

TRC TEST NUMBER: 010129

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V3609

V3609

Vehicle Research and Test Center

Moving Deformable Barrier into Moving 1997 Dodge Caravan at 35 mph

Centerline to Centerline

TRC Test Number 010129

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Section 1.0

Purpose and Test Procedure

Purpose

This 56 km/h centerline to centerline moving deformable barrier-to-vehicle impact test was conducted for National Highway Transportation and Safety Administration (NHTSA) and Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc.). This test is a moving deformable barrier impacting a moving 1997 Dodge Caravan.

The purpose of this test was to determine the response of the subject vehicle impacting another vehicle, simulated by a moving deformable barrier with a new contour compared to a baseline test. Each vehicle was traveling at 56 km/h, impacting centerline to centerline.

Test Procedure

This test was conducted per NHTSA and VRTC instructions. Data was obtained relative to FMVSS 208, "Occupant Protection."

The subject vehicle, a 1997 Dodge Caravan, was instrumented with seven (7) longitudinal axis accelerometers, three (3) lateral axis accelerometers, and four (4) vertical axis accelerometers, and its specified impact velocity range was 55.5 to 57.1 km/h.

The bullet vehicle, a moving deformable barrier, was instrumented with two (2) accelerometers to measure longitudinal axis accelerations, three (3) accelerometers to measure lateral accelerations, two (2) accelerometer to measure vertical axis acceleration, two (2) rate gyros to measure pitch and yaw, and forty-four (44) triaxial load cells to measure barrier face forces. Its specified impact velocity range was 55.5 to 57.1 kph.

The bullet vehicle's centerline was aligned with the subject vehicle's centerline. This test represented a full frontal car to car moving test. The moving deformable barrier had a similar mass, but a new face contour, compared to the baseline test performed June 19, 2000.

One (1) 50th percentile adult male Hybrid III dummy and one (1) 5th percentile adult female dummy were placed in the subject vehicle's left front and right front designated seating positions, respectively. Each dummy had accelerometers in the head, chest, and pelvis to measure longitudinal, lateral, and vertical accelerations; 6-axis upper neck load cells to measure forces and moments in the neck; uniaxial femur load cells in the left and right femurs to measure axial forces; and a potentiometer in the chest to measure chest deflection. The driver dummy was also instrumented with upper and lower tibia force and moment load cells. Each dummy was restrained with a 3-point unbelt.

The one hundred-ninety-nine (199) data channels were digitally sampled and recorded at 12,500 samples per second and processed per SAE J211 March 1995, except for the barrier load cell sign convention (See Report Sign Convention in Appendix D).

The crash event was recorded by one (1) real-time panning motion picture camera and ten (10) high-speed motion picture cameras.

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

Section 2.0

Moving Deformable Barrier into Car Centerline to Centerline Test Summary

Test Results Summary

This 56 kph full frontal centerline to centerline moving deformable barrier-to-vehicle impact test was conducted by TRC Inc. on January 29, 2001.

The subject test vehicle, a 1997 Dodge Caravan, was equipped with a 6-cylinder, transverse engine, automatic transmission, power steering, and power brakes. The subject vehicle's test weight was 2138.8 kg and its impact speed was 56.8 km/h. The bullet vehicle, a moving deformable barrier with new face contour, was to represent a Plymouth Neon. The moving deformable barrier's test weight was 1377.2 kg and its impact speed was 56.2 kph. The subject vehicle's maximum static crush was 620 millimeters. The subject vehicle's barrier face was measured with TRC's Faro arm.

The subject vehicle driver dummy's 36 ms Head Injury Criteria (HIC) was 848. The subject vehicle driver dummy's 15 ms HIC was 709. The subject vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 54.4 g. The subject vehicle driver dummy's chest deflection was 32 mm. The subject vehicle's driver dummy's left and right femur forces were 5156 N and 5198 N, respectively. The driver dummy's neck injury calculations were as follows: NTF, 0.37; NTE, 0.40; NCF, 0.01; NCE, 0.18. The driver dummy's tibia indexes were as follows: left upper, 0.46; right upper, 0.86; left lower 1.11; and right lower, 1.08.

The subject vehicle right front passenger dummy's 36 ms HIC was 232. The subject vehicle right front passenger dummy's 15 ms HIC was 126. The subject vehicle right front passenger dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 40.5 g. The subject vehicle right front passenger dummy's chest deflection was 17 mm. The subject vehicle's right front passenger dummy's left and right femur forces were 6981 N and 4839 N, respectively. The passenger dummy's neck injury calculations were as follows: NTF, 0.42; NTE, 0.14; NCF, 0.78; NCE, 0.18.

Data Acquisition Explanation

The motion picture film time zero event strobes fired 16 milliseconds before the first impact event contact.

The driver's left upper tibia moment about Y-axis load cell, TBLYM1, recorded questionable data after approximately 75 ms.

The right front passenger's neck Z-axis axial force load cell, NEKZF2, and right femur force load cell, RFMZ2, recorded intermittent data spikes.

The engine top X-axis accelerometer, ENGXG1, exceeded the data channel's full scale at approximately 15 ms.

The following moving barrier force load cells did not return to zero after impact:

A1 X-axis force, BA1XF
A1 Z-axis force, BA1ZF
A3 X-axis force, BA3XF
B3 X-axis force, BB3XF
D3 Z-axis force, BD3ZF
H1 X-axis force, BH1XF
H2 X-axis force, BH2XF
H4 X-axis force, BH4XF
I1 Y-axis force, BI1YF
J1 X-axis force, BJ1XF
J2 X-axis force, BJ2XF
J3 X-axis force, BJ3XF
K1 X-axis force, BK1XF
K1 Y-axis force, K1YF
K1 Z-axis force, BK1ZF
K3 X-axis force, BK3XF
K4 X-axis force, BK4XF
E2 X-axis force, BE2XF
B1 X-axis force, BB1XF
K2 X-axis force, BK2XF

Table 1 Crash Test Summary

Test type:	Full Front Centerline to Centerline	
Test date:	01/29/01	
Test time:	1455	
Ambient temperature:	4° C	
Target vehicle:	1997 Dodge Caravan	
Target vehicle test weight:	2138.8 kg	
Bullet vehicle:	Moving Deformable Barrier	
Bullet vehicle test weight:	1377.2 kg	
Impact angle: ¹	0°	
Impact velocity: ²	Target vehicle = 56.8 kph Moving deformable barrier = 56.2 kph	
Target vehicle's maximum static crush:	620 mm	
Target vehicle dummies:	Driver #090	Passenger #416
Type:	572 E (50% male)	572 O (5% female)
Location:	Left front	Right front
Restraint:	3-point unbelt/airbag	3-point unbelt/airbag
Total number of data channels:	27	18
Number of cameras:		
High-speed	10	
Real-time	1	

¹ With respect to tow track centerline.

² Speed trap measurement ($\pm$.08 kph accuracy)

Table 2 Target Test Vehicle Information

Vehicle manufacturer:	Chrysler Corporation		
Make/model:	Dodge/ Caravan		
VIN:	2B4GP44R7VR189055		
Model year:	1997		
Body style:	Van		
Color:	White		
Engine data:			
Type:	Transverse		
Cylinders:	6		
Displacement:	3.3 liters		
Transmission data:	<u> </u> Speed, <u> </u> Manual, <u> X </u> Automatic, <u> X </u> FWD, <u> </u> RWD, <u> </u> 4WD		
Date vehicle received:	1/19/01		
Odometer reading:	60243		
Dealer's name and address:	N/A		
<u>Accessories:</u>			
Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	No	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None	Power door locks	Yes
<u>Certification data from vehicle's label:</u>			
Vehicle manufactured by:	Chrysler Corporation		
Date of manufacture:	10/96		
VIN:	2B4GP44R7VR189055		
GVWR:	5350 lbs.	(2427 kg.)	
GAWR: Front:	2746 lbs.	(1246 kg.)	
Rear:	2746 lbs.	(1246 kg.)	

Table 2 Target Test Vehicle Information, Cont'd.

Tires on vehicle (mfr., line, size): Goodyear (rear), Ultrex II (front) P215/65R15

Tire pressure with maximum capacity vehicle load:	Front:	35 psi	(240 kPa)
	Rear:	44 psi	(303 kPa)

Spare tire (mfr., line, size): Goodyear Temporary, T145/90D16

Type of seats:	Front:	Bucket
	Middle:	Bucket
	Rear:	Bench

Type of front seat backs: Manually adjustable

Maximum width: 1928 mm

Wheelbase: 3040 mm

Location of "Recommended Tire Pressure" label:

The label was located on the glove box.

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

Recommended tire size: P215/65R15

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

Seating capacity:	Front:	2
	Middle:	2
	Rear:	3
	Total:	7

Test vehicle attitude:

Delivered attitude:	LF	772 mm;	RF	767 mm;	LR	772 mm;	RR	762 mm
Pre-test attitude:	LF	737 mm;	RF	727 mm;	LR	720 mm;	RR	725 mm
Post-test attitude:	LF	828 mm;	RF	768 mm;	LR	773 mm;	RR	717 mm

Table 2 Target Test Vehicle Information, Cont'd.

Delivered Weight:

Right Front:	490.0 kg	Right Rear:	386.5 kg
Left Front:	564.5 kg	Left Rear:	376.5 kg
Total Front Weight:	1054.5 kg	(58.0% of total vehicle weight)	
Total Rear Weight:	763.0 kg	(42.0% of total vehicle weight)	
Total Delivered Weight:	1817.5 kg		

Target test weight:¹

Front:	1159.0 kg
Rear:	979.0 kg
Total:	2138.0 kg

Weight of test vehicle with required dummies and 136.0 kg cargo weight:

Right front	550.2 kg	Right rear	498.0 kg
Left front	606.6 kg	Left rear	484.0 kg
Total front weight	1156.8 kg	(54.1% of total vehicle weight)	
Total rear weight	982.0 kg	(45.9% of total vehicle weight)	
Total test weight	2138.8 kg		

Weight of ballast secured in cargo area: 20 kg in engine
52 kg behind passenger seat

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 1396 mm

¹ Provided by VRTC to match a previous test's weight.

Table 3 Moving Deformable Barrier Information

Target test weight = 1377 kg (Based on the test weight of the Plymouth Neon)

Weight of test vehicle

Right front	447.4 kg	Right rear	250.8 kg
Left front	319.4 kg	Left rear	359.6 kg
Total front weight	766.8 kg	(55.7% of total vehicle weight)	
Total rear weight	610.4 kg	(44.3% of total vehicle weight)	
Total test weight	1377.2 kg		

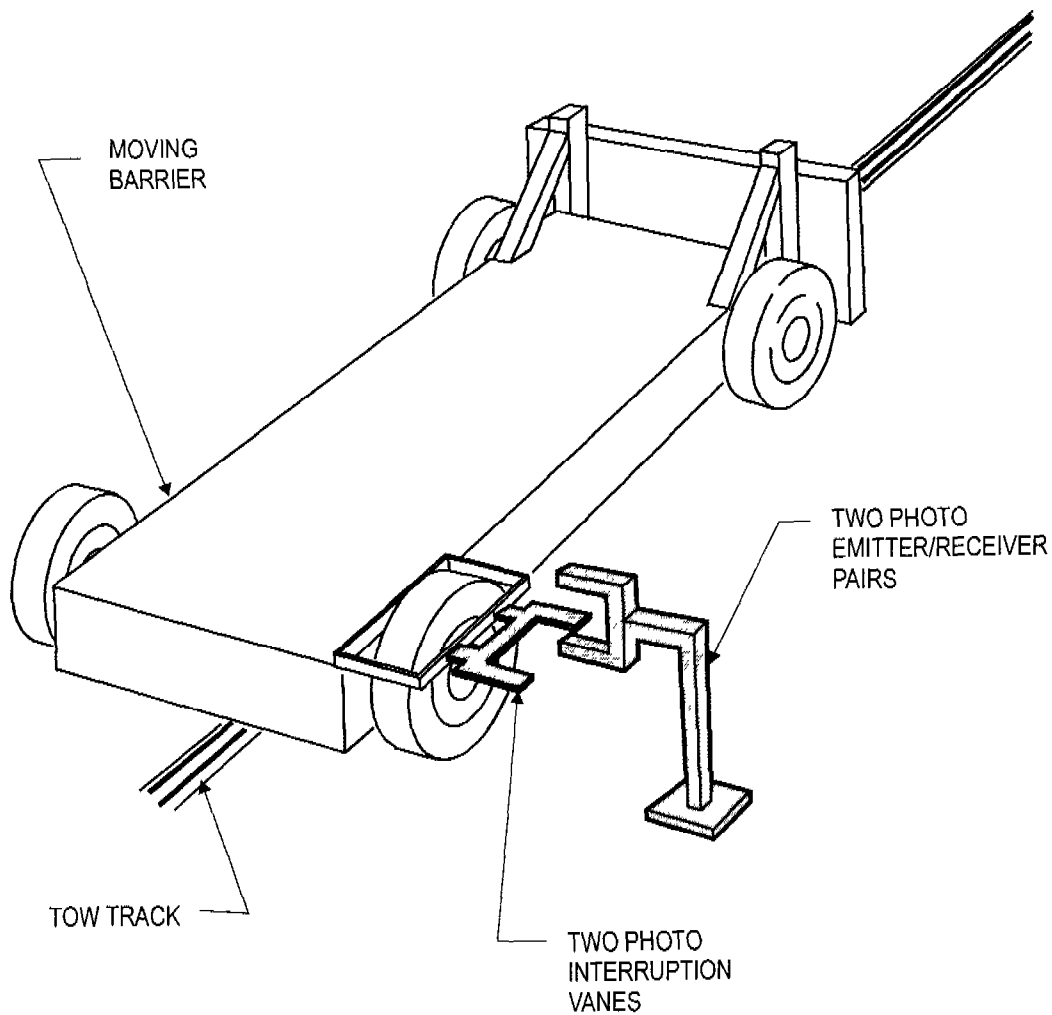
CG rearward of front wheel centerline: 1106 mm

Table 4 Post-Impact Data

Test number:	010129
Date of test:	01/29/01
Time of test:	1455
Type of test:	Full Front Centerline to Centerline
Impact angle:	0°
Ambient temperature at impact area:	4° C
Impact velocity:	
Target vehicle:	56.8 kph
Bullet vehicle:	56.2 kph
	(Specified range = 55.5 to 57.1 kph)
Distance from vehicle to vehicle:	
Entering trap	610 mm
Exiting trap	51 mm
Intended impact point:	Centerline to centerline (0 mm offset)
Actual impact point:	50 mm right offset ¹

¹ Approximate from film analysis.

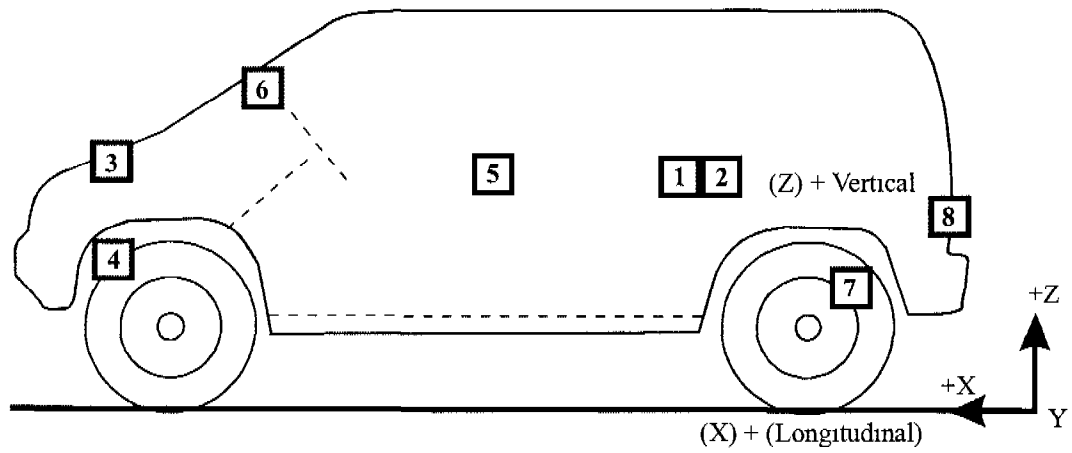
Figure 1 Impact Velocity Measurement System



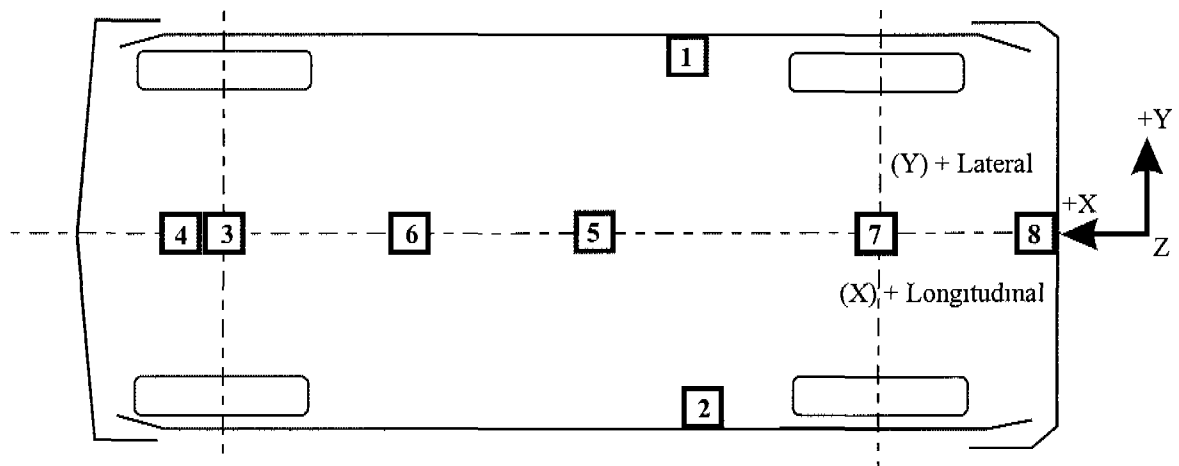
The final vane clears the final emitter/receiver pair 51 millimeters before impact.

The vanes have 610-millimeter spacing.

Figure 2 Target Vehicle Accelerometer Placement



Side View



Bottom View

Table 5 Target Vehicle Accelerometer Locations and Data Summary

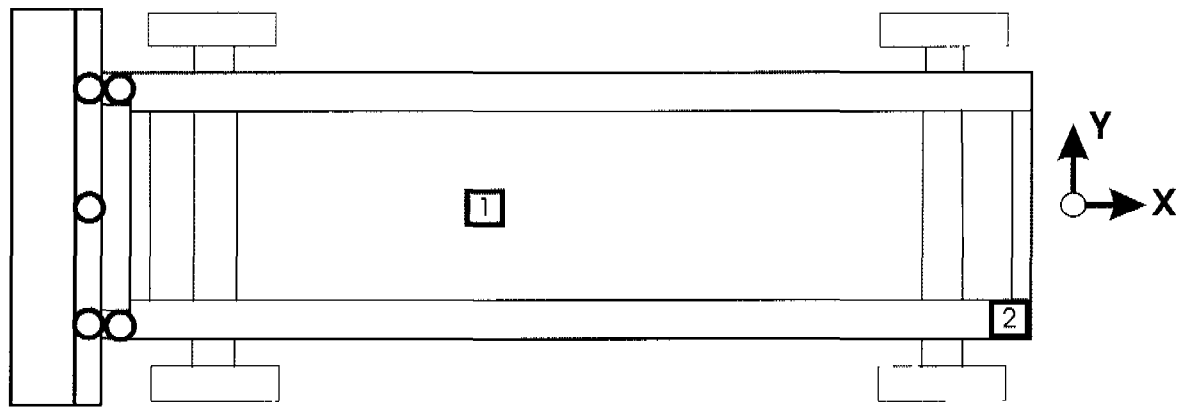
TEST NUMBER: 010129		POSITIVE DIRECTION		NEGATIVE DIRECTION	
No. LOCATION					
1 LEFT REAR SEAT					
CROSSMEMBER					
LONGITUDINAL		3.7 g	@ 141.0 ms	26.3 g	@ 49.1 ms
LATERAL		6.0 g	@ 36.9 ms	4.3 g	@ 44.0 ms
VERTICAL		9.8 g	@ 35.1 ms	10.2 g	@ 39.0 ms
RESULTANT		26.7 g	@ 59.4 ms		
2 RIGHT REAR SEAT					
CROSSMEMBER					
LONGITUDINAL		3.4 g	@ 140.7 ms	28.5 g	@ 33.4 ms
LATERAL		3.6 g	@ 38.2 ms	3.7 g	@ 42.9 ms
VERTICAL		7.4 g	@ 85.7 ms	10.5 g	@ 46.2 ms
RESULTANT		29.4 g	@ 63.4 ms		
3 ENGINE TOP					
LONGITUDINAL ¹		104.0 g	@ 17.7 ms	149.3 g	@ 29.4 ms
4 ENGINE BOTTOM					
LONGITUDINAL		38.6 g	@ 50.8 ms	99.2 g	@ 31.4 ms
5 VEHICLE CENTER OF GRAVITY					
LONGITUDINAL		4.0 g	@ 141.1 ms	32.1 g	@ 58.6 ms
LATERAL		10.3 g	@ 35.6 ms	8.2 g	@ 41.6 ms
VERTICAL		44.6 g	@ 55.1 ms	48.1 g	@ 39.5 ms
RESULTANT		52.0 g	@ 39.5 ms		

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

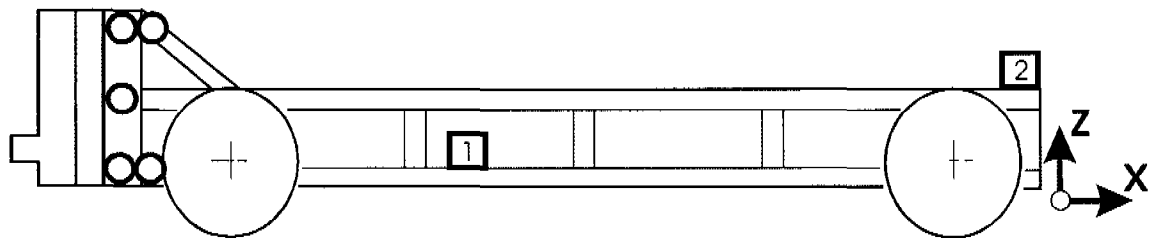
TEST NUMBER: 010129 No. LOCATION		POSITIVE DIRECTION		NEGATIVE DIRECTION	
6	INSTRUMENT PANEL LONGITUDINAL	7.0 g	@ 20.2 ms	48.6 g	@ 23.3 ms
7	REAR AXLE LONGITUDINAL	15.6 g	@ 122.8 ms	27.5 g	@ 60.5 ms
8	VEHICLE REAR CENTER VERTICAL	10.6 g	@ 44.1 ms	13.8 g	@ 37.3 ms

¹ See DATA ACQUISITION EXPLANATIONS

Figure 3 Moving Deformable Barrier Accelerometer Placement



TOP VIEW



SIDE VIEW

Table 6 Moving Deformable Barrier Accelerometer Locations and Data Summary

TEST NUMBER: 010129		POSITIVE		NEGATIVE	
No. LOCATION		DIRECTION		DIRECTION	
1	BARRIER CENTER				
	OF GRAVITY				
	LONGITUDINAL	0.7 g	@ 133.7 ms	63.4 g	@ 34.3 ms
	LATERAL	15.5 g	@ 54.2 ms	14.2 g	@ 40.7 ms
	VERTICAL	48.6 g	@ 34.6 ms	64.7 g	@ 40.9 ms
	RESULTANT	80.1 g	@ 34.5 ms		
2	LEFT REAR FRAME				
	LONGITUDINAL	1.4 g	@ 141.8 ms	66.3 g	@ 33.0 ms
	LATERAL	15.2 g	@ 44.2 ms	13.4 g	@ 35.9 ms

Section 3.0

Summary of FMVSS 208 Data

Table 7 Target Vehicle Dummy Injury Criteria

<u>Maximum Acceleration</u>							
	<u>Head</u>				<u>Chest</u>		
	X	Y	Z	R	X	Y	Z
Driver	-80.5 g	-17.9 g	-13.6 g	82.5 g	-54.8 g	-3.5 g	-13.8 g
Passenger	-63.9 g	-23.3 g	-30.9 g	67.4 g	-108.8 g	-8.8 g	-18.2 g

<u>Maximum Femur Compressive Force</u>		
	<u>Left Femur</u>	<u>Right Femur</u>
Driver	5156 N	5198 N
Passenger	6981 N	4839 N

<u>Head Injury Criteria¹</u>			
	36 ms HIC	Time t ₁	Time t ₂
Driver	719	61.6 ms	84.9 ms
Passenger	232	49.1 ms	85.1 ms
	15 ms HIC	Time t ₁	Time t ₂
Driver	709	65.9 ms	80.9 ms
Passenger	126	68.2 ms	83.2 ms

<u>Chest Maximum Resultant Acceleration²</u>			
	Acceleration	Time t ₁	Time t ₂
Driver	54.4 g	68.3 ms	71.4 ms
Passenger	40.5 g	57.7 ms	60.7 ms

<u>Maximum Chest Deflection</u>	
Driver	32 mm
Passenger	17 mm

¹ As defined in FMVSS No. 208

² Defined as equal to or exceeding 0.003 sec. duration

Table 7 Target Vehicle Dummy Injury Criteria, Cont'd.

Neck Injury Calculations (NIJ)¹

	NTF	NTE	NCF	NCE
Driver	0.37	0.40	0.01	0.18
Passenger	0.42	0.14	0.78	0.18

Neck Load Cell Maximums⁴

Forces

	+X	-X	+Y	-Y	+Z	-Z
Driver	331.6 N	-150.3 N	172.6 N	-44.6 N	2289.9 N	-68.4 N
Passenger	1252.0 N	-76.7 N	456.3 N	-69.1 N	327.6 N ³	-1001.7 N ³

Moments

	+X	-X	+Y	-Y	+Z	-Z
Driver	8.3 Nm	-13.7 Nm	20.8 Nm	-25.9 Nm	20.5 Nm	-8.9 Nm
Passenger	5.6 Nm	-23.7 Nm	121.9 Nm	-8.0 Nm	23.7 Nm	-4.7 Nm

Calculated Neck Y-Axis Moment Occipital Condyle⁴

	+Y	-Y
Driver	15.5 Nm	-24.9 Nm
Passenger	99.7 Nm	-8.1 Nm

Tibia Index

	Upper left	Lower left	Upper right	Lower right
Driver	0.46	1.11	0.86	1.08

¹ As defined in FMVSS No. 208

² Defined as equal to or exceeding 0.003 sec. duration

³ See Data Acquisition Explanations

⁴ See Report Sign Convention in Appendix D

Table 8 Target Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	<u>Driver</u>	<u>Passenger</u>
Head	Airbag	Airbag
Chest	Airbag	Airbag
Abdomen	Airbag	Airbag
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door opening:

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

Seat movement:

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

Glazing damage: The entire windshield was cracked.

Other notable impact effects: None

Section 4.0

Vehicle, Occupant, and Camera Measurements

Target Vehicle Dummy Kinematic Summary

Driver Dummy

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

Right Front Passenger Dummy

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

Figure 4 Target Vehicle Dummy Measurement Locations for Front Seat Occupants

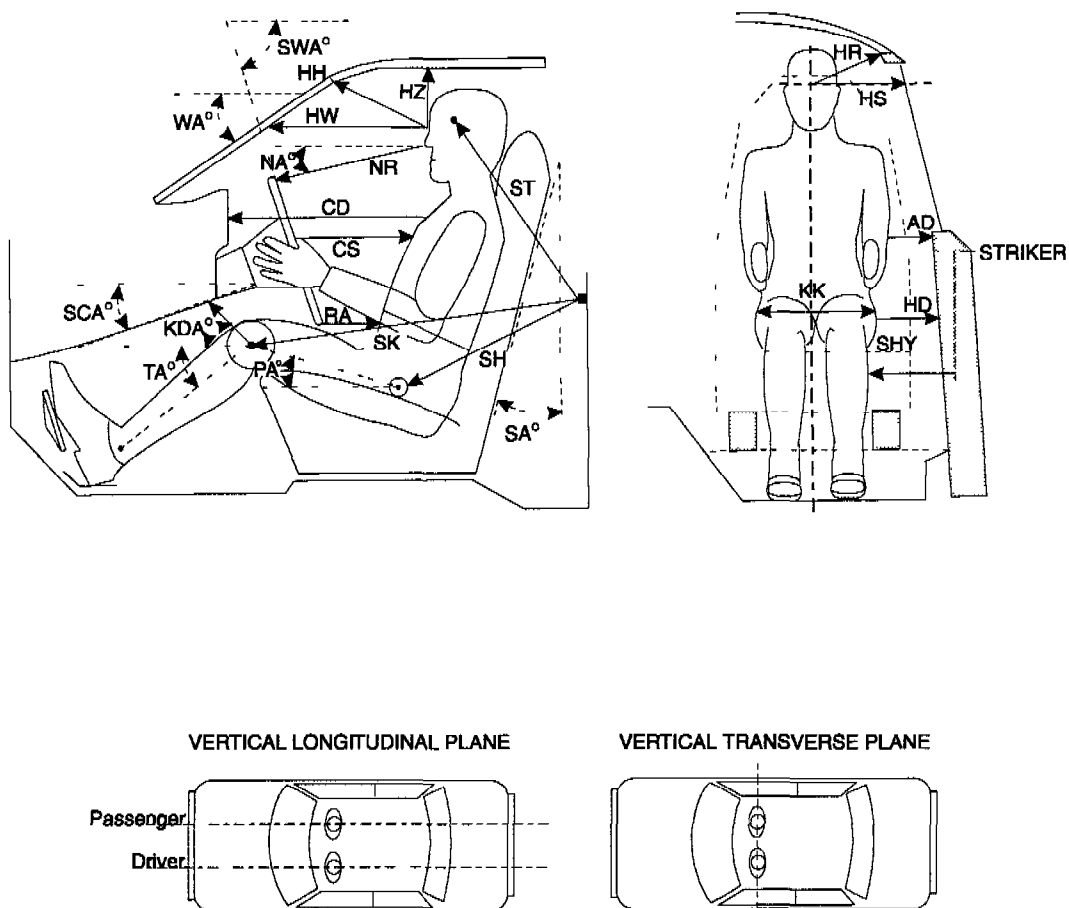


Table 9 Target Vehicle Dummy Measurement Data for Front Seat Occupants

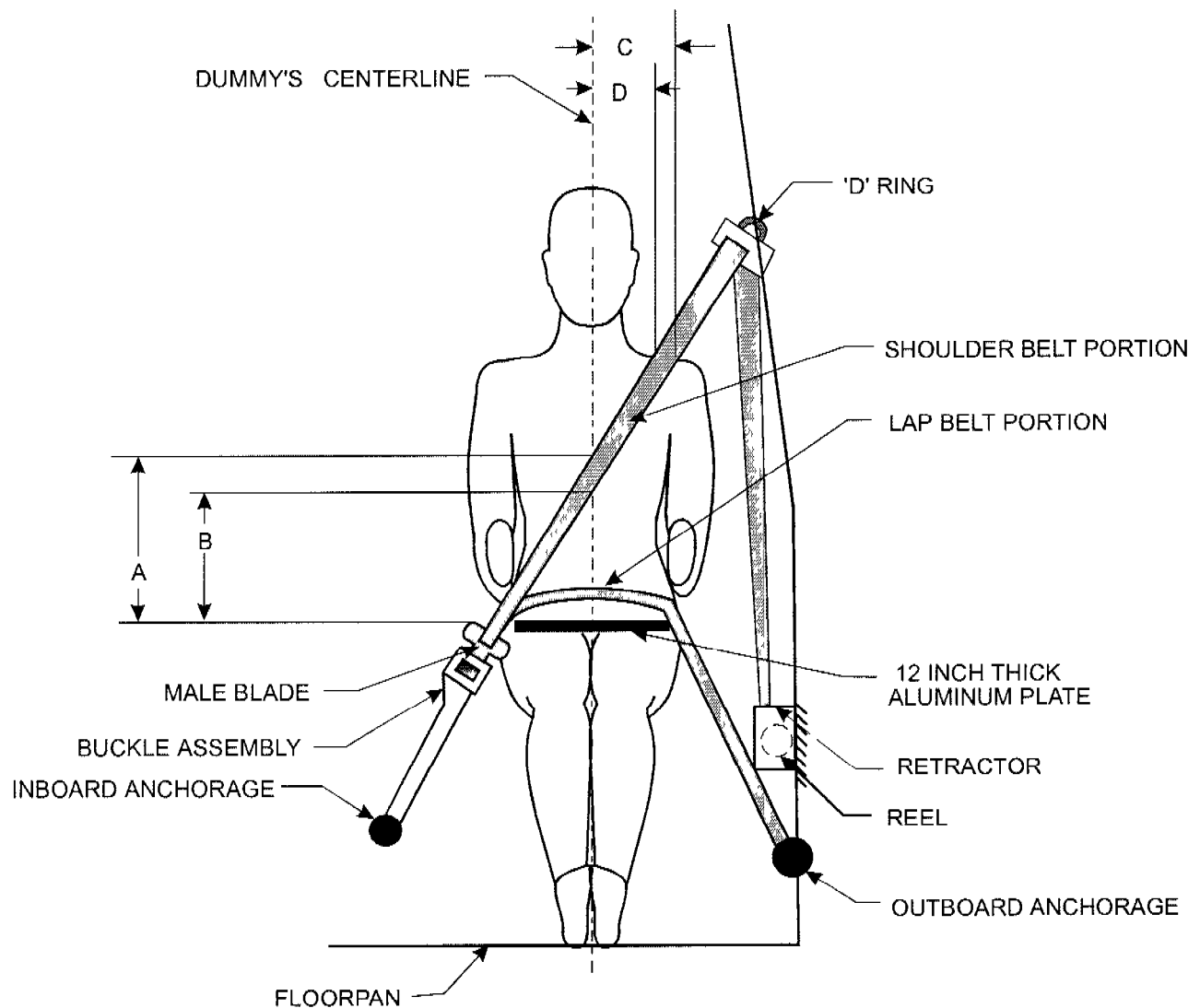
<u>Designation</u>	<u>Type of Measurement</u>	<u>Driver (Serial #090)</u>	<u>Passenger (Serial #416)</u>
WA	Windshield angle	28.8°	N/A
SWA	Steering wheel angle	64°	NA
SCA	Steering column angle	26°	NA
SA	Seat back angle	26°	21°
HZ ²	Head to roof	233 mm	223 mm
HH	Head to header	362 mm	283 mm
HW	Head to windshield	650 mm	622 mm
HR	Head to side header	238 mm	244 mm
NR	Nose to rim	392 mm	NA
NA	Nose to rim angle	11°	NA
CD	Chest to dash	570 mm	435 mm
CS	Steering wheel to chest	290 mm	NA
RA	Rim to abdomen	170 mm	NA
KDL	Left knee to dash	185 mm	114 mm
KDR	Right knee to dash	188 mm	112 mm
KDA	Outboard knee to dash angle	25.5°	19.7°
PA	Pelvic angle	25.1°	18.8°
TA	Tibial angle	63.6°	78°
KK	Knee to knee	310 mm	235 mm
ST ¹	Striker to head	635 mm	622 mm
	Striker to head angle	-80.2°	-69.3°
SK	Striker to knee	625 mm	720 mm
	Striker to knee angle	-9.4°	-9.5°
SH	Striker to H-point	244 mm	371 mm
	Striker to H-point angle	-6.7°	-7.2°
SHY	Striker to H-point (Y dir.)	222 mm	272
HS	Head to side window	332 mm	335 mm
HD	H-point to door	132 mm	162 mm
AD	Arm to door	144 mm	158 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.

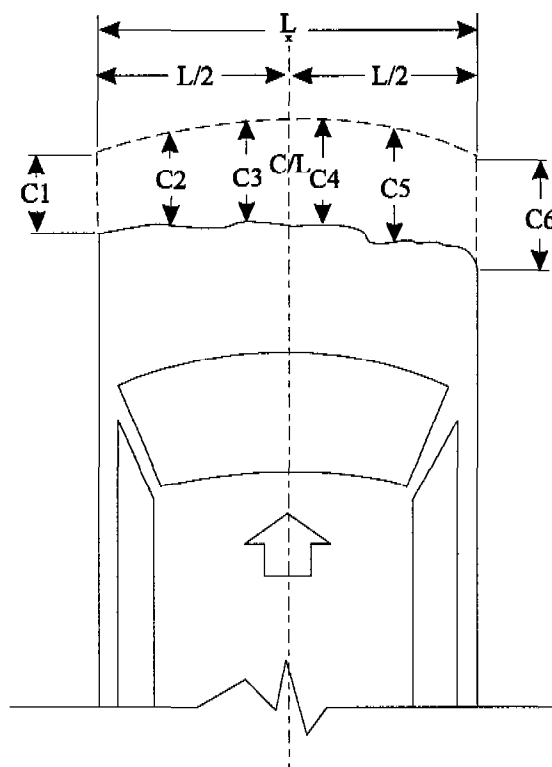
² Passenger's measurement was taken to the visor.

Figure 5 Target Vehicle Seat Belt Positioning Data



	Driver Dummy	Passenger Dummy
A - Top surface of aluminum plate to belt upper edge	335 mm	280 mm
B - Top surface of aluminum plate to belt lower edge	256 mm	199 mm
C - Dummy centerline to outer edge of belt at chest flesh top	102 mm	96 mm
D - Dummy centerline to inner edge of belt at chest flesh top	43 mm	44 mm
E - Dummy centerline to intersection of upper torso belt and lap belt, mm	310 mm	305 mm

Figure 6 Target Vehicle Crush with Bumper



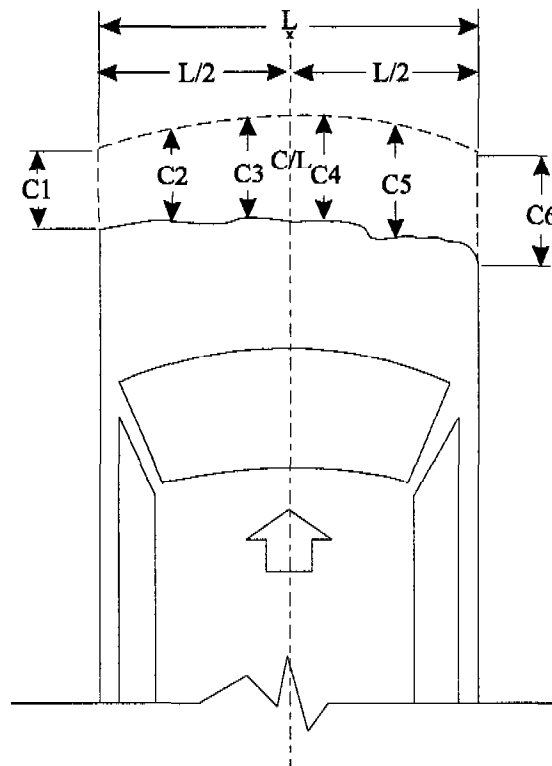
NOTES: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 1997 Dodge Caravan

	Pre-test	Post-test*	Crush*
L	1524 mm		
C1	5150 mm	N/A mm	N/A mm
C2	5273 mm	N/A mm	N/A mm
C3	5316 mm	N/A mm	N/A mm
C4	5316 mm	N/A mm	N/A mm
C5	5273 mm	N/A mm	N/A mm
C6	5150 mm	N/A mm	N/A mm
CL	5320 mm	N/A mm	N/A mm

* At impact, target vehicle bumper fascia disengaged from the vehicle and was lodged into the moving barrier front.

Figure 7 Target Vehicle Crush without Bumper



NOTES: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 1997 Dodge Caravan

	Pre-test	Post-test*	Crush*
L	1524 mm		
C1	5080 mm	4595 mm	485 mm
C2	5201 mm	4595 mm	606 mm
C3	5236 mm	4616 mm	620 mm
C4	5236 mm	4636 mm	600 mm
C5	5201 mm	4640 mm	561 mm
C6	5080 mm	4560 mm	520 mm
CL	5240 mm	4620 mm	620 mm

* Measurements were taken from the bumper beam.

Figure 8 Target Vehicle Pre-test and Post-test Measurement Points

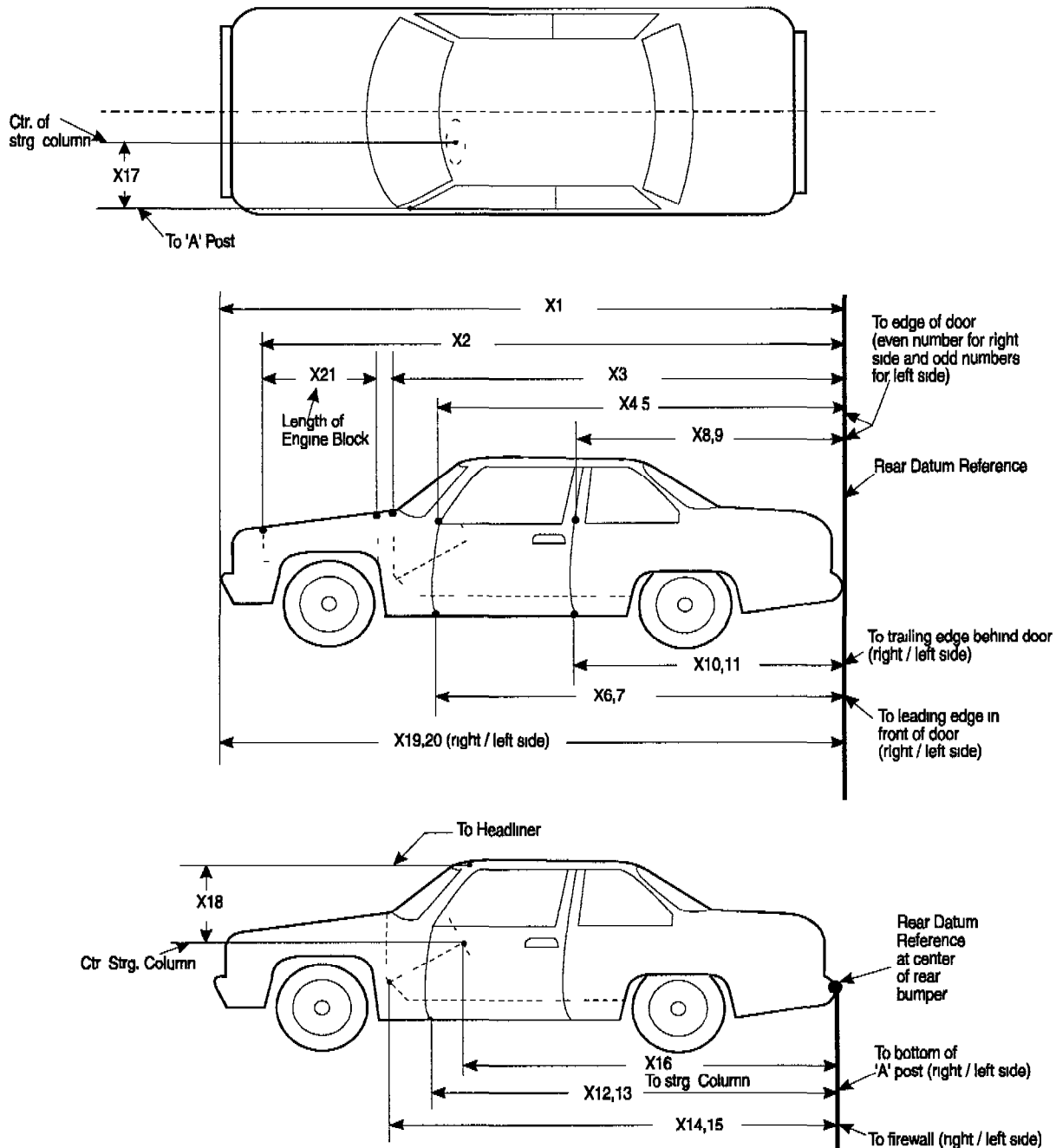


Table 10 Target Vehicle Measurements

Vehicle Make/Model: Dodge Caravan

Test Number: 010129

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline ¹	5240 mm	4620 mm	620 mm
X2	Rear surface of vehicle to front of engine block	4775 mm	4370 mm	405 mm
X3	Rear surface of vehicle to firewall	4588 mm	4550 mm	38 mm
X4	Rear surface of vehicle to upper leading edge of right door	3903 mm	3903 mm	0 mm
X5	Rear surface of vehicle to upper leading edge of left door	3911 mm	3911 mm	0 mm
X6	Rear surface of vehicle to lower leading edge of right door	3878 mm	3888 mm	-10 mm
X7	Rear surface of vehicle to lower leading edge of left door	3890 mm	3902 mm	-12 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2925 mm	2922 mm	3 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2931 mm	2932 mm	-1 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2925 mm	2939 mm	-14 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2936 mm	2950 mm	-14 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3880 mm	3870 mm	10 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3883 mm	3890 mm	-7 mm
X14	Rear surface of vehicle to firewall - right side	4427 mm	4390 mm	37 mm
X15	Rear surface of vehicle to firewall - left side	4412 mm	4404 mm	8 mm
X16	Rear surface of vehicle to steering wheel center	3487 mm	3466 mm	21 mm
X17	Center of steering column to "A" post	307 mm	302 mm	5 mm
X18	Center of steering column to headliner	470 mm	400 mm	70 mm
X19	Rear surface of vehicle to right side of front bumper ¹	5080 mm	4560 mm	520 mm
X20	Rear surface of vehicle to left side of front bumper ¹	5080 mm	4595 mm	485 mm
X21	Length of engine block	420 mm	420 mm	0 mm

¹ Measurements were taken from the bumper beam.

Table 11 Target Vehicle Toe Pan Intrusion Measurements

Intrusion of toe pan at five locations for each front seat position.¹

Left Side

	Pre-Test			Post-Test			Intrusion		
	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
Point 1	1280	N/A	377	1212	N/A	470	68	N/A	-93
Point 2	1282	N/A	385	1175	N/A	466	107	N/A	-81
Point 3	853	N/A	386	845	N/A	472	8	N/A	-86
Point 4	830	N/A	375	825	N/A	452	5	N/A	-77
Point 5	1085	N/A	380	1047	N/A	388	38	N/A	-8

Right Side

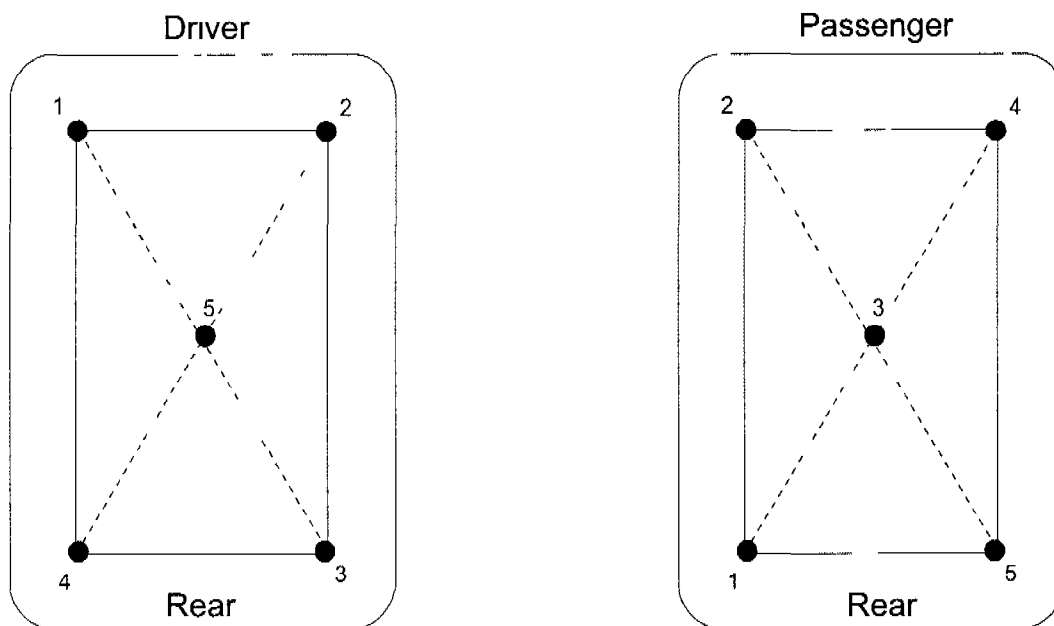
	Pre-Test			Post-Test			Intrusion		
	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
Point 1	837	N/A	392	878	N/A	427	-41	N/A	-35
Point 2	1278	N/A	383	1145	N/A	482	133	N/A	-99
Point 3	1094	N/A	382	1050	N/A	347	44	N/A	35
Point 4	1274	N/A	369	1178	N/A	440	96	N/A	-71
Point 5	822	N/A	380	815	N/A	407	7	N/A	-27

+X: Forward of reference point behind the driver and passenger seats

+Y Left from vehicle longitudinal centerline

+Z Up from ground

Toeboard Measurements¹



¹ The numbering order of the 5 points on each side is similar to the baseline test report (06/19/00)

Figure 9 Moving Deformable Barrier Face Profile Measurements

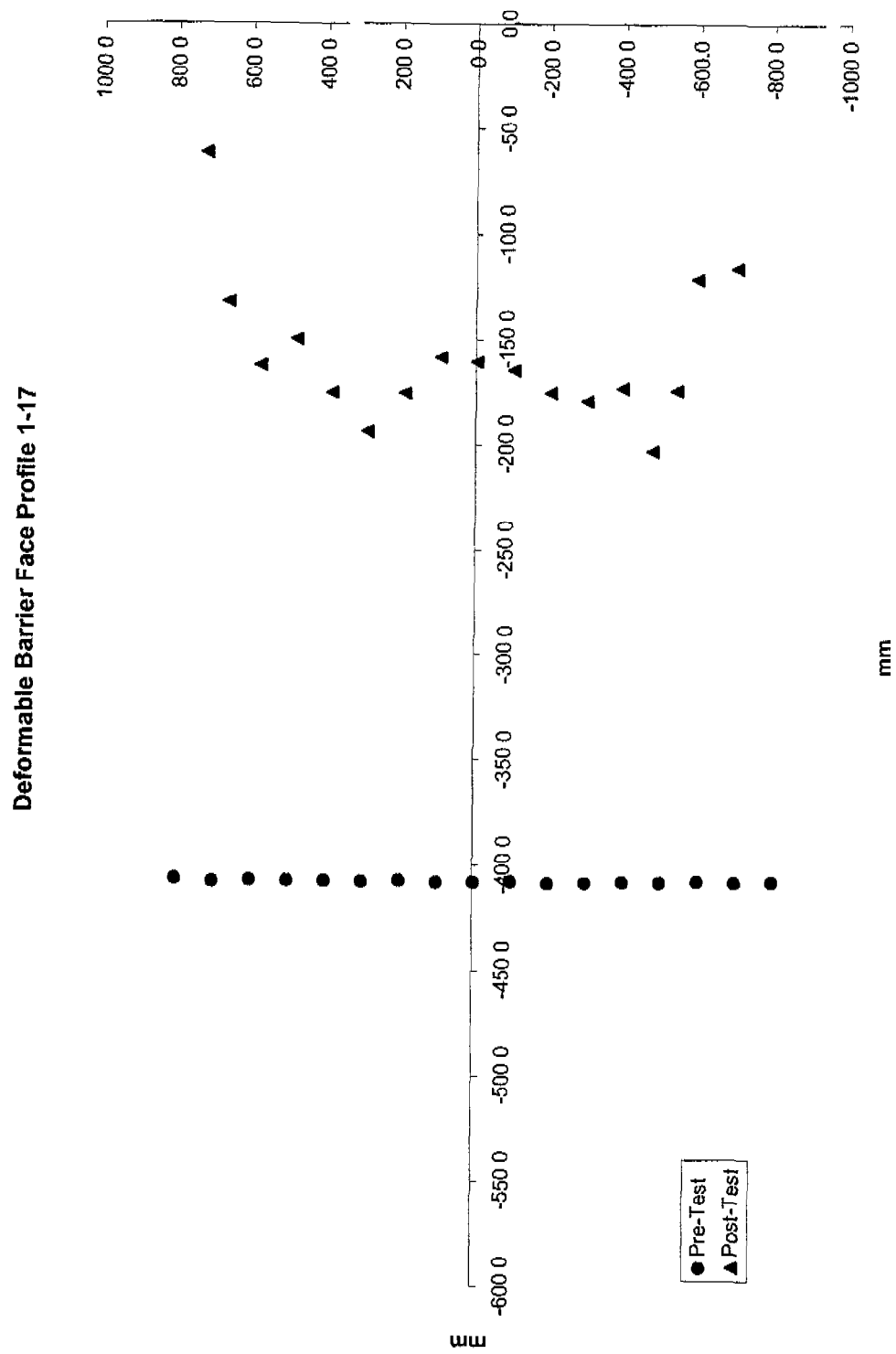


Figure 9 Moving Deformable Barrier Face Profile Measurements, Cont'd.

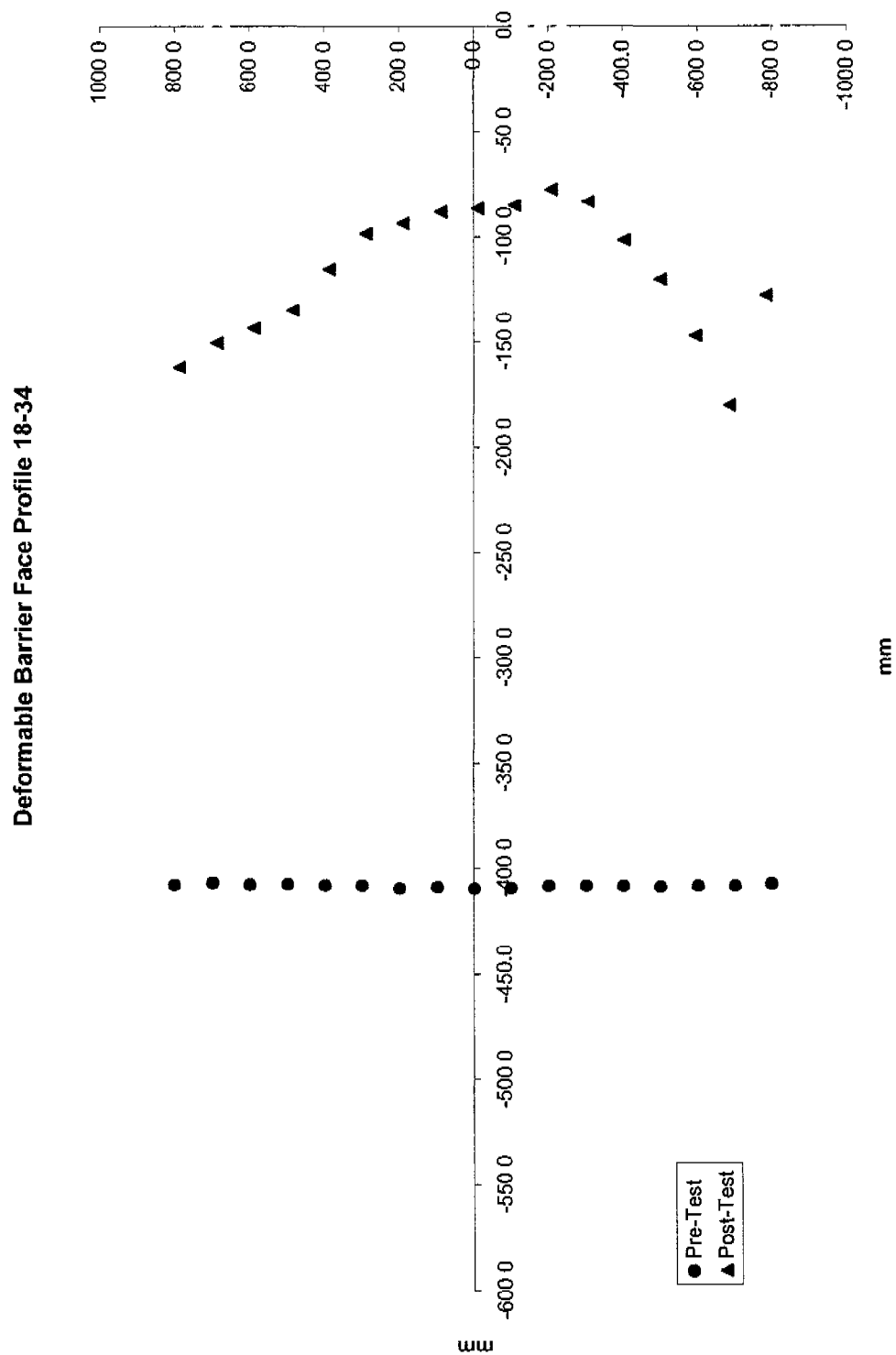




Table 12 Moving Deformable Barrier Face Profile Measurements

Deformable Barrier Face Profile

Pre-Test				Post-Test				Difference			
Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm
1	-407.0	796.9	-68.5	1	-61.8	724.2	-212.5	1	-345.2	72.8	144.1
2	-408.0	695.9	-69.8	2	-132.3	664.0	-179.8	2	-275.7	31.9	110.0
3	-407.5	596.0	-70.6	3	-162.8	576.7	-154.3	3	-244.7	19.3	83.7
4	-407.8	496.4	-70.7	4	-149.9	481.0	-146.6	4	-258.0	15.4	76.0
5	-407.8	395.9	-71.3	5	-175.5	385.1	-134.0	5	-232.3	10.9	62.7
6	-408.1	296.4	-72.1	6	-194.1	289.8	-123.6	6	-214.0	6.6	51.5
7	-407.6	196.2	-72.9	7	-175.9	191.7	-123.6	7	-231.7	4.5	50.7
8	-408.1	96.4	-72.9	8	-158.7	95.4	-121.9	8	-249.4	1.1	49.1
9	-408.2	-4.7	-72.8	9	-161.0	-3.1	-113.1	9	-247.2	-1.6	40.3
10	-408.0	-103.3	-73.7	10	-165.0	-101.9	-104.0	10	-243.1	-1.4	30.3
11	-408.6	-203.7	-74.9	11	-175.4	-200.8	-96.2	11	-233.2	-2.8	21.4
12	-408.3	-303.1	-75.7	12	-179.3	-298.3	-89.2	12	-229.0	-4.8	13.5
13	-408.2	-403.2	-75.0	13	-173.6	-394.2	-82.8	13	-234.7	-9.0	7.8
14	-408.2	-502.9	-76.3	14	-203.0	-476.0	-100.3	14	-205.2	-26.9	24.0
15	-407.6	-603.6	-76.8	15	-174.5	-538.6	-154.6	15	-233.2	-65.0	77.8
16	-408.2	-703.9	-78.4	16	-121.0	-591.1	-216.6	16	-287.2	-112.9	138.2
17	-407.7	-805.2	-79.1	17	-116.0	-699.5	-201.7	17	-291.7	-105.7	122.7
18	-407.5	799.7	-325.1	18	-162.2	787.9	-375.8	18	-245.3	11.8	50.7
19	-406.6	697.5	-324.8	19	-150.7	687.9	-366.2	19	-255.9	9.6	41.4
20	-407.5	596.9	-325.2	20	-143.7	587.9	-371.0	20	-263.8	9.0	45.8
21	-407.4	496.7	-326.4	21	-135.0	483.2	-356.6	21	-272.4	13.5	30.2
22	-407.8	396.6	-325.1	22	-115.5	386.5	-341.3	22	-292.3	10.1	16.2
23	-408.0	297.4	-326.2	23	-98.4	288.5	-335.6	23	-309.6	8.9	9.4
24	-409.3	197.1	-327.7	24	-93.6	188.5	-338.7	24	-315.7	8.6	11.0
25	-408.9	96.6	-327.5	25	-88.2	88.5	-335.7	25	-320.7	8.1	8.1
26	-409.6	-3.3	-327.8	26	-86.7	-11.7	-333.5	26	-322.9	8.4	5.6
27	-409.3	-101.0	-328.1	27	-85.3	-109.8	-331.5	27	-324.1	8.8	3.4
28	-408.3	-202.4	-329.7	28	-77.8	-207.5	-333.0	28	-330.5	5.1	3.3

Table 12 Moving Deformable Barrier Face Profile Measurements, Cont'd.

Deformable Barrier Face Profile Cont'd

Pre-Test				Post-Test				Difference			
Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm
29	-408.4	-302.8	-330.6	29	-83.6	-305.9	-339.1	29	-324.8	3.1	8.5
30	-408.6	-401.7	-330.1	30	-101.8	-403.3	-346.4	30	-306.8	1.7	16.3
31	-408.8	-501.6	-330.8	31	-120.6	-500.0	-361.1	31	-288.2	-1.6	30.3
32	-408.3	-601.6	-331.6	32	-147.5	-594.4	-373.3	32	-260.8	-7.2	41.8
33	-408.3	-701.9	-333.1	33	-180.5	-685.4	-387.9	33	-227.8	-16.5	54.8
34	-407.2	-800.1	-334.2	34	-128.2	-784.7	-400.6	34	-279.1	-15.4	66.5
35	-407.9	799.7	-451.4	35	-112.7	782.8	-479.0	35	-295.2	17.0	27.6
36	-408.3	697.4	-449.9	36	-95.0	684.1	-468.7	36	-313.4	13.3	18.9
37	-409.3	598.5	-451.7	37	-82.2	586.0	-462.5	37	-327.2	12.5	10.8
38	-409.4	498.6	-453.7	38	-88.9	486.9	-458.7	38	-320.5	11.7	5.1
39	-409.2	398.6	-452.1	39	-100.7	387.8	-456.0	39	-308.6	10.8	3.9
40	-408.6	299.8	-452.5	40	-102.5	288.3	-454.2	40	-306.2	11.5	1.6
41	-408.6	200.0	-454.0	41	-99.0	189.7	-454.8	41	-309.6	10.3	0.8
42	-409.3	97.5	-453.6	42	-90.1	87.6	-455.2	42	-319.3	9.9	1.5
43	-409.1	-2.3	-454.8	43	-94.1	-11.8	-454.2	43	-315.0	9.5	-0.6
44	-408.6	-100.2	-454.4	44	-120.3	-108.4	-442.7	44	-288.3	8.2	-11.7
45	-408.9	-200.1	-456.9	45	-118.0	-204.7	-449.6	45	-290.9	4.6	-7.3
46	-408.8	-300.3	-457.6	46	-96.8	-302.0	-457.3	46	-312.0	1.8	-0.3
47	-408.1	-400.8	-458.3	47	-74.9	-399.7	-462.8	47	-333.3	-1.1	4.6
48	-408.5	-499.5	-458.7	48	-79.5	-498.5	-469.8	48	-329.0	-1.0	11.1
49	-408.4	-601.5	-459.9	49	-98.4	-597.0	-480.0	49	-310.0	-4.5	20.1
50	-408.7	-702.2	-461.3	50	-132.6	-681.1	-500.9	50	-276.1	-21.1	39.6
51	-408.4	-800.2	-461.7	51	-108.9	-746.6	-520.9	51	-299.5	-53.6	59.2

Figure 10 Camera Positions

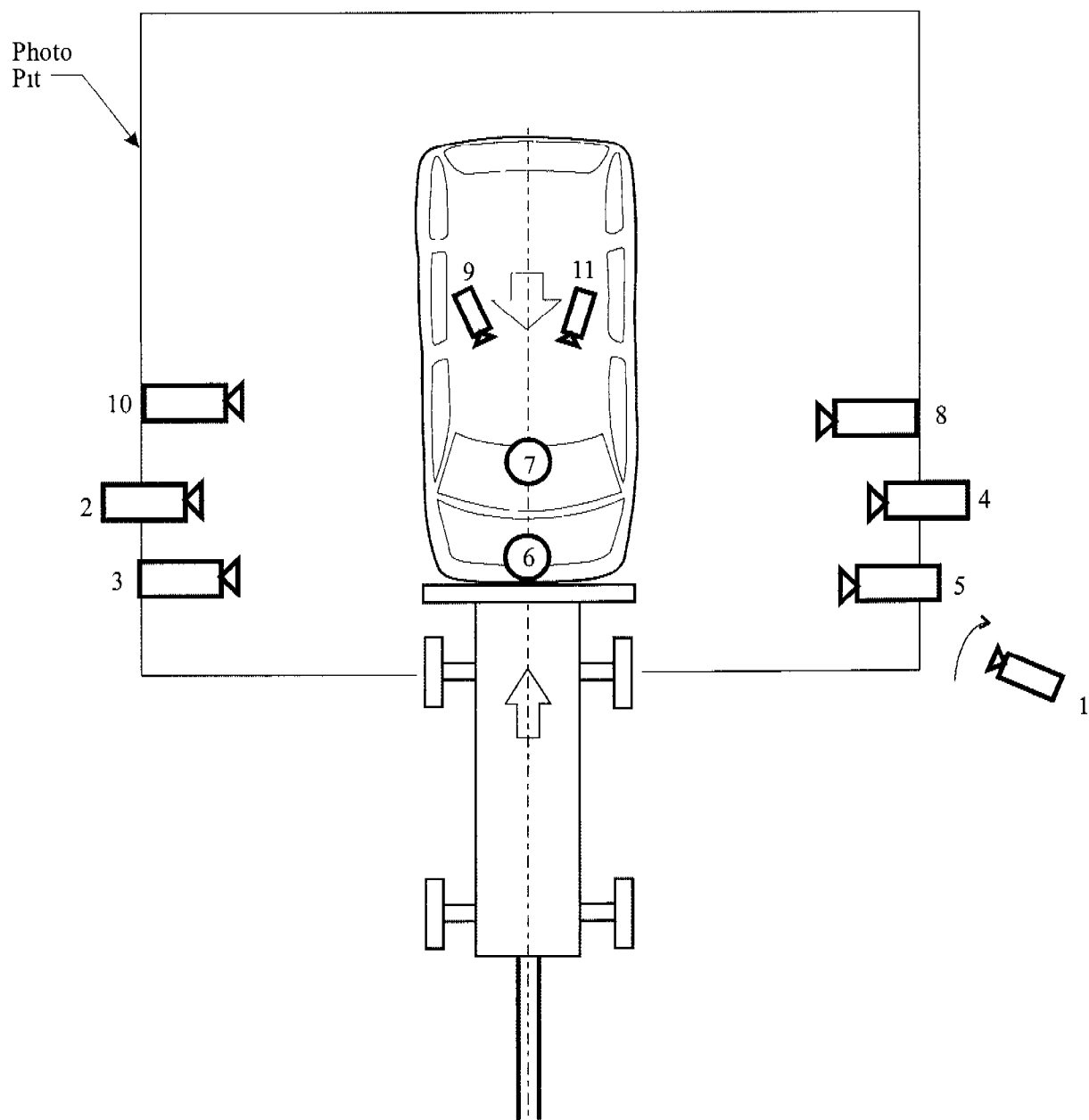


Table 13 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of camera data
1	Panning	Bolex	16	24	Vehicle dynamics
2	Right wide	Photosonic	13	1027	Dummy kinematics
3	Right tight	Photosonic	25	NA ¹	Dummy kinematics
4	Left wide	Photosonic	13	1022	Dummy kinematics
5	Left tight	Photosonic	25	NA ¹	Dummy kinematics
6	Overhead wide	Photosonic	13	980	Vehicle crush
7	Overhead tight	Photosonic	25	NA ¹	Impact point
8	Tight driver	Photosonic	50	1017	Dummy kinematics
9	Onboard driver	Photosonic	8	1017	Dummy kinematics
10	Tight passenger	Photosonic	50	1015	Dummy kinematics
11	Onboard passenger	Photosonic	8	1020	Dummy kinematics

¹ Film was lost during processing as a result of a processor hardware failure.

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 Photosonic and Stalex cameras while horizontal bars are left by the Hycam, Locam, and Fastax II cameras.

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

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

Appendix A

Photographs



Figure A-1 Pre-Test Target Vehicle Front View



Figure A-2 Post-Test Target Vehicle Front View



Figure A-3 Pre-Test Target Vehicle Front with Barrier View

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Figure A-4 Pre-Test Target Vehicle Left Front Three-Quarter with Barrier View



Figure A-5 Post-Test Target Vehicle Left Front Three-Quarter View



Figure A-6 Pre-Test Target Vehicle Left Side with Barrier view



Figure A-7 Post-Test Target Vehicle Left Side View



Figure A-8 Pre-Test Target Vehicle Left Rear Three-Quarter View



Figure A-9 Post-Test Target Vehicle Left Rear Three-Quarter View



Figure A-10 Pre-Test Target Vehicle Rear View



Figure A-11 Post-Test Target Vehicle Rear View



Figure A-12 Pre-Test Target Vehicle Right Rear Three-Quarter View



Figure A-13 Post-Test Target Vehicle Right Rear Three-Quarter View



Figure A-14 Pre-Test Target Vehicle Right Side with Barrier View



Figure A-15 Post-Test Target Vehicle Right Side View



Figure A-16 Pre-Test Target Vehicle Right Front Three-Quarter with Barrier View



Figure A-17 Post-Test Target Vehicle Right Front Three-Quarter View



Figure A-18 Pre-Test Overhead Alignment - View 1



Figure A-19 Pre-Test Overhead Alignment - View 2



Figure A-20 Pre-Test Impact Alignment Left View



Figure A-21 Pre-Test Impact Alignment Right View



Figure A-22 Pre-Test Target Vehicle Front Underbody View



Figure A-23 Post-Test Target Vehicle Front Underbody View



Figure A-24 Pre-Test Target Vehicle Rear Underbody View

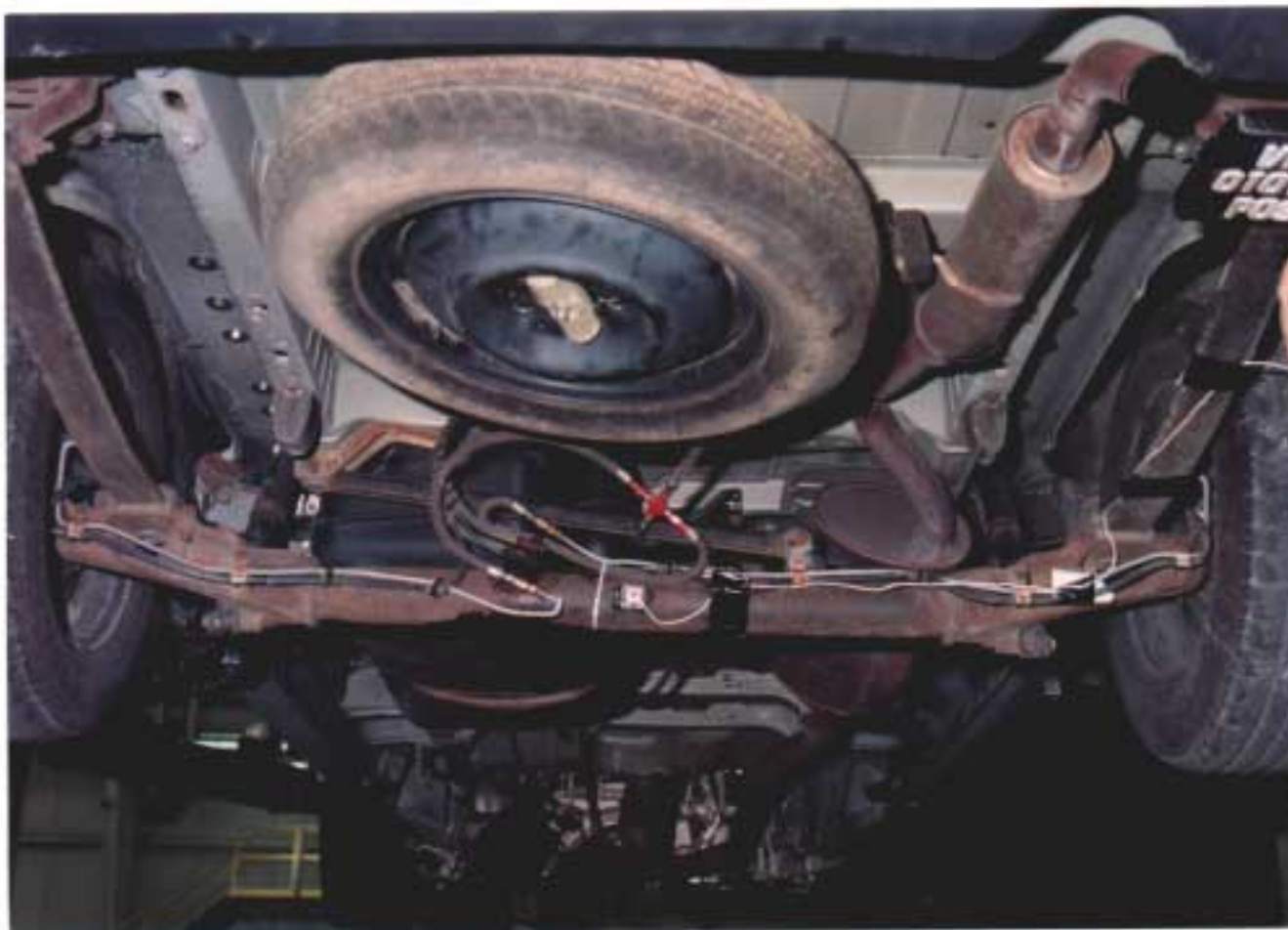


Figure A-25 Post-Test Target Vehicle Rear Underbody View



Figure A-26 Pre-Test Target Vehicle Windshield View - Driver and Passenger Dummies



Figure A-27 Post-Test Target Vehicle Windshield View - Driver and Passenger Dummies



Figure A-28 Pre-Test Target Vehicle Driver Dummy through Windshield View



Figure A-29 Post-Test Target Vehicle Driver Dummy through Windshield View



Figure A-30 Pre-Test Target Vehicle Passenger Dummy through Windshield View



Figure A-31 Post-Test Target Vehicle Passenger Dummy through Windshield View



Figure A-32 Pre-Test Moving Deformable Barrier Front View



Figure A-33 Post-Test Moving Deformable Barrier Front View



Figure A-34 Pre-Test Moving Deformable Barrier Left Side View



Figure A-35 Post-Test Moving Deformable Barrier Left Side View



Figure A-36 Pre-Test Moving Deformable Barrier Right Side View



Figure A-37 Post-Test Moving Deformable Barrier Right Side View



Figure A-38 Pre-Test Target Vehicle Driver Dummy - View 1



Figure A-39 Post-Test Target Vehicle Driver Dummy - View 1



Figure A-40 Pre-Test Target Vehicle Driver Dummy - View 2



Figure A-41 Post-Test Target Vehicle Driver Dummy - View 2



Figure A-42 Pre-Test Target Vehicle Driver Dummy - View 3



Figure A-43 Post-Test Target Vehicle Driver Dummy - View 3



Figure A-44 Post-Test Target Vehicle Driver Dummy Overall View



Figure A-45 Post-Test Target Vehicle Driver Dummy Head Contact - View 1



Figure A-46 Post-Test Target Vehicle Driver Dummy Head Contact - View 2



Figure A-47 Post-Test Target Vehicle Driver Dummy Knee Contact - View 1



Figure A-48 Post-Test Target Vehicle Driver Dummy Knee Contact - View 2

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Figure A-49 Pre-Test Target Vehicle Passenger Dummy - View 1



Figure A-50 Post-Test Target Vehicle Passenger Dummy - View 1



Figure A-51 Pre-Test Target Vehicle Passenger Dummy - View 2



Figure A-52 Post-Test Target Vehicle Passenger Dummy - View 2



Figure A-53 Pre-Test Target Vehicle Passenger Dummy - View 3



Figure A-54 Post-Test Target Vehicle Passenger Dummy - View 3



Figure A-55 Post-Test Target Vehicle Passenger Dummy Overall View



Figure A-56 Post-Test Target Vehicle Passenger Dummy Head Contact - View 1



Figure A-57 Post-Test Target Vehicle Passenger Dummy Head Contact - View 2



Figure A-58 Post-Test Target Vehicle Passenger Dummy Knee Contact View

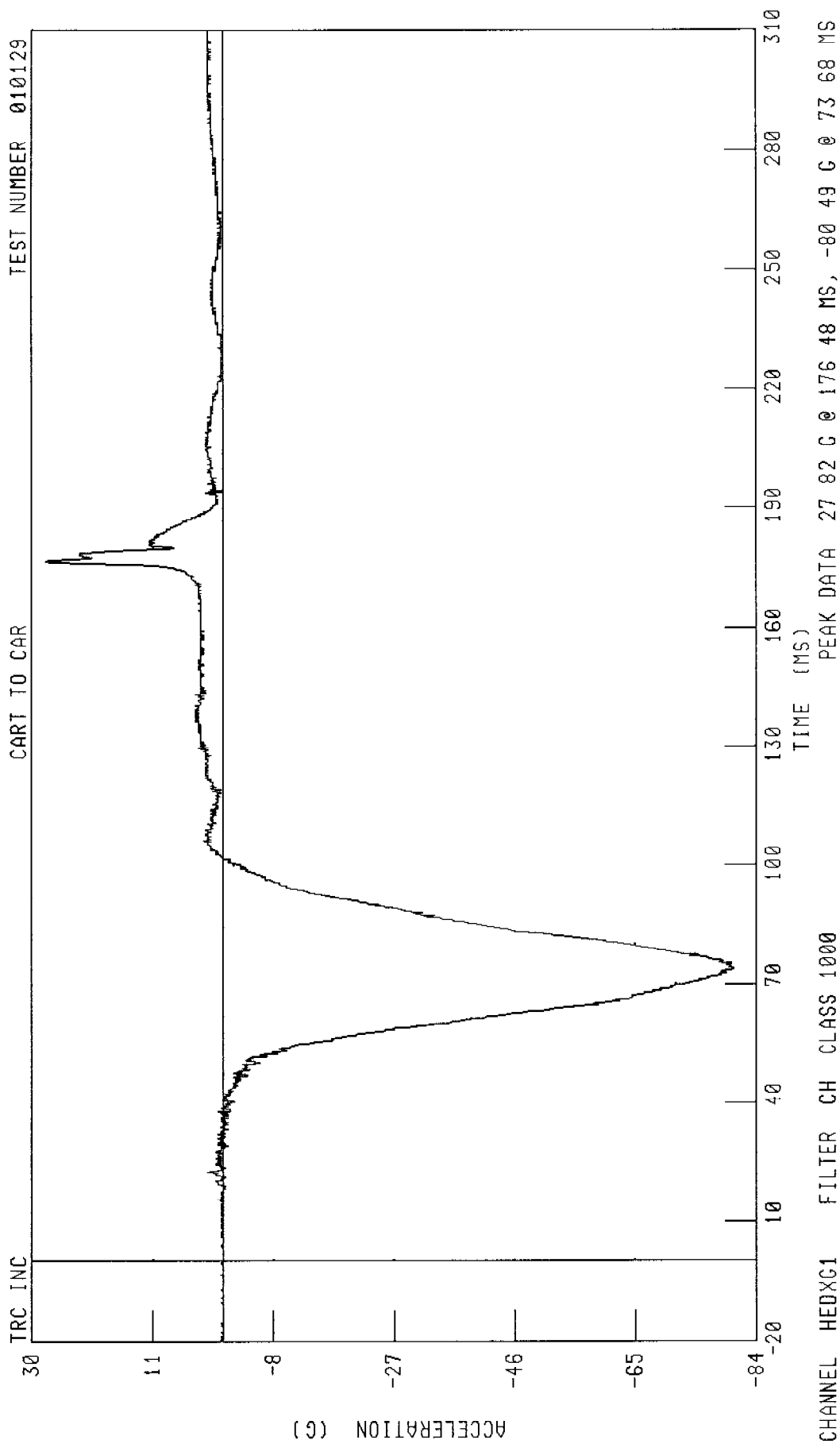


Figure A-59 Target Vehicle Certification and Tire Load Label View

Appendix B

Data Plots

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER HEAD X-AXIS ACCELERATION



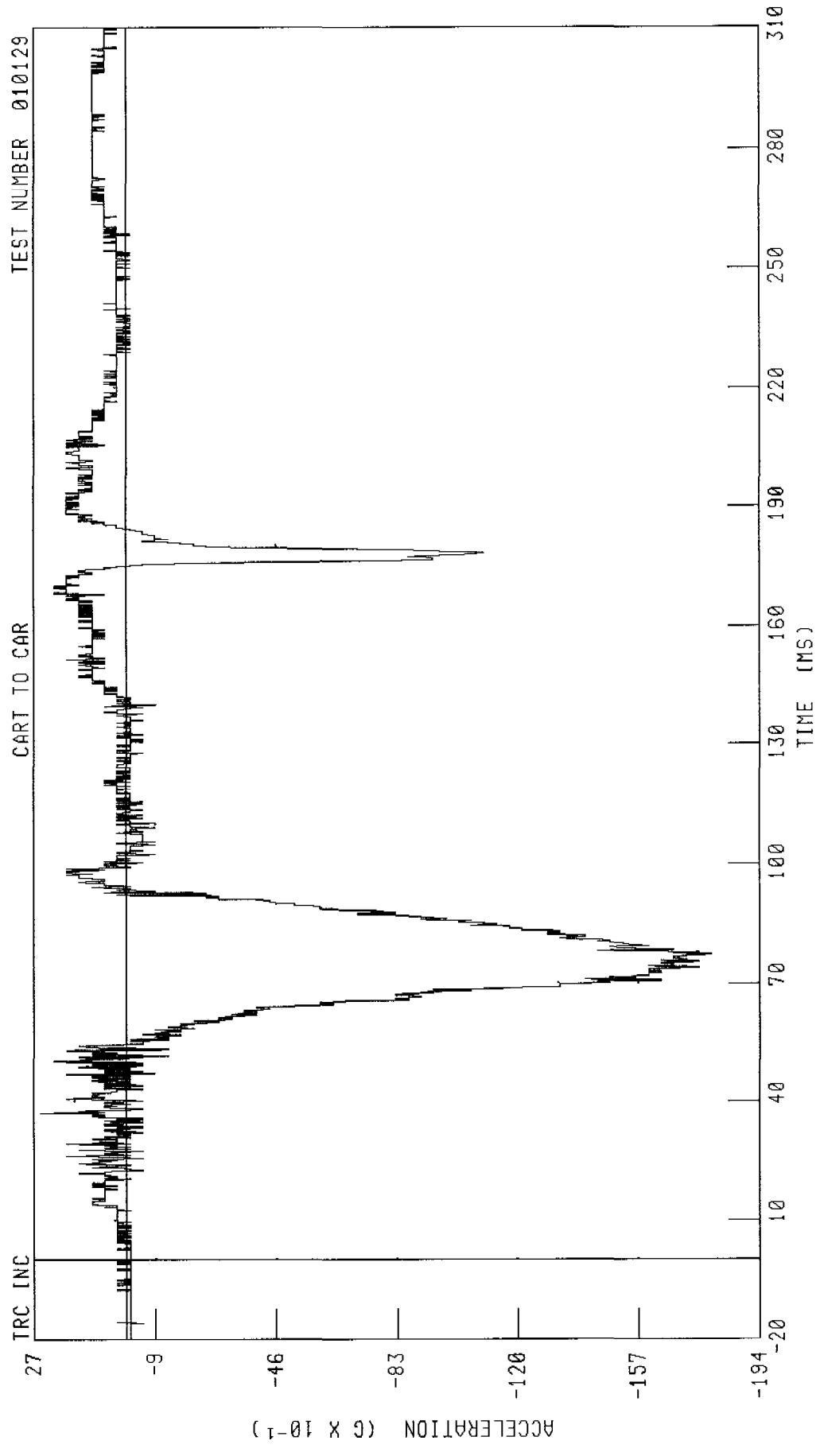
CHANNEL HEDXC1 FILTER CH CLASS 1000 PEAK DATA 27 82 G @ 176 48 MS, -80 49 G @ 73 68 MS

TEST NUMBER 010129

CART TO CAR

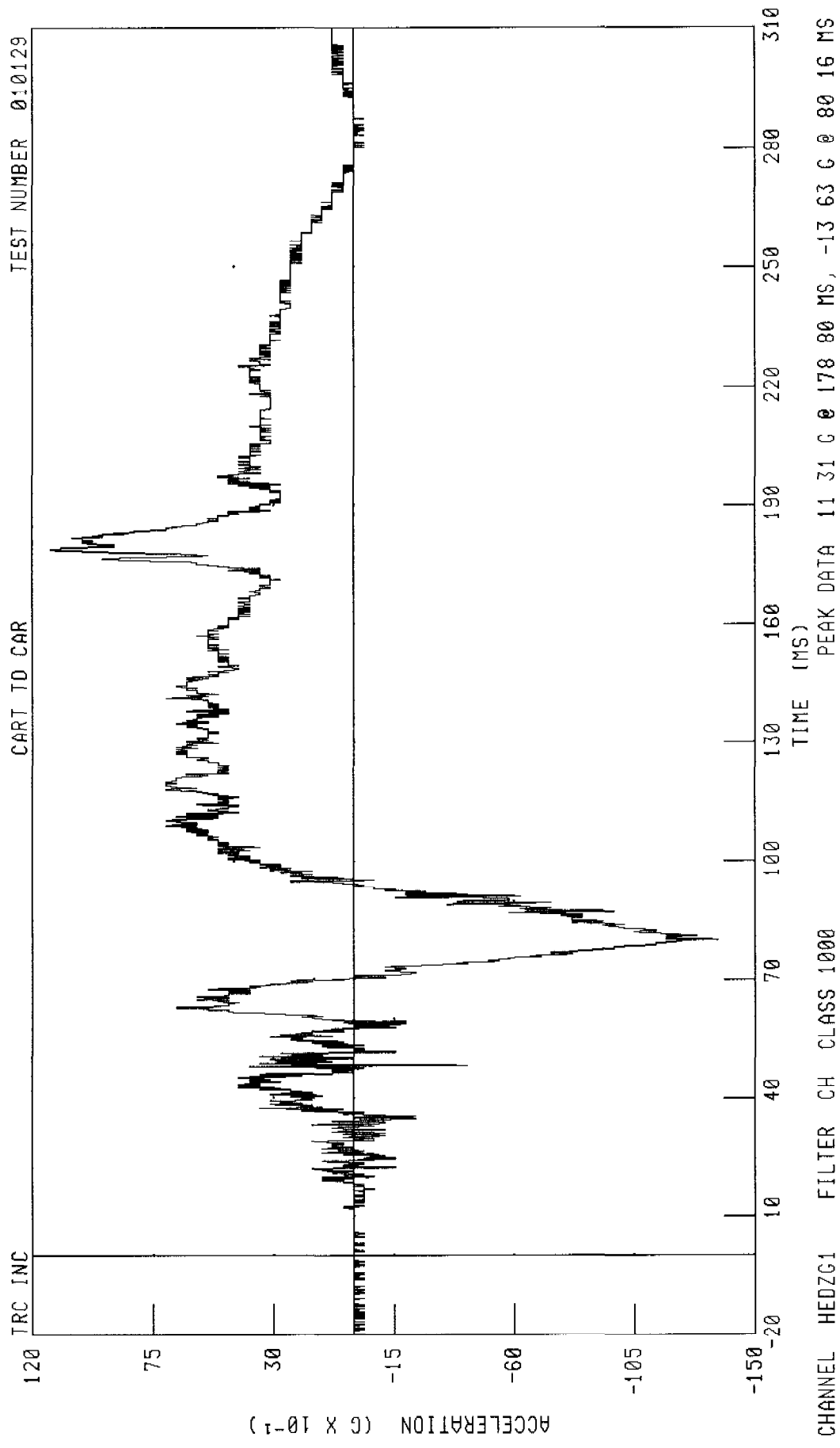
TRC INC

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER HEAD Y-AXIS ACCELERATION

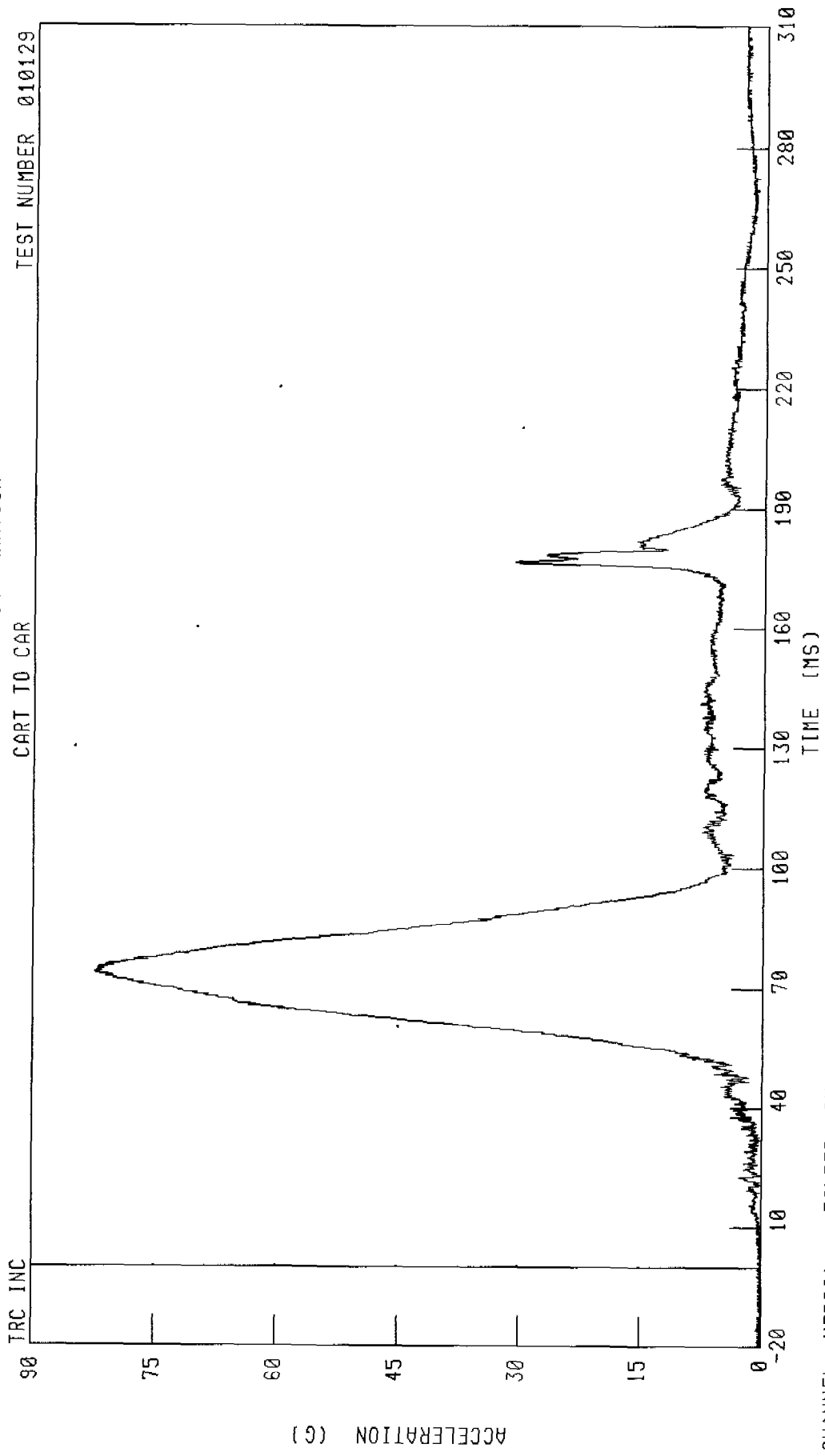


CHANNEL HEDYG1 FILTER CH CLASS 1000 PEAK DATA 2 58 G @ 37 20 MS, -17 94 G @ 77 20 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER HEAD Z-AXIS ACCELERATION



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER HEAD RESULTANT ACCELERATION



TRC INC

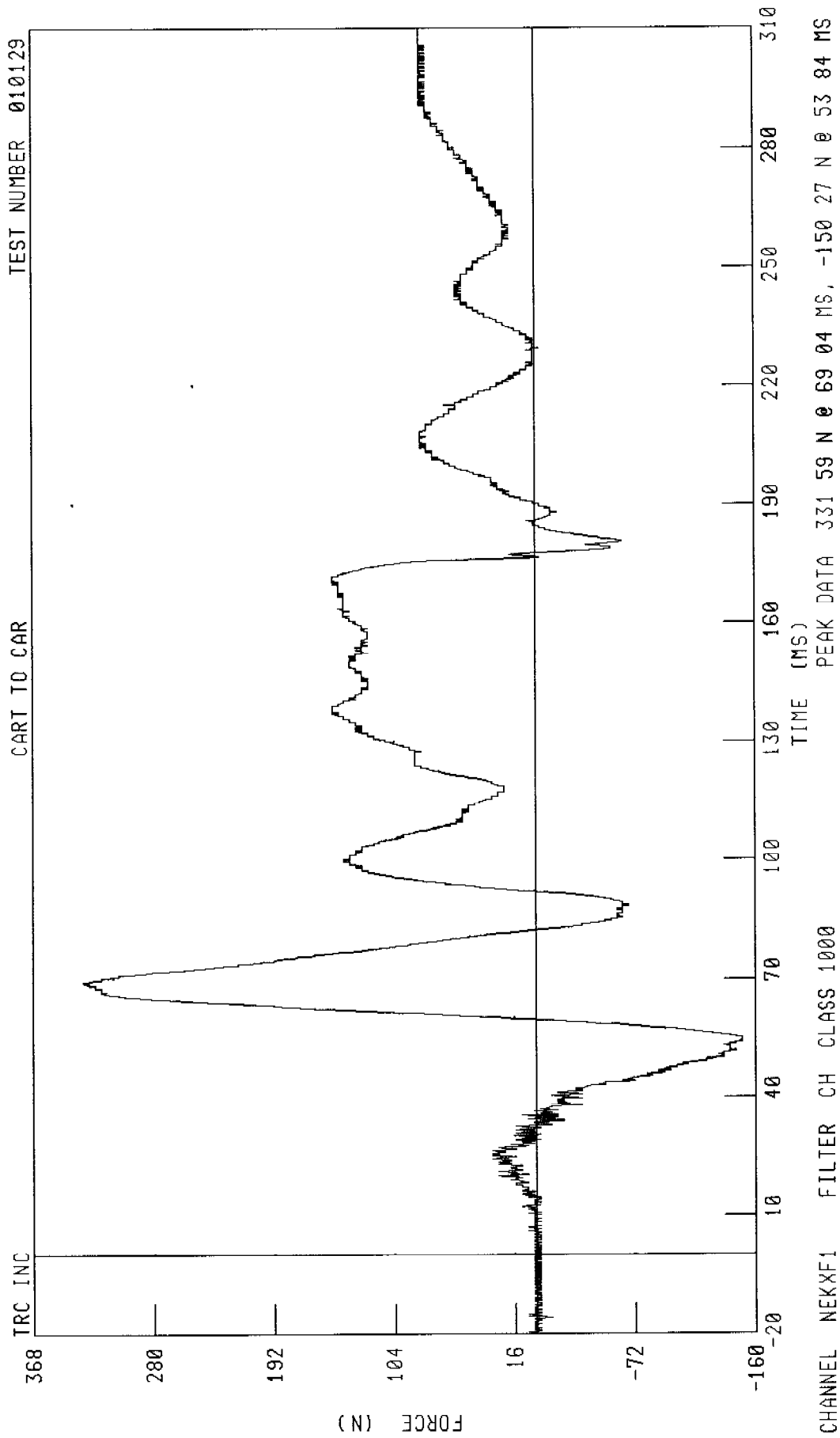
CART TO CAR

TEST NUMBER 010129

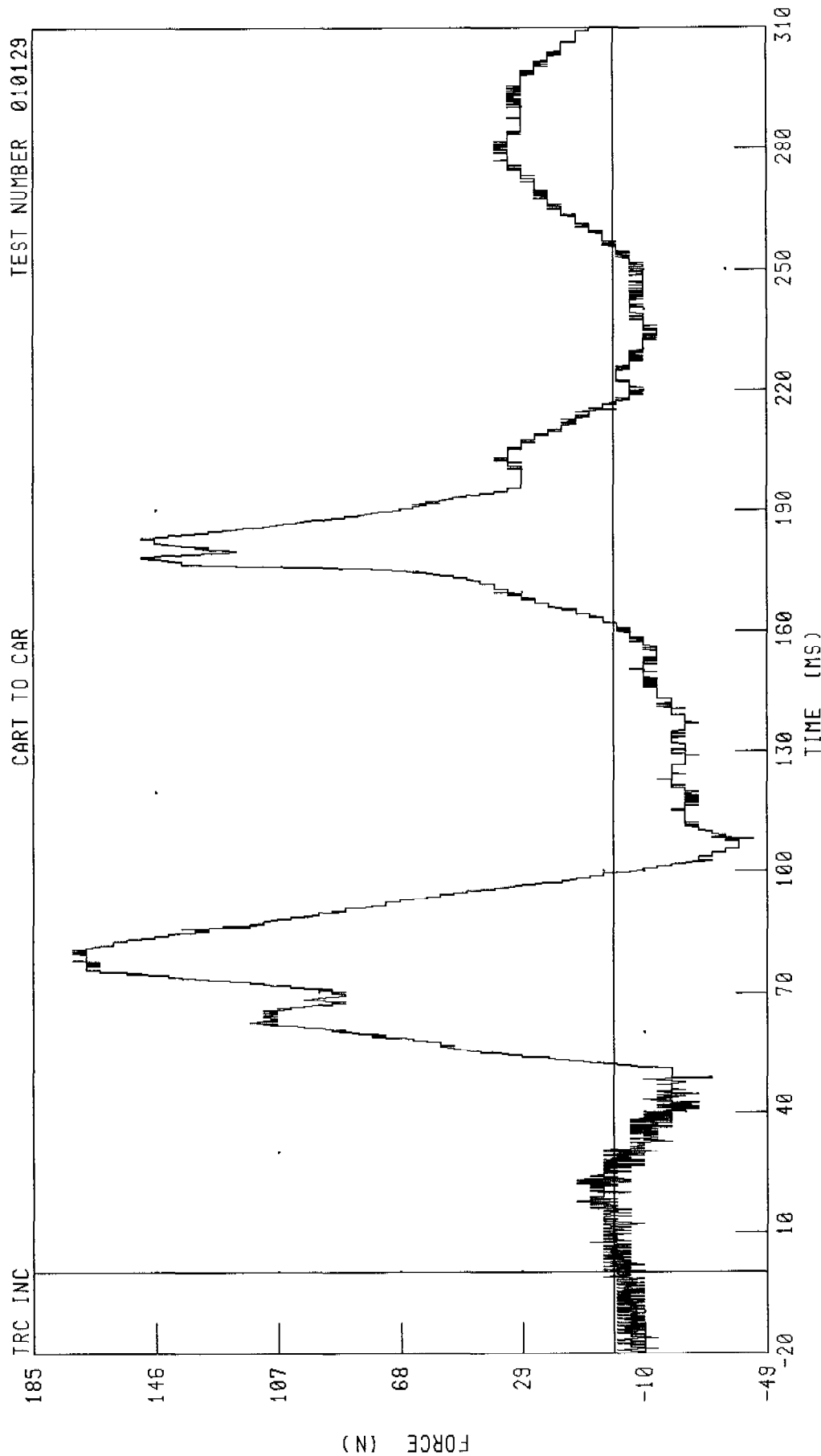
CHANNEL HEDG1 FILTER CH CLASS 1000

PEAK DATA 82 47 0 73 92 MS, 0 13 0 0 -19 84 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK X-AXIS SHEAR FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK Y-AXIS SHEAR FORCE



CHANNEL NEKYF1 FILTER CH CLASS 1000

PEAK DATA 172 57 N @ 78 00 MS, -44 59 N @ 108 24 MS

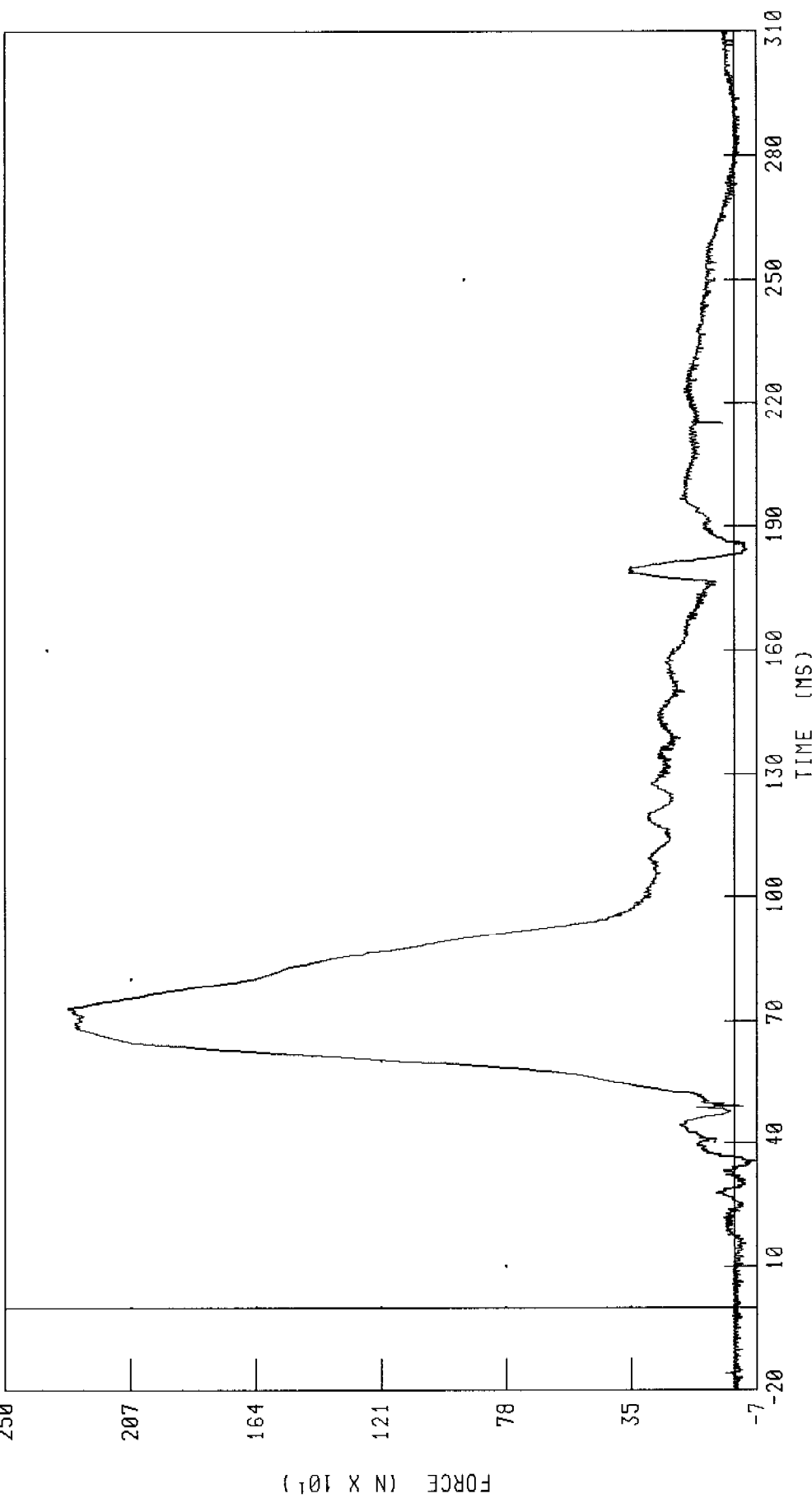
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER NECK Z-AXIS AXIAL FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

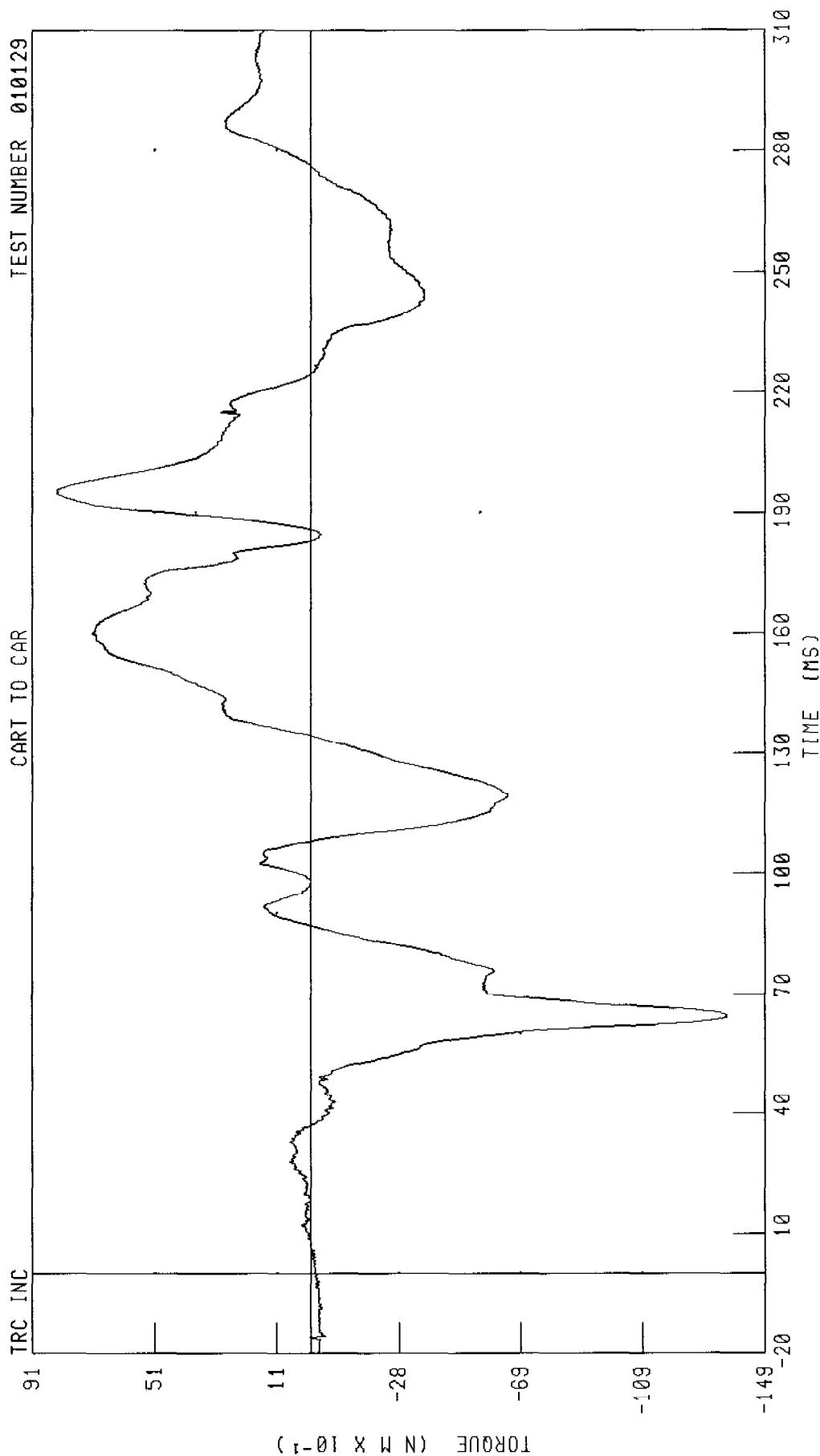


CHANNEL NEKZF1 FILTER CH CLASS 1000

PEAK DATA 2289 90 N @ 73 04 MS, -68 42 N @ 35 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

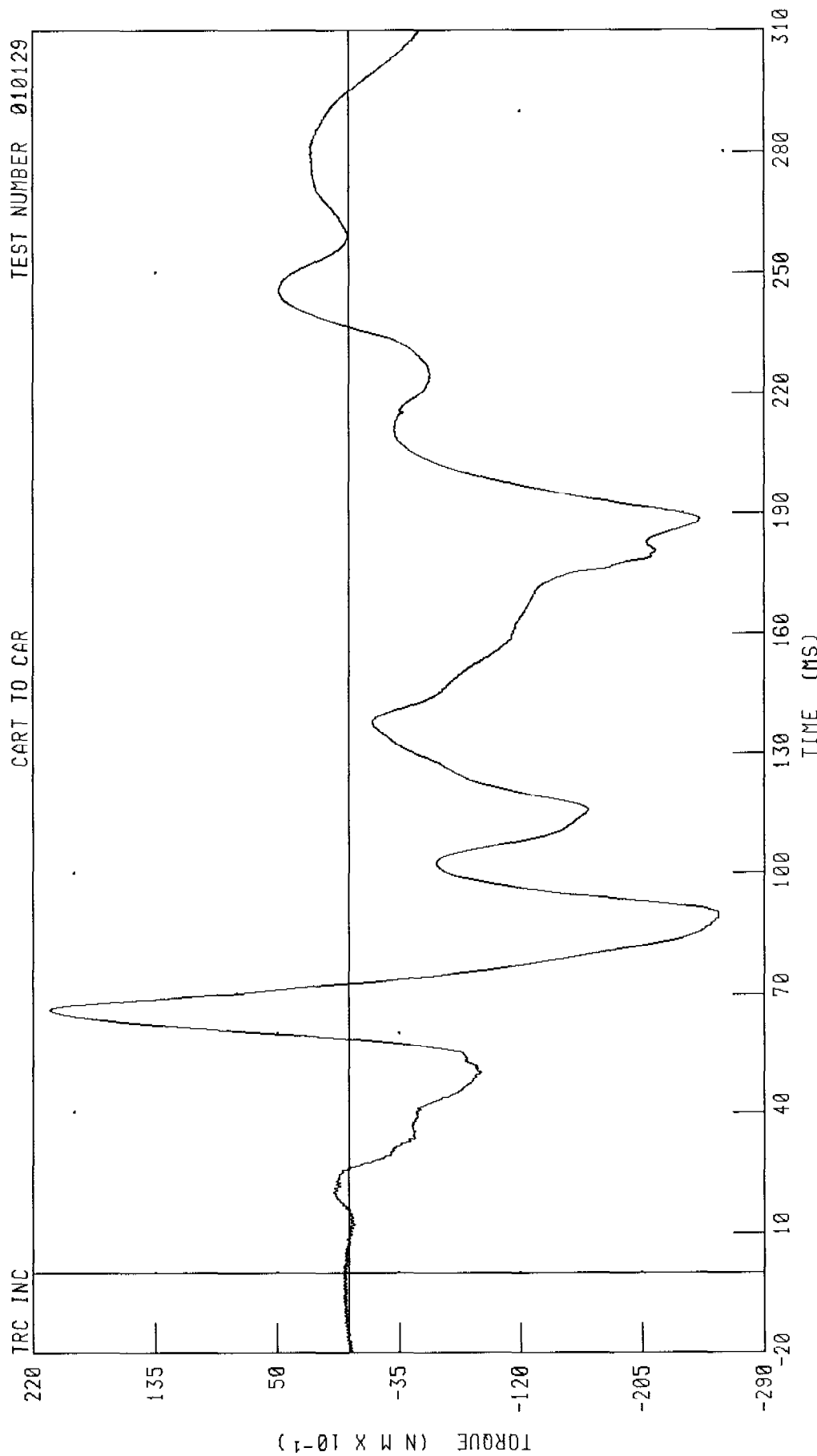
DRIVER NECK MOMENT ABOUT X-AXIS



CHANNEL NEKX11 FILTER CH CLASS 600

PEAK DATA 8 28 N M @ 195 84 MS, -13 66 N M @ 64 32 MS

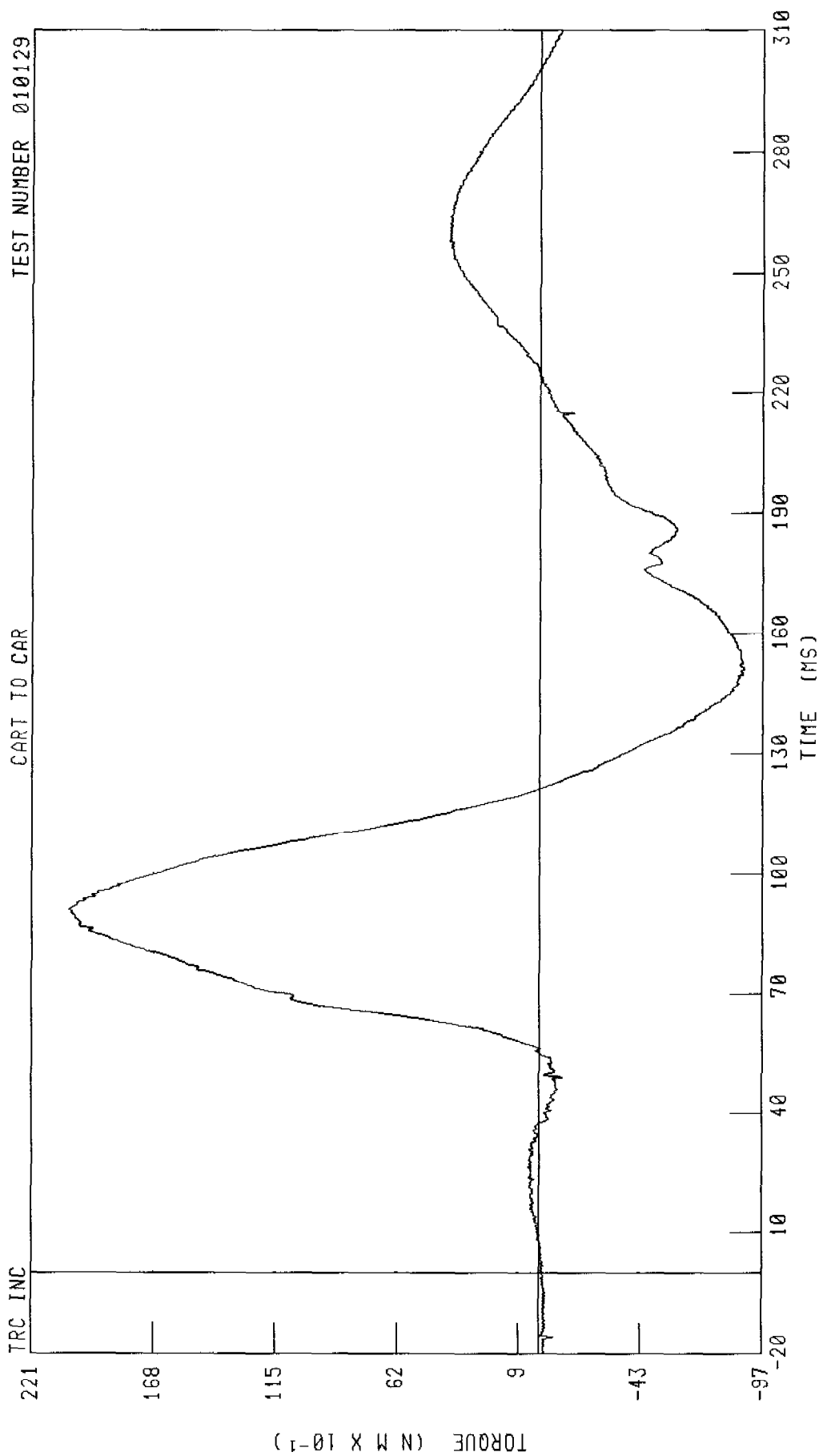
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK MOMENT ABOUT Y-AXIS



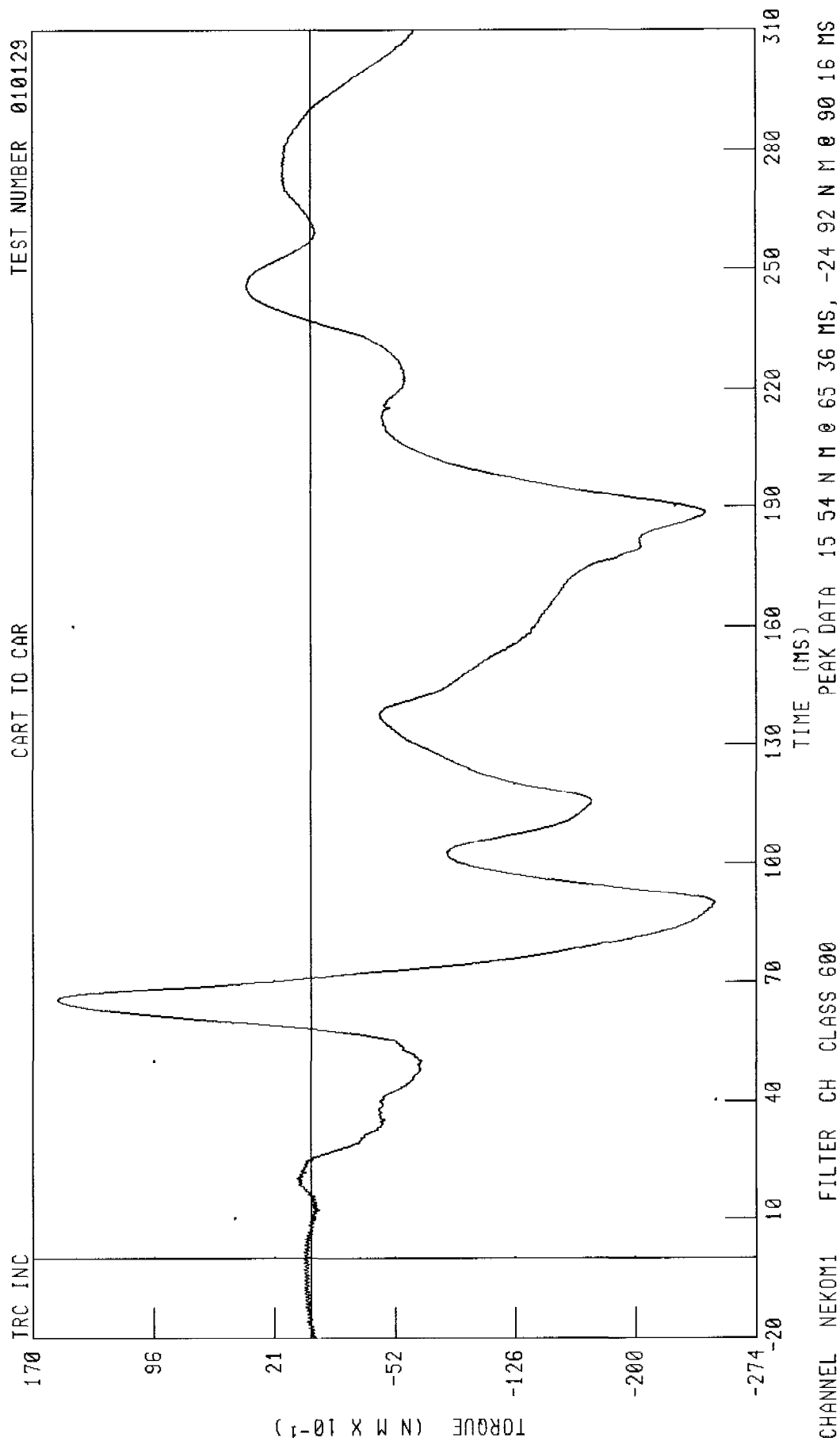
CHANNEL NEYM1 FILTER CH CLASS 600

PEAK DATA 20 84 N M 0 65 92 MS, -25 87 N M 0 90 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK MOMENT ABOUT Z-AXIS



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK MOMENT OCCIPITAL CONDYLE ABOUT Y-AXIS



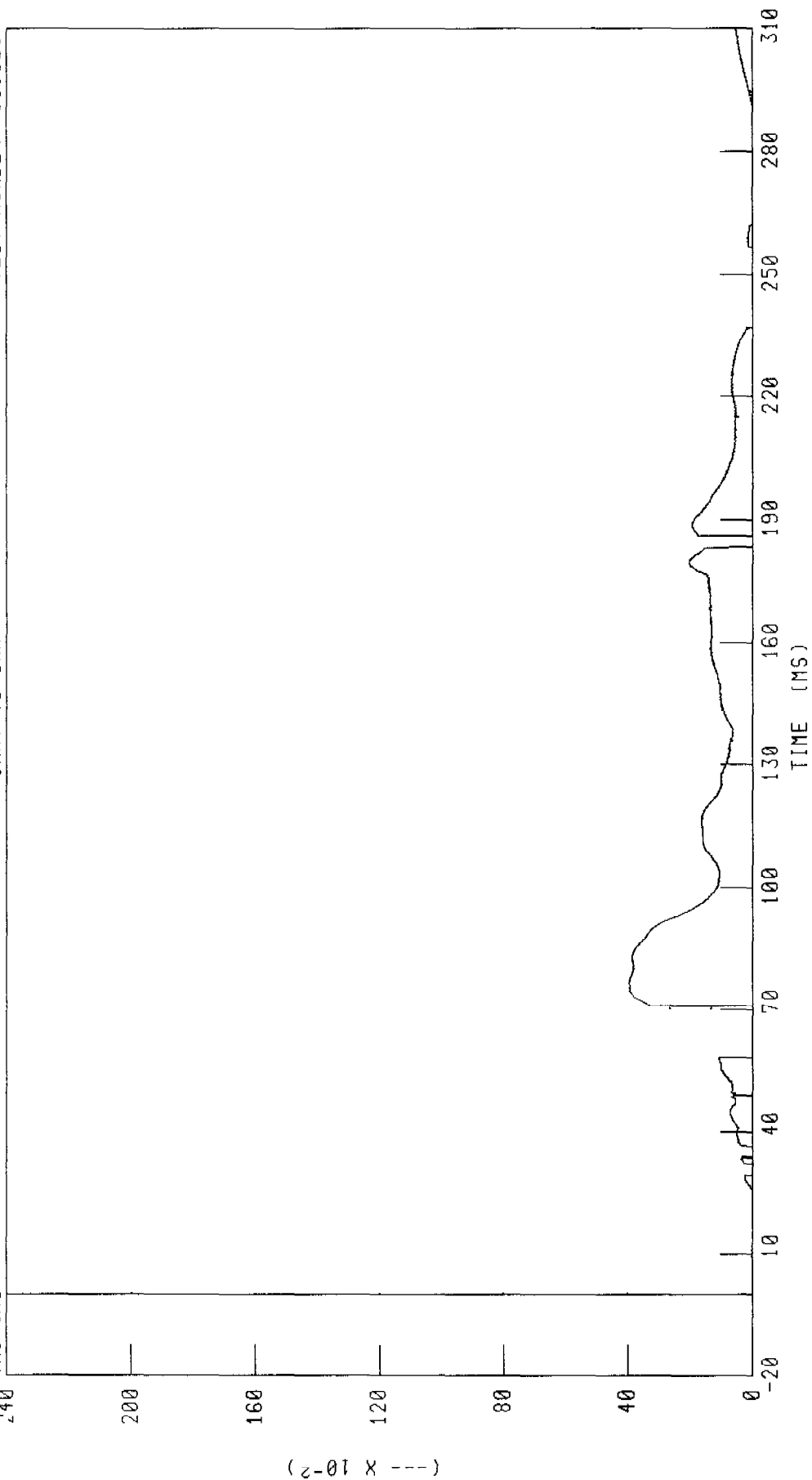
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER NECK TENSION/EXTENSION

TRC INC

CART TO CAR

TEST NUMBER 010129

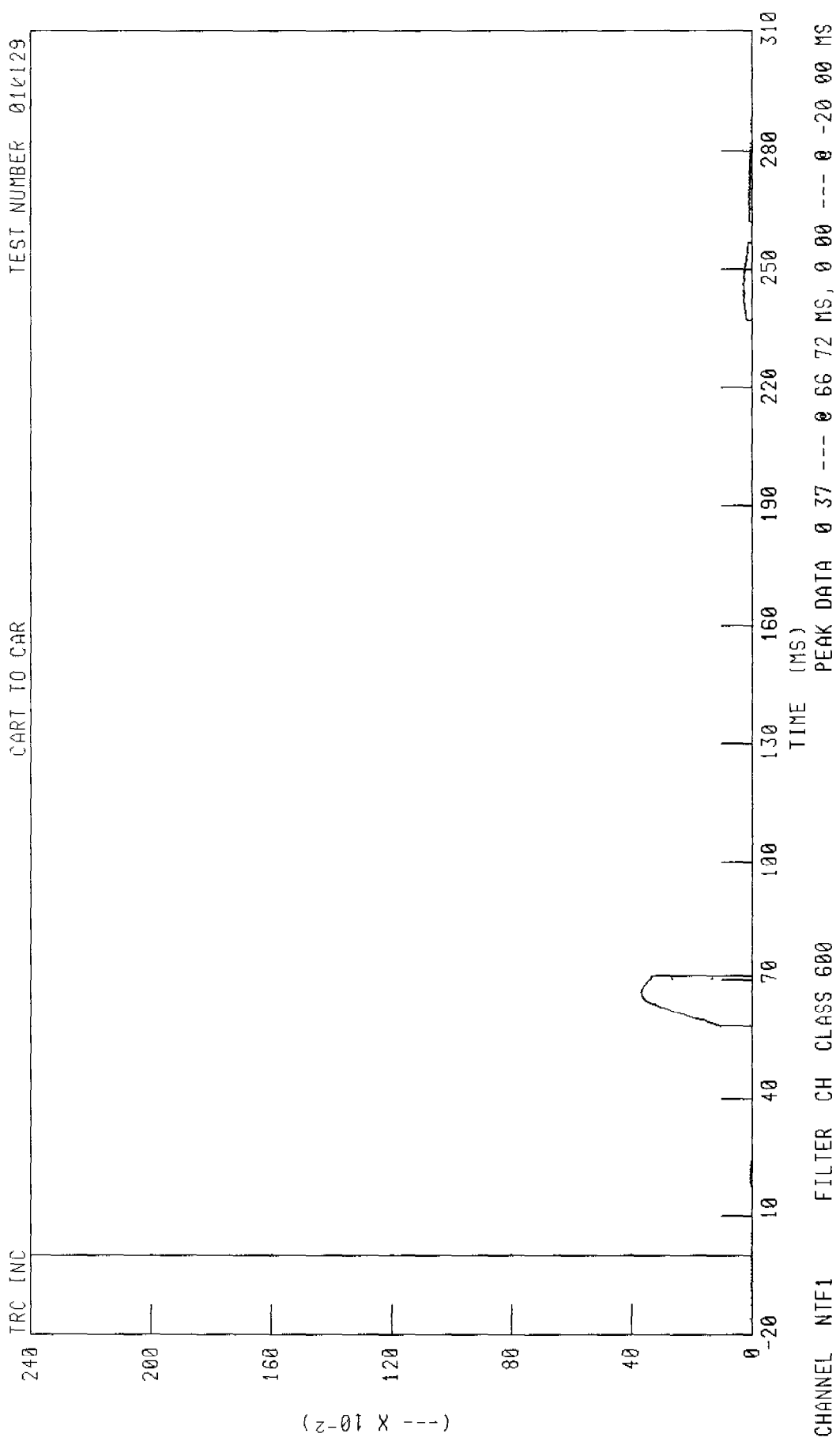


CHANNEL NTE1

FILTER CH CLASS 600

PEAK DATA 0 40 --- 0 76 64 MS, 0 00 --- 0 -19 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER NECK TENSION/FLEXION



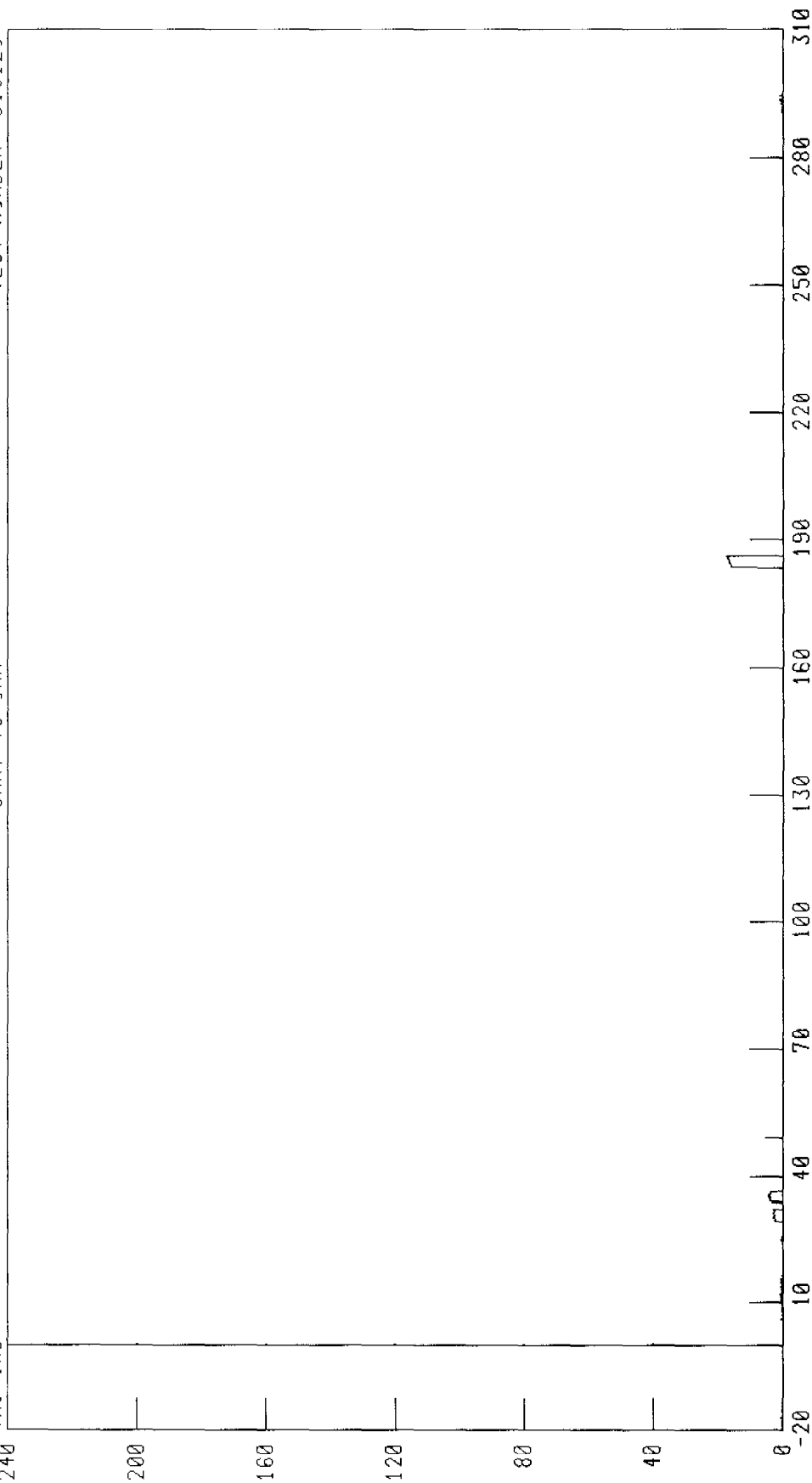
(--- X 10⁻²)

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER NECK COMPRESSION/EXTENSION

TRC INC

CART TO CAR

TEST NUMBER 010129



(--- X 10⁻²)

TIME (MS)

CHANNEL NCE1 FILTER CH CLASS 600

PEAK DATA 0 17 --- 0 186 00 MS, 0 00 --- 0 -20 00 MS

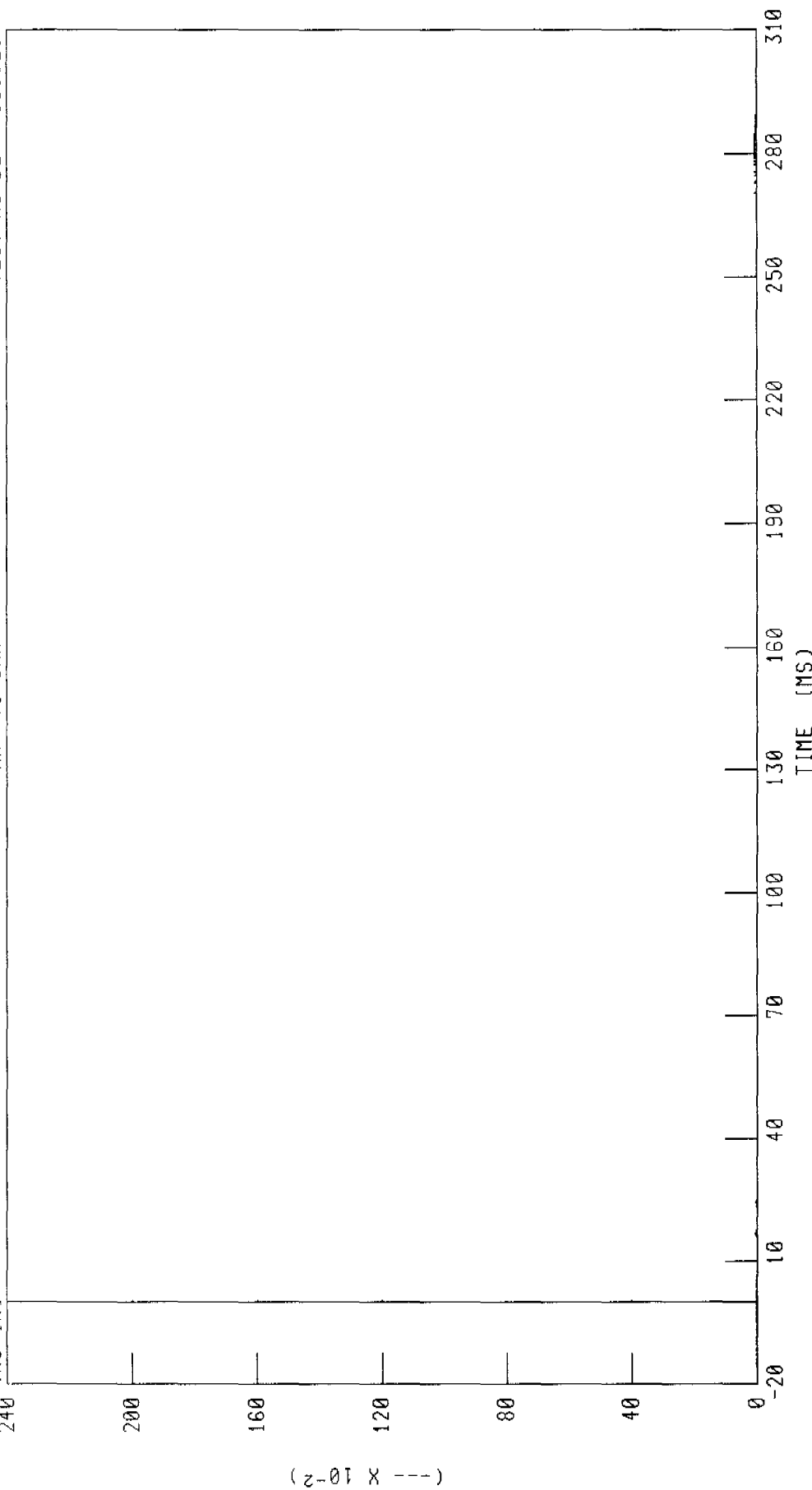
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER NECK COMPRESSION/FLEXION

PART TO CAR

TEST NUMBER 010129

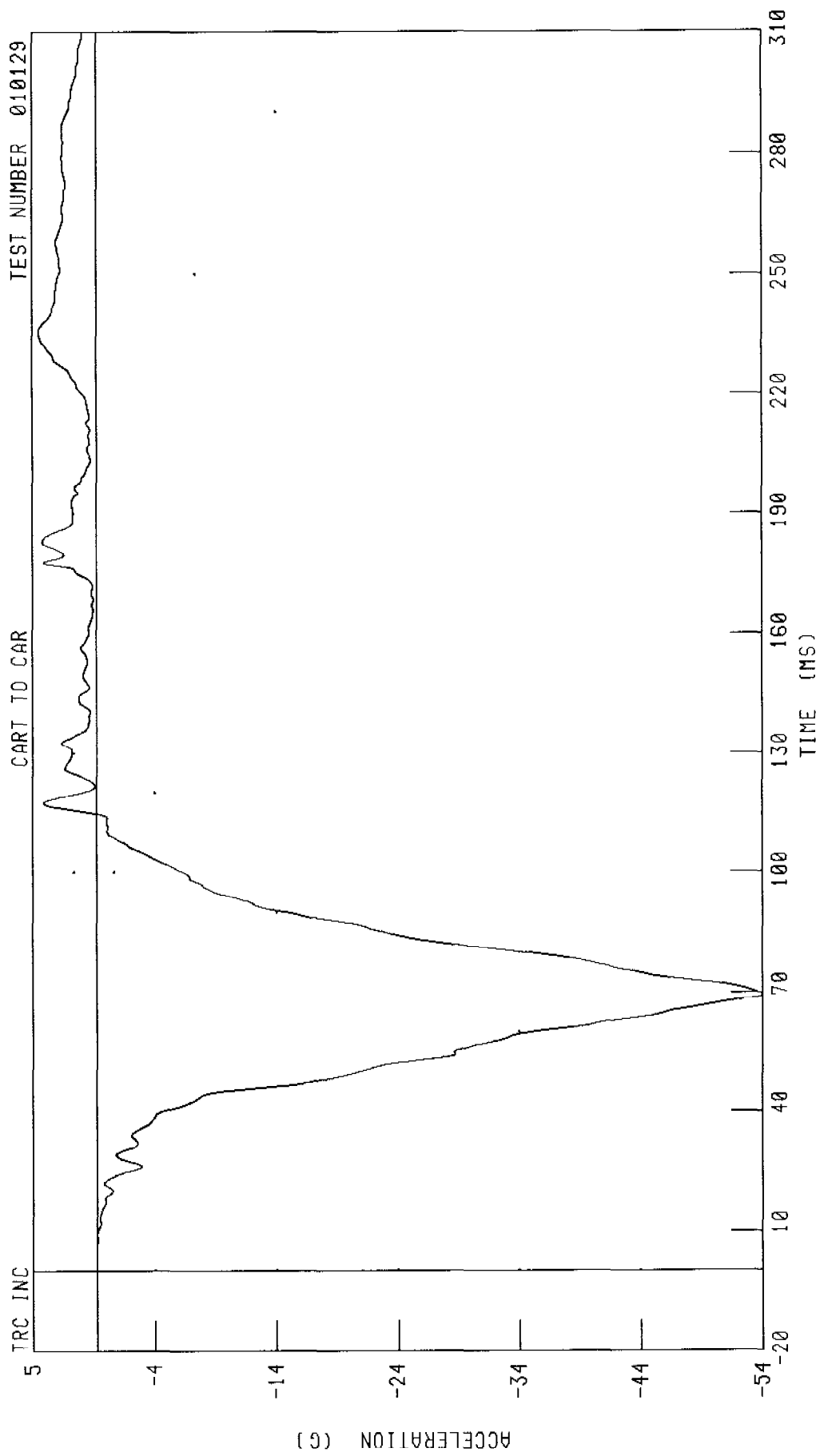
IRC IN.



CHANNEL NCF1 FILTER CH CLASS 600

PEAK DATA 0 01 --- 0 280 80 MS, 0 00 --- 0 -20 00 MS

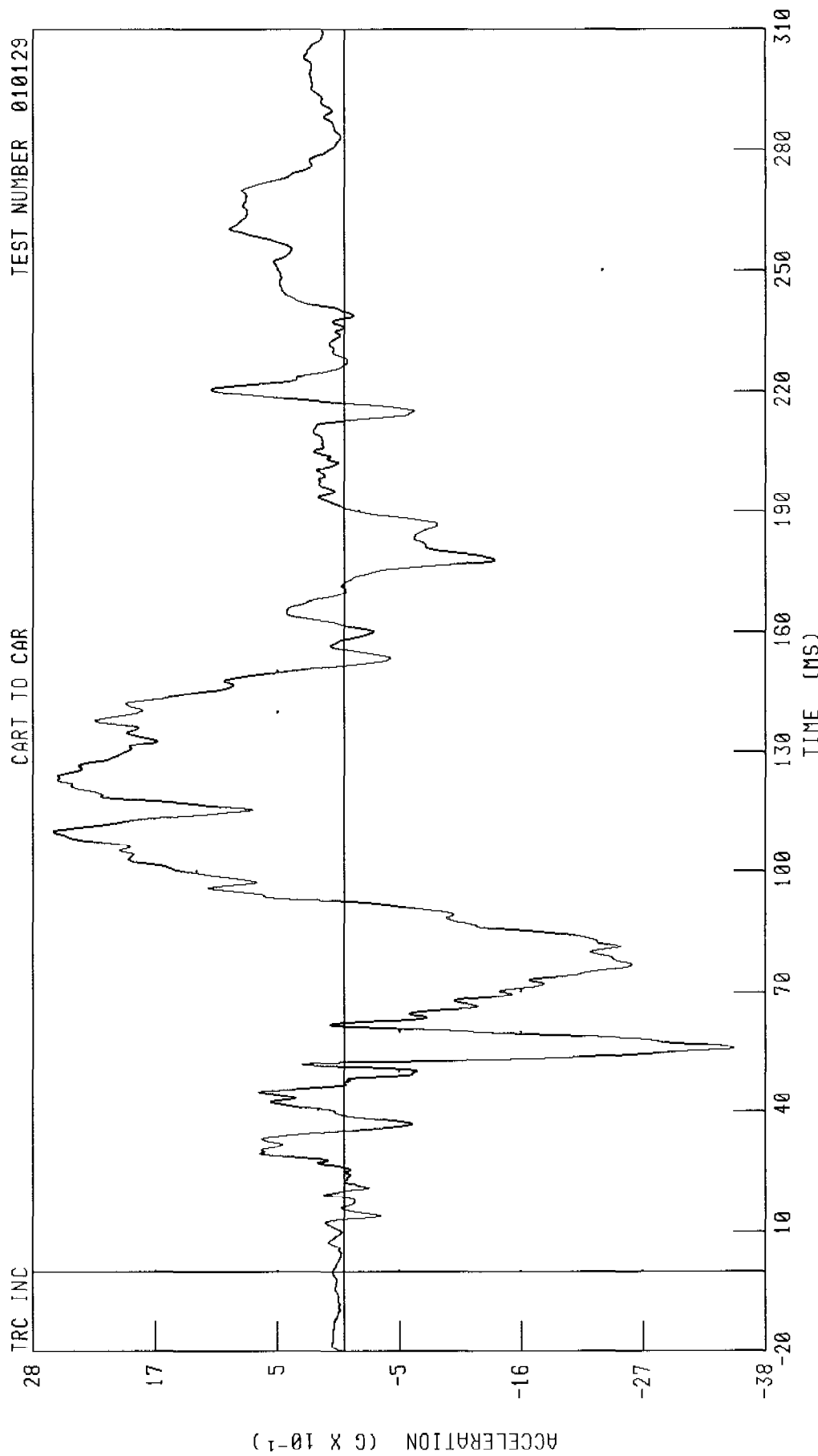
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER CHEST X-AXIS ACCELERATION



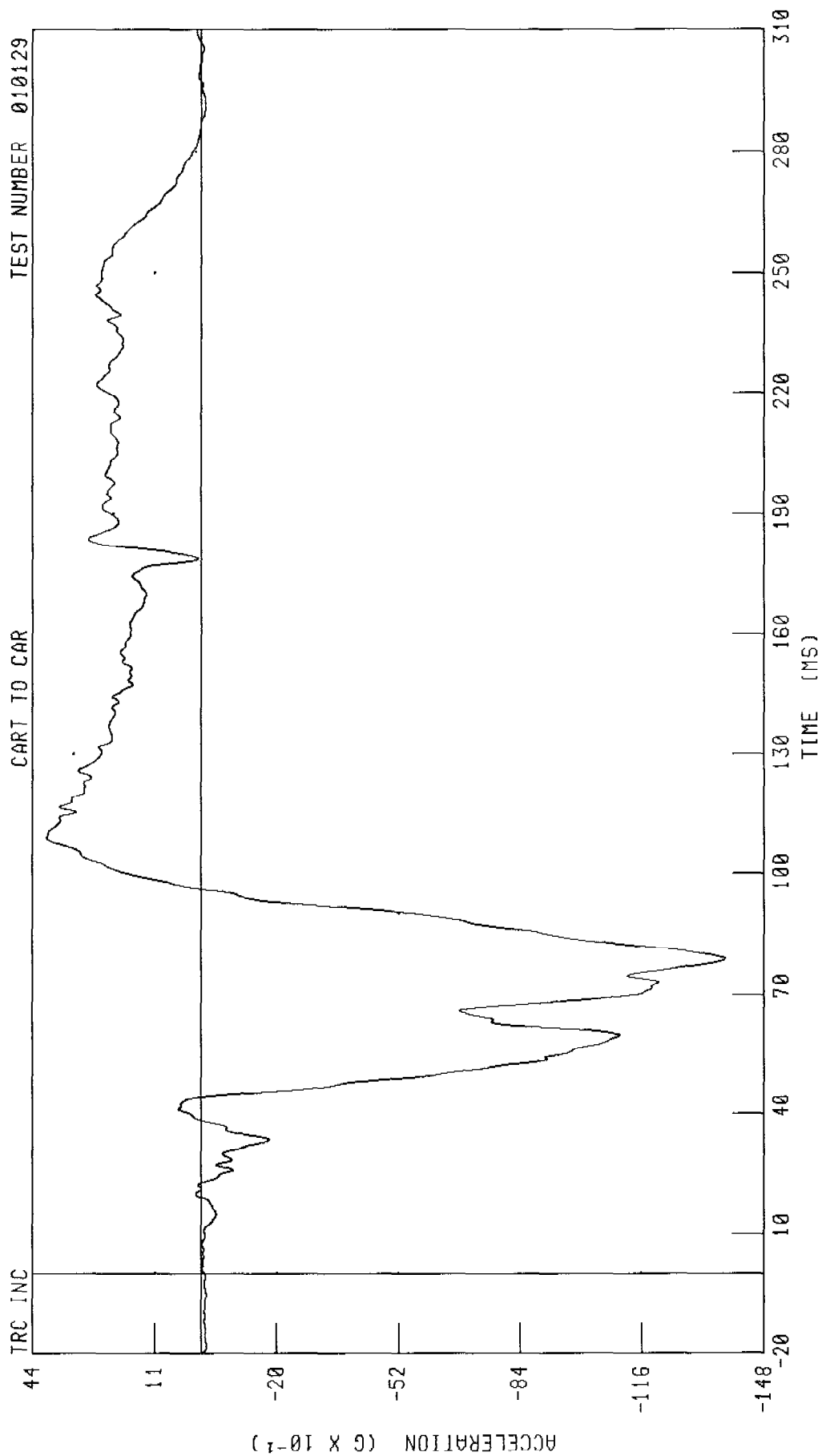
CHANNEL CSTXG1 FILTER CH CLASS 180

PEAK DATA 4 74 G @ 235 60 MS, -54 82 G @ 69 28 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER CHEST Y-AXIS ACCELERATION



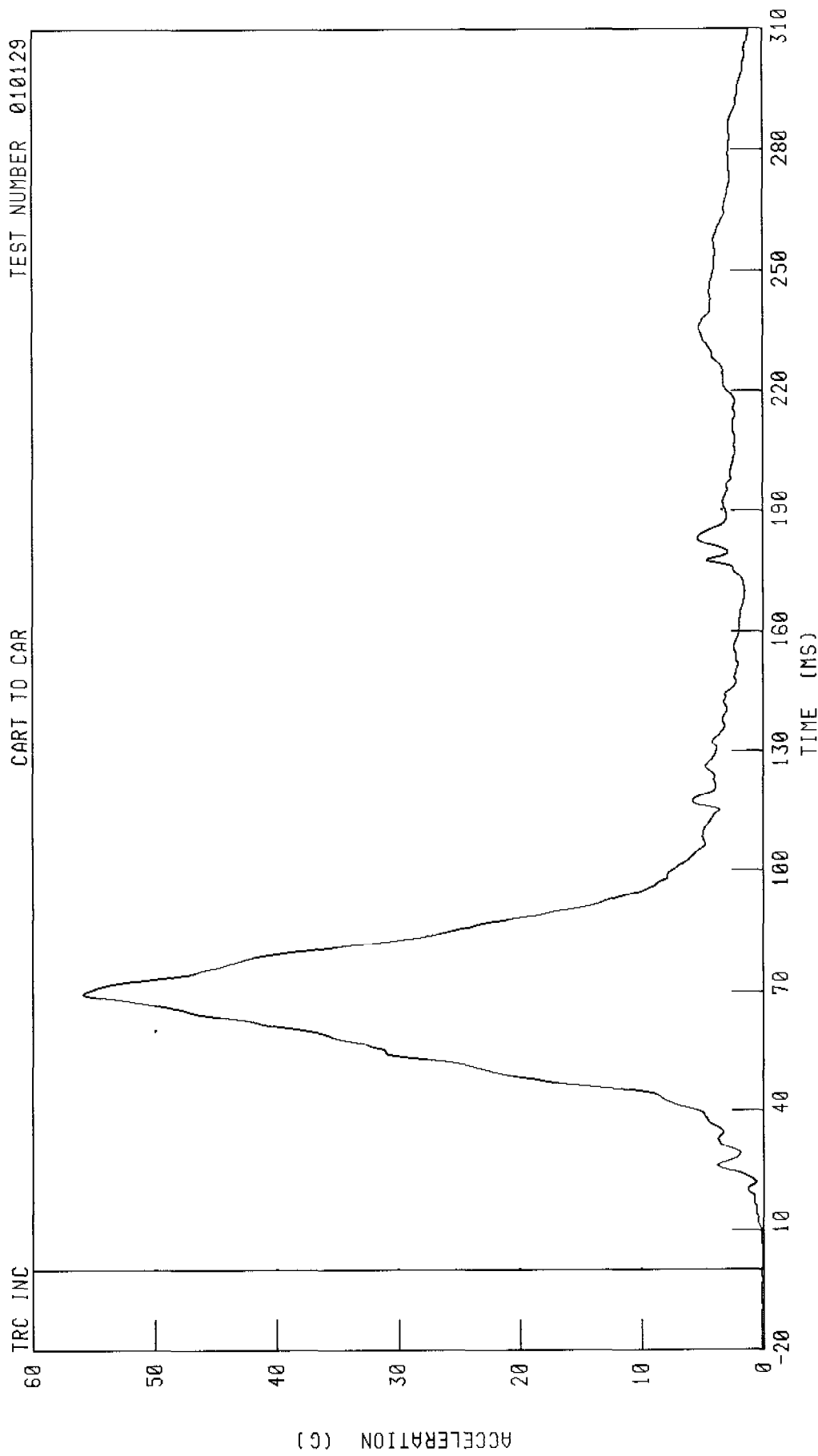
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER CHEST Z-AXIS ACCELERATION



CHANNEL CSTZG1 FILTER CH CLASS 180

PEAK DATA 4 04 G @ 109 12 MS, -13 80 G @ 78 88 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER CHEST RESULTANT ACCELERATION

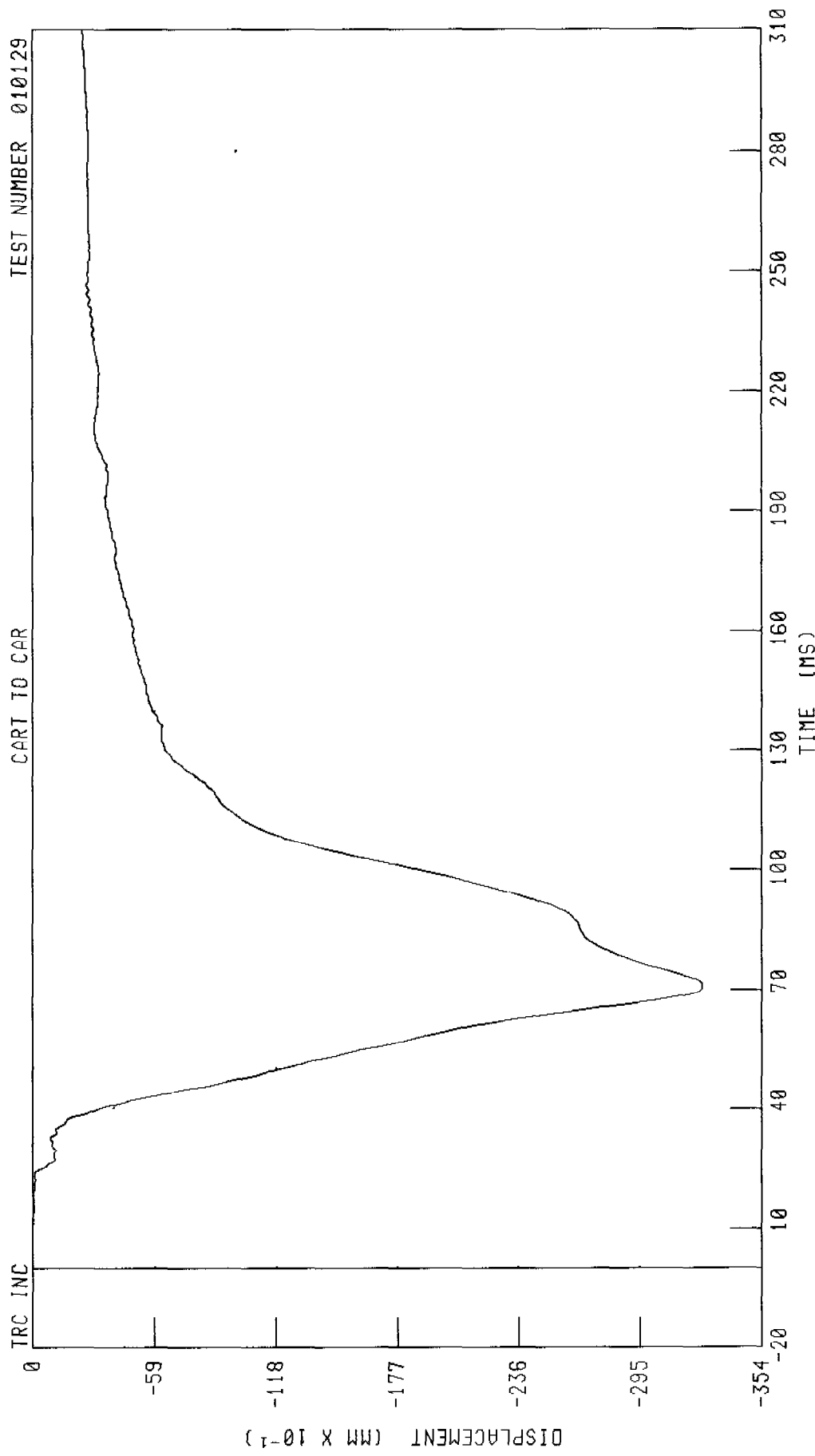


CHANNEL CSTR01 FILTER CH CLASS 180 PEAK DATA 55 92 G @ 69 44 MS, 0 01 G @ -20 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER CHEST DEFLECTION
CART TO CAR

TRC INC

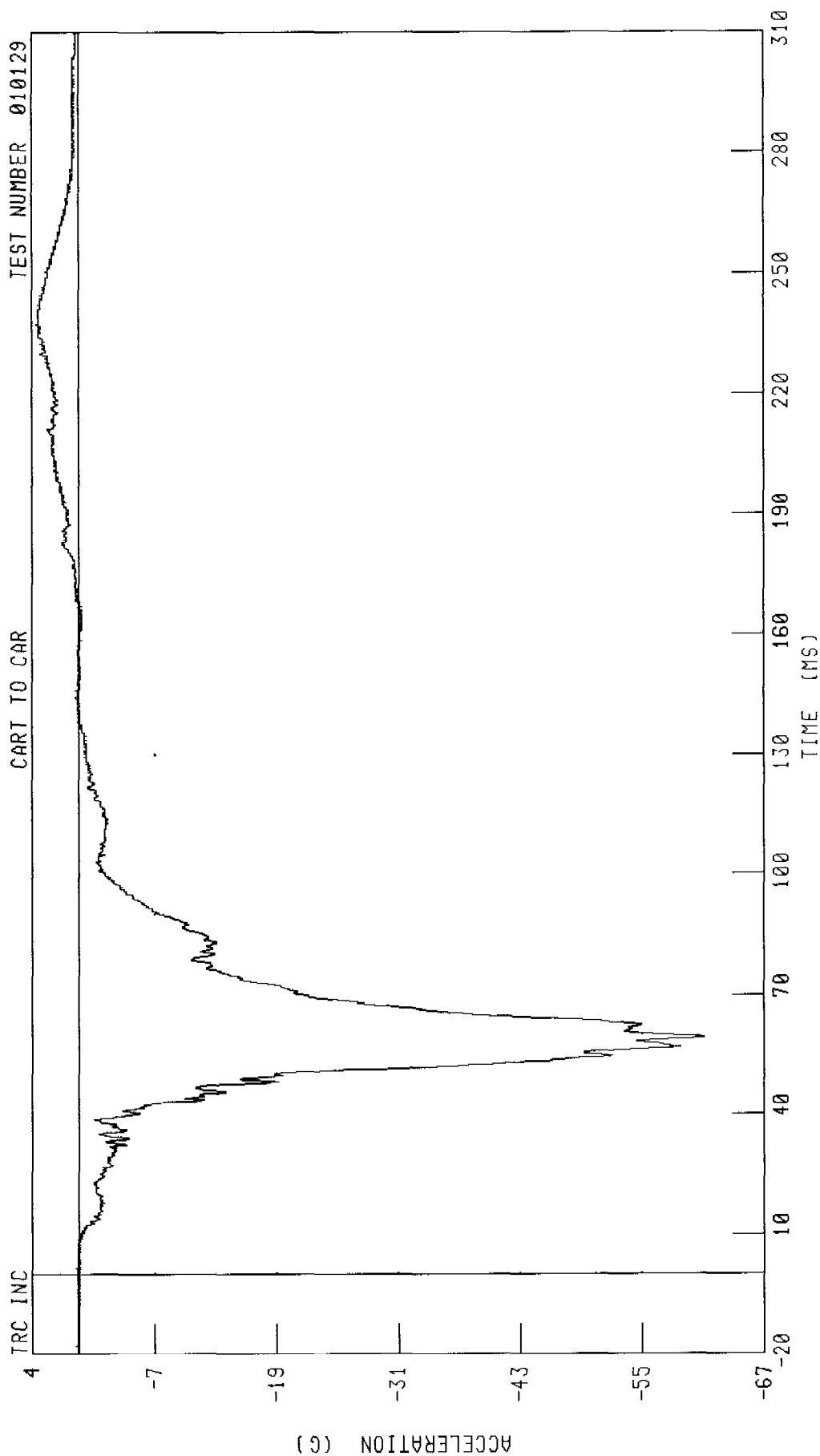
TEST NUMBER 010129



CHANNEL CSTXD1 FILTER CH CLASS 600

PEAK DATA 0 01 MM @ 5 44 MS, -32 50 MM @ 71 44 MS

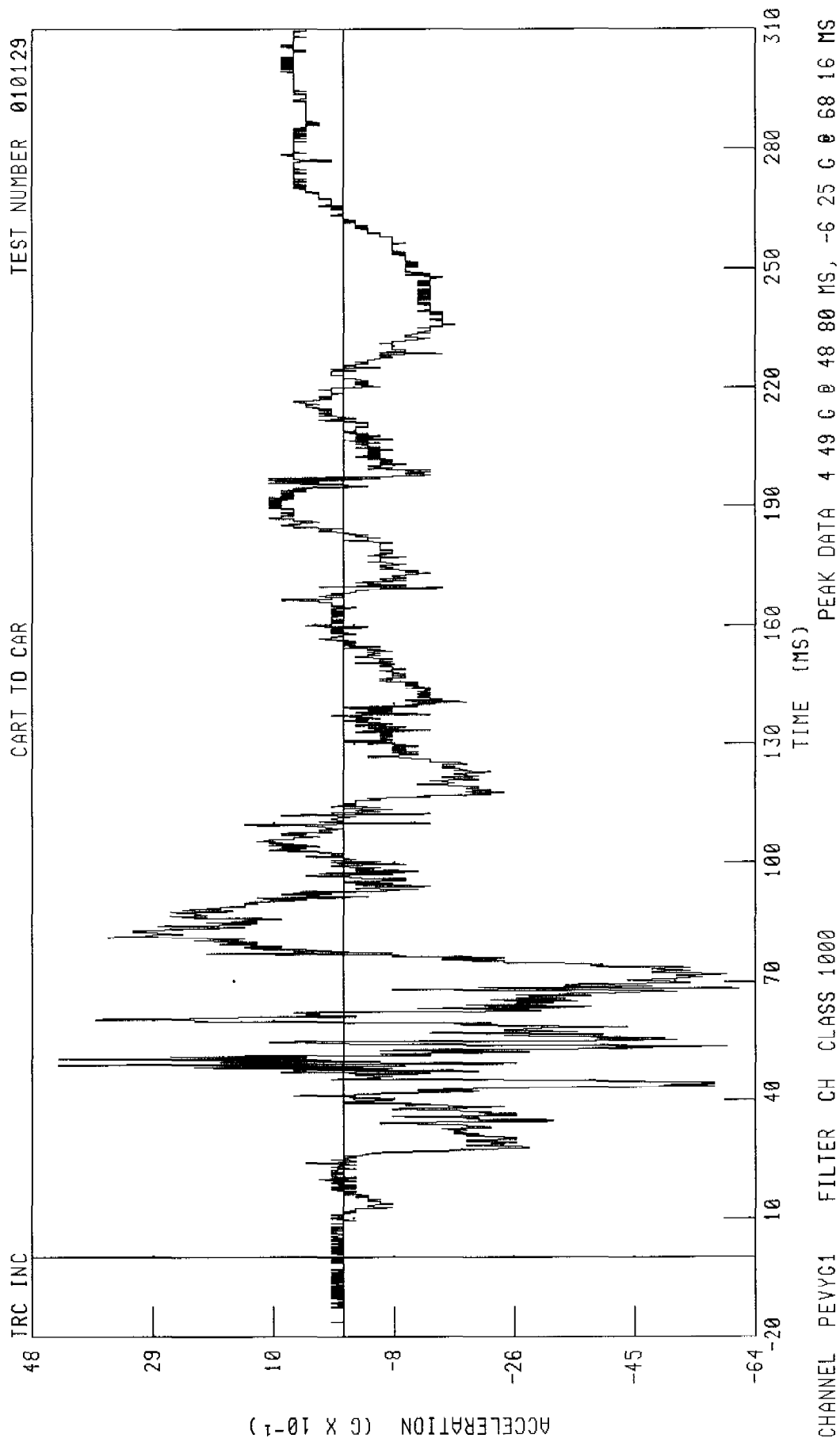
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER PELVIS X-AXIS ACCELERATION



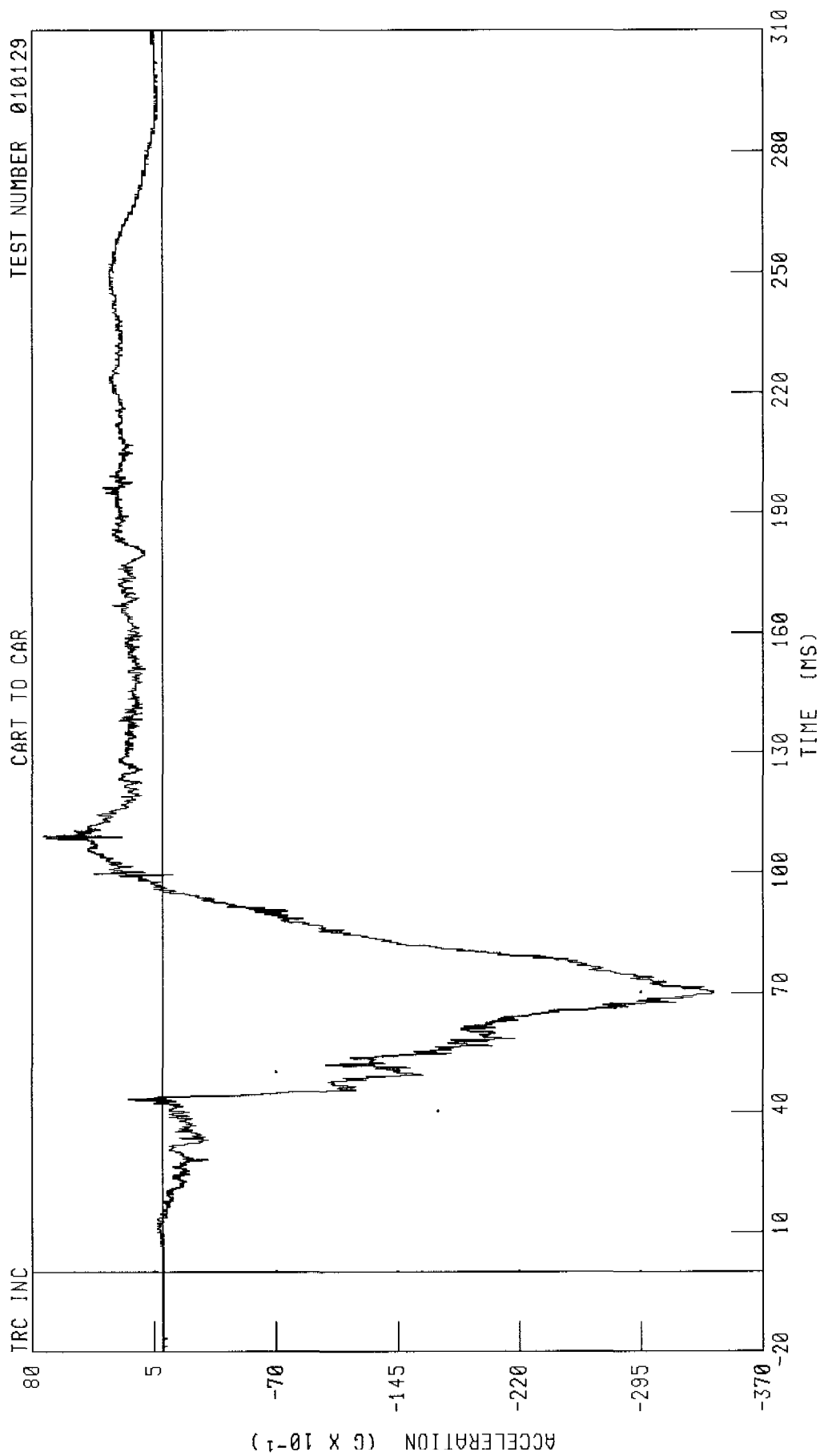
CHANNEL PEVXC1 FILTER CH CLASS 1000

PEAK DATA 4 14 G @ 237 28 MS, -61 64 G @ 59 28 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER PELVIS Y-AXIS ACCELERATION



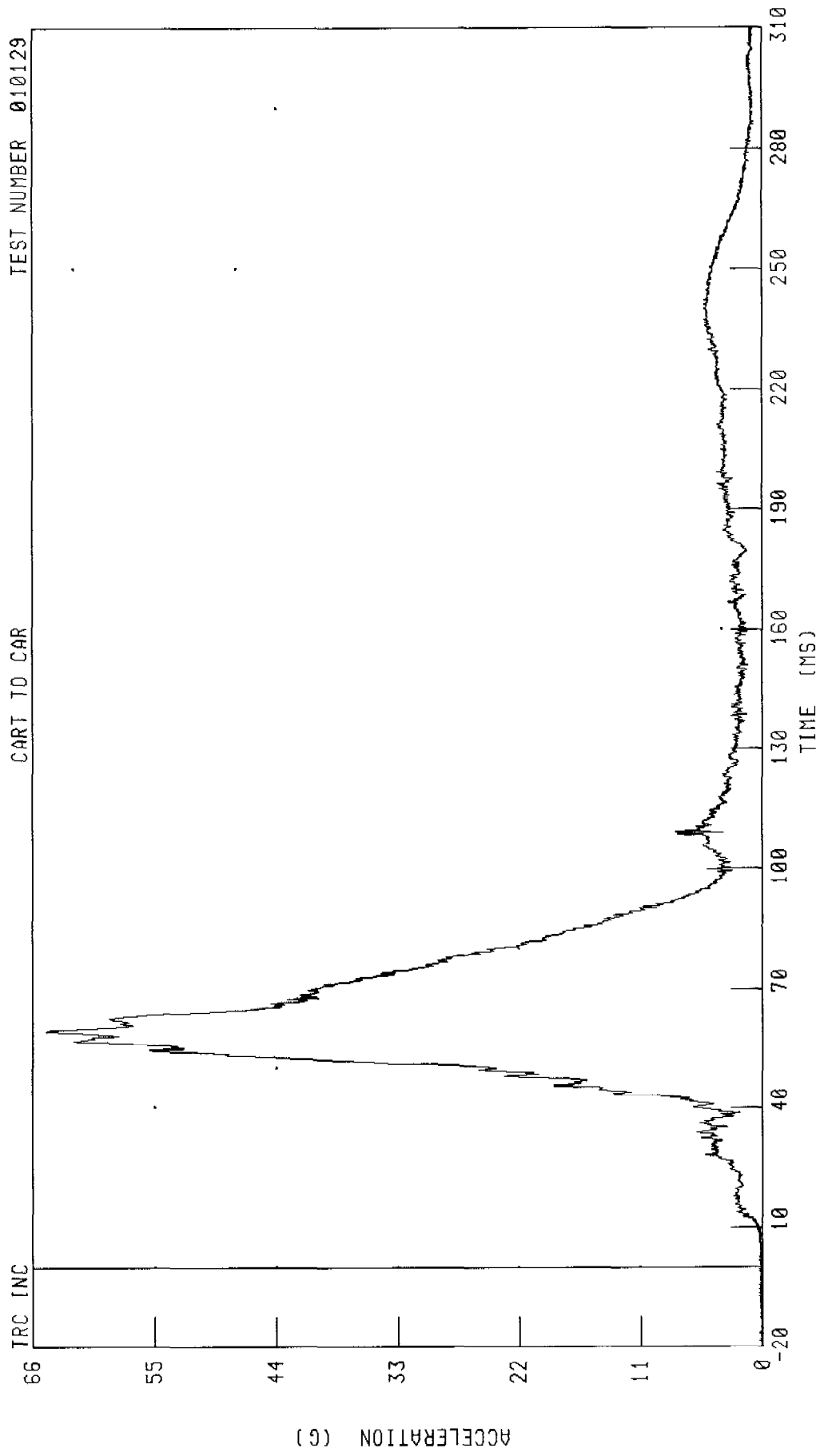
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER PELVIS Z-AXIS ACCELERATION



CHANNEL PEVZG1 FILTER CH CLASS 1000

PEAK DATA 7 34 0 109 28 MS, -33 96 0 0 69 76 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER PELVIS RESULTANT ACCELERATION



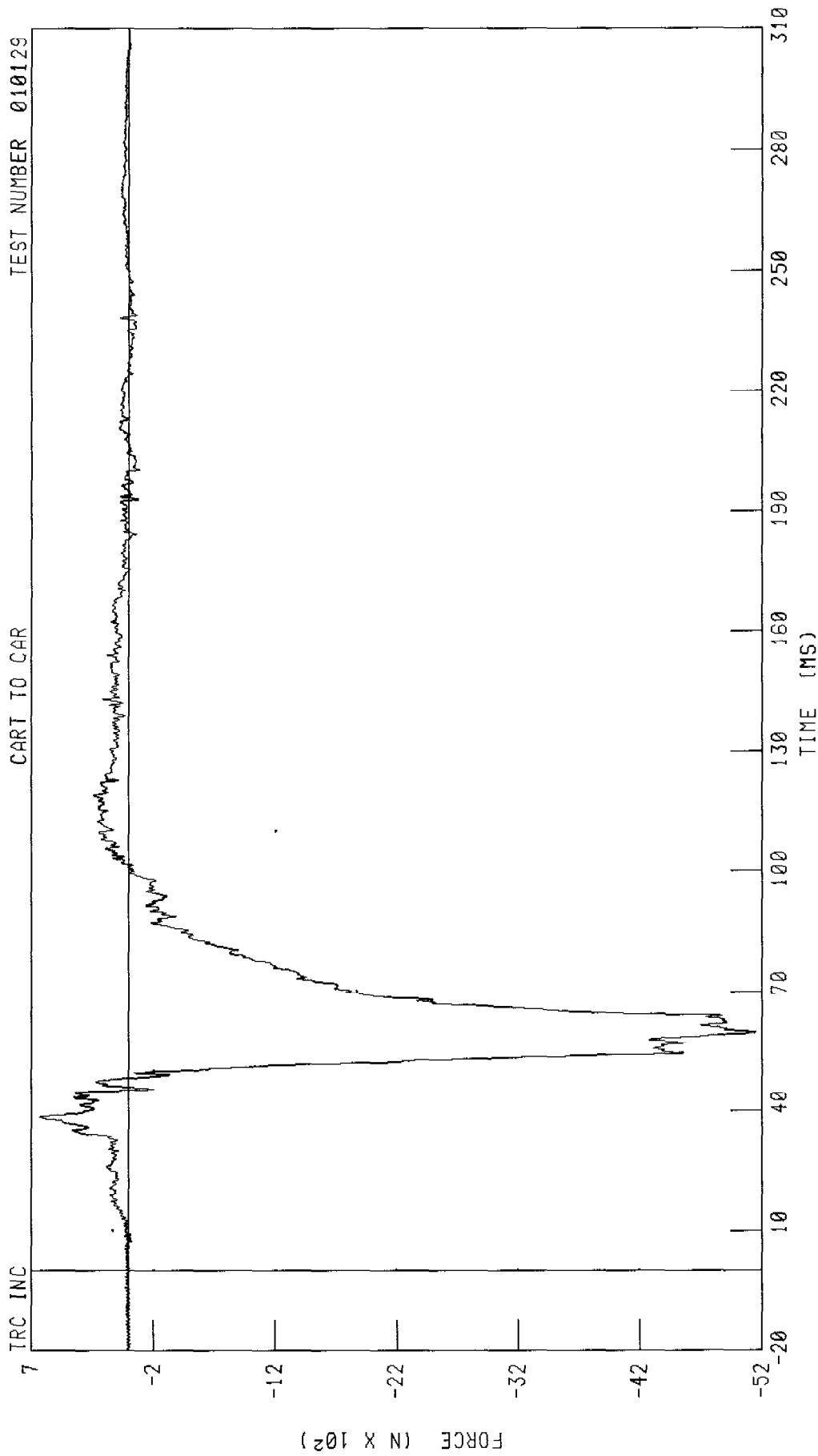
CART TO CAR

TEST NUMBER 010129

CHANNEL PEVRG1 FILTER CH CLASS 1000

PEAK DATA 64.77 G @ 59.28 MS, 0.06 G @ -20.00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER LEFT FEMUR FORCE

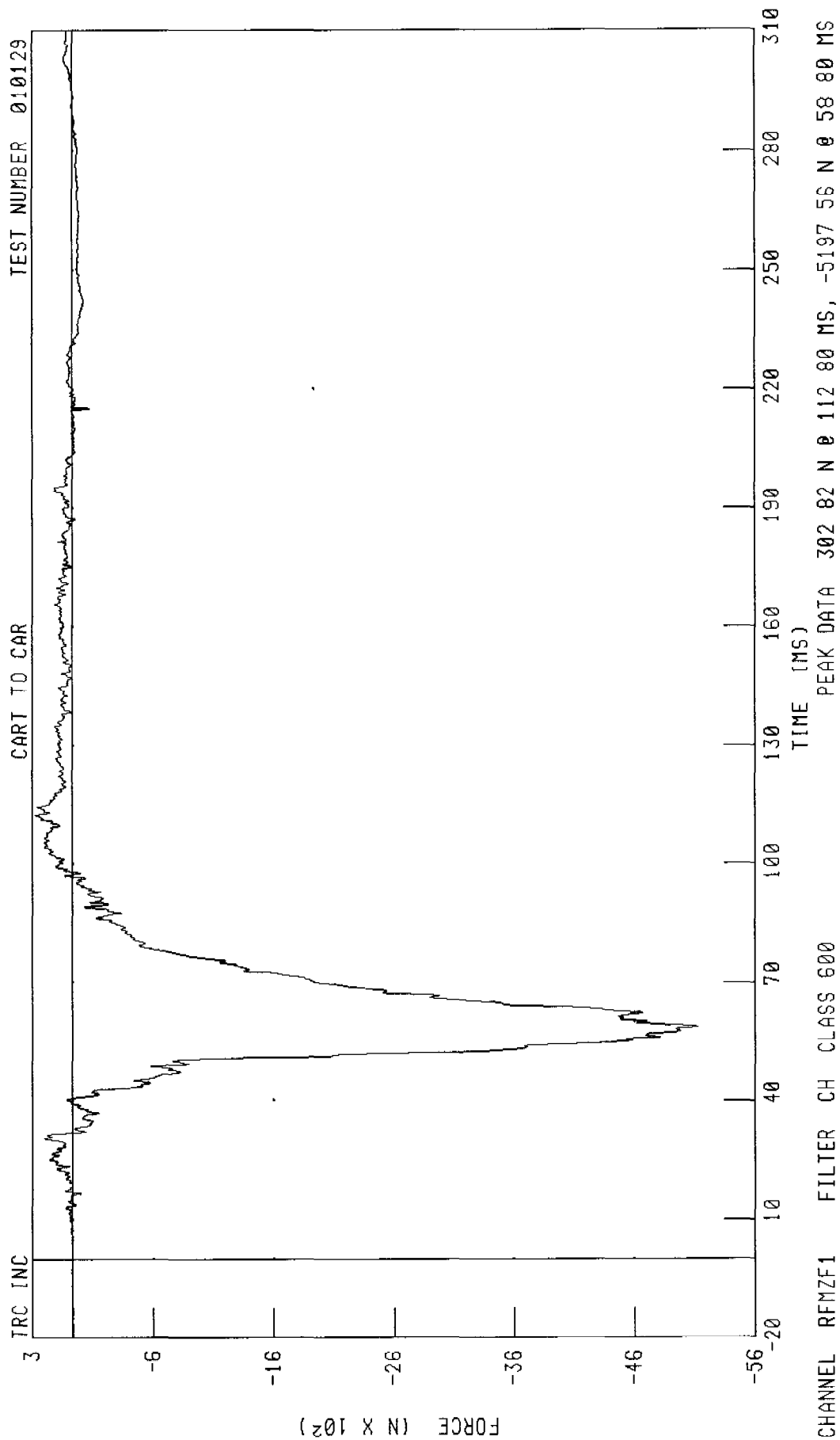


CHANNEL LFMZF1 FILTER CH CLASS 600

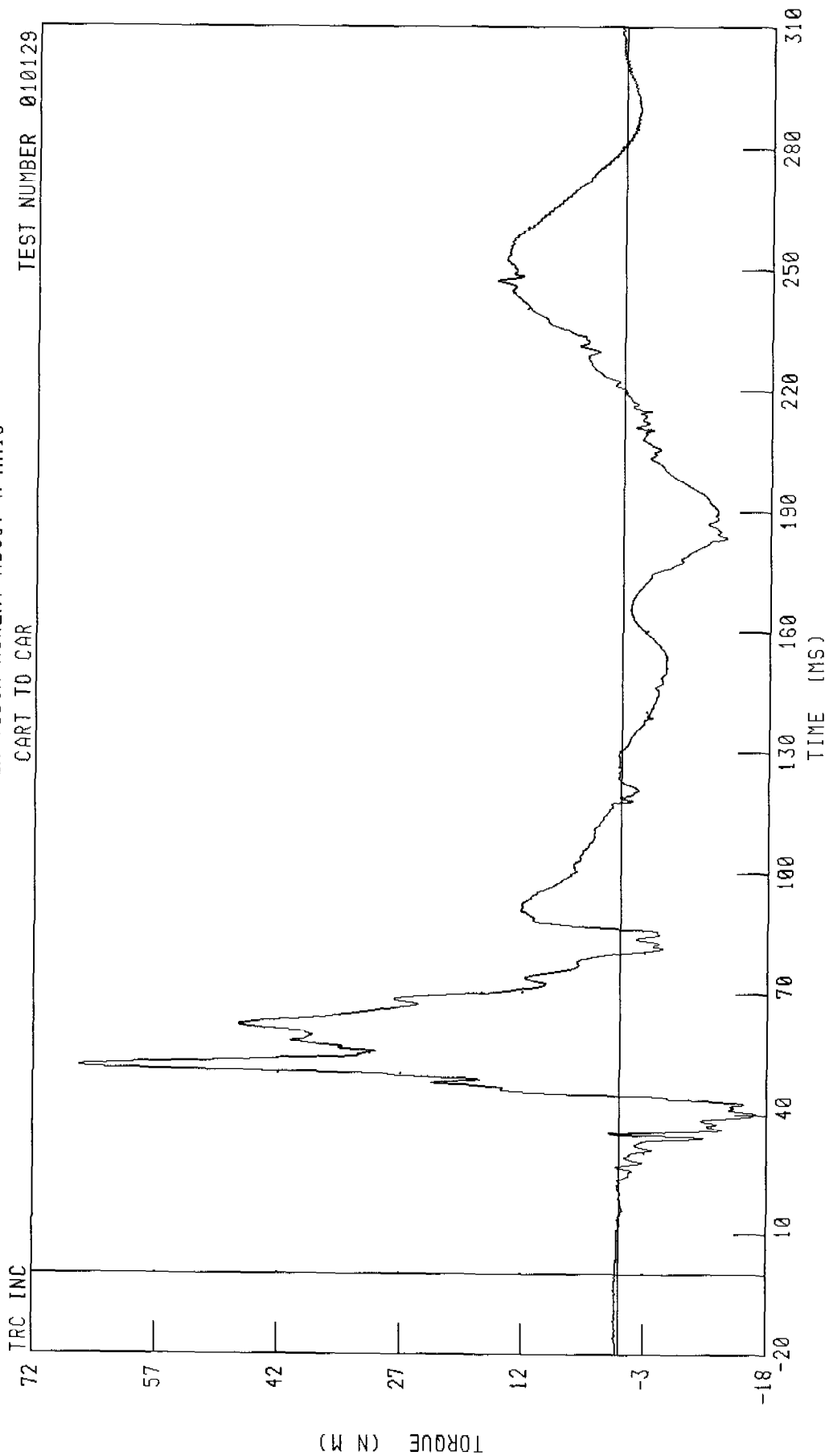
PEAK DATA 720 69 N 0 38 48 MS, -5155 95 N 0 59 60 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER RIGHT FEMUR FORCE



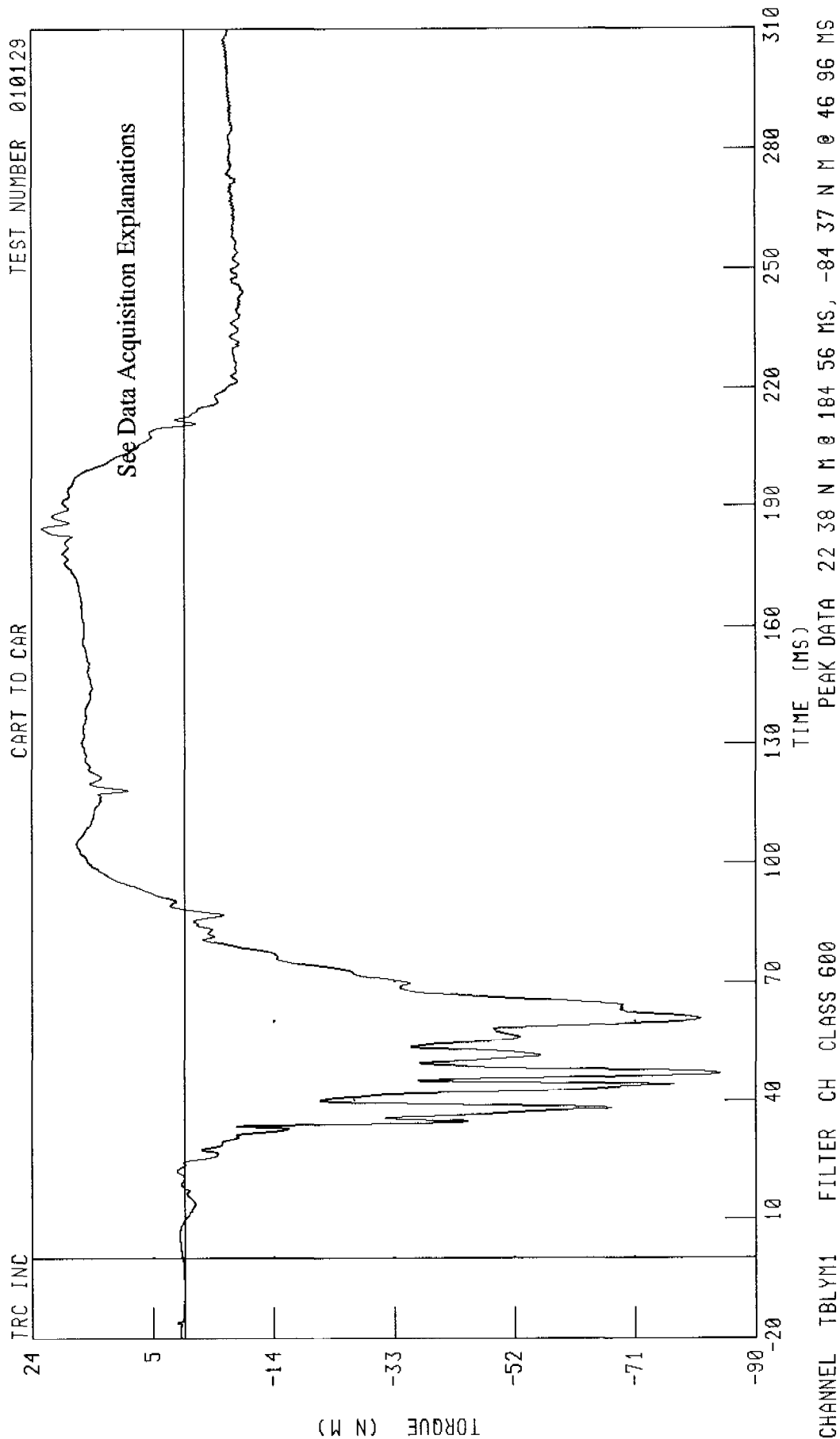
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER LEFT UPPER TIBIA MOMENT ABOUT X-AXIS



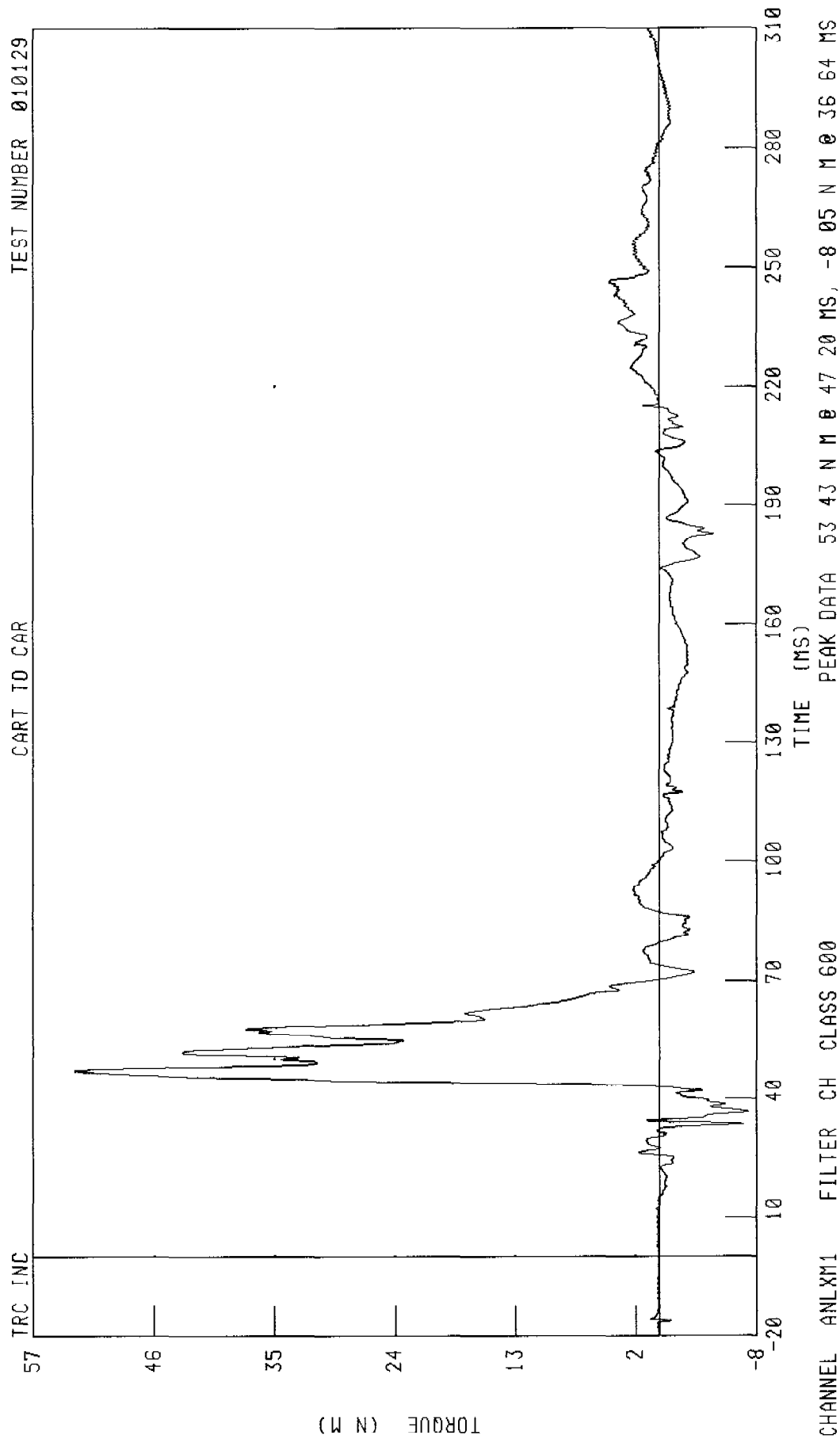
CHANNEL TBLXMI FILTER CH CLASS 600

PEAK DATA 66 41 N M 0 52 00 MS, -16 67 N M 0 40 08 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER LEFT UPPER TIBIA MOMENT ABOUT Y-AXIS



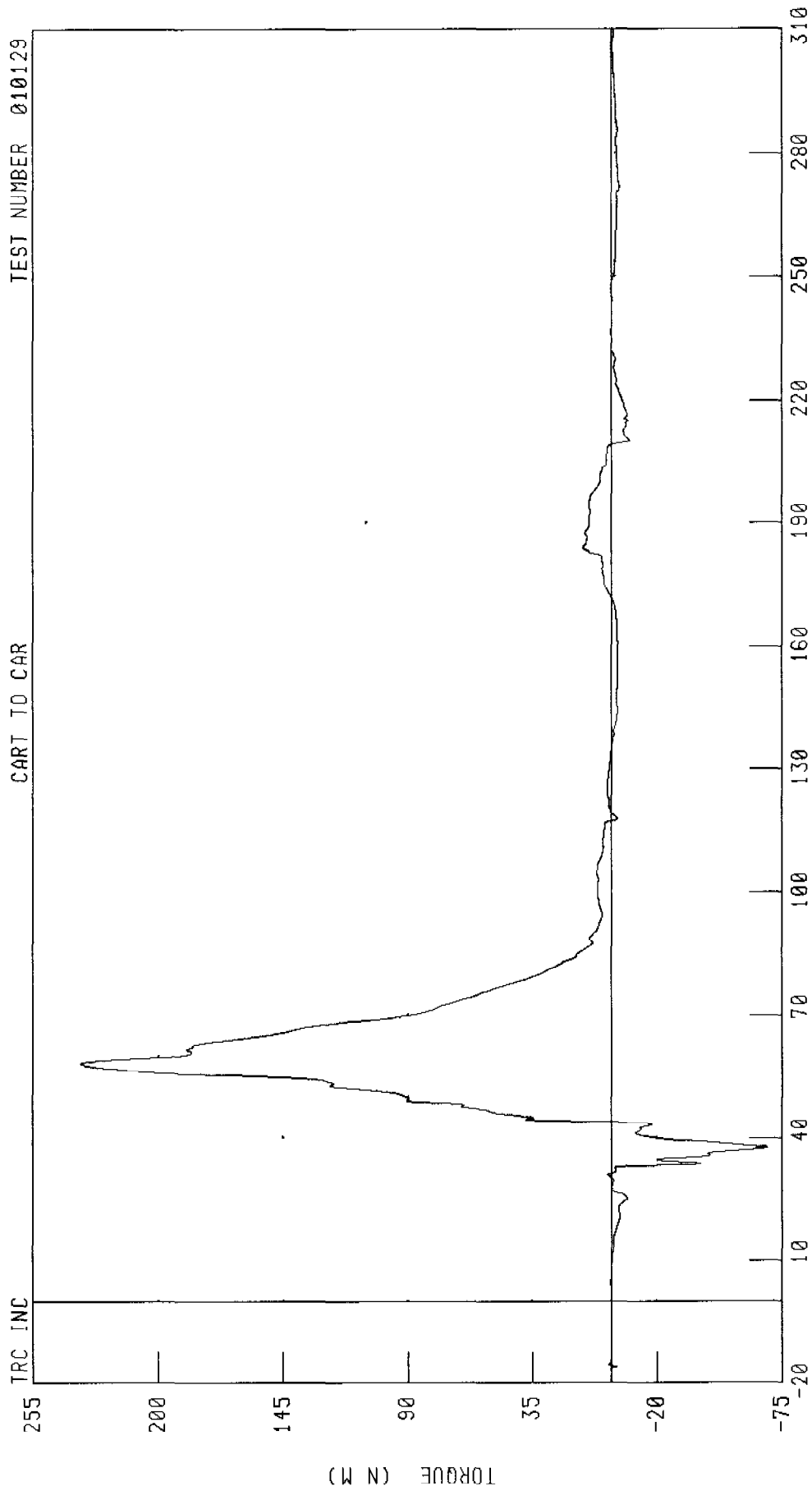
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER LEFT LOWER TIBIA MOMENT ABOUT X-AXIS



CHANNEL ANLXM1 FILTER CH CLASS 600

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER LEFT LOWER TIBIA MOMENT ABOUT Y-AXIS



TRC INC

CART TO CAR

TEST NUMBER 010129

TIME (MS)

CHANNEL ANLYM1 FILTER CH CLASS 600

PEAK DATA 233 97 N M @ 58 08 MS, -68 46 N M @ 37 68 MS

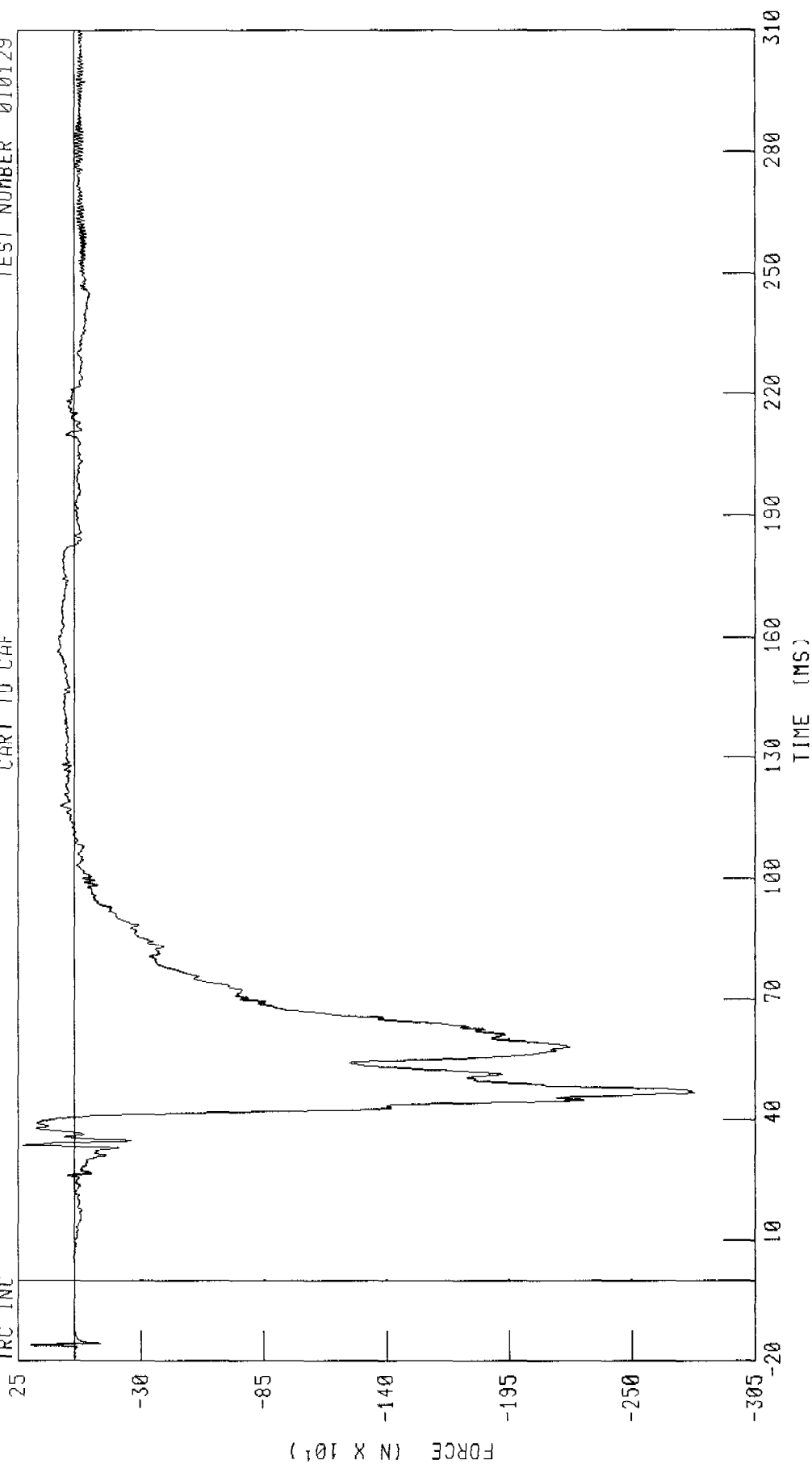
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER LEFT LOWER TIBIA Z-AXIS FORCE

TRC INC

CART TO CHF

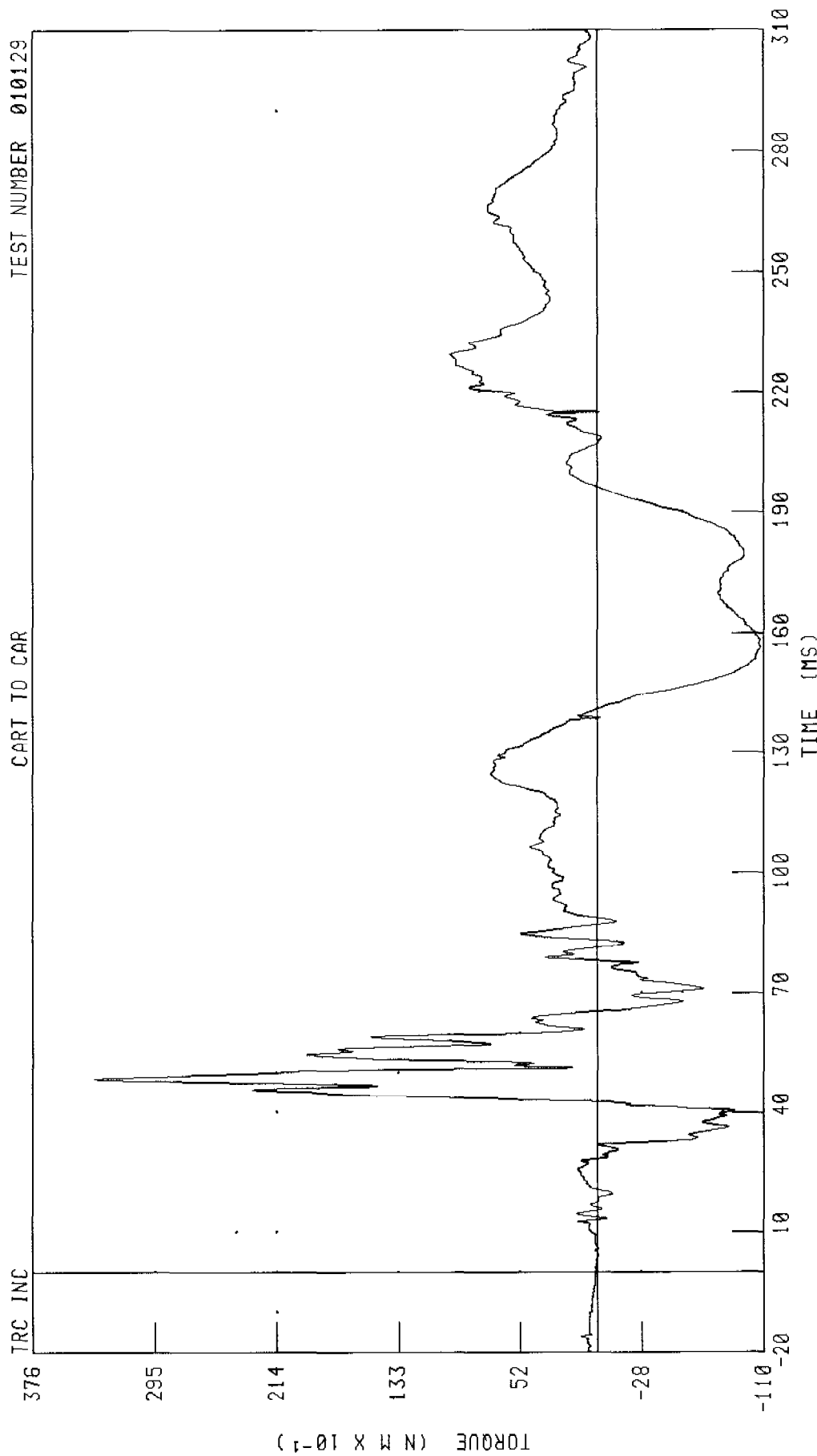
TEST NUMBER 010129



CHANNEL ANLZF1 FILTER CH CLASS 600

PEAK DATA 232 38 N @ 33 68 MS, -2778 44 N @ 46 88 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER RIGHT UPPER TIBIA MOMENT ABOUT X-AXIS

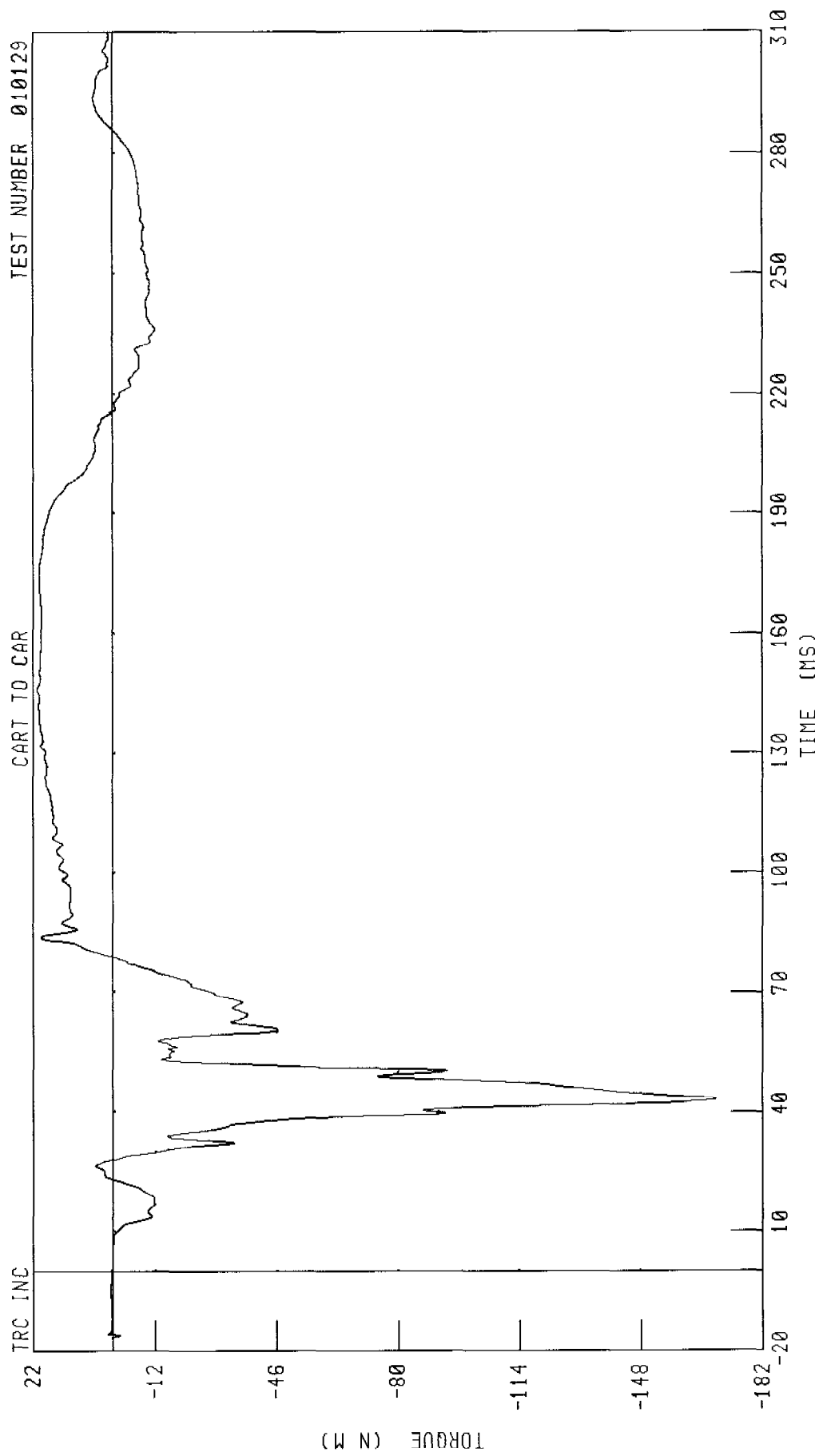


TEST NUMBER 010129

CHANNEL TBRX11 FILTER CH CLASS 600

PEAK DATA 33 47 N M @ 48 56 MS, -10 82 N M @ 158 40 MS

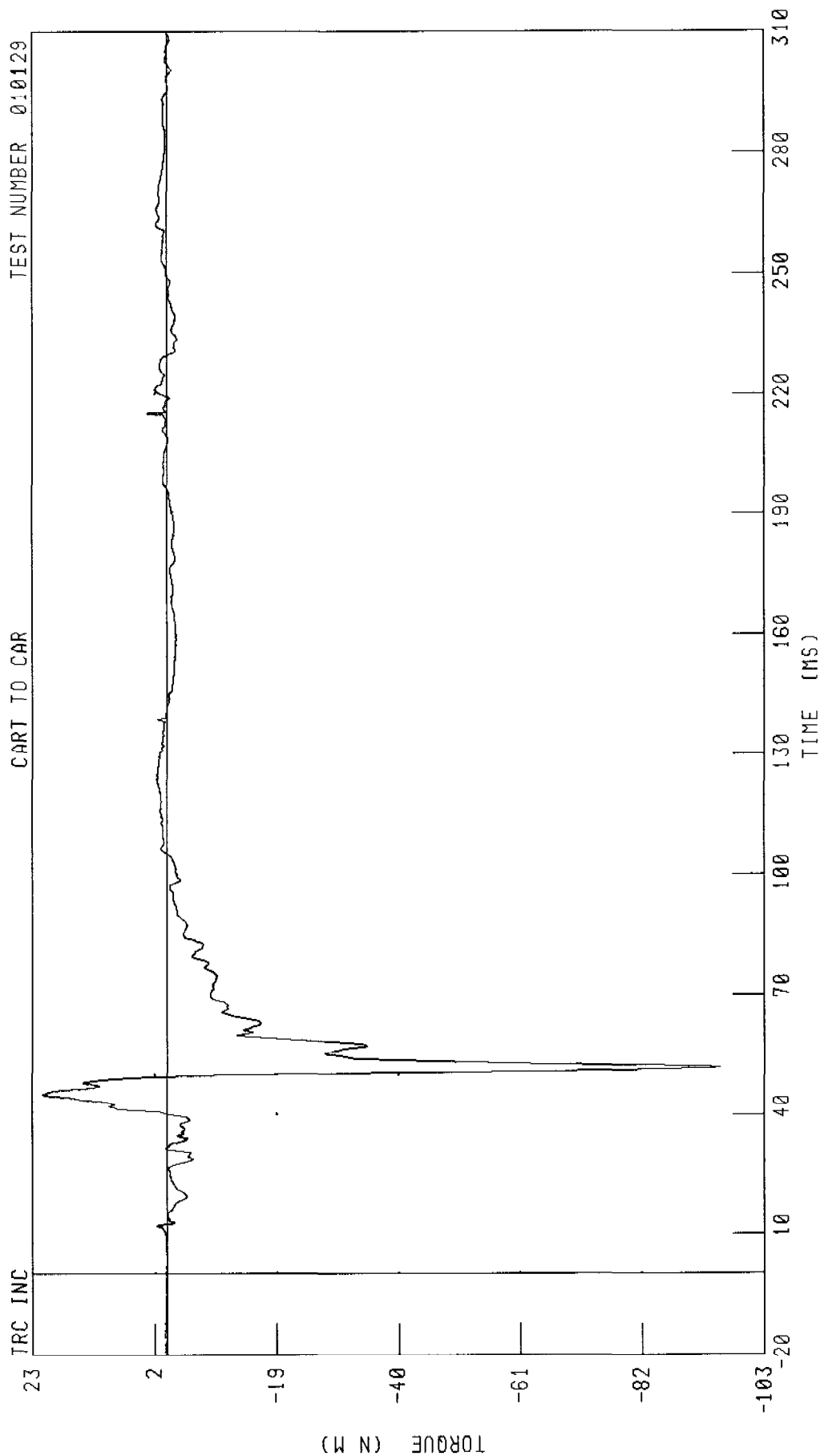
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER RIGHT UPPER TIBIA MOMENT ABOUT Y-AXIS



CHANNEL TBRYM1 FILTER CH CLASS 600

PEAK DATA 20 78 N M @ 145 60 MS, -168 96 N M @ 43 12 MS

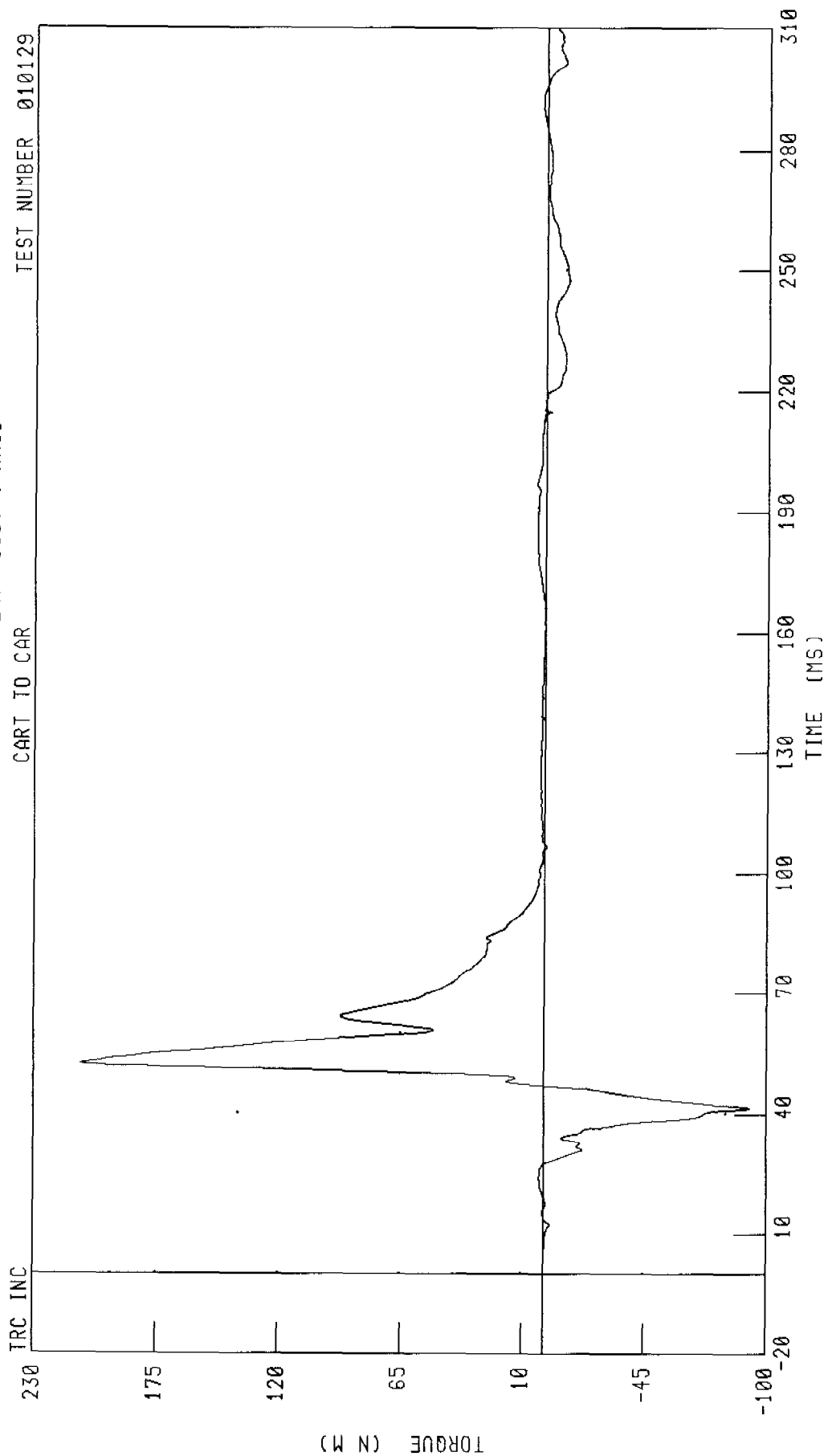
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER RIGHT LOWER TIBIA MOMENT ABOUT X-AXIS



CHANNEL ANRXM1 FILTER CH CLASS 600

PEAK DATA 21 23 N M @ 45 12 MS, -95 41 N M @ 51 84 MS

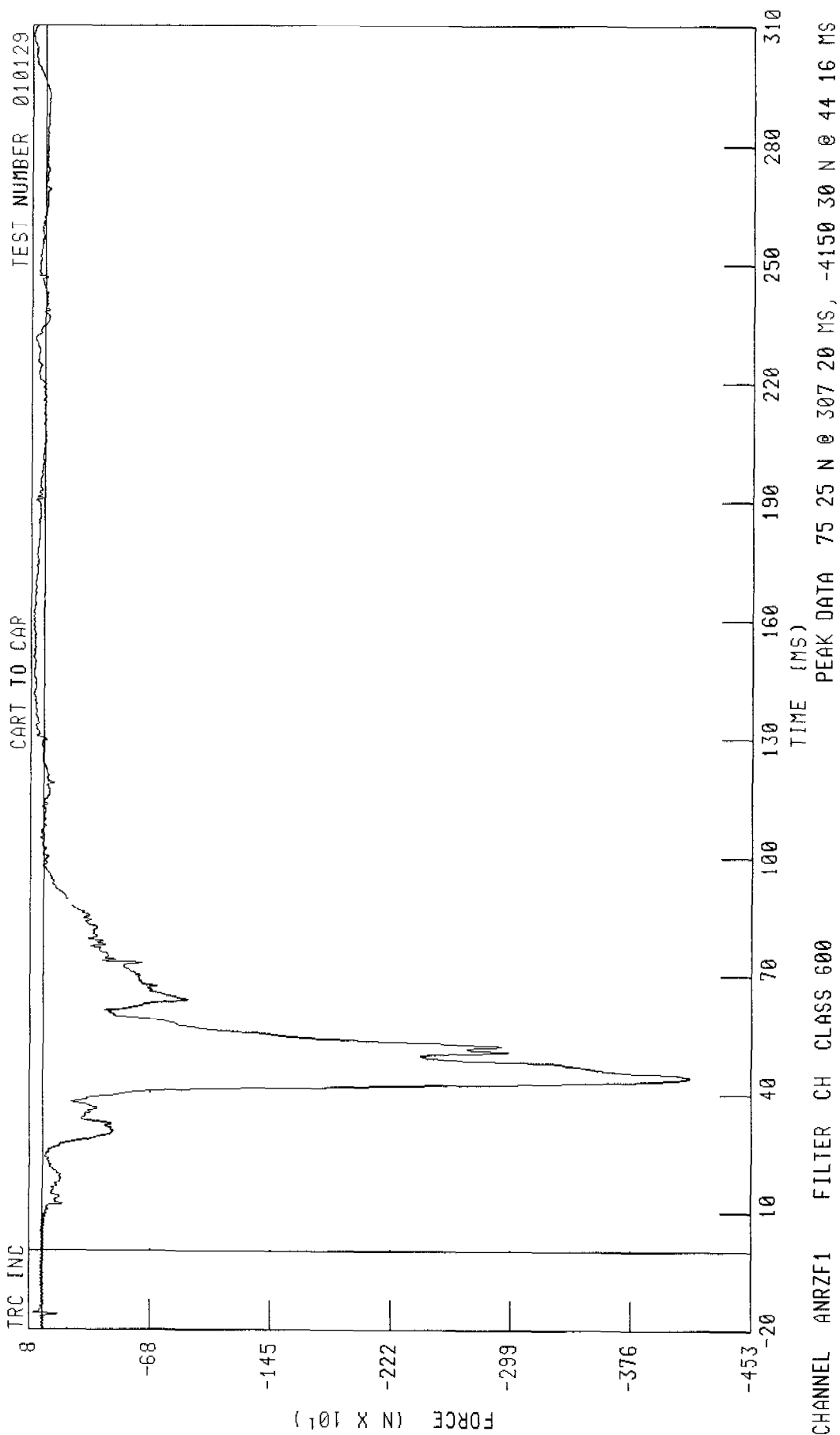
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 DRIVER RIGHT LOWER TIBIA MOMENT ABOUT Y-AXIS



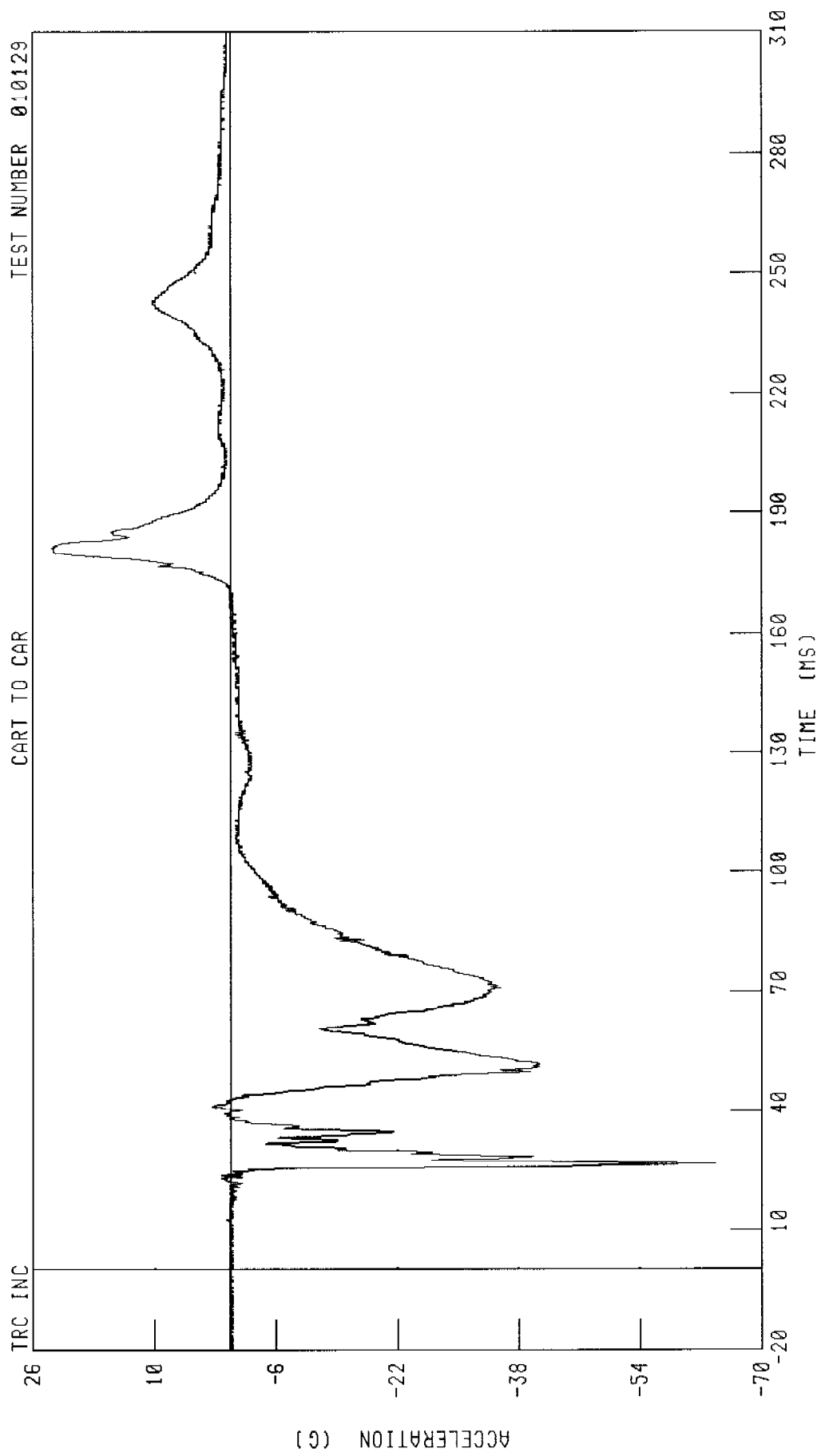
CHANNEL ANRYM1 FILTER CH CLASS 600

PEAK DATA 209 37 N M @ 52 40 MS, -92 63 N M @ 41 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER RIGHT LOWER TIBIA Z-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER HEAD X-AXIS ACCELERATION



CHANNEL HEDXC2 FILTER CH CLASS 1000

PEAK DATA 23 65 G @ 181 12 MS, -63 86 G @ 26 72 MS

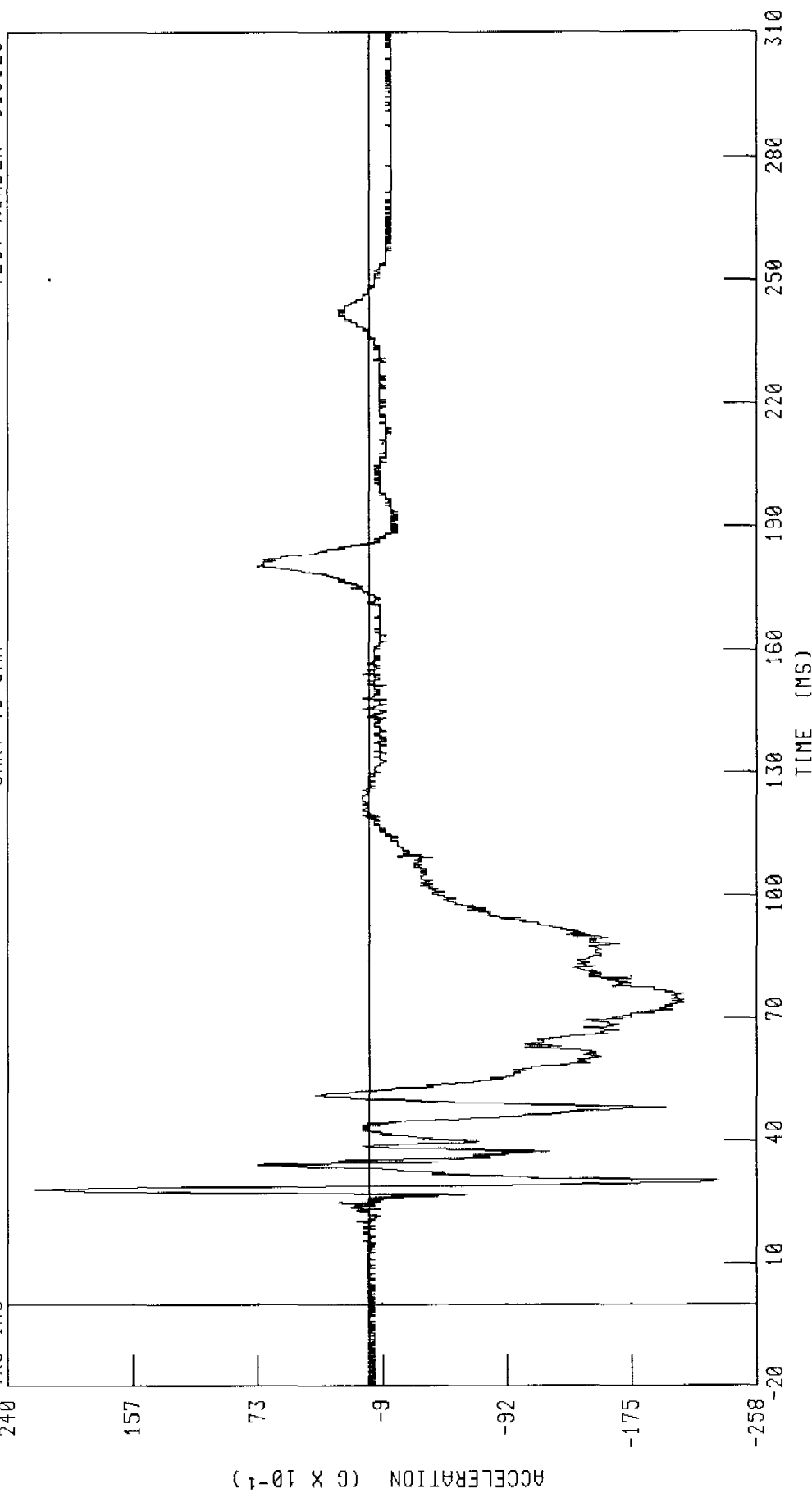
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

PASSENGER HEAD Y-AXIS ACCELERATION

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL HEDYC2 FILTER CH CLASS 1000

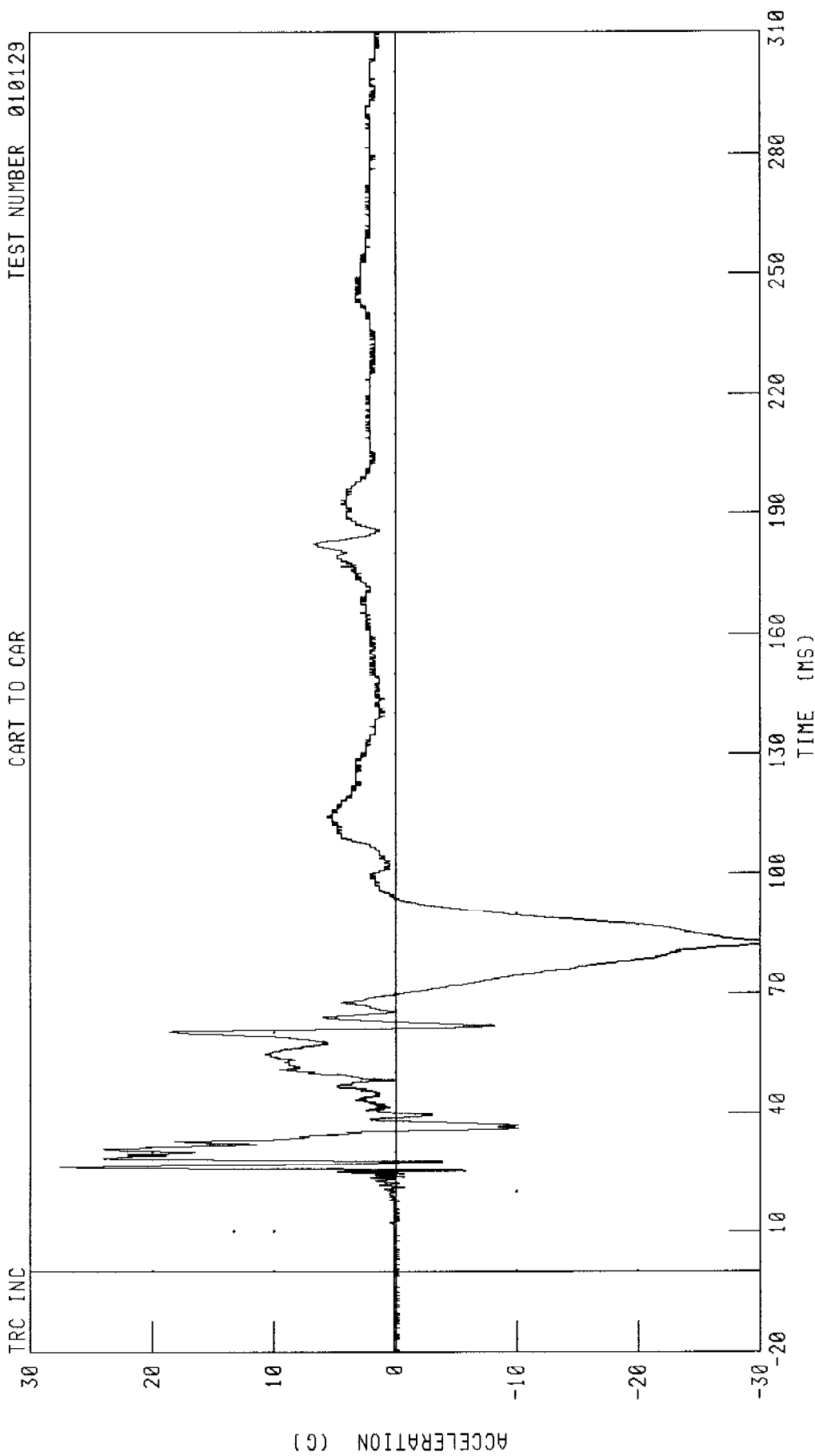
PEAK DATA 22 20 G @ 28 00 MS, -23 28 G @ 30 32 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER 010129

CART TO CAR

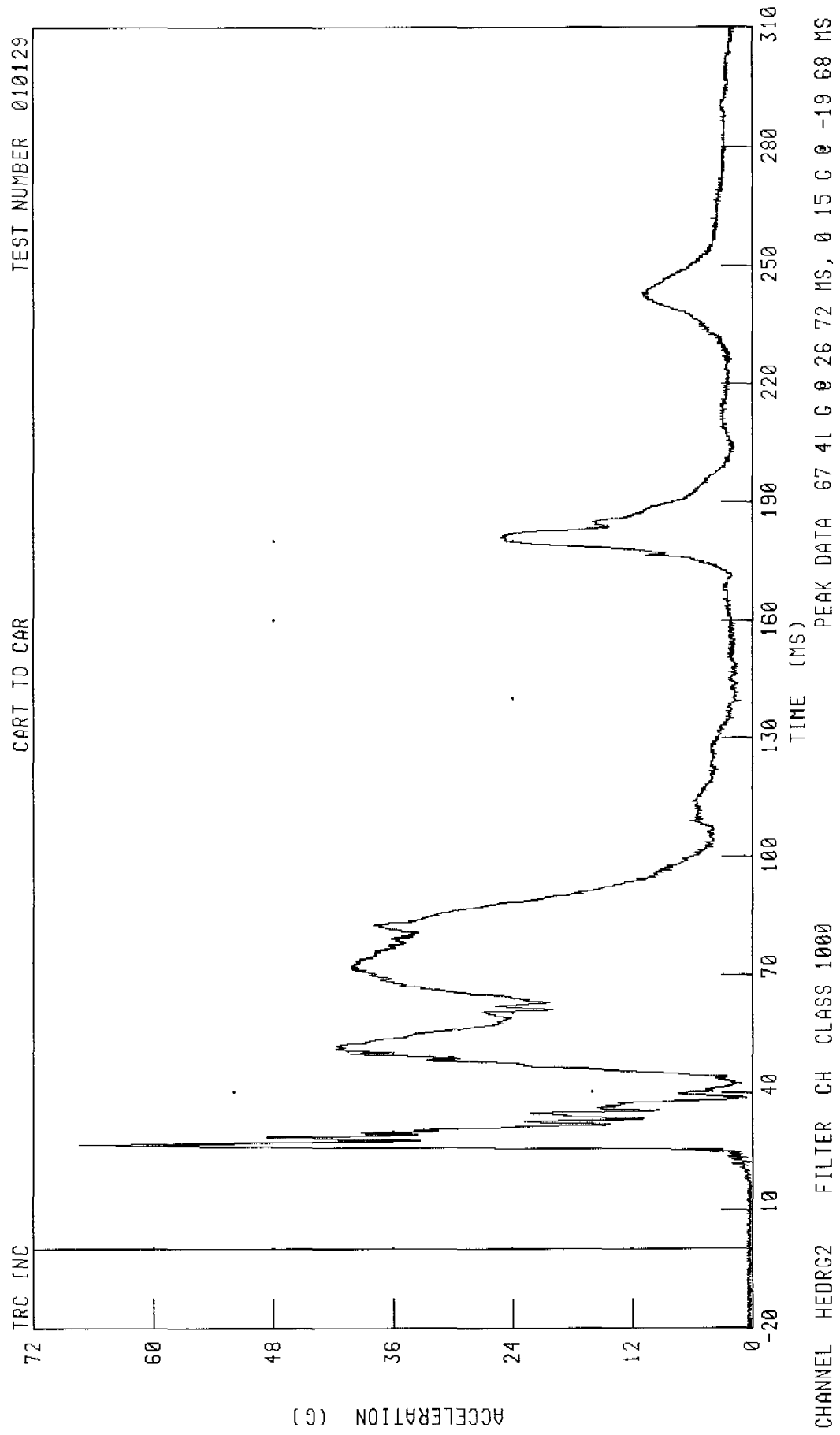
TRC INC



CHANNEL HEDZG2 FILTER CH CLASS 1000

PEAK DATA 27 58 G @ 26 40 MS, -30 91 G @ 82 56 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER HEAD RESULTANT ACCELERATION



TEST NUMBER 010129

CART TO CAR

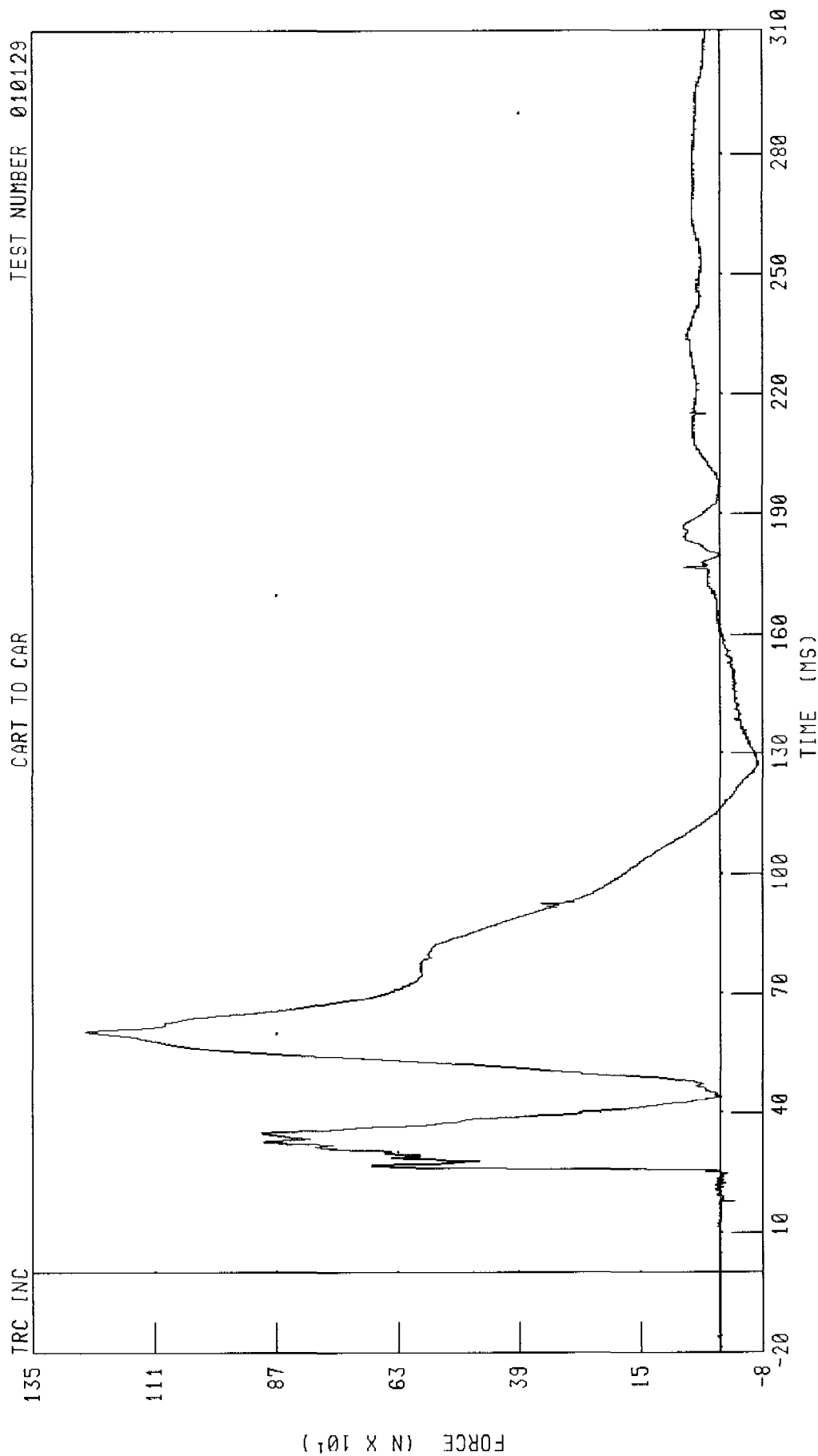
TRC INC

TIME (MS)

CHANNEL HEDRC2 FILTER CH CLASS 1000

PEAK DATA 67 41 G 0 26 72 MS, 0 15 G 0 -19 68 MS

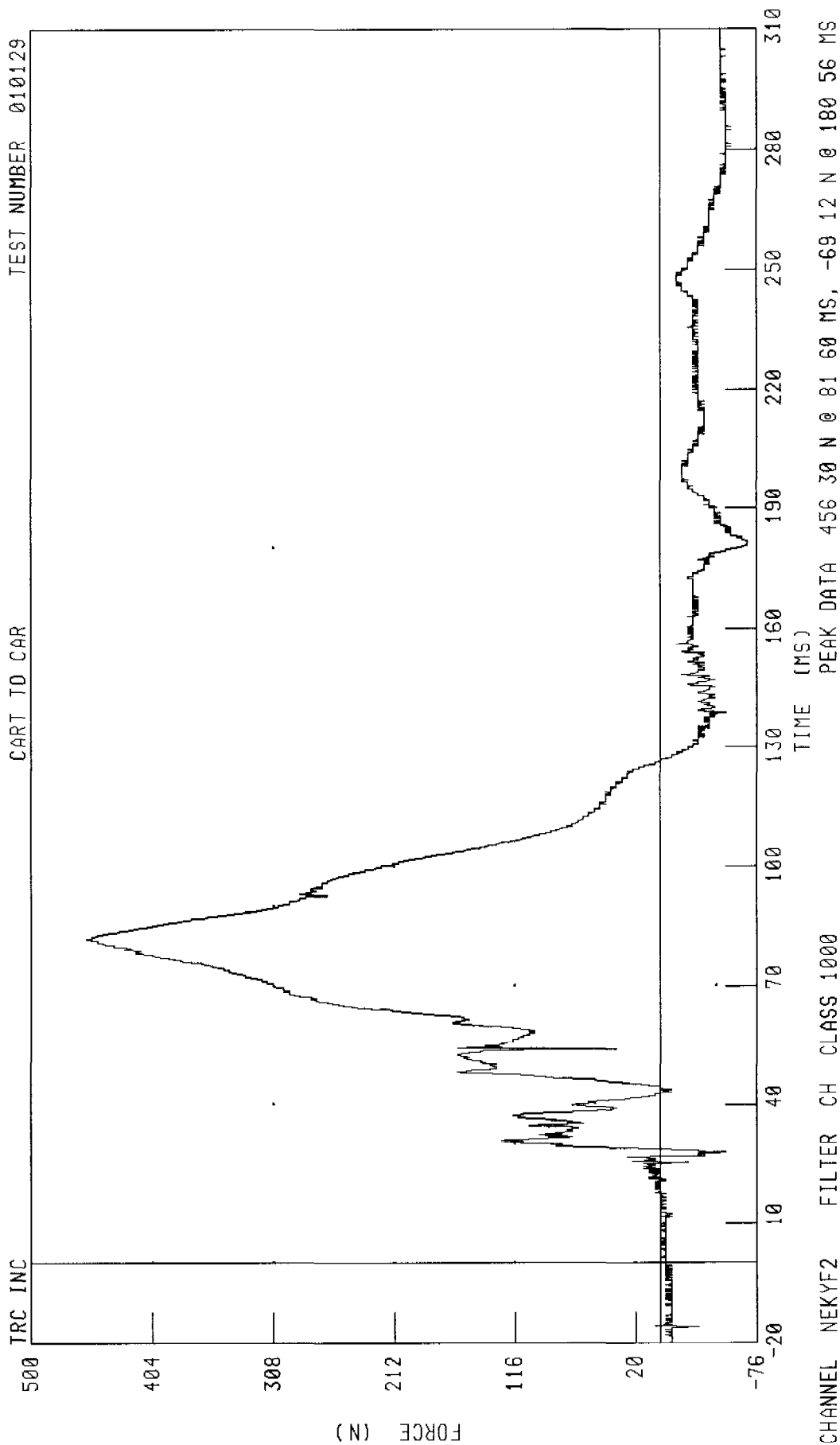
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE



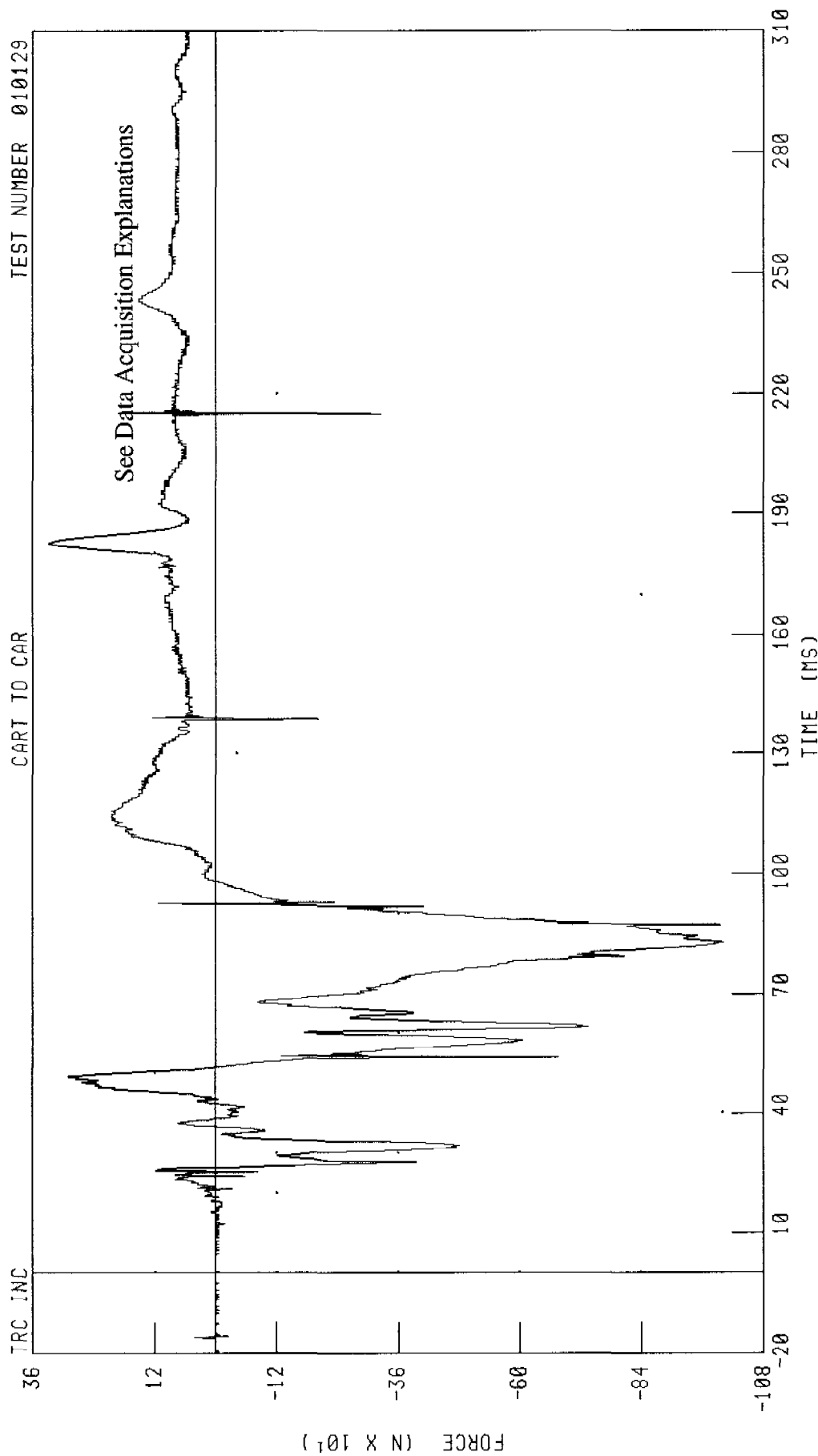
CHANNEL NEKXF2 FILTER CH CLASS 1000

PEAK DATA 1251 99 N @ 60 56 MS, -76 74 N @ 127 12 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE

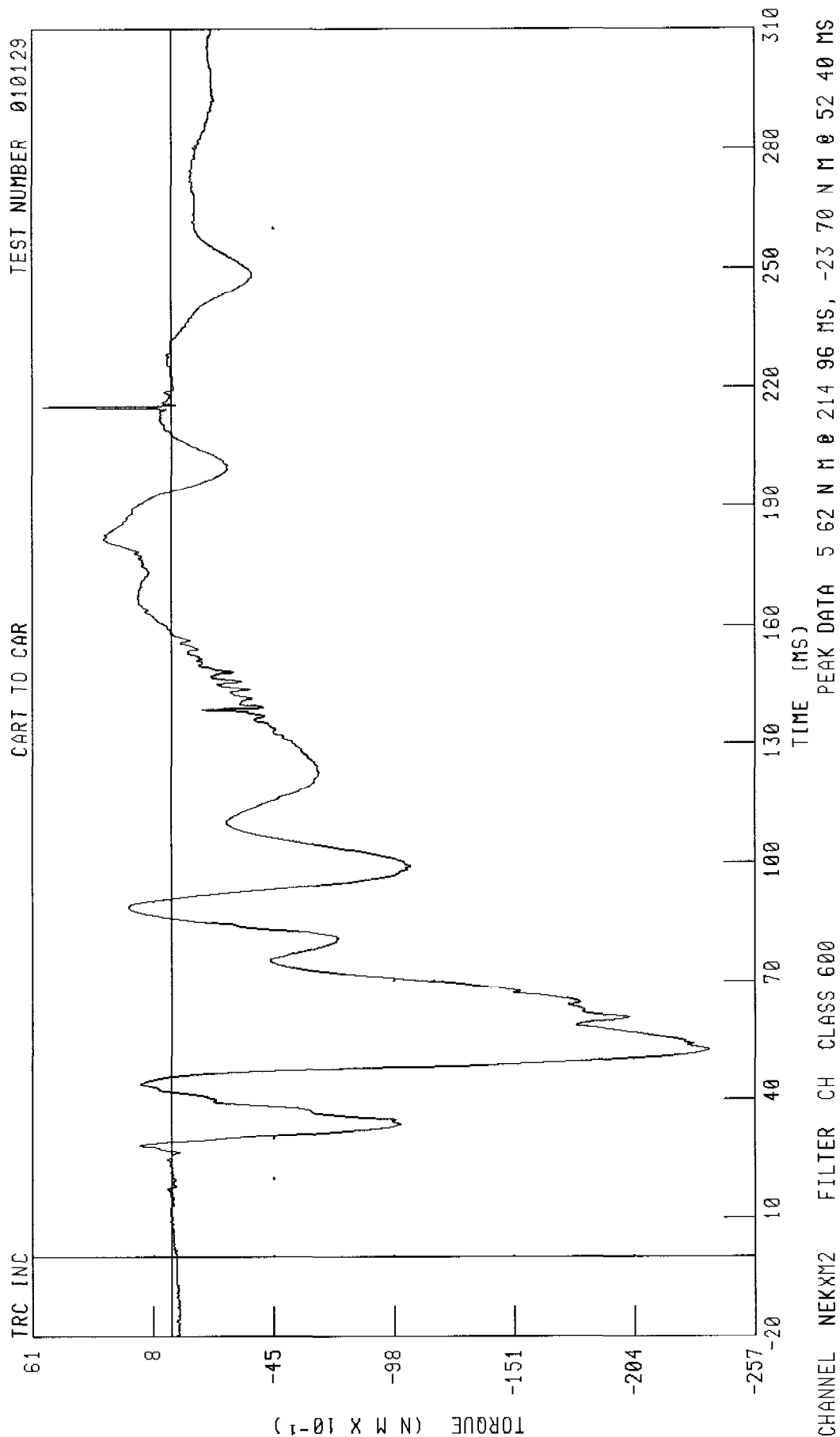


CHANNEL NEKZF2 FILTER CH CLASS 1000

PEAK DATA 327 63 N @ 182 40 MS, -1001 70 N @ 82 80 MS

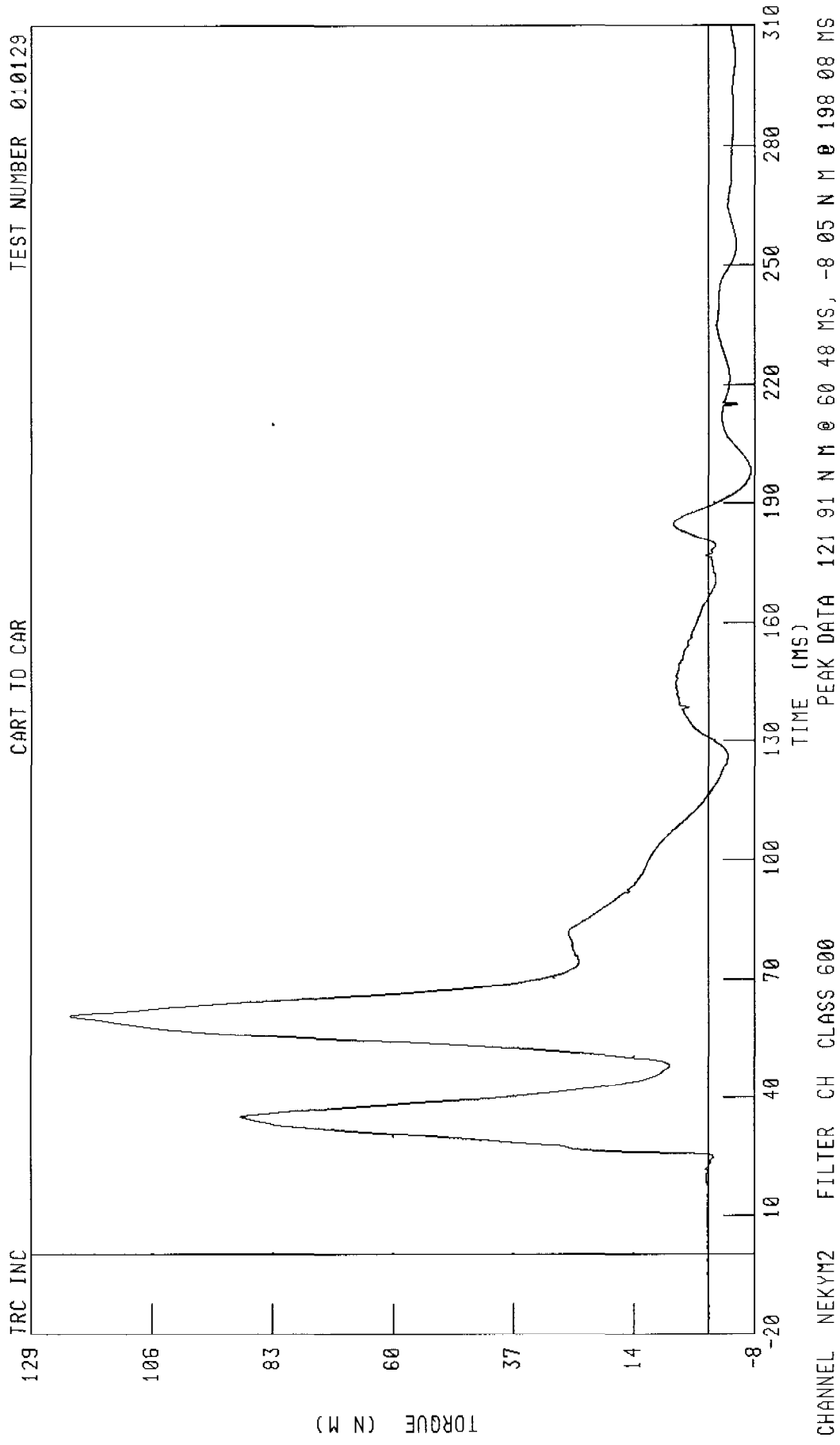
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

RIGHT FRONT PASSENGER NECK MOMENT ABOUT X-AXIS

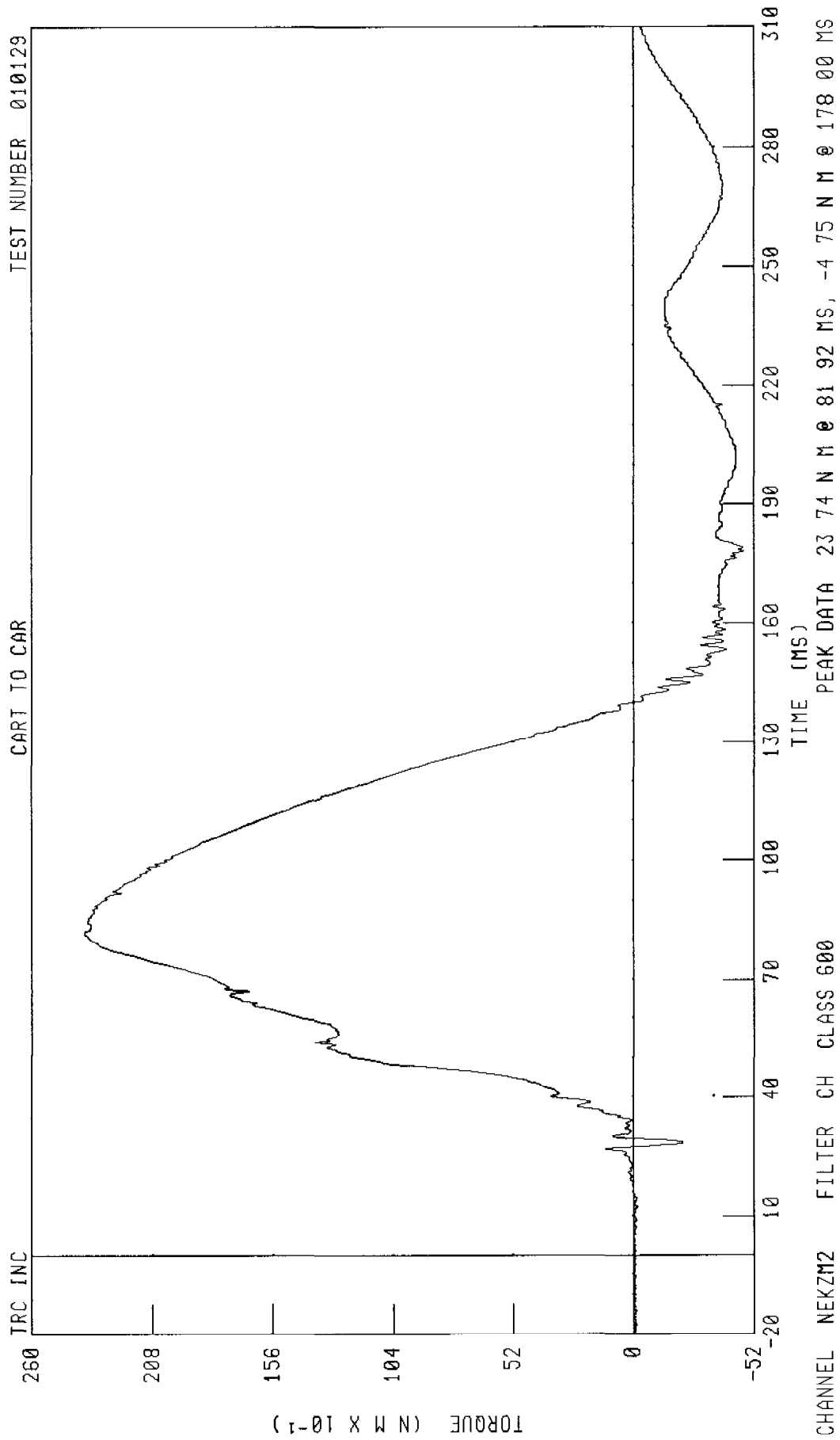


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

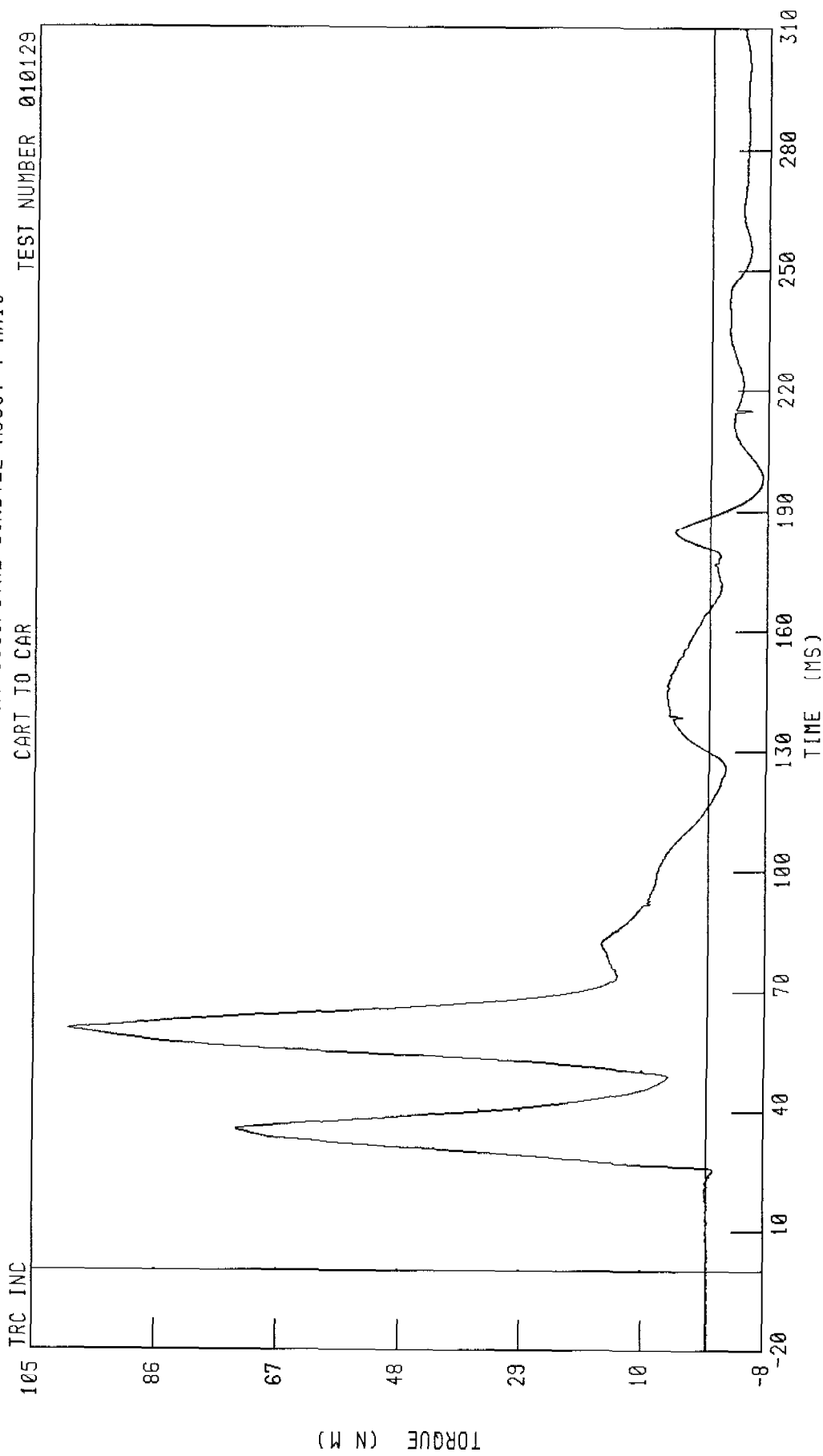
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y-AXIS



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z-AXIS



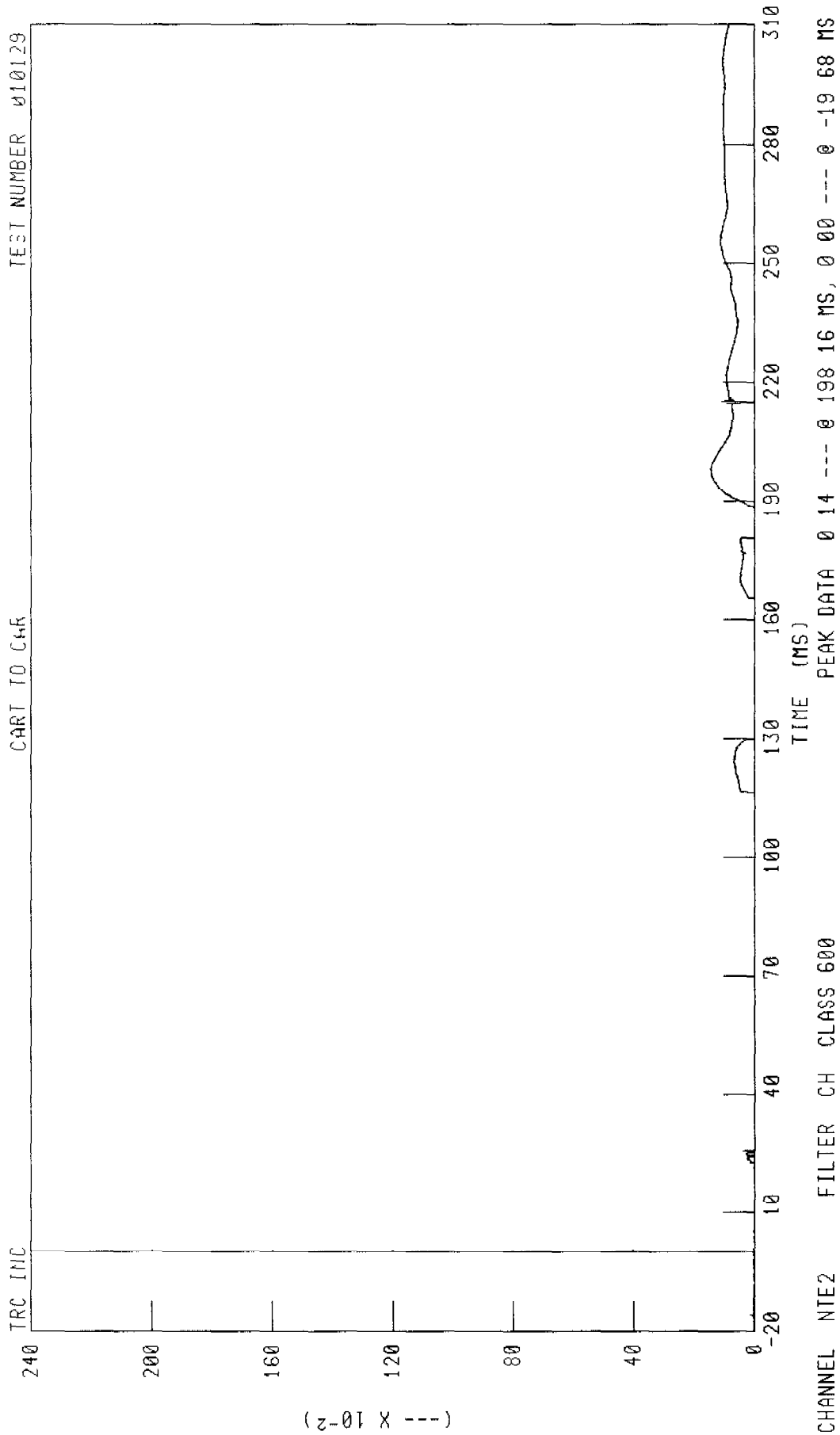
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER NECK MOMENT OCCIPITAL CONDYLE ABOUT Y-AXIS



CHANNEL NEKOM2 FILTER CH CLASS 600

PEAK DATA 99 70 N M @ 60 48 MS, -8 09 N M @ 198 88 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER NECK TENSION/EXTENSION

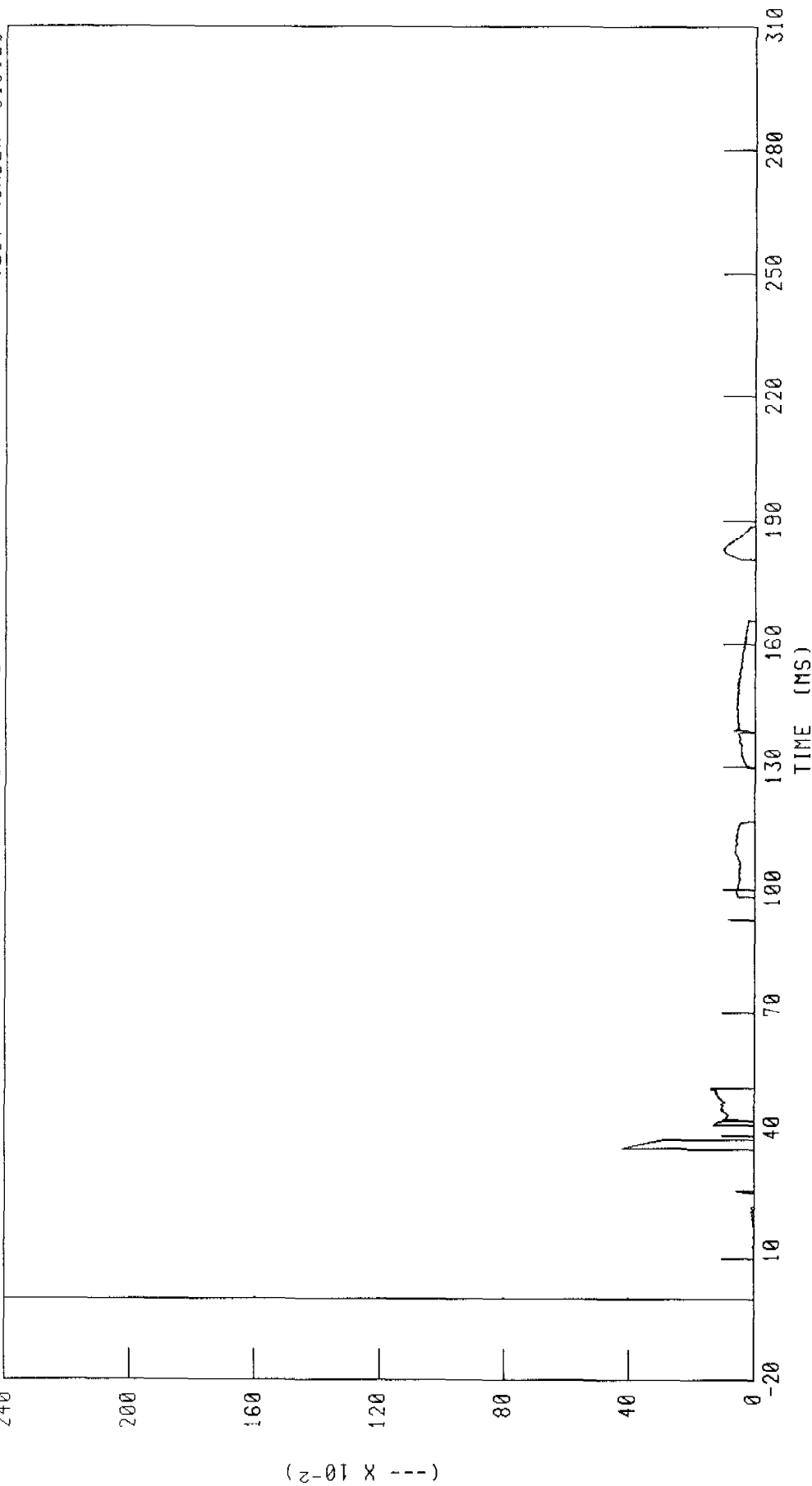


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER NECK TENSION/FLEXION

IRC INC

CAPT TO CAP

TEST NUMEER 010129



(--- X 10⁻²)

CHANNEL NTF2 FILTER CH CLASS 600

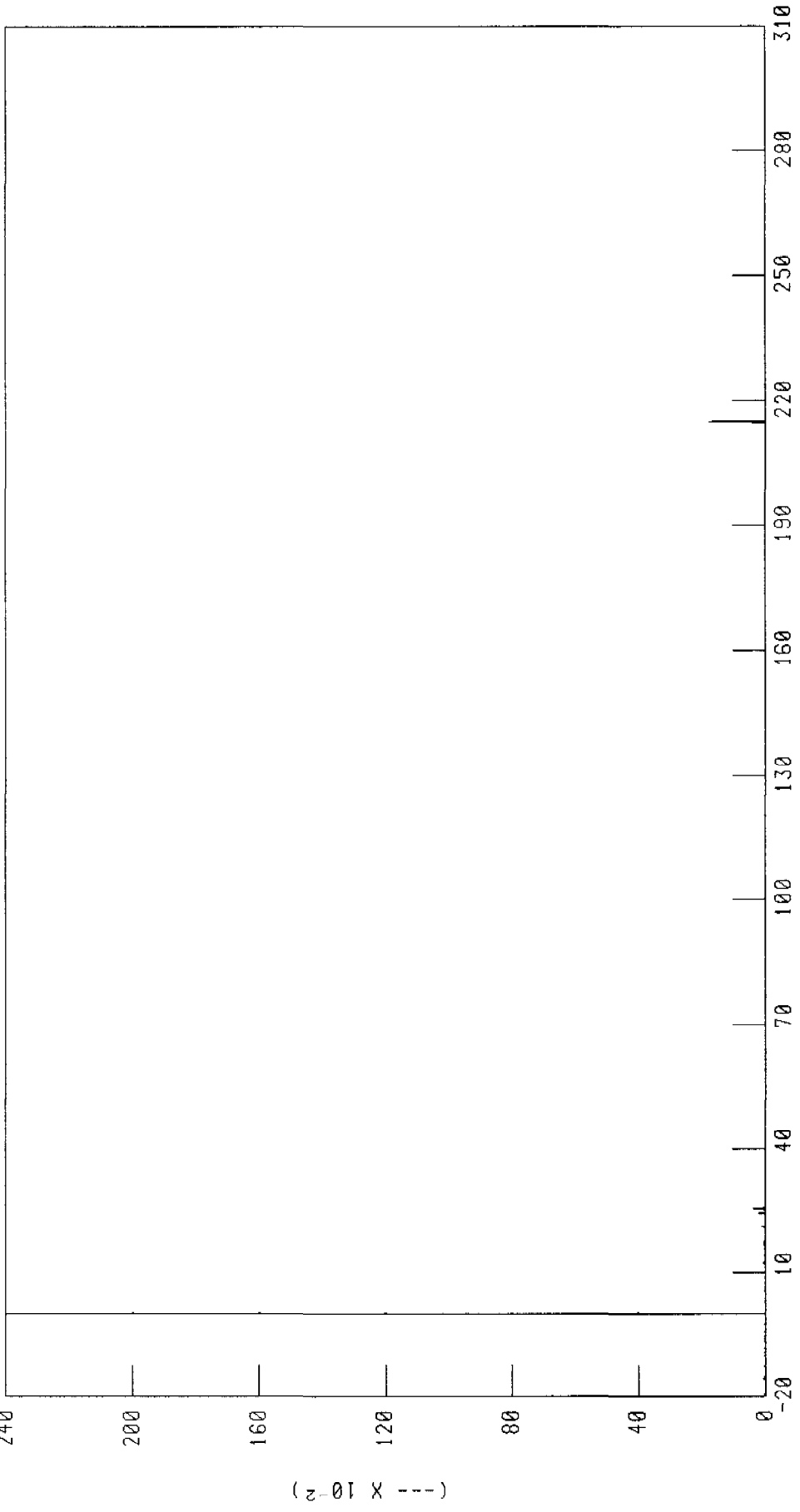
PEAK DATA 0 42 --- 0 36 80 MS, 0 00 --- 0 -20 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER NECK COMPRESSION/EXTENSION

TRC INC

CART 'G CAP

TEST NUMBER 010129



CHANNEL NCE2

FILTER CH CLASS 600

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER NECK COMPRESSION/FLEXION

TEST NUMBER W10129

CART TO CAR

TRC INC

240

200

160

120

80

40

0

(--- X 10⁻²)

310

280

250

220

190

160

130

120

70

40

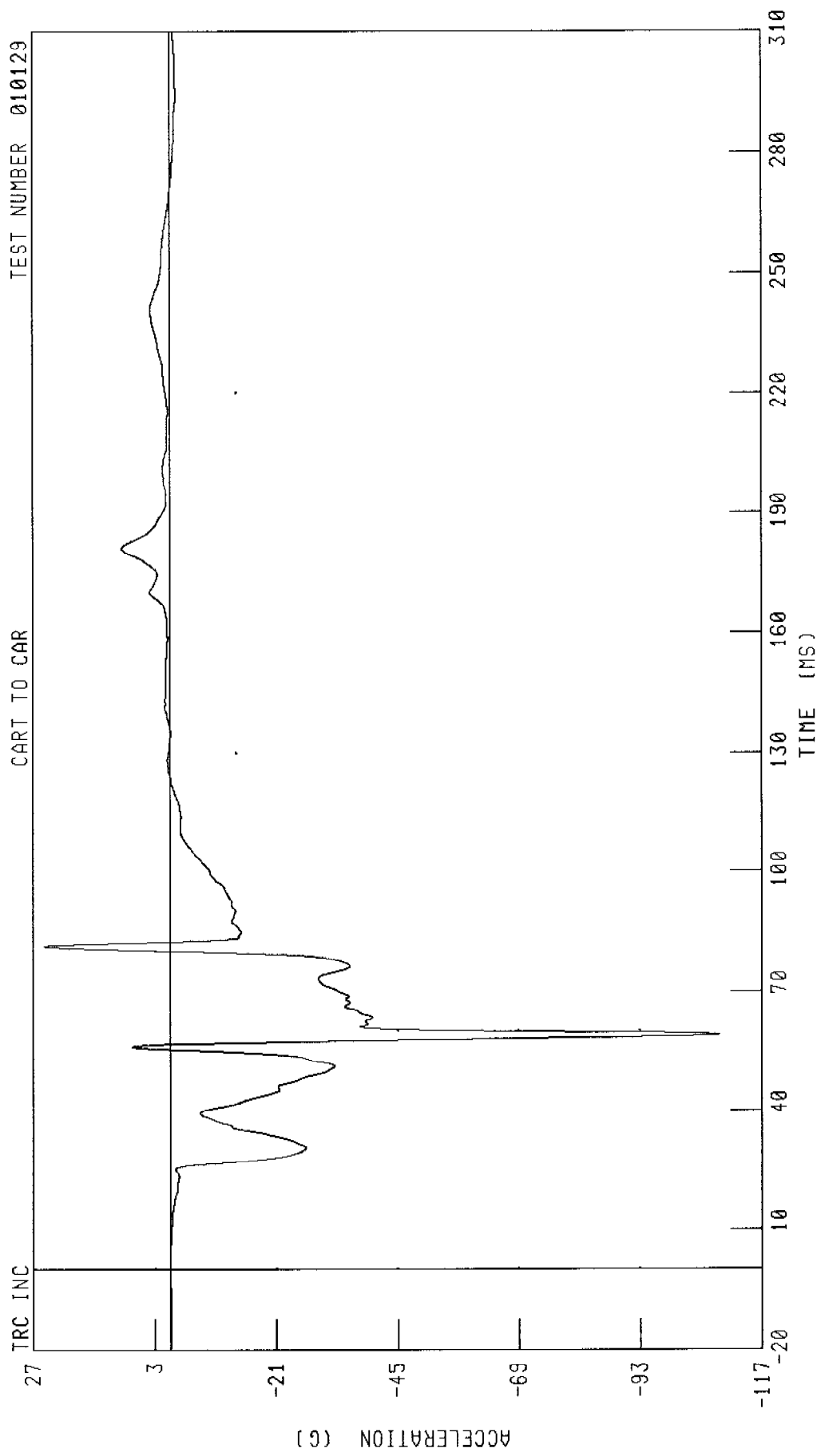
10

TIME (MS)

PEAK DATA 0 78 --- 0 61 52 MS, 0 00 --- 0 -20 00 MS

CHANNEL NCF2 FILTER CH CLASS 600

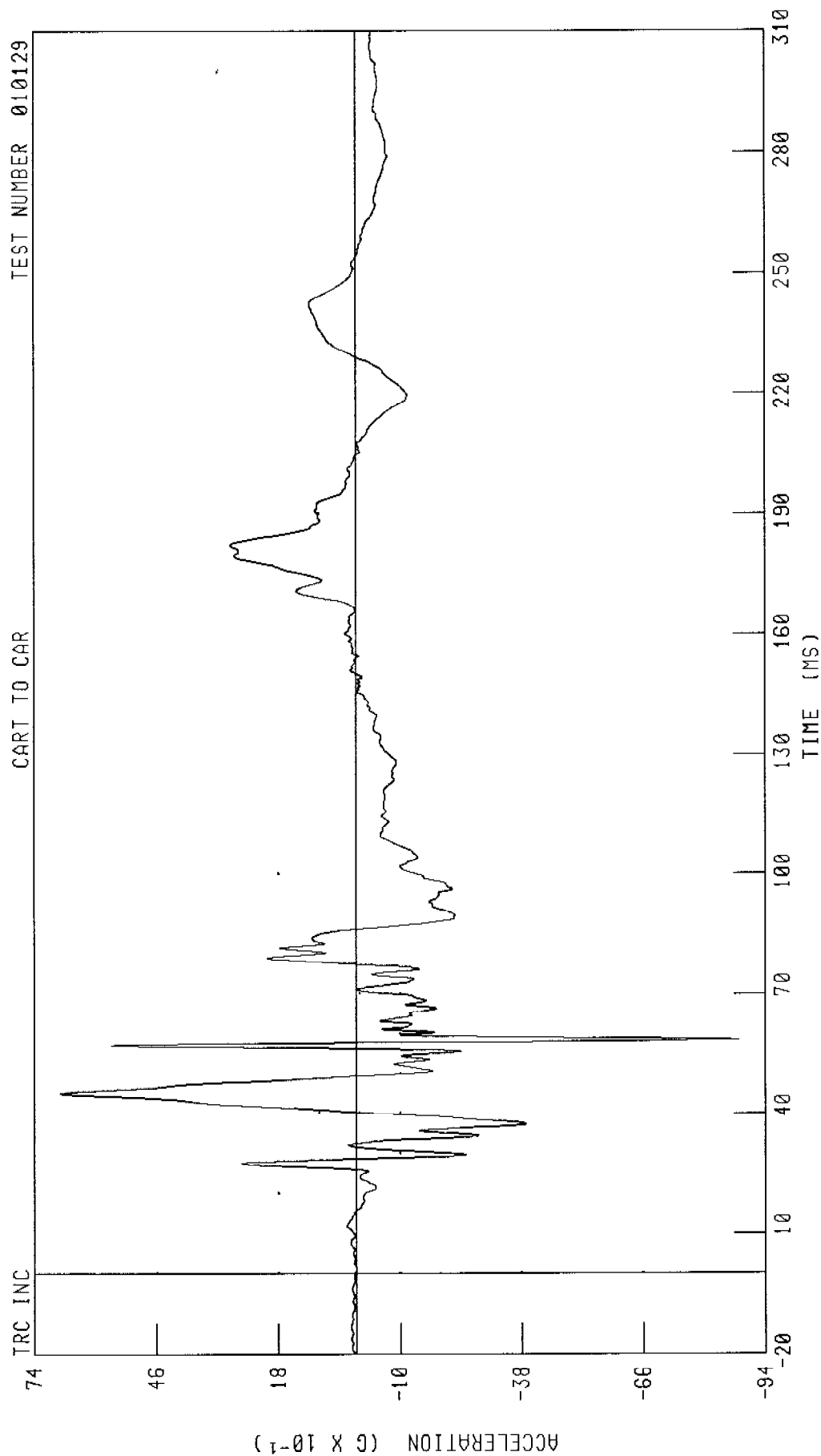
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION



CHANNEL CSTXG2 FILTER CH CLASS 180

PEAK DATA 24 80 G @ 81 28 MS, -108 79 G @ 59 12 MS

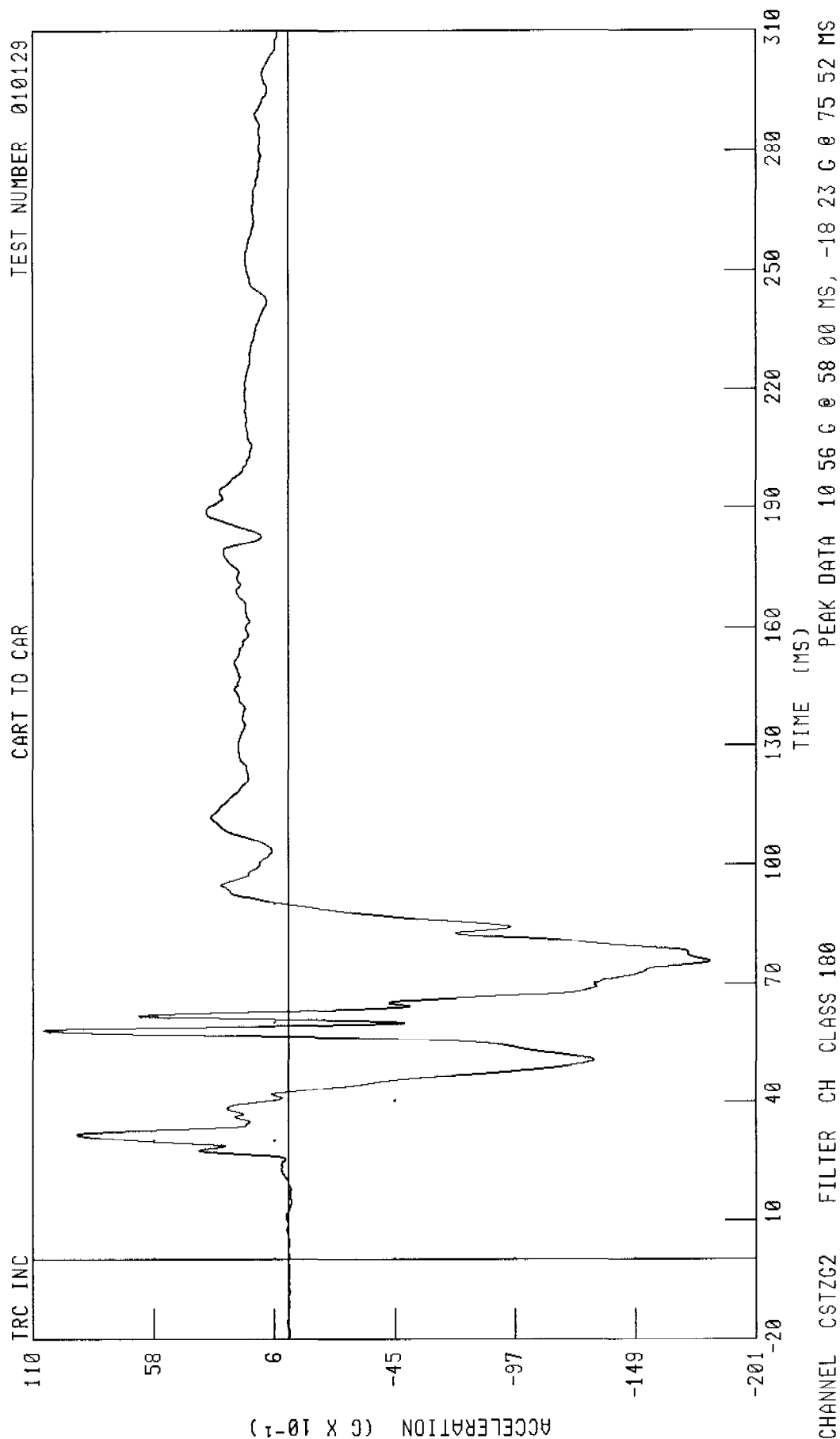
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION



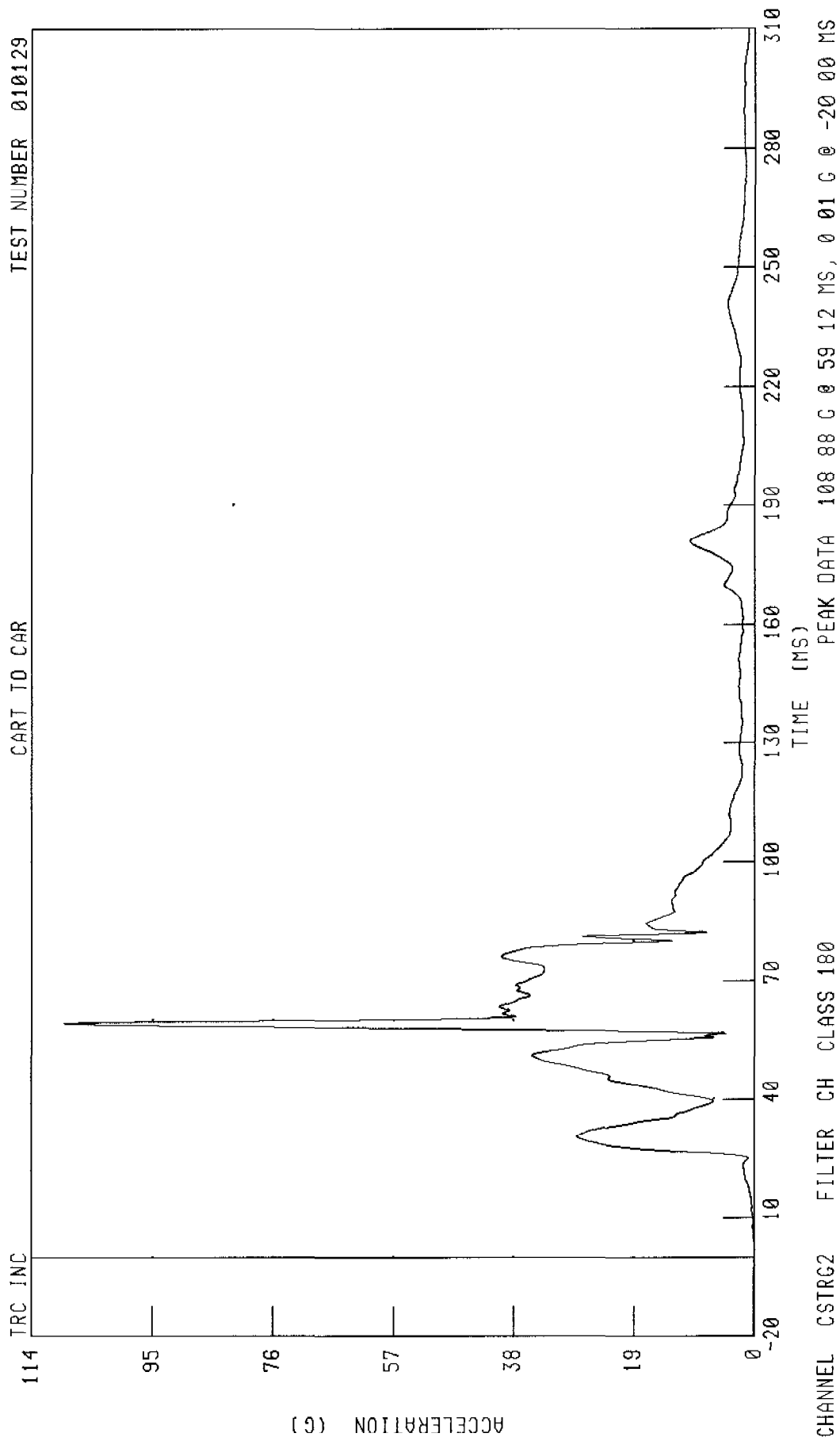
CHANNEL CST02 FILTER CH CLASS 180

PEAK DATA 6 81 G @ 45 20 MS, -8 78 G @ 58 48 MS

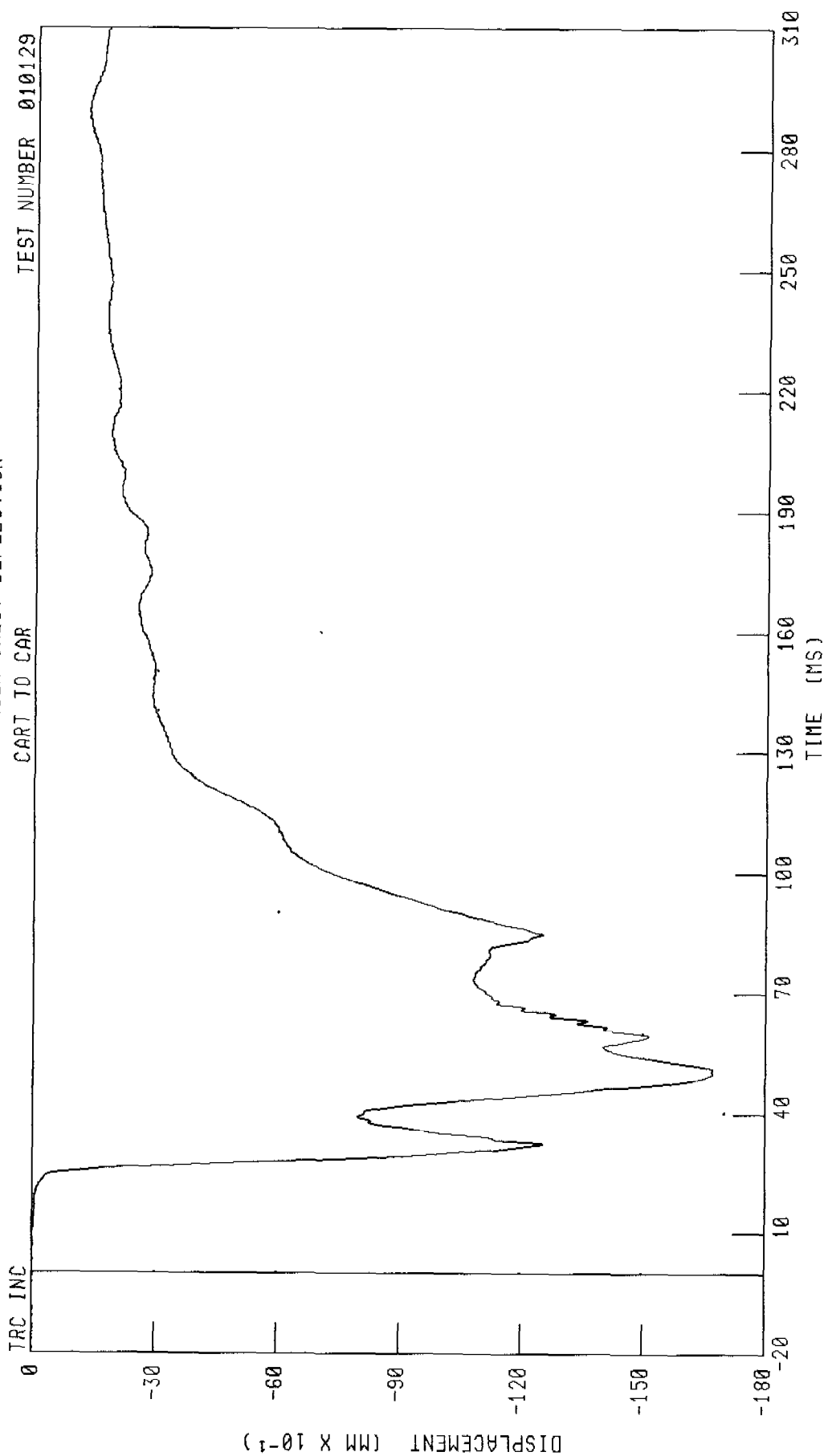
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER CHEST DEFLECTION

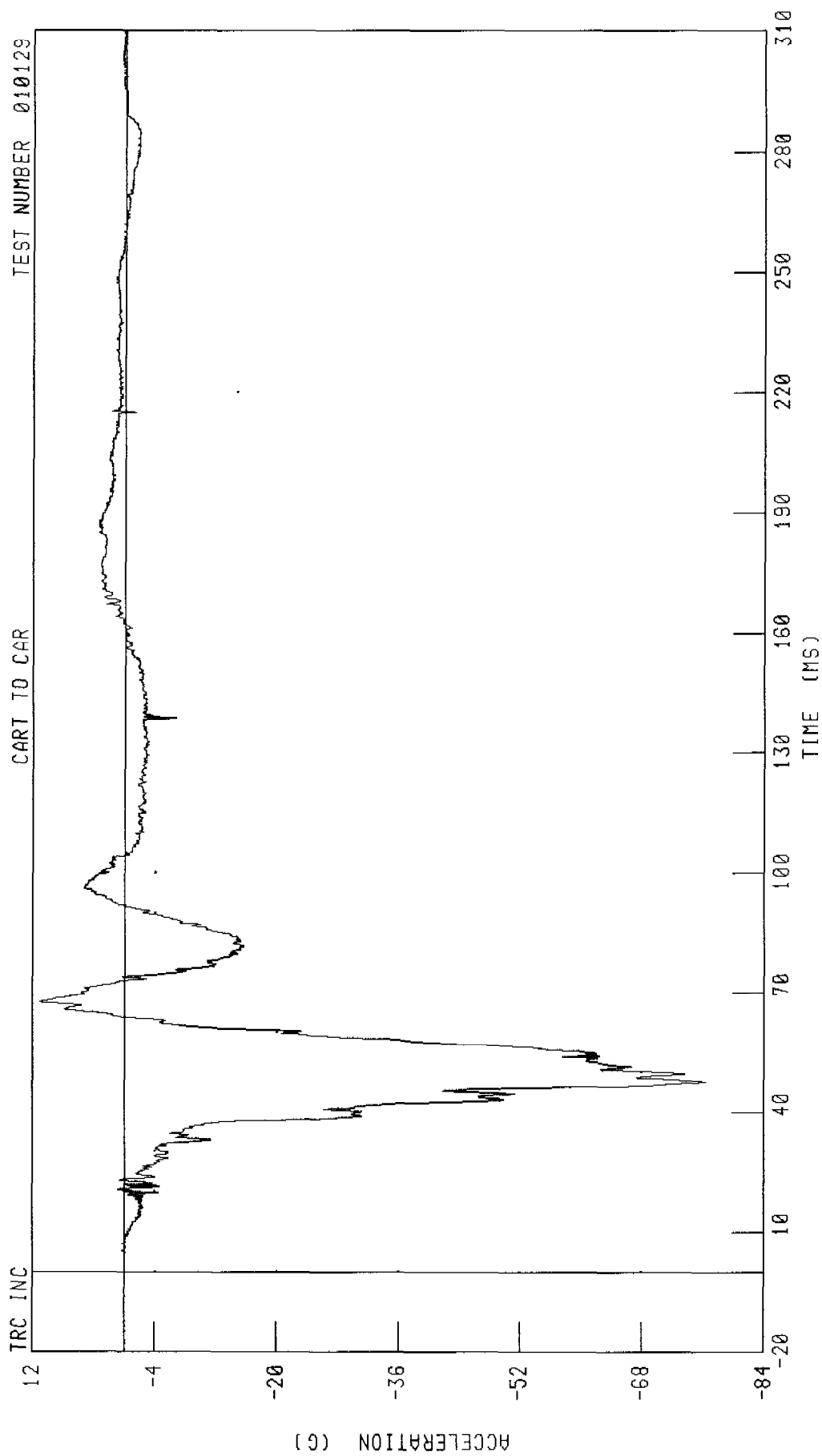


CHANNEL CSTXD2 FILTER CH CLASS 600

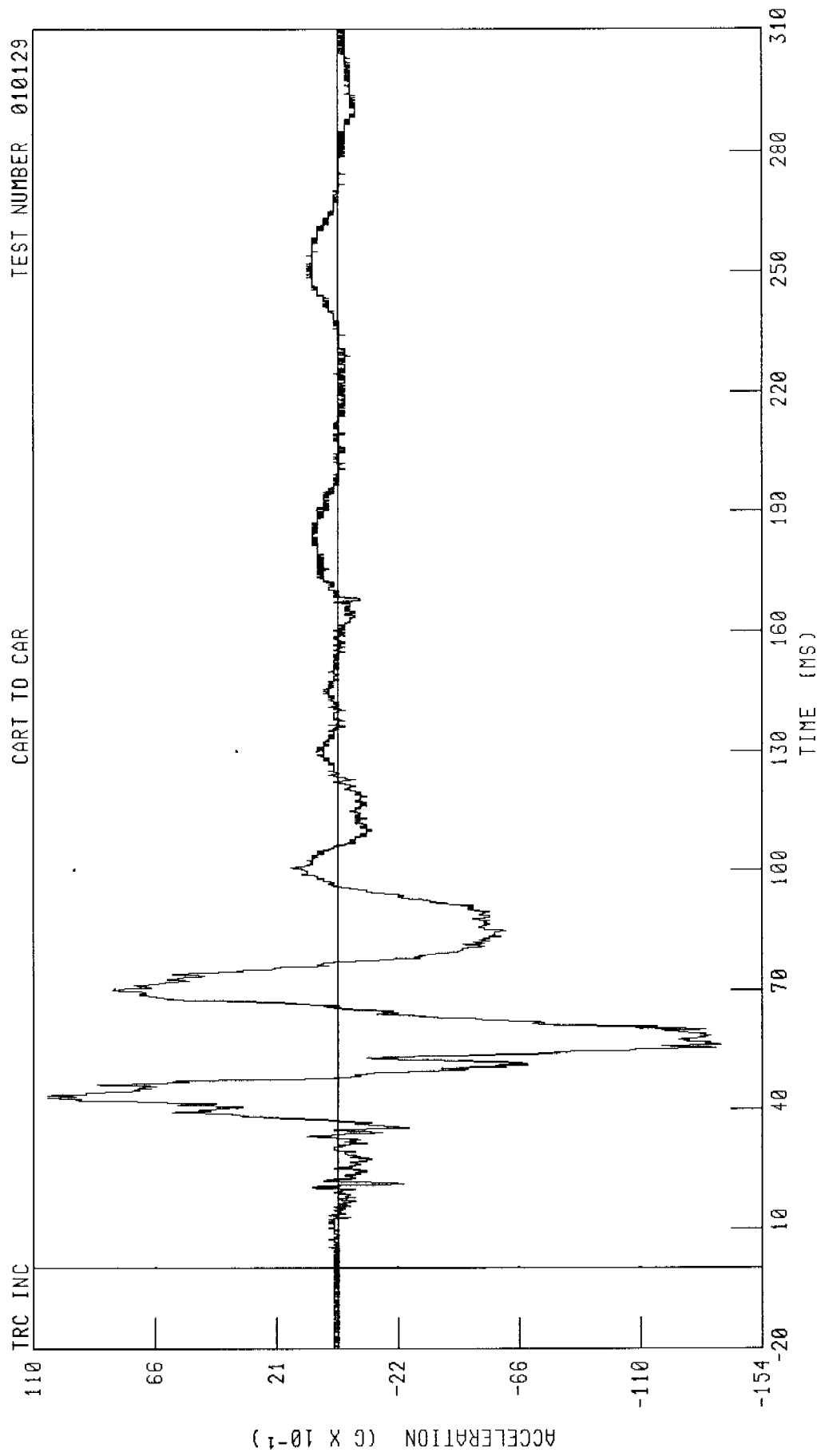
PEAK DATA 0 00 MM @ 10 00 MS, -16 71 MM @ 51 12 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION

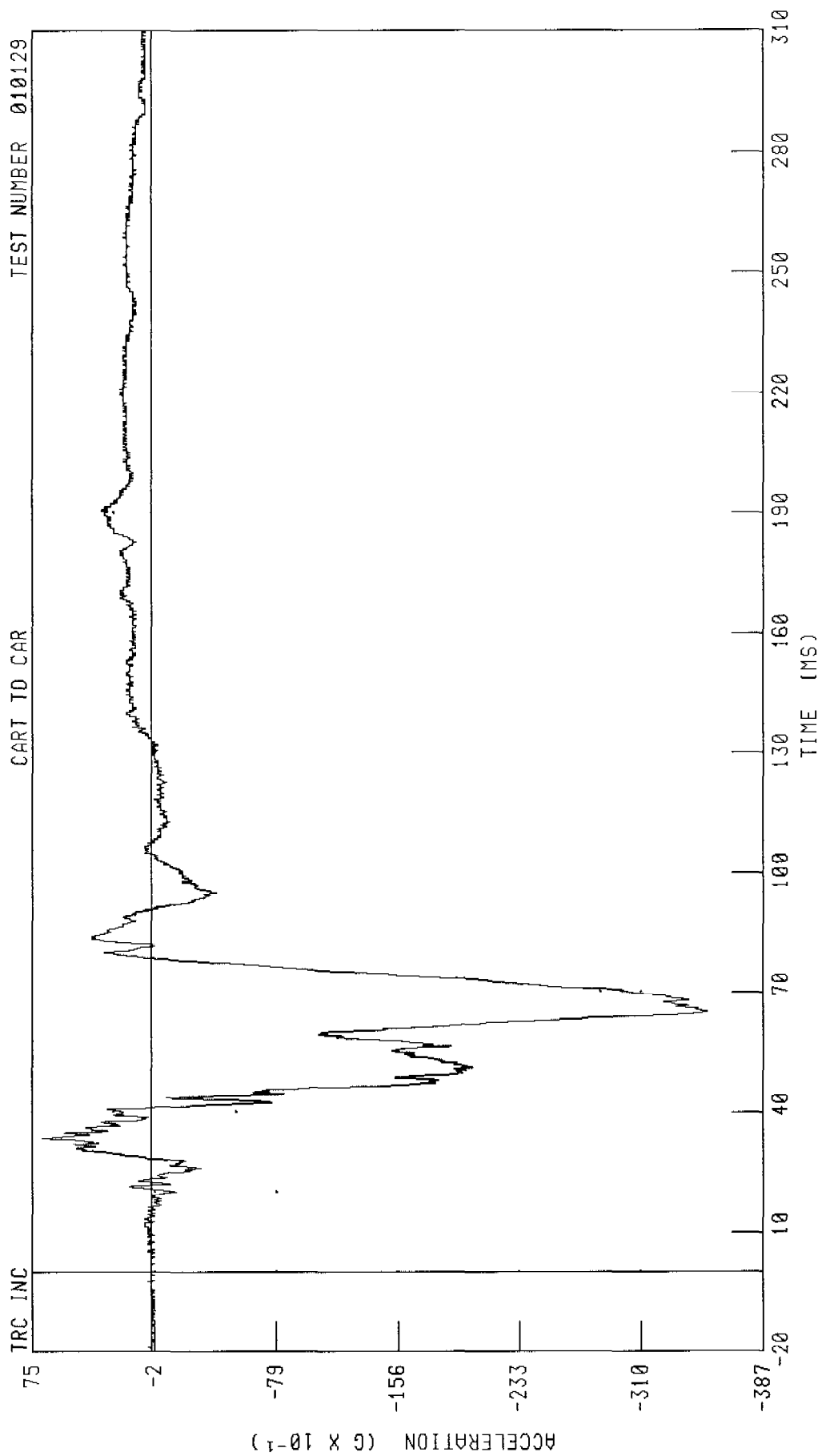


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION



CHANNEL PEVYG2 FILTER CH CLASS 1000 PEAK DATA 10 47 G @ 42 96 MS, -13 93 G @ 56 24 MS

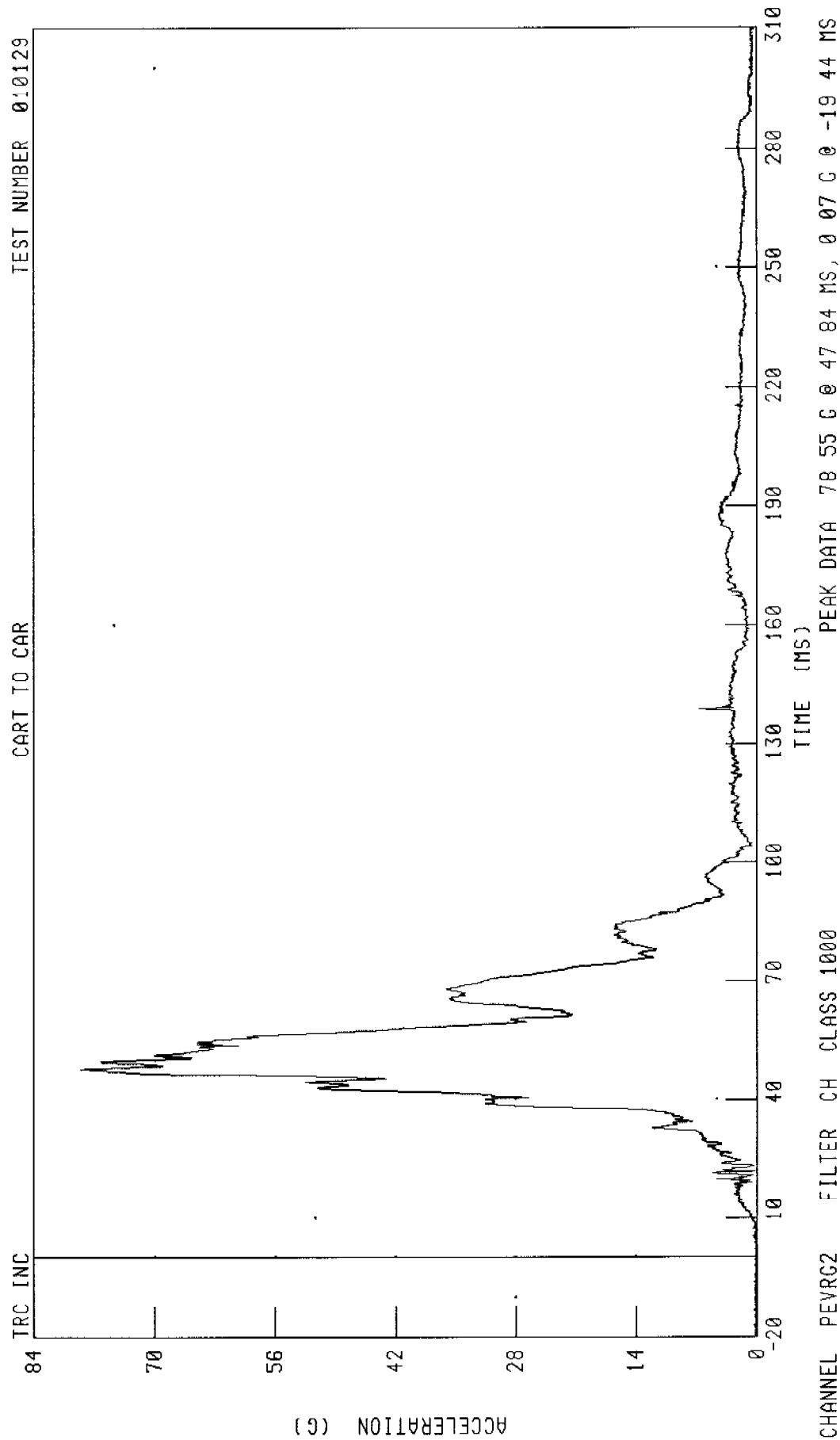
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION



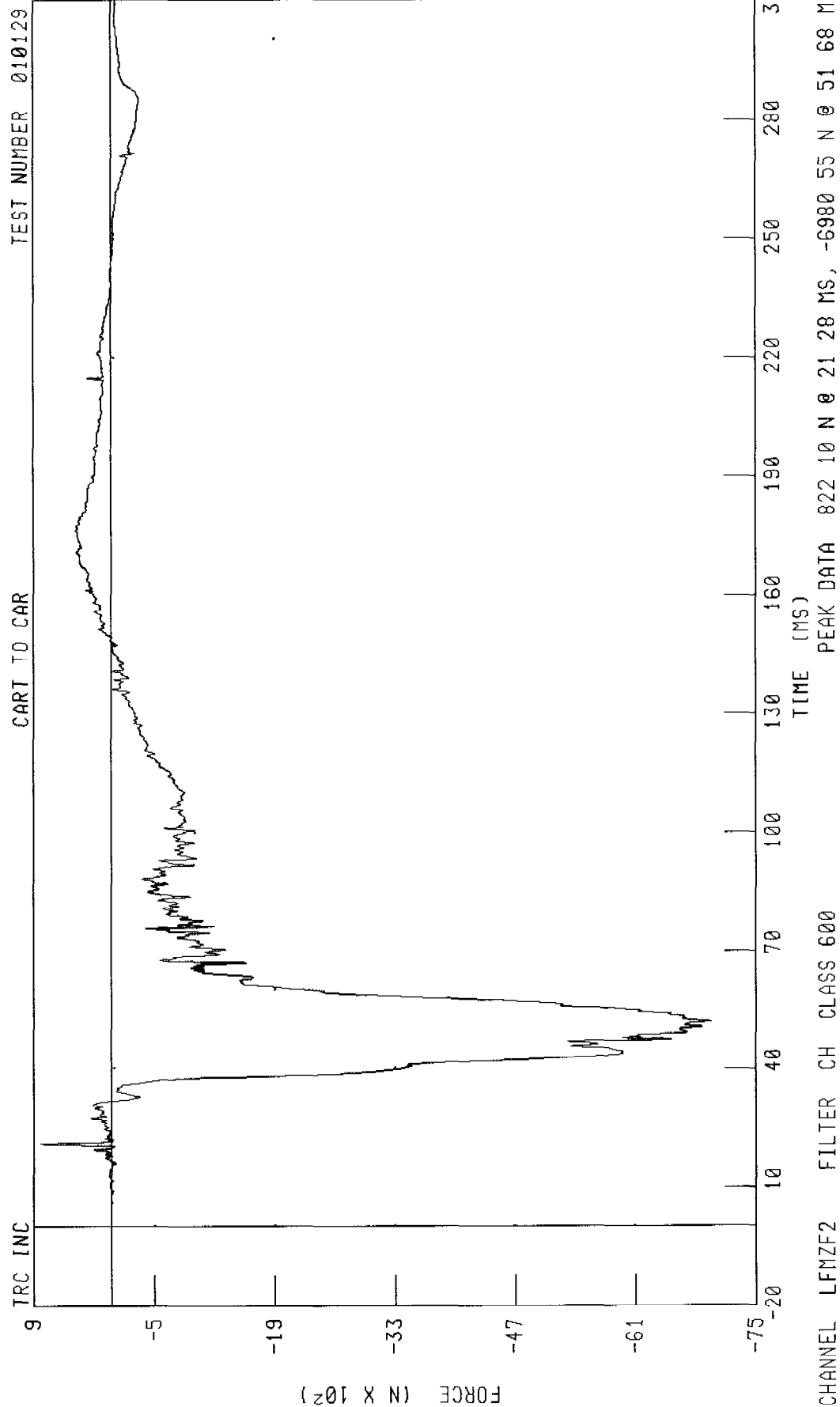
CHANNEL PEVZG2 FILTER CH CLASS 1000

PEAK DATA 6 84 C @ 33 52 MS, -35 20 C @ 65 04 MS

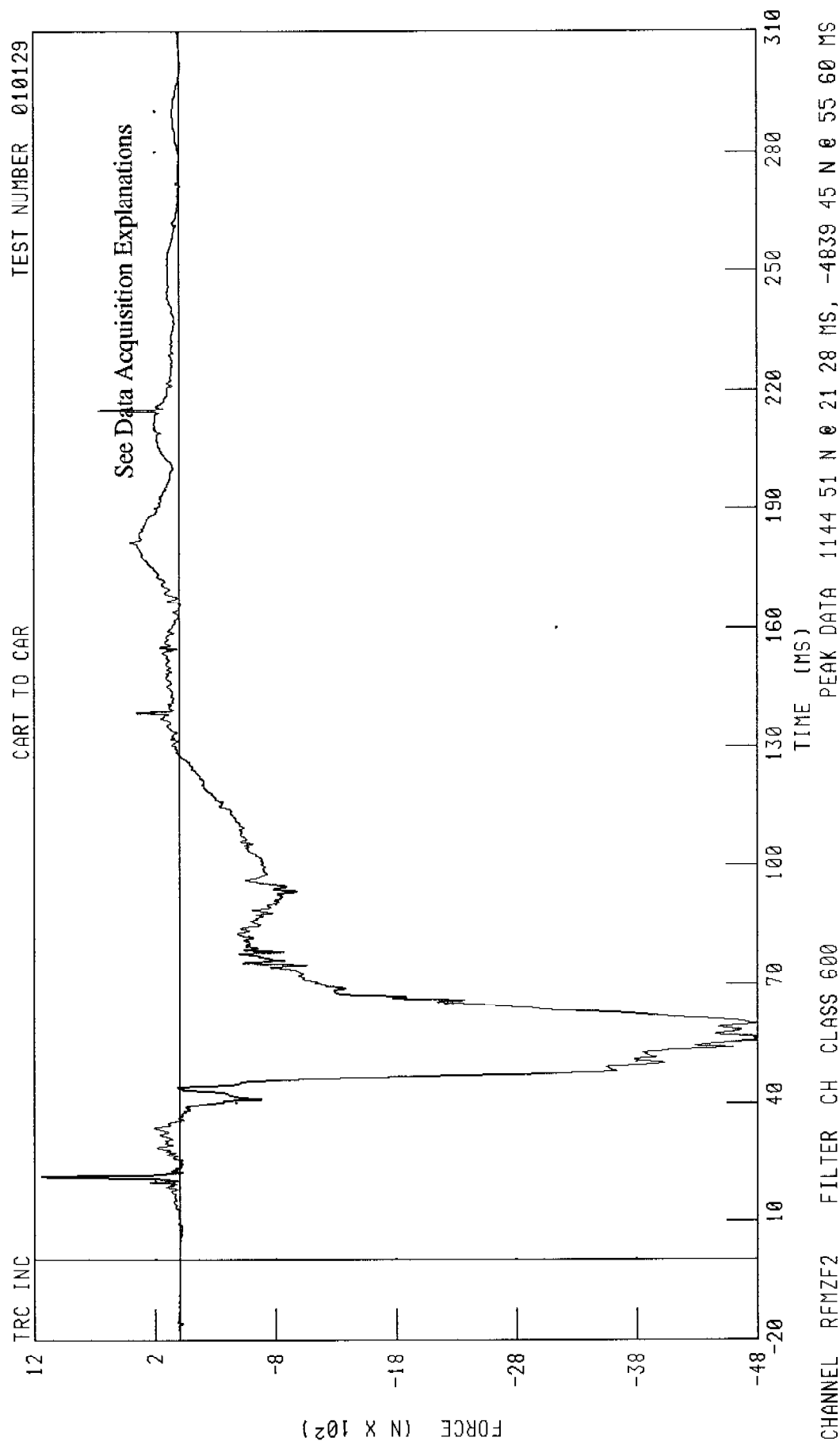
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION



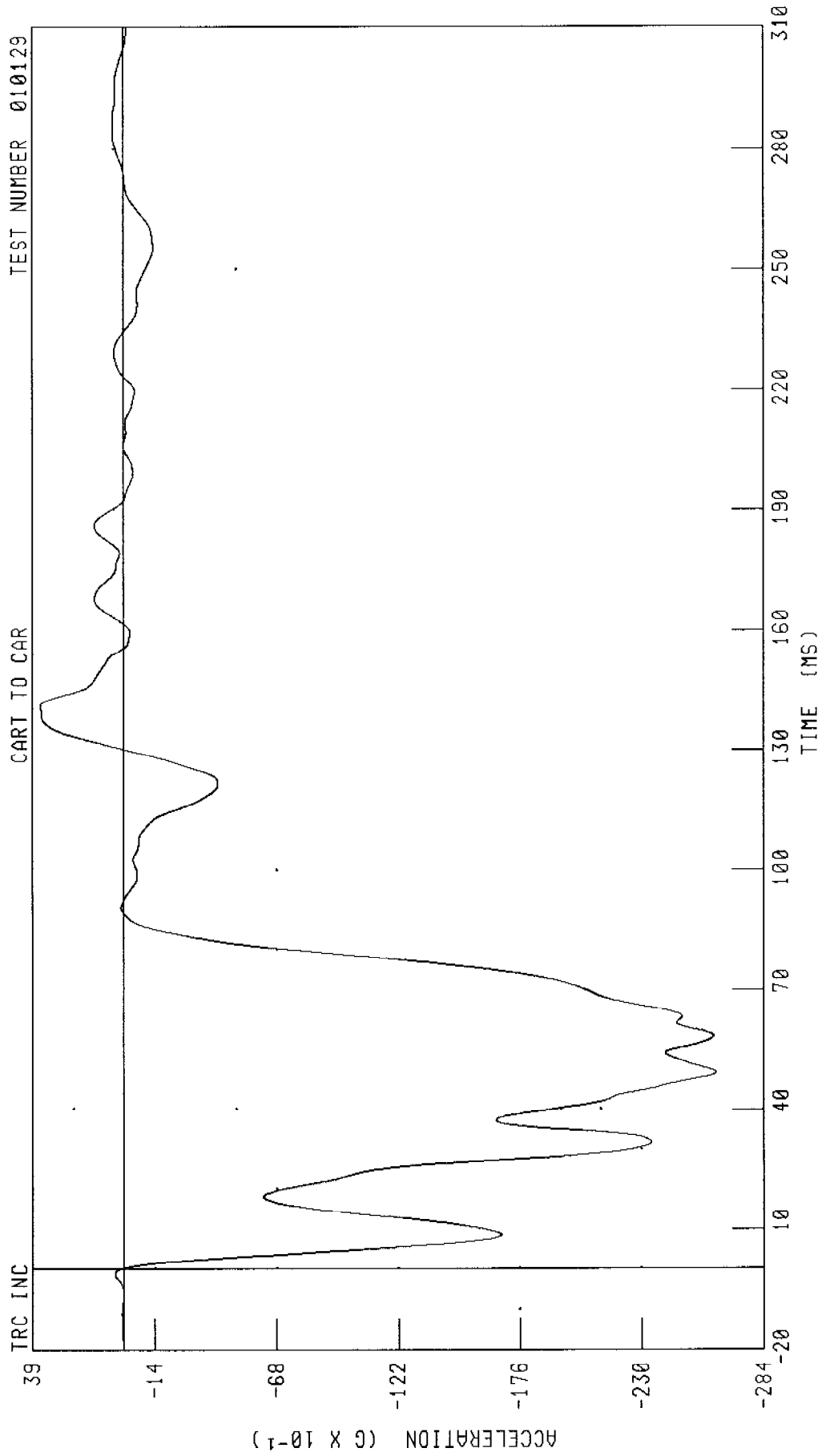
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER LEFT FEMUR FORCE
CART TO CAR



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
LEFT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION



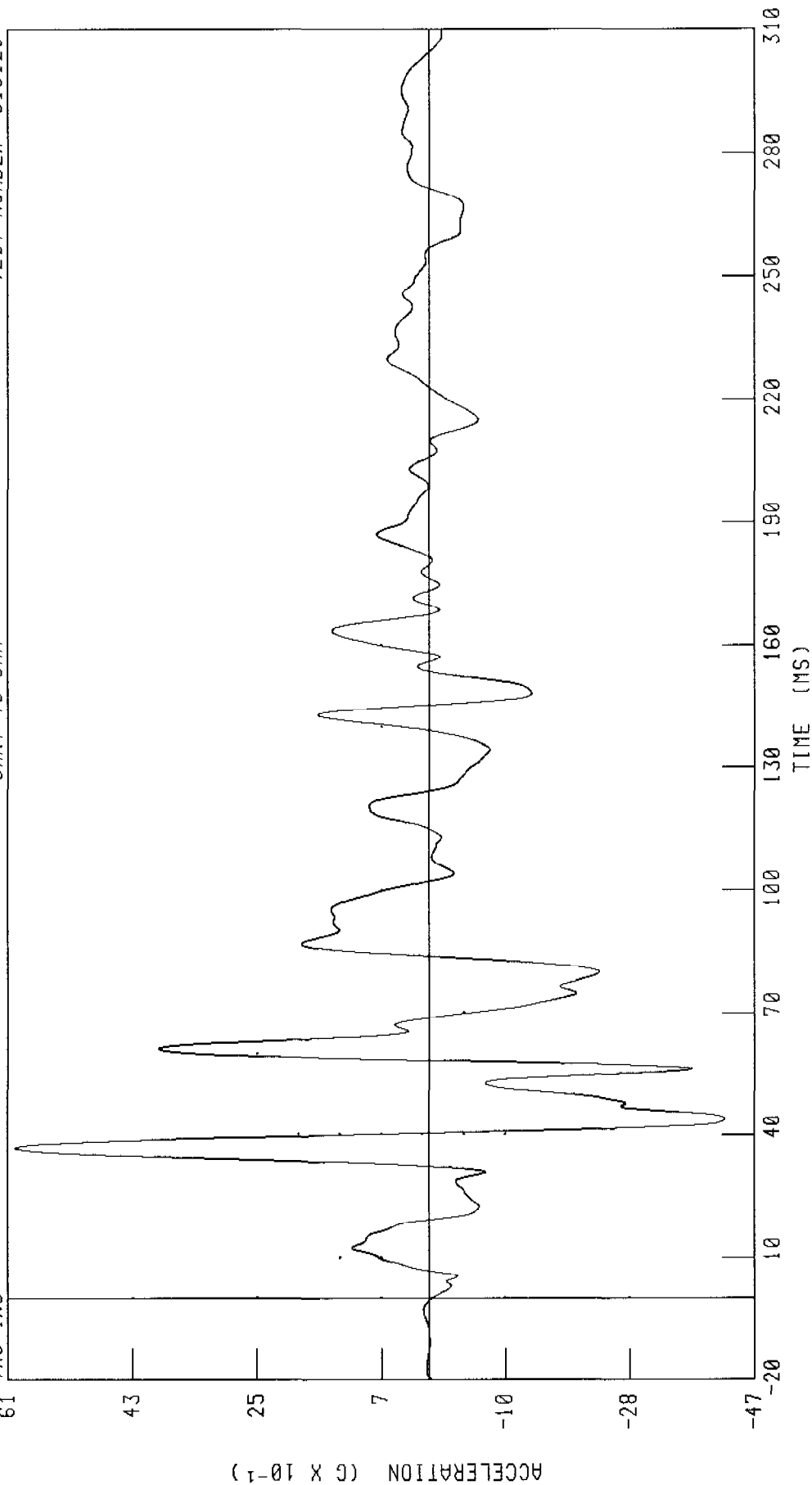
CHANNEL LRSXG1 FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
LEFT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

TEST NUMBER 010129

CART TO CAR

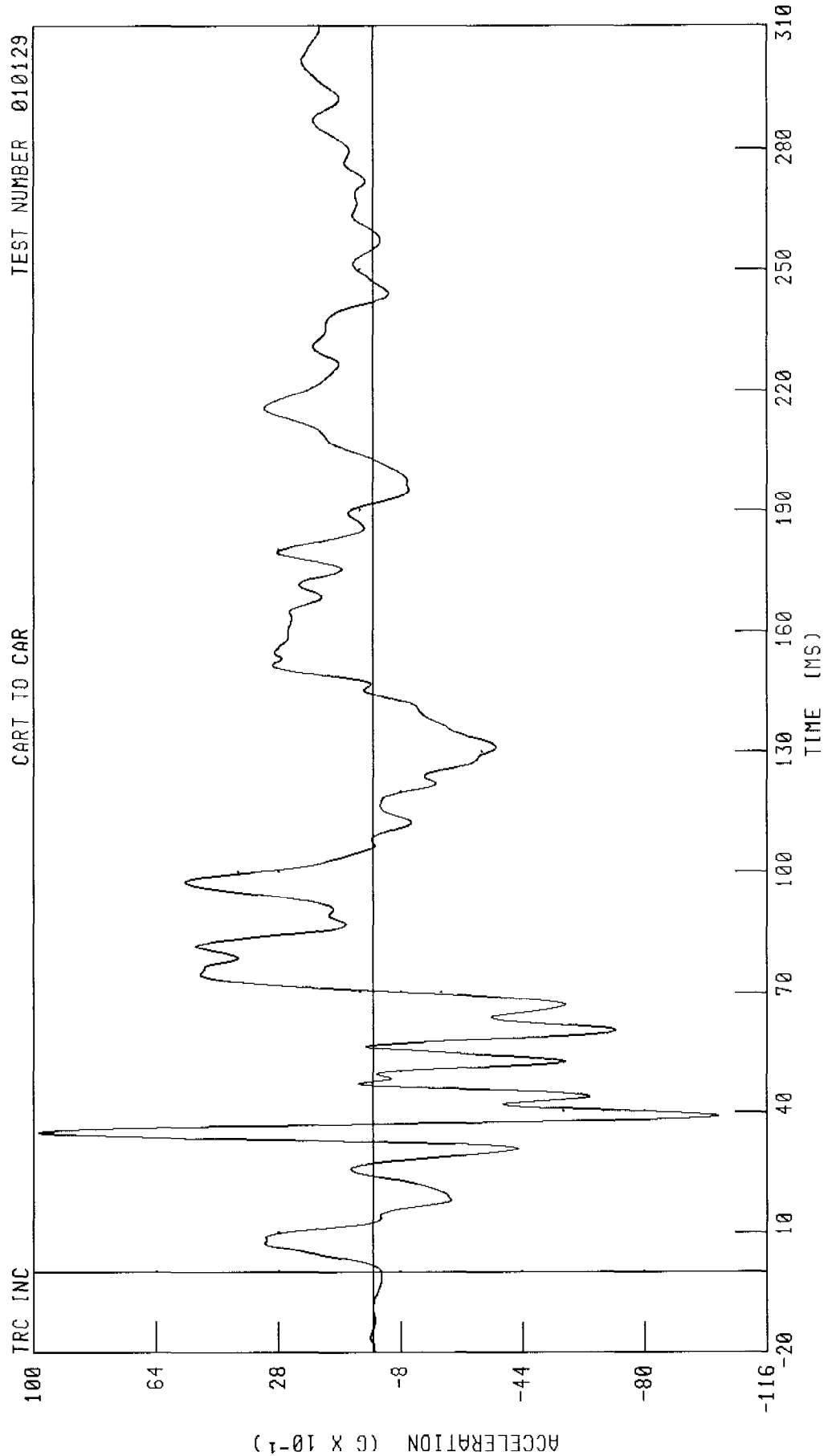
TRC INC



CHANNEL LRSYC1 FILTER CH CLASS 60

PEAK DATA 5 99 G @ 36 88 MS, -4 28 G @ 44 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
LEFT REAR SEAT CROSSMEMBER Z-AXIS ACCELERATION



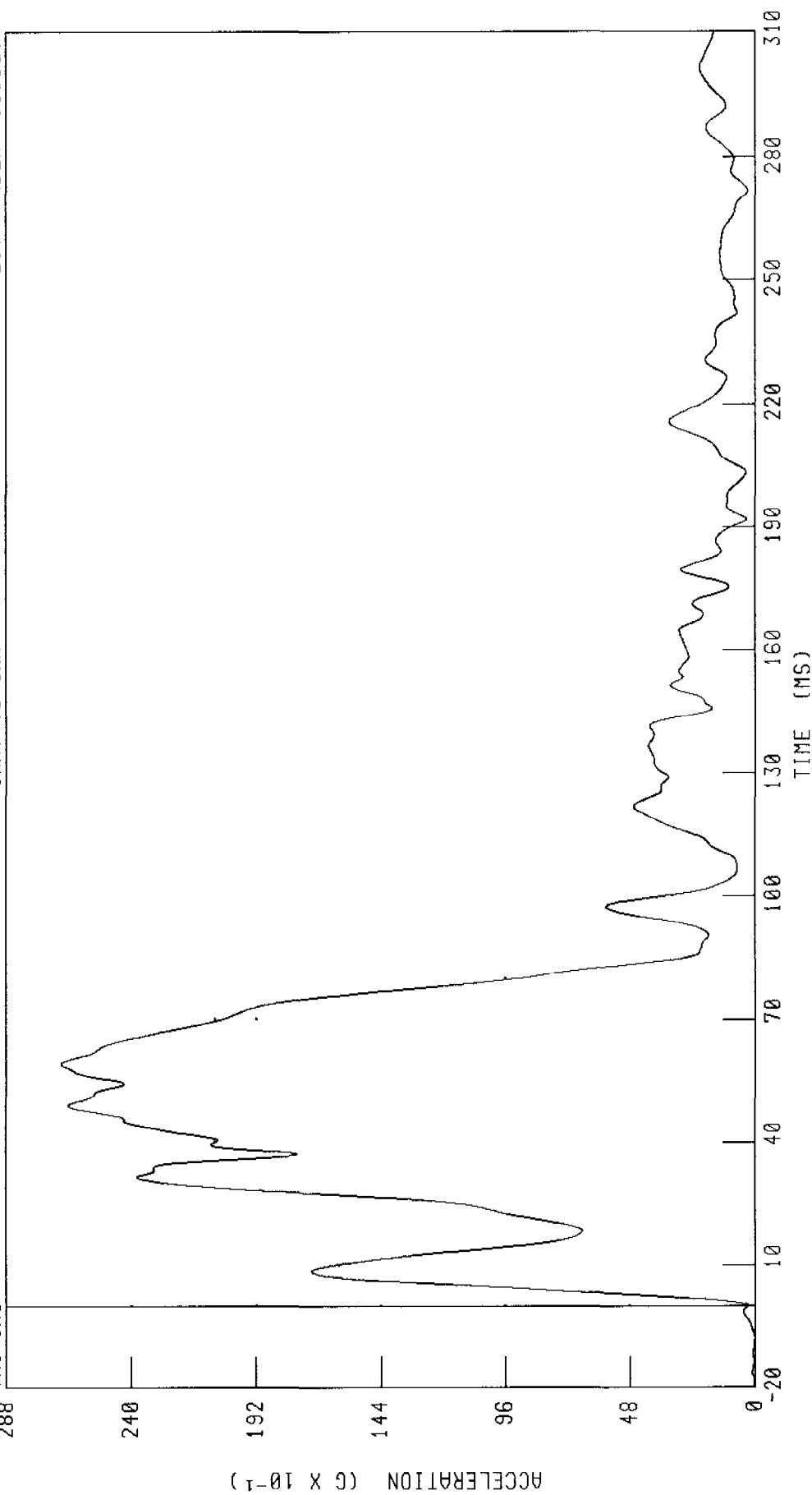
CHANNEL LRSZG1 FILTER CH CLASS 60 PEAK DATA 9 84 C @ 35 12 MS, -10 18 G @ 39 04 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
LEFT REAR SEAT CROSSMEMBER RESULTANT ACCELERATION

TRC INC

CART TO CAR

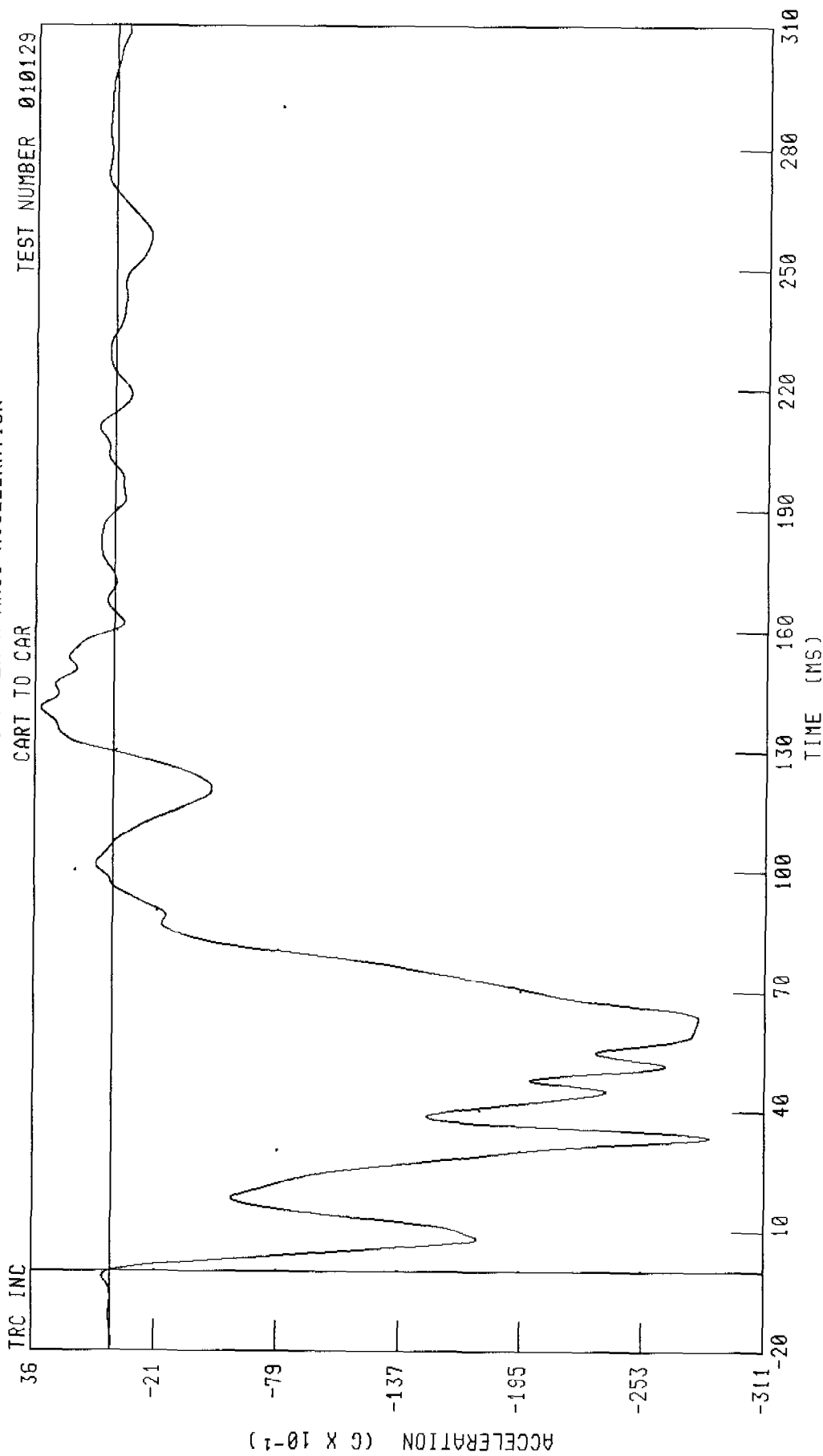
TEST NUMBER 010129



CHANNEL LRRC1 FILTER CH CLASS 60

PEAK DATA 26 72 G @ 59 36 MS, 0 01 G @ -8 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
RIGHT REAR SEAT CROSSMEMBER X-AXIS ACCELERATION



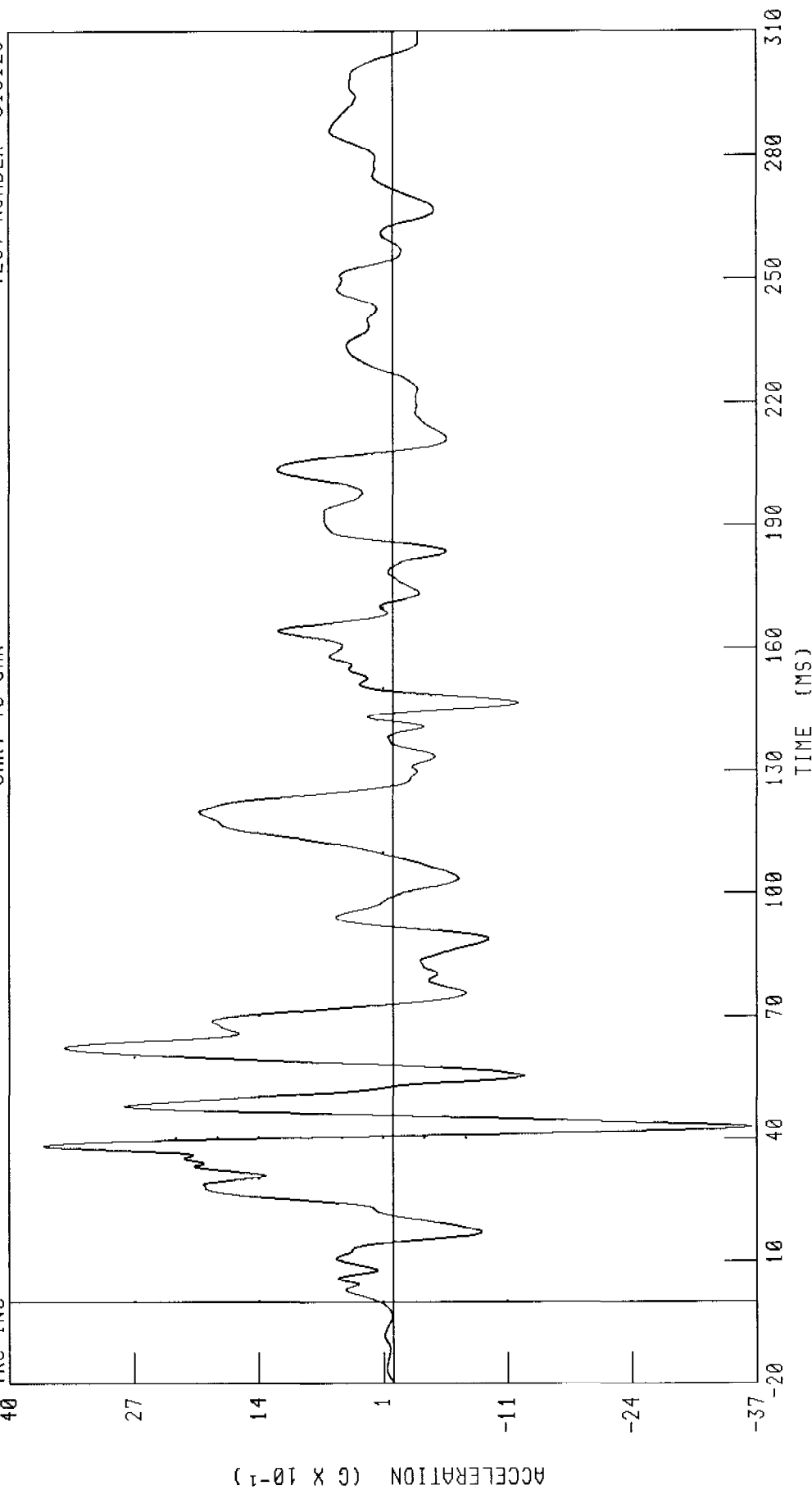
CHANNEL RRSXG1 FILTER CH CLASS 60 PEAK DATA 3 44 G @ 140 72 MS, -28 52 G @ 33 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT REAR SEAT CROSSMEMBER Y-AXIS ACCELERATION

TEST NUMBER 010129

CART TO CAR

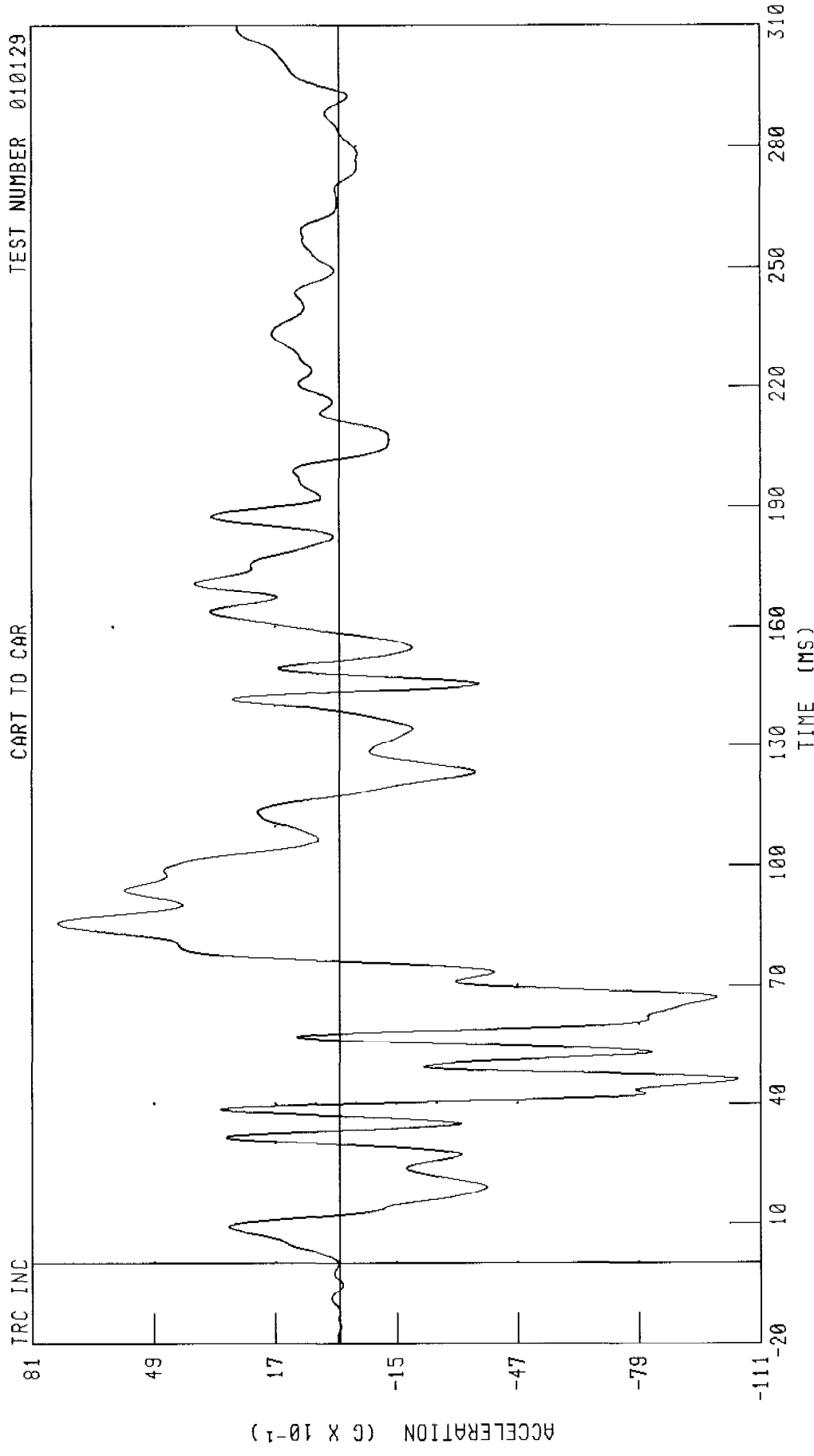
TRC INC



CHANNEL RRSYG1 FILTER CH CLASS 60

PEAK DATA 3 64 G @ 38 24 MS, -3 75 G @ 42 88 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT REAR SEAT CROSSMEMBER Z-AXIS ACCELERATION



CHANNEL RRSZG1 FILTER CH CLASS 60 PEAK DATA 7 43 G @ 85 68 MS, -10 50 G @ 46 16 MS

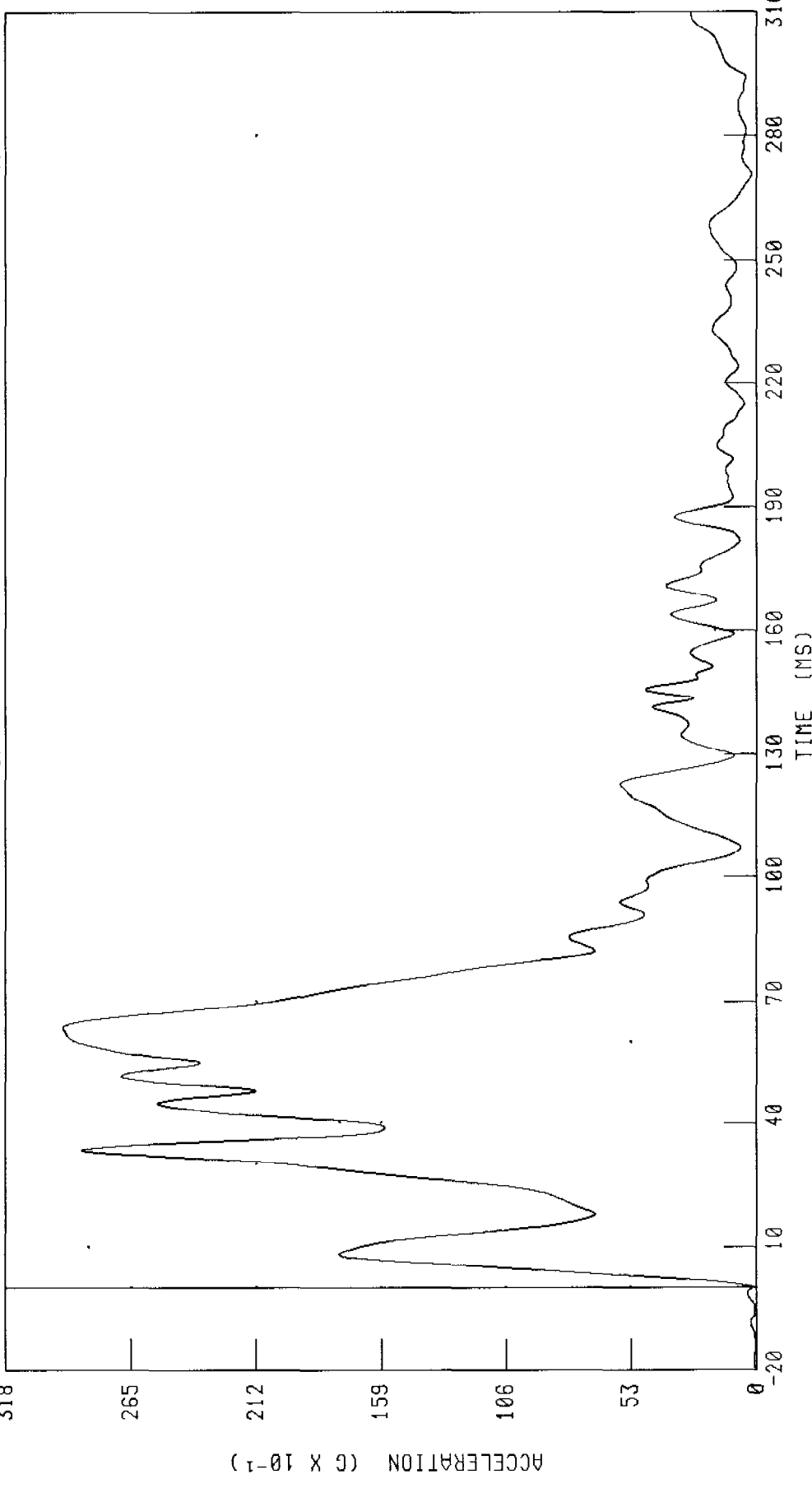
TEST NUMBER 010129

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 RIGHT REAR SEAT CROSSMEMBER RESULTANT ACCELERATION

TEST NUMBER 010129

CART TO CAR

TRC INC



PEAK DATA 29 40 G 0 63 44 MS, 0 04 G 0 -19 92 MS

CHANNEL RRRC01 FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
ENGINE TOP X-AXIS ACCELERATION

TRC INC

CART TO CAR

TEST NUMBER 010129

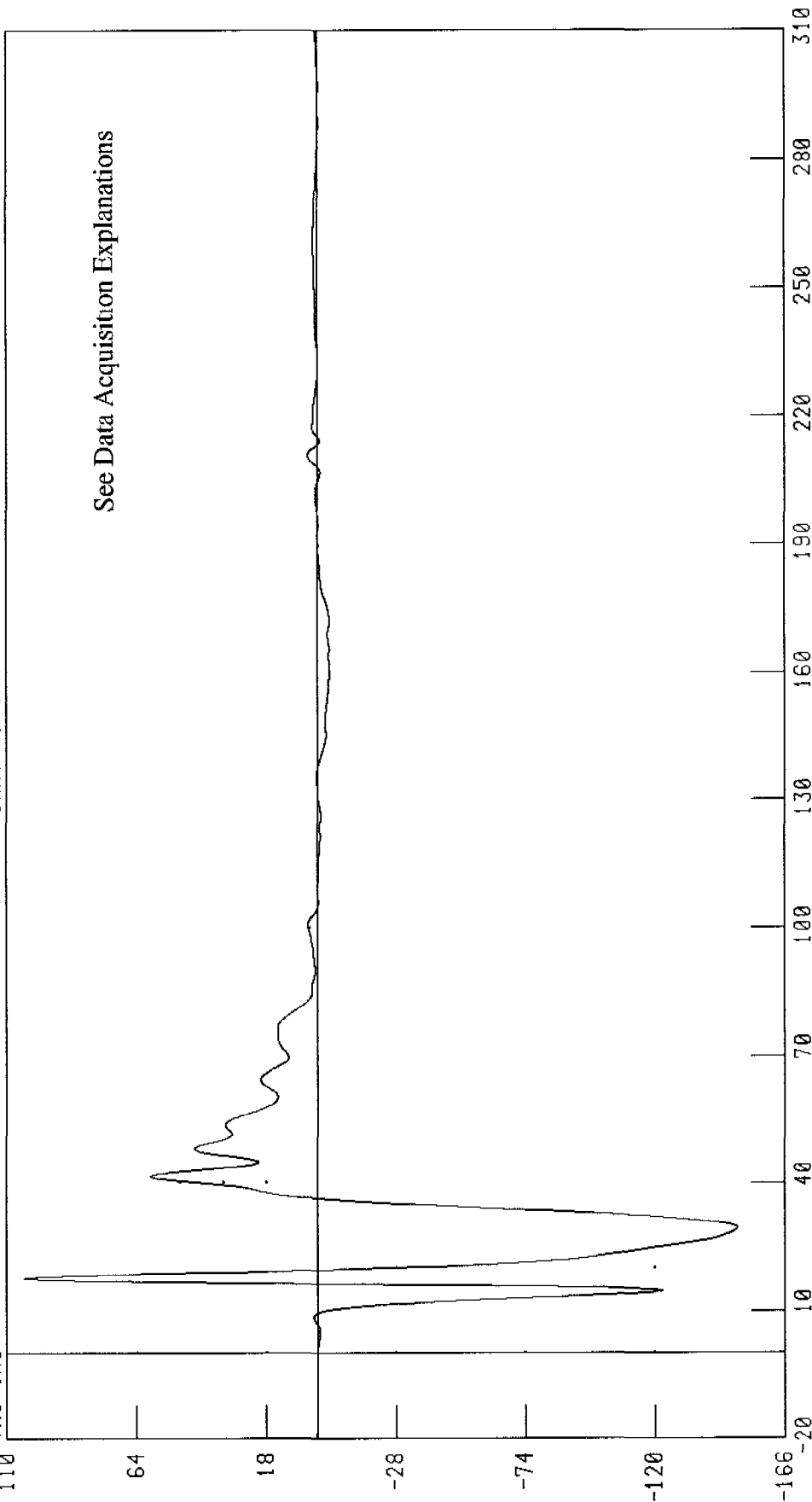
See Data Acquisition Explanations

ACCELERATION (G)

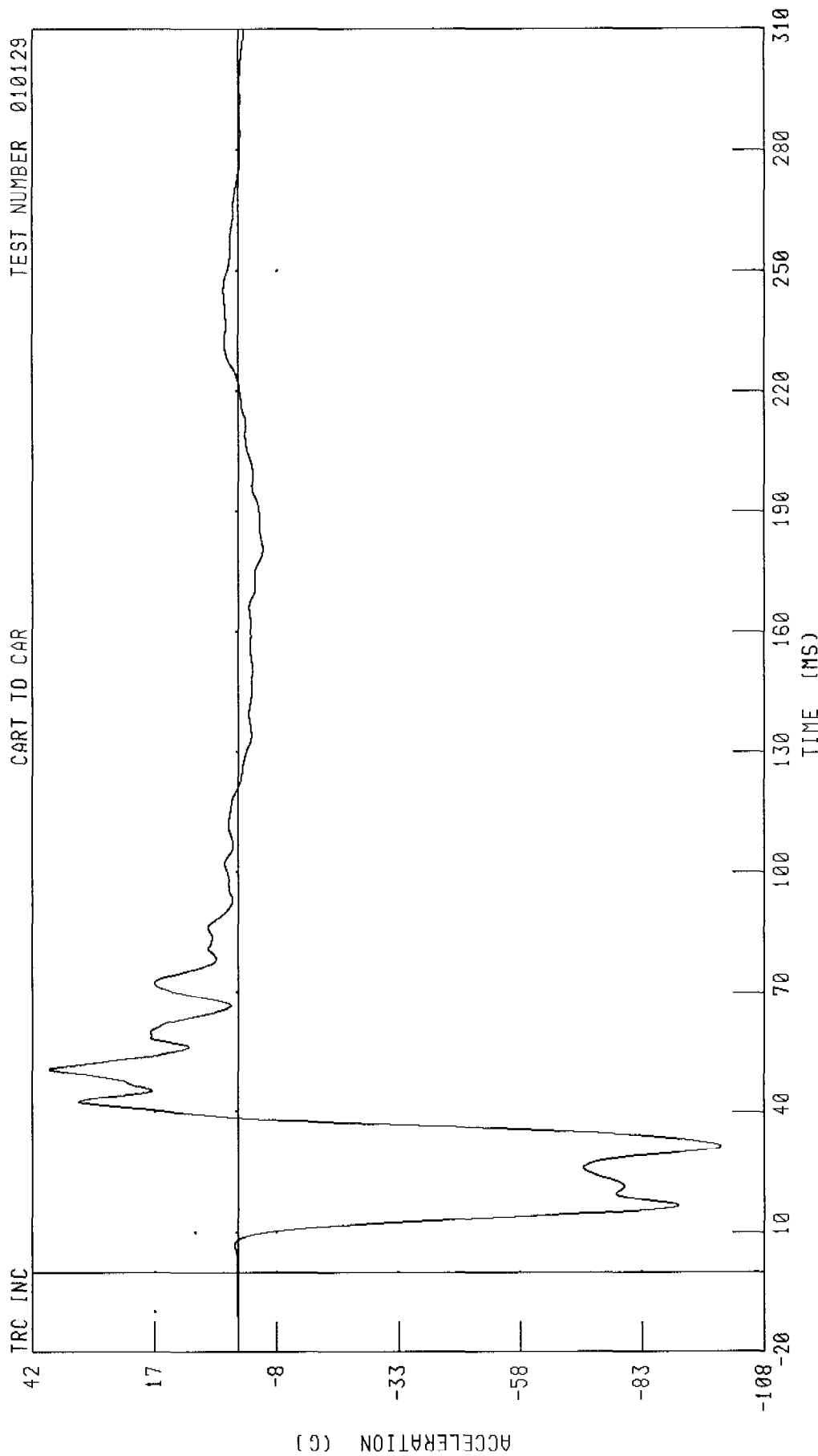
TIME (MS)

CHANNEL ENGXC1 FILTER CH CLASS 60

PEAK DATA 103 98 G @ 17 68 MS, -149 32 G @ 29 36 MS



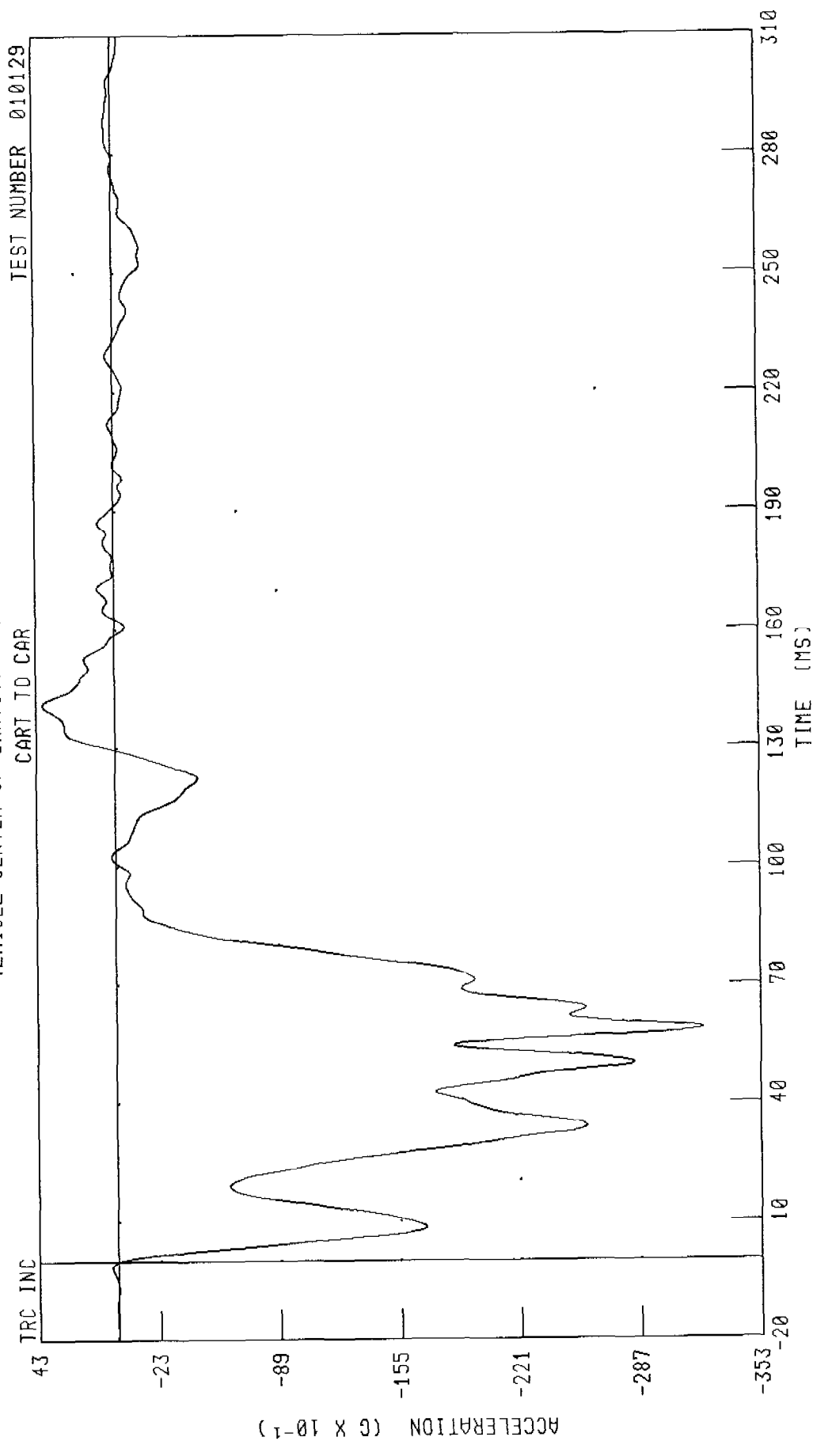
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
ENGINE BOTTOM X-AXIS ACCELERATION



CHANNEL ENGXC2 FILTER CH CLASS 60

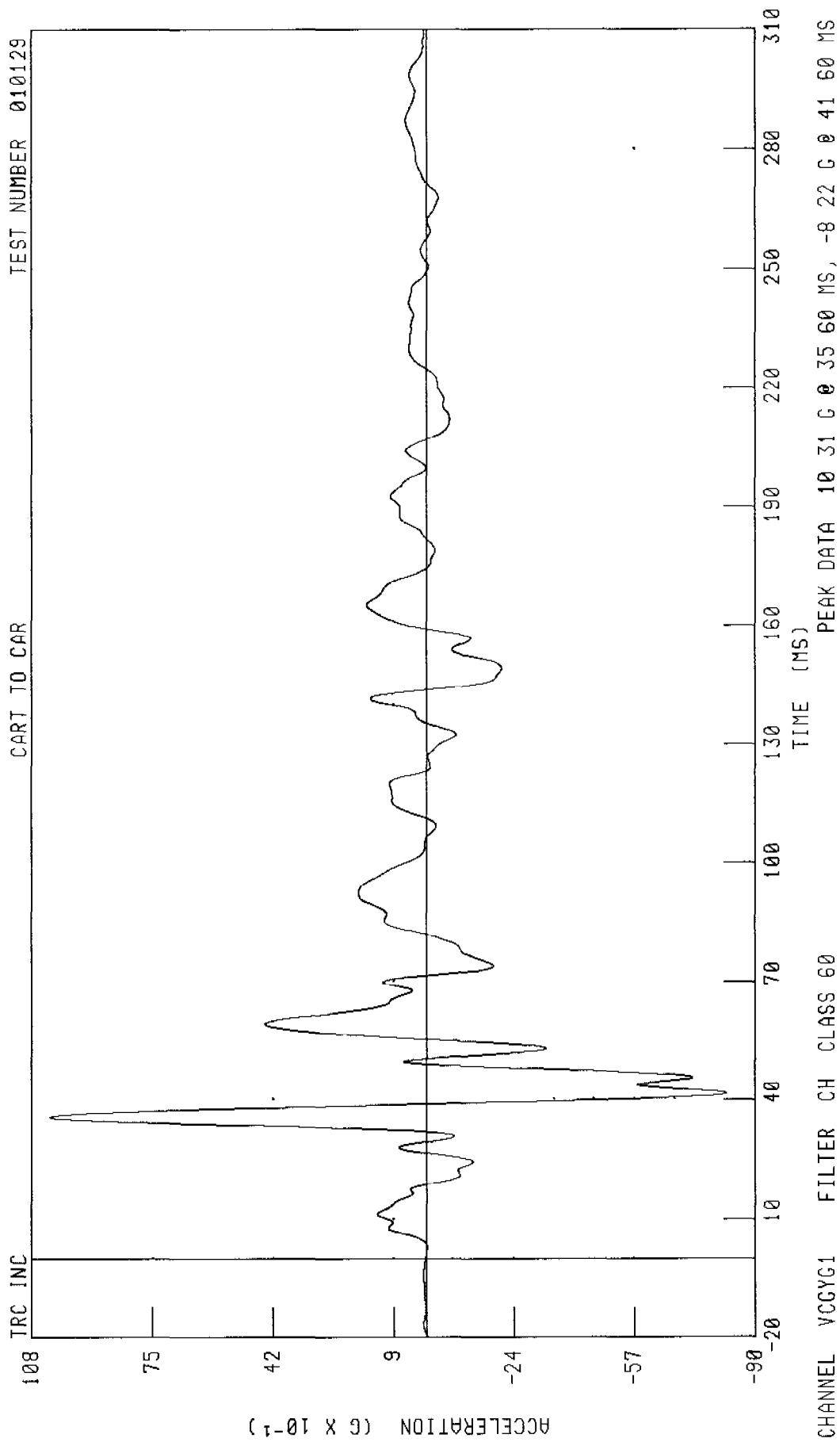
PEAK DATA 38 64 G @ 50 80 MS, -99 23 G @ 31 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

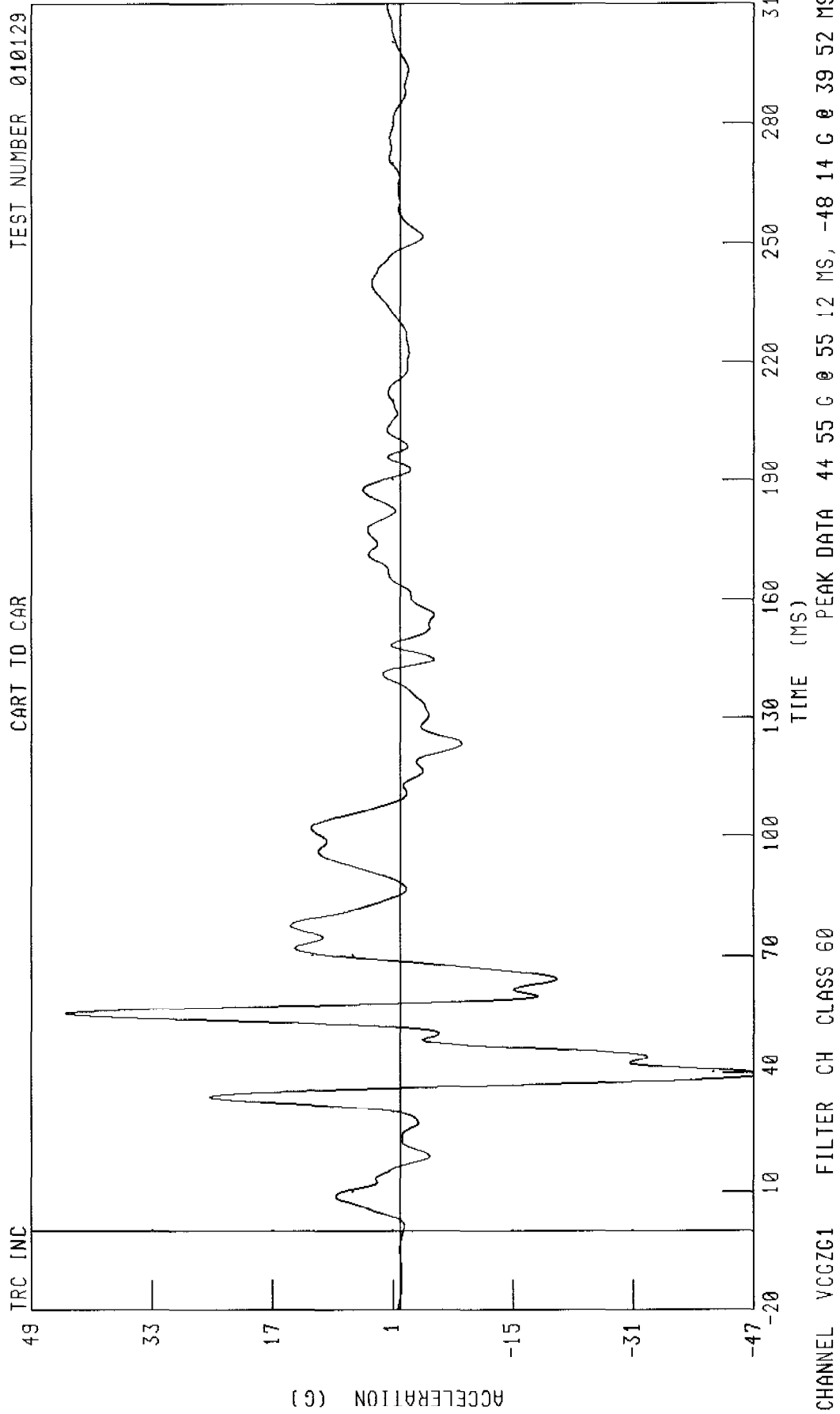


CHANNEL VCGXG1 FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION

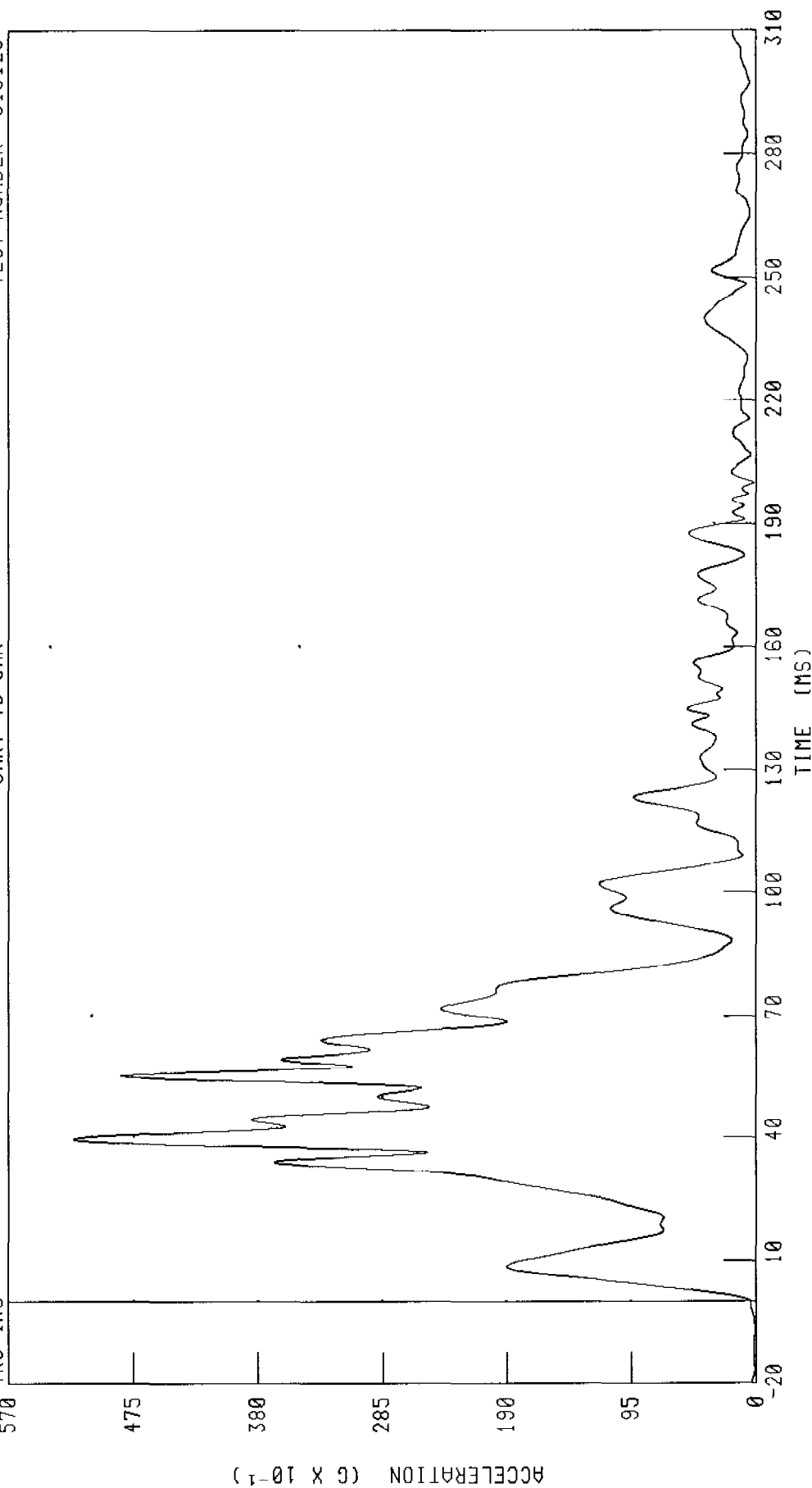


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL VCCRG1 FILTER CH CLASS 60

PEAK DATA 52 05 G @ 39 52 MS, 0 06 G @ -6 64 MS

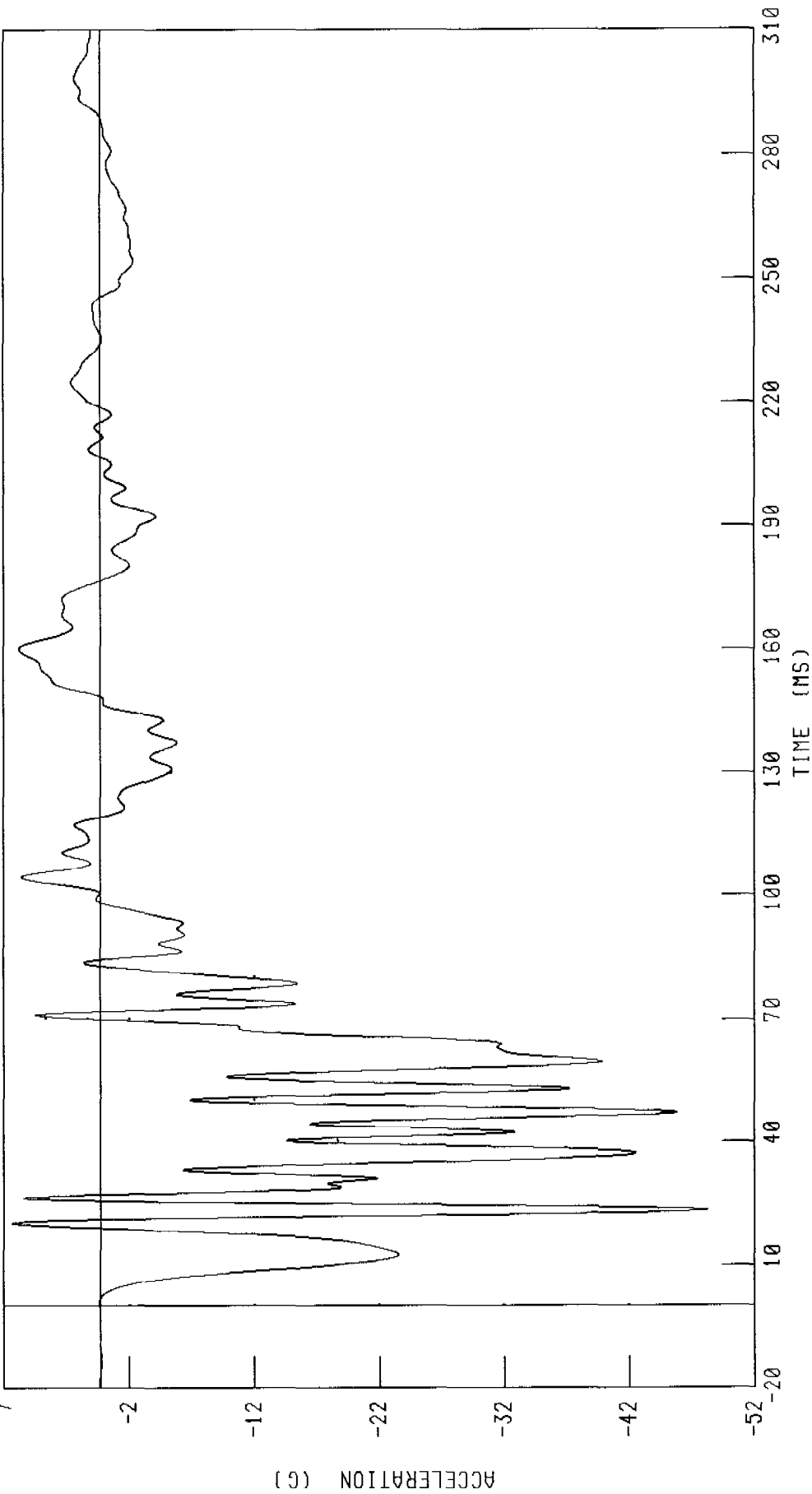
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

INSTRUMENT PANEL X-AXIS ACCELERATION

7 TRC INC

CART TO CAR

TEST NUMBER 010129

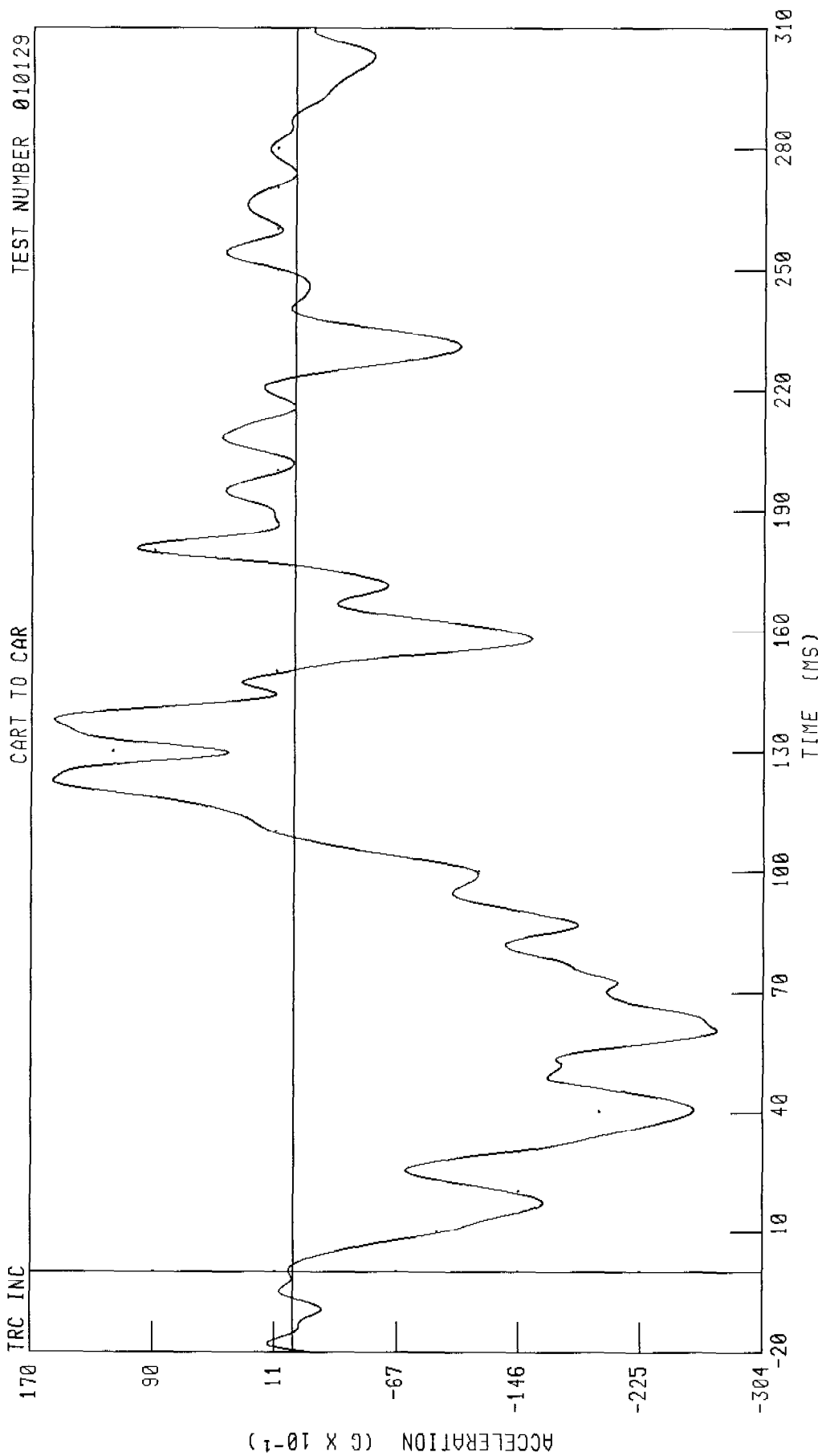


CHANNEL DPCXG1

FILTER CH CLASS 60

PEAK DATA 7 03 G @ 20 24 MS, -48 61 G @ 23 28 MS

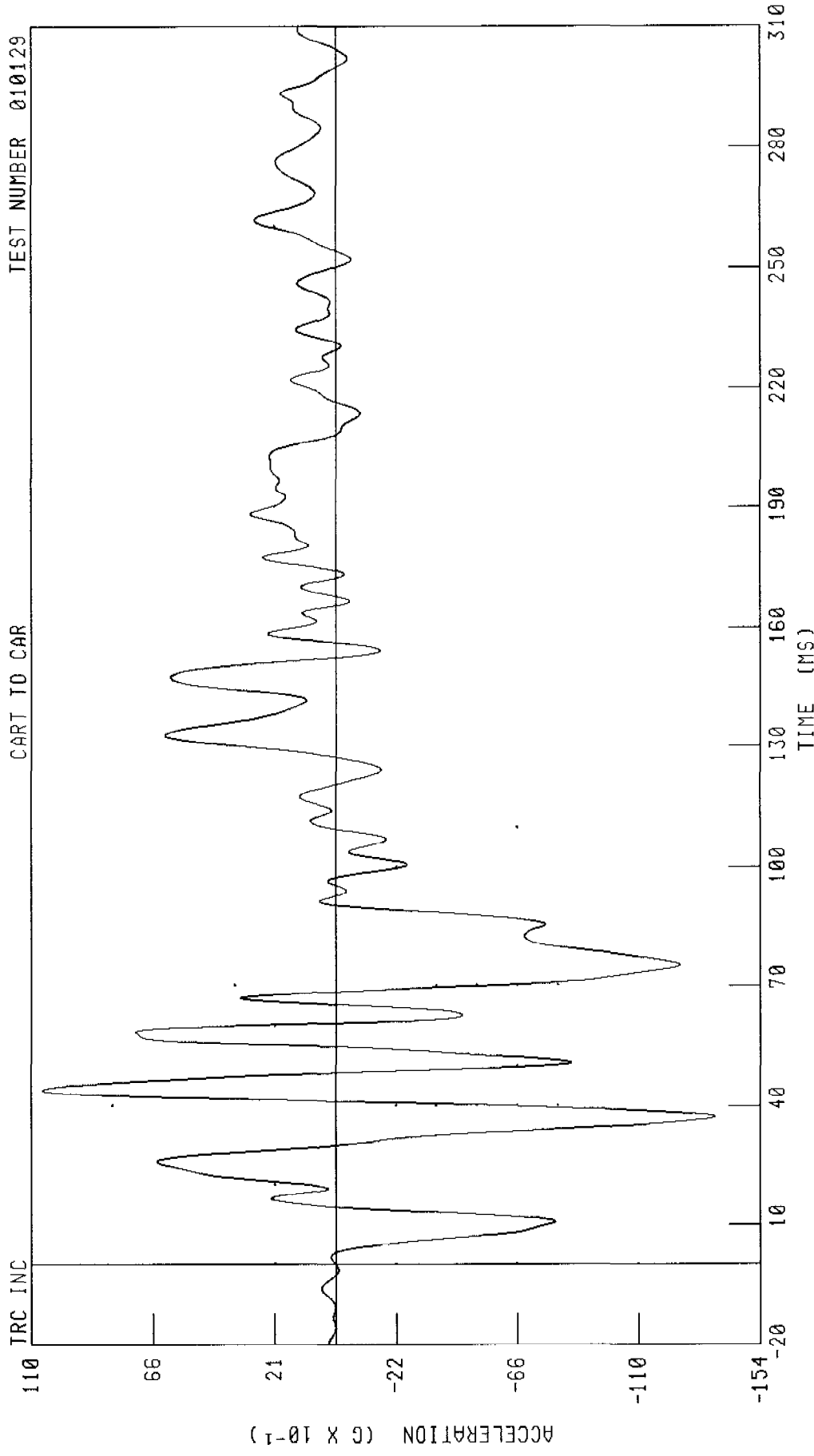
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 REAR AXLE X-AXIS ACCELERATION



CHANNEL RAXXC1 FILTER CH CLASS 60

PEAK DATA 15 62 G @ 122 80 MS, -27 48 G @ 60 48 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
VEHICLE REAR CENTER Z-AXIS ACCELERATION



CHANNEL TFCZG1 FILTER CH CLASS 60 PEAK DATA 10 60 G 0 44 08 MS, -13 78 G 0 37 28 MS

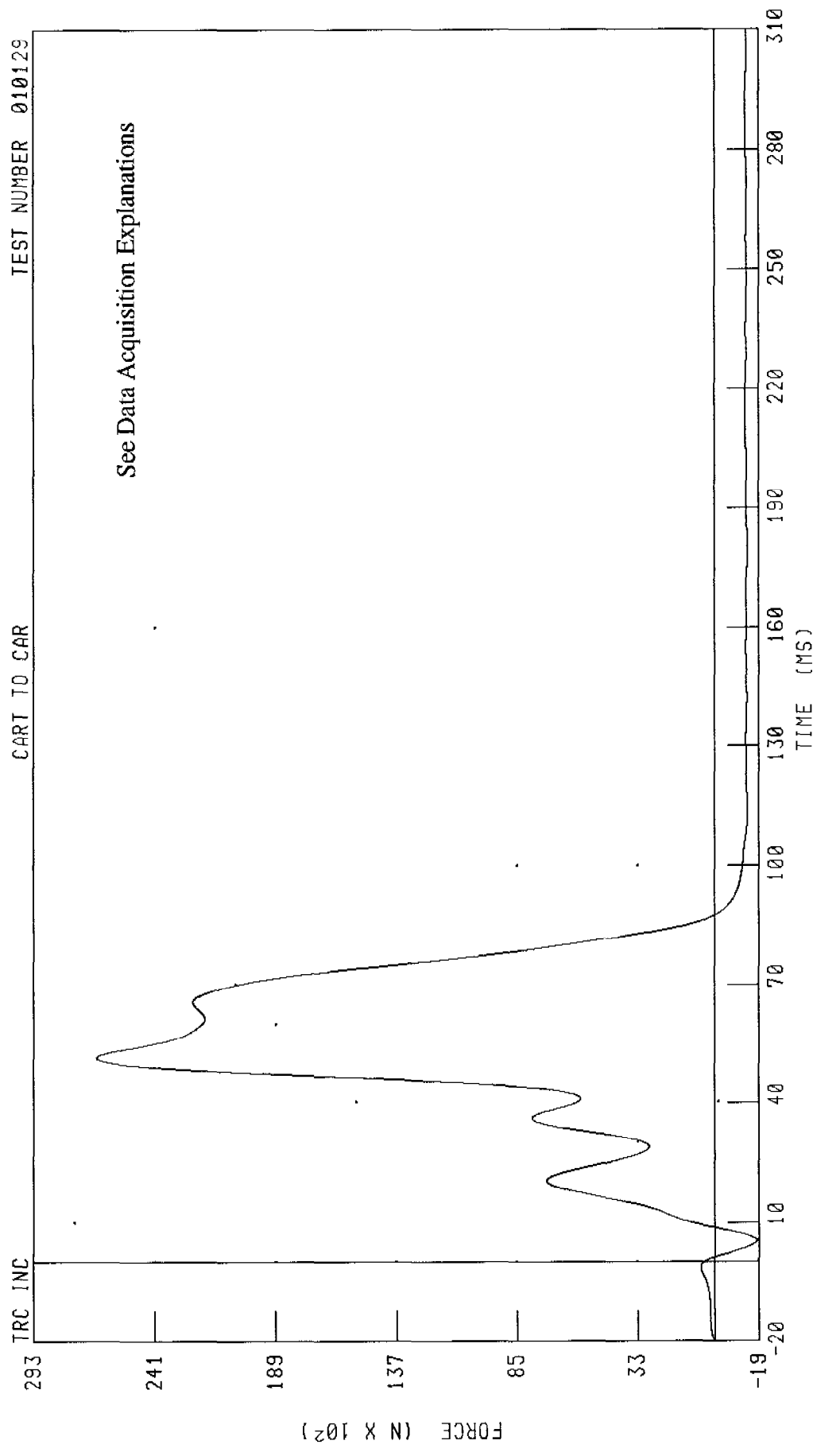
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL A1 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

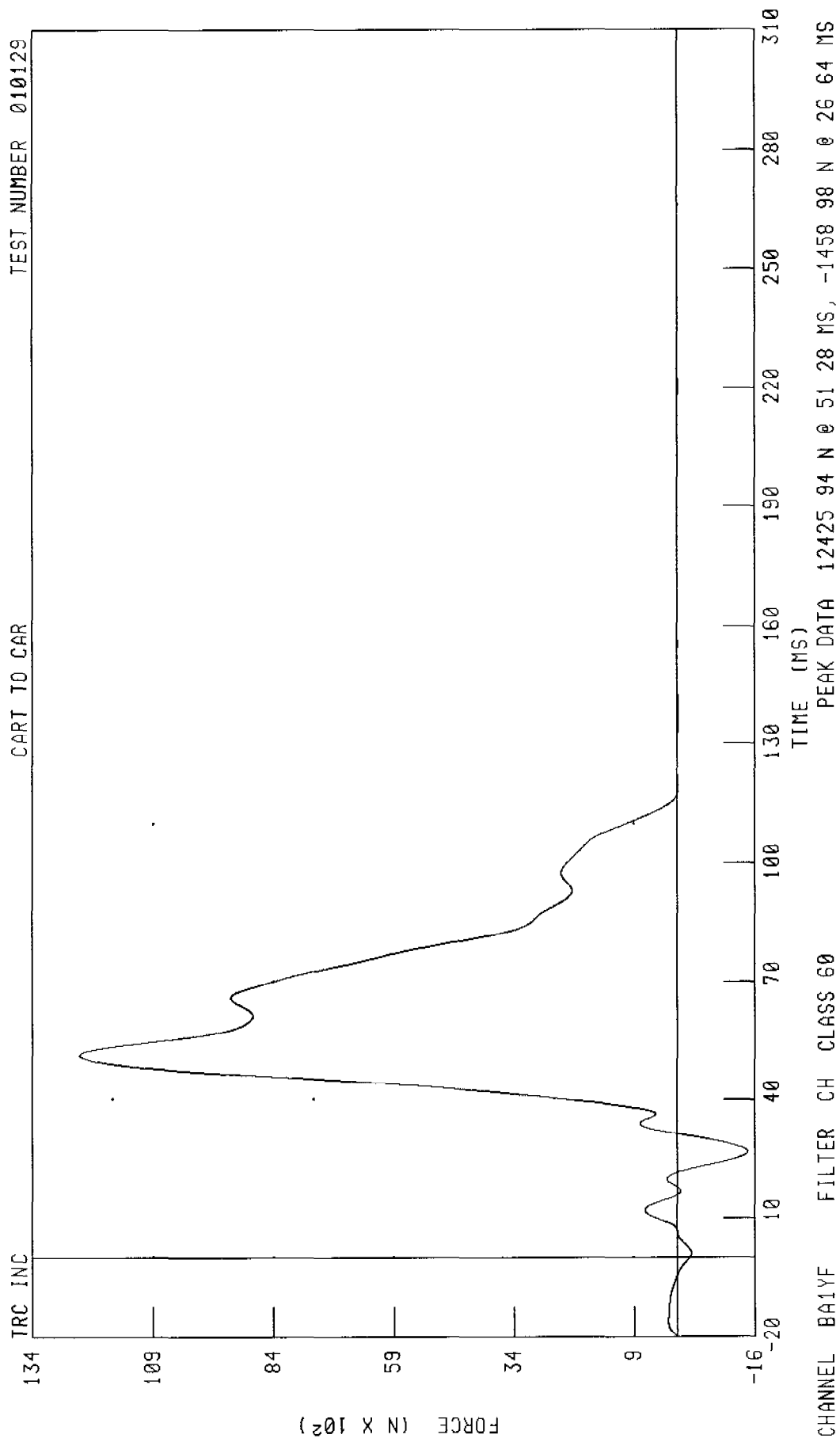
See Data Acquisition Explanations



CHANNEL BA1XF FILTER CH CLASS 60

PEAK DATA 26605 94 N @ 51 52 MS, -1807 68 N @ 5 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A1 Y-AXIS FORCE

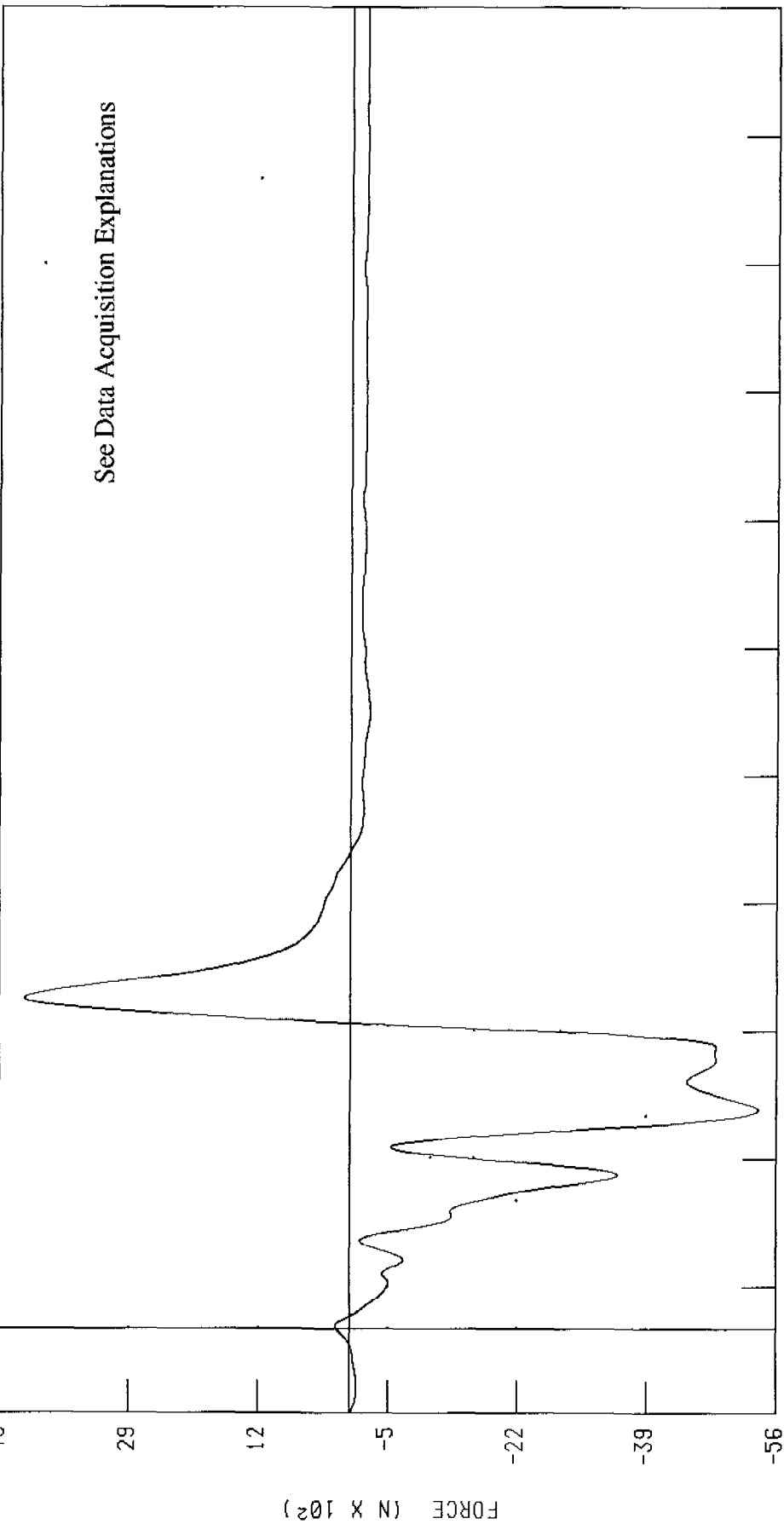


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A1 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



TIME (MS)

CHANNEL BA1ZF FILTER CH CLASS 60 PEAK DATA 4268 03 N @ 77 68 MS, -5365 64 N @ 51 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A3 X-AXIS FORCE

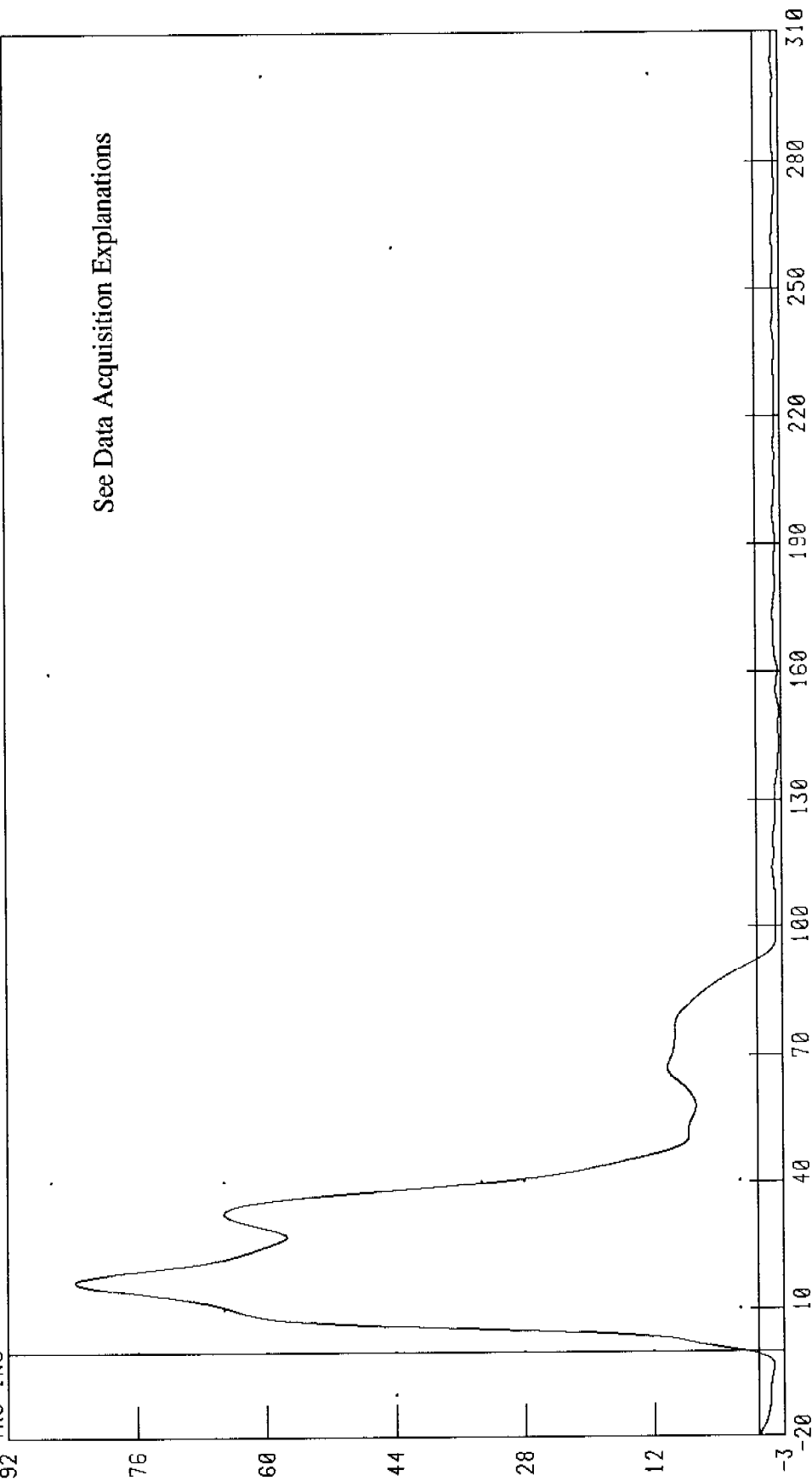
TRC INC

CART TO CAR

TEST NUMBER 010129

See Data Acquisition Explanations

FORCE (N X 10²)

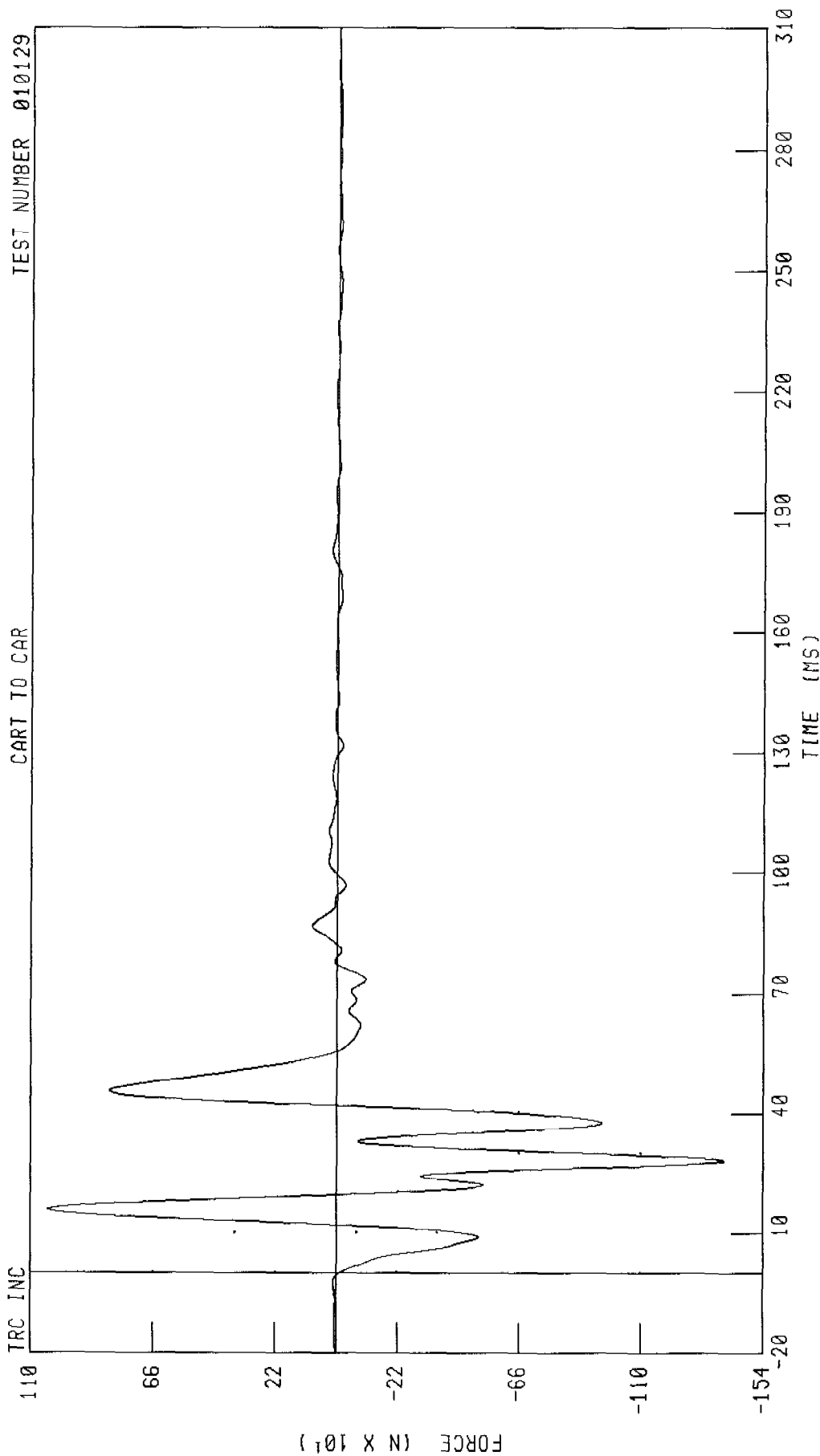


TIME (MS)

PEAK DATA 8458 40 N @ 16 72 MS, -288 61 N @ 143 12 MS

CHANNEL BA3XF FILTER CH CLASS 60

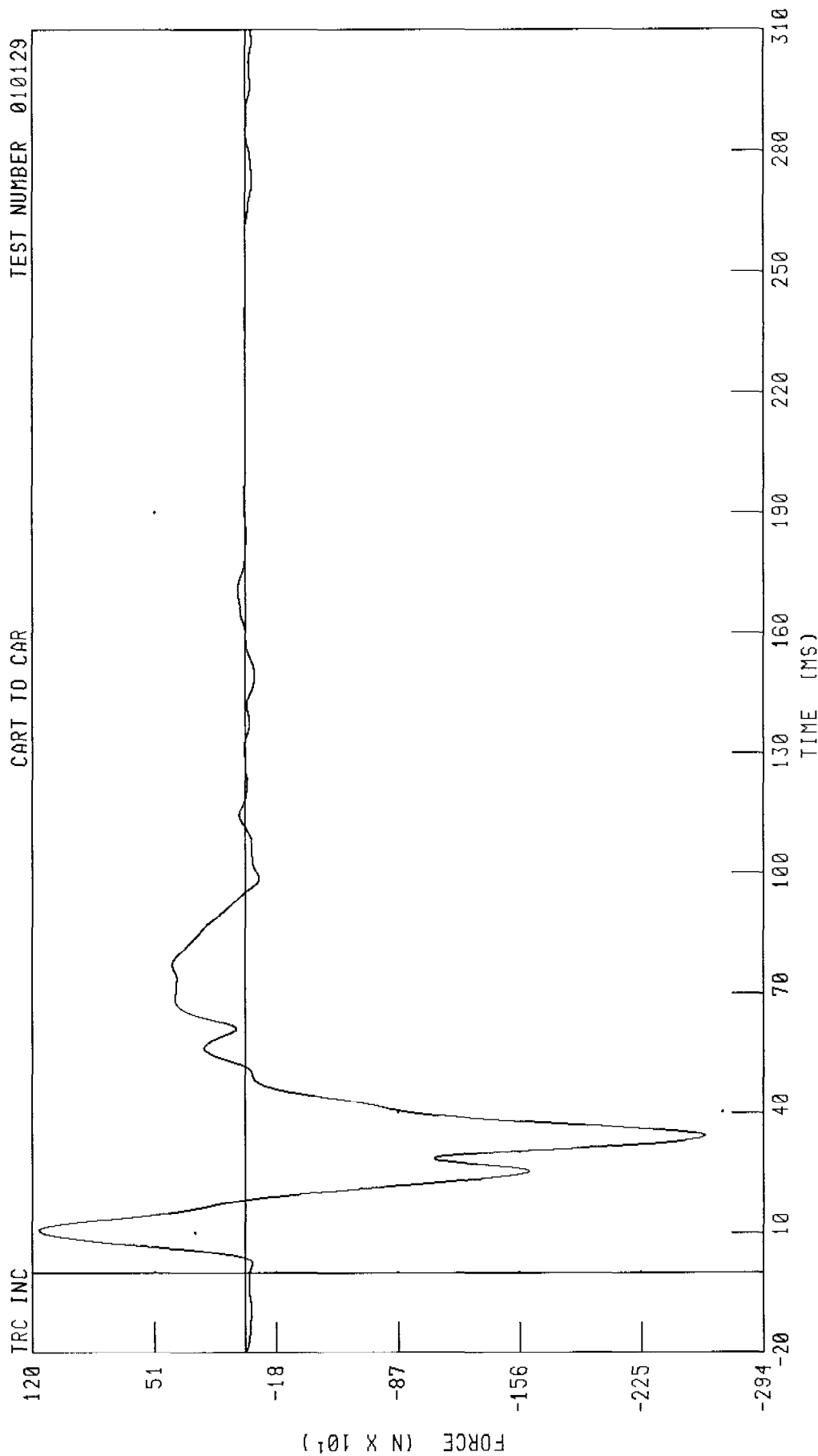
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A3 Y-AXIS FORCE



CHANNEL BA3YF FILTER CH CLASS 60

PEAK DATA 1036 49 N @ 15 92 MS, -1400 58 N @ 28 16 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A3 Z-AXIS FORCE



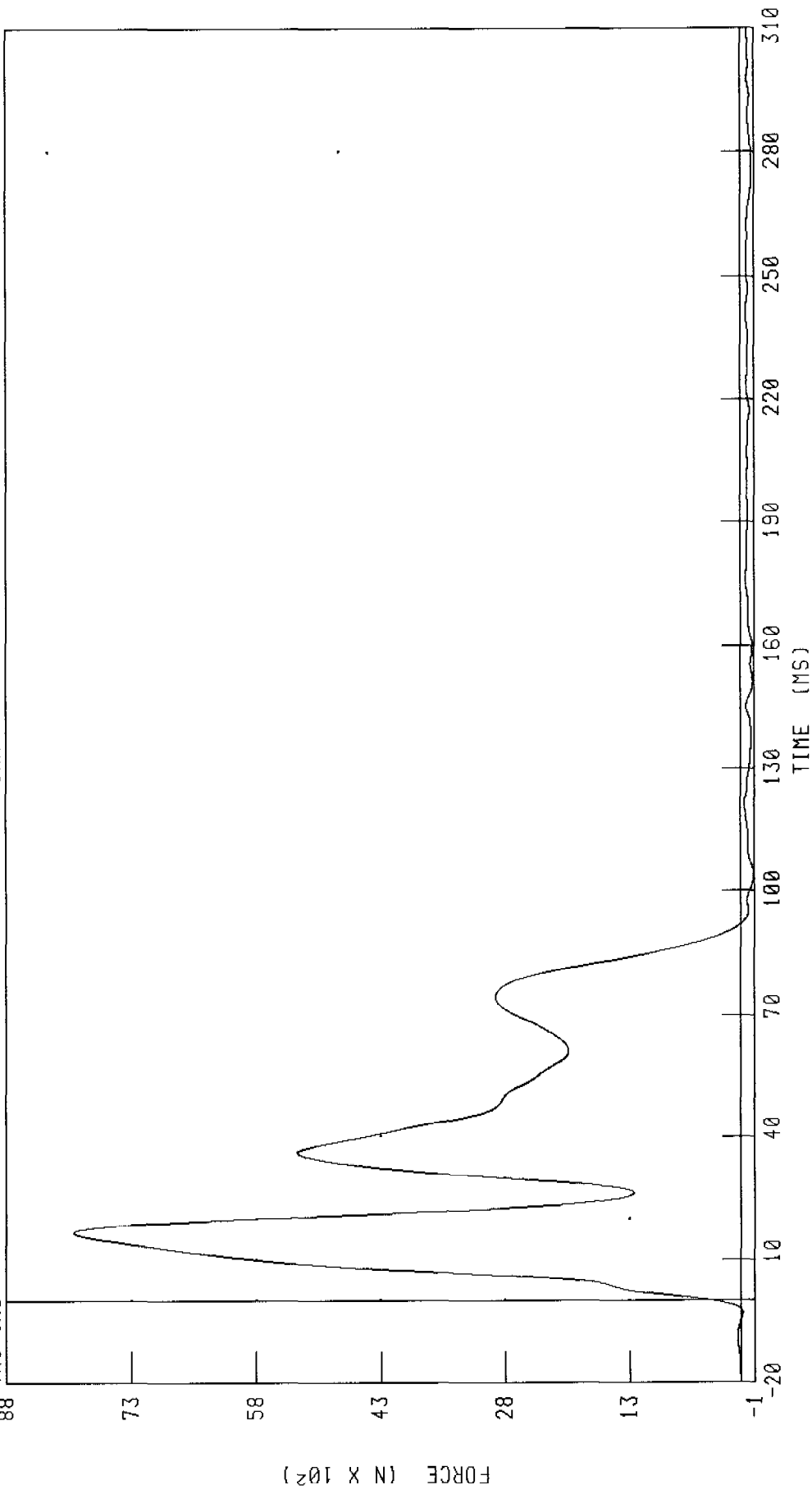
CHANNEL BA3ZF FILTER CH CLASS 60 PEAK DATA 1161 64 N 0 10 64 MS, -2610 95 N 0 34 24 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A4 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

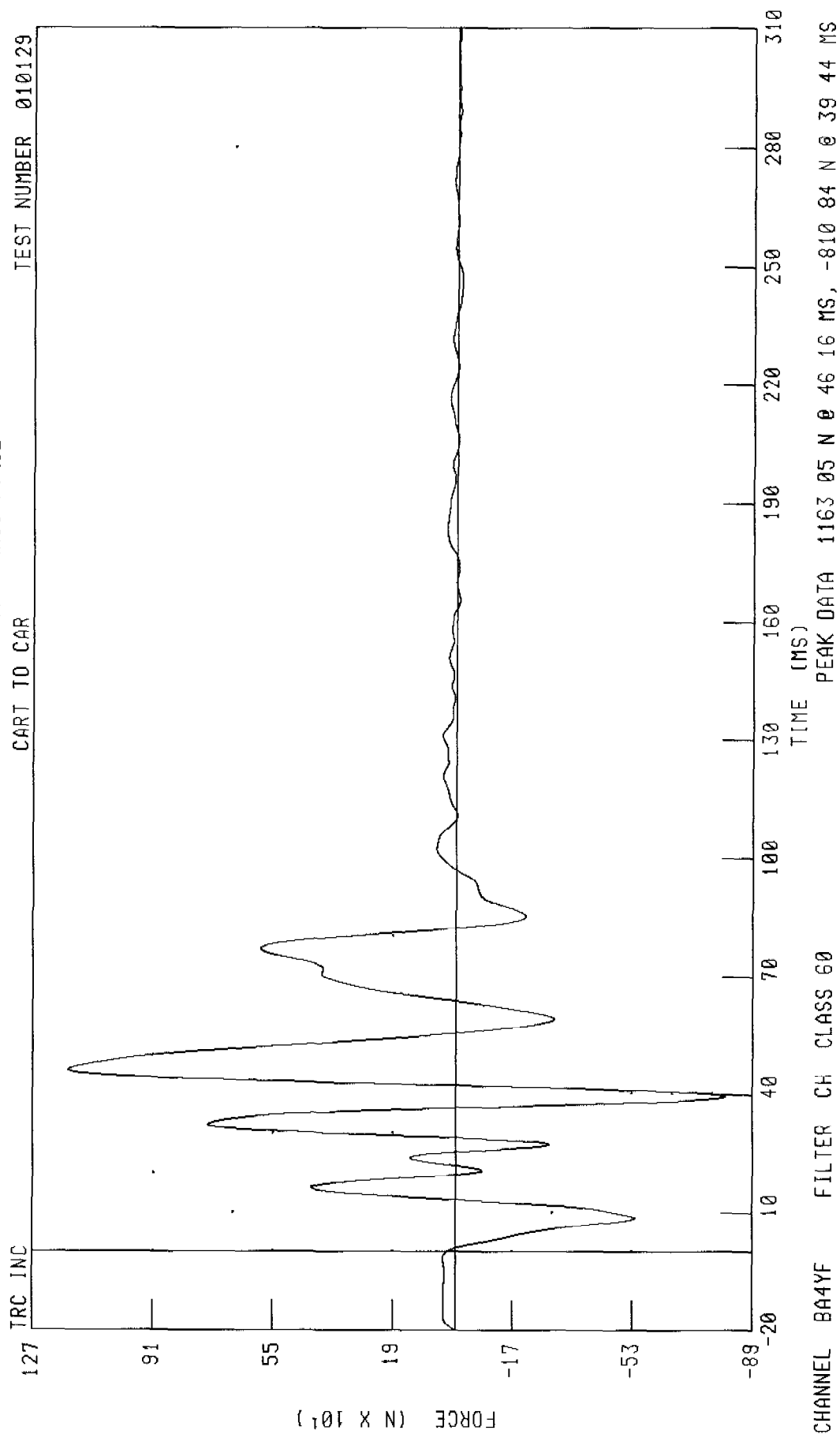
TRC INC



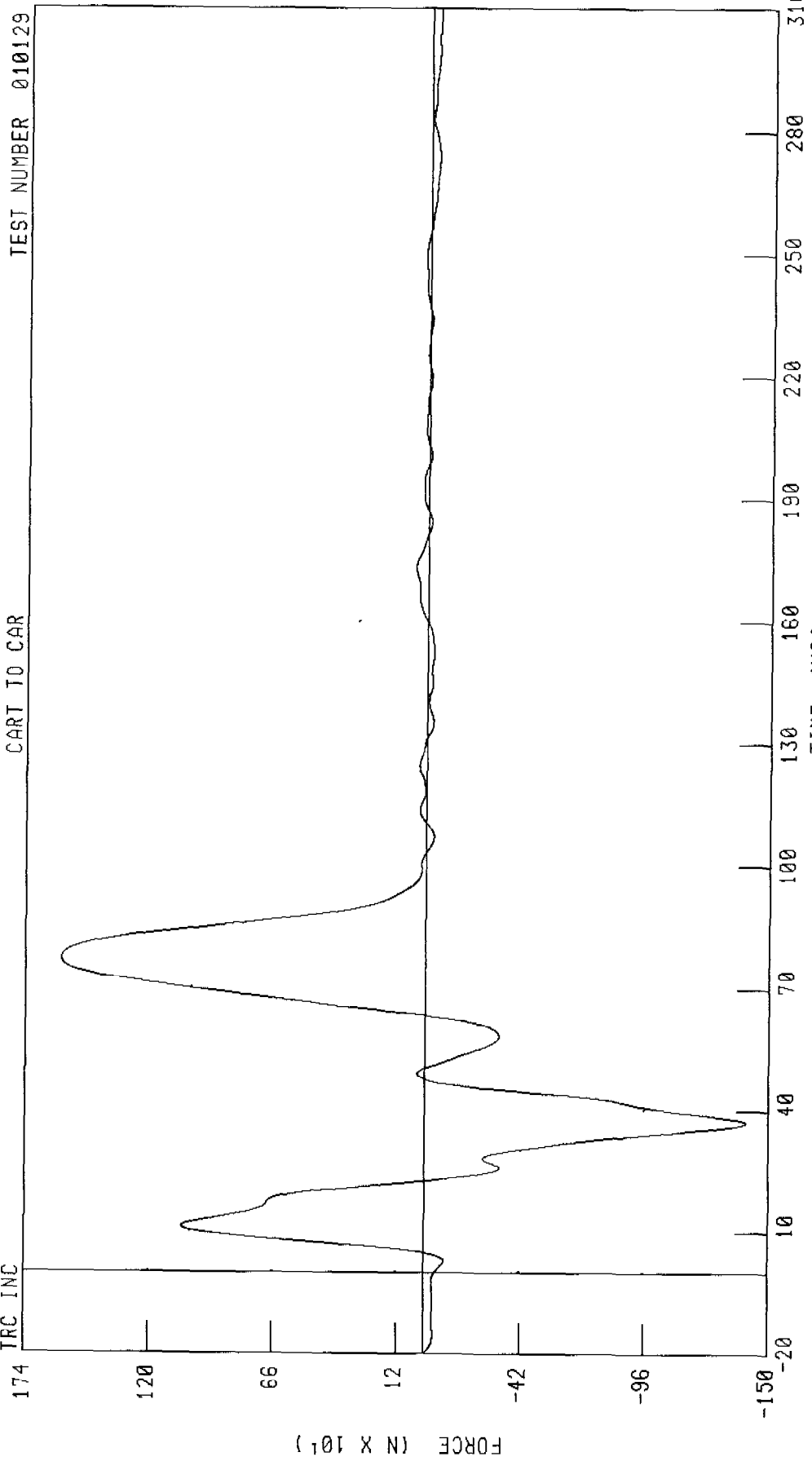
CHANNEL BA4XF FILTER CH CLASS 60

PEAK DATA 8035 41 N @ 16 80 MS, -153 45 N @ 104 24 MS

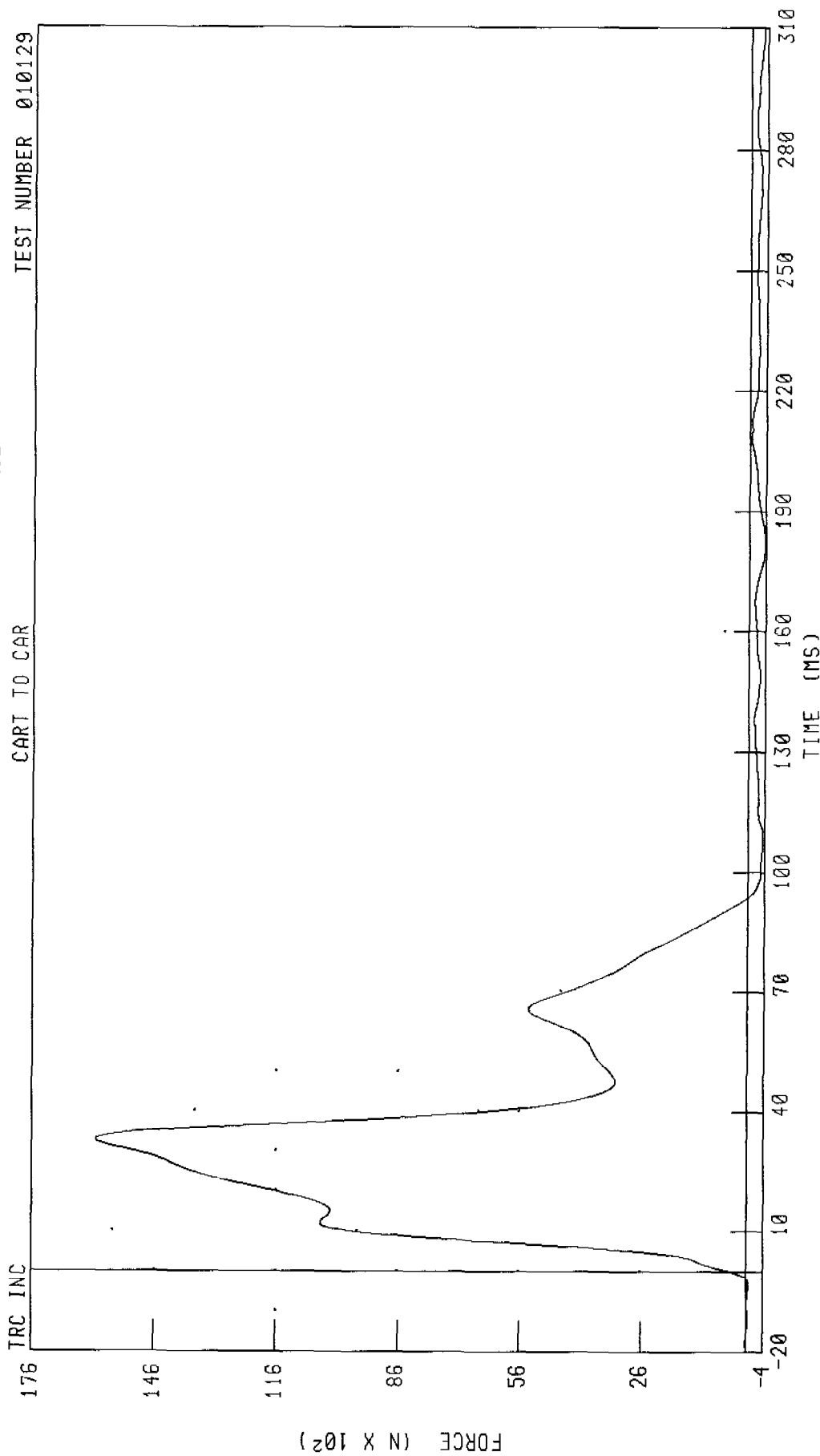
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A4 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL A4 Z-AXIS FORCE



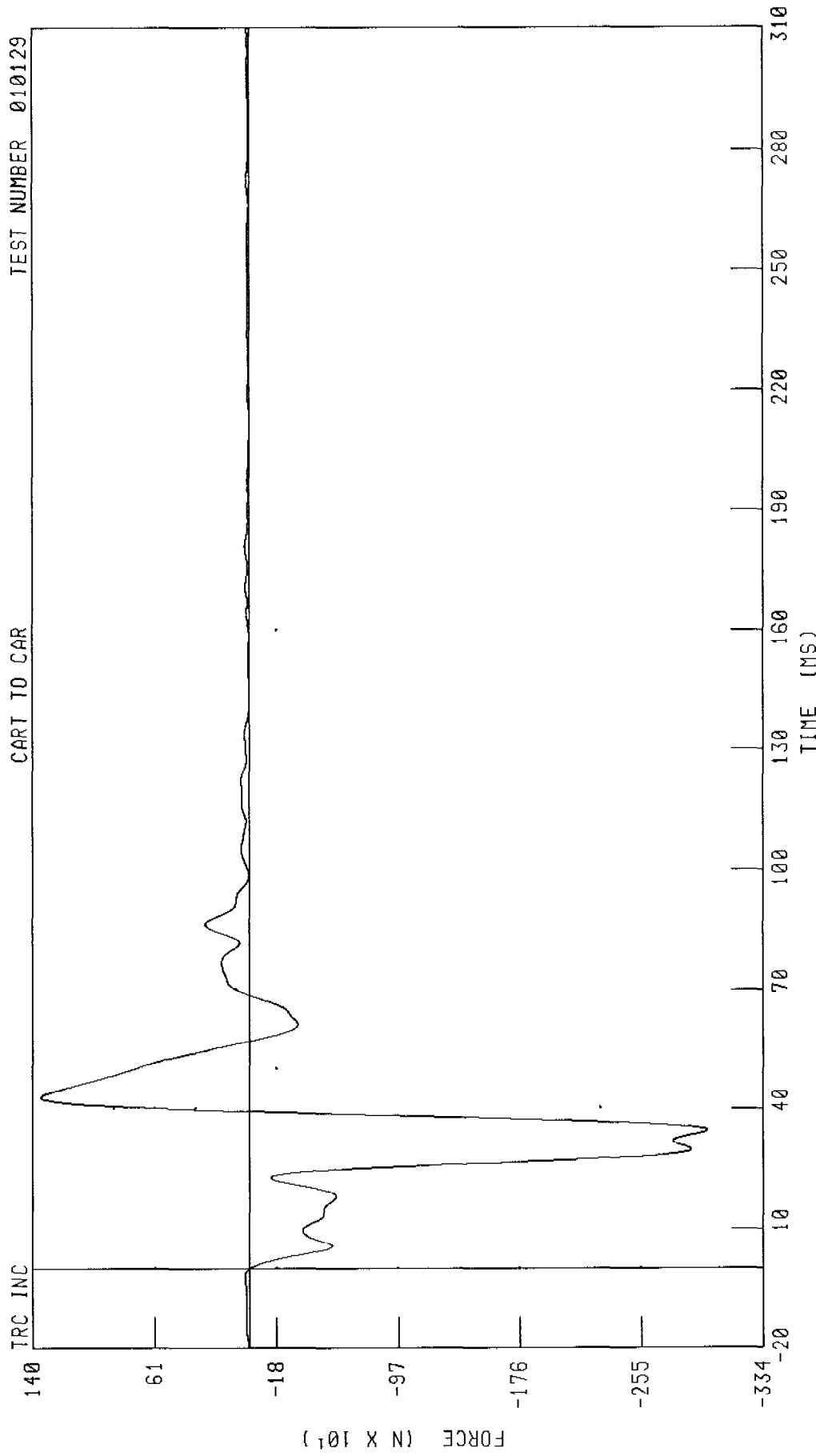
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B2 X-AXIS FORCE



CHANNEL BB2XF FILTER CH CLASS 60

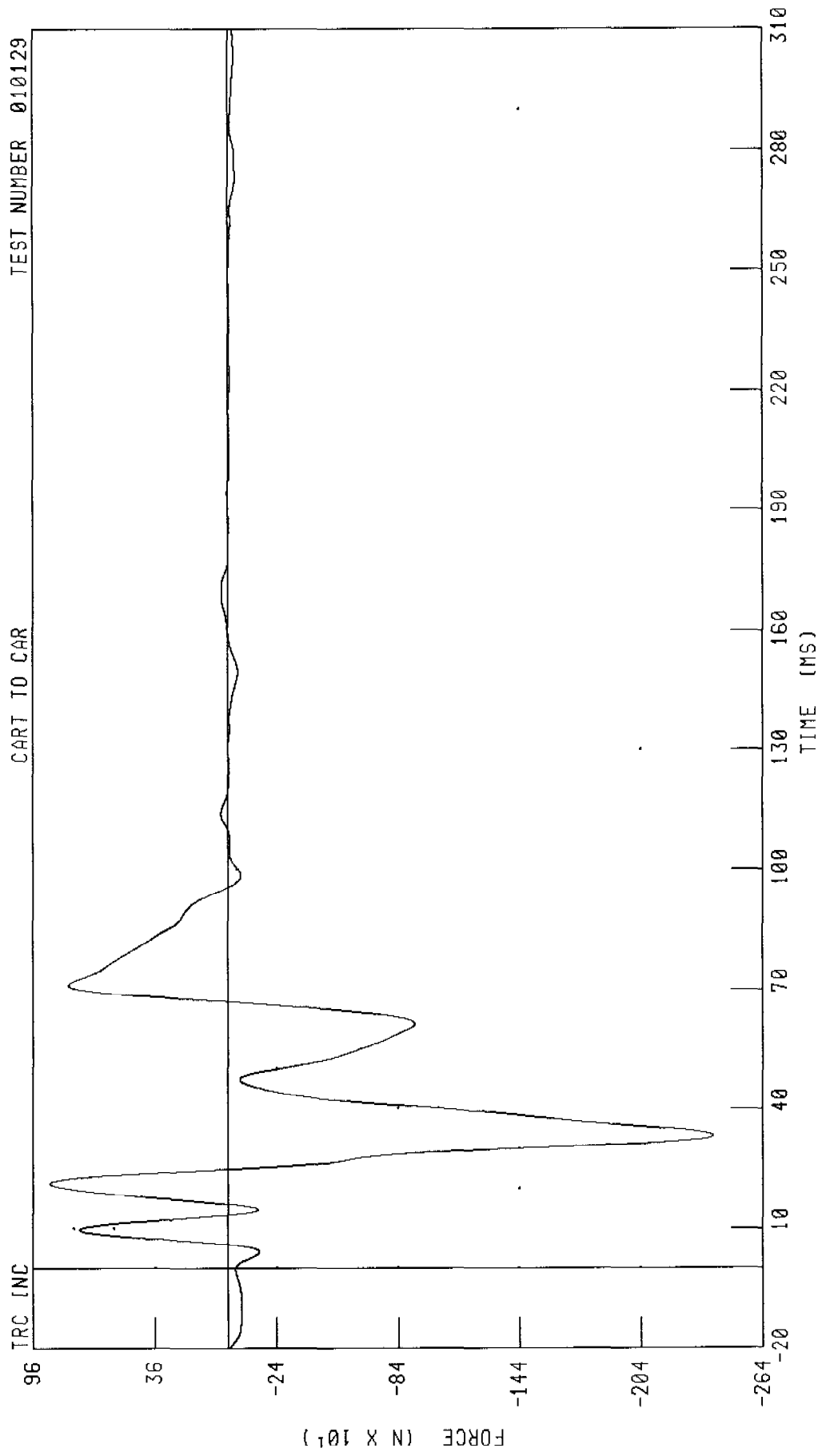
PEAK DATA 16041 49 N @ 32 88 MS, -372 52 N @ 181 68 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B2 Y-AXIS FORCE



CHANNEL BB2VF FILTER CH CLASS 60 PEAK DATA 1345 26 N 0 42 88 MS, -2977 83 N 0 34 64 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B2 Z-AXIS FORCE



CHANNEL BB2ZF FILTER CH CLASS 60 PEAK DATA 878 16 N @ 21 36 MS, -2397 48 N @ 33 28 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B3 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

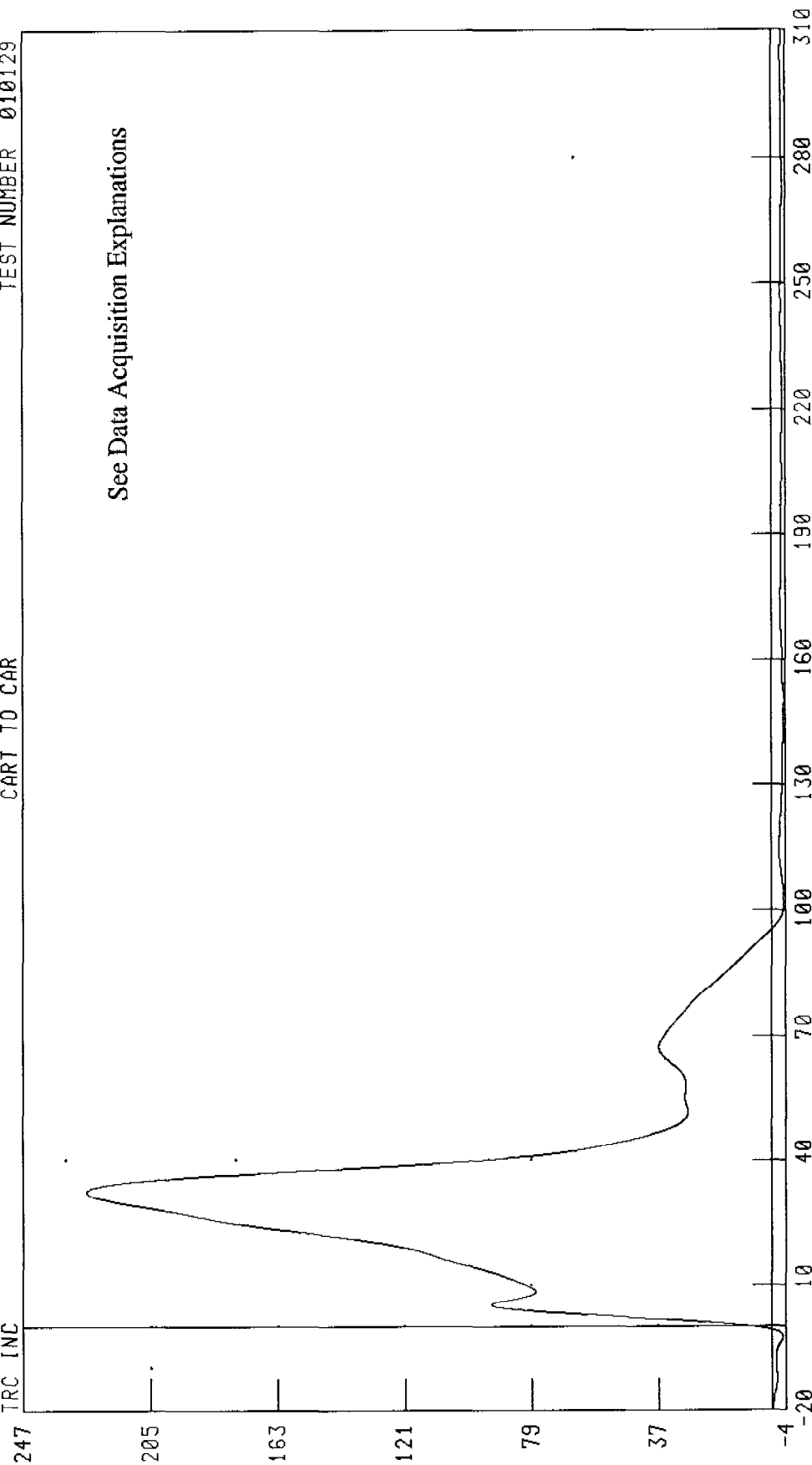
See Data Acquisition Explanations

FORCE (N X 10²)

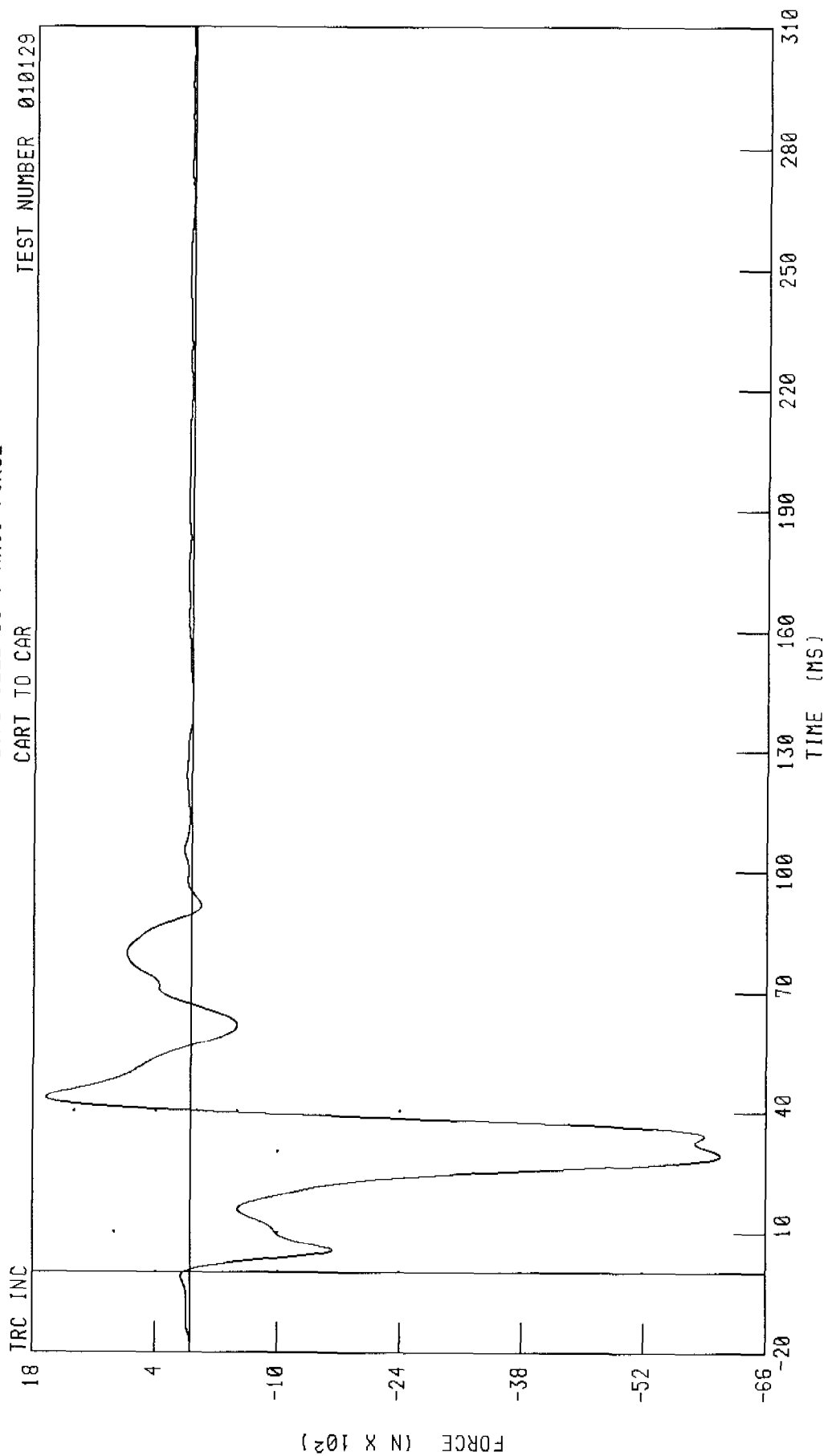
TIME (MS)

CHANNEL BB3XF FILTER CH CLASS 60

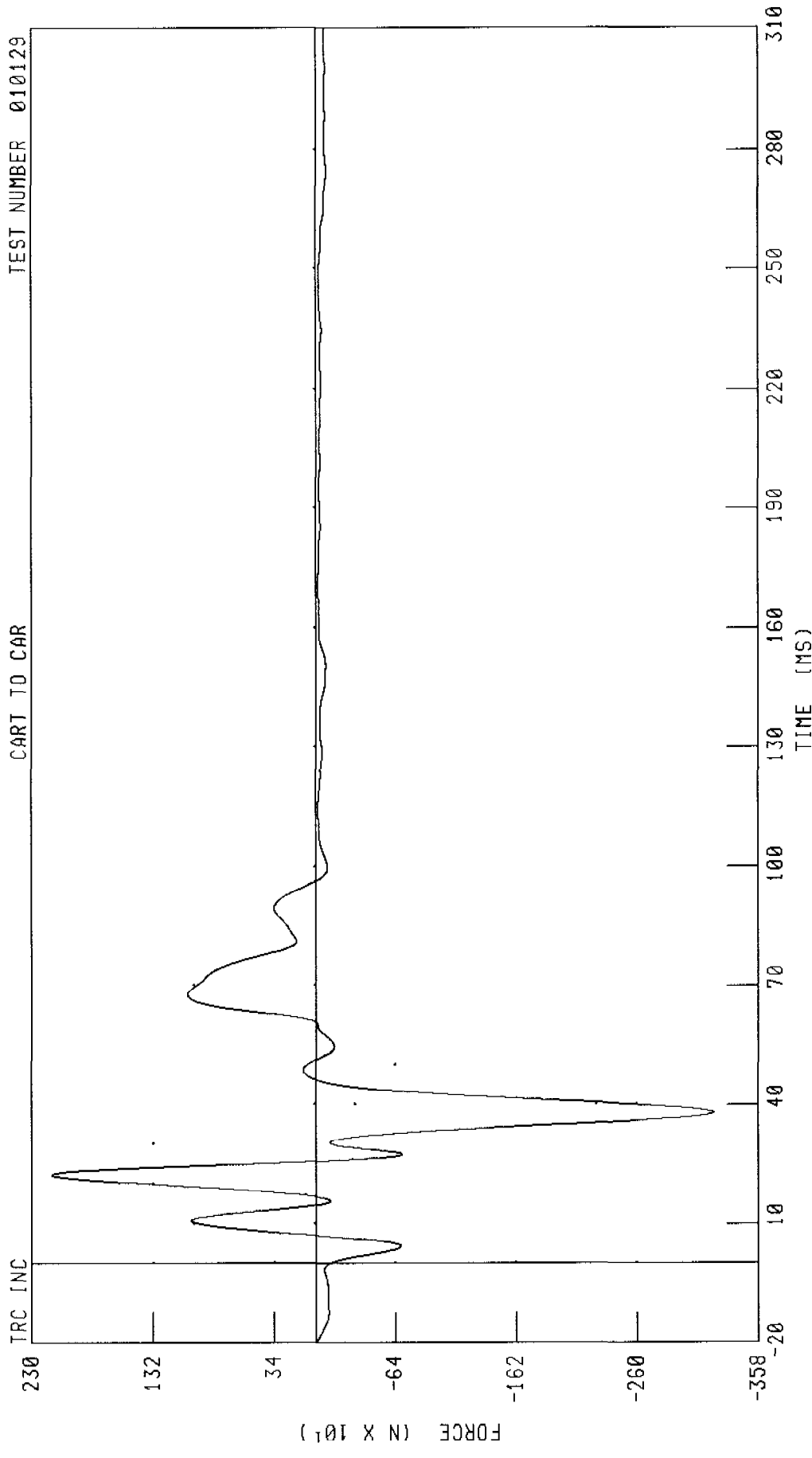
PEAK DATA 22664 54 N @ 32 48 MS, -419 19 N @ 151 04 MS



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B3 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B3 Z-AXIS FORCE

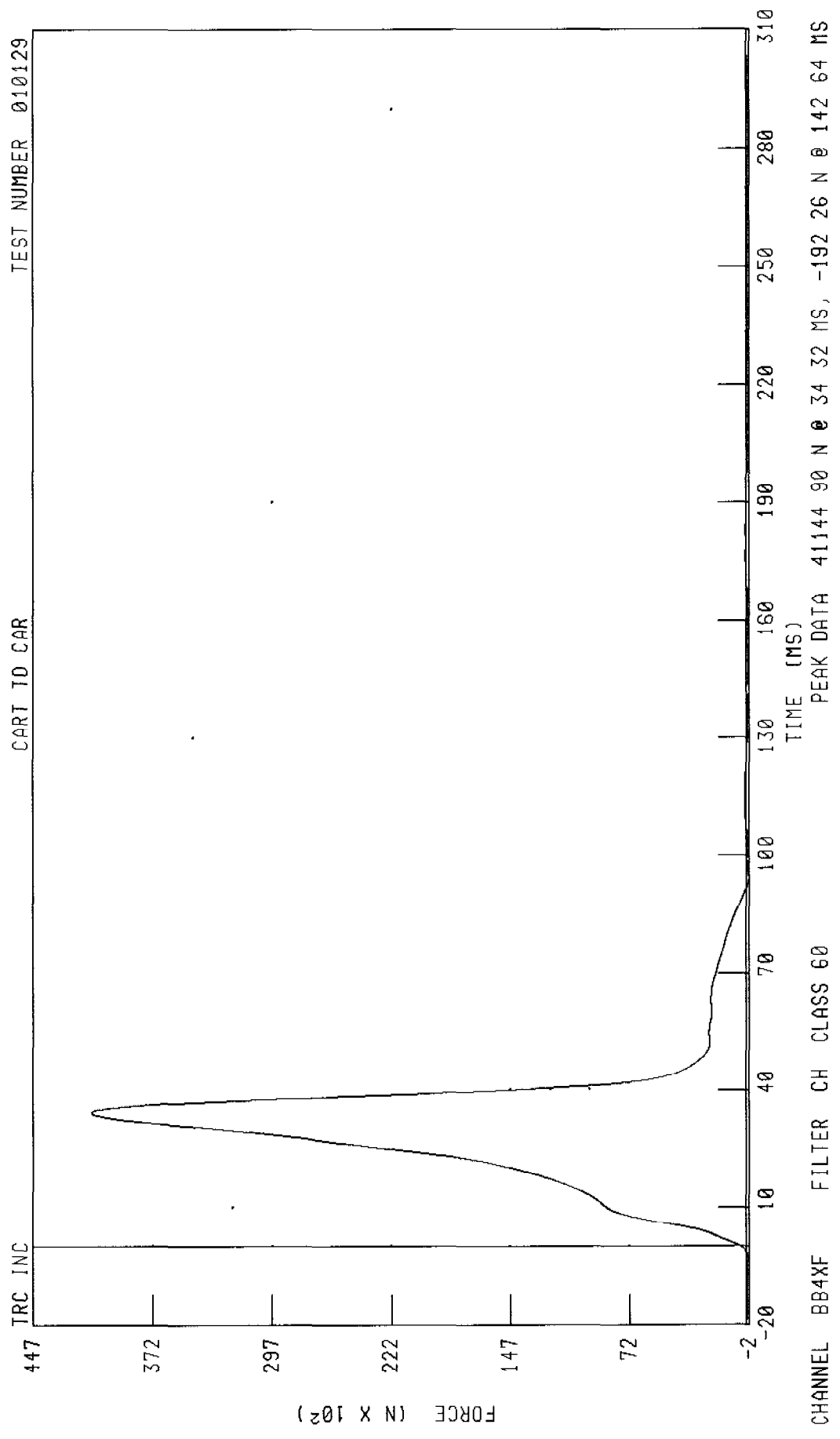


TEST NUMBER 010129

CART TO CAR

CHANNEL BB3ZF FILTER CH CLASS 60 PEAK DATA 2138 27 N 0 22 32 MS, -3223 43 N 0 38 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B4 X-AXIS FORCE

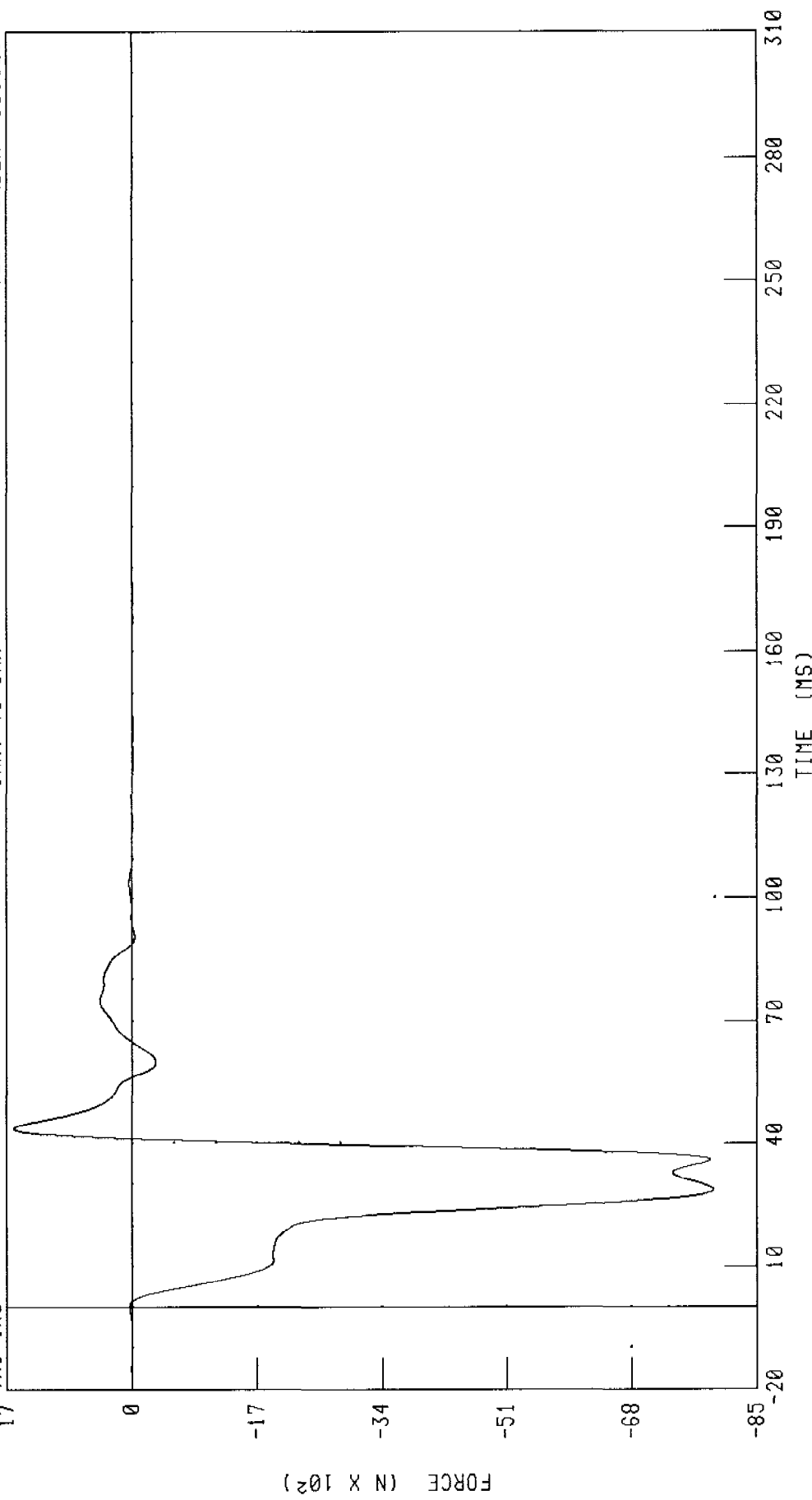


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B4 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BB4YF FILTER CH CLASS 60

PEAK DATA 1607 34 N @ 43 60 MS, -7914 01 N @ 28 56 MS

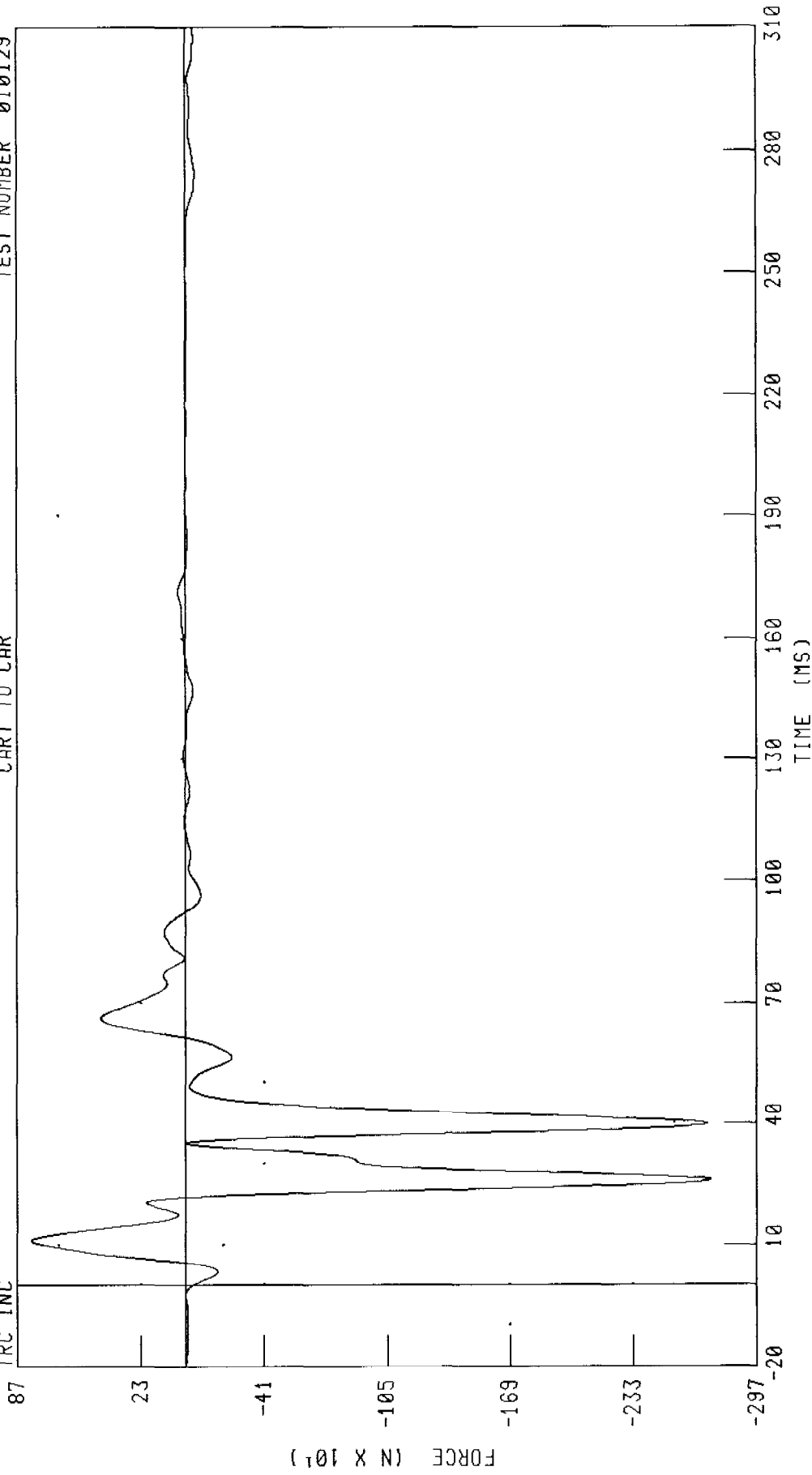
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL B4 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



CHANNEL BB4ZF FILTER CH CLASS 60

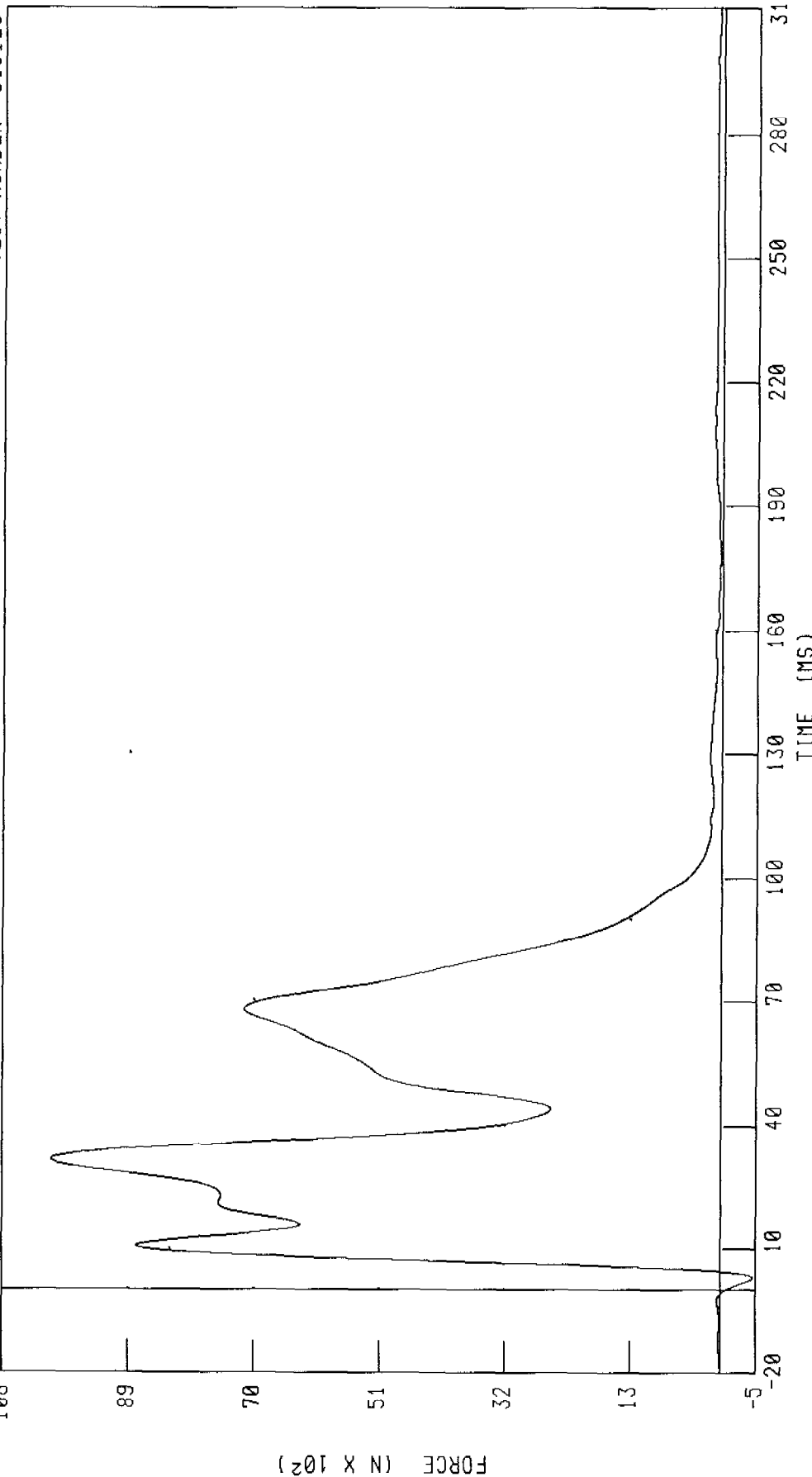
PEAK DATA 795 29 N @ 11 20 MS, -2733 82 N @ 26 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C1 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BC1XF FILTER CH CLASS 60

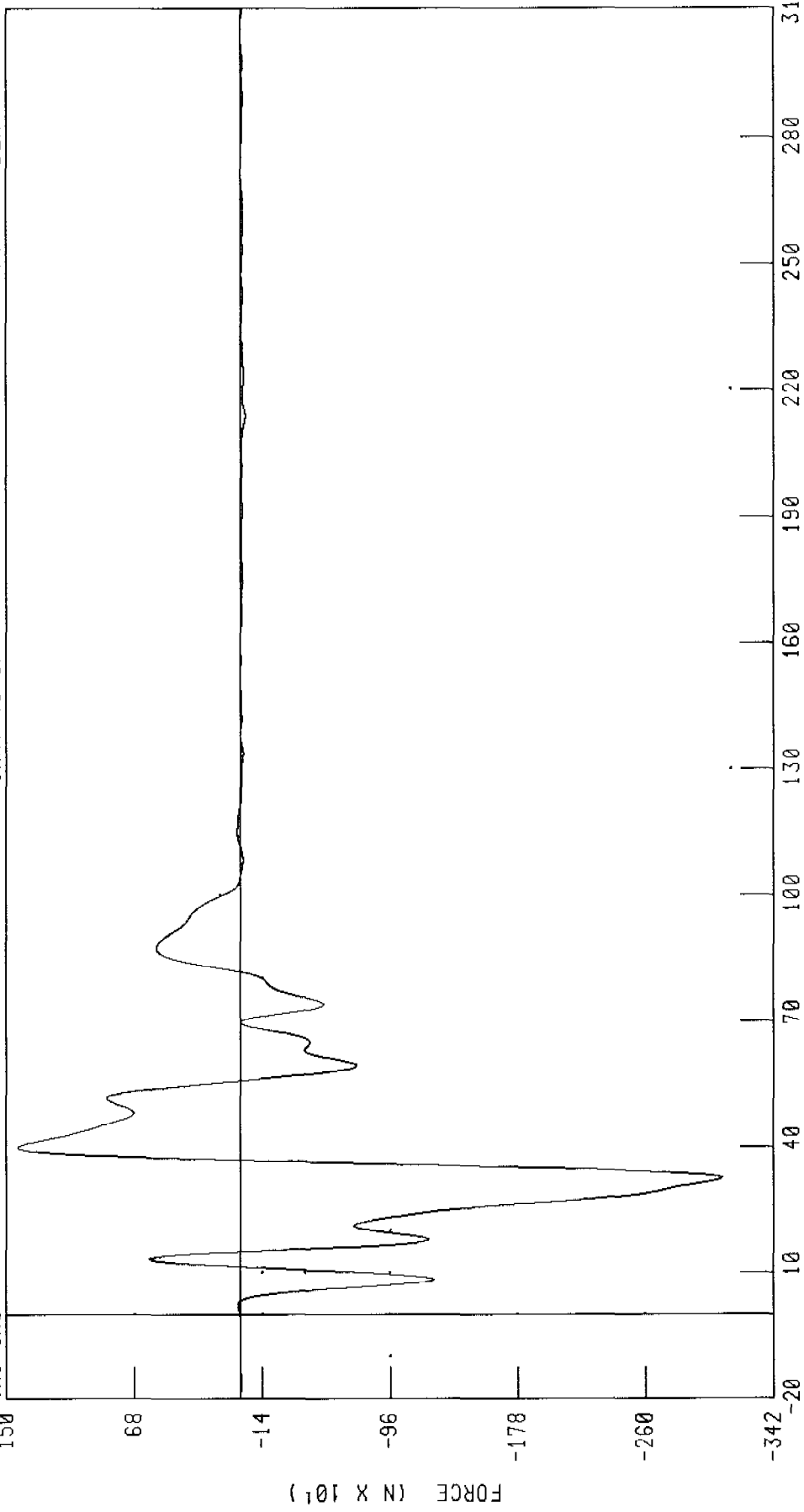
PEAK DATA 10129 77 N @ 31 76 MS, -486 75 N @ 2 96 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C1 Y-AXIS FORCE

TEST NUMBER 010129

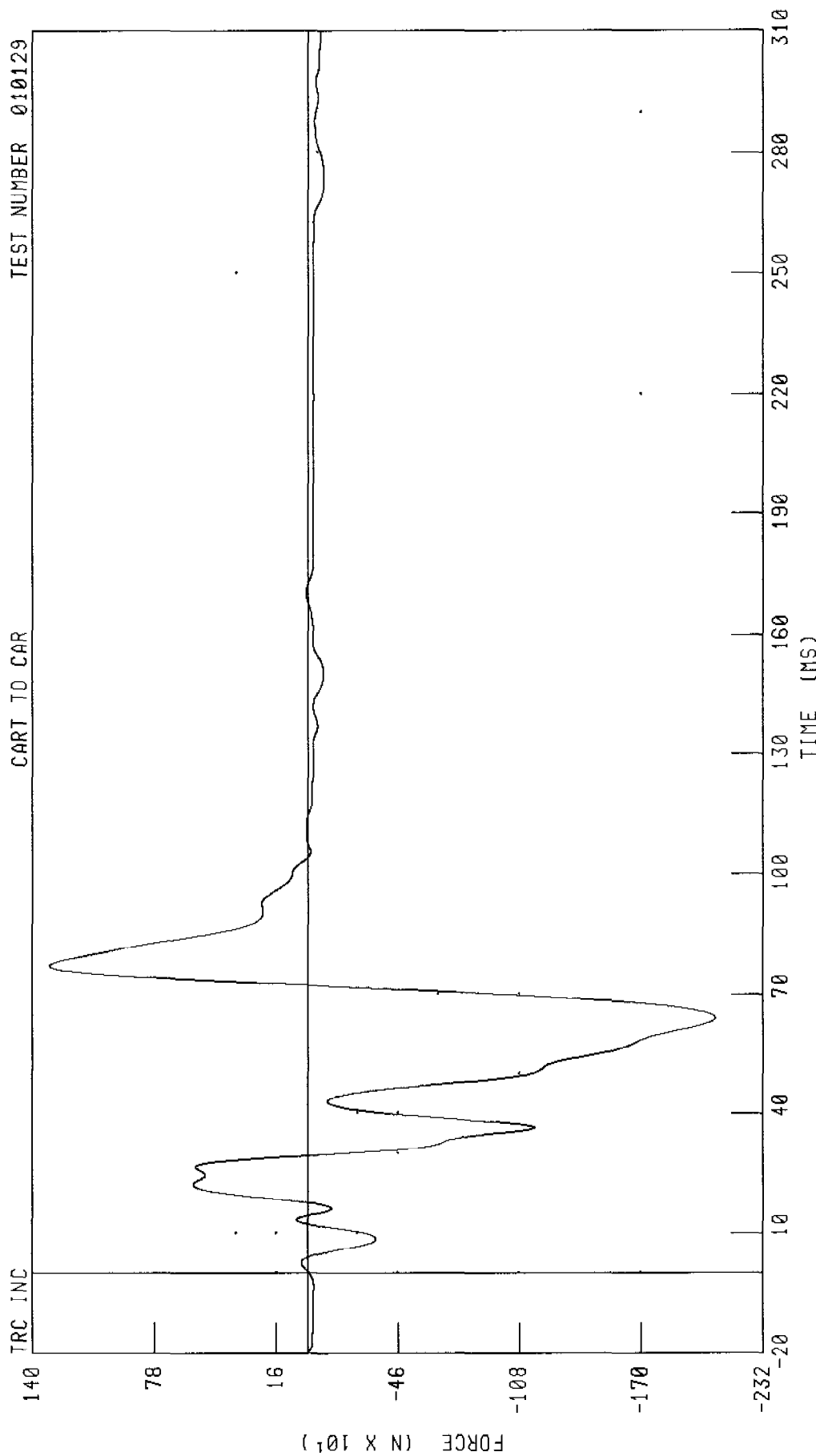
CART TO CAR

TRC INC



CHANNEL BC1YF FILTER CH CLASS 60
PEAK DATA 1426 32 N @ 39 84 MS, -3094 56 N @ 32 56 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C1 Z-AXIS FORCE



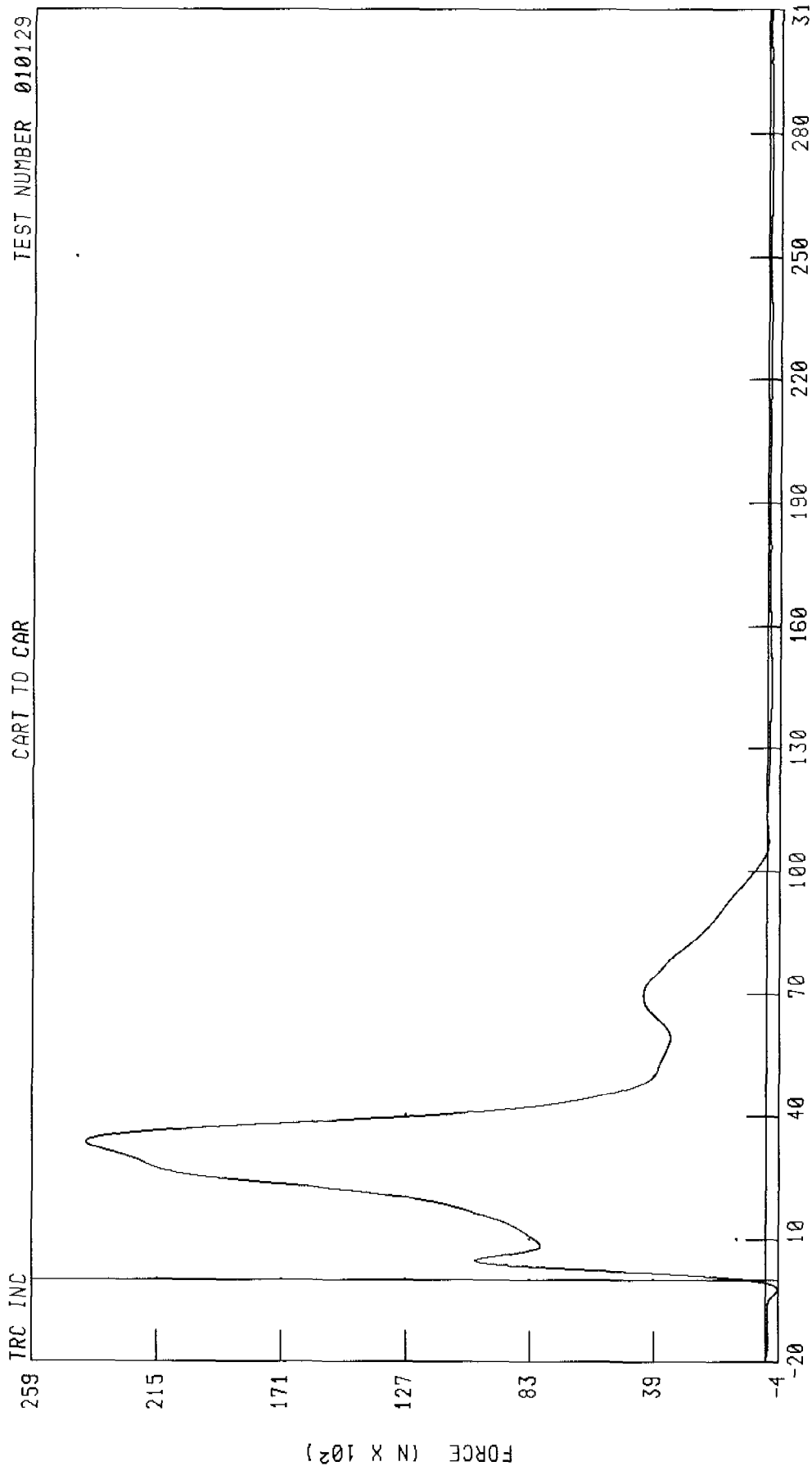
CHANNEL BC1ZF FILTER CH CLASS 60

PEAK DATA 1314 19 N 0 76 96 MS, -2078 45 N 0 63 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C3 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

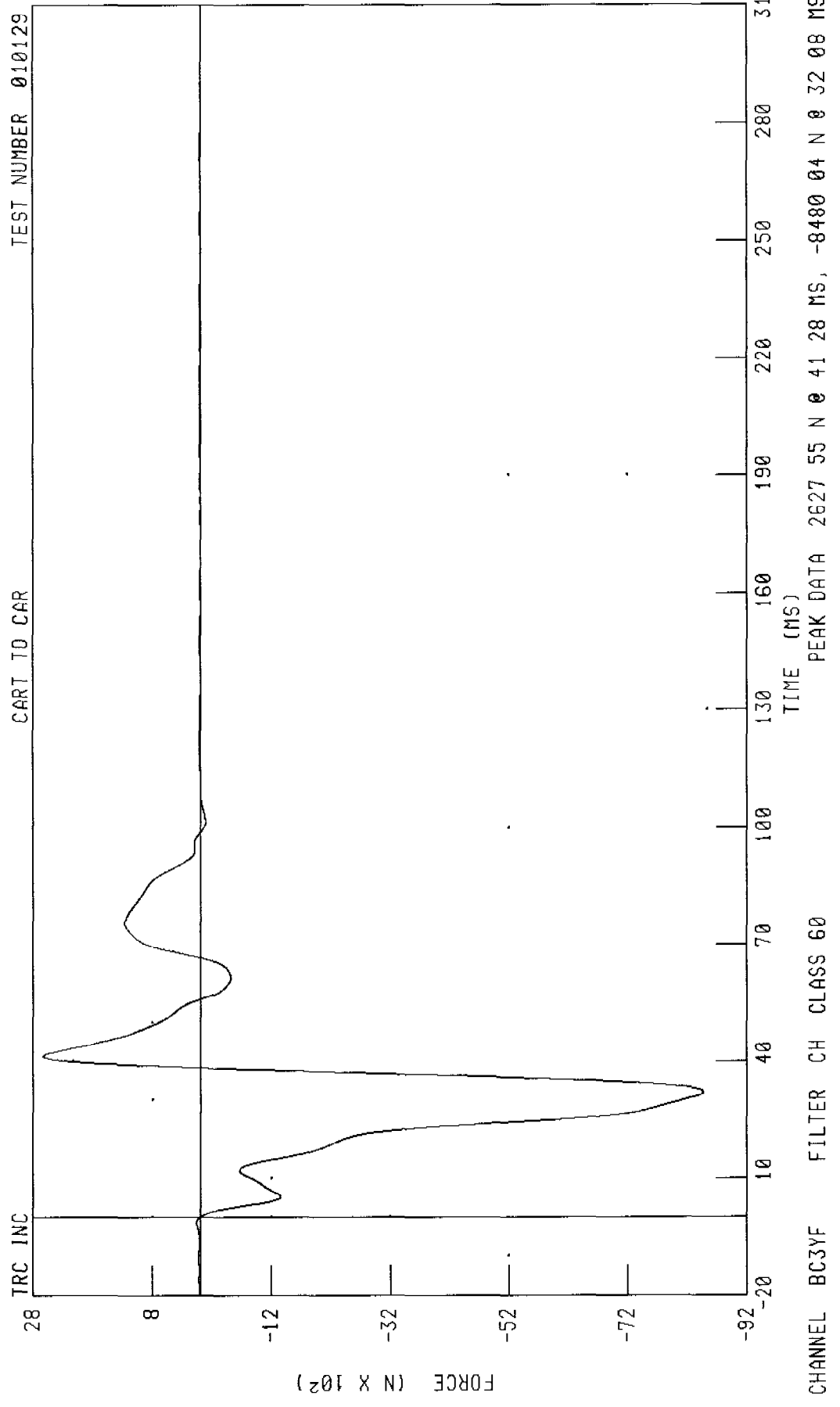


TIME (MS)

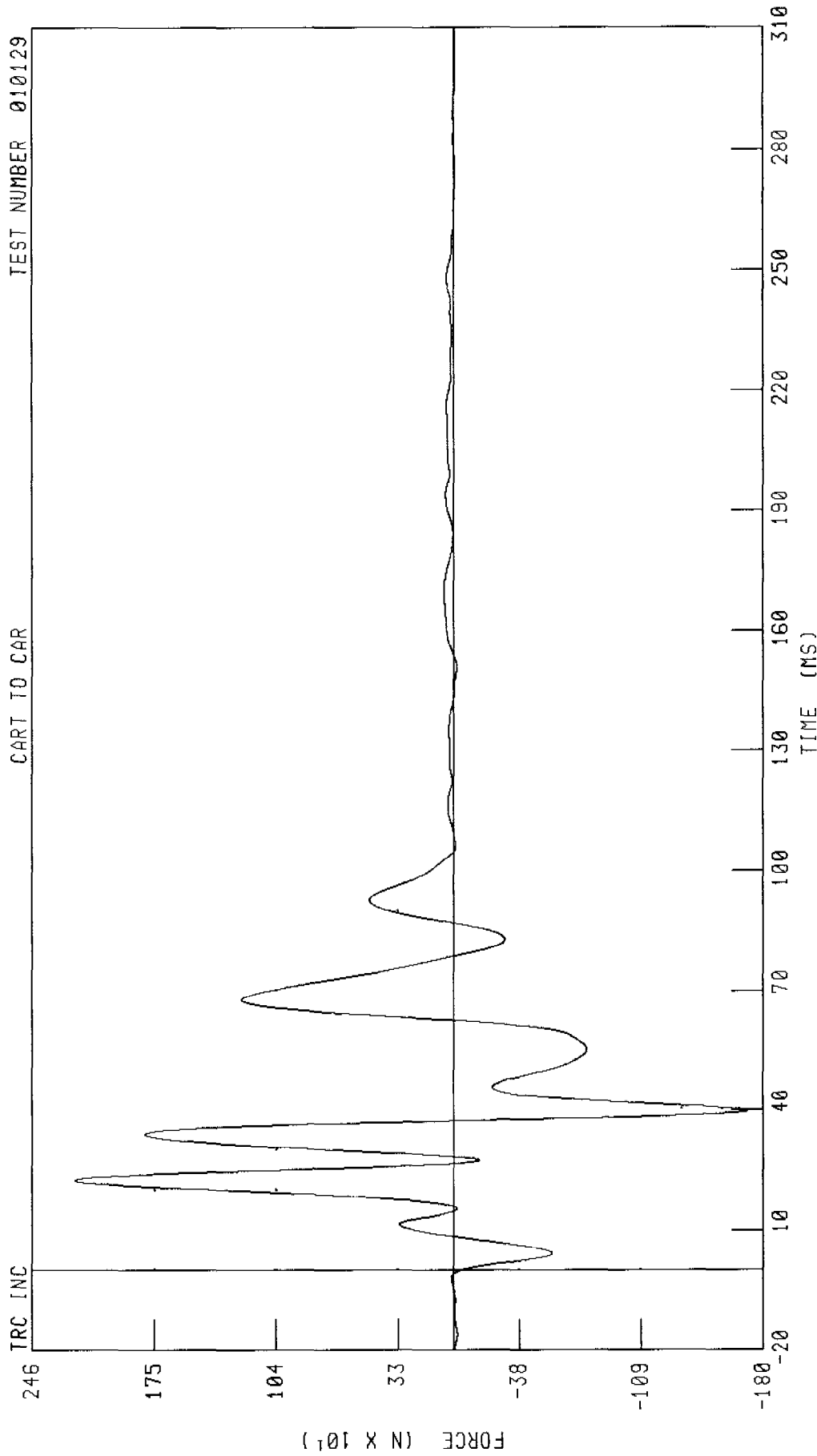
CHANNEL BC3XF FILTER CH CLASS 60

PEAK DATA 24062 04 N @ 33 44 MS, -412 57 N @ -2 16 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C3 Y-AXIS FORCE



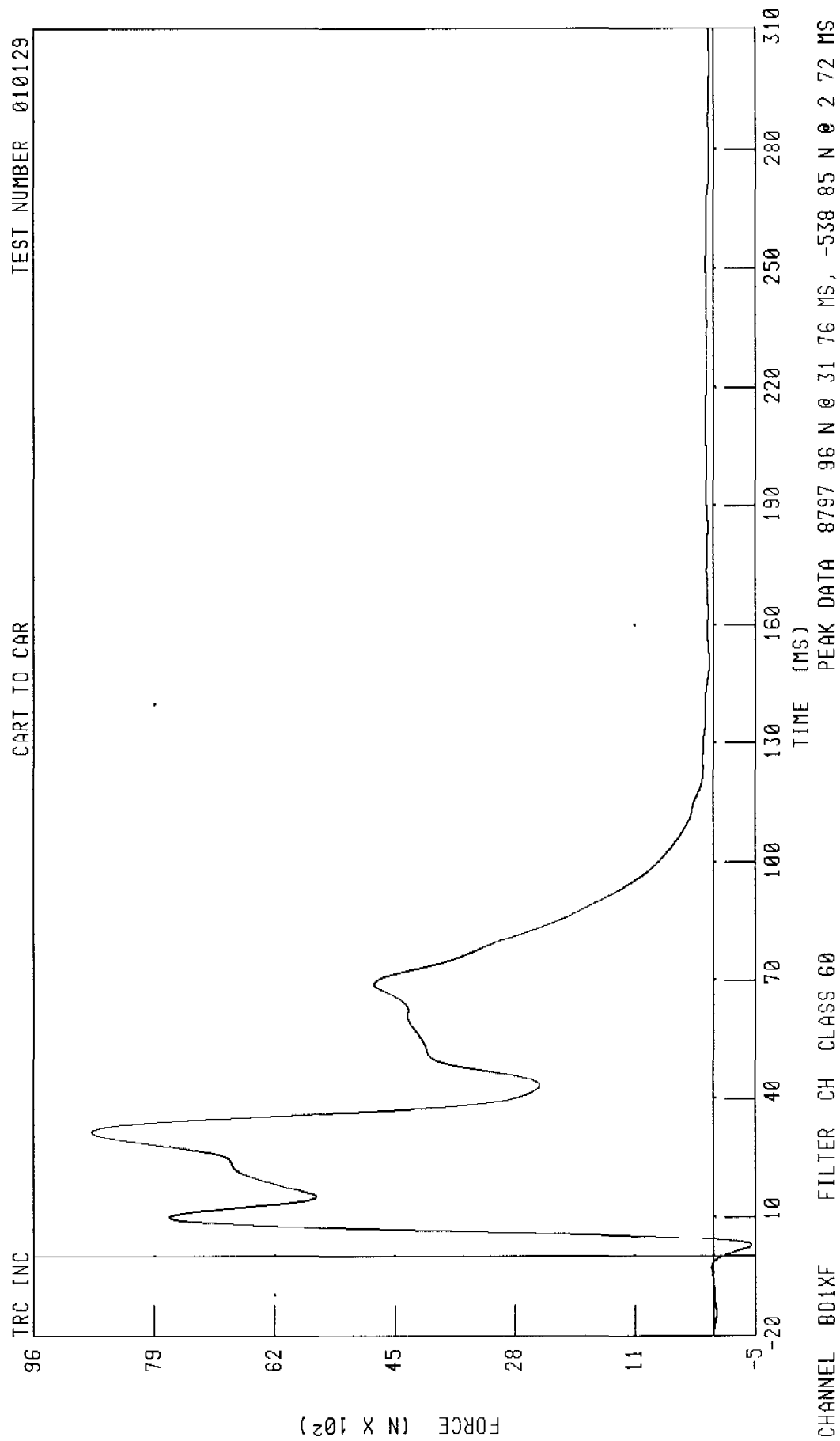
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C3 Z-AXIS FORCE



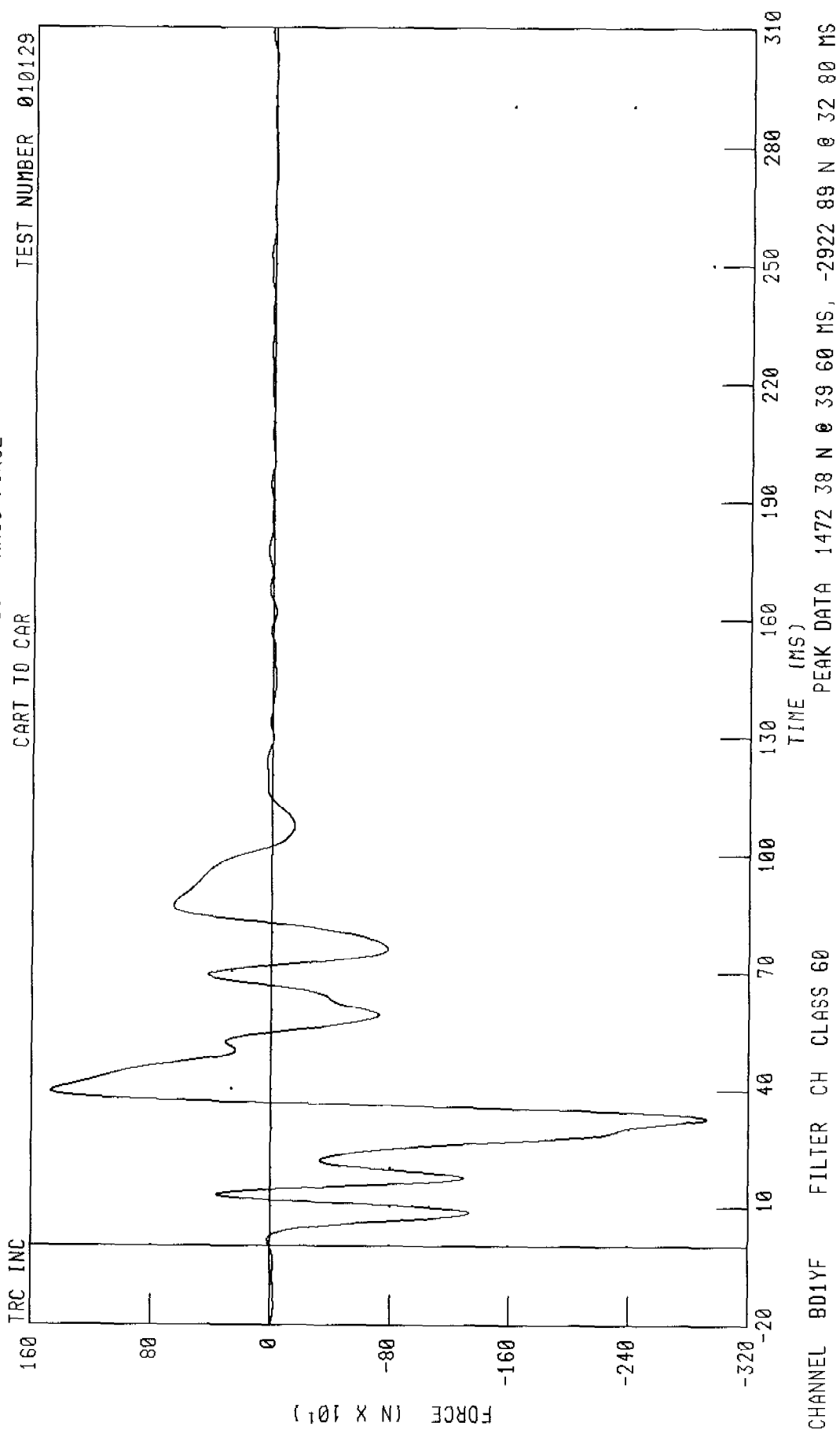
CHANNEL BC3ZF FILTER CH CLASS 60

PEAK DATA 2210 40 N 0 22 56 MS, -1711 87 N 0 39 68 MS

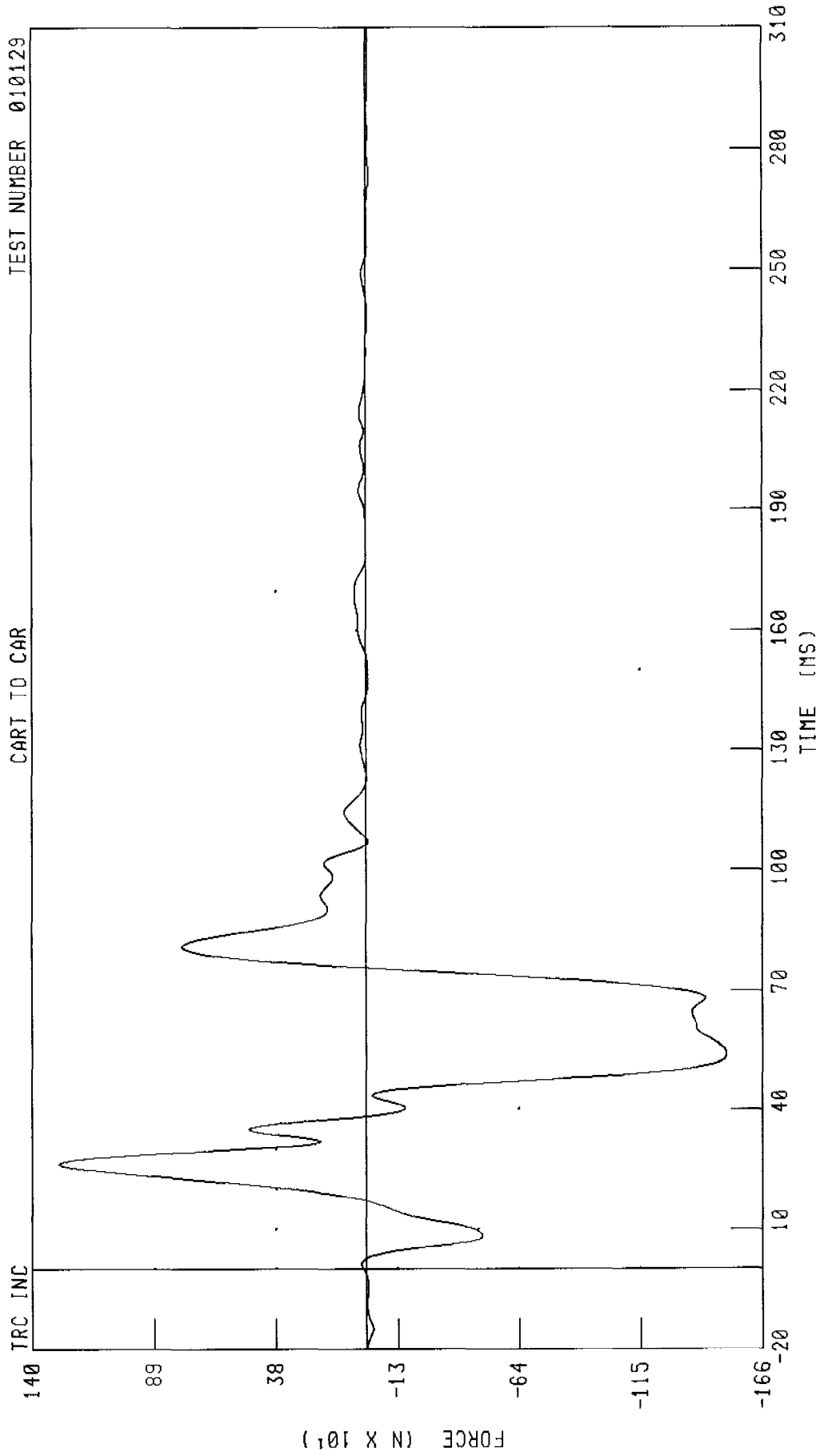
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D1 X-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL 01 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D1 Z-AXIS FORCE



TEST NUMBER 010129

CART TO CAR

CHANNEL BD1ZF FILTER CH CLASS 60

PEAK DATA 1290 84 N @ 26 40 MS, -1508 93 N @ 53 76 MS

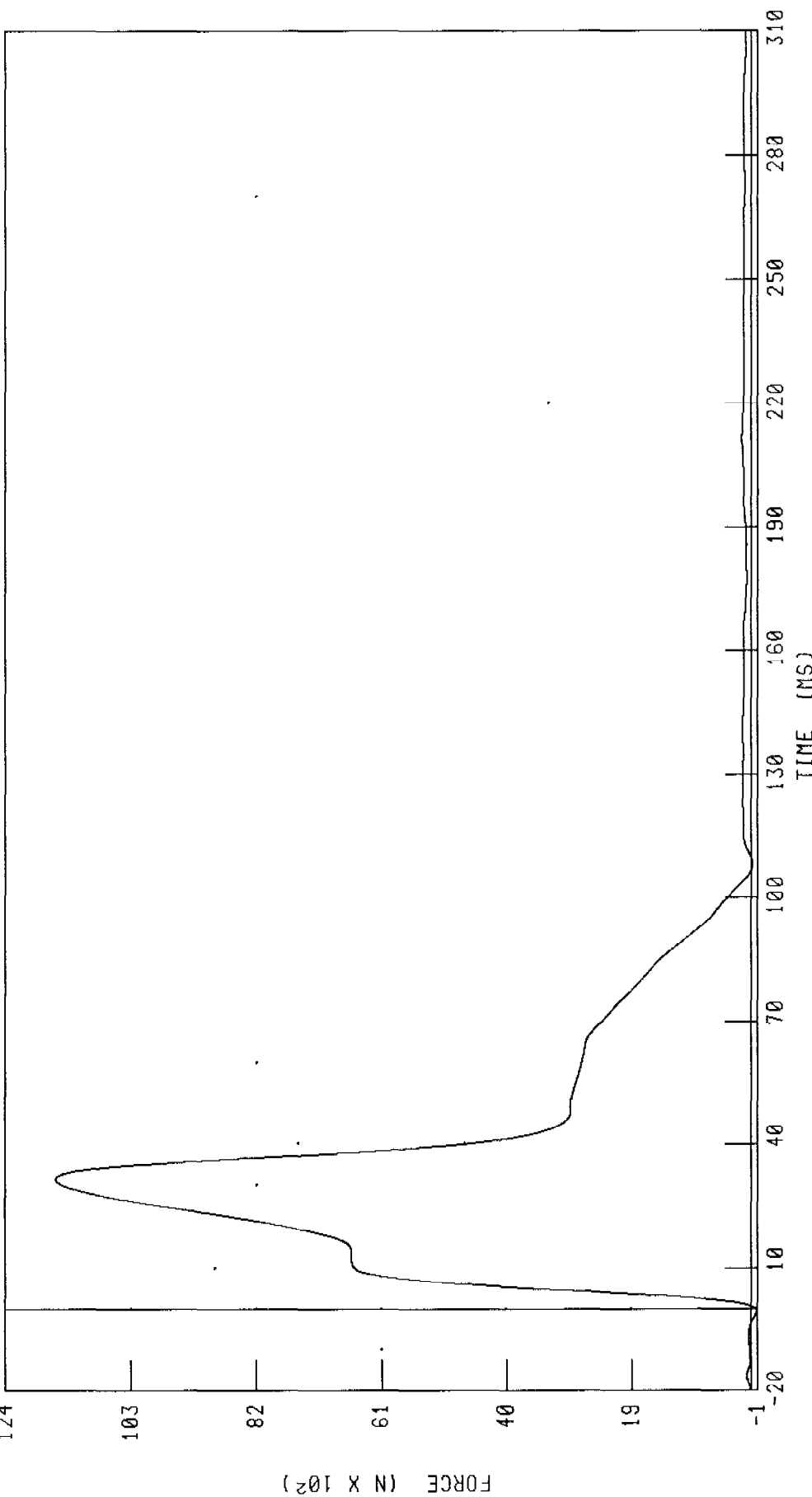
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL D2 X-AXIS FORCE

TRC INC

CART TO CAR

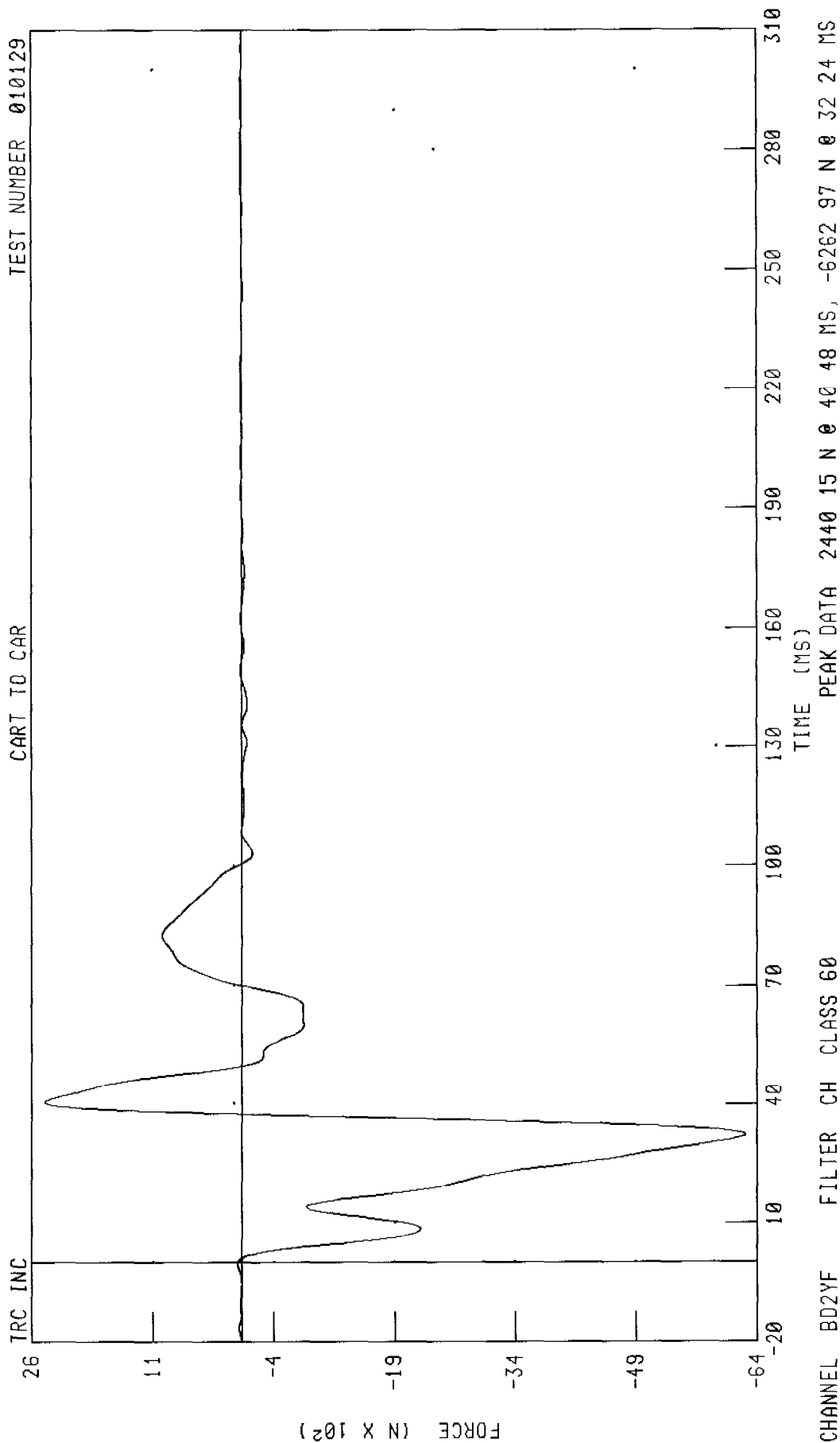
TEST NUMBER 010129



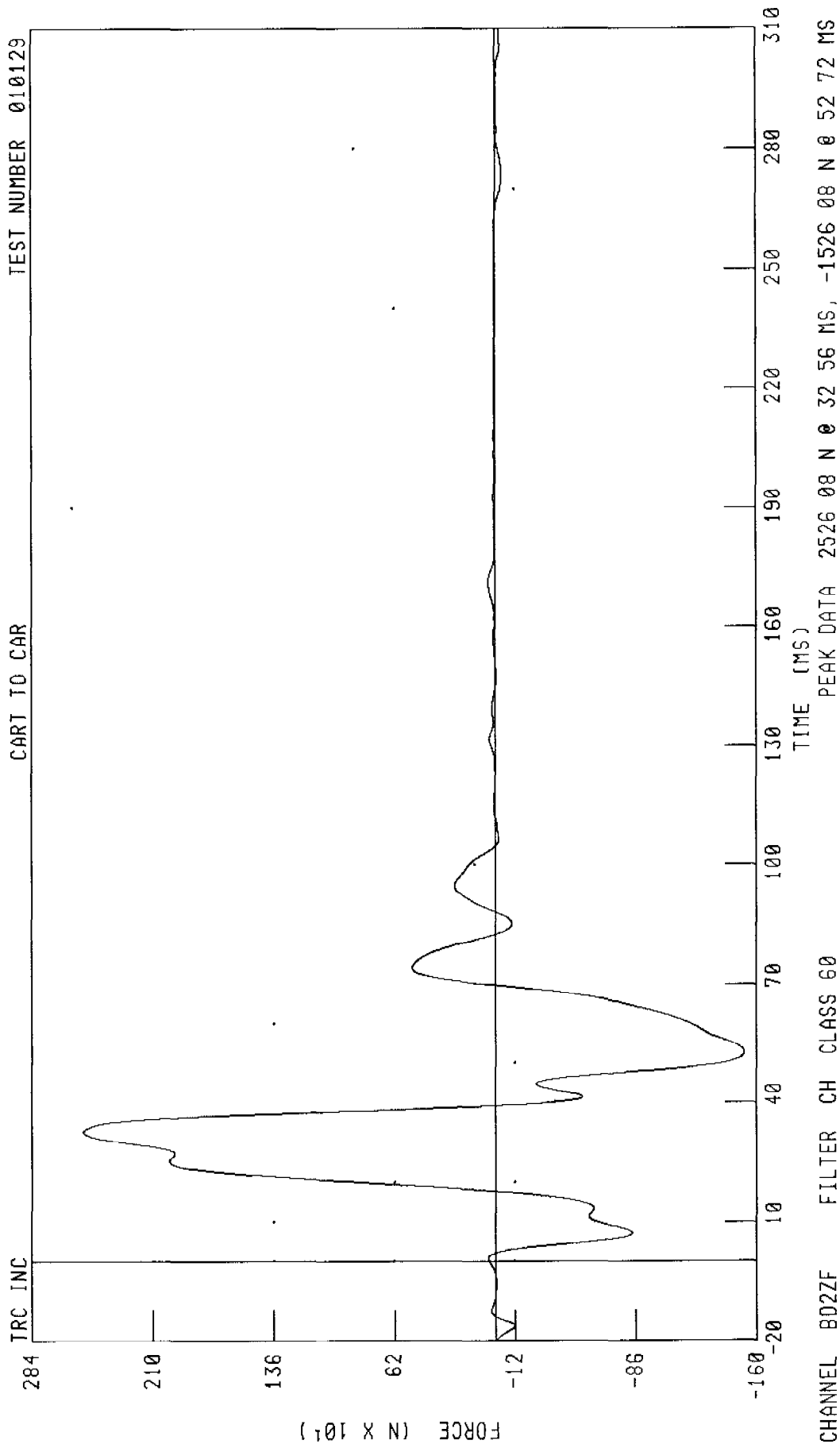
CHANNEL BD2XF FILTER CH CLASS 60

PEAK DATA 11651 26 N @ 31 44 MS, -104 57 N @ -0 56 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D2 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D2 Z-AXIS FORCE

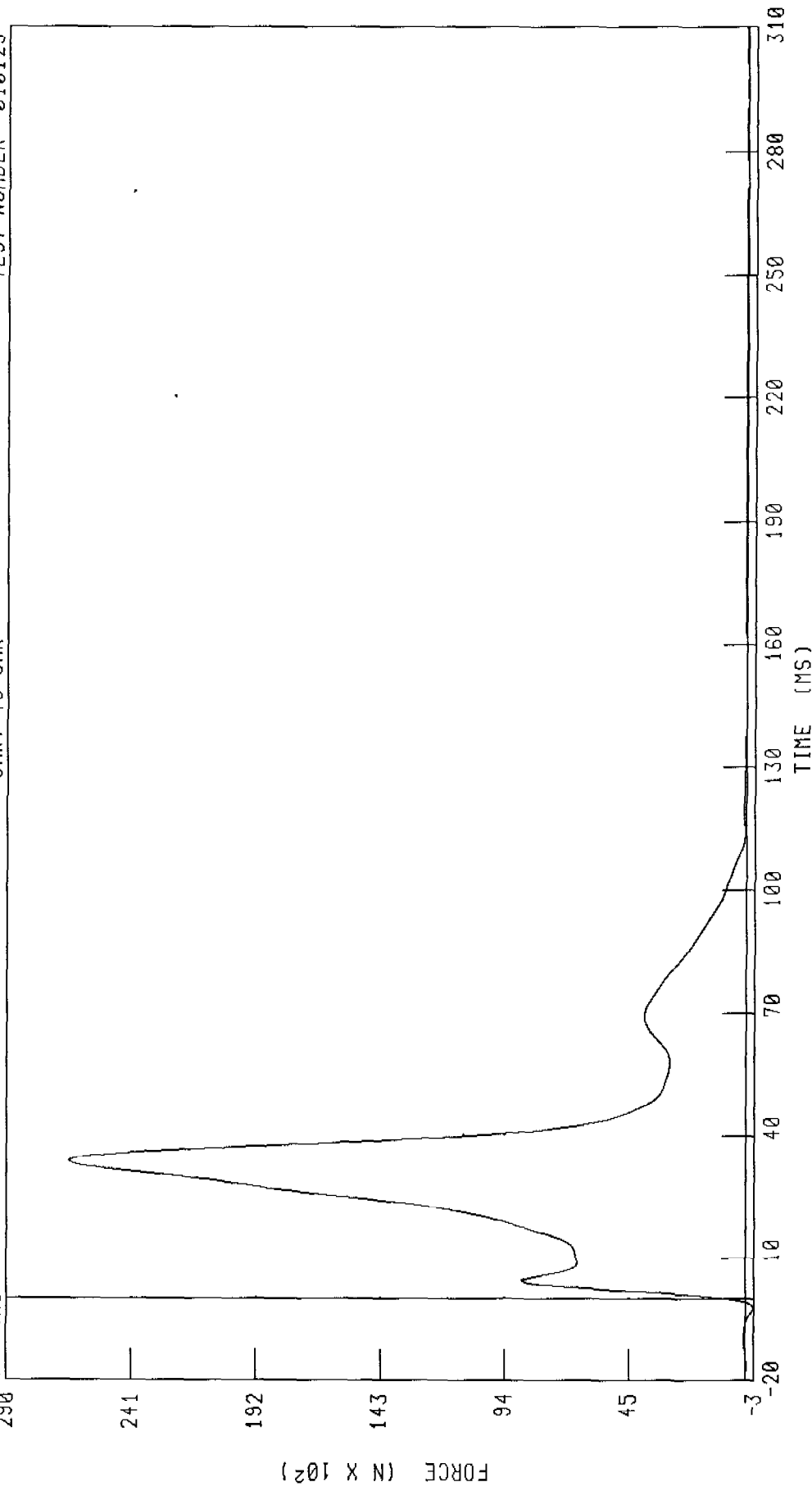


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D3 X-AXIS FORCE

TRC INC

CART TO CAR

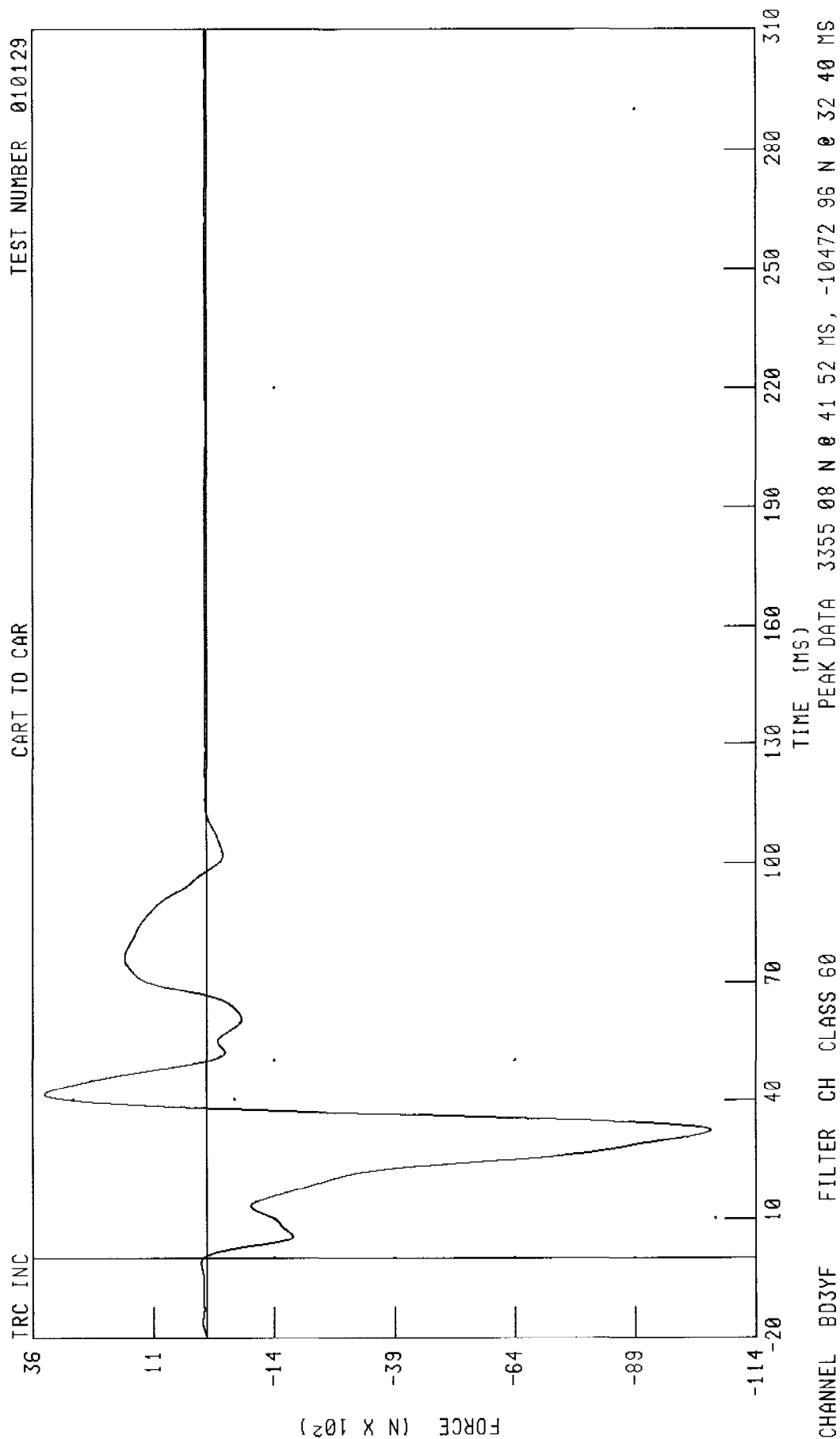
TEST NUMBER 010129



CHANNEL BD3XF FILTER CH CLASS 60

PEAK DATA 26645 03 N @ 33 68 MS, -292 24 N @ -2 32 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D3 Y-AXIS FORCE

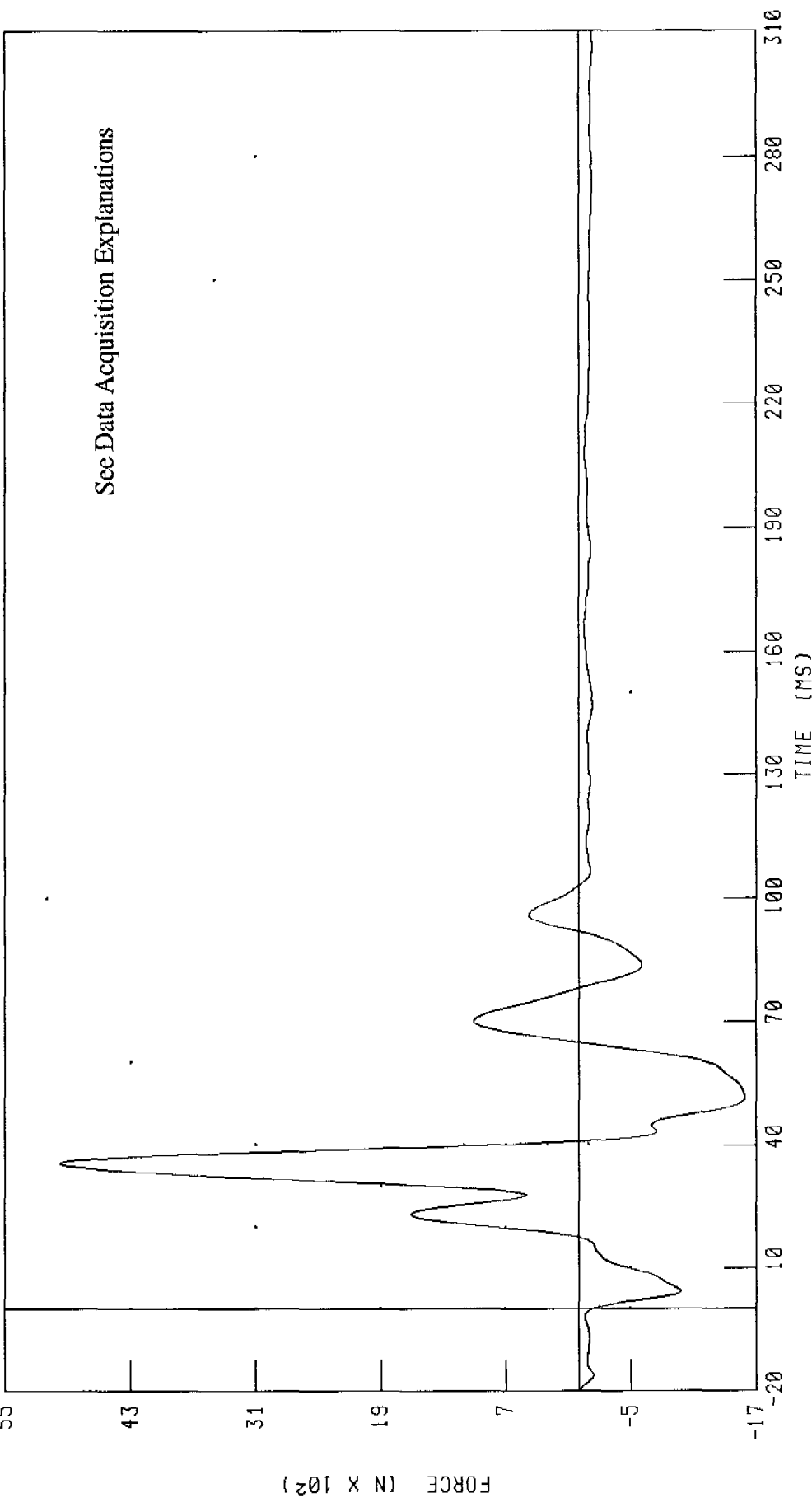


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D3 Z-AXIS FORCE

TRC INC

CART TO CAR

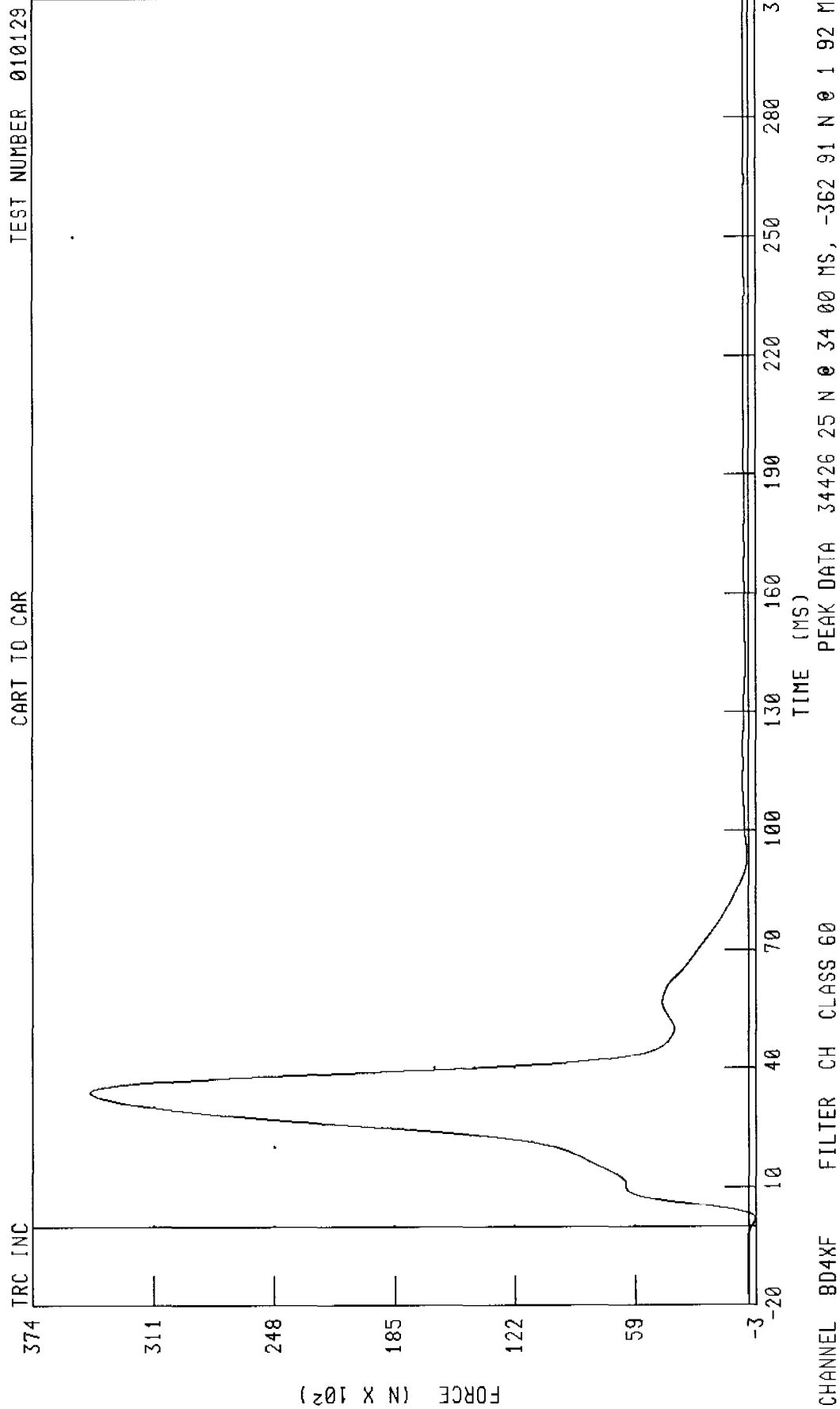
TEST NUMBER 010129



CHANNEL BD3ZF FILTER CH CLASS 60

PEAK DATA 4972 32 N 0 35 76 MS, -1589 49 N 0 51 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D4 X-AXIS FORCE

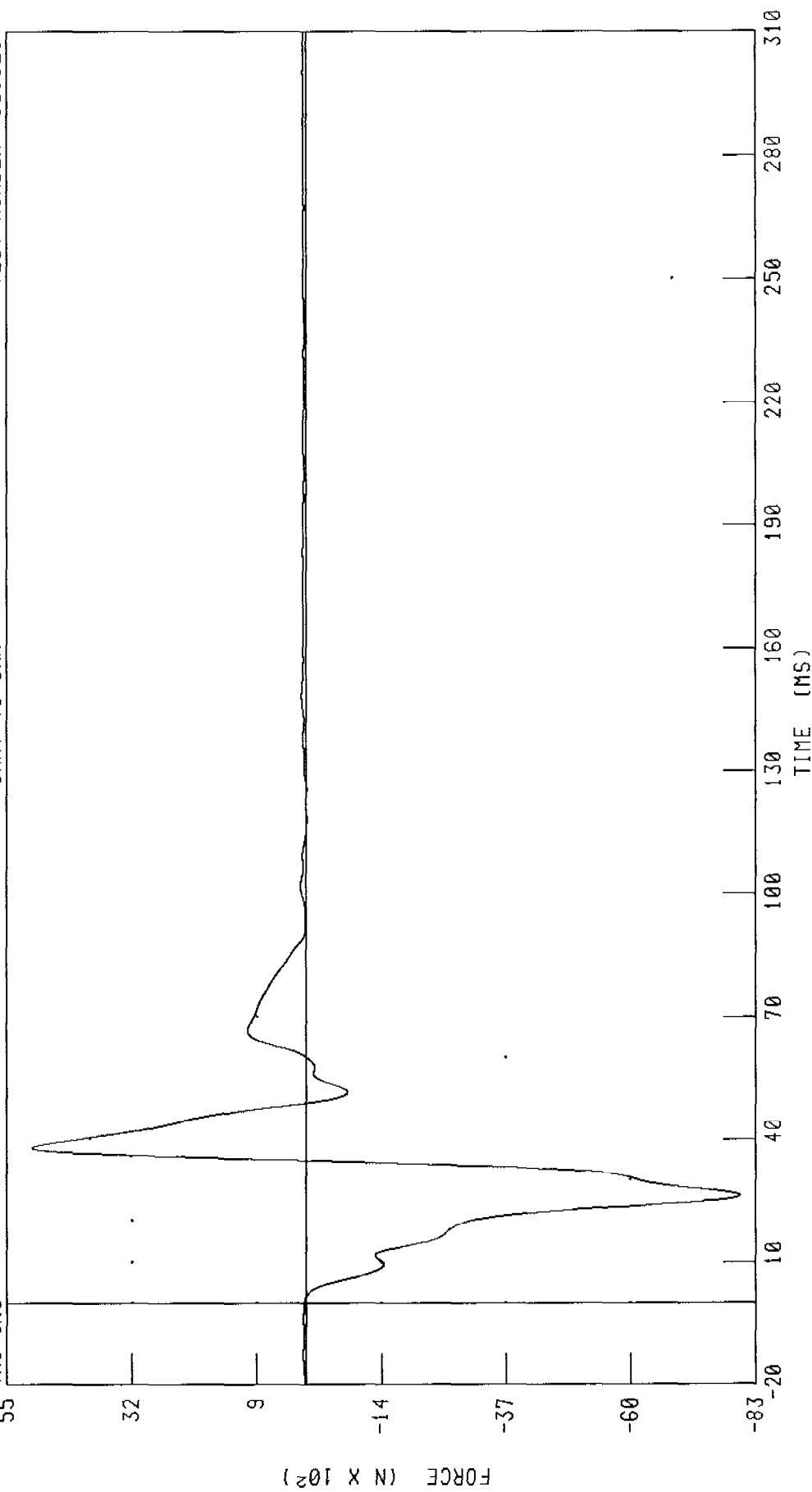


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL 04 Y-AXIS FORCE

TRC INC

CART TO CAR

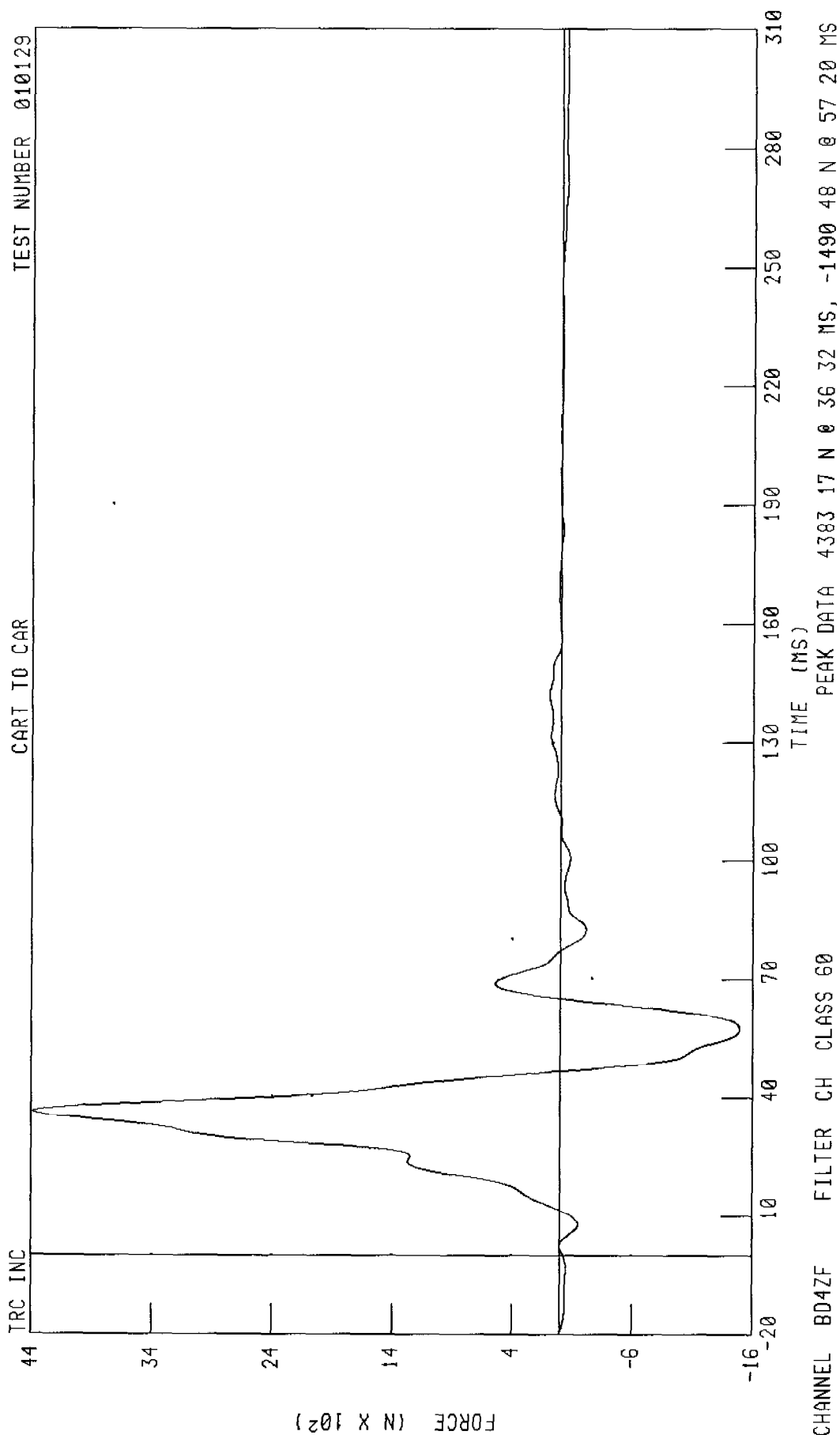
TEST NUMBER 010129



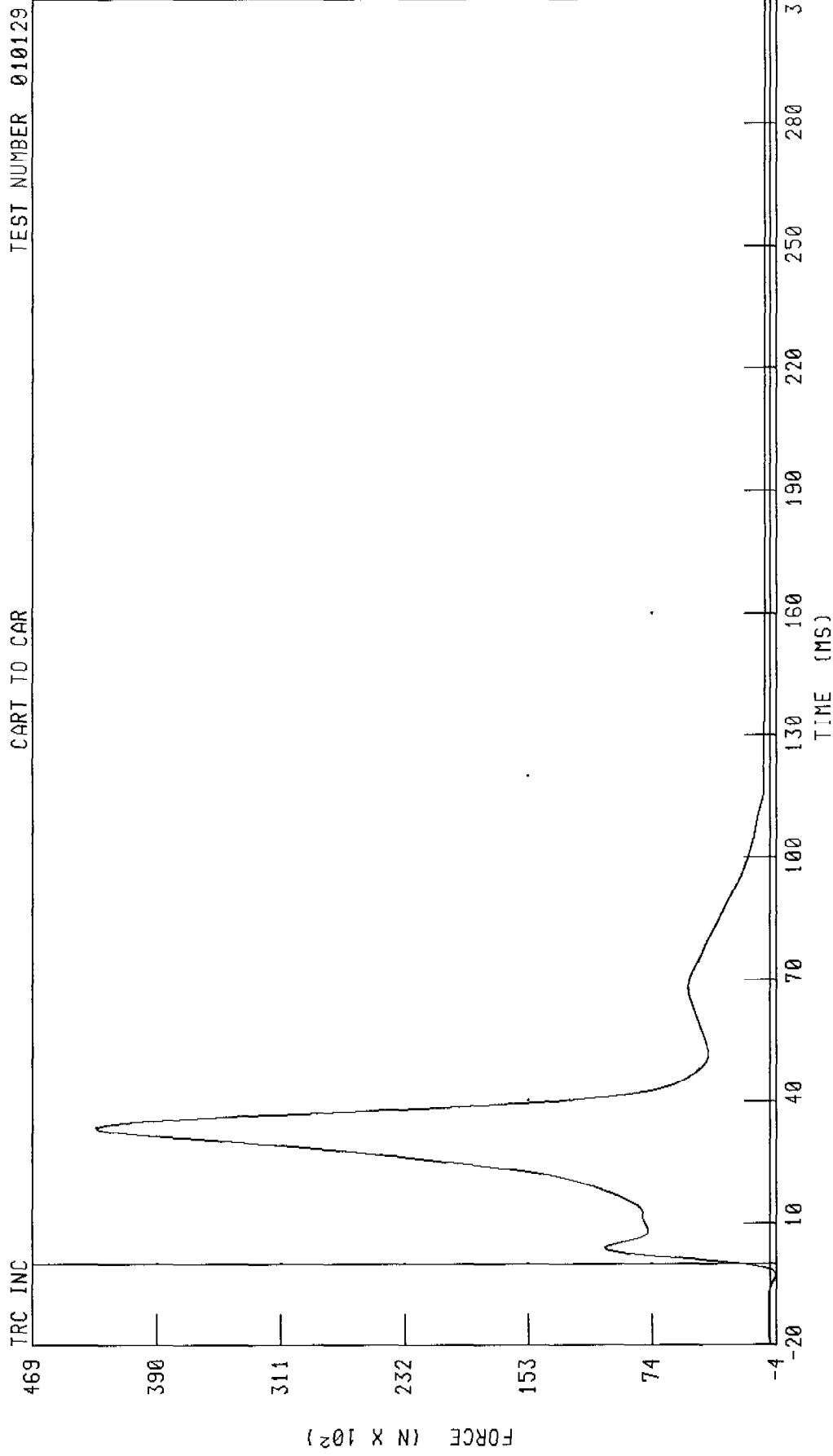
CHANNEL BD4YF FILTER CH CLASS 60

PEAK DATA 5040 79 N @ 37 92 MS, -8026 76 N @ 26 16 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL D4 Z-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL E3 X-AXIS FORCE
 CART TO CAR



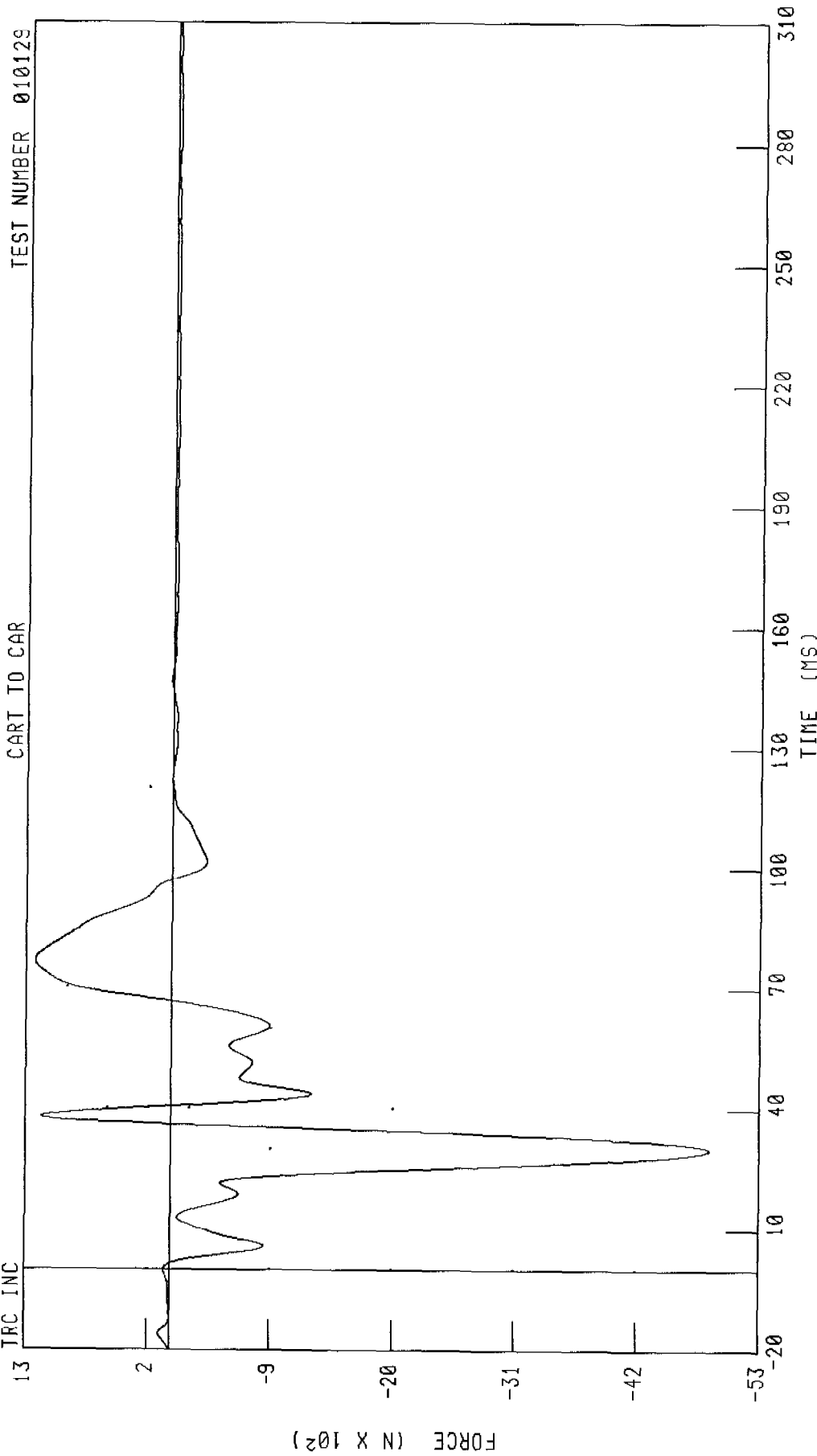
CHANNEL BE3XF FILTER CH CLASS 60 PEAK DATA 42974 51 N 0 33 28 MS, -386 69 N 0 -2 72 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E3 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BE3YF

FILTER CH CLASS 60

TIME (MS)

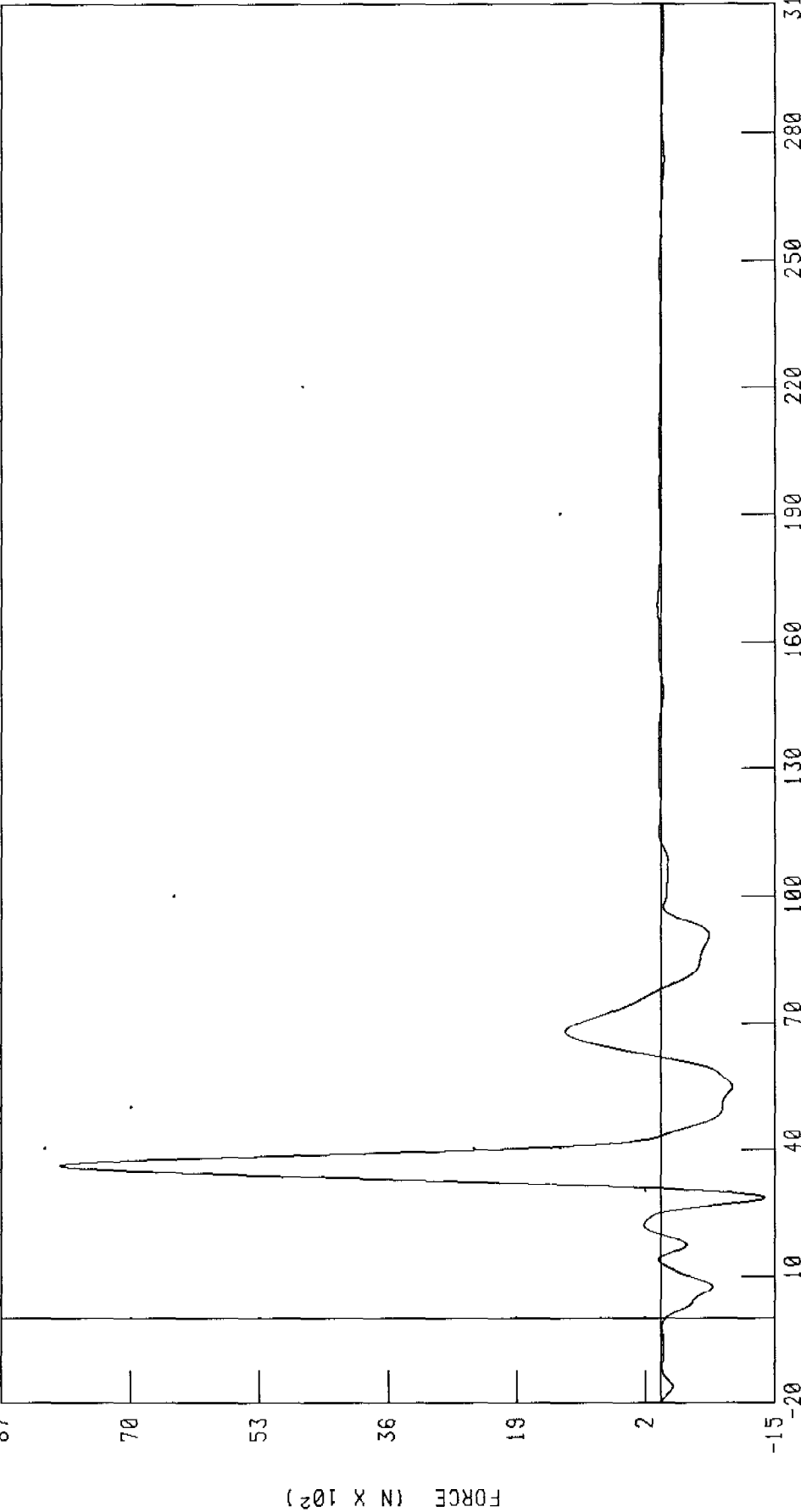
PEAK DATA 1220 46 N @ 76 80 MS, -4850 00 N @ 30 08 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E3 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



CHANNEL BE3ZF FILTER CH CLASS 60

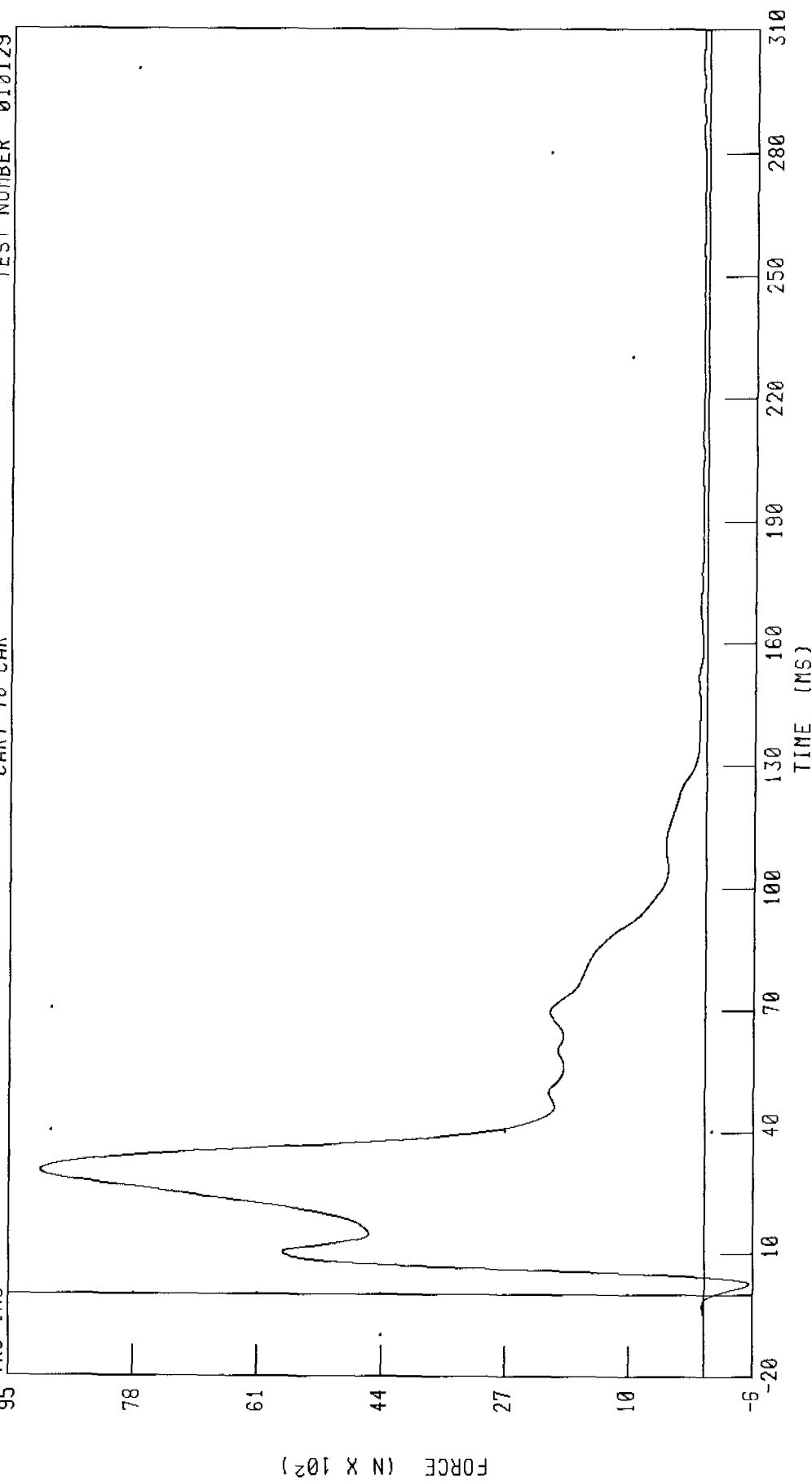
PEAK DATA 7935 89 N @ 36 16 MS, -1367 50 N @ 28 48 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F1 X-AXIS FORCE

TRC INC

TEST NUMBER 010129

CART TO CAR



CHANNEL BFIXF FILTER CH CLASS 60

PEAK DATA 9115 02 N @ 30 32 MS, -604 87 N @ 2 72 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F1 Y-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

346

270

194

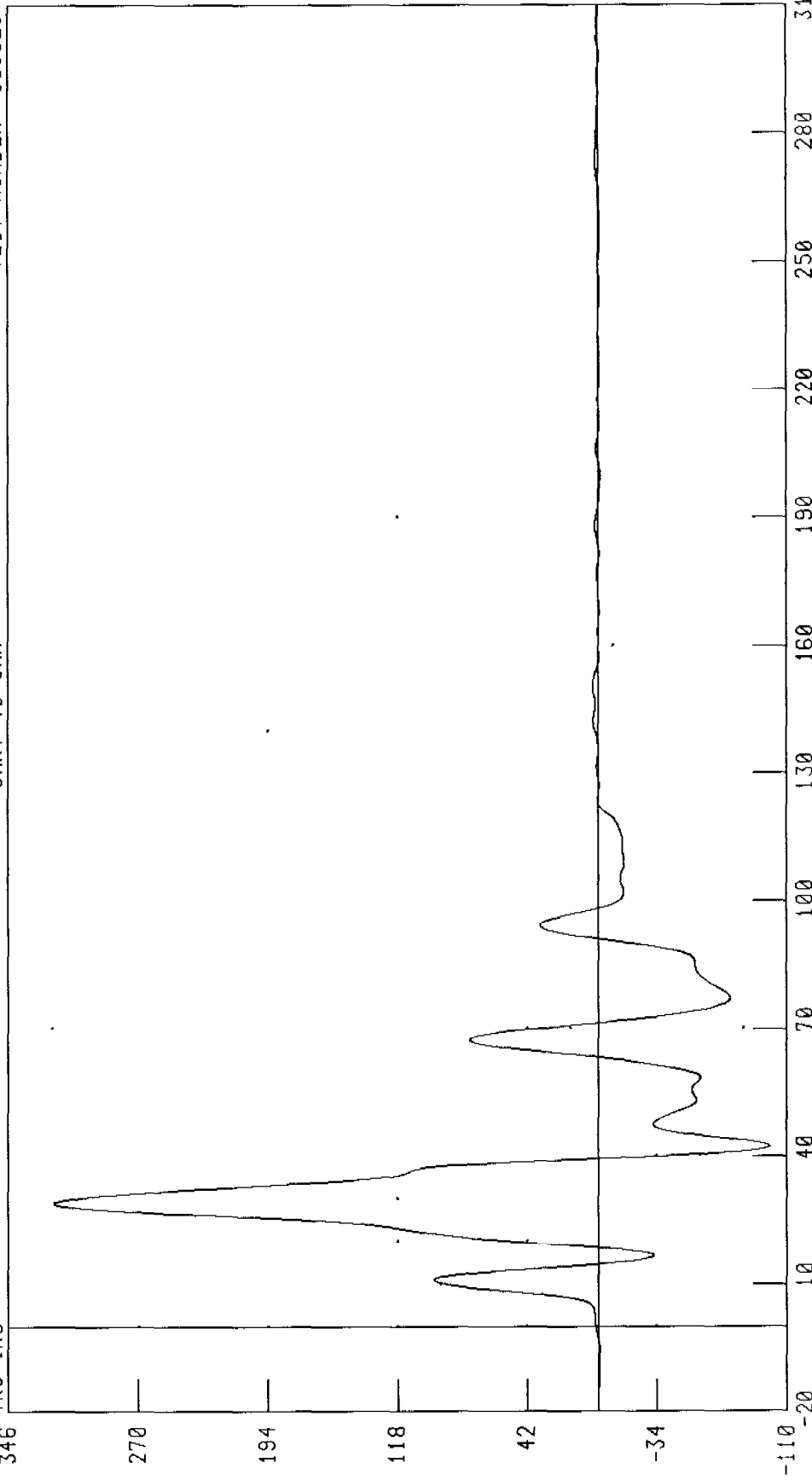
118

42

-34

-110

FORCE (N X 10⁴)



TIME (MS)

310

280

250

220

190

160

130

100

70

40

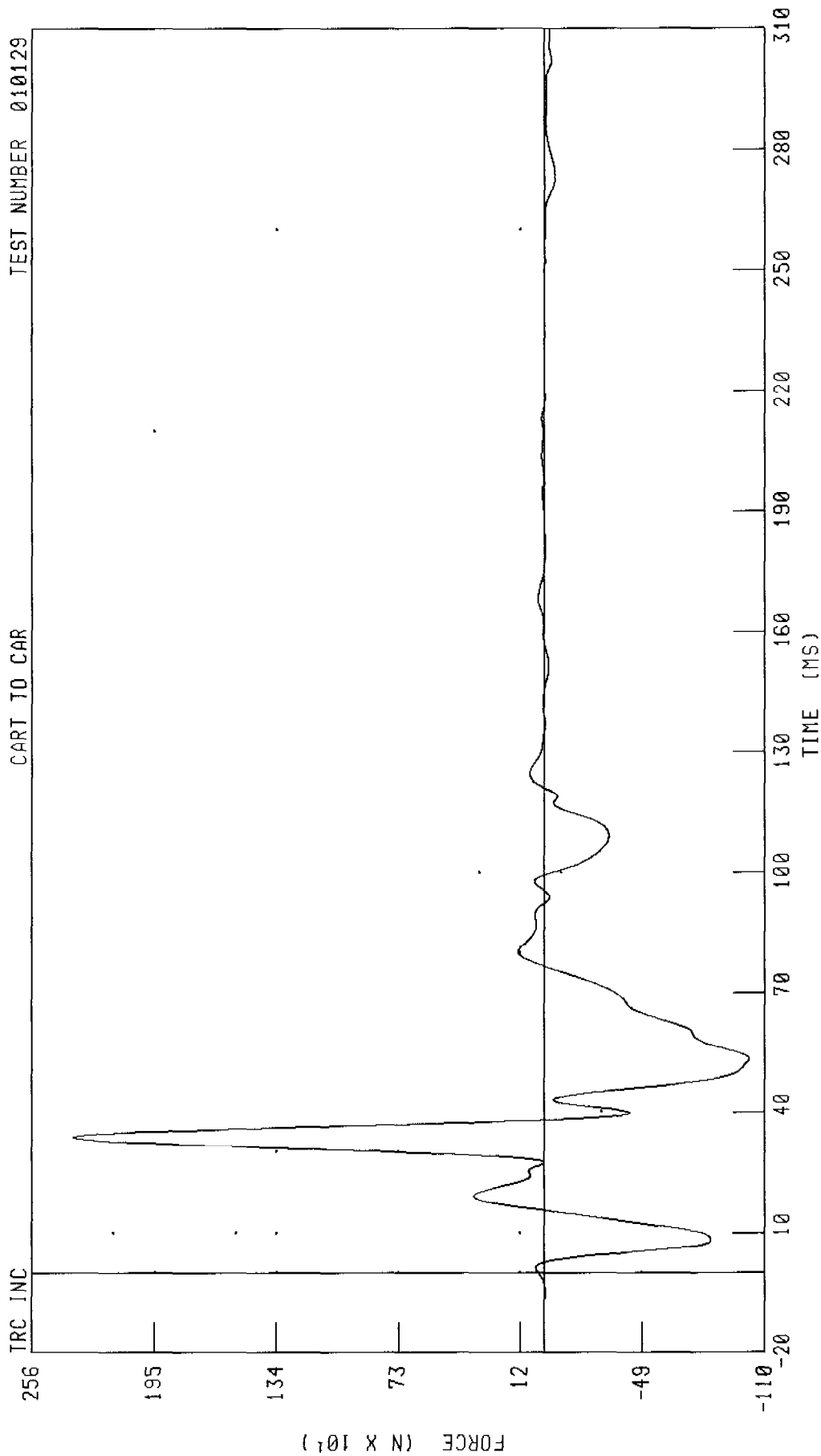
10

-20

PEAK DATA 3193 58 N @ 28 96 MS, -1001 34 N @ 42 32 MS

CHANNEL BF1YF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F1 Z-AXIS FORCE



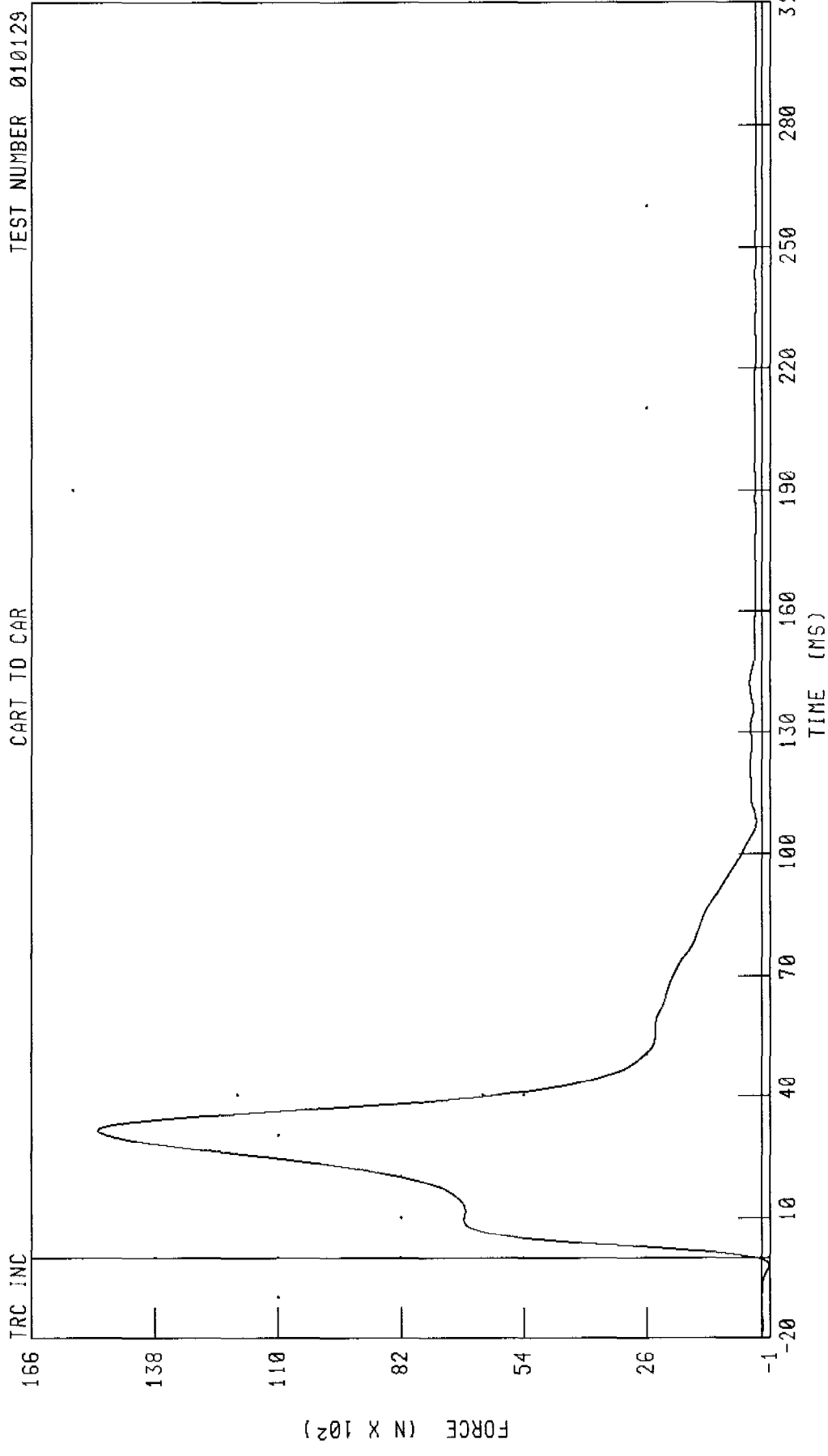
CHANNEL BF1ZF FILTER CH CLASS 60 PEAK DATA 2356 01 N 0 33 68 MS, -1024 36 N 0 53 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F2 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

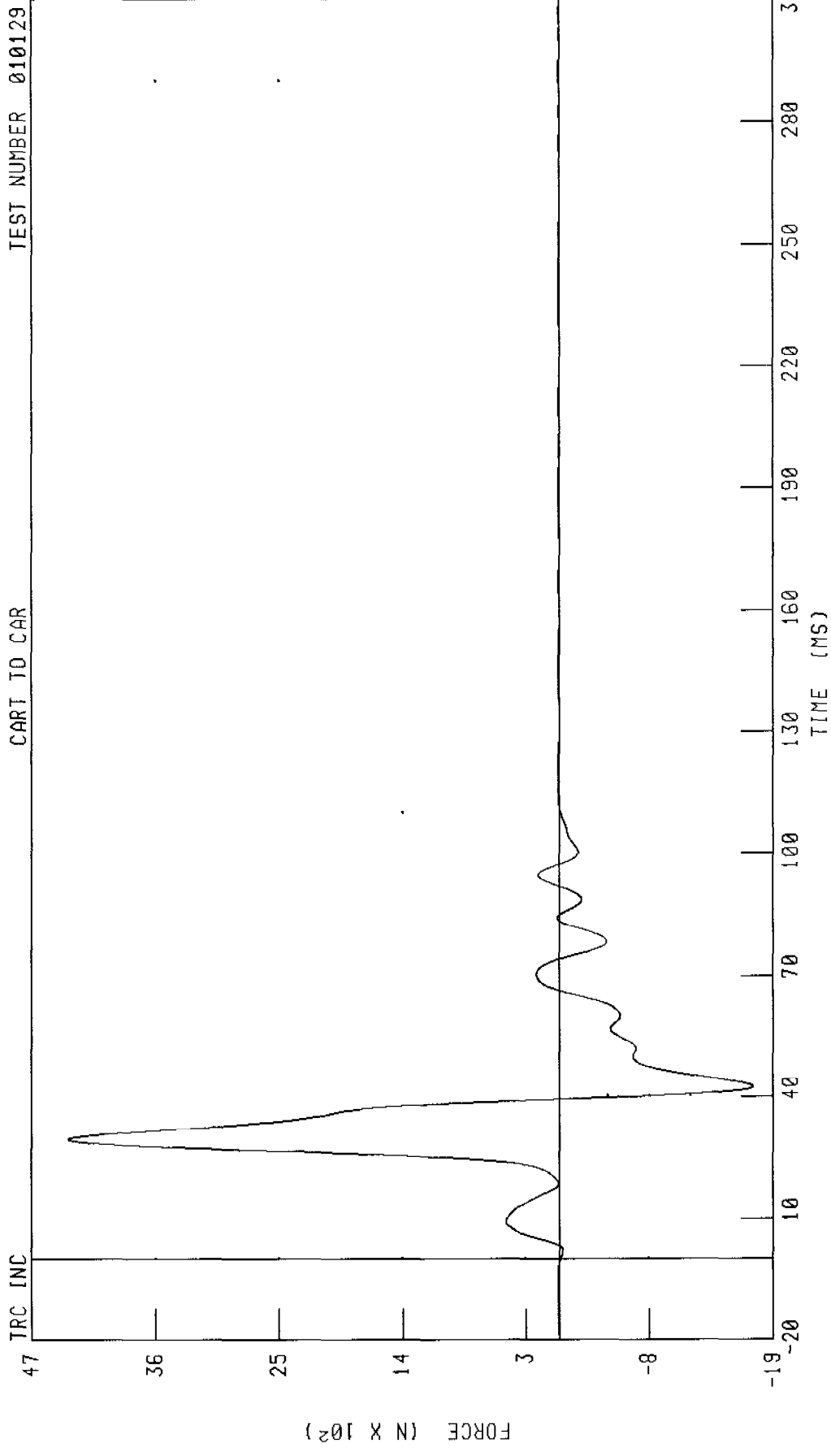
TRC INC



CHANNEL BF2XF FILTER CH CLASS 60

PEAK DATA 15110 06 N @ 31 36 MS, -176 81 N @ -1 84 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F2 Y-AXIS FORCE

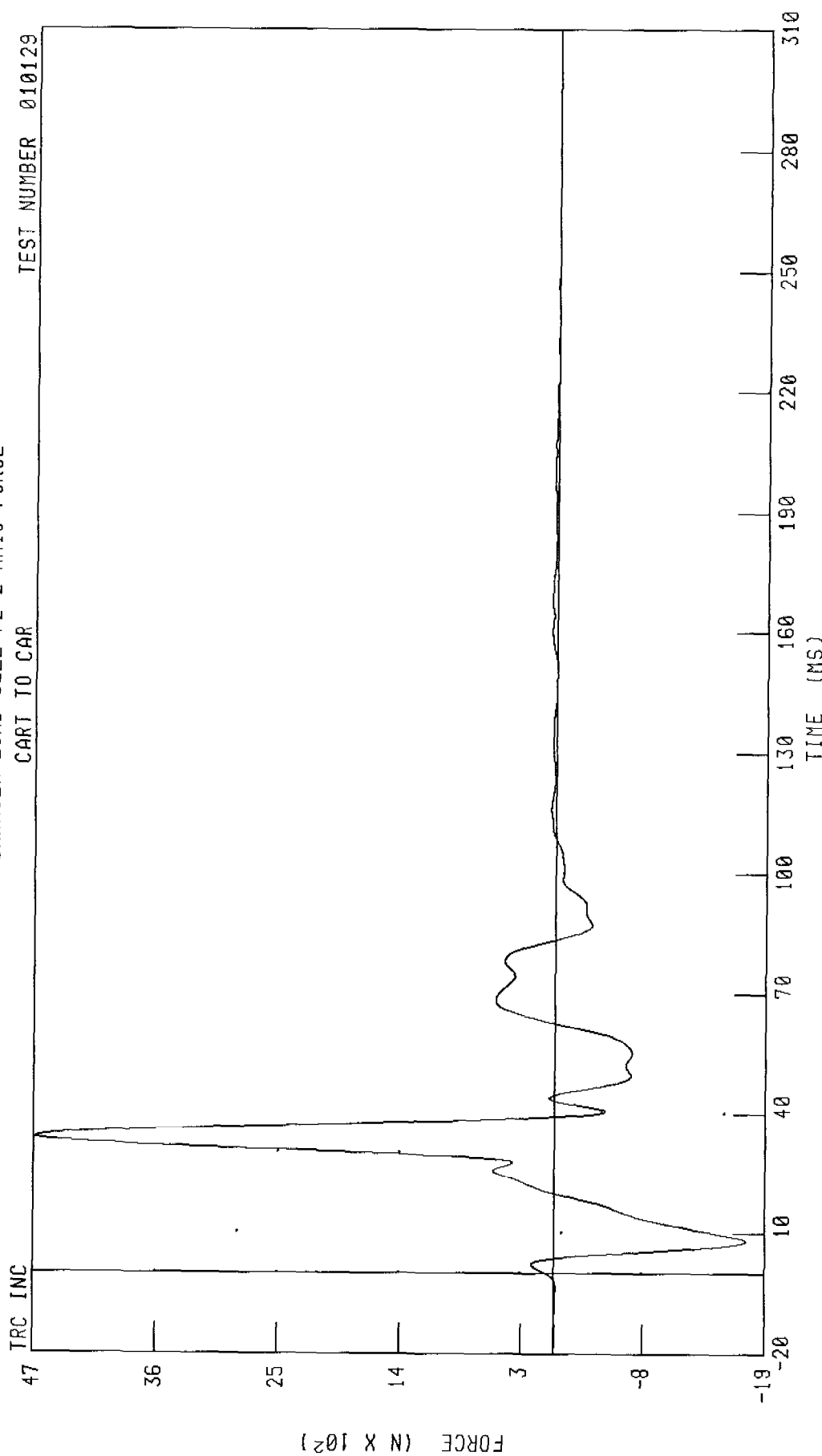


CHANNEL BF2YF FILTER CH CLASS 60 PEAK DATA 4378 88 N @ 29 44 MS, -1728 28 N @ 42 40 MS

TEST NUMBER 010129

CART TO CAR

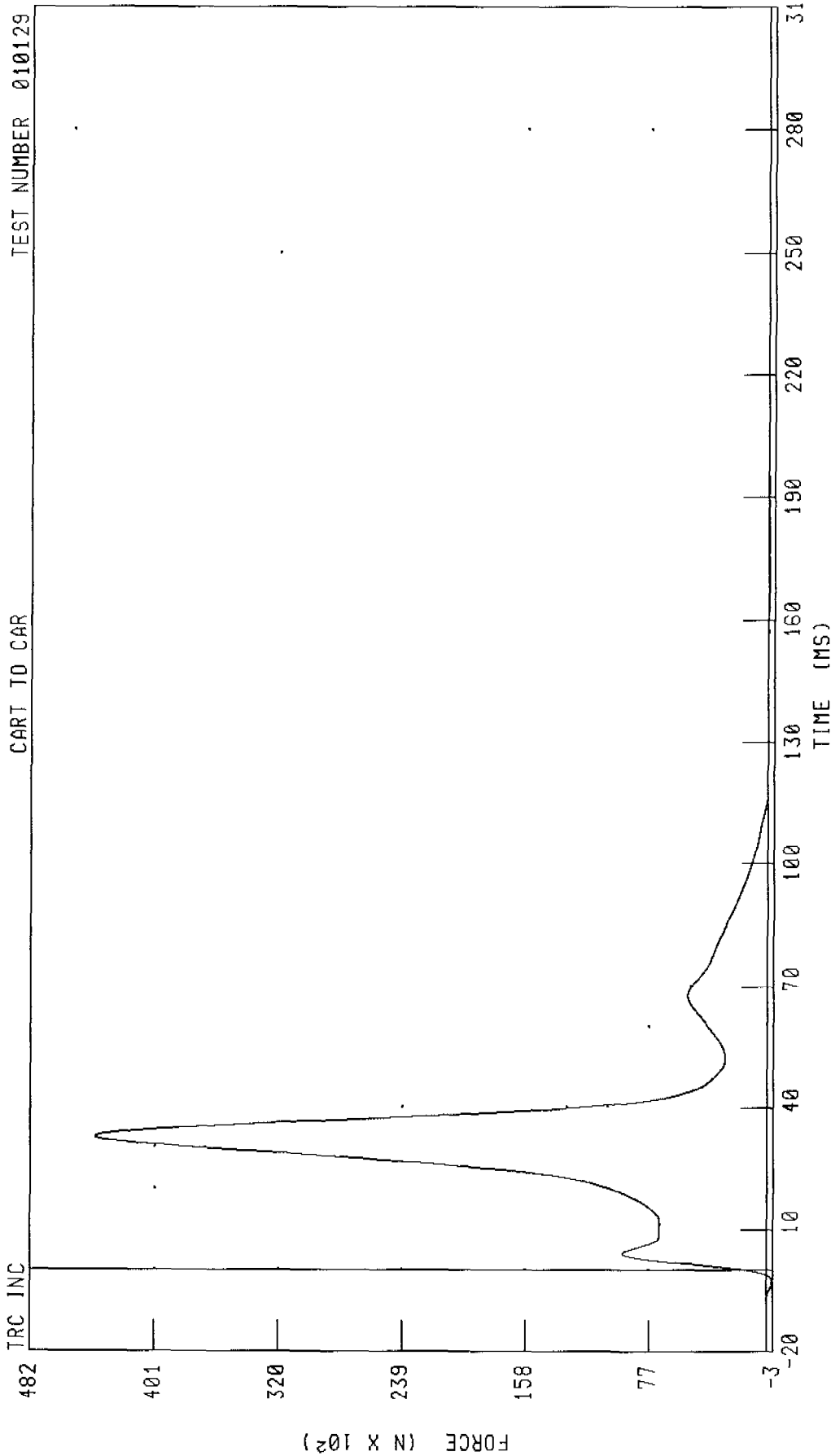
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F2 Z-AXIS FORCE



CHANNEL BF2ZF FILTER CH CLASS 60

PEAK DATA 4687 01 N 0 33 76 MS, -1728 89 N 0 8 00 MS

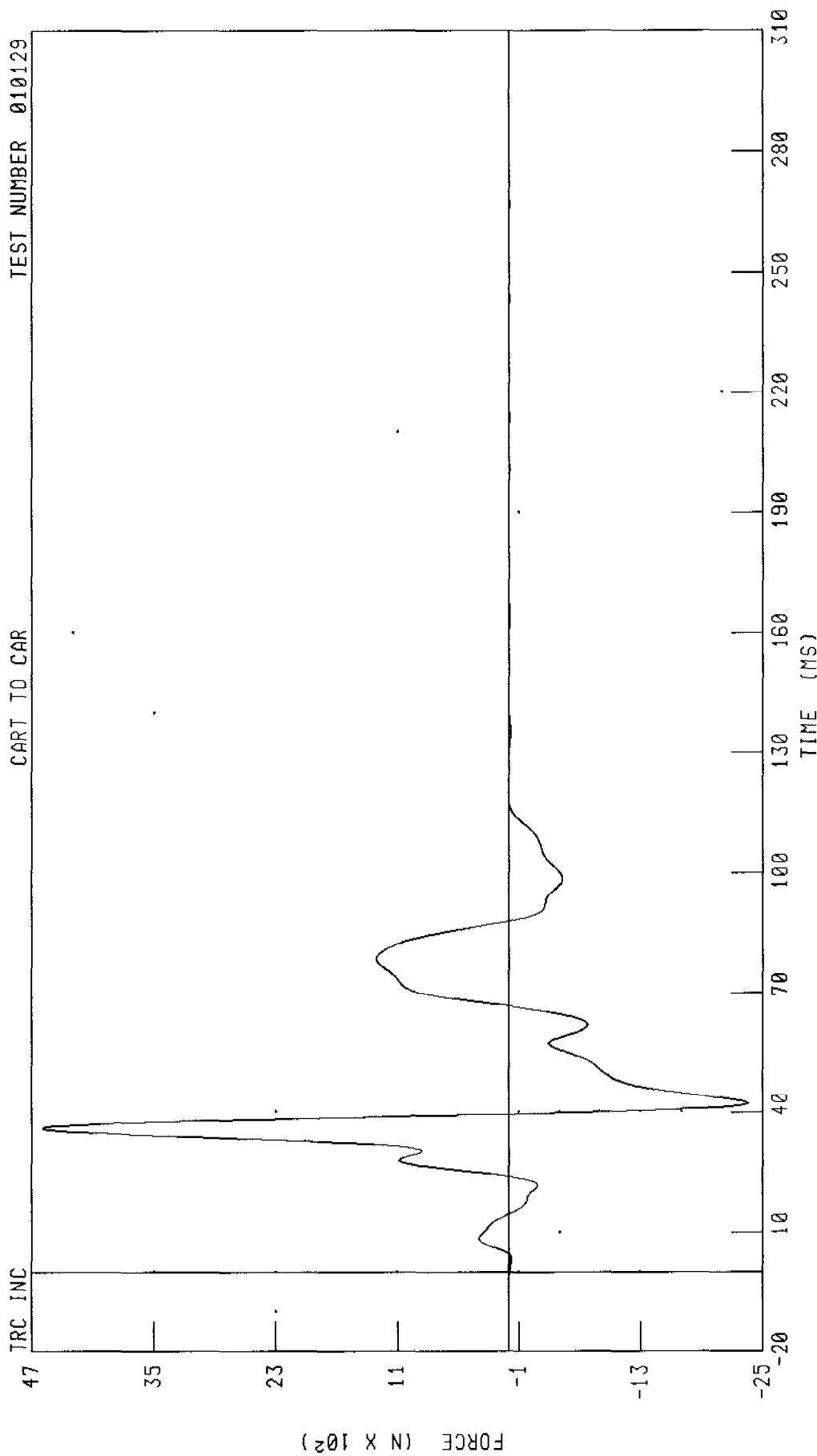
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F3 X-AXIS FORCE



CHANNEL BF3XF FILTER CH CLASS 60 PEAK DATA 43998 27 N 0 32 80 MS, -344 35 N 0 -2 72 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

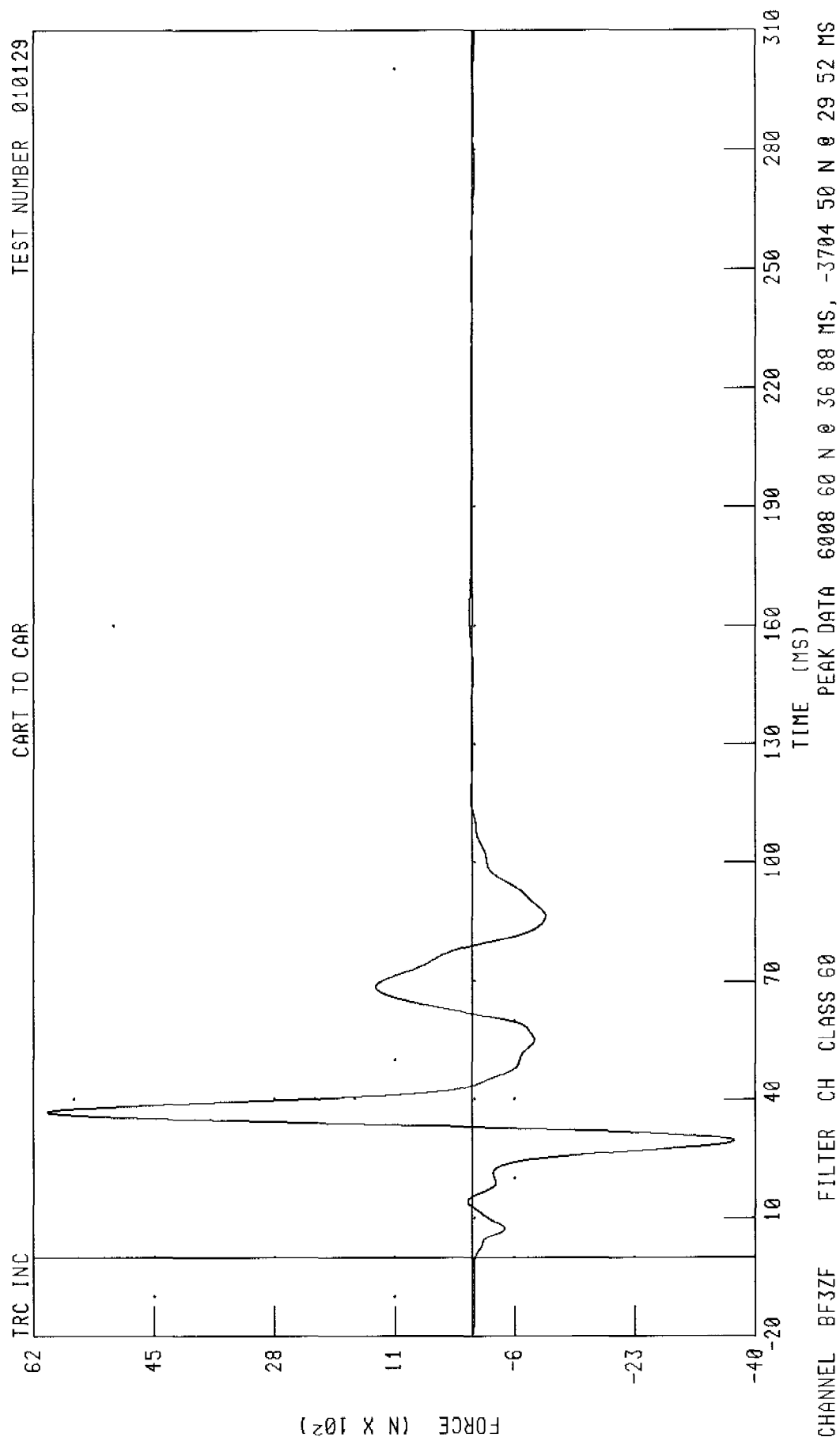
MOVING BARRIER LOAD CELL F3 Y-AXIS FORCE



PEAK DATA 4595 36 N @ 36 00 MS, -2354 71 N @ 42 32 MS

CHANNEL BF3YF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F3 Z-AXIS FORCE

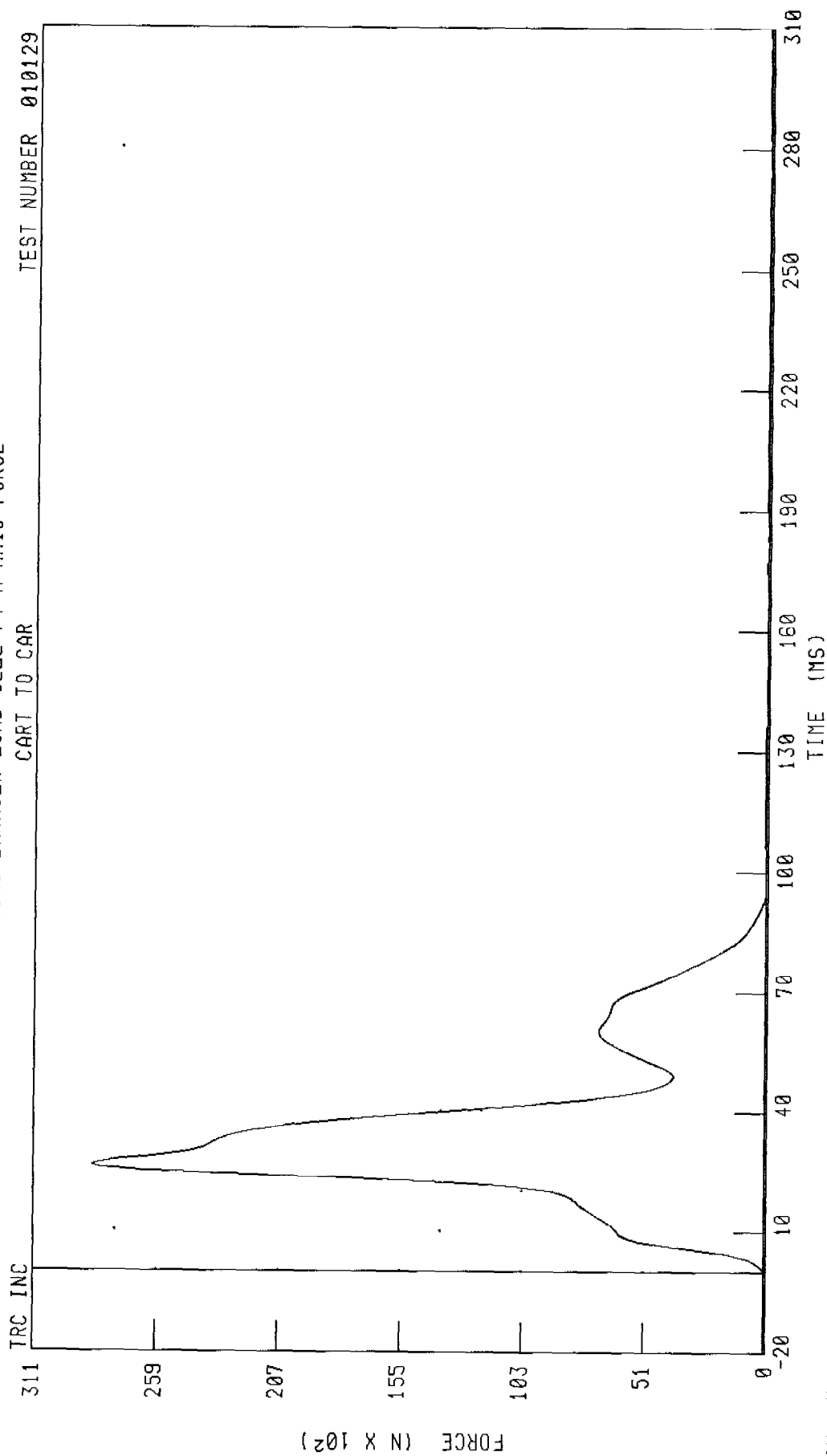


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F4 X-AXIS FORCE

TRC INC

CART TO CAR

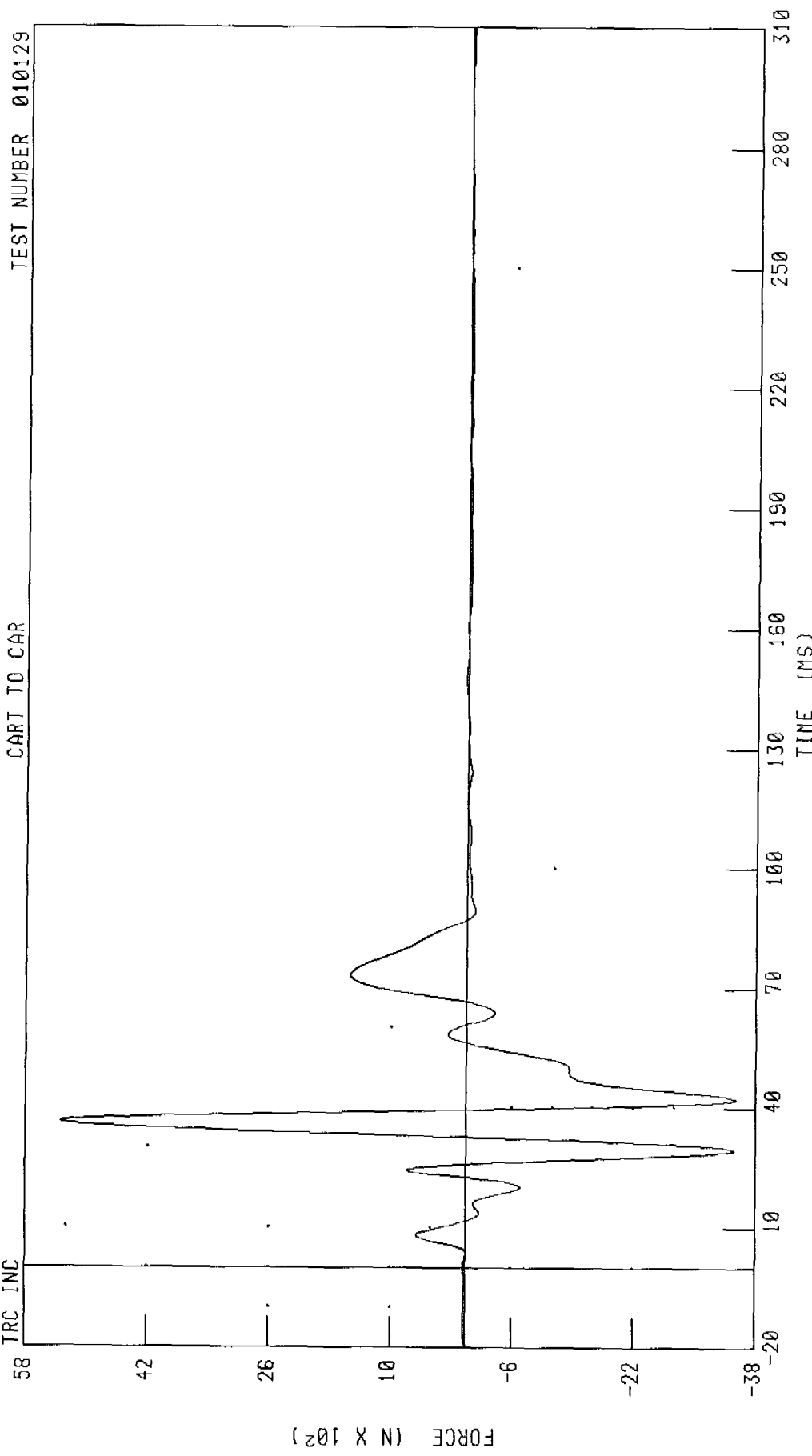
TEST NUMBER 010129



CHANNEL BF4XF FILTER CH CLASS 60

PEAK DATA 28626 78 N @ 26 32 MS, -62 29 N @ -1 68 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL F4 Y-AXIS FORCE



CHANNEL BF4YF FILTER CH CLASS 60 PEAK DATA 5347 98 N @ 36 32 MS, -3542 34 N @ 42 16 MS

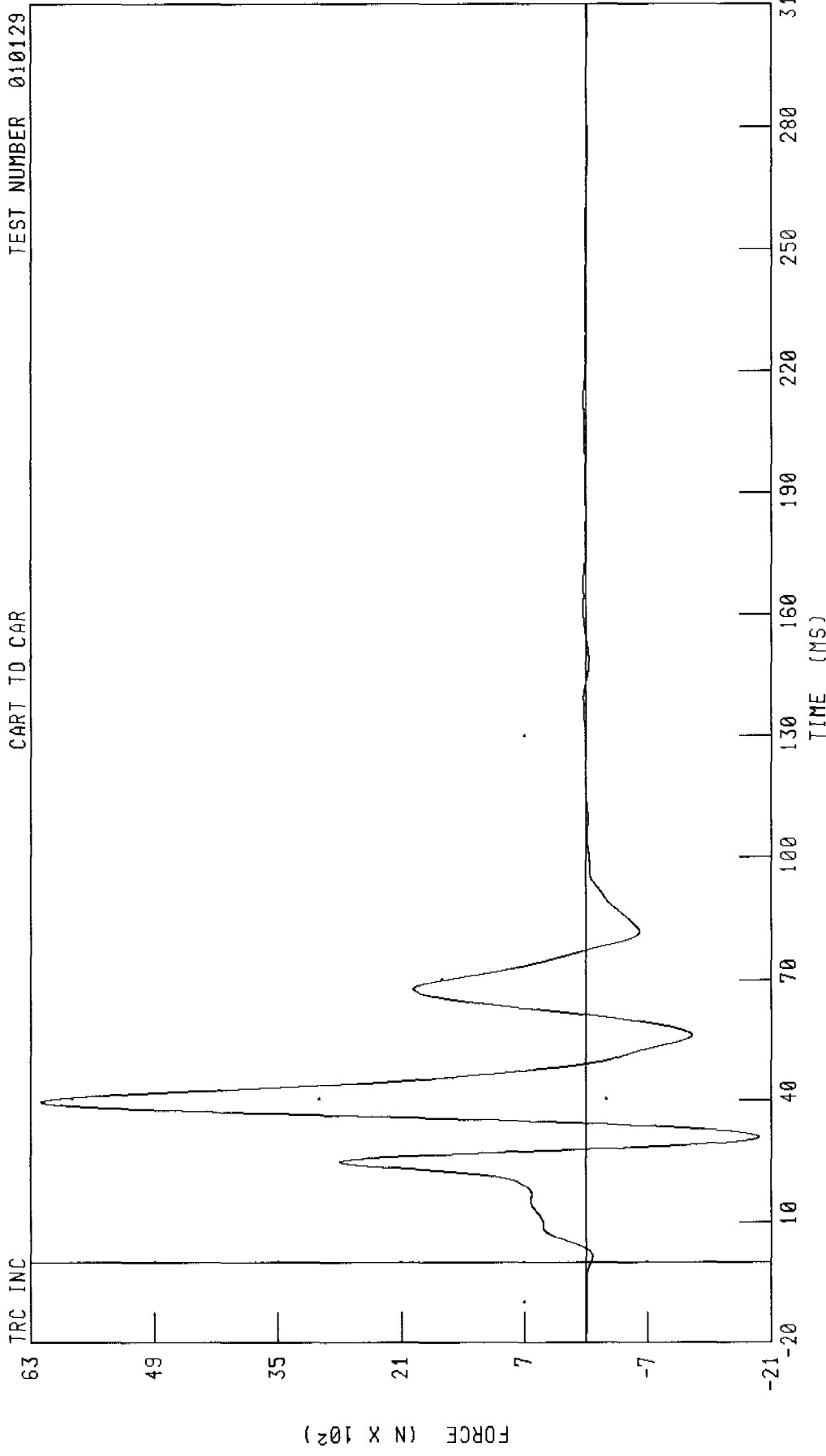
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL F4 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



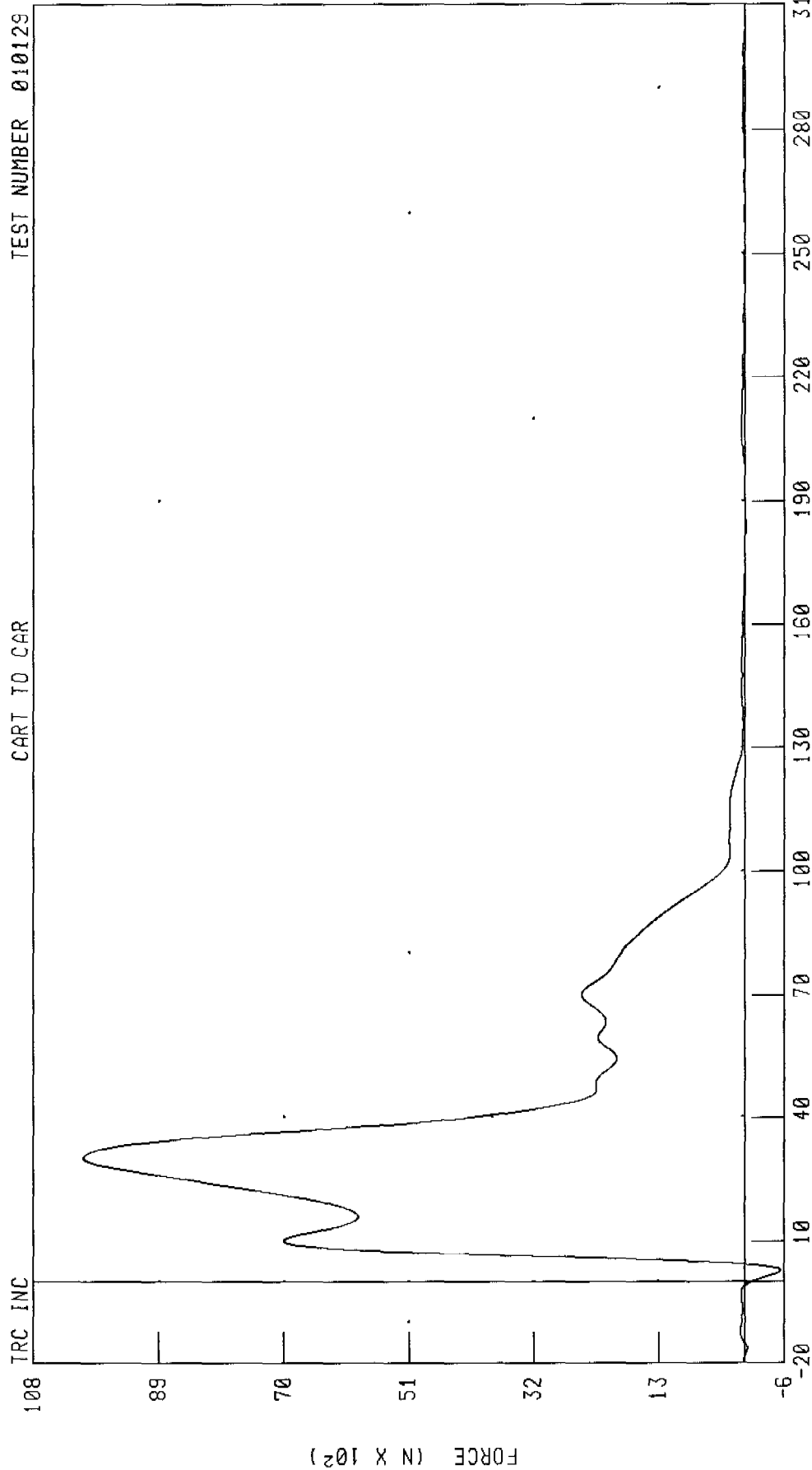
PEAK DATA 6189 74 N @ 39 44 MS, -1964 91 N @ 30 72 MS

CHANNEL BF4ZF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G1 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR



TIME (MS)

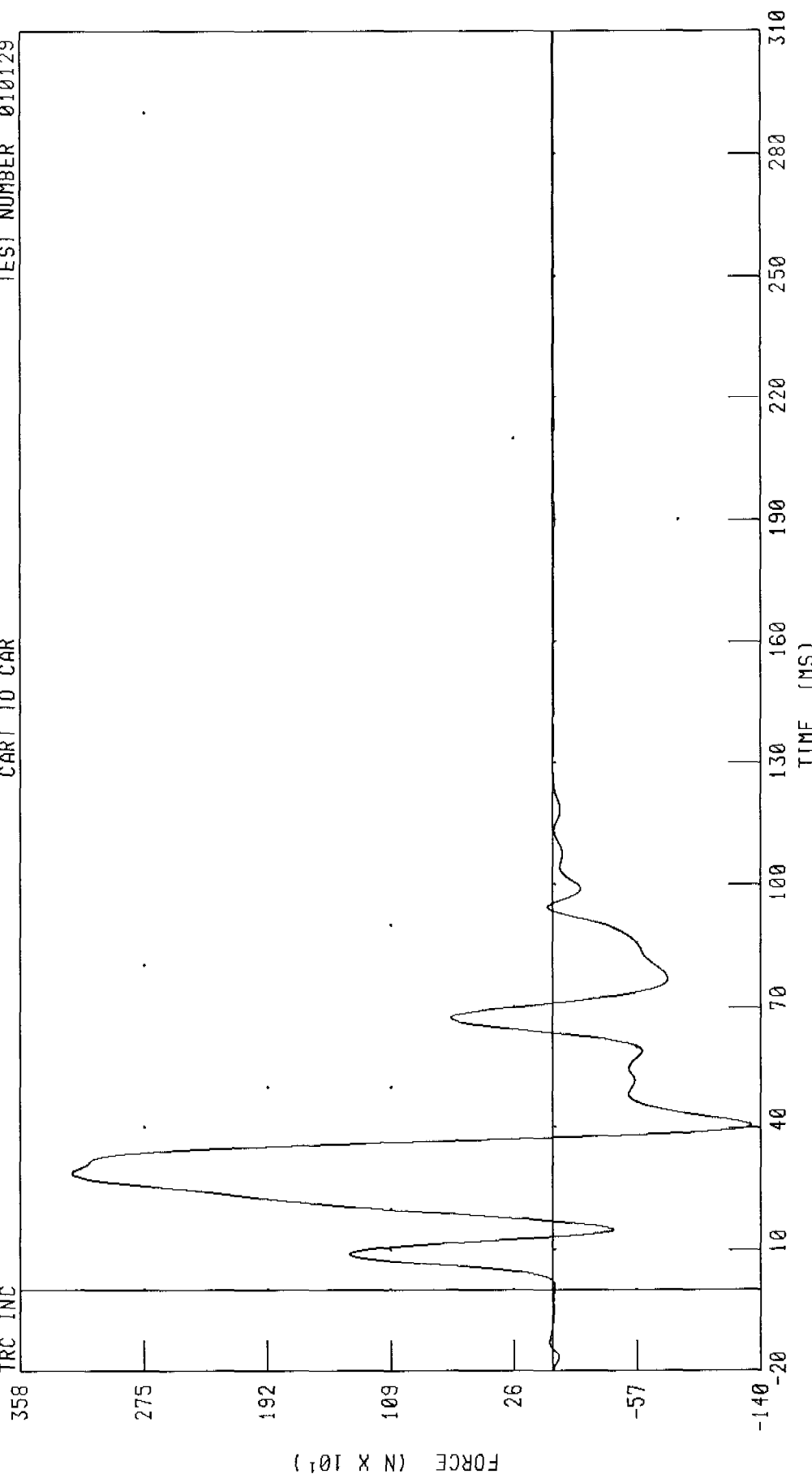
CHANNEL BC1XF FILTER CH CLASS 60

PEAK DATA 10044 81 N 0 30 00 MS, -552 84 N 0 2 72 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL G1 Y-AXIS FORCE
 CART TO CAR

TEST NUMBER 010129

TRC INC



PEAK DATA 3232 68 N @ 28 64 MS, -1335 92 N @ 40 48 MS

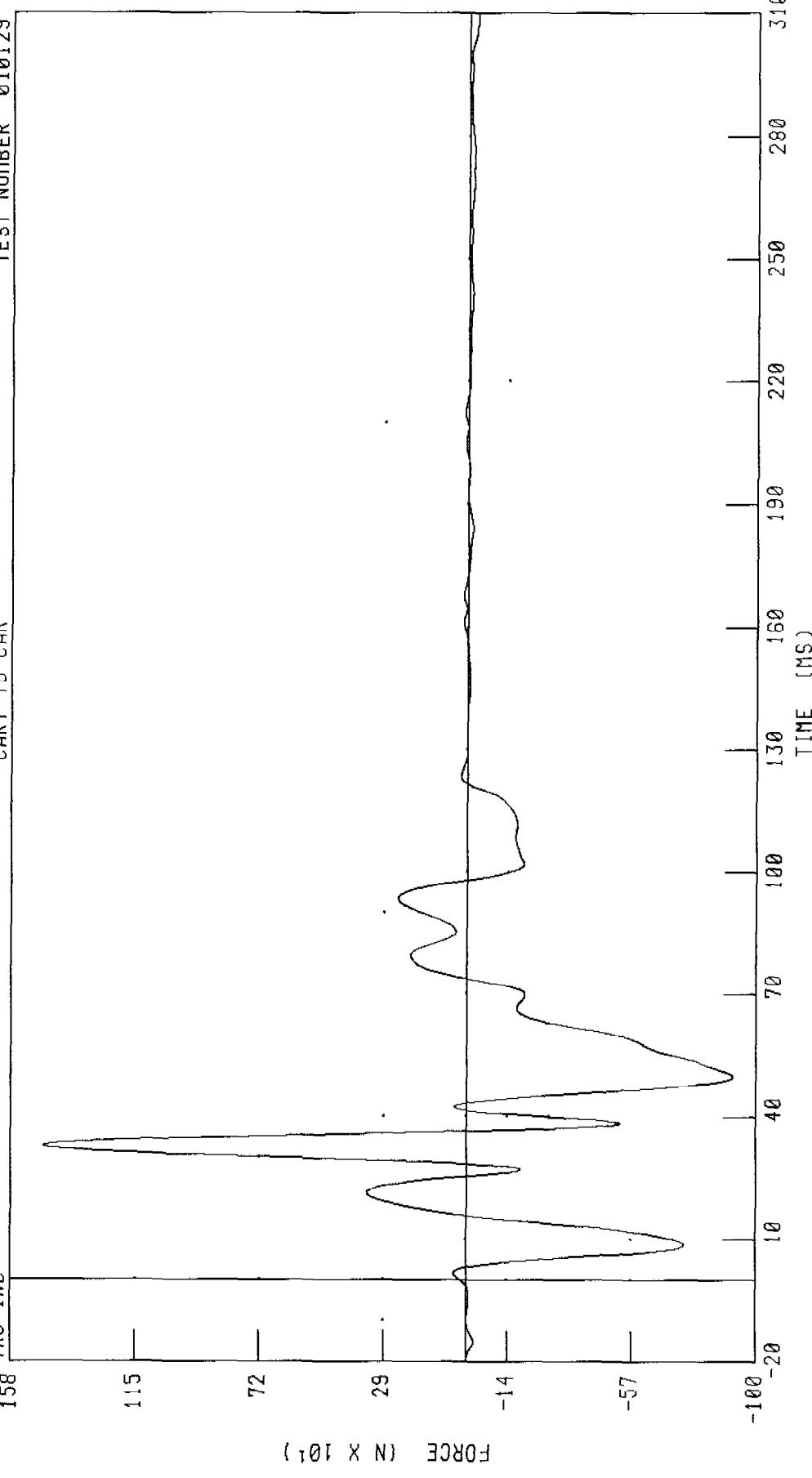
CHANNEL BG1YF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G1 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

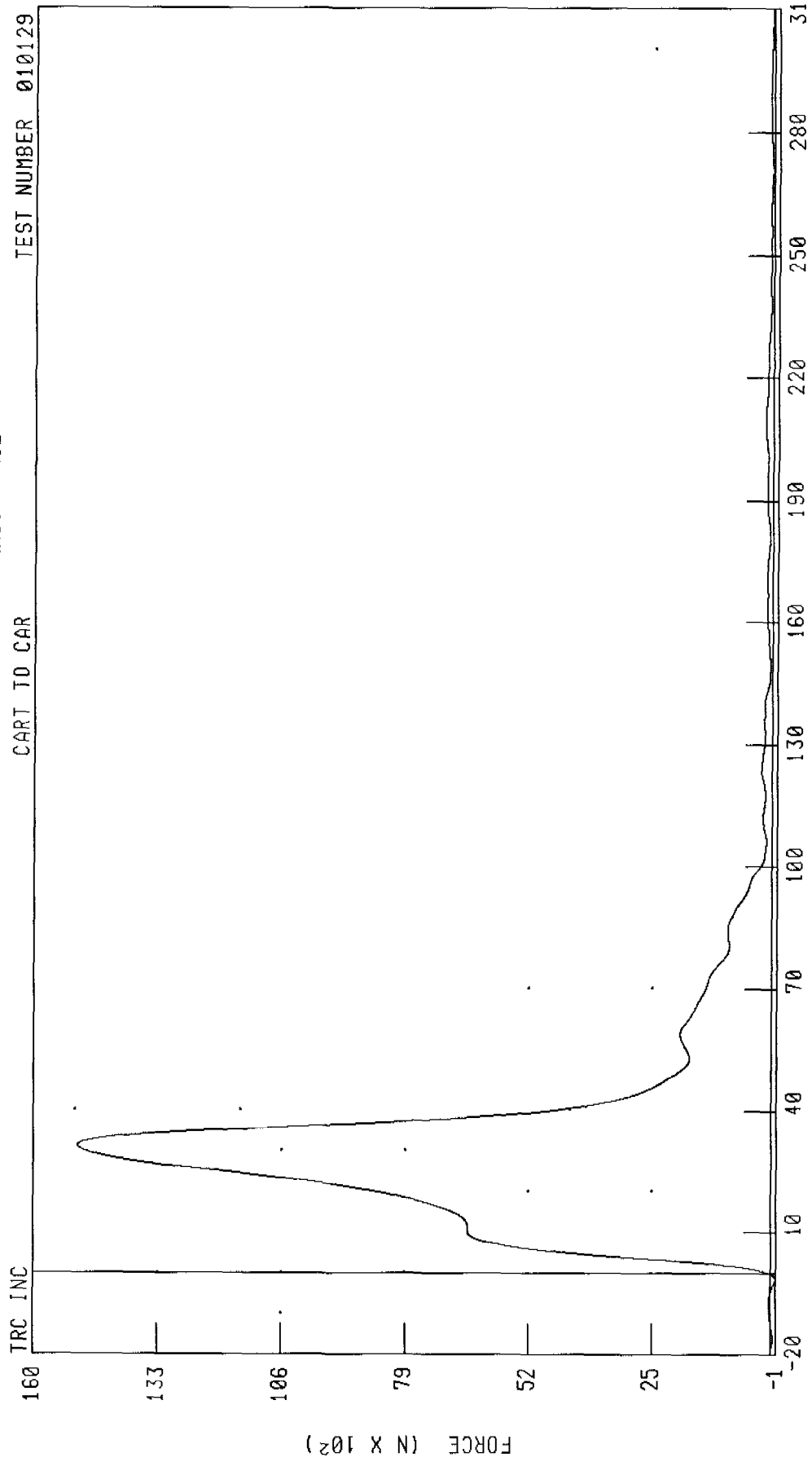


CHANNEL BG1ZF FILTER CH CLASS 60 PEAK DATA 1466 56 N @ 32 80 MS, -920 89 N @ 49 76 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G2 X-AXIS FORCE

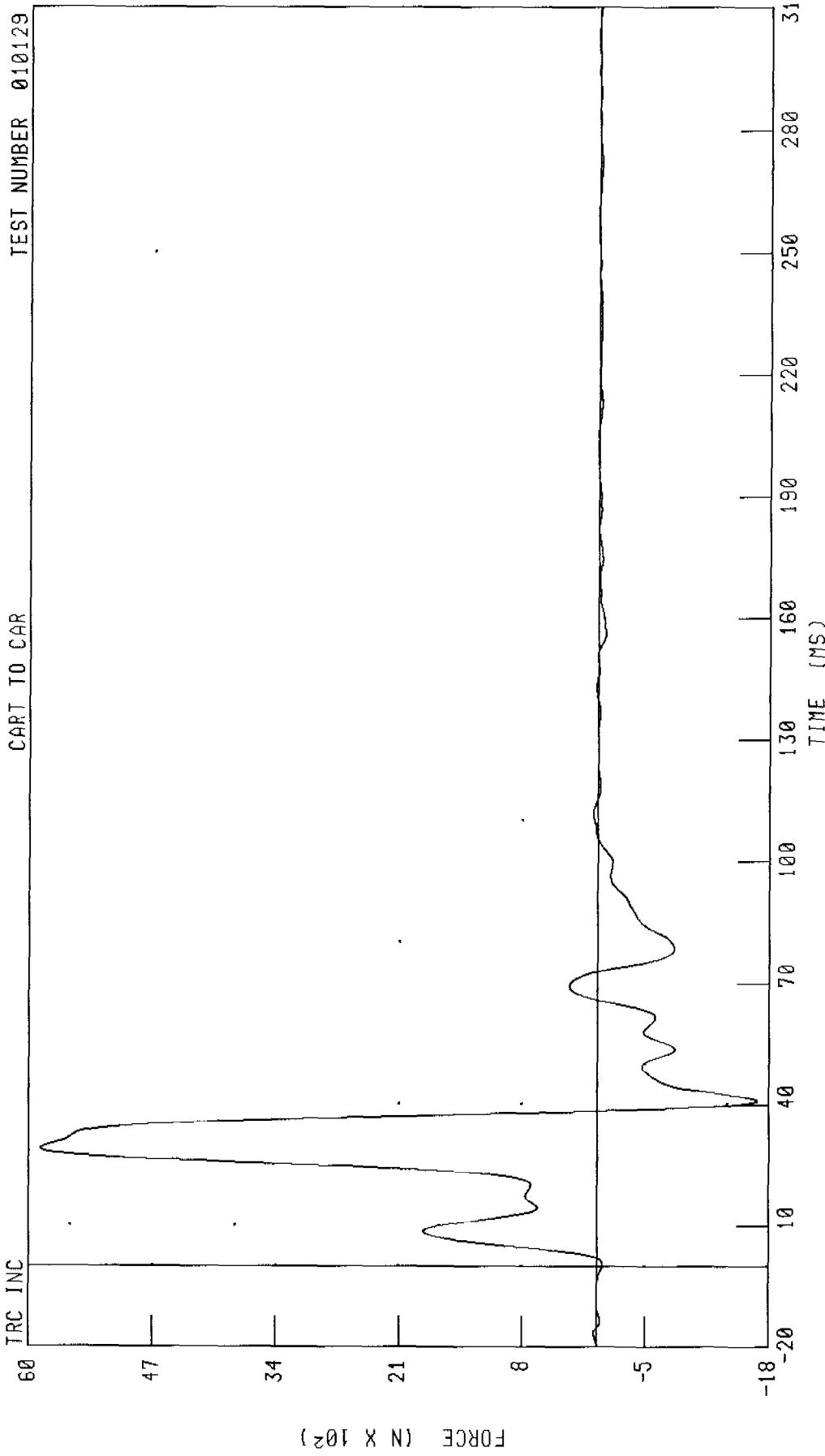
TEST NUMBER 010129

CART TO CAR



CHANNEL BC2XF FILTER CH CLASS 60
TIME (MS)
PEAK DATA 15124 47 N @ 31 20 MS, -114 48 N @ -1 52 MS

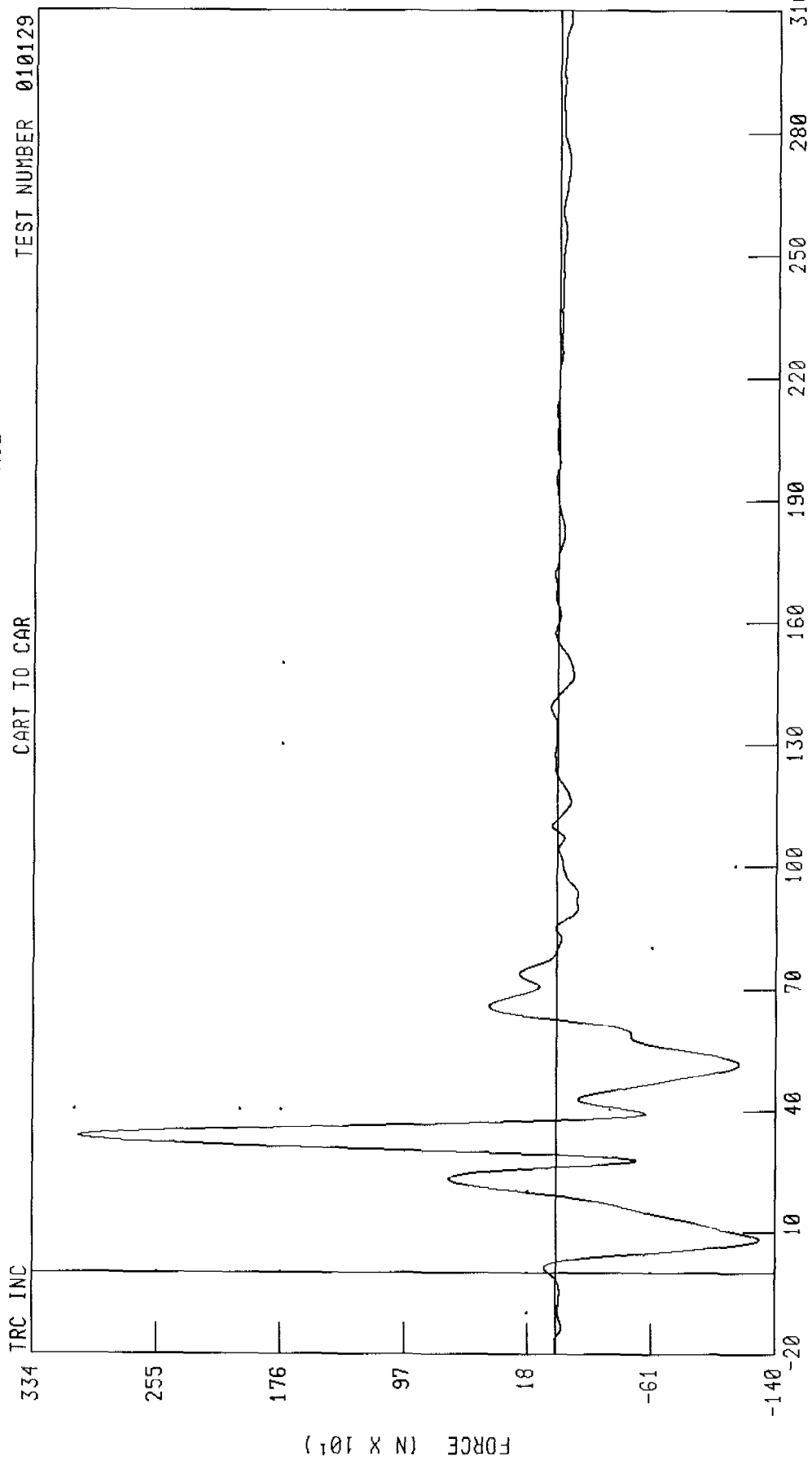
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G2 Y-AXIS FORCE
CART TO CAR



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL G2 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR



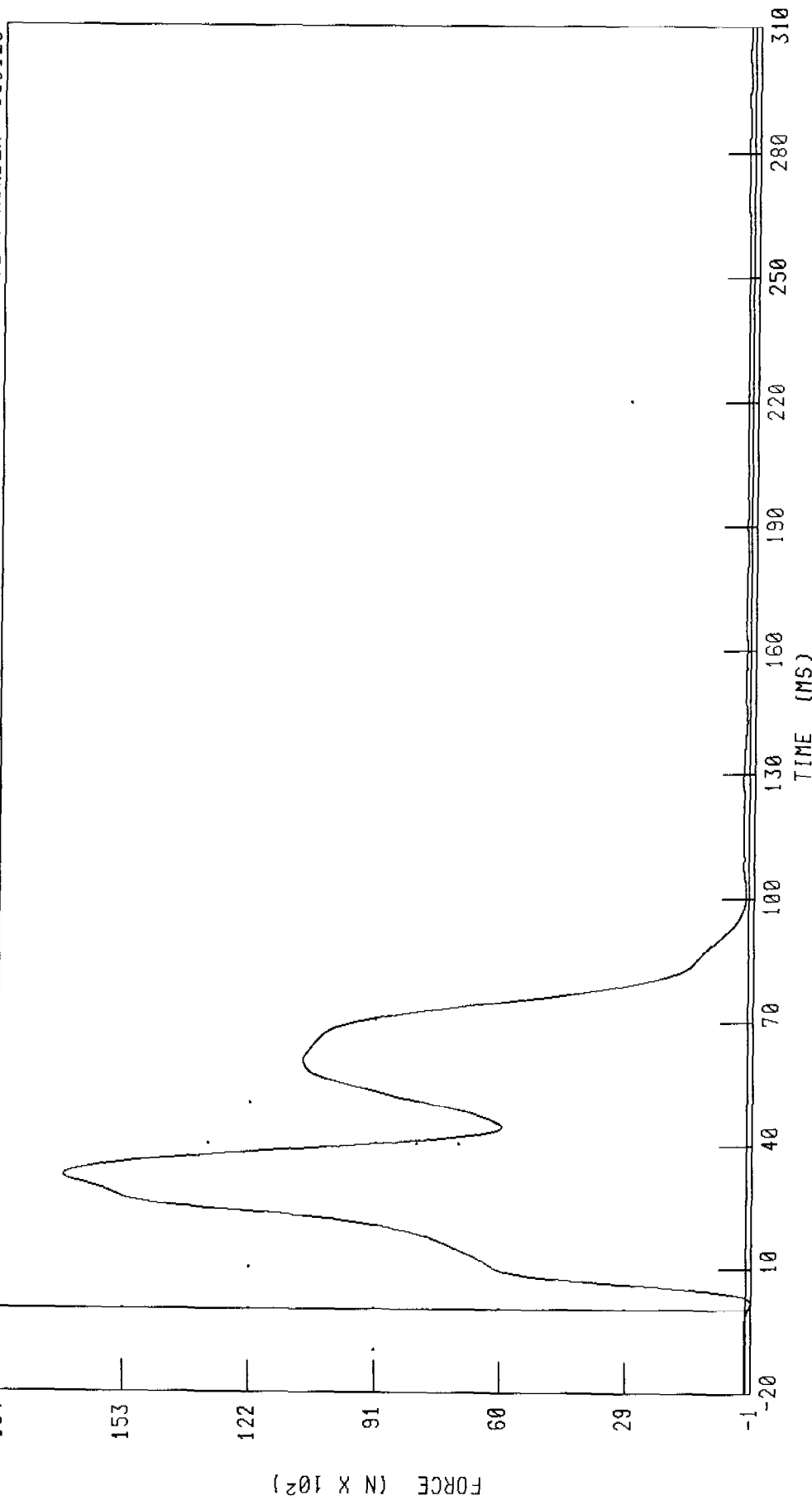
CHANNEL BC2ZF FILTER CH CLASS 60
 PEAK DATA 3049 02 N 0 33 44 MS, -1297 91 N 0 8 16 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G4 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



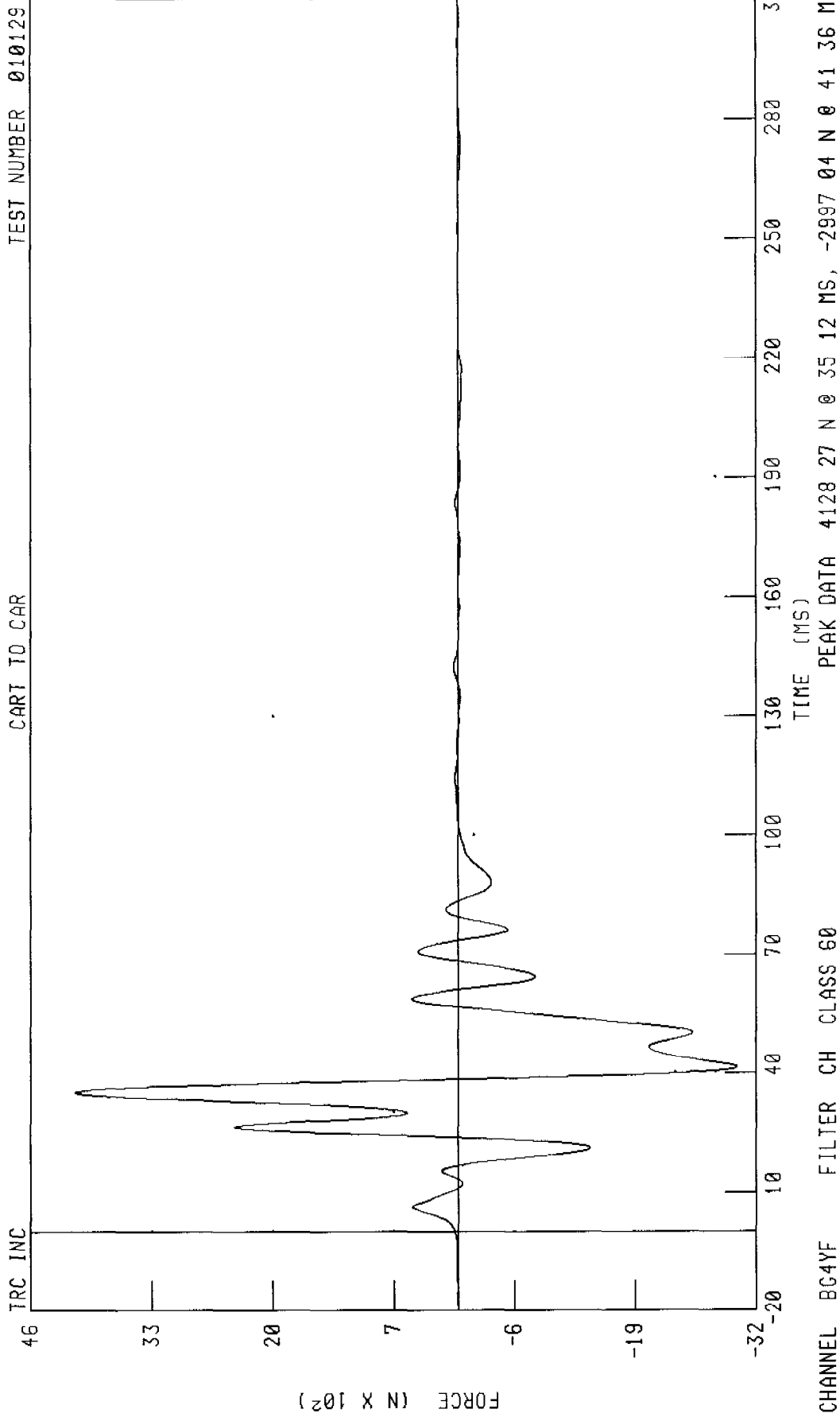
CHANNEL BC4XF

FILTER CH CLASS 60

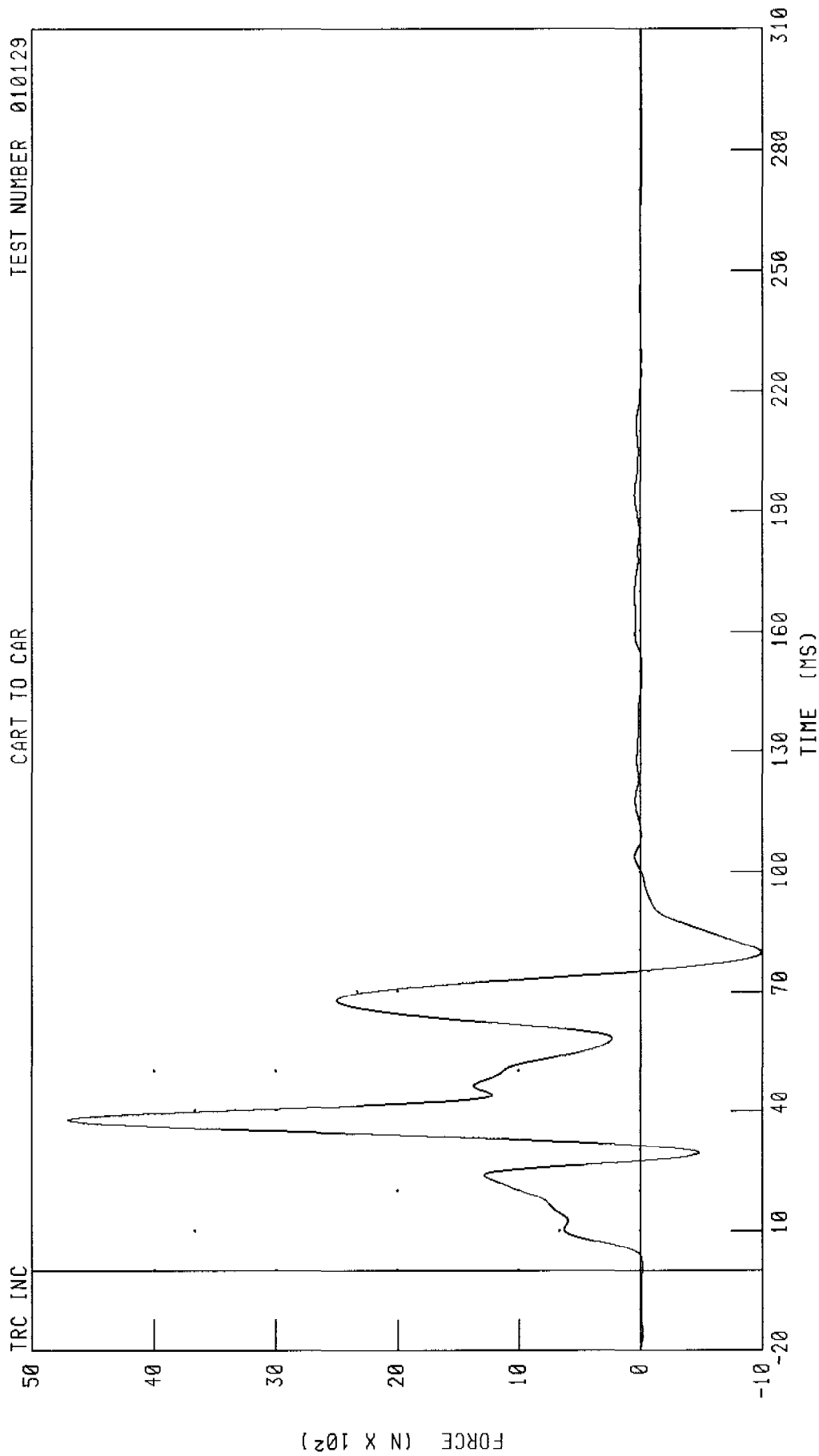
TIME (MS)

PEAK DATA 16851 42 N 0 32 32 MS, -132 61 N 0 1 68 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL G4 Y-AXIS FORCE
 CART TO CAR



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G4 Z-AXIS FORCE



TEST NUMBER 010129

CART TO CAR

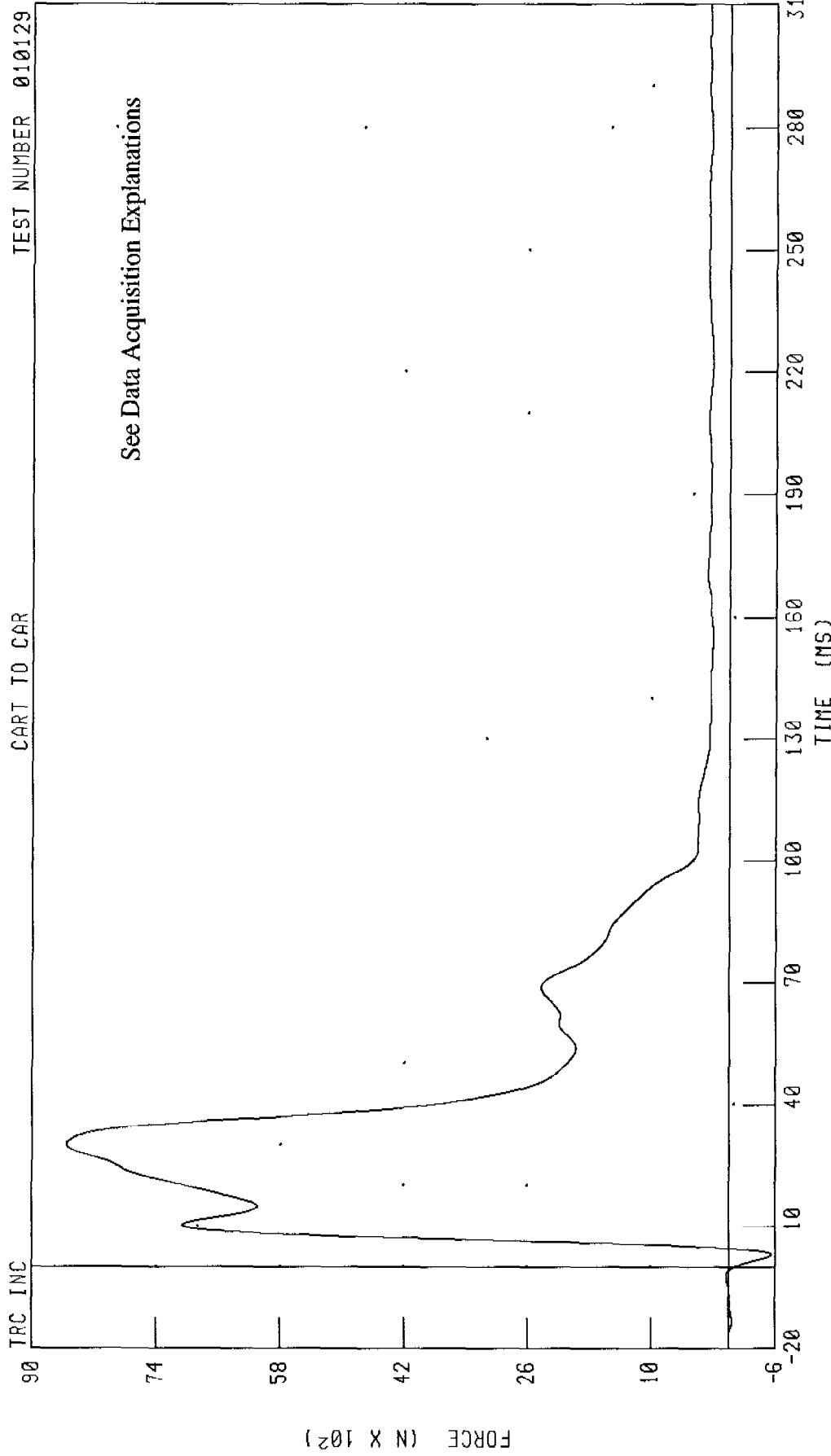
CHANNEL BC4ZF FILTER CH CLASS 60

PEAK DATA 4702 23 N @ 37 76 MS, -993 92 N @ 79 60 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H1 X-AXIS FORCE

TEST NUMBER 010129

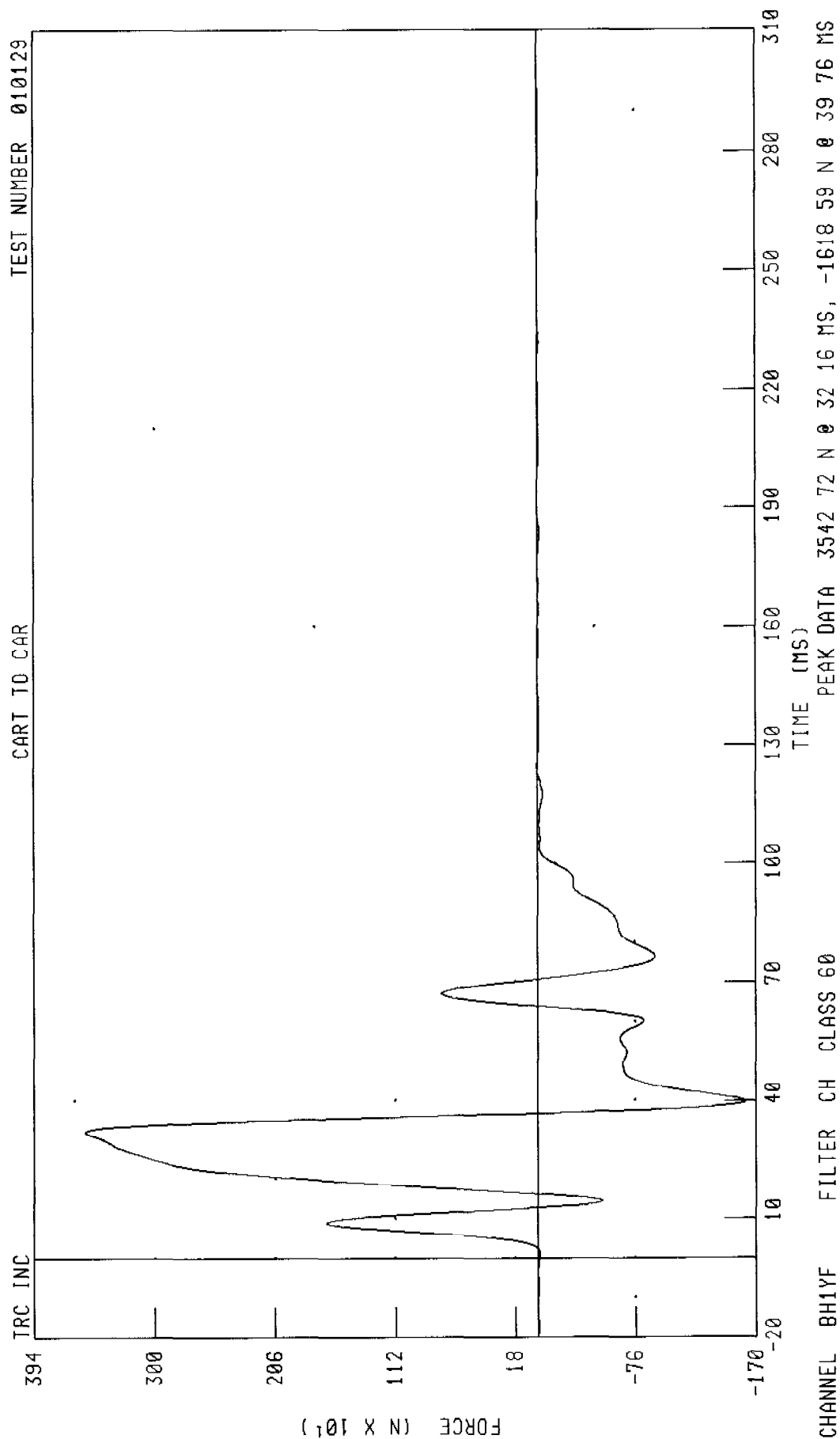
CART TO CAR



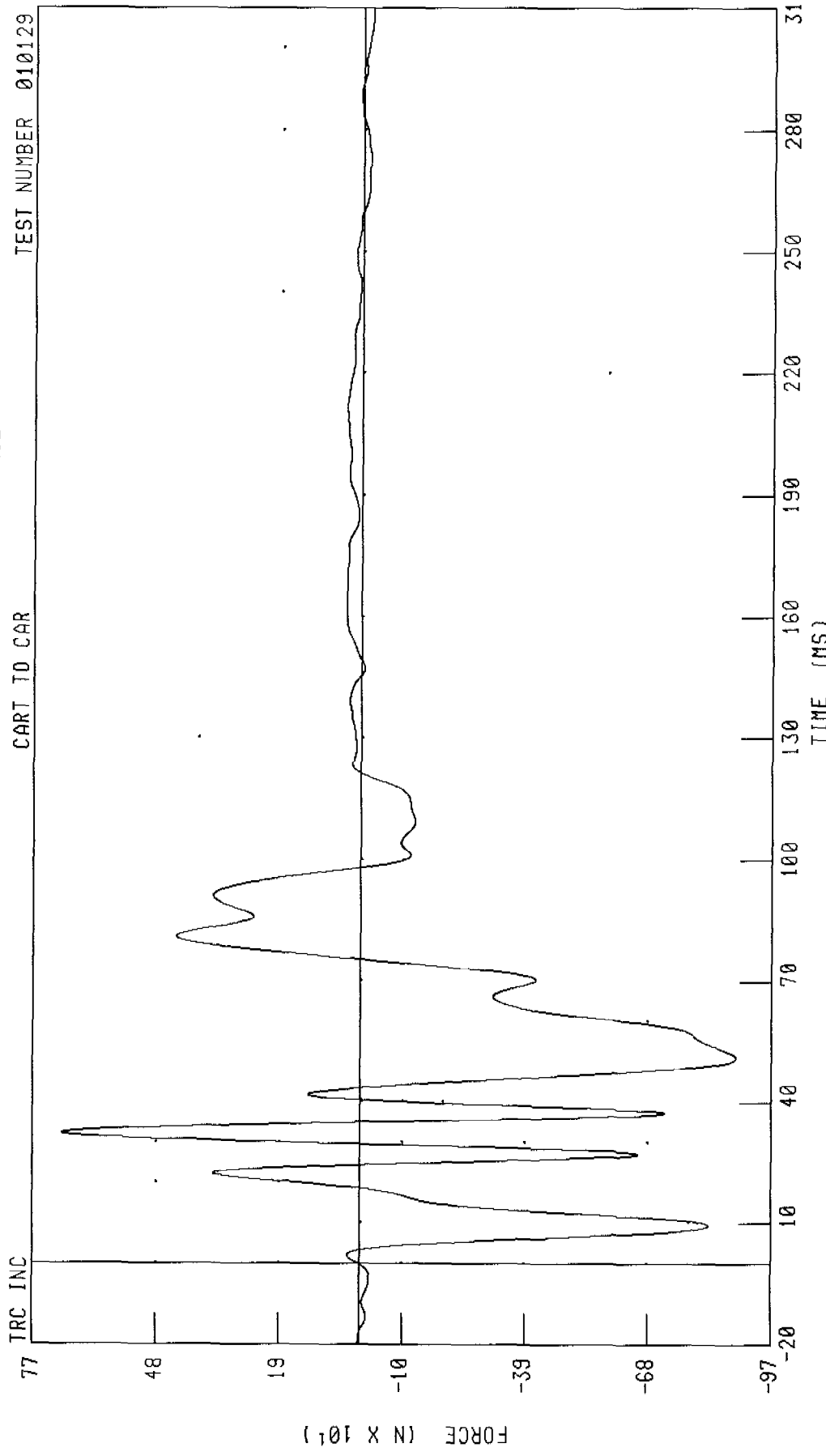
See Data Acquisition Explanations

CHANNEL BH1XF FILTER CH CLASS 60 PEAK DATA 8561 62 N @ 30 08 MS, -551 32 N @ 3 12 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H1 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL H1 Z-AXIS FORCE



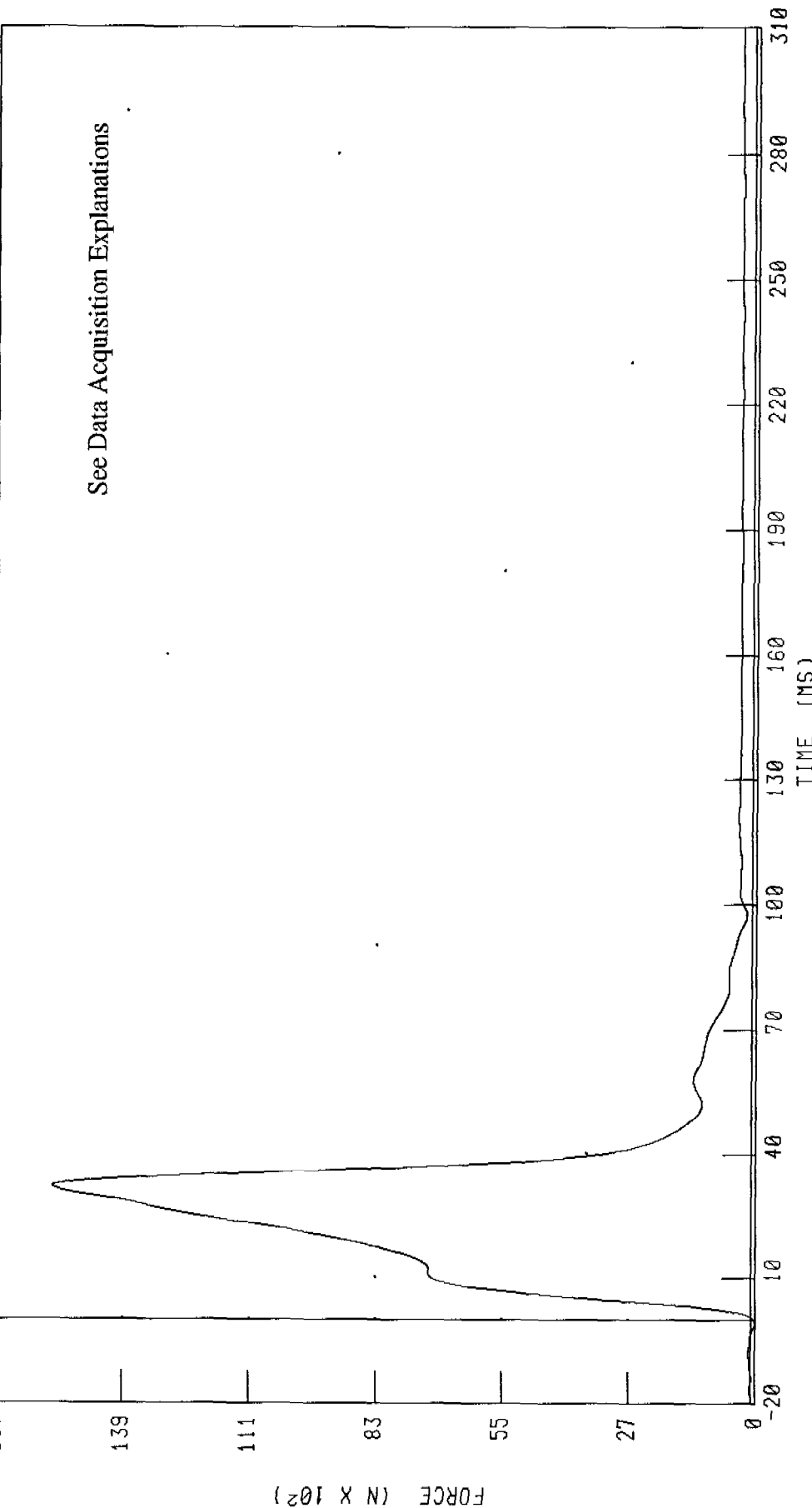
CHANNEL BH1ZF FILTER CH CLASS 60 PEAK DATA 702 89 N 0 32 24 MS, -886 89 N 0 50 96 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H2 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BH2XF

FILTER CH CLASS 60

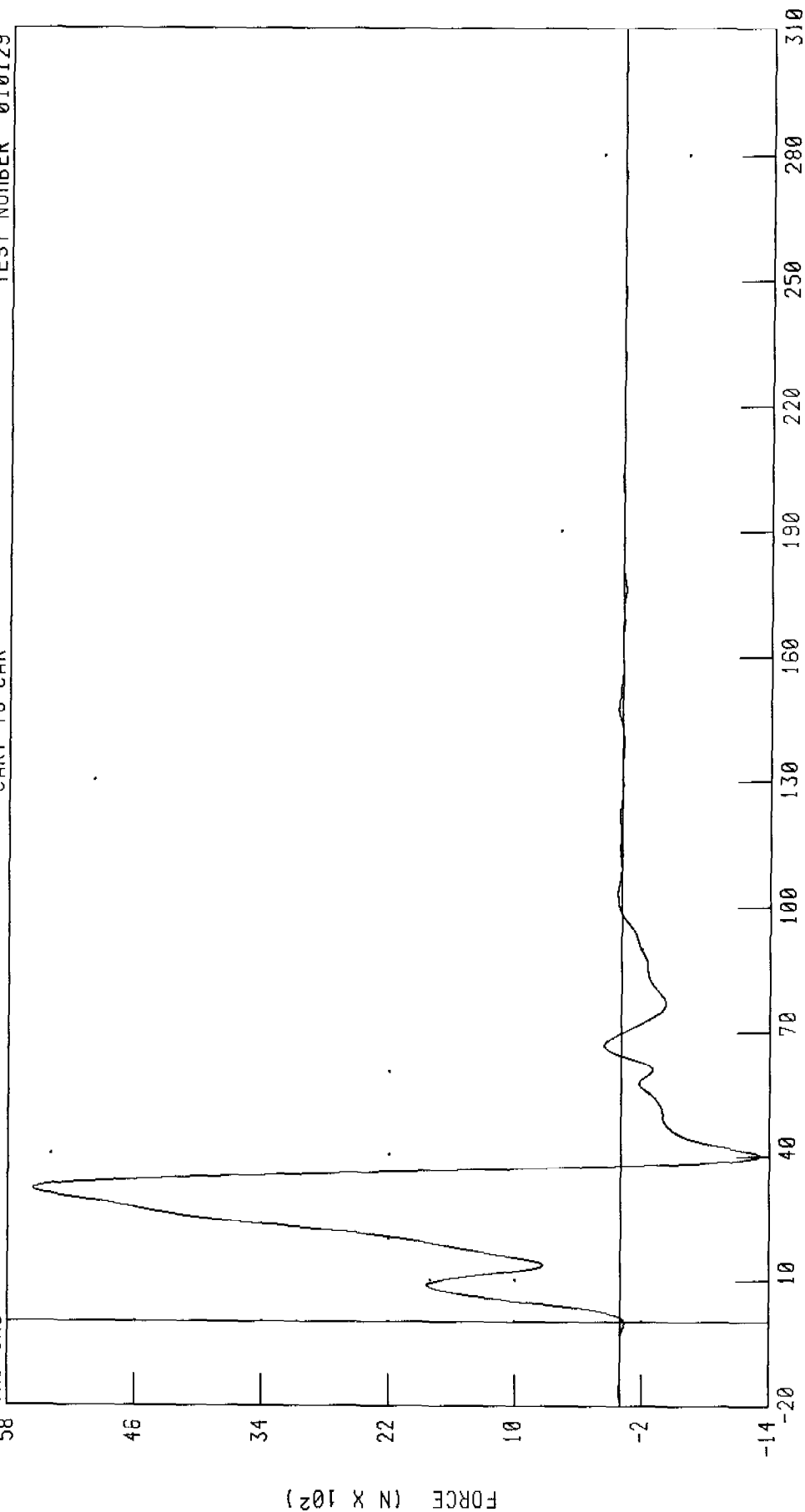
PEAK DATA 15466 85 N @ 32 00 MS, -78 86 N @ -0 72 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H2 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



TIME (MS)

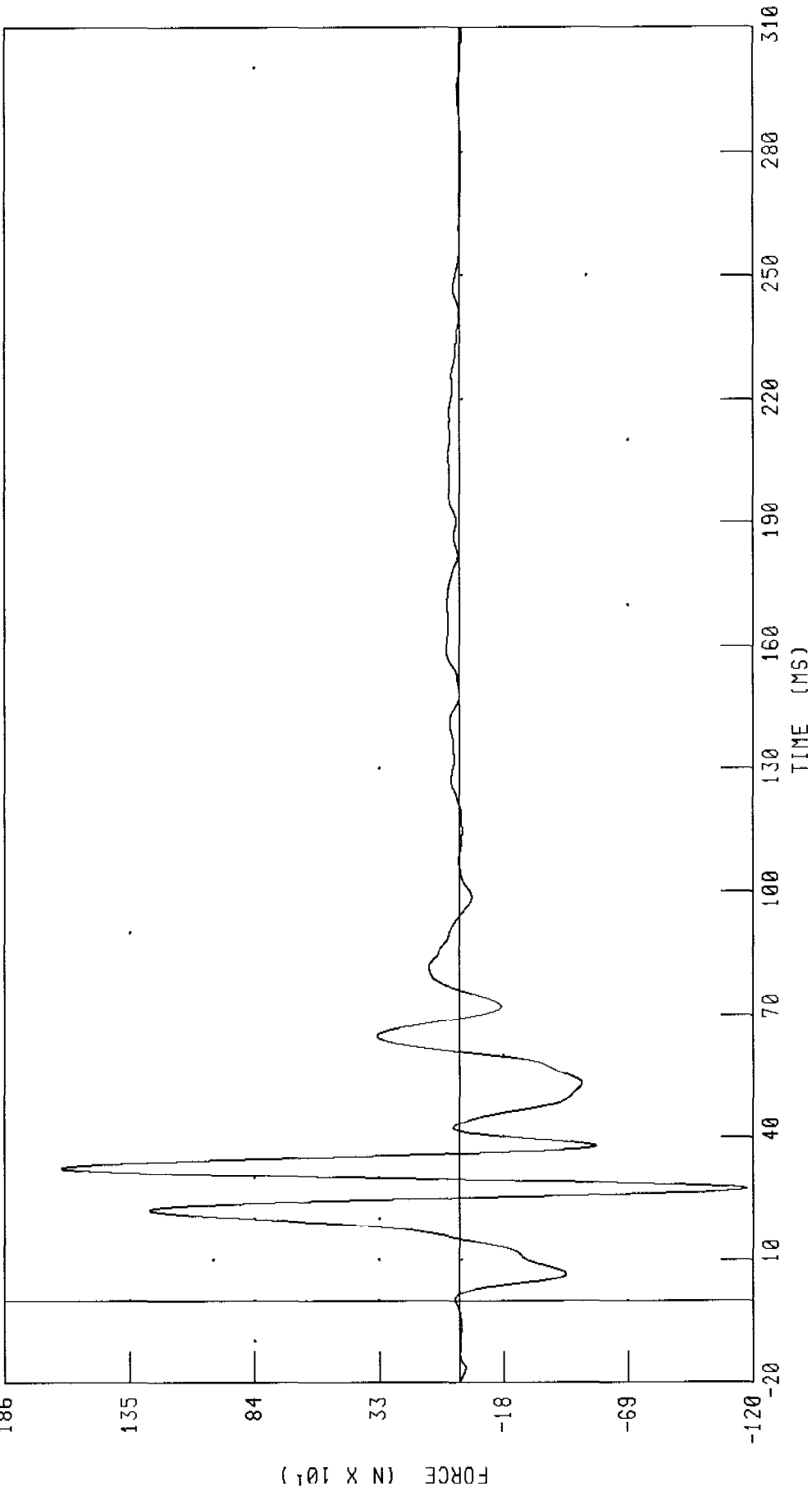
CHANNEL BH2YF FILTER CH CLASS 60 PEAK DATA 5561 98 N @ 31 92 MS, -1306 82 N @ 39 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H2 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

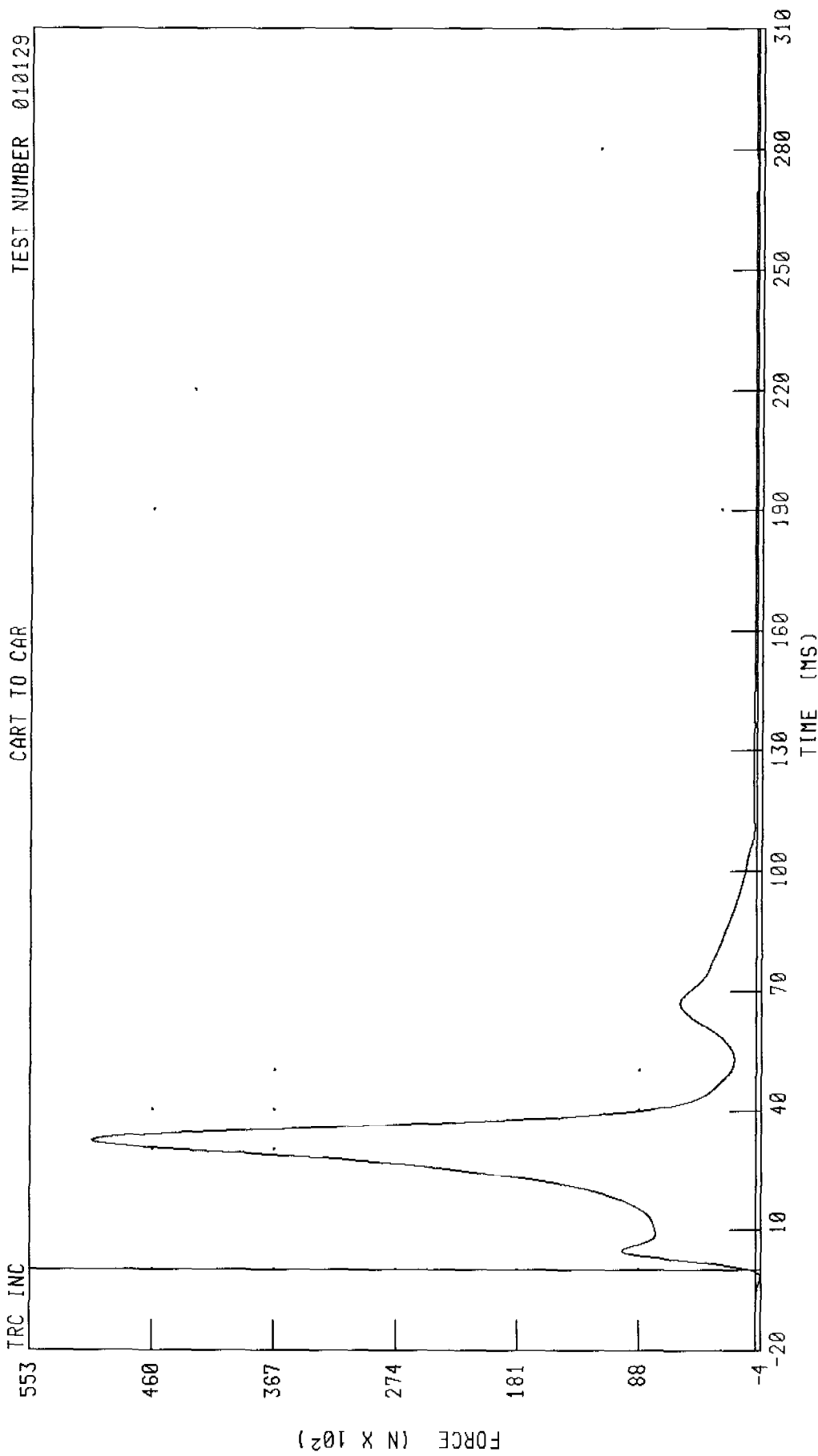
TRC INC



CHANNEL BH2ZF FILTER CH CLASS 60

PEAK DATA 1629 38 N @ 32 64 MS, -1176 04 N @ 27 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H3 X-AXIS FORCE



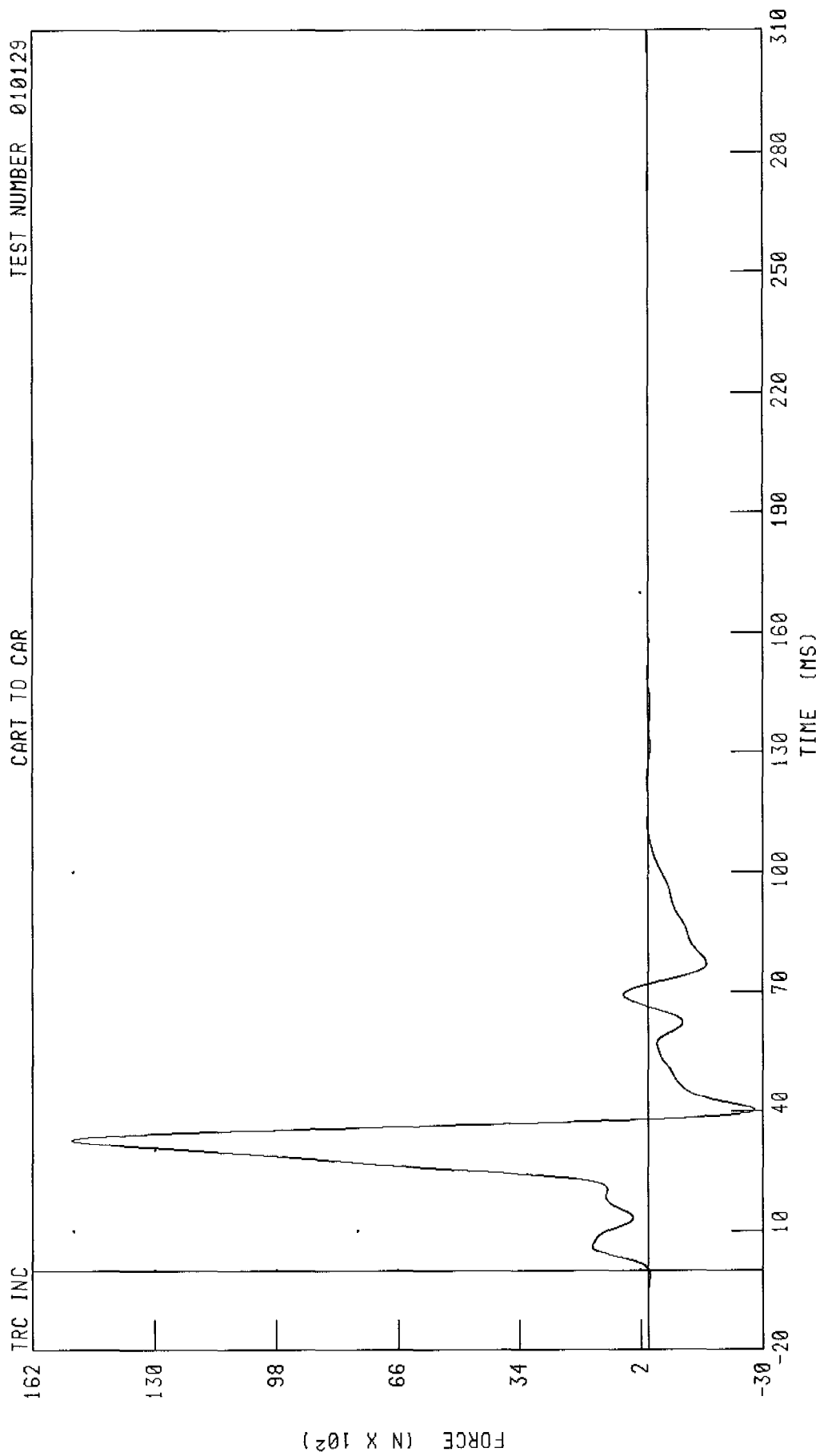
TEST NUMBER 010129

CART TO CAR

PEAK DATA 50672 06 N 0 32 24 MS, -377 21 N 0 -2 00 MS

CHANNEL BH3XF FILTER CH CLASS 60

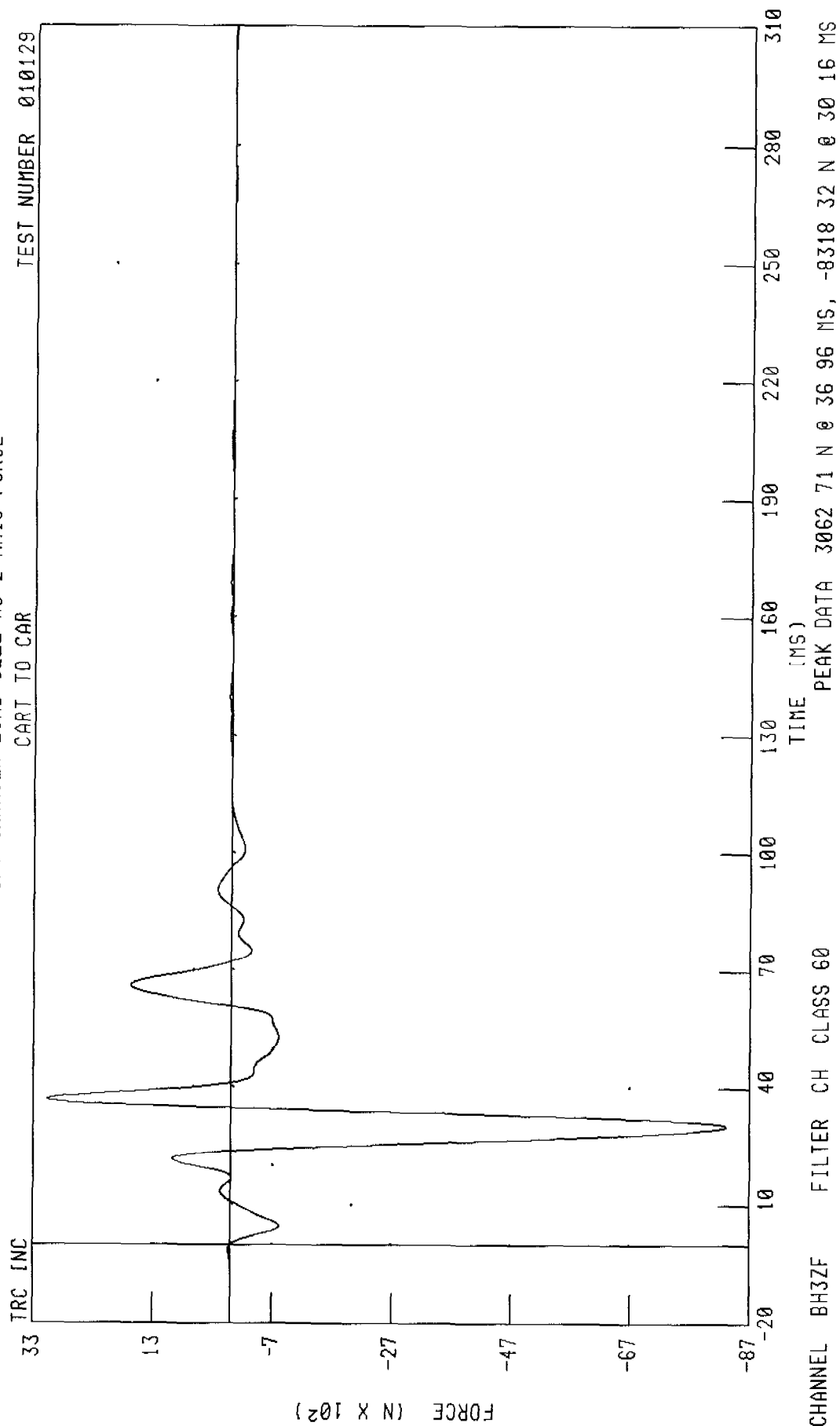
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H3 Y-AXIS FORCE



CHANNEL BH3YF FILTER CH CLASS 60

PEAK DATA 15179 11 N 0 32 72 MS, -2792 13 N 0 40 16 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H3 Z-AXIS FORCE



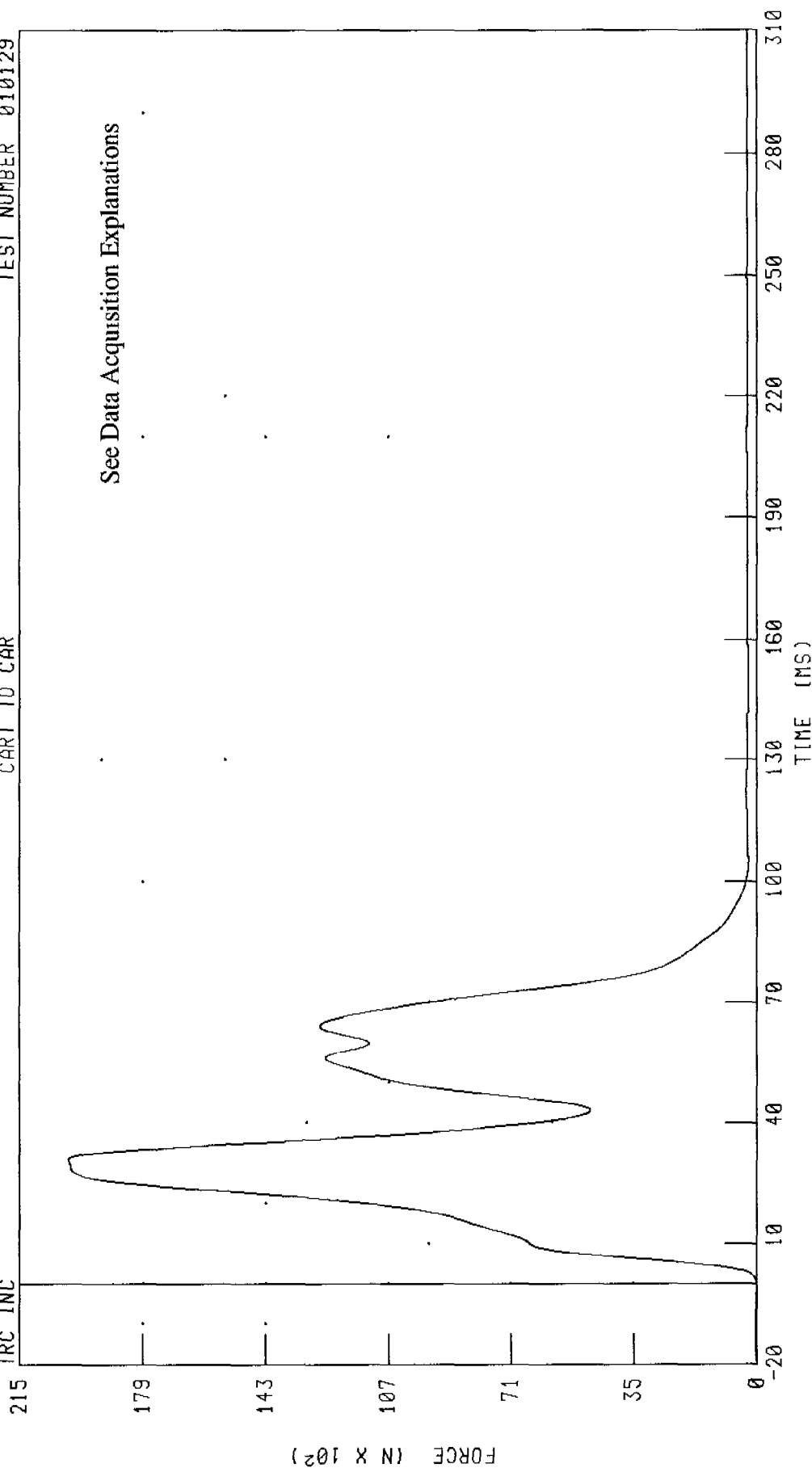
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H4 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

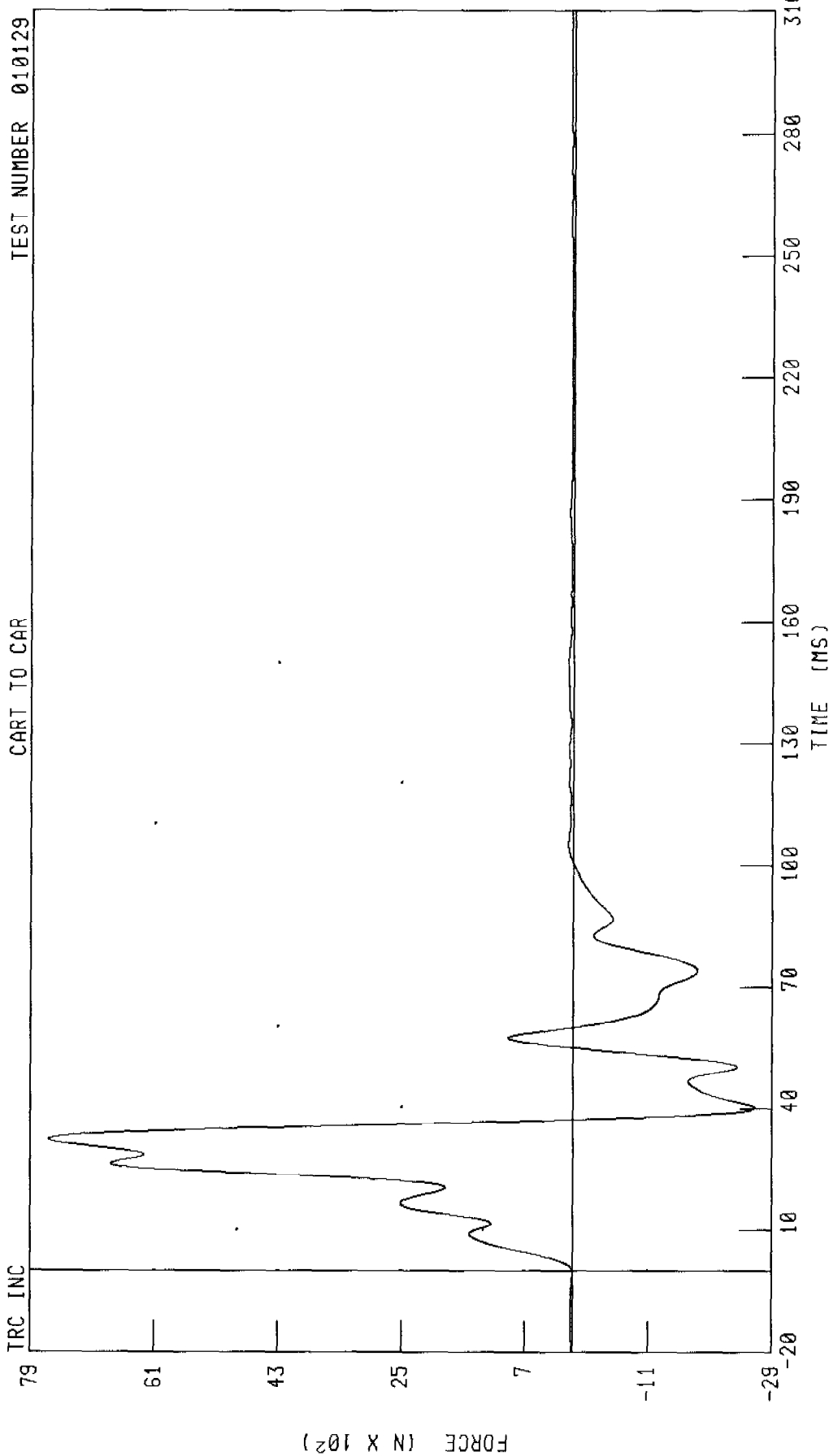
See Data Acquisition Explanations



CHANNEL BH4XF FILTER CH CLASS 60

PEAK DATA 20170 52 N @ 30 72 MS, -1 27 N @ -0 40 MS

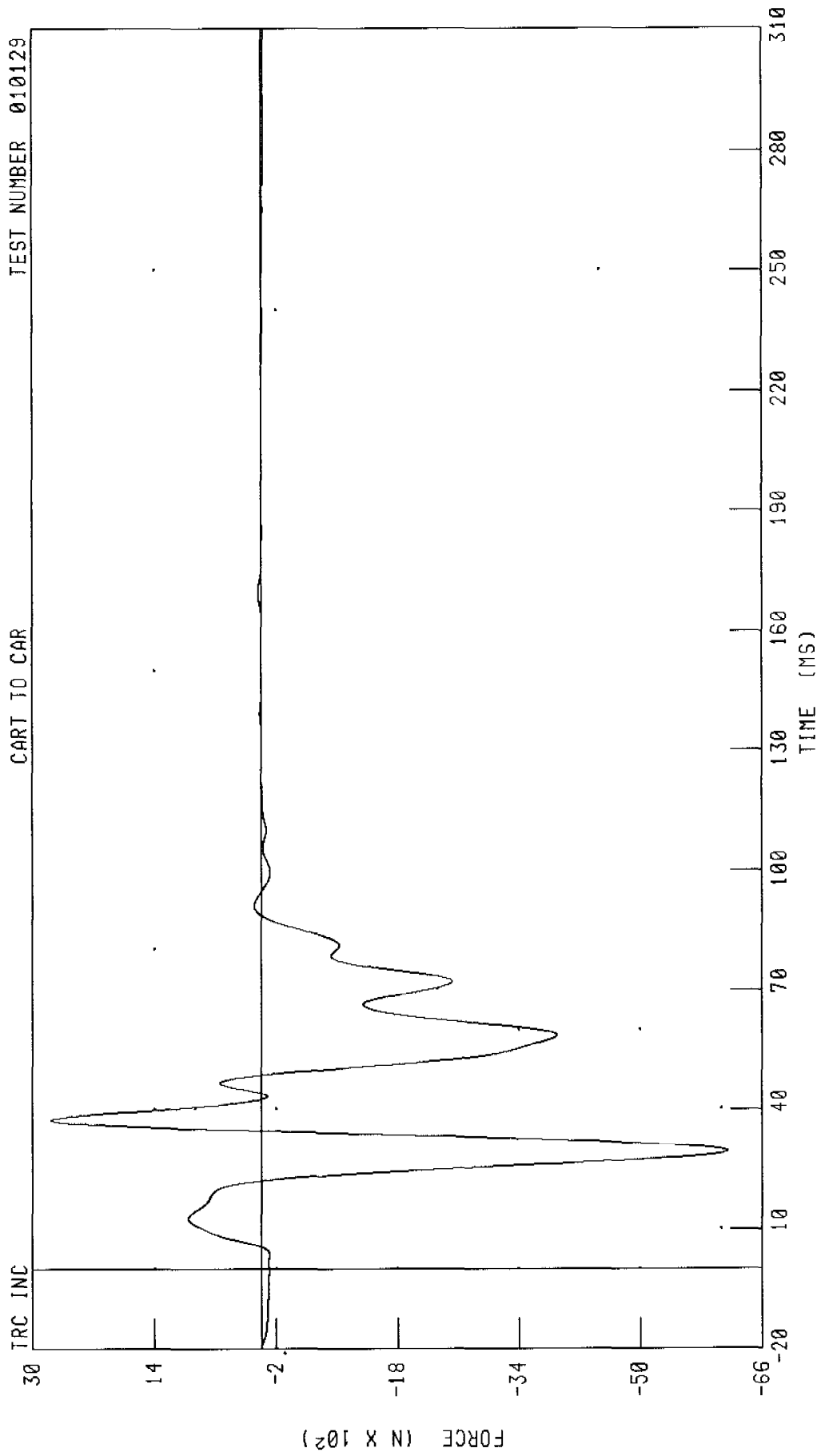
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H4 Y-AXIS FORCE



CHANNEL BH4YF FILTER CH CLASS 60

PEAK DATA 7641 85 N @ 32 24 MS, -2650 77 N @ 40 08 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL H4 Z-AXIS FORCE



TEST NUMBER 010129

CART TO CAR

CHANNEL BH4ZF FILTER CH CLASS 60

PEAK DATA 2755 61 N @ 37 52 MS, -6154 16 N @ 29 60 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I1 X-AXIS FORCE

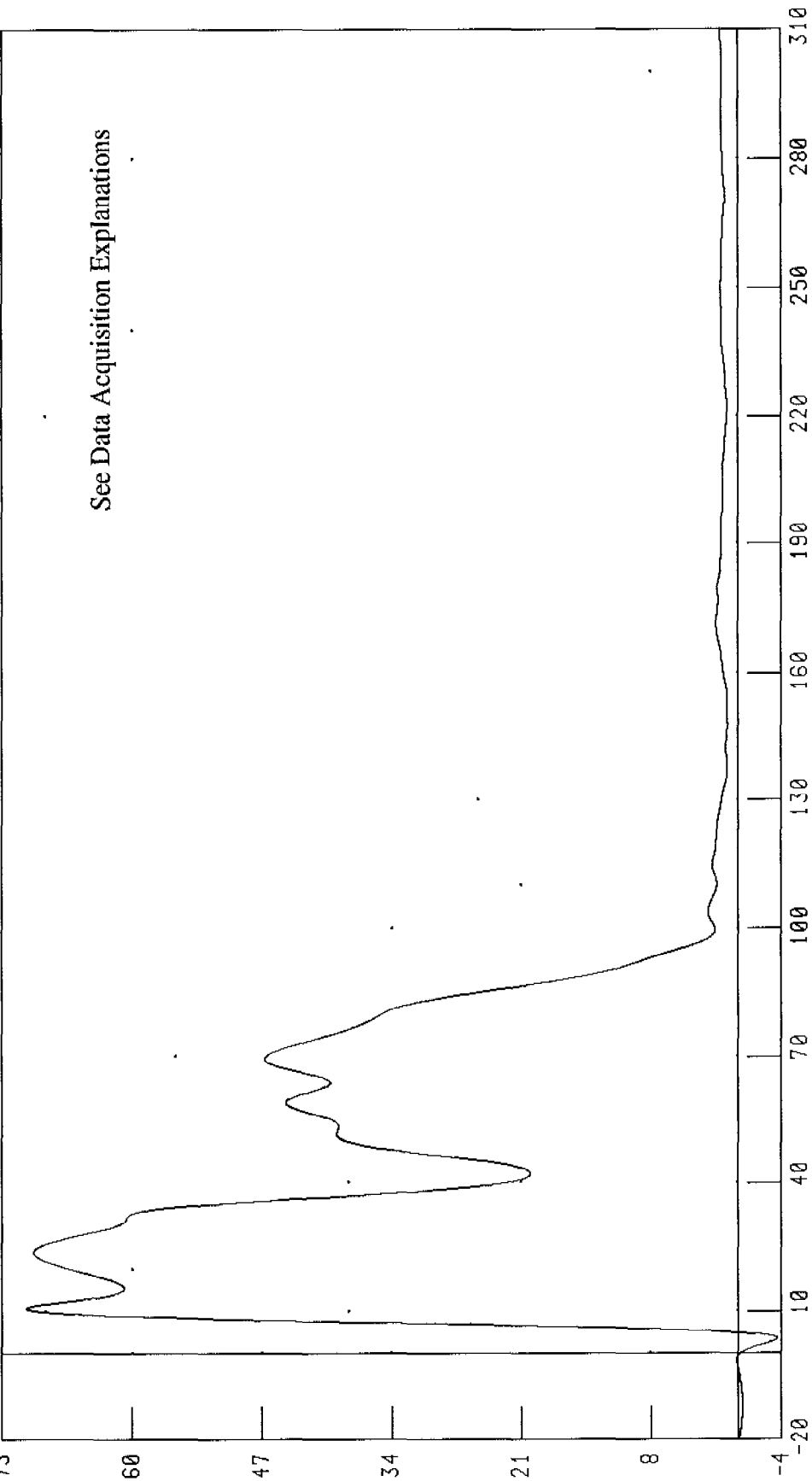
TEST NUMBER 010129

CART TO CAR

TRC INC

See Data Acquisition Explanations

FORCE (N X 10²)

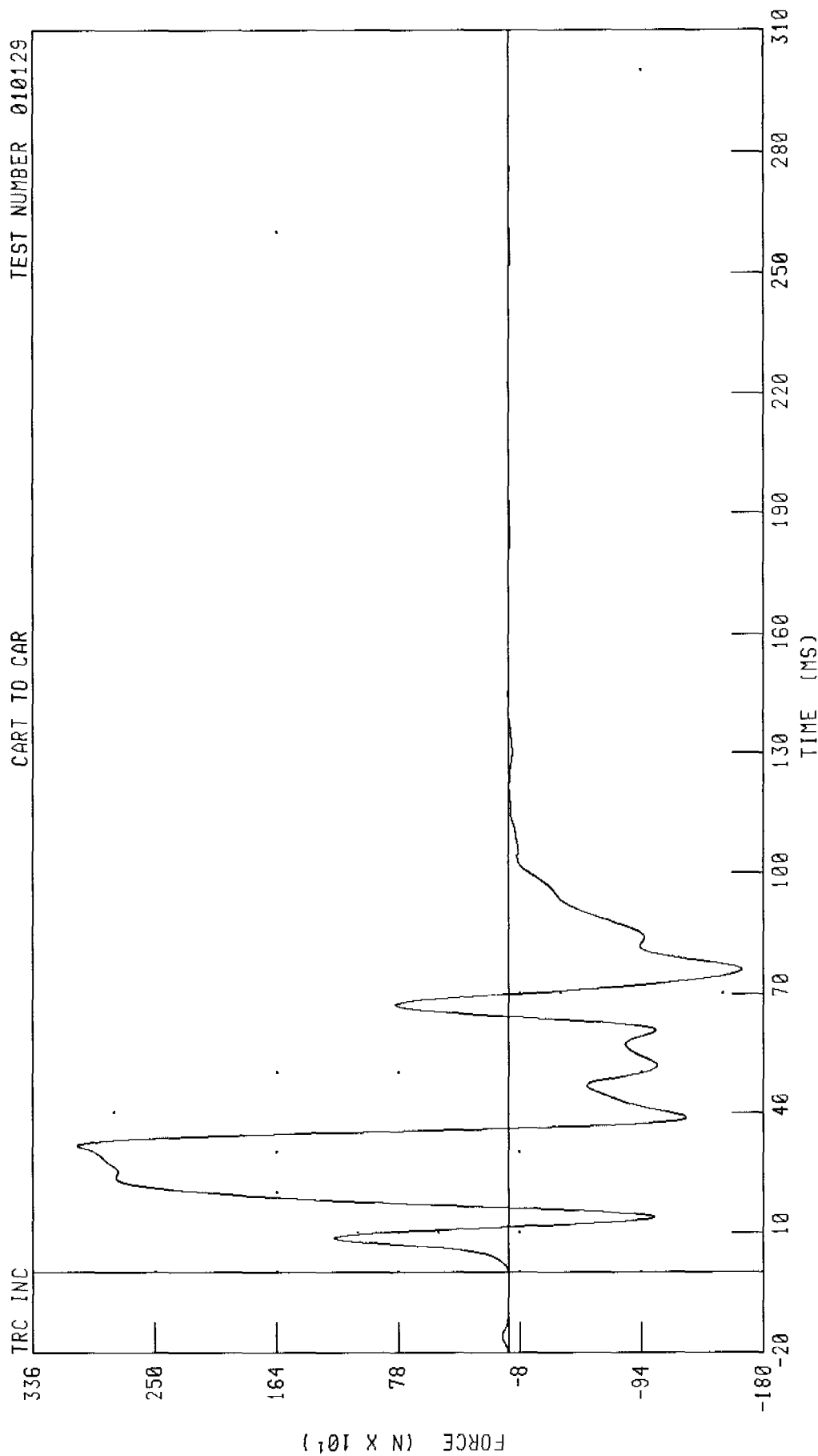


TIME (MS)

CHANNEL B11XF FILTER CH CLASS 60

PEAK DATA 7126 81 N 0 10 72 MS, -391 67 N 0 3 52 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I1 Y-AXIS FORCE



CHANNEL B11YF FILTER CH CLASS 60

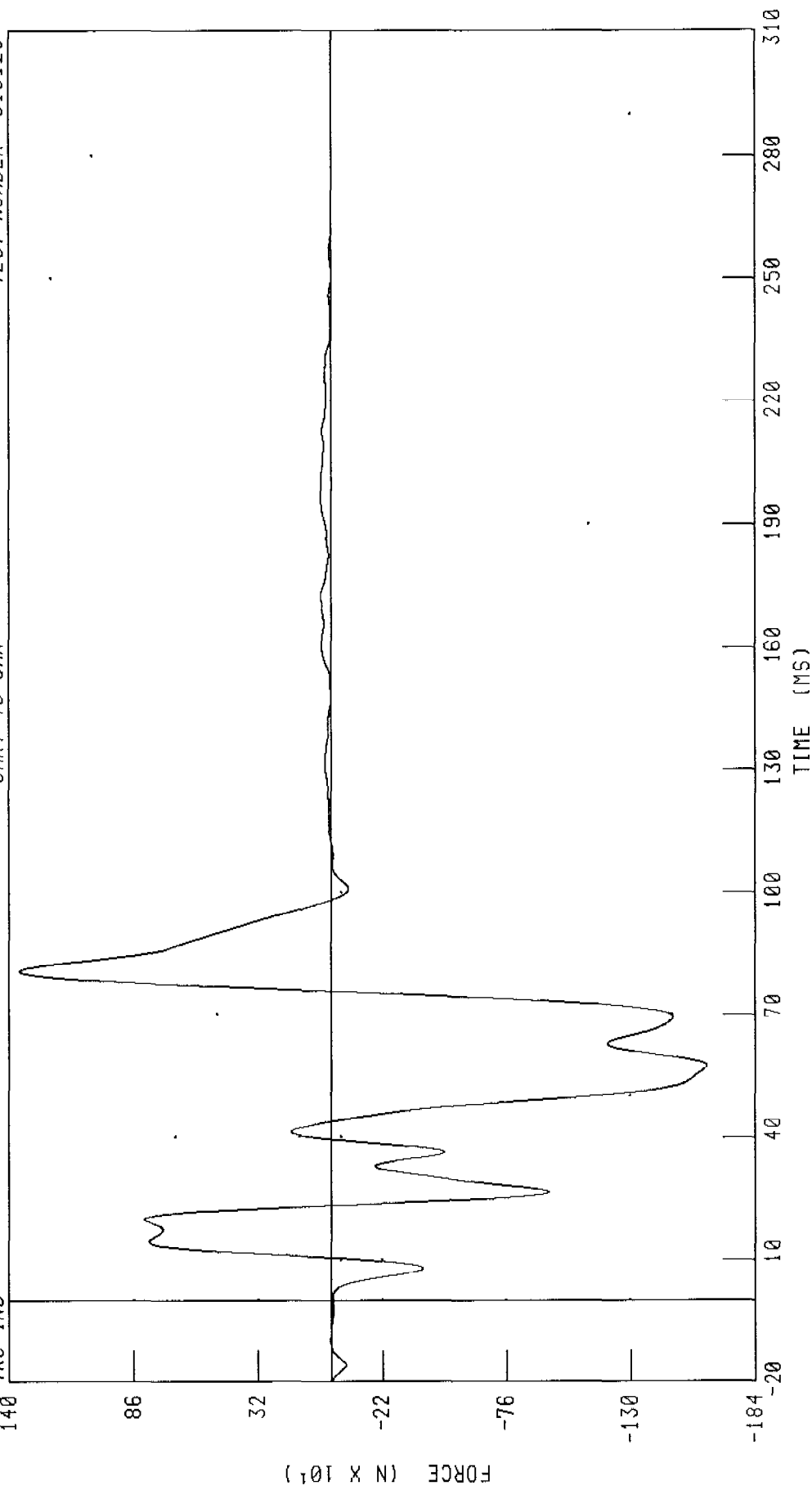
PEAK DATA 3050 98 N 0 31 84 MS, -1648 29 N 0 75 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I1 Z-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



TIME (MS)

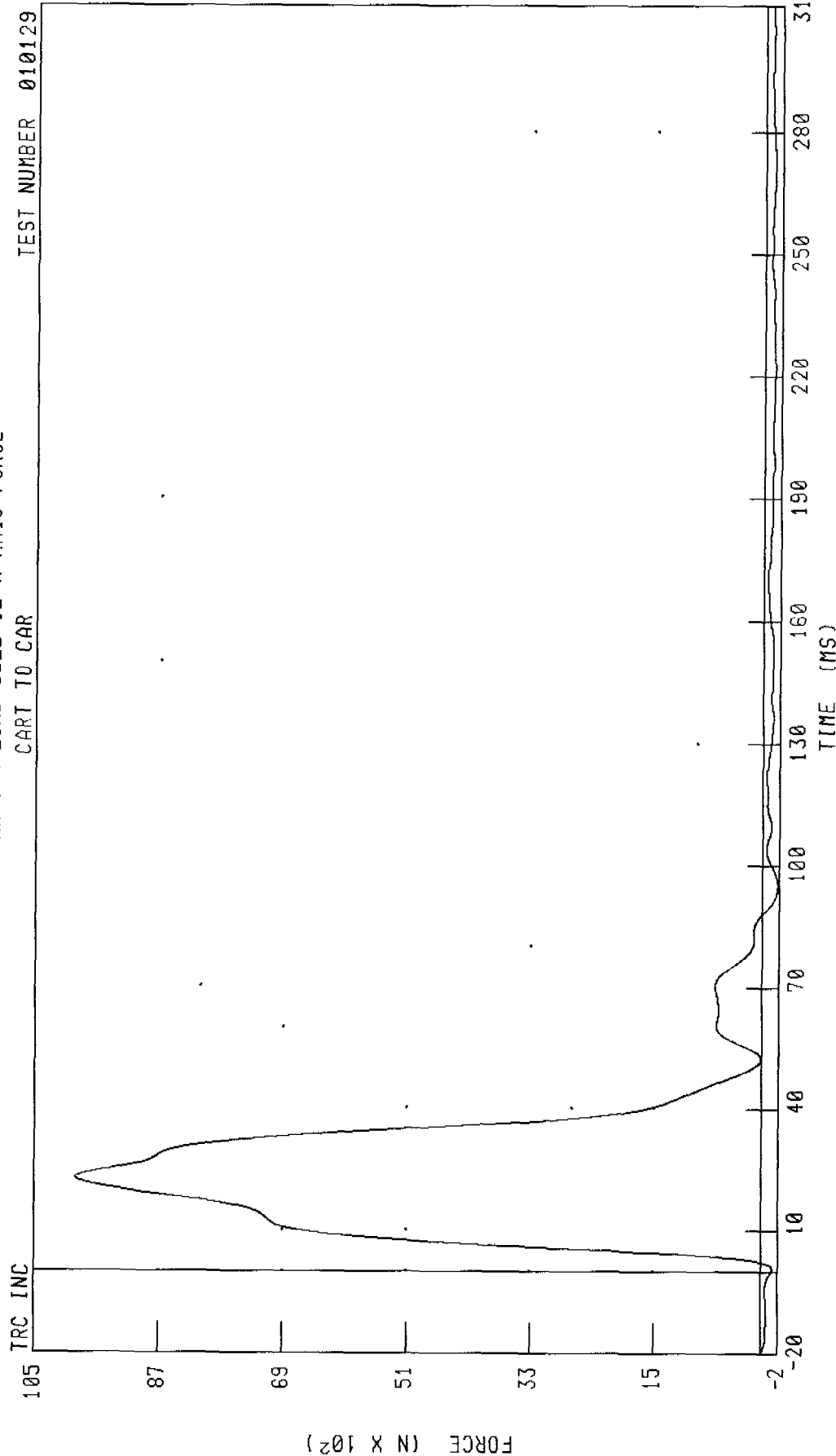
CHANNEL BI1ZF FILTER CH CLASS 60

PEAK DATA 1353 70 N @ 80 64 MS, -1632 32 N @ 57 20 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL 12 X-AXIS FORCE

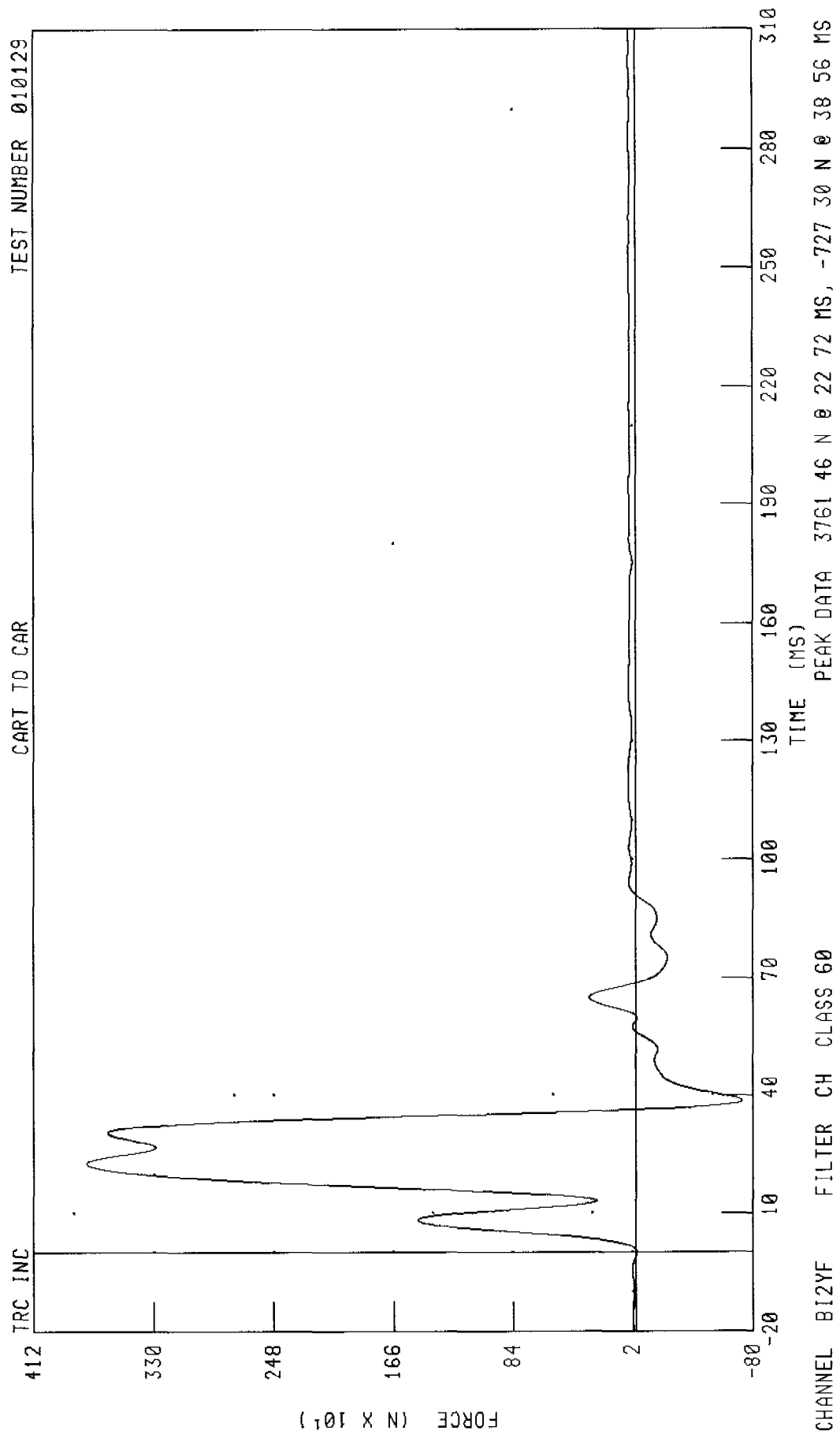
TEST NUMBER 010129

CART TO CAR



CHANNEL B12XF FILTER CH CLASS 60 PEAK DATA 9969 97 N @ 22 80 MS, -220 43 N @ 94 96 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL I2 Y-AXIS FORCE

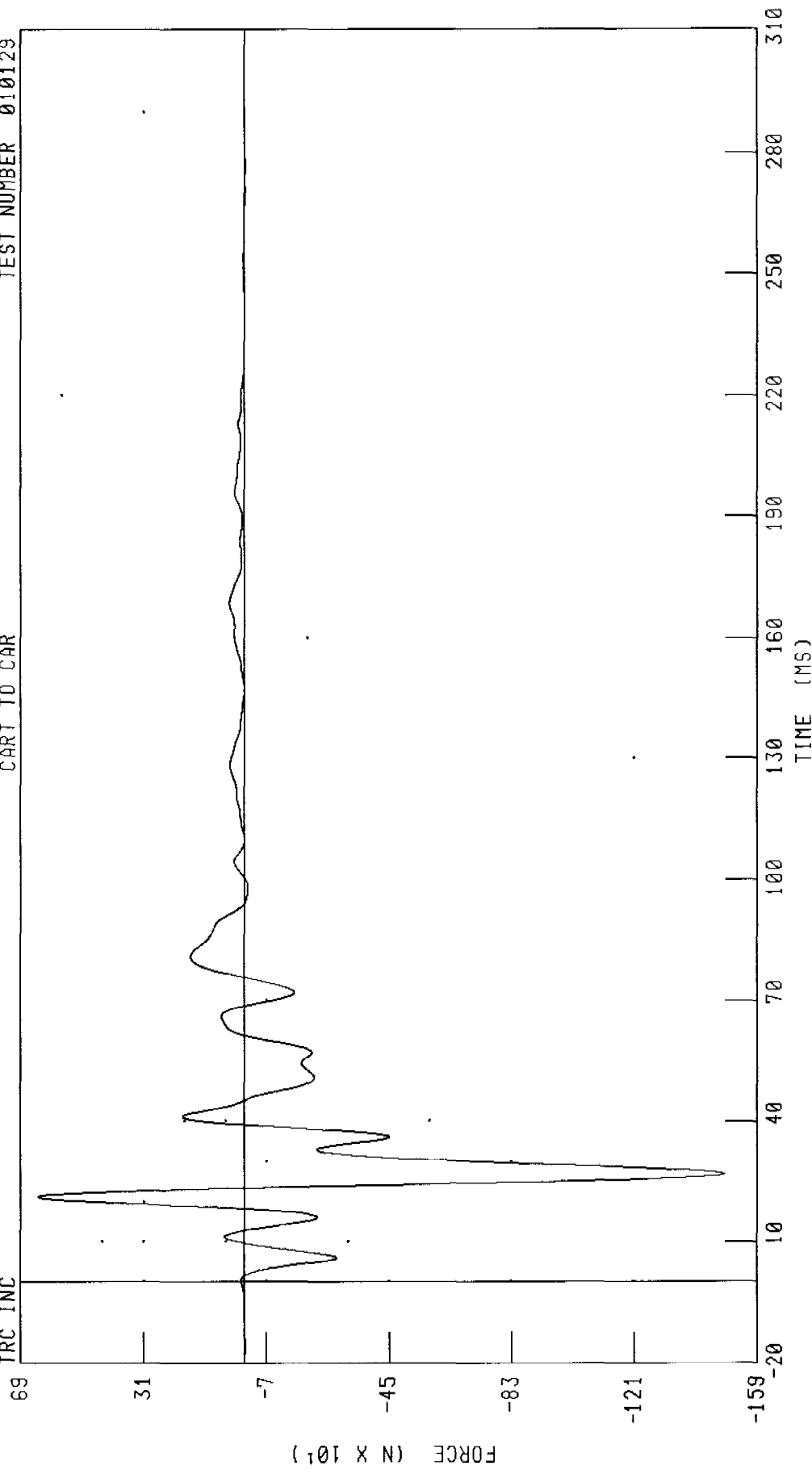


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I2 Z-AXIS FORCE

TRC INC

CART TO CAR

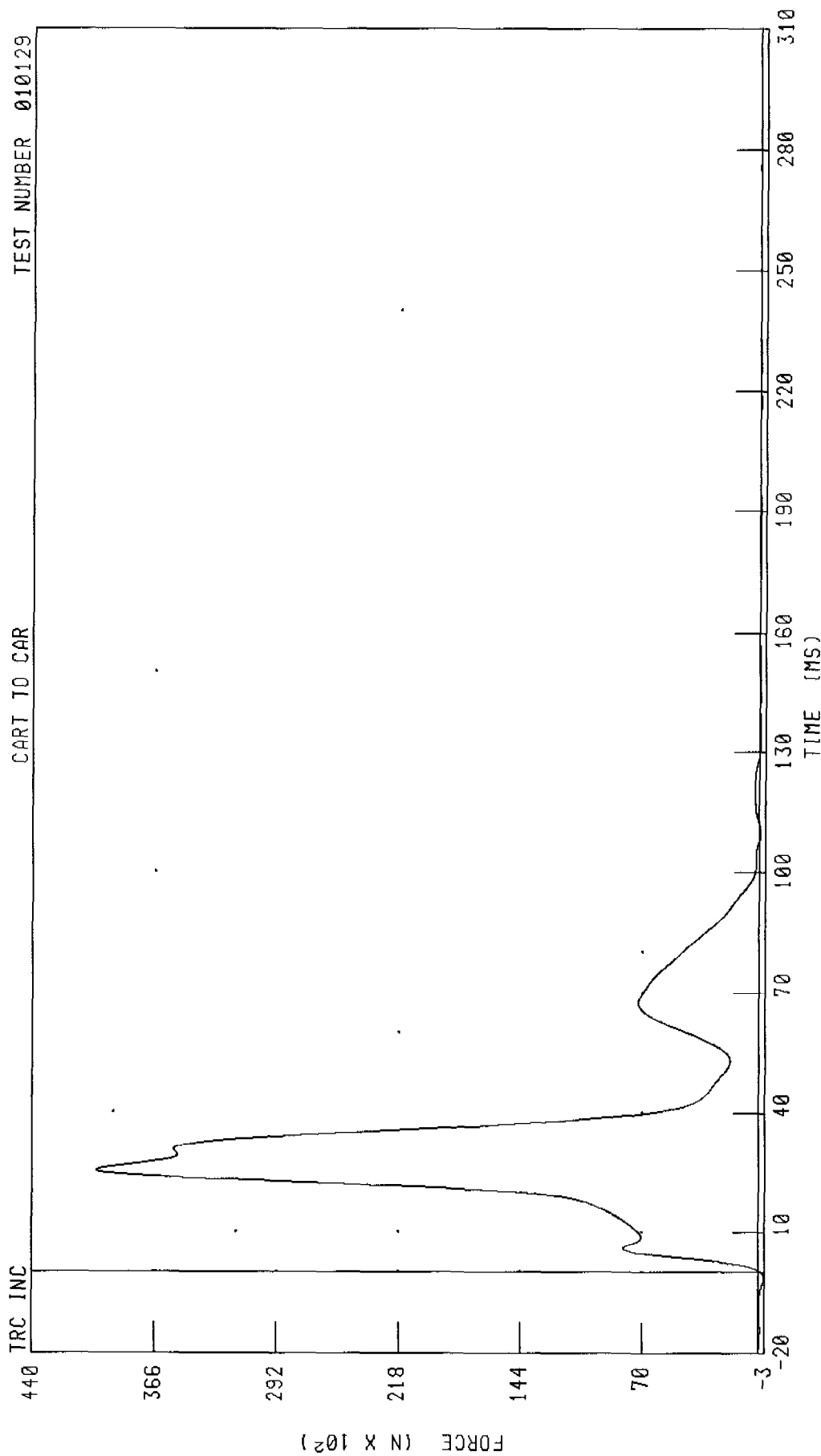
TEST NUMBER 010129



CHANNEL B12ZF FILTER CH CLASS 60

PEAK DATA 635 61 N @ 21 28 MS, -1489 36 N @ 26 88 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I3 X-AXIS FORCE



CHANNEL B13XF FILTER CH CLASS 60

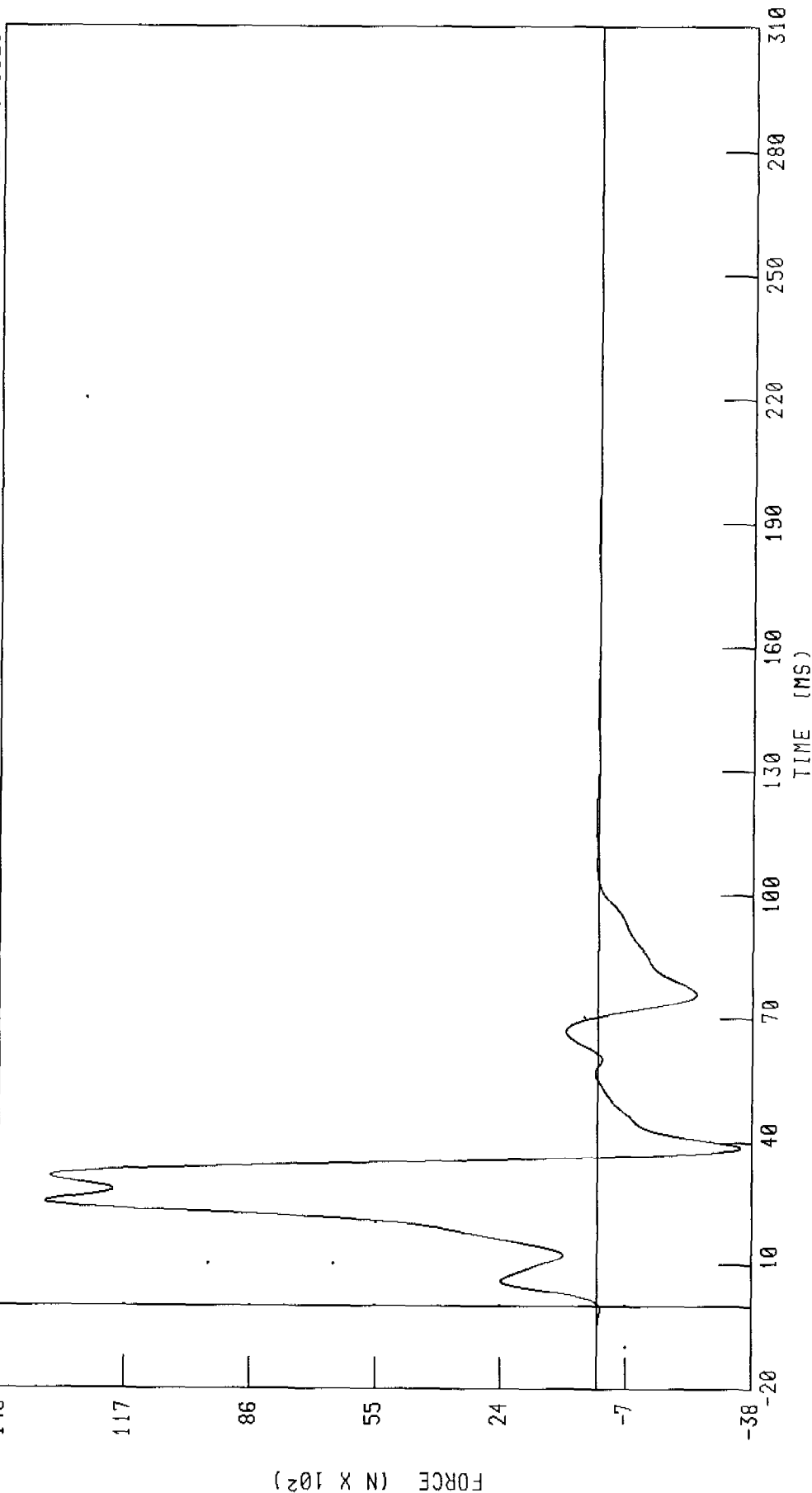
PEAK DATA 40167 59 N @ 25 60 MS, -318 95 N @ -1 28 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL 13 Y-AXIS FORCE

TRC INC

CART TO CAR

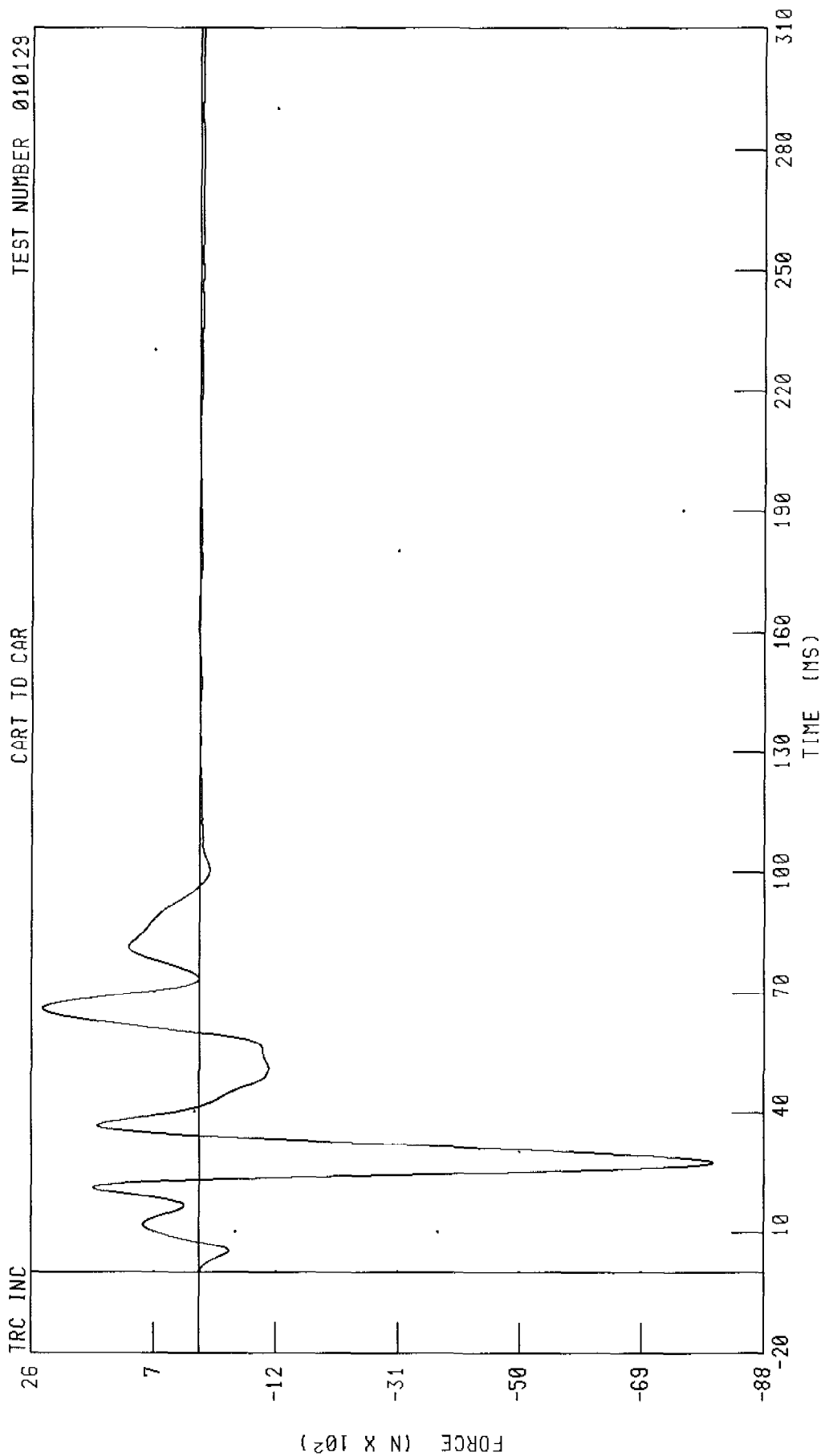
TEST NUMBER 010129



CHANNEL B13YF FILTER CH CLASS 60

PEAK DATA 13652 86 N 0 25 36 MS, -3522 19 N 0 38 56 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I3 Z-AXIS FORCE



CHANNEL B13ZF FILTER CH CLASS 60

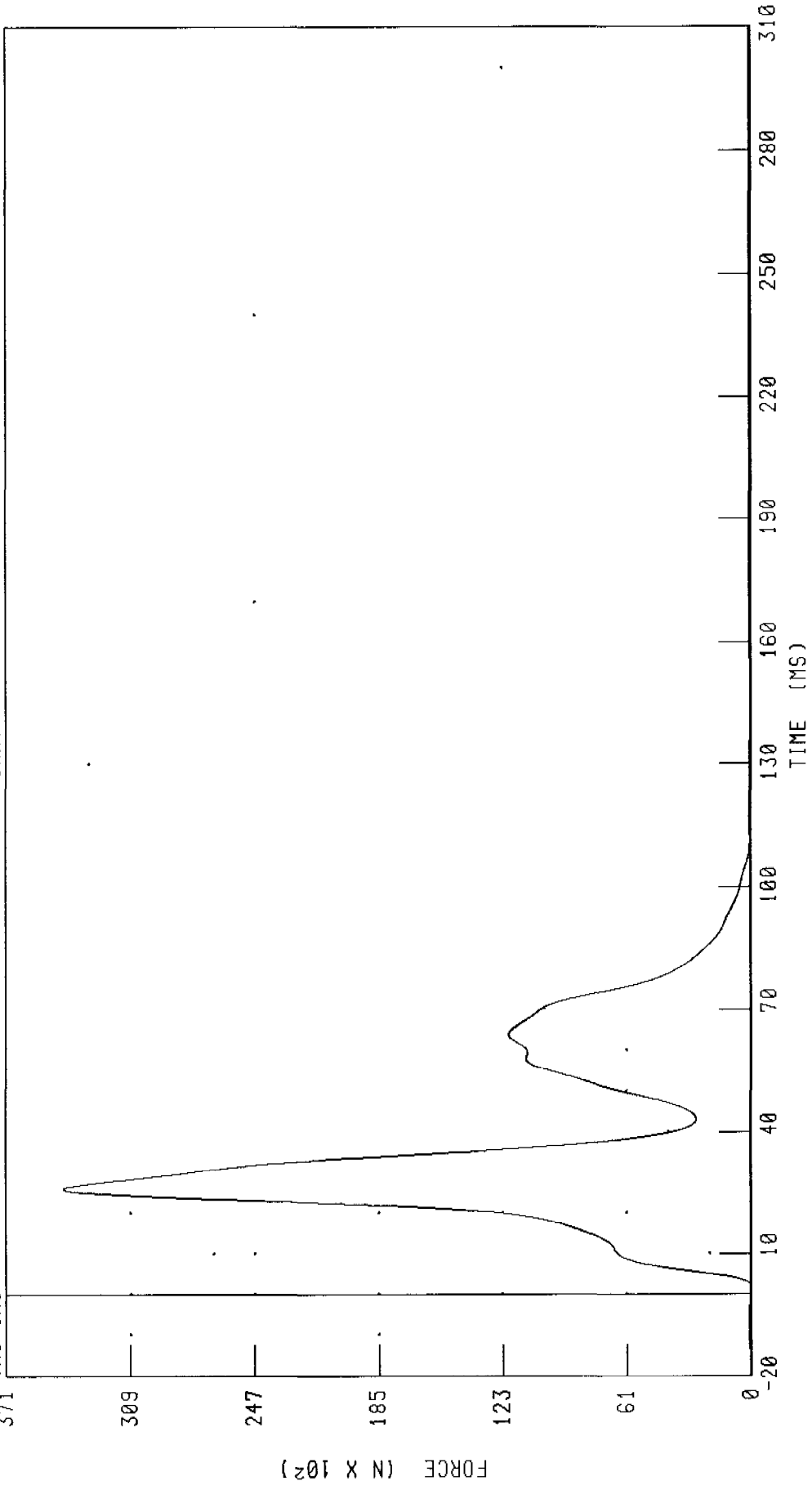
PEAK DATA 2426 60 N @ 66 00 MS, -8009 48 N @ 27 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I4 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



CHANNEL BI4XF FILTER CH CLASS 60

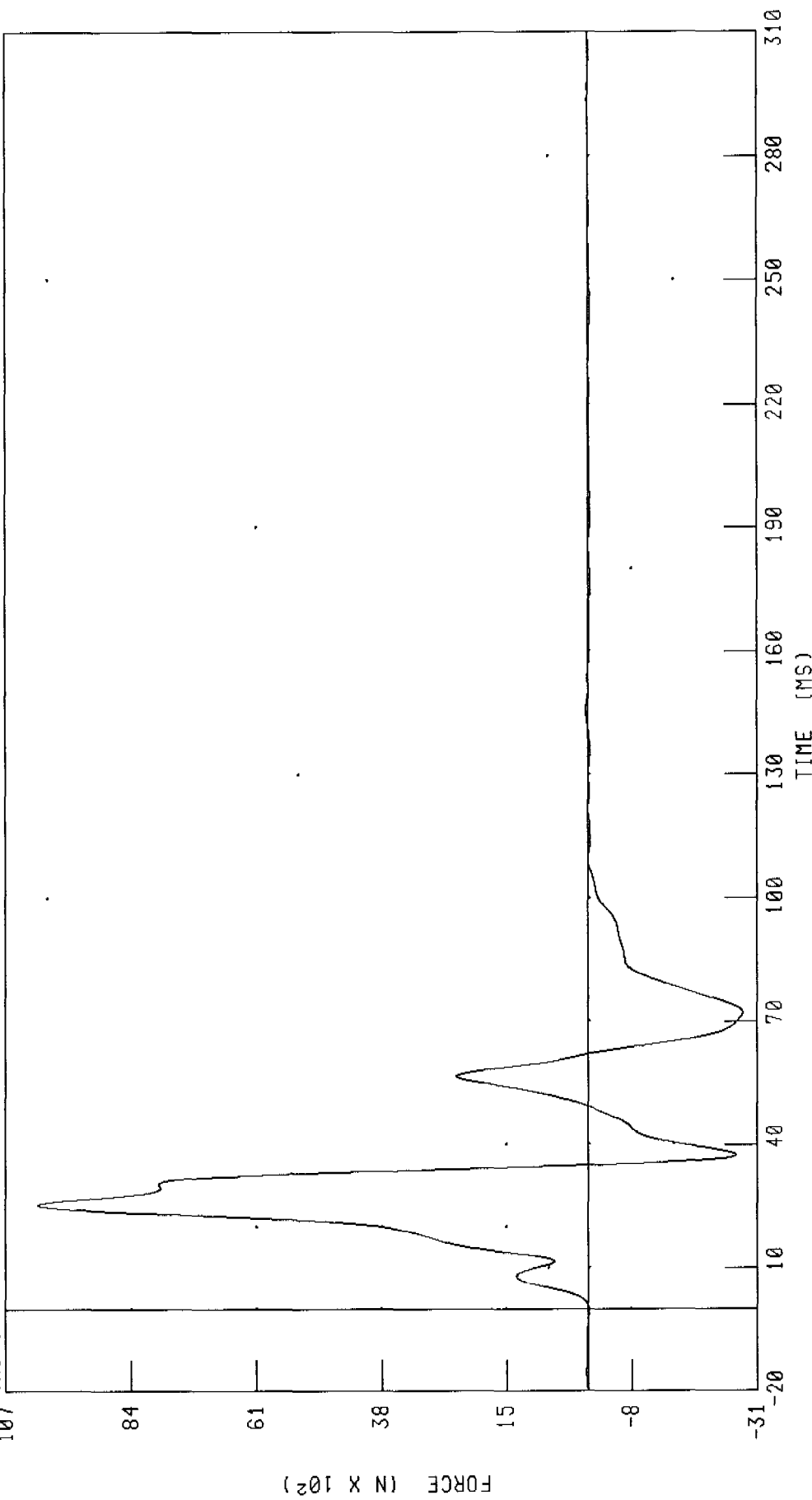
PEAK DATA 34284 23 N 0 25 84 MS, -54 20 N 0 1 04 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I4 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

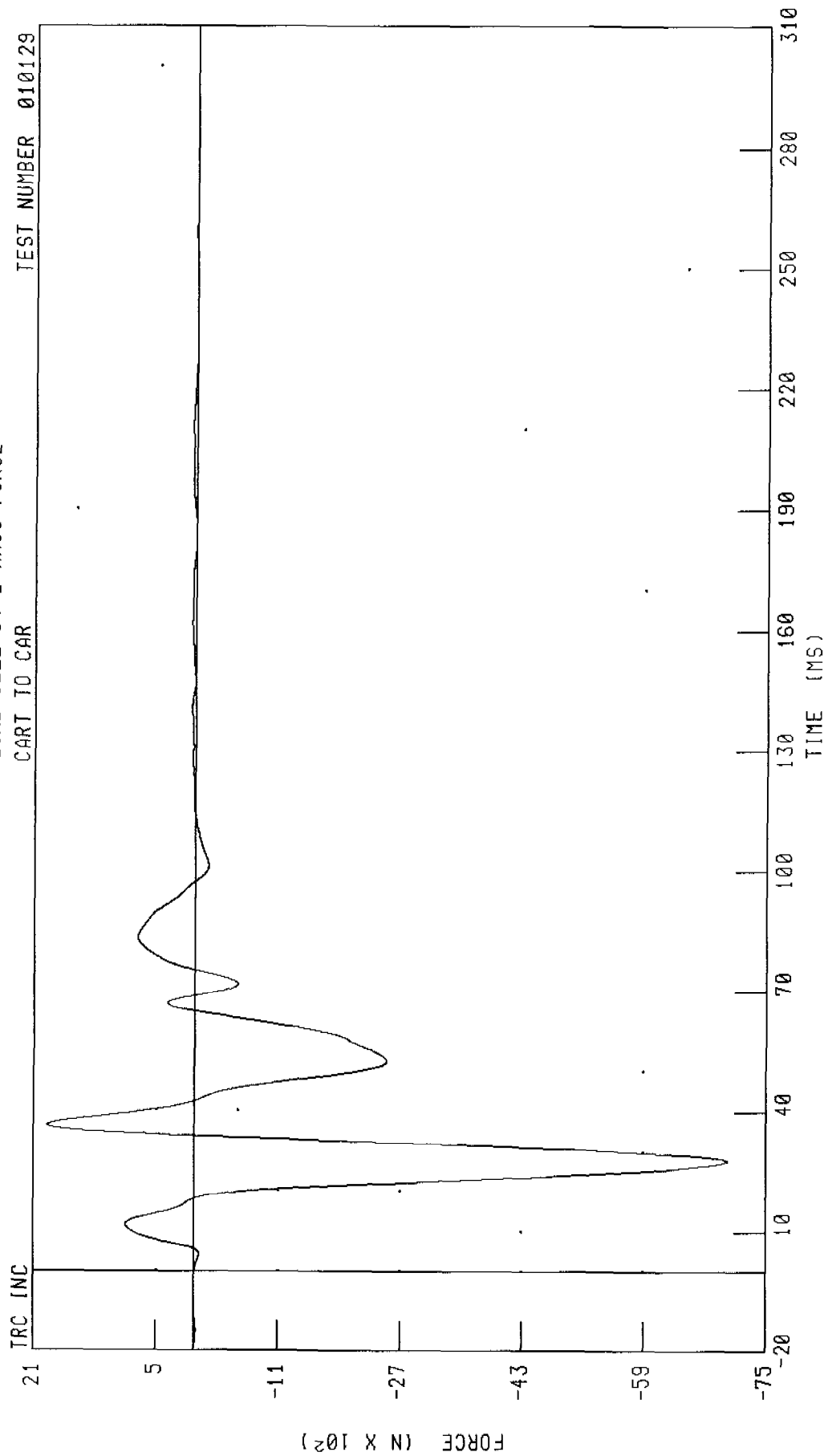


TIME (MS)

PEAK DATA 10109 09 N @ 25 28 MS, -2843 73 N @ 72 00 MS

CHANNEL BI4YF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL I4 Z-AXIS FORCE



CHANNEL BI4ZF FILTER CH CLASS 60

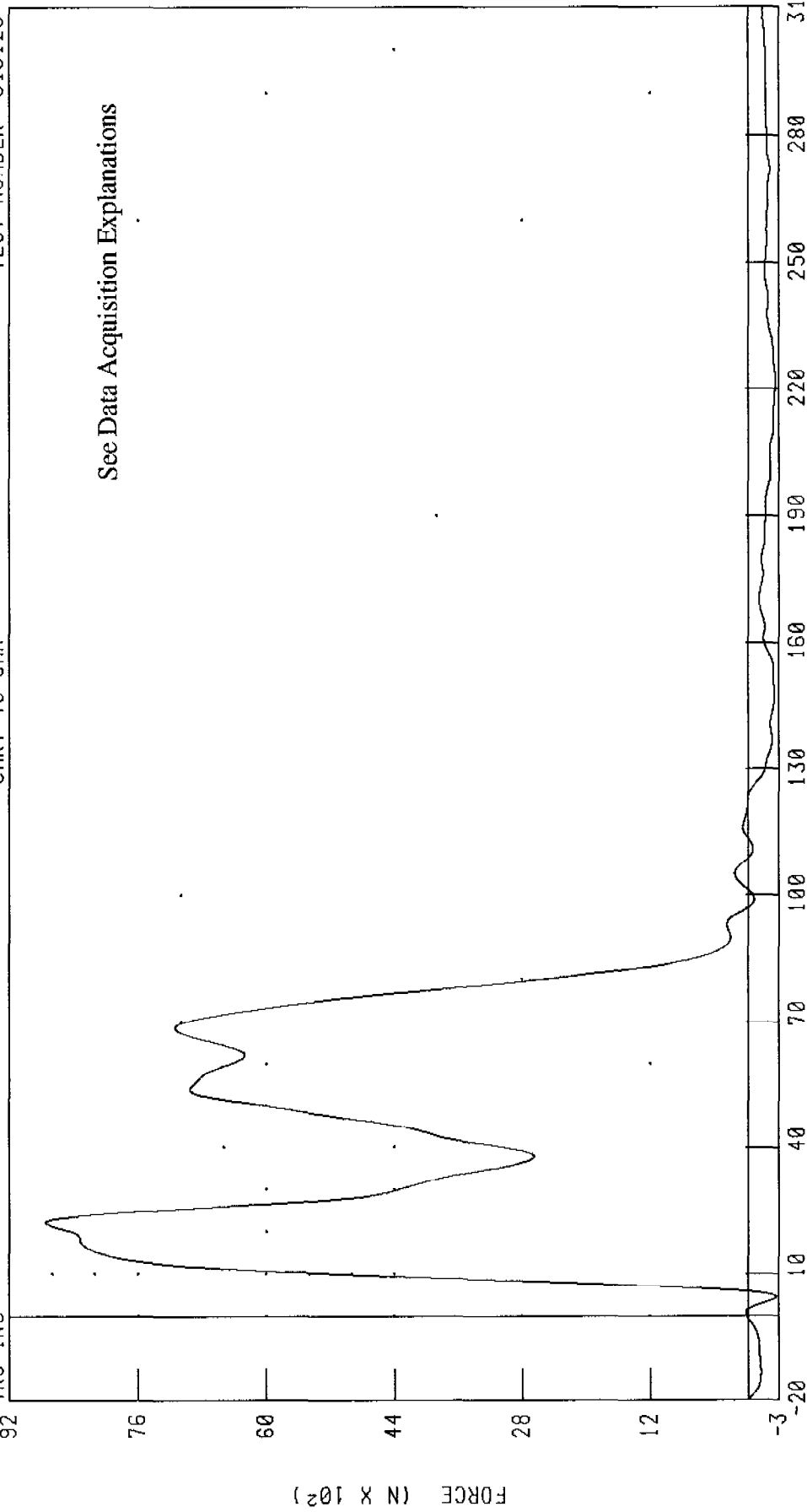
PEAK DATA 1923 02 N 0 36 56 MS, -7003 54 N 0 27 68 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J1 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



See Data Acquisition Explanations

TIME (MS)

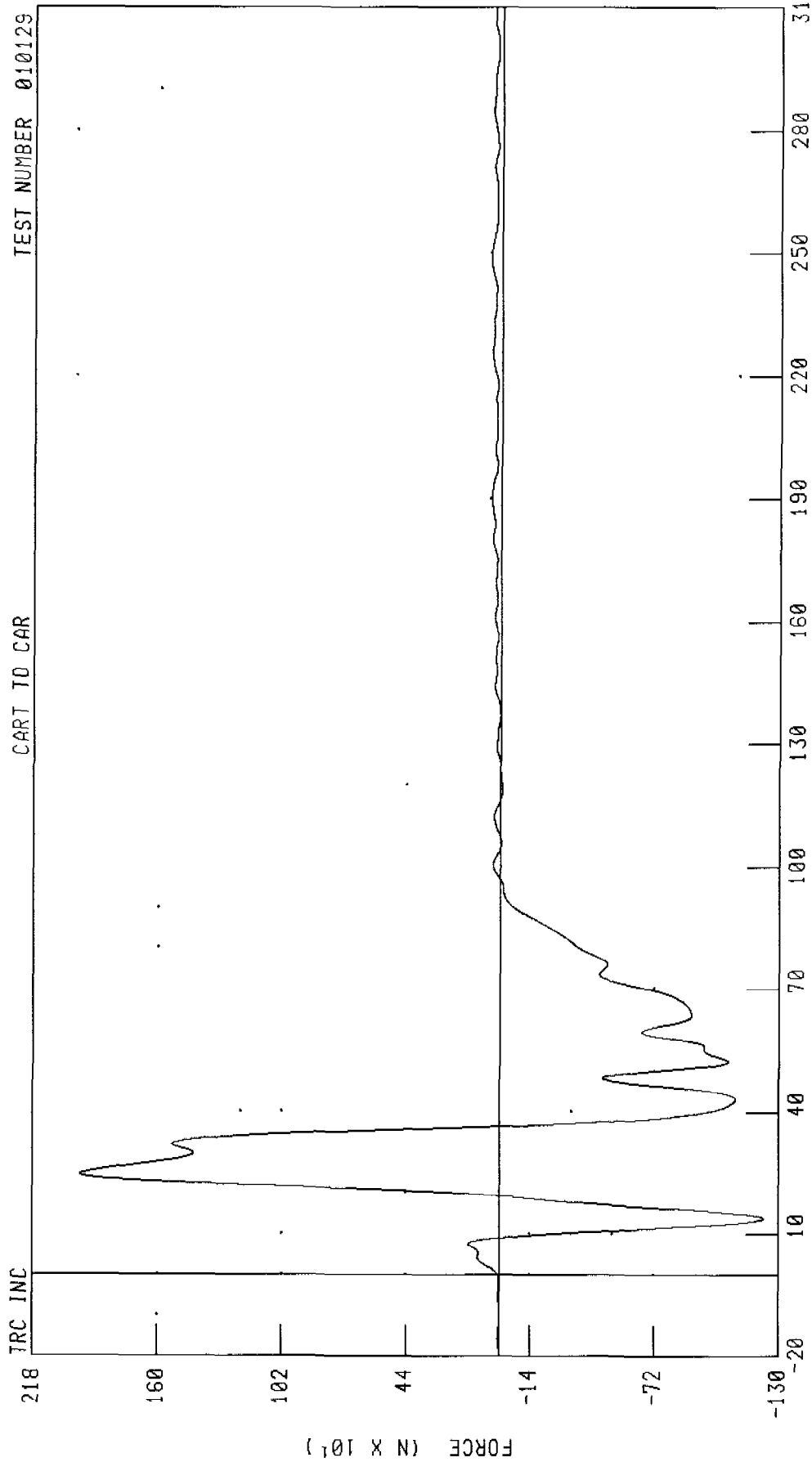
PEAK DATA 8770 04 N @ 22 24 MS, -353 18 N @ 4 48 MS

CHANNEL BJ1XF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL J1 Y-AXIS FORCE

TEST NUMBER 010129

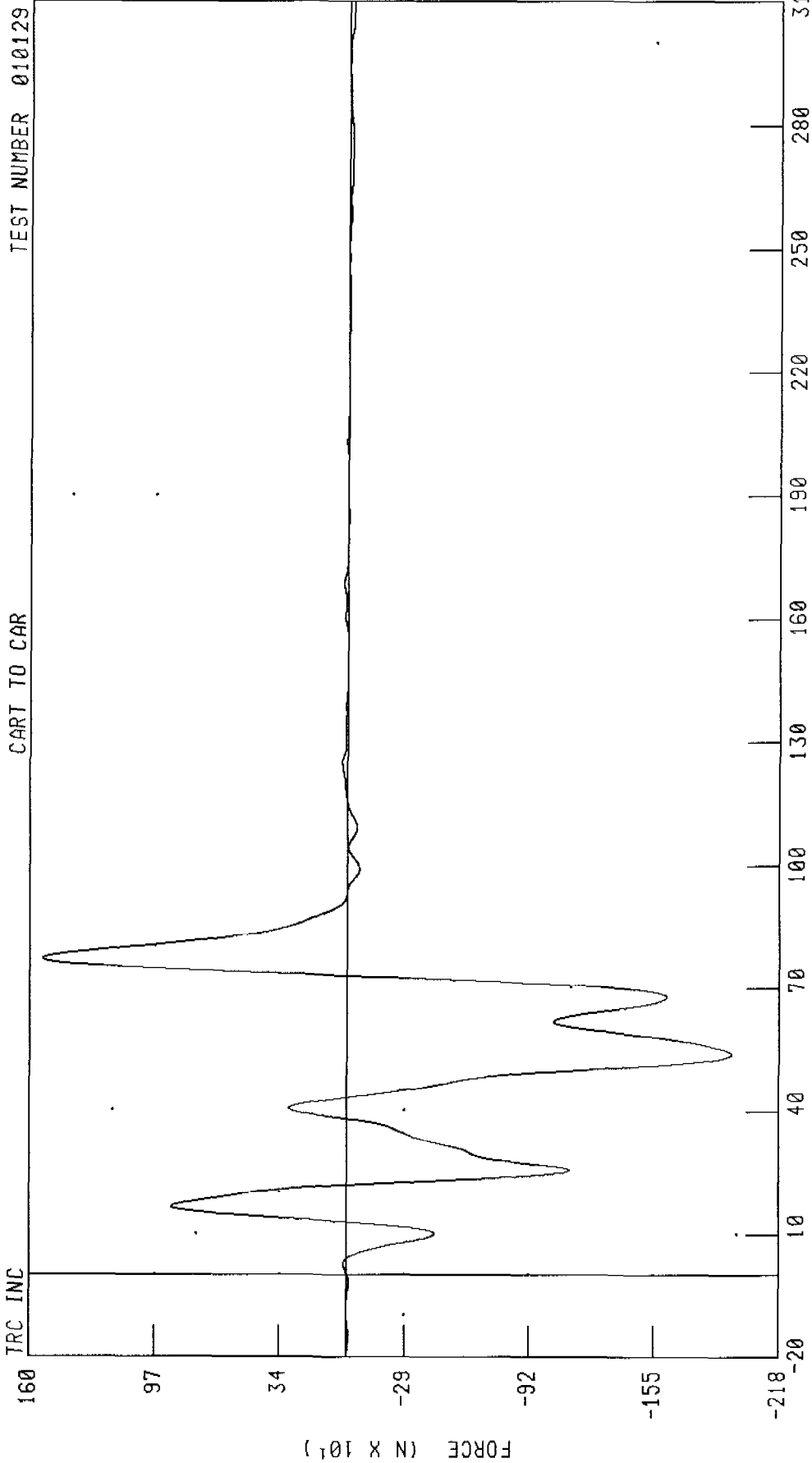
CART TO CAR



TIME (MS)

CHANNEL BJ1VF FILTER CH CLASS 60 PEAK DATA 1958 71 N 0 24 56 MS, -1233 54 N 0 13 68 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL J1 Z-AXIS FORCE
 CART TO CAR



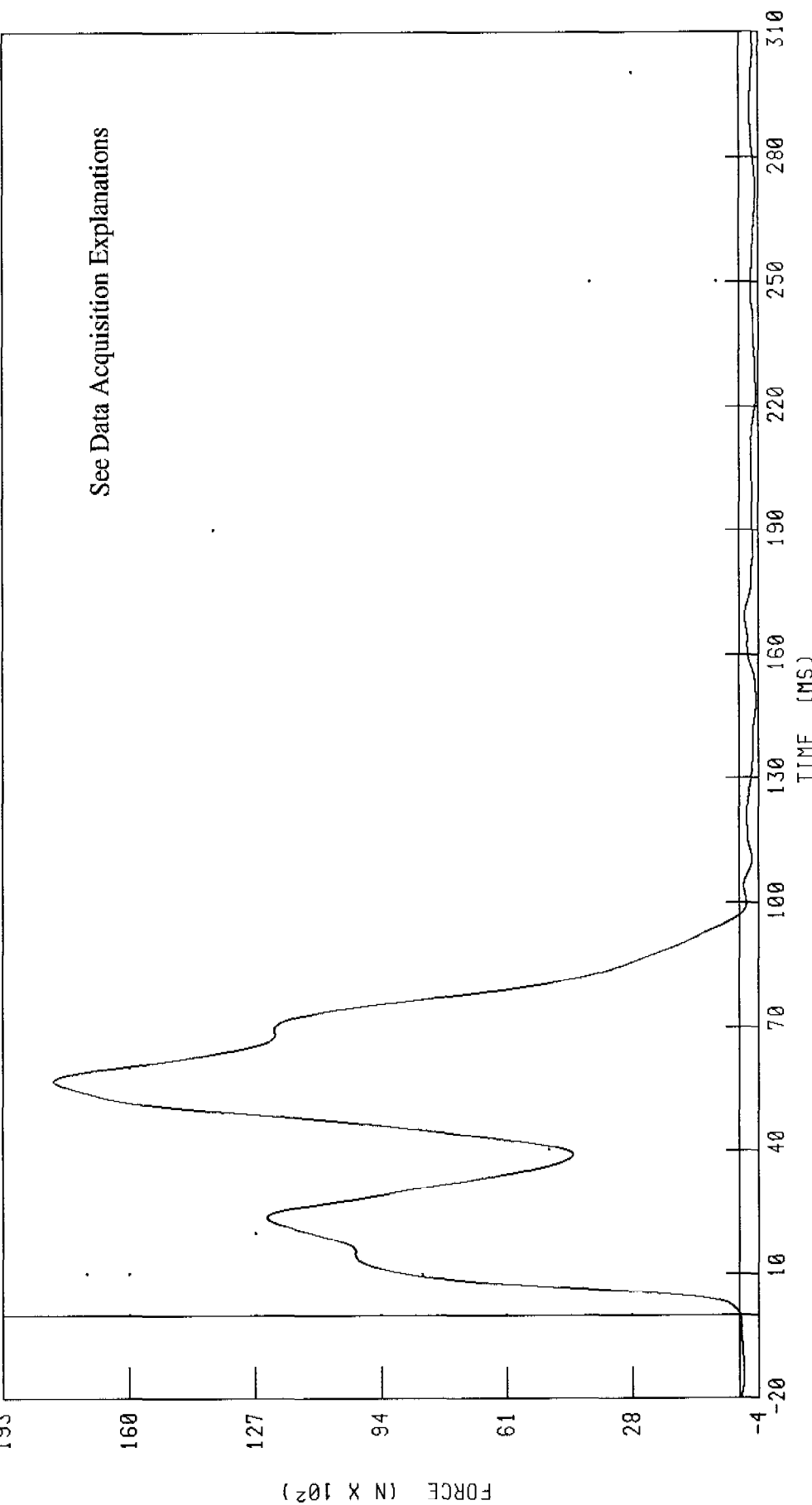
CHANNEL BJ1ZF FILTER CH CLASS 60 PEAK DATA 1539 86 N @ 77 04 MS, -1941 33 N @ 54 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J2 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BJ2XF FILTER CH CLASS 60

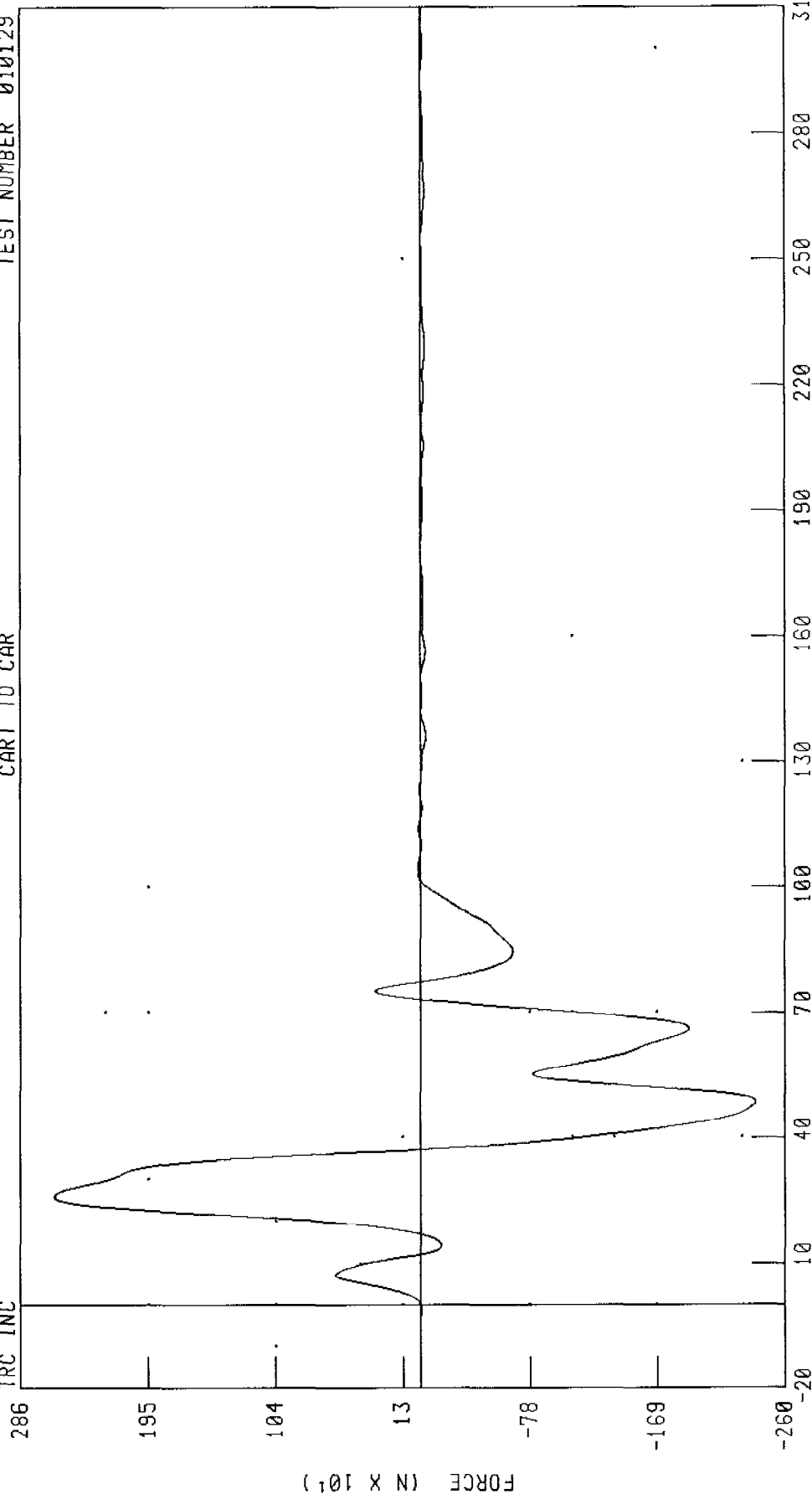
PEAK DATA 18003 29 N 0 56 80 MS, -448 11 N 0 222 96 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J2 Y-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



TIME (MS)

PEAK DATA 2619 33 N 0 26 00 MS, -2396 05 N 0 48 64 MS

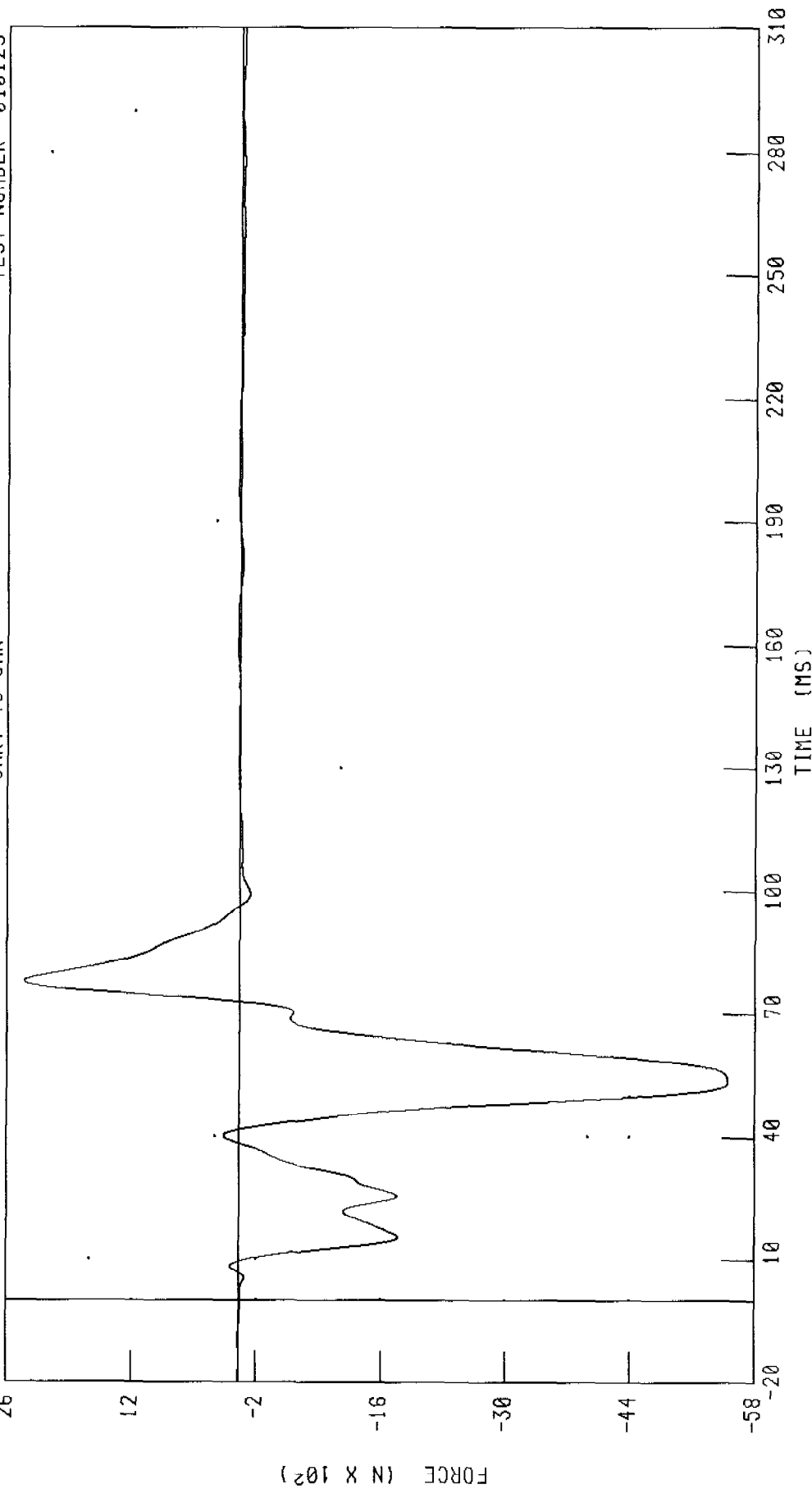
CHANNEL BJ2YF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J2 Z-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



TIME (MS)

PEAK DATA 2405 10 N @ 77 92 MS, -5498 15 N @ 53 60 MS

CHANNEL BJ2ZF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J3 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

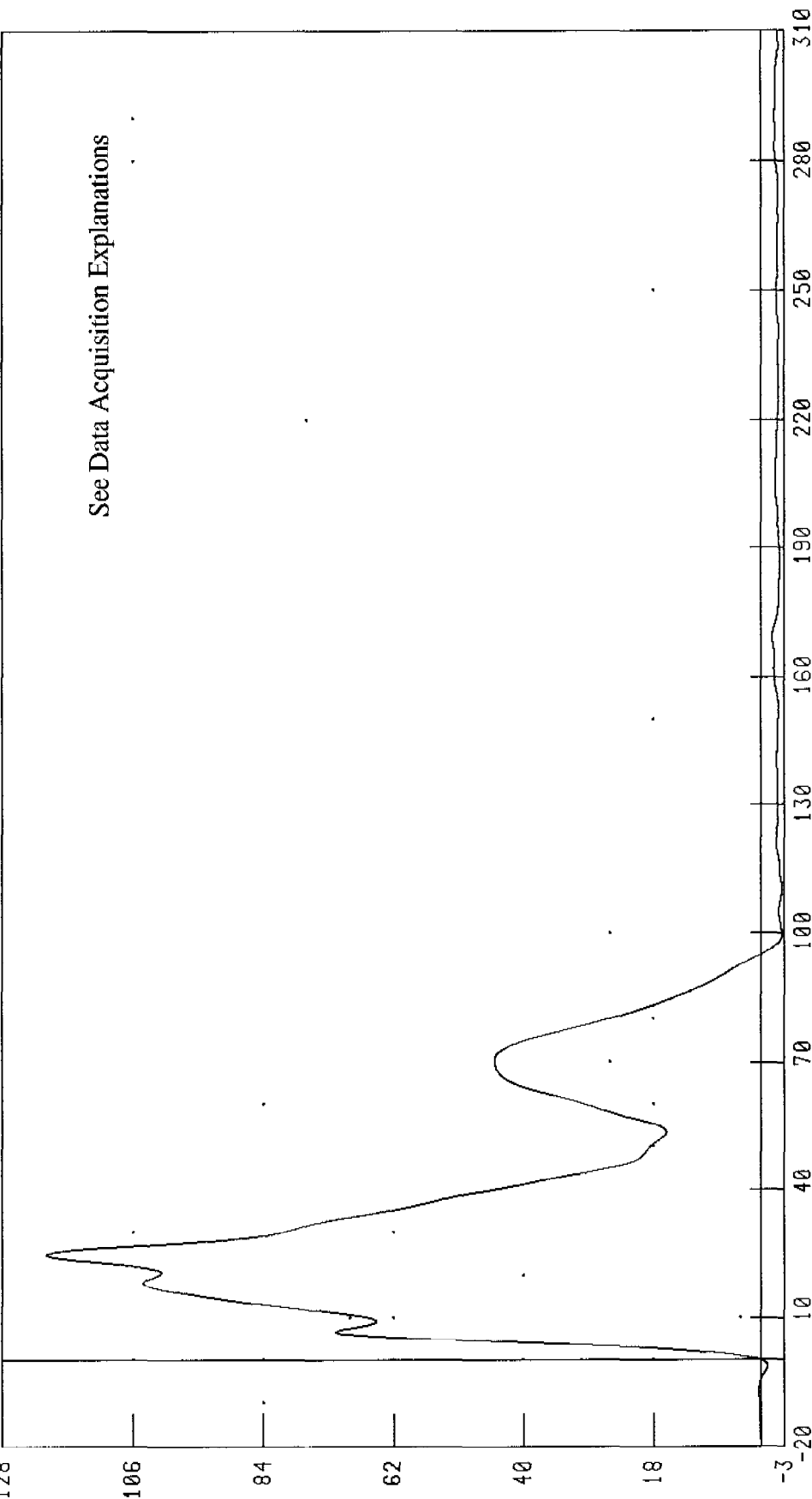
See Data Acquisition Explanations

FORCE (N X 10²)

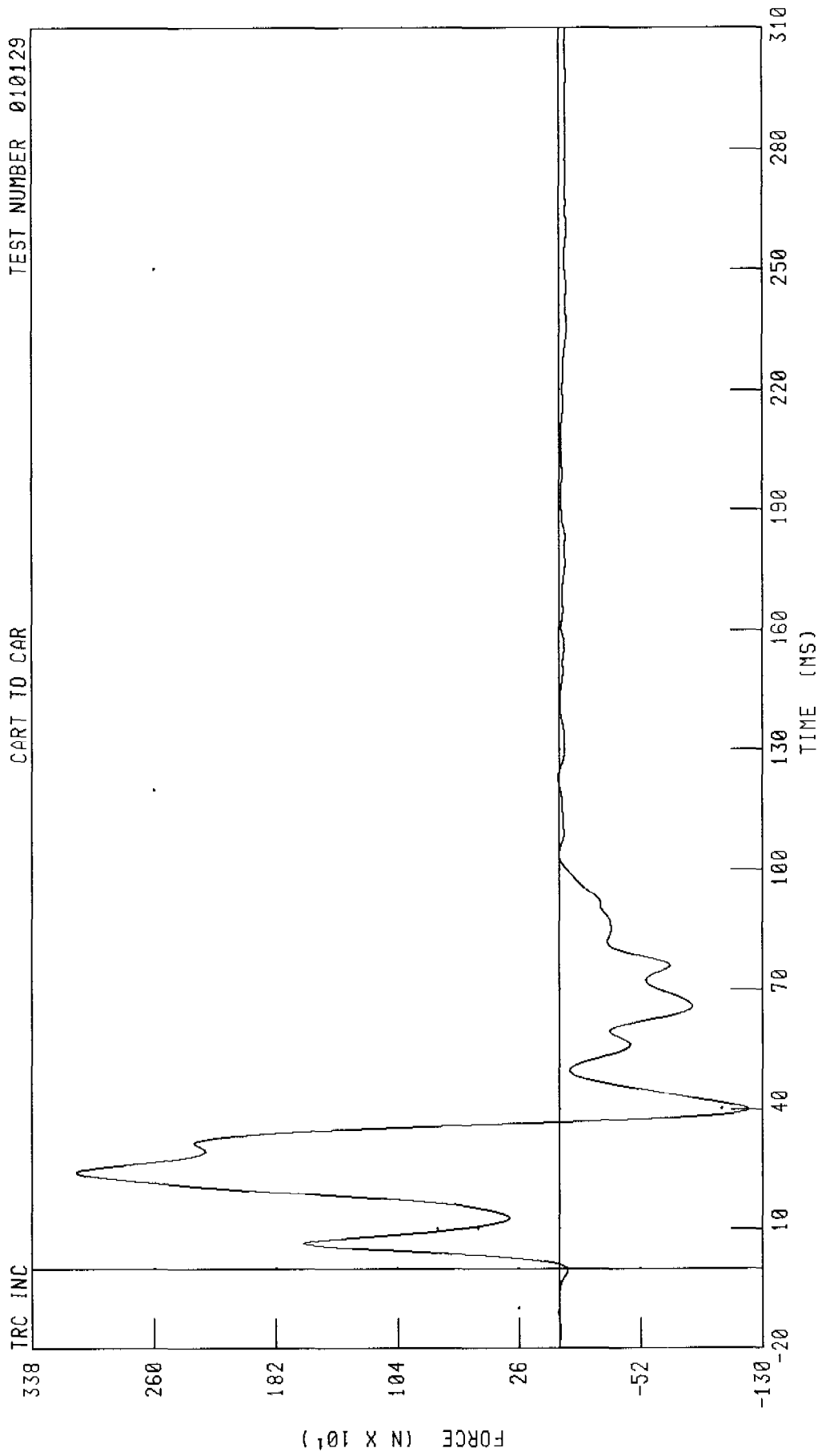
TIME (MS)

CHANNEL BJ3XF FILTER CH CLASS 60

PEAK DATA 12087 94 N @ 24 80 MS, -345 56 N @ 110 56 MS

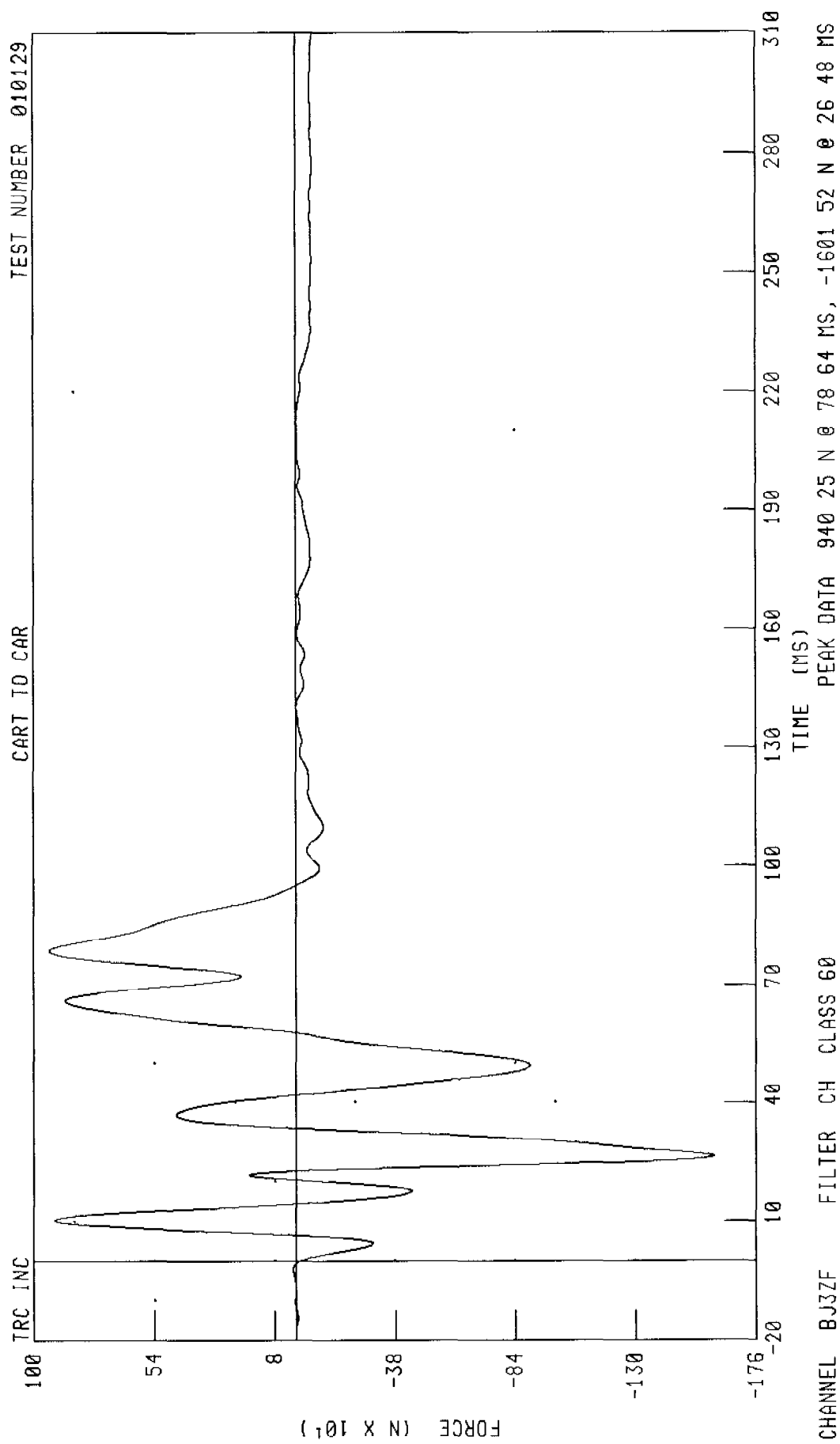


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J3 Y-AXIS FORCE



CHANNEL BJ3YF FILTER CH CLASS 60 PEAK DATA 3098 02 N 0 24 24 MS, -1209 50 N 0 39 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J3 Z-AXIS FORCE

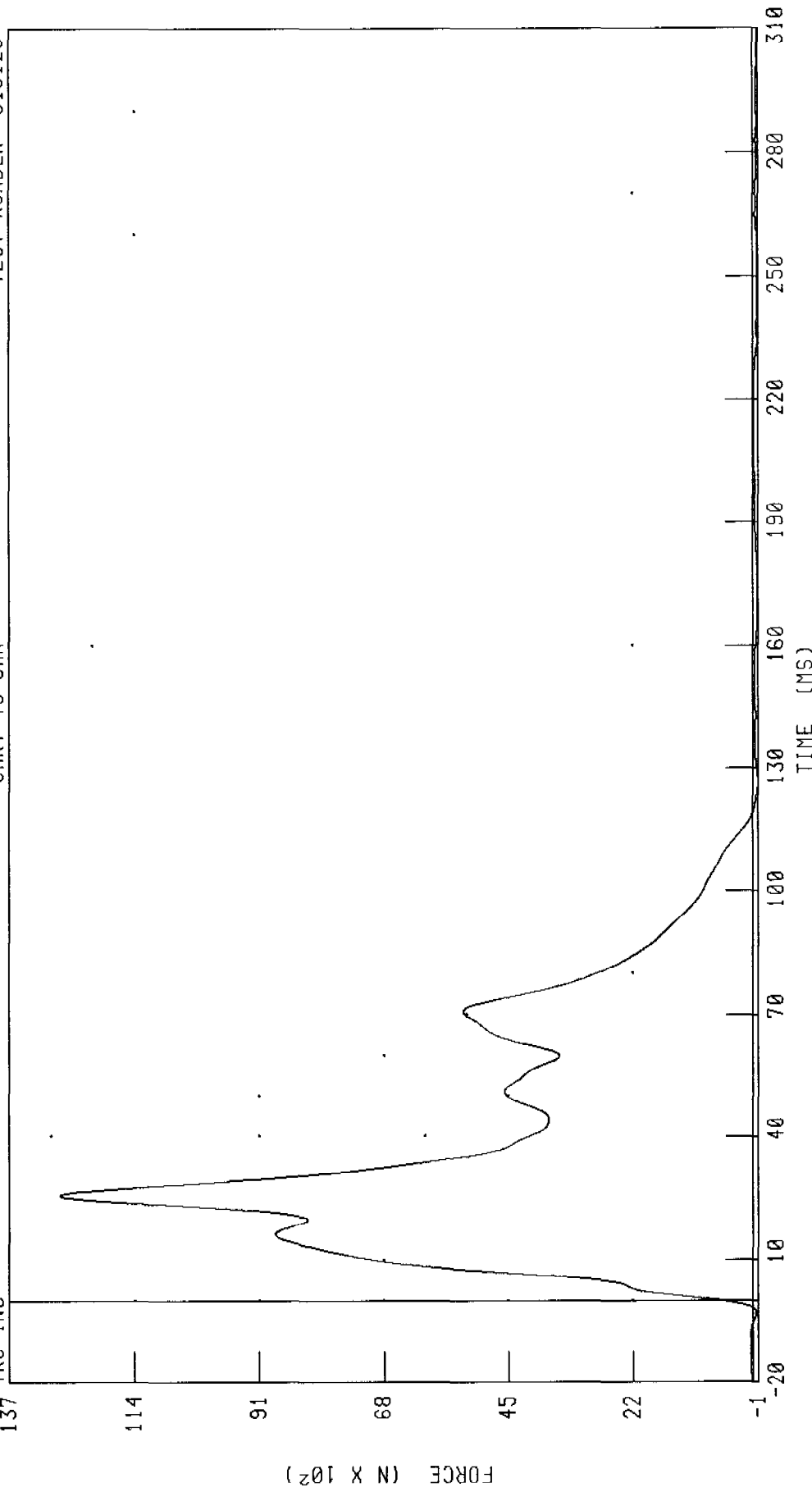


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J4 X-AXIS FORCE

TRC INC

CART TO CAR

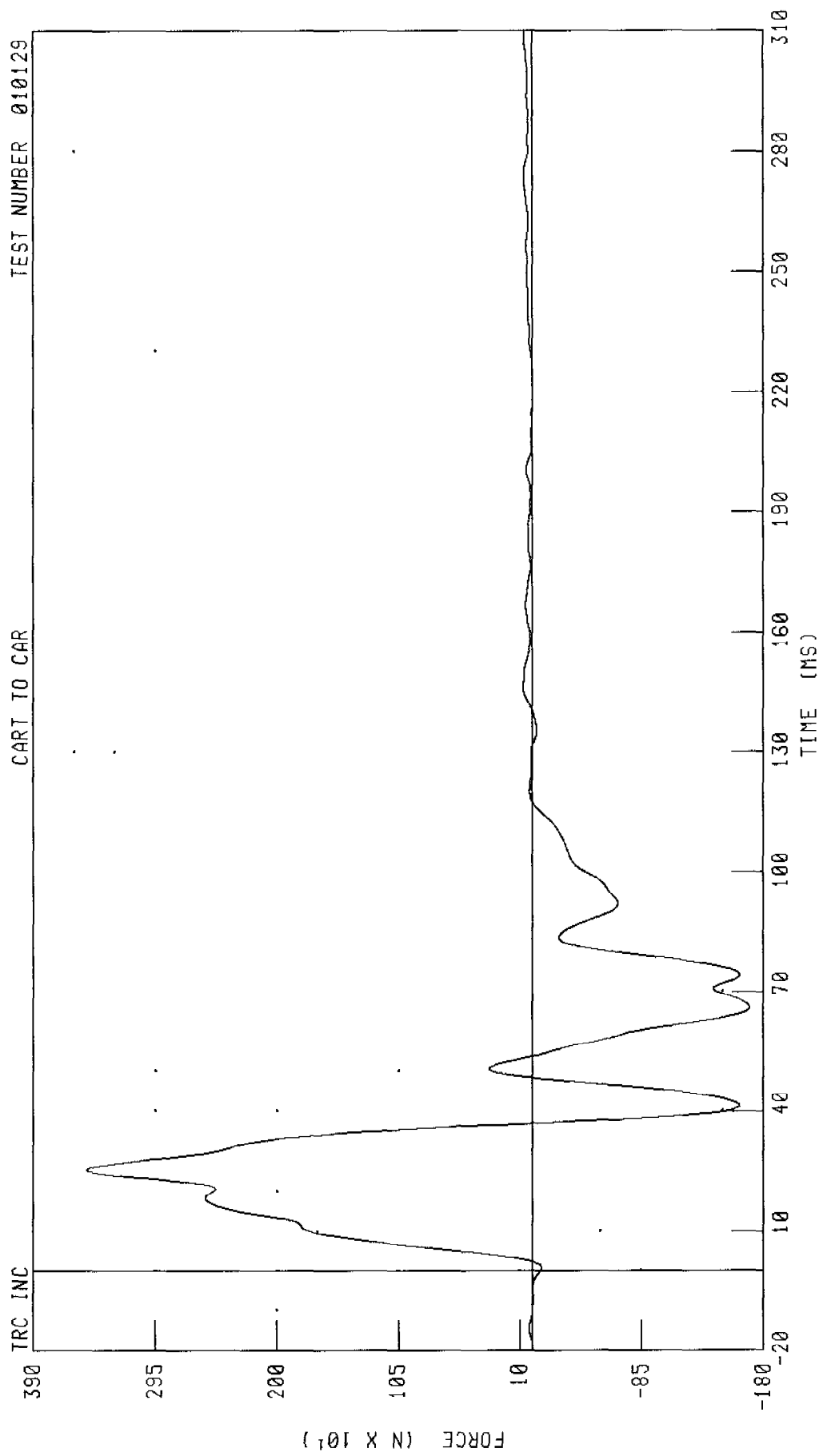
TEST NUMBER 010129



CHANNEL BJ4XF FILTER CH CLASS 60

PEAK DATA 12775 01 N @ 25 44 MS, -99 68 N @ 126 56 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL J4 Y-AXIS FORCE



TRC INC

CART TO CAR

TEST NUMBER 0110129

CHANNEL BJ4VF FILTER CH CLASS 60

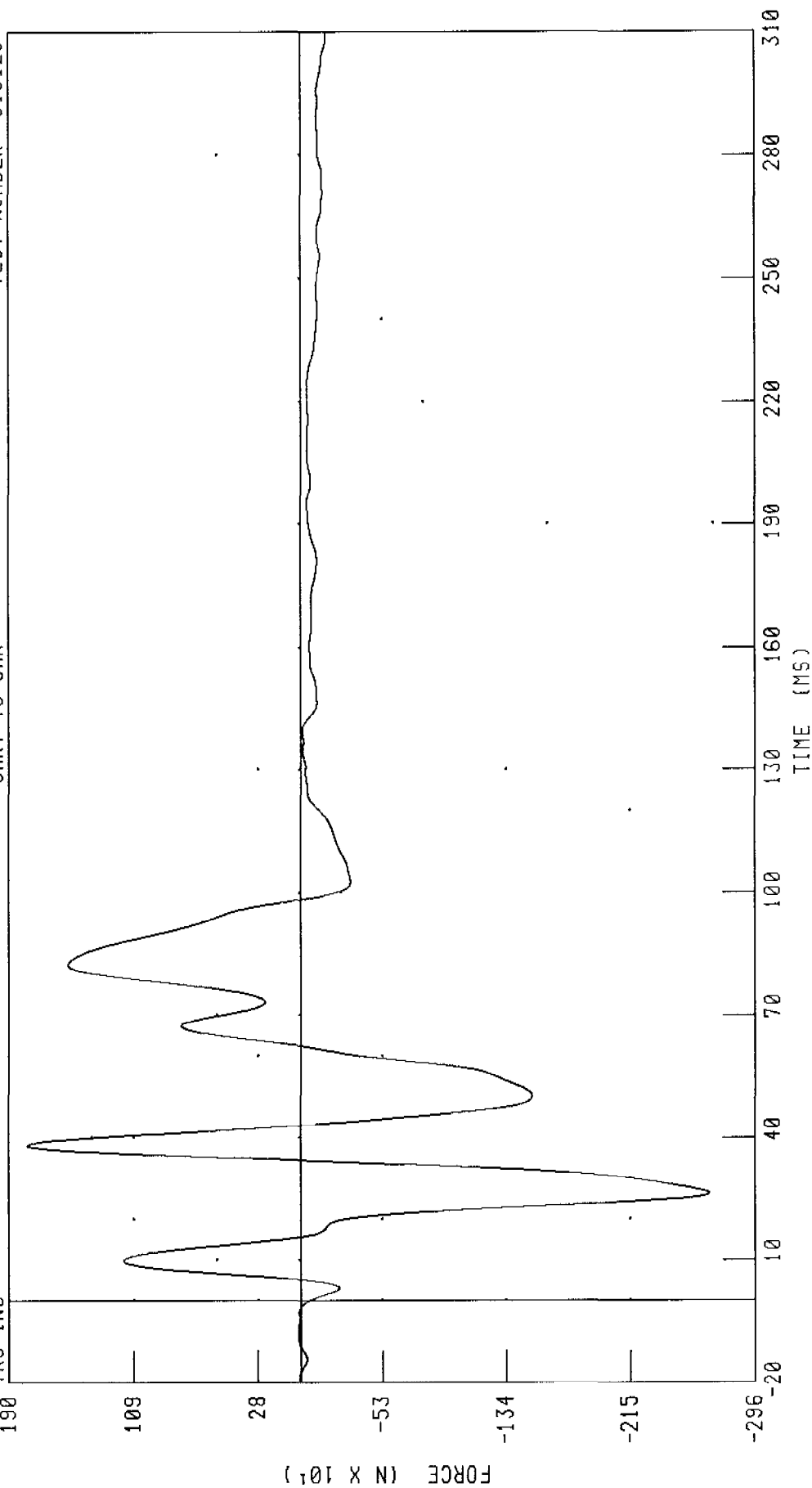
PEAK DATA 3485 60 N @ 25 36 MS, -1696 28 N @ 65 84 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL J4 Z-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



TIME (MS)

CHANNEL BJ4ZF FILTER CH CLASS 60

PEAK DATA 1781 48 N @ 38 16 MS, -2664 12 N @ 26 24 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K1 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

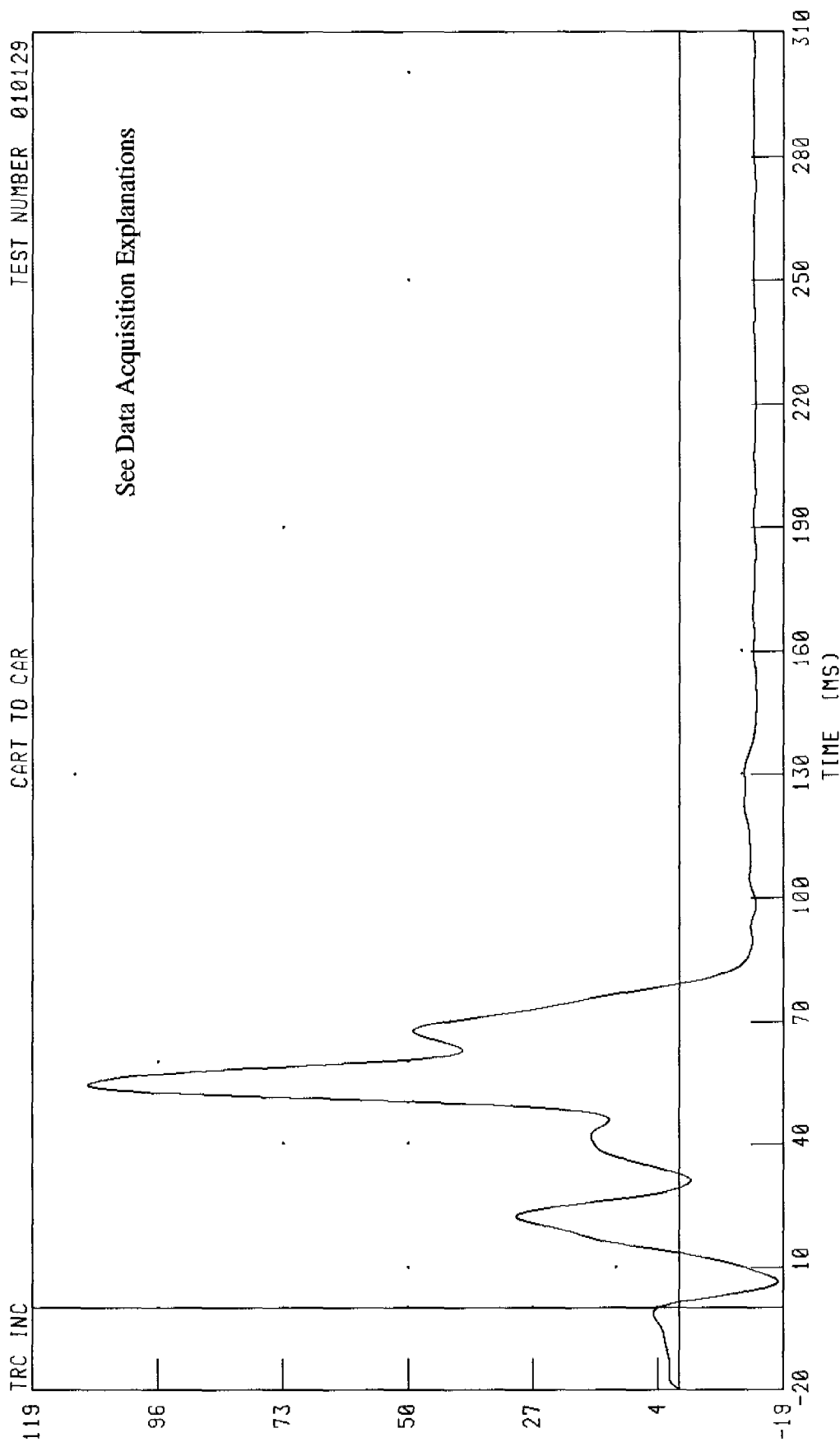
See Data Acquisition Explanations

FORCE (N X 10²)

TIME (MS)

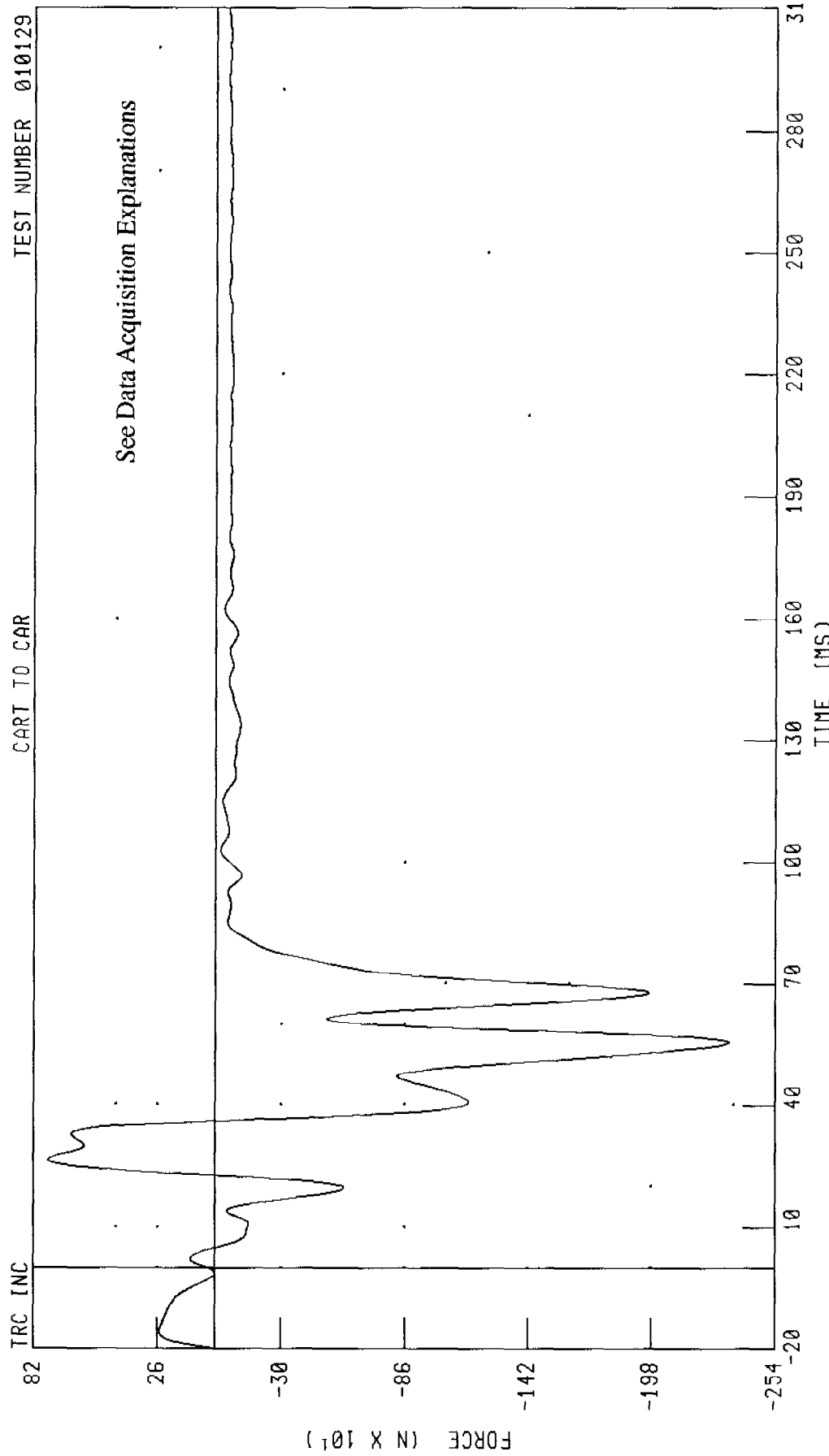
CHANNEL BK1XF FILTER CH CLASS 60

PEAK DATA 10887 73 N 0 54 24 MS, -1803 85 N 0 6 40 MS



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL K1 Y-AXIS FORCE
 CART TO CAR

TEST NUMBER 010129



CHANNEL BK1YF FILTER CH CLASS 60 PEAK DATA 753 58 N 0 26 64 MS, -2329 81 N 0 55 52 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K1 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

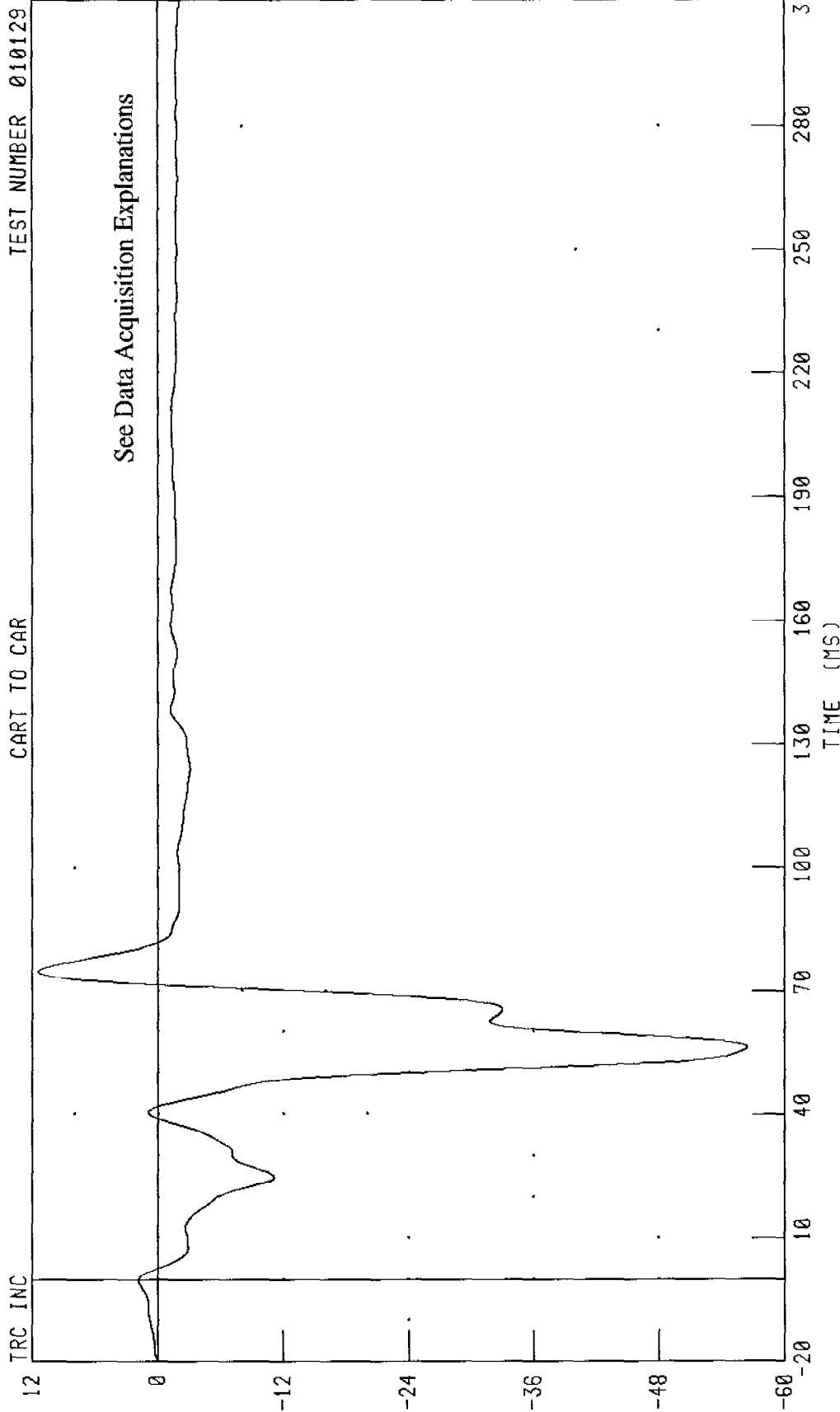
See Data Acquisition Explanations

FORCE (N X 10²)

TIME (MS)

CHANNEL BK1ZF FILTER CH CLASS 60

PEAK DATA 1141 04 N 0 74 88 MS, -5646 40 N 0 56 16 MS



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K3 X-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

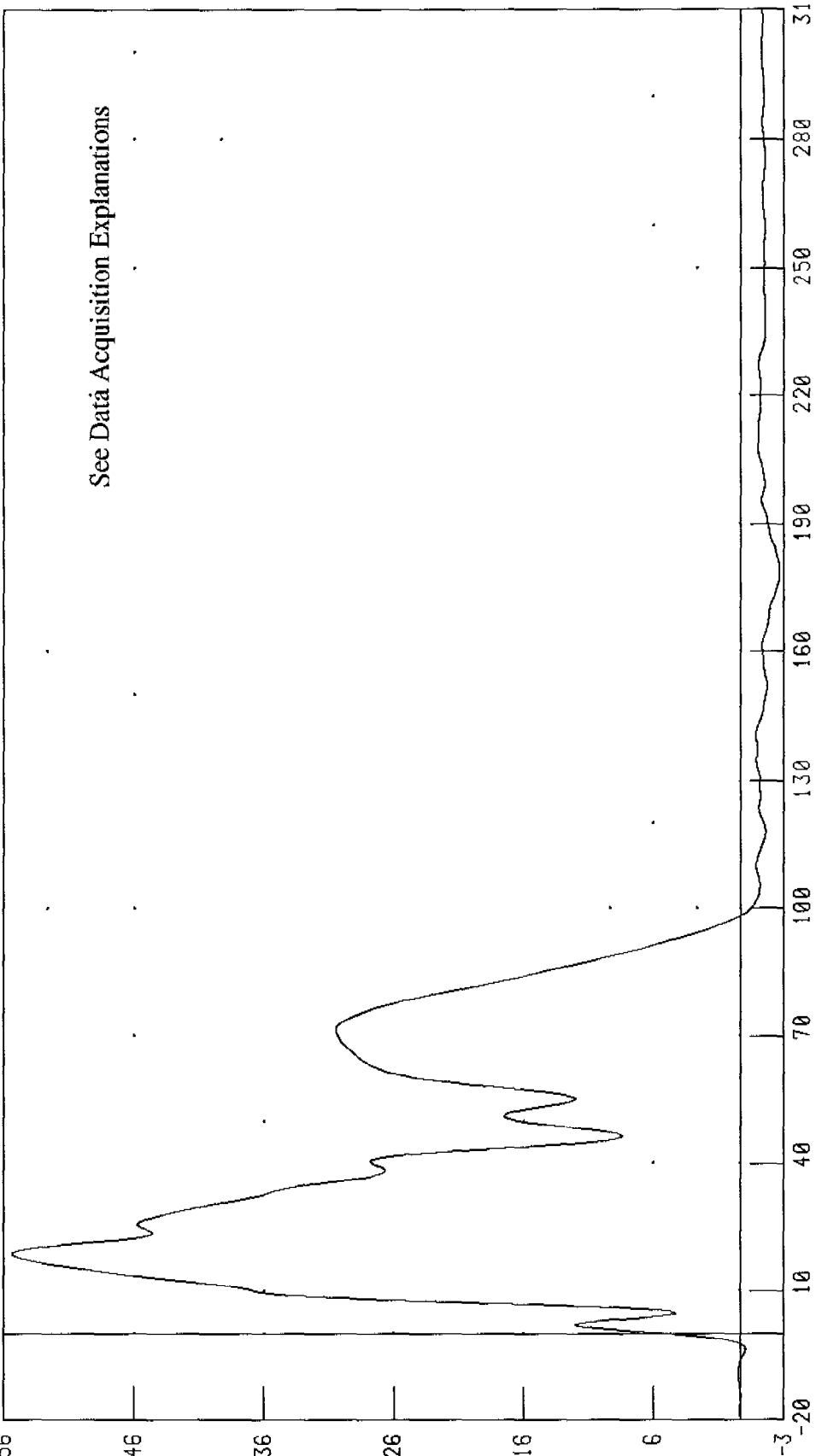
See Data Acquisition Explanations

FORCE (N X 10²)

TIME (MS)

CHANNEL BK3XF FILTER CH CLASS 60

PEAK DATA 5607 88 N 0 18 72 MS, -301 07 N 0 178 72 MS



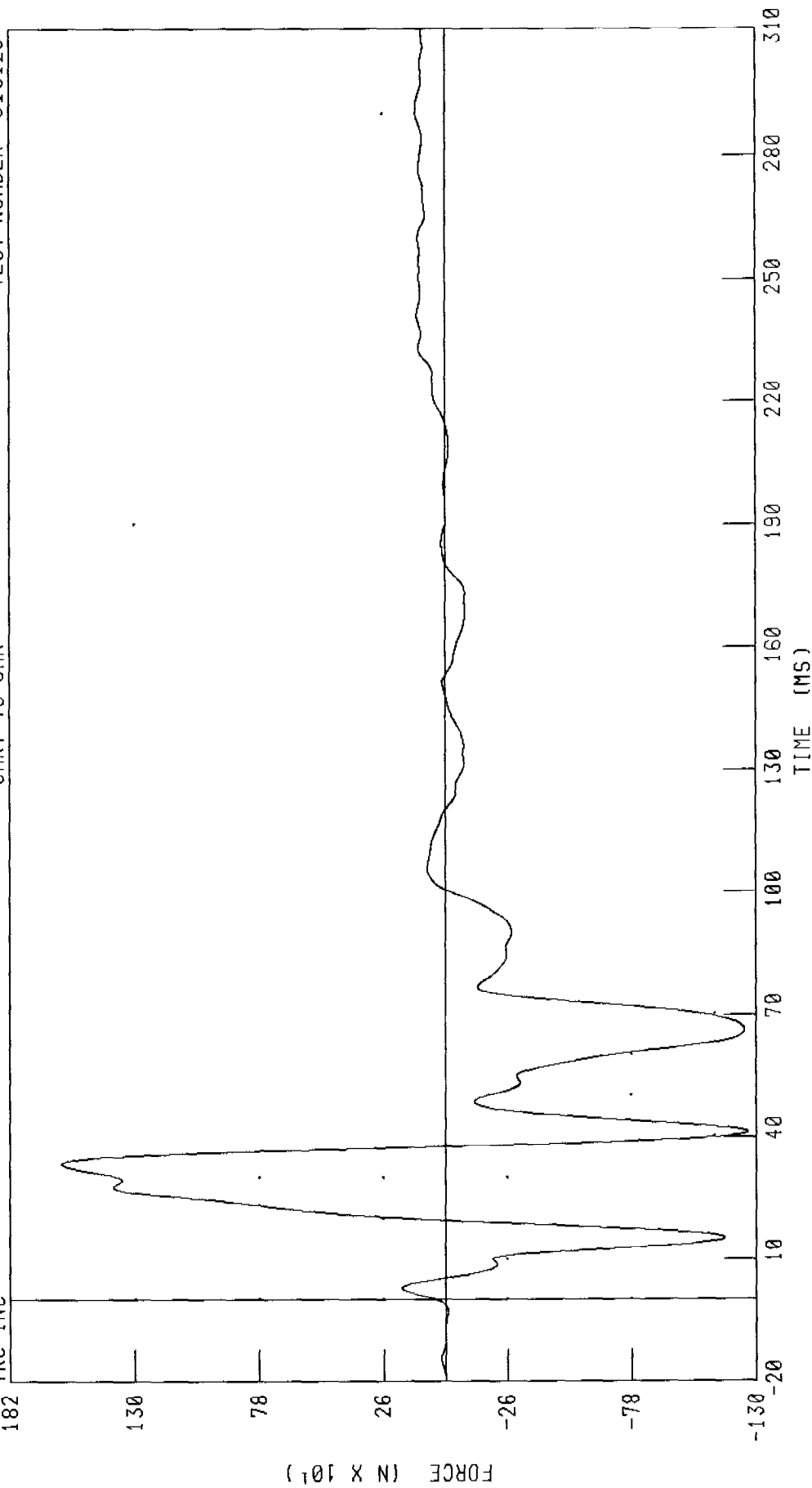
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL K3 Y-AXIS FORCE

TRC INC

CART TO CAR

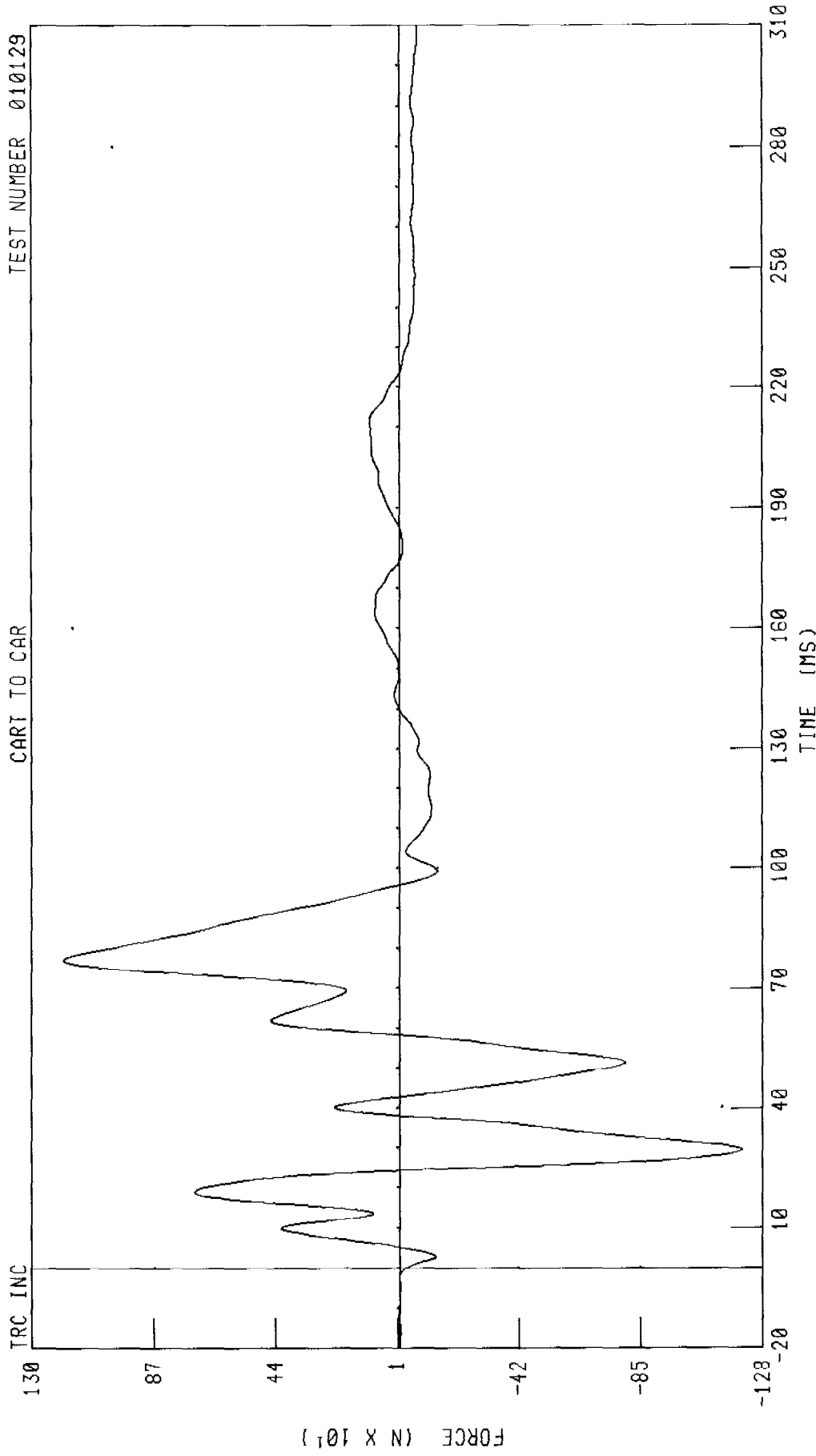
TEST NUMBER 010129



CHANNEL BK3YF FILTER CH CLASS 60

PEAK DATA 1606 75 N 0 33 44 MS, -1265 51 N 0 41 12 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K3 Z-AXIS FORCE



CHANNEL BK3ZF FILTER CH CLASS 60

PEAK DATA 1187 92 N @ 77 12 MS, -1207 85 N @ 29 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K4 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC

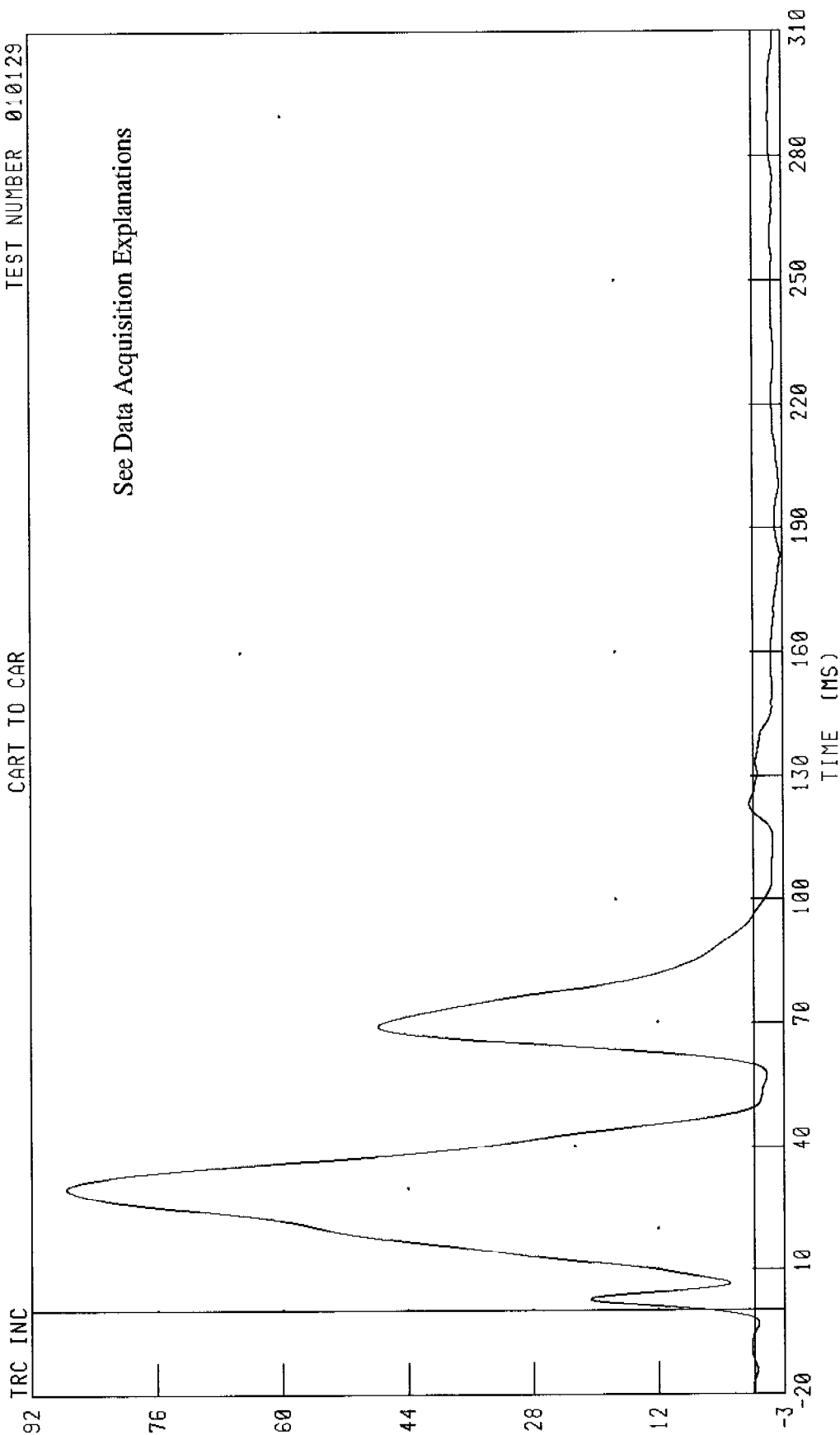
See Data Acquisition Explanations

FORCE (N X 10²)

TIME (MS)

CHANNEL BK4XF FILTER CH CLASS 60

PEAK DATA 8773 64 N @ 30 08 MS, -349 19 N @ 183 52 MS



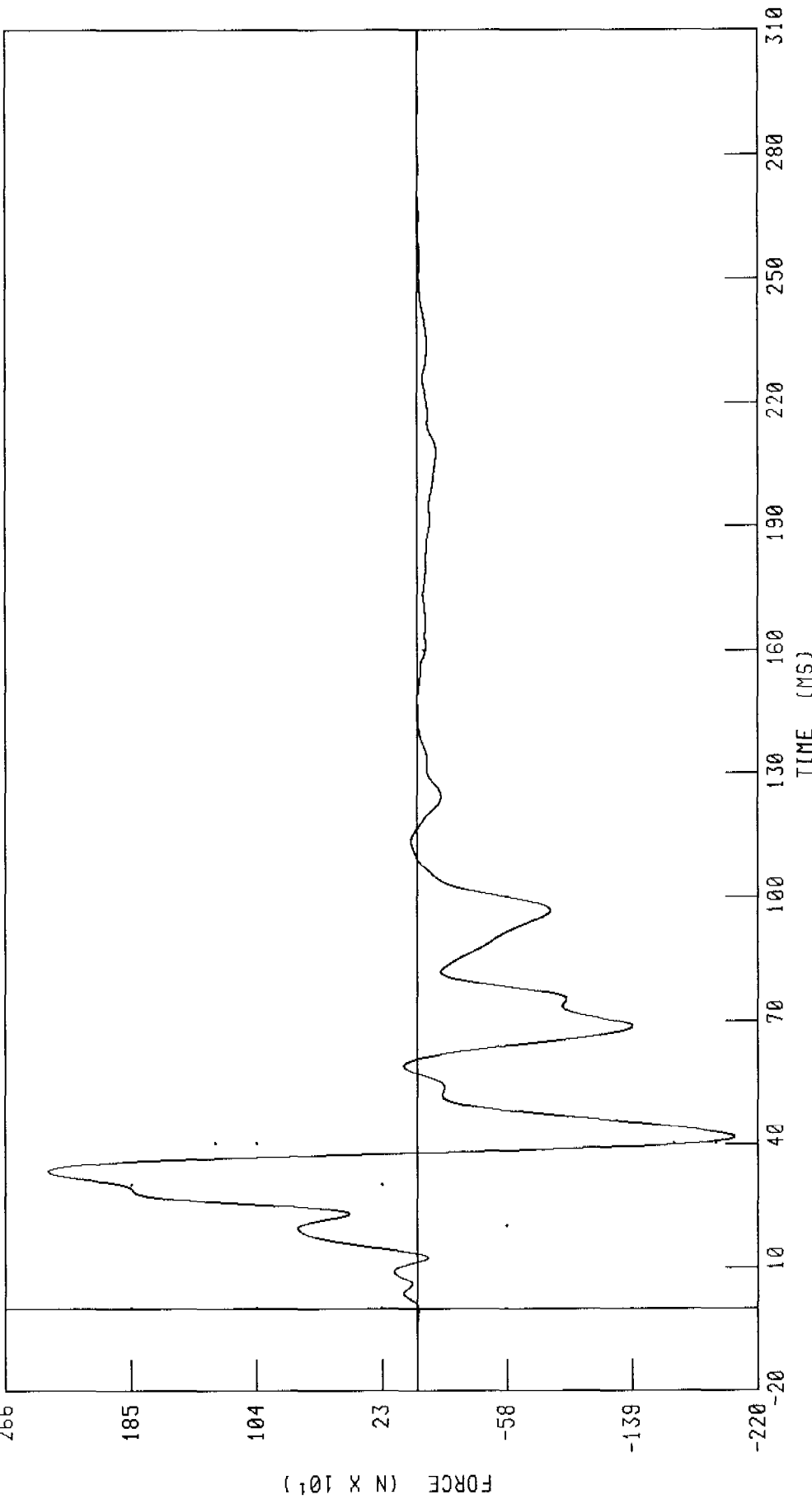
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL K4 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BK4VF FILTER CH CLASS 60

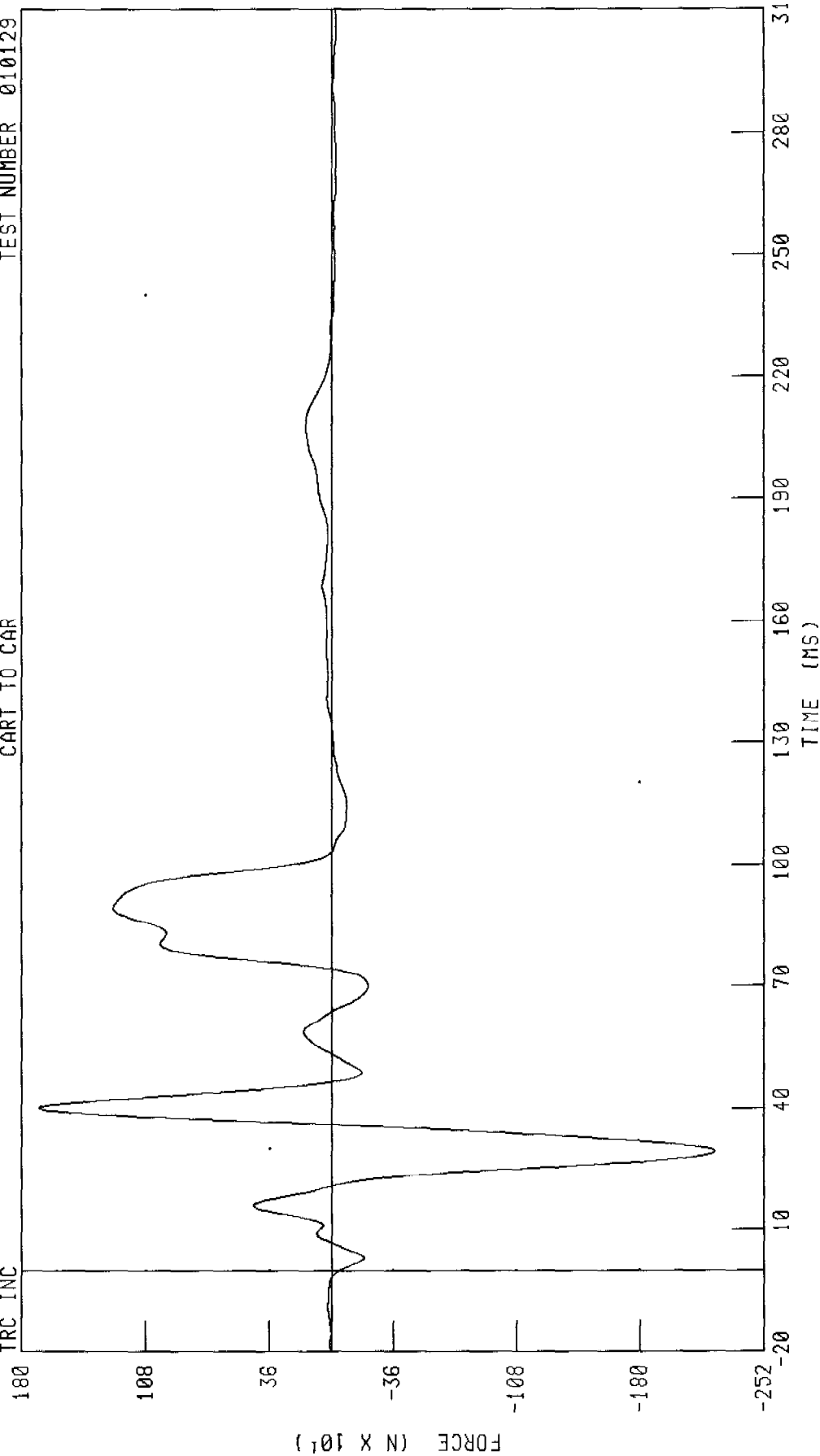
PEAK DATA 2386 73 N @ 33 36 MS, -2051 70 N @ 41 60 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K4 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



CHANNEL BK4ZF FILTER CH CLASS 60

PEAK DATA 1697 11 N 0 40 08 MS, -2236 45 N 0 29 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G3 X-AXIS FORCE

TRC INC

TEST NUMBER 010129

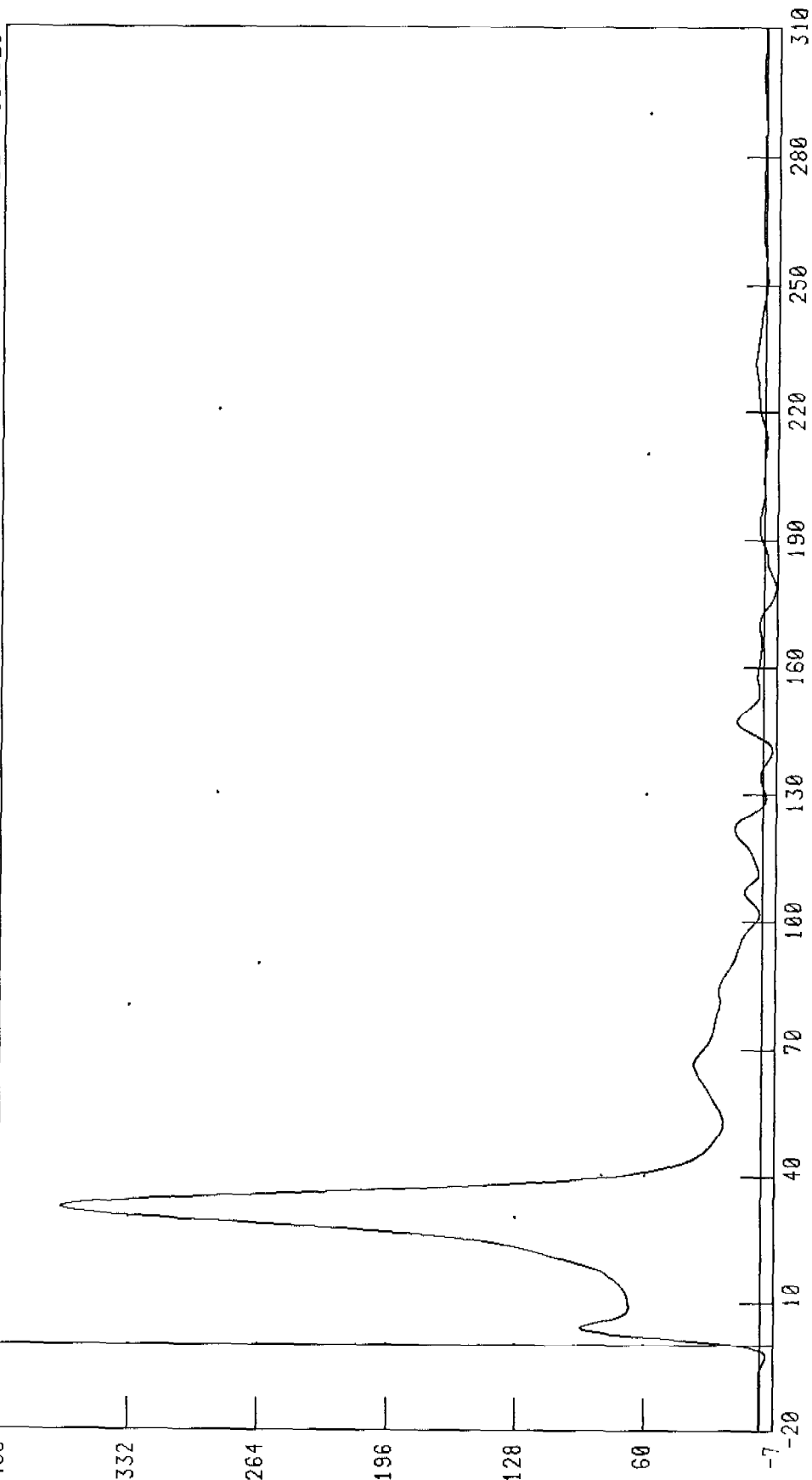
CART TO CAR

FORCE (N X 10²)

TIME (MS)

CHANNEL BG3XF FILTER CH CLASS 60

PEAK DATA 36837 06 N 0 32 24 MS, -649 35 N 0 178 80 MS

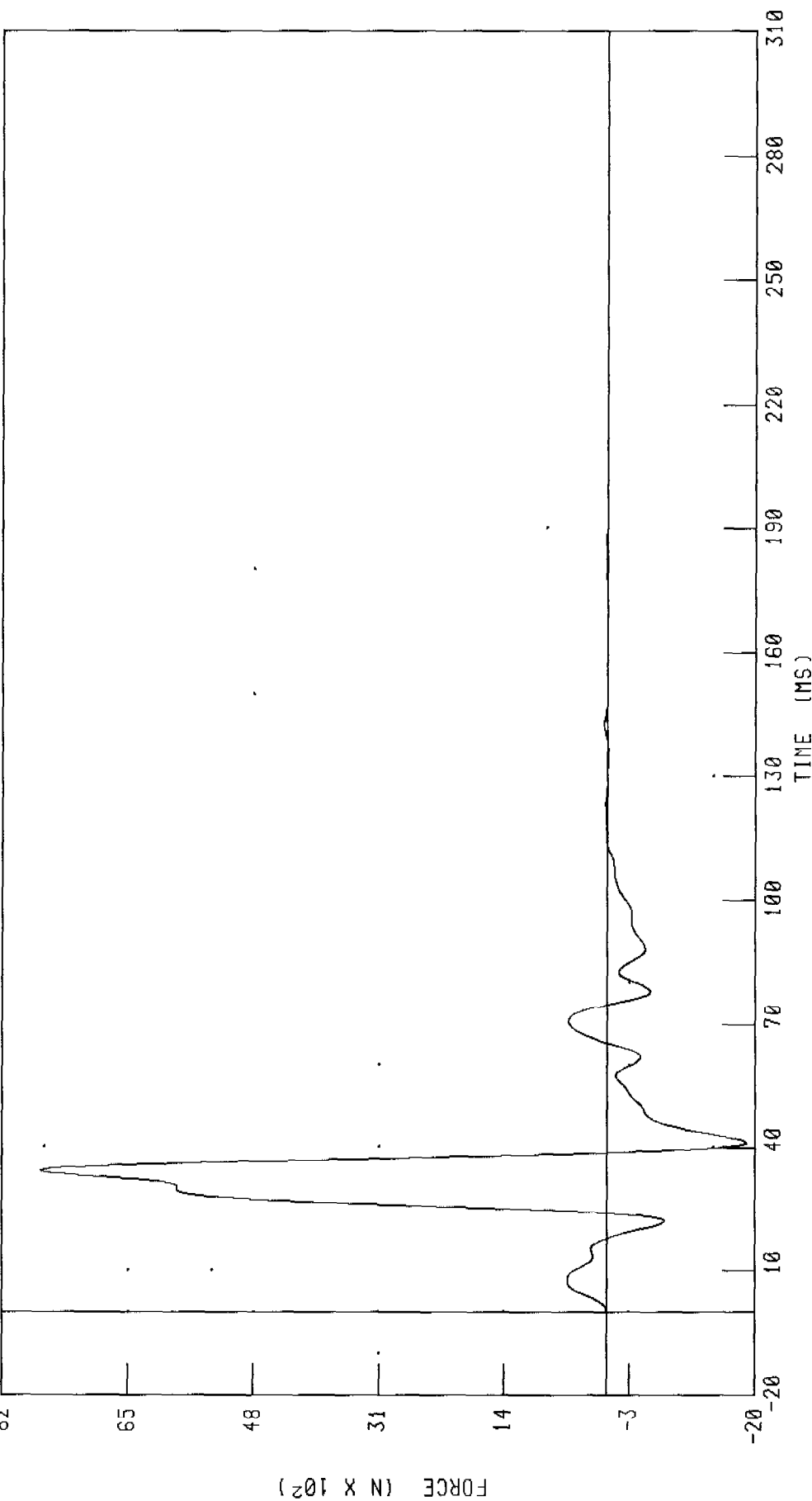


MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G3 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

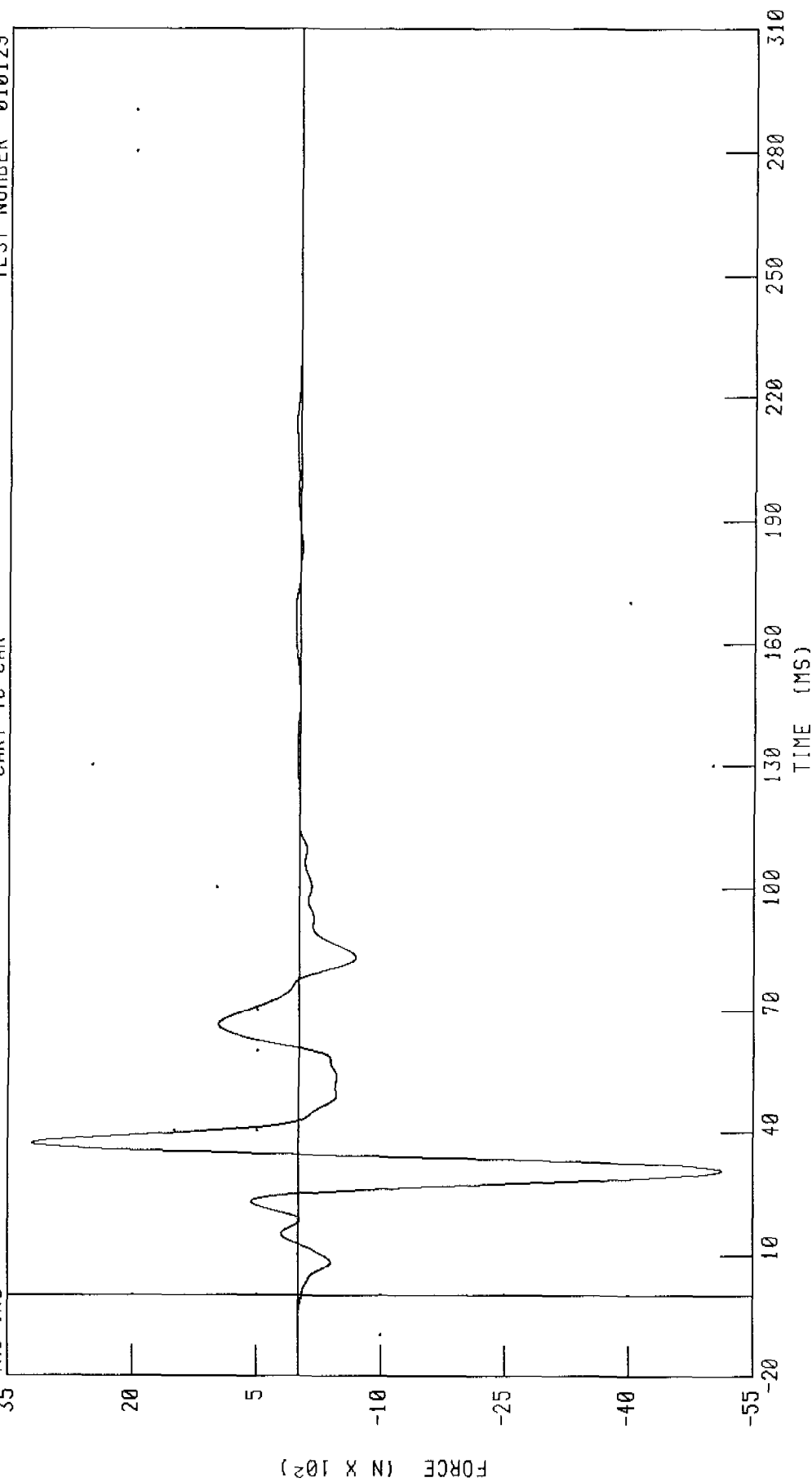


CHANNEL BG3YF FILTER CH CLASS 60 PEAK DATA 7679 52 N @ 34 24 MS, -1884 35 N @ 41 20 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL G3 Z-AXIS FORCE
CART TO CAR

TRC INC

TEST NUMBER 010129



CHANNEL BG3ZF FILTER CH CLASS 60

PEAK DATA 3210 43 N @ 37 04 MS, -5121 61 N @ 30 40 MS

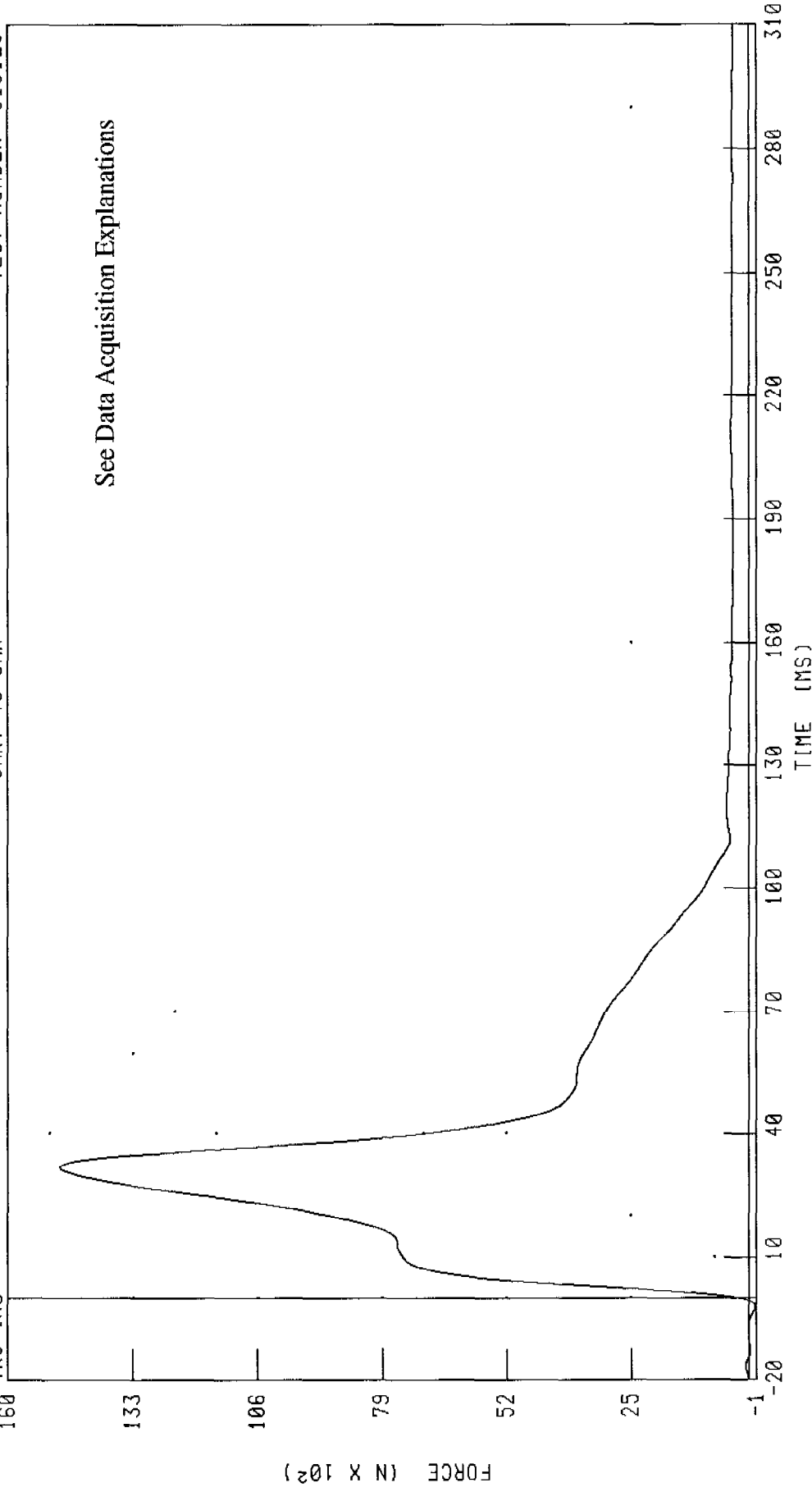
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL E2 X-AXIS FORCE

TRC INC

CART TO CAR

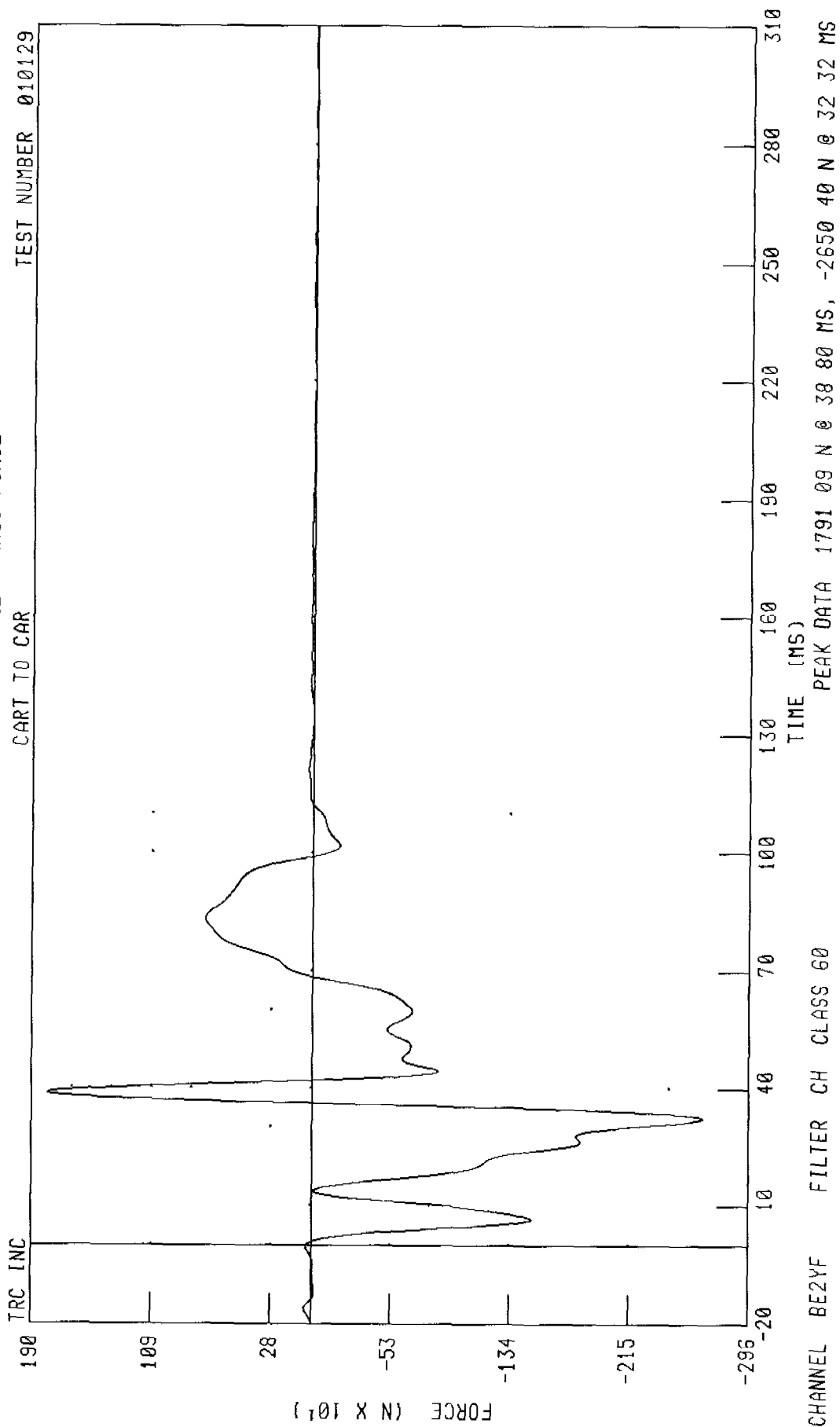
TEST NUMBER 010129



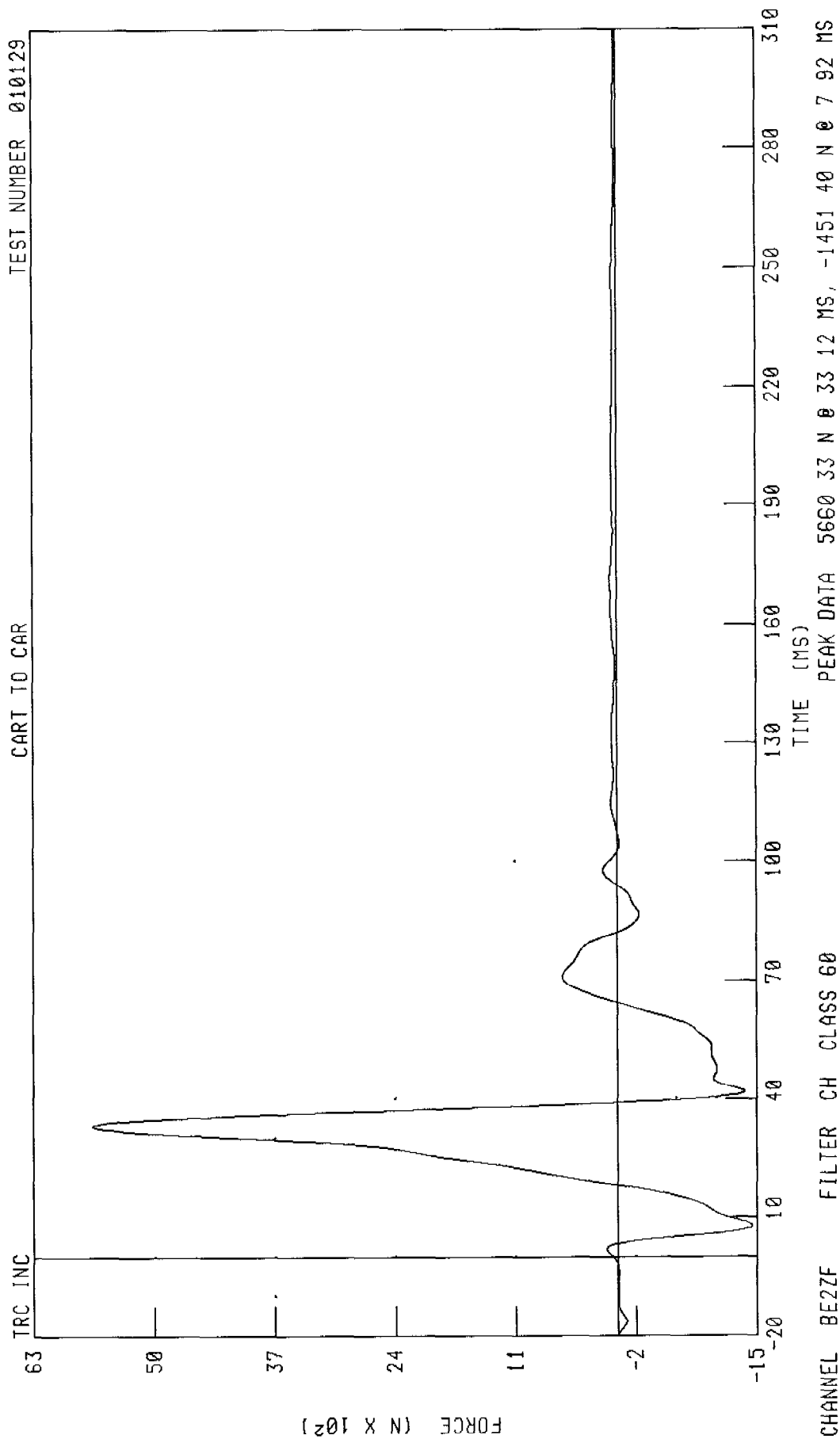
CHANNEL BE2XF FILTER CH CLASS 60

PEAK DATA 14917 95 N @ 31 84 MS, -149 60 N @ -2 00 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E2 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E2 Z-AXIS FORCE



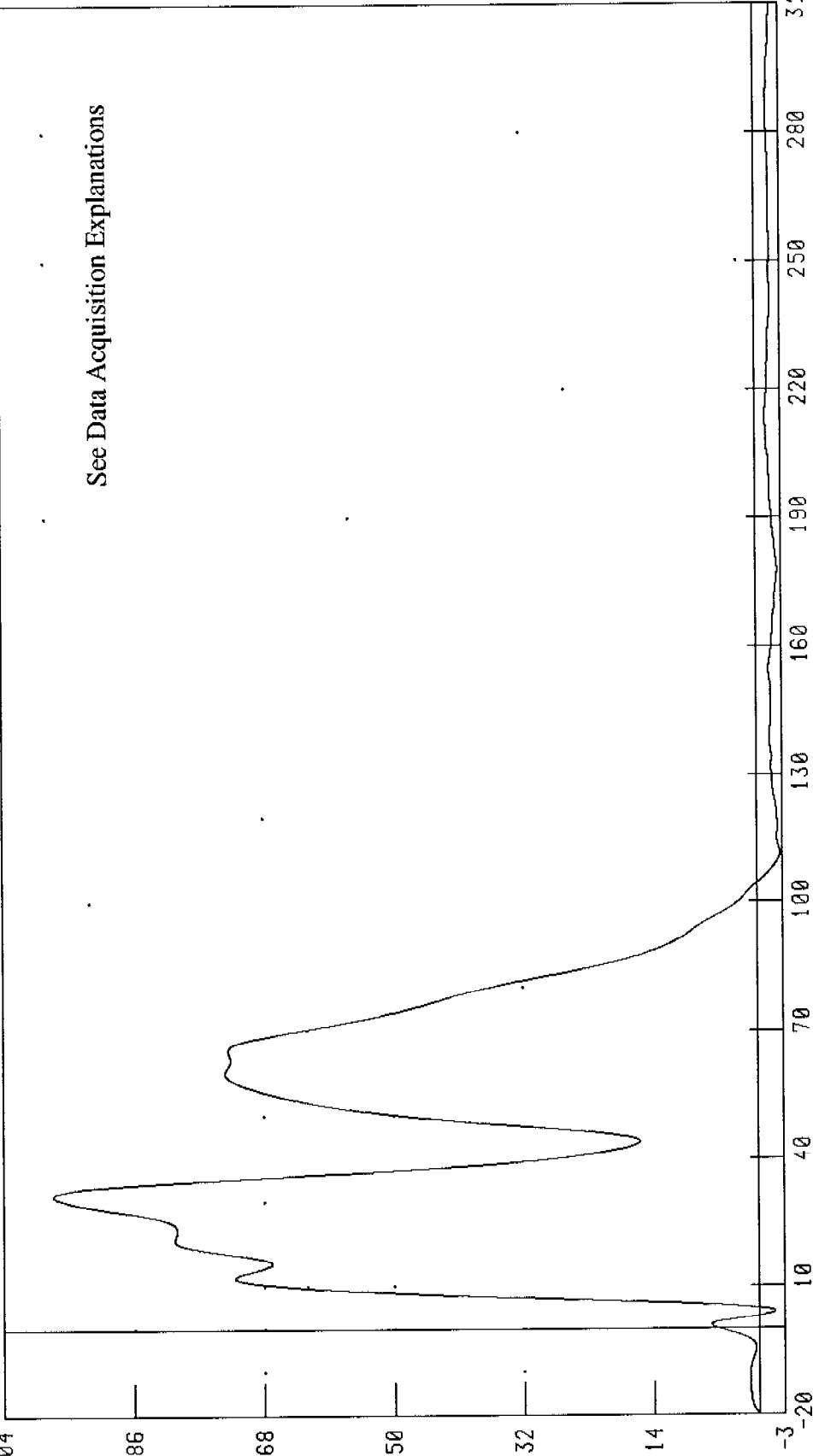
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL B1 X-AXIS FORCE
 CART TO CAR

TEST NUMBER 010129

TRC INC

See Data Acquisition Explanations

FORCE (N X 10²)

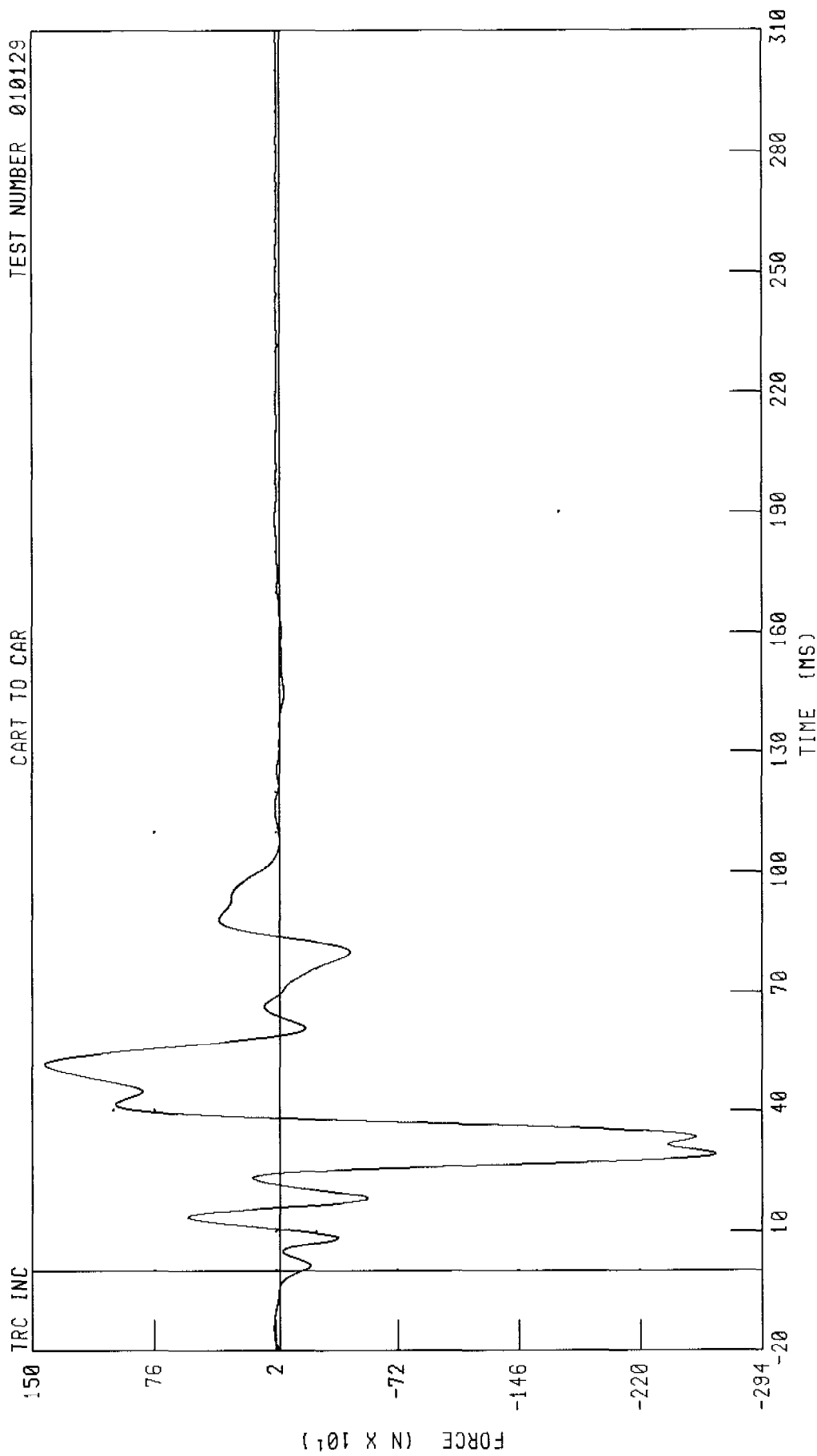


TIME (MS)

PEAK DATA 9771 48 N @ 31 60 MS, -319 72 N @ 111 44 MS

CHANNEL BB1XF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B1 Y-AXIS FORCE



TEST NUMBER 010129

CART TO CAR

PEAK DATA 1428 00 N 0 51 76 MS, -2660 40 N 0 29 12 MS

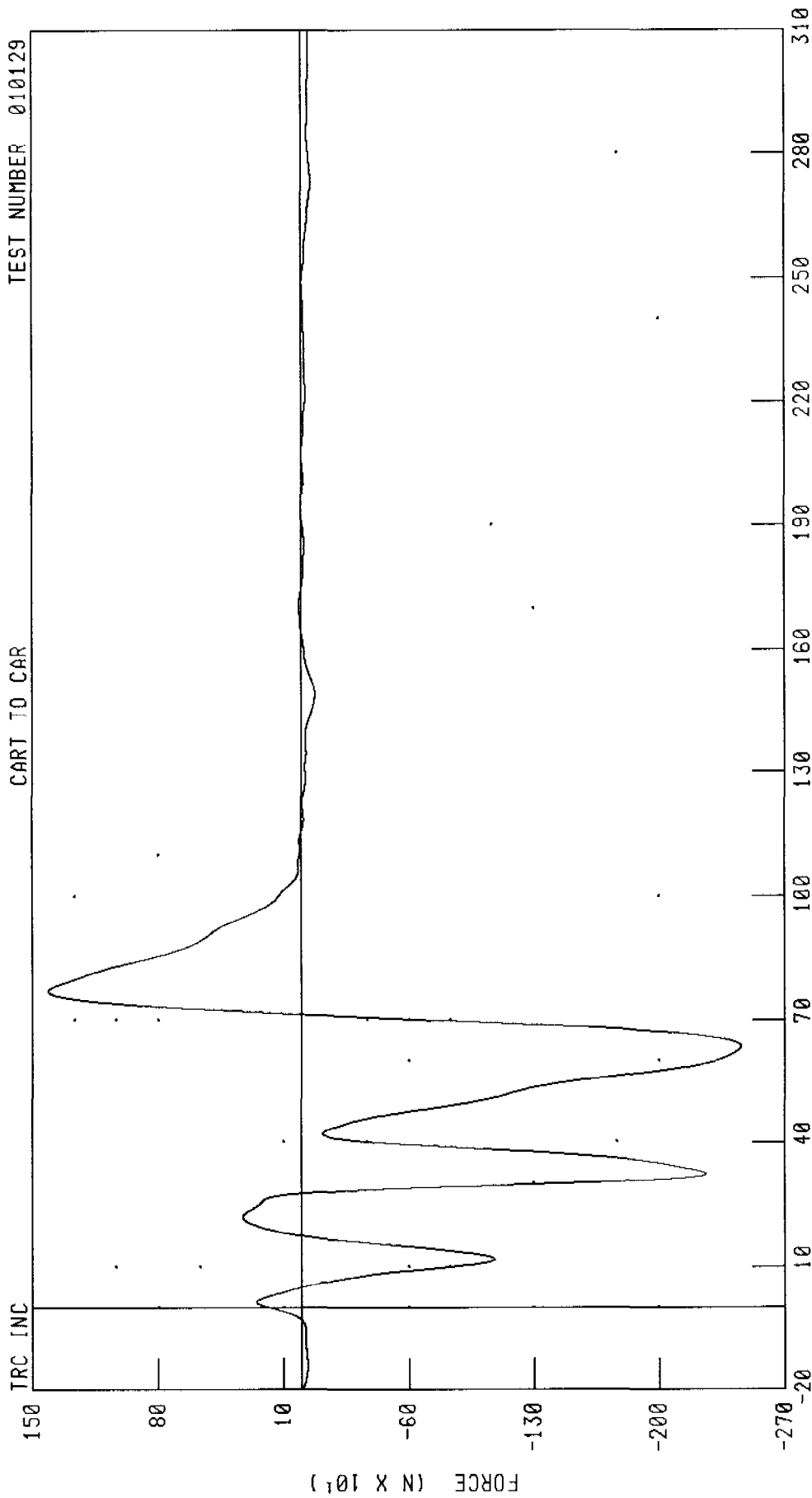
CHANNEL BB1YF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL B1 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

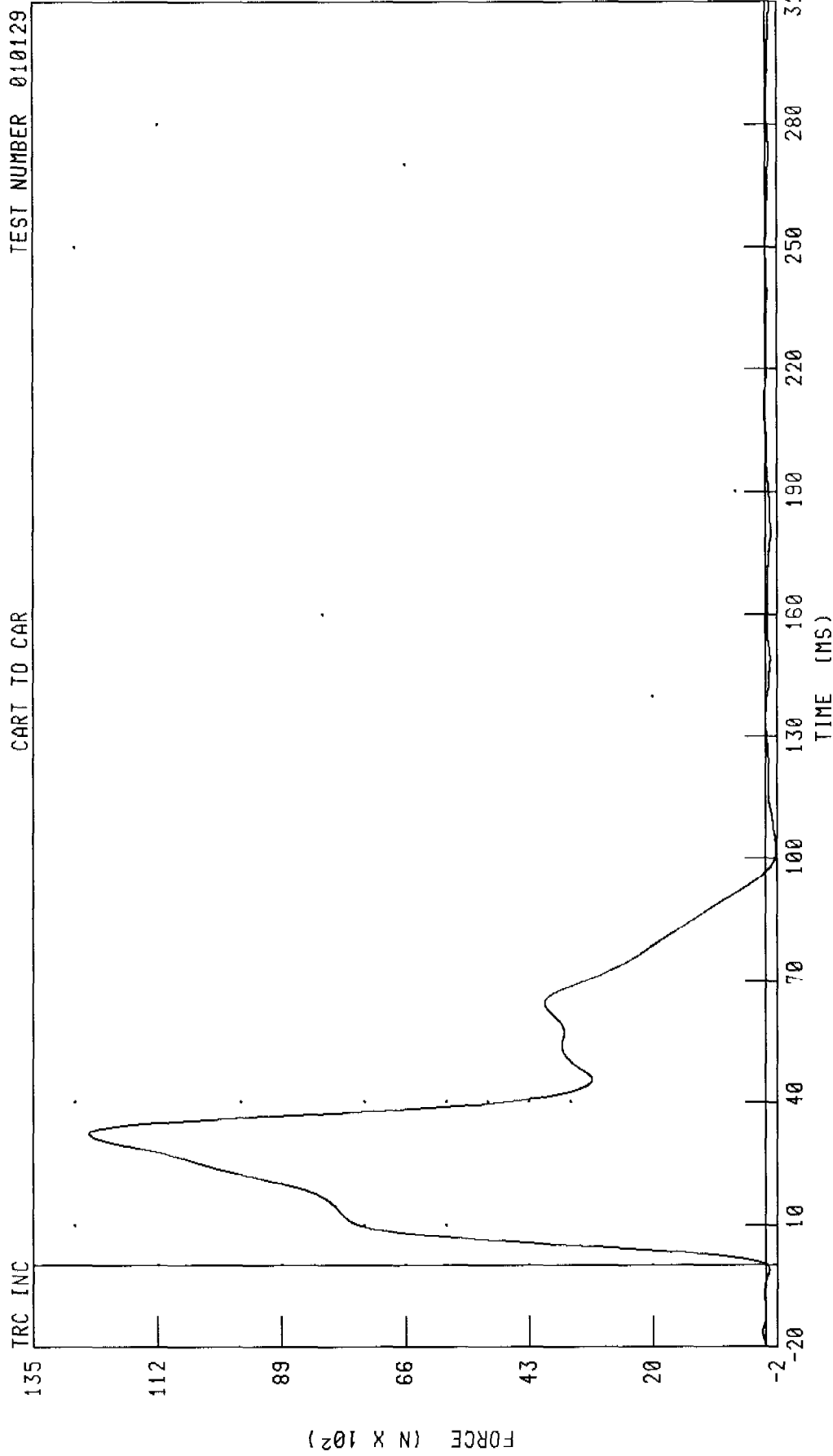
TRC INC



CHANNEL BB1ZF FILTER CH CLASS 60

PEAK DATA 1412 67 N @ 76 88 MS, -2458 36 N @ 63 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C2 X-AXIS FORCE



CHANNEL BC2XF FILTER CH CLASS 60 PEAK DATA 12561 77 N @ 32 24 MS, -193 85 N @ 101 92 MS

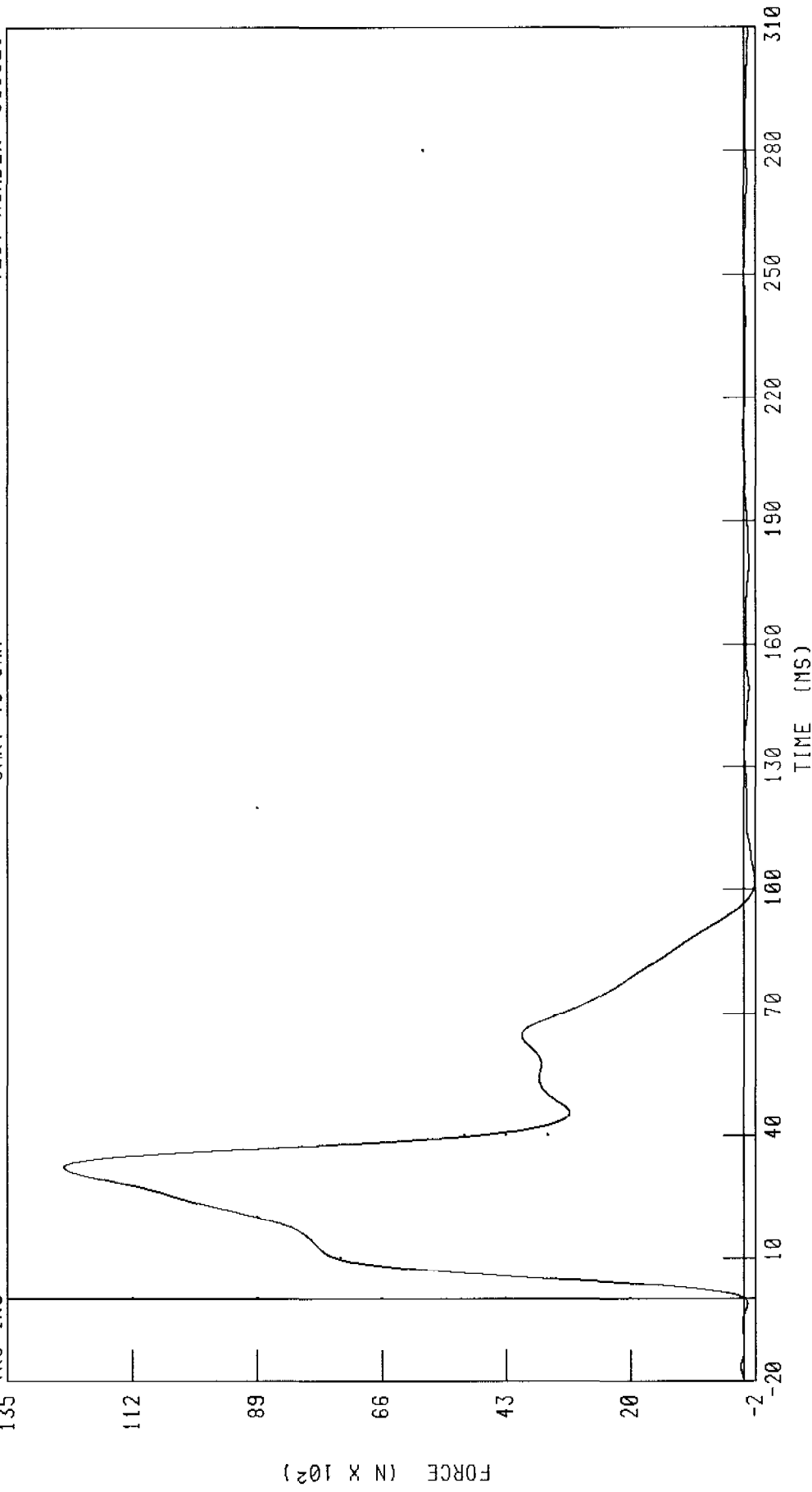
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL C2 X-AXIS FORCE

TRC INC

CART TO CAR

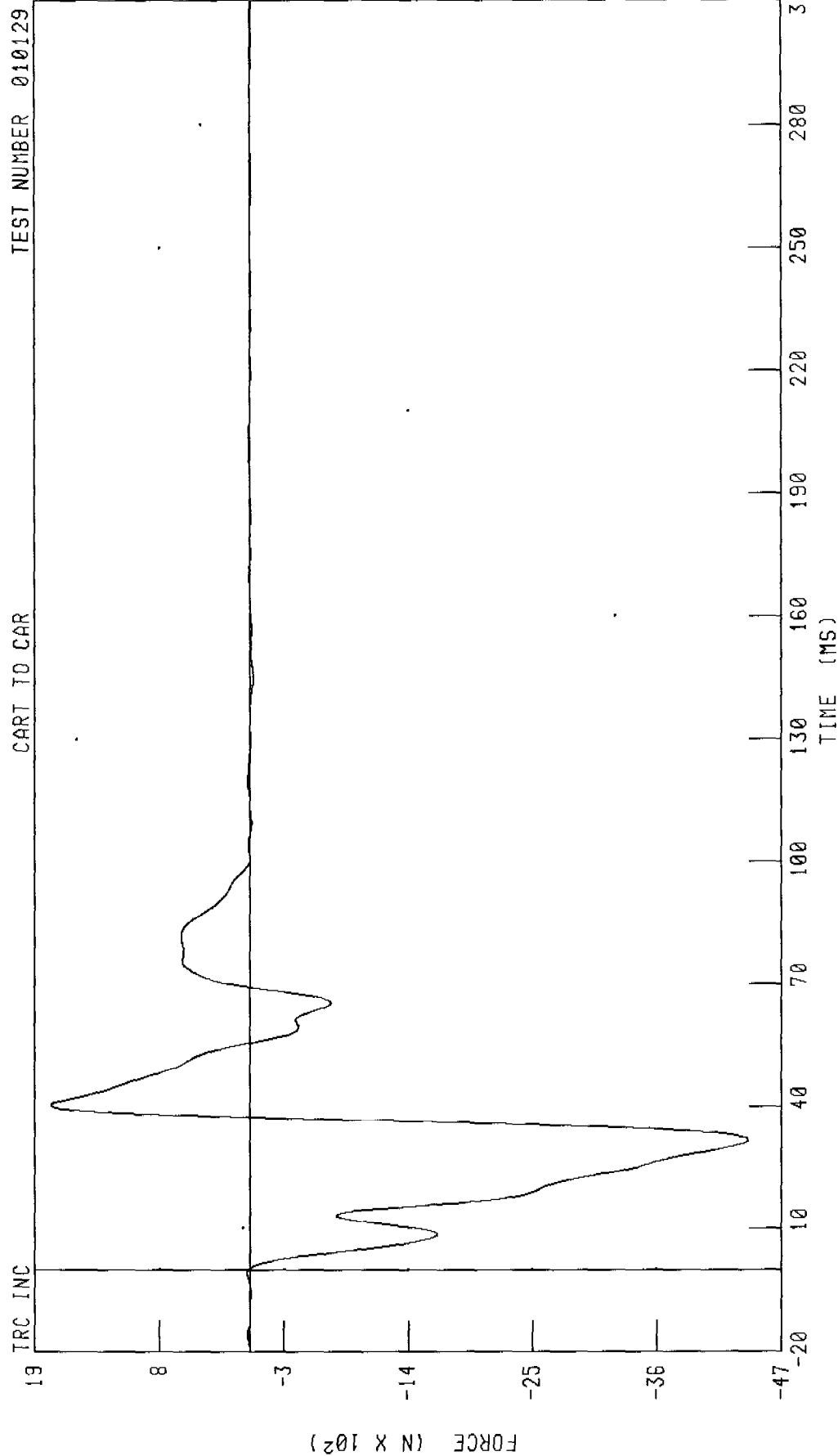
TEST NUMBER 010129



CHANNEL BC2XF FILTER CH CLASS 60

PEAK DATA 12561 77 N 0 32 24 MS, -193 85 N 0 101 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL C2 Y-AXIS FORCE
 CART TO CAR



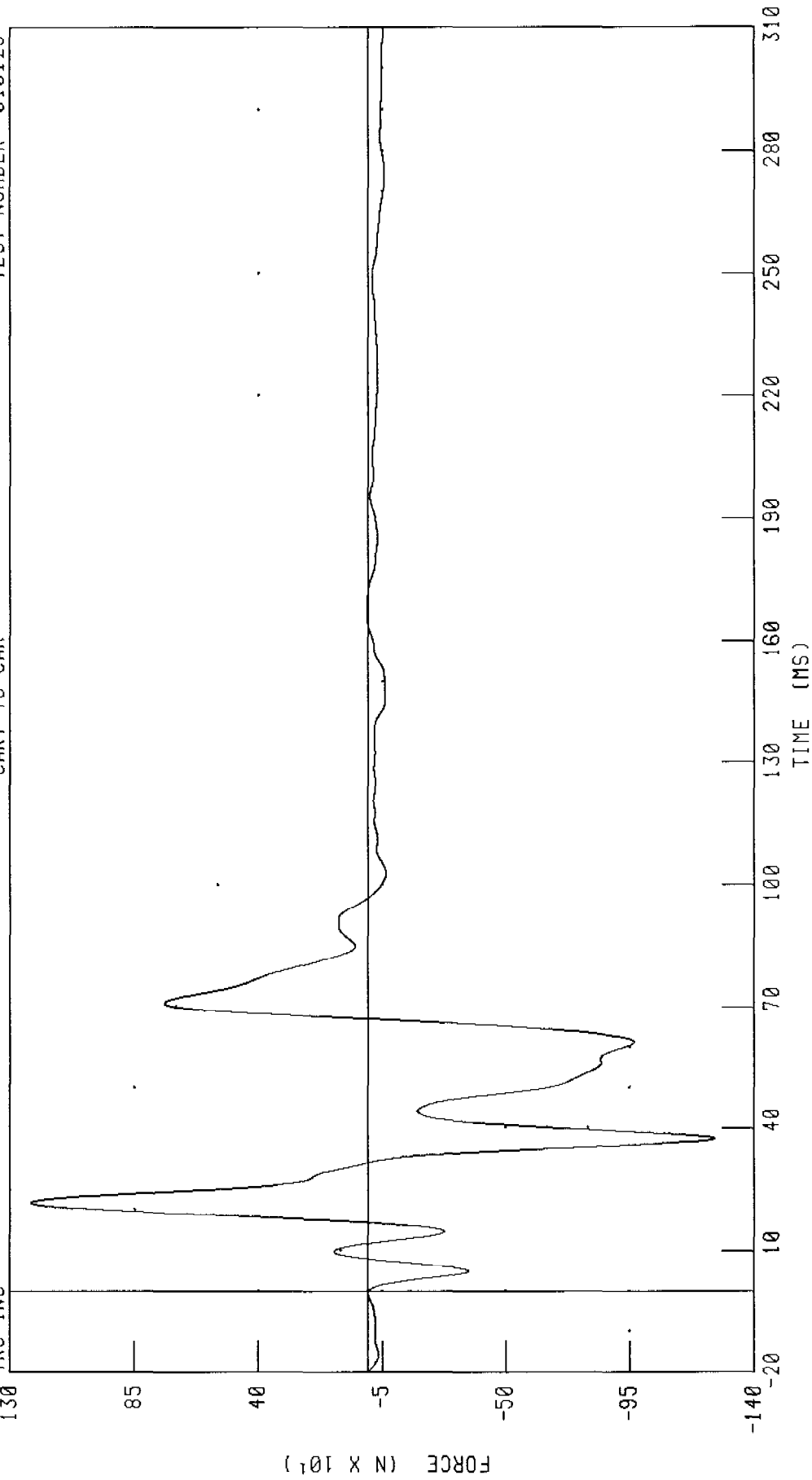
CHANNEL BC2YF FILTER CH CLASS 60 PEAK DATA 1757 31 N @ 40 32 MS, -4406 32 N @ 31 68 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C2 Z-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BC2ZF FILTER CH CLASS 60

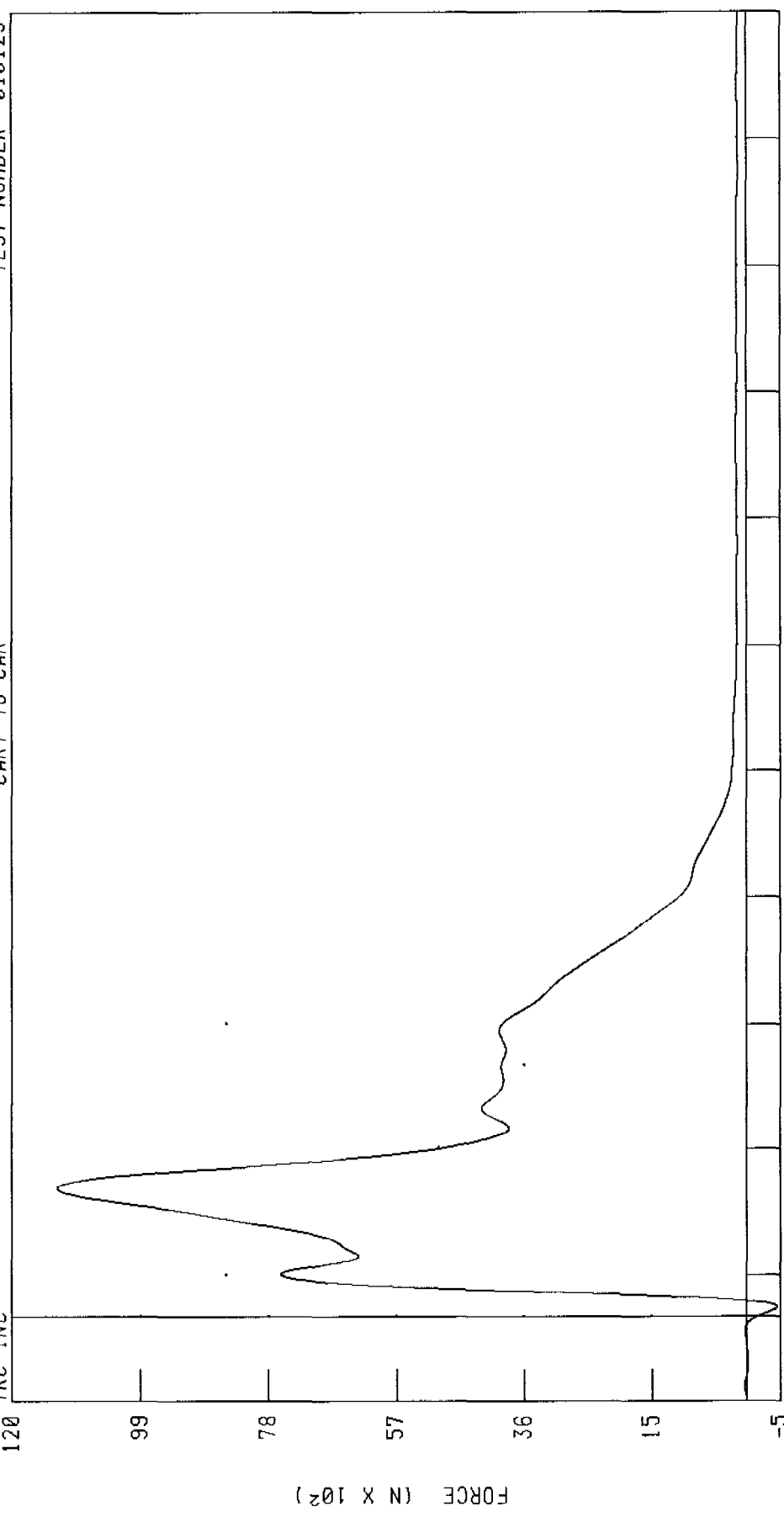
PEAK DATA 1226 11 N @ 21 76 MS, -1258 51 N @ 37 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E1 X-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

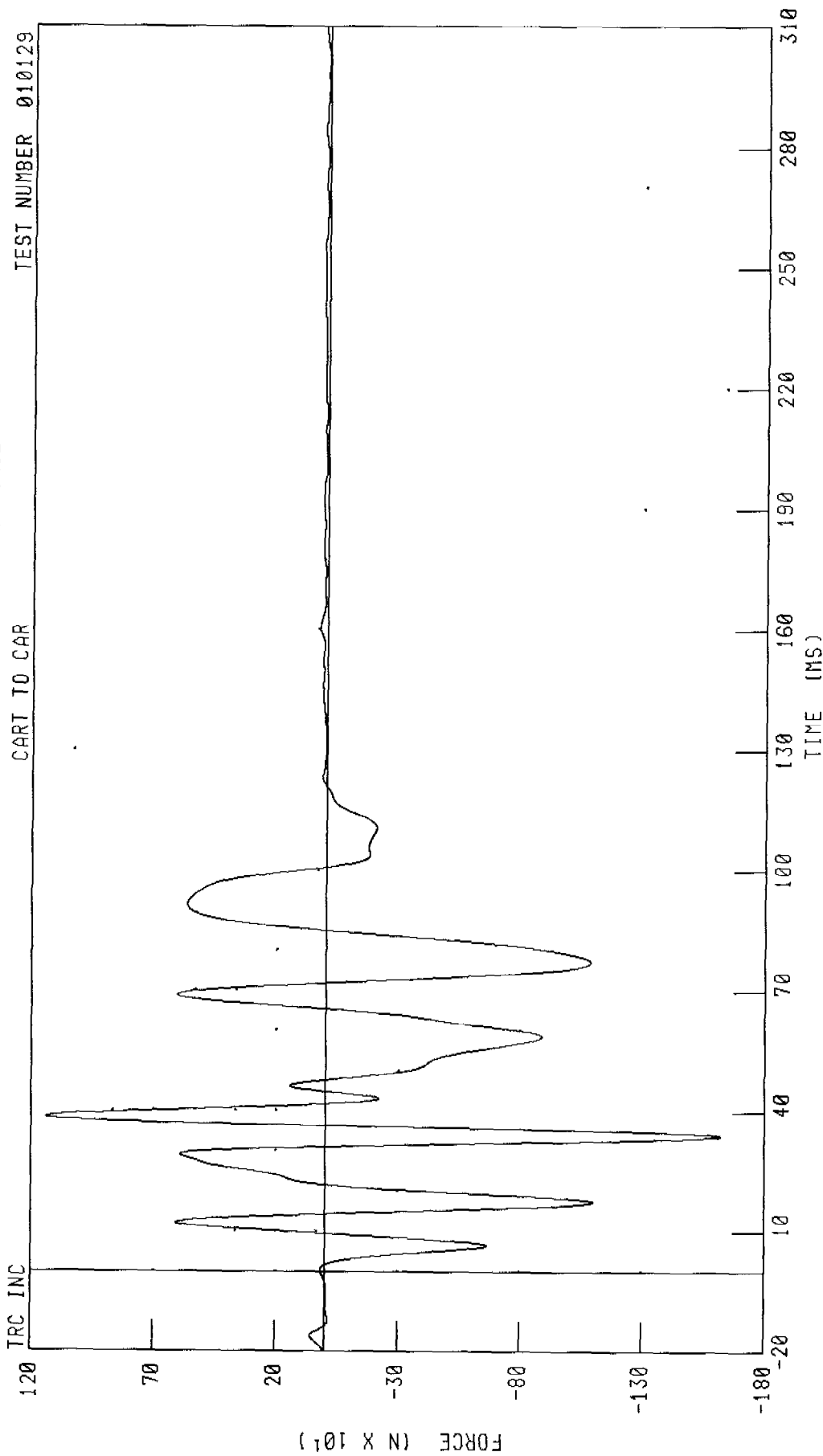
TRC INC



PEAK DATA 11314 72 N @ 30 56 MS, -500 75 N @ 2 24 MS

CHANNEL BE1XF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E1 Y-AXIS FORCE



CHANNEL BE1YF FILTER CH CLASS 60

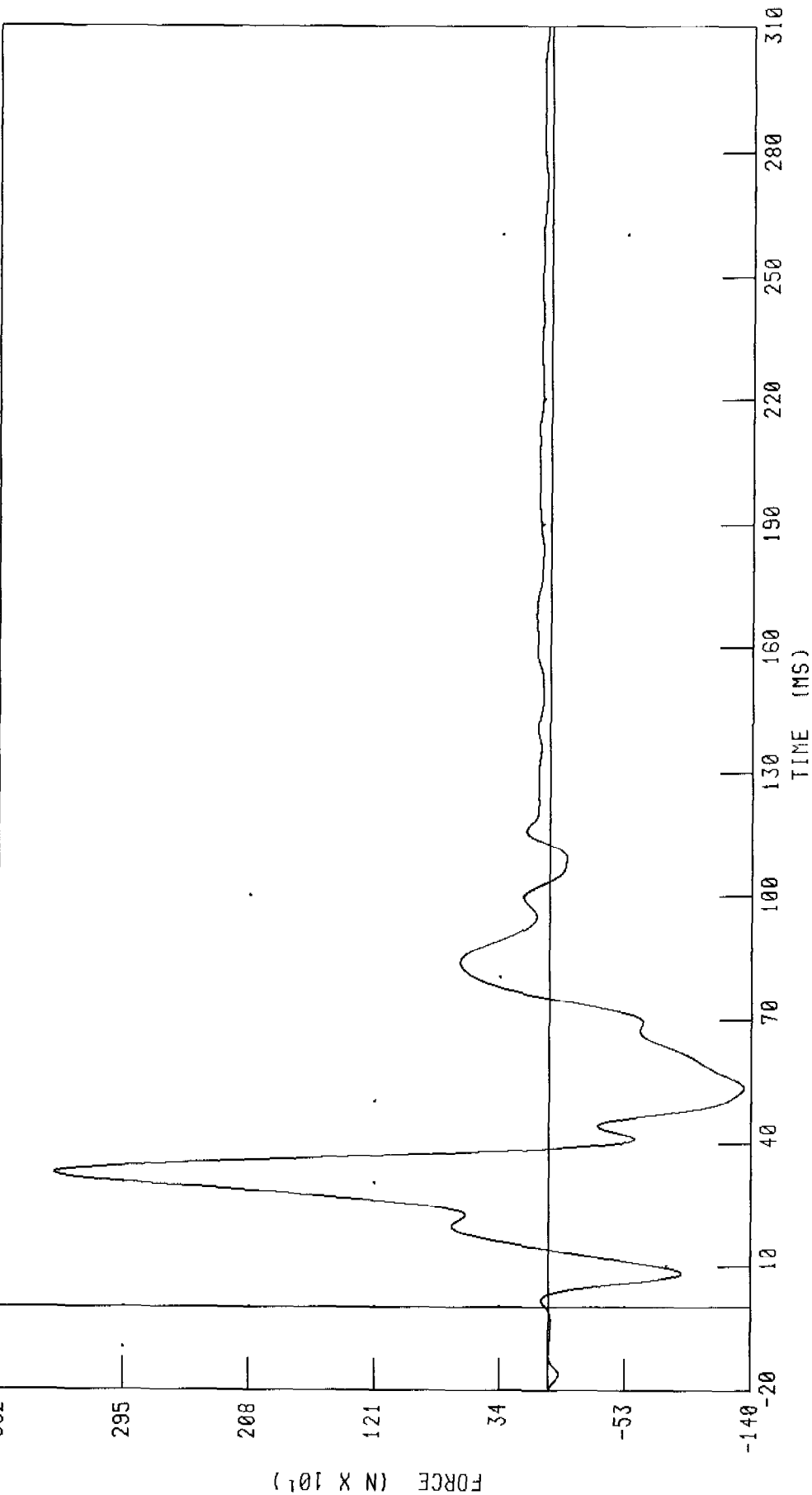
PEAK DATA 1141 31 N 0 38 48 MS, -1623 58 N 0 33 84 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E1 Z-AXIS FORCE

TEST NUMBER 010129

CART TO CAR

TRC INC



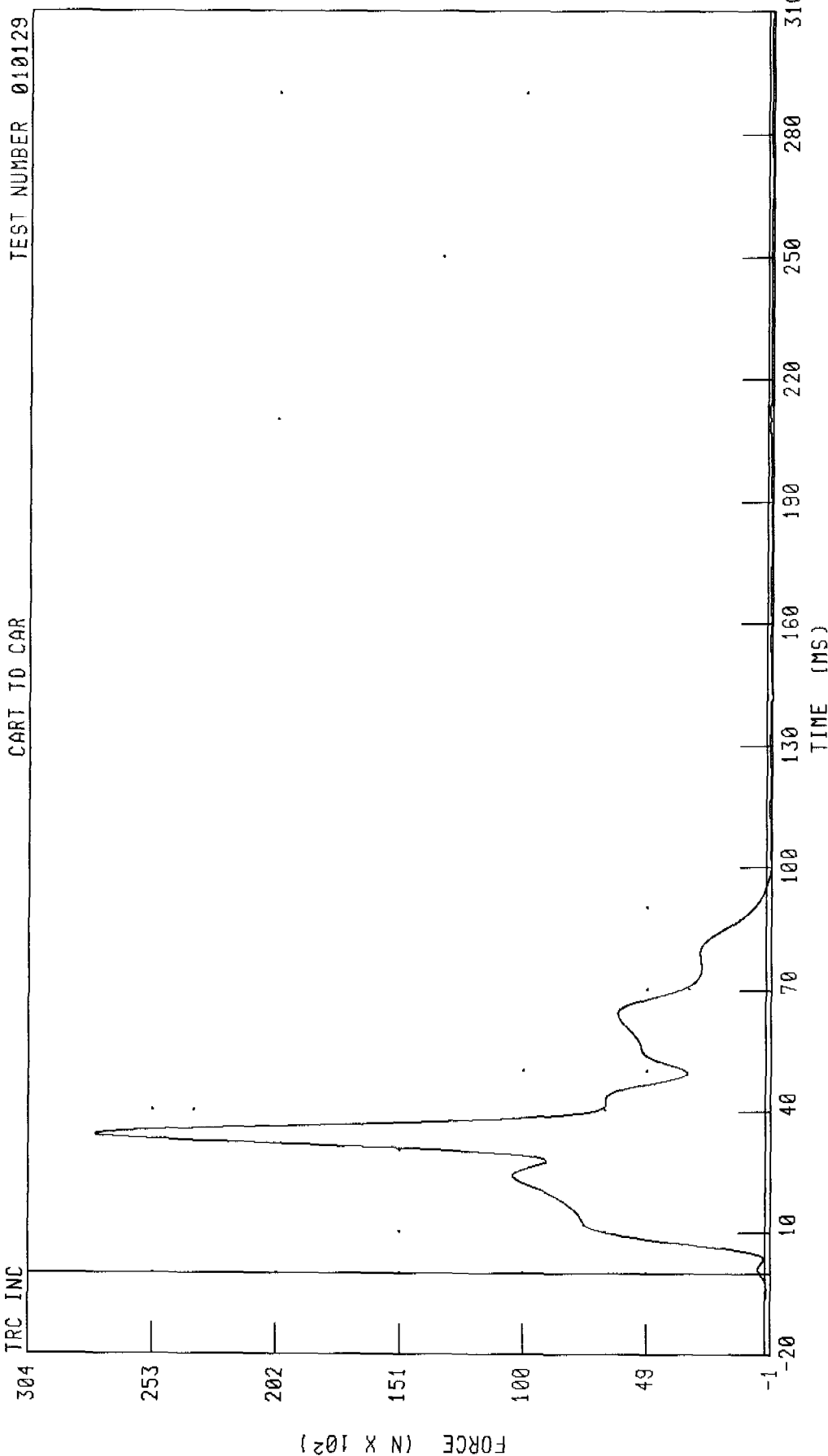
CHANNEL BE1ZF FILTER CH CLASS 60

PEAK DATA 3430 56 N @ 32 40 MS, -1349 18 N @ 53 36 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
 MOVING BARRIER LOAD CELL A2 X-AXIS FORCE
 CART TO CAR

TRC INC

TEST NUMBER 010129



CHANNEL BA2XF FILTER CH CLASS 60

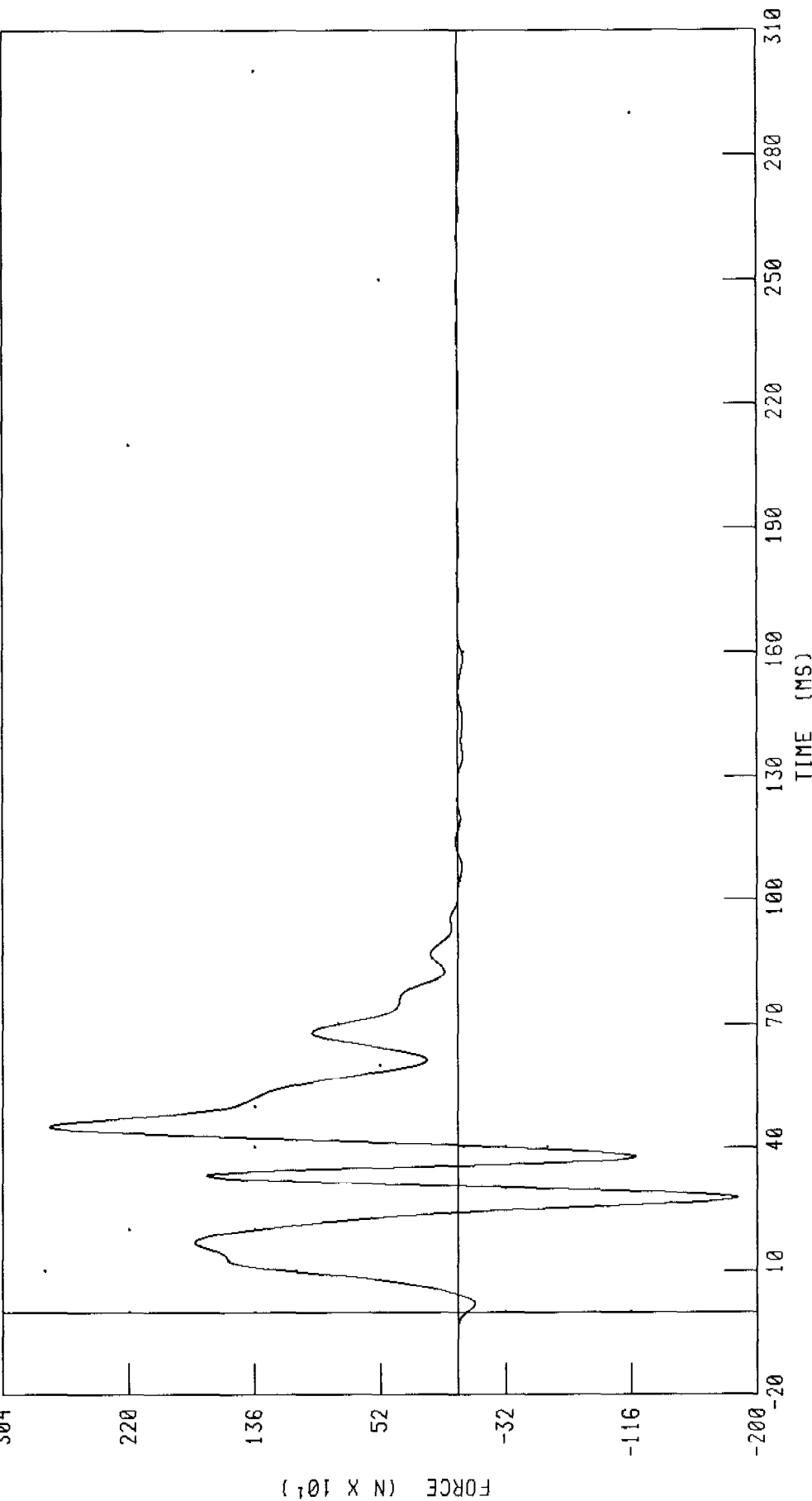
PEAK DATA 27676 02 N @ 34 00 MS, -179 70 N @ 100 48 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL A2 Y-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BA2YF FILTER CH CLASS 60

PEAK DATA 2726 38 N 0 45 28 MS, -1873 04 N 0 27 68 MS

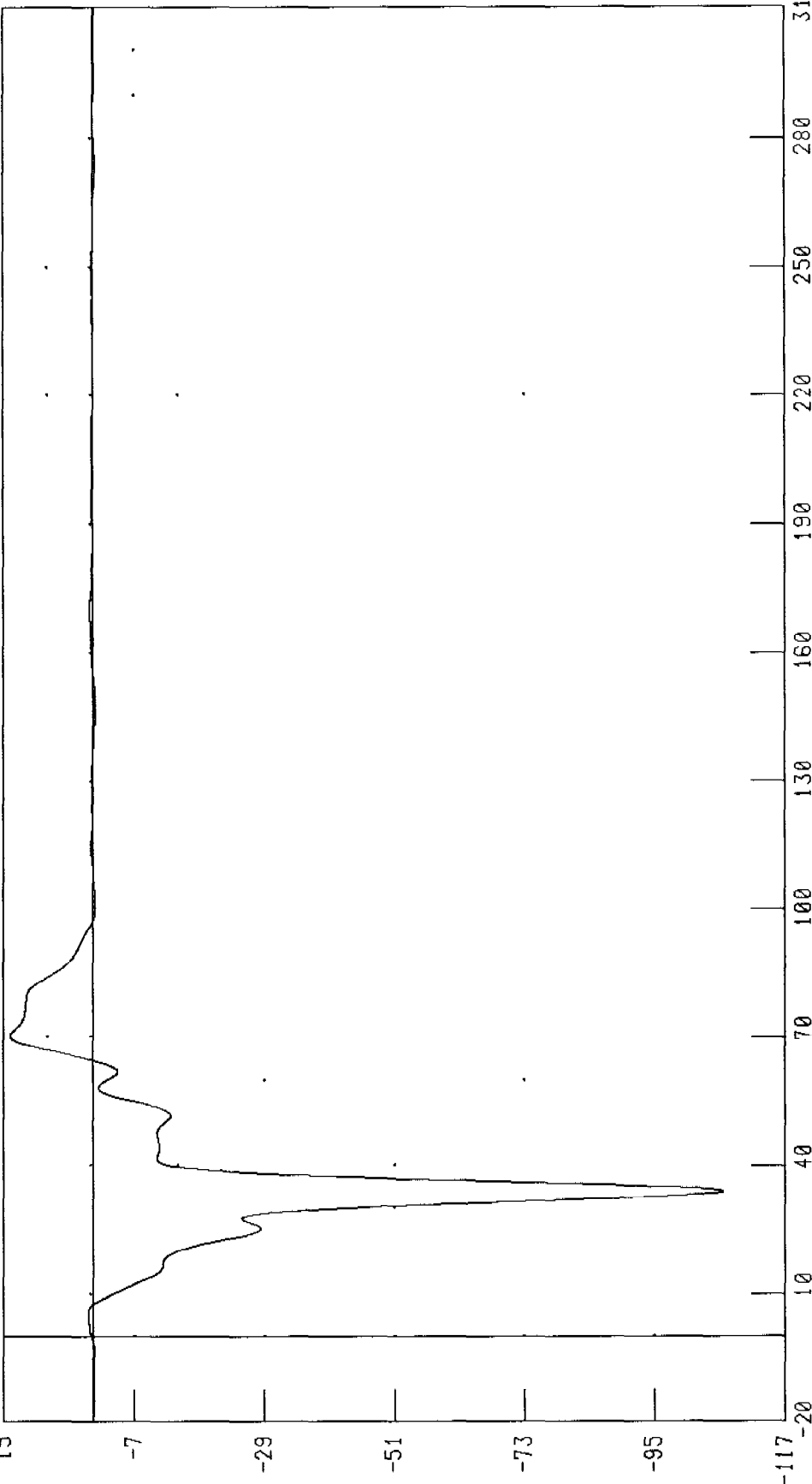
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

MOVING BARRIER LOAD CELL A2 Z-AXIS FORCE

TRC INC

CART TO CAR

TEST NUMBER 010129

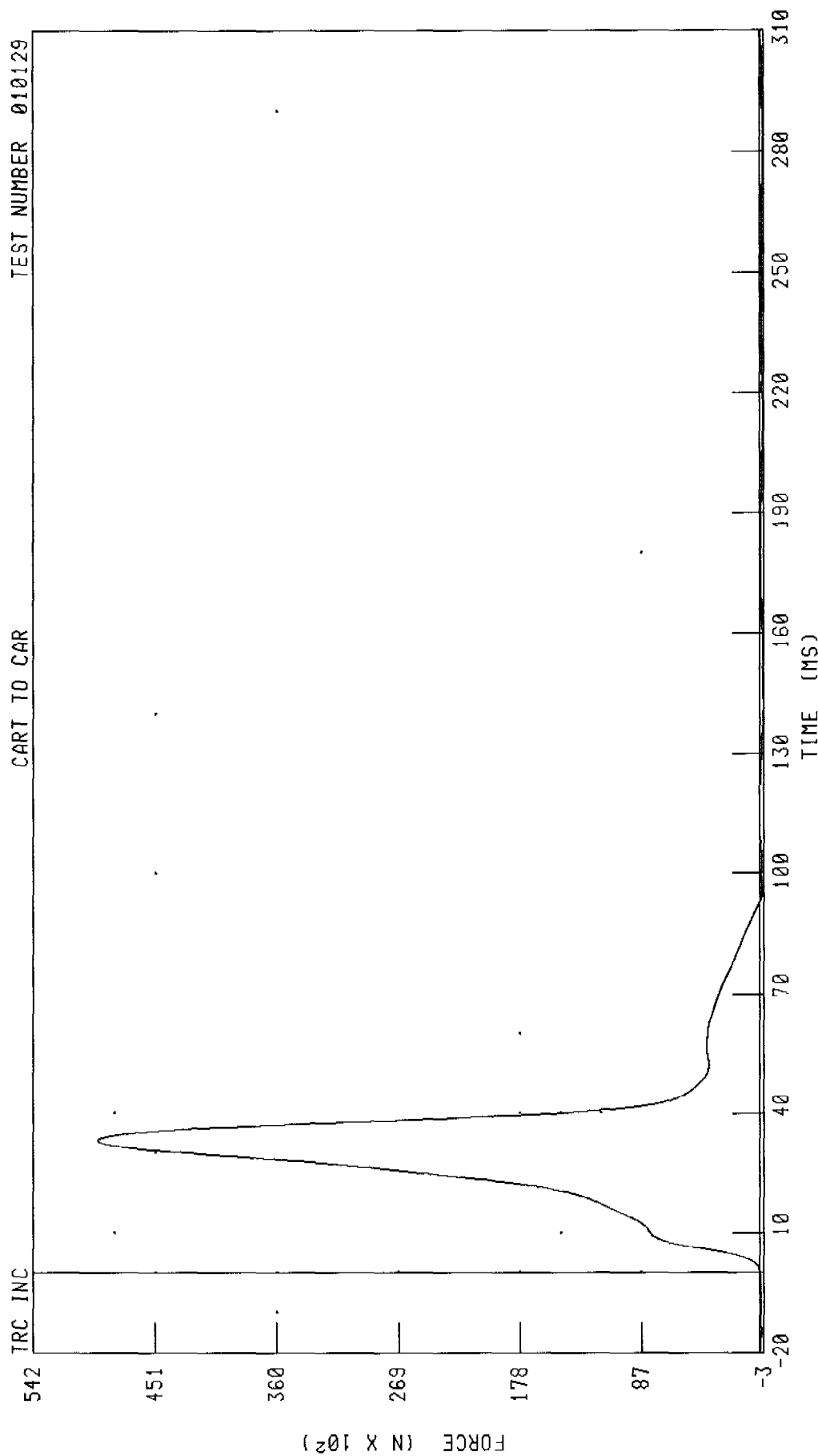


TIME (MS)

CHANNEL BA2ZF FILTER CH CLASS 60

PEAK DATA 1393 81 N @ 70 32 MS, -10659 76 N @ 34 00 MS

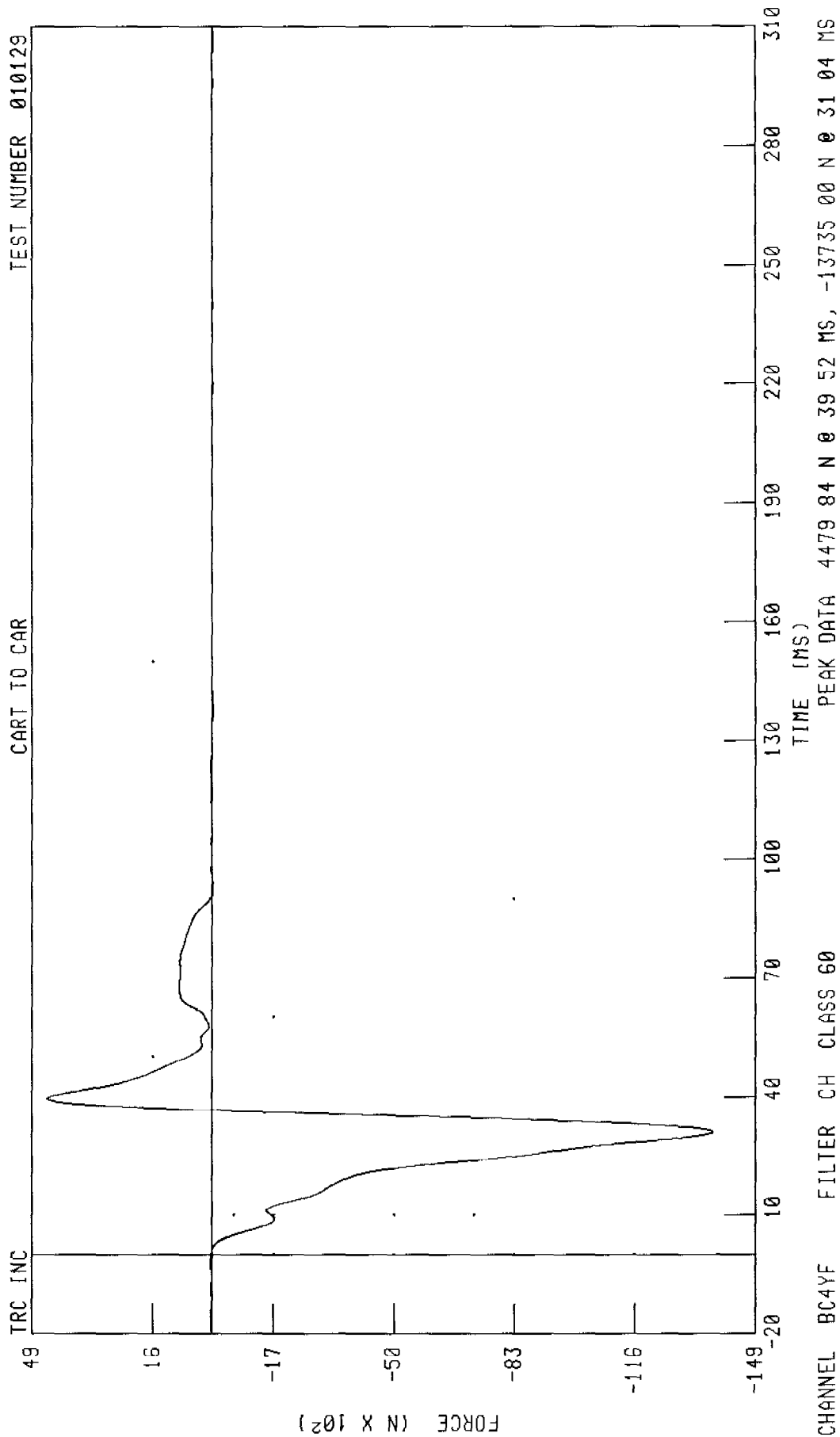
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C4 X-AXIS FORCE



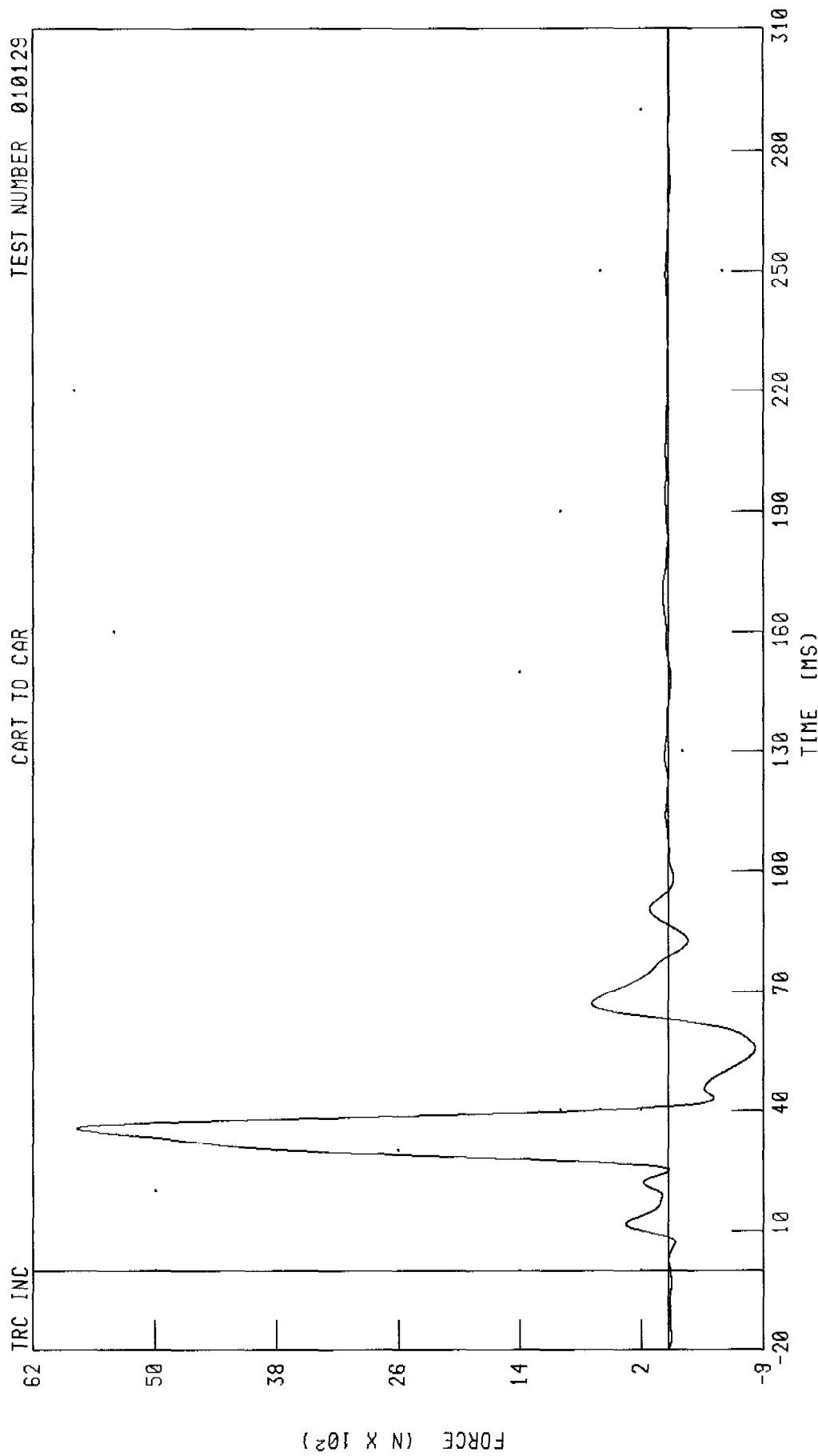
CHANNEL BC4XF FILTER CH CLASS 60

PEAK DATA 49475 74 N @ 33 36 MS, -283 68 N @ 142 08 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C4 Y-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL C4 Z-AXIS FORCE



CHANNEL BC4ZF FILTER CH CLASS 60

PEAK DATA 5843 13 N 0 35 68 MS, -851 29 N 0 55 60 MS

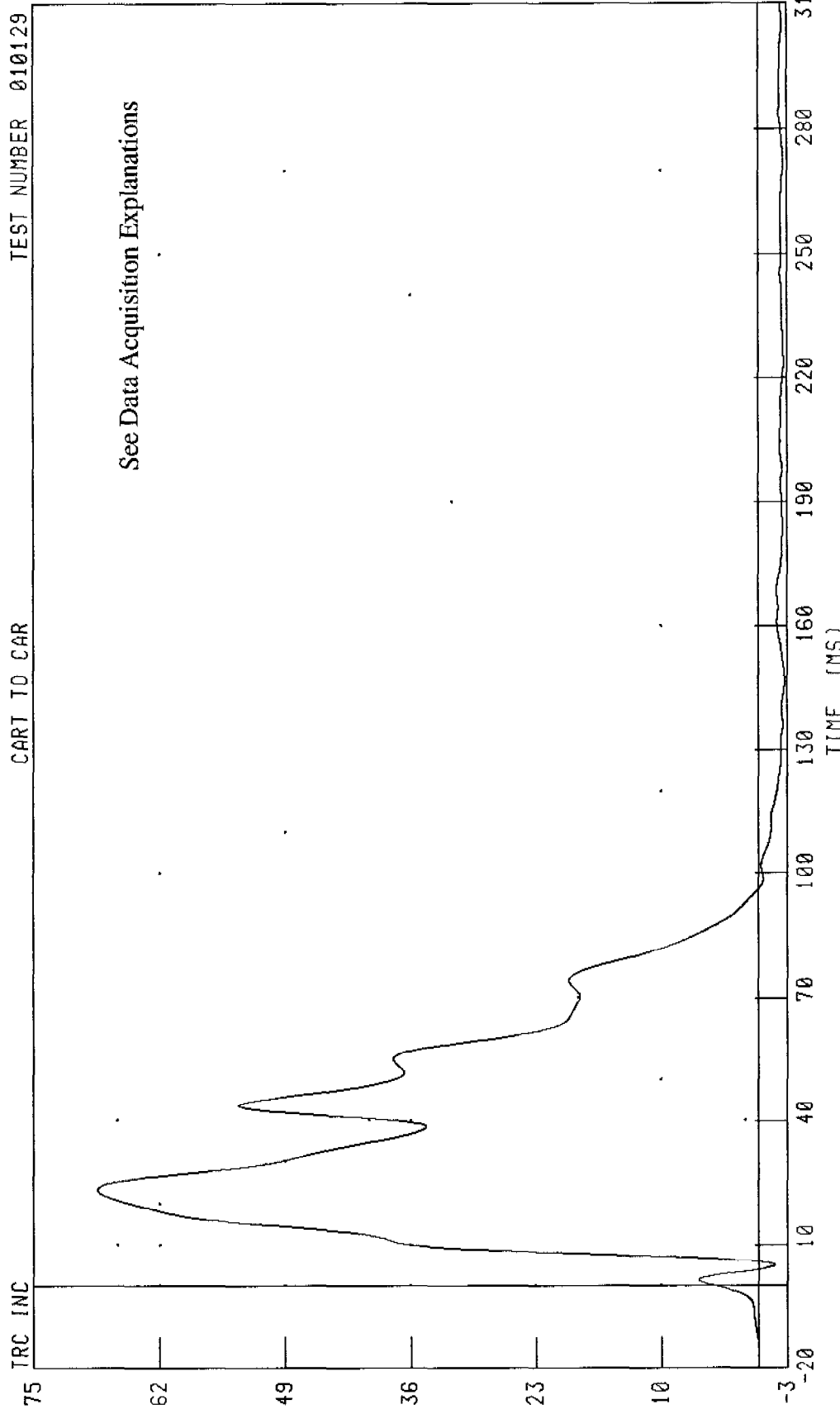
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K2 X-AXIS FORCE
CART TO CAR

TRC INC

TEST NUMBER 010129

See Data Acquisition Explanations

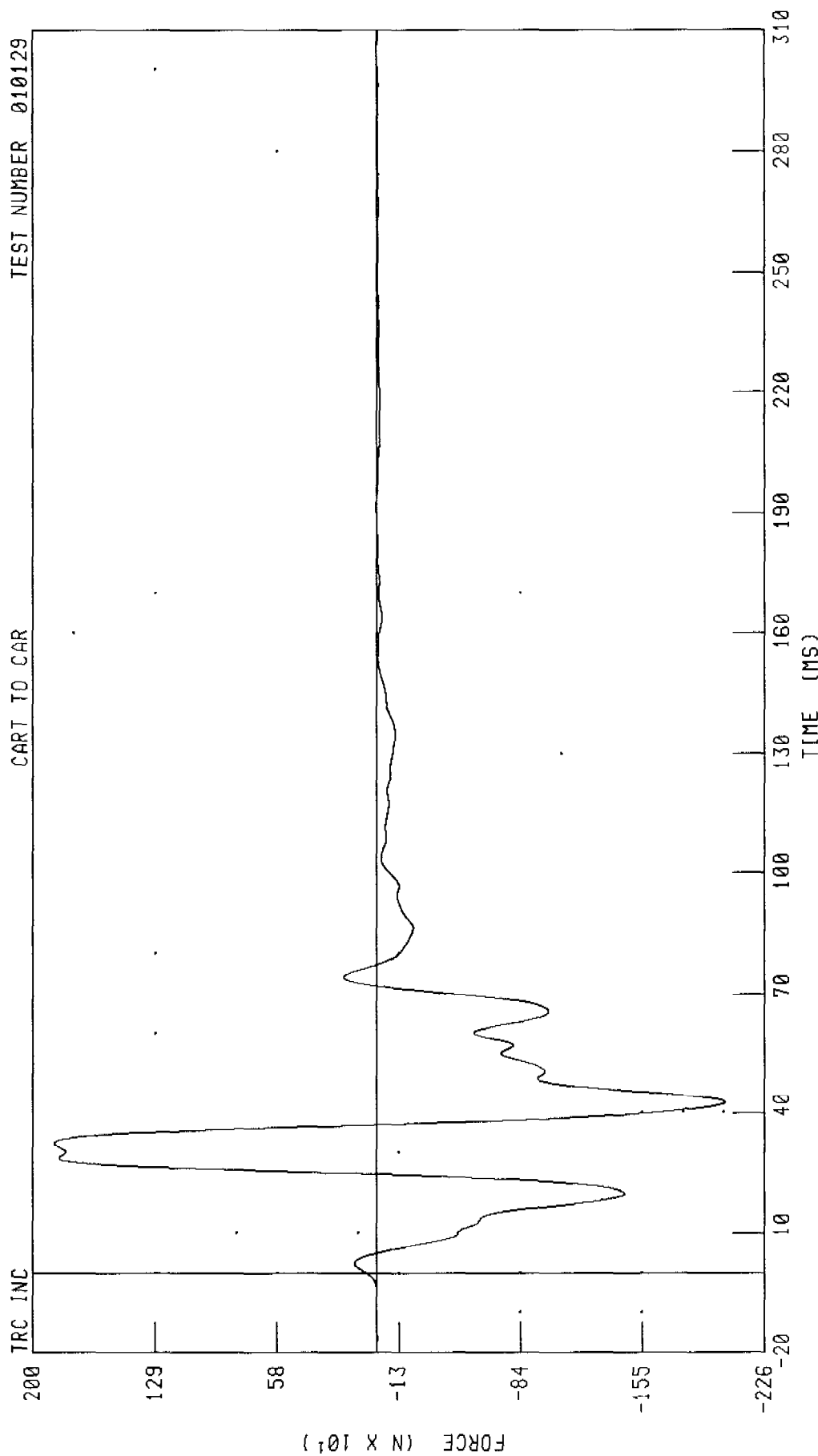
FORCE (N X 10²)



PEAK DATA 6839 55 N @ 23 44 MS, -275 60 N @ 146 72 MS

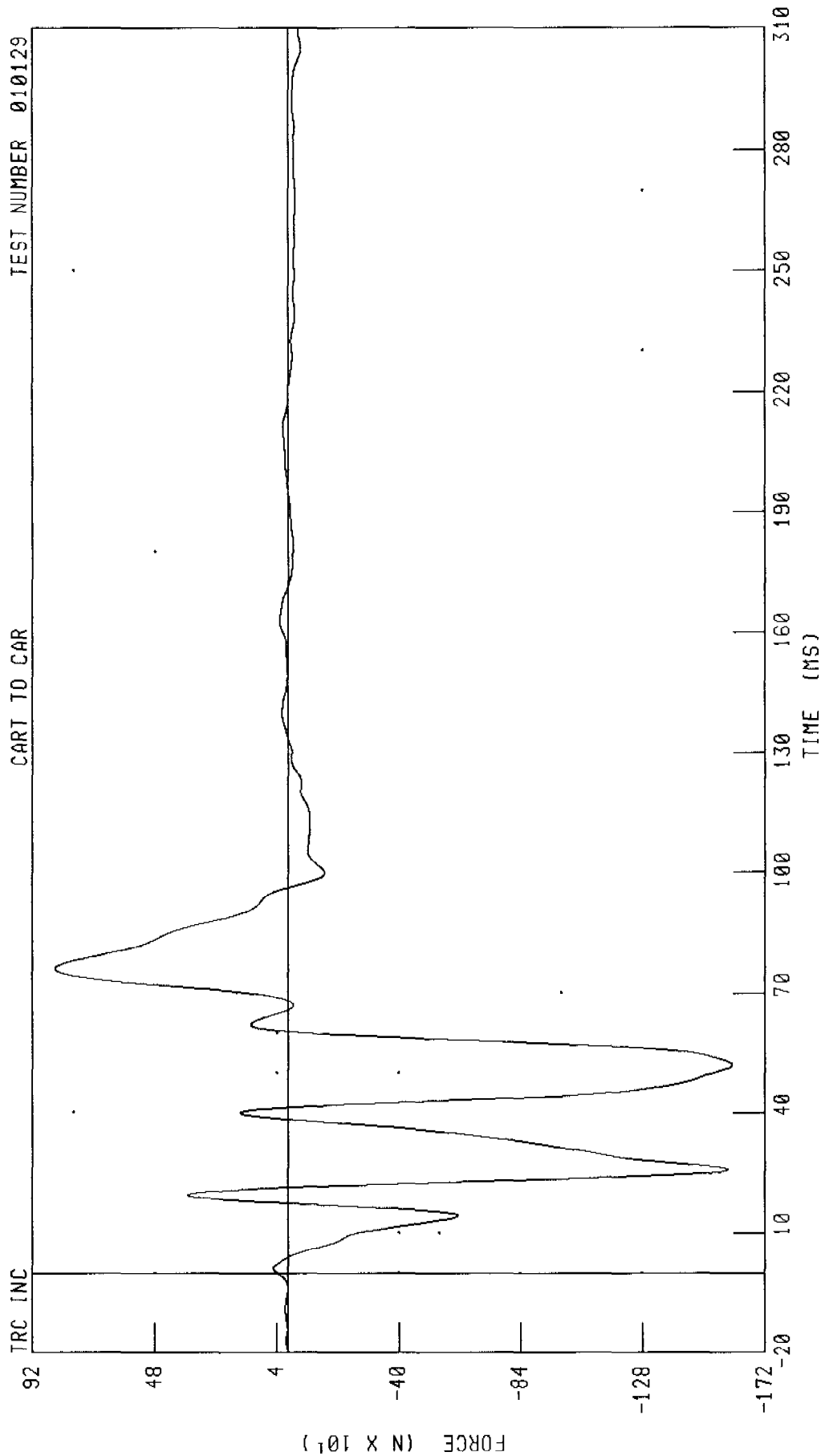
CHANNEL BK2XF FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K2 Y-AXIS FORCE



CHANNEL BK2YF FILTER CH CLASS 60

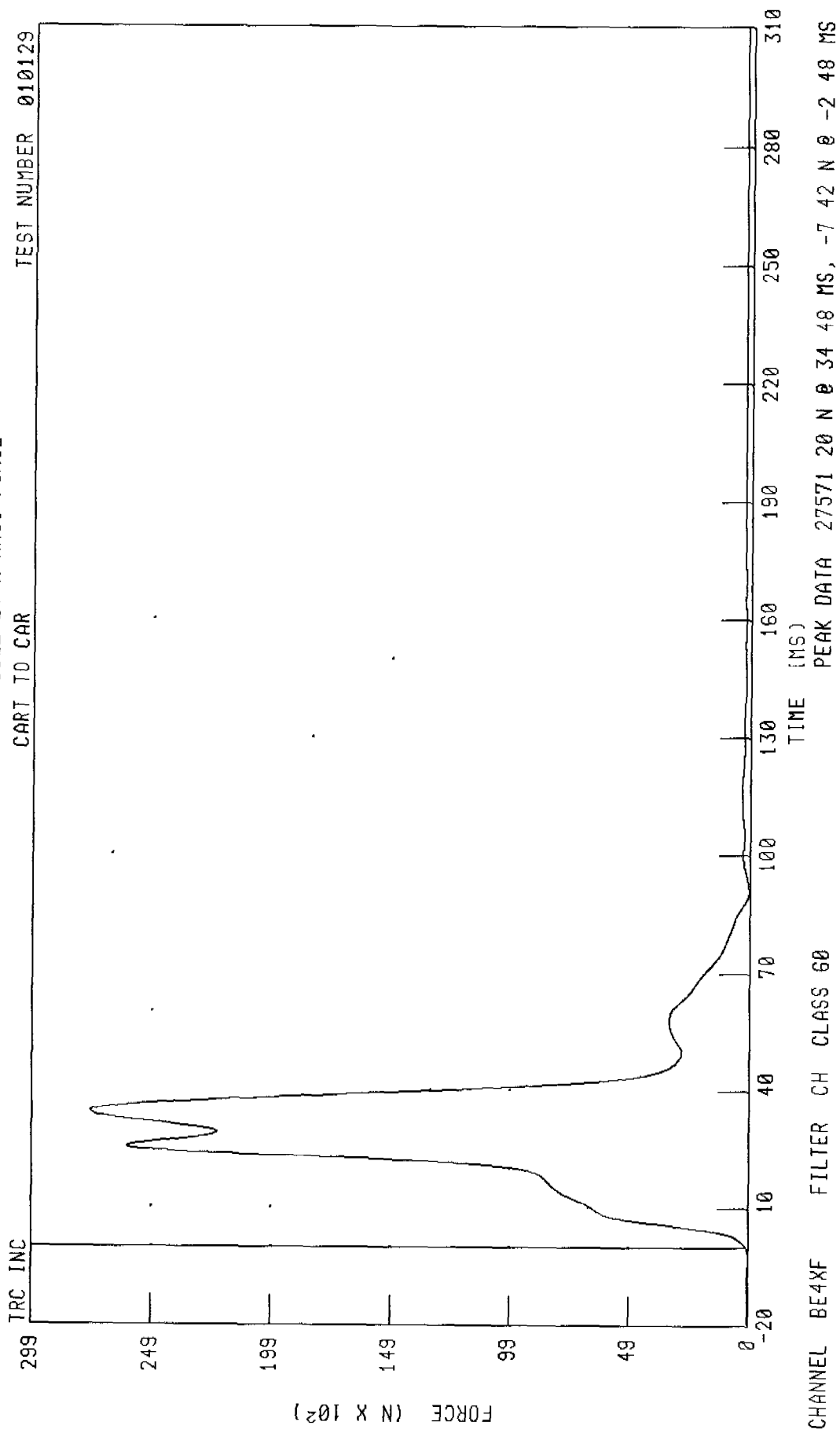
MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL K2 Z-AXIS FORCE



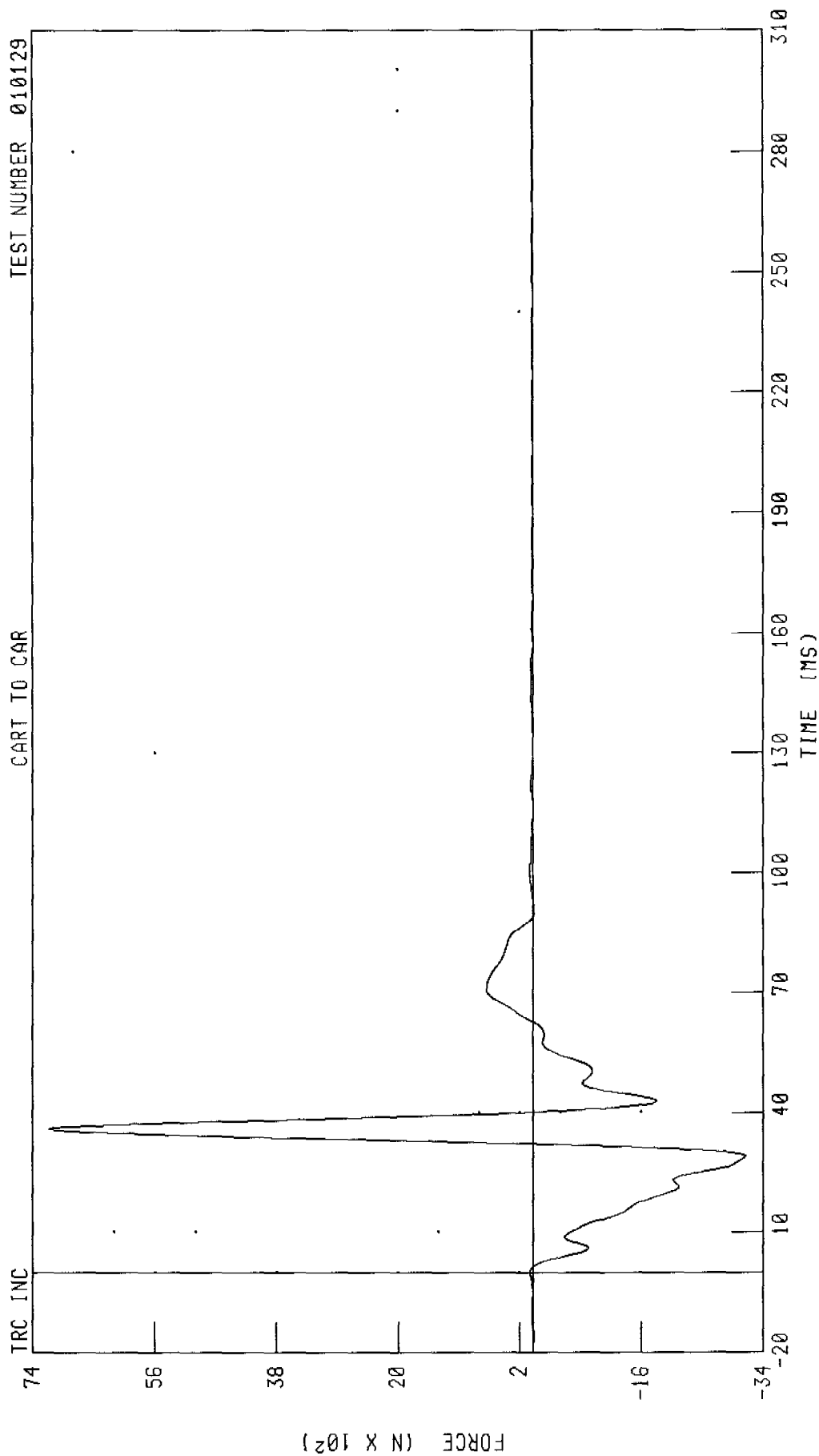
CHANNEL BK2ZF FILTER CH CLASS 60

PEAK DATA 840 05 N 0 76 08 MS, -1603 03 N 0 51 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E4 X-AXIS FORCE



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E4 Y-AXIS FORCE



CHANNEL BE4YF FILTER CH CLASS 60

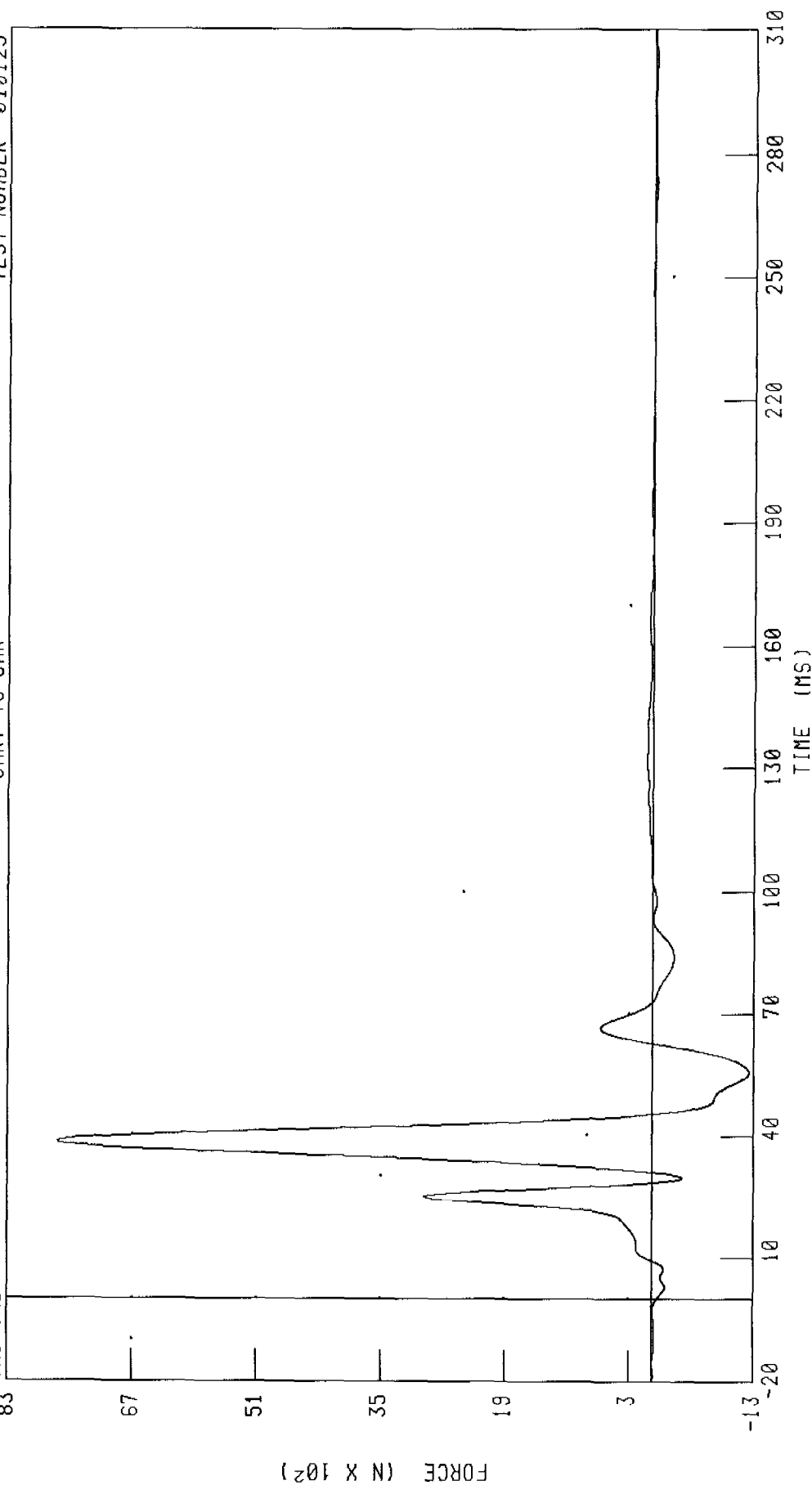
PEAK DATA 7155 96 N @ 36 00 MS, -3141 22 N @ 29 04 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LOAD CELL E4 Z-AXIS FORCE

TRC INC

TEST NUMBER 010129

CART TO CAR



CHANNEL BE4ZF FILTER CH CLASS 60

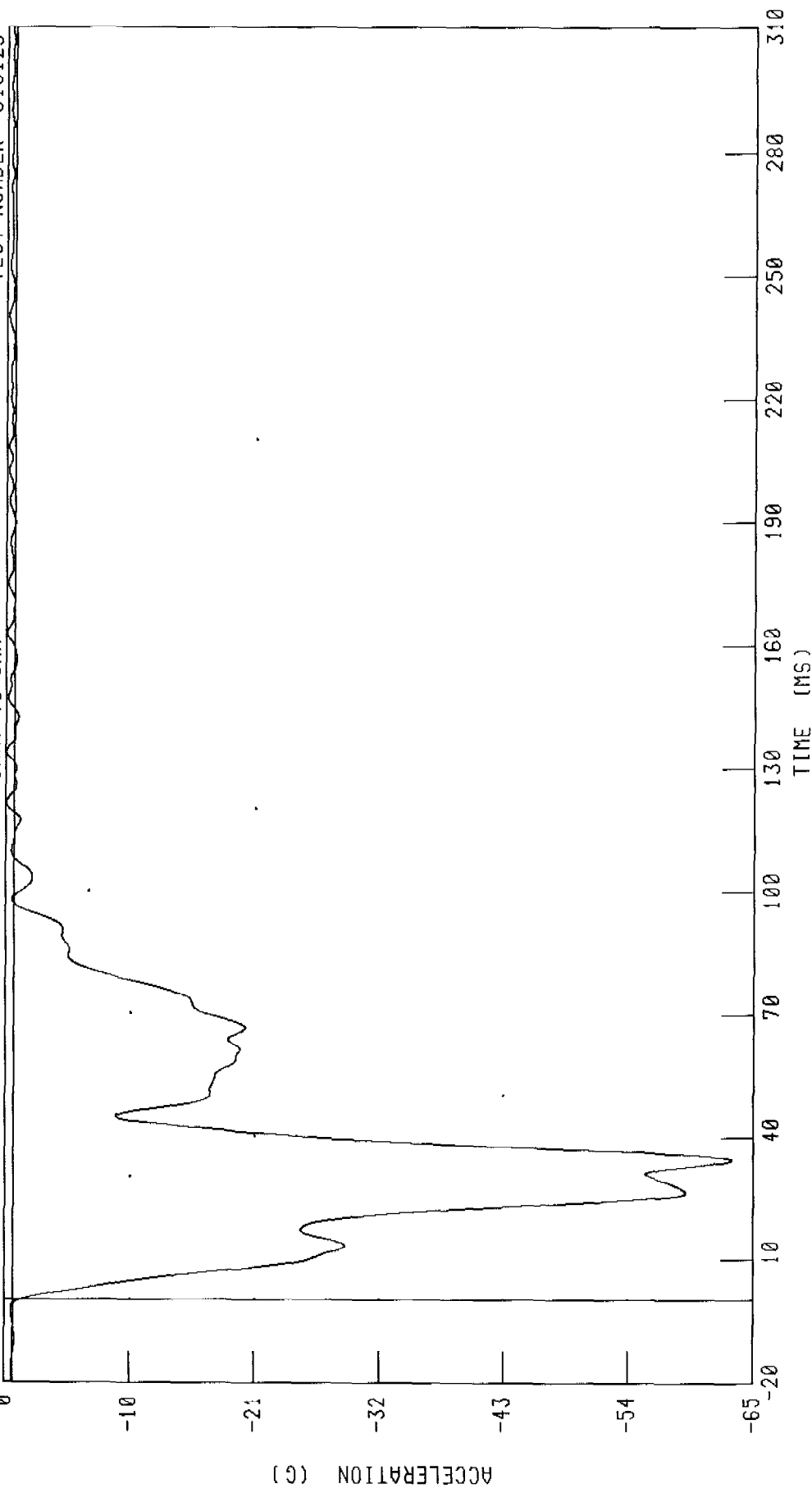
PEAK DATA 7657 93 N @ 38 48 MS, -1243 78 N @ 55 44 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER CENTER OF GRAVITY X-AXIS ACCELERATION

TRC INC

CART TO CAR

TEST NUMBER 010129



PEAK DATA 0 70 G 0 133 68 MS, -63 44 G 0 34 32 MS

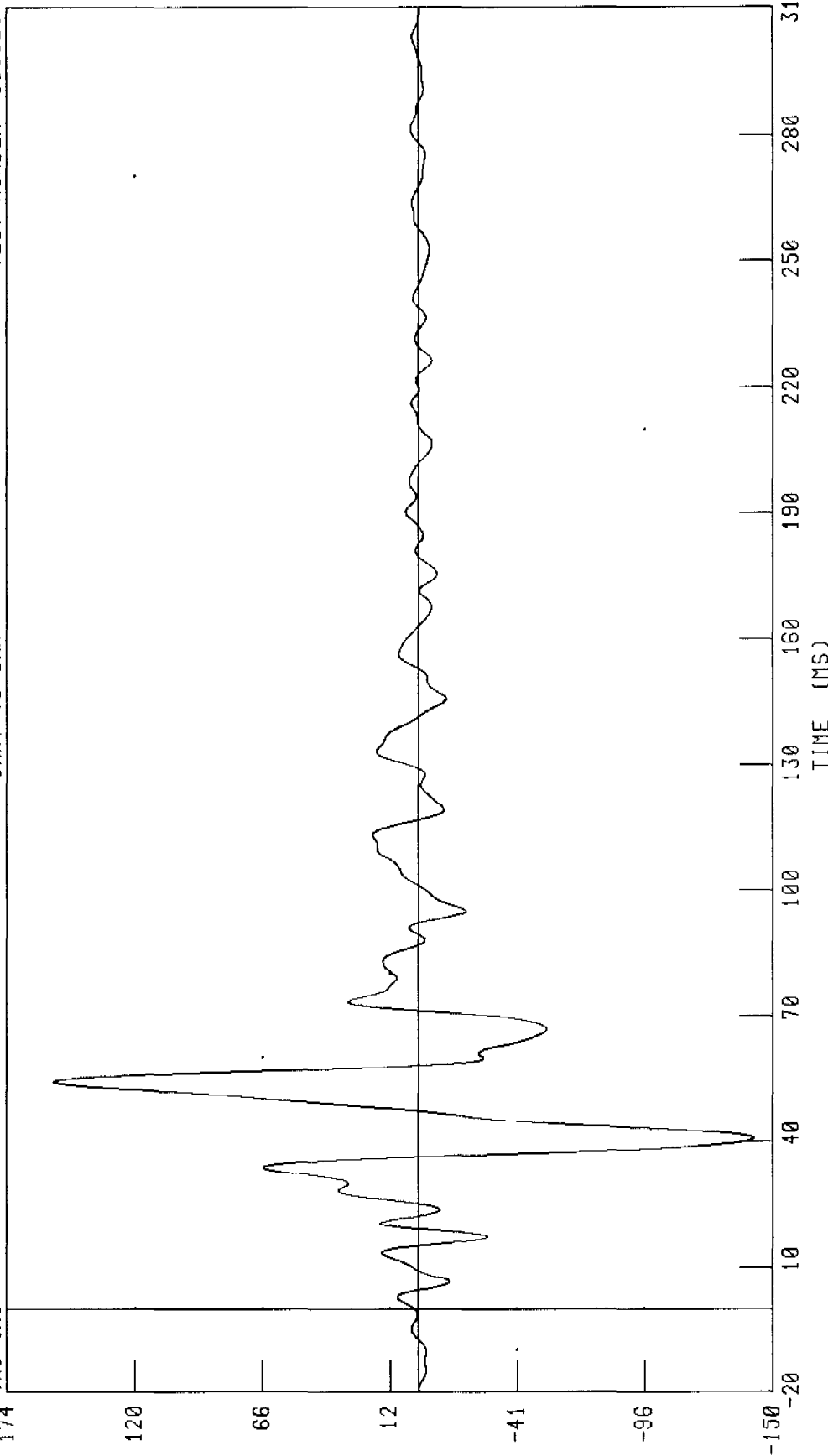
CHANNEL BCGXG1 FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER CENTER OF GRAVITY Y-AXIS ACCELERATION

TRC INC

CART TO CAR

TEST NUMBER 010129



CHANNEL BCCYC1 FILTER CH CLASS 60

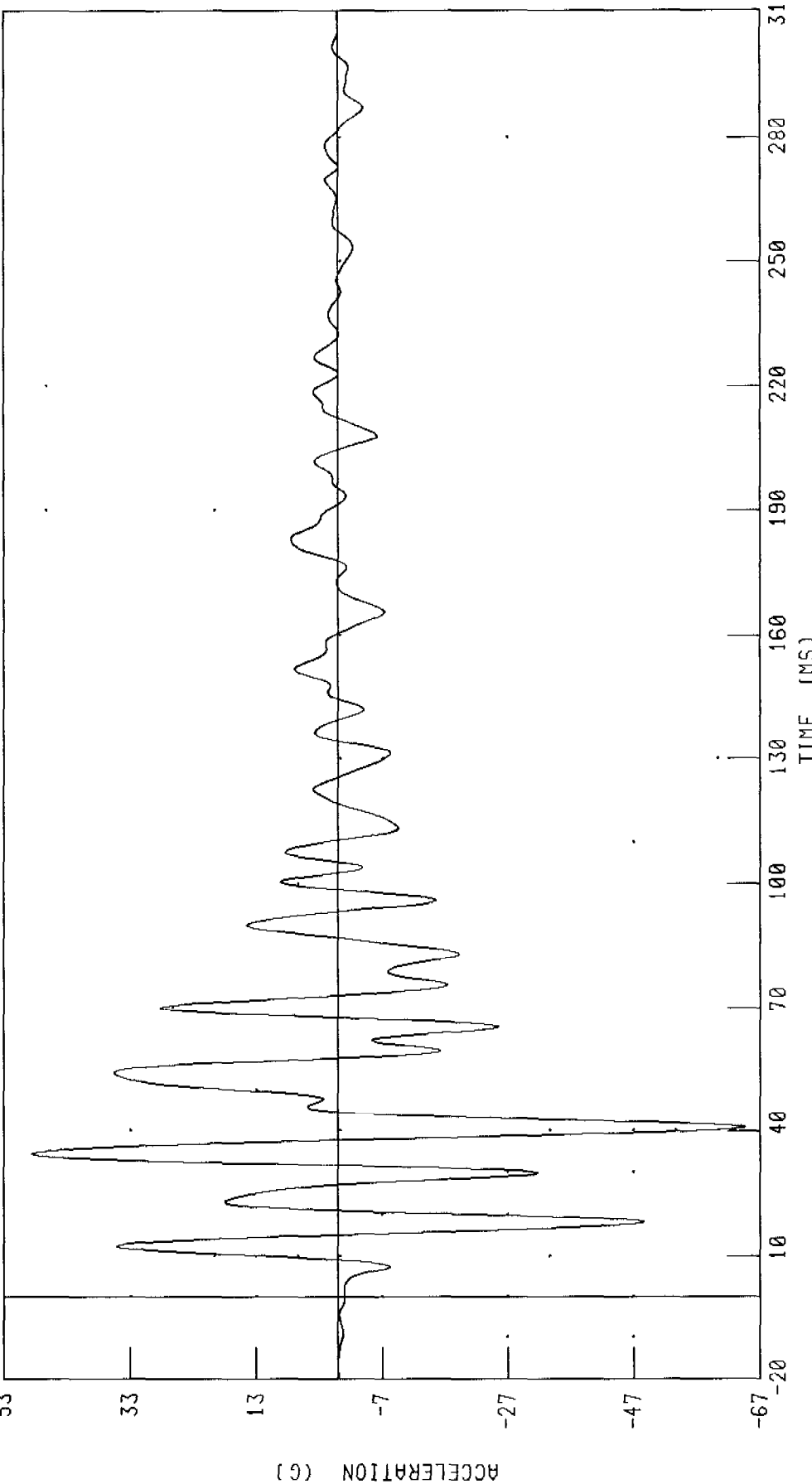
PEAK DATA 15 45 G @ 54 16 MS, -14 22 G @ 40 72 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER CENTER OF GRAVITY Z-AXIS ACCELERATION

TEST NUMBER 010129

CART TO CAR

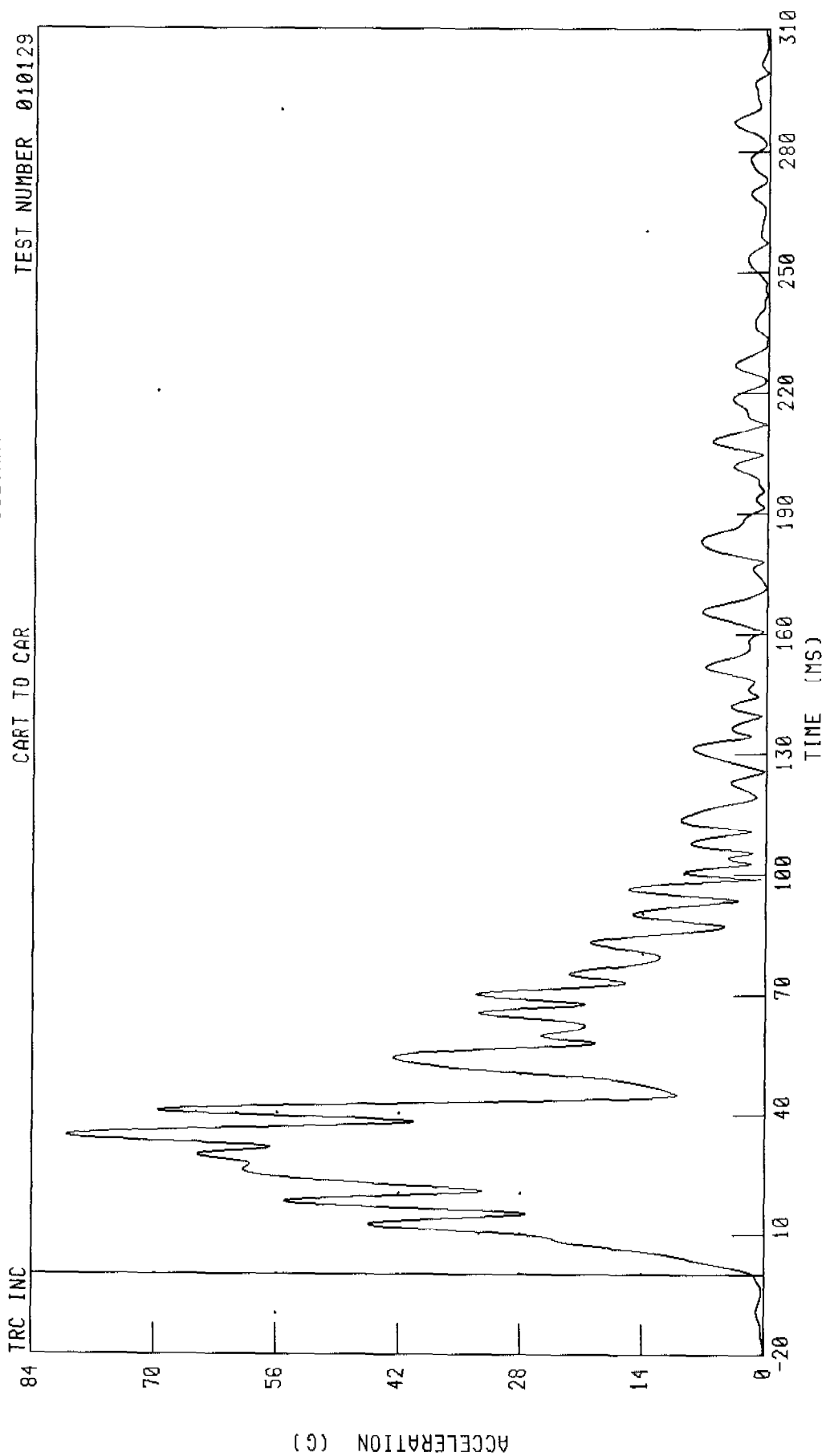
TRC INC



PEAK DATA 48 56 60 34 64 MS, -64 73 60 40 88 MS

CHANNEL BCGZG1 FILTER CH CLASS 60

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER CENTER OF GRAVITY RESULTANT

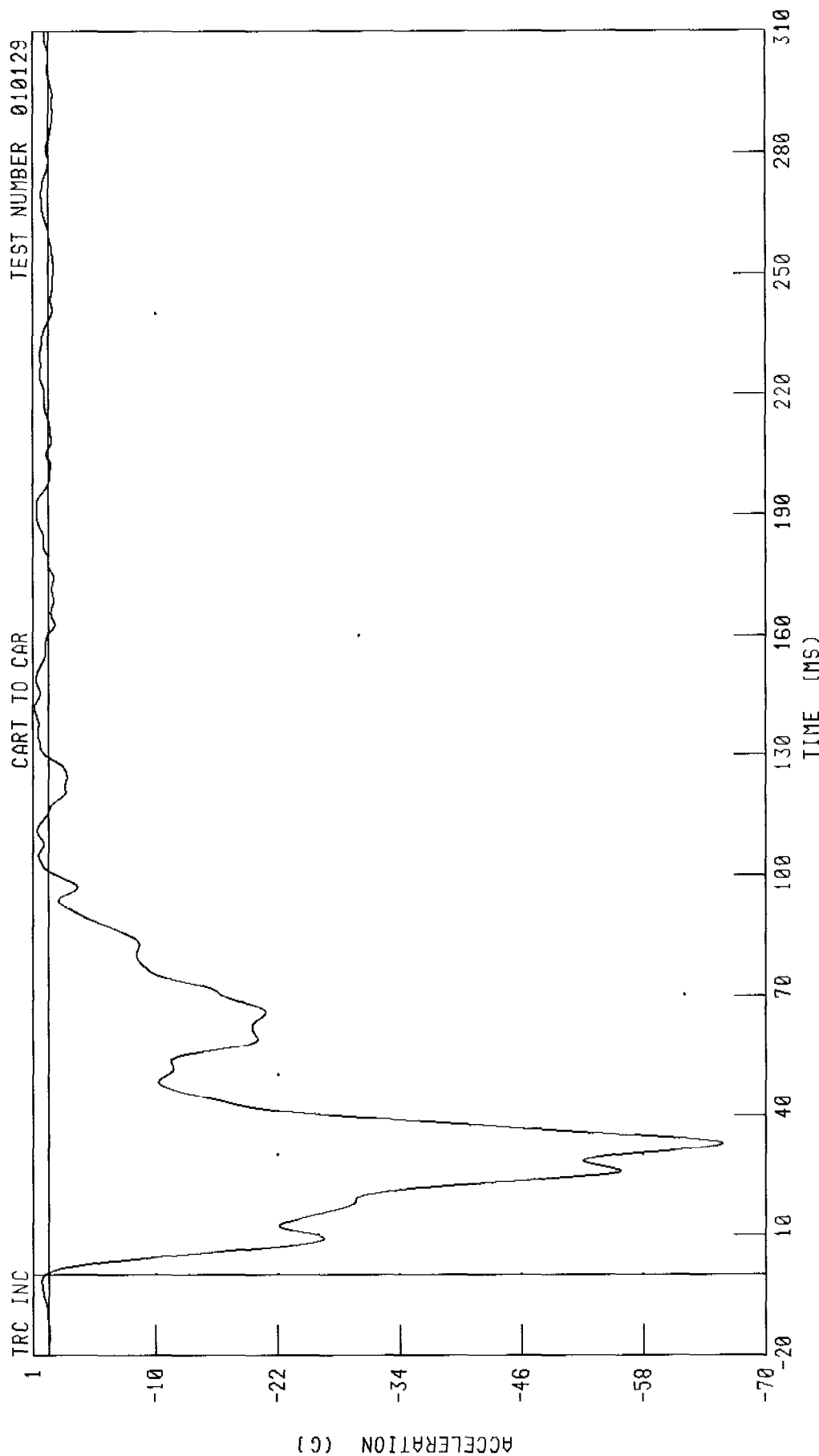


CHANNEL BCCRG1 FILTER CH CLASS 60

PEAK DATA 80 05 G @ 34 48 MS, 0 08 G @ -18 64 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE

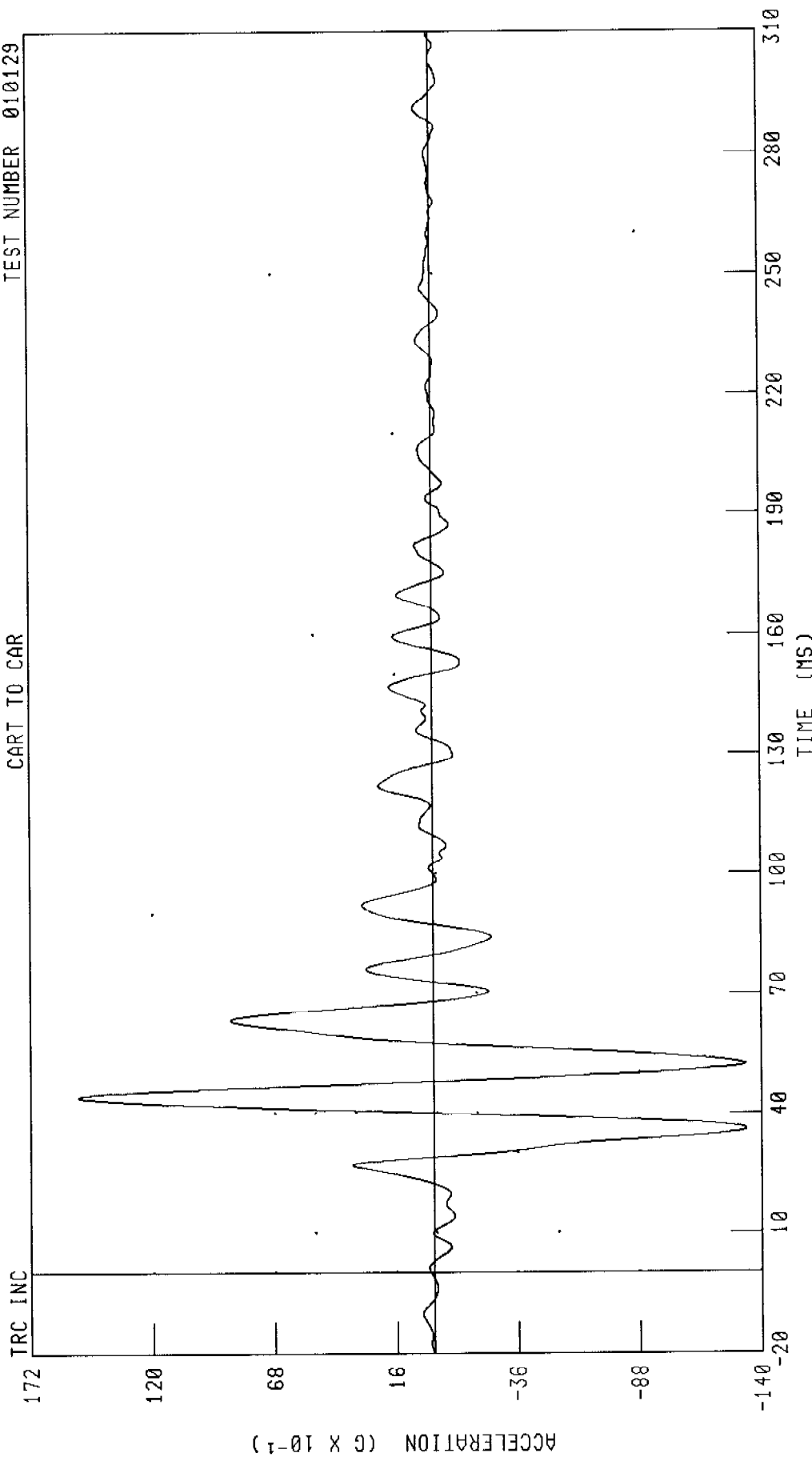
MOVING BARRIER LEFT REAR FRAME X-AXIS ACCELERATION



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER LEFT REAR FRAME Y-AXIS ACCELERATION

TEST NUMBER 010129

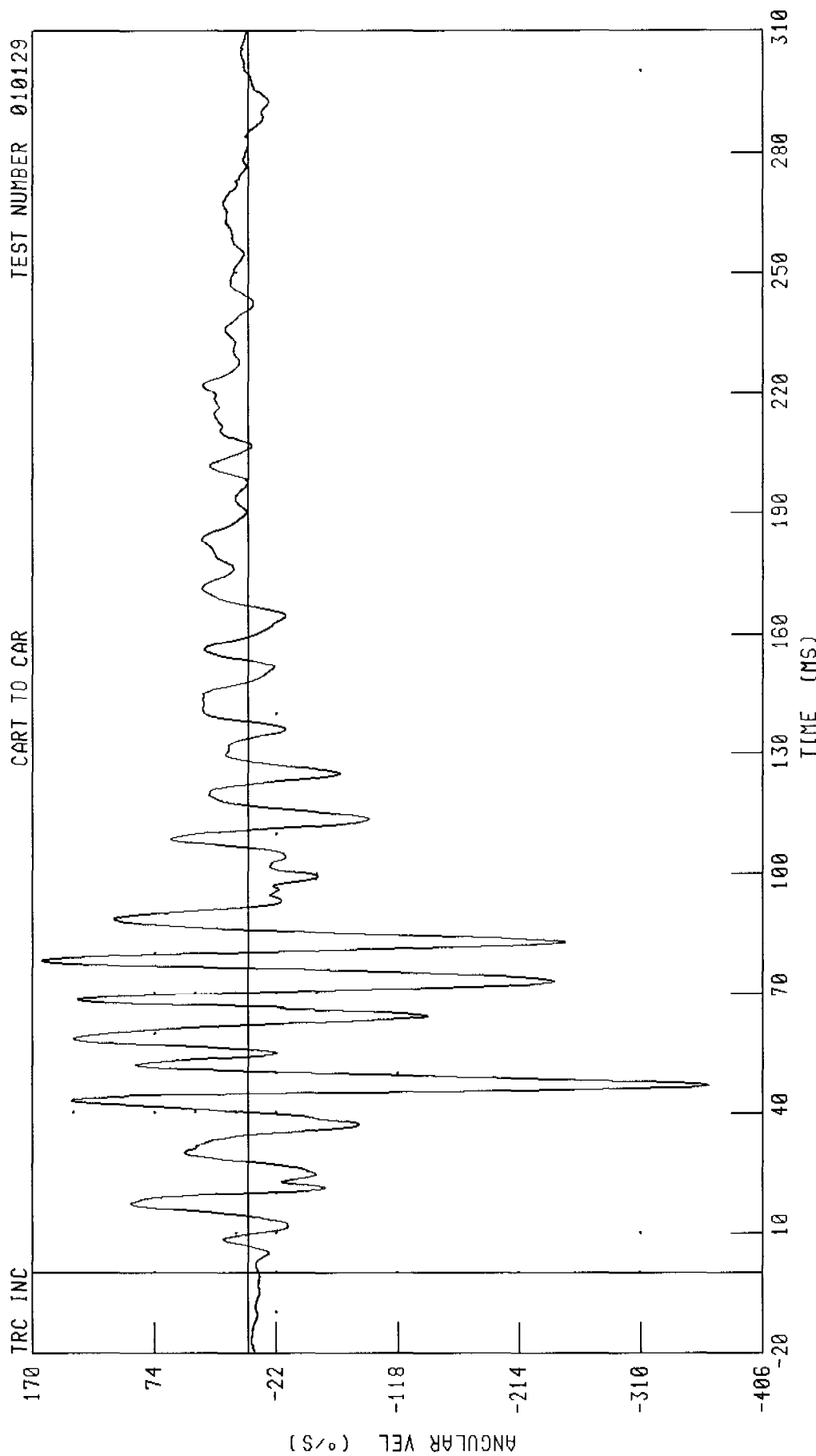
CART TO CAR



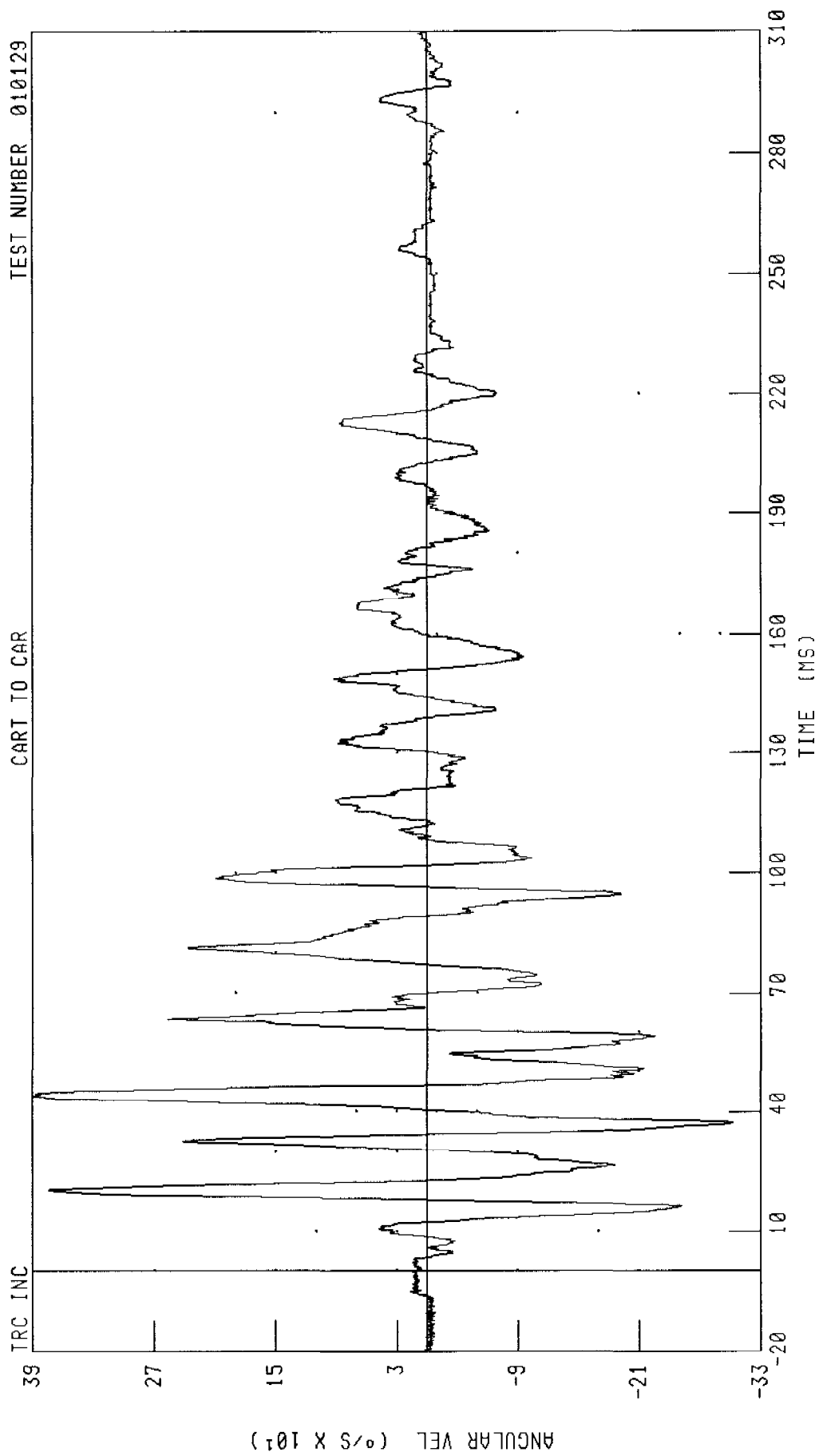
CHANNEL BLRYG1 FILTER CH CLASS 60

PEAK DATA 15 18 G 0 44 24 MS, -13 36 G 0 35 92 MS

MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER PITCH



MOVING DEFORMABLE BARRIER INTO 1997 DODGE CARAVAN AT 35 MPH CENTERLINE TO CENTERLINE
MOVING BARRIER YAW



CHANNEL VCGZV1 FILTER CH CLASS 1000

Appendix C

Dummy Certification Data

Pre-Test Calibration

Target Vehicle Driver Dummy S/N 090

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS
SN090

25-JAN-01

TRC INC. TEST NO: 090C32ED1 572E SN090 EXT.DIMENSION CAL32

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE (AA)		429 - 434 MM	432. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)		226 - 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)		970 -1001 MM	988. MM
WAIST CIRCUMFERENCE (Z)		836 - 866 MM	853. MM
CHEST DEPTH (O)		213 - 229 MM	221. MM
H-POINT HEIGHT (C)		84 - 89 MM	86. MM
H-POINT FROM SEATBACK (D)		135 - 140 MM	137. MM
SKULL CAP TO BACKLINE (H)		41 - 46 MM	43. MM
TOTAL SITTING HEIGHT (A)		879 - 889 MM	886. MM
THIGH CLEARANCE (F)		140 - 155 MM	150. MM
BUTTOCK KNEE LENGTH (K)		579 - 605 MM	597. MM
BUTTOCK POPLITEAL LENGTH (N)		452 - 478 MM	462. MM
POPLITEAL HEIGHT (L)		429 - 455 MM	437. MM
KNEE PIVOT HEIGHT (M)		485 - 500 MM	495. MM
FOOT LENGTH (P)		252 - 267 MM	259. MM
FOOT BREADTH (W)		91 - 107 MM	99. MM
SHOULDER PIVOT FROM BACKLINE (E)		84 - 94 MM	86. MM
SHOULDER BREADTH (V)		422 - 437 MM	427. MM
SHOULDER PIVOT HEIGHT (B)		506 - 521 MM	516. MM
ELBOW REST HEIGHT (J)		191 - 211 MM	206. MM
SHOULDER-ELBOW LENGTH (I)		330 - 345 MM	343. MM
BACK OF ELBOW TO WRIST PIVOT (G)		290 - 305 MM	300. MM

572E SN090 EXT.DIMENSION CAL32

DUMMY MEETS SPECIFICATIONS

TECHNICIAN

Dustin Wallen

RUN NUMBER: 012501.0954

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th

24-JAN-01

TRC INC.

TEST NO: 090C32HD1

572E SN090 HEAD DROP CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	23.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	260.22 G
PEAK LATERAL ACCELERATION	15 G MAX	1.80 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN *Dustin Walker*

RUN NUMBER: 012401.1729;1

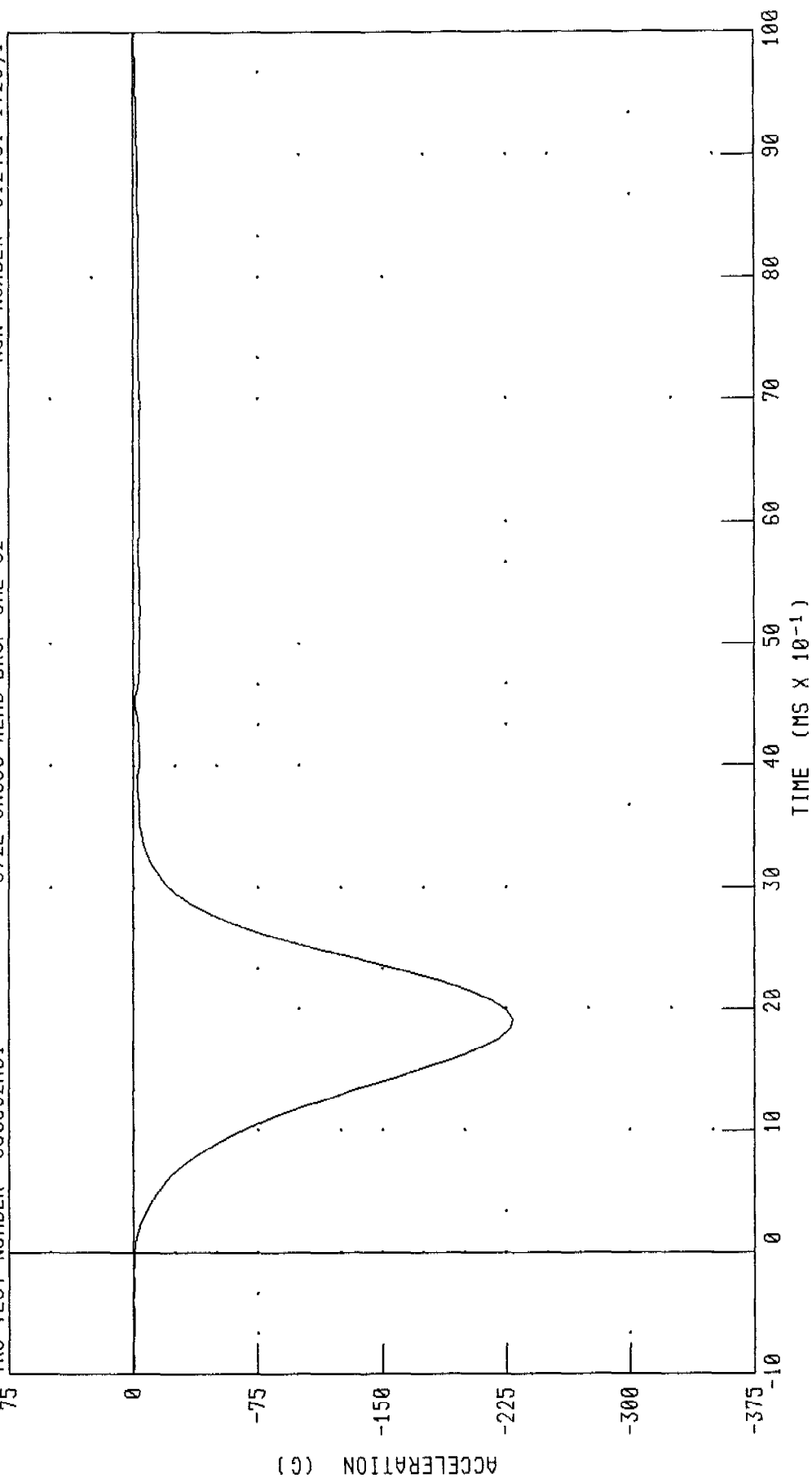
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER 090C32HD1

572E SN090 HEAD DROP CAL 32

RUN NUMBER 012401 1729,1



CHANNEL HEDXC FILTER CH CLASS 1000

TIME (MS X 10⁻¹)

PEAK DATA 0 05 C 0 -0 80 MS, -228 91 G 0 1 92 MS

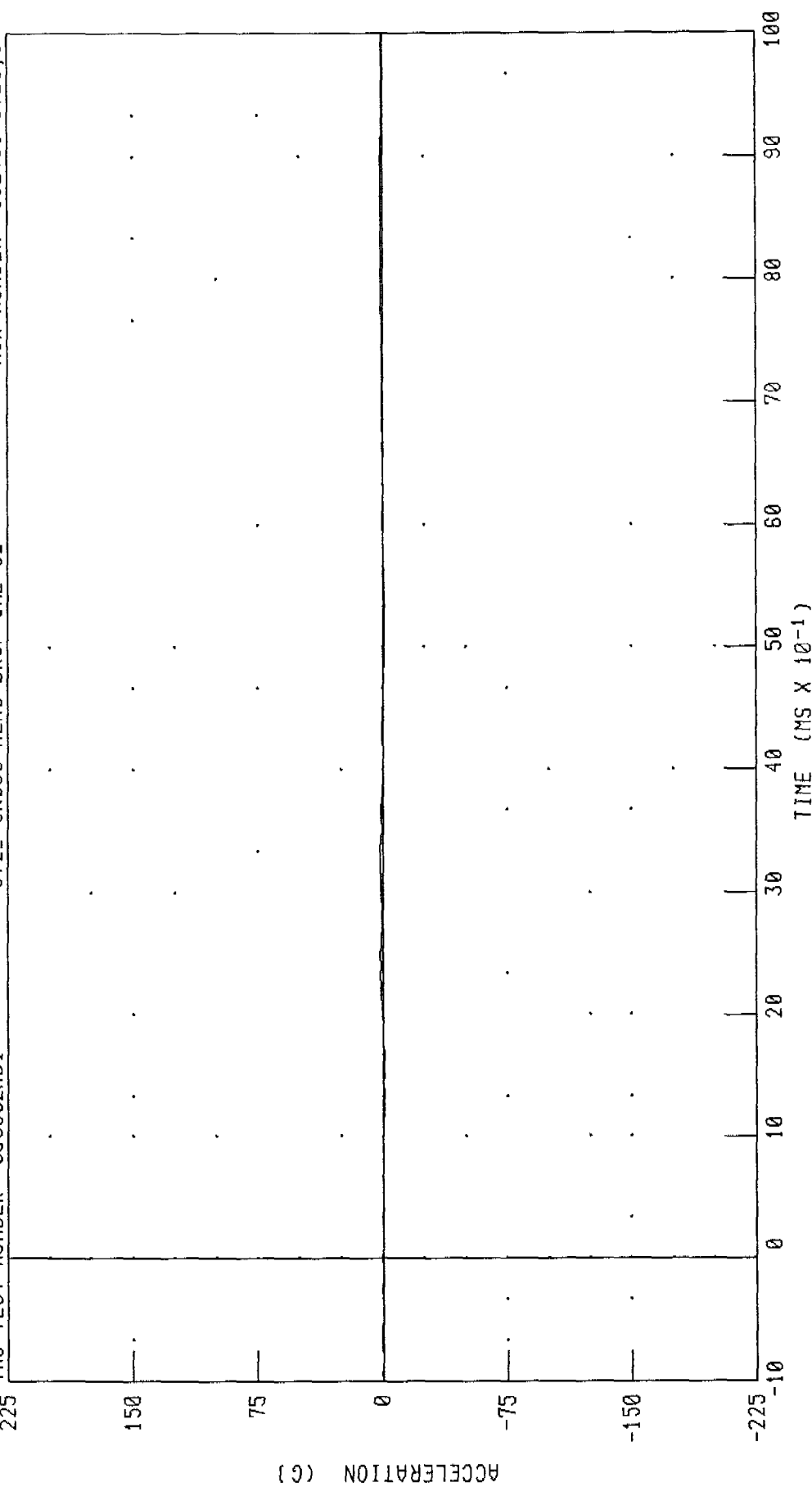
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER 090C32HD1

572E SN090 HEAD DROP CAL 32

RUN NUMBER 012401 1729,1



CHANNEL HEDYC FILTER CH CLASS 1000

PEAK DATA 1 80 G @ 3 28 MS, -1 12 G @ 5 12 MS

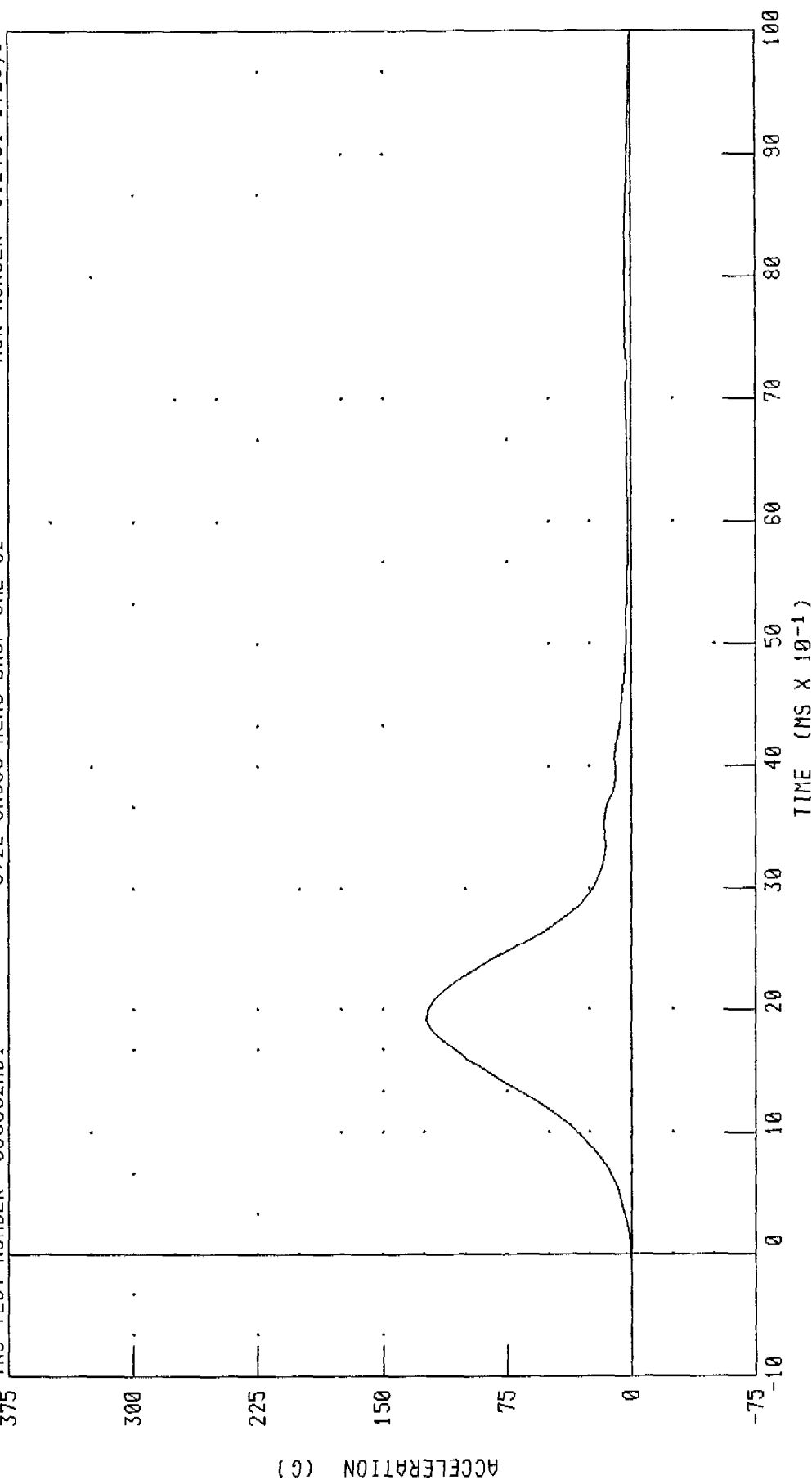
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER 090C32HD1

572E SN090 HEAD DROP CAL 32

RUN NUMBER 012401 1729,1



CHANNEL HEADZC FILTER CH CLASS 1000

TIME (MS X 10⁻¹)

PEAK DATA 123 75 G 0 1 92 MS, -0 13 G 0 -0 80 MS

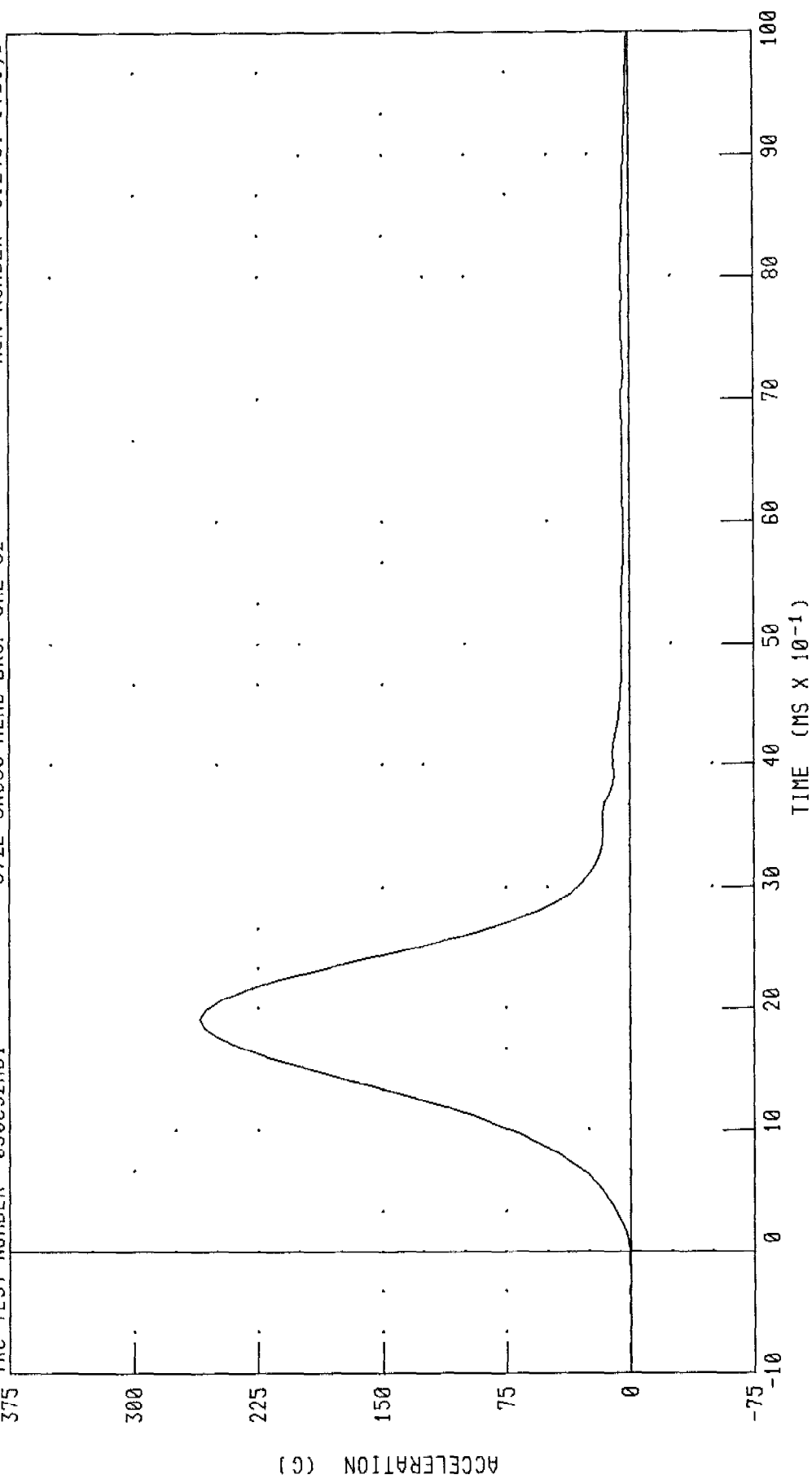
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SN090 HEAD DROP CAL 32

TRC TEST NUMBER 090C32HD1

RUN NUMBER 012401 1729,1



CHANNEL HEDRC FILTER CH CLASS 1000

PEAK DATA 260 22 G 0 1 92 MS, 0 10 G 0 -0 72 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

24-JAN-01

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 090C32NE1 572E SN090 NECK EXT CAL32

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	23.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.65 G
	20 MS	14.00 - 19.00 G	15.86 G
	30 MS	11.00 - 16.00 G	13.99 G
MAX PENDULUM G		22 G MAX	19.02 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.96 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	41.84 MS
D PLANE	MAX	81 - 106 DEG.	101.49 DEG.
ROTATION	TIME	72 - 82 MS	81.04 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-70.66 NM
	TIME	65 - 79 MS	75.44 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	163.52 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	147.92 MS

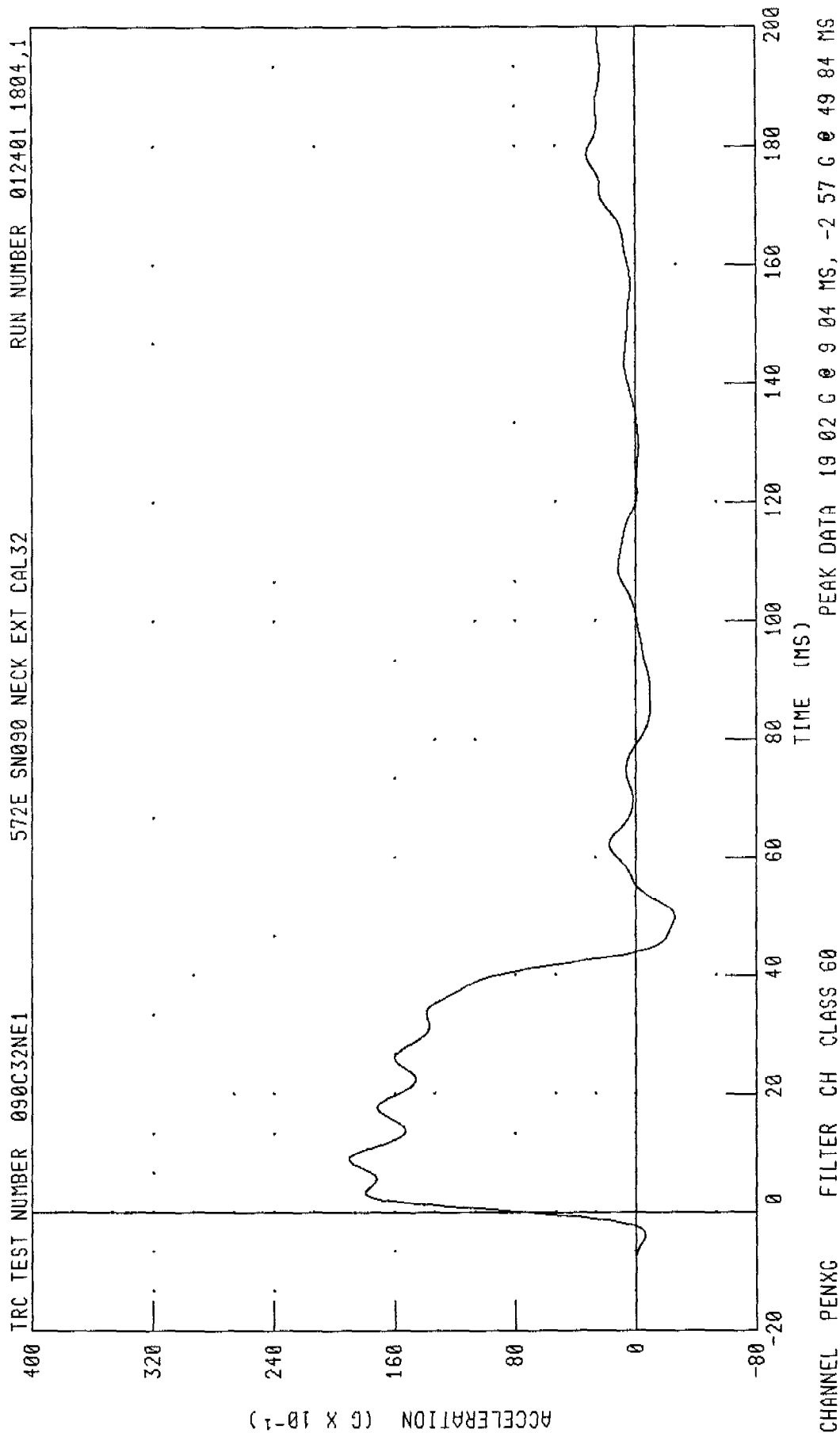
TEST MEETS SPECIFICATIONS

TECHNICIAN

Dust Walker

RUN NUMBER: 012401.1804;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
 PENDULUM DECELERATION



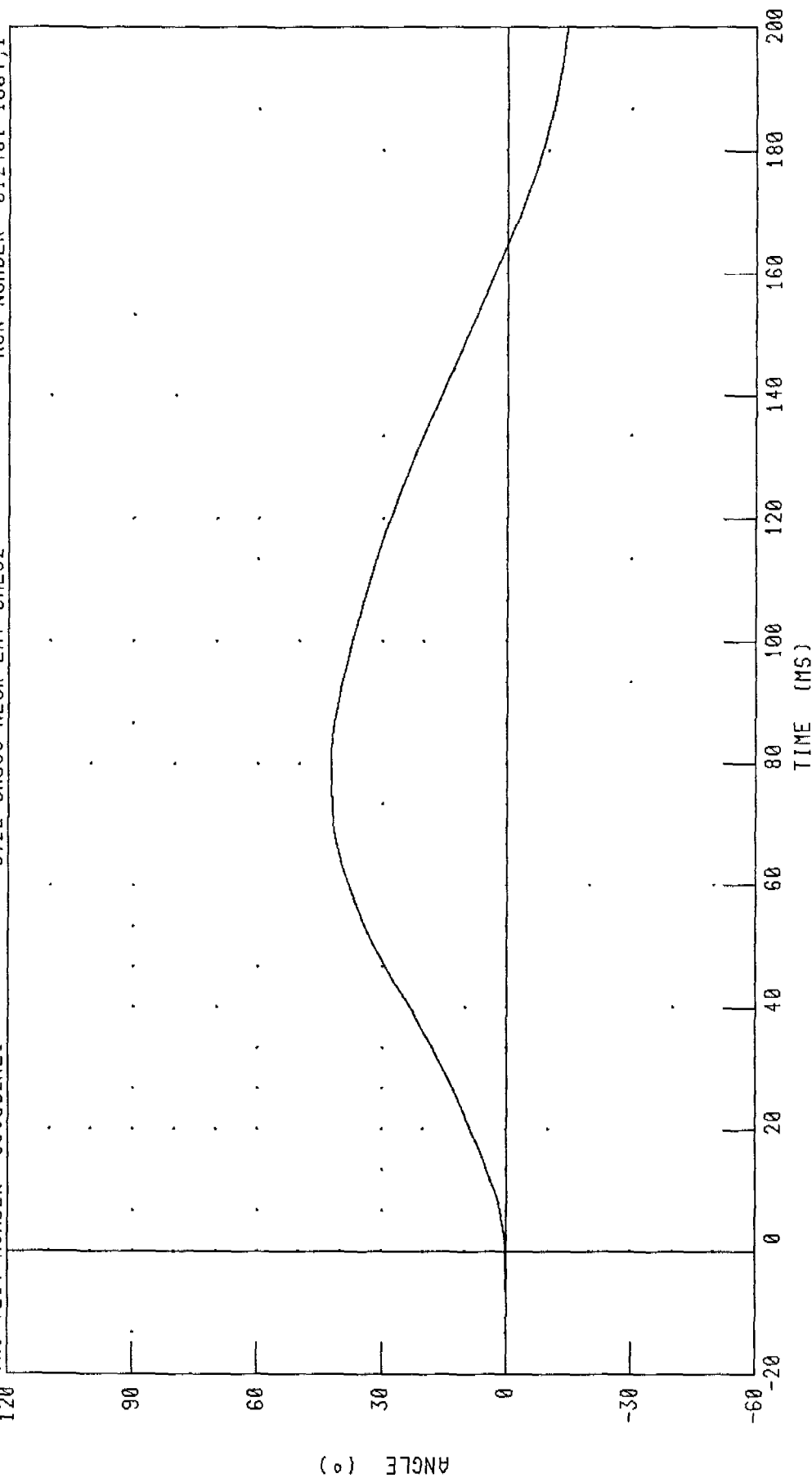
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER 090C32NE1

572E SN090 NECK EXT CAL32

RUN NUMBER 012401 1804,1



CHANNEL BETA FILTER CH CLASS 60 PEAK DATA 42 38 ° 0 79 68 MS, -14 60 ° 0 200 00 MS

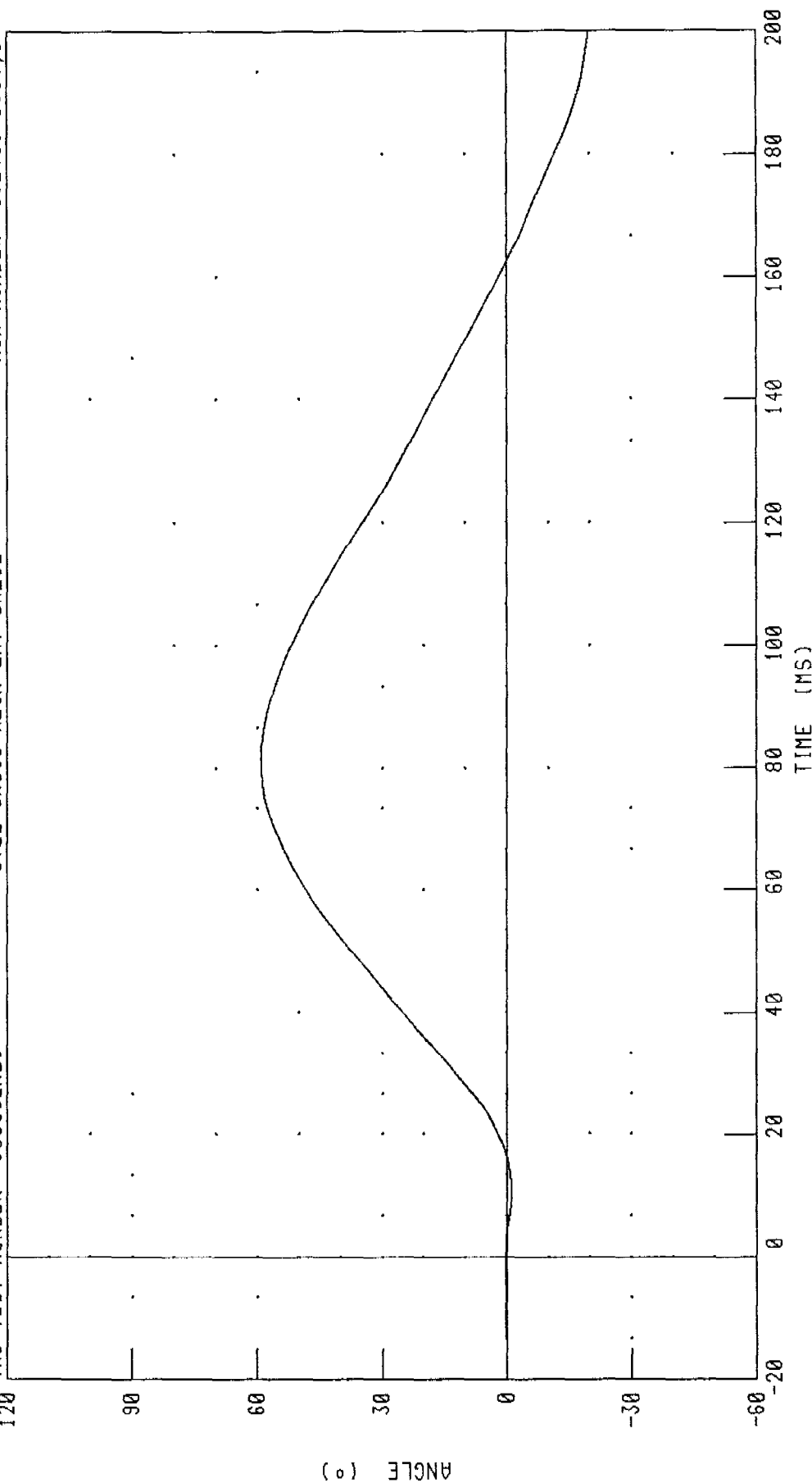
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 090C32NE1

572E SN090 NECK EXT CAL32

RUN NUMBER 012401 1804,1



CHANNEL THETA FILTER CH CLASS 60

PEAK DATA 59 16 ° @ 81 76 MS, -19 72 ° @ 200 00 MS

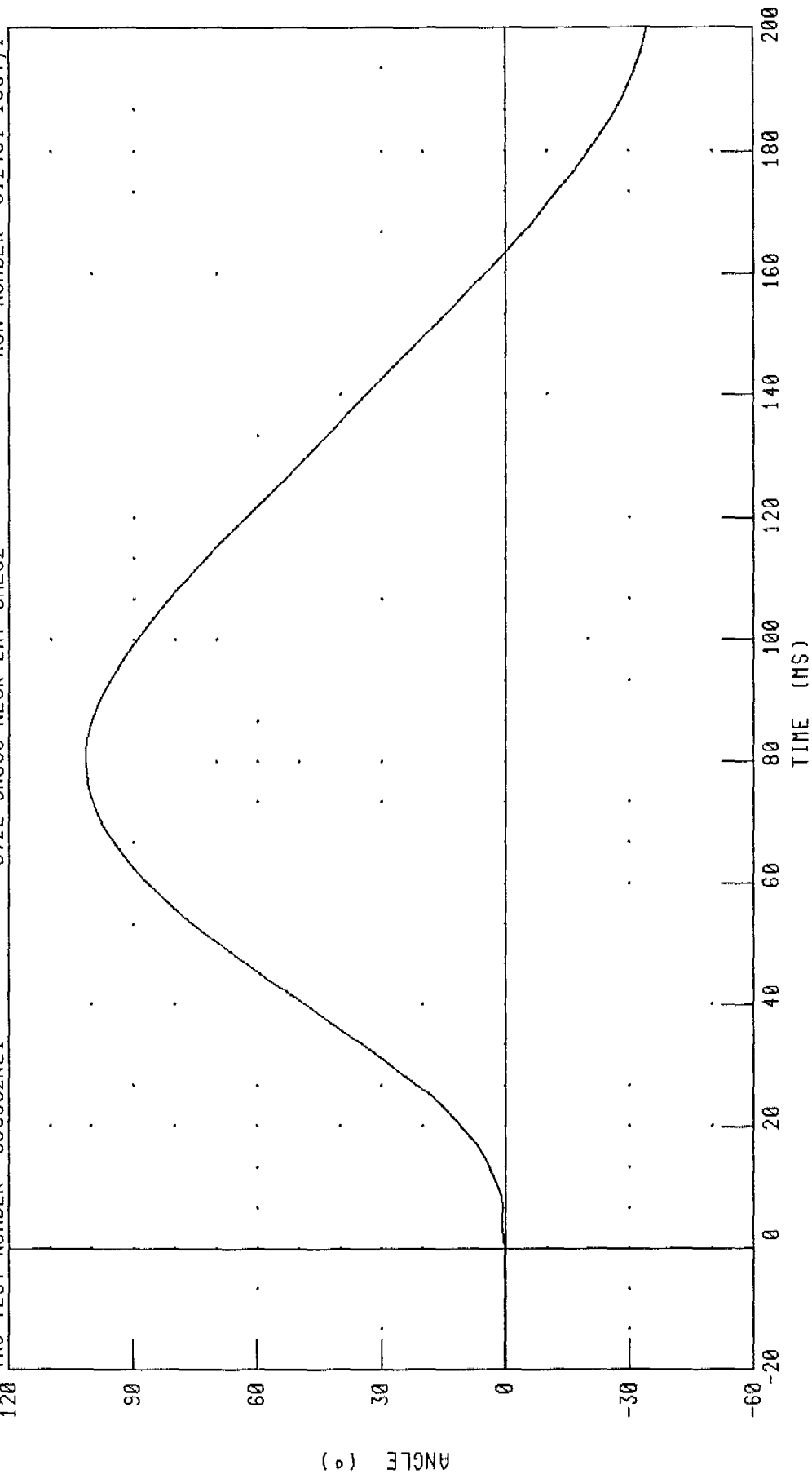
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER 090C32NE1

572E SN090 NECK EXT CAL32

RUN NUMBER 012401 1804,1



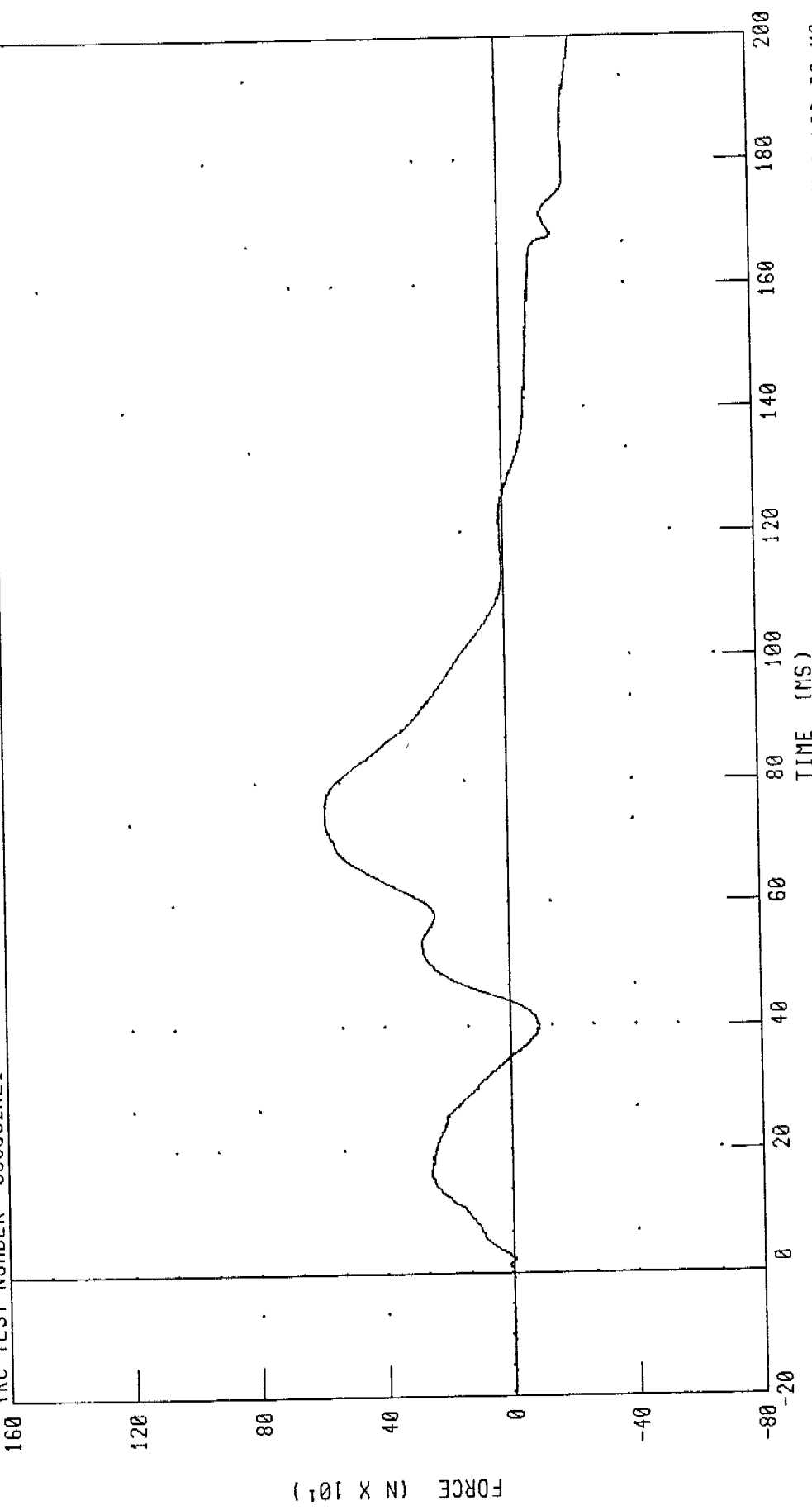
CHANNEL TOTAL FILTER CH CLASS 60

PEAK DATA 101 50 ° 0 81 04 MS, -34 32 ° 0 200 00 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER 090C32NE1 572E SN090 NECK EXT CAL32 RUN NUMBER 012401 1804,1

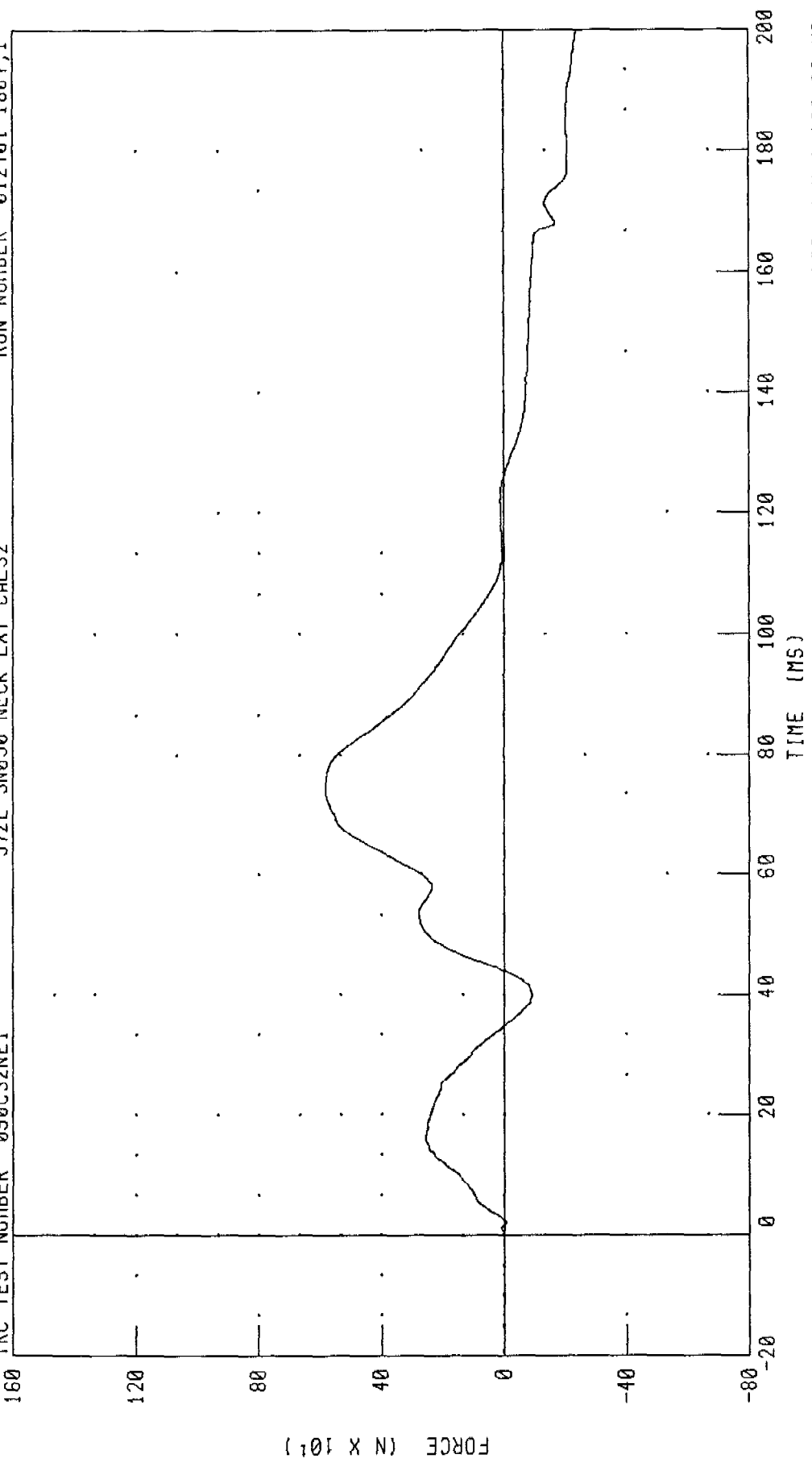


CHANNEL NEKXF FILTER CH CLASS 1000

PEAK DATA 581 82 N 0 73 04 MS, -238 64 N 0 199 20 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION

TRC TEST NUMBER 090C32NE1 572E SN090 NECK EXT CAL32 RUN NUMBER 012401 1804,1



CHANNEL NEKXFC FILTER CH CLASS 600 PEAK DATA 581 97 N @ 73 44 MS, -238 74 N @ 199 68 MS

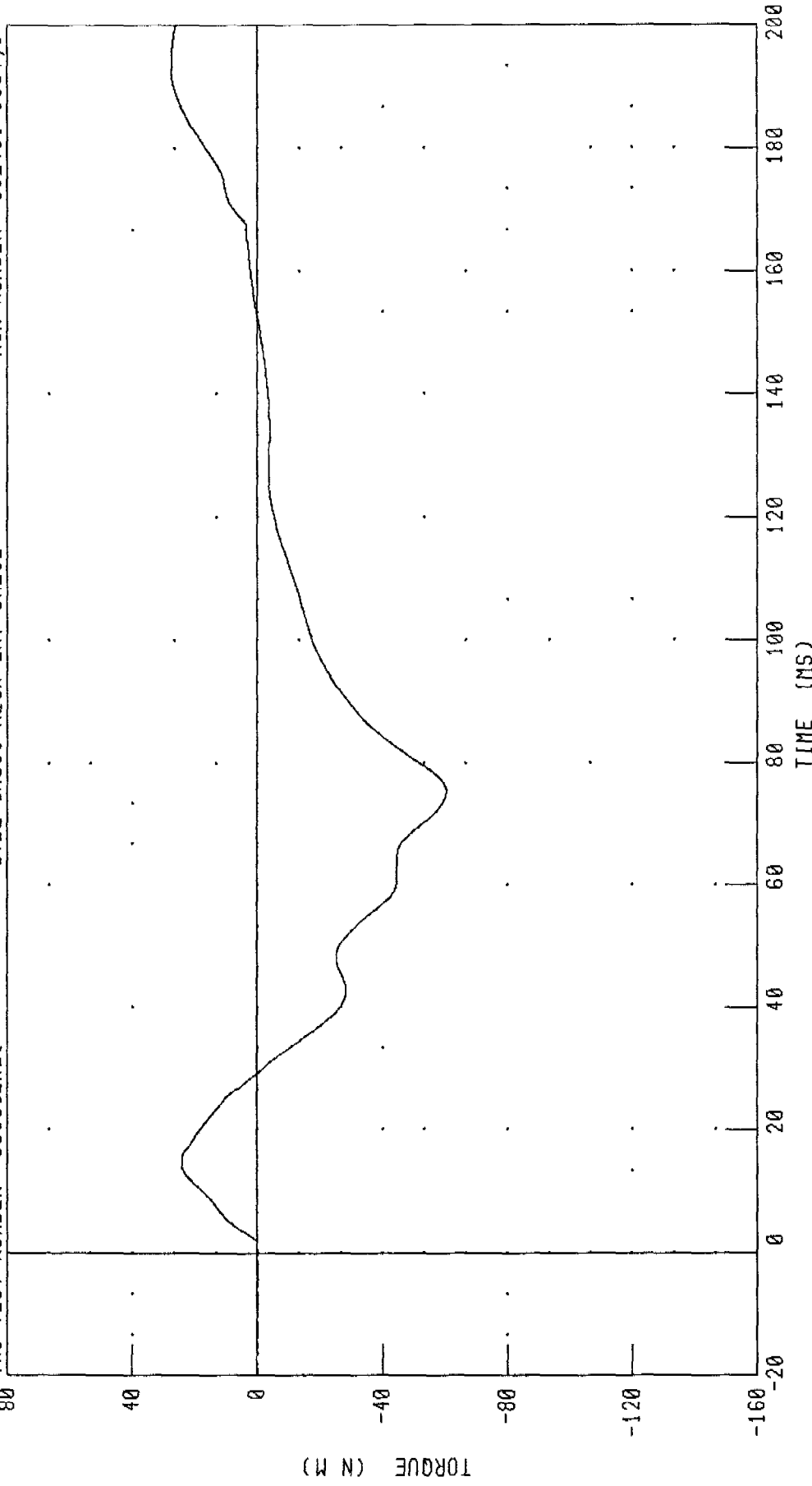
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER 090C32NE1

572E SN090 NECK EXT CAL32

RUN NUMBER 012401 1804,1



CHANNEL NEKYM FILTER CH CLASS 600

TIME (MS)

PEAK DATA 27 71 N M @ 192 32 MS, -60 31 N M @ 75 44 MS

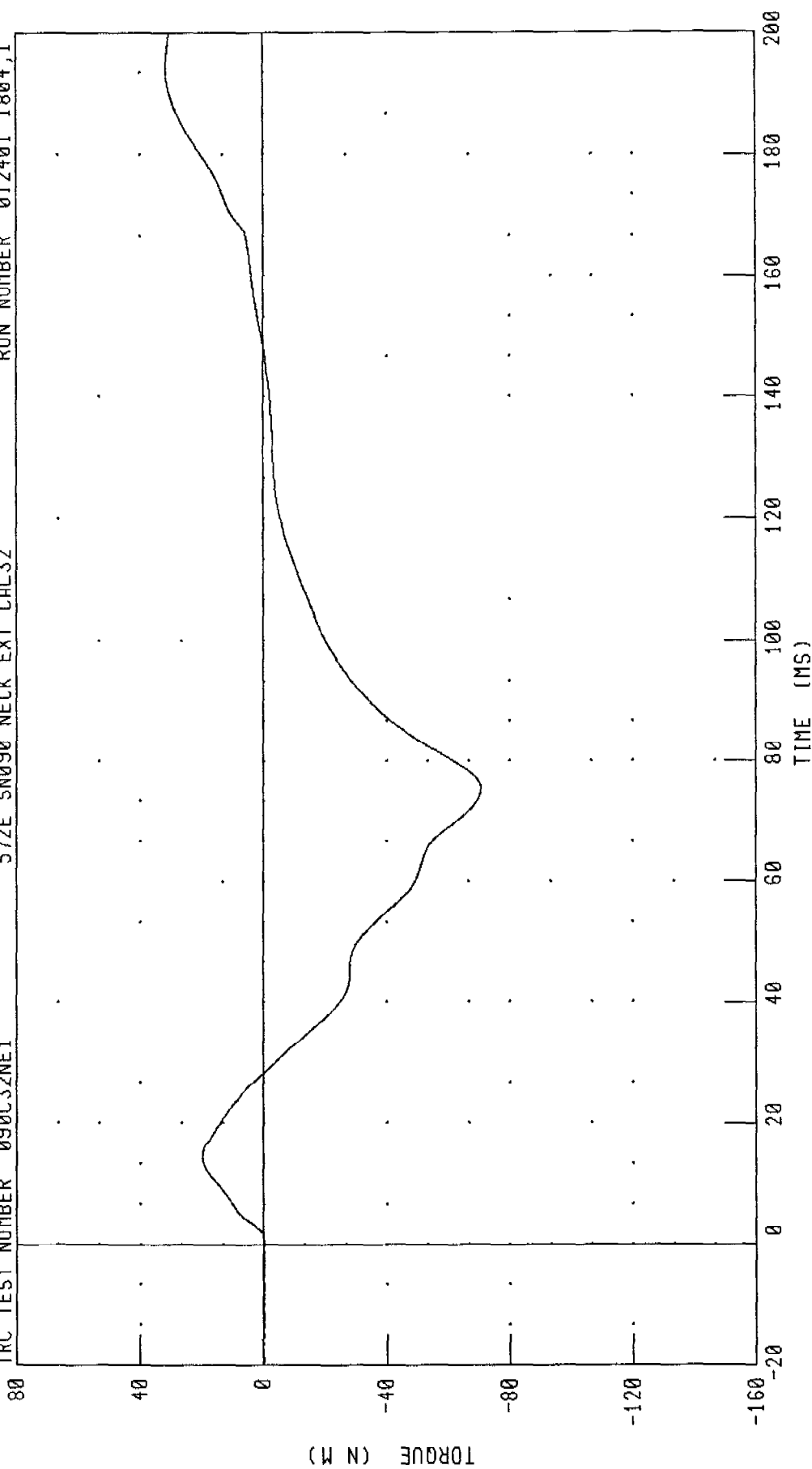
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 090C32NE1

572E SN090 NECK EXT CAL32

RUN NUMBER 012401 1804,1



CHANNEL NEKOM FILTER CH CLASS 600

PEAK DATA 31 72 N M @ 194 96 MS, -70 66 N M @ 75 44 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

24-JAN-01

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 090C32NF1 572E SN090 NECK FLEXION CAL32

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	23.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	24.69 G
	20 MS	17.60 - 22.60 G	19.75 G
	30 MS	12.50 - 18.50 G	16.16 G
MAX PENDULUM G		29 G MAX	25.11 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.12 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	38.48 MS
D PLANE	MAX	64 - 78 DEG.	73.03 DEG.
ROTATION	TIME	57 - 64 MS	62.96 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	93.43 NM
	TIME	47 - 58 MS	52.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	120.08 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	100.96 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 012401.1743;1

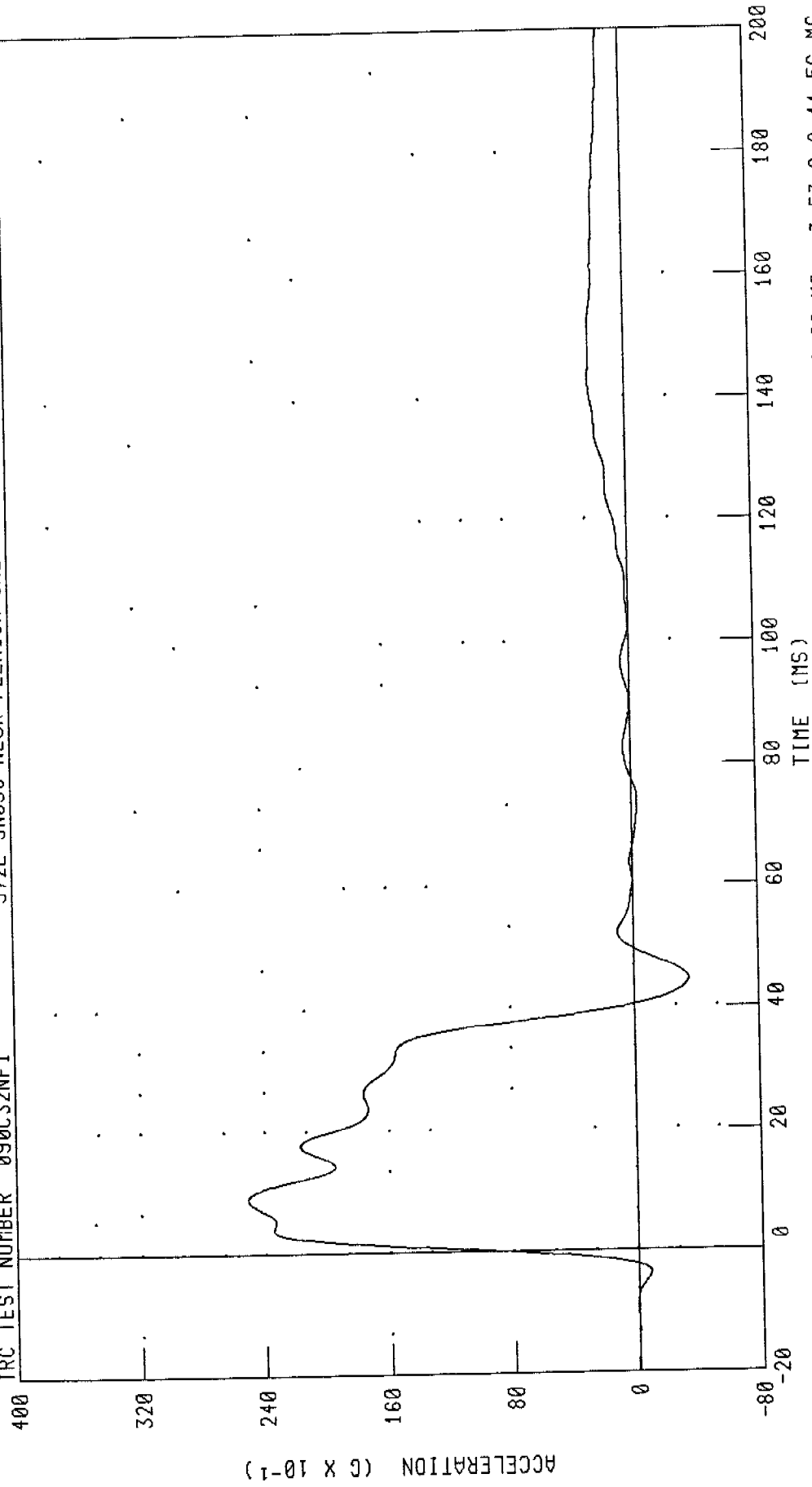
PART 572-E HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

RUN NUMBER 012401 1744,1

572E SN090 NECK FLEXION CAL32

TRC TEST NUMBER 090C32NF1



CHANNEL PENXC FILTER CH CLASS 60

PEAK DATA 25 11 C 0 8 96 MS, -3 53 G 0 44 56 MS

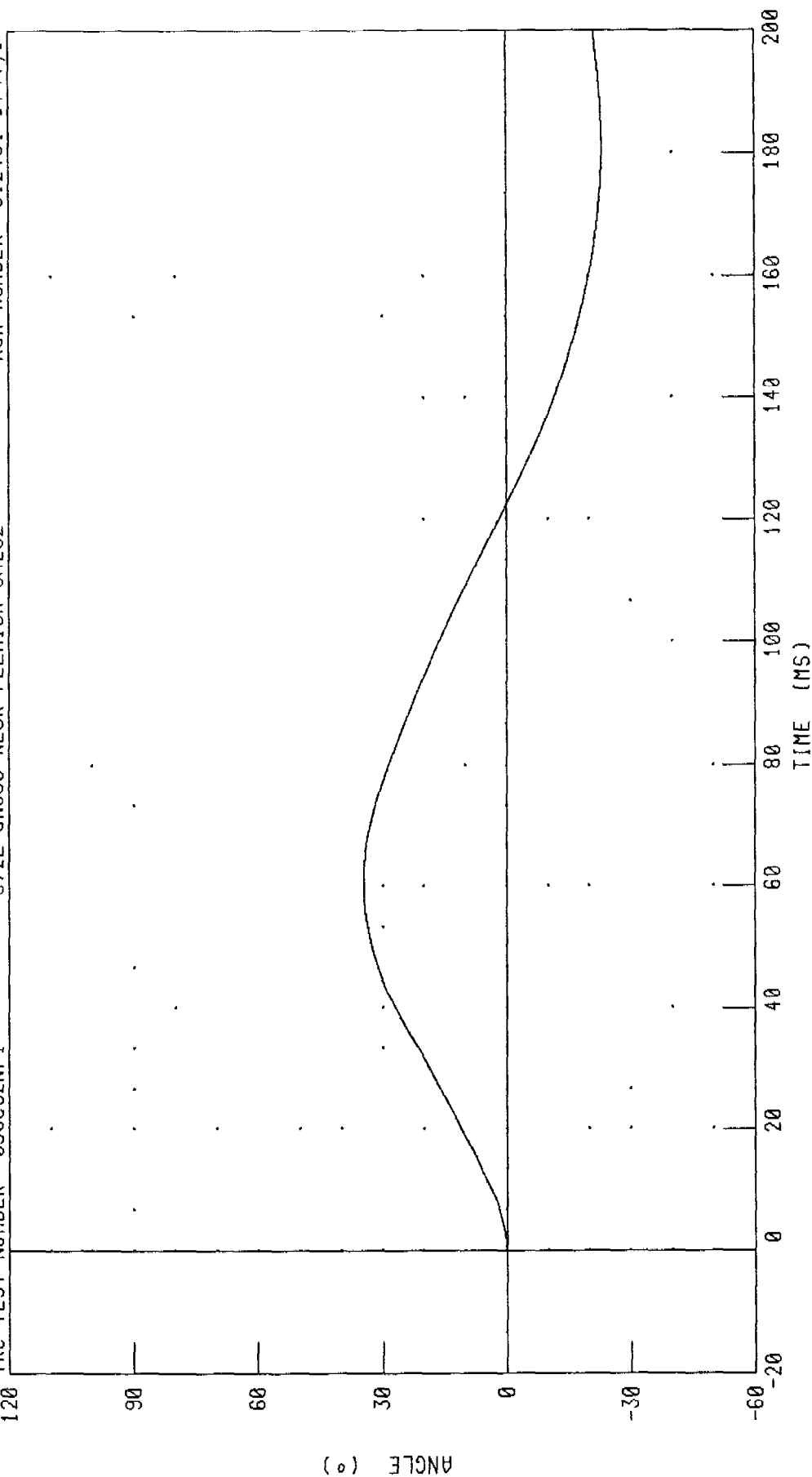
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN090 NECK FLEXION CAL32

TRC TEST NUMBER 090C32NF1

RUN NUMBER 012401 1744,1



CHANNEL BETA FILTER CH CLASS 60

PEAK DATA 34 52 ° @ 60 08 MS, -23 16 ° @ 181 12 MS

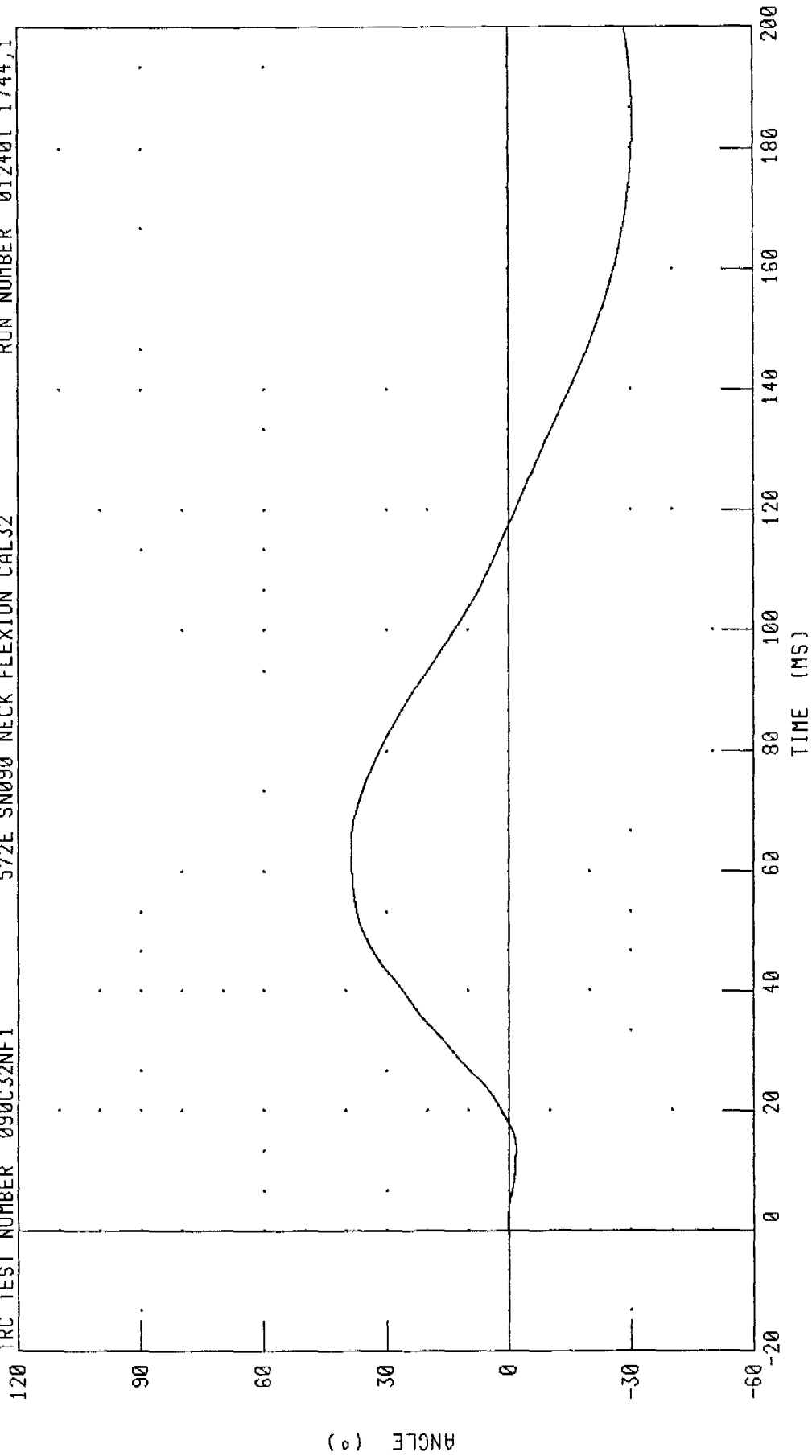
PART 572-E HYBRID (II) NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 090C32NF1

572E SN090 NECK FLEXION CAL32

RUN NUMBER 012401 1744,1



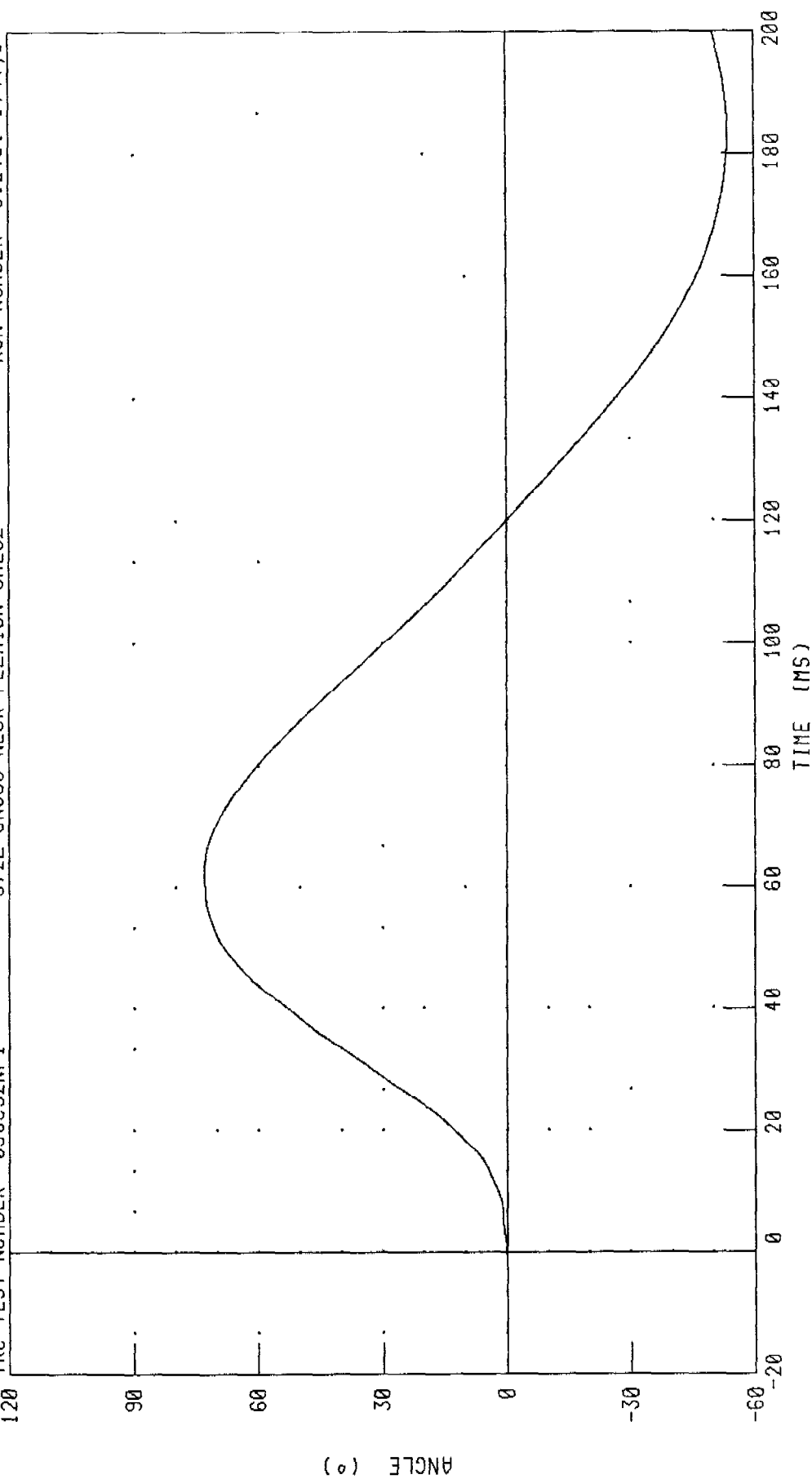
CHANNEL THETA FILTER CH CLASS 60

PEAK DATA 38 64 ° @ 64 00 MS, -30 56 ° @ 184 80 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER 090C32NF1 572E SN090 NECK FLEXION CAL32 RUN NUMBER 012401 1744,1



CHANNEL TOTAL FILTER CH CLASS 60

PEAK DATA 73 04 ° 62 96 MS, -53 67 ° 183 52 MS

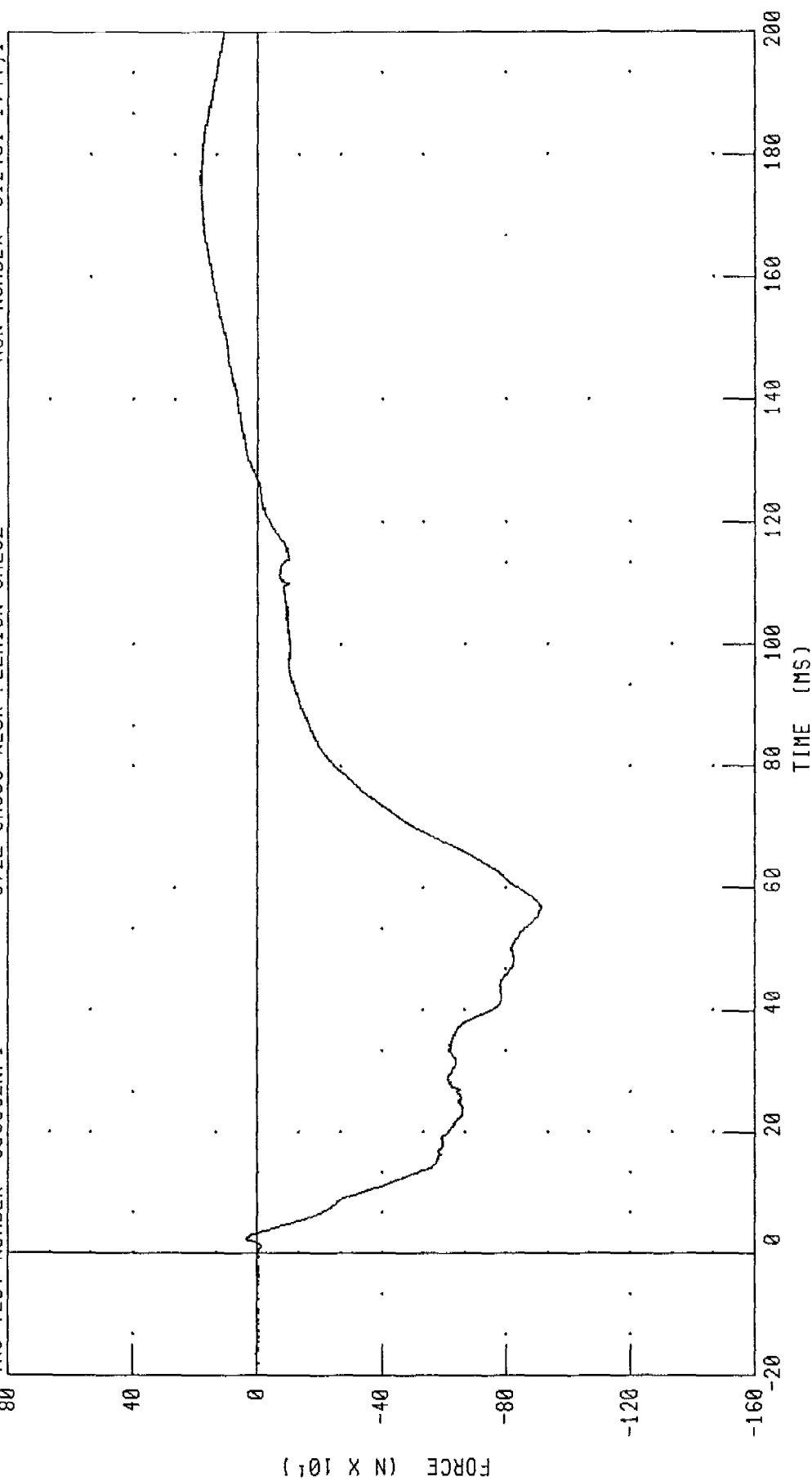
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER 090C32NF1

572E SN090 NECK FLEXION CAL32

RUN NUMBER 012401 1744,1



CHANNEL NEKXF FILTER CH CLASS 1000

PEAK DATA 187 01 N @ 175 12 MS, -911 27 N @ 56 48 MS

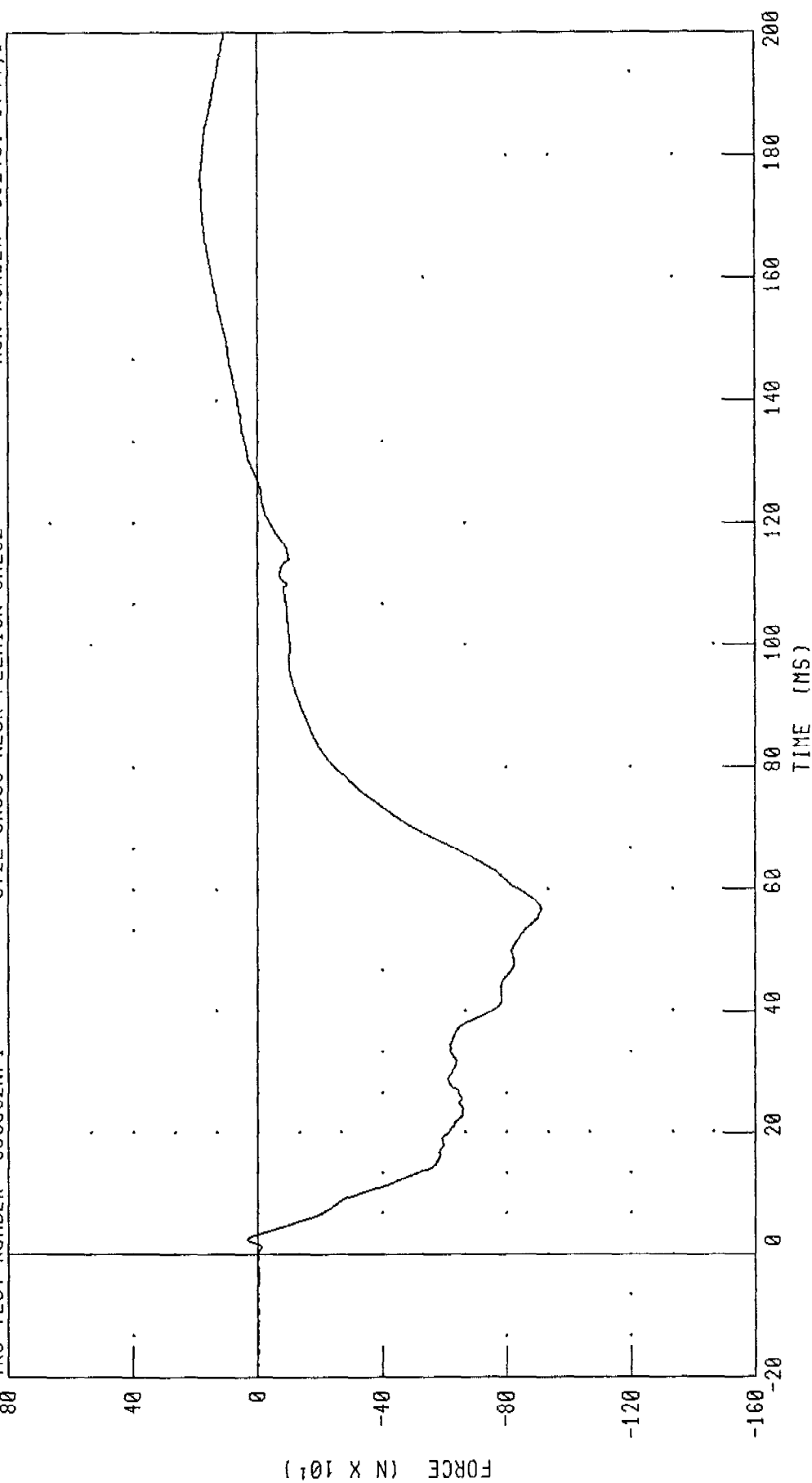
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION

TRC TEST NUMBER 090C32NF1

572E SN090 NECK FLEXION CAL32

RUN NUMBER 012401 1744,1



CHANNEL NEKXFC FILTER CH CLASS 600

PEAK DATA 186 35 N @ 176 24 MS, -911 26 N @ 56 72 MS

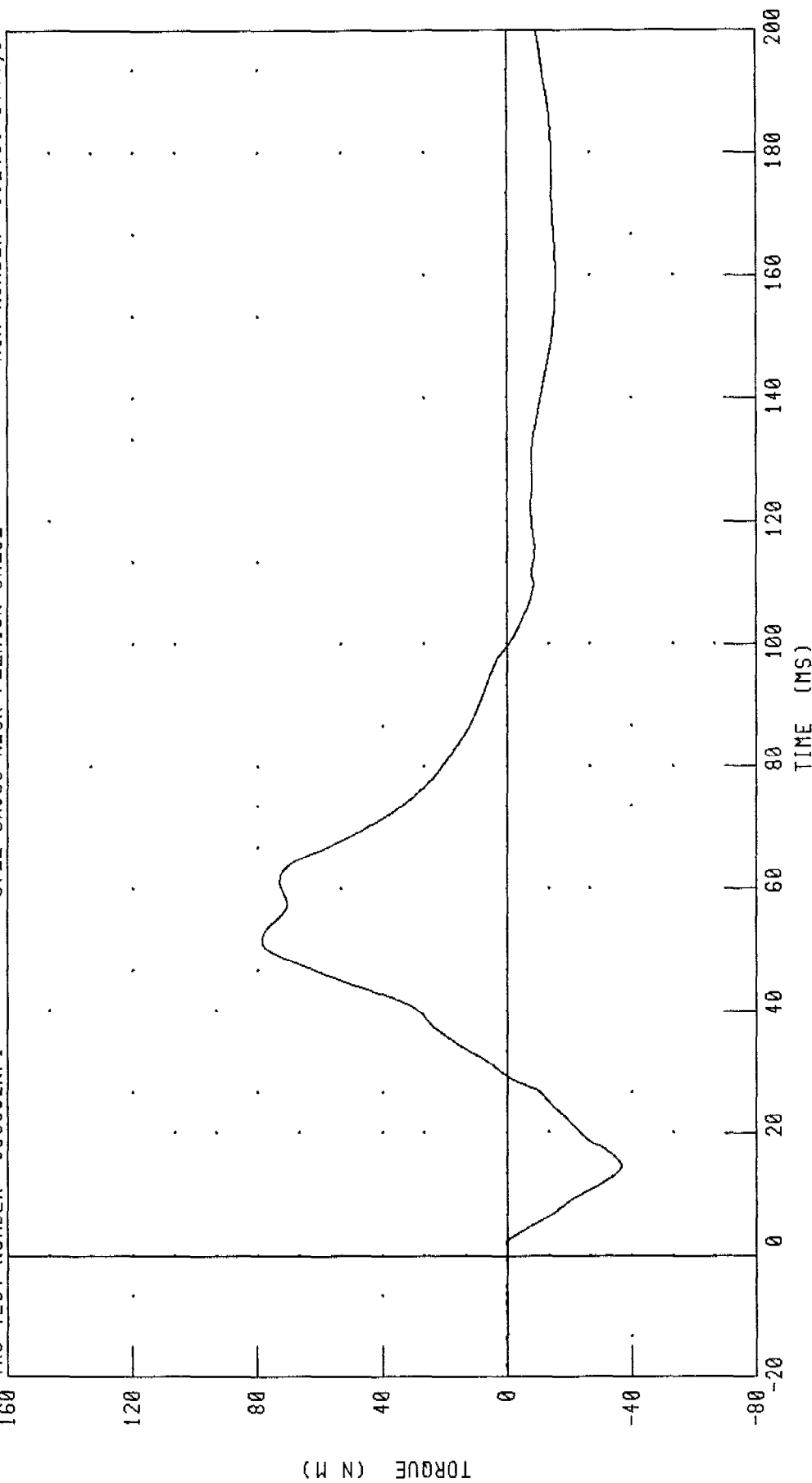
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

IRC TEST NUMBER 090C32NF1

572E SN090 NECK FLEXION CAL32

RUN NUMBER 012401 1744,1



CHANNEL NEKYM FILTER CH CLASS 600

PEAK DATA 78 55 N M @ 51 68 MS, -36 70 N M @ 14 72 MS

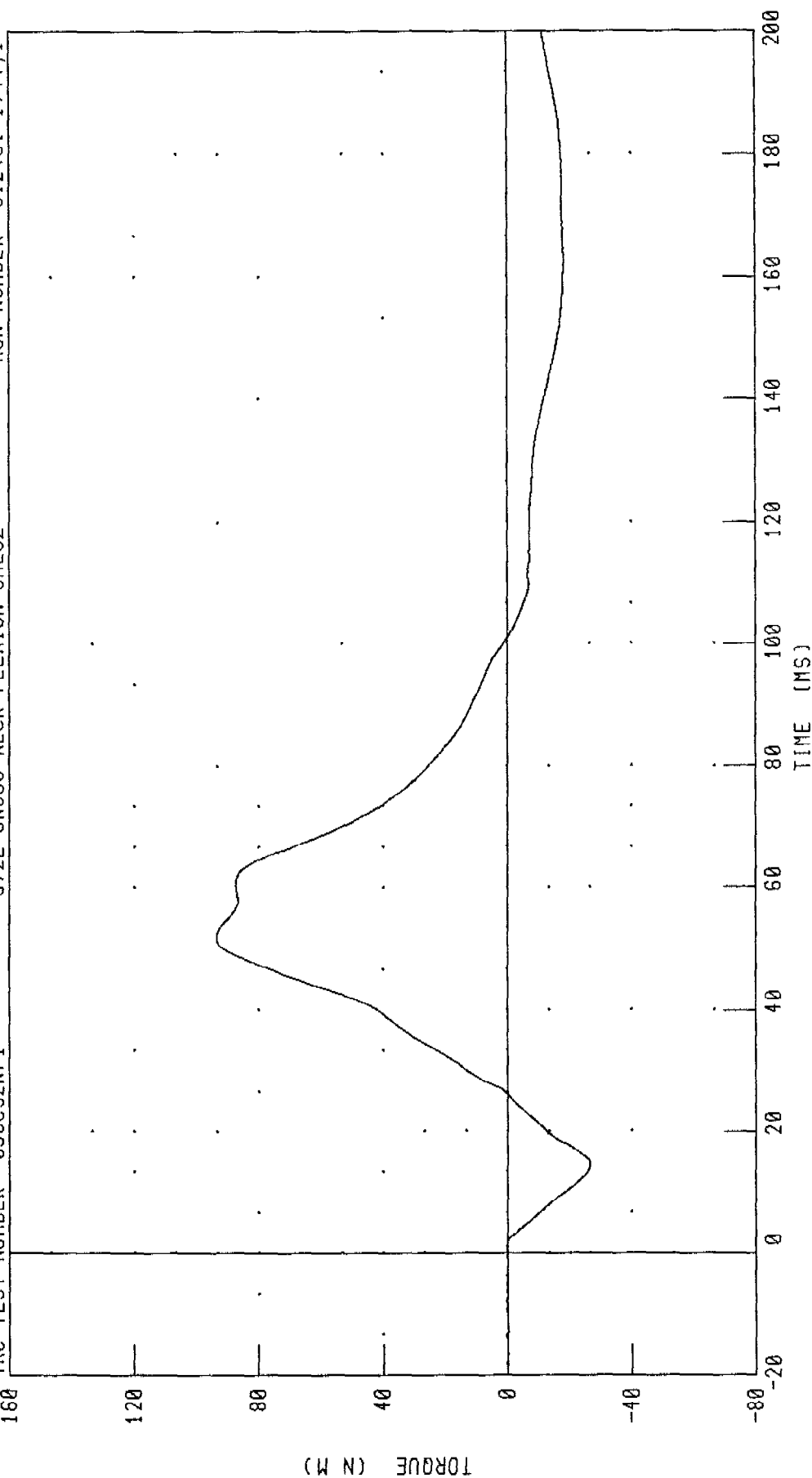
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 090C32NF1

572E SN090 NECK FLEXION CAL32

RUN NUMBER 012401 1744,1



CHANNEL NEKOM FILTER CH CLASS 600

PEAK DATA 93 43 N M 0 52 00 MS, -26 64 N M 0 14 40 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th

24-JAN-01

TRC INC.

TEST NO: 090C32TH1

572E SN090 H.S.THORAX CAL32

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	23.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.59 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	68.5 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5875. N
INTERNAL HYSTERESIS	69% - 85%	72.4%

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 012401.1630;1

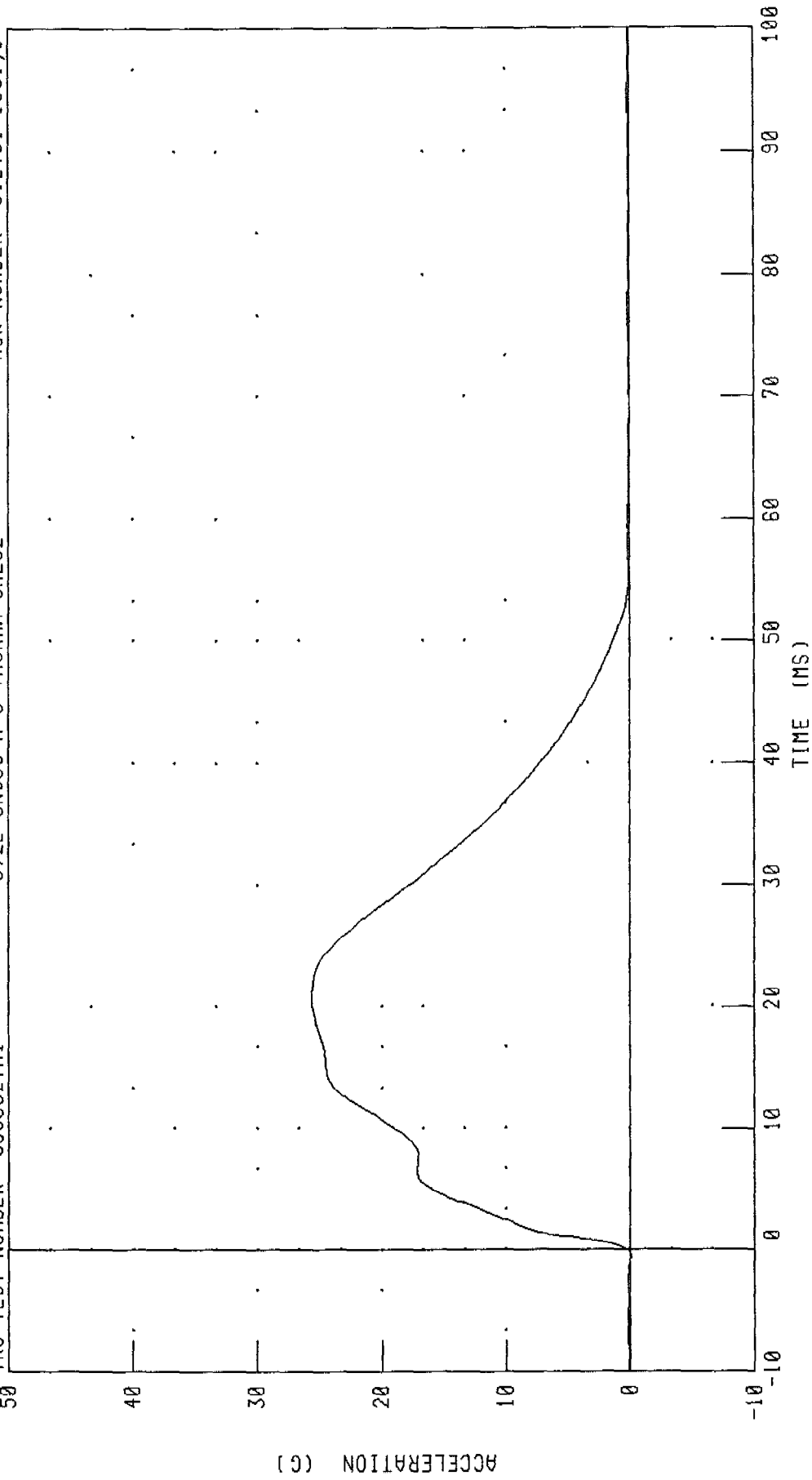
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER 090C32TH1

572E SN090 H S THORAX CAL32

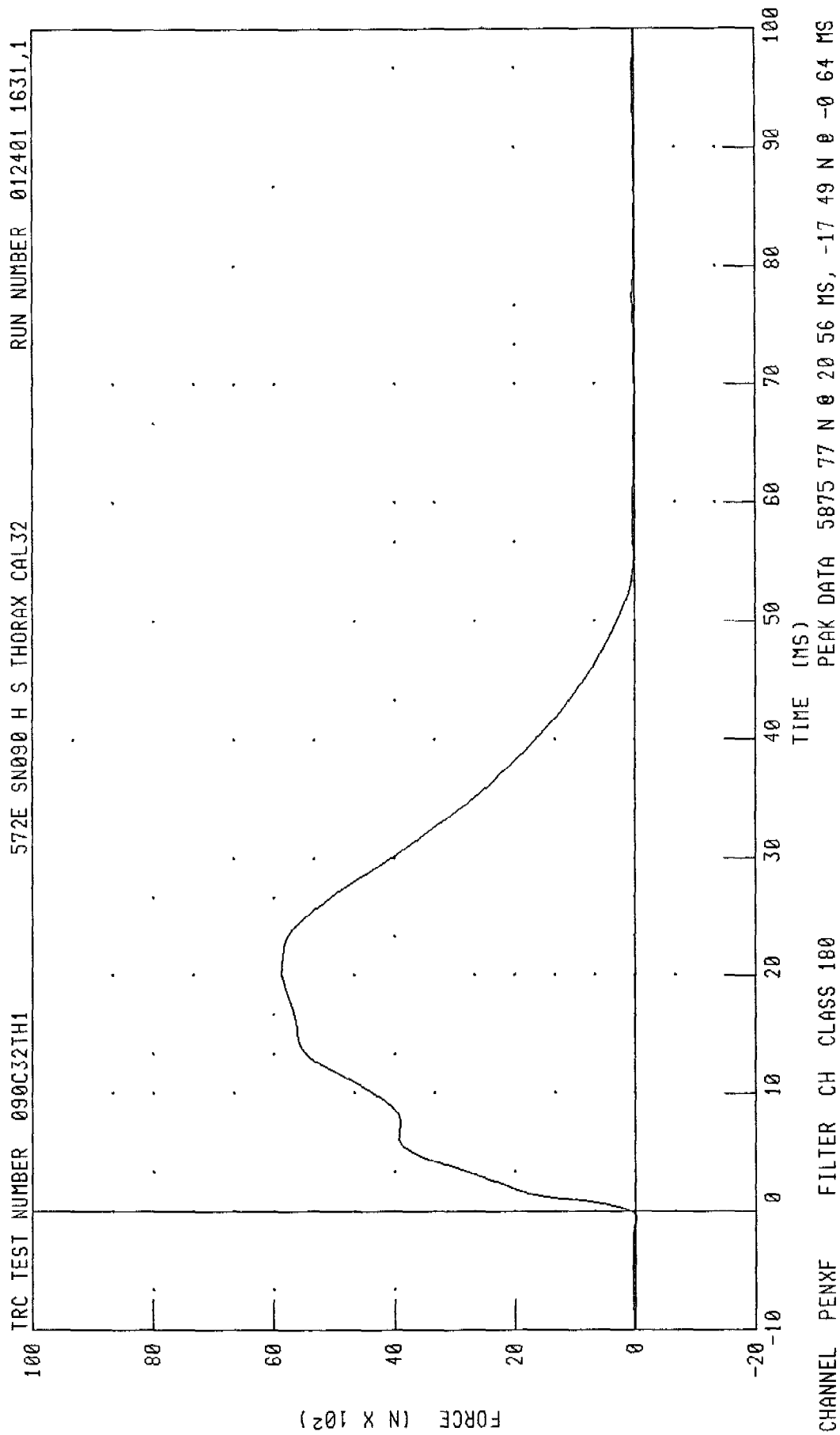
RUN NUMBER 012401 1631,1



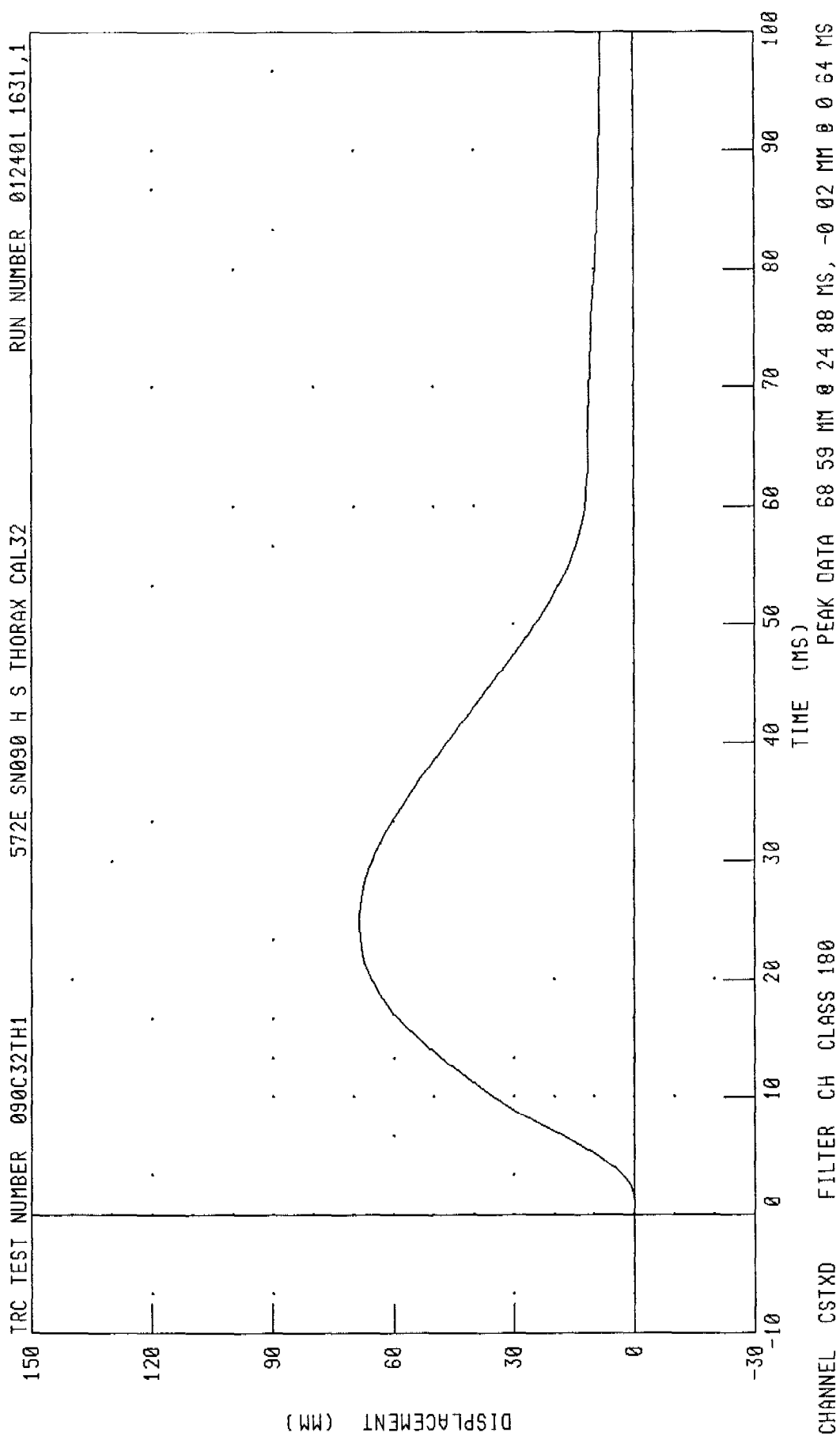
CHANNEL PENXG FILTER CH CLASS 180

PEAK DATA 25 65 G 0 20 56 MS, -0 08 G 0 -0 64 MS

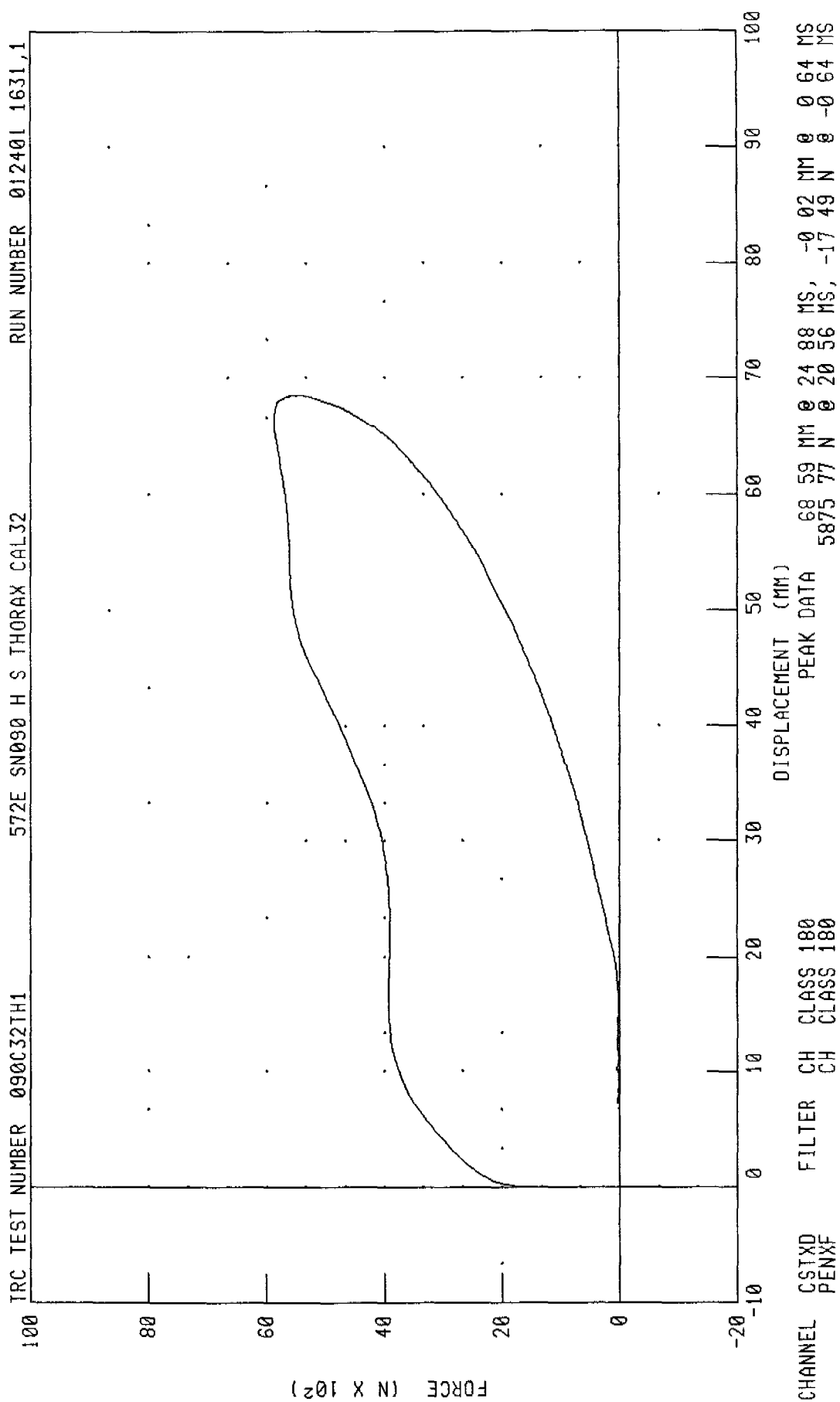
PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE



PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT



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



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 090L

Date: 01/25/2001

Test Number: 090C32

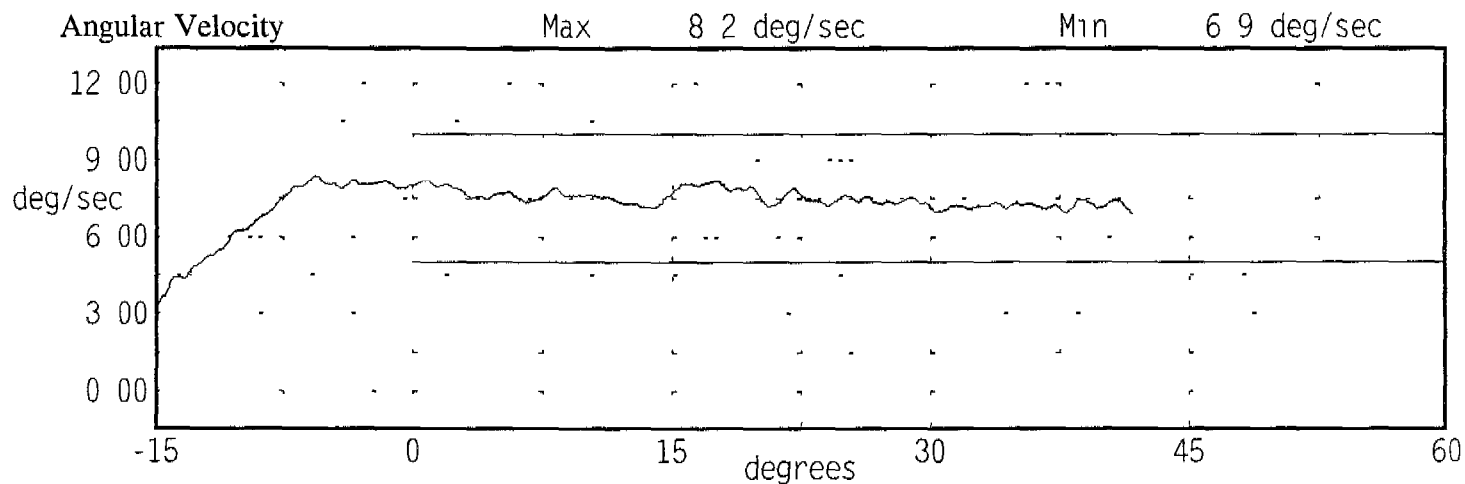
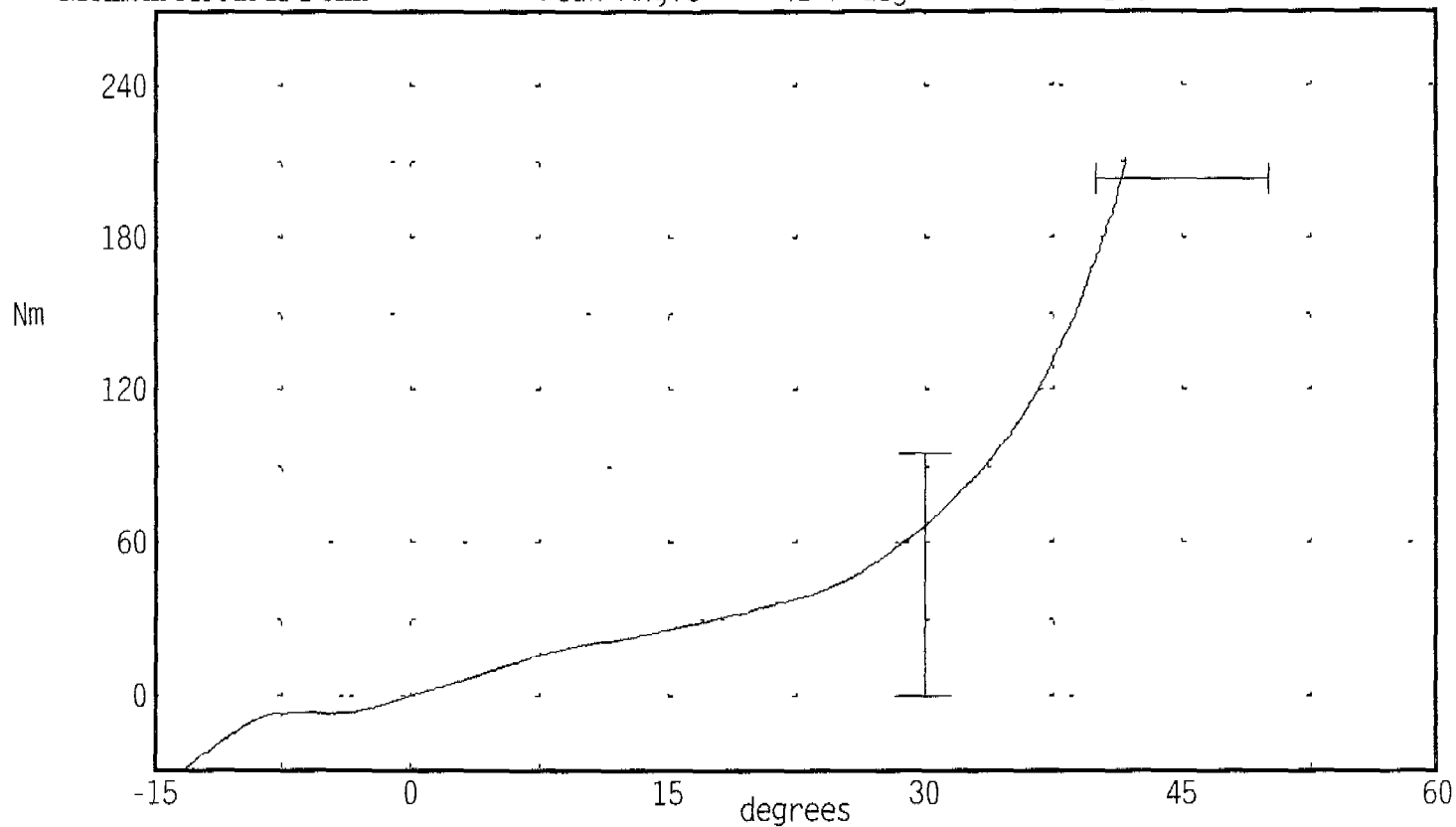
Time: 07:19

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.5 °C Pass
Humidity	10 - 70	15 % Pass
Moment at 30 deg	<= 94.9	67.0 Nm Pass
Angle at 203 Nm	40.0 - 50.0	41.5 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point

Peak Moment	211.0 Nm	at	41.7 deg
Peak Angle	41.7 deg	at	211.0 Nm



Transportation Research Center Inc

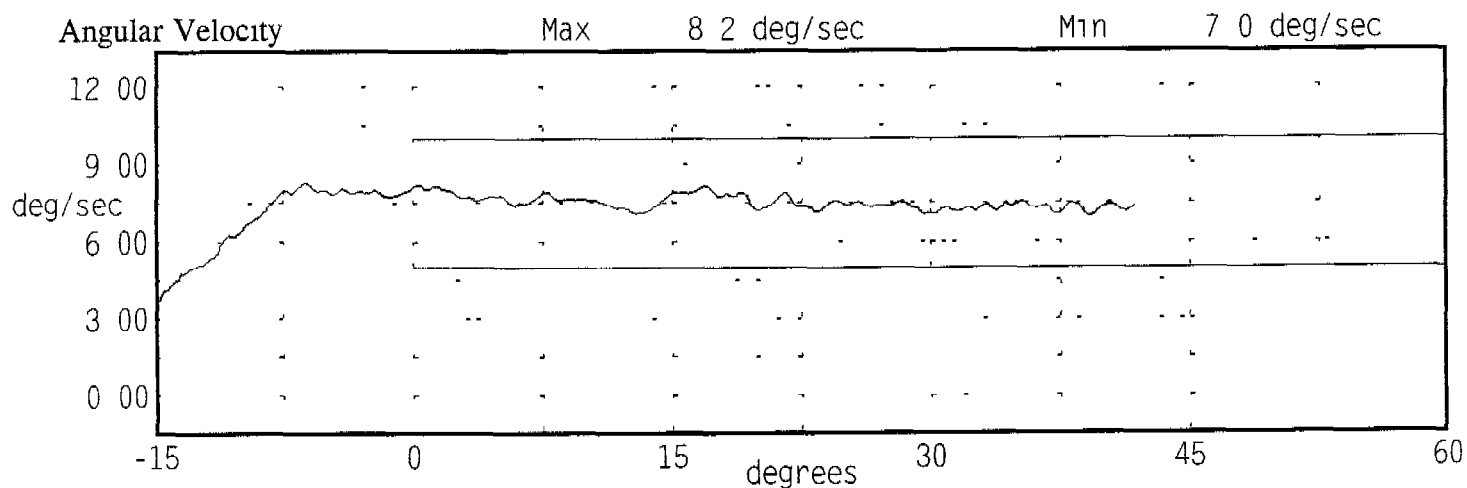
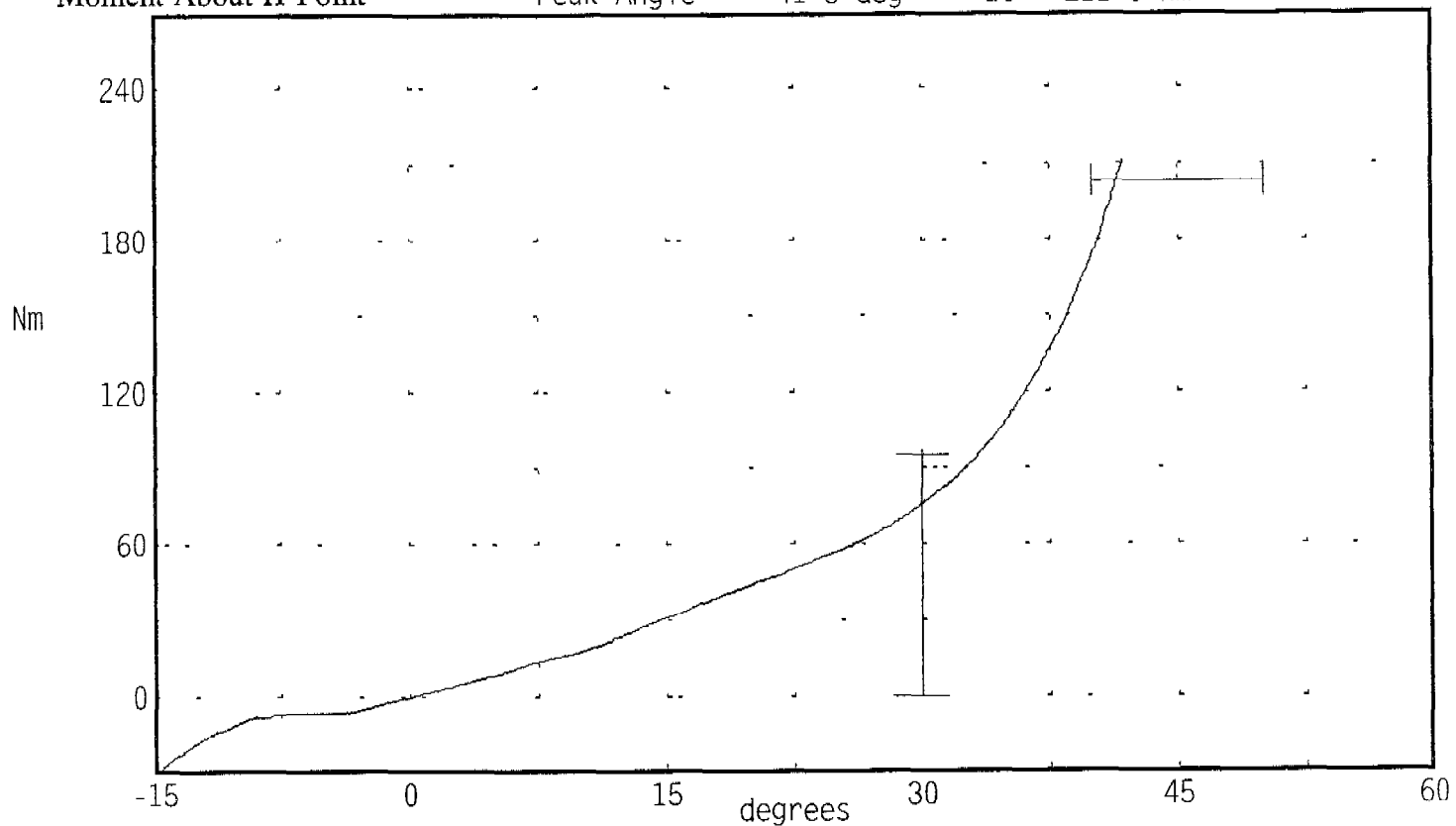
Hybrid III Hip Range of Motion

Serial Number: 090R
Test Number: 090C32
Comments:

Date: 01/25/2001
Time: 07 23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.5 °C Pass
Humidity	10 - 70	15 % Pass
Moment at 30 deg	<= 94.9	75.5 Nm Pass
Angle at 203 Nm	40.0 - 50.0	41.4 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point
Peak Moment 211.0 Nm at 41.8 deg
Peak Angle 41.8 deg at 211.0 Nm



TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th

25-JAN-01

TRC INC.

TEST NO: 090C32LK1

572E SN090 LEFT KNEE CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	15.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5672.0 N

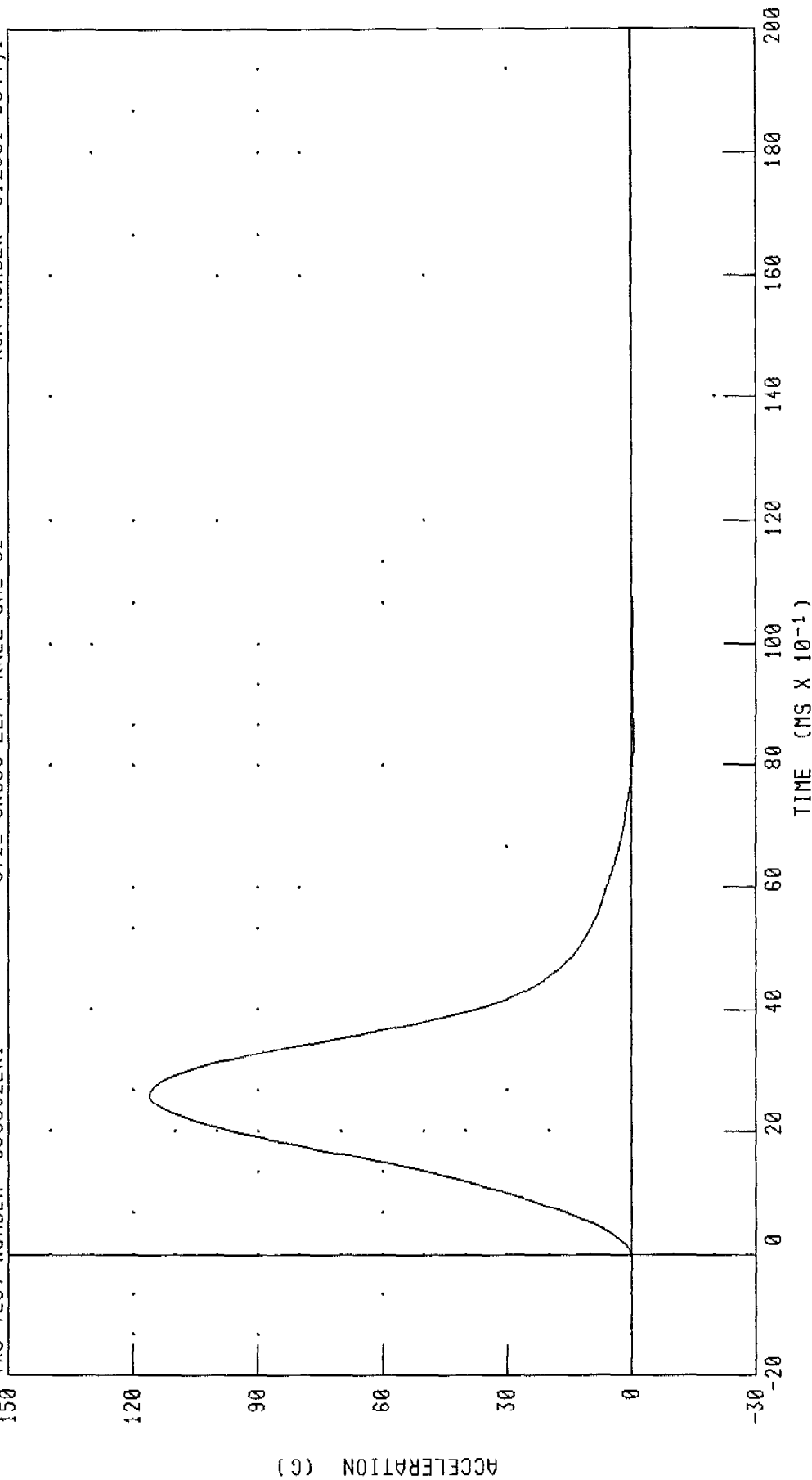
TEST MEETS SPECIFICATIONS

TECHNICIAN Dustin Walker

RUN NUMBER: 012501.0944;1

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

TRC TEST NUMBER 090C32LK1 572E SN090 LEFT KNEE CAL 32 RUN NUMBER 012501 0944,1



CHANNEL PENXC FILTER CH CLASS 600

PEAK DATA 115 93 G @ 2 56 MS, -0 47 G @ 8 56 MS

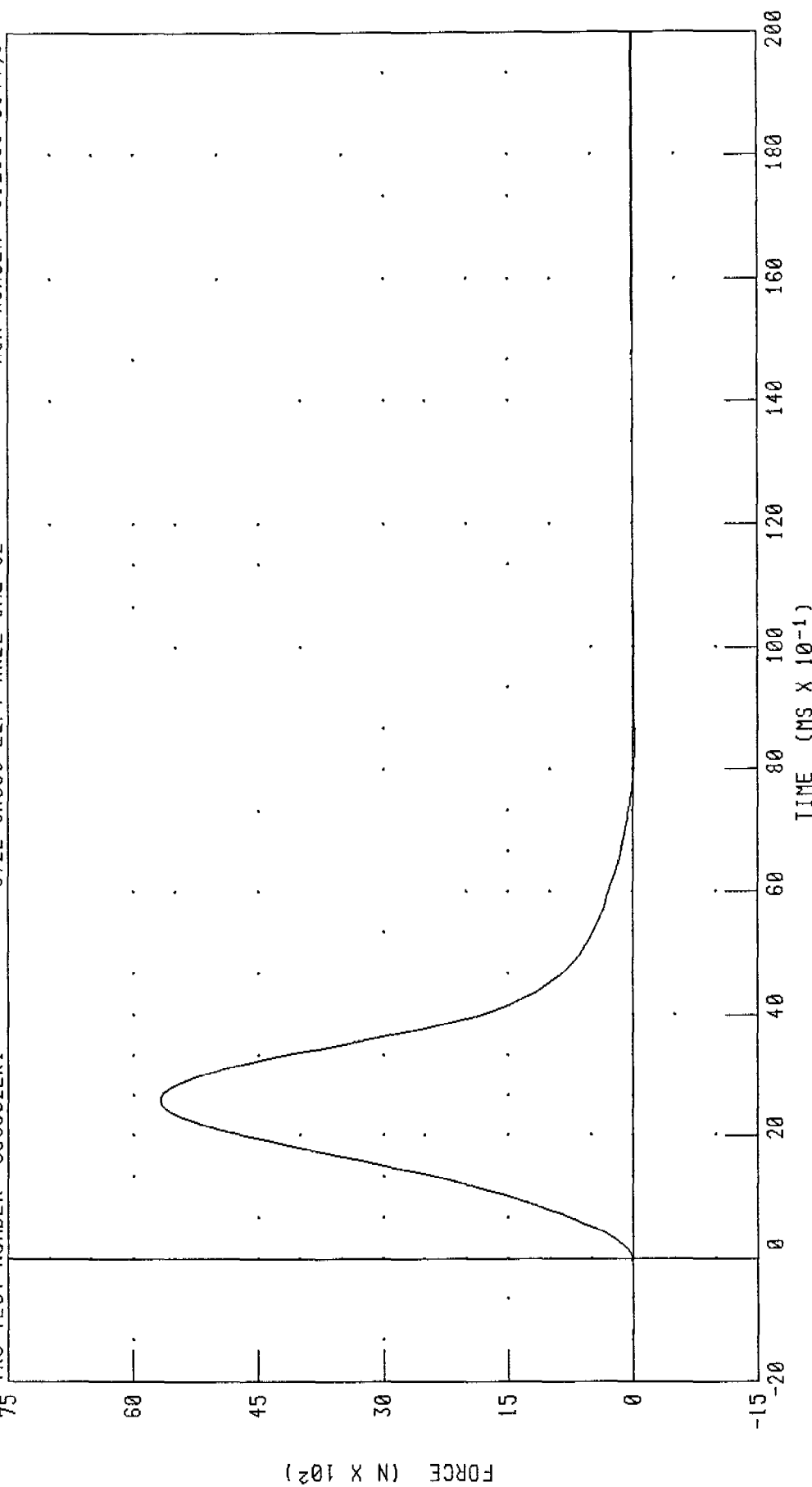
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND)

TRC TEST NUMBER 090C32LK1

572E SN090 LEFT KNEE CAL 32

RUN NUMBER 012501 0944,1



CHANNEL PENXF FILTER CH CLASS 600

PEAK DATA 5672 03 N 0 2 56 MS, -23 22 N 0 8 56 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th

25-JAN-01

TRC INC.

TEST NO: 090C32RK1

572E SN090 RIGHT KNEE CAL 32

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	15.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.09 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5695.3 N

TEST MEETS SPECIFICATIONS

TECHNICIAN Dustin Walker

RUN NUMBER: 012501.0951;1

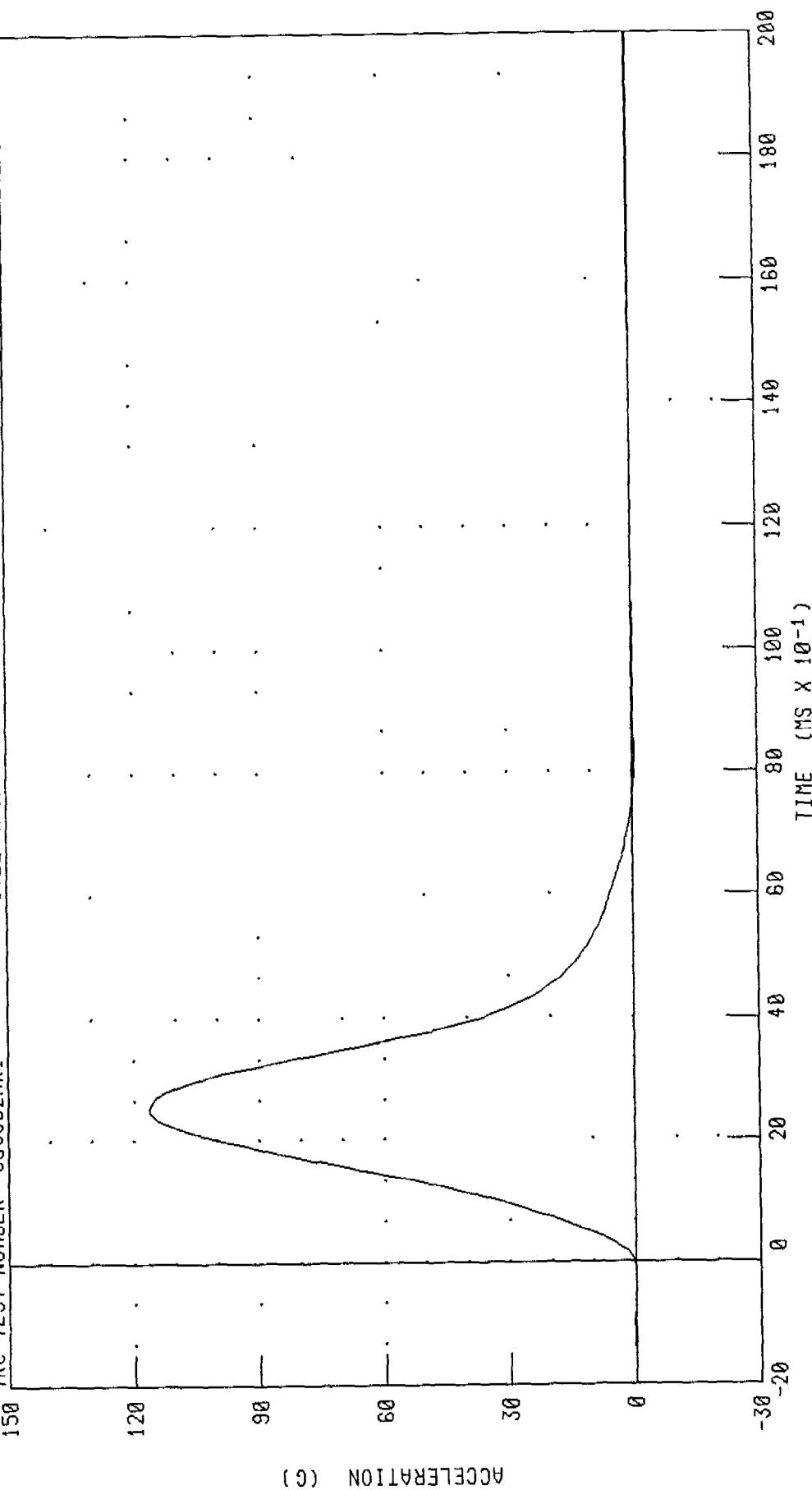
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM DECELERATION (5 KG PEND)

TRC TEST NUMBER 090C32RK1

572E SN090 RIGHT KNEE CAL 32

RUN NUMBER 012501 0951.1



CHANNEL PENXG FILTER CH CLASS 600

PEAK DATA 116 40 G 2 56 MS, -0 63 G 0 8 16 MS

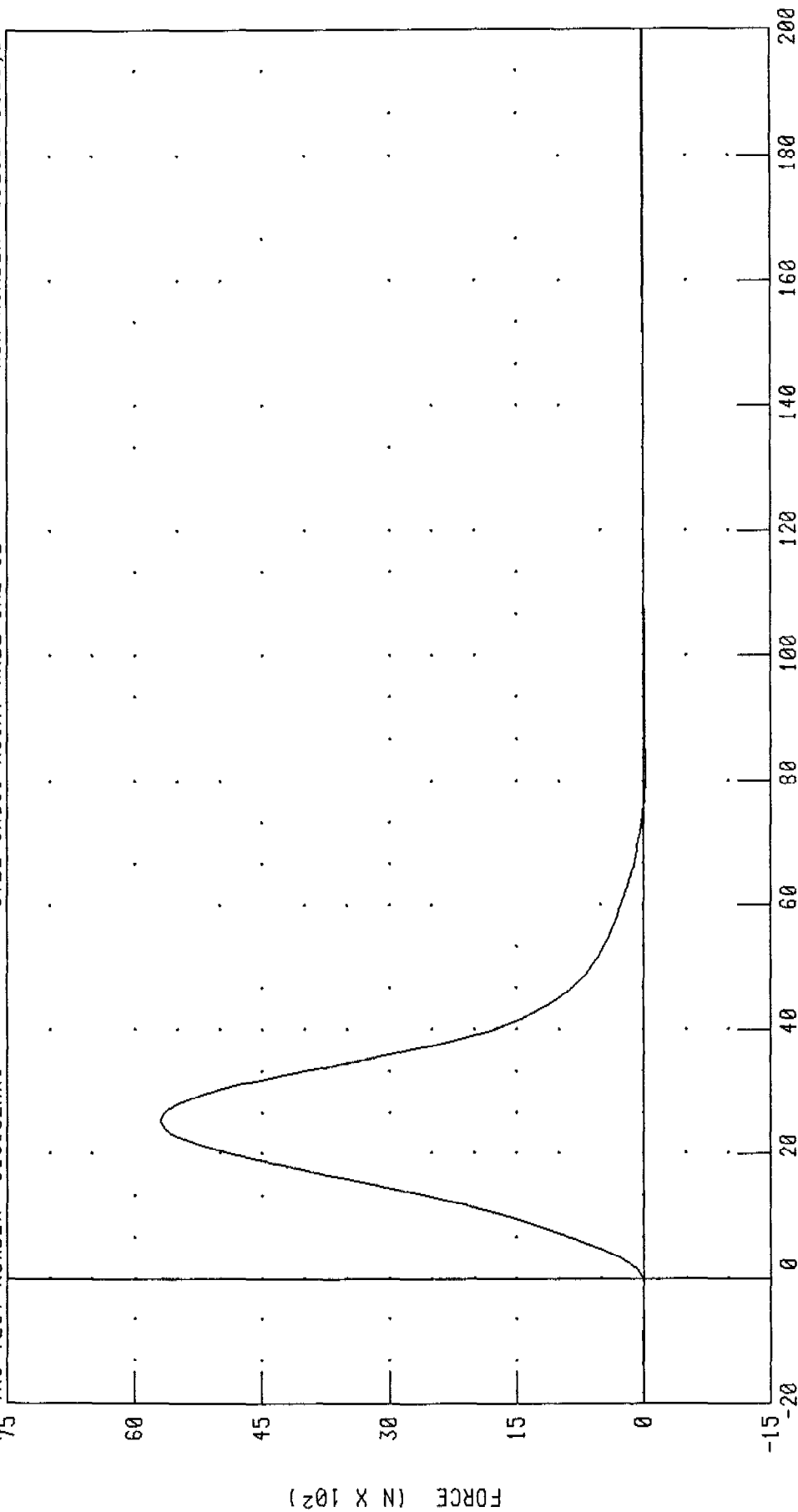
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND)

TRC TEST NUMBER 090C32RK1

572E SN090 RIGHT KNEE CAL 32

RUN NUMBER 012501 0951,1



TIME ($\text{MS} \times 10^{-1}$)

CHANNEL PENXF FILTER CH CLASS 600

PEAK DATA 5695 30 N 0 2 56 MS, -30 97 N 0 8 16 MS

Pre-Test Calibration

Target Vehicle Passenger Dummy S/N 416

**TRANSPORTATION RESEARCH CENTER INC.
HYBRID III SMALL FEMALE EXTERNAL DIMENSIONS
SN: 416 MFG:FTSS**

DATE: 26-Jan-01

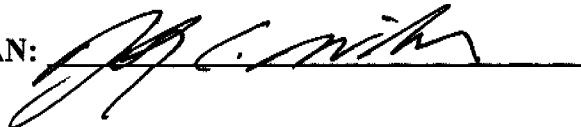
TRC INC. TEST NO: 416C8ED

5720 SN416EXT. DIMENSION CAL08

TEST PARAMETER	DIMEN.	SPECIFICATION	TEST RESULTS
Total Sitting Height	A	774 7 - 800 1 MM	789 94 MM
Shoulder Pivot Height	B	431 8 - 457 2 MM	444.5 MM
Hip Pivot Height	C	81 3 - 86 3 MM	83.82 MM
Hip Pivot from Backline	D	144 8 - 149 8 MM	144.78 MM
Shoulder Pivot from Backline	E	68 6 - 83 8 MM	73 66 MM
Thigh Clearance	F	119 4 - 134 6 MM	129 54 MM
Back of Elbow to Wrist Pivot	G	243 9 - 259 1 MM	248 92 MM
Head Back from Backline	H	40 7 - 45 7 MM	43 18 MM
Shoulder to Elbow Length	I	276 8 - 297 2 MM	287 02 MM
Elbow Rest Height	J	182 8 - 203 2 MM	193 04 MM
Buttock to Knee Length	K	520 7 - 546 1 MM	530.86 MM
Popliteal Height	L	355 6 - 376 MM	373 38 MM
Knee to Floor Height	M	393 7 - 419 1 MM	403.86 MM
Buttock Popliteal Length	N	414 - 439 4 MM	434.34 MM
Chest Depth	O	175 3 - 190 5 MM	182 88 MM
Foot Length	P	218 5 - 233 7 MM	228 6 MM
Buttock to Knee Pivot Length	R	457 2 - 482 6 MM	474.98 MM
Head Breadth	S	137 1 - 147 3 MM	142 24 MM
Head Depth	T	177 8 - 188 MM	185.42 MM
Hip Breadth	U	299 7 - 314 9 MM	302 26 MM
Shoulder Breadth	V	350 5 - 365 7 MM	358.14 MM
Foot Breadth	W	78 8 - 94 MM	88 9 MM
Head Circumference	X	528 3 - 548 7 MM	535.94 MM
Chest Circumference with Jacket	Y	850 9 - 881 3 MM	868 68 MM
Waist Circumference	Z	759 5 - 789 9 MM	779.78 MM
Ref Location for Chest Circumference	AA	299 7 - 309 9 MM	302.26 MM
Ref Location for Waist Circumference	BB	160 - 170 2 MM	167 64 MM

DUMMY MEETS SPECIFICATION

TECHNICIAN:



TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III SMALL FEMALE

25-JAN-01

TRC INC.

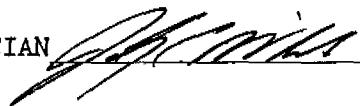
TEST NO: 416C8HD2

572 0 SN416 HEAD DROP CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	15.0 %
PEAK RESULTANT ACCELERATION	250 - 300 G	280.74 G
PEAK LATERAL ACCELERATION	15 G MAX	-8.45 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 012501.1133;1

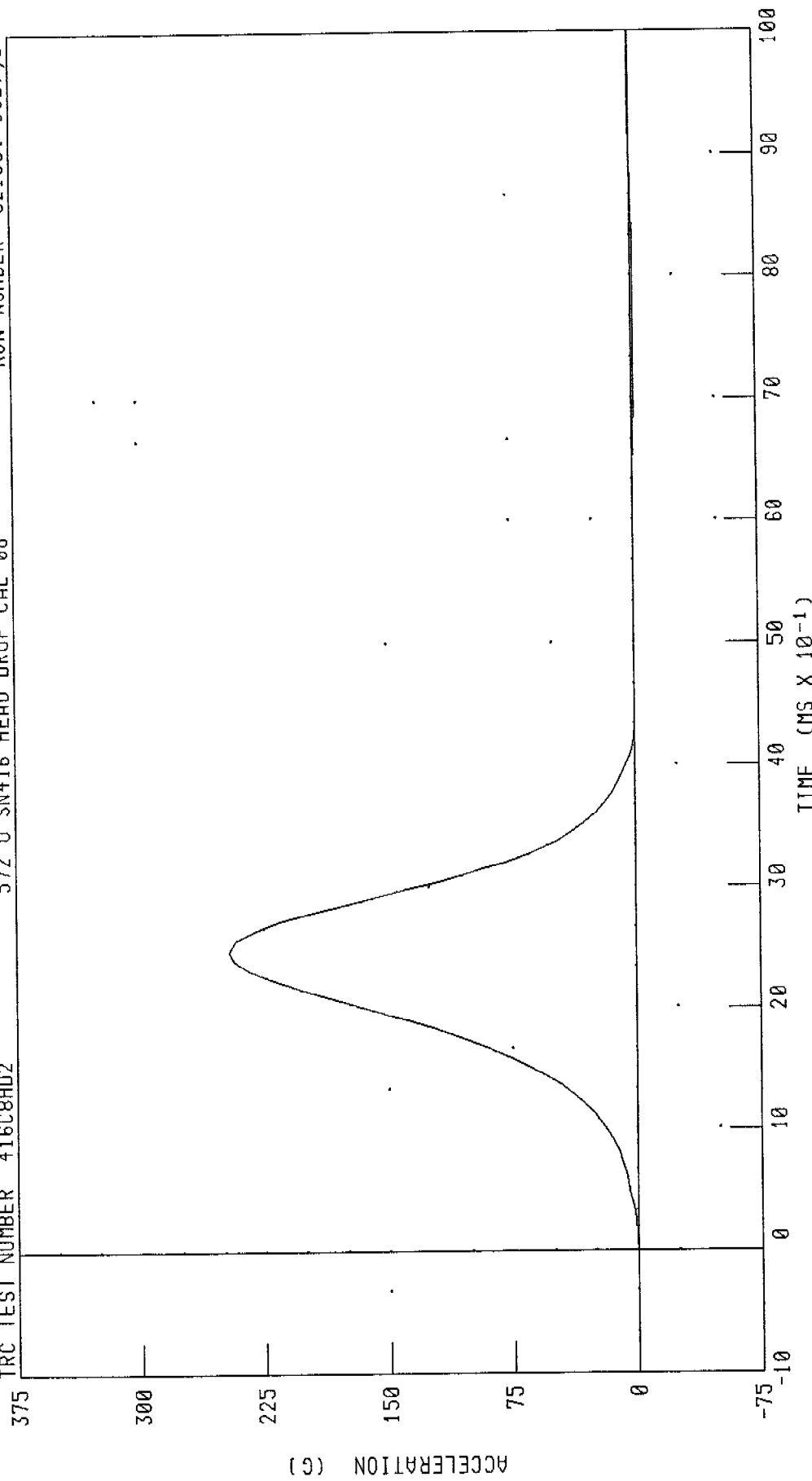
PART 572-0 HYBRID III SMALL FEMALE - HEAD CALIBRATION

HEAD ACCELERATION X AXIS

TRC TEST NUMBER 416C8HD2

572 0 SN416 HEAD DROP CAL 08

RUN NUMBER 021501 0927,1



PEAK DATA 246 07 G 2 48 MS, -1 38 G 0 6 96 MS

CHANNEL HEDXC FILTER CH CLASS 1000

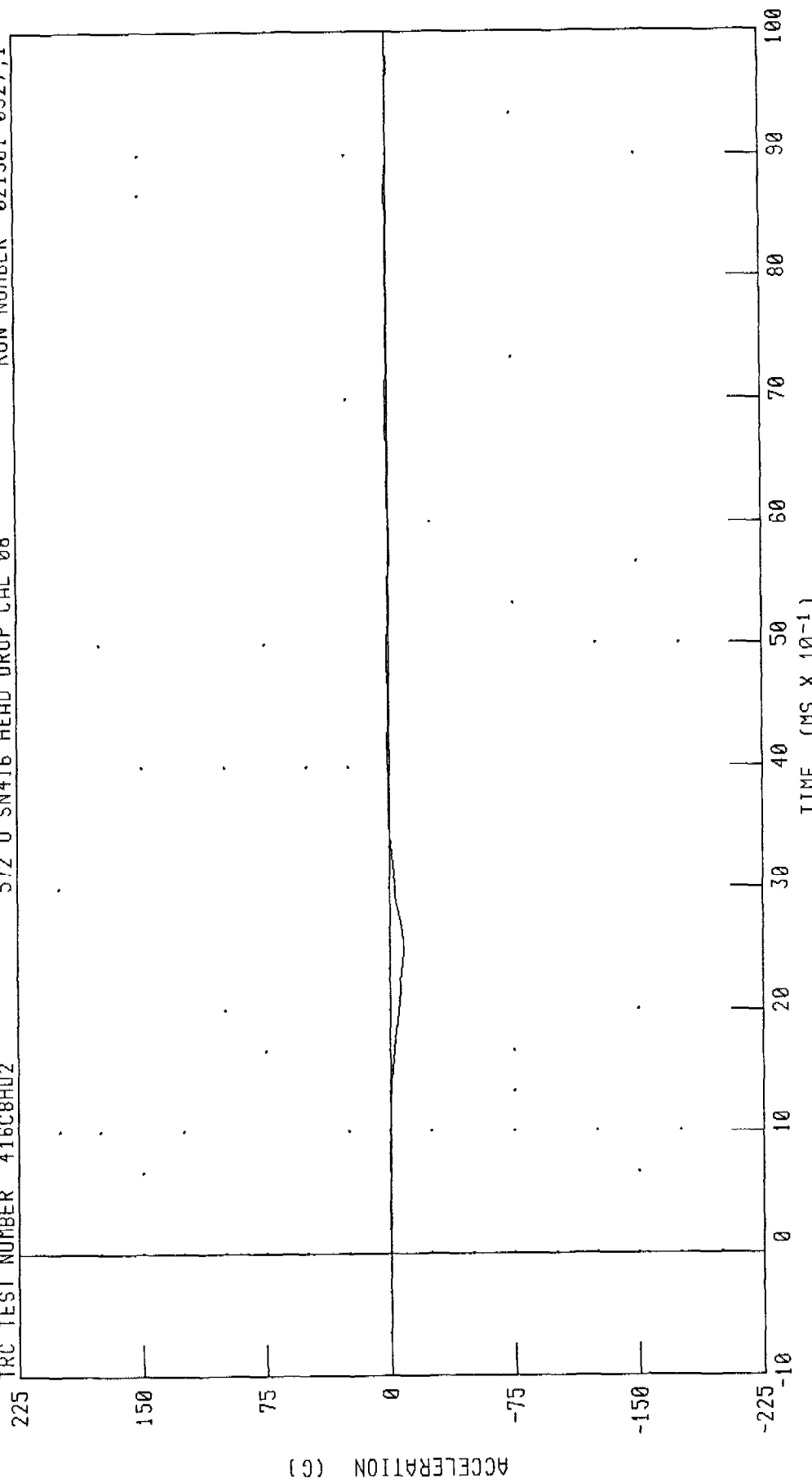
PART 572-0 HYBRID III SMALL FEMALE - HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER 416C8HD2

572 0 SN416 HEAD DROP CAL 08

RUN NUMBER 021501 0927,1



CHANNEL HEDYC FILTER CH CLASS 1000

PEAK DATA 0 89 G 0 4 08 MS, -8 46 G 0 2 48 MS

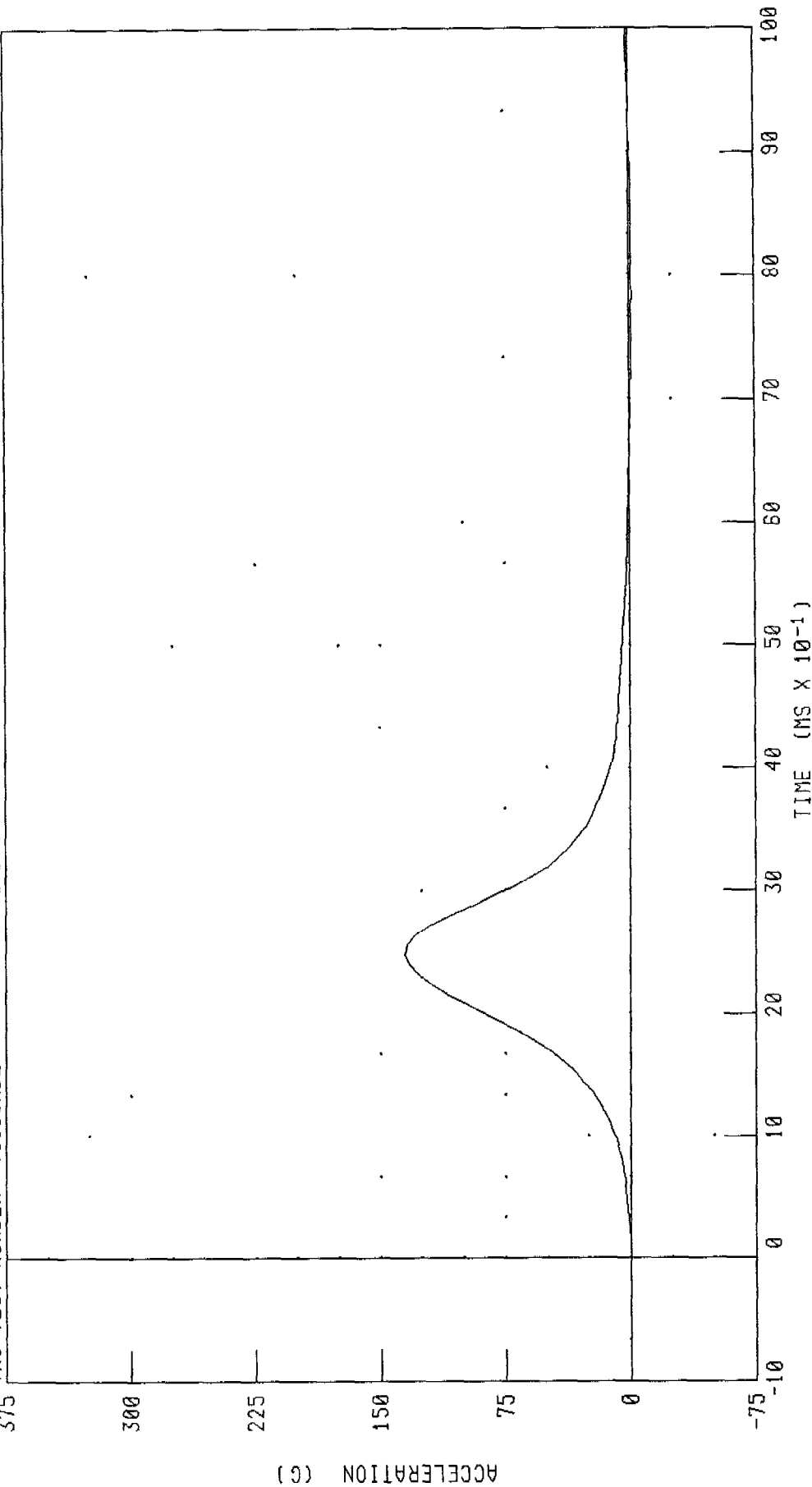
PART 572-0 HYBRID III SMALL FEMALE - HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER 416C8HD2

572 0 SN416 HEAD DROP CAL 08

RUN NUMBER 021501 0927.1



CHANNEL HEADZG FILTER CH CLASS 1000

PEAK DATA 134 88 G @ 2 48 MS, -1 75 G @ 7 84 MS

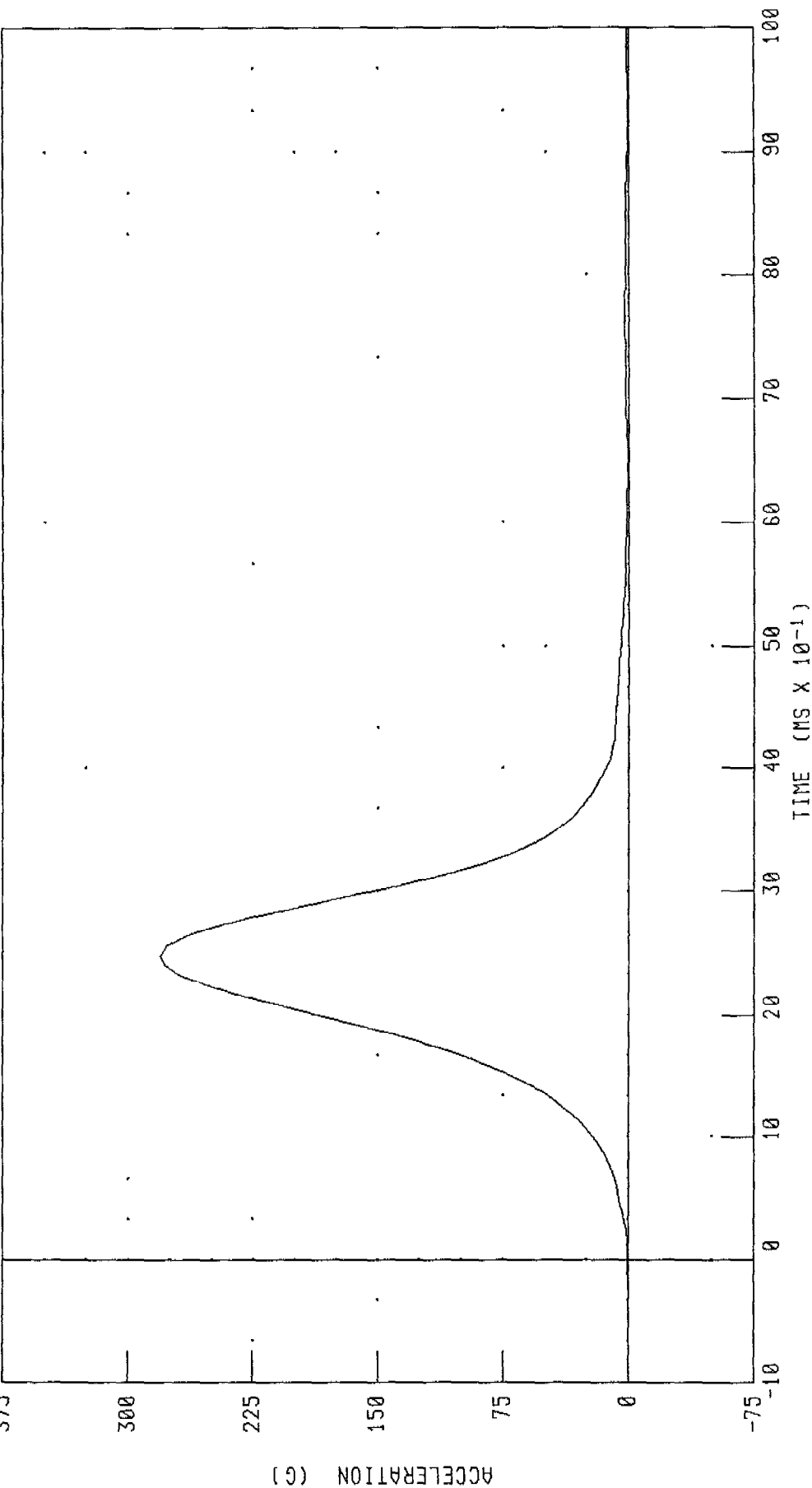
PART 572-0 HYBRID III SMALL FEMALE - HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER 416CBHD2

572 0 SN416 HEAD DROP CAL 08

RUN NUMBER 021501 0927,1



CHANNEL HEDRG

FILTER CH CLASS 1000

PEAK DATA 280 74 C 0 2 48 MS, 0 08 G 0 -0 96 MS

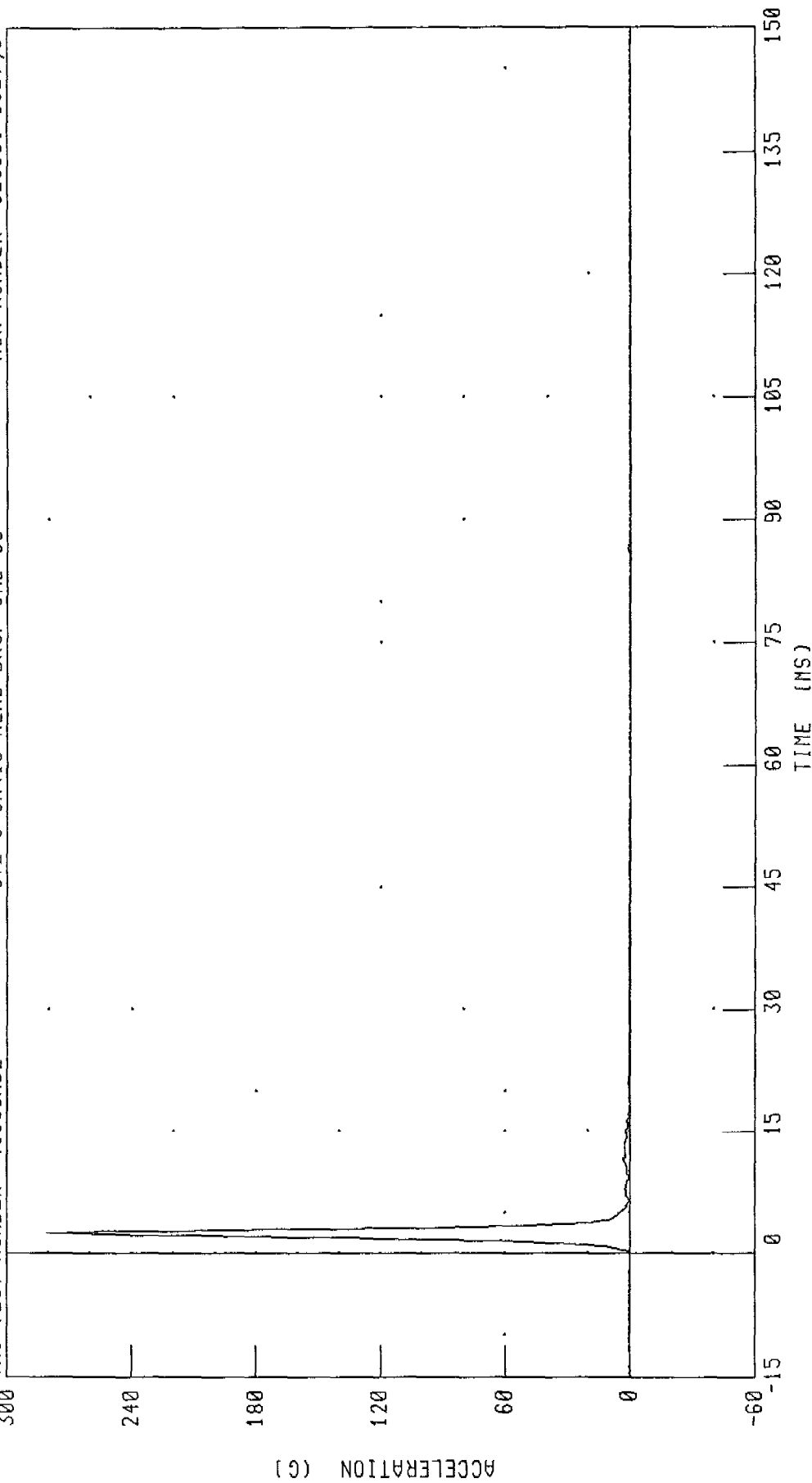
PART 572-0 HYBRID III SMALL FEMALE - HEAD CALIBRATION

CHECK PLOT - HEAD RESULTANT ACCELERATION

TRC TEST NUMBER 416C8HD2

572 0 SN416 HEAD DROP CAL 08

RUN NUMBER 021501 0927,1



CHANNEL HEDRC FILTER CH CLASS 1000

PEAK DATA 280 74 G @ 2 48 MS, 0 08 G @ -14 96 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III SMALL FEMALE

25-JAN-01

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 416C8NE1 572 0 SN416 NECK EXT. CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	15.0 %
IMPACT VELOCITY	5.95 - 6.19 M/S	6.19 M/S
INTEGRATED PENDULUM VELOCITY	10 MS 1.5 - 1.9 M/S	1.79 M/S
	20 MS 3.1 - 3.9 M/S	3.60 M/S
	30 MS 4.6 - 5.6 M/S	5.16 M/S
PEAK D-PLANE ROTATION	99 - 114 DEG.	106.29 DEG.
PEAK MOMENT DURING ROTATION INTERVAL	-53 / -65 NM	-55.69 NM
NEGATIVE MOMENT DECAY TIME TO -10 NM LEVEL	94 - 114 MS	104.00 MS

TEST MEETS SPECIFICATIONS

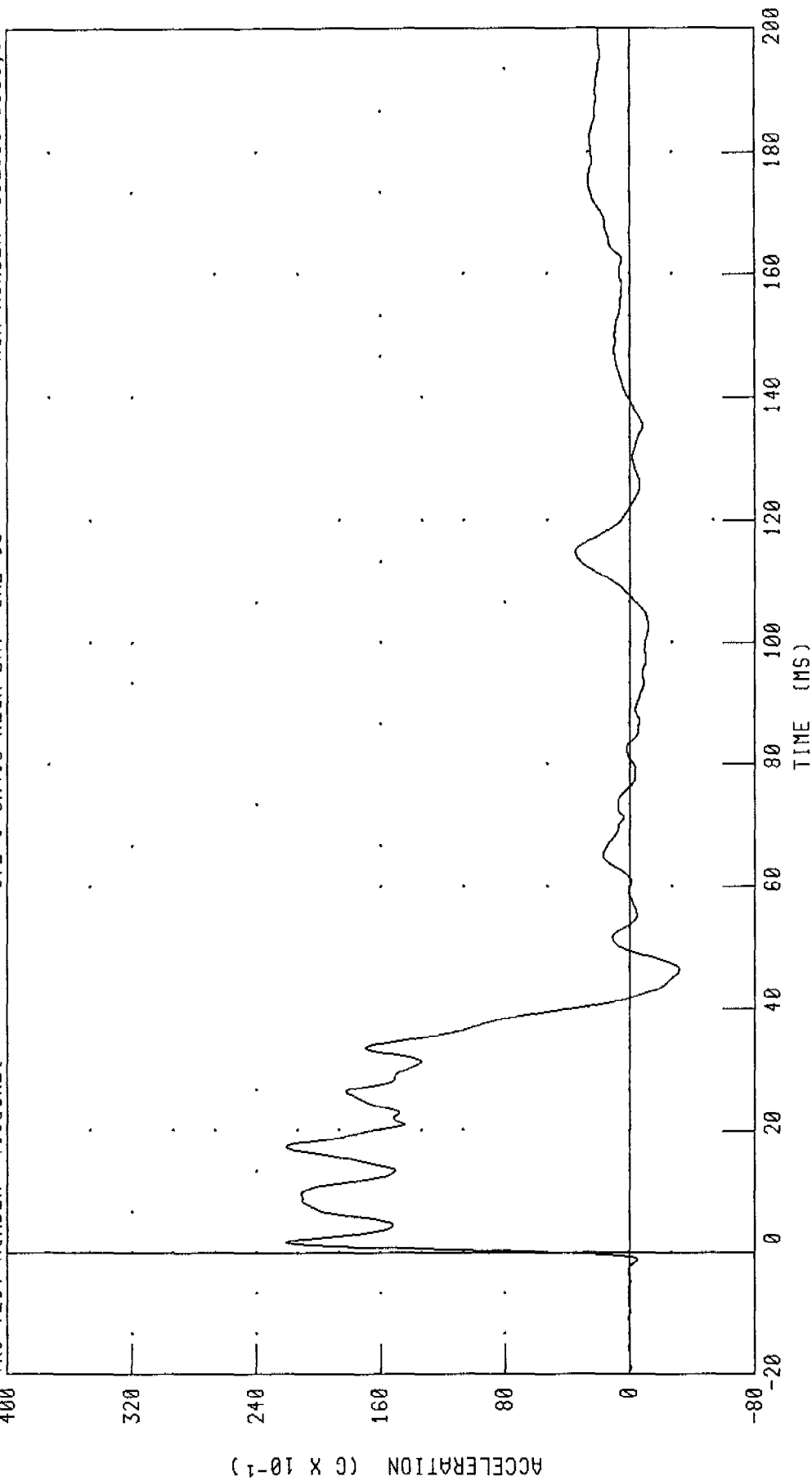
TECHNICIAN *John C. Mills*

RUN NUMBER: 012501.1059;1

PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER 416C8NE1 572 0 SN416 NECK EXT CAL 08 RUN NUMBER 012501 1106,1



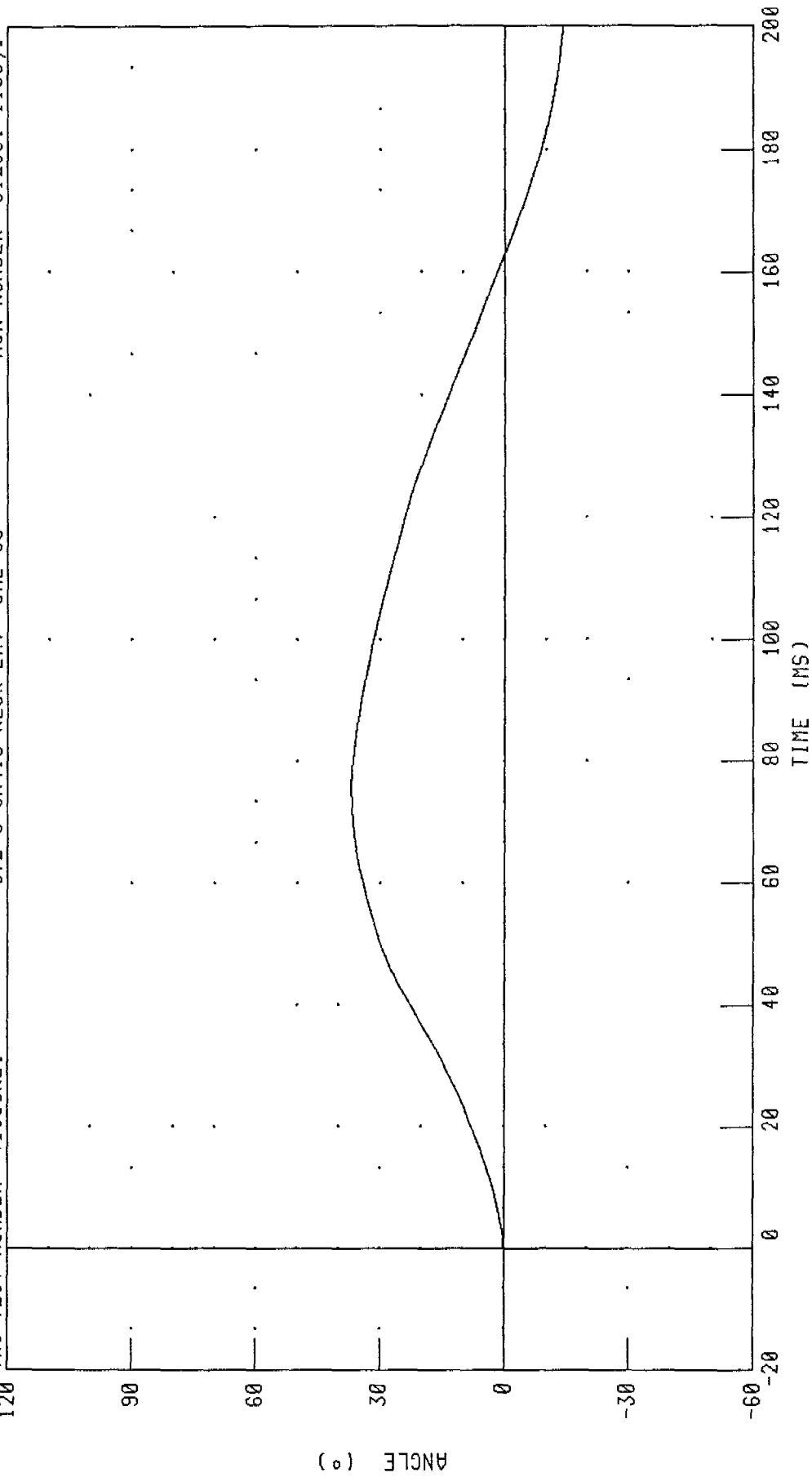
CHANNEL PENXC FILTER CH CLASS 180

PEAK DATA 22 13 G 0 1 68 MS, -3 17 G 0 46 48 MS

PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION

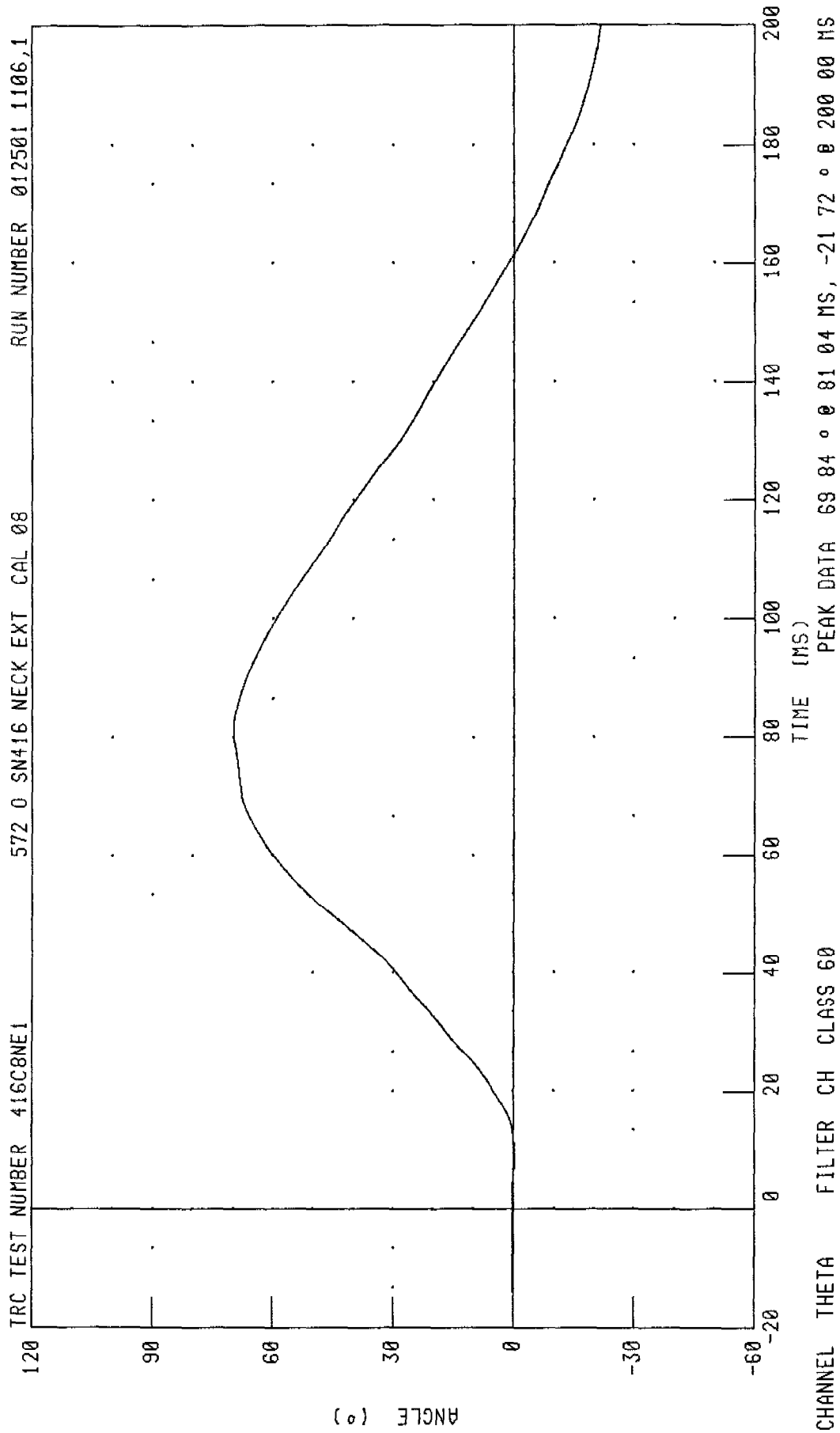
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER 416C8NE1 572 0 SN416 NECK EXT CAL 08 RUN NUMBER 012501 1106,1



CHANNEL BETA FILTER CH CLASS 60 PEAK DATA 36 90 ° 75 52 MS, -14 13 ° 200 00 MS

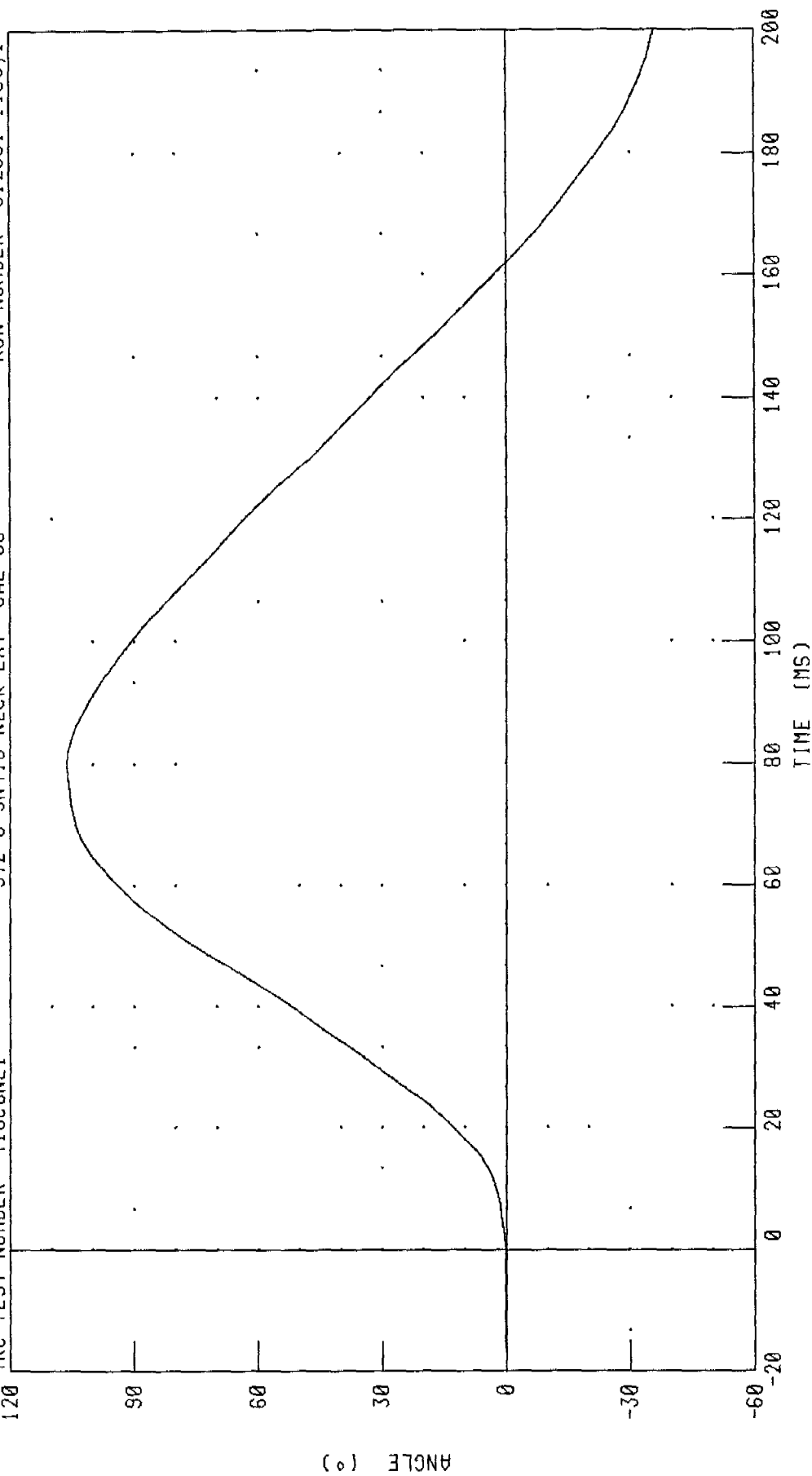
PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION
 ROTATION ABOUT OCCIPITAL CONDYLE



PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER 416C8NE1 572 0 SN416 NECK EXT CAL 08 RUN NUMBER 012501 1106,1

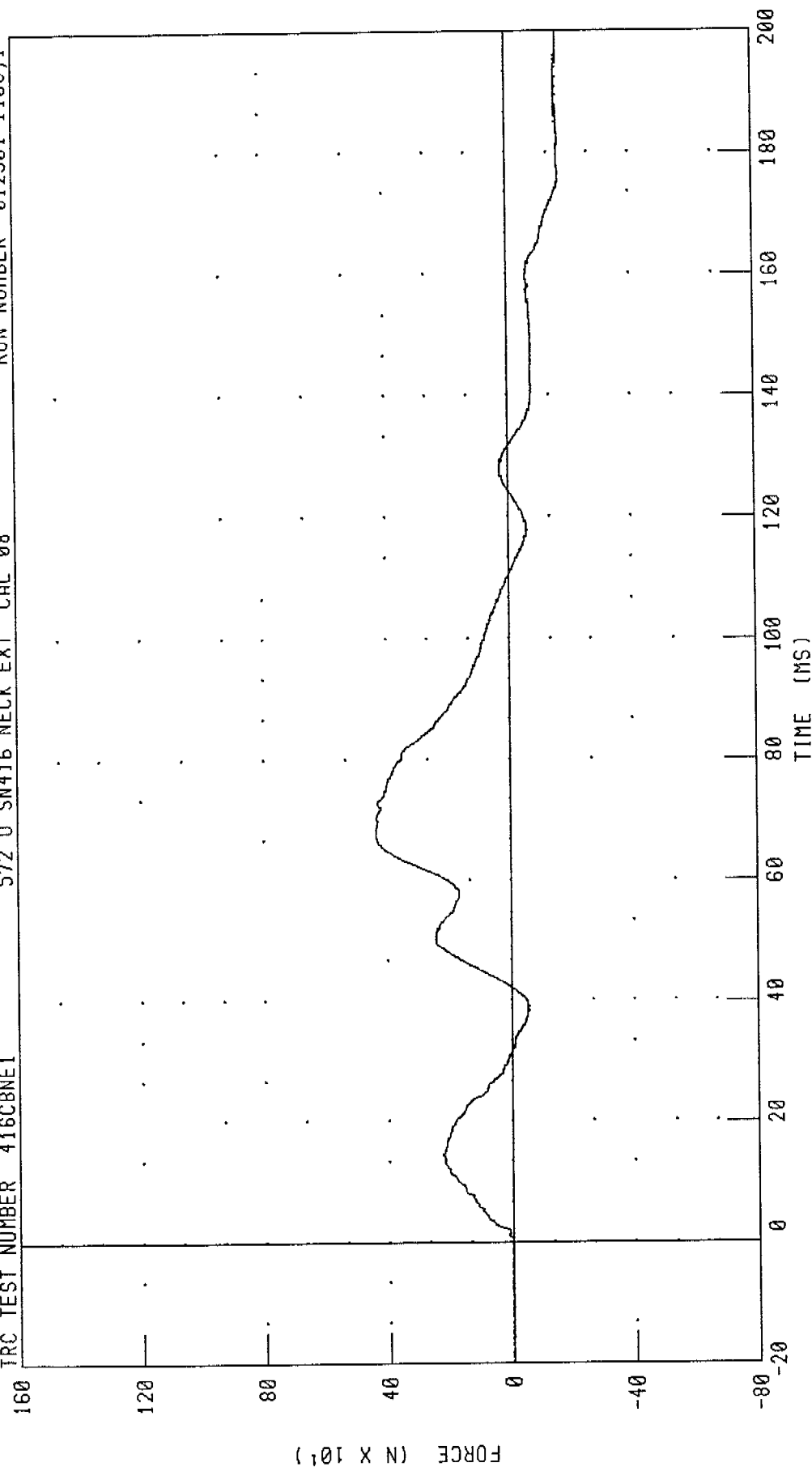


CHANNEL TOTAL FILTER CH CLASS 60 PEAK DATA 106 29 ° @ 79 76 MS, -35 86 ° @ 200 00 MS

PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION

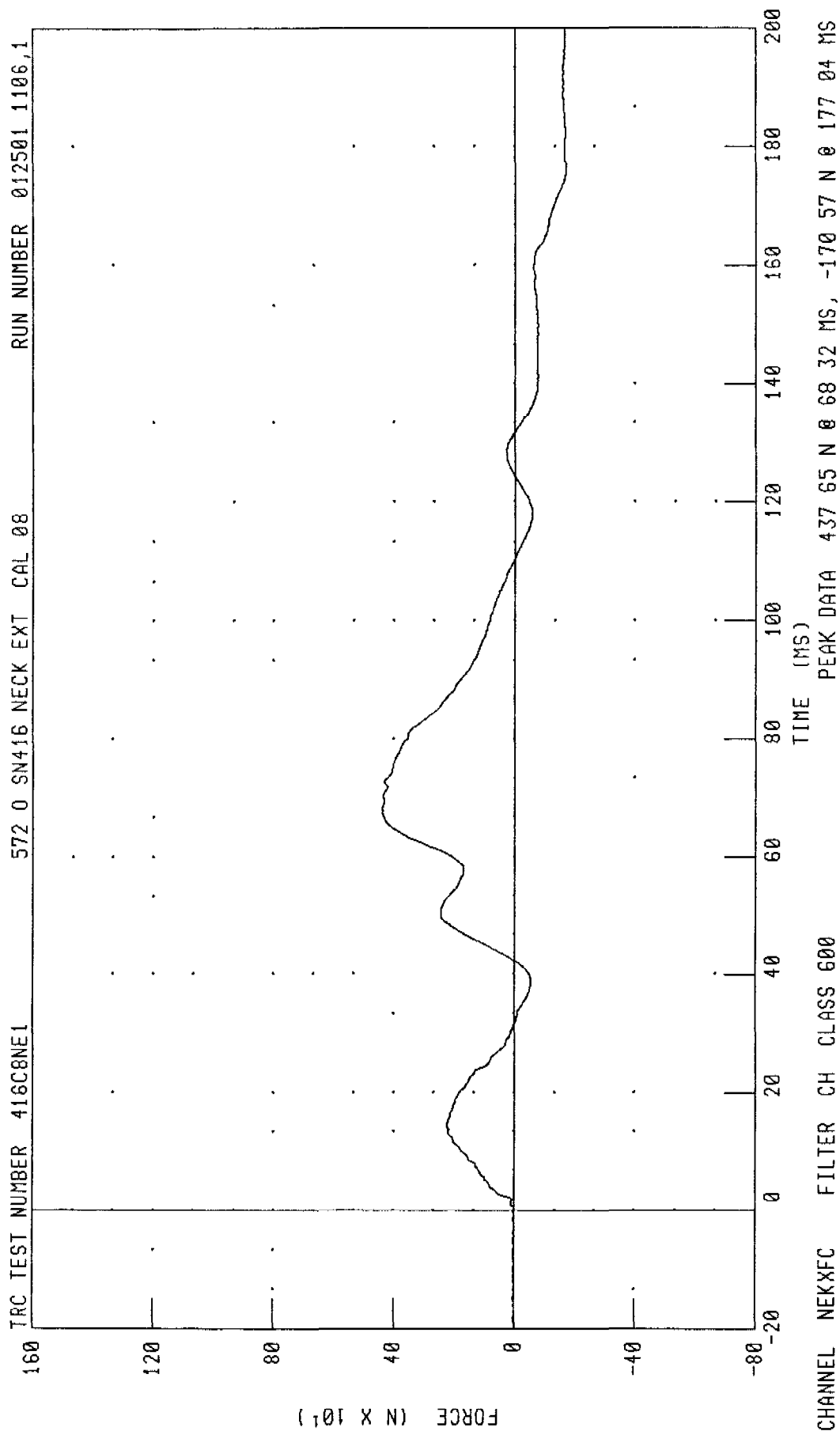
NECK FORCE X AXIS

TRC TEST NUMBER 416CBNE1 572 0 SN416 NECK EXT CAL 08 RUN NUMBER 012501 1106,1



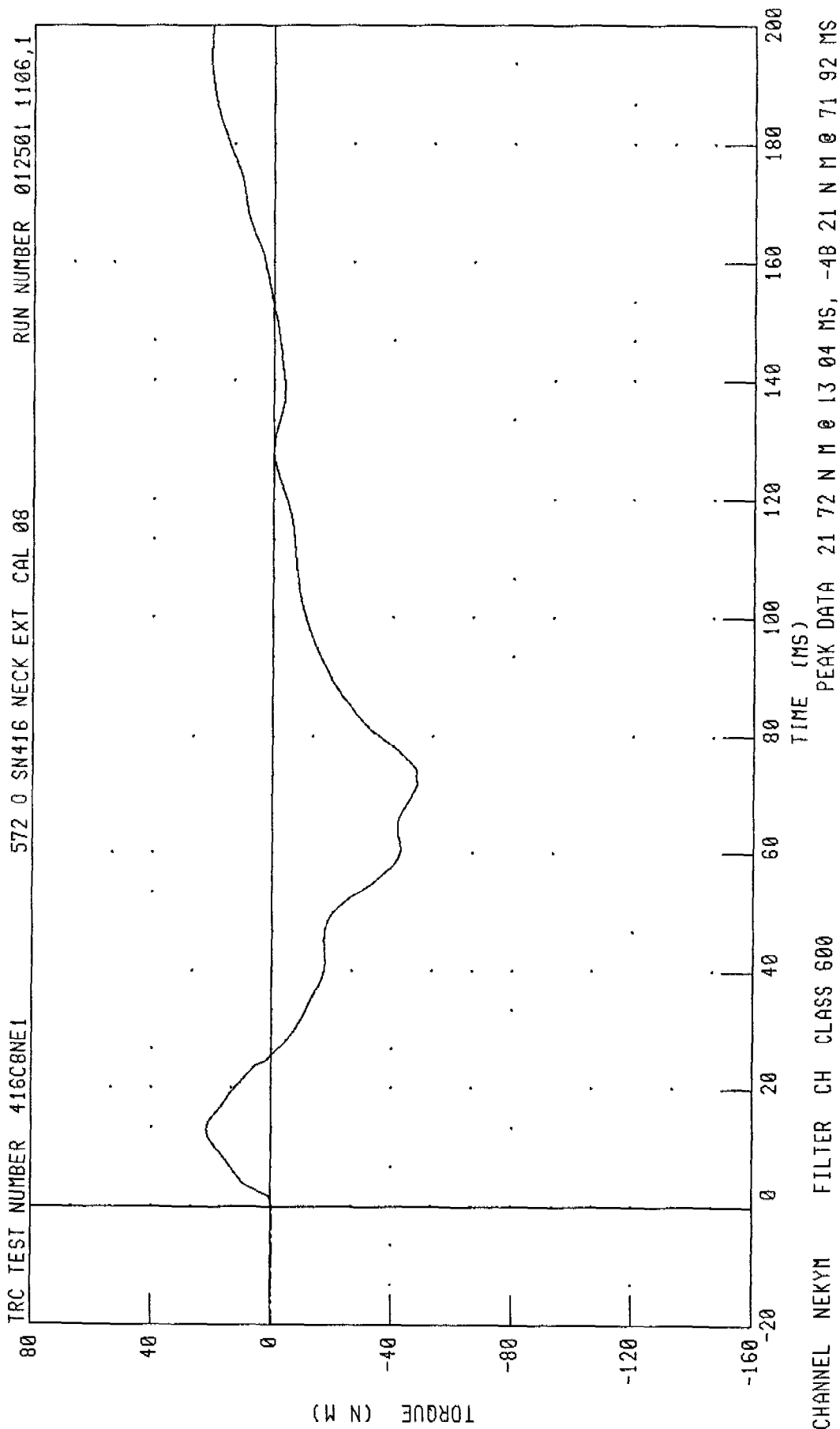
CHANNEL NEKXF FILTER CH CLASS 1000 PEAK DATA 437 49 N 0 66 96 MS, -170 43 N 0 174 88 MS

PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION
 NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION



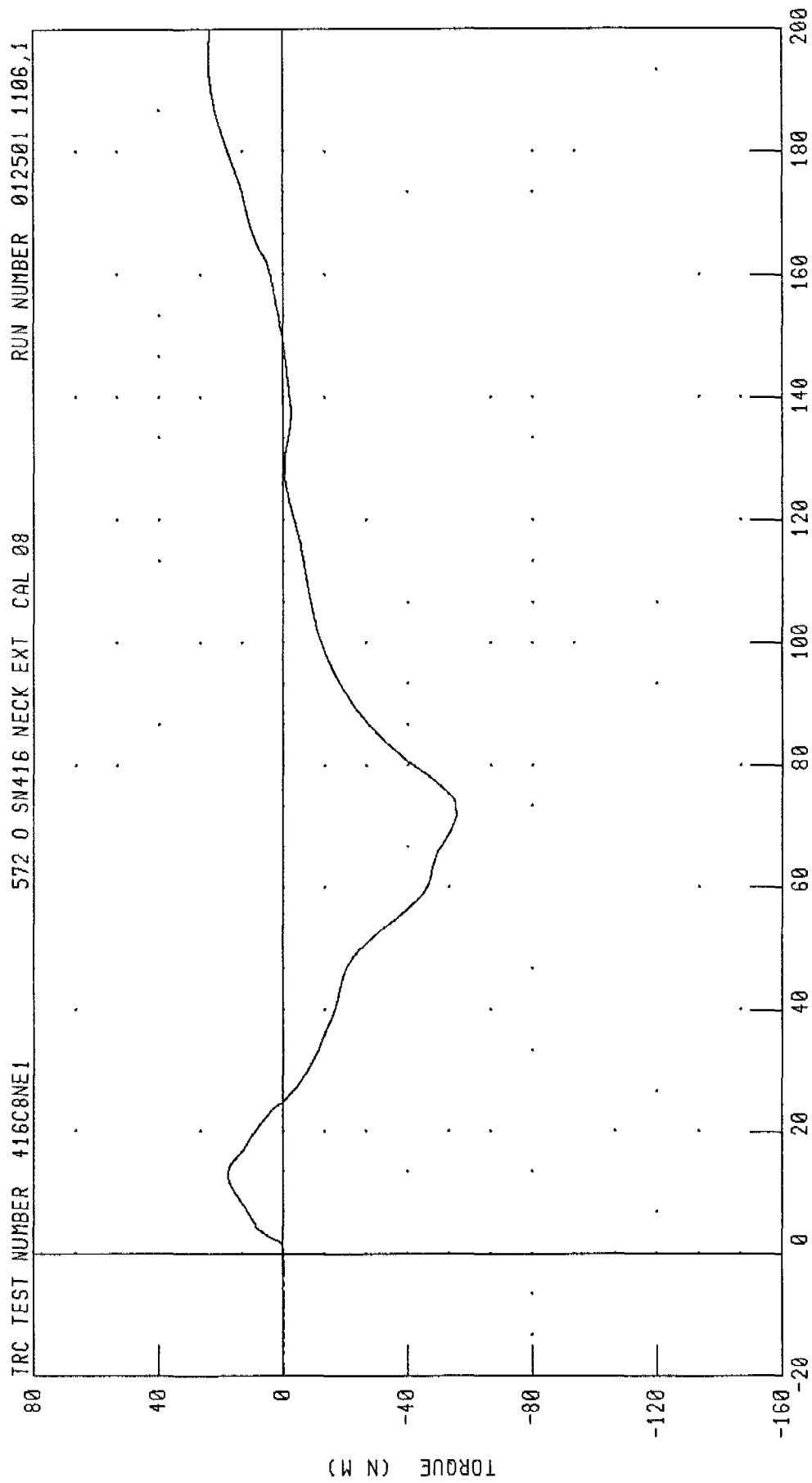
PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS



PART 572-0 HYBRID III SMALL FEMALE - NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



TIME (MS)

CHANNEL NEKOM FILTER CH CLASS 600 PEAK DATA 23 99 N M @ 195 68 MS, -55 69 N M @ 72 08 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III SMALL FEMALE

25-JAN-01

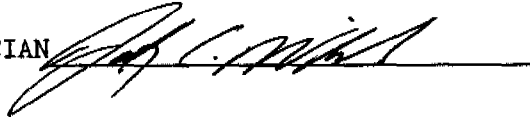
NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 416C8NF1 572 0 SN416 NECK FLEX. CAL08

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	15.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.13 M/S
INTEGRATED PENDULUM VELOCITY	10 MS	2.0 - 2.5 M/S	2.47 M/S
	20 MS	4.0 - 5.0 M/S	4.87 M/S
	30 MS	5.8 - 7.0 M/S	6.84 M/S
PEAK D-PLANE ROTATION		77 - 91 DEG.	79.71 DEG.
PEAK MOMENT DURING ROTATIONAL INTERVAL		69 - 83 NM	78.99 NM
POSITIVE MOMENT DECAY TIME TO 10 NM		80 - 100 MS	86.00 MS

TEST MEETS SPECIFICATIONS

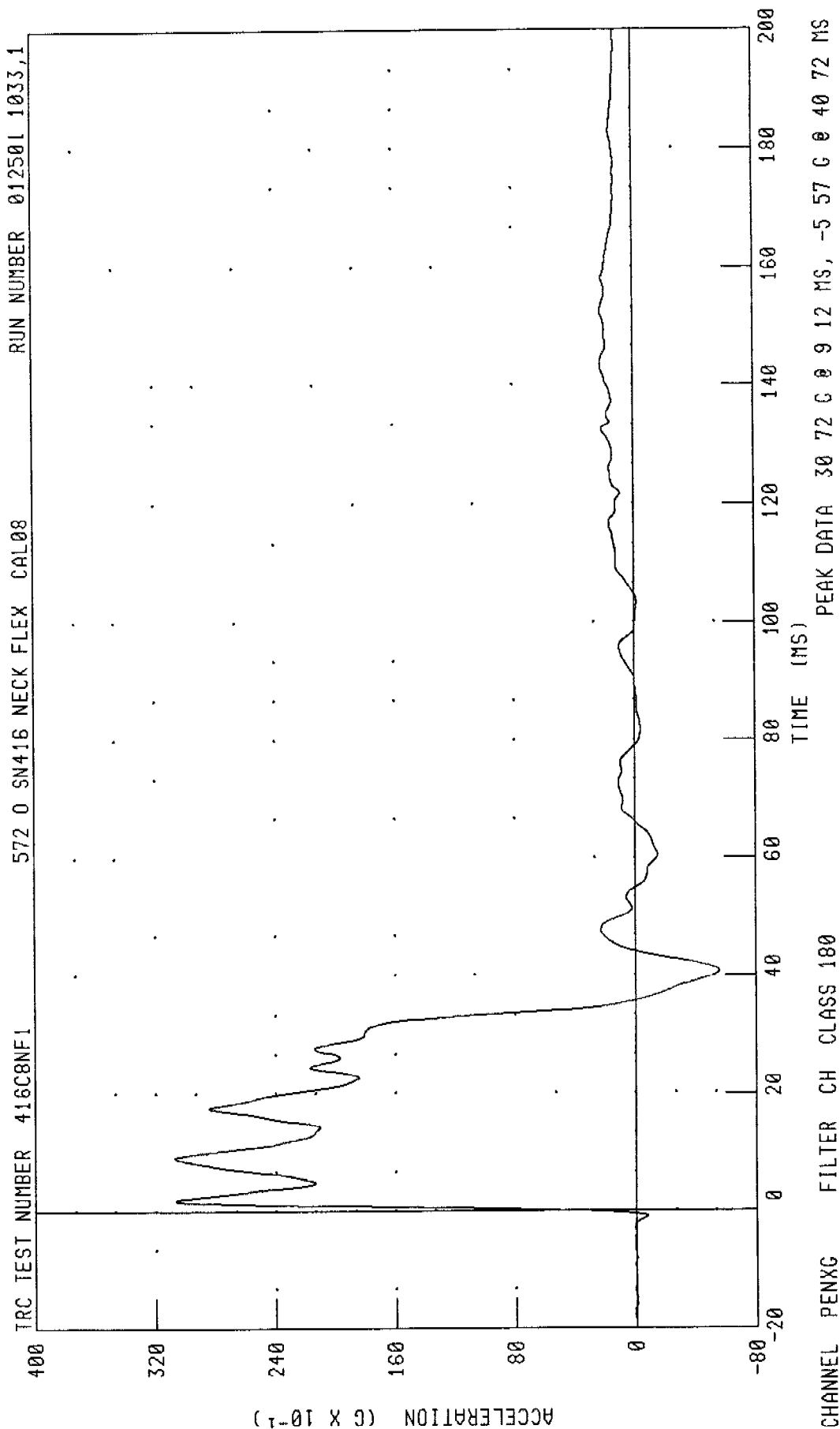
TECHNICIAN



RUN NUMBER: 012501.1024;1

PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

PENDULUM DECELERATION



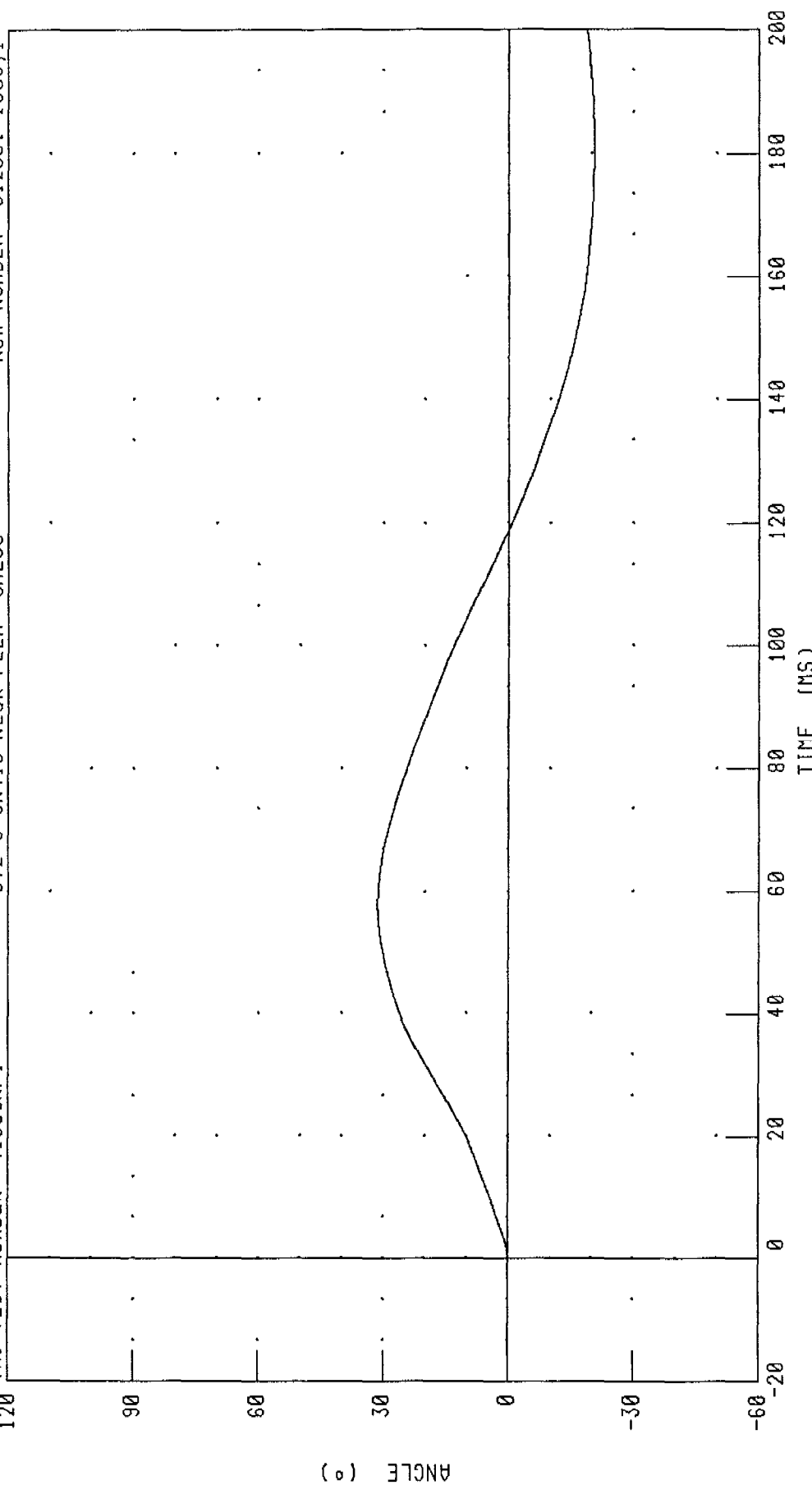
PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER 416C8NF1

572 0 SN416 NECK FLEX CAL08

RUN NUMBER 012501 1033,1



CHANNEL BETA FILTER CH CLASS 60

PEAK DATA 31 31 ° 0 57 92 MS, -20 64 ° 0 182 08 MS

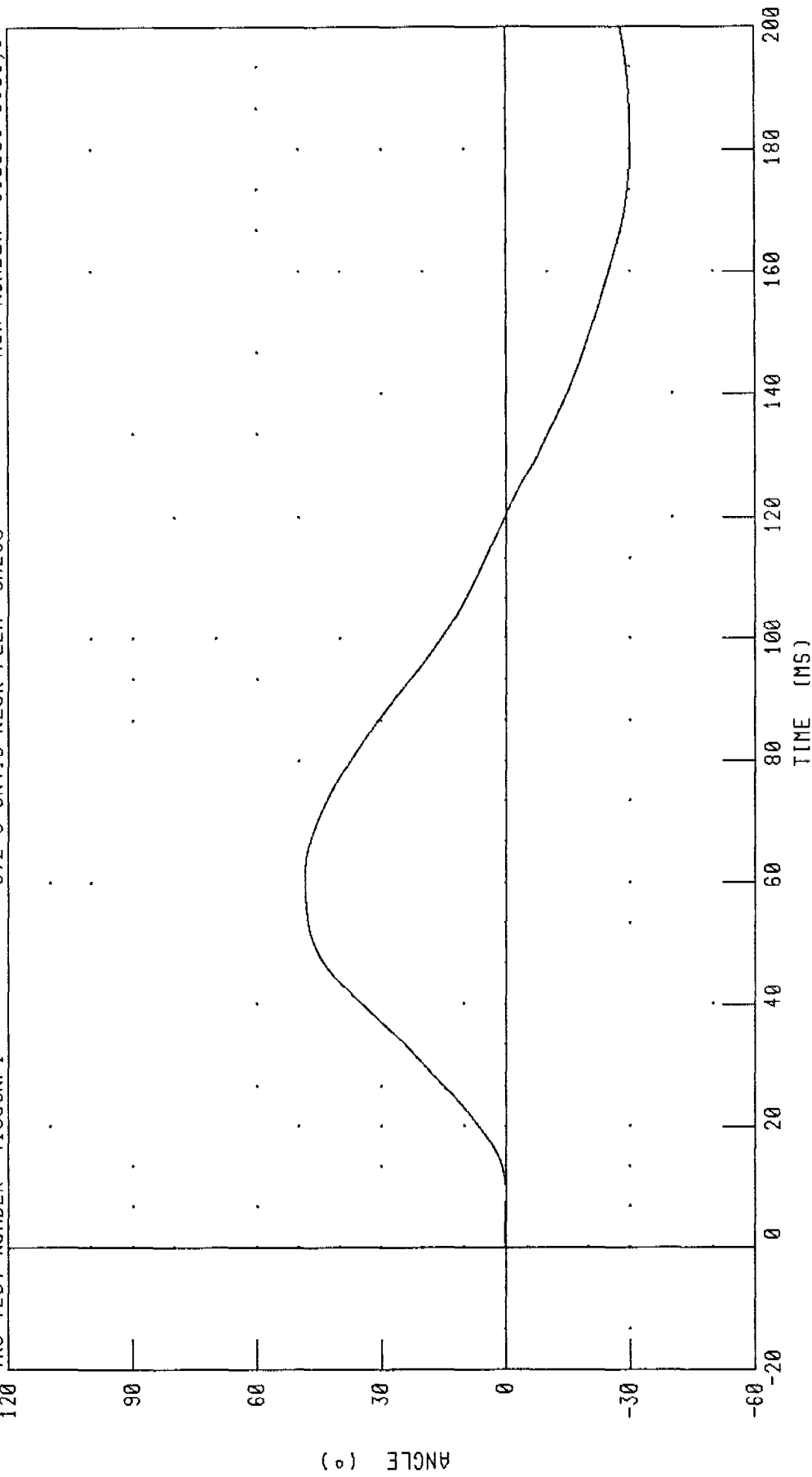
PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 416C8NF1

572 0 SN416 NECK FLEX CAL08

RUN NUMBER 012501 1033,1



CHANNEL THETA

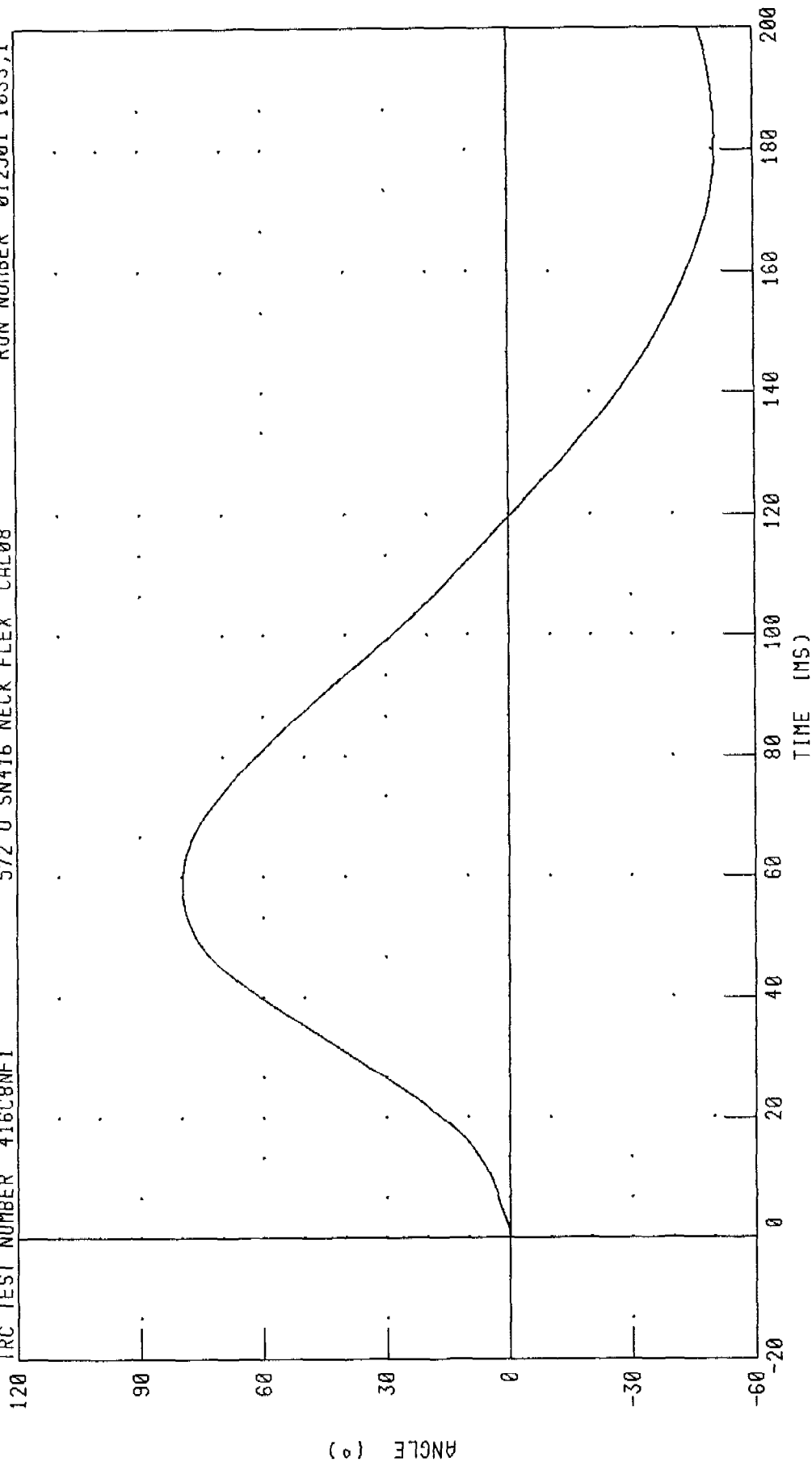
FILTER CH CLASS 60

PEAK DATA 48 44 ° 60 24 MS, -30 12 ° 182 00 MS

PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER 416C8NF1 572 0 SN416 NECK FLEX CAL08 RUN NUMBER 012501 1033,1



CHANNEL TOTAL FILTER CH CLASS 60

PEAK DATA 79 71 ° 0 58 64 MS, -50 75 ° 0 182 08 MS

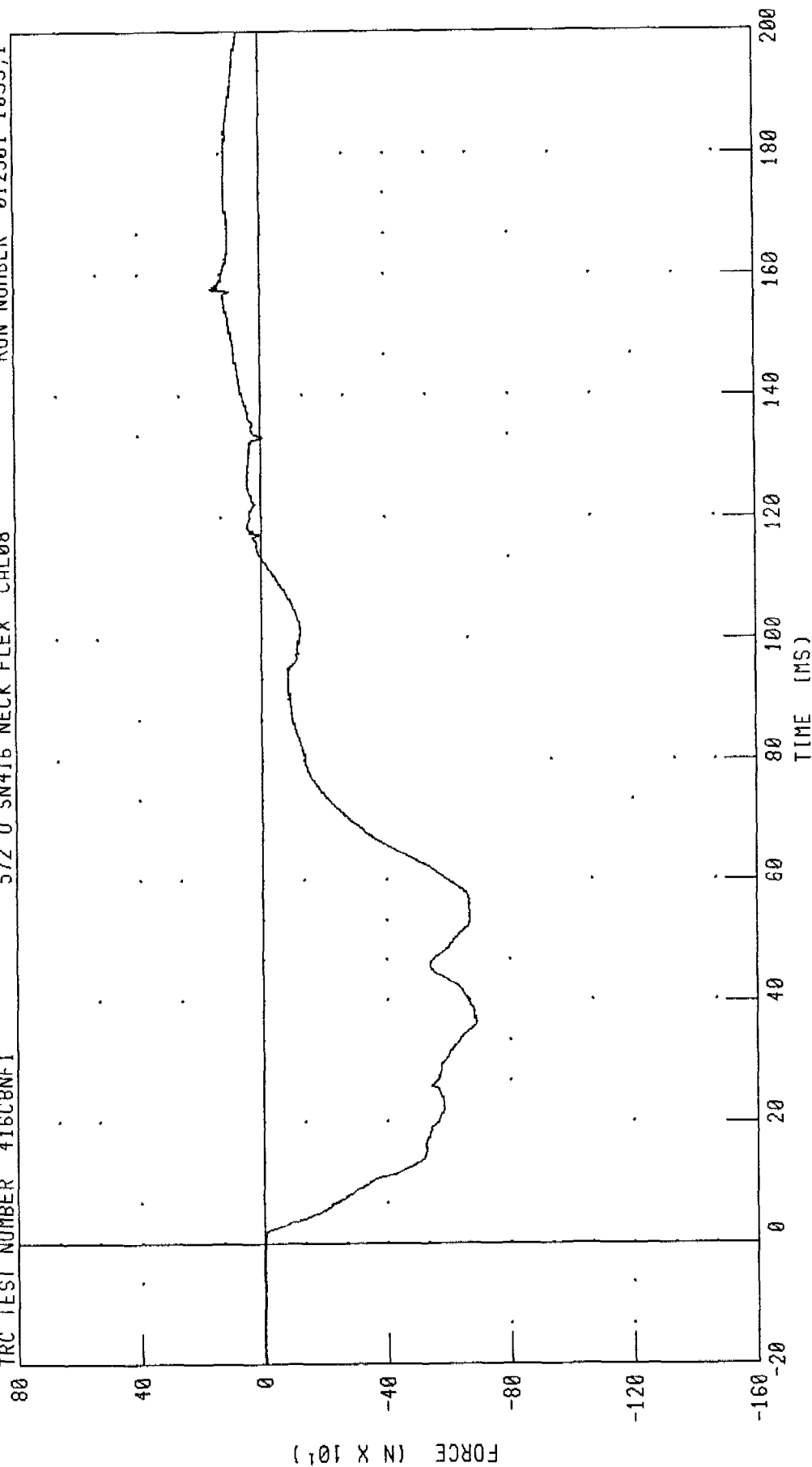
PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER 416C8NF1

572 0 SN416 NECK FLEX CAL08

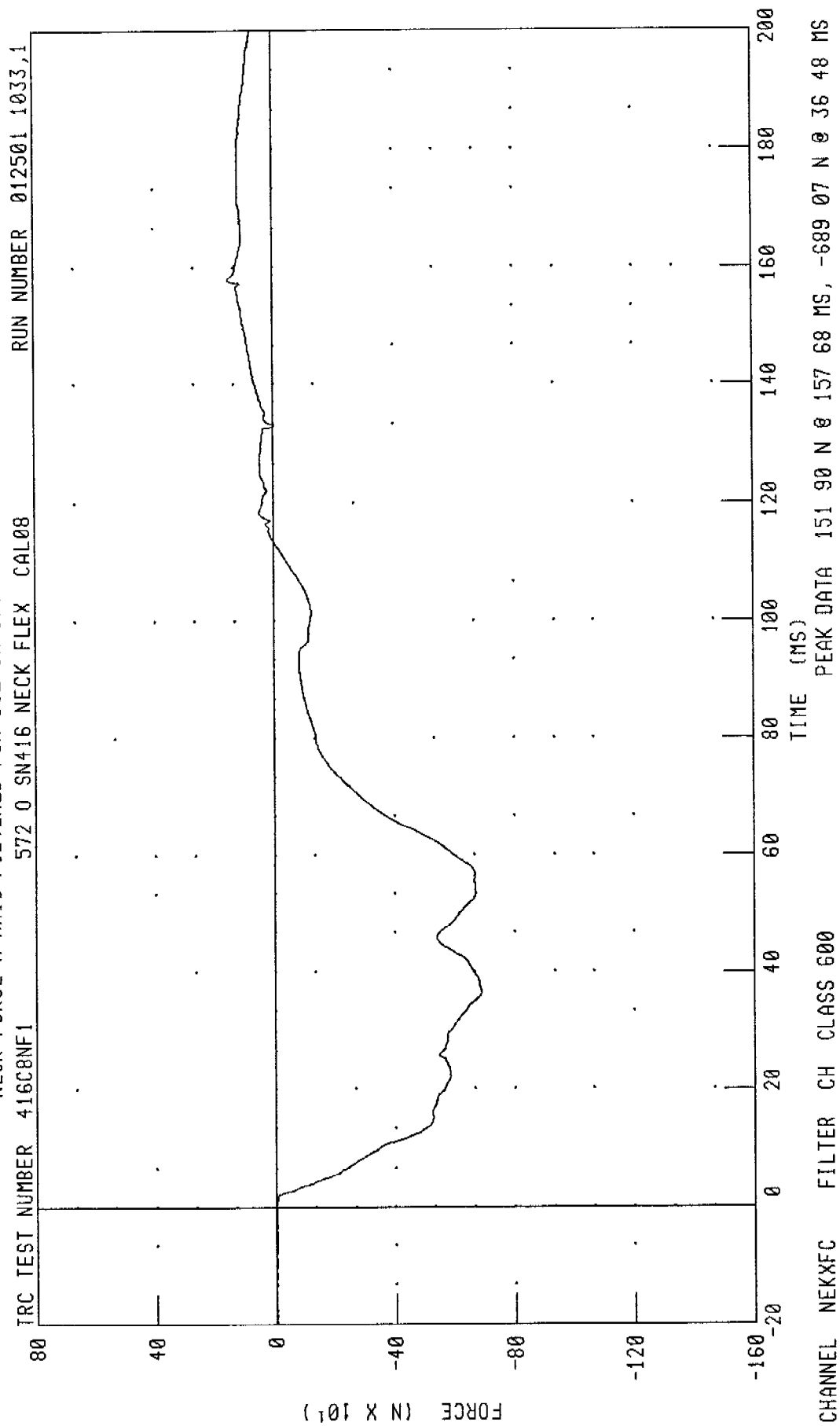
RUN NUMBER 012501 1033,1



PEAK DATA 163 13 N @ 157 52 MS, -692 30 N @ 36 48 MS

CHANNEL NEKXF FILTER CH CLASS 1000

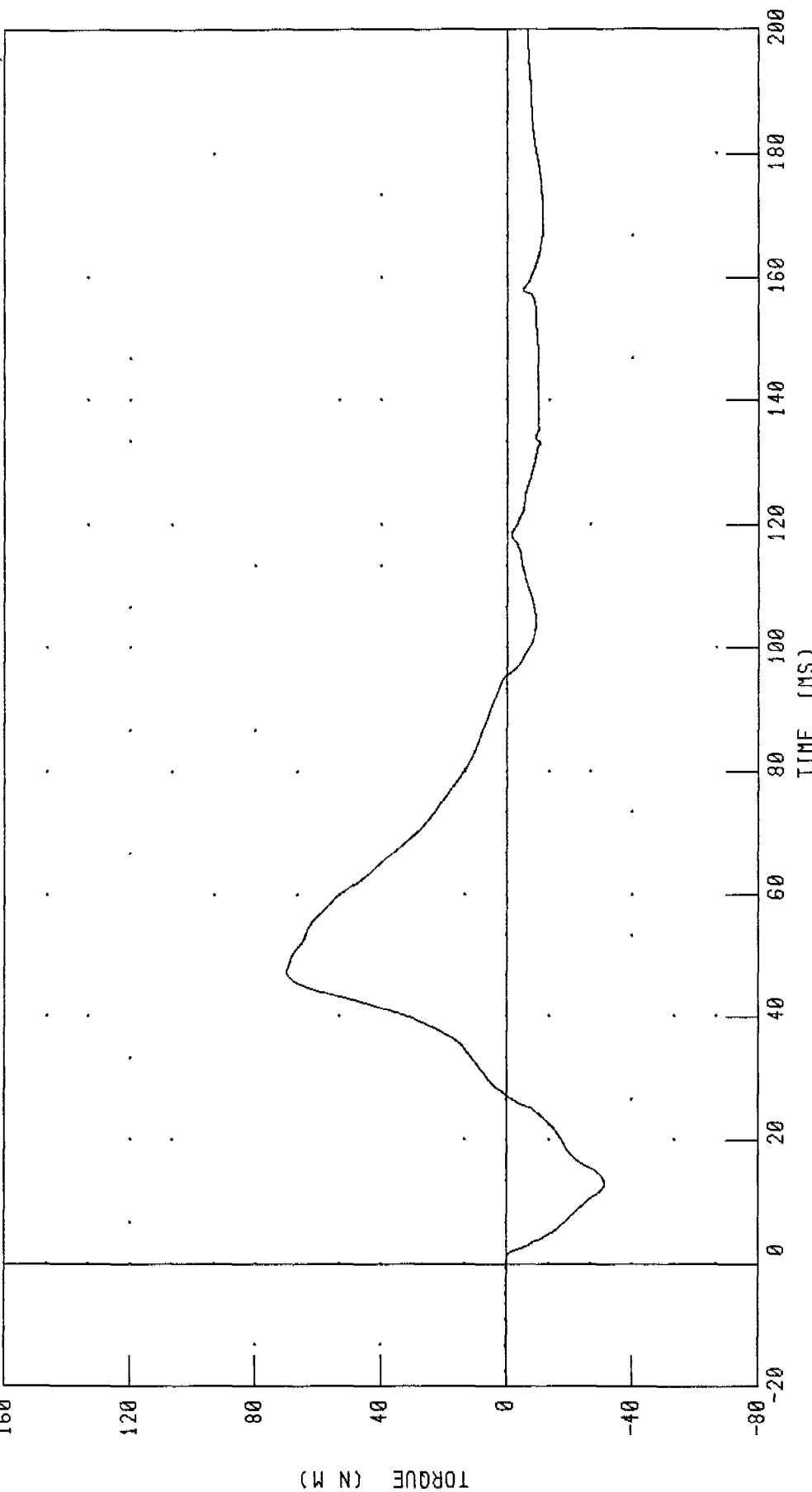
PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION
 NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION



PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER 416C8NF1 572 0 SN416 NECK FLEX CAL08 RUN NUMBER 012501 1033,1



CHANNEL NEKYM FILTER CH CLASS 600 PEAK DATA 69 96 N M @ 47 28 MS, -31 19 N M @ 13 04 MS

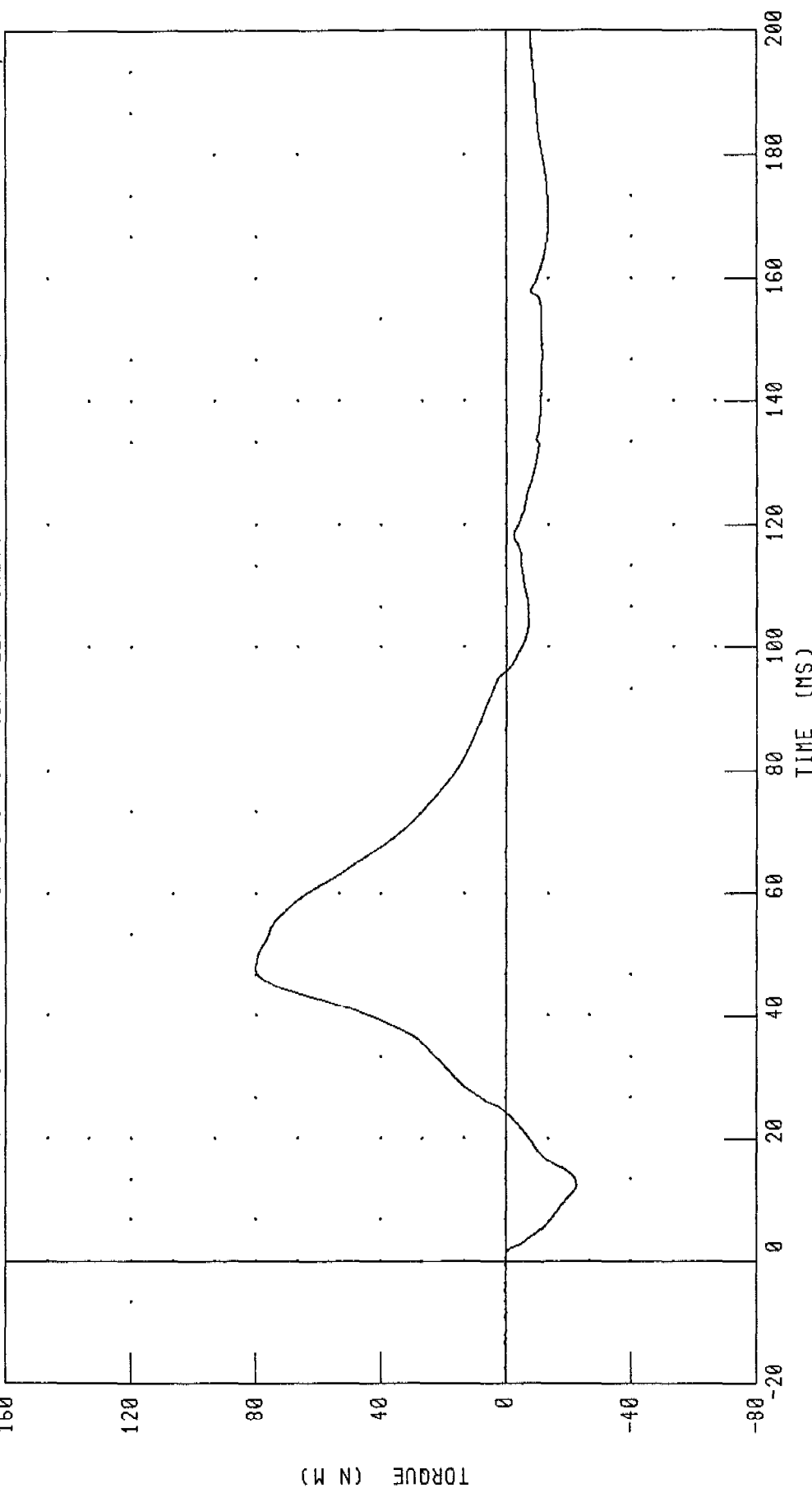
PART 572-0 HYBRID III SMALL FEMALE - NECK FLEXION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER 416C8NF1

572 0 SN416 NECK FLEX CAL08

RUN NUMBER 012501 1033,1



CHANNEL NEKOM FILTER CH CLASS 600

PEAK DATA 80 07 N M @ 48 16 MS, -22 64 N M @ 12 48 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III SMALL FEMALE

26-JAN-01

TRC INC.

TEST NO: 416C8TH6

572 0 SN416 THORAX CAL08

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	14.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.59 M/S
MAXIMUM DEFLECTION	50 - 58 MM	53.4 MM
PEAK RESISTIVE FORCE DURING DEFLECTION INTERVAL	3900 - 4400 N	4343. N
PEAK FORCE DURING 18 MM TO 50 MM DEFLECTION	<= 105%	104 %
INTERNAL HYSTERESIS	69% - 85%	73.1%

TEST MEETS SPECIFICATIONS

TECHNICIAN

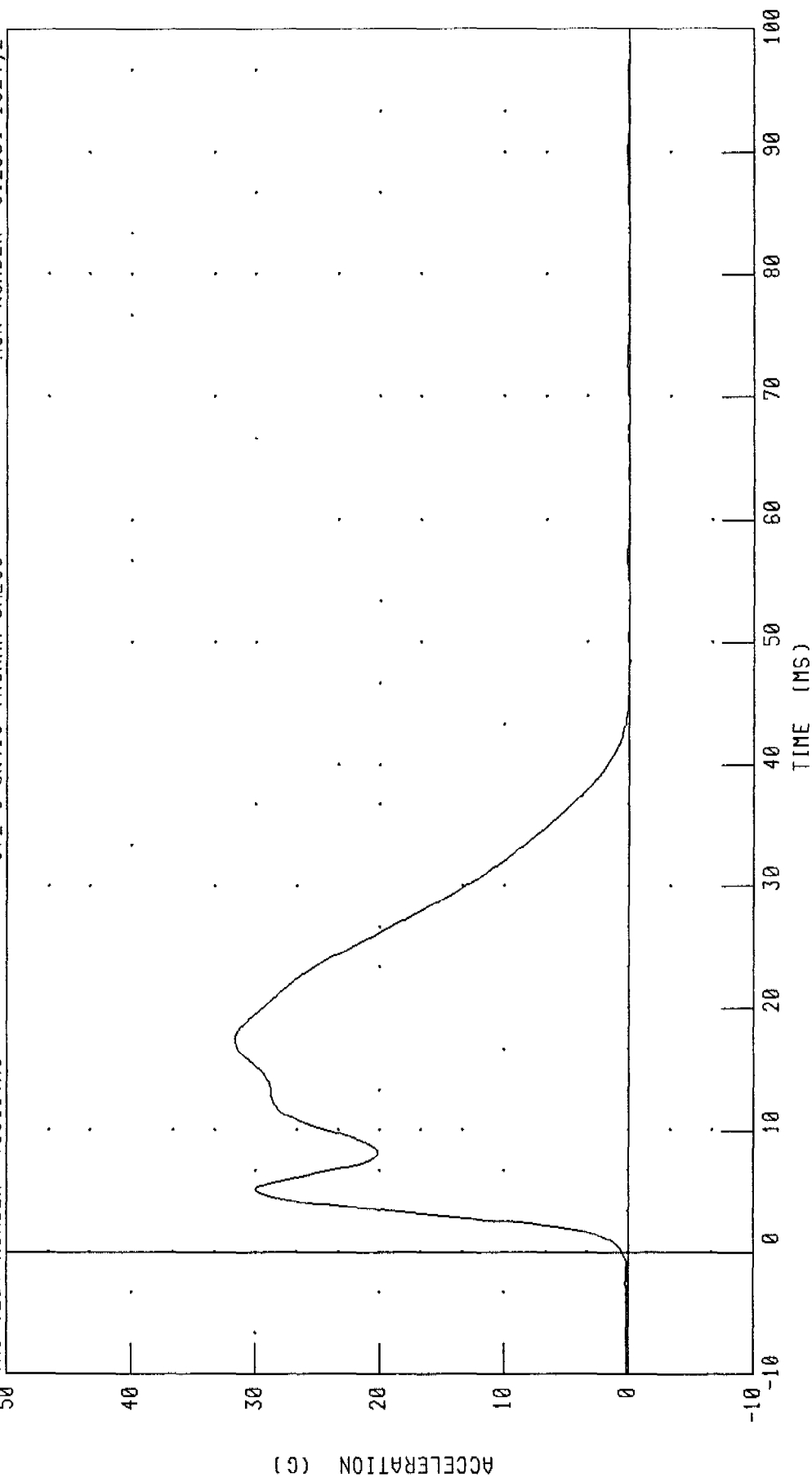
J. C. Mills

RUN NUMBER: 012601.1518;2

PART 572-0 HYBRID III SMALL FEMALE - THORAX CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER 416C8TH6 572 0 SN416 THORAX CAL08 RUN NUMBER 012601 1524,2

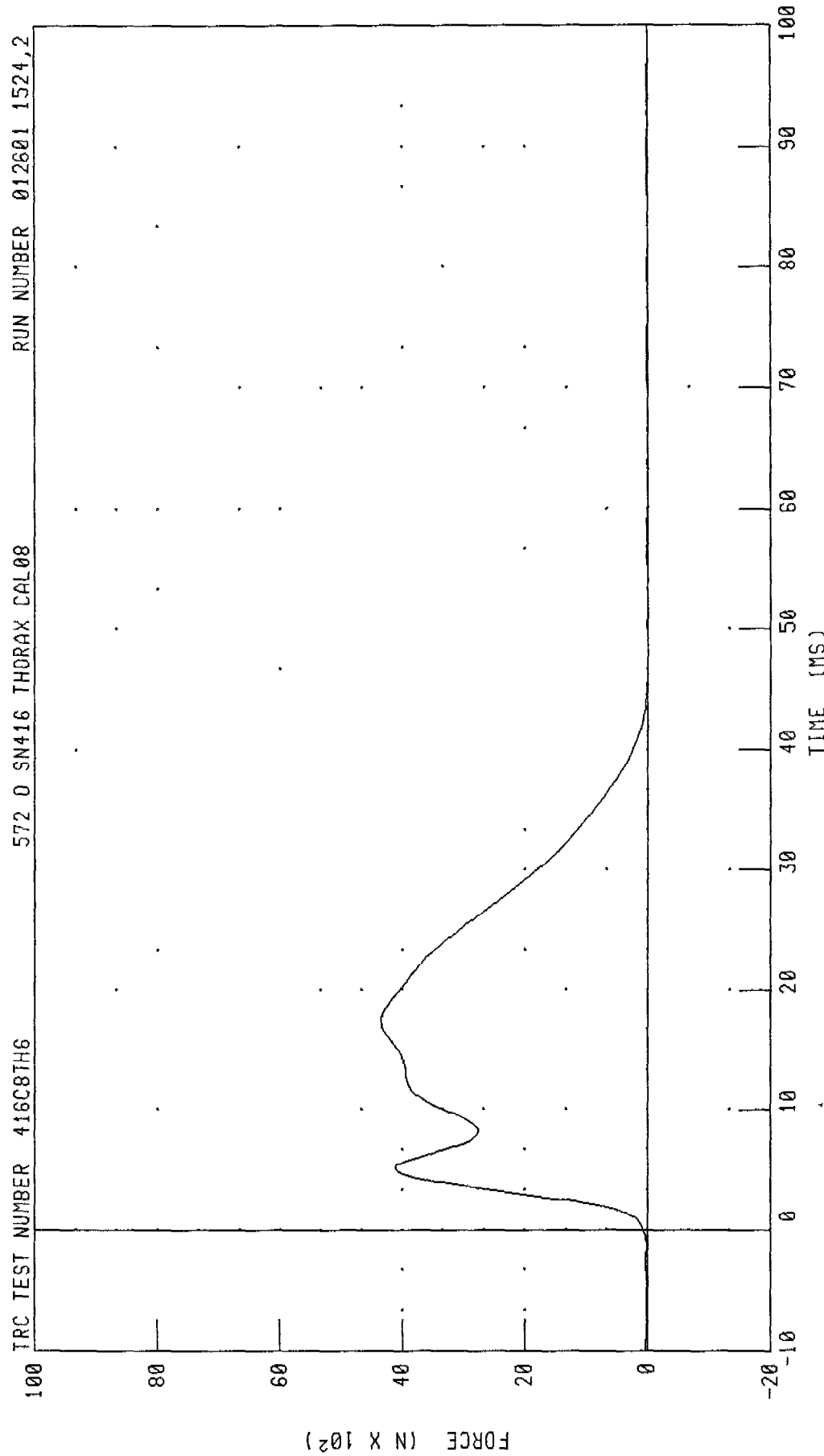


CHANNEL PENXC FILTER CH CLASS 180

PEAK DATA 31 65 C 0 17 52 MS, -0 07 C 0 48 48 MS

PART 572-0 HYBRID III SMALL FEMALE - THORAX CALIBRATION

PENDULUM FORCE



CHANNEL PENXF FILTER CH CLASS 180 PEAK DATA 4343 77 N @ 17 52 MS, -8 93 N @ 48 48 MS

PART 572-0 HYBRID III SMALL FEMALE - THORAX CALIBRATION

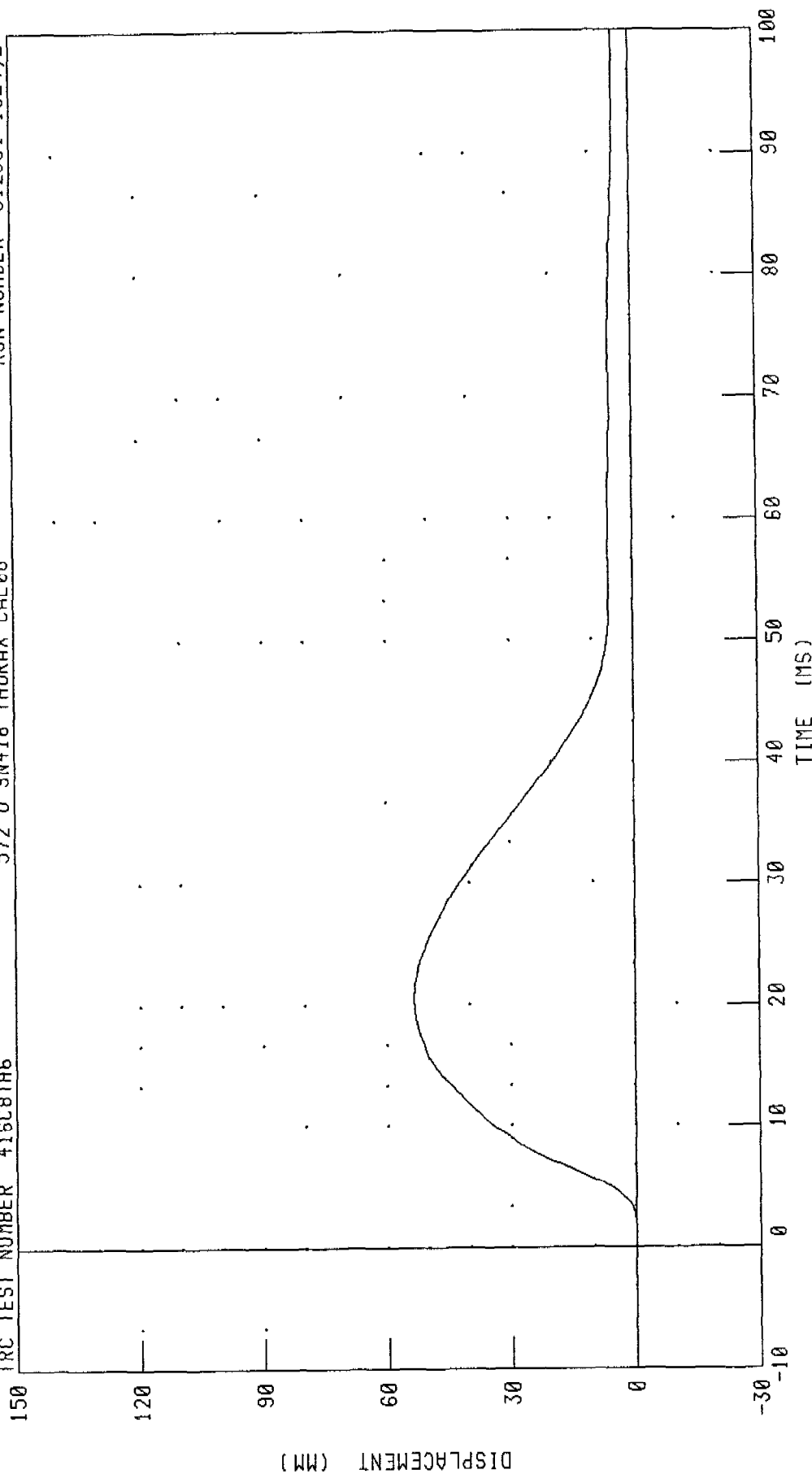
STERNUM DISPLACEMENT

572 0 SN416 THORAX CAL08

TRC TEST NUMBER 416C8TH6

572 0 SN416 THORAX CAL08

RUN NUMBER 012601 1524,2

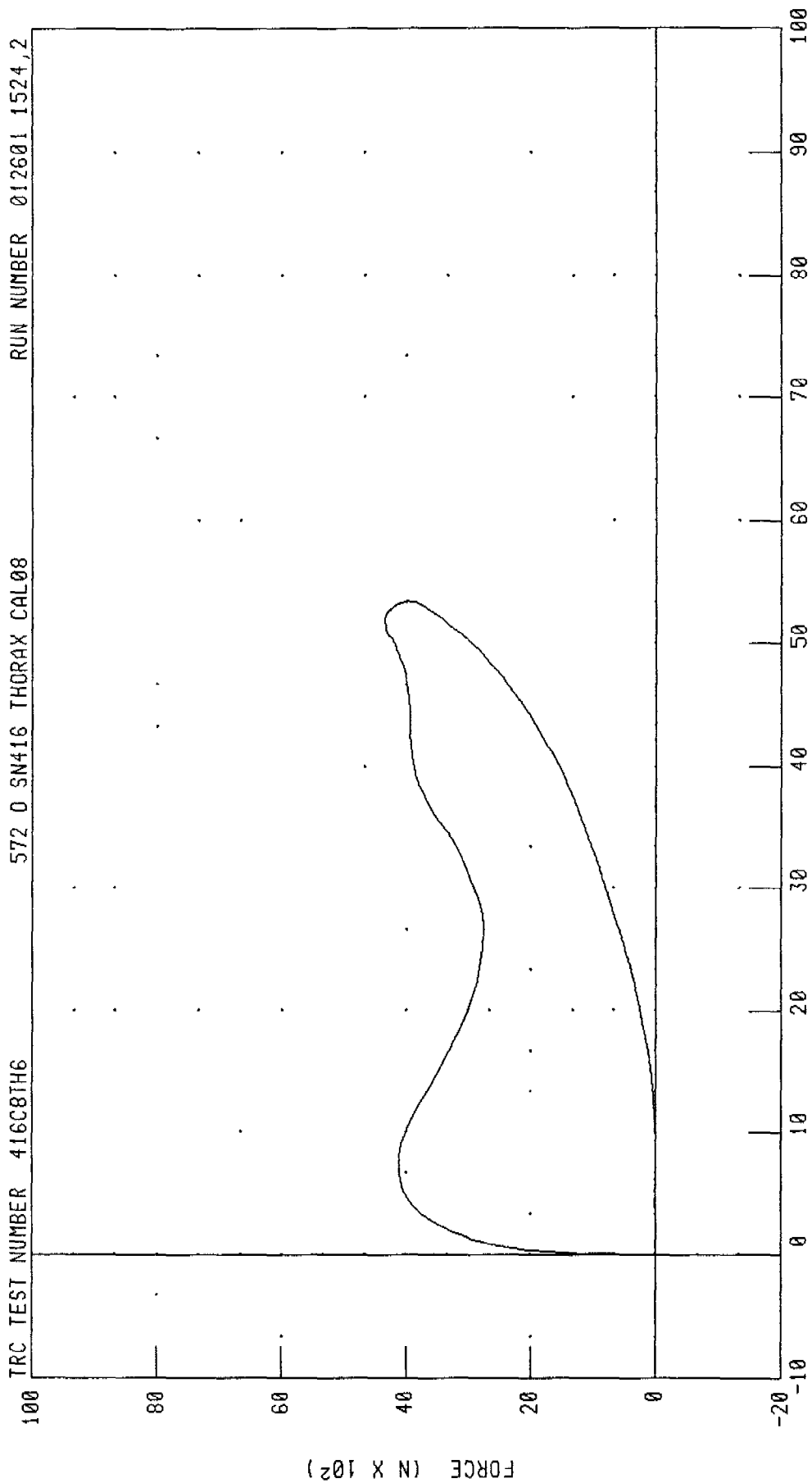


PEAK DATA 53 45 MM @ 20 48 MS, -0 01 MM @ -5 52 MS

CHANNEL CSTXD FILTER CH CLASS 600

PART 572-0 HYBRID III SMALL FEMALE - THORAX CALIBRATION

CHEST DISPLACEMENT VS PENDULUM FORCE



TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 25-JAN-01

TRC, INC. TEST NO: 416C8TF1 572 O SN416 TORSO FLEX CAL 08

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG C	21.7 DEG C
RELATIVE HUMIDITY	10 – 70 %	15 %
INITIAL ANGLE OF UNSUPPORTED DUMMY	≤ 20 DEG REFERENCED TO VERTICAL	3 DEG
MAXIMUM FORCE AT 45 DEG DURING 10 SECOND PERIOD	320 – 390 N	347 N
RETURN ANGLE	± 8 DEG OF INITIAL ANGLE	9 DEG

TEST MEETS SPECIFICATIONS

TECHNICIAN Derek Wallen

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III SMALL FEMALE

25-JAN-01

TRC INC.

TEST NO: 416C8LK1

572 O SN416 LEFT KNEE CAL8

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	15.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.08 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3450 - 4060 N	3708.9 N

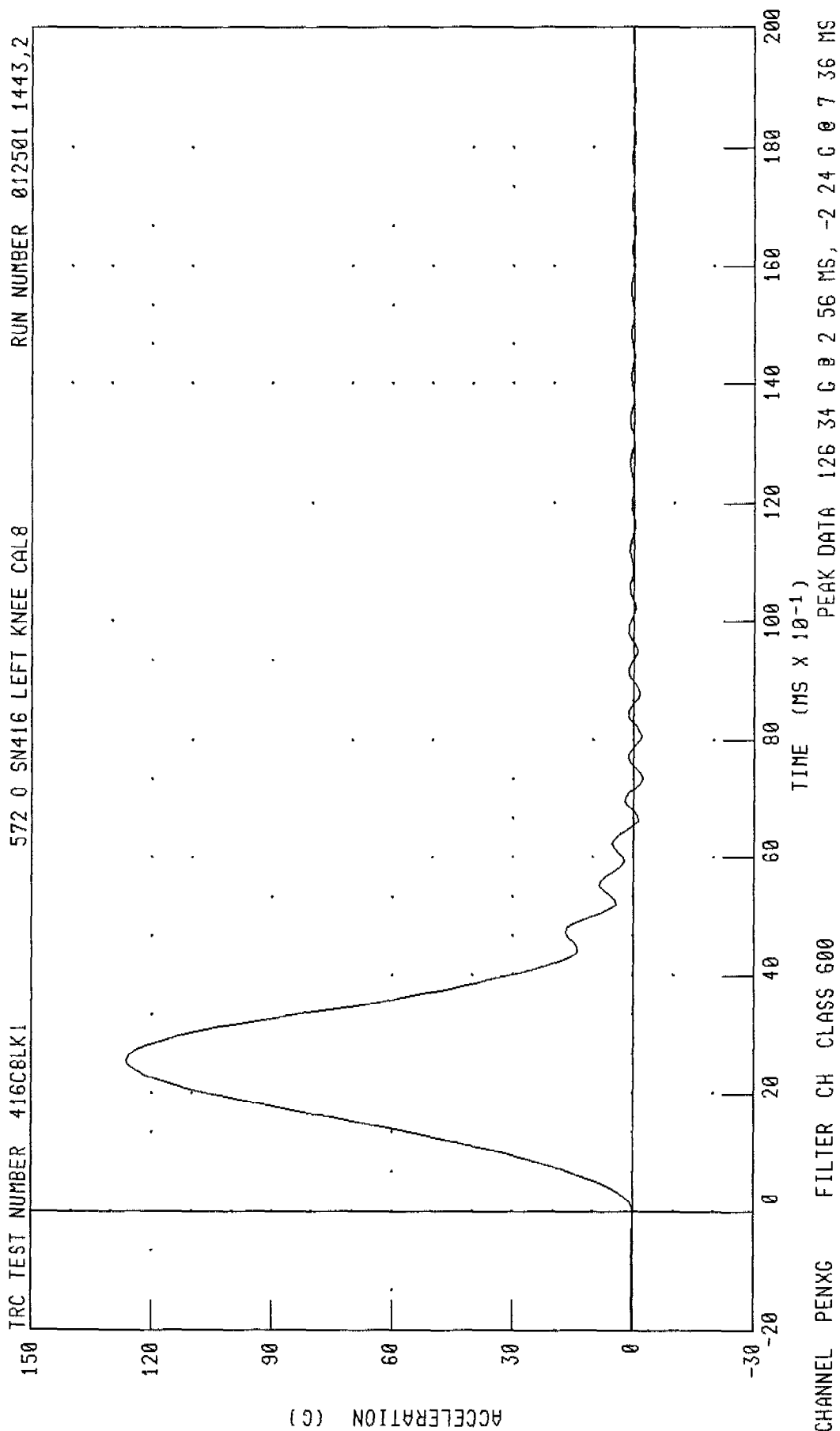
TEST MEETS SPECIFICATIONS

TECHNICIAN

[Signature]

RUN NUMBER: 012501.1442;2

PART 572-0 HYBRID III SMALL FEMALE - LEFT KNEE CALIBRATION
 PENDULUM DECELERATION (5 KG PEND)



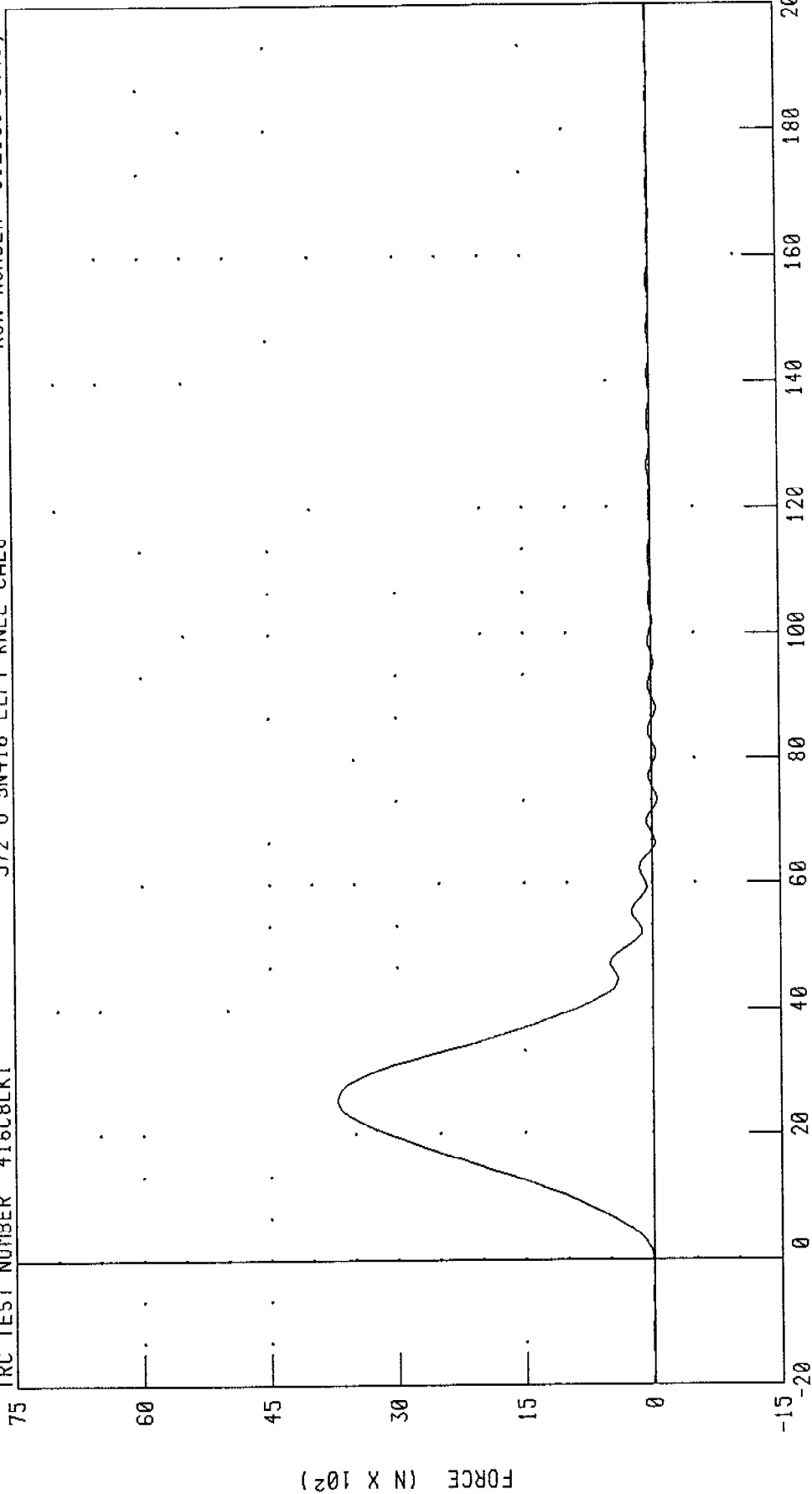
PART 572-0 HYBRID III SMALL FEMALE - LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND)

TRC TEST NUMBER 416C8LK1

572 0 SN416 LEFT KNEE CAL8

RUN NUMBER 012501 1443,2



CHANNEL PENXF FILTER CH CLASS 600

PEAK DATA 3708 93 N 0 2 56 MS, -65 65 N 0 7 36 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III SMALL FEMALE

25-JAN-01

TRC INC.

TEST NO: 416C8RK1

572 0 SN416 R.KNEE CAL8

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	15.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.07 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3450 - 4060 N	3562.4 N

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 012501.1400;1

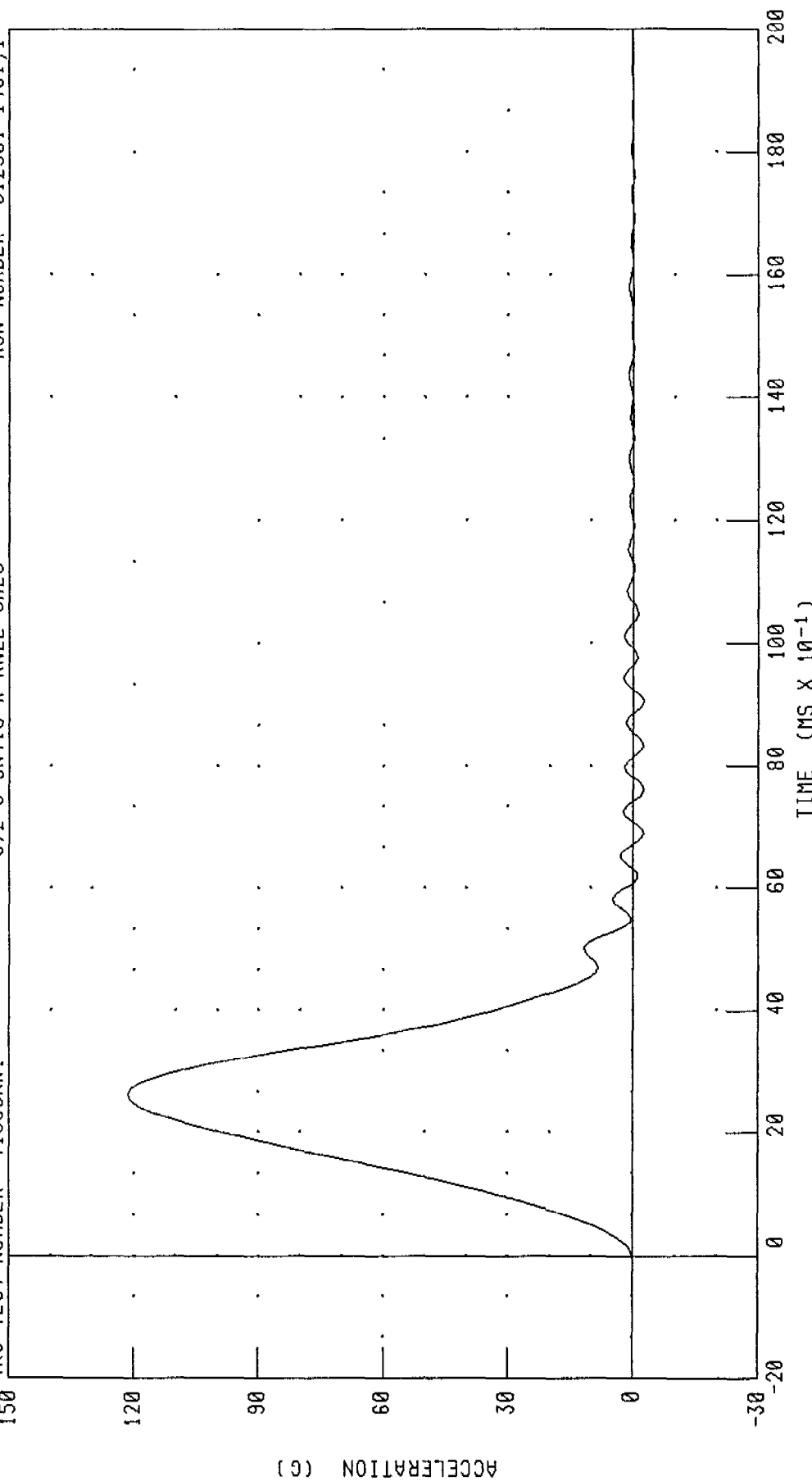
PART 572-0 HYBRID III SMALL FEMALE - RIGHT KNEE CALIBRATION

PENDULUM DECELERATION (5 KG PEND)

TRC TEST NUMBER 416C8RK1

572 0 SN416 R KNEE CAL8

RUN NUMBER 012501 1401,1



CHANNEL PENXS FILTER CH CLASS 600

TIME (MS X 10⁻¹)

PEAK DATA 121 35 G @ 2 64 MS, -2 67 G @ 7 60 MS

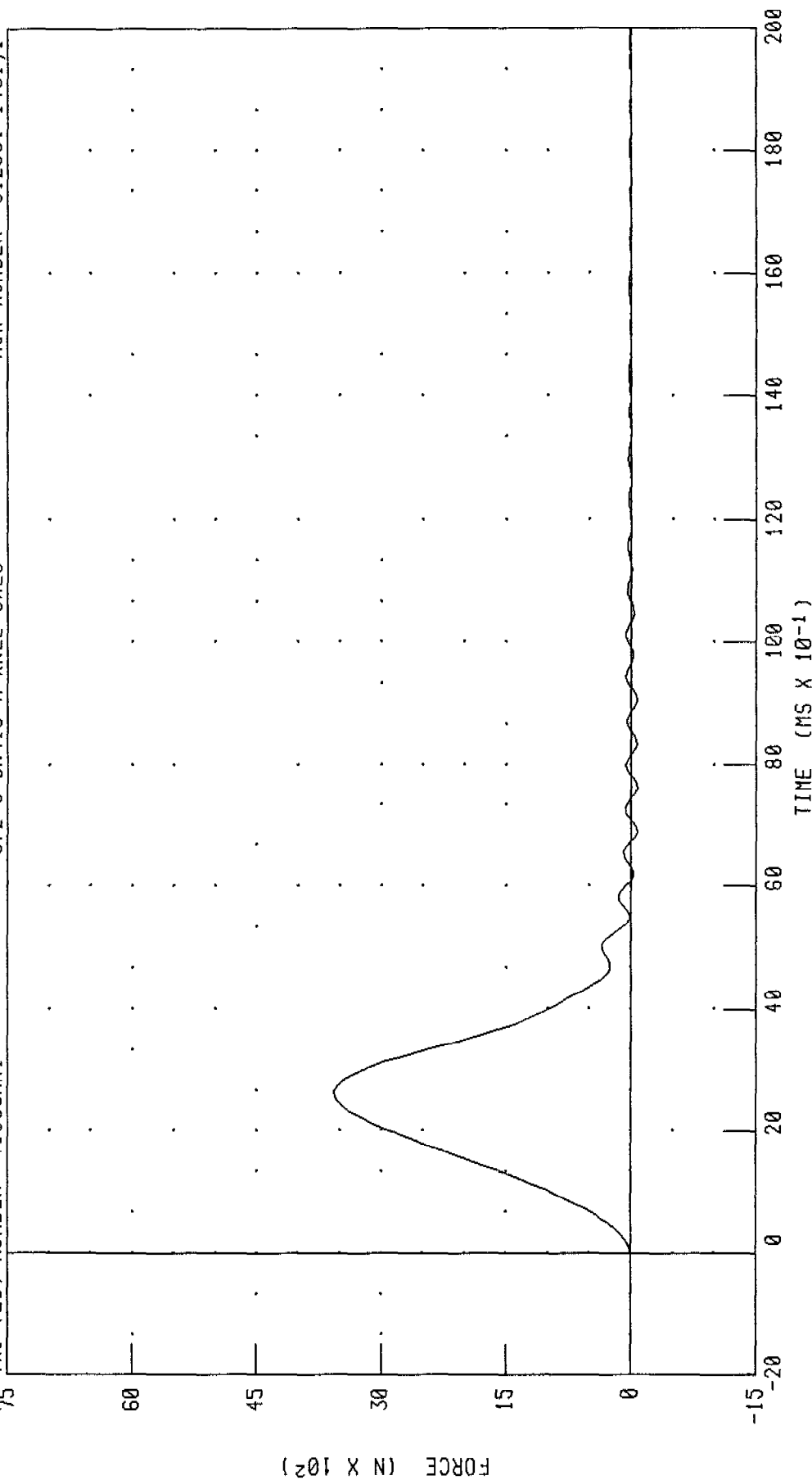
PART 572-0 HYBRID IJI SMALL FEMALE - RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND)

TRC TEST NUMBER 416C8RK1

572 0 SN416 R KNEE CAL8

RUN NUMBER 012501 1401,1



CHANNEL PENXF FILTER CH CLASS 600

PEAK DATA 3562 42 N @ 2 64 MS, -78 25 N @ 7 60 MS

Appendix D

Miscellaneous Test Information

Report Sign Convention

J211 MAR95

Vehicle

Accelerometers: +X: Forward
 +Y: Rightward
 +Z: Downward

Rate Gyro angular velocity:

+Y (Pitch): Nose up
+Z (Yaw): Nose right

Moving barrier face load cells (referenced to cart)¹:

+X force: Rearward (compression)
+Y force: Left
+Z force: Up

Dummy

Potentiometers: +Chest longitudinal deflection: Outward
 + Chest lateral deflection: Rightward

Femur Load cells: +Z force: Tension

Neck load cells: +X force: Head rearward, chest forward
 +Y force: Head leftward, chest rightward
 +Z force: Head upward (tension on neck), chest downward
 +X moment: Left ear rotating toward left shoulder
 +Y moment: Chin rotating toward chest
 +Z moment: Chin rotating toward left shoulder

Accelerometers: +X: Forward
 +Y: Rightward
 +Z: Downward

¹ Barrier face load cell sign convention does not match J211 sign convention: the sign convention used in the baseline report 06/19/00 was repeated, so that X, Y, and Z forces are all opposite of J211.

Report Sign Convention, Cont'd.

J211 MAR95

Tibia Load Cells:

Upper tibia loads: +X moment: Ankle leftward, hold knee in place
 +Y moment: Ankle forward, bottom of knee clevis rearward

Lower tibia loads: +Z force: Ankle downward, knee upward
 +X moment: Ankle leftward, hold knee in place
 +Y moment: Ankle forward, bottom of knee clevis rearward

Filtering Data

J211 MAR95

Load Cell Barrier Forces Class 60

Vehicle Structural Accelerations Class 60

Hybrid III Occupant

Head Accelerometer Class 1000

Neck Load Cell Force Class 1000

Neck Load Cell Moment Class 600

Chest Accelerometer Class 180

Chest Deflection Class 600

Femur Force Class 600

Sternum Accelerometer Class 180

Lower Leg Class 600

Hybrid III SID Occupant

Head Accelerometer Class 1000

Neck Load Cell Force Class 1000

Neck Load Cell Moment Class 600

Rib Accelerometer FIR100¹

Spine Accelerometer FIR100¹

Pelvis Accelerometer FIR100¹

Chest Deflection Class 600

¹ The FIR100 filter procedure is defined in 49 CFR 571.214 (S6.13.5) and 49 CFR 572.44 (d).

Target Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: Alderson/090

Seating position: Driver

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation ¹ (+ Sensing)
HEDXG1	Head	X	Endevco	7264	J23802	Rearward
HEDYG1	Head	Y	Endevco	7264	J34696	Leftward
HEDZG1	Head	Z	Endevco	7264	J23942	Upward
NEKXF1	Neck	X	First Tech	IF-205	197-FX	Head forward
NEKYF1	Neck	Y	First Tech	IF-205	197-FY	Head leftward
NEKZF1	Neck	Z	First Tech	IF-205	197-FZ	Head upward (tension)
NEKXM1	Neck	X	First Tech	IF-205	197-MX	Right ear to right shoulder
NEKYM1	Neck	Y	First Tech	IF-205	197-MY	Chin to chest
NEKZM1	Neck	Z	First Tech	IF-205	197-MZ	Chin to left
CSTXG1	Chest	X	Endevco	7264	J24017	Forward
CSTYG1	Chest	Y	Endevco	7264	J23759	Leftward
CSTZG1	Chest	Z	Endevco	7264	J18664	Upward
PEVXG1	Pelvis	X	Endevco	7264	J36418	Rearward
PEVYG1	Pelvis	Y	Endevco	7264	J23913	Leftward
PEVZG1	Pelvis	Z	Endevco	7264	J21963	Upward
CSTXD1	Chest	X	Servo	14CBI-2897	83672-14	Outward
LFMF1	Femur	Z	GSE	2430	739	Tension
RFMF1	Femur	Z	GSE	2430	760	Tension
TBLXM1	Tibia	X	Denton	1583	0614-MX	Tibia left
TBLYM1	Tibia	Y	Denton	1583	0614-MY	Tibia rearward
ANLXM1	Tibia	X	Denton	3093	119-MX	Ankle right
ANLYM1	Tibia	Y	Denton	3093	119-MY	Ankle forward
ANLZF1	Tibia	Z	Denton	3093	119-FZ	Ankle down
TBRXM1	Tibia	X	Denton	1583	0615-MX	Tibia left
TBRYM1	Tibia	Y	Denton	1583	0615-MY	Tibia rearward

Target Vehicle Dummy Instrumentation Placement, Cont'd.

Dummy Manufacturer and S/N: Alderson/090

Seating position: Driver

<u>Mnemonic</u>	<u>Location</u>	<u>Axis</u>	<u>Manufacturer</u>	<u>Model</u>	<u>S/N</u>	<u>Orientation¹</u> <u>(+ Sensing)</u>
ANRXM1	Tibia	X	Denton	3093	120-MX	Ankle right
ANRYM1	Tibia	Y	Denton	3093	120-MY	Ankle forward
ANRZF1	Tibia	Z	Denton	3093	120-FZ	Ankle down

¹ This column describes transducer output as mounted and wired in the test location. See Report Sign Convention sheet for description of data output as presented in the report: channels were adjusted in post-acquisition data processing to conform to customer sign convention.

Target Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: First Technologies/416

Seating position: Passenger

<u>Mnemonic</u>	<u>Location</u>	<u>Axis</u>	<u>Manufacturer</u>	<u>Model</u>	<u>S/N</u>	<u>Orientation¹</u> <u>(+ Sensing)</u>
HEDXG2	Head	X	Endevco	7264	AAKC3	Rearward
HEDYG2	Head	Y	Endevco	7264	J35560	Leftward
HEDZG2	Head	Z	Endevco	7264	AAMF2	Upward
NEKXF2	Neck	X	First Tech	IF-205	199-FX	Head forward
NEKYF2	Neck	Y	First Tech	IF-205	199-FY	Head leftward
NEKZF2	Neck	Z	First Tech	IF-205	199-FZ	Head upward (tension)
NEKXM2	Neck	X	First Tech	IF-205	199-MX	Right ear to right shoulder
NEKYM2	Neck	Y	First Tech	IF-205	199-MY	Chin to chest
NEKZM2	Neck	Z	First Tech	IF-205	199-MZ	Chin to left
CSTXG2	Chest	X	Entran	EGE-73BQE0	98H12-F07	Forward
CSTYG2	Chest	Y	Entran	EGE-73BQE0	98H12-F08	Leftward
CSTZG2	Chest	Z	Entran	EGE-73BQE0	98H12-F15	Upward
CSTXD2	Chest	X	Servo	14CB1-2897	416	Outward
PEVXG2	Pelvis	X	Endevco	7264	J34843	Rearward
PEVYG2	Pelvis	Y	Entran	EGE-73BQE0	98H12-F30	Leftward
PEVZG2	Pelvis	Z	Entran	EGE-73BQE0	98H12-F06	Upward
LFMF2	Left femur	Z	GSE	2430	717	Tension
RFMF2	Right femur	Z	GSE	2430	729	Tension

¹ This column describes transducer output as mounted and wired in the test location. See Report Sign Convention sheet for description of data output as presented in the report: channels were adjusted in post-acquisition data processing to conform to customer sign convention.

Target Vehicle Instrumentation Placement

Number	Location	Axis	Manufacturer	Model	S/N	Orientation ¹ (+ Sensing)
1	Left rear seat crossmember	X	Endevco	7264	J35077	Forward
		Y	Endevco	7264	J35076	Leftward
		Z	Endevco	7264	J31070	Upward
2	Right rear seat crossmember	X	Endevco	7264	CY62H	Forward
		Y	Endevco	7264	A56JJ	Leftward
		Z	Endevco	7264	EA52J	Upward
3	Engine top	X	Endevco	7264	J35794	Forward
4	Engine bottom	X	Endevco	7264	J35904	Forward
5	Vehicle center of gravity	X	Endevco	7264	J29990	Forward
		Y	Endevco	7264	J30479	Leftward
		Z	Endevco	7264	J27250	Upward
6	Instrument panel center	X	Endevco	7264	J35836	Forward
7	Rear Axle	X	Endevco	7264	J35782	Rearward
8	Vehicle rear center	Z	Endevco	7264	J35810	Upward

¹ This column describes transducer output as mounted and wired in the test location. See Report Sign Convention sheet for description of data output as presented in the report: channels were adjusted in post-acquisition data processing to conform to customer sign convention.

Moving Deformable Barrier Instrumentation Placement

Number	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
1	Vehicle center of gravity	X	Endevco	7264	J31064	Forward
		Y	Endevco	7264	J30380	Rightward
		Z	Endevco	7264	J32272	Upward
2	Vehicle left rear frame	X	Endevco	7264	J35049	Rearward
		Y	Endevco	7264	A20FJ	Leftward
3	Vehicle pitch	Y	Humphrey	RG28	H19	
4	Vehicle yaw	Z	Humphrey	RG28	H16	

¹ This column describes transducer output as mounted and wired in the test location. See Report Sign Convention sheet for description of data output as presented in the report: channels were adjusted in post-acquisition data processing to conform to customer sign convention.

Barrier Face Load Cell Placement

FRONT VIEW

A1	B1	C1	D1	E1	F1	G1	H1	I1	J1	K1
A2	B2	C2	D2	E2	F2	G2	H2	I2	J2	K2
A3	B3	C3	D3	E3	F3	G3	H3	I3	J3	K3
A4	B4	C4	D4	E4	F4	G4	H4	I4	J4	K4

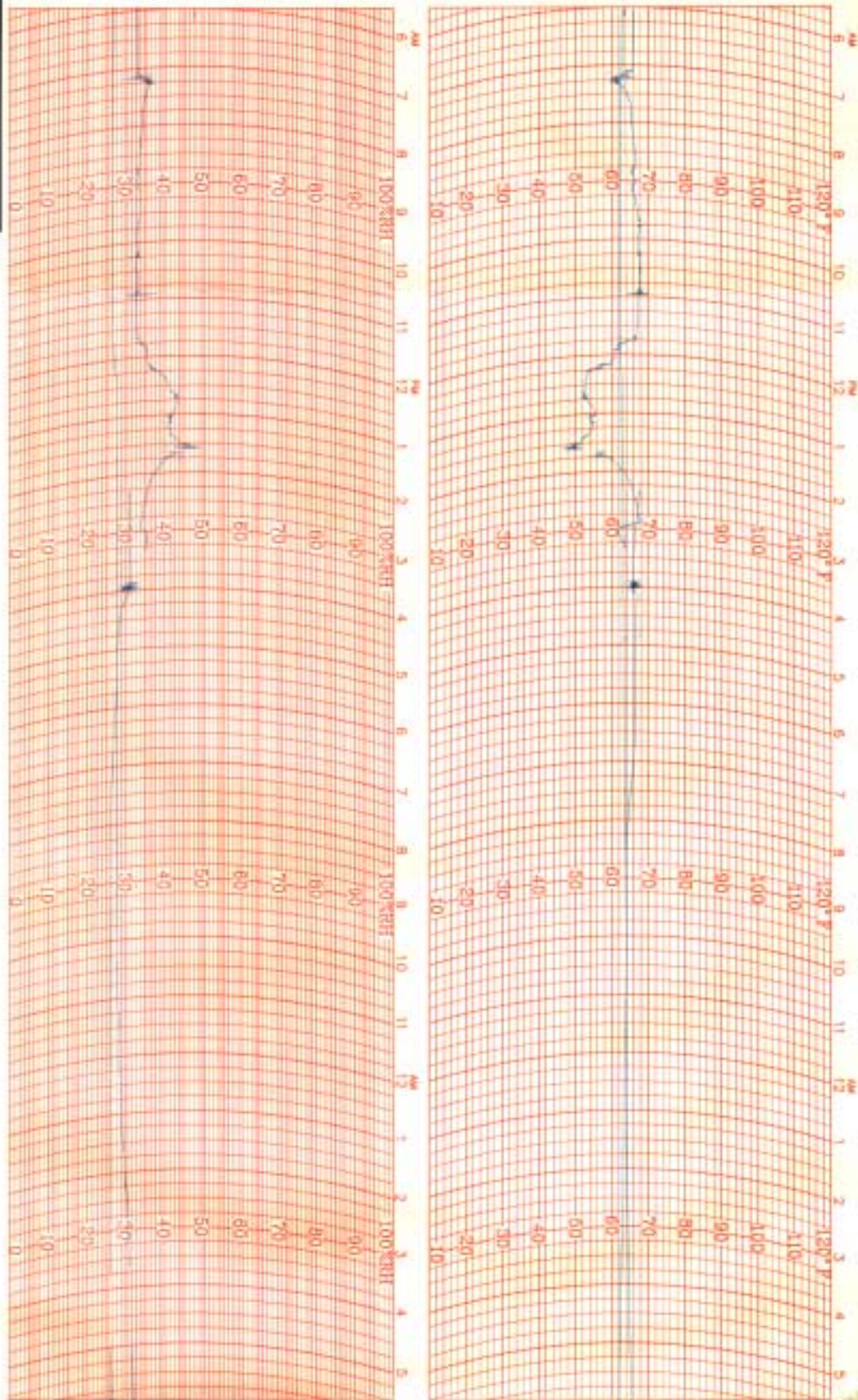
Track C/L

44 LOAD CELLS
4 ROWS
11 COLUMNS

Barrier Face Load Cell Description

Location	Cable Label	Manufacturer	Model	Orientation ¹ (+ Sensing)
All Barrier Face X-axis	-ZF	Key Transducers	6244-02	Rearward (compression)
All Barrier Face Y-axis	-XF	Key Transducers	6244-02	Right
All Barrier Face Z-axis	-YF	Key Transducers	6244-02	Up

¹ This column describes transducer output as mounted and wired in the test location. See Sign Convention sheet for description of data output as presented in the report.



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HYGROTHERMOGRAPH
1 DAY

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01-27-01

DATE OFF

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