V5414

Vehicle Research and Test Center

Moving 1997 Dodge Caravan into Moving 1996 Plymouth Neon at 35 mph

Centerline to Centerline

TRC Test Number 000623

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Final Report

Prepared for:

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Section 1.0

Purpose and Test Procedure

Purpose

This 56 kph centerline to centerline vehicle-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). This is a three series test mode. The vehicles represented are the Plymouth Neon and the Dodge Caravan. The purpose of this test was to determine the response of the subject vehicle hitting another vehicle at 56 kph centerline to centerline. The first two tests have a moving deformable barrier representing the opposite subject vehicle. This third of the series test had the Plymouth Neon and Dodge Caravan centerline to centerline.

Test Procedure

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

The target vehicle, a 1996 Plymouth Neon, was instrumented with seven (7) longitudinal axis accelerometers, three (3) lateral axis accelerometers, four (4) vertical axis accelerometers, and its specified impact velocity range was 55.5 to 57.1 km/h.

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

The bullet vehicle's centerline was aligned with the target vehicle's centerline. This test was a full frontal car to car moving test.

One (1) 50th percentile adult male Hybrid III dummy and one (1) 5th percentile adult female dummy were placed in both the bullet and target 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. Each dummy was restrained with a 3-point unibelt.

The one hundred (100) data channels were digitally sampled and recorded at 12,500 samples per second and processed per SAE J211 March 1995.

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

The vehicle data are summarized in Section 2.0 The FMVSS 208 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

Full Frontal Centerline to Centerline Impact Test Summary

Test Results Summary

This 56 kph full frontal centerline to centerline vehicle-to-vehicle impact test was conducted at TRC on June 23, 2000.

The target test vehicle, a 1996 Plymouth Neon, was equipped with a 4-cylinder, transverse engine, automatic transmission, power steering, and power brakes. The target vehicle's test weight was 1378.0 kg and its impact speed was 55.9 km/h. The bullet vehicle, a Dodge Caravan, was equipped with a V-6, transverse engine, automatic transmission, power steering, and power brakes. The bullet vehicle's test weight was 2059.5 kg and its impact speed was 56.5 kph. The target vehicle's maximum static crush was 620 millimeters. The bullet vehicle's maximum static crush was 588 millimeters.

The target vehicle driver dummy's Head Injury Criteria (HIC) was 778. The target vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 69.0 g. The target vehicle driver dummy's chest deflection was 39 mm. The target vehicle's driver dummy's left and right femur forces were 5299 N and 6717 N, respectively. The target vehicle's driver dummy's neck injury calculation were as follows: NTE, 0.90; NTF, 0.59; NCE, 1.20; NCF, 0.01.

The target vehicle right front passenger dummy's HIC was 601. The target vehicle right front passenger dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 55.9 g. The target vehicle right front passenger dummy's chest deflection was 35 mm. The target vehicle's right front passenger dummy's left and right femur forces were 4862 N and 3262 N, respectively. The target vehicle's fight front passenger dummy's neck injury calculations were as follows: NTE, 0.26; NTF, 1.11; NCE, 0.15; NCF, 1.03.

The bullet vehicle driver dummy's Head Injury Criteria (HIC) was 776. The bullet vehicle driver dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 44.6 g. The bullet vehicle driver dummy's chest deflection was 29 mm. The bullet vehicle's driver dummy's left and right femur forces were 2839 and 5596 N, respectively. The bullet vehicle driver dummy's neck injury calculations were as follows: NTE, 0.28; NTF, 0.74; NCE, 0.27; NCF, 0.19.

The bullet vehicle right front passenger dummy's HIC was 2340 (See Data Acquisition Explanations). The bullet vehicle right front passenger dummy's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 35.0 g. The bullet vehicle right front passenger dummy's chest deflection was 29 mm. The bullet vehicle's right front passenger dummy's left and right femur forces were 4771 and 3243 N, respectively. The bullet vehicle's right front passenger dummy's neck injury calculations were as follows: NTE, 0.99; NTF, 0.55; NCE, 0.48; NCF, 0.19.

Data Acquisition Explanations

The target vehicle's engine bottom X-axis acceleration data channel, ENGXGB, exceeded full scale and subsequently no valid data beyond that point, after approximately 55 milliseconds.

The bullet vehicle's right front passenger dummy's head X-axis acceleration data channel, HEDXG2, had random data spikes throughout the event. This affected the resultant and HIC calculations.

The bullet vehicle's right front passenger dummy's head Y-axis acceleration data channel, HEDYG2, did not return to zero after impact. This affected the resultant and the HIC calculations.

The bullet vehicle's right front passenger dummy's head Z-axis acceleration data channel, HEDZG2, had random data spikes throughout the event. This affected the resultant and HIC calculations.

The bullet vehicle's engine top X-axis acceleration data channel, ENGXG1, lost data after approximately 37 milliseconds.

Table 1 Crash Test Summary

Test type:	Full Front Centerline to Centerline	
Test date:	6/23/00	
Test time:	1325	
Ambient temperature:	26° C	
Target vehicle:	1996 Plymouth Neon	
Target vehicle test weight:	1378.0 kg	
Bullet vehicle:	1997 Dodge Caravan	
Bullet vehicle test weight:	2059.5 kg	
Impact angle:[1]	0°	
Impact velocity:[2]	Target vehicle = 55.9 kph Bullet vehicle = 56.5 kph	
Target vehicle's maximum static crush:	620 mm	
Bullet vehicle's maximum static crush:	588 mm	
Target vehicle dummies:	Driver #090	Passenger #329
Type:	Hybrid III (50% male)	Hybrid III (5% female)
Location:	Left front	Right front
Restraint:	3-point unibelt/airbag	3-point unibelt/airbag
Total number of data channels:	20	20
Number of cameras:		
High-speed	14	
Real-time	1	

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

Table 1 Crash Test Summary, Cont'd

Bullet vehicle dummies:	Driver #045	Passenger #416
Type:	Hybrid III (50% male)	Hybrid III (5% female)
Location:	Left front	Right front
Restraint:	3-point unibelt/airbag	3-point unibelt/airbag
Total number of data channels:	20	20
Number of cameras:		
High-speed	14	
Real-time	1	

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

Table 2 Target Test Vehicle Information

Vehicle manufacturer:	Daimler Chrysler
Make/model:	Plymouth/ Neon
VIN:	1P3ES27C7TD717889
Model year:	1996
Body style:	4-door
Color:	White
Engine data:	
Type:	Transverse
Cylinders:	4
Displacement:	2.0 Liters
Transmission data:	_3_ Speed, __Manual, _X_ Automatic, _X_ FWD, __RWD, __4WD
Date vehicle received:	5/2/00
Odometer reading:	57,138
Dealer's name and address:	N/A

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	No
Power seats	No	Tilting steering wheel	No
Power windows	No	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by:		Daimler Chrysler
Date of manufacture:		06/96
VIN:		1P3ES27C7TD717889
GVWR:		3449 lbs.
GAWR:	Front:	1931 lbs.
	Rear:	1593 lbs.

Table 2 Target Test Vehicle Information, Cont'd.

Tires on vehicle (mfr., line, size):	P185/65R14	
Tire pressure with maximum capacity vehicle load:	Front: Rear:	44 psi 55 psi
Spare tire (mfr., line, size):	N/A	
Type of seats:	Front: Rear:	Bucket Bench
Type of front seat backs:	Manually adjustable	
Maximum width:	1710 mm	
Wheelbase:	2645 mm	

Location of "Recommended Tire Pressure" label:

The label was located on the driver door.

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

Recommended tire size:	P165/80R13	
Recommended cold tire pressure:	Front: Rear:	32 psi 32 psi
Seating capacity:	Front: Rear: Total:	2 3 5
Vehicle capacity weight:	N/A	

Test vehicle attitude:

Delivered attitude:	LF	641 mm;	RF	637 mm;	LR	674 mm;	RR	663 mm
Pre-test attitude:	LF	624 mm;	RF	631 mm;	LR	616 mm;	RR	621 mm
Post-test attitude:	LF	646 mm;	RF	658 mm;	LR	621 mm;	RR	615 mm

Table 2 Target Test Vehicle Information, Cont'd.

Delivered Weight:

Right Front:	367.0	kg	Right Rear:	198.2	kg
Left Front:	373.8	kg	Left Rear:	203.7	kg
Total Front Weight:	740.8	kg	(64.8% of total vehicle weight)		
Total Rear Weight:	401.9	kg	(35.2% of total vehicle weight)		
Total Delivered Weight:	1142.7	kg			

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight (82.1 kg)

UDW = Unloaded delivered weight (1142.7 kg)

VCW = Vehicle capacity weight (422.3 kg)

DSC = Designated seating capacity (5)

Target test weight = UDW + RCLW + (No. of Hybrid III dummies x 75.8 kg + No. of Hybrid III dummies x 47.6 kg)

Target test weight = 1142.7 + 82.1 kg + 75.8 kg + 47.6 kg

Calculated target test weight = 1348.2 kg

Customer requested target test weight = 1377.6 kg

Weight of test vehicle with required dummies and 82.1 kg cargo weight:

Right front	381.0	kg	Right rear	293.5	kg
Left front	420.0	kg	Left rear	283.5	kg
Total front weight	801.0	kg	(58.1% of total vehicle weight)		
Total rear weight	577.0	kg	(41.9% of total vehicle weight)		
Total test weight	1378.0	kg			

Weight of ballast secured in tank area: 2 gallons of water

Components removed to meet target test weight: all stoddard

CG rearward of front wheel centerline: 1108 mm

Table 3 Bullet Test Vehicle Information

Vehicle manufacturer:	Chrysler Canada Ltd.
Make/model:	Dodge/Caravan
VIN:	1B4GP54L9VB465297
Model year:	1997
Body style:	Van
Color:	Silver
Engine data:	
Type:	Transverse
Cylinders:	V6
Displacement:	3.8 liters
Transmission data:	_3_ Speed, _ Manual, _X_ Automatic, _X_ FWD, __ RWD, __ 4WD
Date vehicle received:	5/2/00
Odometer reading:	17,233
Dealer's name and address:	N/A

Accessories:

Power steering	Yes	Automatic transmission	Yes
Power brakes	Yes	Automatic speed control	Yes
Power seats	Yes	Tilting steering wheel	Yes
Power windows	Yes	Telescoping steering wheel	No
Tinted glass	Yes	Air conditioning	Yes
Radio	Yes	Anti-skid brake	Yes
Clock	Yes	Rear window defroster	Yes
Other	None		

Certification data from vehicle's label:

Vehicle manufactured by:		Chrysler Canada Ltd.
Date of manufacture:		06/97
VIN:		1B4GP54L9VB465297
GVWR:		5350 lbs.
GAWR:	Front:	2746 lbs.
	Rear:	2746 lbs.

Table 3 Bullet Test Vehicle Information, Cont'd.

Tires on vehicle (mfr., line, size):	P215/65R16
Tire pressure with maximum capacity vehicle load:	Front: 44 psi Rear: 44 psi
Spare tire (mfr., line, size):	Goodyear/convenience spare tire/T145/90/D16
Type of seats:	Front: Bucket Middle: Bucket Rear: Bench
Type of front seat backs:	Manually adjustable
Maximum width:	1952 mm
Wheelbase:	3035 mm

Location of "Recommended Tire Pressure" label:

The label was located on the driver door.

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

Recommended tire size:	P215/65R16
Recommended cold tire pressure:	Front: 35 psi Rear: 35 psi
Seating capacity:	Front: 2 Middle: 2 Rear: 3 Total: 7
Vehicle capacity weight:	N/A

Test vehicle attitude:

Delivered attitude:	LF	746 mm;	RF	757 mm;	LR	764 mm;	RR 771 mm
Pre-test attitude:	LF	747 mm;	RF	741 mm;	LR	742 mm;	RR 734 mm
Post-test attitude:	LF	764 mm;	RF	800 mm;	LR	740 mm;	RR 760 mm

Table 3 Bullet Test Vehicle Information, Cont'd.

Delivered Weight:

Right Front:	521.0	kg	Right Rear:	397.0	kg
Left Front:	557.0	kg	Left Rear:	408.0	kg
Total Front Weight:	1078.0	kg	(57.2% of total vehicle weight)		
Total Rear Weight:	805.0	kg	(42.8% of total vehicle weight)		
Total Delivered Weight:	1883.0	kg			

Calculation of test vehicle's target test weight:

RCLW = Rated cargo and luggage weight (67.4 kg)

UDW = Unloaded delivered weight (1883.0 kg)

VCW = Vehicle capacity weight (543.7 kg)

DSC = Designated seating capacity (7)

Target test weight = UDW + RCLW + (No. of Hybrid III dummies x 75.8 kg + No. of Hybrid III dummies x 47.6 kg)

Target test weight = 1883.0 + 67.4 kg + 75.8 kg + 47.6 kg

Target test weight = 2073.8 kg

Weight of test vehicle with required dummies and 67.4 kg cargo weight:

Right front	547.5	kg	Right rear	460.0	kg
Left front	587.5	kg	Left rear	464.5	kg
Total front weight	1135.0	kg	(55.1% of total vehicle weight)		
Total rear weight	924.5	kg	(44.9% of total vehicle weight)		
Total test weight	2059.5	kg			

Weight of ballast secured in tank area: none

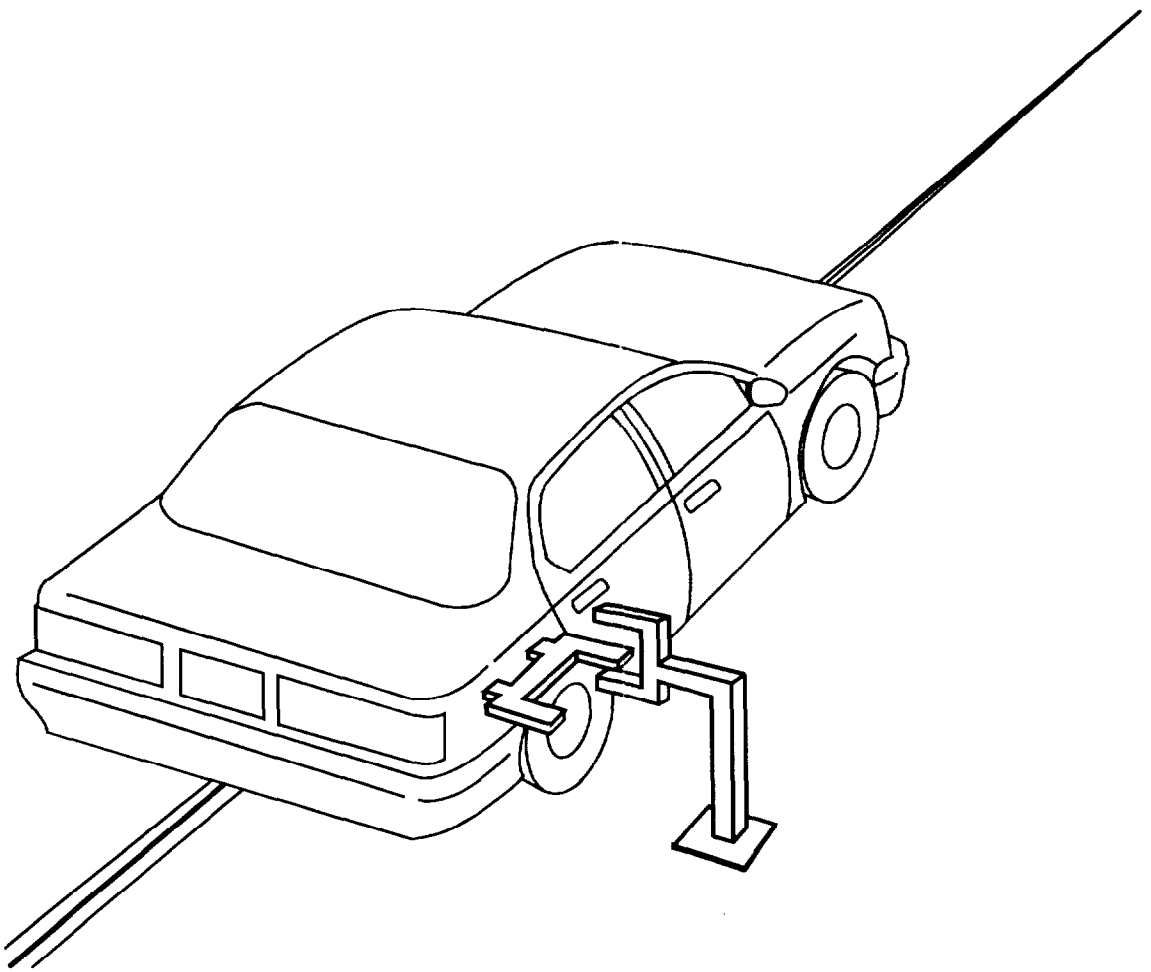
Components removed to meet target test weight: Spare tire and stoddard

CG rearward of front wheel centerline: 1362 mm

Table 4 Post-Impact Data

Test number:	000623
Date of test:	6/23/00
Time of test:	1325
Type of test:	Full Front Centerline to Centerline
Impact angle:	0°
Ambient temperature at impact area:	26° C
Impact velocity:	
Target vehicle:	55.9 kph
Bullet vehicle:	56.5 kph
	(Specified range = 55.5 to 57.1 kph)
Distance from vehicle to vehicle:	
Entering trap	610 mm
Exiting trap	51 mm

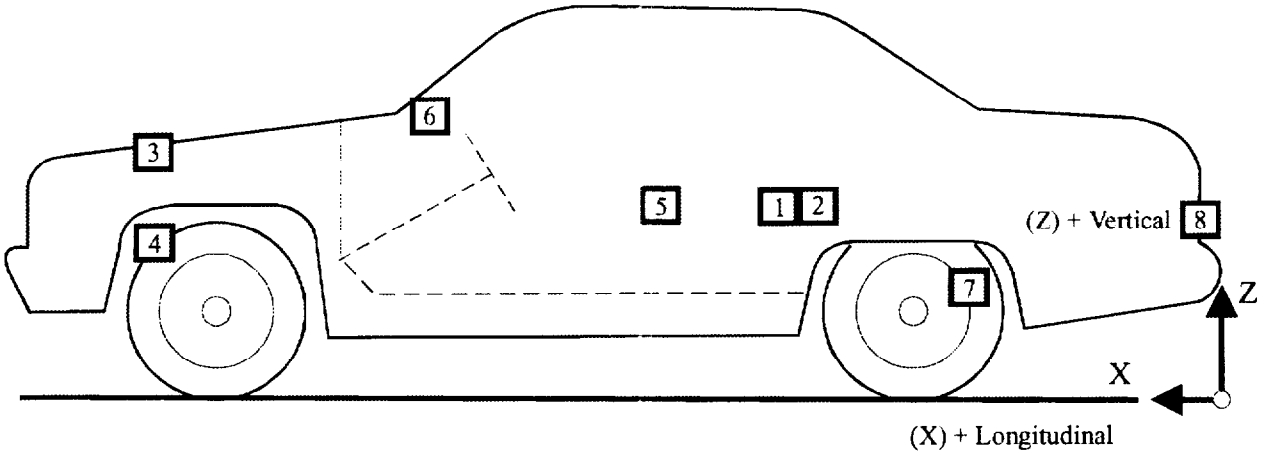
Figure 1 Impact Velocity Measurement System



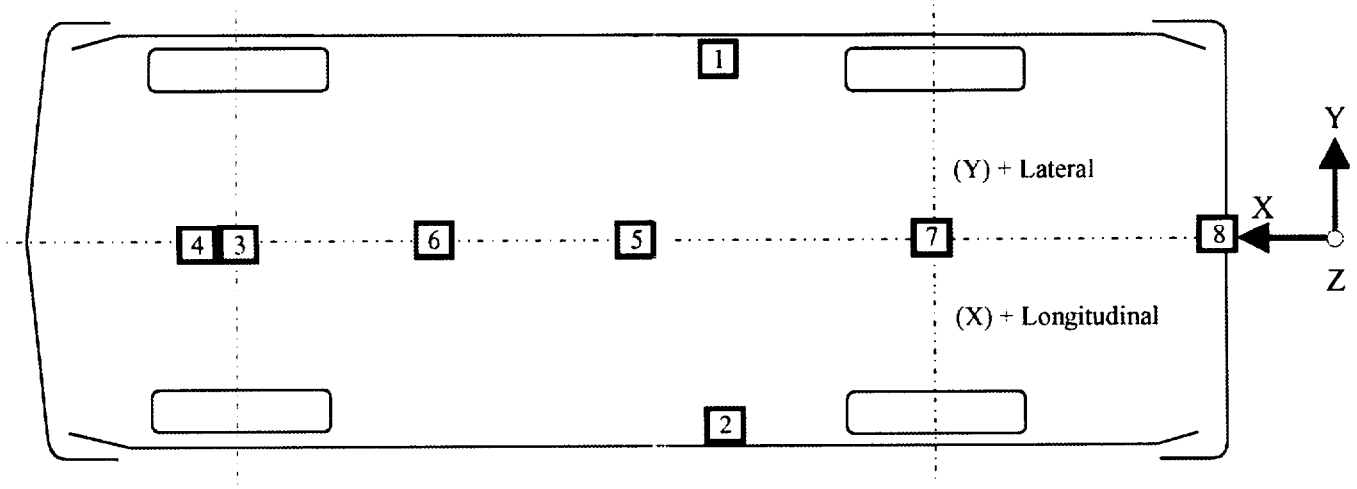
The final vane clears the final emitter/receiver pair 51 millimeters before impact.

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: 000623 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 LEFT REAR SEAT	NA	NA	NA				
LONGITUDINAL				5.5 g	@ 132.5 ms	41.0 g	@ 47.2 ms
LATERAL				11.2 g	@ 71.6 ms	4.8 g	@ 48.1 ms
VERTICAL				14.5 g	@ 51.6 ms	17.1 g	@ 47.5 ms
RESULTANT				44.6 g	@ 47.4 ms		
2 RIGHT REAR SEAT	NA	NA	NA				
LONGITUDINAL				3.5 g	@ 128.0 ms	52.3 g	@ 70.4 ms
LATERAL				12.6 g	@ 67.8 ms	10.1 g	@ 54.8 ms
VERTICAL				22.5 g	@ 60.2 ms	35.4 g	@ 66.6 ms
RESULTANT				53.8 g	@ 70.7 ms		
3 ENGINE TOP	NA	NA	NA				
LONGITUDINAL				30.9 g	@ 47.7 ms	186.2 g	@ 31.4 ms
4 ENGINE BOTTOM	NA	NA	NA				
LONGITUDINAL[1]				---	---	---	---
5 VEHICLE CENTER OF GRAVITY	NA	NA	NA				
LONGITUDINAL				3.4 g	@ 149.9 ms	56.2 g	@ 47.0 ms
LATERAL				26.5 g	@ 62.2 ms	26.0 g	@ 52.6 ms
VERTICAL				41.4 g	@ 19.3 ms	23.5 g	@ 63.4 ms
RESULTANT				62.5 g	@ 62.9 ms		

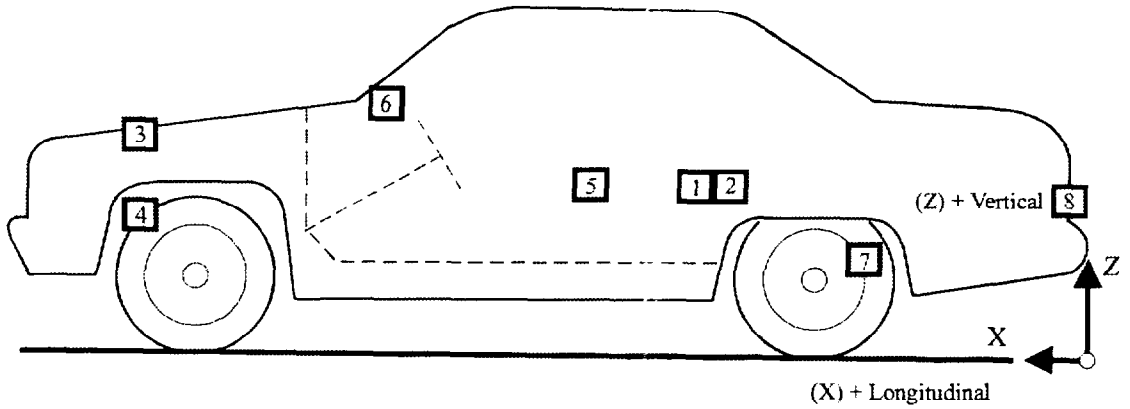
Table 5 Target Vehicle Accelerometer Locations and Data Summary, Cont'd.

TEST NUMBER: 000623 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
6 INSTRUMENT PANEL CENTER LONGITUDINAL	NA	NA	NA	52.2 g	@ 27.7 ms	149.0 g	@ 59.0 ms
7 REAR AXLE LONGITUDINAL	NA	NA	NA	3.9 g	@ 128.2 ms	37.3 g	@ 50.4 ms
8 REAR VEHICLE CENTERLINE VERTICAL	NA	NA	NA	11.0 g	@ 23.2 ms	13.0 g	@ 35.2 ms

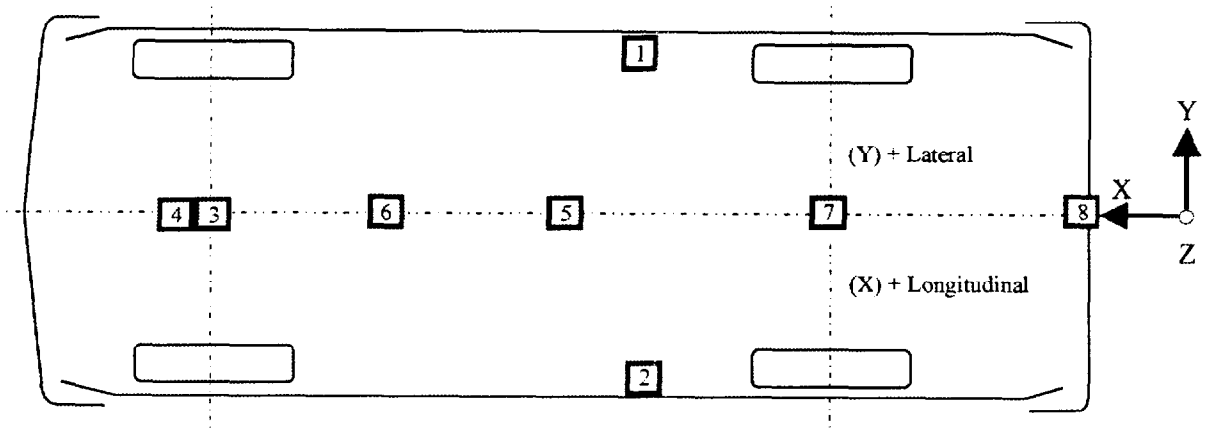
REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + LEFTWARD FROM VEHICLE CENTERLINE
Z: + UPWARD FROM GROUND LEVEL

[1]See DATA ACQUISITION EXPLANATIONS

Figure 3 Bullet Vehicle Accelerometer Placement



Side View



Bottom View

Table 6 Bullet Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 000623 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
1 LEFT REAR SEAT	NA	NA	NA				
LONGITUDINAL				0.8 g	@ 180.5 ms	28.6 g	@ 36.4 ms
LATERAL				2.6 g	@ 23.8 ms	3.4 g	@ 39.0 ms
VERTICAL				5.8 g	@ 64.6 ms	11.3 g	@ 49.3 ms
RESULTANT				28.7 g	@ 36.4 ms		
2 RIGHT REAR SEAT	NA	NA	NA				
LONGITUDINAL				1.2 g	@ 181.7 ms	25.9 g	@ 66.1 ms
LATERAL				5.1 g	@ 55.0 ms	3.5 g	@ 43.1 ms
VERTICAL				4.3 g	@ 34.1 ms	9.1 g	@ 43.3 ms
RESULTANT				27.0 g	@ 66.1 ms		
3 ENGINE TOP	NA	NA	NA				
LONGITUDINAL[1]				---	---	---	---
4 ENGINE BOTTOM	NA	NA	NA				
LONGITUDINAL				12.8 g	@ 41.5 ms	100.8 g	@ 30.3 ms
5 VEHICLE CENTER OF GRAVITY	NA	NA	NA				
LONGITUDINAL				1.0 g	@ 180.0 ms	26.4 g	@ 50.5 ms
LATERAL				5.7 g	@ 84.4 ms	9.2 g	@ 41.9 ms
VERTICAL				45.0 g	@ 43.3 ms	35.4 g	@ 59.2 ms
RESULTANT				50.2 g	@ 43.3 ms		

Table 6 Bullet Vehicle Accelerometer Locations and Data Summary, Cont'd

TEST NUMBER: 000623 No. LOCATION	X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
6 INSTRUMENT PANEL CENTER LONGITUDINAL	NA	NA	NA	18.5 g	@ 50.7 ms	65.1 g	@ 60.2 ms
7 REAR AXLE LONGITUDINAL	NA	NA	NA	1.2 g	@ 178.6 ms	27.3 g	@ 36.2 ms
8 REAR VEHICLE CENTERLINE VERTICAL	NA	NA	NA	10.7 g	@ 30.5 ms	11.0 g	@ 38.2 ms

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

[1]See DATA ACQUISITION EXPLANATIONS

Section 3.0

Summary of FMVSS 208 Data

Table 7 Target Vehicle Dummy Injury Criteria

Maximum Acceleration

	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	-62.1 g	-22.0 g	54.7 g	70.6 g	-70.1 g	-11.8 g	21.1 g
Passenger	-64.8 g	14.5 g	25.2 g	69.1 g	-57.0 g	23.7 g	-23.7 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	5299 N	6717 N
Passenger	4862 N	3262 N

Head Injury Criteria[1]

	HIC	Time t_1	Time t_2
Driver	778	56.4 ms	88.0 ms
Passenger	601	48.8 ms	81.0 ms

Chest Maximum Resultant Acceleration[2]

	Acceleration	Time t_1	Time t_2
Driver	69.0 g	73.0 ms	76.1 ms
Passenger	55.9 g	53.0 ms	56.1 ms

Maximum Chest Deflection

Driver	39 mm
Passenger	35 mm

Table 7 Target Vehicle Dummy Injury Criteria Cont'd

Neck Injury Calculations (Nij)

	NTF	NTE	NCF	NCE
Driver	0.59	0.90	0.01	1.20
Passenger	1.11	0.26	1.03	0.15

[1] As defined in FMVSS No. 208

[2] Defined as equal to or exceeding 0.003 sec. Duration

Table 8 Target Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	Driver	Passenger
Head	Airbag/headrest	Airbag/headrest
Chest	Airbag	Airbag
Abdomen	Steering wheel rim	Airbag
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door opening:

	Left	Right
Front	Difficult	Difficult
Rear	Easy	Easy

Seat movement:

	Seat back failure	Seat shift
Front	None	None
Rear	None	None

Glazing damage: The entire windshield was cracked.

Other notable impact effects: None

Table 9 Bullet Vehicle Dummy Injury Criteria

Maximum Acceleration

	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	-76.3 g	4.3 g	-12.2 g	76.4 g	-44.7 g	-5.0 g	-15.8 g
Passenger	-386.8[3]g	-26.4[3]g	-202.1[3]g	387.2[3]g	-45.1 g	4.1 g	-20.7 g

Maximum Femur Compressive Force

	Left Femur	Right Femur
Driver	2839 N	5596 N
Passenger	4771 N	3243 N

Head Injury Criteria[1]

	HIC	Time t_1	Time t_2
Driver	776	64.5 ms	90.6 ms
Passenger[3]	2340	59.4 ms	61.1 ms

Chest Maximum Resultant Acceleration[2]

	Acceleration	Time t_1	Time t_2
Driver	44.6 g	72.0 ms	75.0 ms
Passenger	35.0 g	66.0 ms	69.0 ms

Maximum Chest Deflection

Driver	29 mm
Passenger	29 mm

Table 9 Bullet Vehicle Dummy Injury Criteria Cont'd

Neck Injury Calculations (Nij)

	NTF	NTE	NCF	NCE
Driver	0.74	0.28	0.19	0.27
Passenger	0.55	0.99	0.19	0.48

[1] As defined in FMVSS No. 208
[2] Defined as equal to or exceeding 0.003 sec. Duration
[3] See Data Acquisition Explanations

Table 10 Bullet Vehicle Post-Impact Dummy/Vehicle Data

Visible Dummy Contact Points:

	Driver	Passenger
Head	Airbag/headrest	Airbag/headrest
Chest	Airbag	Airbag
Abdomen	Steering wheel rim	Airbag
Left knee	Instrument panel	Instrument panel
Right knee	Instrument panel	Instrument panel

Door opening:

	Left	Right
Front	Easy	Easy
Rear	Easy	Easy

Seat movement:

	Seat back failure	Seat shift
Front	None	None
Rear	None	None

Glazing damage: Slight windshield cracking on passenger side.

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. The dummy's head and chest impacted the airbag. The dummy rebounded low into the seat back. 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. The dummy's head and chest impacted the airbag. The dummy's torso lifted rearward as the dummy rebounded into the seat back. The passenger dummy came to rest seated leaning slightly forward in the passenger's seat.

Figure 4 Target Vehicle Dummy Measurement Locations for Front Seat Occupants

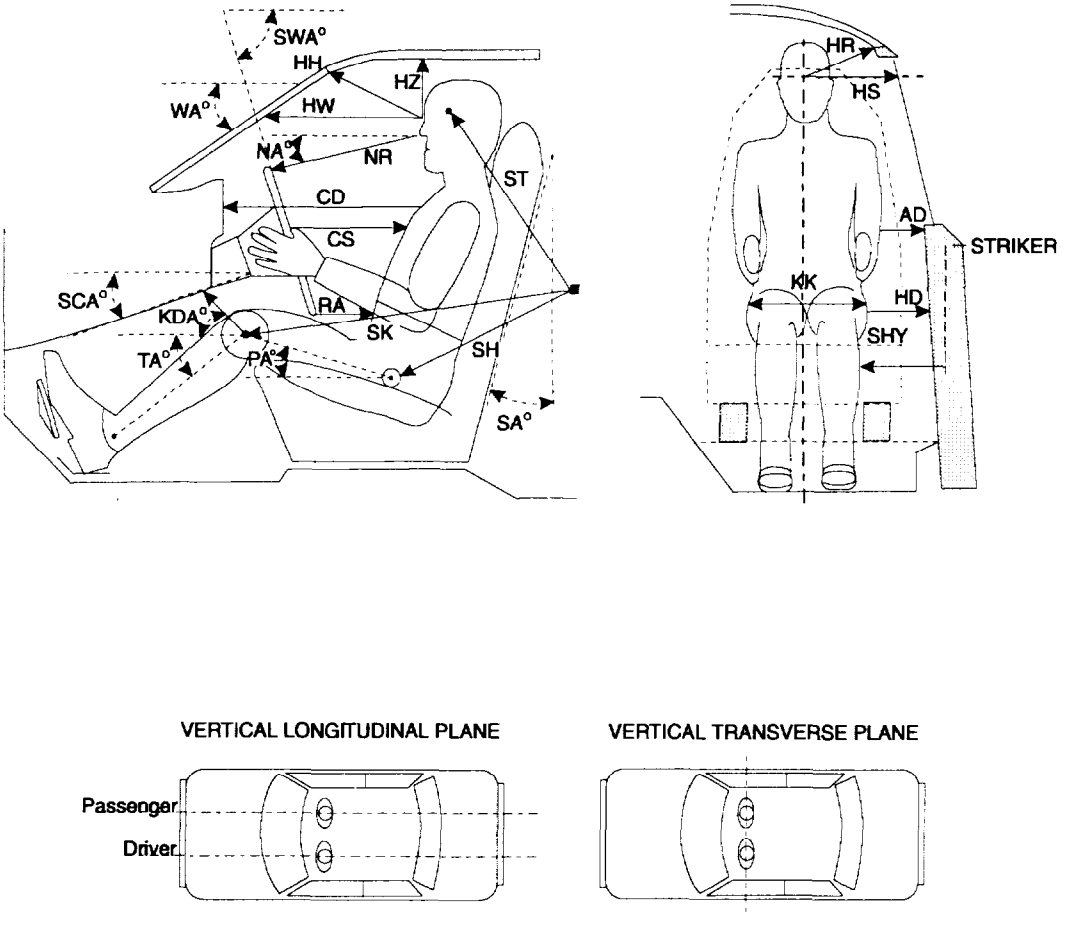


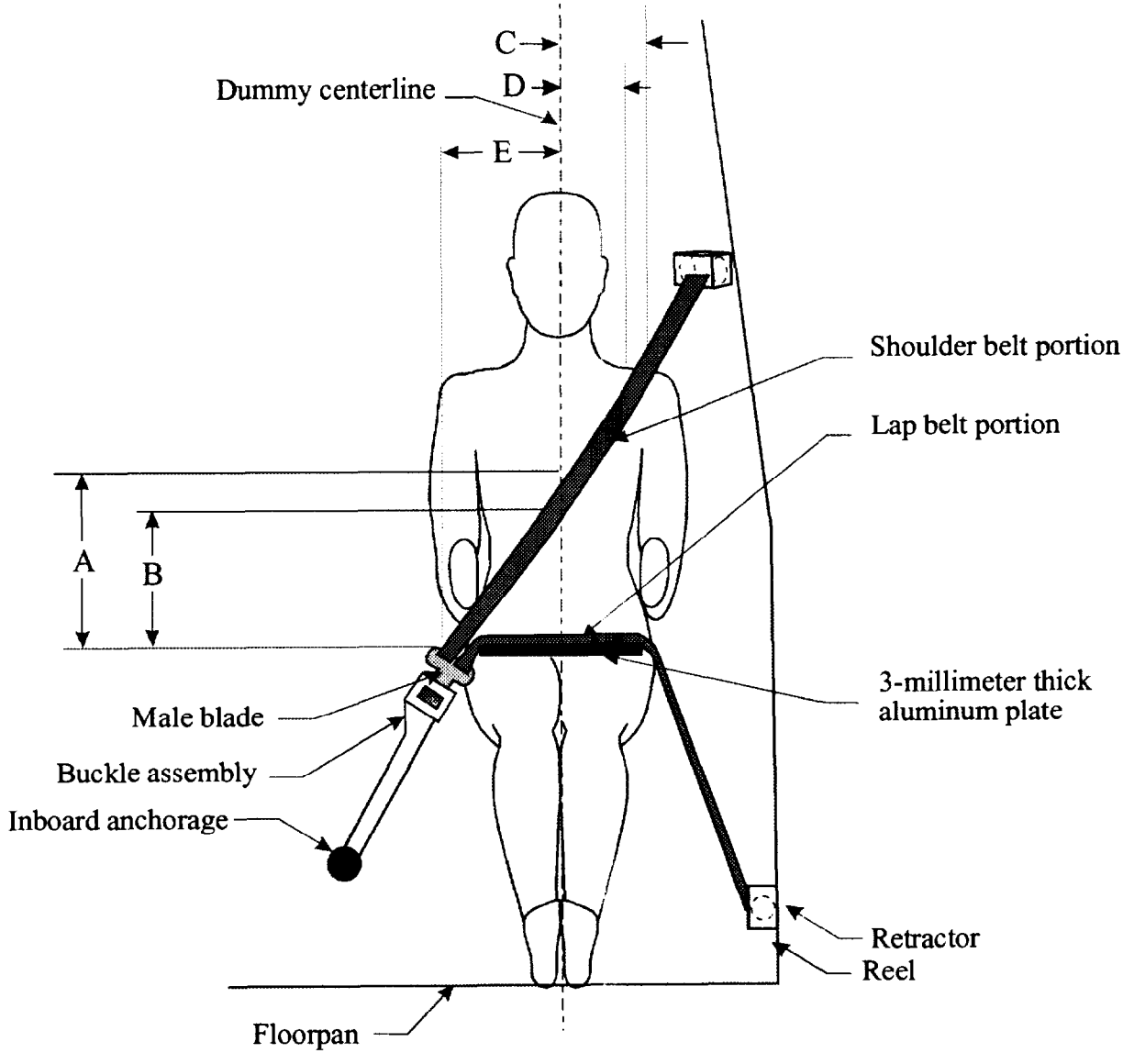
Table 11 Target Vehicle Dummy Measurement Data for Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #090)	Passenger (Serial #329)
WA	Windshield angle	28°	28°
SWA	Steering wheel angle	19°	NA
SCA	Steering column angle	71°	NA
SA	Seat back angle	21°	10°
HZ[2]	Head to roof	225 mm	221 mm
HH	Head to header	323 mm	275 mm
HW	Head to windshield	575 mm	556 mm
HR	Head to side header	236 mm	252 mm
NR	Nose to rim	350 mm	NA
NA	Nose to rim angle	11°	NA
CD	Chest to dash	537 mm	356 mm
CS	Steering wheel to chest	305 mm	NA
RA	Rim to abdomen	170 mm	NA
KDL	Left knee to dash	160 mm	101 mm
KDR	Right knee to dash	125 mm	100 mm
KDA	Outboard knee to dash angle	23°	50°
PA	Pelvic angle	25°	20°
TA	Tibial angle	40°	56°
KK	Knee to knee	310 mm	230 mm
ST[1]	Striker to head	545 mm	488 mm
	Striker to head angle	-76°	-71°
SK	Striker to knee	555 mm	635 mm
	Striker to knee angle	-3°	-1°
SH	Striker to H-point	228 mm	334 mm
	Striker to H-point angle	36°	14°
SHY	Striker to H-point (Y dir.)	245 mm	256 mm
HS	Head to side window	233 mm	333 mm
HD	H-point to door	117 mm	140 mm
AD	Arm to door	85 mm	129 mm

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

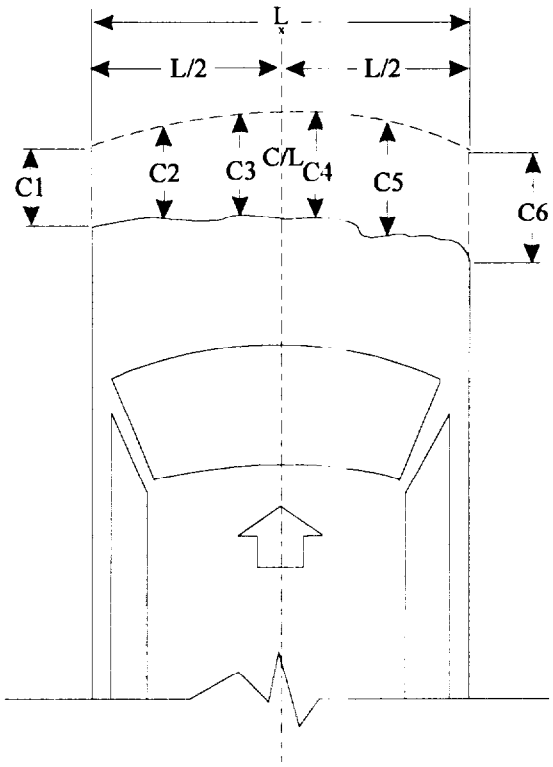
[1] A negative angle indicates the measurement point was above the striker.
[2] Passenger's measurement was taken to the visor.

Figure 5 Target Vehicle Seat Belt Positioning Data



		Driver Dummy	Passenger Dummy
A.	Top surface of aluminum plate to belt upper edge	305 mm	223 mm
B.	Top surface of aluminum plate to belt lower edge	220 mm	150 mm
C.	Dummy centerline to outer edge of belt at chest flesh top	133 mm	168 mm
D.	Dummy centerline to inner edge of belt at chest flesh top	80 mm	114 mm
E.	Dummy centerline to intersection of upper torso belt and lap belt	255 mm	210 mm

Figure 6 Target Vehicle Crush with Bumper

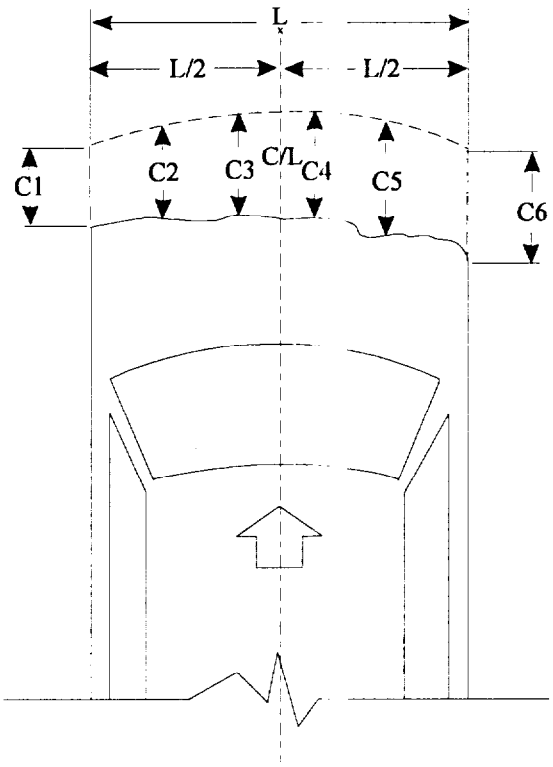


NOTES: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 1996 Plymouth Neon

	Pre-test	Post-test	Crush
L	1220 mm		
C1	4293 mm	3845 mm	448 mm
C2	4374 mm	3877 mm	497 mm
C3	4395 mm	3884 mm	511 mm
C4	4400 mm	3874 mm	526 mm
C5	4384 mm	3856 mm	528 mm
C6	4305 mm	3793 mm	512 mm
CL	4400 mm	3882 mm	518 mm

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: 1996 Plymouth Neon

	Pre-test	Post-test	Crush
L	1220 mm		
C1	4263 mm	N/A	N/A
C2	4314 mm	3749 mm	565 mm
C3	4315 mm	3768 mm	547 mm
C4	4320 mm	3755 mm	565 mm
C5	4324 mm	3704 mm	620 mm
C6	4275 mm	N/A	N/A
CL	4320 mm	3739 mm	581 mm

Measurements were taken from the bumper beam.

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

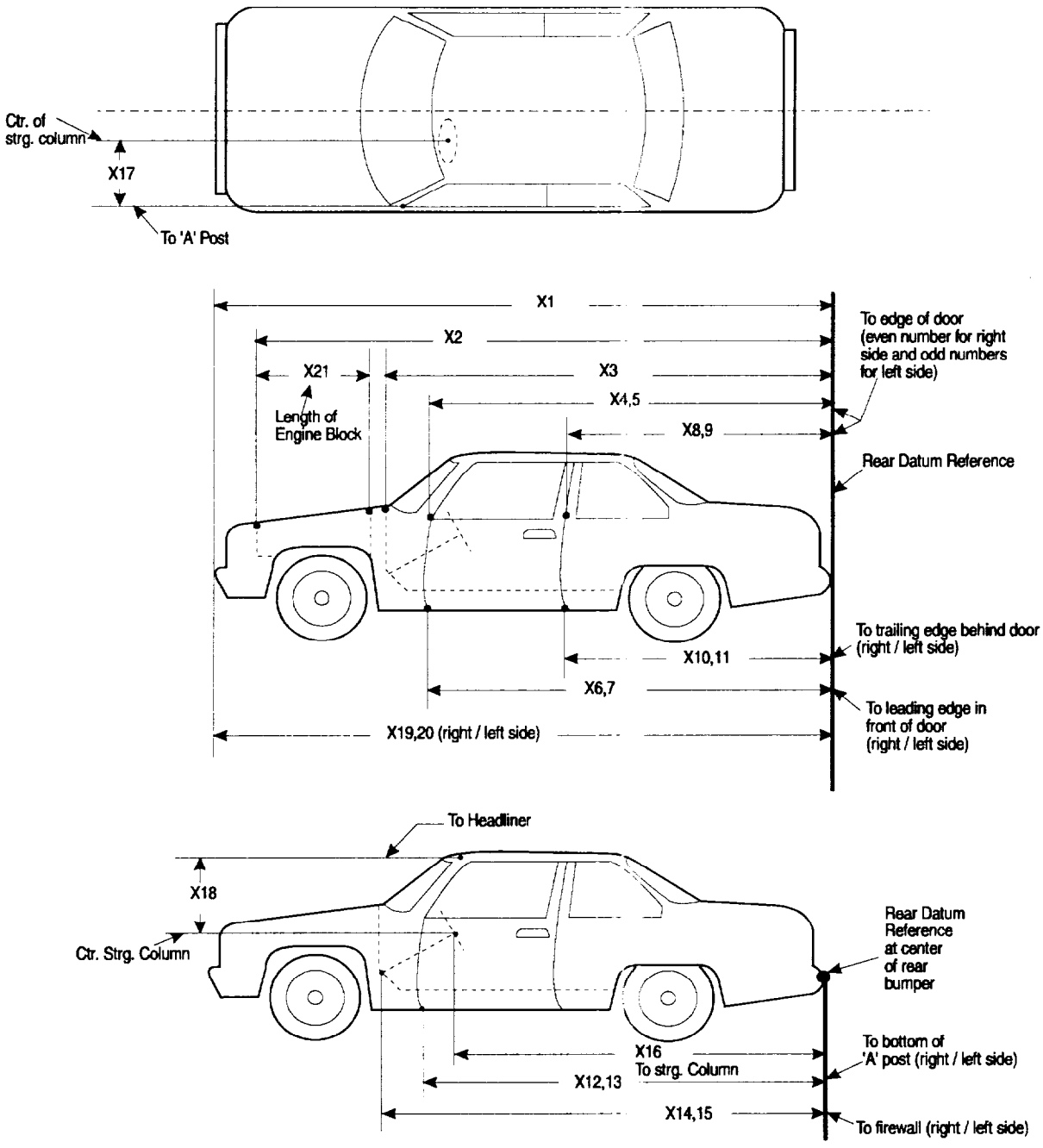


Table 12 Target Vehicle Measurements

Vehicle Make/Model: Plymouth Neon

Test Number: 000623

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	4400 mm	3882 mm	518 mm
X2	Rear surface of vehicle to front of engine block	3970 mm	3668 mm	302 mm
X3	Rear surface of vehicle to firewall	3500 mm	3195 mm	305 mm
X4	Rear surface of vehicle to upper leading edge of right door	3024 mm	2992 mm	32 mm
X5	Rear surface of vehicle to upper leading edge of left door	3030 mm	3006 mm	24 mm
X6	Rear surface of vehicle to lower leading edge of right door	3078 mm	3013 mm	65 mm
X7	Rear surface of vehicle to lower leading edge of left door	3076 mm	3021 mm	55 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2070 mm	2027 mm	43 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2059 mm	2008 mm	51 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2062 mm	2049 mm	13 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2062 mm	2055 mm	7 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3060 mm	2942 mm	118 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3060 mm	2985 mm	75 mm
X14	Rear surface of vehicle to firewall - right side	3355 mm	3200 mm	155 mm
X15	Rear surface of vehicle to firewall - left side	3353 mm	3260 mm	93 mm
X16	Rear surface of vehicle to steering wheel center	2626 mm	2520 mm	106 mm
X17	Center of steering column to "A" post	280 mm	260 mm	20 mm
X18	Center of steering column to headliner	444 mm	525 mm	-81 mm
X19	Rear surface of vehicle to right side of front bumper	4305 mm	3793 mm	512 mm
X20	Rear surface of vehicle to left side of front bumper	4293 mm	3845 mm	448 mm
X21	Length of engine block	460 mm	460 mm	0 mm

Table 13 Target Vehicle Toe Pan Intrusion Measurements

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

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	1385	590	219	1325	590	160	60	0	59
Point 2	1465	590	339	1337	590	325	128	0	14
Point 3	1380	190	219	1292	190	160	88	0	59
Point 4	1505	200	309	1342	200	280	163	0	29
Point 5	1485	380	284	1298	380	260	187	0	24

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	1330	-190	200	1242	-190	188	88	0	12
Point 2	1508	-218	320	1335	-218	358	173	0	-38
Point 3	1350	-370	200	1271	-370	163	79	0	37
Point 4	1440	-560	350	1305	-560	323	135	0	27
Point 5	1435	-562	245	1233	-562	218	202	0	27

+X: Forward of reference point behind the driver and passenger seats.
+Y: Left from vehicle longitudinal centerline.
+Z: Up from ground.

Bullet Vehicle Dummy Kinematic Summary

Driver Dummy

Upon impact, the driver dummy translated forward on the seat impacting both knees into the instrument panel. The dummy's head and chest impacted the airbag. The dummy's head and upper torso rotated rearward as the dummy rebounded into the seat back. The driver dummy's abdomen impacted the steering wheel rim. 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. The dummy's head and chest impacted the airbag. The dummy's torso lifted rearward as the dummy rebounded into the seat back. The passenger dummy came to rest seated leaning slightly forward in the passenger's seat.

Figure 9 Bullet Vehicle Dummy Measurement Locations for Front Seat Occupants

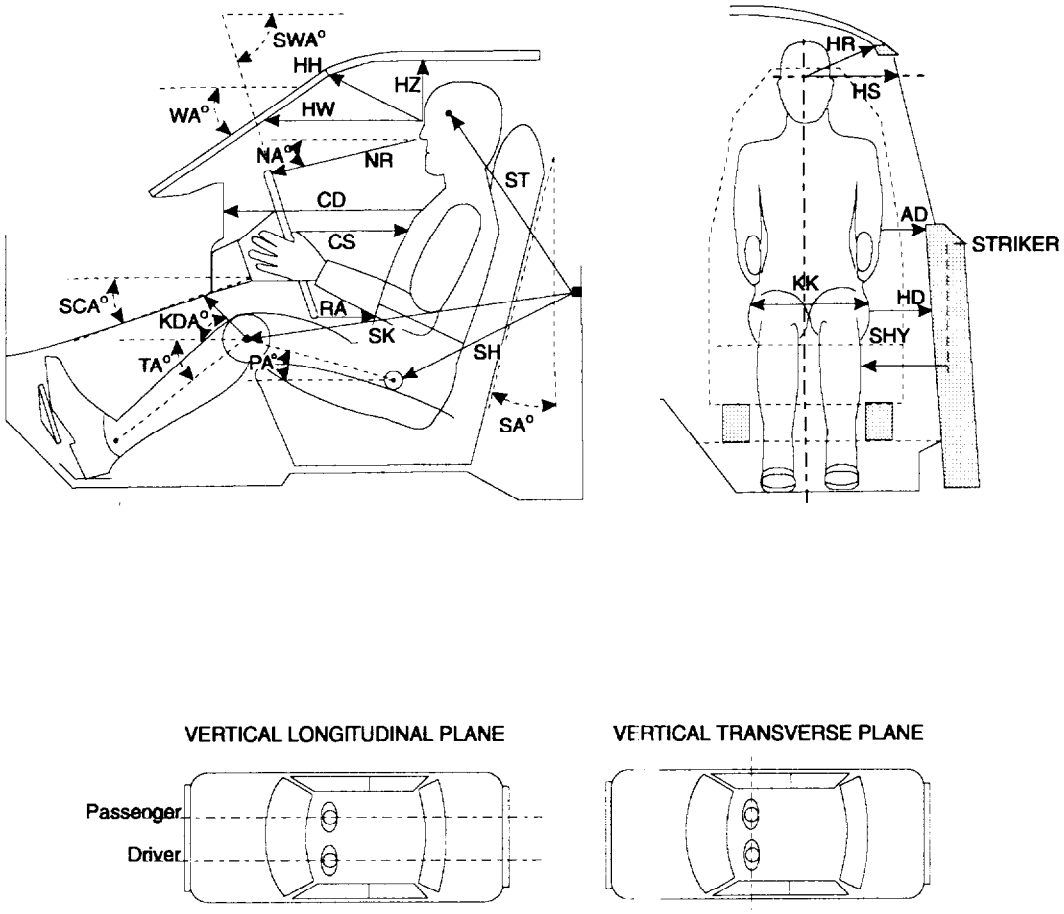


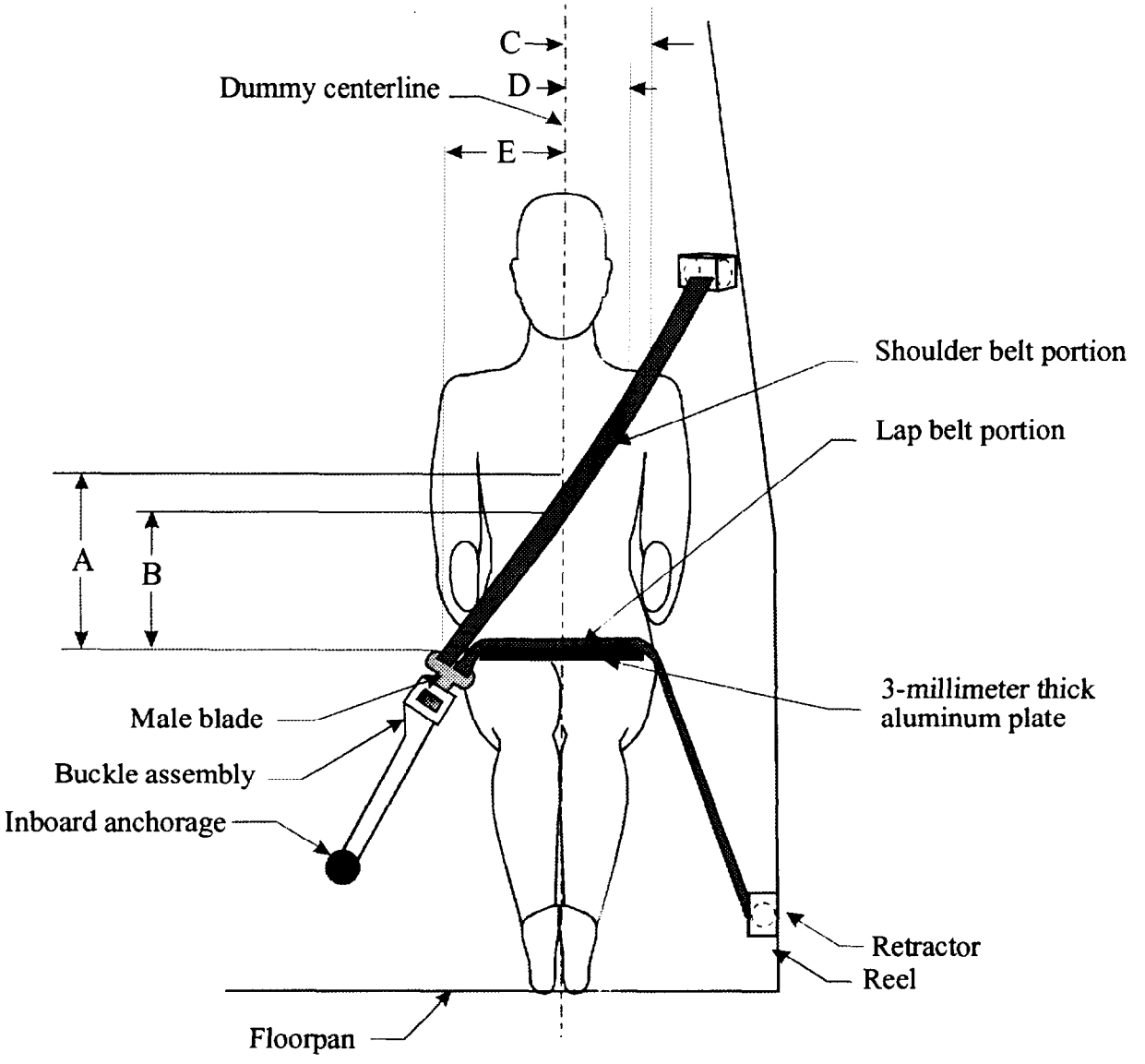
Table 14 Bullet Vehicle Dummy Measurement Data for Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #045)	Passenger (Serial #416)
WA	Windshield angle	27°	27°
SWA	Steering wheel angle	64°	NA
SCA	Steering column angle	26°	NA
SA	Seat back angle	15°	3°
HZ[2]	Head to roof	243 mm	227 mm
HH	Head to header	368 mm	290 mm
HW	Head to windshield	622 mm	598 mm
HR	Head to side header	235 mm	255 mm
NR	Nose to rim	379 mm	NA
NA	Nose to rim angle	8°	NA
CD	Chest to dash	549 mm	433 mm
CS	Steering wheel to chest	286 mm	NA
RA	Rim to abdomen	155 mm	NA
KDL	Left knee to dash	196 mm	122 mm
KDR	Right knee to dash	198 mm	120 mm
KDA	Outboard knee to dash angle	14°	25°
PA	Pelvic angle	21°	17°
TA	Tibial angle	52°	71°
KK	Knee to knee	281 mm	250 mm
ST[1]	Striker to head	633 mm	639 mm
	Striker to head angle	-78°	-69°
SK	Striker to knee	623 mm	718 mm
	Striker to knee angle	-7°	-14°
SH	Striker to H-point	238 mm	277 mm
	Striker to H-point angle	8°	-13°
SHY	Striker to H-point (Y dir.)	214 mm	264 mm
HS	Head to side window	340 mm	333 mm
HD	H-point to door	122 mm	160 mm
AD	Arm to door	127 mm	155 mm

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

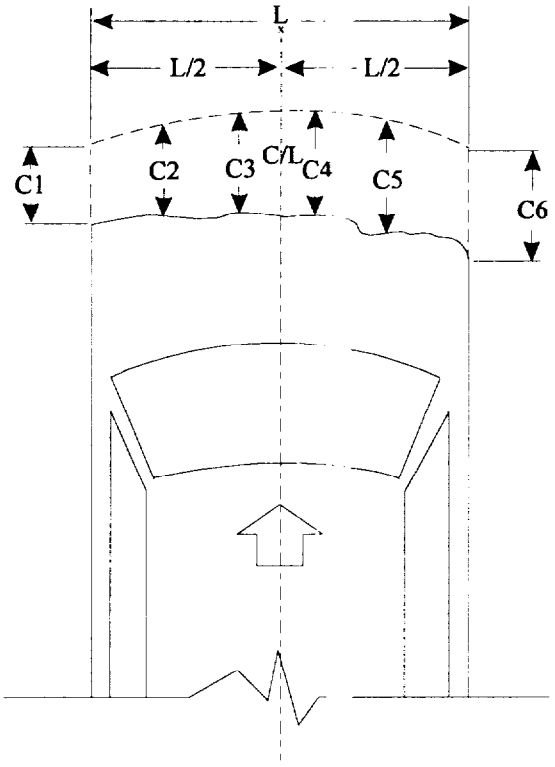
[1] A negative angle indicates the measurement point was above the striker.
[2] Passenger's measurement was taken to the visor.

Figure 10 Bullet Vehicle Seat Belt Positioning Data



		Driver Dummy	Passenger Dummy
A.	Top surface of aluminum plate to belt upper edge	360 mm	282 mm
B.	Top surface of aluminum plate to belt lower edge	280 mm	194 mm
C.	Dummy centerline to outer edge of belt at chest flesh top	115 mm	129 mm
D.	Dummy centerline to inner edge of belt at chest flesh top	60 mm	83 mm
E.	Dummy centerline to intersection of upper torso belt and lap belt	330 mm	302 mm

Figure 11 Bullet Vehicle Crush with Bumper



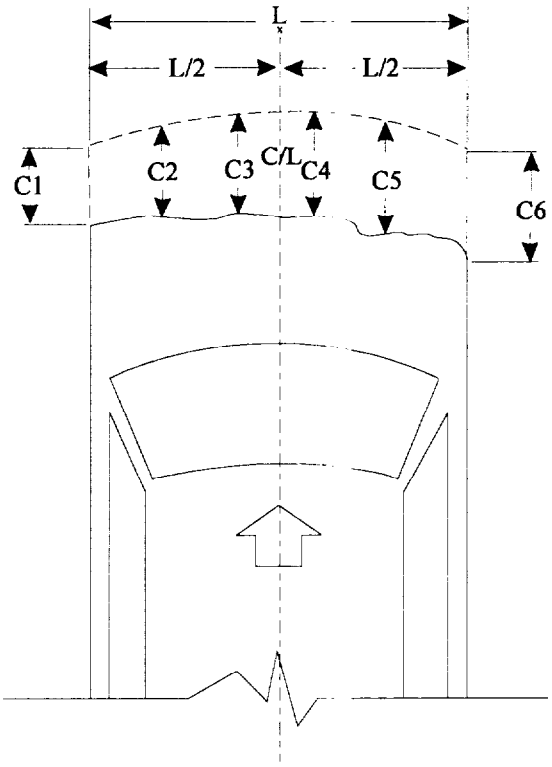
NOTES: L is pre-test length of contact surface.
C1 through C6 are spaced equally apart.
CL is vehicle centerline.

Vehicle: 1997 Dodge Caravan

	Pre-test	Post-test[1]	Crush
L	1525 mm		
C1	5050 mm	N/A	N/A
C2	5155 mm	N/A	N/A
C3	5200 mm	N/A	N/A
C4	5200 mm	N/A	N/A
C5	5150 mm	N/A	N/A
C6	5050 mm	N/A	N/A
CL	5200 mm	N/A	N/A

[1] Bullet vehicle lost bumper at impact

Figure 12 Bullet 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	1525 mm		
C1	4985 mm	N/A	N/A
C2	5090 mm	4576 mm	514 mm
C3	5135 mm	4573 mm	562 mm
C4	5135 mm	4547 mm	588 mm
C5	5085 mm	4528 mm	557 mm
C6	4985 mm	N/A	N/A
CL	5135 mm	4561 mm	574 mm

Measurements were taken from the bumper beam.

Figure 13 Bullet Vehicle Pre-test and Post-test Measurement Points

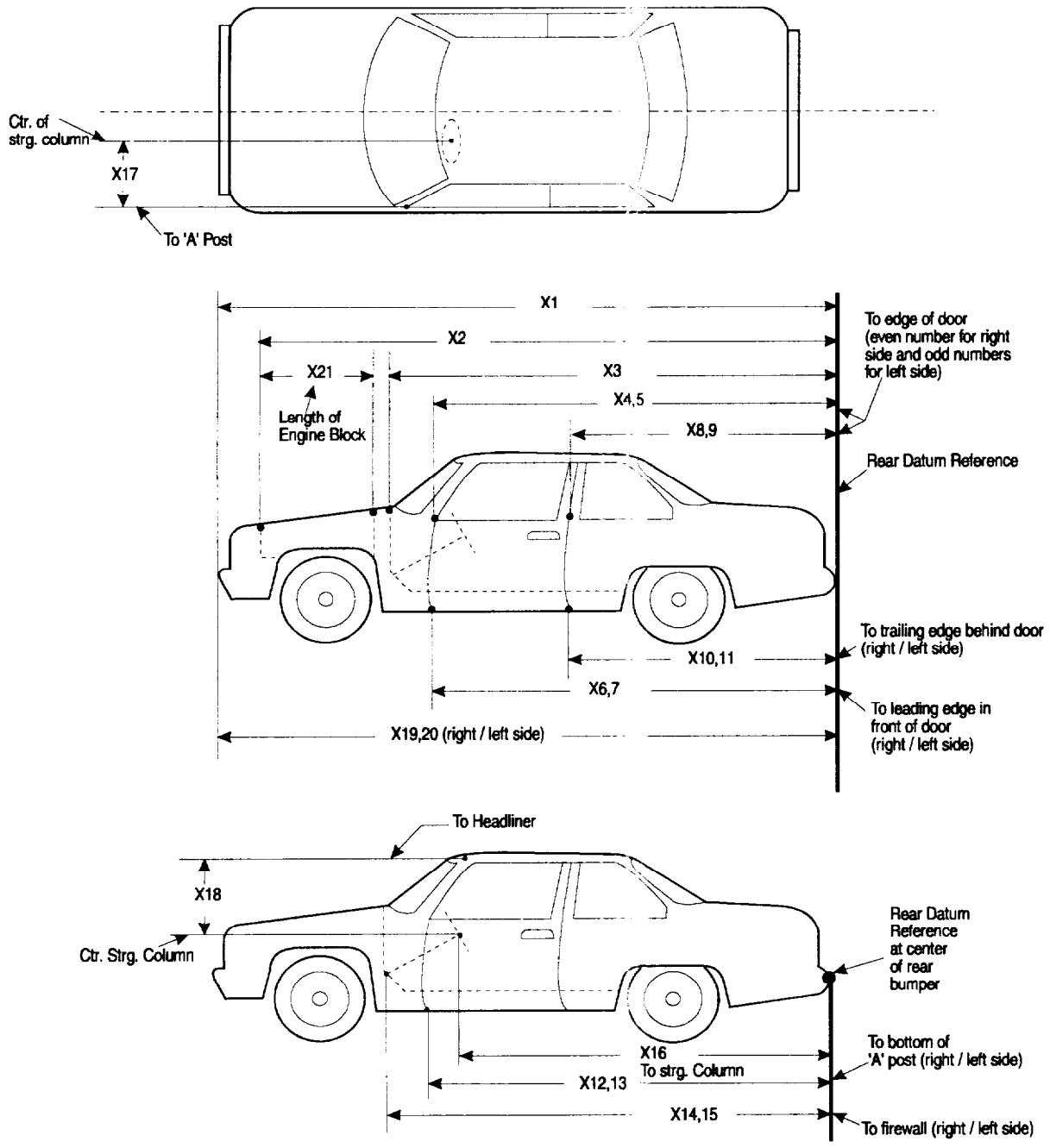


Table 15 Bullet Vehicle Measurements

Vehicle Make/Model: Dodge Caravan

Test Number: 000623

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	5200 mm	N/A[1] mm	N/A[1] mm
X2	Rear surface of vehicle to front of engine block	4490 mm	4374 mm	116 mm
X3	Rear surface of vehicle to firewall	4450 mm	4447 mm	3 mm
X4	Rear surface of vehicle to upper leading edge of right door	3806 mm	3801 mm	5 mm
X5	Rear surface of vehicle to upper leading edge of left door	3809 mm	3809 mm	0 mm
X6	Rear surface of vehicle to lower leading edge of right door	3785 mm	3773 mm	12 mm
X7	Rear surface of vehicle to lower leading edge of left door	3790 mm	3781 mm	9 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2820 mm	2817 mm	3 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2828 mm	2828 mm	0 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2835 mm	2822 mm	13 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2842 mm	2830 mm	12 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3810 mm	3805 mm	5 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3810 mm	3805 mm	5 mm
X14	Rear surface of vehicle to firewall - right side	4410 mm	4353 mm	57 mm
X15	Rear surface of vehicle to firewall - left side	4400 mm	4398 mm	2 mm
X16	Rear surface of vehicle to steering wheel center	3380 mm	3400 mm	-20 mm
X17	Center of steering column to "A" post	310 mm	310 mm	0 mm
X18	Center of steering column to headliner	468 mm	355 mm	113 mm
X19	Rear surface of vehicle to right side of front bumper	5050 mm	N/A[1] mm	N/A[1]
X20	Rear surface of vehicle to left side of front bumper	5050 mm	N/A[1] mm	N/A[1] mm
X21	Length of engine block	360 mm	360 mm	0 mm

[1] Bullet vehicle lost bumper at impact

Table 16 Bullet Vehicle Toe Pan Intrusion Measurements

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

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	755	680	380	755	680	395	0	0	-15
Point 2	1100	690	538	1110	690	540	-10	0	-2
Point 3	1175	175	538	914	175	620	261	0	-82
Point 4	750	200	402	730	200	395	20	0	7
Point 5	920	410	405	917	410	410	3	0	-5

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	770	-185	401	710	-185	435	60	0	-34
Point 2	1020	-190	528	946	-190	600	74	0	-72
Point 3	1278	-670	396	1168	-670	605	110	0	-209
Point 4	781	-680	378	781	-680	445	0	0	-67
Point 5	1120	-410	528	1072	-410	415	48	0	113

+X: Forward of reference point behind the driver and passenger seats.
+Y: Left from vehicle longitudinal centerline.
+Z: Up from ground.

Figure 14 Camera Positions

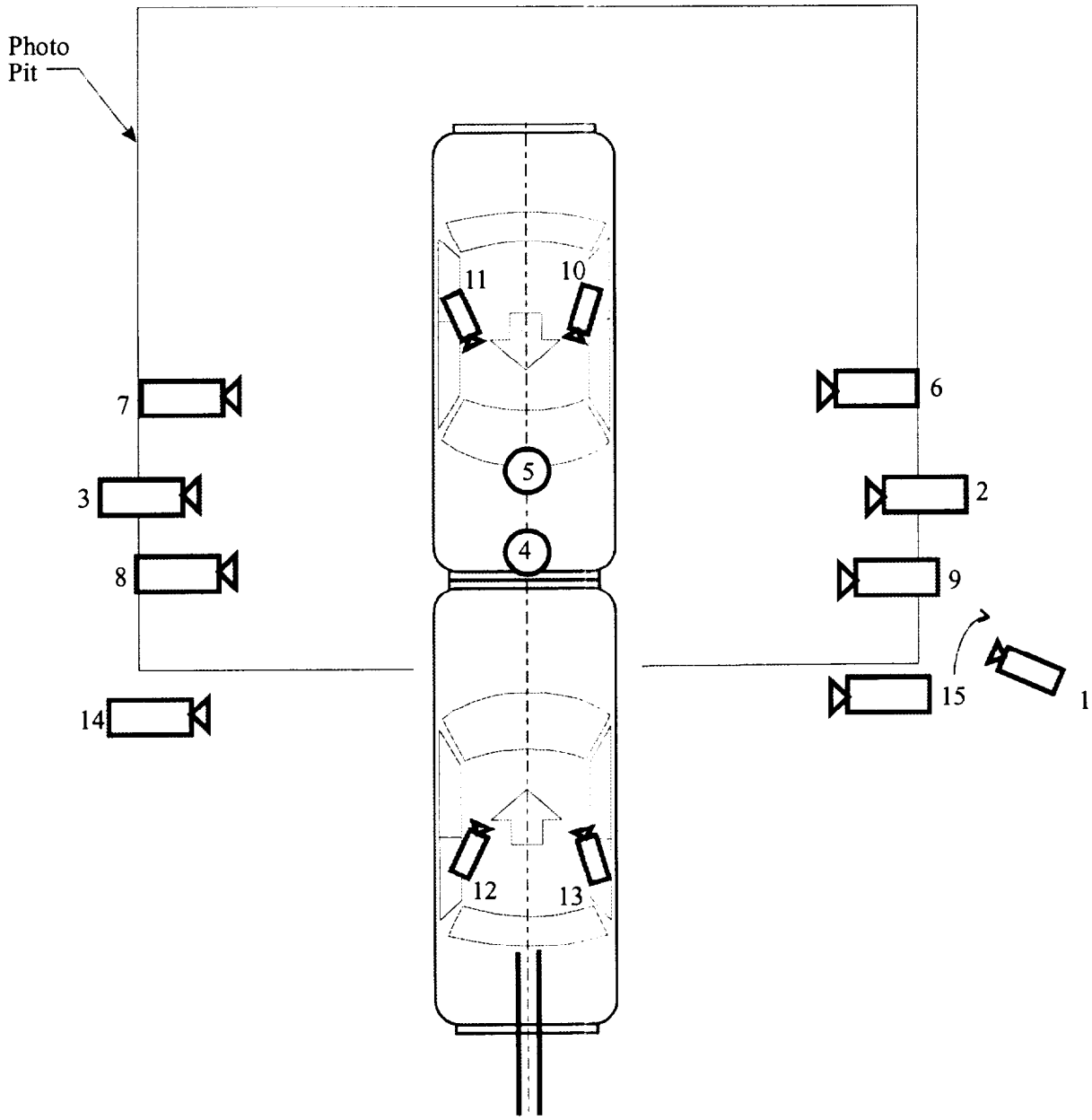


Table 17 Camera Information

Camera Number	Location	Type	Lens (mm)	Speed (fps)	Purpose of camera data
1	Panning	Bolex	16	24	Vehicle dynamics
2	Right wide	Photosonic	13	997	Dummy kinematics
3	Left wide	Photosonic	13	No Speed	Dummy kinematics
4	Overhead wide	Photosonic	8.5	1002	Vehicle dynamics
5	Overhead tight	Photosonic	25	992	Vehicle crush
6	Target veh. tight drvr.	Photosonic	50	992	Dummy kinematics
7	Target veh. tight pass.	Photosonic	50	990	Dummy kinematics
8	Vehicle tight left	Photosonic	25	935	Impact
9	Vehicle tight right	Photosonic	25	No Speed	Impact
10	Target veh. ob drvr.	Photosonic	8	1000	Dummy kinematics
11	Target veh. ob pass.	Photosonic	8	1012	Dummy kinematics
12	Bullet veh. ob drvr.	Photosonic	8	1002	Dummy kinematics
13	Bullet veh. ob pass.	Photosonic	8	995	Dummy kinematics
14	Bullet driver tight	Photosonic	50	795	Dummy kinematics
15	Bullet pass. tight	Photosonic	50	997	Dummy kinematics

Description Of Timing Marks On TRC High-Speed Film

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

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

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

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

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

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

Appendix A

Photographs

Figure A-1 Pre-Test Target Vehicle Left Front with Bullet Vehicle Right Front - View 1

Figure A-2 Pre-Test Target Vehicle Left Front with Bullet Vehicle Right Front - View 2

Figure A-3 Pre-Test Bullet Vehicle Left Front with Target Vehicle Right Front - View 1

Figure A-4 Pre-Test Bullet Vehicle Left Front with Target Vehicle Right Front - View 2

Figure A-5 Post-Test Bullet Vehicle Left Front with Target Vehicle Right Front - View 1

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Figure A-6 Pre-Test Target Vehicle Rear View to Bullet Vehicle View

Figure A-7 Post-Test Target Vehicle Rear View to Bullet Vehicle View

Figure A-8 Pre-Test Bullet Vehicle Rear View to Target Vehicle View

Figure A-9 Post-Test Bullet Vehicle Rear View to Target Vehicle View

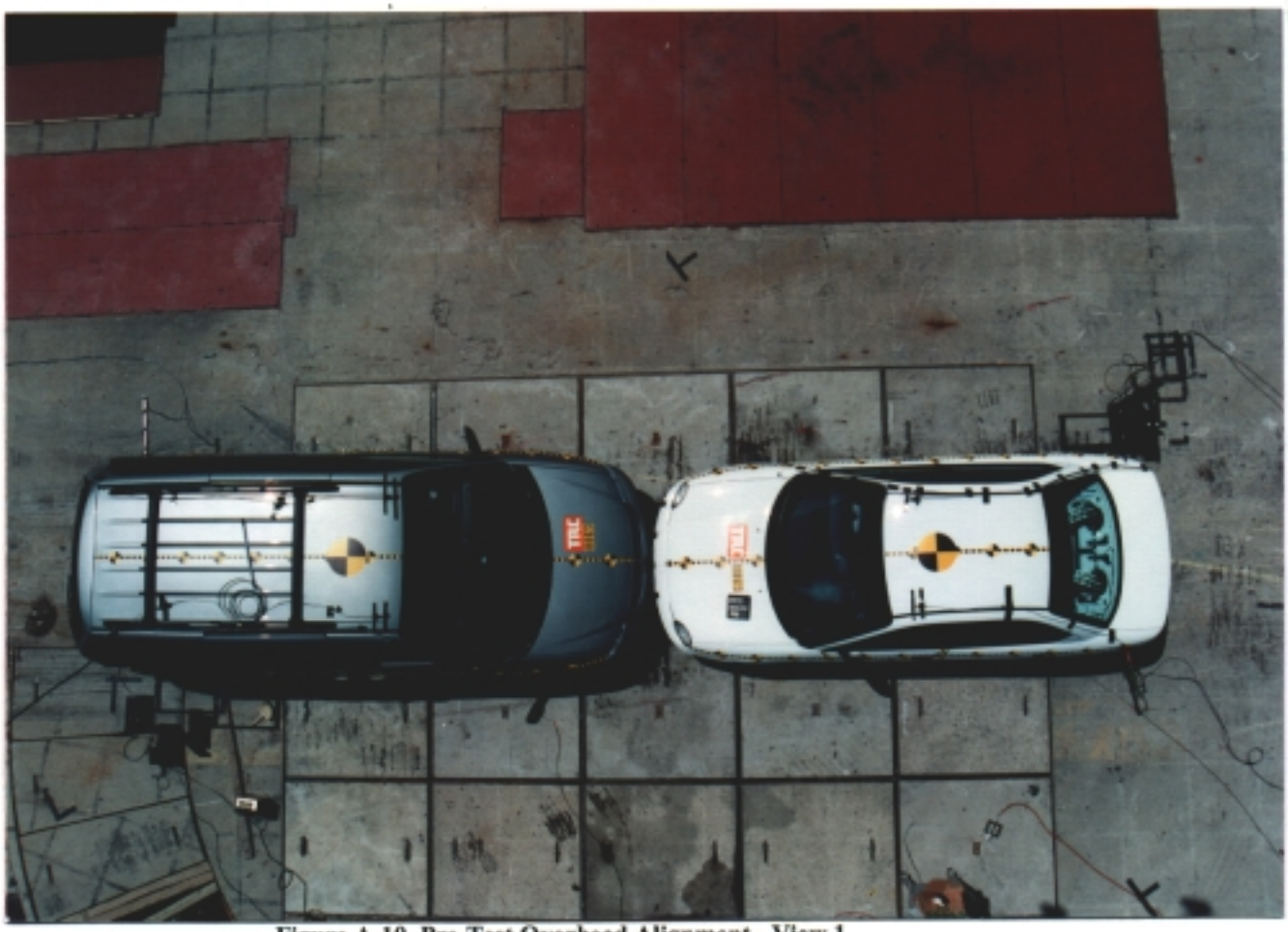

Figure A-10 Pre-Test Overhead Alignment - View 1

Figure A-11 Pre-Test Overhead Alignment - View 2

Figure A-12 Pre-Test Target Vehicle Front View

Figure A-13 Post-Test Target Vehicle Front View

Figure A-14 Pre-Test Target Vehicle Left Front Three-Quarter View

Figure A-15 Post-Test Target Vehicle Left Front Three-Quarter View

Figure A-16 Pre-Test Target Vehicle Right Front Three-Quarter View - View 1

Figure A-17 Post-Test Target Vehicle Right Front Three-Quarter - View 1

Figure A-18 Post-Test Target Vehicle Right Front Three-Quarter - View 2

Figure A-19 Post-Test Target Vehicle Left Side View

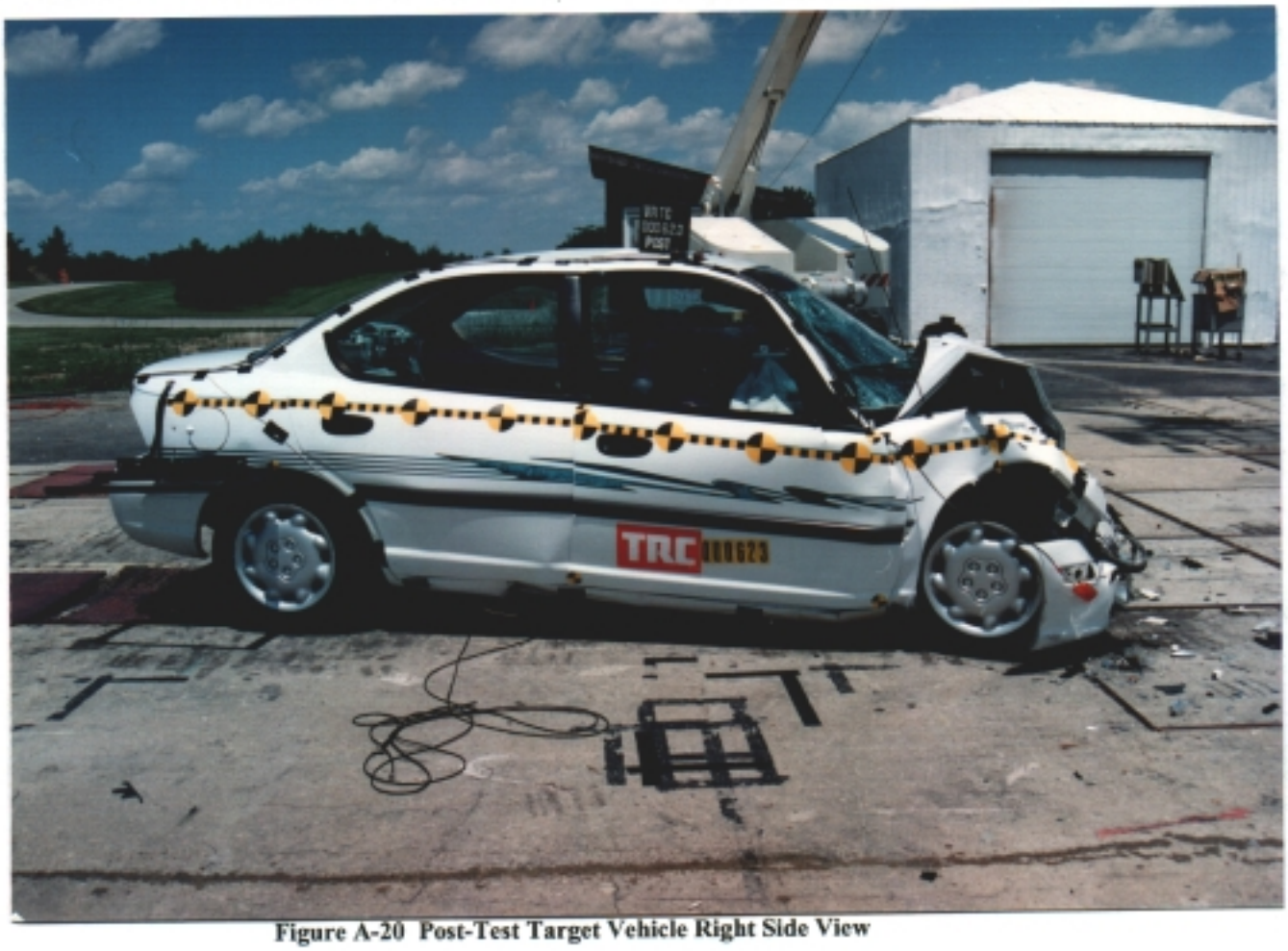

Figure A-20 Post-Test Target Vehicle Right Side View

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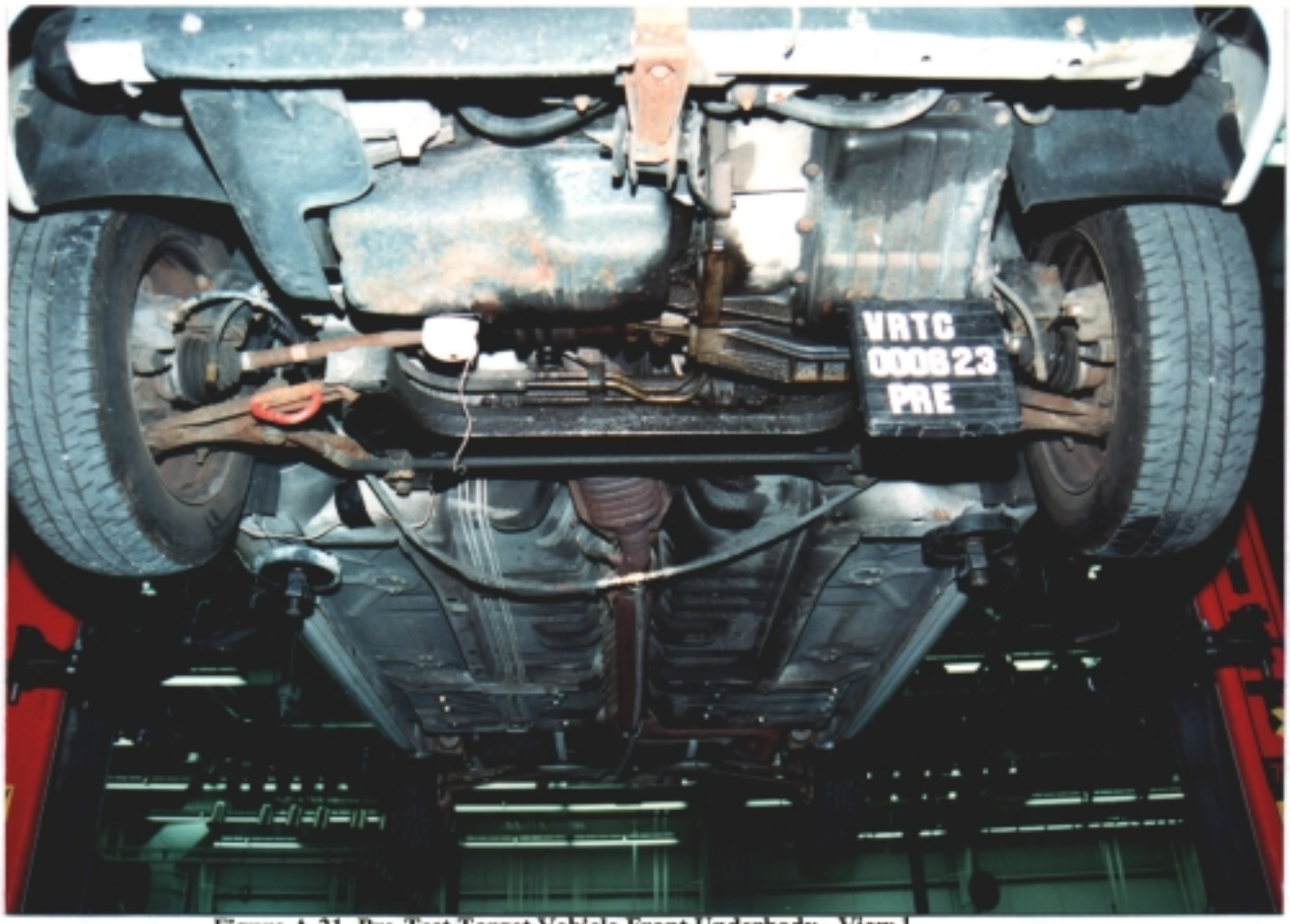


Figure A-21 Pre-Test Target Vehicle Front Underbody - View 1

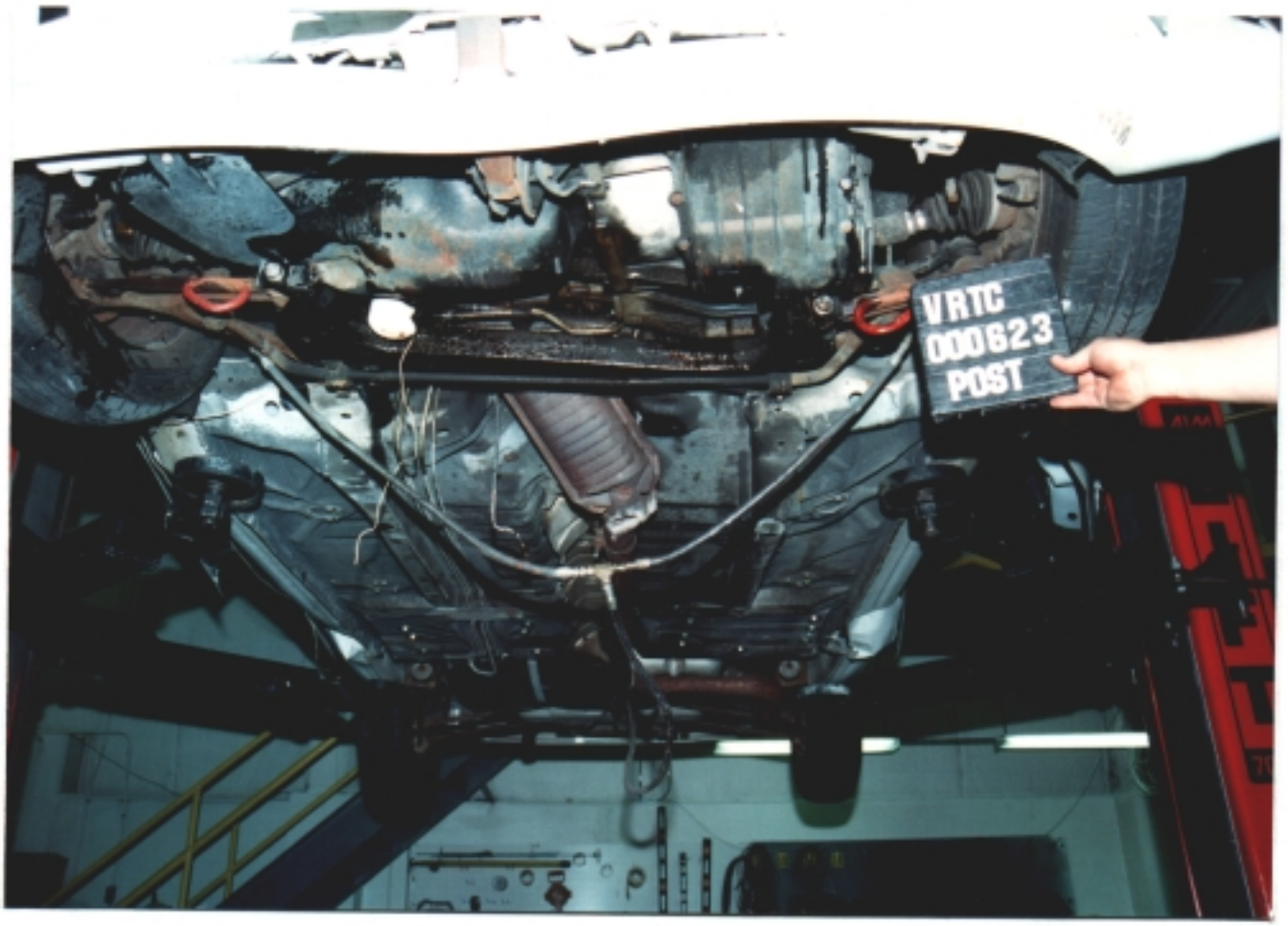


Figure A-22 Post-Test Target Vehicle Front Underbody - View 1

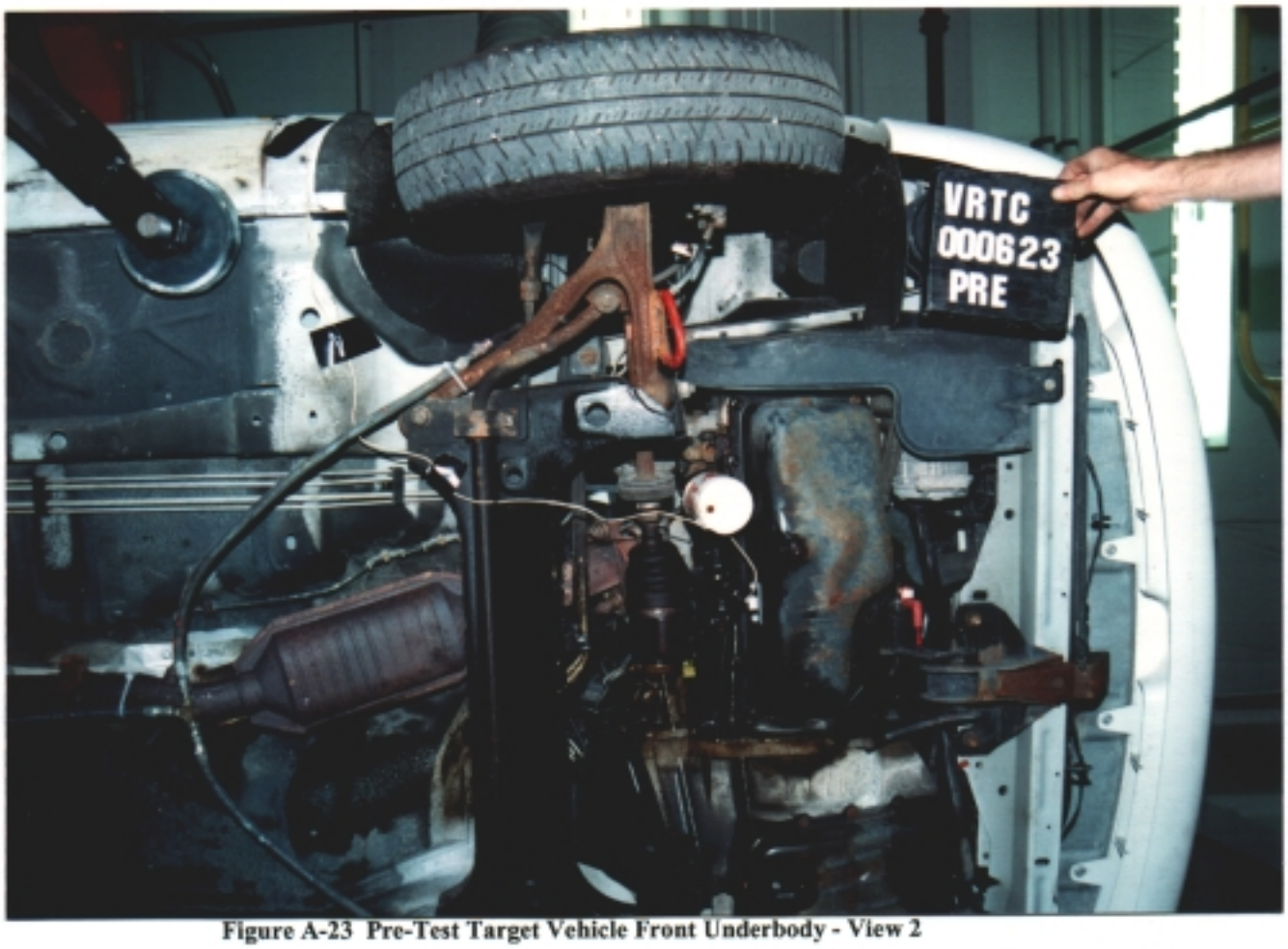


Figure A-23 Pre-Test Target Vehicle Front Underbody - View 2

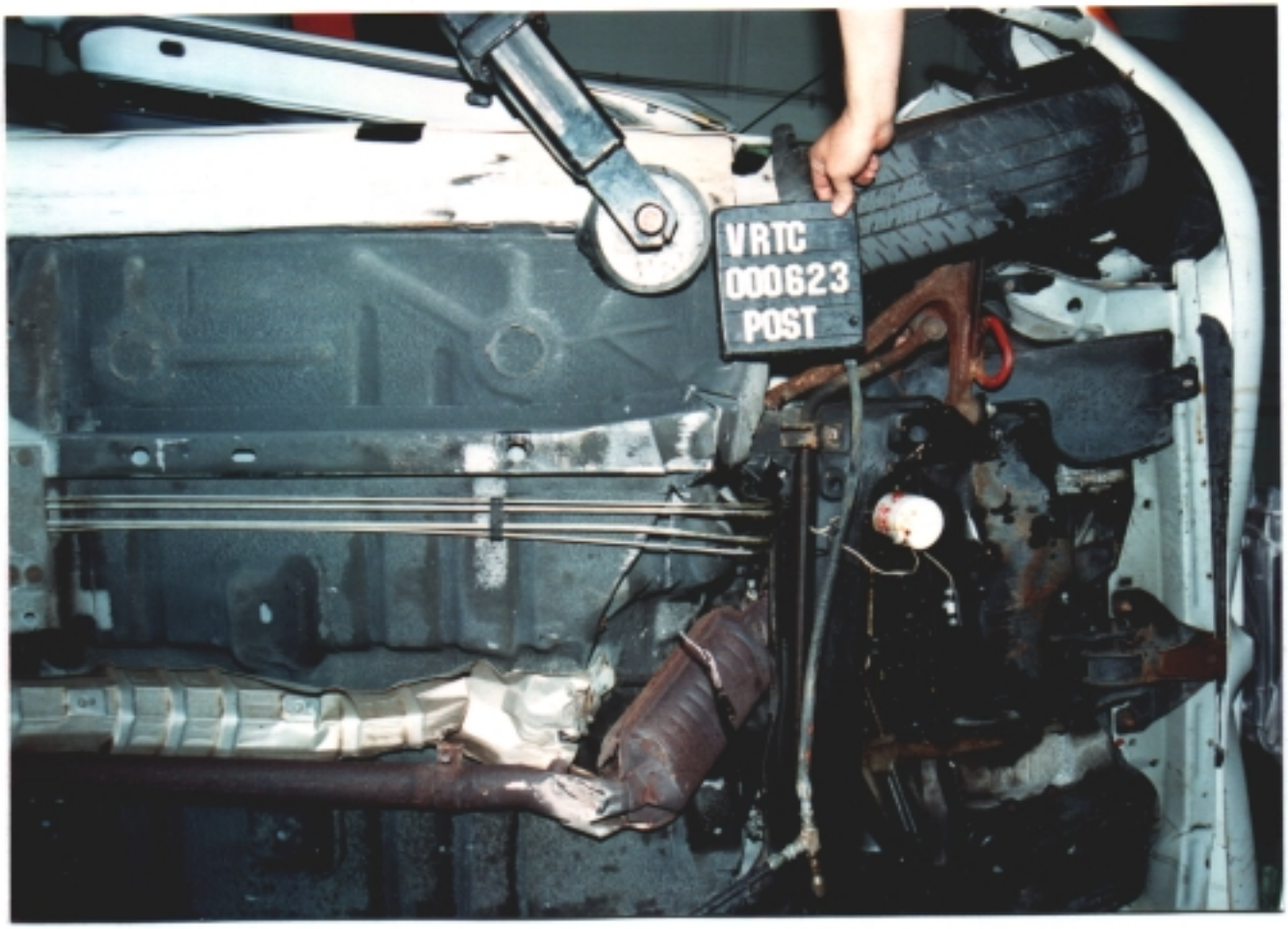


Figure A-24 Post-Test Target Vehicle Front Underbody - View 2

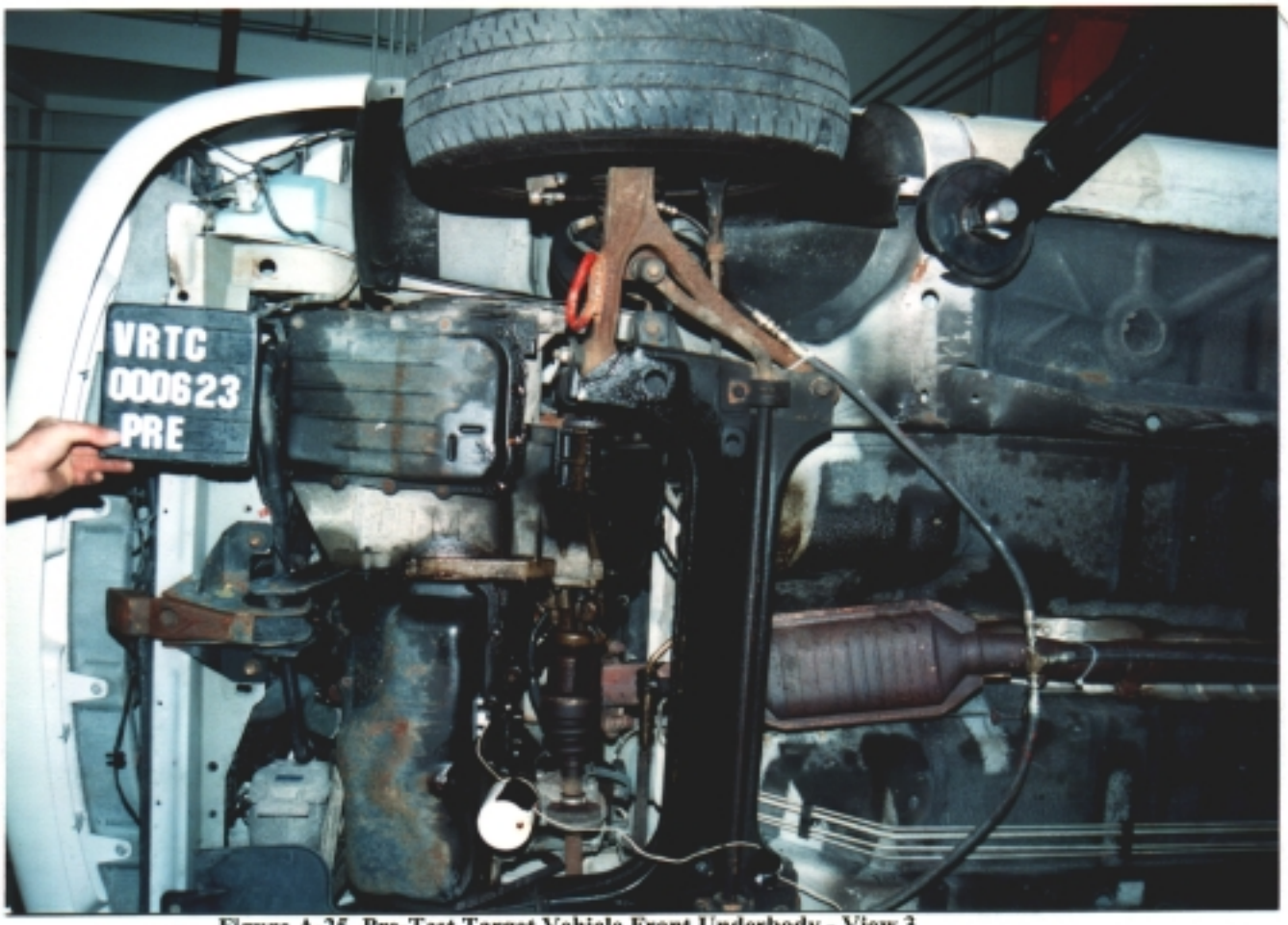


Figure A-25 Pre-Test Target Vehicle Front Underbody - View 3

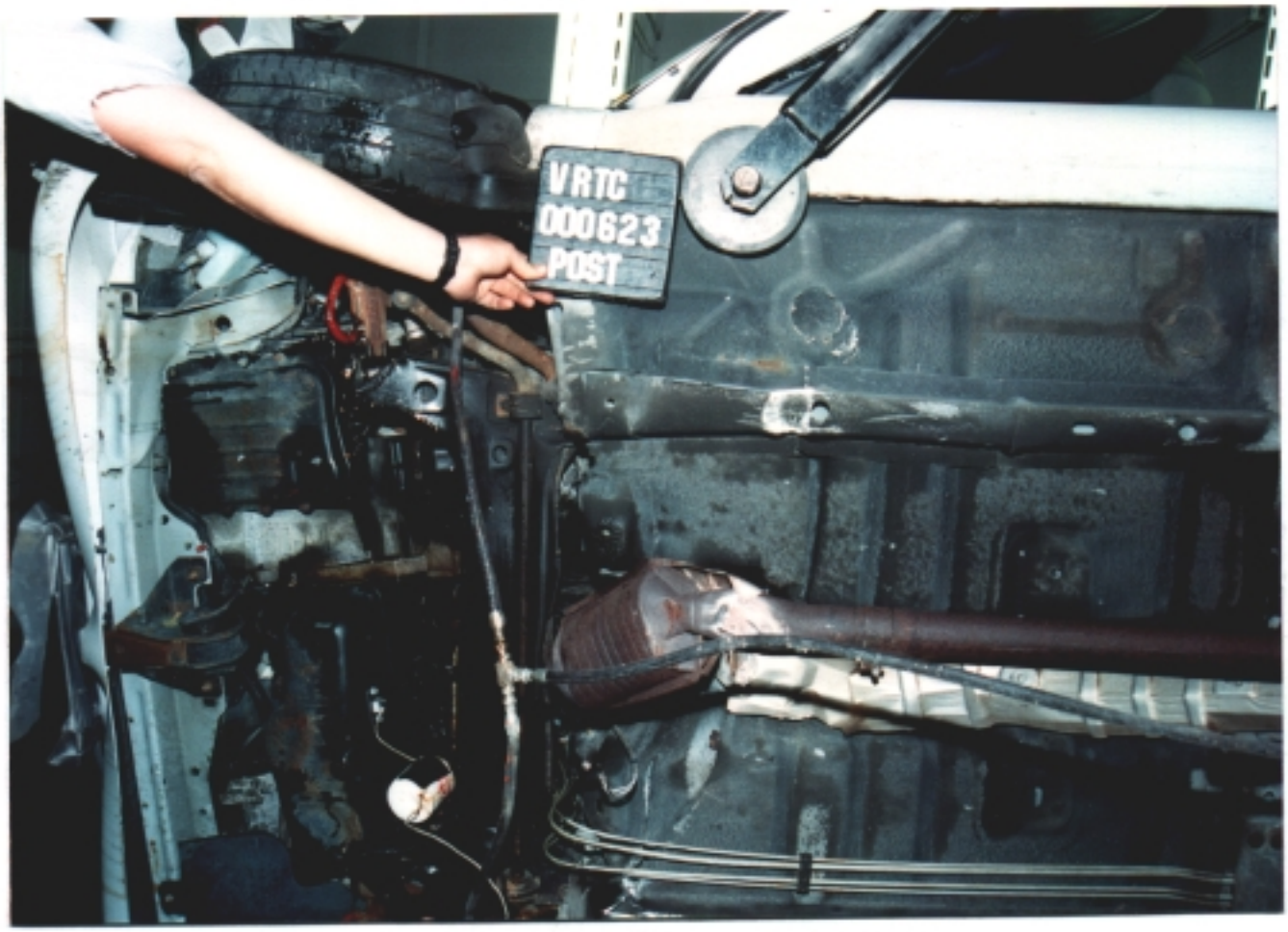


Figure A-26 Post-Test Target Vehicle Front Underbody - View 3

Figure A-27 Pre-Test Target Vehicle Rear Underbody View

Figure A-28 Post-Test Target Vehicle Rear Underbody View

Figure A-29 Pre-Test Target Vehicle Windshield View - Driver and Passenger Dummies

Figure A-30 Post-Test Target Vehicle Windshield View - Driver and Passenger Dummies

Figure A-31 Pre-Test Target Vehicle Driver Dummy Windshield View

Figure A-32 Post-Test Target Vehicle Driver Dummy Windshield View

Figure A-33 Pre-Test Target Vehicle Passenger Dummy Windshield View

Figure A-34 Post-Test Target Vehicle Passenger Dummy Windshield View

Figure A-35 Pre-Test Driver Vehicle Driver Dummy - View 1

Figure A-36 Post-Test Driver Vehicle Driver Dummy - View 1

Figure A-37 Post-Test Driver Vehicle Driver Dummy - View 2

Intentionally Left Blank

Figure A-38 Pre-Test Target Vehicle Driver Dummy - View 3

Figure A-39 Post-Test Target Vehicle Driver Dummy - View 3

Figure A-40 Pre-Test Target Vehicle Driver Dummy - View 4

Figure A-41 Post-Test Target Vehicle Driver Dummy - View 4

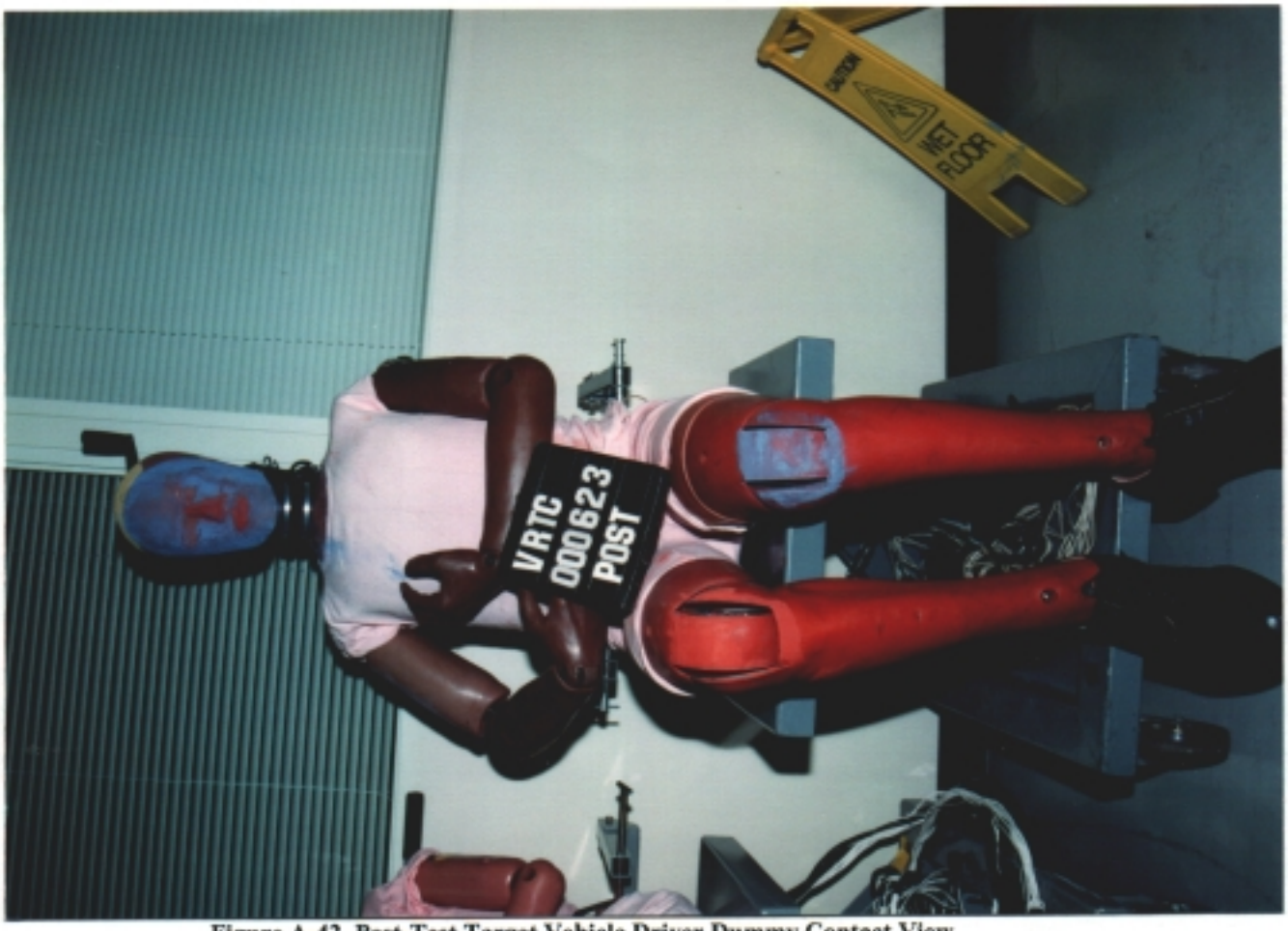


Figure A-42 Post-Test Target Vehicle Driver Dummy Contact View

Figure A-43 Post-Test Target Vehicle Driver Dummy Head Contact - View 1

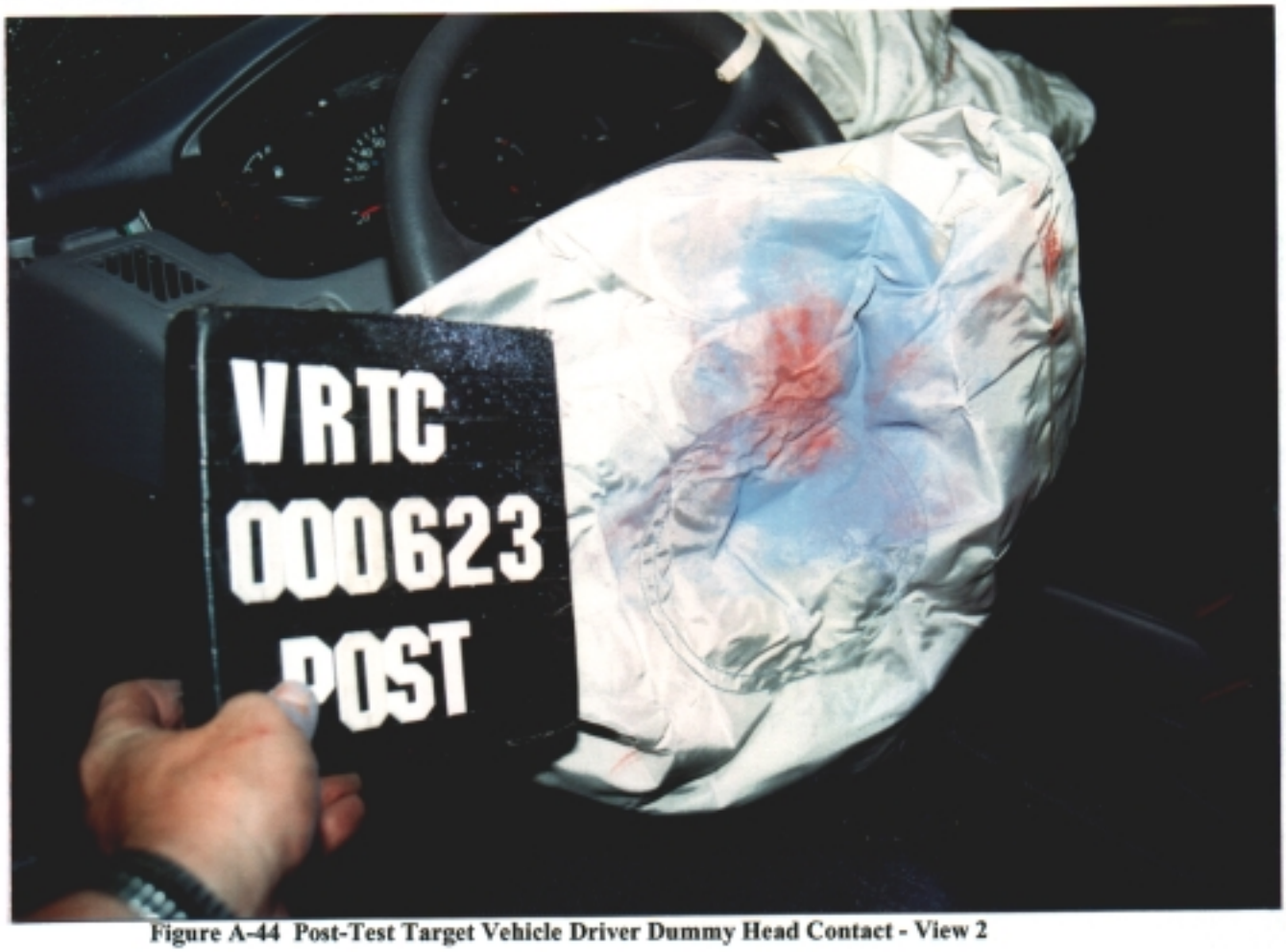


Figure A-44 Post-Test Target Vehicle Driver Dummy Head Contact - View 2

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

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

Figure A-47 Post-Test Target Vehicle Driver Floorpan View

Figure A-48 Pre-Test Target Vehicle Passenger Dummy - View 1

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

Figure A-50 Post-Test Target Vehicle Passenger Dummy - View 2

Intentionally Left Blank

Figure A-51 Pre-Test Target Vehicle Passenger Dummy - View 3

Figure A-52 Post-Test Target Vehicle Passenger Dummy - View 3

Figure A-53 Pre-Test Target Vehicle Passenger Dummy - View 4

Figure A-54 Post-Test Target Vehicle Passenger Dummy - View 4

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

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

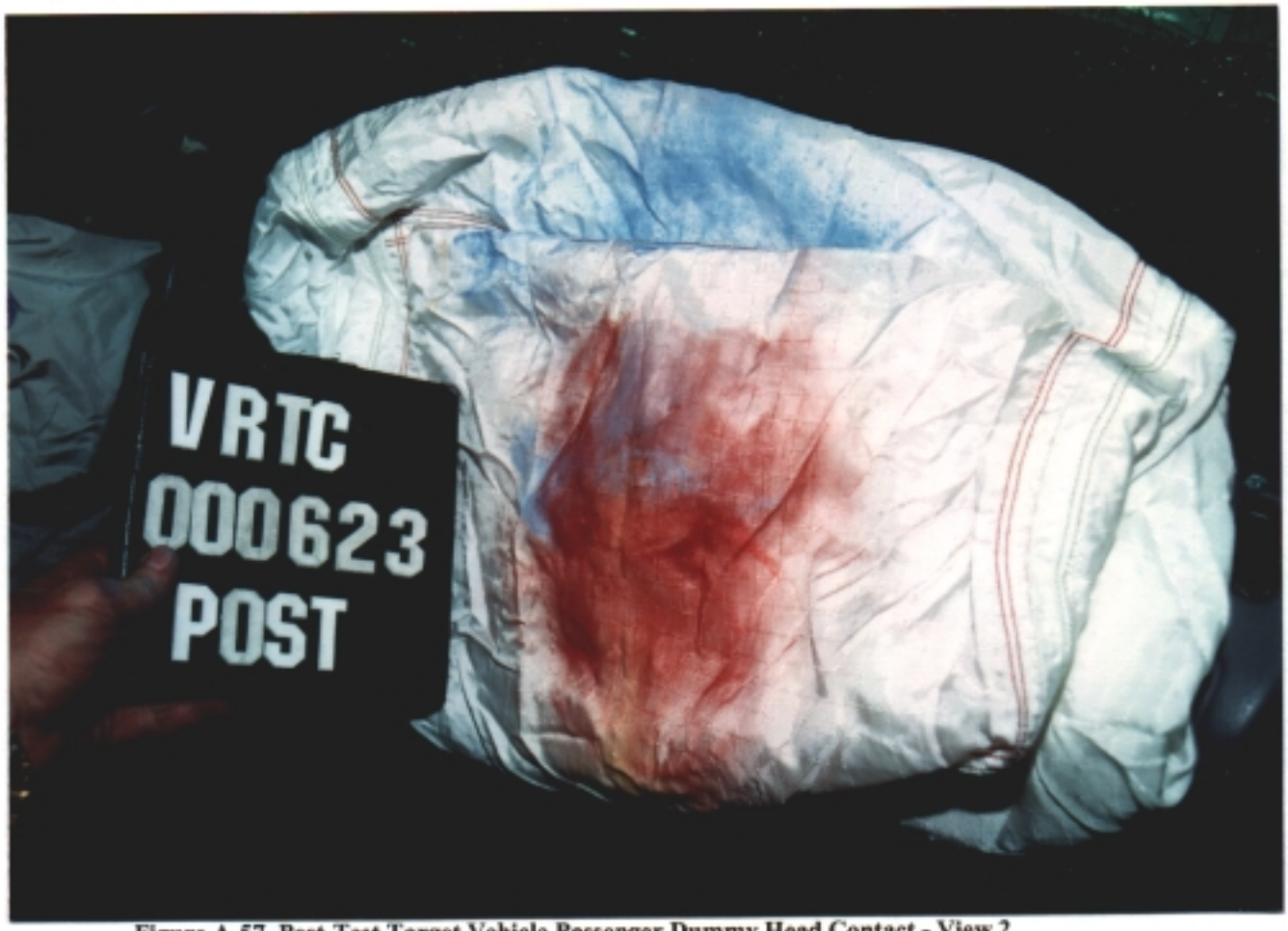


Figure A-57 Post-Test Target Vehicle Passenger Dummy Head Contact - View 2

Figure A-58 Post-Test Target Vehicle Passenger Dummy Knee Contact - View 1

Figure A-59 Post-Test Target Vehicle Passenger Dummy Knee Contact - View 2

Intentionally Left Blank

Figure A-60 Pre-Test Bullet Vehicle Front View

Figure A-61 Post-Test Bullet Vehicle Front View

Figure A-62 Pre-Test Bullet Vehicle Left Front Three-Quarter View

Figure A-63 Post-Test Bullet Vehicle Left Front Three-Quarter View

Figure A-64 Pre-Test Bullet Vehicle Right Front Three-Quarter View

Figure A-65 Post-Test Bullet Vehicle Right Front Three-Quarter - View 1

Figure A-66 Post-Test Bullet Vehicle Right Front Three-Quarter - View 2

Figure A-67 Post-Test Bullet Vehicle Left Side View

Figure A-68 Post-Test Bullet Vehicle Right Side View

Intentionally Left Blank

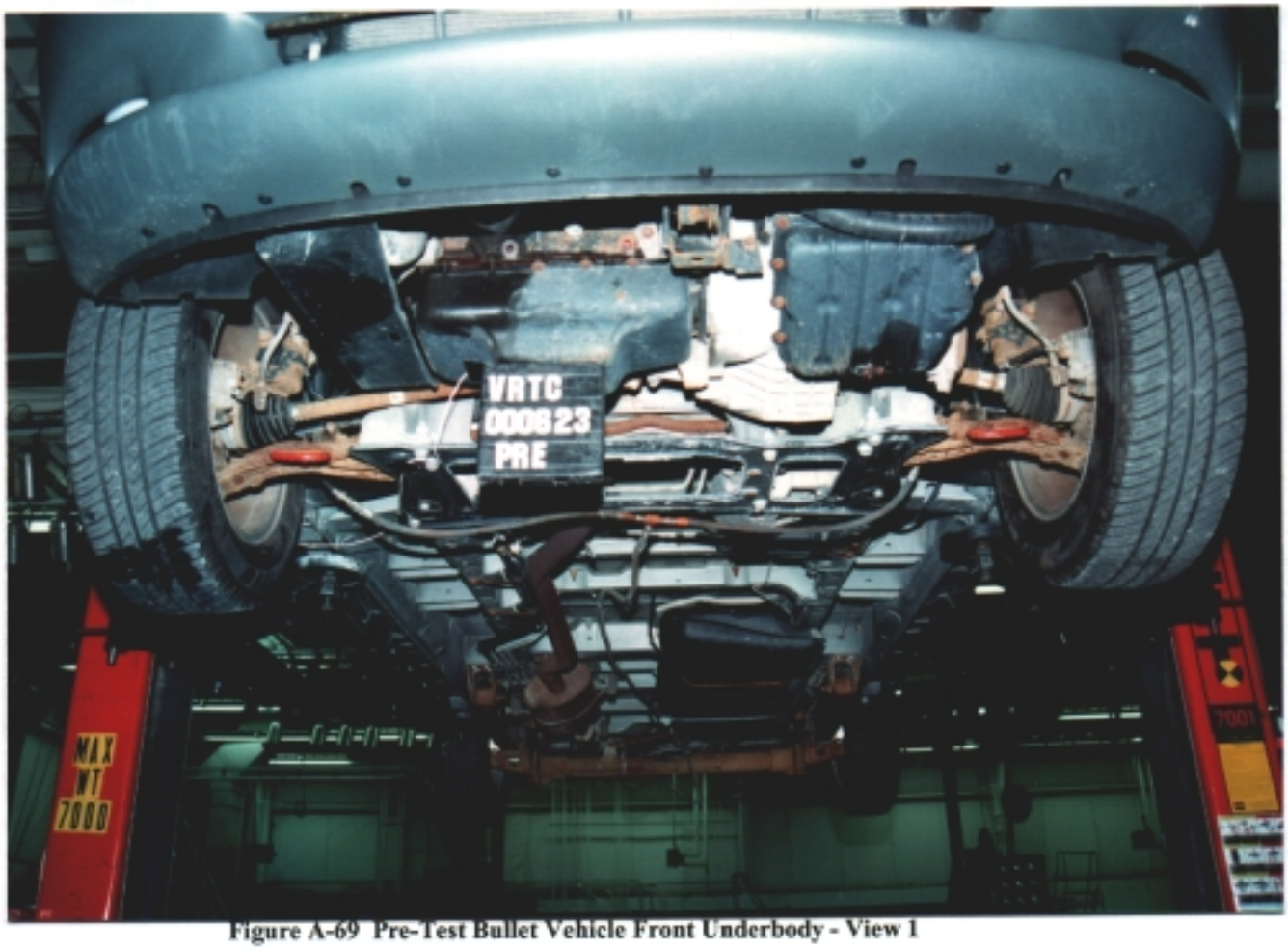


Figure A-69 Pre-Test Bullet Vehicle Front Underbody - View 1

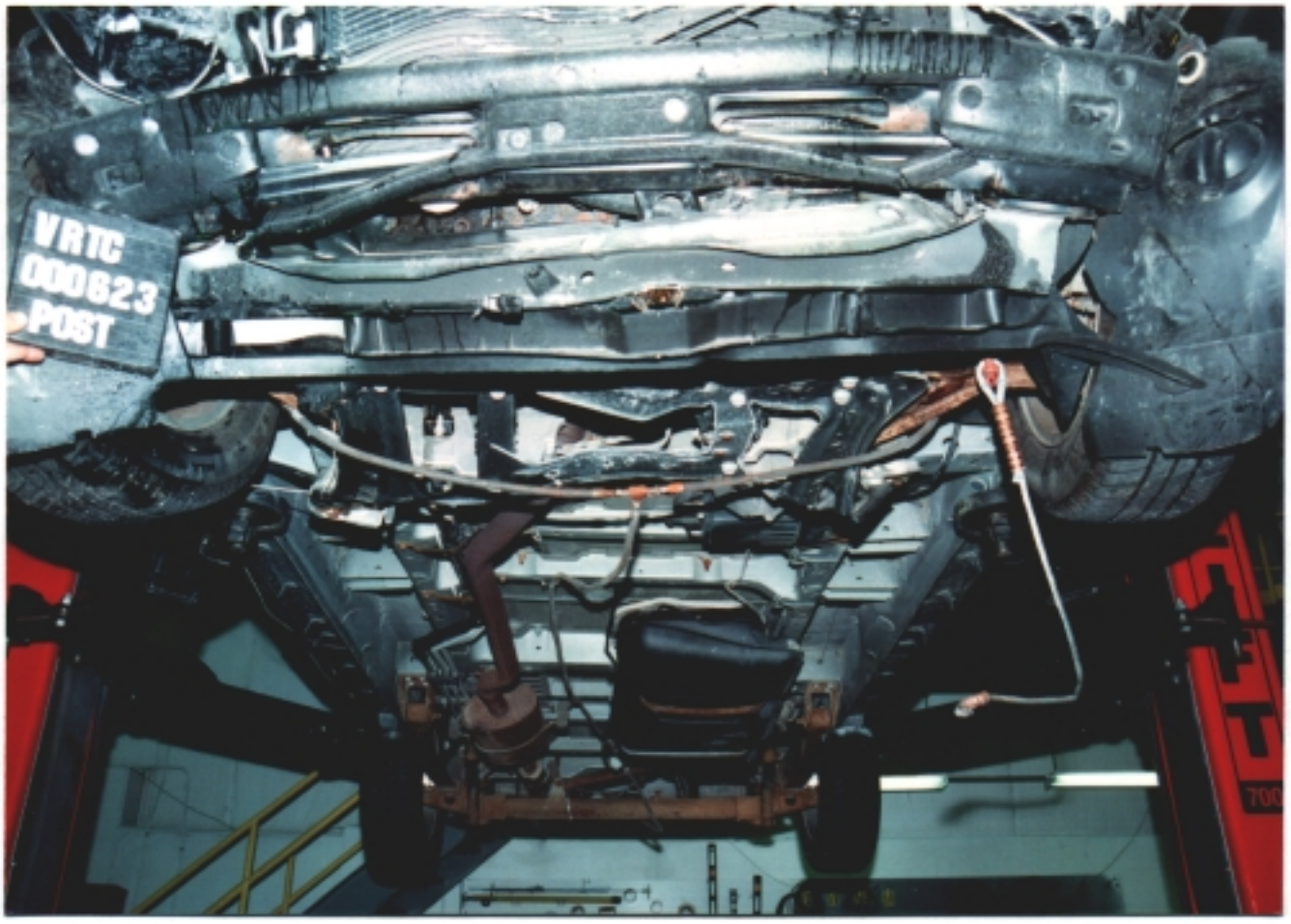


Figure A-70 Post-Test Bullet Vehicle Front Underbody - View 1

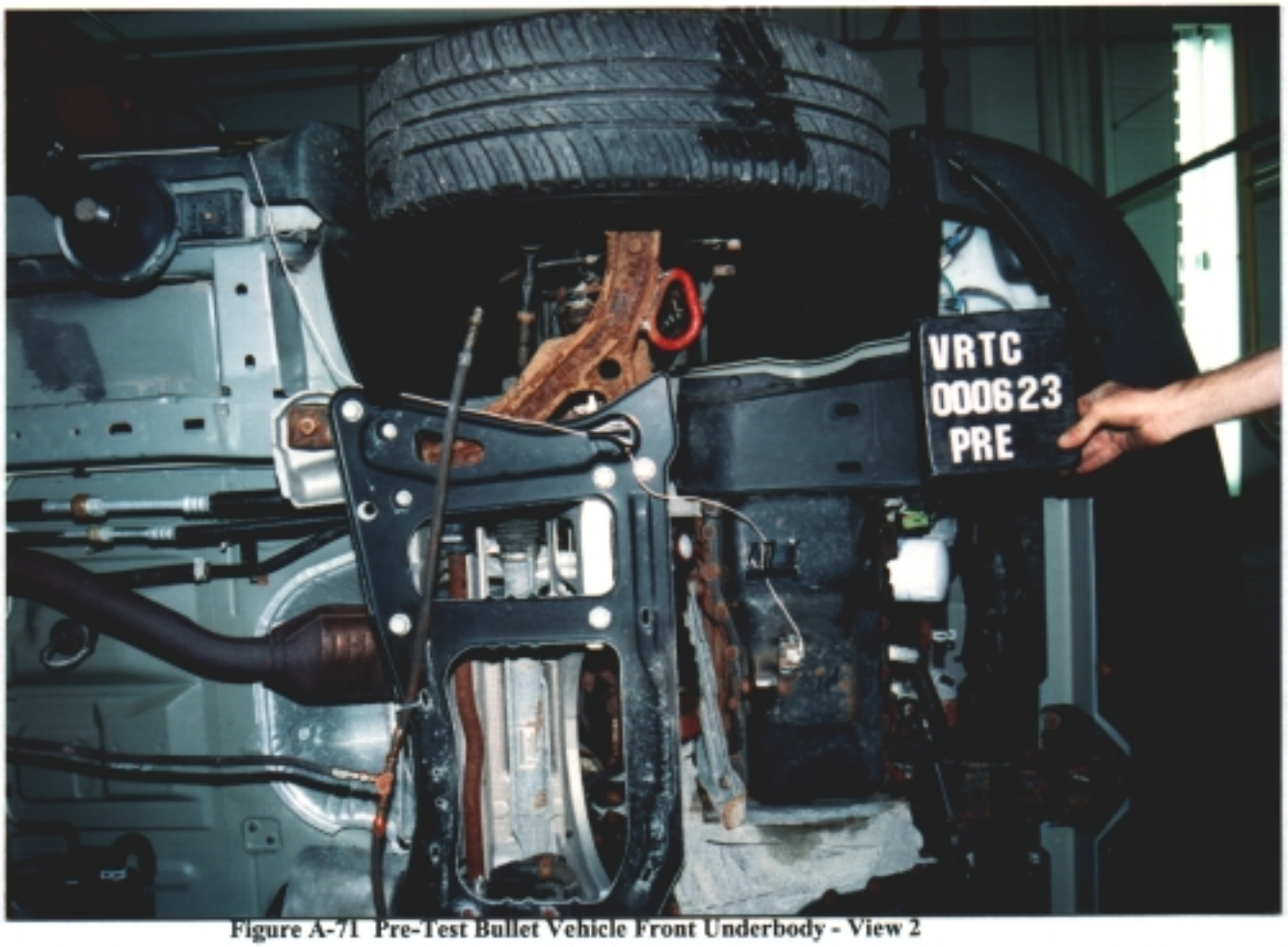


Figure A-71 Pre-Test Bullet Vehicle Front Underbody - View 2

Figure A-72 Post-Test Bullet Vehicle Front Underbody - View 2

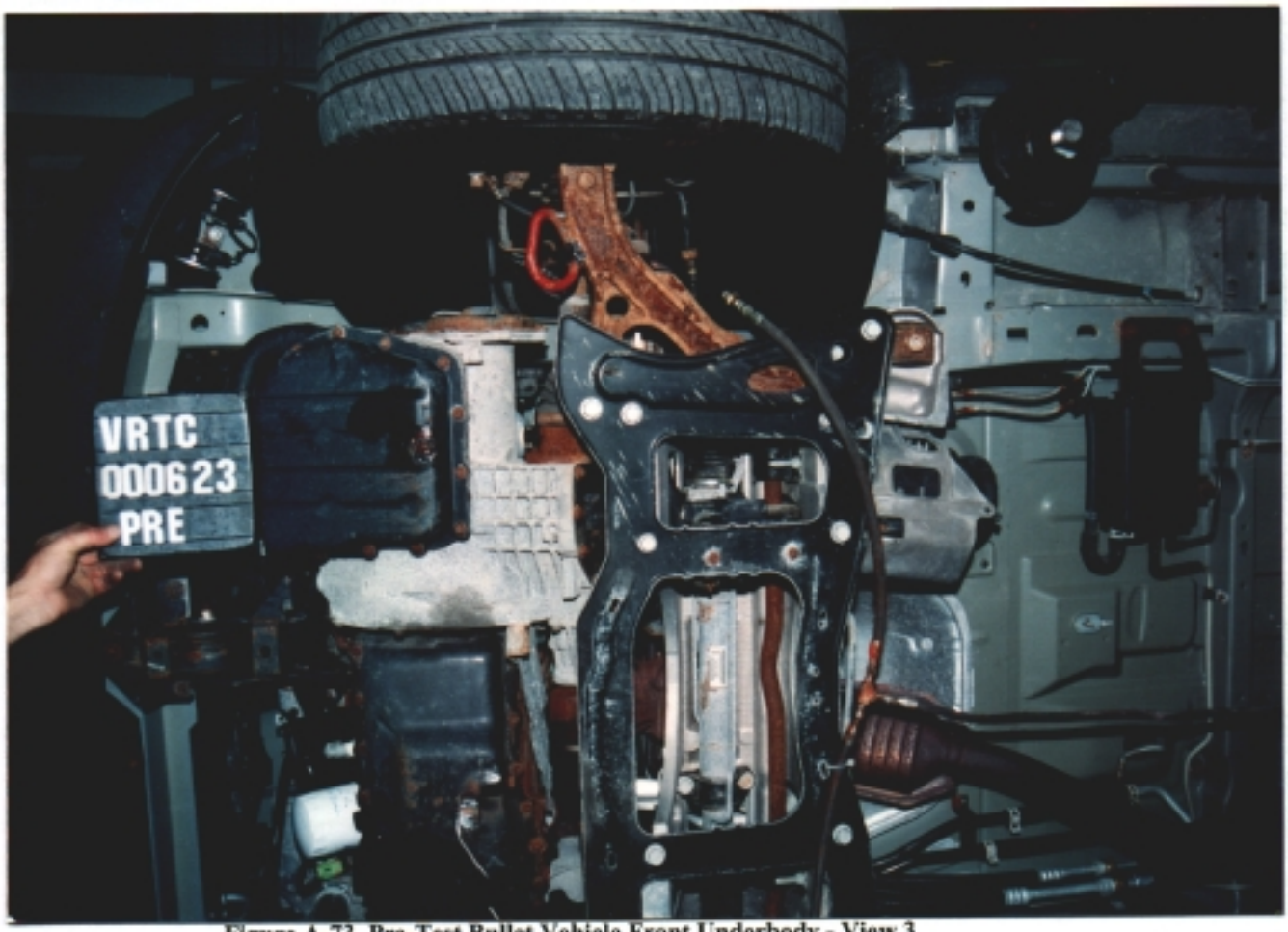


Figure A-73 Pre-Test Bullet Vehicle Front Underbody - View 3

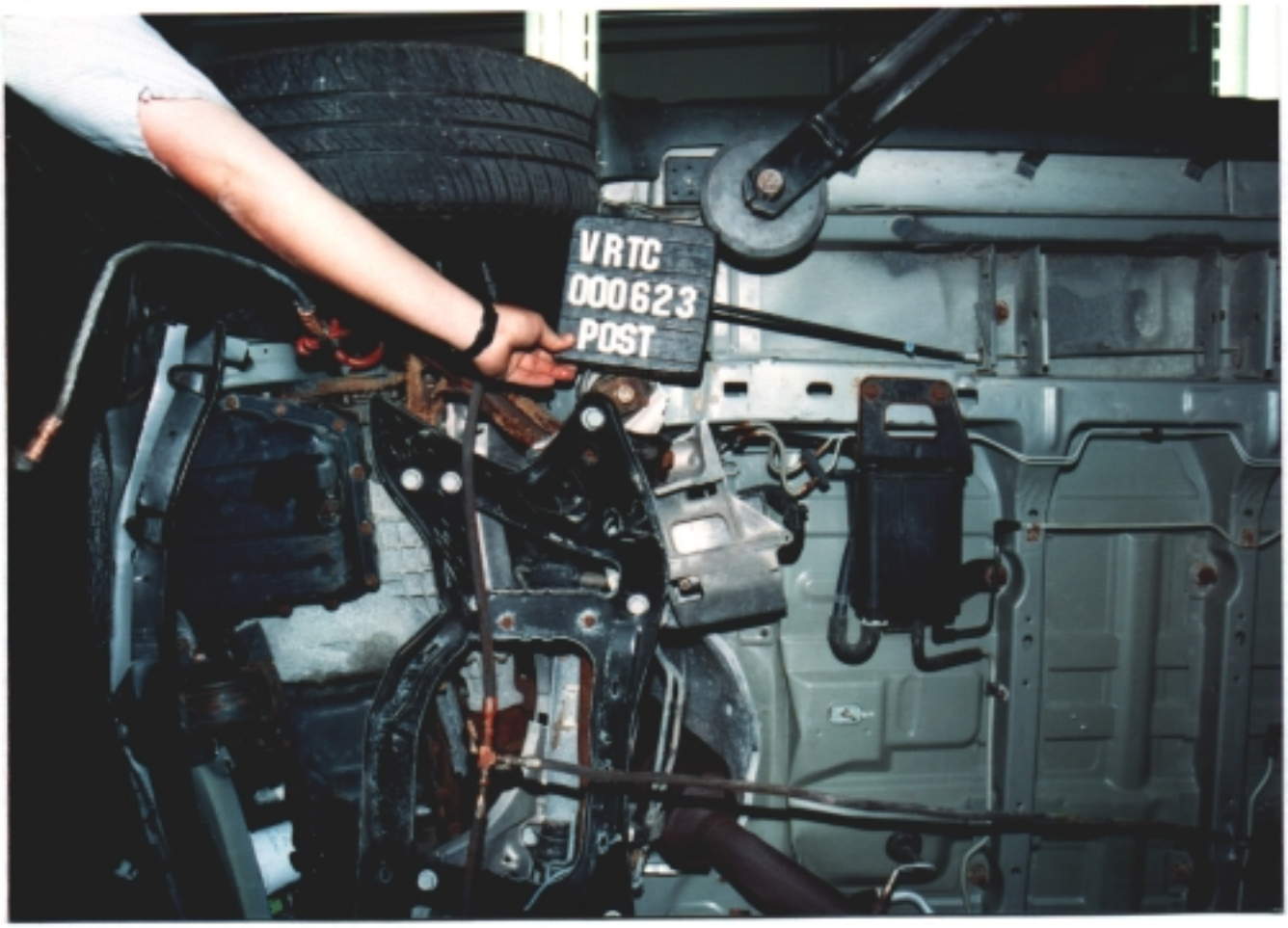


Figure A-74 Post-Test Bullet Vehicle Front Underbody - View 3

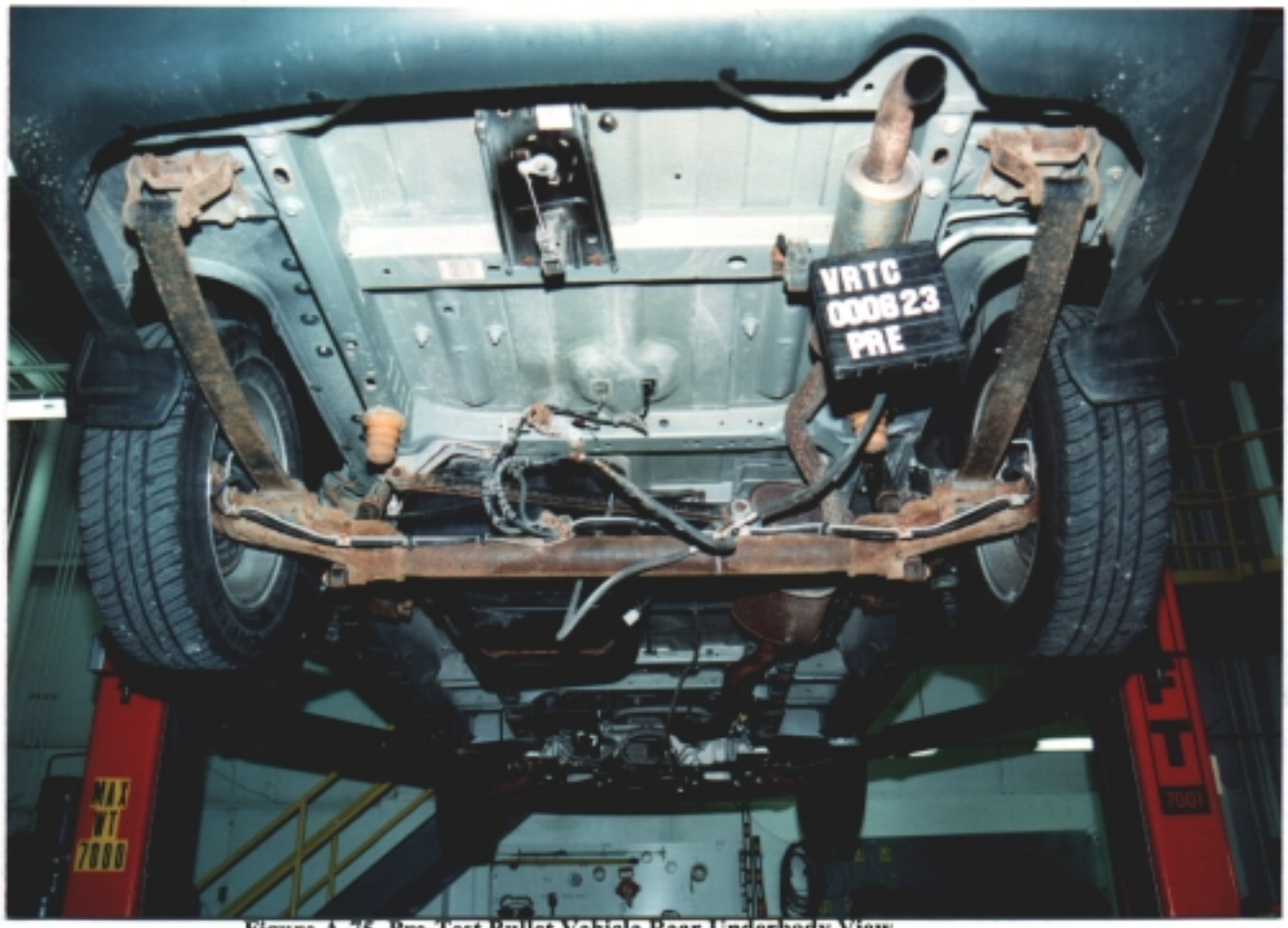


Figure A-75 Pre-Test Bullet Vehicle Rear Underbody View

Figure A-76 Post-Test Bullet Vehicle Rear Underbody View

Figure A-77 Pre-Test Bullet Vehicle Windshield View - Driver and Passenger Dummies

Figure A-78 Post-Test Bullet Vehicle Windshield View - Driver and Passenger Dummies

Figure A-79 Pre-Test Bullet Vehicle Driver Dummy Windshield View

Figure A-80 Post-Test Bullet Vehicle Driver Dummy Windshield View

Figure A-81 Pre-Test Bullet Vehicle Passenger Dummy Windshield View

Figure A-82 Post-Test Bullet Vehicle Passenger Dummy Windshield View

Figure A-83 Pre-Test Bullet Vehicle Driver Dummy - View 1

Figure A-84 Post-Test Bullet Vehicle Driver Dummy - View 1

Figure A-85 Pre-Test Bullet Vehicle Driver Dummy - View 2

Figure A-86 Post-Test Bullet Vehicle Driver Dummy - View 2

Figure A-87 Pre-Test Bullet Vehicle Driver Dummy - View 3

Figure A-88 Post-Test Bullet Vehicle Driver Dummy - View 3

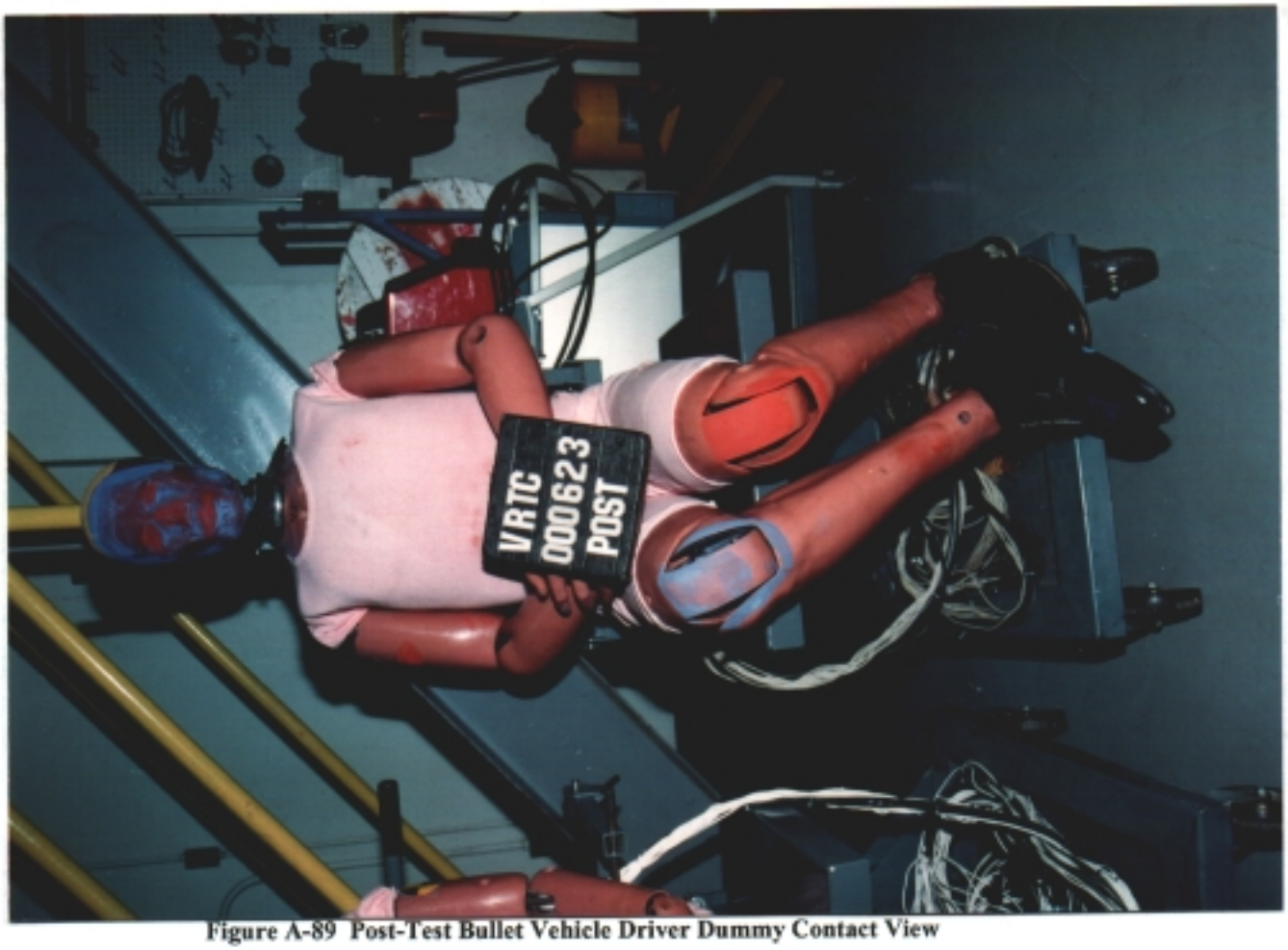


Figure A-89 Post-Test Bullet Vehicle Driver Dummy Contact View

Figure A-90 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 1

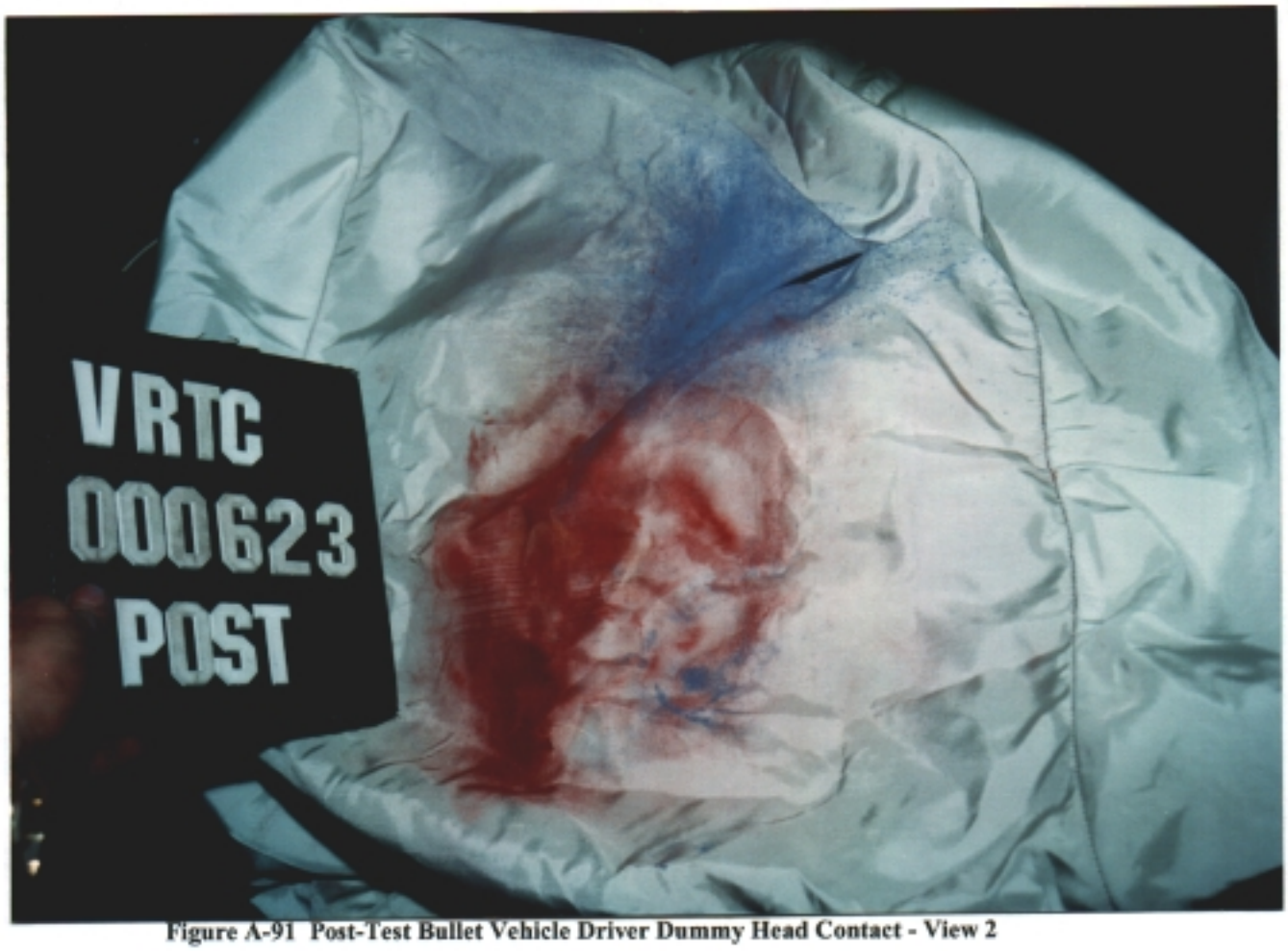


Figure A-91 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 2

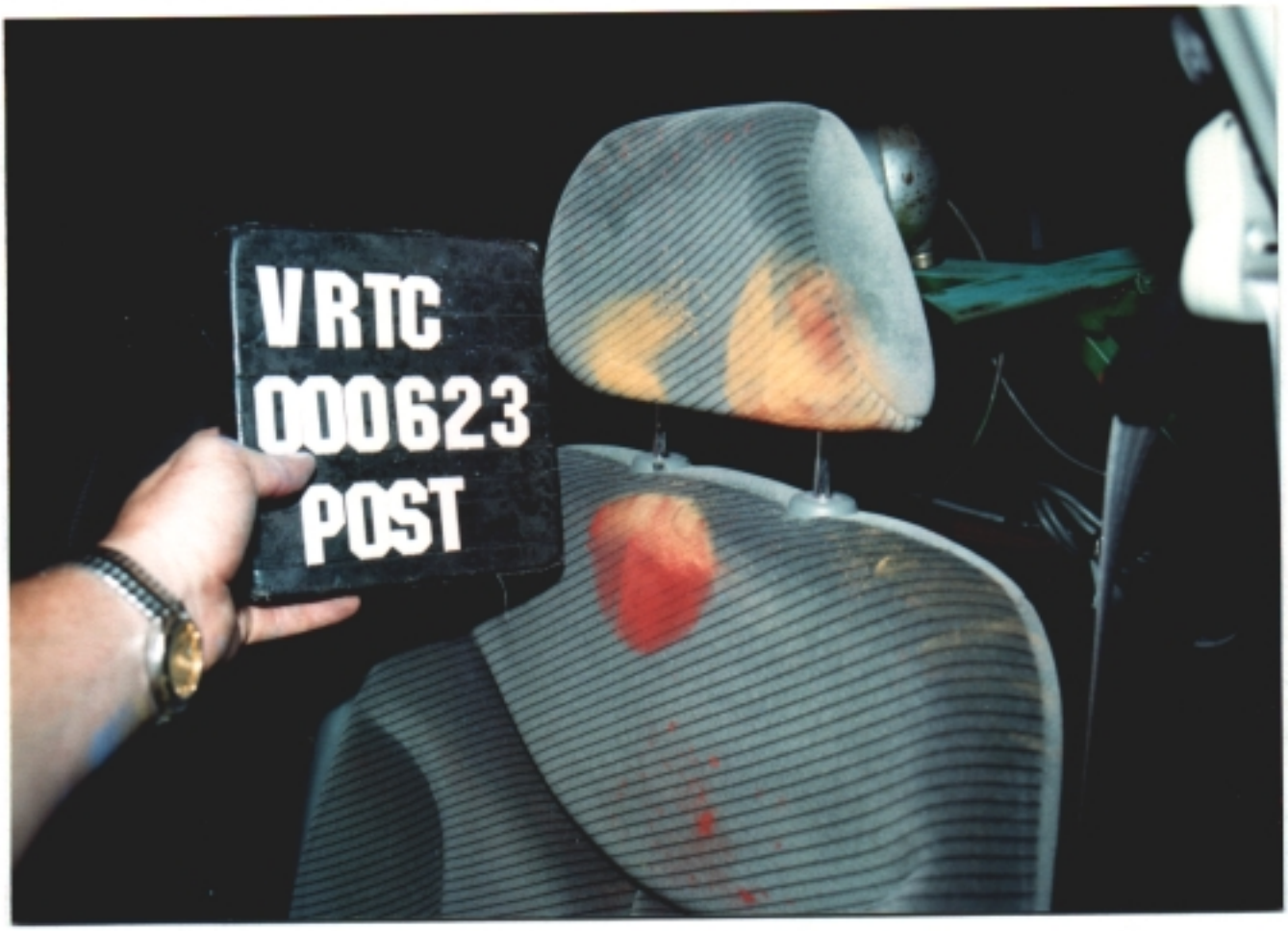


Figure A-92 Post-Test Bullet Vehicle Driver Dummy Head Contact - View 3

Figure A-93 Post-Test Bullet Vehicle Driver Dummy Knee Contact - View 1

Figure A-94 Post-Test Bullet Vehicle Driver Dummy Knee Contact - View 2

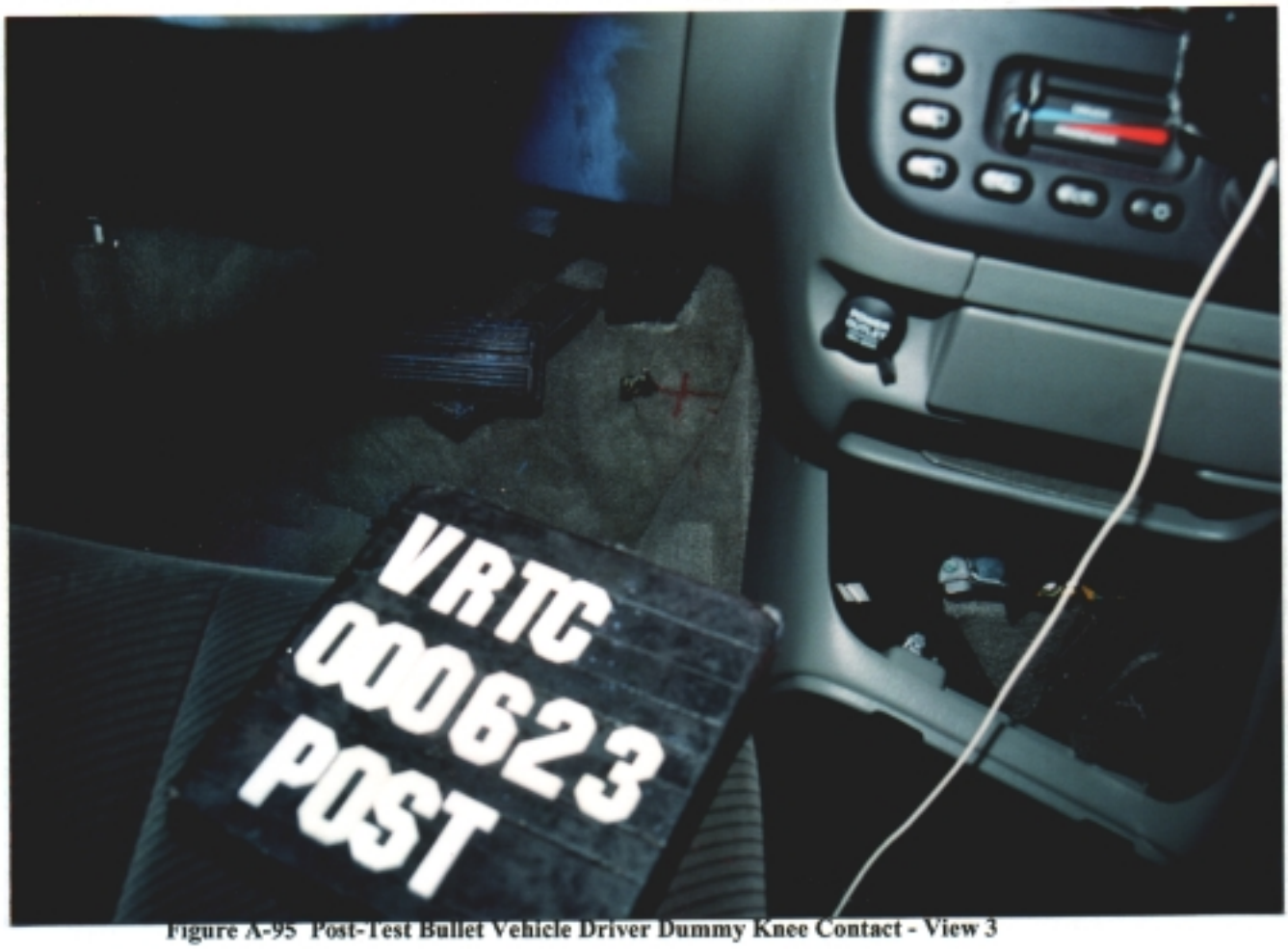


Figure A-95 Post-Test Bullet Vehicle Driver Dummy Knee Contact - View 3

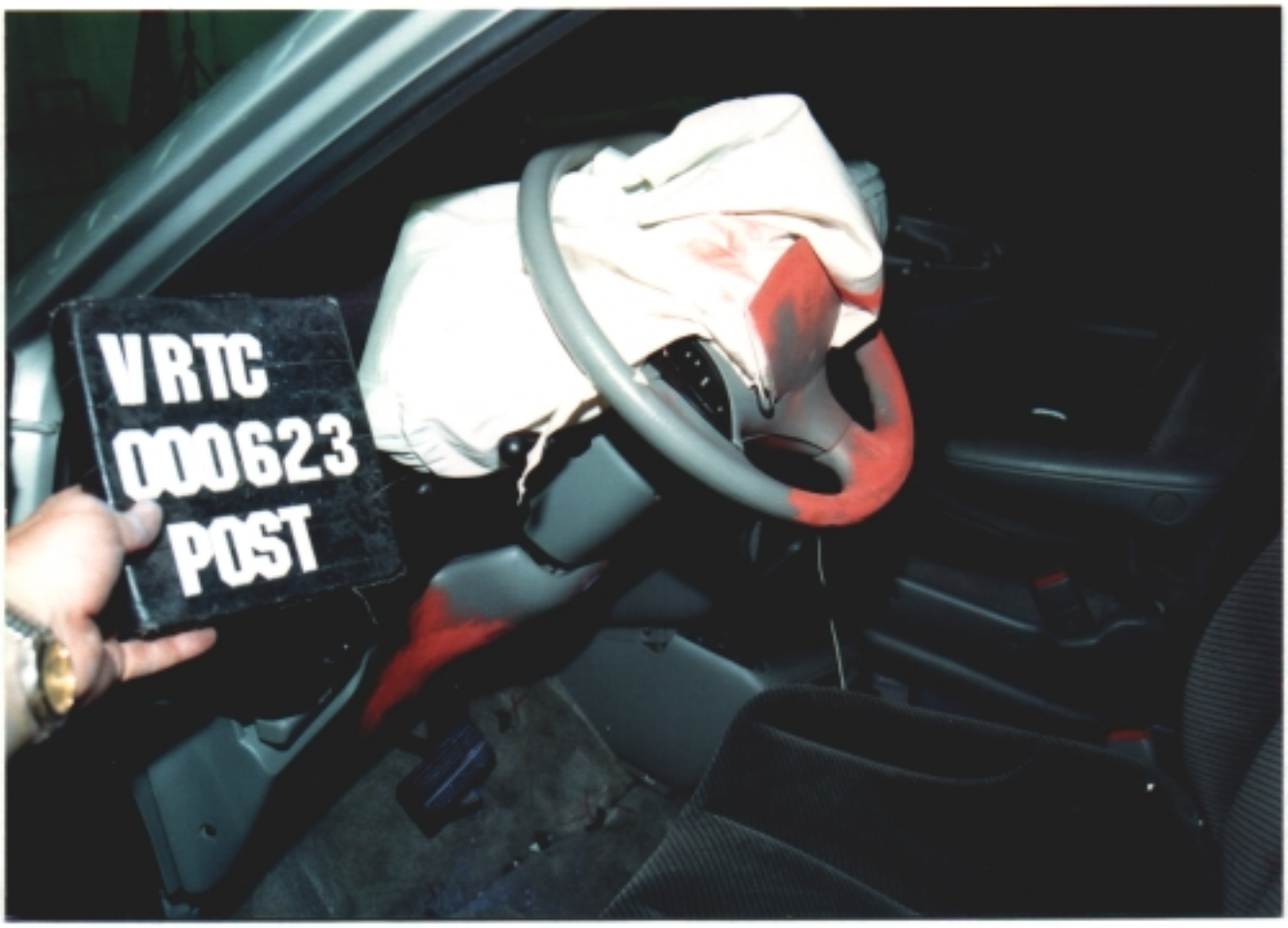


Figure A-96 Post-Test Bullet Vehicle Driver Dummy Abdomen Contact View

Figure A-97 Pre-Test Bullet Vehicle Passenger Dummy - View 1

Figure A-98 Post-Test Bullet Vehicle Passenger Dummy - View 1

Figure A-99 Pre-Test Bullet Vehicle Passenger Dummy - View 2

Figure A-100 Post-Test Bullet Vehicle Passenger Dummy - View 2

Figure A-101 Pre-Test Bullet Vehicle Passenger Dummy - View 3

Figure A-102 Post-Test Bullet Vehicle Passenger Dummy - View 3

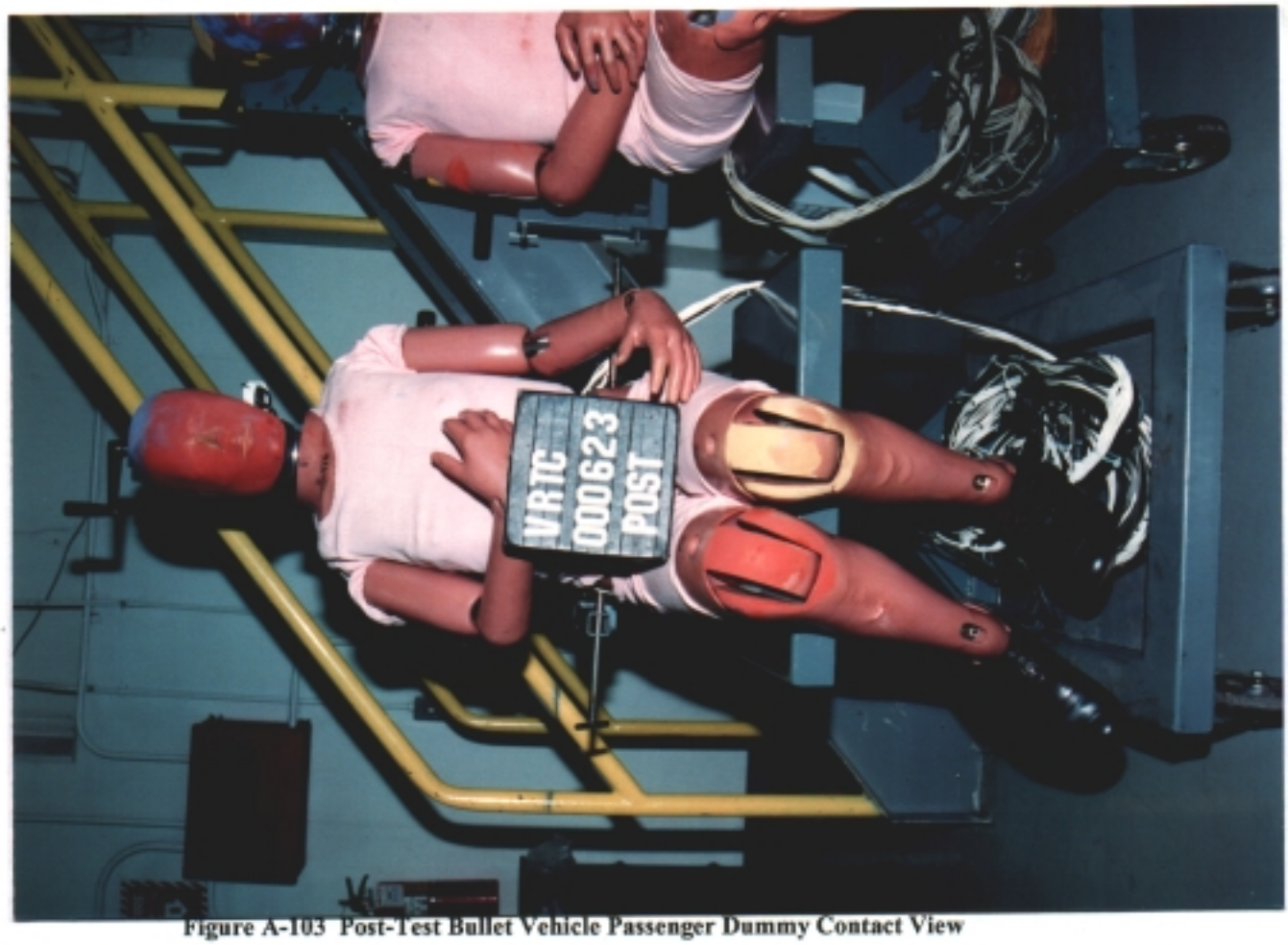


Figure A-103 Post-Test Bullet Vehicle Passenger Dummy Contact View

Figure A-104 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 1

Figure A-105 Post-Test Bullet Vehicle Passenger Dummy Head Contact - View 2

Figure A-106 Post-Test Bullet Vehicle Passenger Dummy Knee Contact - View 1

Figure A-107 Post-Test Bullet Vehicle Passenger Dummy Knee Contact - View 2

Figure A-108 Target Vehicle Certification Label

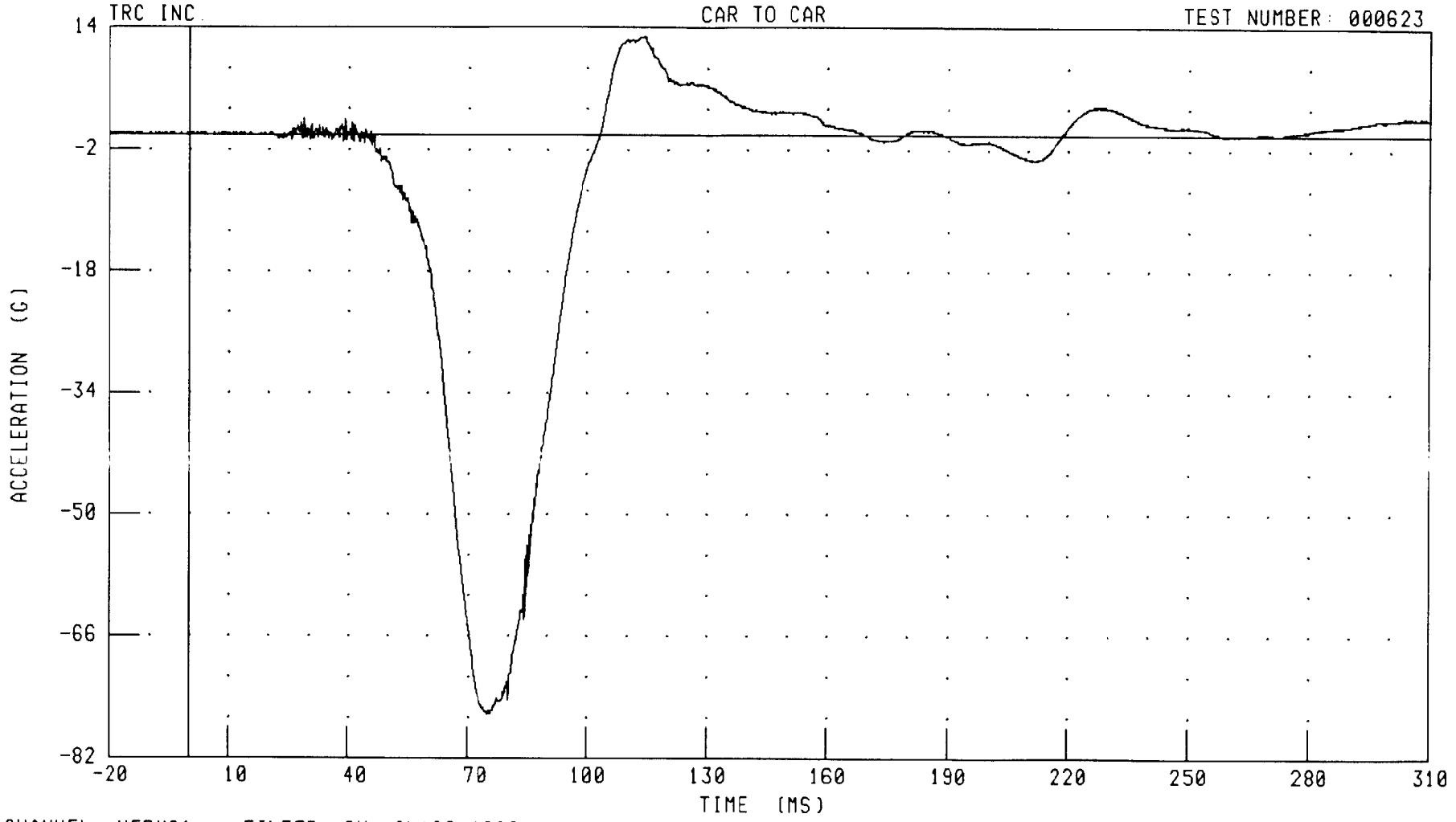
Figure A-109 Bullet Vehicle Certification Label

Appendix B

Data Plots

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

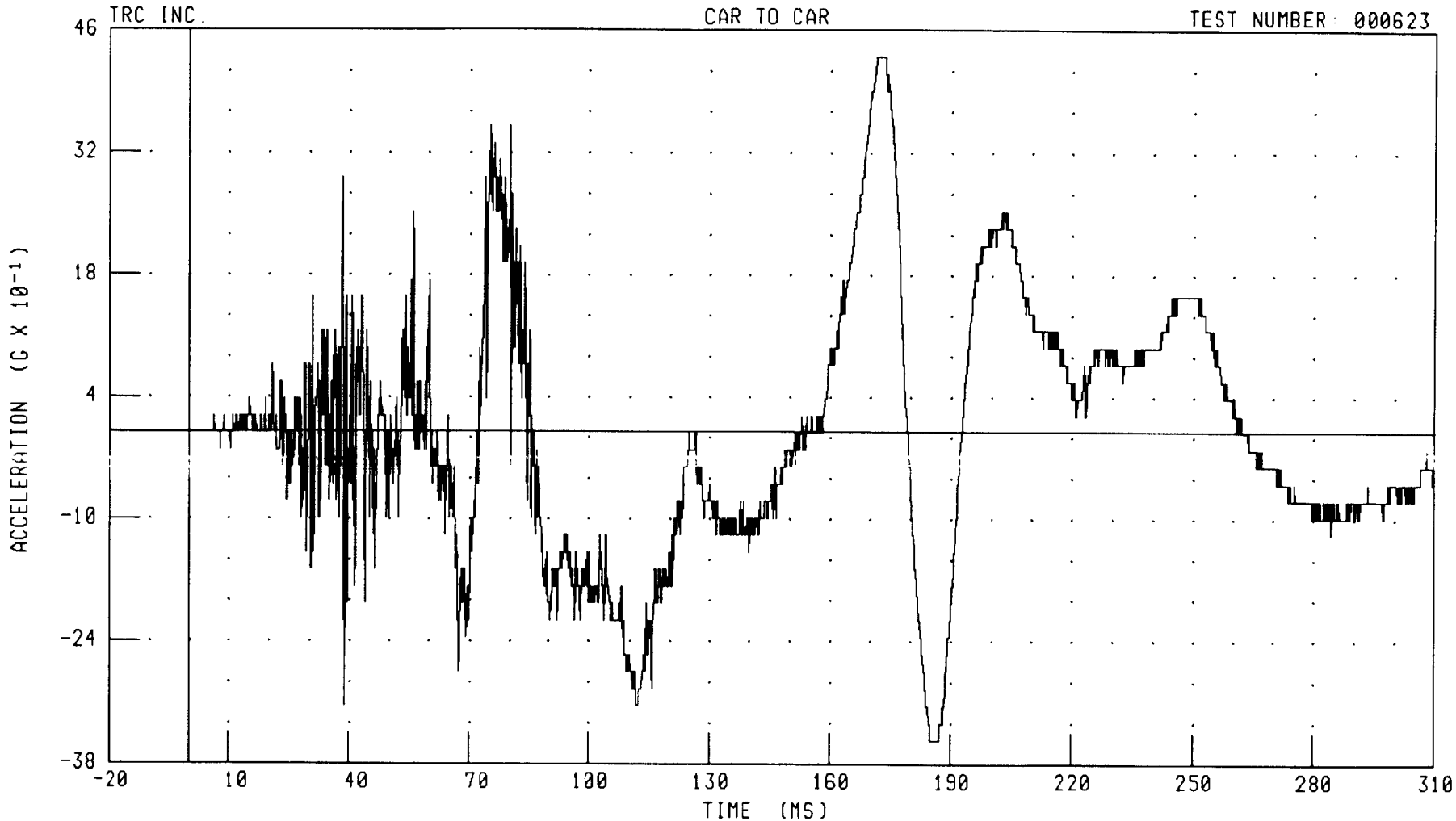
CARAVAN DRIVER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXG1 FILTER: CH. CLASS 1000 PEAK DATA: 12.83 G @ 114.40 MS, -76.33 G @ 74.96 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

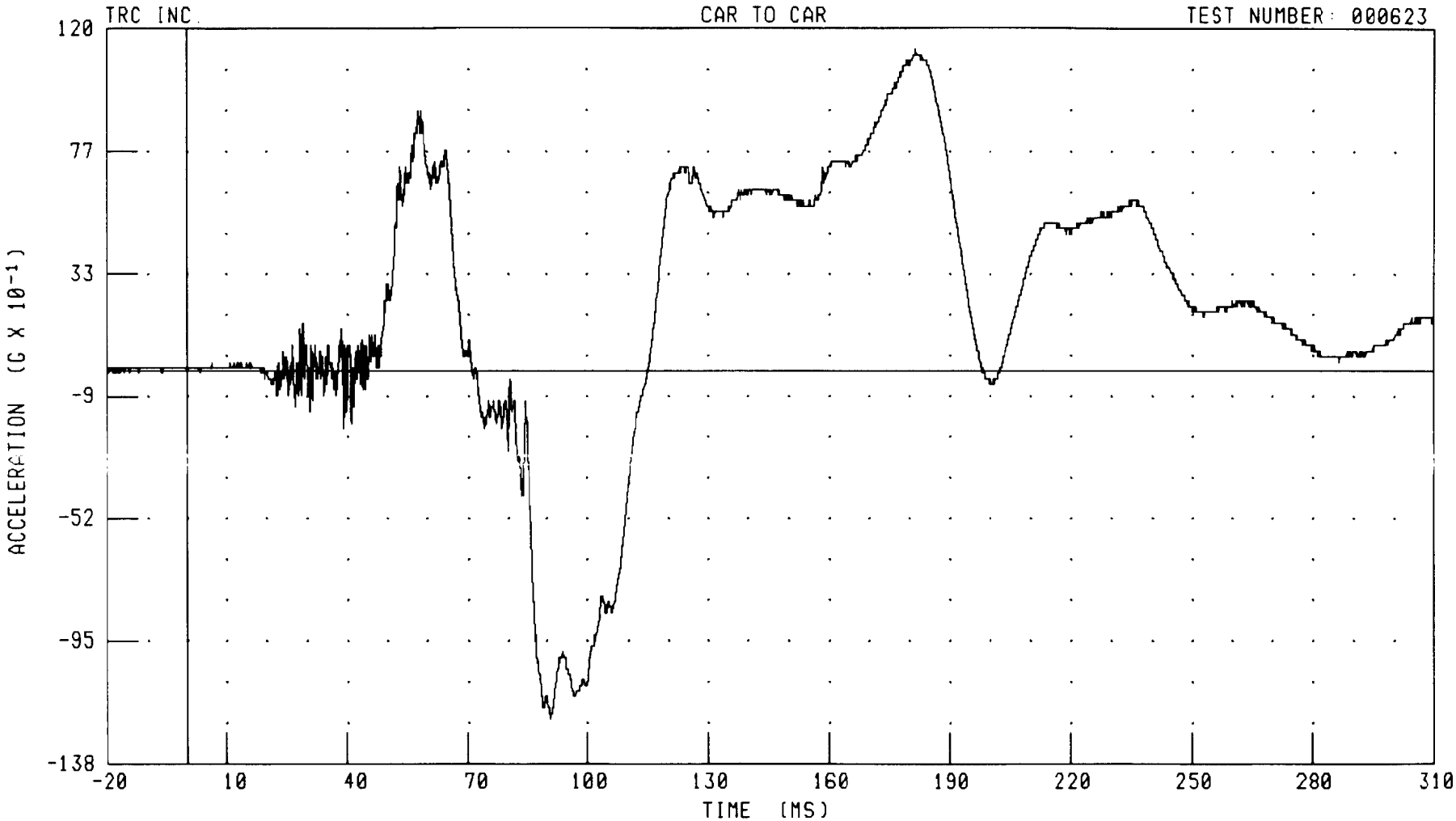
CARAVAN DRIVER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYG1 FILTER: CH. CLASS 1000 PEAK DATA: 4.29 G @ 171.36 MS; -3.53 G @ 185.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

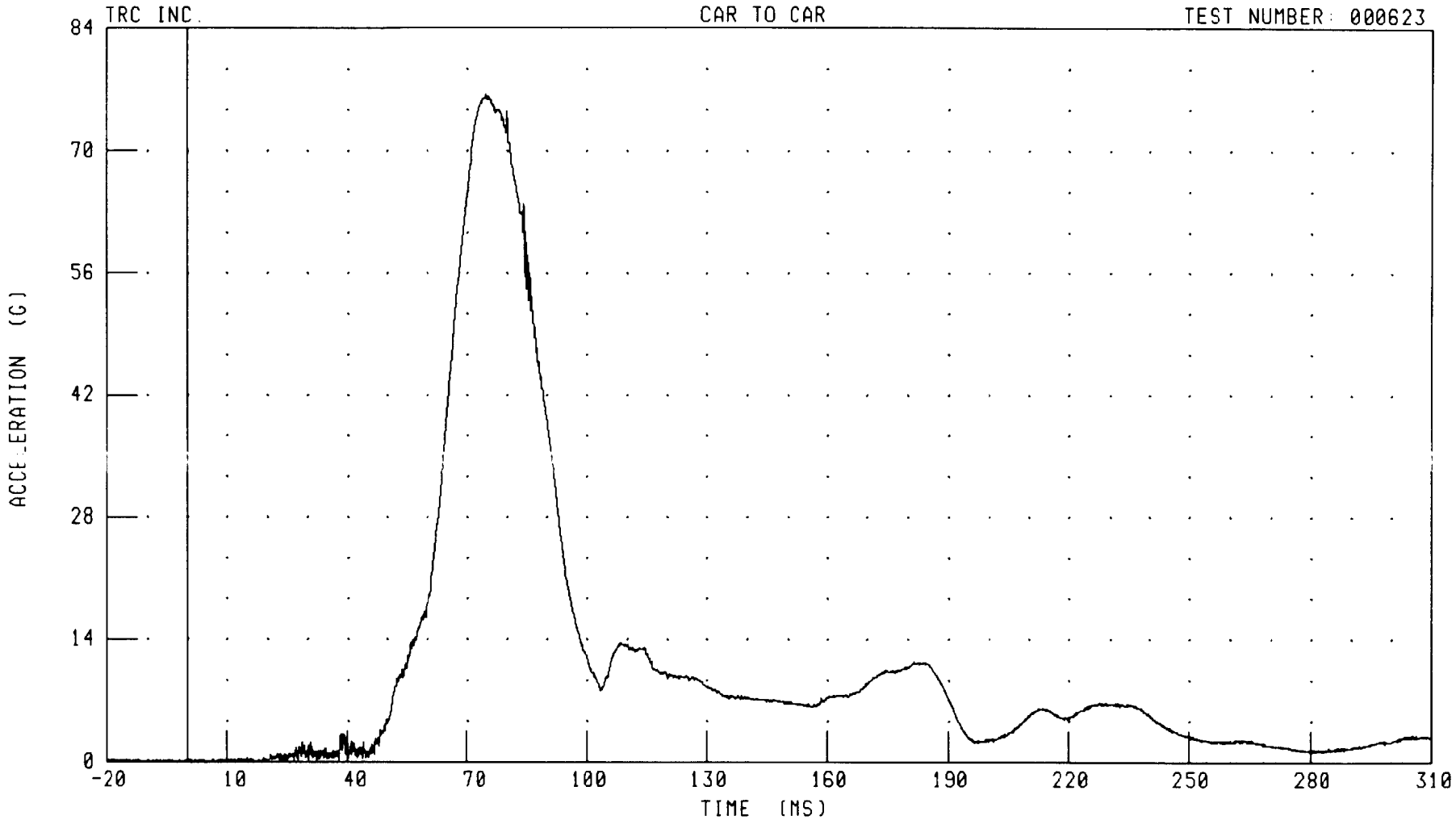
CARAVAN DRIVER HEAD Z-AXIS ACCELERATION



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000 PEAK DATA: 11.27 G @ 181.76 MS; -12.24 G @ 90.96 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

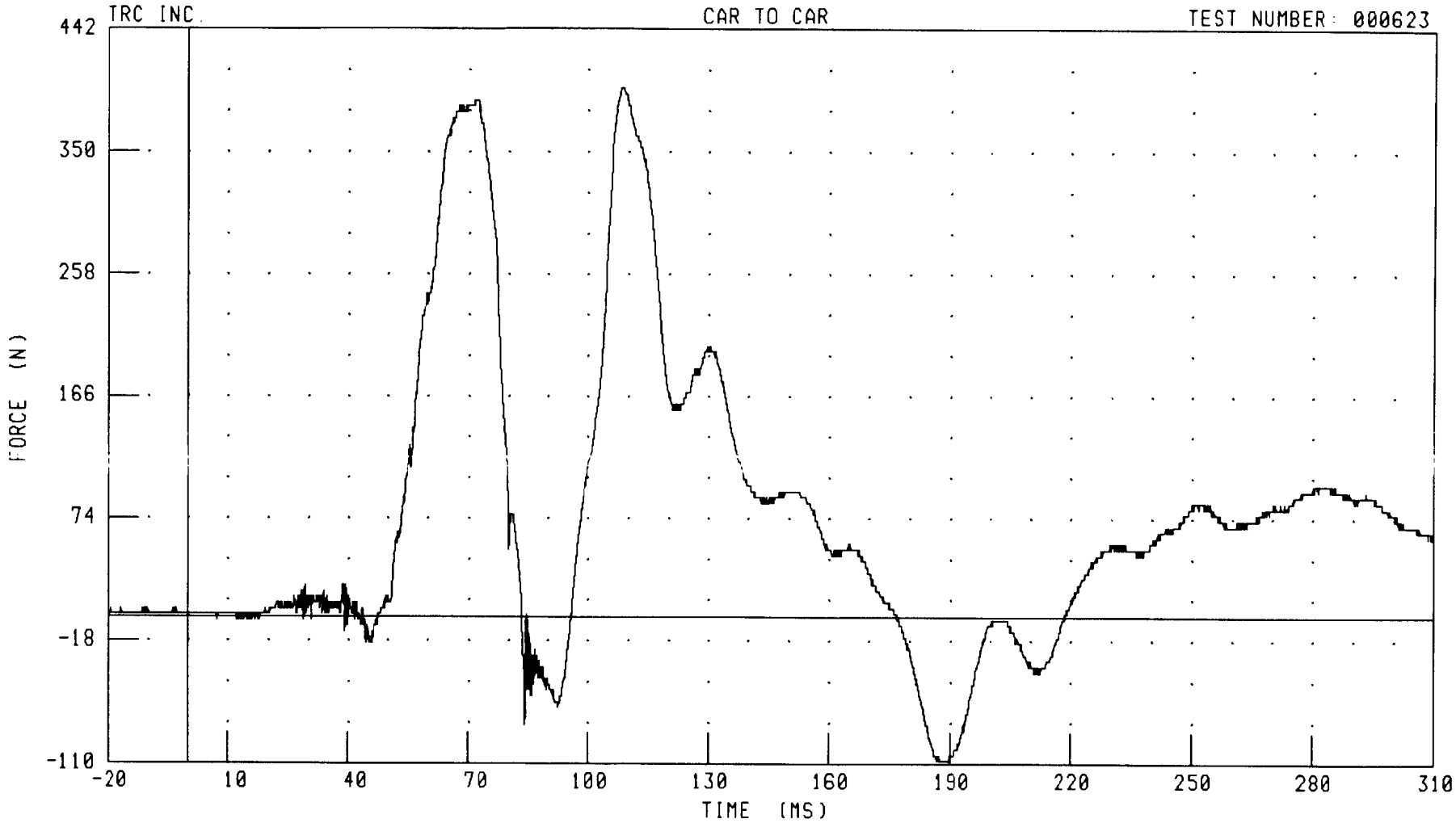
CARAVAN DRIVER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG1 FILTER: CH CLASS 1000 PEAK DATA: 76.40 G @ 75.04 MS; 0.09 G @ -18.64 MS

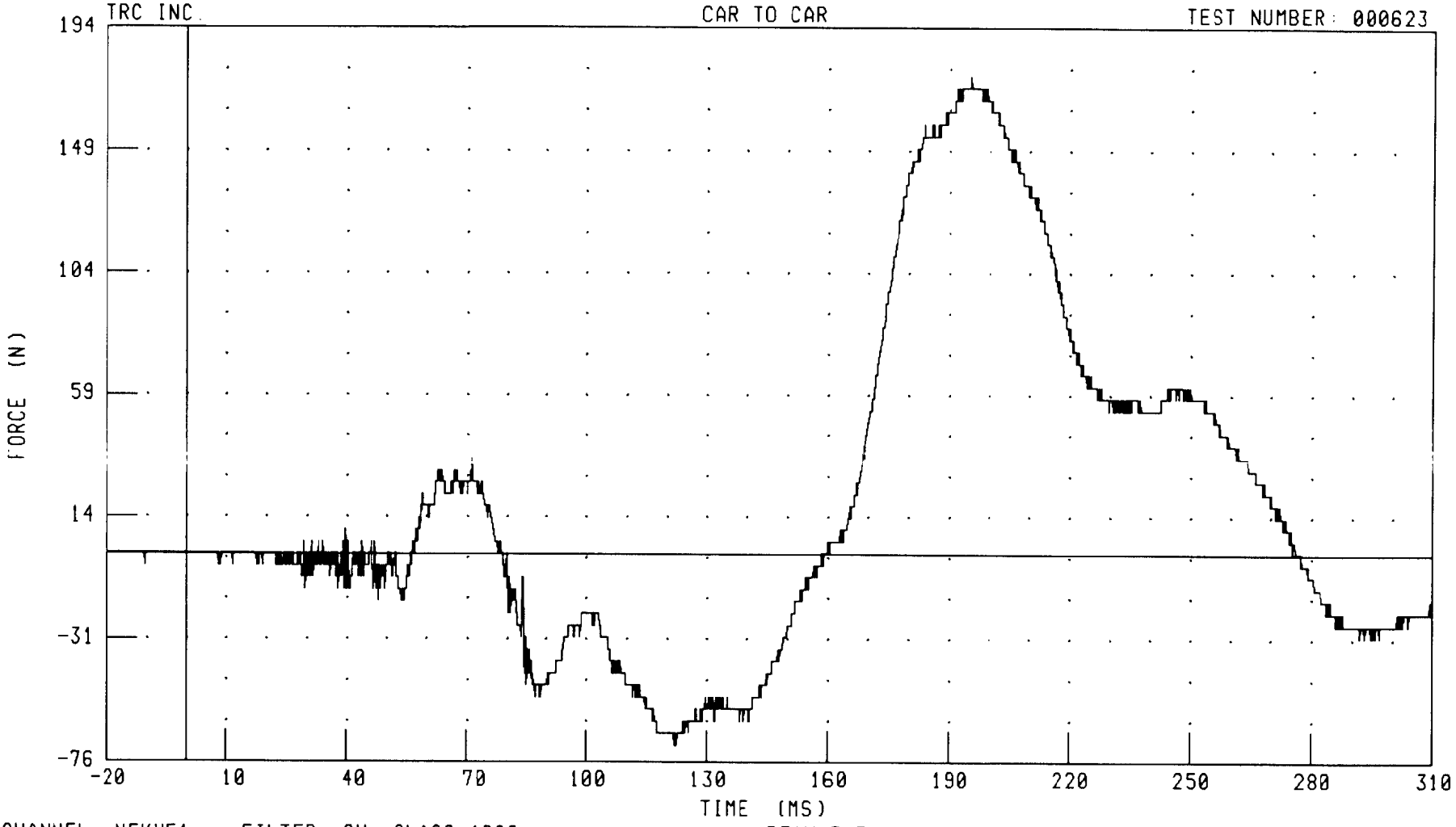
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN DRIVER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXF1 FILTER: CH. CLASS 1000 PEAK DATA: 397.41 N @ 108.16 MS; -107.89 N @ 186.64 MS

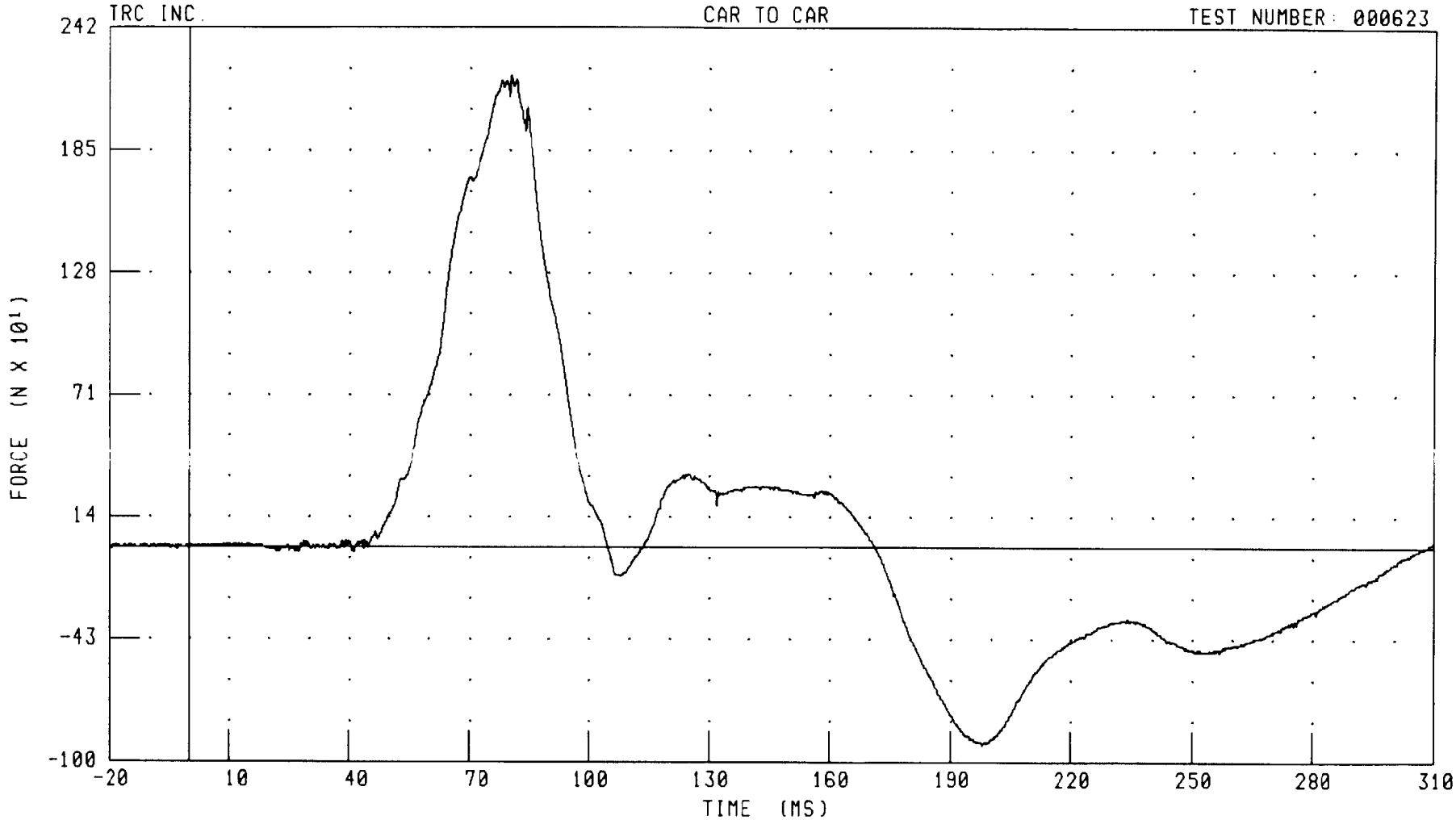
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER NECK Y-AXIS SHEAR FORCE



CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 176.25 N @ 195.44 MS; -69.91 N @ 121.84 MS

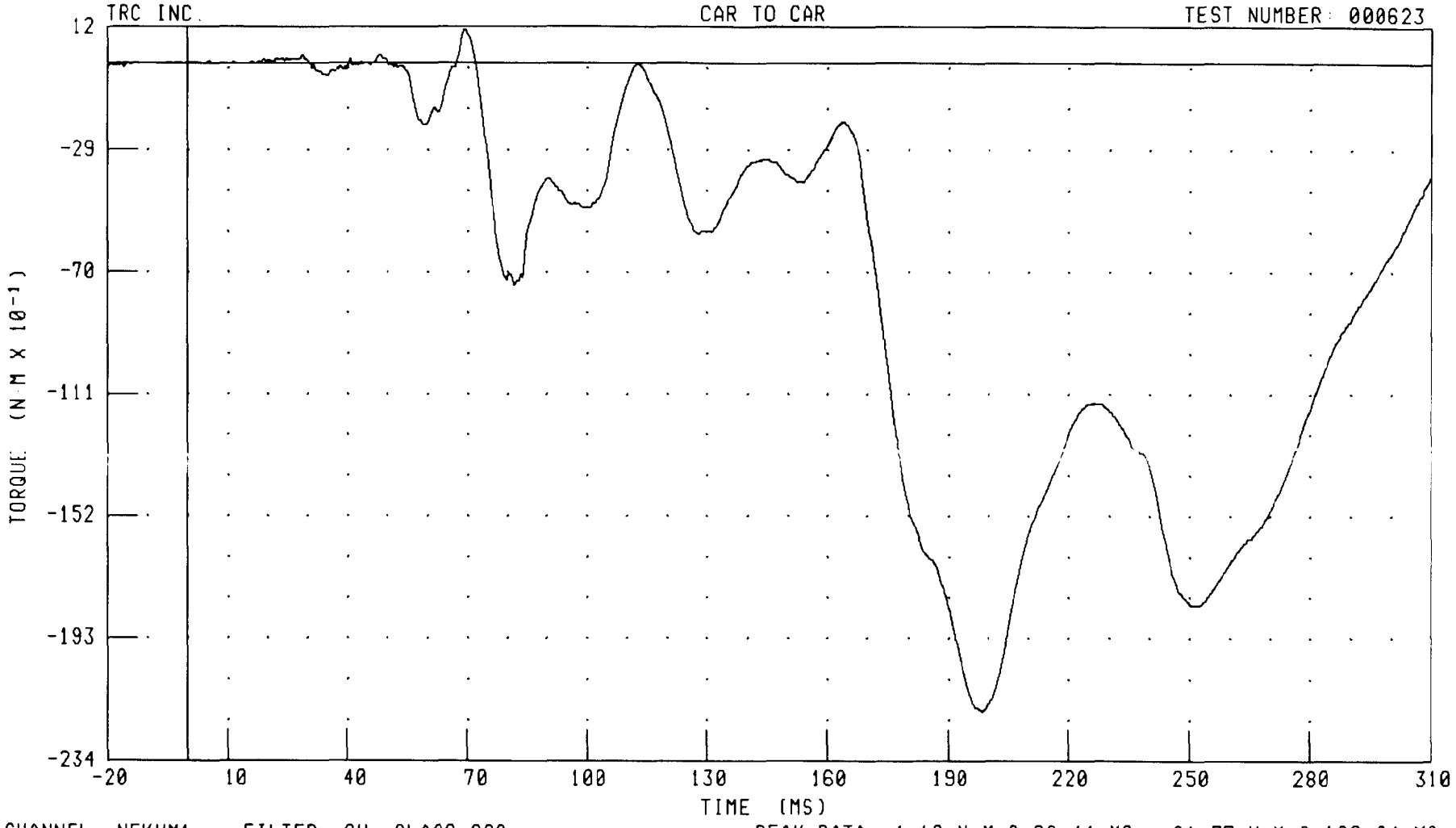
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN DRIVER NECK Z-AXIS AXIAL FORCE



CHANNEL: NEKZF1 FILTER: CH. CLASS 1000 PEAK DATA: 2201.08 N @ 80.48 MS; -921.55 N @ 198.00 MS

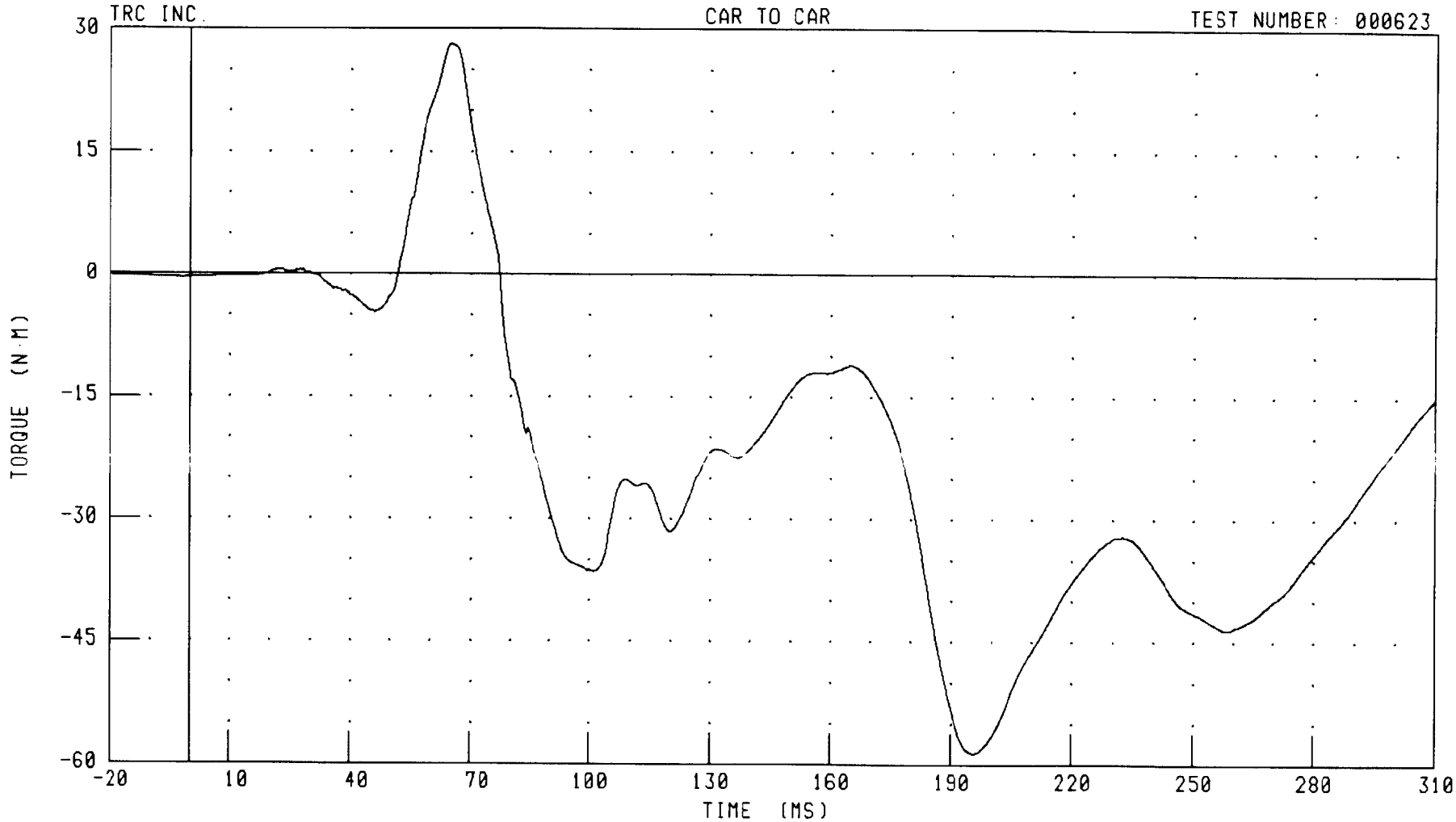
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER NECK MOMENT ABOUT X AXIS



CHANNEL: NEKXM1 FILTER: CH. CLASS 600 PEAK DATA: 1.12 N-M @ 69.44 MS; -21.77 N-M @ 198.64 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

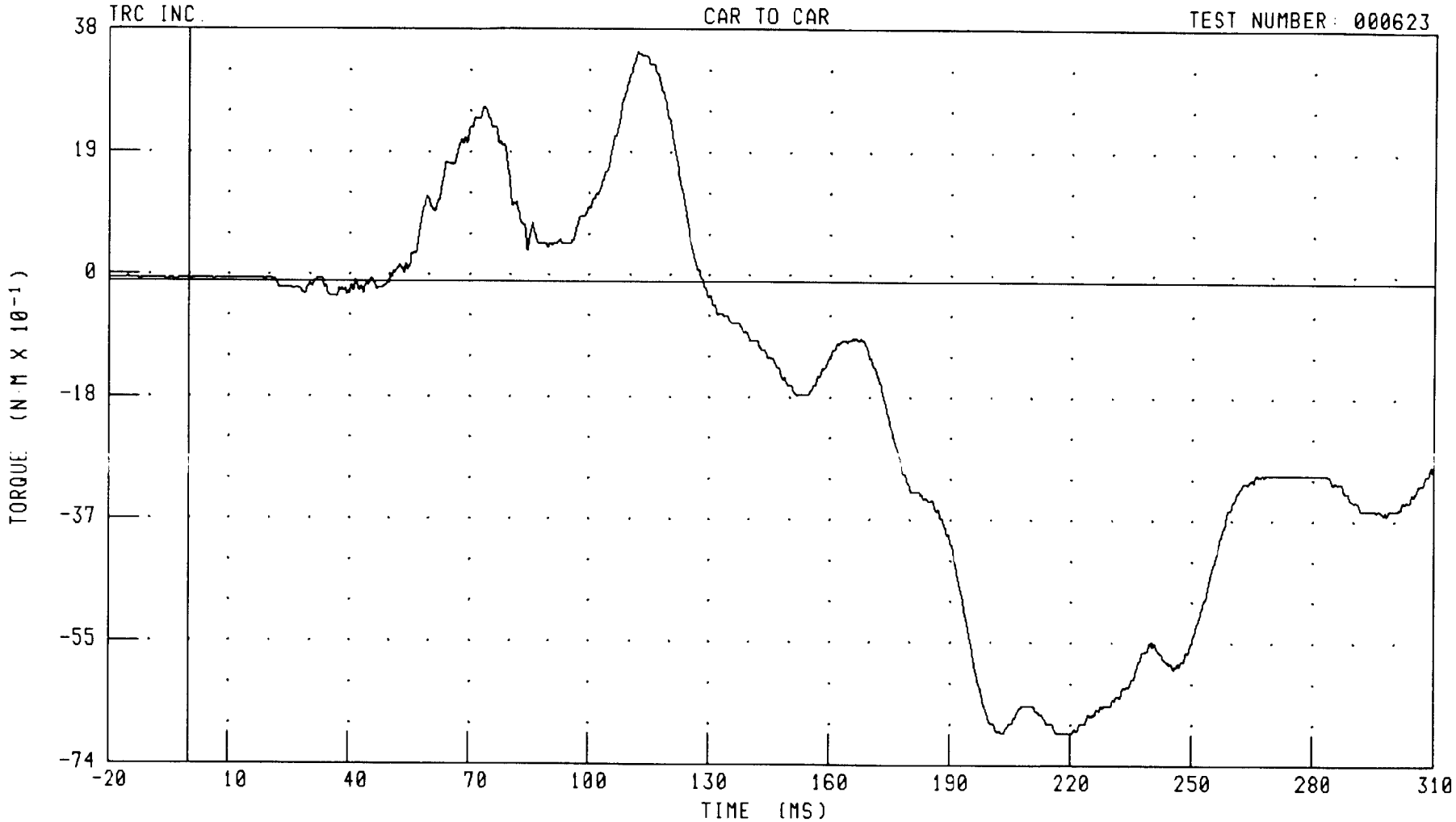
CARAVAN DRIVER NECK MOMENT ABOUT Y AXIS



CHANNEL: NEKYM1 FILTER: CH. CLASS 600

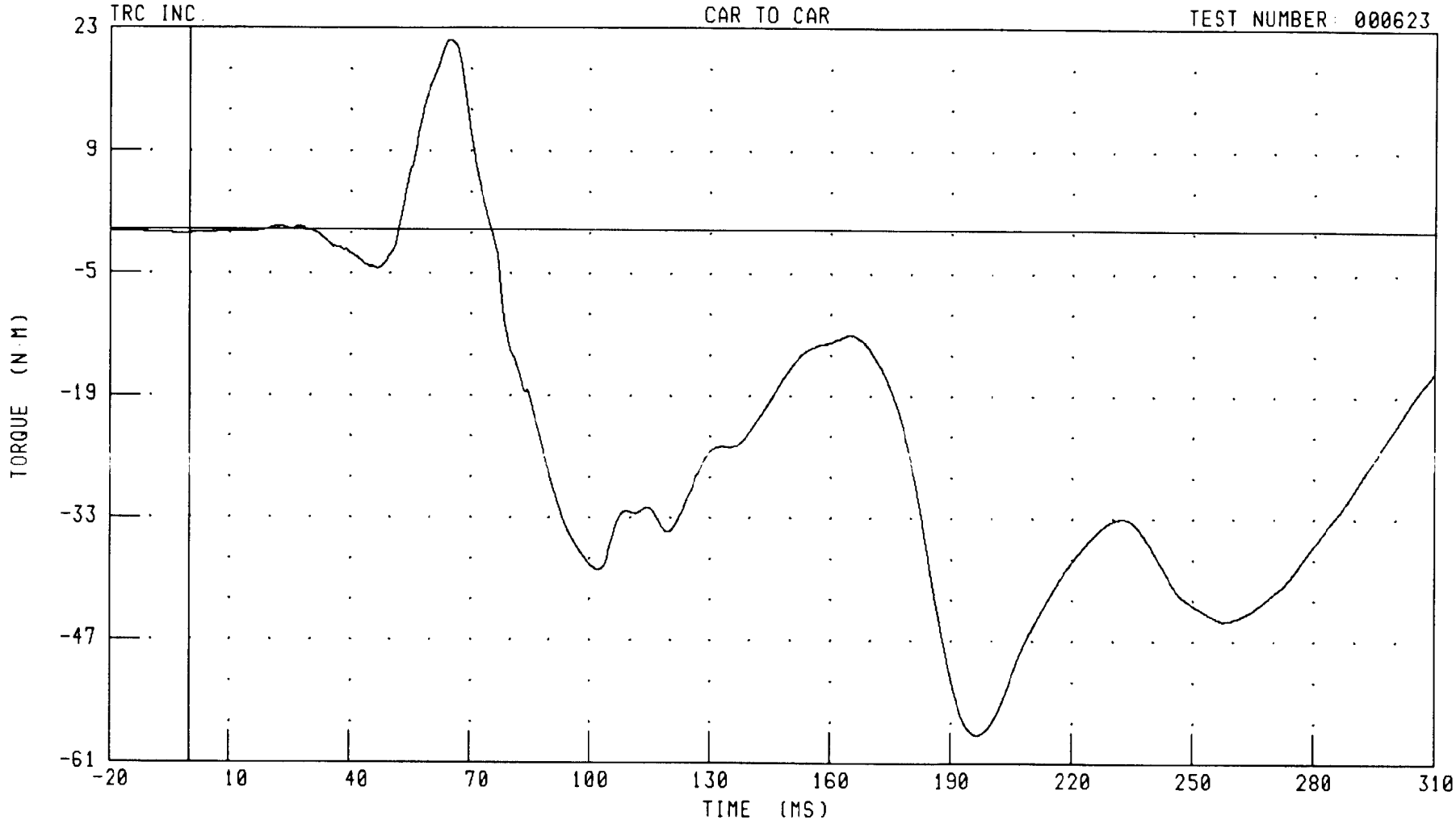
PEAK DATA: 28.09 N-M @ 65.04 MS; -58.62 N-M @ 195.76 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER NECK MOMENT ABOUT Z AXIS



CHANNEL: NEKZM1 FILTER: CH. CLASS 600 PEAK DATA: 3.55 N-M @ 111.92 MS; -7.00 N-M @ 203.28 MS

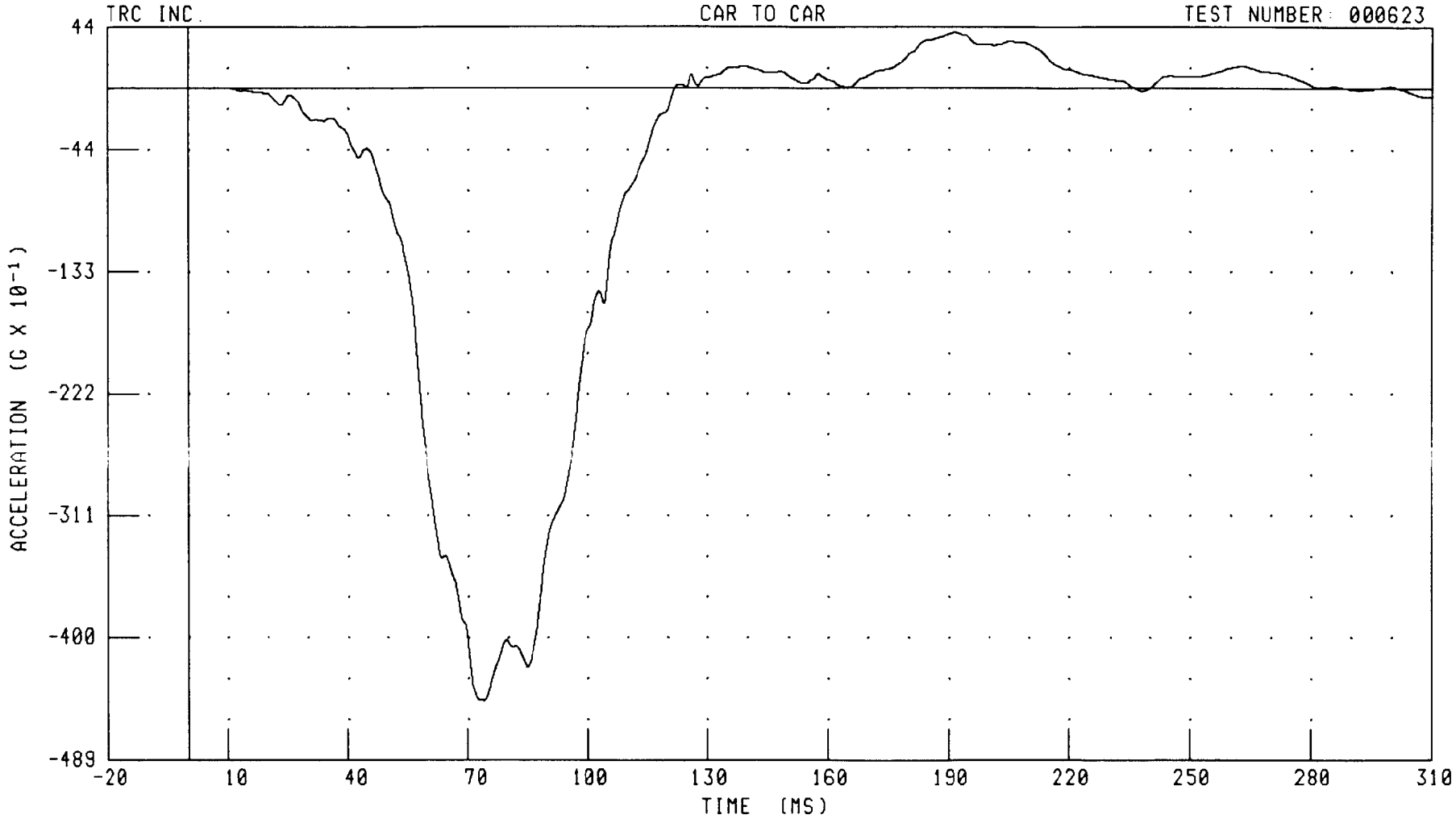
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS



CHANNEL: NEKOM1 FILTER: CH. CLASS 600 PEAK DATA: 21.64 N-M @ 64.96 MS; -57.81 N-M @ 196.72 MS

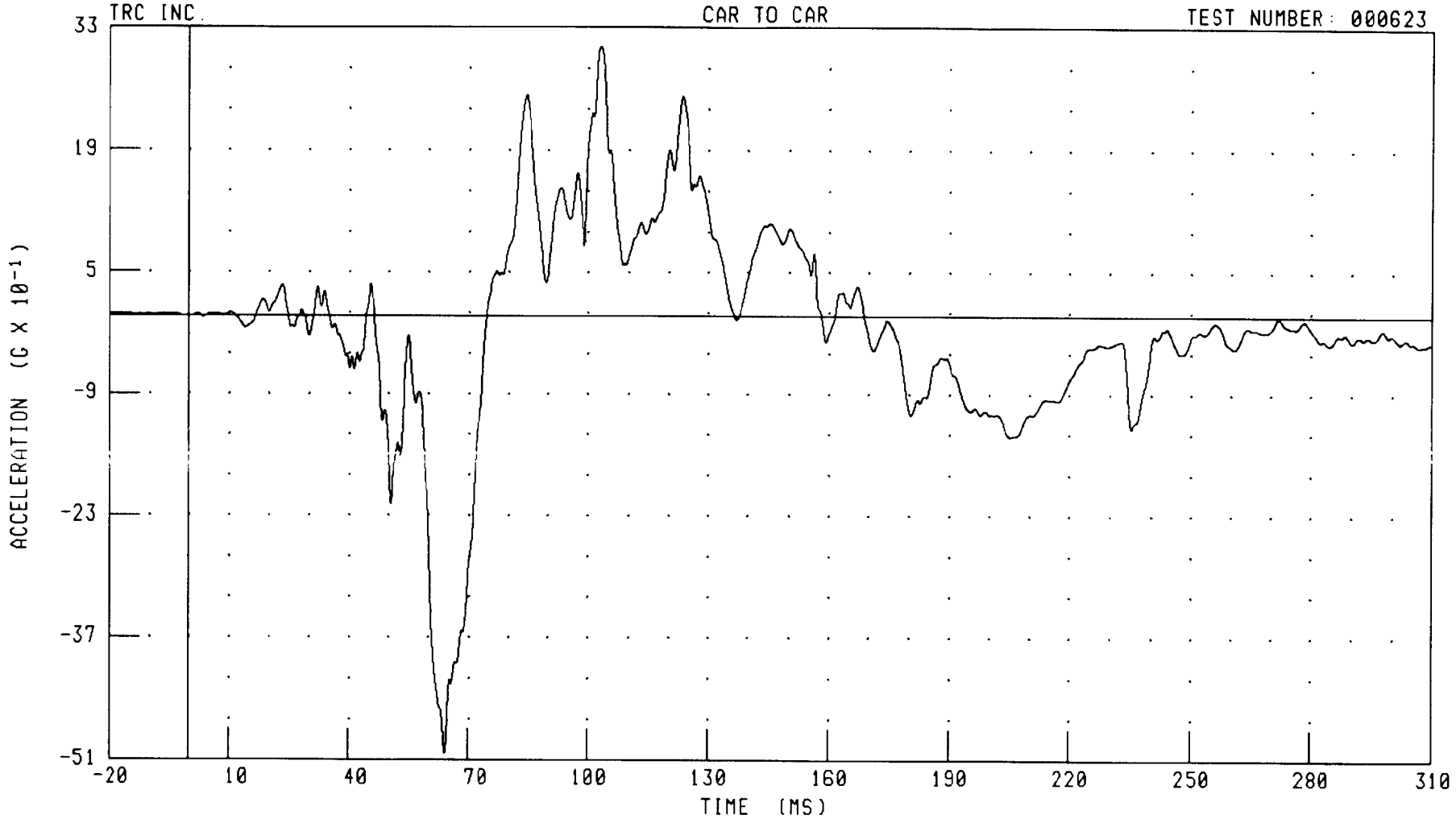
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN DRIVER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG1 FILTER: CH. CLASS 180 PEAK DATA: 4.02 G @ 191.68 MS, -44.68 G @ 74.16 MS

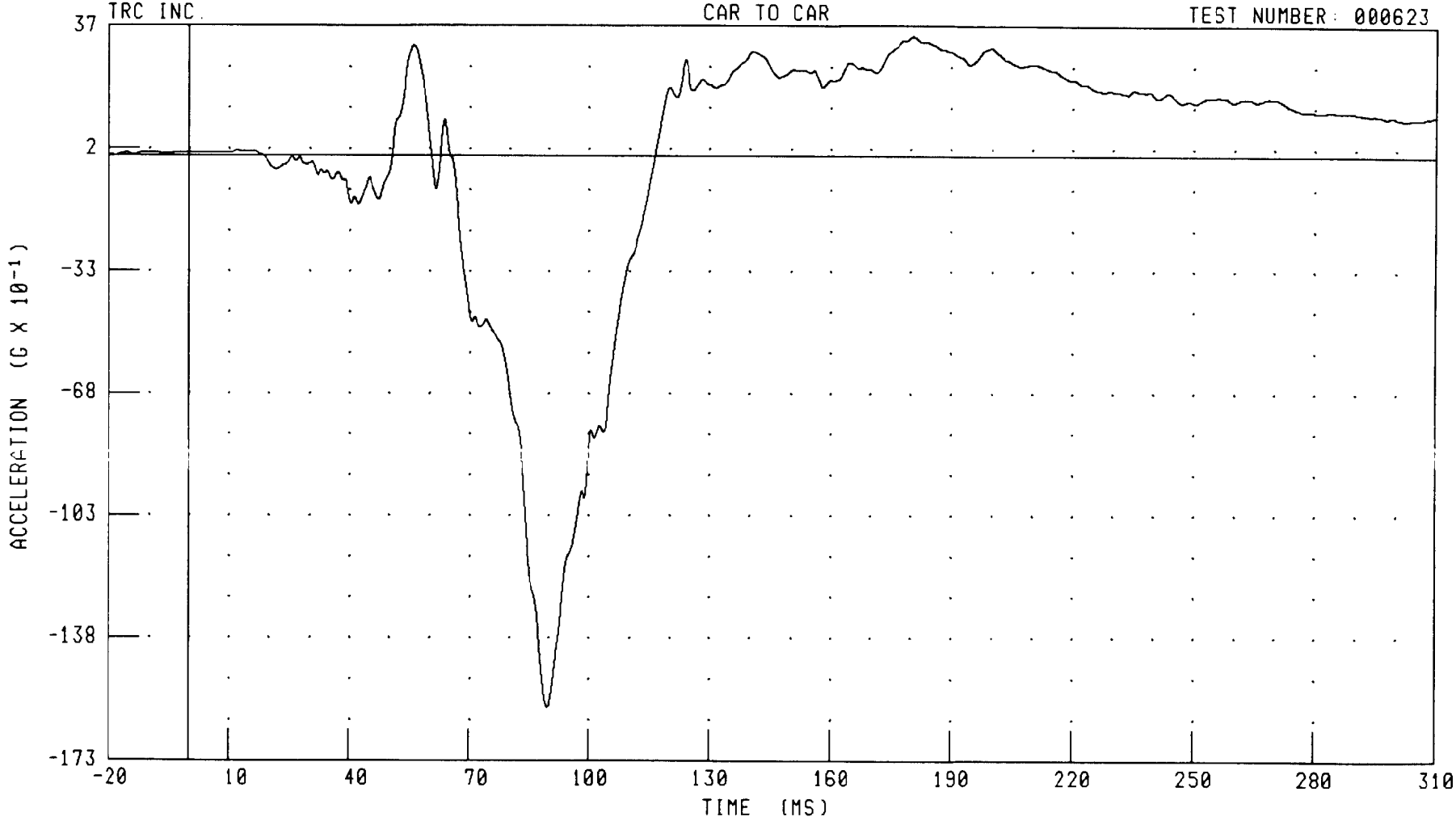
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYG1 FILTER: CH. CLASS 180 PEAK DATA: 3.08 G @ 103.20 MS; -5.03 G @ 64.16 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

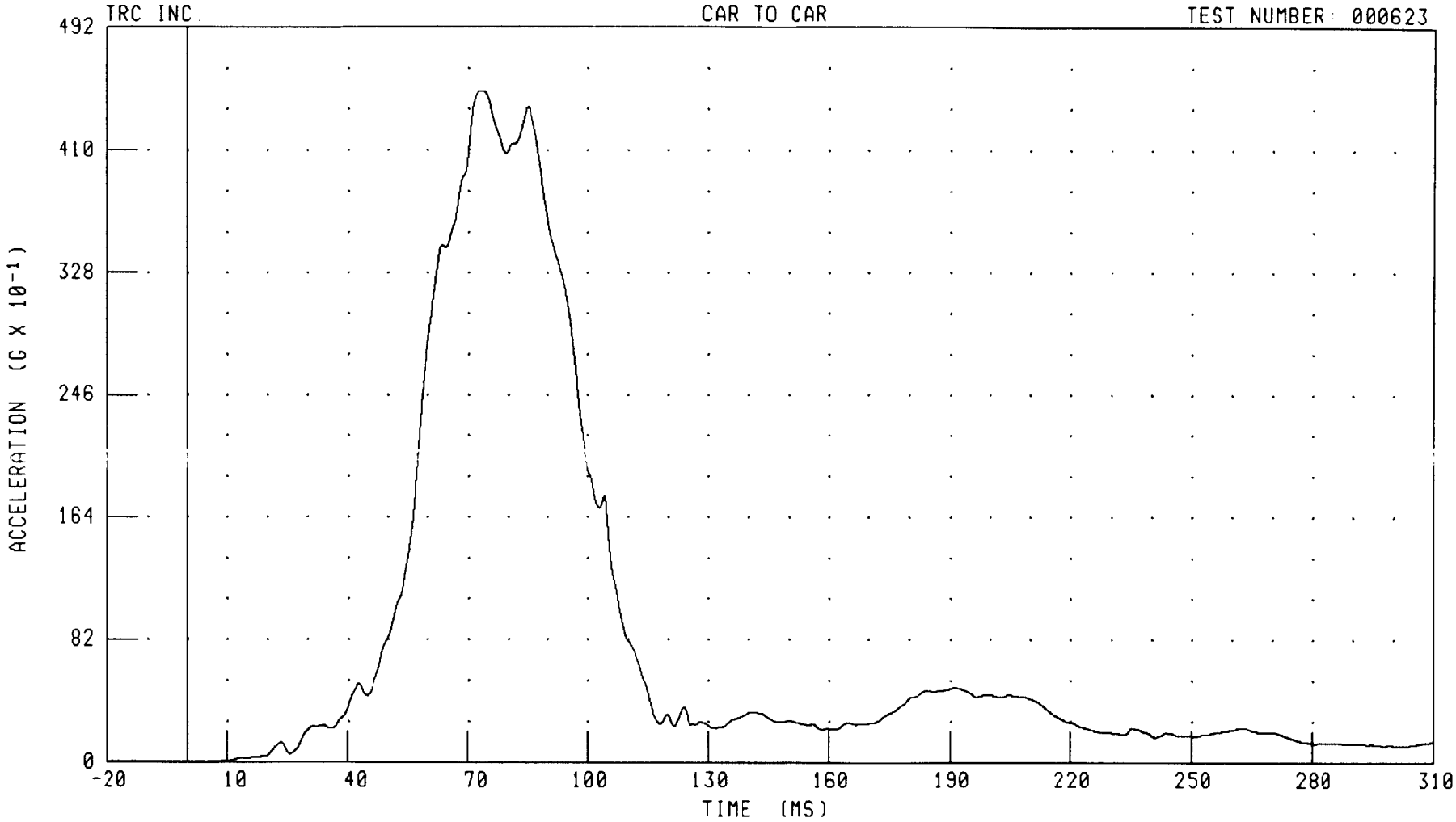
CARAVAN DRIVER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 3.40 G @ 180.72 MS; -15.78 G @ 89.76 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

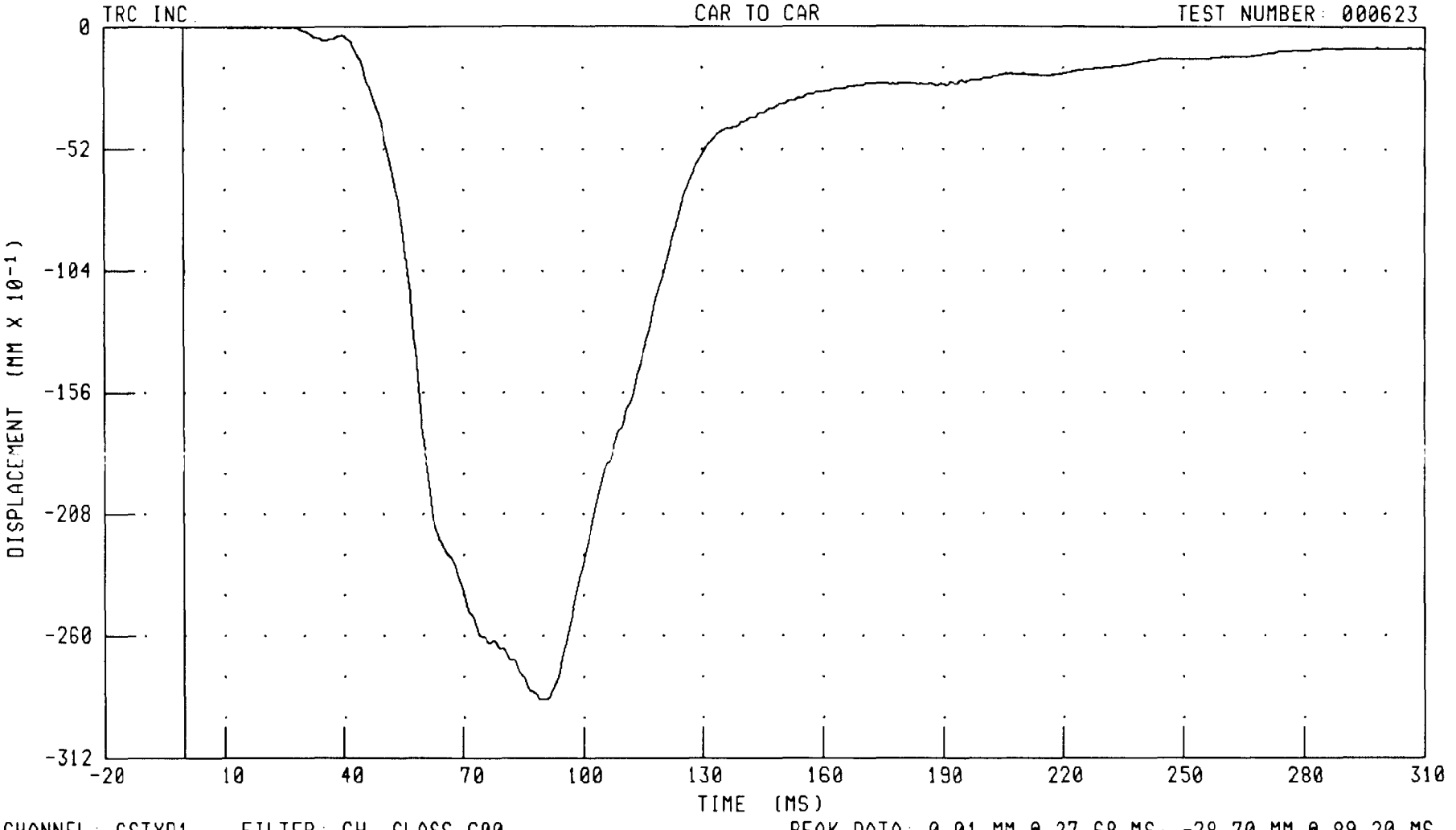
CARAVAN DRIVER CHEST RESULTANT ACCELERATION



CHANNEL: CSTRG1 FILTER: CH. CLASS 180 PEAK DATA: 44.94 G @ 72.88 MS; 0.00 G @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

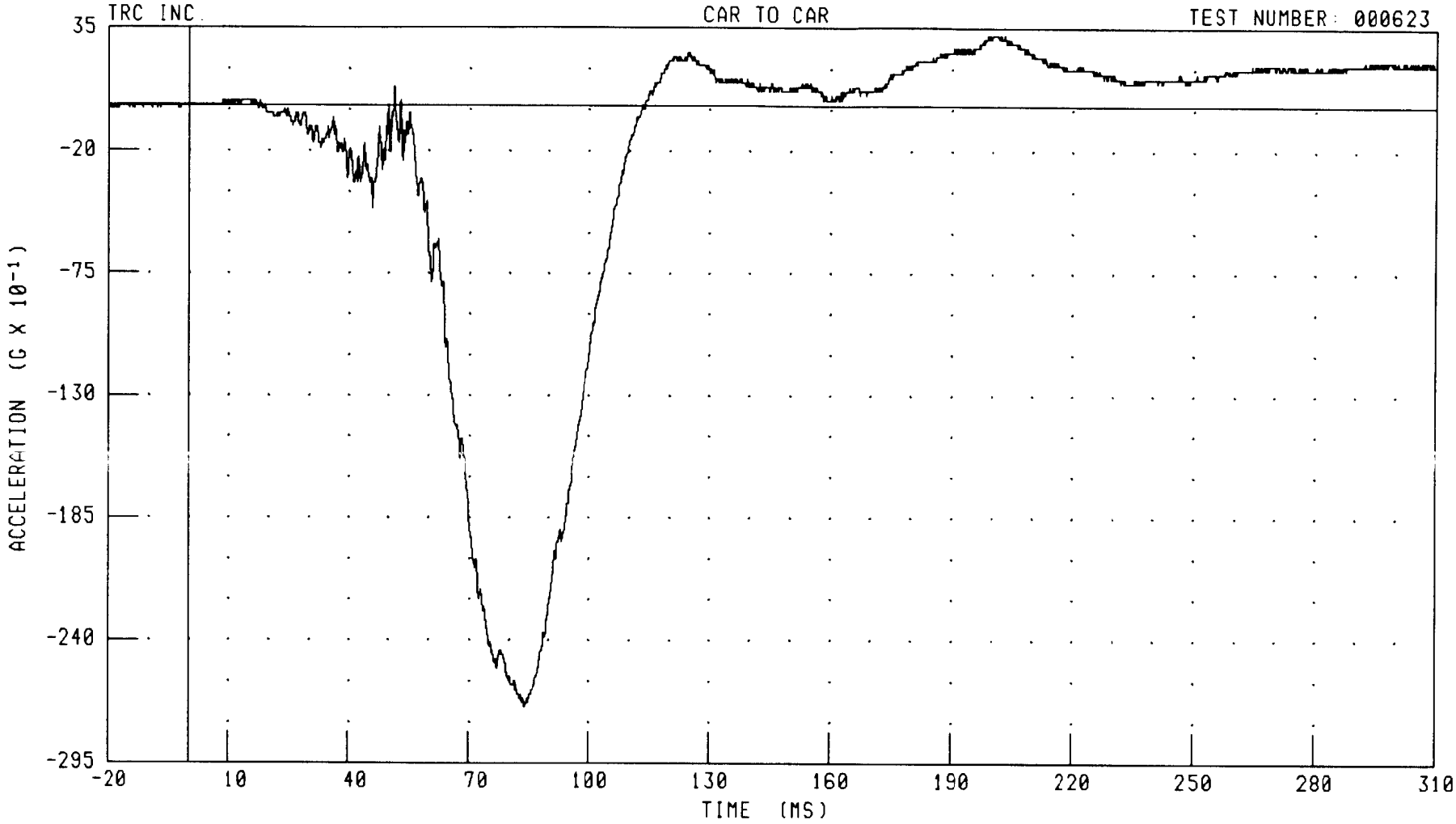
CARAVAN DRIVER CHEST DEFLECTION



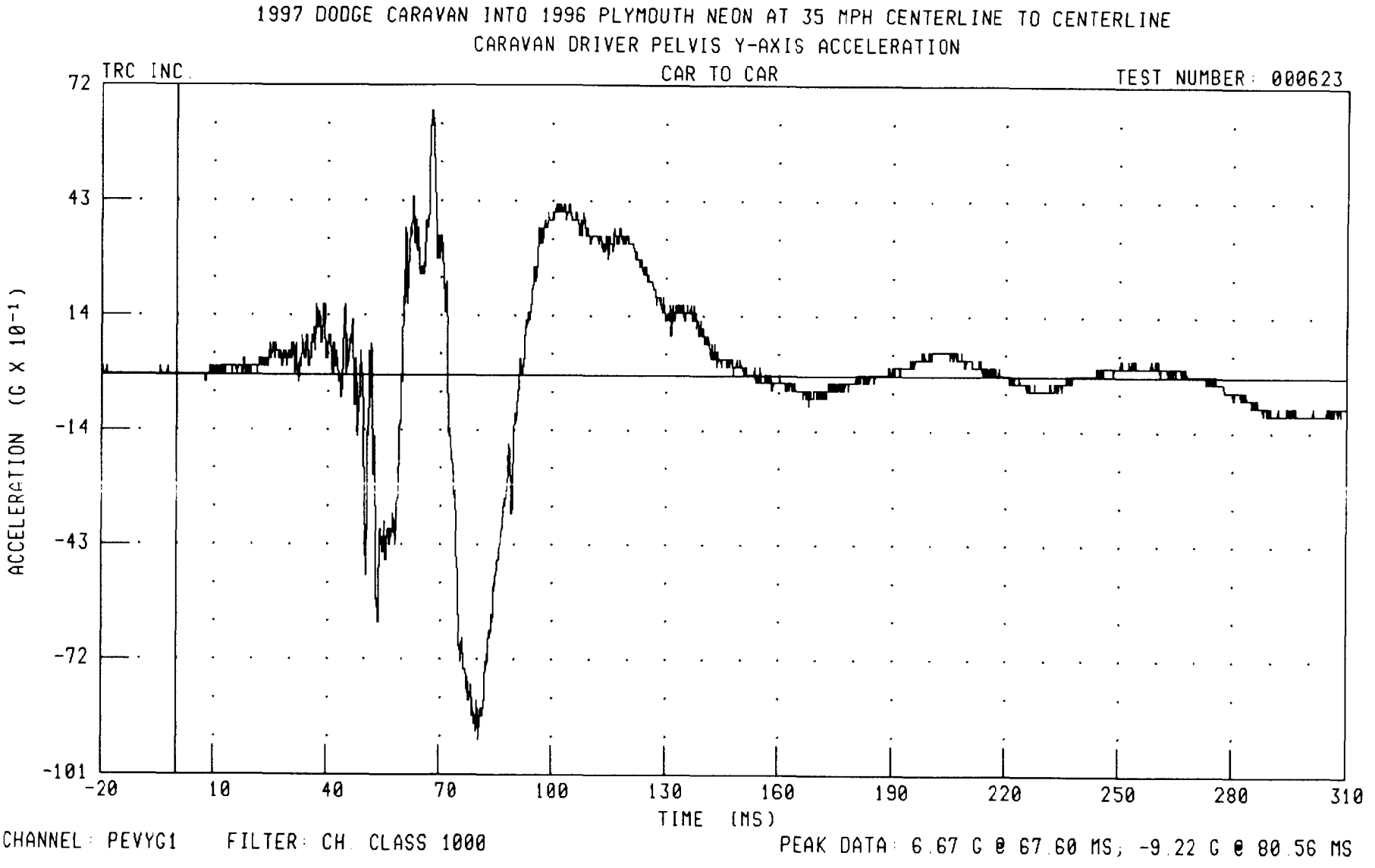
CHANNEL: CSTXD1 FILTER: CH. CLASS 600 PEAK DATA: 0.01 MM @ 27.68 MS, -28.70 MM @ 89.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN DRIVER PELVIS X-AXIS ACCELERATION

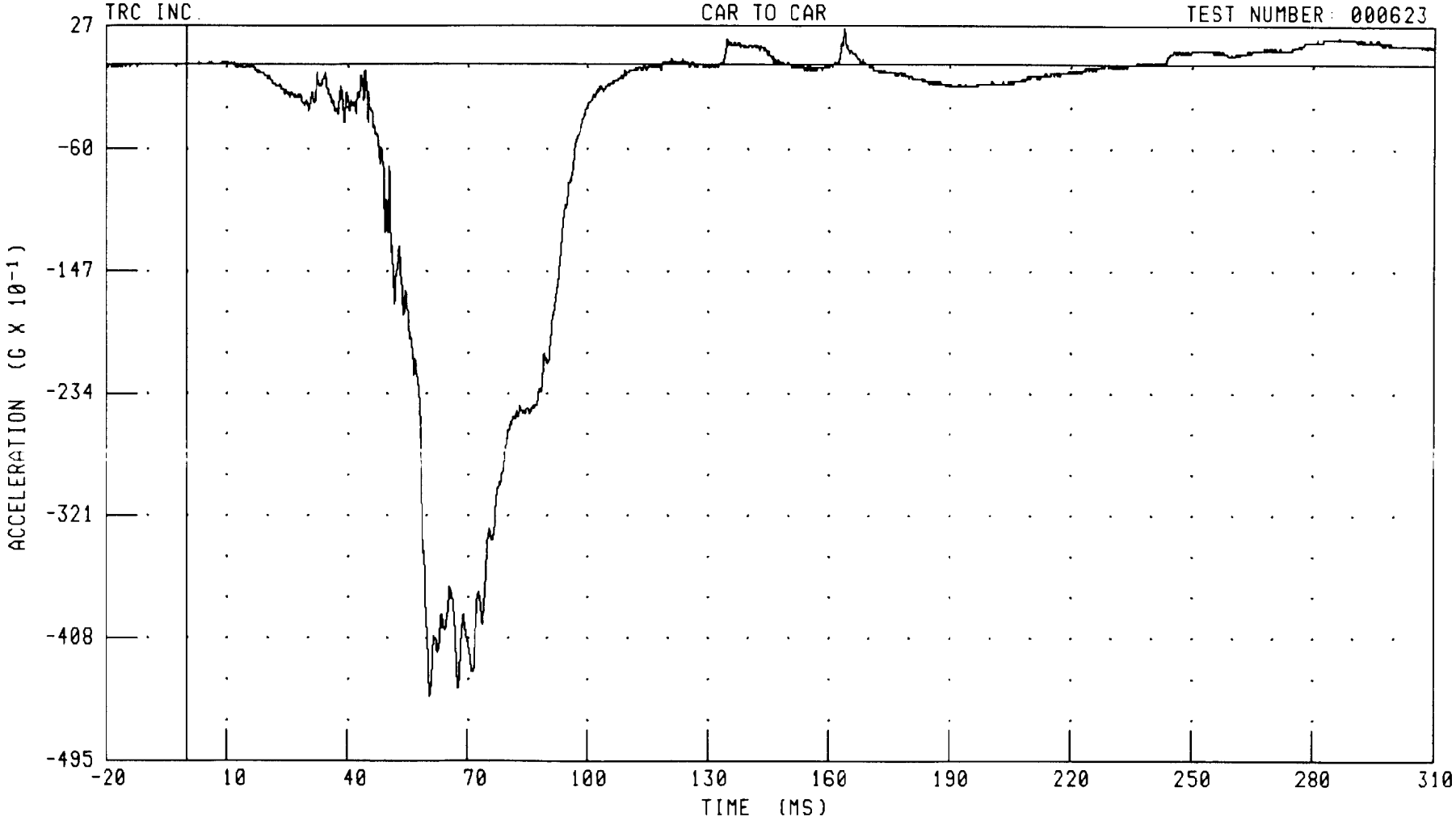


CHANNEL: PEVXG1 FILTER: CH. CLASS 1000 PEAK DATA: 3.19 G @ 198.96 MS; -27.00 G @ 83.92 MS


1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER PELVIS Y-AXIS ACCELERATION
TRC INC.
CAR TO CAR
TEST NUMBER: 000623
72
43
14
-14
-43
-72
-101
ACCELERATION (G X 10-1)
-20
10
40
70
100
130
160
190
220
250
280
310
TIME (MS)
CHANNEL: PEVYG1
FILTER: CH. CLASS 1000
PEAK DATA: 6.67 G @ 67.60 MS, -9.22 G @ 80.56 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

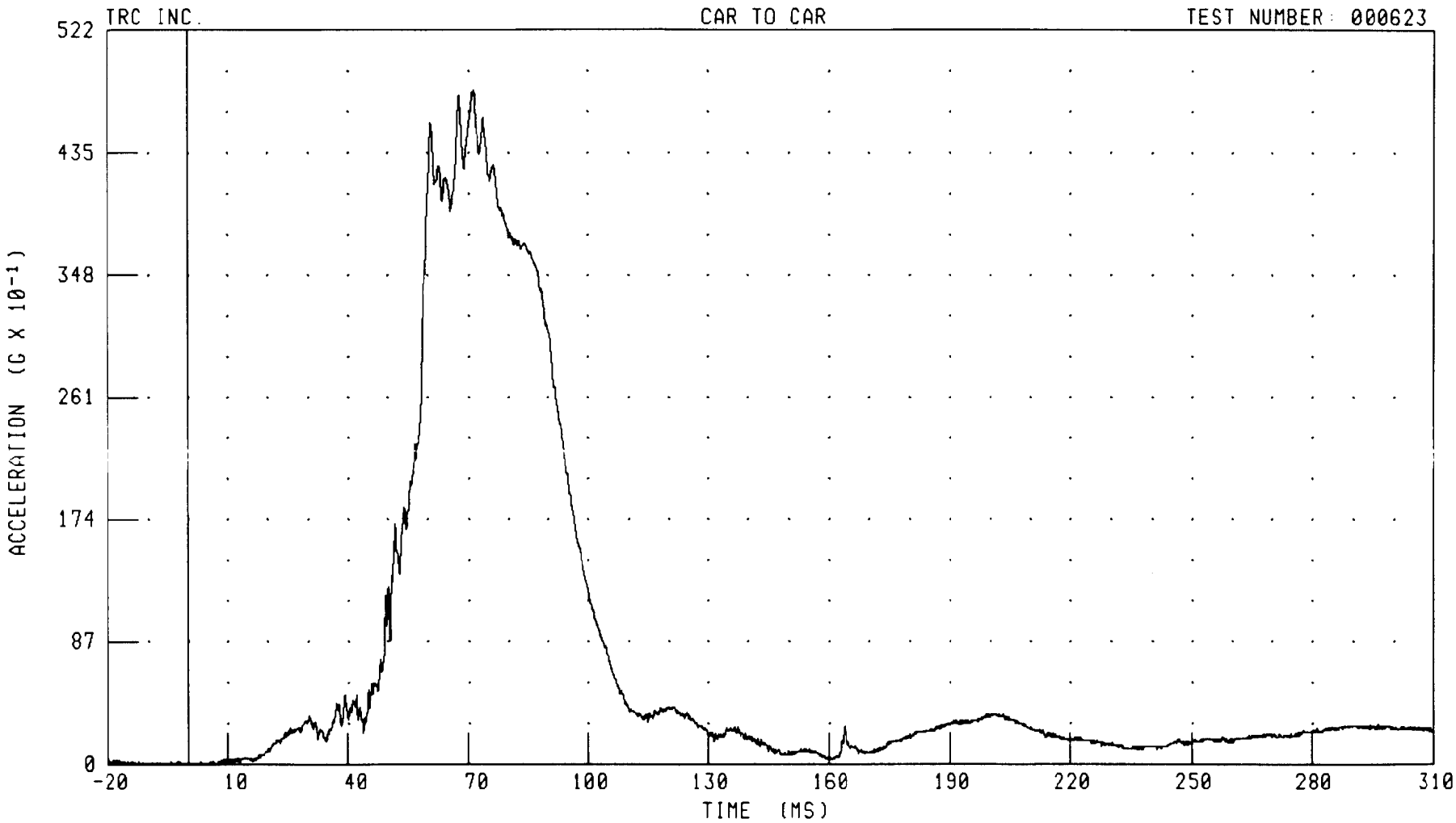
CARAVAN DRIVER PELVIS Z-AXIS ACCELERATION



CHANNEL: PEVZG1 FILTER: CH. CLASS 1000 PEAK DATA: 2.51 G @ 163.84 MS; -44.95 G @ 60.72 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

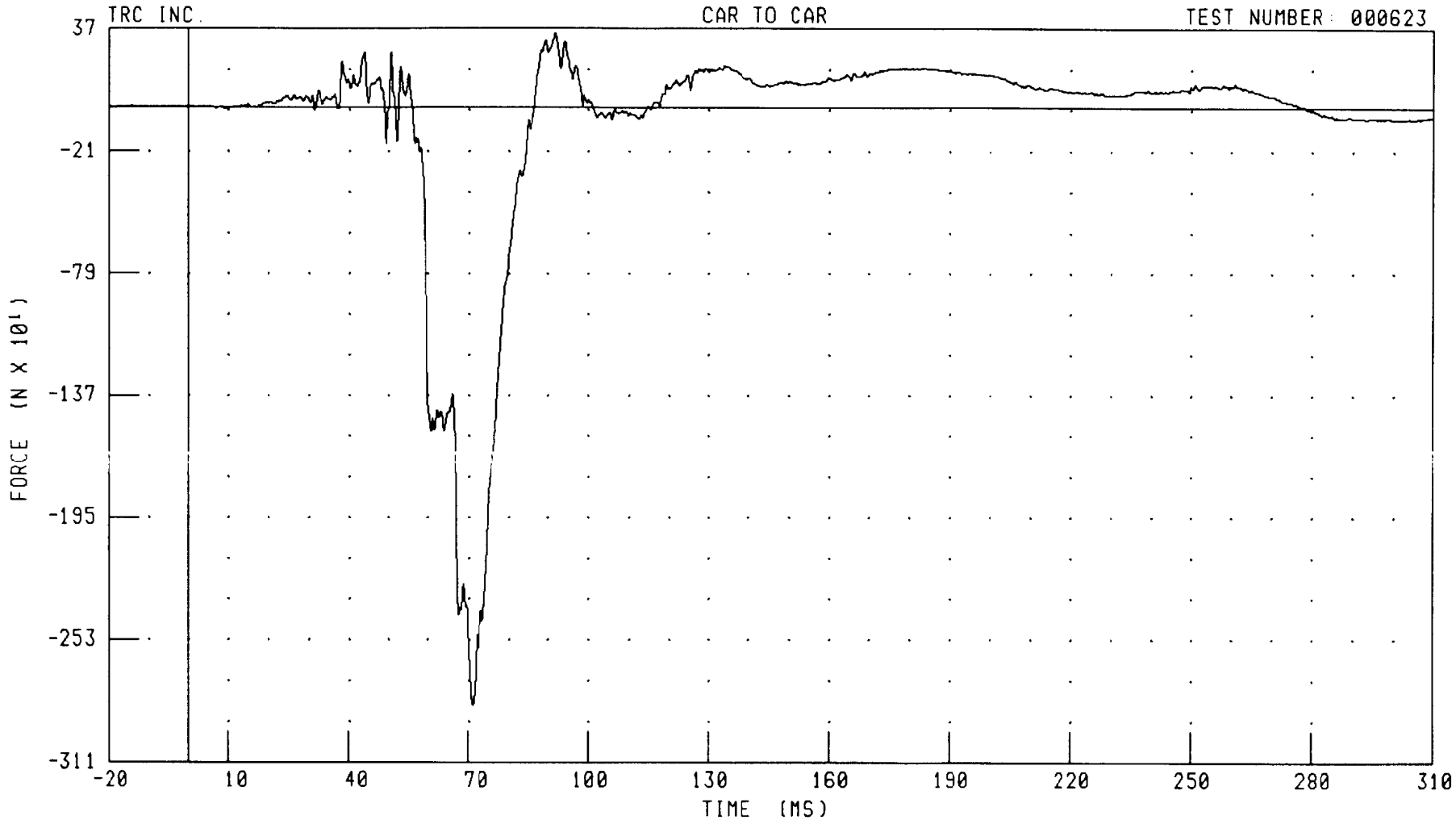
CARAVAN DRIVER PELVIS RESULTANT ACCELERATION



CHANNEL: PEVRG1 FILTER: CH. CLASS 1000 PEAK DATA: 47.97 G @ 71.52 MS, 0.08 G @ -19.92 MS

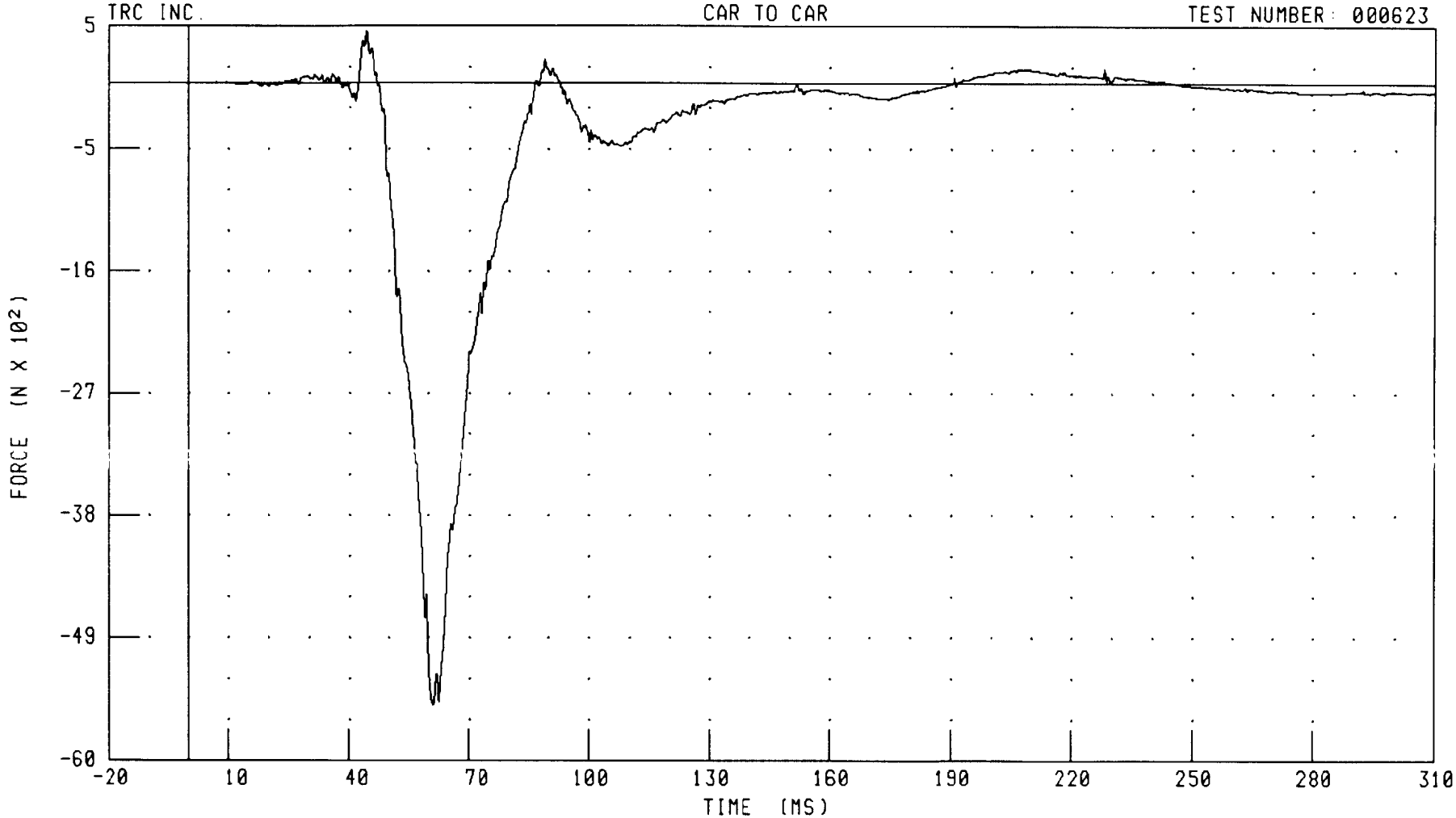
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN DRIVER LEFT FEMUR FORCE



CHANNEL: LFMZF1 FILTER: CH. CLASS 600 PEAK DATA: 345.35 N @ 91.92 MS, -2838.67 N @ 71.04 MS

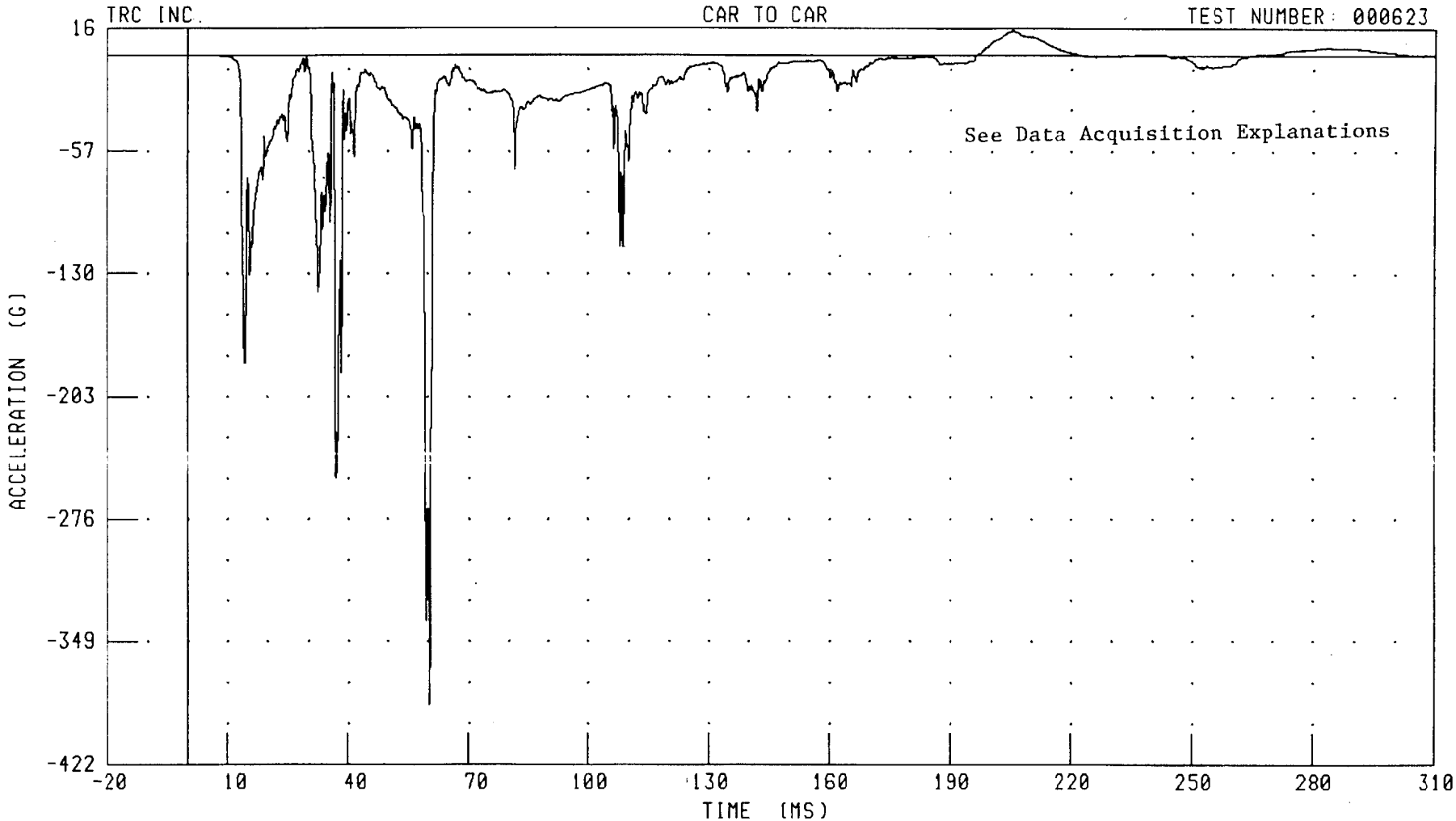
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN DRIVER RIGHT FEMUR FORCE



CHANNEL: RFMZF1 FILTER: CH. CLASS 600 PEAK DATA: 469.72 N @ 44.32 MS; -5596.20 N @ 61.36 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

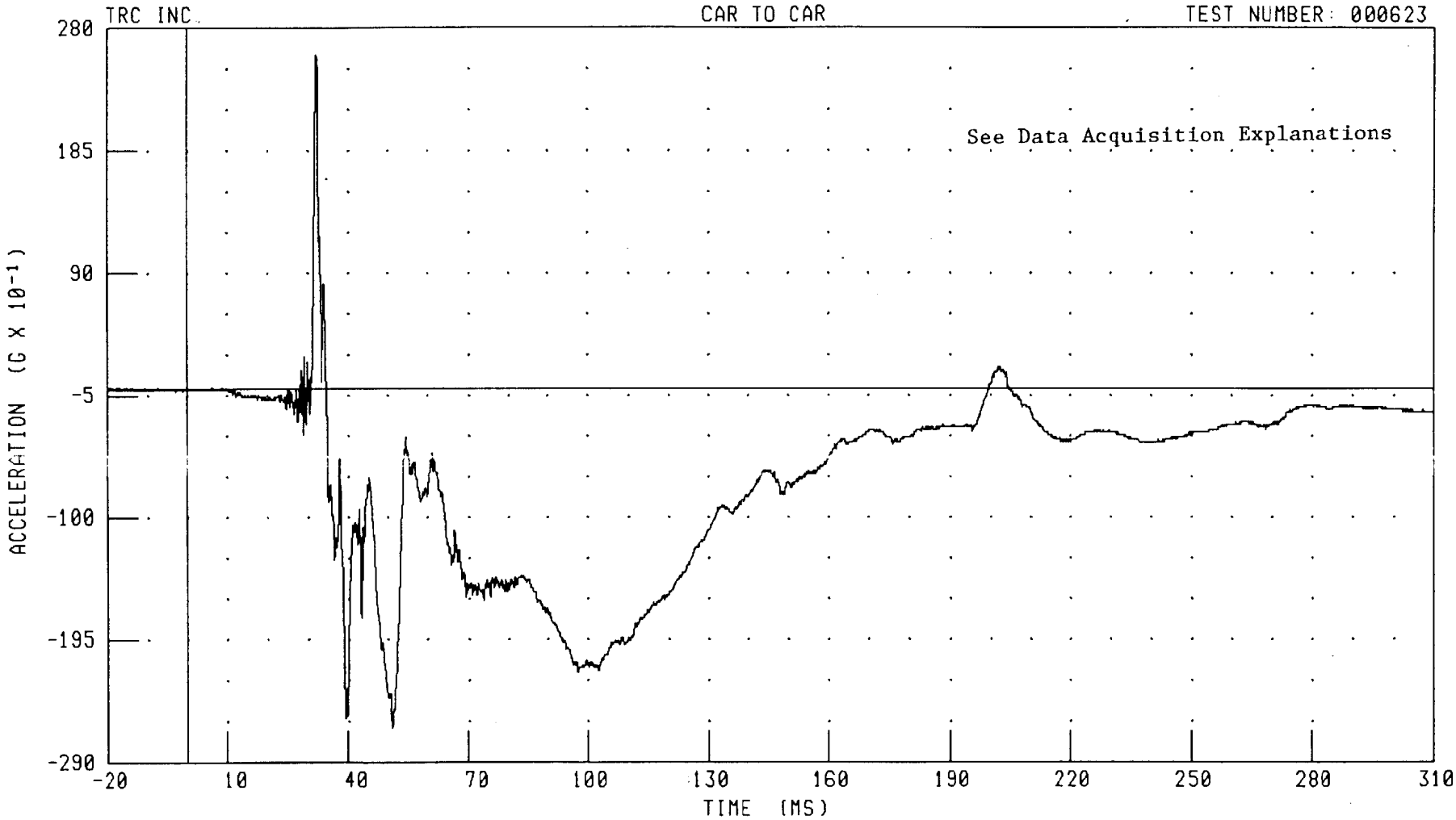
CARAVAN RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXG2 FILTER: CH. CLASS 1000 PEAK DATA: 14.73 G @ 205.36 MS; -386.76 G @ 60.48 MS

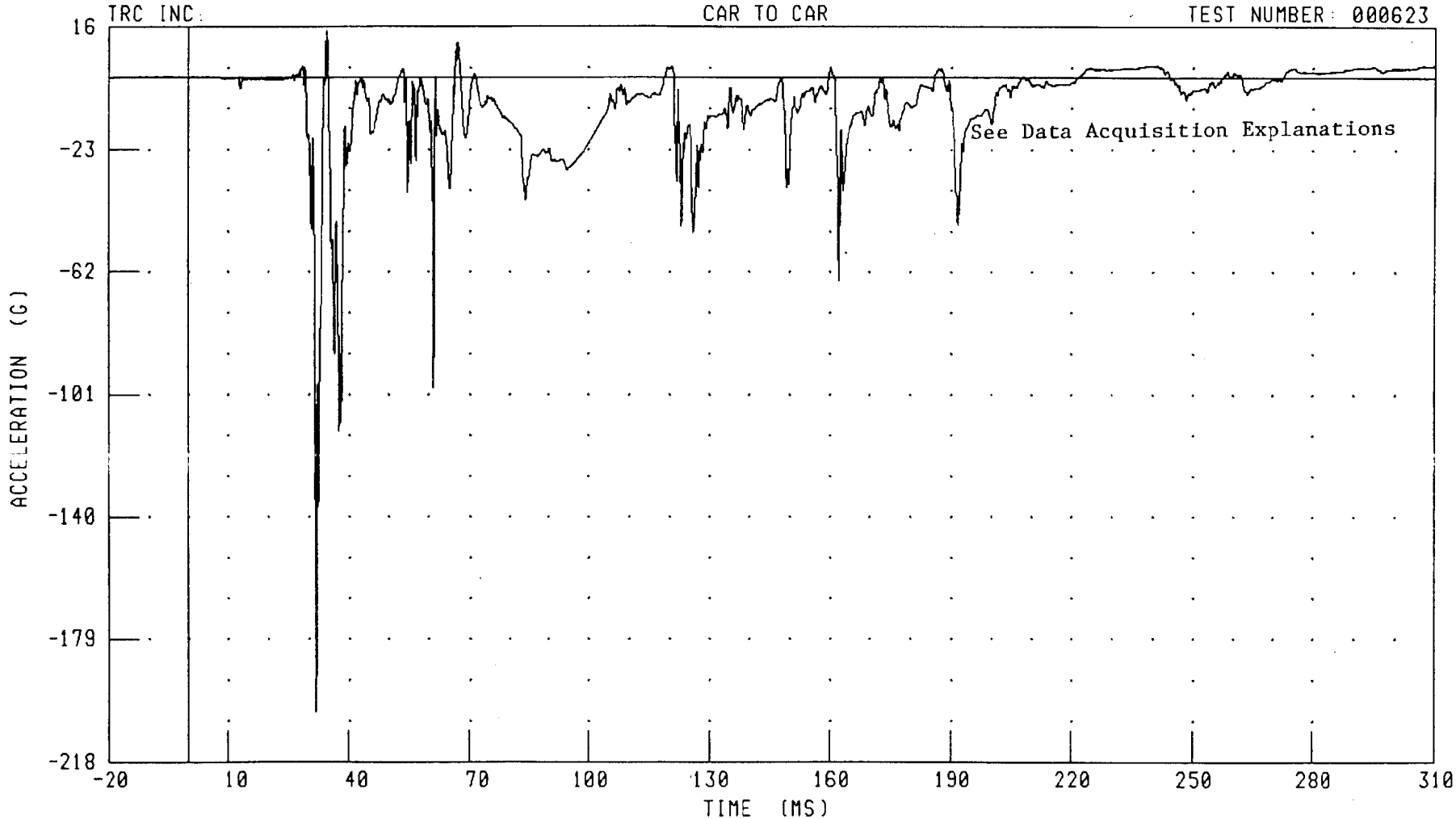
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION



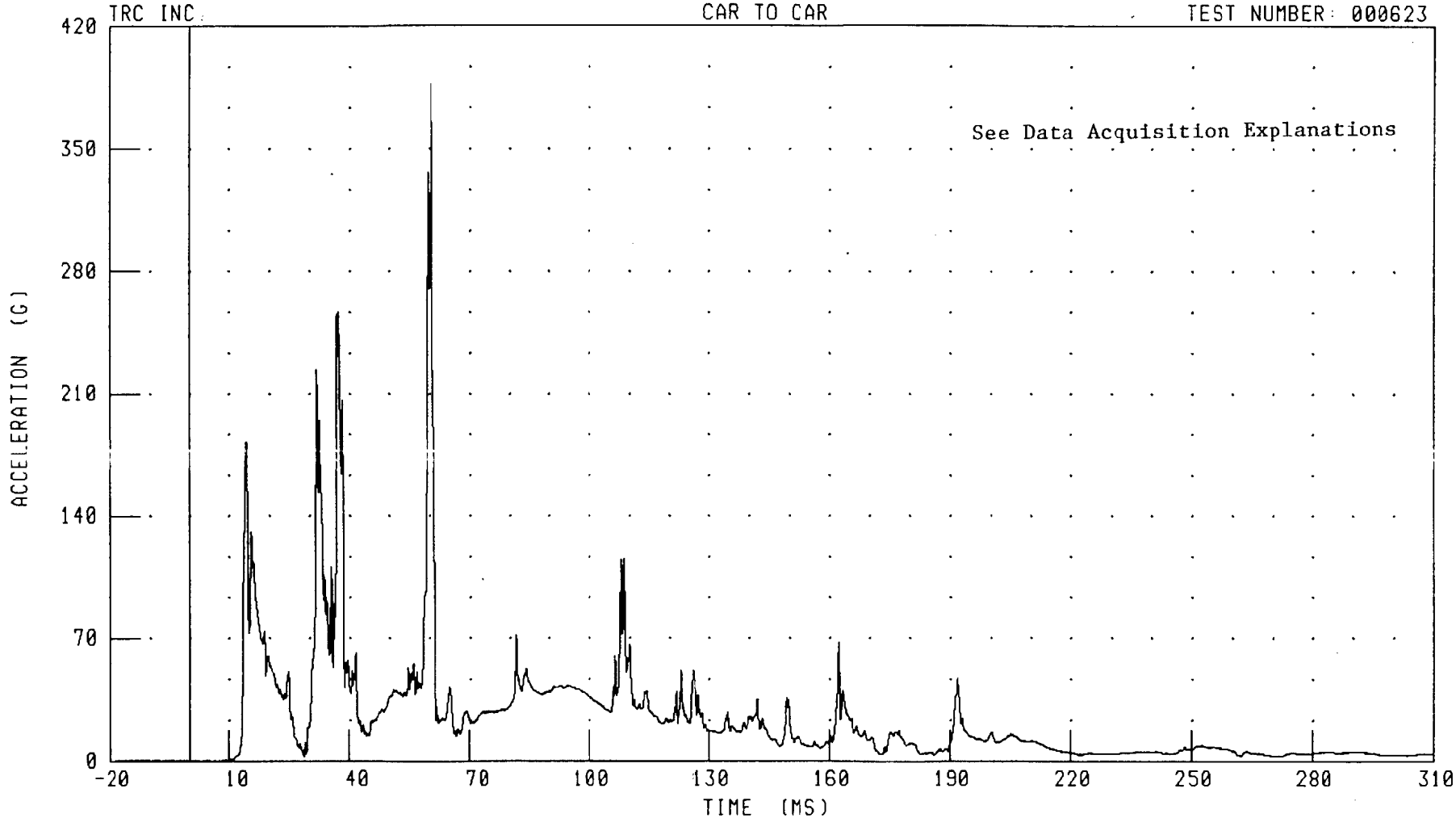
CHANNEL: HEDYG2 FILTER: CH. CLASS 1000 PEAK DATA: 25.91 G @ 32.08 MS; -26.40 G @ 51.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION



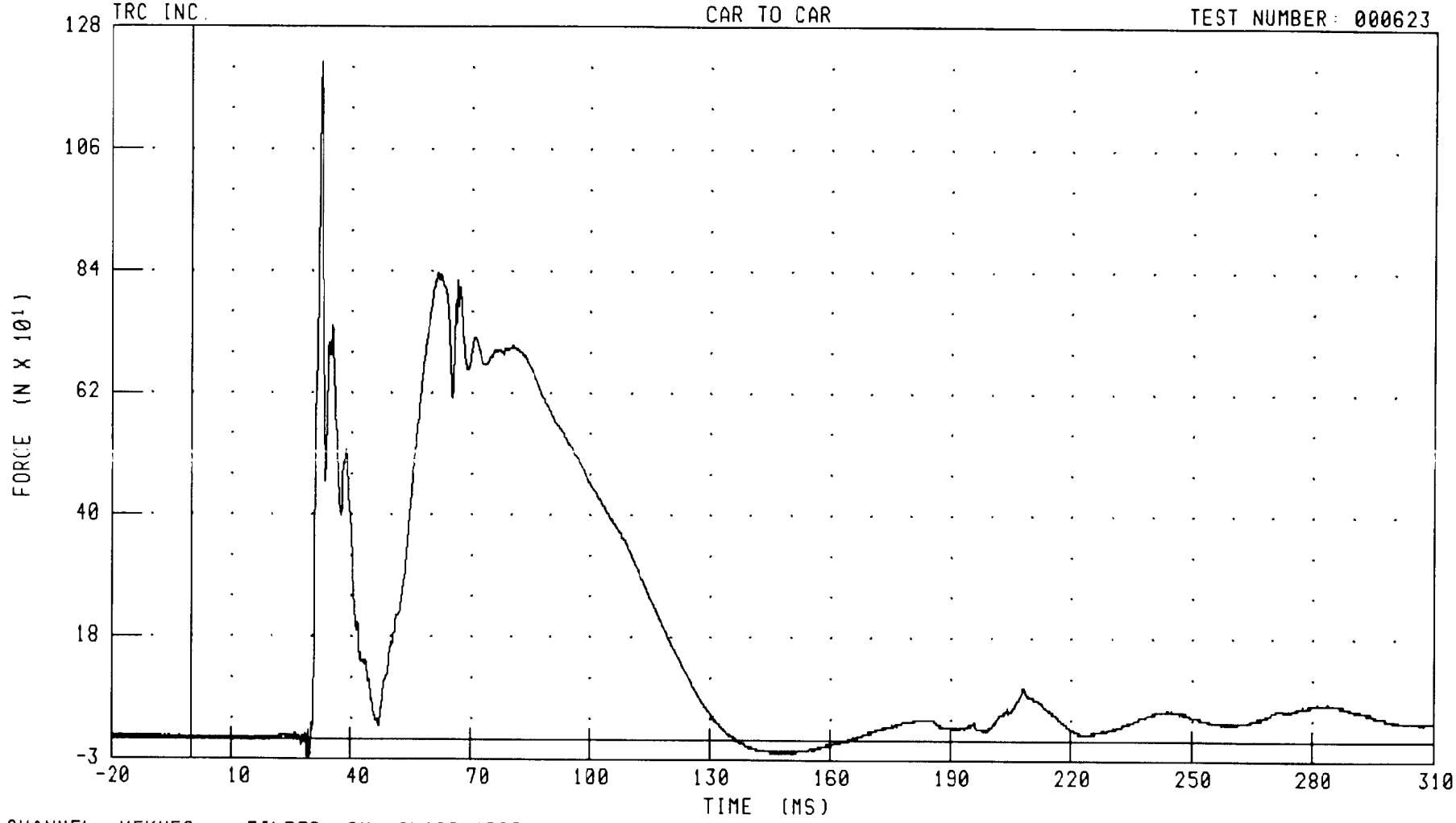
CHANNEL: HEDZG2 FILTER: CH. CLASS 1000 PEAK DATA: 14.71 G @ 34.56 MS; -202.10 G @ 31.84 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG2 FILTER: CH. CLASS 1000 PEAK DATA: 387.21 G @ 60.48 MS; 0.09 G @ -20.00 MS

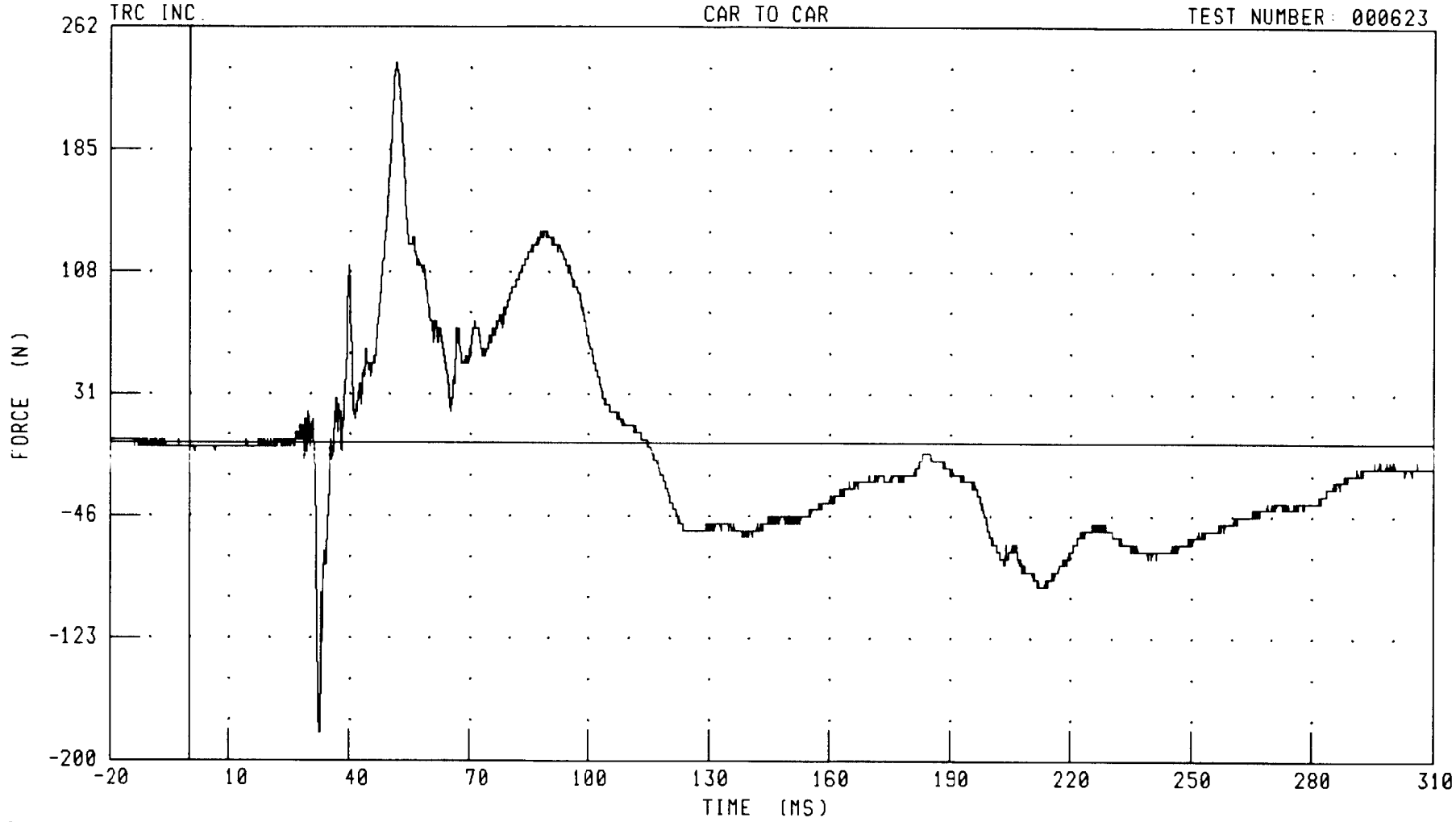
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXF2 FILTER: CH. CLASS 1000 PEAK DATA: 1220.26 N @ 32.56 MS; -33.10 N @ 28.88 MS

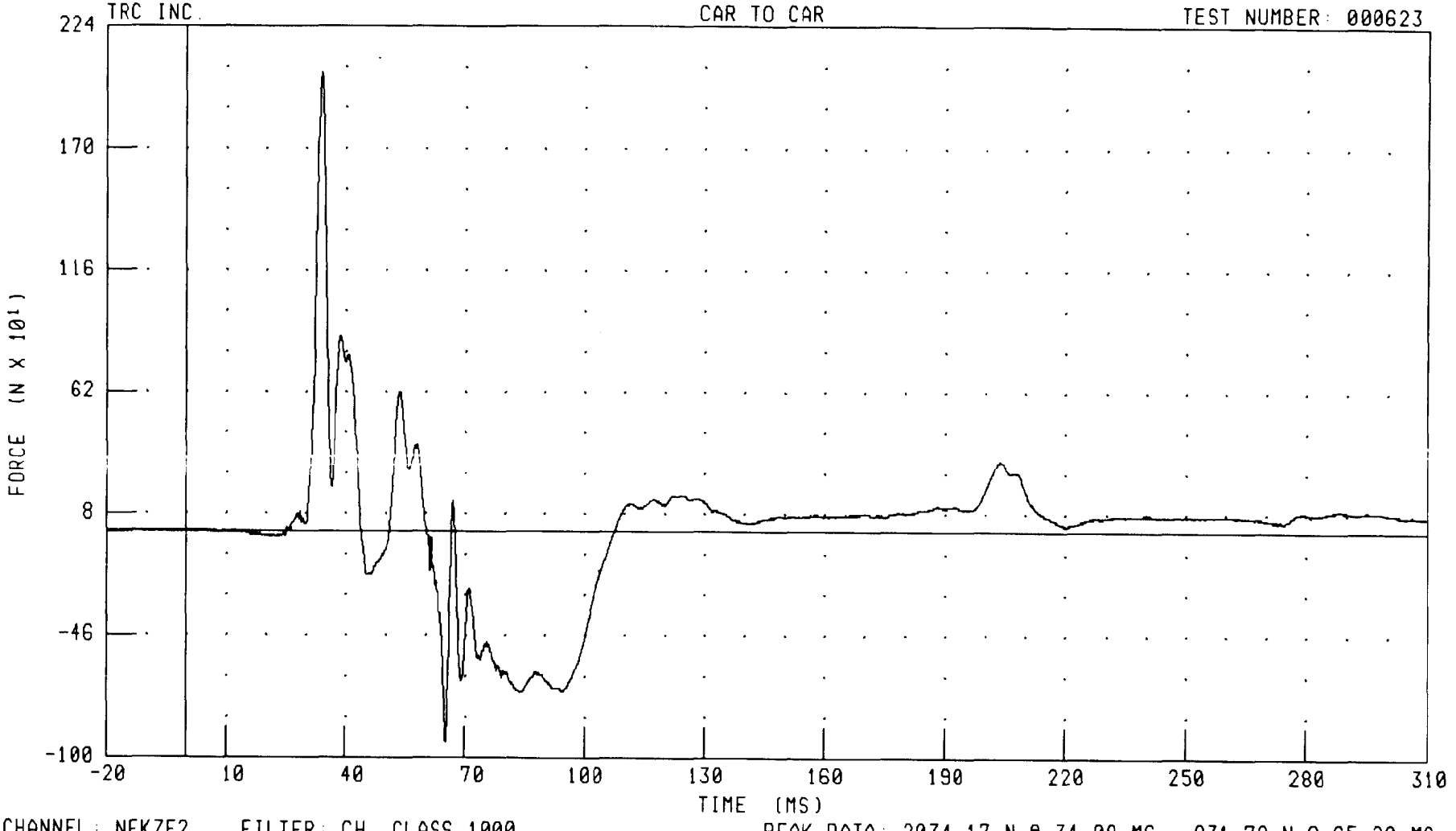
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE



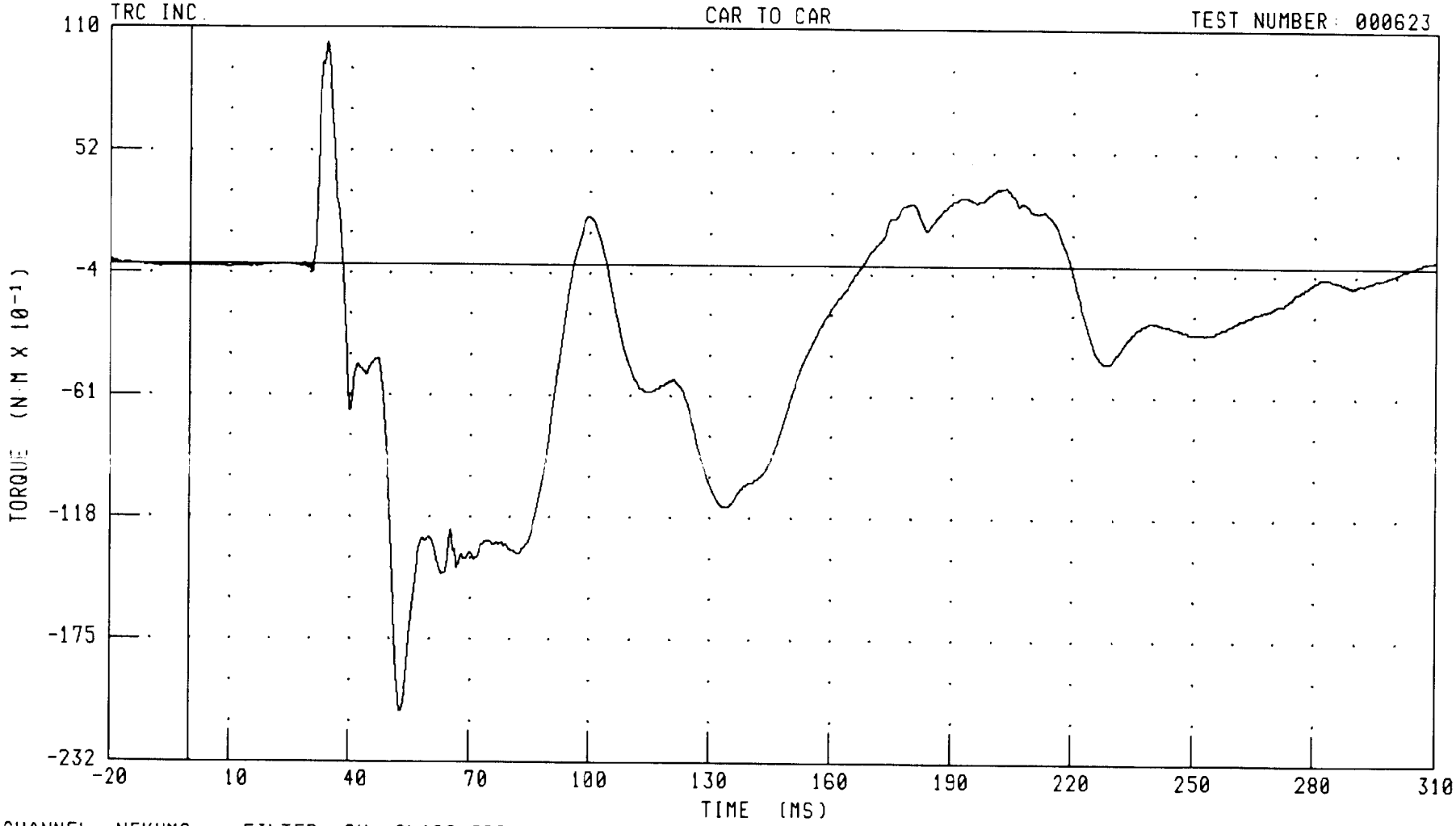
CHANNEL: NEKYF2 FILTER: CH. CLASS 1000 PEAK DATA: 239.49 N @ 51.60 MS; -182.62 N @ 32.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE



CHANNEL: NEKZF2 FILTER: CH. CLASS 1000 PEAK DATA: 2034.17 N @ 34.08 MS, -931.79 N @ 65.20 MS

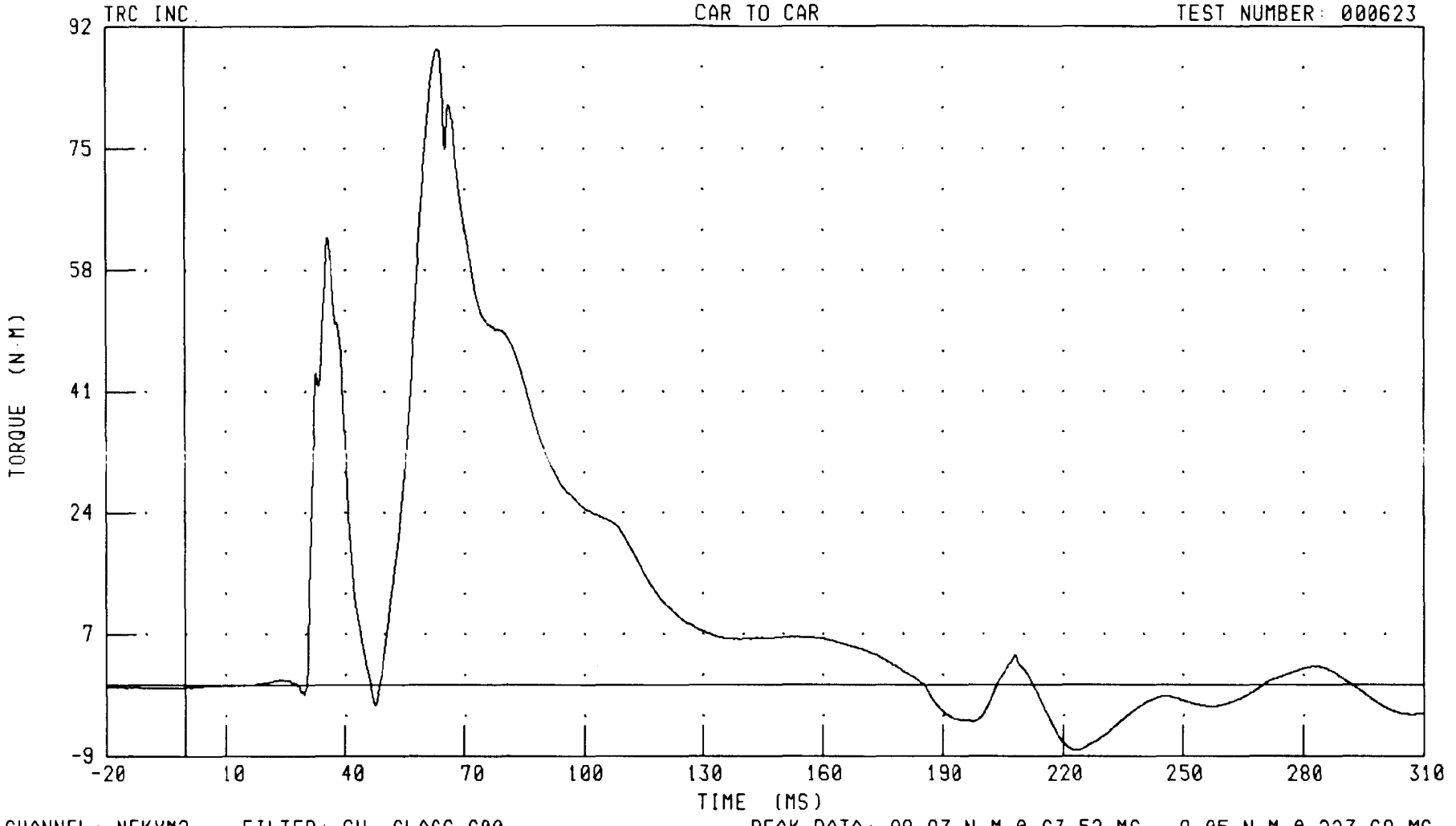
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS



CHANNEL: NEKXM2 FILTER: CH. CLASS 600

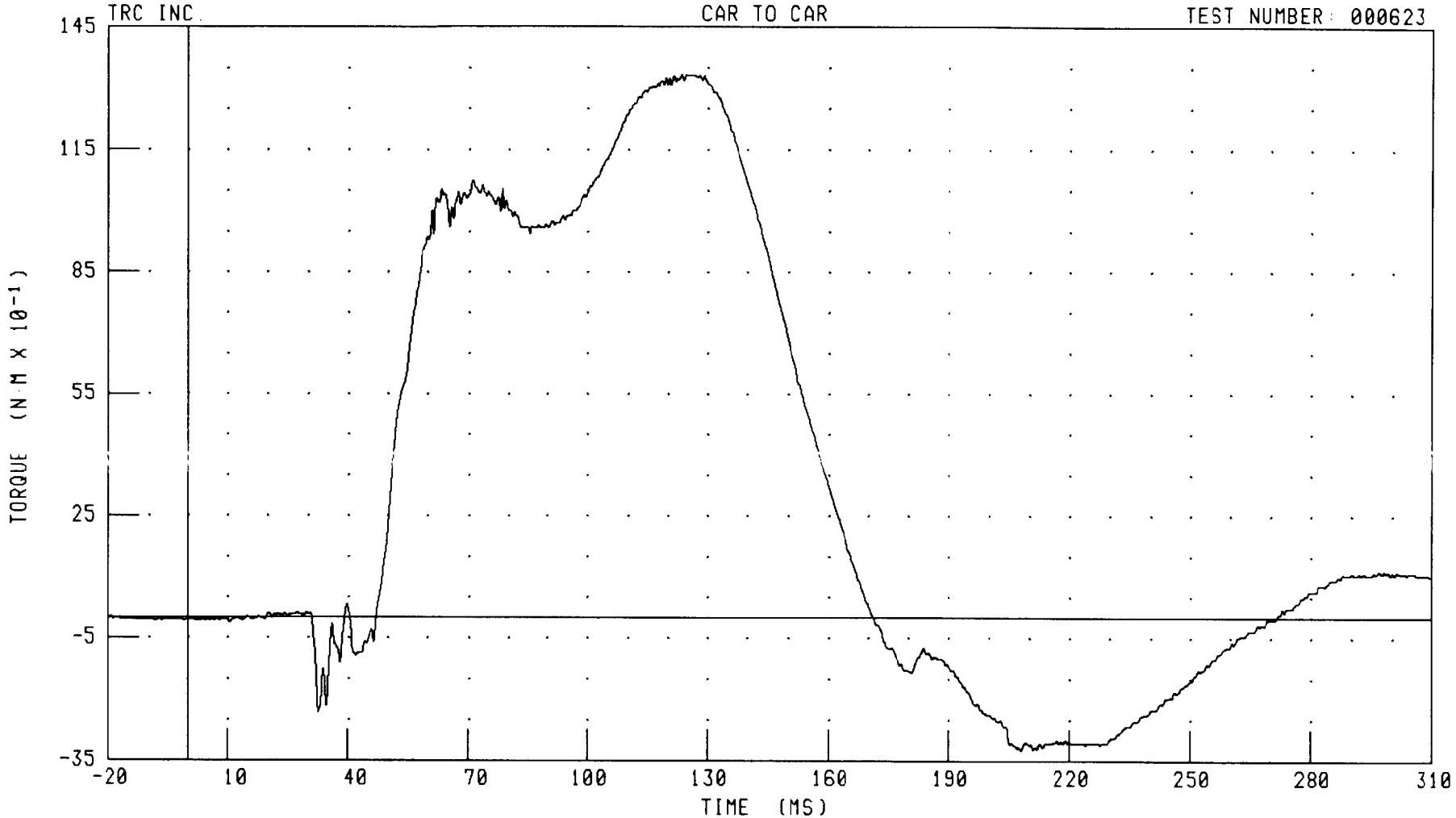
PEAK DATA: 10.26 N-M @ 34.32 MS; -20.86 N-M @ 52.88 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS



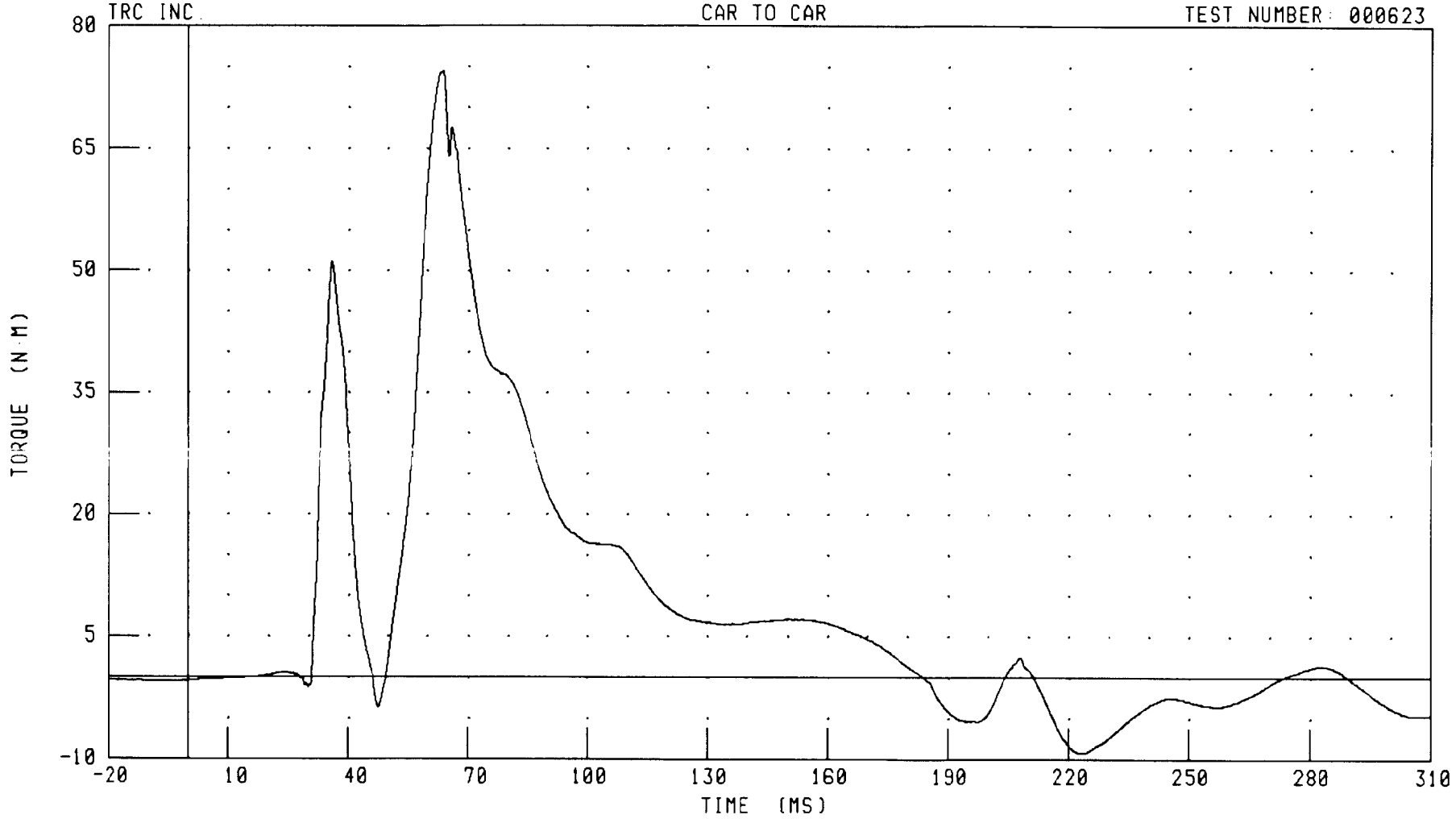
CHANNEL: NEKYM2 FILTER: CH. CLASS 600 PEAK DATA: 88.83 N-M @ 63.52 MS; -9.05 N-M @ 223.68 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS



CHANNEL: NEKZM2 FILTER: CH. CLASS 600 PEAK DATA: 13.33 N-M @ 123.36 MS; -3.24 N-M @ 208.08 MS

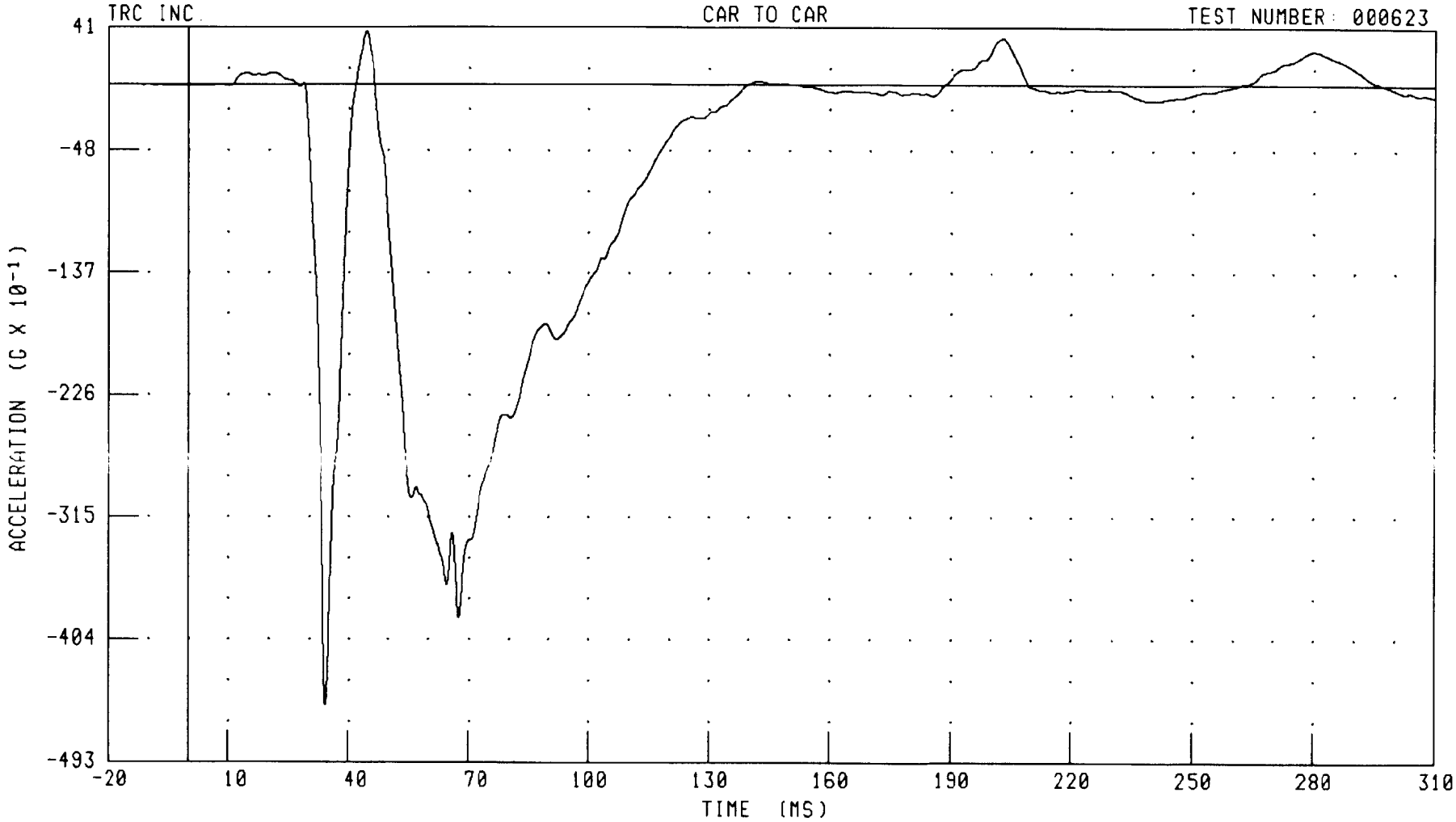
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS



CHANNEL: NEKOM2 FILTER: CH. CLASS 600 PEAK DATA: 74.44 N-M @ 63.84 MS; -9.25 N-M @ 223.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

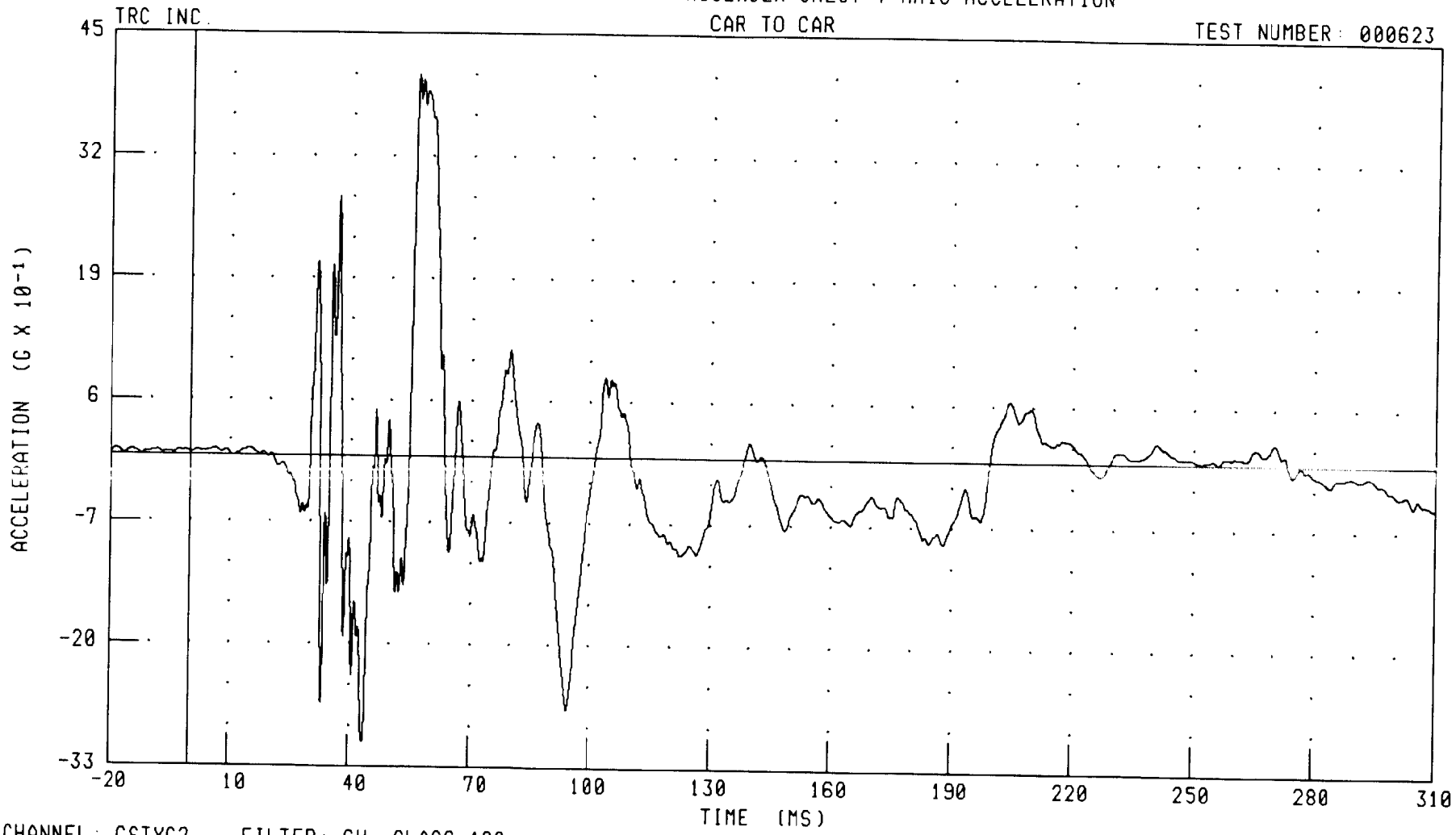
CARAVAN RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXG2 FILTER: CH. CLASS 180 PEAK DATA: 3.81 G @ 44.56 MS, -45.14 G @ 34.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

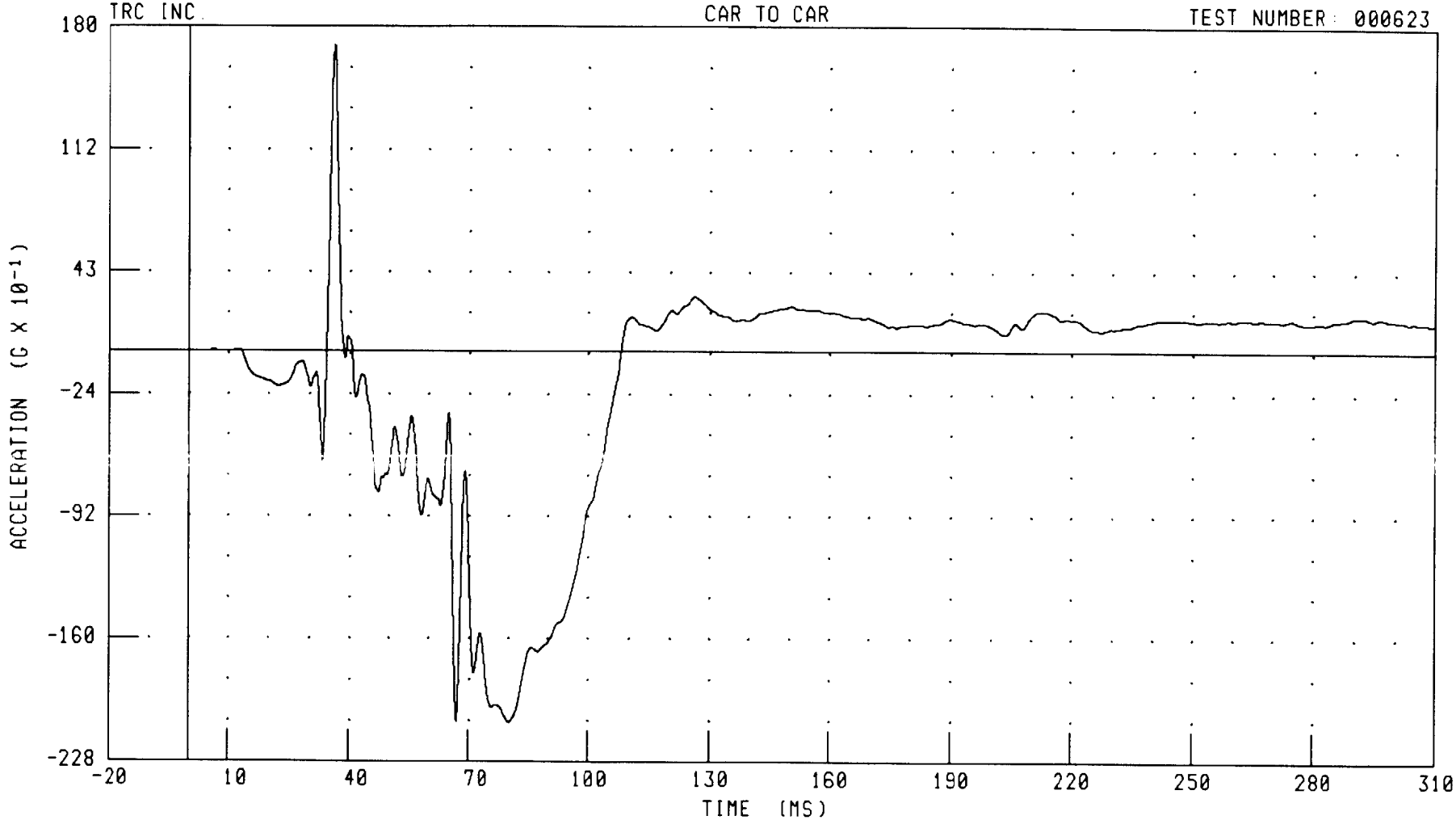
CARAVAN RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYG2 FILTER: CH. CLASS 180

PEAK DATA: 4.07 G @ 56.40 MS; -3.03 G @ 43.36 MS

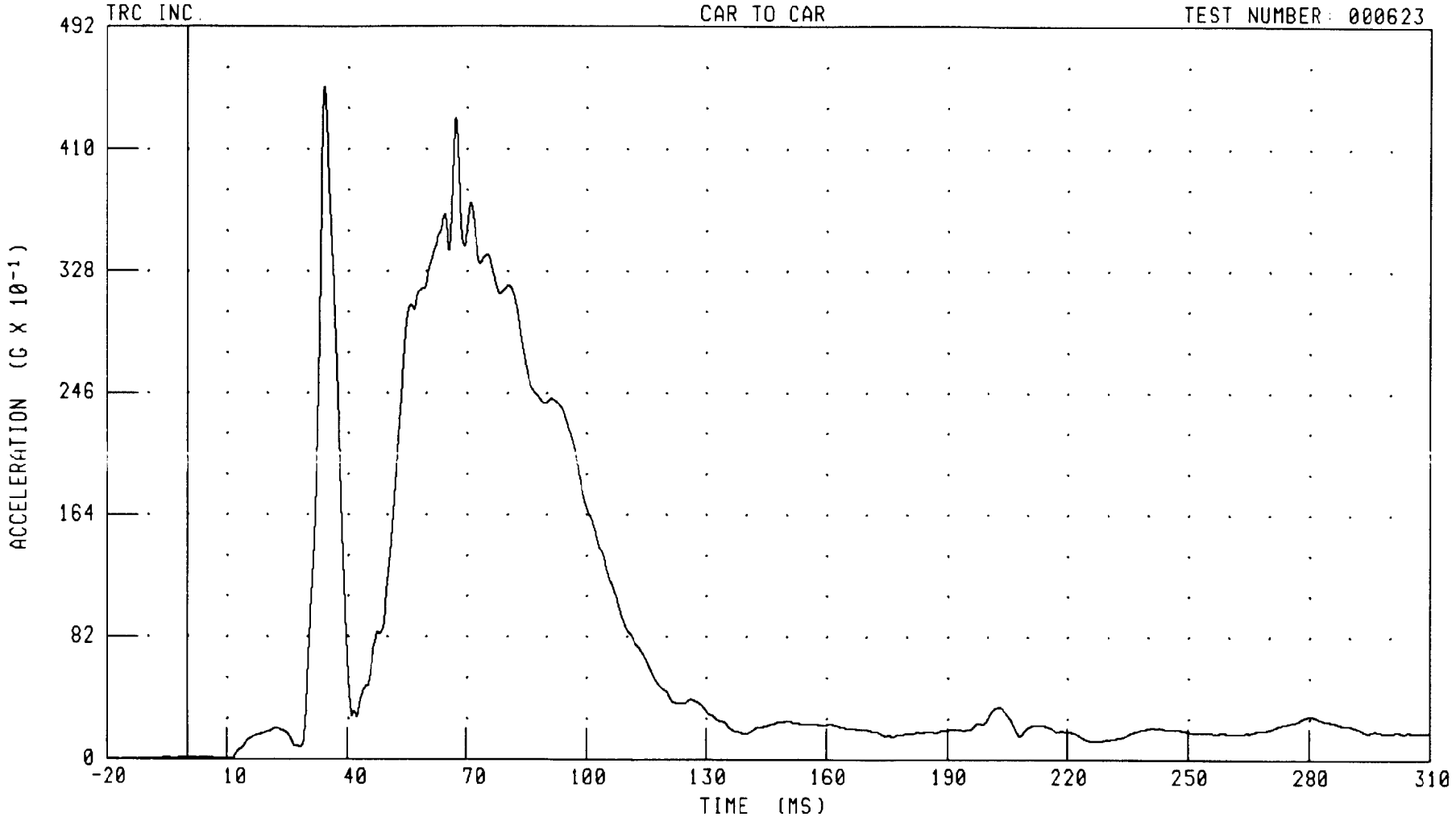
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZG2 FILTER: CH. CLASS 180 PEAK DATA: 16.95 G @ 36.16 MS; -20.65 G @ 80.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

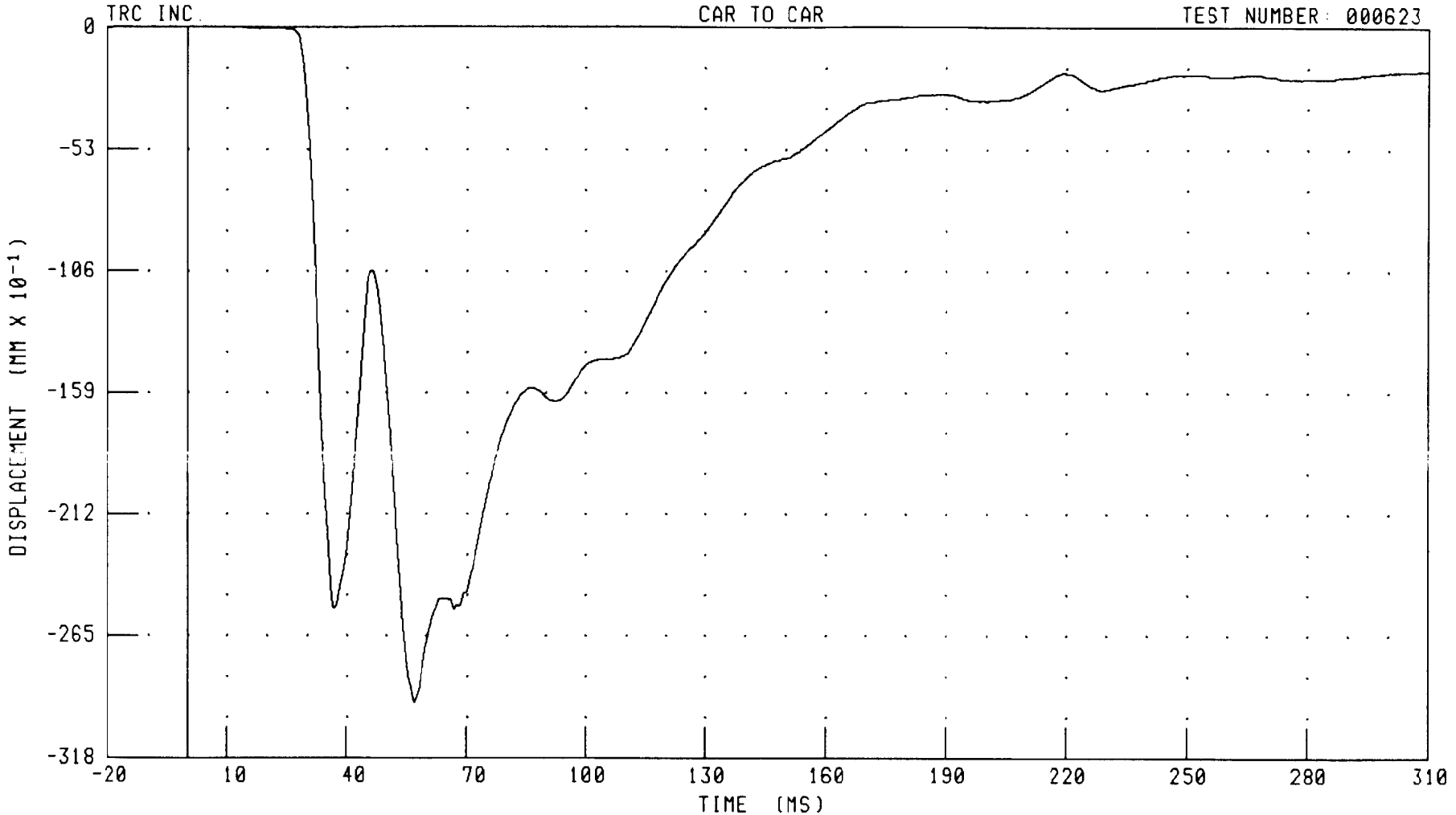
CARAVAN RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION



CHANNEL: CSTRG2 FILTER: CH. CLASS 180 PEAK DATA: 45.17 G @ 34.24 MS, 0.00 G @ 11.28 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

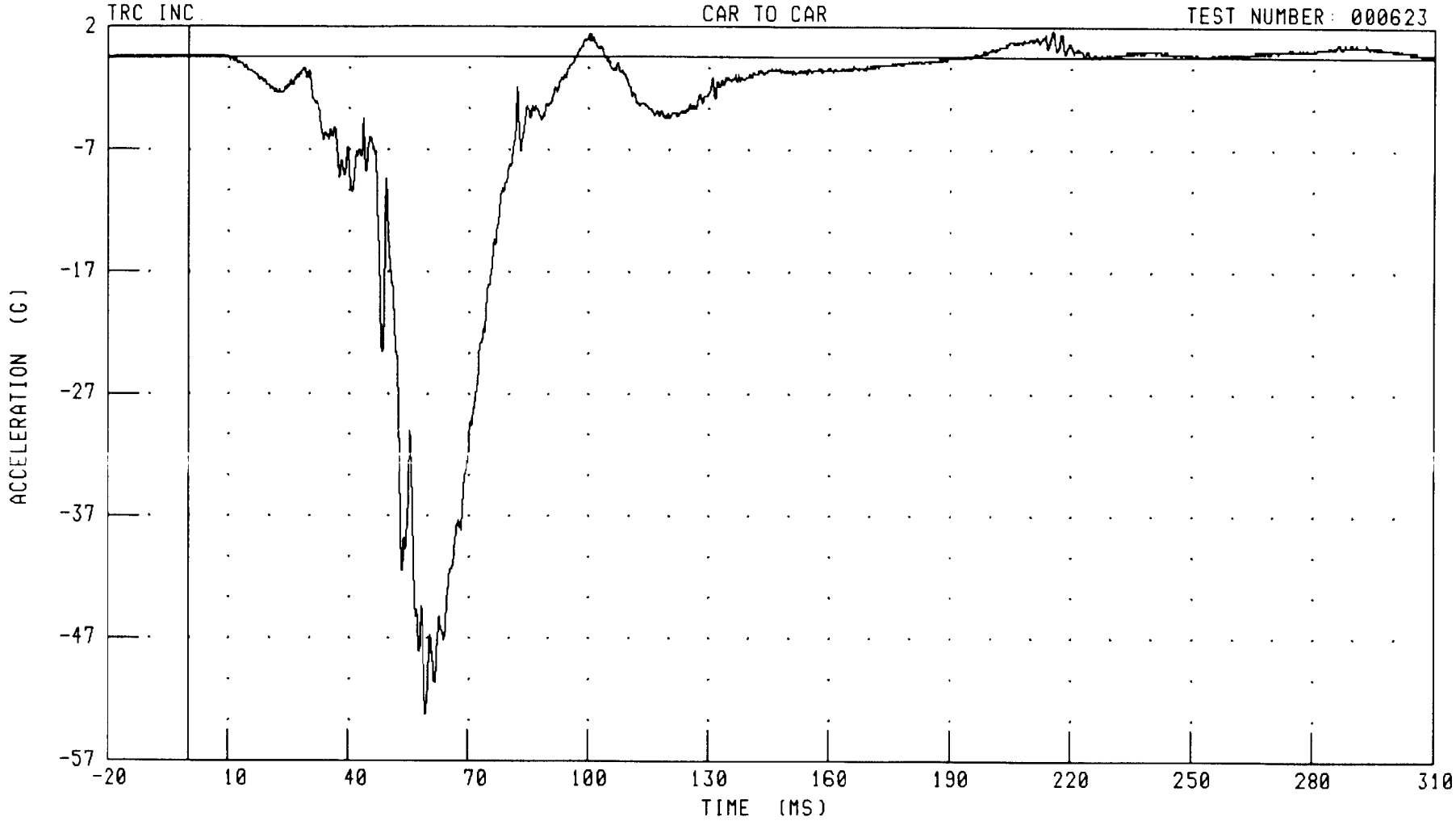
CARAVAN RIGHT FRONT PASSENGER CHEST DEFLECTION



CHANNEL: CSTXD2 FILTER: CH. CLASS 600 PEAK DATA: 0.02 MM @ -7.28 MS, -29.39 MM @ 57.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

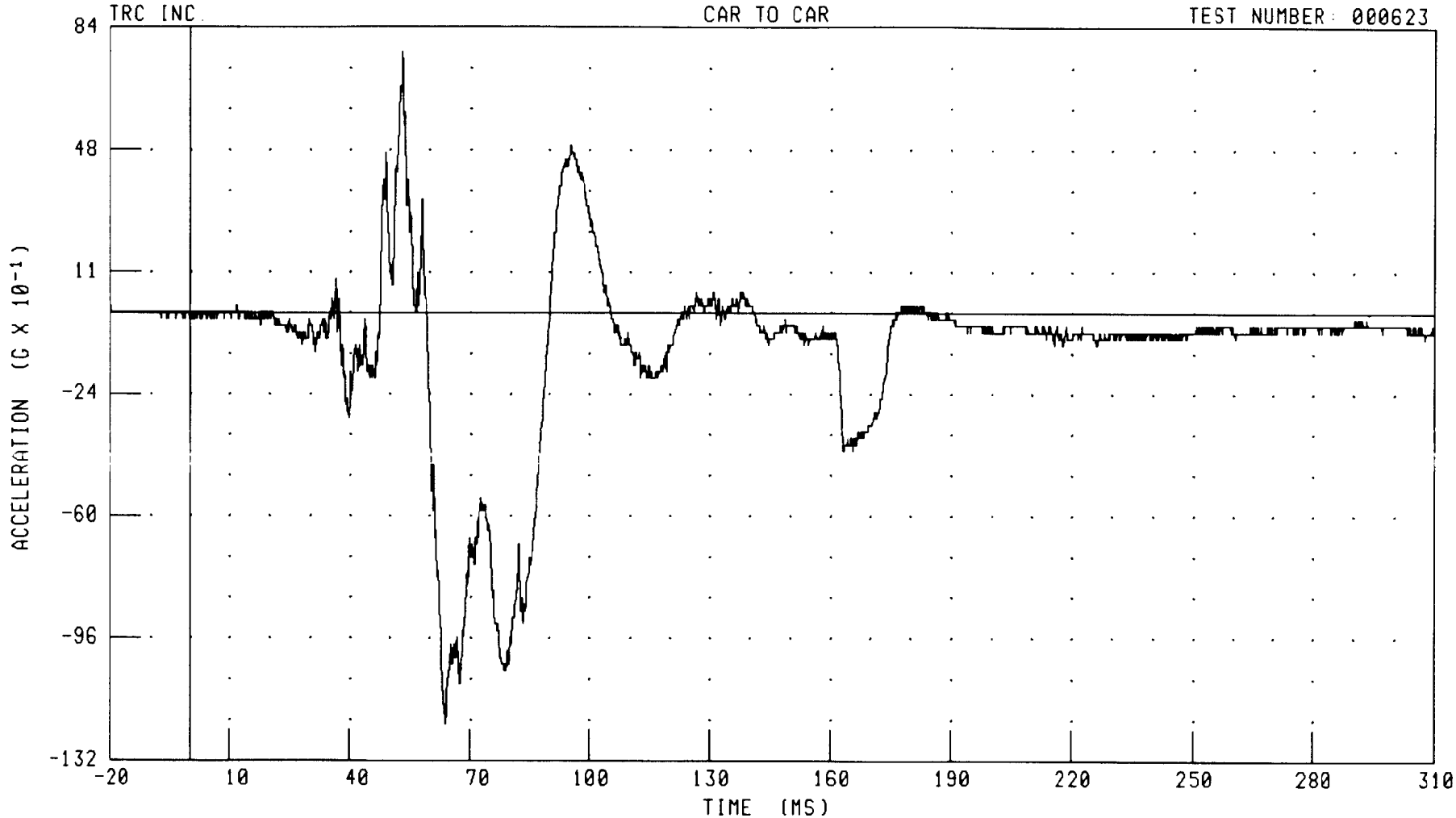
CARAVAN RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION



CHANNEL: PEVXG2 FILTER: CH. CLASS 1000 PEAK DATA: 2.19 G @ 215.44 MS; -53.81 G @ 59.52 MS

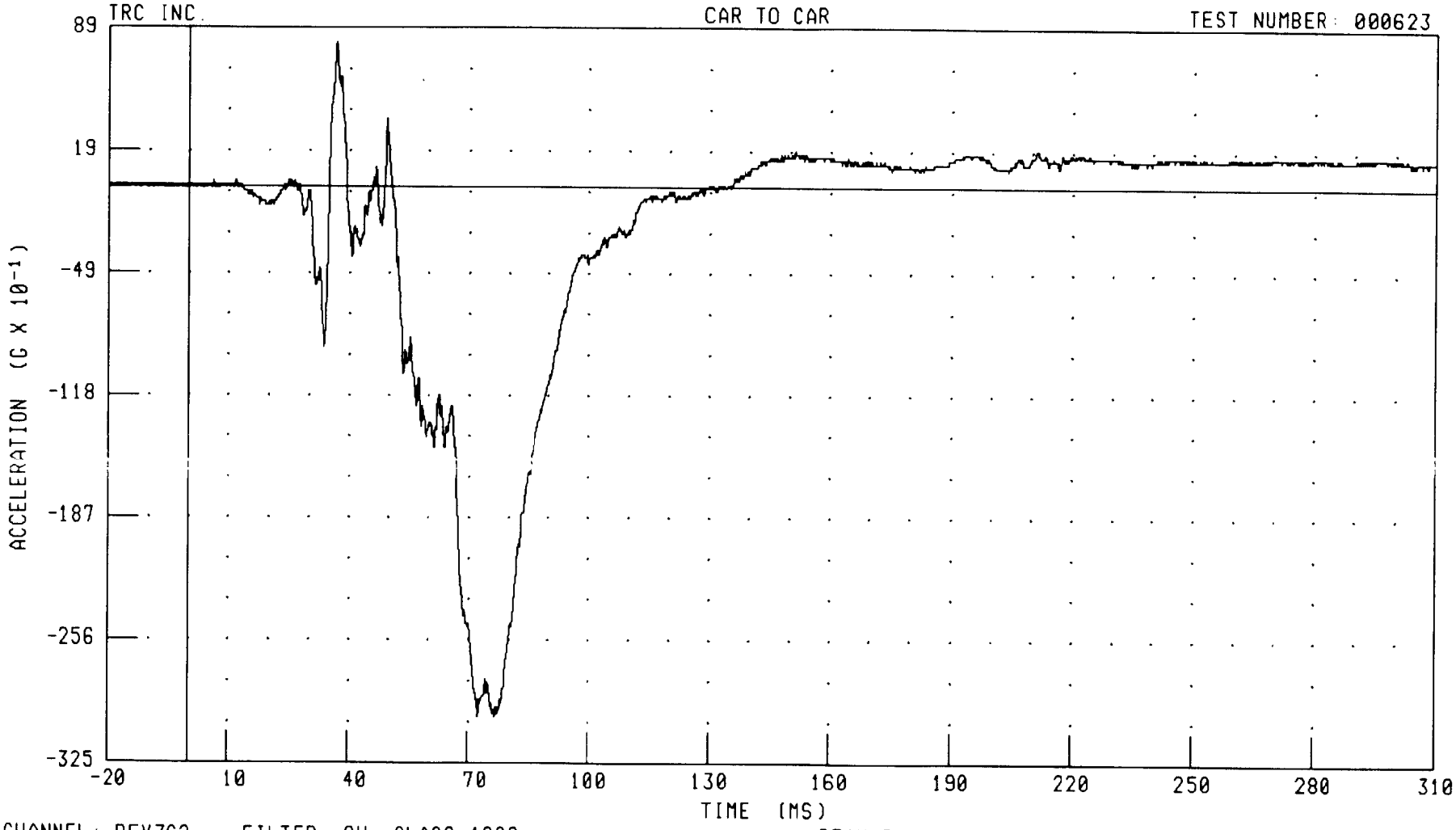
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION



CHANNEL: PEVYG2 FILTER: CH. CLASS 1000 PEAK DATA: 7.66 G @ 53.20 MS; -12.13 G @ 64.00 MS

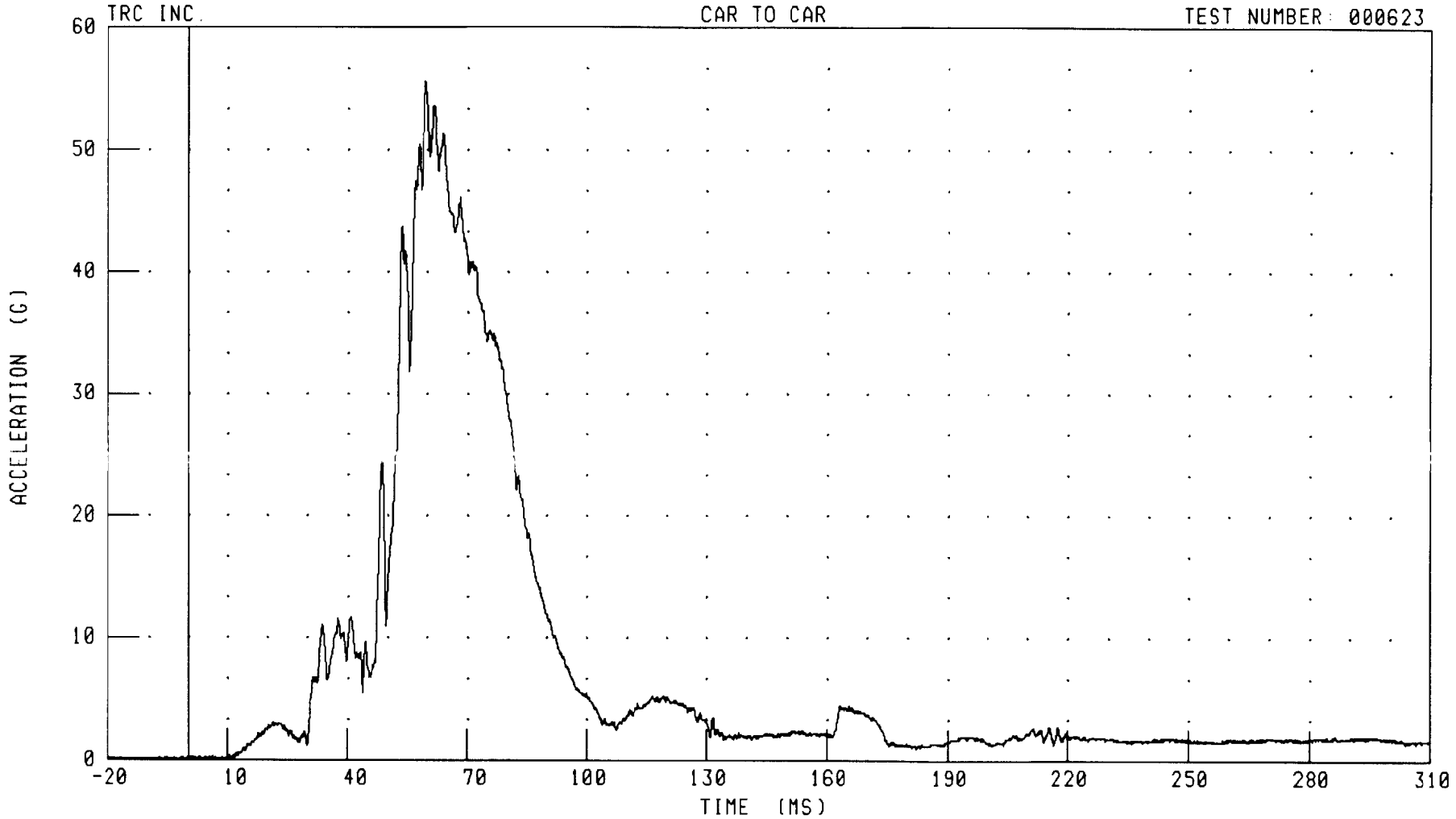
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION



CHANNEL: PEVZG2 FILTER: CH. CLASS 1000 PEAK DATA: 8.11 G @ 36.80 MS; -29.94 G @ 72.48 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

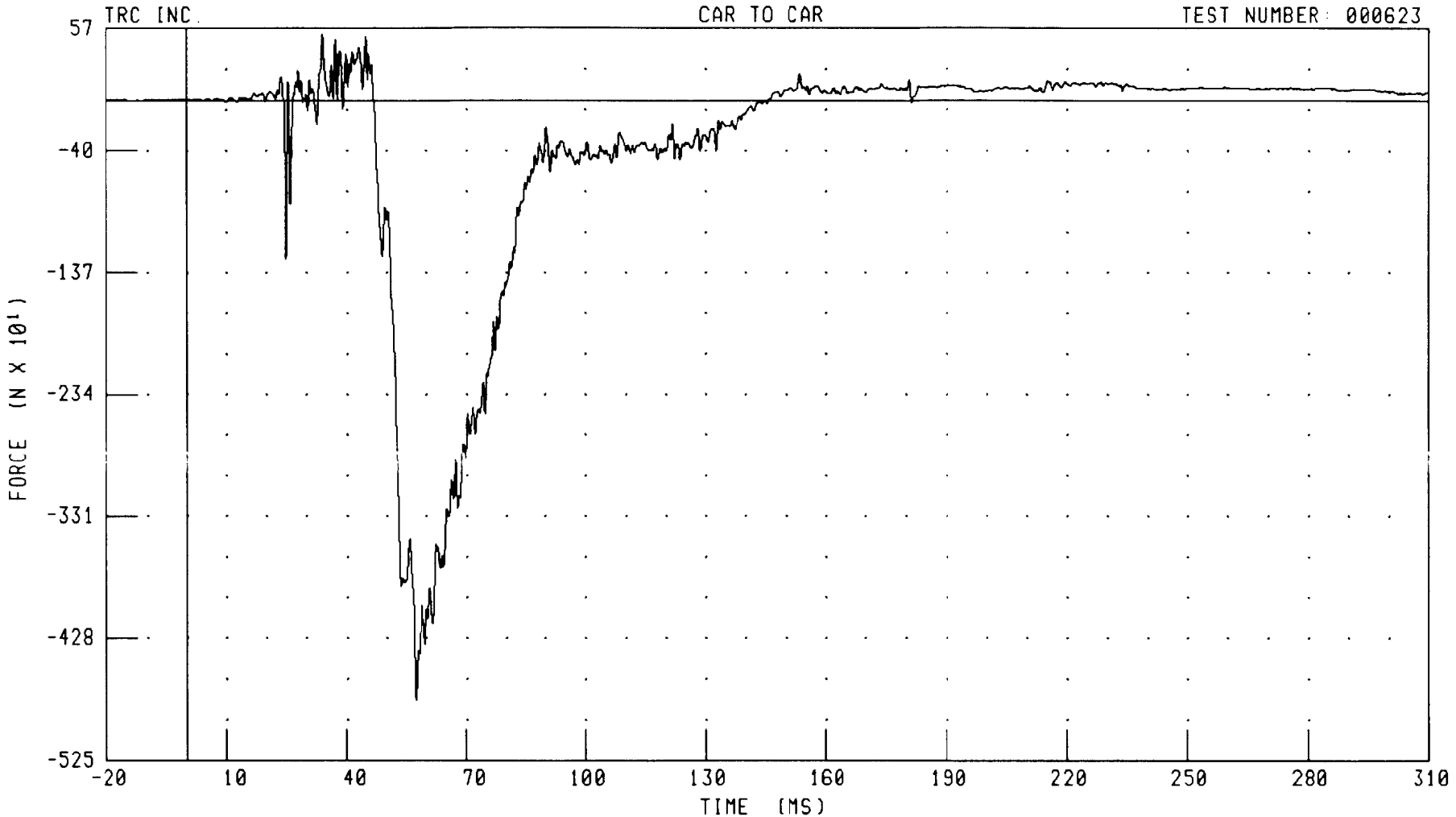
CARAVAN RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION



CHANNEL: PEVRG2 FILTER: CH. CLASS 1000 PEAK DATA: 55.60 G @ 59.52 MS; 0.10 G @ -20.00 MS

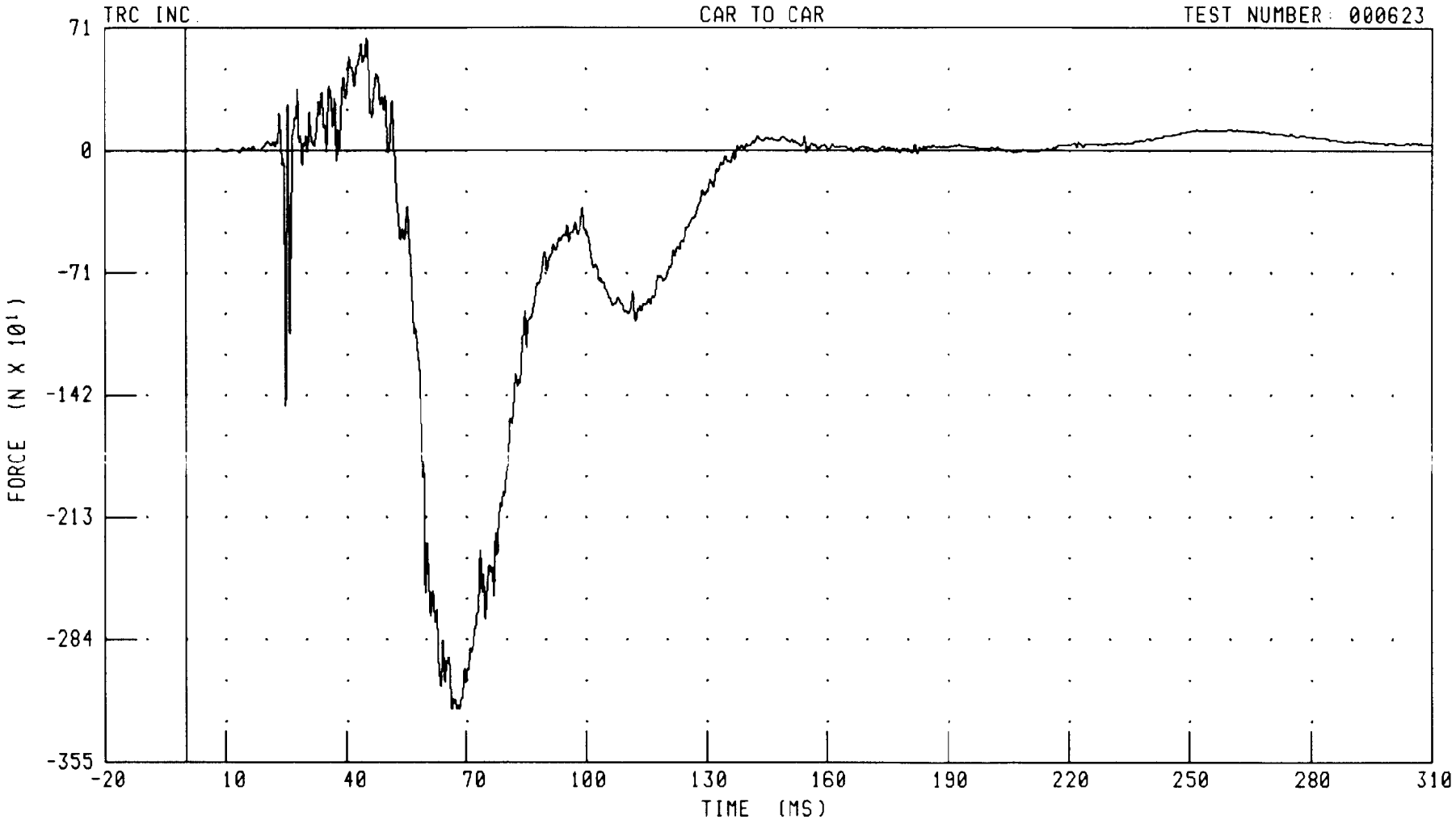
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

CARAVAN RIGHT FRONT PASSENGER LEFT FEMUR FORCE



CHANNEL: LFMZF2 FILTER: CH. CLASS 600 PEAK DATA: 521.91 N @ 34.16 MS, -4770.72 N @ 57.36 MS

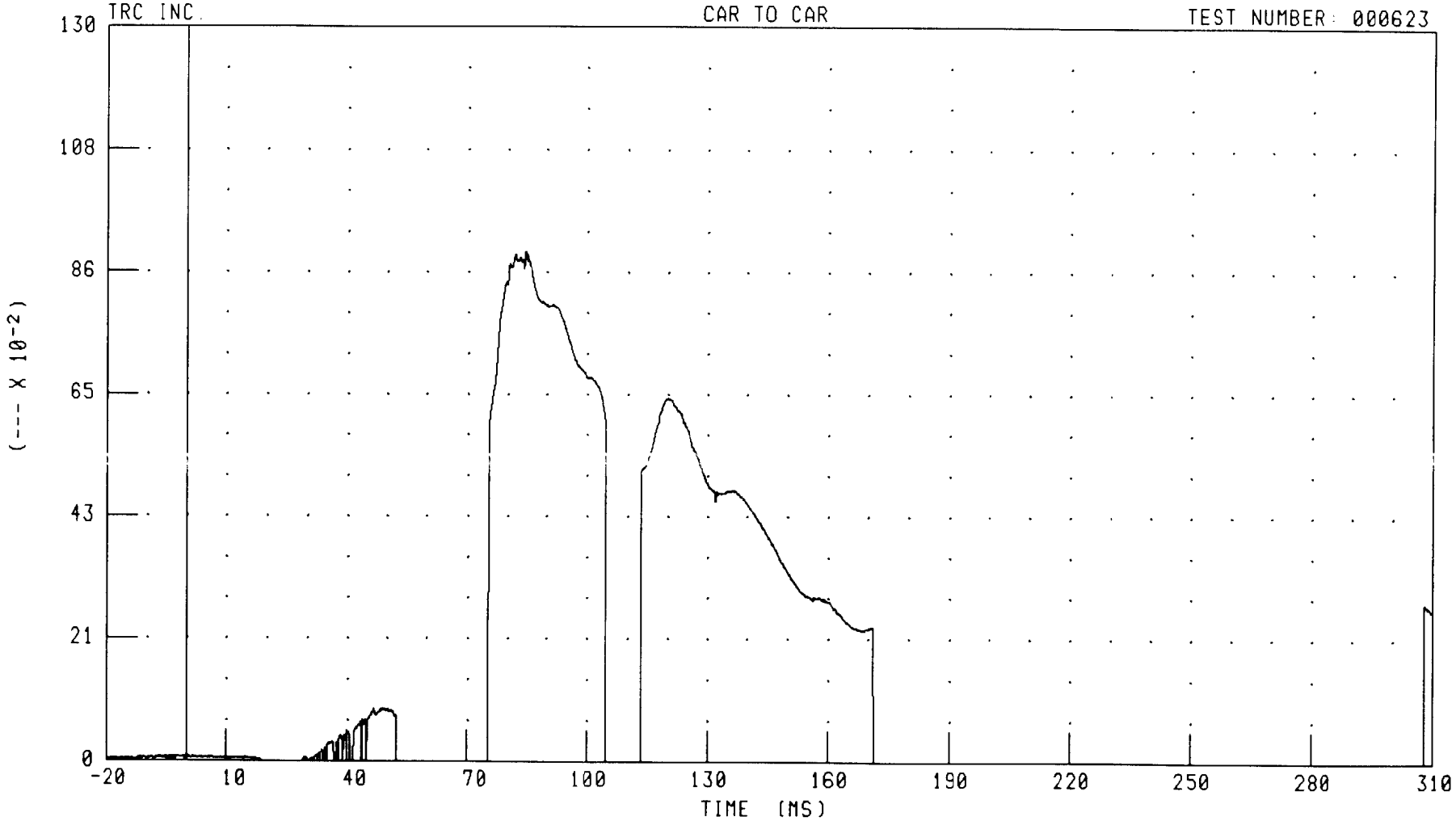
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
CARAVAN RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



CHANNEL: RFMZF2 FILTER: CH. CLASS 600 PEAK DATA: 650.94 N @ 45.04 MS; -3242.68 N @ 66.48 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

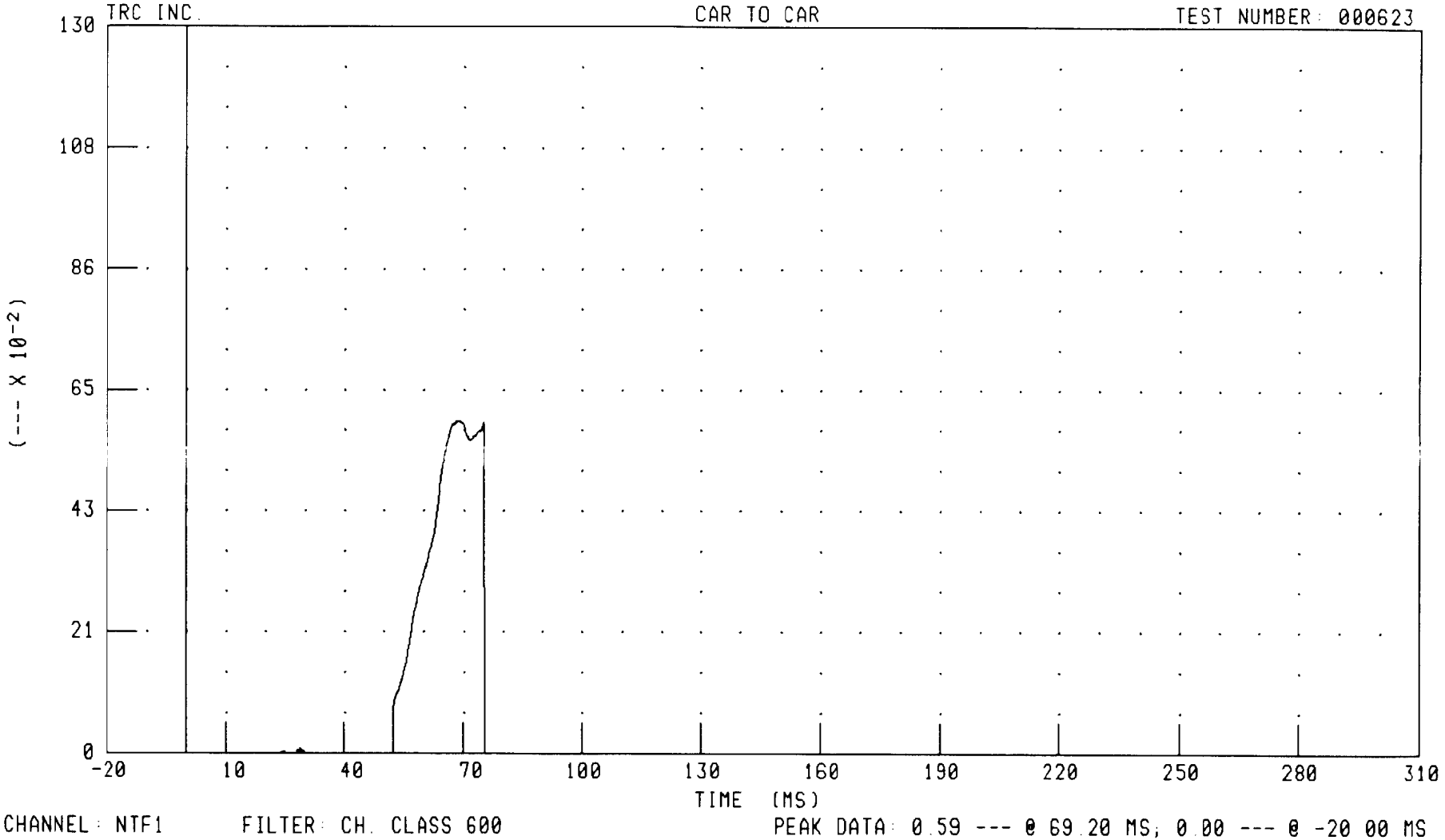
DRIVER NECK TENSION/EXTENSION



CHANNEL: NTE1 FILTER: CH. CLASS 600 PEAK DATA 0.90 --- @ 84.48 MS, 0.00 --- @ -19.92 MS

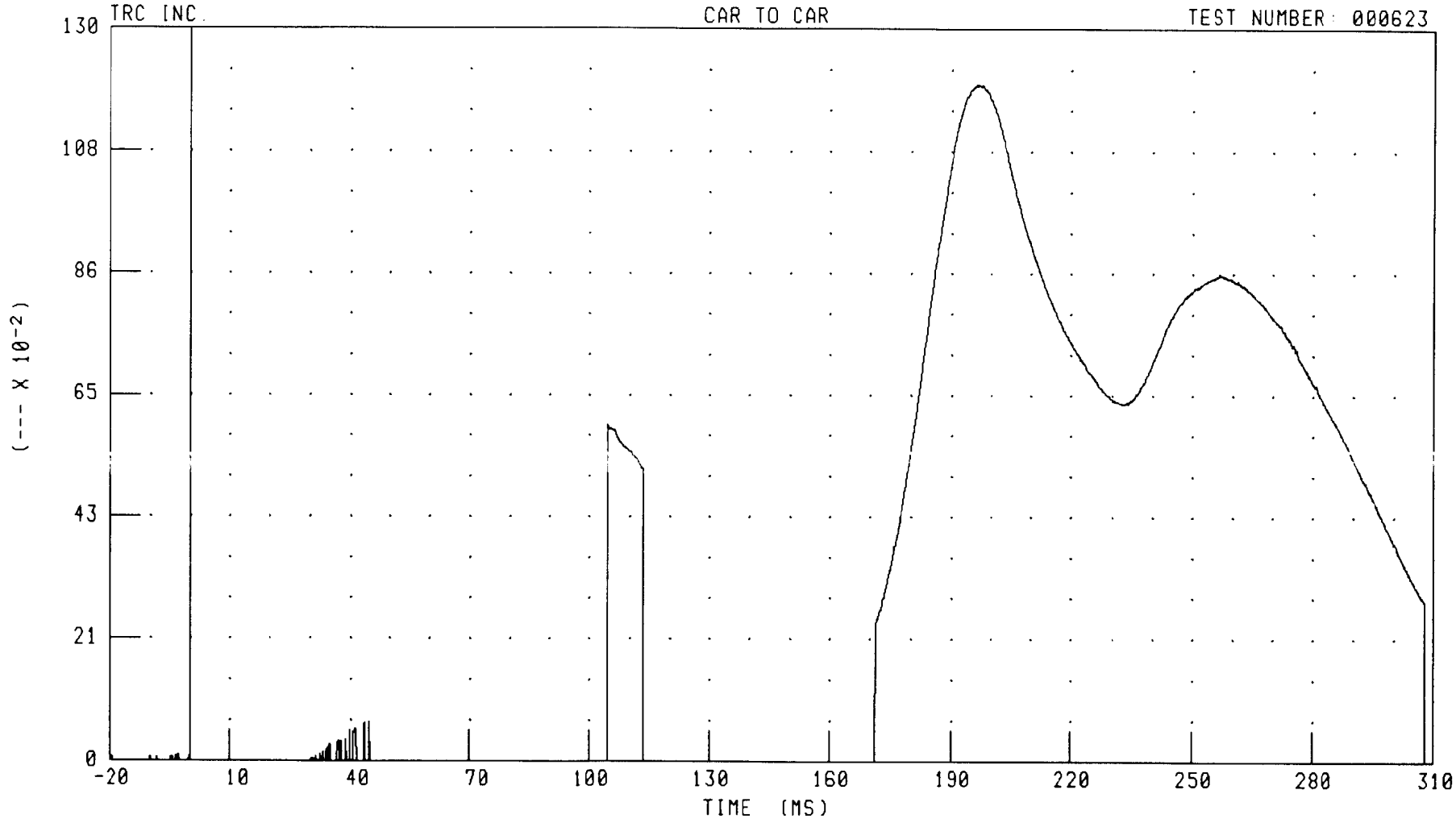
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER NECK TENSION/FLEXION



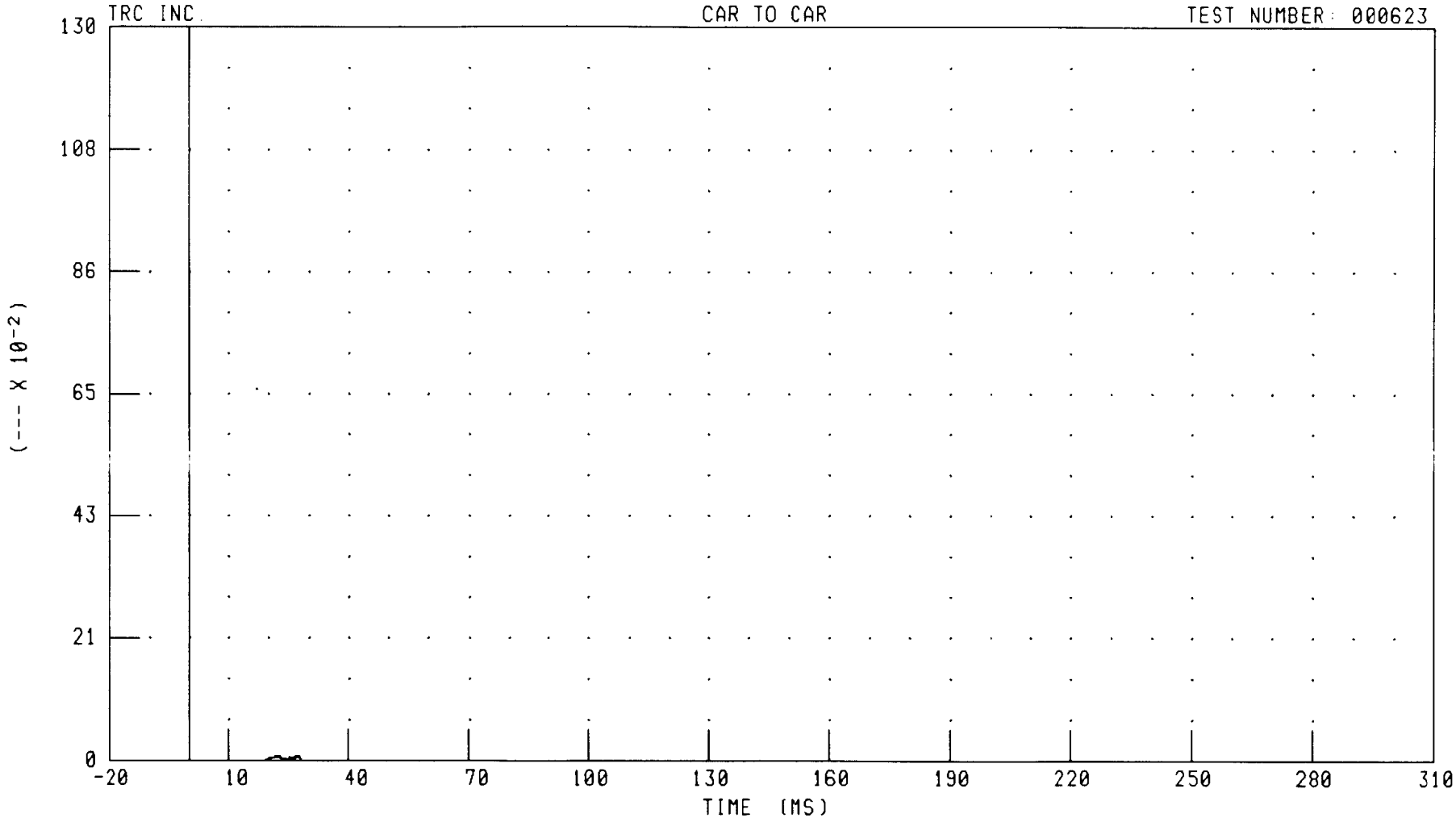
CHANNEL: NTF1 FILTER: CH. CLASS 600 PEAK DATA: 0.59 --- @ 69.20 MS; 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK COMPRESSION/EXTENSION



CHANNEL: NCE1 FILTER: CH. CLASS 600 PEAK DATA: 1.20 --- @ 196.64 MS; 0.00 --- @ -20.00 MS

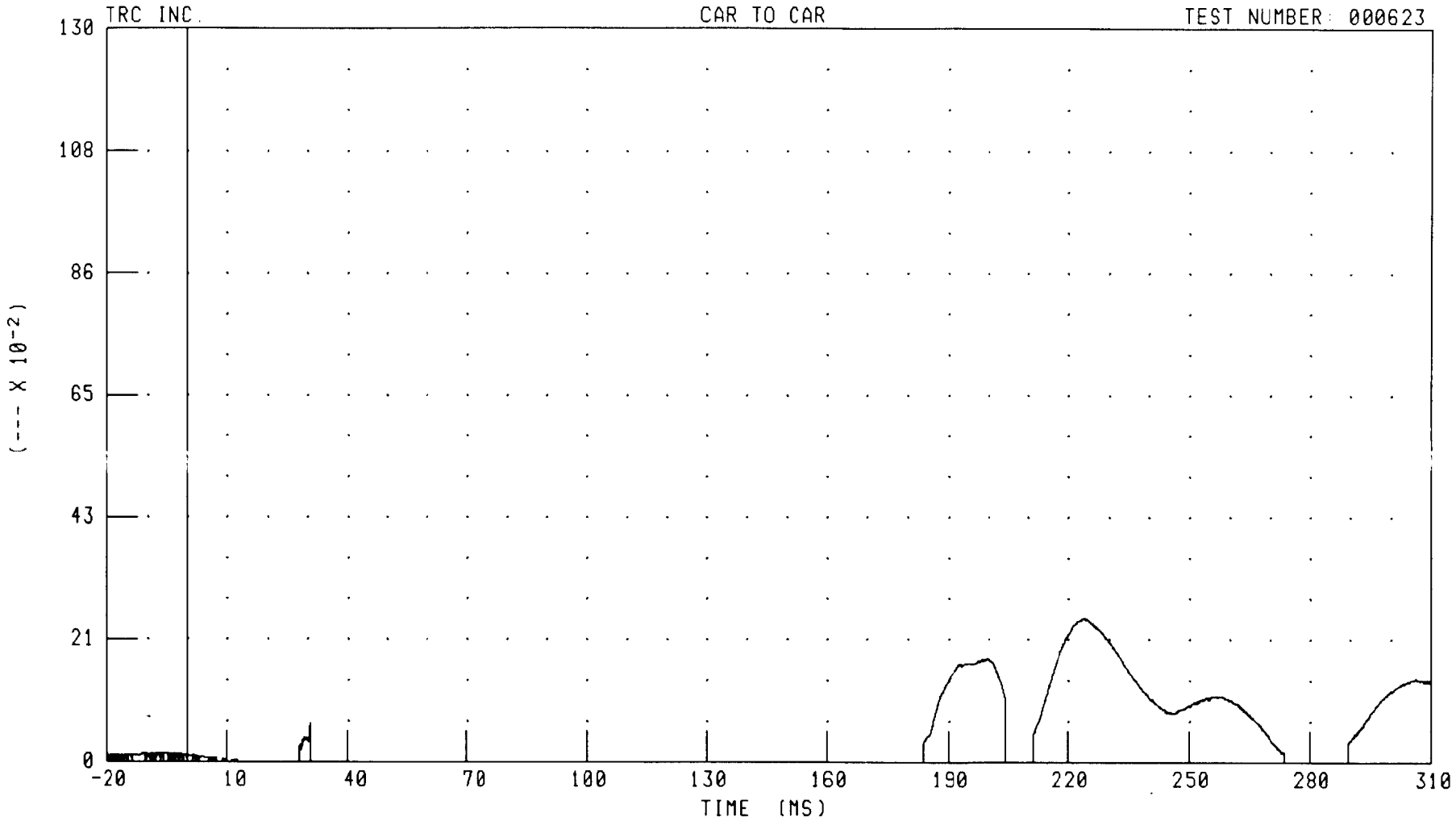
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK COMPRESSION/FLEXION



CHANNEL: NCF1 FILTER: CH. CLASS 600 PEAK DATA: 0.01 --- @ 27.52 MS; 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

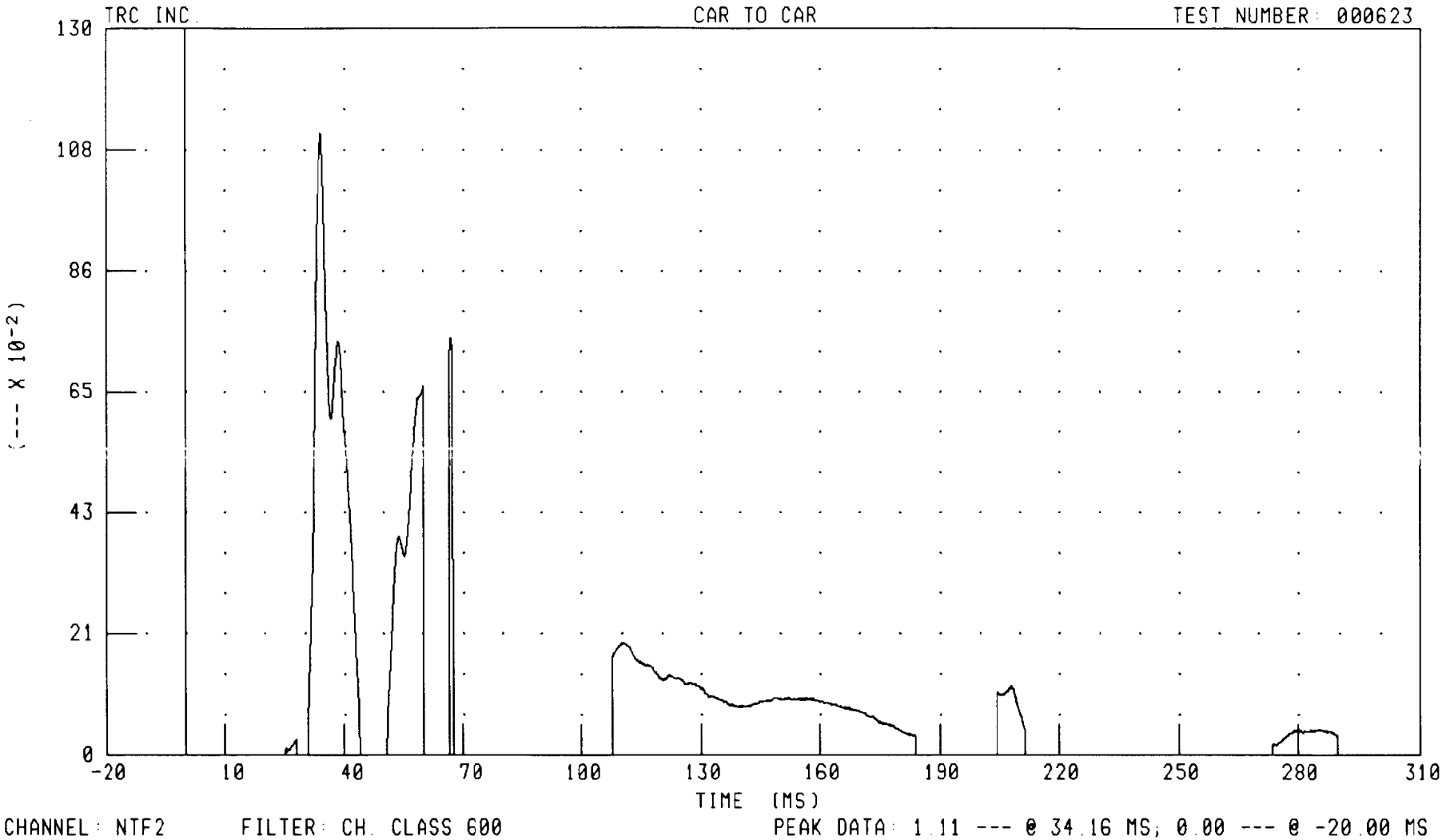
PASSENGER NECK TENSION/EXTENSION



CHANNEL: NTE2 FILTER: CH. CLASS 600 PEAK DATA: 0.26 --- @ 223.76 MS; 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

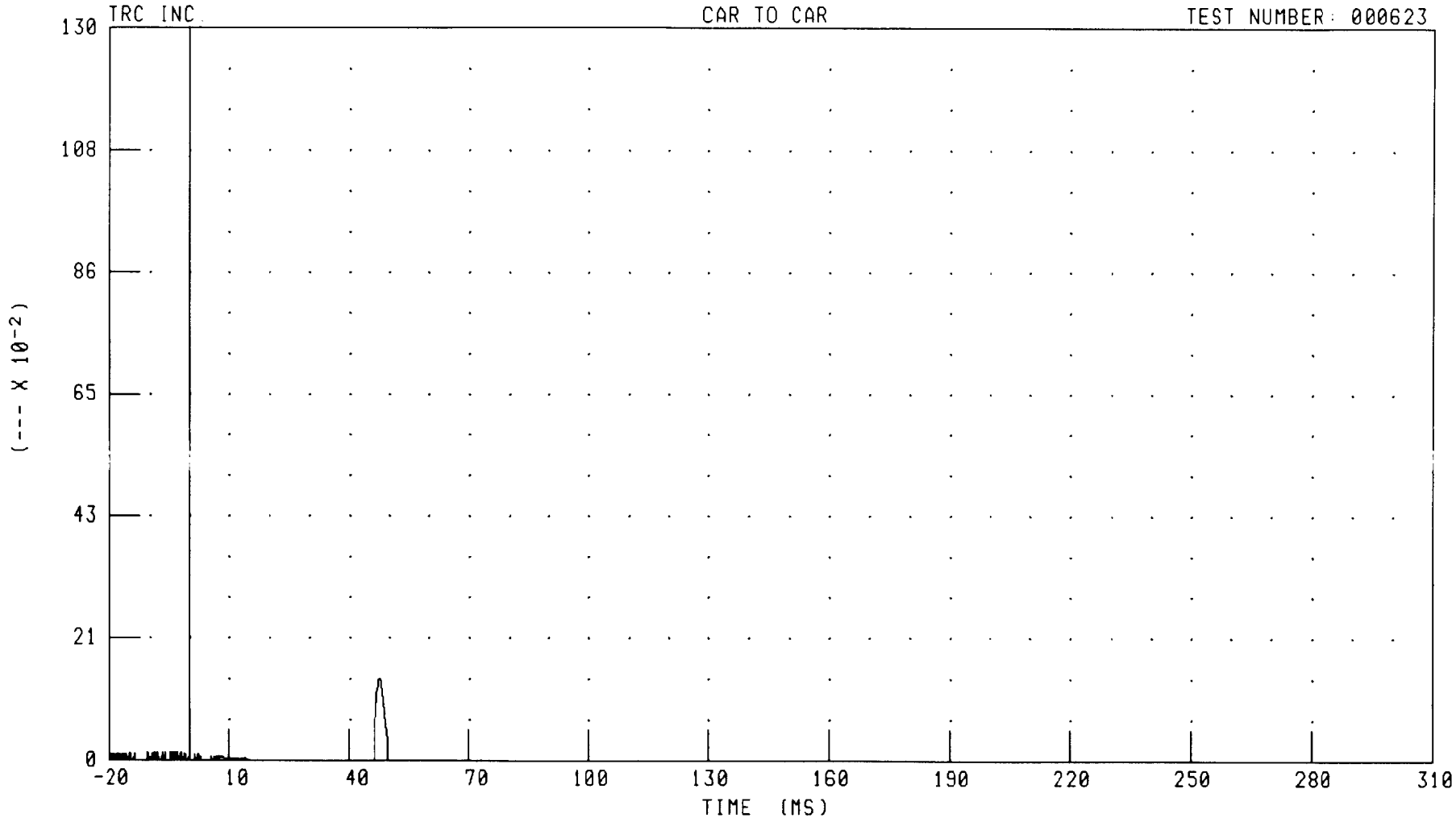
PASSENGER NECK TENSION/FLEXION



CHANNEL: NTF2 FILTER: CH. CLASS 600 PEAK DATA: 1.11 --- @ 34.16 MS; 0.00 --- @ -20.00 MS

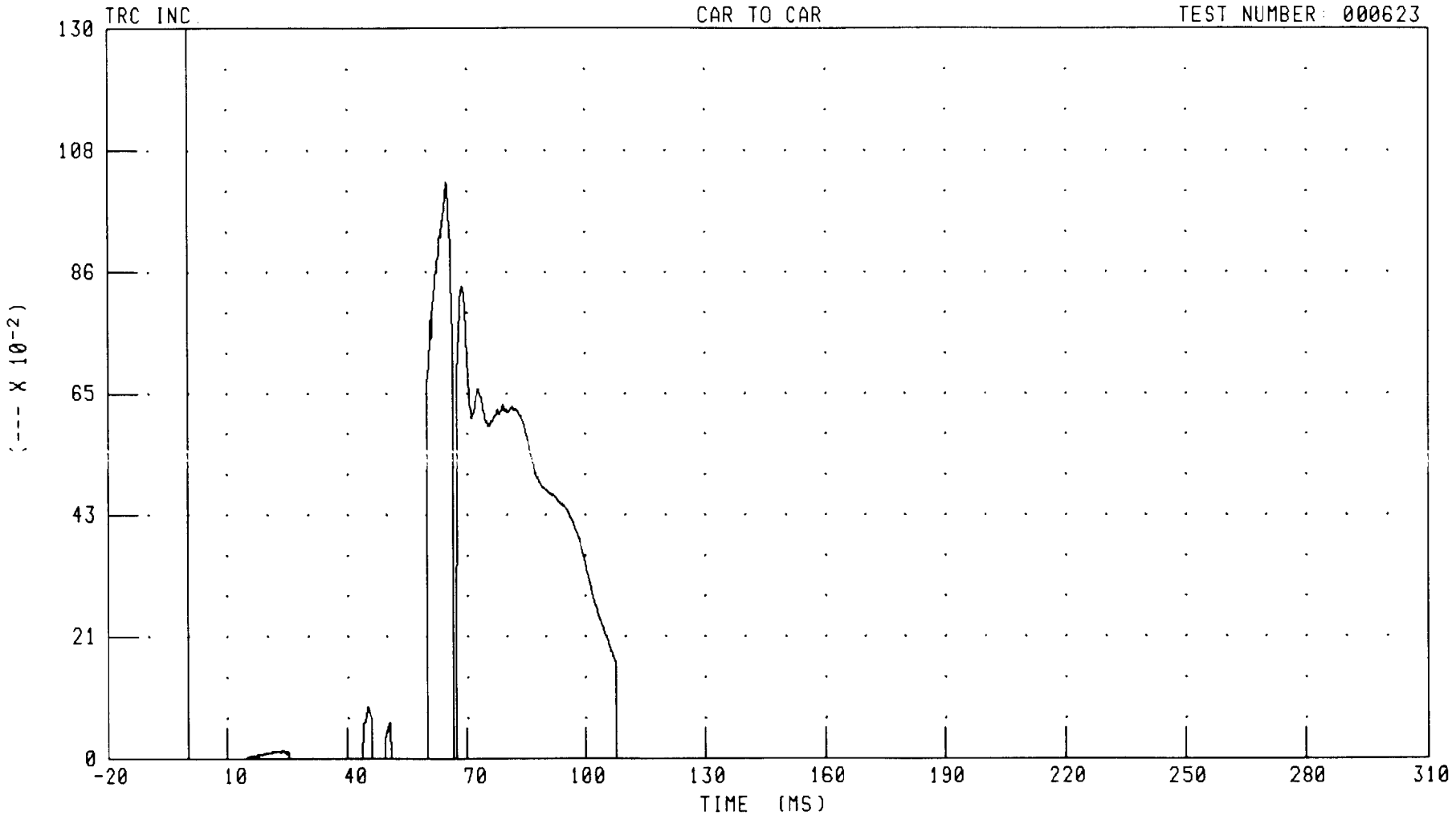
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

PASSENGER NECK COMPRESSION/EXTENSION



CHANNEL: NCE2 FILTER: CH. CLASS 600 PEAK DATA: 0.15 --- @ 47.68 MS; 0.00 --- @ -19.68 MS

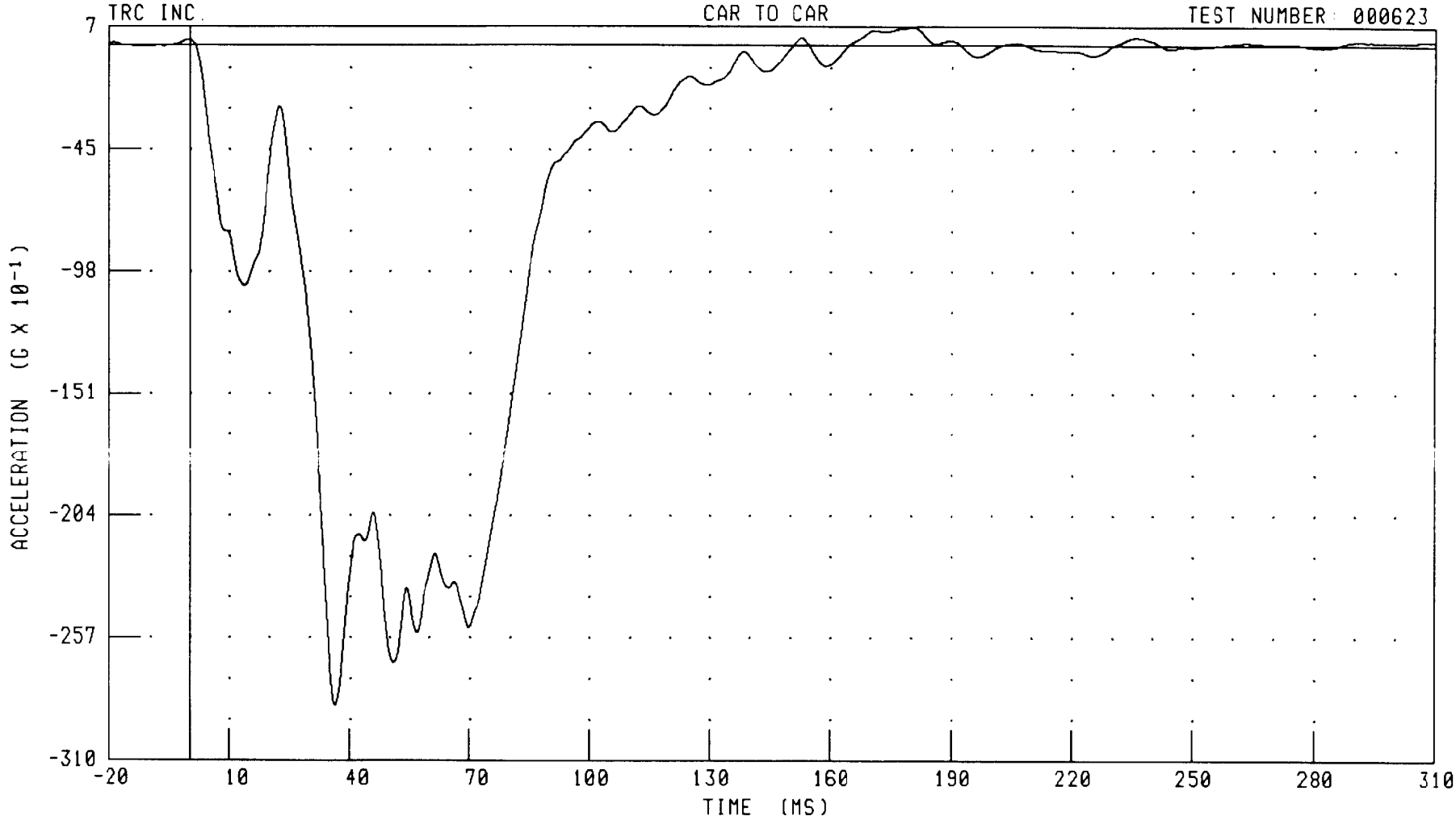
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER NECK COMPRESSION/FLEXION



CHANNEL: NCF2 FILTER: CH. CLASS 600 PEAK DATA: 1.03 --- @ 65.12 MS; 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

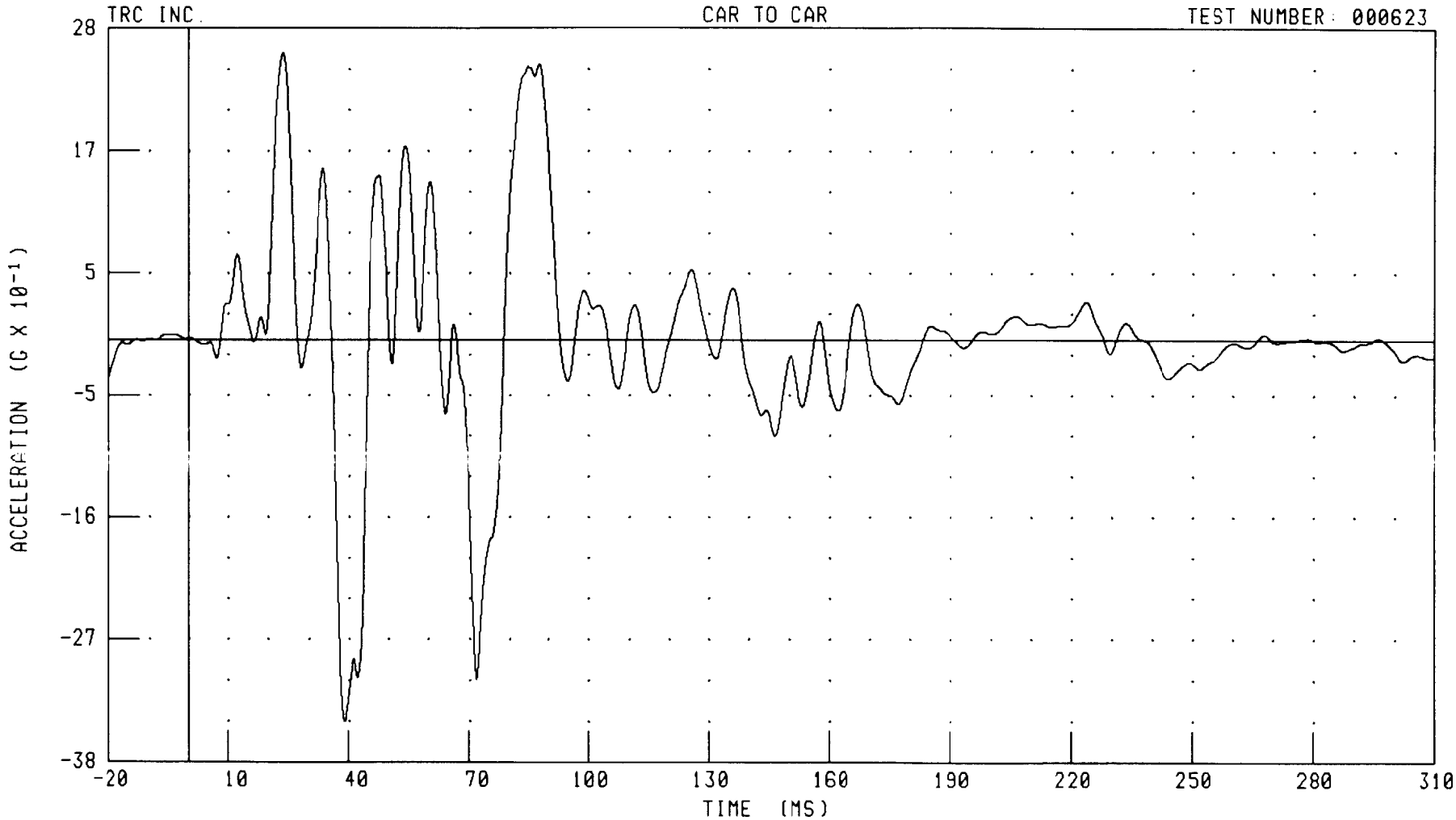
CARAVAN LEFT REAR SEAT X-AXIS ACCELERATION



CHANNEL: LRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.77 G @ 180.48 MS, -28.63 G @ 36.40 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

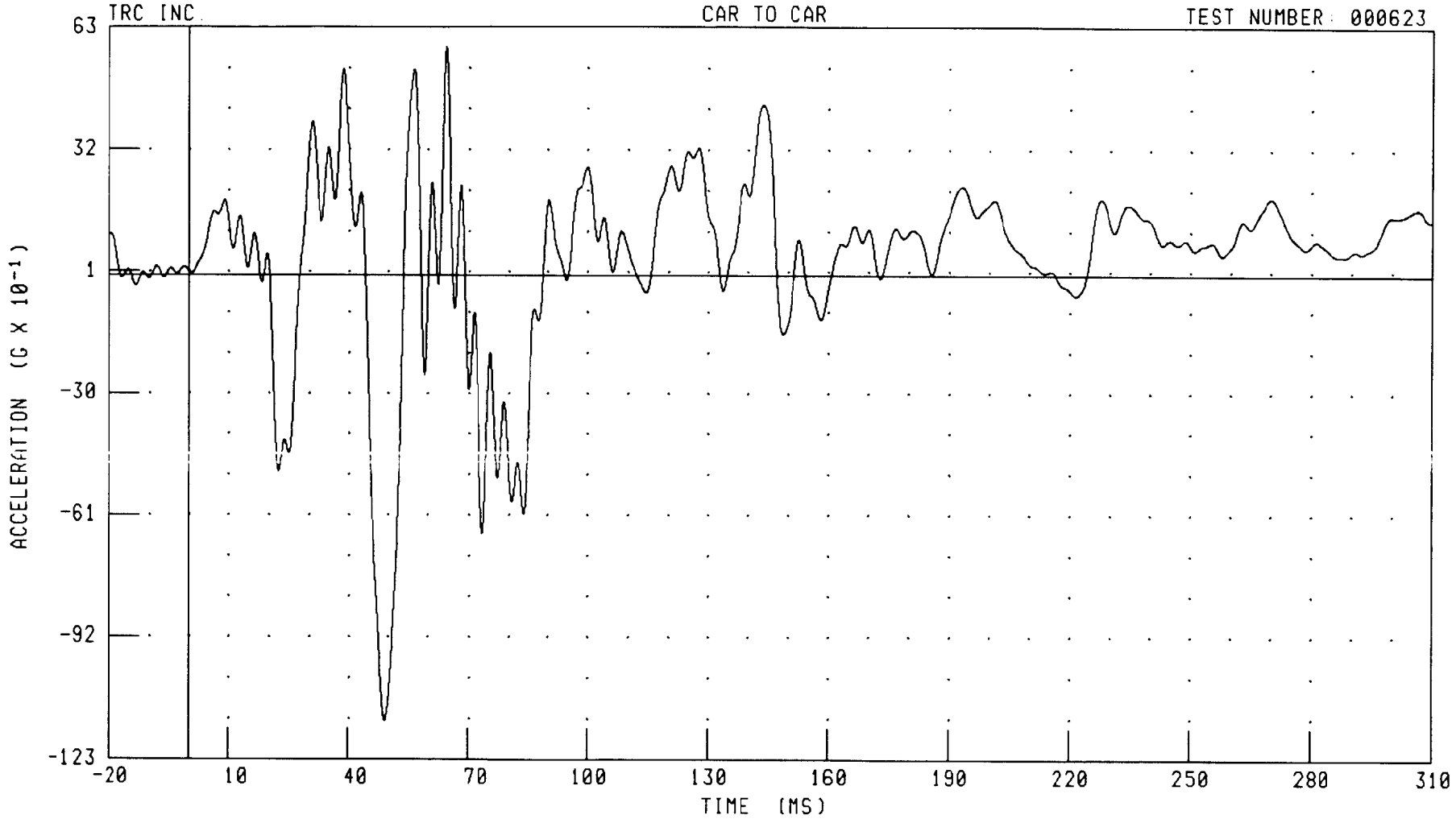
CARAVAN LEFT REAR SEAT Y-AXIS ACCELERATION



CHANNEL: LRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 2.58 G @ 23.76 MS; -3.44 G @ 39.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

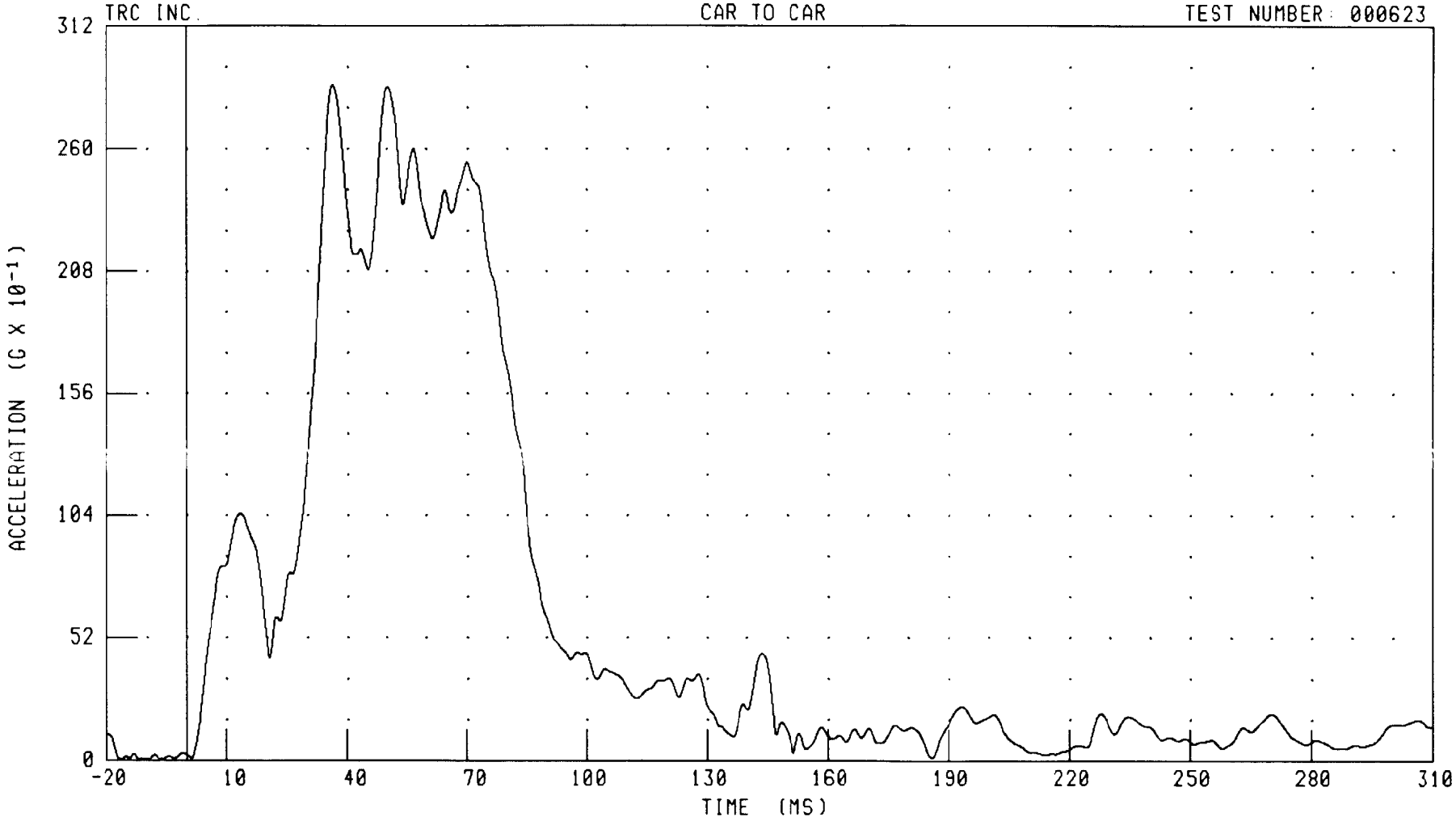
CARAVAN LEFT REAR SEAT Z-AXIS ACCELERATION



CHANNEL: LRSZG1 FILTER: CH. CLASS 60 PEAK DATA: 5.80 G @ 64.64 MS, -11.33 G @ 49.28 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

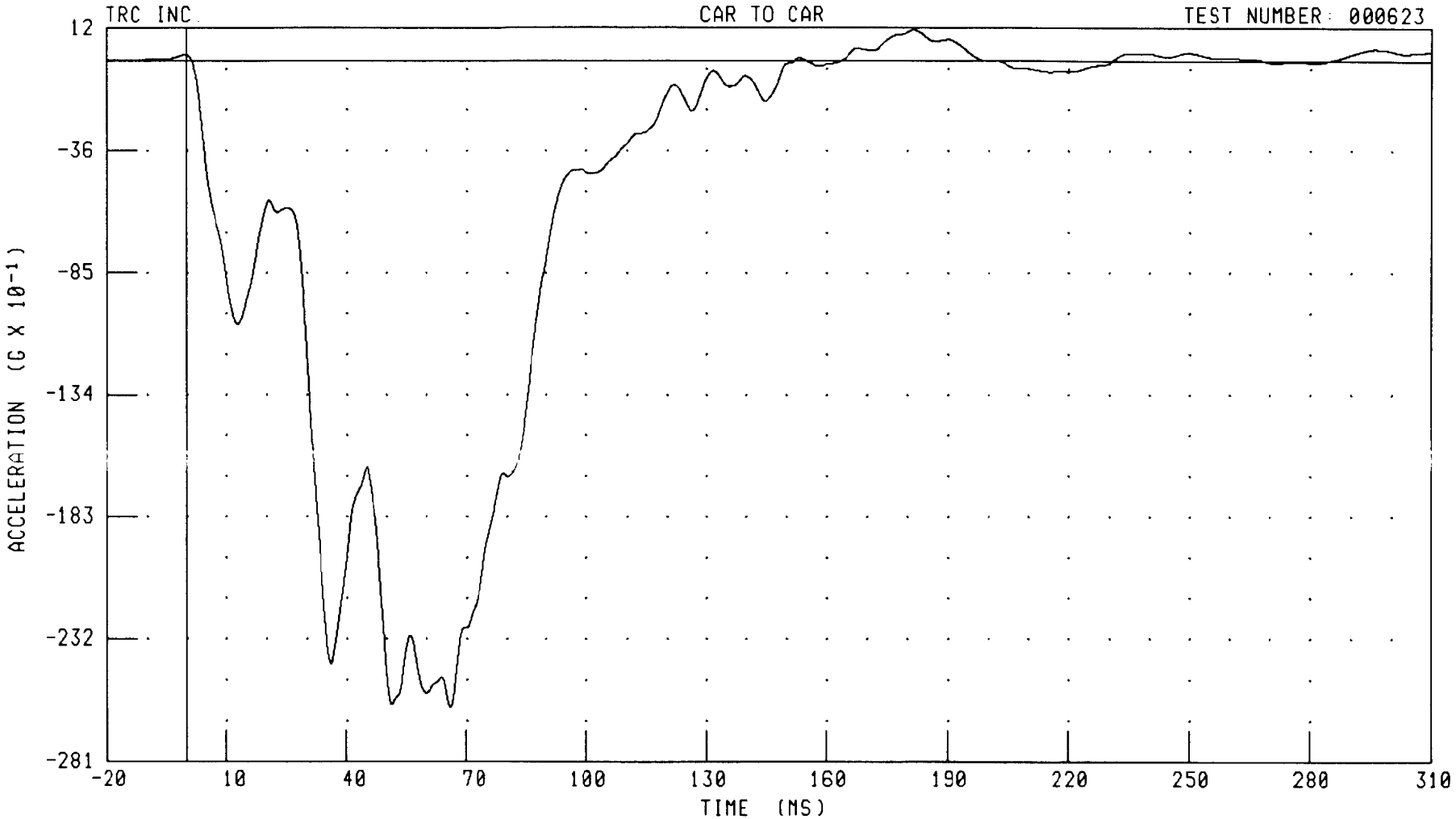
CARAVAN LEFT REAR SEAT RESULTANT ACCELERATION



CHANNEL: LRSRG1 FILTER: CH. CLASS 60 PEAK DATA: 28.71 G @ 36.40 MS; 0.03 G @ -16.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

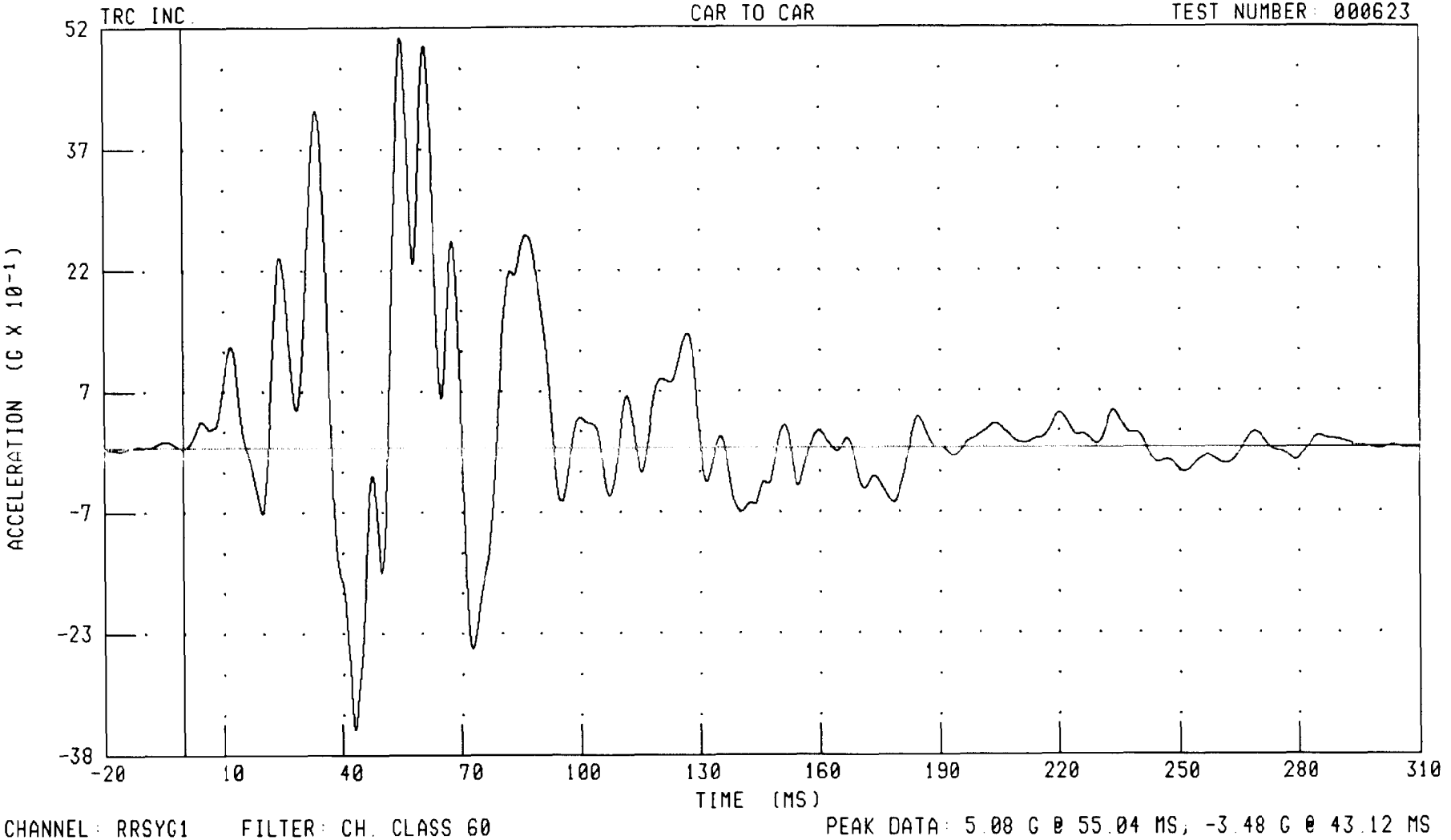
CARAVAN RIGHT REAR SEAT X-AXIS ACCELERATION



CHANNEL: RRSXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.22 G @ 181.68 MS; -25.94 G @ 66.08 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

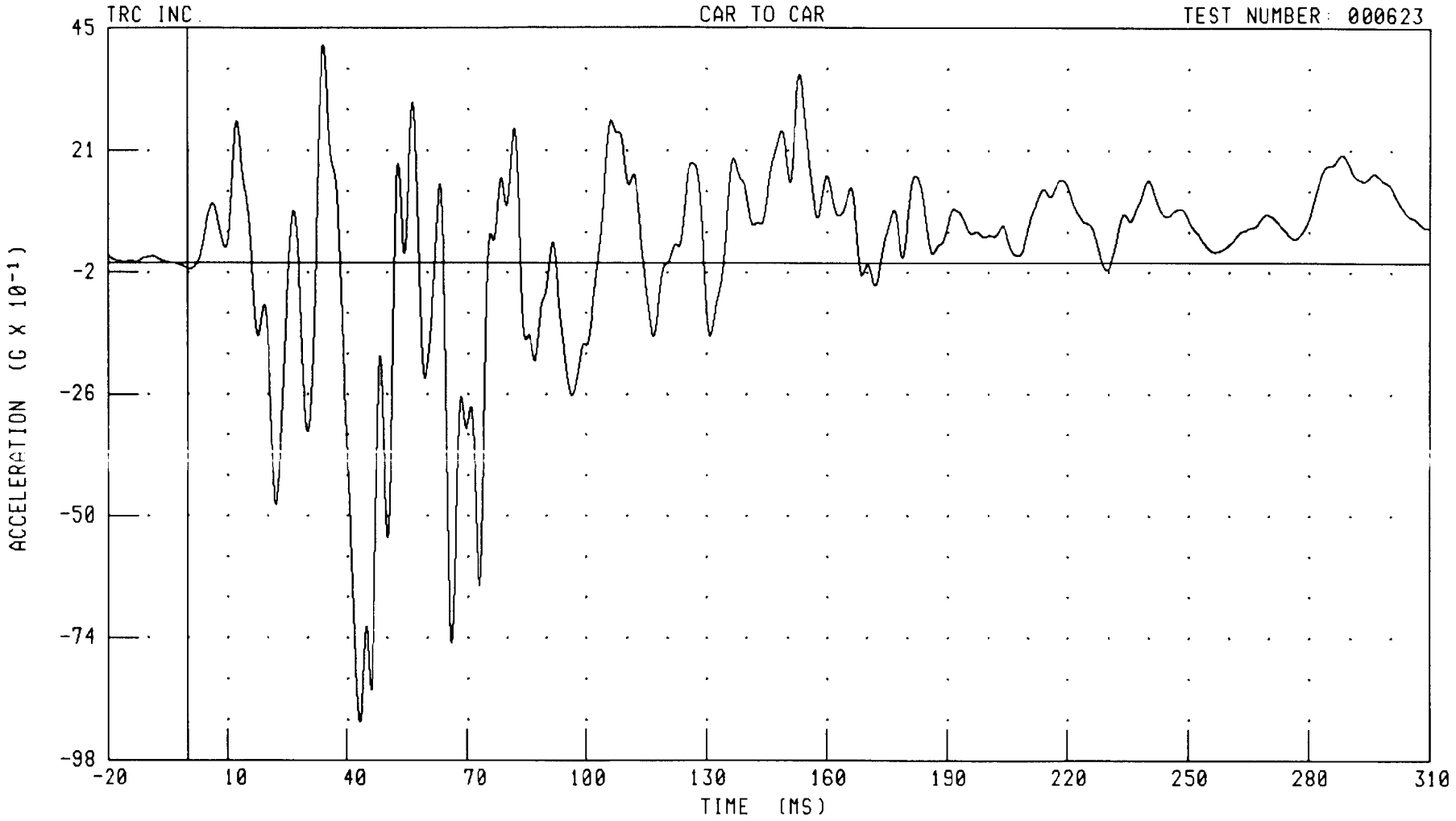
CARAVAN RIGHT REAR SEAT Y-AXIS ACCELERATION



CHANNEL: RRSYG1 FILTER: CH. CLASS 60 PEAK DATA: 5.08 G @ 55.04 MS, -3.48 G @ 43.12 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

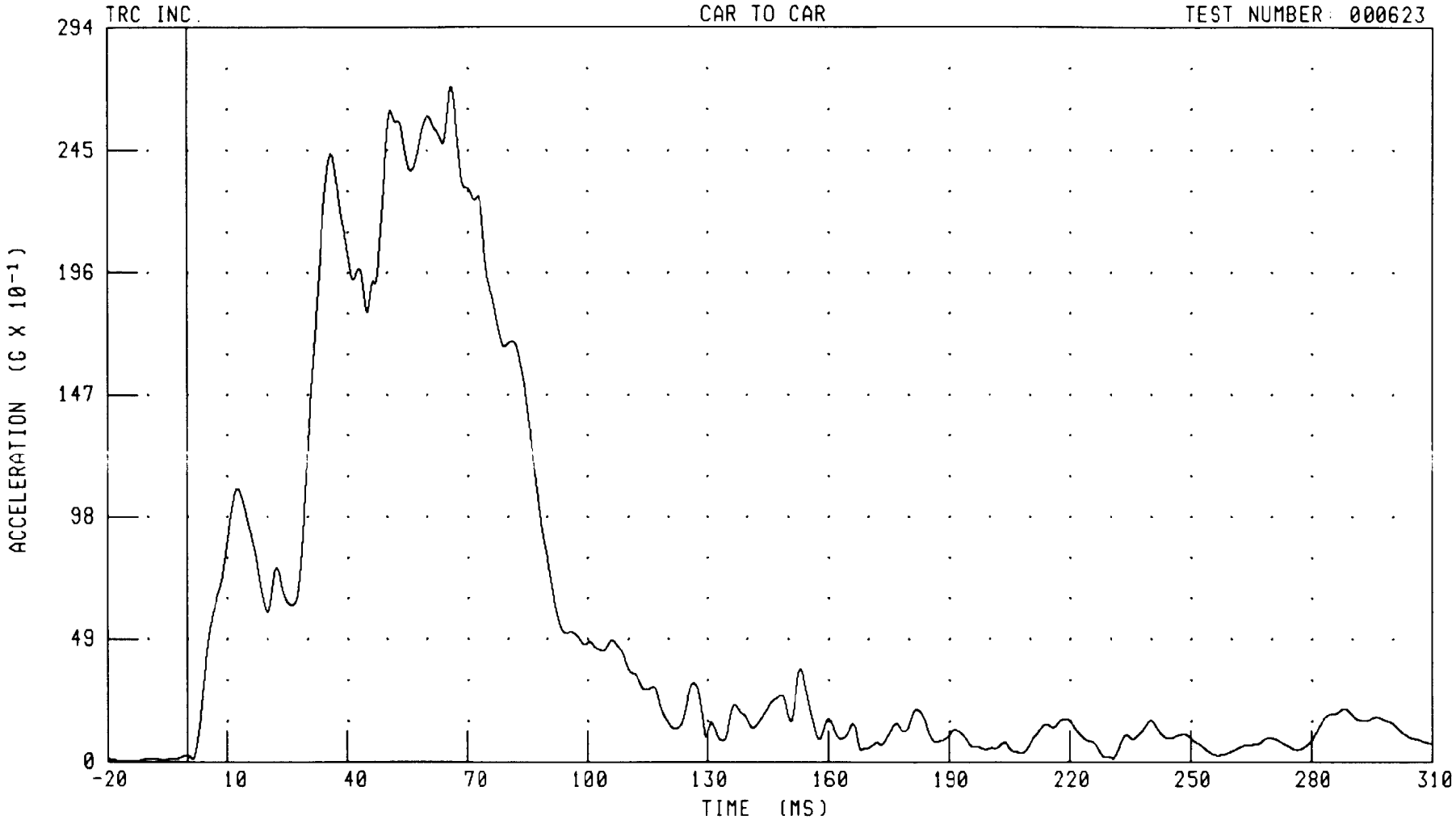
CARAVAN RIGHT REAR SEAT Z-AXIS ACCELERATION



CHANNEL: RRSZG1 FILTER: CH. CLASS 60 PEAK DATA: 4.27 G @ 34.08 MS; -9.05 G @ 43.28 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

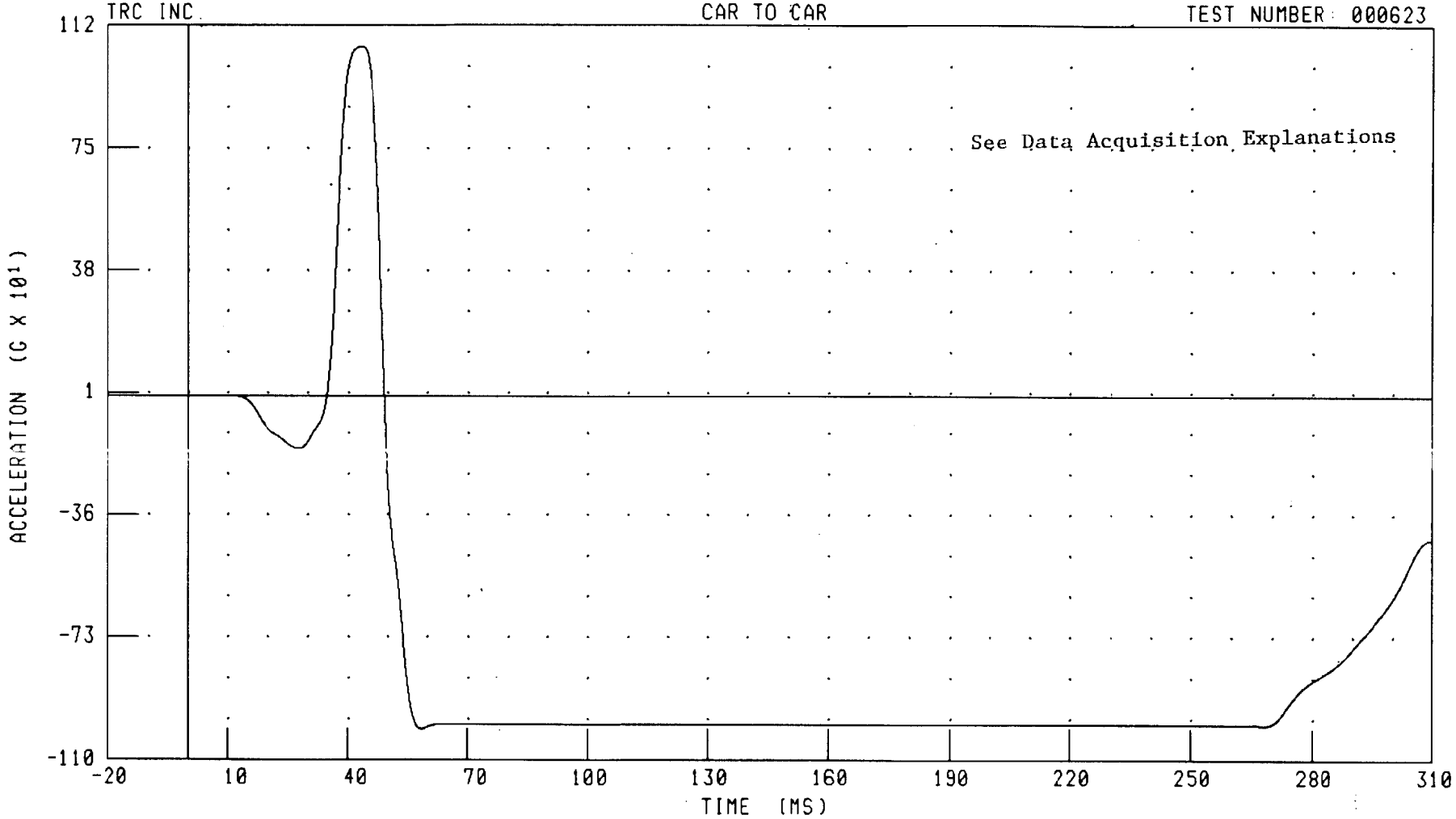
CARAVAN RIGHT REAR SEAT RESULTANT ACCELERATION



CHANNEL: RRSRG1 FILTER: CH. CLASS 60 PEAK DATA: 27.03 G @ 66.08 MS; 0.03 G @ -12.96 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

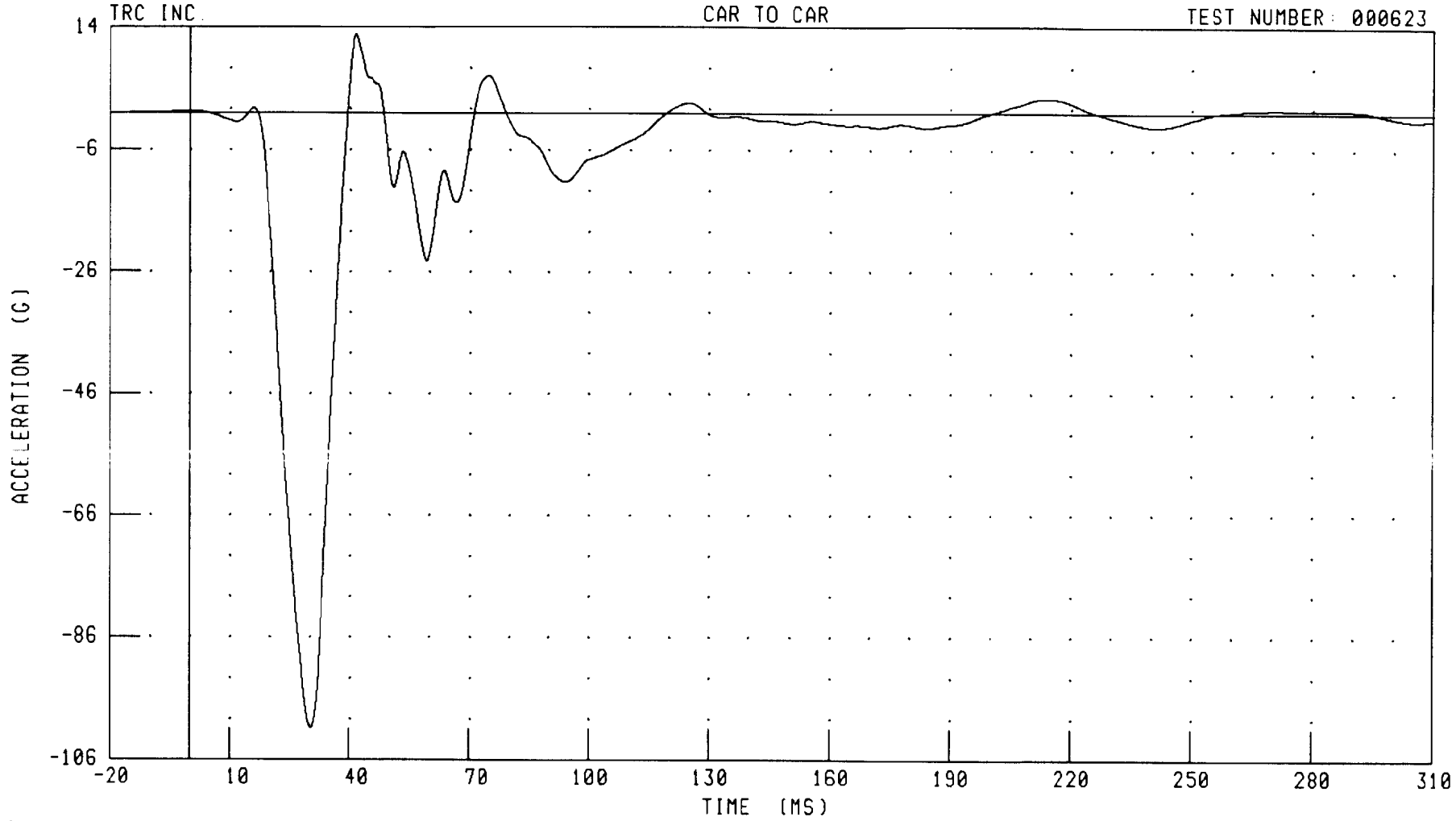
CARAVAN ENGINE TOP X-AXIS ACCELERATION



CHANNEL: ENGXG1 FILTER: CH. CLASS 60 PEAK DATA: 1056.50 G @ 43.52 MS; -1008.33 G @ 58.40 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

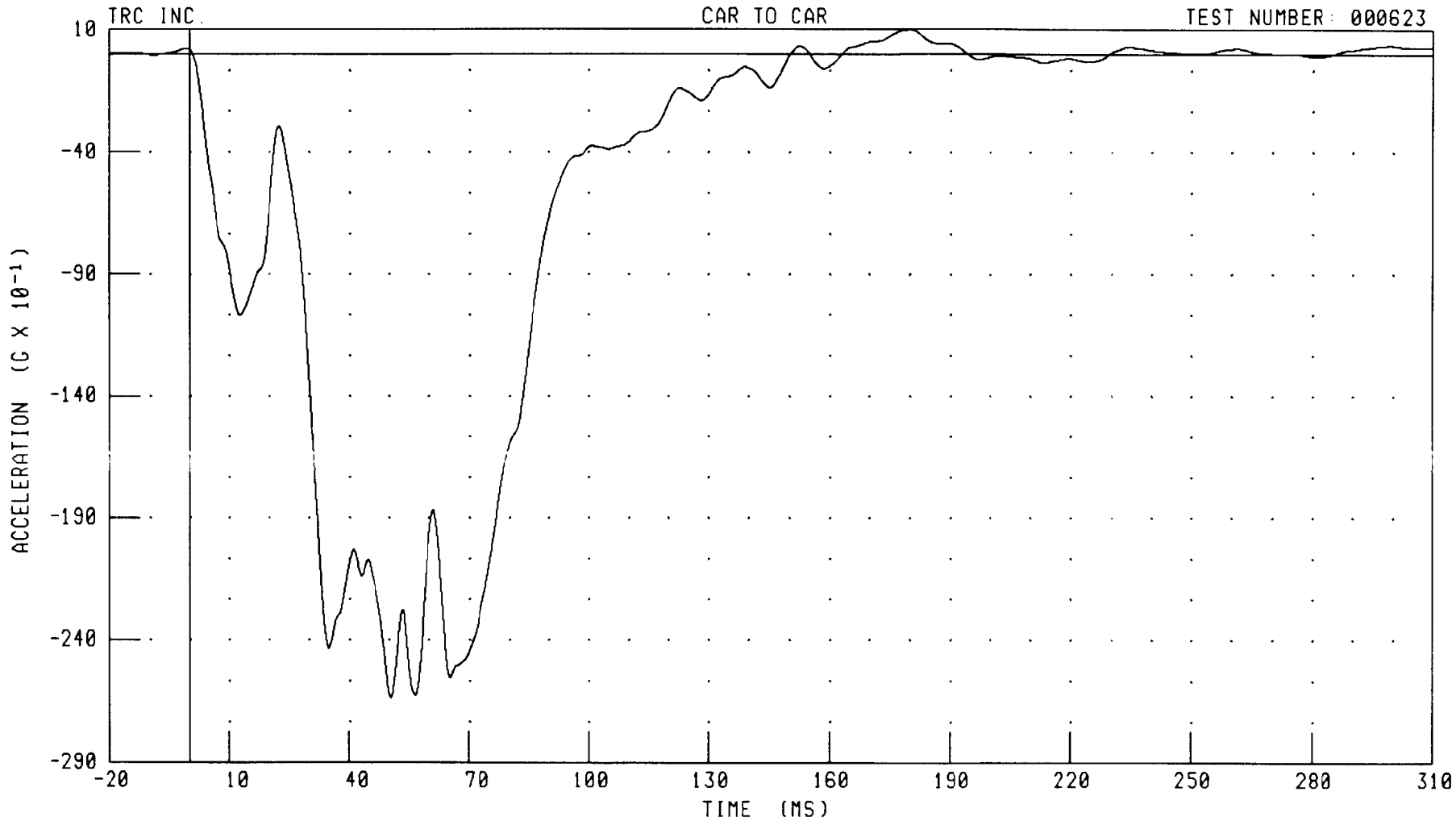
CARAVAN ENGINE BOTTOM X-AXIS ACCELERATION



CHANNEL: ENGXG2 FILTER: CH. CLASS 60 PEAK DATA: 12.79 G @ 41.52 MS, -100.84 G @ 30.32 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

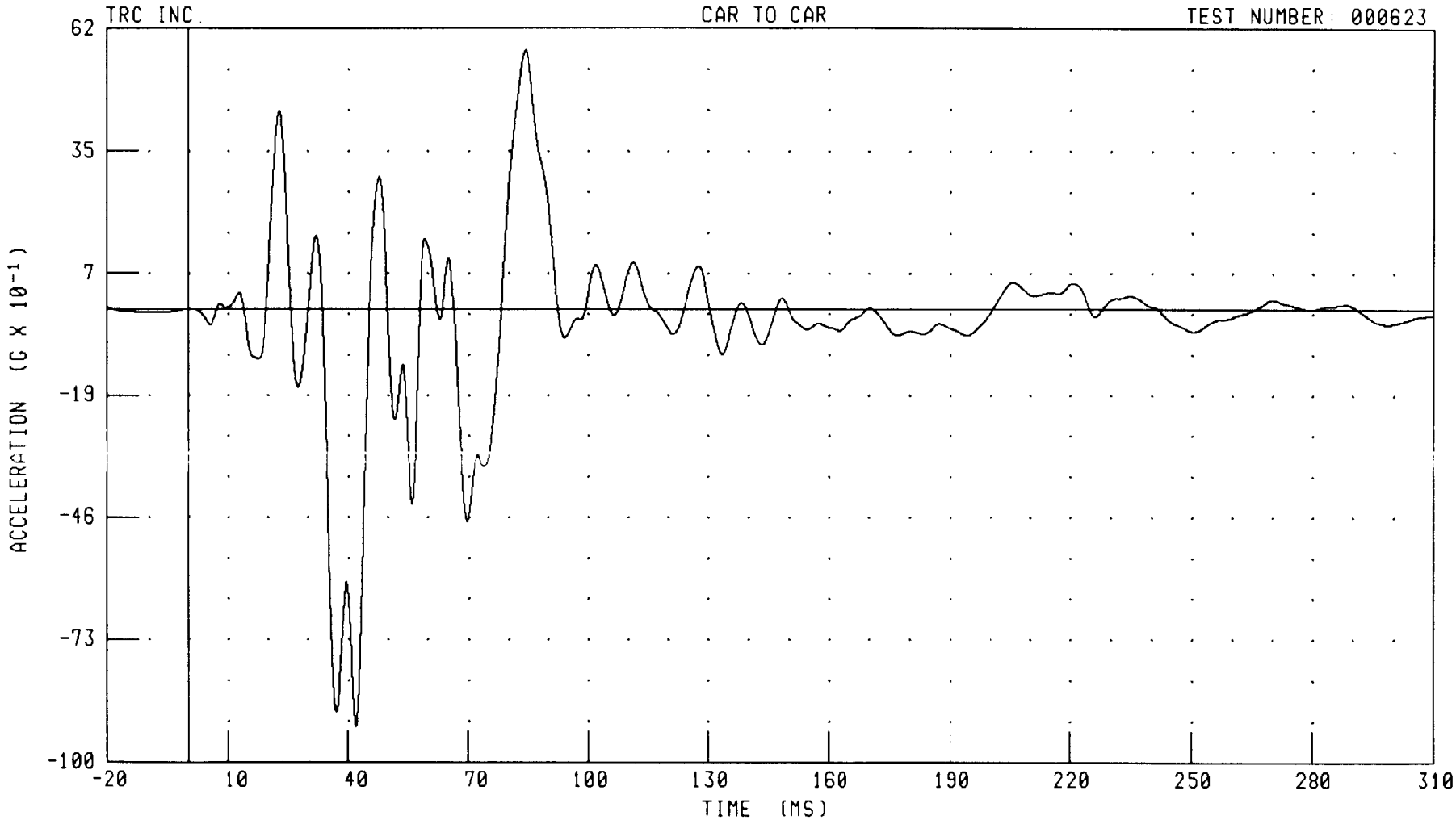
CARAVAN VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION



CHANNEL: VCGXG1 FILTER: CH. CLASS 60 PEAK DATA: 0.99 G @ 180.00 MS; -26.36 G @ 50.48 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

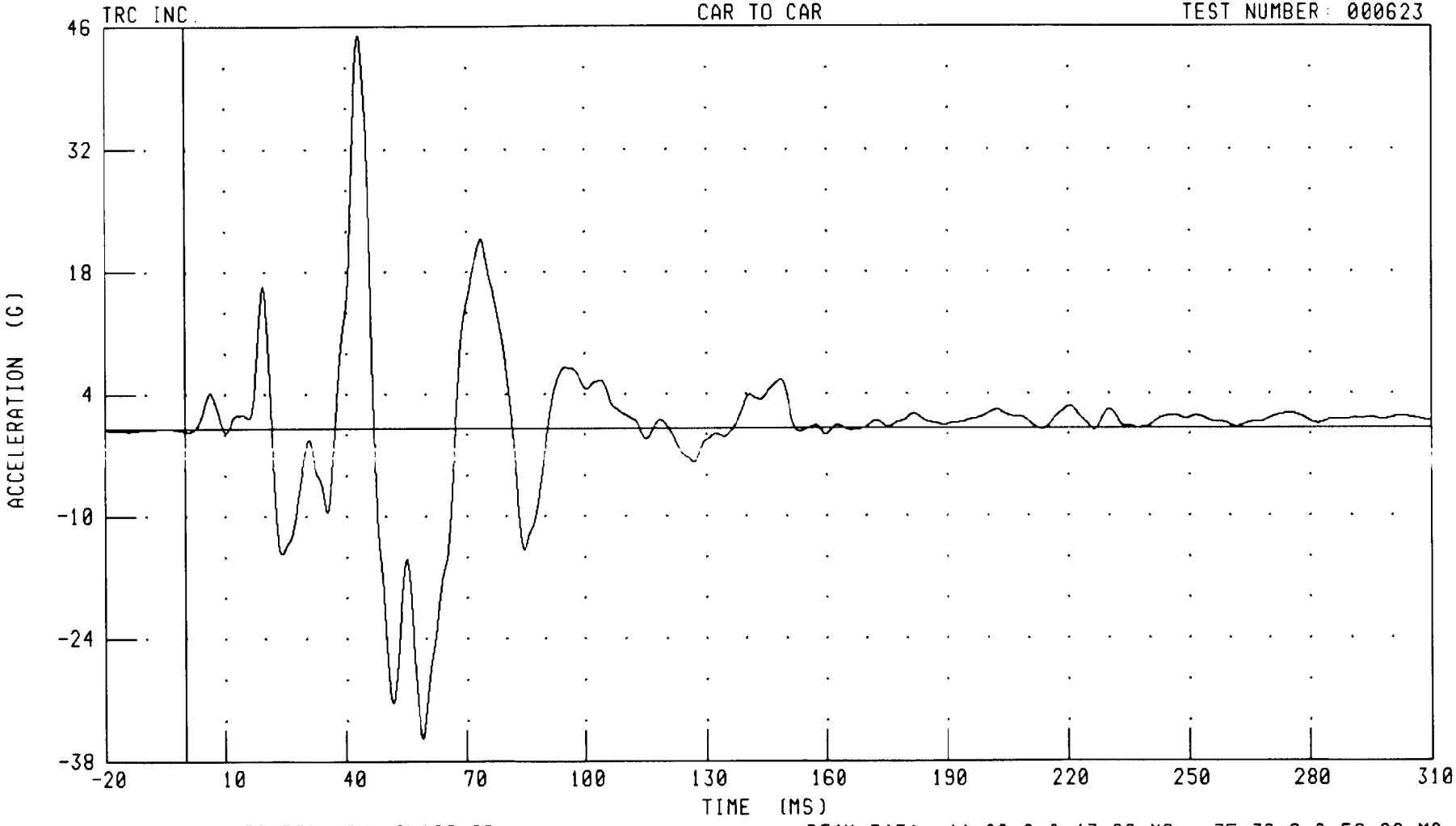
CARAVAN VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION



CHANNEL: VCGYG1 FILTER: CH. CLASS 60 PEAK DATA: 5.71 G @ 84.40 MS; -9.22 G @ 41.92 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

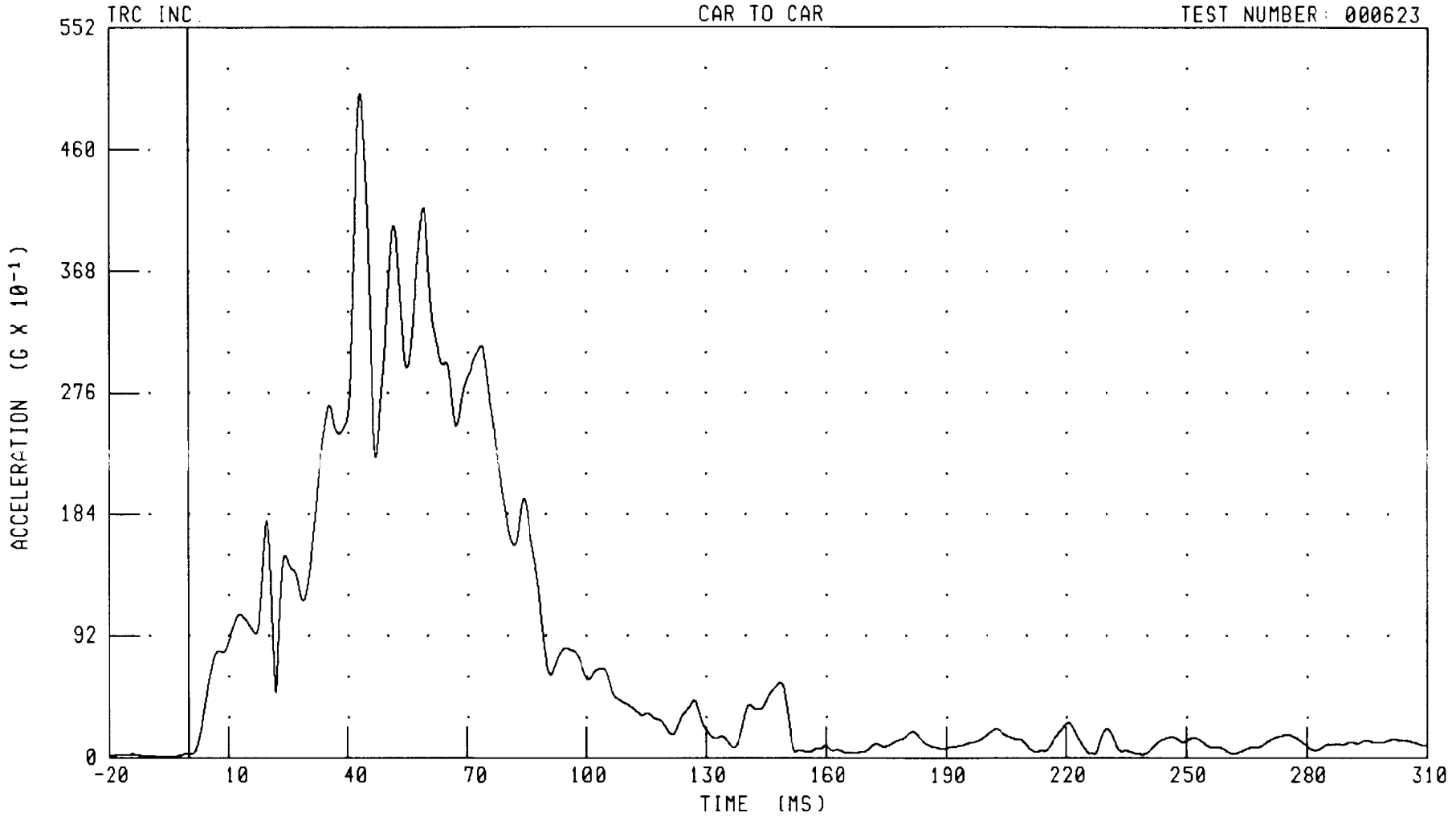
CARAVAN VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION



CHANNEL: VCGZG1 FILTER: CH. CLASS 60 PEAK DATA: 44.99 G @ 43.28 MS; -35.38 G @ 59.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

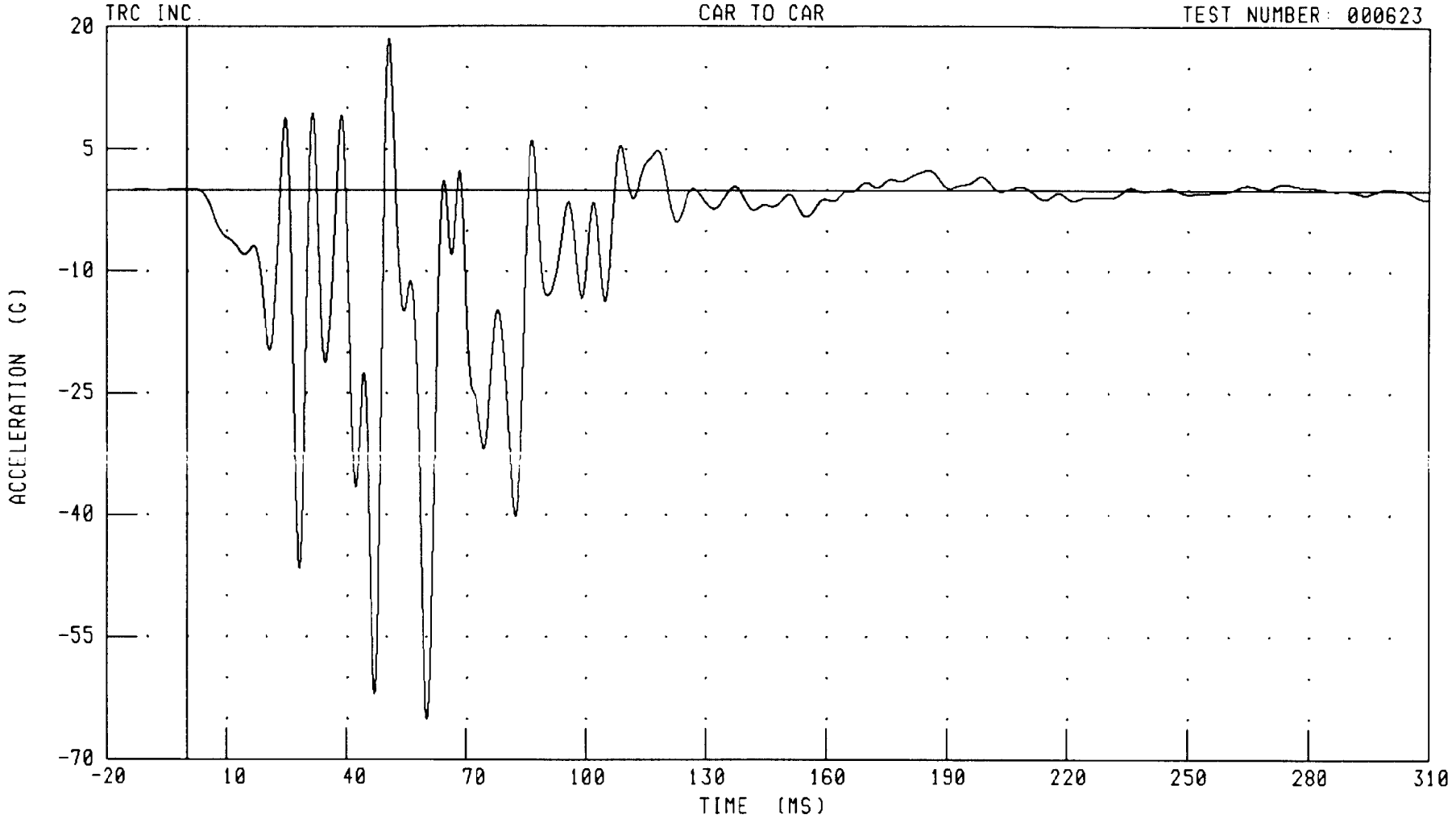
CARAVAN VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION



CHANNEL: VCGRG1 FILTER: CH. CLASS 60 PEAK DATA: 50.23 G @ 43.28 MS, 0.07 G @ -7.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

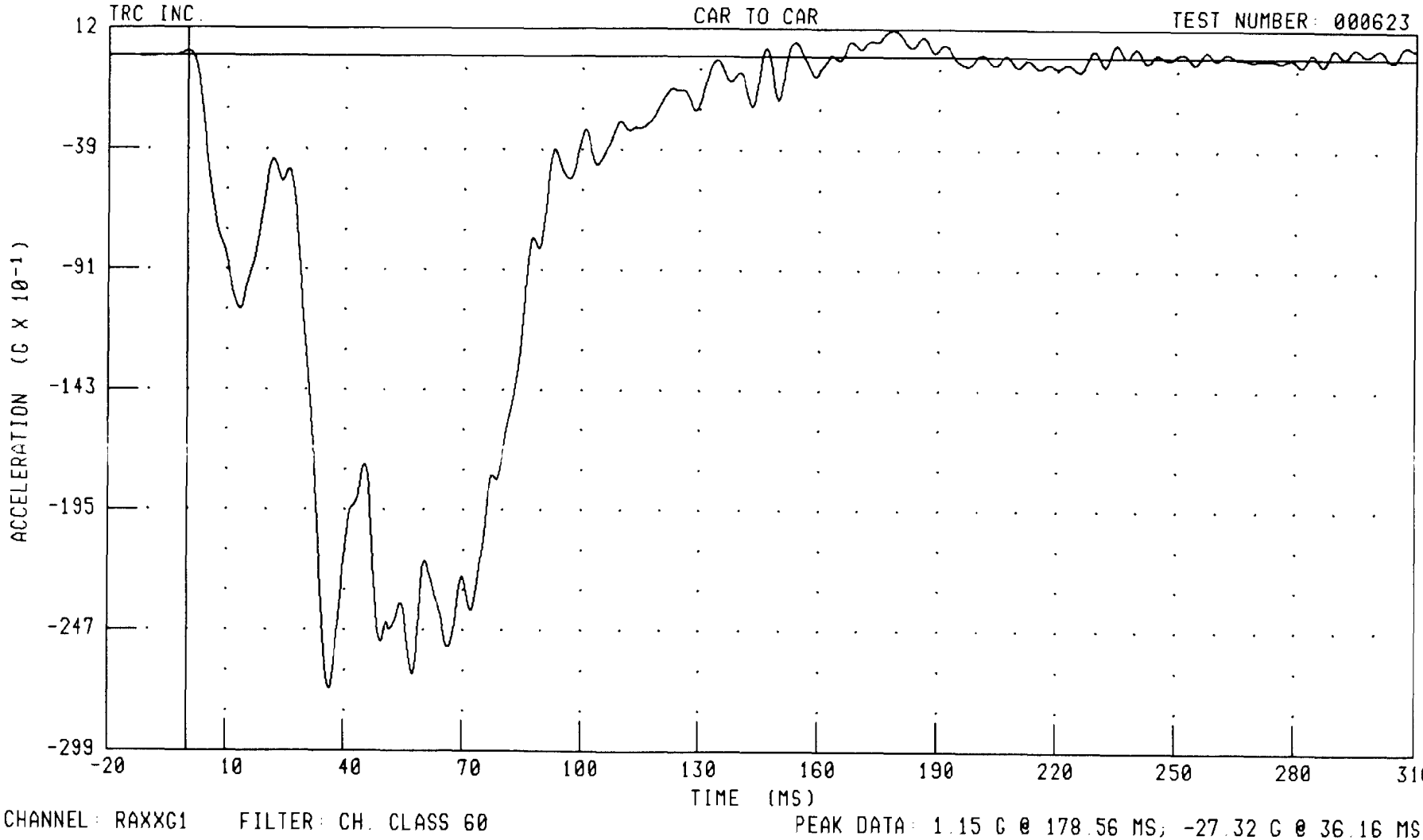
CARAVAN DASH PANEL CENTER X-AXIS ACCELERATION



CHANNEL: DPCXG1 FILTER: CH CLASS 60 PEAK DATA: 18.51 G @ 50.72 MS; -65.10 G @ 60.16 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

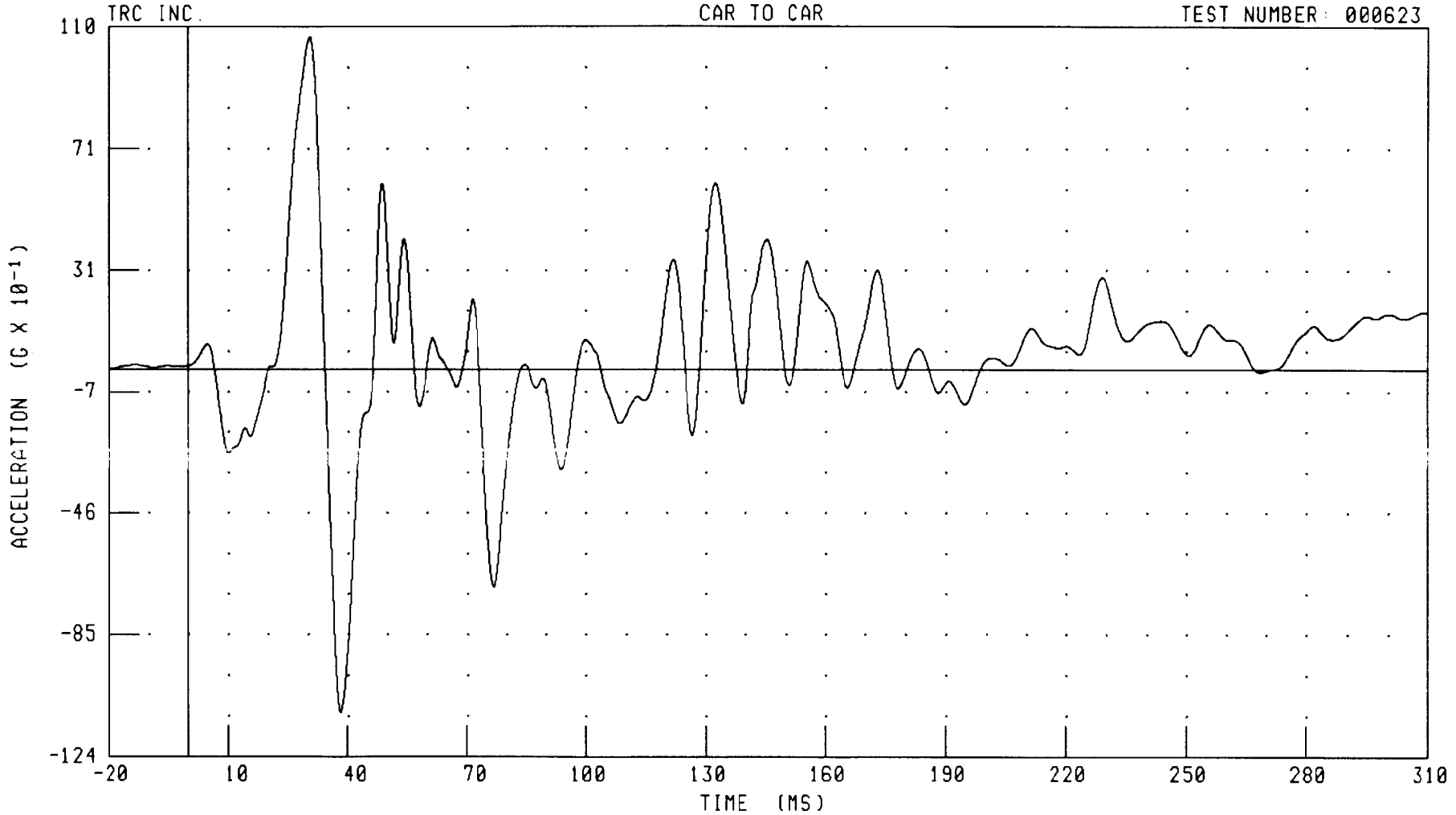
CARAVAN REAR AXLE X-AXIS ACCELERATION



CHANNEL: RAXXG1 FILTER: CH. CLASS 60 PEAK DATA: 1.15 G @ 178.56 MS; -27.32 G @ 36.16 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

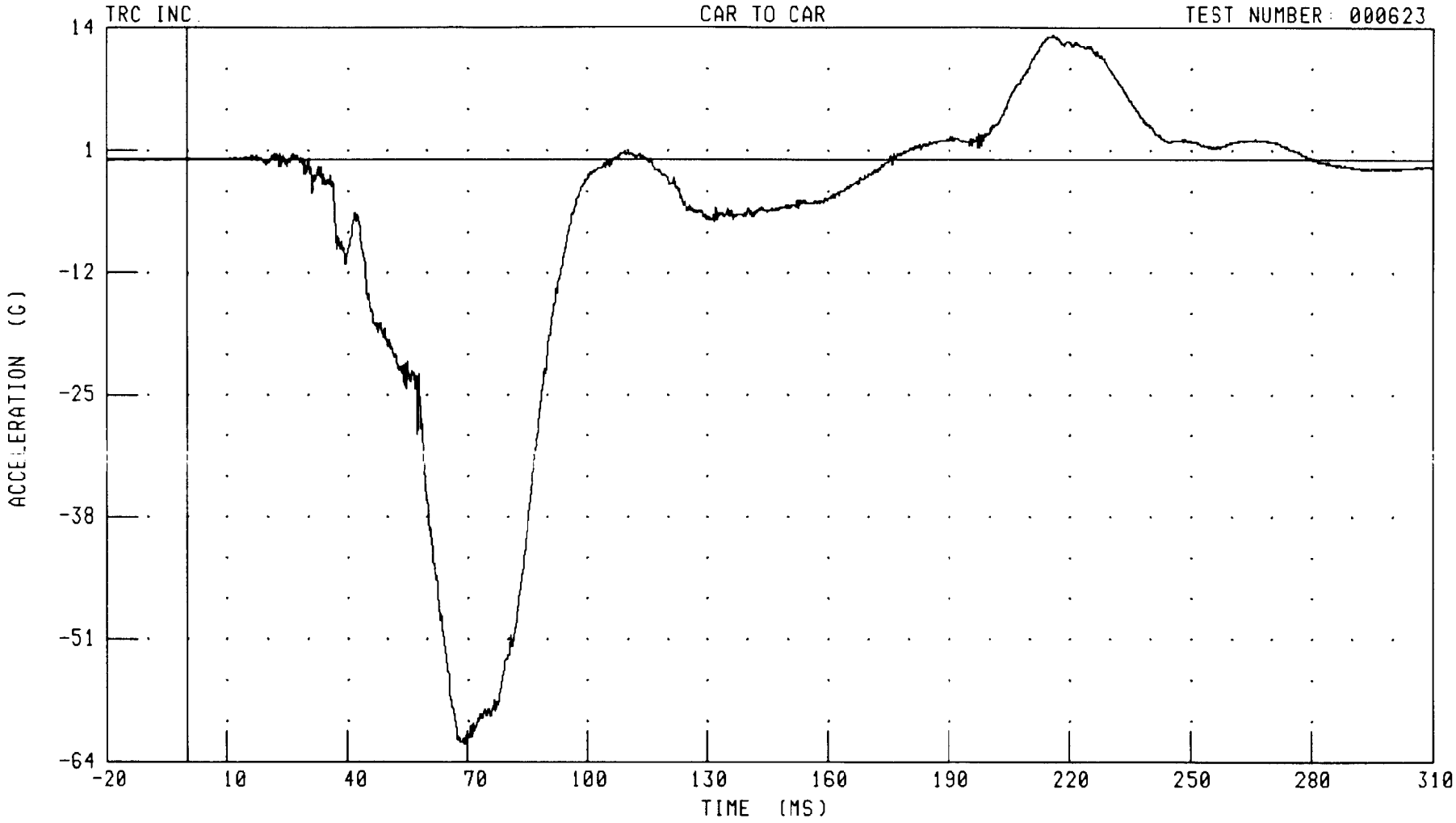
CARAVAN VEHICLE REAR CENTER Z-AXIS ACCELERATION



CHANNEL: TFCZG1 FILTER: CH. CLASS 60 PEAK DATA: 10.69 G @ 30.48 MS; -10.98 G @ 38.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

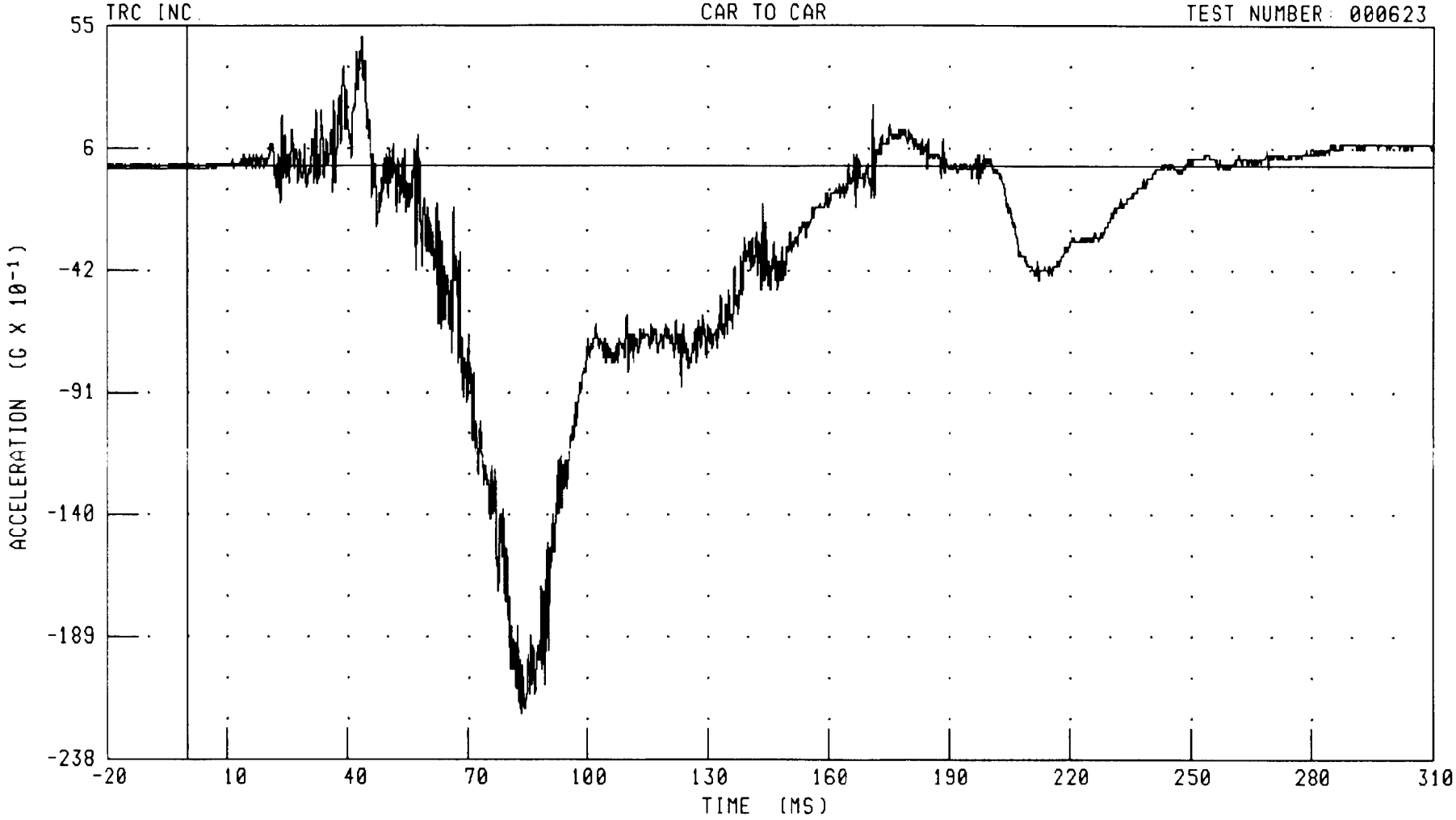
NEON DRIVER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXGA FILTER: CH. CLASS 1000 PEAK DATA: 13.22 G @ 215.76 MS, -62.12 G @ 69.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

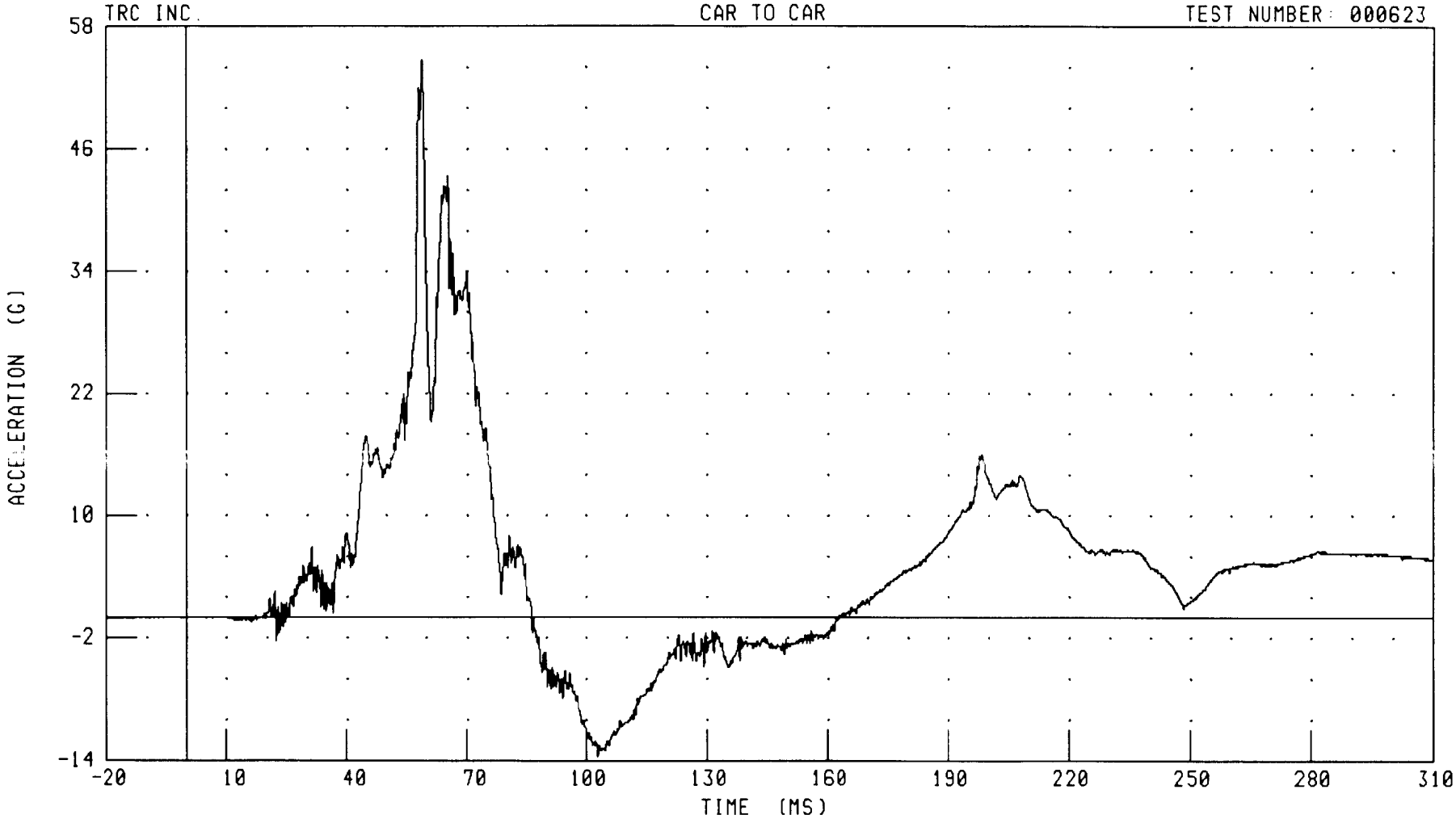
NEON DRIVER HEAD Y-AXIS ACCELERATION



CHANNEL: HEDYGA FILTER: CH. CLASS 1000 PEAK DATA: 5.17 G @ 43.52 MS; -21.97 G @ 83.28 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

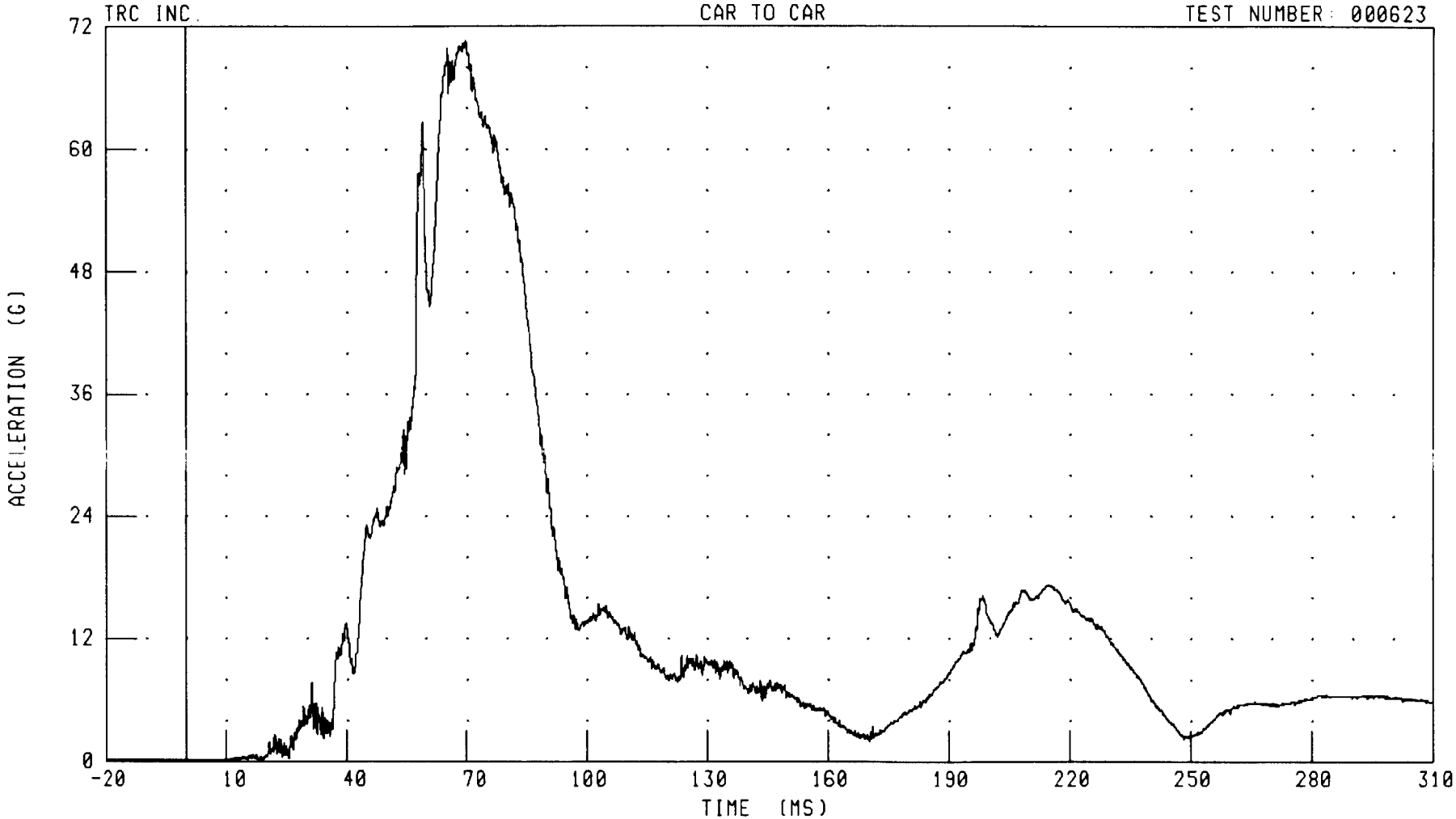
NEON DRIVER HEAD Z-AXIS ACCELERATION



CHANNEL: HEDZGA FILTER: CH. CLASS 1000 PEAK DATA: 54.72 G @ 59.04 MS, -13.61 G @ 102.96 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

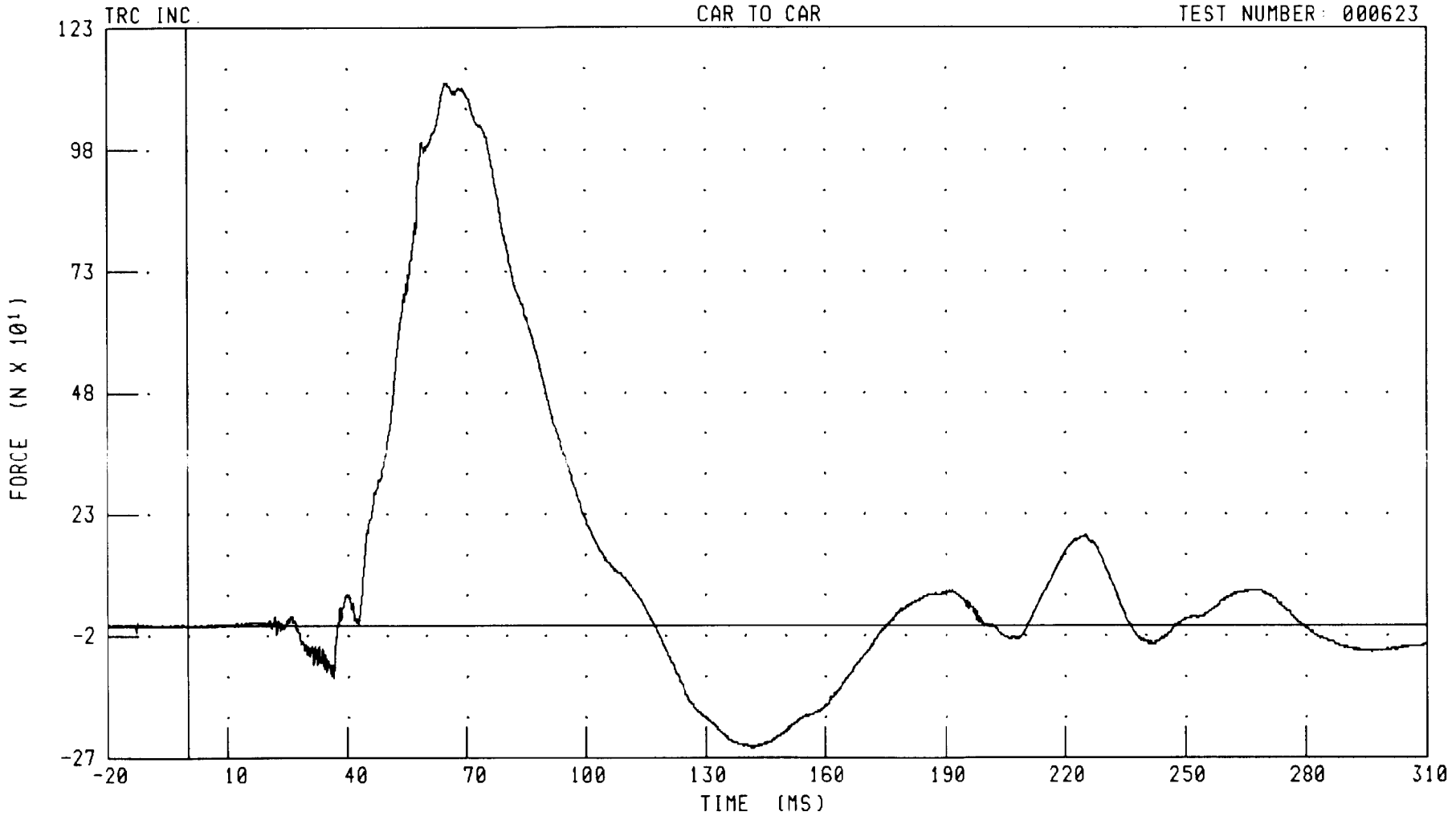
NEON DRIVER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRGA FILTER: CH. CLASS 1000 PEAK DATA: 70.57 G @ 70.00 MS, 0.14 G @ -10.88 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

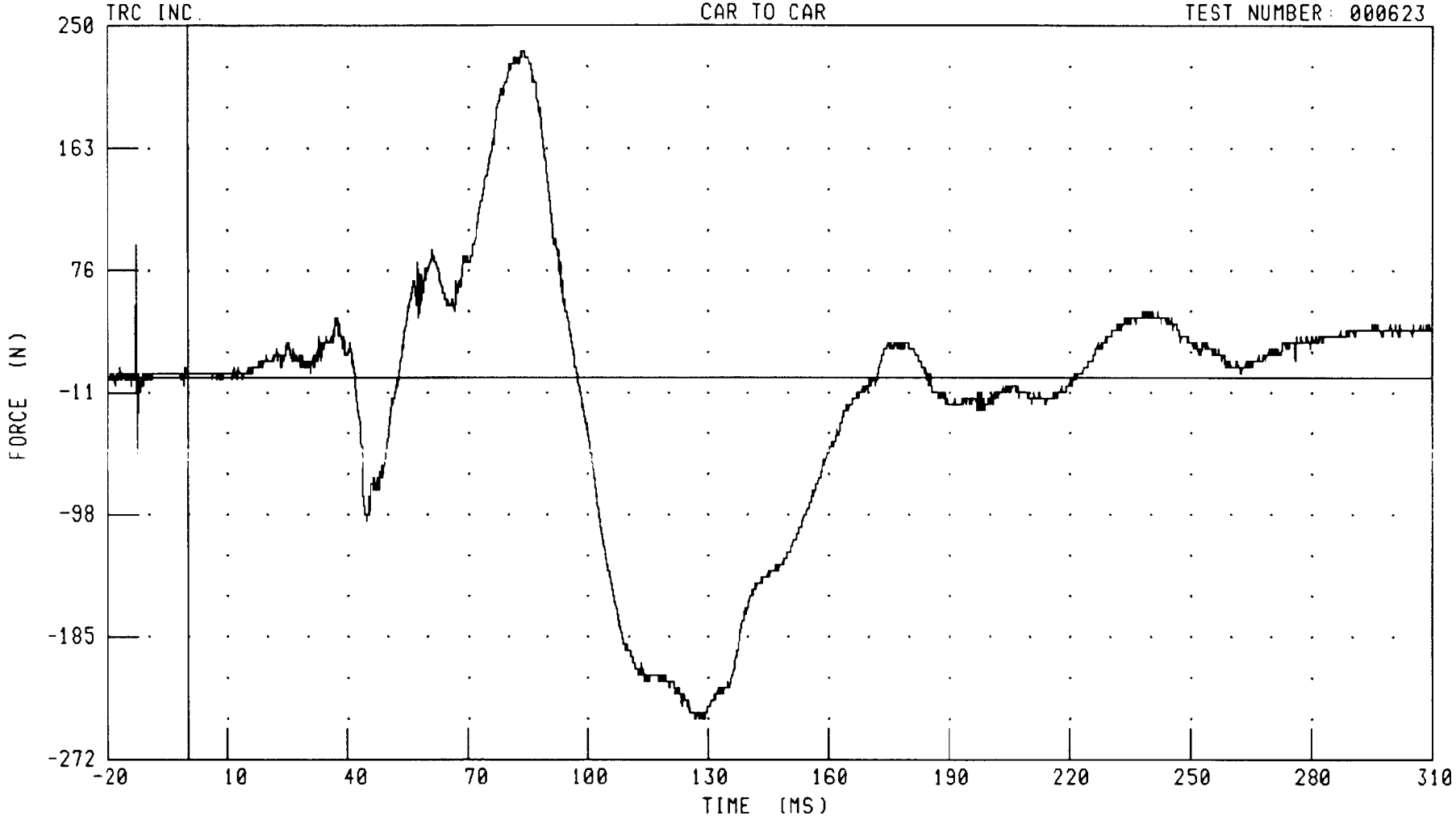
NEON DRIVER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXFA FILTER: CH. CLASS 1000 PEAK DATA: 1115.26 N @ 64.88 MS; -251.77 N @ 141.52 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

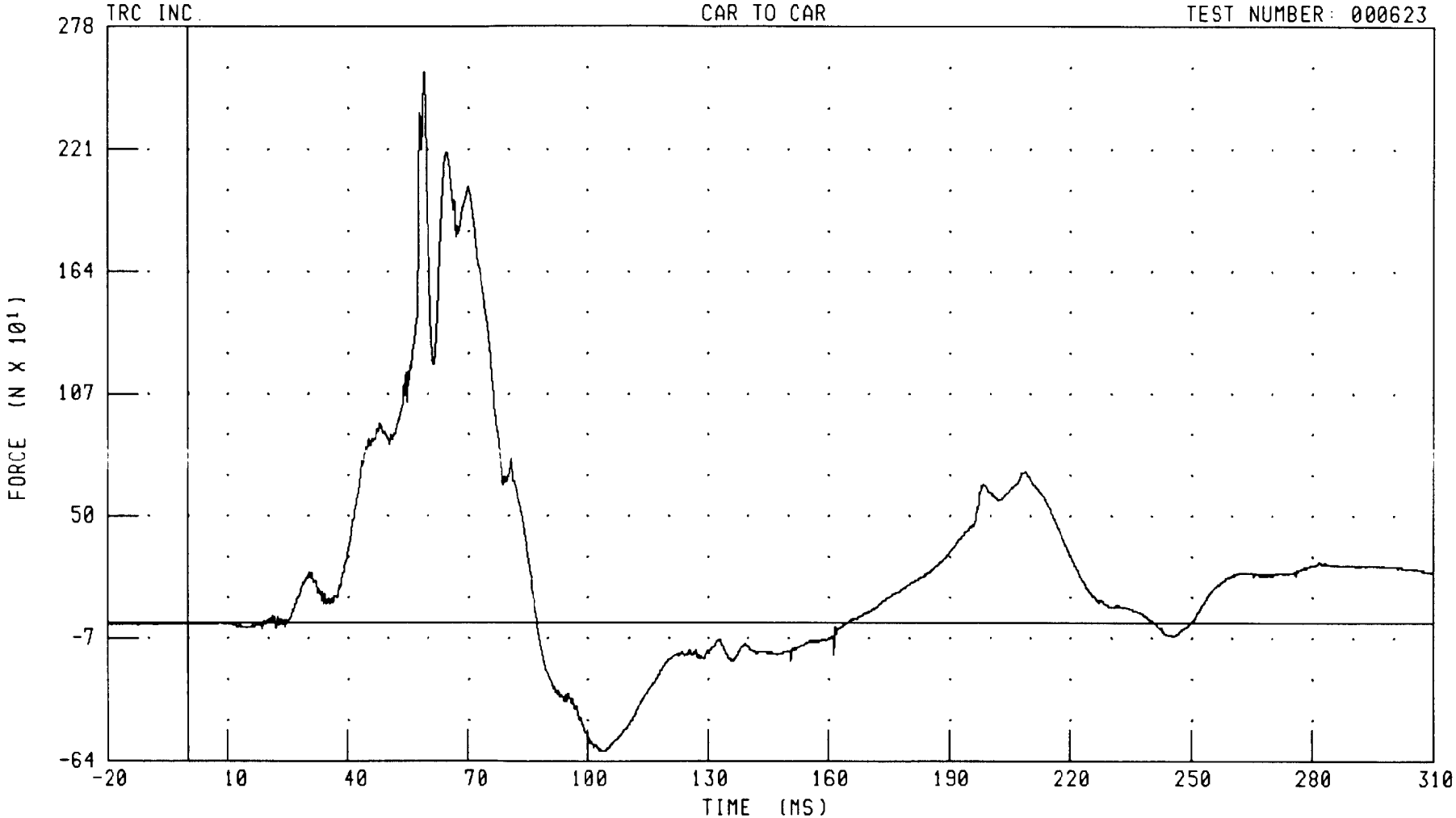
NEON DRIVER NECK Y-AXIS SHEAR FORCE



CHANNEL: NEKYFA FILTER: CH. CLASS 1000 PEAK DATA: 231.39 N @ 83.44 MS; -243.43 N @ 126.80 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

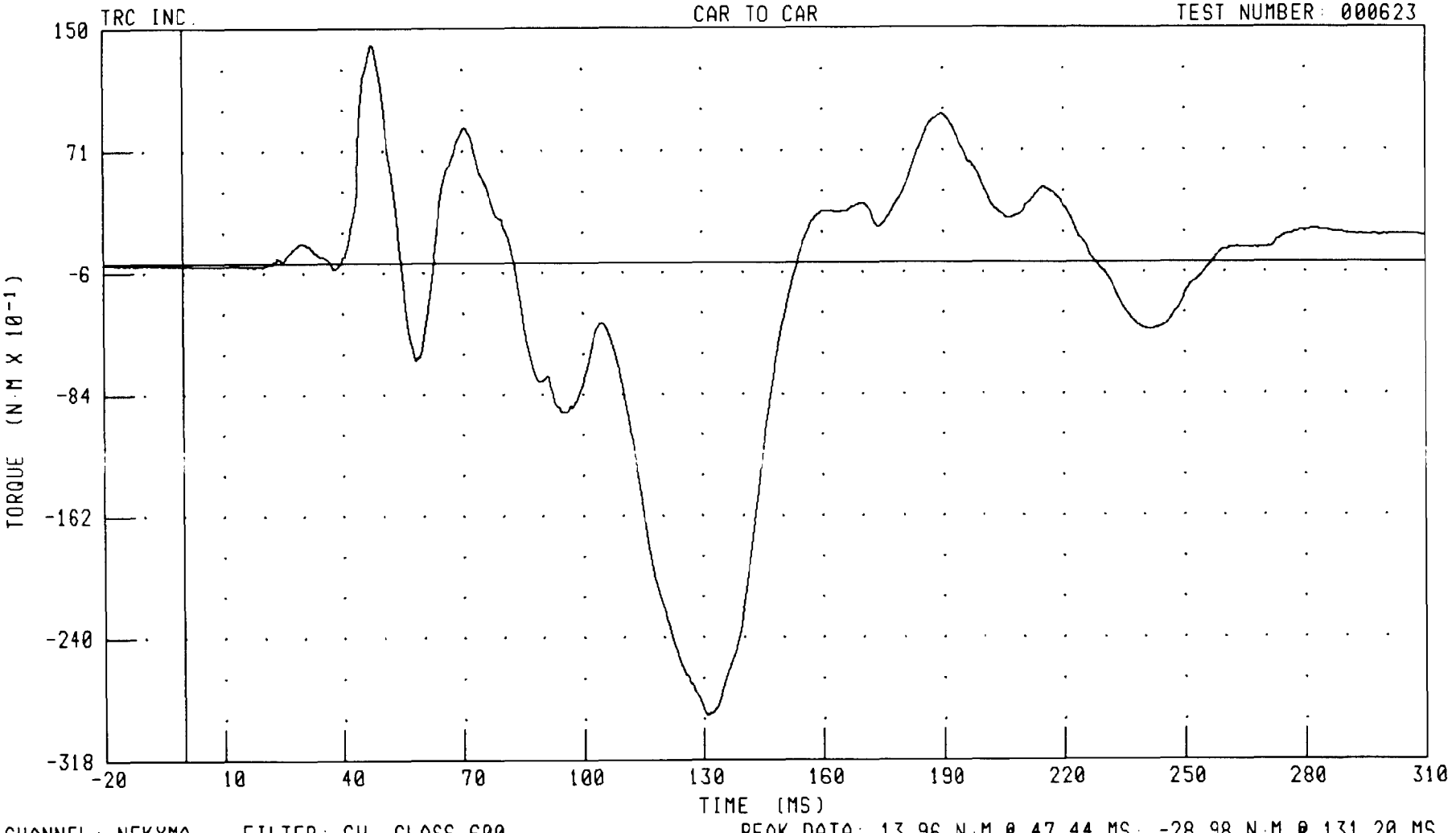
NEON DRIVER NECK Z-AXIS AXIAL FORCE



CHANNEL: NEKZFA FILTER: CH. CLASS 1000 PEAK DATA: 2567.06 N @ 59.04 MS; -590.28 N @ 102.88 MS

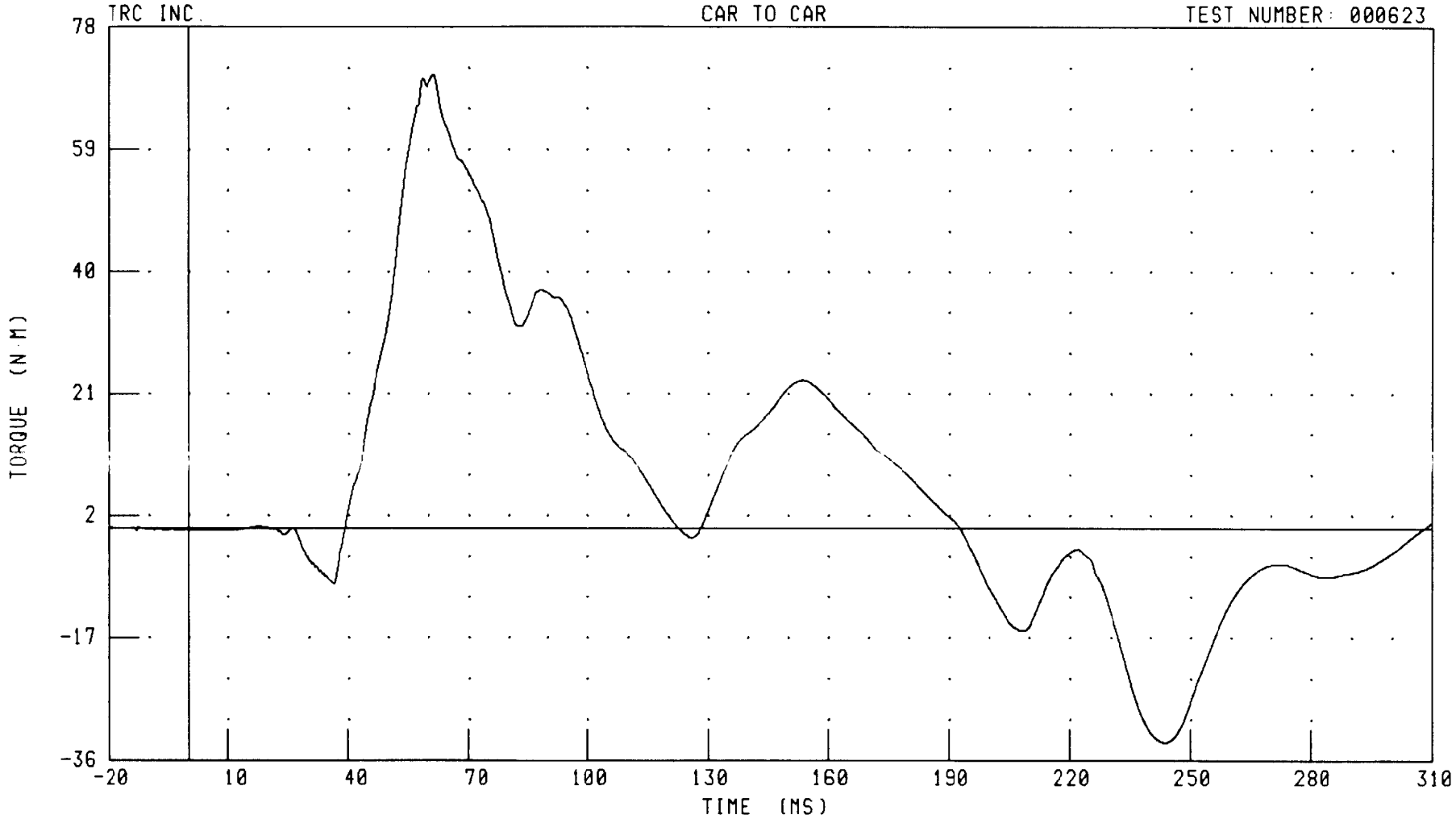
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON DRIVER NECK MOMENT ABOUT X AXIS



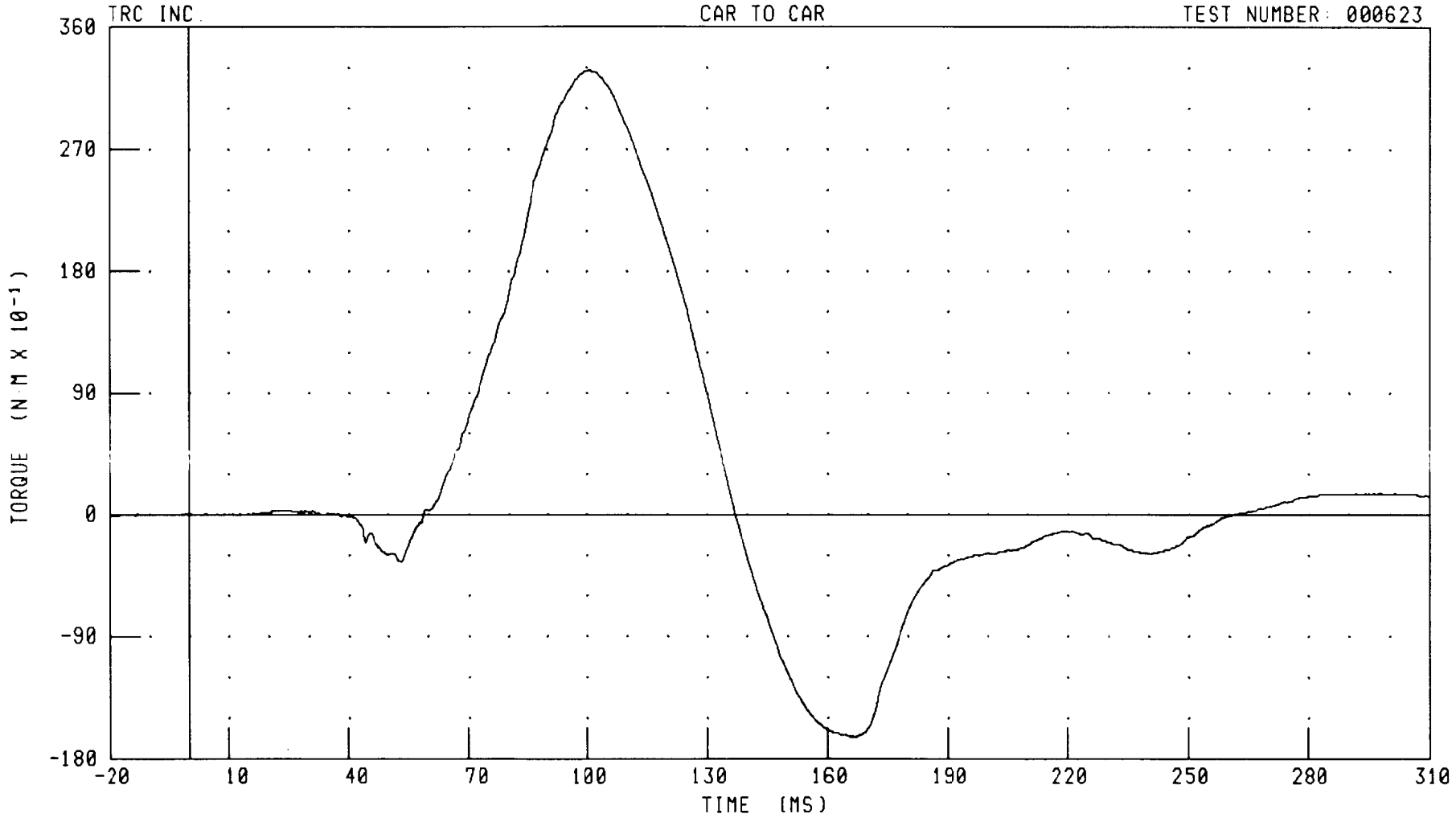
CHANNEL: NEKXMA FILTER: CH. CLASS 600 PEAK DATA: 13.96 N-M @ 47.44 MS, -28.98 N-M @ 131.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON DRIVER NECK MOMENT ABOUT Y AXIS



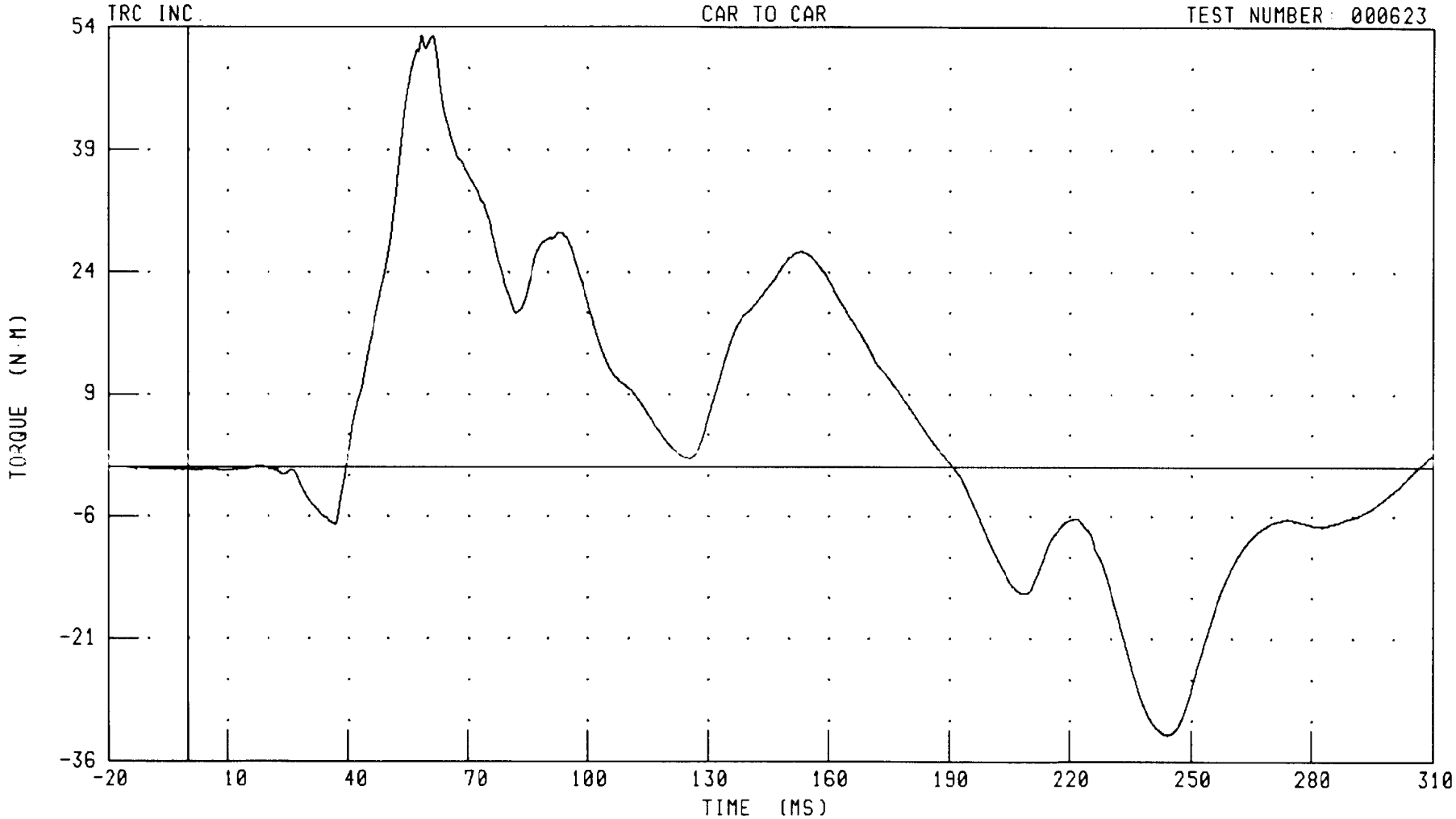
CHANNEL: NEKYMA FILTER: CH. CLASS 600 PEAK DATA: 70.68 N-M @ 61.36 MS; -33.26 N-M @ 244.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON DRIVER NECK MOMENT ABOUT Z AXIS



CHANNEL: NEKZMA FILTER: CH CLASS 600 PEAK DATA: 32.81 N M @ 100.88 MS; -16.41 N M @ 167.20 MS

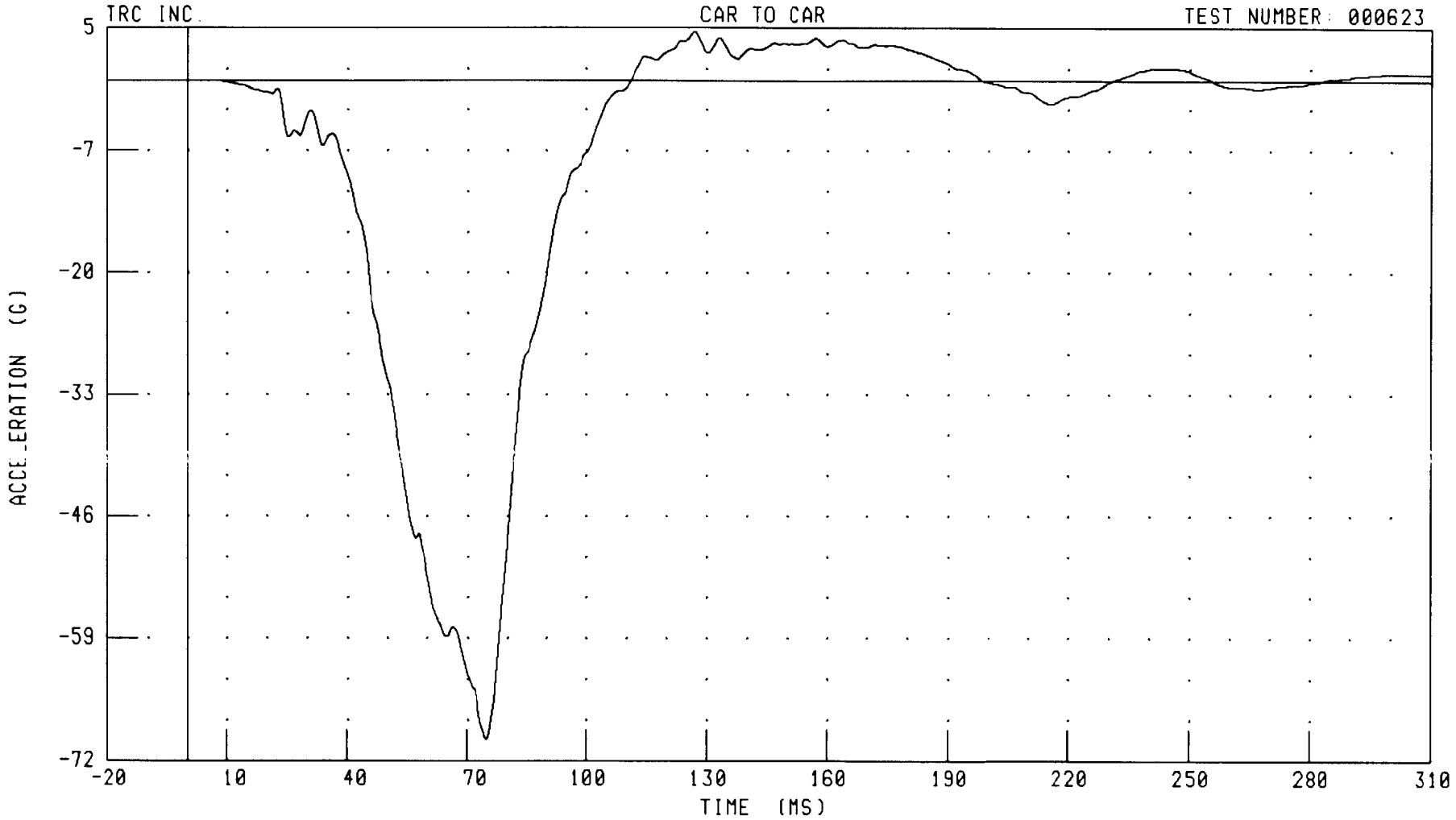
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON DRIVER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS



CHANNEL: NEKOMA FILTER: CH. CLASS 600 PEAK DATA: 53.01 N M @ 58.40 MS; -32.78 N M @ 244.08 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

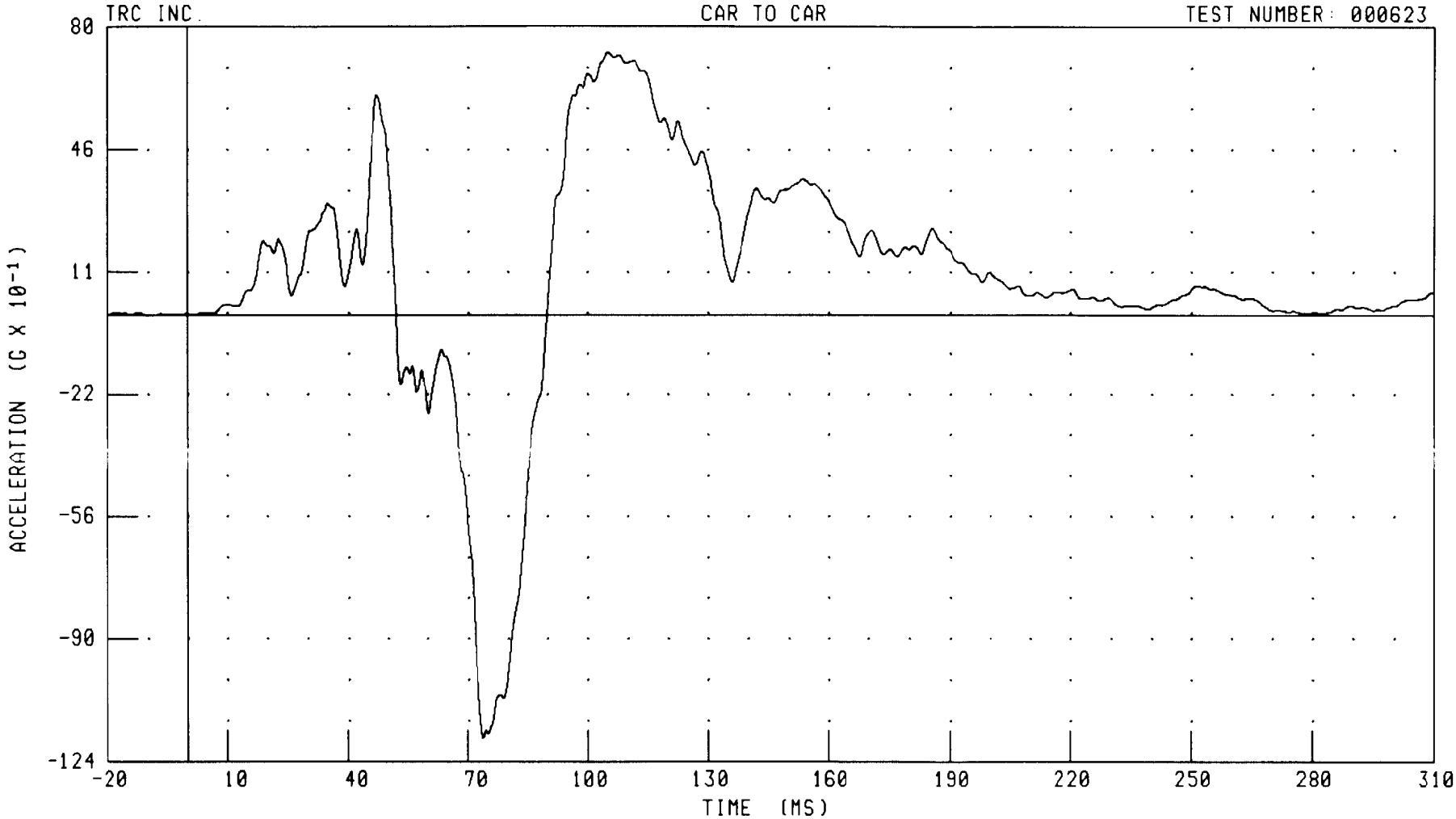
NEON DRIVER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXGA FILTER: CH. CLASS 180 PEAK DATA: 5.18 G @ 127.20 MS; -70.12 G @ 74.80 MS

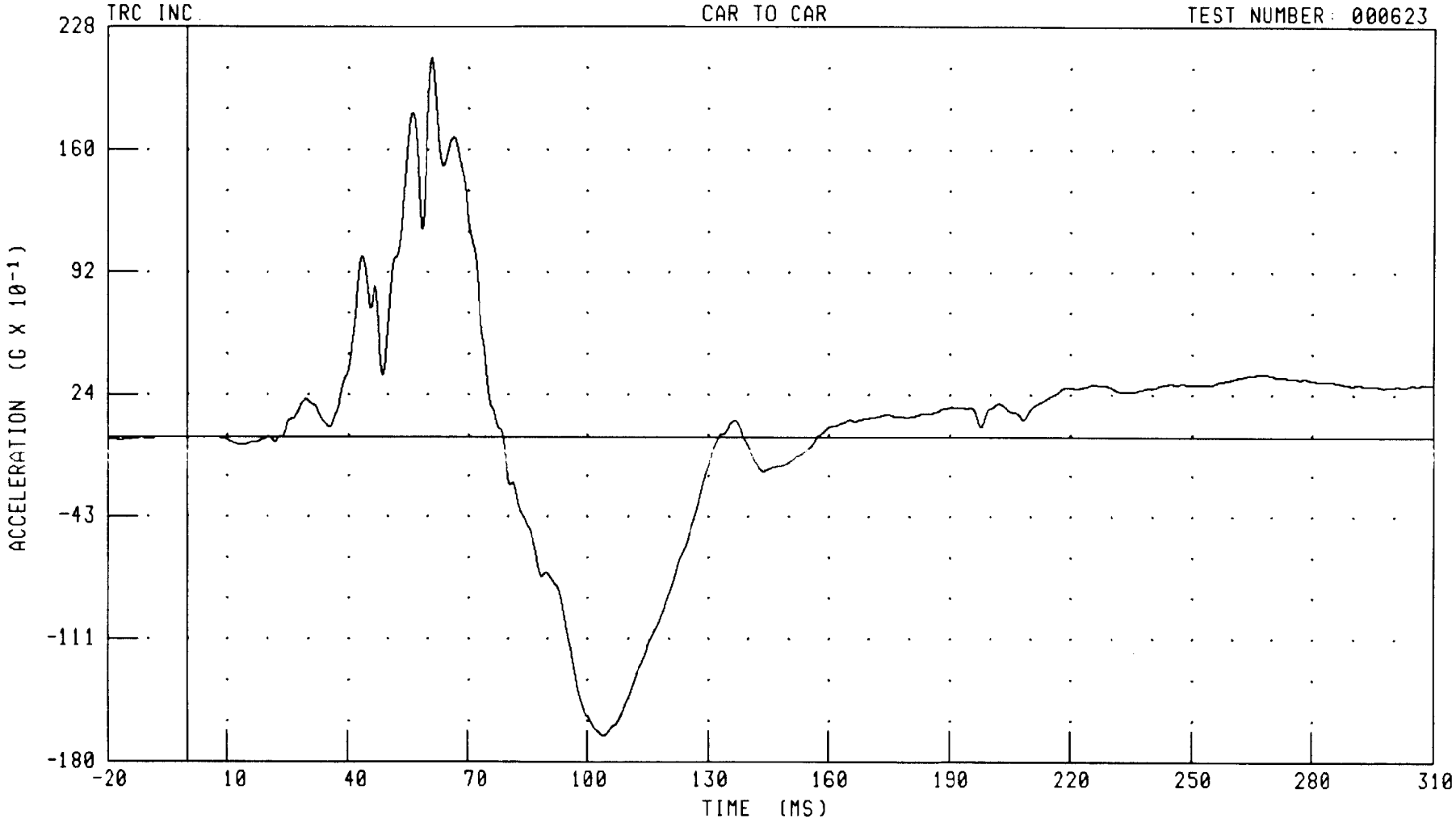
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON DRIVER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYGA FILTER: CH. CLASS 180 PEAK DATA: 7.29 G @ 105.20 MS, -11.75 G @ 73.84 MS

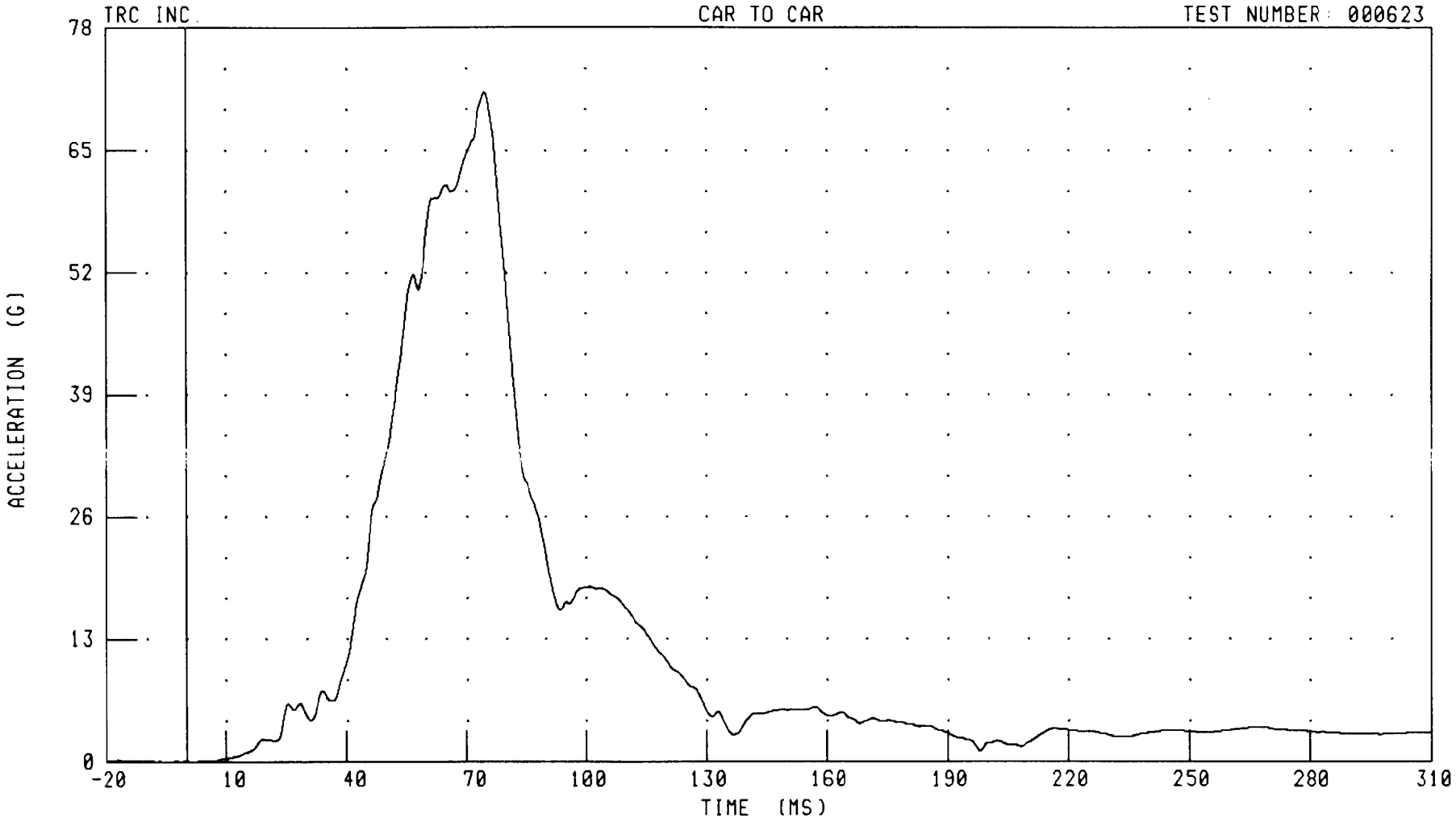
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON DRIVER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZGA FILTER: CH CLASS 180 PEAK DATA: 21.08 G @ 61.12 MS; -16.54 G @ 104.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

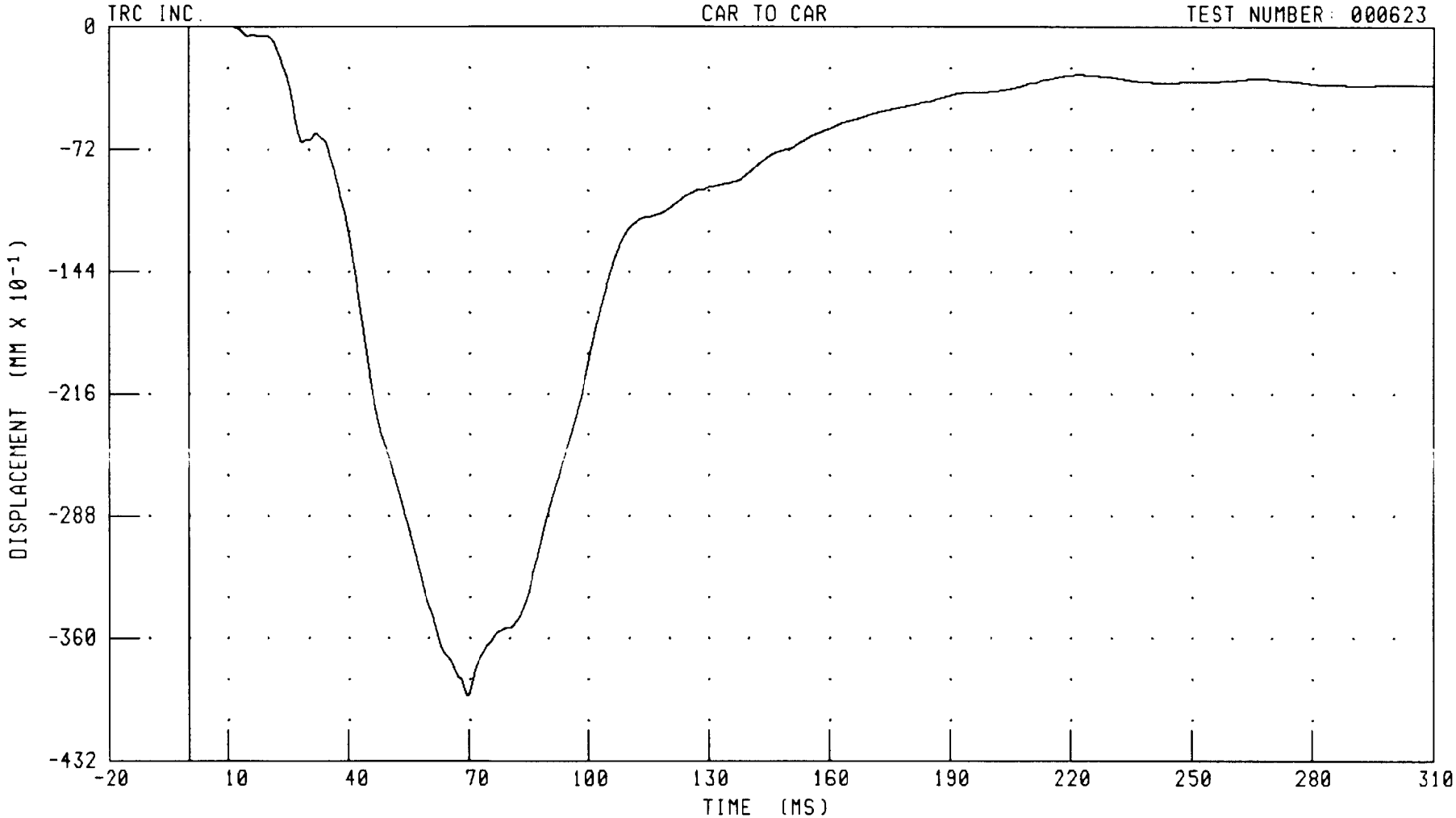
NEON DRIVER CHEST RESULTANT ACCELERATION



CHANNEL: CSTRGA FILTER: CH. CLASS 180 PEAK DATA: 71.16 G @ 74.80 MS; 0.01 G @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

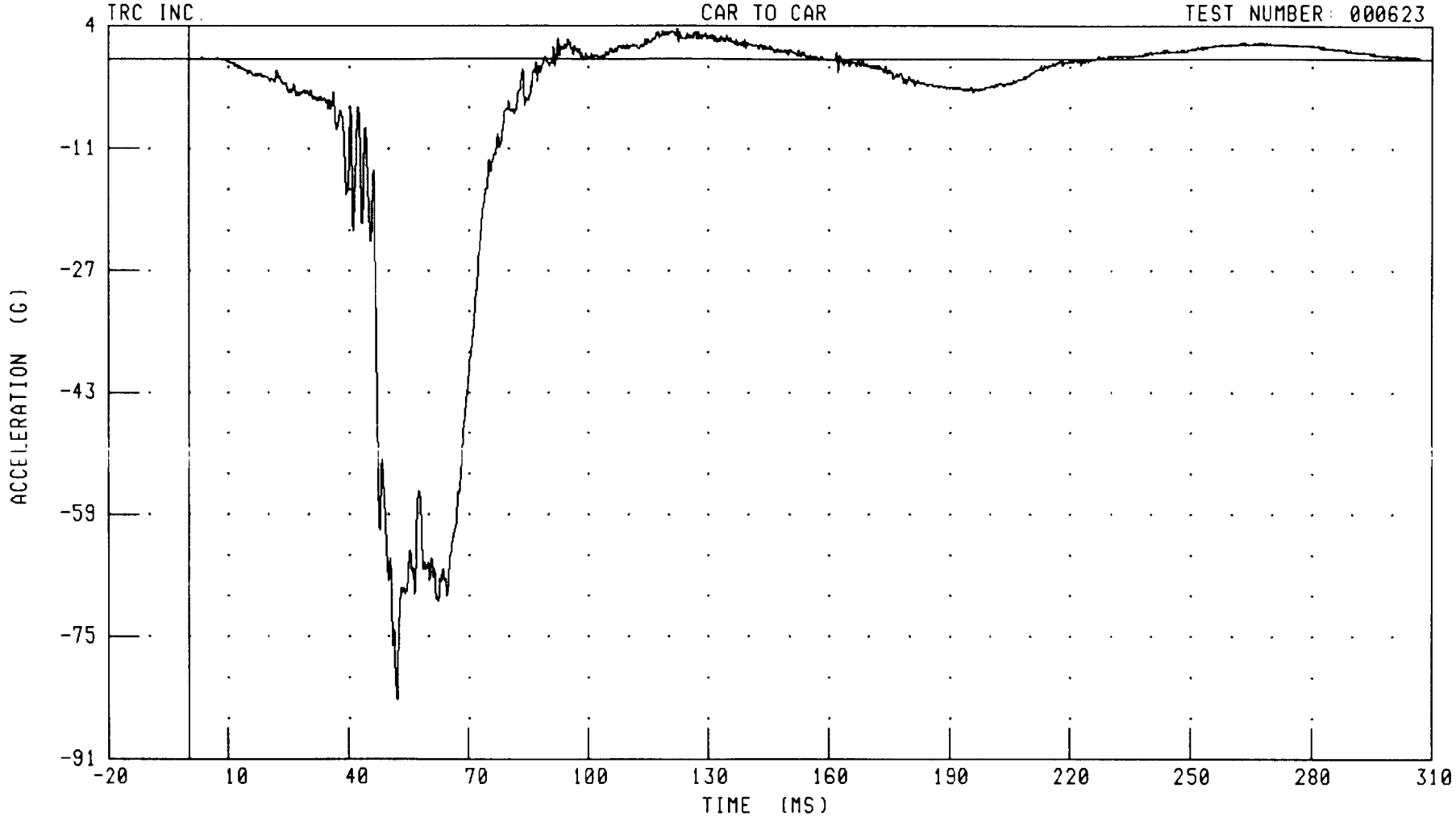
NEON DRIVER CHEST DEFLECTION



CHANNEL: CSTXDA FILTER: CH. CLASS 180 PEAK DATA: 0.00 MM @ 10.96 MS; -39.38 MM @ 69.68 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

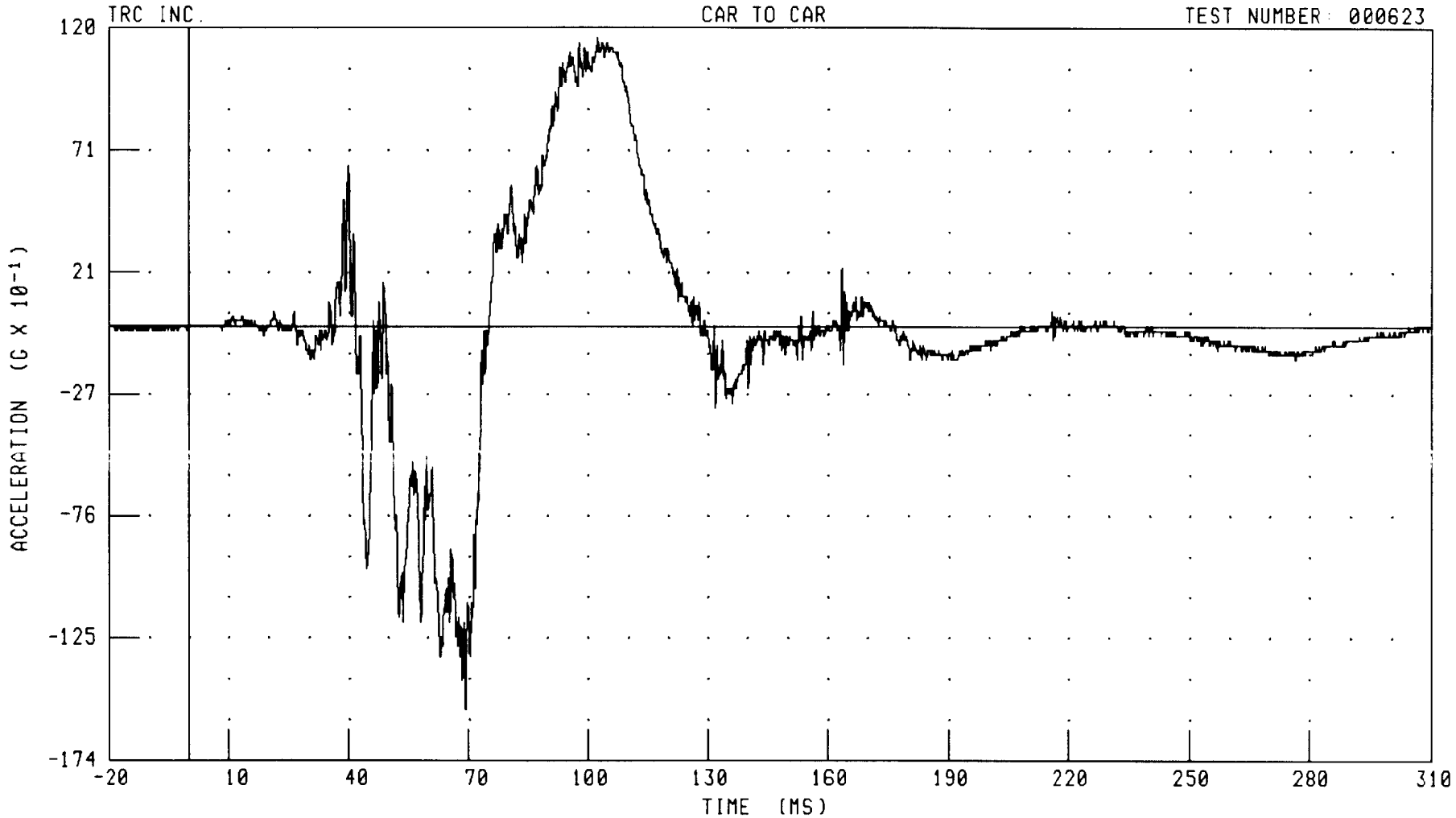
NEON DRIVER PELVIS X-AXIS ACCELERATION



CHANNEL: PEVXGA FILTER: CH. CLASS 1000 PEAK DATA: 3.91 G @ 122.32 MS; -83.98 G @ 52.24 MS

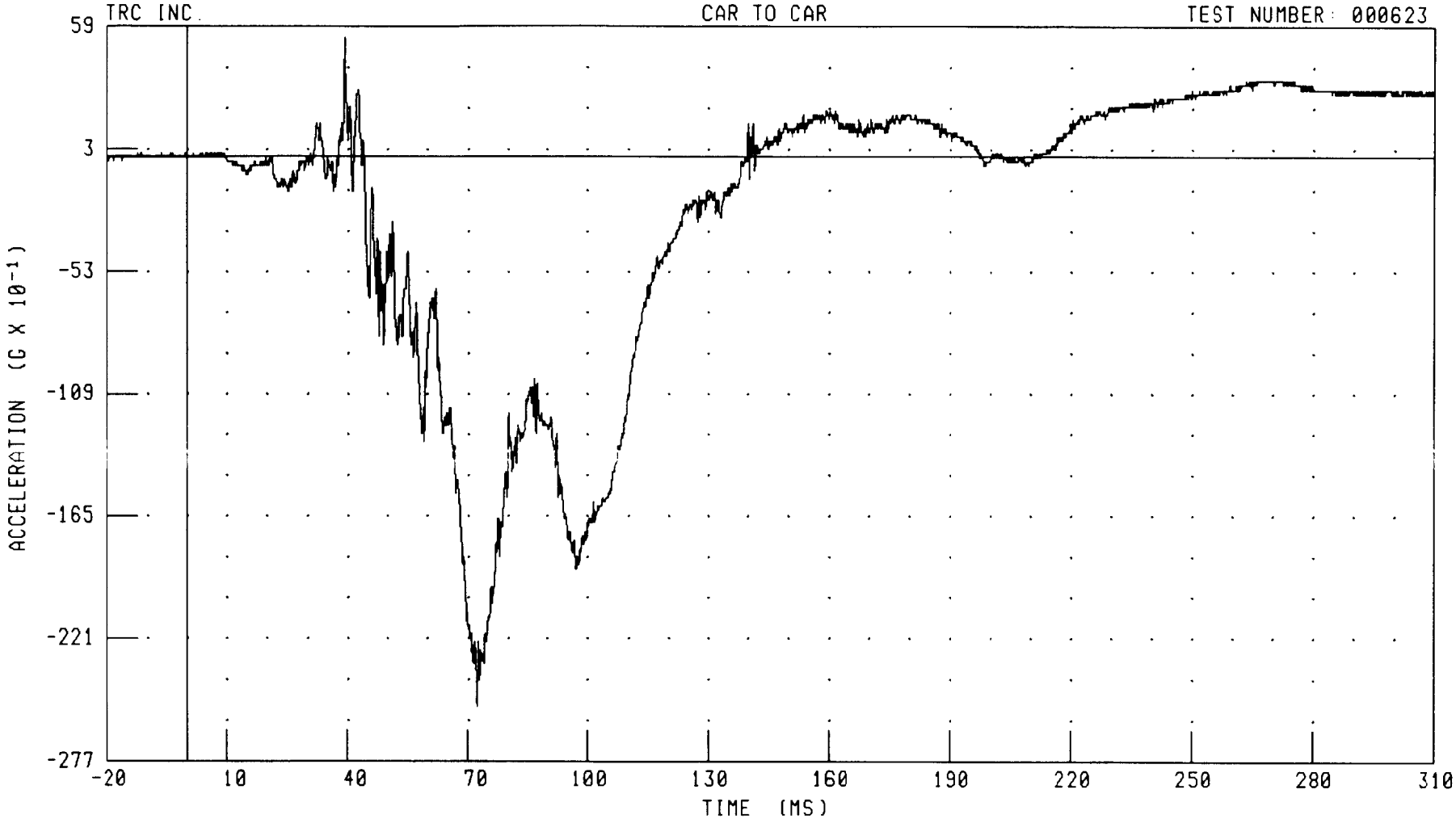
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON DRIVER PELVIS Y-AXIS ACCELERATION



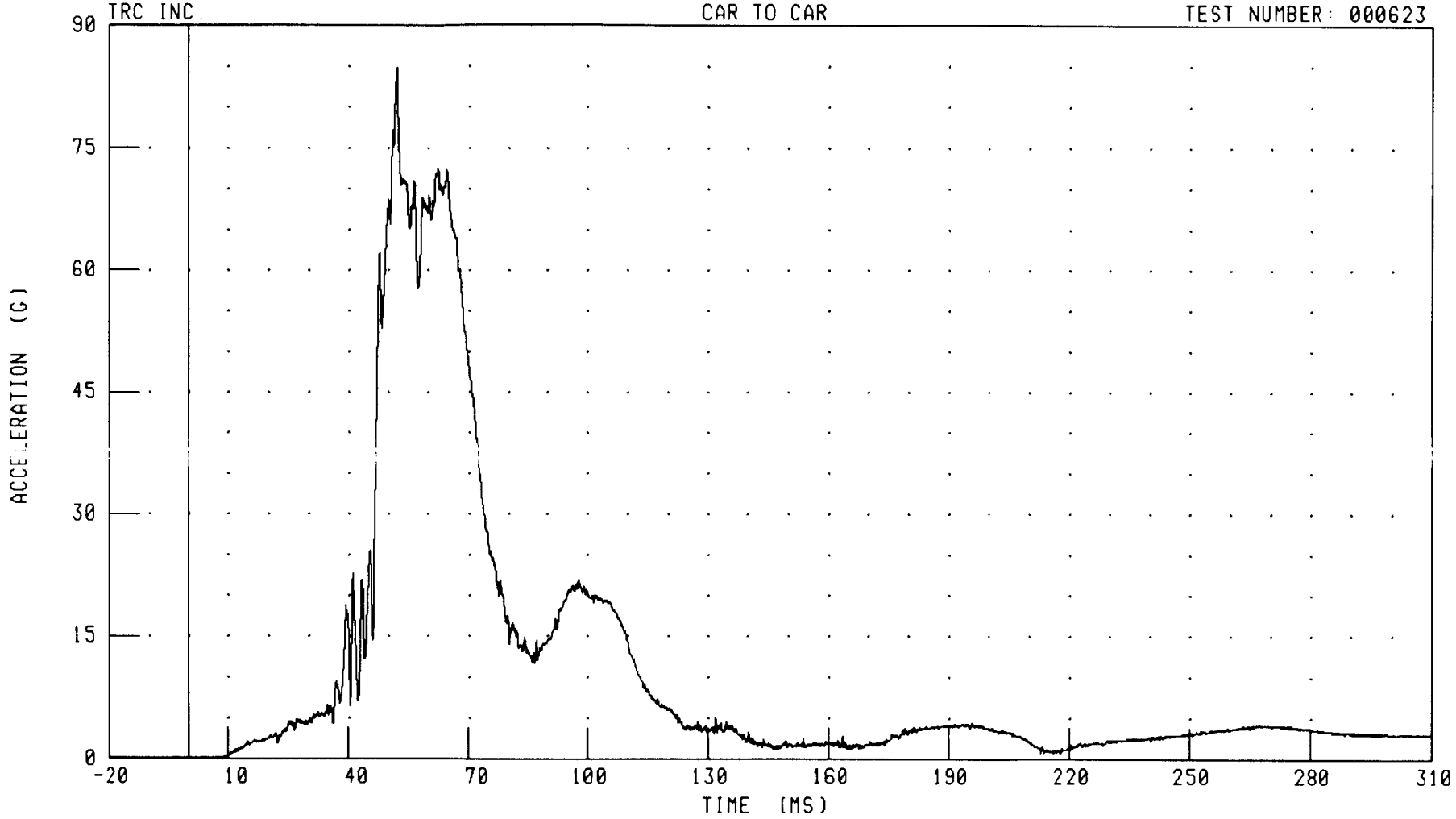
CHANNEL: PEVYGA FILTER: CH. CLASS 1000 PEAK DATA: 11.59 G @ 102.40 MS; -15.39 G @ 69.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON DRIVER PELVIS Z-AXIS ACCELERATION



CHANNEL: PEVZGA FILTER: CH. CLASS 1000 PEAK DATA: 5.37 G @ 39.36 MS; -25.18 G @ 72.32 MS

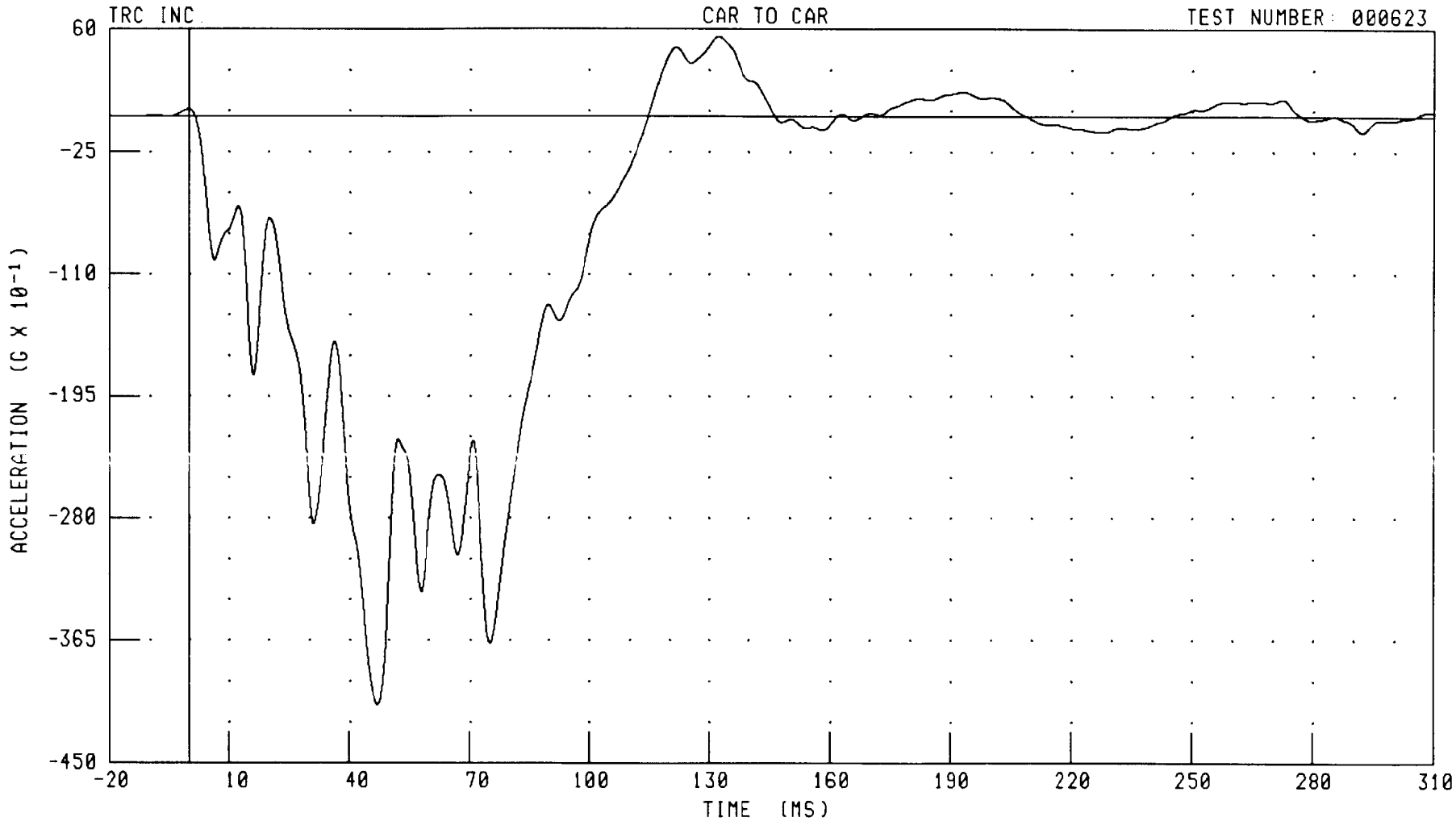
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON DRIVER PELVIS RESULTANT ACCELERATION



CHANNEL: PEVRGA FILTER: CH. CLASS 1000 PEAK DATA: 84.78 G @ 52.24 MS; 0.09 G @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

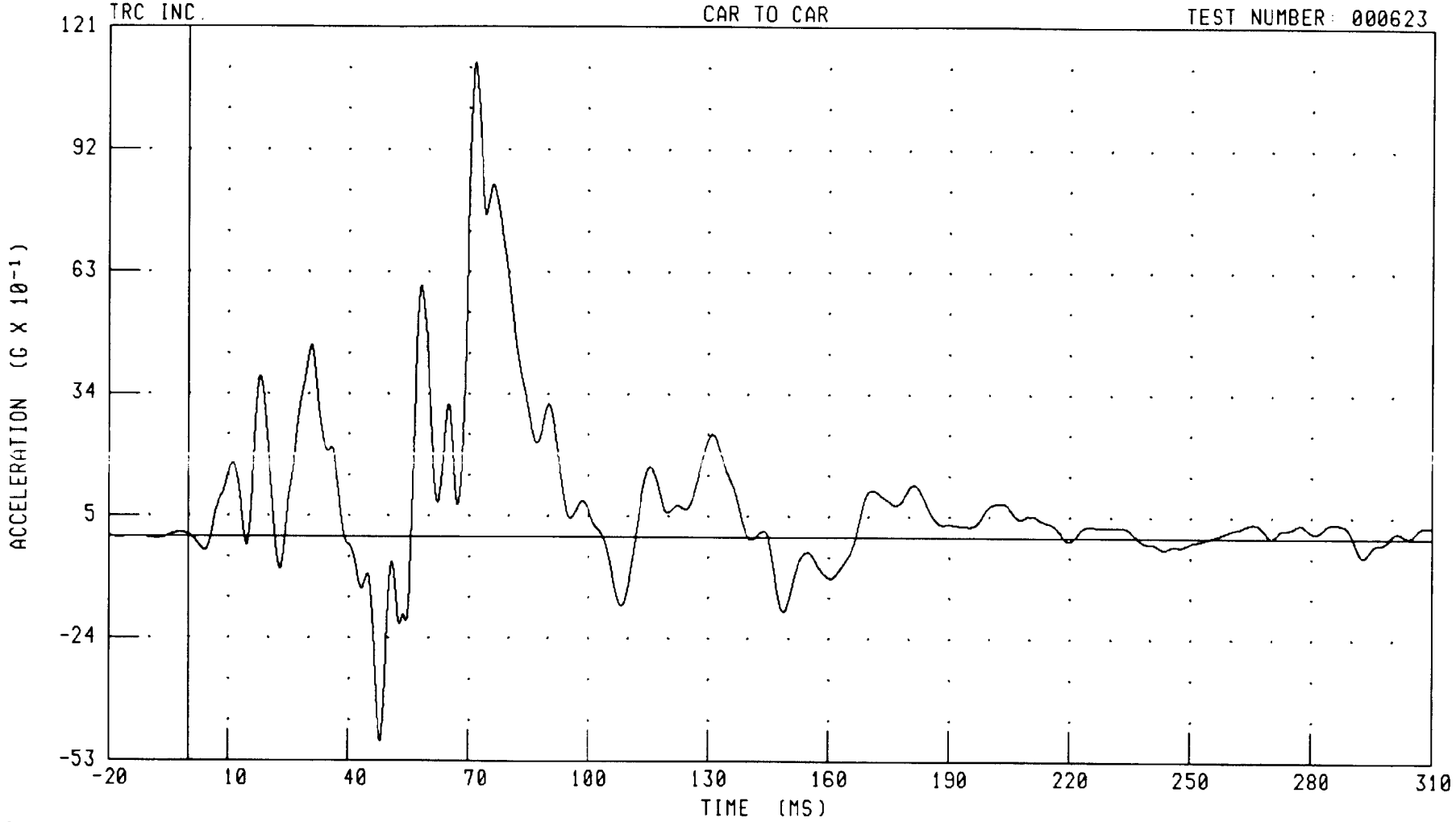
NEON LEFT REAR SEAT X-AXIS ACCELERATION



CHANNEL: LRSXGA FILTER: CH. CLASS 60 PEAK DATA: 5.47 G @ 132.48 MS, -40.95 G @ 47.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

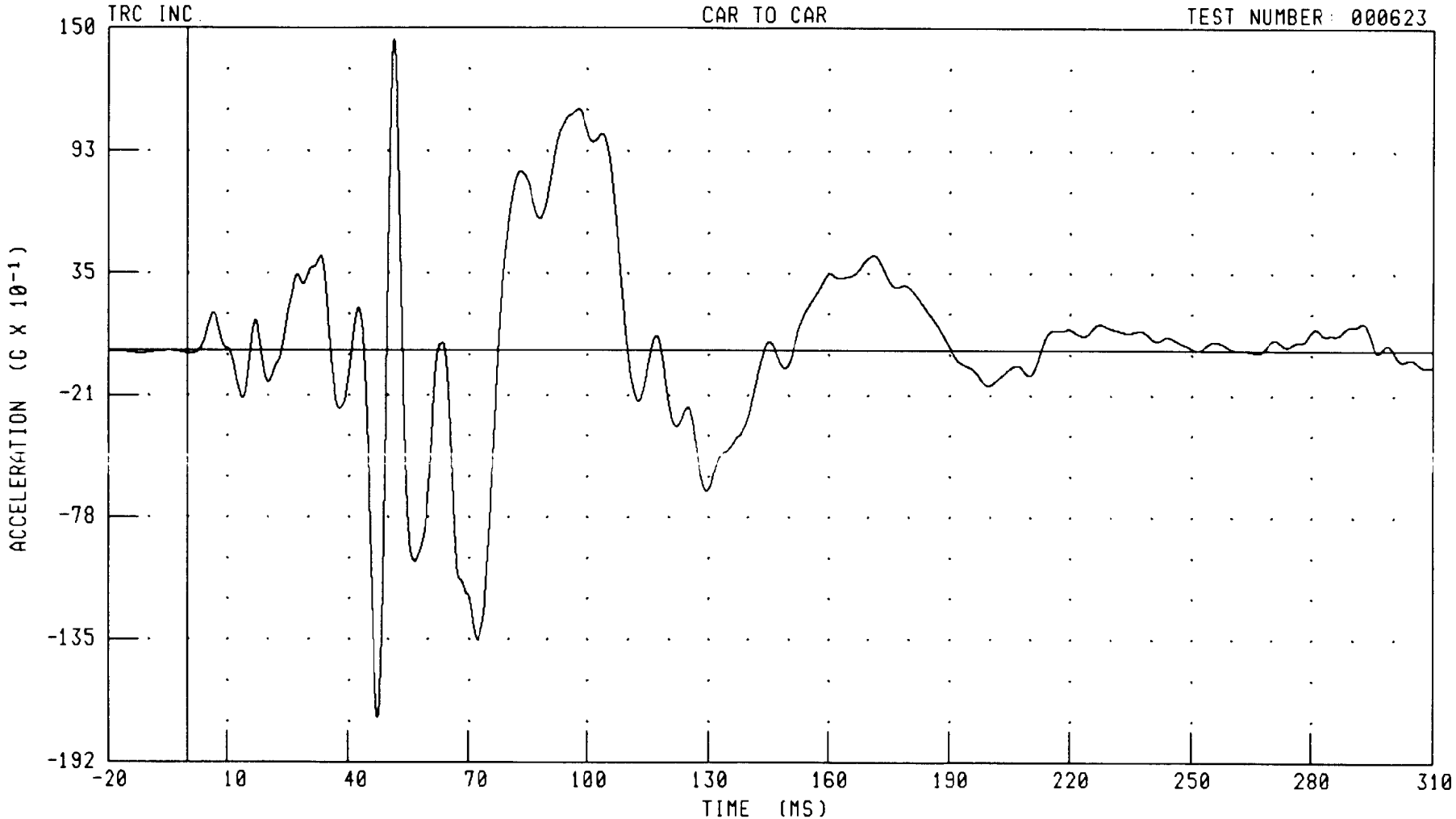
NEON LEFT REAR SEAT Y-AXIS ACCELERATION



CHANNEL: LRSYGA FILTER: CH. CLASS 60

PEAK DATA: 11.24 G @ 71.60 MS; -4.84 G @ 48.08 MS

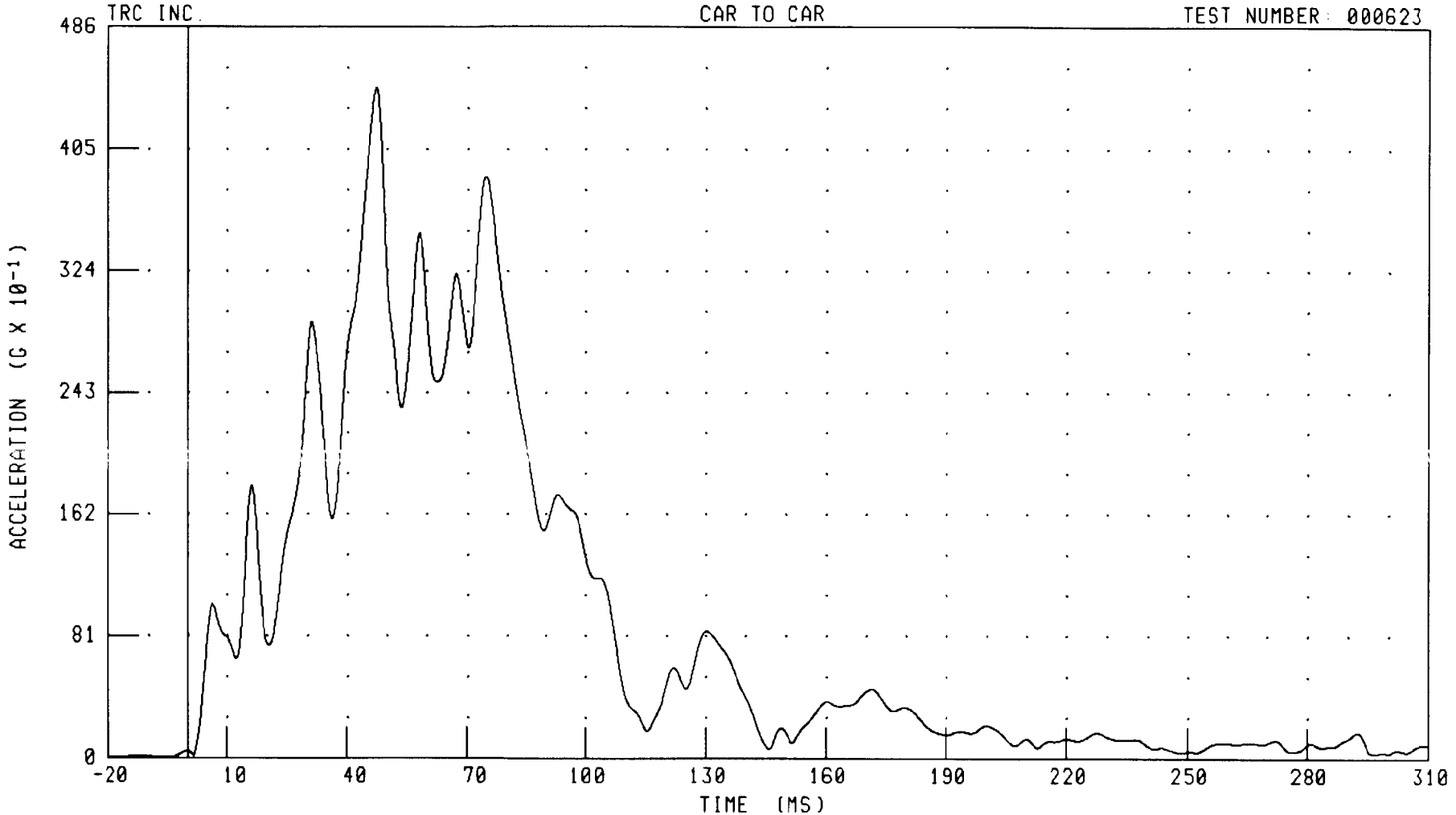
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON LEFT REAR SEAT Z-AXIS ACCELERATION



CHANNEL: LRSZGA FILTER: CH. CLASS 60 PEAK DATA: 14.47 G @ 51.60 MS; -17.13 G @ 47.52 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

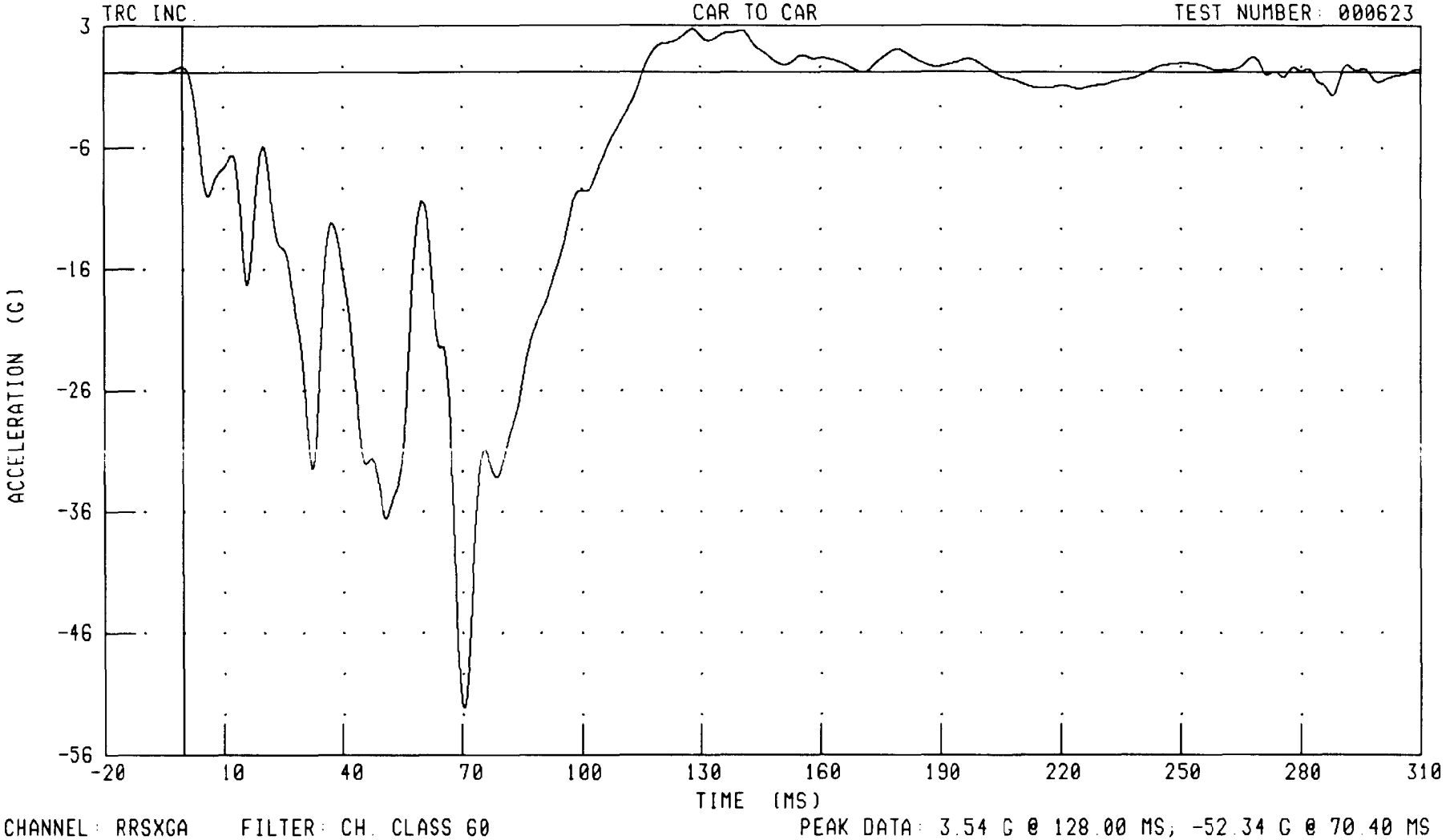
NEON LEFT REAR SEAT RESULTANT ACCELERATION



CHANNEL: LRSRGA FILTER: CH. CLASS 60

PEAK DATA: 44.56 G @ 47.44 MS; 0.03 G @ -6.00 MS

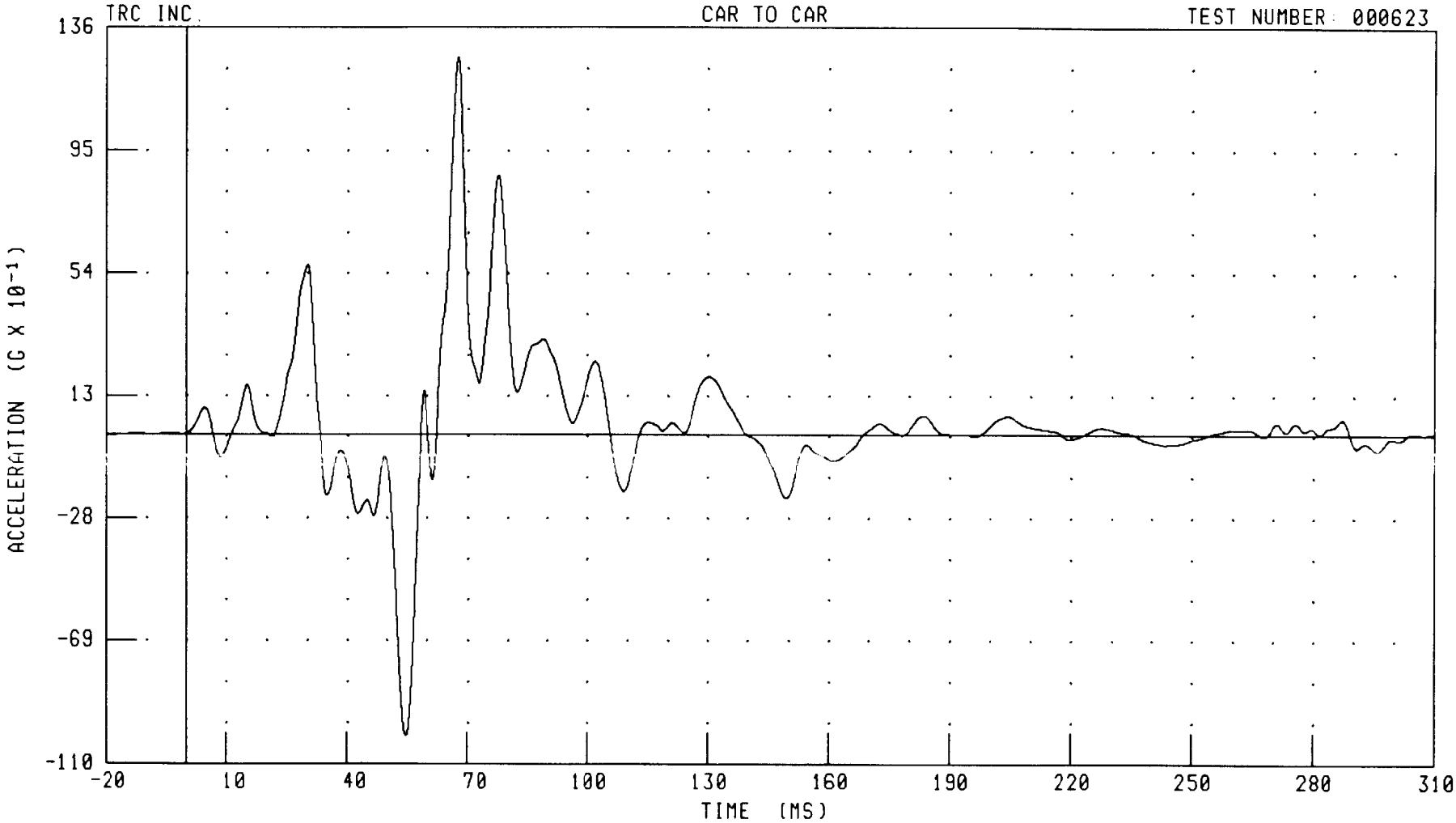
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT REAR SEAT X-AXIS ACCELERATION



CHANNEL: RRSXGA FILTER: CH. CLASS 60 PEAK DATA: 3.54 G @ 128.00 MS; -52.34 G @ 70.40 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

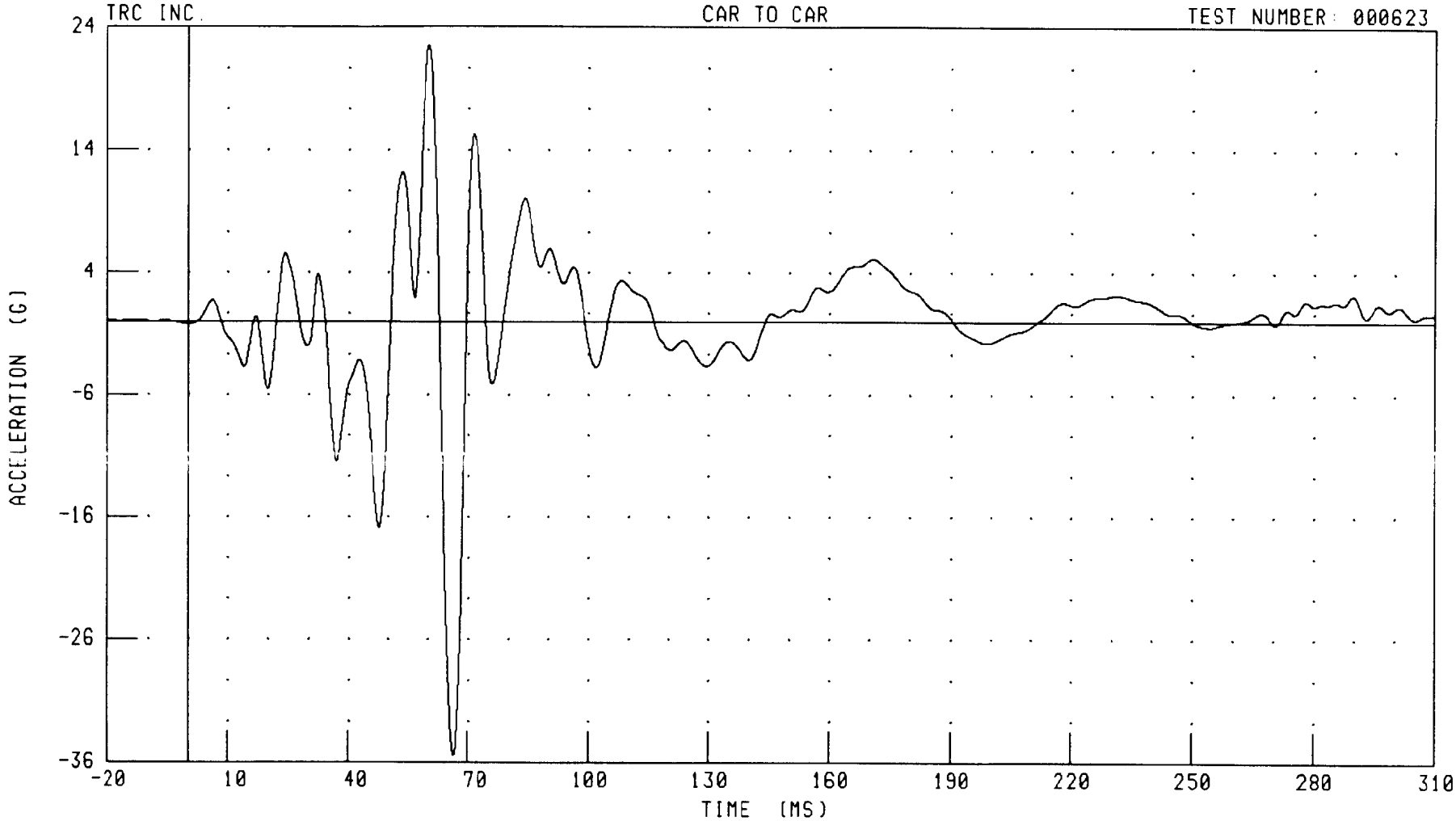
NEON RIGHT REAR SEAT Y-AXIS ACCELERATION



CHANNEL: RRSYGA FILTER: CH. CLASS 60 PEAK DATA: 12.61 G @ 67.76 MS; -10.07 G @ 54.80 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

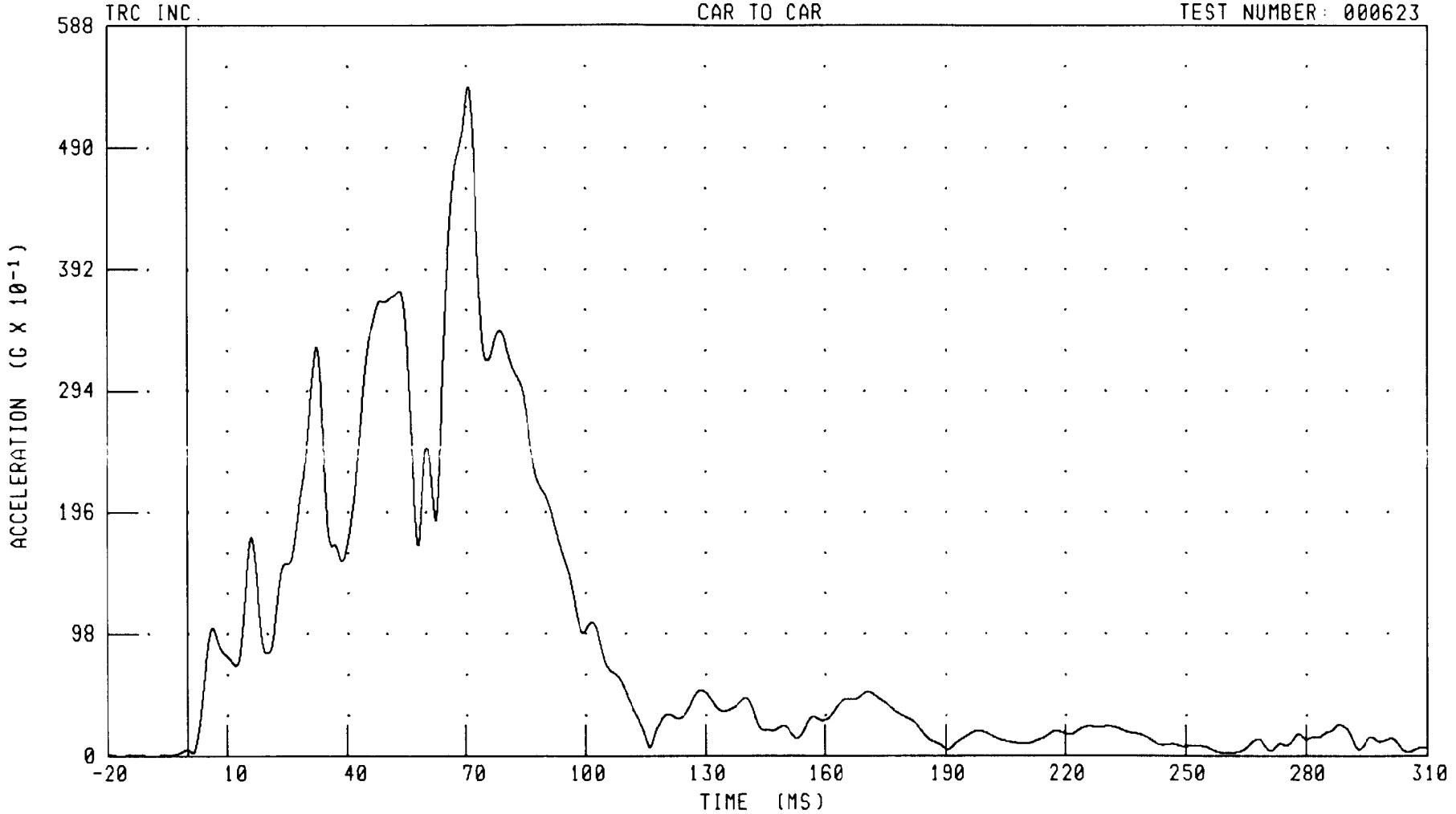
NEON RIGHT REAR SEAT Z-AXIS ACCELERATION



CHANNEL: RRSZGA FILTER: CH. CLASS 60 PEAK DATA: 22.52 G @ 60.24 MS; -35.44 G @ 66.56 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

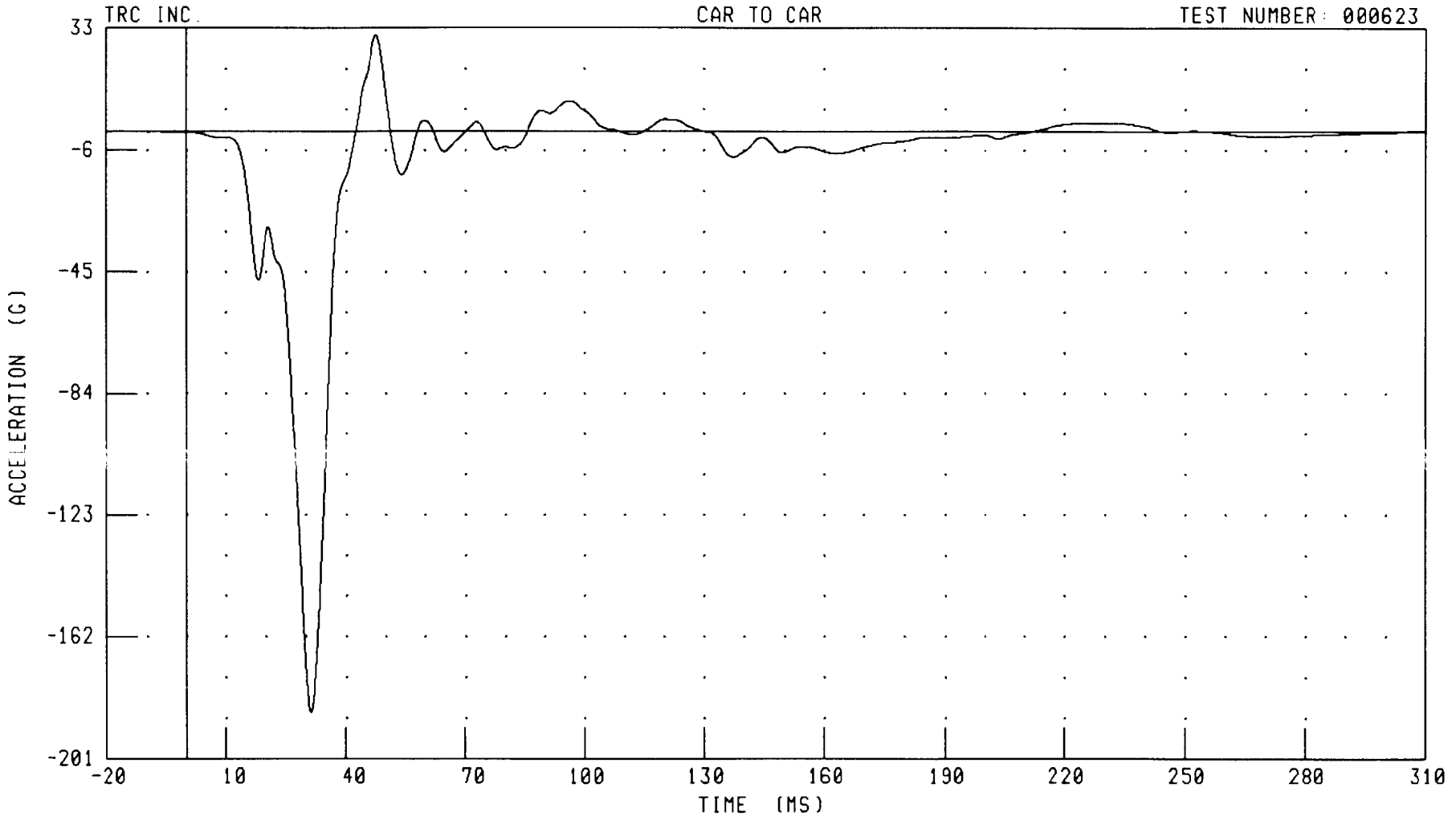
NEON RIGHT REAR SEAT RESULTANT ACCELERATION



CHANNEL: RRSRGA FILTER: CH. CLASS 60 PEAK DATA: 53.83 G @ 70.72 MS; 0.01 G @ -9.60 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

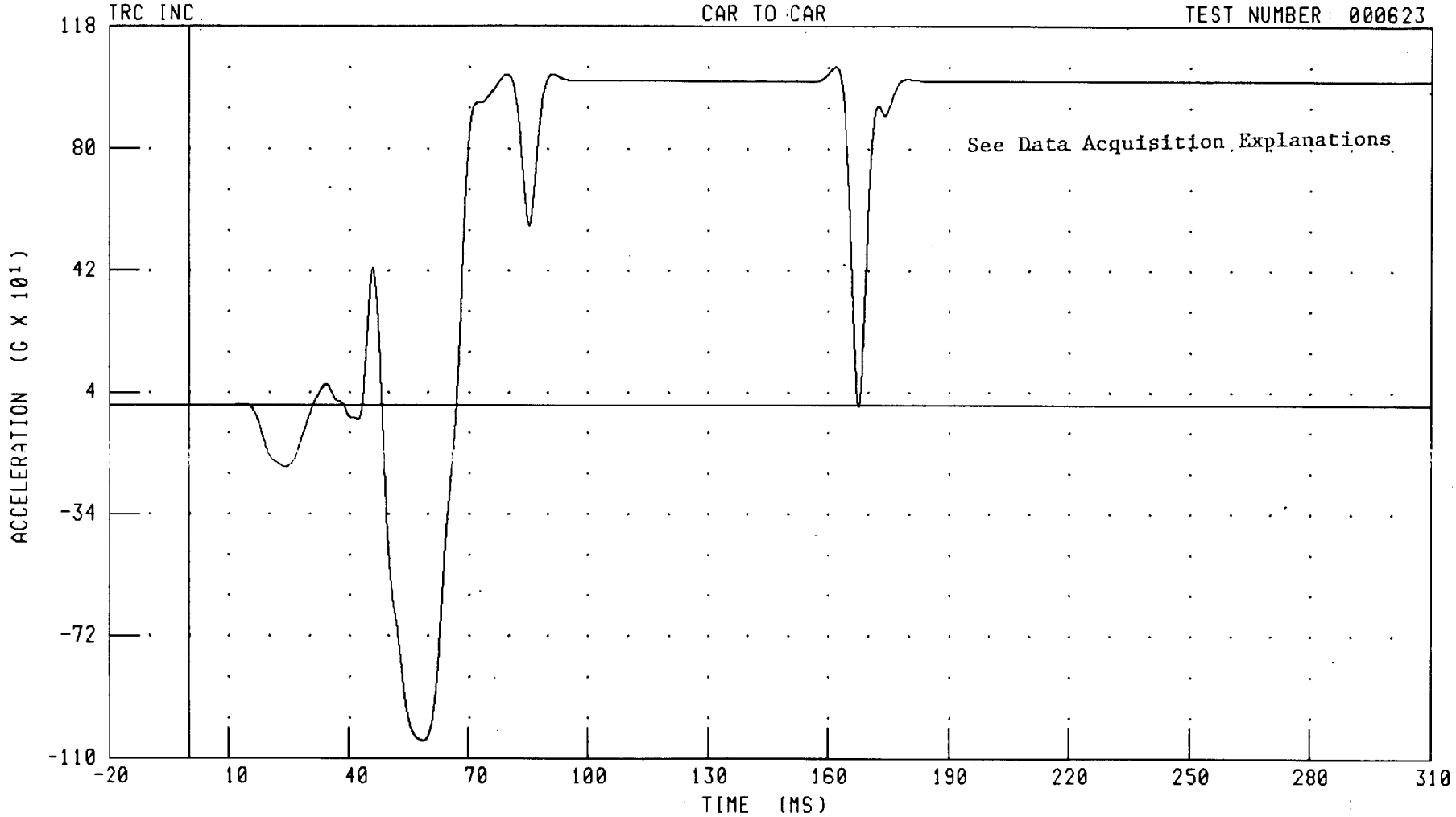
NEON ENGINE TOP X-AXIS ACCELERATION



CHANNEL: ENGXGA FILTER: CH. CLASS 60 PEAK DATA: 30.91 G @ 47.68 MS; -186.18 G @ 31.36 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

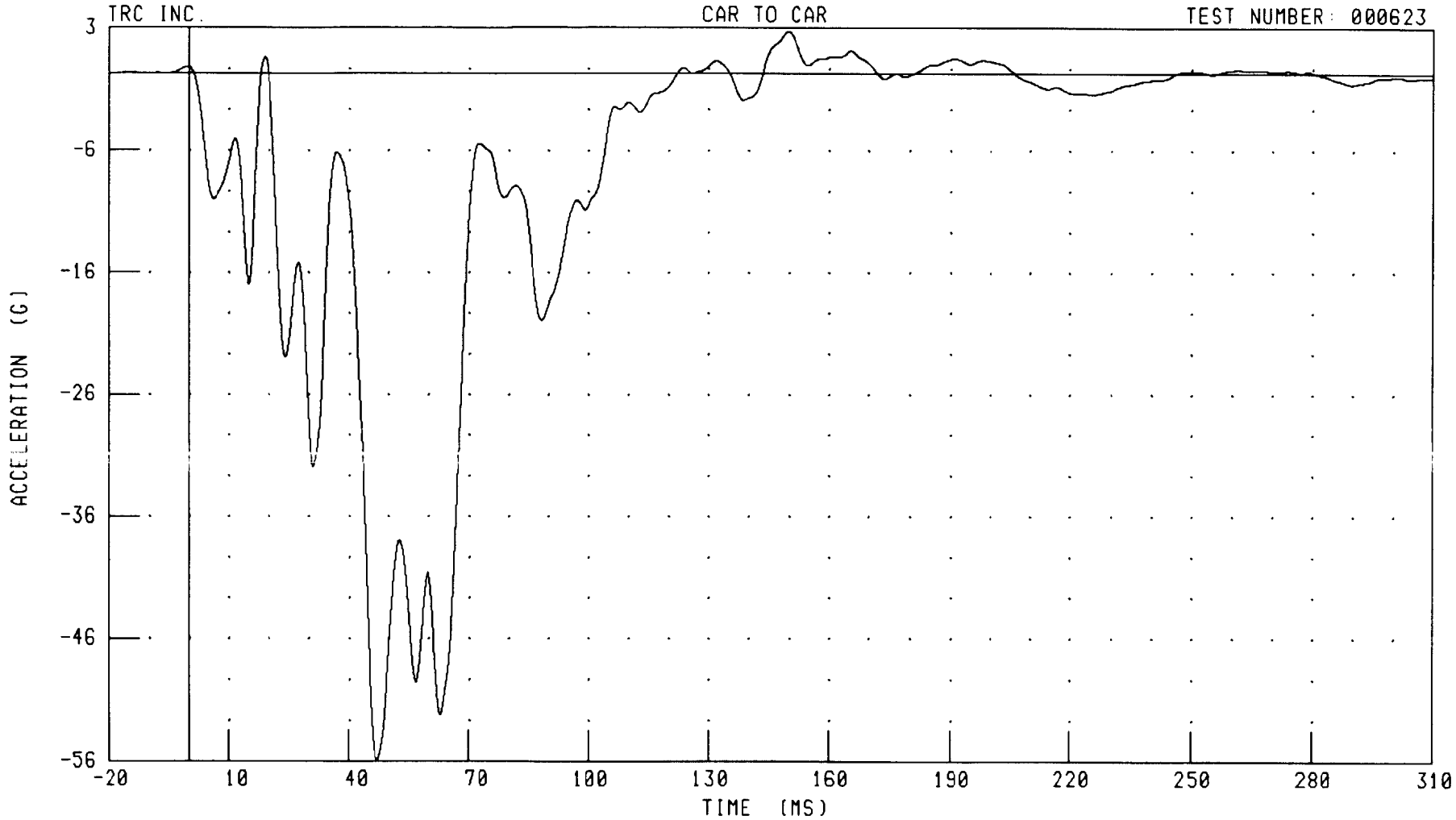
NEON ENGINE BOTTOM X-AXIS ACCELERATION



CHANNEL: ENGXGB FILTER: CH. CLASS 60 PEAK DATA: 1054.21 G @ 162.00 MS; -1045.43 G @ 58.80 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

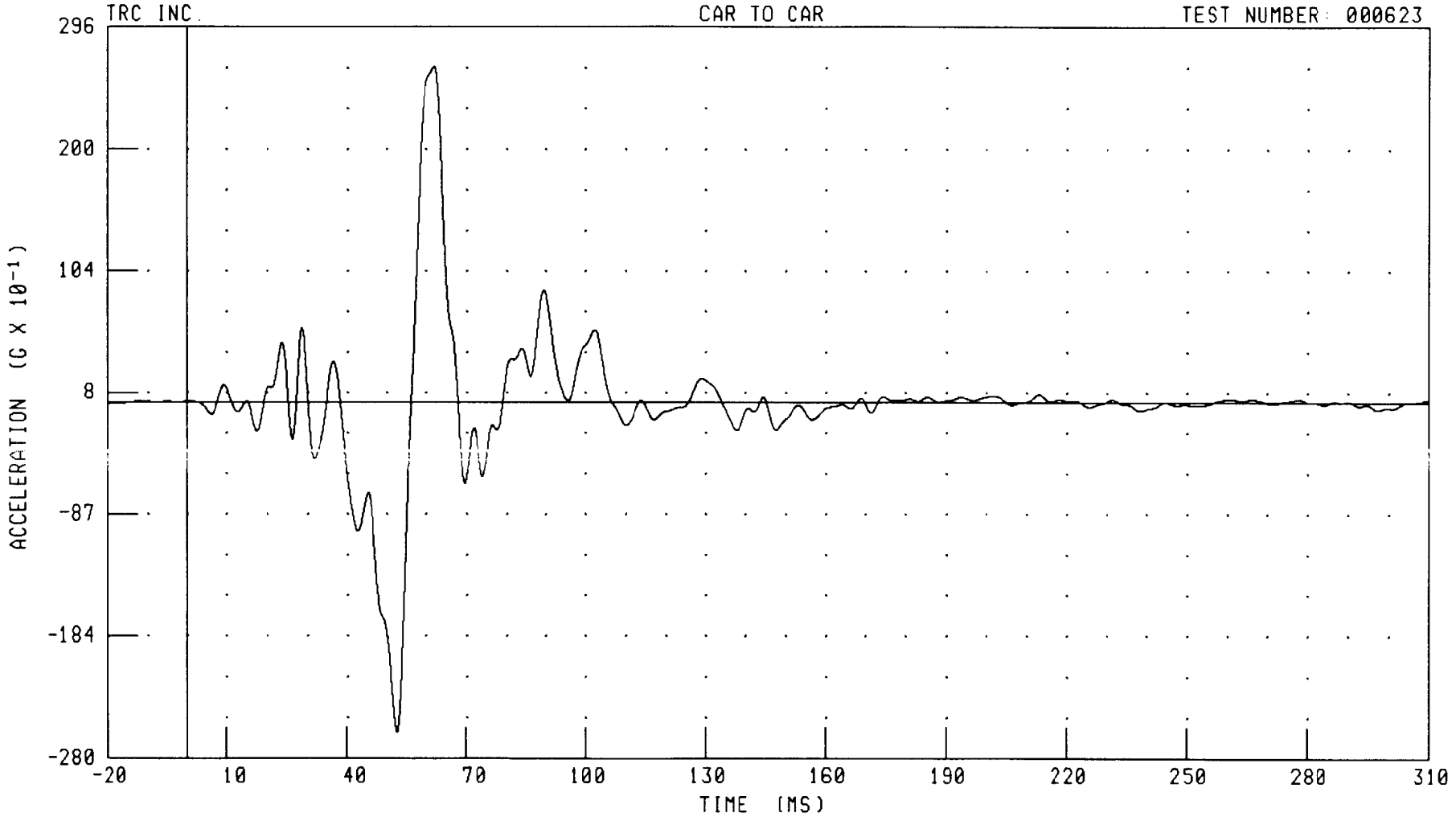
NEON VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION



CHANNEL: VCGXGA FILTER: CH. CLASS 60 PEAK DATA: 3.42 G @ 149.92 MS, -56.23 G @ 46.96 MS

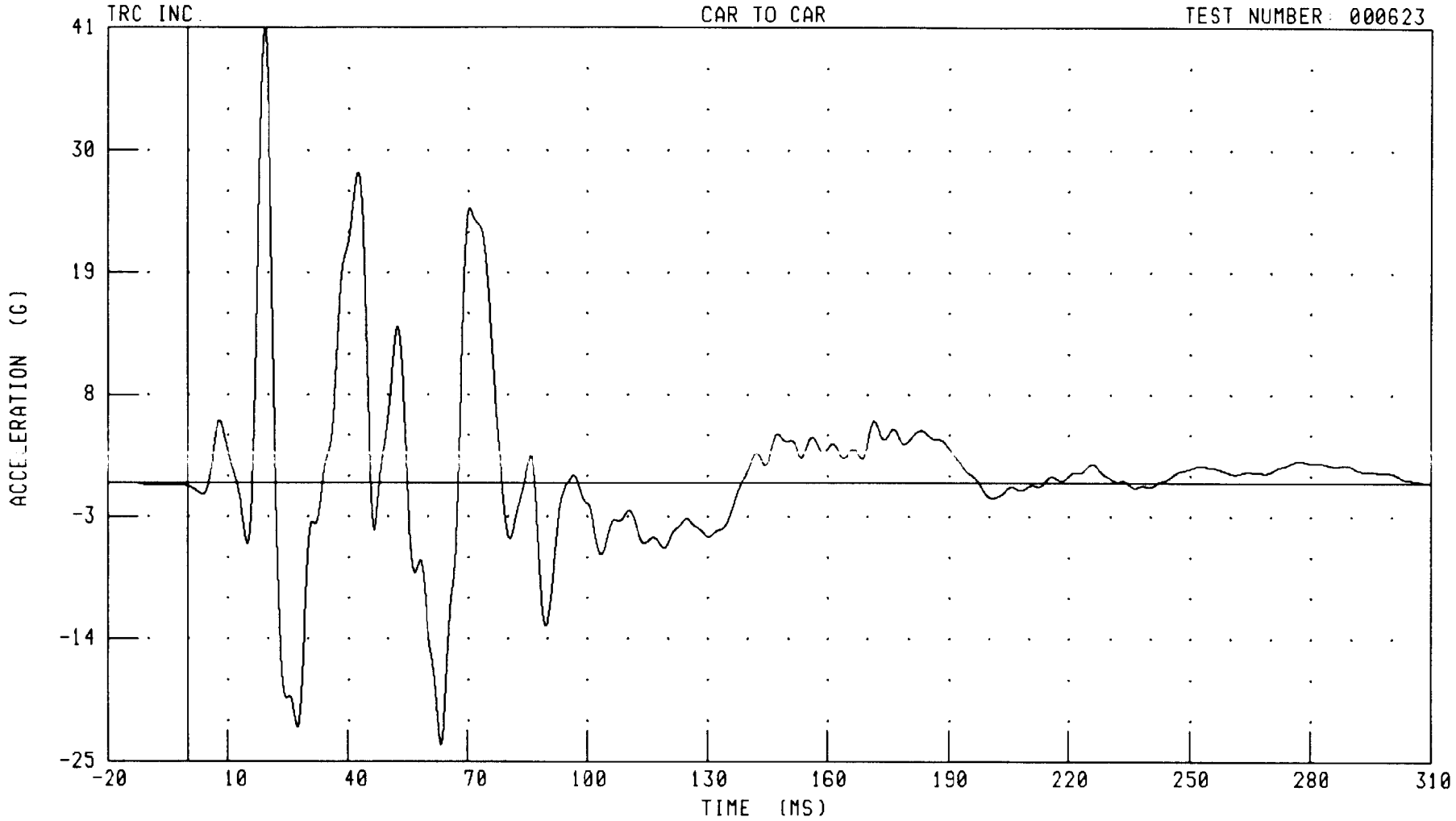
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION



CHANNEL: VCGYGA FILTER: CH. CLASS 60 PEAK DATA: 26.49 G @ 62.16 MS, -25.98 G @ 52.64 MS

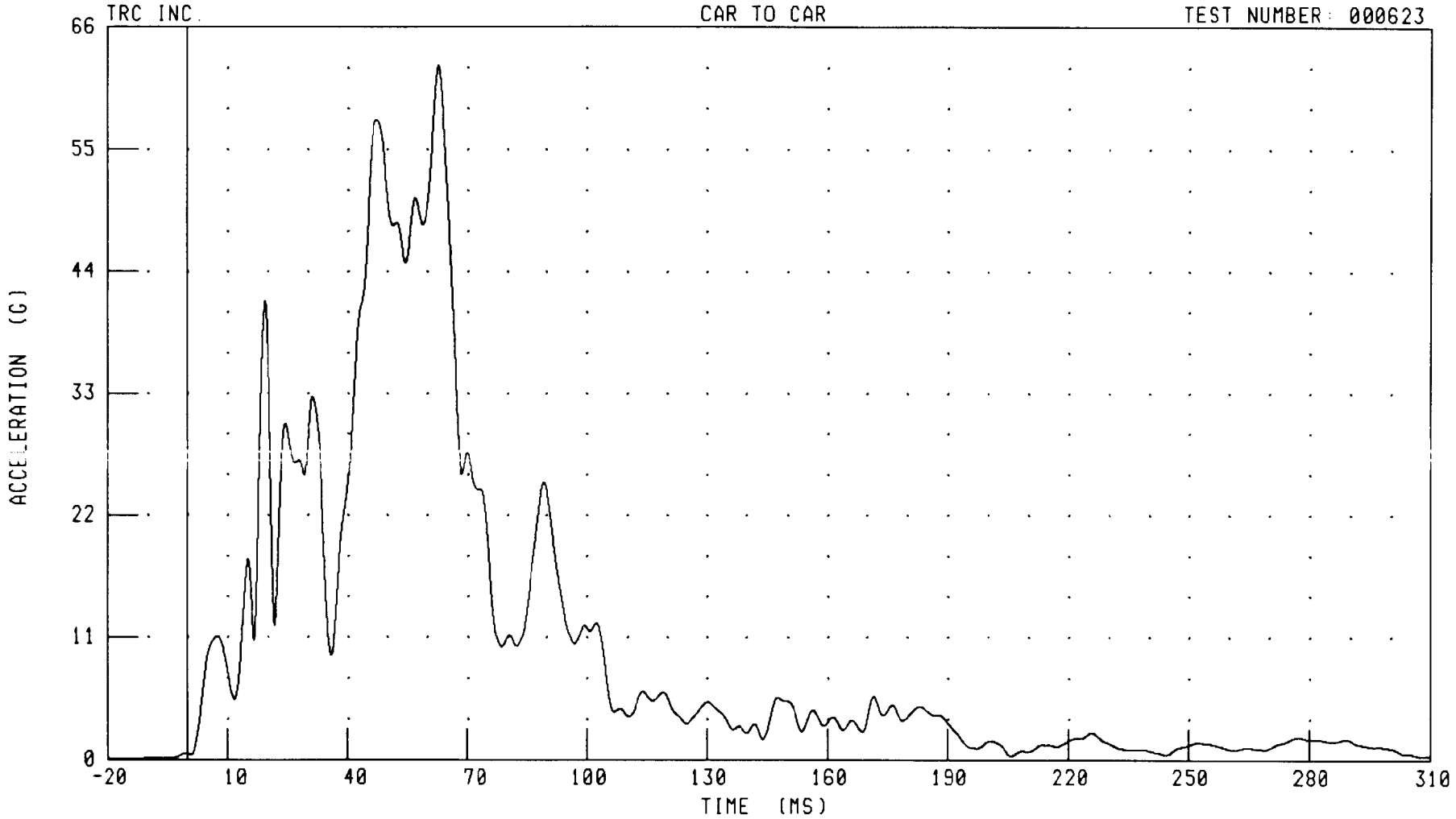
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION



CHANNEL: VCGZGA FILTER: CH. CLASS 60 PEAK DATA: 41.36 G @ 19.28 MS; -23.49 G @ 63.36 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

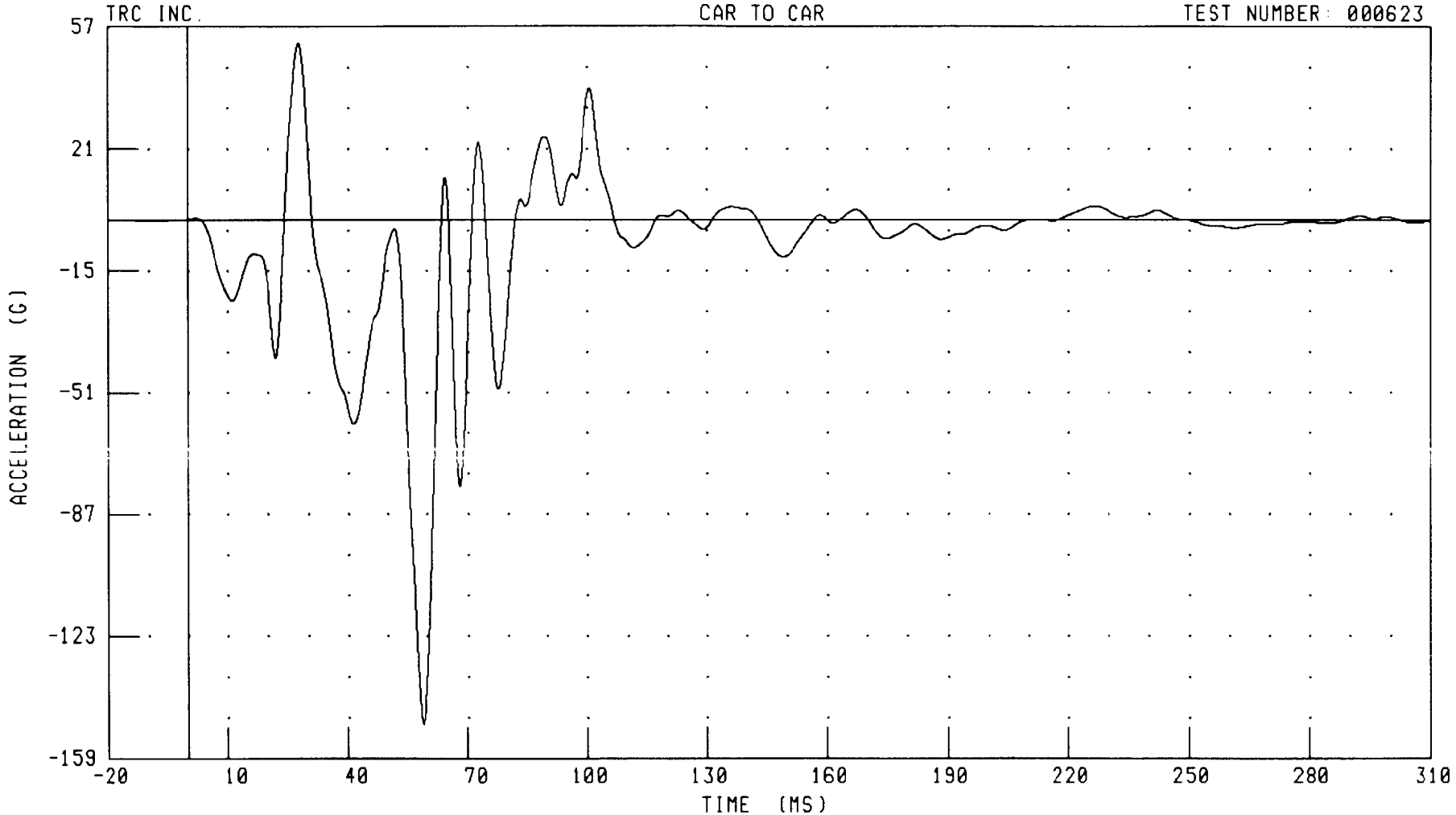
NEON VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION



CHANNEL: VCGRGA FILTER: CH. CLASS 60 PEAK DATA: 62.54 G @ 62.88 MS; 0.05 G @ -18.48 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

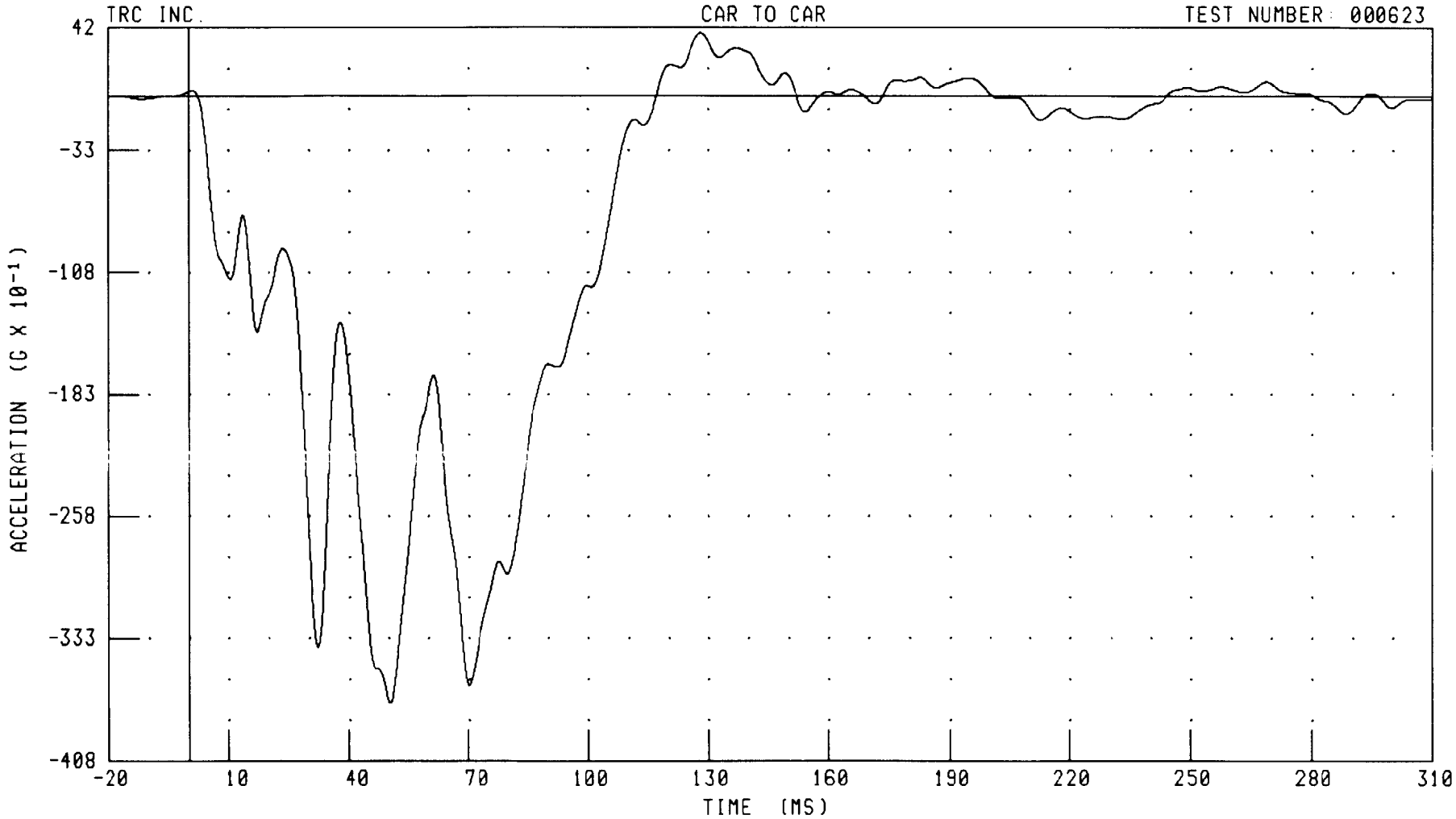
NEON DASH PANEL CENTER X-AXIS ACCELERATION



CHANNEL: DPCXGA FILTER: CH. CLASS 60 PEAK DATA: 52.18 G @ 27.68 MS; -149.01 G @ 59.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

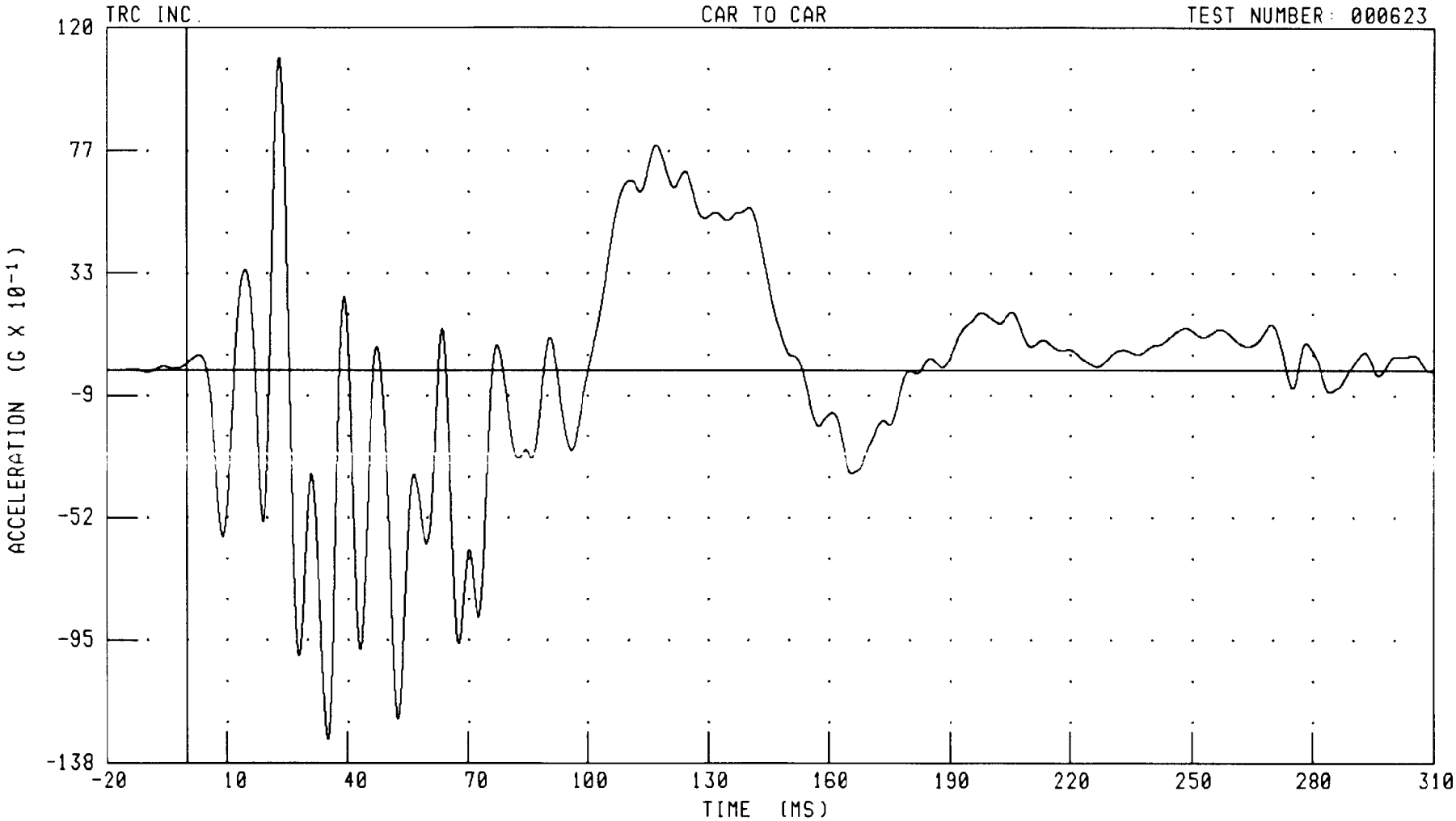
NEON REAR AXLE X-AXIS ACCELERATION



CHANNEL: RAXXGA FILTER: CH. CLASS 60 PEAK DATA: 3.87 G @ 128.24 MS; -37.28 G @ 50.40 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

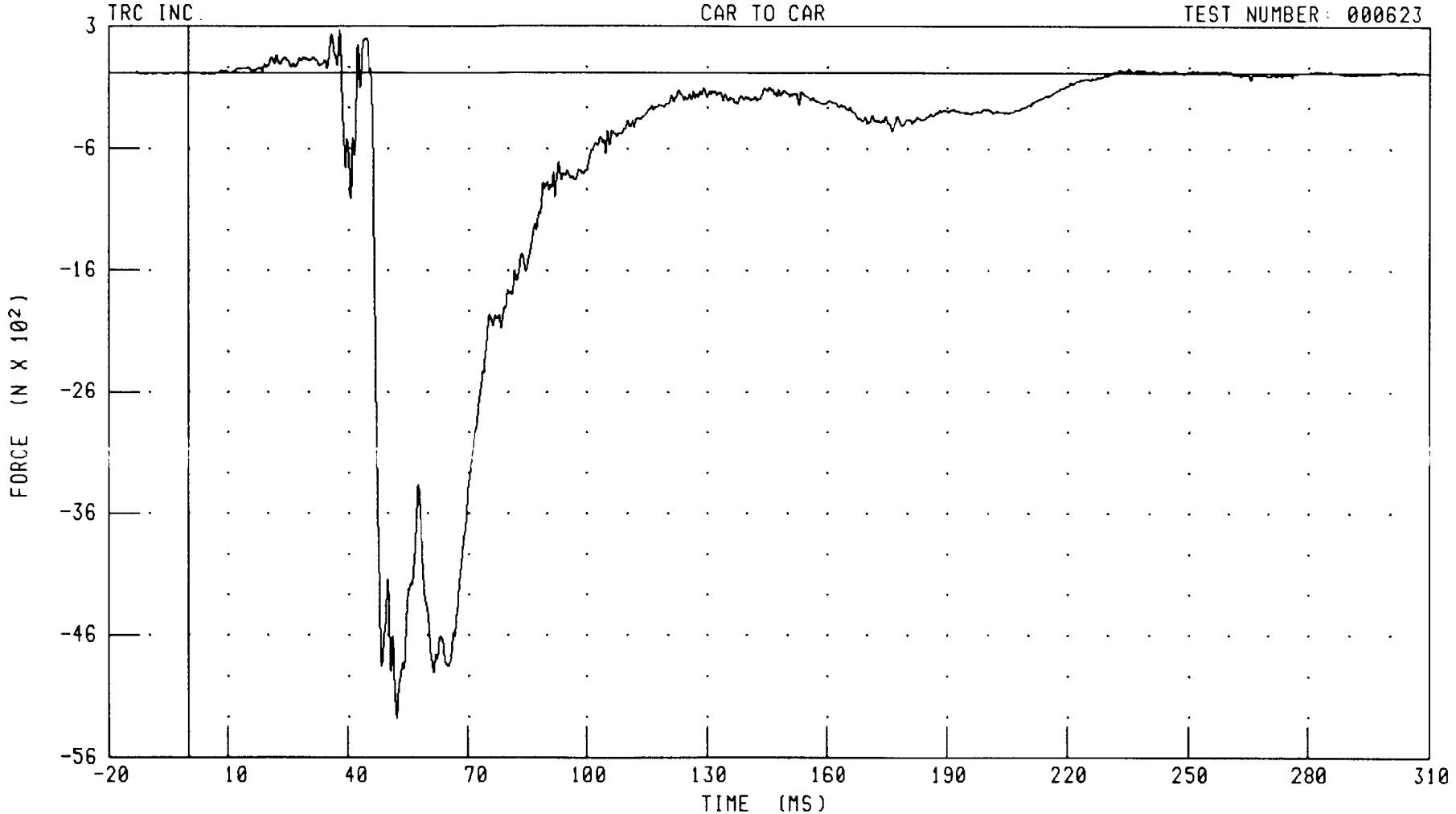
NEON VEHICLE REAR CENTER Z-AXIS ACCELERATION



CHANNEL: TFCZGA FILTER: CH. CLASS 60 PEAK DATA: 10.97 G @ 23.20 MS; -12.97 G @ 35.20 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

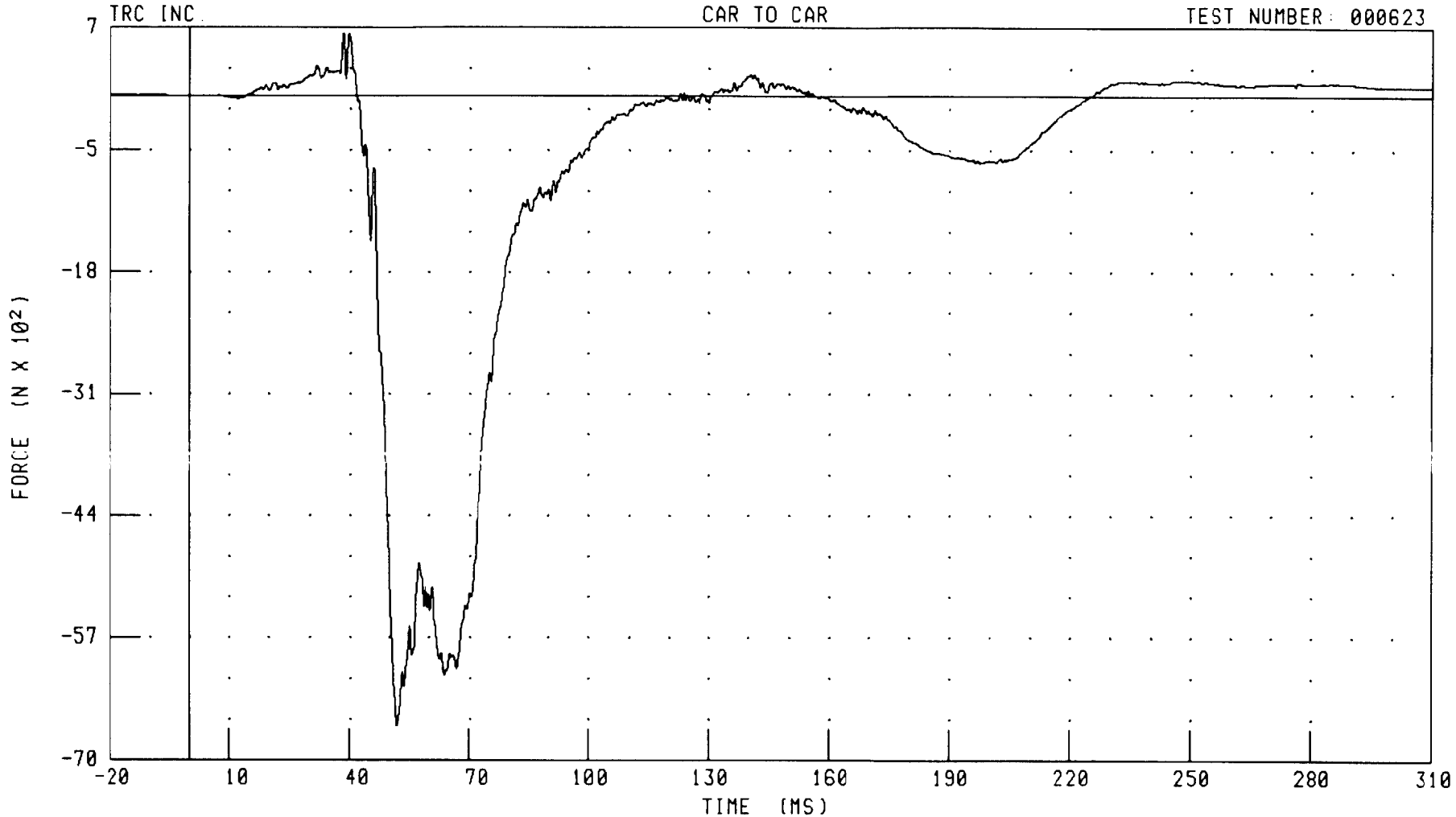
NEON DRIVER LEFT FEMUR FORCE



CHANNEL: LFMZFA FILTER: CH. CLASS 600 PEAK DATA: 347.22 N @ 37.92 MS; -5298.81 N @ 52.32 MS

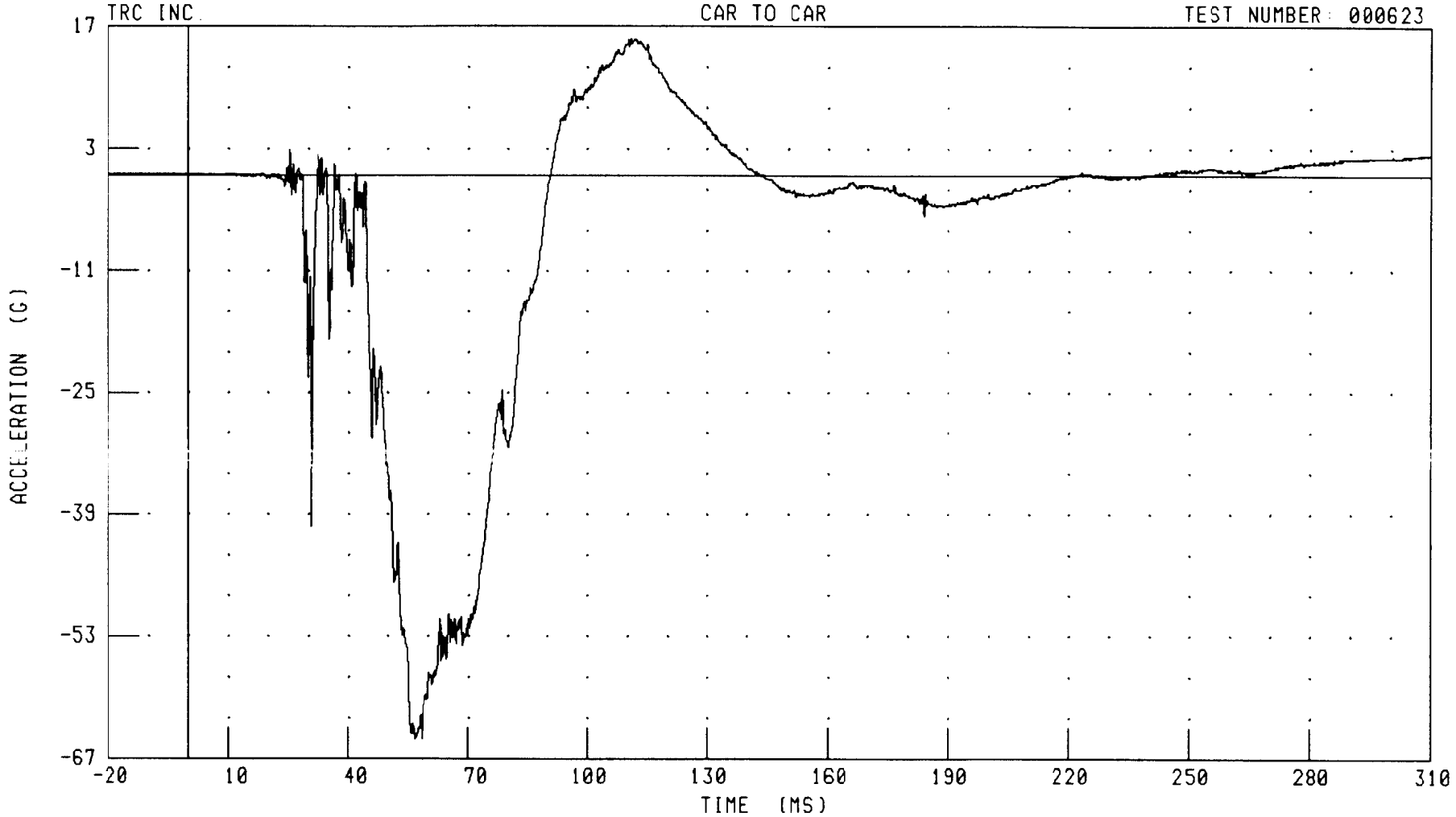
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON DRIVER RIGHT FEMUR FORCE



CHANNEL: RFMZFA FILTER: CH. CLASS 600 PEAK DATA: 659.20 N @ 38.56 MS; -6717.08 N @ 52.00 MS

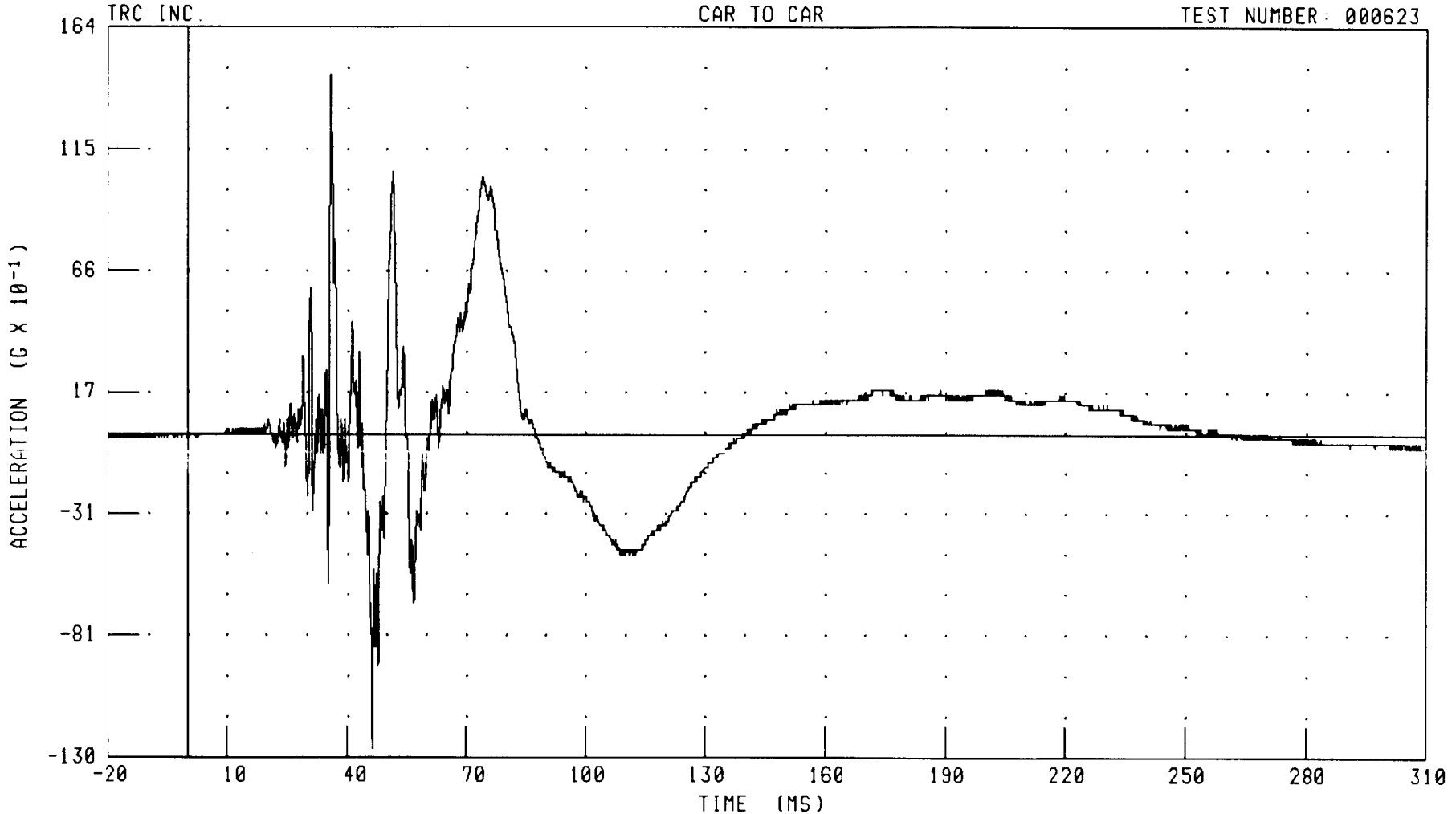
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION



CHANNEL: HEDXGB FILTER: CH. CLASS 1000 PEAK DATA: 15.63 G @ 110.96 MS, -64.78 G @ 56.64 MS

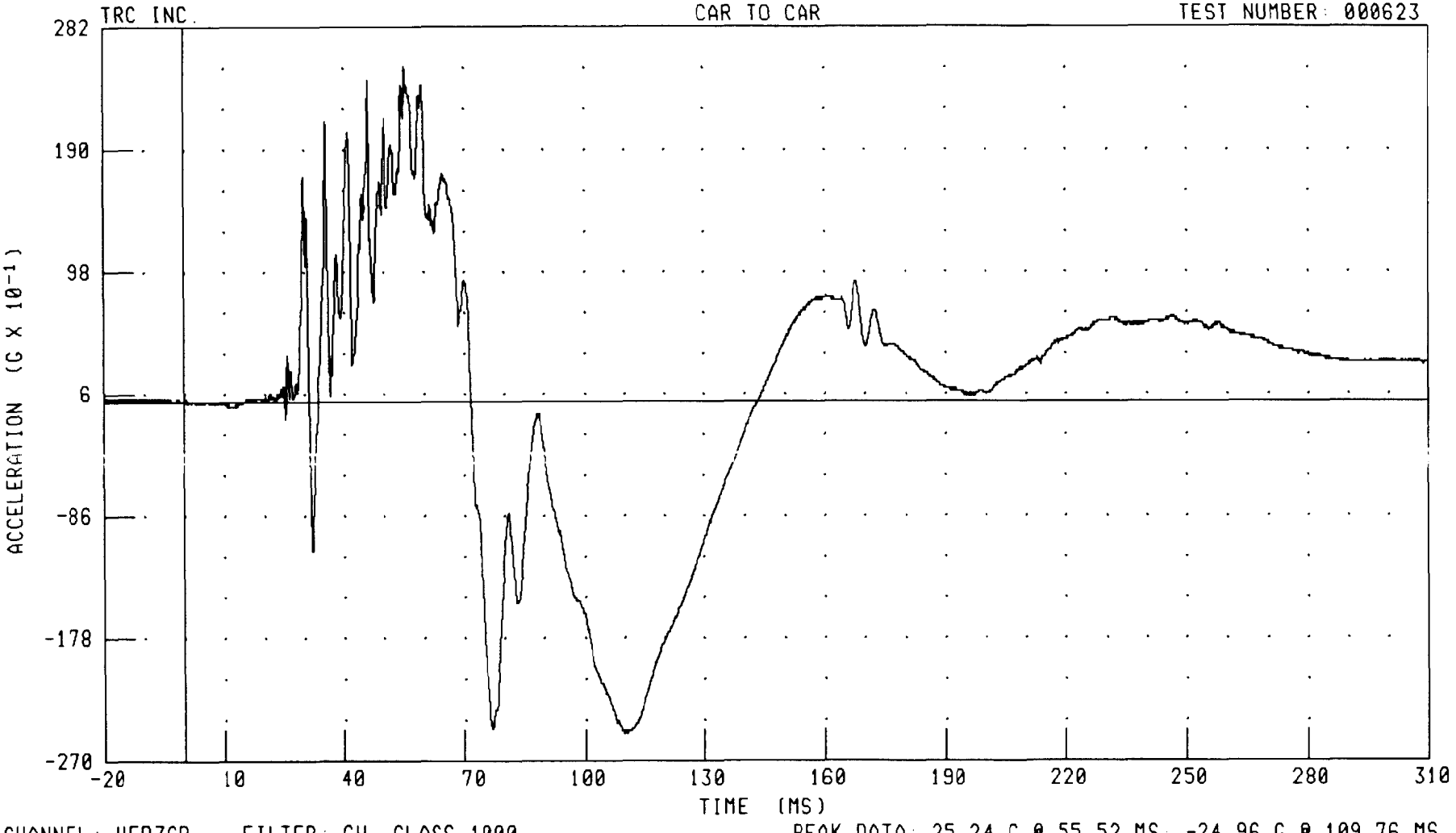
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION



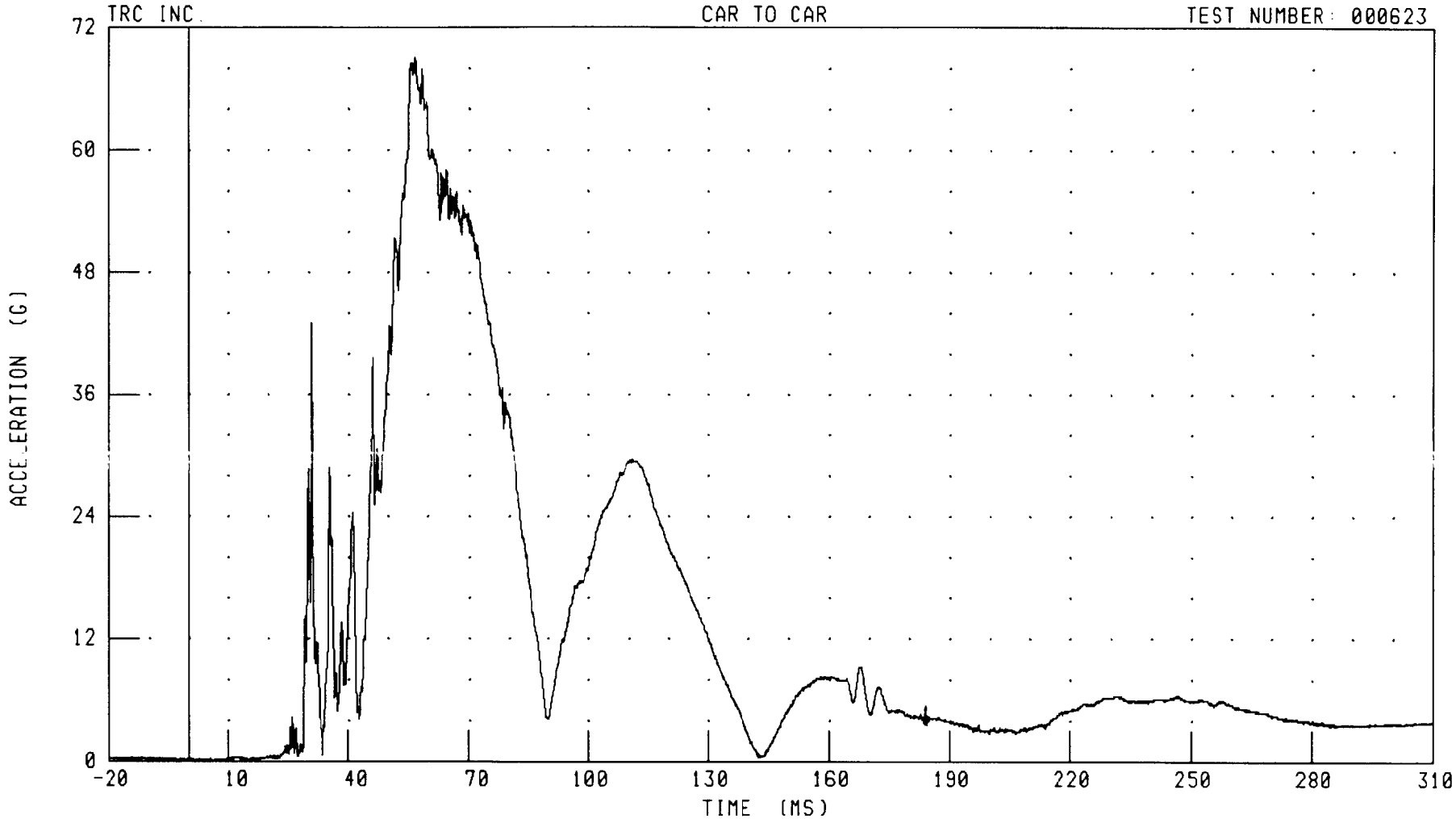
CHANNEL: HEDYGB FILTER: CH. CLASS 1000 PEAK DATA: 14.51 G @ 35.92 MS; -12.68 G @ 46.40 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION



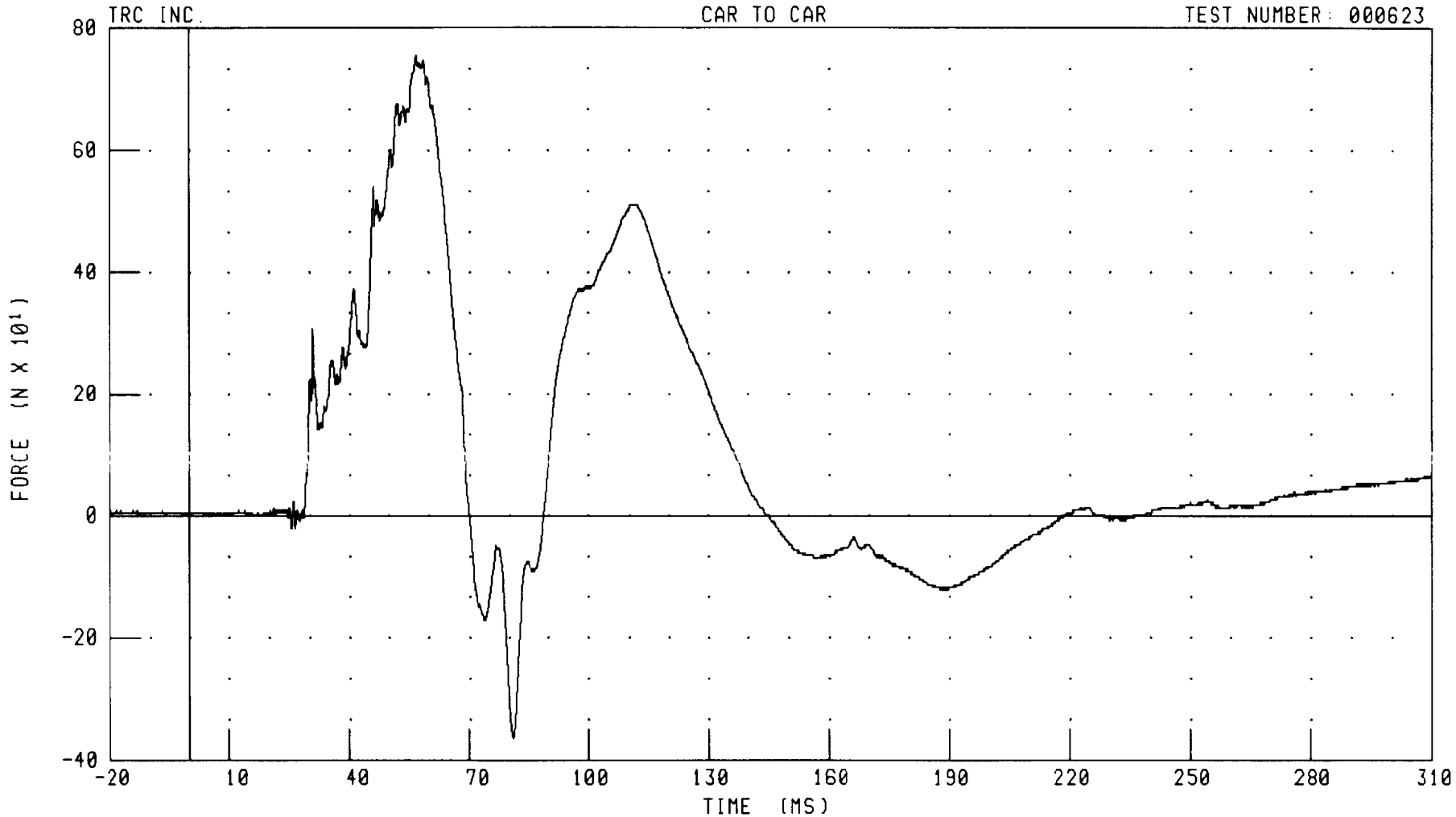
CHANNEL: HEDZGB FILTER: CH. CLASS 1000 PEAK DATA: 25.24 G @ 55.52 MS, -24.96 G @ 109.76 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION



CHANNEL: HEDRGB FILTER: CH. CLASS 1000 PEAK DATA: 69.11 G @ 56.64 MS; 0.08 G @ -16.80 MS

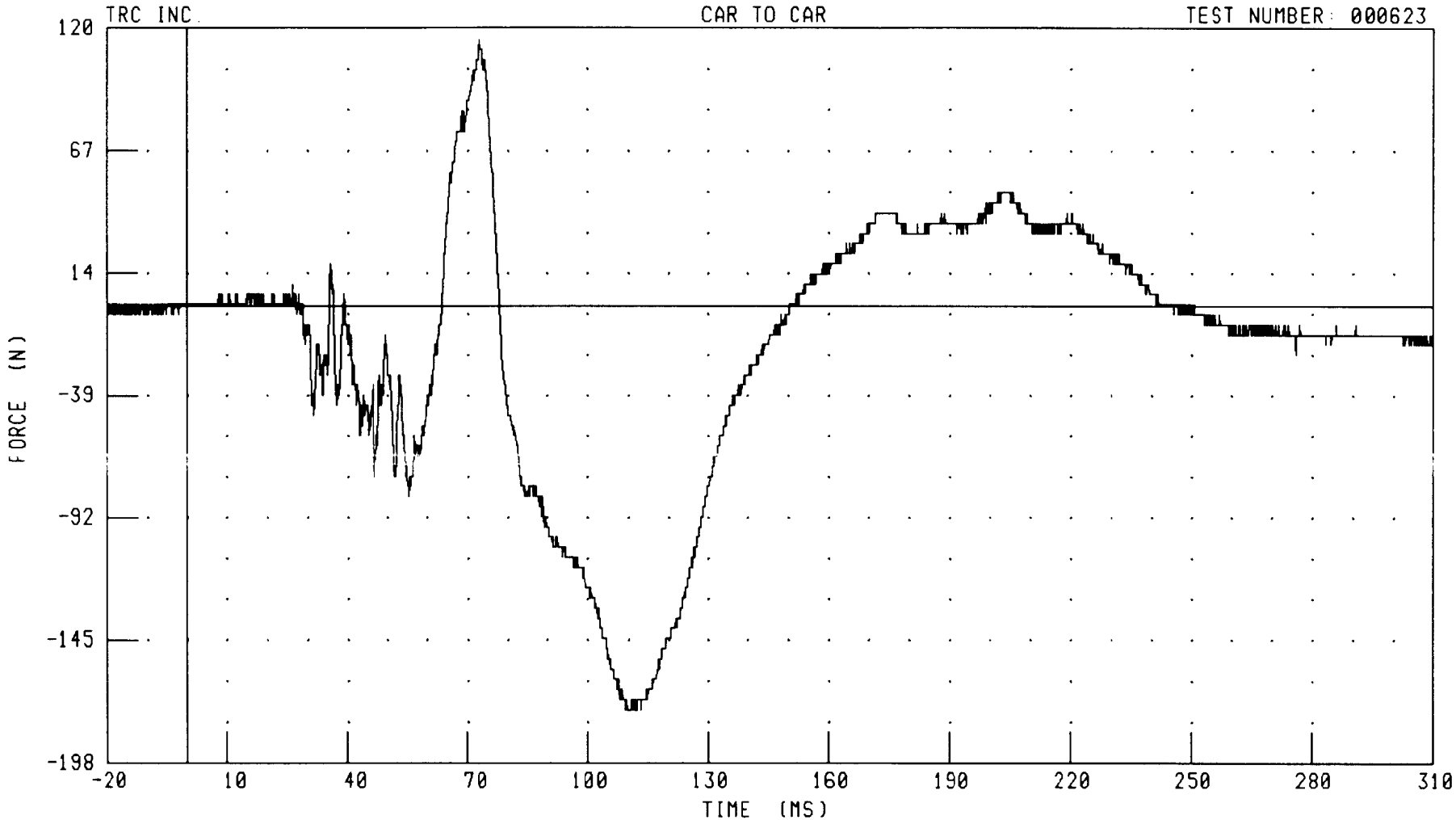
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE



CHANNEL: NEKXFB FILTER: CH. CLASS 1000 PEAK DATA: 756.02 N @ 56.88 MS; -364.22 N @ 80.96 MS

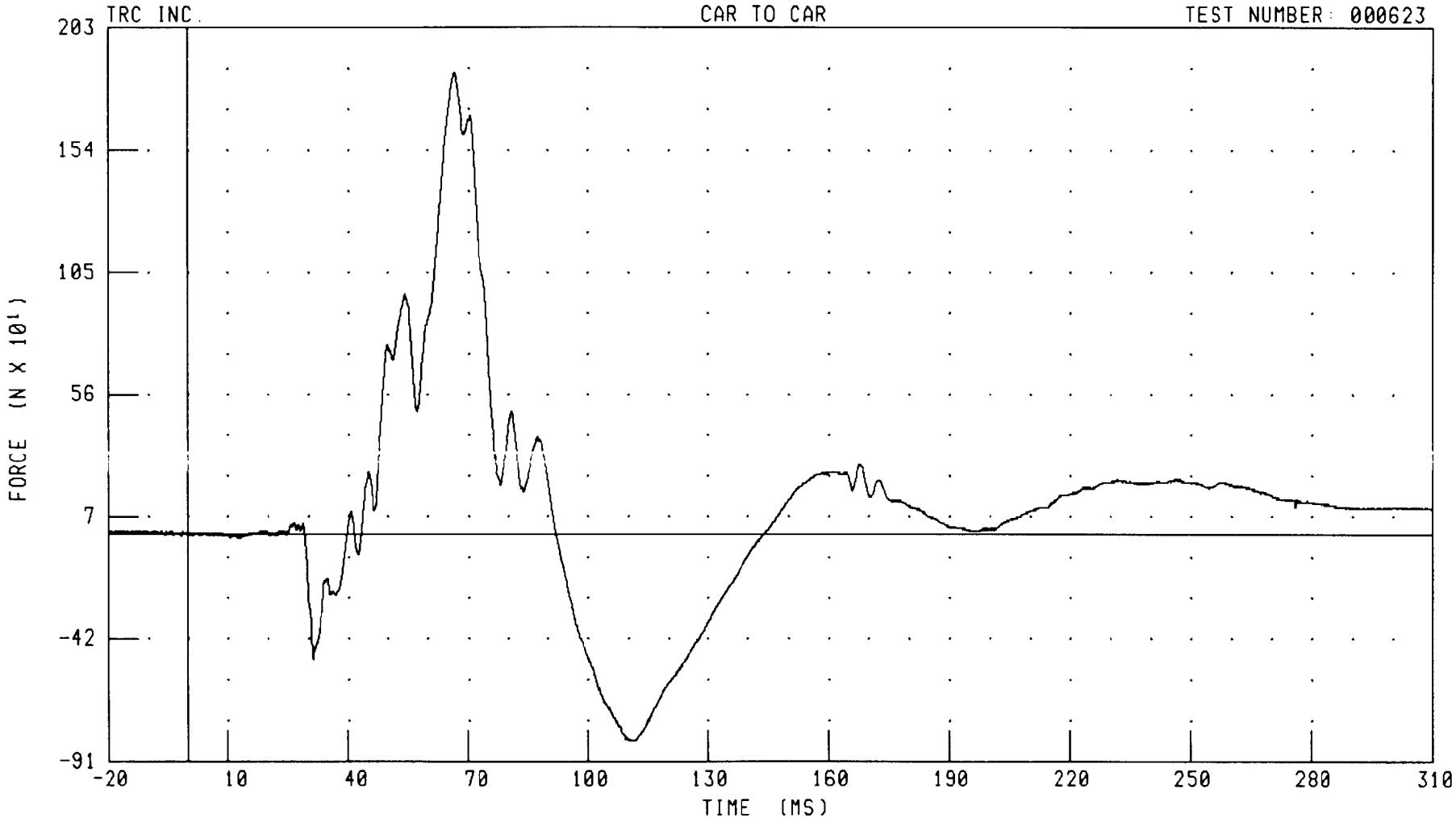
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE



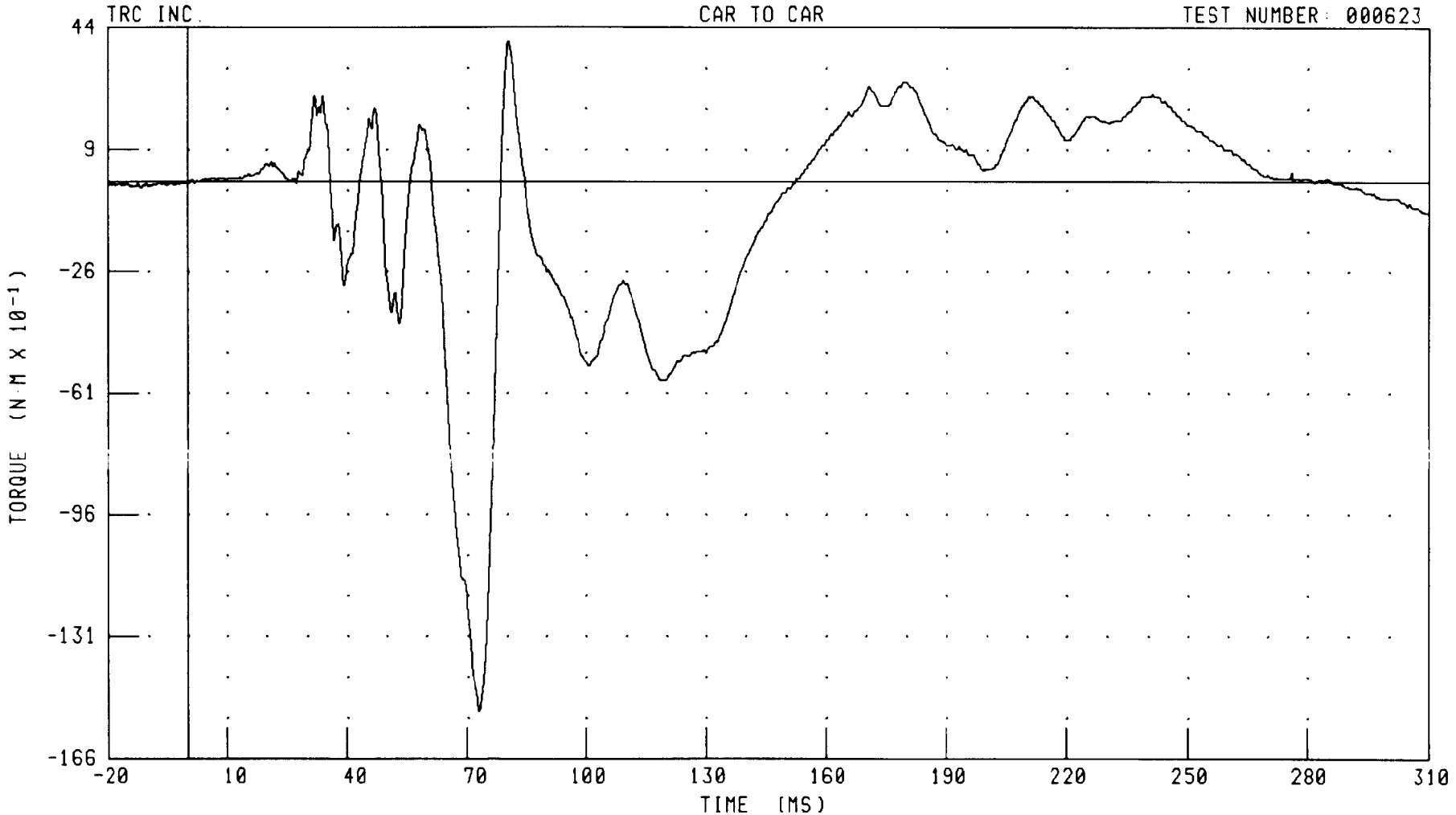
CHANNEL: NEKYFB FILTER: CH. CLASS 1000 PEAK DATA: 114.90 N @ 72.88 MS; -175.07 N @ 109.36 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE



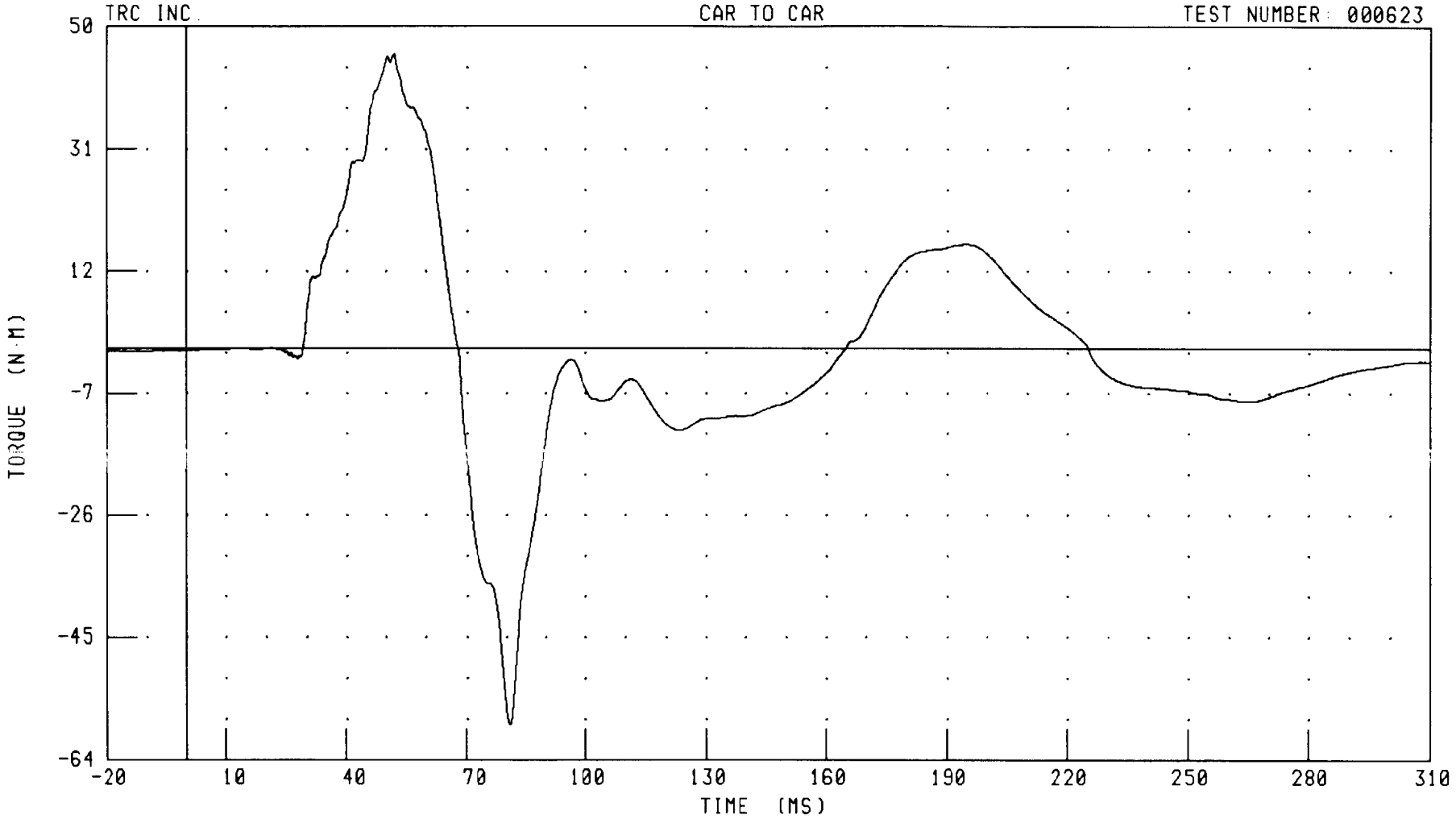
CHANNEL: NEKZFB FILTER: CH. CLASS 1000 PEAK DATA: 1847.96 N @ 66.48 MS; -827.80 N @ 110.24 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS



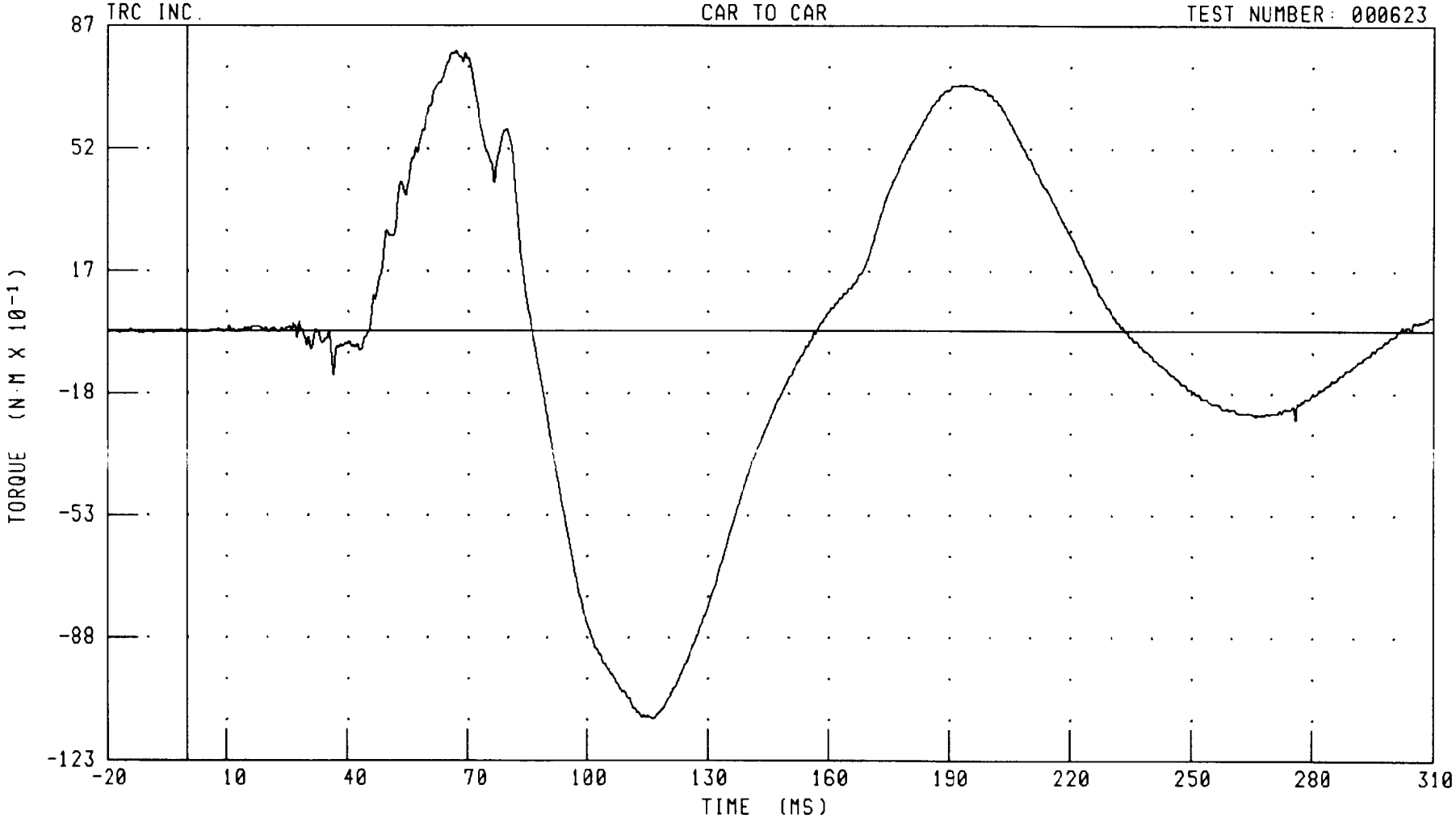
CHANNEL: NEKXMB FILTER: CH. CLASS 600 PEAK DATA: 4.01 N-M @ 80.40 MS; -15.24 N-M @ 73.12 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS



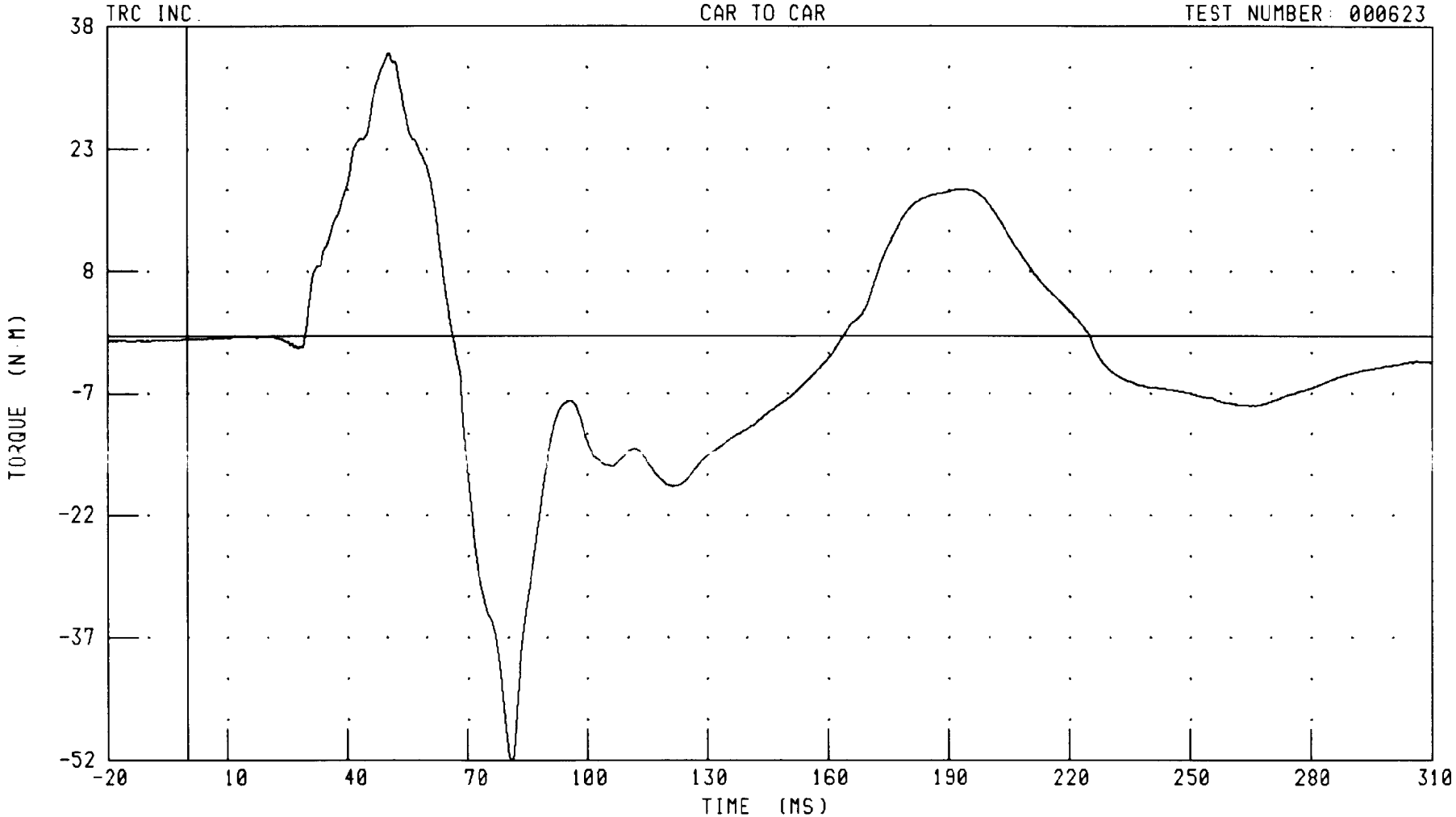
CHANNEL: NEKYMB FILTER: CH. CLASS 600 PEAK DATA: 45.70 N-M @ 52.08 MS; -58.59 N-M @ 80.96 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS



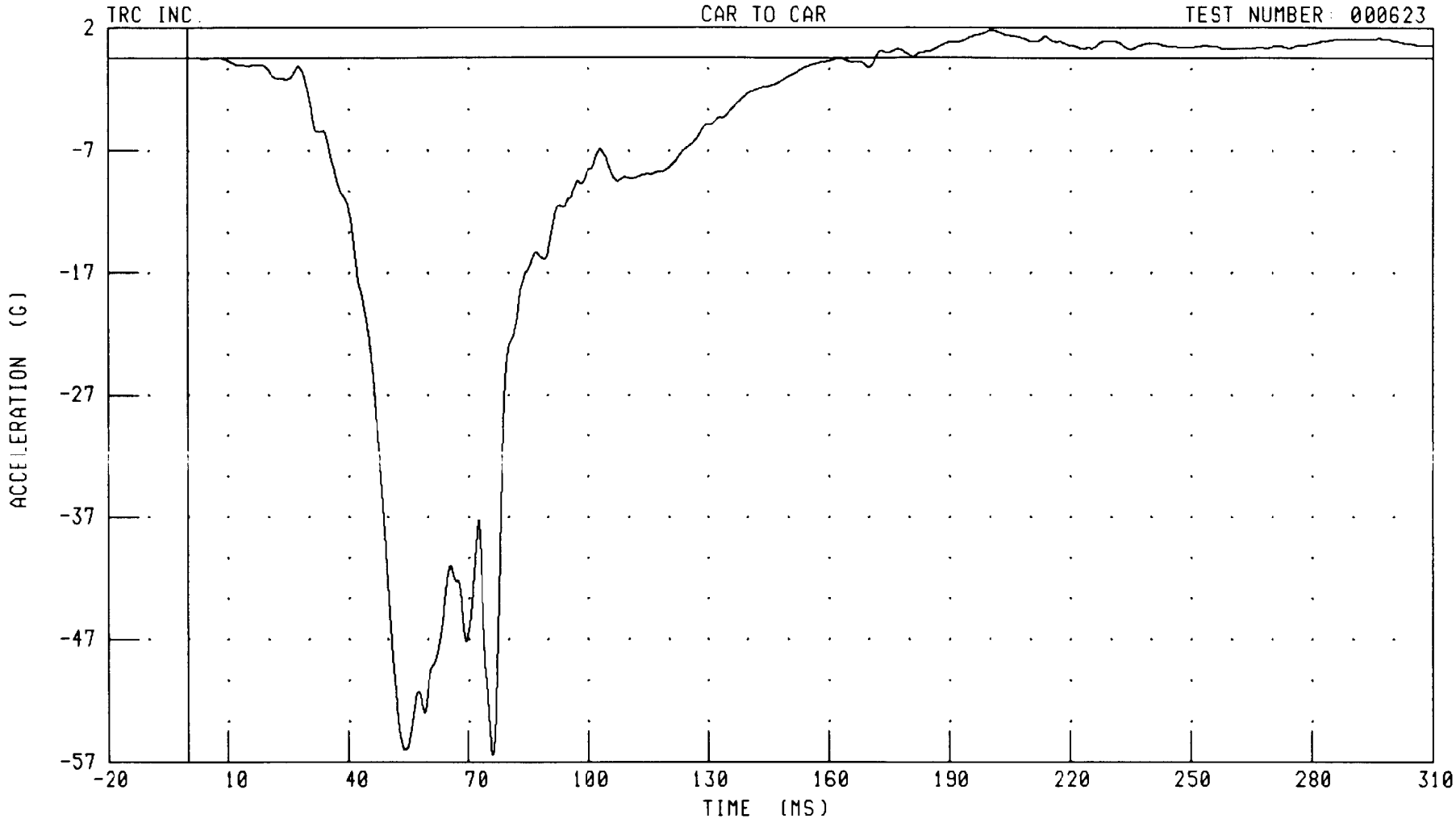
CHANNEL: NEKZMB FILTER: CH. CLASS 600 PEAK DATA: 7.99 N-M @ 67.04 MS; -11.12 N-M @ 116.08 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER NECK OCCIPITAL CONDYLE MOMENT ABOUT Y AXIS



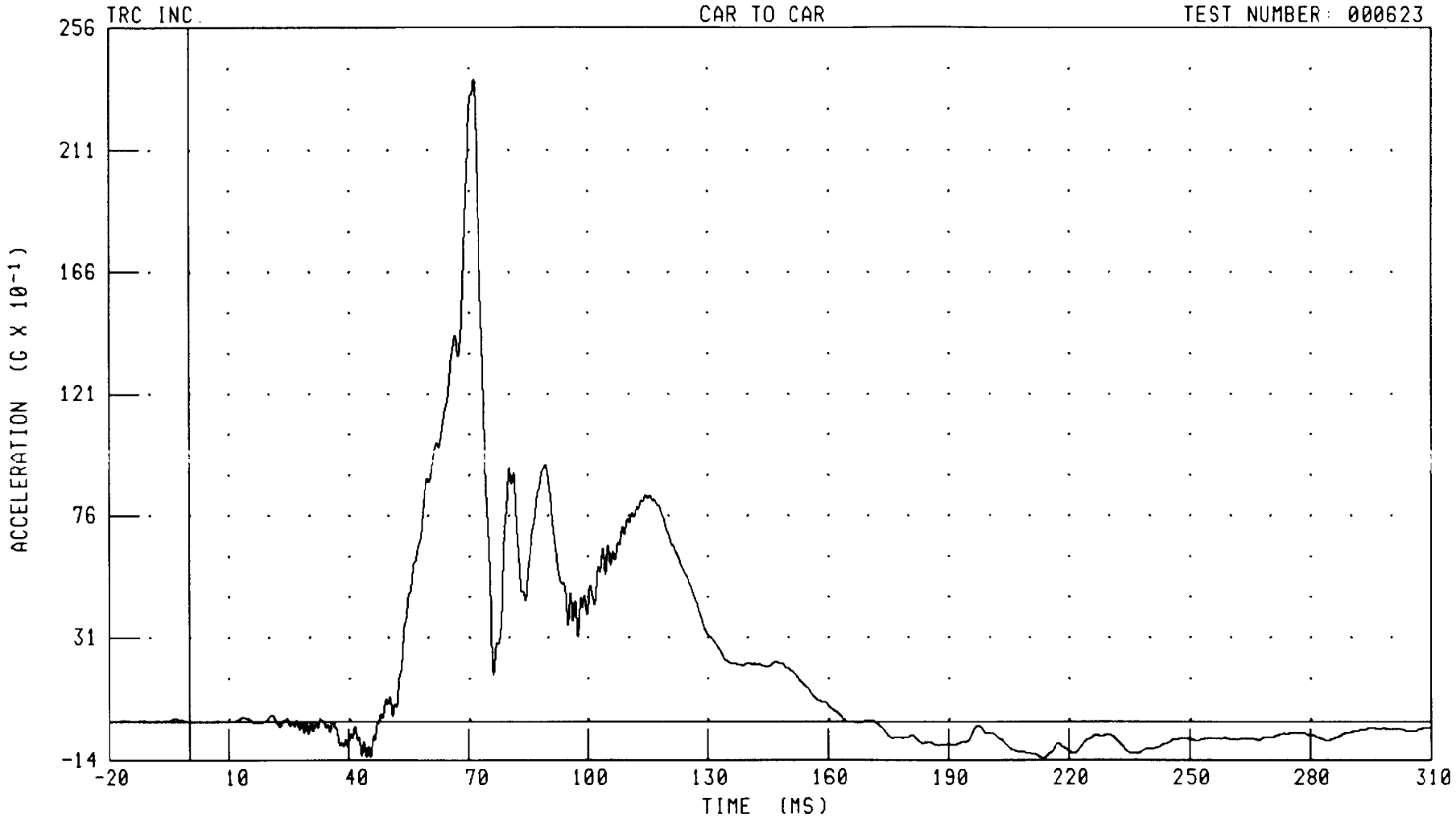
CHANNEL: NEKOMB FILTER: CH. CLASS 600 PEAK DATA: 34.76 N-M @ 50.56 MS; -52.13 N-M @ 80.88 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION



CHANNEL: CSTXGB FILTER: CH CLASS 180 PEAK DATA: 2.22 G @ 200.40 MS; -57.05 G @ 76.16 MS

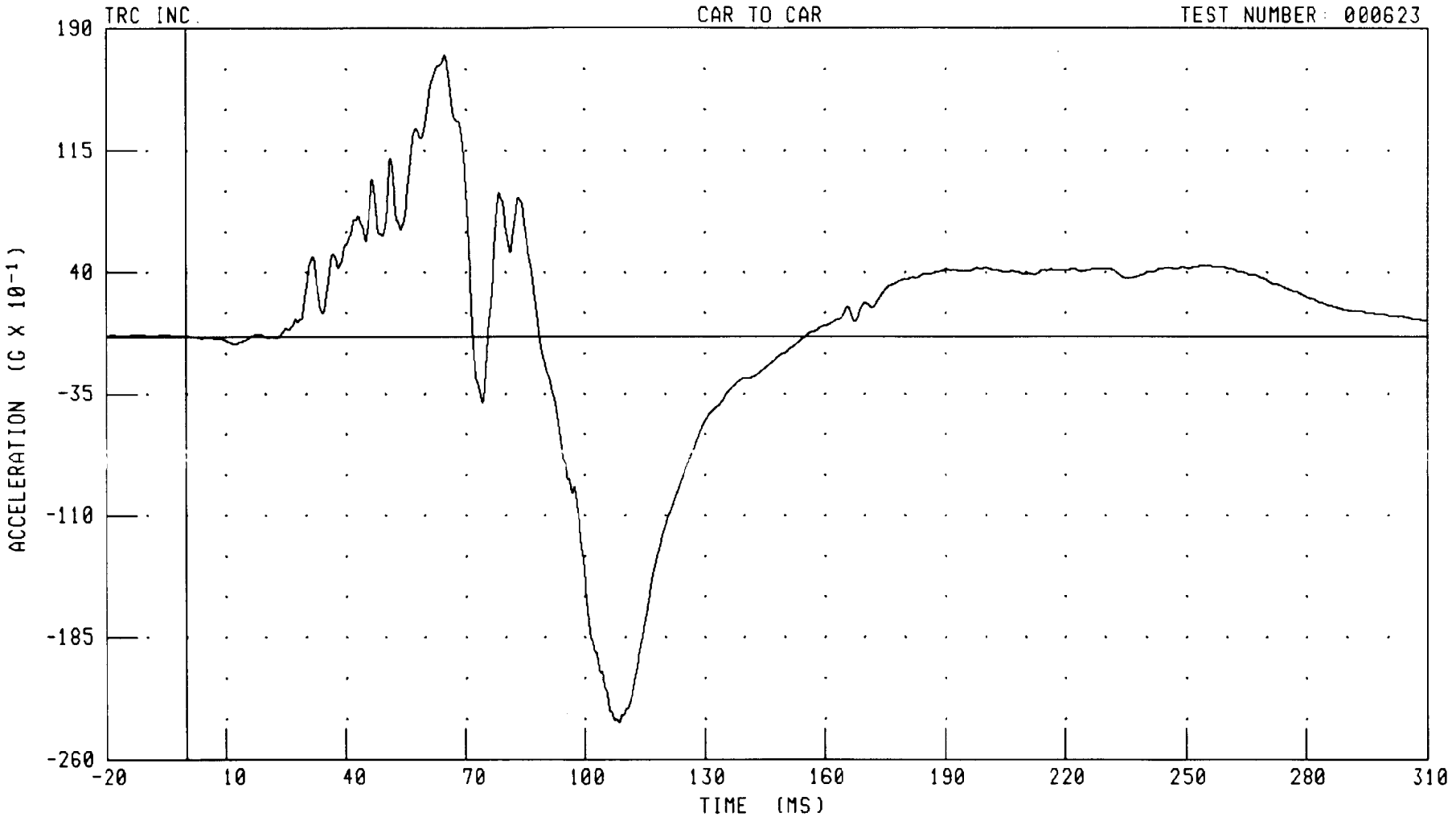
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION



CHANNEL: CSTYGB FILTER: CH. CLASS 180 PEAK DATA: 23.72 G @ 71.44 MS, -1.34 G @ 213.52 MS

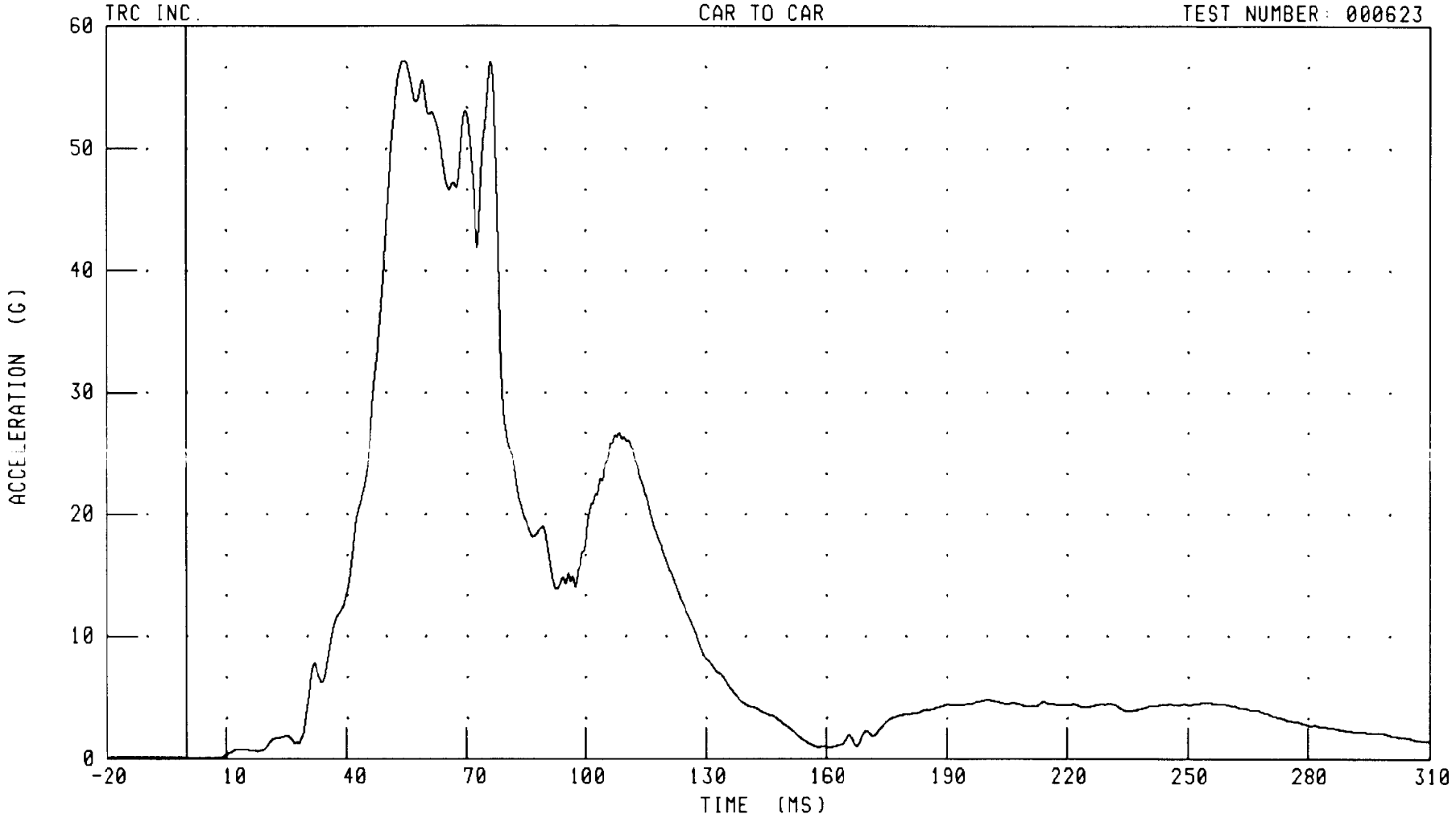
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION



CHANNEL: CSTZGB FILTER: CH. CLASS 180 PEAK DATA: 17.34 G @ 65.04 MS; -23.73 G @ 108.48 MS

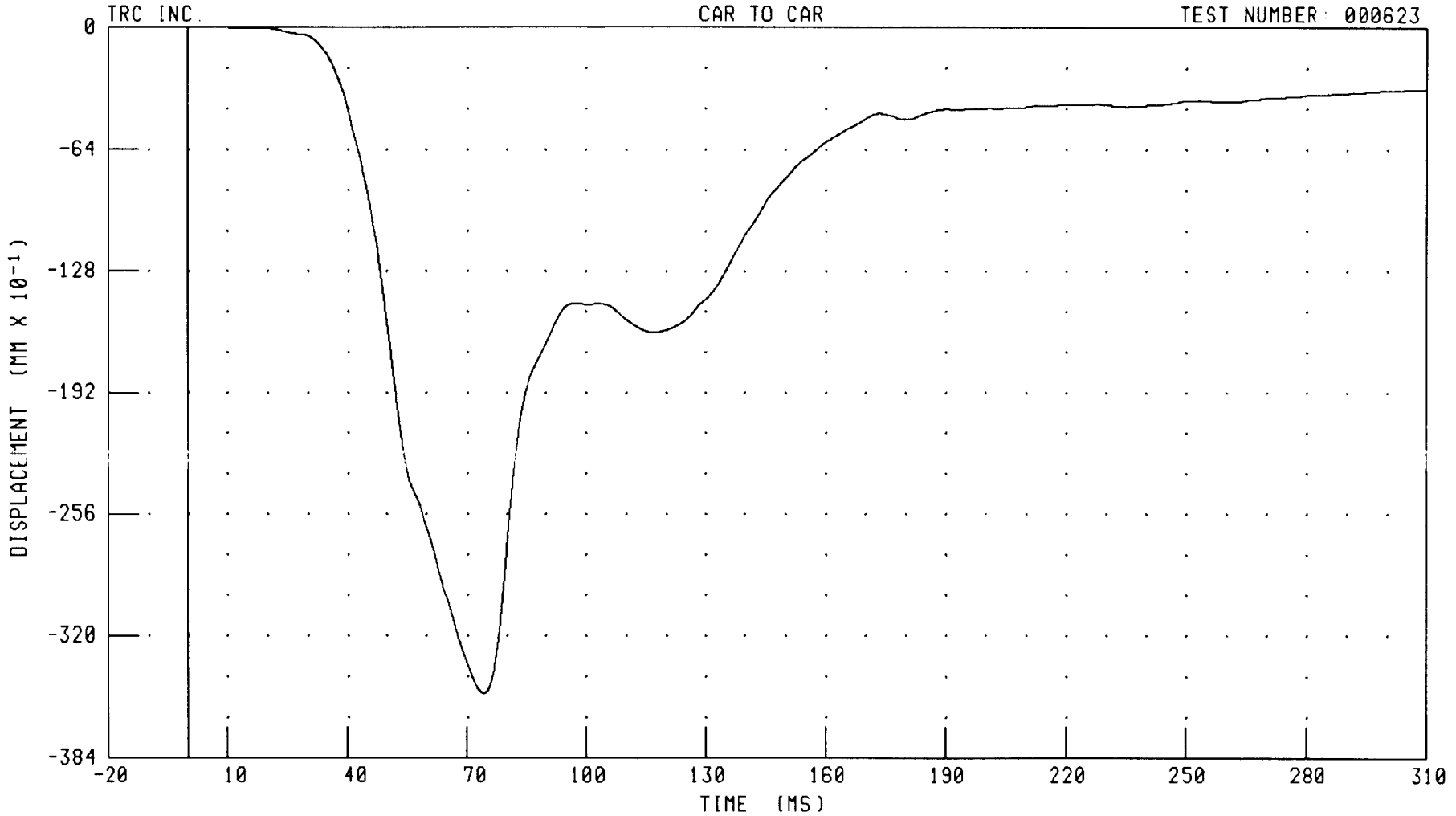
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION



CHANNEL: CSTRGB FILTER: CH. CLASS 180 PEAK DATA: 57.13 G @ 54.80 MS; 0.01 G @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

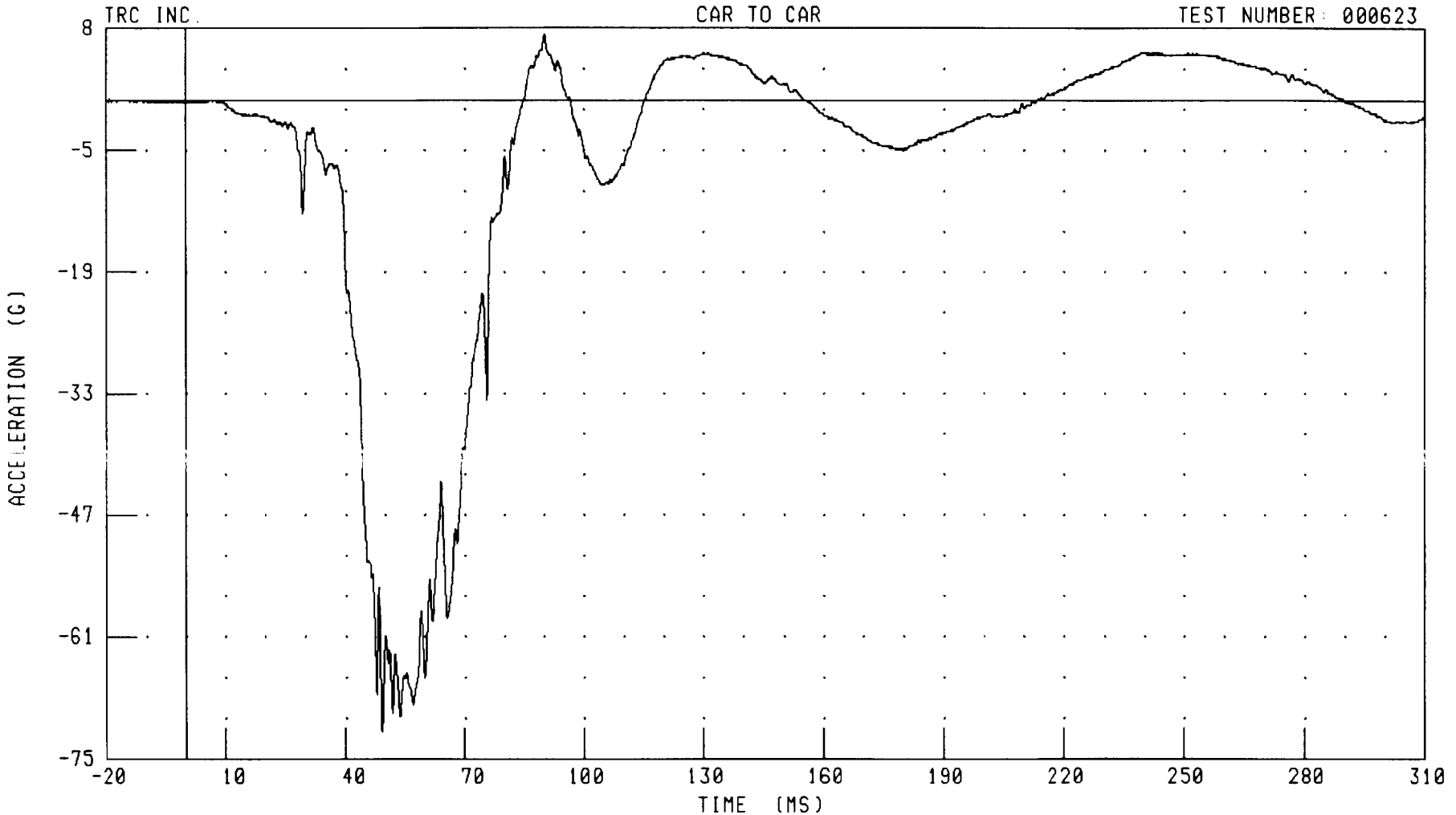
NEON RIGHT FRONT PASSENGER CHEST DEFLECTION



CHANNEL: CSTXDB FILTER: CH. CLASS 180 PEAK DATA: 0.01 MM @ -11.04 MS, -35.02 MM @ 74.32 MS

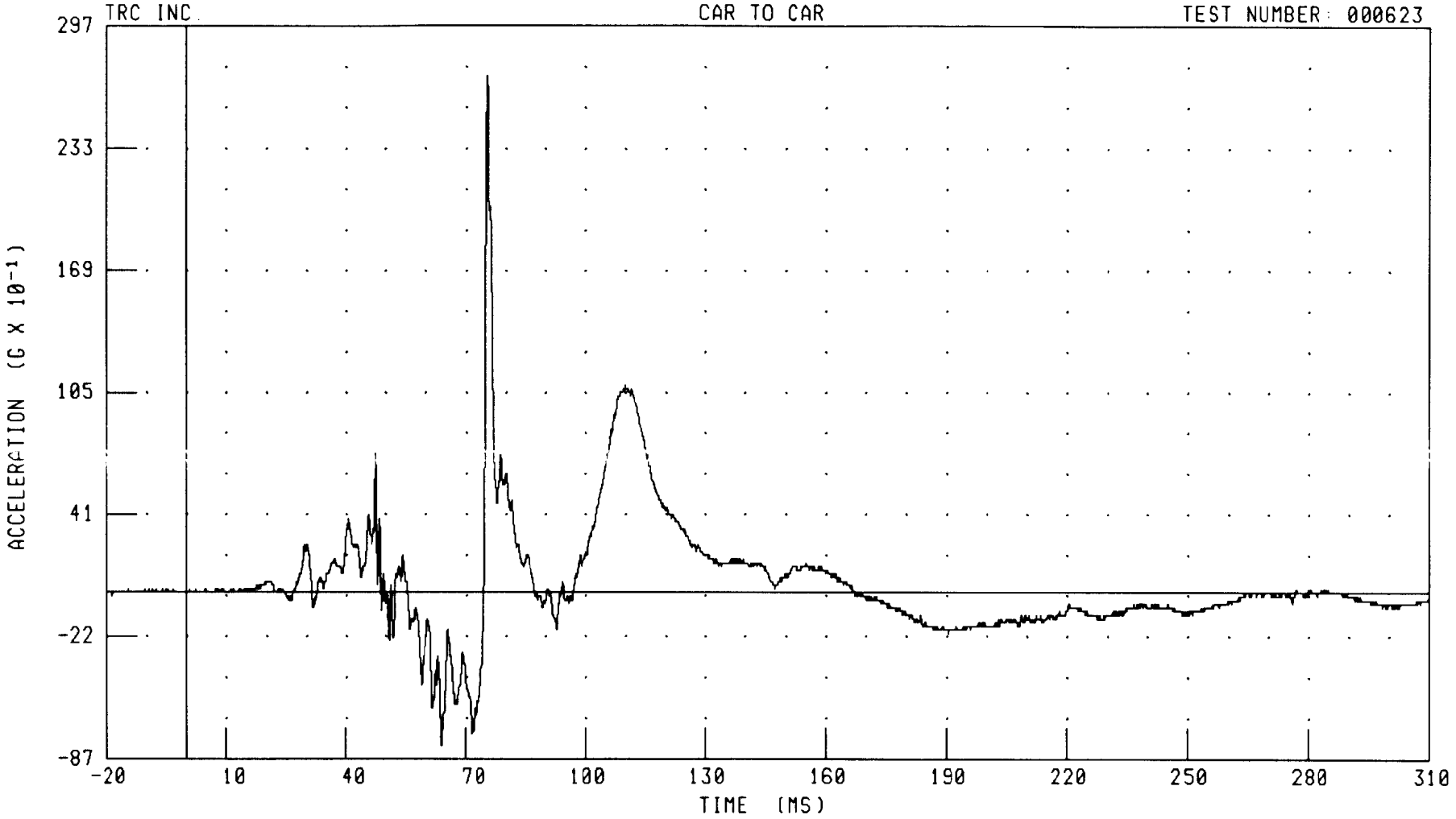
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON RIGHT FRONT PASSENGER PELVIS X-AXIS ACCELERATION



CHANNEL: PEVXGB FILTER: CH. CLASS 1000 PEAK DATA: 7.62 G @ 90.32 MS, -72.65 G @ 49.20 MS

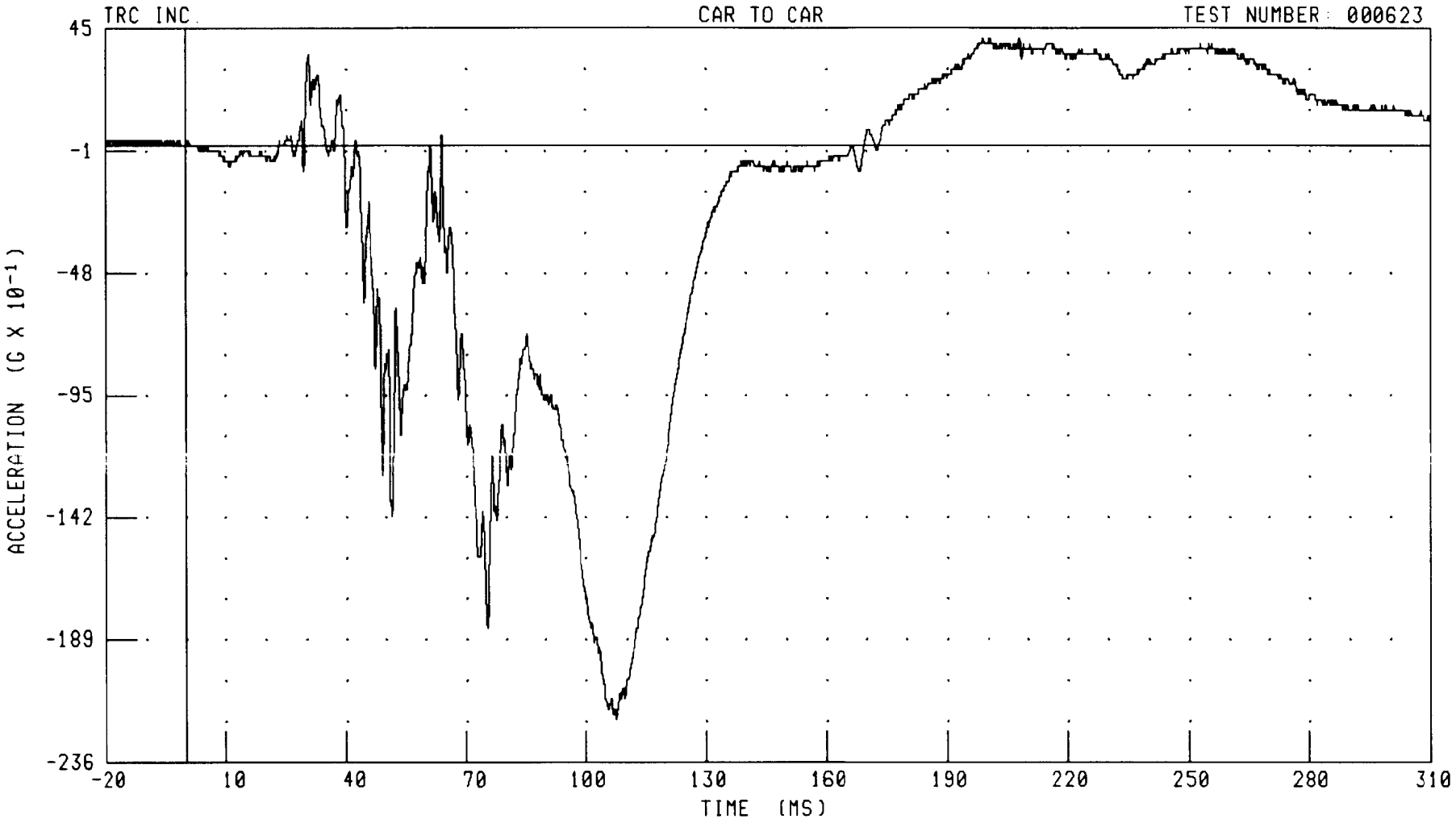
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER PELVIS Y-AXIS ACCELERATION



CHANNEL: PEVYGB FILTER: CH. CLASS 1000 PEAK DATA: 27.09 G @ 75.44 MS; -8.00 G @ 63.84 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

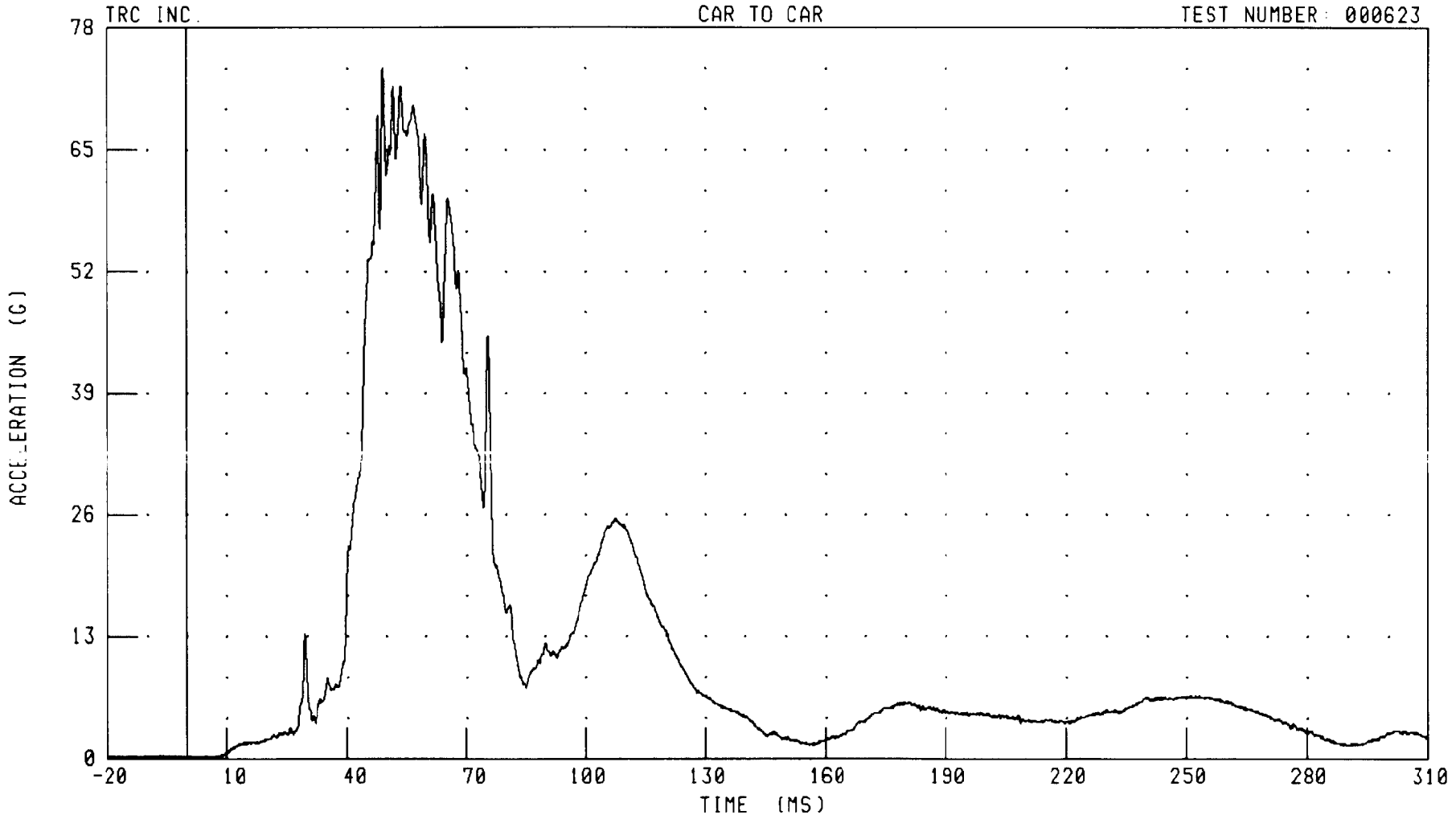
NEON RIGHT FRONT PASSENGER PELVIS Z-AXIS ACCELERATION



CHANNEL: PEVZGB FILTER: CH. CLASS 1000 PEAK DATA: 4.11 G @ 198.64 MS; -22.07 G @ 107.44 MS

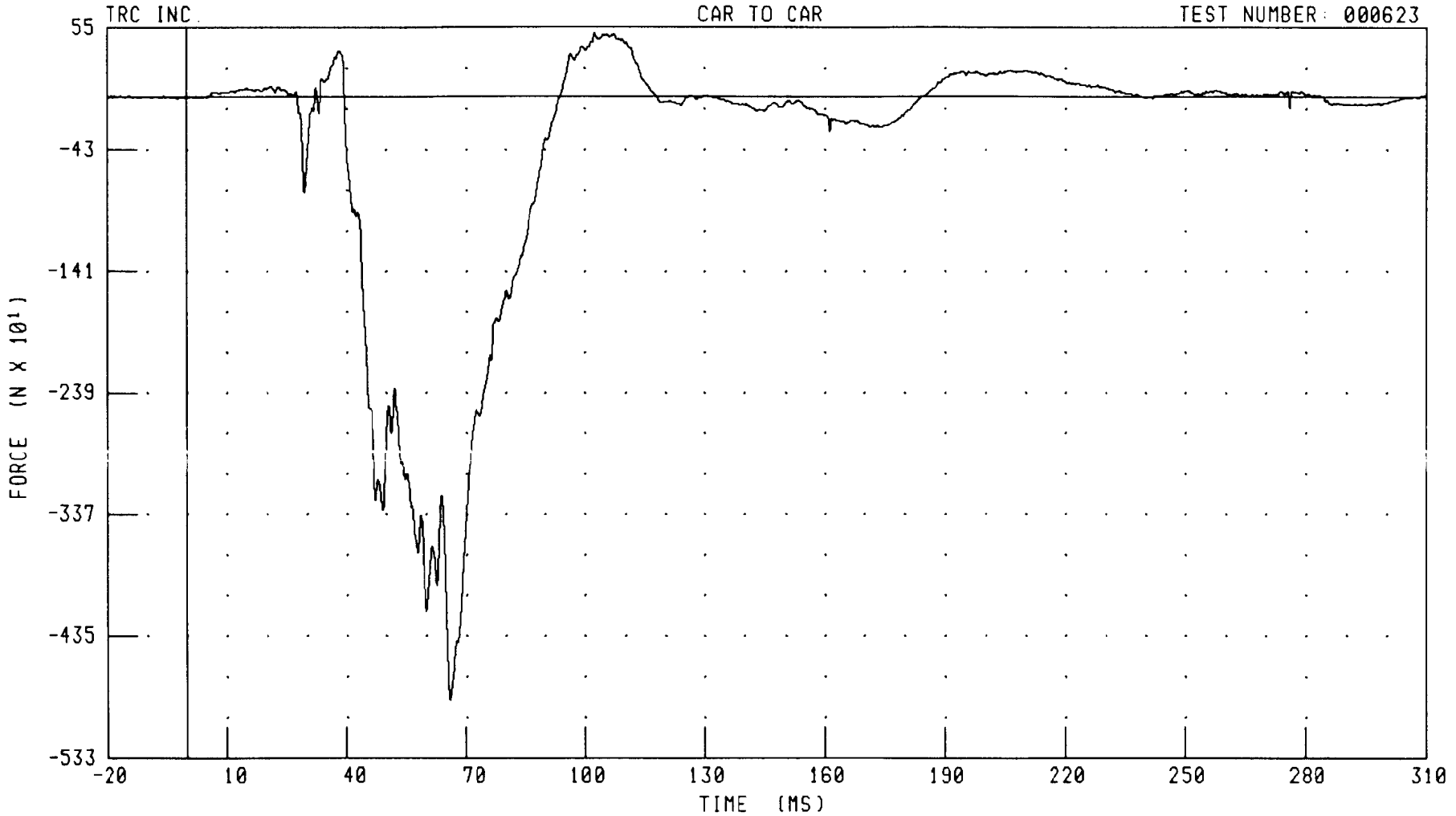
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

NEON RIGHT FRONT PASSENGER PELVIS RESULTANT ACCELERATION



CHANNEL: PEVRGB FILTER: CH. CLASS 1000 PEAK DATA: 73.75 G @ 49.20 MS; 0.02 G @ -20.00 MS

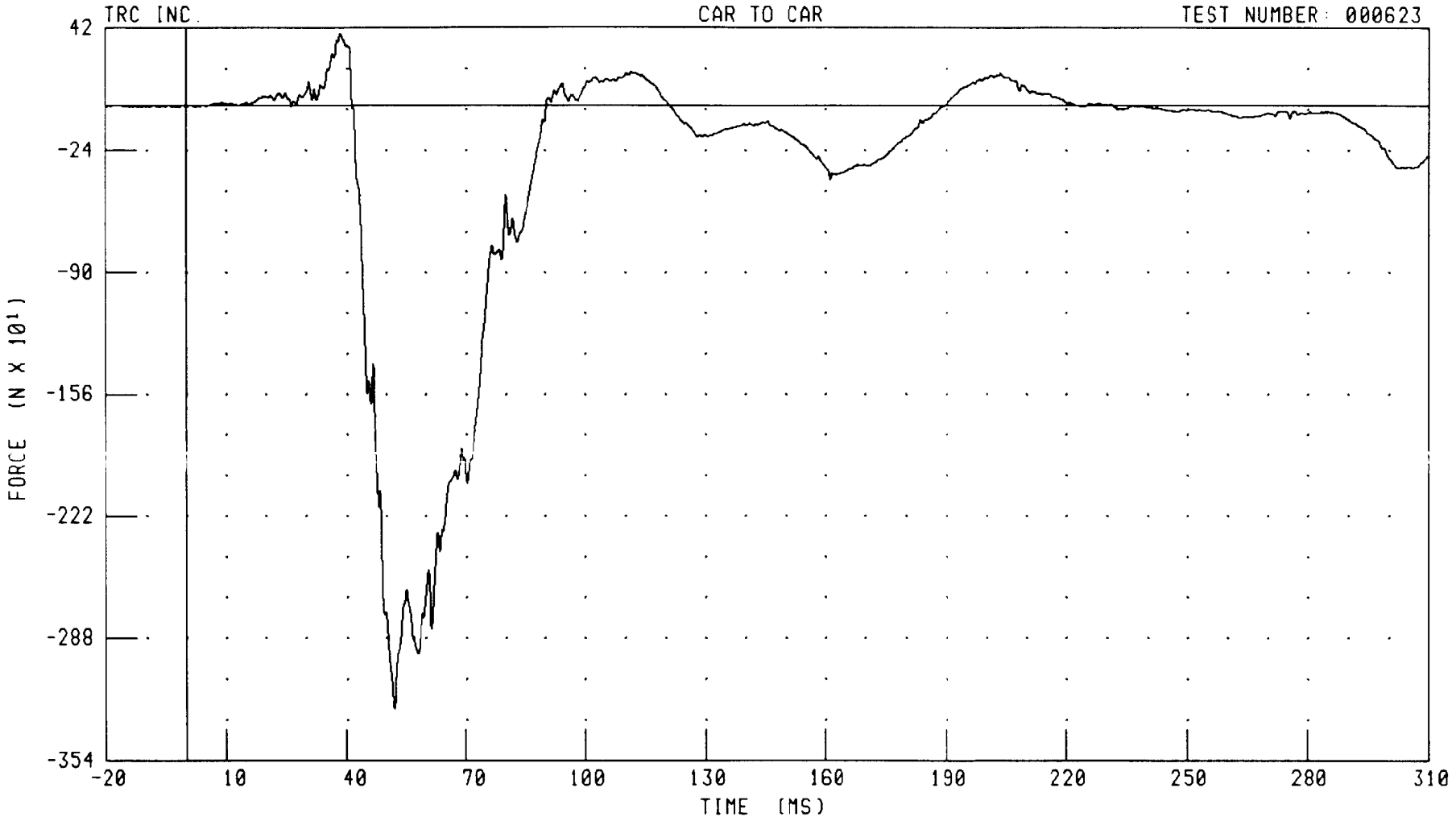
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
NEON RIGHT FRONT PASSENGER LEFT FEMUR FORCE



CHANNEL: LFMZFB FILTER: CH. CLASS 600 PEAK DATA: 504.24 N @ 102.48 MS; -4862.38 N @ 66.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

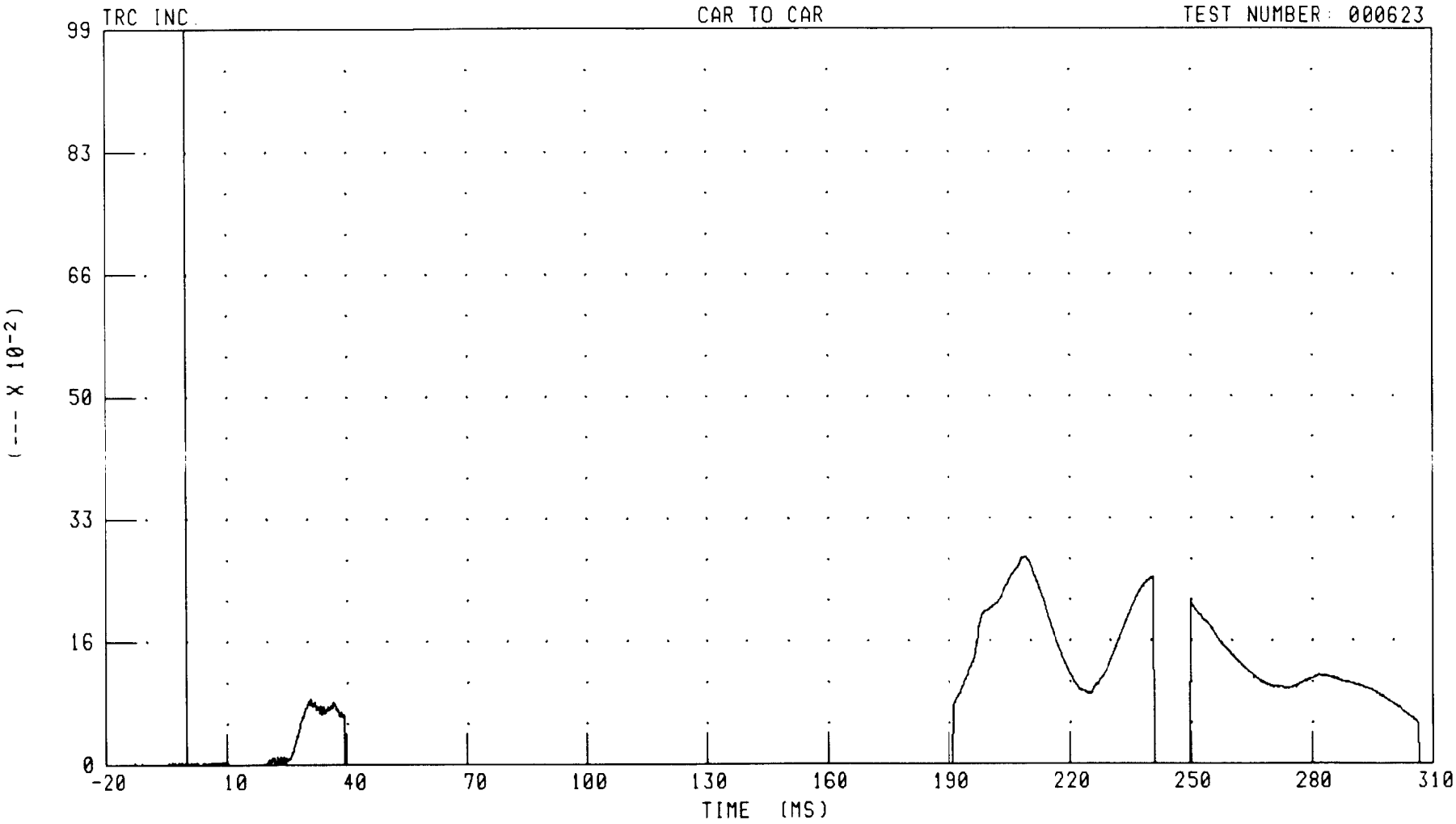
NEON RIGHT FRONT PASSENGER RIGHT FEMUR FORCE



CHANNEL: RFMZFB FILTER: CH. CLASS 600 PEAK DATA: 388.21 N @ 38.56 MS; -3262.11 N @ 52.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

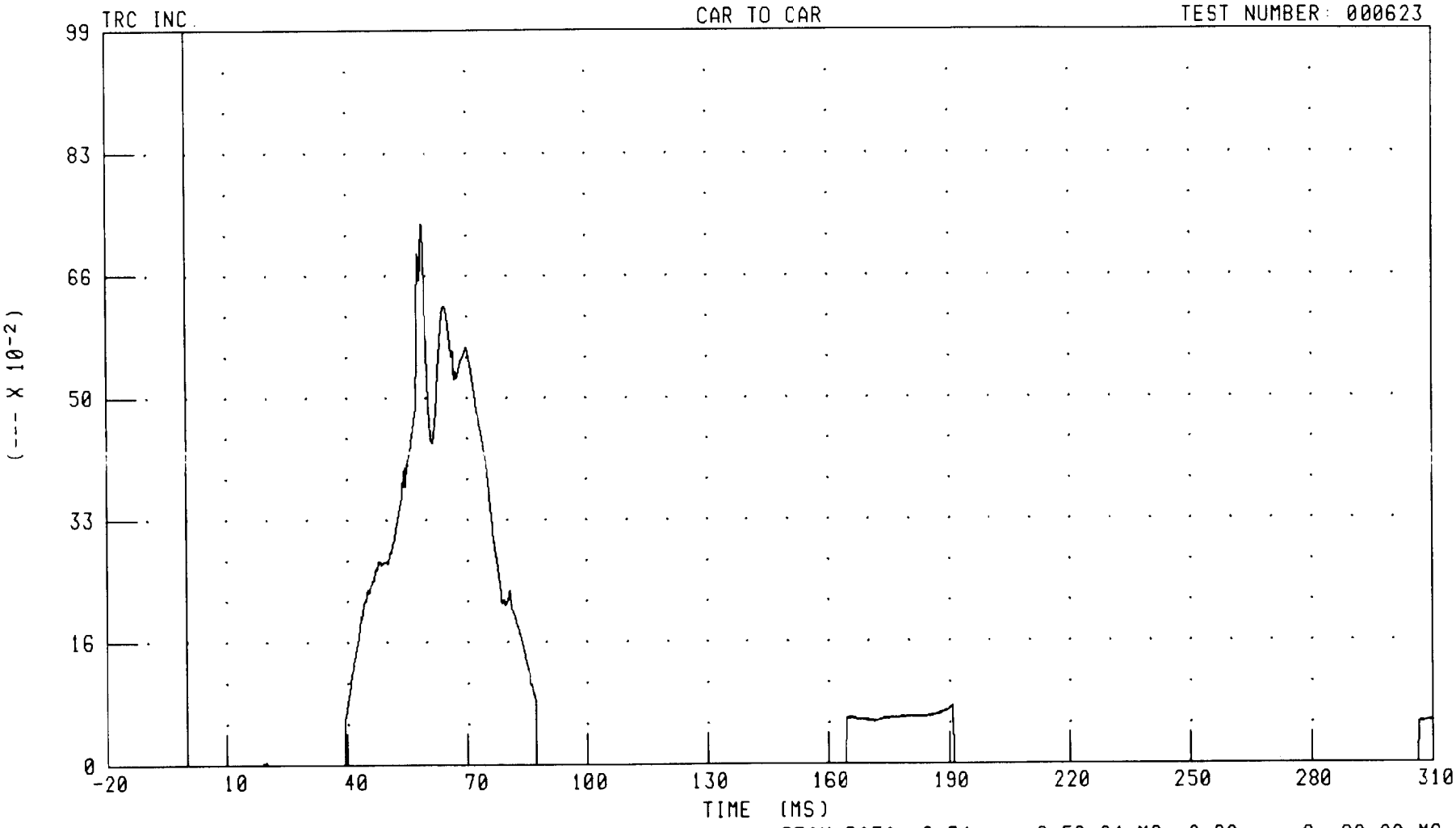
DRIVER NECK TENSION/EXTENSION



CHANNEL: NTEA FILTER: CH. CLASS 600 PEAK DATA: 0.28 --- @ 209.12 MS; 0.00 --- @ -20.00 MS

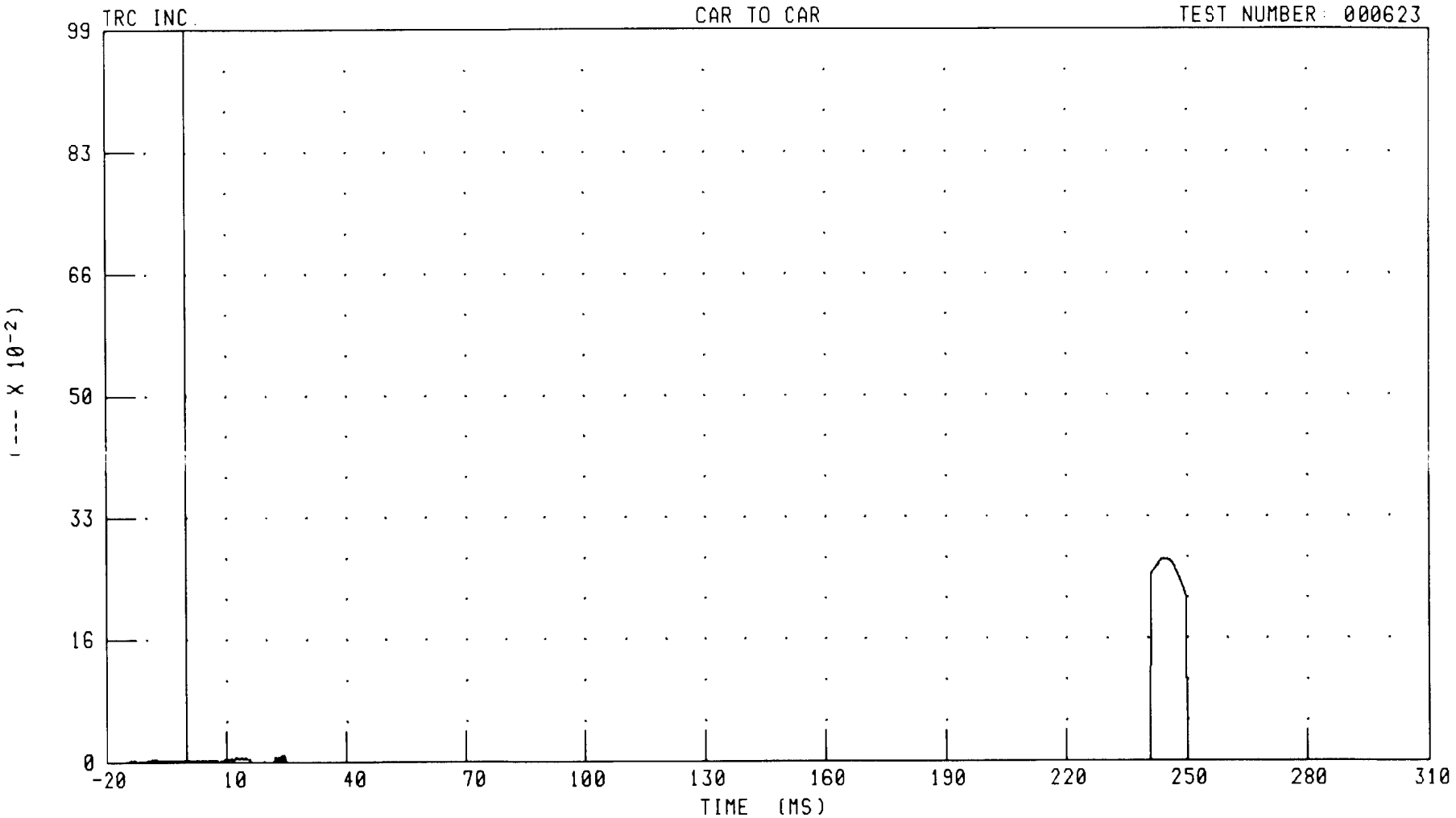
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

DRIVER NECK TENSION/FLEXION



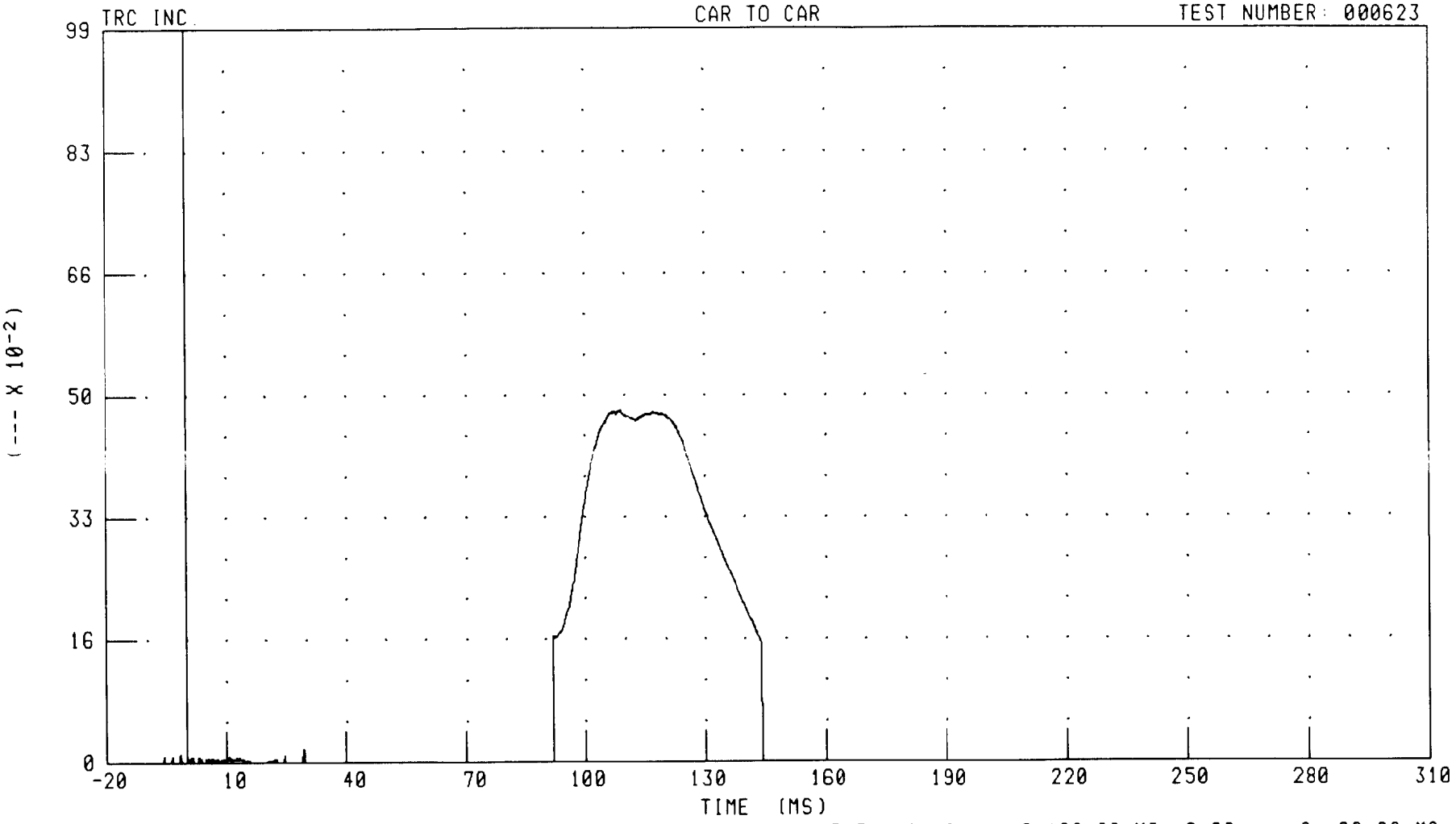
CHANNEL: NTFA FILTER: CH. CLASS 600 PEAK DATA: 0.74 --- @ 59.04 MS; 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
DRIVER NECK COMPRESSION/EXTENSION



CHANNEL: NCEA FILTER: CH. CLASS 600 PEAK DATA: 0.27 --- @ 245.04 MS; 0.00 --- @ -20.00 MS

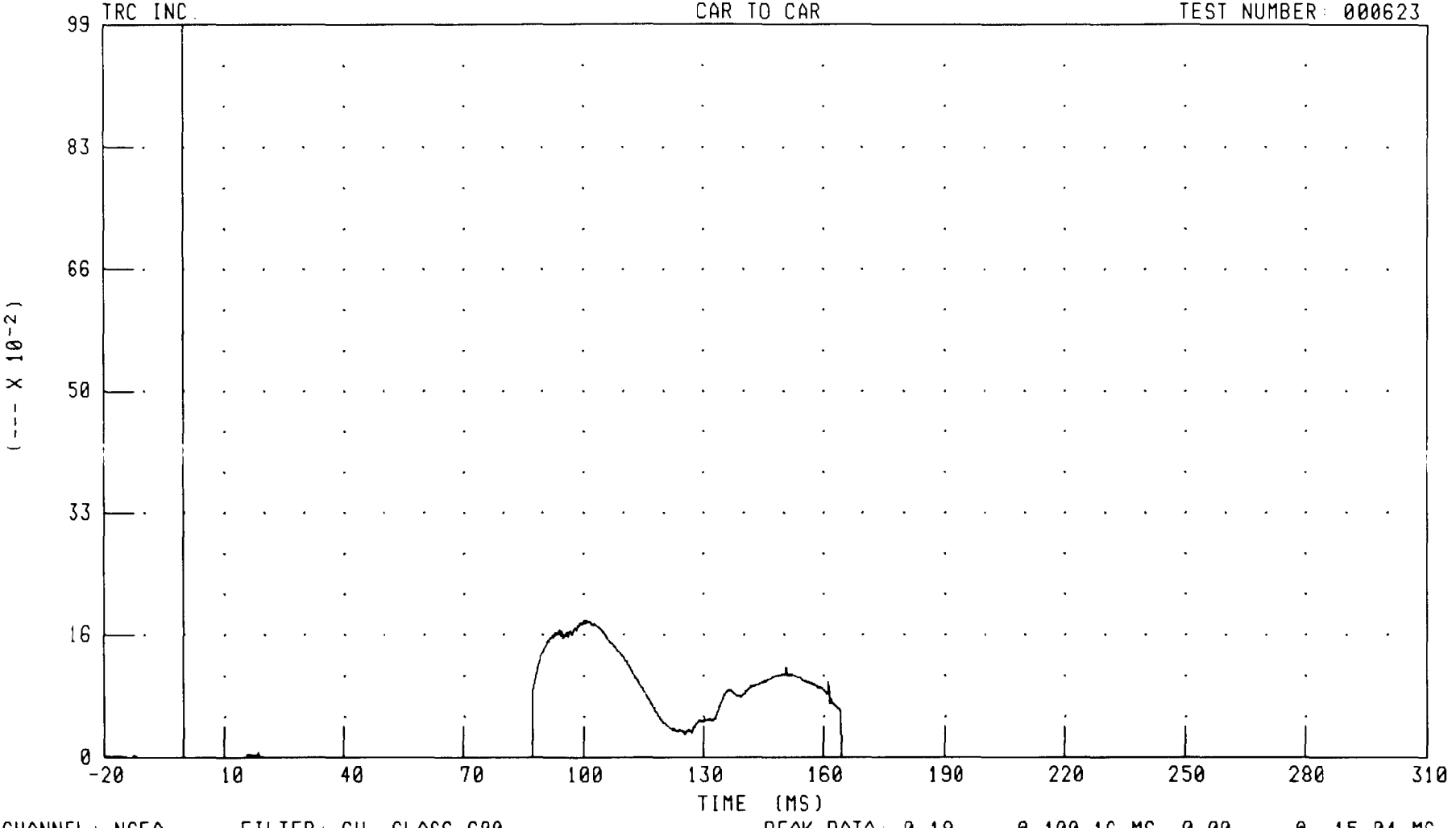
1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE
PASSENGER NECK COMPRESSION/EXTENSION



CHANNEL: NCEB FILTER: CH. CLASS 600 PEAK DATA: 0.48 --- @ 109.28 MS, 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

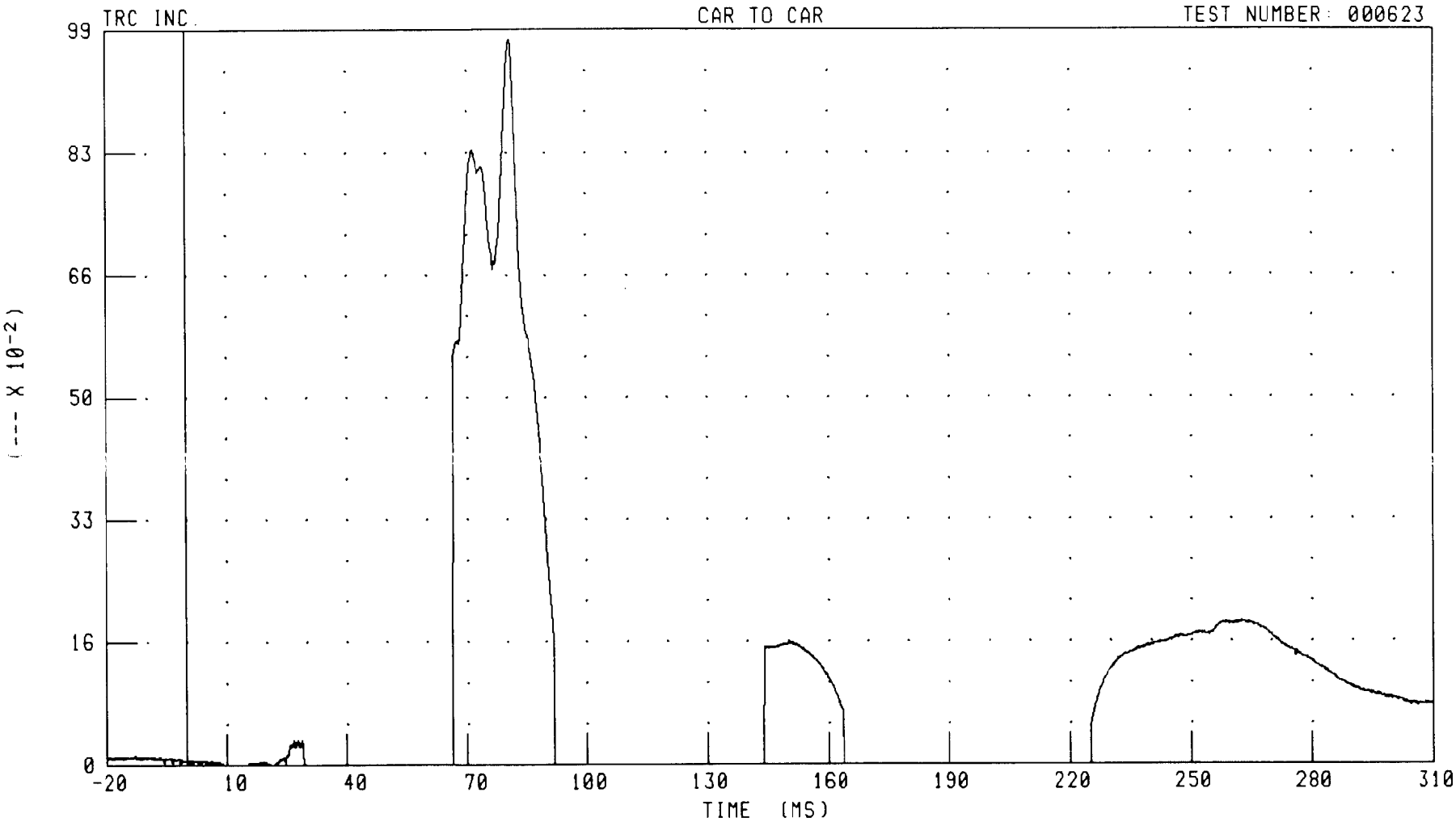
DRIVER NECK COMPRESSION/FLEXION



CHANNEL: NCFA FILTER: CH. CLASS 600 PEAK DATA: 0.19 --- @ 100.16 MS; 0.00 --- @ -15.04 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

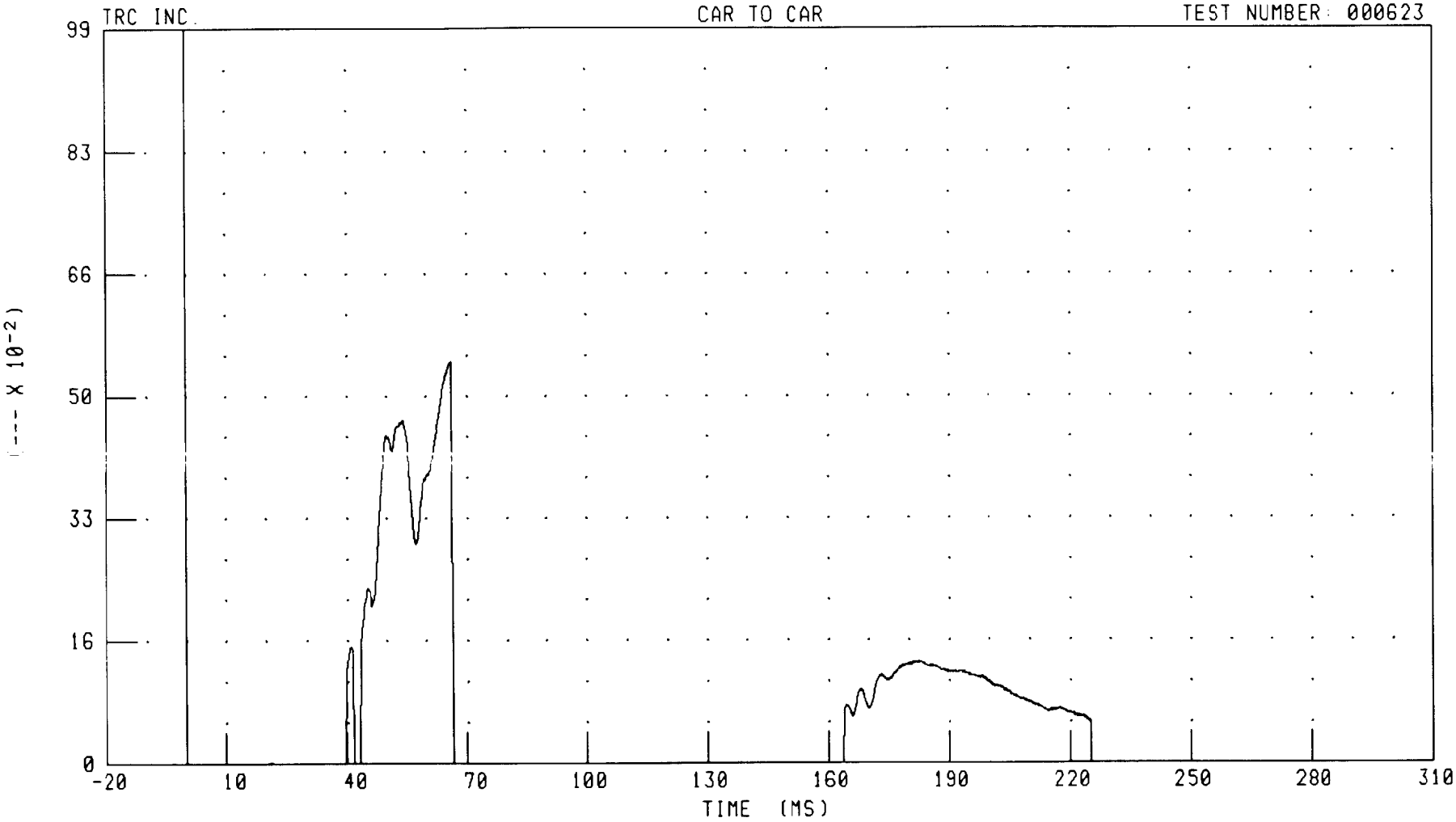
PASSENGER NECK TENSION/EXTENSION



CHANNEL: NTEB FILTER: CH. CLASS 600 PEAK DATA: 0.99 --- @ 80.88 MS, 0.00 --- @ -5.60 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

PASSENGER NECK TENSION/FLEXION

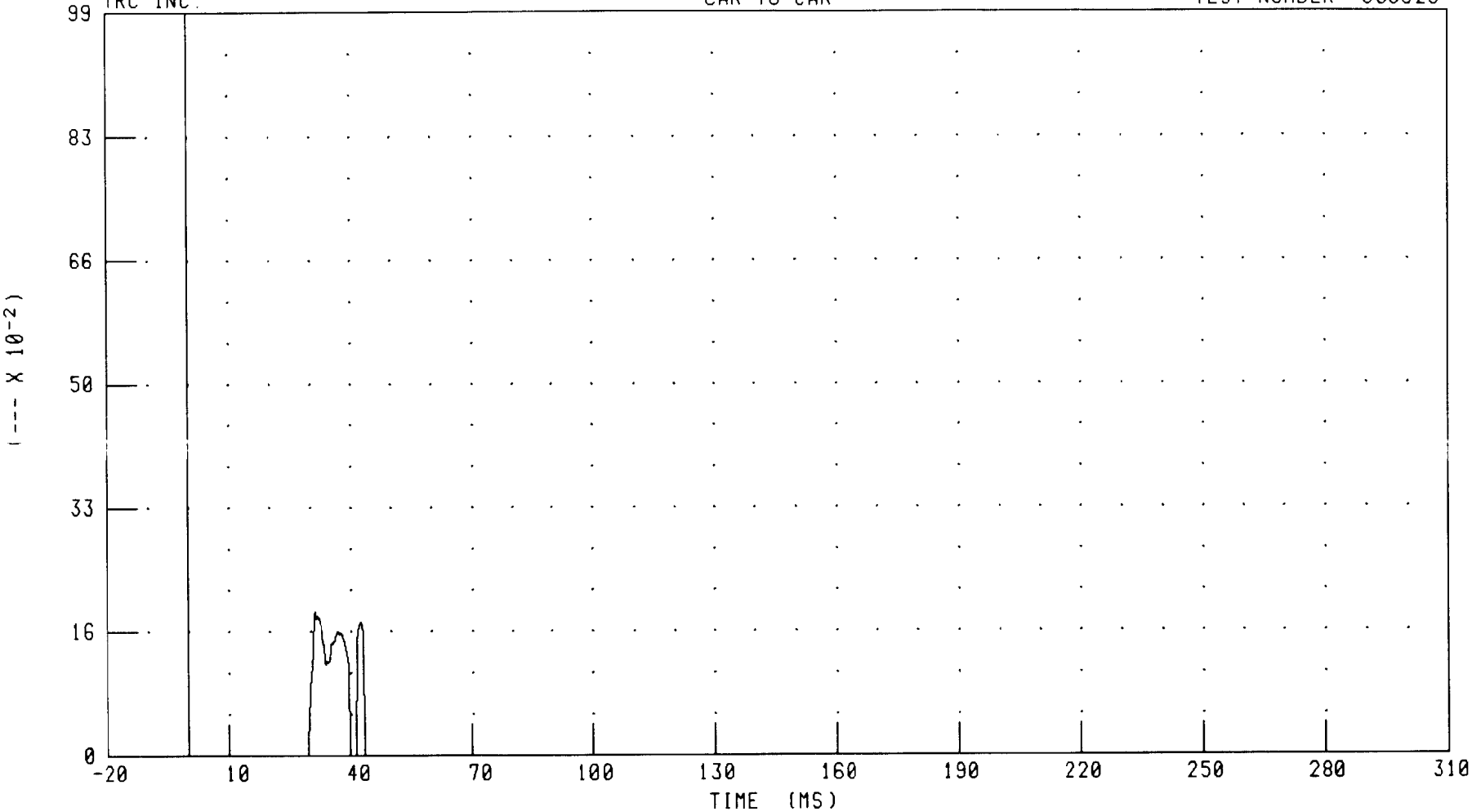


CHANNEL: NTFB FILTER: CH. CLASS 600 PEAK DATA: 0.55 --- @ 66.40 MS, 0.00 --- @ -20.00 MS

1997 DODGE CARAVAN INTO 1996 PLYMOUTH NEON AT 35 MPH CENTERLINE TO CENTERLINE

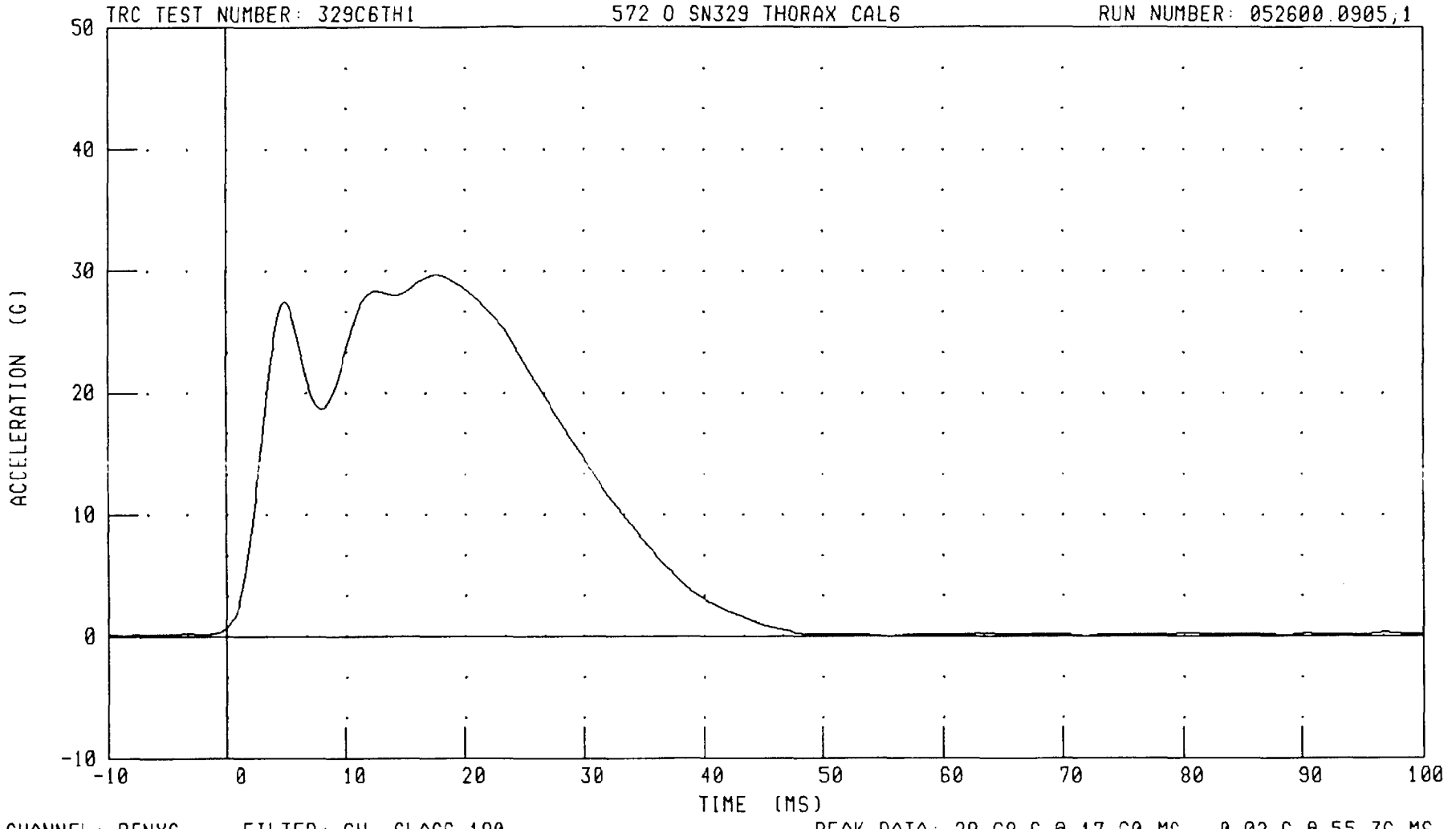
PASSENGER NECK COMPRESSION/FLEXION

TRC INC. CAR TO CAR TEST NUMBER: 000623



CHANNEL: NCFB FILTER: CH. CLASS 600 PEAK DATA: 0.19 --- @ 31.20 MS; 0.00 --- @ -20.00 MS

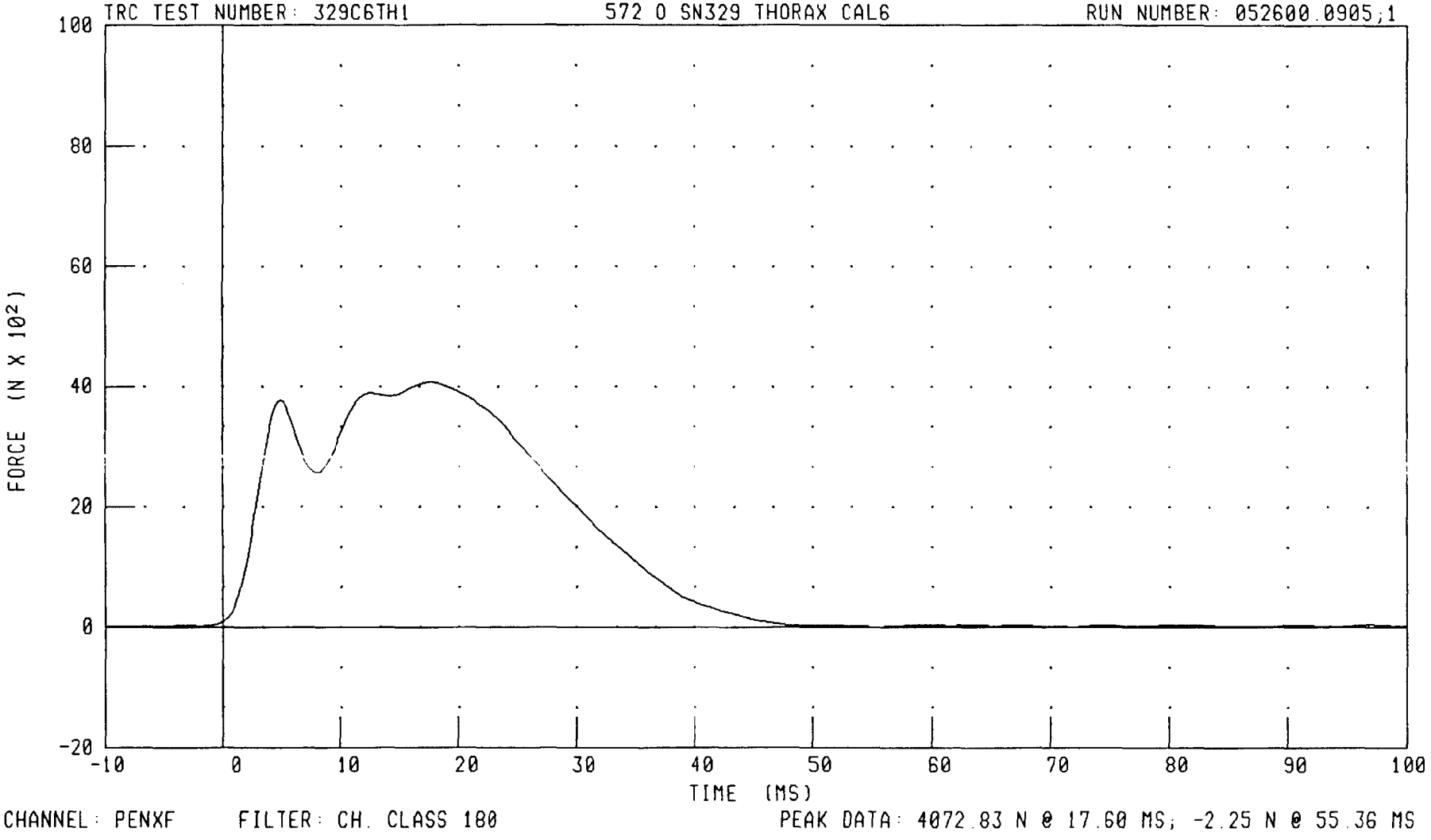
PART 572-O HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 29.68 G @ 17.60 MS; -0.02 G @ 55.36 MS

PART 572-O HYBRID III THORAX CALIBRATION

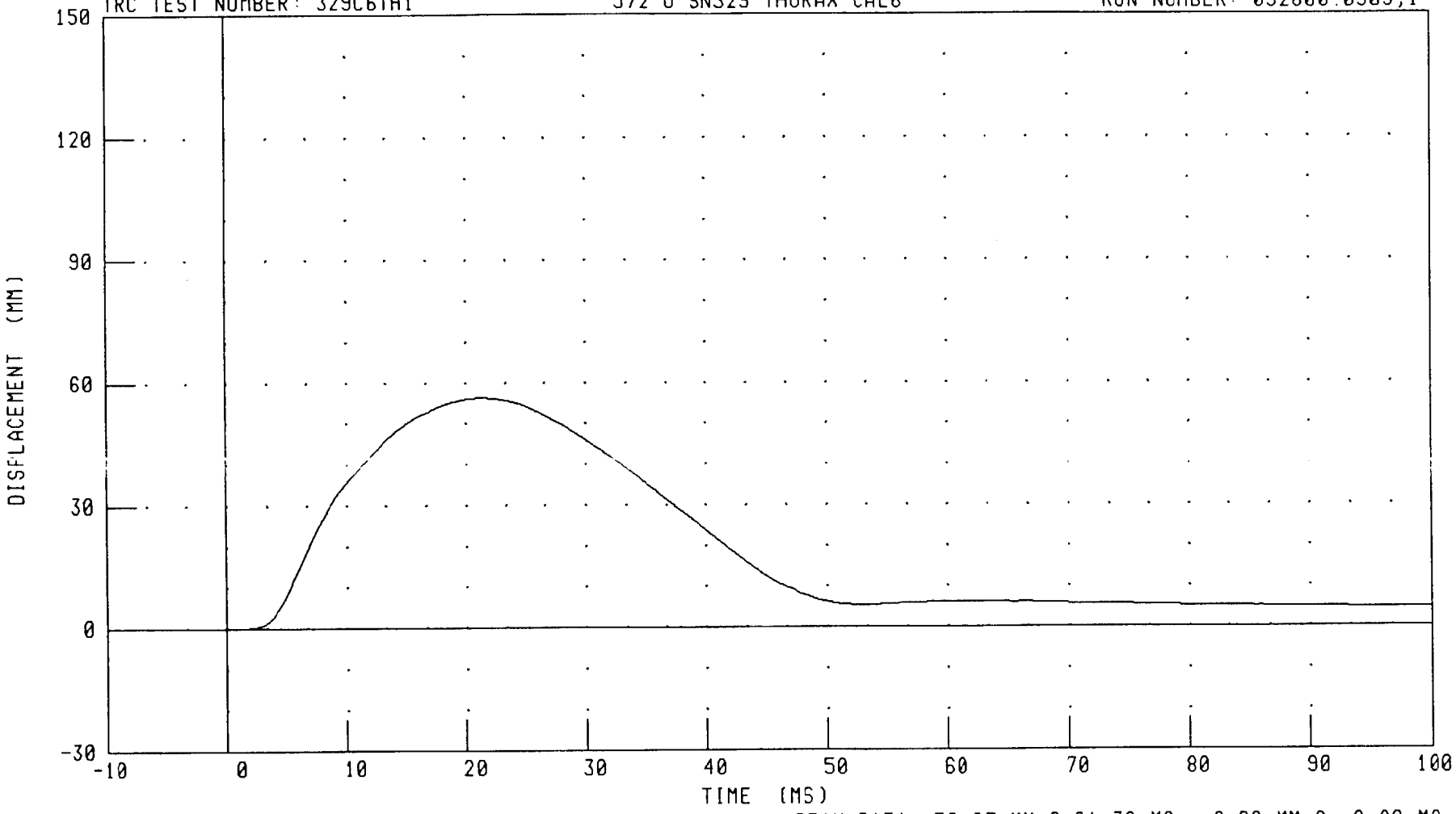
PENDULUM FORCE



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 4072.83 N @ 17.60 MS; -2.25 N @ 55.36 MS

PART 572-O HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 329C6TH1 572 O SN329 THORAX CAL6 RUN NUMBER: 052600.0905;1

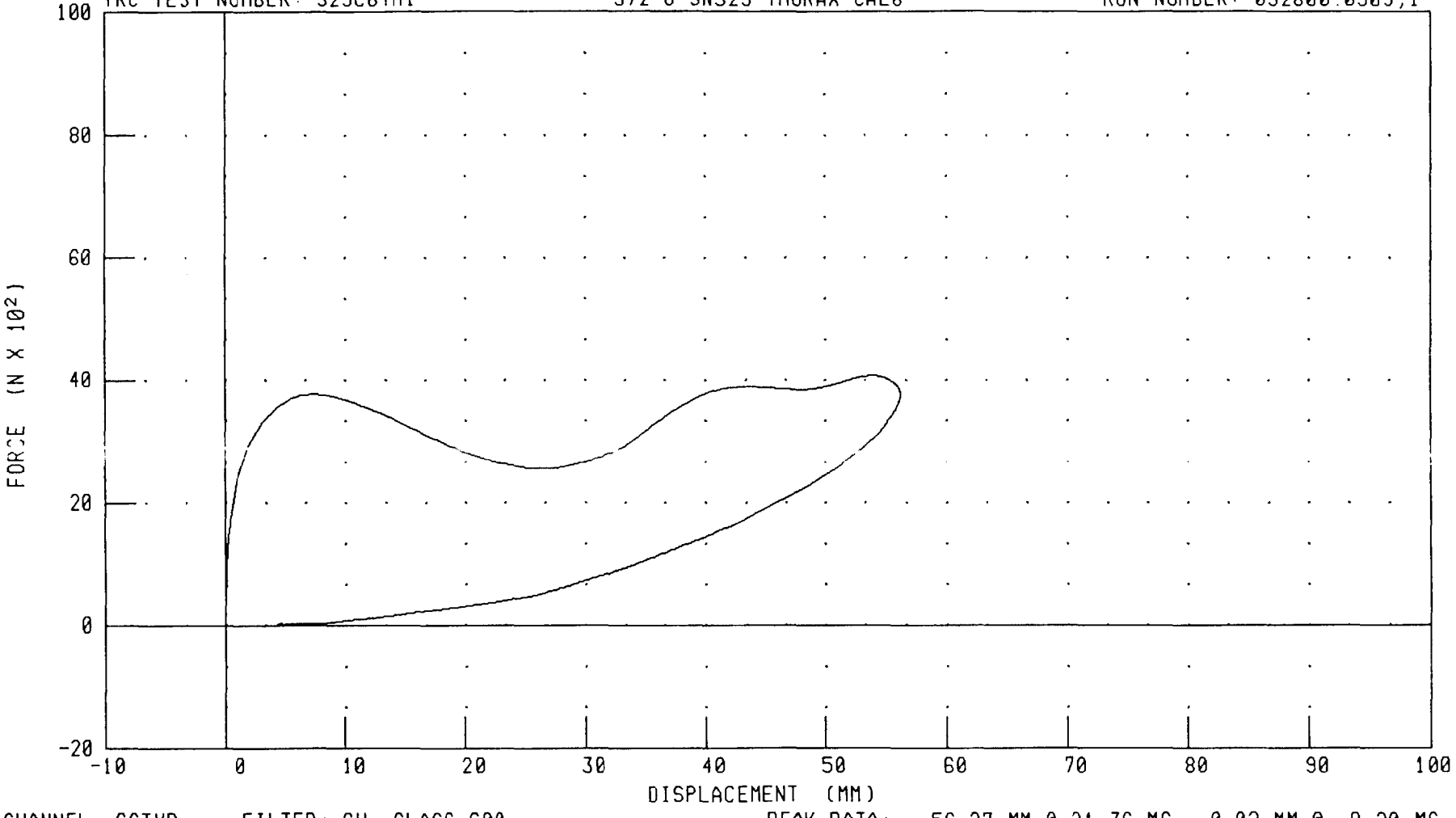


CHANNEL: CSTXD FILTER: CH. CLASS 600 PEAK DATA: 56.27 MM @ 21.36 MS; -0.02 MM @ -9.20 MS

PART 572-0 HYBRID III THORAX CALIBRATION

CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 329C6TH1 572 0 SN329 THORAX CAL6 RUN NUMBER: 052600.0905;1



CHANNEL: CSTXD FILTER: CH. CLASS 600 PEAK DATA: 56.27 MM @ 21.36 MS; -0.02 MM @ -9.20 MS

PENXF CH. CLASS 180 4072.83 N @ 17.60 MS; -2.25 N @ 55.36 MS

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 25-May-00

TRC, INC. **TEST NO: 329C6TF1** **572 O SN329 TORSO FLEX CAL 6**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 – 70 %	65.0 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY	<= 20 DEG. REFERENCED TO VERTICAL	15.0 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 – 390 N	382.5 N
RETURN ANGLE	+/- 5 DEG OF INTIAL ANGLE	22.0 DEG.

TEST MEETS SPECIFICATIONS

TECHNICIAN 

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 26-May-00

TRC, INC. **TEST NO: 329C6TF1** **572 O SN329 TORSO FLEX CAL 6**

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 – 70 %	65.0 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY	<= 20 DEG. REFERENCED TO VERTICAL	15.0 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 - 390 N	382.5 N
RETURN ANGLE	+/- 8 DEG OF INTIAL ANGLE	22.0 DEG.

TEST MEETS SPECIFICATIONS

TECHNICIAN Scott Preslock

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III SMALL FEMALE 24-MAY-00

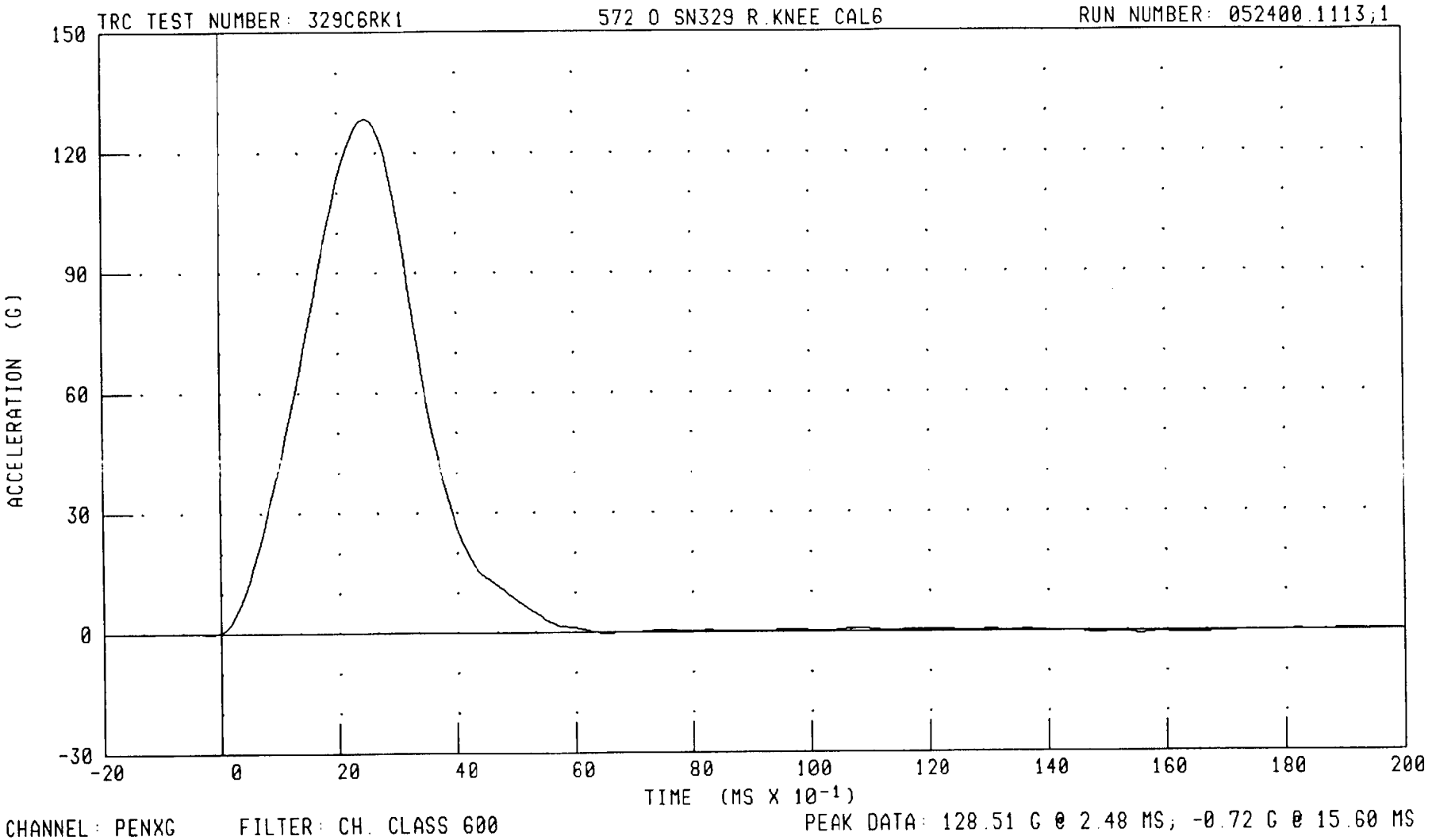
TRC INC. TEST NO: 329C6RK1 572 O SN329 R.KNEE CAL6

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.08 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3450 - 4060 N	3772.7 N

TEST MEETS SPECIFICATIONS

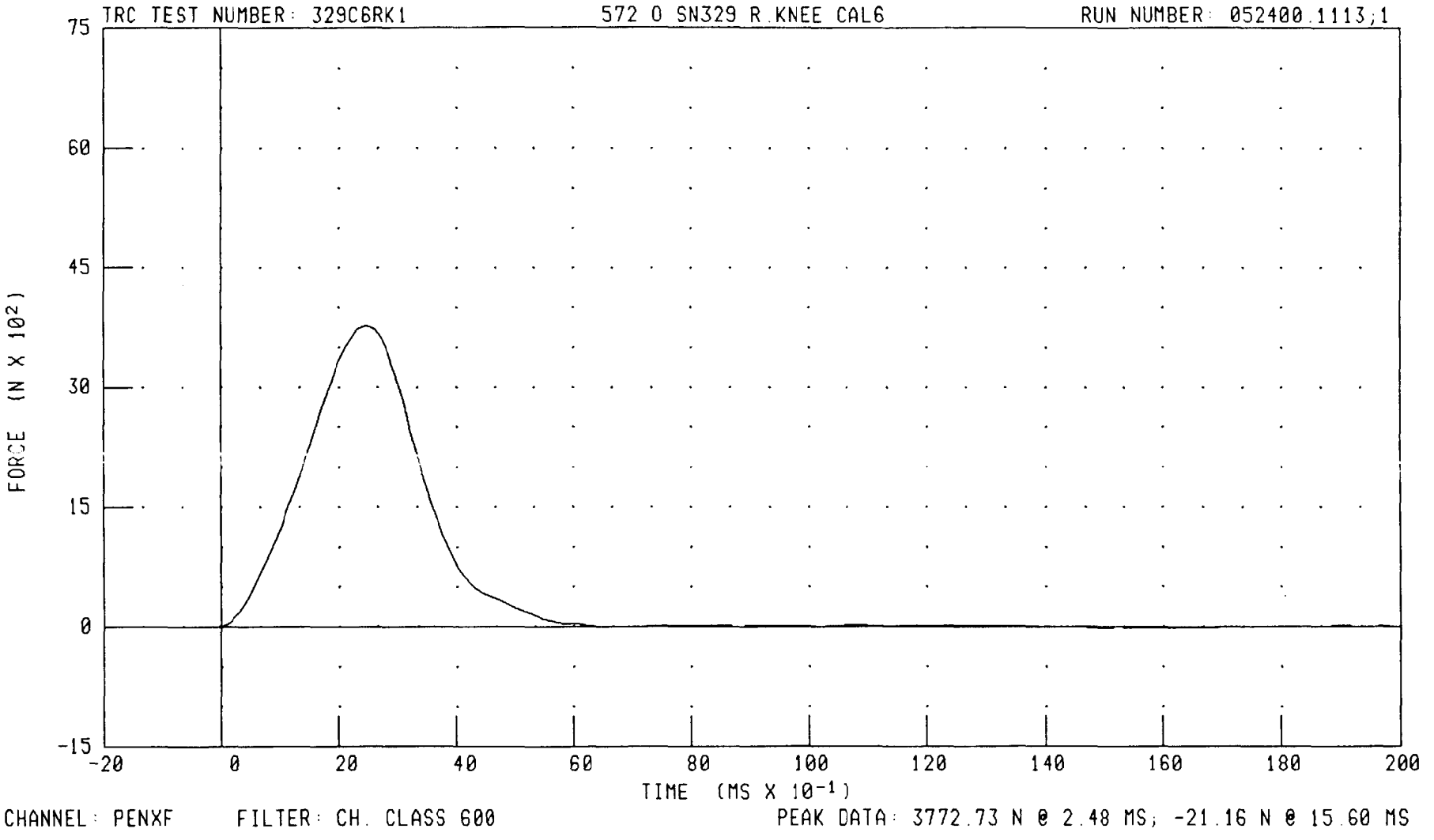
TECHNICIAN  RUN NUMBER: 052400.1112;1

PART 572-0 HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 128.51 G @ 2.48 MS; -0.72 G @ 15.60 MS

PART 572-0 HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 3772.73 N @ 2.48 MS; -21.16 N @ 15.60 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

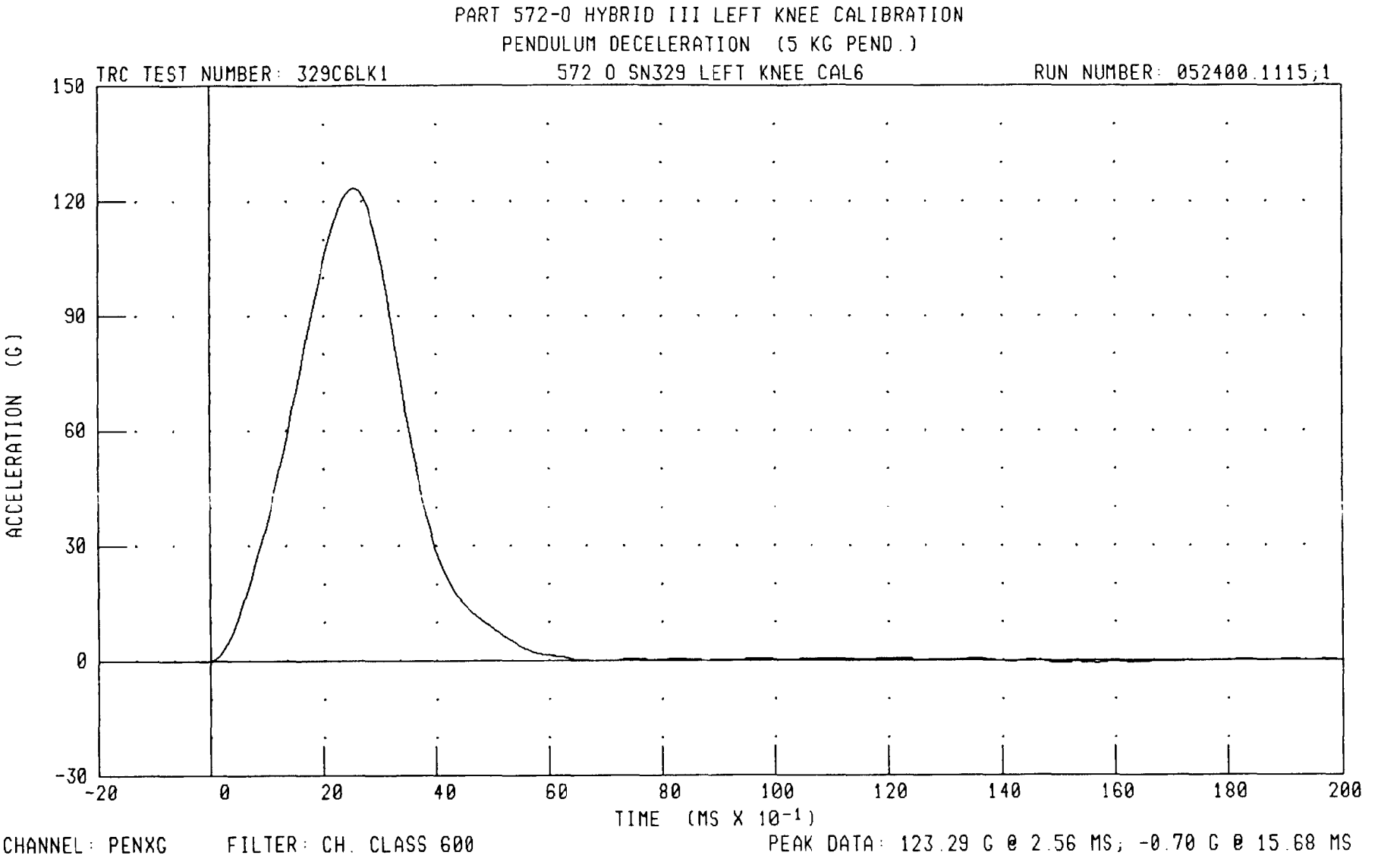
HYBRID III SMALL FEMALE 24-MAY-00

TRC INC. TEST NO: 329C6LK1 572 O SN329 LEFT KNEE CAL6

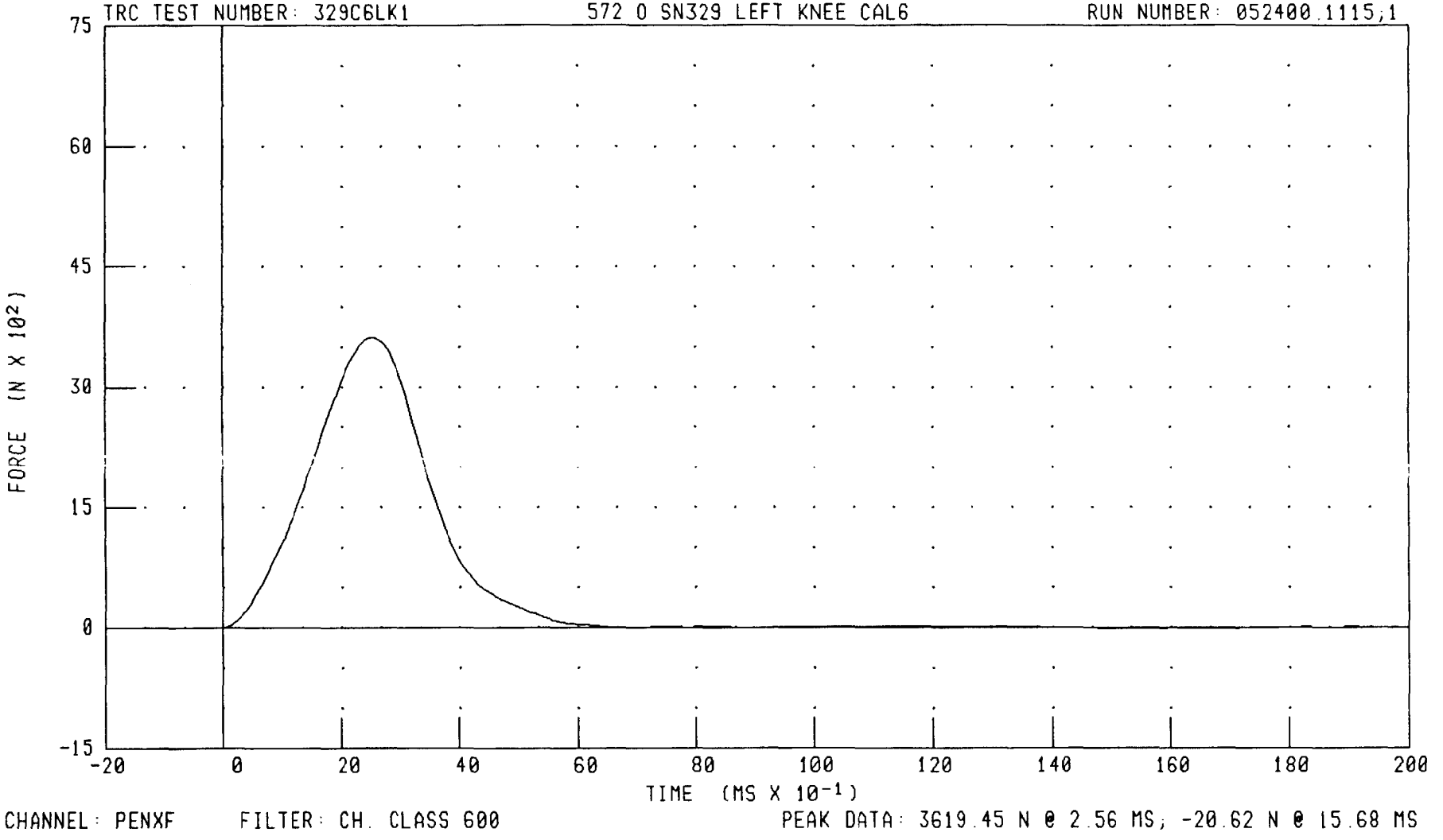
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.08 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3450 - 4060 N	3619.4 N

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052400.1107;1


PART 572-O HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 329C6LK1
572 O SN329 LEFT KNEE CAL6
RUN NUMBER: 052400.1115;1
ACCELERATION (G)
150
120
90
60
30
0
-30
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10-1)
CHANNEL: PENXC
FILTER: CH. CLASS 600
PEAK DATA: 123.29 G @ 2.56 MS; -0.70 G @ 15.68 MS

PART 572-0 HYBRID III LEFT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 3619.45 N @ 2.56 MS; -20.62 N @ 15.68 MS

Pre-Test Calibration

Bullet Vehicle Driver Dummy S/N 045

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS

45 26-05-00

TRC INC. TEST NO: 45C41ED1 572E SN45 EXT.DIMENTION CAL41

TEST PARAMETER	(DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE	(AA)	429 - 434 MM	431. MM
LOCATION FOR WAIST CIRCUMFERENCE	(BB)	226 - 231 MM	229. MM
CHEST CIRCUMFERENCE	(Y)	970 -1001 MM	985. MM
WAIST CIRCUMFERENCE	(Z)	836 - 866 MM	854. MM
CHEST DEPTH	(O)	213 - 229 MM	219. MM
H-POINT HEIGHT	(C)	84 - 89 MM	85. MM
H-POINT FROM SEATBACK	(D)	135 - 140 MM	136. MM
SKULL CAP TO BACKLINE	(H)	41 - 46 MM	44. MM
TOTAL SITTING HEIGHT	(A)	879 - 889 MM	884. MM
THIGH CLEARANCE	(F)	140 - 155 MM	147. MM
BUTTOCK KNEE LENGTH	(K)	579 - 605 MM	593. MM
BUTTOCK POPLITEAL LENGTH	(N)	452 - 478 MM	462. MM
POPLITEAL HEIGHT	(L)	429 - 455 MM	441. MM
KNEE PIVOT HEIGHT	(M)	485 - 500 MM	493. MM
FOOT LENGTH	(P)	252 - 267 MM	257. MM
FOOT BREADTH	(W)	91 - 107 MM	98. MM
SHOULDER PIVOT FROM BACKLINE	(E)	84 - 94 MM	87. MM
SHOULDER BREADTH	(V)	422 - 437 MM	431. MM
SHOULDER PIVOT HEIGHT	(B)	506 - 521 MM	512. MM
ELBOW REST HEIGHT	(J)	191 - 211 MM	199. MM
SHOULDER-ELBOW LENGTH	(I)	330 - 345 MM	341. MM
BACK OF ELBOW TO WRIST PIVOT	(G)	290 - 305 MM	298. MM

572E SN45 EXT.DIMENTION CAL41
DUMMY MEETS SPECIFICATIONS
TECHNICIAN _____ RUN NUMBER: 052600.1215

B

Appendix C

Dummy Certification Data

Pre-Test Calibration

Target Vehicle Driver Dummy S/N 090

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III EXTERNAL DIMENSIONS

90 26-05-00

TRC INC. TEST NO: 90C28ED1 572E SN90 EXT.DIMENTION CAL28

TEST PARAMETER (DIMEN.)	SPECIFICATION	TEST RESULTS
LOCATION FOR CHEST CIRCUMFERENCE (AA)	429 - 434 MM	431. MM
LOCATION FOR WAIST CIRCUMFERENCE (BB)	226 - 231 MM	229. MM
CHEST CIRCUMFERENCE (Y)	970 -1001 MM	985. MM
WAIST CIRCUMFERENCE (Z)	836 - 866 MM	854. MM
CHEST DEPTH (O)	213 - 229 MM	221. MM
H-POINT HEIGHT (C)	84 - 89 MM	85. MM
H-POINT FROM SEATBACK (D)	135 - 140 MM	136. MM
SKULL CAP TO BACKLINE (H)	41 - 46 MM	44. MM
TOTAL SITTING HEIGHT (A)	879 - 889 MM	886. MM
THIGH CLEARANCE (F)	140 - 155 MM	147. MM
BUTTOCK KNEE LENGTH (K)	579 - 605 MM	593. MM
BUTTOCK POPLITEAL LENGTH (N)	452 - 478 MM	462. MM
POPLITEAL HEIGHT (L)	429 - 455 MM	441. MM
KNEE PIVOT HEIGHT (M)	485 - 500 MM	493. MM
FOOT LENGTH (P)	252 - 267 MM	257. MM
FOOT BREADTH (W)	91 - 107 MM	98. MM
SHOULDER PIVOT FROM BACKLINE (E)	84 - 94 MM	87. MM
SHOULDER BREADTH (V)	422 - 437 MM	431. MM
SHOULDER PIVOT HEIGHT (B)	506 - 521 MM	512. MM
ELBOW REST HEIGHT (J)	191 - 211 MM	199. MM
SHOULDER-ELBOW LENGTH (I)	330 - 345 MM	341. MM
BACK OF ELBOW TO WRIST PIVOT (G)	290 - 305 MM	298. MM

572E SN90 EXT.DIMENTION CAL28
DUMMY MEETS SPECIFICATIONS
TECHNICIAN _____ RUN NUMBER: 052600.1228

B

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th 26-MAY-00

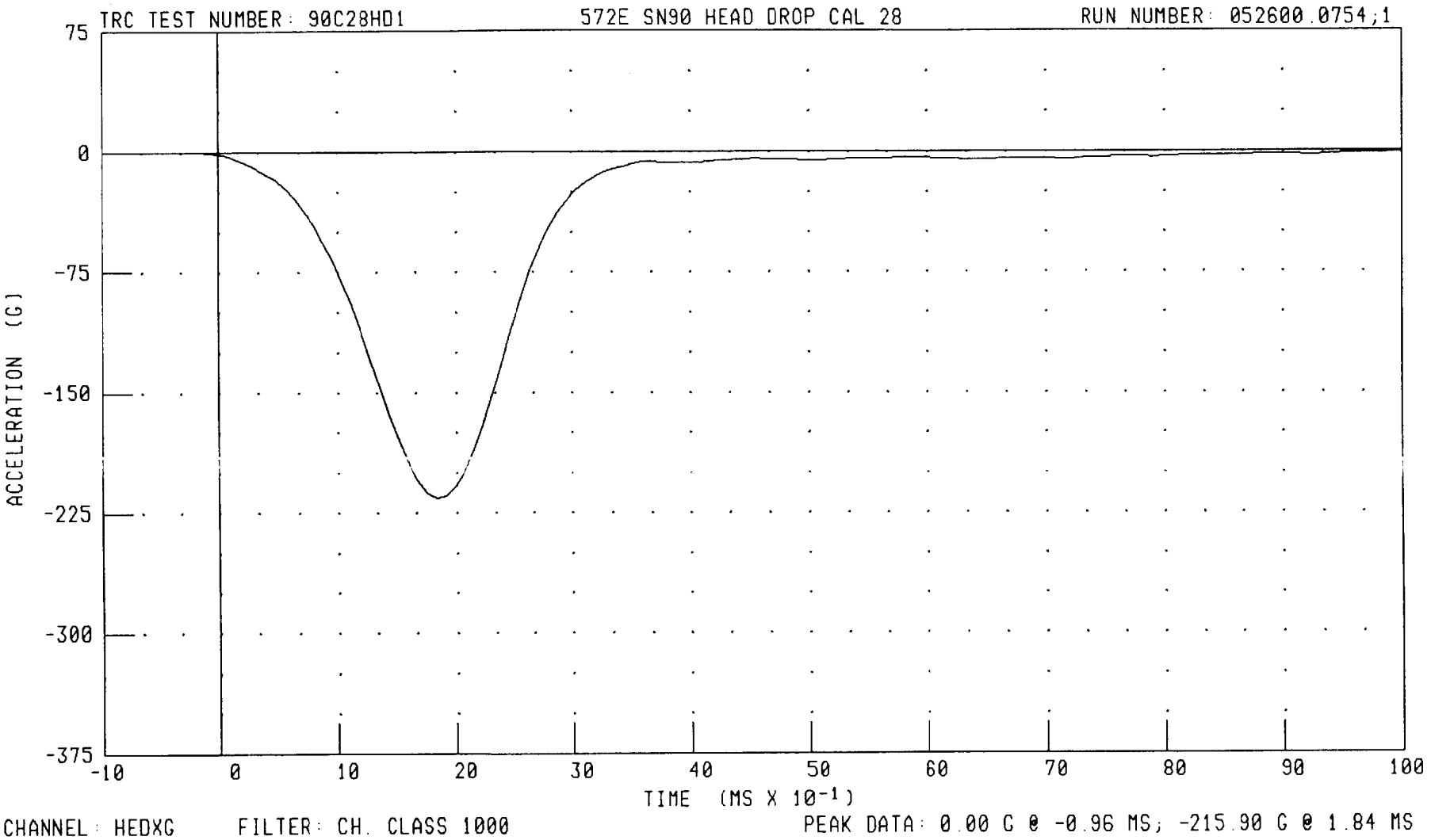
TRC INC. TEST NO: 90C28HD1 572E SN90 HEAD DROP CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	241.22 G
PEAK LATERAL ACCELERATION	15 G MAX	4.27 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052600.0754;1

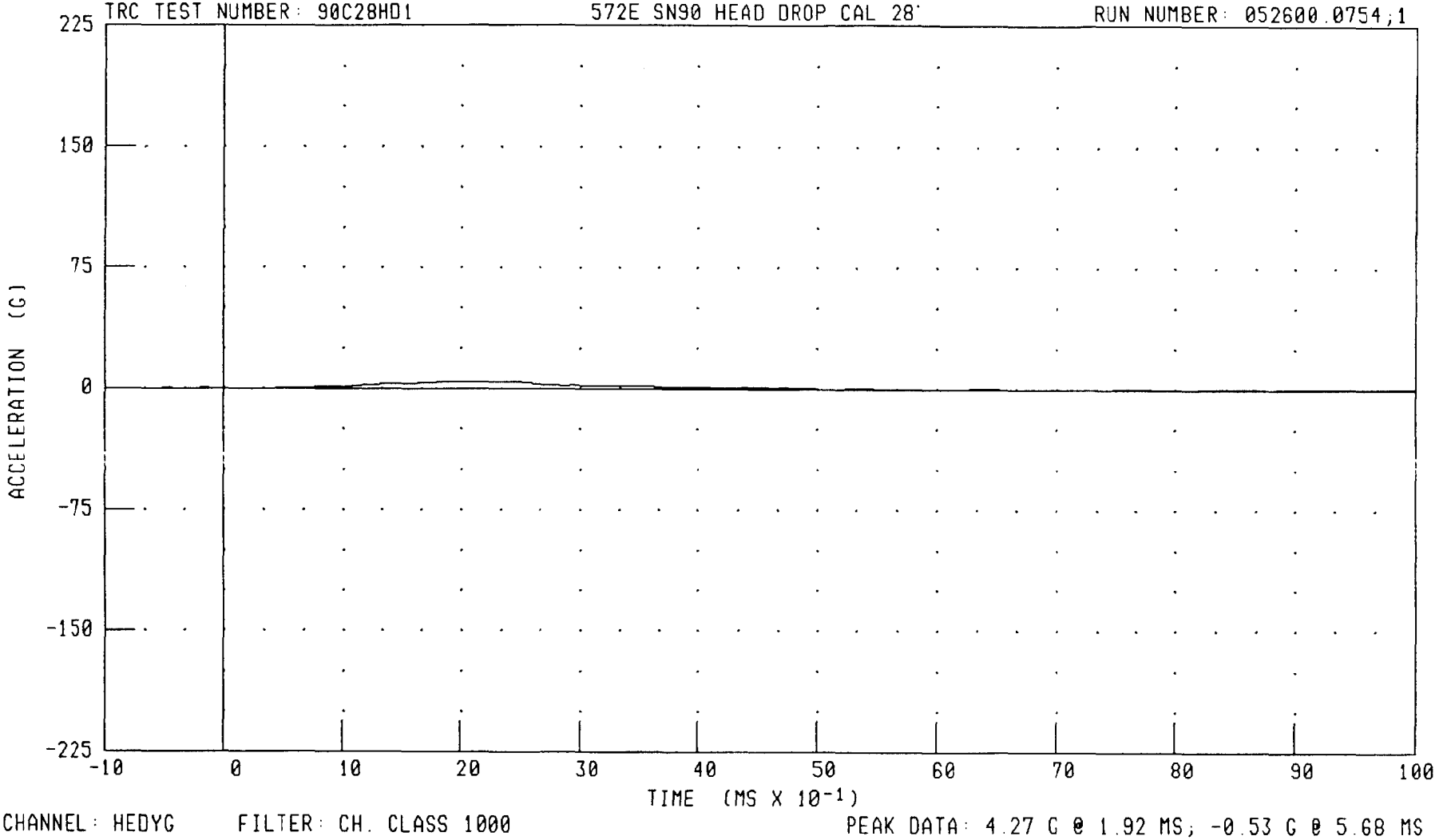
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS



PART 572-E HYBRID III HEAD CALIBRATION

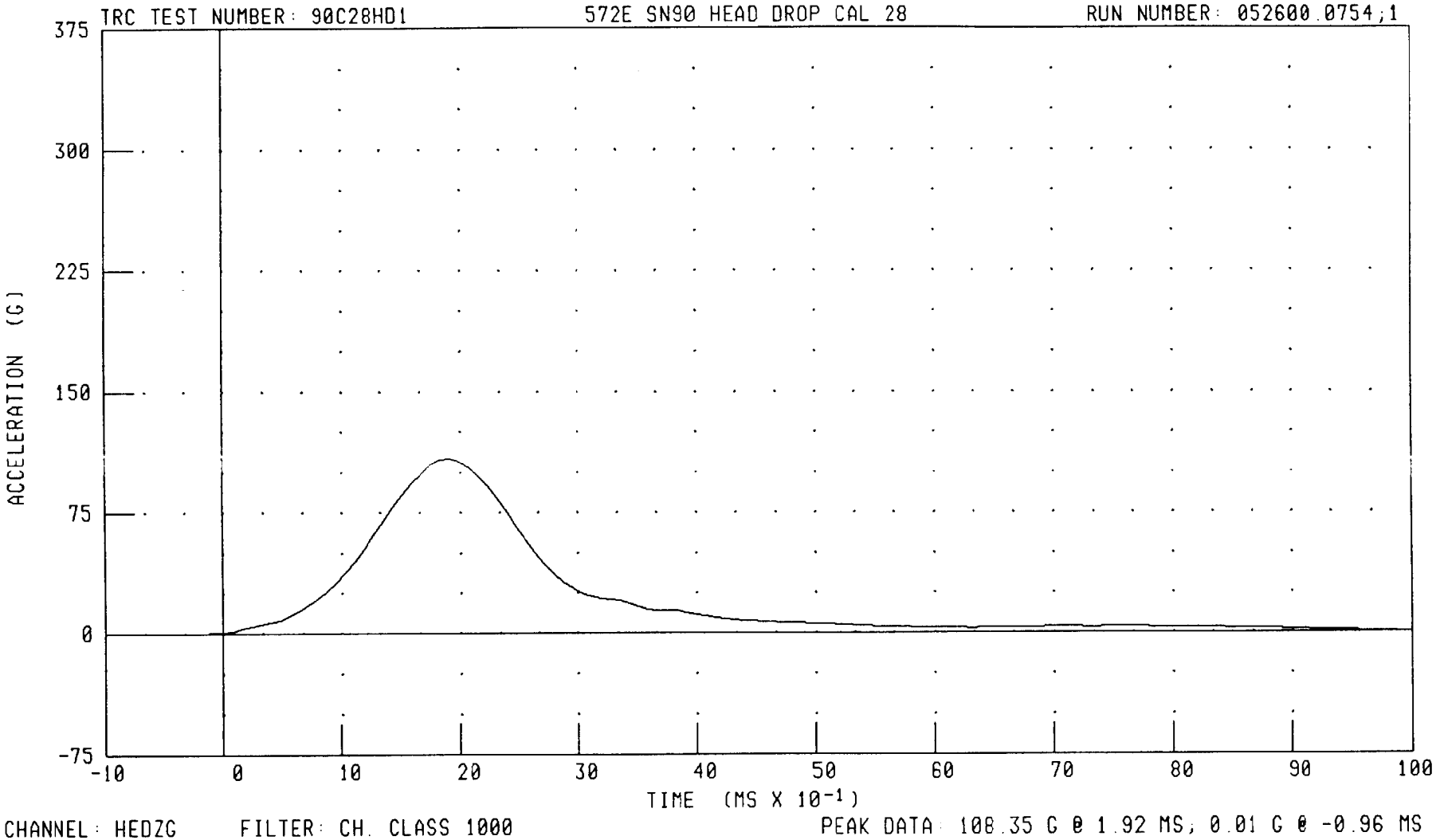
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 90C28HD1 572E SN90 HEAD DROP CAL 28" RUN NUMBER: 052600.0754;1



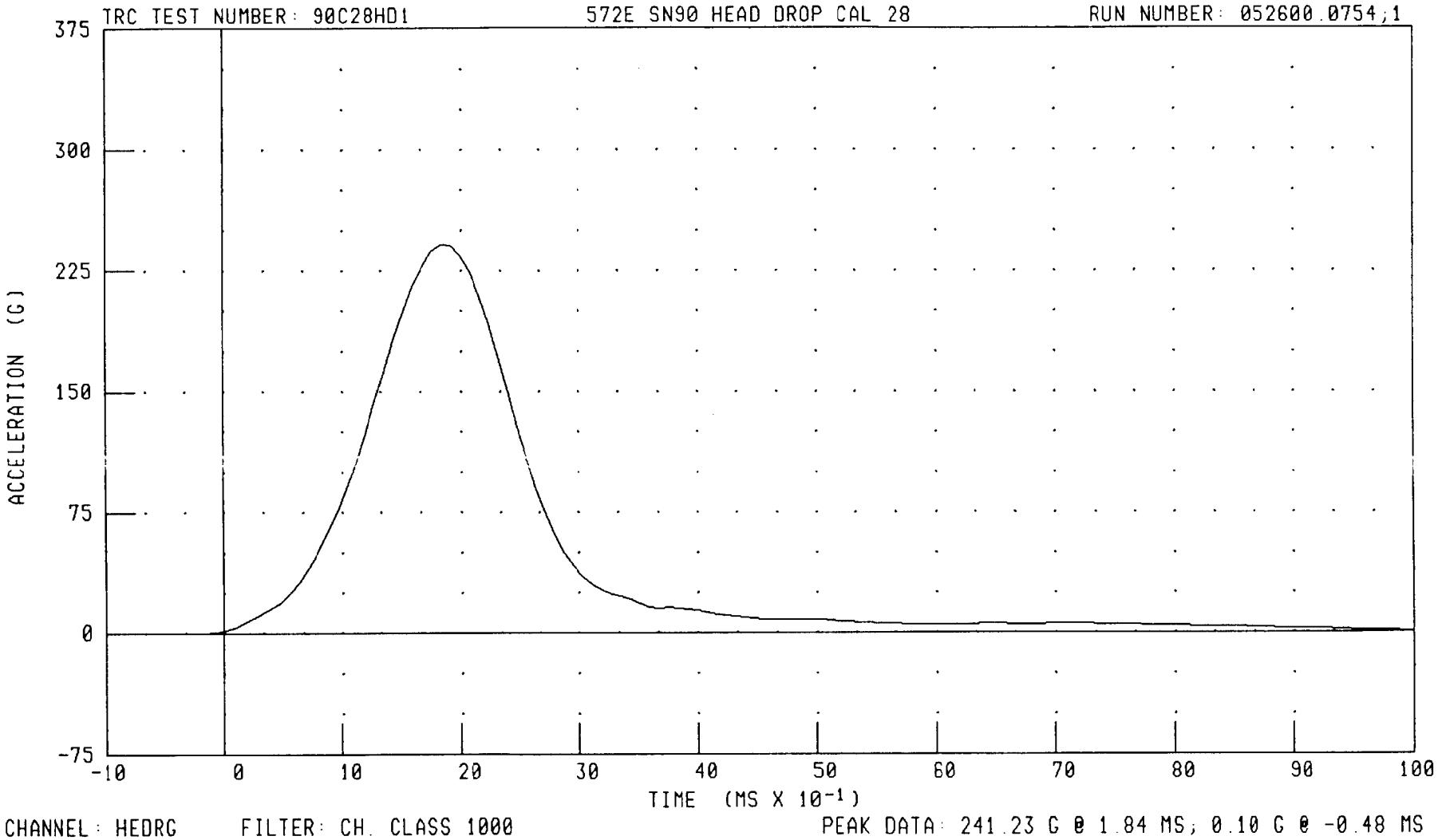
CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 4.27 G @ 1.92 MS; -0.53 G @ 5.68 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS

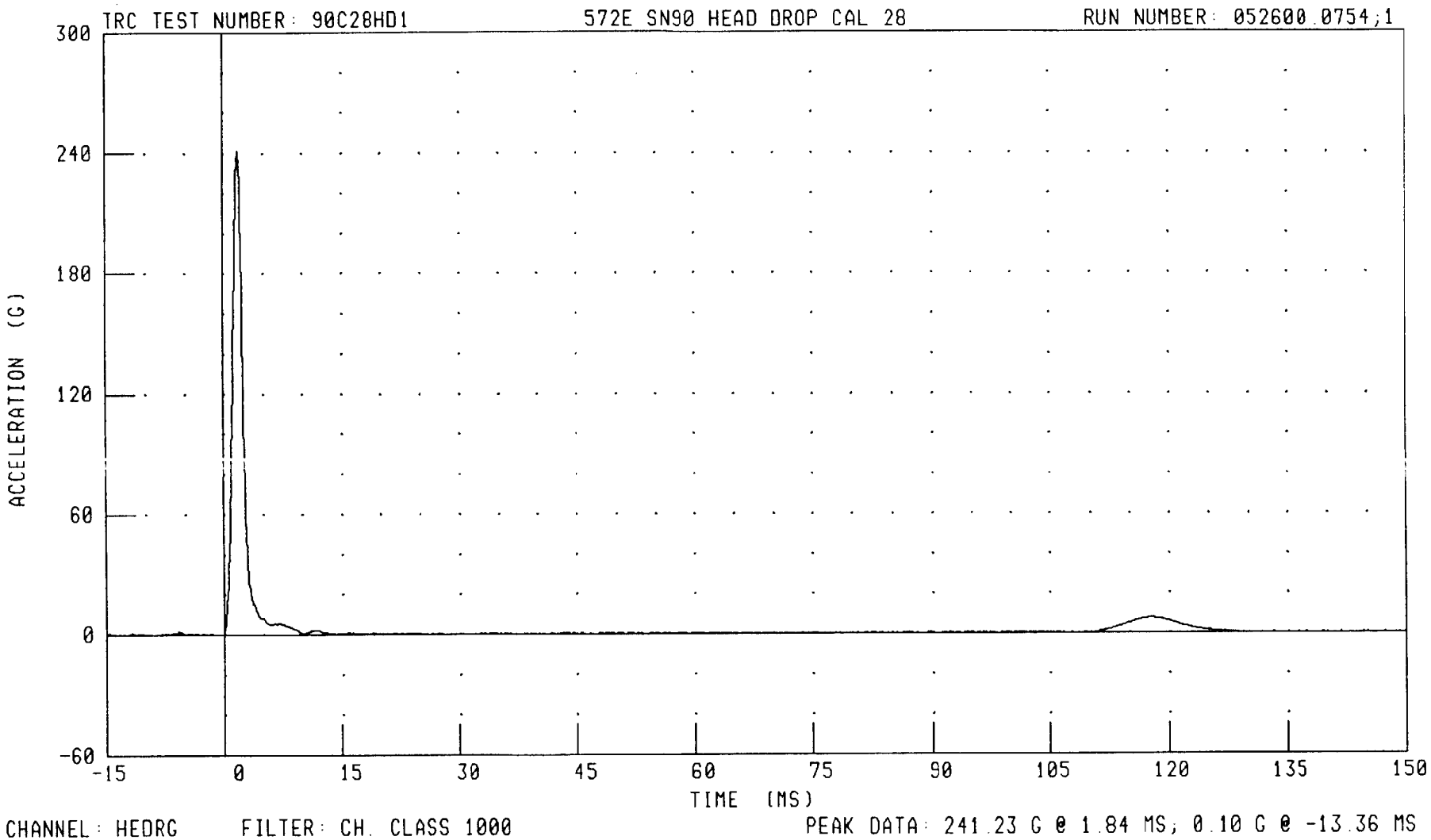


PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION



PART 572-E HYBRID III HEAD CALIBRATION
CHECK PLOT - HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 241.23 G @ 1.84 MS; 0.10 G @ -13.36 MS

TRANSPORTATION RESEARCH CENTER INC.

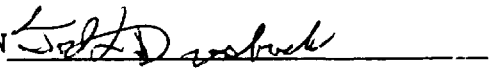
HYBRID III 50th 26-MAY-00

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 90C28NF1 572E SN90 NECK FLEXION CAL28

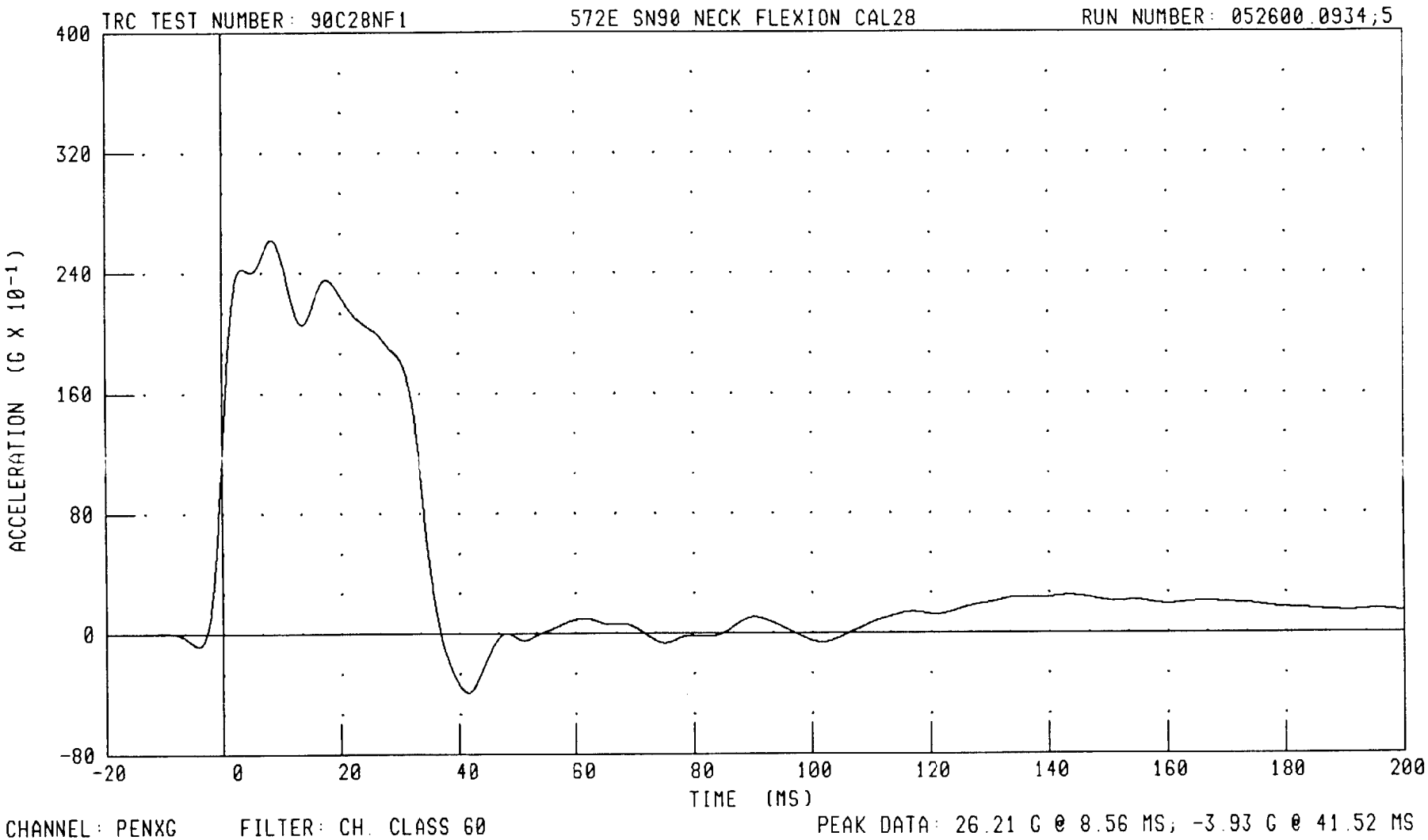
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	55.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	25.18 G
	20 MS	17.60 - 22.60 G	22.56 G
	30 MS	12.50 - 18.50 G	18.29 G
MAX PENDULUM G		29 G MAX	26.21 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	18.24 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	34.88 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	77.78 DEG.
	TIME	57 - 64 MS	58.16 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	97.85 NM
	TIME	47 - 58 MS	48.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	123.60 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	99.36 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052600.0934;5

PART 572-E HYBRID III NECK FLEXION CALIBRATION

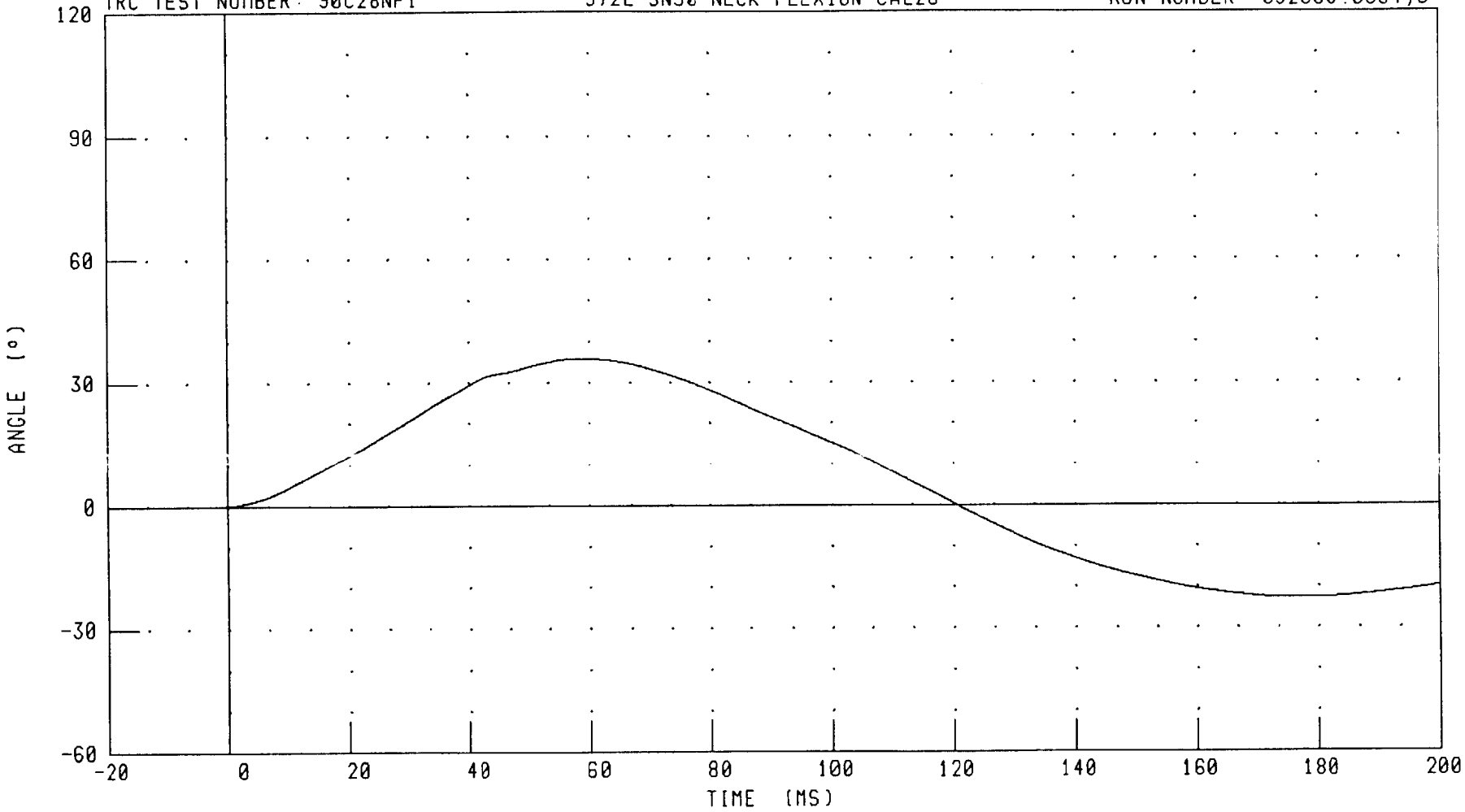
PENDULUM DECELERATION



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 26.21 G @ 8.56 MS; -3.93 G @ 41.52 MS

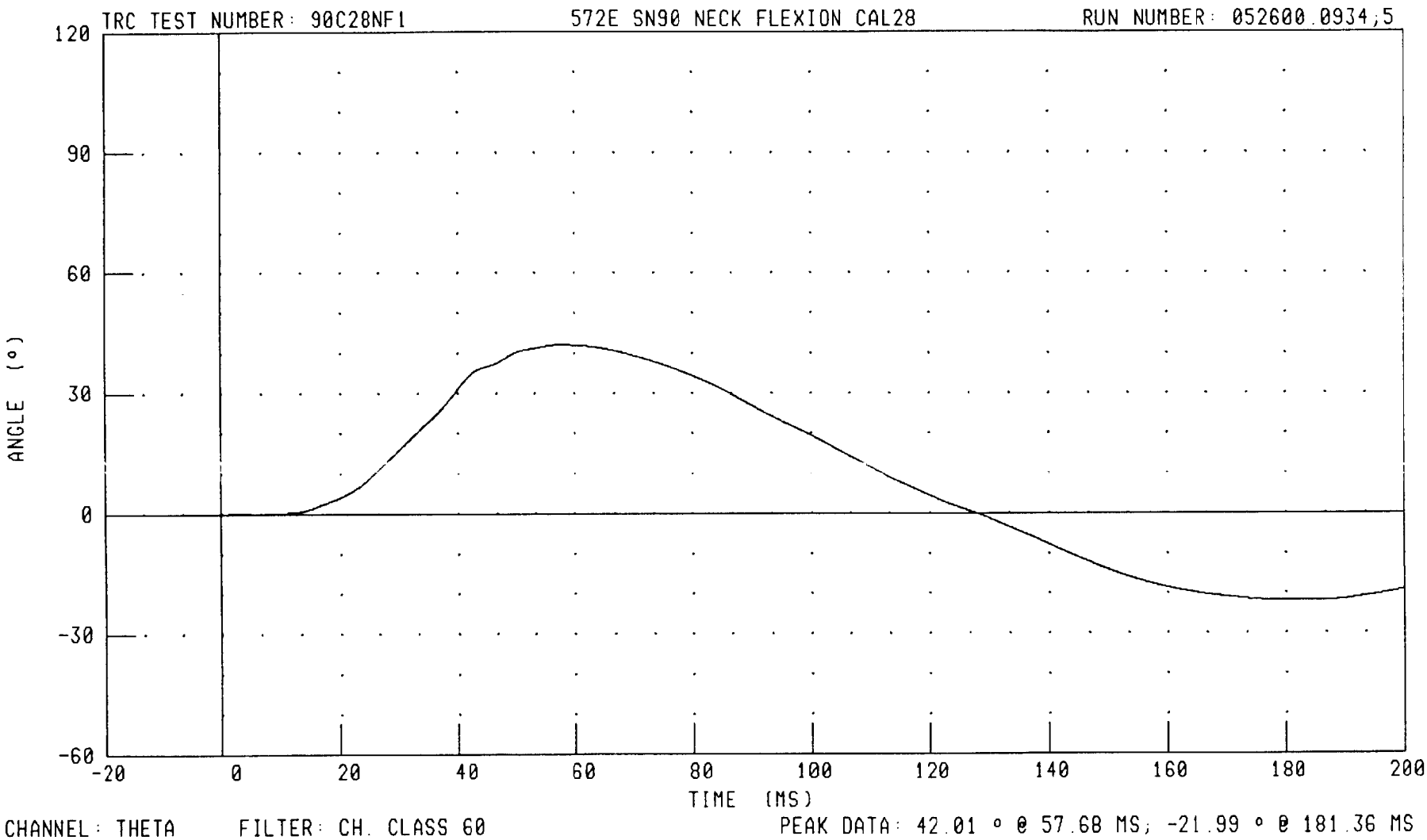
PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 90C28NF1
572E SN90 NECK FLEXION CAL28
RUN NUMBER: 052600.0934;5



CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 35.79 ° @ 58.64 MS; -22.73 ° @ 176.72 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

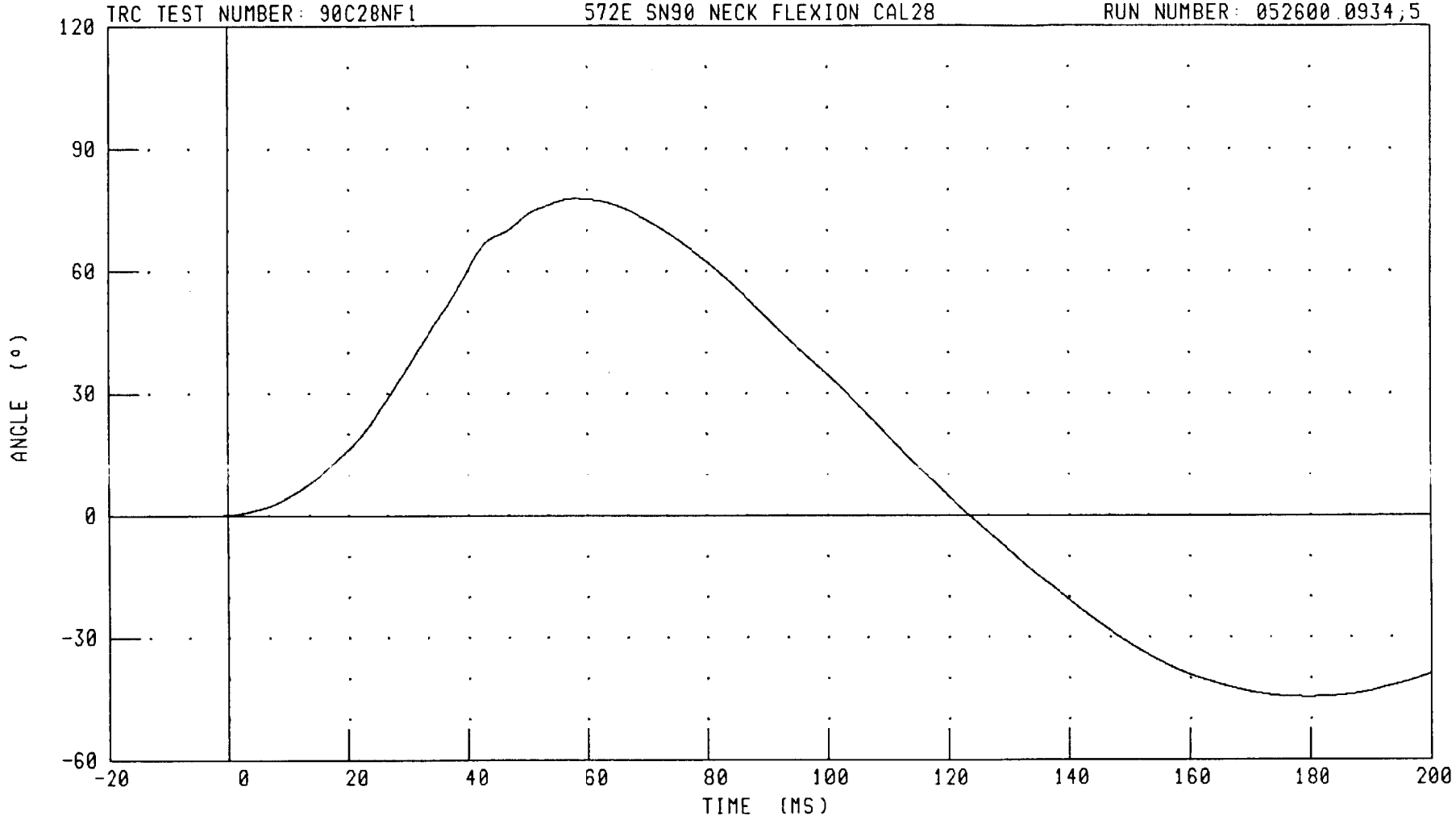


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 42.01 ° @ 57.68 MS; -21.99 ° @ 181.36 MS

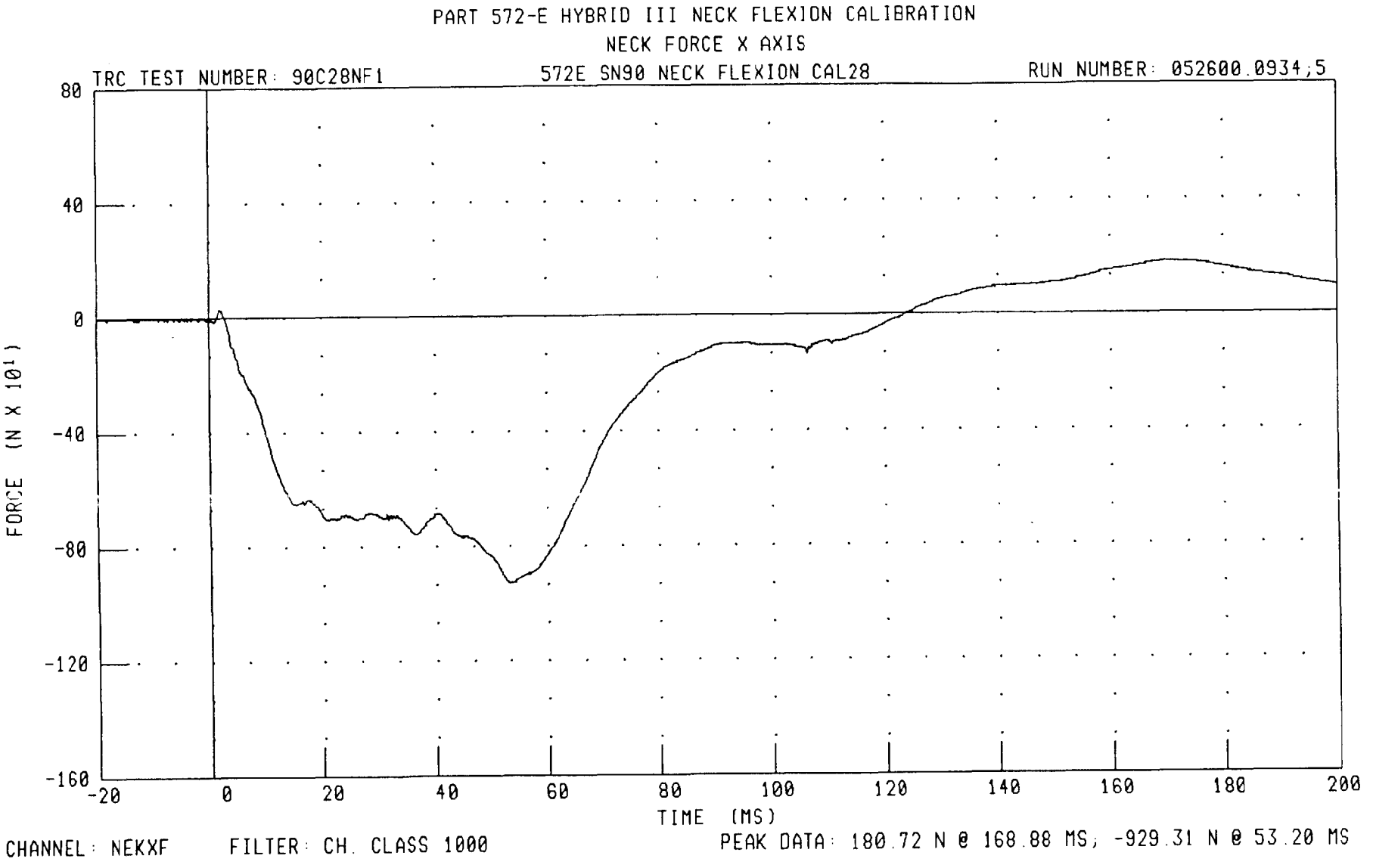
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 90C28NF1 572E SN90 NECK FLEXION CAL28 RUN NUMBER: 052600.0934;5

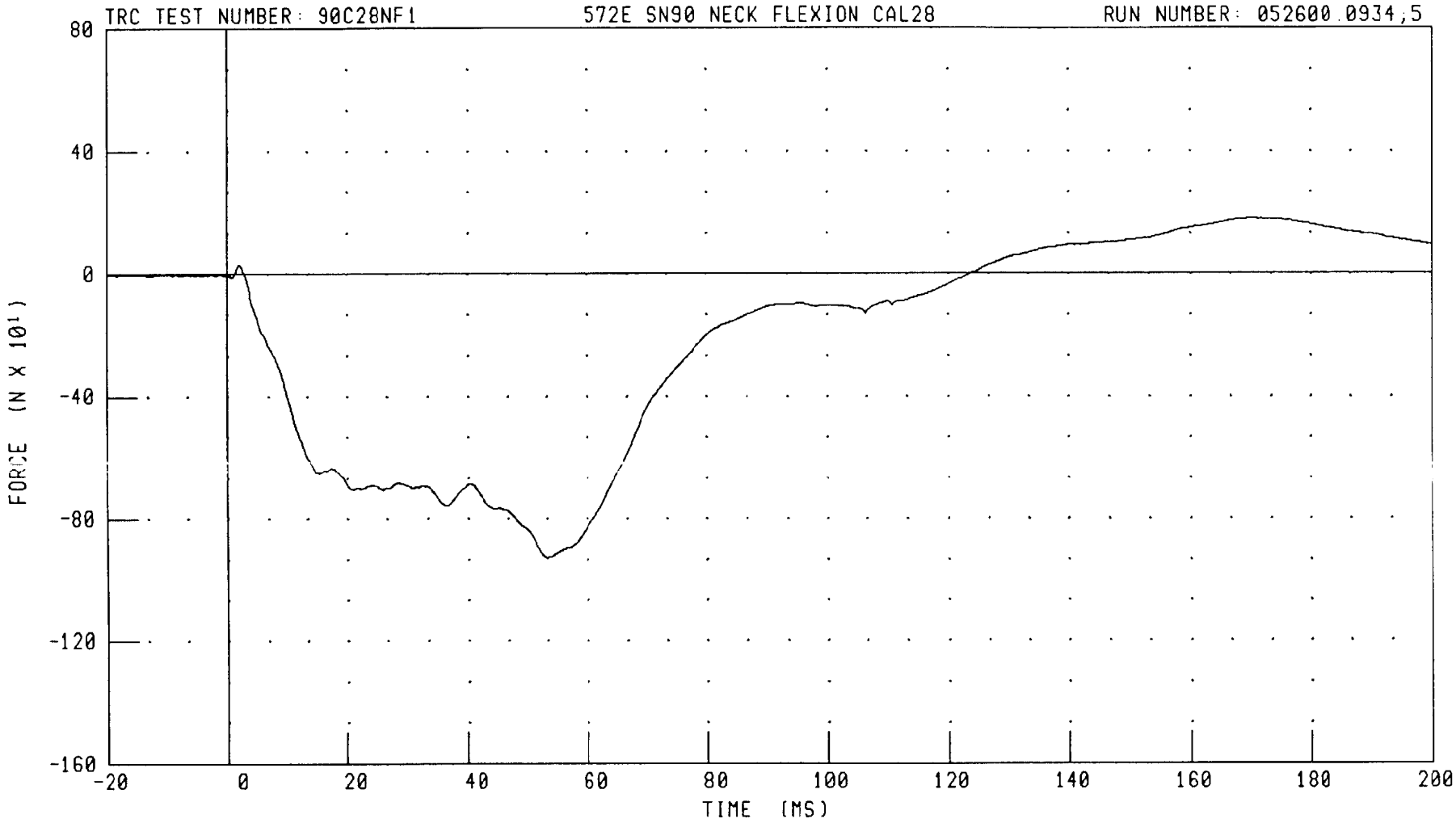


CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 77.79 ° @ 58.16 MS; -44.67 ° @ 179.52 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS
TRC TEST NUMBER: 90C28NF1
572E SN90 NECK FLEXION CAL28
RUN NUMBER: 052600.0934;5
80
40
0
-40
-80
-120
-160
FORCE (N X 10¹)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKXF
FILTER: CH. CLASS 1000
PEAK DATA: 180.72 N @ 168.88 MS; -929.31 N @ 53.20 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION



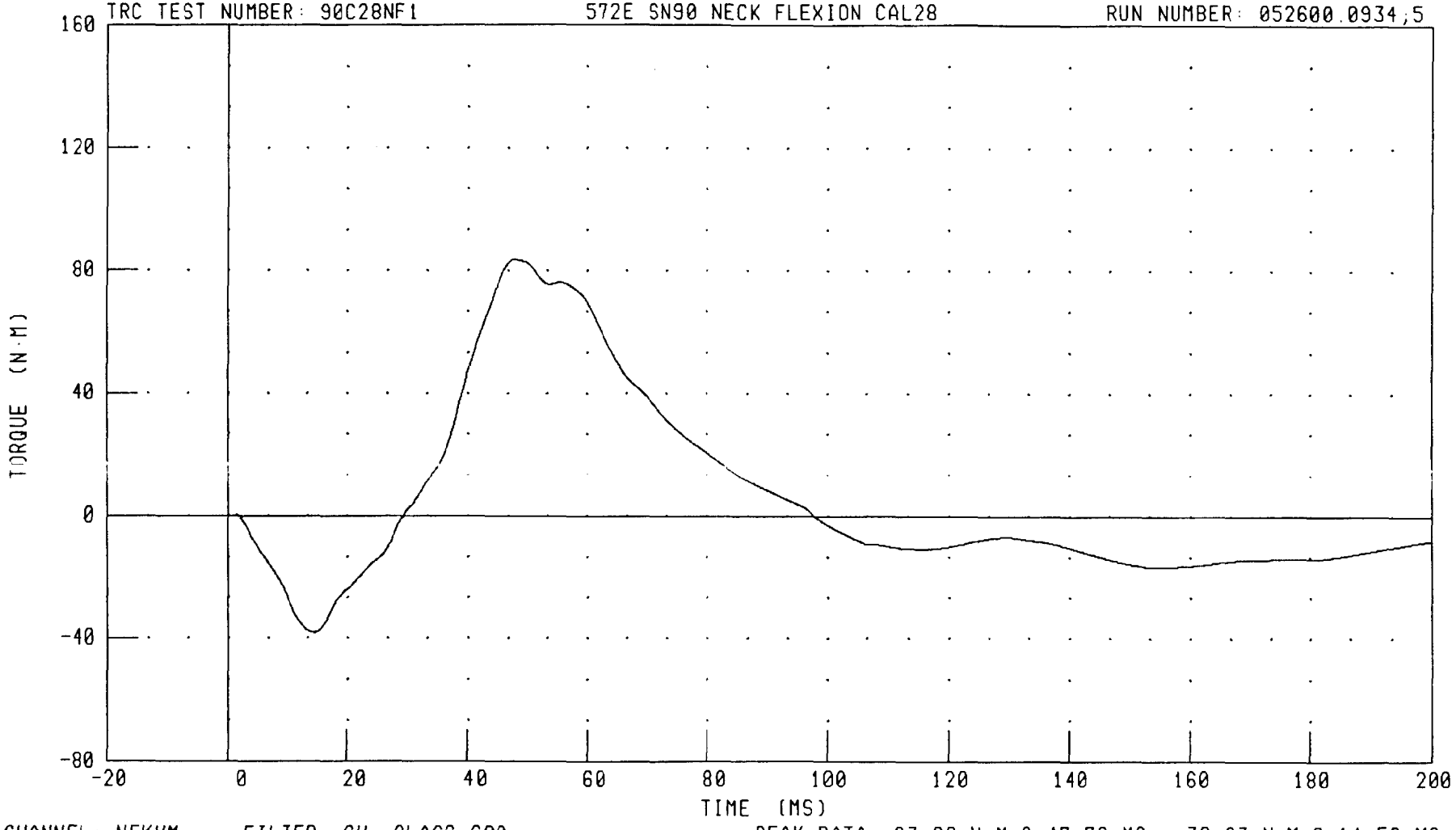
CHANNEL: NEKXFC FILTER: CH. CLASS 600

PEAK DATA: 180.67 N @ 169.84 MS; -928.93 N @ 53.36 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

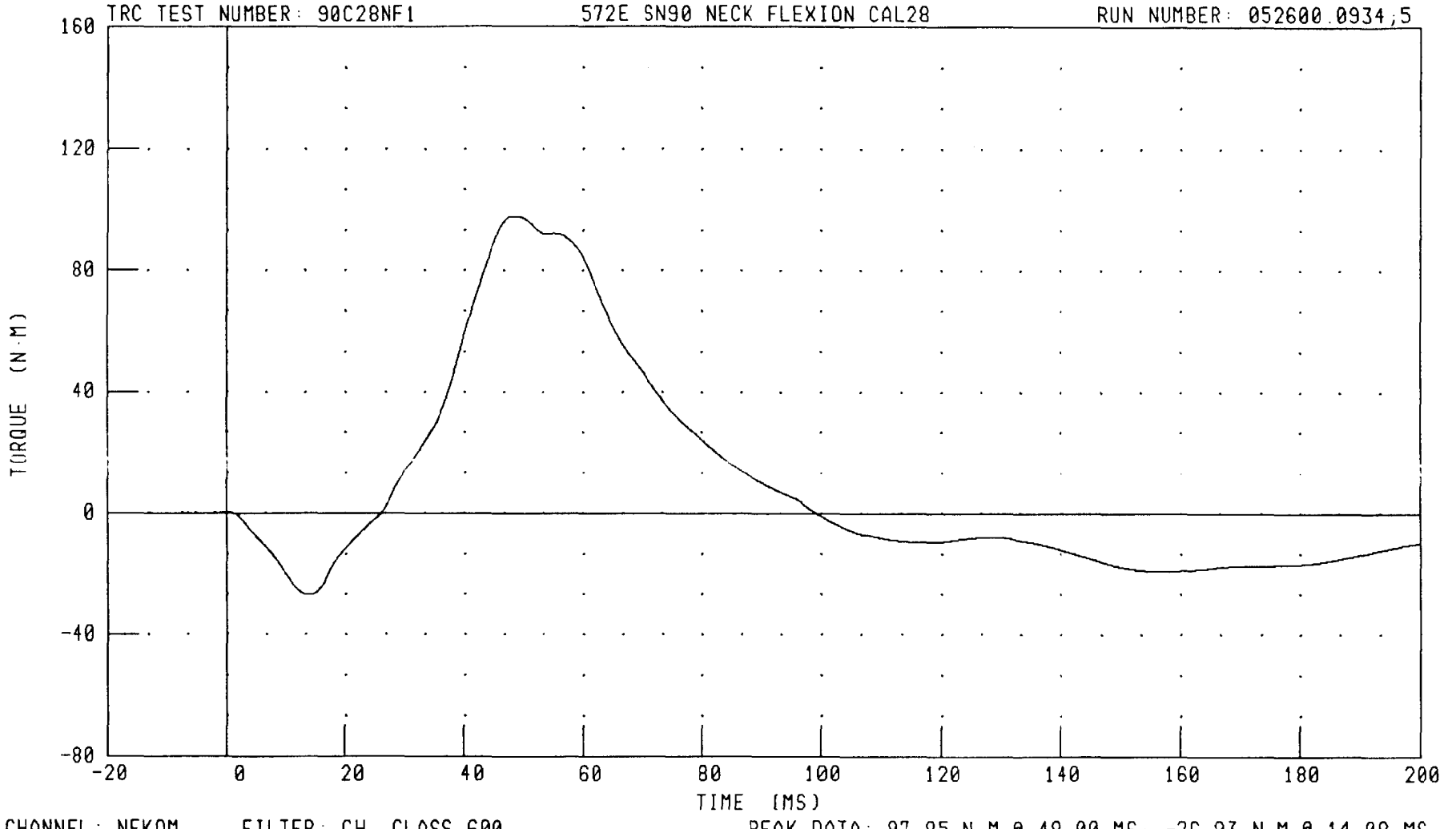
NECK MOMENT Y AXIS

TRC TEST NUMBER: 90C28NF1 572E SN90 NECK FLEXION CAL28 RUN NUMBER: 052600.0934;5



CHANNEL: NEKYM FILTER: CH. CLASS 600 PEAK DATA: 83.66 N-M @ 47.76 MS; -38.23 N-M @ 14.56 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



CHANNEL: NEKOM FILTER: CH. CLASS 600 PEAK DATA: 97.85 N-M @ 48.00 MS; -26.93 N-M @ 14.08 MS

TRANSPORTATION RESEARCH CENTER INC.

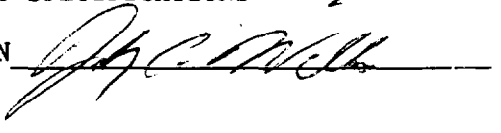
HYBRID III 50th 26-MAY-00

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 90C28NE2 572E SN90 NECK EXT CAL28

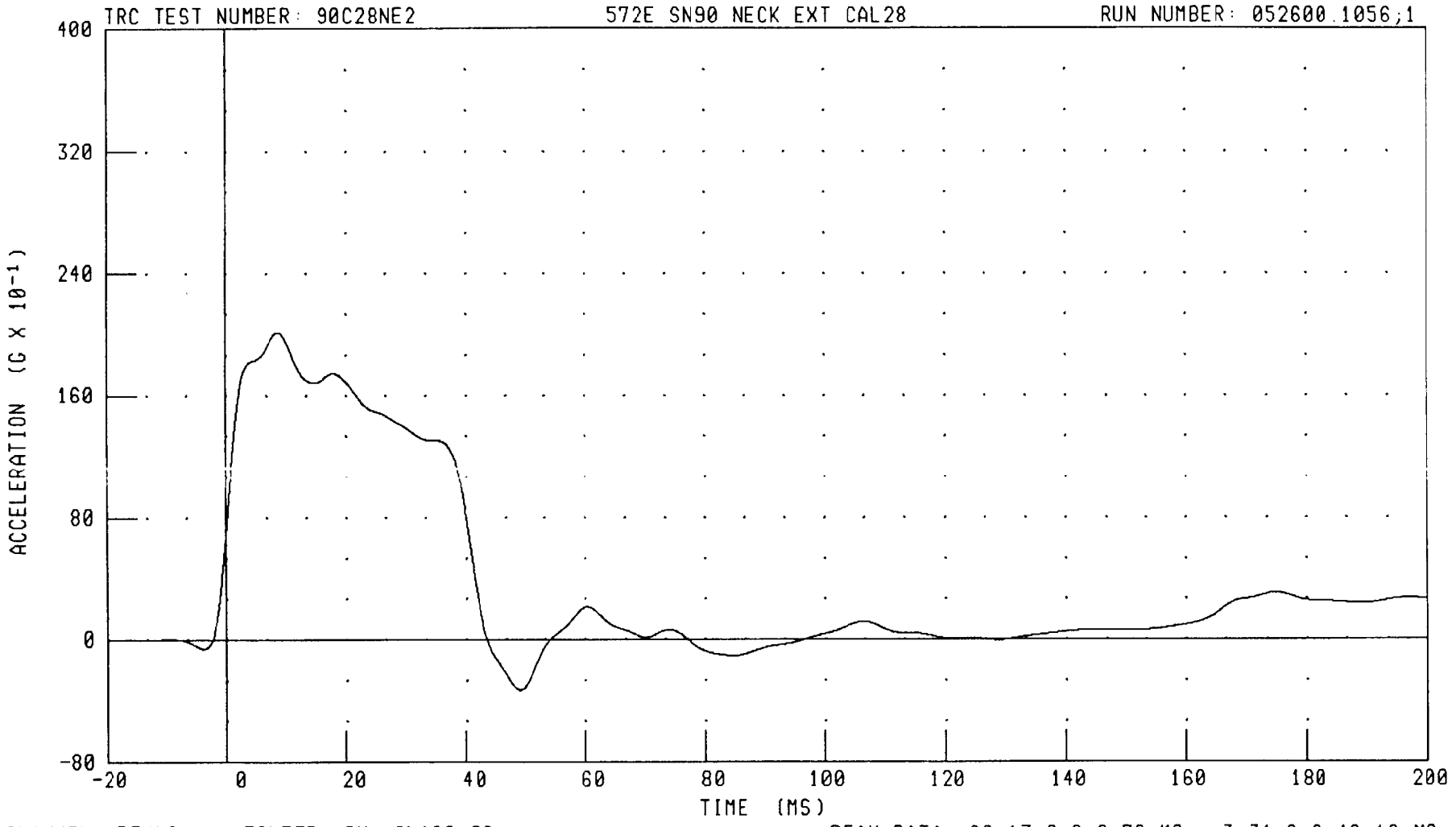
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	55.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.10 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.57 G
	20 MS	14.00 - 19.00 G	16.94 G
	30 MS	11.00 - 16.00 G	13.91 G
MAX PENDULUM G		22 G MAX	20.13 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	13.89 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	41.12 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	96.84 DEG.
	TIME	72 - 82 MS	78.16 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-73.65 NM
	TIME	65 - 79 MS	73.76 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	164.72 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	145.52 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052600.1055;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

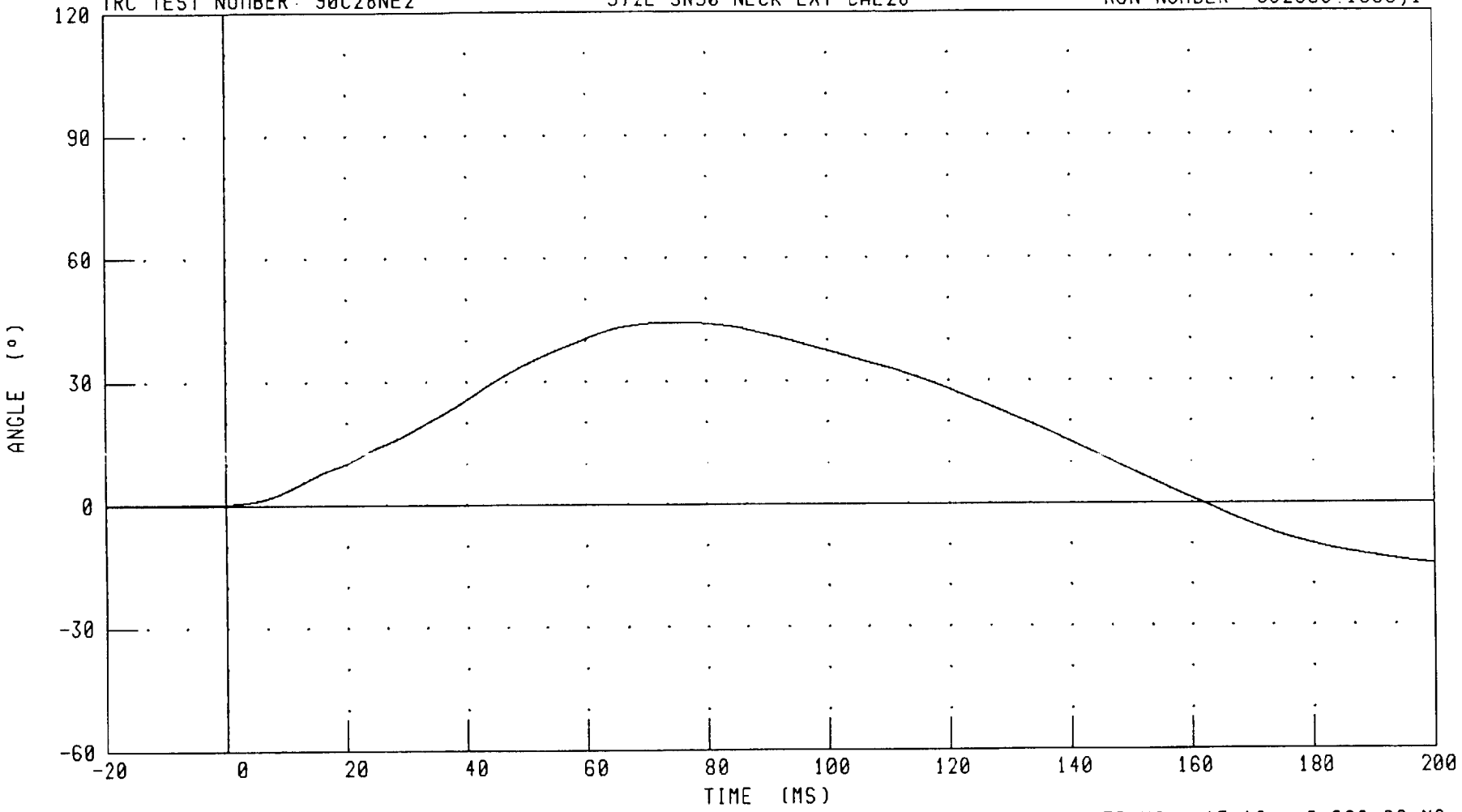
PENDULUM DECELERATION



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 20.13 G @ 8.72 MS; -3.31 G @ 49.12 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

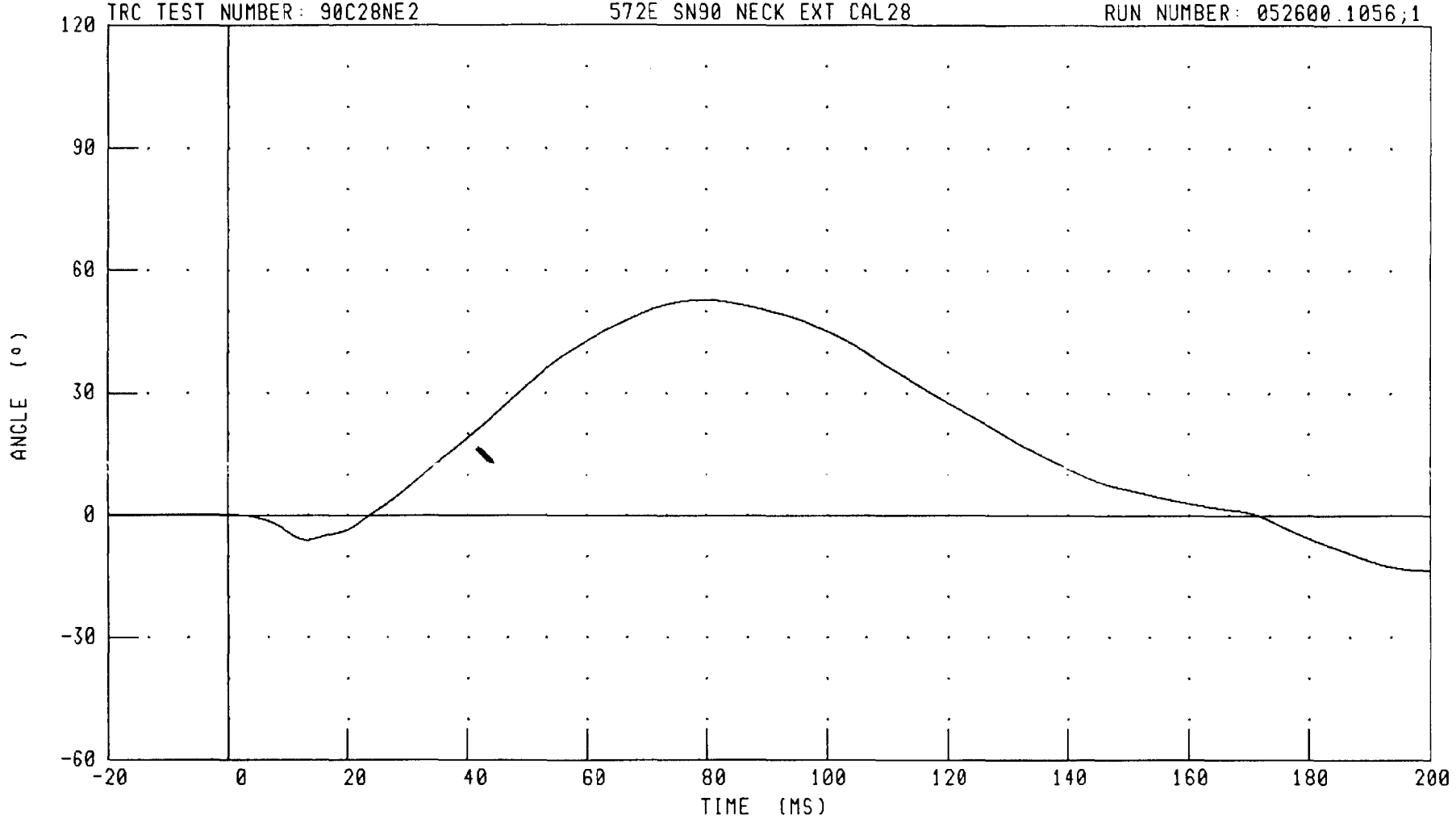
TRC TEST NUMBER: 90C28NE2 572E SN90 NECK EXT CAL28 RUN NUMBER: 052600.1056;1



CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 44.20 ° @ 74.72 MS; -15.18 ° @ 200.00 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

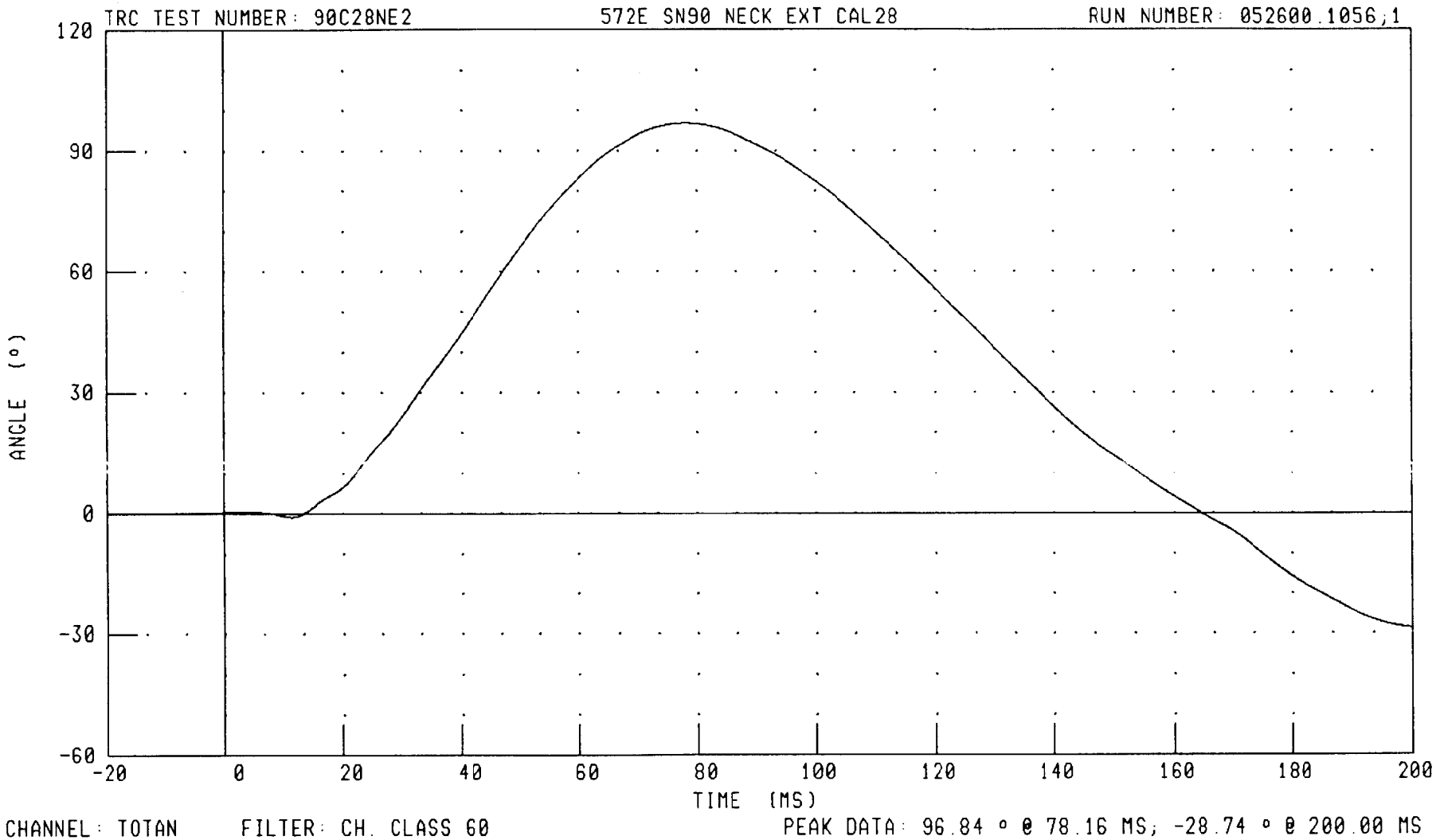
TRC TEST NUMBER: 90C28NE2 572E SN90 NECK EXT CAL28 RUN NUMBER: 052600.1056;1



CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 52.78 ° @ 79.52 MS; -13.56 ° @ 199.28 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

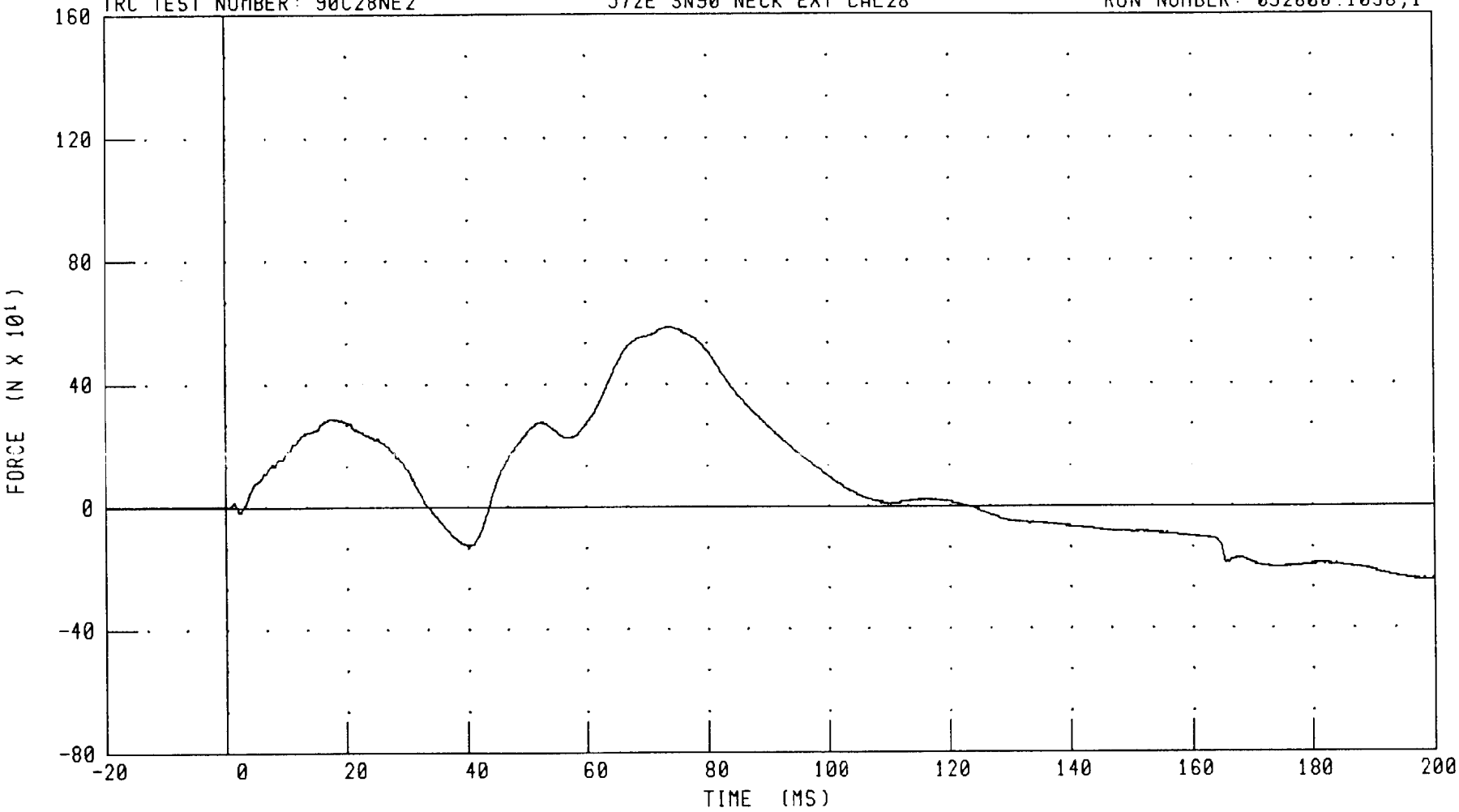


CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 96.84 ° @ 78.16 MS; -28.74 ° @ 200.00 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

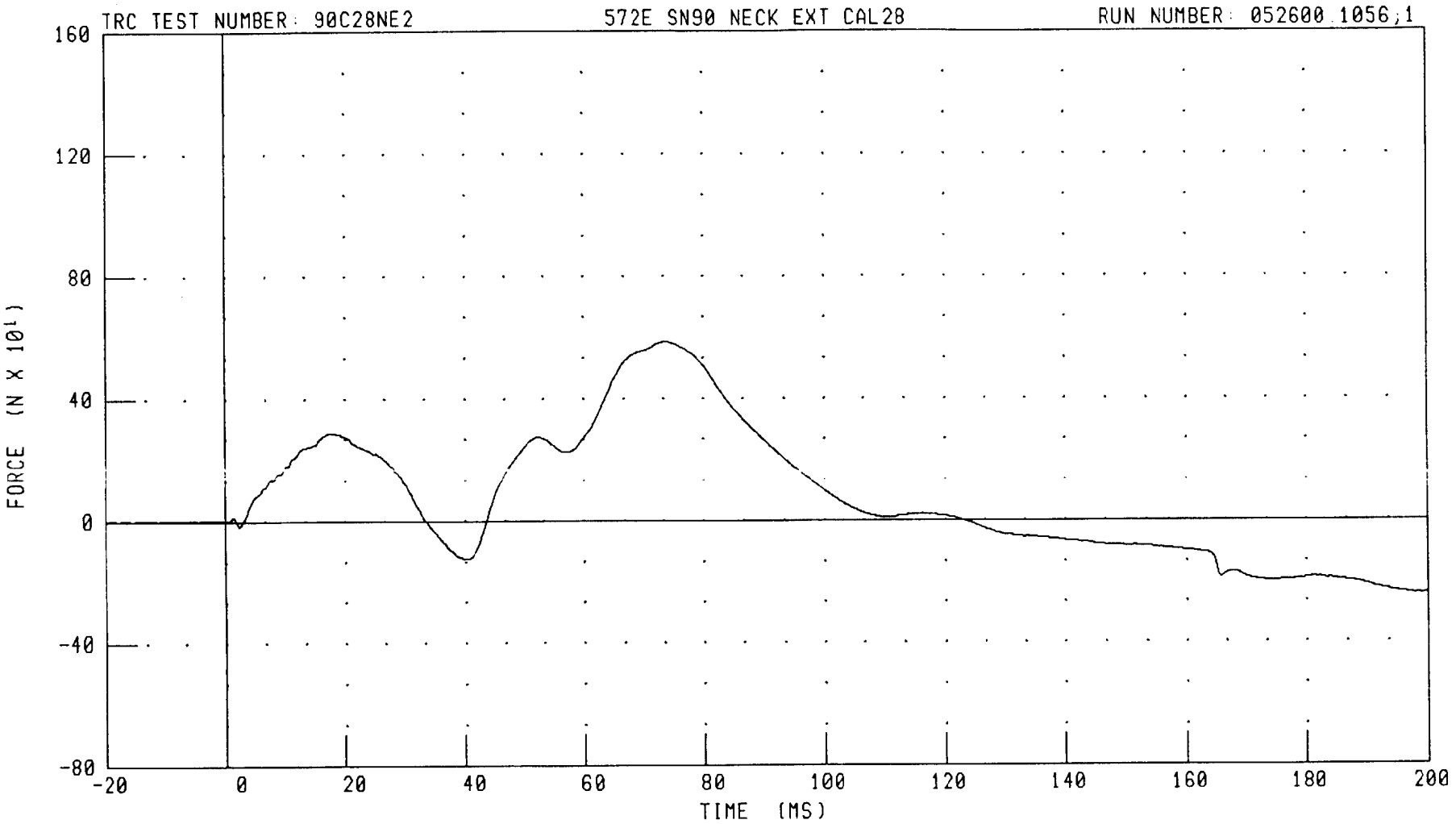
TRC TEST NUMBER: 90C28NE2 572E SN90 NECK EXT CAL28 RUN NUMBER: 052600.1056;1



CHANNEL: NEKXF FILTER: CH. CLASS 1000 PEAK DATA: 585.06 N @ 73.36 MS; -243.56 N @ 196.56 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION

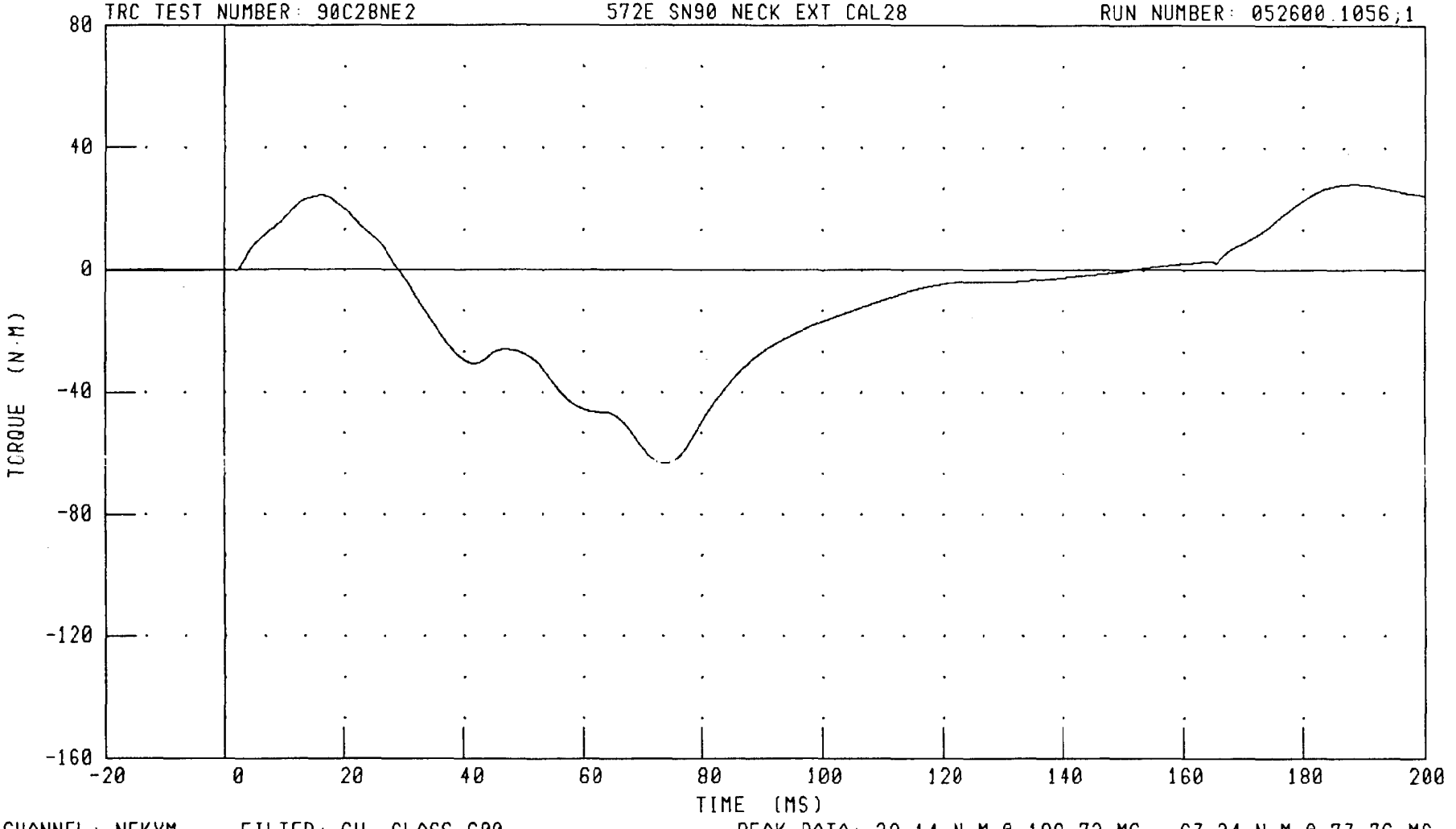


CHANNEL: NEKXFC FILTER: CH. CLASS 600

PEAK DATA: 585.27 N @ 73.84 MS; -243.65 N @ 197.68 MS

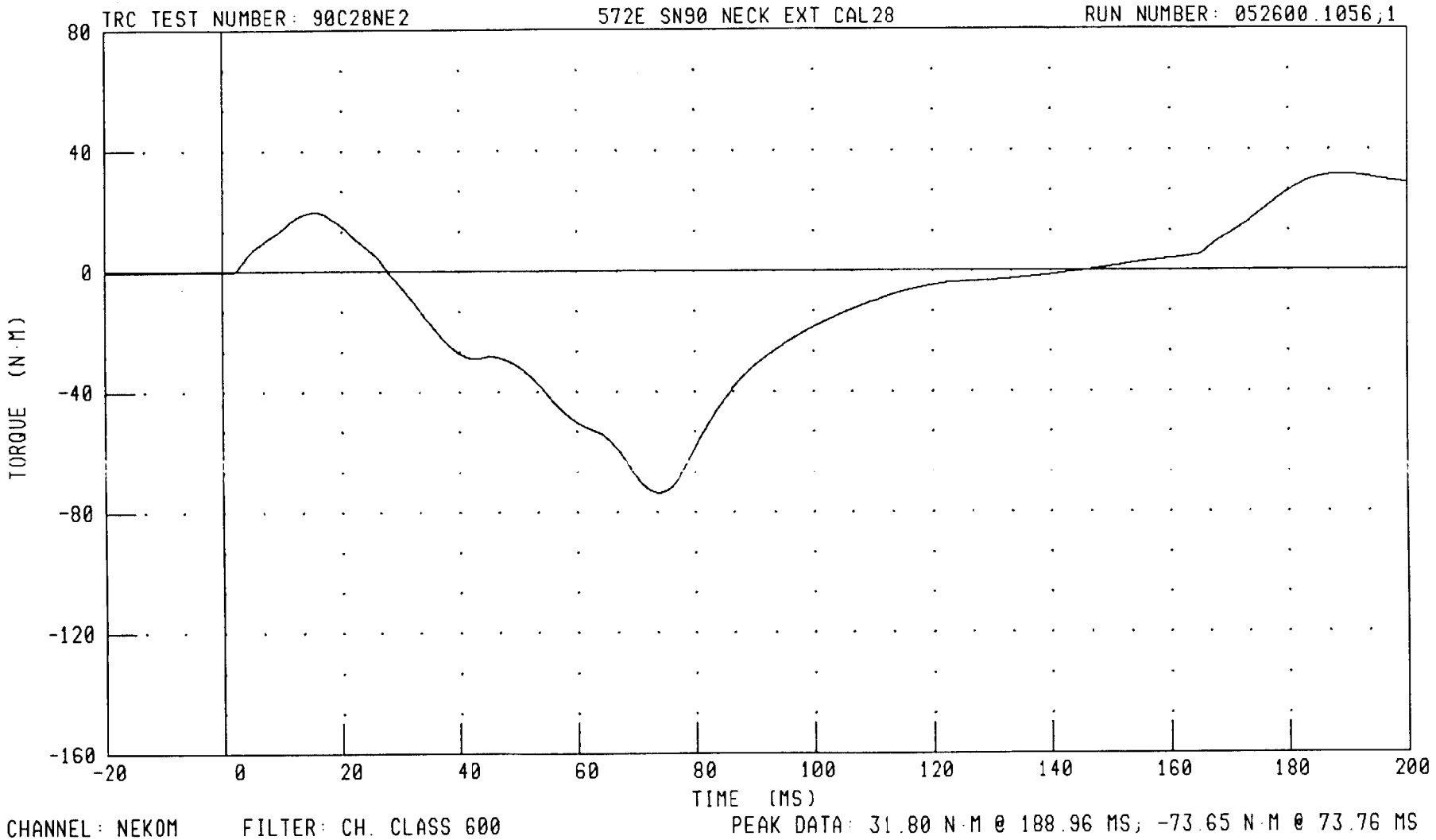
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS



CHANNEL: NEKYM FILTER: CH. CLASS 600 PEAK DATA: 28.14 N-M @ 188.72 MS; -63.24 N-M @ 73.76 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



CHANNEL: NEKOM FILTER: CH. CLASS 600

PEAK DATA: 31.80 N-M @ 188.96 MS; -73.65 N-M @ 73.76 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th 25-MAY-00

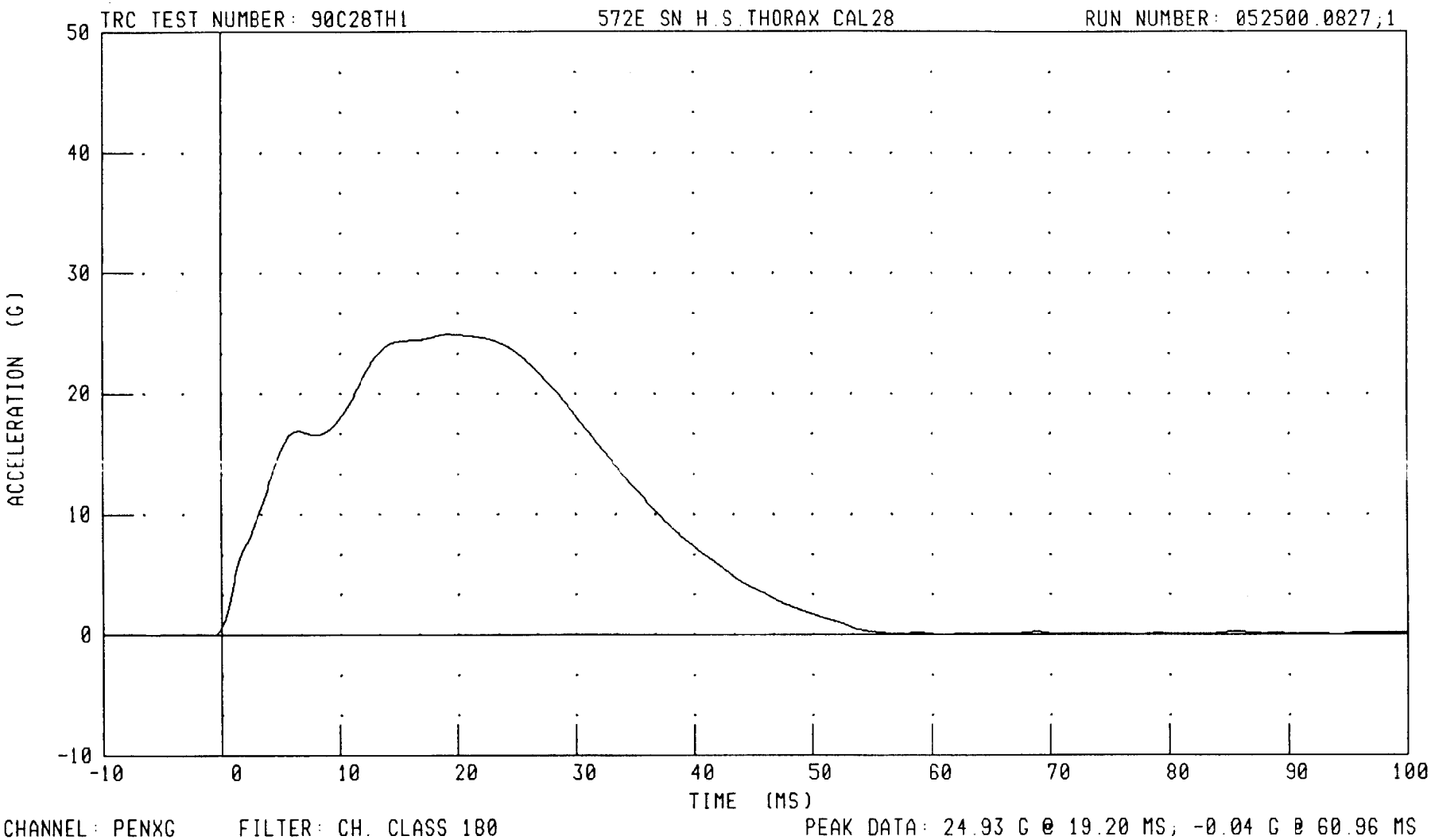
TRC INC. TEST NO: 90C28TH1 572E SN H.S.THORAX CAL28

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.62 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	71.3 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5709. N
INTERNAL HYSTERESIS	69% - 85%	72.6%

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052500.0826;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

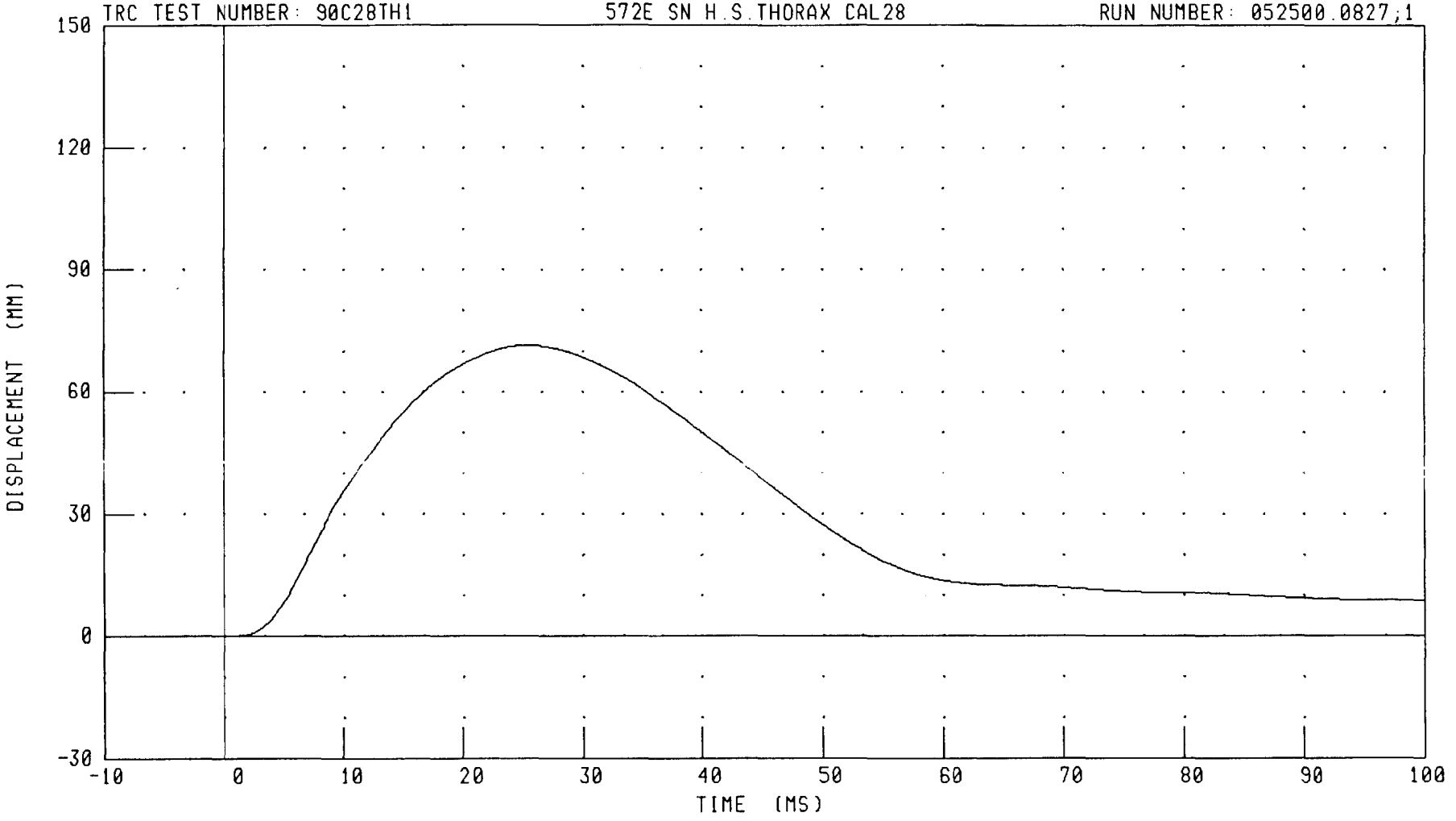


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 24.93 G @ 19.20 MS; -0.04 G @ 60.96 MS

PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

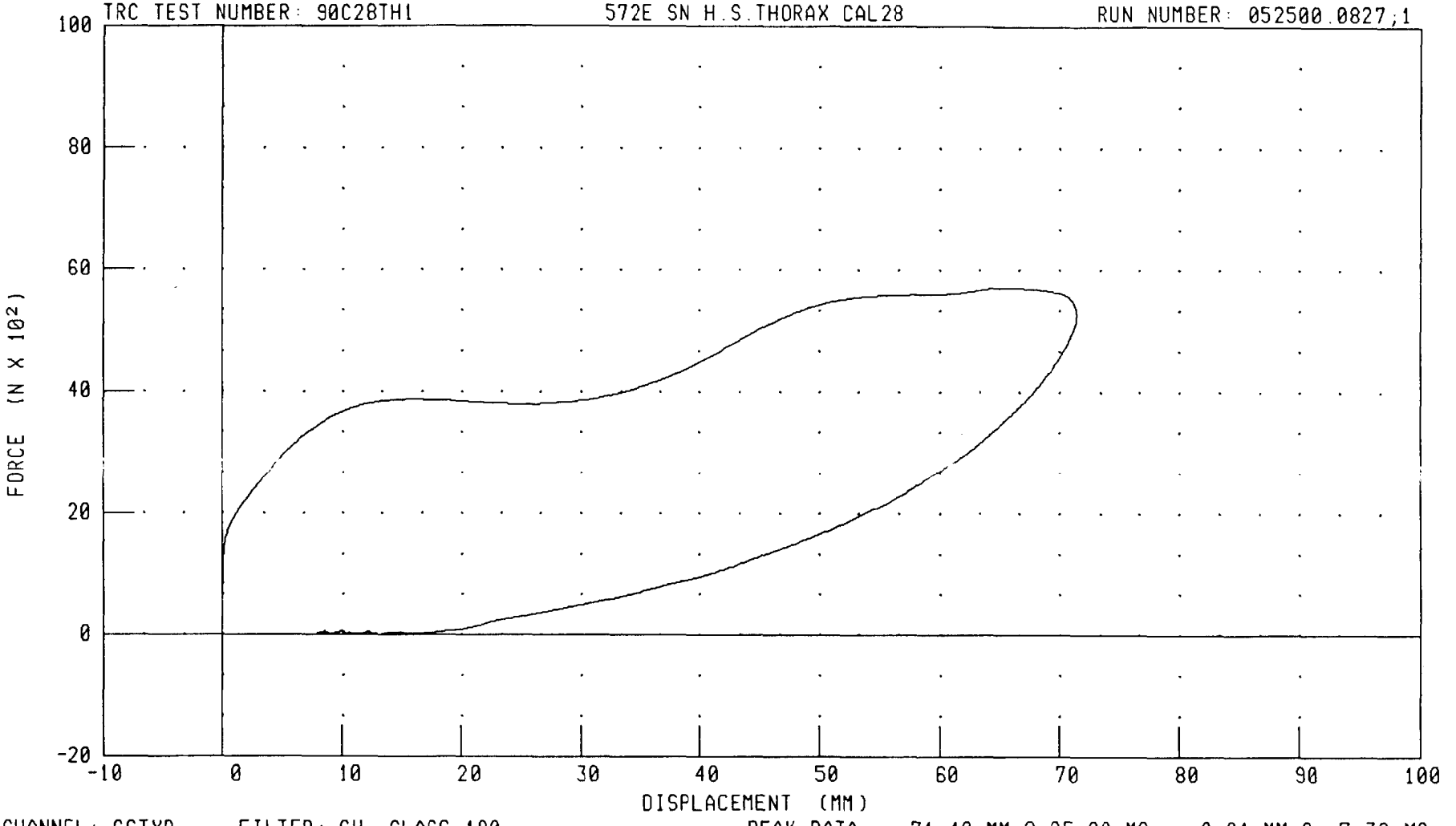
TRC TEST NUMBER: 90C28TH1 572E SN H.S.THORAX CAL28 RUN NUMBER: 052500.0827;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 71.40 MM @ 25.60 MS; -0.01 MM @ -7.36 MS

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

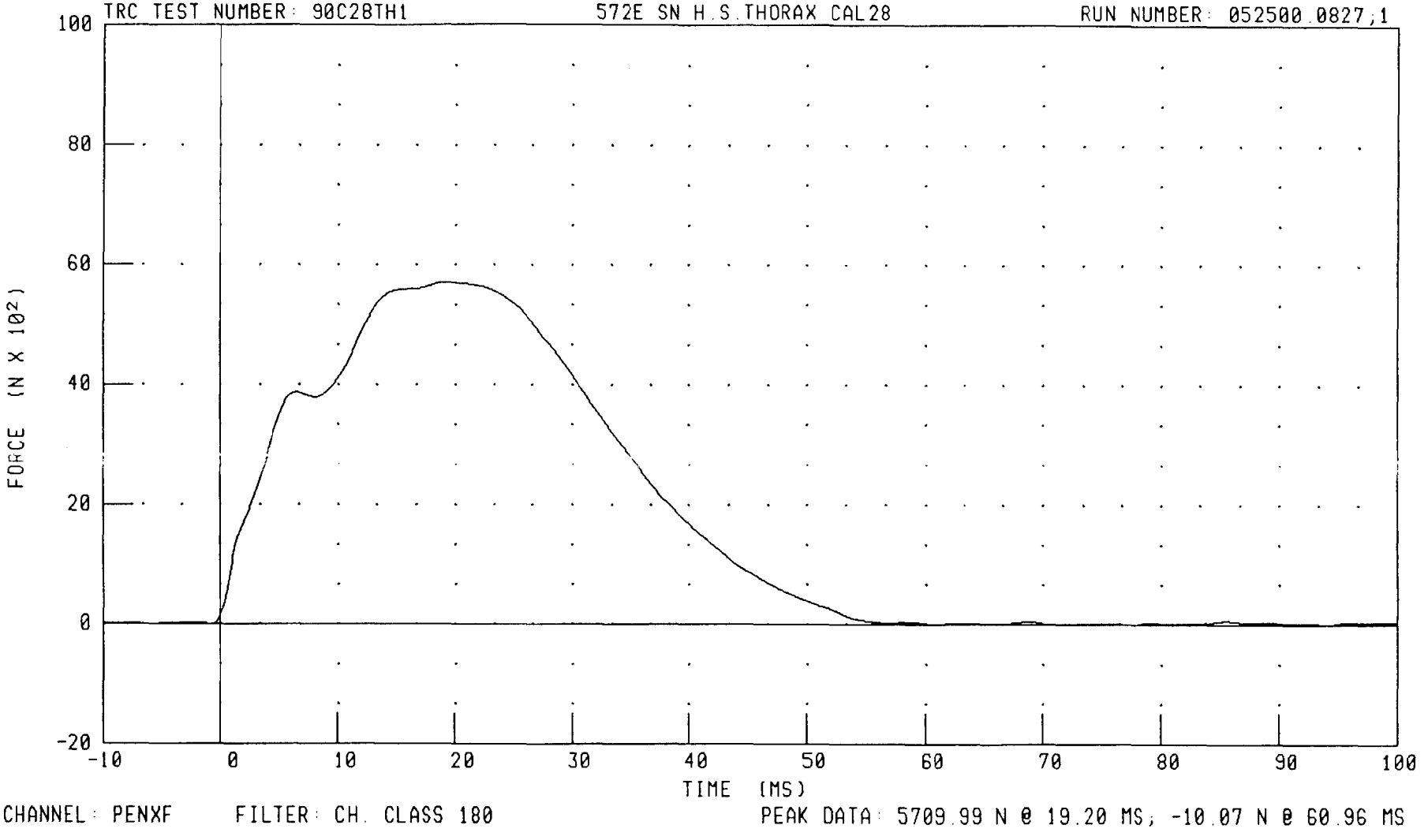
TRC TEST NUMBER: 90C28TH1 572E SN H.S.THORAX CAL28 RUN NUMBER: 052500.0827;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 71.40 MM @ 25.60 MS; -0.01 MM @ -7.36 MS
PENXF CH. CLASS 180 5709.99 N @ 19.20 MS; -10.07 N @ 60.96 MS

PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE



CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5709.99 N @ 19.20 MS; -10.07 N @ 60.96 MS

Transportation Research Center Inc

Hybrid III Hip Range of Motion

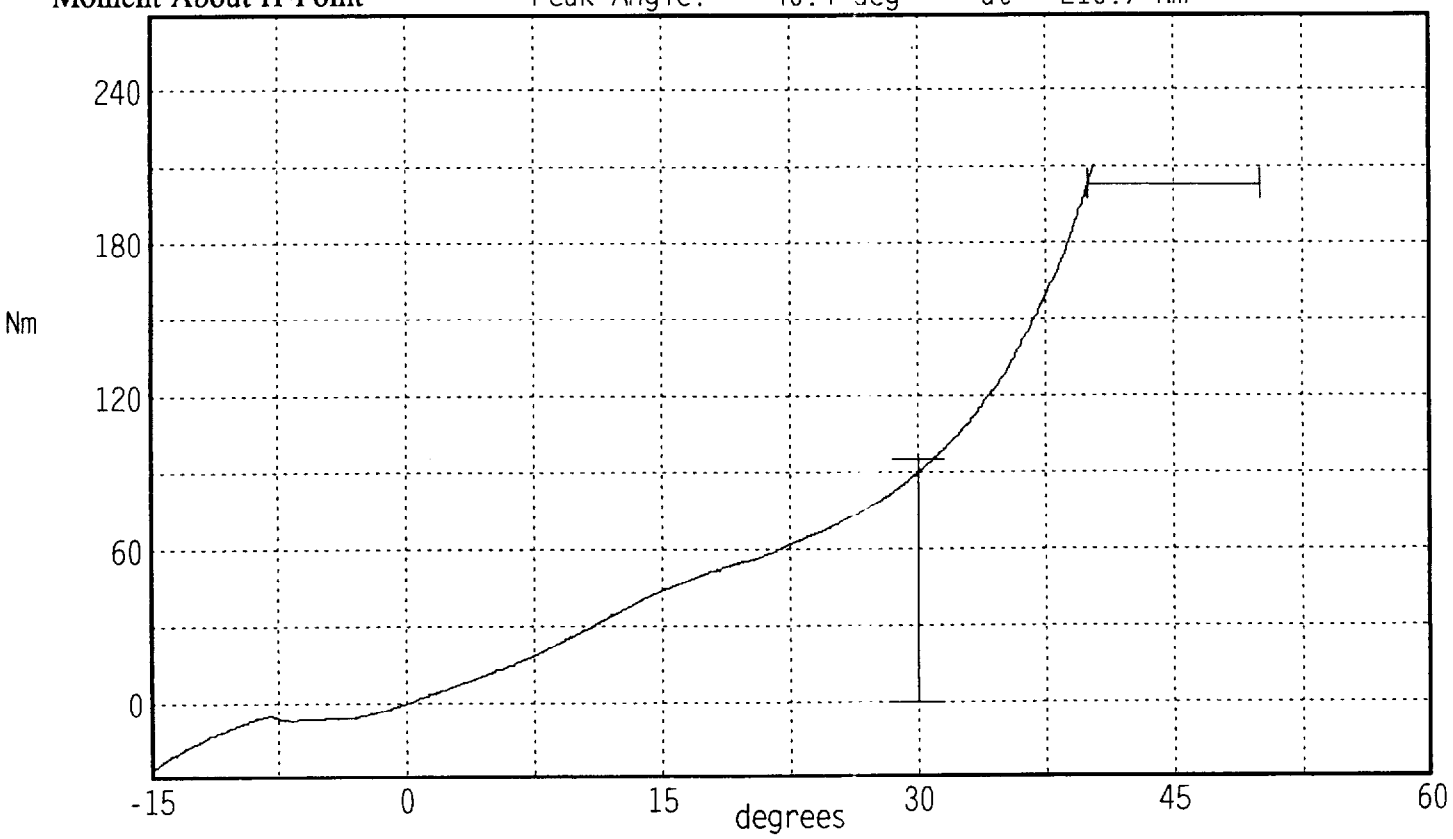
Serial Number: 90R
Test Number:
Comments:

Date: 05/26/2000
Time: 09:56

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	22.0	°C	Pass
Humidity	10 - 70	55	%	Pass
Moment at 30 deg	<= 94.9	90.4	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	40.1	deg	Pass
Average Velocity	5.0 - 10.0	7.5	deg/sec	Pass

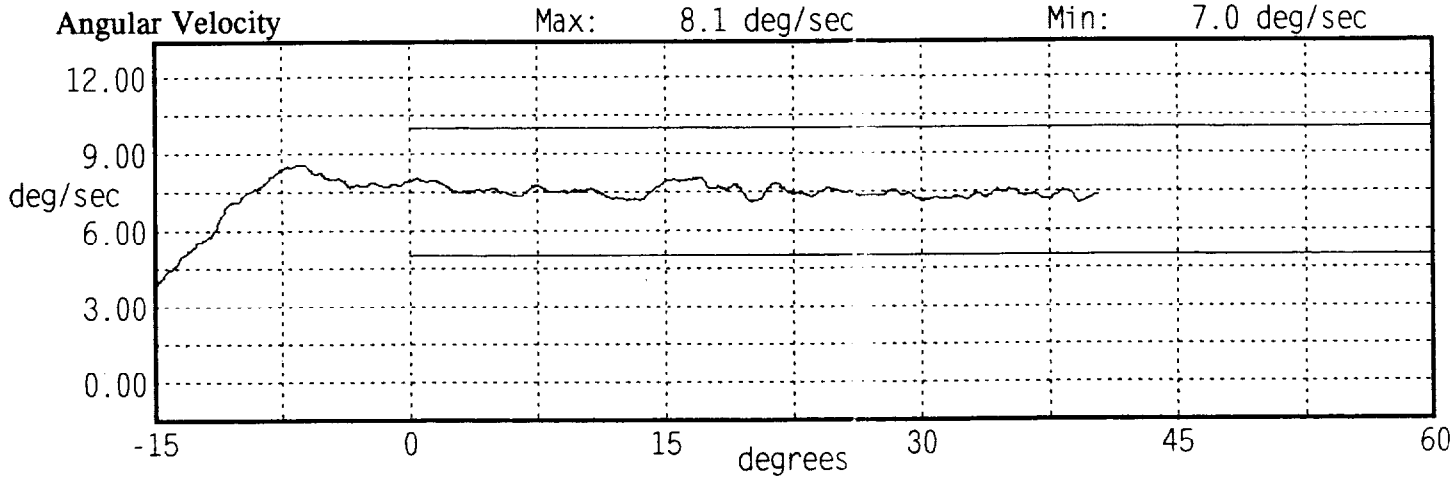
Moment About H-Point

Peak Moment: 210.7 Nm at 40.4 deg
Peak Angle: 40.4 deg at 210.7 Nm



Angular Velocity

Max: 8.1 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

Hybrid III Hip Range of Motion

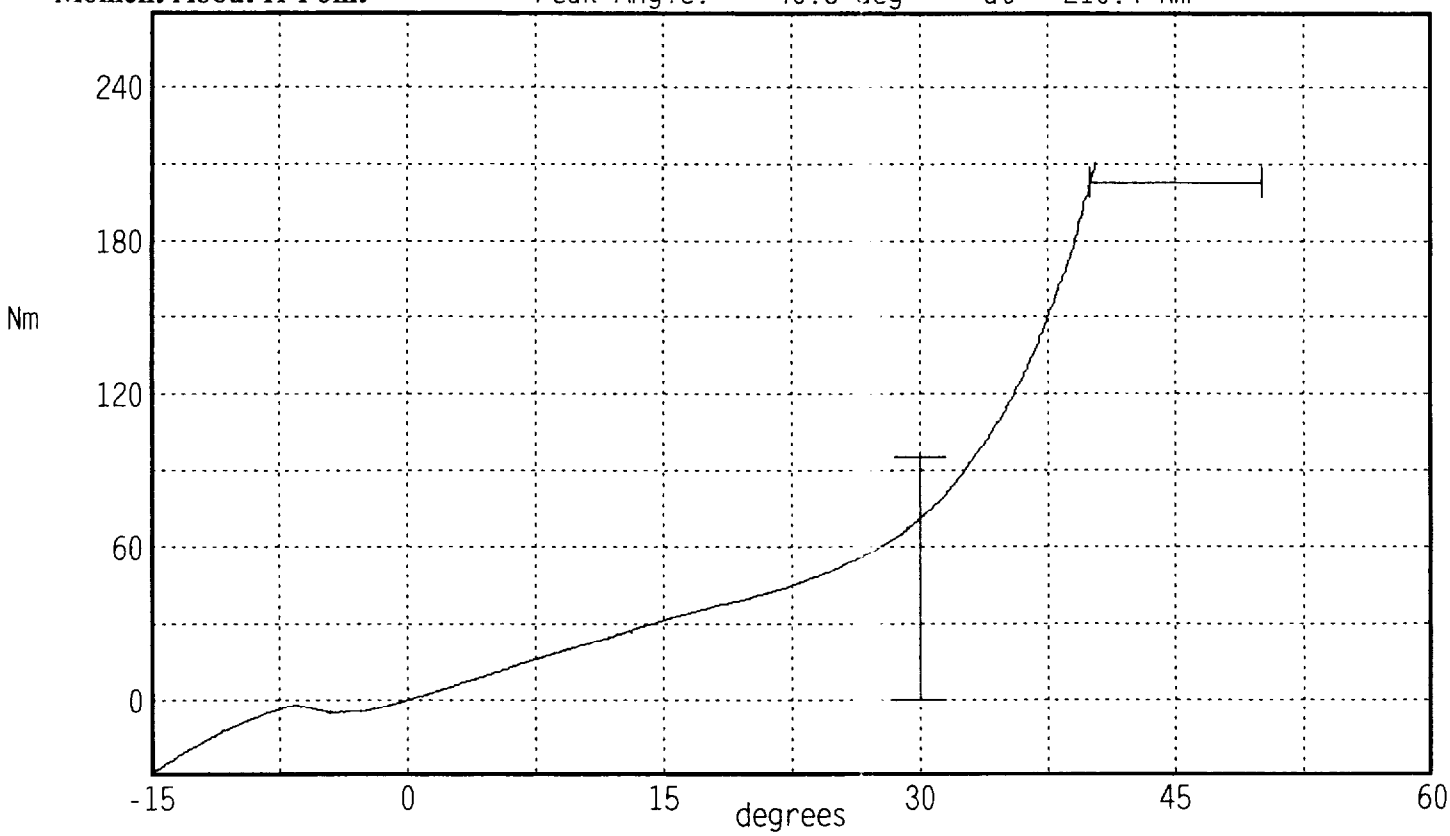
Serial Number: 90L
Test Number:
Comments:

Date: 05/26/2000
Time: 10:12

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	22.0 °C	Pass
Humidity	10 - 70	55 %	Pass
Moment at 30 deg	<= 94.9	71.3 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	40.1 deg	Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec	Pass

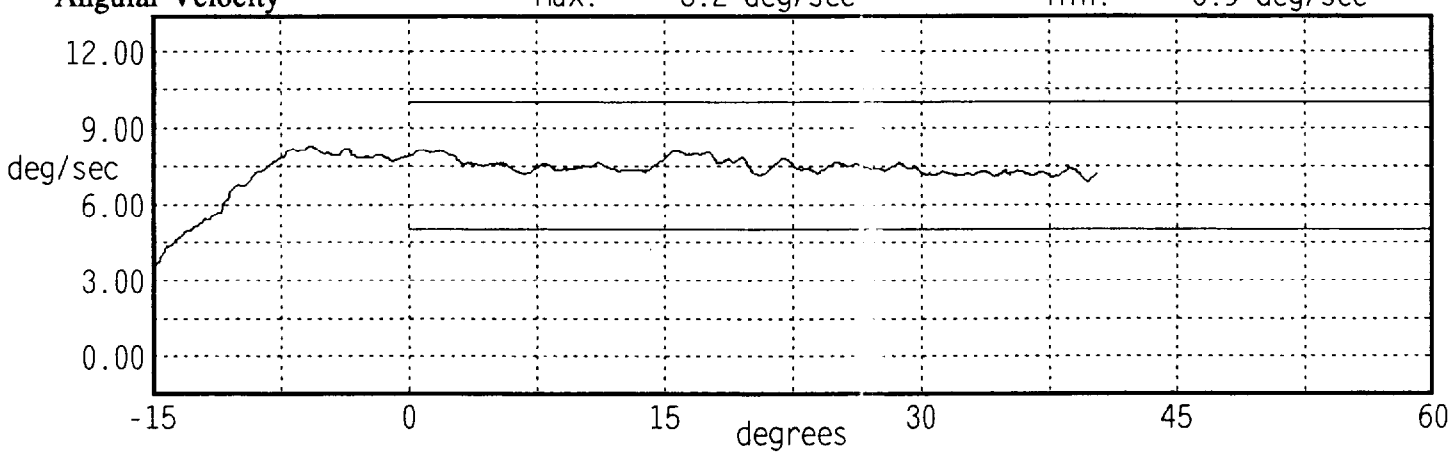
Moment About H-Point

Peak Moment: 210.4 Nm at 40.3 deg
Peak Angle: 40.3 deg at 210.4 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.9 deg/sec



TRANSPORTATION RESEARCH CENTER INC.

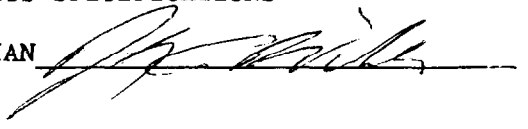
RIGHT KNEE IMPACT TEST

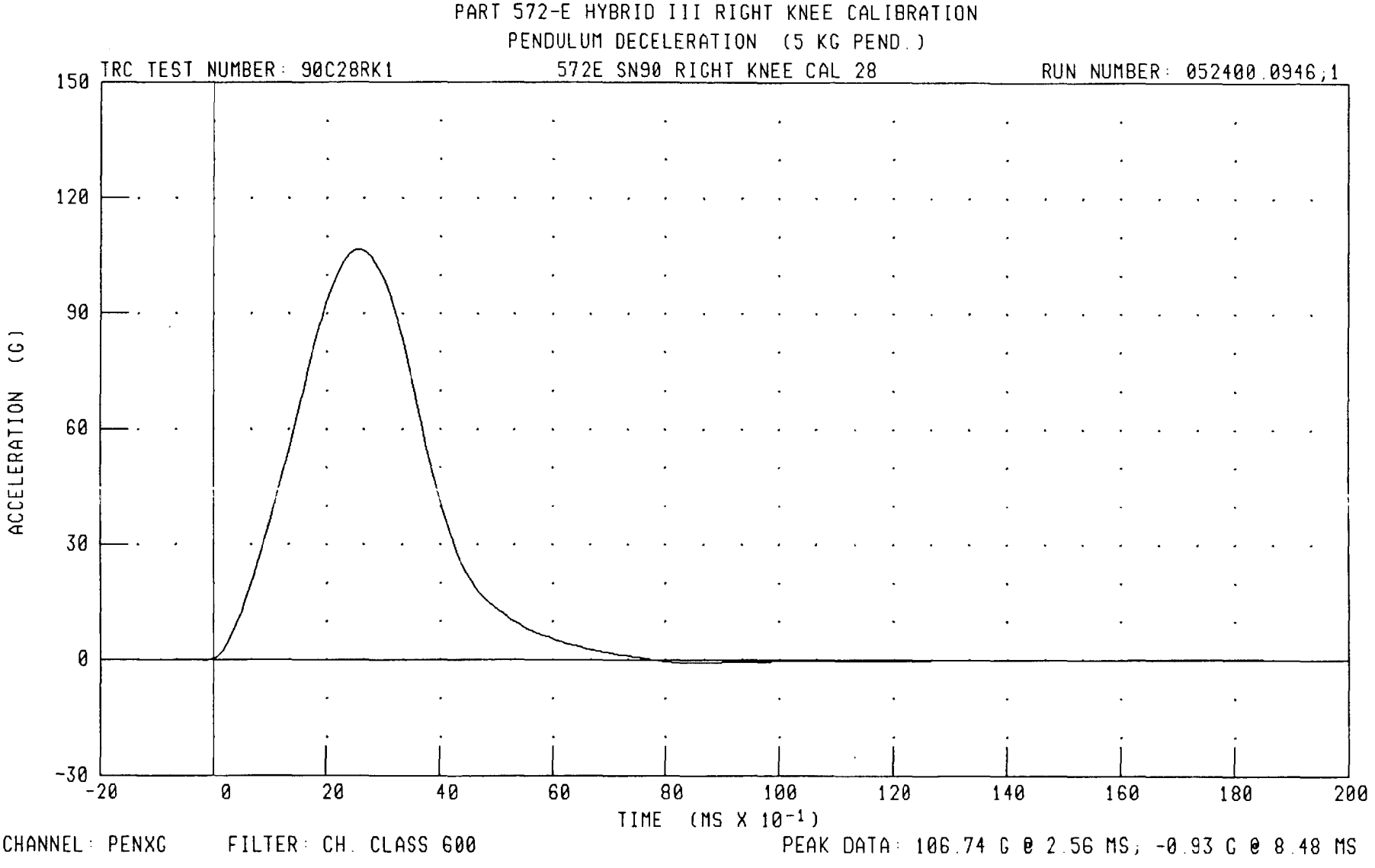
HYBRID III 50th 24-MAY-00

TRC INC. TEST NO: 90C28RK1 572E SN90 RIGHT KNEE CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5222.6 N

TEST MEETS SPECIFICATIONS

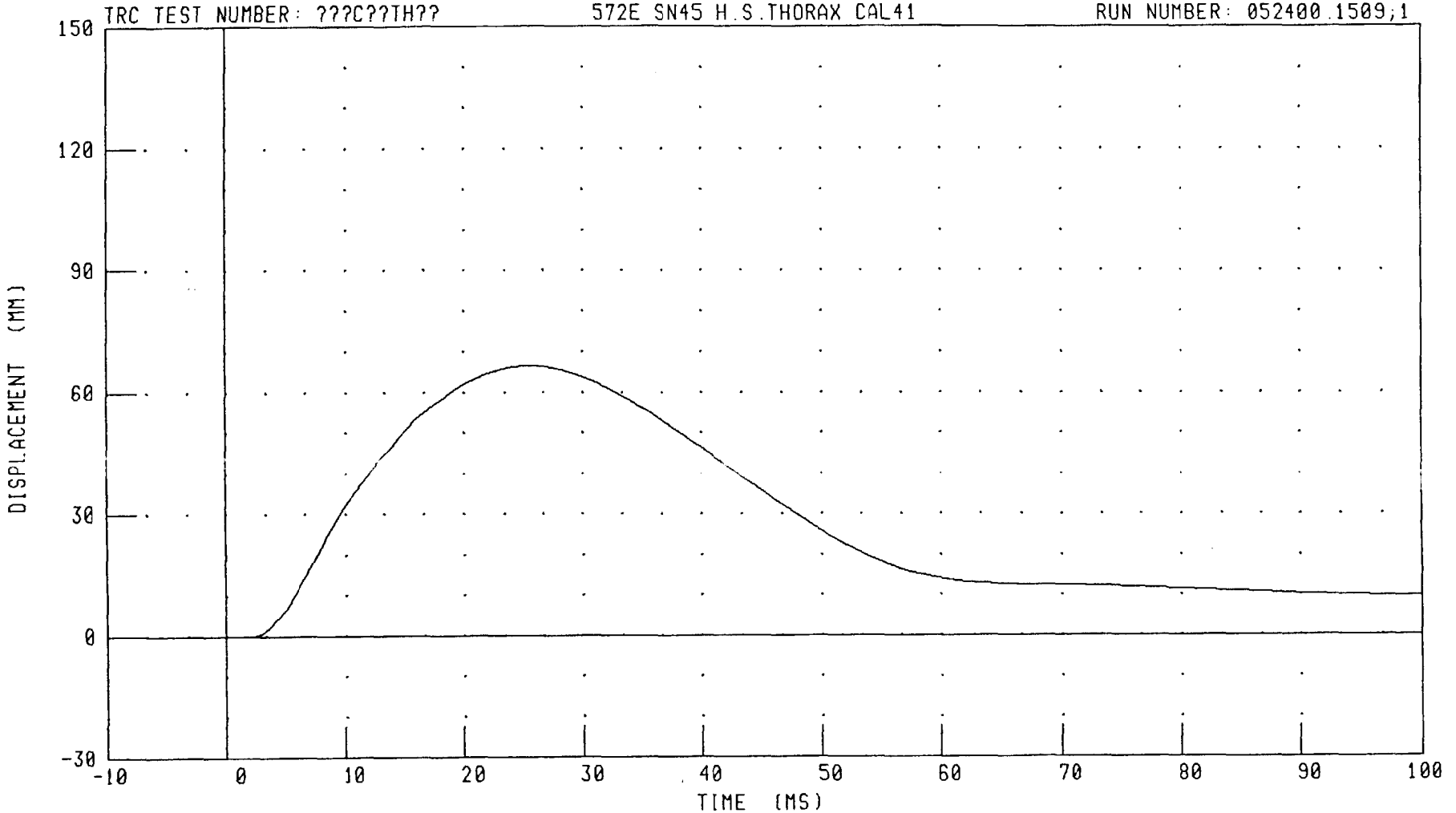
TECHNICIAN  RUN NUMBER: 052400.0940;1


PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 90C28RK1
572E SN90 RIGHT KNEE CAL 28
RUN NUMBER: 052400.0946;1
ACCELERATION (G)
150
120
90
60
30
0
-30
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXG
FILTER: CH. CLASS 600
PEAK DATA: 106.74 G @ 2.56 MS; -0.93 G @ 8.48 MS

PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

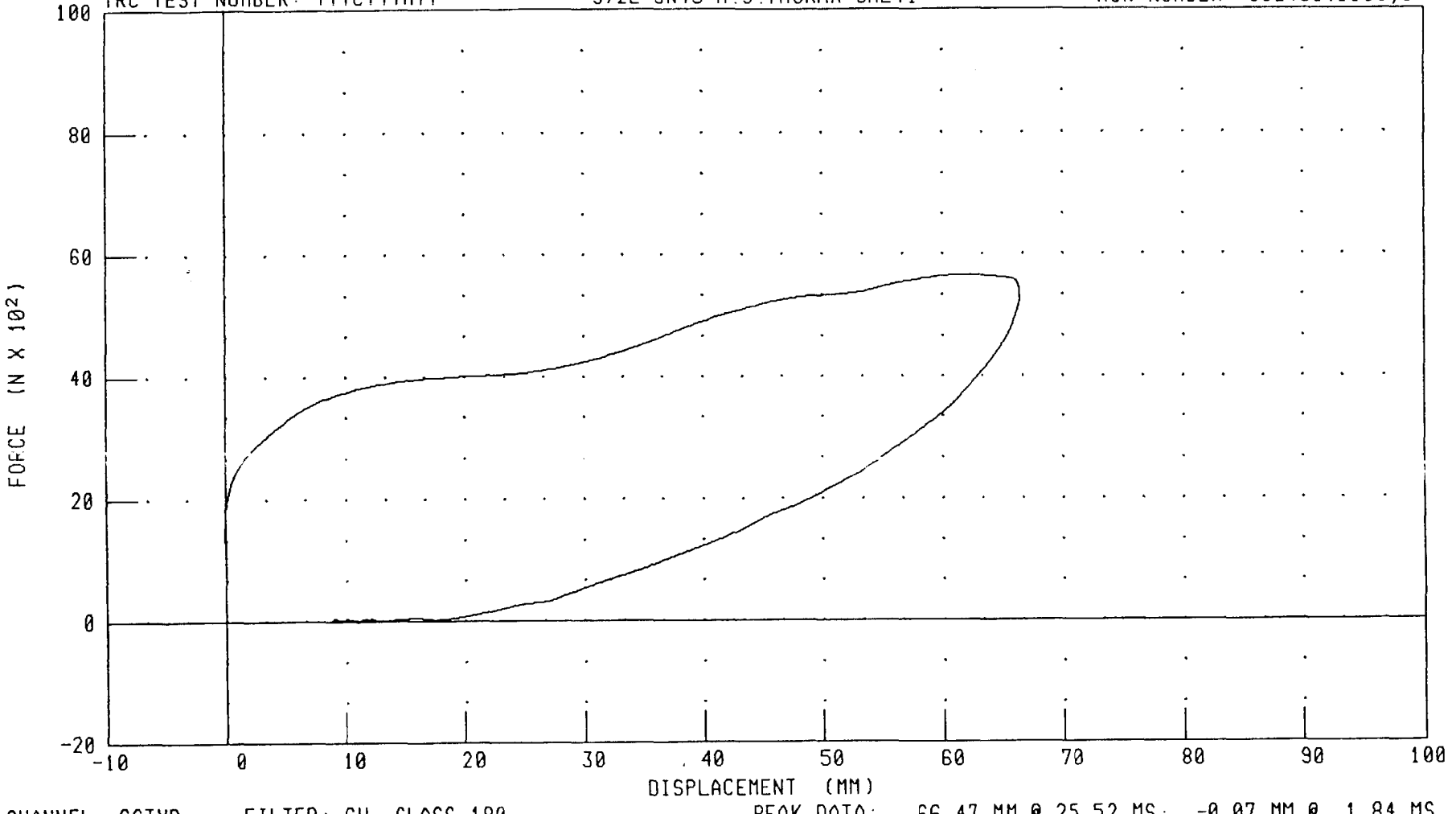
TRC TEST NUMBER: ???C??TH?? 572E SN45 H.S.THORAX CAL41 RUN NUMBER: 052400.1509;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 66.47 MM @ 25.52 MS; -0.07 MM @ 1.84 MS

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

TRC TEST NUMBER: ???C??TH?? 572E SN45 H.S.THORAX CAL41 RUN NUMBER: 052400.1509;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 66.47 MM @ 25.52 MS; -0.07 MM @ 1.84 MS
PENXF CH. CLASS 180 5650.14 N @ 20.00 MS; -26.46 N @ -0.64 MS

Transportation Research Center Inc

Hybrid III Hip Range of Motion

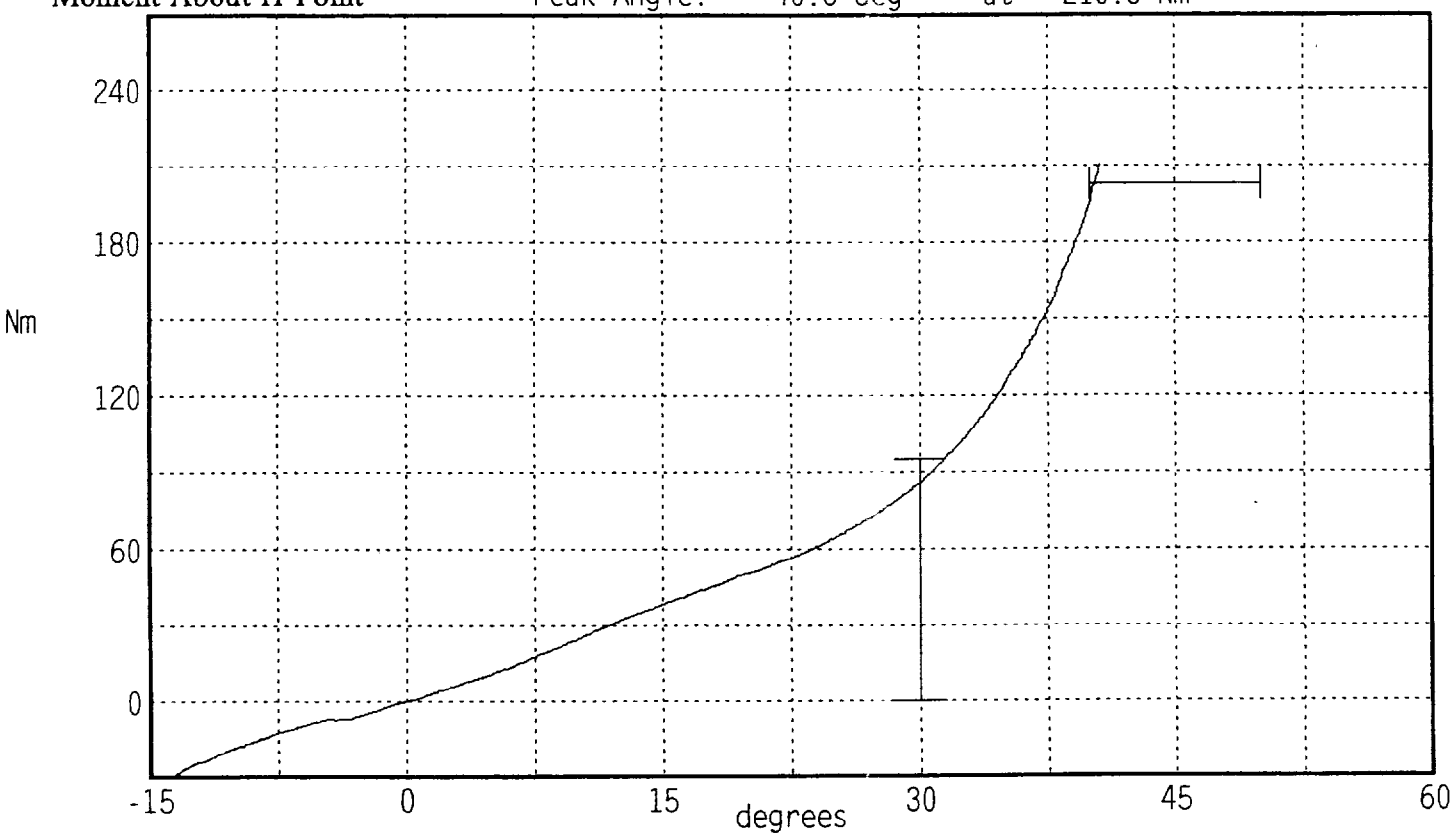
Serial Number: 45R
Test Number:
Comments:

Date: 05/26/2000
Time: 12:25

TEST PARAMETER	SPECIFICATION	TEST RESULTS		
Temperature	18.9 - 25.6	22.0	°C	Pass
Humidity	10 - 70	55	%	Pass
Moment at 30 deg	<= 94.9	86.0	Nm	Pass
Angle at 203 Nm	40.0 - 50.0	40.3	deg	Pass
Average Velocity	5.0 - 10.0	7.4	deg/sec	Pass

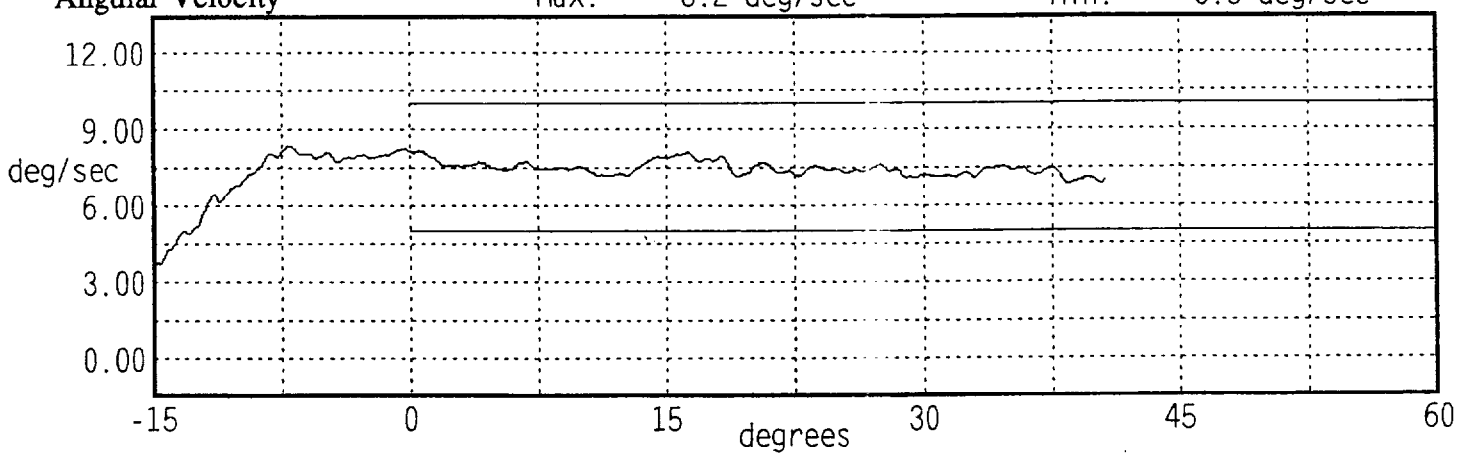
Moment About H-Point

Peak Moment: 210.3 Nm at 40.6 deg
Peak Angle: 40.6 ceg at 210.3 Nm



Angular Velocity

Max: 8.2 deg/sec Min: 6.8 deg/sec



TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th 24-MAY-00

TRC INC. TEST NO: 45C41RK2 572E SN45 RIGHT KNEE CAL 41

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5263.3 N

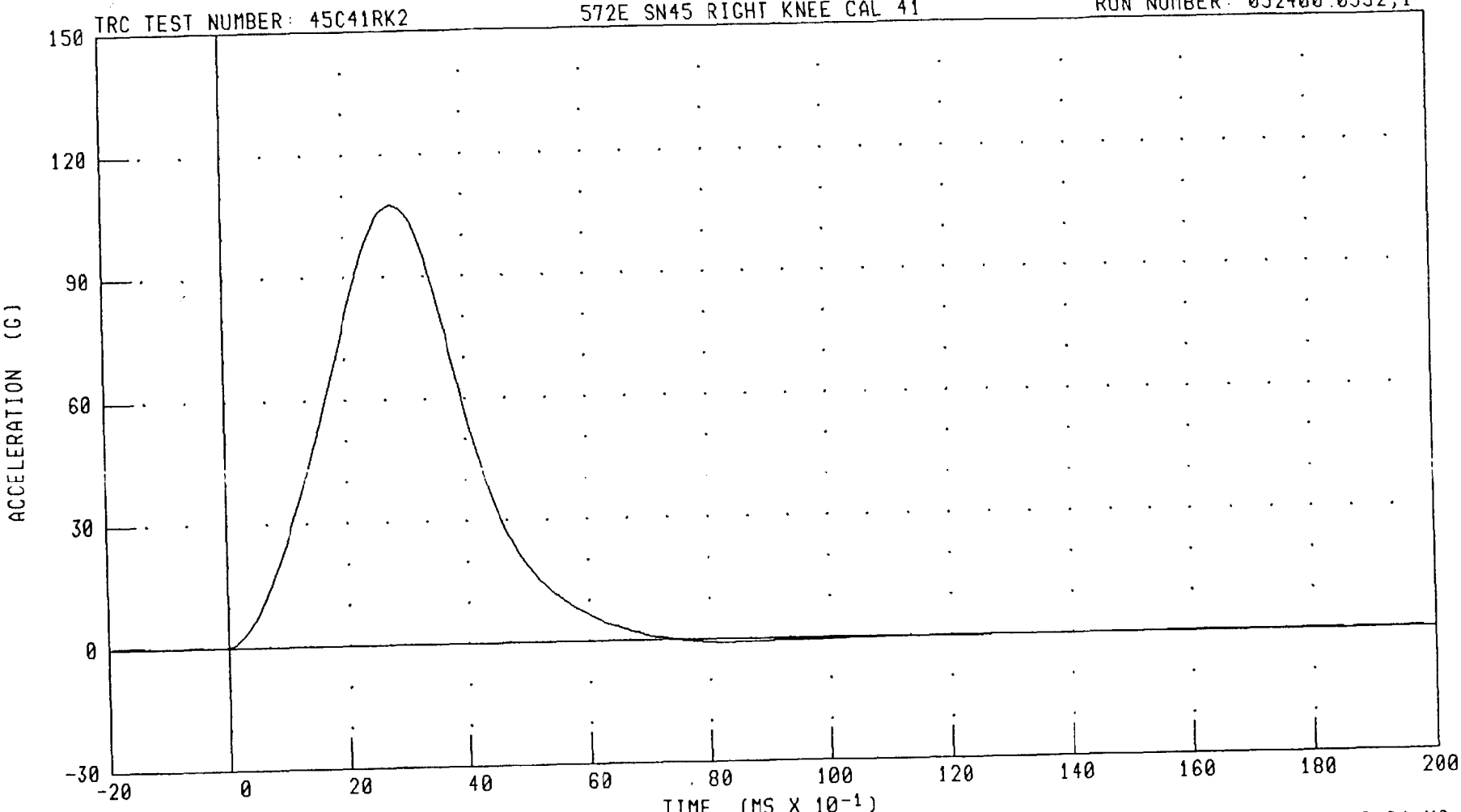
TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052400.0932;1

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
572E SN45 RIGHT KNEE CAL 41

TRC TEST NUMBER: 45C41RK2

RUN NUMBER: 052400.0932;1

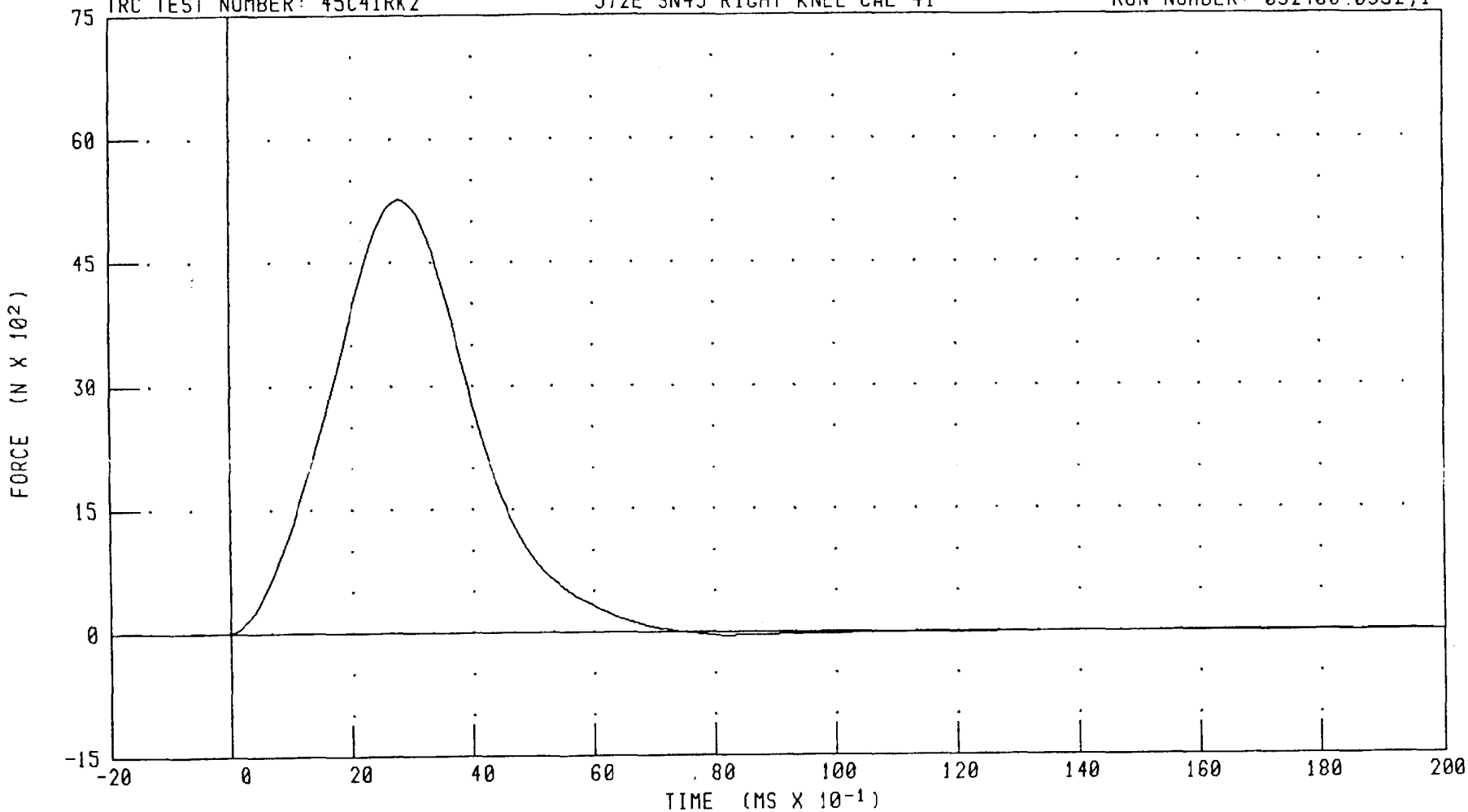


CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 107.57 G @ 2.80 MS; -0.99 G @ 8.24 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 45C41RK2
572E SN45 RIGHT KNEE CAL 41
RUN NUMBER: 052400.0932;1



CHANNEL: PENXF FILTER: CH. CLASS 600
PEAK DATA: 5263.35 N @ 2.80 MS; -48.37 N @ 8.24 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th 24-MAY-00

TRC INC. TEST NO: 45C41LK2 572E SN45 LEFT KNEE CAL 41

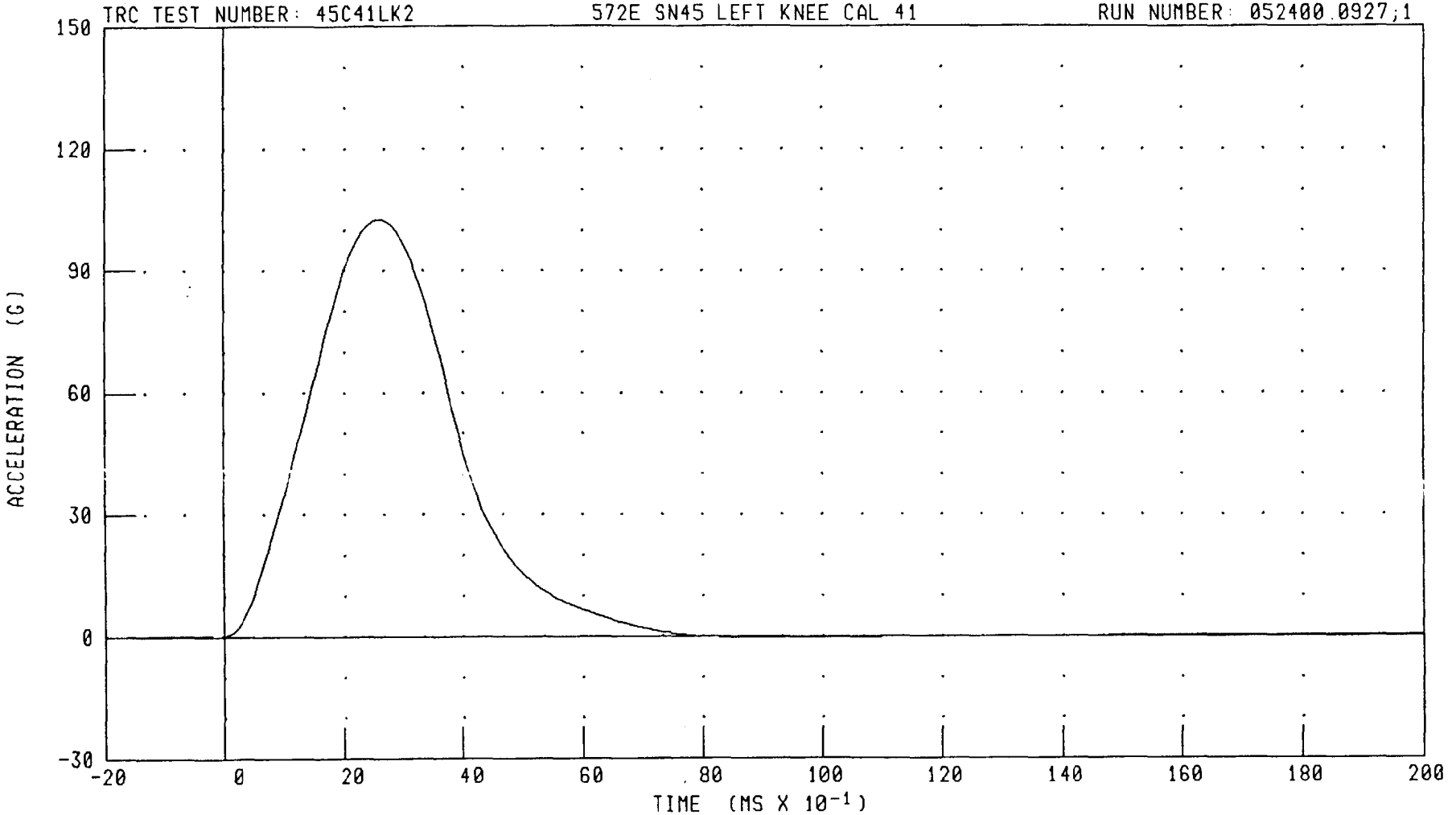
TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5012.7 N

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052400.0927;1

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

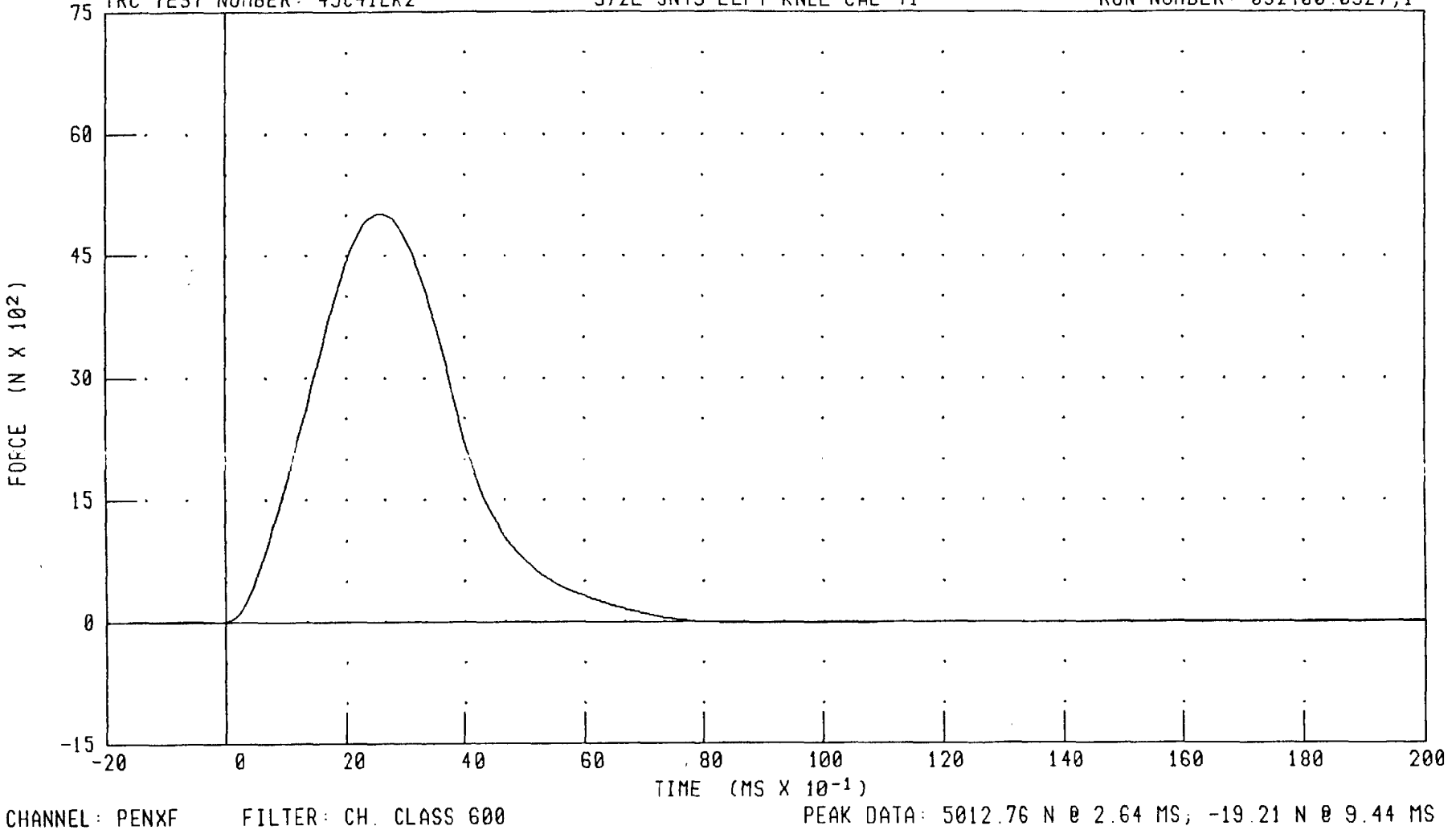
TRC TEST NUMBER: 45C41LK2 572E SN45 LEFT KNEE CAL 41 RUN NUMBER: 052400.0927;1



CHANNEL: PENXC FILTER: CH. CLASS 600 PEAK DATA: 102.45 G @ 2.64 MS; -0.39 G @ 9.44 MS

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

TRC TEST NUMBER: 45C41LK2 572E SN45 LEFT KNEE CAL 41 RUN NUMBER: 052400.0927;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5012.76 N @ 2.64 MS; -19.21 N @ 9.44 MS

Pre-Test Calibration

Bullet Vehicle Passenger Dummy S/N 416

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

DATE: 25-May-00

TRC INC. TEST NO: 416C4ED 572O SN416EXT. DIMENSION CAL4

TEST PARAMETER	DIMEN.	SPECIFICATION	TEST RESULTS
Total Sitting Height	A	622.3 - 647.7 MM	779.78 MM
Shoulder Pivot Height	B	348.0 - 363.2 MM	447.04 MM
Hip Pivot Height	C	63.5 - 73.7 MM	81.28 MM
Hip Pivot from Backline	D	88.9 - 99.1 MM	147.32 MM
Shoulder Pivot from Backline	E	53.3 - 63.5 MM	76.2 MM
Thigh Clearance	F	88.9 - 104.1 MM	129.54 MM
Back of Elbow to Wrist Pivot	G	182.9 - 198.1 MM	251.46 MM
Head Back from Backline	H	41.2 - 48.3 MM	48.26 MM
Shoulder to Elbow Length	I	215.9 - 231.1 MM	287.02 MM
Elbow Rest Height	J	157.4 - 177.8 MM	190.5 MM
Buttock to Knee Length	K	370.8 - 391.2 MM	538.48 MM
Popliteal Height	L	269.2 - 289.6 MM	363.22 MM
Knee to Floor Height	M	307.4 - 322.6 MM	403.86 MM
Buttock Popliteal Length	N	320.0 - 340.4 MM	426.72 MM
Chest Depth	O	129.6 - 144.8 MM	180.34 MM
Foot Length	P	170.2 - 185.4 MM	226.06 MM
Buttock to Knee Pivot Length	R	342.9 - 363.3 MM	467.36 MM
Head Breadth	S	137.1 - 147.3 MM	144.78 MM
Head Depth	T	167.6 - 177.8 MM	185.42 MM
Hip Breadth	U	208.3 - 223.5 MM	307.34 MM
Shoulder Breadth	V	259.1 - 274.3 MM	355.6 MM
Foot Breadth	W	62.3 - 77.5 MM	88.9 MM
Head Circumference	X	510.5 - 530.9 MM	541.02 MM
Chest Circumference with Jacket	Y	596.9 - 622.3 MM	866.14 MM
Waist Circumference	Z	558.8 - 584.2 MM	779.78 MM
Ref Location for Chest Circumference	AA	325.1 - 335.3 MM	302.26 MM
Ref Location for Waist Circumference	BB	153.7 - 163.9 MM	165.1 MM

DUMMY MEETS SPECIFICATION

TECHNICIAN: Todd L Dunstack

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III SMALL FEMALE 24-MAY-00

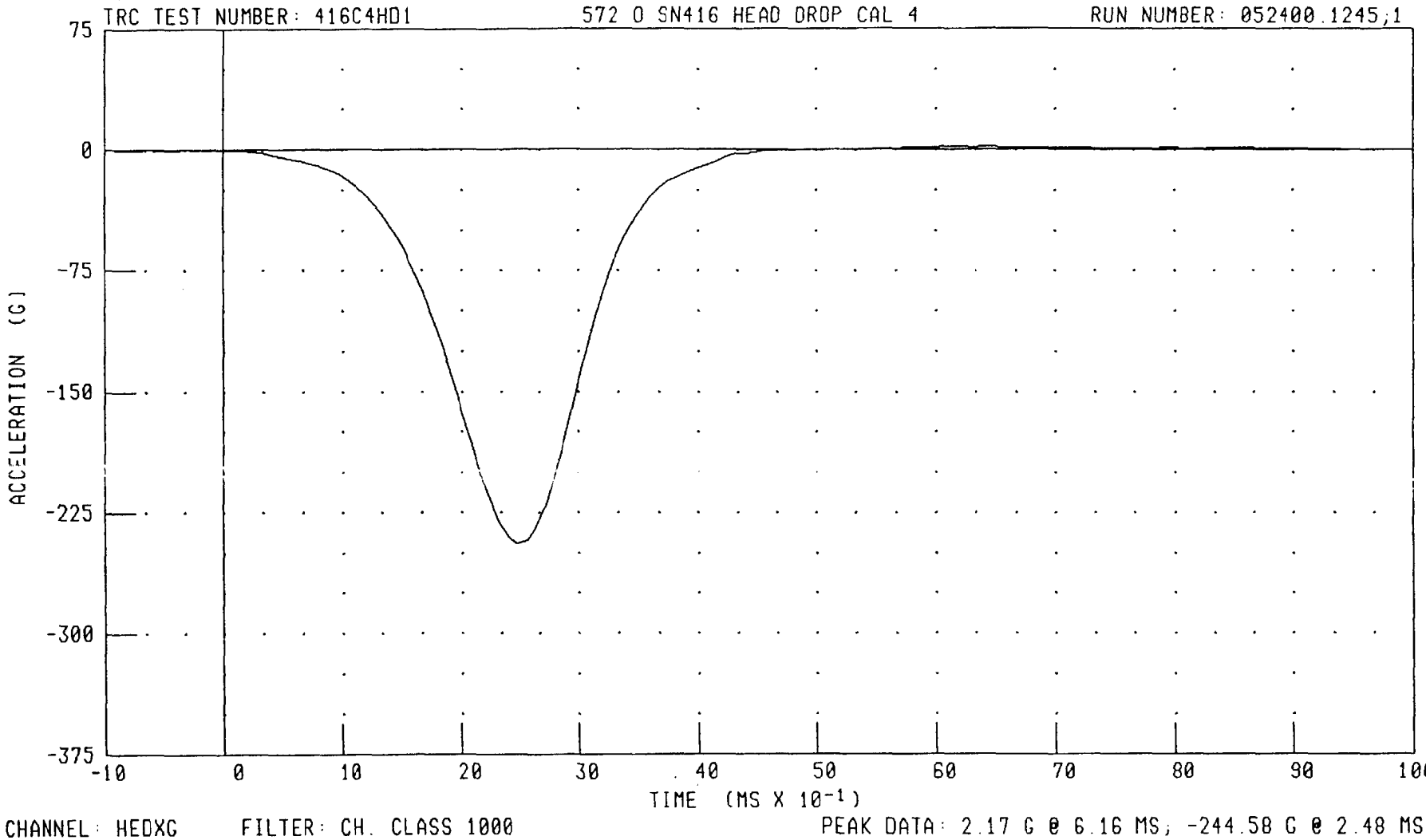
TRC INC. TEST NO: 416C4HD1 572 O SN416 HEAD DROP CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PEAK RESULTANT ACCELERATION	250 - 300 G	275.18 G
PEAK LATERAL ACCELERATION	15 G MAX	4.77 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052400.1244;1

PART 572-O HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

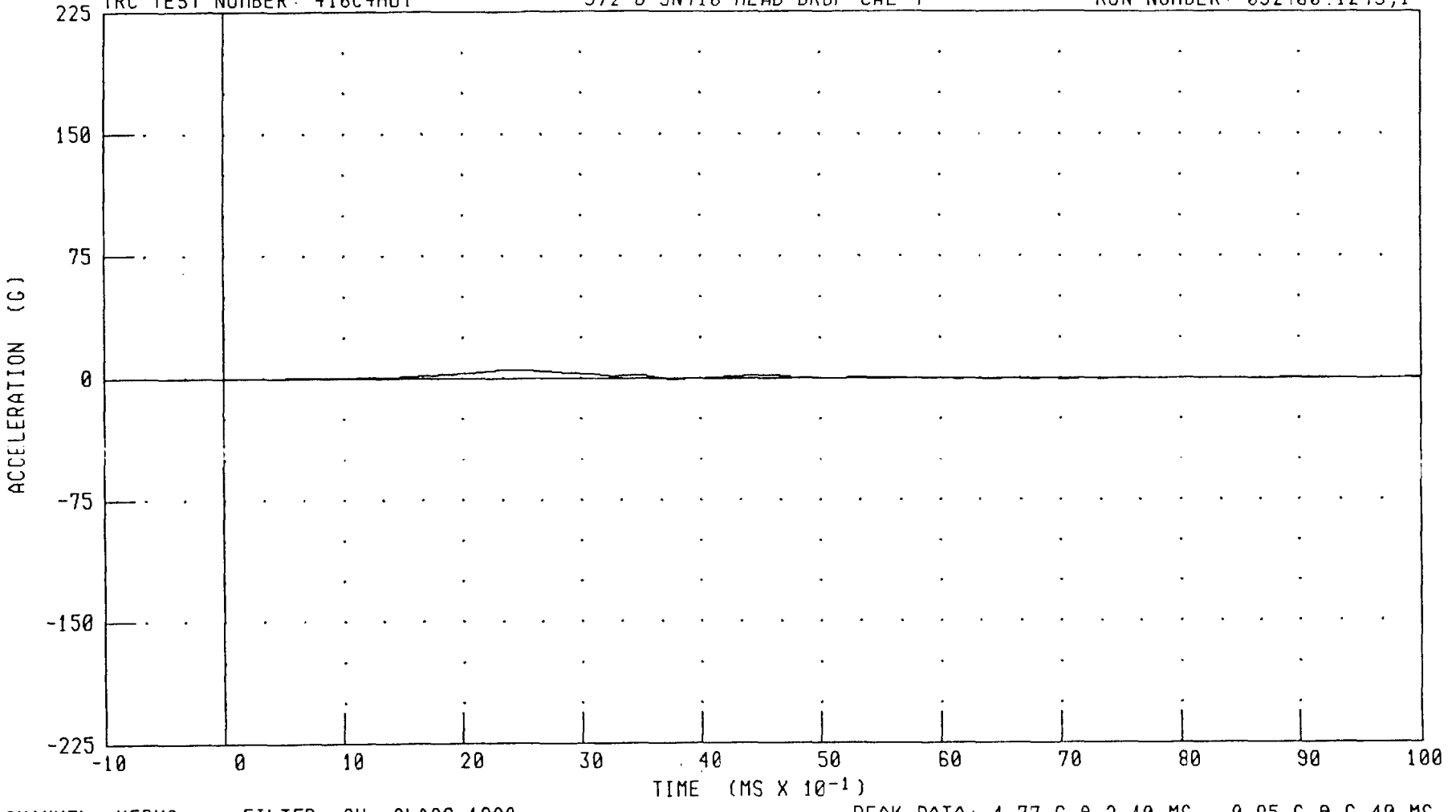


CHANNEL: HEDXG FILTER: CH. CLASS 1000 PEAK DATA: 2.17 G @ 6.16 MS; -244.58 G @ 2.48 MS

PART 572-O HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 416C4HD1 572 O SN416 HEAD DROP CAL 4 RUN NUMBER: 052400.1245;1

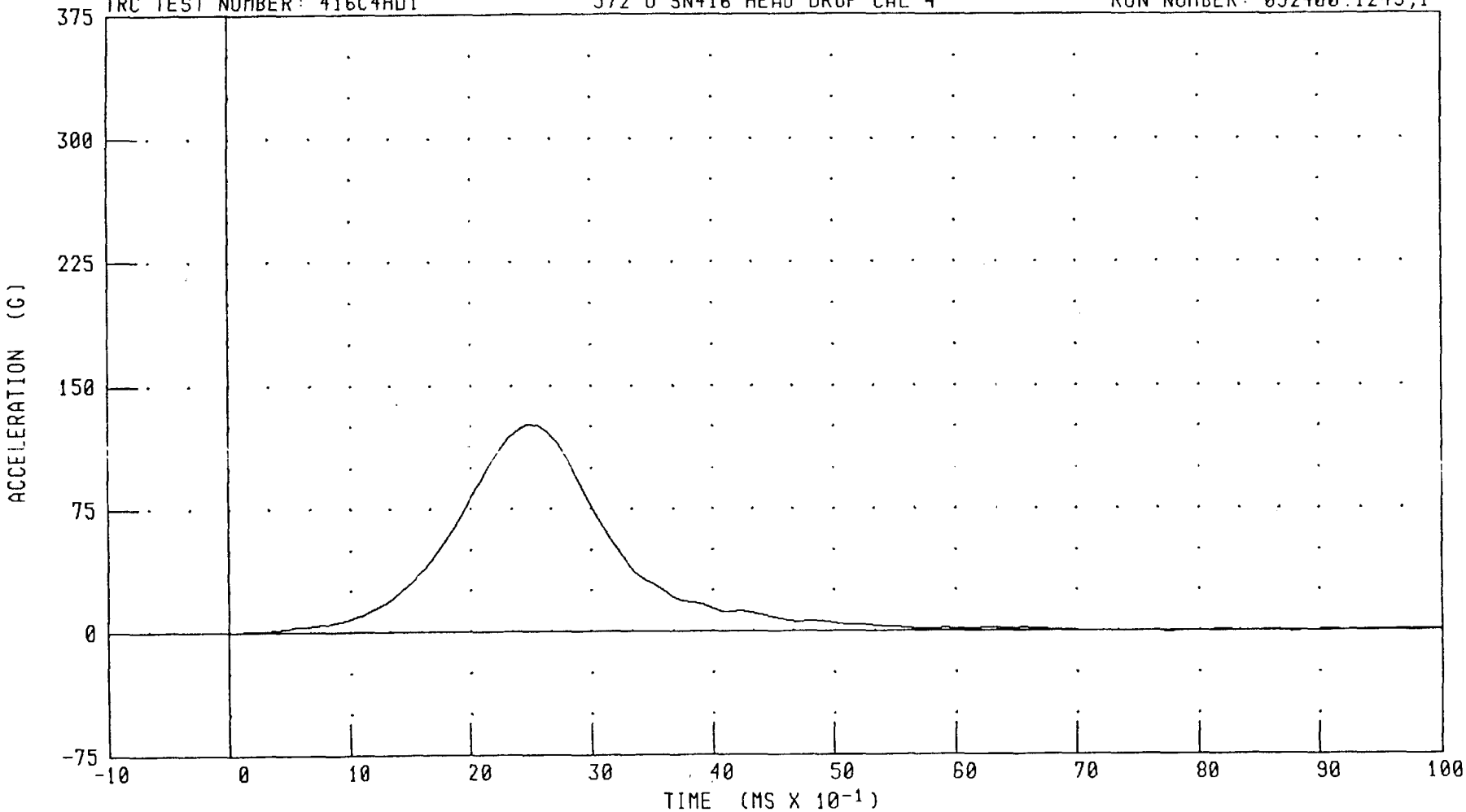


CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 4.77 G @ 2.40 MS; -0.85 G @ 6.40 MS

PART 572-O HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: 416C4HD1 572 O SN416 HEAD DROP CAL 4 RUN NUMBER: 052400.1245;1

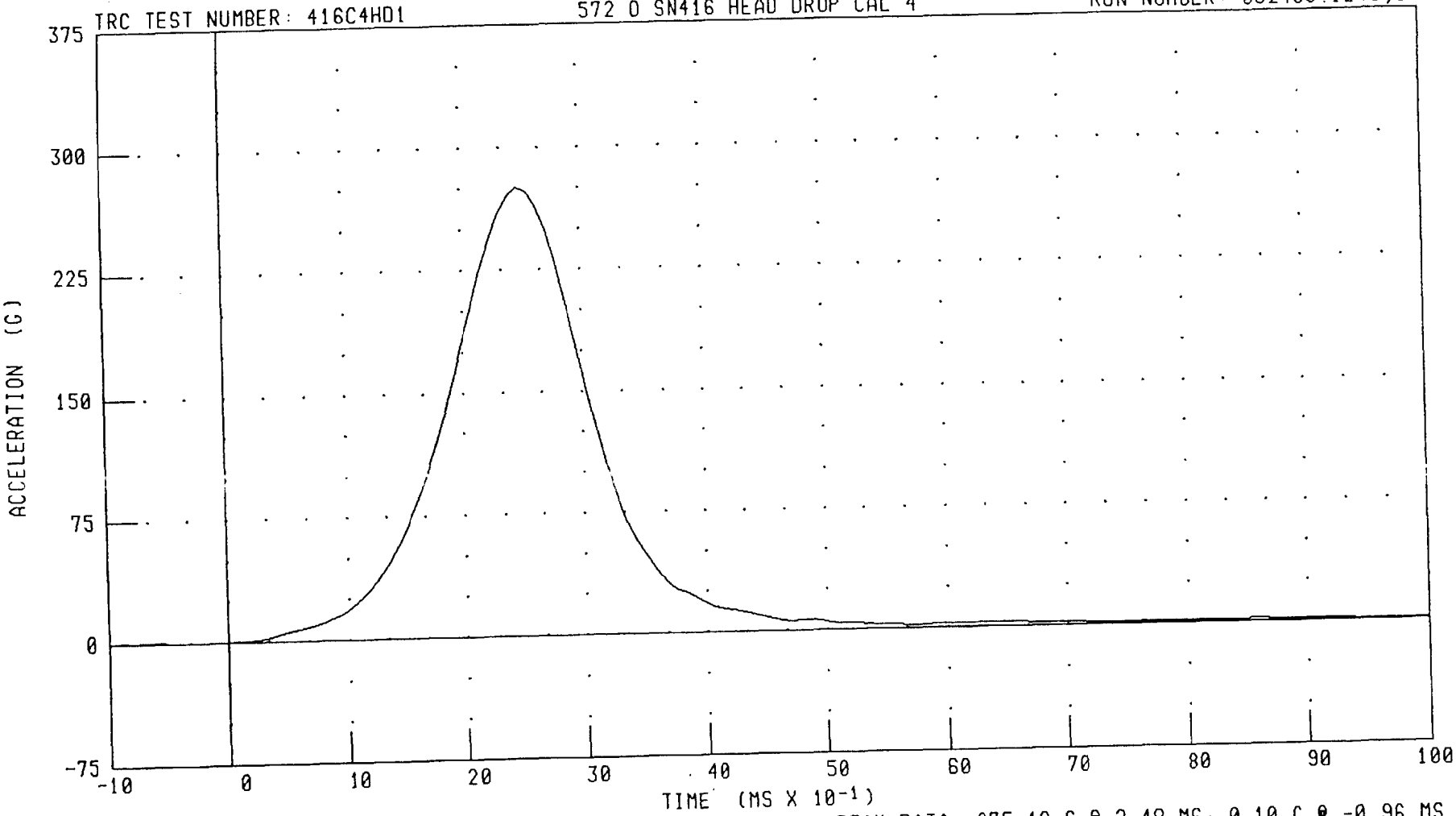


CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 126.04 G @ 2.48 MS; -0.59 G @ 7.76 MS

PART 572-O HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
572 O SN416 HEAD DROP CAL 4

TRC TEST NUMBER: 416C4HD1

RUN NUMBER: 052400.1245;1

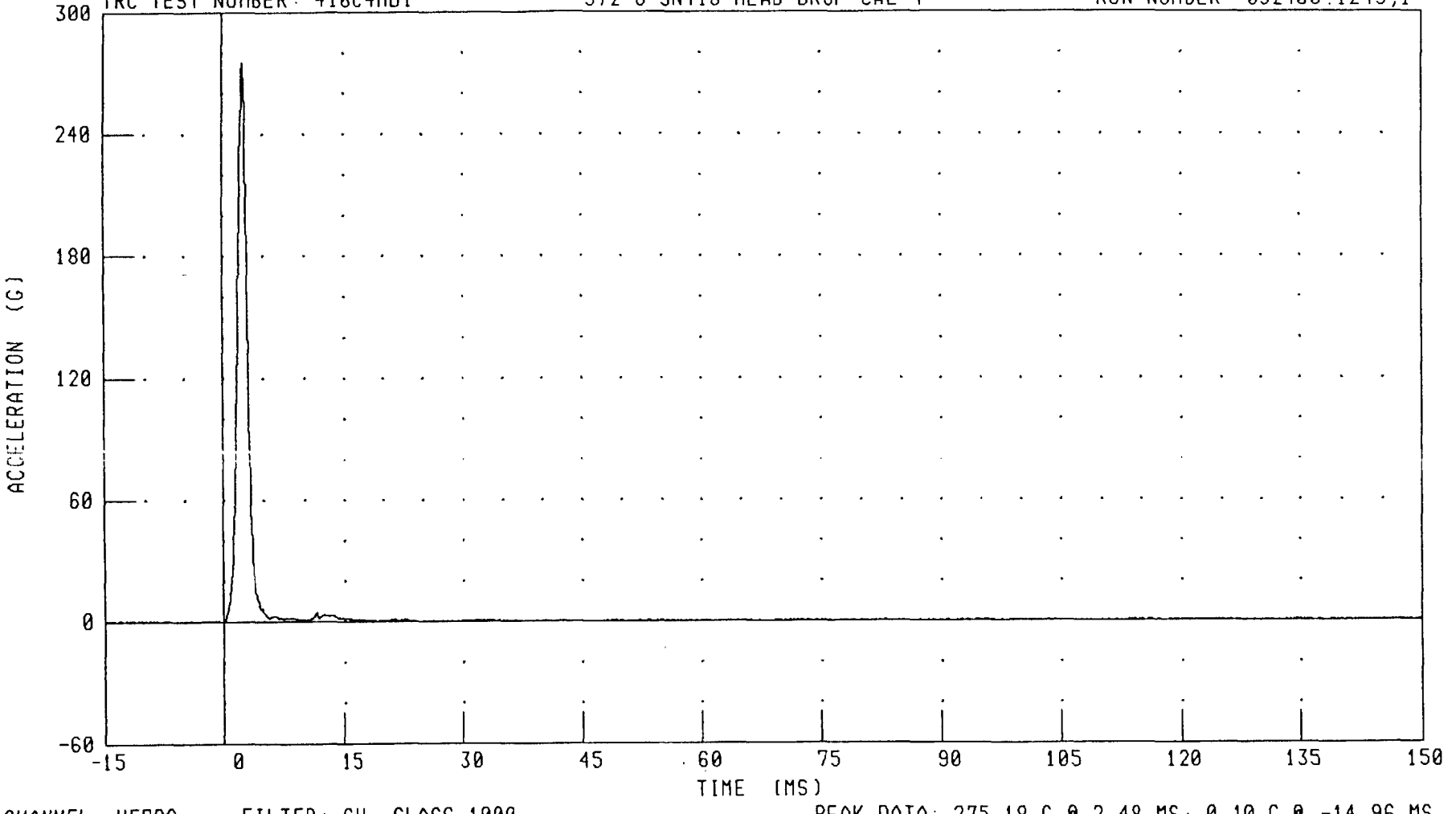


CHANNEL: HEDRG FILTER: CH. CLASS 1000

PEAK DATA: 275.18 G @ 2.48 MS; 0.10 G @ -0.96 MS

PART 572-O HYBRID III HEAD CALIBRATION
CHECK PLOT - HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 416C4HD1 572 O SN416 HEAD DROP CAL 4 RUN NUMBER: 052400.1245;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 275.18 G @ 2.48 MS; 0.10 G @ -14.96 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III SMALL FEMALE 24-MAY-00

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

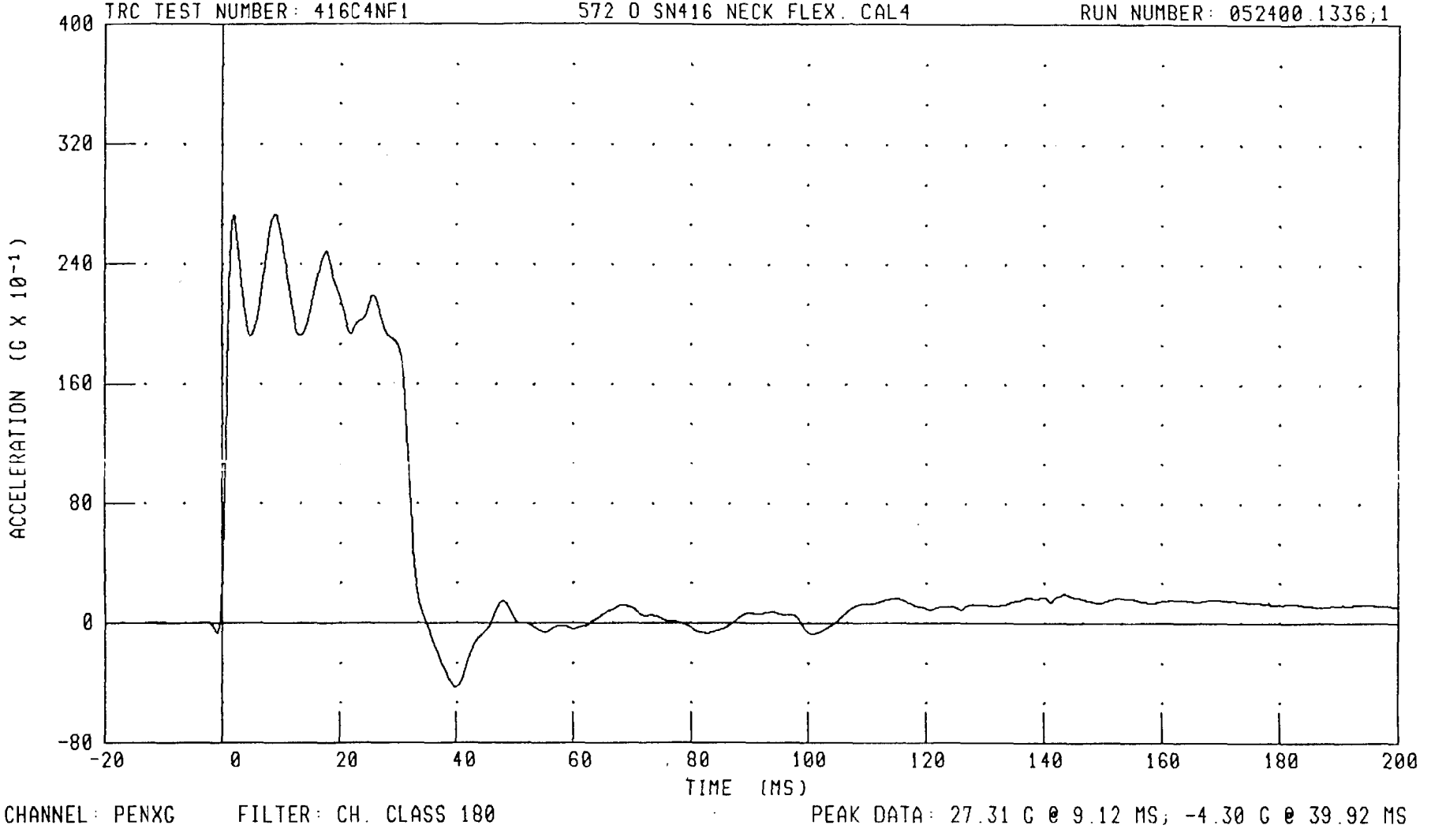
TRC INC. TEST NO: 416C4NF1 572 O SN416 NECK FLEX. CAL4

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	65.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.12 M/S
INTEGRATED PENDULUM VELOCITY	10 MS	2.0 - 2.5 M/S	2.17 M/S
	20 MS	4.0 - 5.0 M/S	4.36 M/S
	30 MS	5.8 - 7.0 M/S	6.34 M/S
PEAK D-PLANE ROTATION		77 - 91 DEG.	78.04 DEG.
PEAK MOMENT DURING ROTATION INTERVAL		69 - 83 NM	73.95 NM
POSITIVE MOMENT DECAY TIME TO 10 NM		80 - 100 MS	87.92 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN John C. Miller RUN NUMBER: 052400.1323;1

PART 572-0 HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

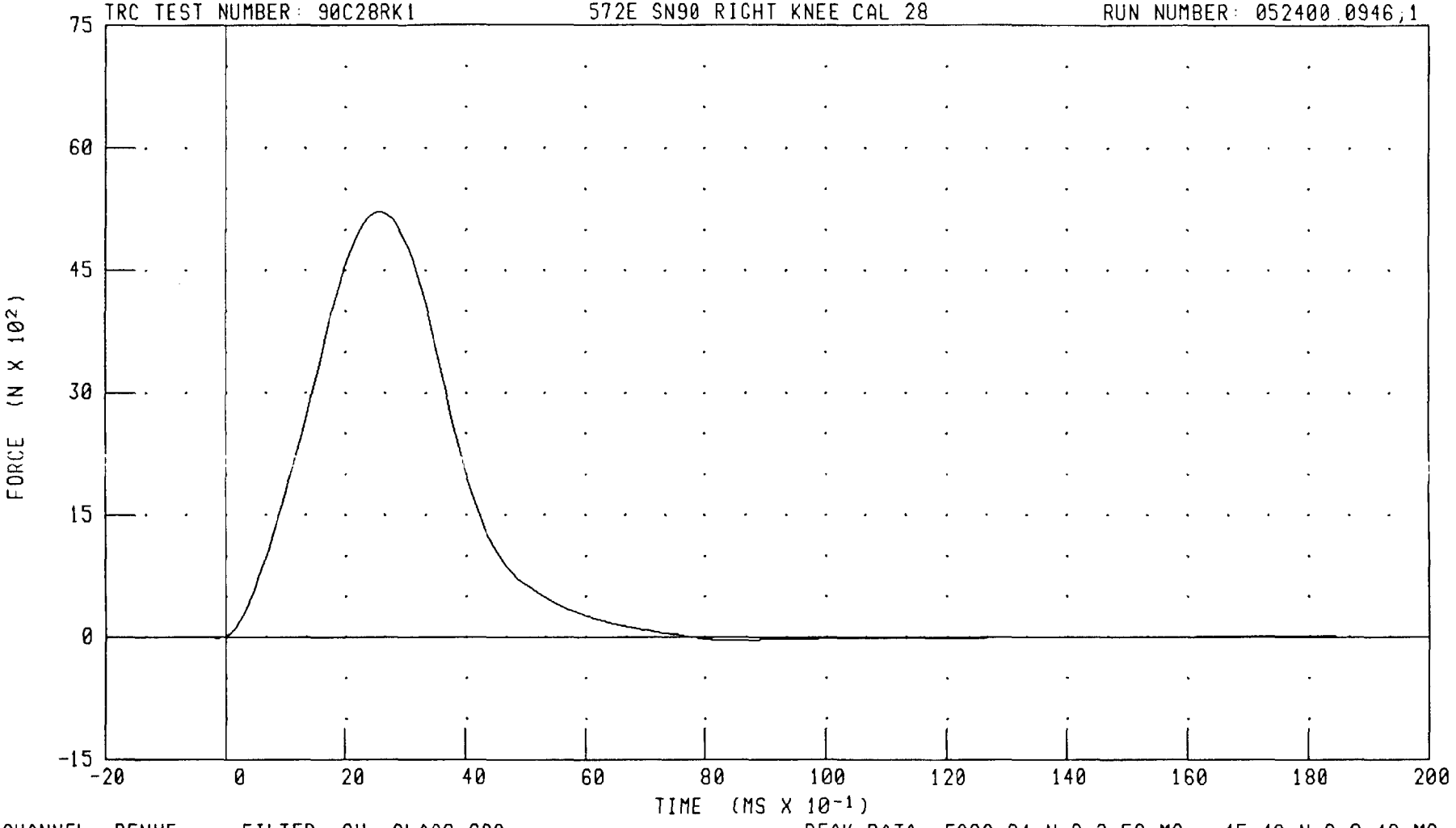


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 27.31 G @ 9.12 MS; -4.30 G @ 39.92 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 90C28RK1 572E SN90 RIGHT KNEE CAL 28 RUN NUMBER: 052400.0946;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5222.64 N @ 2.56 MS; -45.49 N @ 8.48 MS

TRANSPORTATION RESEARCH CENTER INC.

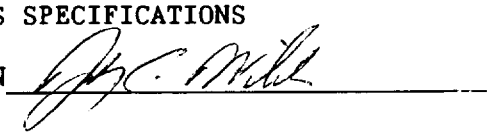
LEFT KNEE IMPACT TEST

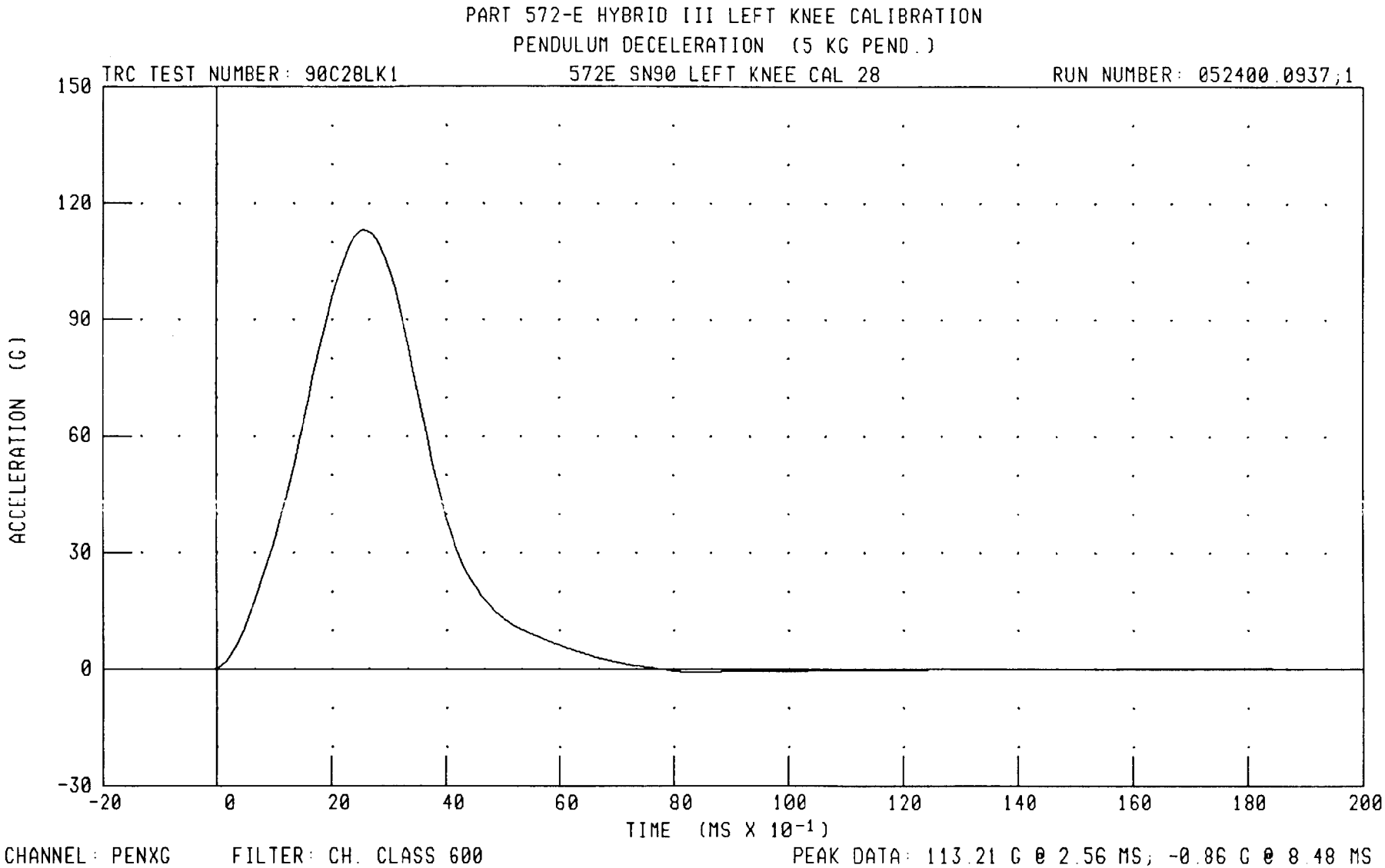
HYBRID III 50th 24-MAY-00

TRC INC. TEST NO: 90C28LK1 572E SN90 LEFT KNEE CAL 28

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.10 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5539.3 N

TEST MEETS SPECIFICATIONS

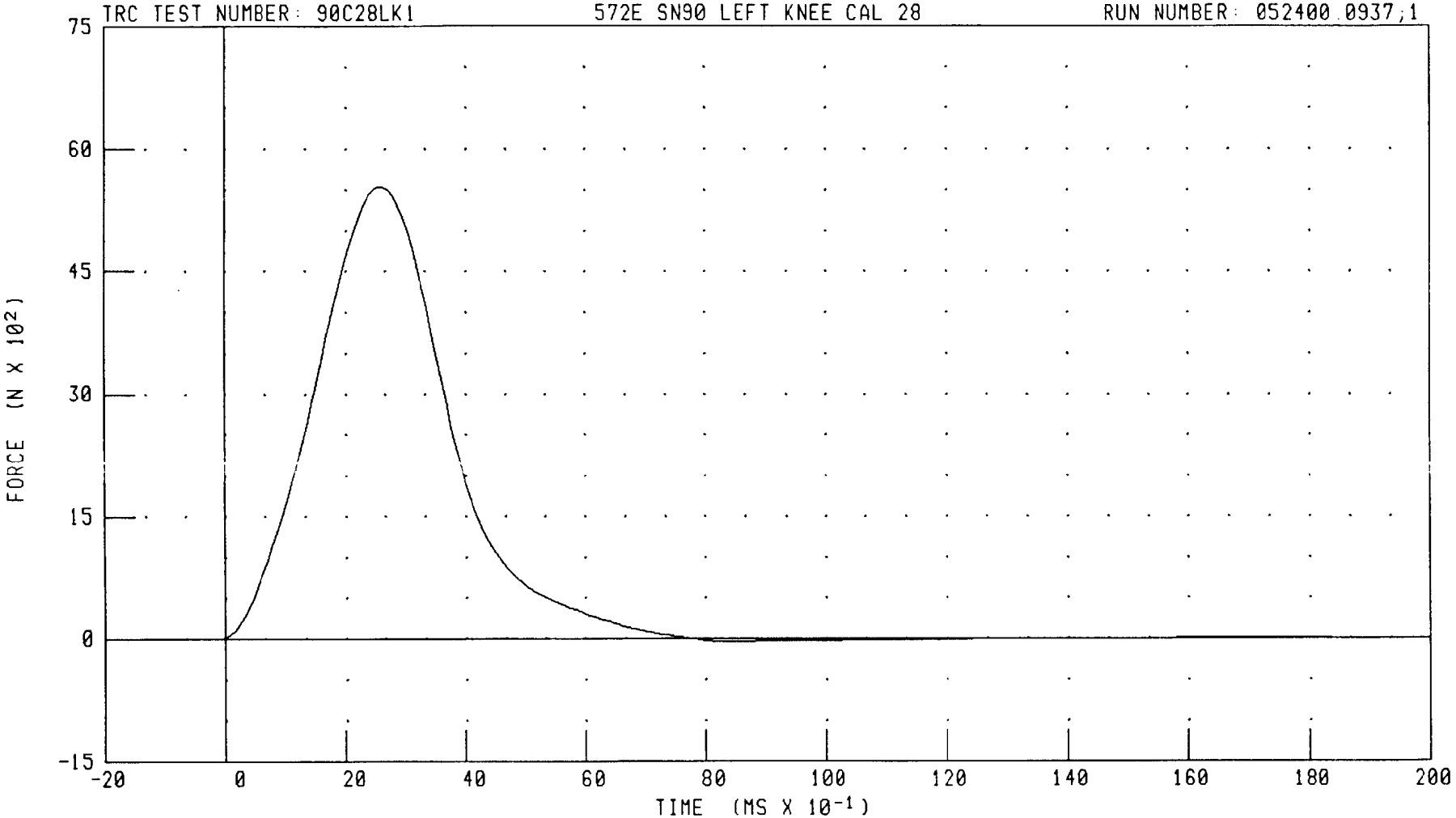
TECHNICIAN  RUN NUMBER: 052400.0937;1


PART 572-E HYBRID III LEFT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)
TRC TEST NUMBER: 90C28LK1
572E SN90 LEFT KNEE CAL 28
RUN NUMBER: 052400.0937;1
ACCELERATION (G)
150
120
90
60
30
0
-30
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS X 10⁻¹)
CHANNEL: PENXG
FILTER: CH. CLASS 600
PEAK DATA: 113.21 G @ 2.56 MS; -0.86 G @ 8.48 MS

PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 90C28LK1 572E SN90 LEFT KNEE CAL 28 RUN NUMBER: 052400.0937;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5539.33 N @ 2.56 MS, -42.28 N @ 8.48 MS

Pre-Test Calibration

Target Vehicle Passenger Dummy S/N 329

TRANSPORTATION RESEARCH CENTER INC.
HYBRID III SMALL FEMALE EXTERNAL DIMENSIONS
SN: 329 MFG:FTSS

DATE: 26-May-00

TRC INC. TEST NO: 329C6ED 572O SN329EXT. DIMENSION CAL6

TEST PARAMETER	DIMEN.	SPECIFICATION	TEST RESULTS
Total Sitting Height	A	622.3 - 647.7 MM	784.9 MM
Shoulder Pivot Height	B	348.0 - 363.2 MM	447.0 MM
Hip Pivot Height	C	63.5 - 73.7 MM	83.8 MM
Hip Pivot from Backline	D	88.9 - 99.1 MM	147.3 MM
Shoulder Pivot from Backline	E	53.3 - 63.5 MM	73.7 MM
Thigh Clearance	F	88.9 - 104.1 MM	129.5 MM
Back of Elbow to Wrist Pivot	G	182.9 - 198.1 MM	251.5 MM
Head Back from Backline	H	43.2 - 48.3 MM	45.7 MM
Shoulder to Elbow Length	I	215.9 - 231.1 MM	287.0 MM
Elbow Rest Height	J	157.4 - 177.8 MM	193.0 MM
Buttock to Knee Length	K	370.8 - 391.2 MM	530.9 MM
Popliteal Height	L	269.2 - 289.6 MM	355.6 MM
Knee to Floor Height	M	307.4 - 322.6 MM	403.9 MM
Buttock Popliteal Length	N	320.0 - 340.4 MM	429.3 MM
Chest Depth	O	129.6 - 144.8 MM	180.3 MM
Foot Length	P	170.2 - 185.4 MM	223.5 MM
Buttock to Knee Pivot Length	R	342.9 - 363.3 MM	475.0 MM
Head Breadth	S	137.1 - 147.3 MM	144.8 MM
Head Depth	T	167.6 - 177.8 MM	185.4 MM
Hip Breadth	U	208.3 - 223.5 MM	304.8 MM
Shoulder Breadth	V	259.1 - 274.3 MM	353.1 MM
Foot Breadth	W	62.3 - 77.5 MM	88.9 MM
Head Circumference	X	510.5 - 530.9 MM	541.0 MM
Chest Circumference with Jacket	Y	596.9 - 622.3 MM	866.1 MM
Waist Circumference	Z	558.8 - 584.2 MM	782.3 MM
Ref Location for Chest Circumference	AA	325.1 - 335.3 MM	302.3 MM
Ref Location for Waist Circumference	BB	153.7 - 163.9 MM	167.6 MM

DUMMY MEETS SPECIFICATION

TECHNICIAN: Walt Drushel

TRANSPORTATION RESEARCH CENTER INC.

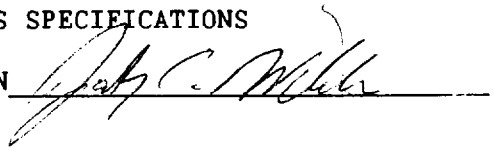
HEAD DROP TEST

HYBRID III SMALL FEMALE 24-MAY-00

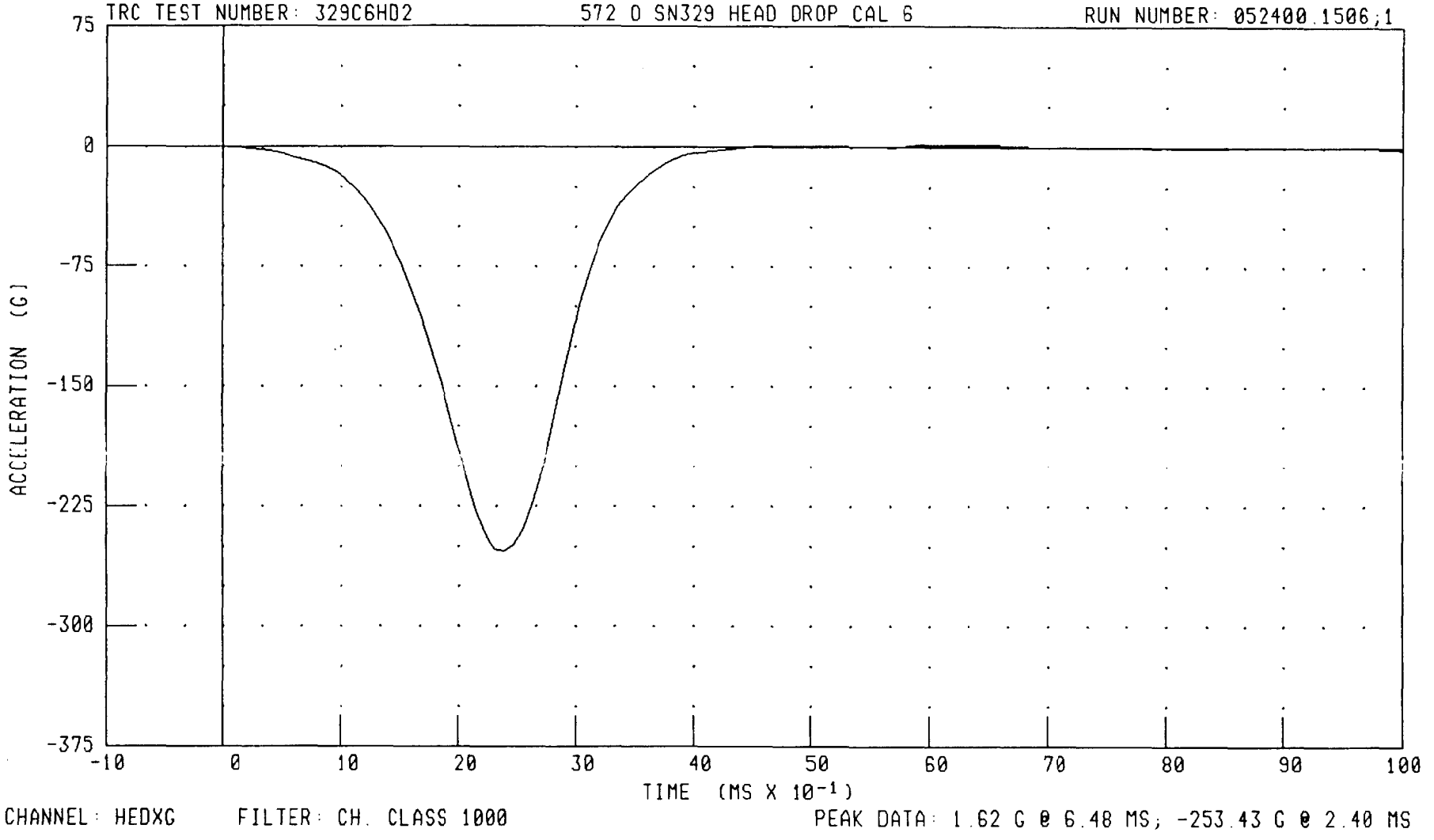
TRC INC. TEST NO: 329C6HD2 572 O SN329 HEAD DROP CAL 6

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	60.0 %
PEAK RESULTANT ACCELERATION	250 - 300 G	289.35 G
PEAK LATERAL ACCELERATION	15 G MAX	9.99 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052400.1504;1

PART 572-O HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS

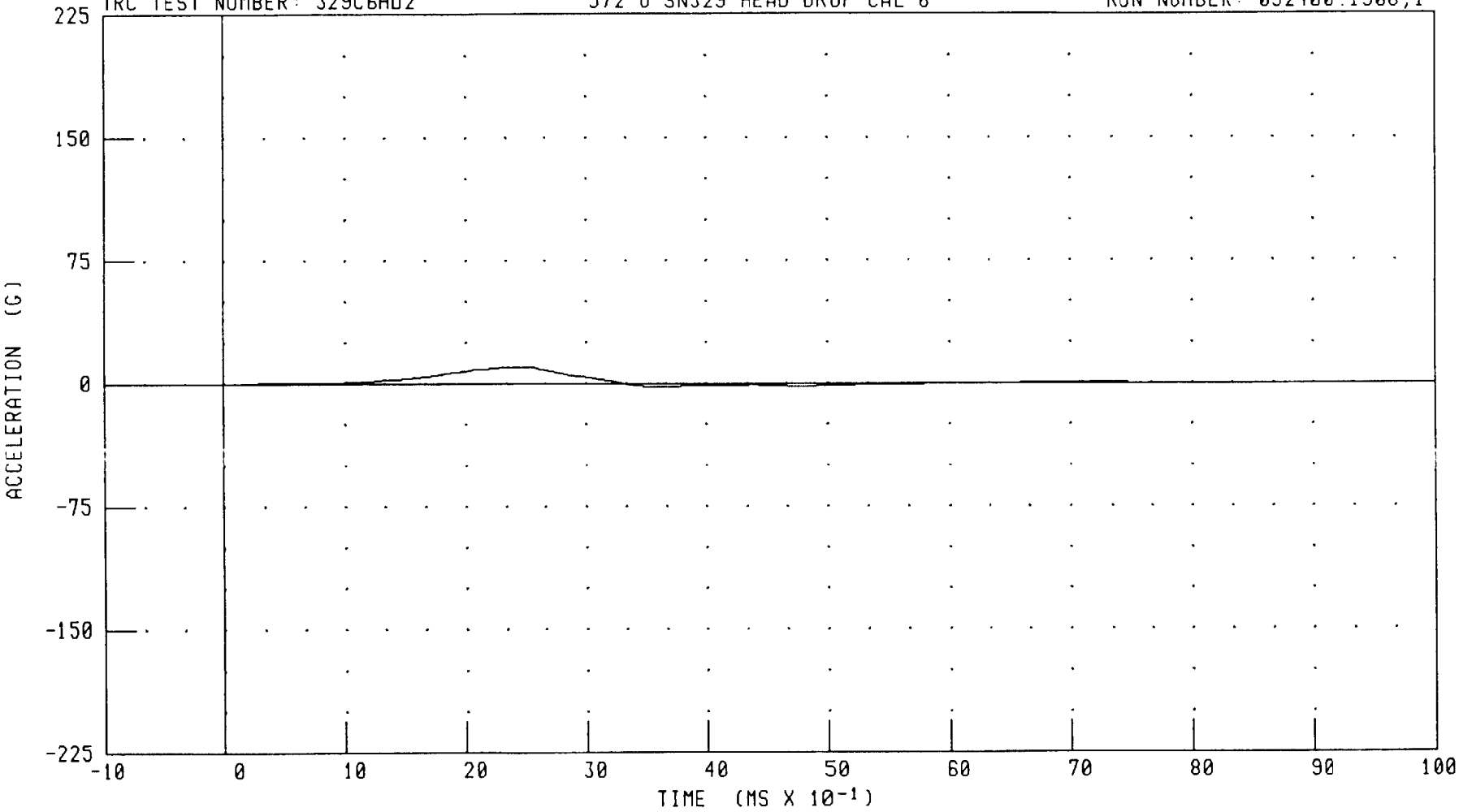


CHANNEL: HEDXC FILTER: CH. CLASS 1000 PEAK DATA: 1.62 G @ 6.48 MS; -253.43 G @ 2.40 MS

PART 572-O HYBRID III HEAD CALIBRATION

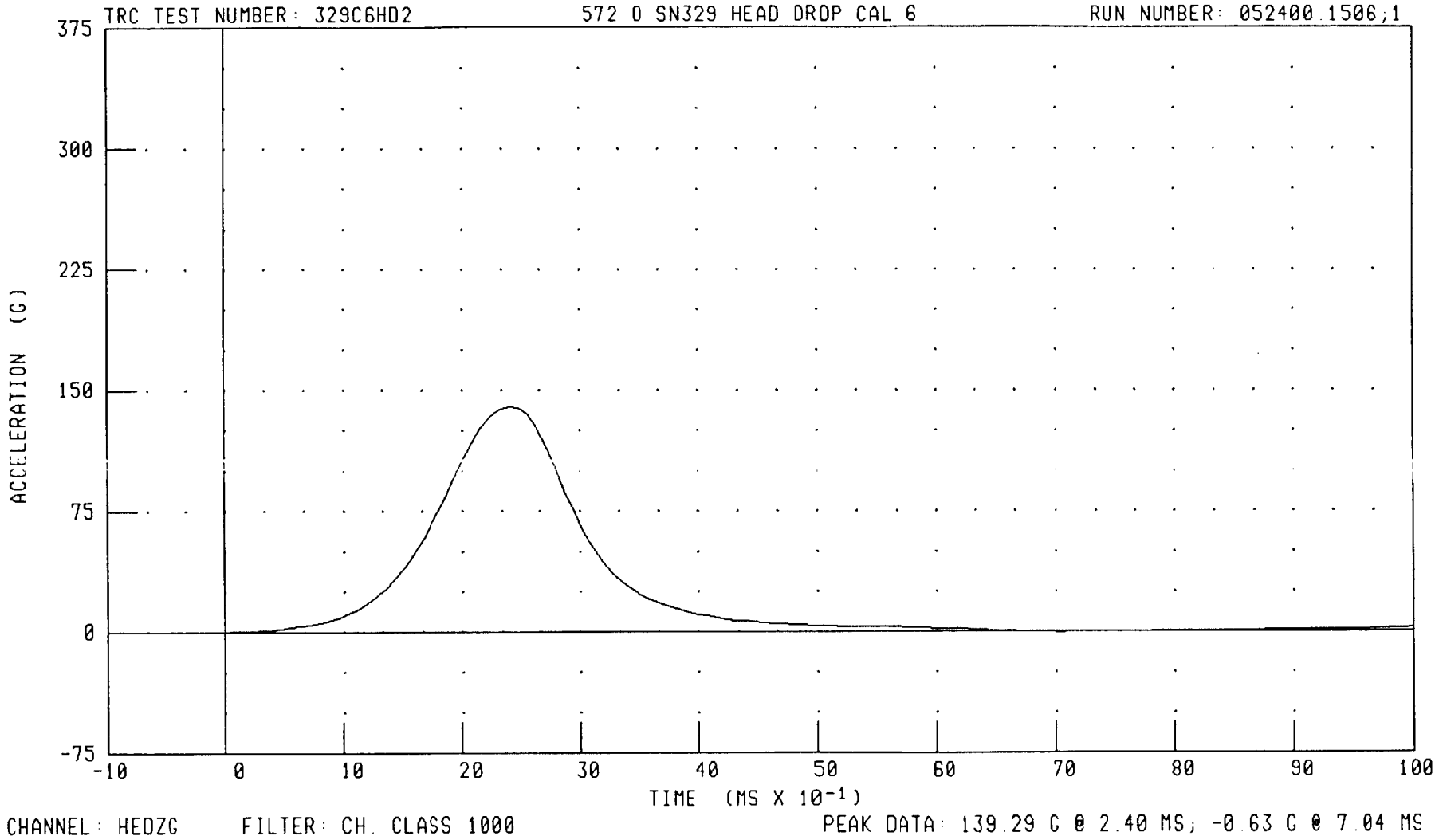
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 329C6HD2 572 O SN329 HEAD DROP CAL 6 RUN NUMBER: 052400.1506;1



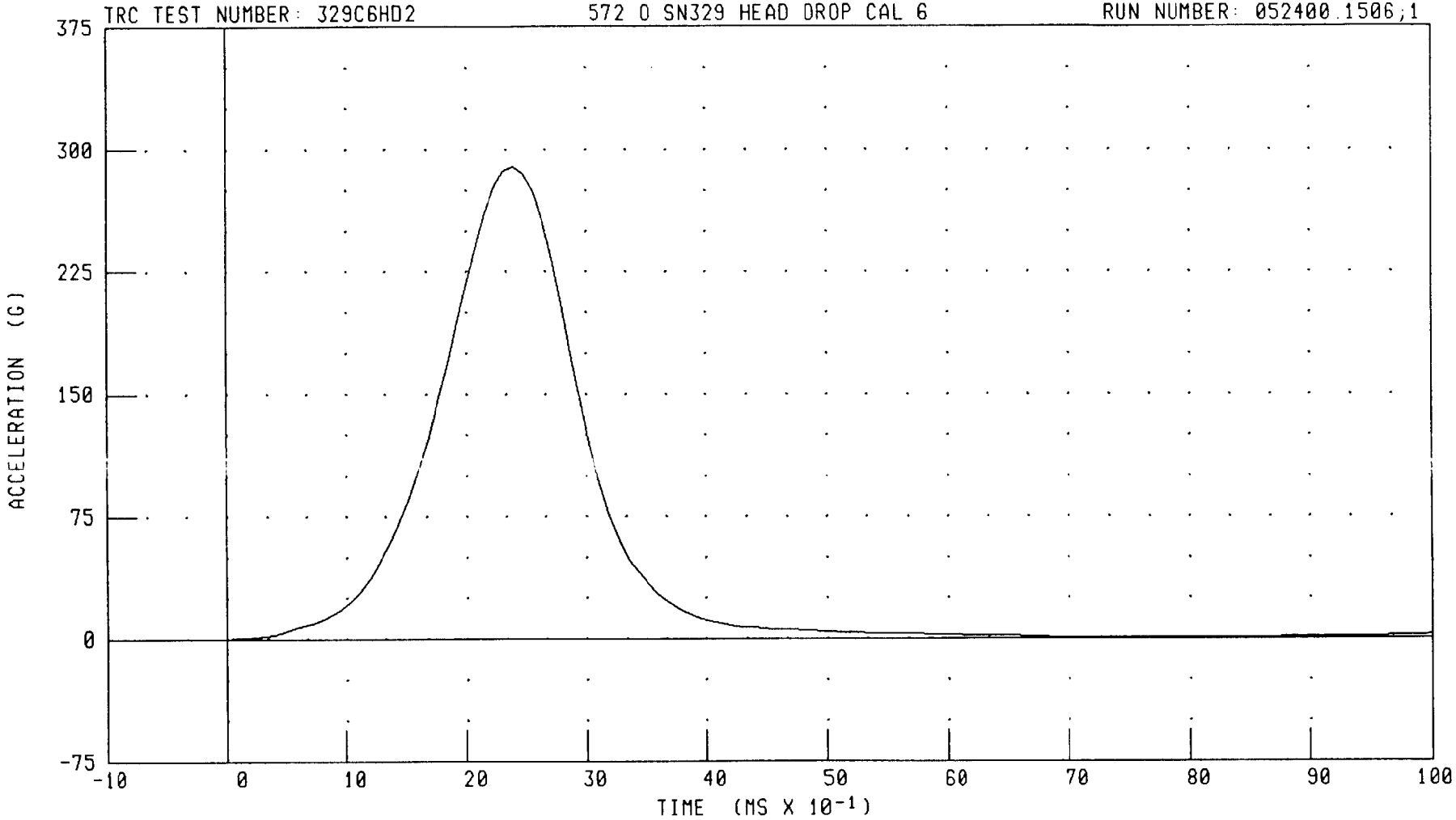
CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 9.99 G @ 2.40 MS; -2.08 G @ 3.60 MS

PART 572-O HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS



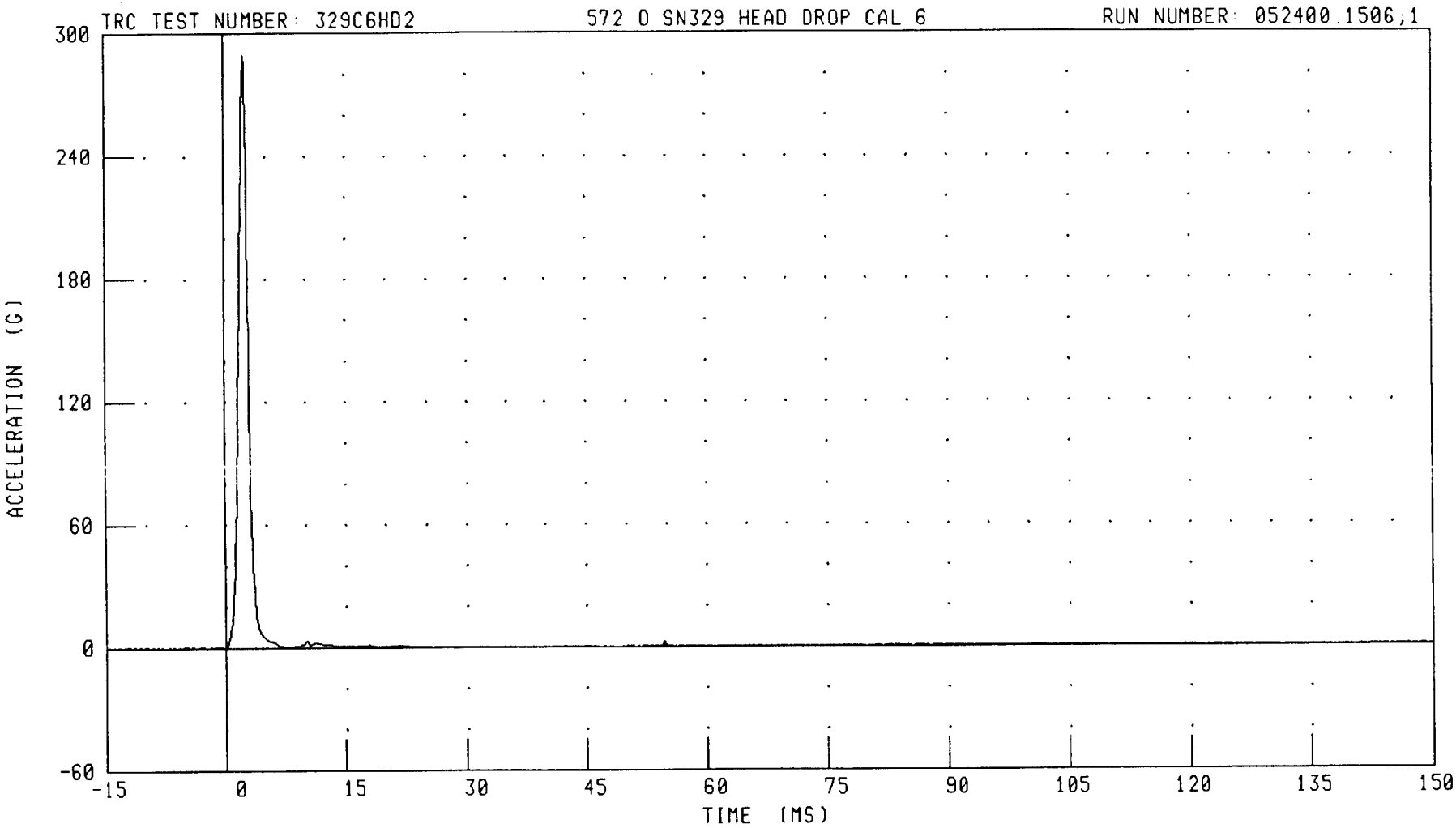
PART 572-0 HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 329C6HD2 572 0 SN329 HEAD DROP CAL 6 RUN NUMBER: 052400.1506;1



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 289.35 G @ 2.40 MS; 0.04 G @ -0.96 MS

PART 572-O HYBRID III HEAD CALIBRATION
CHECK PLOT - HEAD RESULTANT ACCELERATION



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 289.35 G @ 2.40 MS; 0.04 G @ -14.96 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III SMALL FEMALE 25-MAY-00

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 329C6NF1 572 O SN329 NECK FLEX. CAL6

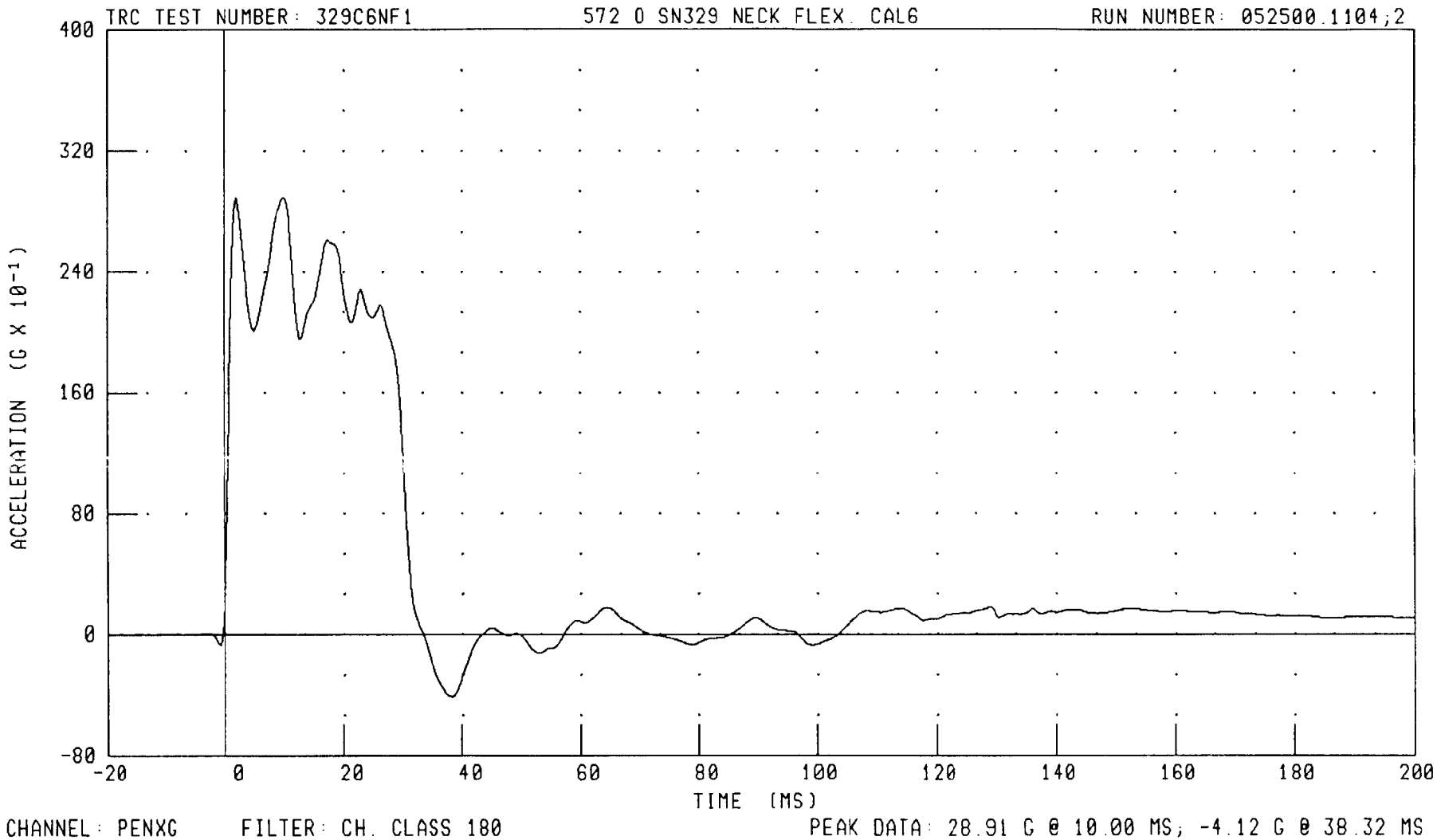
TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	50.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.12 M/S
INTEGRATED PENDULUM VELOCITY	10 MS	2.0 - 2.5 M/S	2.26 M/S
	20 MS	4.0 - 5.0 M/S	4.60 M/S
	30 MS	5.8 - 7.0 M/S	6.62 M/S
PEAK D-PLANE ROTATION		77 - 91 DEG.	79.56 DEG.
PEAK MOMENT DURING ROTATION INTERAL		69 - 83 NM	79.54 NM
POSITIVE MOMENT DECAY TIME TO 10 NM		80 - 100 MS	83.44 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052500.1054;2

PART 572-0 HYBRID III NECK FLEXION CALIBRATION

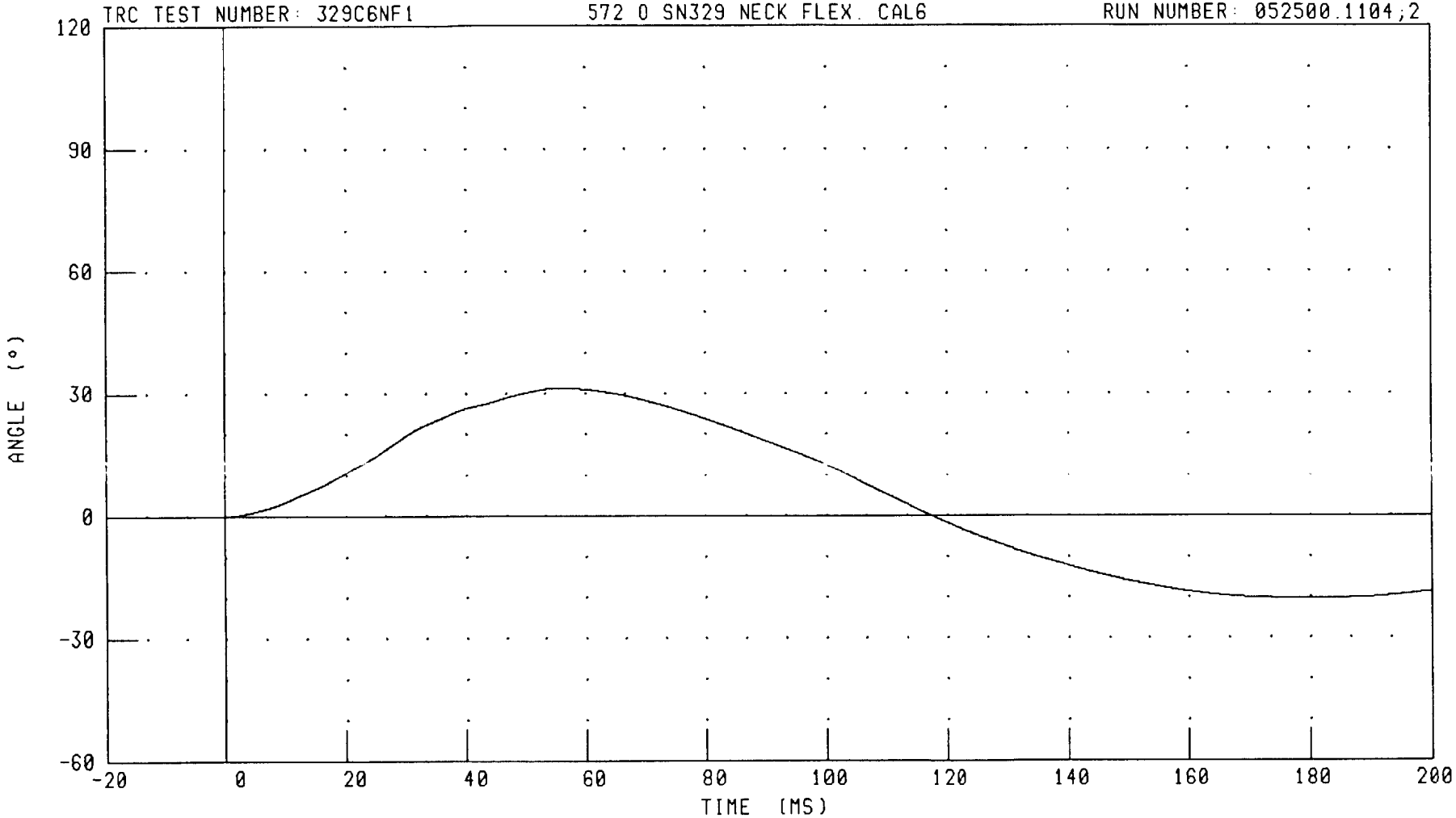
PENDULUM DECELERATION



CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 28.91 G @ 10.00 MS; -4.12 G @ 38.32 MS

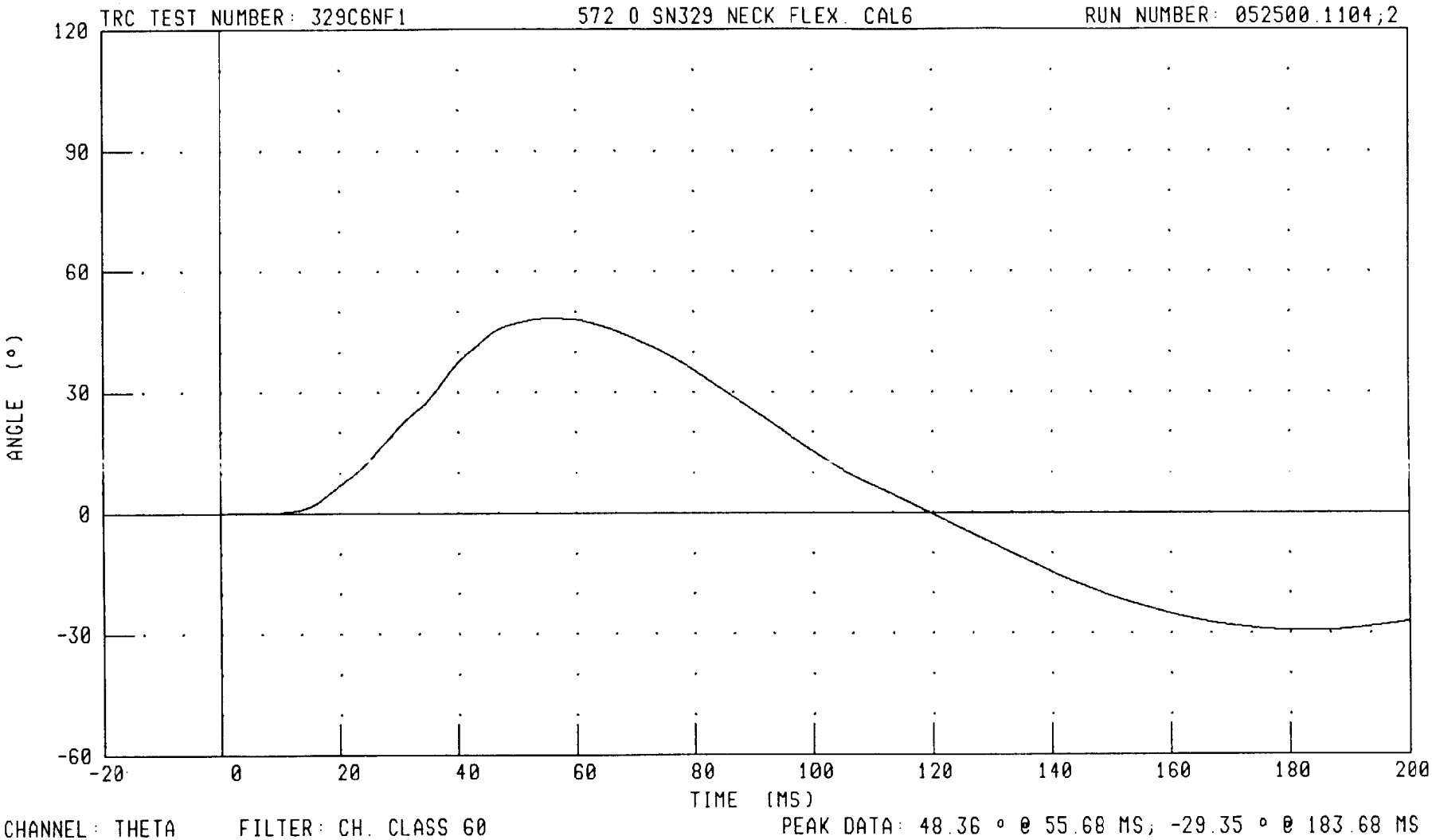
PART 572-O HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 329C6NF1
572 O SN329 NECK FLEX. CAL6
RUN NUMBER: 052500.1104;2



CHANNEL: BETA FILTER: CH. CLASS 60
PEAK DATA: 31.20 ° @ 55.92 MS; -20.38 ° @ 179.04 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

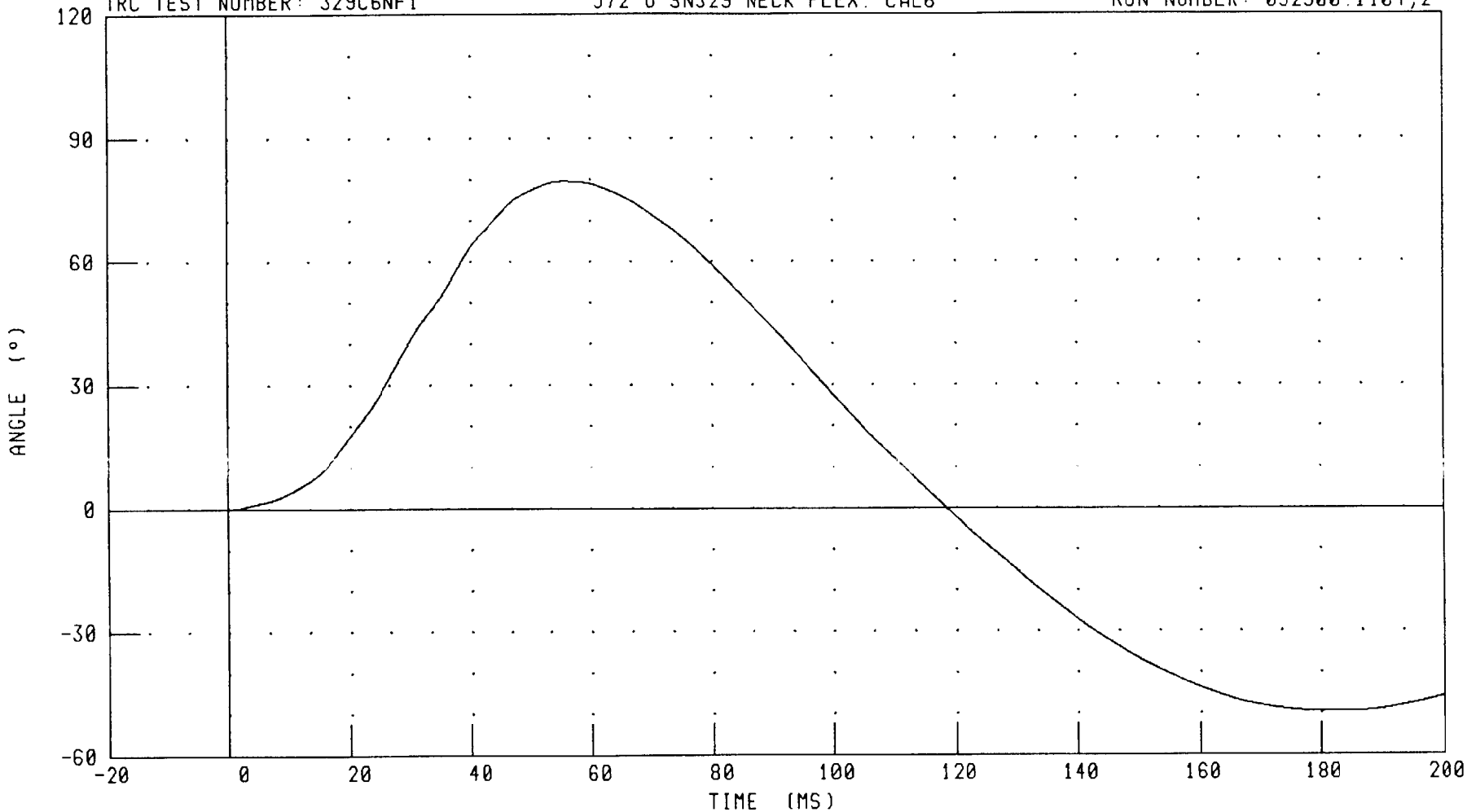


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 48.36 ° @ 55.68 MS; -29.35 ° @ 183.68 MS

PART 572-O HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

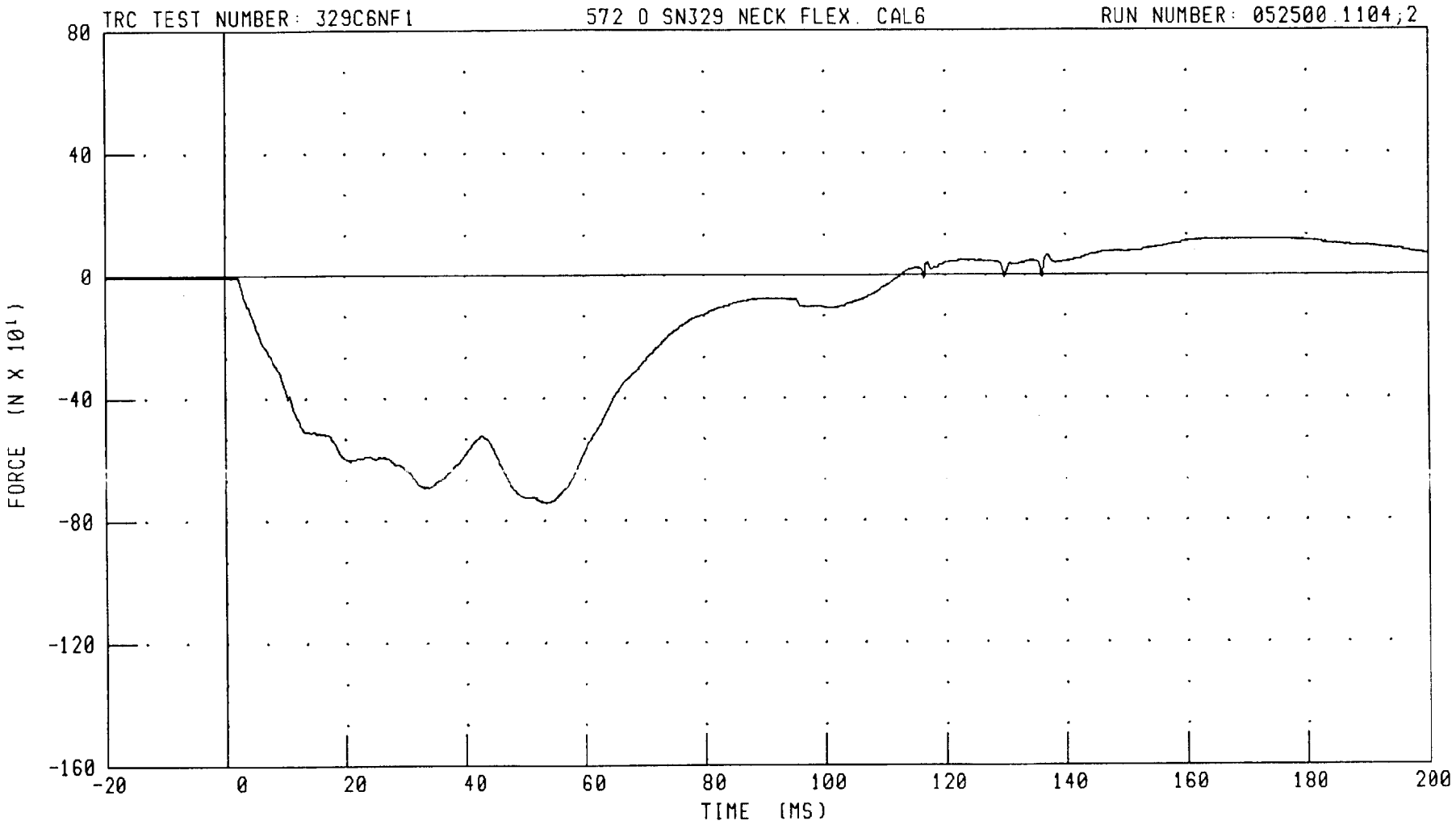
TRC TEST NUMBER: 329C6NF1 572 O SN329 NECK FLEX. CAL6 RUN NUMBER: 052500.1104;2



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 79.56 ° @ 55.84 MS, -49.71 ° @ 182.08 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION

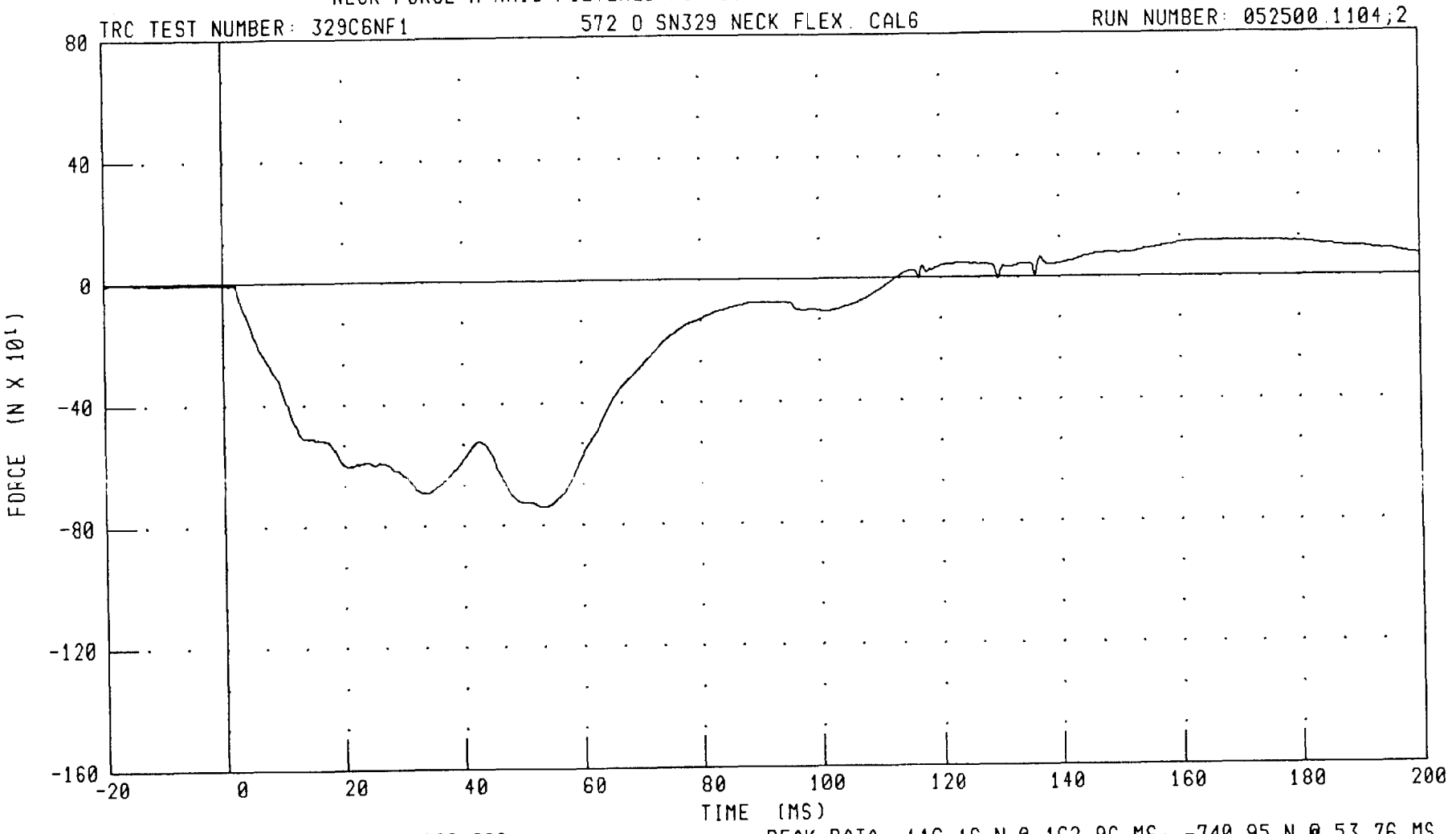
NECK FORCE X AXIS



CHANNEL: NEKXF FILTER: CH. CLASS 1000 PEAK DATA: 116.05 N @ 161.60 MS; -743.38 N @ 53.68 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION



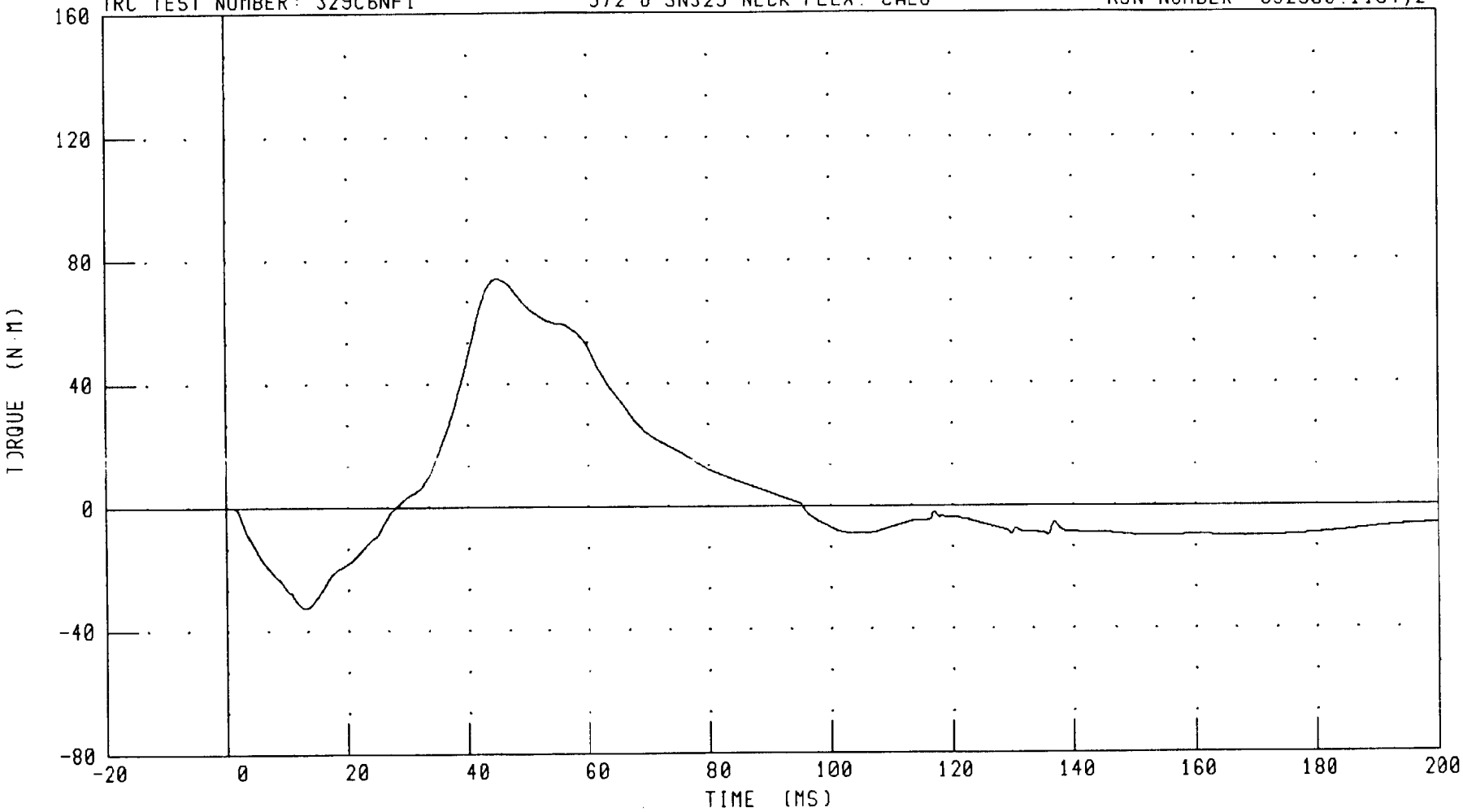
CHANNEL: NEKXFC FILTER: CH. CLASS 600

PEAK DATA: 116.16 N @ 162.96 MS; -740.95 N @ 53.76 MS

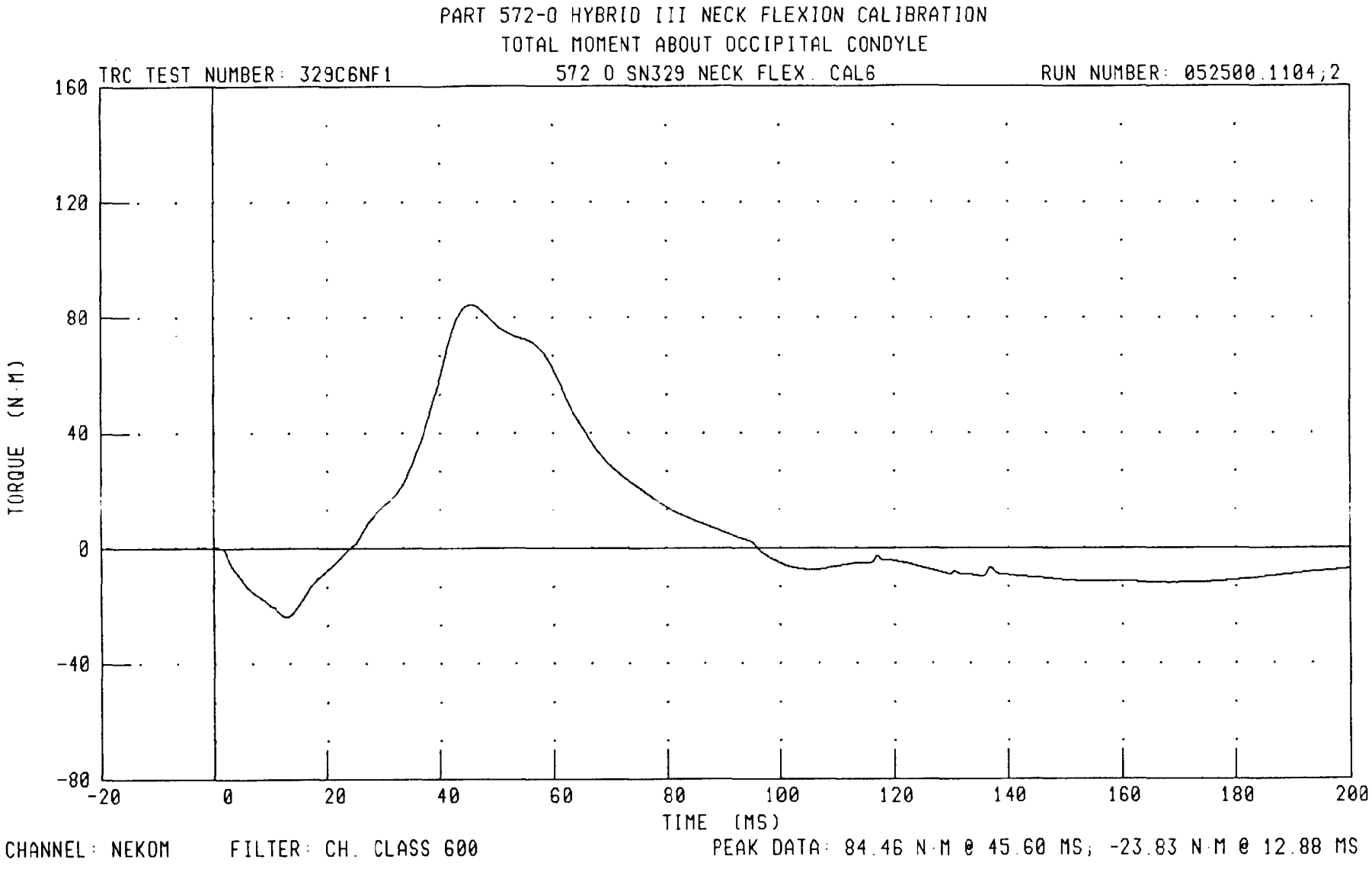
PART 572-0 HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 329C6NF1 572 0 SN329 NECK FLEX. CAL6 RUN NUMBER: 052500.1104;2



CHANNEL: NEKYM FILTER: CH. CLASS 600 PEAK DATA: 73.98 N-M @ 45.04 MS; -32.78 N-M @ 13.04 MS


PART 572-0 HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 329C6NF1
572 0 SN329 NECK FLEX. CAL6
RUN NUMBER: 052500.1104;2
160
120
80
40
0
-40
-80
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 600
PEAK DATA: 84.46 N-M @ 45.60 MS; -23.83 N-M @ 12.88 MS

TRANSPORTATION RESEARCH CENTER INC.

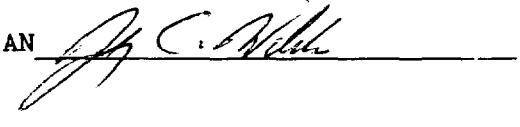
HYBRID III SMALL FEMALE 25-MAY-00

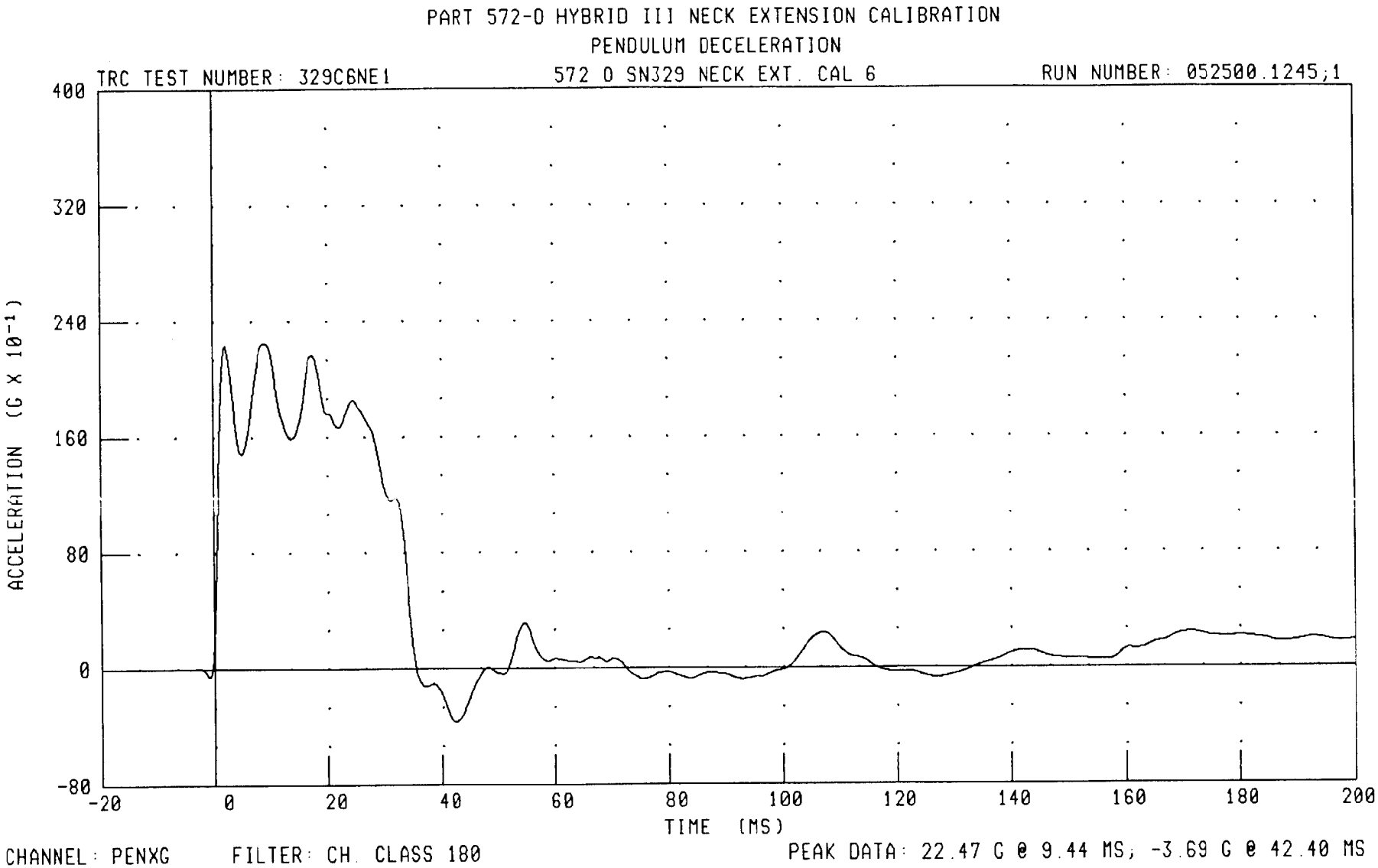
NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 329C6NE1 572 O SN329 NECK EXT. CAL 6

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	50.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.10 M/S
INTEGRATED PENDULUM VELOCITY	10 MS	1.5 - 1.9 M/S	1.77 M/S
	20 MS	3.1 - 3.9 M/S	3.60 M/S
	30 MS	4.6 - 5.6 M/S	5.26 M/S
PEAK D-PLANE ROTATION		99 - 114 DEG.	100.76 DEG.
PEAK MOMENT DURING ROTATION INTERVAL		54 - 67 NM	-60.27 NM
NEGATIVE MOMENT DECAY TIME TO 10 NM LEVEL		28 - 38 MS	31.12 MS

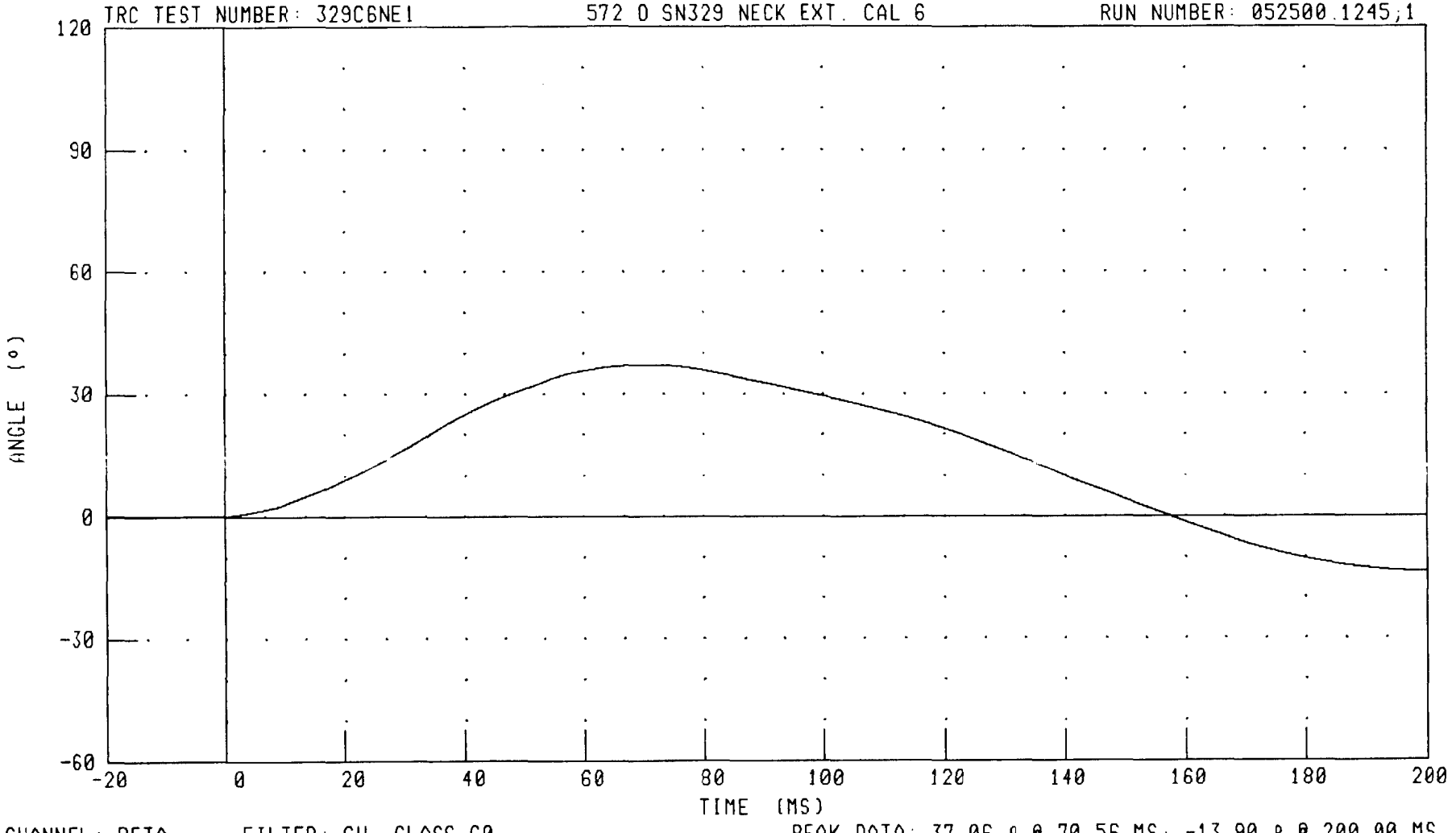
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052500.1238;1


PART 572-O HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION
TRC TEST NUMBER: 329C6NE1
572 O SN329 NECK EXT. CAL 6
RUN NUMBER: 052500.1245;1
ACCELERATION (G X 10⁻¹)
400
320
240
160
80
0
-80
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: PENXG
FILTER: CH. CLASS 180
PEAK DATA: 22.47 G @ 9.44 MS; -3.69 G @ 42.40 MS

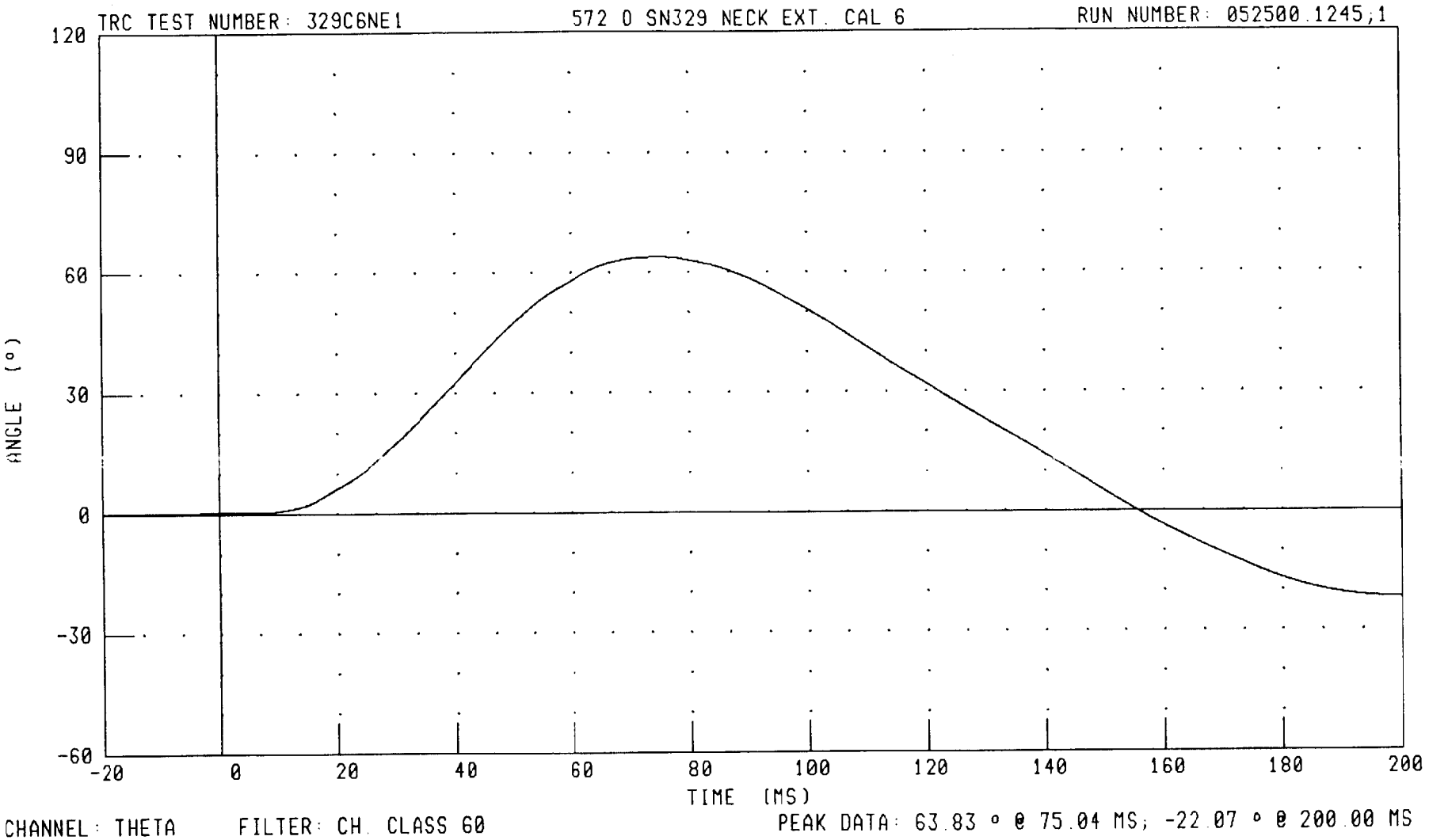
PART 572-O HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 329C6NE1
572 O SN329 NECK EXT. CAL 6
RUN NUMBER: 052500.1245;1



CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 37.06 ° @ 70.56 MS; -13.90 ° @ 200.00 MS

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

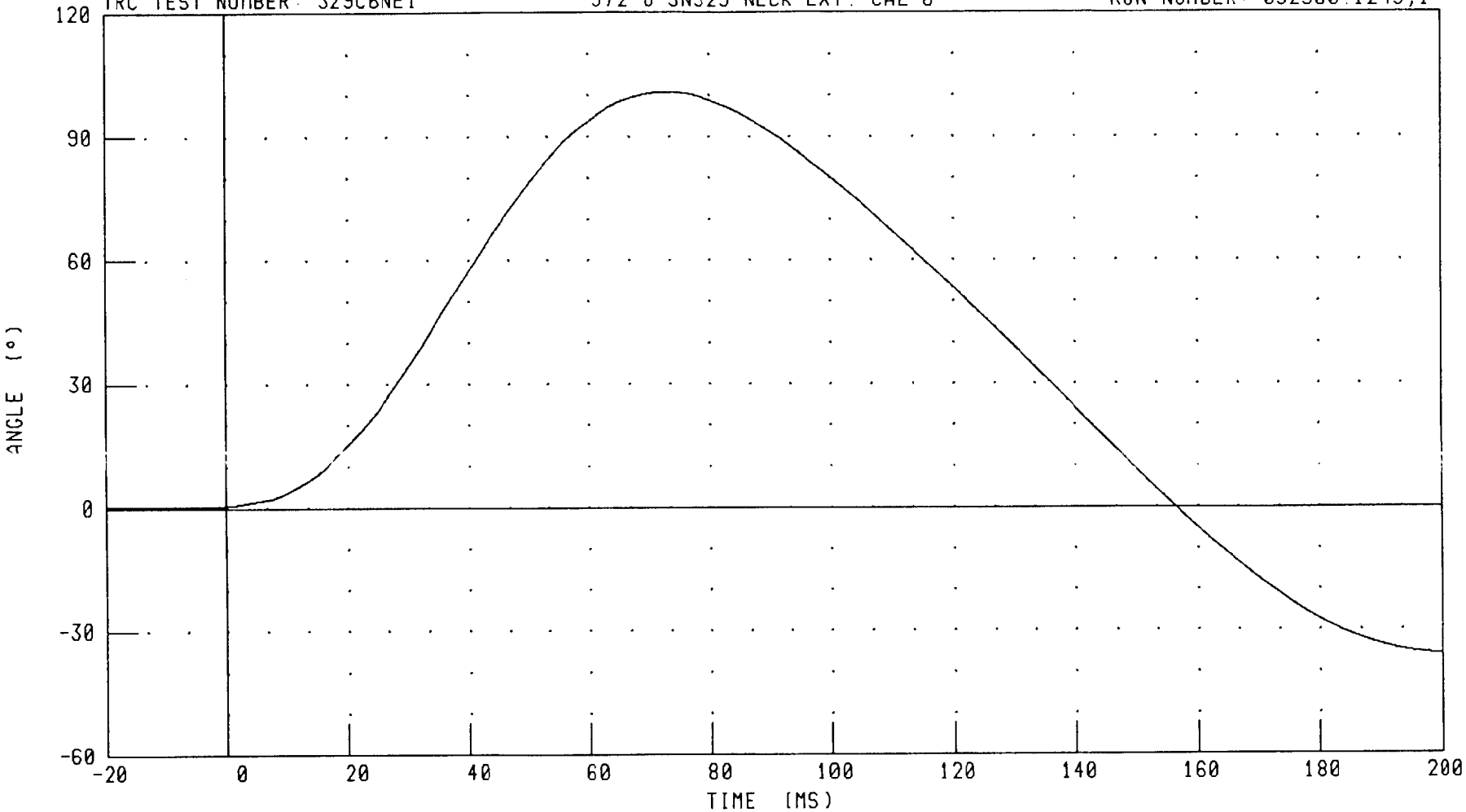


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 63.83 ° @ 75.04 MS; -22.07 ° @ 200.00 MS

PART 572-0 HYBRID III NECK EXTENSION CALIBRATION

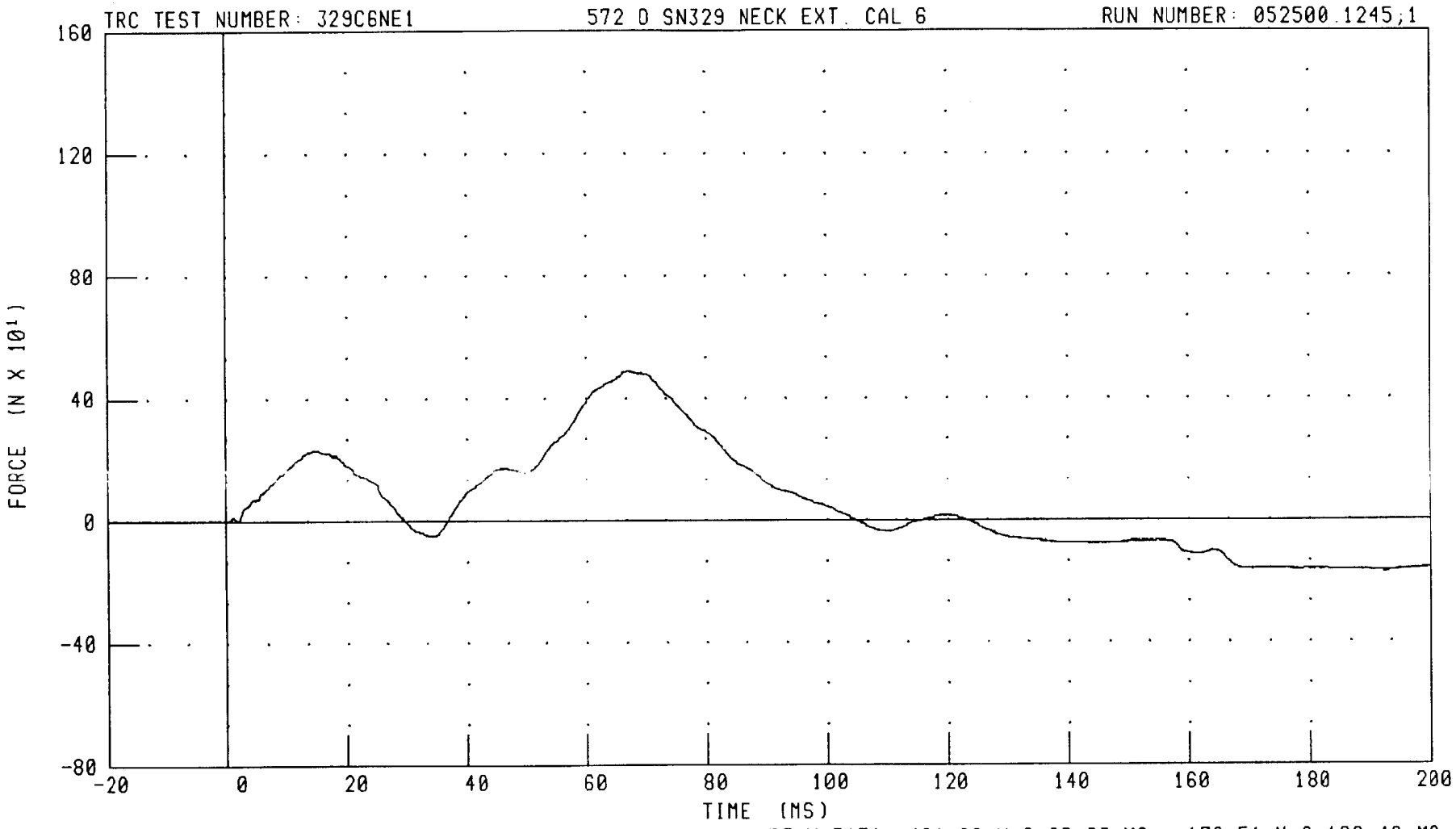
TOTAL ROTATION

TRC TEST NUMBER: 329C6NE1 572 0 SN329 NECK EXT. CAL 6 RUN NUMBER: 052500.1245;1



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 100.77 ° @ 72.96 MS; -35.97 ° @ 200.00 MS

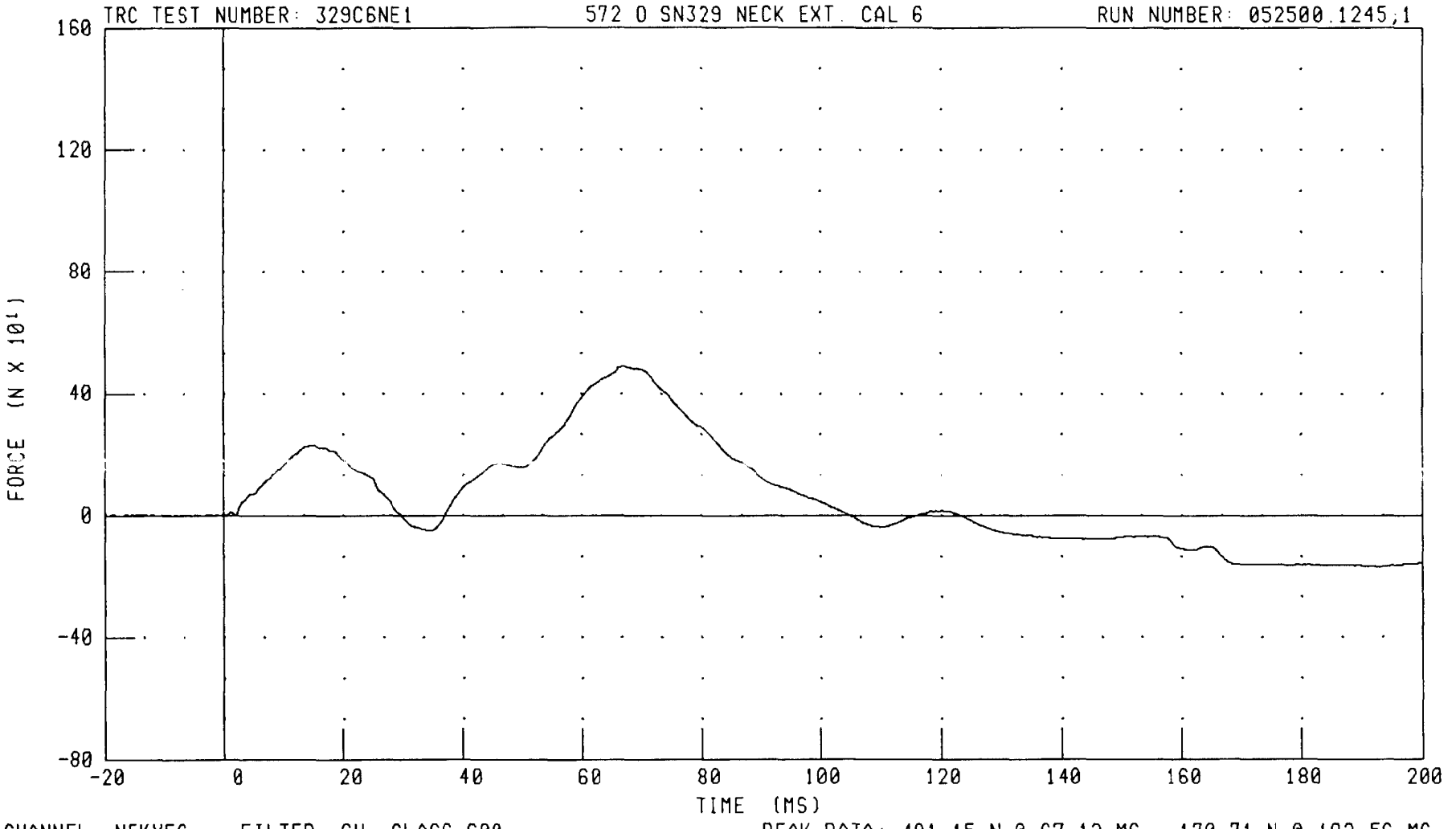
PART 572-O HYBRID III NECK EXTENSION CALIBRATION
NECK FORCE X AXIS



CHANNEL: NEKXF FILTER: CH. CLASS 1000 PEAK DATA: 491.60 N @ 66.96 MS; -172.51 N @ 192.40 MS

PART 572-D HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION

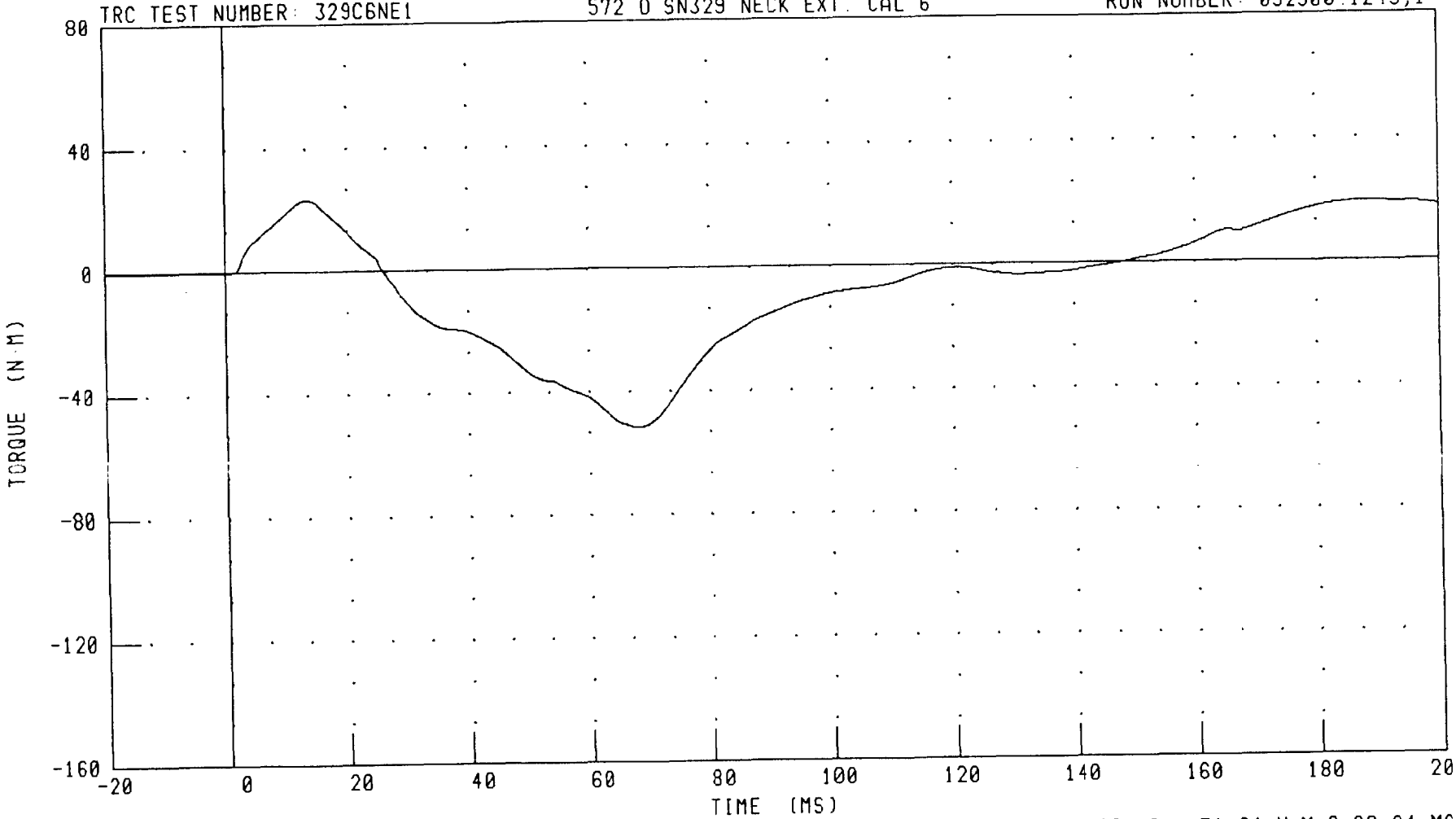


CHANNEL: NEKXFC FILTER: CH. CLASS 600 PEAK DATA: 491.15 N @ 67.12 MS; -170.71 N @ 192.56 MS

PART 572-O HYBRID III NECK EXTENSION CALIBRATION

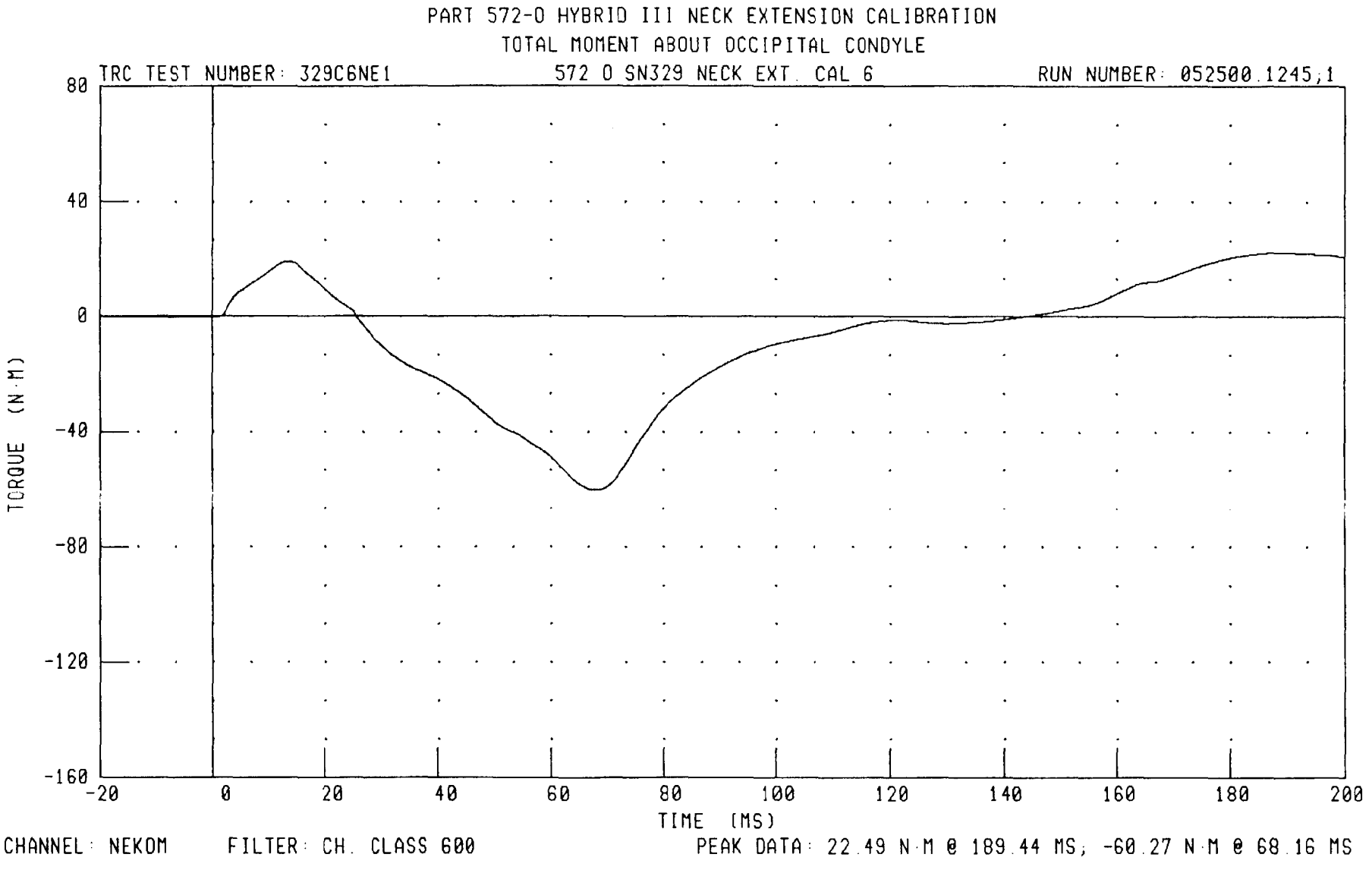
NECK MOMENT Y AXIS

TRC TEST NUMBER: 329C6NE1 572 O SN329 NECK EXT. CAL 6 RUN NUMBER: 052500.1245;1



CHANNEL: NEKYM FILTER: CH. CLASS 600

PEAK DATA: 23.16 N-M @ 13.68 MS; -51.64 N-M @ 68.24 MS


PART 572-O HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
TRC TEST NUMBER: 329C6NE1
572 O SN329 NECK EXT. CAL 6
RUN NUMBER: 052500.1245;1
80
40
0
-40
-80
-120
-160
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 600
PEAK DATA: 22.49 N-M @ 189.44 MS; -60.27 N-M @ 68.16 MS

TRANSPORTATION RESEARCH CENTER INC.

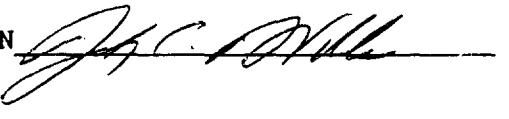
THORAX IMPACT TEST

HYBRID III SMALL FEMALE 26-MAY-00

TRC INC. TEST NO: 329C6TH1 572 O SN329 THORAX CAL6

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.59 M/S
MAXIMUM DEFLECTION	51 - 58 MM	56.2 MM
MAXIMUM RESISTIVE FORCE	3900 - 4400 N	4072. N
PEAK FORCE DURING 18MM TO 50 MM DEFLECTION	<=105% OF PEAK FORCE	95.5 %
INTERNAL HYSTERESIS	69% - 85%	70.5%

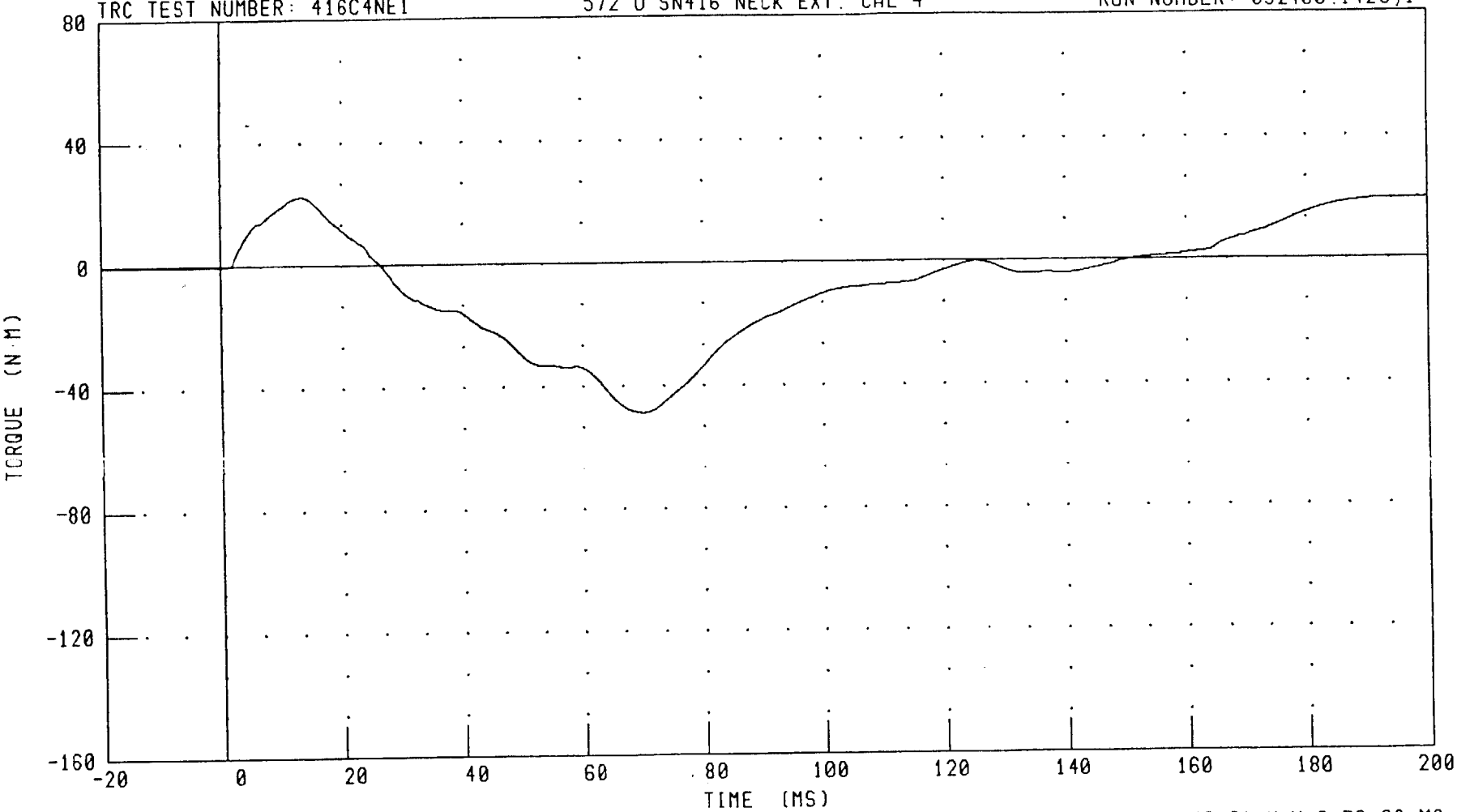
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052600.0851;1

PART 572-O HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 416C4NE1 572 O SN416 NECK EXT. CAL 4 RUN NUMBER: 052400.1423;1

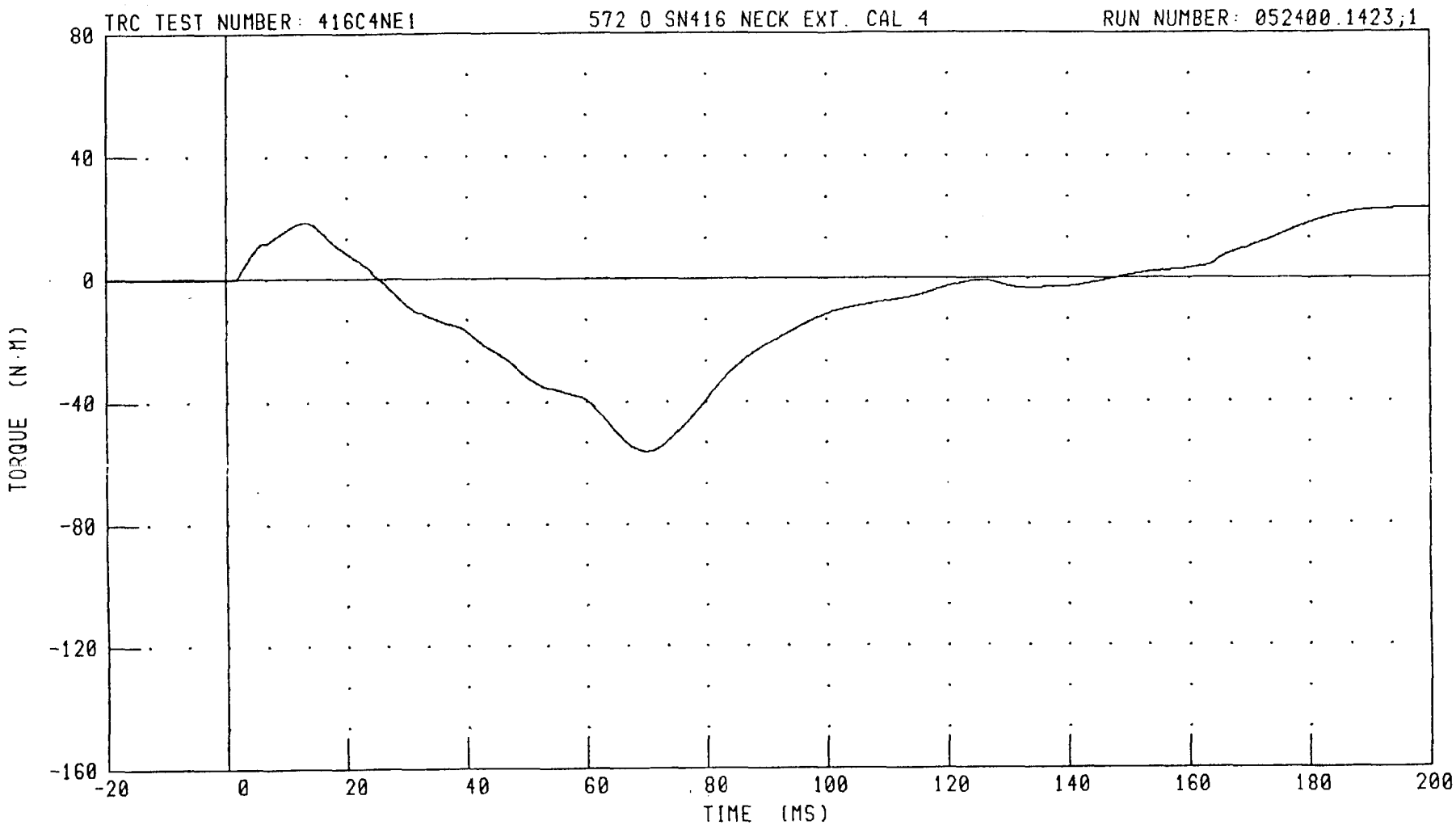


CHANNEL: NEKYM FILTER: CH. CLASS 600

PEAK DATA: 22.38 N·M @ 13.52 MS; -48.81 N·M @ 70.00 MS

PART 572-0 HYBRID III NECK EXTENSION CALIBRATION

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



CHANNEL: NEKOM FILTER: CH. CLASS 600 PEAK DATA: 22.81 N-M @ 198.40 MS; -56.28 N-M @ 70.00 MS

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III SMALL FEMALE 25-MAY-00

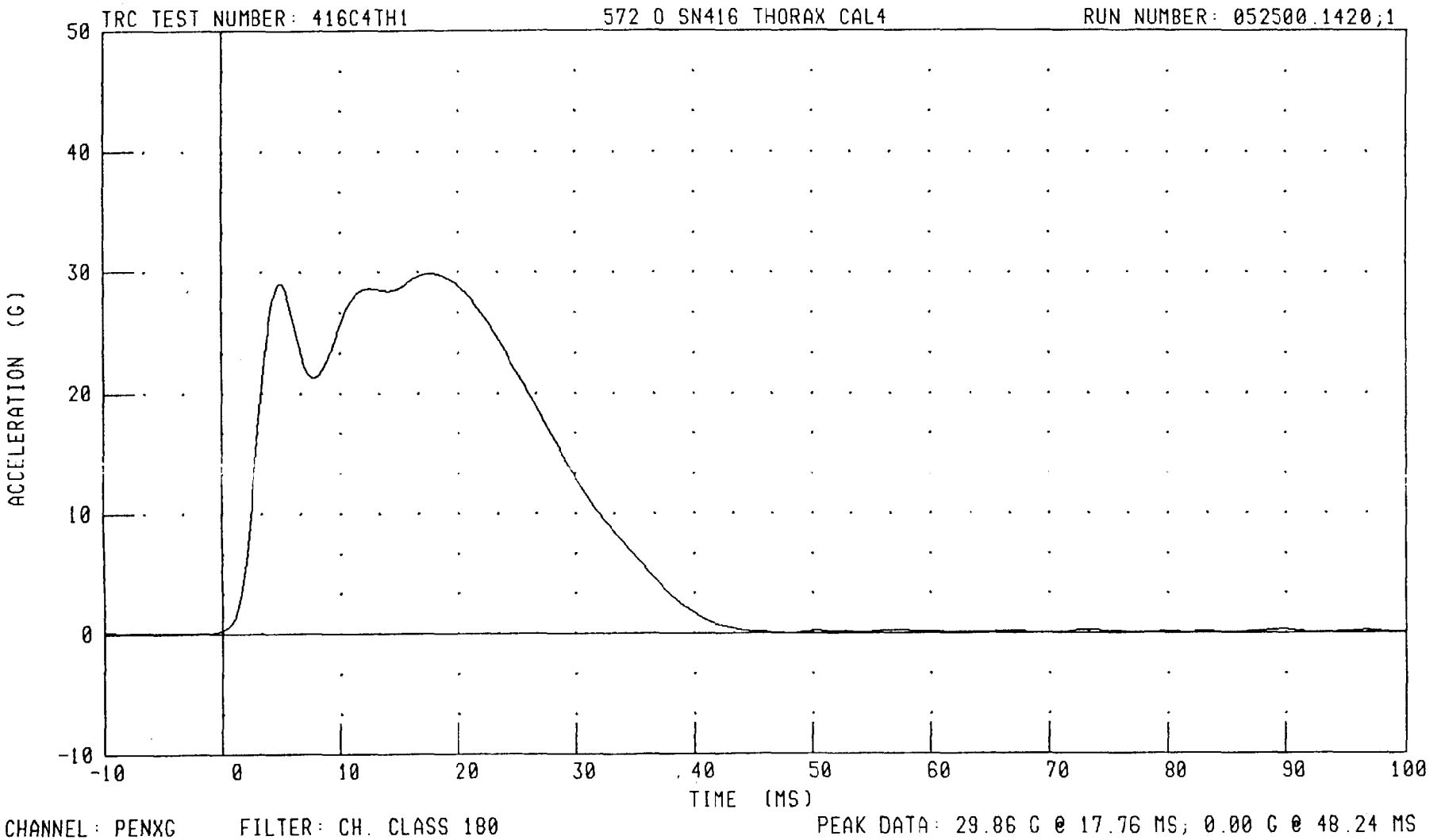
TRC INC. TEST NO: 416C4TH1 572 O SN416 THORAX CAL4

TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	50.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.59 M/S
MAXIMUM DEFLECTION	50 - 58 MM	53.2 MM
MAXIMUM RESISTIVE FORCE	3900 - 4400 N	4098. N
PEAK FORCE DURING 18 MM TO 50MM DEFLECTION	<= 105%	98%
INTERNAL HYSTERESIS	69% - 85%	73.6%

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052500.1406;1

PART 572-0 HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

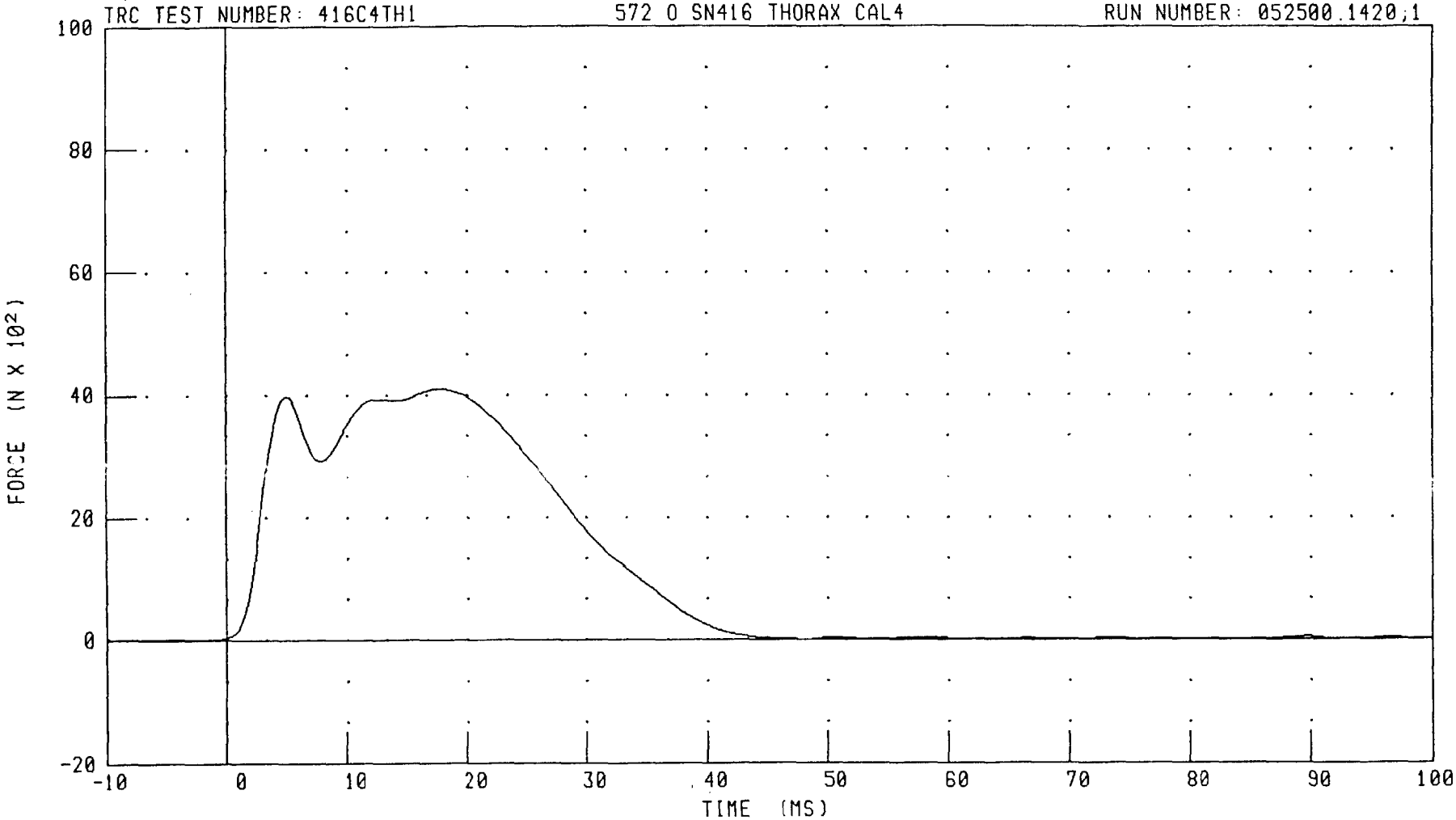


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 29.86 G @ 17.76 MS; 0.00 G @ 48.24 MS

PART 572-0 HYBRID III THORAX CALIBRATION

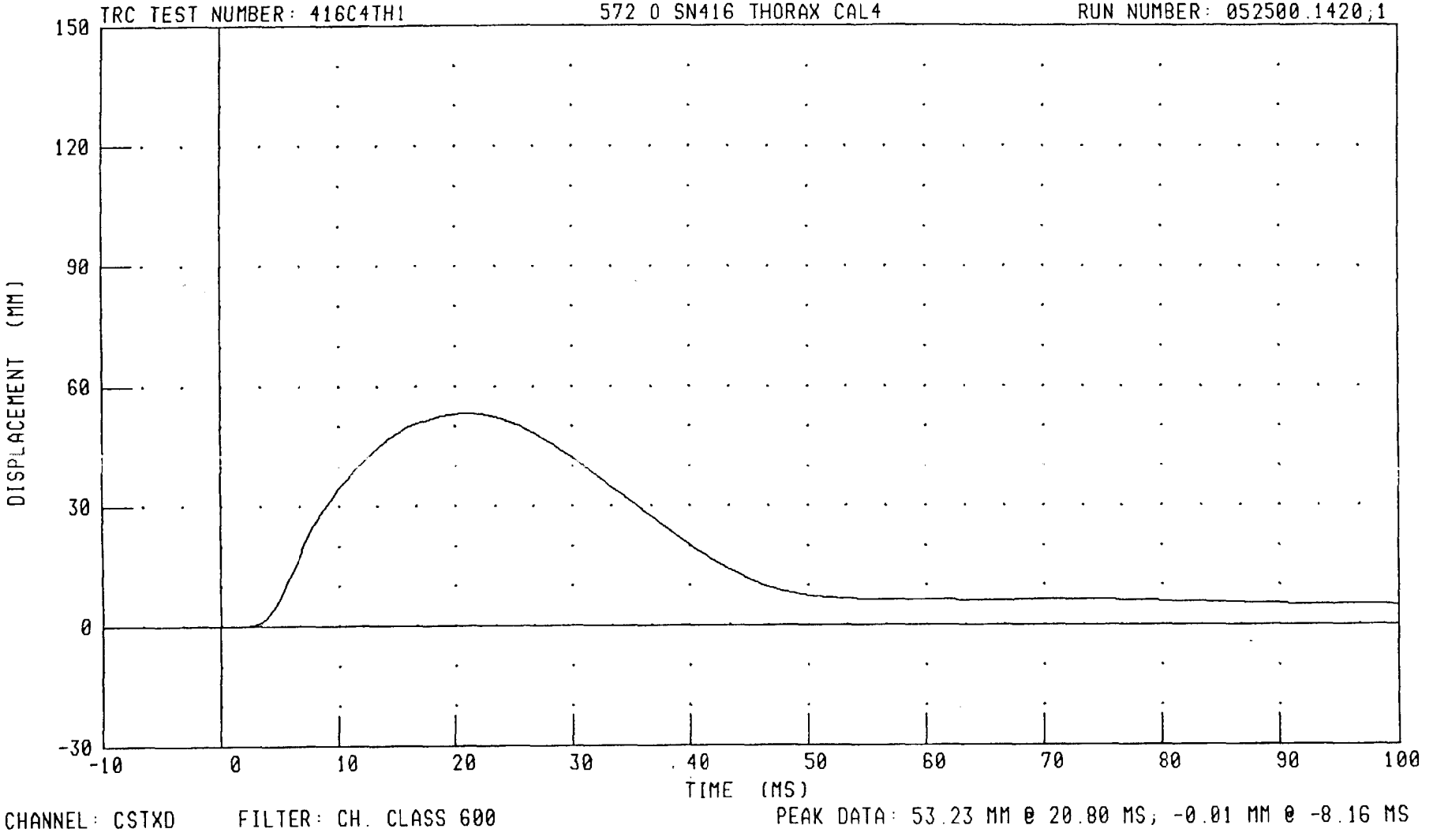
PENDULUM FORCE

TRC TEST NUMBER: 416C4TH1 572 0 SN416 THORAX CAL4 RUN NUMBER: 052500.1420;1



CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 4098.11 N @ 17.76 MS; 0.65 N @ 48.24 MS

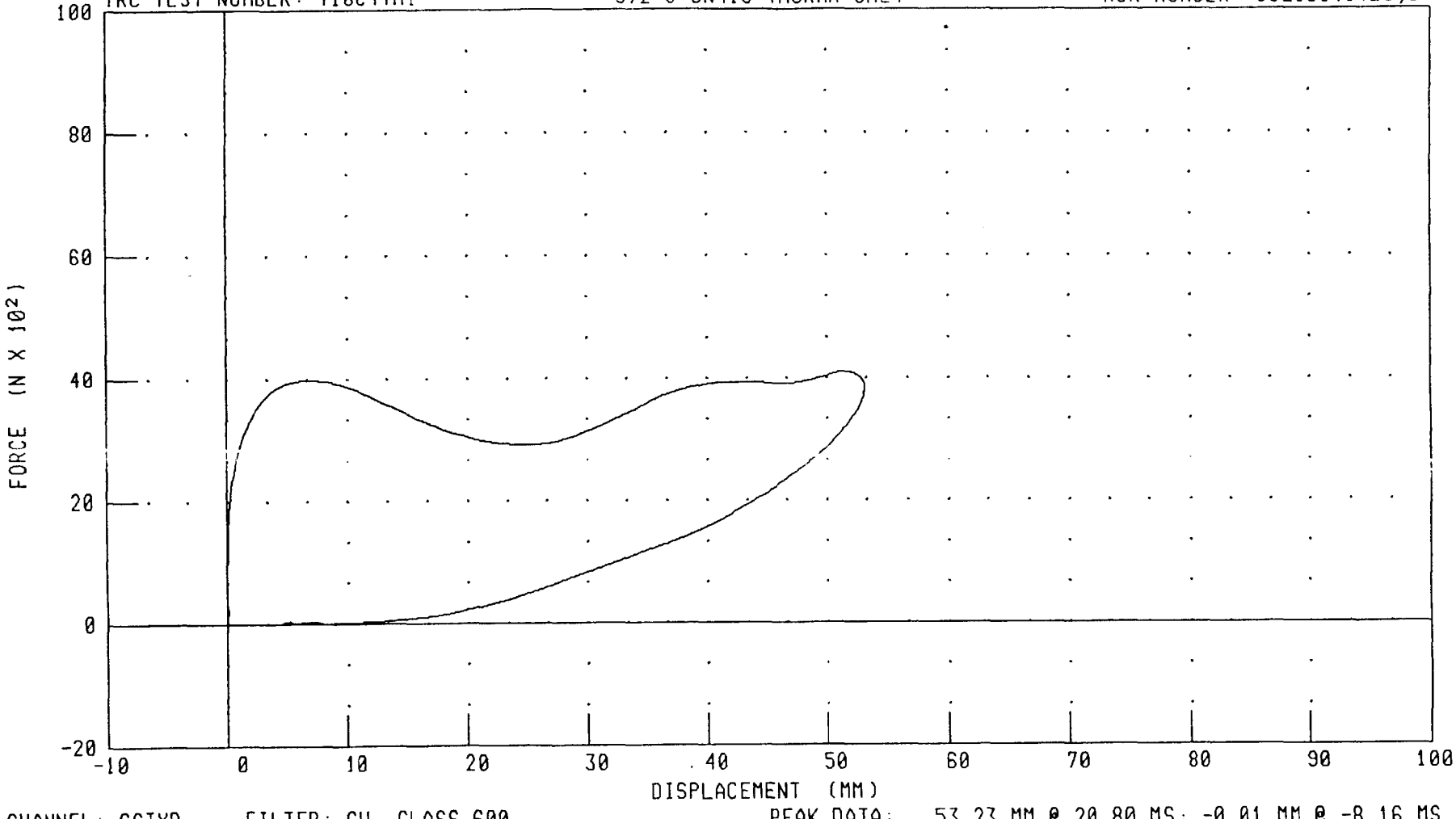
PART 572-0 HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT



CHANNEL: CSTXD FILTER: CH. CLASS 600 PEAK DATA: 53.23 MM @ 20.80 MS; -0.01 MM @ -8.16 MS

PART 572-0 HYBRID III THORAX CALIBRATION
CHEST DISPLACEMENT VS PENDULUM FORCE

TRC TEST NUMBER: 416C4TH1 572 0 SN416 THORAX CAL4 RUN NUMBER: 052500.1420;1



CHANNEL: CSTXD FILTER: CH. CLASS 600
PENXF CH. CLASS 180

PEAK DATA: 53.23 MM @ 20.80 MS; -0.01 MM @ -8.16 MS
4098.11 N @ 17.76 MS; 0.65 N @ 48.24 MS

TRANSPORTATION RESEARCH CENTER INC.

TORSO FLEXION TEST

HYBRID III SMALL FEMALE

CAL DATE: 25-May-00

TRC, INC. TEST NO: 416CTF1 572 O SN416 TORSO FLEX CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 – 25.6 DEG. C	22.0 DEG. C
RELATIVE HUMIDITY	10 – 70 %	50 %
INITIAL ANGLE OF UNSUPPORRTED DUMMY	<= 20 DEG. REFERENCED TO VERTICAL	17 DEG.
MAXIMUM FORCE AT 45 DEG. DURING 10 SECOND PERIOD	320 - 390 N	378 N
RETURN ANGLE	+/- 8 DEG OF INTIAL ANGLE	23 DEG.

TEST MEETS SPECIFICATIONS

TECHNICIAN 

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III SMALL FEMALE 24-MAY-00

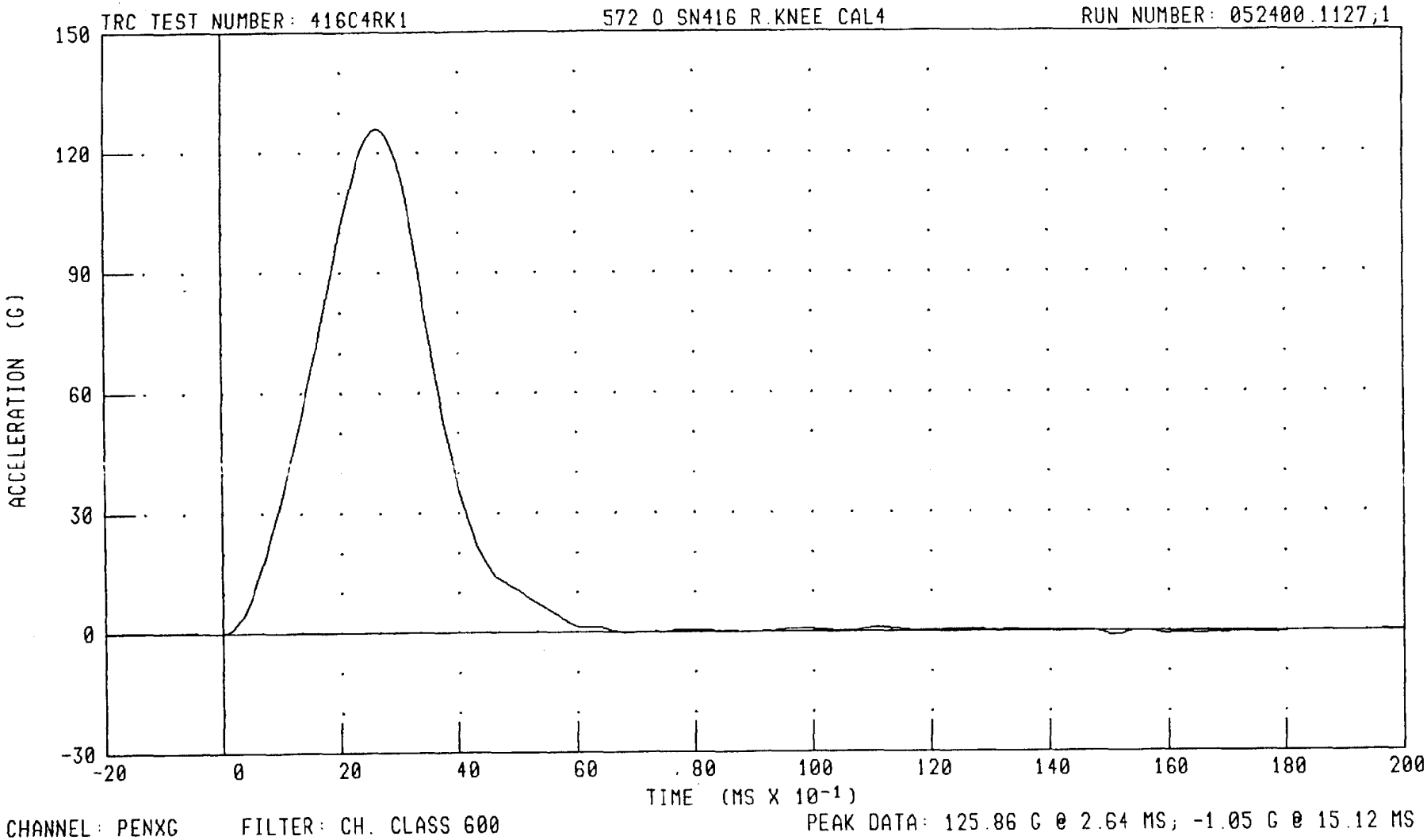
TRC INC. TEST NO: 416C4RK1 572 O SN416 R.KNEE CAL4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.08 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3450 - 4060 N	3694.9 N

TEST MEETS SPECIFICATIONS

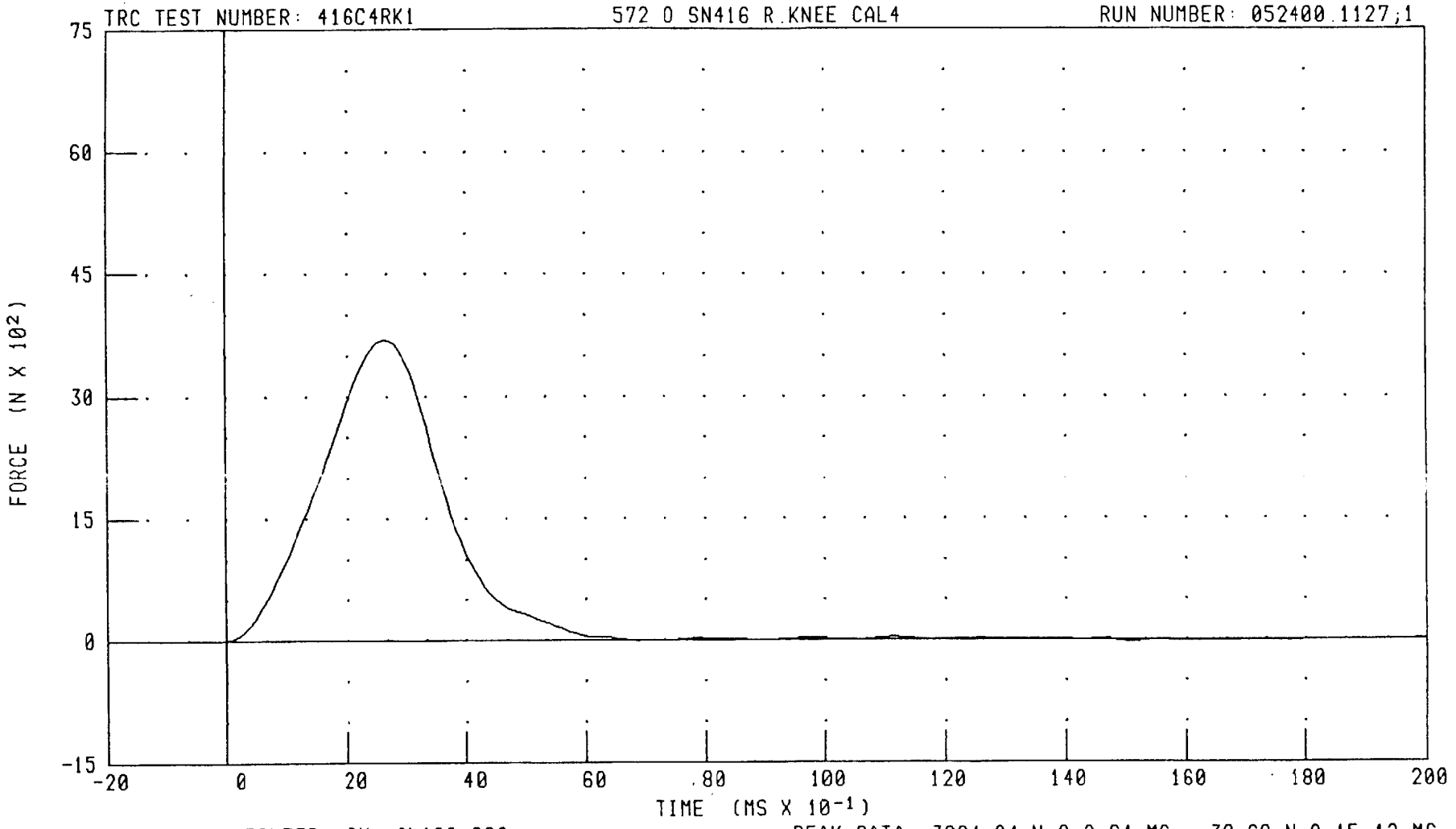
TECHNICIAN  RUN NUMBER: 052400.1126;1

PART 572-O HYBRID III RIGHT KNEE CALIBRATION
PENDULUM DECELERATION (5 KG PEND.)



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 125.86 G @ 2.64 MS; -1.05 G @ 15.12 MS

PART 572-0 HYBRID III RIGHT KNEE CALIBRATION
PENDULUM FORCE (5 KG PEND.)



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 3694.94 N @ 2.64 MS; -30.68 N @ 15.12 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III SMALL FEMALE 24-MAY-00

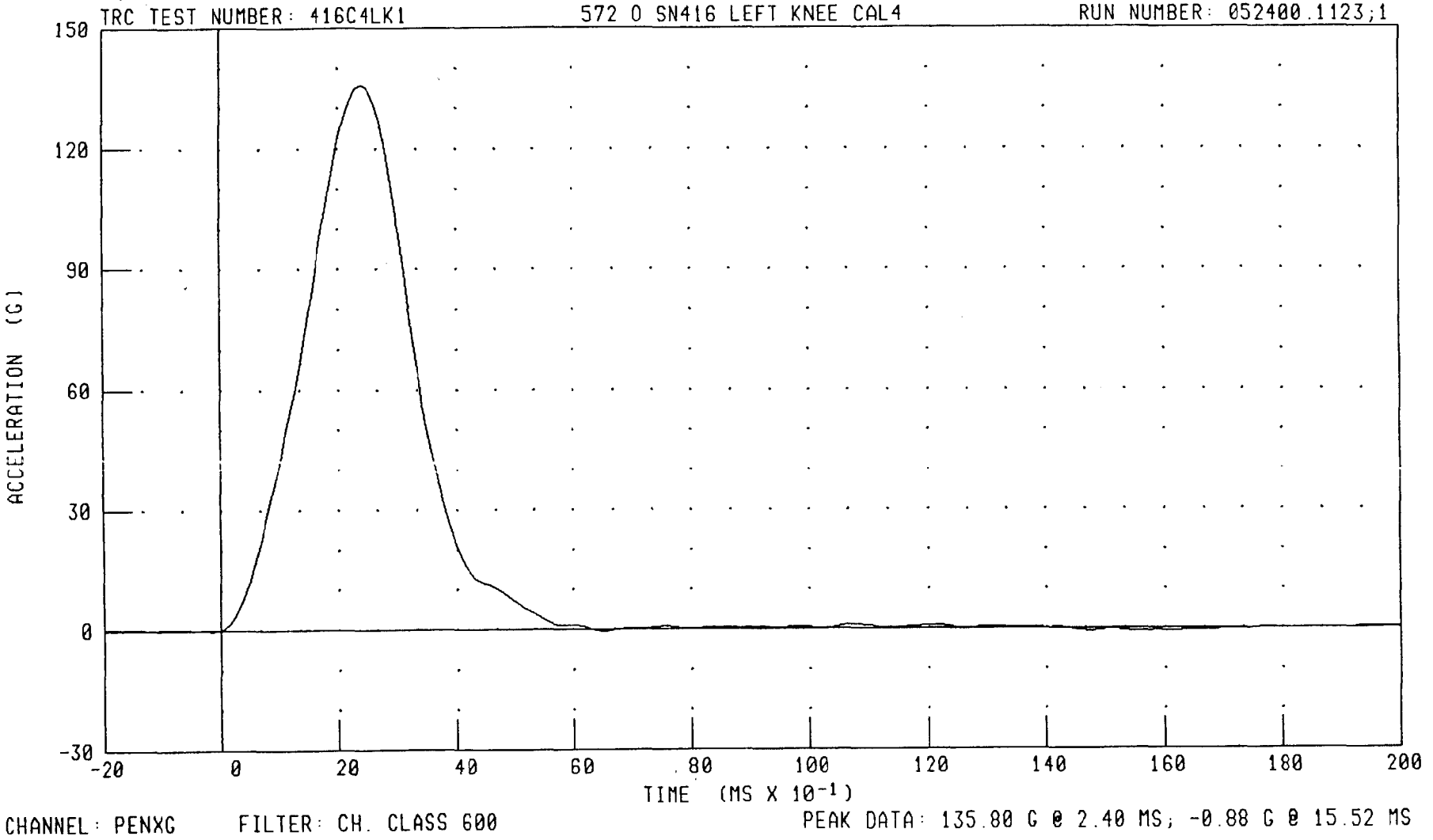
TRC INC. TEST NO: 416C4LK1 572 O SN416 LEFT KNEE CAL4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.08 M/S
PEAK KNEE IMPACT FORCE 3.0 KG PENDULUM	3450 - 4060 N	3986.6 N

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052400.1122;1

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

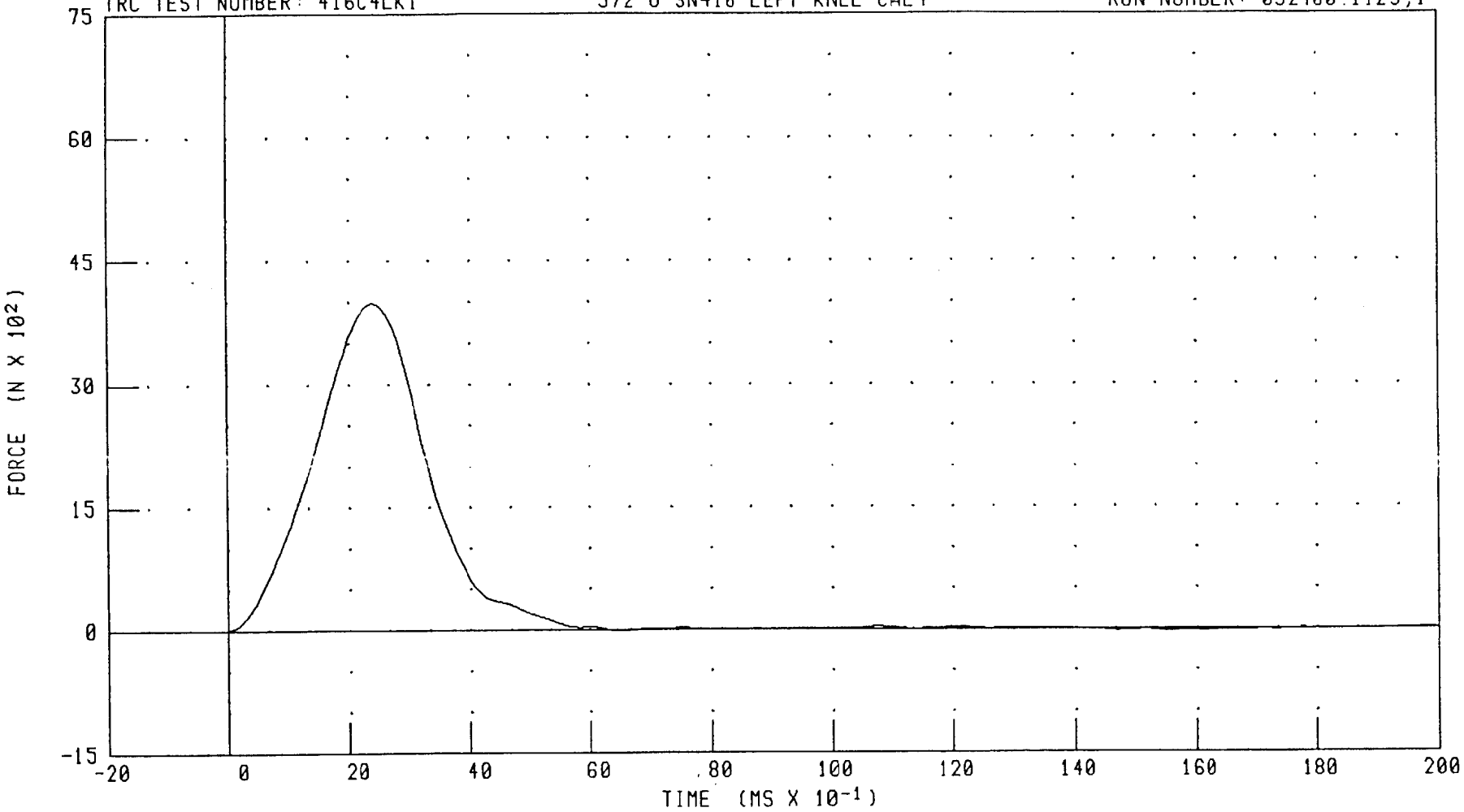


CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 135.80 G @ 2.40 MS; -0.88 G @ 15.52 MS

PART 572-O HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

TRC TEST NUMBER: 416C4LK1 572 O SN416 LEFT KNEE CAL4 RUN NUMBER: 052400.1123;1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 3986.65 N @ 2.40 MS; -25.71 N @ 15.52 MS

Appendix D

Miscellaneous Test Information

Dummy Sign Convention

Vehicle Accelerometers:	+X: Forward	
	+Y: Rightward	
	+Z: Downward	
Potentiometers:	+Chest longitudinal deflection:	Inward
Load cells:	+Femur force:	Compression
Neck load cells:	+X force:	Head forward
	+Y force:	Head leftward
	+Z force:	Head upward (tension on neck)
	+X moment:	Right ear rotating toward right shoulder
	+Y moment:	Chin rotating toward chest
	+Z moment:	Chin rotating toward left shoulder

Filtering Data

J211 OCT 88

Load Cell Barrier Forces Class 60

Vehicle Structural Accelerations Class 60

Occupant

Head Accelerometer Class 1000

Neck Class 60

Chest Accelerometer Class 180

Chest Deflection Class 180

Femur Force Class 600

Sternum Accelerometer Class 180

Leg Force Class 600

Target Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: First Tech/090

Seating position: Driver

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXGA	Head	X	Endevco	7264	J23802	Rearward
HEDYGA	Head	Y	Endevco	7264	AJ535	Left
HEDZGA	Head	Z	Endevco	7264	J23942	Up
NEKXFA[1]	Neck	X	First Tech	IF-205	197-FX	N/A
NEKYFA[1]	Neck	Y	First Tech	IF-205	197-FY	N/A
NEKZFA[1]	Neck	Z	First Tech	IF-205	197-FZ	N/A
NEKXMA[1]	Neck	X	First Tech	IF-205	197-MX	N/A
NEKYMA[1]	Neck	Y	First Tech	IF-205	197-MY	N/A
NEKZMA[1]	Neck	Z	First Tech	IF-205	197-MZ	N/A
CSTXGA	Chest	X	Endevco	7264	J20417	Forward
CSTYGA	Chest	Y	Endevco	7264	J23759	Left
CSTZGA	Chest	Z	Endevco	7264	J18664	Up
CSTXDA	Chest	X	Servo	14CBI-2897	83672	Inward
PEVXGA	Pelvis	X	Endevco	7264	AJ7R1	Rearward
PEVYGA	Pelvis	Y	Endevco	7264	J23913	Left
PEVZGA	Pelvis	Z	Endevco	7264	J21963	Up
LFMFA	Femur	Z	GSE	2430	739	Tension
RFMFA	Femur	Z	GSE	2430	760	Tension

[1] See Dummy Sign Convention sheet for polarity.

Target Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: Applied Safety Technologies/329

Seating position: Passenger

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation[1] (+ Sensing)
HEDXGB	Head	X	Endevco	7364	A75JJ	Rearward
HEDYGB	Head	Y	Entran	EGE-73BQE0	98H14-K20	Left
HEDZGB	Head	Z	Entran	EGE-73BQE0	99H13-F04	Up
NEKXFB[1]	Neck	X	Denton	1716	1039-FX	N/A
NEKYFB[1]	Neck	Y	Denton	1716	1039-FY	N/A
NEKZFB[1]	Neck	Z	Denton	1716	1039-FZ	N/A
NEKXMB[1]	Neck	X	Denton	1716	1039-MX	N/A
NEKYMB[1]	Neck	Y	Denton	1716	1039-MY	N/A
NEKZMB[1]	Neck	Z	Denton	1716	1039-MZ	N/A
CSTXGB	Chest	X	Entran	EGE-73BQE0	98H13-F05	Forward
CSTYGB	Chest	Y	Entran	EGE-73BQE0	98H13-F07	Left
CSTZGB	Chest	Z	Entran	EGE-73BQE0	98H10-F10	Up
CSTXDB	Chest	X	Servo	14CB1-2897	329	Inward
PEVXGB	Pelvis	X	Entran	EGE-73BQE0	98H13-F01	Rearward
PEVYGB	Pelvis	Y	Entran	EGE-73BQE0	98H10-F19	Left
PEVZGB	Pelvis	Z	Entran	EGE-73BQE0	98H10-F12	Up
LFMFB	Left femur	Z	Denton	1914	0376	Tension
RFMFB	Left femur	Z	Denton	1914	0383	Tension

[1] See Dummy Sign Convention sheet for polarity

Target Vehicle Instrumentation Placement

Number	Location	Axis	Manufacturer	Model	S/N	Orientation[1] (+ Sensing)
1	Left rear seat crossmember	X	Endevco	7264	J30469	Forward
		Y	Endevco	7264	J31456	Left
		Z	Endevco	7264	J31019	Up
2	Right rear seat crossmember	X	Endevco	7264	J31086	Forward
		Y	Endevco	7264	J30377	Left
		Z	Endevco	7264	J29018	Up
3	Engine top	X	Endevco	7264	J34531	Forward
4	Engine bottom	X	Endevco	7264	J27328	Rear
5	Vehicle center of gravity	X	Endevco	7264	J34492	Forward
		Y	Endevco	7264	J34501	Left
		Z	Endevco	7264	J29073	Up
6	Instrument panel center	X	Endevco	7264	J27720	Forward
7	Rear axle	X	Endevco	7264	J34525	Rear
8	Vehicle rear center	Z	Endevco	7264	J31091	Up

[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 J211 MAR95

Bullet Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: Humanoid/045

Seating position: Driver

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXG1	Head	X	Endevco	7264	AJ4L2	Rearward
HEDYG1	Head	Y	Endevco	7264	J23996	Left
HEDZG1	Head	Z	Endevco	7264	EJ97J	Up
NEKXF1[1]	Neck	X	First Tech	IF-205	180-FX	N/A
NEKYF1[1]	Neck	Y	First Tech	IF-205	180-FY	N/A
NEKZF1[1]	Neck	Z	First Tech	IF-205	180-FZ	N/A
NEKXM1[1]	Neck	X	First Tech	IF-205	180-MX	N/A
NEKYM1[1]	Neck	Y	First Tech	IF-205	180-MY	N/A
NEKZM1[1]	Neck	Z	First Tech	IF-205	180-MZ	N/A
CSTXG1	Chest	X	Endevco	7264	AJ7W9	Forward
CSTYG1	Chest	Y	Endevco	7264	J21989	Left
CSTZG1	Chest	Z	Endevco	7264	BE95J	Up
CSTXD1	Chest	X	Servo	14CBI-2897	86696	Inward
PEVXG1	Pelvis	X	Endevco	7264	AJ4F8	Rearward
PEVYG1	Pelvis	Y	Endevco	7264	AJ767	Left
PEVZG1	Pelvis	Z	Endevco	7264	J19338	Up
LFMF1	Femur	Z	GSE	2430	736	Tension
RFMF1	Femur	Z	GSE	2430	631	Tension

[1] See Dummy Sign Convention sheet for polarity.

Bullet Vehicle Dummy Instrumentation Placement

Dummy Manufacturer and S/N: First Technocogies/446

Seating position: Passenger

Mnemonic	Location	Axis	Manufacturer	Model	S/N	Orientation (+ Sensing)
HEDXG2	Head	X	Entram	EGE-73BQE0	99H12-F15	Rearward
HEDYG2	Head	Y	Entran	EGE-73BQE0	98H14-K20	Left
HEDZG2	Head	Z	Entran	EGE-73BQE0	99H13-F04	Up
NEKXF2[1]	Neck	X	First Tech	IF-205	1039-FX	N/A
NEKYF2[1]	Neck	Y	First Tech	IF-205	1039-FY	N/A
NEKZF2[1]	Neck	Z	First Tech	IF-205	1039-FZ	N/A
NEKXM2[1]	Neck	X	First Tech	IF-205	1039-MX	N/A
NEKYM2[1]	Neck	Y	First Tech	IF-205	1039-MY	N/A
NEKZM2[1]	Neck	Z	First Tech	IF-205	1039-MZ	N/A
CSTXG2	Chest	X	Entran	EGE-73BQE0	98H13-F07	Forward
CSTYG2	Chest	Y	Entran	EGE-73BQE0	98H13-F87	Left
CSTZG2	Chest	Z	Entran	EGE-73BQE0	98H10-F15	Up
CSTXD2	Chest	X	Servo	14CB1-2897	416	Inward
PEVXG2	Pelvis	X	Entran	EGE-73BQE0	98H13-F21	Rearward
PEVYG2	Pelvis	Y	Entran	EGE-73BQE0	98H10-F30	Left
PEVZG2	Pelvis	Z	Entran	EGE-73BQE0	98H10-F06	Up
LFMF2	Left femur	Z	GSE	2430	717	Tension
RFMF2	Left femur	Z	GSE	2430	729	Tension

[1] See Dummy Sign Convention sheet for polarity

Bullet Vehicle Instrumentation Placement

Number	Location	Axis	Manufacturer	Model	S/N	Orientation[1] (+ Sensing)
1	Left rear seat crossmember	X	Endevco	7264	J34529	Forward
		Y	Endevco	7264	J32030	Left
		Z	Endevco	7264	J34528	Up
2	Right rear seat crossmember	X	Endevco	7264	J27112	Forward
		Y	Endevco	7264	J34848	Left
		Z	Endevco	7264	J34843	Up
3	Engine top	X	Endevco	7264	J31068	Forward
4	Engine bottom	X	Endevco	7264	J35154	Forward
5	Vehicle center of gravity	X	Endevco	7264	J22170	Forward
		Y	Endevco	7264	J31017	Left
		Z	Endevco	7264	J22080	Up
6	Instrument panel center	X	Endevco	7264	J35144	Forward
7	Rear axle	X	Endevco	7264	J32151	Rear
8	Vehicle rear center	Z	Endevco	7264	J35075	Up

[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 J211 MAR95.

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th 26-MAY-00

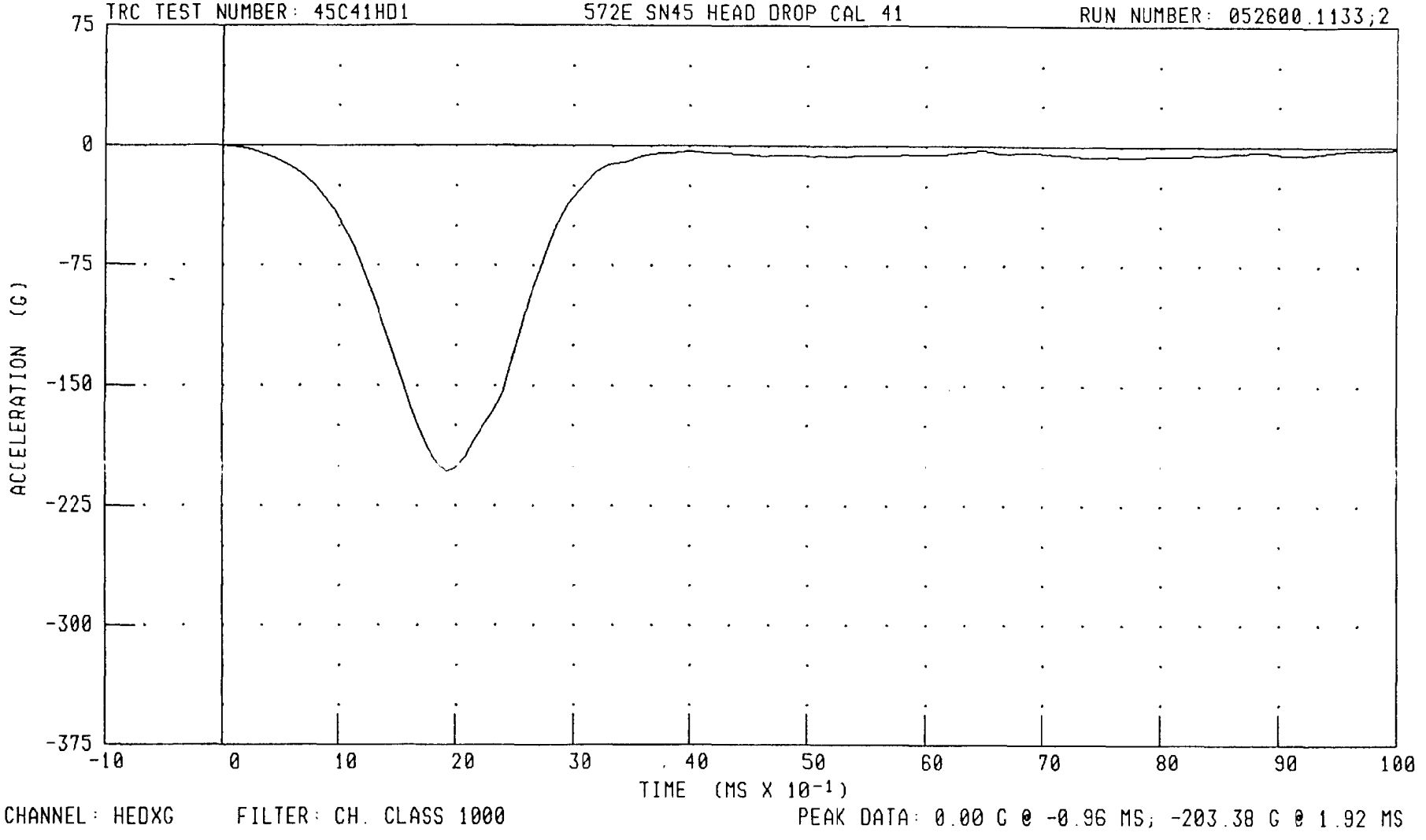
TRC INC. TEST NO: 45C41HD1 572E SN45 HEAD DROP CAL 41

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	55.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	237.35 G
PEAK LATERAL ACCELERATION	15 G MAX	2.61 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN _____ RUN NUMBER: 052600.1132;2

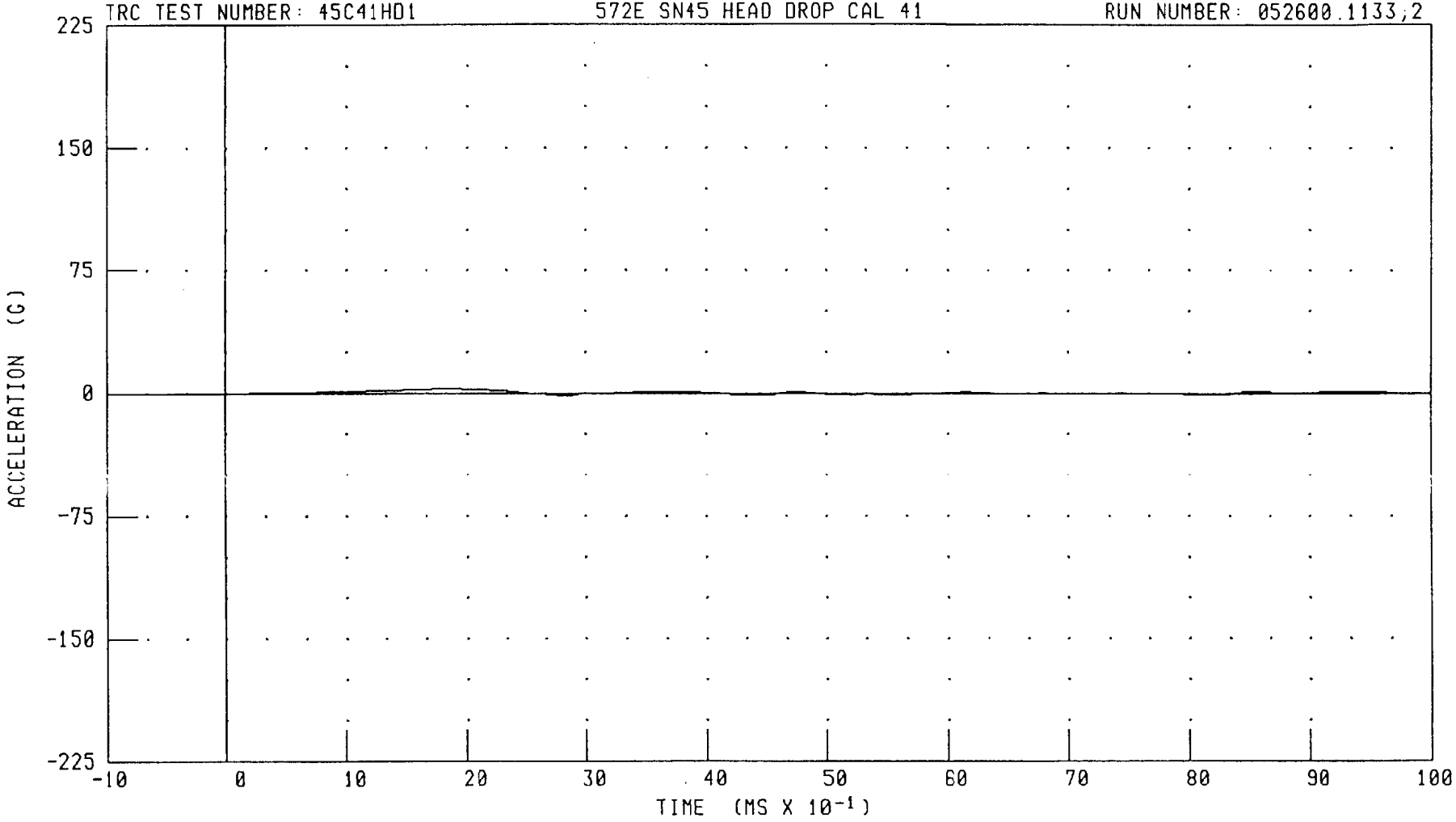
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION X AXIS



PART 572-E HYBRID III HEAD CALIBRATION

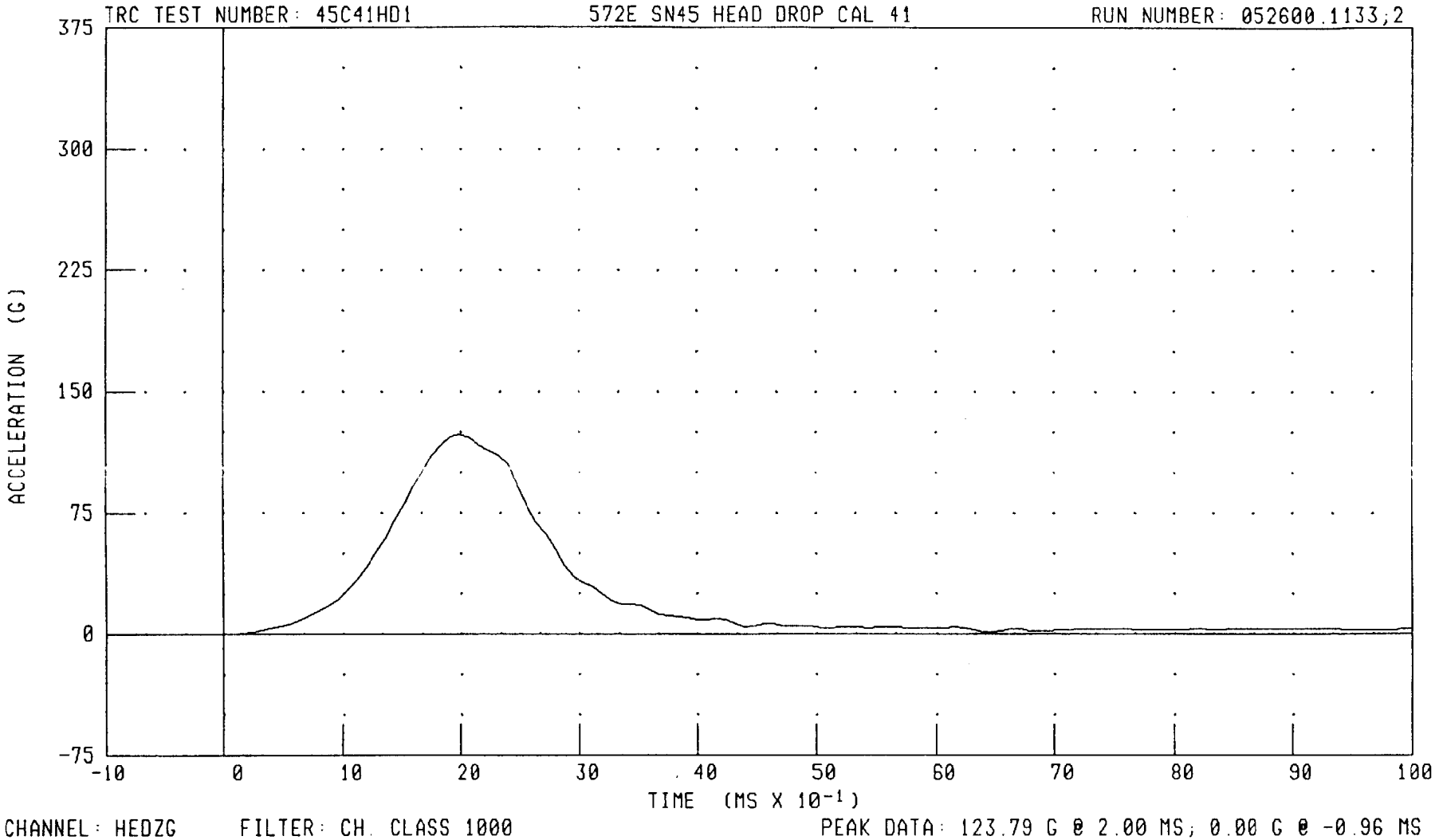
HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 45C41HD1 572E SN45 HEAD DROP CAL 41 RUN NUMBER: 052600.1133;2



CHANNEL: HEDYG FILTER: CH. CLASS 1000 PEAK DATA: 2.62 G @ 1.76 MS; -1.81 G @ 2.80 MS

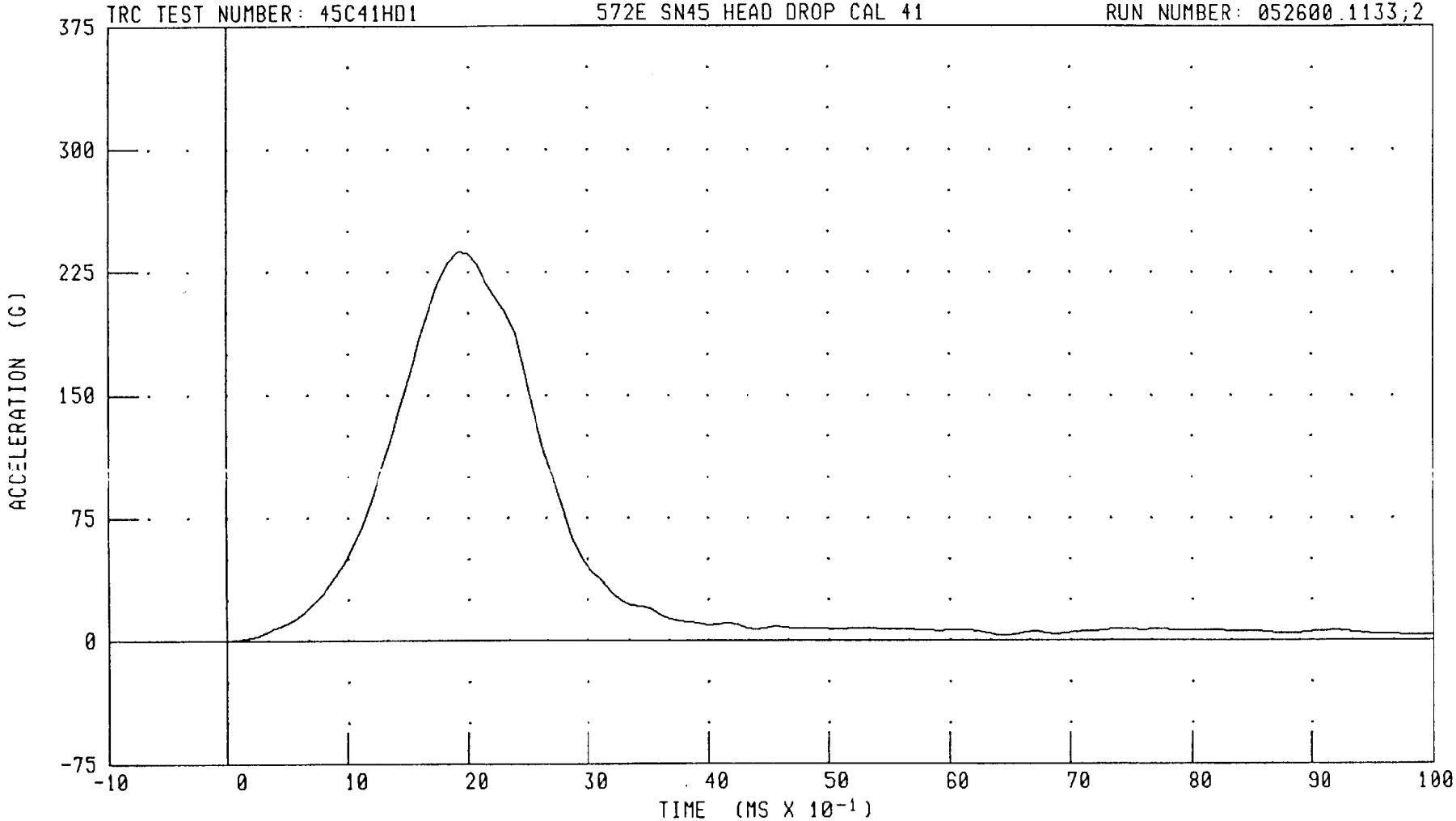
PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 123.79 G @ 2.00 MS; 0.00 G @ -0.96 MS

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION

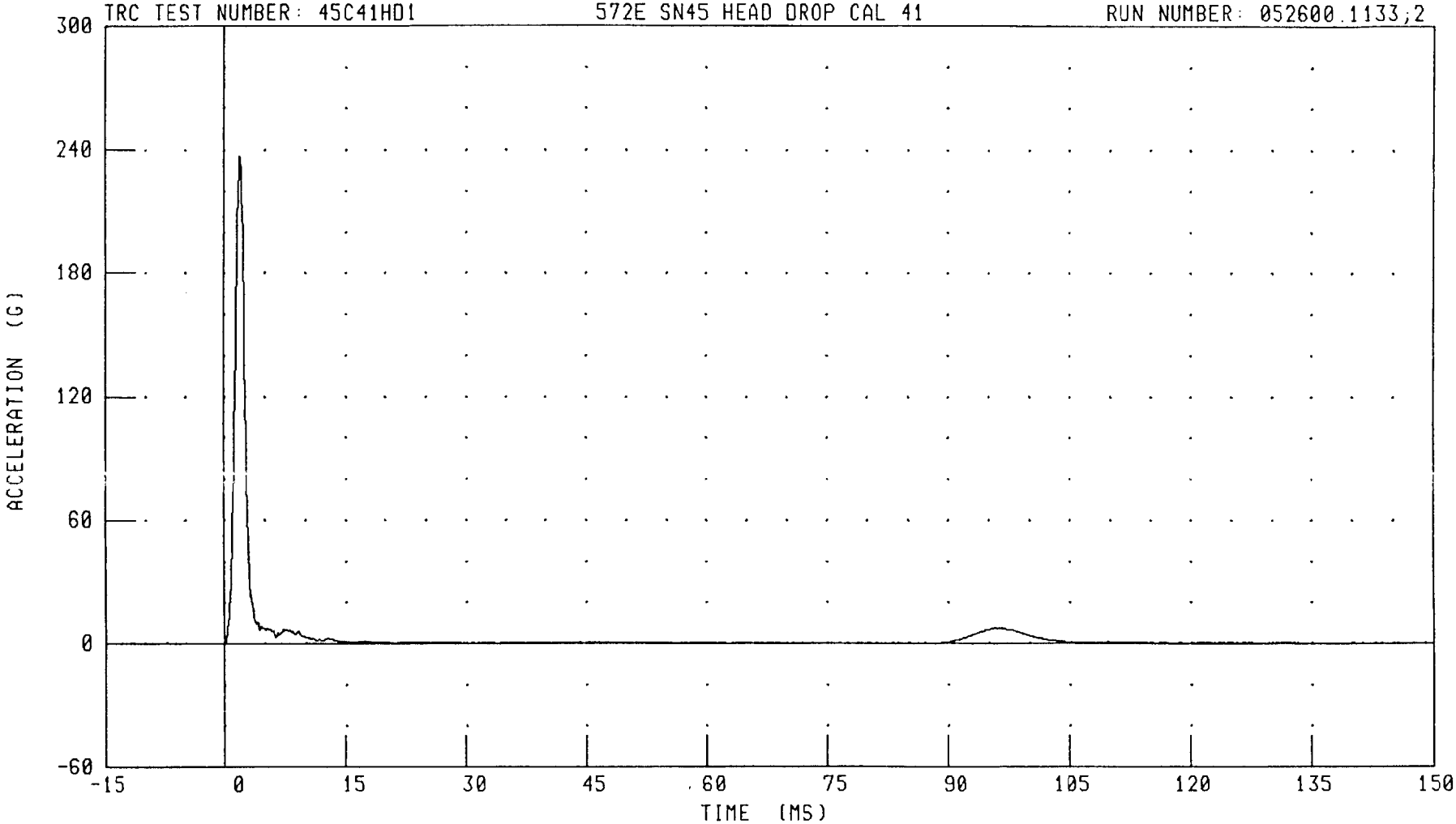
TRC TEST NUMBER: 45C41HD1 572E SN45 HEAD DROP CAL 41 RUN NUMBER: 052600.1133;2



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 237.35 G @ 1.92 MS; 0.00 G @ -0.96 MS

PART 572-E HYBRID III HEAD CALIBRATION
CHECK PLOT - HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: 45C41HD1 572E SN45 HEAD DROP CAL 41 RUN NUMBER: 052600.1133;2



CHANNEL: HEDRG FILTER: CH. CLASS 1000 PEAK DATA: 237.35 G @ 1.92 MS; 0.00 G @ -14.96 MS

TRANSPORTATION RESEARCH CENTER INC.

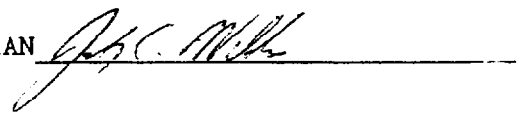
HYBRID III 50th 30-MAY-00

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 45C41NF4 572E SN45 NECK FLEXION CAL41

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	65.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.55 G
	20 MS	17.60 - 22.60 G	22.22 G
	30 MS	12.50 - 18.50 G	18.46 G
MAX PENDULUM G		29 G MAX	23.87 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	18.41 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	37.52 MS
D PLANE ROTATION	MAX	64 - 78 DEG.	75.00 DEG.
	TIME	57 - 64 MS	60.88 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	98.38 NM
	TIME	47 - 58 MS	50.56 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	118.56 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.68 MS

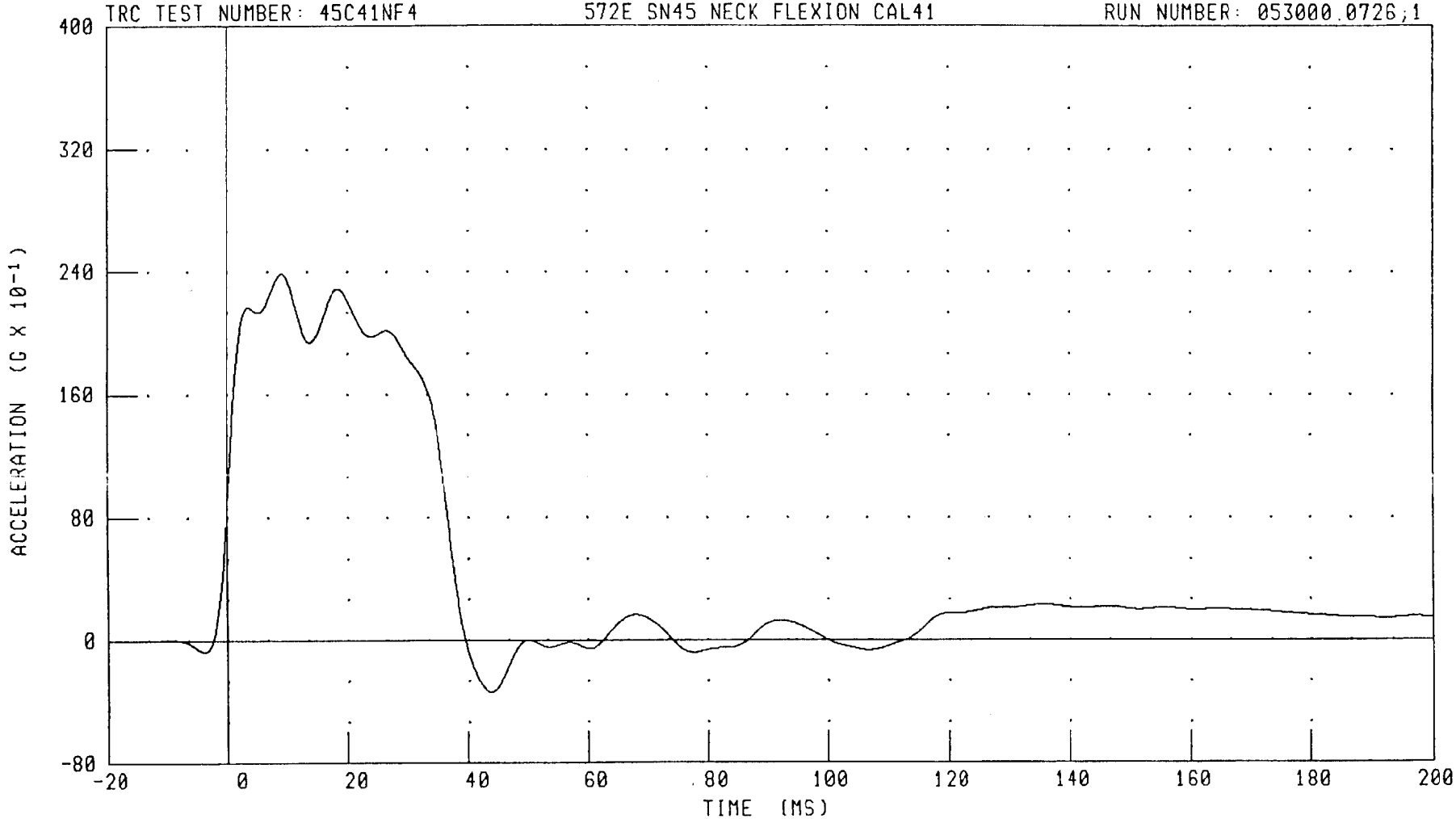
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 053000.0725;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

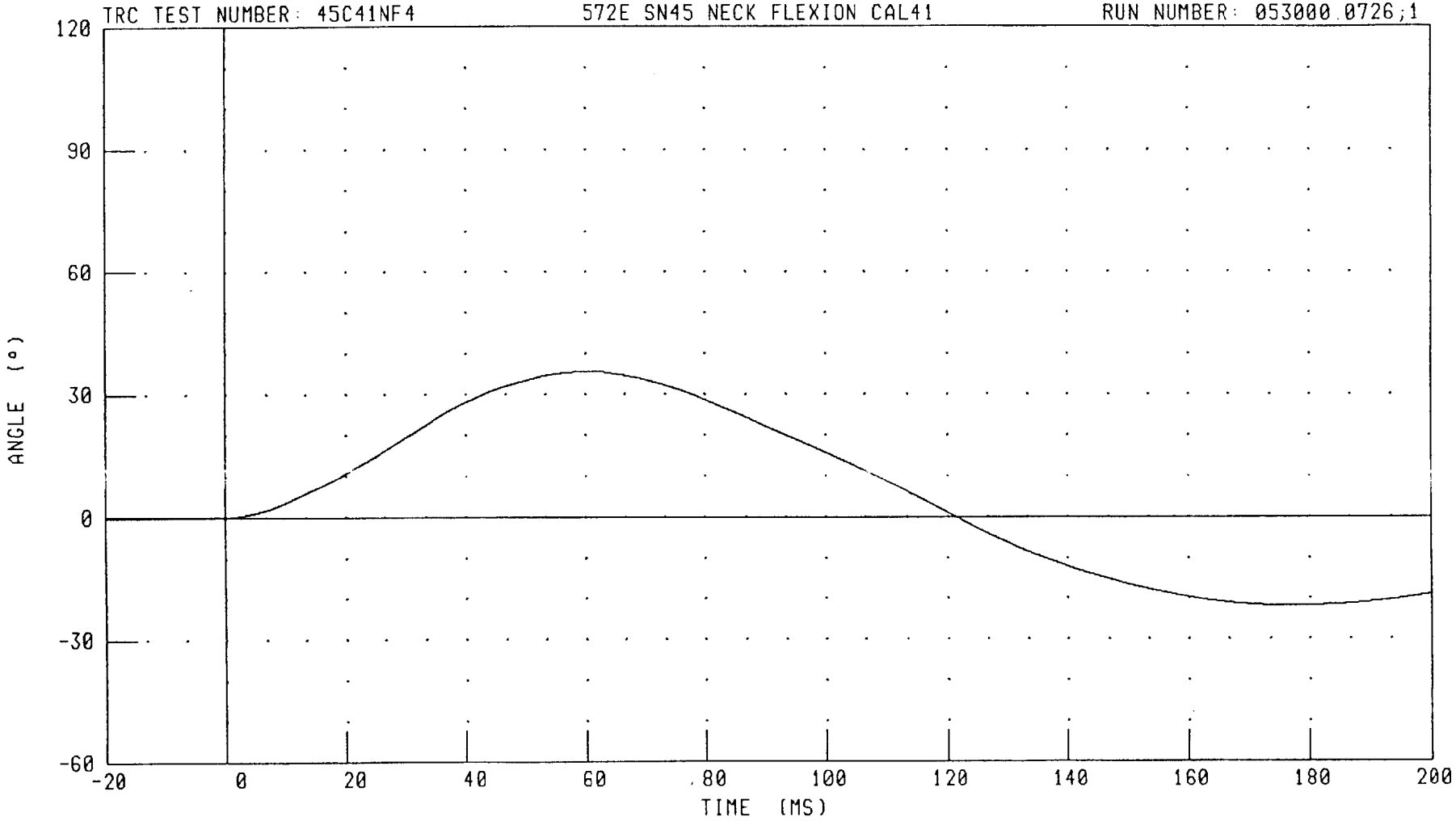
TRC TEST NUMBER: 45C41NF4 572E SN45 NECK FLEXION CAL41 RUN NUMBER: 053000.0726;1



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 23.87 G @ 9.20 MS; -3.42 G @ 43.84 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

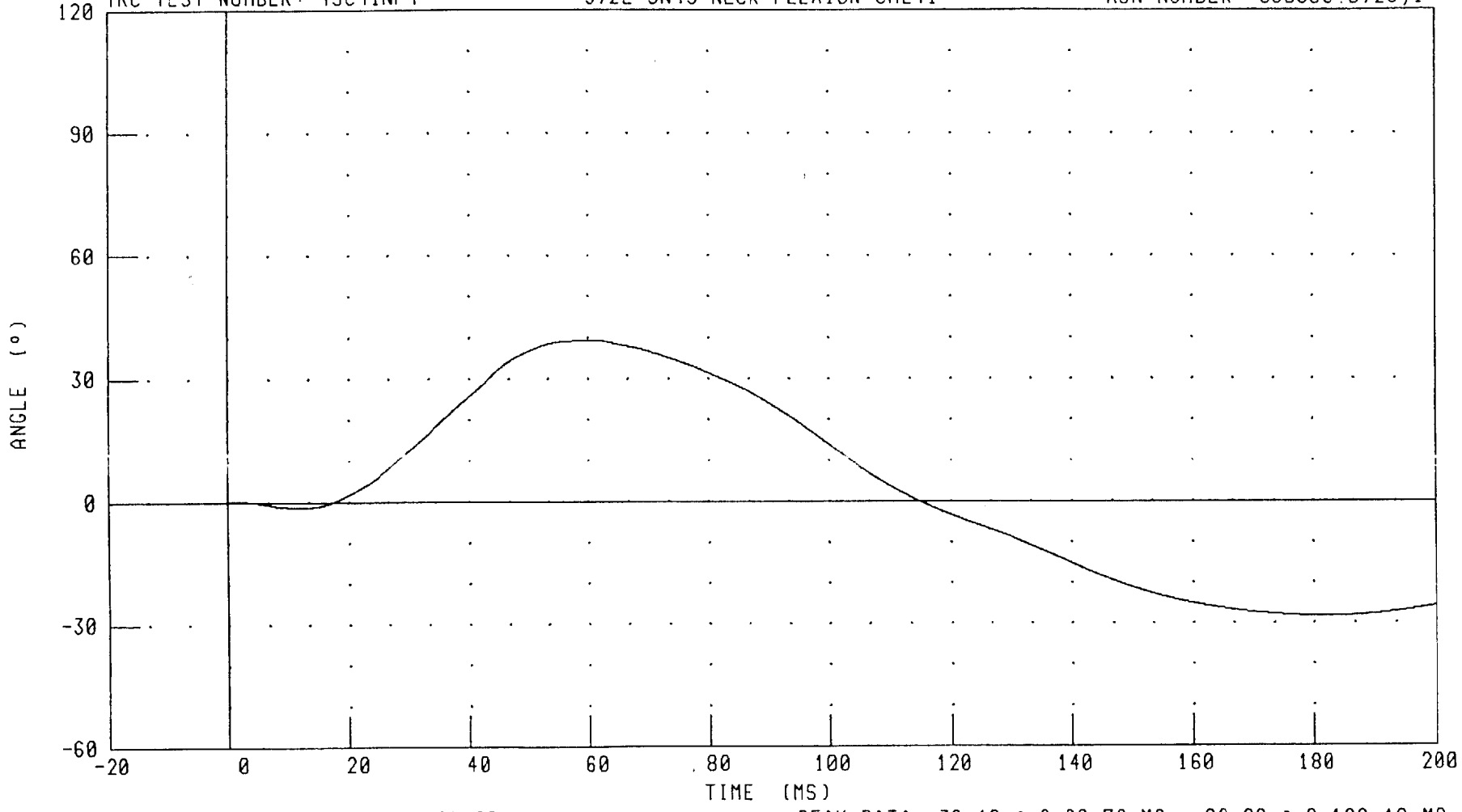
TRC TEST NUMBER: 45C41NF4 572E SN45 NECK FLEXION CAL41 RUN NUMBER: 053000.0726;1



CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 35.60 ° @ 61.04 MS; -21.96 ° @ 176.80 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 45C41NF4 572E SN45 NECK FLEXION CAL41 RUN NUMBER: 053000.0726;1

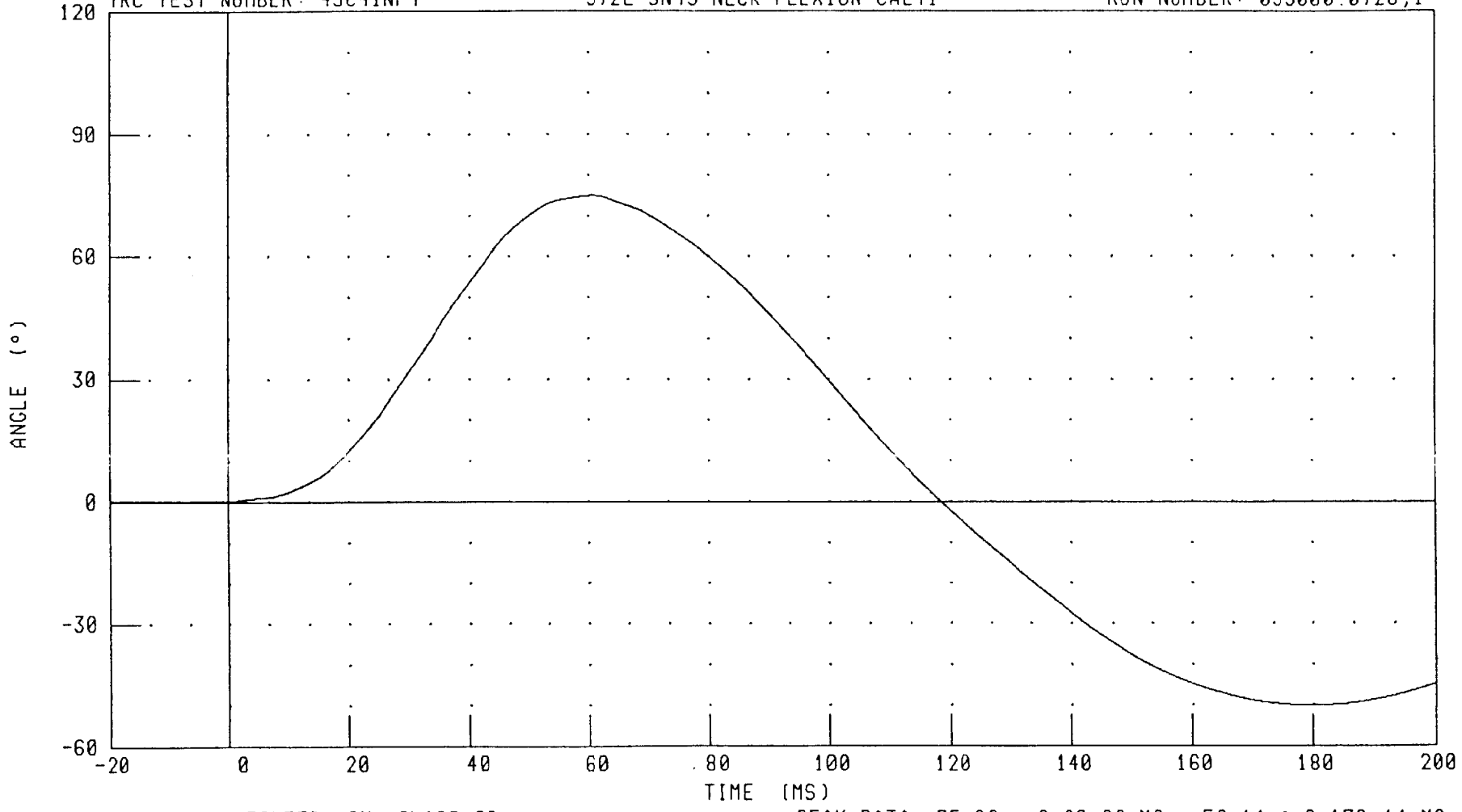


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 39.40 ° @ 60.72 MS; -28.26 ° @ 182.16 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 45C41NF4 572E SN45 NECK FLEXION CAL41 RUN NUMBER: 053000.0726;1

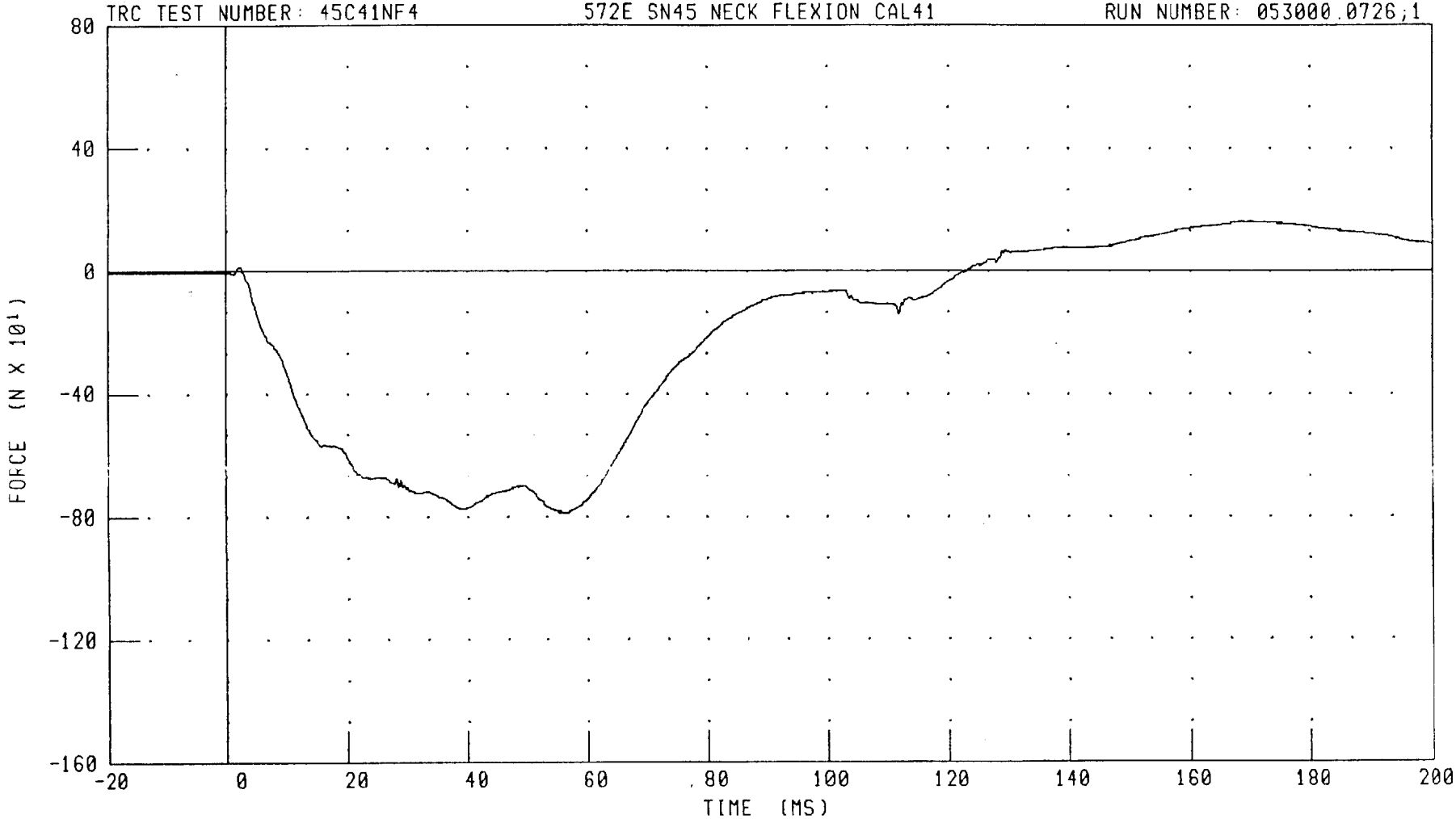


CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 75.00 ° @ 60.88 MS; -50.14 ° @ 179.44 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 45C41NF4 572E SN45 NECK FLEXION CAL41 RUN NUMBER: 053000.0726;1

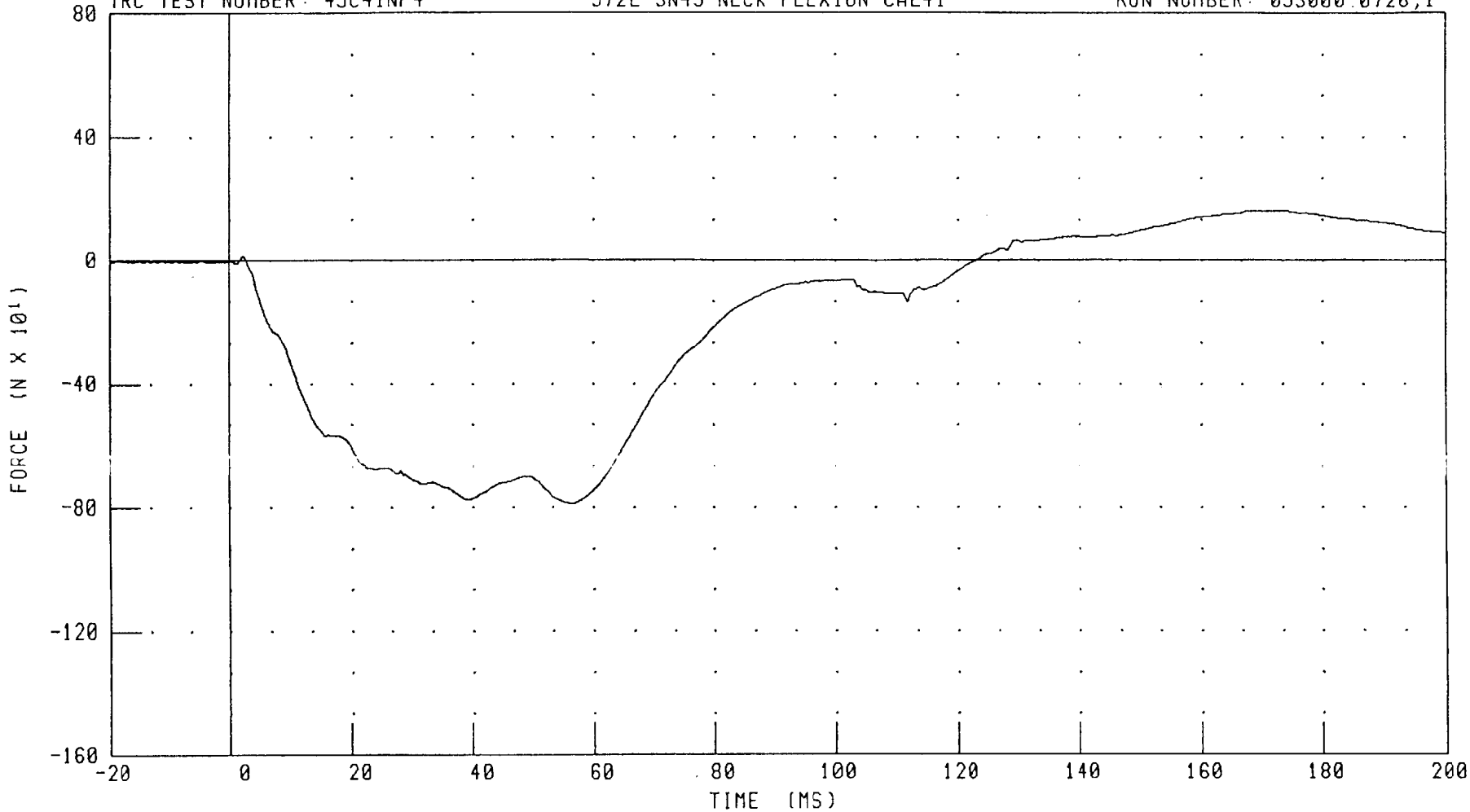


CHANNEL: NEKXF FILTER: CH. CLASS 1000 PEAK DATA: 163.09 N @ 168.32 MS; -786.17 N @ 55.44 MS

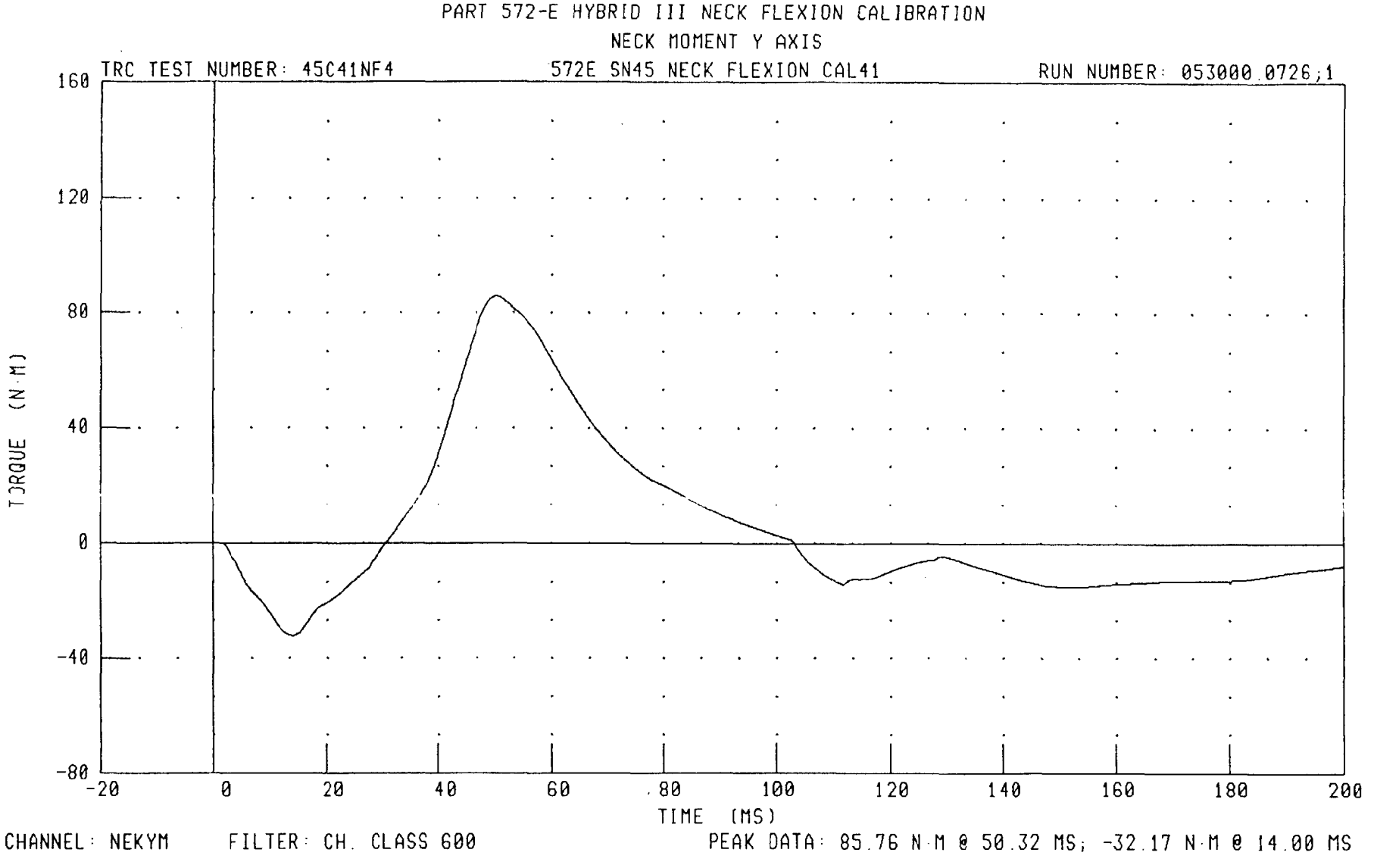
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION

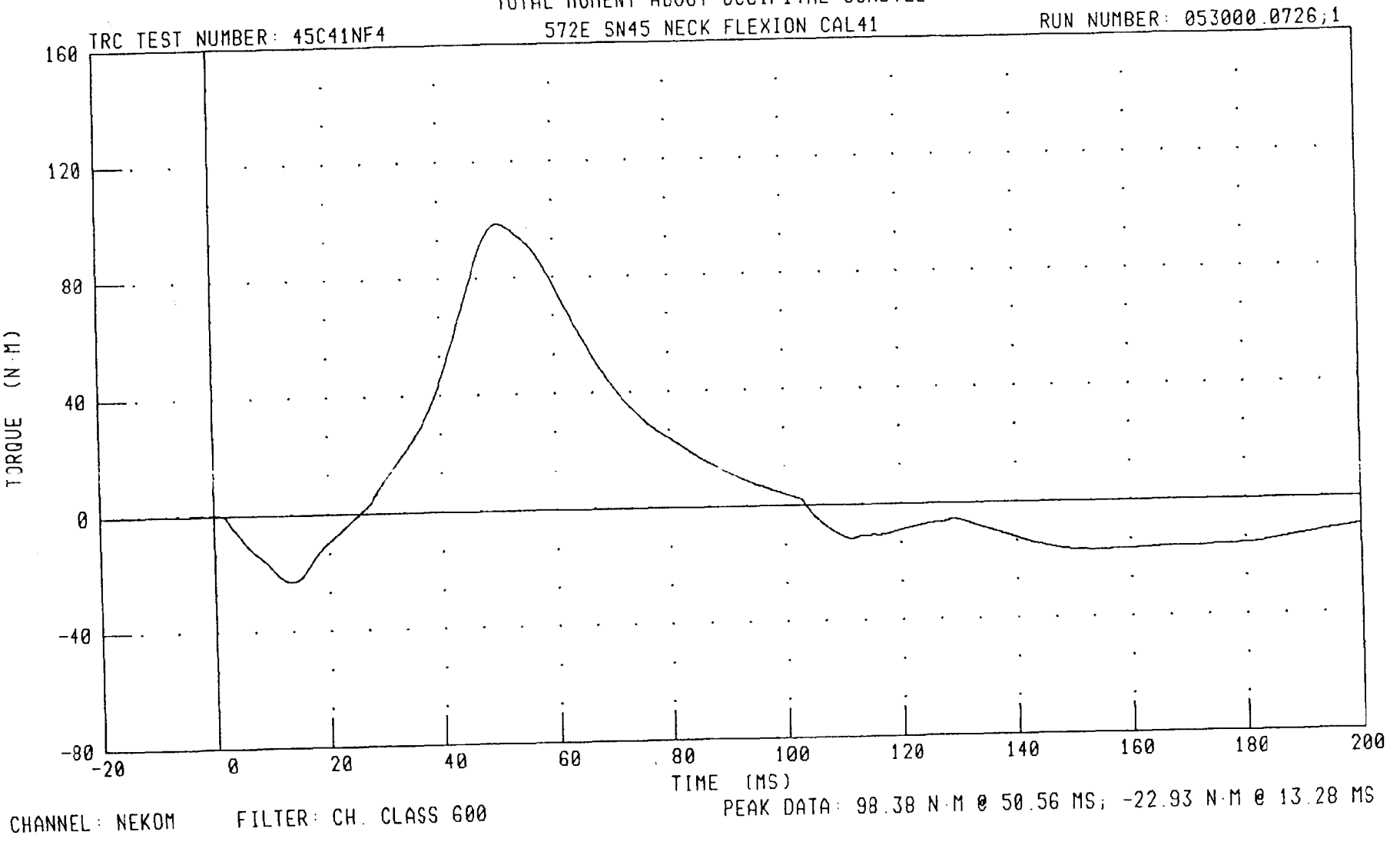
TRC TEST NUMBER: 45C41NF4 572E SN45 NECK FLEXION CAL41 RUN NUMBER: 053000.0726;1



CHANNEL: NEKXFC FILTER: CH. CLASS 600 PEAK DATA: 161.78 N @ 168.80 MS; -786.31 N @ 56.72 MS


PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS
TRC TEST NUMBER: 45C41NF4
572E SN45 NECK FLEXION CAL41
RUN NUMBER: 053000.0726;1
160
120
80
40
0
-40
-80
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKYM
FILTER: CH. CLASS 600
PEAK DATA: 85.76 N-M @ 50.32 MS; -32.17 N-M @ 14.00 MS

PART 572-E HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



CHANNEL: NEKOM FILTER: CH. CLASS 600

PEAK DATA: 98.38 N-M @ 50.56 MS; -22.93 N-M @ 13.28 MS

TRANSPORTATION RESEARCH CENTER INC.

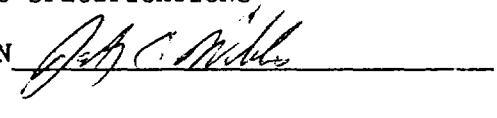
HYBRID III 50th 30-MAY-00

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 45C41NE1 572E SN45 NECK EXT CAL41

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	65.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.10 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	20.19 G
	20 MS	14.00 - 19.00 G	17.35 G
	30 MS	11.00 - 16.00 G	15.01 G
MAX PENDULUM G		22 G MAX	20.62 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.97 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	39.76 MS
D PLANE ROTATION	MAX	81 - 106 DEG.	99.39 DEG.
	TIME	72 - 82 MS	74.96 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-68.46 NM
	TIME	65 - 79 MS	70.00 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	156.16 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	143.36 MS

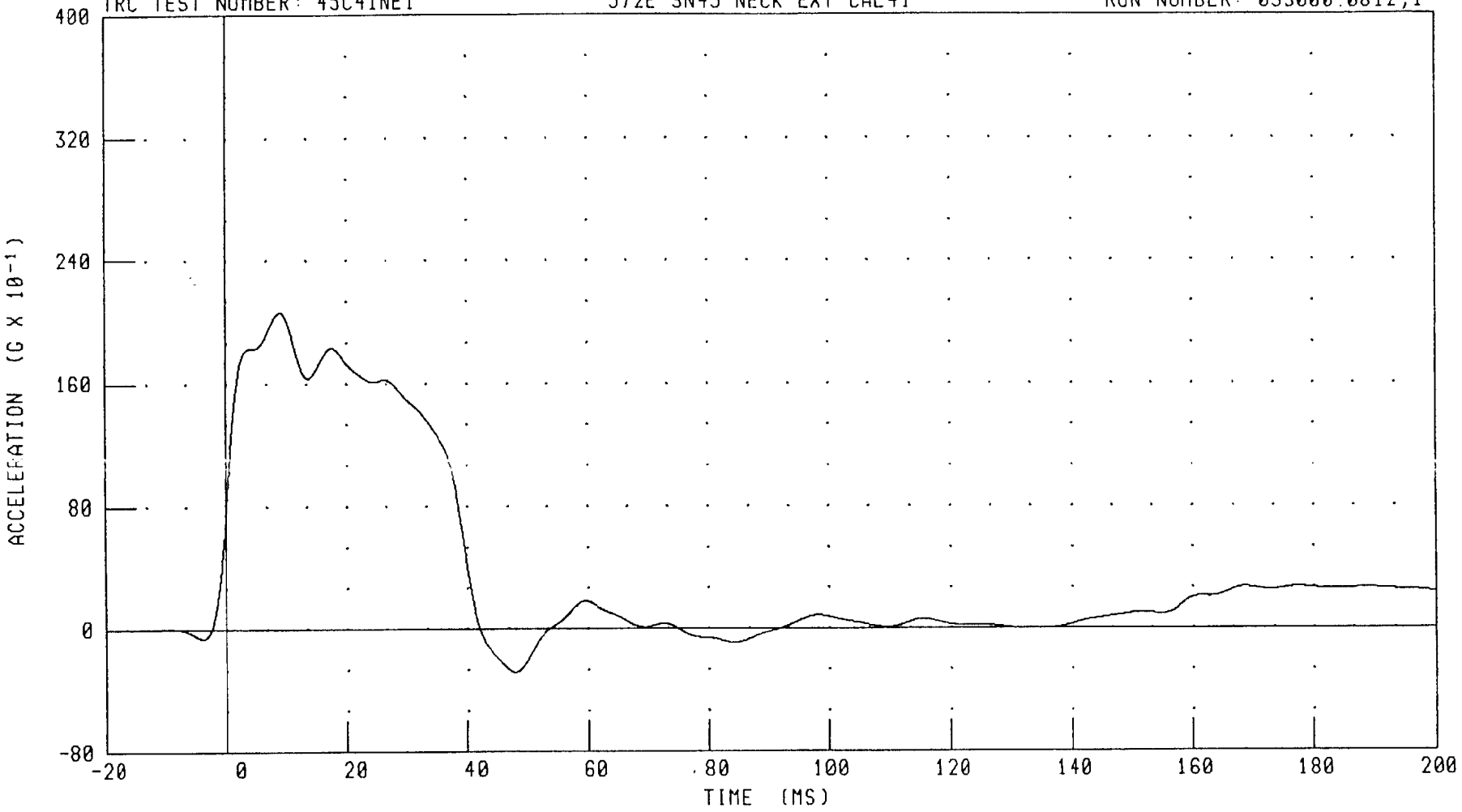
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 053000.0811;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

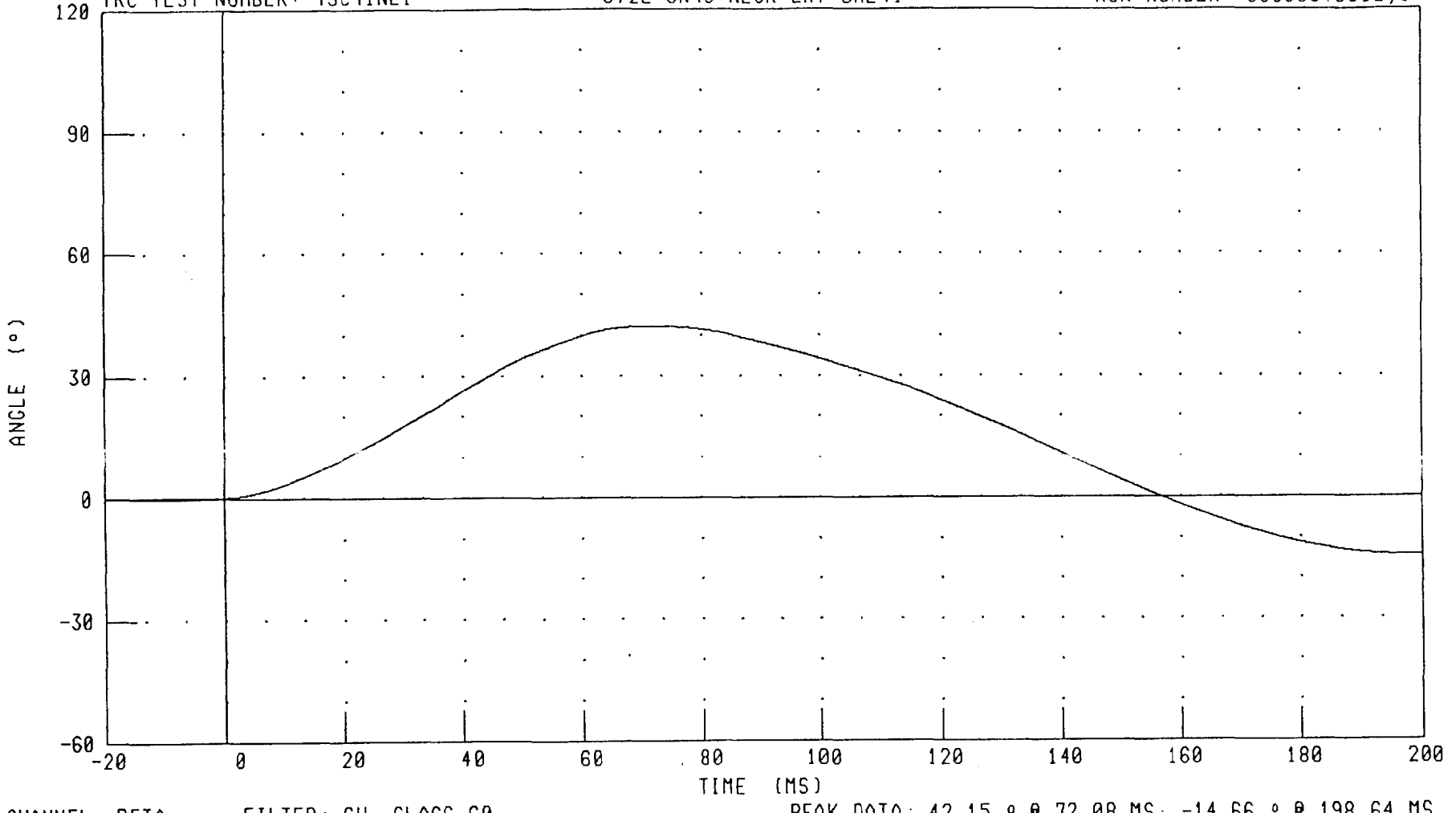
TRC TEST NUMBER: 45C41NE1 572E SN45 NECK EXT CAL41 RUN NUMBER: 053000.0812;1



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 20.62 G @ 9.04 MS; -2.84 G @ 47.84 MS

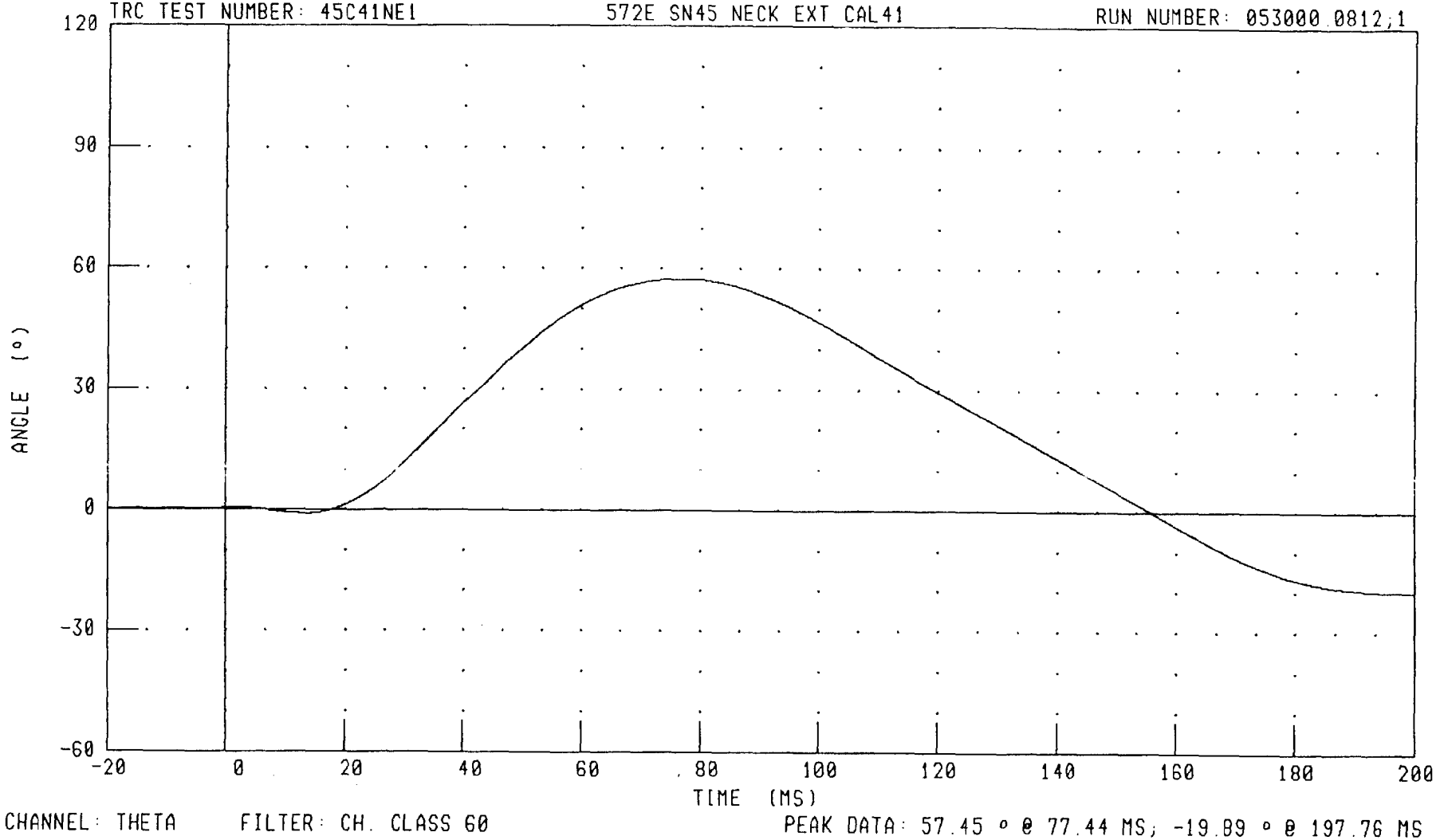
PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: 45C41NE1 572E SN45 NECK EXT CAL41 RUN NUMBER: 053000.0812;1



CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 42.15 ° @ 72.08 MS; -14.66 ° @ 198.64 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

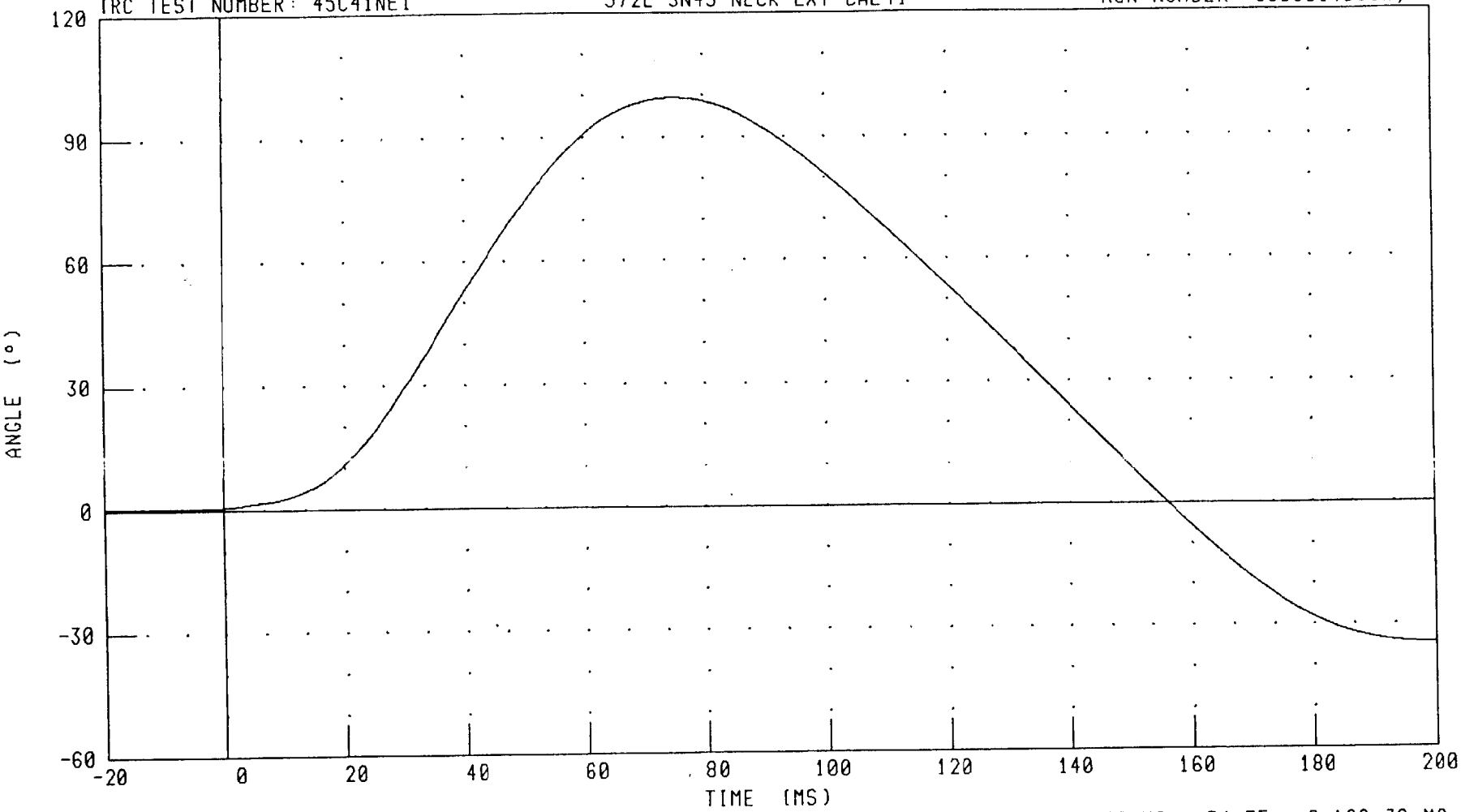


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 57.45 ° @ 77.44 MS; -19.89 ° @ 197.76 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 45C41NE1 572E SN45 NECK EXT CAL41 RUN NUMBER: 053000.0812;1



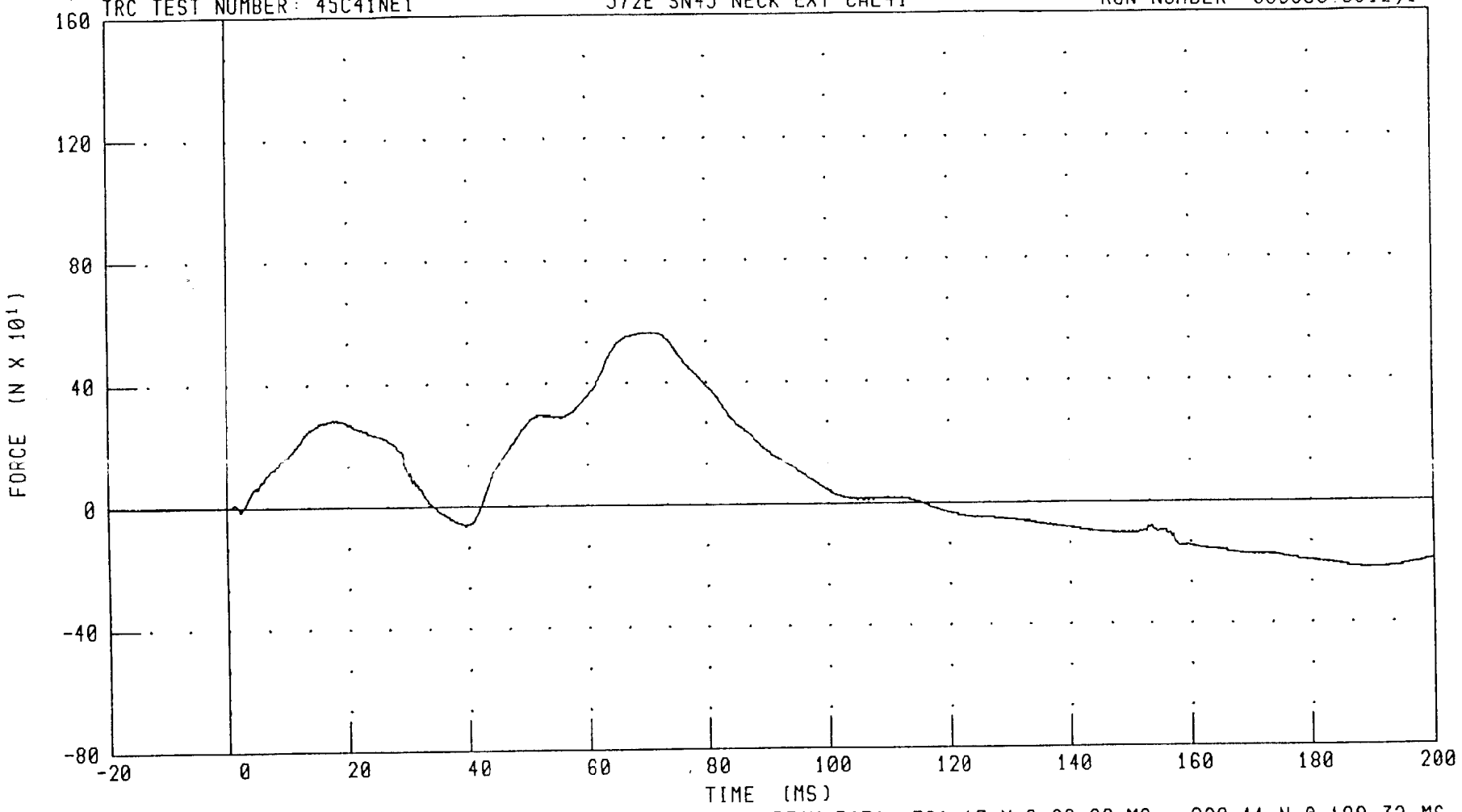
CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 99.40 ° @ 74.96 MS; -34.55 ° @ 198.32 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 45C41NE1 572E SN45 NECK EXT CAL41 RUN NUMBER: 053000 0812;1

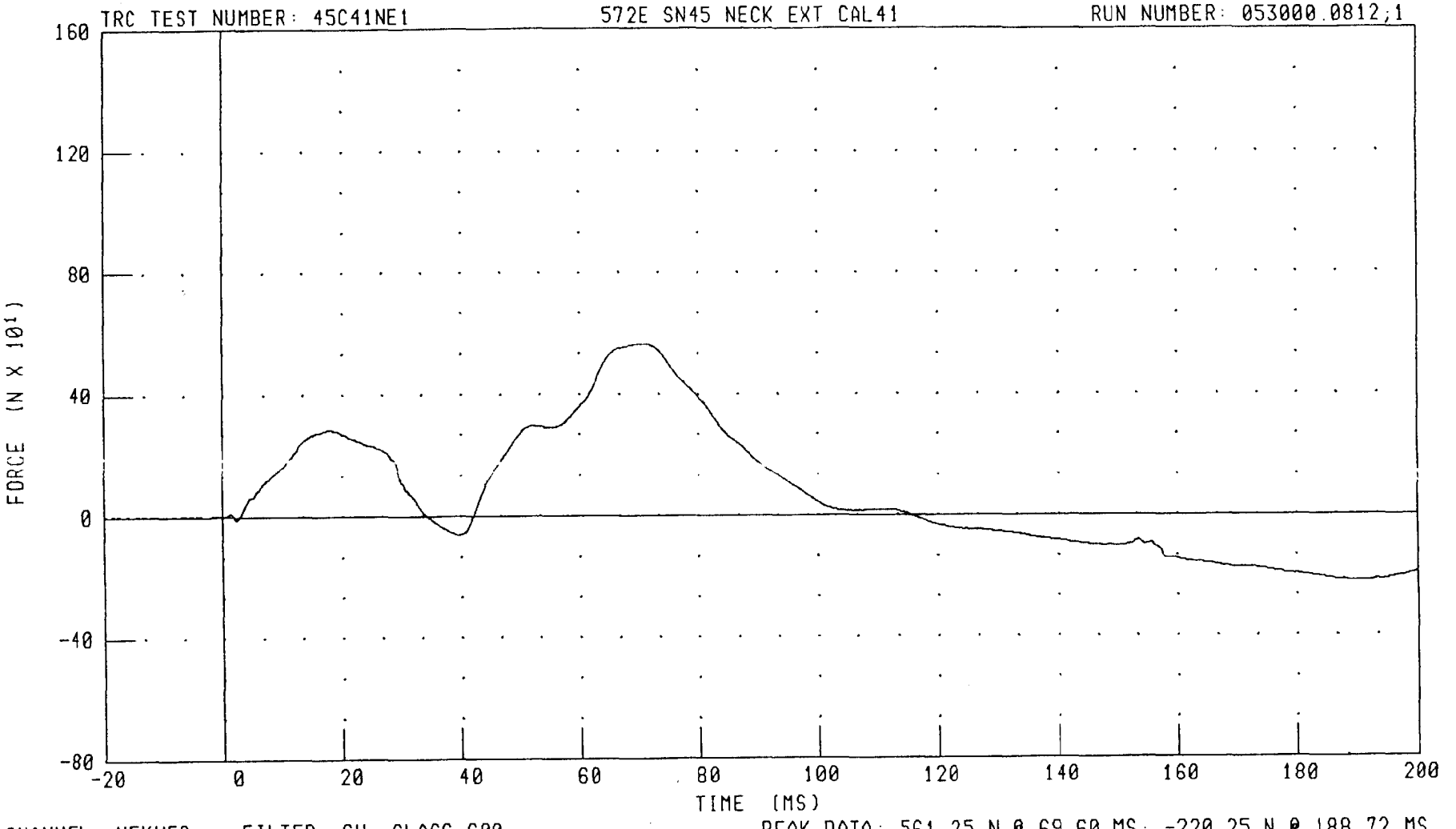


CHANNEL: NEKXF FILTER: CH. CLASS 1000

PEAK DATA: 561.17 N @ 68.88 MS; -220.11 N @ 188.32 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

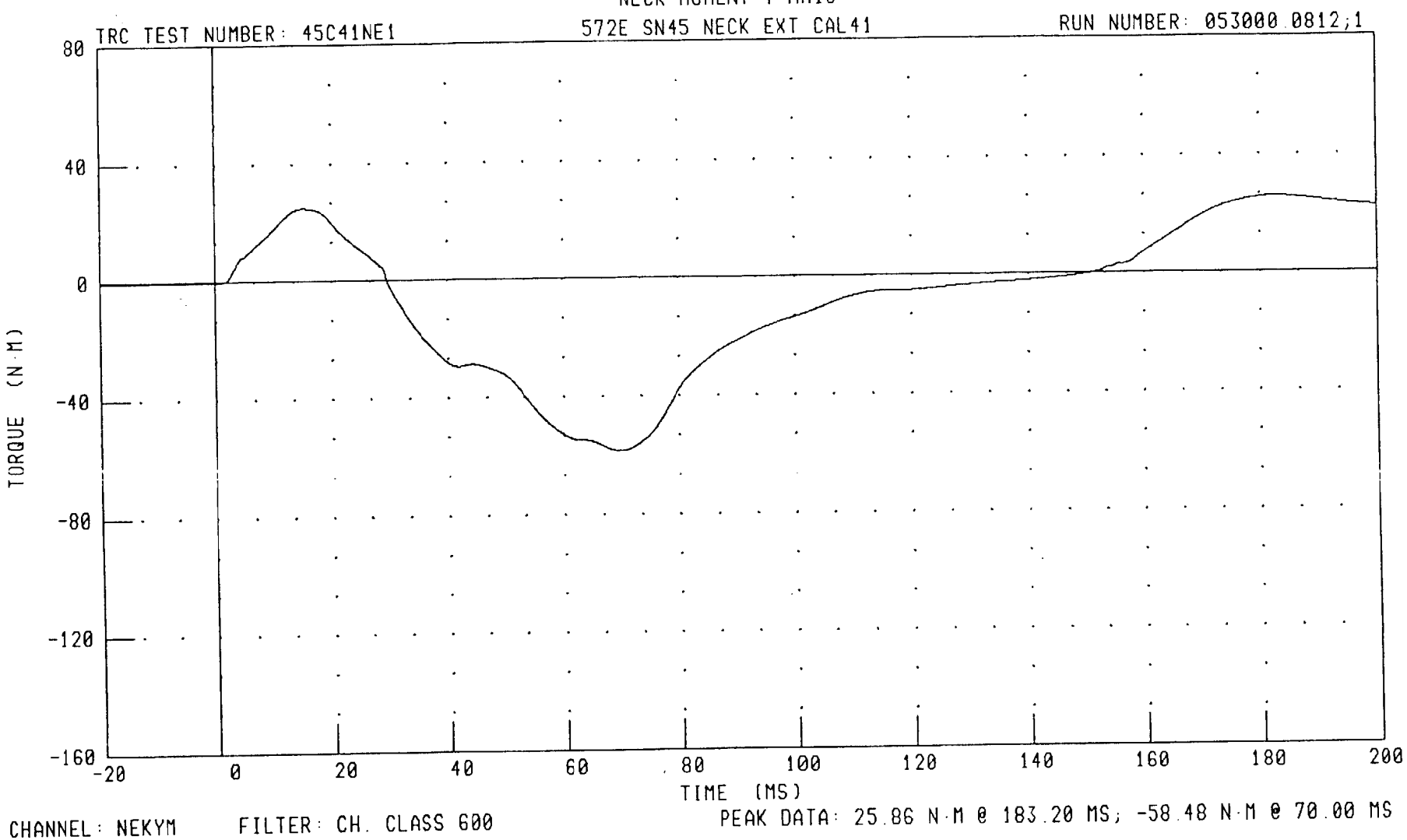
NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION



CHANNEL: NEKXFC FILTER: CH. CLASS 600

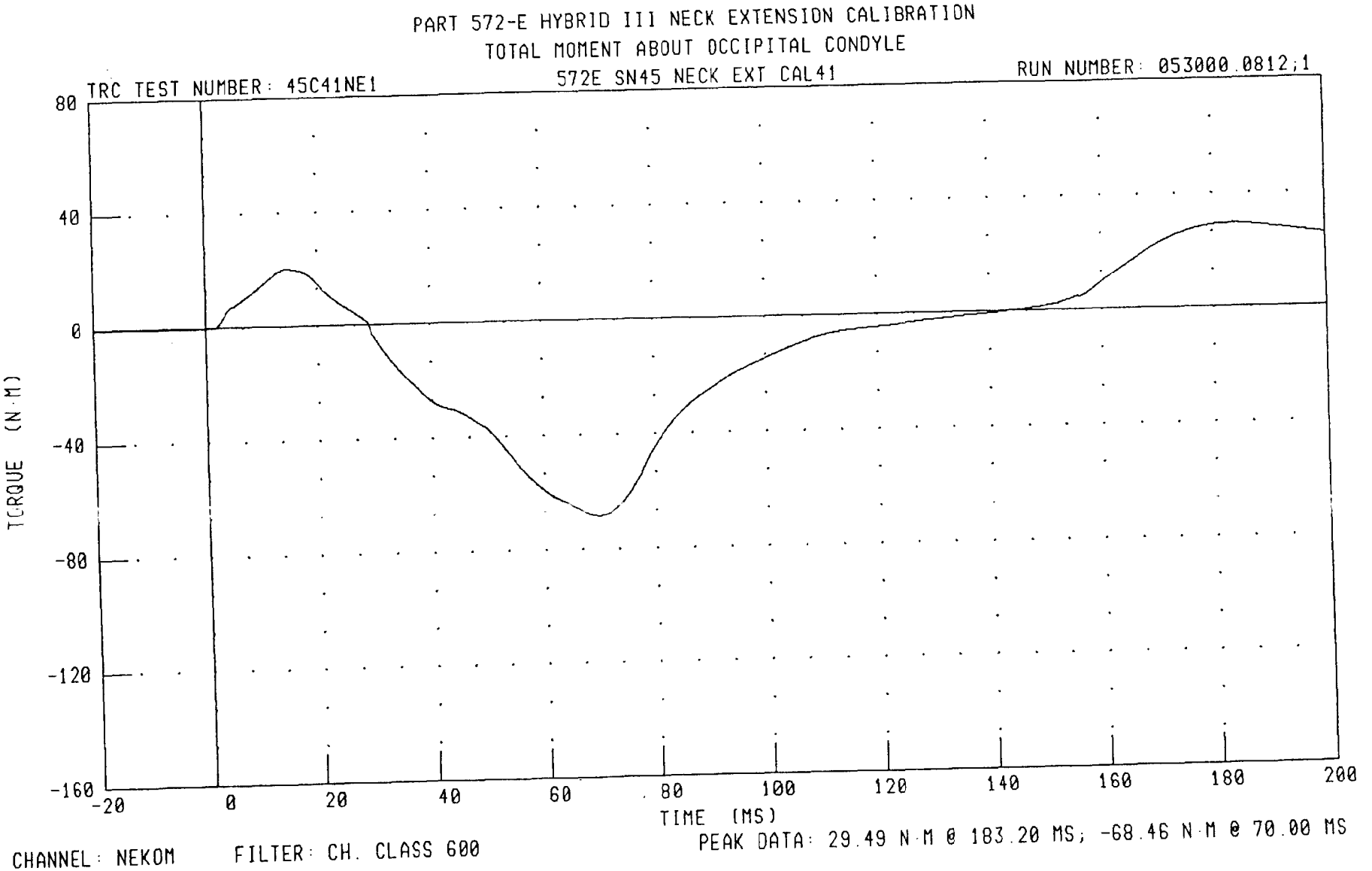
PEAK DATA: 561.25 N @ 69.60 MS; -220.25 N @ 188.72 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
NECK MOMENT Y AXIS



CHANNEL: NEKYM FILTER: CH. CLASS 600

PEAK DATA: 25.86 N-M @ 183.20 MS; -58.48 N-M @ 70.00 MS


PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE
572E SN45 NECK EXT CAL41
TRC TEST NUMBER: 45C41NE1
RUN NUMBER: 053000.0812;1
80
40
0
-40
-80
-120
-160
TORQUE (N-M)
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: NEKOM
FILTER: CH. CLASS 600
PEAK DATA: 29.49 N-M @ 183.20 MS; -68.46 N-M @ 70.00 MS

TRANSPORTATION RESEARCH CENTER INC.

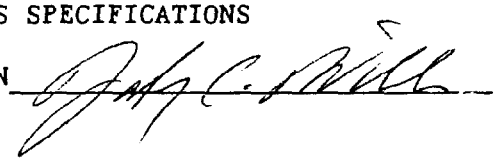
THORAX IMPACT TEST

HYBRID III 50th 24-MAY-00

TRC INC. TEST NO: 45C41TH1 572E SN45 H.S.THORAX CAL41

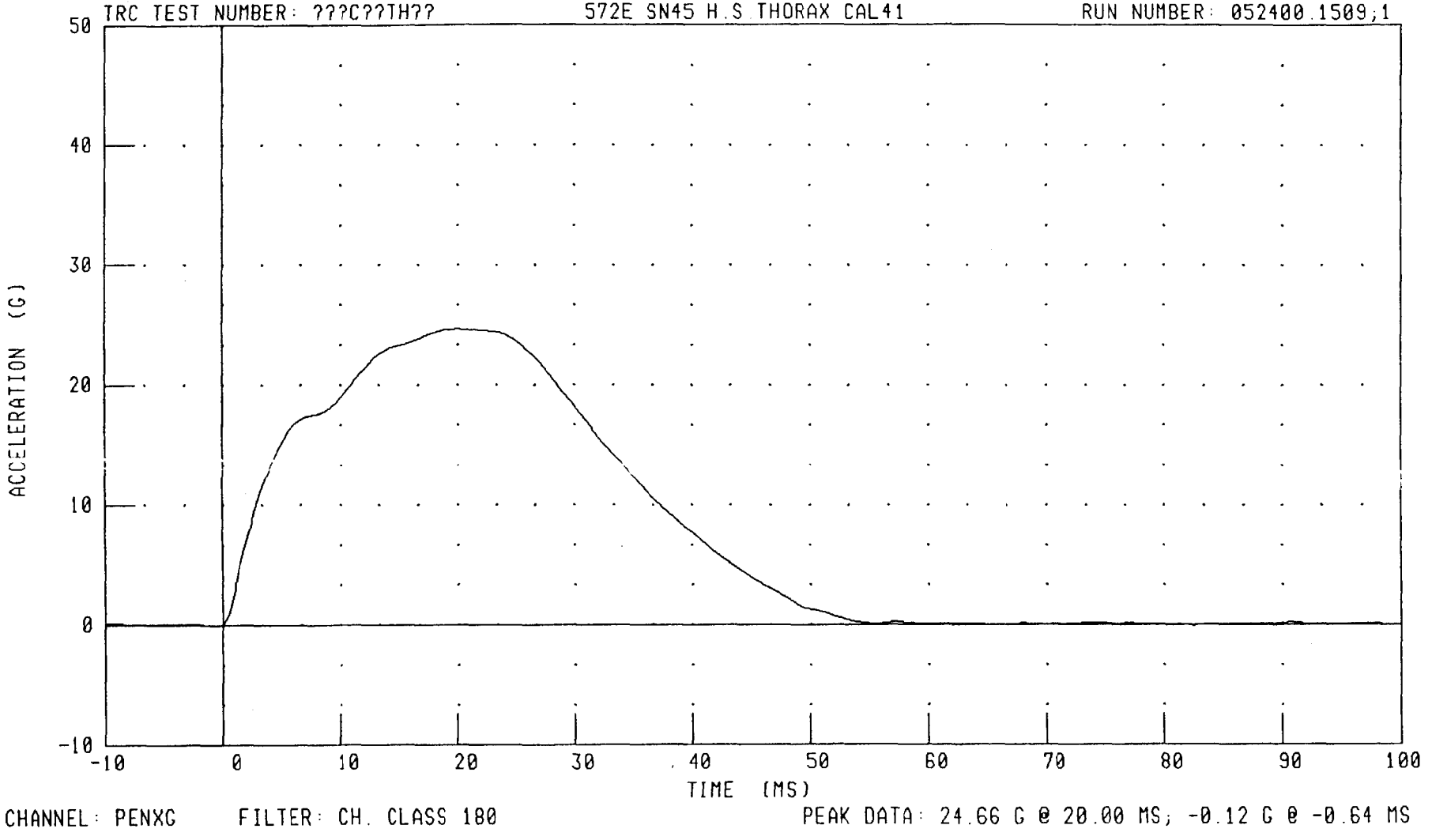
TEST PARAMETER	HIGH SPEED TEST SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	65.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.59 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	66.4 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5650. N
INTERNAL HYSTERESIS	69% - 85%	72.6%

TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052400.1453;1

PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

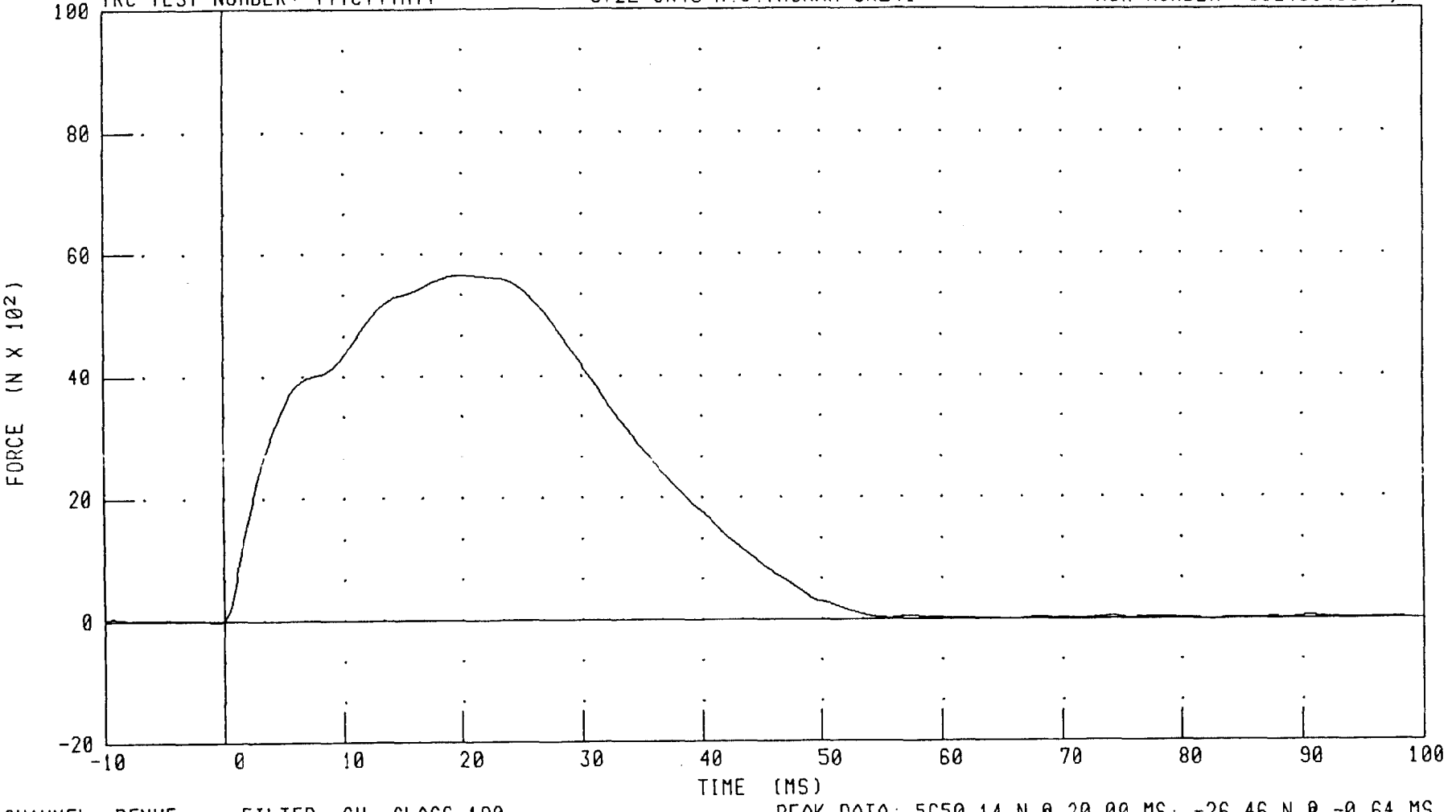


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 24.66 G @ 20.00 MS; -0.12 G @ -0.64 MS

PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: ???C??TH?? 572E SN45 H.S.THORAX CAL41 RUN NUMBER: 052400.1509;1

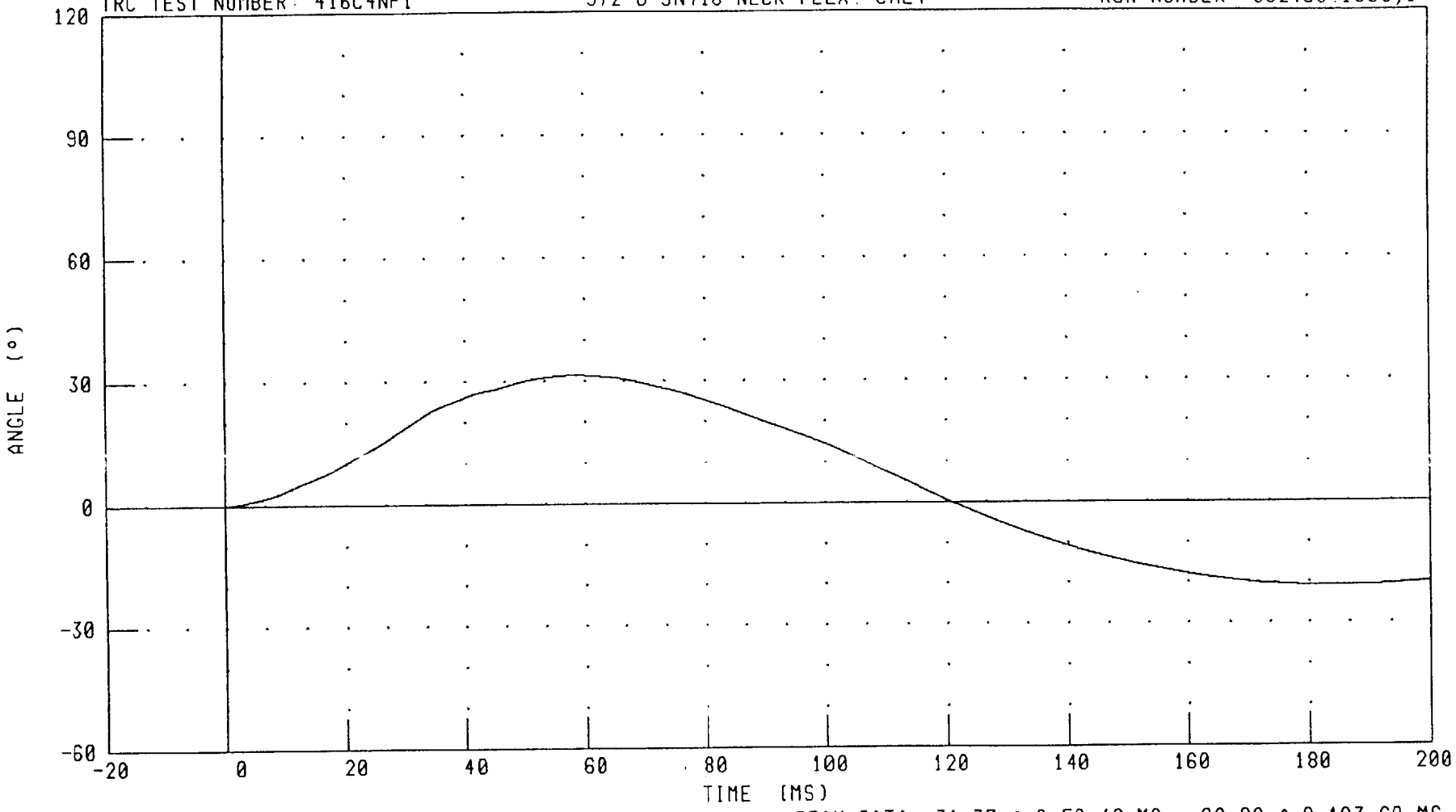


CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5650.14 N @ 20.00 MS; -26.46 N @ -0.64 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT BASE OF NECK

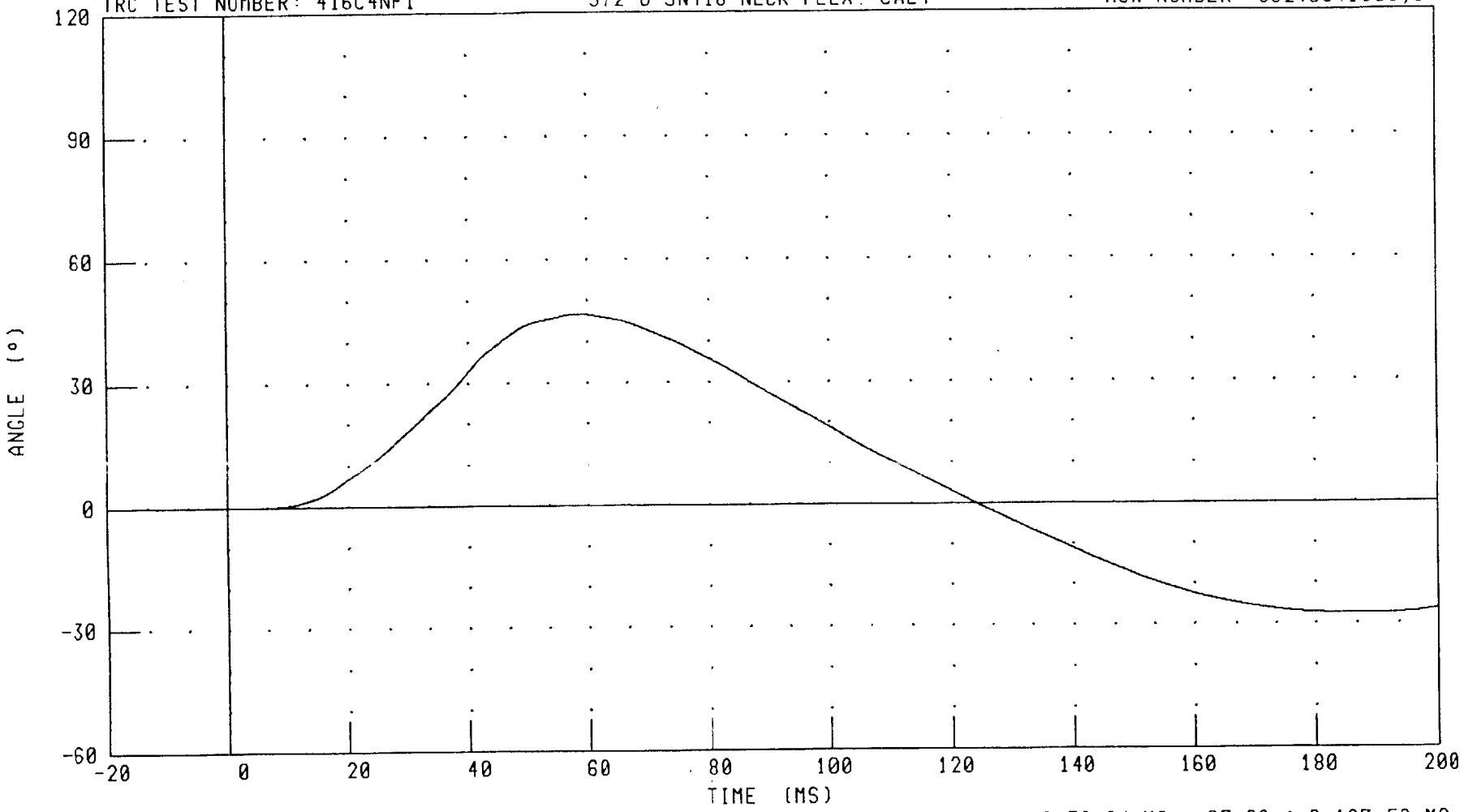
TRC TEST NUMBER: 416C4NF1
572 0 SN416 NECK FLEX. CAL4
RUN NUMBER: 052400.1336;1



CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 31.37 ° @ 58.48 MS; -20.99 ° @ 183.68 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION
ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: 416C4NF1 572 0 SN416 NECK FLEX. CAL4 RUN NUMBER: 052400.1336;1

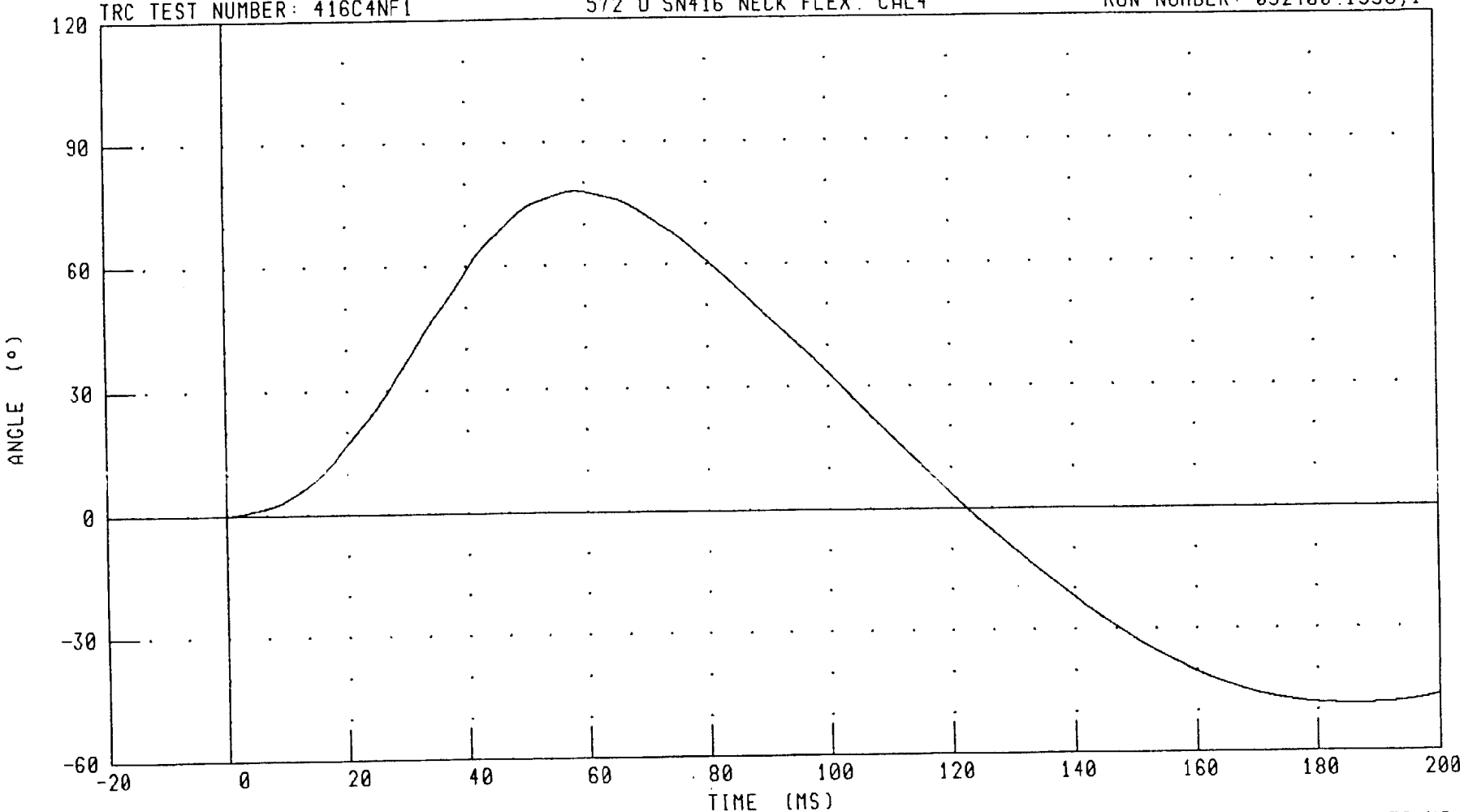


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 46.67 ° @ 58.64 MS; -27.60 ° @ 187.52 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

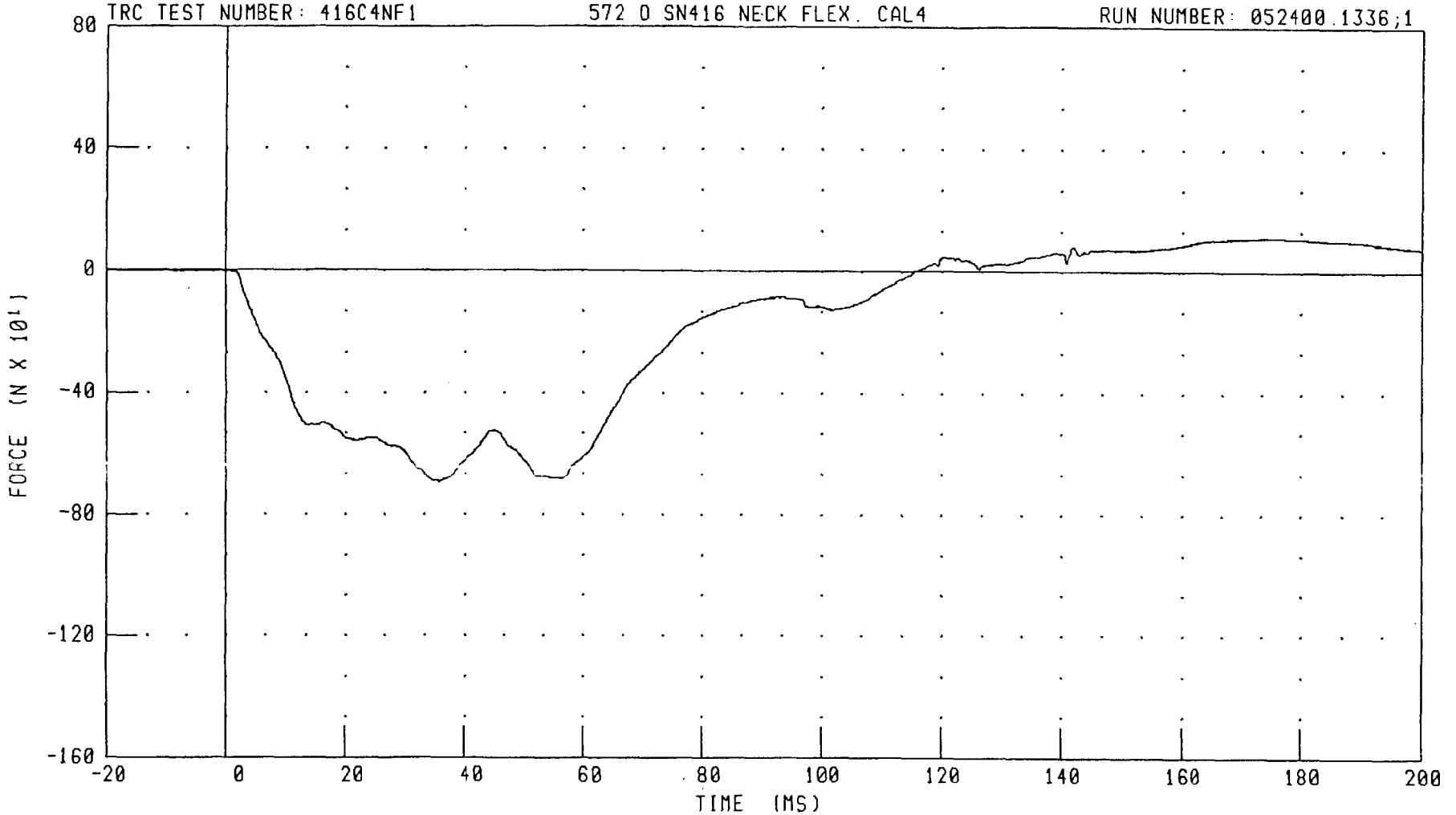
TRC TEST NUMBER: 416C4NF1 572 0 SN416 NECK FLEX. CAL4 RUN NUMBER: 052400.1336;1



CHANNEL: TOTAN FILTER: CH. CLASS 60 PEAK DATA: 78.04 ° @ 58.56 MS; -48.55 ° @ 185.76 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION

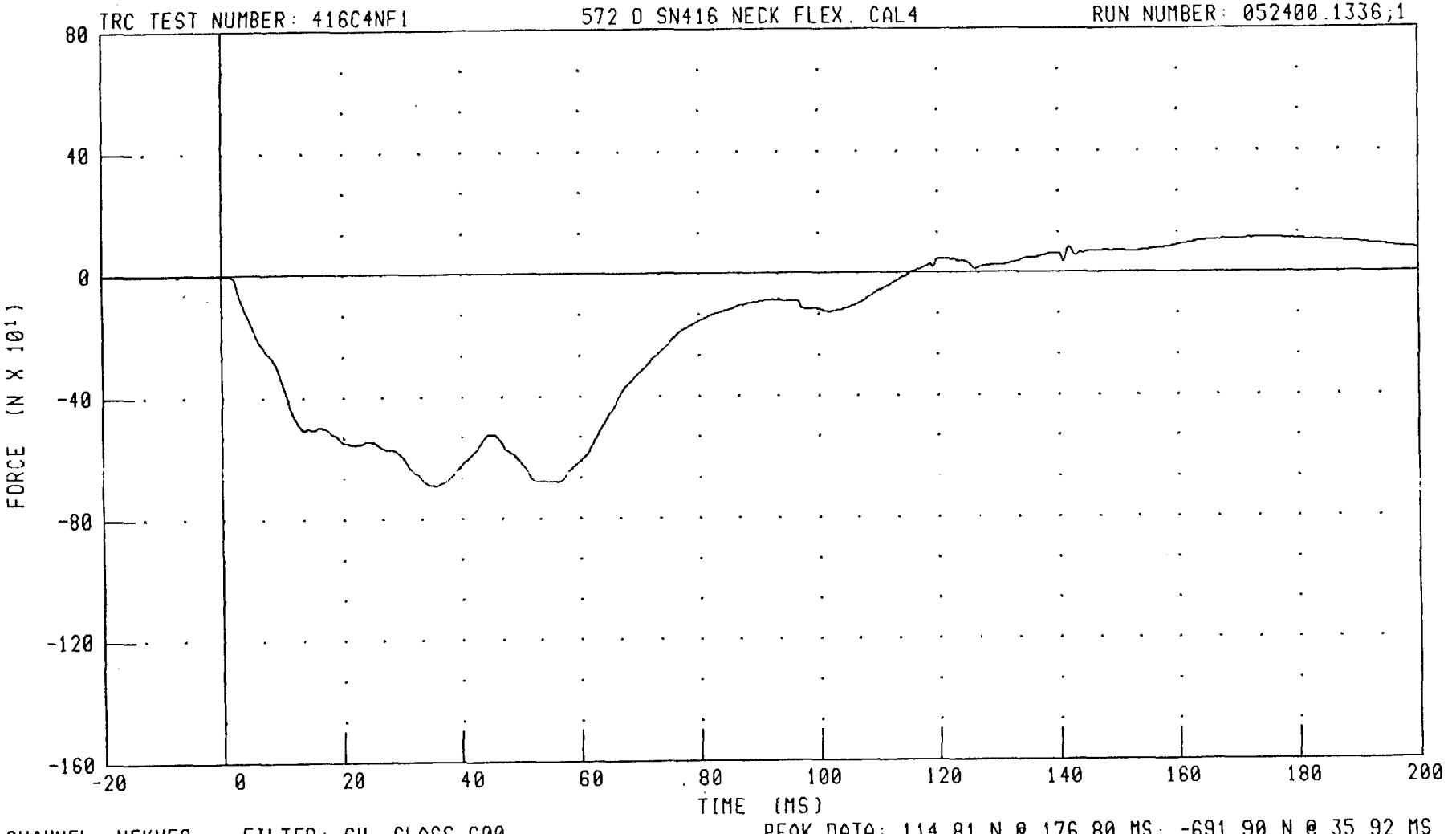
NECK FORCE X AXIS



CHANNEL: NEKXF FILTER: CH. CLASS 1000 PEAK DATA: 114.67 N @ 171.92 MS; -694.80 N @ 35.92 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION

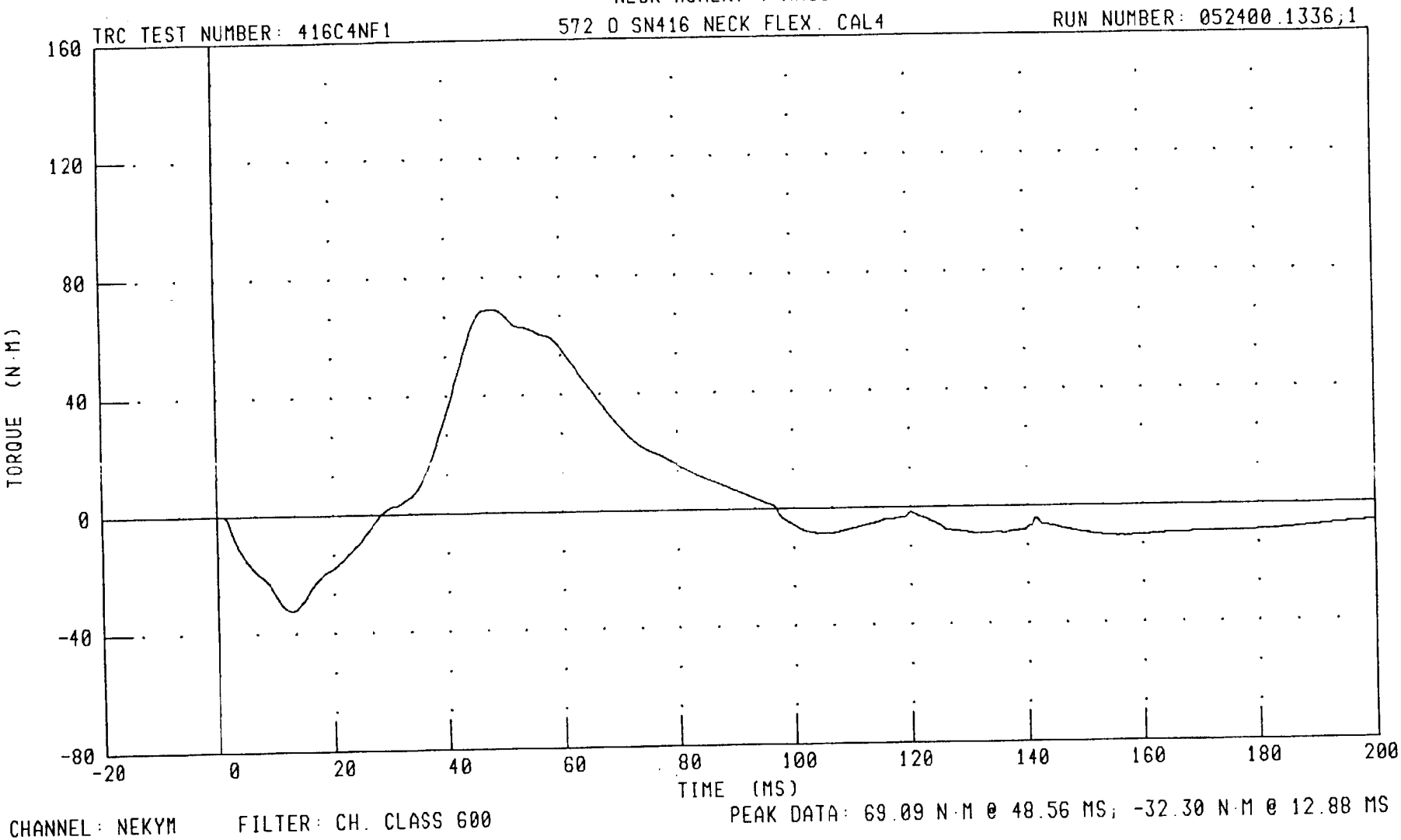
NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION



CHANNEL: NEKXFC FILTER: CH. CLASS 600

PEAK DATA: 114.81 N @ 176.80 MS; -691.90 N @ 35.92 MS

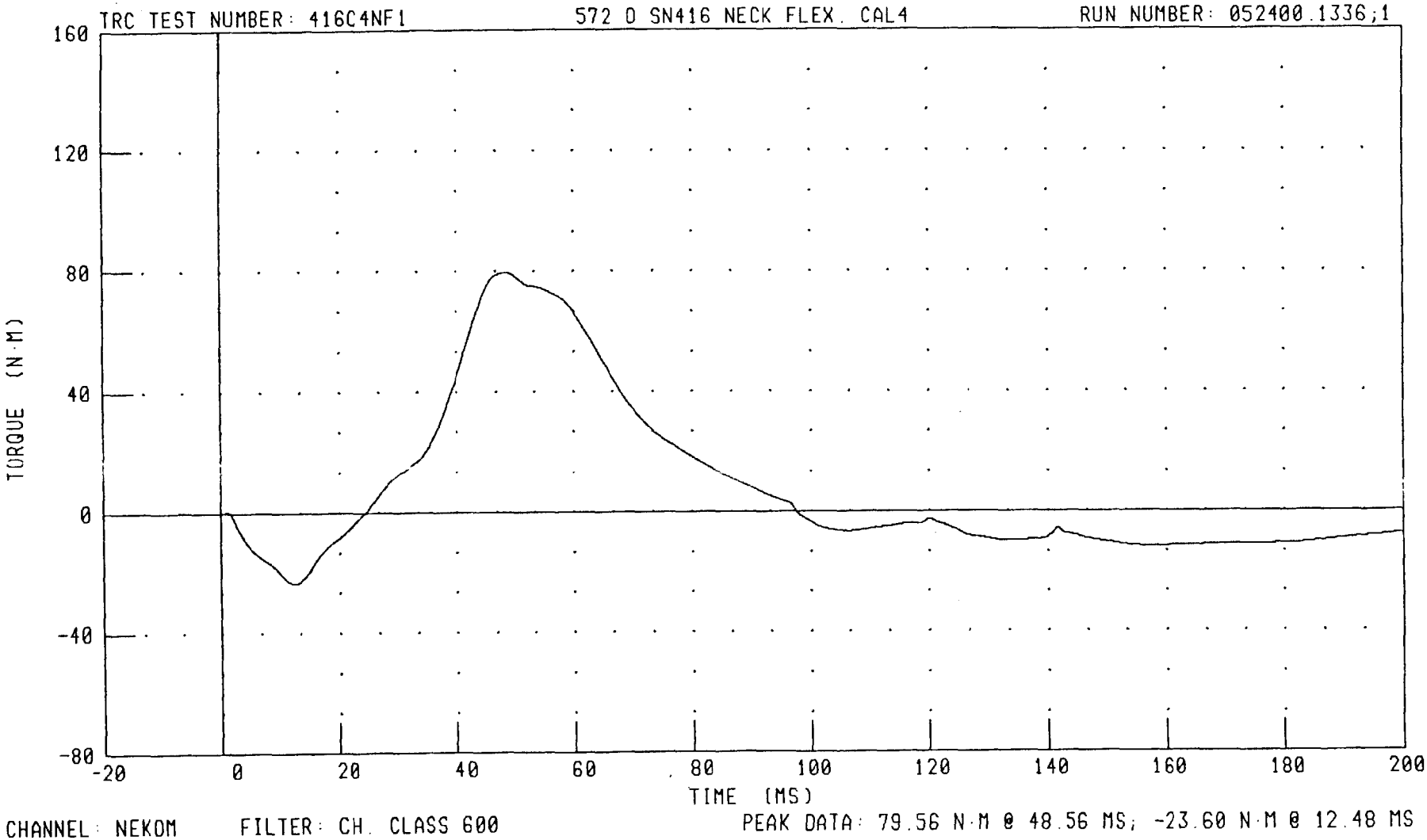
PART 572-0 HYBRID III NECK FLEXION CALIBRATION
NECK MOMENT Y AXIS



CHANNEL: NEKYM FILTER: CH. CLASS 600

PEAK DATA: 69.09 N.M @ 48.56 MS; -32.30 N.M @ 12.88 MS

PART 572-0 HYBRID III NECK FLEXION CALIBRATION
TOTAL MOMENT ABOUT OCCIPITAL CONDYLE



CHANNEL: NEKOM FILTER: CH. CLASS 600

PEAK DATA: 79.56 N-M @ 48.56 MS; -23.60 N-M @ 12.48 MS

TRANSPORTATION RESEARCH CENTER INC.

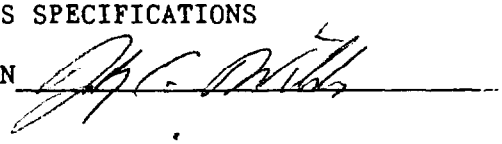
HYBRID III SMALL FEMALE 24-MAY-00

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 416C4NE1 572 O SN416 NECK EXT. CAL 4

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	65.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.10 M/S
INTEGRATED PENDULUM VELOCITY	10 MS	1.5 - 1.9 M/S	1.67 M/S
	20 MS	3.1 - 3.9 M/S	3.31 M/S
	30 MS	4.6 - 5.6 M/S	4.95 M/S
PEAK D-PLANE ROTATION		99 - 114 DEG.	99.44 DEG.
PEAK MOMENT DURING ROTATION INTERVAL		-53 / -65 NM	-53.63 NM
NEGATIVE MOMENT DECAY TIME TO 10 NM LEVEL		94 - 114 MS	102.88 MS

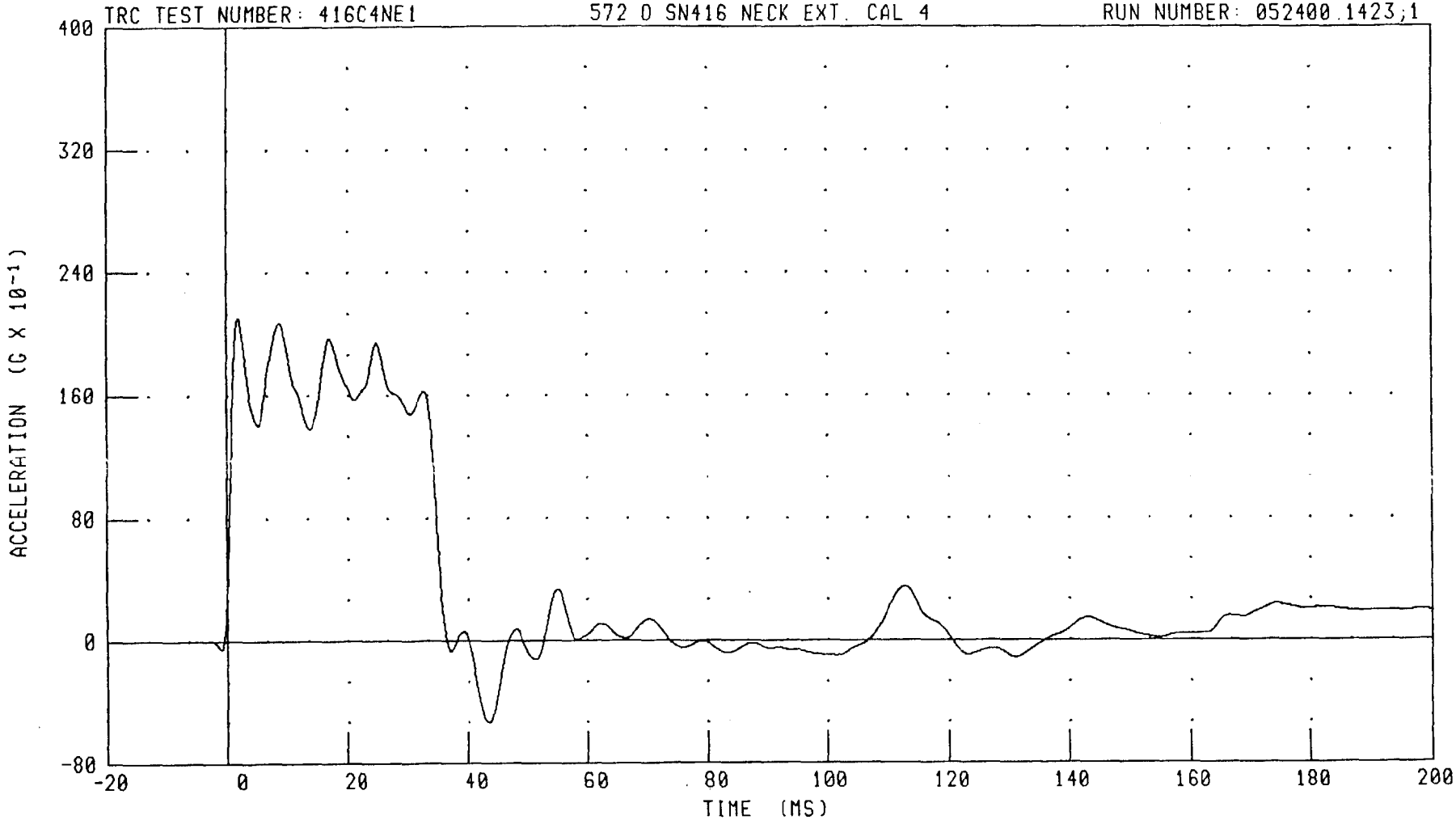
TEST MEETS SPECIFICATIONS

TECHNICIAN  RUN NUMBER: 052400.1413;1

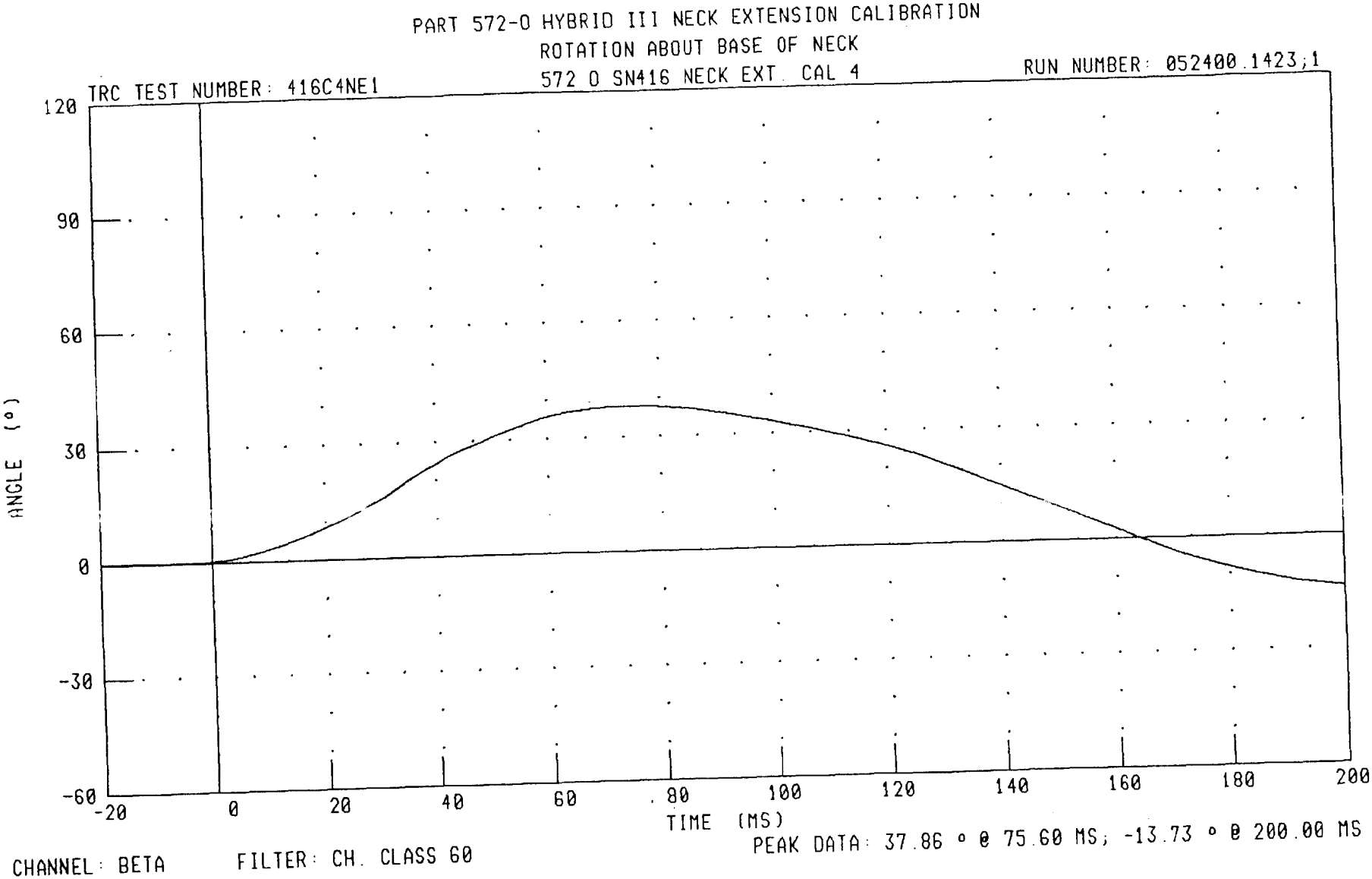
PART 572-0 HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 416C4NE1 572 0 SN416 NECK EXT. CAL 4 RUN NUMBER: 052400.1423;1

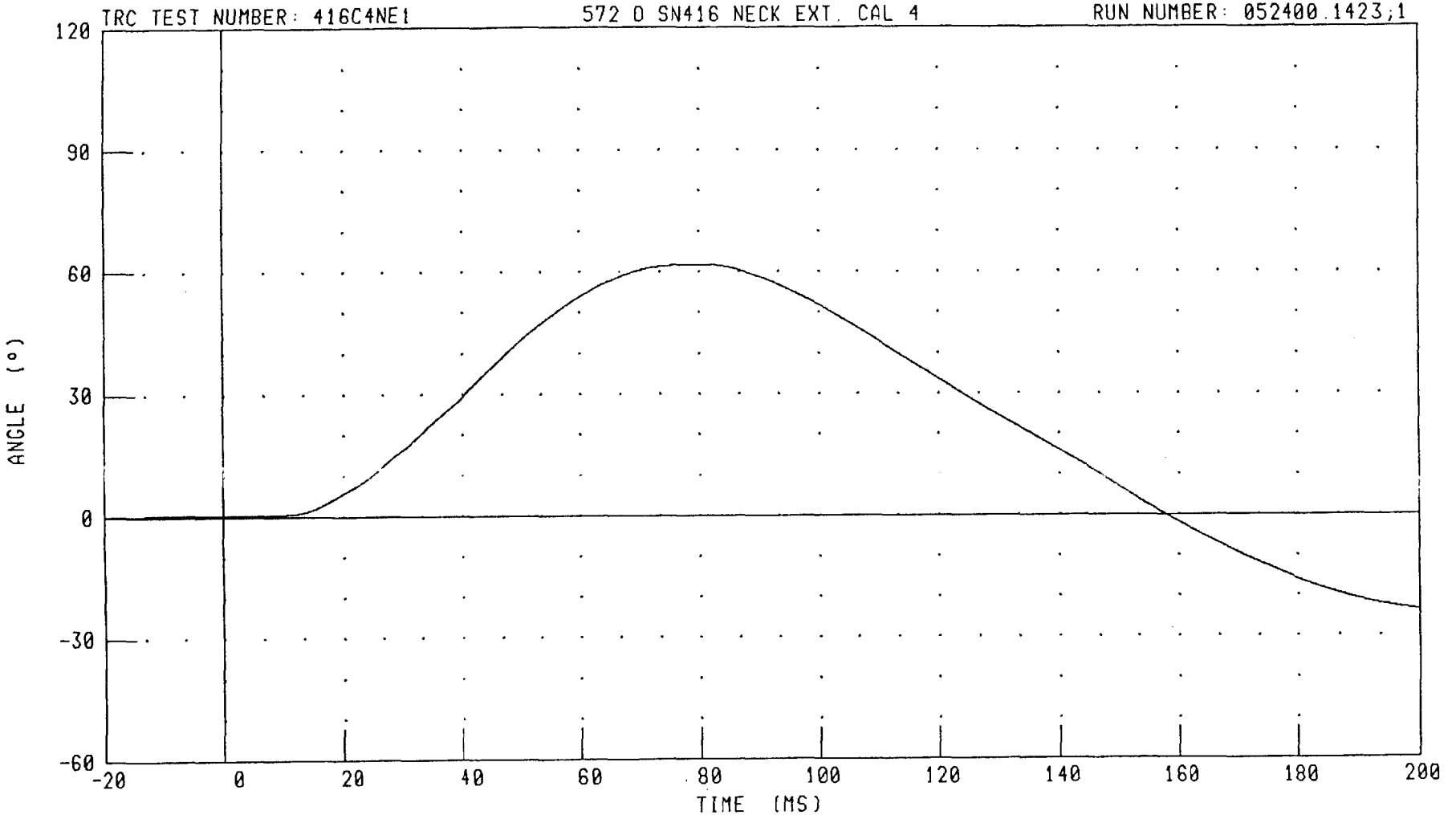


CHANNEL: PENXG FILTER: CH. CLASS 180 PEAK DATA: 21.06 G @ 1.92 MS; -5.36 G @ 43.60 MS


PART 572-O HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK
572 O SN416 NECK EXT. CAL 4
TRC TEST NUMBER: 416C4NE1
RUN NUMBER: 052400.1423;1
ANGLE (°)
120
90
60
30
0
-30
-60
-20
0
20
40
60
80
100
120
140
160
180
200
TIME (MS)
CHANNEL: BETA
FILTER: CH. CLASS 60
PEAK DATA: 37.86 ° @ 75.60 MS; -13.73 ° @ 200.00 MS

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

TRC TEST NUMBER: 416C4NE1 572 0 SN416 NECK EXT. CAL 4 RUN NUMBER: 052400.1423;1

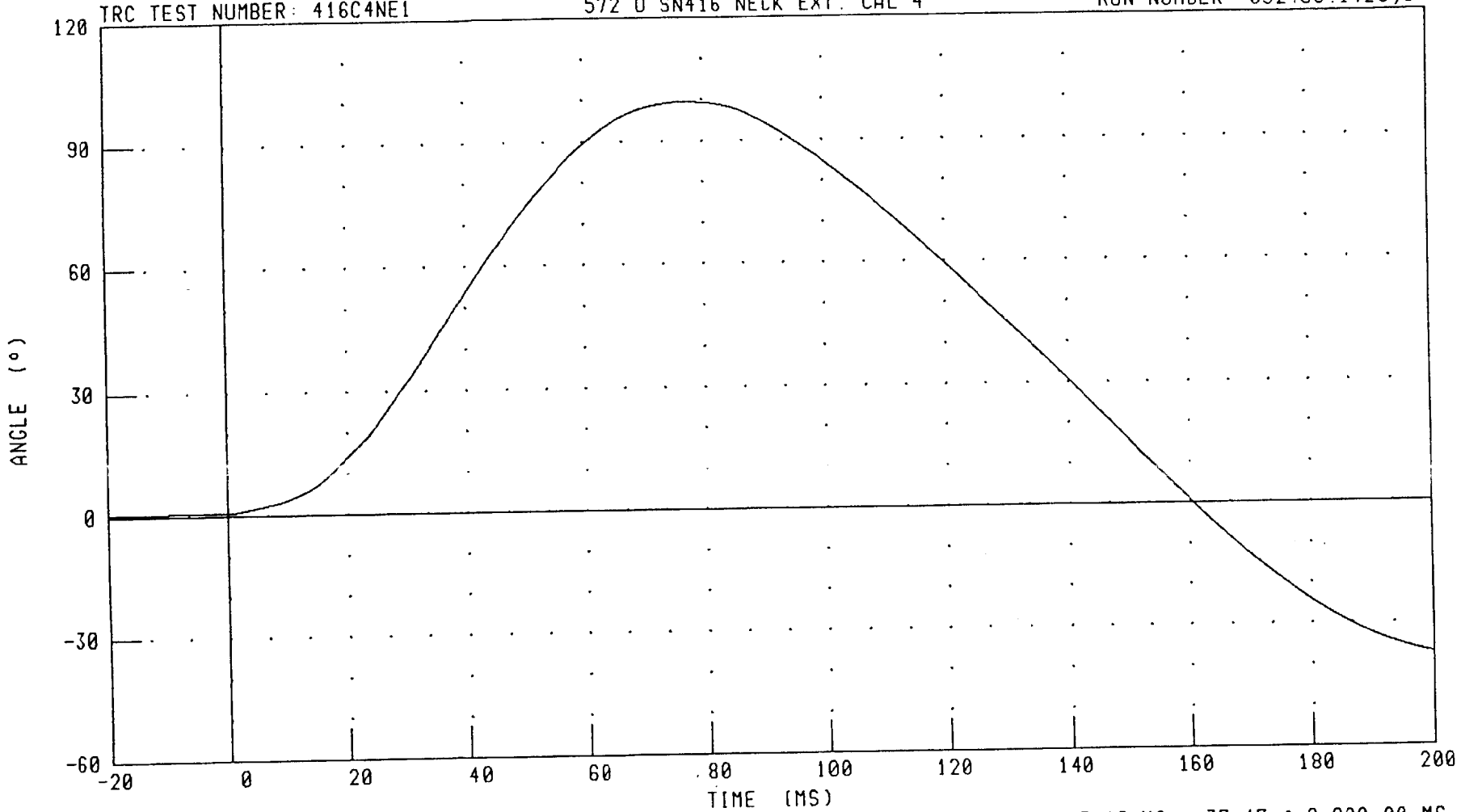


CHANNEL: THETA FILTER: CH. CLASS 60 PEAK DATA: 61.68 ° @ 79.92 MS; -23.73 ° @ 200.00 MS

PART 572-O HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 416C4NE1 572 O SN416 NECK EXT. CAL 4 RUN NUMBER: 052400.1423;1



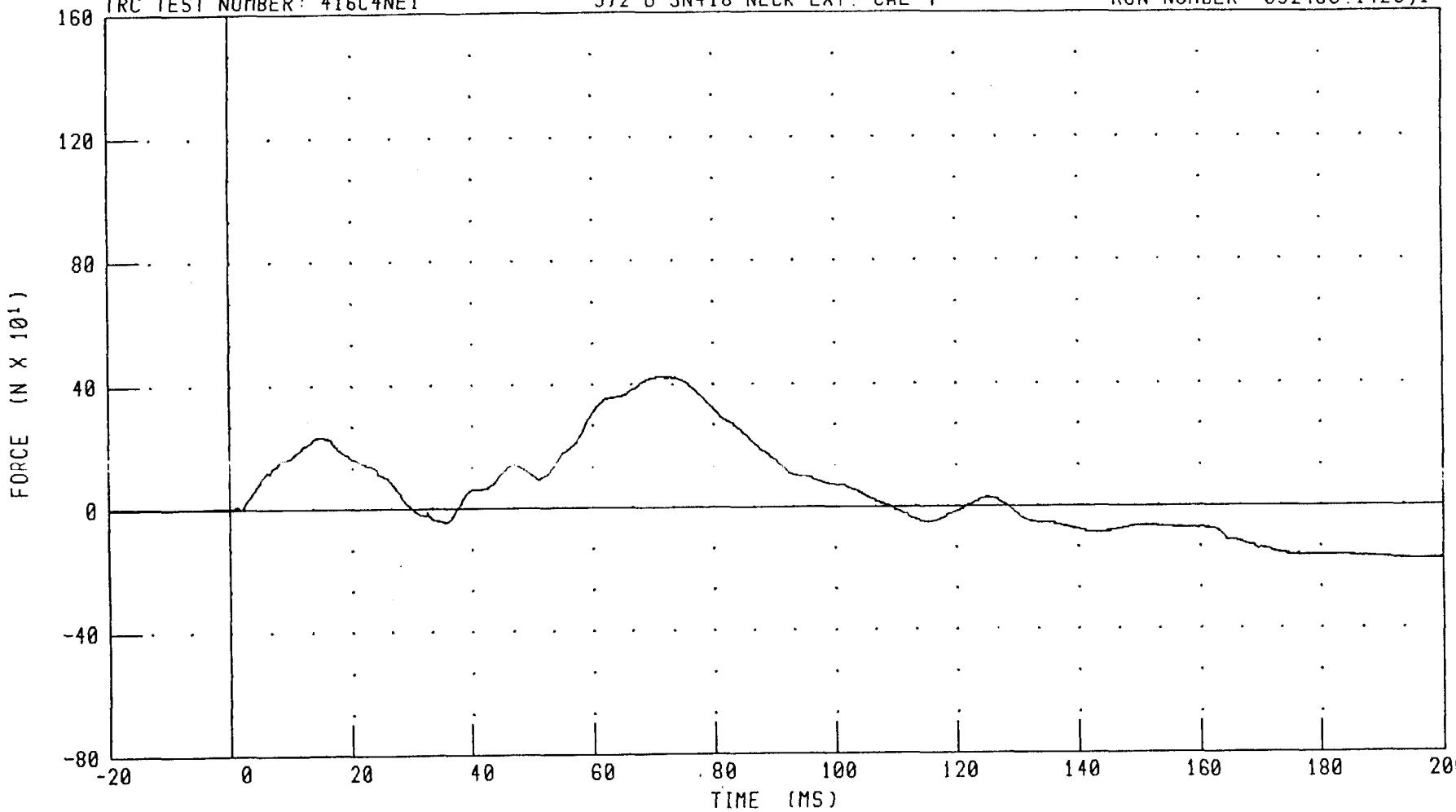
CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 99.45 ° @ 77.12 MS; -37.47 ° @ 200.00 MS

PART 572-0 HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 416C4NE1 572 0 SN416 NECK EXT. CAL 4 RUN NUMBER: 052400.1423;1

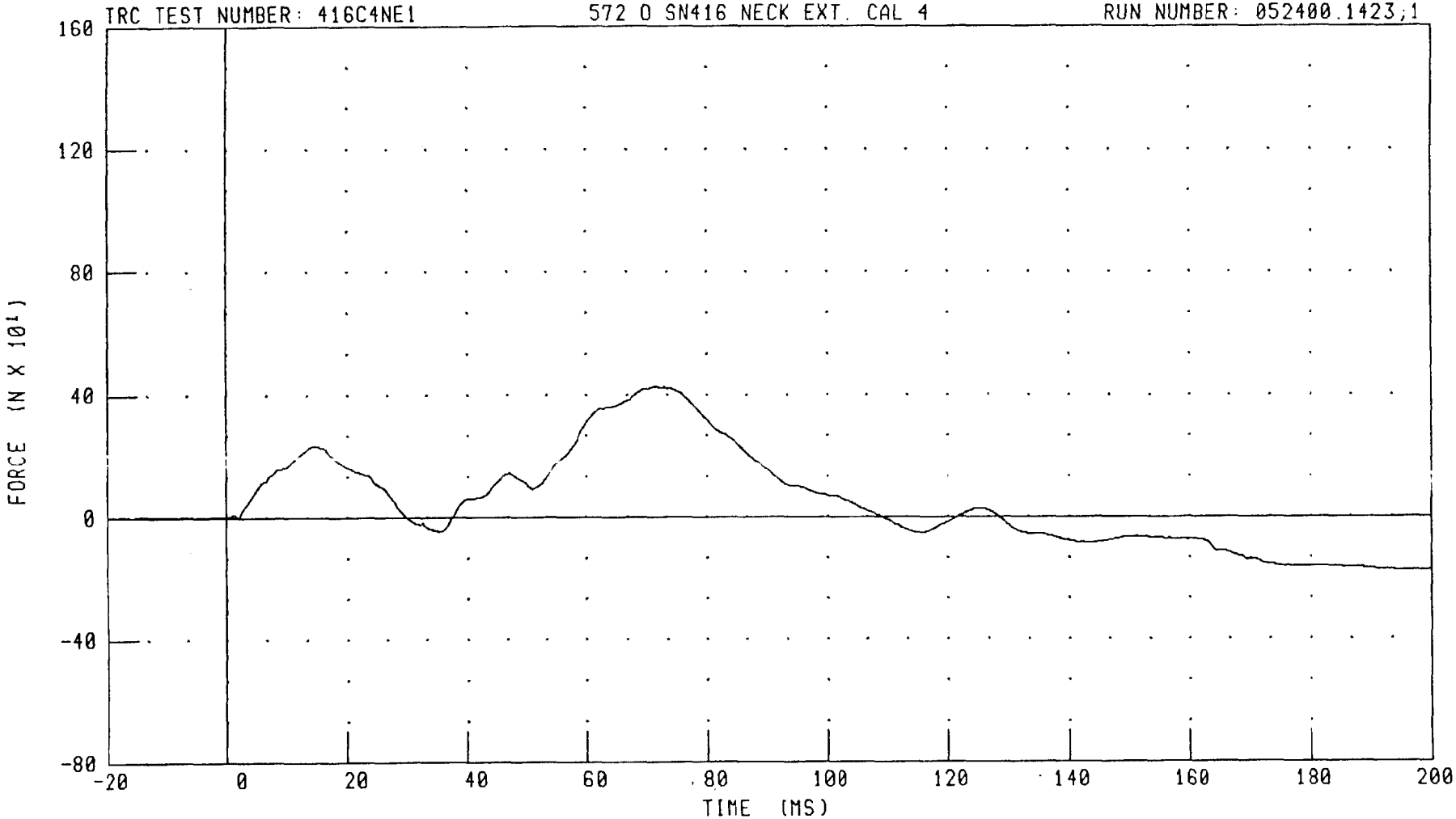


CHANNEL: NEKXF FILTER: CH. CLASS 1000 PEAK DATA: 424.23 N @ 70.88 MS; -177.99 N @ 192.08 MS

PART 572-0 HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS FILTERED FOR USE IN OCCIPITAL MOMENT CALCULATION

TRC TEST NUMBER: 416C4NE1 572 0 SN416 NECK EXT. CAL 4 RUN NUMBER: 052400.1423;1



CHANNEL: NEKXFC FILTER: CH. CLASS 600 PEAK DATA: 424.37 N @ 71.28 MS; -178.05 N @ 194.80 MS