V5195

1999 Acura 3.5 RL
into a Flat Frontal Barrier
TRC Test Number: 990427

Prepared by:
Transportation Research Center Inc.
10820 State Route 347
East Liberty, OH 43319

Final Report
April - May 1999

Prepared For:
Vehicle Research and Test Center
P. O. Box 37
East Liberty, OH 43319

Notice

Transportation Research Center Inc. does not endorse or certify products of manufacturers. The manufacturer's name appears solely to identify the test article. Transportation Research Center Inc. assumes no liability for the report or use thereof. It is responsible for the facts and the accuracy of the data presented herein. This report does not constitute a standard, specification, or regulation.

This publication is distributed by the U. S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Table of Contents

List of Tables

List of Figures

List of Photographs

List of Photographs, Cont'd.

Section 1.0

Purpose and Test Procedure

Purpose and Test Summary

This 25 mph flat frontal barrier impact test has as the main objective to investigate both vehicle and occupant dynamics during a flat frontal barrier test. A secondary objective is to gather information on depowered airbags.

This test was conducted with a 1999 Acura 3.5 RL that impacted a flat frontal barrier. The test vehicle contained two instrumented Hybrid III 50th percentile adult male dummies.

Section 2.0

Frontal Barrier Impact Test Summary

Test Procedure

This test was conducted per VRTC personnel's instructions. Data was obtained relative to FMVSS 208, "Occupant Crash Protection," performance.

The test vehicle was instrumented with eight (8) accelerometers to measure longitudinal, lateral, and vertical axis accelerations and three (3) inductive pickup switches to measure the driver and passenger airbag fire times (the passenger side has a two-stage airbag). The vehicle's specified impact velocity range was 39.4 to 41.0 kph. The vehicle impacted a flat frontal barrier.

The test vehicle contained two (2) Hybrid III 50th percentile adult male anthropomorphic test devices (dummies). The dummies were positioned in the front outboard designated seating positions according to the FMVSS 208 laboratory seating procedure.

Both dummies were instrumented with head and chest accelerometers to measure longitudinal, lateral, and vertical accelerations; chest deflection potentiometers; left and right femur load cells to measure axial forces; and upper neck load cells to measure forces and moments.

The forty-one (41) data channels were digitally sampled at 12,500 samples per second and processed per Sections 11.13 through 11.15 of the Laboratory Test Procedure.

The crash event was recorded by one (1) real-time panning motion picture camera and fourteen (14) high-speed motion picture cameras. The pre-test and post-test conditions were recorded by one (1) real-time motion picture camera.

The vehicle and occupant data are summarized in Section 2.0. The FMVSS 208 data are presented in Section 3.0. The vehicle, occupant, and camera measurements are presented in Section 4.0. Appendix A contains the still photographic prints. Appendix B contains the dummy and vehicle data plots. Appendix C contains the miscellaneous test information.

Test Results Summary

This flat frontal barrier test was conducted at TRC on April 27, 1999.

The test vehicle, a 1999 Acura 3.5 RL, was equipped with airbags at the driver's and right front passenger's seating positions (the passenger side has a two-stage airbag). The vehicle's test weight was 1906.9 kilograms. The vehicle's impact speed was 40.1 kph. The vehicle's maximum static crush was 340 millimeters.

The driver's 15-millisecond HIC was 63 and its 36-millisecond HIC was 99. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 34.8 g. The driver's chest deflection was 35.7 millimeters. The driver's left and right femur maximum compressive forces were 5912 N and 5825 N, respectively.

The right front passenger's 15-millisecond HIC was 120 and its 36-millisecond HIC was 181. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 32.5 g. The passenger's chest deflection was 17.3 millimeters. The right front passenger's left and right femur maximum compressive forces were 5552 N and 6216 N, respectively.

Data Acquisition Explanations

The passenger airbag secondary inductive pickup switch, ABSQ2, recorded invalid data throughout the event.

Table 1 Crash Test Summary

Test type:	Frontal barrier impact
Test date:	04/27/99
Test time:	2336
Ambient temperature at impact area:	21° C
Vehicle year/make/ model/body style:	1999/Acura/3.5 RL/Sedan
Vehicle test weight:	1906.9 kg
Impact angle[1]:	0°
Impact velocity[2]:	
Primary:	40.1 kph
Secondary:	40.2 kph
Maximum static crush:	340 mm
Average rebound:	570 mm
Number of cameras:	
Real-time:	1
High-speed:	14
Door opening data:	
Left-front:	Easy
Right-front:	Easy

[1] With respect to tow track centerline.
[2] Speed trap measurement (± .08 km/h accuracy)

Table 1 Crash Test Summary, Cont'd.

Dummies:	Driver #168	Passenger #169
Type:	Hybrid III 50th percentile adult male	Hybrid III 50th percentile adult male
Location:	Left front	Right front
Restraint:	Airbag	Airbag
Number of data channels:	15	15
Front seat data:		
Seat track failure:	None	None
Seat back failure:	None	None
Visible dummy contact points:		
Head:	Airbag	Airbag
Chest:	Airbag	Airbag
Abdomen:	None	None
Left knee:	Instrument panel, Steering column	Instrument panel
Right knee:	Instrument panel	Instrument panel

Table 2 Test Vehicle Information

Vehicle year/make/ model/body style:	1999/Acura/3.5 RL/Sedan			
Color:	Green			
VIN:	JH4KA9655XC001813			
Engine data:				
Placement:	Transverse			
Cylinders:	6			
Displacement:	3.5 liters			
Transmission data:	_4_speed,	___manual,	_X_automatic,	___overdrive
Final drive:	_X_fwd,	___rwd,	___4wd	
Date vehicle received:	4-22-99			
Odometer reading:	5661 km			
Dealer's name and address:	N/A			

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	Yes	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	Yes
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Power door locks	Yes	Other:	None

Certification data from vehicle's label:

Vehicle manufactured by:		Honda Motor Co.
Date of manufacture:		09/98
VIN:		JH4KA9655XC001813
GVWR:		4830 lb.
GAWR:	Front:	2570 lb.
	Rear:	2260 lb.

Table 2 Test Vehicle Information, Cont'd.

Size of tires on vehicle:	P215/60R16
Spare tire:	Space saver
Type of front seats:	Bucket

Tire & capacity data from vehicle's label:

Recommended tire size:	P215/60R16
Recommended cold tire pressure:	
Front:	200 kPa
Rear:	200 kPa
Designated Seating Capacity:	
Front	2
Rear	3
Total	5
Vehicle Cargo Weight:	850 lb.

Test vehicle attitudes:

Delivered attitude:	LF:	714 mm	RF:	714 mm	LR:	705 mm	RR:	710 mm
Fully loaded attitude:	LF:	695 mm	RF:	693 mm	LR:	672 mm	RR:	674 mm
Pre-test attitude:	LF:	685 mm	RF:	688 mm	LR:	665 mm	RR:	664 mm
Post-test attitude:	LF:	676 mm	RF:	691 mm	LR:	660 mm	RR:	675 mm

Table 2 Test Vehicle Information, Cont'd.

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

Right front	529.8	kg	Right rear	354.3 kg
Left front	487.2	kg	Left rear	347.5 kg
Total front weight	1017.0	kg	(59.2% of total vehicle weight)	
Total rear weight	701.8	kg	(40.8% of total vehicle weight)	
Total delivered weight	1718.8	kg		

Calculation of test vehicle's target test weight:

RCLW = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (1718.8 kg)

DSC[1] = Designated Seating Capacity (5)

RCLW[2] = 45.4 kg

Target test weight = UDW + RCLW + (number of Hybrid III Dummies x 75.7 kg per dummy)

Target test weight = 1718.8 + 45.4 + 151.4 = 1915.6 kg

Weight of test vehicle with required dummies and 2.3 kg of cargo weight:

Right front	519.8	kg	Right rear	417.8 kg
Left front	565.6	kg	Left rear	403.7 kg
Total front weight	1085.4	kg	(56.9% of total vehicle weight)	
Total rear weight	821.5	kg	(43.1% of total vehicle weight)	
Total test weight	1906.9	kg	(0.45% under target test weight)	

Weight of ballast secured in vehicle: 2.3 kg

Components removed to meet target test weight: Rear muffler, Right tail light assembly, Rear package shelf, Speakers, Truck lid liner, Rear seat belts (all), Rear mount tail light, Stereo amp, Rear seats, Spare tire

CG rearward of front wheel centerline: 1254 mm

Vehicle Wheelbase: 2910 mm

[1] The designated seating capacity is determined by counting the number of seat belts installed in the vehicle.

[2] From vehicle's tire label.

Table 3 Post-Impact Data

Test number:	990427
Test date:	04/27/99
Test time:	2336
Test type:	Frontal barrier impact
Impact angle:	0°
Ambient temperature at impact area:	22° C
Temperature in occupant compartment:	21° C

Impact velocity:

Primary:	40.1 kph
Secondary	40.2 kph
Specified range:	39.4 to 41.0 kph

Distance from vehicle to barrier:

Entering velocity trap:	356 mm
Exiting velocity trap:	51 mm

Test vehicle static crush:

Overall length of test vehicle:

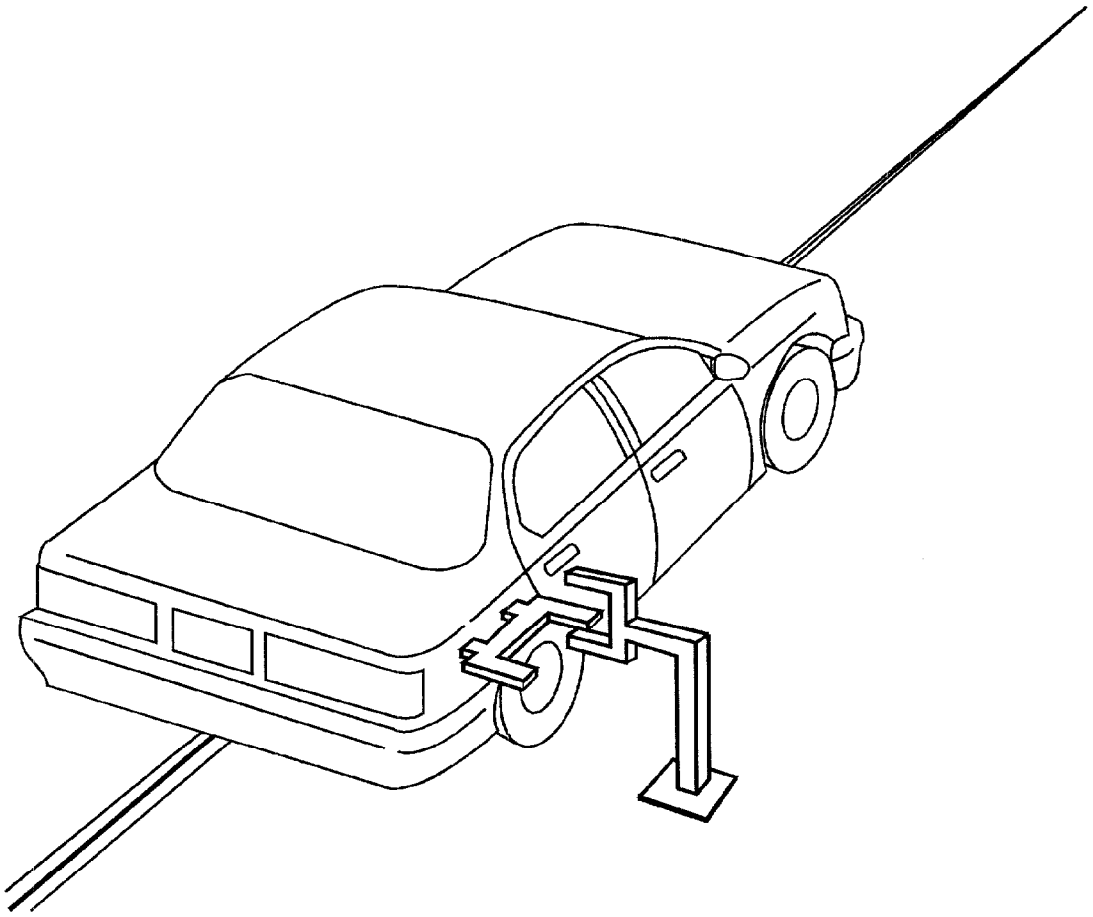
Pre-test:	L:	4885 mm	C: 5100 mm	R:	4905 mm
Post-test:	L:	4679 mm	C: 4760 mm	R:	4706 mm
Total crush:	L:	206 mm	C 340 mm	R:	199 mm
Average crush:	248 mm				

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test:	L:	636 mm	C: 505 mm	R:	569 mm
Average rebound:	570 mm				

Figure 1 Impact Velocity Measurement System

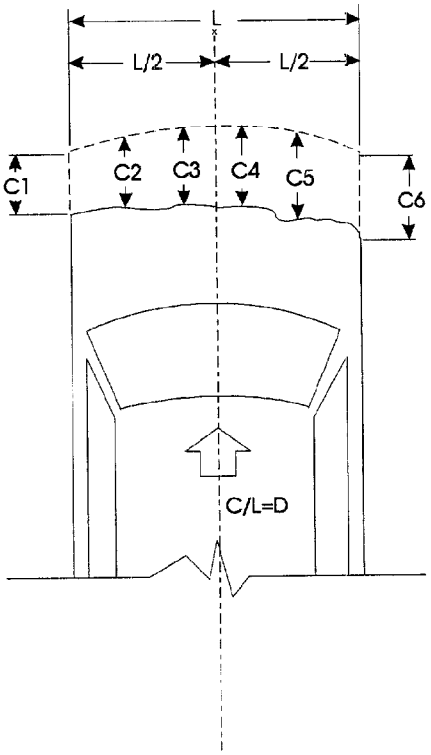


The final vane clears the final emitter/receiver pair 51 millimeters before impact.

The vanes have 305-millimeter spacing.

Figure 2 Accident Investigation Division Data for 25 mph Frontal Barrier Impact

Test date:	04/27/99
Vehicle year/make/ model/body style:	1999/Acura/3.5 RL/Sedan
VIN:	JH4KA9655XC001813
Build date:	09/98
Test weight:	1906.9 kg
Vehicle wheelbase:	2910 mm
Maximum width:	1800 mm
Front overhang:	920 mm



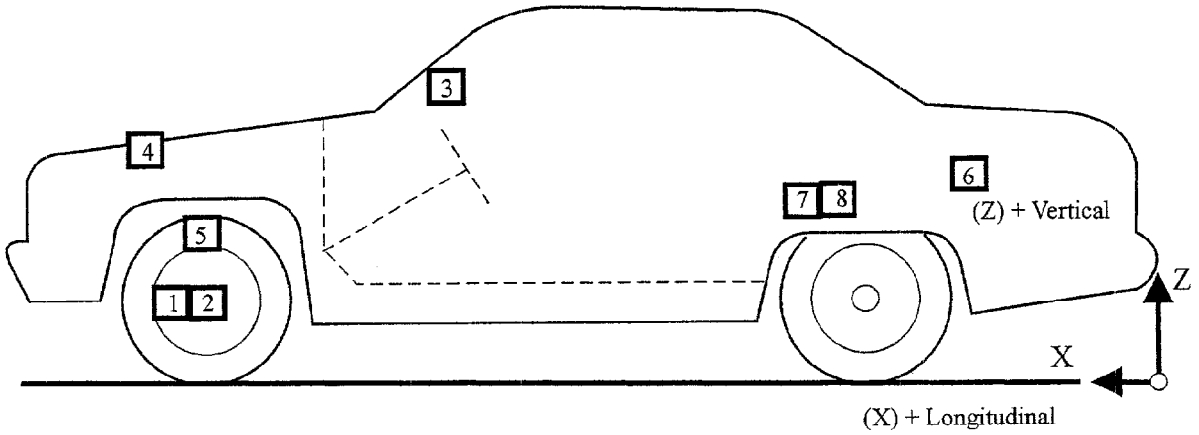
Collision Deformation Classification (CDC) Code: 12FDEW2

Crush depth measurements:	C1: 206 mm
	C2: 245 mm
	C3: 306 mm
	C4: 307 mm
	C5: 238 mm
	C6: 199 mm

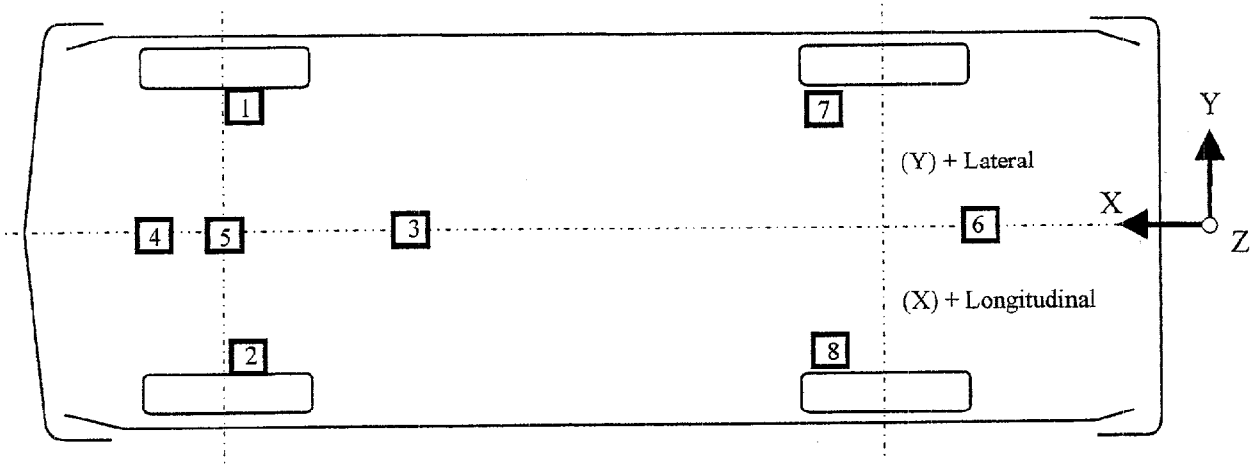
Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged region: L: 1525 mm

Figure 3 Vehicle Accelerometer Placement



Side View



Bottom View

Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 990427 No. LOCATION		X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 LEFT BRAKE CALIPER	PRE	3950 mm	701 mm	382 mm				
	POST	3941 mm	695 mm	391 mm				
LONGITUDINAL					49.4 g	@ 2.5 ms	45.0 g	@ 169.3 ms
2 RIGHT BRAKE CALIPER	PRE	3950 mm	-701 mm	372 mm				
	POST	3945 mm	-693 mm	382 mm				
LONGITUDINAL					21.4 g	@ 73.6 ms	54.5 g	@ 42.5 ms
3 INSTRUMENT PANEL CENTER	PRE	3456 mm	0 mm	955 mm				
	POST	3480 mm	0 mm	950 mm				
LONGITUDINAL					18.0 g	@ 68.0 ms	38.3 g	@ 62.8 ms
4 ENGINE TOP	PRE	4060 mm	0 mm	887 mm				
	POST	4000 mm	0 mm	900 mm				
LONGITUDINAL					20.9 g	@ 30.4 ms	64.5 g	@ 36.6 ms
5 ENGINE BOTTOM	PRE	4145 mm	0 mm	160 mm				
	POST	4085 mm	0 mm	200 mm				
LONGITUDINAL					19.7 g	@ 66.5 ms	55.1 g	@ 49.2 ms

Table 4 Vehicle Accelerometer Locations and Data Summary, Cont'd.

TEST NUMBER: 990427 No. LOCATION		X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
6 REAR VEHICLE CENTERLINE	PRE	260 mm	0 mm	540 mm				
	POST	370 mm	0 mm	555 mm				
VERTICAL					11.4 g	@ 86.6 ms	10.2 g	@ 47.3 ms
7 LEFT REAR SEAT	PRE	2095 mm	565 mm	379 mm				
	POST	2074 mm	565 mm	369 mm				
LONGITUDINAL					2.5 g	@ 109.8 ms	27.4 g	@ 62.0 ms
8 RIGHT REAR SEAT	PRE	2095 mm	-540 mm	370 mm				
	POST	2075 mm	-540 mm	380 mm				
LONGITUDINAL					2.1 g	@ 100.1 ms	26.6 g	@ 66.1 ms

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

Section 3.0

FMVSS 208 Data

Table 5 Dummy Injury Criteria

Maximum Acceleration

	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	-26.8 g	10.5 g	8.6 g	29.1 g	-35.0 g	3.8 g	5.6 g
Passenger	-29.9 g	-23.7 g	18.2 g	38.8 g	-32.7 g	-6.2 g	-11.0 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	5912 N	5825 N
Passenger	5552 N	6216 N

15-millisecond Head Injury Criteria [1]

	HIC	Time t_1	Time t_2
Driver	63	87.3 ms	102.4 ms
Passenger	120	86.3 ms	101.4 ms

36-millisecond Head Injury Criteria[1]

	HIC	Time t_1	Time t_2
Driver	99	77.4 ms	113.4 ms
Passenger	181	75.7 ms	110.2 ms

Chest Maximum Resultant Acceleration[2]

	Acceleration	Time t_1	Time t_2
Driver	34.8 g	103.8 ms	106.9 ms
Passenger	32.5 g	97.1 ms	100.2 ms

Maximum Chest Deflection

Driver	35.7 mm
Passenger	17.3 mm

[1] As defined in FMVSS No. 208
[2] Defined as equal to or exceeding 0.003 sec. duration

Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The left knee also impacted the steering column. The dummy's head and chest impacted the airbag. The dummy rebounded rearward into the seat, and came to rest seated upright in the driver's seat, bent slightly forward from the waist.

Right Front Passenger Dummy

Upon impact, the passenger dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy's head rotated to the left as the dummy's torso rebounded rearward into the seat. The dummy came to rest seated upright in the passenger seat, bent slightly forward from the waist.

Section 4.0

Vehicle, Occupant, and Camera Measurements

Figure 4 Pre-test and Post-test Measurement Points

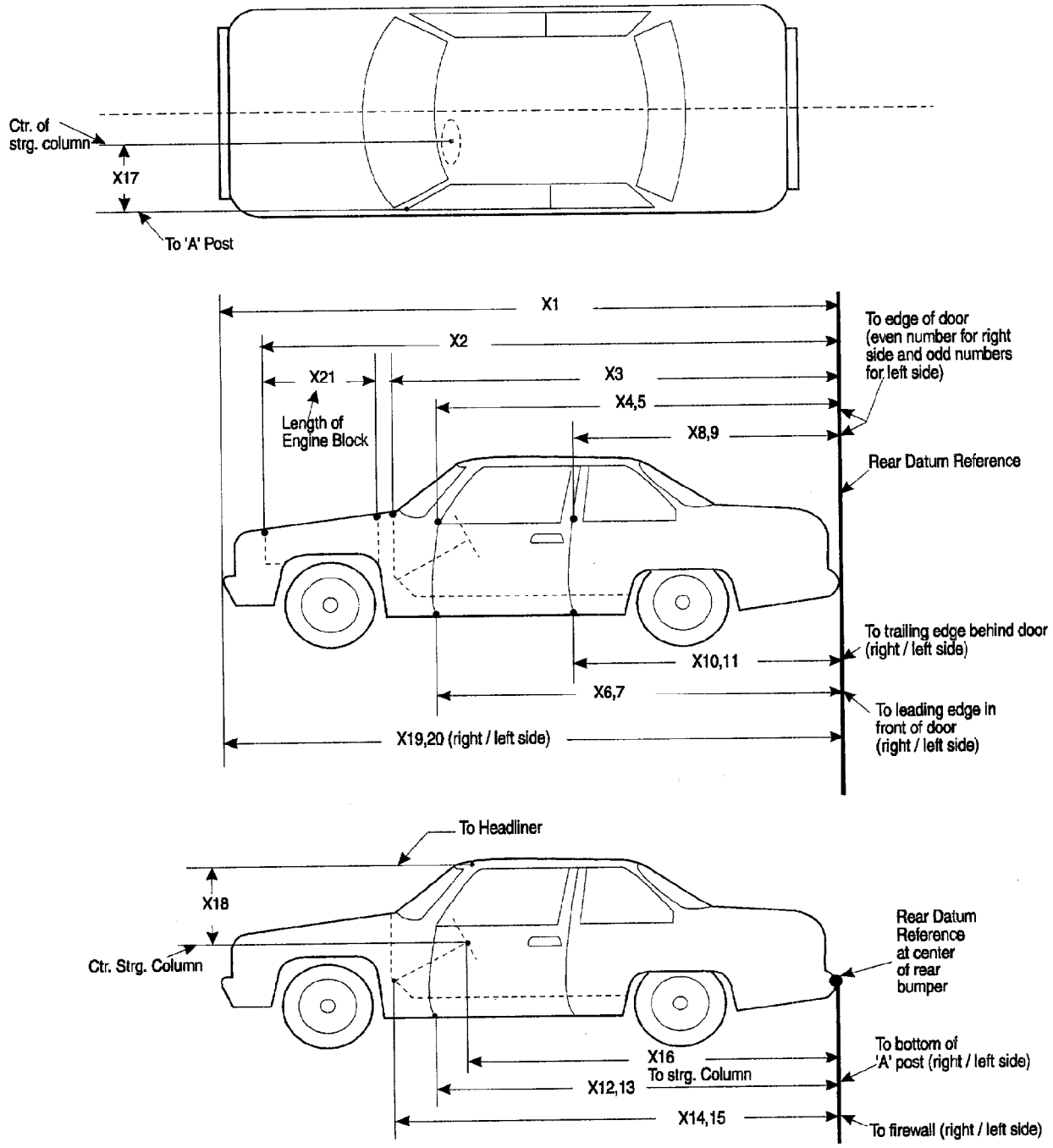


Table 6 Impacted Vehicle Measurements

Vehicle year/make/model/body style: 1999/Acura/3.5 RL/Sedan

Test Number: 990427

No.	Type of measurement	Pre-Test	Post-Test	Difference
X1	Total Length of Veh. at Centerline	5100	4760	340
X2	Rear Surface of Veh. to Front of Engine Block	4413	4328	85
X3	Rear Surface of Veh. to Firewall	3840	3819	21
X4	Rear Surface of Veh. to Upper Leading Edge of Right Door	3471	3464	7
X5	Rear Surface of Veh. to Upper Leading Edge of Left Door	3470	3473	-3
X6	Rear Surface of Veh. to Lower Leading Edge of Right Door	3480	3457	23
X7	Rear Surface of Veh. to Lower Leading Edge of Left Door	3486	3469	17
X8	Rear Surface of Veh. to Upper Trailing Edge of Right Door	2456	2450	6
X9	Rear Surface of Veh. to Upper Trailing Edge of Left Door	2457	2455	2
X10	Rear Surface of Veh. to Lower Trailing Edge of Right Door	2461	2439	22
X11	Rear Surface of Veh. to Lower Trailing Edge of Left Door	2460	2444	16
X12	Rear Surface of Veh. to Bottom of " A " Post on Right Side	3505	3501	4
X13	Rear Surface of Veh. to Bottom of " A " Post on Left Side	3505	3505	0
X14	Rear Surface of Veh. to Firewall--Right Side	3765	3842	-77
X15	Rear Surface of Vehicle to Firewall --Left Side	3771	3759	12
X16	Rear Surface of Veh. to Steering Wheel Center	3097	3147	-50
X17	Center of Steering Column to " A " Post	305	307	-2
X18	Center of Steering Column to Headliner	405	380	25
X19	Rear Surface of Veh. to Right Side of Front Bumper	4905	4706	199
X20	Rear Surface of Veh. to Left Side of Front Bumper	4885	4679	206
X21	Length of Engine Block	460	460	0

Figure 5 Vehicle Target Locations

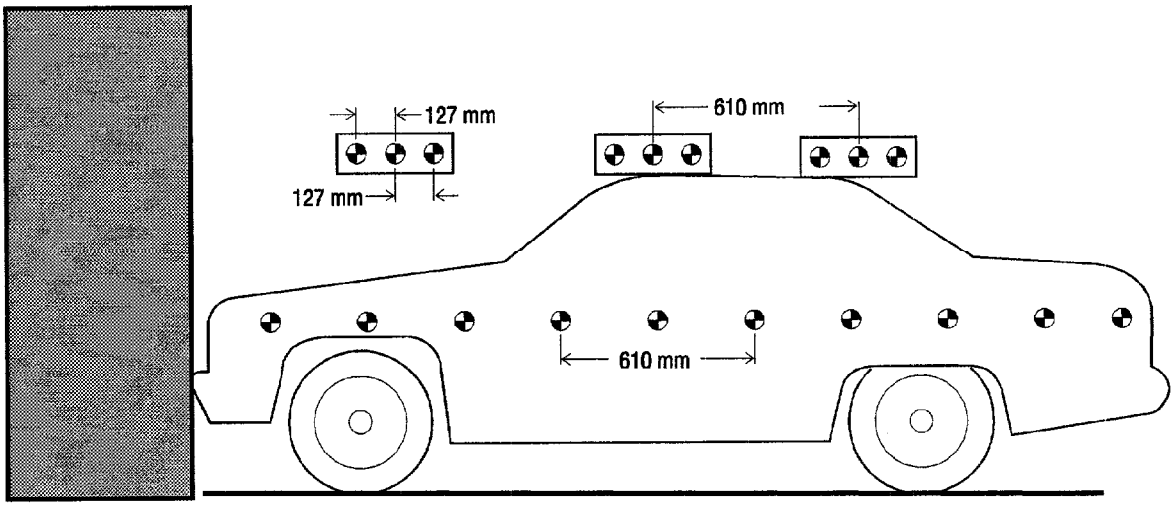


Figure 6 Dummy Measurement Locations for Front Seat Occupants

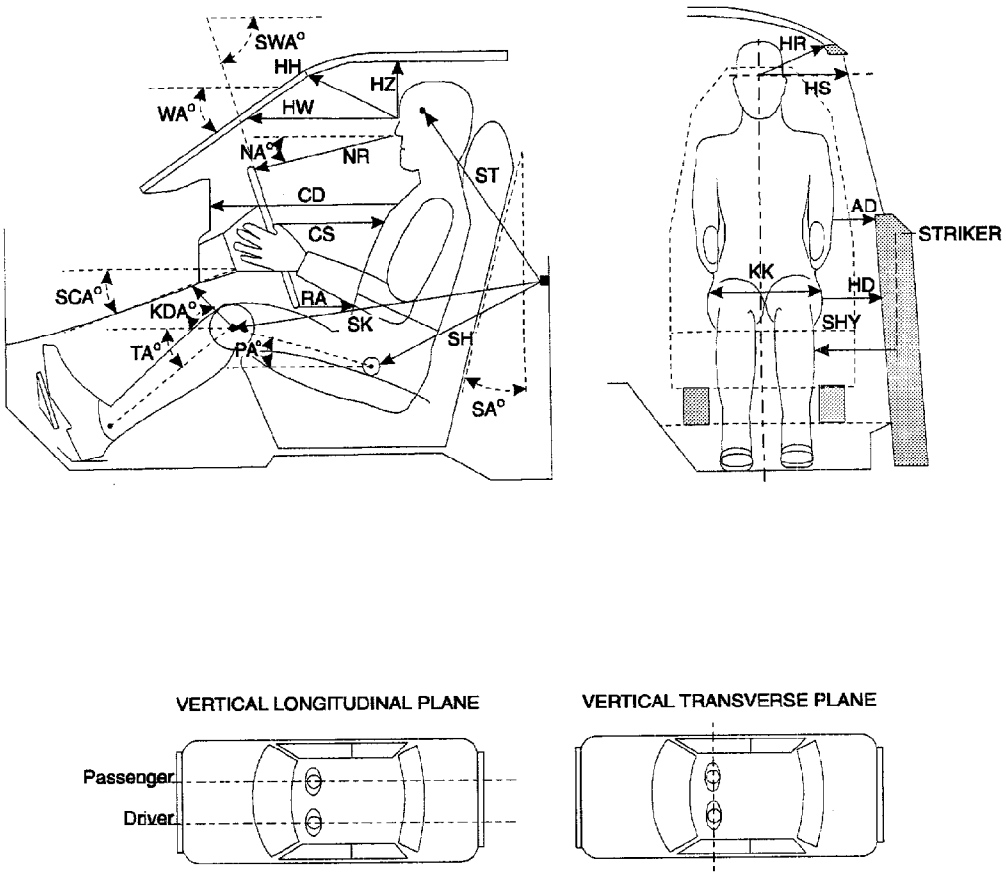


Table 7 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #168)	Passenger (Serial #169)
WA	Windshield angle	30°	N/A
SWA	Steering wheel angle	63°	N/A
SCA	Steering column angle	27°	N/A
SA	Seat back angle	24°	25°
HZ	Head to roof	177 mm	162 mm
HH	Head to header	382 mm	361 mm
HW	Head to windshield	591 mm	575 mm
HR	Head to side header	182 mm	185 mm
NR	Nose to rim	460 mm	N/A
NA	Nose to rim angle	6°	N/A
CD	Chest to dash	579 mm	641 mm
CS	Steering wheel to chest	360 mm	N/A
RA	Rim to abdomen	226 mm	N/A
KDL	Left knee to dash	217 mm	216 mm
KDR	Right knee to dash	216 mm	222 mm
KDA	Outboard knee to dash angle	32°	26.1°
PA	Pelvic angle	24°	21.4°
TA	Tibial angle	30°	36.3°
KK	Knee to knee	295 mm	274 mm
ST[1]	Striker to head	474 mm	482 mm
	Striker to head angle	-78°	-82.6°
SK	Striker to knee	590 mm	594 mm
	Striker to knee angle	11°	5.0°
SH[1]	Striker to H-point	274 mm	257 mm
	Striker to H-point angle	47°	42.8°
SHY	Striker to H-point (Y dir.)	255 mm	245 mm
HS	Head to side window	274 mm	300 mm
HD	H-point to door	146 mm	138 mm
AD	Arm to door	85 mm	87 mm

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

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

Figure 7 Camera Positions

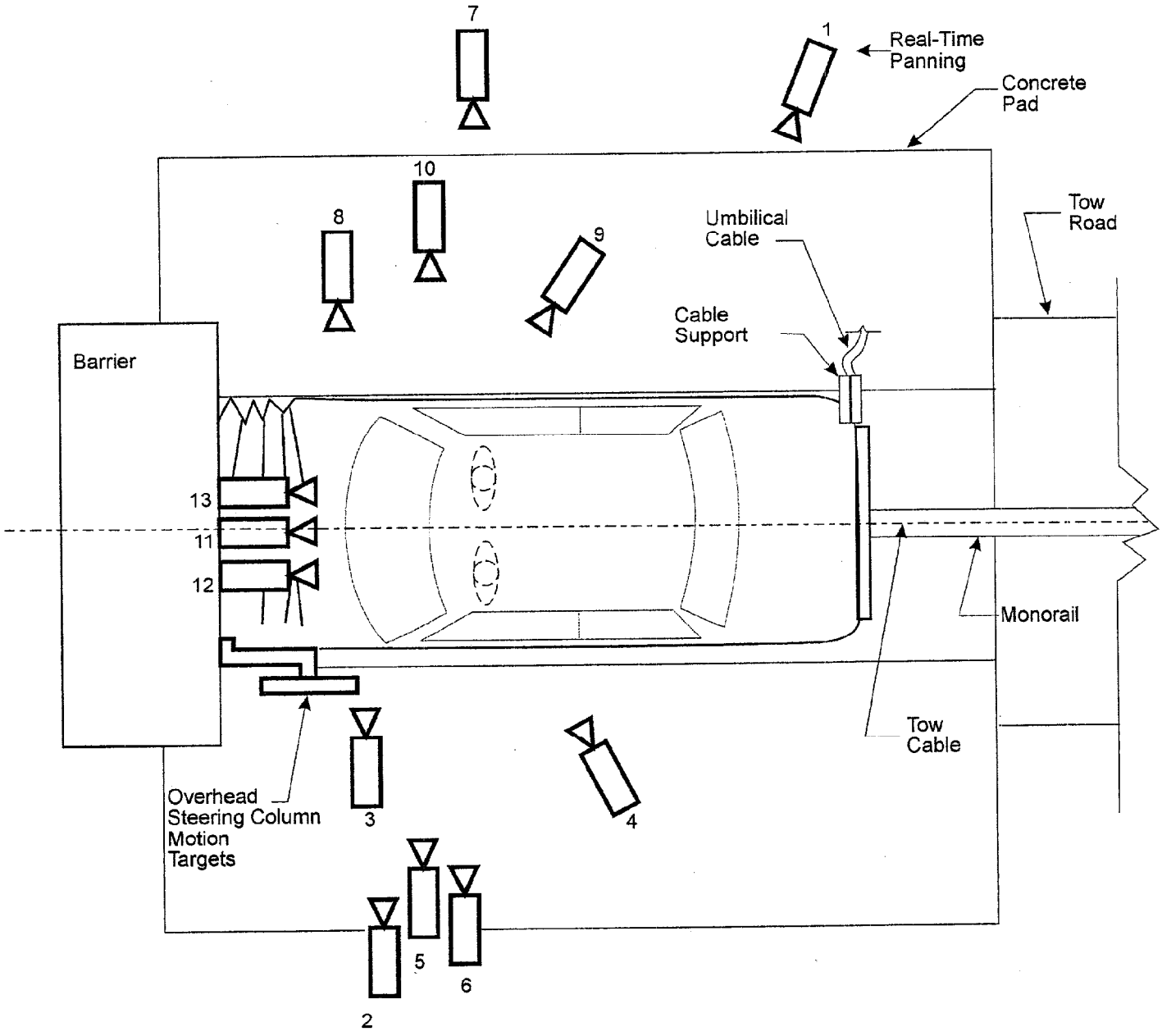


Figure 7 Camera Positions, Cont'd.

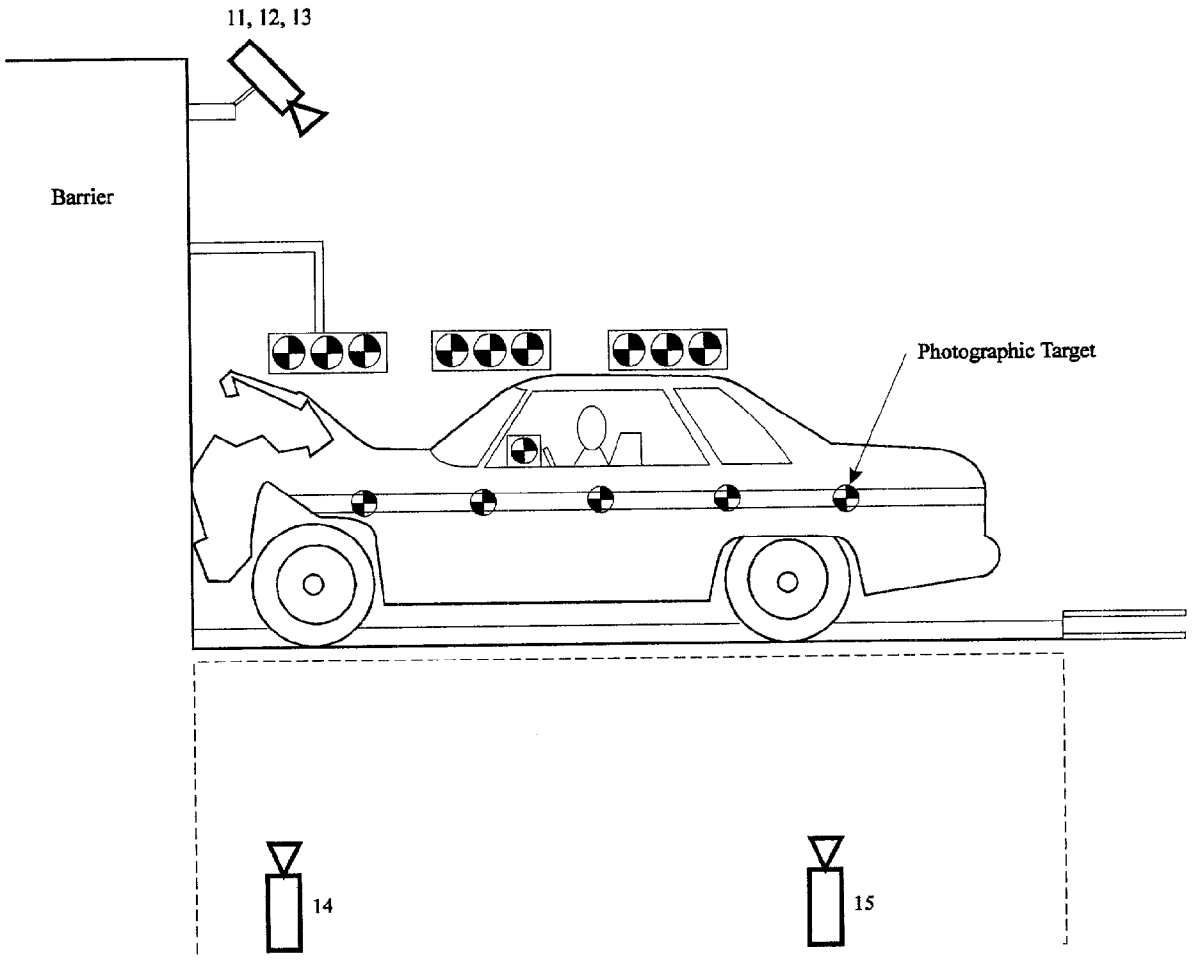


Table 8 Motion Picture Camera Locations

Vehicle year/make/model/body style: 1999/Acura/3.5 RL/Sedan

Test number: 990427

Camera Number	View	Camera Positions[1,3] X	Y	Z	Camera Angle[2,3]	Film Plane to Head Target[3]	Camera Lens	Film Speed
1	Real-time panning	NA	NA	NA	NA	NA	16 mm	24 frames/s
2	Left vehicle crush	NA	NA	NA	NA	NA	25 mm	995 frames/s
3	Left windshield intrusion	NA	NA	NA	NA	NA	50 mm	1005 frames/s
4	Driver kinematics	NA	NA	NA	NA	NA	25 mm	998 frames/s
5	Steering column motion	NA	NA	NA	NA	NA	25 mm	1002 frames/s
6	Steering column motion	NA	NA	NA	NA	NA	25 mm	1008 frames/s
7	Right overall	NA	NA	NA	NA	NA	25 mm	995 frames/s
8	Right windshield intrusion	NA	NA	NA	NA	NA	50 mm	100 frames/s
9	Passenger kinematics	NA	NA	NA	NA	NA	25 mm	998 frames/s
10	Passenger kinematics	NA	NA	NA	NA	NA	25 mm	1005 frames/s
11	Windshield front view	NA	NA	NA	NA	NA	8.5 mm	1000 frames/s
12	Driver - front view	NA	NA	NA	NA	NA	17 mm	998 frames/s
13	Passenger - front view	NA	NA	NA	NA	NA	17 mm	968 frames/s
14	Pit - front position	NA	NA	NA	NA	NA	13 mm	1005 frames/s
15	Pit - rear position	NA	NA	NA	NA	NA	13 mm	1002 frames/s

[1] +X: Film plane forward of barrier face
+Y: Film plane to left of monorail centerline
+Z: Film plane above ground level

[2] +Angle: Film plane angled upward from horizontal plane

[3] Camera location measurements were not recorded for this test.

Appendix A

Photographs

Figure A-1 Pre-Test Front View

Figure A-2 Post-Test Front View

Figure A-3 Pre-Test Left Side View

Figure A-4 Post-Test Left Side View

Figure A-5 Pre-Test Rear View

Figure A-6 Post-Test Rear View

Figure A-7 Pre-Test Right Side View

Figure A-8 Post-Test Right Side View

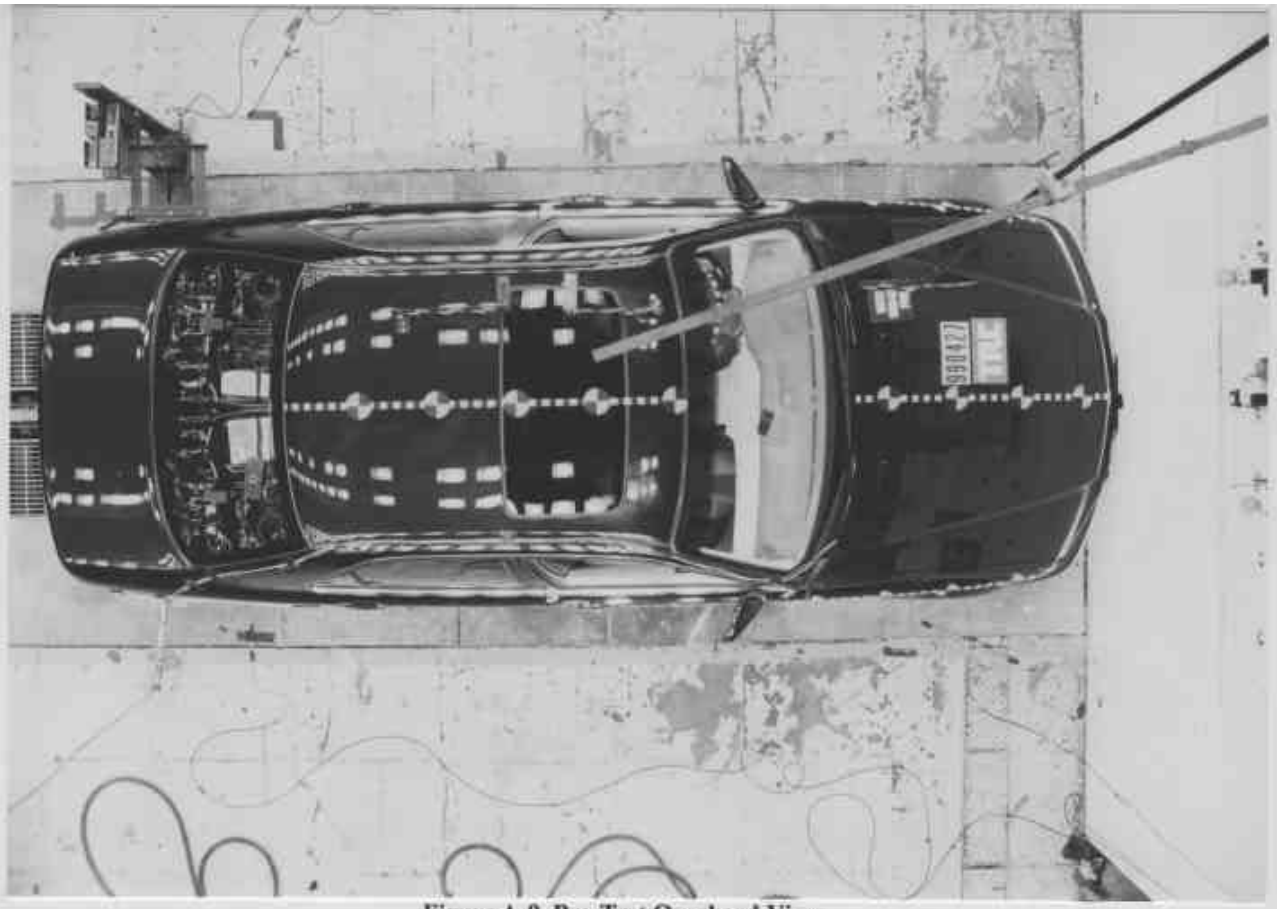


Figure A-9 Pre-Test Overhead View

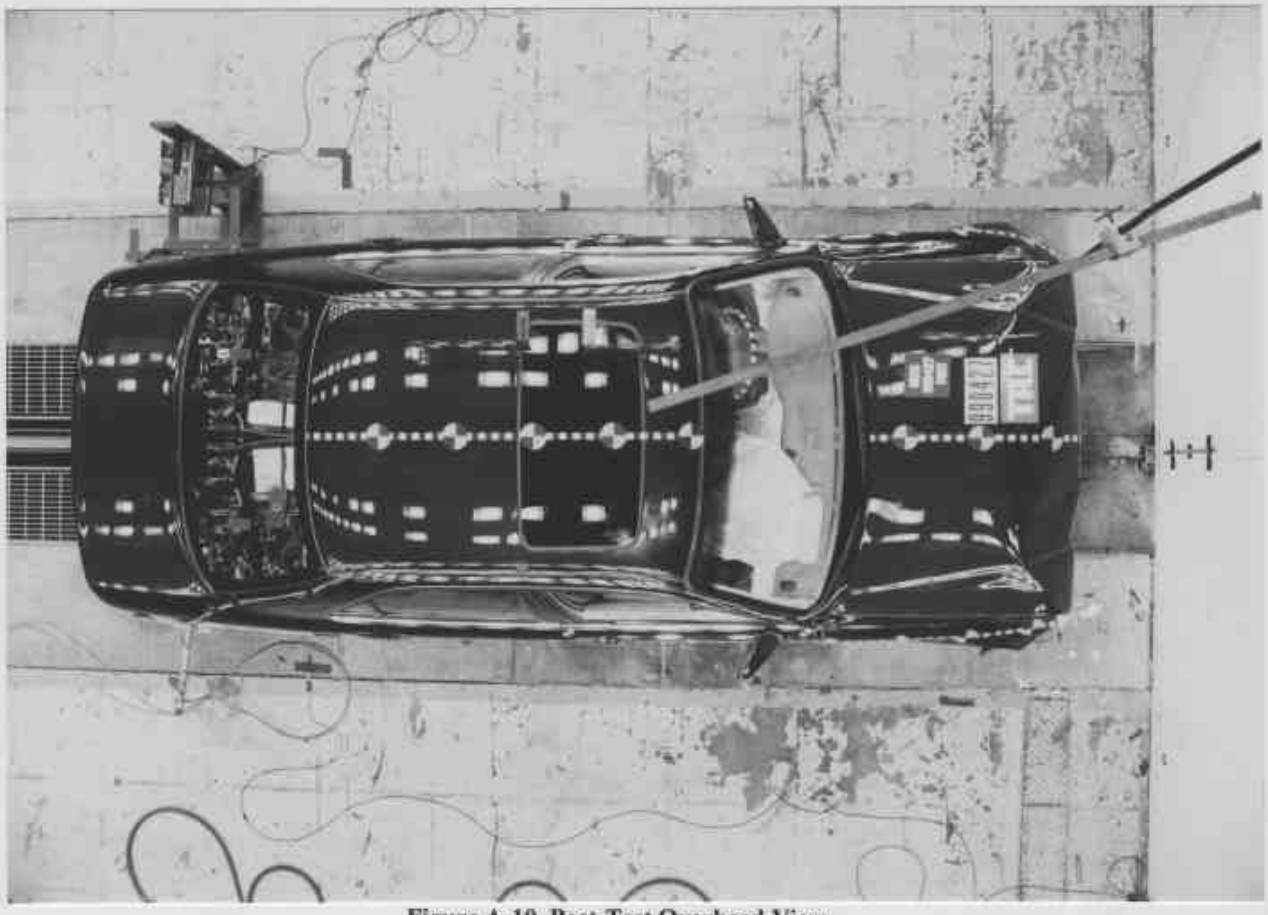


Figure A-10 Post-Test Overhead View

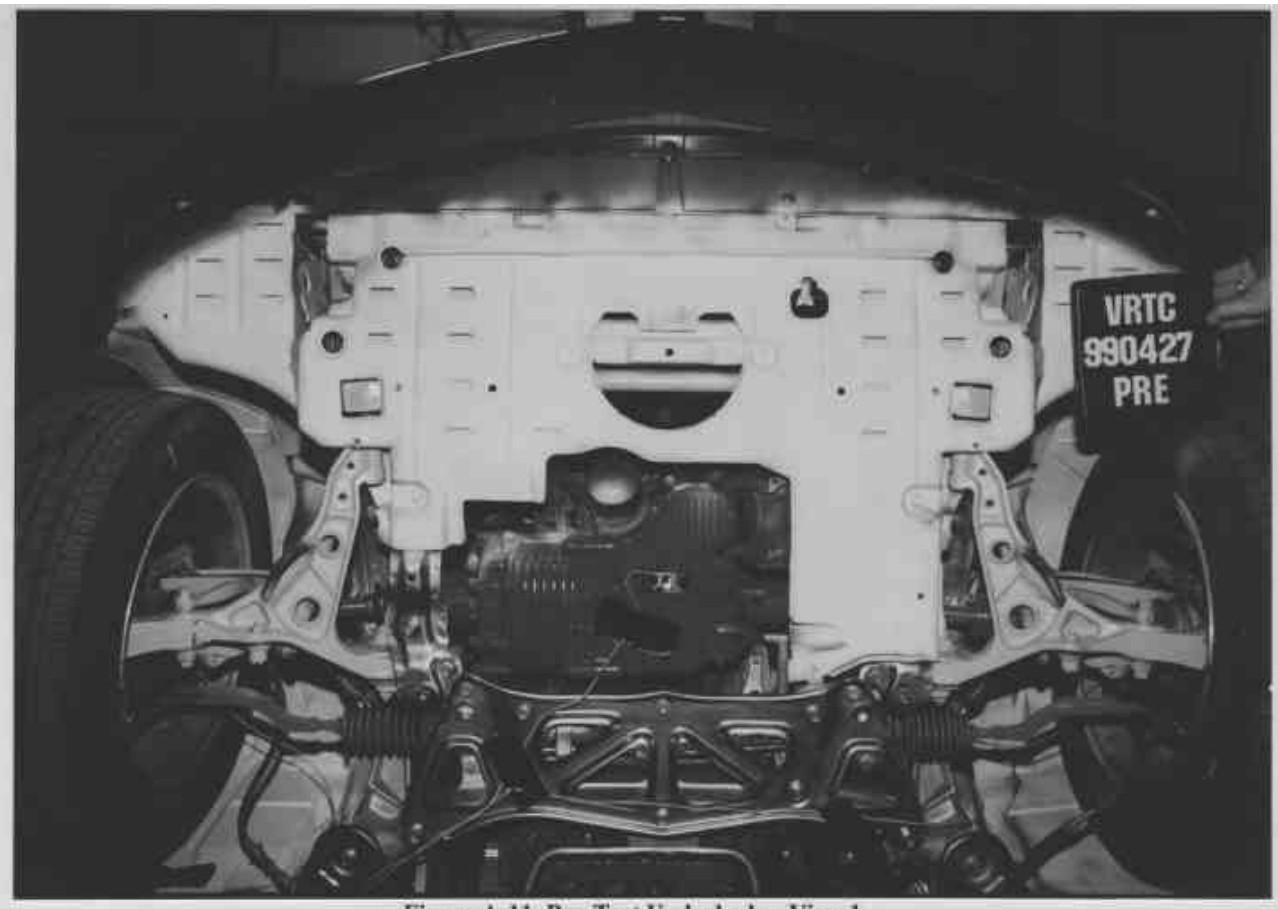


Figure A-11 Pre-Test Underbody - View 1

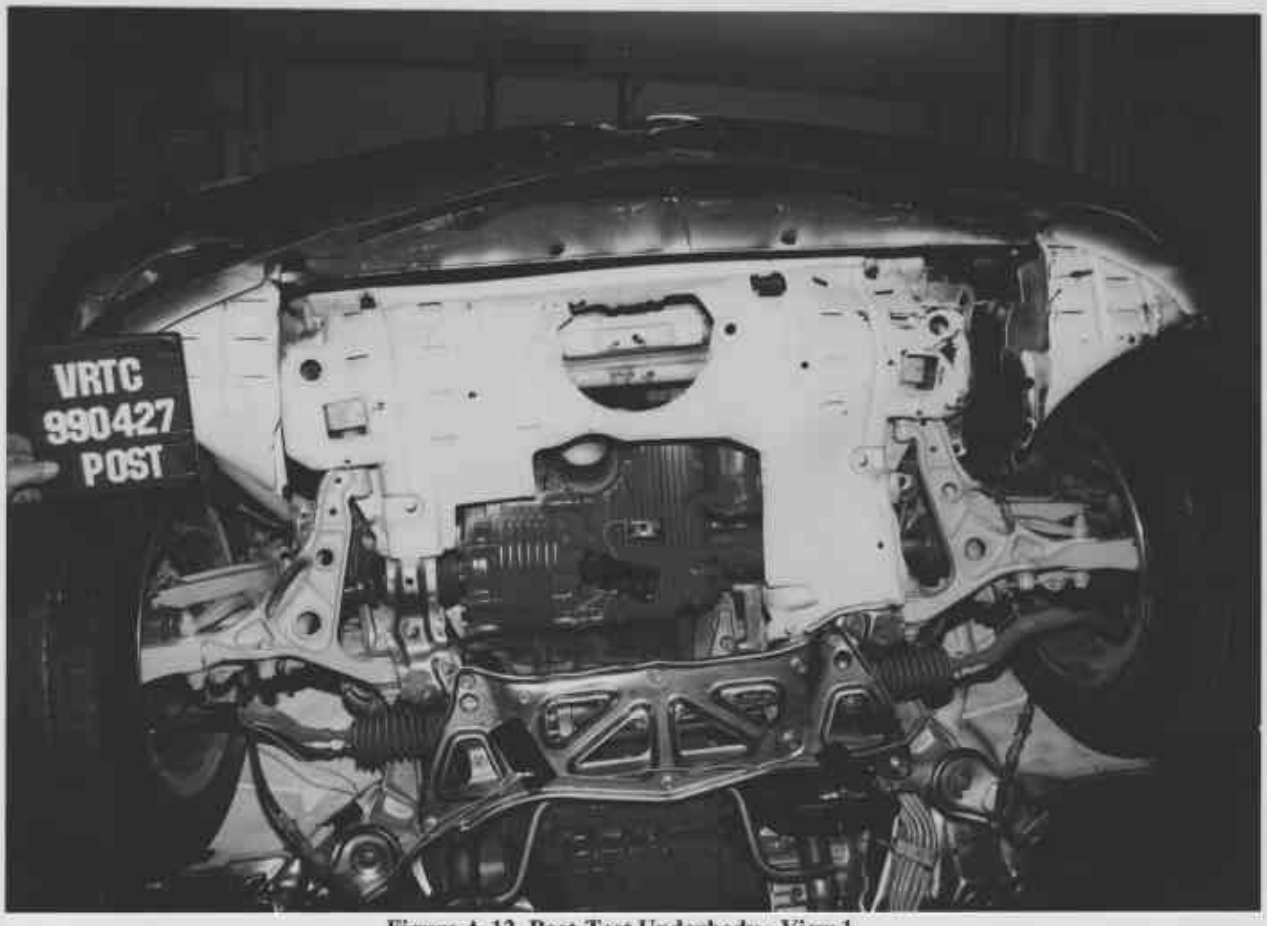


Figure A-12 Post-Test Underbody - View 1

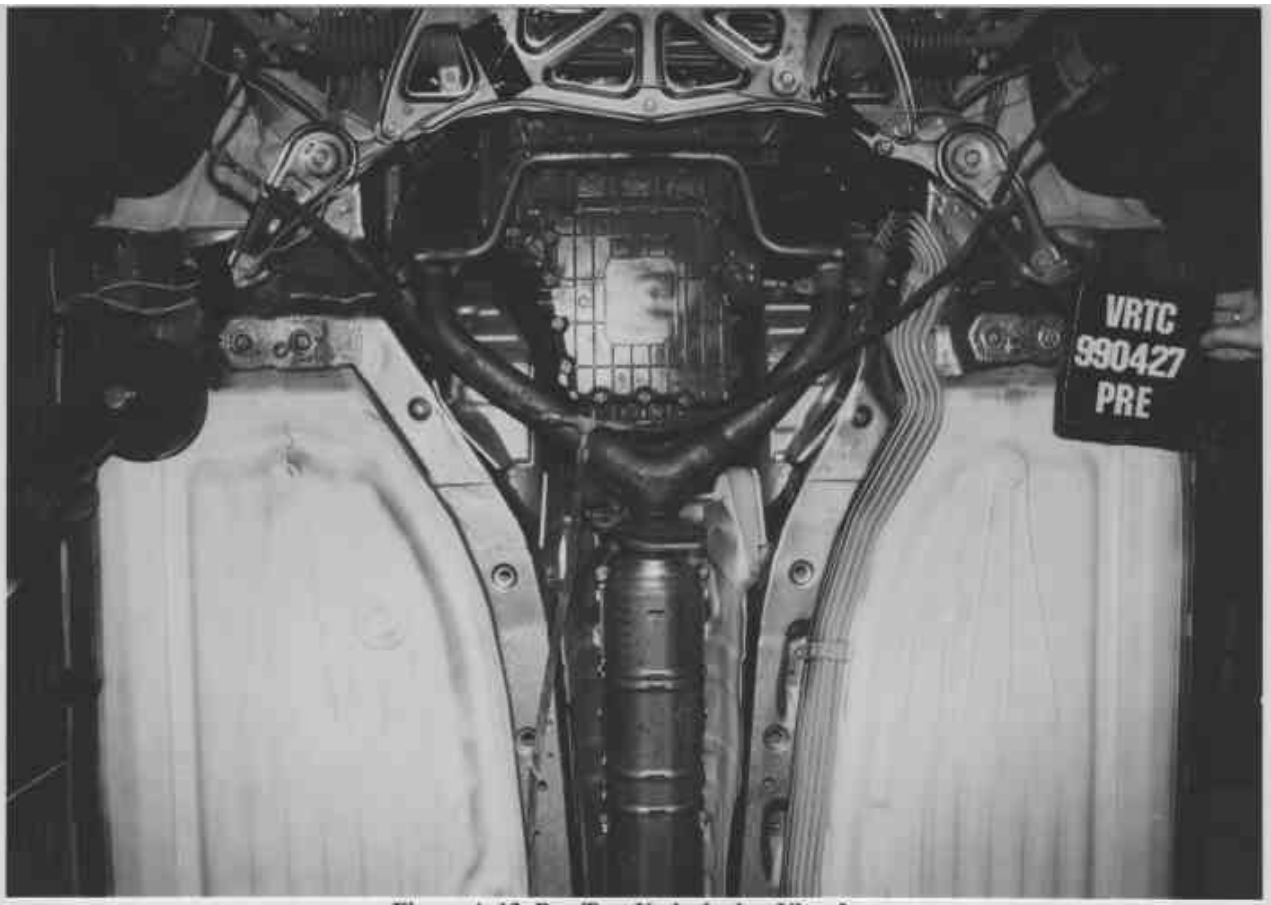


Figure A-13 Pre-Test Underbody - View 2

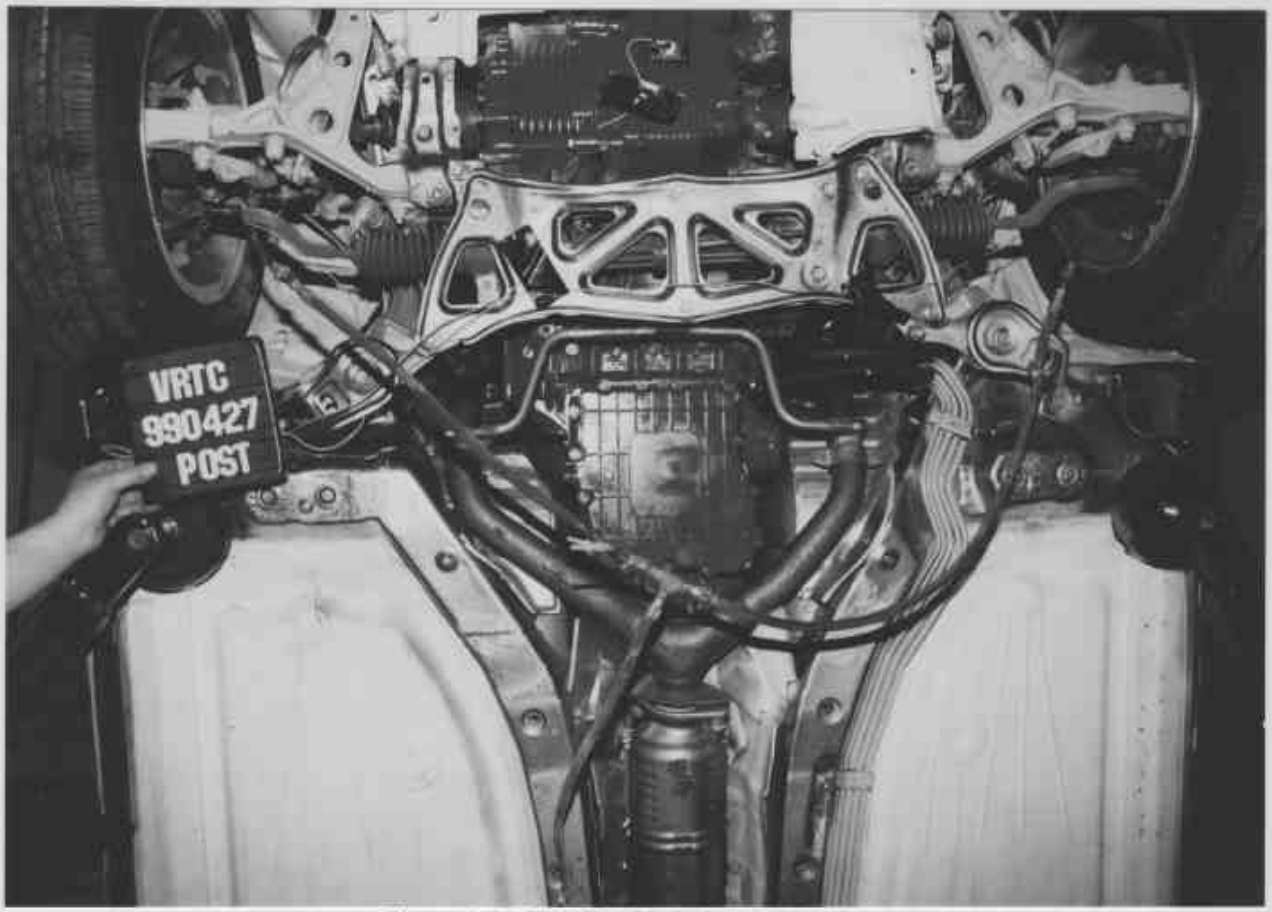


Figure A-14 Post-Test Underbody - View 2

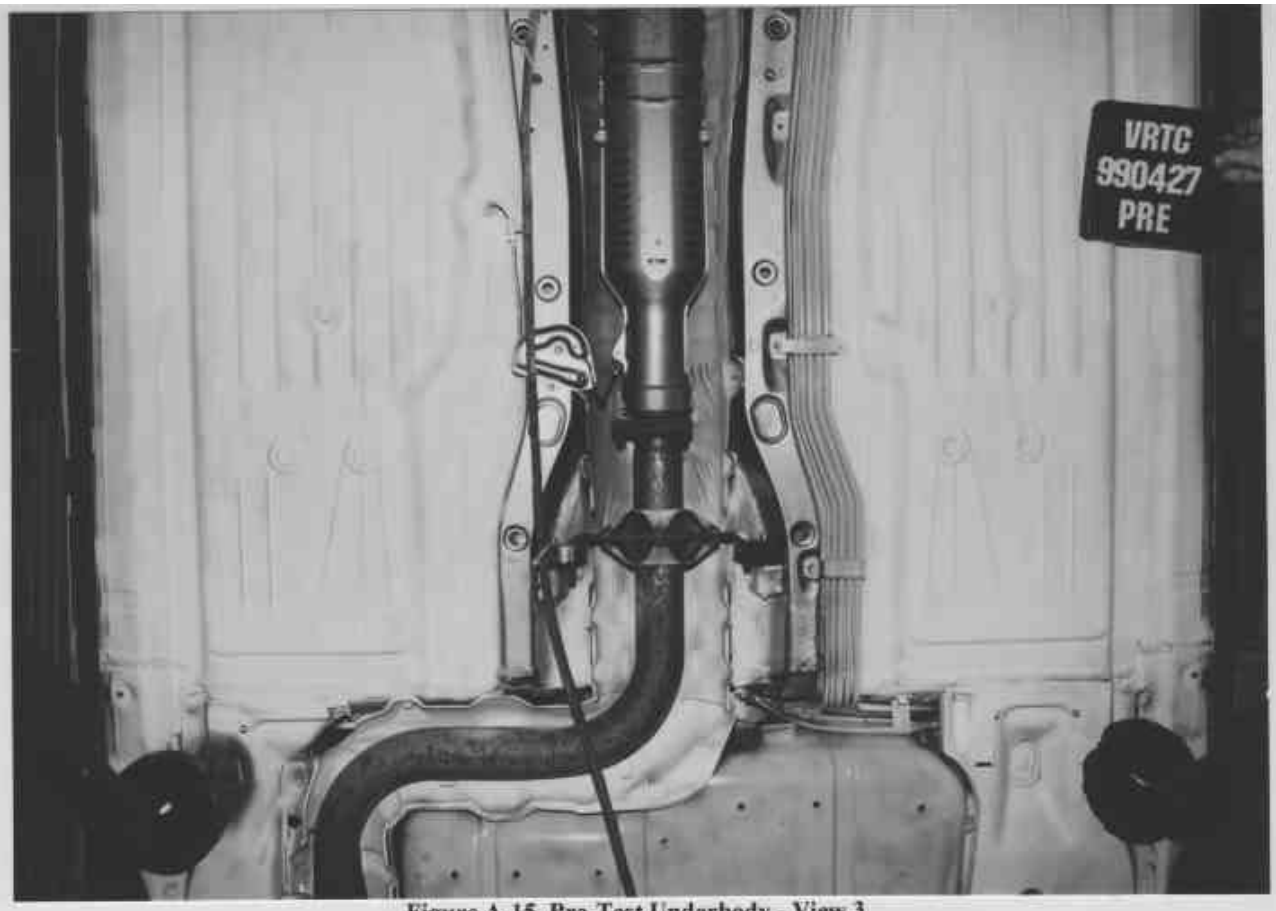


Figure A-15 Pre-Test Underbody - View 3

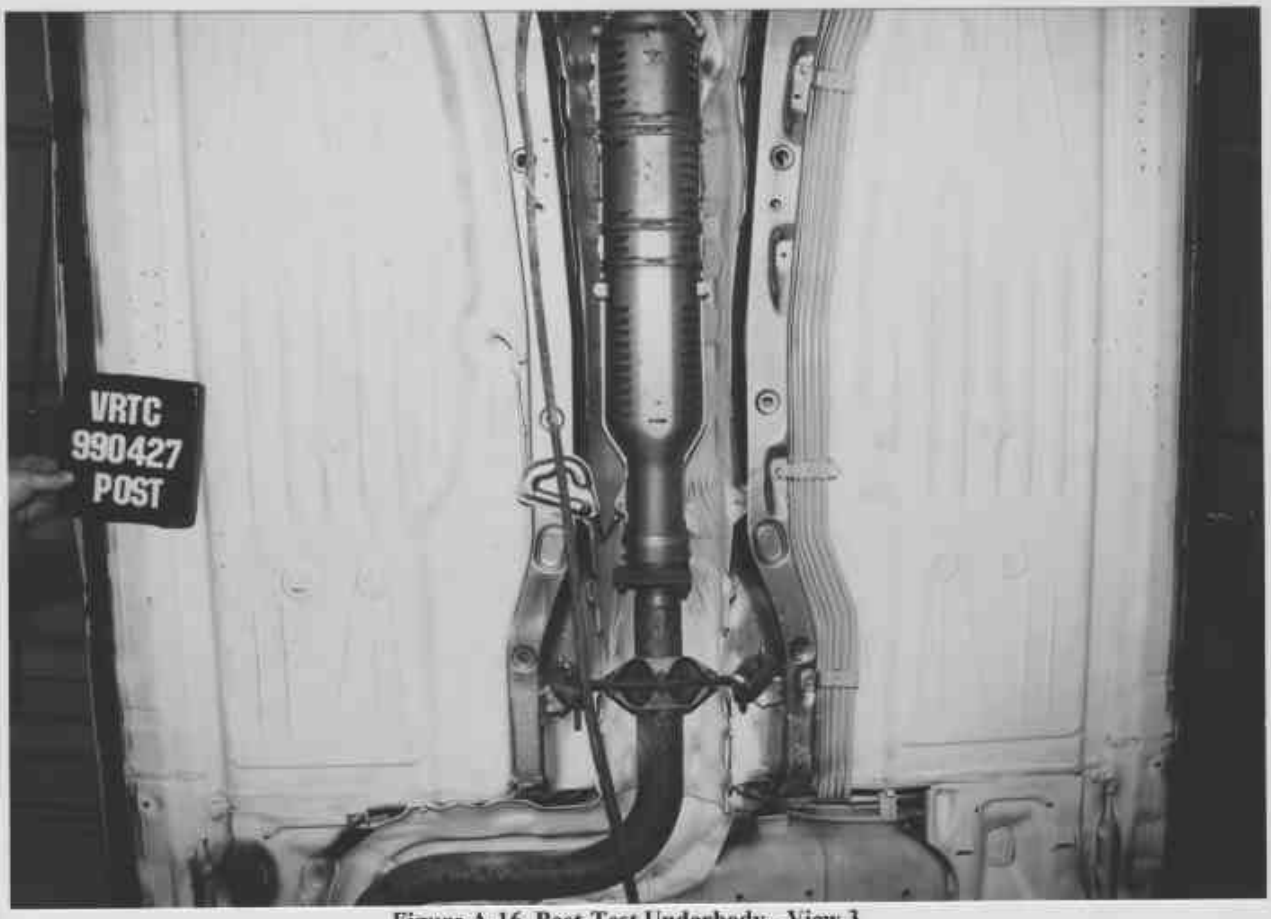


Figure A-16 Post-Test Underbody - View 3

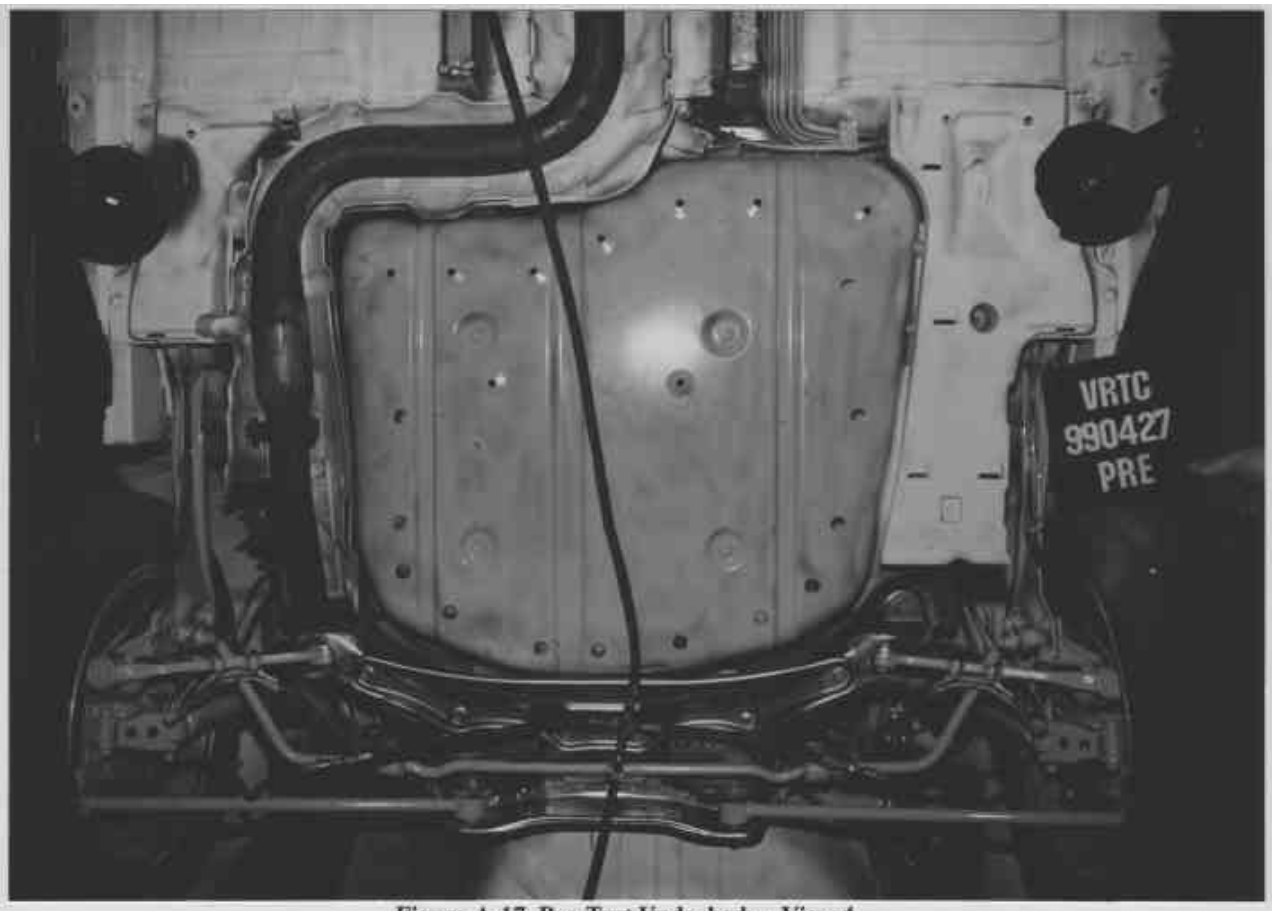


Figure A-17 Pre-Test Underbody - View 4

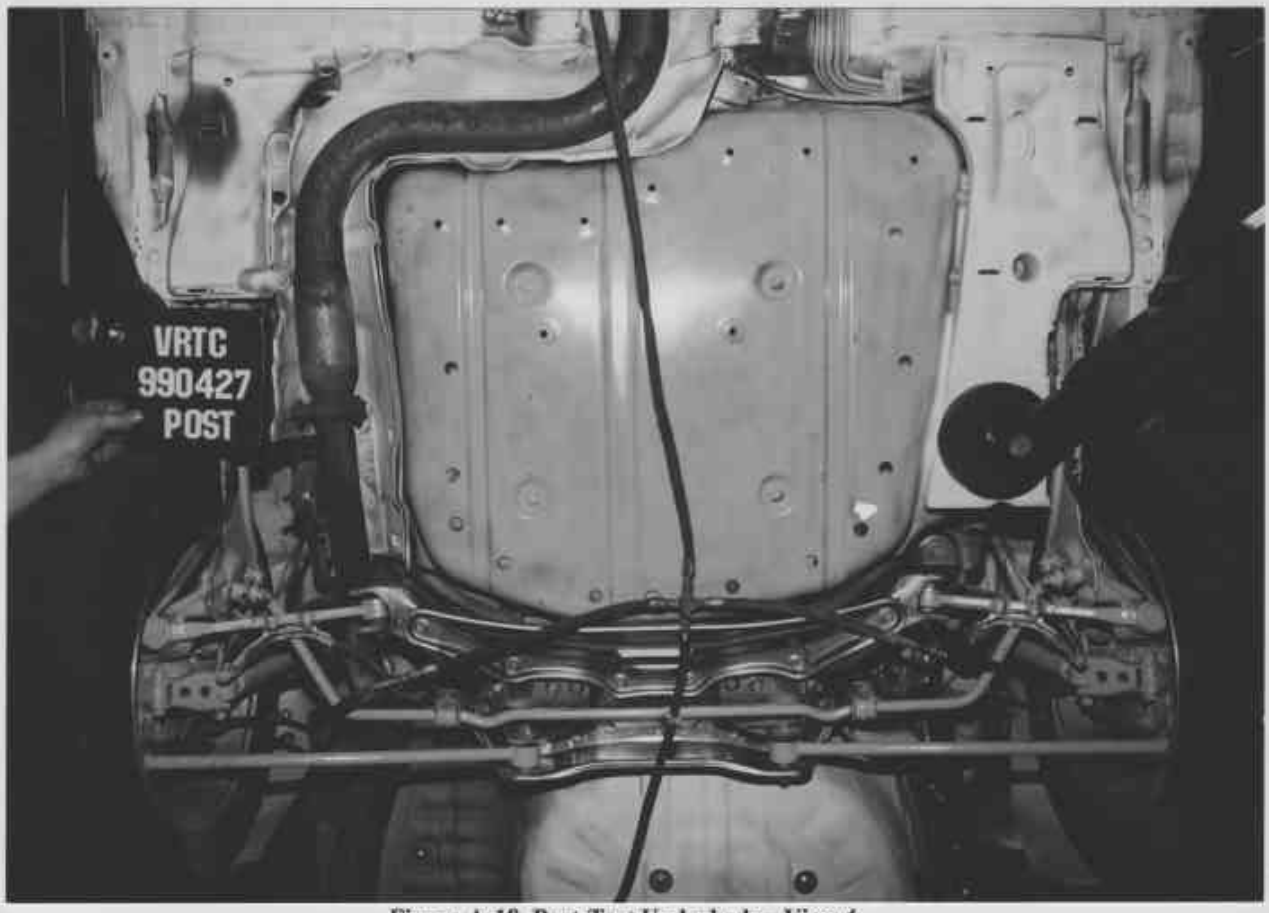


Figure A-18 Post-Test Underbody - View 4

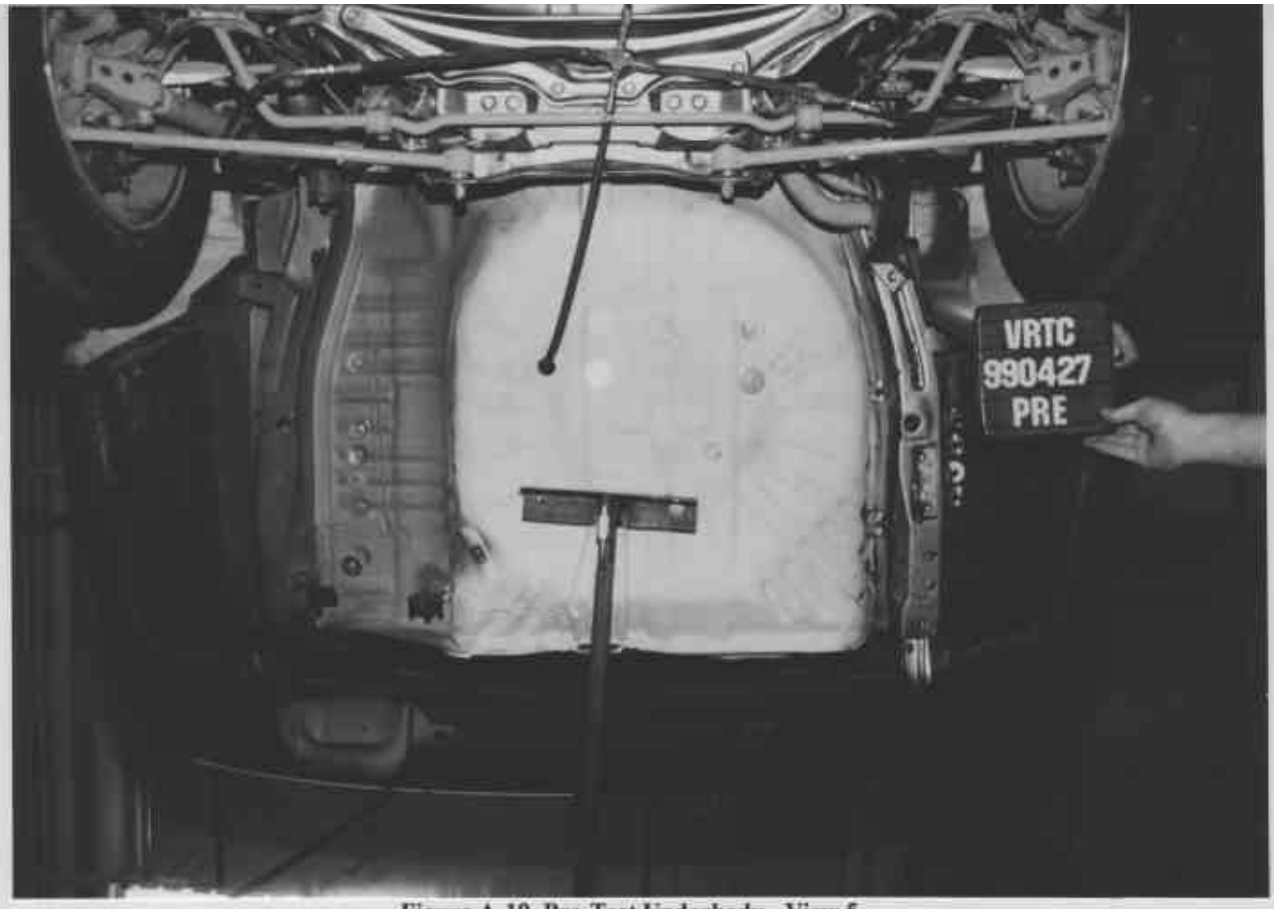


Figure A-19 Pre-Test Underbody - View 5

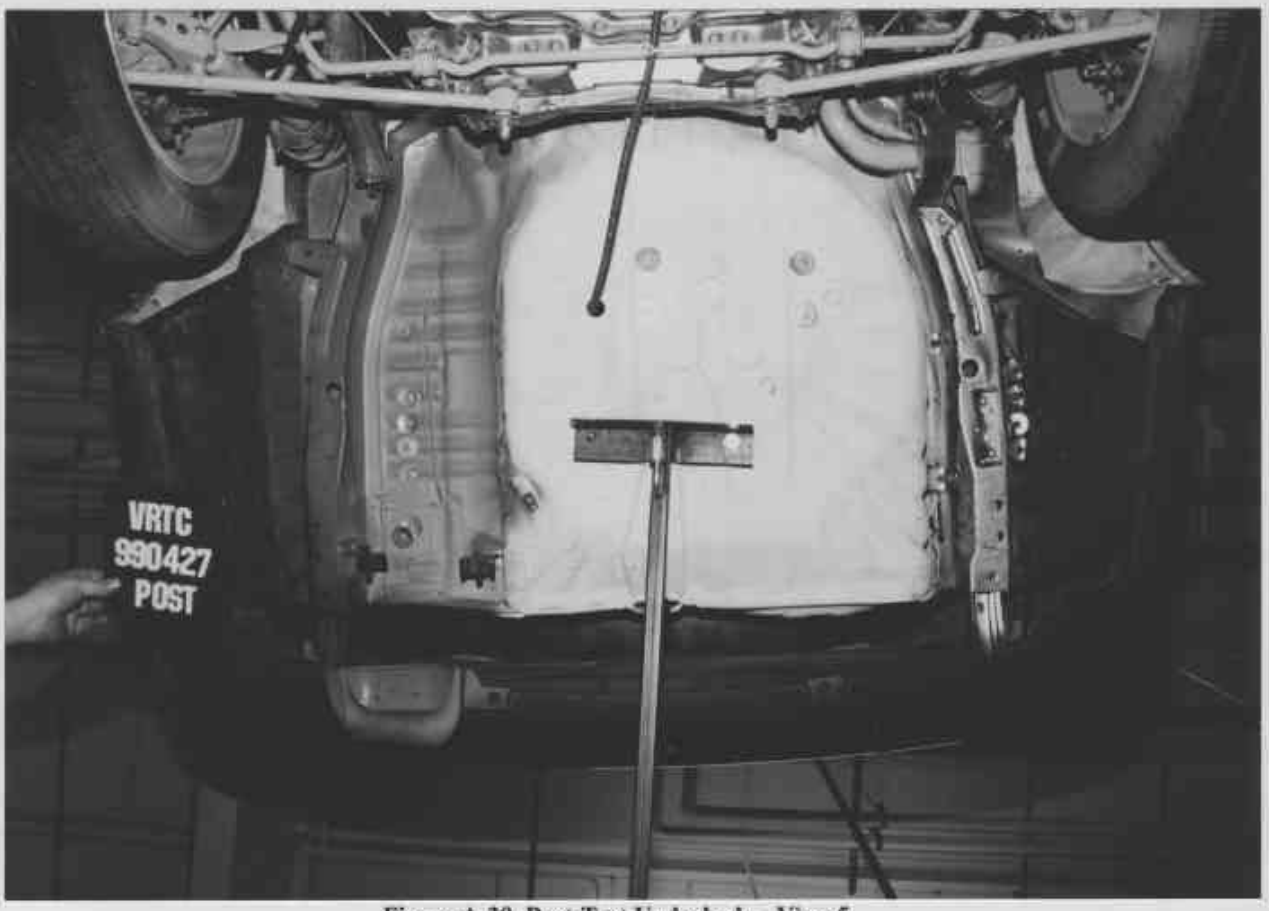


Figure A-20 Post-Test Underbody - View 5

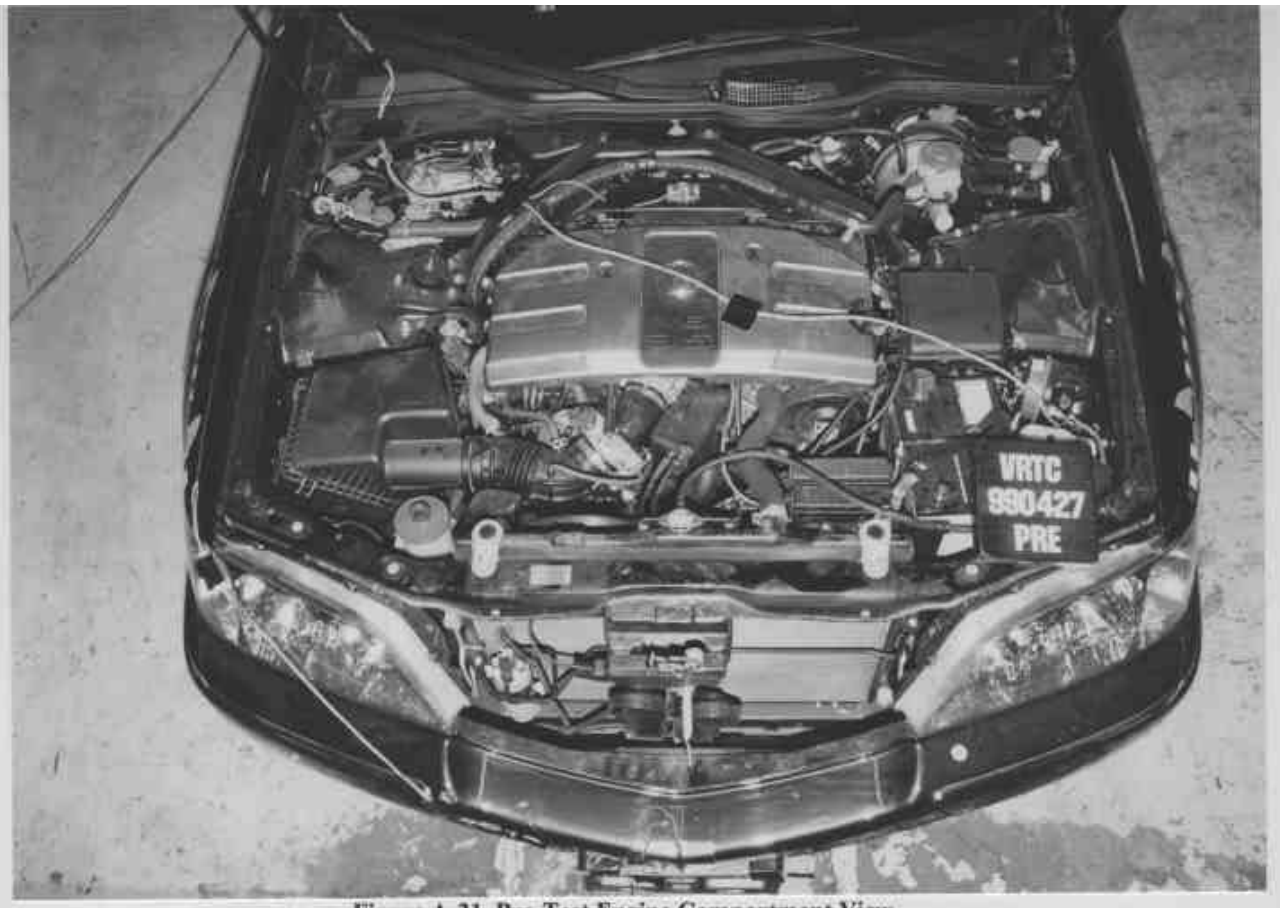


Figure A-21 Pre-Test Engine Compartment View

Figure A-22 Post-Test Engine Compartment View

Figure A-23 Pre-Test Windshield - View 1

Figure A-24 Post-Test Windshield - View 1

Figure A-25 Pre-Test Windshield - View 2

Figure A-26 Post-Test Windshield - View 2

Figure A-27 Pre-Test Driver Dummy Windshield View

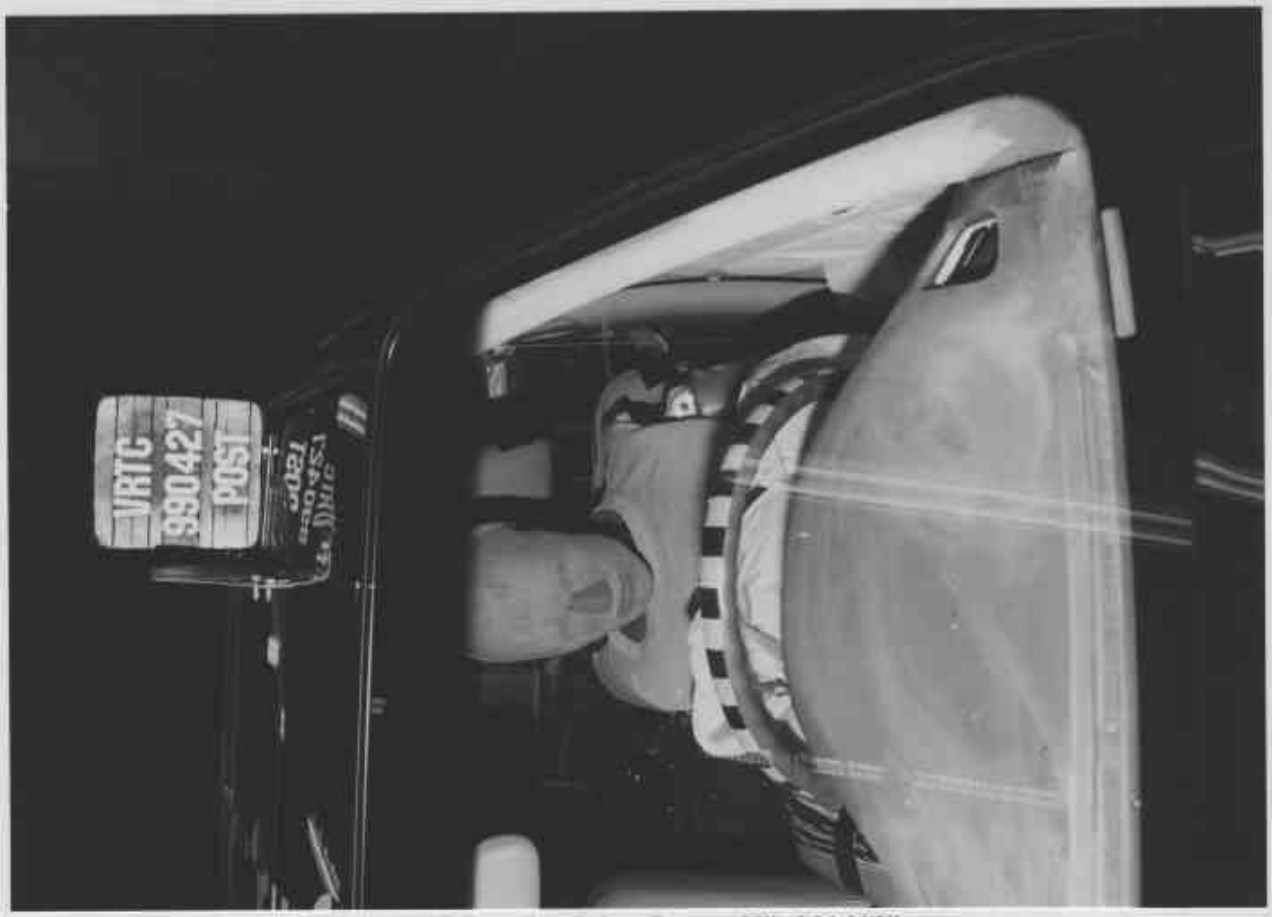


Figure A-28 Post-Test Driver Dummy Windshield View

Figure A-29 Pre-Test Passenger Dummy Windshield View

Figure A-30 Post-Test Passenger Dummy Windshield View

Figure A-31 Pre-Test Driver Dummy Position - View 1

Figure A-32 Post-Test Driver Dummy Position - View 1

Figure A-35 Pre-Test Driver Dummy Position -View 3

Figure A-36 Post-Test Driver Dummy Position - View 3

Figure A-37 Pre-Test Passenger Dummy Position - View 1

Figure A-38 Post-Test Passenger Dummy Position - View 1

Figure A-39 Pre-Test Passenger Dummy Position - View 2

Figure A-40 Post-Test Passenger Dummy Position - View 2

Figure A-41 Pre-Test Passenger Dummy Position - View 3

Figure A-42 Post-Test Passenger Dummy Position - View 3

Figure A-43 Post-Test Driver Dummy View

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

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

Figure A-46 Post-Test Driver Dummy Knee Contact - View 1

Figure A-47 Post-Test Driver Dummy Knee Contact - View 2

Figure A-48 Post-Test Passenger Dummy View

Figure A-49 Post-Test Passenger Dummy Head Contact - View 1

Figure A-50 Post-Test Passenger Dummy Head Contact - View 2

Figure A-51 Post-Test Passenger Dummy Knee Contact - View 1

Figure A-52 Post-Test Passenger Dummy Knee Contact - View 2

Figure A-53 Pre-Test Vehicle Certification Label View

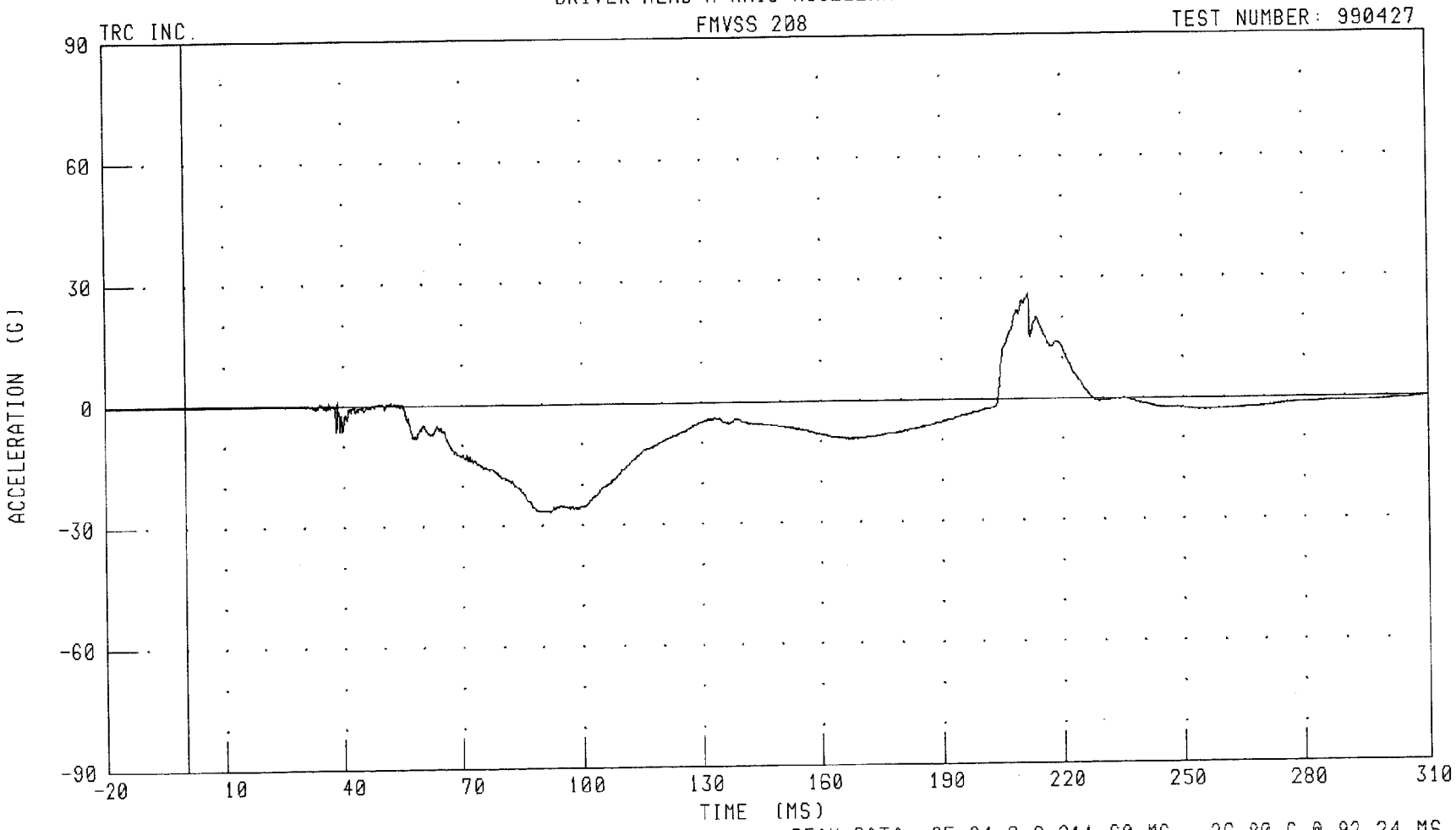
Figure A-54 Pre-Test Vehicle Tire Information Label View

27

Appendix B

Data Plots

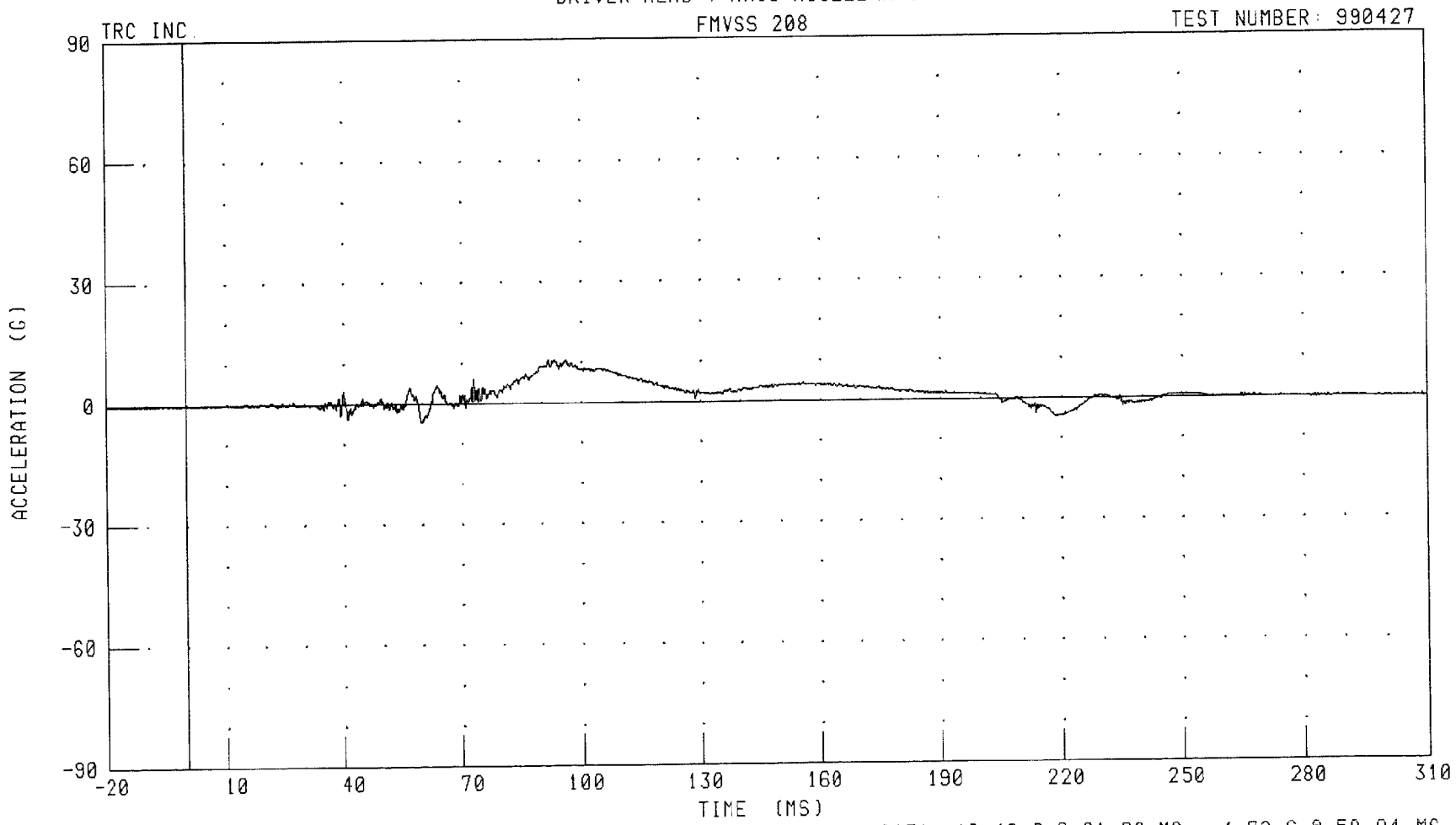
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER HEAD X-AXIS ACCELERATION
FMVSS 208



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000

PEAK DATA: 25.94 G @ 211.60 MS; -26.80 G @ 92.24 MS

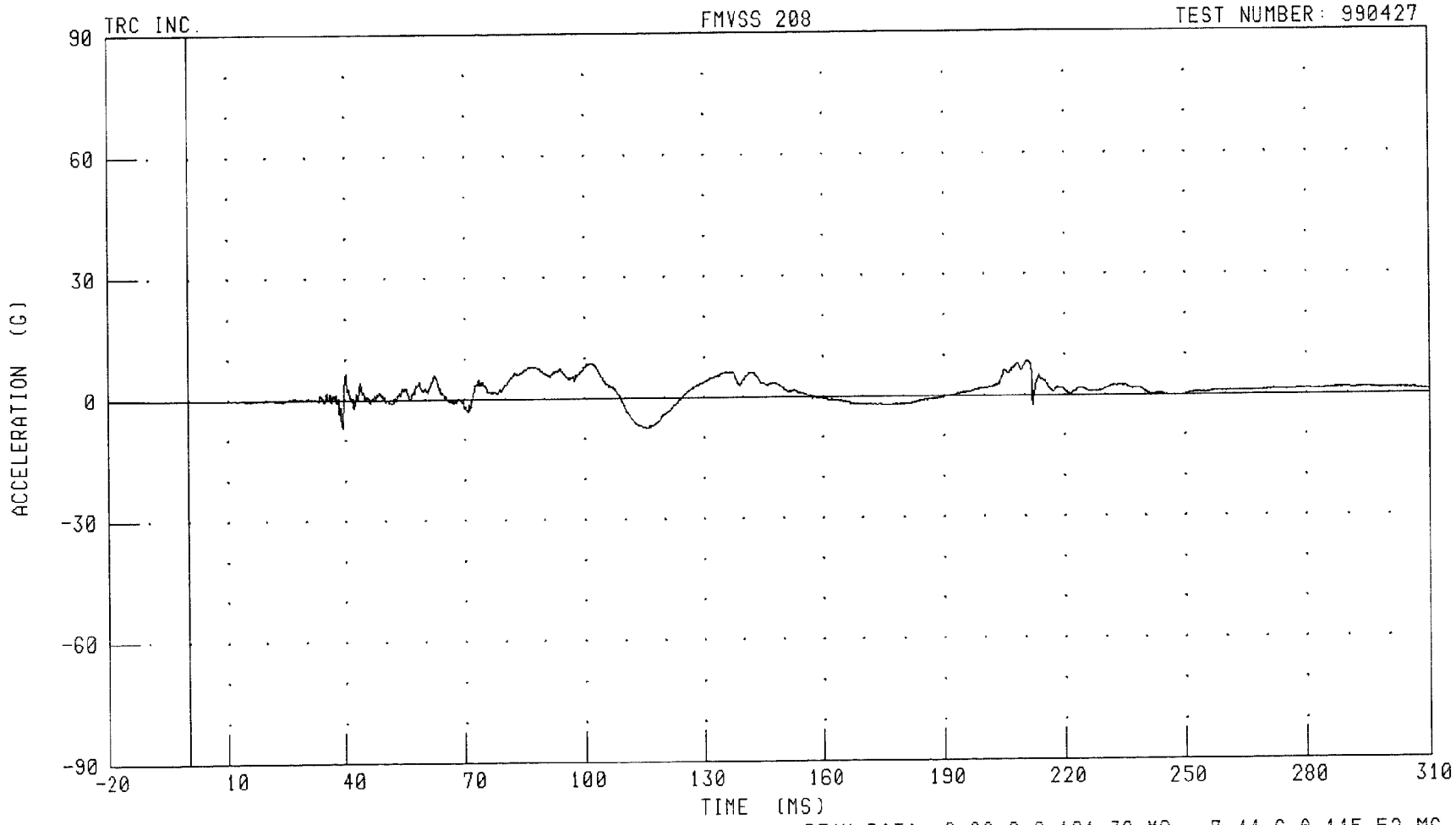
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER HEAD Y-AXIS ACCELERATION
FMVSS 208



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

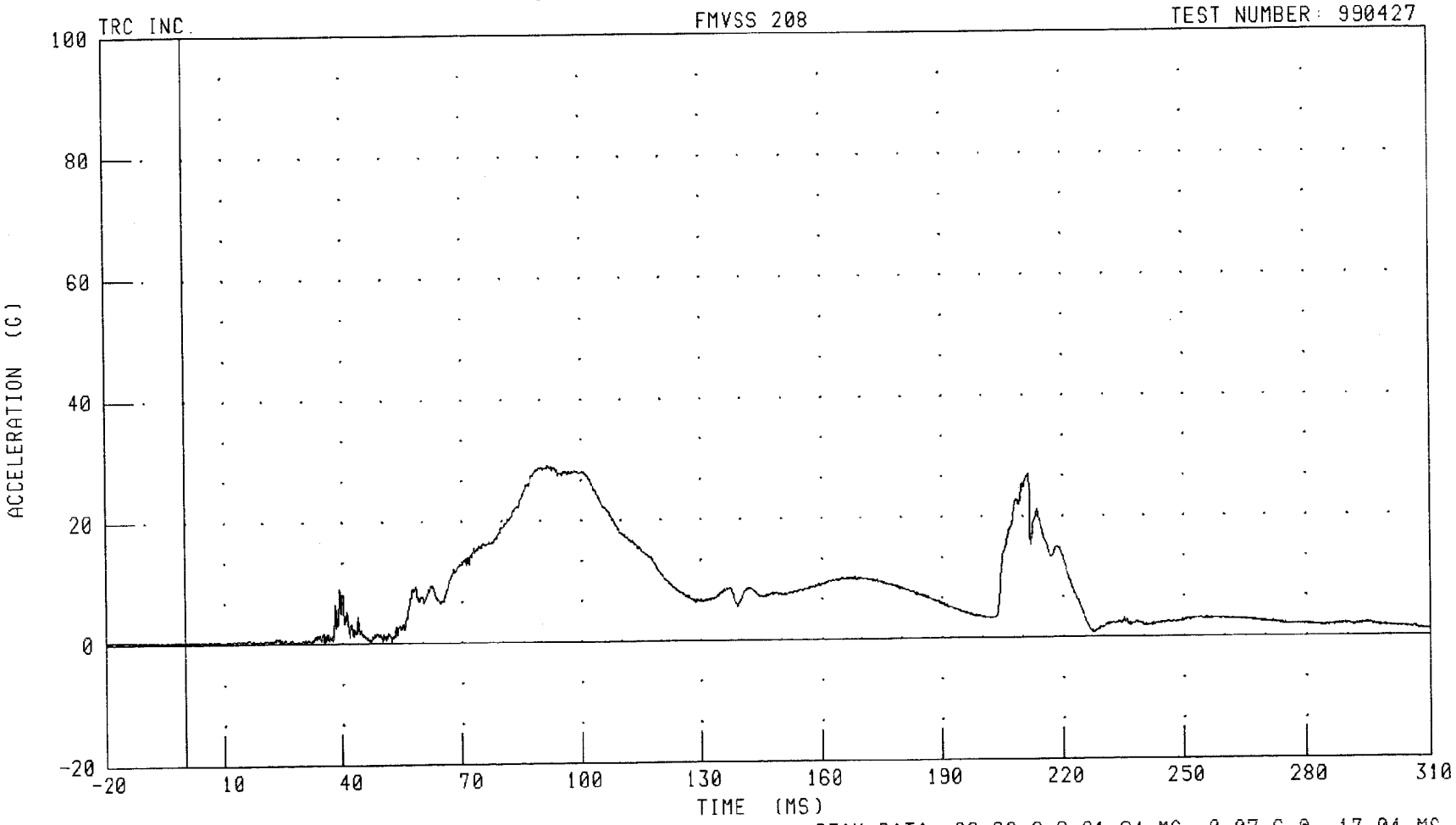
PEAK DATA: 10.48 G @ 91.92 MS; -4.72 G @ 59.84 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER HEAD Z-AXIS ACCELERATION
FMVSS 208



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000 PEAK DATA: 8.62 G @ 101.36 MS; -7.44 G @ 115.52 MS

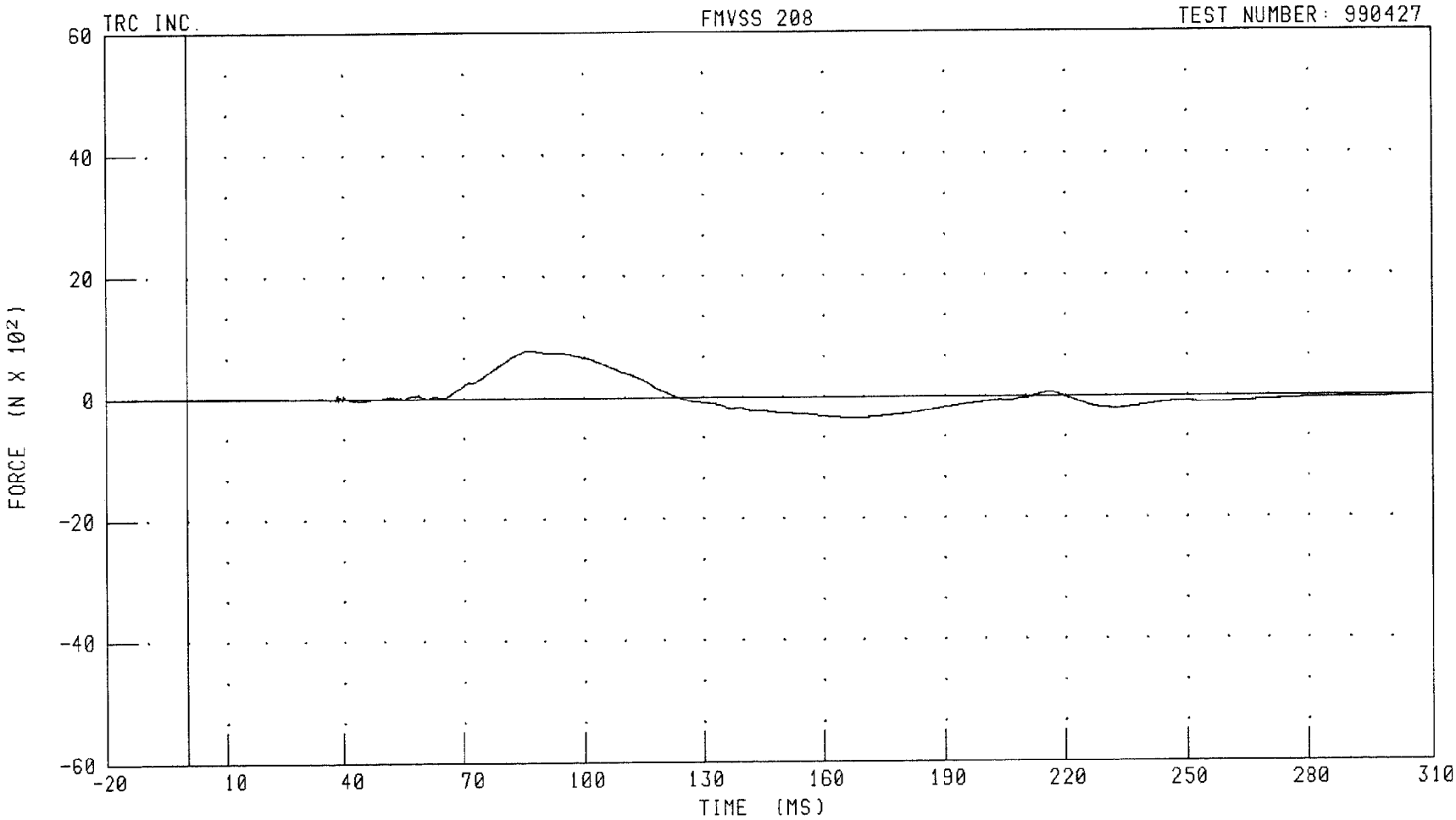
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG1 FILTER: CH. CLASS 1000

PEAK DATA: 29.08 G @ 91.84 MS; 0.07 G @ -17.04 MS

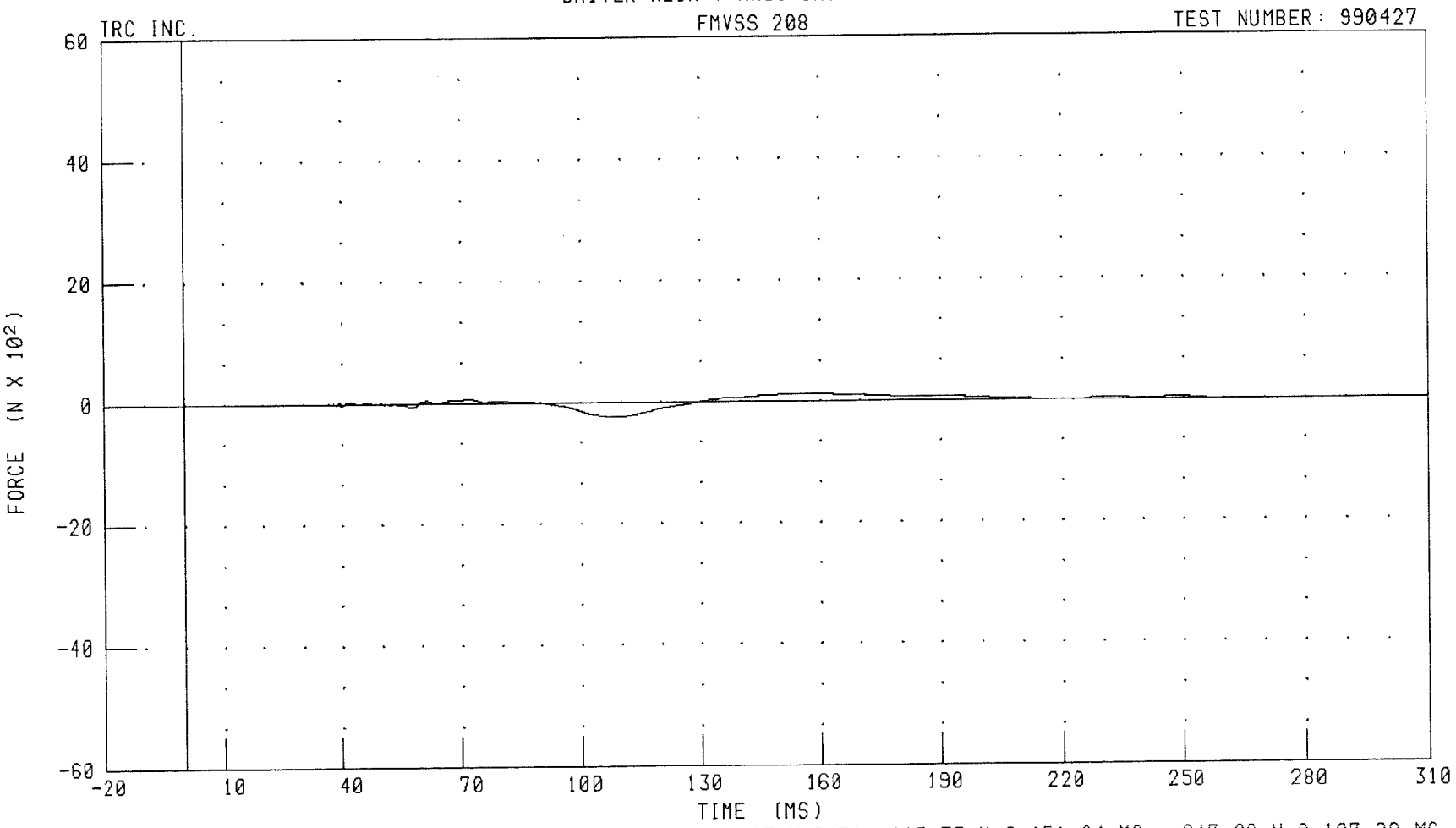
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

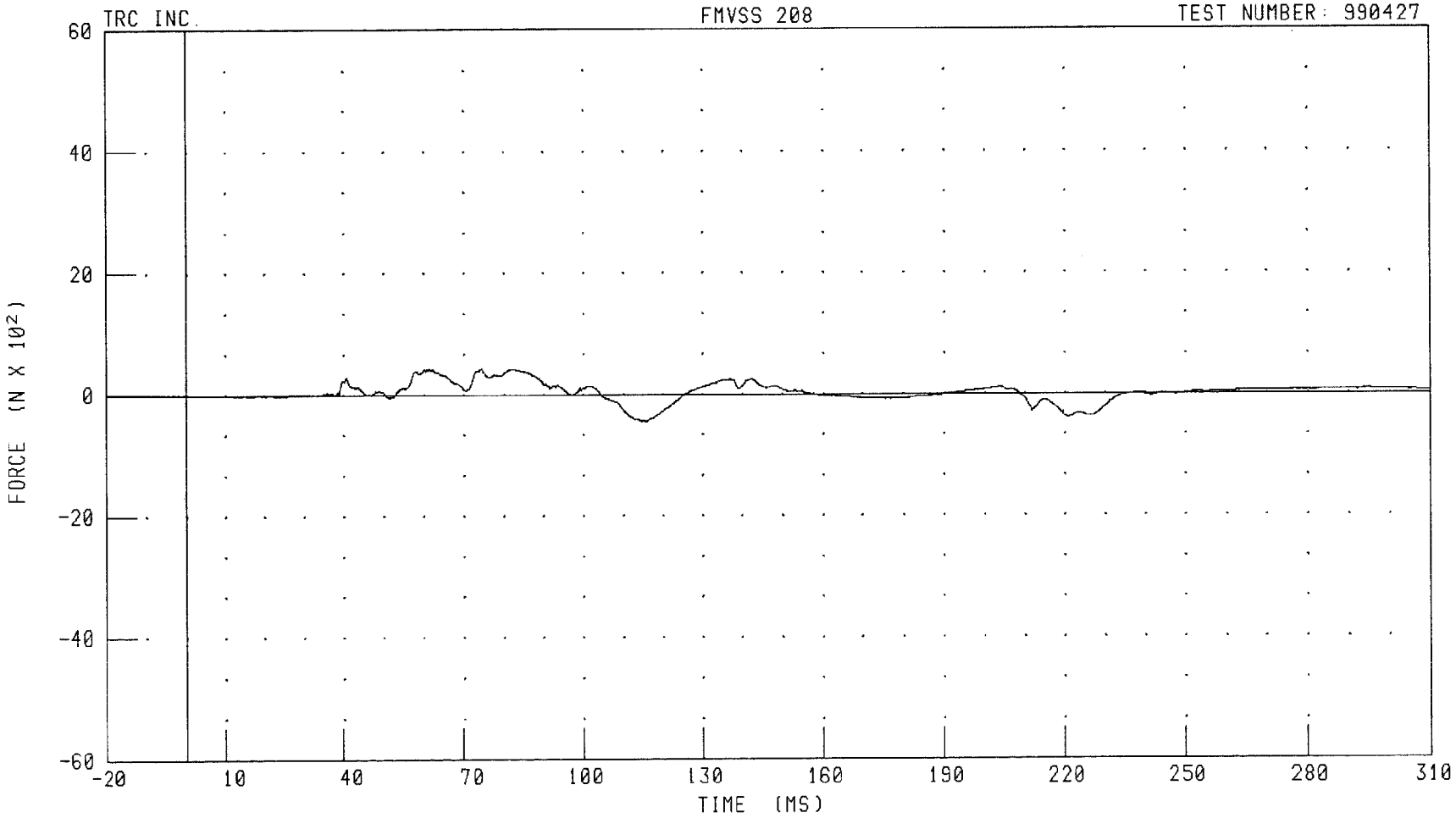
PEAK DATA: 771.52 N @ 86.48 MS; -349.12 N @ 166.32 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK Y-AXIS SHEAR FORCE



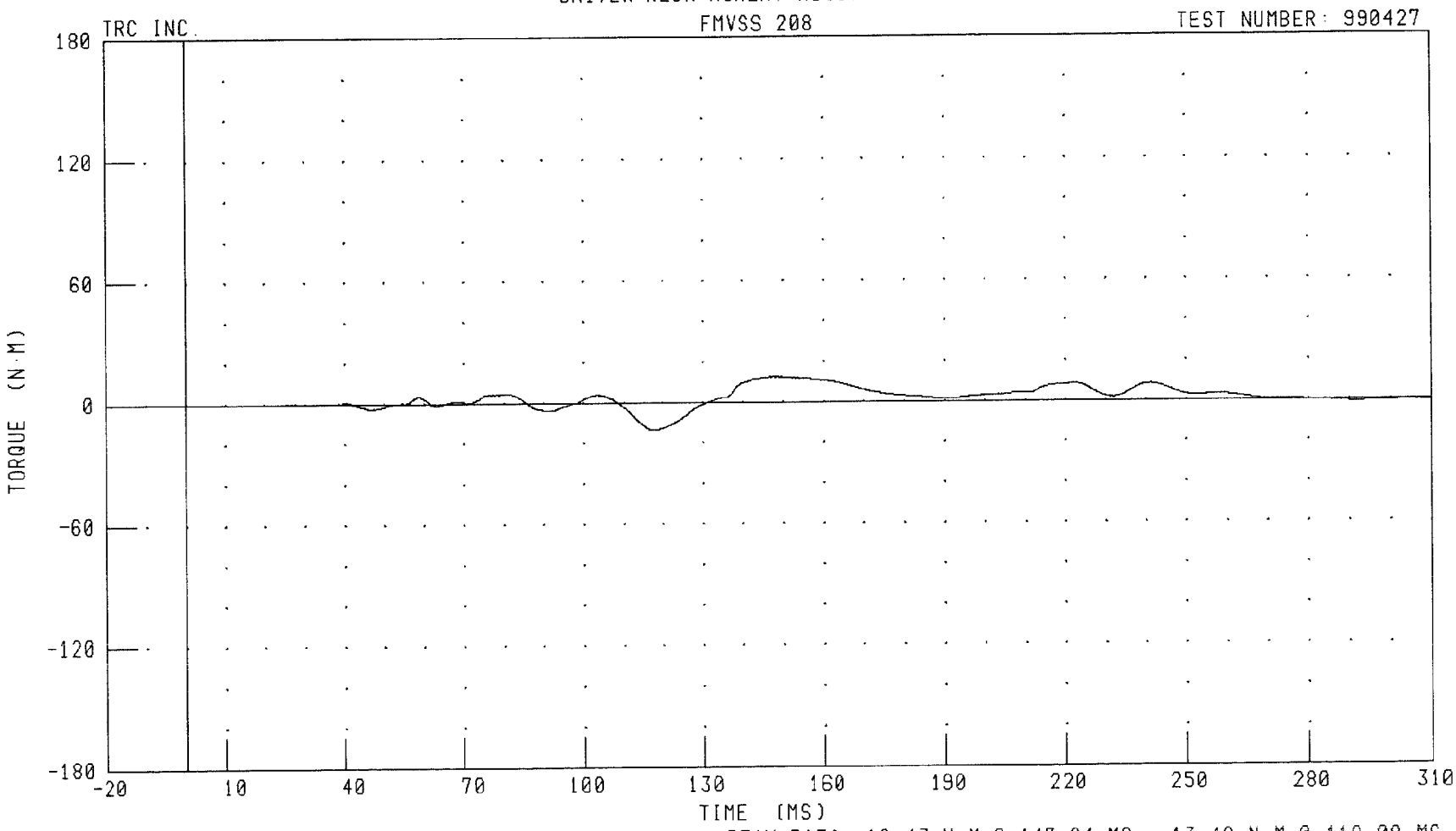
CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 113.53 N @ 151.84 MS; -247.22 N @ 107.28 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK Z-AXIS AXIAL FORCE



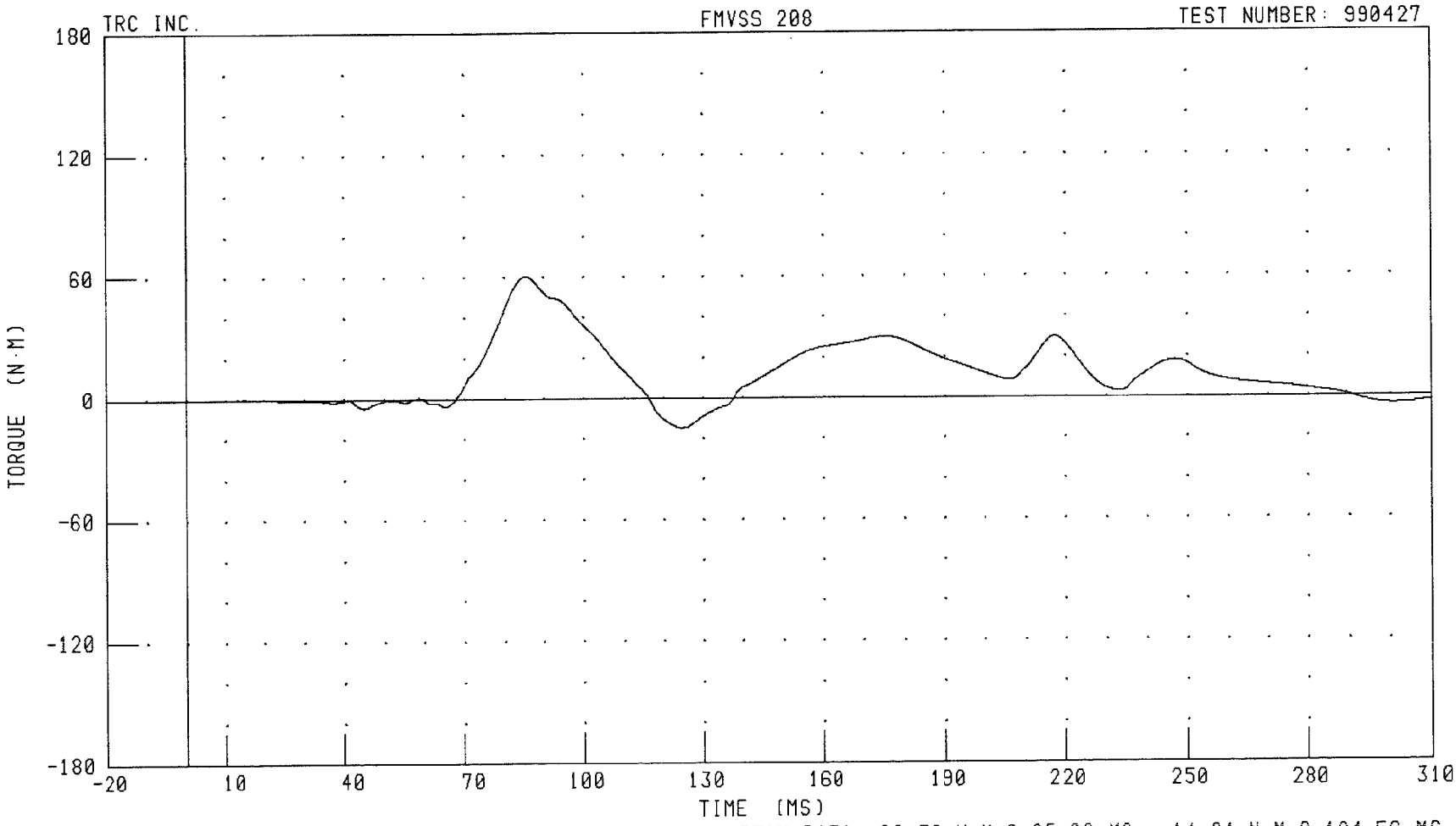
CHANNEL: NEKZF1 FILTER: CH. CLASS 1000 PEAK DATA: 425.99 N @ 61.52 MS; -440.23 N @ 114.96 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK MOMENT ABOUT X AXIS



CHANNEL: NEKXM1 FILTER: CH. CLASS 600 PEAK DATA: 12.43 N-M @ 147.84 MS; -13.48 N-M @ 118.08 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK MOMENT ABOUT Y AXIS

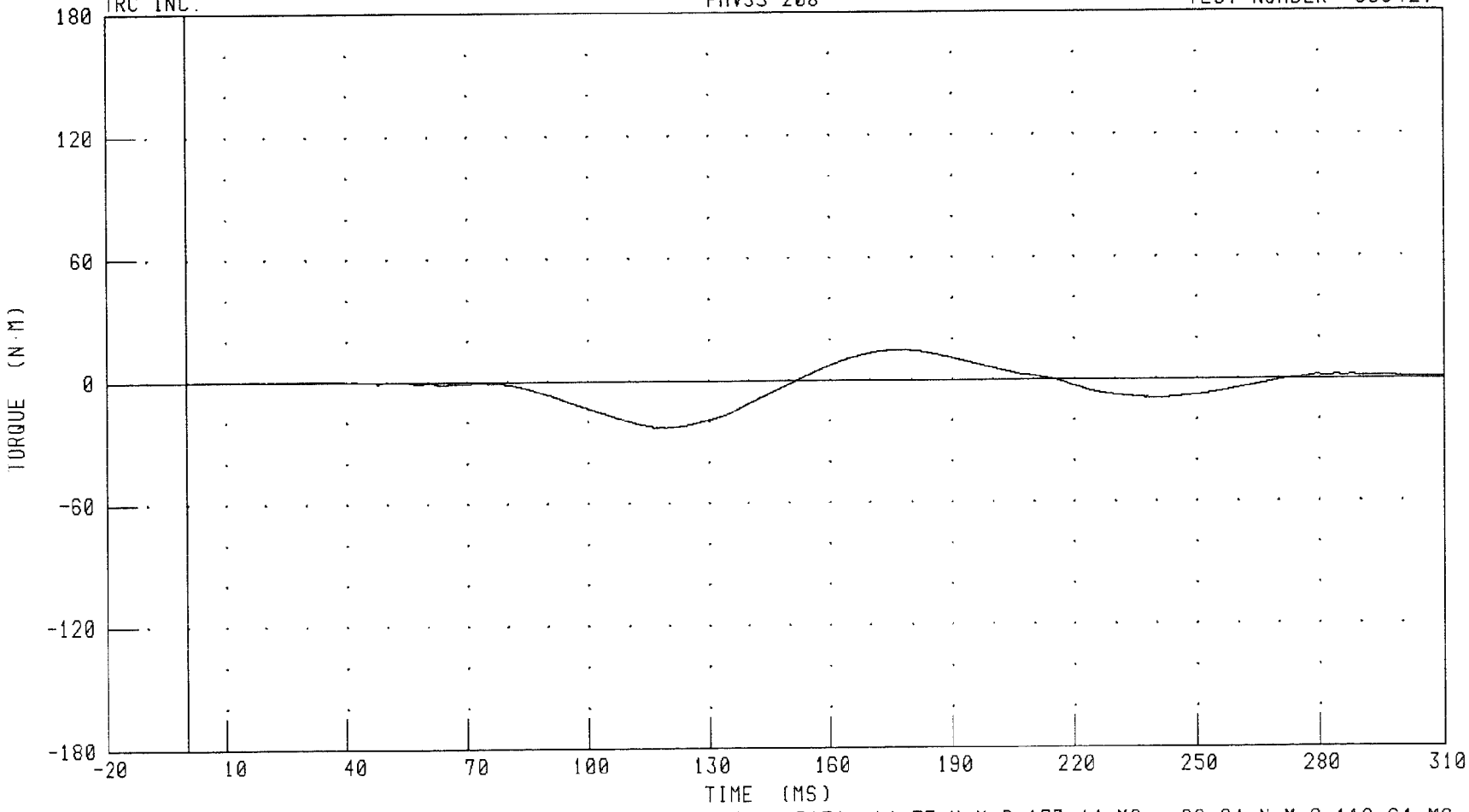


CHANNEL: NEKYM1 FILTER: CH. CLASS 600

PEAK DATA: 60.39 N-M @ 85.60 MS; -14.84 N-M @ 124.56 MS

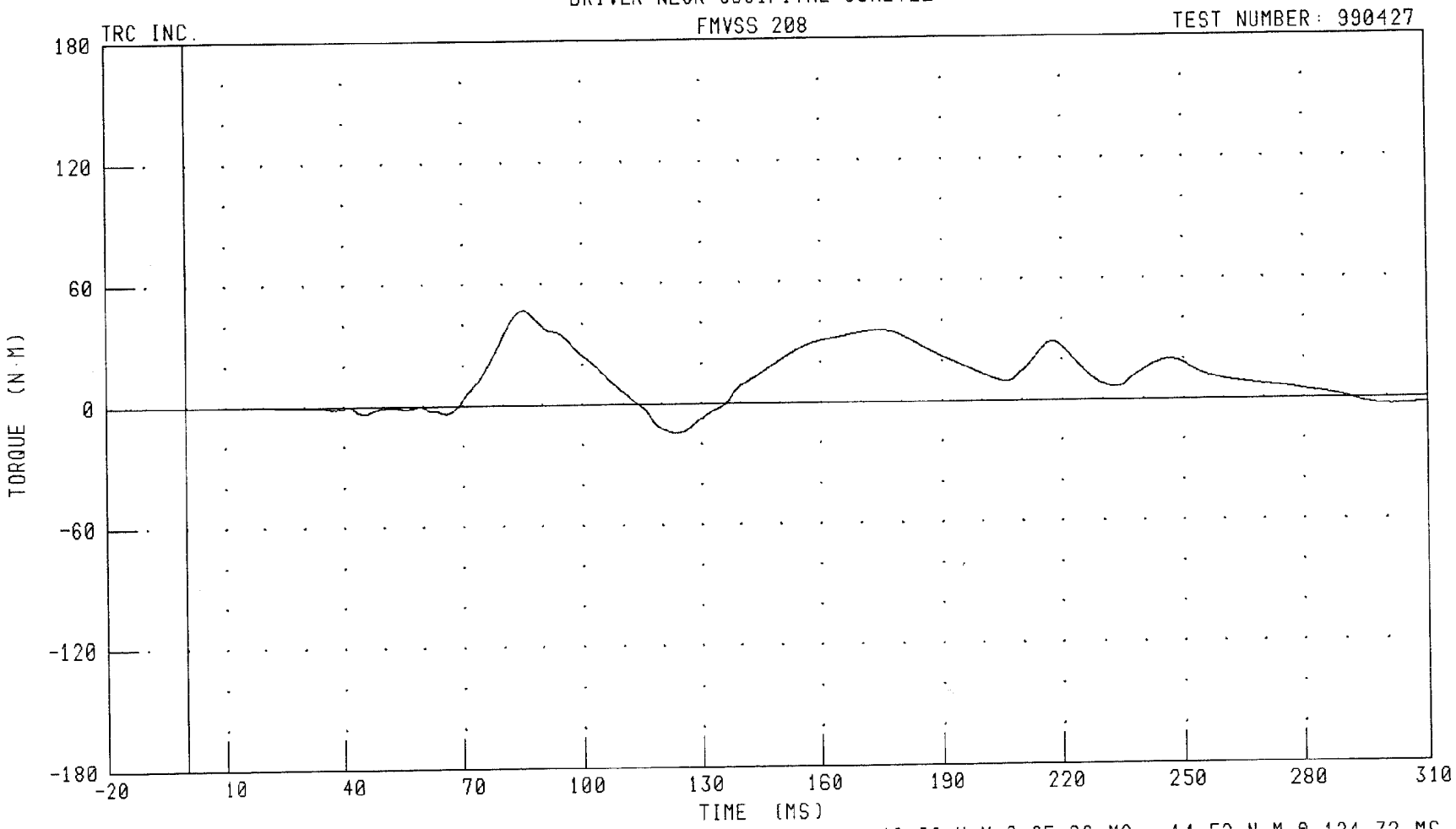
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK MOMENT ABOUT Z AXIS

TRC INC. FMVSS 208 TEST NUMBER: 990427



CHANNEL: NEKZM1 FILTER: CH. CLASS 600 PEAK DATA: 14.57 N-M @ 177.44 MS; -22.94 N-M @ 116.64 MS

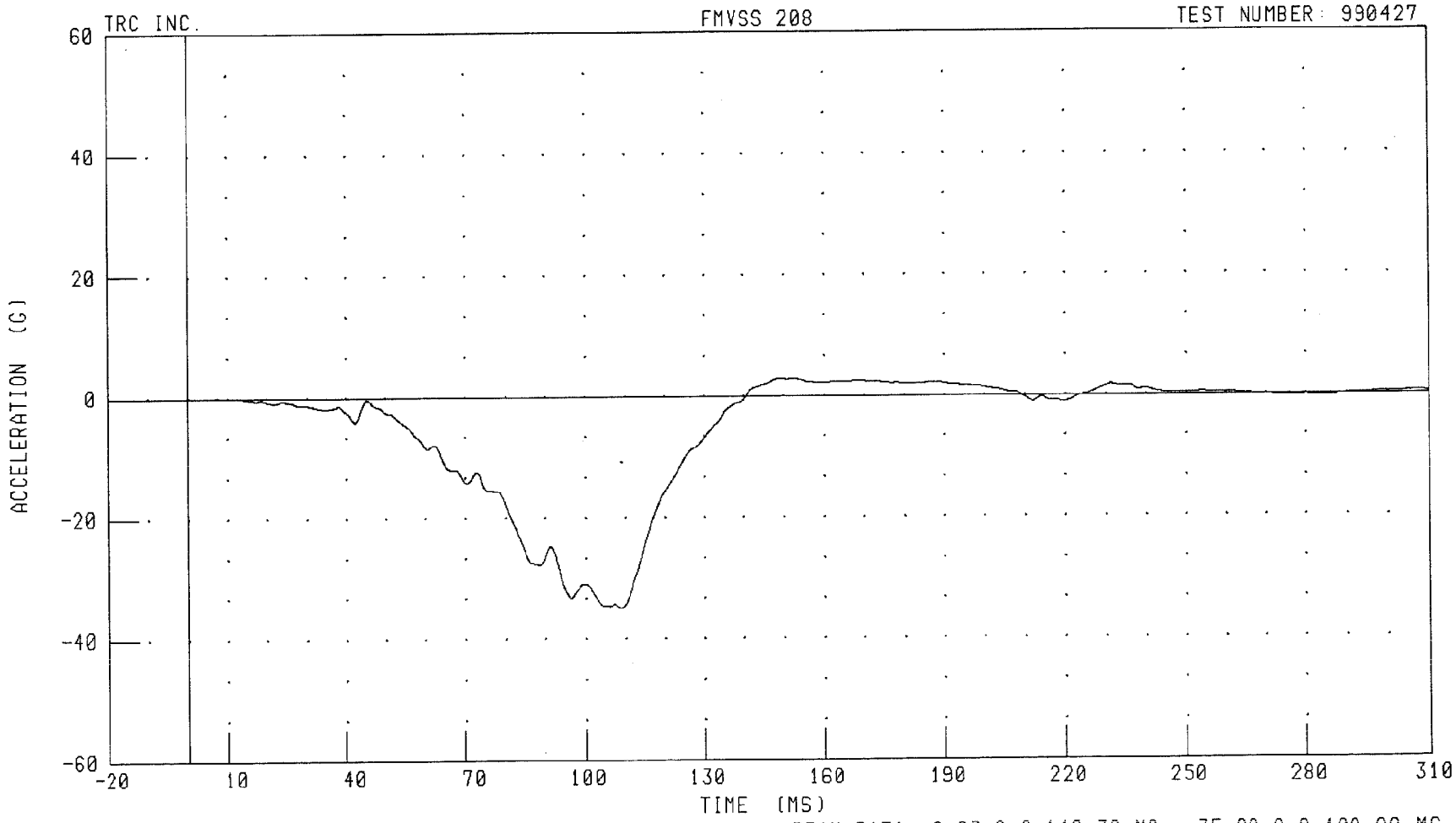
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER NECK OCCIPITAL CONDYLE
FMVSS 208



CHANNEL: NEKOM1 FILTER: CH. CLASS 600

PEAK DATA: 46.82 N-M @ 85.60 MS; -14.52 N-M @ 124.32 MS

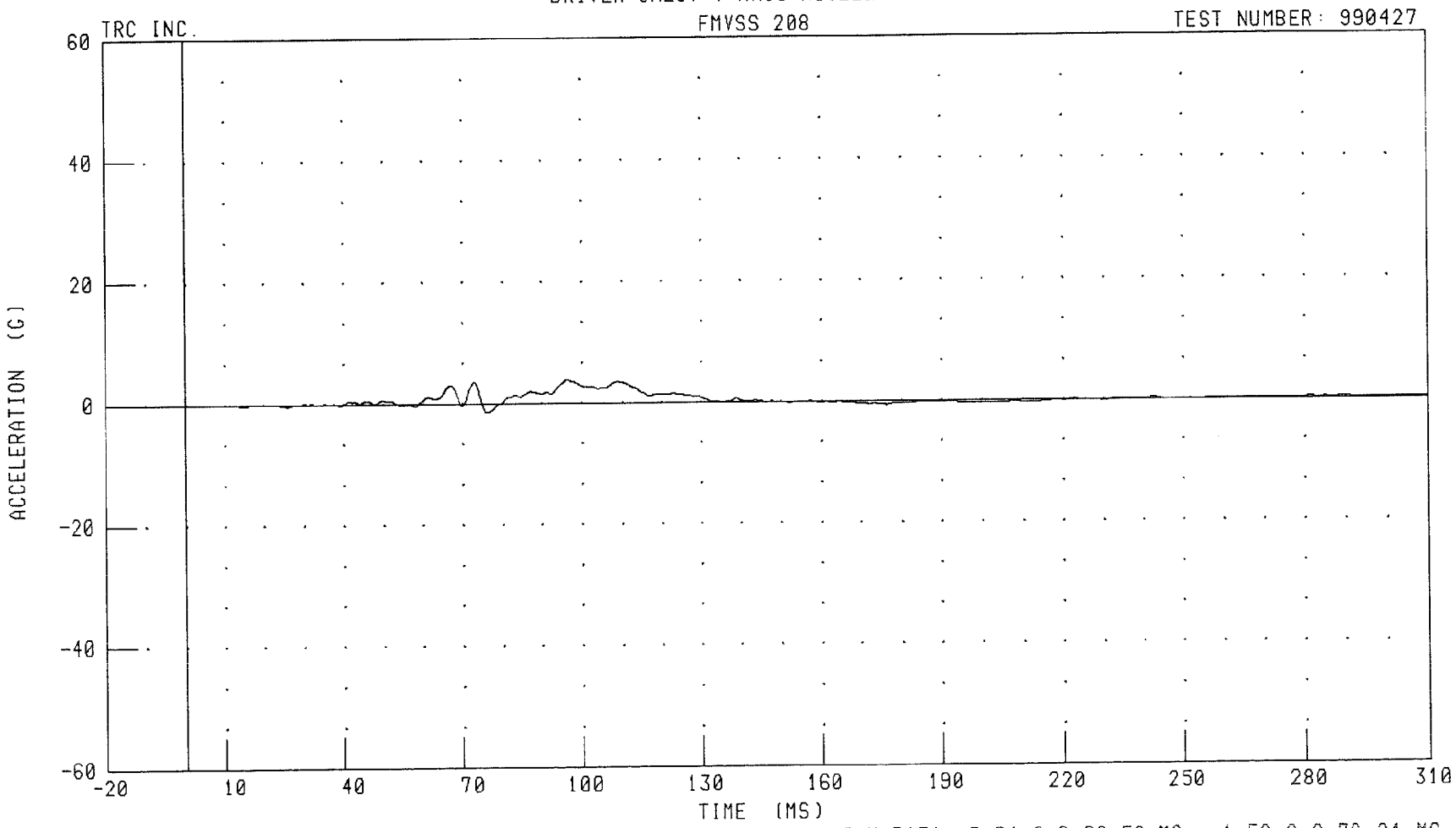
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG1 FILTER: CH. CLASS 180

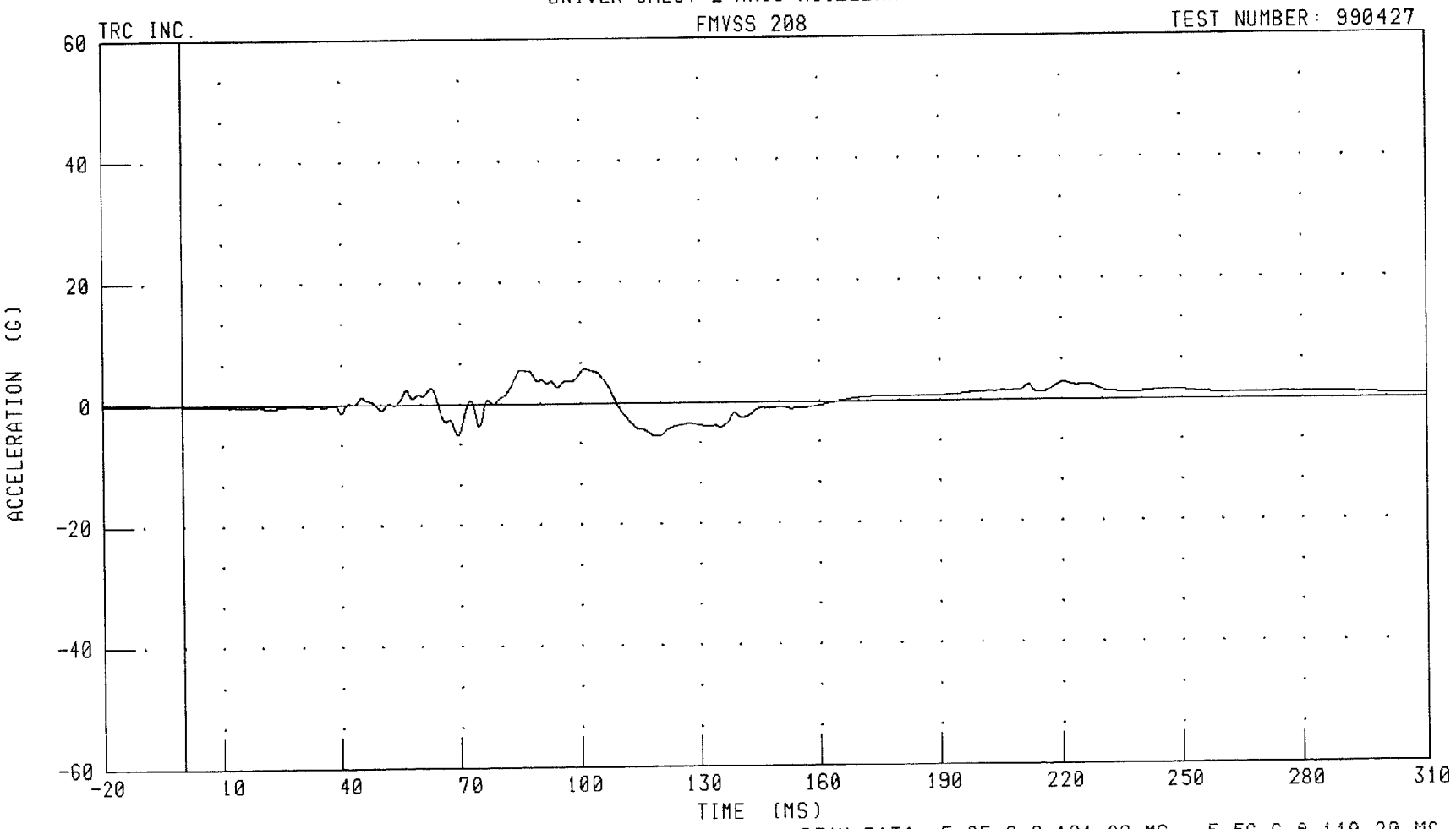
PEAK DATA: 2.83 G @ 149.36 MS; -35.00 G @ 108.88 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER CHEST Y-AXIS ACCELERATION



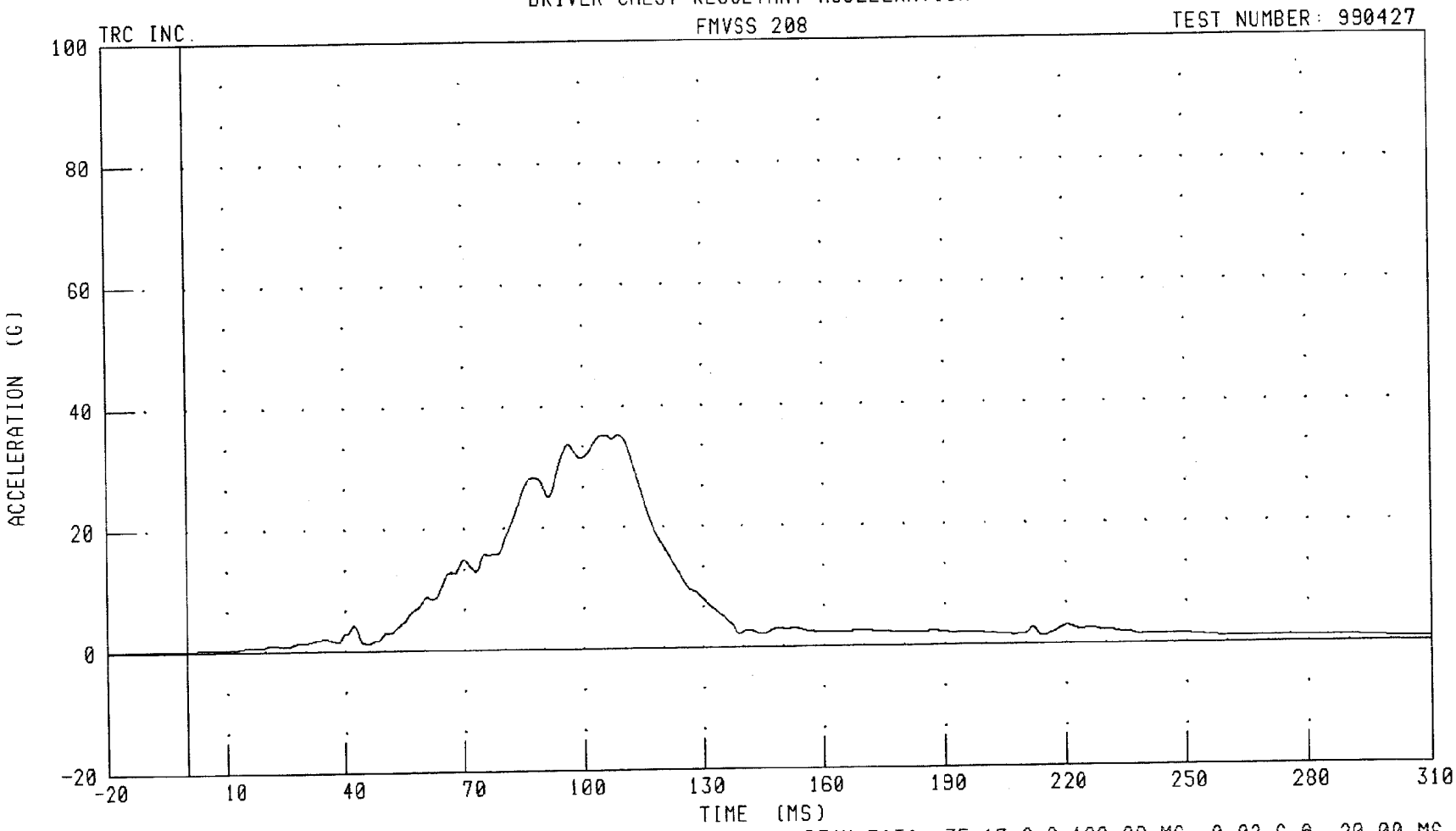
CHANNEL: CSTYG1 FILTER: CH. CLASS 180 PEAK DATA: 3.84 G @ 96.56 MS; -1.50 G @ 76.24 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER CHEST Z-AXIS ACCELERATION
FMVSS 208



CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 5.65 G @ 101.28 MS; -5.56 G @ 119.20 MS

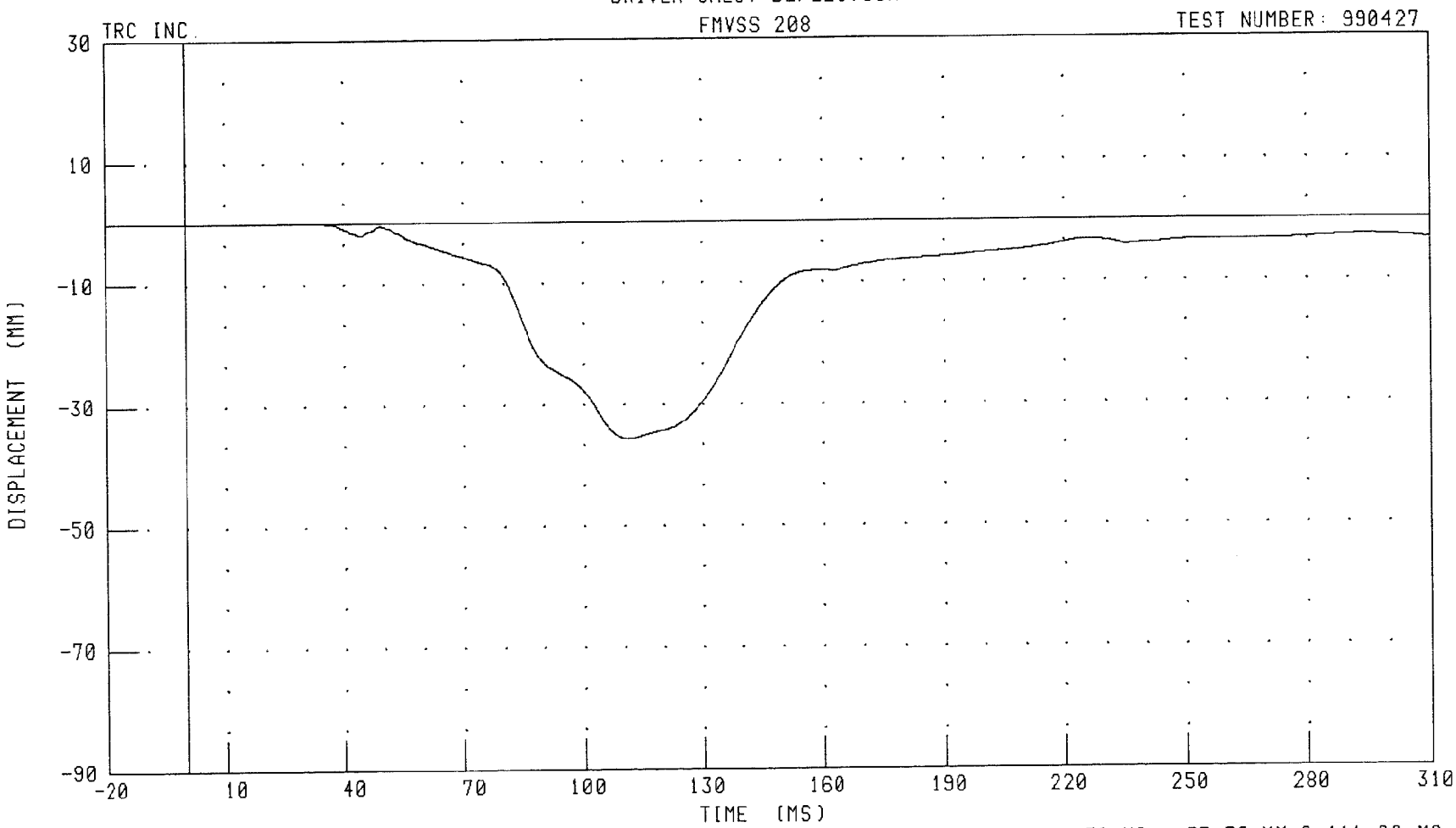
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER CHEST RESULTANT ACCELERATION
FMVSS 208



CHANNEL: CSTRG1 FILTER: CH. CLASS 180

PEAK DATA: 35.17 G @ 108.88 MS; 0.02 G @ -20.00 MS

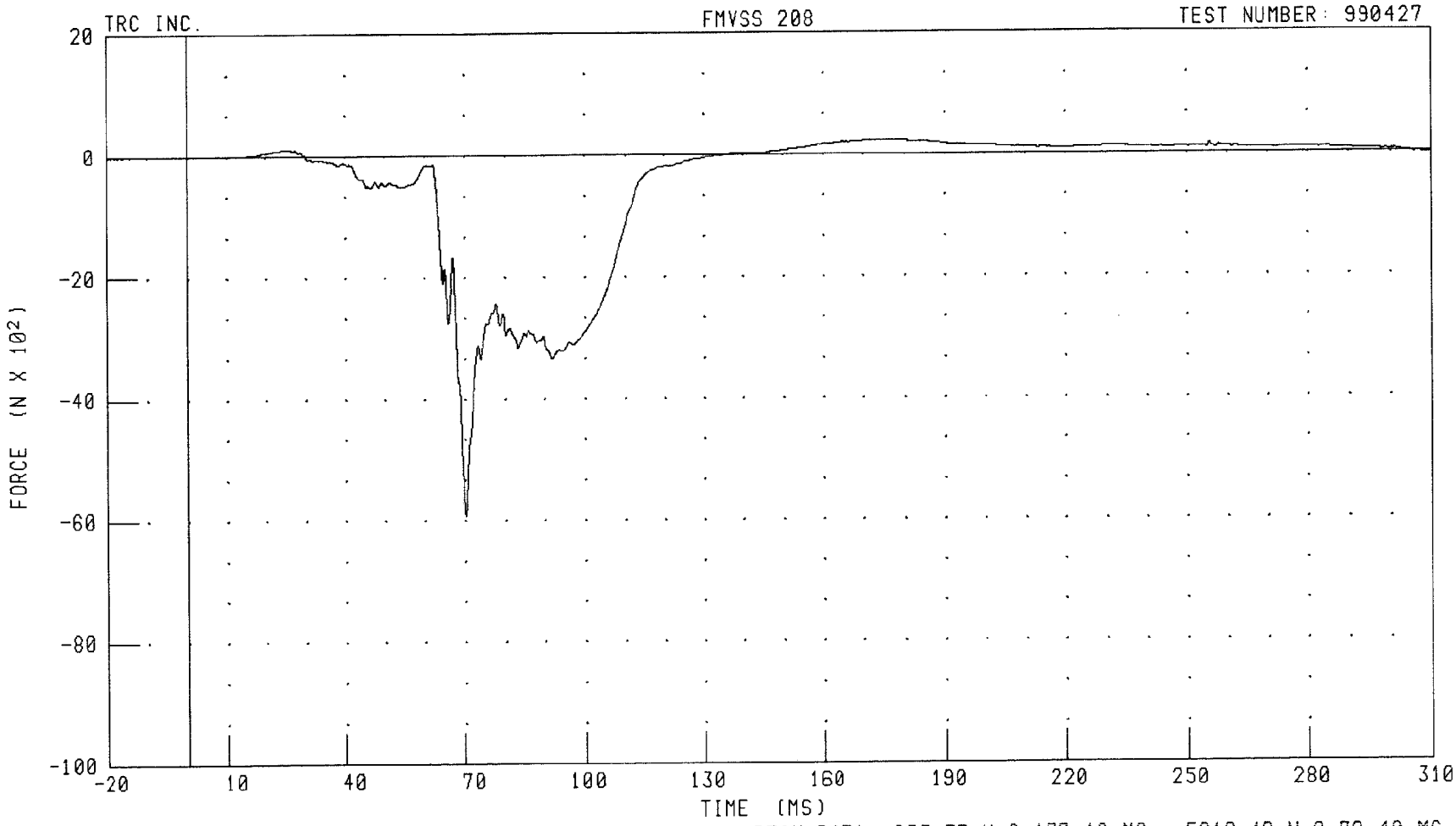
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER CHEST DEFLECTION
FMVSS 208



CHANNEL: CSTXD1 FILTER: CH. CLASS 180

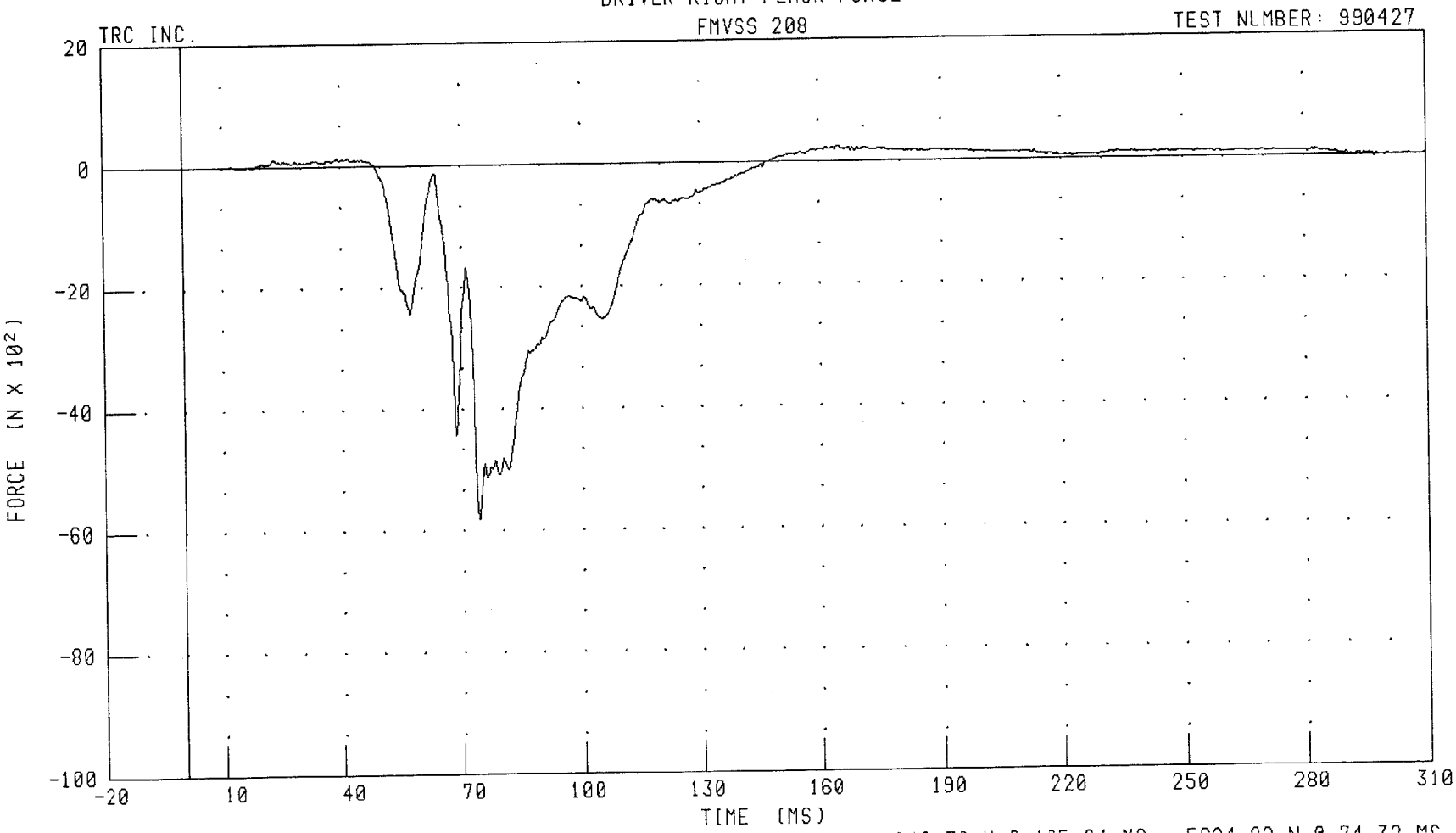
PEAK DATA: 0.12 MM @ 31.52 MS; -35.70 MM @ 111.28 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER LEFT FEMUR FORCE



CHANNEL: LFMF1 FILTER: CH. CLASS 600 PEAK DATA: 233.37 N @ 177.12 MS; -5912.49 N @ 70.40 MS

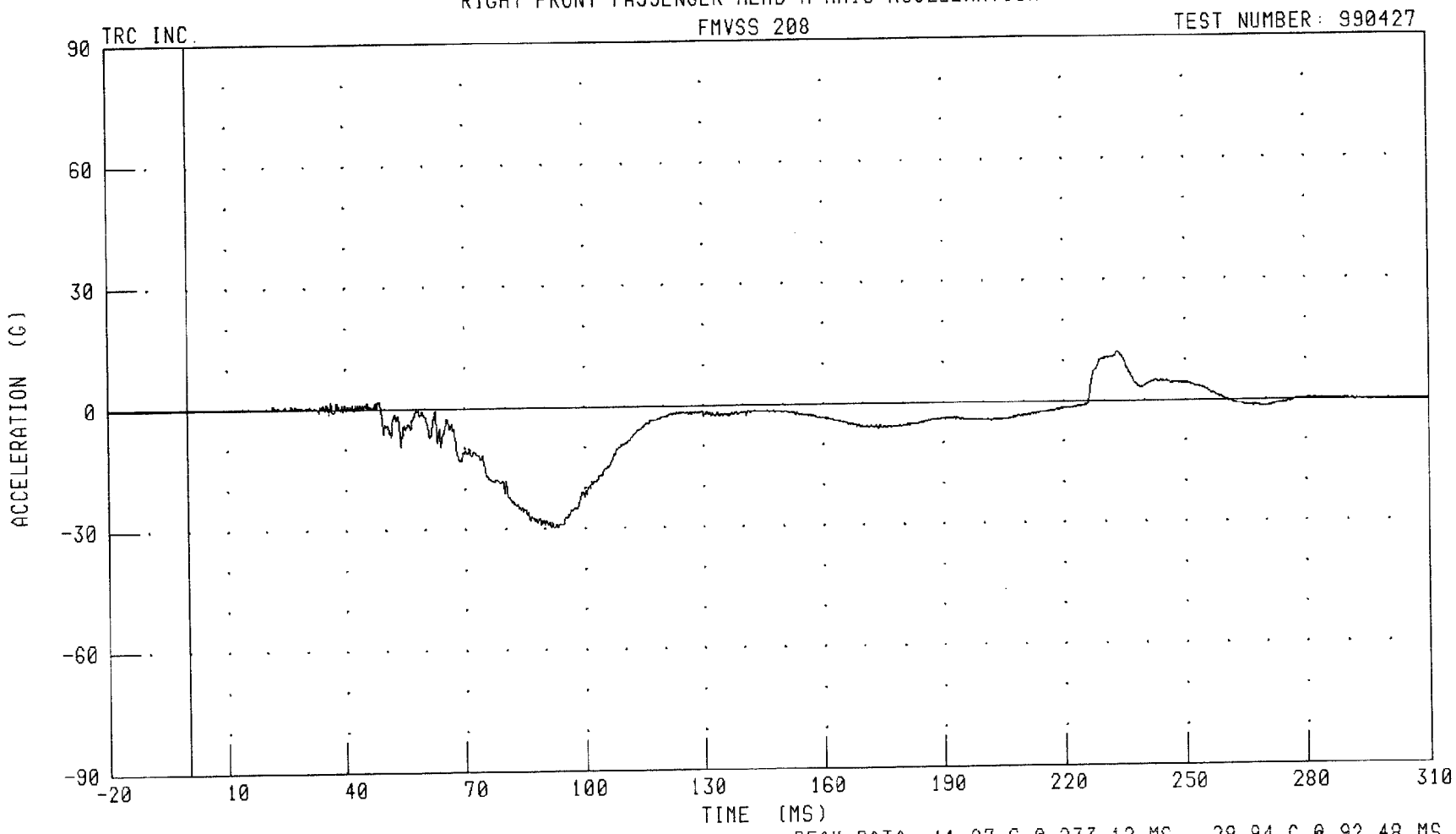
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER RIGHT FEMUR FORCE
FMVSS 208



CHANNEL: RFMF1 FILTER: CH. CLASS 600

PEAK DATA: 242.50 N @ 165.04 MS; -5824.92 N @ 74.32 MS

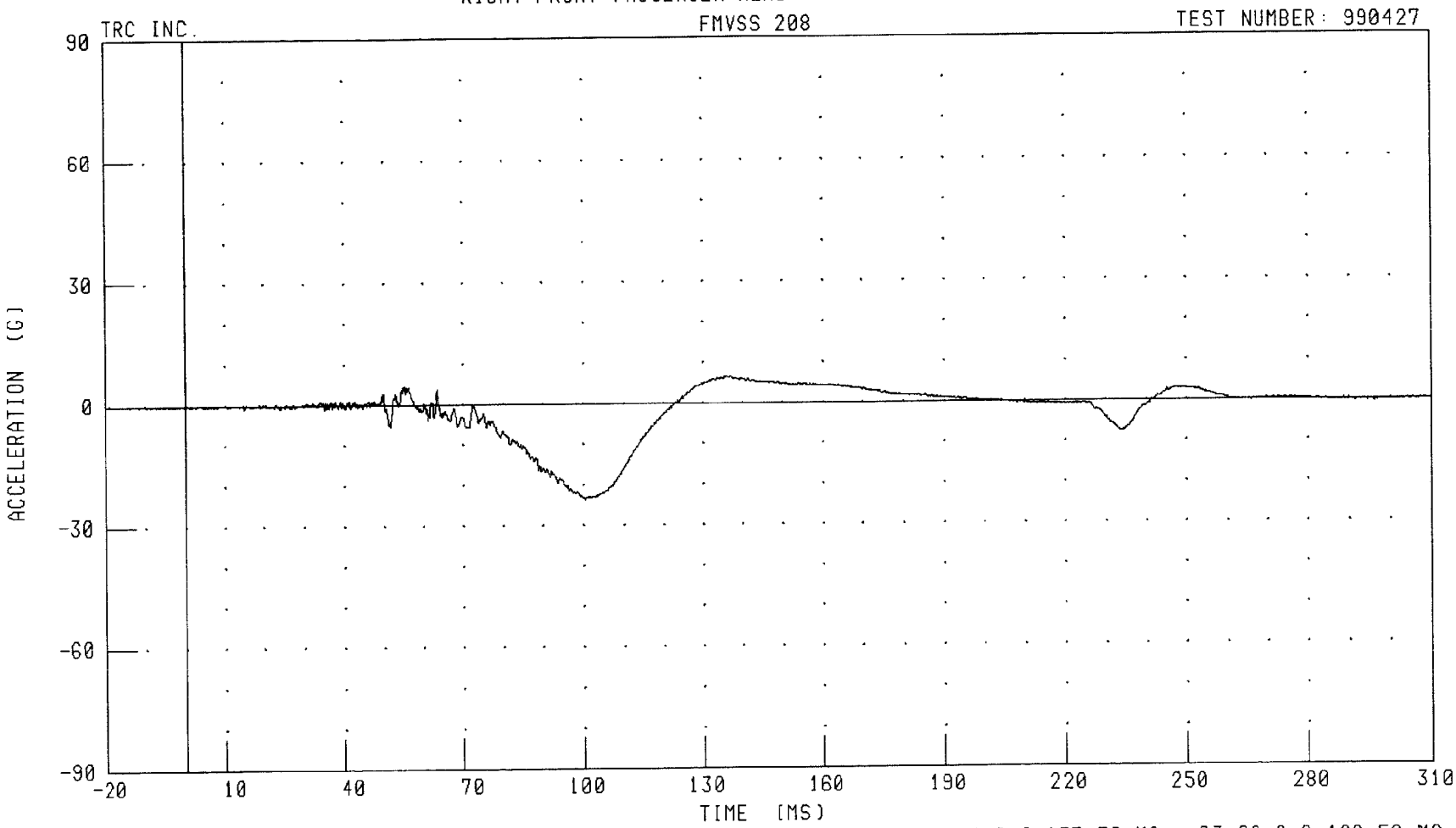
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION
FMVSS 208



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000

PEAK DATA: 11.97 G @ 233.12 MS; -29.94 G @ 92.48 MS

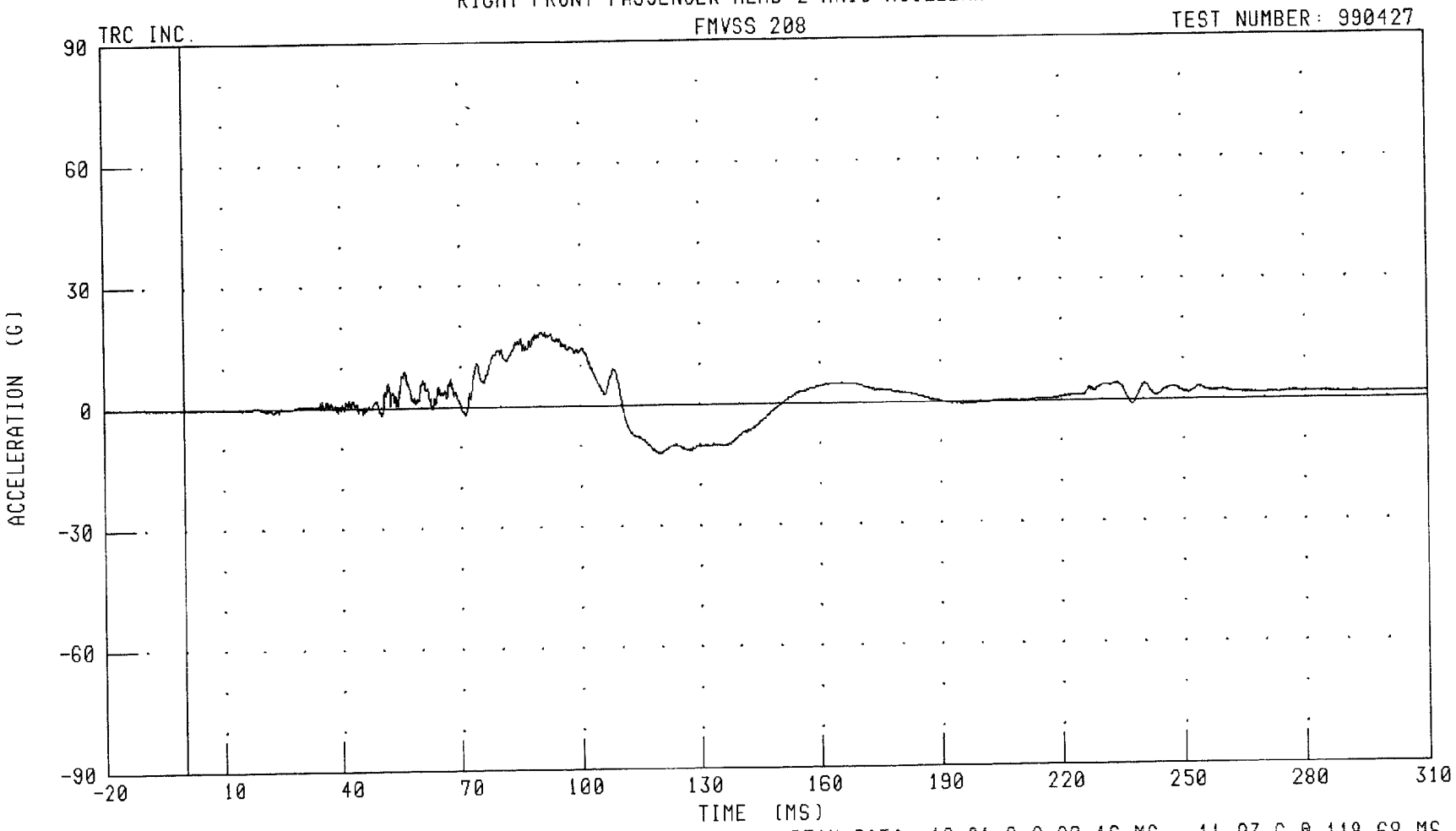
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYG2 FILTER: CH. CLASS 1000

PEAK DATA: 6.44 G @ 135.52 MS; -23.68 G @ 100.56 MS

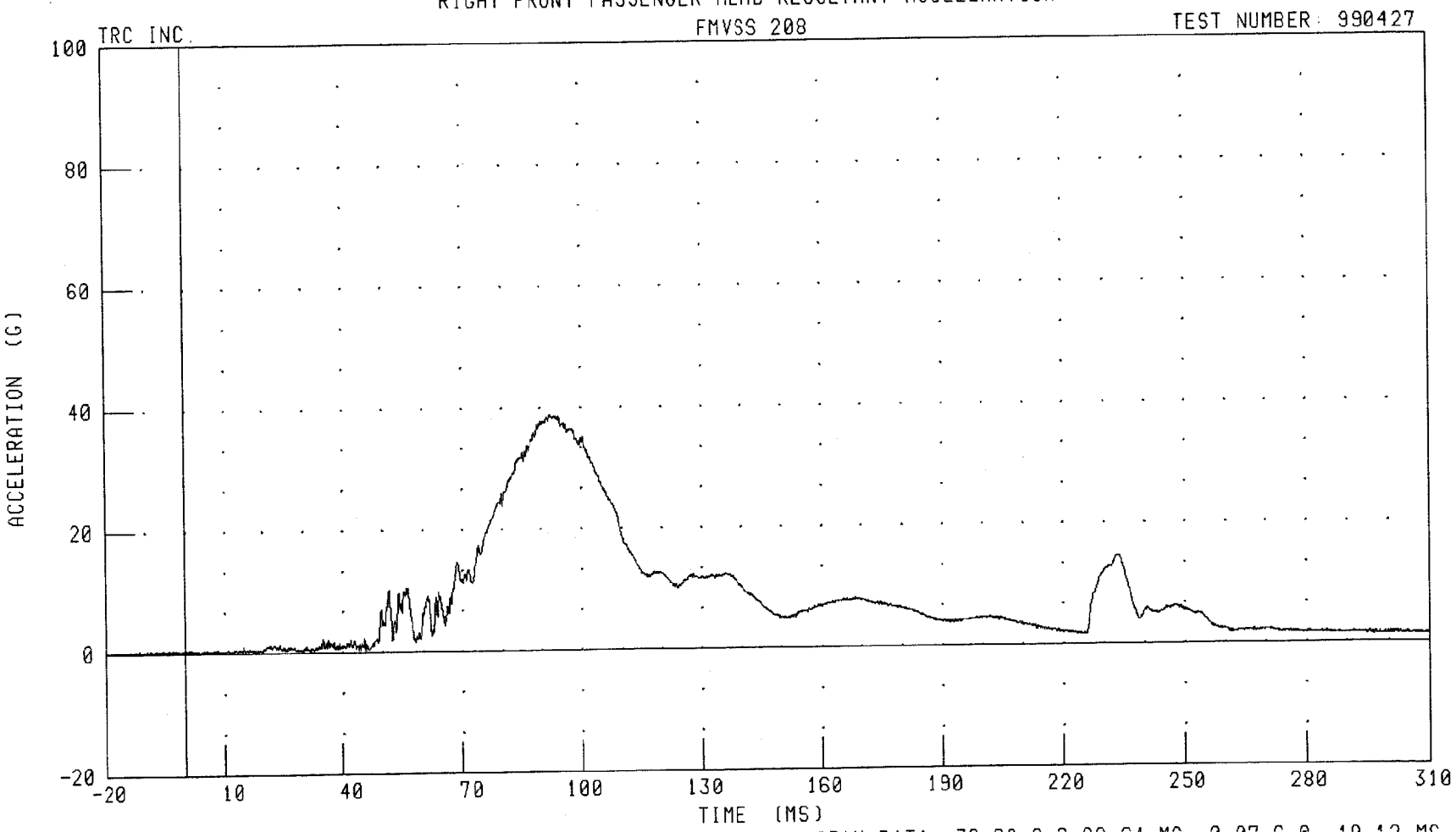
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION
FMVSS 208



CHANNEL: HEDZG2 FILTER: CH. CLASS 1000

PEAK DATA: 18.21 G @ 90.16 MS; -11.93 G @ 119.68 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION
FMVSS 208



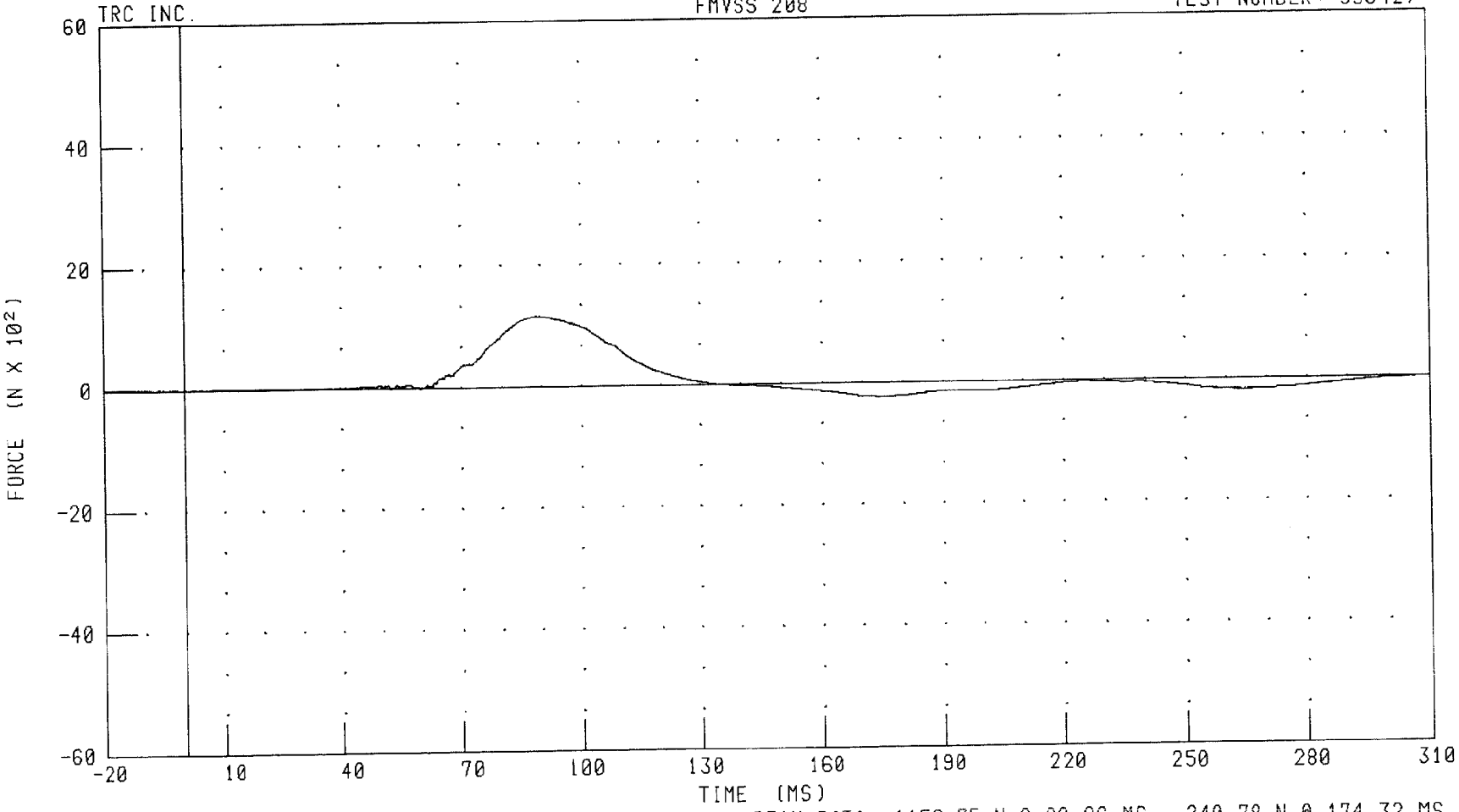
CHANNEL: HEDRG2 FILTER: CH. CLASS 1000

PEAK DATA: 38.80 G @ 92.64 MS; 0.07 G @ -19.12 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE
FMVSS 208

TRC INC.

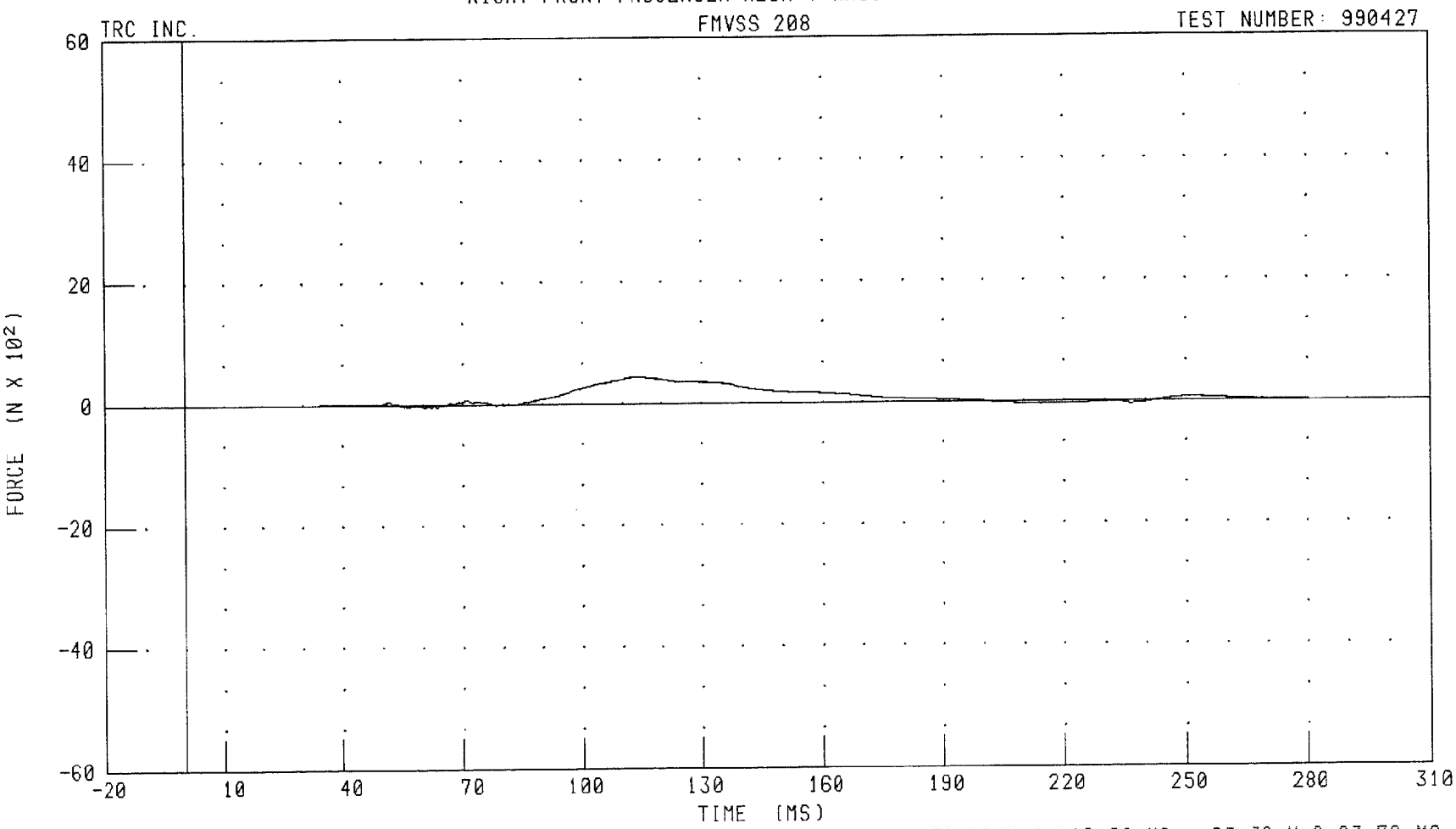
TEST NUMBER: 990427



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000

PEAK DATA: 1152.75 N @ 88.96 MS; -240.78 N @ 174.32 MS

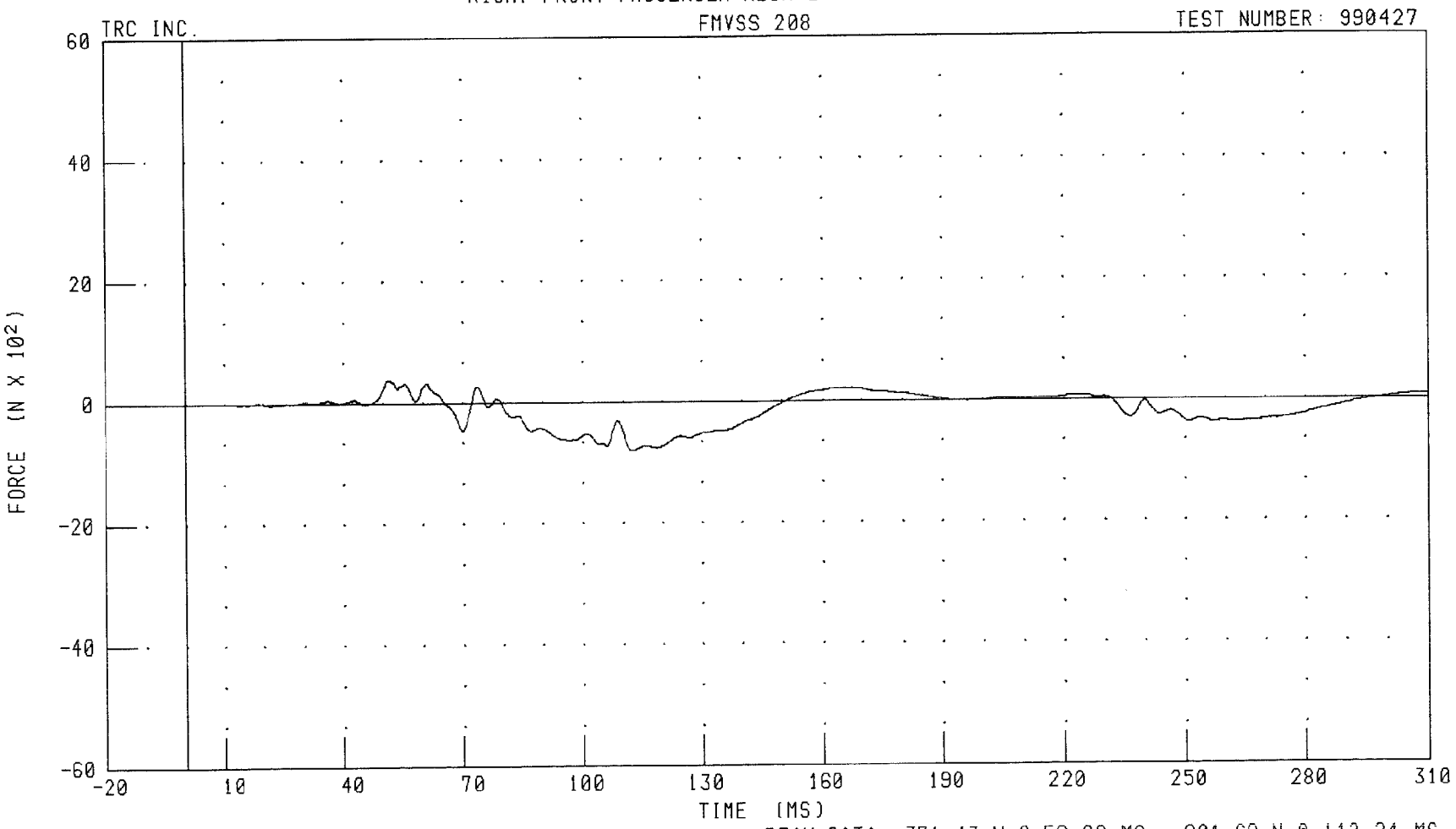
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE



CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

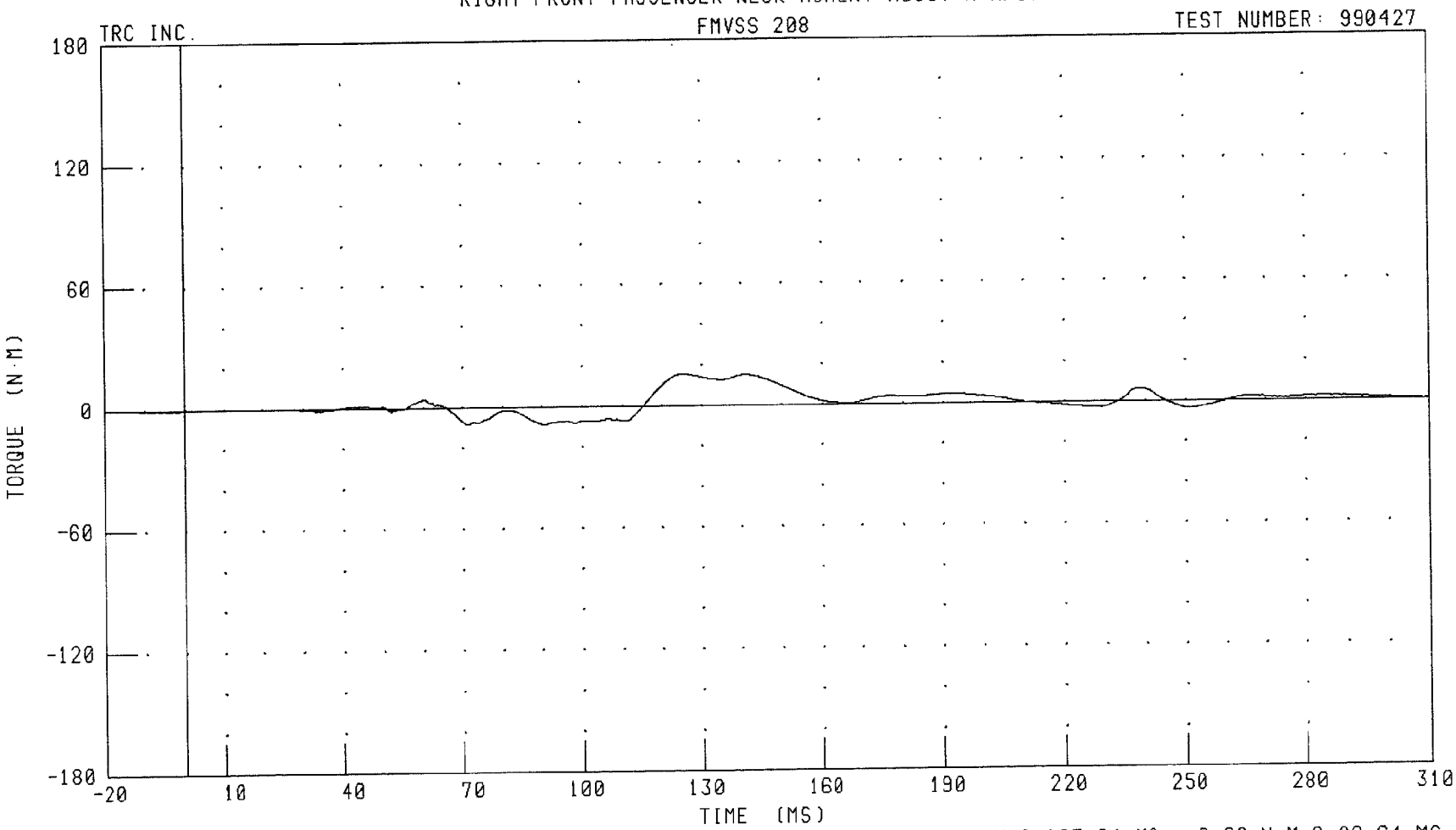
PEAK DATA: 432.19 N @ 112.96 MS; -63.39 N @ 63.76 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000 PEAK DATA: 371.43 N @ 50.88 MS; -801.68 N @ 112.24 MS

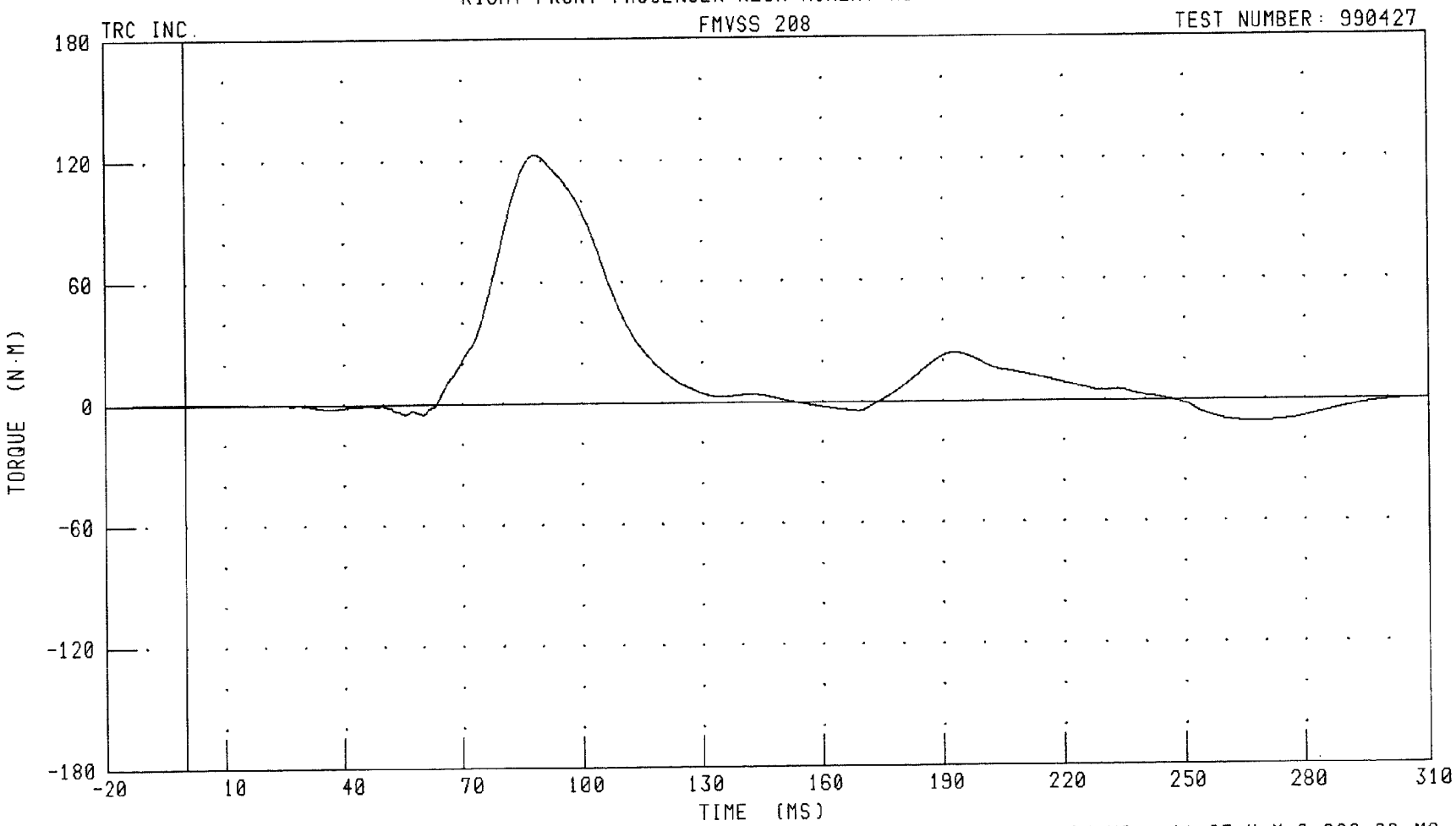
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS



CHANNEL: NEKXM2 FILTER: CH CLASS 600

PEAK DATA: 15.57 N-M @ 125.84 MS; -8.86 N-M @ 90.64 MS

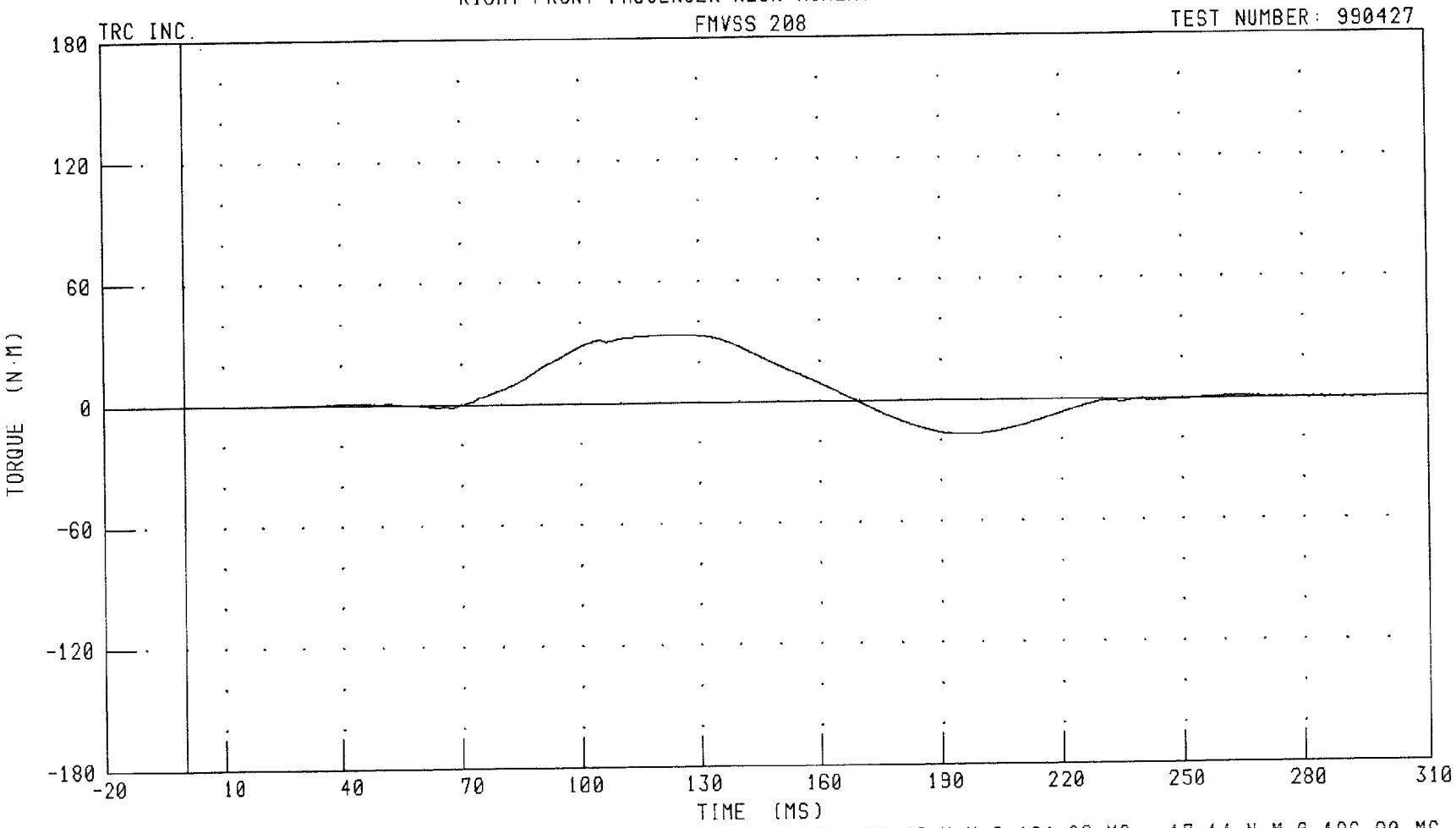
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS



CHANNEL: NEKYM2 FILTER: CH. CLASS 600

PEAK DATA: 122.76 N-M @ 88.24 MS; -11.05 N-M @ 268.08 MS

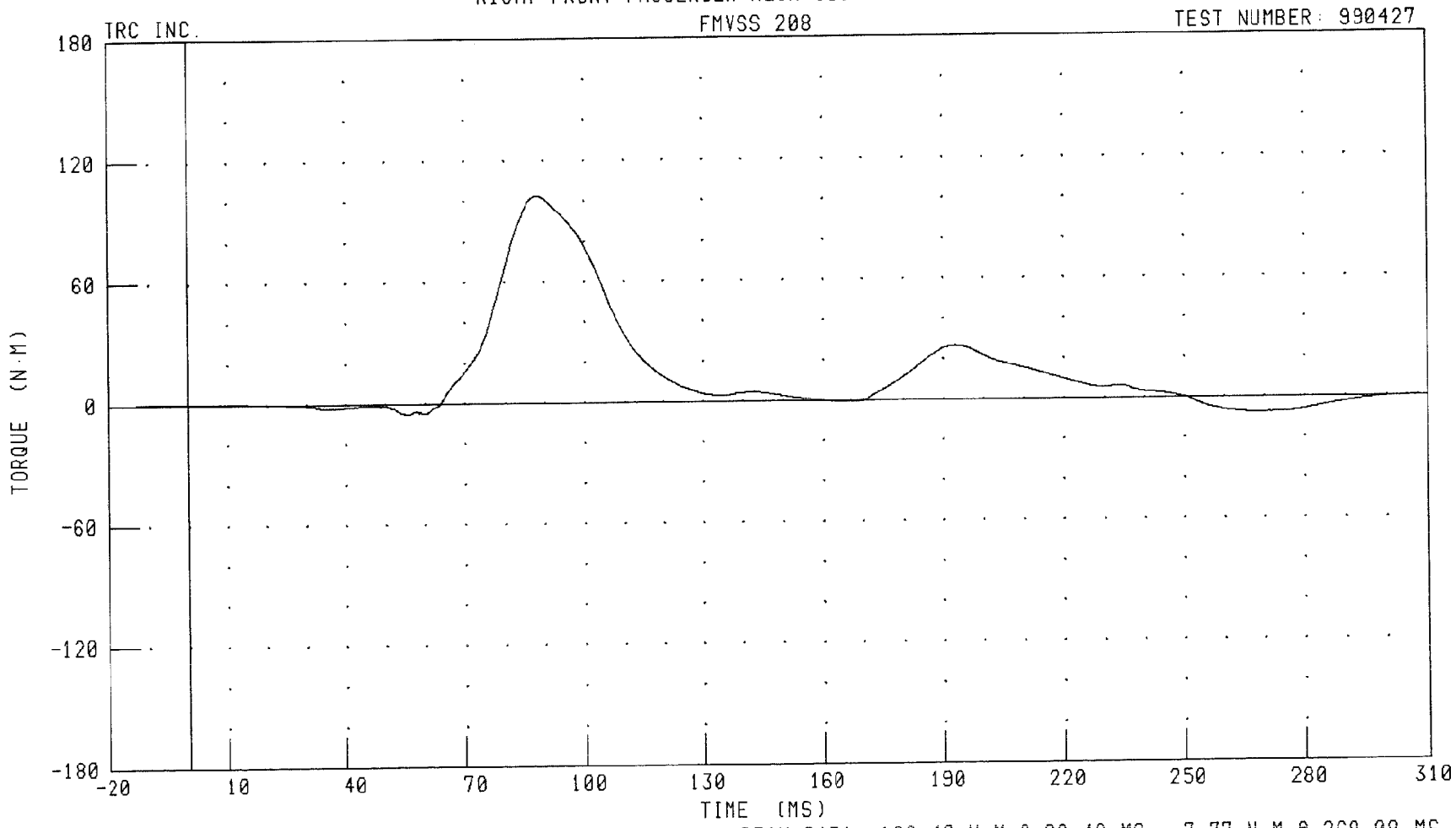
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS
FMVSS 208



CHANNEL: NEKZM2 FILTER: CH. CLASS 600

PEAK DATA: 33.40 N-M @ 124.00 MS; -17.14 N-M @ 196.80 MS

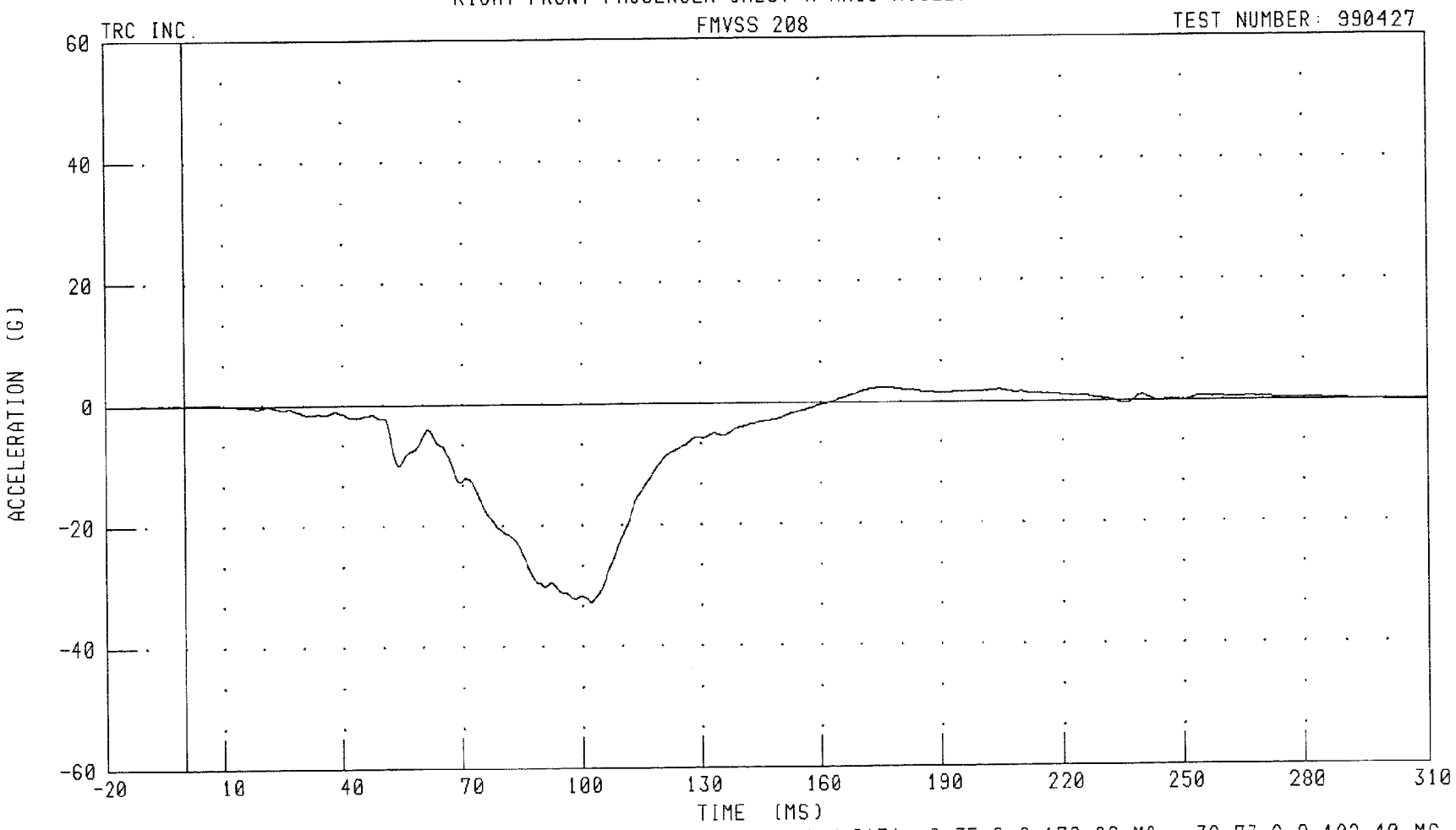
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER NECK OCCIPITAL CONDYLE



CHANNEL: NEKOM2 FILTER: CH. CLASS 600

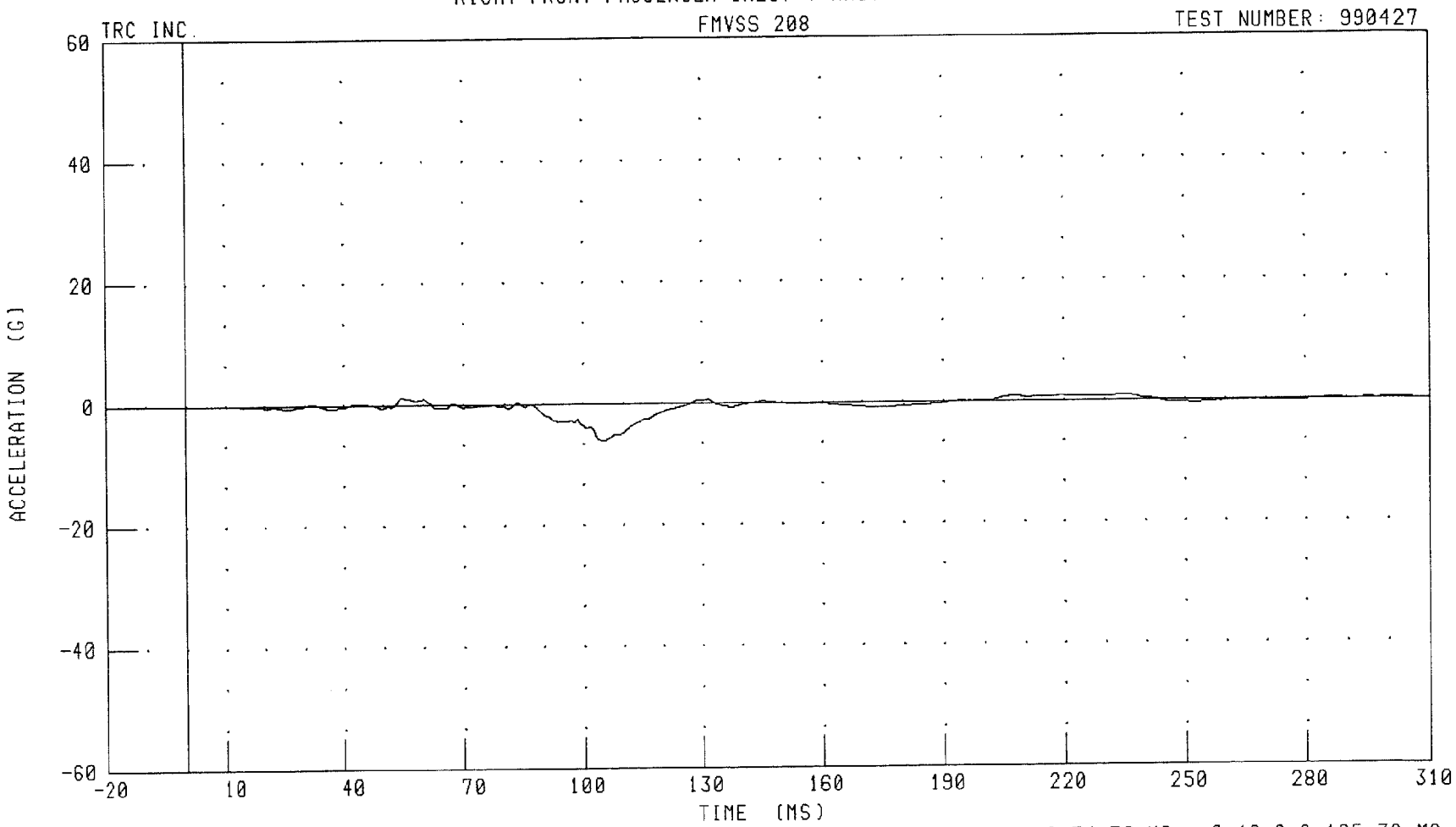
PEAK DATA: 102.40 N-M @ 88.40 MS; -7.77 N-M @ 268.08 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG2 FILTER: CH CLASS 180 PEAK DATA: 2.35 G @ 176.88 MS; -32.73 G @ 102.40 MS

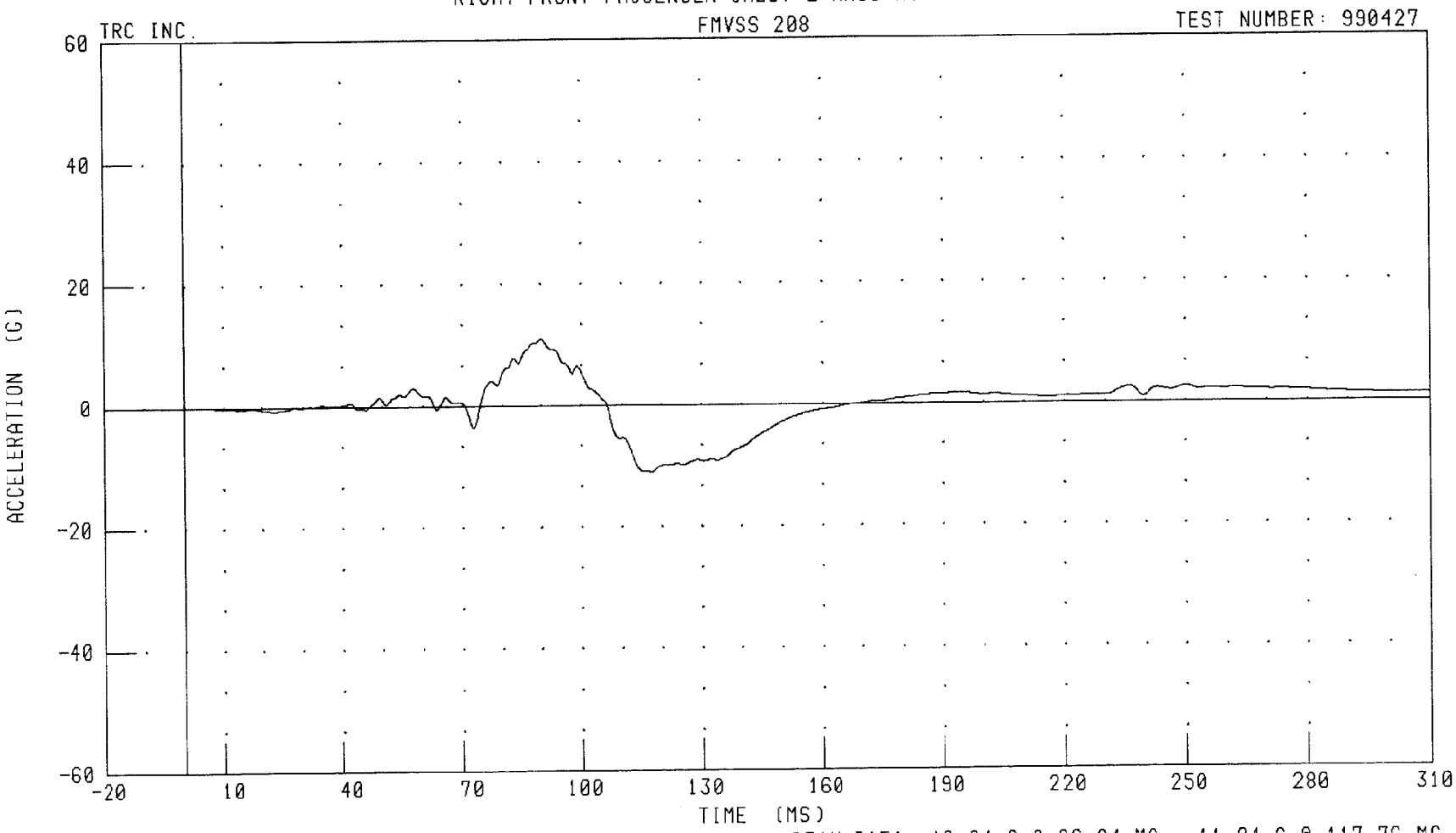
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 1.13 G @ 54.72 MS; -6.16 G @ 105.36 MS

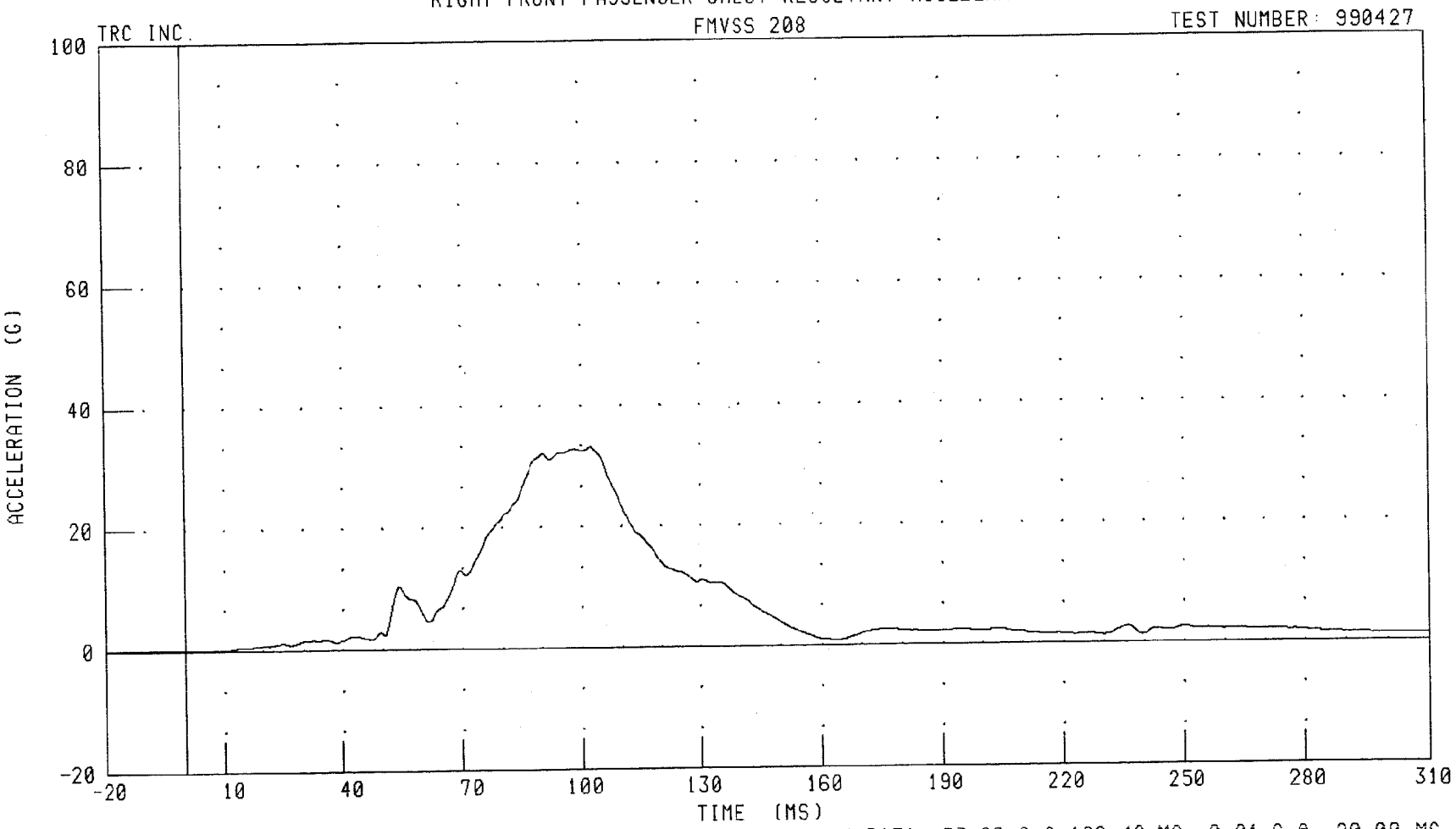
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZG2 FILTER: CH. CLASS 180

PEAK DATA: 10.94 G @ 90.24 MS; -11.04 G @ 117.76 MS

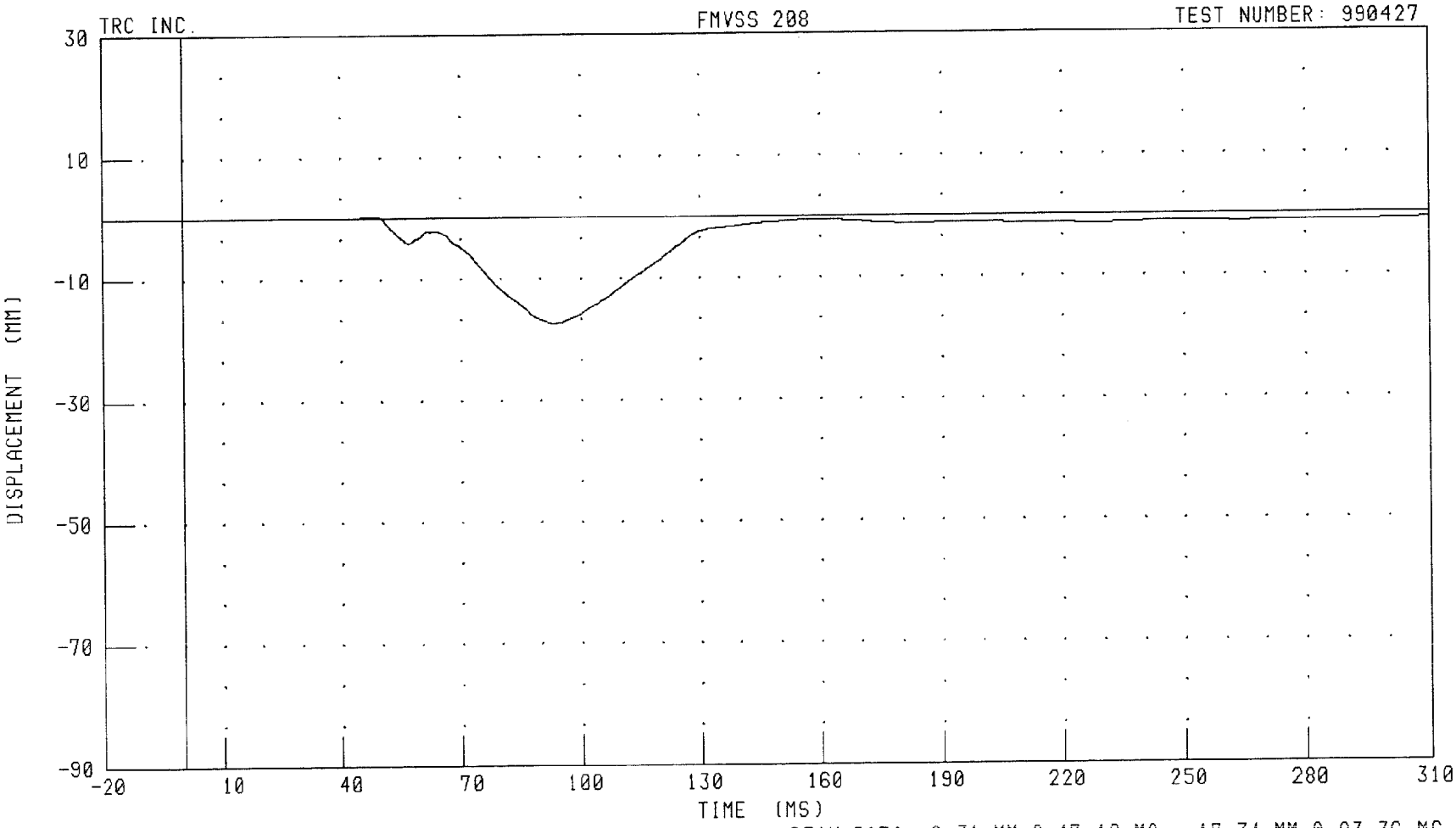
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION
FMVSS 208



CHANNEL: CSTRG2 FILTER: CH. CLASS 180

PEAK DATA: 33.09 G @ 102.48 MS; 0.01 G @ -20.00 MS

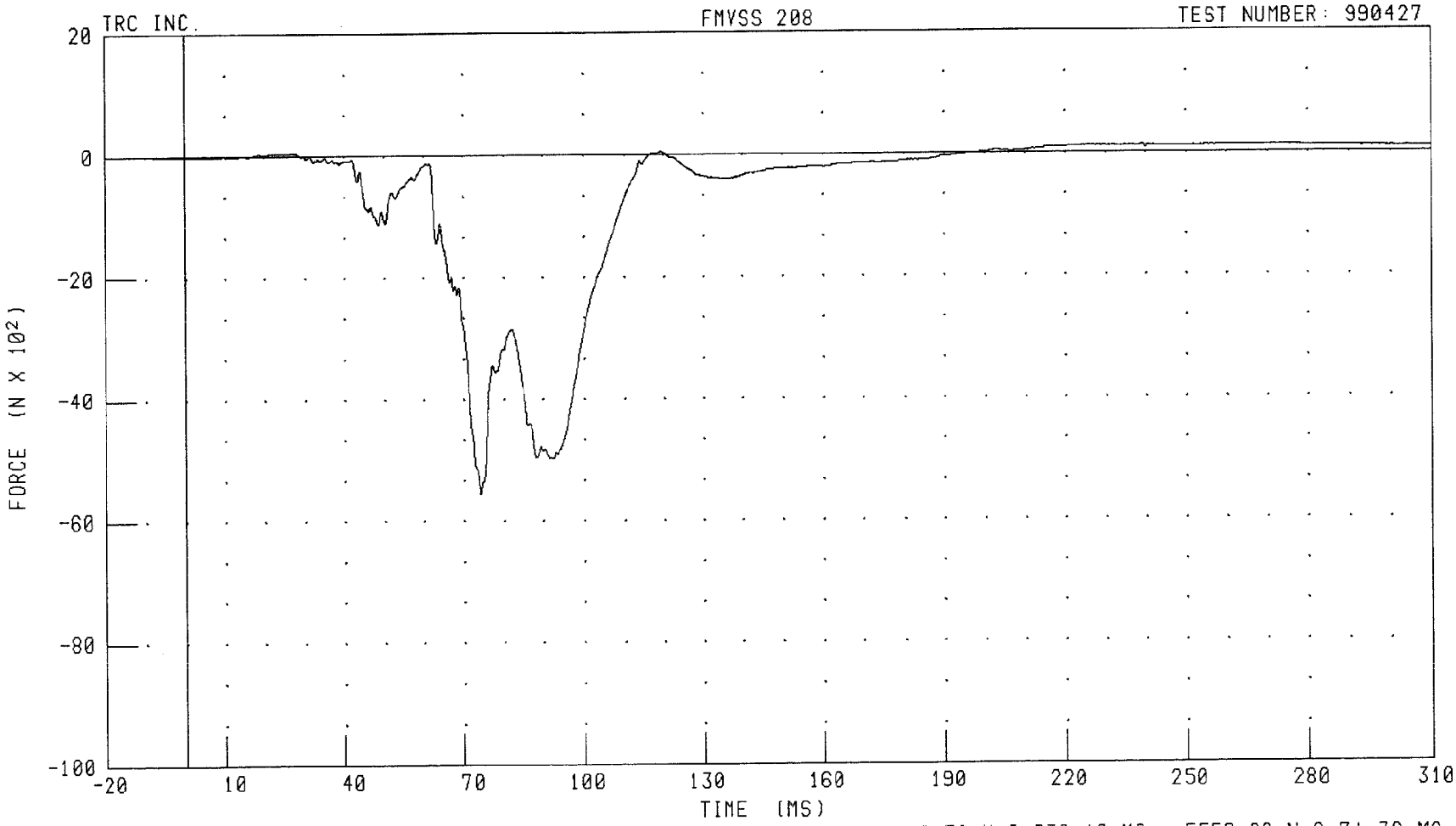
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER CHEST DEFLECTION
FMVSS 208



CHANNEL: CSTXD2 FILTER: CH. CLASS 180

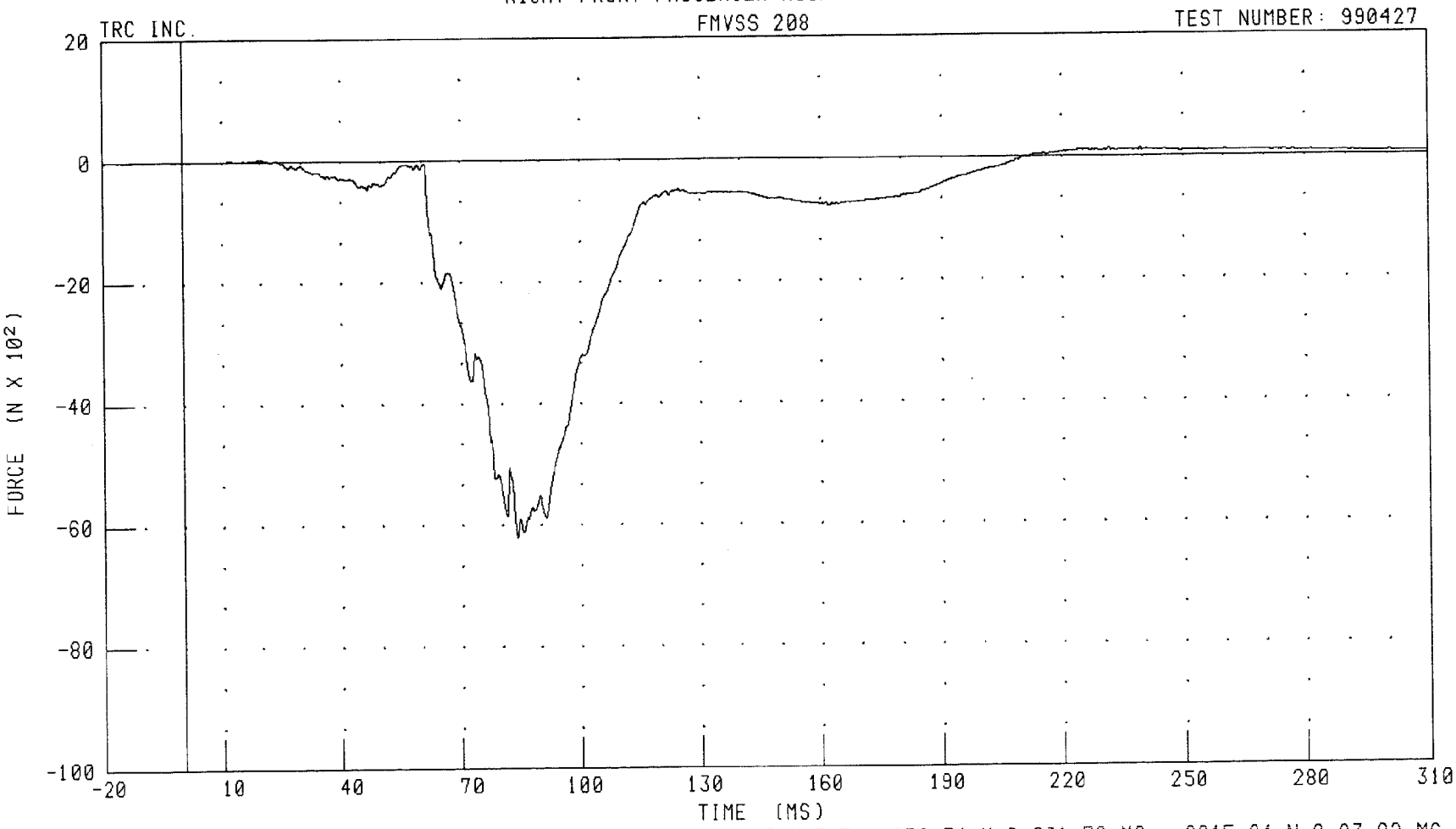
PEAK DATA: 0.31 MM @ 47.12 MS; -17.34 MM @ 93.36 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER LEFT FEMUR FORCE



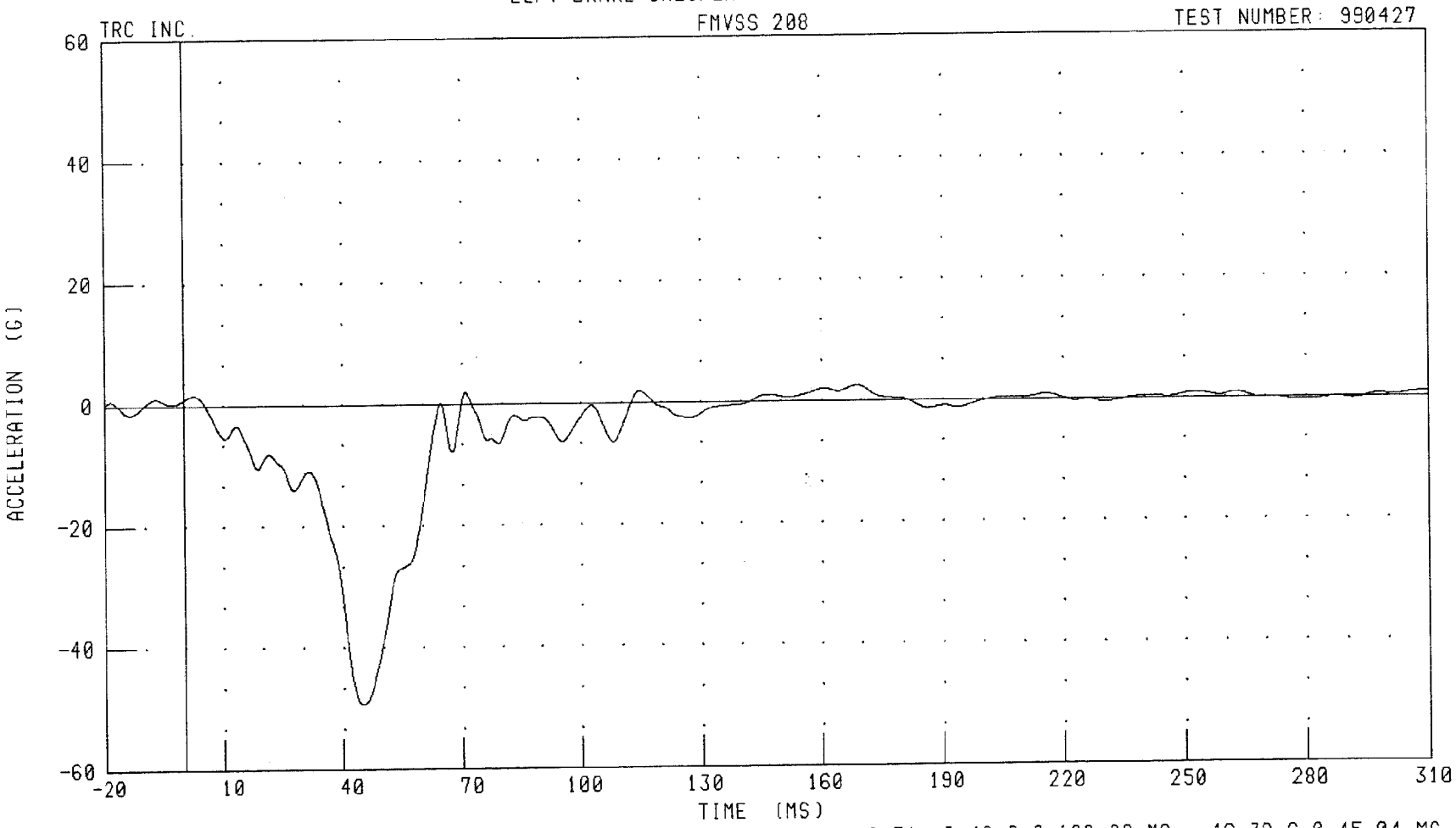
CHANNEL: LFMF2 FILTER: CH. CLASS 600 PEAK DATA: 132.78 N @ 239.12 MS; -5552.28 N @ 74.32 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



CHANNEL: RFMF2 FILTER: CH. CLASS 600 PEAK DATA: 138.54 N @ 231.76 MS; -6215.64 N @ 83.92 MS

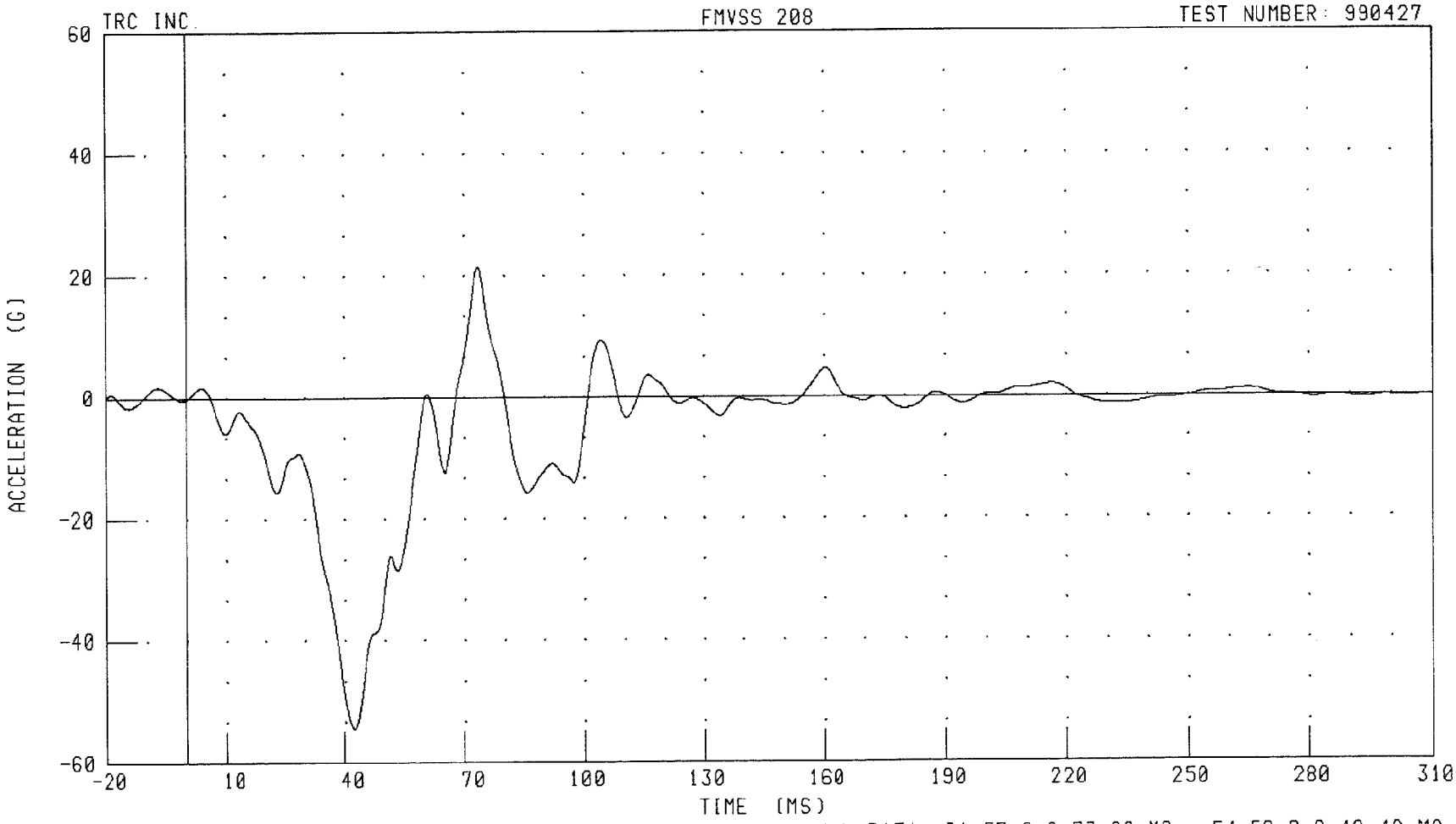
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
LEFT BRAKE CALIPER X-AXIS ACCELERATION
FMVSS 208



CHANNEL: BCLXG1 FILTER: CH. CLASS 60

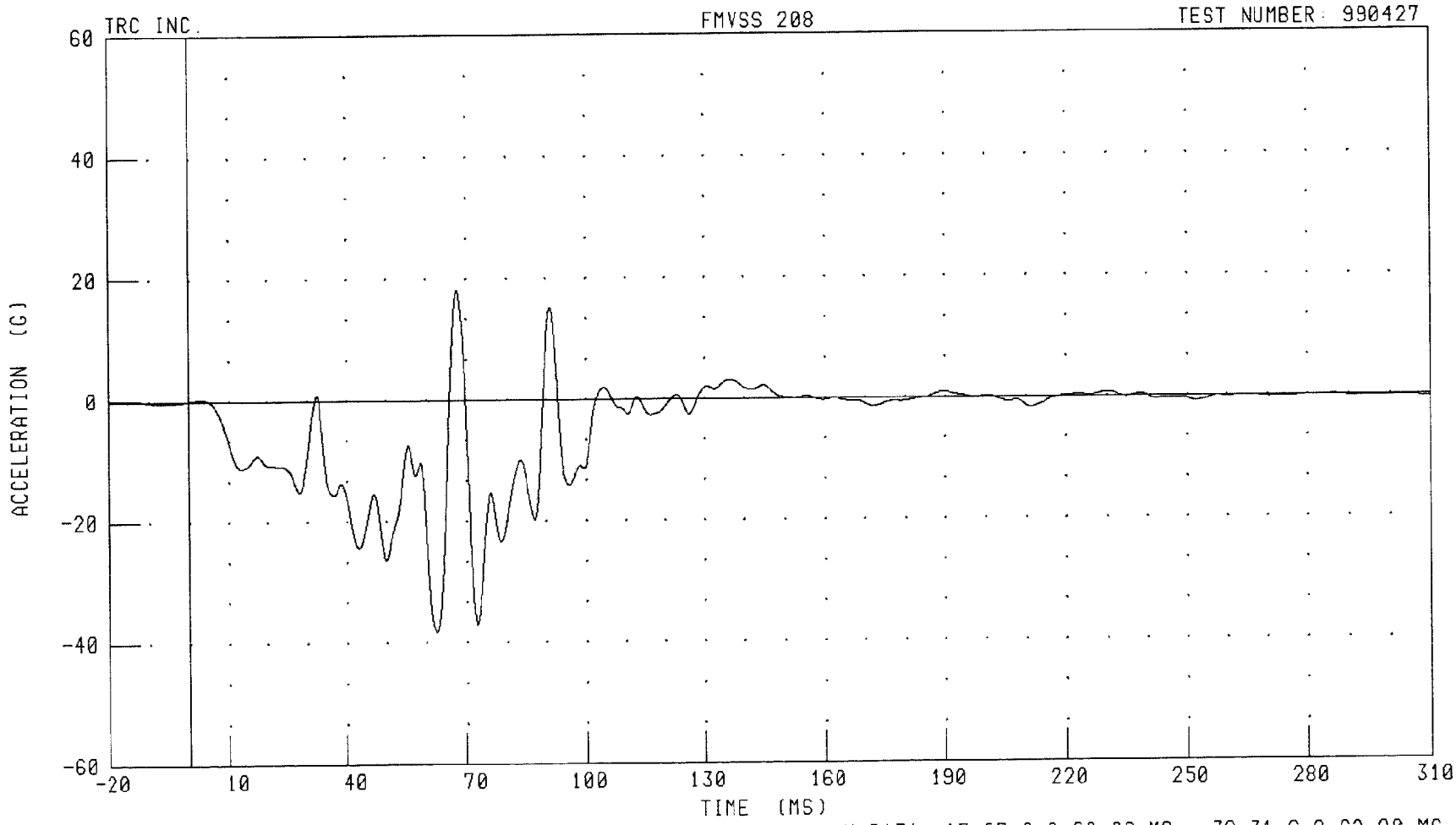
PEAK DATA: 2.46 G @ 169.28 MS; -49.38 G @ 45.04 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT BRAKE CALIPER X-AXIS ACCELERATION



CHANNEL: BCRXG1 FILTER: CH. CLASS 60 PEAK DATA: 21.37 G @ 73.60 MS; -54.52 G @ 42.48 MS

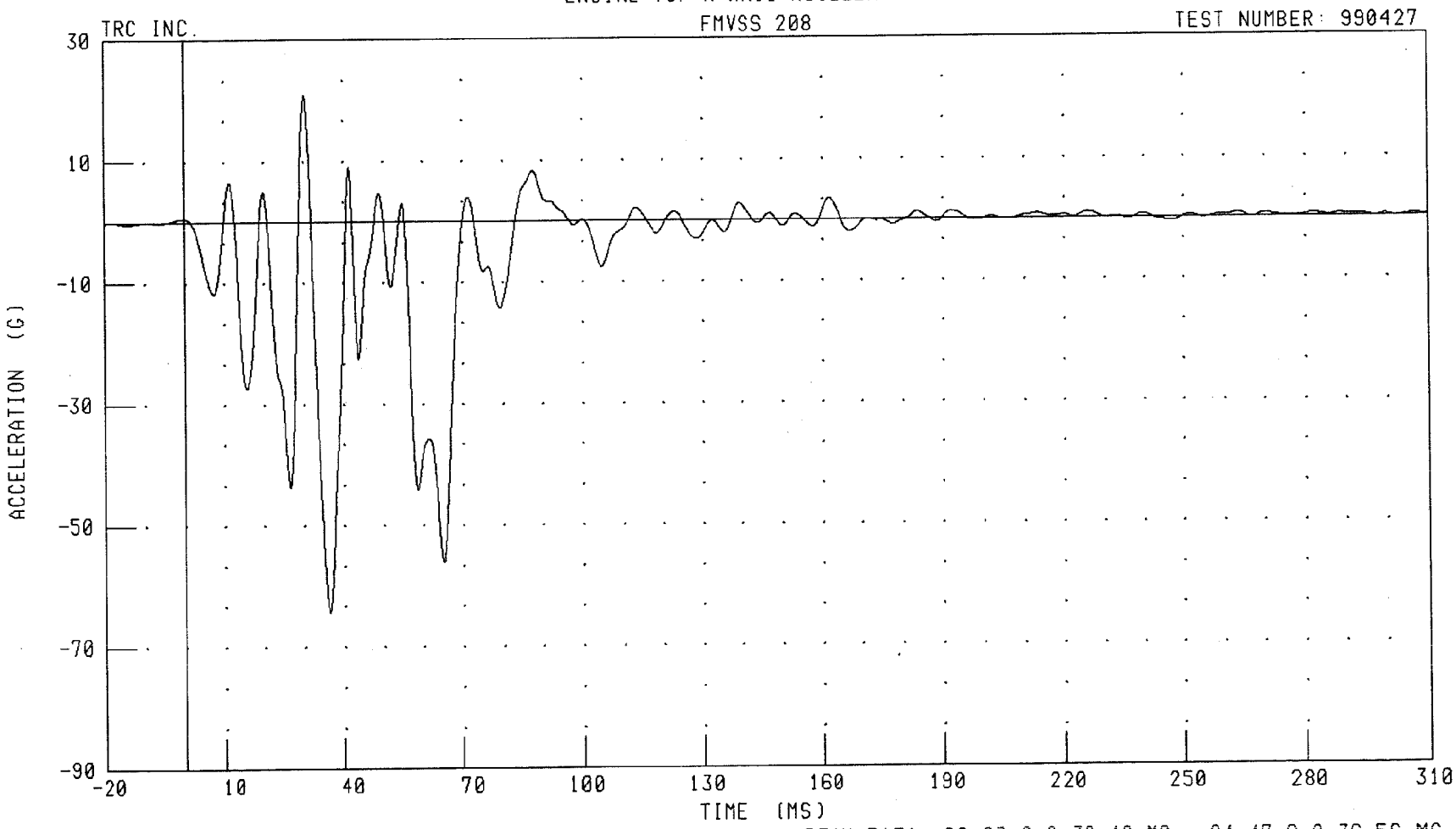
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DASH PANEL CENTER X-AXIS ACCELERATION
FMVSS 208



CHANNEL: DPCXG1 FILTER: CH. CLASS 60

PEAK DATA: 17.97 G @ 68.00 MS; -38.31 G @ 62.80 MS

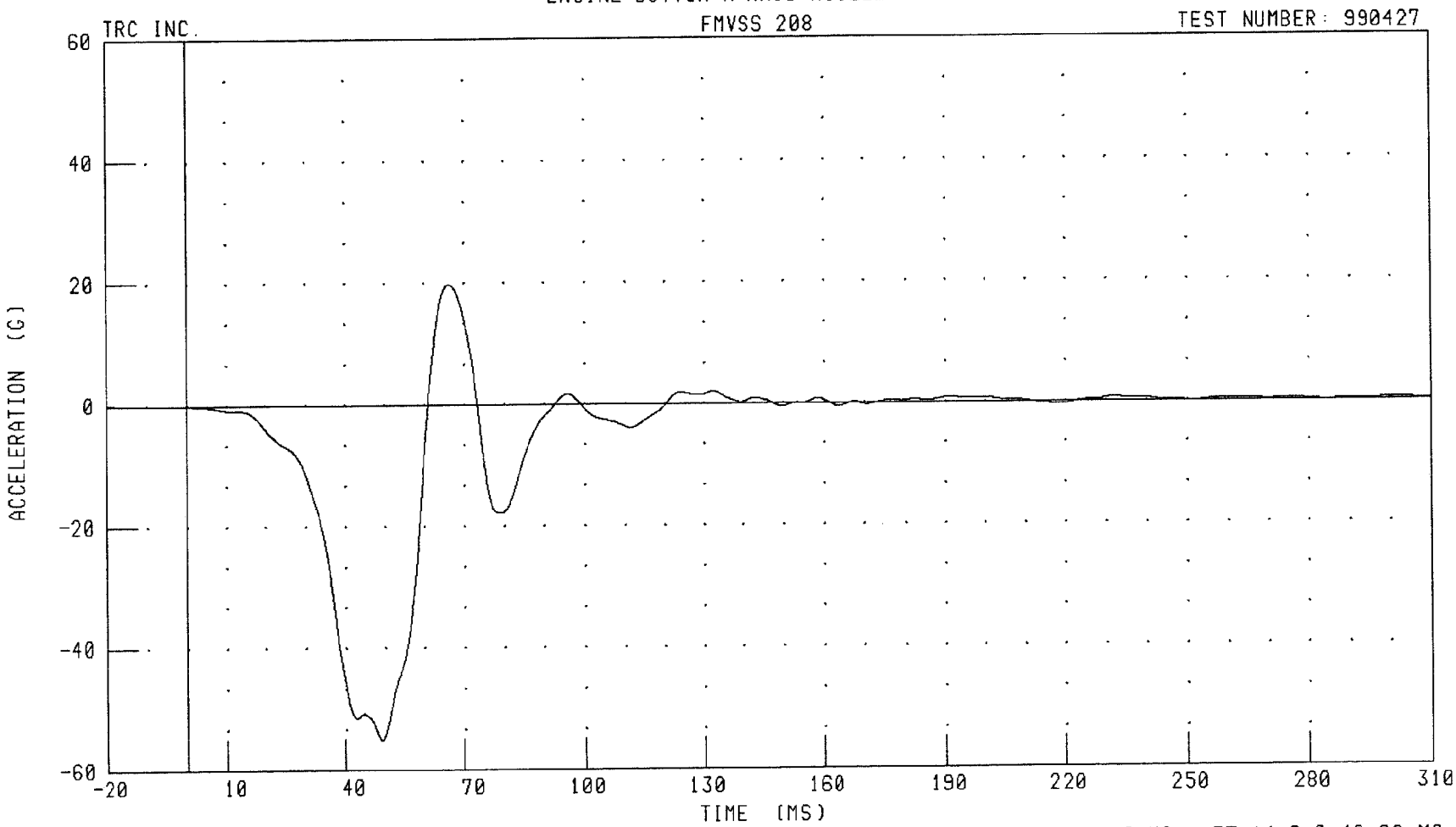
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
ENGINE TOP X-AXIS ACCELERATION
FMVSS 208



CHANNEL: ENGXG1 FILTER: CH. CLASS 60

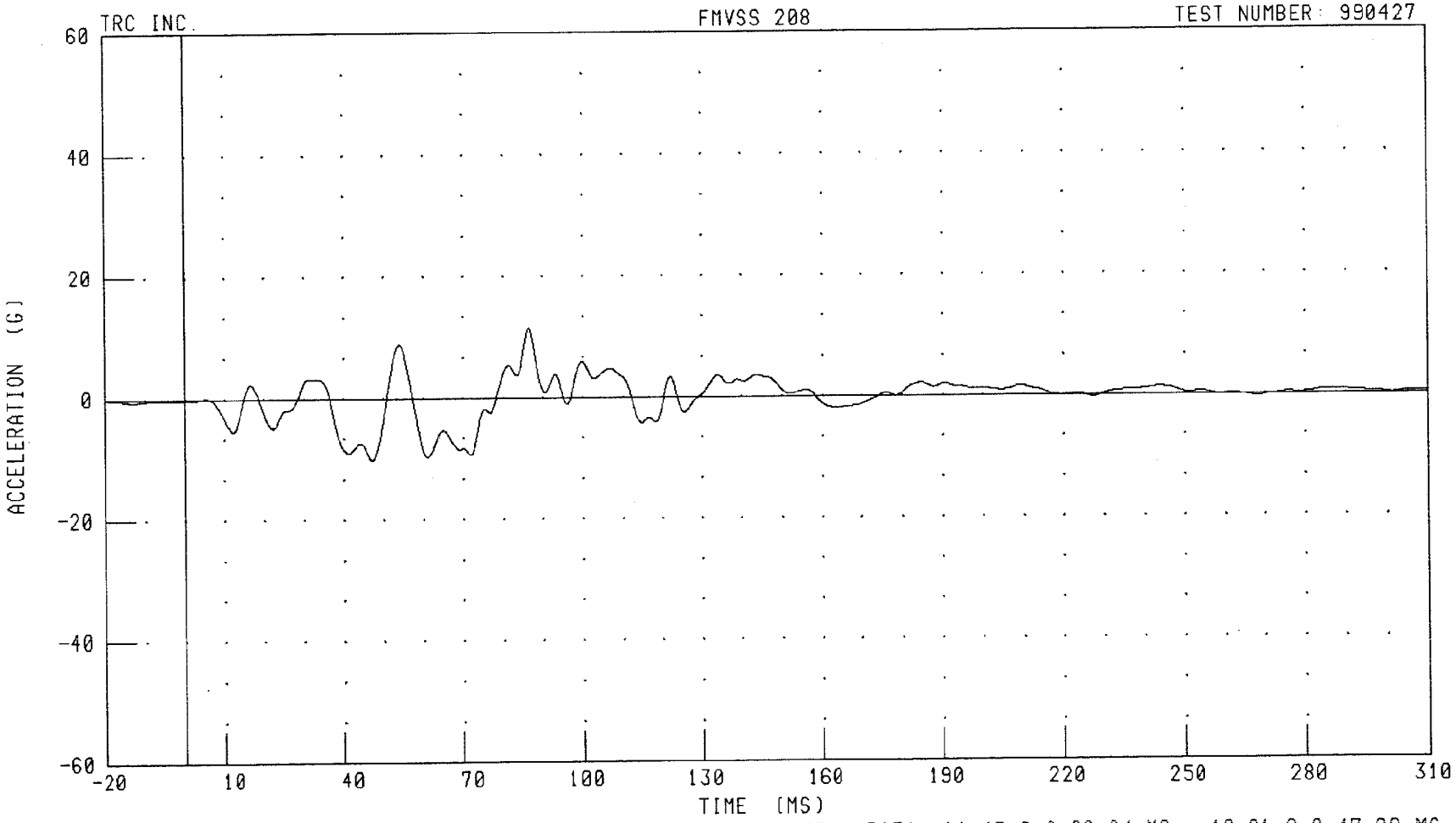
PEAK DATA: 20.93 G @ 30.40 MS; -64.47 G @ 36.56 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
ENGINE BOTTOM X-AXIS ACCELERATION



CHANNEL: ENGXG2 FILTER: CH. CLASS 60 PEAK DATA: 19.74 G @ 66.48 MS; -55.14 G @ 49.20 MS

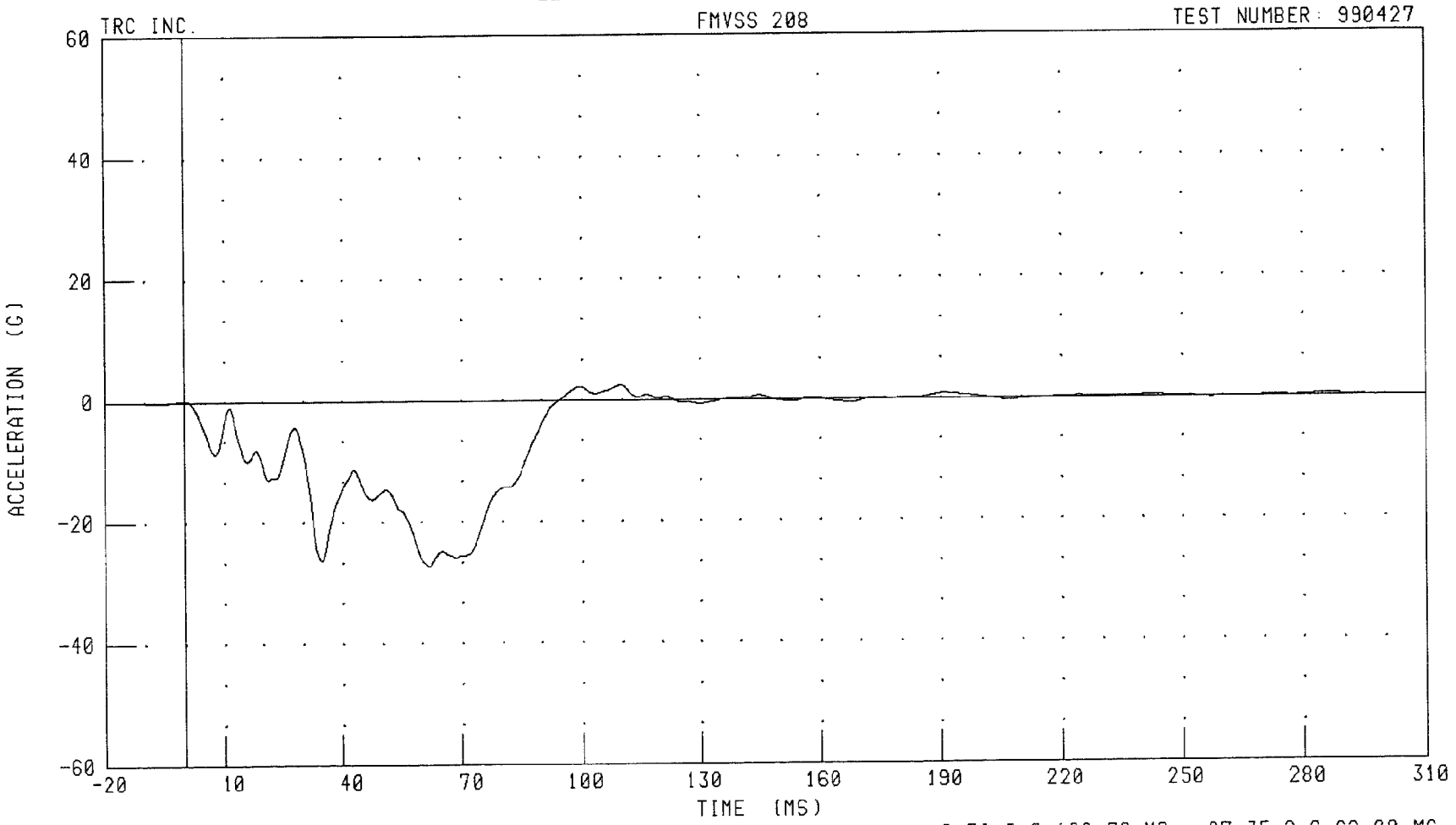
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
VEHICLE REAR CENTER Z-AXIS ACCELERATION



CHANNEL: RDKZG1 FILTER: CH. CLASS 60

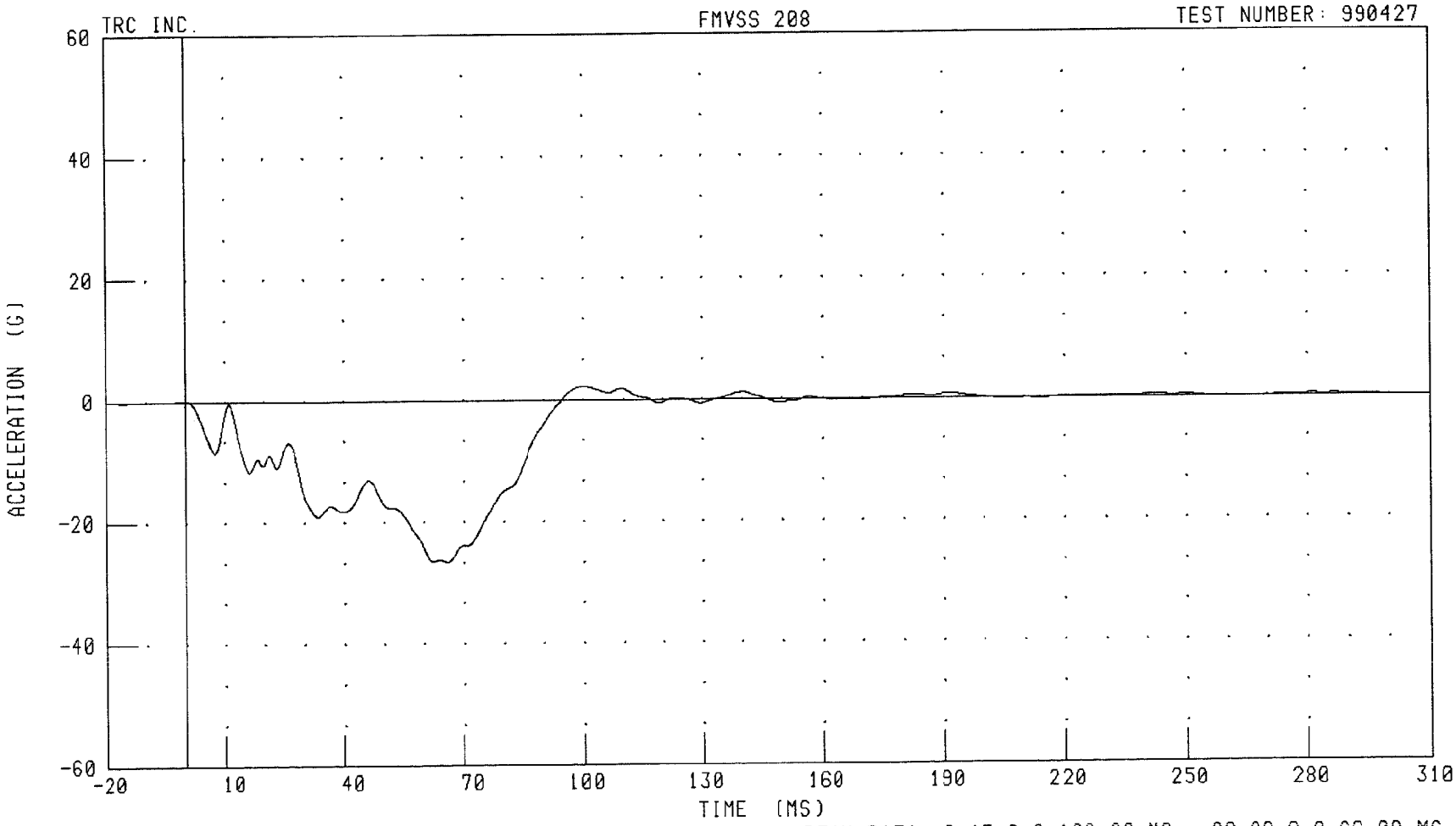
PEAK DATA: 11.43 G @ 86.64 MS; -10.21 G @ 47.28 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
LEFT REAR SEAT X-AXIS ACCELERATION



CHANNEL: TLRXG1 FILTER: CH. CLASS 60 PEAK DATA: 2.50 G @ 109.76 MS; -27.35 G @ 62.00 MS

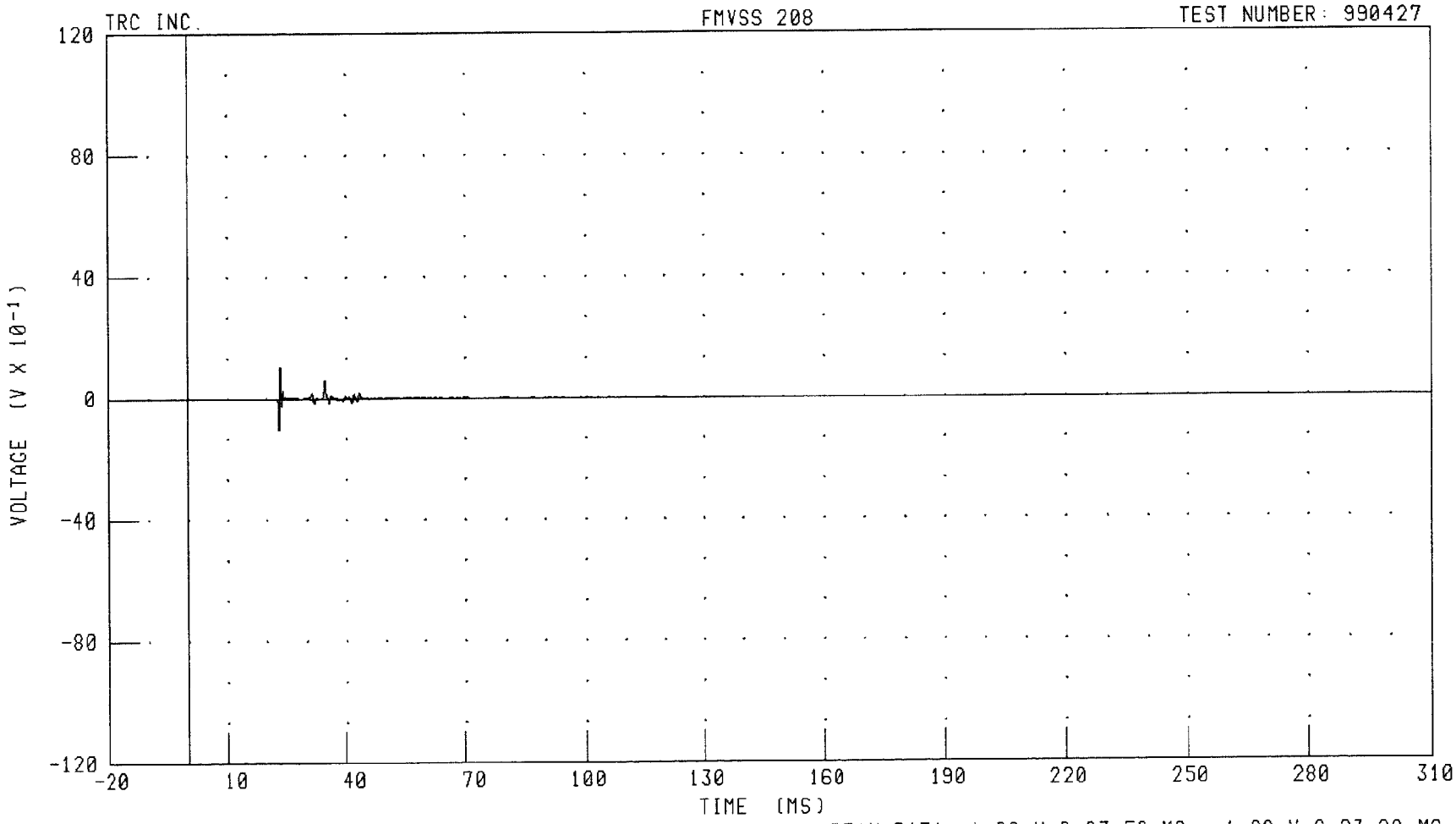
1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
RIGHT REAR SEAT X-AXIS ACCELERATION



CHANNEL: TRRXG1 FILTER: CH. CLASS 60

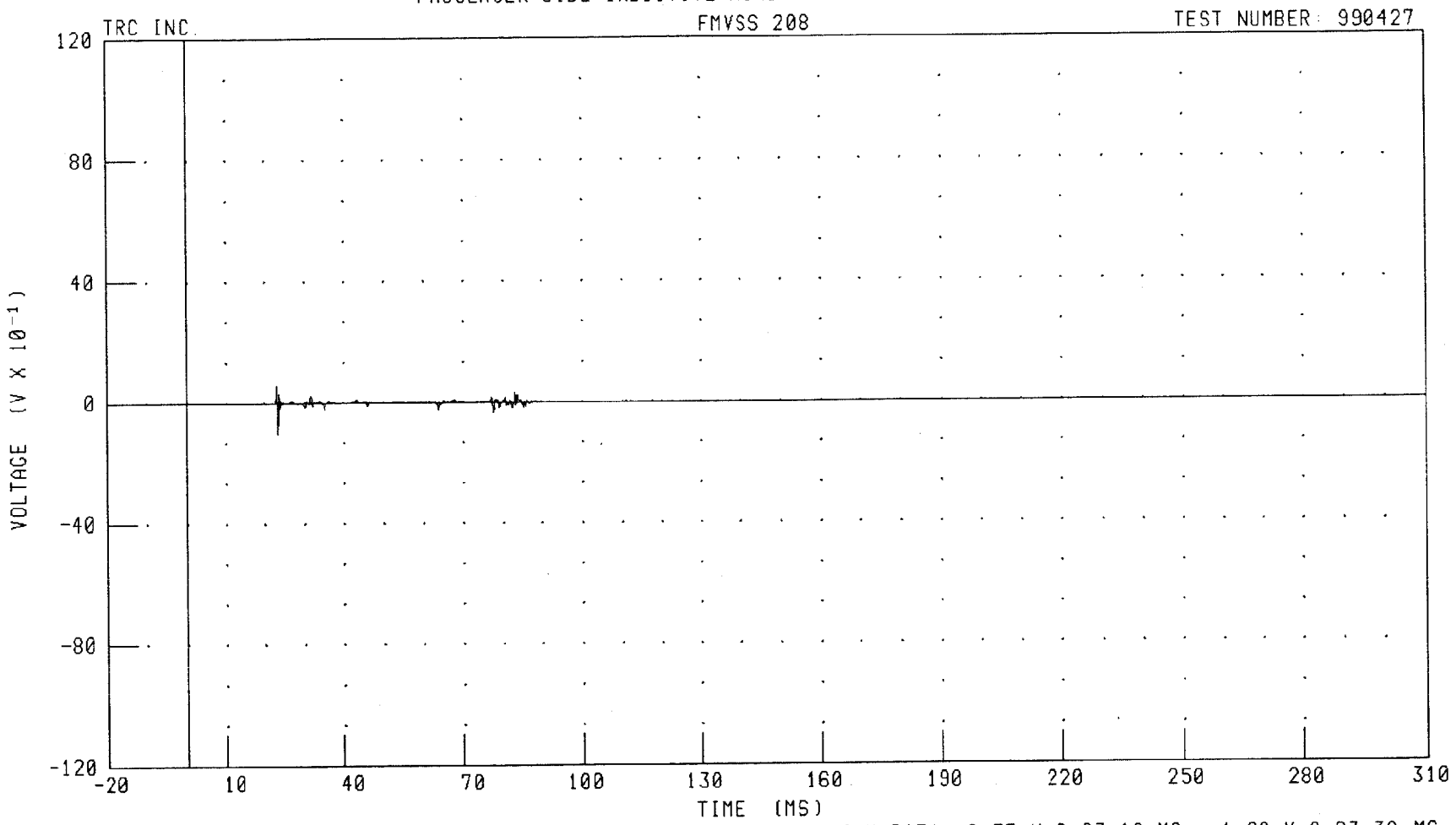
PEAK DATA: 2.15 G @ 100.08 MS; -26.62 G @ 66.08 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
DRIVER SIDE INDUCTIVE AIRBAG FIRE PICKUP



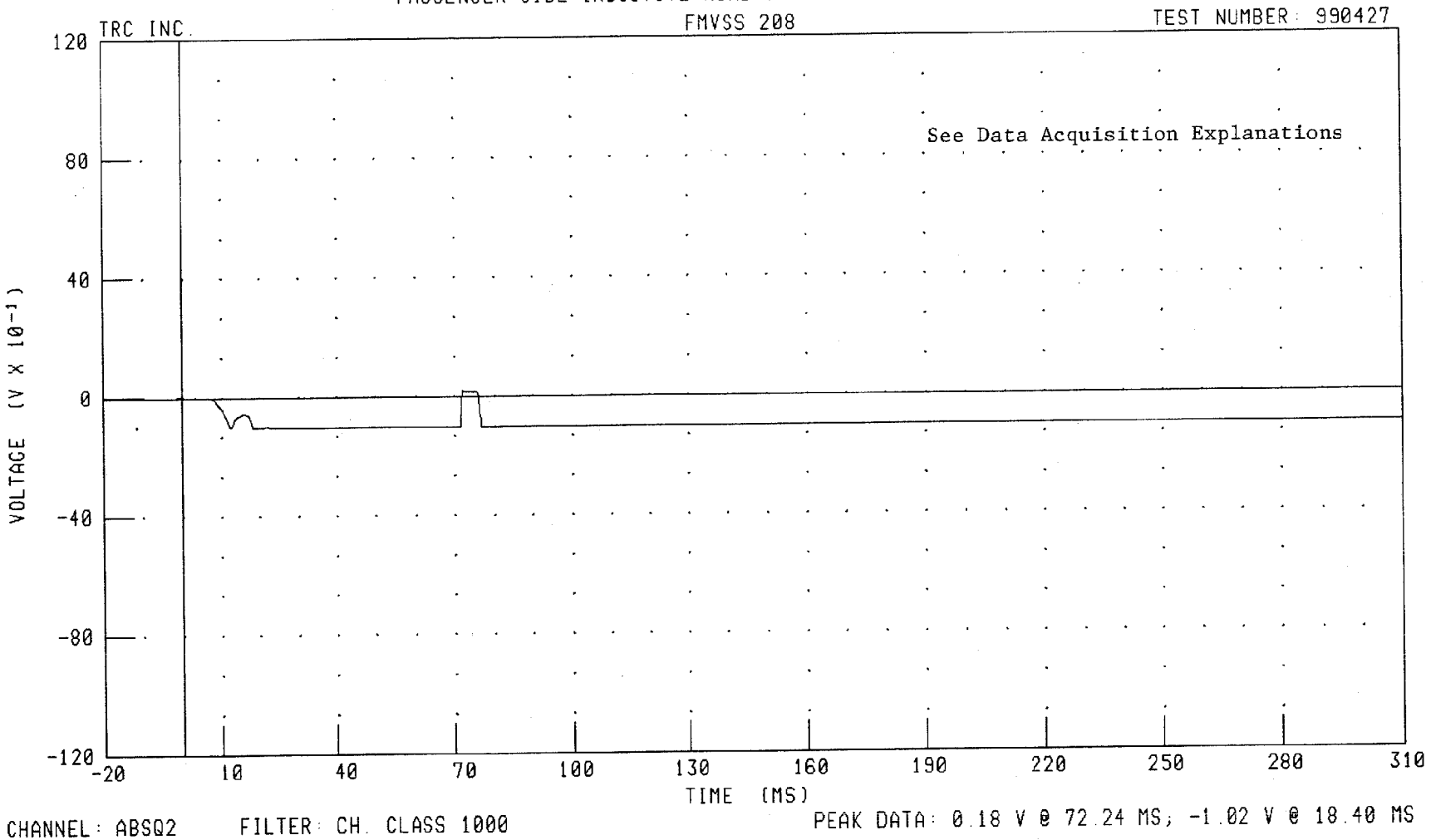
CHANNEL: ABSQ1 FILTER: CH. CLASS 1000 PEAK DATA: 1.02 V @ 23.52 MS; -1.02 V @ 23.20 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
PASSENGER SIDE INDUCTIVE AIRBAG FIRE PICKUP - PRIMARY



CHANNEL: ABSQ3 FILTER: CH. CLASS 1000 PEAK DATA: 0.57 V @ 23.12 MS; -1.02 V @ 23.36 MS

1999 ACURA RL INTO A FLAT FRONTAL BARRIER AT 25 MPH
PASSENGER SIDE INDUCTIVE AIRBAG FIRE PICKUP - SECONDARY
FMVSS 208



CHANNEL: ABSQ2 FILTER: CH. CLASS 1000 PEAK DATA: 0.18 V @ 72.24 MS; -1.02 V @ 18.40 MS

Appendix C

Miscellaneous Test Information

Vehicle Instrumentation Placement

Test Number 990427

Number	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
1	Left Brake Caliper	X	Endevco	7264-2000T	J23899	Rearward
2	Right Brake Caliper	X	Endevco	7264-2000T	J21533	Forward
3	Instrument Panel Center	X	Endevco	7264-2000T	J27678	Rearward
4	Engine Top	X	Endevco	7264-2000T	J22660	Forward
5	Engine Bottom	X	Endevco	7264-2000T	J26523	Forward
6	Vehicle Rear Center	Z	Endevco	7264-2000T	J27682	Up
7	Left Rear Seat Crossmember	X	Endevco	7264-2000T	J26887	Forward
8	Right Rear Seat Crossmember	X	Endevco	7264-2000T	J26952	Forward
9	Driver Airbag	N/A	Fluke	Y8101A	IP1	N/A
10	Passenger Airbag Secondary	N/A	Fluke	Y8101A	IP2	N/A
11	Passenger Airbag Primary	N/A	Fluke	Y8101A	IP3	N/A

Dummy Sign Convention

Accelerometers:	+X: Forward	
	+Y: Rightward	
	+Z: Downward	
Potentiometers:	+Chest longitudinal deflection:	Outward
Load cells:	+Femur force:	Tension
Neck load cells:	+X force:	Head rearward
	+Y force:	Head leftward
	+Z force:	Head upward (tension on neck)
	+X moment:	Left ear rotating toward left shoulder
	+Y moment:	Chin rotating toward chest
	+Z moment:	Chin rotating toward left shoulder

Filtering Data

J211 MAR95

Load Cell Barrier Forces Class 60

Vehicle Structural Accelerations Class 60

Occupant

Head Accelerometer Class 1000

Neck Class 60

Chest Accelerometer Class 180

Chest Deflection Class 180

Femur Force Class 600

Sternum Accelerometer Class 180

Lower Leg Class 600

Description Of Timing Marks On TRC High-Speed Film

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

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

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

1. Every frame will have **one** led appear in it. This indicates a *millisecond* pulse.

2. Every ten frames will have **two** leds appear in it. These indicate a *millisecond* pulse plus a *hundredth of a second* pulse.

3. Every one hundred frames will have **three** leds appear in it. These indicate a *millisecond* pulse, a *hundredth of a second* pulse, and a *tenth of a second* pulse.

TRANSDUCER INFORMATION

HYBRID III DUMMY SERIAL NO.: _168v_____; MFR.: _____; SEATING POSITION: __DR_____

PROJECT-SEGMENT NO.: _____097360 3030_____; ENGINEER: _____PG_____; TEST DATE: ____4-27-99_____

MNEMONIC PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NO.	SERIAL NO.	MFR.	SENSITIVITY	CAL DUE DATE	FULL SCALE (ENGR. UNITS) DESIRED	ACTUAL	DIRECTION OF POSITIVE POLARITY	CABLE NO.
HEDXG HAP	HEAD X-AXIS ACCEL.	7264	J19535	End.	.2649 mv/g at 10 volts	8-3-1999	400 g		Rear	J19535
HEDYG HLR	HEAD Y-AXIS ACCEL.	"	J19548	"	.2192 mv/g at 10 volts	"	400 g		Left	J19548
HEDZG HIS	HEAD Z-AXIS ACCEL.	"	J27913	"	.2527 mv/g at 10 volts	9-5-99	400 g		Up	J27913
NEKXF NFX*	NECK X-AXIS SHEAR FORCE	1716A	0853	Dento n.	1.7387 MV/V @ 2000 LBS	8-3-1999	900 Kg 2,000 lbs. 9,000 N			FX
NEKYF NFY*	NECK Y-AXIS SHEAR FORCE	"	"	"	1.6587 MV/V @2000 LBS	"	900 Kg 2,000 lbs. 9,000 N			FY
NEKZF NFZ*	NECK Z-AXIS AXIAL FORCE	"	"	"	1.2806 MV/V @3000 LBS	"	1300 Kg 3,000 lbs. 13,500 N			FZ
NEKXM NMX*	NECK MOMENT ABOUT X AXIS	"	"	"	1.6595 MV/V @2500 IN- LBS	"	30 Kgm 200 ft·lbs 275 N·m			MX
NEKYM NMY*	NECK MOMENT ABOUT Y AXIS	"	"	"	1.6596 MV/V @2500 IN-LBS	"	30 Kgm 200 ft·lbs 275 N·m			MY
NEKZM NMZ*	NECK MOMENT ABOUT Z AXIS	"	"	"	2.3663 MV/V @2500 IN-LBS	"	30 Kgm 200 ft·lbs 275 N·m			MZ

TRANSDUCER INFORMATION

HYBRID III DUMMY SERIAL NO.: _168v_____; MFR.: _____; SEATING POSITION: __DR_____

PROJECT-SEGMENT NO.: _____097360 3030_____; ENGINEER: _____PG_____; TEST DATE: ____4-27-99_____

MNEMONIC PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NO.	SERIAL NO.	MFR.	SENSITIVITY	CAL DUE DATE	FULL SCALE (ENGR. UNITS) DESIRED	ACTUAL	DIRECTION OF POSITIVE POLARITY	CABLE NO.
CSTXG CAP	CHEST X-AXIS ACCEL.	7264	J20011	End.	.2324 mv/g at 10 volts	8-3-1999	400 g		Forward	J20011
CSTYG CLR	CHEST Y-AXIS ACCEL.	"	J20001	"	.2709 mv/g at 10 volts	"	400 g		Left	J20001
CSTZG CIS	CHEST Z-AXIS ACCEL.	"	J20438	"	.2313 mv/g at 10 volts	"	400 g		Up	J20438
CSTXD CAPD	CHEST DEFLECTION	14CB1-2847	168	SERV	27.89 mv/v /in	8-3-1999	6 inch 150 mm			168
PEVXG PAP	PELVIS X-AXIS ACCEL.						400 g			
PEVYG PLR	PELVIS Y-AXIS ACCEL.						400 g			
PEVZG PIS	PELVIS Z-AXIS ACCEL.						400 g			
LFMF LF	LEFT FEMUR FORCE	2430	726	DENT	0.9495 mv/v at 3000 lbs.	8-3-1999	1300 Kg 3,000 lbs. 13,500 N			726
RFMF RF	RIGHT FEMUR FORCE	"	741	"	0.9030 mv/v at 3000 lbs.	"	1300 Kg 3,000 lbs. 13,500 N			741

TRANSDUCER INFORMATION

HYBRID III DUMMY SERIAL NO.: _169v_____; MFR.: _____; SEATING POSITION: __PASS_____

PROJECT-SEGMENT NO.: _____097360 3030_____; ENGINEER: _____PG_____; TEST DATE: ____4-27-99_____

MNEMONIC PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NO.	SERIAL NO.	MFR.	SENSITIVITY	CAL DUE DATE	FULL SCALE (ENGR. UNITS) DESIRED	ACTUAL	DIRECTION OF POSITIVE POLARITY	CABLE NO.
HEDXG HAP	HEAD X-AXIS ACCEL.	7264	J21935	End.	.2409 mv/g at 10 volts	8-3-1999	400 g		Rear	J21935
HEDYG HLR	HEAD Y-AXIS ACCEL.	"	J23912	"	.2827 mv/g at 10 volts	"	400 g		Left	J23912
HEDZG HIS	HEAD Z-AXIS ACCEL.	"	J23810	"	.2826 mv/g at 10 volts	"	400 g		Up	J23810
NEKXF NFX*	NECK X-AXIS SHEAR FORCE	1716	0106	Dento n.	1.7167 MV/V @ 2000 LBS	8-3-1999	900 Kg 2,000 lbs. 9,000 N			FX
NEKYF NFY*	NECK Y-AXIS SHEAR FORCE	"	"	"	1.6802 MV/V @2000 LBS	"	900 Kg 2,000 lbs. 9,000 N			FY
NEKZF NFZ*	NECK Z-AXIS AXIAL FORCE	"	"	"	1.2943 MV/V @3000 LBS	"	1300 Kg 3,000 lbs. 13,500 N			FZ
NEKXM NMX*	NECK MOMENT ABOUT X AXIS	"	"	"	1.6148 MV/V @2500 IN- LBS	"	30 Kgm 200 ft·lbs 275 N·m			MX
NEKYM NMY*	NECK MOMENT ABOUT Y AXIS	"	"	"	1.6205 MV/V @2500 IN-LBS	"	30 Kgm 200 ft·lbs 275 N·m			MY
NEKZM NMZ*	NECK MOMENT ABOUT Z AXIS	"	"	"	2.2982 MV/V @2500 IN-LBS	"	30 Kgm 200 ft·lbs 275 N·m			MZ

TRANSDUCER INFORMATION

HYBRID III DUMMY SERIAL NO.: _169v_____; MFR.: _____; SEATING POSITION: __PASS_____

PROJECT-SEGMENT NO.: _____097360 3030_____; ENGINEER: _____PG_____; TEST DATE: ____4-27-99_____

MNEMONIC PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NO.	SERIAL NO.	MFR.	SENSITIVITY	CAL DUE DATE	FULL SCALE (ENGR. UNITS) DESIRED	ACTUAL	DIRECTION OF POSITIVE POLARITY	CABLE NO.
CSTXG CAP	CHEST X-AXIS ACCEL.	7264	J23914	End.	.2528 mv/g at 10 volts	8-3-1999	400 g		Forward	J23914
CSTYG CLR	CHEST Y-AXIS ACCEL.	"	J23808	"	.2843 mv/g at 10 volts	"	400 g		Left	J23808
CSTZG CIS	CHEST Z-AXIS ACCEL.	"	J23774	"	.2405 mv/g at 10 volts	"	400 g		Up	J23774
CSTXD CAPD	CHEST DEFLECTION	14CB1-2847	169	SERV	28.26 mv/v /in	8-3-1999	6 inch 150 mm			169
PEVXG PAP	PELVIS X-AXIS ACCEL.						400 g			
PEVYG PLR	PELVIS Y-AXIS ACCEL.						400 g			
PEVZG PIS	PELVIS Z-AXIS ACCEL.						400 g			
LFMF LF	LEFT FEMUR FORCE	2430	96661	GSE	0.8816 mv/v at 3000 lbs.	8-3-1999	1300 Kg 3,000 lbs. 13,500 N			D105
RFMF RF	RIGHT FEMUR FORCE	"	96662	"	0.8605 mv/v at 3000 lbs.	"	1300 Kg 3,000 lbs. 13,500 N			709