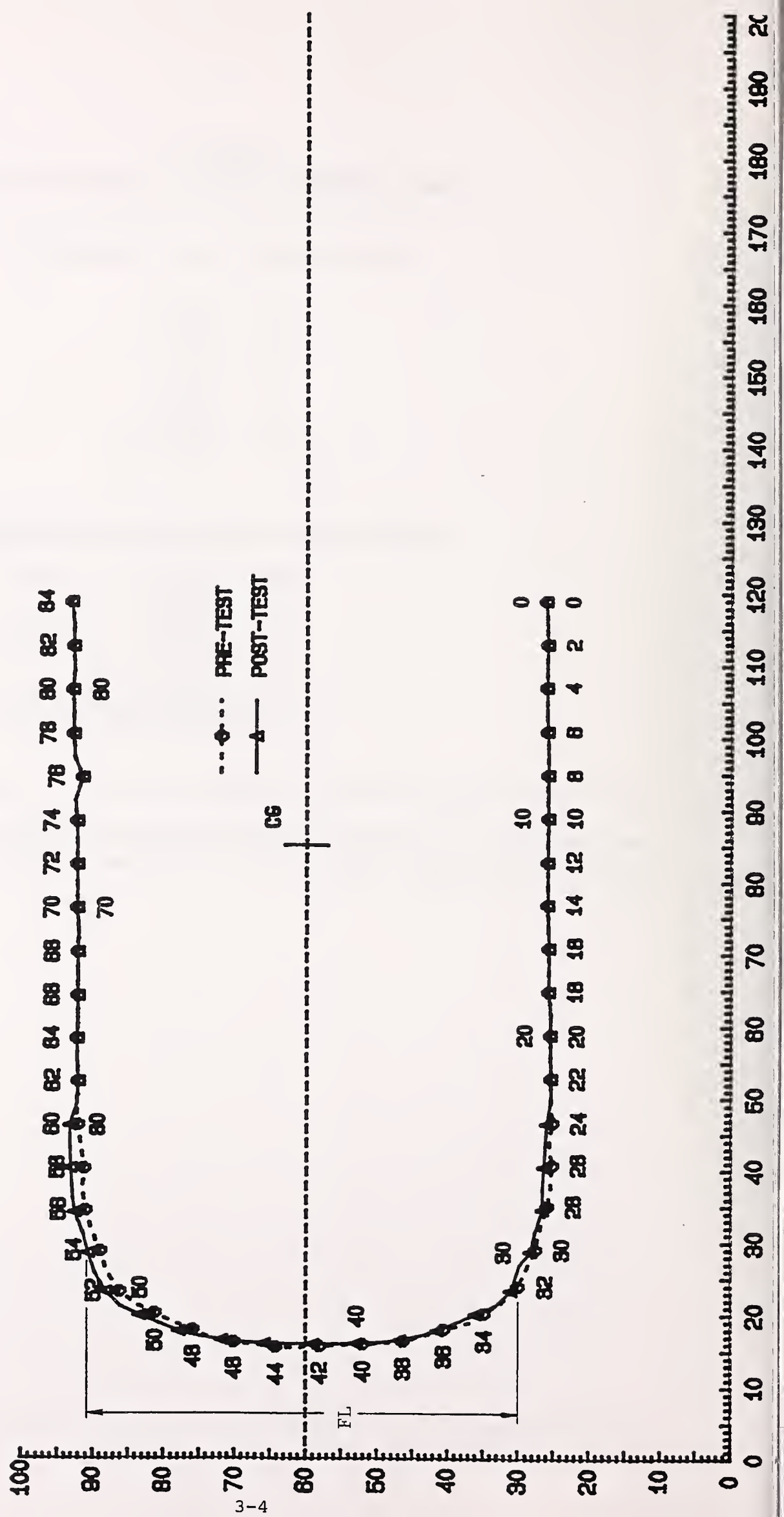


FIGURE 4
TEST 1 - VEHICLE CRUSH PROFILE AT UNDERRIDE GUARD BUMPER HEIGHT

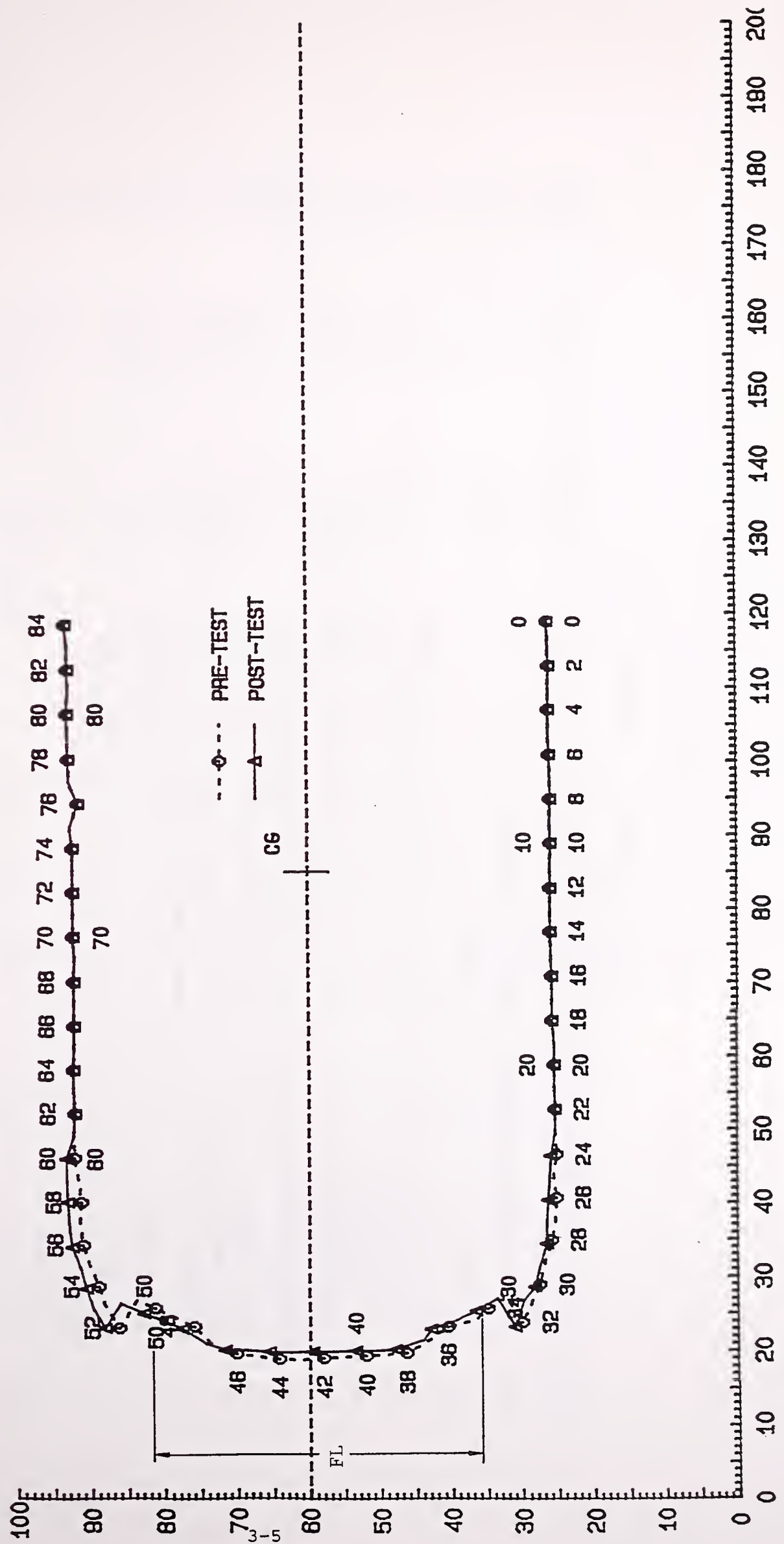


TABLE 6

TEST NO. 930512-1 VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Honda/Civic DX

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	160.2	159.9	0.3
X2	REAR SURFACE OF VEHICLE TO FRONT OF ENGINE BLOCK	140.1	NA	NA
X3	REAR SURFACE OF VEHICLE TO FIREWALL	118.7	NA	NA
X4	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF RIGHT DOOR	107.5	107.5	0.0
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	107.6	107.6	0.0
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	108.2	108.2	0.0
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	108.1	108.1	0.0
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	57.2	57.2	0.0
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	57.2	57.2	0.0
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	60.5	60.5	0.0
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	60.5	60.5	0.0
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	107.4	107.4	0.0
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	107.5	107.5	0.0
X14	REAR SURFACE OF VEHICLE TO FIREWALL - RIGHT SIDE	114.5	NA	NA
X15	REAR SURFACE OF VEHICLE TO FIREWALL - LEFT SIDE	116.3	NA	NA
X16	REAR SURFACE OF VEHICLE TO STEERING WHEEL CENTER	88.2	88.2	0.0
X17	CENTER OF STEERING COLUMN TO "A" POST	12.0	12.0	0.0
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.0	17.0	0.0
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	152.7	152.7	0.0
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	151.9	152.5	-0.6
X21	LENGTH OF ENGINE BLOCK	16.0	16.0	0.0

All distance measurements are in inches.

TABLE 7

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930512-1

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION MAX G MSEC	NEGATIVE DIRECTION MAX G MSEC
1 LEFT REAR SILL	52.4	22.9	16.9		
LONGITUDINAL				0.2 261.9	3.1 69.0
LATERAL				0.4 131.6	0.3 222.5
2 RIGHT REAR SILL	52.2	-23.0	17.0		
LONGITUDINAL				0.4 265.9	2.9 71.4
LATERAL				0.3 152.0	0.4 65.0
3 VEHICLE CENTER OF GRAVITY	81.5	0.0	17.0		
LONGITUDINAL				0.5 196.4	3.0 63.8
LATERAL				0.4 162.4	0.4 67.3
RESULTANT				3.0 63.9	

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

TABLE 8
TEST NO. 930512-1 CAMERA INFORMATION

CAMERA NUMBER	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Left tight	Photosonic	25	1000	Impact overall
2	Right wide	Photosonic	13	1000	Impact overall

SECTION 4.0

TEST 930512-2 SUMMARY

TABLE 9

TEST NO. 930512-2 TEST CONDITIONS

DATE OF TEST: 05/12/93

TIME OF TEST: 1127

AMBIENT TEMPERATURE AT IMPACT AREA: 70° F

INTENDED IMPACT VELOCITY: 15.0 MPH

ACTUAL IMPACT VELOCITY: PRIMARY = 14.9 MPH
SECONDARY = 15.0 MPH

SUBJECT VEHICLE DATA

LENGTH OF DIRECT CONTACT DAMAGE: 48.0 IN.

MAXIMUM CUMULATIVE CRUSH
AT VEHICLE BUMPER HEIGHT: -2.3 IN.

MAXIMUM CUMULATIVE CRUSH AT
UNDERRIDE GUARD BUMPER HEIGHT: 10.9 IN.

VEHICLE ATTITUDES:

POST-TEST: LF: 29.6; RF: 30.0; LR: 25.6; RR: 25.8

All distance measurements are in inches.

TABLE 10
TEST NO. 930512-2 VEHICLE CRUSH MEASUREMENTS

VEHICLE BUMPER HEIGHT MEASUREMENTS

FL	<u>59.3</u>
C1	<u>-2.5</u>
C2	<u>-2.9</u>
C3	<u>-2.9</u>
C4	<u>-2.8</u>
C5	<u>-3.6</u>
C6	<u>-3.7</u>

UNDERRIDE GUARD BUMPER HEIGHT MEASUREMENTS

FL	<u>56.7</u>
C1	<u>-2.9</u>
C2	<u>9.4</u>
C3	<u>10.7</u>
C4	<u>10.9</u>
C5	<u>10.1</u>
C6	<u>-3.7</u>

NOTE: FL is post-test length of damage surface.

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

All measurements are in inches.

FIGURE 5
TEST 2 - VEHICLE CRUSH PROFILE AT VEHICLE BUMPER HEIGHT

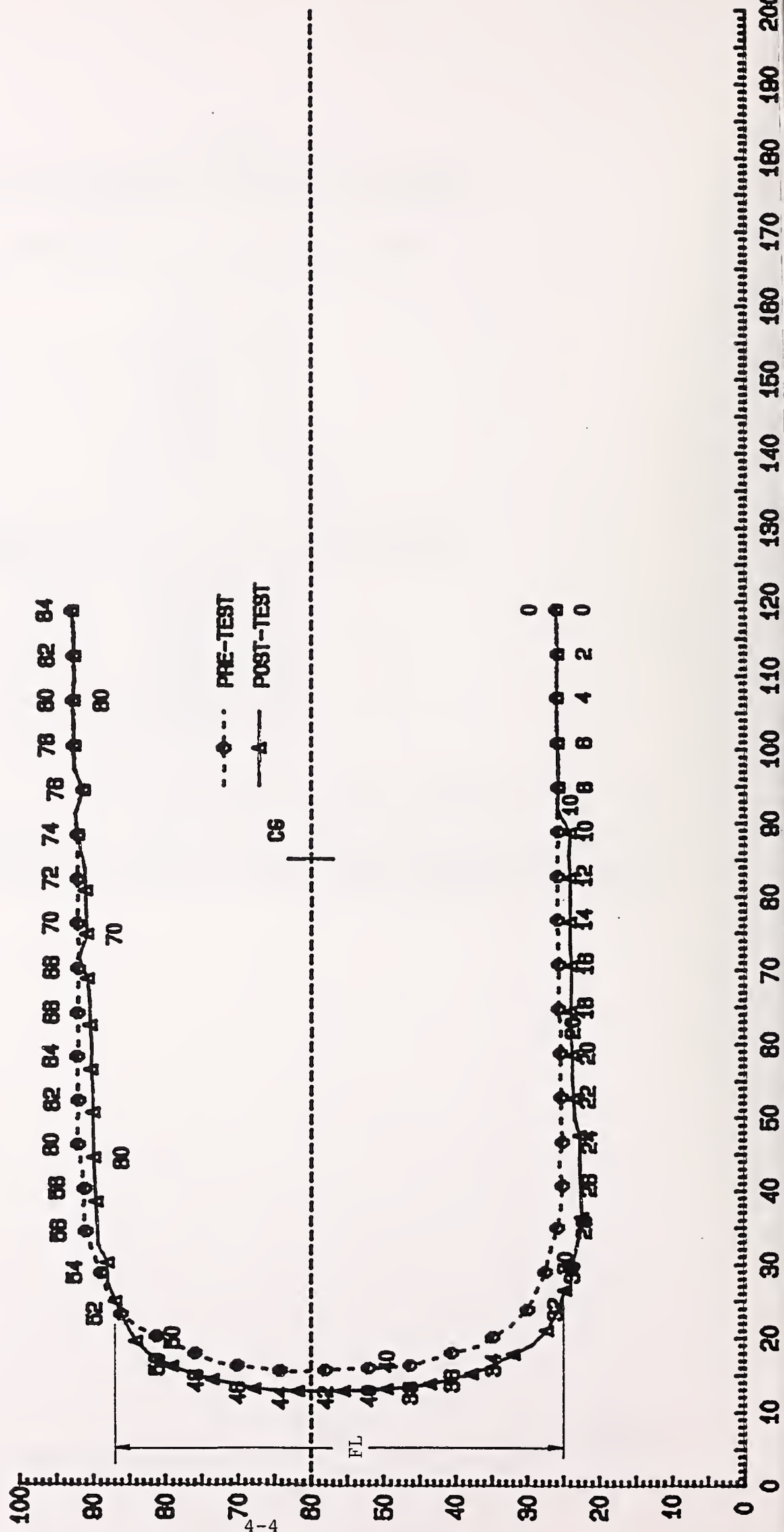


FIGURE 6
TEST 2 - VEHICLE CRUSH PROFILE AT UNDERRIDE GUARD BUMPER HEIGHT

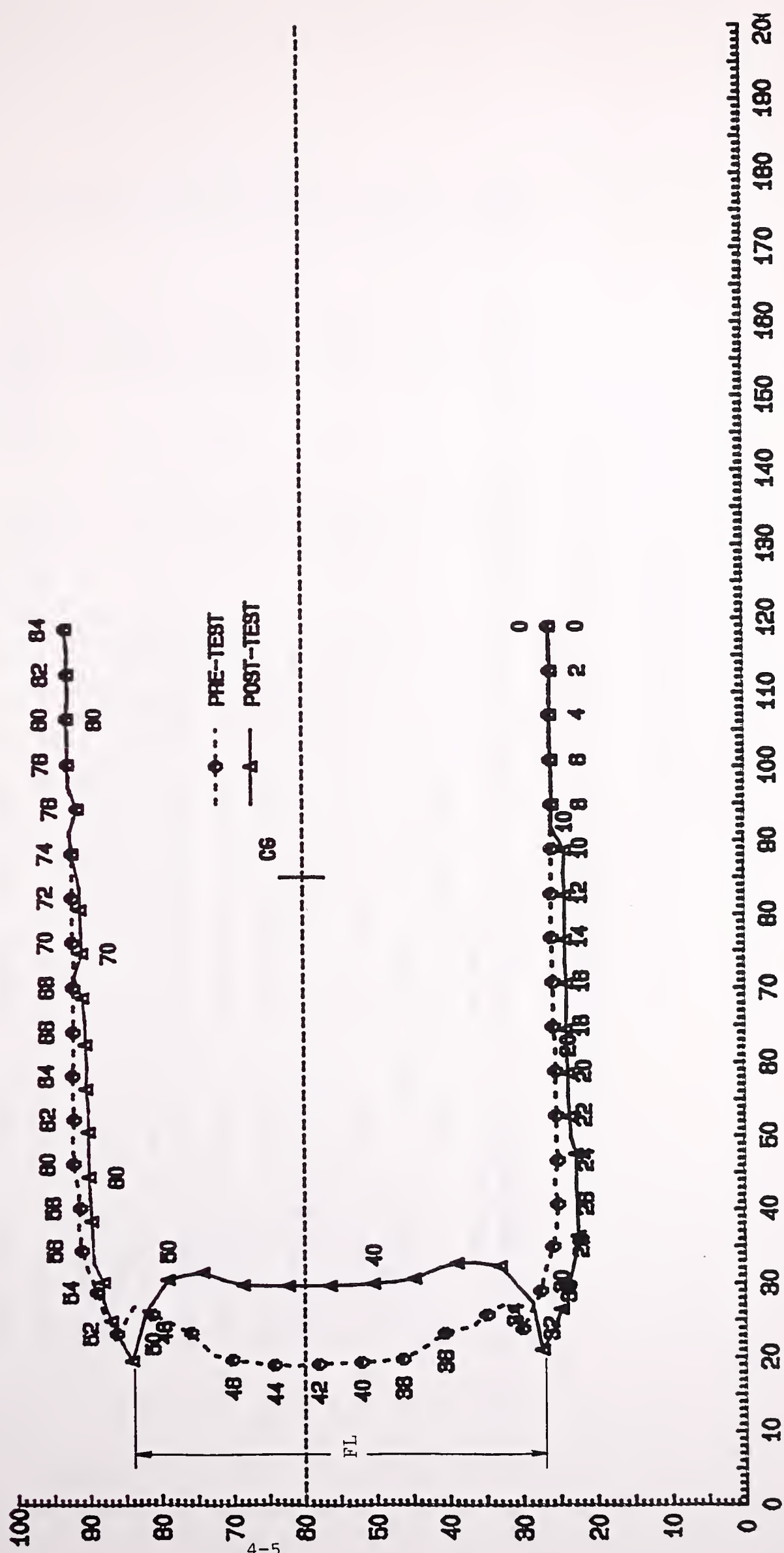


TABLE 11

TEST NO. 930512-2 VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Honda/Civic DX

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	159.9	163.1	-3.2
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	107.5	107.7	-0.2
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	107.6	108.6	-1.0
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	108.2	108.2	0.0
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	108.1	108.0	0.1
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	57.2	57.6	-0.4
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	57.2	57.8	-0.6
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	60.5	60.6	-0.1
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	60.5	61.0	-0.5
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	107.4	107.8	-0.4
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	107.5	107.9	-0.4
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	88.2	85.9	2.3
X17	CENTER OF STEERING COLUMN TO "A" POST	12.0	12.2	-0.2
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.0	17.5	-0.5
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	152.7	156.4	-3.7
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	152.5	154.8	-2.3
X21	LENGTH OF ENGINE BLOCK	16.0	16.0	0.0

All distance measurements are in inches.

TABLE 12

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930512-2

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
				MAX G	MSEC	MAX G	MSEC
1 LEFT REAR SILL	52.4	22.9	16.9				
LONGITUDINAL				2.6	35.8	16.2	89.3
LATERAL				2.2	37.5	1.3	33.5
2 RIGHT REAR SILL	52.2	-23.0	17.0				
LONGITUDINAL				2.3	35.3	17.2	89.6
LATERAL				1.0	31.3	2.8	84.9
3 VEHICLE CENTER OF GRAVITY	81.5	0.0	17.0				
LONGITUDINAL				2.6	35.0	17.8	87.0
LATERAL				1.0	287.8	1.9	96.0
RESULTANT				17.9	87.0		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

TABLE 13
TEST NO. 930512-2 CAMERA INFORMATION

CAMERA NUMBER	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Left tight	Photosonic	25	1000	Impact overall
2	Right wide	Photosonic	13	1000	Impact overall

SECTION 5.0

TEST 930512-3 SUMMARY

TABLE 14

TEST NO. 930512-3 TEST CONDITIONS

DATE OF TEST: 05/12/93

TIME OF TEST: 1326

AMBIENT TEMPERATURE AT IMPACT AREA: 70° F

INTENDED IMPACT VELOCITY: 15.0 MPH

ACTUAL IMPACT VELOCITY: PRIMARY = 14.8 MPH
SECONDARY = 14.8 MPH

SUBJECT VEHICLE DATA

LENGTH OF DIRECT CONTACT DAMAGE: 66.6 IN.

MAXIMUM CUMULATIVE CRUSH AT
UNDERRIDE GUARD BUMPER HEIGHT: 15.6 IN.

VEHICLE ATTITUDES:

POST-TEST: LF: 29.3; RF: 30.0; LR: 27.9; RR: 26.0

All distance measurements are in inches.

TABLE 15
TEST NO. 930512-3

VEHICLE CRUSH MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT

FL	<u>66.6</u>
C1	<u>-0.7</u>
C2	<u>11.8</u>
C3	<u>14.8</u>
C4	<u>15.2</u>
C5	<u>8.4</u>
C6	<u>-0.2</u>

NOTE: FL is post-test length of damage surface.

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

All measurements are in inches.

FIGURE 7
TEST 3 - VEHICLE CRUSH PROFILE AT UNDERRIDE GUARD BUMPER HEIGHT

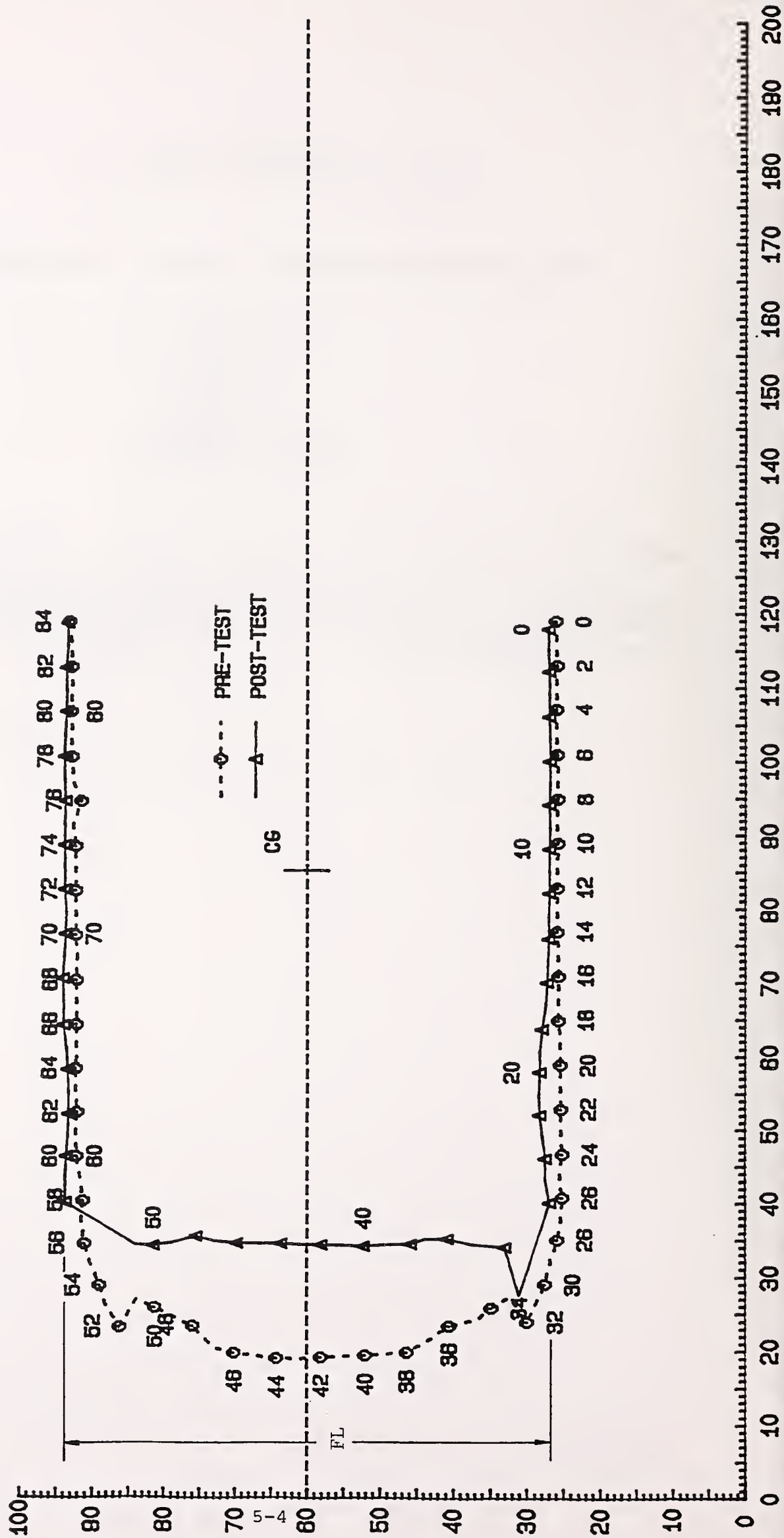


TABLE 16

TEST NO. 930512-3 VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Honda/Civic DX

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	163.1	163.3	-0.2
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	107.7	107.8	-0.1
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	108.6	108.1	0.5
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	108.2	108.4	-0.2
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	108.0	108.5	-0.5
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	57.6	57.8	-0.2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	57.8	57.9	-0.1
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	60.6	60.5	0.1
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	61.0	61.0	0.0
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	107.8	107.6	0.2
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	107.9	107.9	0.0
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	85.9	87.8	-1.9
X17	CENTER OF STEERING COLUMN TO "A" POST	12.2	11.1	1.1
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.5	18.2	-0.7
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	156.4	155.7	0.7
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	154.8	156.8	-2.0
X21	LENGTH OF ENGINE BLOCK	16.0	16.0	0.0

All distance measurements are in inches.

TABLE 17

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930512-3

No. LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE	
				DIRECTION	MAX G MSEC	DIRECTION	MAX G MSEC
1 LEFT REAR SILL LONGITUDINAL LATERAL	52.4	22.9	16.9	2.6	40.6	25.4	102.0
				6.3	82.9	3.1	88.1
2 RIGHT REAR SILL LONGITUDINAL LATERAL	52.2	-23.0	17.0	2.4	39.3	27.5	101.1
				1.9	102.5	5.3	84.3
3 VEHICLE CENTER OF GRAVITY LONGITUDINAL LATERAL RESULTANT	81.5	0.0	17.0				
				3.1	39.4	29.6	101.0
				1.7	116.9	4.0	98.5
				29.6	101.0		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

TABLE 18
TEST NO. 930512-3 CAMERA INFORMATION

CAMERA NUMBER	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Left tight	Photosonic	25	998	Impact overall
2	Right wide	Photosonic	13	1000	Impact overall



SECTION 6.0

TEST 930512-4 SUMMARY

TABLE 19
TEST NO. 930512-4 TEST CONDITIONS

DATE OF TEST: 05/12/93

TIME OF TEST: 1500

AMBIENT TEMPERATURE AT IMPACT AREA: 70° F

INTENDED IMPACT VELOCITY: 20.0 MPH

ACTUAL IMPACT VELOCITY: PRIMARY = 19.9 MPH
SECONDARY = 19.9 MPH

SUBJECT VEHICLE DATA

LENGTH OF DIRECT CONTACT DAMAGE: 67.7 IN.

MAXIMUM CUMULATIVE CRUSH AT
UNDERRIDE GUARD BUMPER HEIGHT: 16.0 IN.

VEHICLE ATTITUDES:

POST-TEST: LF: 29.2; RF: 29.5; LR: 27.2; RR: 28.0

All distance measurements are in inches.

TABLE 20
TEST NO. 930512-4

VEHICLE CRUSH MEASUREMENTS AT UNDERRIDE GUARD BUMPER HEIGHT

FL	<u>67.7</u>
C1	<u>1.7</u>
C2	<u>15.5</u>
C3	<u>19.9</u>
C4	<u>20.1</u>
C5	<u>14.2</u>
C6	<u>1.0</u>

NOTE: FL is post-test length of damage surface.

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

All measurements are in inches.

FIGURE 8
TEST 4 - VEHICLE CRUSH PROFILE AT UNDERRIDE GUARD BUMPER HEIGHT

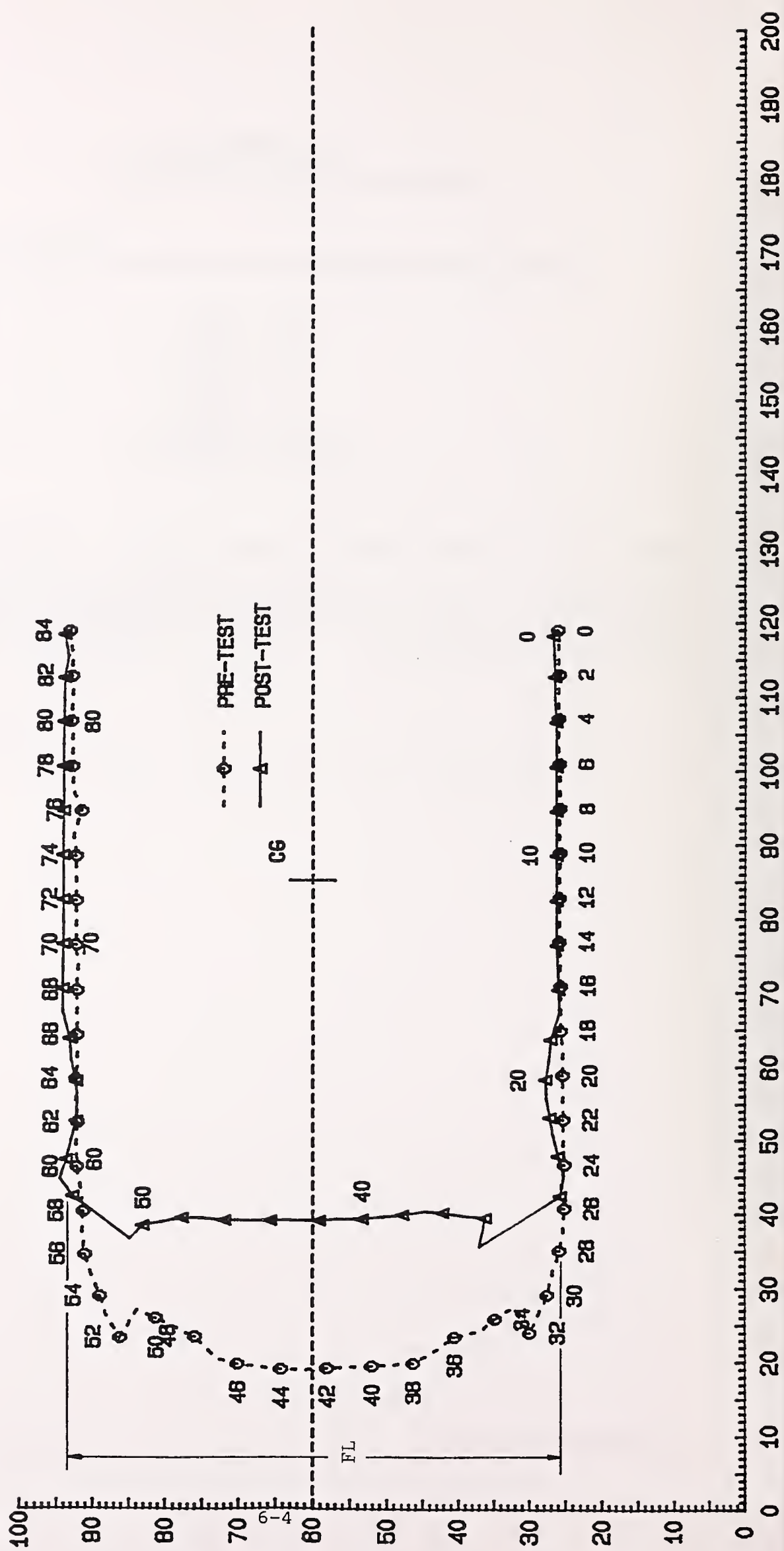


TABLE 21

TEST NO. 930512-4 VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Honda/Civic DX

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	163.3	159.8	3.5
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	107.8	108.0	-0.2
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	108.1	107.8	0.3
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	108.4	108.0	0.4
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	108.5	108.0	0.5
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	57.8	58.0	-0.2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	57.9	57.8	0.1
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	60.5	60.4	0.1
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	61.0	60.4	0.6
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	107.6	107.4	0.2
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	107.9	107.1	0.8
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	87.8	87.6	0.2
X17	CENTER OF STEERING COLUMN TO "A" POST	11.1	10.0	1.1
X18	CENTER OF STEERING COLUMN TO HEADLINER	18.2	17.4	0.8
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	155.7	NA	NA
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	156.8	NA	NA
X21	LENGTH OF ENGINE BLOCK	16.0	16.0	0.0

All distance measurements are in inches.

TABLE 22

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930512-4

No. LOCATION	X*	Y*	Z*	POSITIVE DIRECTION		NEGATIVE DIRECTION	
				MAX G	MSEC	MAX G	MSEC
1 LEFT REAR SILL	52.4	22.9	16.9				
LONGITUDINAL				2.0	144.4	29.7	70.0
LATERAL				6.5	68.0	8.2	73.3
2 RIGHT REAR SILL	52.2	-23.0	17.0				
LONGITUDINAL				2.5	146.1	31.5	85.0
LATERAL				2.0	110.5	8.5	87.1
3 VEHICLE CENTER OF GRAVITY	81.5	0.0	17.0				
LONGITUDINAL				2.1	32.5	32.6	71.0
LATERAL				3.8	101.8	5.2	83.4
RESULTANT				32.7	71.0		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

REFERENCE: X: + FORWARD FROM VEHICLE'S REAR BUMPER

Y: + LEFTWARD FROM VEHICLE'S LONGITUDINAL CENTERLINE

Z: + UPWARD FROM GROUND LEVEL

TABLE 23
TEST NO. 930512-4 CAMERA INFORMATION

CAMERA NUMBER	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Left tight	Photosonic	25	998	Impact overall
2	Right wide	Photosonic	13	1000	Impact overall

SECTION 7.0

TEST 930513-1 SUMMARY

TABLE 24

TEST NO. 930513-1 TEST CONDITIONS

DATE OF TEST: 05/13/93

TIME OF TEST: 0730

AMBIENT TEMPERATURE AT IMPACT AREA: 66° F

INTENDED IMPACT VELOCITY: 35.0 MPH

ACTUAL IMPACT VELOCITY: PRIMARY = 35.0 MPH
SECONDARY = 34.9 MPH

SUBJECT VEHICLE DATA

LENGTH OF DIRECT CONTACT DAMAGE: 64.0 IN.

MAXIMUM CUMULATIVE CRUSH
AT VEHICLE BUMPER HEIGHT: 9.2 IN.

MAXIMUM CUMULATIVE CRUSH AT
UNDERRIDE GUARD BUMPER HEIGHT: 36.7 IN.

VEHICLE ATTITUDES:

POST-TEST: LF: 32.4; RF: 32.6; LR: 25.2; RR: 26.1

All distance measurements are in inches.

TABLE 25
TEST NO. 930513-1 VEHICLE CRUSH MEASUREMENTS

VEHICLE BUMPER HEIGHT MEASUREMENTS

FL	<u>30.3</u>
C1	<u>9.2</u>
C2	<u>9.1</u>
C3	<u>7.7</u>
C4	<u>6.9</u>
C5	<u>6.2</u>
C6	<u>5.8</u>

UNDERRIDE GUARD BUMPER HEIGHT MEASUREMENTS

FL	<u>69.8</u>
C1	<u>-0.1</u>
C2	<u>17.1</u>
C3	<u>35.2</u>
C4	<u>36.5</u>
C5	<u>30.8</u>
C6	<u>10.0</u>

NOTE: FL is post-test length of damage surface.

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

All measurements are in inches.

FIGURE 9
TEST 5 - VEHICLE CRUSH PROFILE AT VEHICLE BUMPER HEIGHT

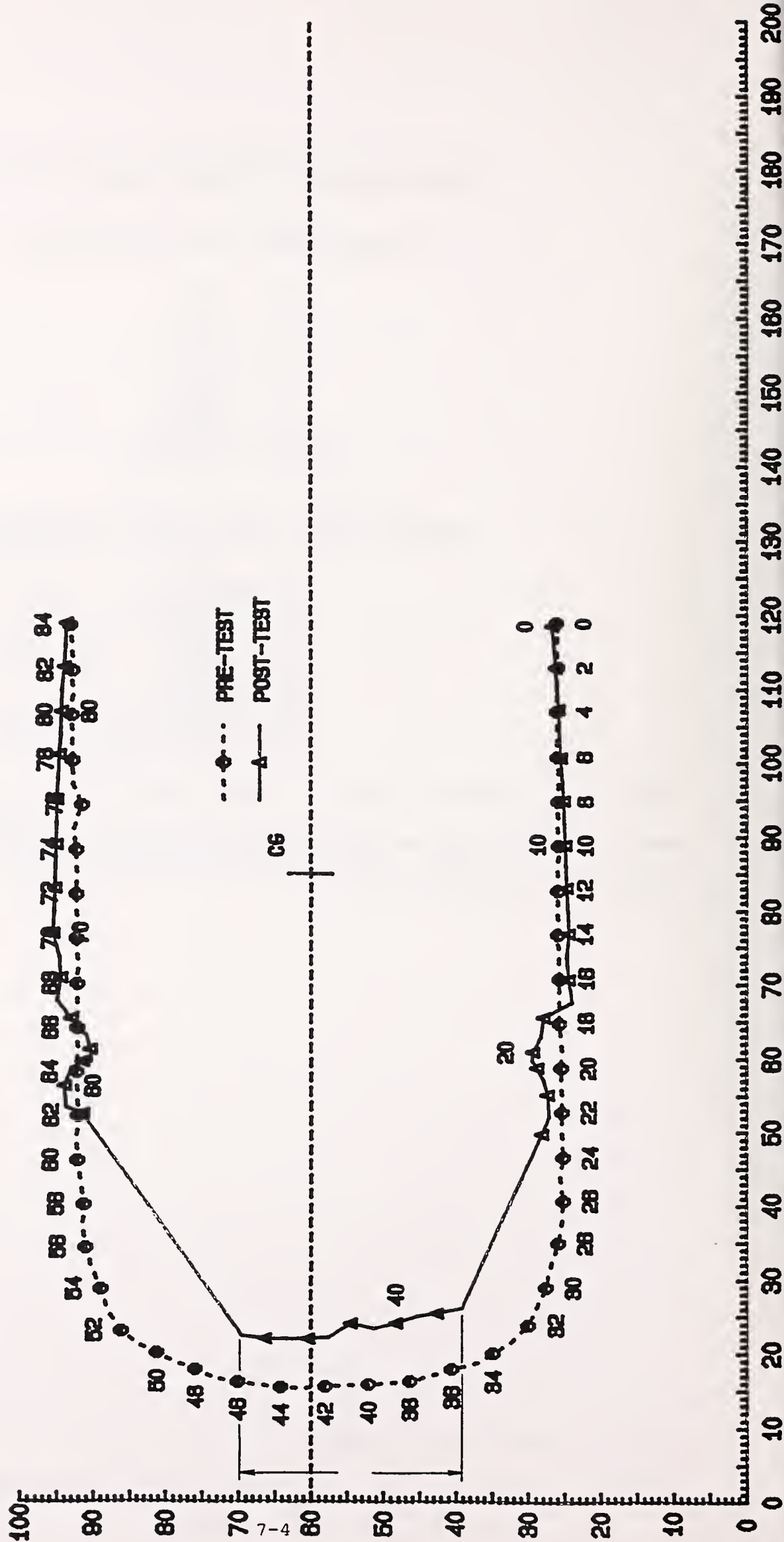


FIGURE 10
TEST 5 - VEHICLE CRUSH PROFILE AT UNDERRIDE GUARD BUMPER HEIGHT

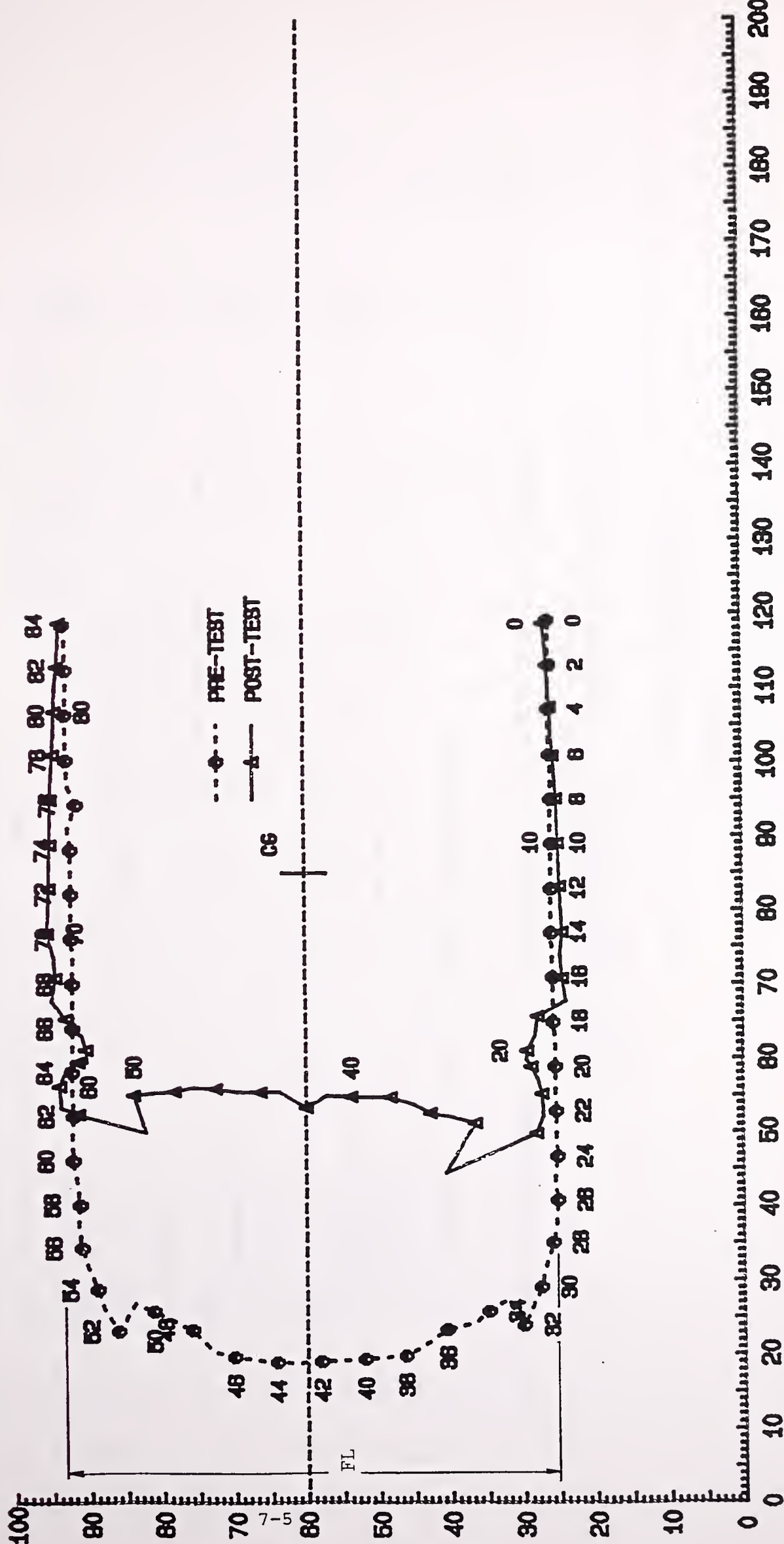


TABLE 26

TEST NO. 930513-1 VEHICLE MEASUREMENTS

VEHICLE MAKE/MODEL: Honda/Civic DX

NO.	TYPE OF MEASUREMENT	PRE-TEST	POST-TEST	DIFF.
X1	TOTAL LENGTH OF VEHICLE AT CENTERLINE	159.8	151.4	8.4
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	108.0	106.1	1.9
X5	REAR SURFACE OF VEHICLE TO UPPER LEADING EDGE OF LEFT DOOR	107.8	106.8	1.0
X6	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF RIGHT DOOR	108.0	107.5	0.5
X7	REAR SURFACE OF VEHICLE TO LOWER LEADING EDGE OF LEFT DOOR	108.0	107.1	0.9
X8	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF RIGHT DOOR	58.0	59.2	-1.2
X9	REAR SURFACE OF VEHICLE TO UPPER TRAILING EDGE OF LEFT DOOR	57.8	59.5	-1.7
X10	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF RIGHT DOOR	60.4	59.9	0.5
X11	REAR SURFACE OF VEHICLE TO LOWER TRAILING EDGE OF LEFT DOOR	60.4	59.9	0.5
X12	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON RIGHT SIDE	107.4	NA	NA
X13	REAR SURFACE OF VEHICLE TO BOTTOM OF "A" POST ON LEFT SIDE	107.1	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	87.6	83.4	4.2
X17	CENTER OF STEERING COLUMN TO "A" POST	10.0	8.8	1.2
X18	CENTER OF STEERING COLUMN TO HEADLINER	17.4	21.8	-4.4
X19	REAR SURFACE OF VEHICLE TO RIGHT SIDE OF FRONT BUMPER	NA	NA	NA
X20	REAR SURFACE OF VEHICLE TO LEFT SIDE OF FRONT BUMPER	NA	NA	NA
X21	LENGTH OF ENGINE BLOCK	16.0	16.0	0.0

All distance measurements are in inches.

TABLE 27

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

TEST NUMBER 930513-1

No.	LOCATION	X*	Y*	Z*	POSITIVE		NEGATIVE	
					DIRECTION	MAX G	DIRECTION	MAX G
1	LEFT REAR SILL	52.4	22.9	16.9				
	LONGITUDINAL				1.5	237.9	31.6	56.9
	LATERAL				10.9	51.0	9.2	45.6
2	RIGHT REAR SILL	52.2	-23.0	17.0				
	LONGITUDINAL				7.0	29.8	30.0	54.9
	LATERAL				4.0	63.3	8.8	54.1
3	VEHICLE CENTER	81.5	0.0	17.0				
	OF GRAVITY							
	LONGITUDINAL				3.7	28.1	39.8	60.8
	LATERAL				7.5	49.3	9.2	53.9
	RESULTANT				39.8	60.8		

* ALL MEASUREMENTS OF ACCELEROMETER LOCATIONS ARE IN INCHES.

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

TABLE 28
TEST NO. 930513-1 CAMERA INFORMATION

CAMERA NUMBER	LOCATION	TYPE	LENS (mm)	SPEED (fps)	PURPOSE OF CAMERA DATA
1	Left tight	Photosonic	25	1000	Impact overall
2	Right wide	Photosonic	13	1000	Impact overall

APPENDIX A

PHOTOGRAPHS

LIST OF PHOTOGRAPHS

TEST NO. 930512-1

- 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 1
- A-6. PRE-TEST FRONT - VIEW 2
- A-7. POST-TEST FRONT VIEW
- A-8. PRE-TEST LEFT FRONT THREE-QUARTER VIEW
- A-9. POST-TEST LEFT FRONT THREE-QUARTER VIEW
- A-10. PRE-TEST LEFT SIDE VIEW
- A-11. POST-TEST LEFT SIDE VIEW

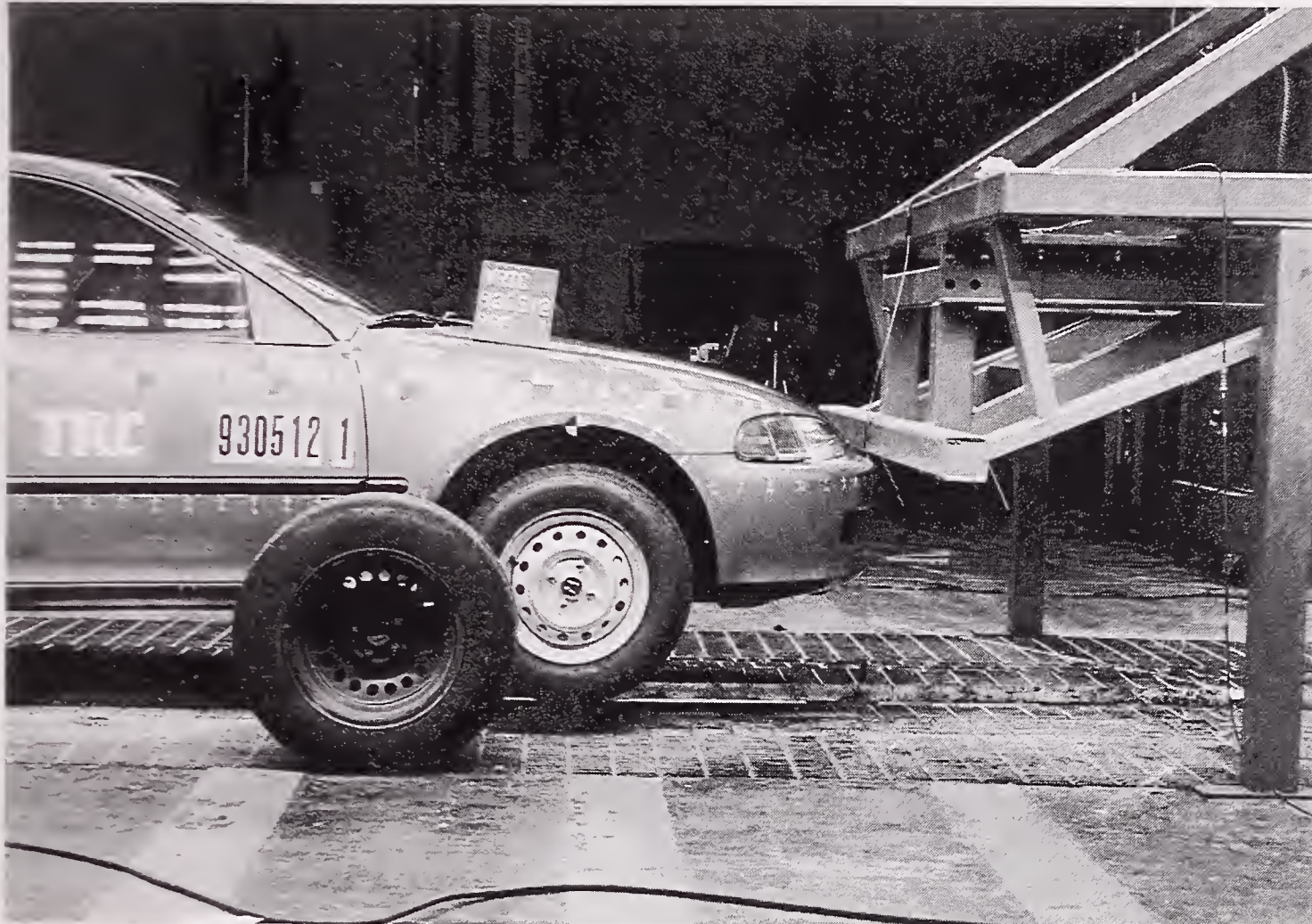


Figure A-1. PRE-TEST RIGHT SIDE VIEW



Figure A-2. POST-TEST RIGHT SIDE VIEW

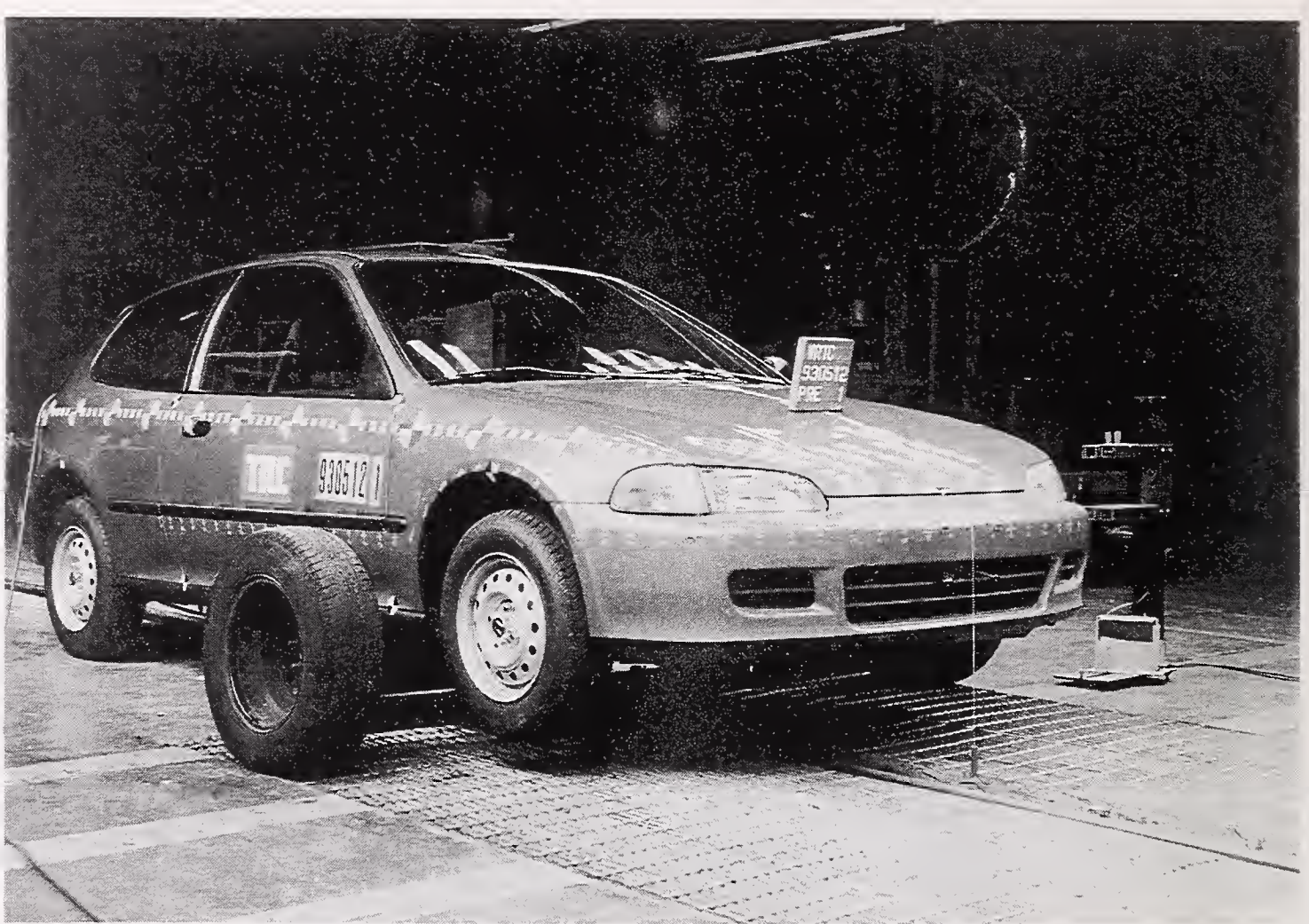


Figure A-3. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-4. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

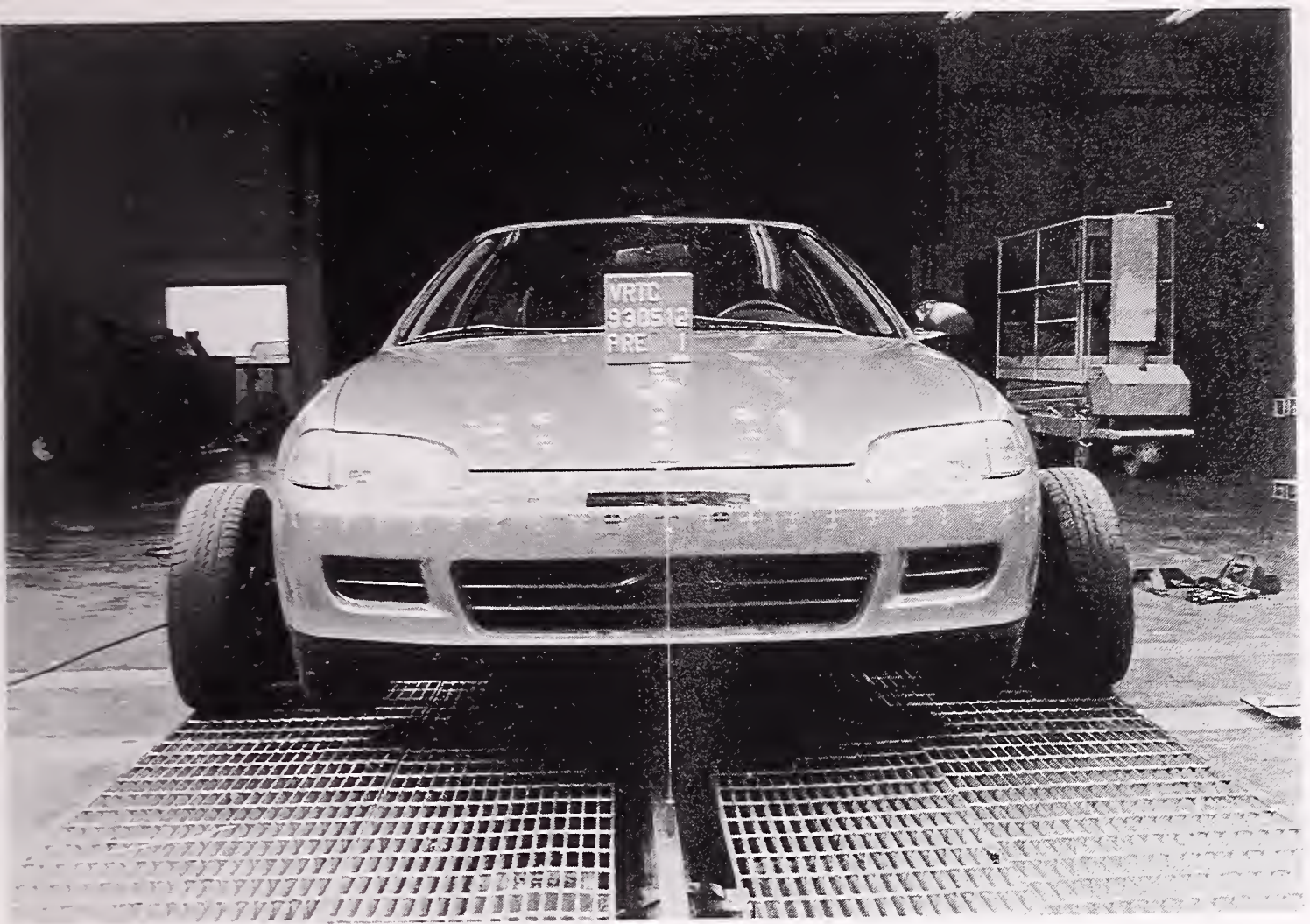


Figure A-5. PRE-TEST FRONT - VIEW 1



Figure A-6. PRE-TEST FRONT - VIEW 2

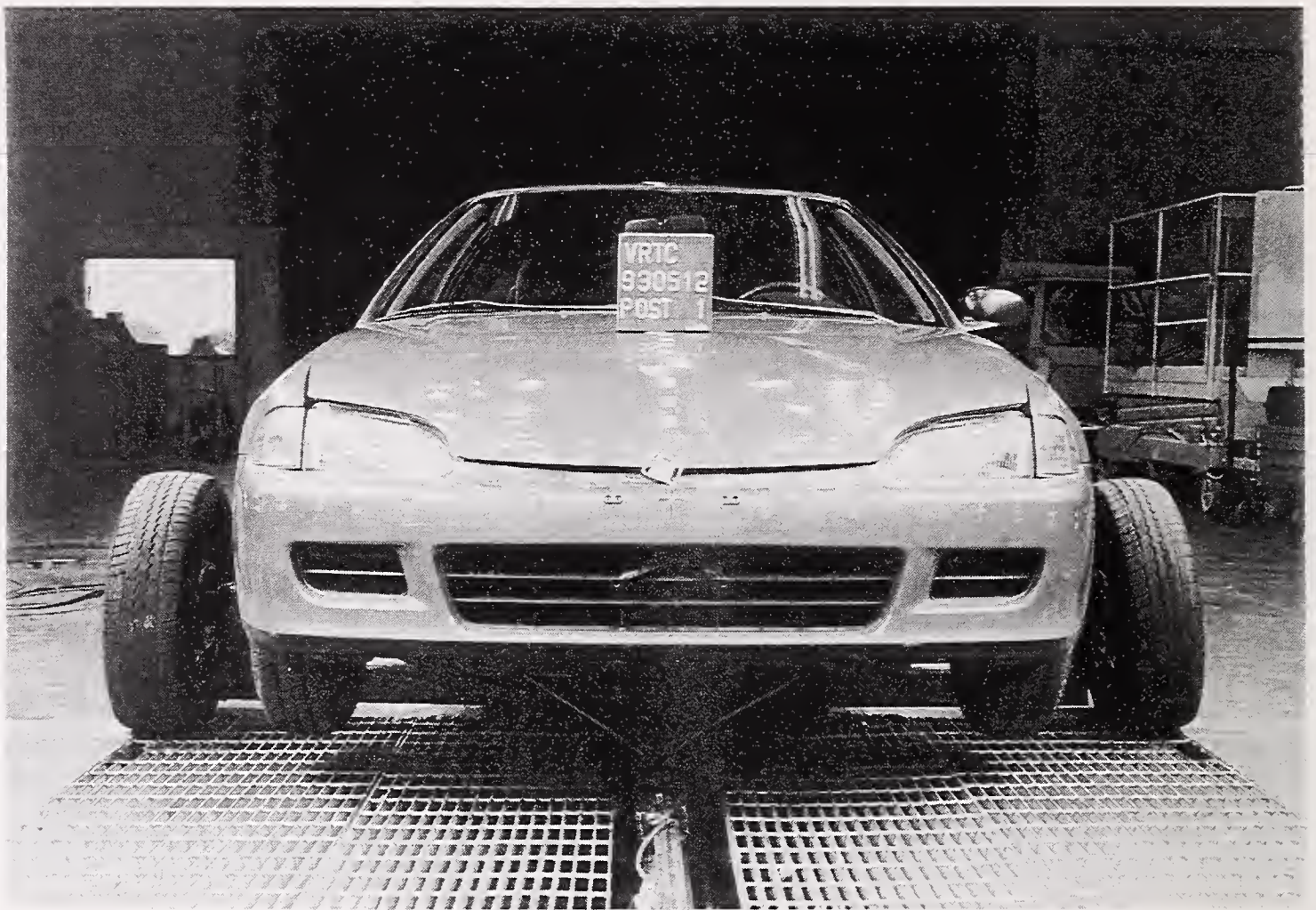


Figure A-7. POST-TEST FRONT VIEW

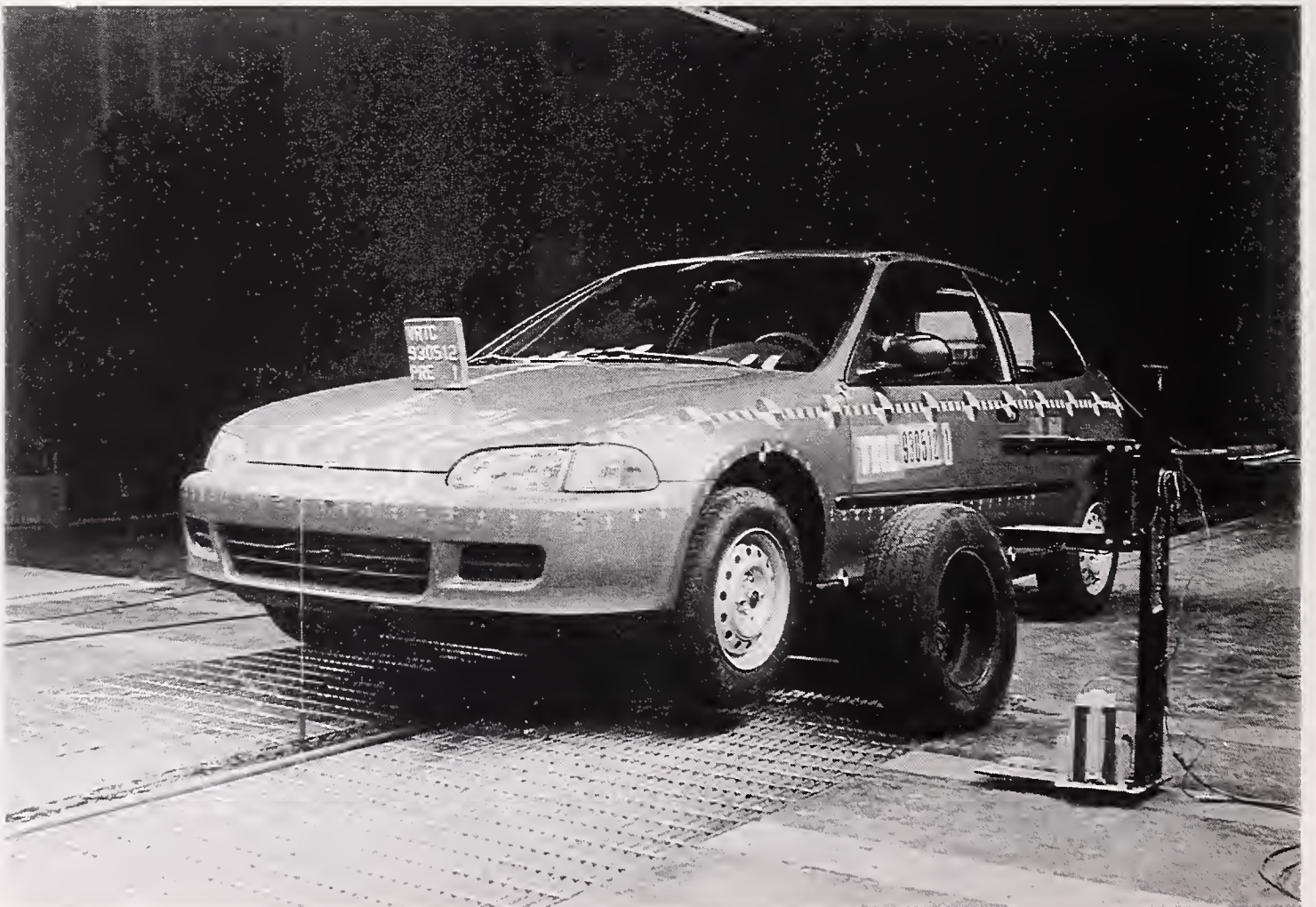


Figure A-8. PRE-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-9. POST-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-10. PRE-TEST LEFT SIDE VIEW



Figure A-11. POST-TEST LEFT SIDE VIEW

LIST OF PHOTOGRAPHS

TEST NO. 930512-2

- A-12. PRE-TEST RIGHT SIDE VIEW
- A-13. POST-TEST RIGHT SIDE VIEW
- A-14. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-15. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-16. PRE-TEST FRONT VIEW
- A-17. POST-TEST FRONT VIEW
- A-18. PRE-TEST LEFT FRONT THREE-QUARTER VIEW
- A-19. POST-TEST LEFT FRONT THREE-QUARTER VIEW
- A-20. PRE-TEST LEFT SIDE VIEW
- A-21. POST-TEST LEFT SIDE VIEW

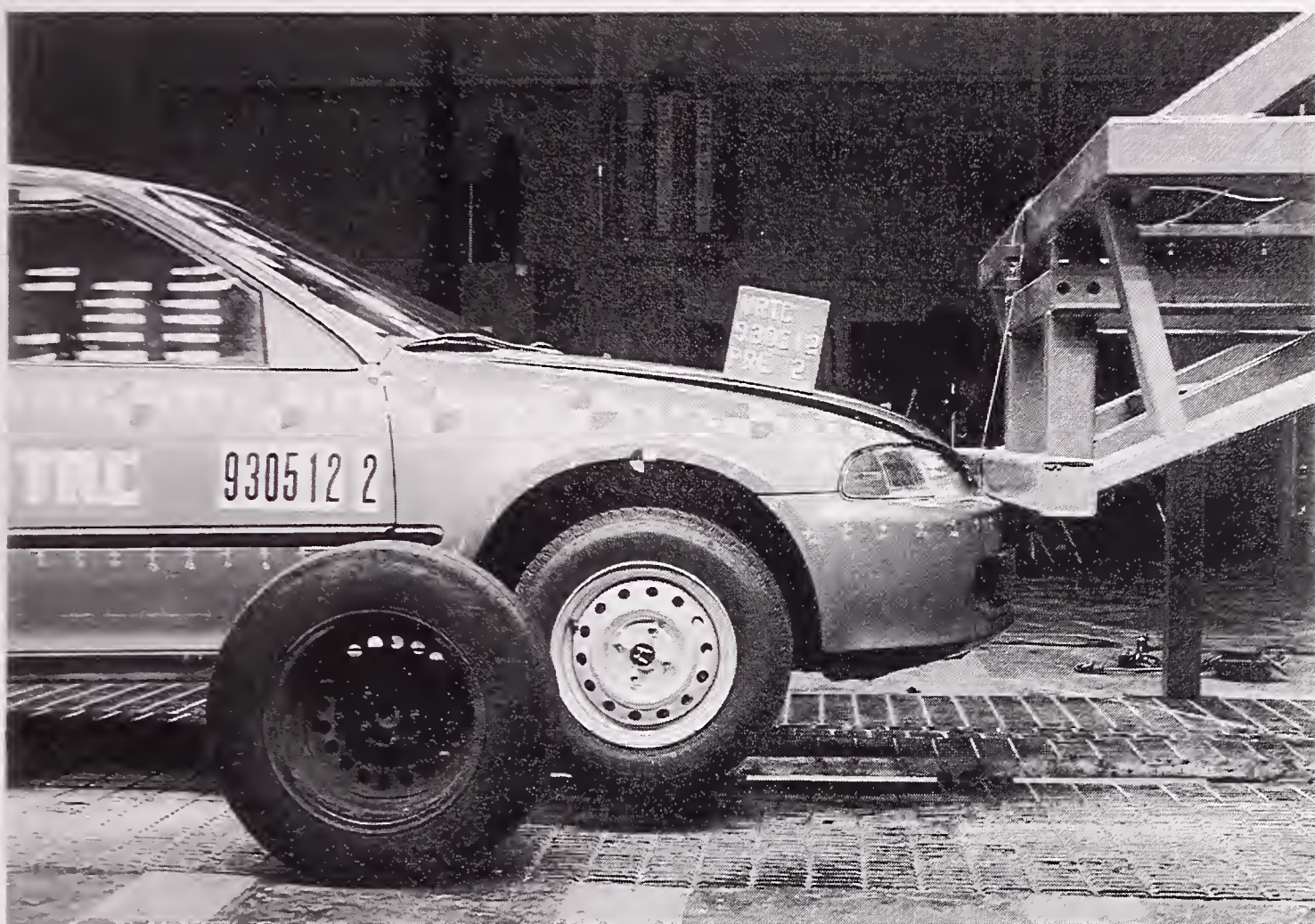


Figure A-12. PRE-TEST RIGHT SIDE VIEW

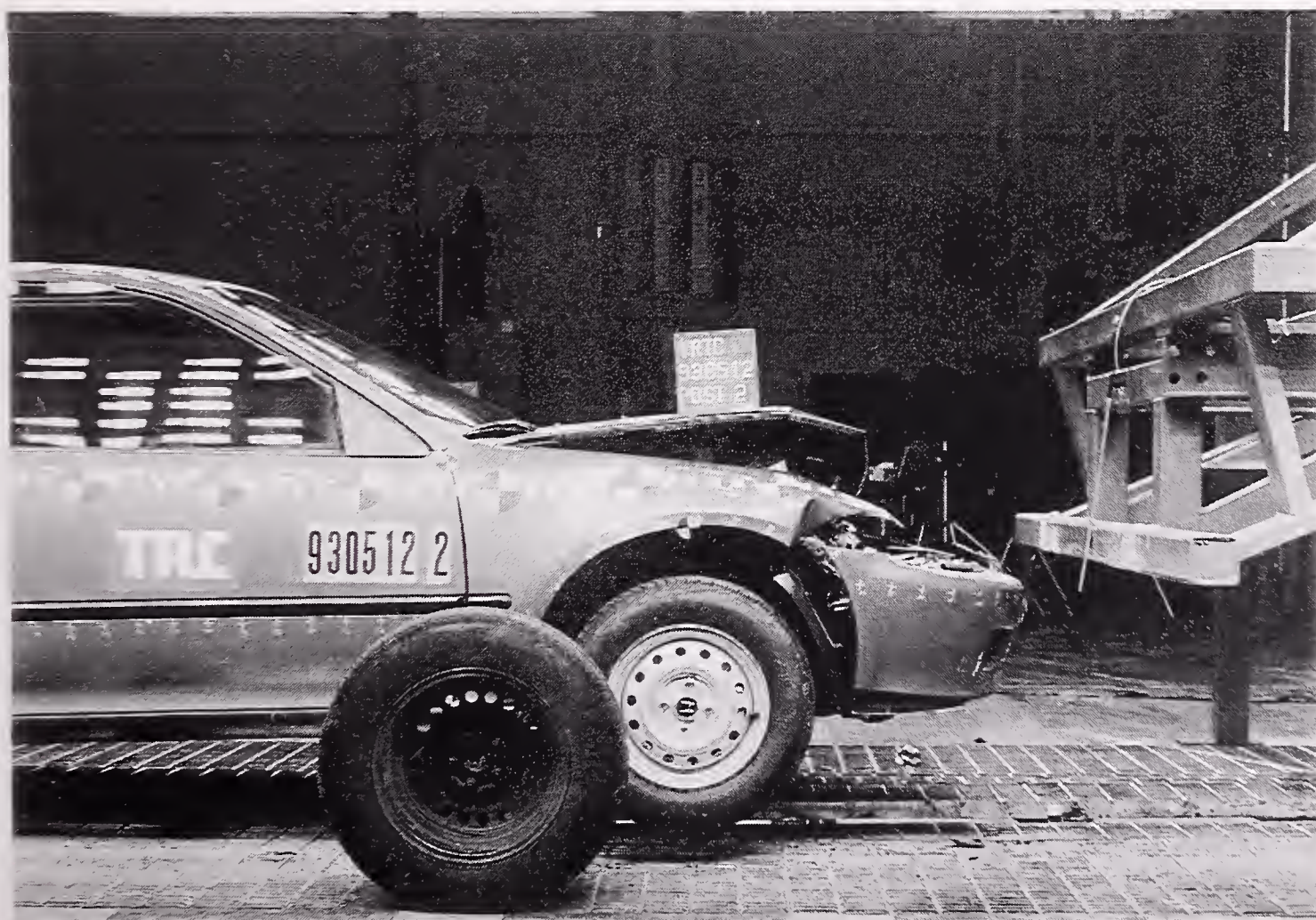


Figure A-13. POST-TEST RIGHT SIDE VIEW

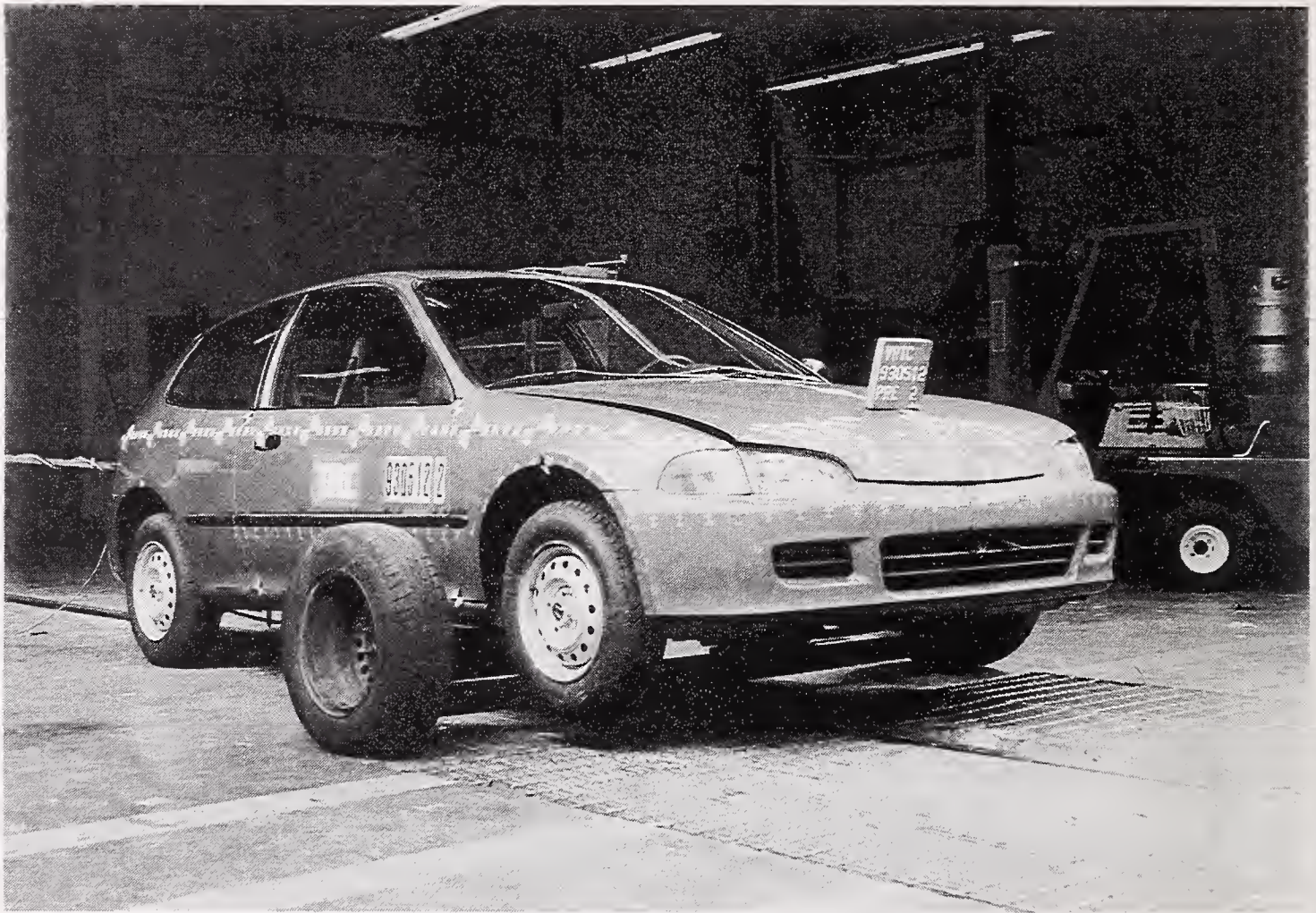


Figure A-14. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-15. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

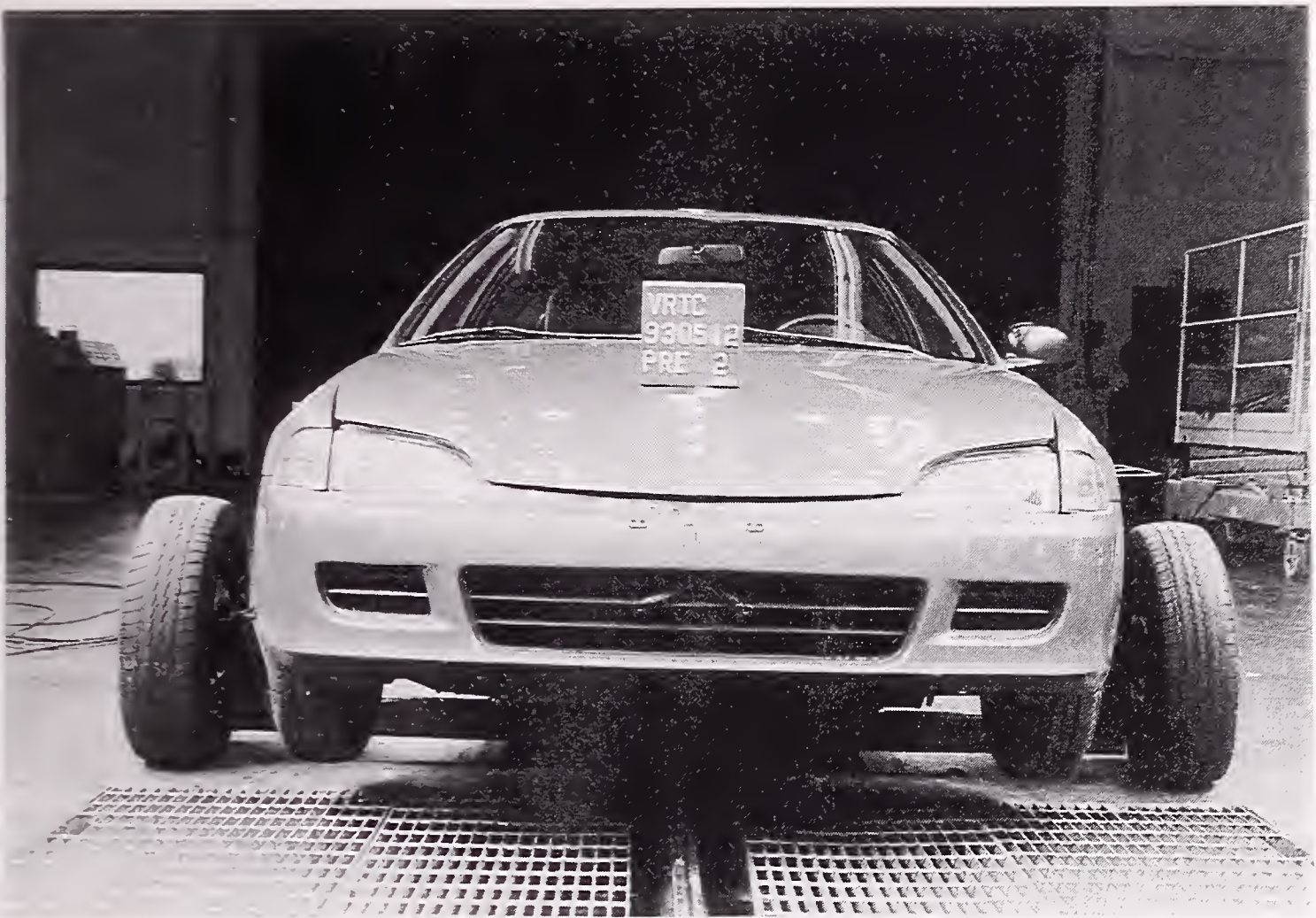


Figure A-16. PRE-TEST FRONT VIEW

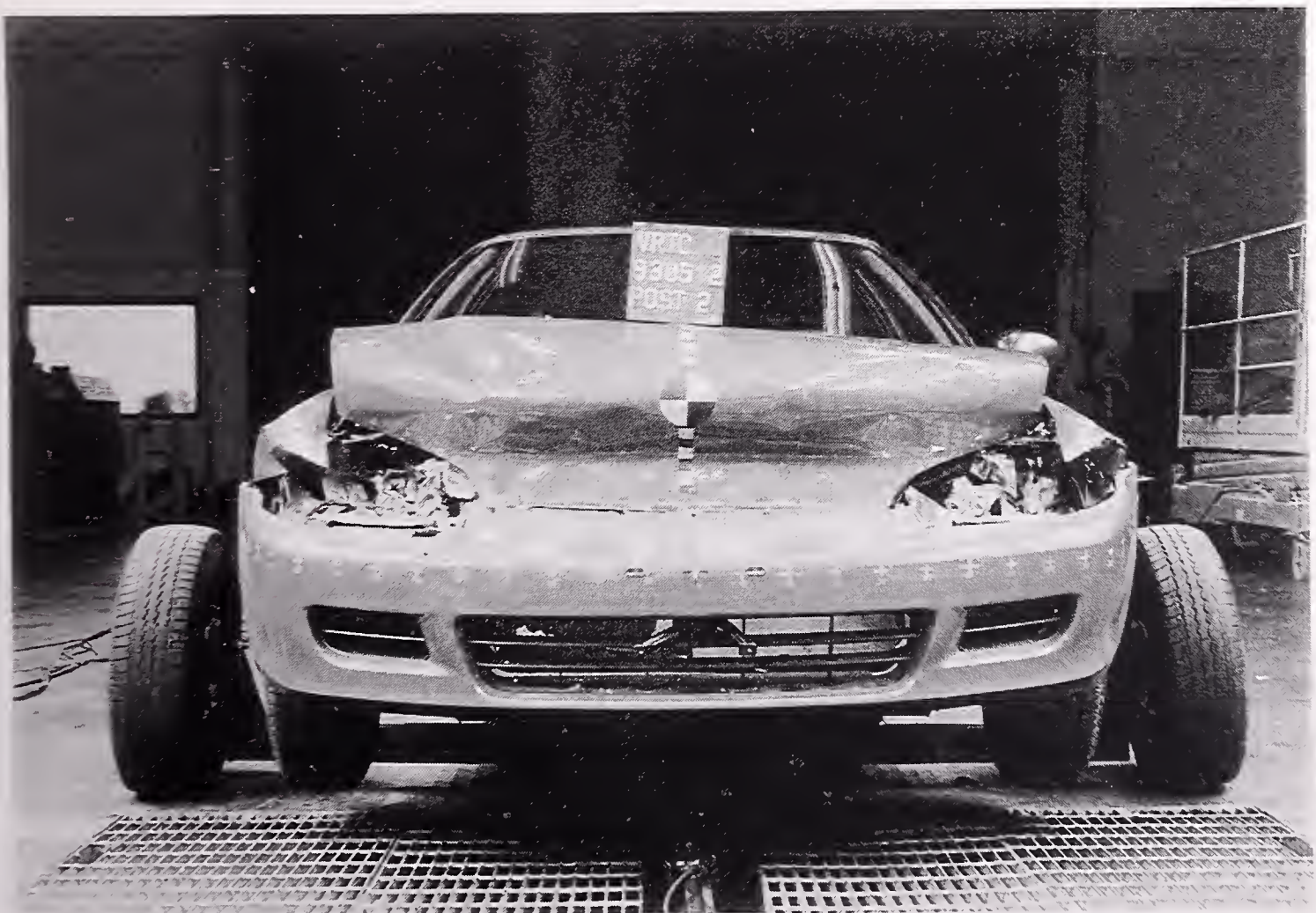


Figure A-17. POST-TEST FRONT VIEW

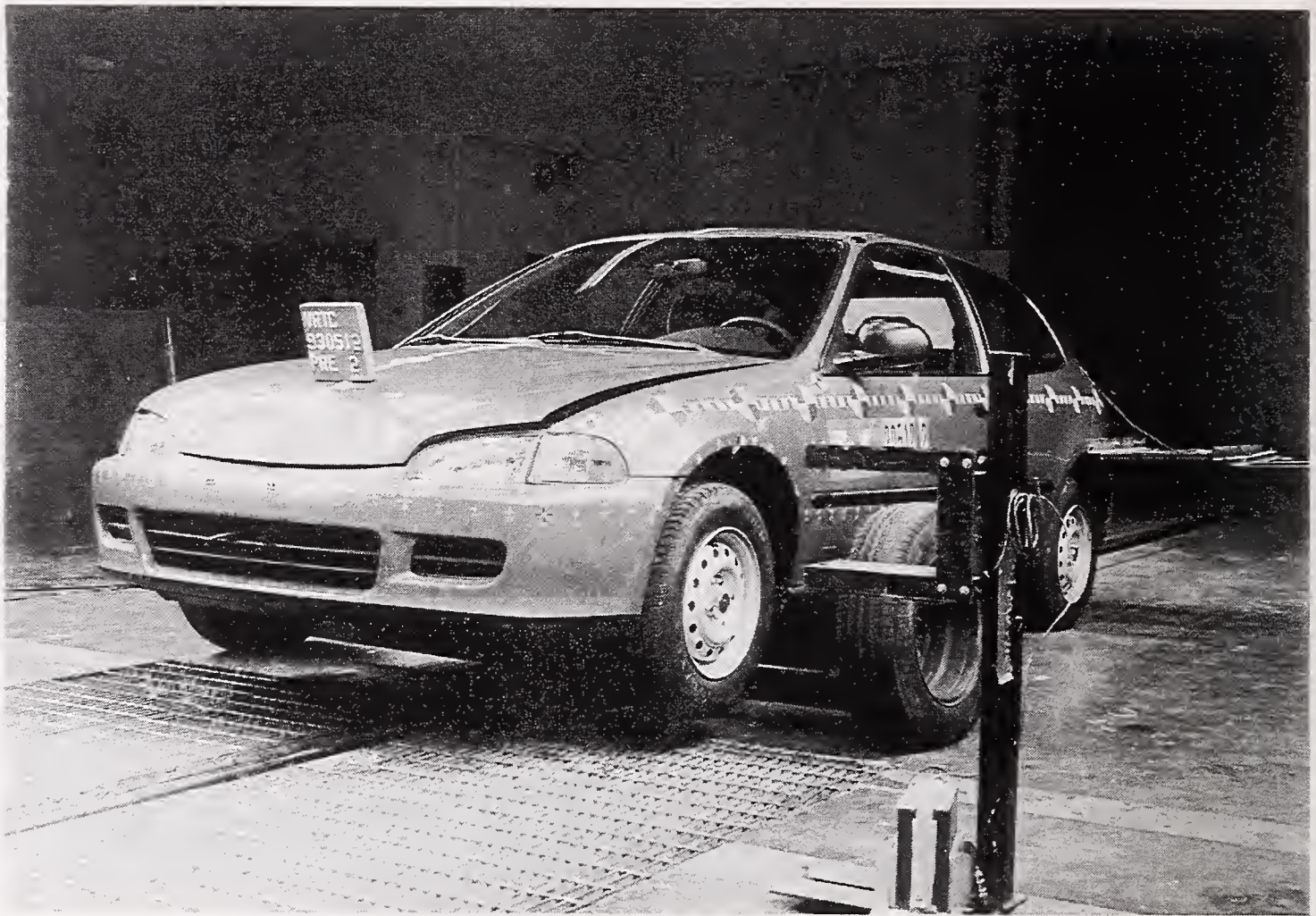


Figure A-18. PRE-TEST LEFT FRONT THREE-QUARTER VIEW

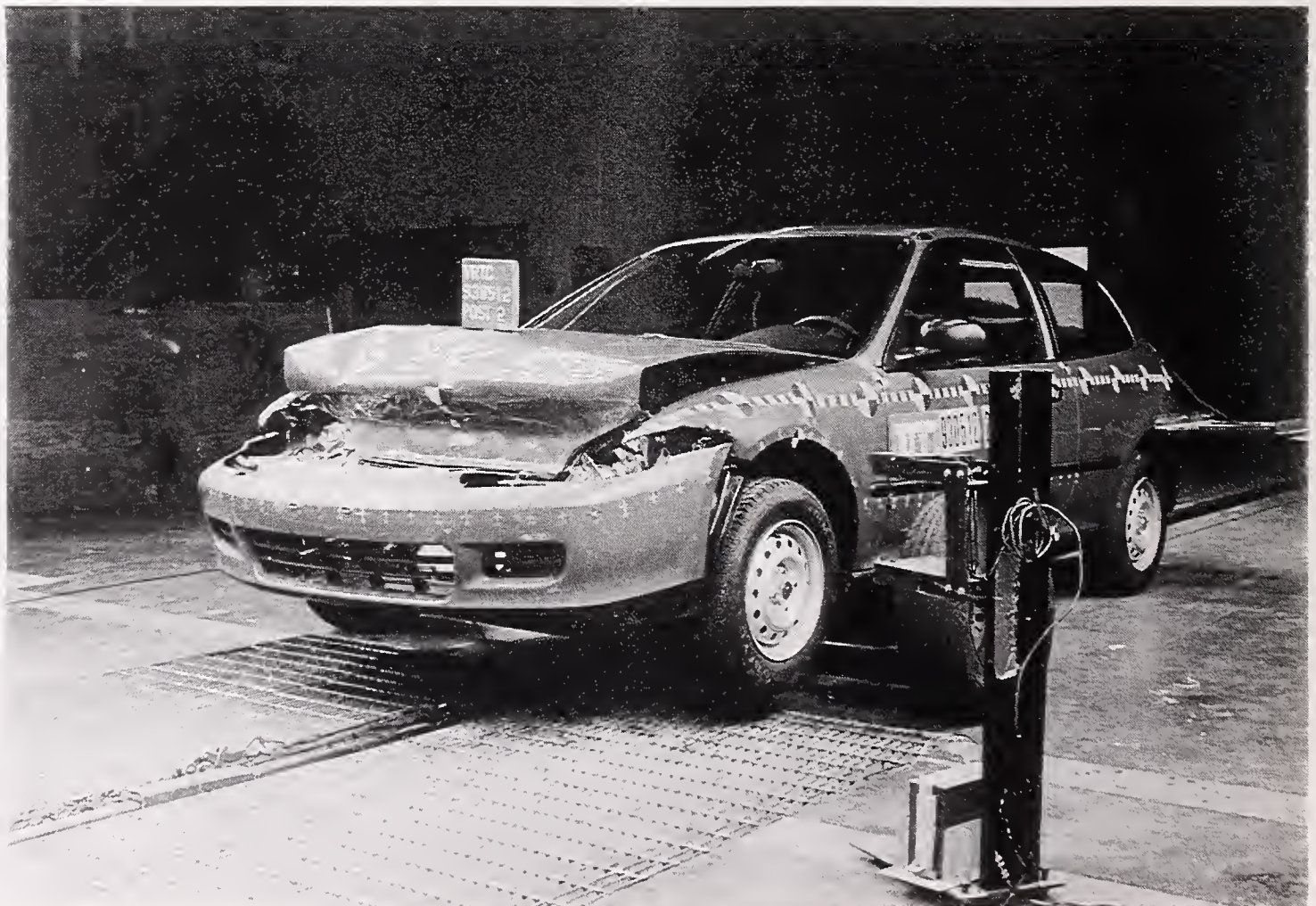


Figure A-19. POST-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-20. PRE-TEST LEFT SIDE VIEW



Figure A-21. POST-TEST LEFT SIDE VIEW



LIST OF PHOTOGRAPHS

TEST NO. 930512-3

- A-22. PRE-TEST RIGHT SIDE VIEW
- A-23. POST-TEST RIGHT SIDE VIEW
- A-24. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-25. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-26. PRE-TEST FRONT VIEW
- A-27. POST-TEST FRONT VIEW
- A-28. PRE-TEST LEFT FRONT THREE-QUARTER VIEW
- A-29. POST-TEST LEFT FRONT THREE-QUARTER VIEW
- A-30. PRE-TEST LEFT SIDE VIEW
- A-31. POST-TEST LEFT SIDE VIEW



Figure A-22. PRE-TEST RIGHT SIDE VIEW



Figure A-23. POST-TEST RIGHT SIDE VIEW



Figure A-24. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-25. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

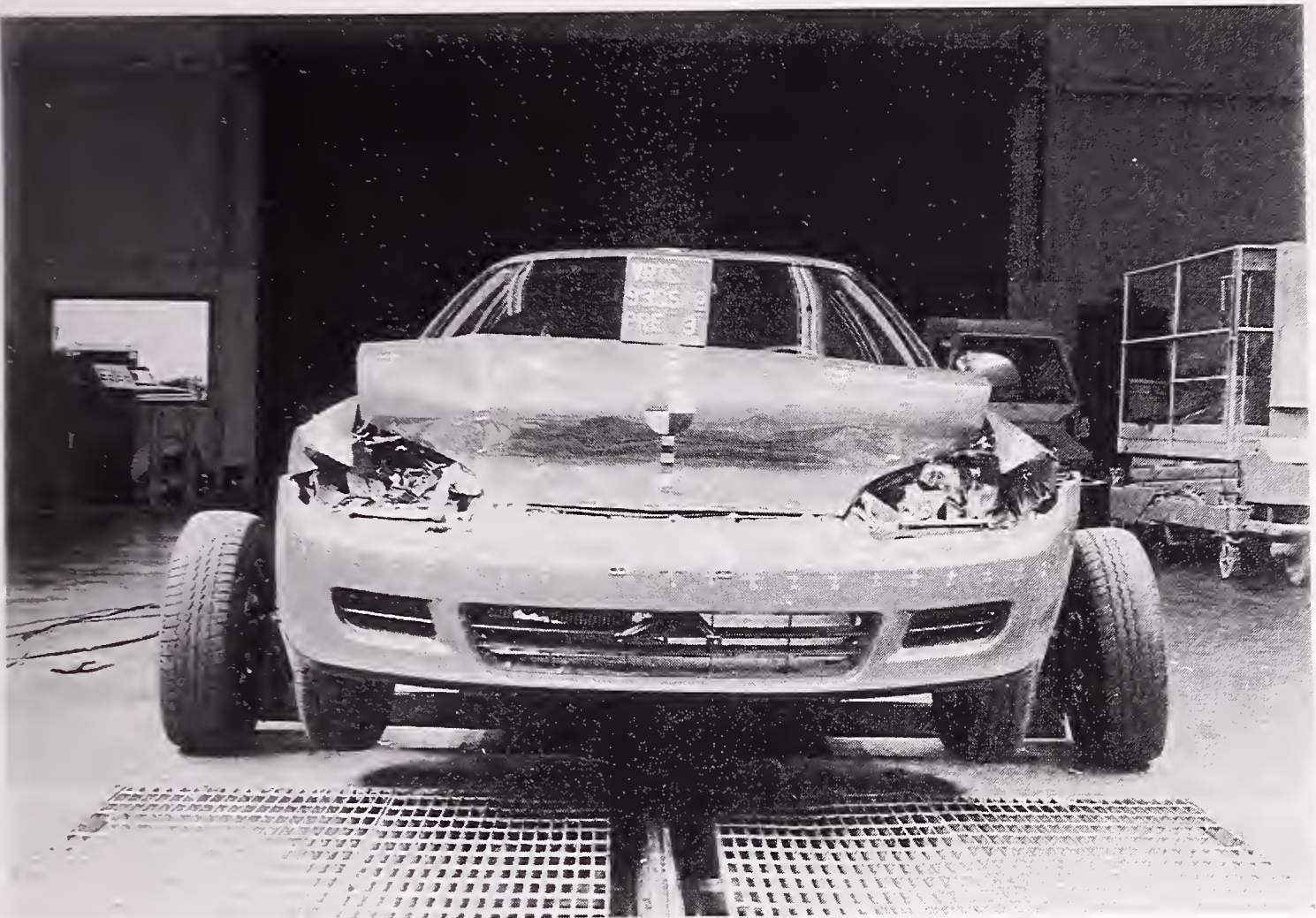


Figure A-26. PRE-TEST FRONT VIEW

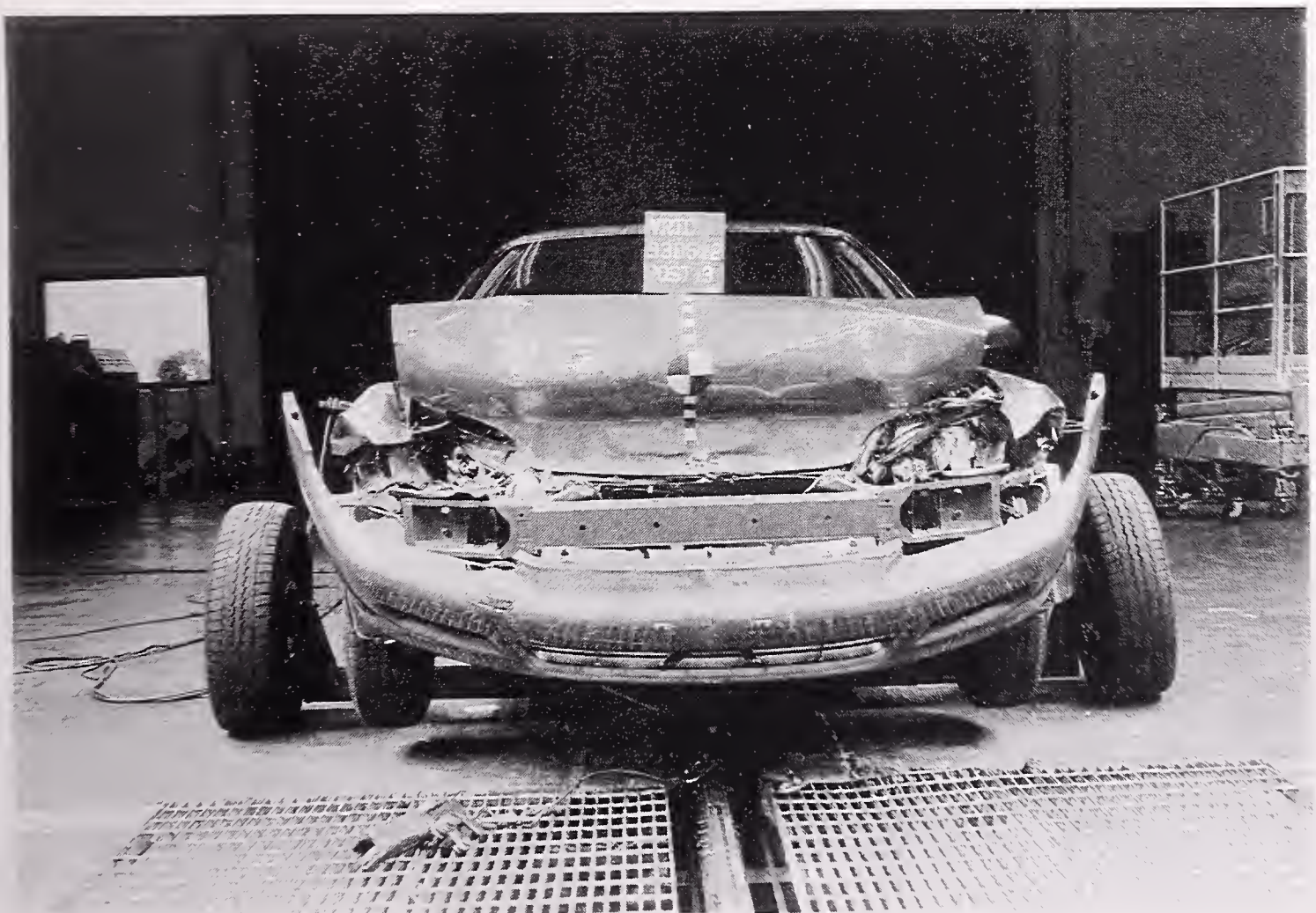


Figure A-27. POST-TEST FRONT VIEW



Figure A-28. PRE-TEST LEFT FRONT THREE-QUARTER VIEW

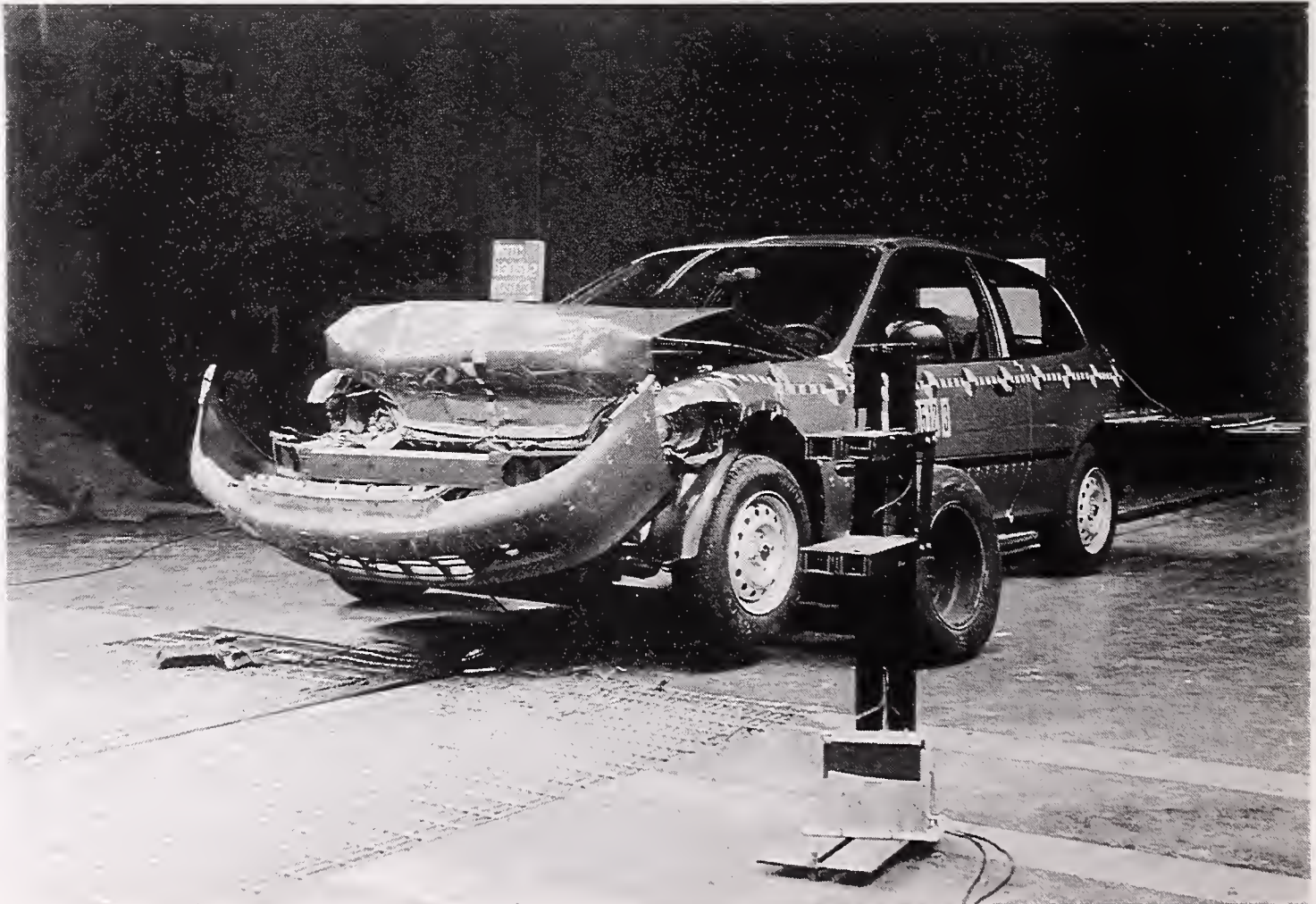


Figure A-29. POST-TEST LEFT FRONT THREE-QUARTER VIEW

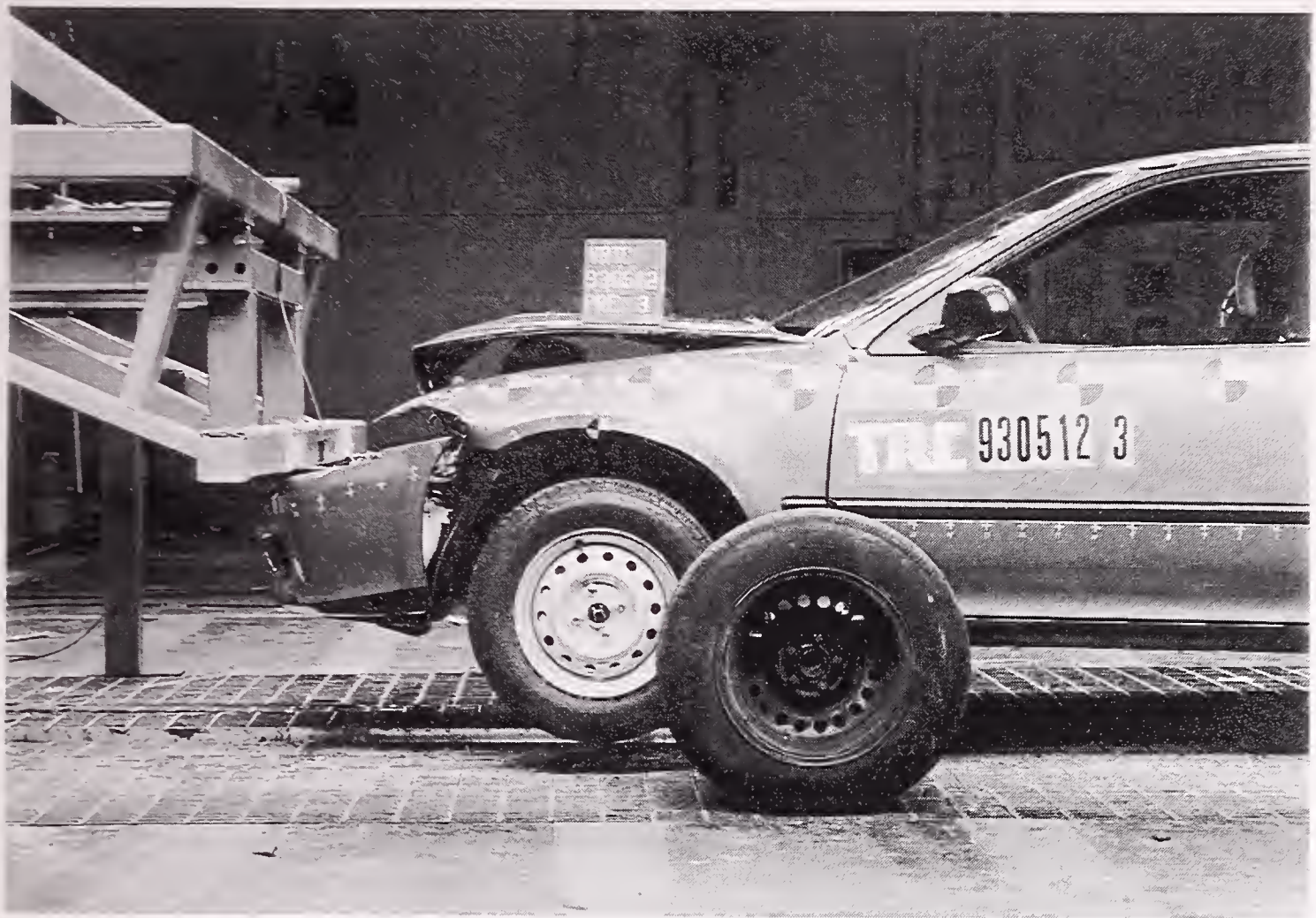


Figure A-30. PRE-TEST LEFT SIDE VIEW

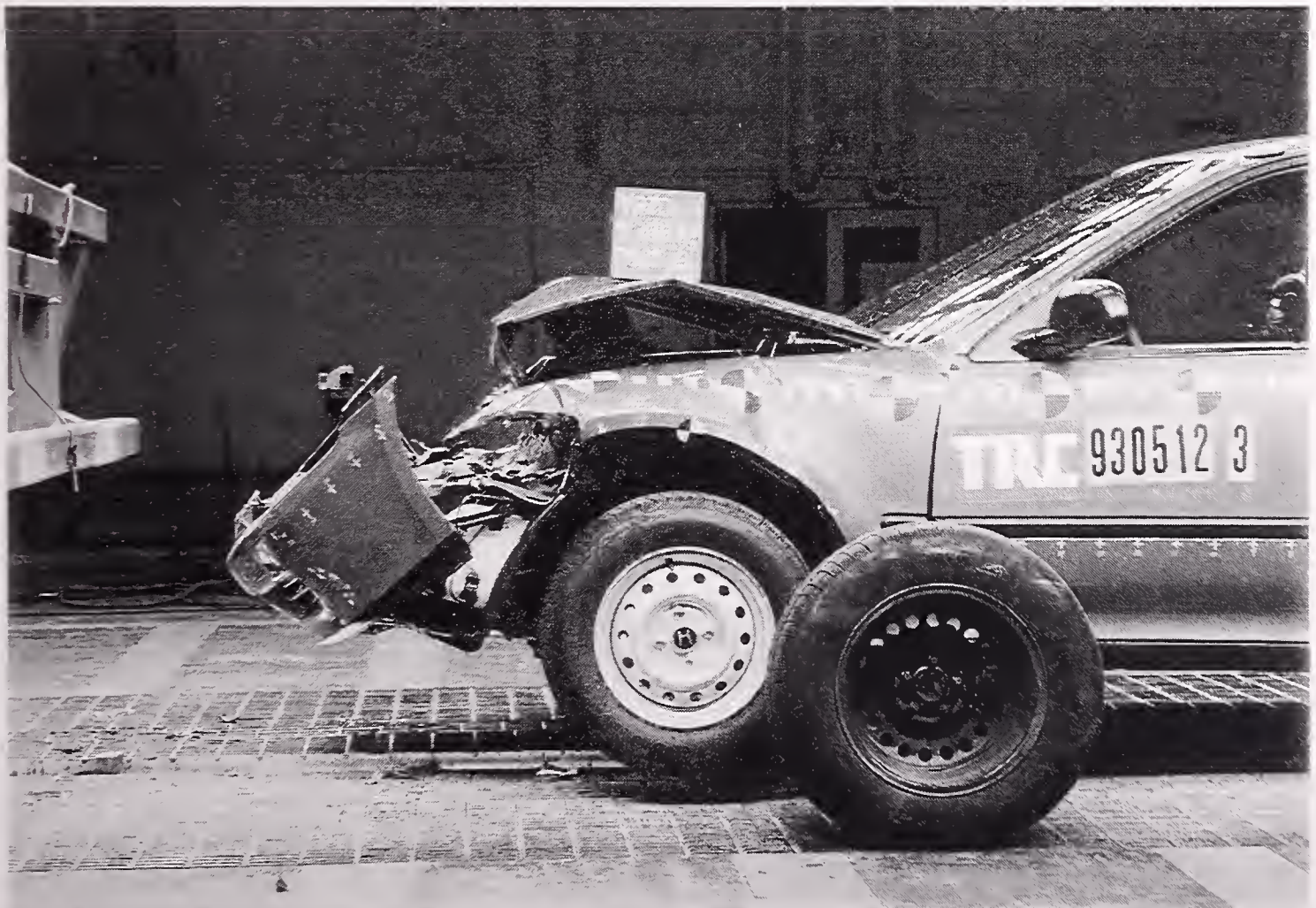


Figure A-31. POST-TEST LEFT SIDE VIEW



LIST OF PHOTOGRAPHS

TEST NO. 930512-4

- A-32. PRE-TEST RIGHT SIDE VIEW
- A-33. POST-TEST RIGHT SIDE VIEW
- A-34. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-35. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-36. PRE-TEST FRONT VIEW
- A-37. POST-TEST FRONT VIEW
- A-38. PRE-TEST LEFT FRONT THREE-QUARTER VIEW
- A-39. POST-TEST LEFT FRONT THREE-QUARTER VIEW
- A-40. PRE-TEST LEFT SIDE VIEW
- A-41. POST-TEST LEFT SIDE VIEW
- A-42. POST-TEST ENGINE LEFT SIDE - VIEW 1
- A-43. POST-TEST ENGINE LEFT SIDE - VIEW 2



Figure A-32. PRE-TEST RIGHT SIDE VIEW



Figure A-33. POST-TEST RIGHT SIDE VIEW



Figure A-34. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW

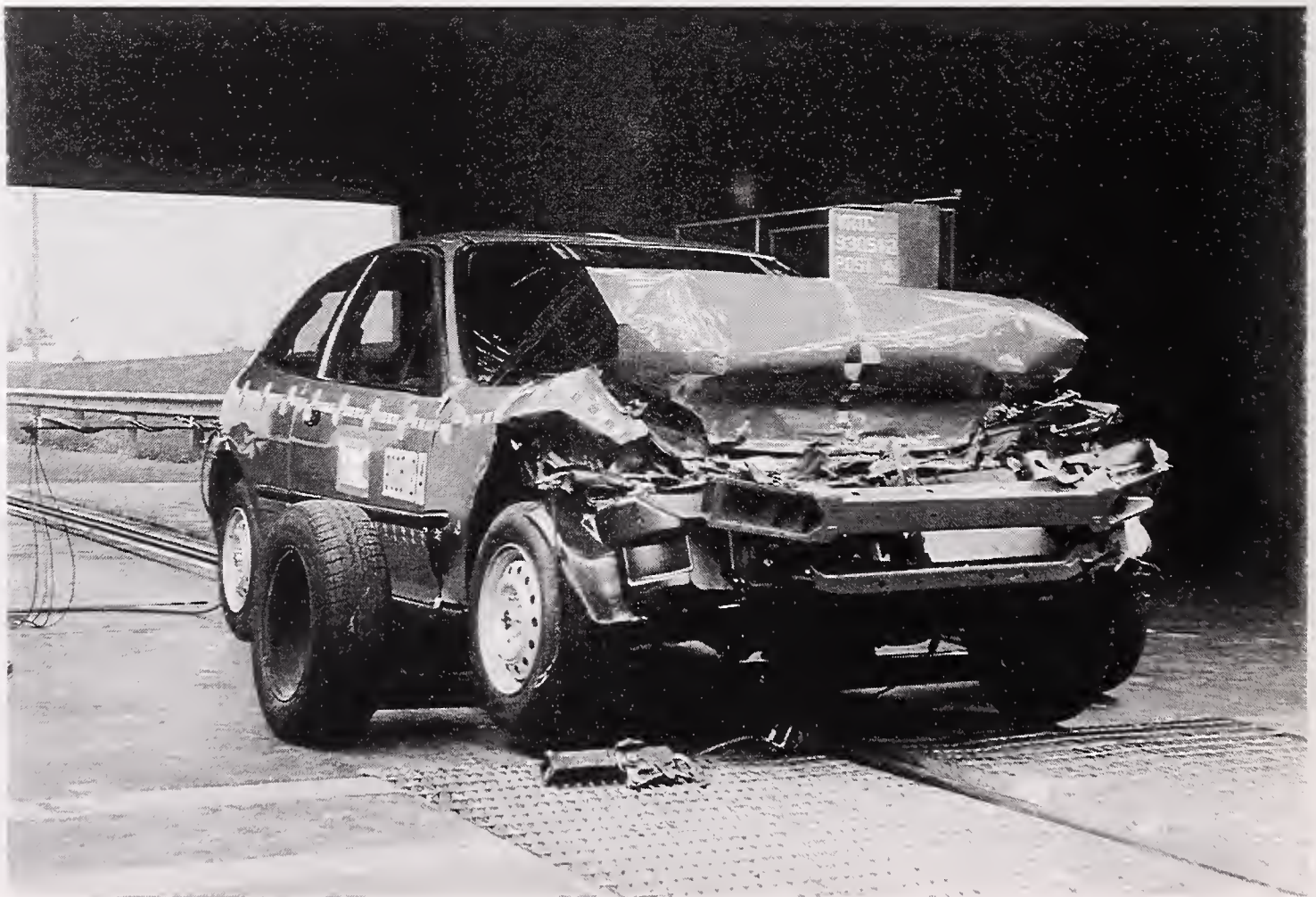


Figure A-35. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

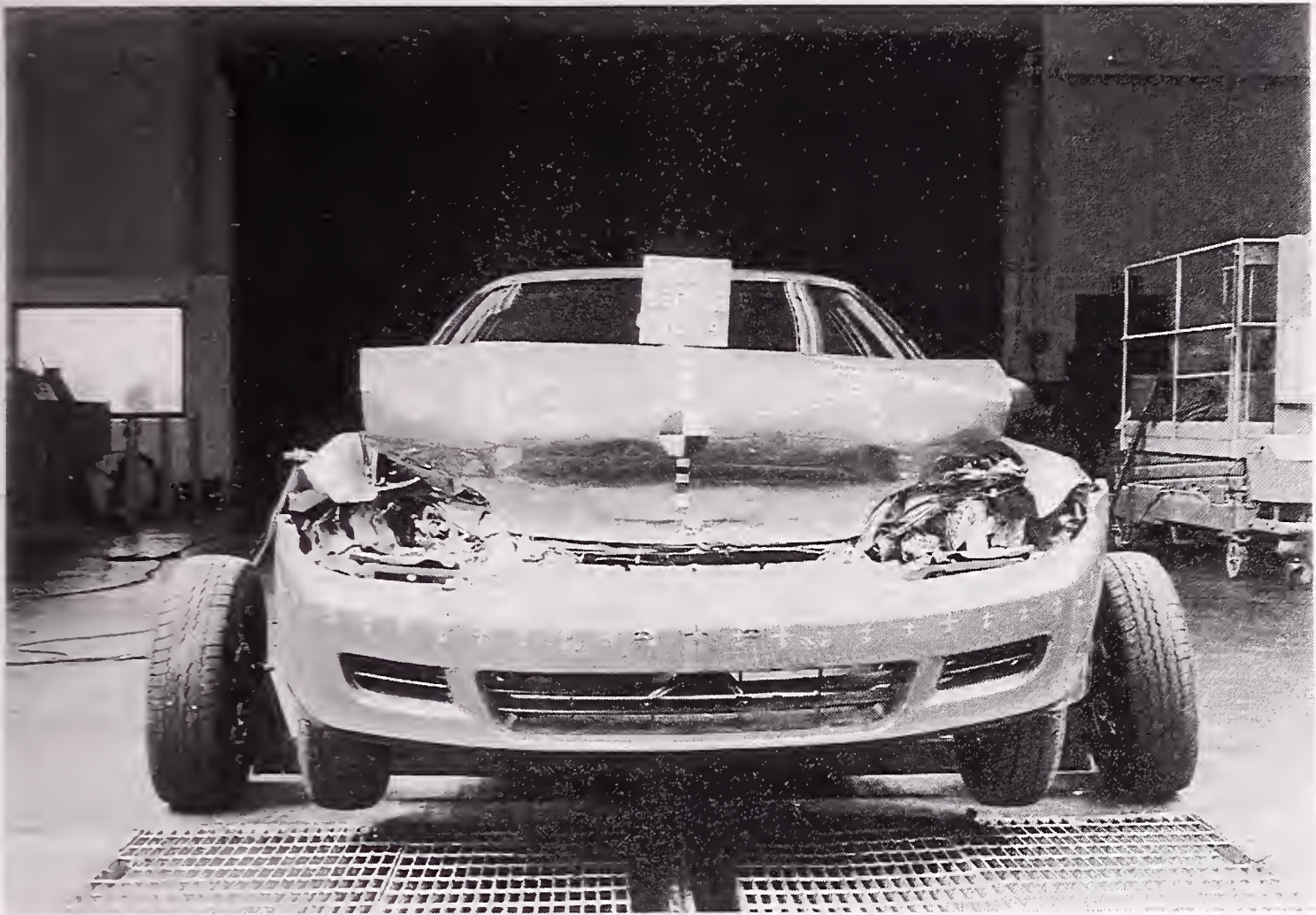


Figure A-36. PRE-TEST FRONT VIEW

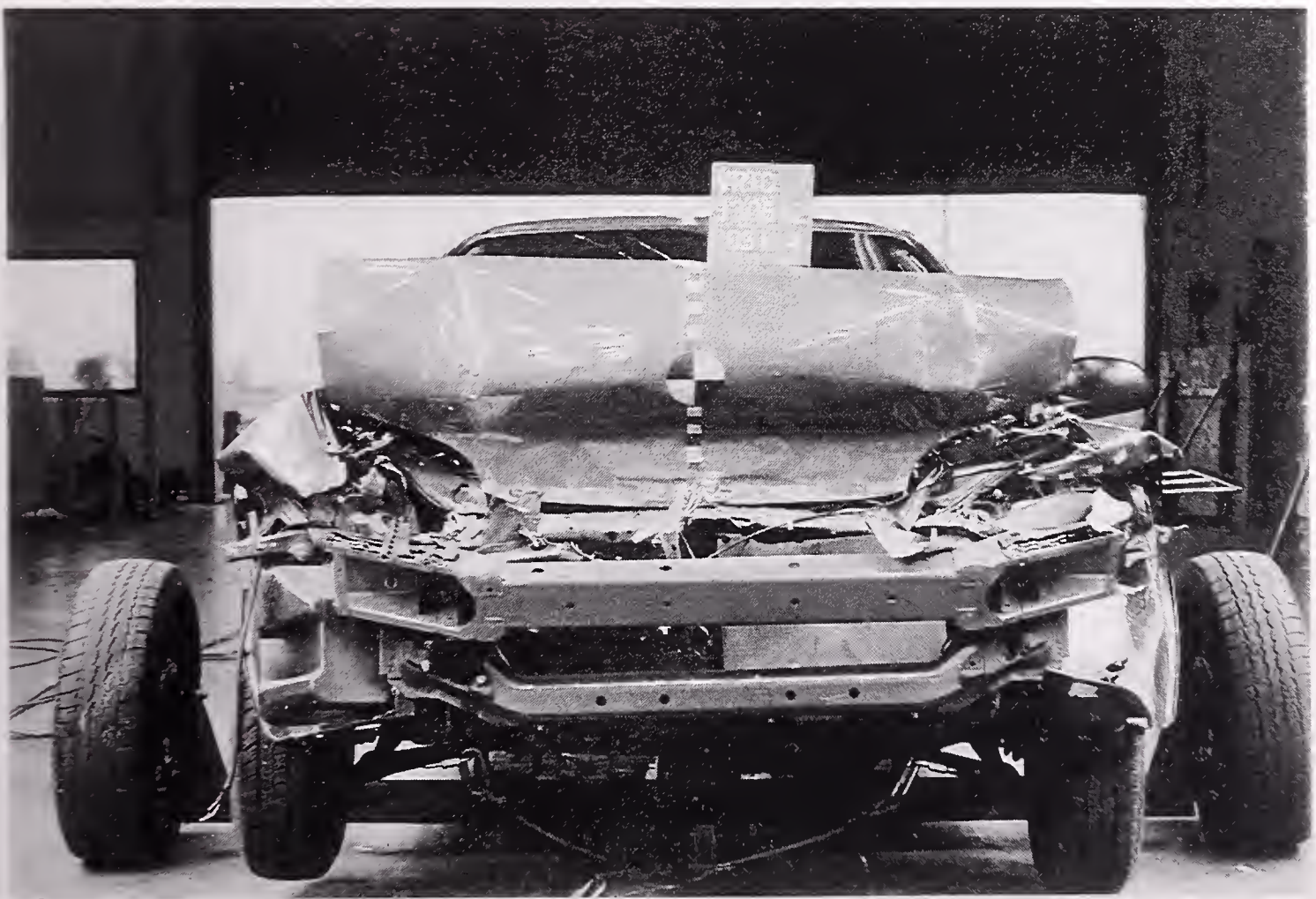


Figure A-37. POST-TEST FRONT VIEW

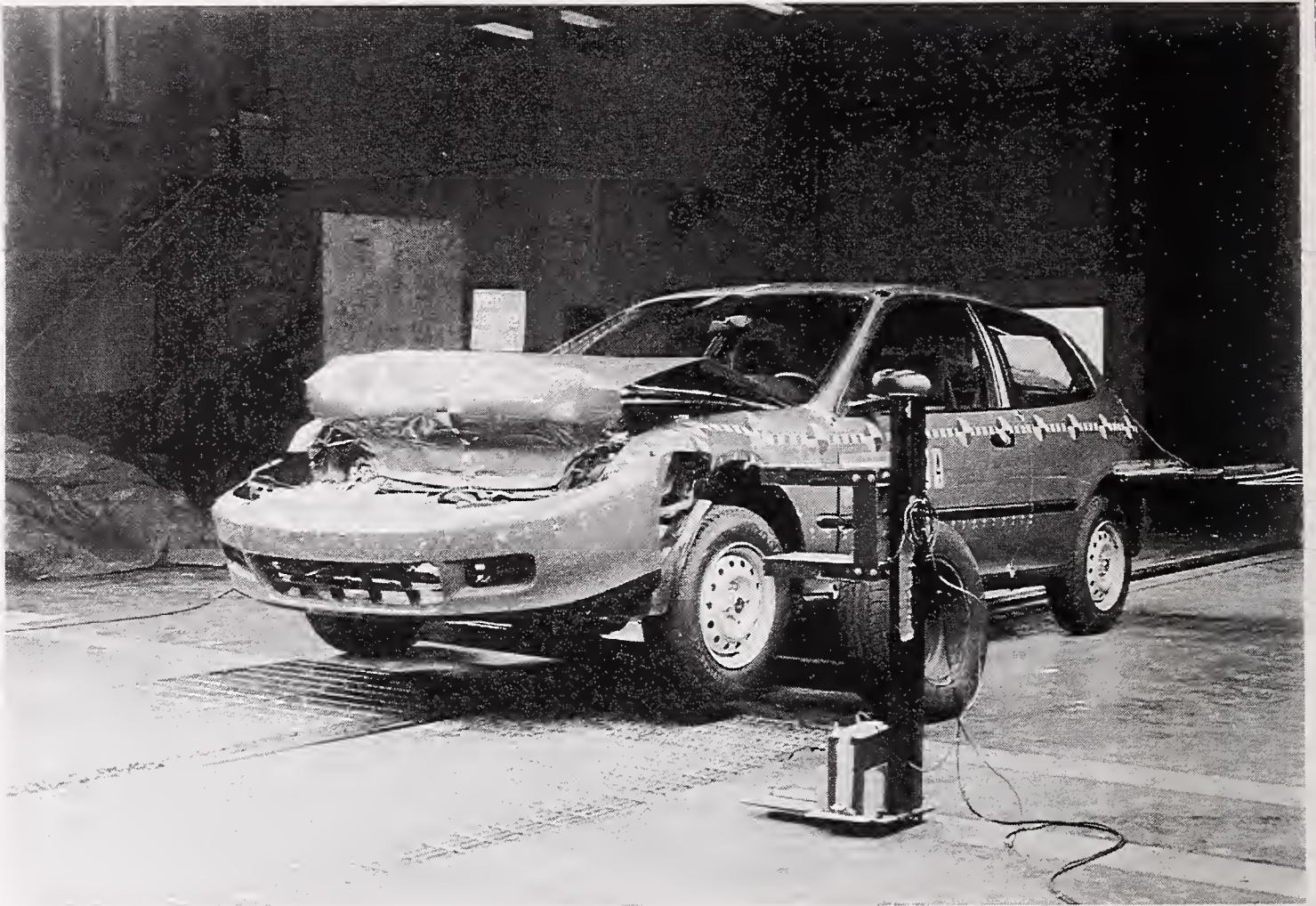


Figure A-38. PRE-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-39. POST-TEST LEFT FRONT THREE-QUARTER VIEW

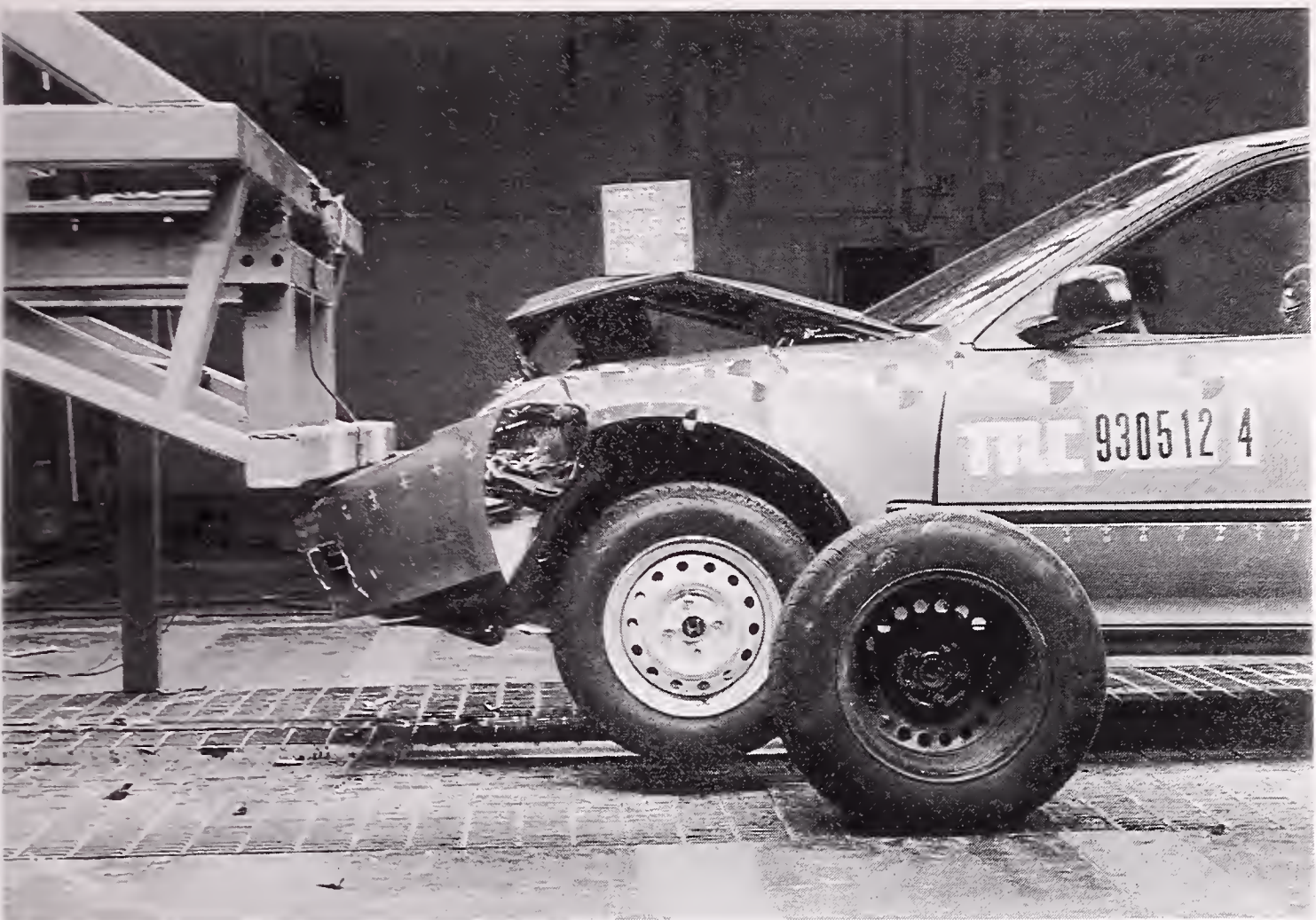


Figure A-40. PRE-TEST LEFT SIDE VIEW



Figure A-41. POST-TEST LEFT SIDE VIEW

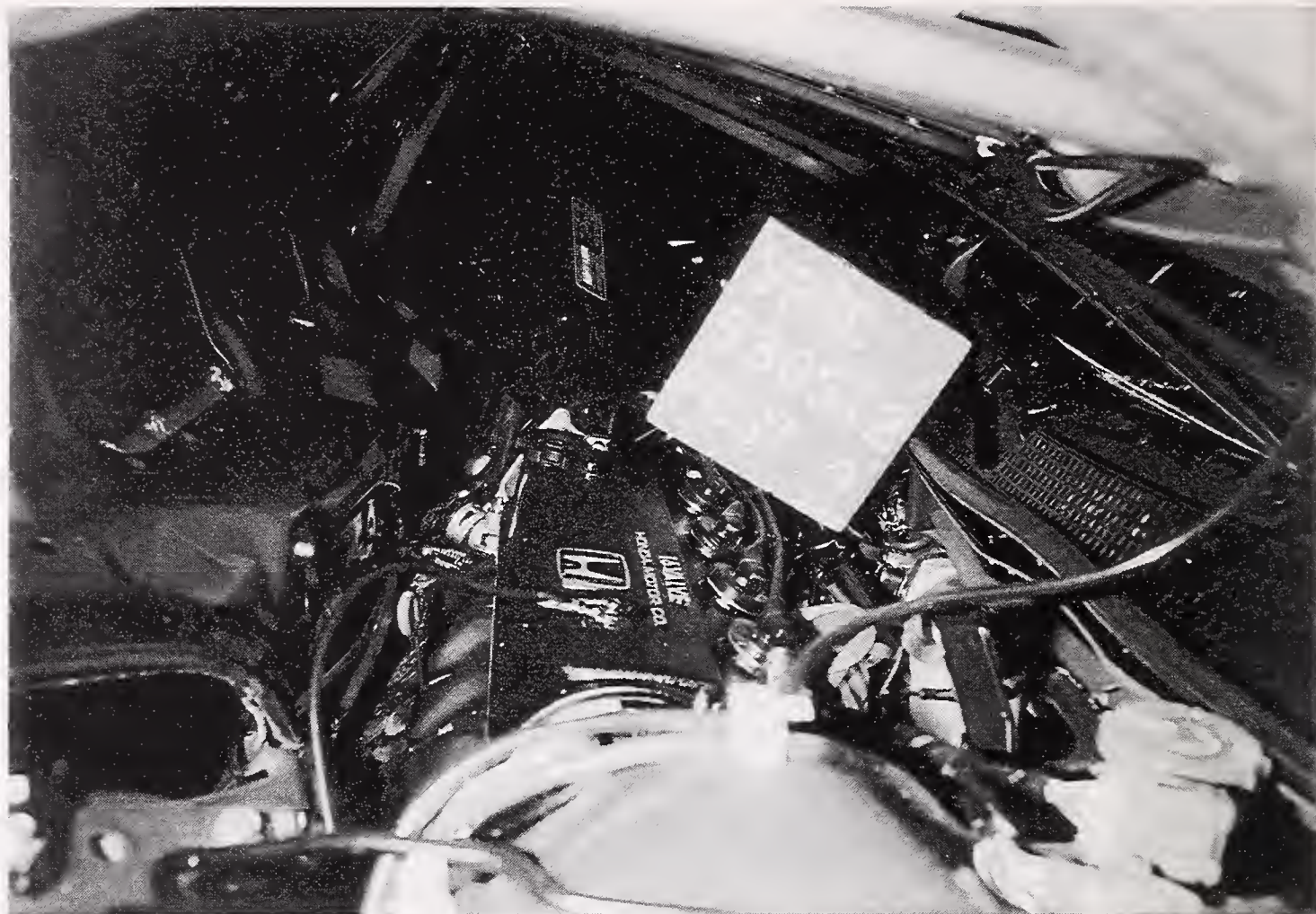


Figure A-42. POST-TEST ENGINE LEFT SIDE - VIEW 1

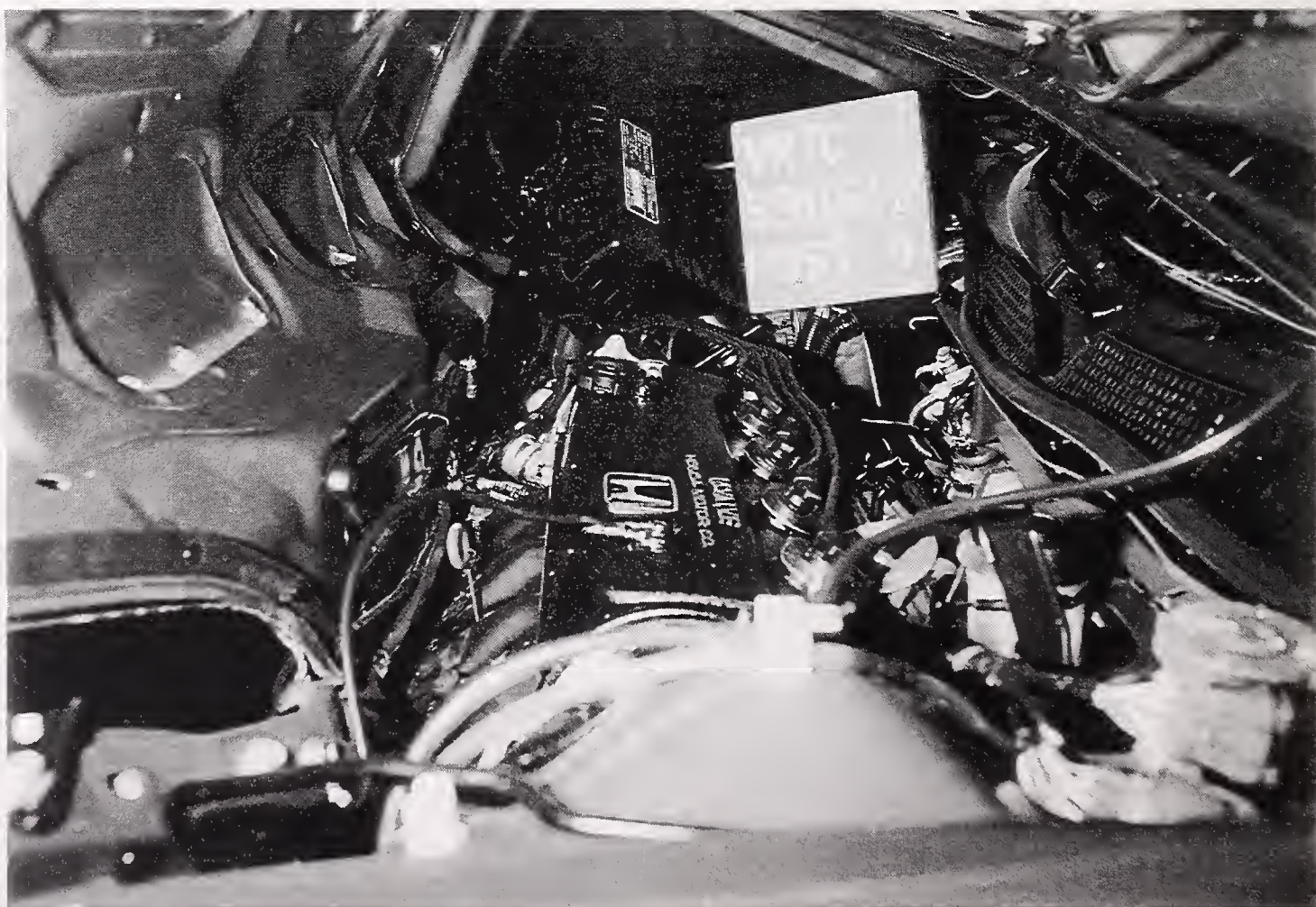


Figure A-43. POST-TEST ENGINE LEFT SIDE - VIEW 2

LIST OF PHOTOGRAPHS

TEST NO. 930513-1

- A-44. PRE-TEST RIGHT SIDE VIEW
- A-45. POST-TEST RIGHT SIDE VIEW
- A-46. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-47. POST-TEST RIGHT FRONT THREE-QUARTER VIEW
- A-48. PRE-TEST FRONT VIEW
- A-49. POST-TEST FRONT VIEW
- A-50. PRE-TEST LEFT FRONT THREE-QUARTER VIEW
- A-51. POST-TEST LEFT FRONT THREE-QUARTER VIEW
- A-52. PRE-TEST LEFT SIDE VIEW
- A-53. POST-TEST LEFT SIDE VIEW
- A-54. POST-TEST LEFT SIDE ENGINE COMPARTMENT
- A-55. POST-TEST RIGHT SIDE ENGINE COMPARTMENT
- A-56. POST-TEST FRONT ENGINE COMPARTMENT - VIEW 1
- A-57. POST-TEST FRONT ENGINE COMPARTMENT - VIEW 2



Figure A-44. PRE-TEST RIGHT SIDE VIEW

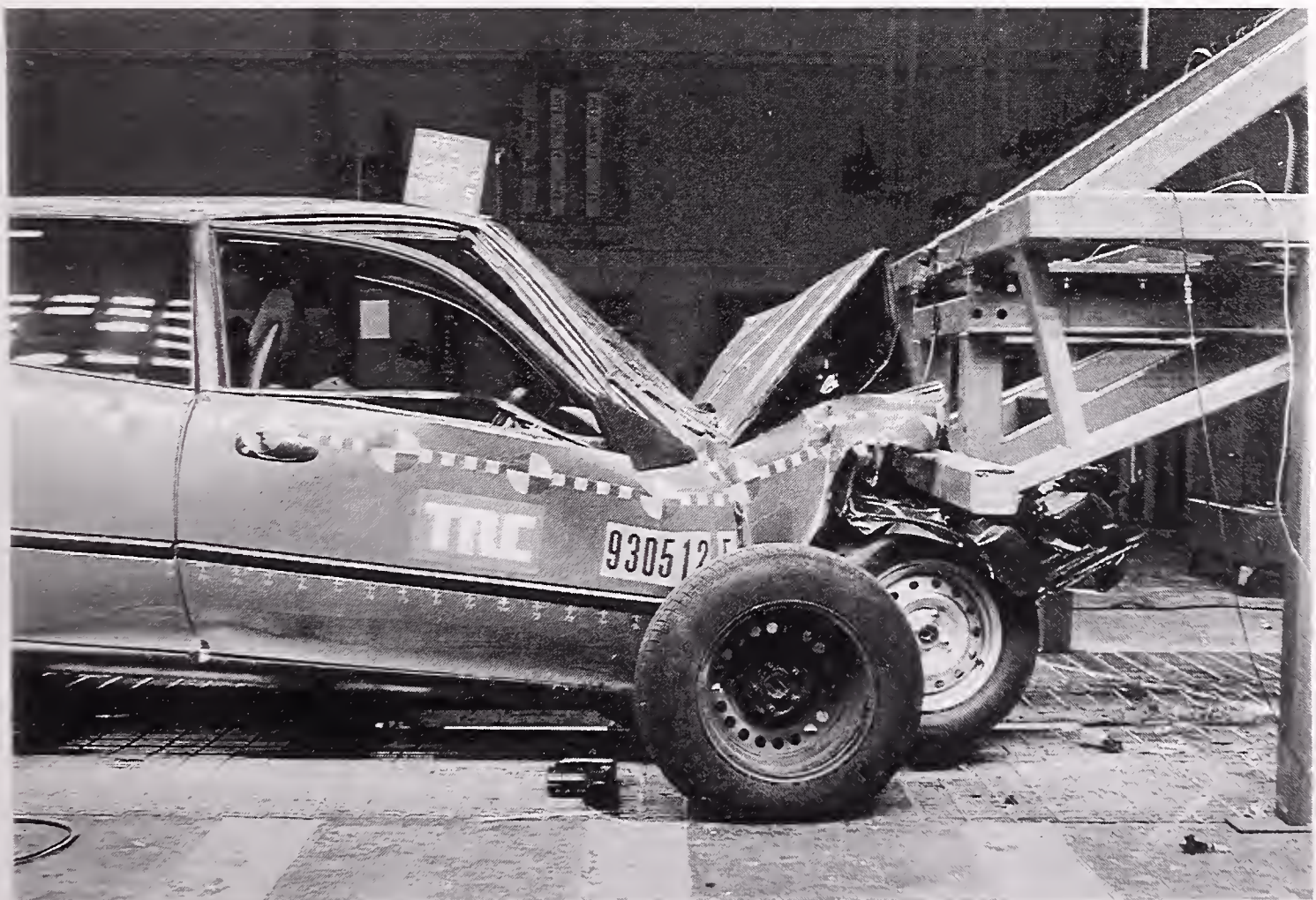


Figure A-45. POST-TEST RIGHT SIDE VIEW

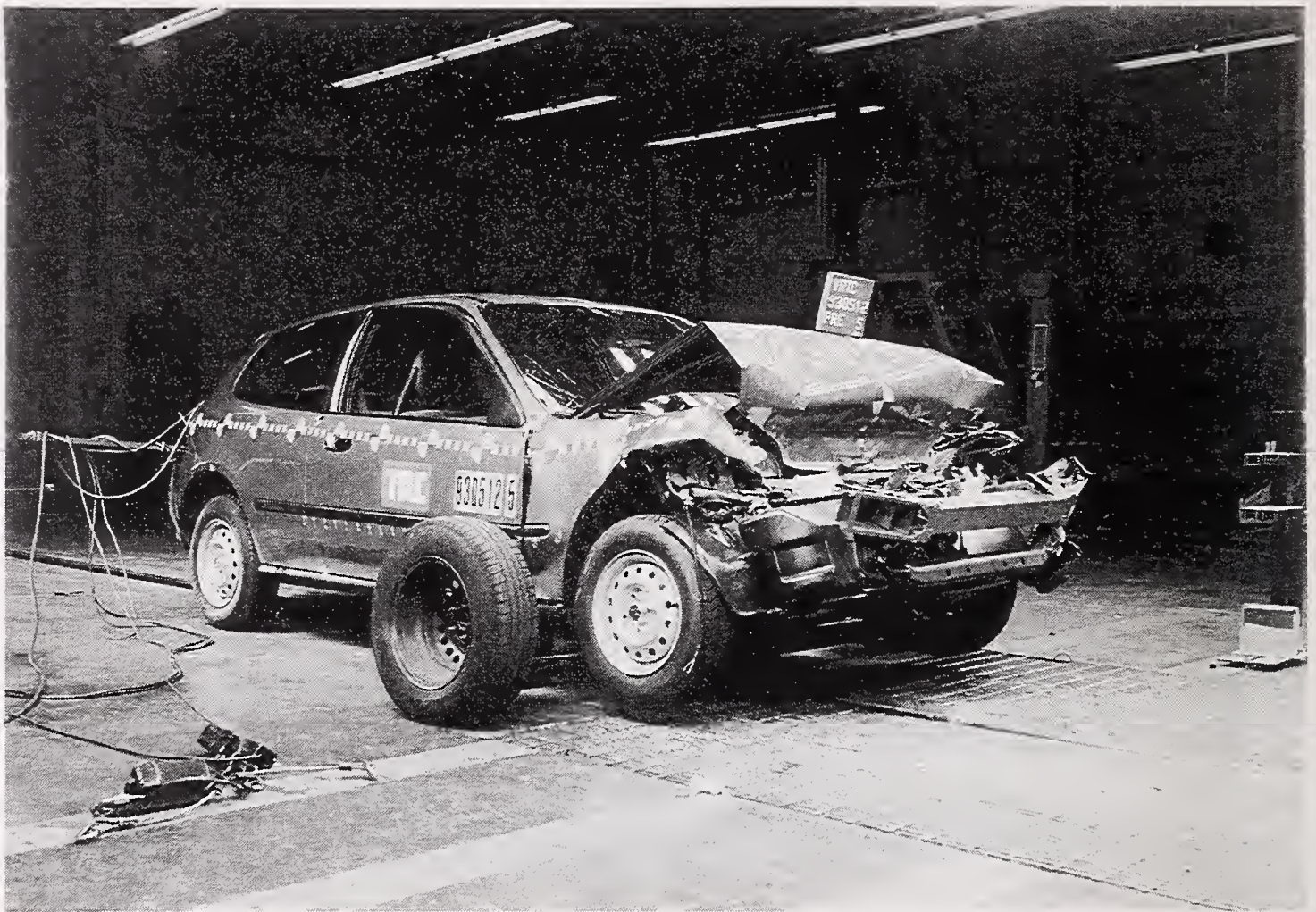


Figure A-46. PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-47. POST-TEST RIGHT FRONT THREE-QUARTER VIEW

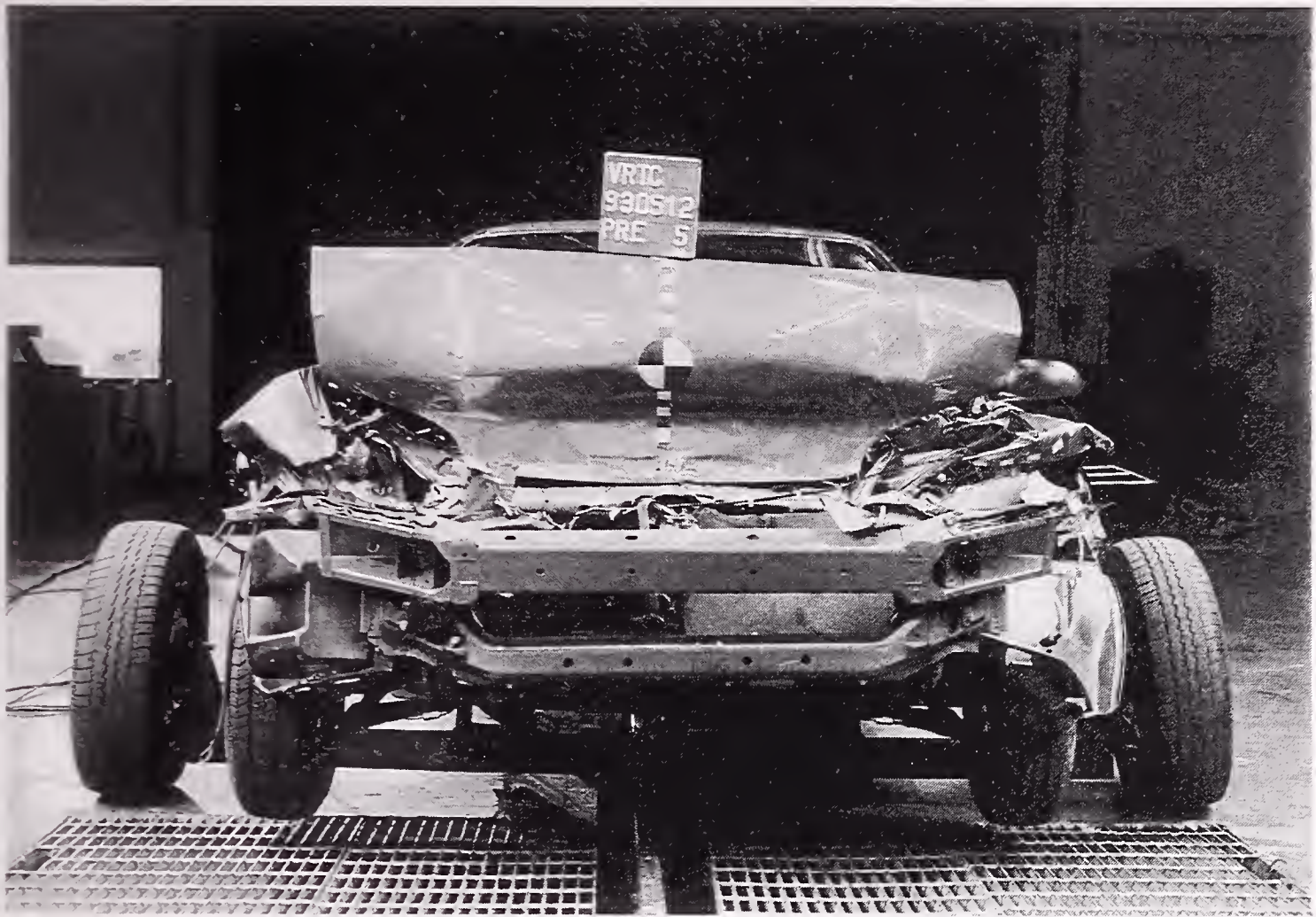


Figure A-48. PRE-TEST FRONT VIEW

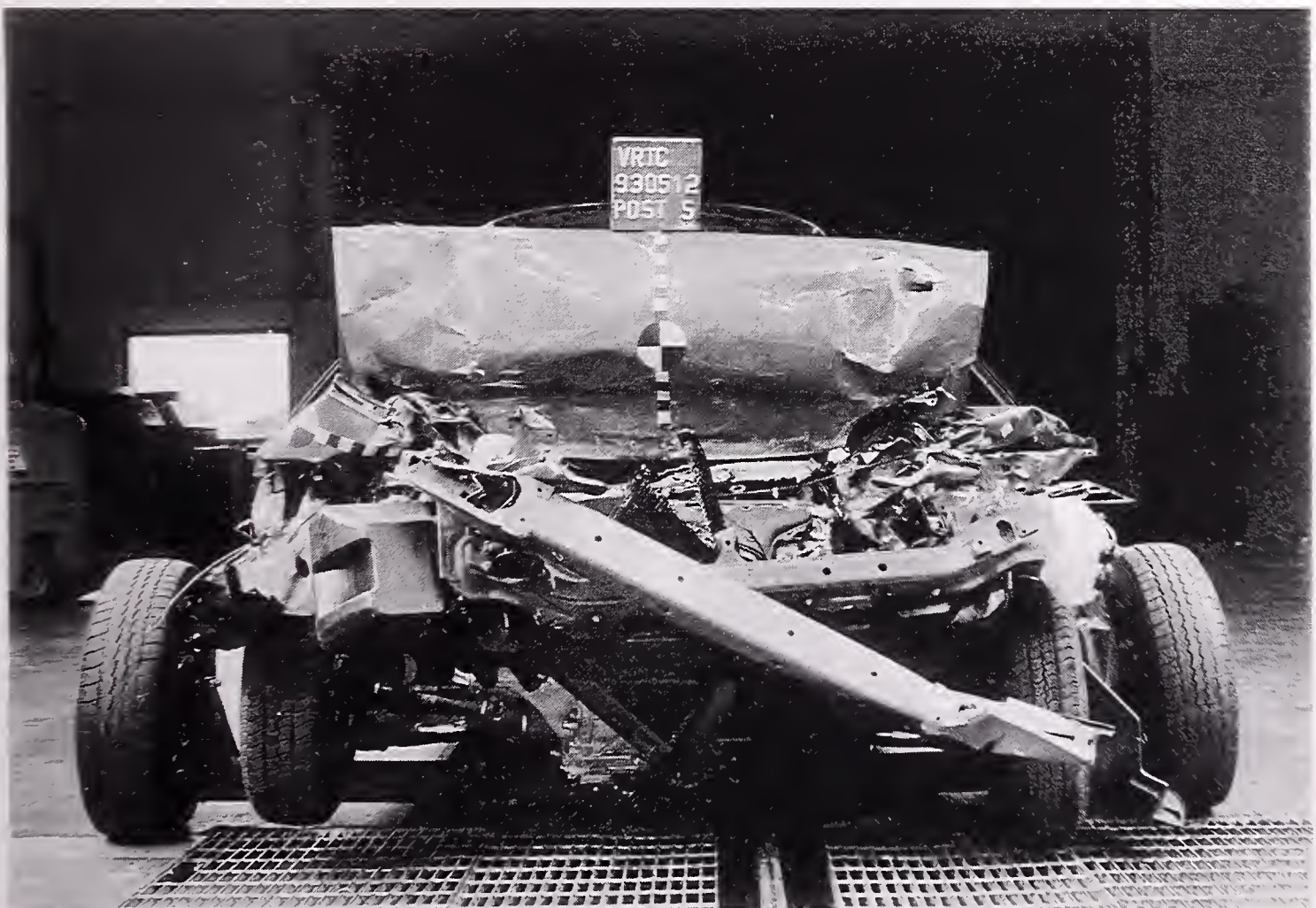


Figure A-49. POST-TEST FRONT VIEW

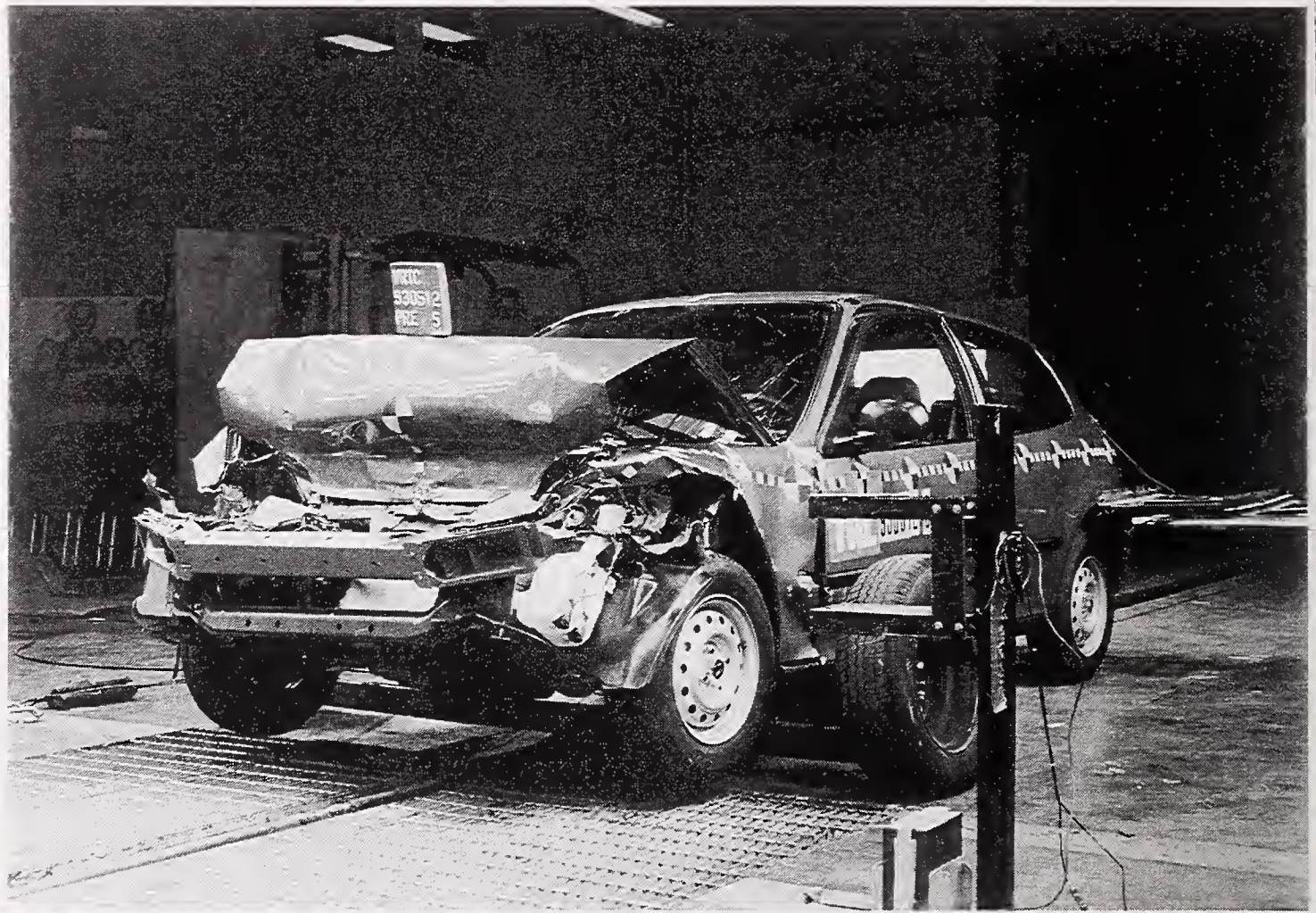


Figure A-50. PRE-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-51. POST-TEST LEFT FRONT THREE-QUARTER VIEW



Figure A-52. PRE-TEST LEFT SIDE VIEW

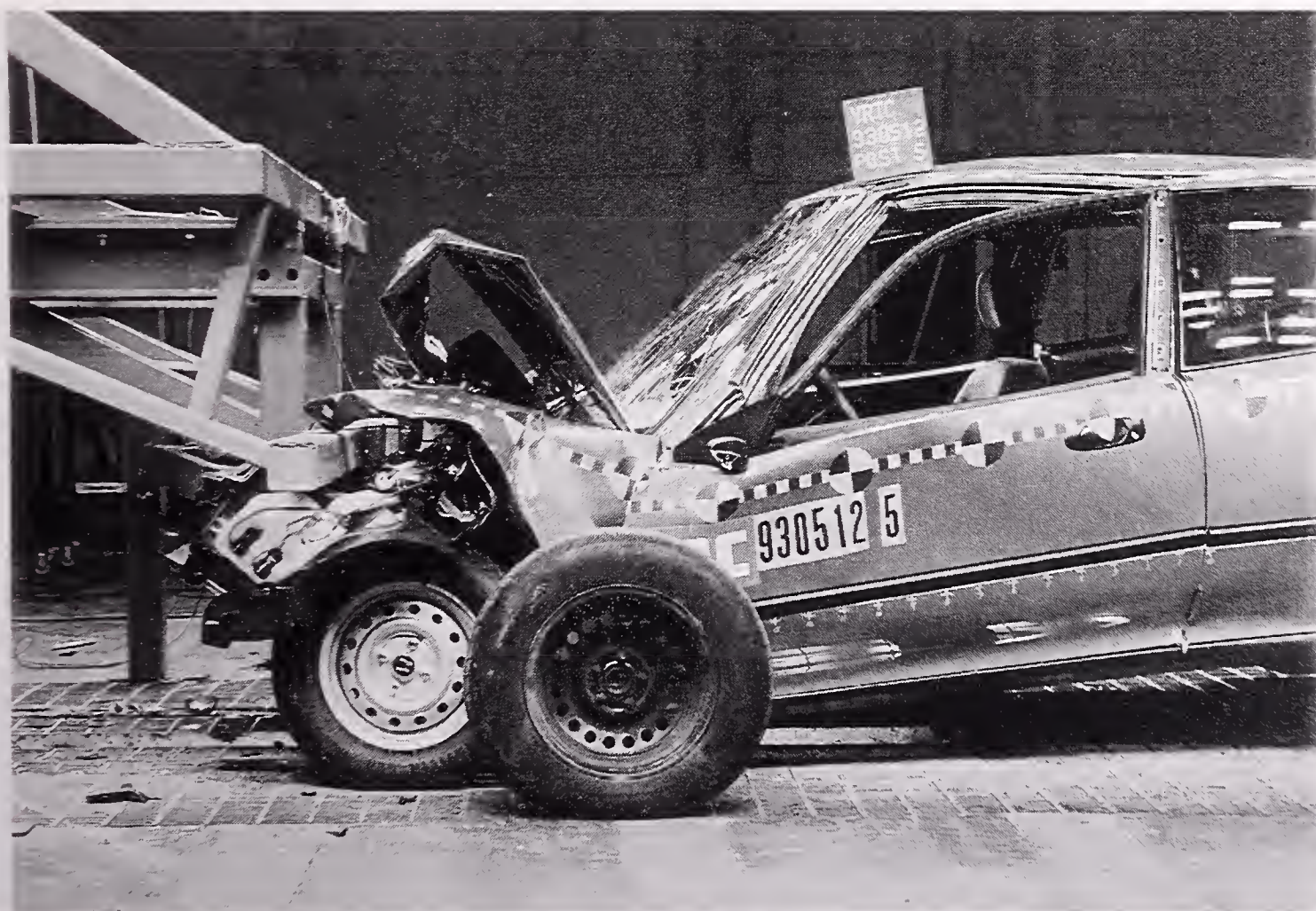


Figure A-53. POST-TEST LEFT SIDE VIEW



Figure A-54. POST-TEST LEFT SIDE ENGINE COMPARTMENT VIEW



Figure A-55. POST-TEST RIGHT SIDE ENGINE COMPARTMENT VIEW



Figure A-56. POST-TEST FRONT ENGINE COMPARTMENT - VIEW 1

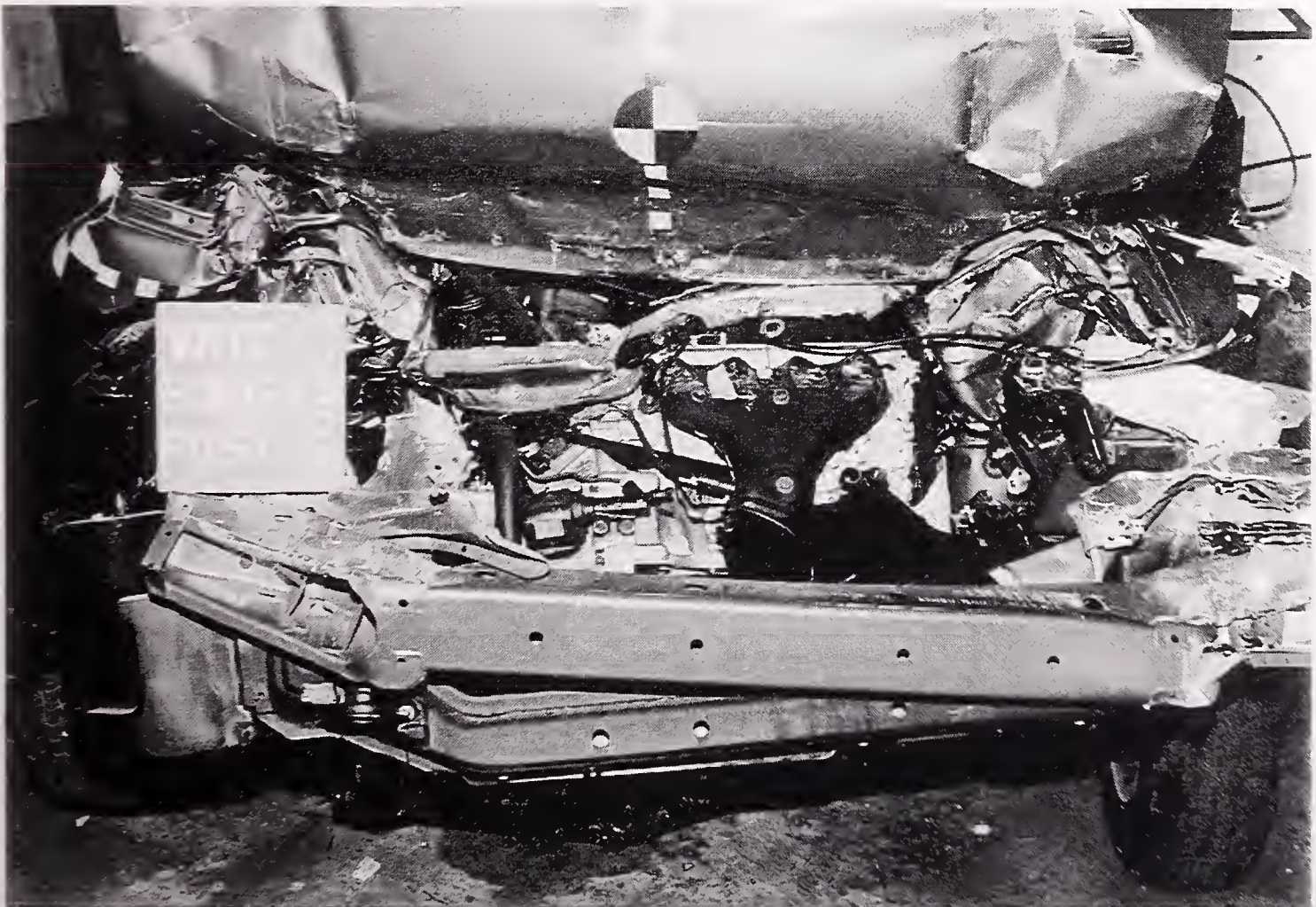


Figure A-57. POST-TEST FRONT ENGINE COMPARTMENT - VIEW 2



APPENDIX B

DATA PLOTS

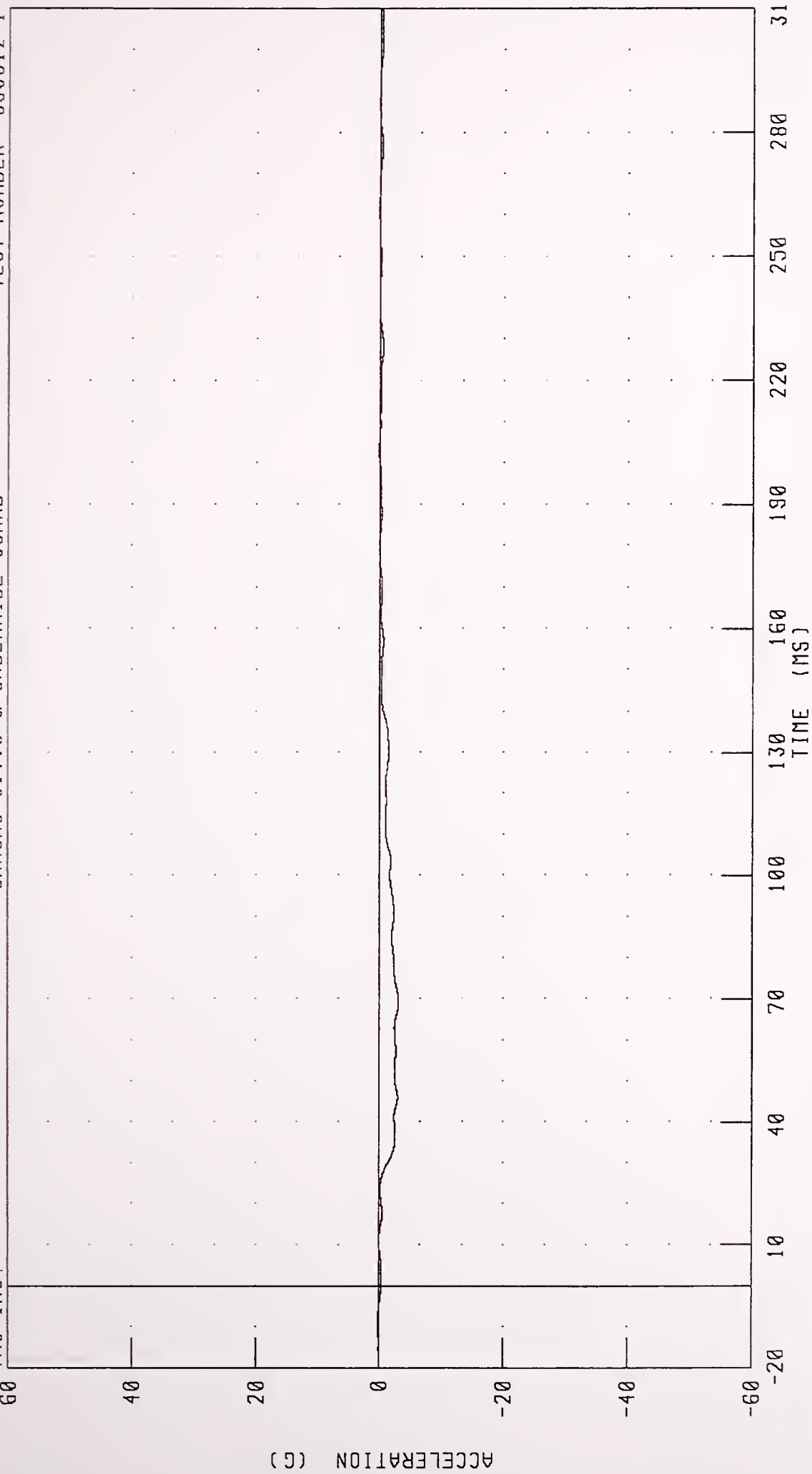
DATA PLOTS

TEST NO. 930512-1

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
LEFT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD
TEST NUMBER: 930512-1

TRC INC.



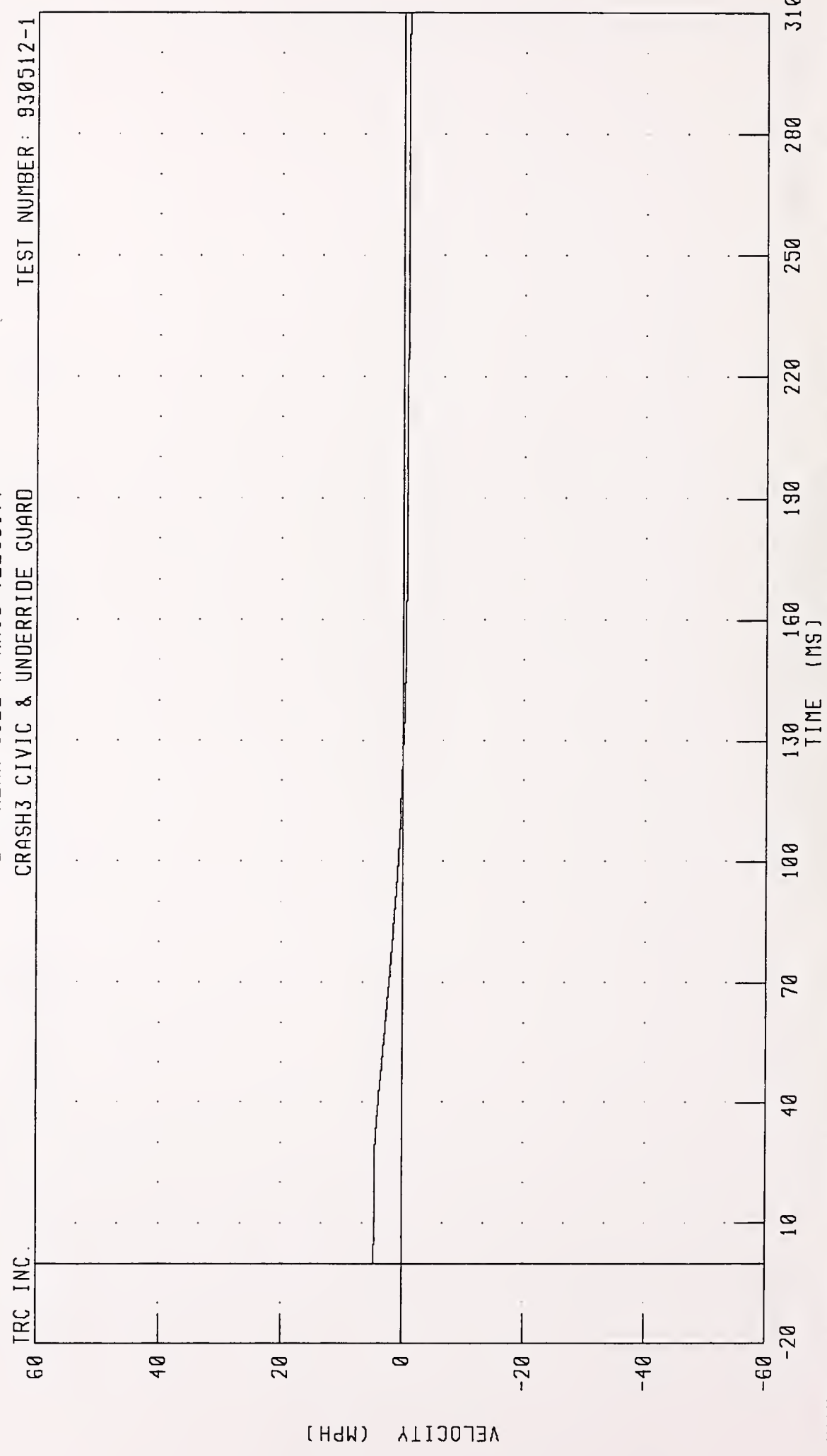
CHANNEL: LRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.20 G @ -9.00 MS; -3.07 G @ 69.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1

LEFT REAR SILL X-AXIS VELOCITY
CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-1



CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 4.70 MPH @ 0.00 MS; -0.96 MPH @ 310.00 MS

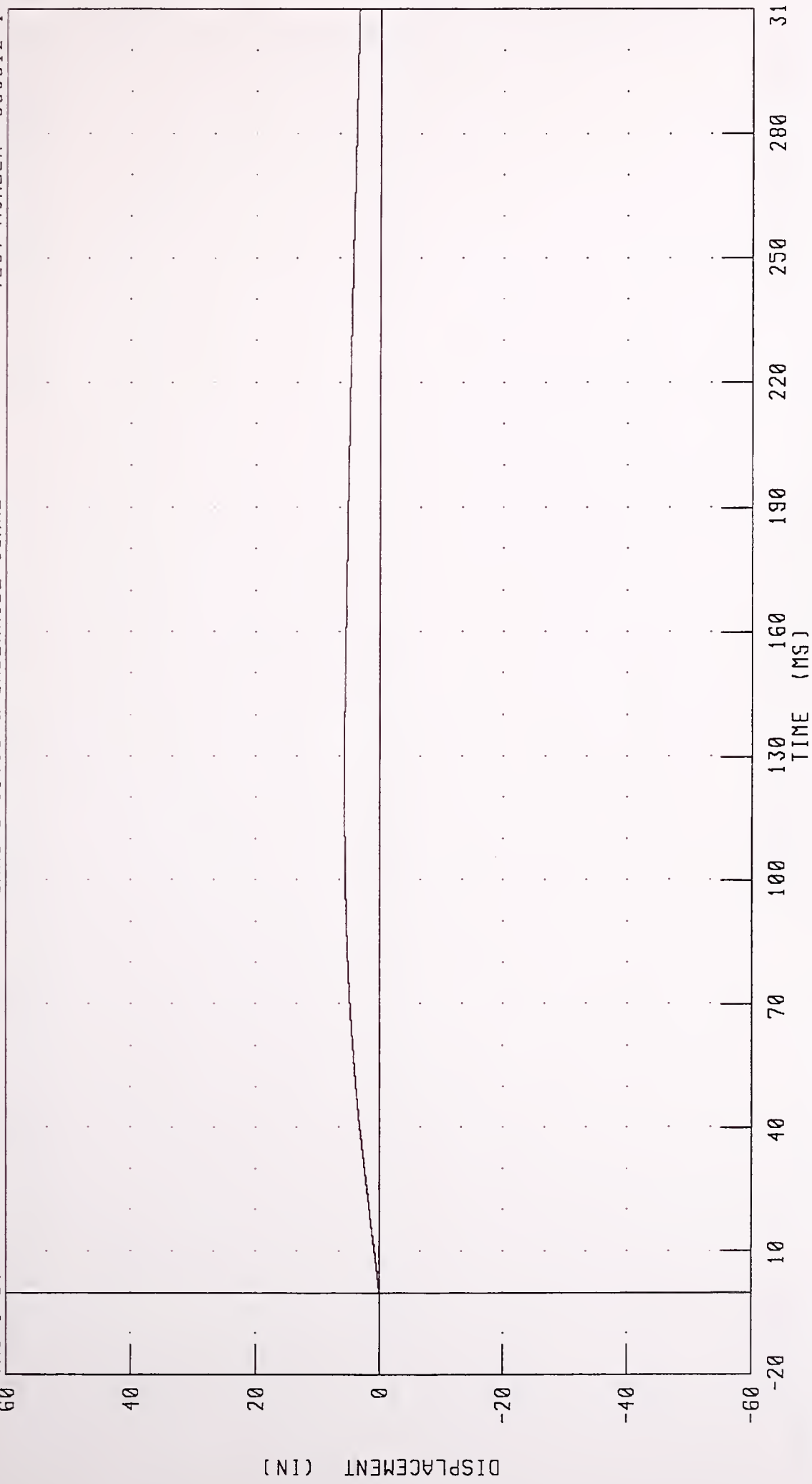
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1

LEFT REAR SILL X-AXIS DISPLACEMENT

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

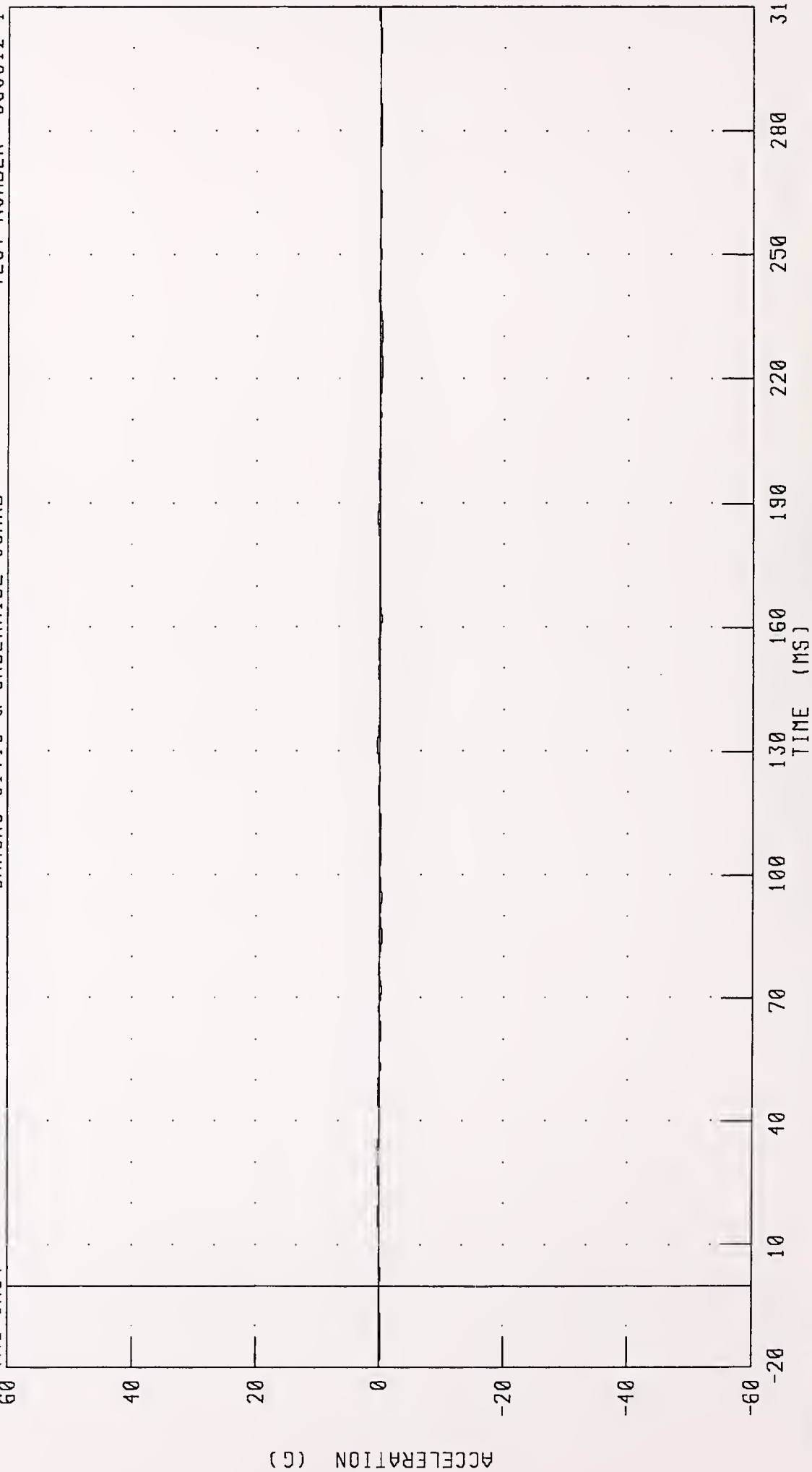


CHANNEL: LRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 5.74 IN @ 126.63 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
LEFT REAR SILL Y-AXIS ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 0.37 G @ 131.63 MS; -0.35 G @ 222.50 MS

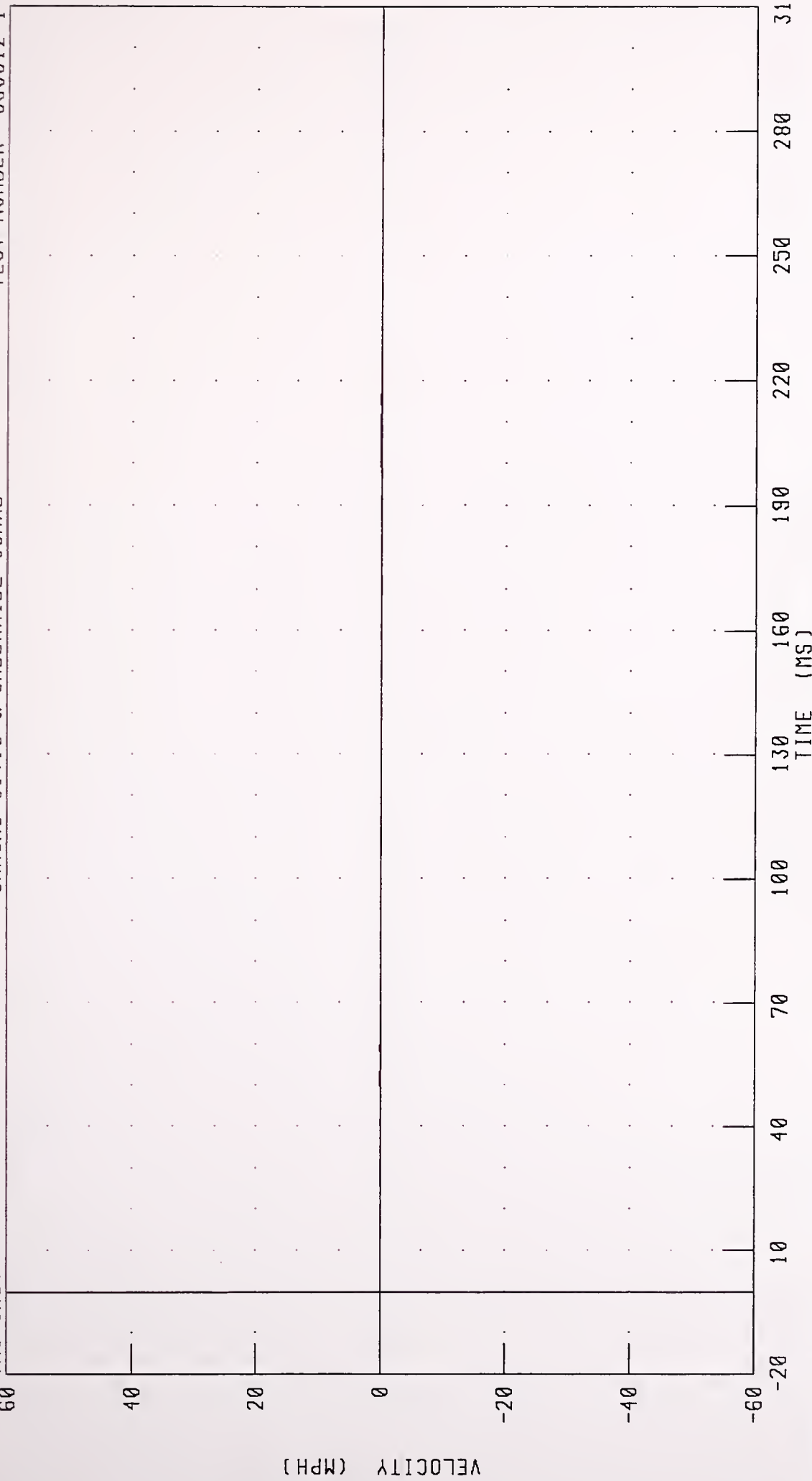
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1

LEFT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-1

TRC INC.

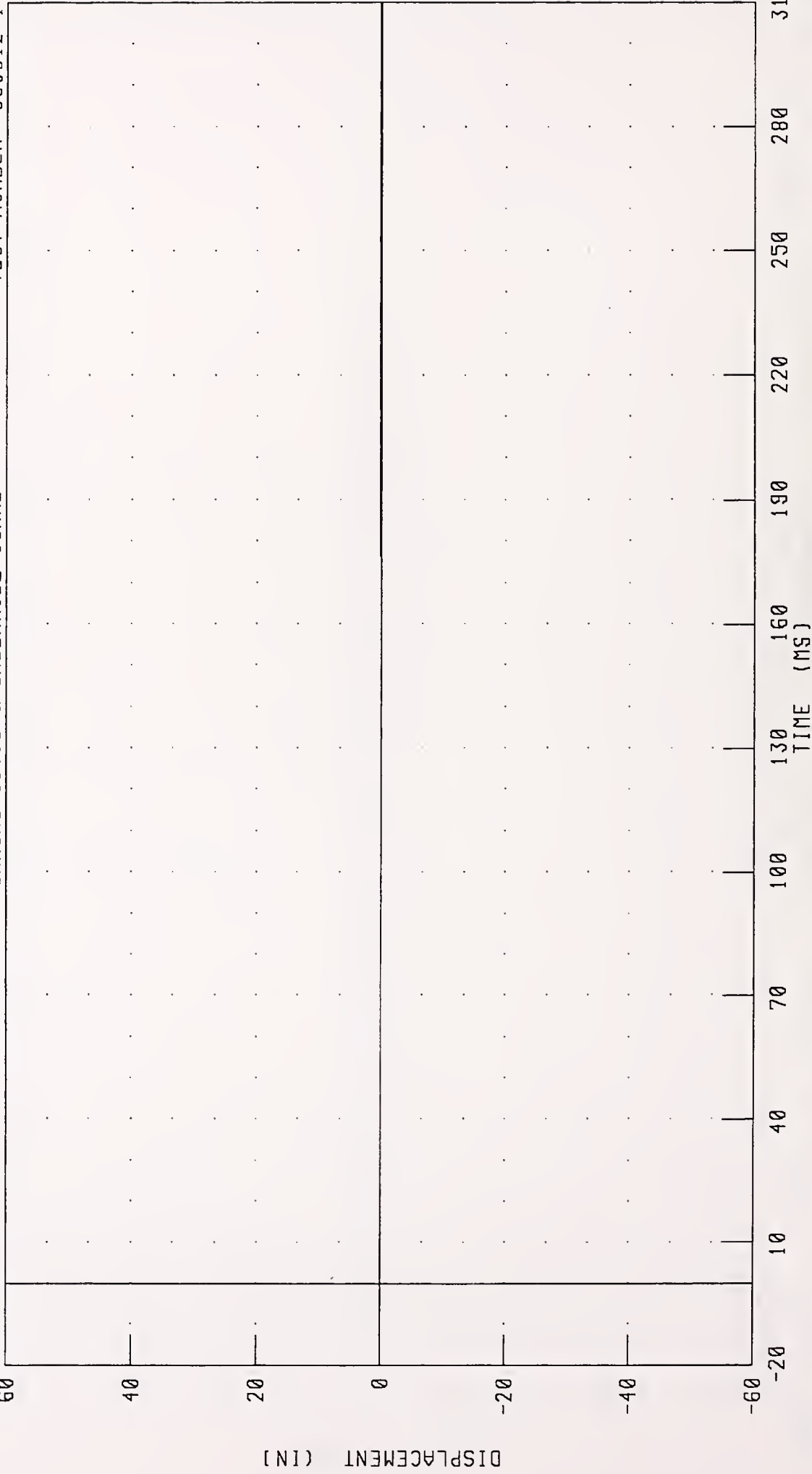


CHANNEL: LRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.10 MPH @ 209.88 MS; -0.08 MPH @ 305.50 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
LEFT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



CHANNEL: LRSYD1 FILTER: CH. CLASS 180

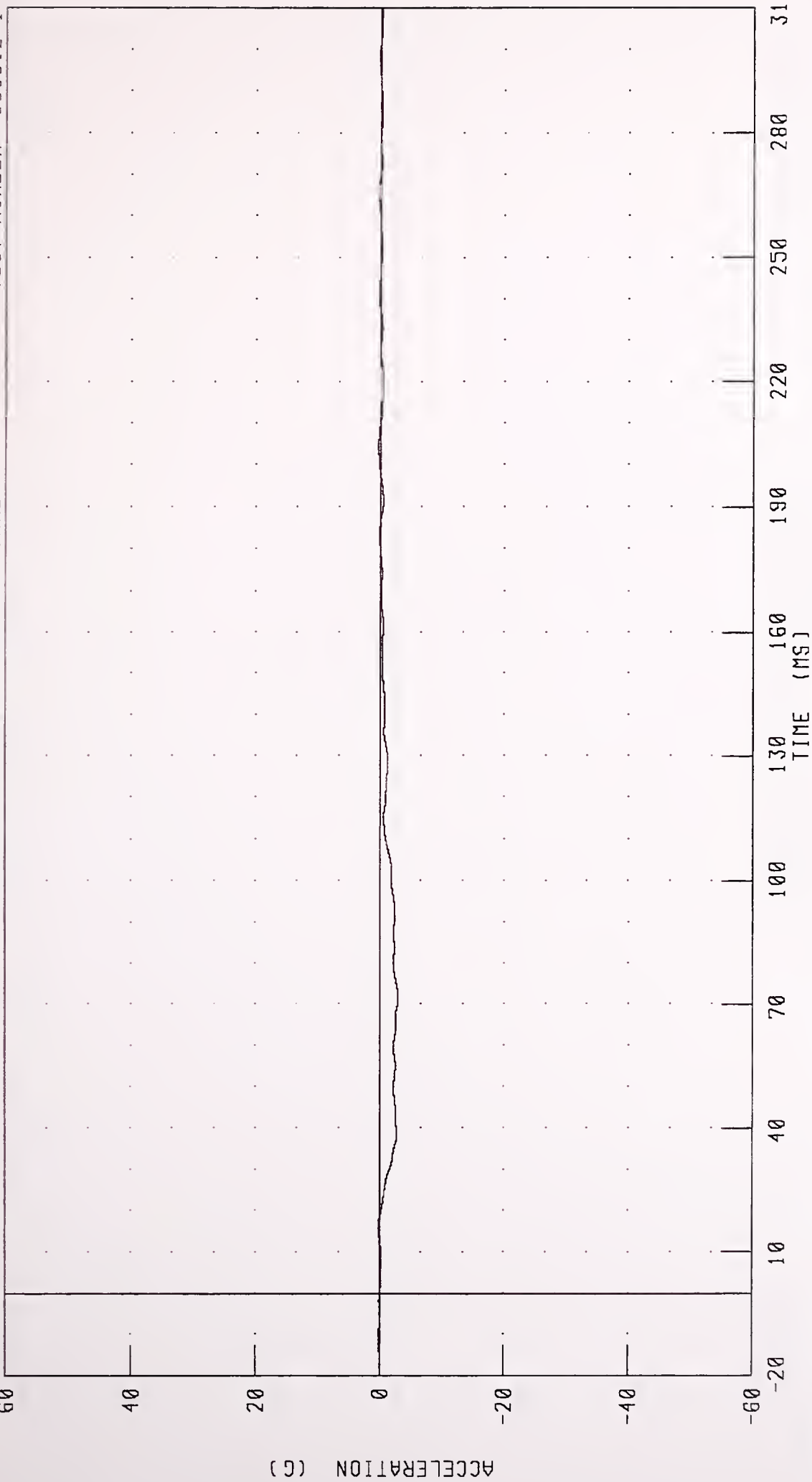
PEAK DATA: 0.17 IN @ 233.88 MS; 0.00 IN @ 17.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
RIGHT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-1

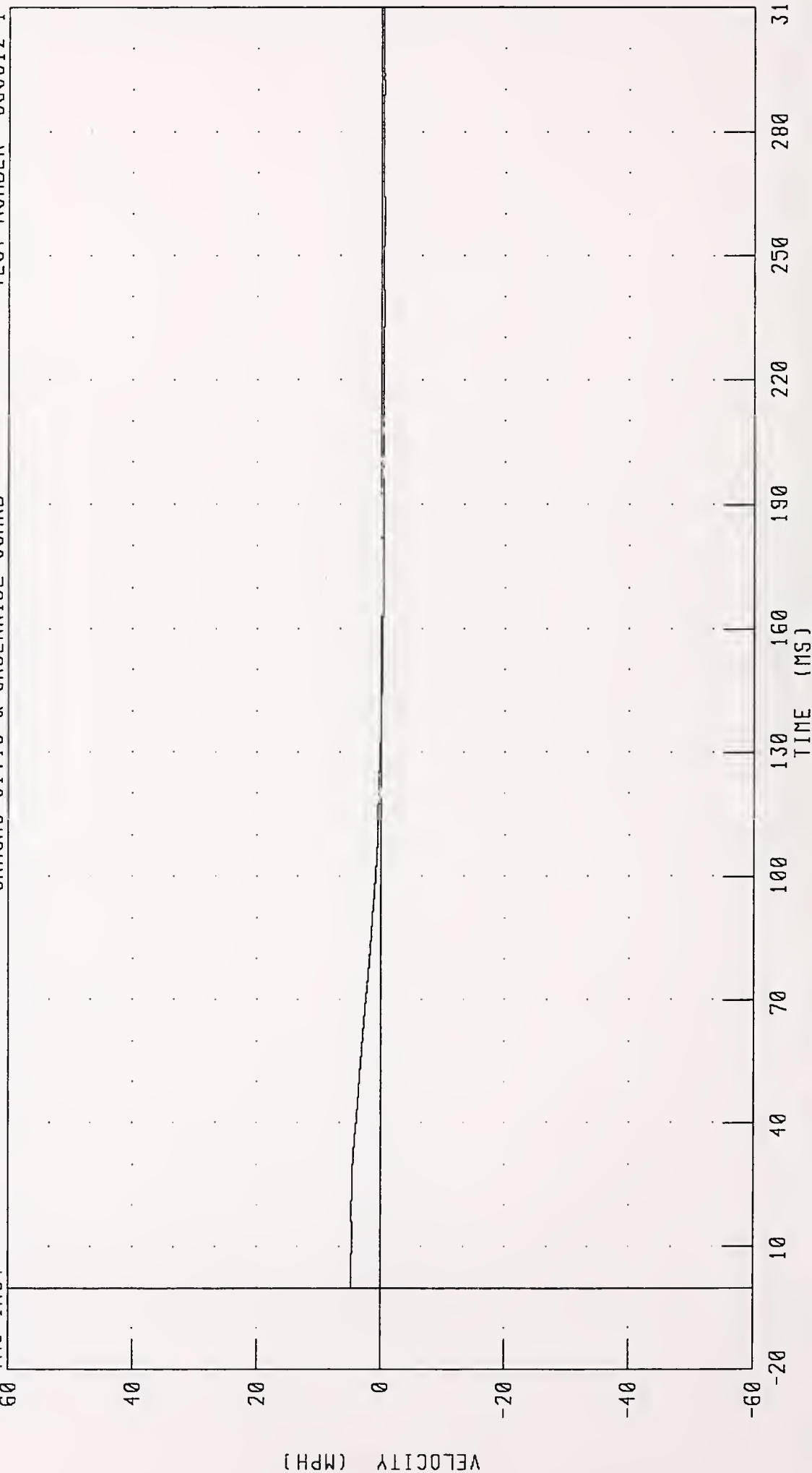


CHANNEL: RRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 0.41 G @ 265.88 MS; -2.92 G @ 71.38 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
RIGHT REAR SILL X-AXIS VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



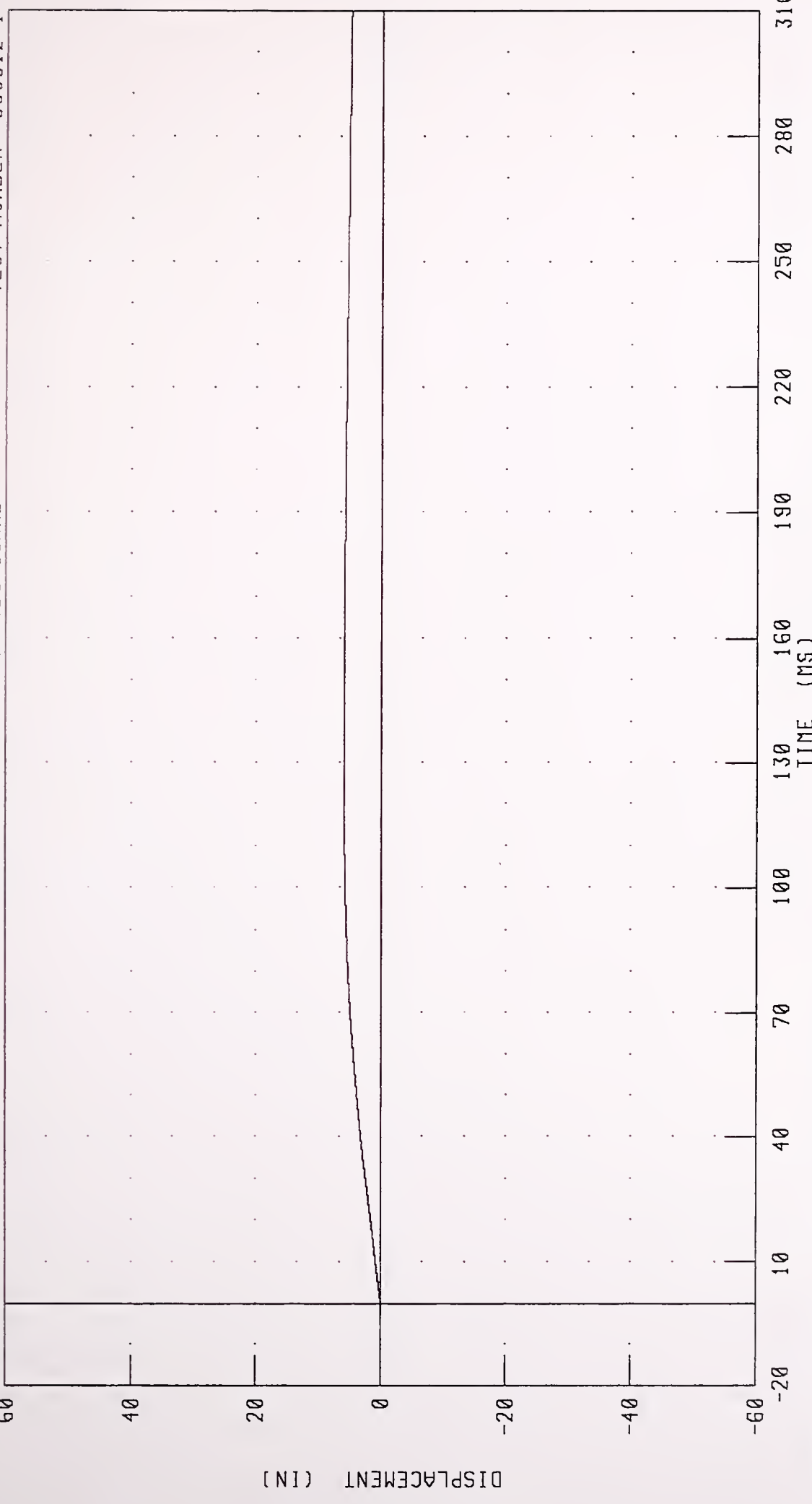
CHANNEL: RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 4.70 MPH @ 0 00 MS; -0.43 MPH @ 237.50 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 1
 RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1

TRC INC.

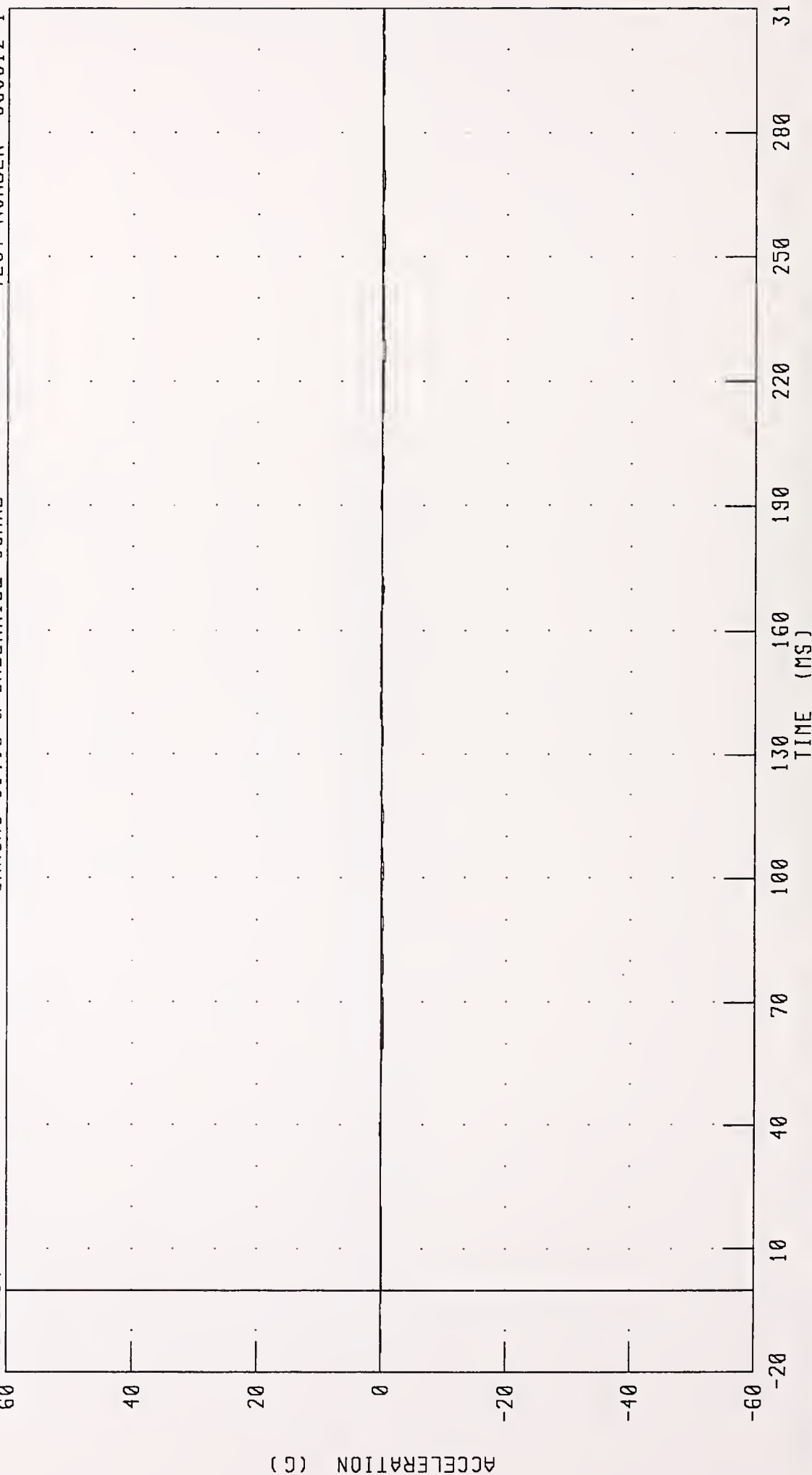


CHANNEL: RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 6.01 IN @ 139.25 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 RIGHT REAR SILL Y-AXIS ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



CHANNEL: RRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 0.26 G @ 152.00 MS; -0.37 G @ 65.00 MS

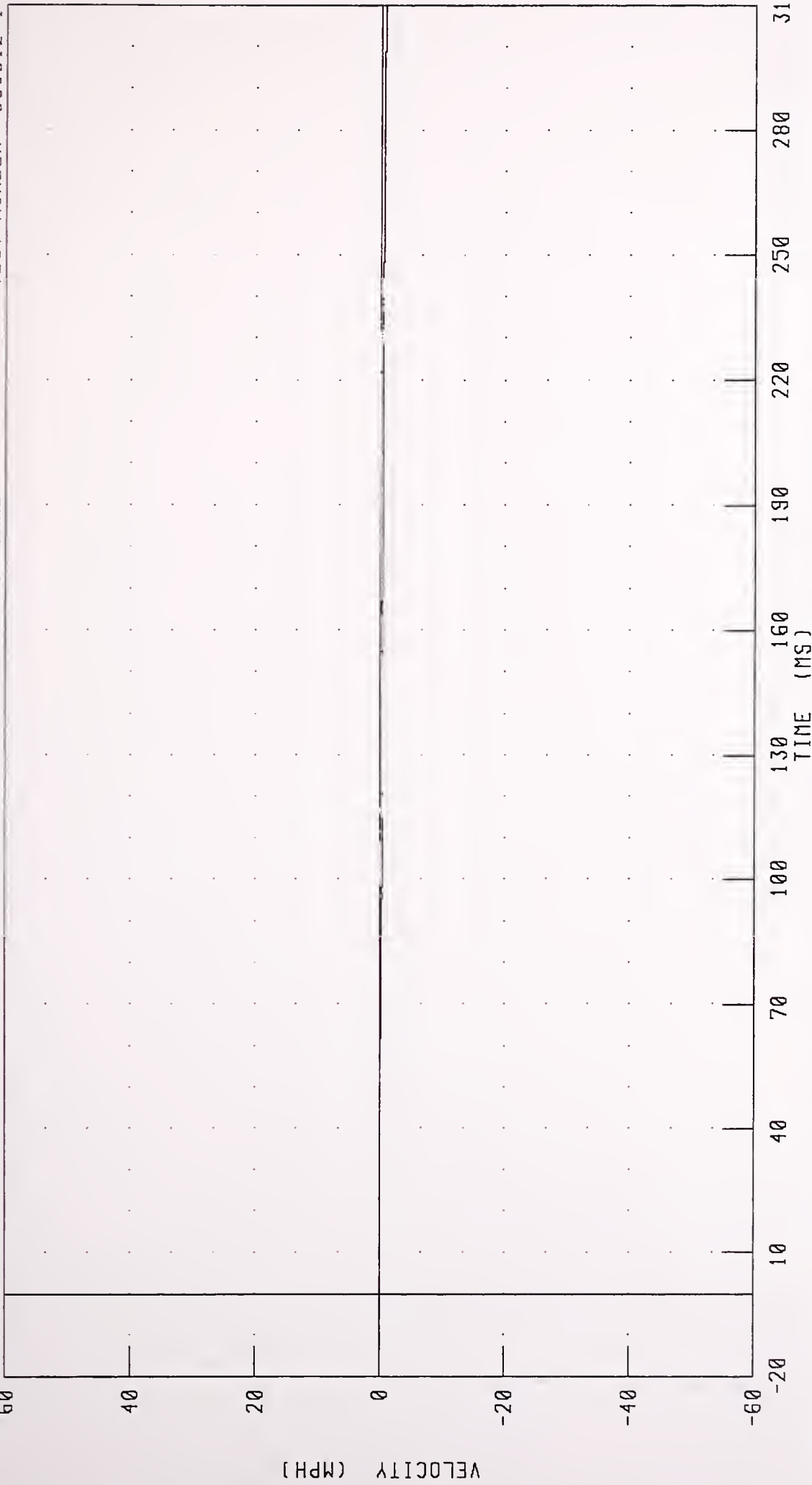
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1

RIGHT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-1



CHANNEL: RRSYV1 FILTER: CH. CLASS 180

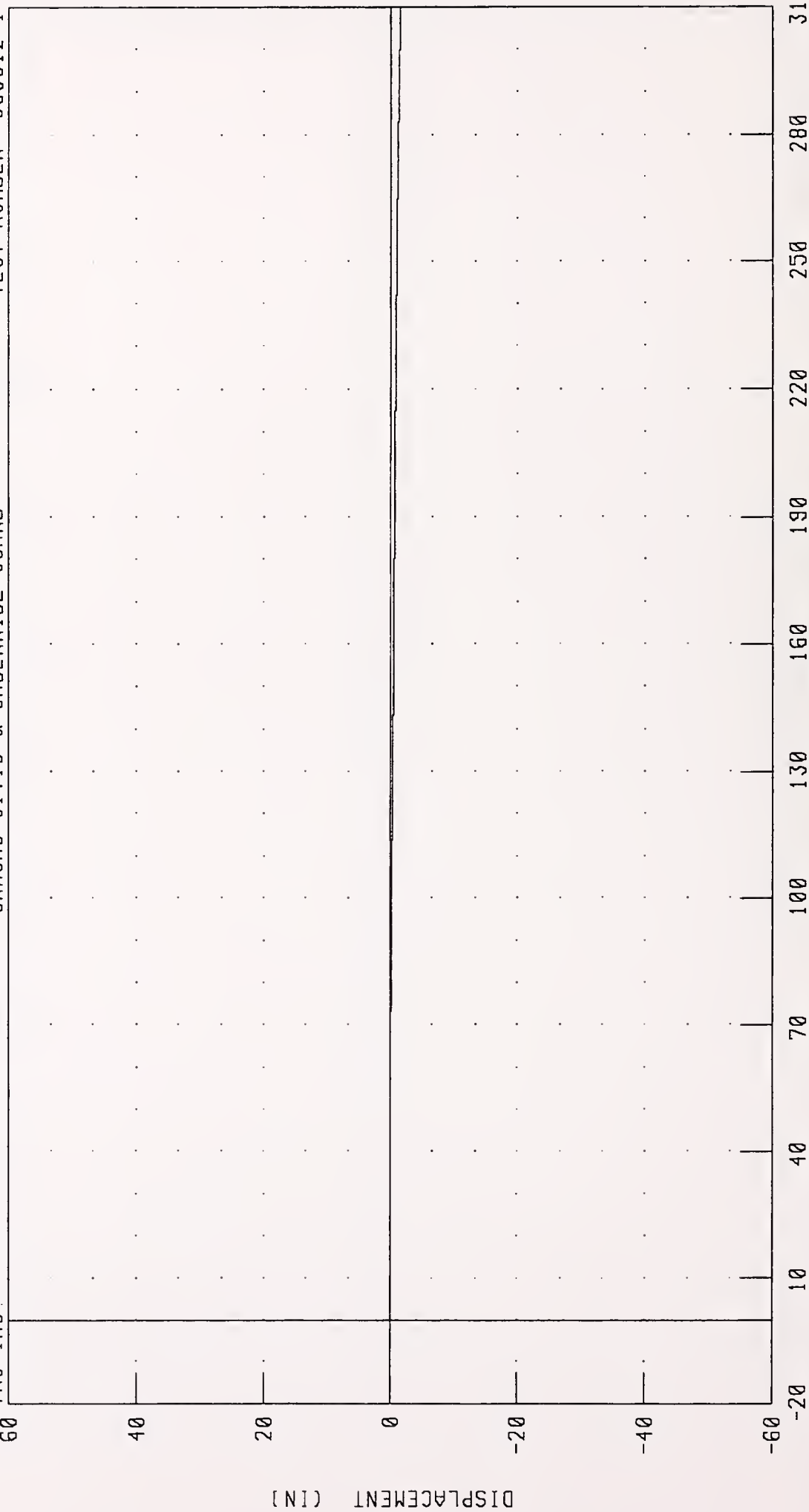
PEAK DATA: 0.00 MPH @ 0.50 MS; -0.62 MPH @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 RIGHT REAR SILL Y-AXIS DISPLACEMENT

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL: RRSYD1 FILTER: CH. CLASS 180

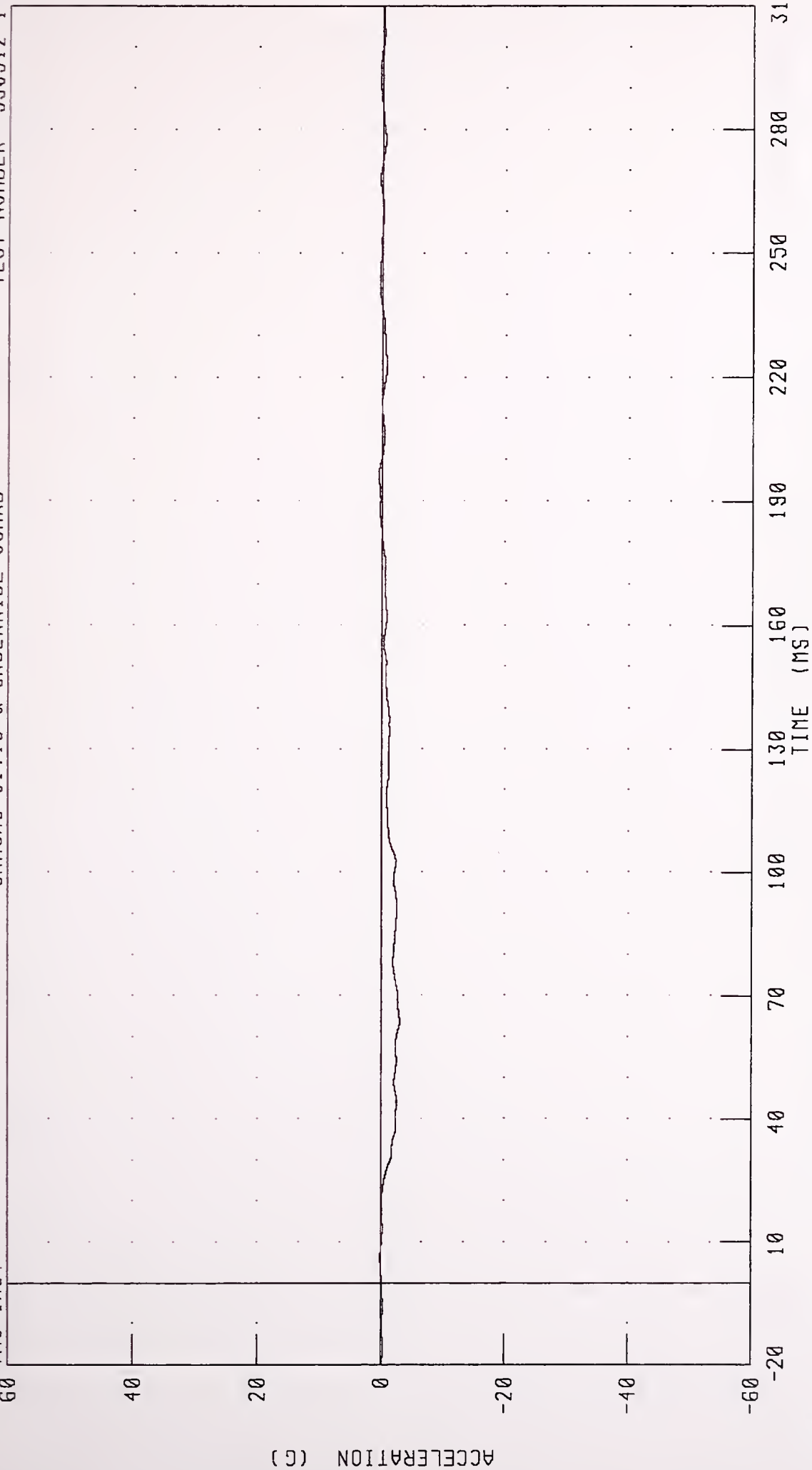
PEAK DATA: 0.00 IN @ 0.88 MS; -1.53 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

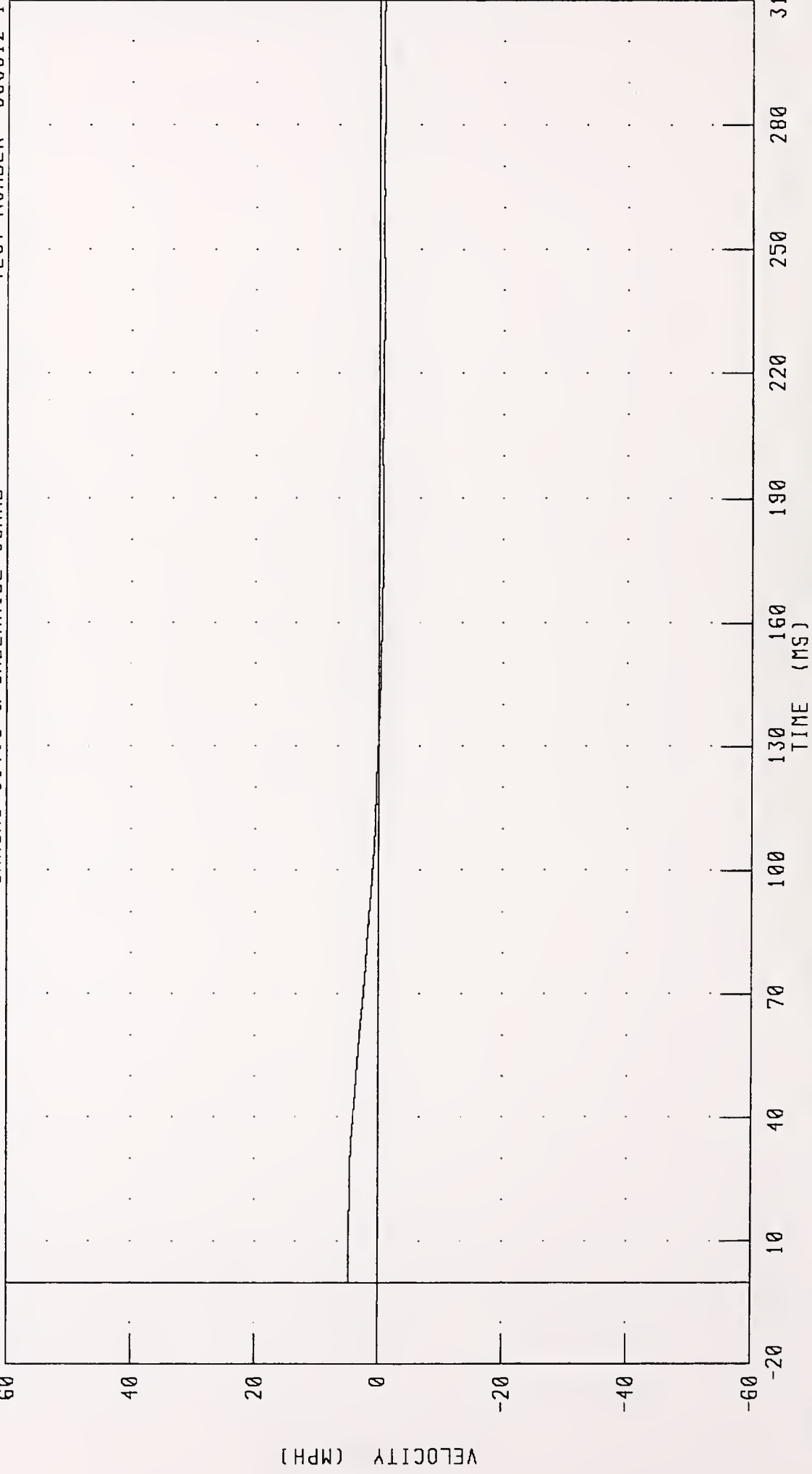


CHANNEL: VCGXG1 FILTER: CH CLASS 60

PEAK DATA: 0.51 G @ 196.38 MS; -2.98 G @ 63.75 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 4.70 MPH @ 8.75 MS; -0.82 MPH @ 237.38 MS

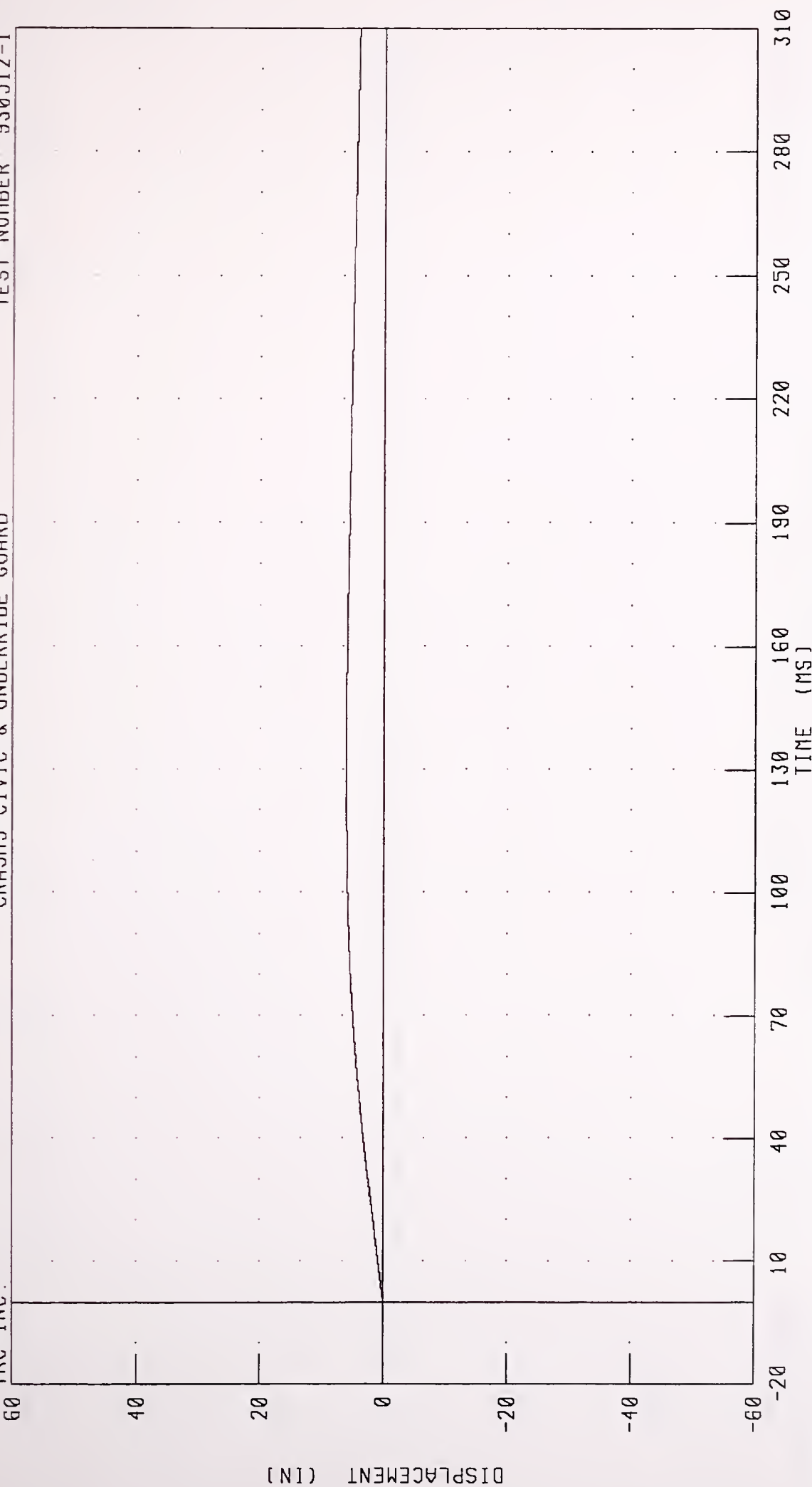
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 1

VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER 930512-1

TRC INC.



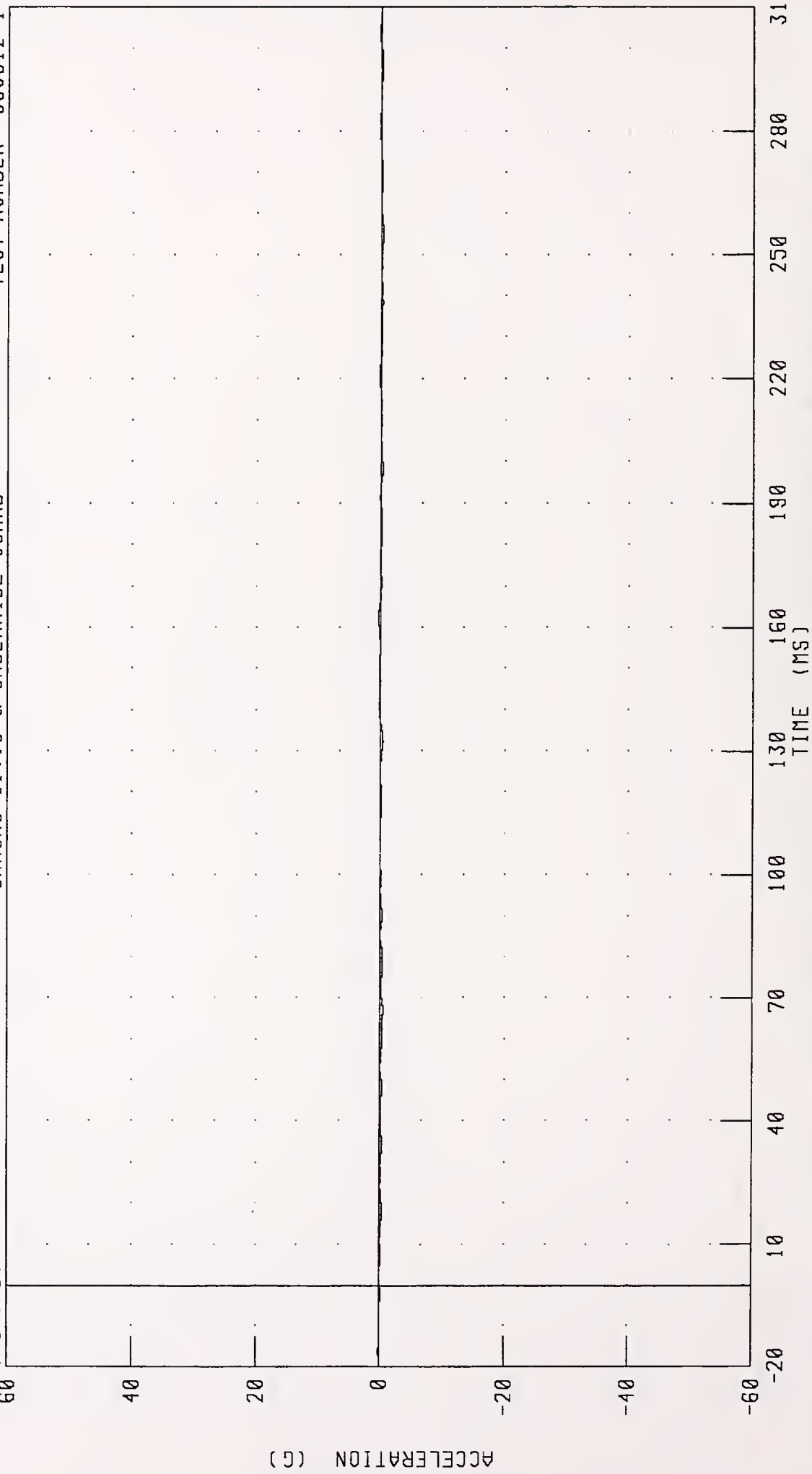
CHANNEL: VCGXD1 FILTER: CH. CLASS 180 PEAK DATA: 6.10 IN @ 133.88 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL: VCGYG1 FILTER: CH. CLASS 60

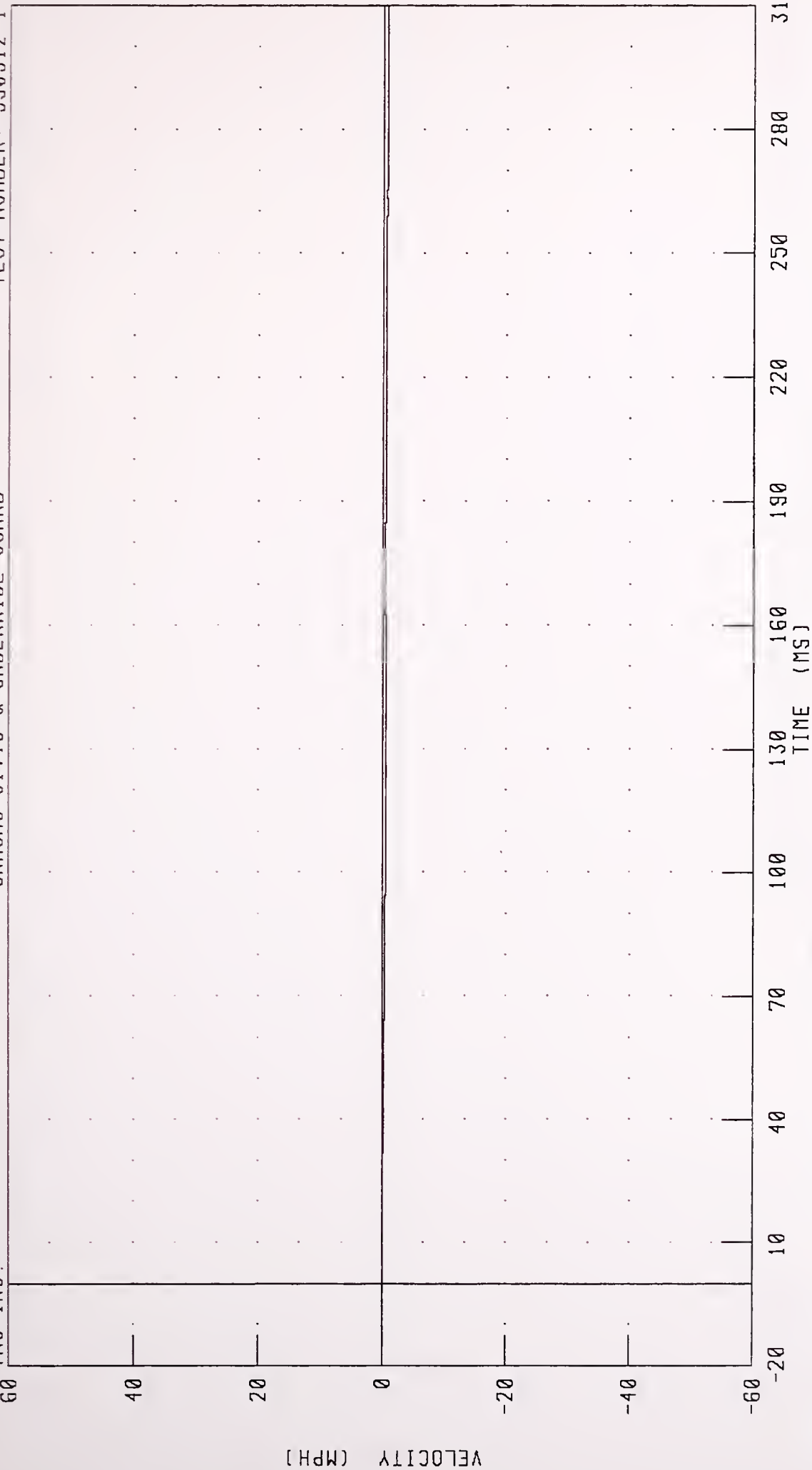
PEAK DATA: 0.38 G @ 162.38 MS; -0.44 G @ 167.25 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-1

TRC INC.



CHANNEL: VCGYV1 FILTER: CH. CLASS 180

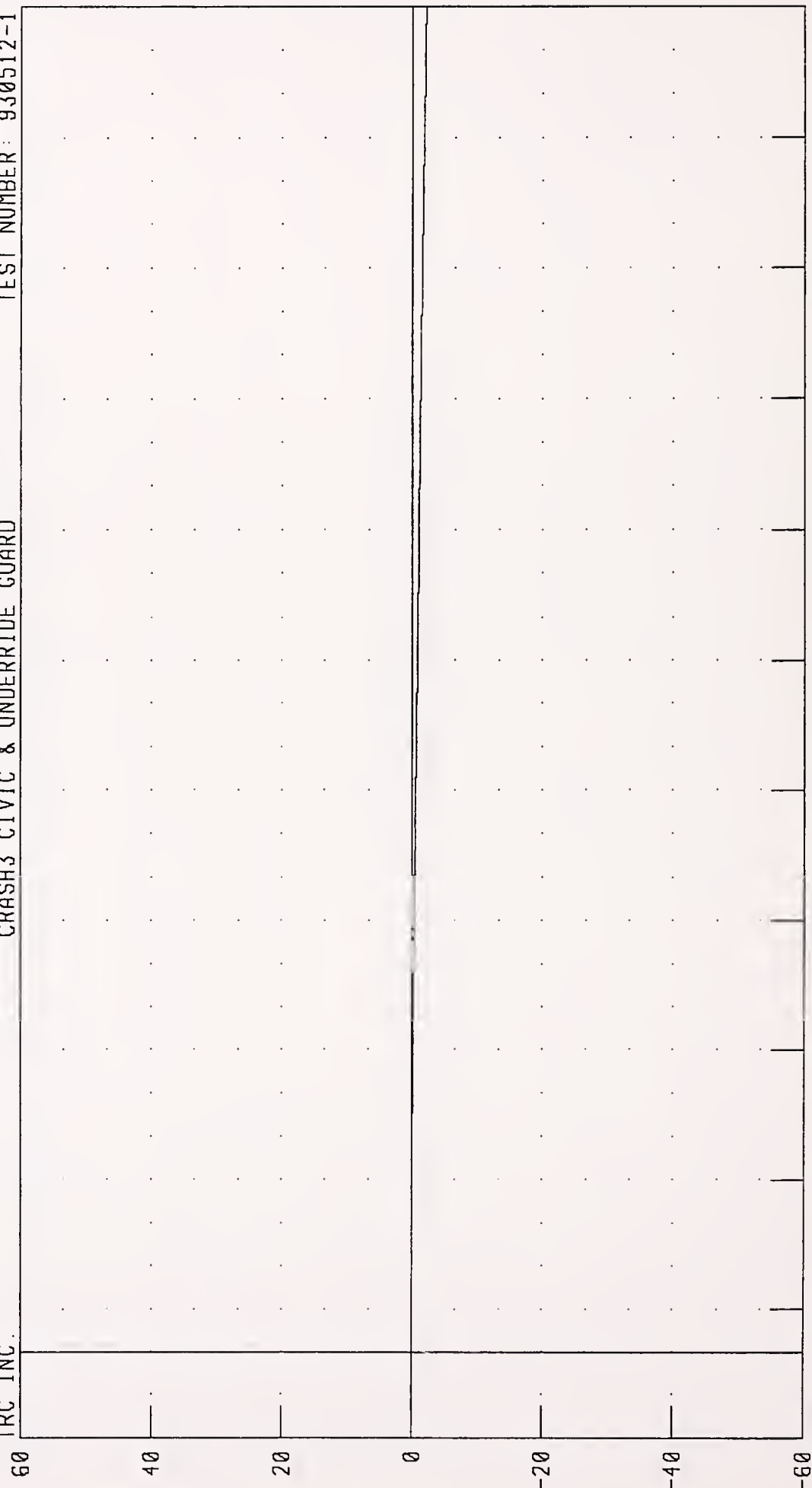
PEAK DATA: 0.01 MPH @ 4.25 MS; -0.61 MPH @ 300.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL: VCGYD1 FILTER: CH. CLASS 180

TIME (MS)

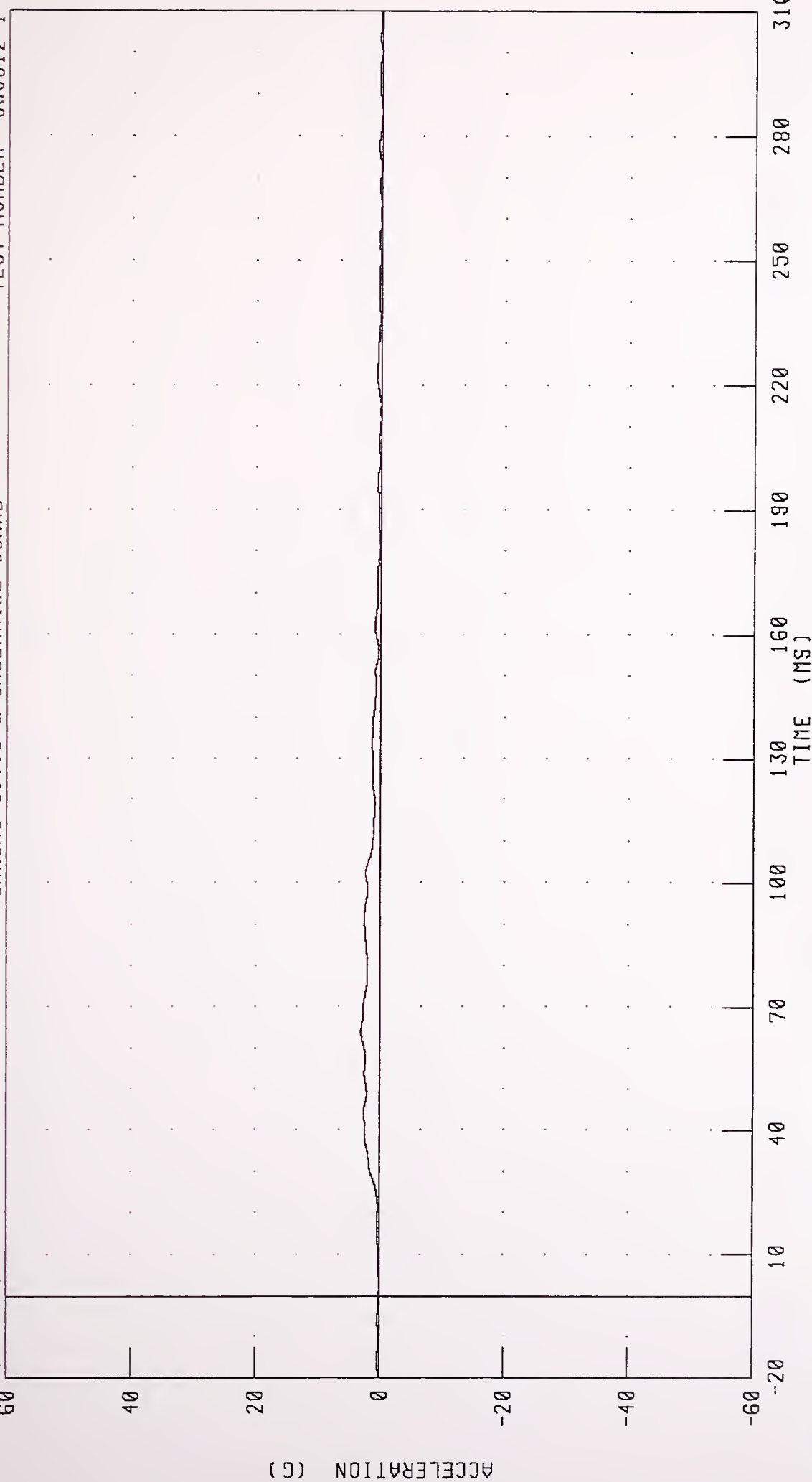
PEAK DATA: 0.00 IN @ 5.75 MS; -2.15 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

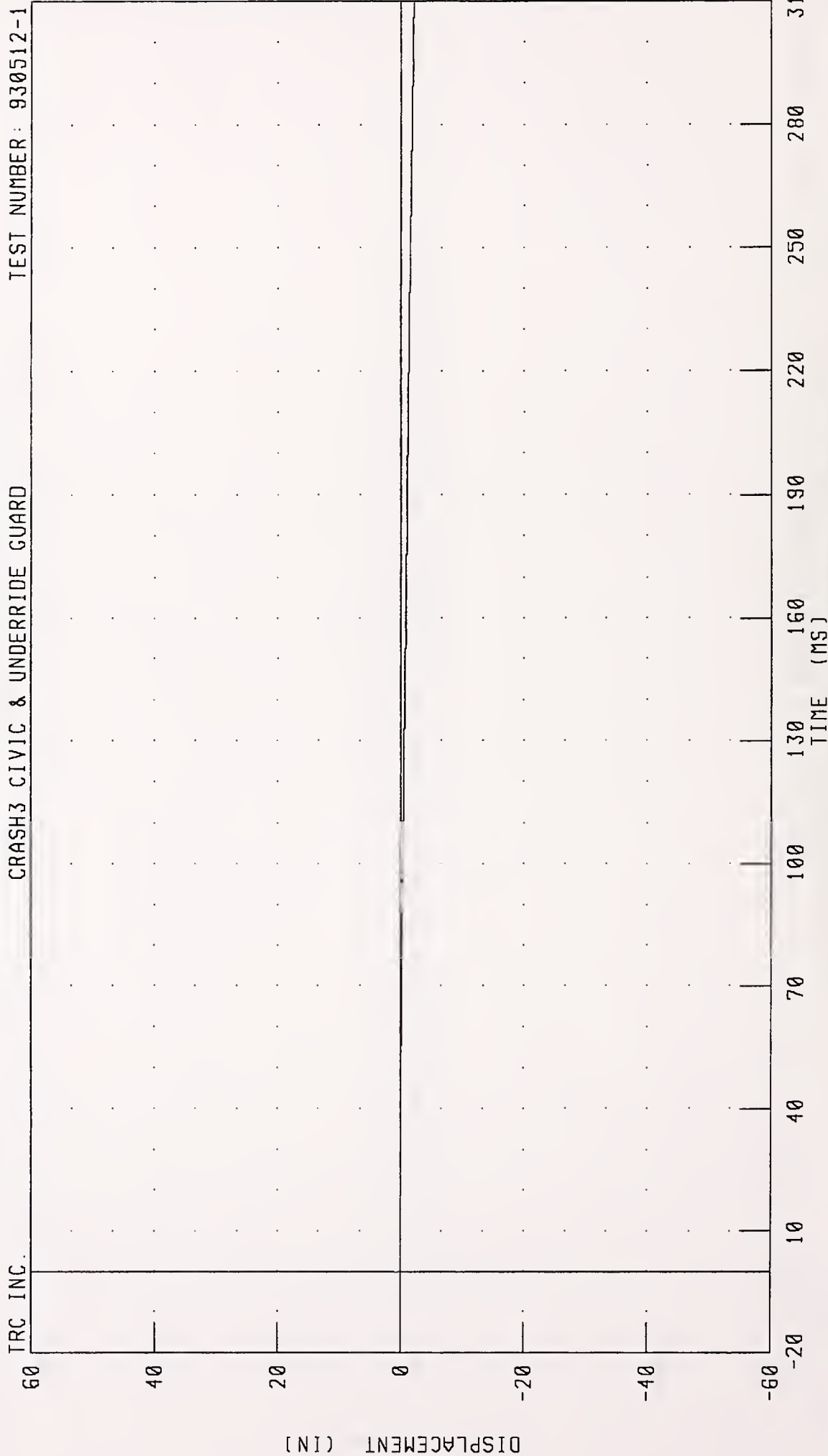


CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 3.00 G @ 63.88 MS; 0.00 G @ 3.75 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



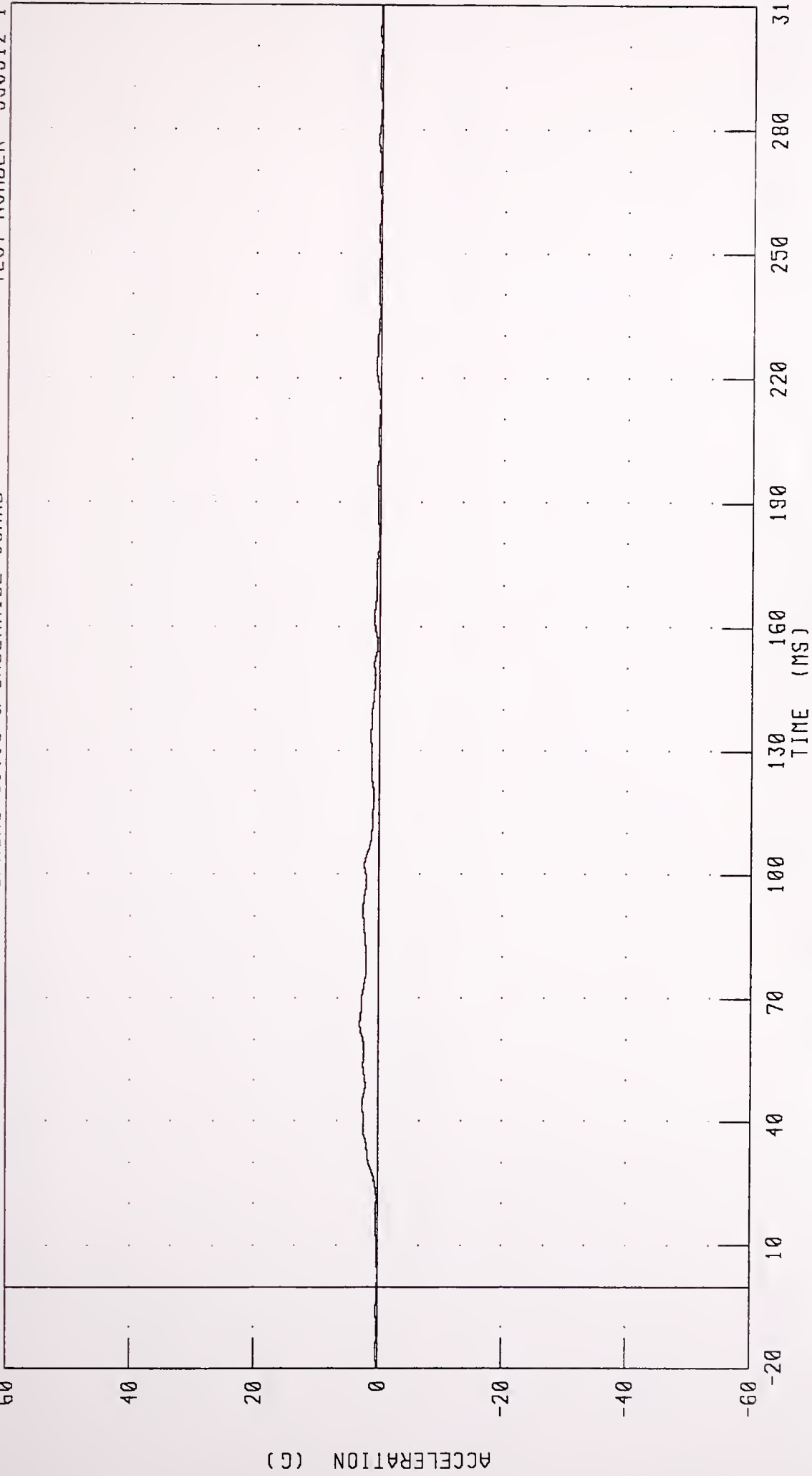
CHANNEL: VCCYD1 FILTER: CH. CLASS 180

PEAK DATA: 0 00 IN @ 5.75 MS; -2.15 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 1
VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD
TEST NUMBER: 930512-1

TRC INC.



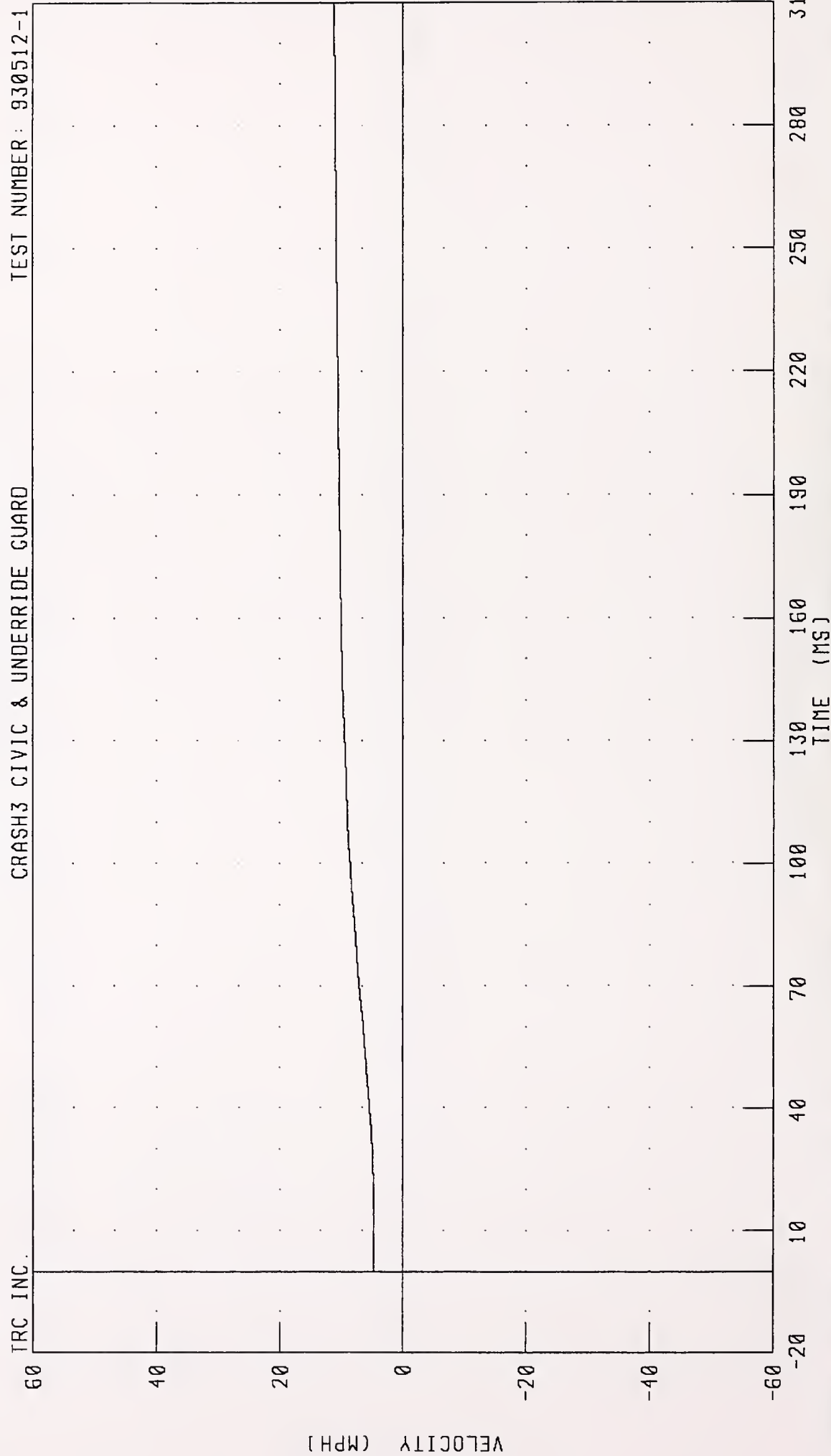
CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 3.00 G @ 63.88 MS; 0.00 G @ 3.75 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
 VEHICLE CENTER OF GRAVITY RESULTANT VELOCITY

TEST NUMBER: 930512-1

CRASH3 CIVIC & UNDERRIDE GUARD

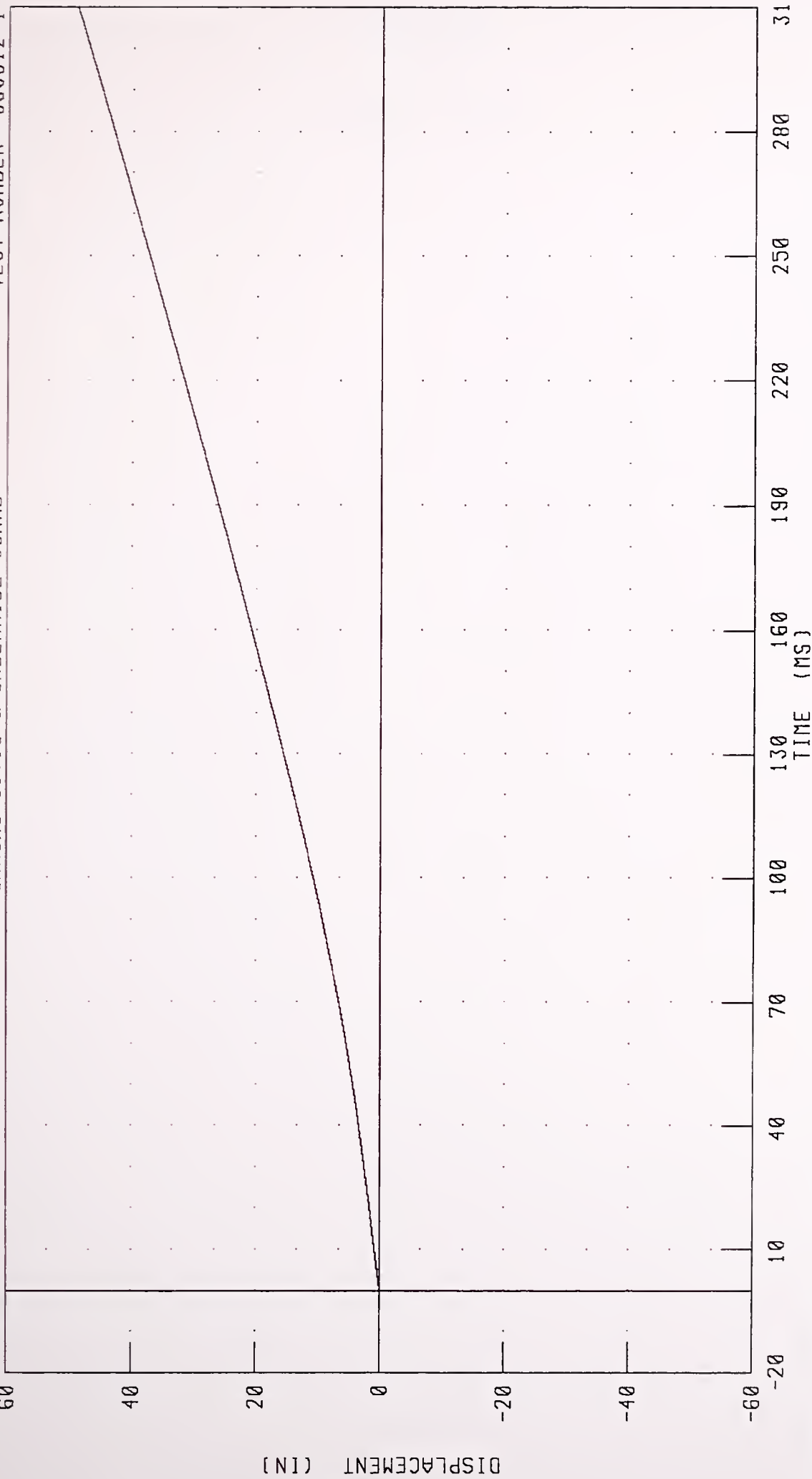


CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 11.17 MPH @ 310.00 MS; 4.70 MPH @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 1
VEHICLE CENTER OF GRAVITY RESULTANT DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-1



CHANNEL: VCGRD1 FILTER: CH. CLASS 180

PEAK DATA: 48.92 IN @ 310.00 MS; 0.00 IN @ 0.00 MS



DATA PLOTS

TEST NO. 930512-2

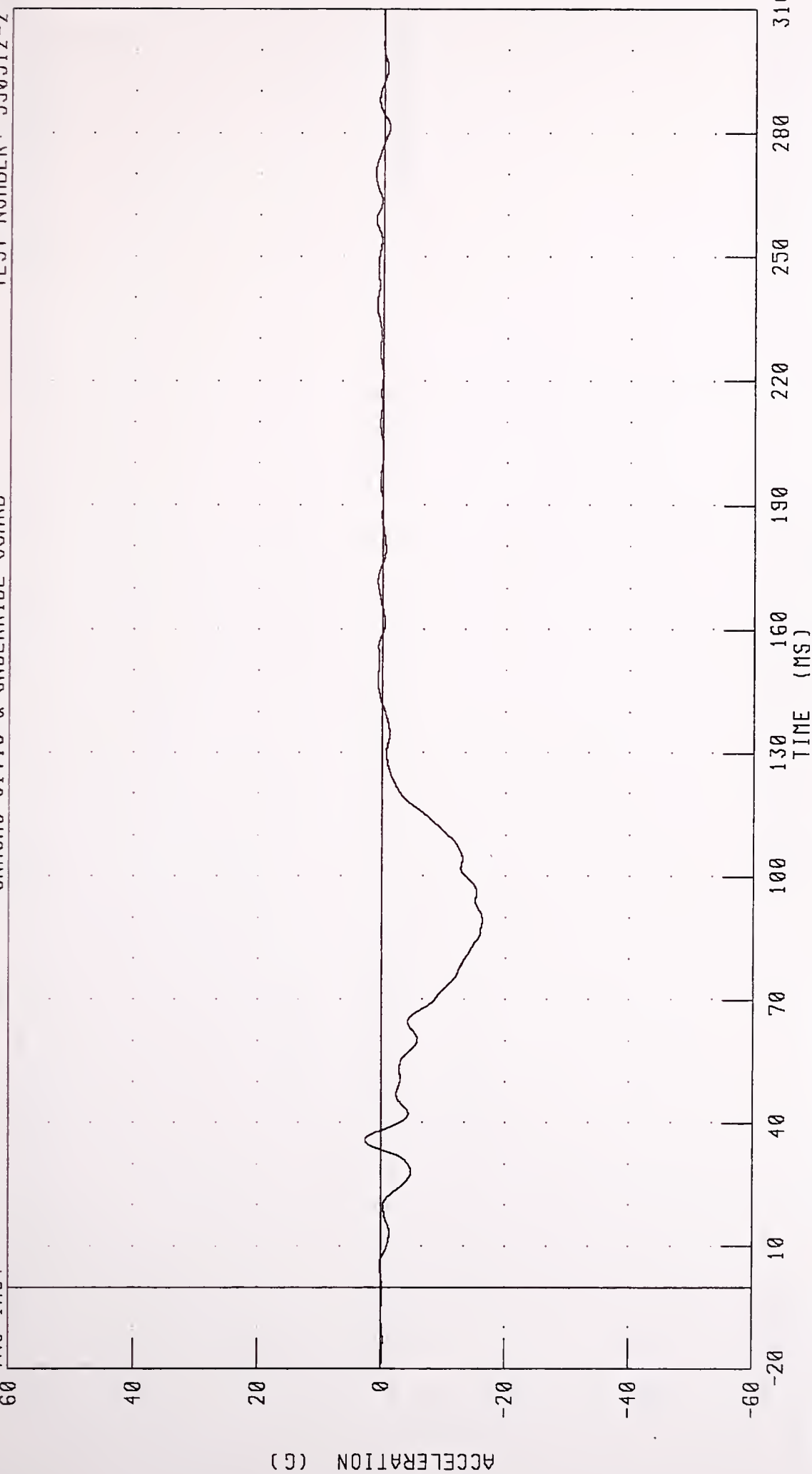
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

LEFT REAR SILL X-AXIS ACCELERATION

TEST NUMBER: 930512-2

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL: LRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.60 G @ 35.75 MS; -16.21 G @ 89.25 MS

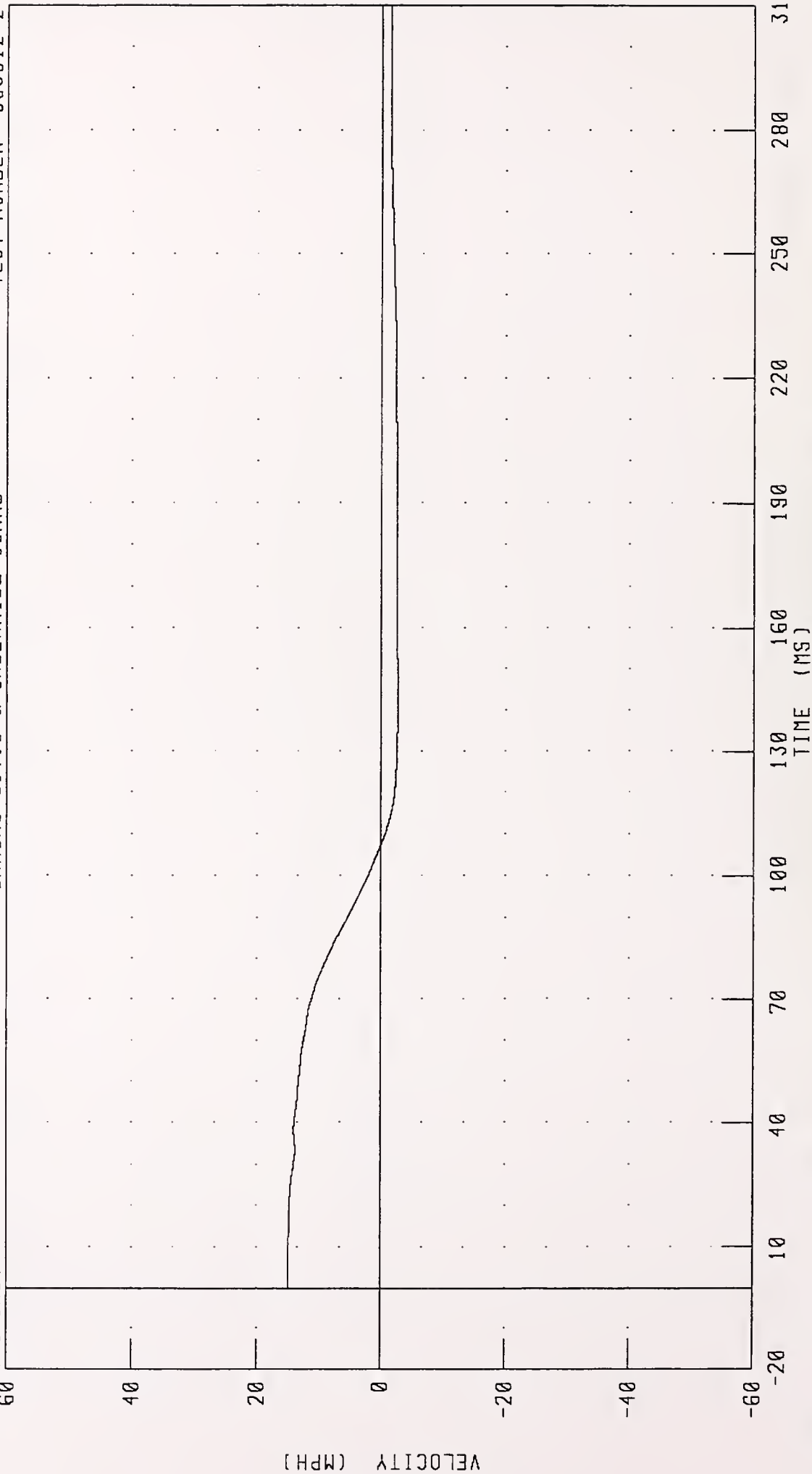
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2

LEFT REAR SILL X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-2

TRC INC.



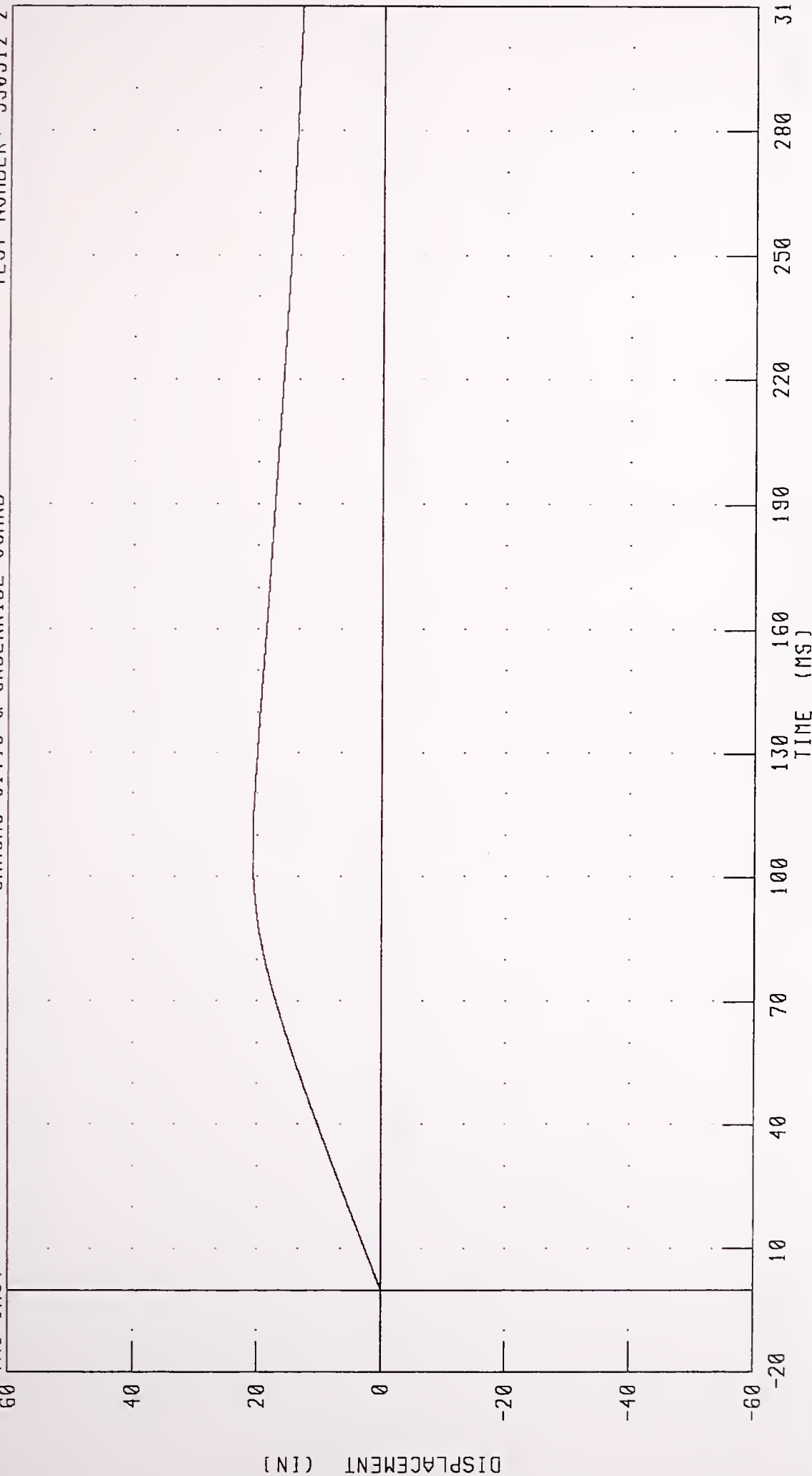
CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 14.92 MPH @ 7.25 MS; -2.75 MPH @ 141.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD
TEST NUMBER: 930512-2

TRC INC.



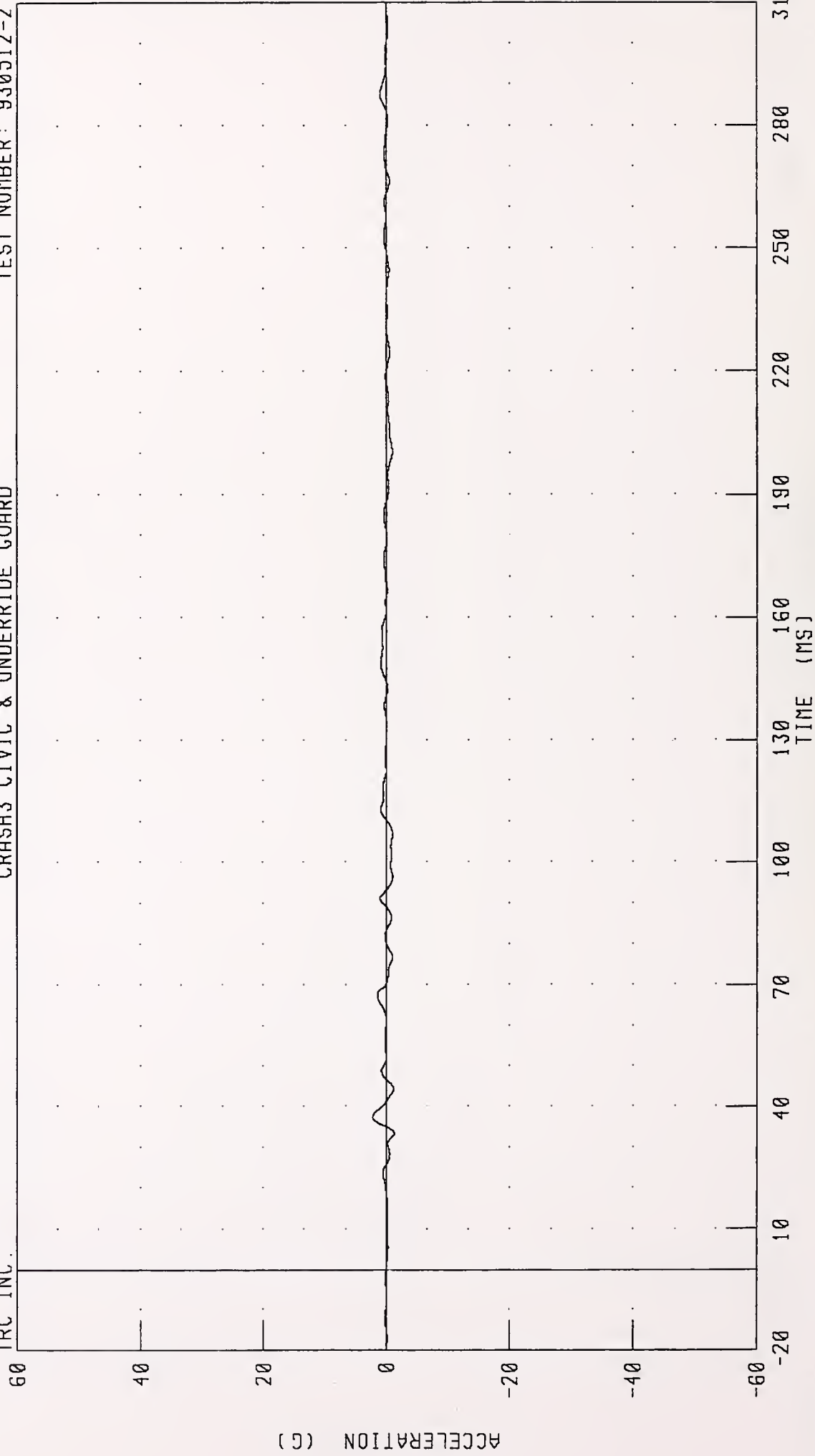
CHANNEL: LRSXD1 FILTER: CH. CLASS 180

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
LEFT REAR SILL Y-AXIS ACCELERATION

TEST NUMBER: 930512-2

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

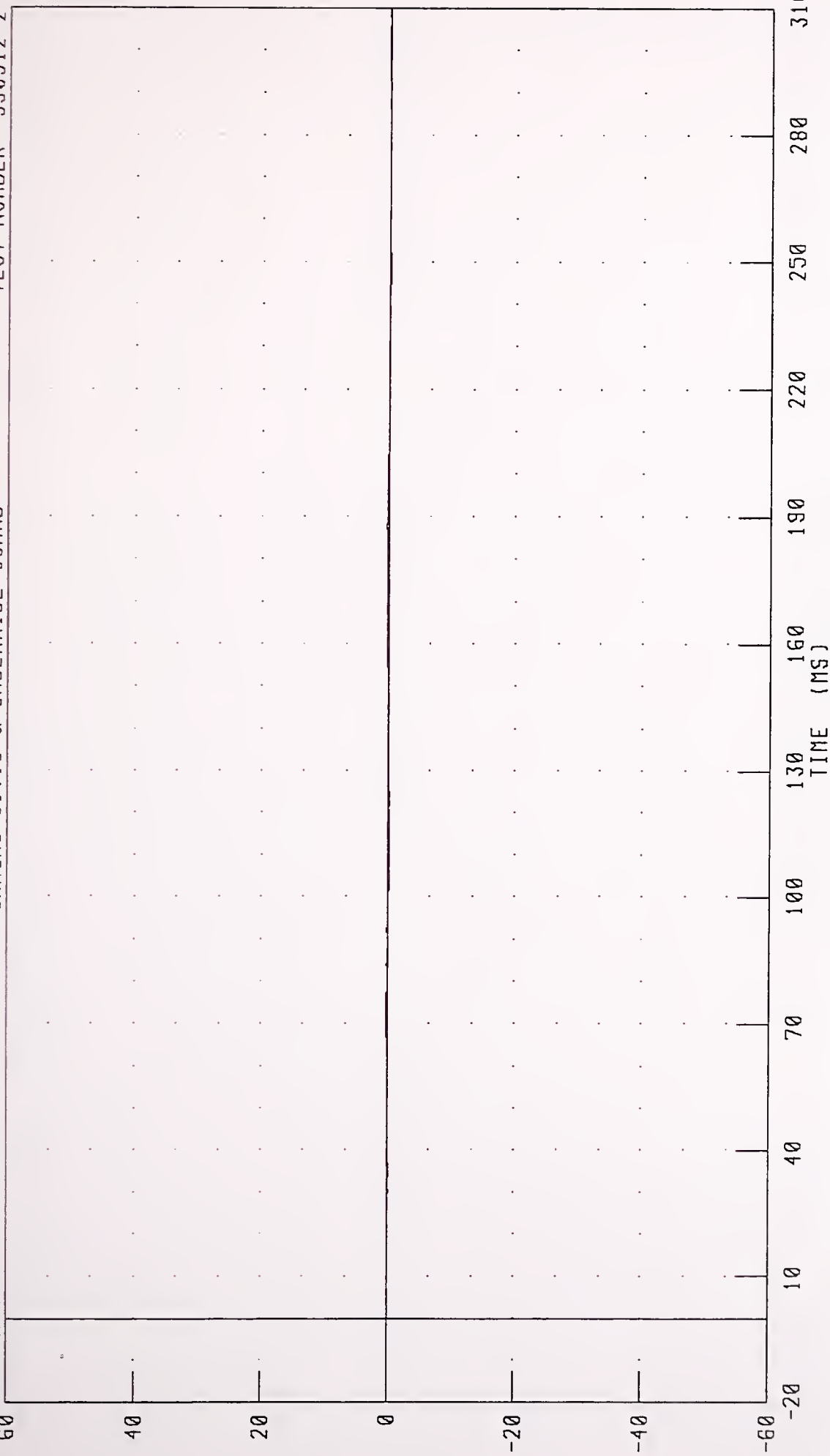
PEAK DATA: 2.25 G @ 37.50 MS; -1.29 G @ 33.50 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

LEFT REAR SILL Y-AXIS VELOCITY
CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-2

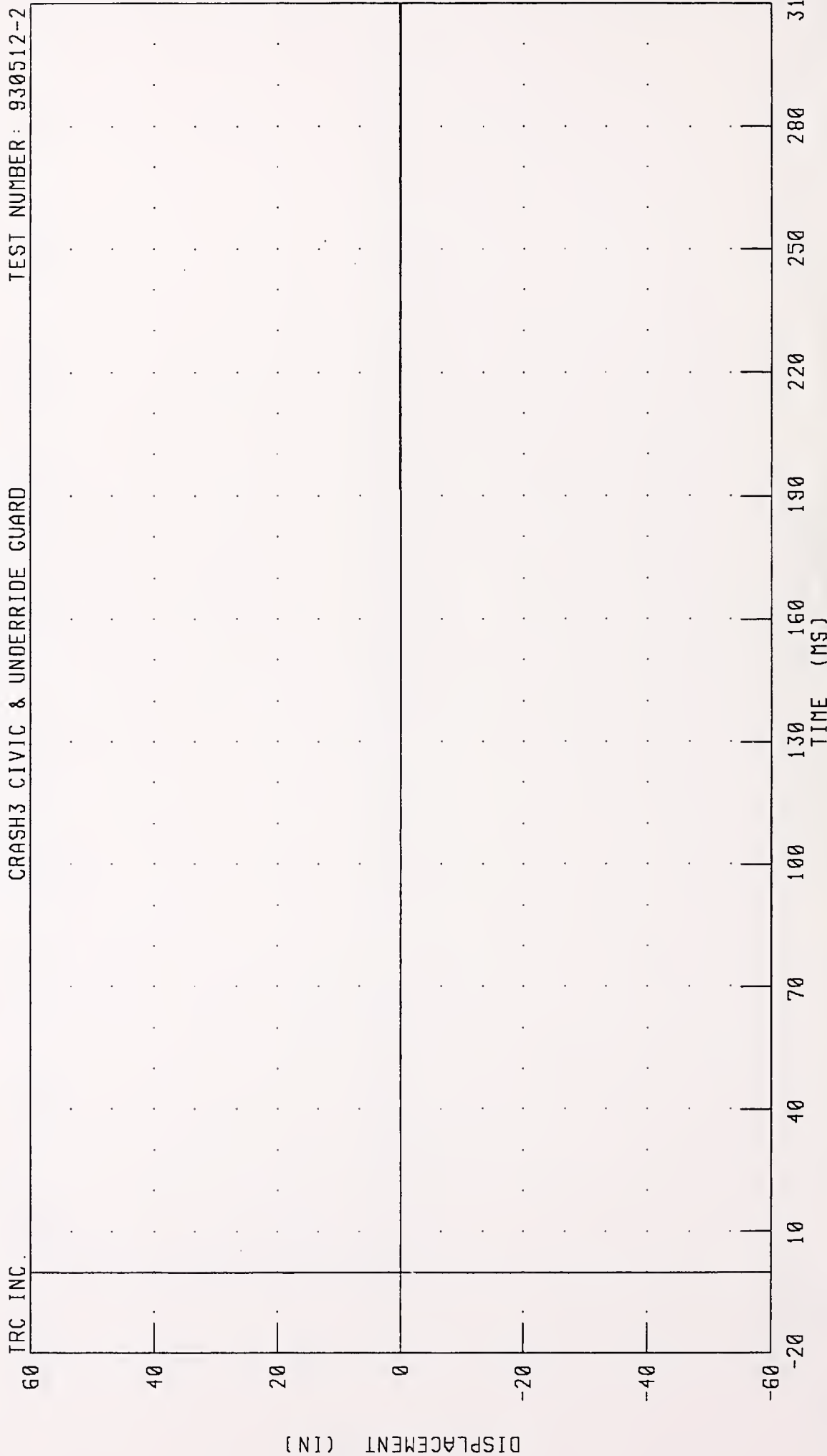
TRC INC.



CHANNEL: LRSYV1 FILTER: CH. CLASS 180

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-2



CHANNEL: LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.15 IN @ 224.00 MS; -0.04 IN @ 148.38 MS

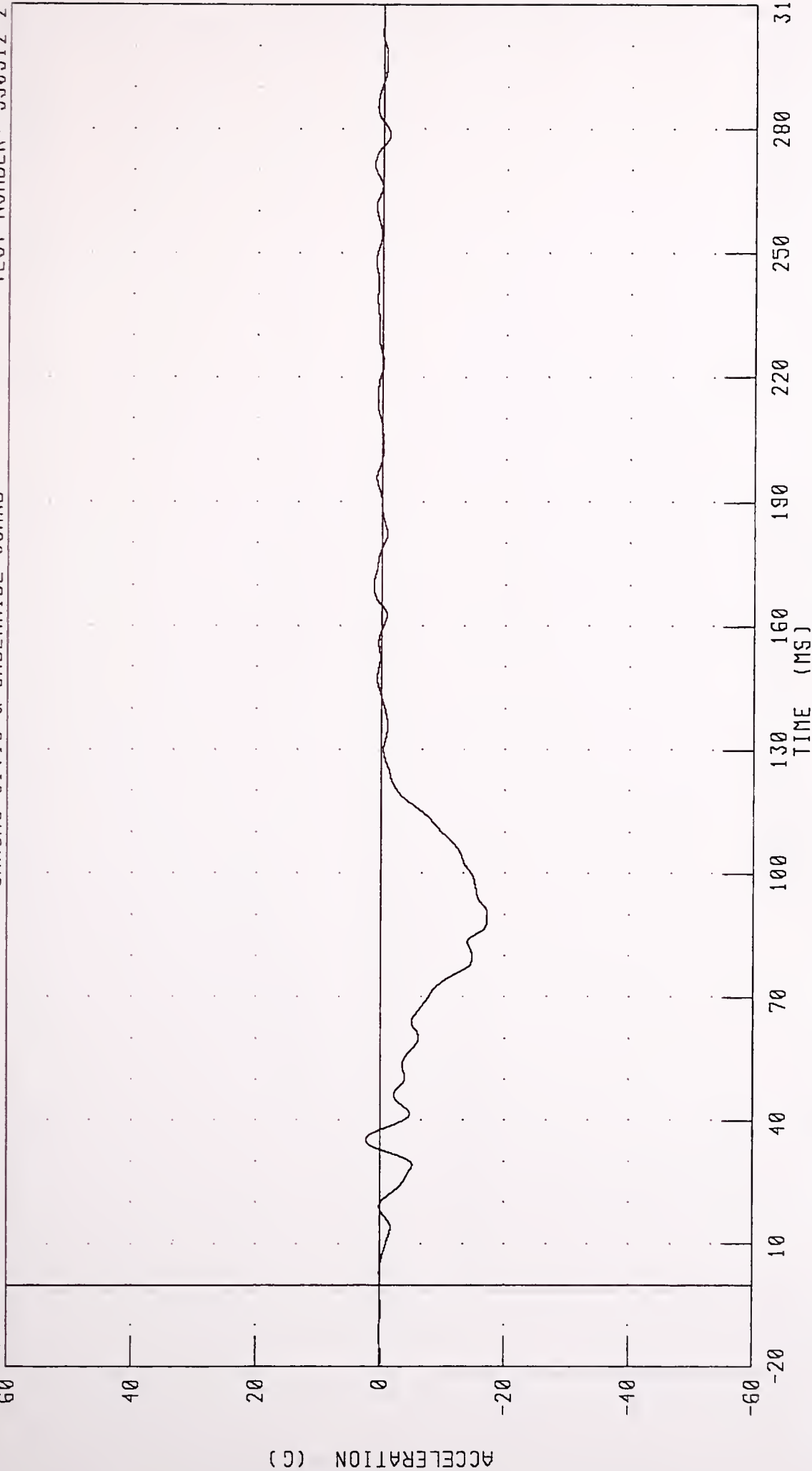
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-2



CHANNEL: RRSXG1 FILTER: CH. CLASS 60

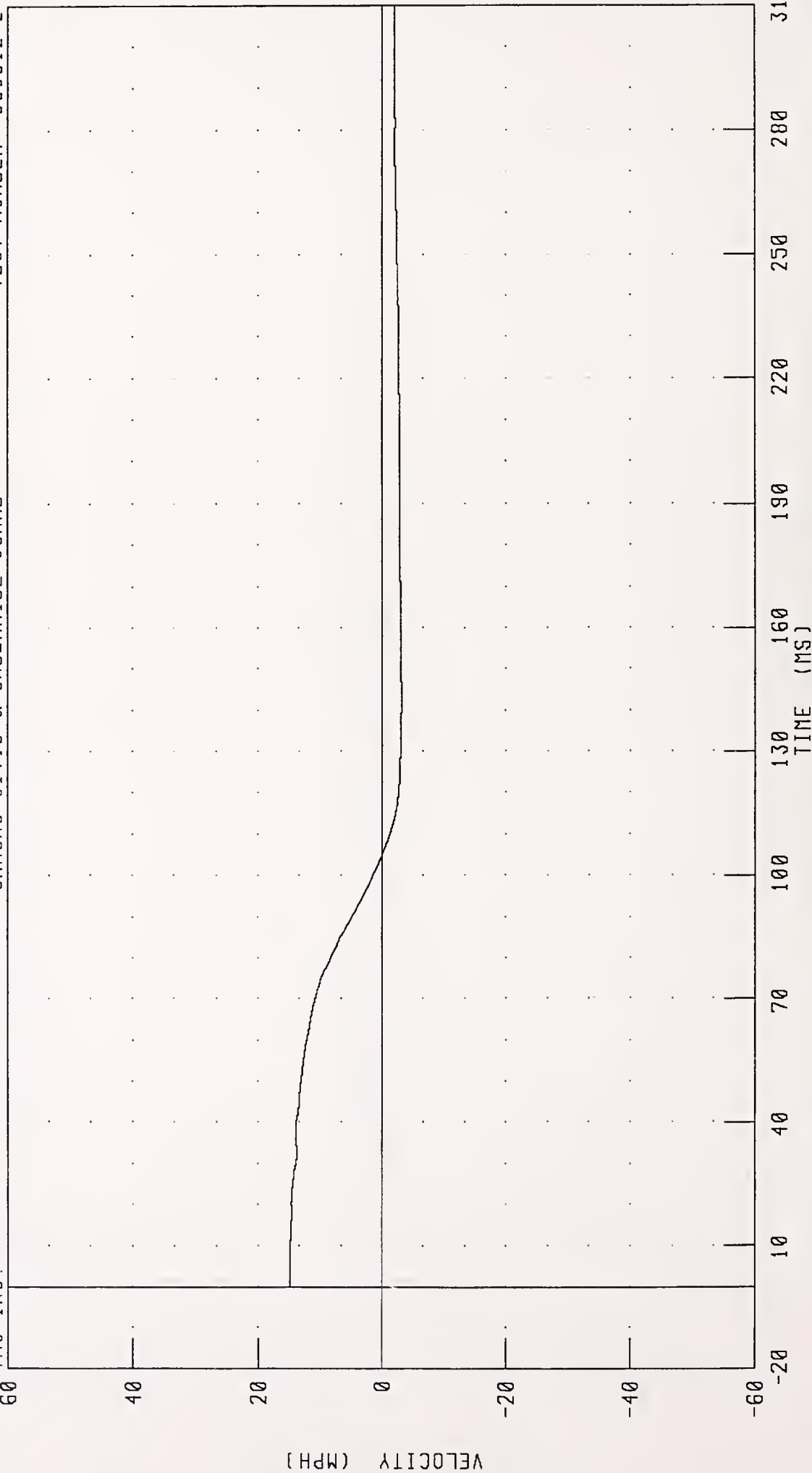
PEAK DATA: 2.27 G @ 35.25 MS, -17.15 G @ 89.63 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
RIGHT REAR SILL X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-2

TRC INC.



CHANNEL: RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 14.91 MPH @ 4.38 MS; -3.16 MPH @ 142.38 MS

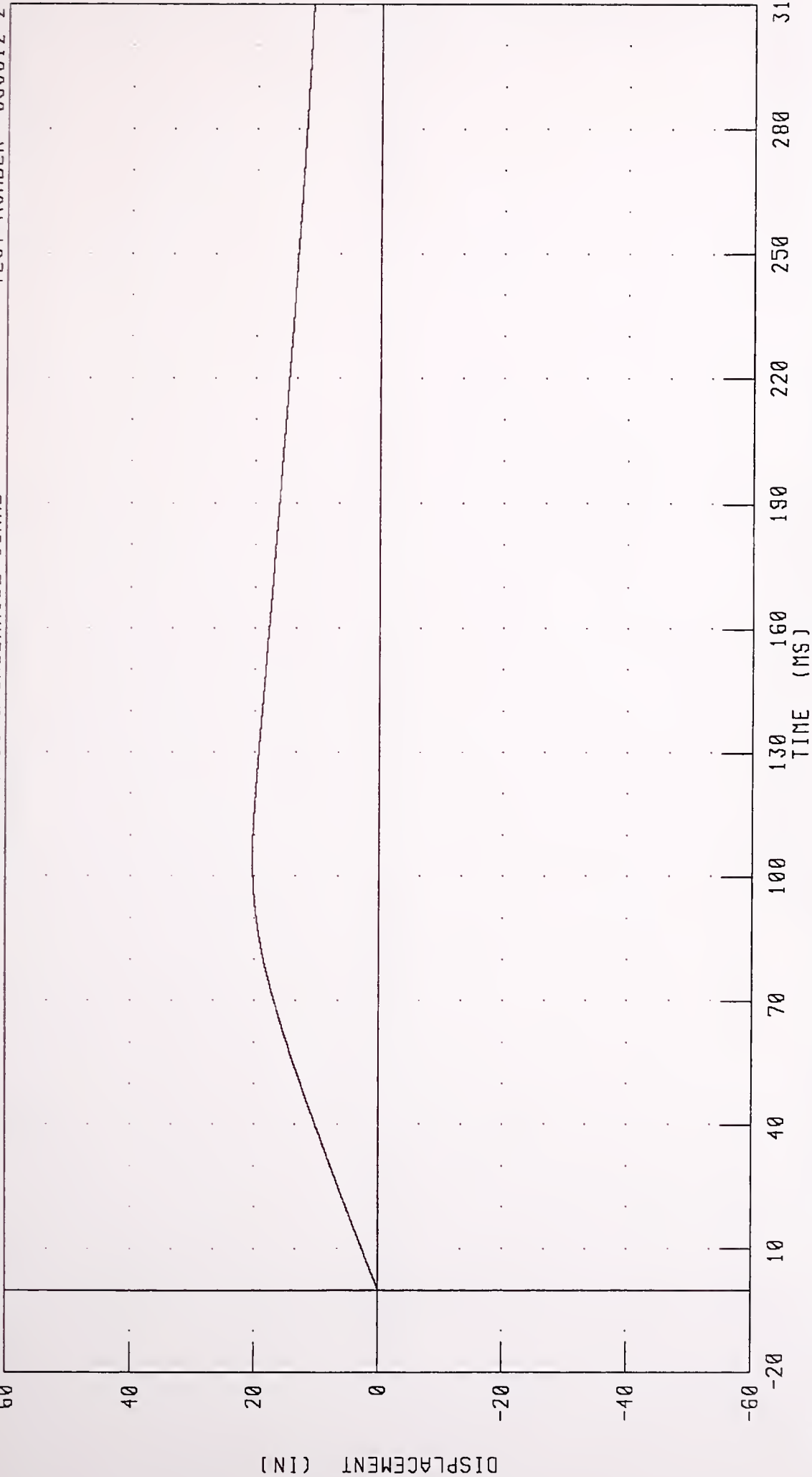
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-2



CHANNEL: RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 20.31 IN @ 104.88 MS; 0 00 IN @ 0.00 MS

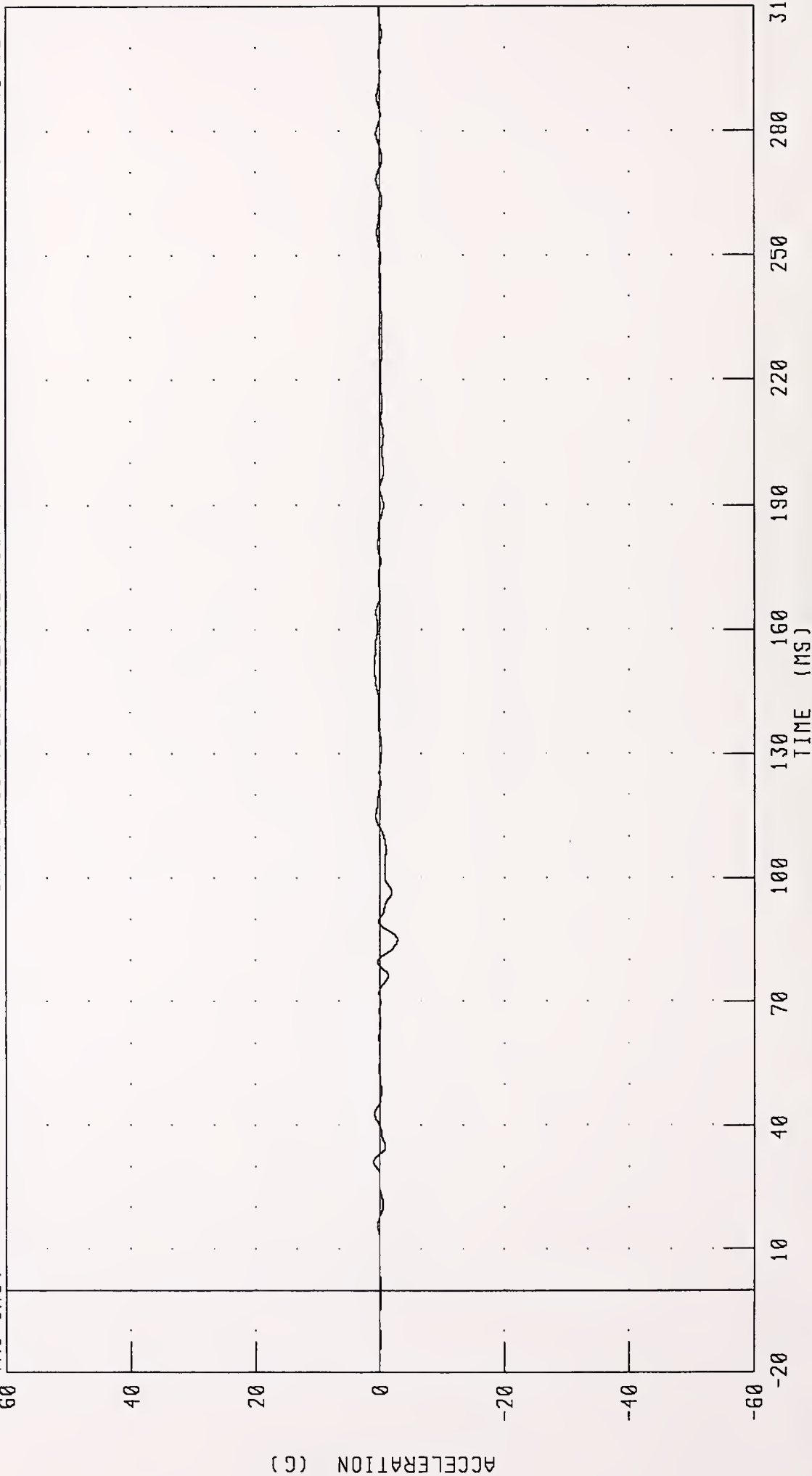
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2

RIGHT REAR SILL Y-AXIS ACCELERATION

TEST NUMBER: 930512-2

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL: RRSYG1 FILTER: CH. CLASS 60

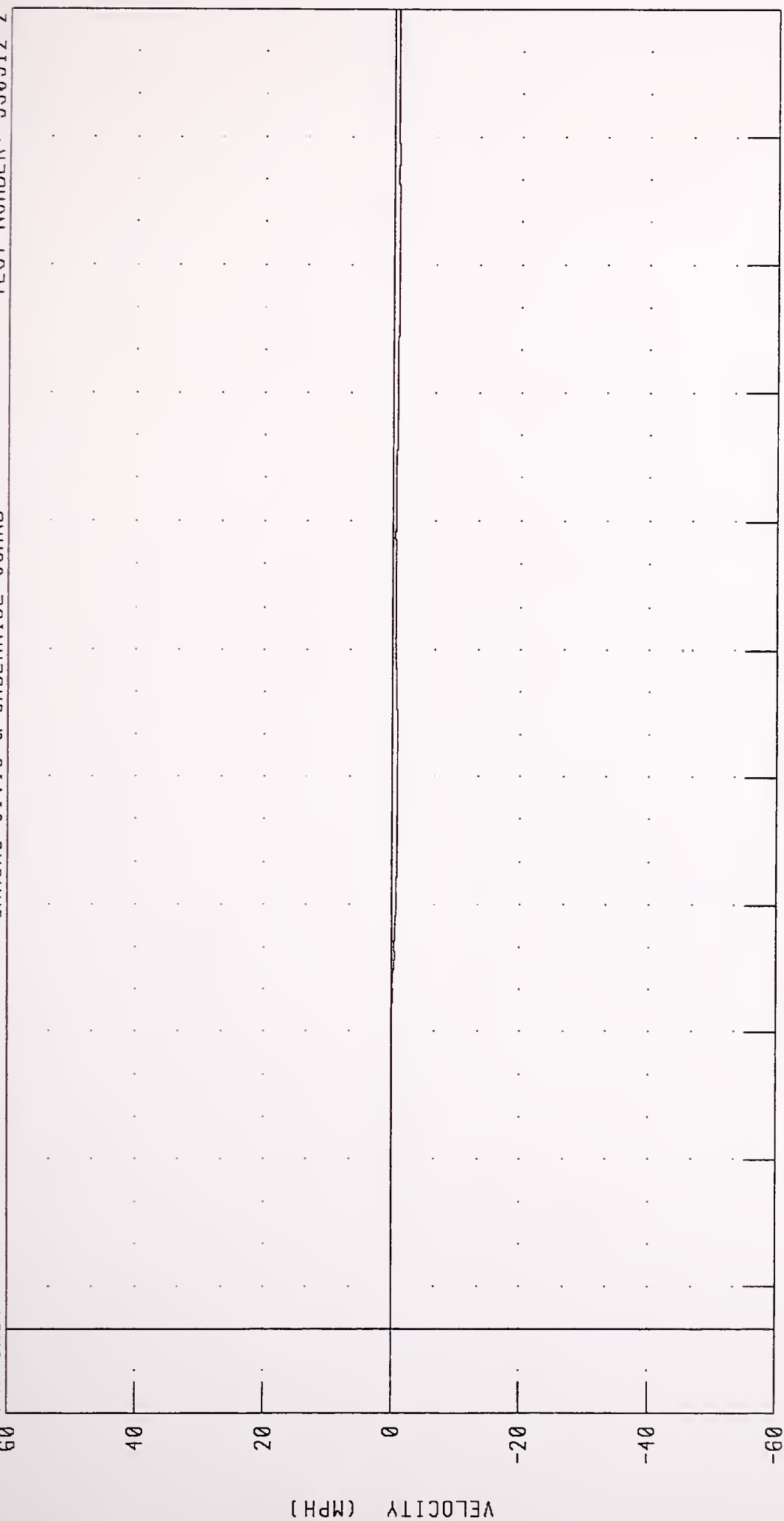
PEAK DATA: 0.96 G @ 31.25 MS; -2.81 G @ 84.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

RIGHT REAR SILL Y-AXIS VELOCITY
CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-2

TRC INC.

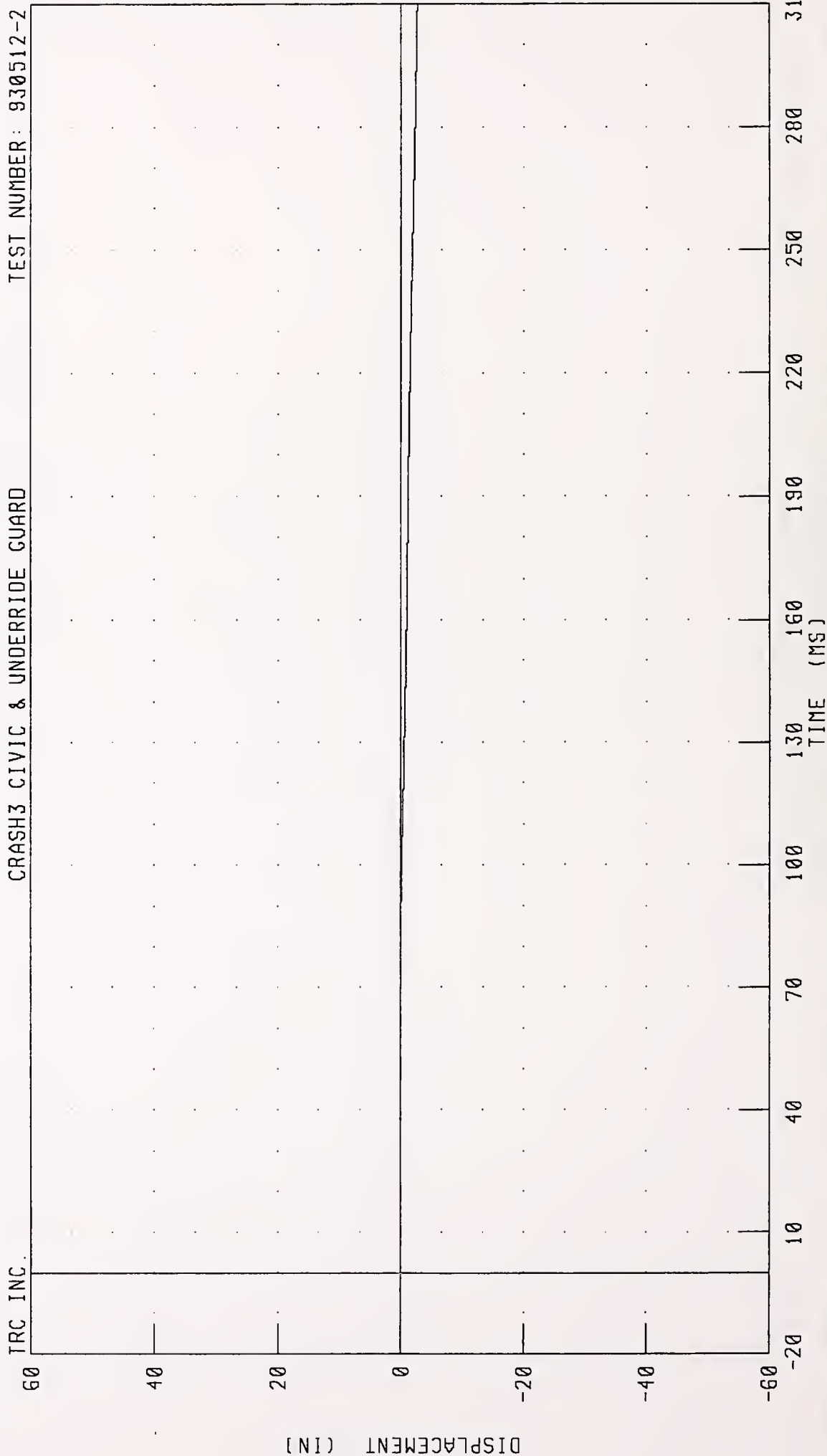


CHANNEL: RRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.06 MPH @ 33.13 MS; -0.85 MPH @ 112.25 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
 RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-2



CHANNEL: RRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 IN @ 0.00 MS; -2.64 IN @ 310.00 MS

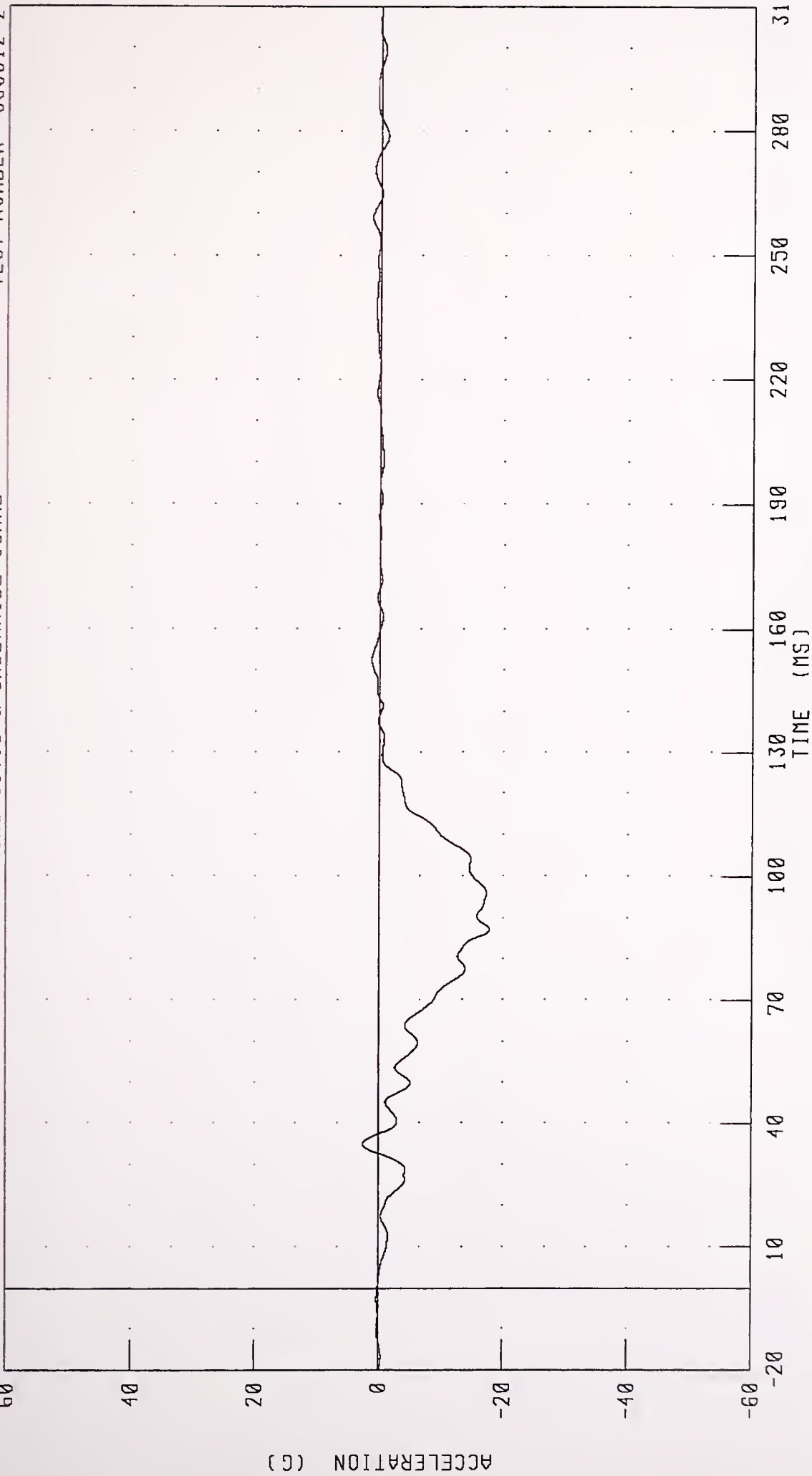
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-2

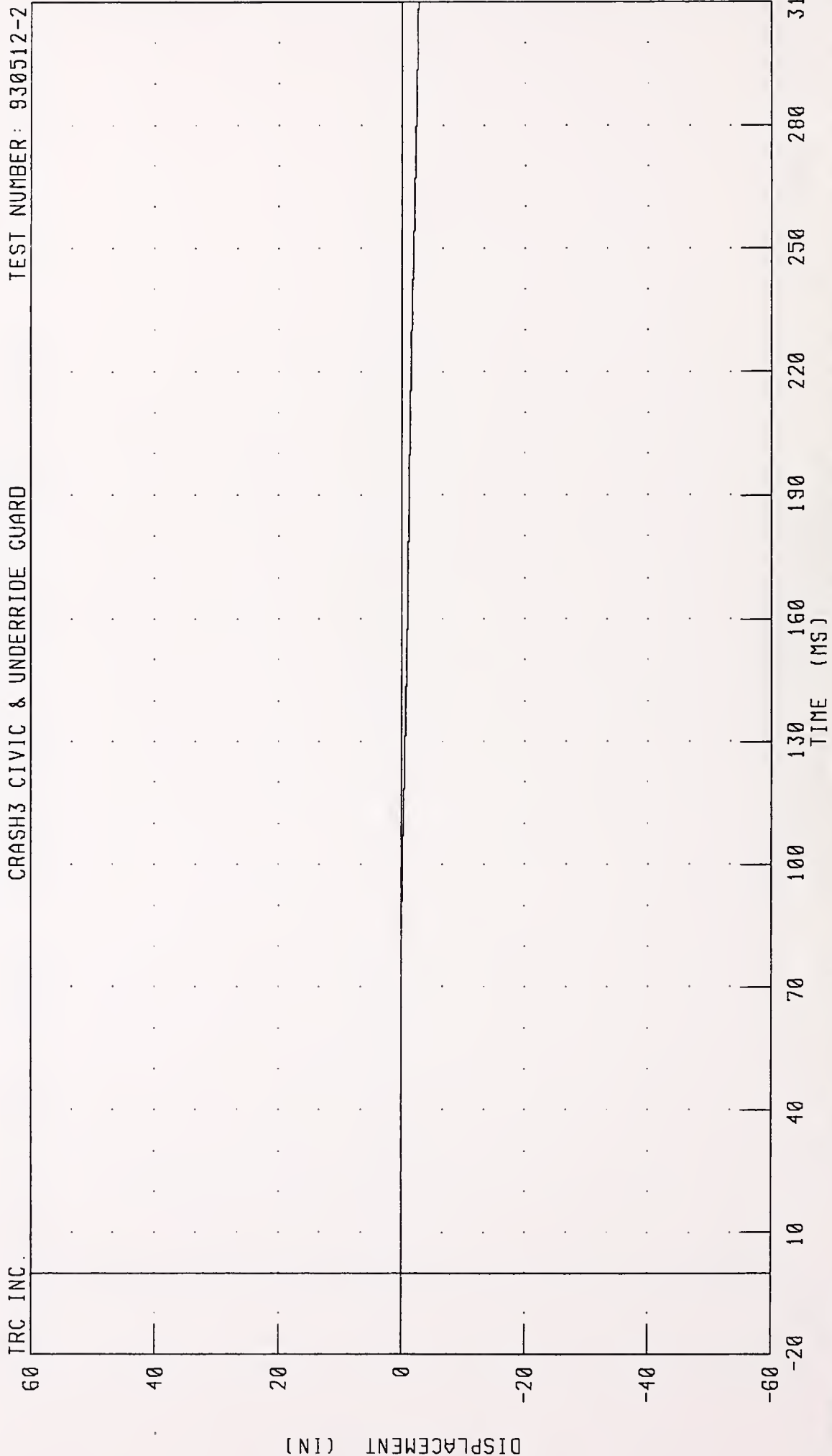


CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.56 G @ 35.00 MS; -17.81 G @ 87.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
 RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-2



CHANNEL: RRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 IN @ 0.00 MS; -2.64 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

60

40

20

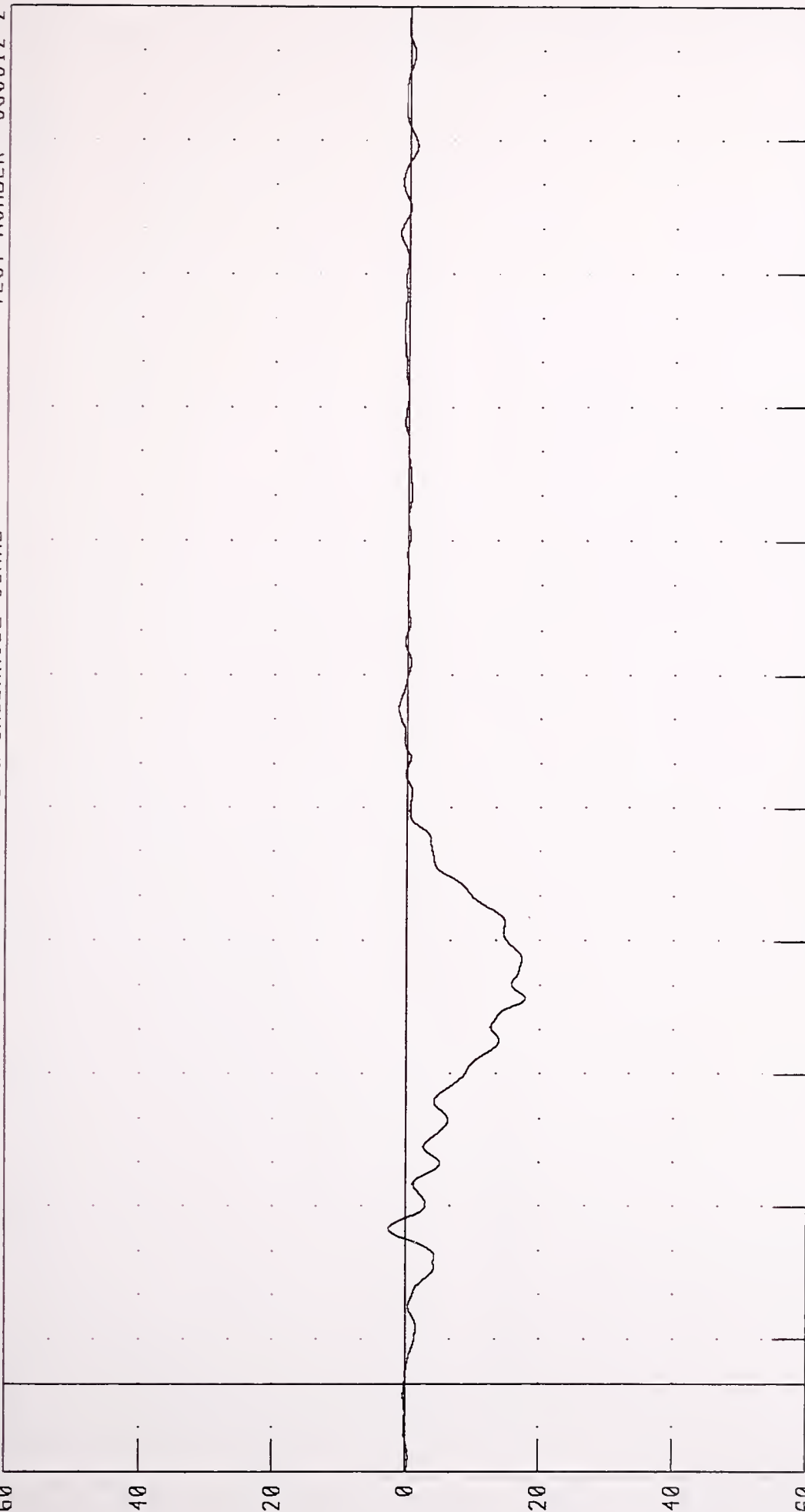
0

-20

-40

-60

ACCELERATION (G)



CHANNEL: VCGXG1 FILTER: CH. CLASS 60

TIME (MS)

130 160 190 220 250 280 310

PEAK DATA: 2.56 G @ 35.00 MS; -17.81 G @ 87.00 MS

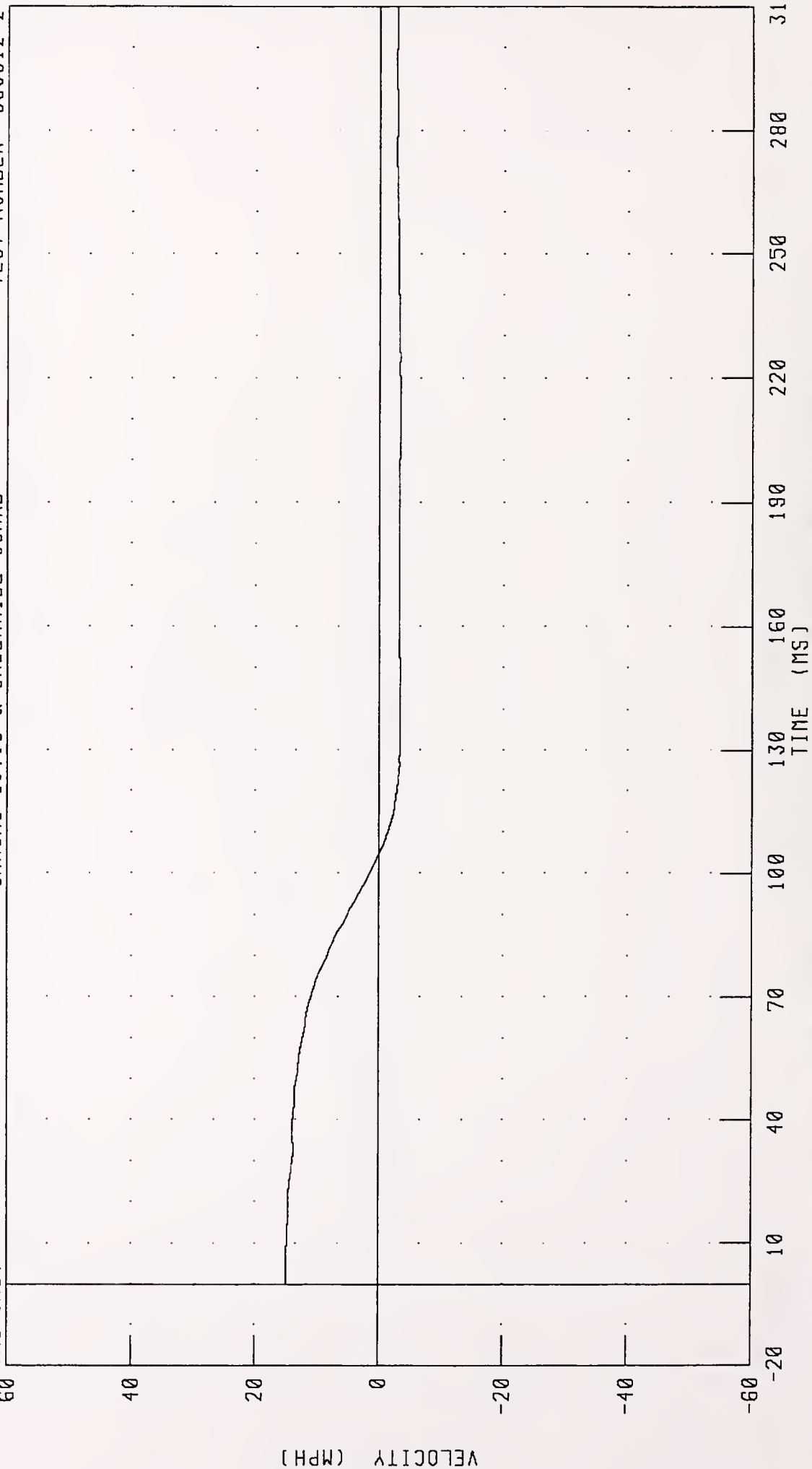
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2

VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

TRC INC.

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-2



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 14.90 MPH @ 1.00 MS; -3.45 MPH @ 142.63 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT

TEST NUMBER: 930512-2

CRASH3 CIVIC & UNDERRIDE GUARD

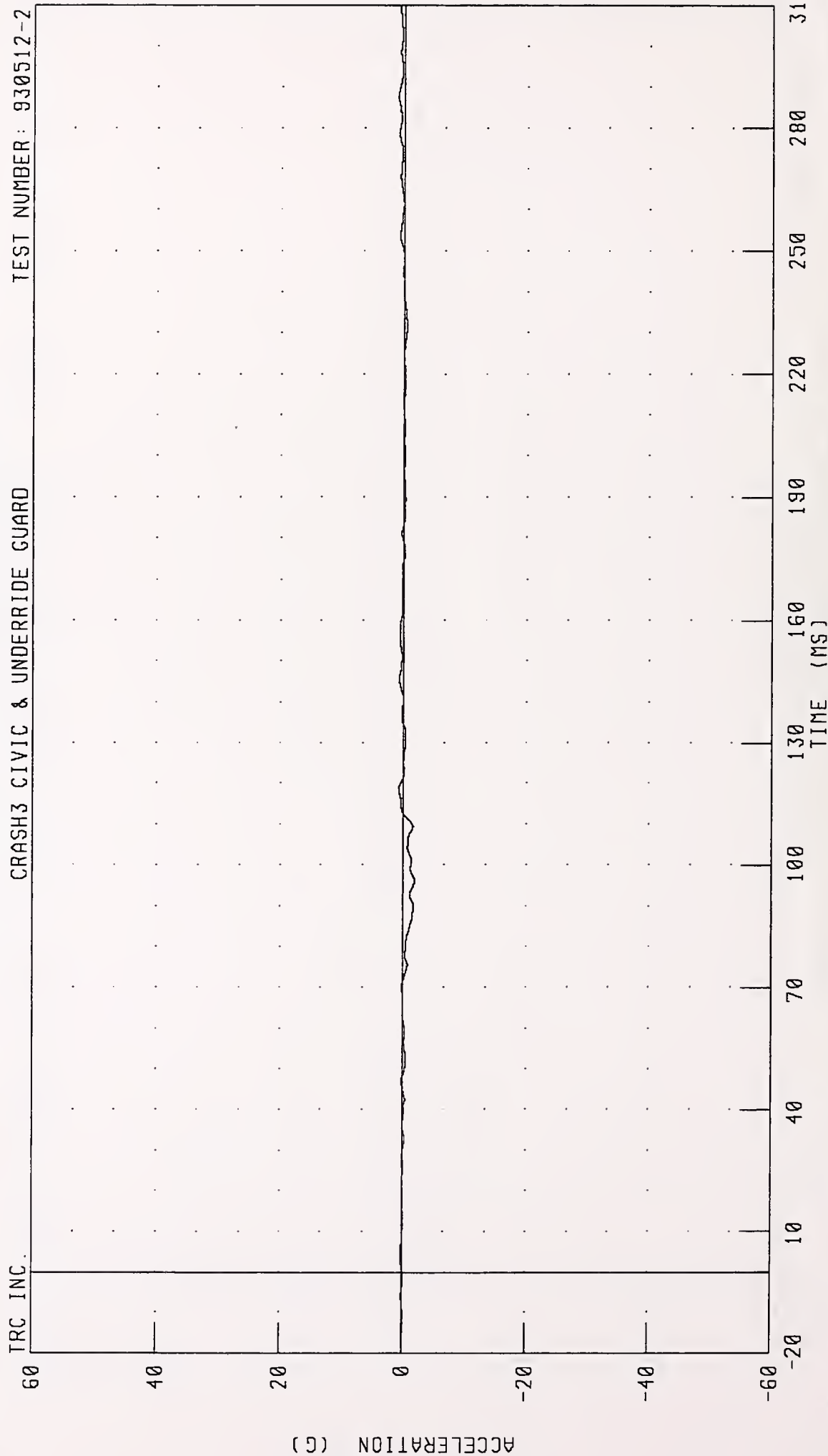
TRC INC.



CHANNEL: VCGXD1 FILTER: CH. CLASS 180

PEAK DATA: 20.46 IN @ 104.75 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
 VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION



CHANNEL: VCGYG1 FILTER: CH. CLASS 60

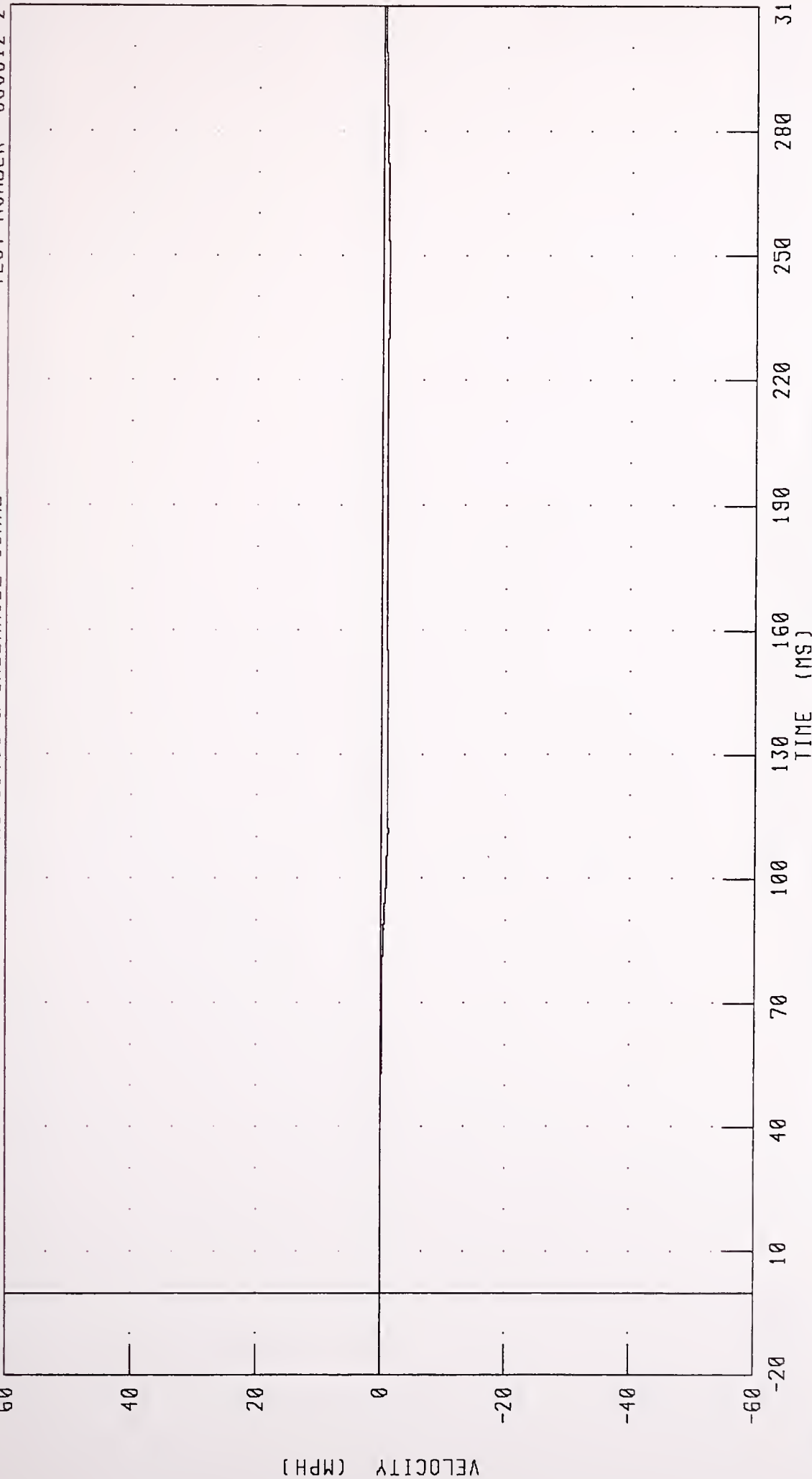
PEAK DATA: 1.00 G @ 287.75 MS; -1.87 G @ 96.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

TEST NUMBER: 930512-2

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

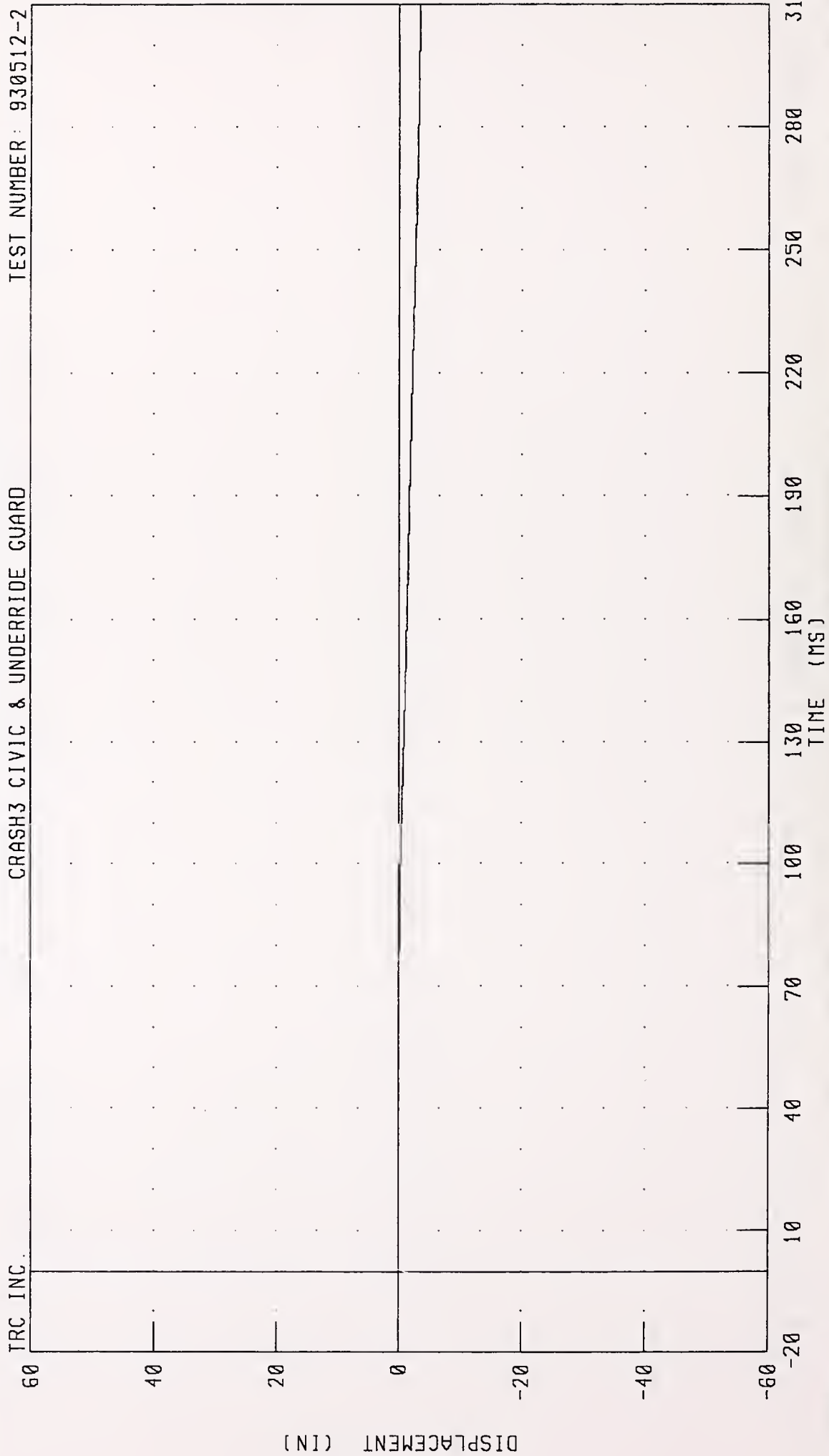


CHANNEL: VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.02 MPH @ 6.50 MS; -1.10 MPH @ 111.38 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
 VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-2

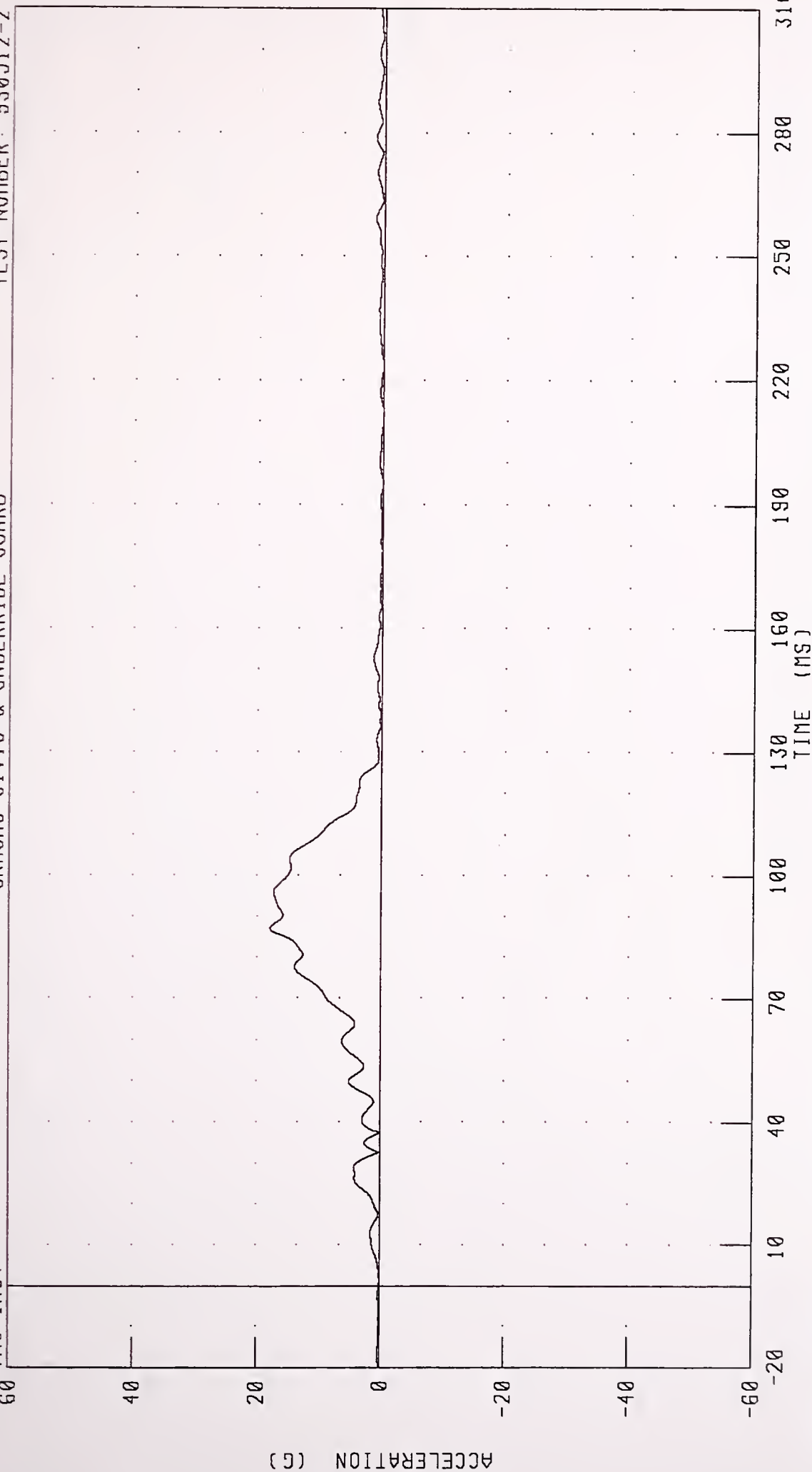


CHANNEL: VCGYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.01 IN @ 32.25 MS; -3.36 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2
VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-2



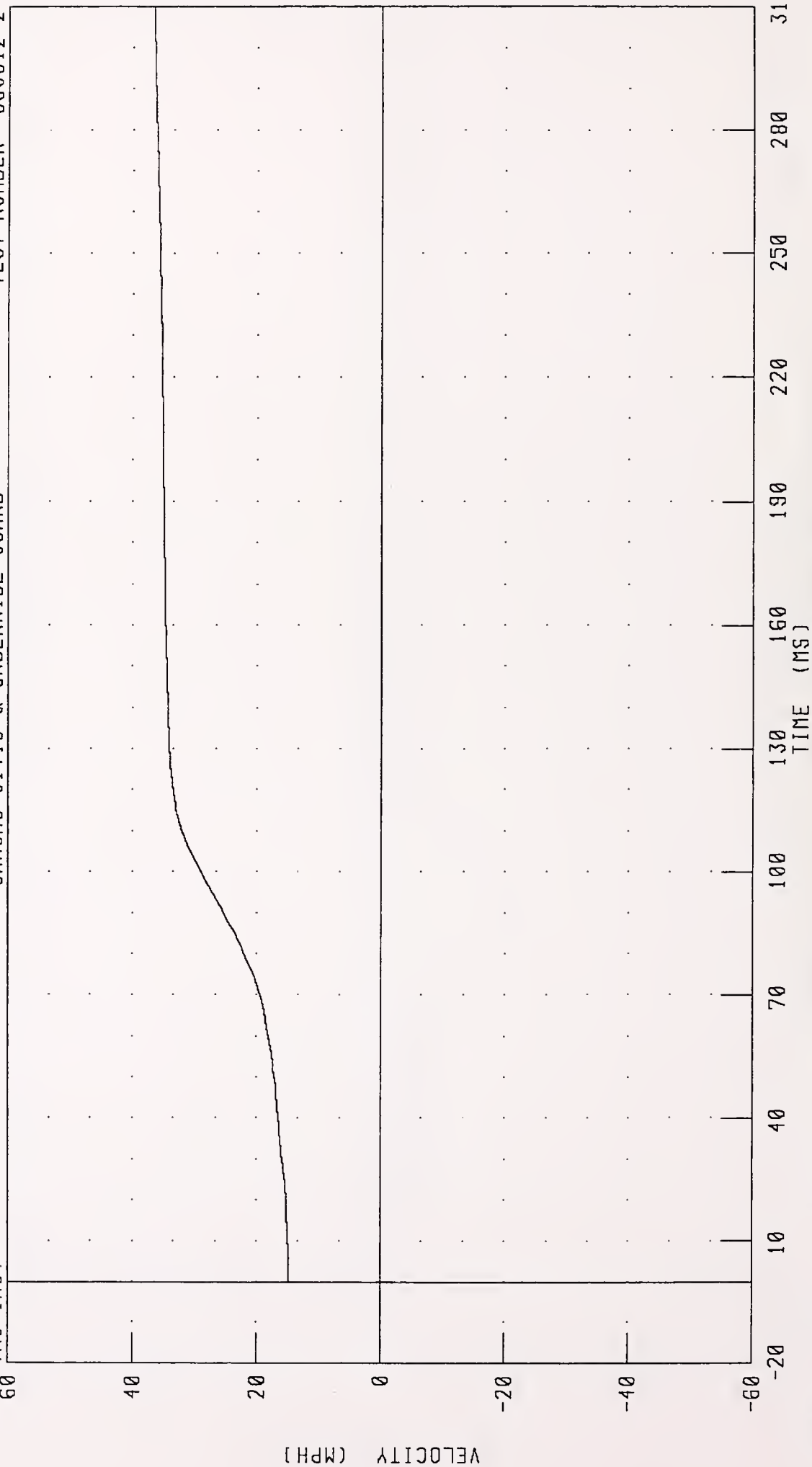
CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 17.87 G @ 87.00 MS; 0.00 G @ 224.38 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 2

VEHICLE CENTER OF GRAVITY RESULTANT VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-2



CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 36.62 MPH @ 310.00 MS; 14.90 MPH @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 2

VEHICLE CENTER OF GRAVITY RESULTANT DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER 930512-2

TRC INC.

180

150

120

90

60

30

0

DISPLACEMENT (IN)

-20

10

40

70

100

130

160

190

220

250

280

310

TIME (MS)

CHANNEL: VCCRD1 FILTER: CH. CLASS 180

PEAK DATA: 161.75 IN @ 310.00 MS; 0.00 IN @ 0.00 MS

DATA PLOTS

TEST NO. 930512-3

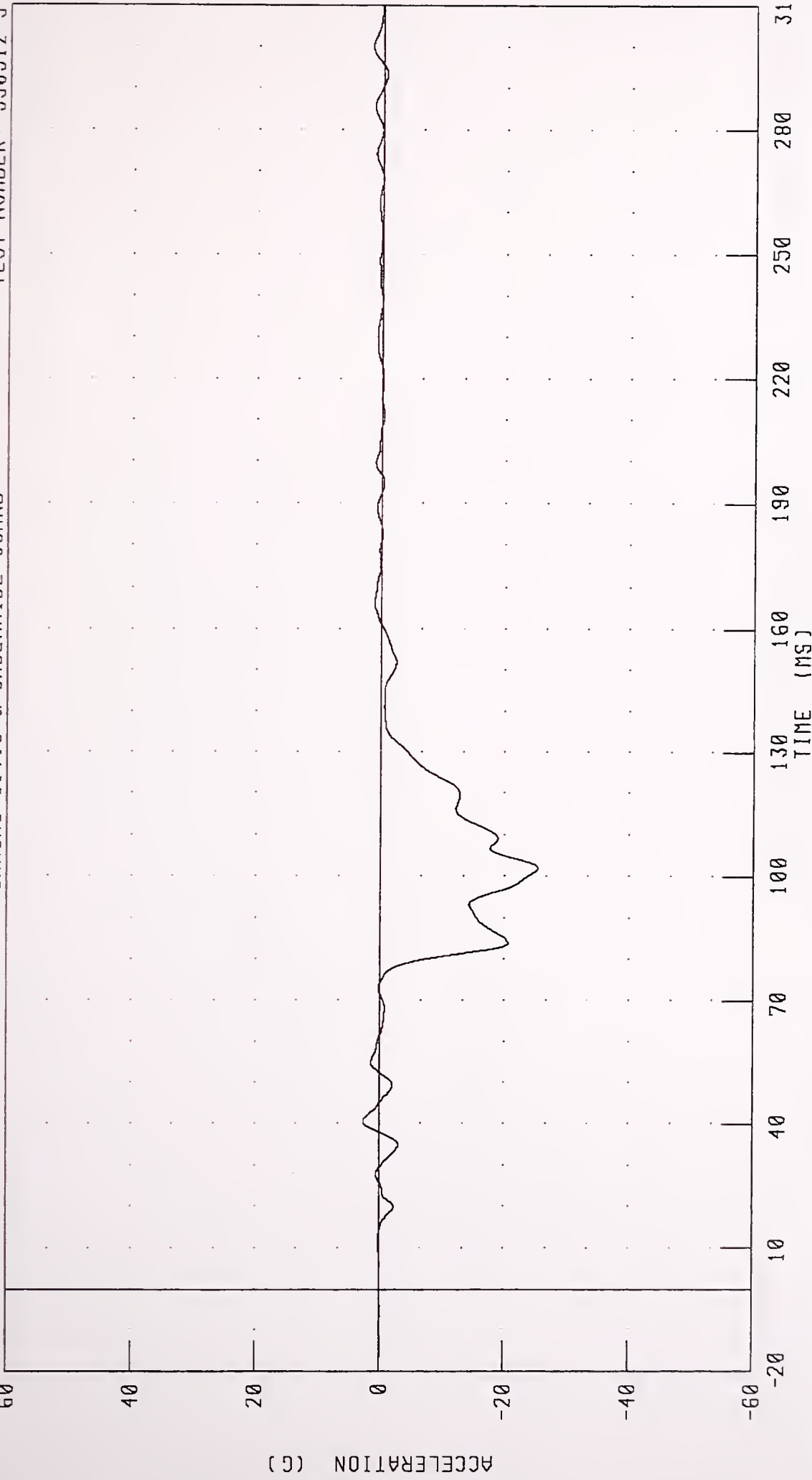
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 3

LEFT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-3

TRC INC.

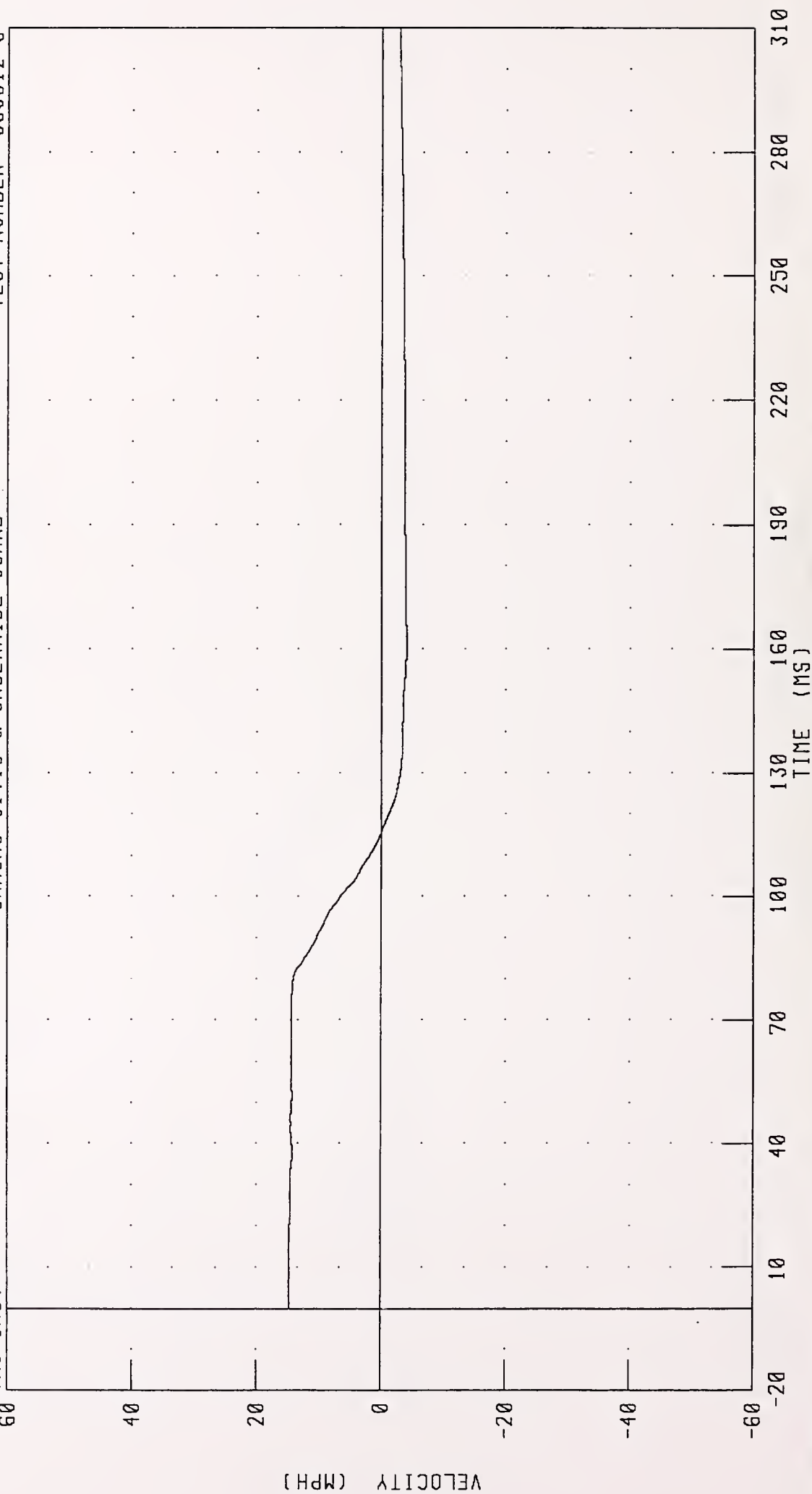


CHANNEL: LRSXG1 FILTER: CH CLASS 60

PEAK DATA: 2.61 G @ 40.63 MS; -25.37 G @ 102.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
 LEFT REAR SILL X-AXIS VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 14.82 MPH @ 13.88 MS; -4.03 MPH @ 161.38 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD
TEST NUMBER: 930512-3

TRC INC.

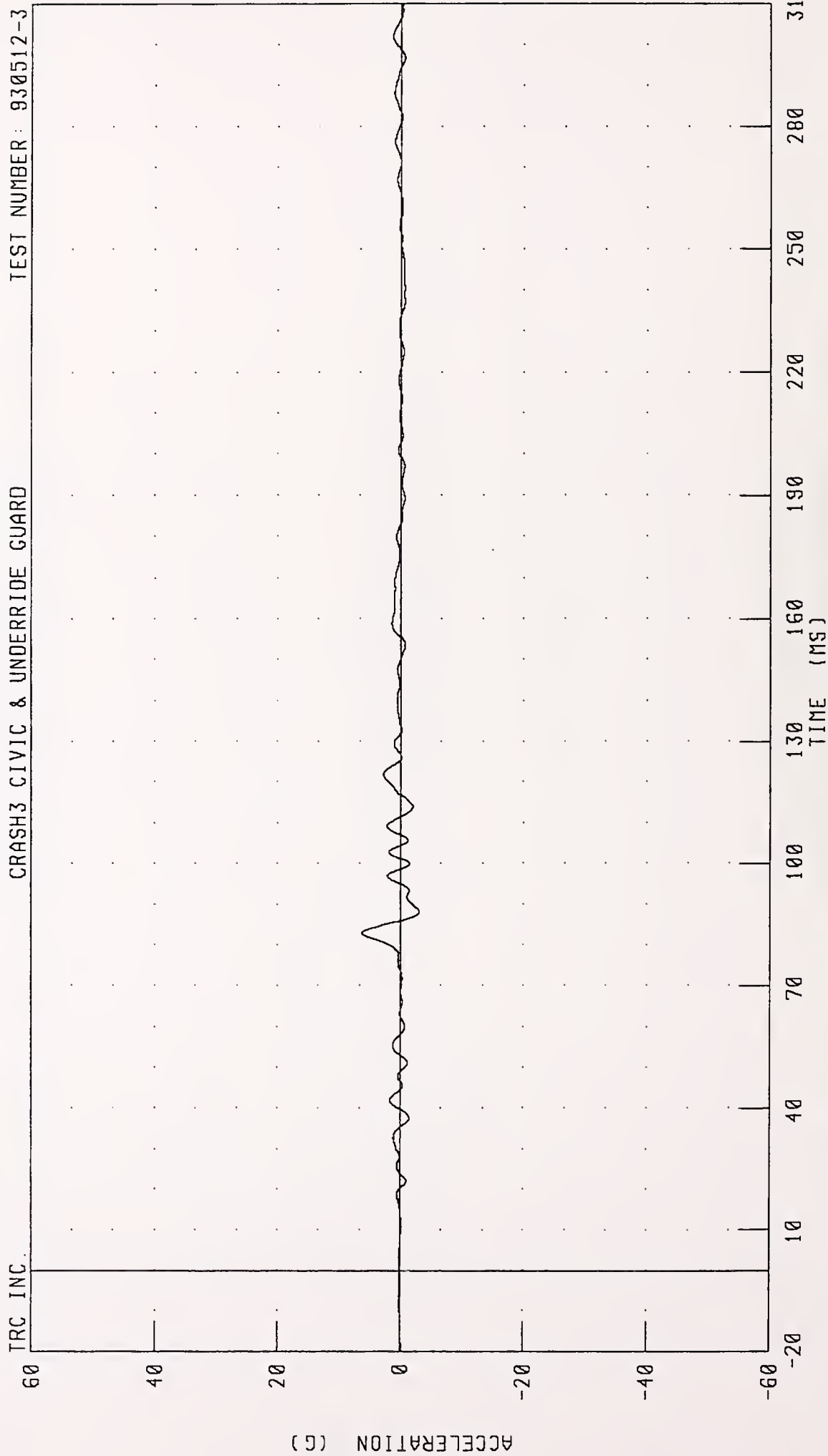


CHANNEL: LRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 24.92 IN @ 115.63 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
LEFT REAR SILL Y-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 6.32 G @ 82.88 MS; -3.08 G @ 88.13 MS

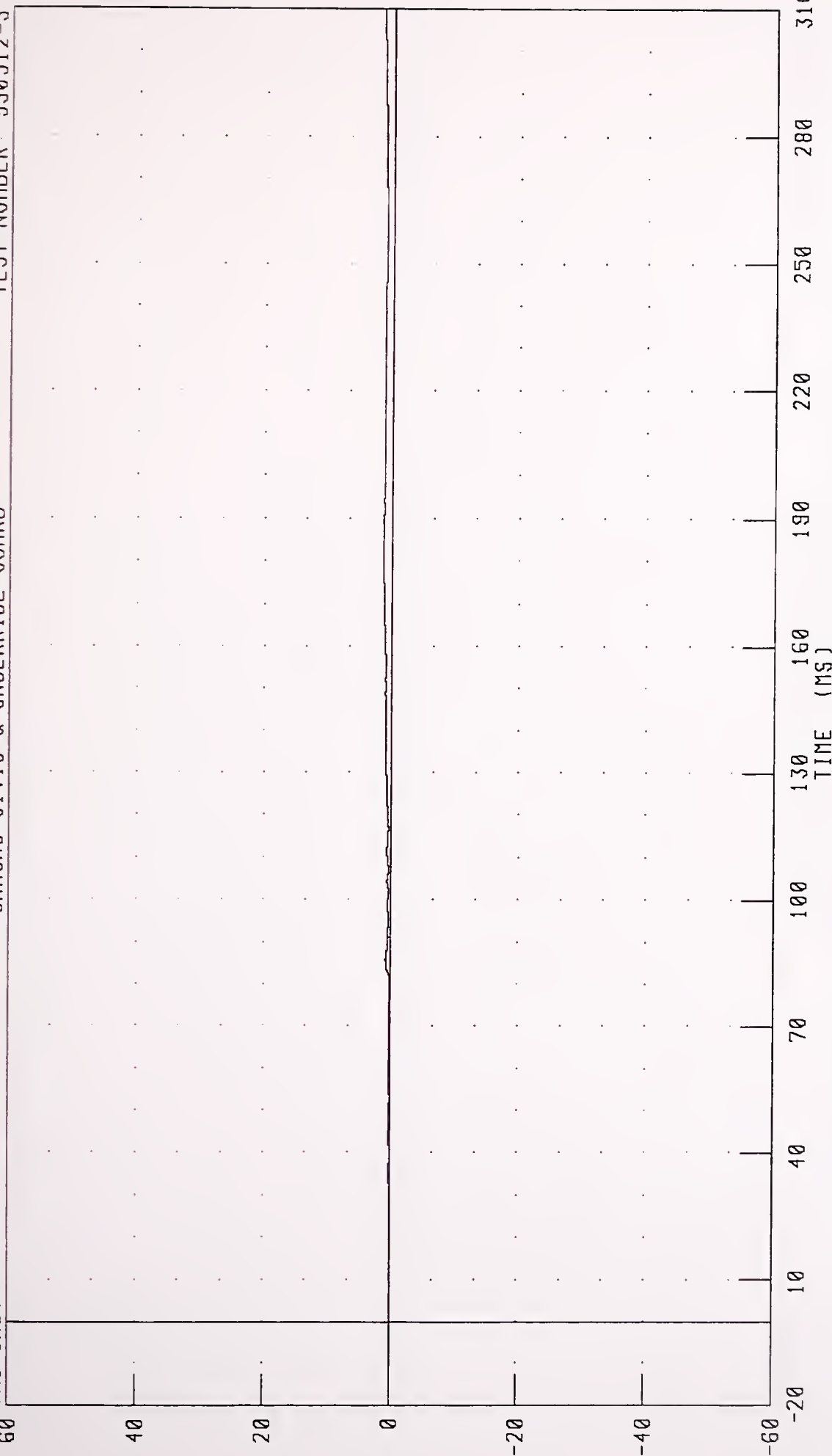
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3

LEFT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-3

TRC INC.

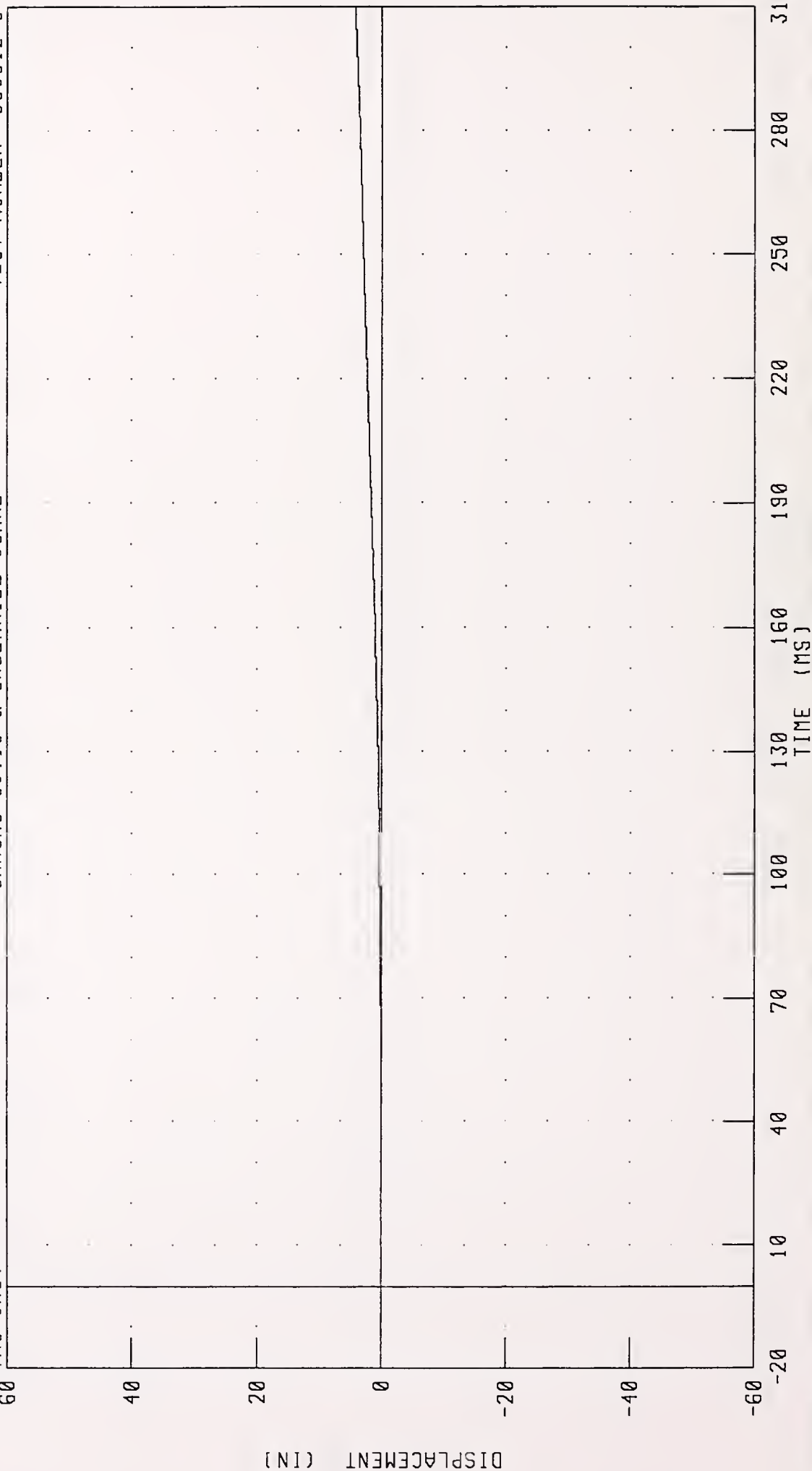


CHANNEL: LRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 1.50 MPH @ 306.38 MS; -0.04 MPH @ 23.13 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
 LEFT REAR SILL Y-AXIS DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



CHANNEL: LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 4.31 IN @ 310.00 MS; 0.00 IN @ 0.00 MS

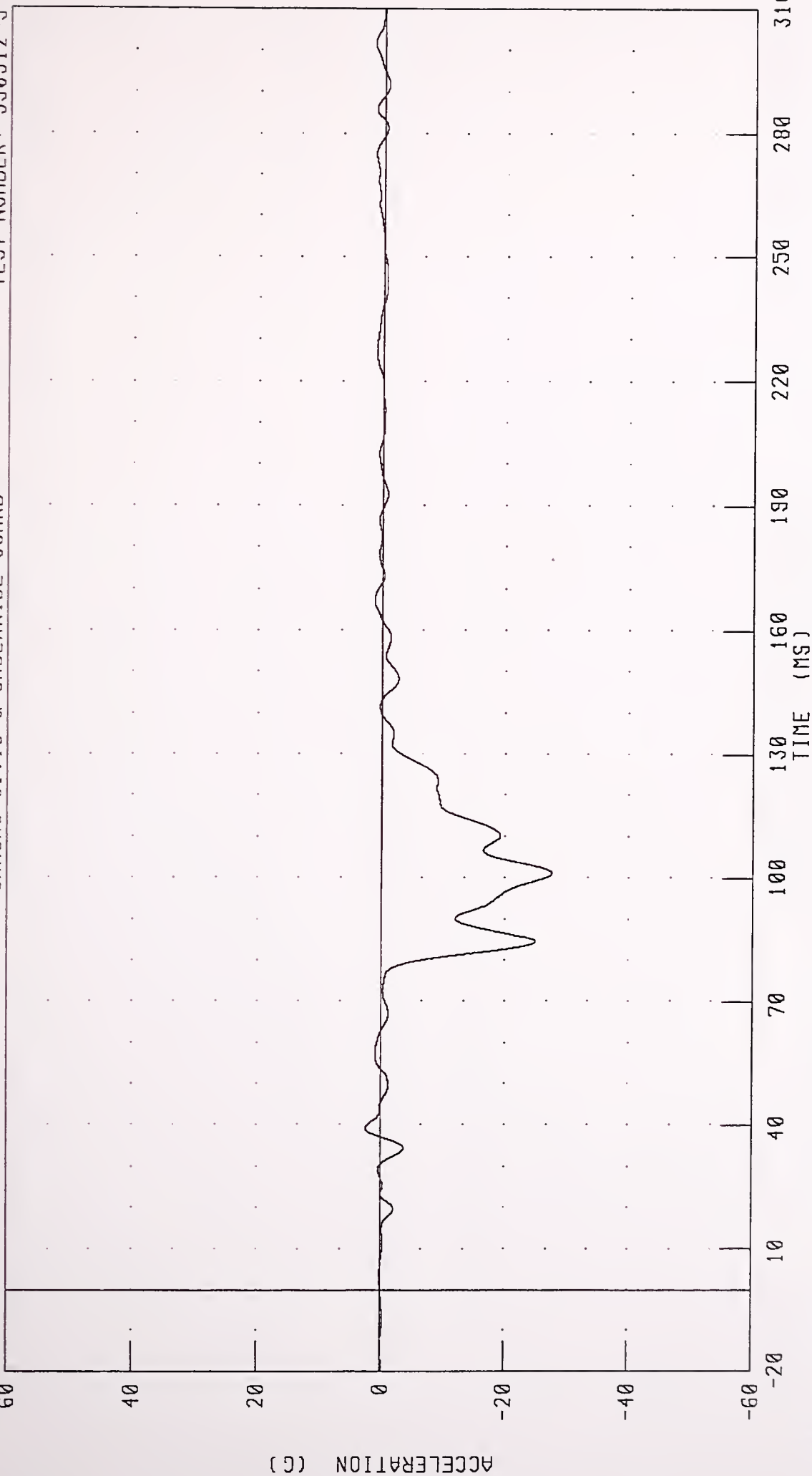
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 3

RIGHT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-3

TRC INC.



CHANNEL: RRSXG1 FILTER: CH. CLASS 60

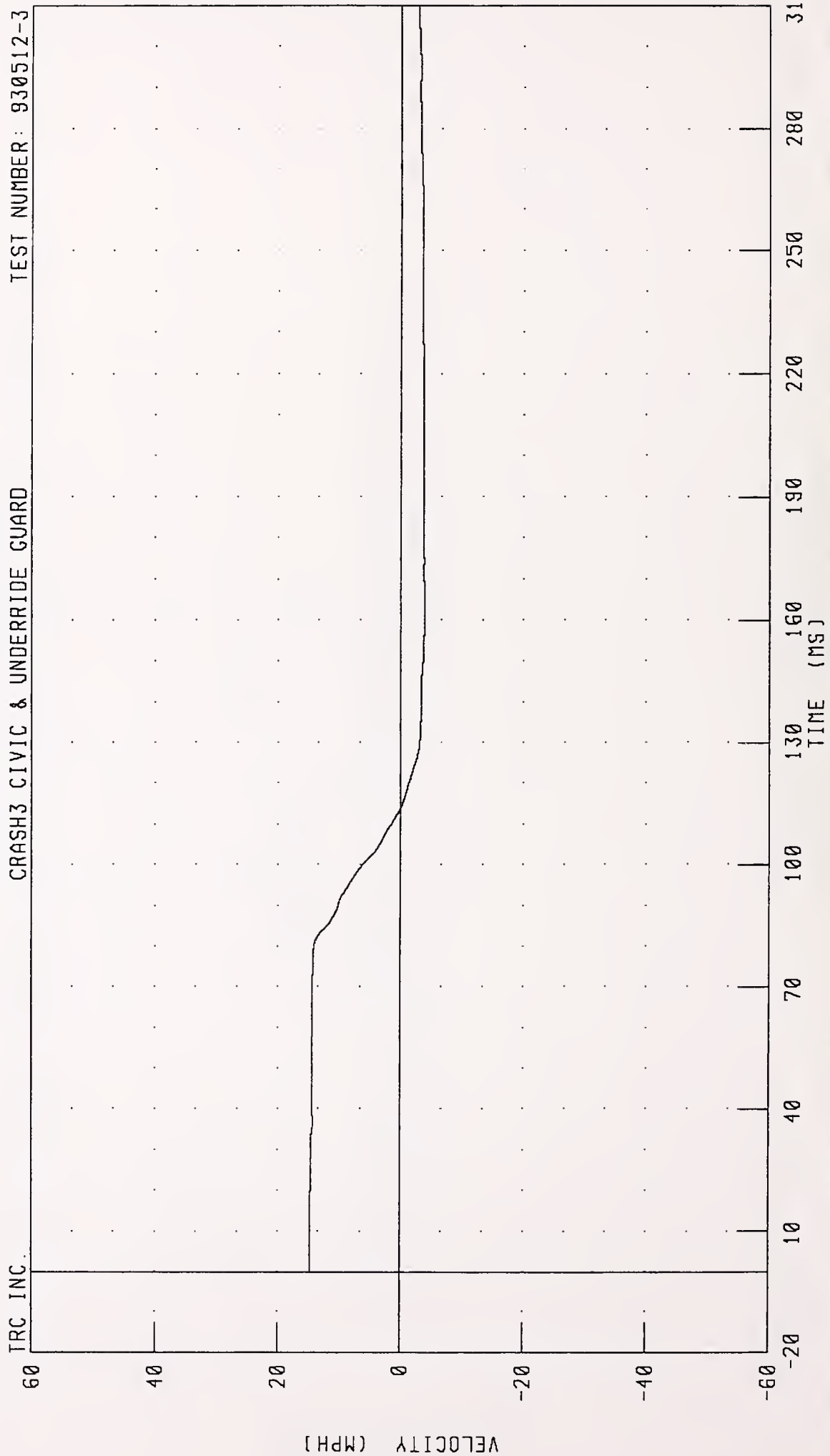
PEAK DATA: 2.43 G @ 39.25 MS; -27.52 G @ 101.13 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3

RIGHT REAR SILL X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-3

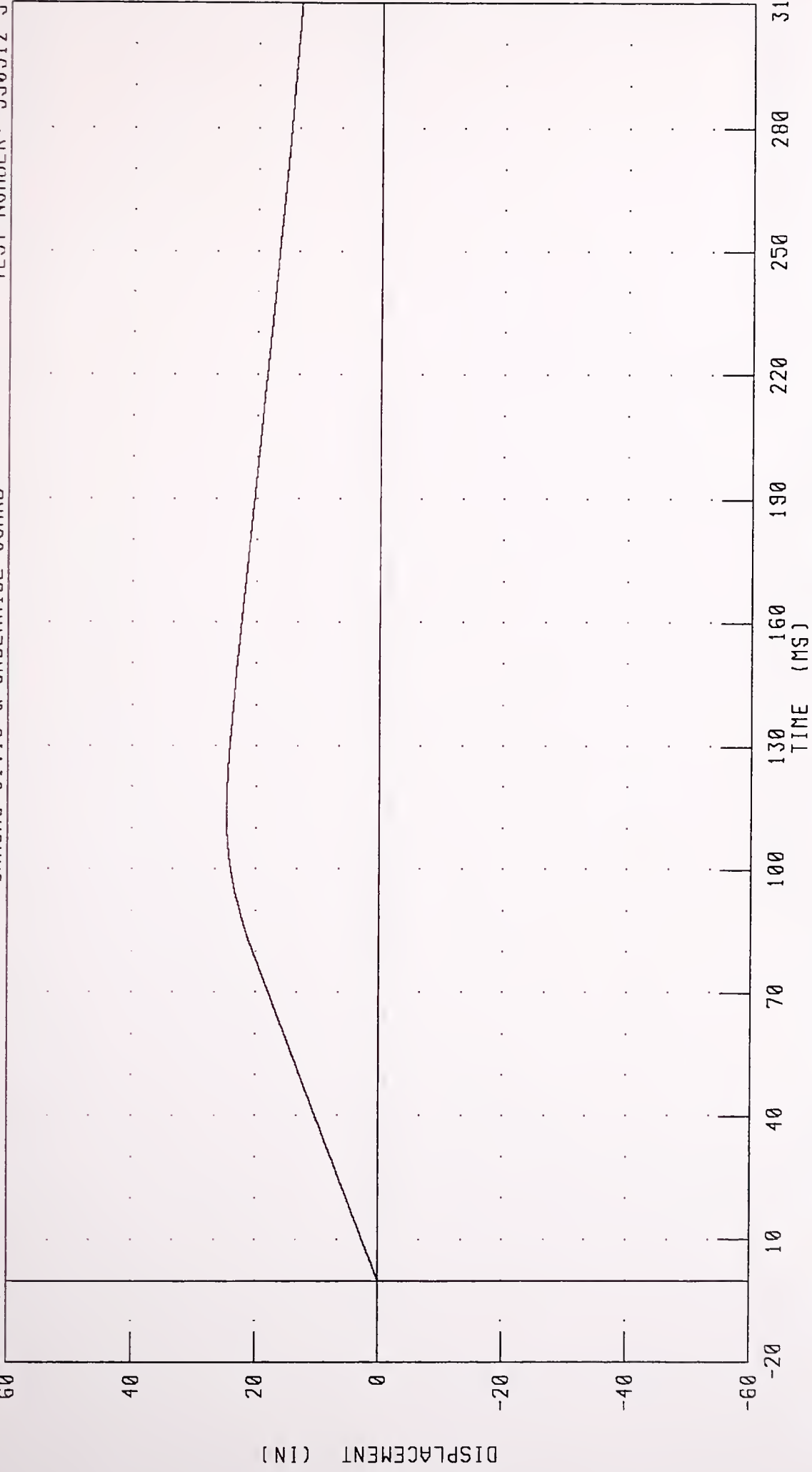


CHANNEL: RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 14.82 MPH @ 5.75 MS; -3.93 MPH @ 161.13 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 3
RIGHT REAR STILL X-AXIS DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

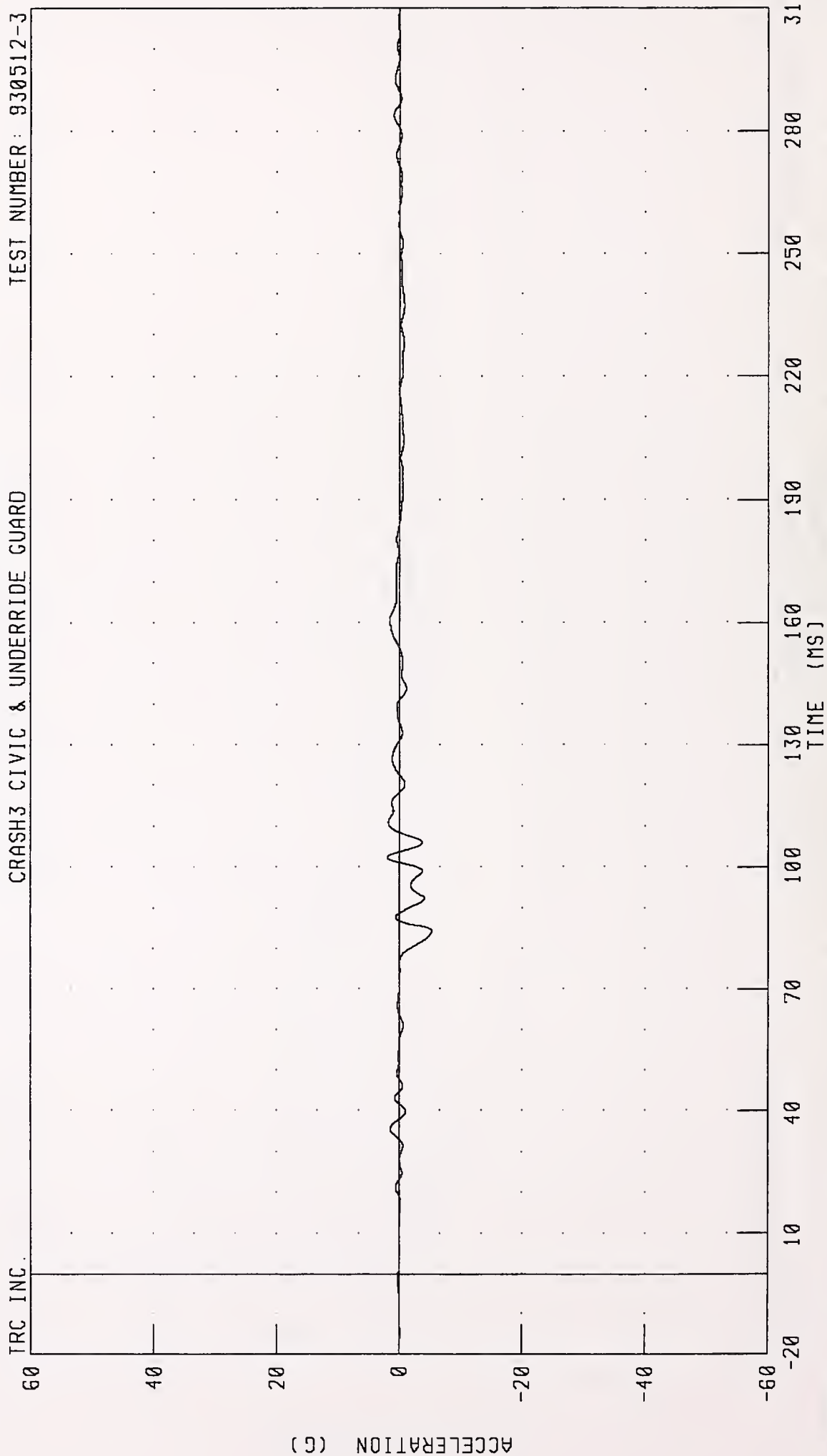


CHANNEL: RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 24.76 IN @ 113.88 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

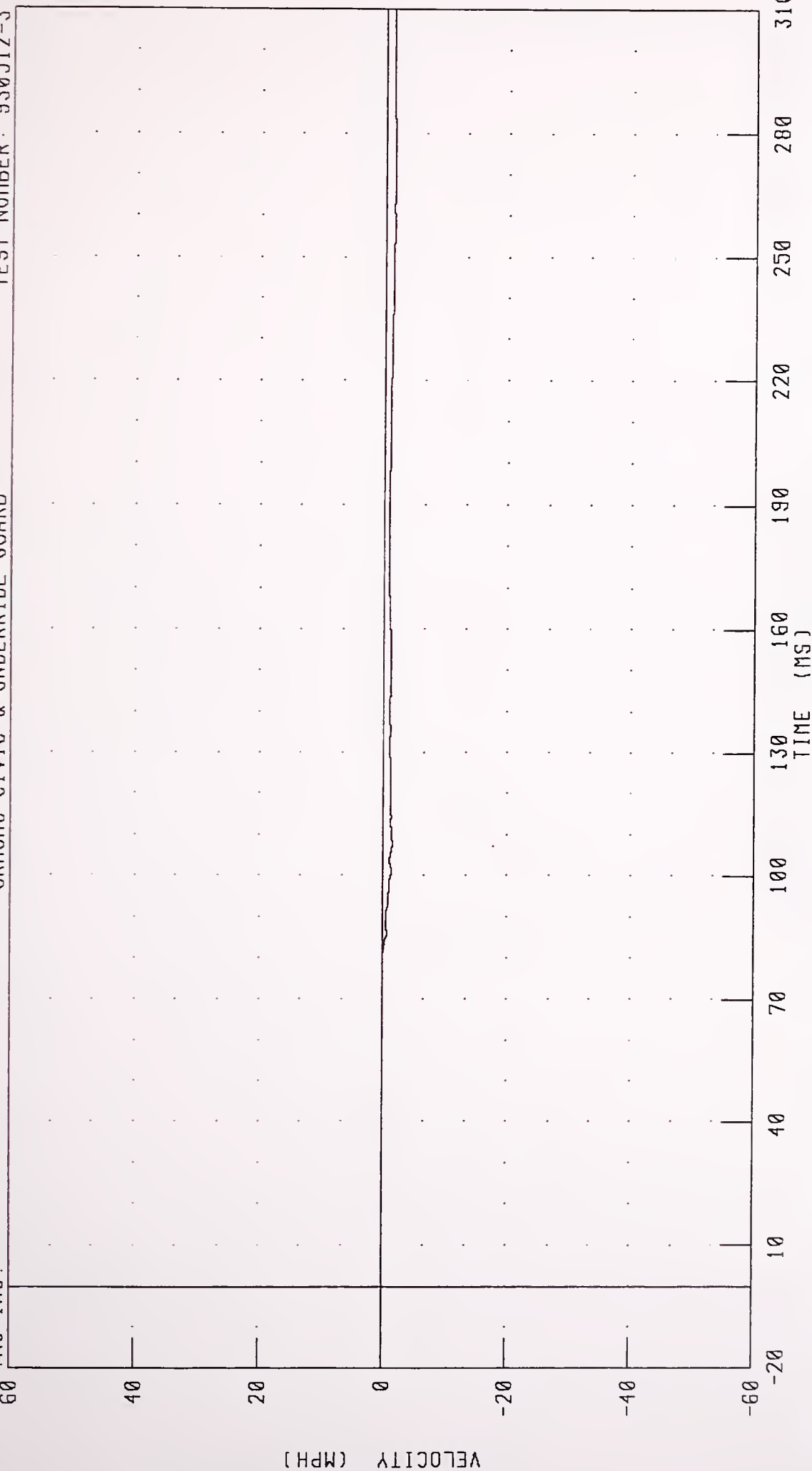


CHANNEL: RRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 1.92 G @ 102.50 MS; -5.27 G @ 84.25 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
RIGHT REAR SILL Y-AXIS VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

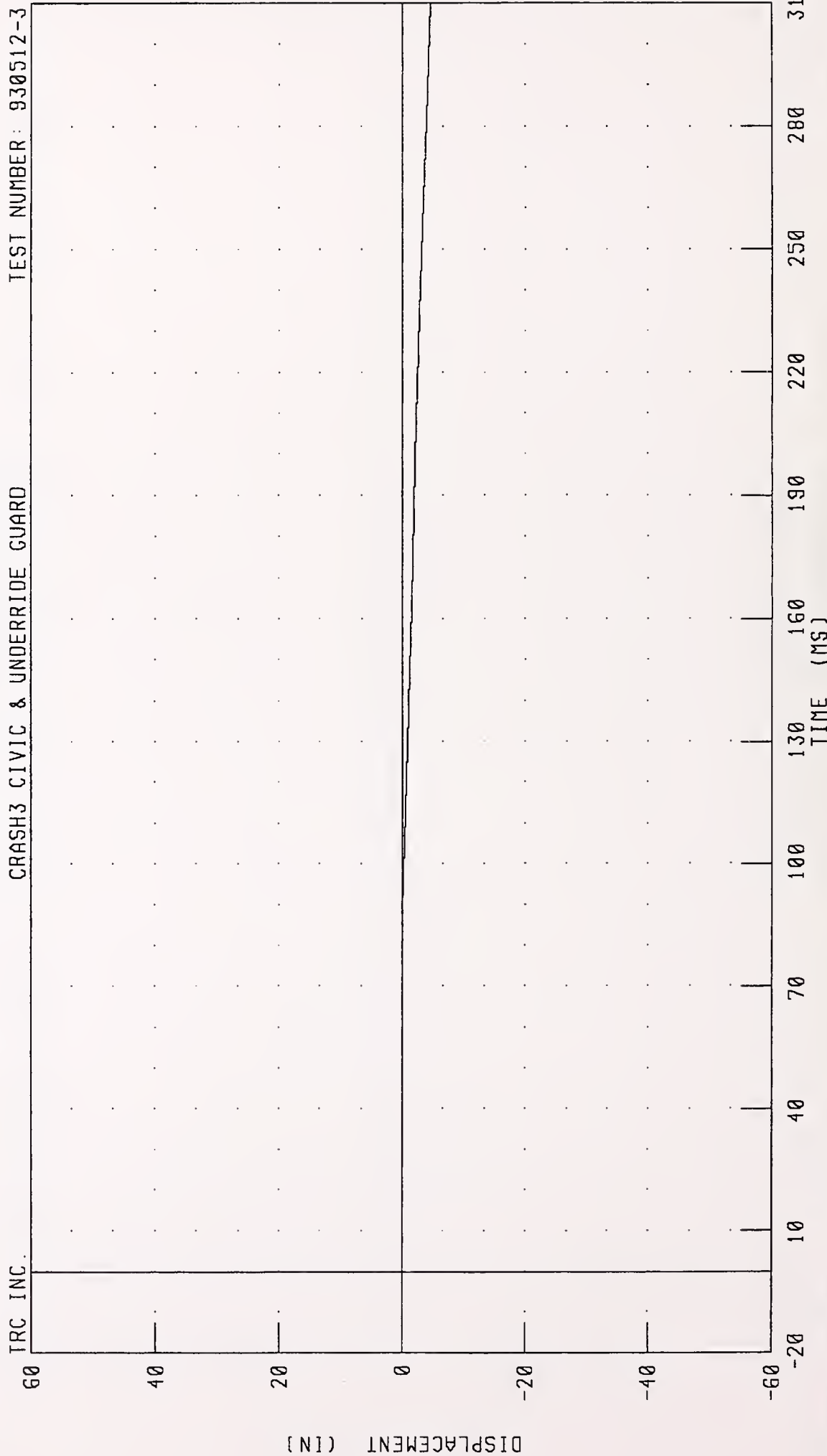


CHANNEL: RRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.08 MPH @ 38.25 MS; -1.48 MPH @ 271.63 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
 RIGHT REAR SILL Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



CHANNEL: RRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.01 IN @ 79.63 MS; -4.55 IN @ 310.00 MS

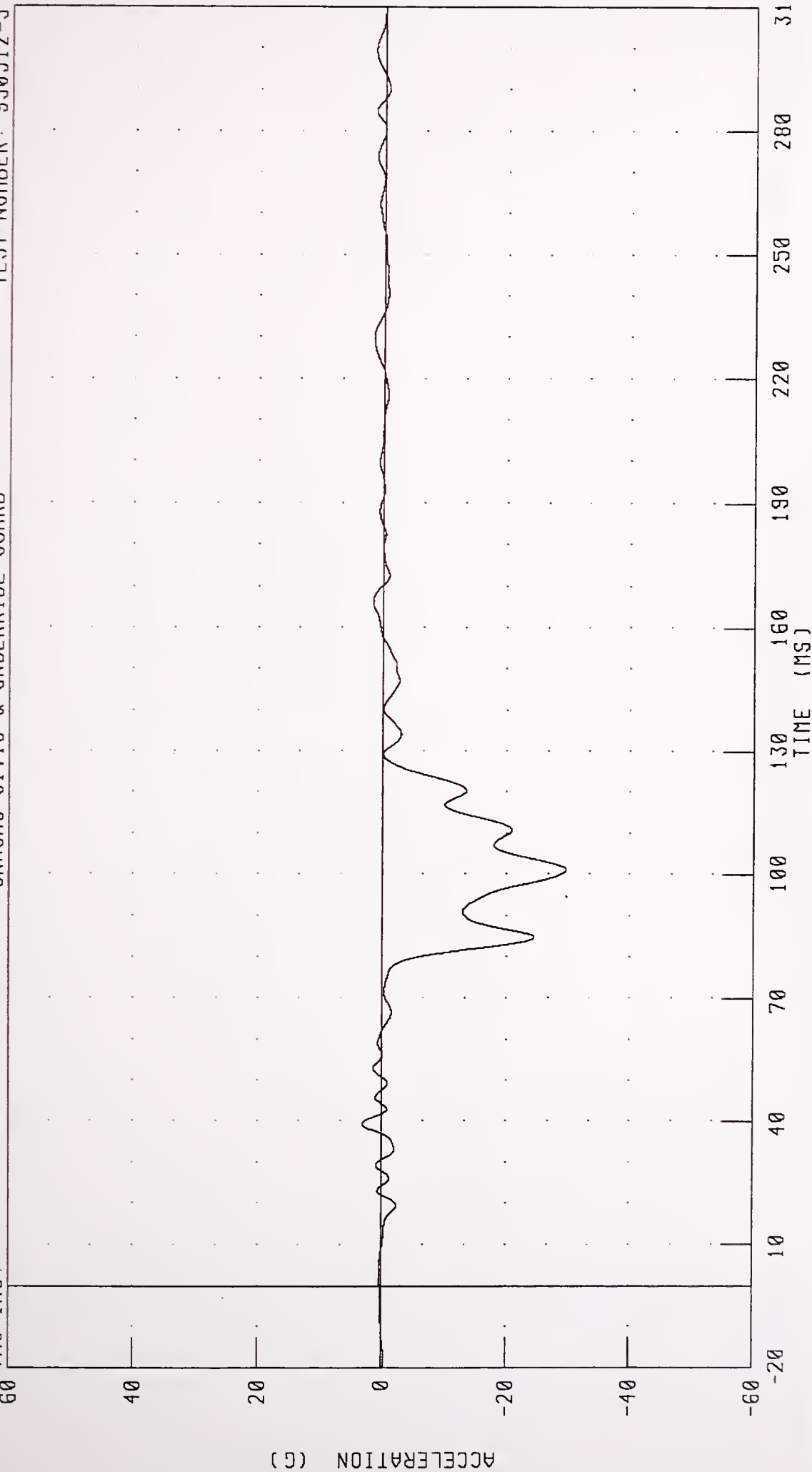
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER: 930512-3

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

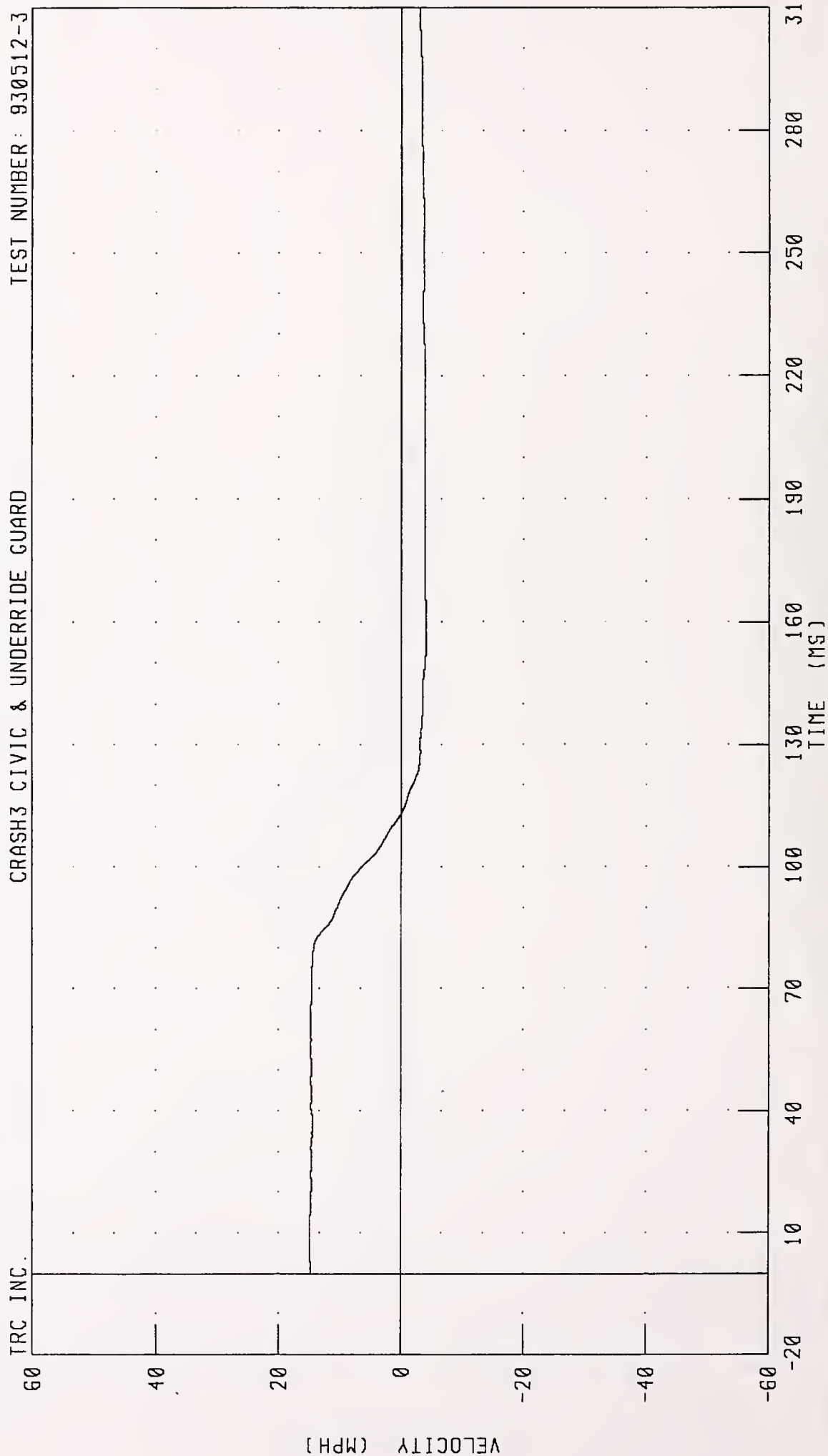


CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 3.14 G @ 39.38 MS; -29.64 G @ 101.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
 VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

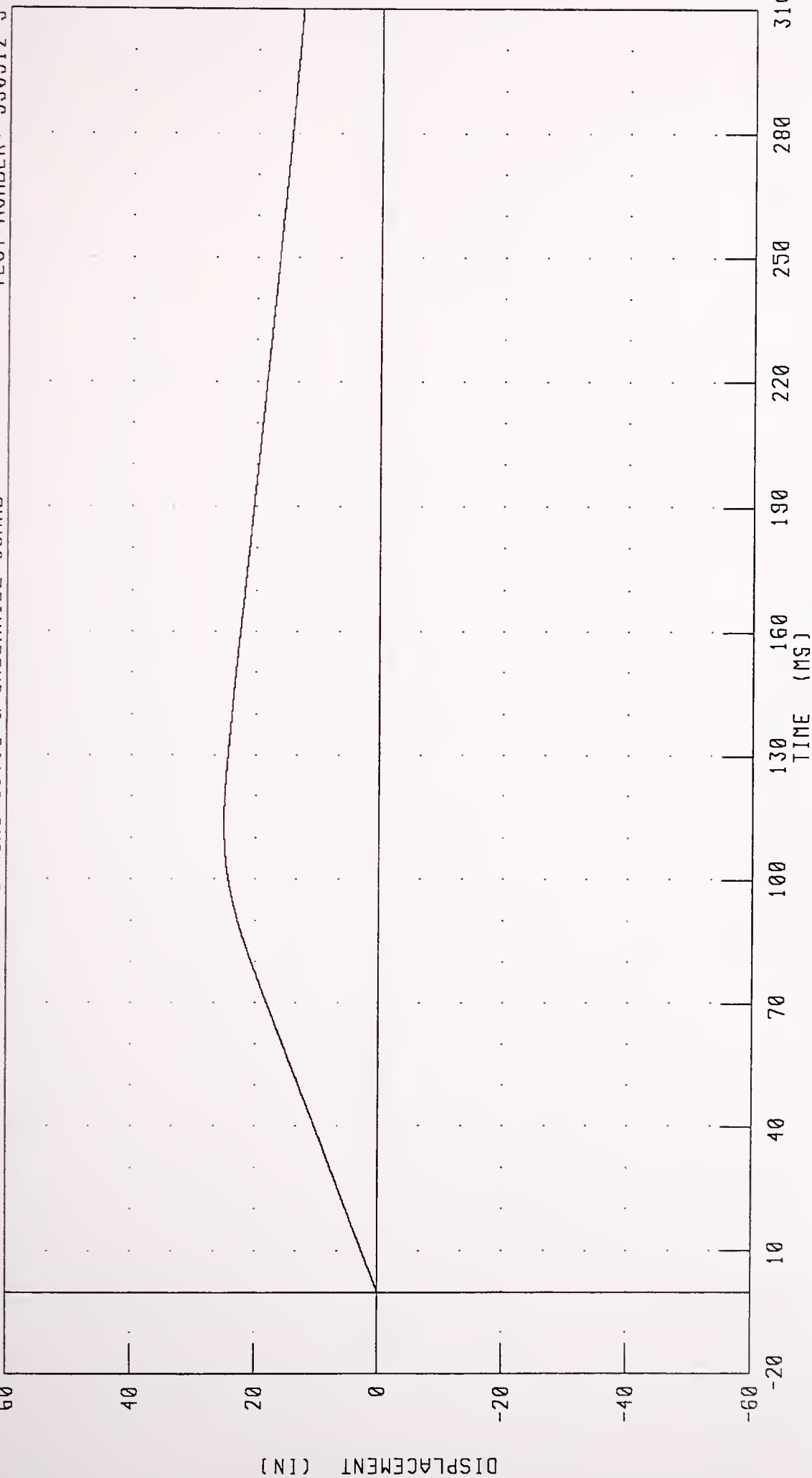
CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

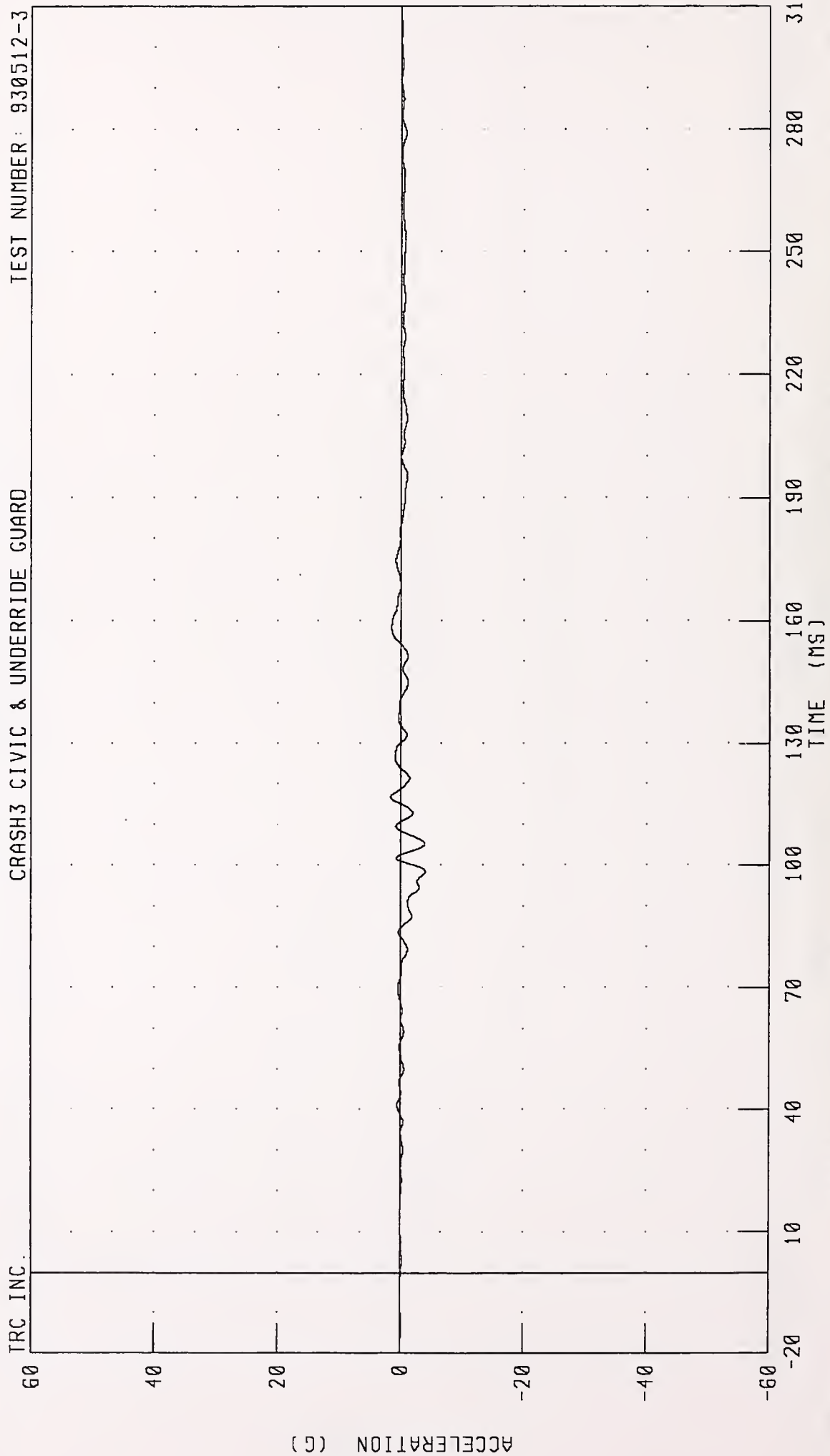


CHANNEL: VCGXD1 FILTER: CH. CLASS 180

PEAK DATA: 25.04 IN @ 113.13 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



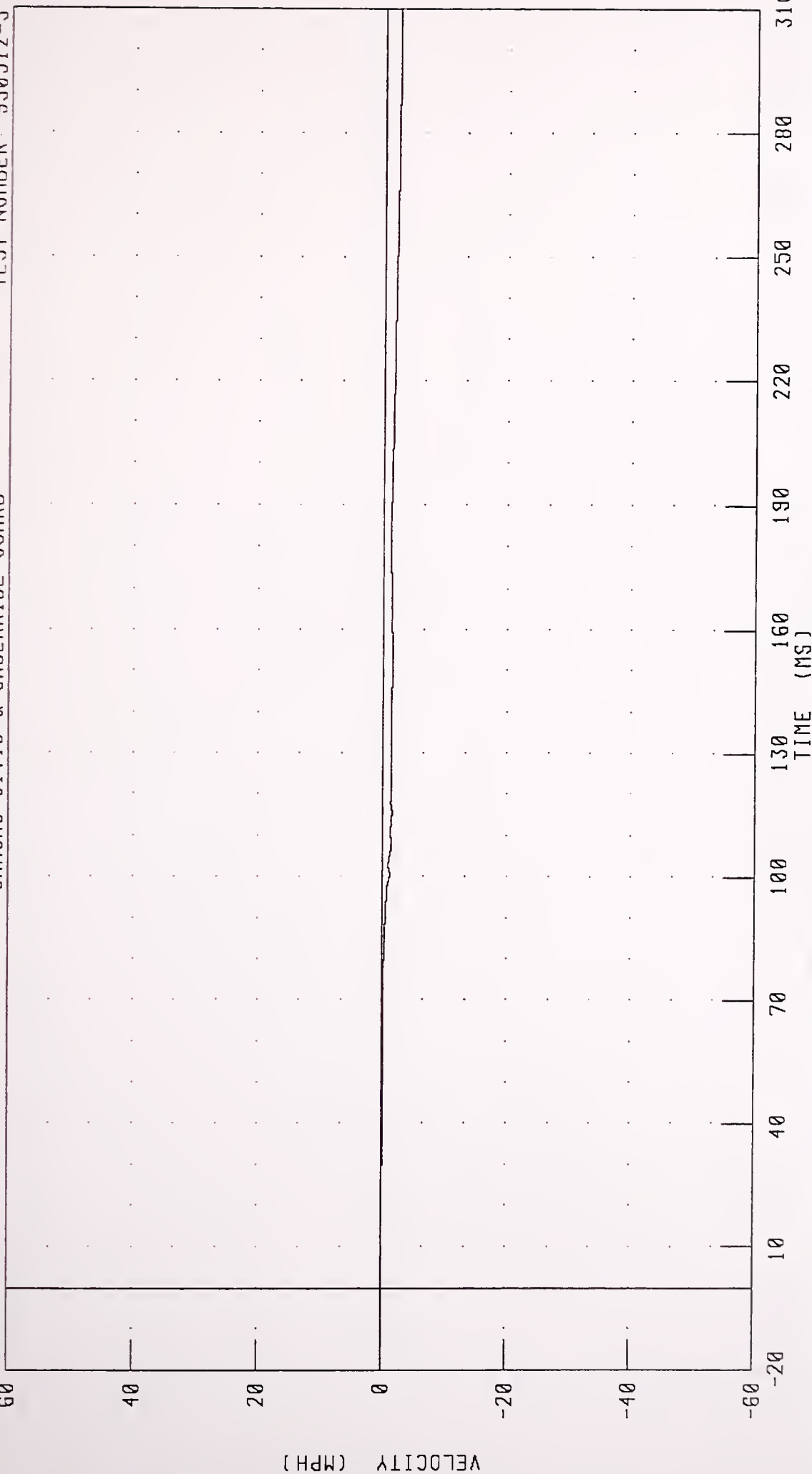
CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 1.66 G @ 116.88 MS; -4.01 G @ 98.50 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3

VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

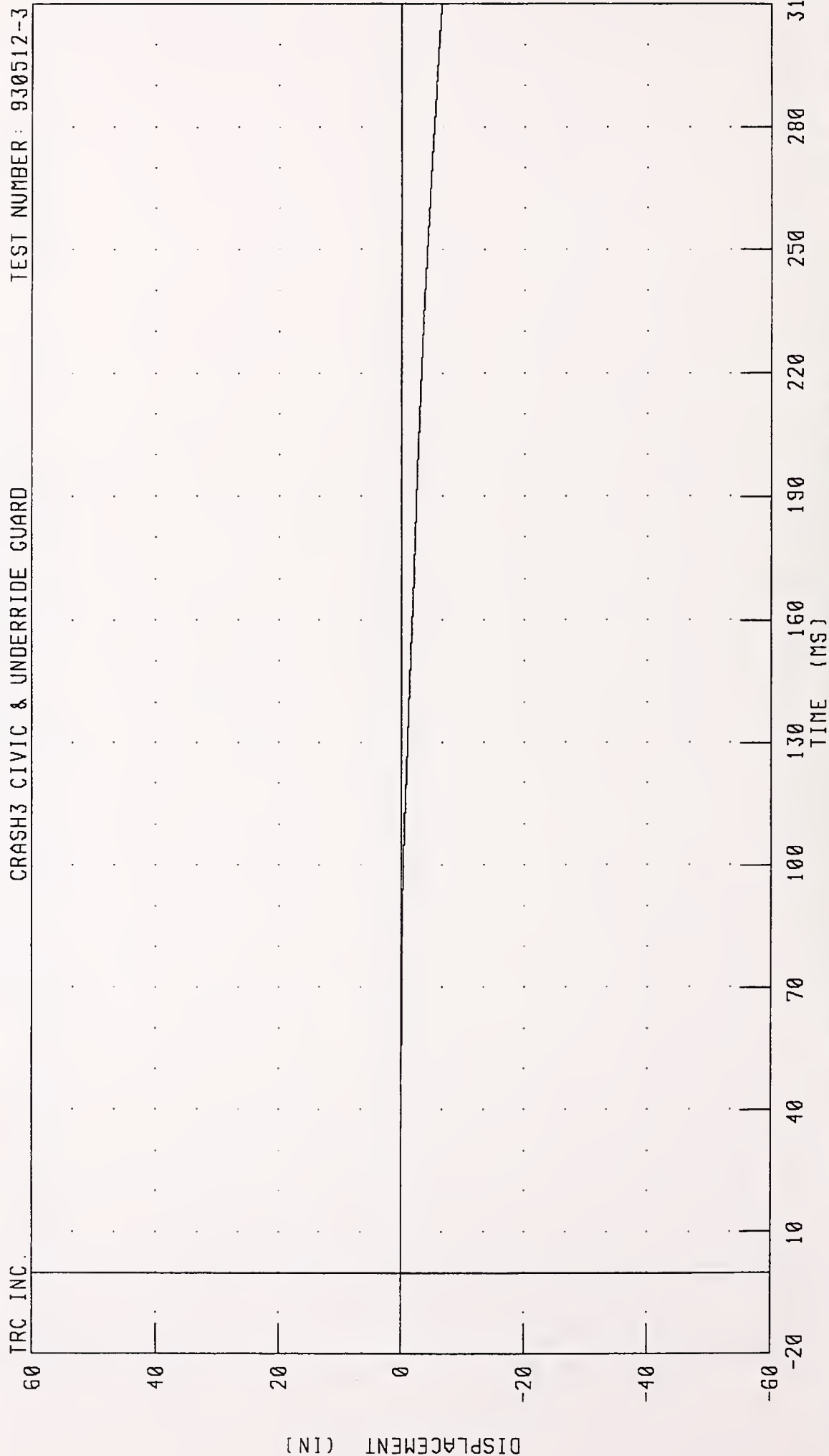


CHANNEL: VCGYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MPH @ 0.00 MS; -2.36 MPH @ 307.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
 VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

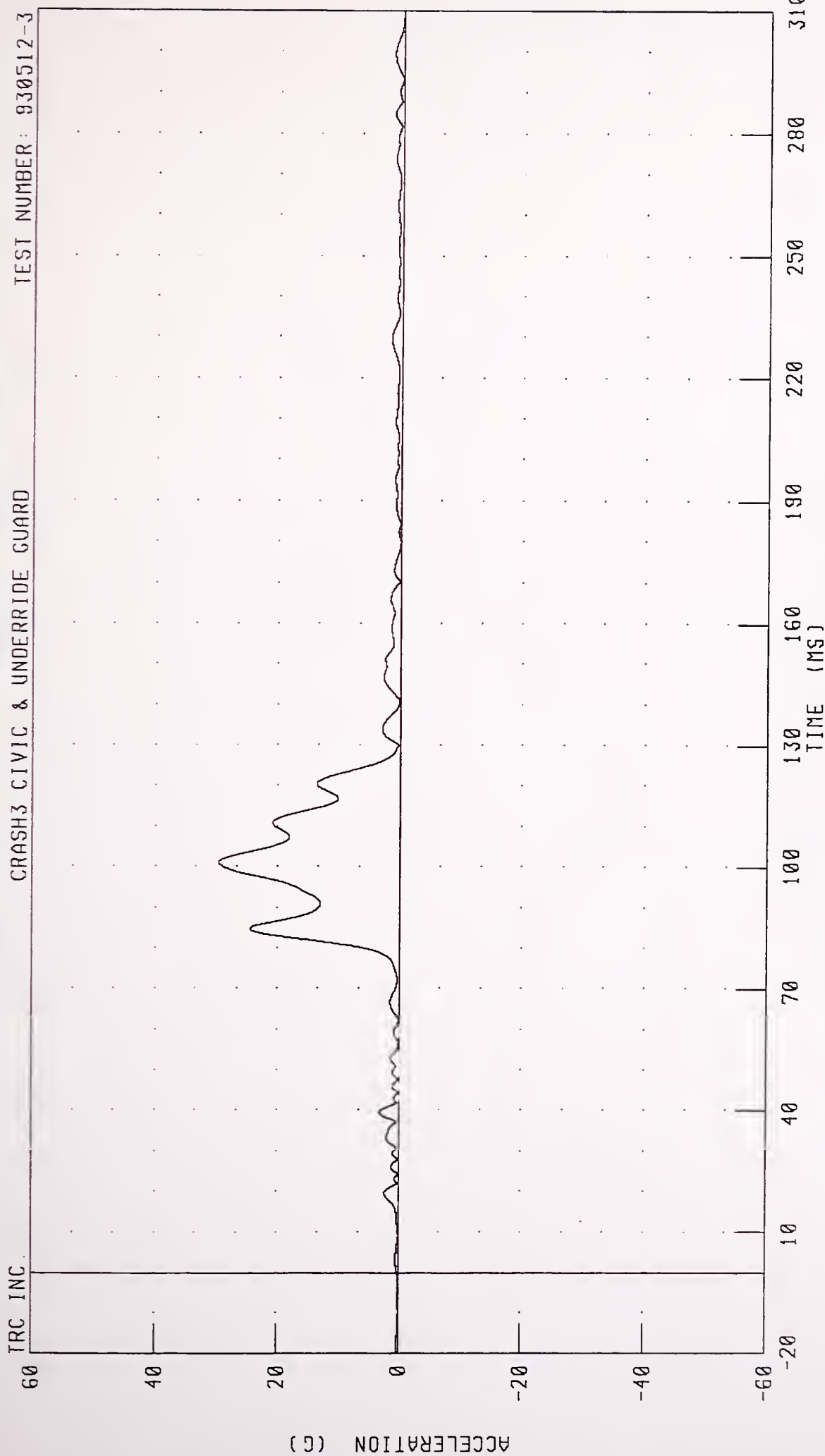


CHANNEL: VCGYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 IN @ 0.00 MS; -6.44 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3

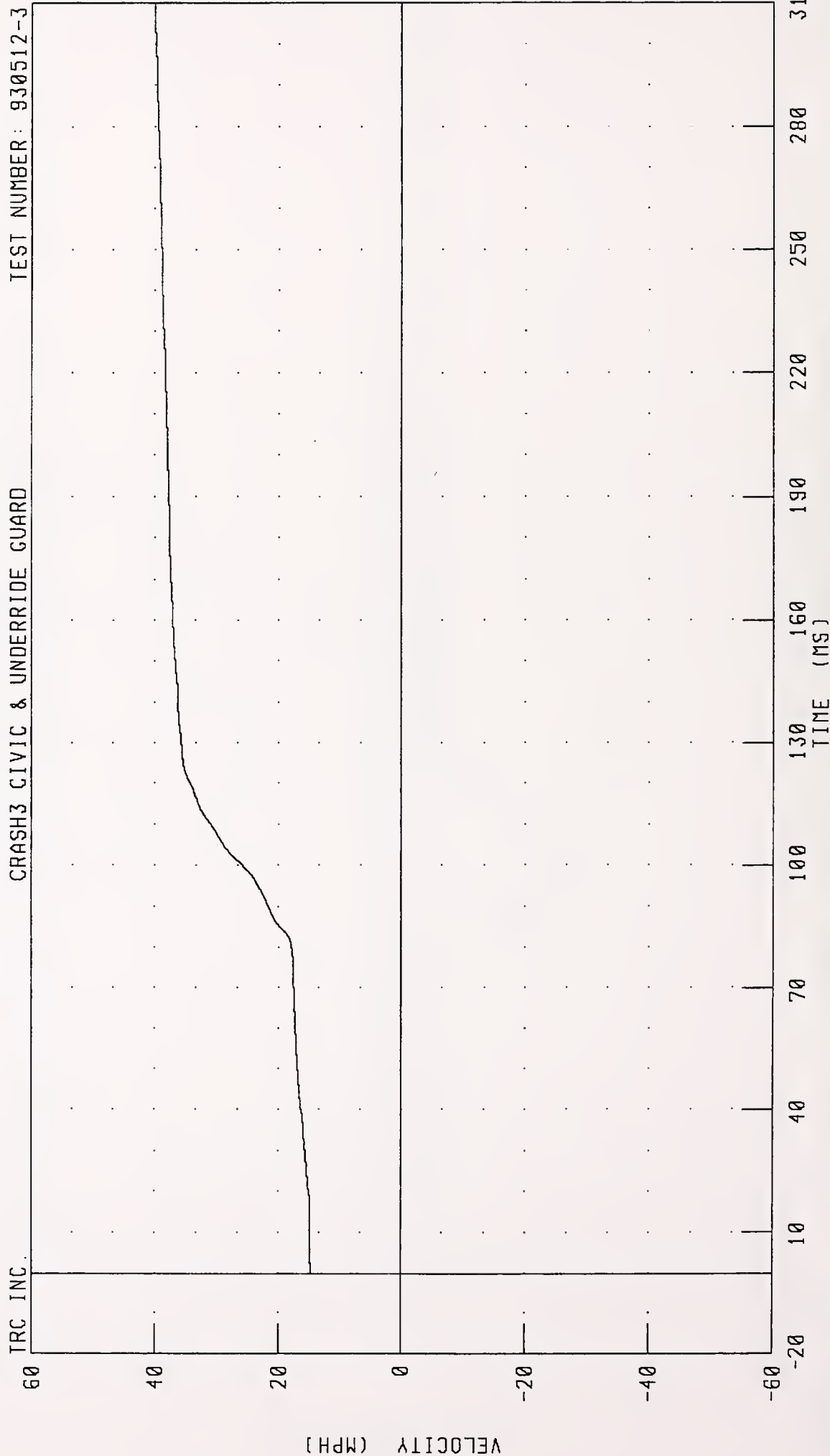


CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 29.64 G @ 101.00 MS; 0.03 G @ 62.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3
VEHICLE CENTER OF GRAVITY RESULTANT VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-3



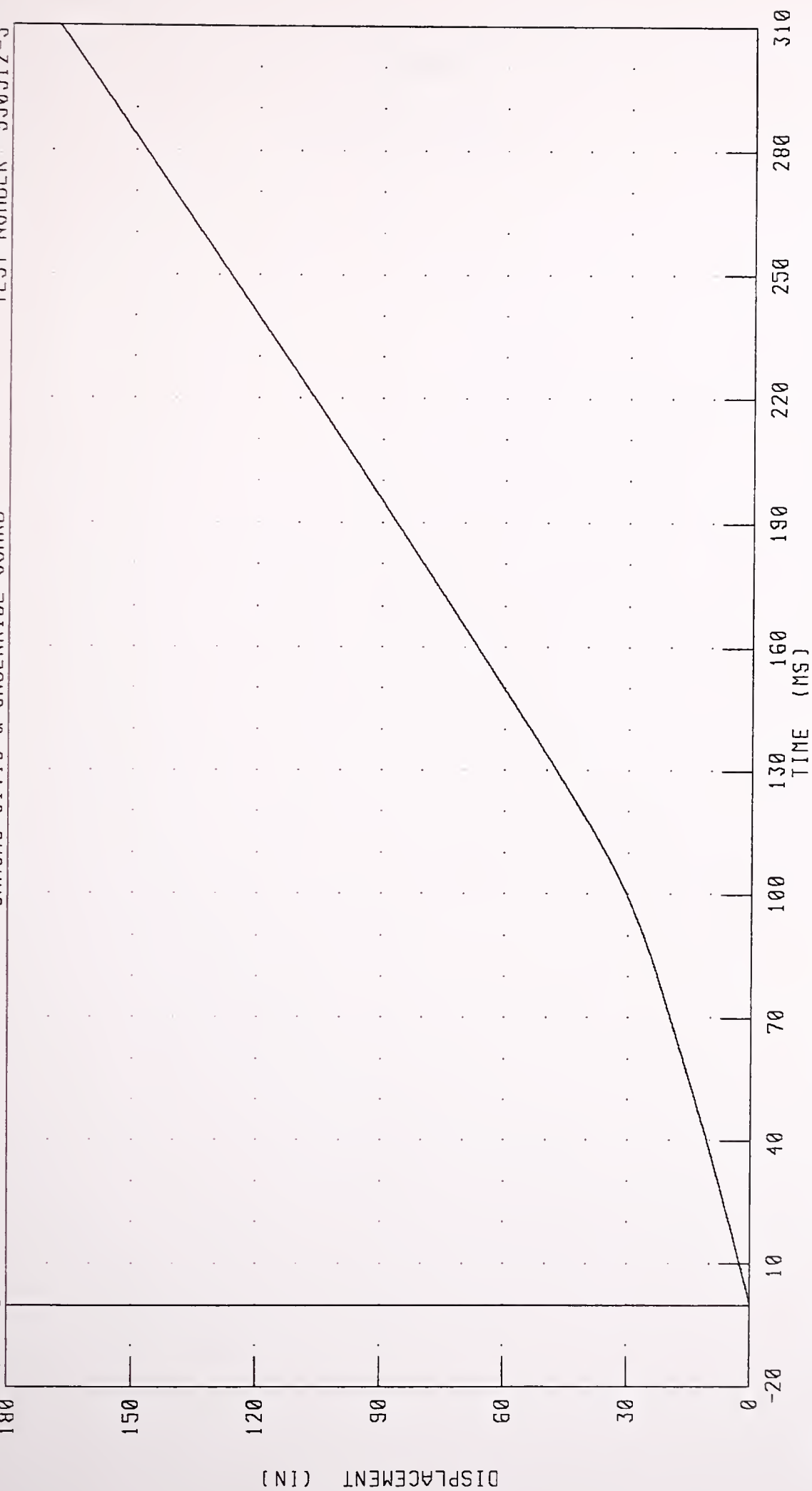
CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 39.97 MPH @ 310.00 MS; 14.80 MPH @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 3

VEHICLE CENTER OF GRAVITY RESULTANT DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER 930512-3

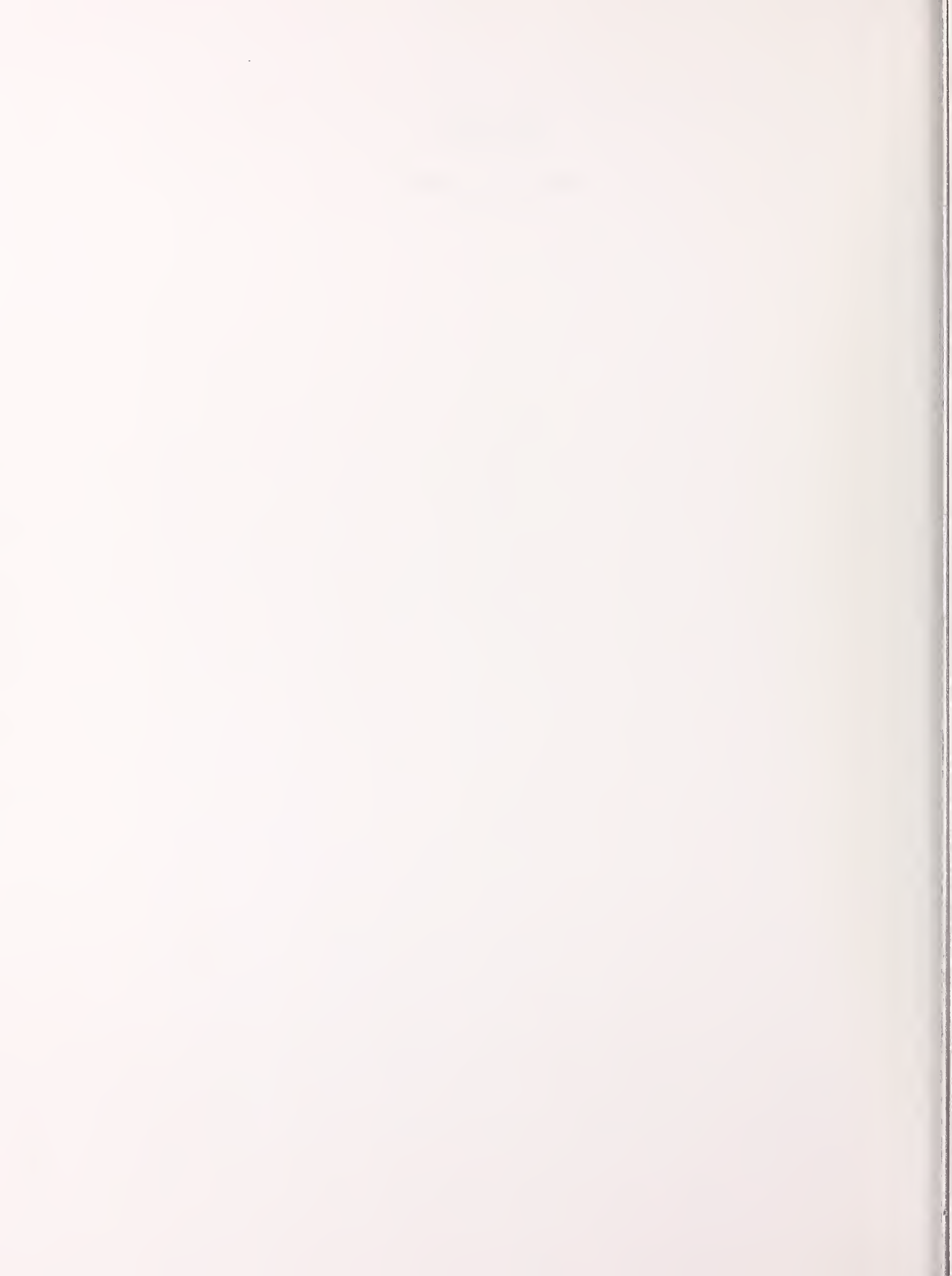


CHANNEL VCGRD1 FILTER: CH CLASS 180

PEAK DATA: 168.52 IN @ 310.00 MS; 0.00 IN @ 0.00 MS

DATA PLOTS

TEST NO. 930512-4

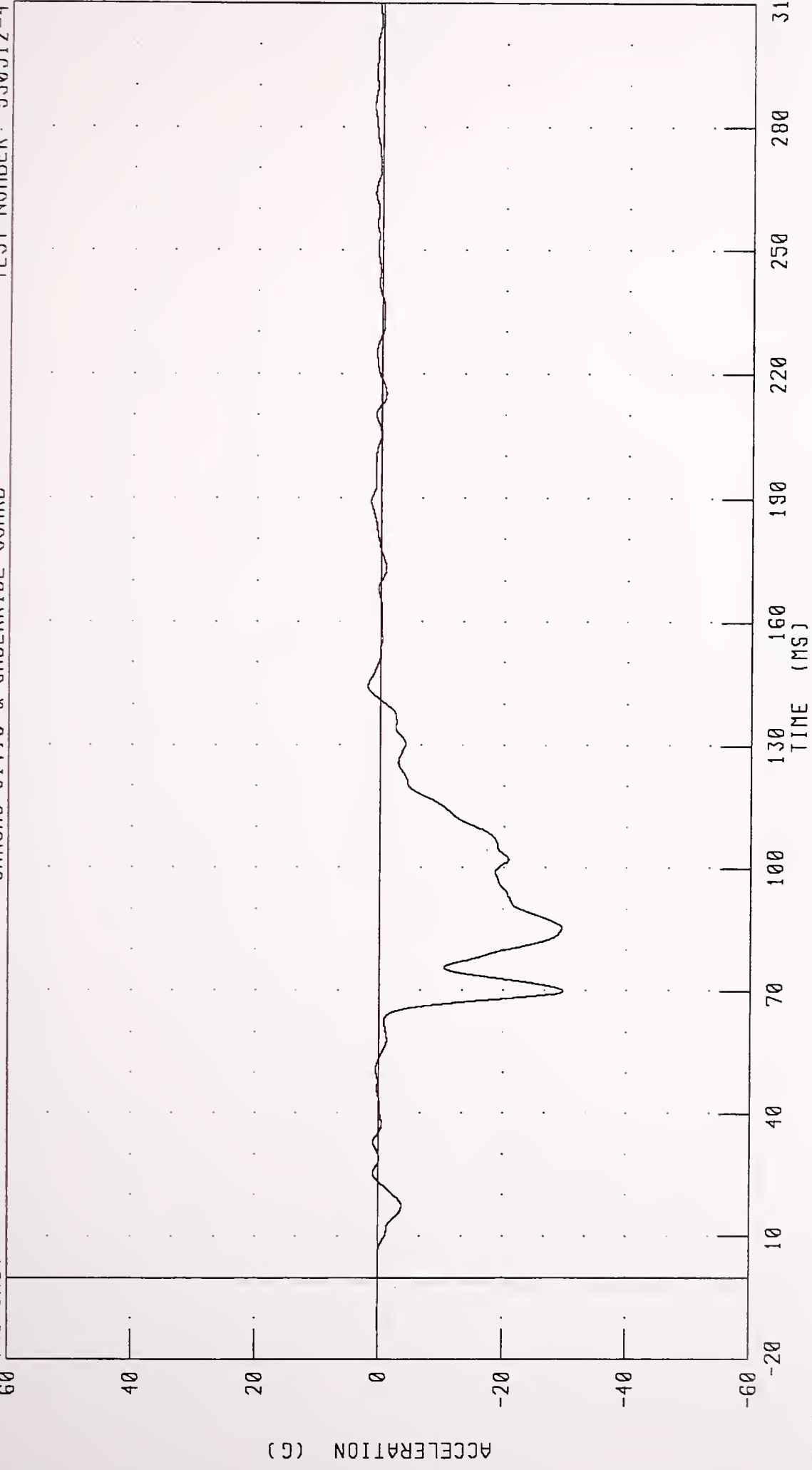


1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
LEFT REAR SILL X-AXIS ACCELERATION

TEST NUMBER: 930512-4

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

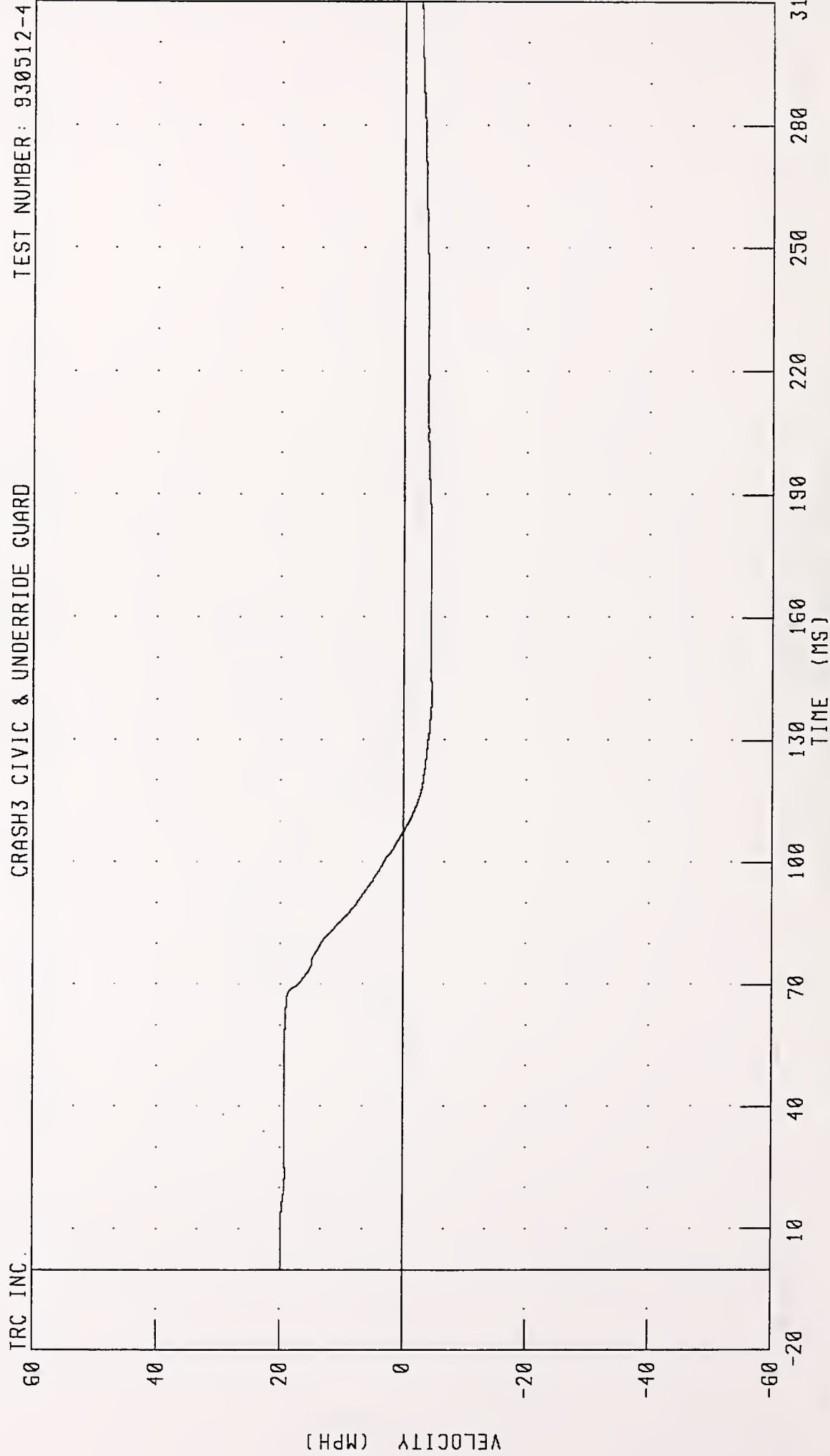


CHANNEL: LRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.03 G @ 144.38 MS; -29.67 G @ 70.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
LEFT REAR SILL X-AXIS VELOCITY
CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4



CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 19.90 MPH @ 0.13 MS; -4.58 MPH @ 141.63 MS

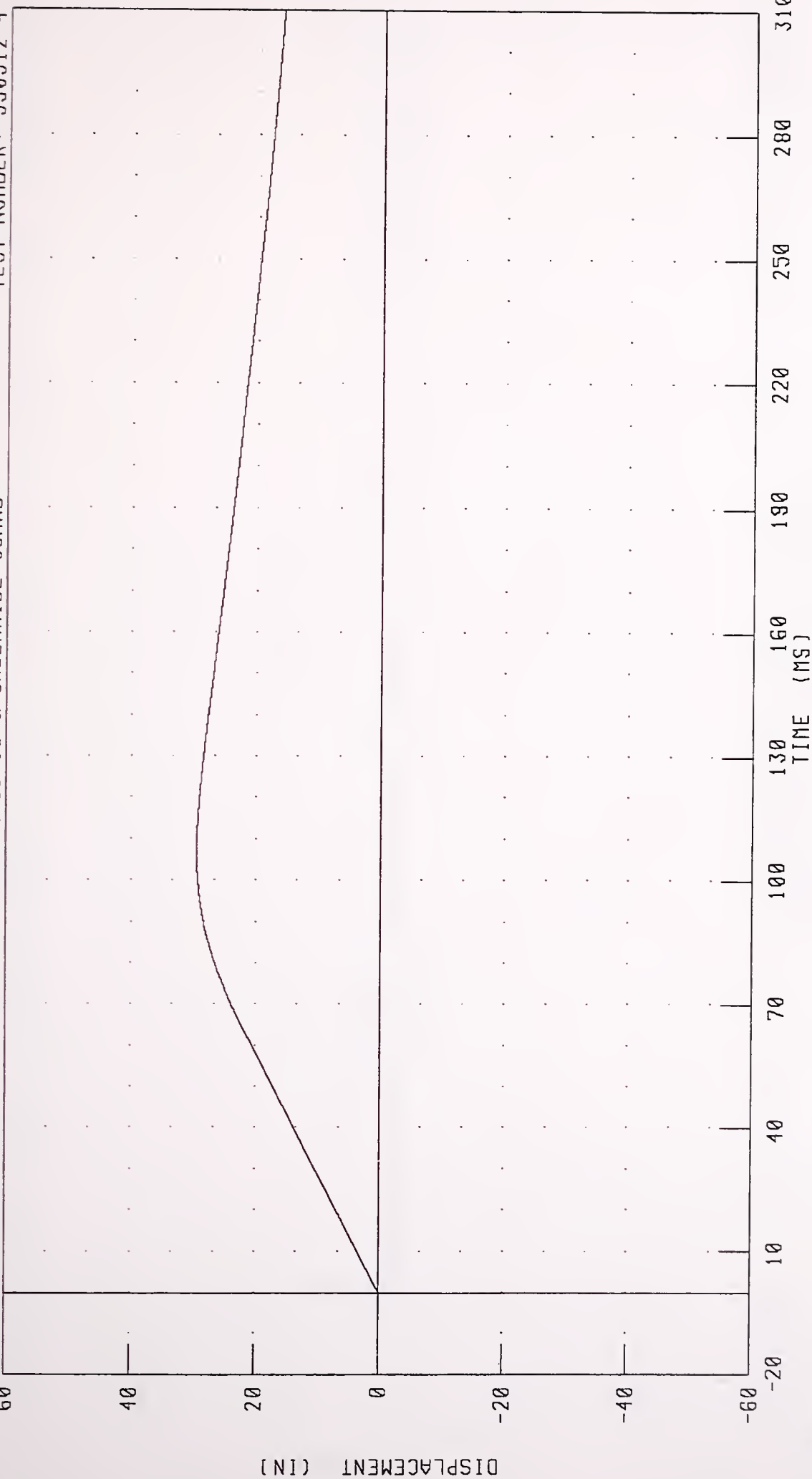
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4

LEFT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4

TRC INC.



CHANNEL: LRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 29.50 IN @ 107.38 MS; 0.00 IN @ 0.00 MS

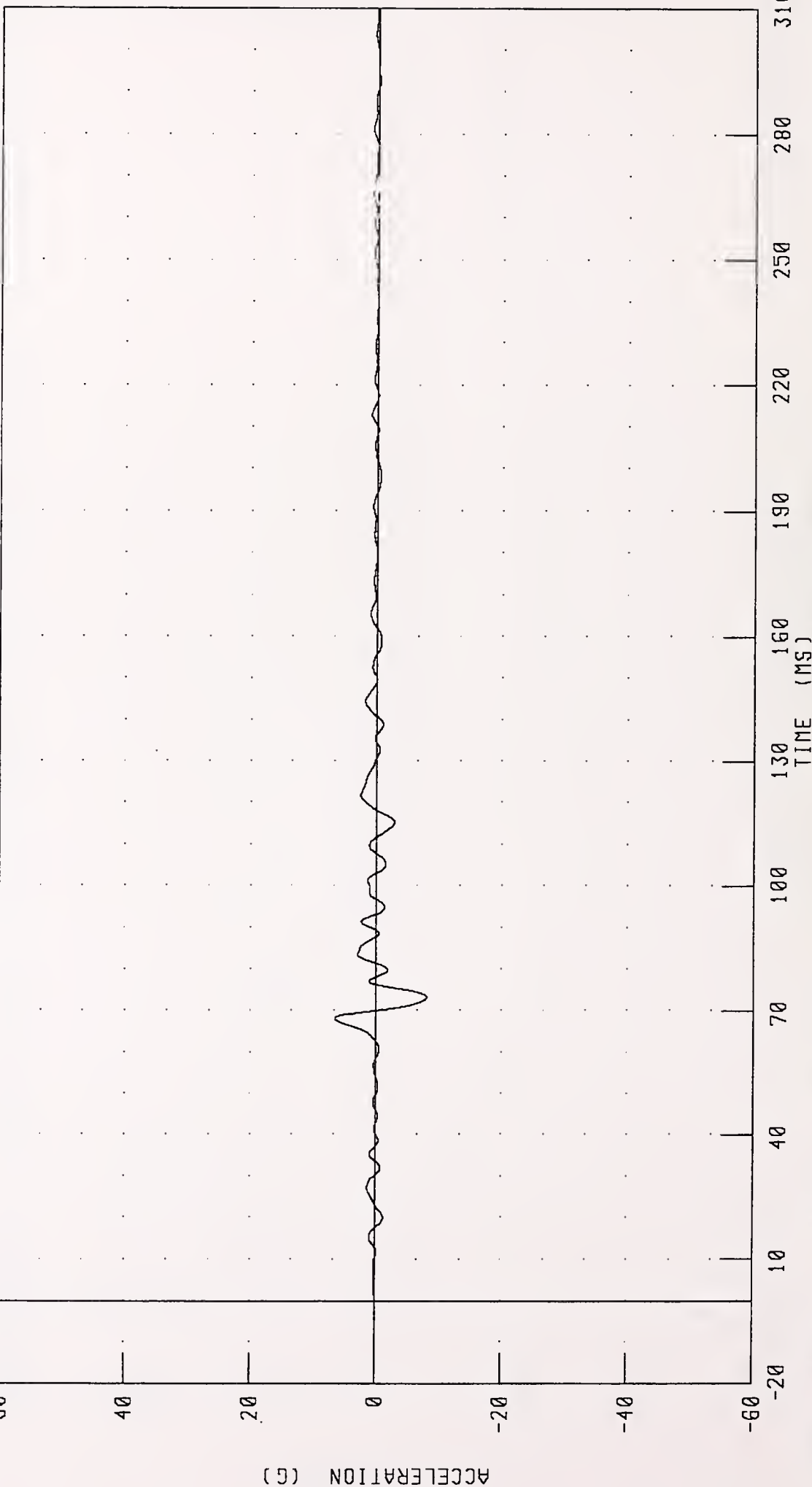
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4

LEFT REAR SILL Y-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-4



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 6.50 G @ 68.00 MS; -8.16 G @ 73.25 MS

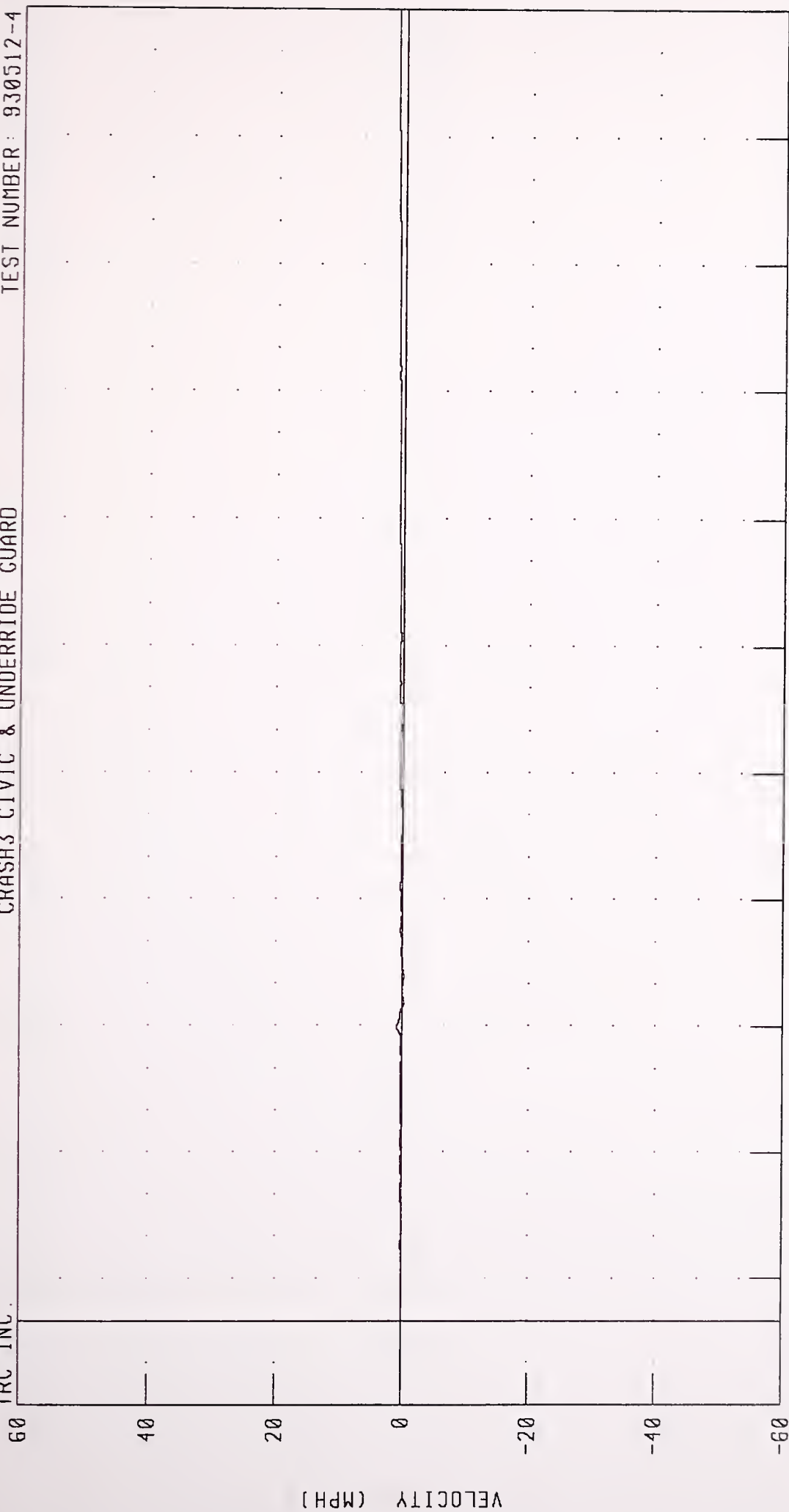
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4

LEFT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4

TRC INC.



CHANNEL: LRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 1.24 MPH @ 310.00 MS; -0.30 MPH @ 75.50 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4

LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4

TRC INC.

DISPLACEMENT (IN)

TIME (MS)

CHANNEL: LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 2.68 IN @ 310.00 MS; 0.00 IN @ 0.25 MS

60

40

20

0

-20

-40

-60

10

40

70

100

130

160

190

220

250

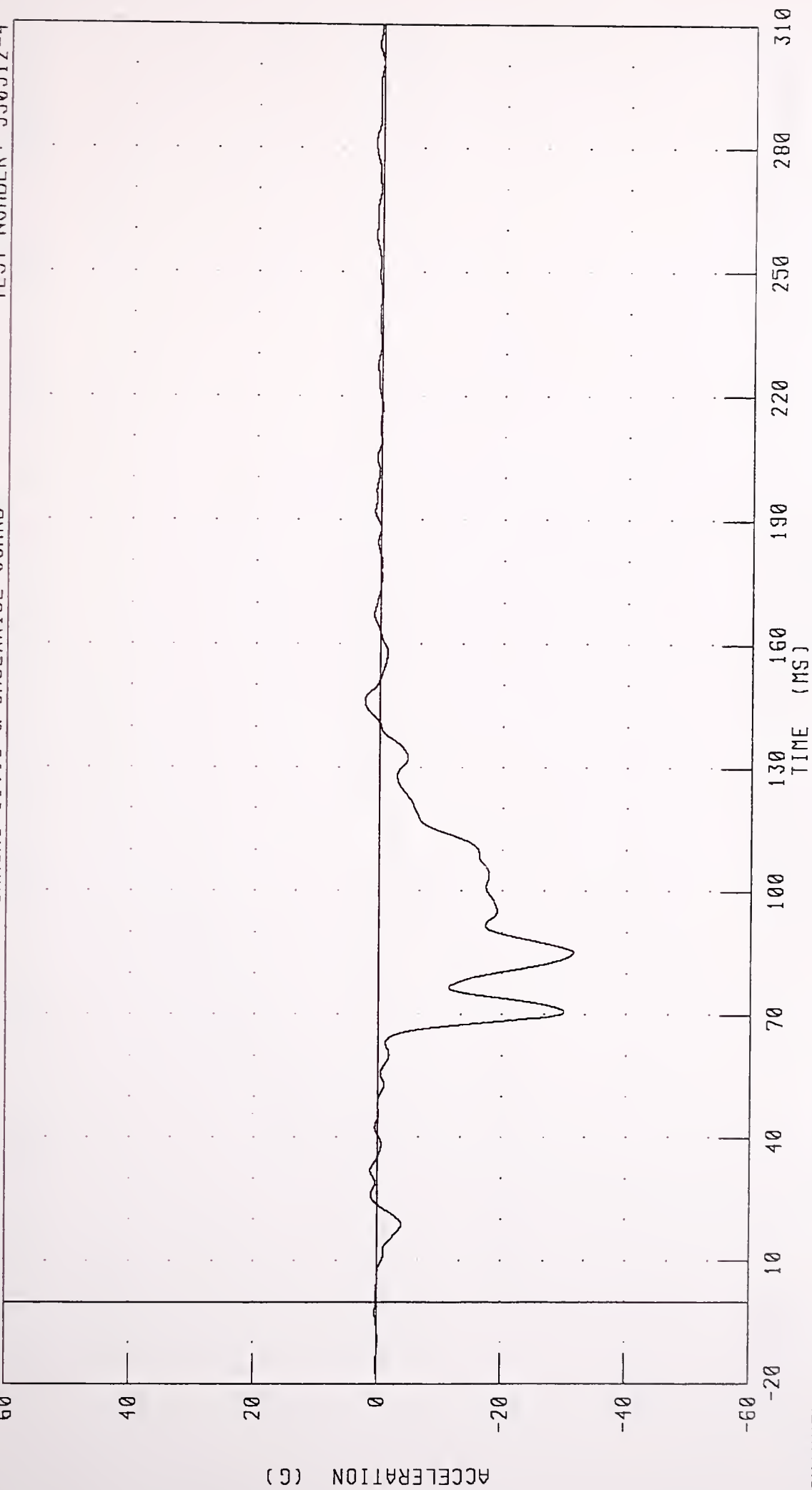
280

310

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4

RIGHT REAR SILL X-AXIS ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-4



CHANNEL: RRSXG1 FILTER: CH. CLASS 60

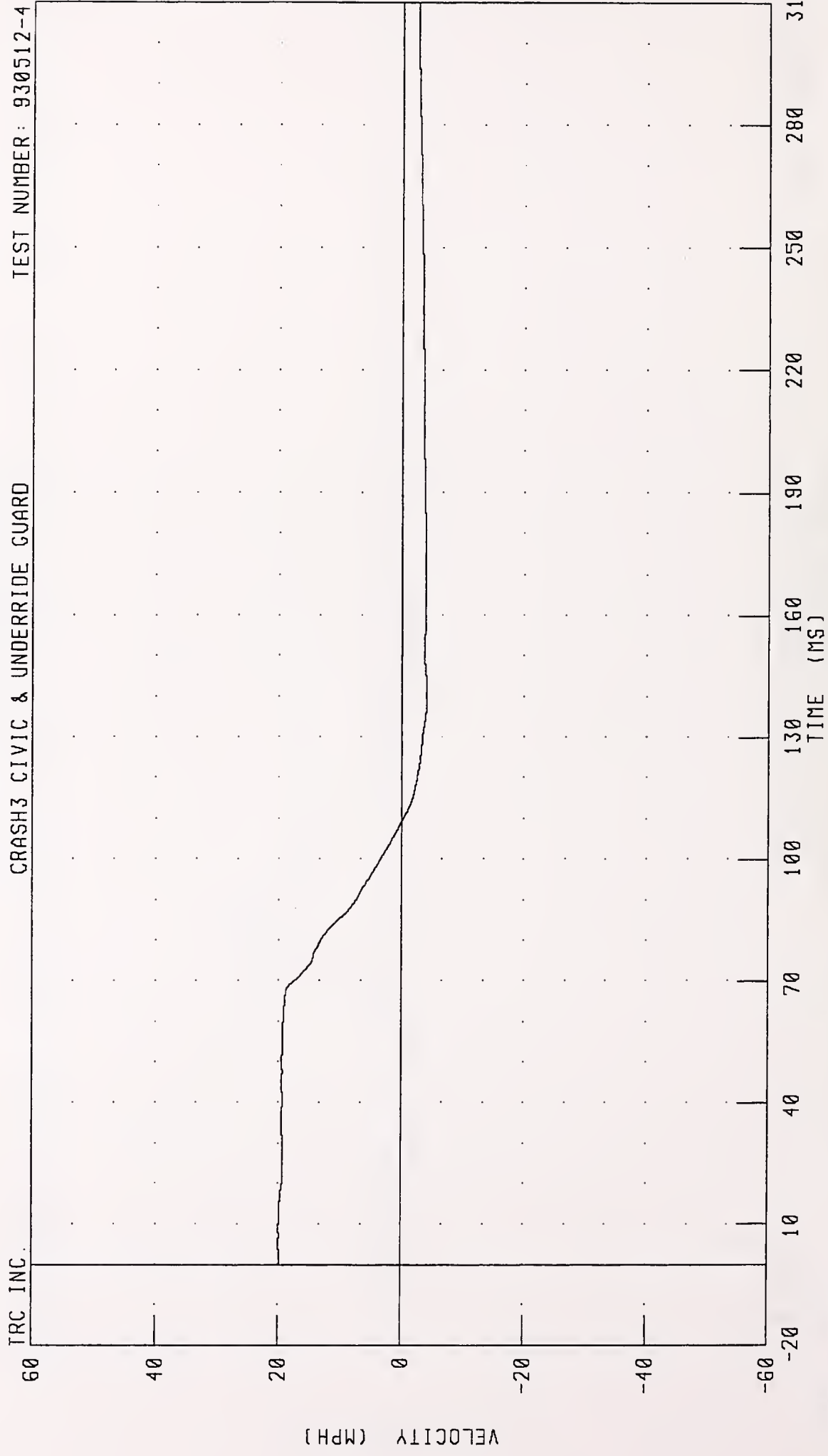
PEAK DATA: 2.46 G @ 146.13 MS; -31.47 G @ 85.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4

RIGHT REAR SILL X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4



CHANNEL: RRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 19.92 MPH @ 4.88 MS; -4.08 MPH @ 141.63 MS

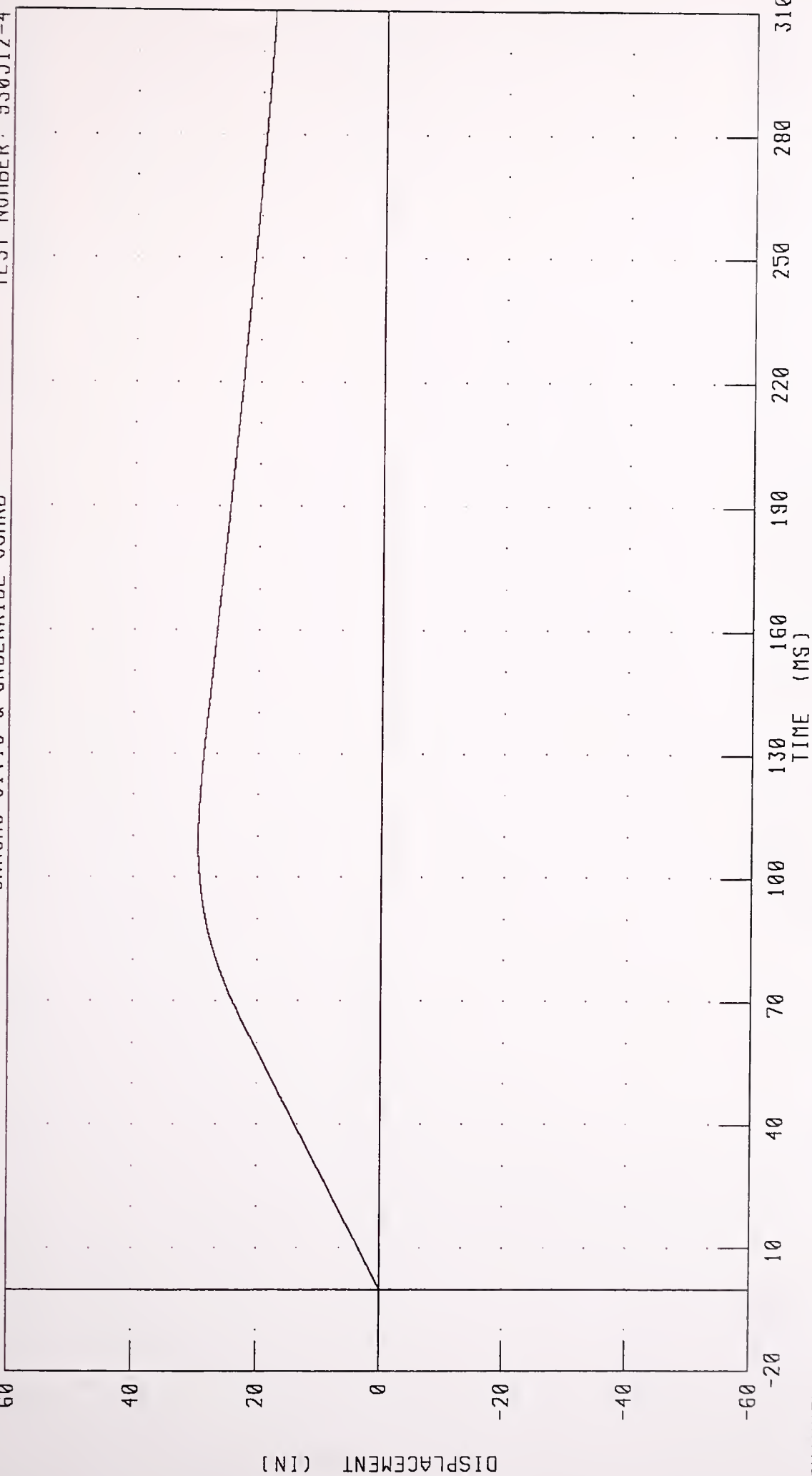
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4

RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4

TRC INC.

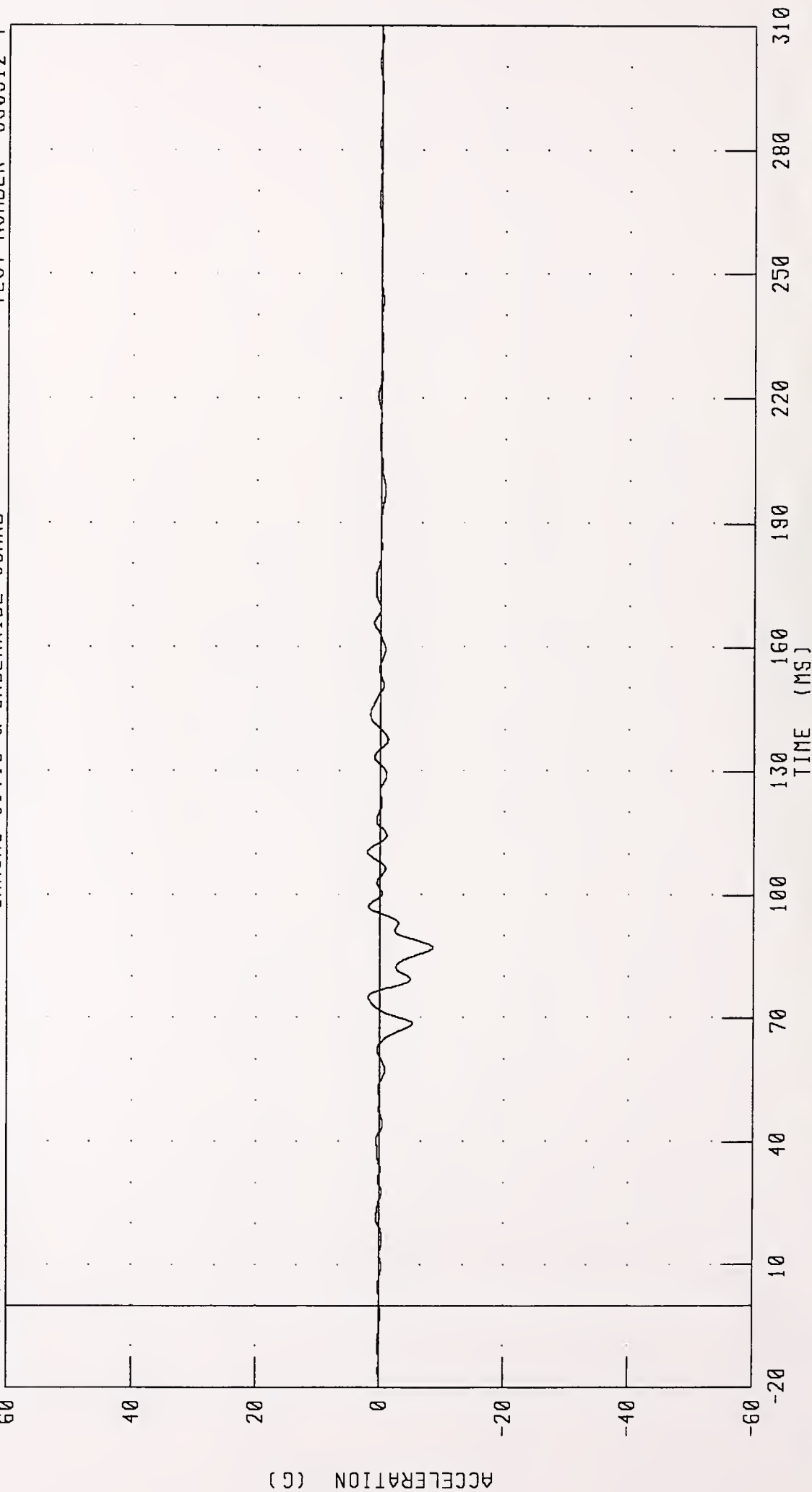


CHANNEL RRSXD1 FILTER: CH. CLASS 180

PEAK DATA: 29.61 IN @ 109.25 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
RIGHT REAR SILL Y-AXIS ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-4



CHANNEL: RRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 2.01 G @ 110.50 MS; -8.49 G @ 87.13 MS

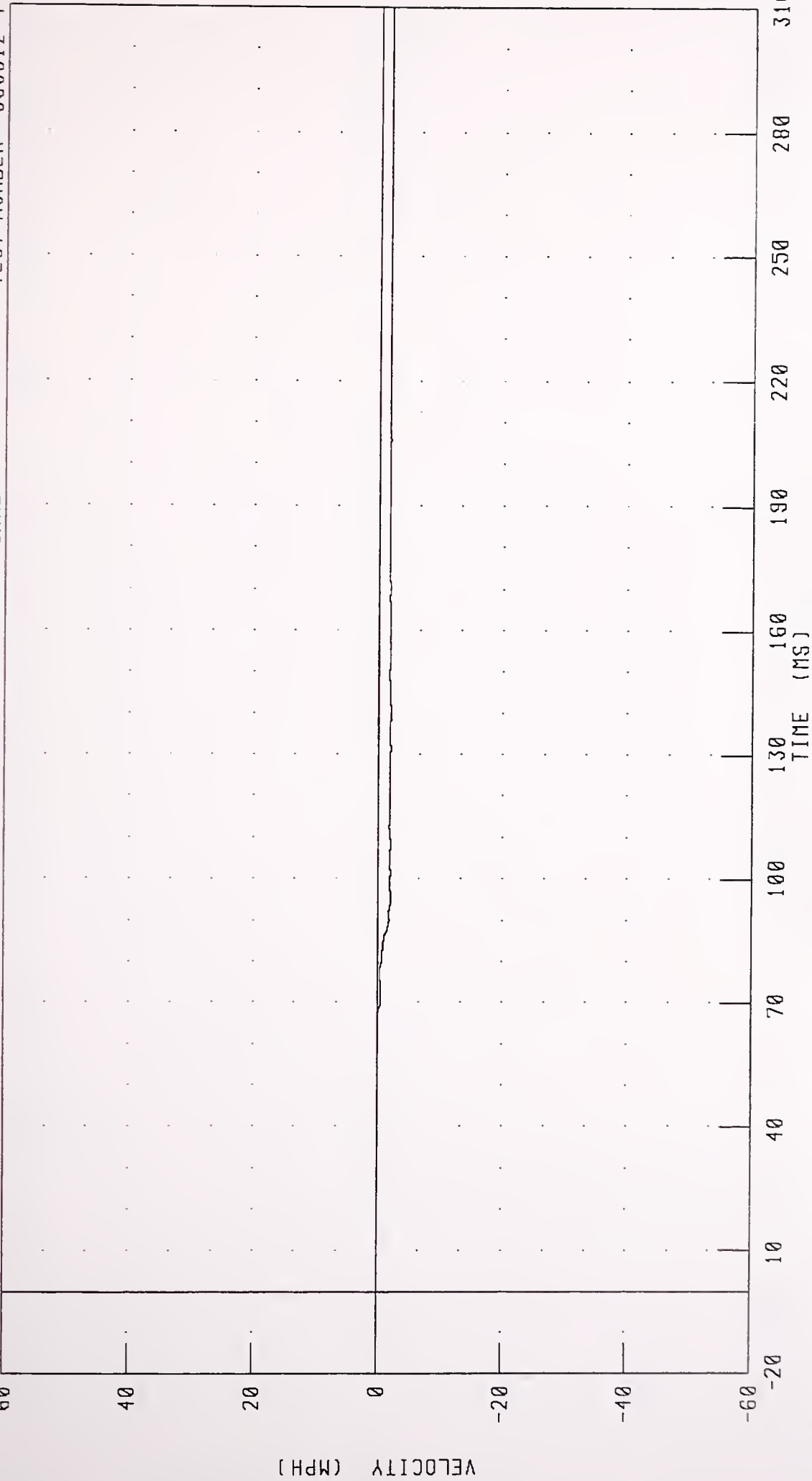
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4

RIGHT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930512-4



CHANNEL: RRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.08 MPH @ 42.25 MS; -2.08 MPH @ 95.50 MS

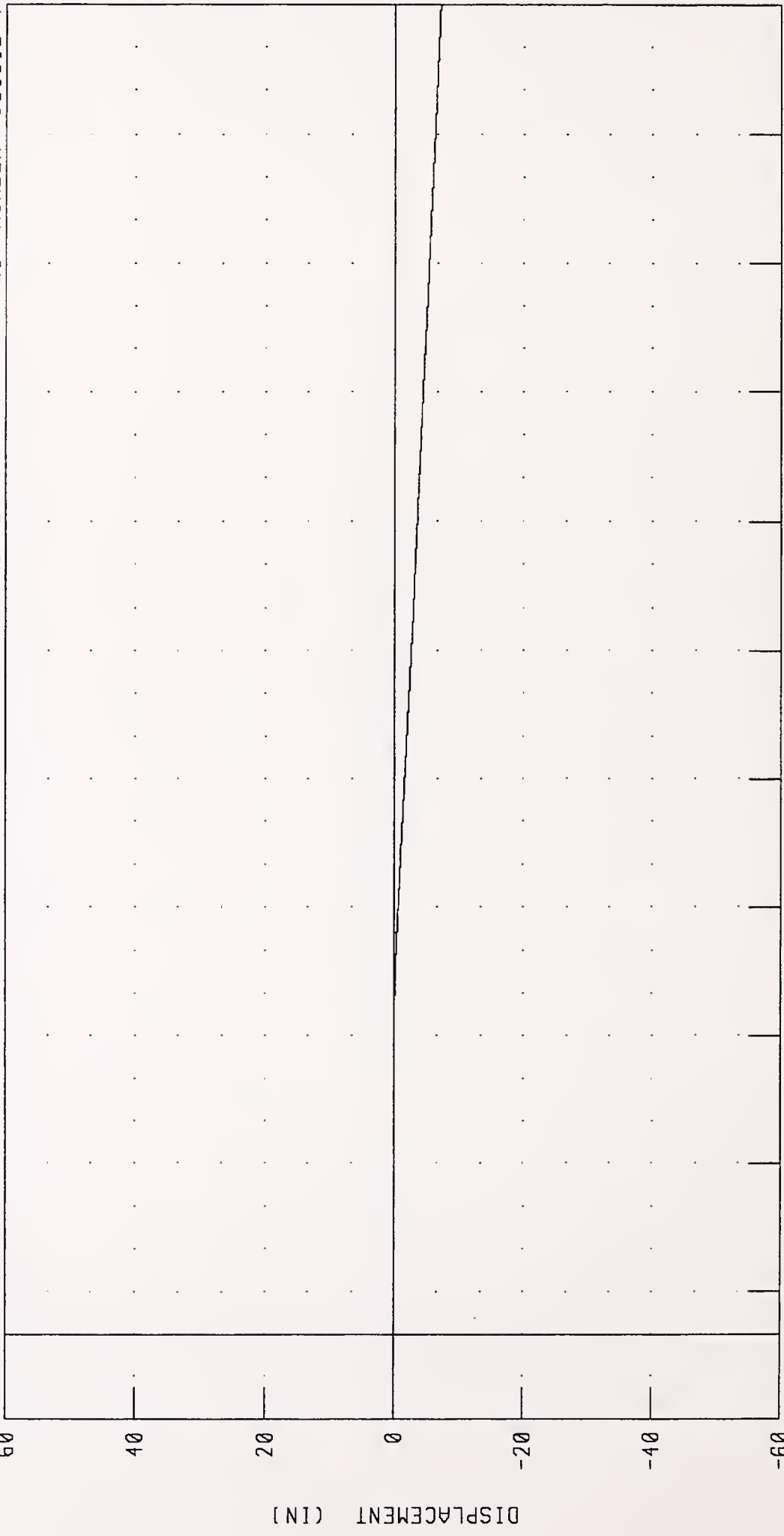
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4

RIGHT REAR SILL Y-AXIS DISPLACEMENT

TRC INC.

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4

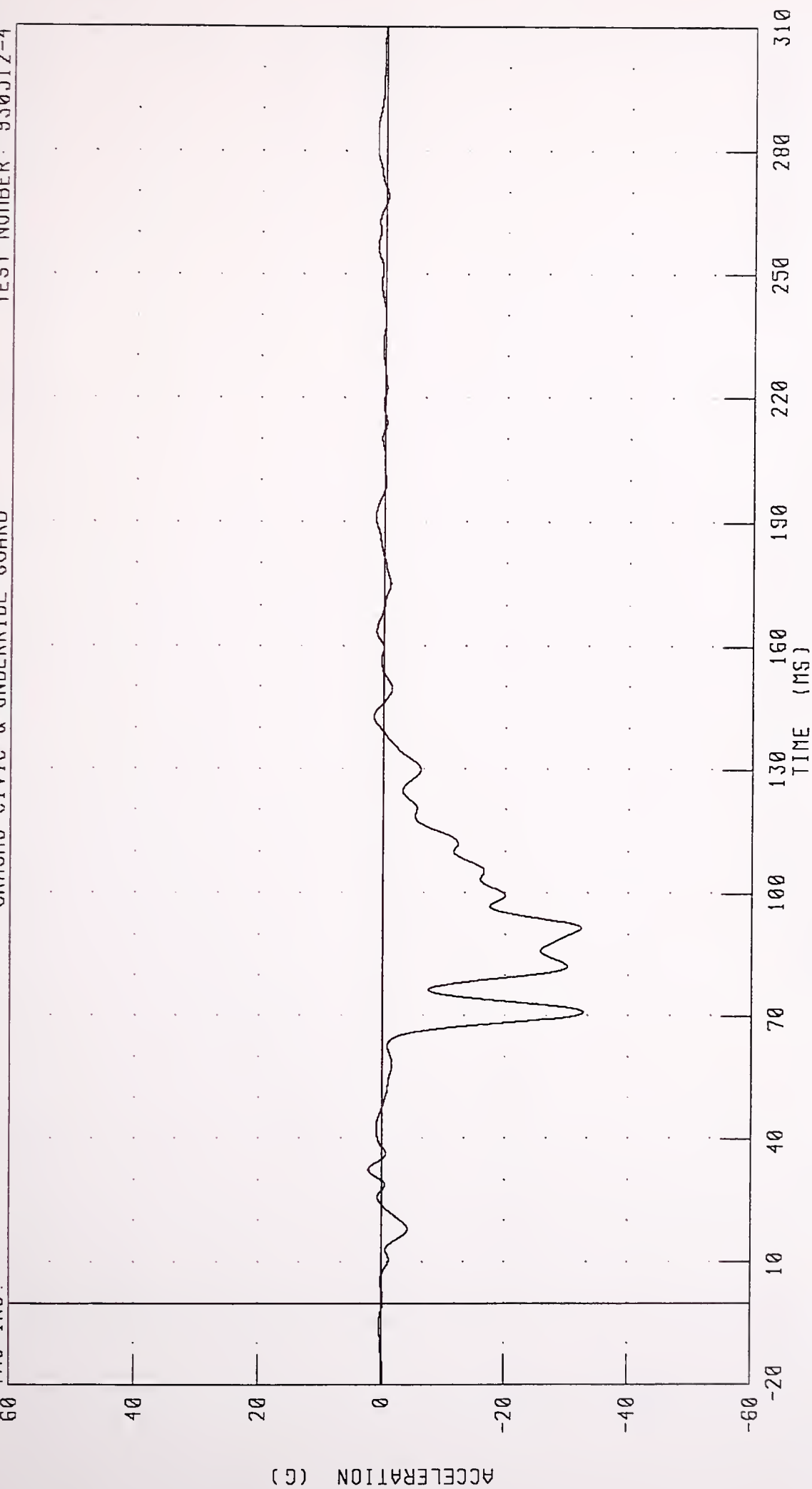


CHANNEL: RRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.01 IN @ 57.63 MS; -7 06 IN @ 310 00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4
VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-4



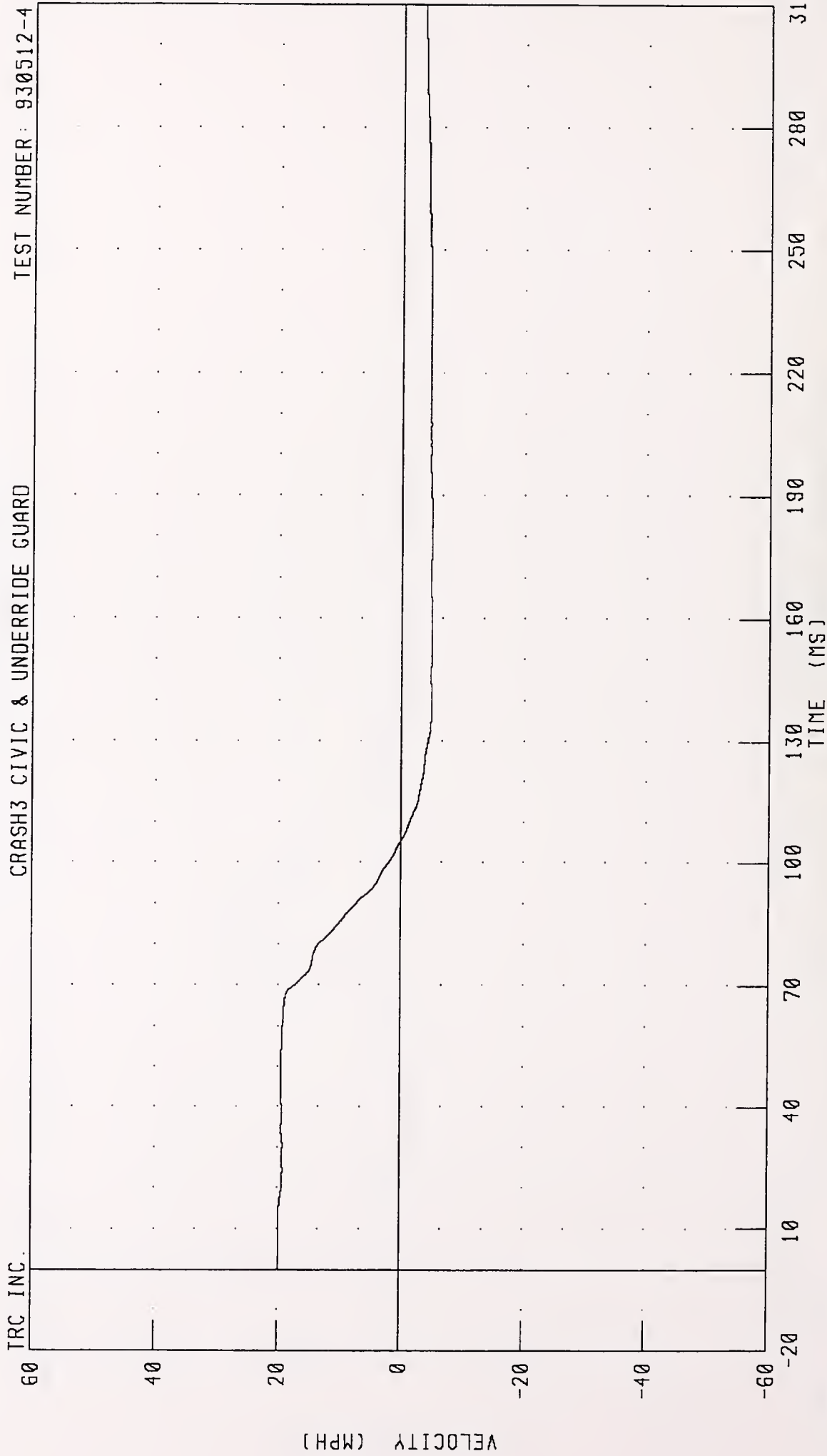
CHANNEL: VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.14 G @ 32.50 MS; -32.65 G @ 71.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4
VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

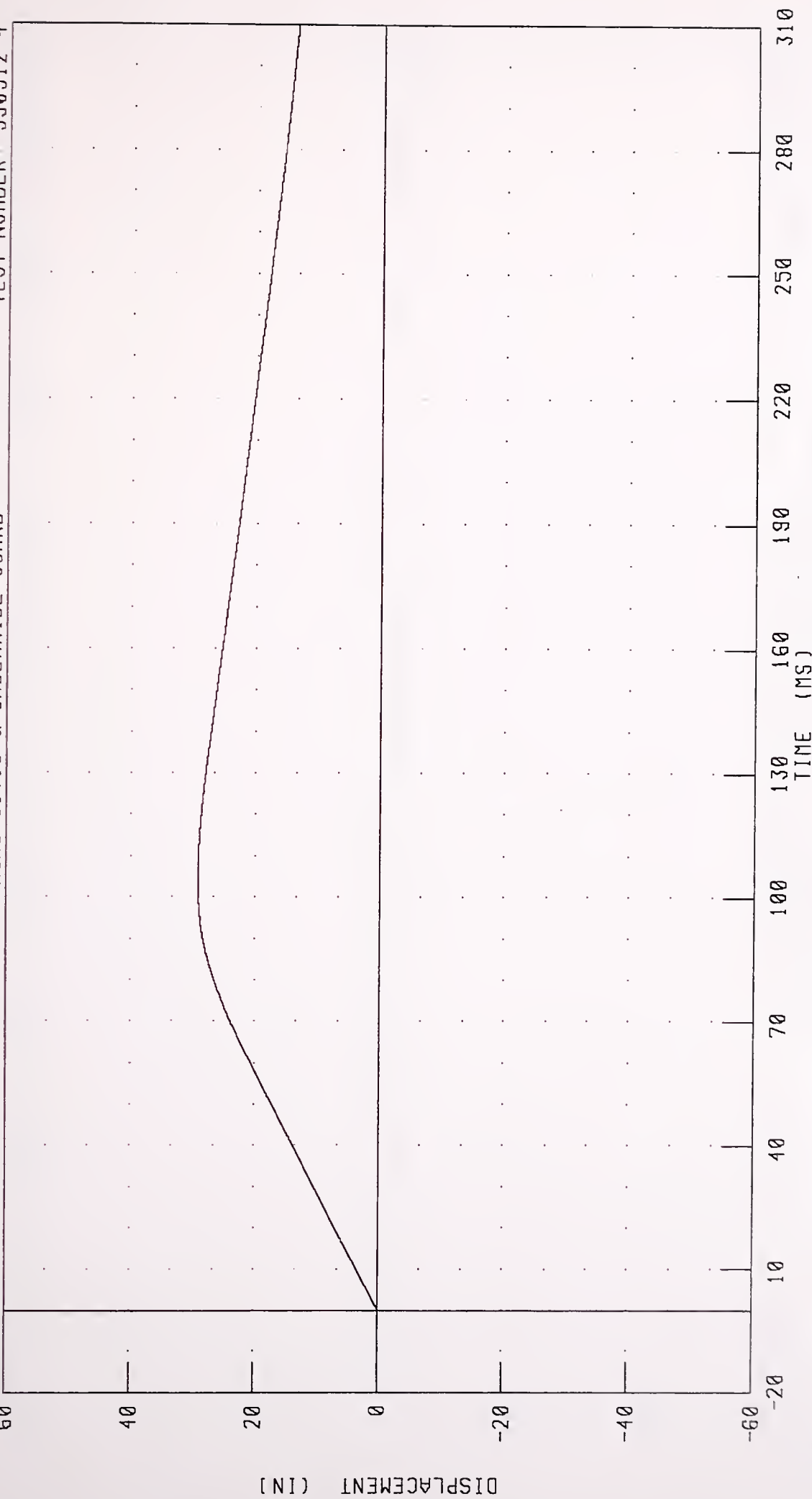
TEST NUMBER: 930512-4



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

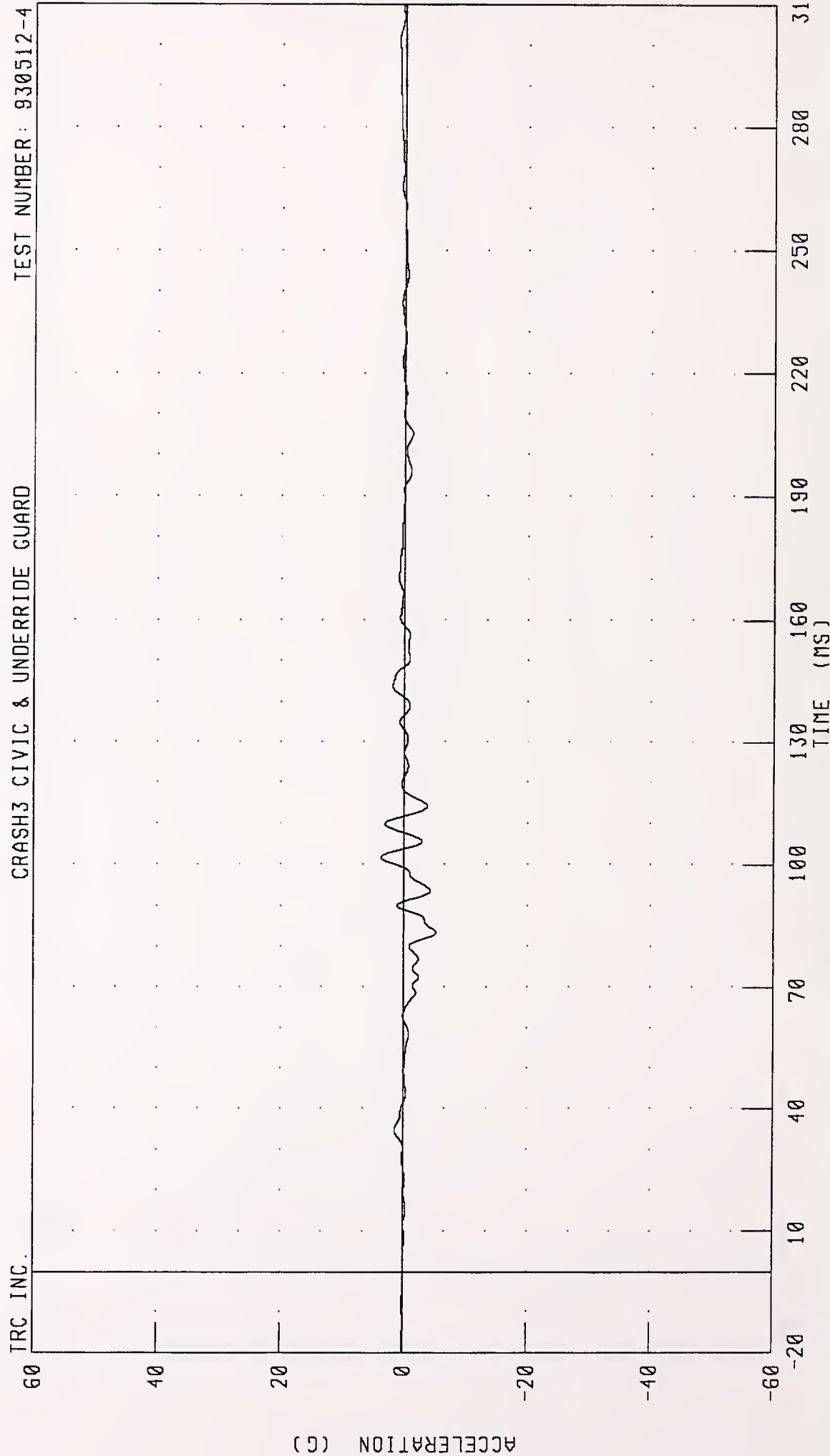
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4
VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER 930512-4



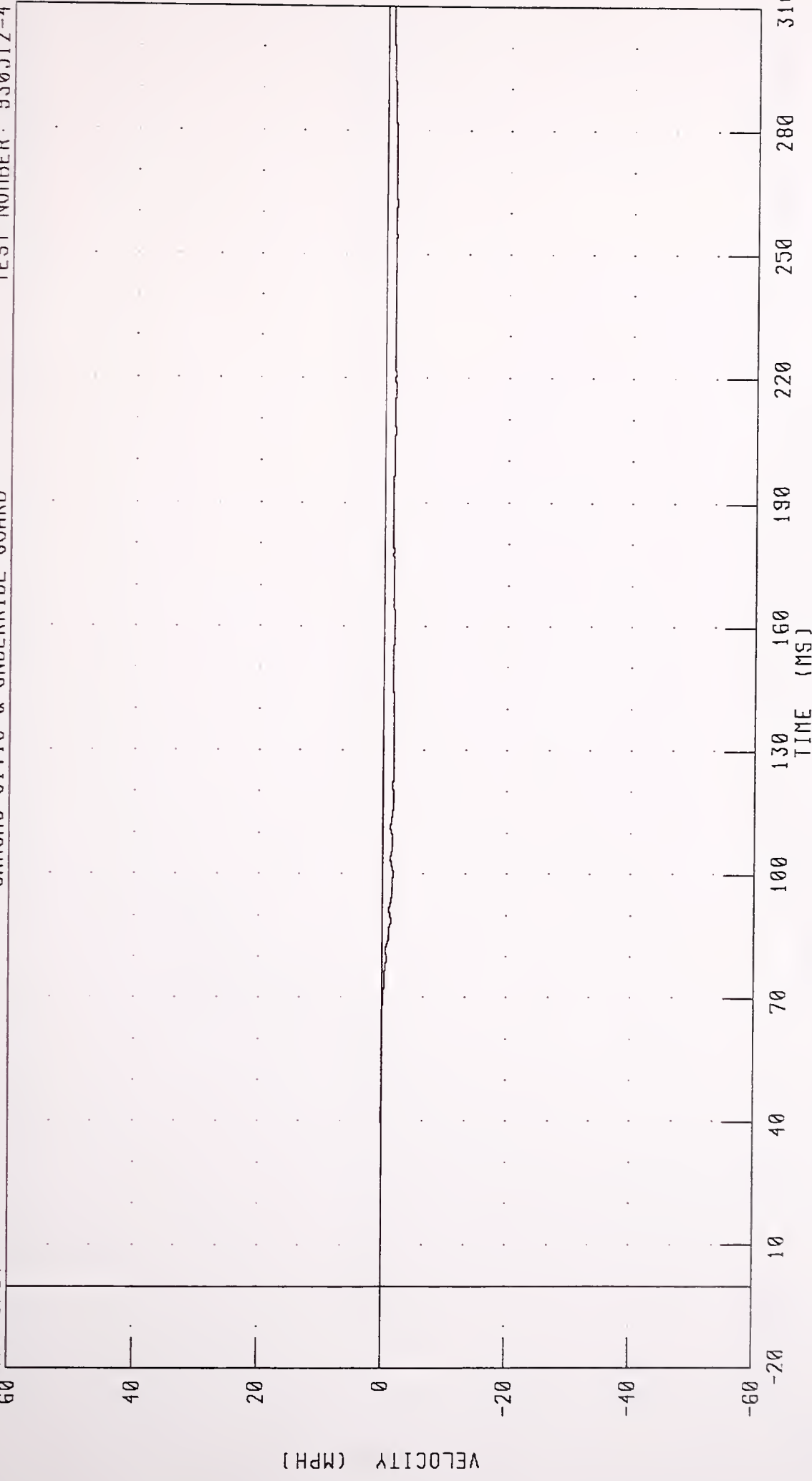
CHANNEL VCGXD1 FILTER: CH. CLASS 180 PEAK DATA: 29.21 IN @ 105.38 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION



1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4
VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

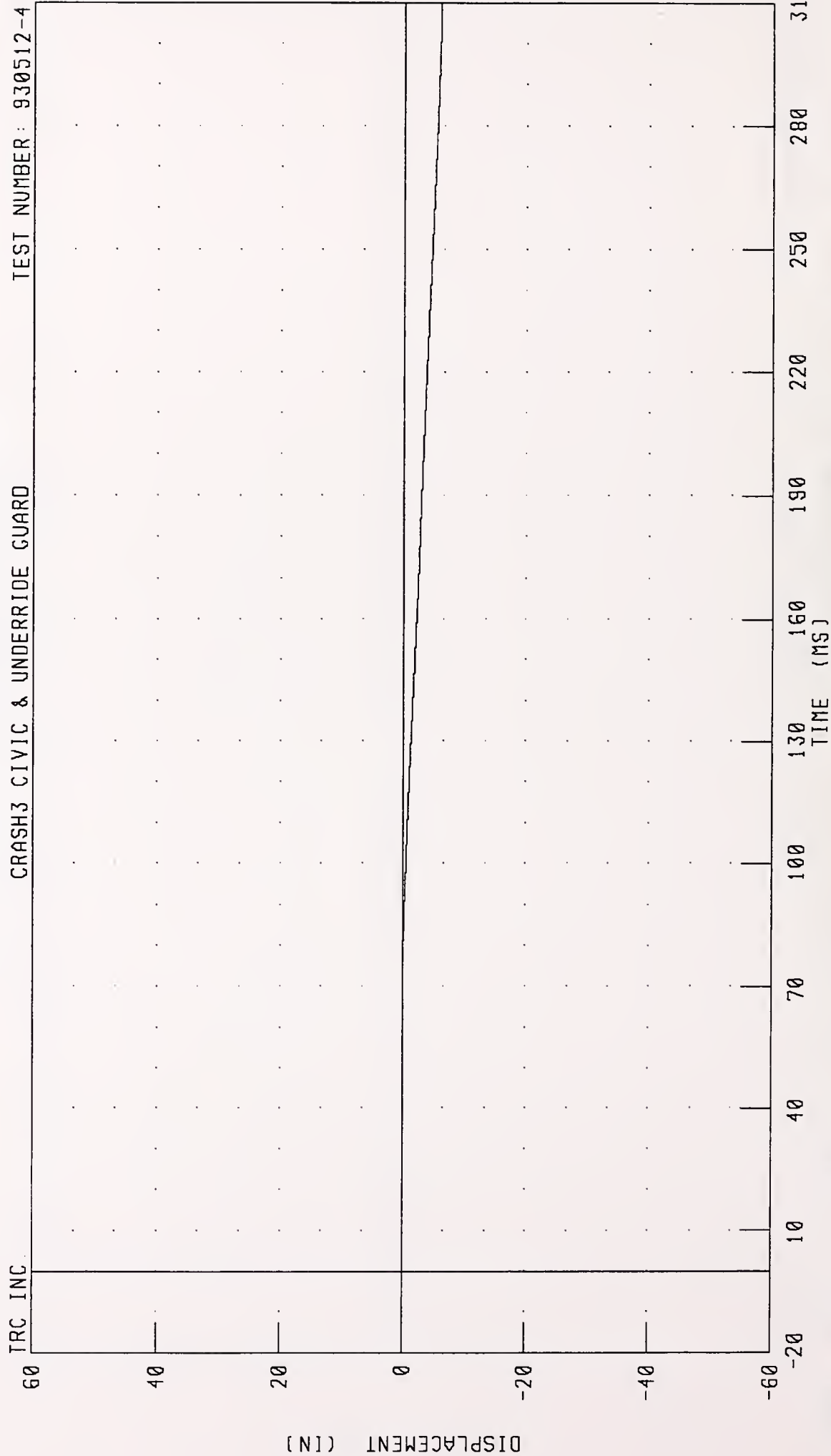
TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-4



CHANNEL: VCGYV1 FILTER: CH. CLASS 180 PEAK DATA: 0.12 MPH @ 40.88 MS; -1.74 MPH @ 141.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 4
 VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930512-4



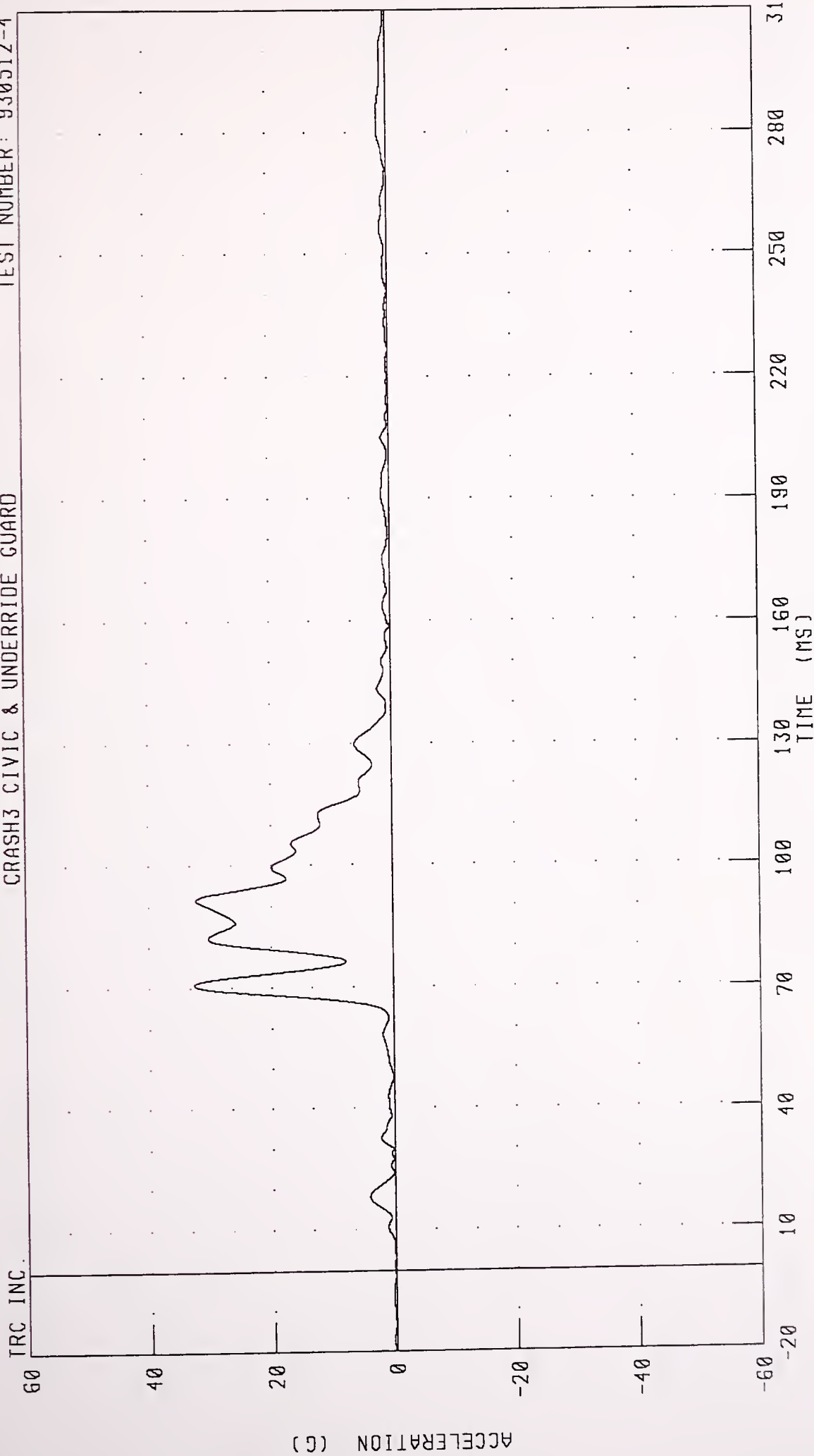
CHANNEL: VCGY01 FILTER: CH. CLASS 180

PEAK DATA: 0.01 IN @ 58.63 MS; -6.00 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

TEST NUMBER: 930512-4

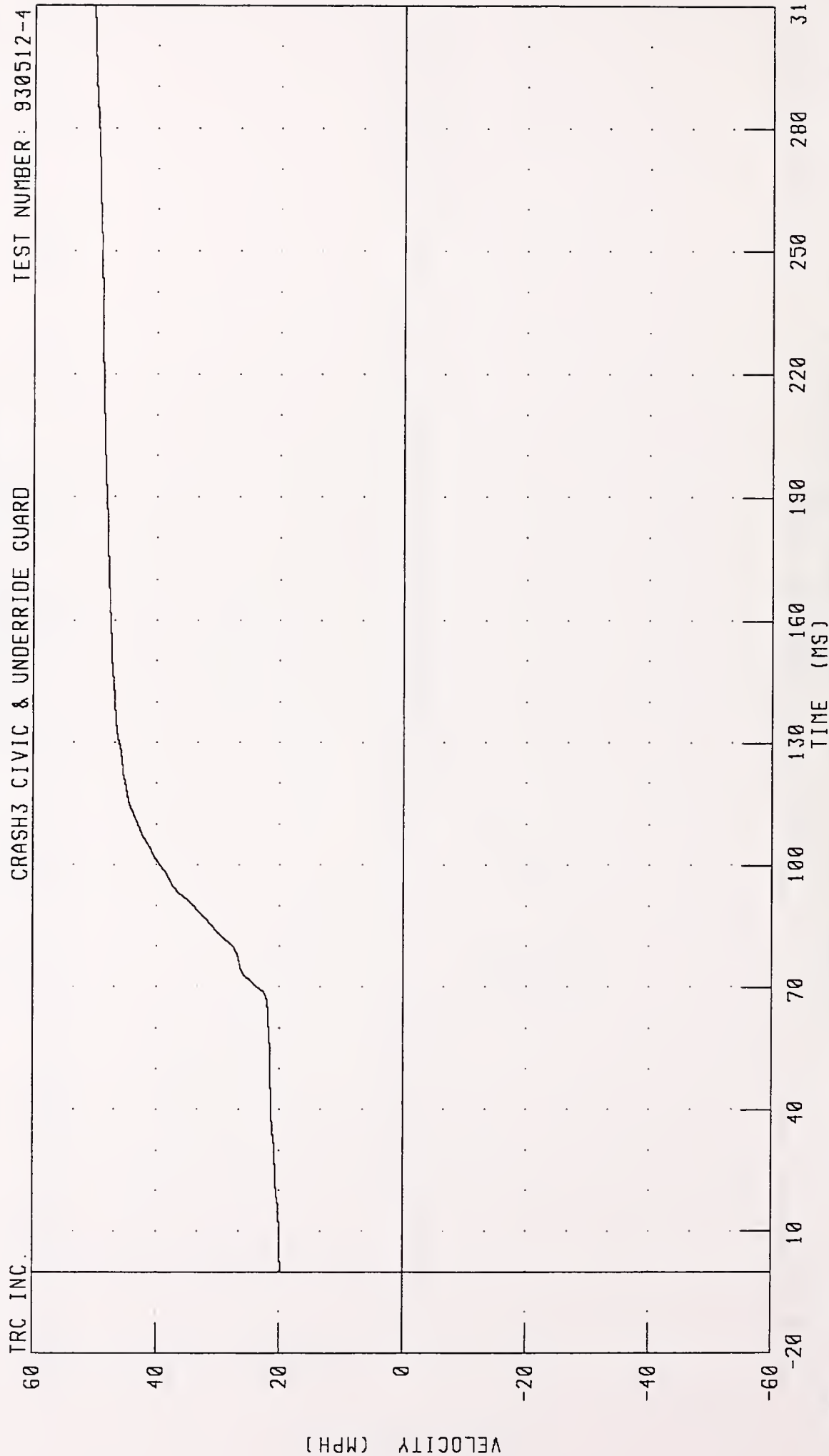
CRASH3 CIVIC & UNDERRIDE GUARD



CHANNEL: VCGRG1 FILTER: CH. CLASS 60

PEAK DATA: 32.69 G @ 71.00 MS; 0.01 G @ 226.63 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
VEHICLE CENTER OF GRAVITY RESULTANT VELOCITY



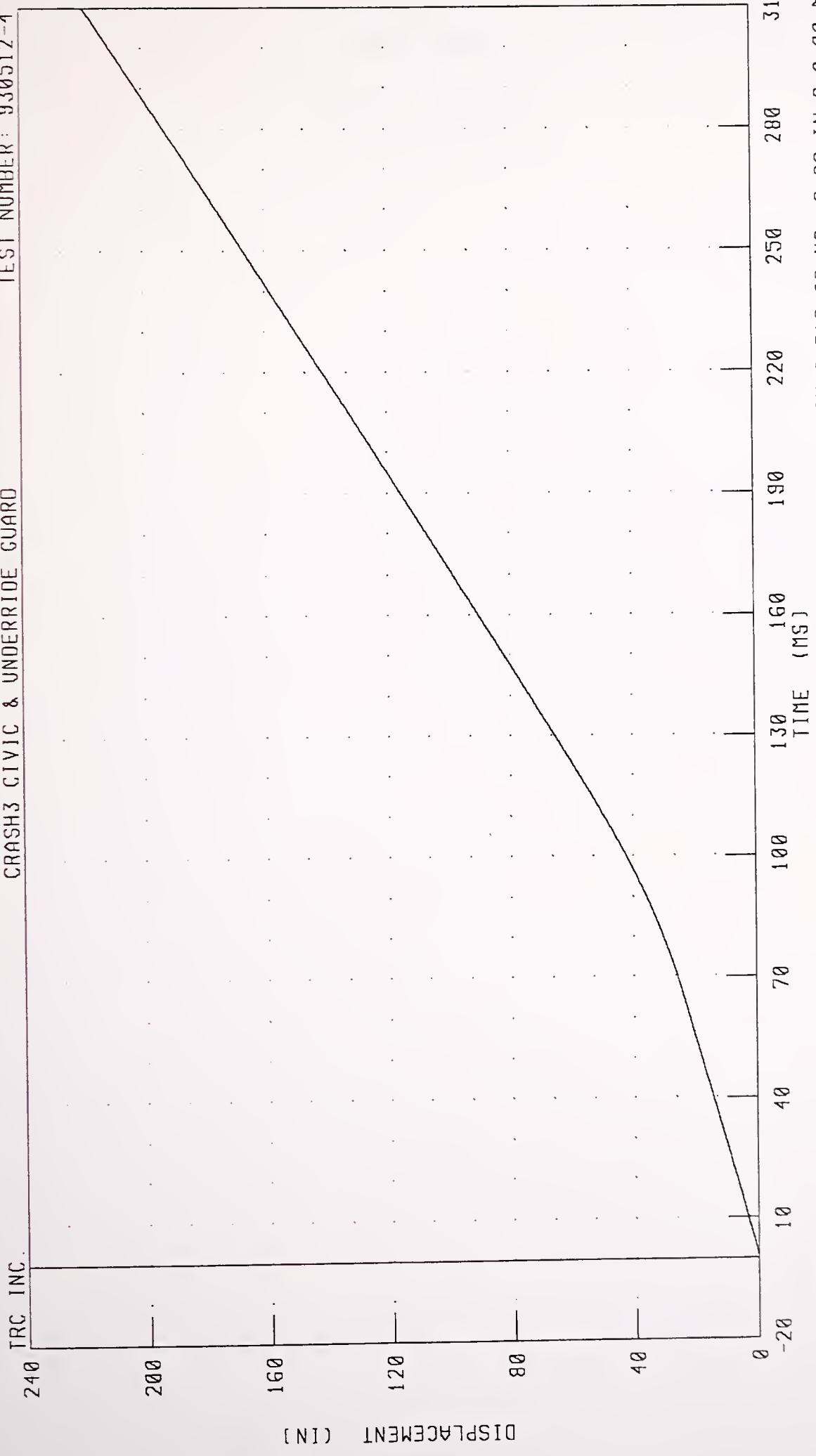
CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 50.26 MPH @ 310.00 MS; 19.90 MPH @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 4
VEHICLE CENTER OF GRAVITY RESULTANT DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930512-4



CHANNEL: VCGRD1 FILTER: CH. CLASS 180 PEAK DATA: 219.24 IN @ 310.00 MS; 0.00 IN @ 0.00 MS

DATA PLOTS

TEST NO. 930513-1

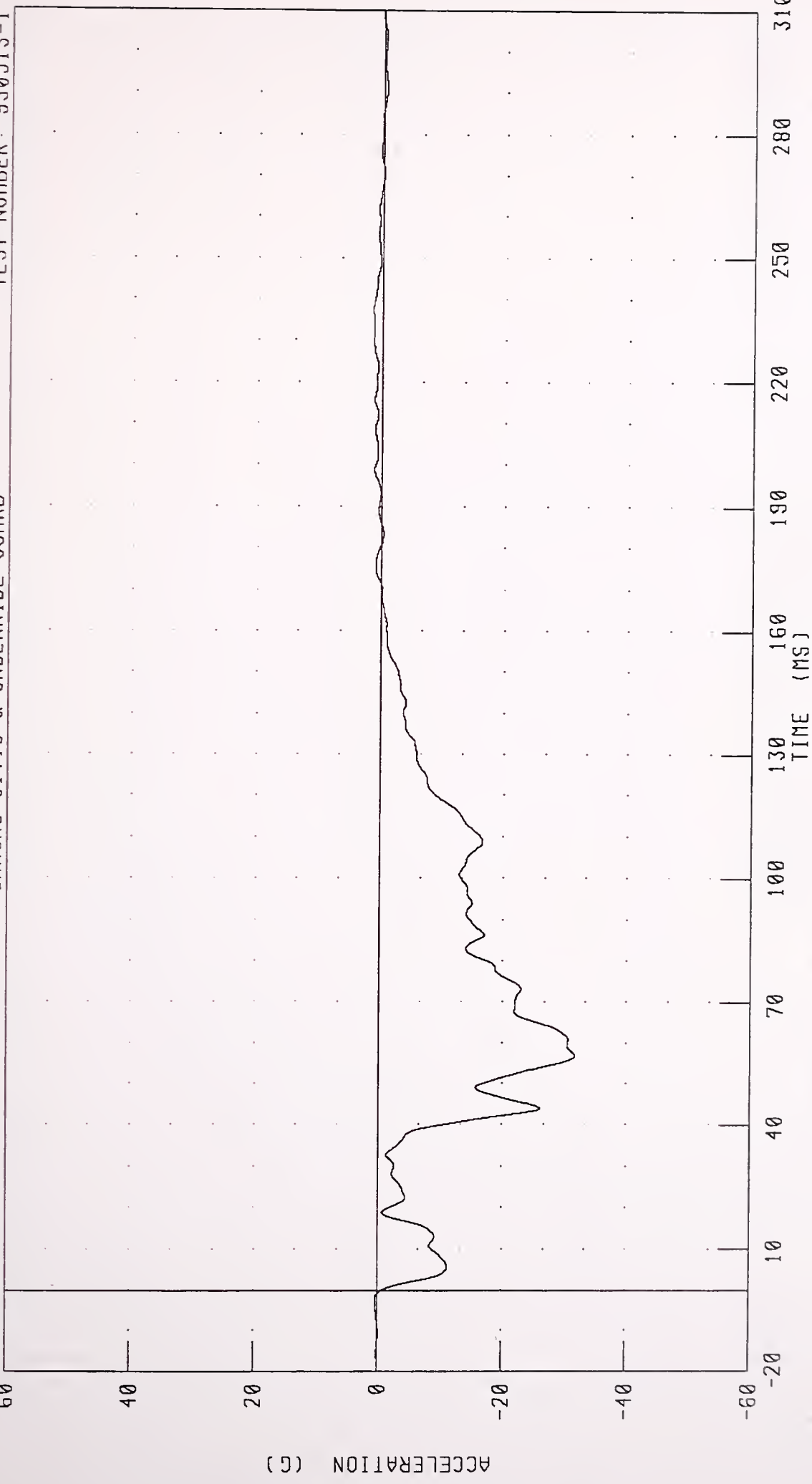
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

LEFT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

TRC INC.



CHANNEL: LRSXG1 FILTER: CH. CLASS 60

PEAK DATA: 1.48 G @ 237.88 MS; -31.64 G @ 56.88 MS

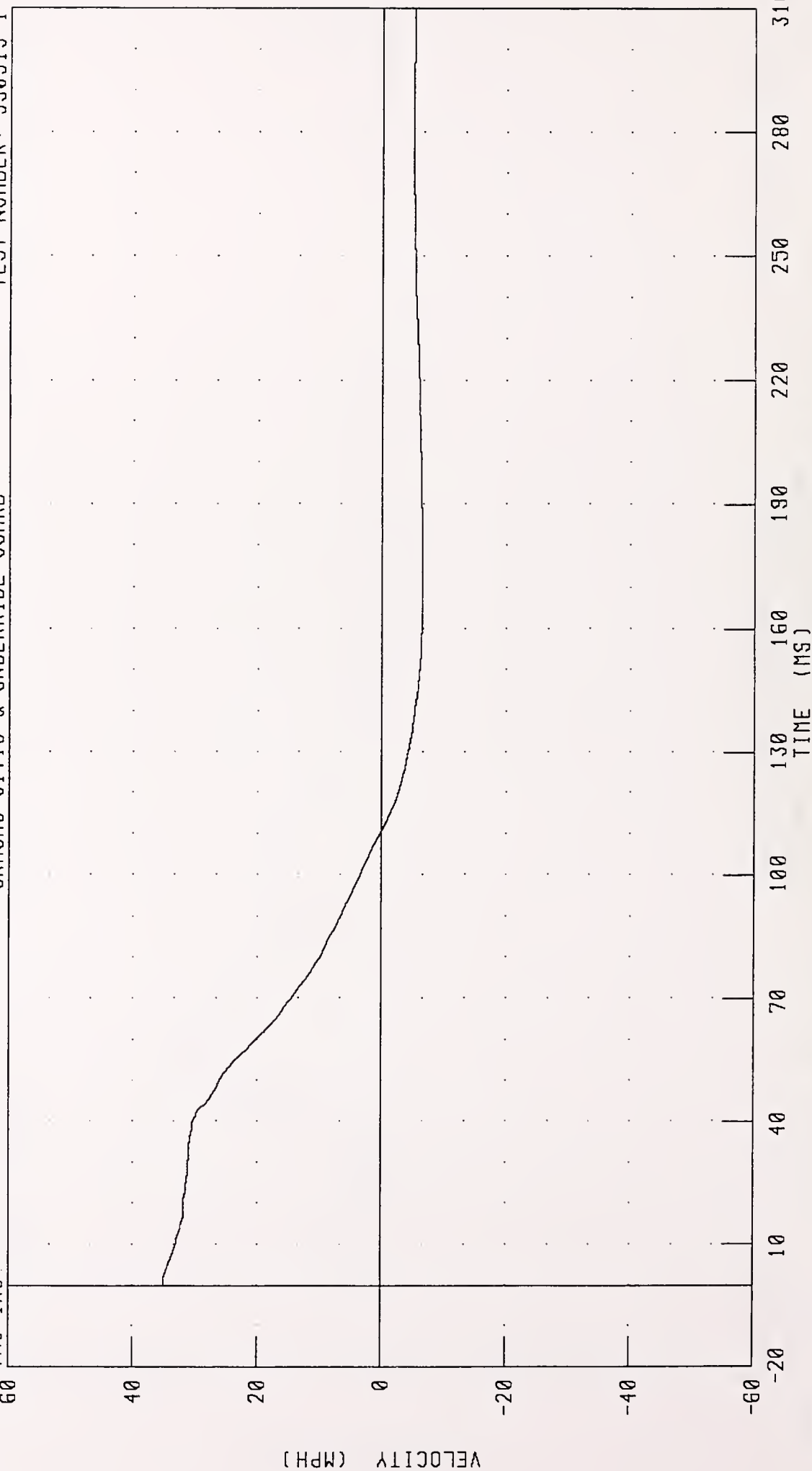
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

LEFT REAR SILL X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930513-1

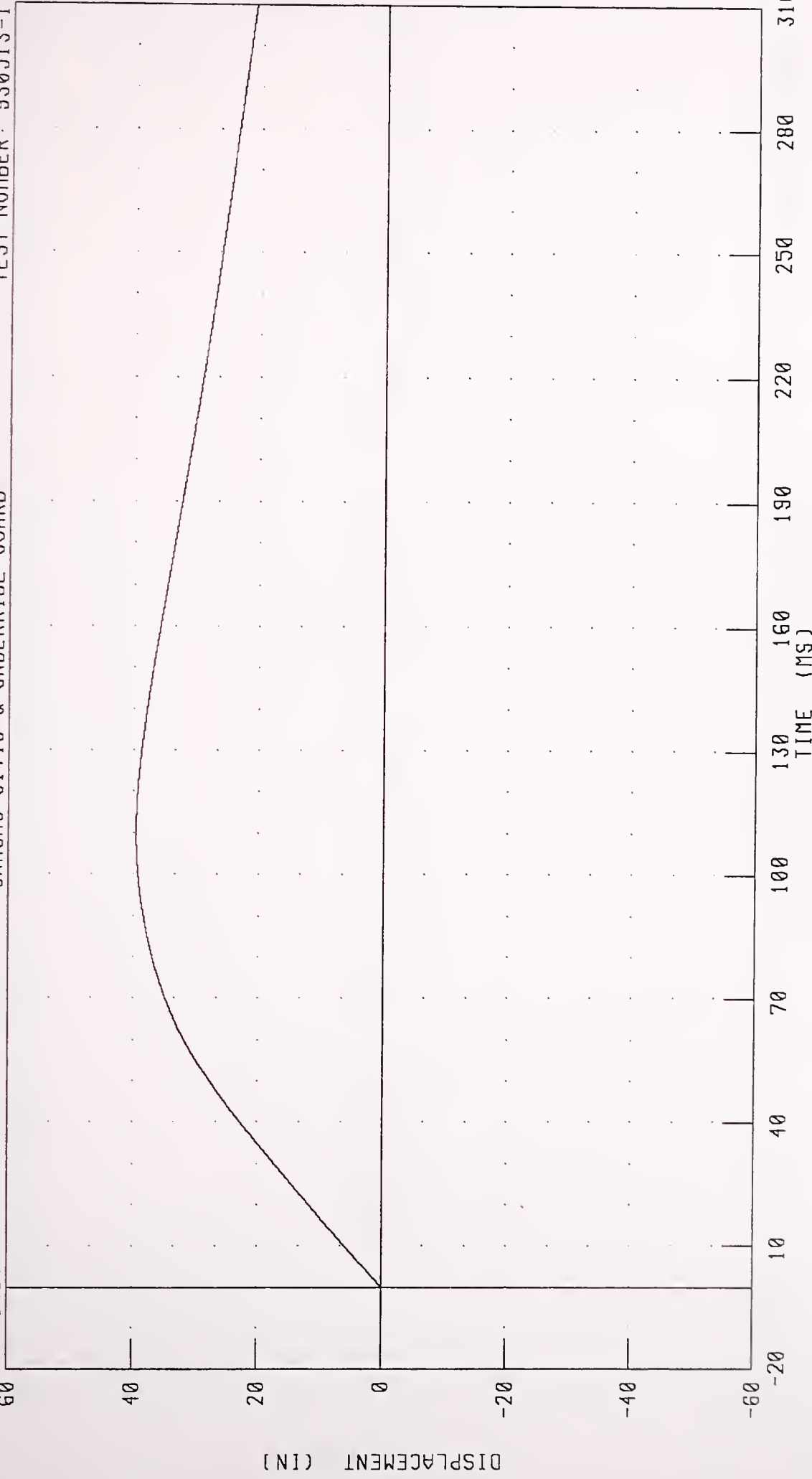


CHANNEL: LRSXV1 FILTER: CH. CLASS 180

PEAK DATA: 35.00 MPH @ 1.38 MS; -6.48 MPH @ 172.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5
LEFT REAR SILL X-AXIS DISPLACEMENT

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930513-1



CHANNEL: LRSXD1 FILTER: CH. CLASS 180

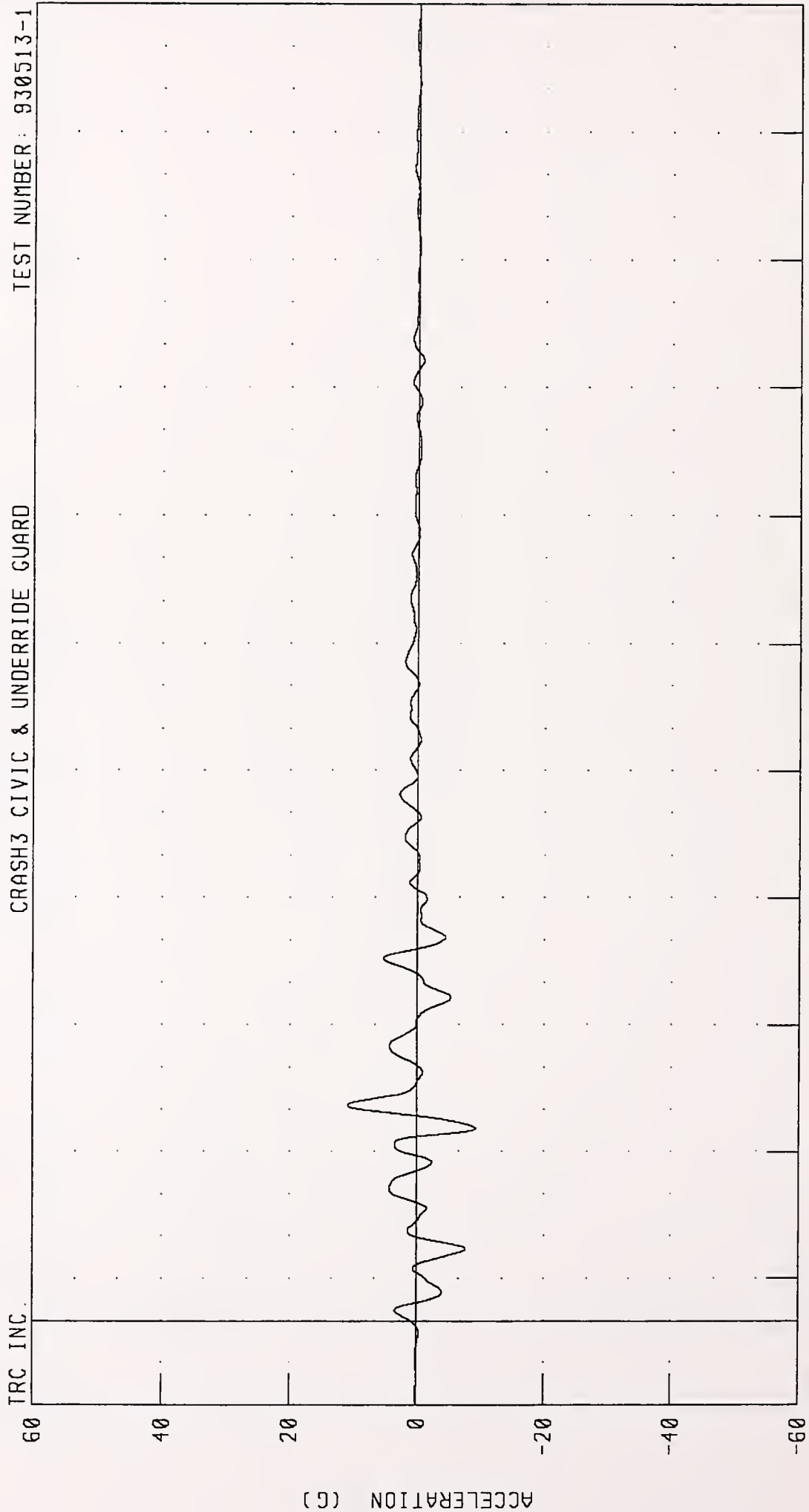
PEAK DATA: 39.59 IN @ 110 63 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

LEFT REAR SILL Y-AXIS ACCELERATION

TEST NUMBER: 930513-1

CRASH3 CIVIC & UNDERRIDE GUARD



CHANNEL: LRSYG1 FILTER: CH. CLASS 60

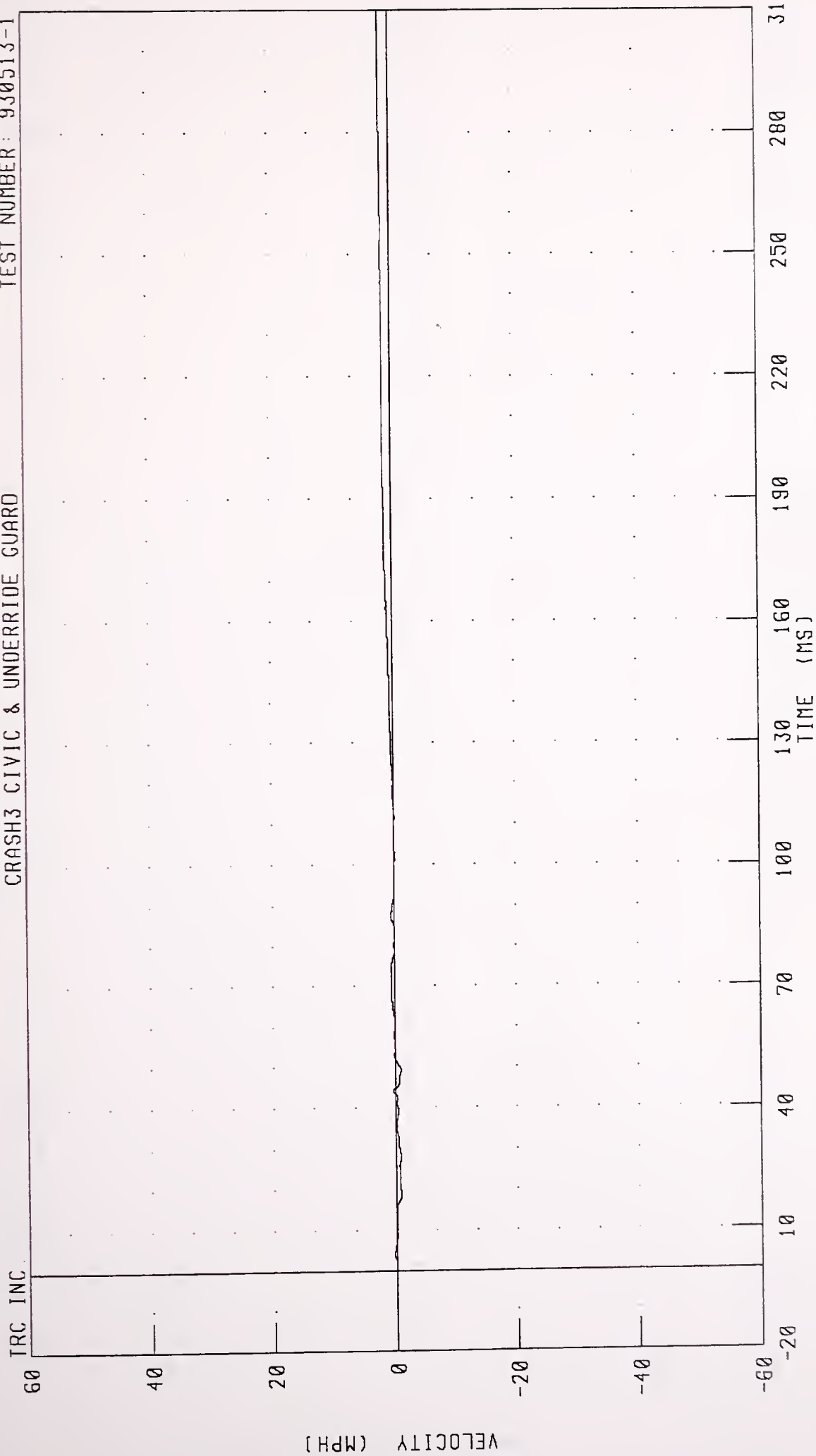
PEAK DATA: 10.89 G @ 51.00 MS; -9.24 G @ 45.63 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

LEFT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1



PEAK DATA: 1.74 MPH @ 309.63 MS; -0.94 MPH @ 49.38 MS

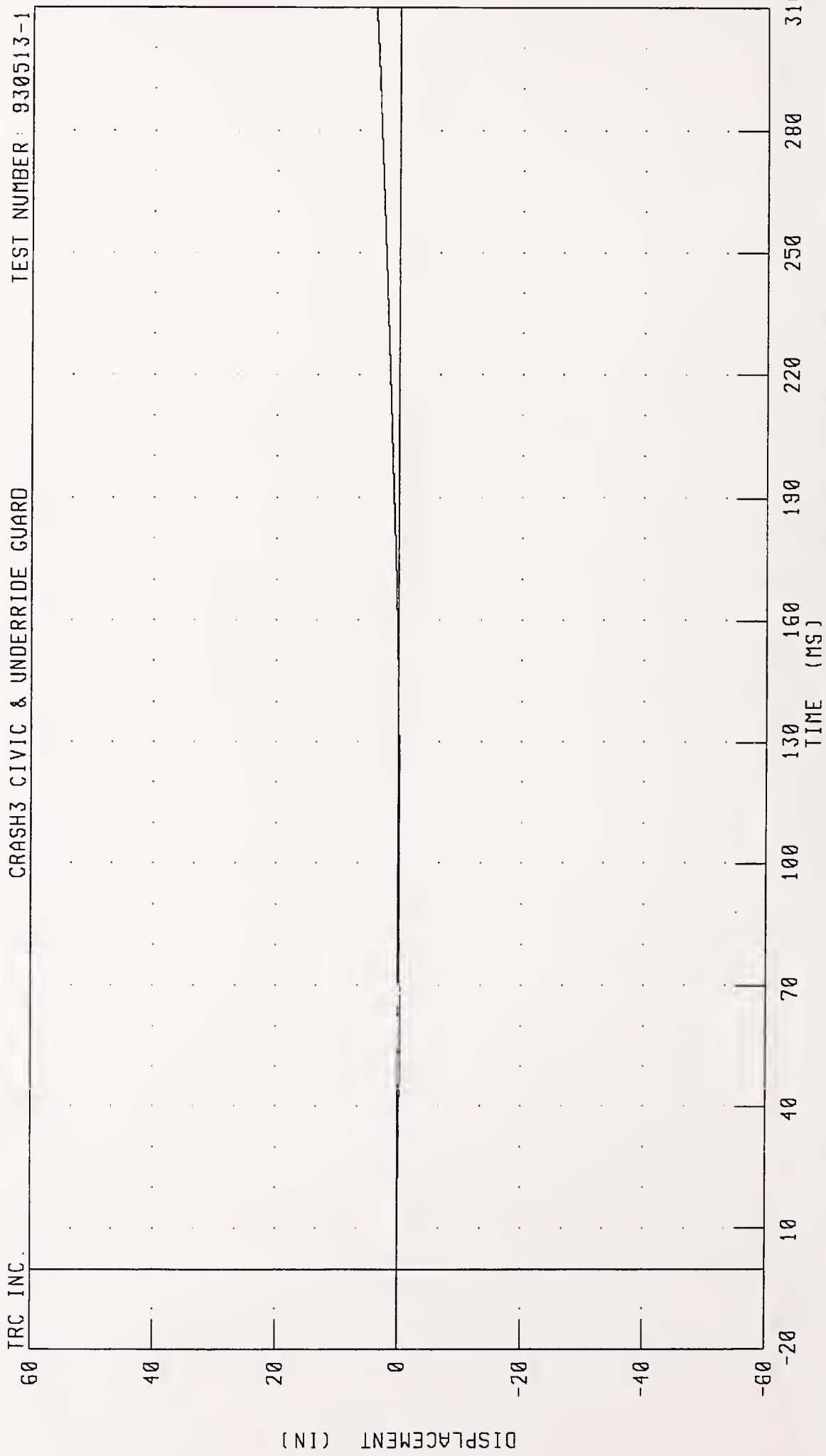
CHANNEL: LRSYV1 FILTER: CH. CLASS 180

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

LEFT REAR SILL Y-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

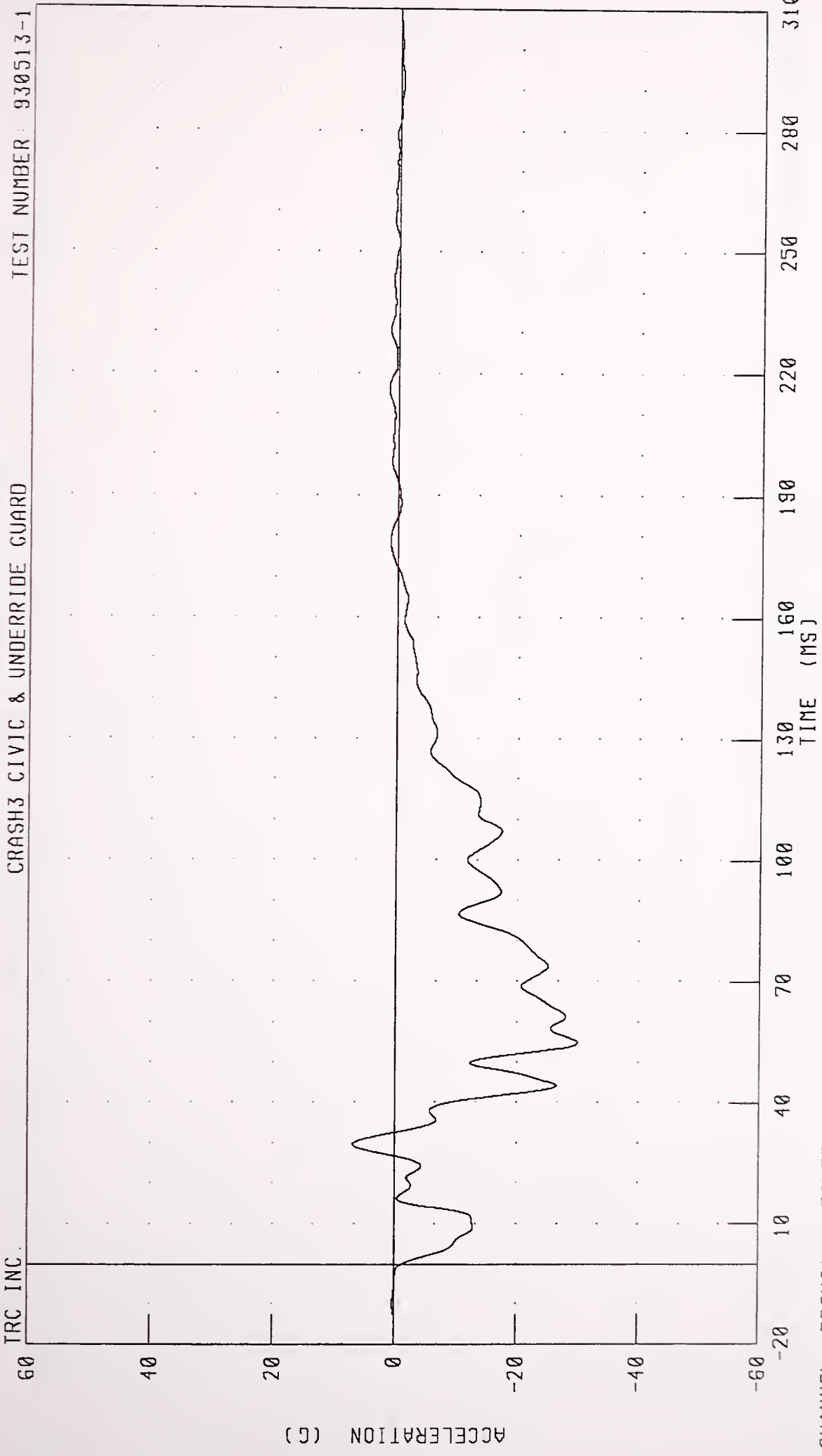


CHANNEL: LRSYD1 FILTER: CH. CLASS 180

PEAK DATA: 3.92 IN @ 310.00 MS; -0.32 IN @ 51.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5
RIGHT REAR SILL X-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD
TEST NUMBER: 930513-1



CHANNEL RRSXG1 FILTER: CH. CLASS 60

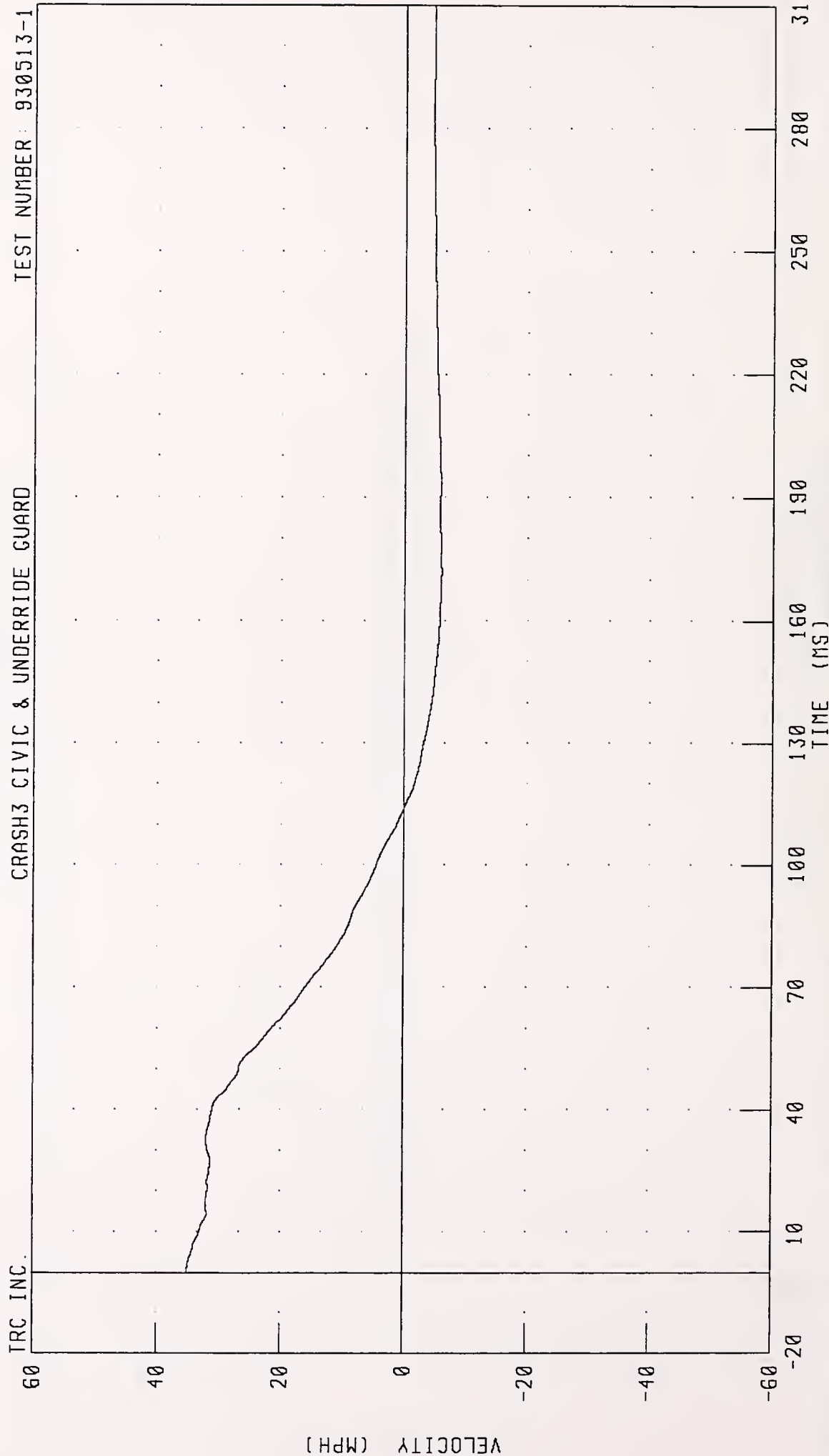
PEAK DATA: 6.97 G @ 29.75 MS; -29.98 G @ 54.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

RIGHT REAR SILL X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1



CHANNEL: RRSXV1 FILTER: CH. CLASS 180

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

RIGHT REAR SILL X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

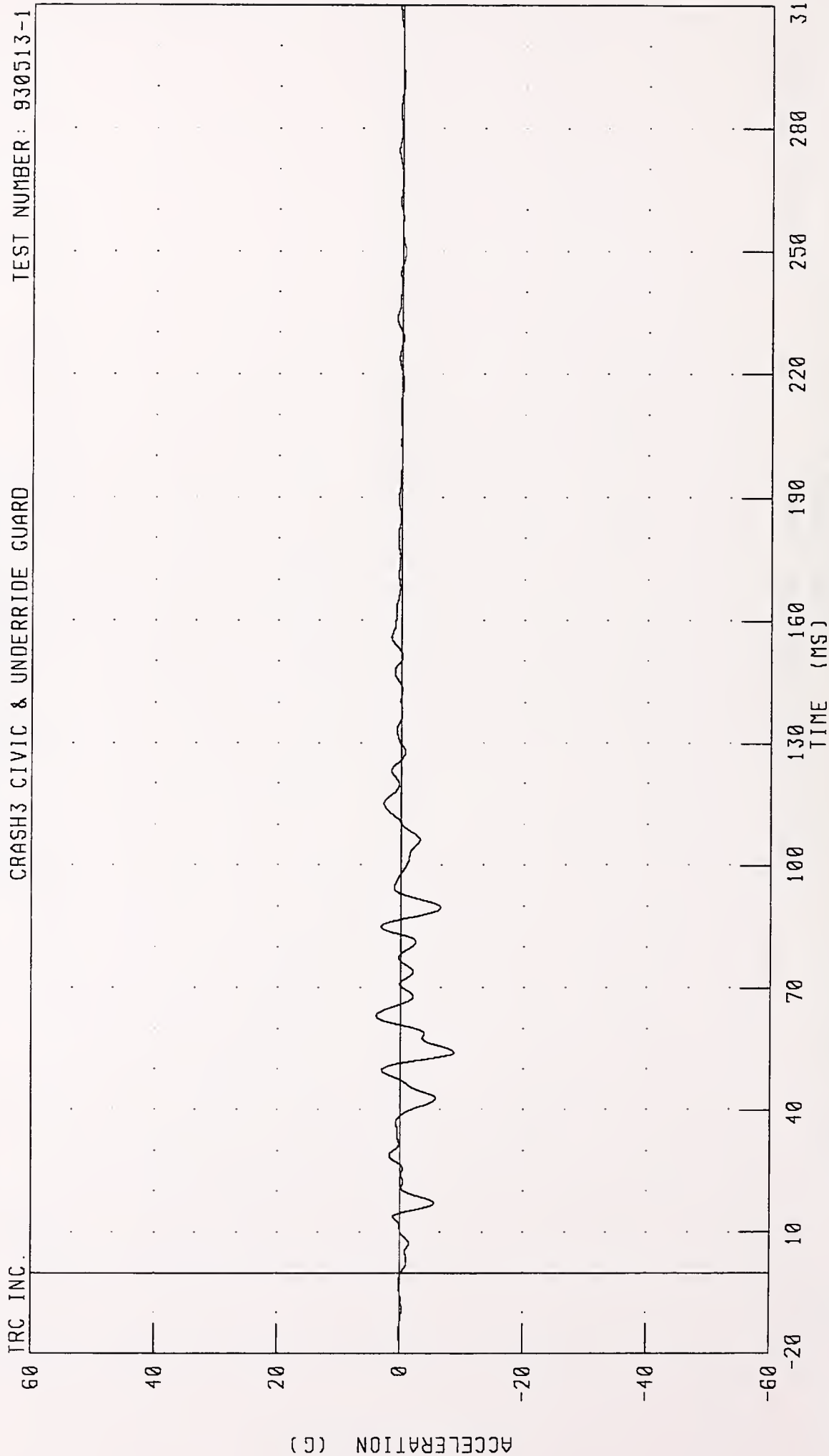
TRC INC.



CHANNEL RRSXD1 FILTER: CH. CLASS 180
PEAK DATA: 41.12 IN @ 114.00 MS; 0.00 IN @ 0.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5
RIGHT REAR SILL Y-AXIS ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER: 930513-1



CHANNEL: RRSYG1 FILTER: CH. CLASS 60

PEAK DATA: 4.03 G @ 63.25 MS; -8.76 G @ 54.13 MS

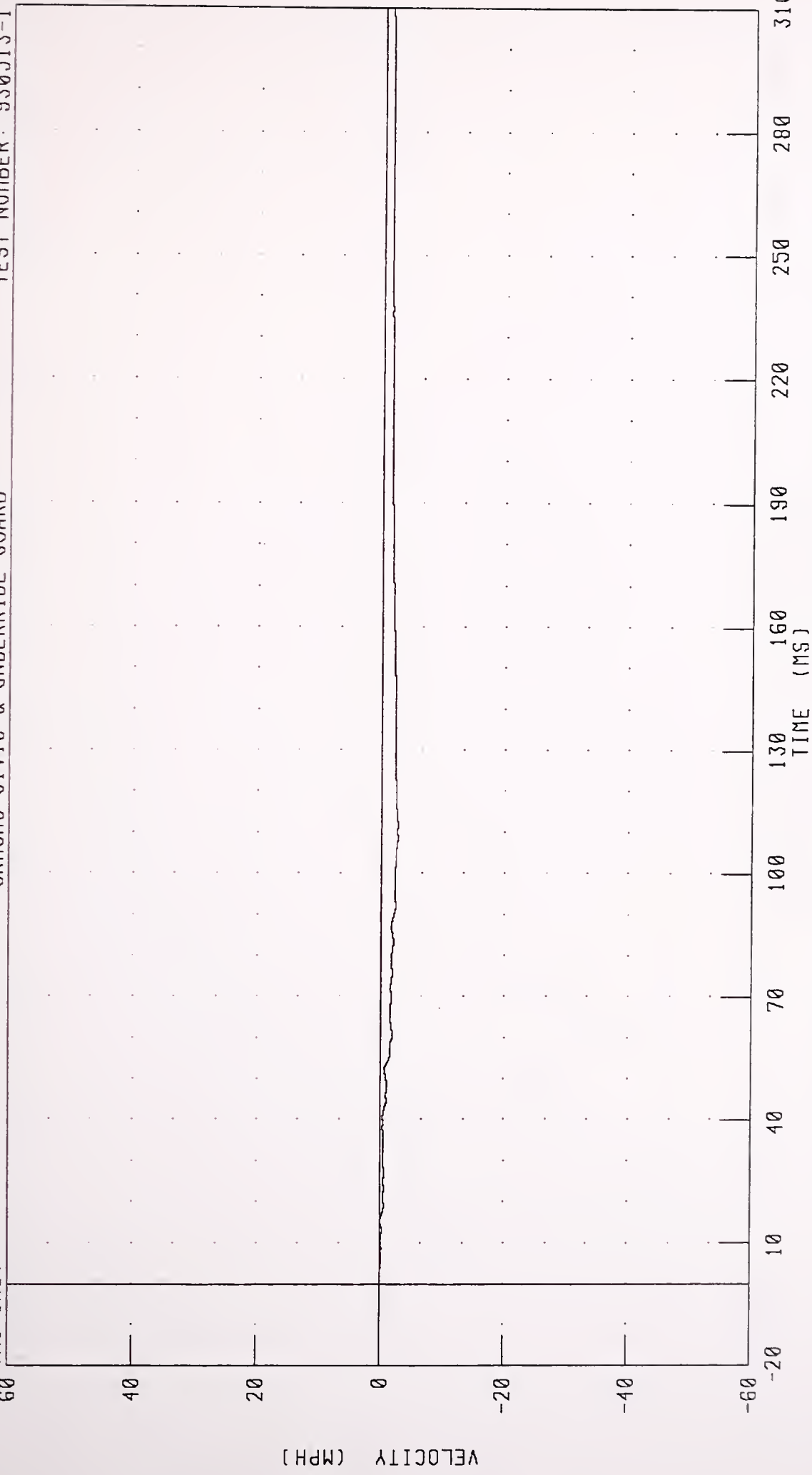
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

RIGHT REAR SILL Y-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

TRC INC.



CHANNEL: RRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 MPH @ 0.00 MS; -2.64 MPH @ 108.50 MS

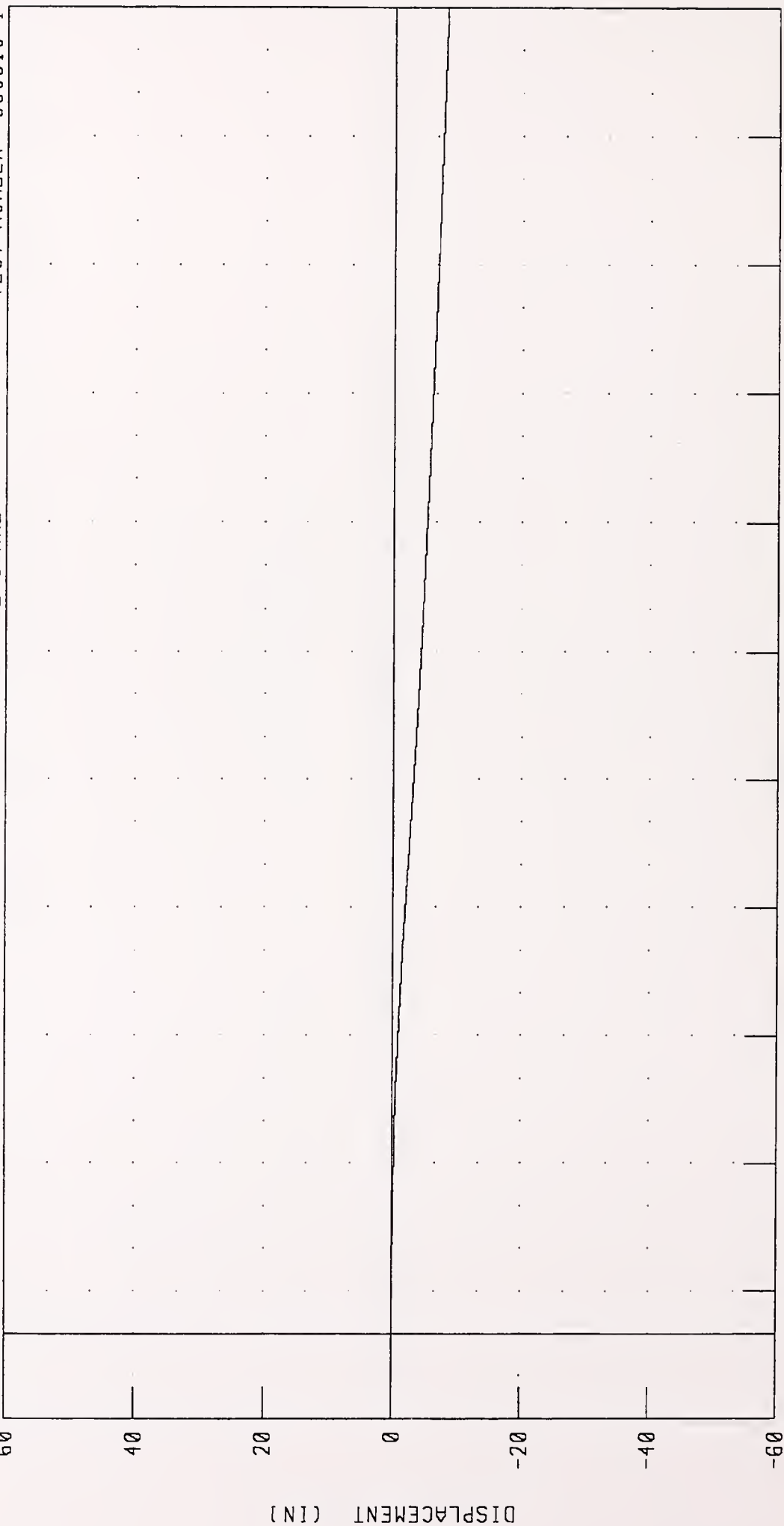
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

RIGHT REAR SILL Y-AXIS DISPLACEMENT

TRC INC.

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513--1



CHANNEL: RRSYD1 FILTER: CH. CLASS 180

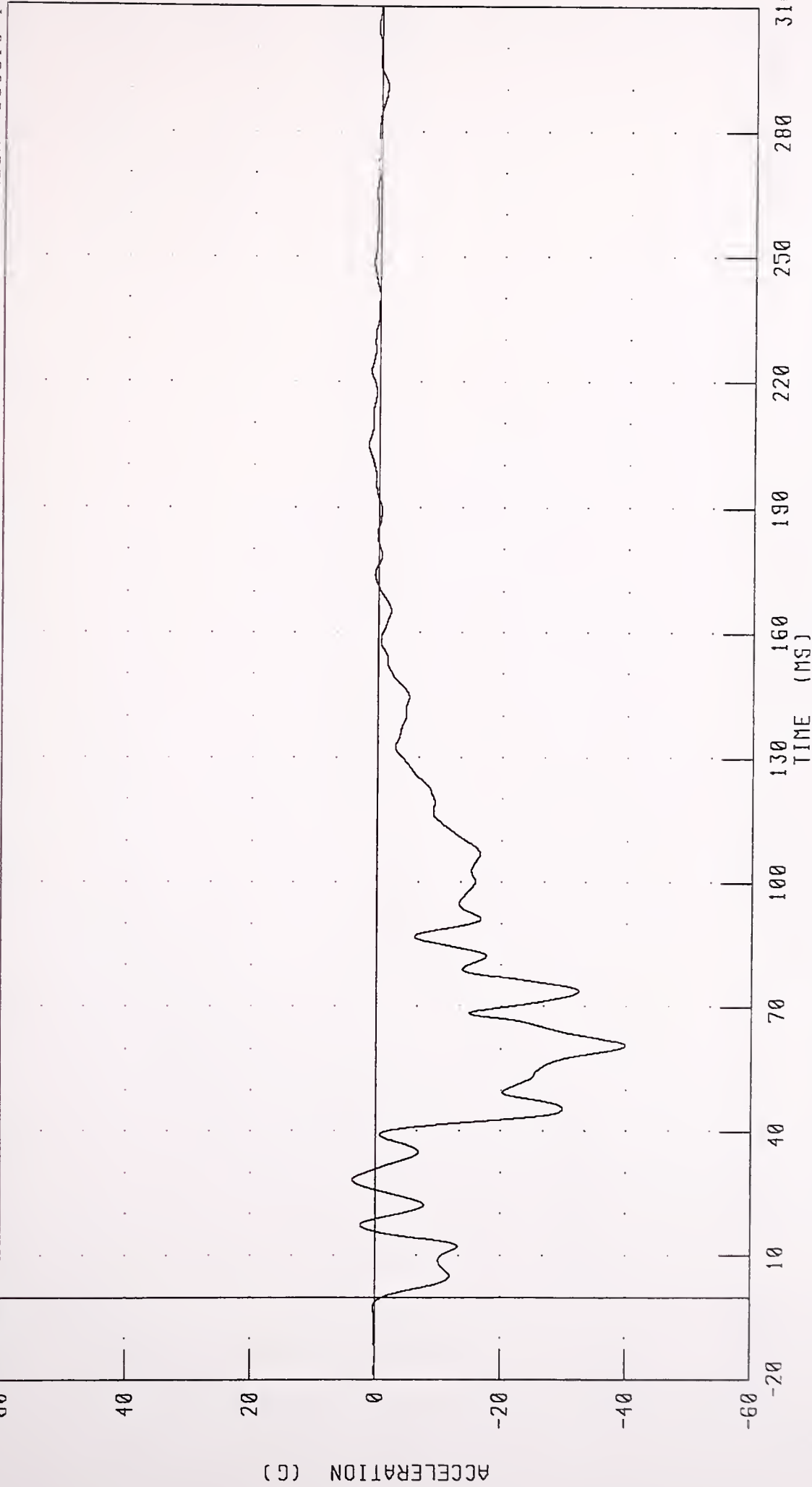
PEAK DATA: 0.00 IN @ 0.00 MS; -8.19 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5
VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER: 930513-1

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.



CHANNEL VCGXG1 FILTER: CH. CLASS 60

PEAK DATA: 3.71 G @ 28.13 MS; -39.80 G @ 60.75 MS

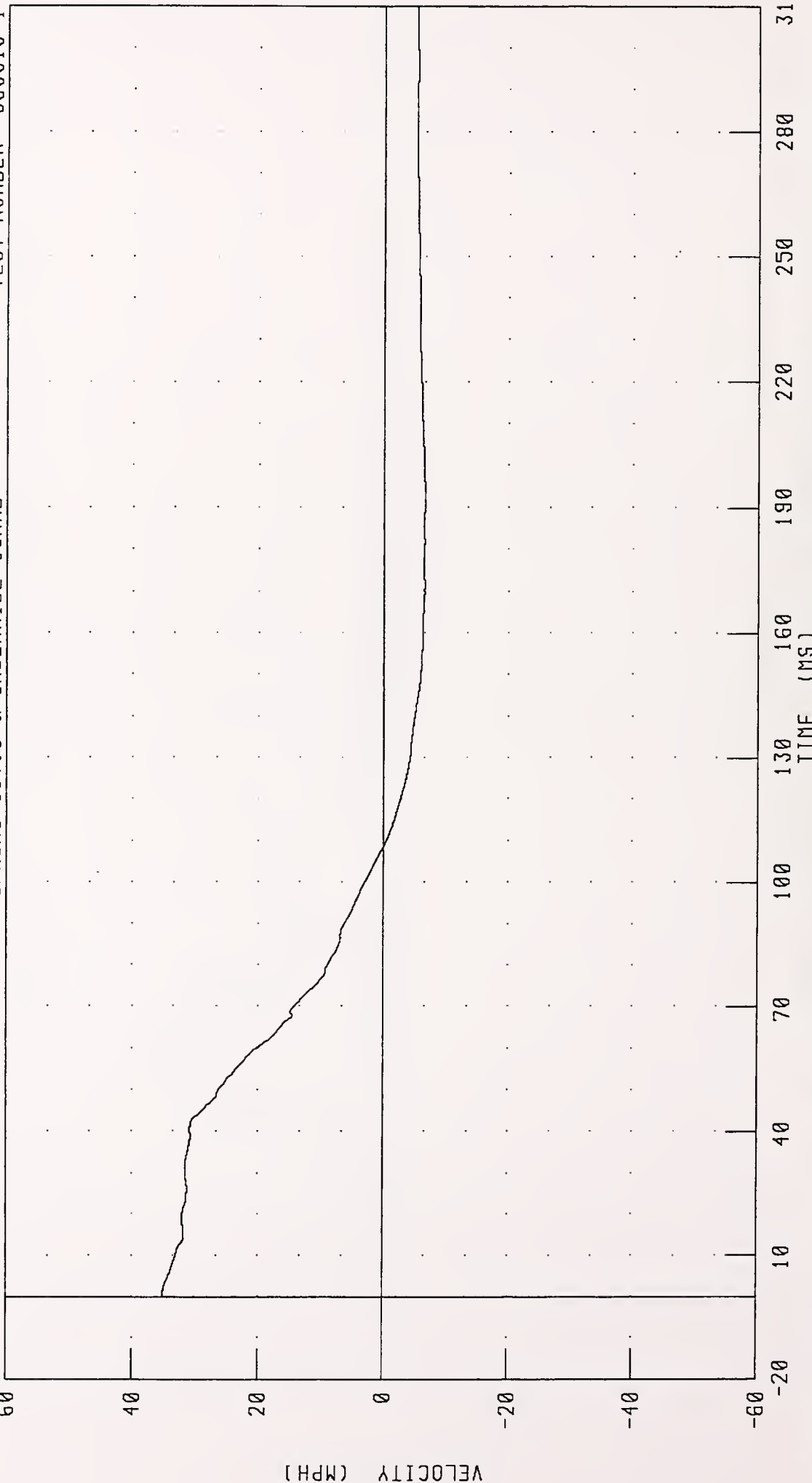
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

CRASH3 CIVIC & UNDERRIDE GUARD

TRC INC.

TEST NUMBER: 930513-1



CHANNEL: VCGXV1 FILTER: CH. CLASS 180

PEAK DATA: 35.00 MPH @ 0.50 MS; -6.55 MPH @ 191.63 MS

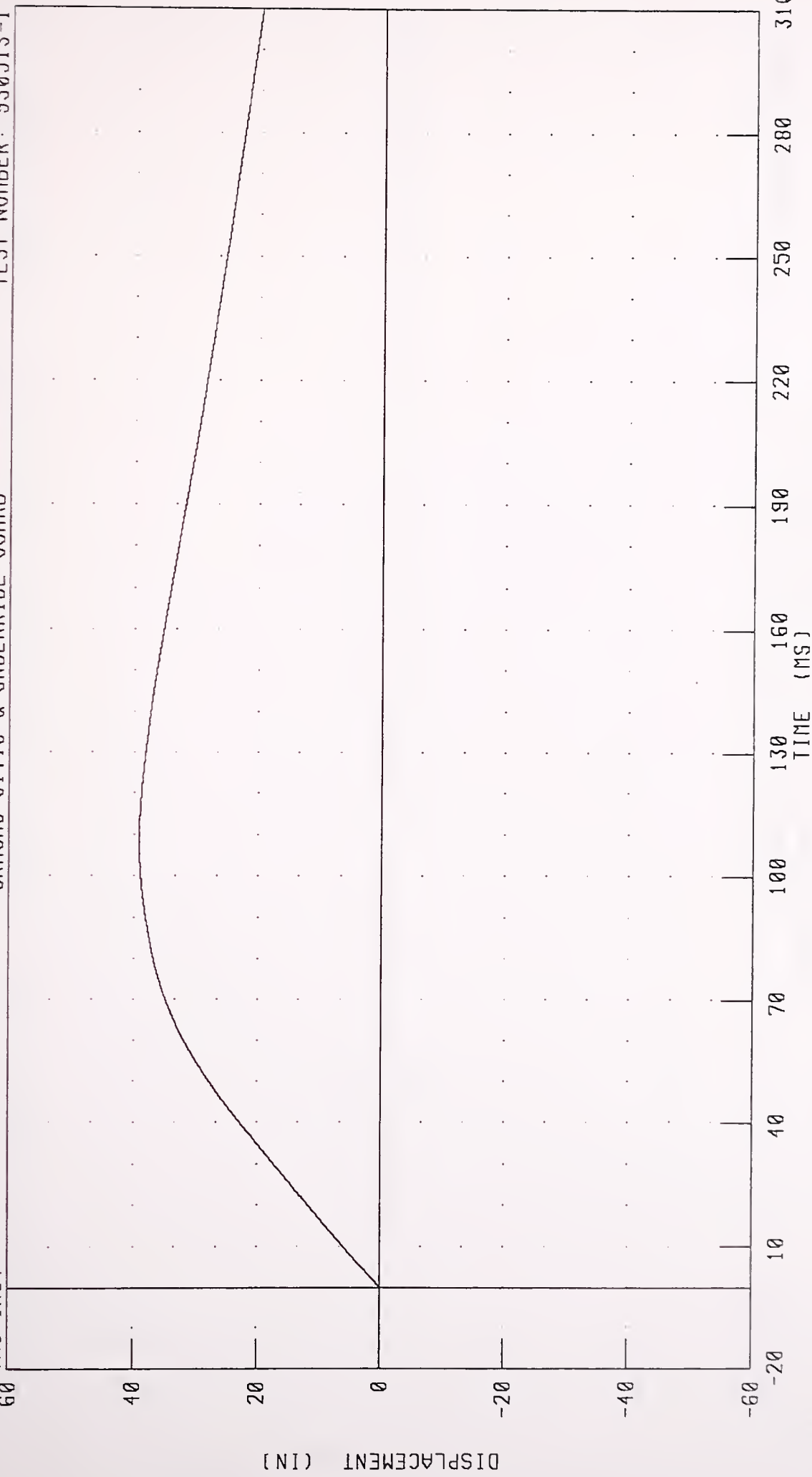
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

VEHICLE CENTER OF GRAVITY X-AXIS DISPLACEMENT

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

TRC INC.



CHANNEL: VCGXD1 FILTER: CH. CLASS 180

PEAK DATA: 39.13 IN @ 108.63 MS; 0.00 IN @ 0.00 MS

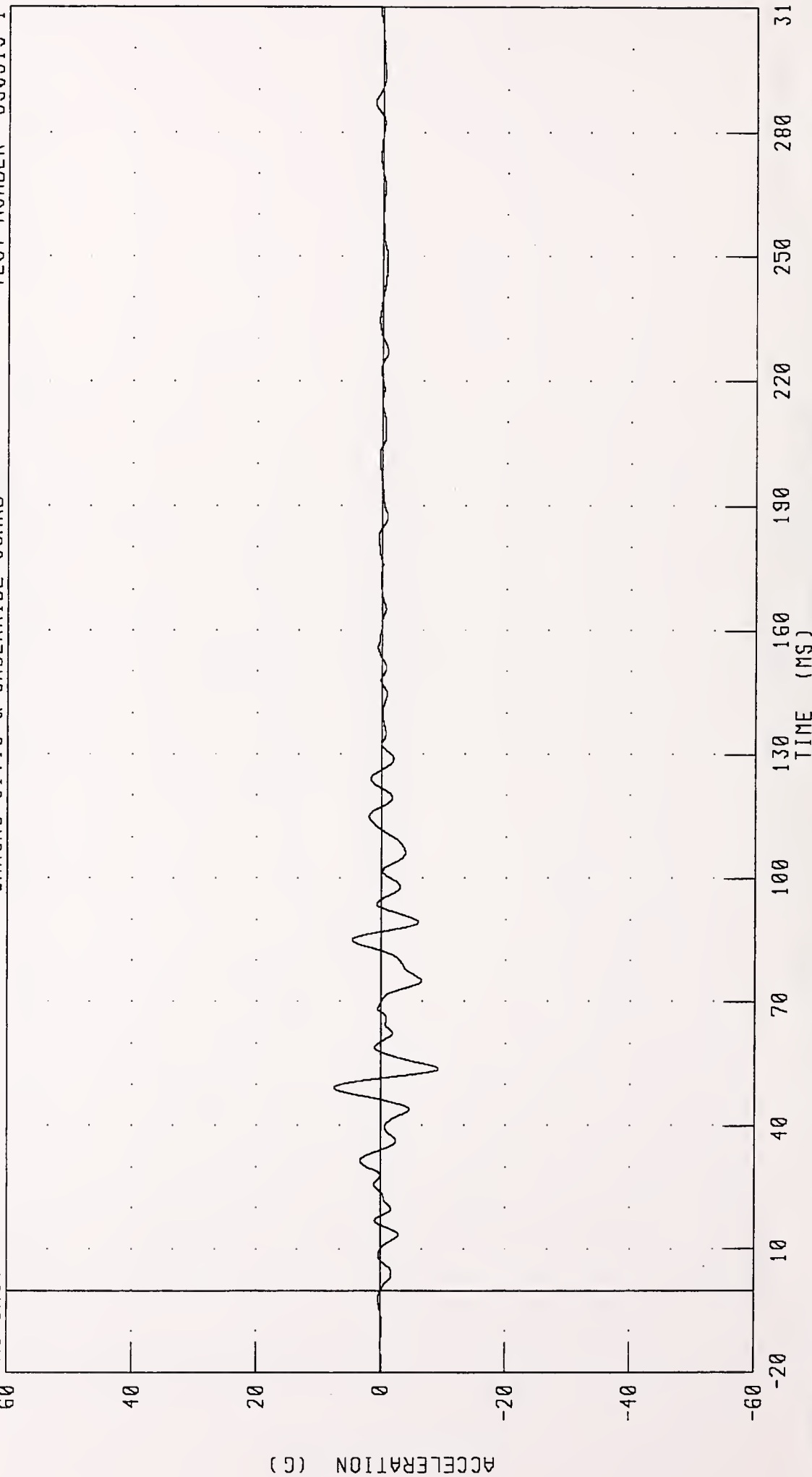
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION

TRC INC.

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

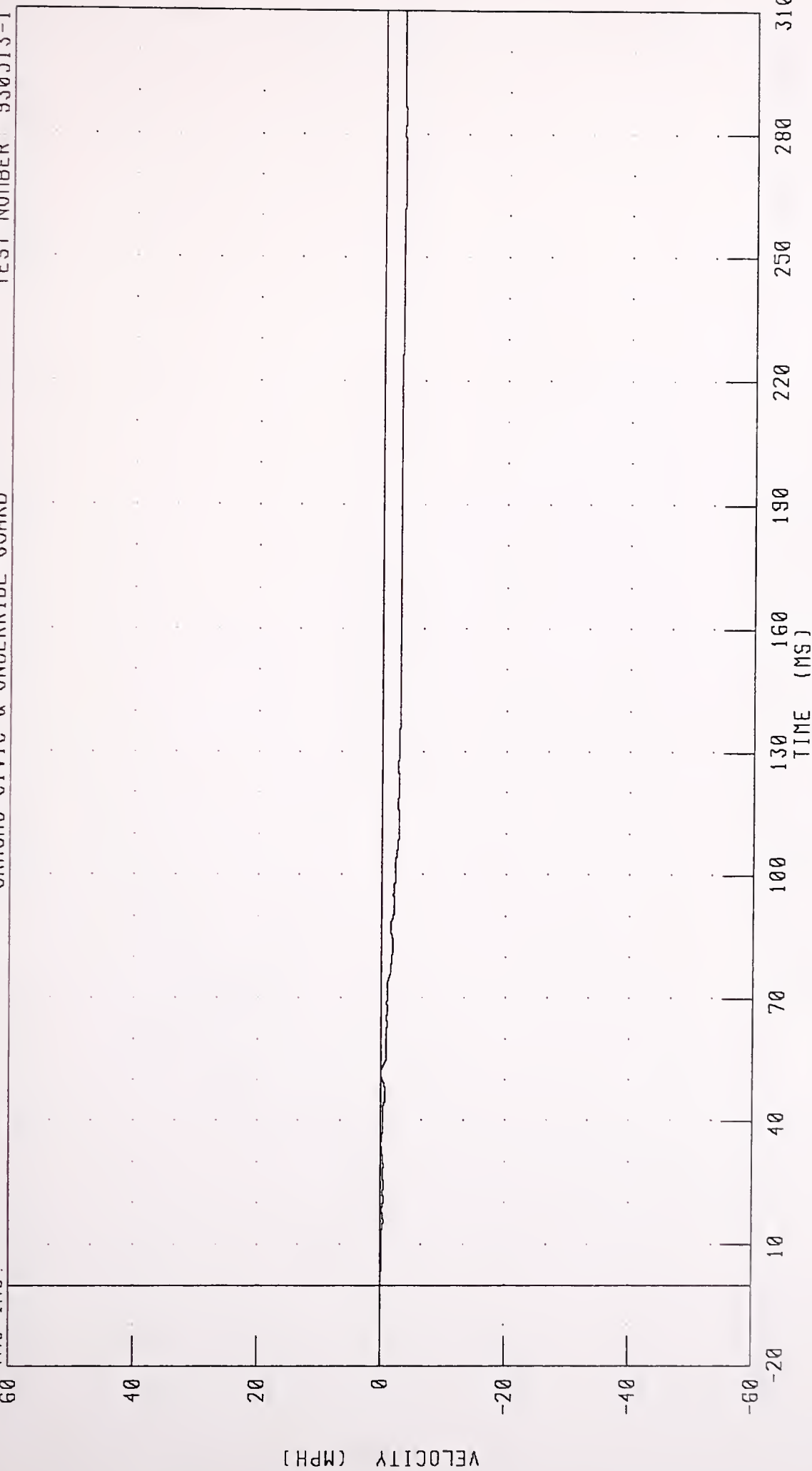


CHANNEL: VCGYG1 FILTER: CH. CLASS 60

PEAK DATA: 7.50 G @ 49.25 MS; -9.21 G @ 53.88 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5
VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

TRC INC. CRASH3 CIVIC & UNDERRIDE GUARD TEST NUMBER 930513-1



CHANNEL: VCGYV1 FILTER: CH. CLASS 180 PEAK DATA: 0.03 MPH @ 51.88 MS; -3.16 MPH @ 268.63 MS

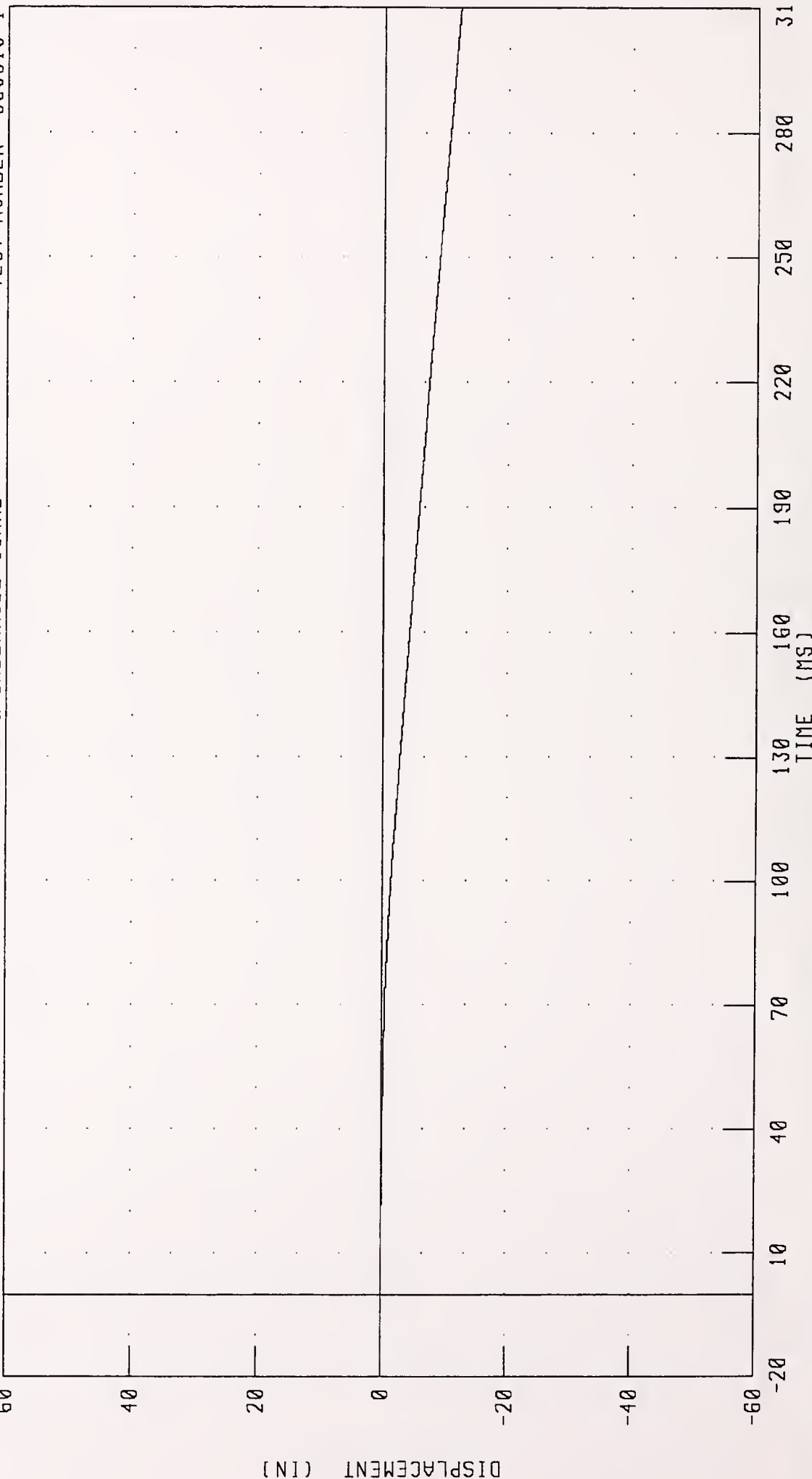
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

VEHICLE CENTER OF GRAVITY Y-AXIS DISPLACEMENT

TRC INC.

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1

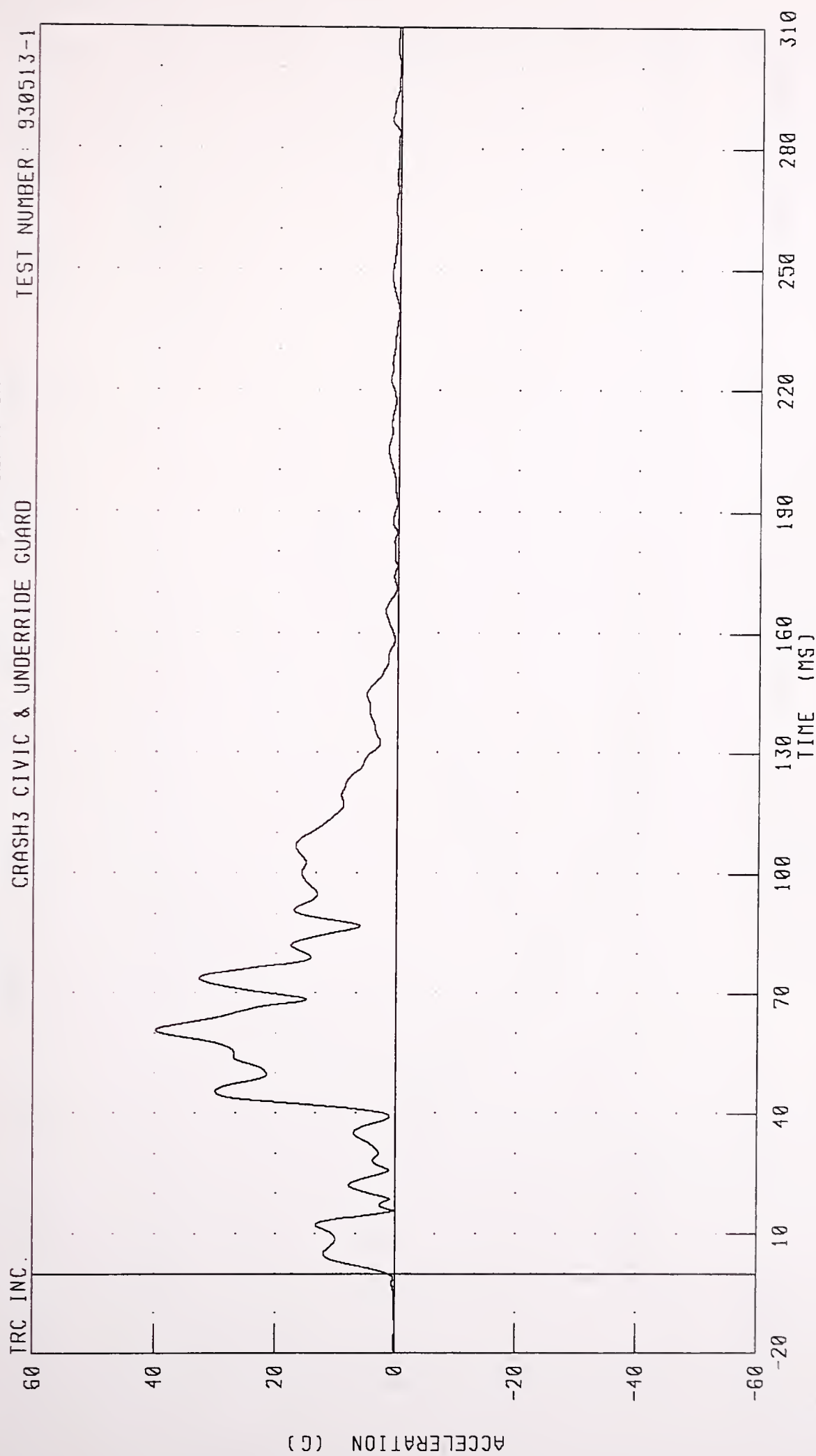


CHANNEL: VCGYD1 FILTER: CH. CLASS 180

PEAK DATA: 0.00 IN @ 2.50 MS; -12.15 IN @ 310.00 MS

1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5
VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

CRASH3 CIVIC & UNDERRIDE GUARD
TEST NUMBER: 930513-1



CHANNEL: VCGRG1 FILTER: CH CLASS 60

PEAK DATA: 39.81 G @ 60.75 MS; 0.02 G @ -13.63 MS

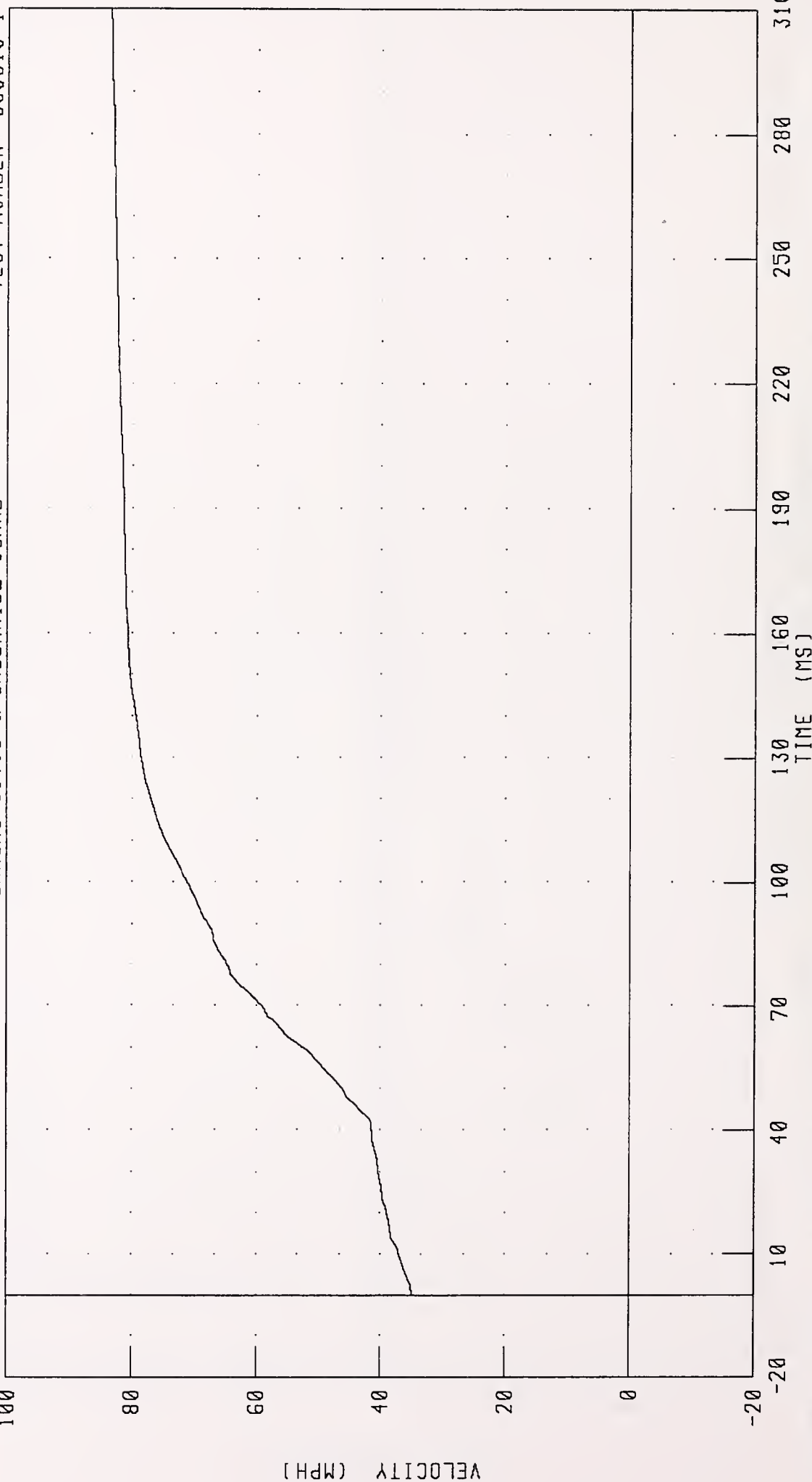
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO. 5

VEHICLE CENTER OF GRAVITY RESULTANT VELOCITY

TRC INC.

CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER: 930513-1



CHANNEL: VCGRV1 FILTER: CH. CLASS 180

PEAK DATA: 83.50 MPH @ 310.00 MS; 35.00 MPH @ 0.00 MS

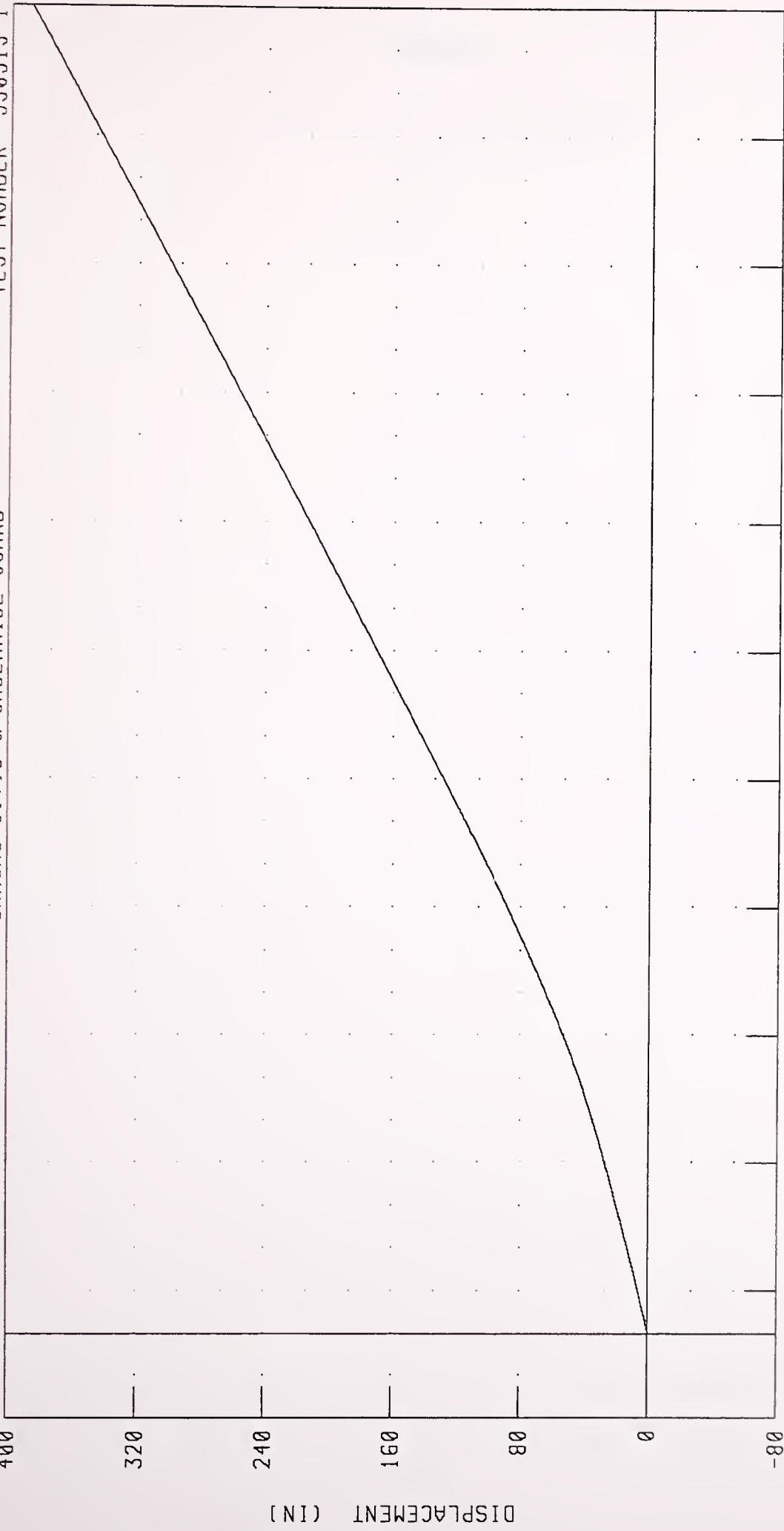
1993 HONDA CIVIC INTO RIGID HEAVY TRUCK REAR UNDERRIDE GUARD TEST NO 5

VEHICLE CENTER OF GRAVITY RESULTANT DISPLACEMENT

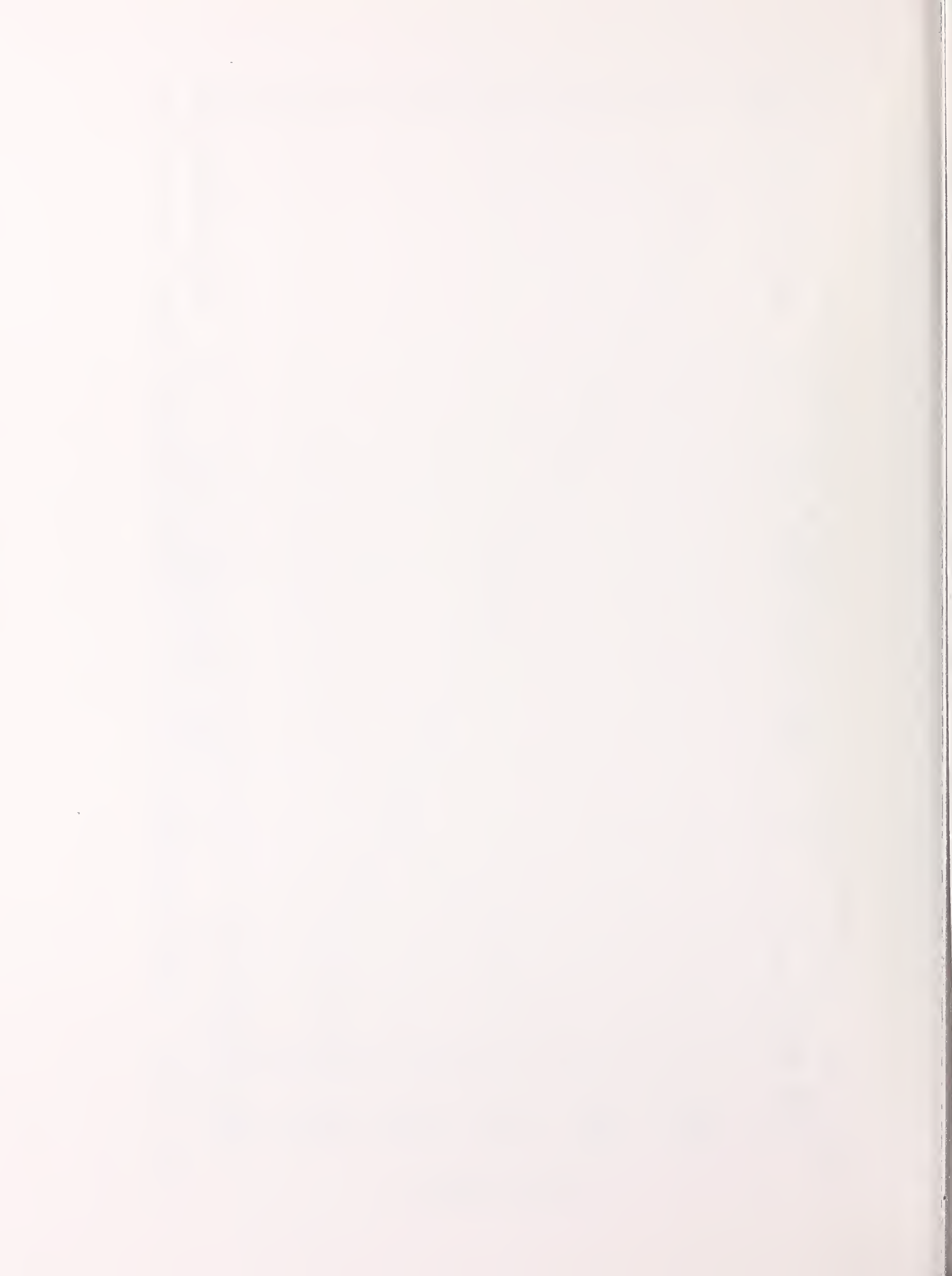
CRASH3 CIVIC & UNDERRIDE GUARD

TEST NUMBER 930513-1

TRC INC.

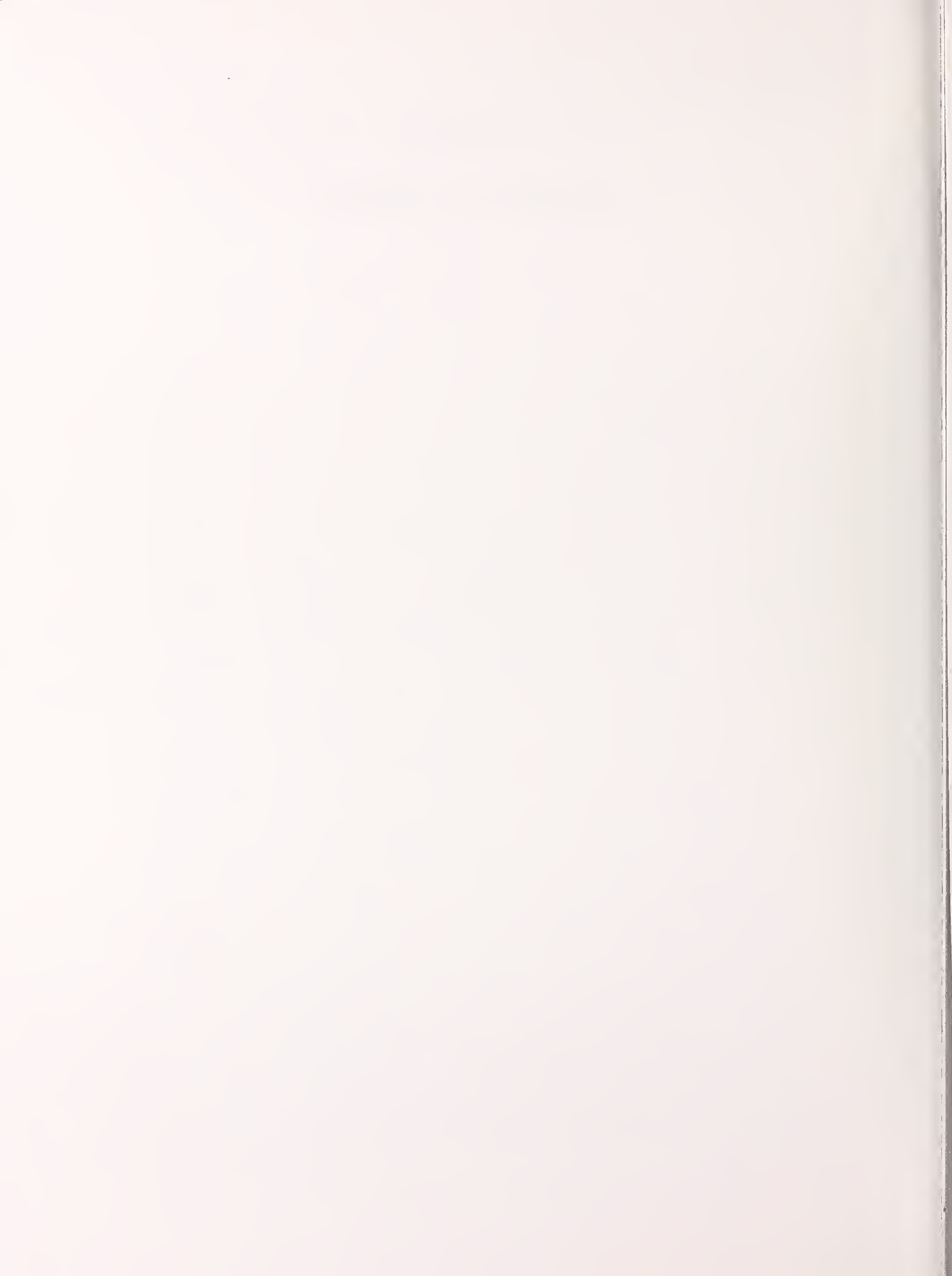


CHANNEL: VCCRD1 FILTER: CH. CLASS 180 PEAK DATA: 387.40 IN @ 310.00 MS; 0.00 IN @ 0.00 MS



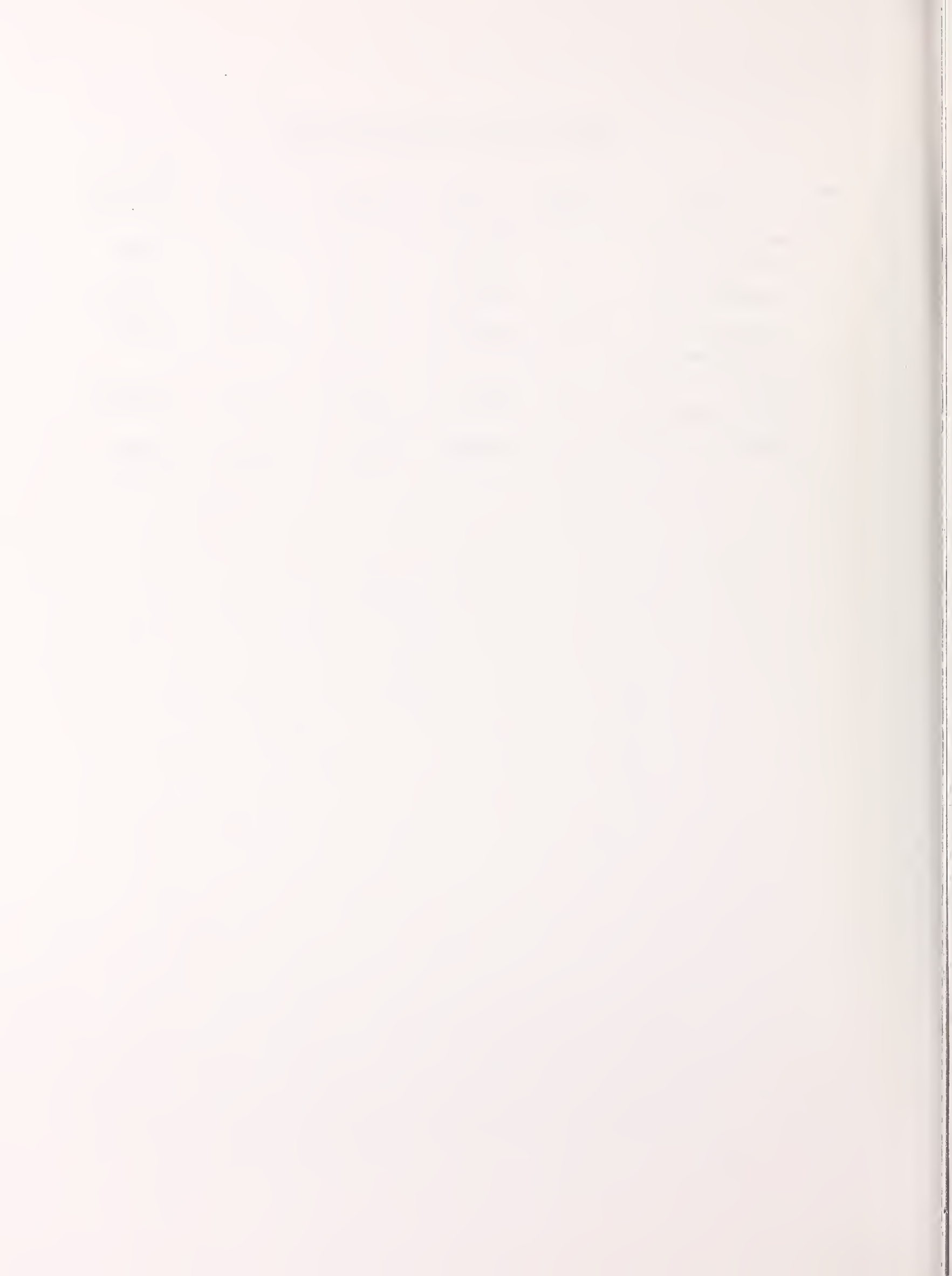
APPENDIX C

MISCELLANEOUS TEST INFORMATION



VEHICLE ACCELEROMETER INFORMATION

NO.	LOCATION	AXIS	MFR	MODEL	S/N	ORIENTATION (+ SENSING)
1	LEFT REAR SILL	X	ENDEVCO	2264	AR49	REAR
	LEFT REAR SILL	Y	ENDEVCO	2264	AS95	LEFT
2	RIGHT REAR SILL	X	ENDEVCO	2264	AY66	FORWARD
	RIGHT REAR SILL	Y	ENDEVCO	2264	AU09	RIGHT
3	VEHICLE CENTER OF GRAVITY	X	ENDEVCO	2264	AR38	FORWARD
	VEHICLE CENTER OF GRAVITY	Y	ENDEVCO	2264	AN06	RIGHT



SIGN CONVENTION

ALL DUMMY, BARRIER AND VEHICLE CHANNELS:

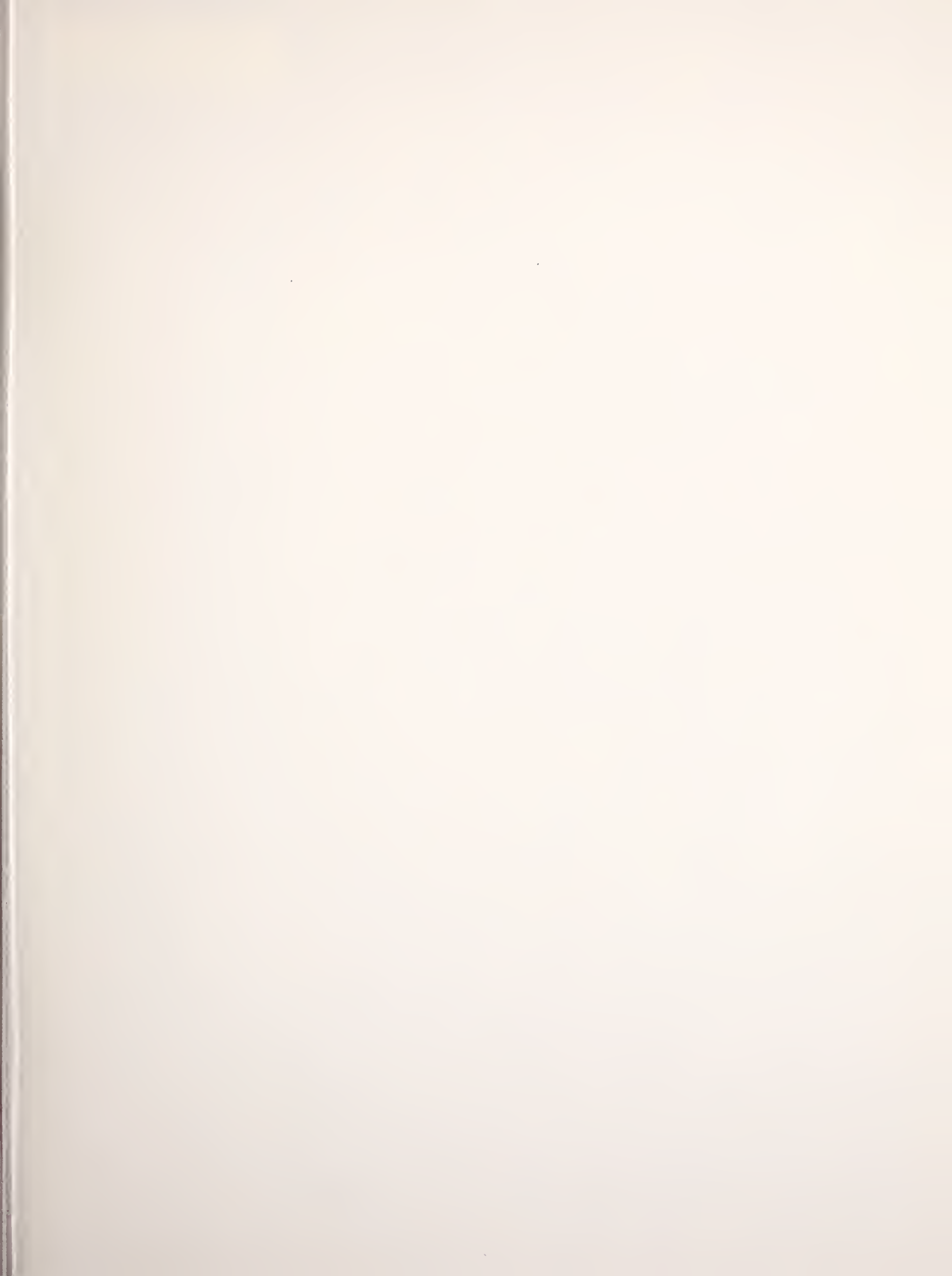
+X: FORWARD

+Y: LEFTWARD

+Z: UPWARD

+FORCE: TENSION





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