

V3126

**1999 Dodge Intrepid
into a Flat Frontal Barrier
TRC Test Number: 990216**

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

**Final Report
February - March 1999**

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

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Section 1.0

Purpose and Test Procedure

Purpose and Test Summary

This 30 mph flat frontal barrier impact test has the main objective to investigate both vehicle and occupant dynamics during a flat frontal barrier test. A secondary objective is to gather information on depowered airbags.

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

Section 2.0

Frontal Barrier Impact Test Summary

Test Procedure

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

The test vehicle was instrumented with eight (8) accelerometers to measure longitudinal, lateral, and vertical axis accelerations. The vehicle's specified impact velocity range was 47.5 to 49.1 kph. The vehicle impacted a flat frontal barrier.

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

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

The thirty-eight (38) data channels were digitally sampled at 12,500 samples per second and processed per Sections 11.13 through 11.15 of the Laboratory Test Procedure.

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

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

Test Results Summary

This flat frontal barrier test was conducted at TRC on February 16, 1999.

The test vehicle, a 1999 Dodge Intrepid, was equipped with airbags at the driver's and right front passenger's seating positions. The vehicle's test weight was 1798.1 kilograms. The vehicle's impact speed was 48.3 kph. The vehicle's maximum static crush was 490 millimeters.

The driver's 36 millisecond HIC was 559. The driver's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 54.4 g. The driver's chest deflection was 44.7 millimeters. The driver's left and right femur maximum compressive forces were 5282 N and 7786 N, respectively.

The right front passenger's 36 millisecond HIC was 401. The right front passenger's chest maximum resultant acceleration with three (3) milliseconds minimum duration was 54.1 g. The passenger's chest deflection was 25.7 millimeters. The right front passenger's left and right femur maximum compressive forces were 7486 N and 7890 N, respectively.

Data Acquisition Explanations

The vehicle's left brake caliper X-axis acceleration data channel, BCLXG1, exceeded it's data channel's full scale input at approximately 49 milliseconds and recorded questionable data after that.

Table 1 Crash Test Summary

Test type:	Frontal barrier impact
Test date:	02/16/99
Test time:	1711
Ambient temperature at impact area:	22° C
Vehicle year/make/ model/body style:	1999/Dodge/Intrepid/4-door Sedan
Vehicle test weight:	1798.1 kg
Impact angle ¹ :	0°
Impact velocity ² :	
Primary:	48.3 kph
Secondary:	48.3 kph
Maximum static crush:	490 mm
Average rebound:	497 mm
Number of cameras:	
Real-time:	1
High-speed:	14
Door opening data:	
Left-front:	Easy
Right-front:	Easy

¹ With respect to tow track centerline.

² Speed trap measurement ($\pm .08$ km/h accuracy)

Table 1 Crash Test Summary, Cont'd.

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

Table 2 Test Vehicle Information

Vehicle year/make/
model/body style: 1999/Dodge/Intrepid/4-door Sedan

Color: Silver

VIN: 2B3HD46R7XH614443

Engine data:

Placement: Transverse

Cylinders: 6

Displacement: 2.7 liters

Transmission data: 3 speed, manual, X automatic, overdrive

Final drive: X fwd, rwd, 4wd

Date vehicle received: 02/12/99

Odometer reading: 40

Dealer's name and address: Nelson Automotive, LTD
1751 South Main St.
Bellefontaine, OH 43311-1997

Accessories:

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

Certification data from vehicle's label:

Vehicle manufactured by: Chrysler Corporation

Date of manufacture: 11/98

VIN: 2B3HD46R7XH614443

GVWR: 2065 kg

GAWR: Front: 1178 kg

Rear: 922 kg

Table 2 Test Vehicle Information, Cont'd.

Size of tires on vehicle:	P205/70R15
Spare tire:	Space saver
Type of front seats:	Bucket, manually adjustable

Tire & capacity data from vehicle's label:

Recommended tire size:	P205/70R15 95T
Recommended cold tire pressure:	
Front:	220 kPa
Rear:	220 kPa
Designated Seating Capacity:	
Front	2
Rear	3
Total	5
Vehicle Cargo Weight:	52 kg

Test vehicle attitudes:

Delivered attitude:	LF: 749 mm	RF: 742 mm	LR: 744 mm	RR: 742 mm
Fully loaded attitude:	LF: 734 mm	RF: 726 mm	LR: 701 mm	RR: 693 mm
Pre-test attitude:	LF: 726 mm	RF: 719 mm	LR: 690 mm	RR: 681 mm
Post-test attitude:	LF: 745 mm	RF: 742 mm	LR: 690 mm	RR: 680 mm

Table 2 Test Vehicle Information, Cont'd.

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

Right front	474.9 kg	Right rear	283.5 kg
Left front	504.8 kg	Left rear	272.2 kg
Total front weight	979.7 kg	(63.8% of total vehicle weight)	
Total rear weight	555.7 kg	(36.2% of total vehicle weight)	
Total delivered weight	1535.4 kg		

Calculation of test vehicle's target test weight:

RCLW¹ = Rated Cargo and Luggage Weight

UDW = Unloaded Delivered Weight (1535.4 kg)

VCW = Vehicle Capacity Weight (392 kg)

DSC² = Designated Seating Capacity (5)

RCLW³ = 52 kg

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

Target test weight = 1535.4 + 120.2 + 151.4 = 1807.0 kg

Weight of test vehicle with required dummies and 111.3 kg of cargo weight:

Right front	517.6 kg	Right rear	382.4 kg
Left front	500.3 kg	Left rear	397.8 kg
Total front weight	1017.9 kg	(56.6% of total vehicle weight)	
Total rear weight	780.2 kg	(43.4% of total vehicle weight)	
Total test weight	1798.1 kg	(0.5% under target test weight)	

Weight of ballast secured in vehicle: 49.9 kg steel plate in trunk

Components removed to meet target test weight: None

CG rearward of front wheel centerline: 1247 mm

Vehicle Wheelbase: 2873 mm

¹ Cargo weight for multi-purpose passenger vehicles, trucks, and buses is the vehicle's calculated cargo and luggage weight or 136.1 kg, whichever is less.

² The designated seating capacity is determined by counting the number of seat belts installed in the vehicle.

³ From vehicle's tire label.

Table 3 Post-Impact Data

Test number: 990216
Test date: 02/16/99
Test time: 1711
Test type: Frontal barrier impact
Impact angle: 0°
Ambient temperature
at impact area: 22° C
Temperature in
occupant compartment: 21° C
Impact velocity:
Primary: 48.3 kph
Secondary 48.3 kph
Specified range: 47.5 to 49.1 kph

Distance from vehicle to barrier:

Entering velocity trap: 660 mm
Exiting velocity trap: 51 mm

Test vehicle static crush:

Overall length of test vehicle:

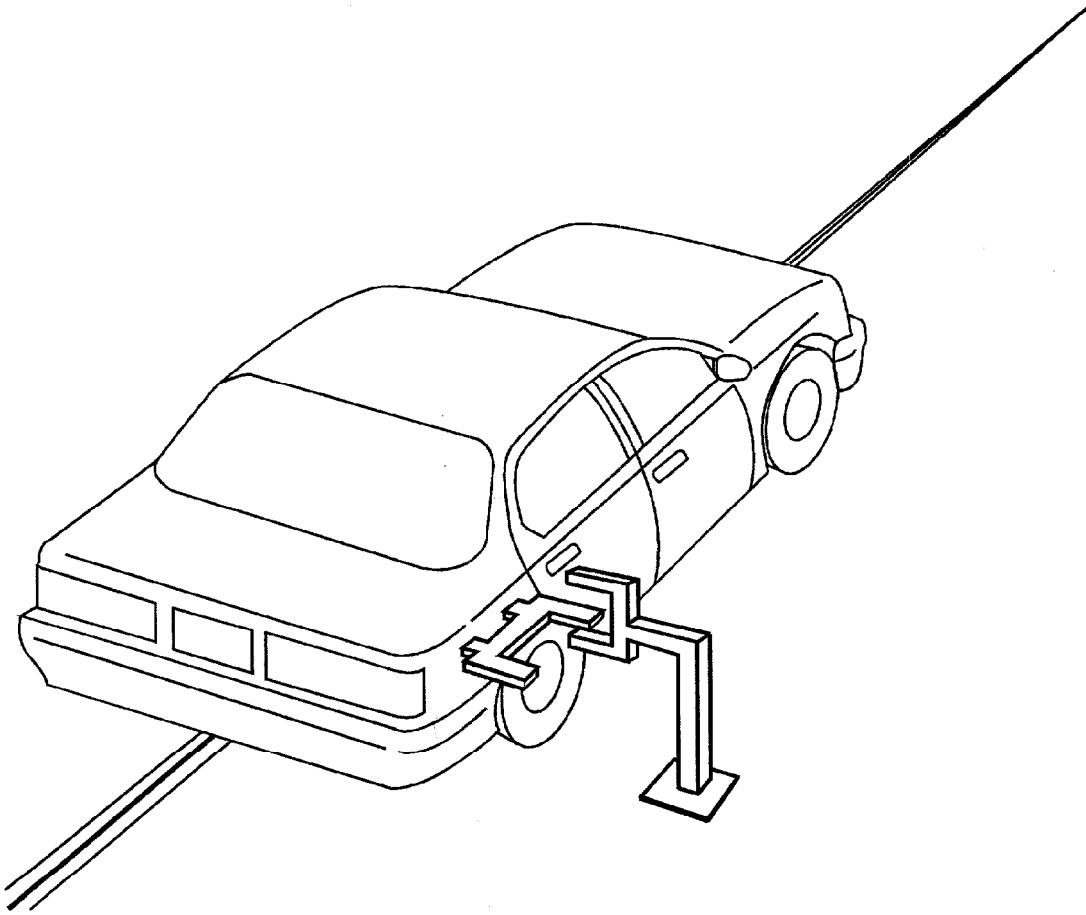
Pre-test:	L: 5062 mm	C: 5290 mm	R: 5065 mm
Post-test:	L: 4742 mm	C: 4800 mm	R: 4777 mm
Total crush:	L: 320 mm	C: 490 mm	R: 288 mm
Average crush:	366 mm		

Test vehicle rebound from flat barrier:

Distance from test vehicle to barrier:

Post-test:	L: 550 mm	C: 480 mm	R: 460 mm
Average rebound:	497 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. Accident Investigation Division Data for 30 mph Frontal Barrier Impact

Test date: 02/16/99
 Vehicle year/make/
 model/body style: 1999/Dodge/Intrepid/4-door Sedan
 VIN: 2B3HD46R7XH614443
 Build date: 11/98
 Test weight: 1798.1 kg
 Vehicle wheelbase: 2873 mm
 Maximum width: 1897 mm
 Front overhang: 927 mm

Collision Deformation
 Classification (CDC) Code: 12FDW3

Crush depth
 measurements: C1: 320 mm
 C2: 434 mm
 C3: 477 mm
 C4: 468 mm
 C5: 391 mm
 C6: 288 mm

Midpoint of damage: D: Vehicle Longitudinal Centerline

Length of damaged
 region: L: 1525 mm

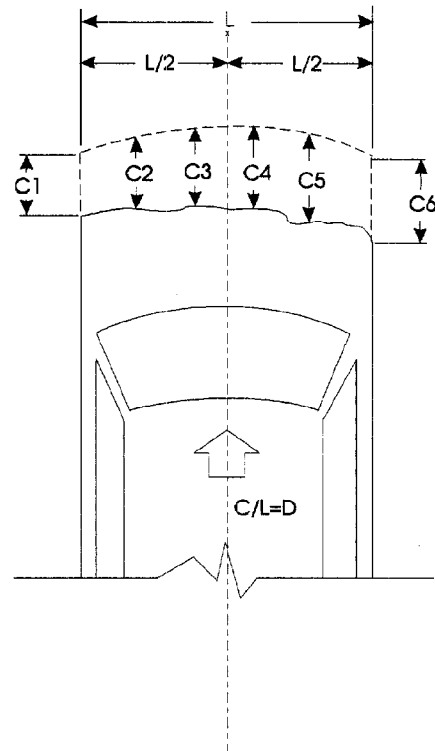


Figure 3 Vehicle Accelerometer Placement

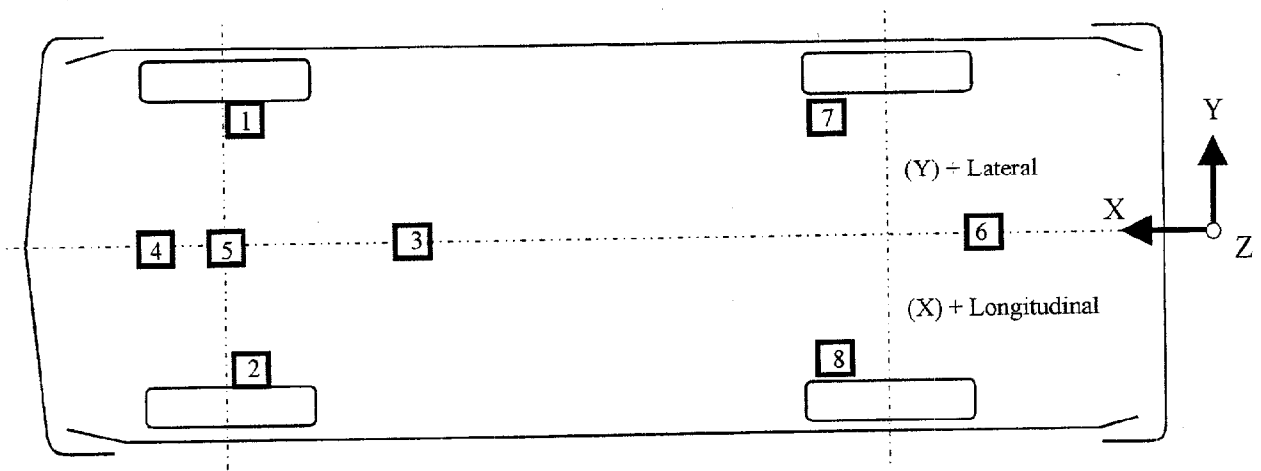
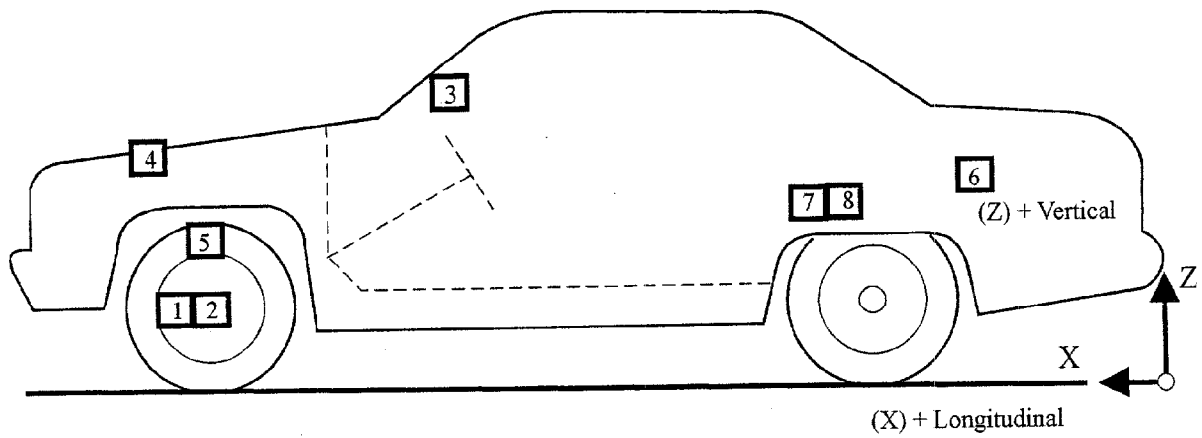


Table 4 Vehicle Accelerometer Locations and Data Summary

TEST NUMBER: 990216 No. LOCATION		X	Y	Z	POSITIVE DIRECTION	NEGATIVE DIRECTION
1 LEFT BRAKE CALIPER	PRE	4204 mm	693 mm	312 mm		
	POST	4240 mm	730 mm	NA		
LONGITUDINAL					----- @ -----	@ -----
2 RIGHT BRAKE CALIPER	PRE	4204 mm	-693 mm	305 mm		
	POST	4190 mm	-720 mm	NA		
LONGITUDINAL					21.2 g @ 72.9 ms	@ 80.6 g @ 45.8 ms
3 INSTRUMENT PANEL CENTER	PRE	3699 mm	-27 mm	945 mm		
	POST	3680 mm	-27 mm	NA		
LONGITUDINAL					24.2 g @ 30.9 ms	@ 56.2 g @ 34.6 ms
4 ENGINE TOP	PRE	4698 mm	-235 mm	1048 mm		
	POST	4480 mm	-245 mm	NA		
LONGITUDINAL					61.4 g @ 46.0 ms	@ 150.3 g @ 32.8 ms
5 ENGINE BOTTOM	PRE	4585 mm	-5 mm	180 mm		
	POST	4301 mm	-10 mm	NA		
LONGITUDINAL					30.4 g @ 42.6 ms	@ 130.9 g @ 32.2 ms

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

TEST NUMBER: 990216 No. LOCATION			X	Y	Z	POSITIVE DIRECTION		NEGATIVE DIRECTION	
	PRE	POST							
6 REAR VEHICLE CENTERLINE VERTICAL	279 mm	0 mm	638 mm						
	275 mm	0 mm	NA			5.9 g	@ 20.5 ms	5.1 g	@ 97.2 ms
7 LEFT REAR SEAT LONGITUDINAL	2266 mm	559 mm	263 mm						
	2263 mm	559 mm	NA			1.6 g	@ 120.7 ms	26.8 g	@ 52.1 ms
8 RIGHT REAR SEAT LONGITUDINAL	2266 mm	-572 mm	290 mm						
	2263 mm	-572 mm	NA			2.3 g	@ 119.4 ms	26.8 g	@ 58.3 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

FMVSS 208 Data

Table 5 Dummy Injury Criteria

<u>Maximum Acceleration</u>							
	Head				Chest		
	X	Y	Z	R	X	Y	Z
Driver	-61.6 g	10.4 g	-20.1 g	62.9 g	-54.2 g	4.6 g	14.3 g
Passenger	-48.5 g	-14.8 g	34.1 g	49.8 g	-53.1 g	6.7 g	20.8 g

<u>Maximum Femur Compressive Force</u>		
	Left Femur	Right Femur
Driver	5282 N	7786 N
Passenger	7486 N	7890 N

<u>Head Injury Criteria¹</u>			
	HIC	Time t ₁	Time t ₂
Driver	559	69.8 ms	103.4 ms
Passenger	401	71.3 ms	107.3 ms

<u>Chest Maximum Resultant Acceleration²</u>			
	Acceleration	Time t ₁	Time t ₂
Driver	54.4 g	74.3 ms	77.4 ms
Passenger	54.1 g	77.1 ms	80.2 ms

<u>Maximum Chest Deflection</u>	
Driver	44.7 mm
Passenger	25.7 mm

¹ As defined in FMVSS No. 208

² Defined as equal to or exceeding 0.003 sec. duration

Dummy Kinematic Summary

Driver Dummy

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

Section 4.0

Vehicle, Occupant, and Camera Measurements

Figure 4 Pre-test and Post-test Measurement Points

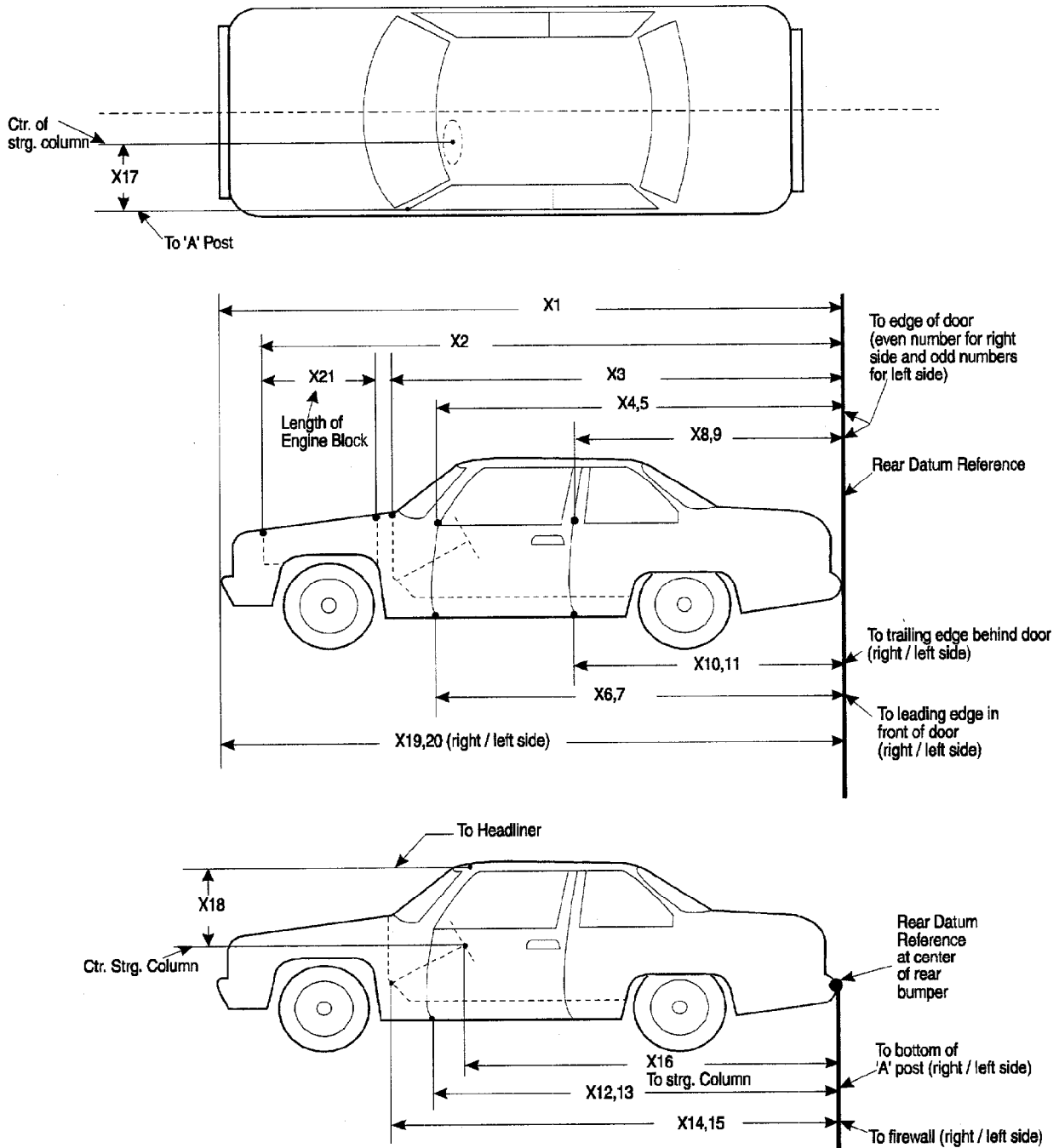


Table 6 Impacted Vehicle Measurements

Vehicle year/make/model/body style: 1999/Dodge/Intrepid/4-door Sedan

Test Number: 990216

No.	Type of measurement	Pre-test	Post-test	Difference
X1	Total length of vehicle at centerline	5290 mm	4800 mm	490 mm
X2	Rear surface of vehicle to front of engine block	4718 mm	4487 mm	231 mm
X3	Rear surface of vehicle to firewall	4300 mm	4226 mm	74 mm
X4	Rear surface of vehicle to upper leading edge of right door	3735 mm	3719 mm	16 mm
X5	Rear surface of vehicle to upper leading edge of left door	3750 mm	3701 mm	49 mm
X6	Rear surface of vehicle to lower leading edge of right door	3680 mm	3672 mm	8 mm
X7	Rear surface of vehicle to lower leading edge of left door	3664 mm	3647 mm	17 mm
X8	Rear surface of vehicle to upper trailing edge of right door	2641 mm	2627 mm	14 mm
X9	Rear surface of vehicle to upper trailing edge of left door	2640 mm	2613 mm	27 mm
X10	Rear surface of vehicle to lower trailing edge of right door	2647 mm	2635 mm	12 mm
X11	Rear surface of vehicle to lower trailing edge of left door	2636 mm	2619 mm	17 mm
X12	Rear surface of vehicle to bottom of "A" post on right side	3665 mm	3650 mm	15 mm
X13	Rear surface of vehicle to bottom of "A" post on left side	3665 mm	3640 mm	25 mm
X14	Rear surface of vehicle to firewall - right side	4378 mm	4340 mm	38 mm
X15	Rear surface of vehicle to firewall - left side	4373 mm	4335 mm	38 mm
X16	Rear surface of vehicle to steering wheel center	3210 mm	3190 mm	20 mm
X17	Center of steering column to "A" post	305 mm	315 mm	-10 mm
X18	Center of steering column to headliner	400 mm	390 mm	10 mm
X19	Rear surface of vehicle to right side of front bumper	5065 mm	4777 mm	288 mm
X20	Rear surface of vehicle to left side of front bumper	5062 mm	4742 mm	320 mm
X21	Length of engine block	482 mm	482 mm	0 mm

Figure 5 Vehicle Target Locations

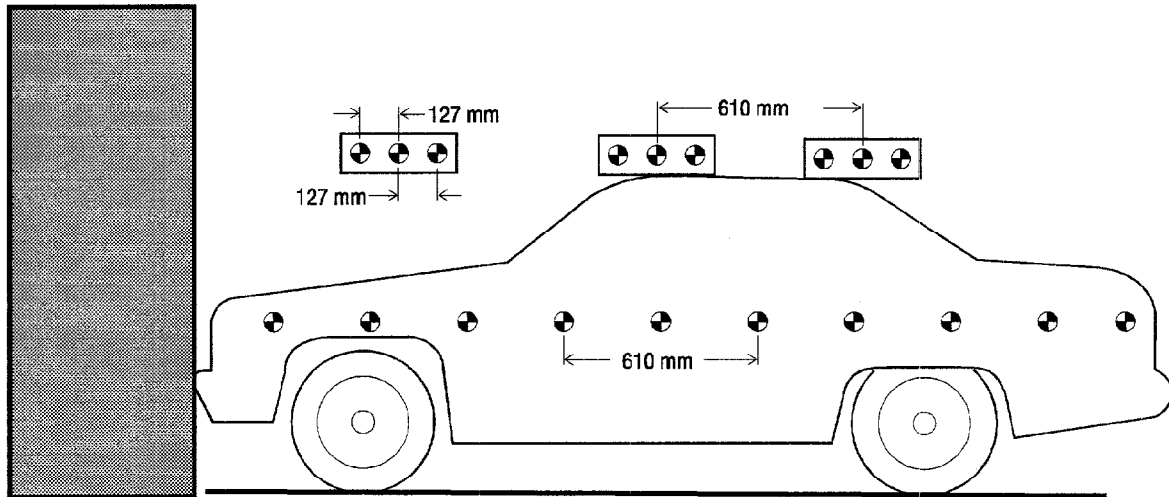


Figure 6 Dummy Measurement Locations for Front Seat Occupants

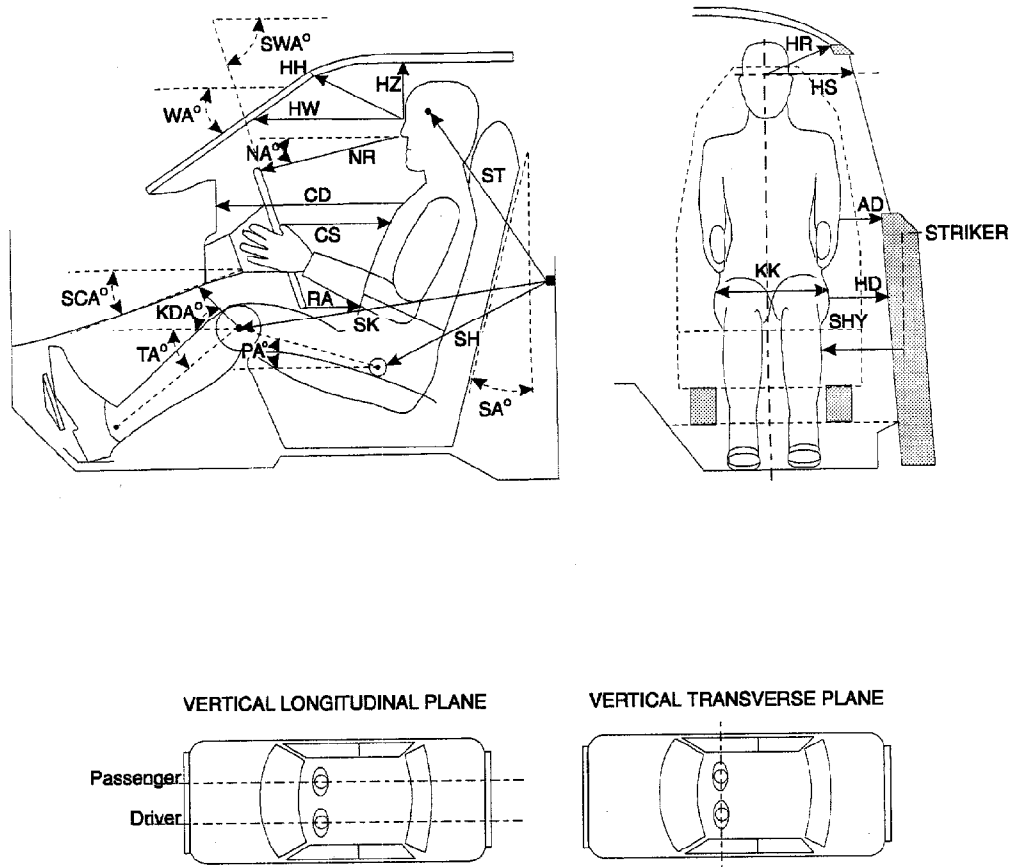


Table 7 Dummy Measurement Data For Front Seat Occupants

Designation	Type of Measurement	Driver (Serial #168)	Passenger (Serial #169)
WA	Windshield angle	25°	25°
SWA	Steering wheel angle	68°	NA
SCA	Steering column angle	22°	NA
SA	Seat back angle	25°	25°
HZ	Head to roof	175 mm	175 mm
HH	Head to header	355 mm	362 mm
HW	Head to windshield	626 mm	640 mm
HR	Head to side header	187 mm	183 mm
NR	Nose to rim	394 mm	N/A
NA	Nose to rim angle	11°	N/A
CD	Chest to dash	535 mm	650 mm
CS	Steering wheel to chest	265 mm	N/A
RA	Rim to abdomen	201 mm	N/A
KDL	Left knee to dash	144 mm	186 mm
KDR	Right knee to dash	160 mm	162 mm
KDA	Outboard knee to dash angle	33°	25°
PA	Pelvic angle	24°	24°
TA	Tibial angle	44°	45°
KK	Knee to knee	370 mm	290 mm
ST ¹	Striker to head	511 mm	527 mm
	Striker to head angle	-87°	-85°
SK	Striker to knee	558 mm	521 mm
	Striker to knee angle	-5°	-8°
SH ¹	Striker to H-point	222 mm	218 mm
	Striker to H-point angle	33°	29°
SHY	Striker to H-point (Y dir.)	263 mm	271 mm
HS	Head to side window	327 mm	342 mm
HD	H-point to door	159 mm	168 mm
AD	Arm to door	120 mm	126 mm

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

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

Figure 7 Camera Positions

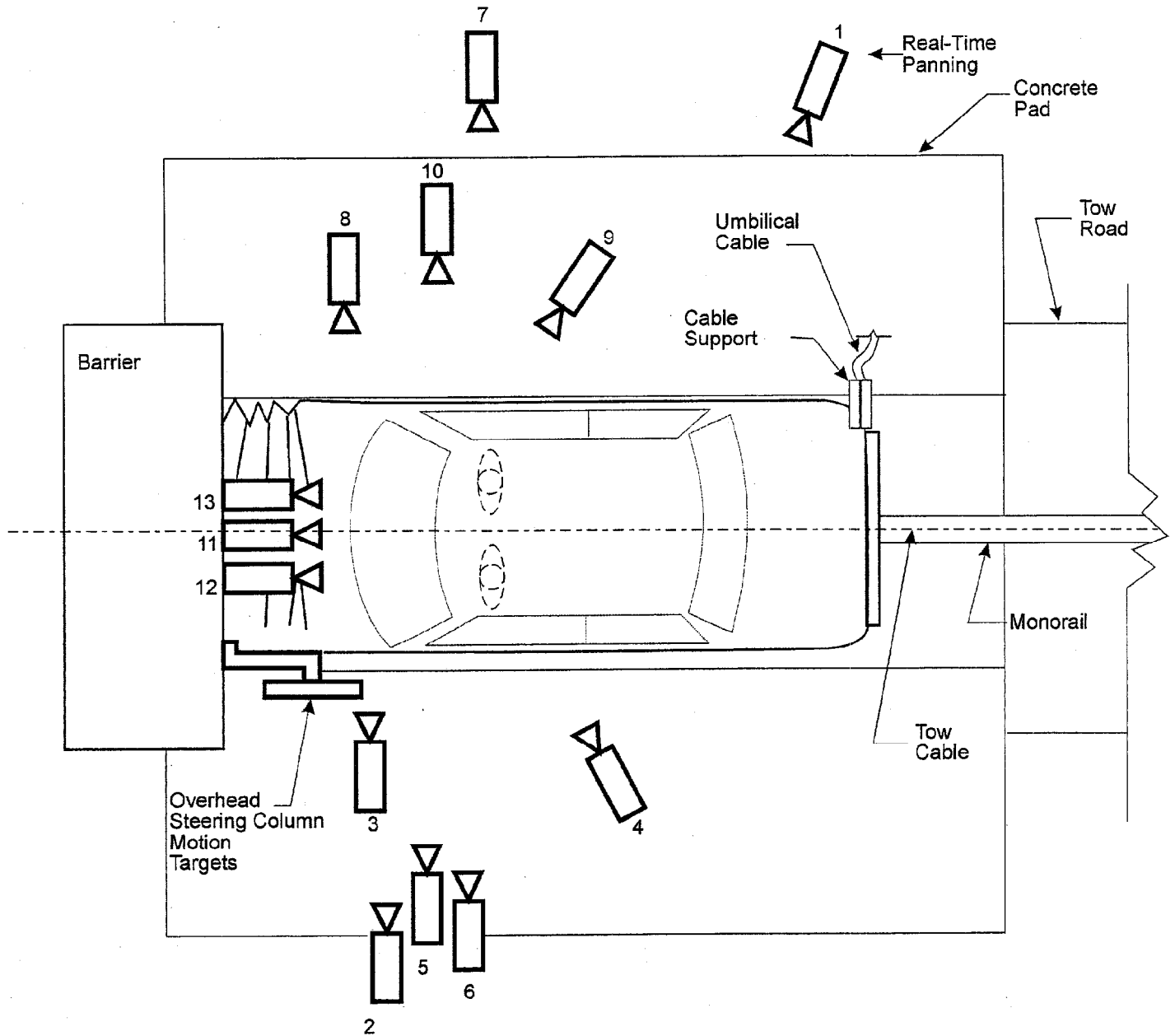


Figure 7 Camera Positions, Cont'd.

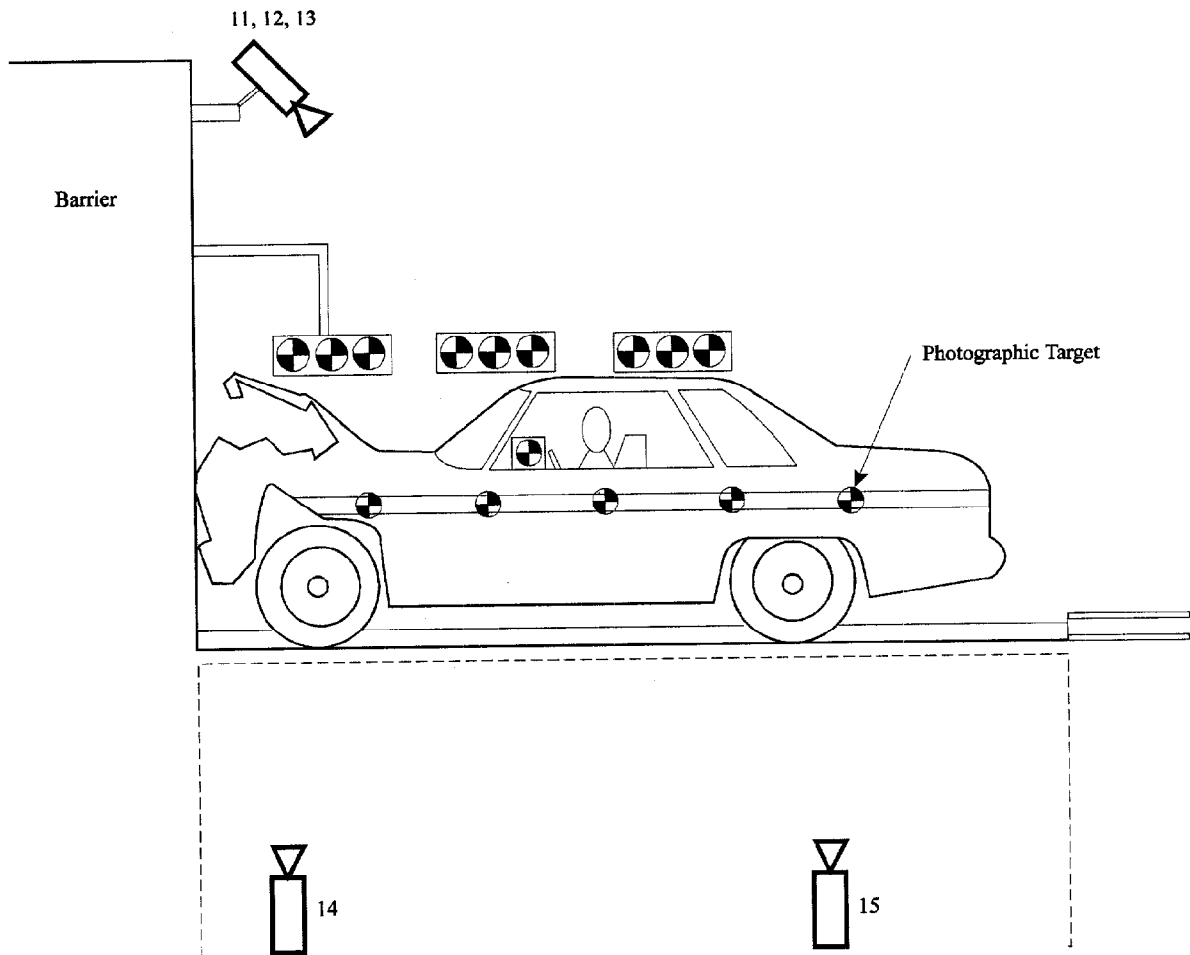


Table 8 Motion Picture Camera Locations

Vehicle year/make/model/body style: 1999/Dodge/Intrepid/4-door Sedan

Test number: 990216

Camera Number	View	Camera Positions ¹			Camera Angle ²	Film Plane		Camera Lens	Film Speed
		X	Y	Z		to Head Target			
1	Real-time panning	NA	NA	NA	NA	NA		16 mm	24 frames/s
2	Left vehicle crush	-1054 mm	7493 mm	1118 mm	-4°	7569 mm		25 mm	990 frames/s
3	Left windshield intrusion	-1346 mm	7859 mm	1074 mm	0°	NA		50 mm	1005 frames/s
4	Driver kinematics	-3995 mm	2946 mm	2210 mm	-27°	2438 mm		25 mm	1002 frames/s
5	Steering column motion	-1168 mm	7264 mm	2616 mm	-14°	NA		25 mm	1000 frames/s
6	Steering column motion	-1168 mm	7264 mm	1908 mm	-9°	NA		25 mm	998 frames/s
7	Right overall	-2065 mm	-6767 mm	942 mm	-2°	NA		13 mm	995 frames/s
8	Right windshield intrusion	-968 mm	-7775 mm	1118 mm	0°	NA		50 mm	1002 frames/s
9	Passenger kinematics	-3863 mm	-2946 mm	2210 mm	-26°	2286 mm		25 mm	1000 frames/s
10	Passenger kinematics	-986 mm	-7442 mm	1151 mm	-4°	5944 mm		25 mm	995 frames/s
11	Windshield front view	-152 mm	0 mm	2235 mm	-40°	NA		8.5 mm	998 frames/s
12	Driver - front view	-173 mm	368 mm	2362 mm	-50°	NA		17 mm	968 frames/s
13	Passenger - front view	-114 mm	-351 mm	2362 mm	-50°	NA		17 mm	995 frames/s
14	Pit - front position	-1283 mm	0 mm	-2347 mm	90°	NA		13 mm	1005 frames/s
15	Pit - rear position	-2522 mm	0 mm	-2515 mm	90°	NA		13 mm	1005 frames/s
	Real-time documentation	NA	NA	NA	NA	NA		12-120 mm	24 frames/s

¹ +X: Film plane forward of barrier face

+Y: Film plane to left of monorail centerline

+Z: Film plane above ground level

² +Angle: Film plane angled upward from horizontal plane

Appendix A

Photographs



Figure A-1 Pre-Test Front View



Figure A-2 Post-Test Front View



Figure A-3 Pre-Test Left Side View



Figure A-4 Post-Test Left Side View



Figure A-5 Pre-Test Left Rear Three-Quarter View

Intentionally Left Blank



Figure A-6 Pre-Test Rear View



Figure A-7 Post-Test Rear View

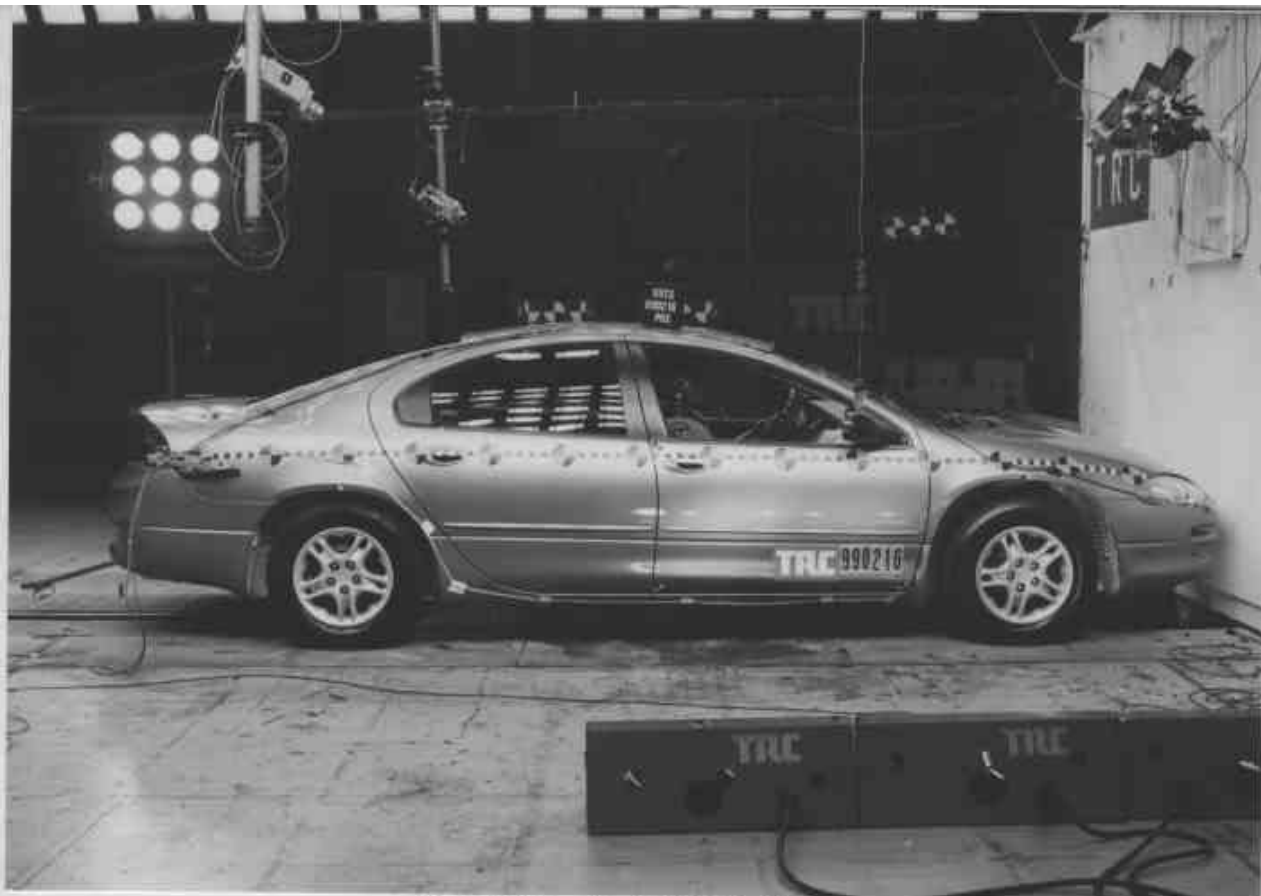


Figure A-8 Pre-Test Right Side View

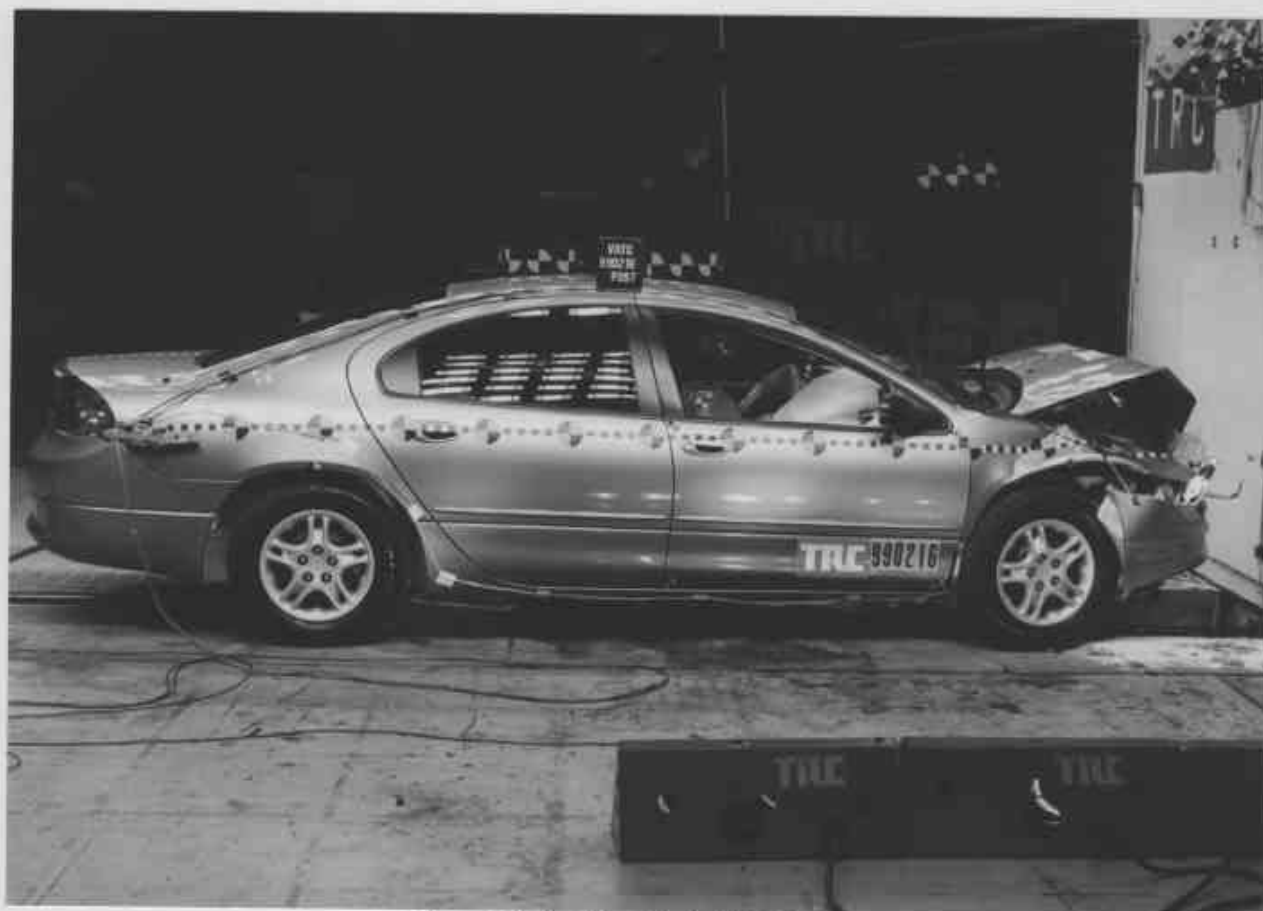


Figure A-9 Post-Test Right Side View



Figure A-10 Pre-Test Right Front Three-Quarter View



Figure A-11 Post-Test Right Front Three-Quarter View



Figure A-12 Post-Test Left Front Three-Quarter View

Intentionally Left Blank

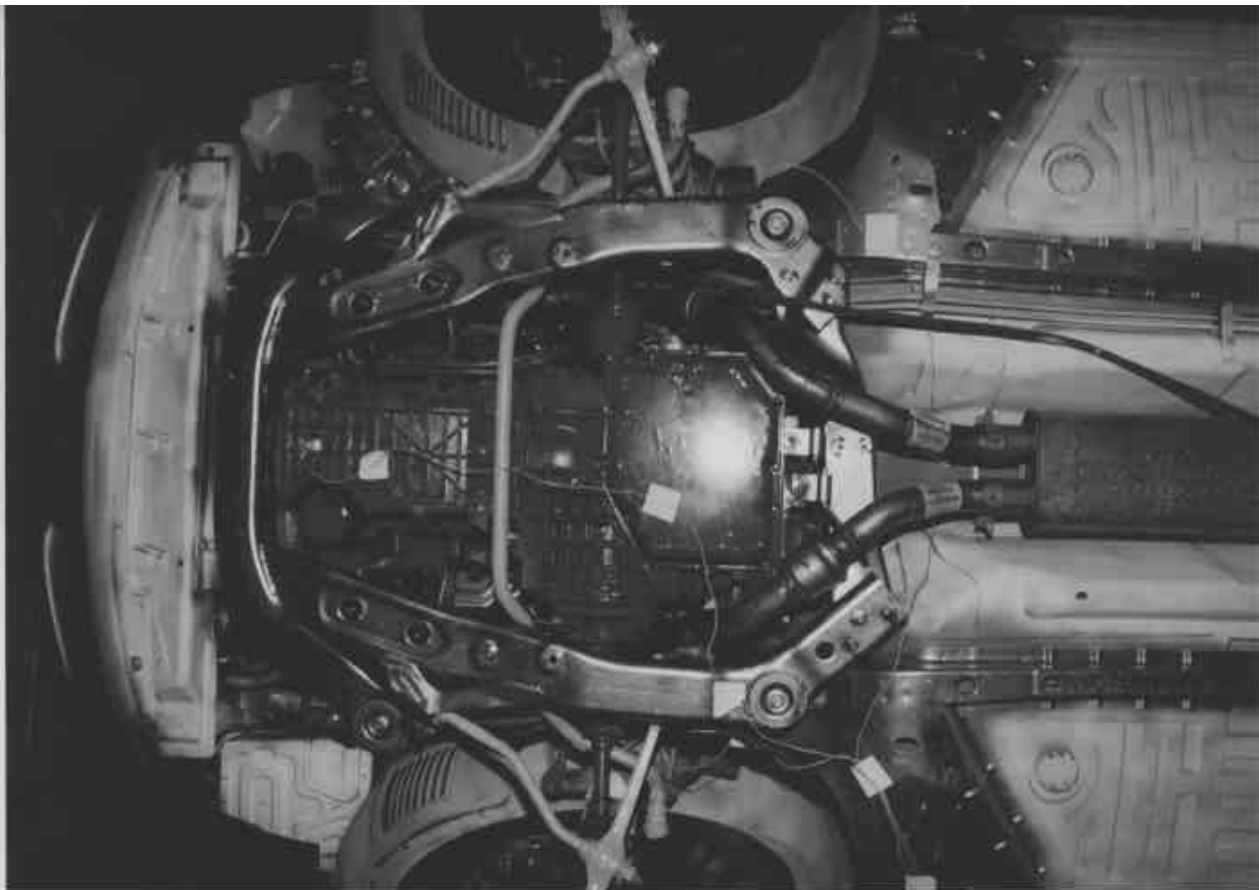


Figure A-13 Pre-Test Front Underbody View



Figure A-14 Post-Test Front Underbody View

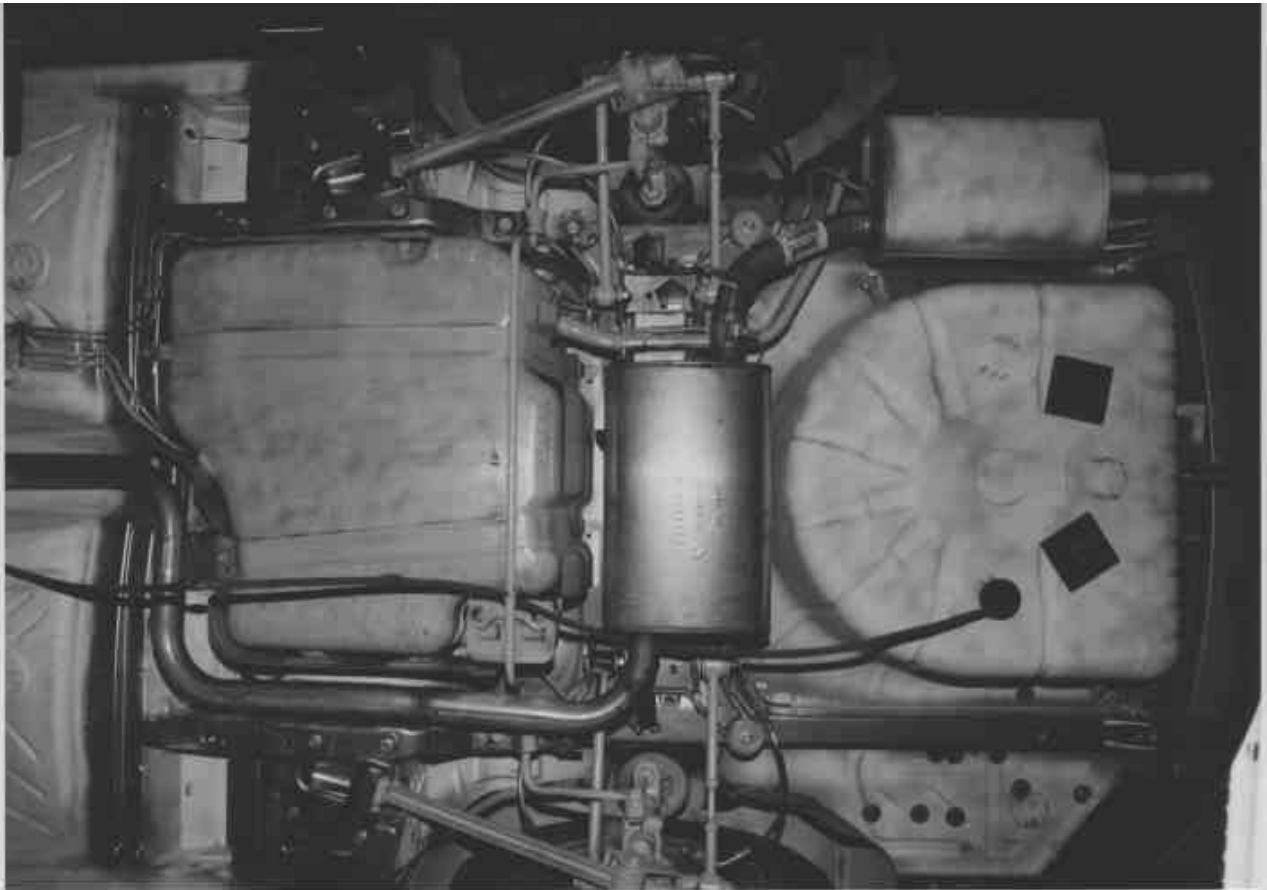


Figure A-15 Pre-Test Rear Underbody View



Figure A-16 Post-Test Rear Underbody View



Figure A-17 Pre-Test Engine Compartment View

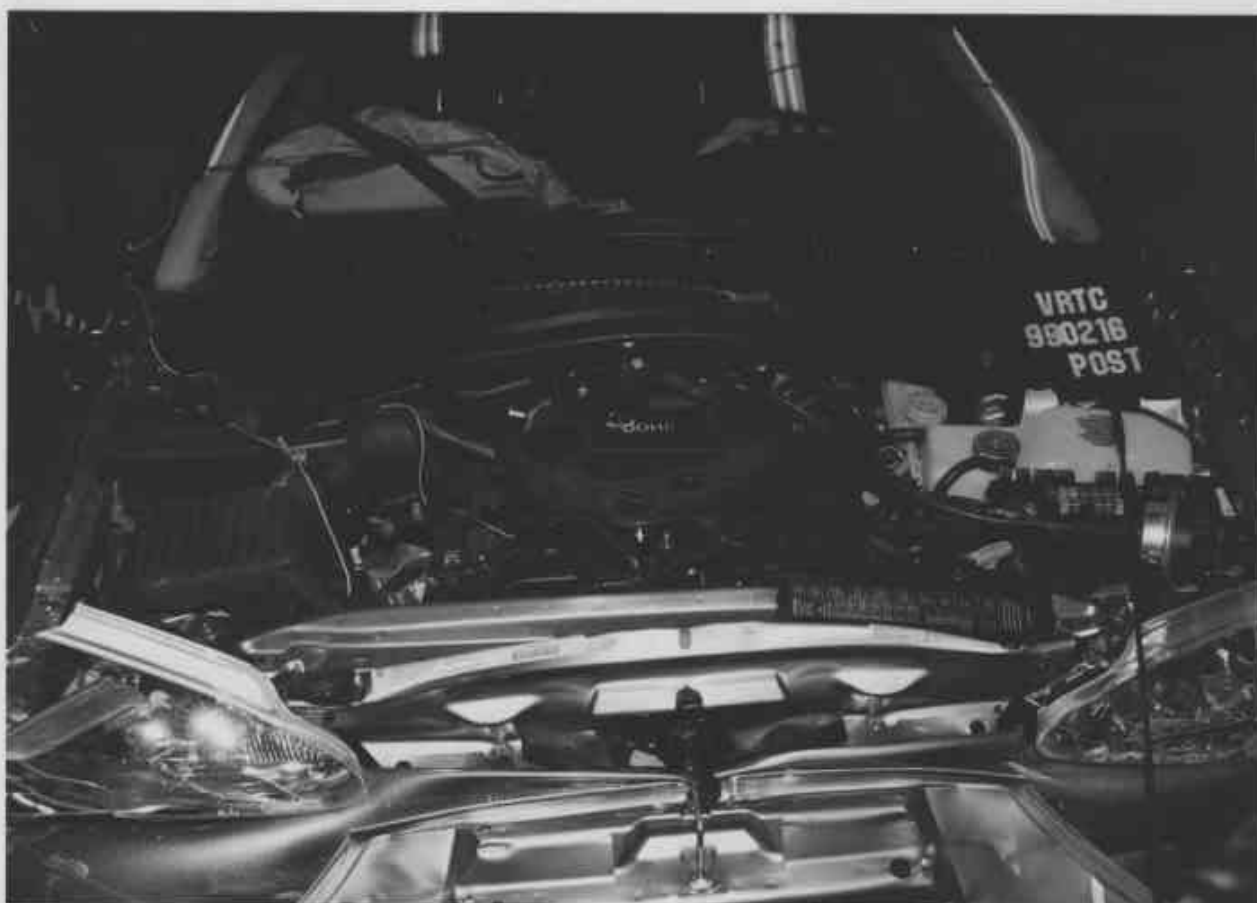


Figure A-18 Post-Test Engine Compartment View



Figure A-19 Pre-Test Windshield View



Figure A-20 Post-Test Windshield View



Figure A-21 Pre-Test Driver Dummy Windshield View



Figure A-22 Post-Test Driver Dummy Windshield View

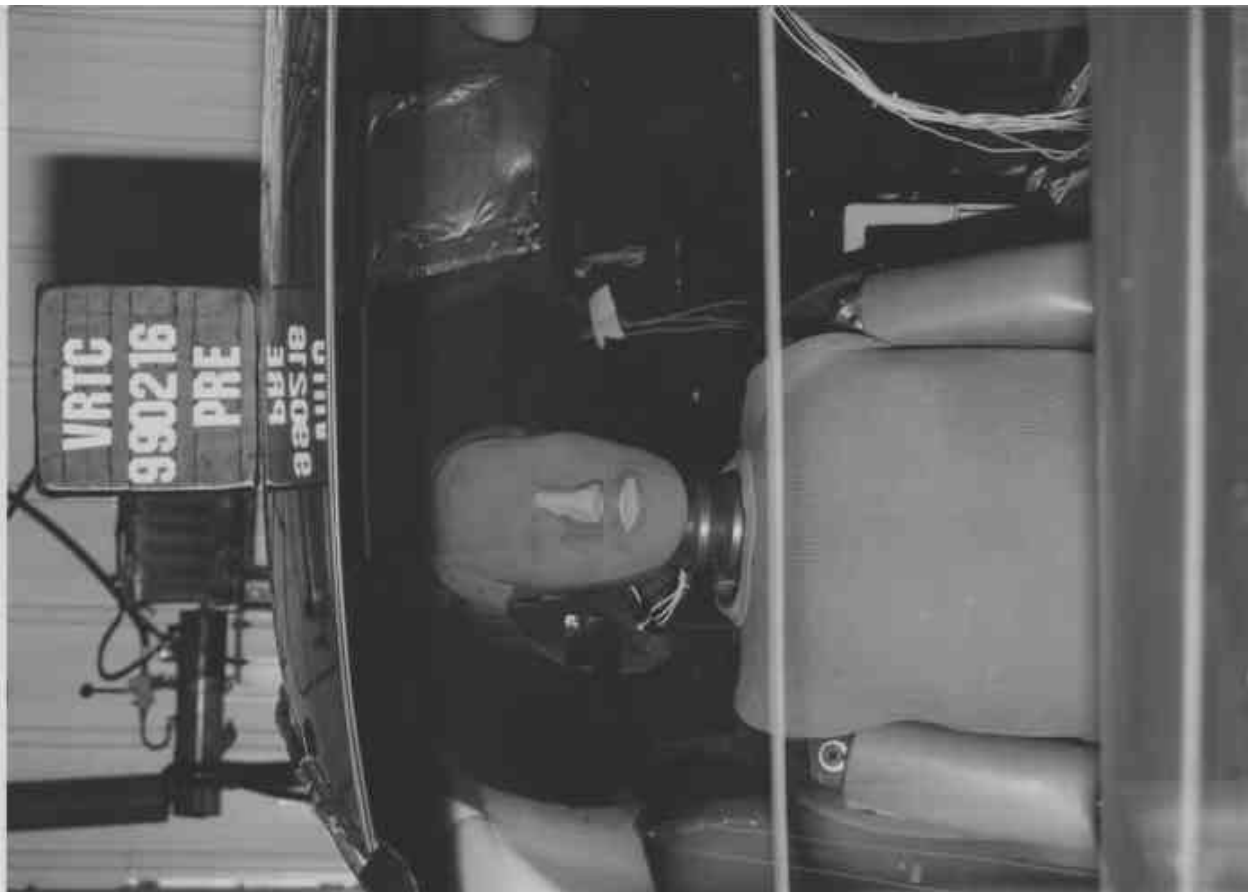


Figure A-23 Pre-Test Passenger Dummy Windshield View



Figure A-24 Post-Test Passenger Dummy Windshield View



Figure A-25 Pre-Test Driver Dummy Position - View 1



Figure A-26 Post-Test Driver Dummy Position - View 1



Figure A-27 Pre-Test Driver Dummy Position -View 2



Figure A-28 Post-Test Driver Dummy Position - View 2



Figure A-29 Pre-Test Driver Dummy Position -View 3



Figure A-30 Post-Test Driver Dummy Position - View 3

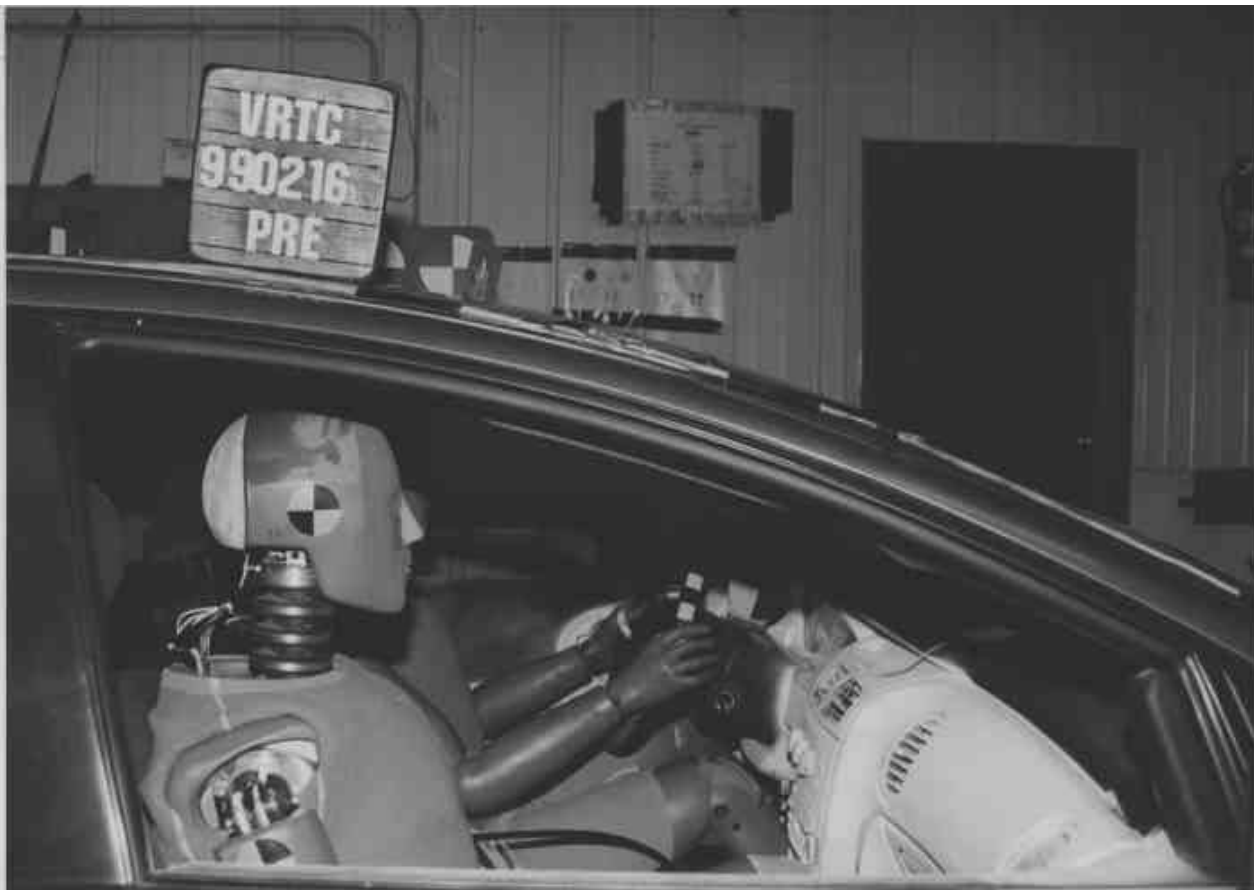


Figure A-31 Pre-Test Passenger Dummy Position - View 1



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



Figure A-33 Pre-Test Passenger Dummy Position - View 2



Figure A-34 Post-Test Passenger Dummy Position - View 2



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



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



Figure A-37 Post-Test Driver Dummy View



Figure A-38 Post-Test Driver Dummy Head Contact - View 1



Figure A-39 Post-Test Driver Dummy Head Contact - View 2



Figure A-40 Post-Test Driver Dummy Knee Contact - View 1



Figure A-41 Post-Test Driver Dummy Knee Contact - View 2



Figure A-42 Post-Test Driver Footwell Deformation View



Figure A-43 Post-Test Passenger Dummy View



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



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



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



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

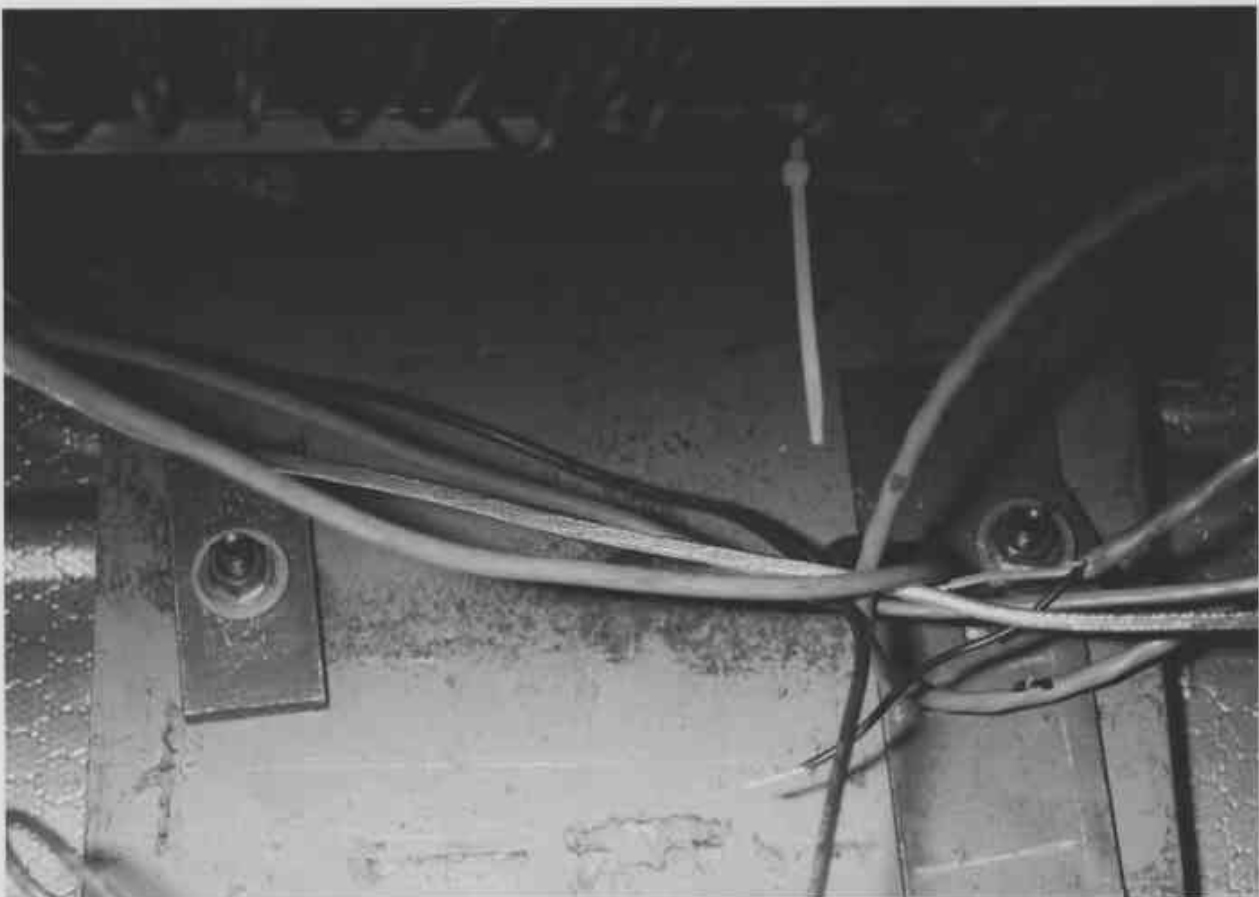


Figure A-48 Pre-Test Ballast Location View

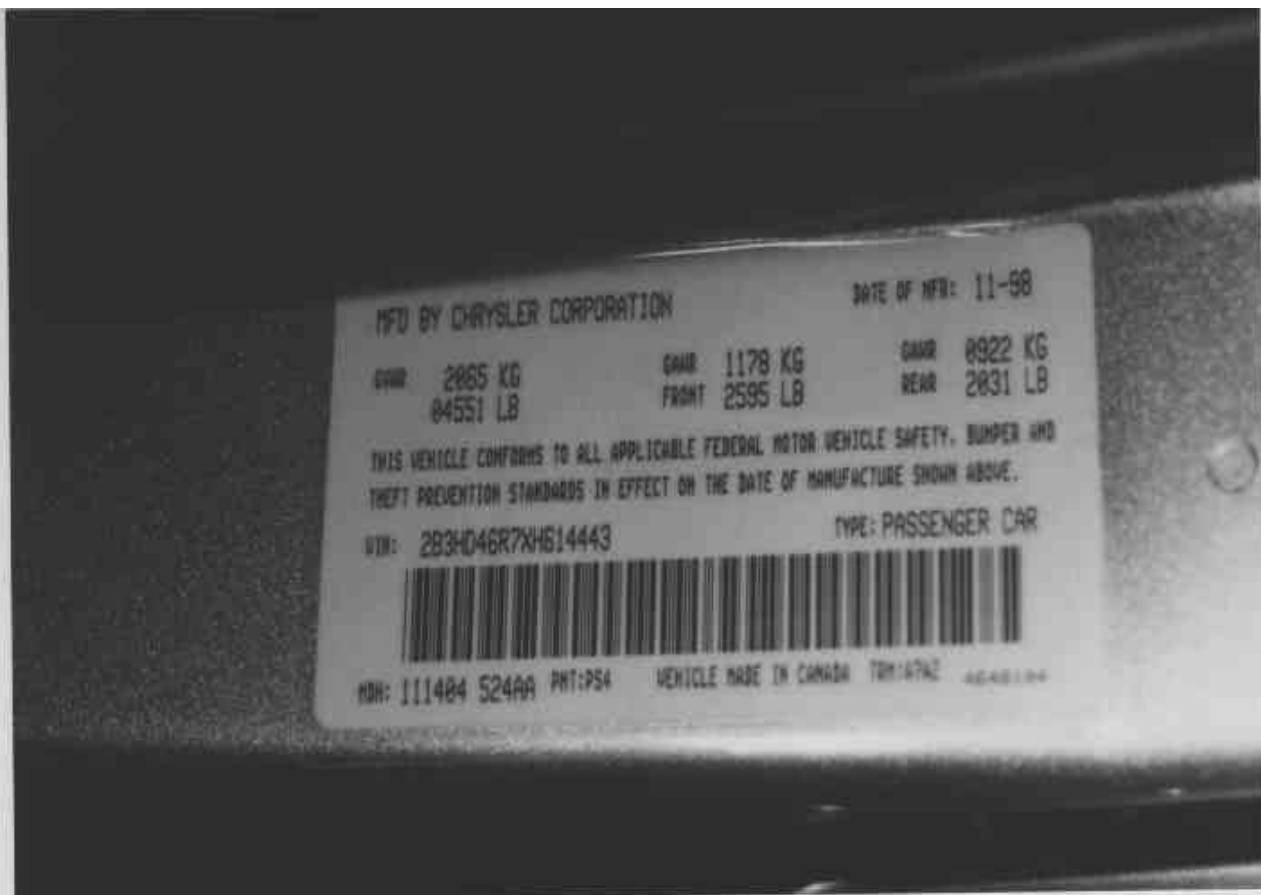


Figure A-49 Pre-Test Vehicle Certification Label View

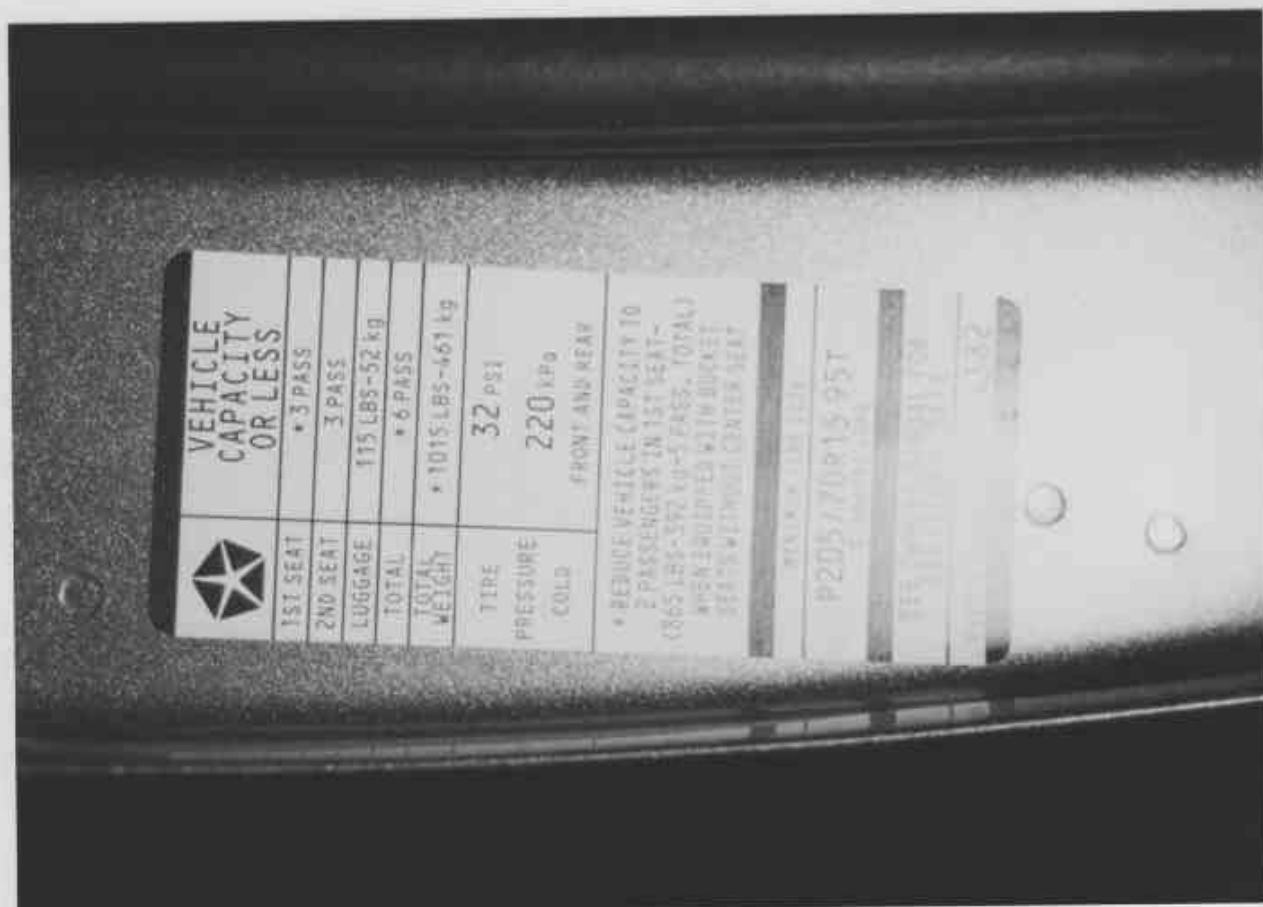


Figure A-50 Pre-Test Vehicle Tire Information Label View

Appendix B

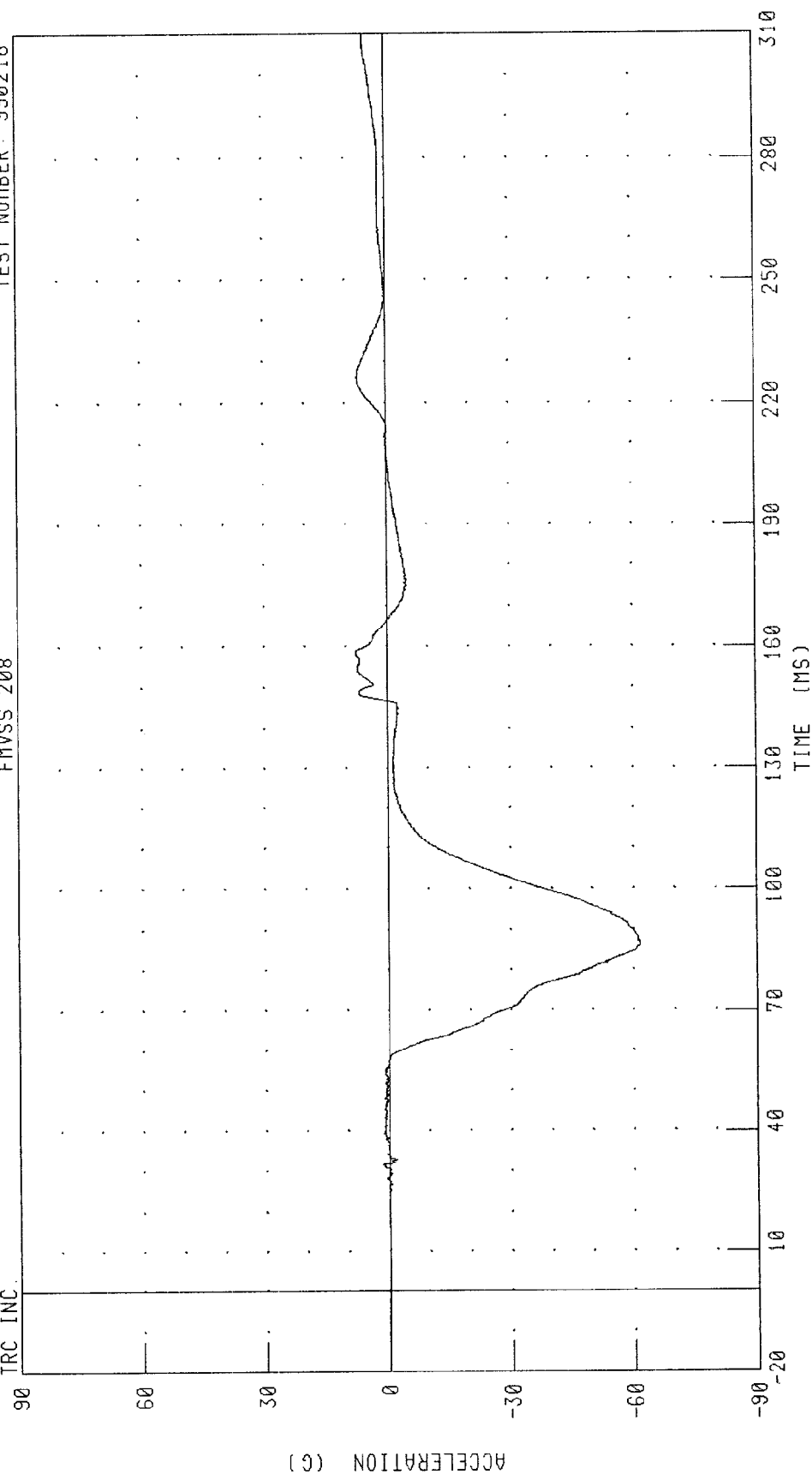
Data Plots

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER HEAD X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: HEDXC1 FILTER: CH. CLASS 1000

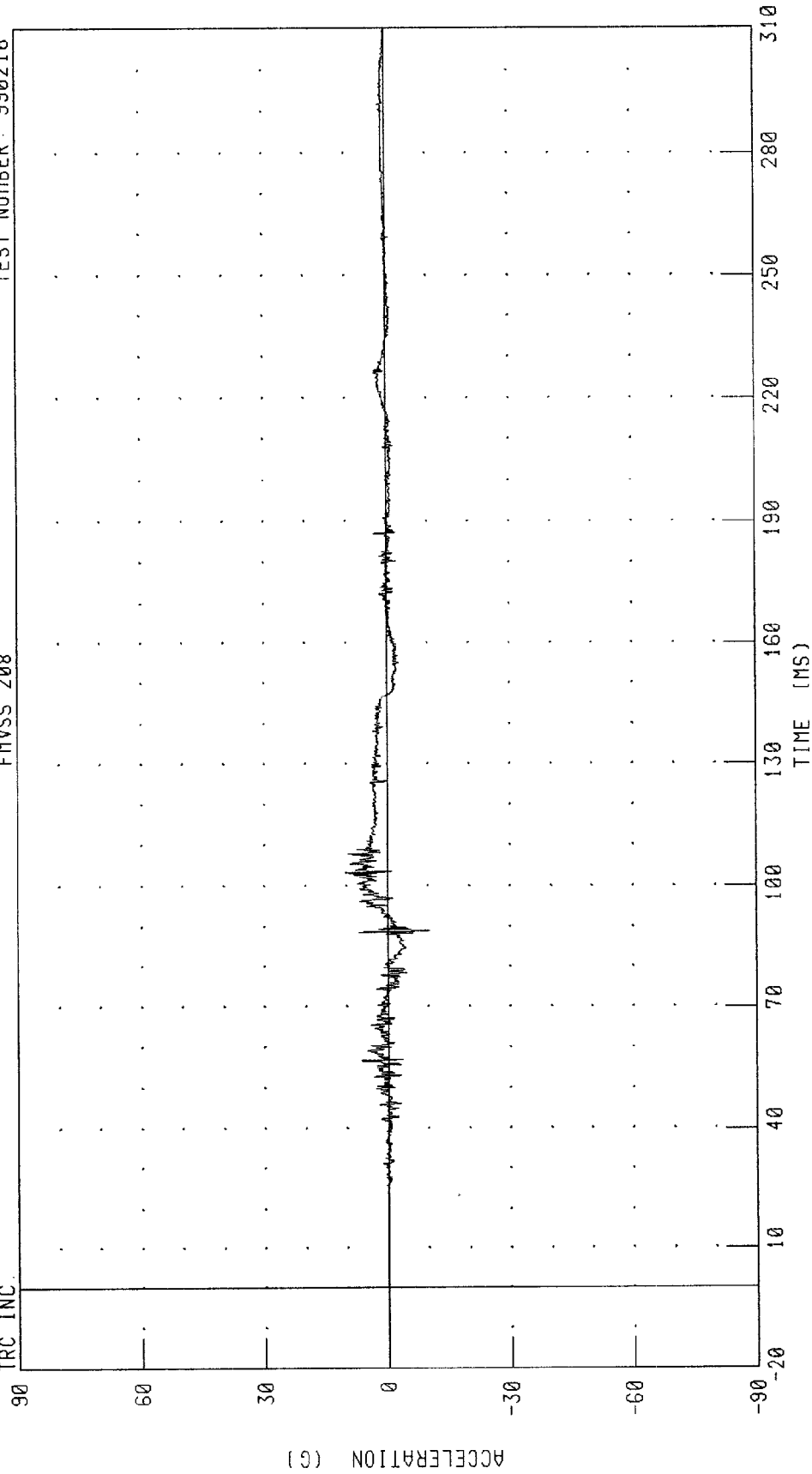
PEAK DATA: 7.62 G @ 158.24 MS, -61.65 G @ 86.24 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 10.36 G @ 103.36 MS; -10.31 G @ 89.20 MS

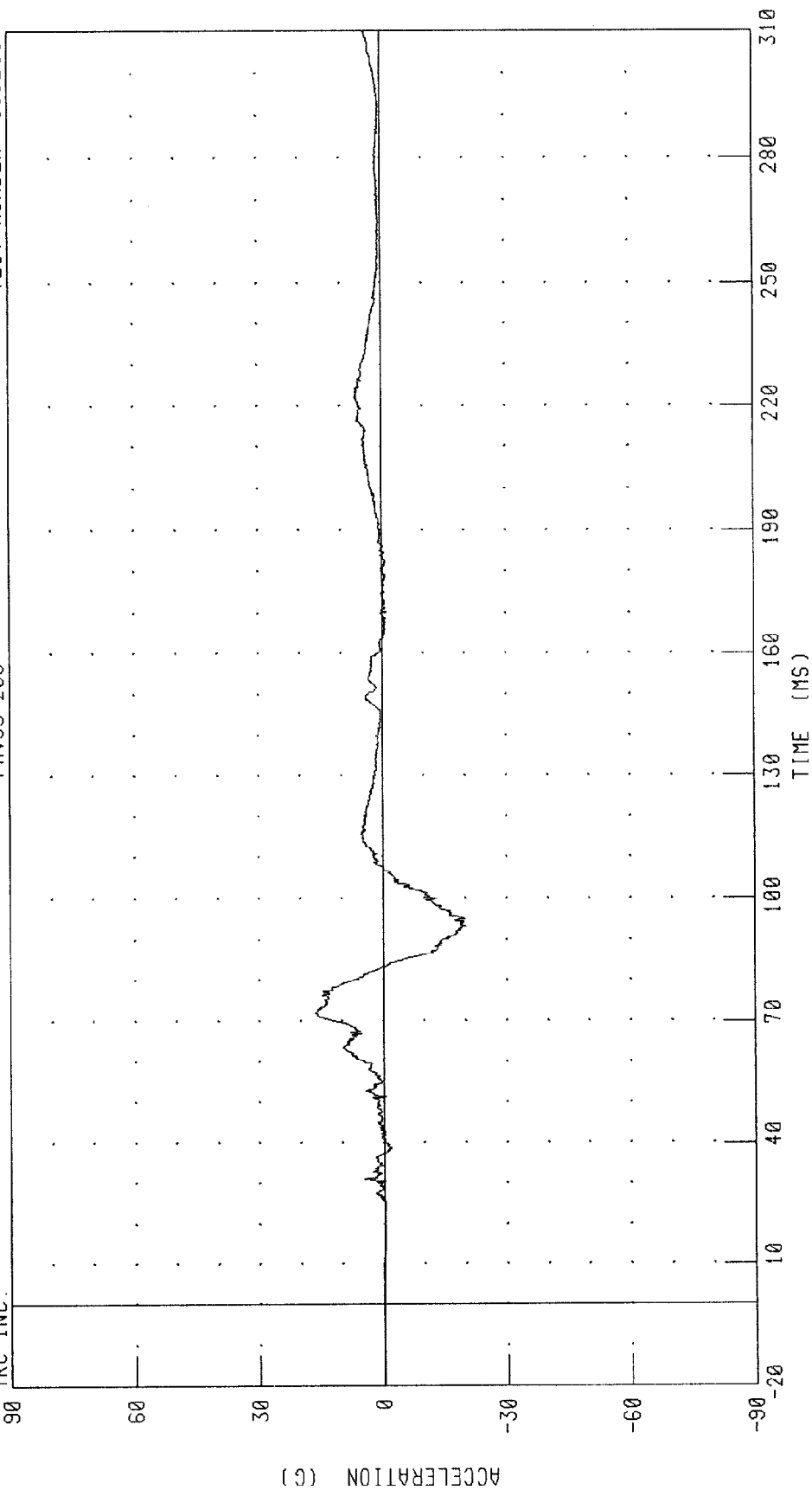
CHANNEL: HEDYG1 FILTER: CH. CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER HEAD Z-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: HEDZG1 FILTER: CH. CLASS 1000

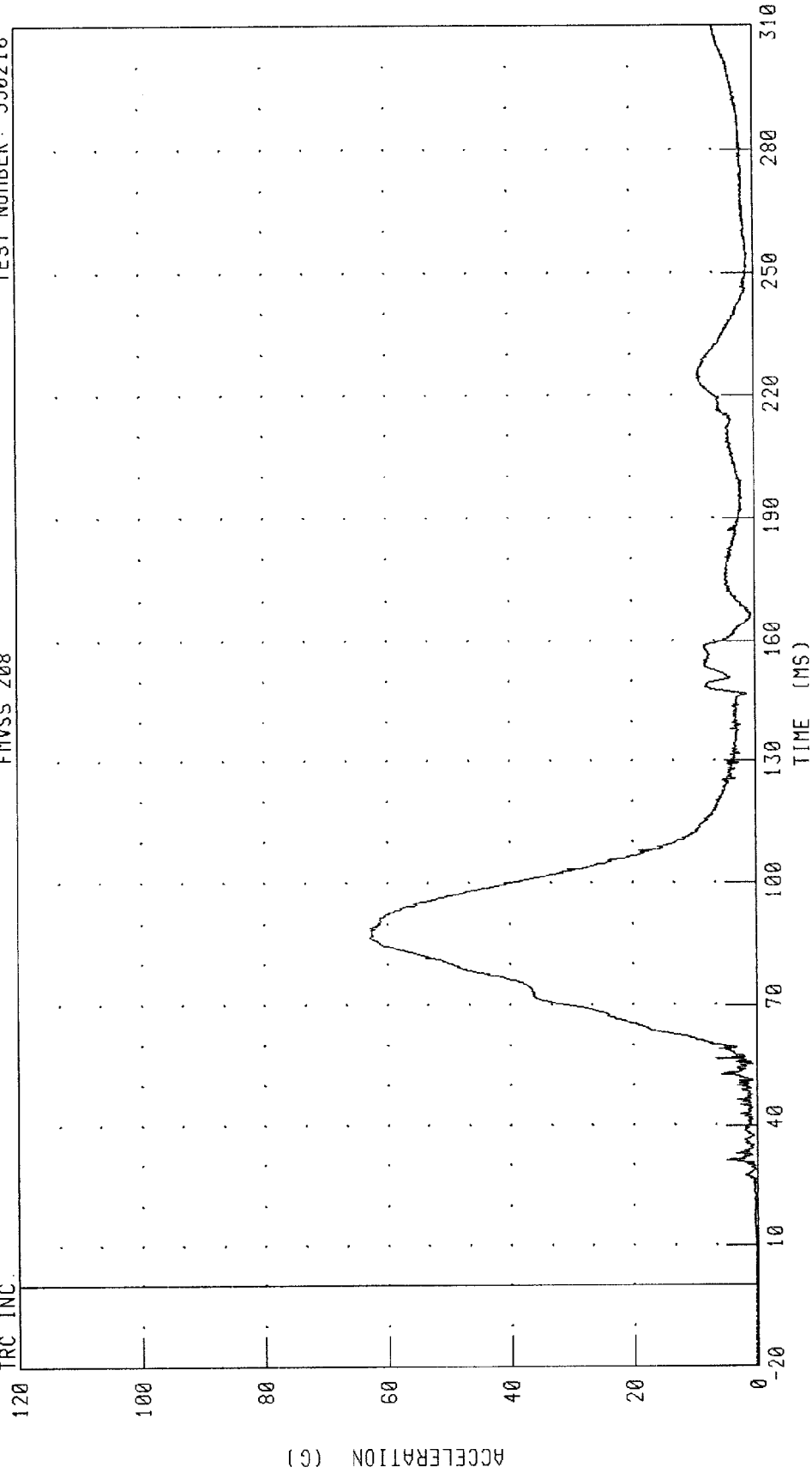
PEAK DATA: 16.38 G @ 72.00 MS; -20.06 G @ 93.36 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER : 990216

FMVSS 208

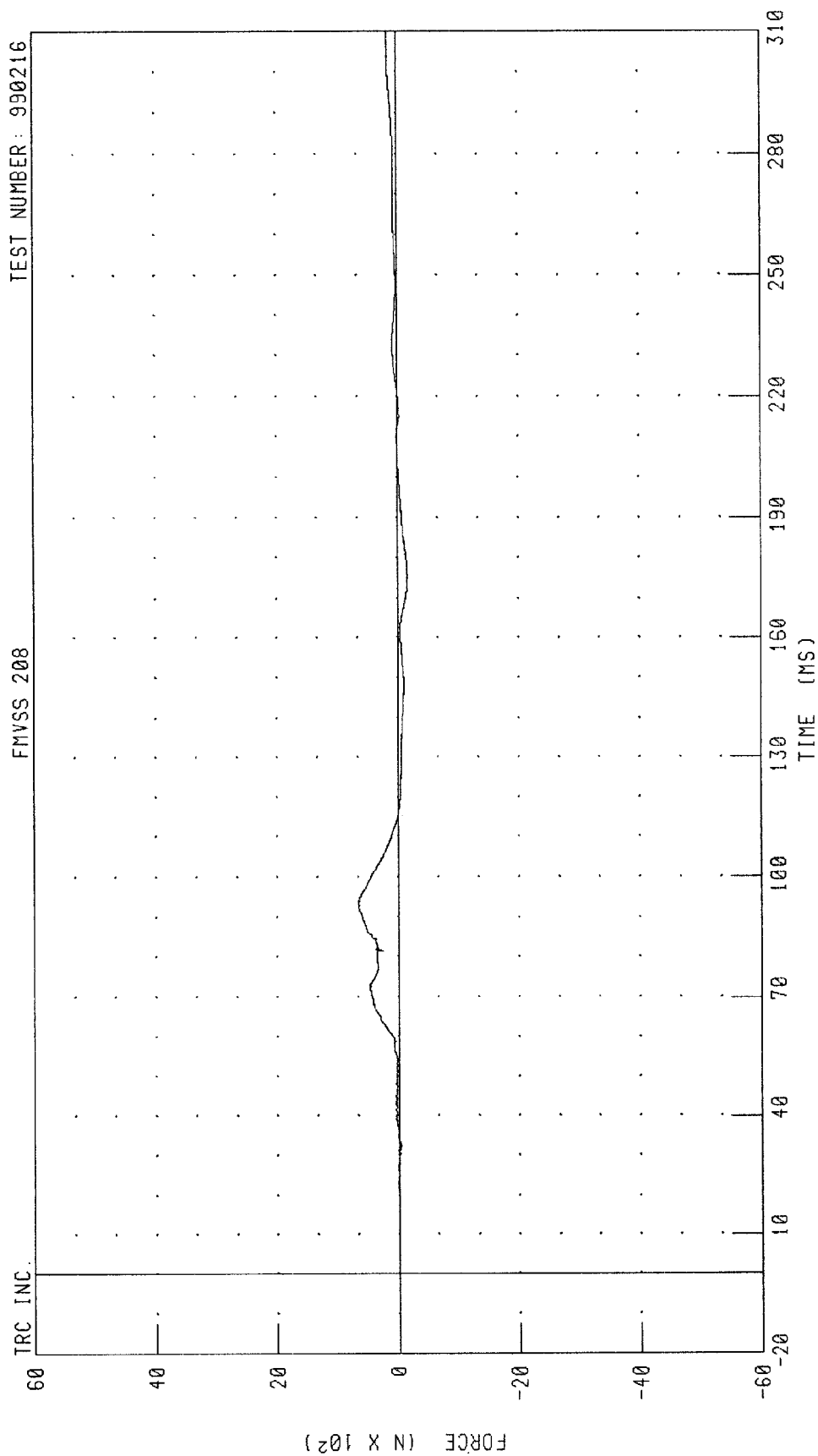
TRC INC.



PEAK DATA: 62.93 G @ 86.96 MS; 0.09 G @ -18.68 MS

CHANNEL : HEDRG1 FILTER: CH. CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK X-AXIS SHEAR FORCE



PEAK DATA: 651.19 N @ 92.16 MS, -169.75 N @ 175.12 MS

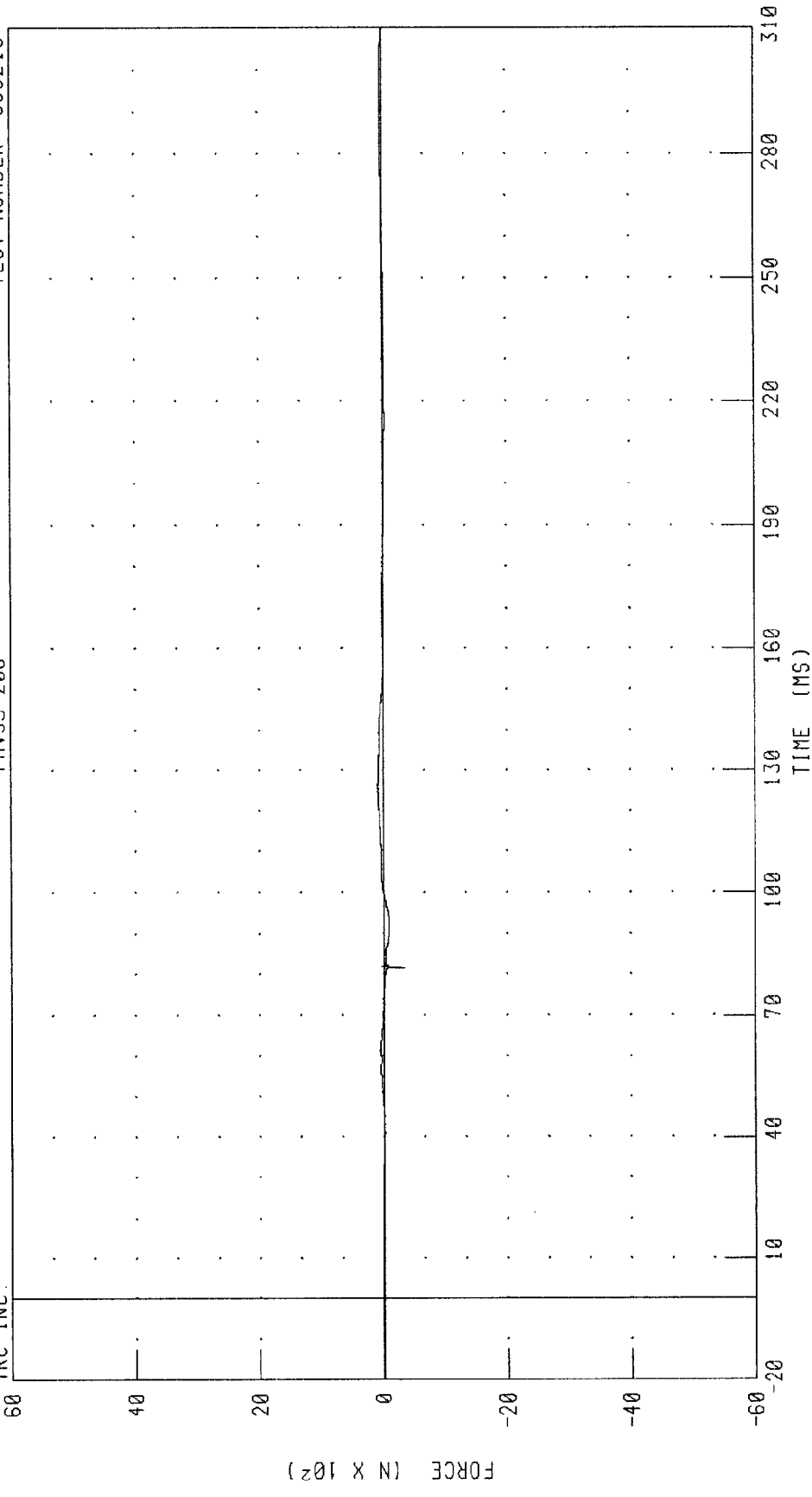
CHANNEL: NEKXF1 FILTER: CH. CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 990216

FMVSS 208

TRC INC.



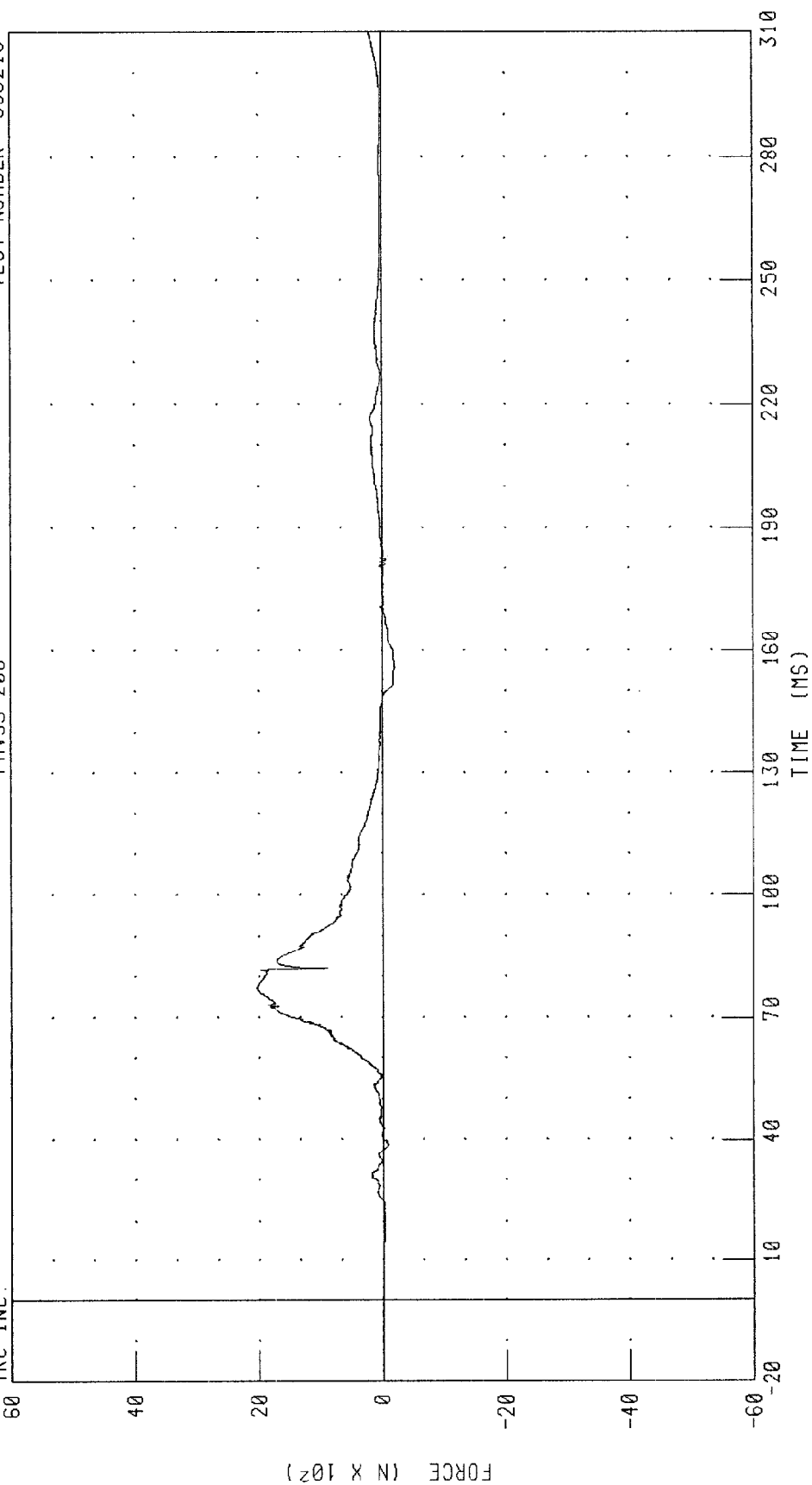
CHANNEL: NEKYF1 FILTER: CH. CLASS 1000 PEAK DATA: 88.09 N @ 124.64 MS; -337.86 N @ 81.68 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 2039.28 N @ 77.28 MS; -207.67 N @ 156.08 MS

CHANNEL: NEKZF1 FILTER: CH. CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK MOMENT ABOUT X AXIS

TEST NUMBER: 990216

FMVSS 208

TRC INC.

180

120

60

0

-60

-120

-180

TORQUE (N·M)

TIME (MS)

310

280

250

220

190

160

130

100

70

40

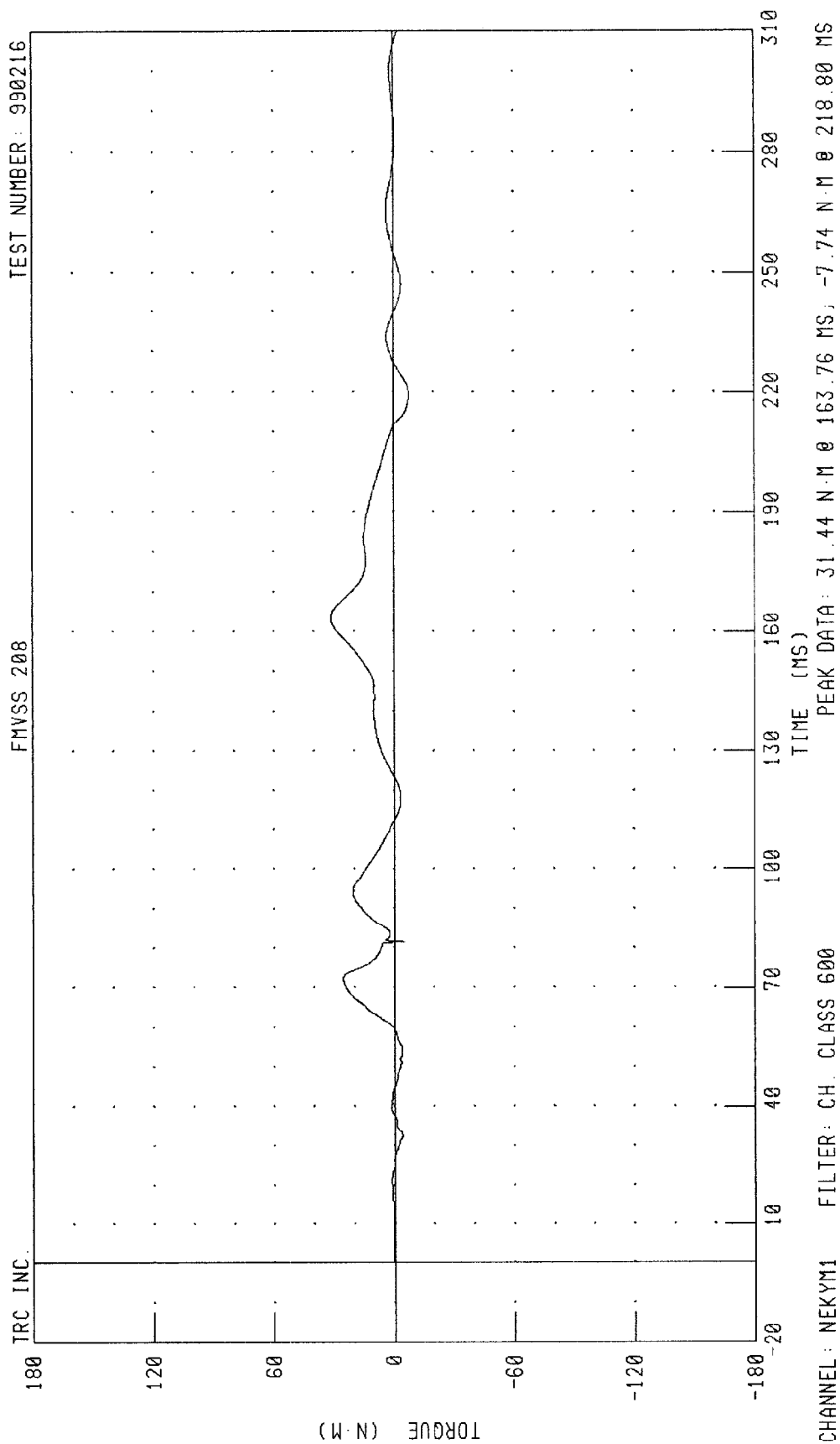
10

PEAK DATA: 12.28 N·M @ 128.48 MS, -2.38 N·M @ 225.60 MS

FILTER: CH. CLASS 600

CHANNEL: NEKXM1

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK MOMENT ABOUT Y AXIS

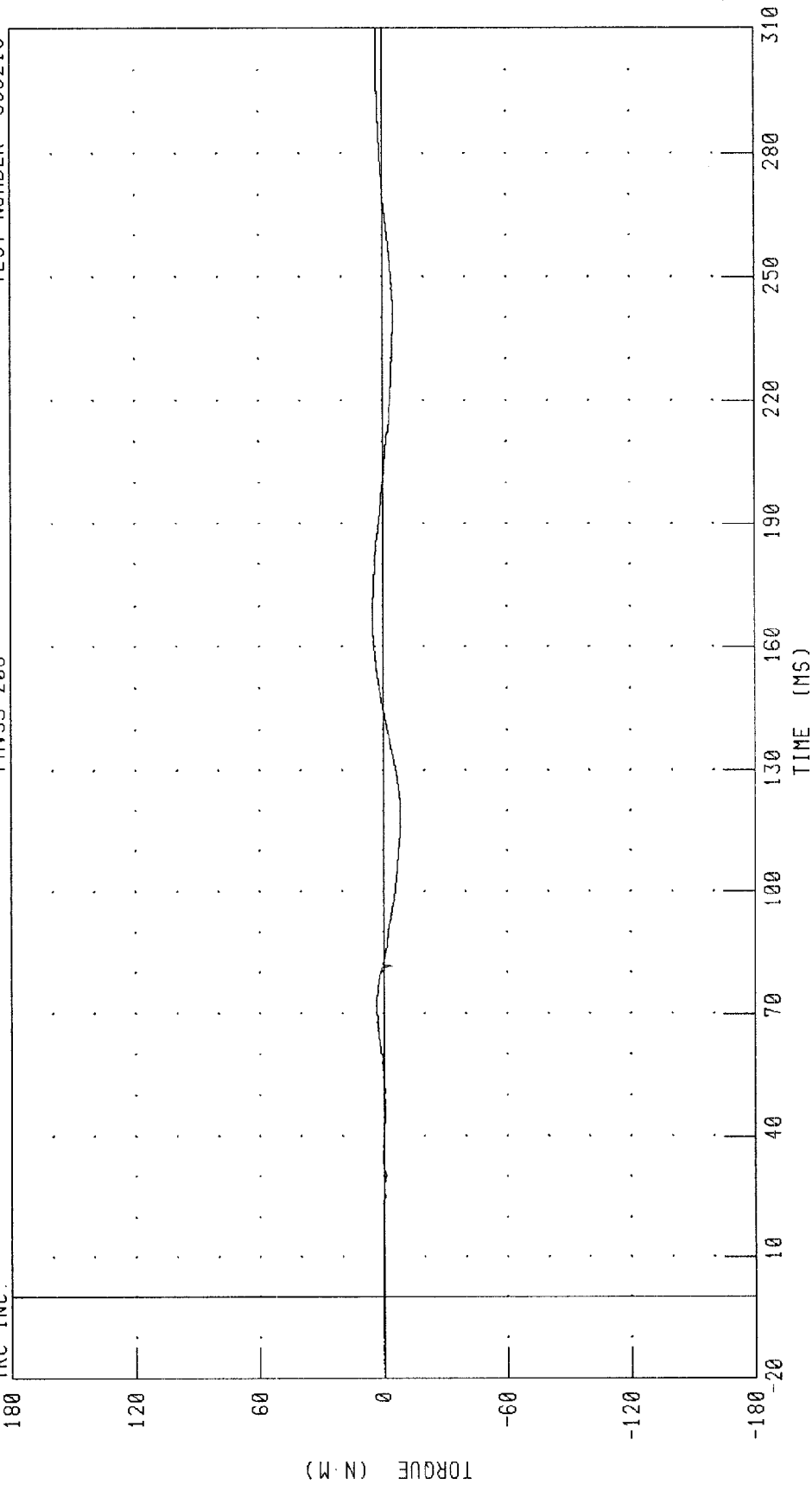


1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 990216

FMVSS 208

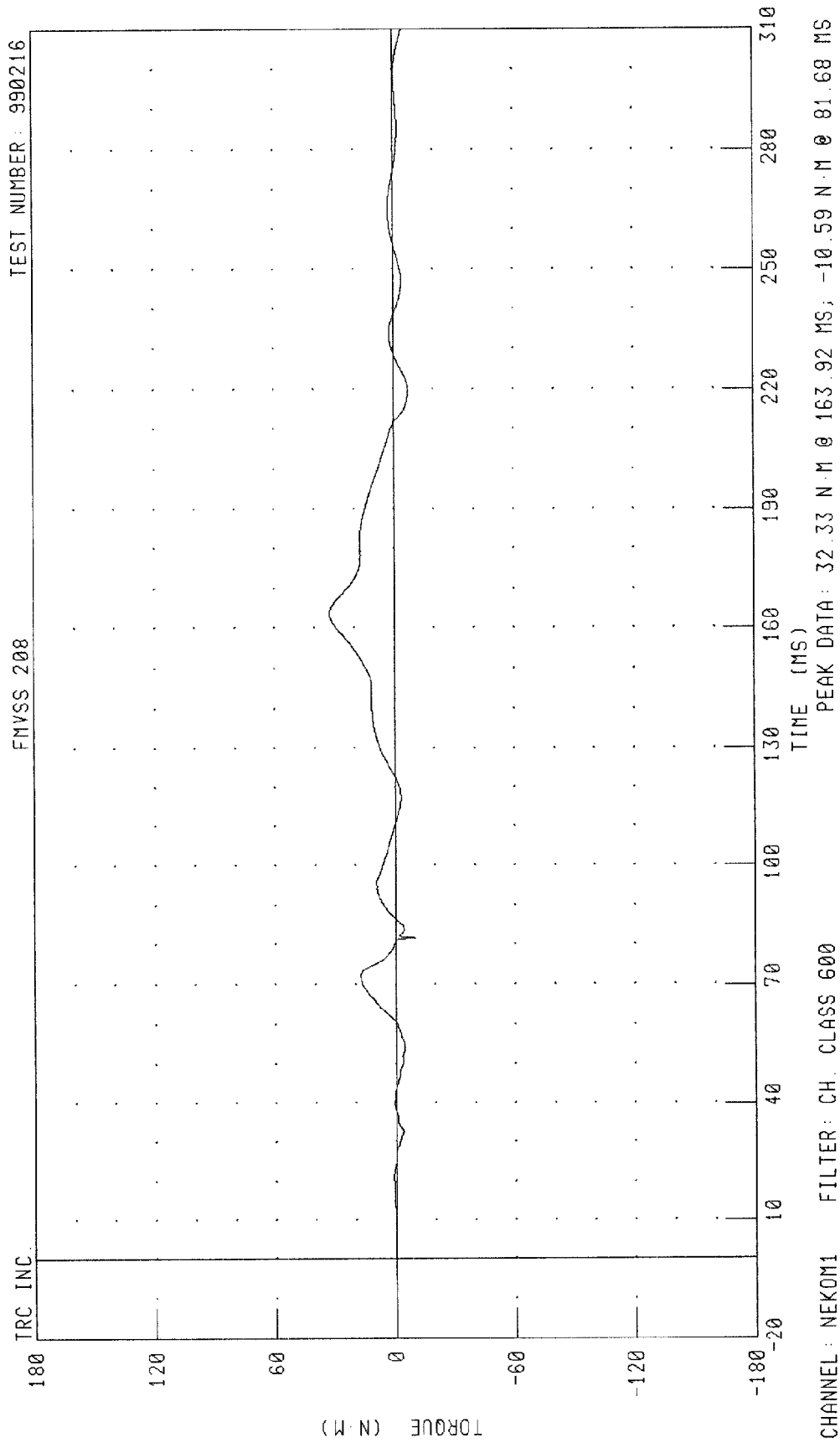
TRC INC.



PEAK DATA: 4.93 N·m @ 166.16 ms; -8.59 N·m @ 117.28 ms

CHANNEL: NEKZM1 FILTER: CH. CLASS 600

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER NECK OCCIPITAL CONDYLE

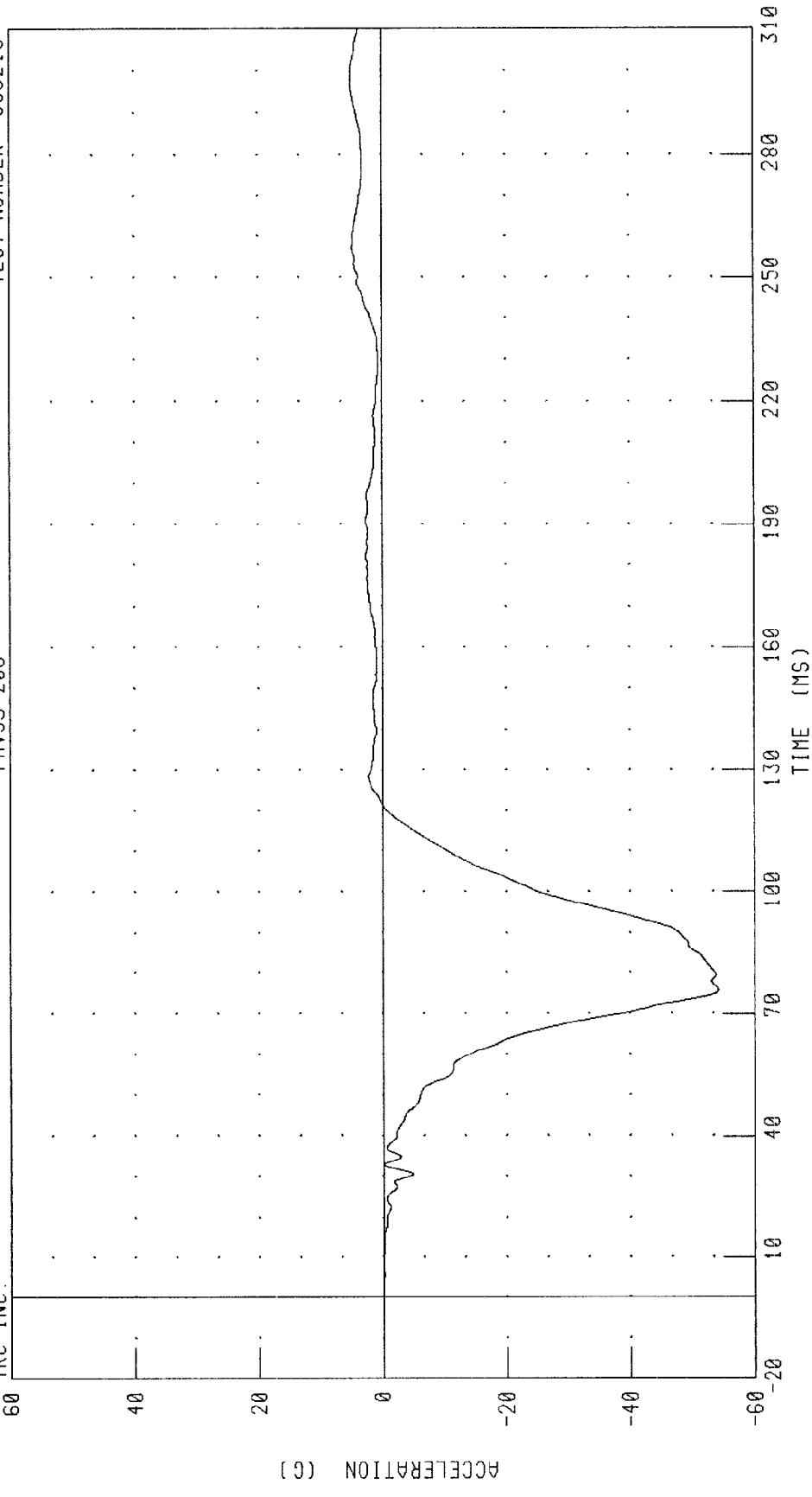


1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER CHEST X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

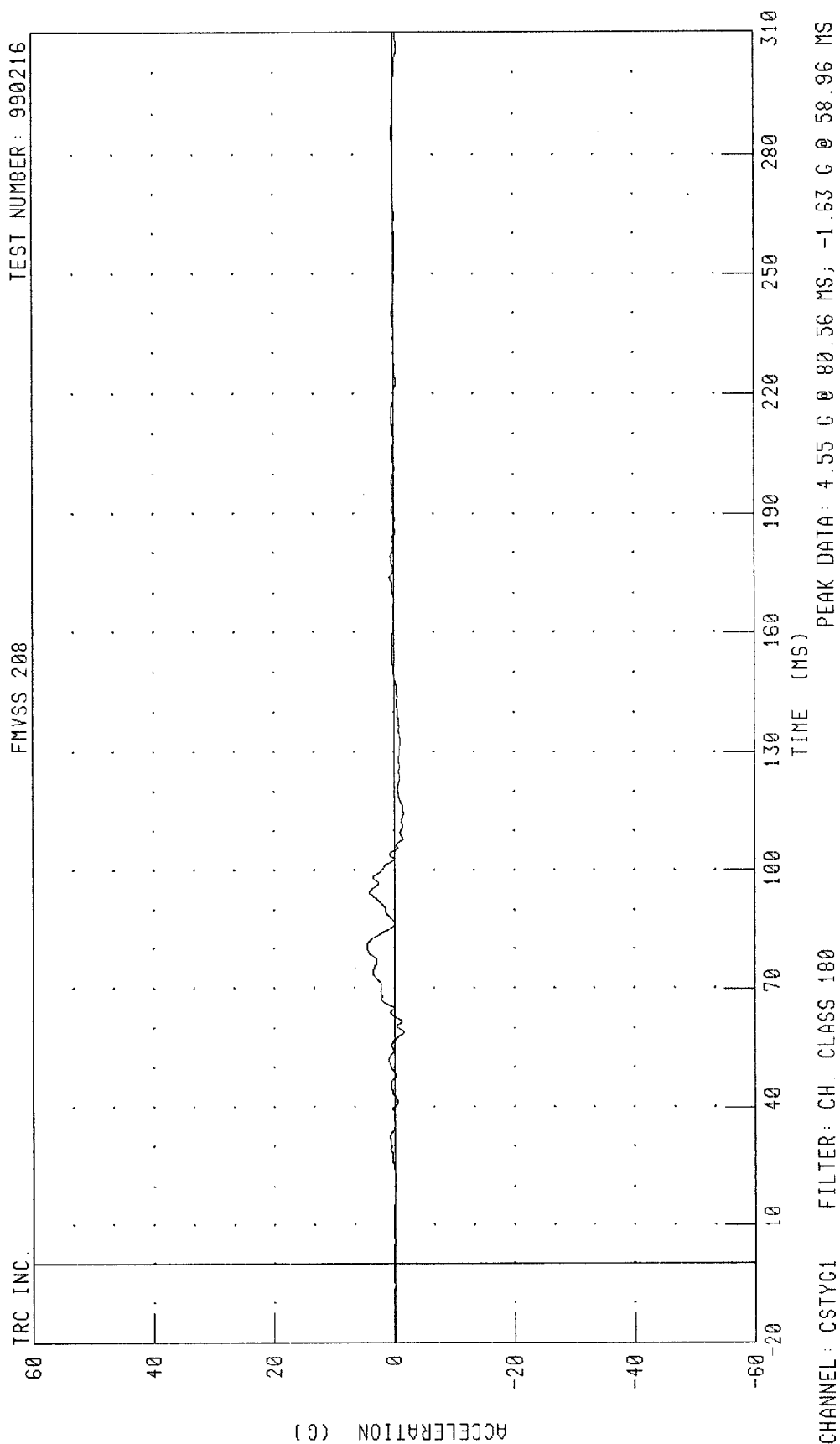
TRC INC.



CHANNEL: CSTXG1 FILTER: CH. CLASS 180

PEAK DATA: 5.08 G @ 298.56 MS, -54.20 G @ 75.84 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER CHEST Y-AXIS ACCELERATION

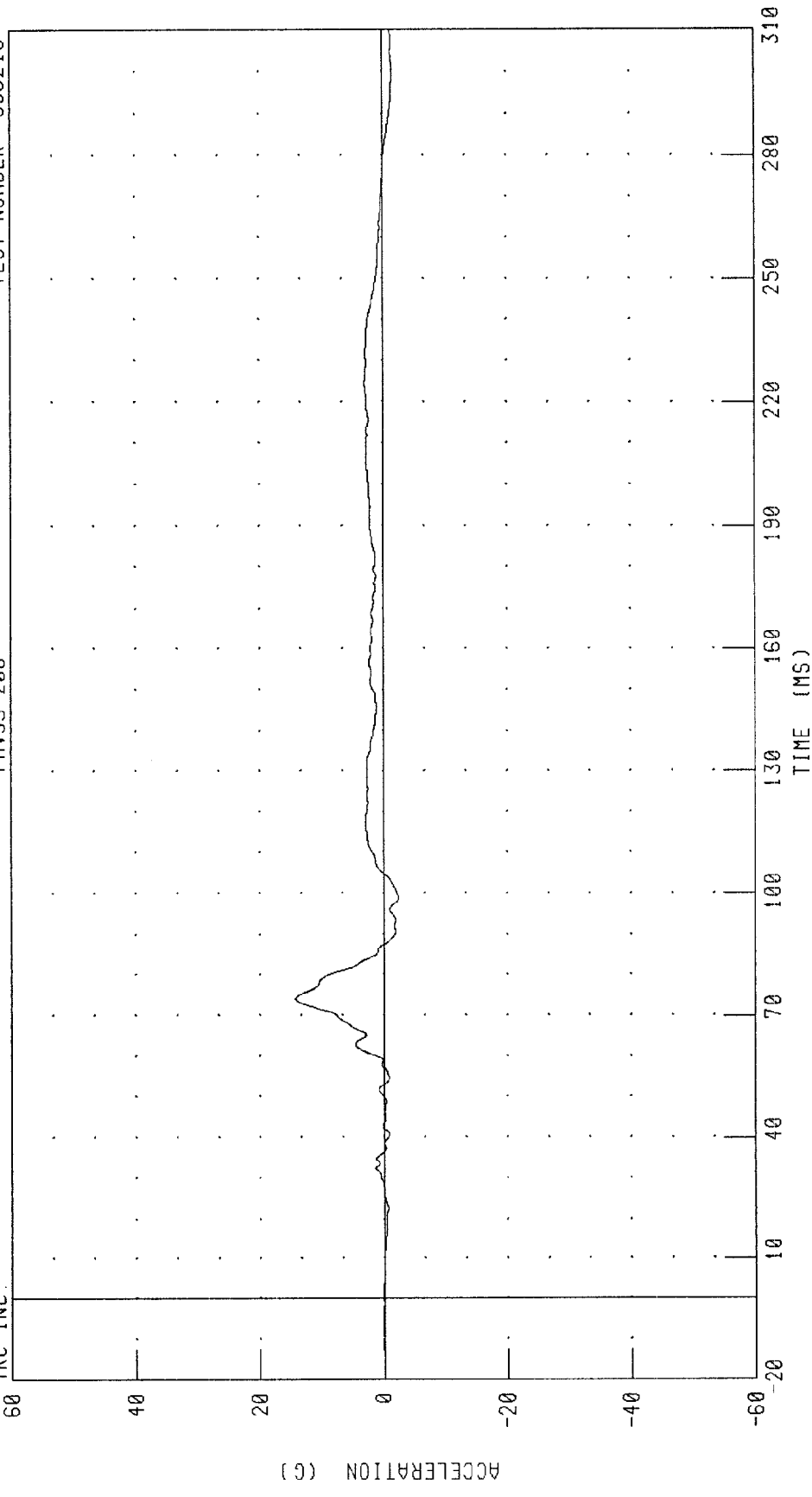


1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 990216

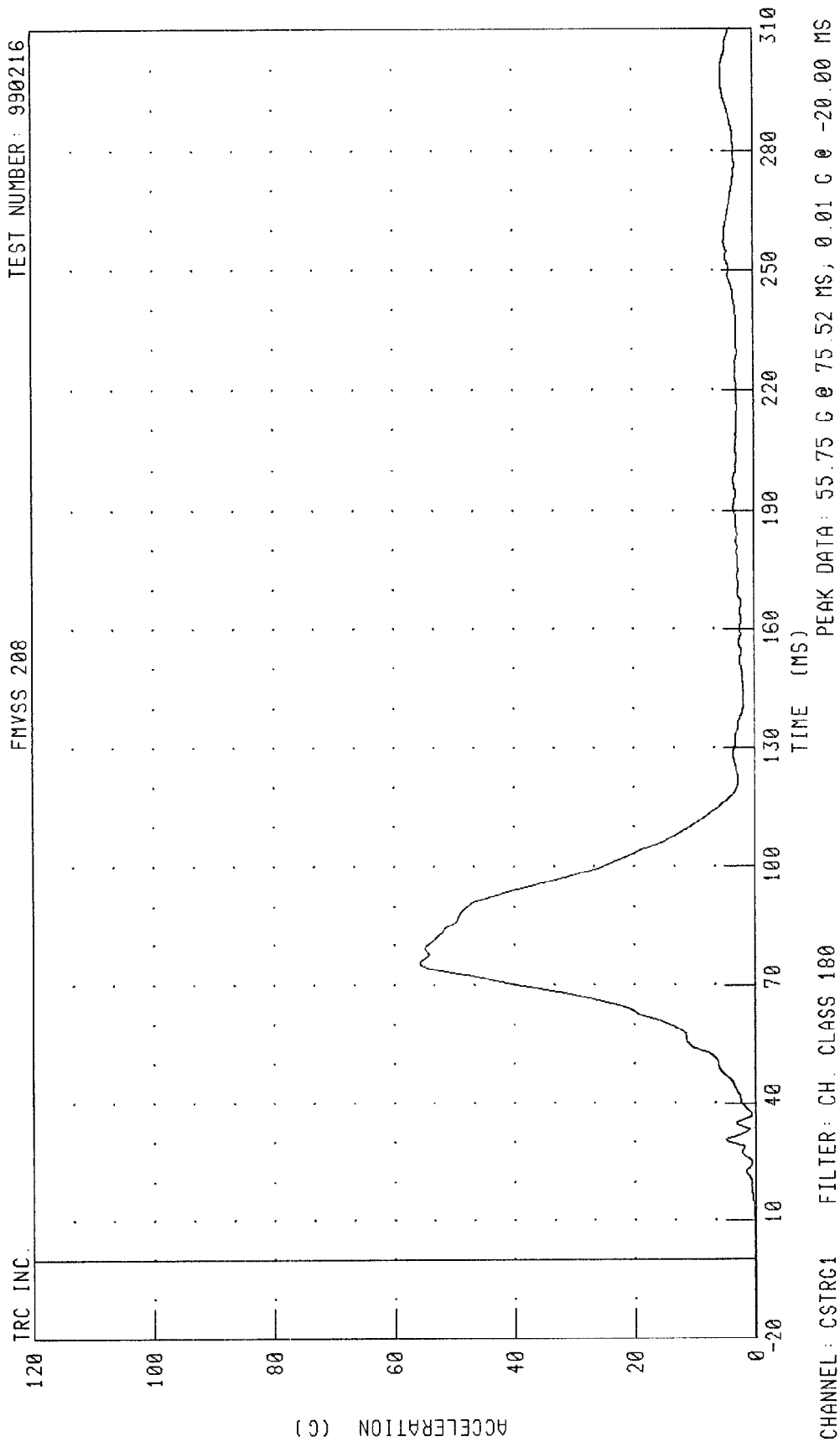
FMVSS 208

TRC INC.



CHANNEL: CSTZG1 FILTER: CH. CLASS 180 PEAK DATA: 14.30 G @ 74.08 MS; -2.48 G @ 98.96 MS

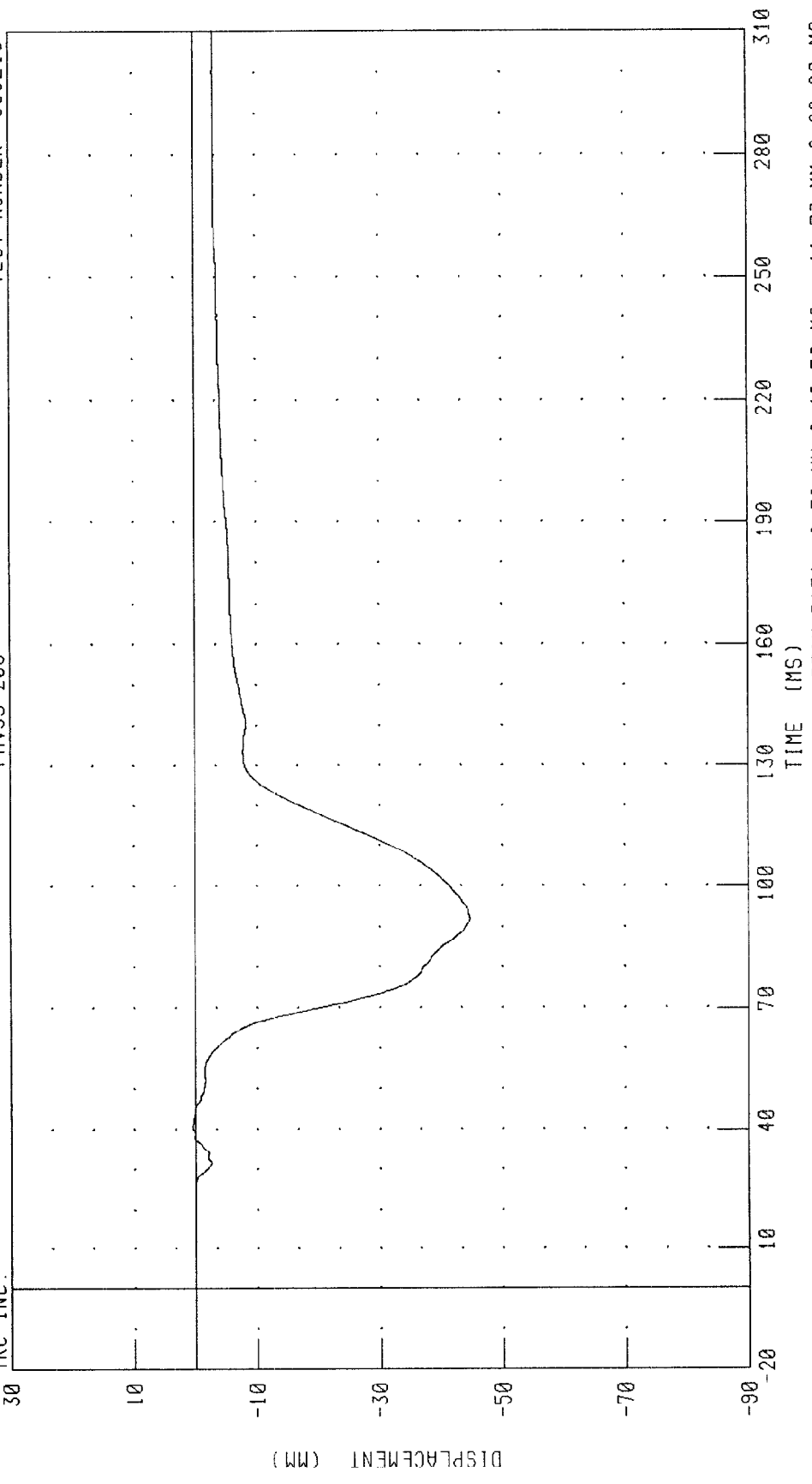
1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER CHEST RESULTANT ACCELERATION



1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER CHEST DEFLECTION
FMVSS 208

TEST NUMBER: 990216

TRC INC.

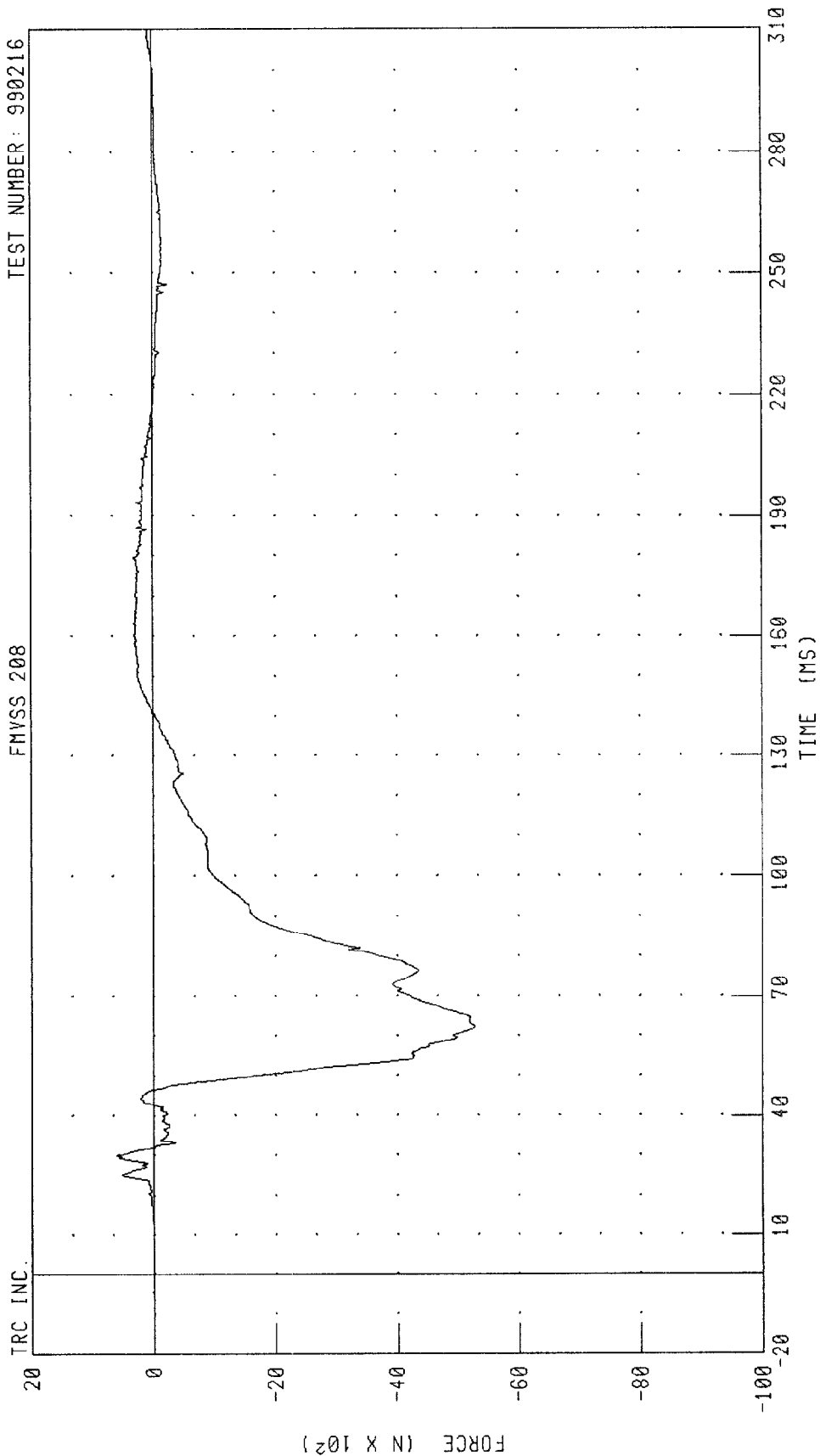


PEAK DATA: 0.59 MM @ 40.72 MS; -44.73 MM @ 92.00 MS

CHANNEL: CSTXD1 FILTER: CH. CLASS 180

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER LEFT FEMUR FORCE
FMVSS 208

TEST NUMBER: 990216

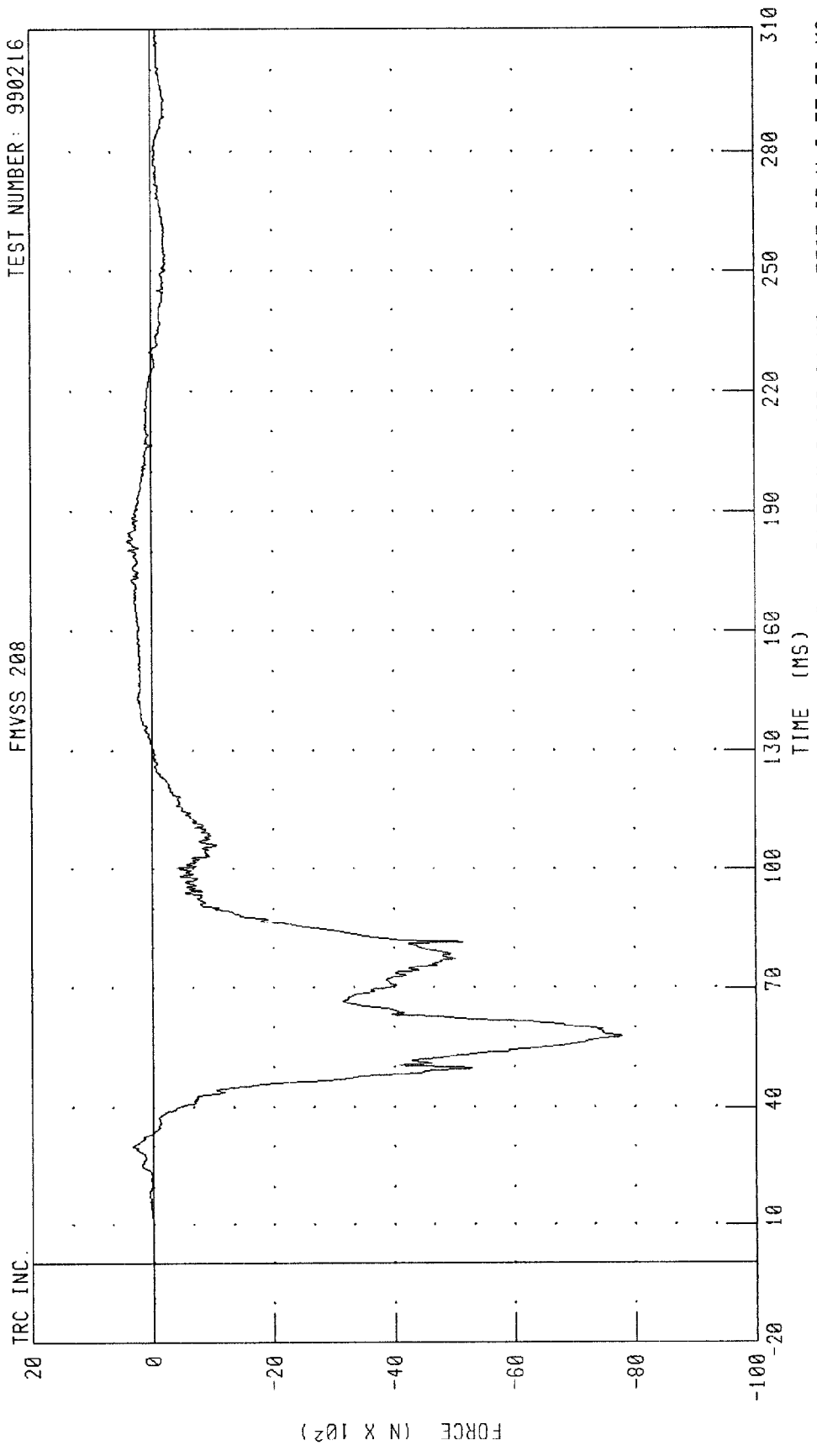


PEAK DATA: 622.69 N @ 30.08 MS, -5281.85 N @ 62.32 MS

CHANNEL: LFMF1 FILTER: CH. CLASS 600

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DRIVER RIGHT FEMUR FORCE
FMVSS 208

TEST NUMBER: 990216



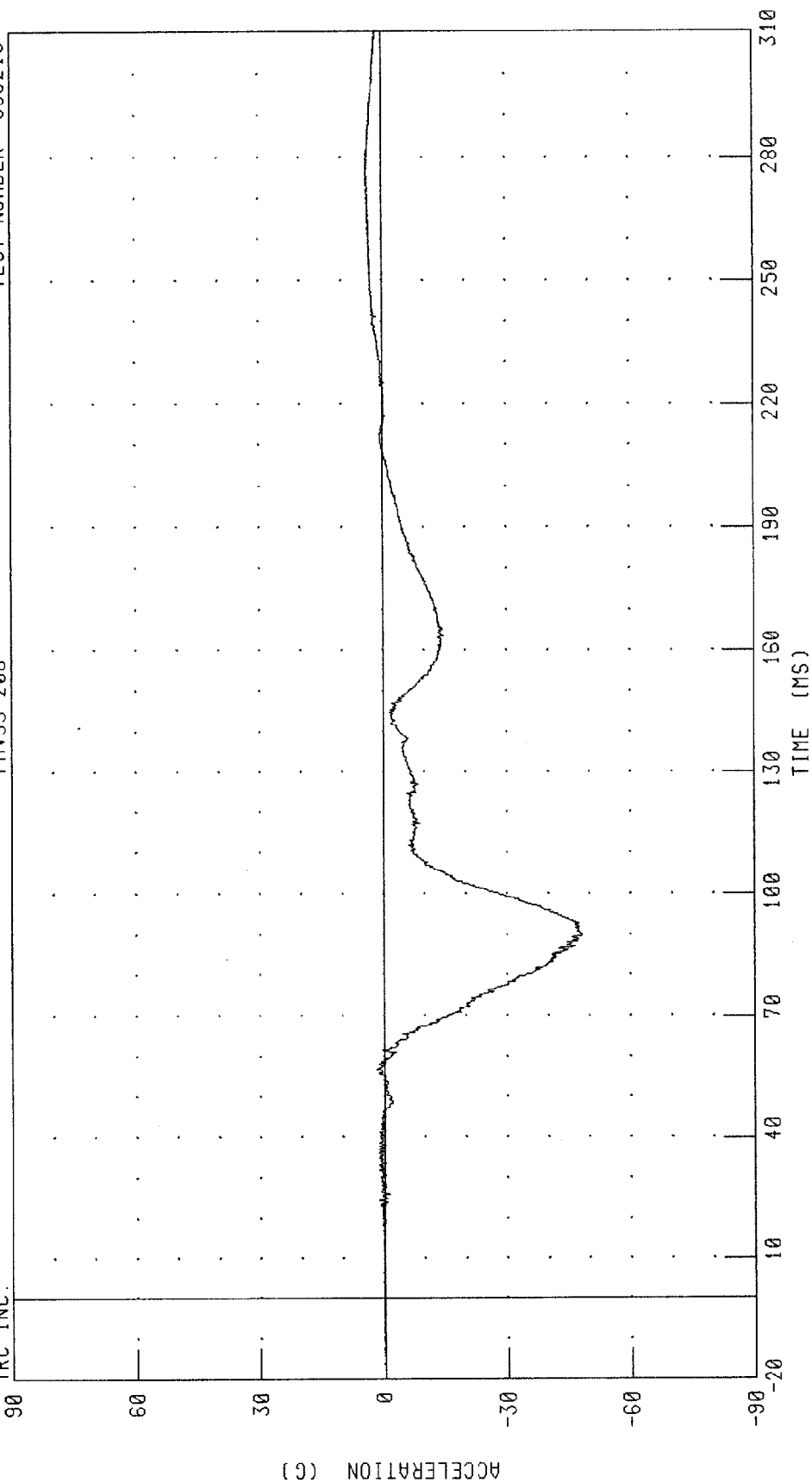
CHANNEL: RFMF1 FILTER: CH. CLASS 600
PEAK DATA: 404.52 N @ 182.64 MS; -7785.93 N @ 57.76 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER HEAD X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: HEDXC2 FILTER: CH. CLASS 1000

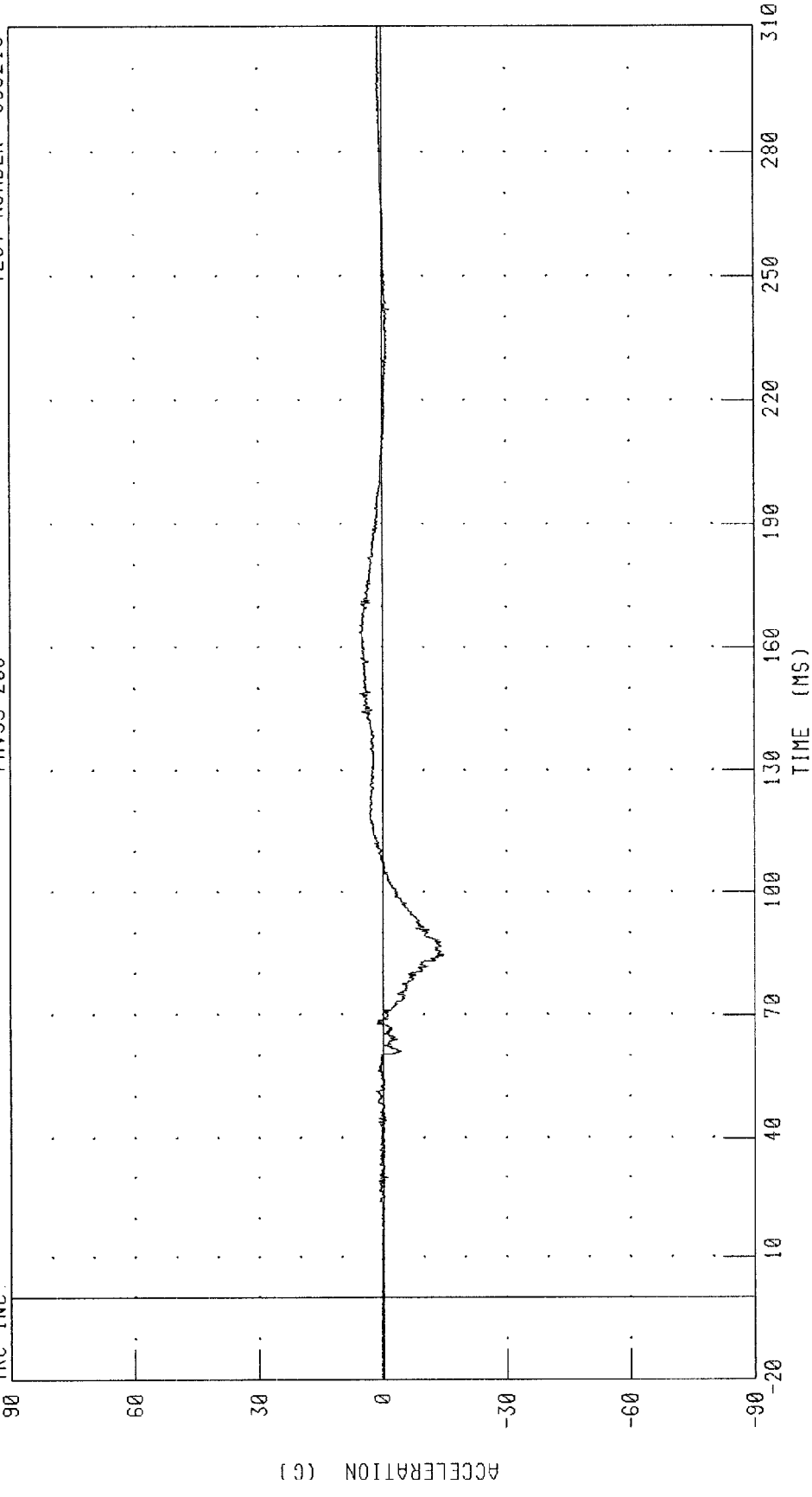
PEAK DATA: 3.82 G @ 276.96 MS; -48.46 G @ 89.84 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER HEAD Y-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

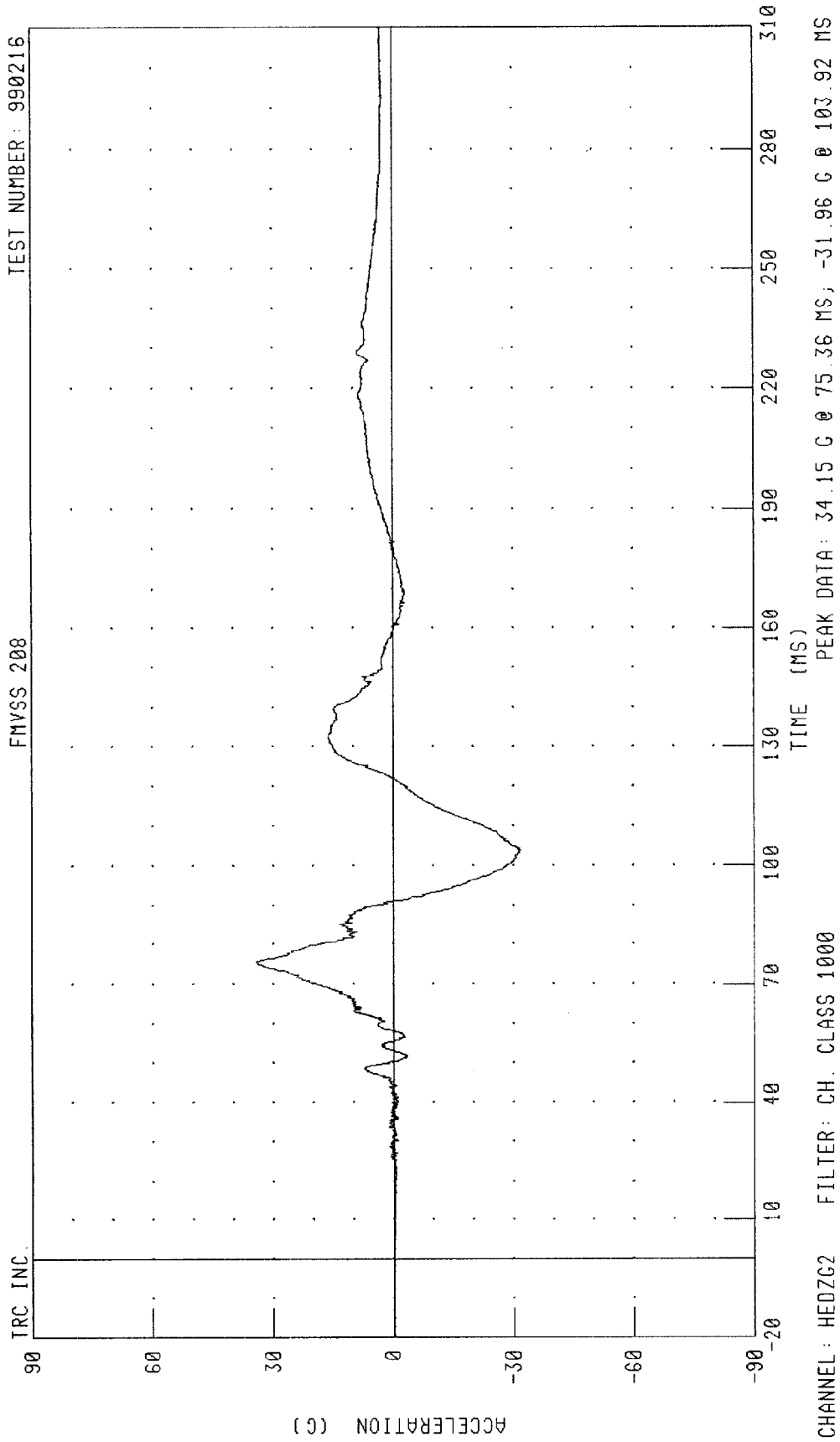
TRC INC.



CHANNEL: HEDYC2 FILTER: CH. CLASS 1000

PEAK DATA: 5.55 G @ 165.60 MS; -14.85 G @ 84.48 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER HEAD Z-AXIS ACCELERATION

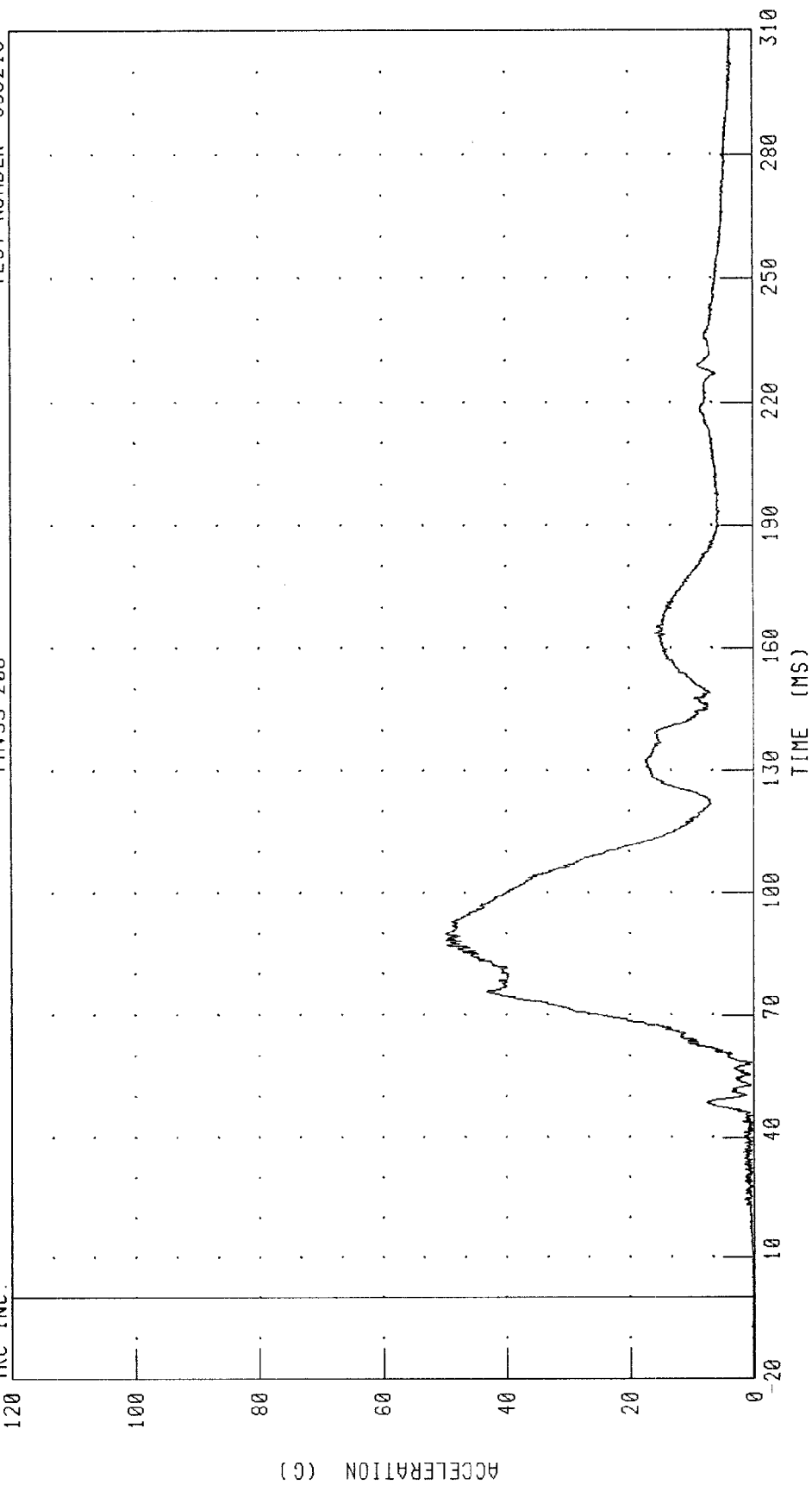


1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER HEAD RESULTANT ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: HEDRC2 FILTER: CH. CLASS 1000

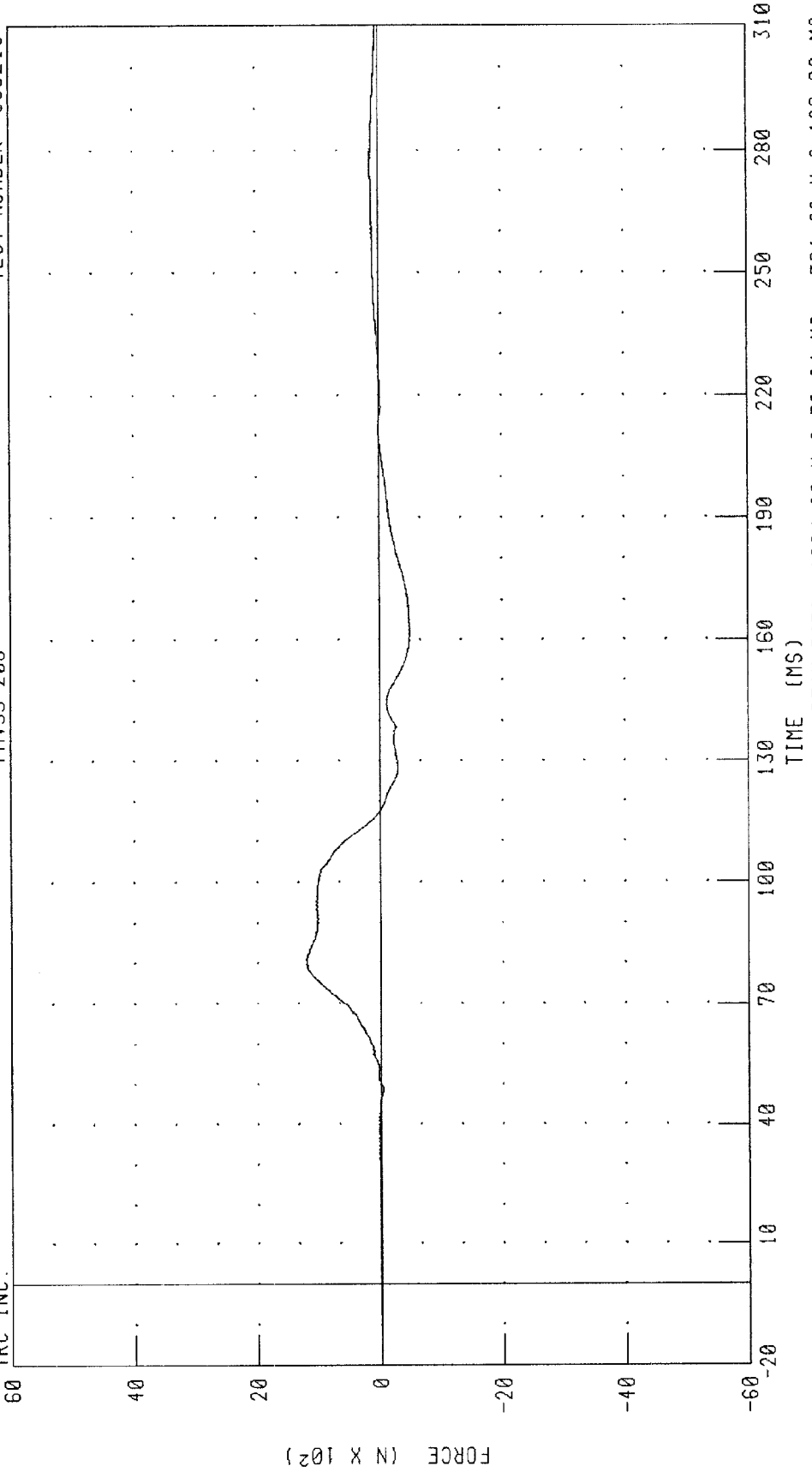
PEAK DATA: 49.84 G @ 88.48 MS; 0.15 G @ 2.96 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK X-AXIS SHEAR FORCE

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 1204.88 N @ 79.84 MS; -501.22 N @ 162.00 MS

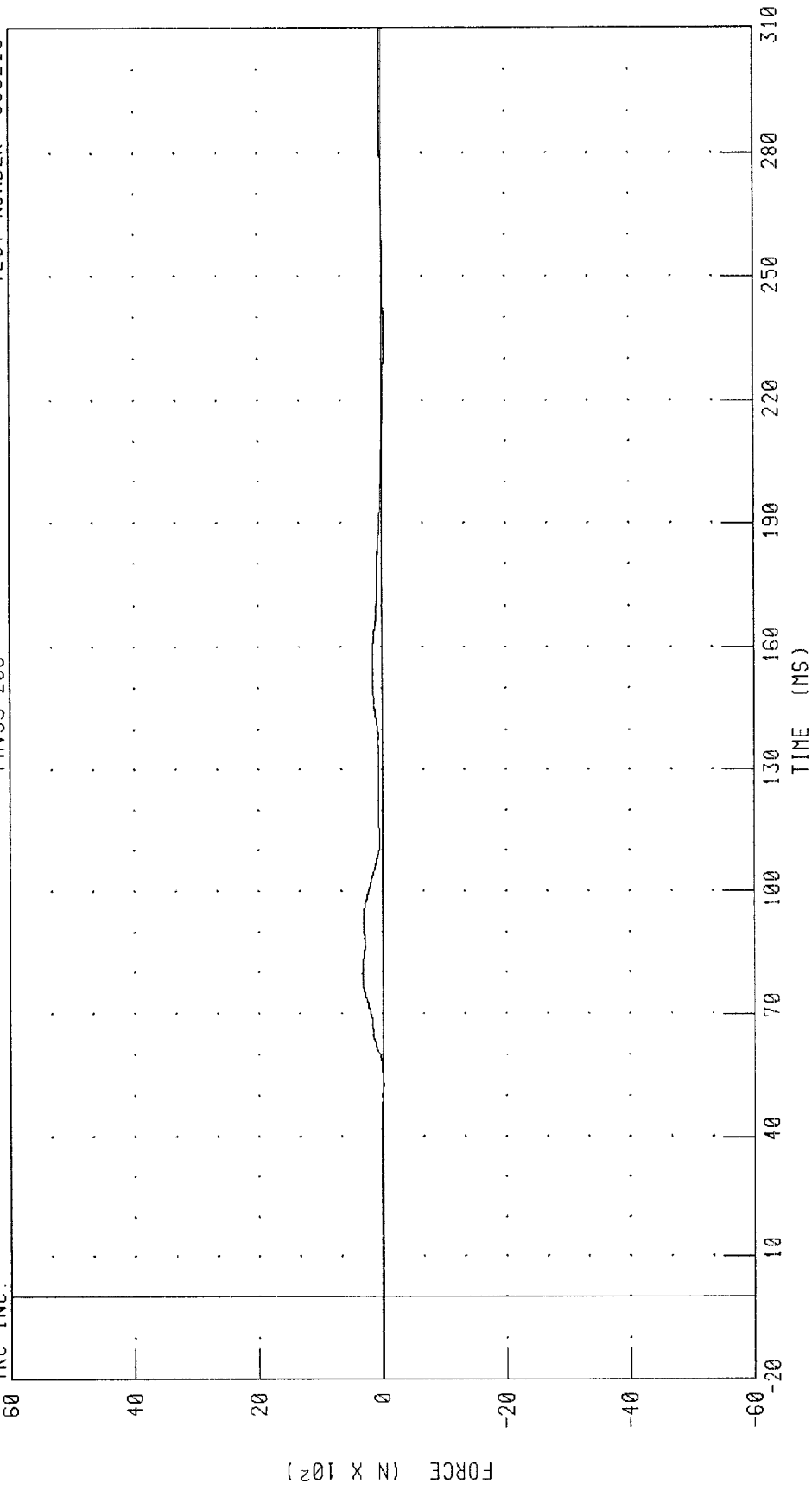
CHANNEL: NEKXF2 FILTER: CH CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK Y-AXIS SHEAR FORCE

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 324.16 N @ 79.76 MS; -41.01 N @ 231.76 MS

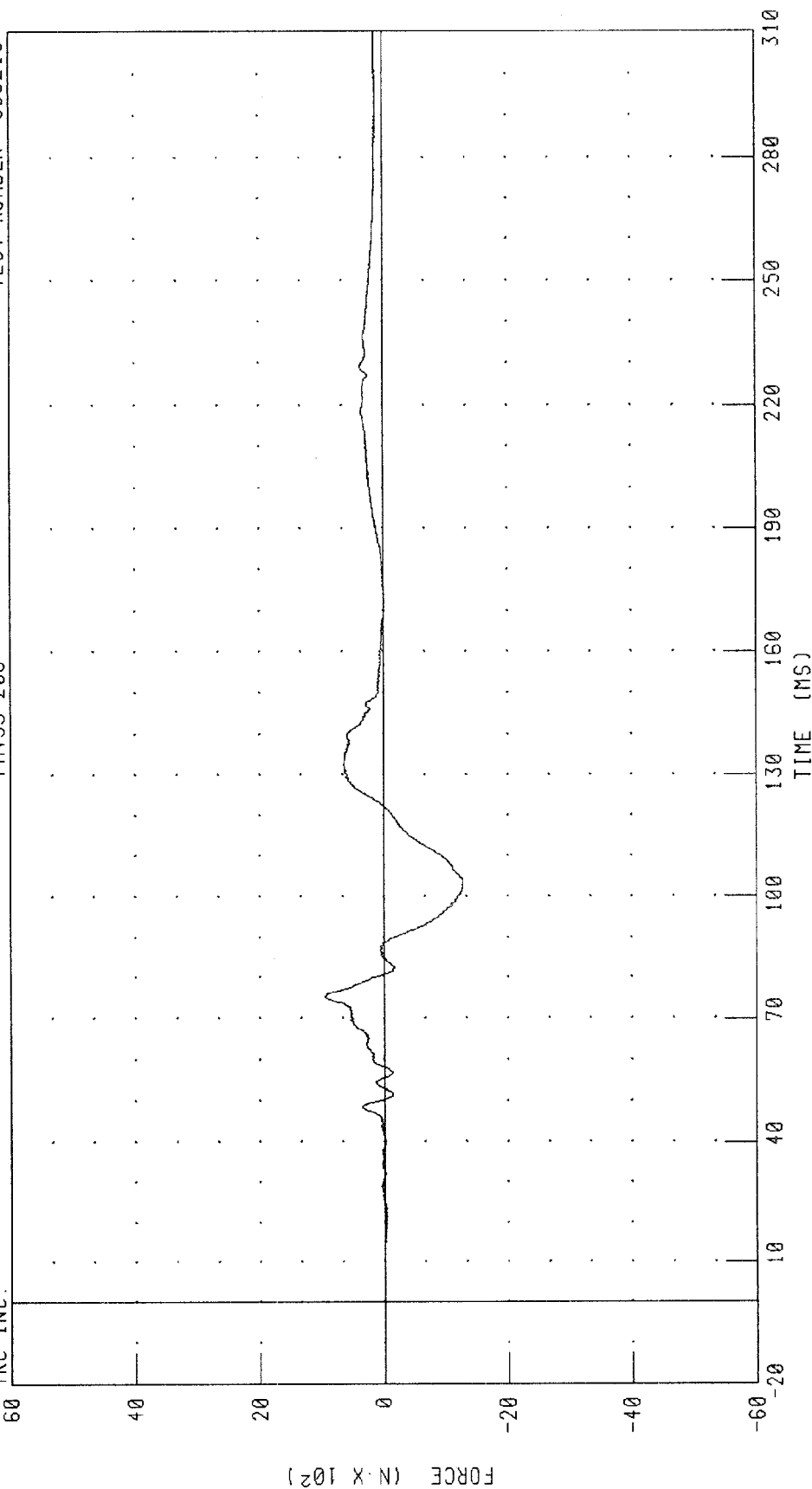
CHANNEL: NEKYF2 FILTER: CH. CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK Z-AXIS AXIAL FORCE

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 957.11 N @ 75.20 MS, -1284.84 N @ 103.20 MS

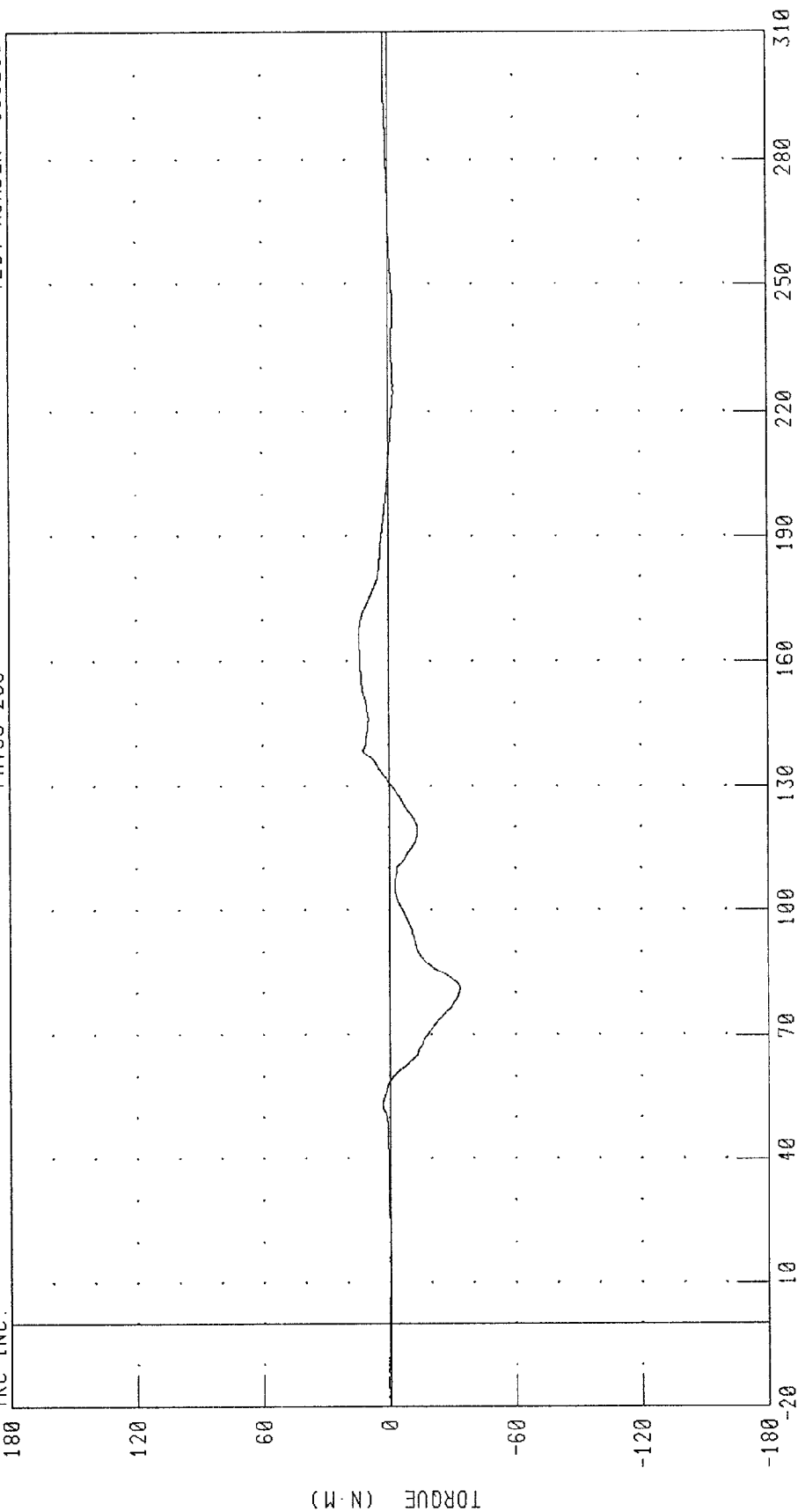
CHANNEL: NEKZF2 FILTER: CH. CLASS 1000

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK MOMENT ABOUT X AXIS

TEST NUMBER: 990216

FMVSS 208

TRC INC.



TIME (MS)

PEAK DATA: 14.09 N-M @ 155.92 MS, -33.52 N-M @ 81.20 MS

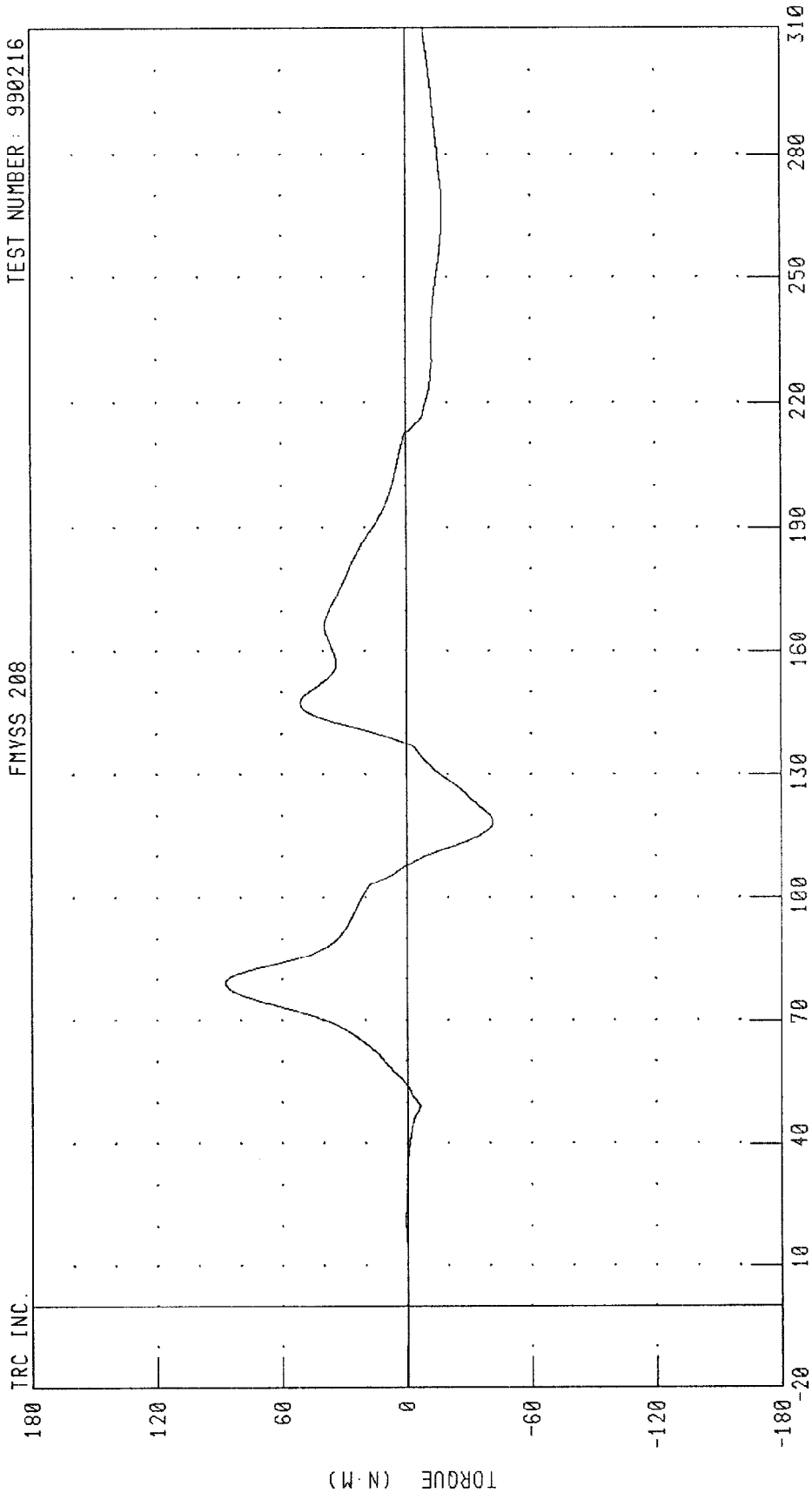
CHANNEL: NEKX2 FILTER: CH. CLASS 600

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Y AXIS

TEST NUMBER: 990216

FMVSS 208

TRC INC.



TIME (MS)

PEAK DATA: 87.24 N M @ 79.04 MS, -41.56 N M @ 118.80 MS

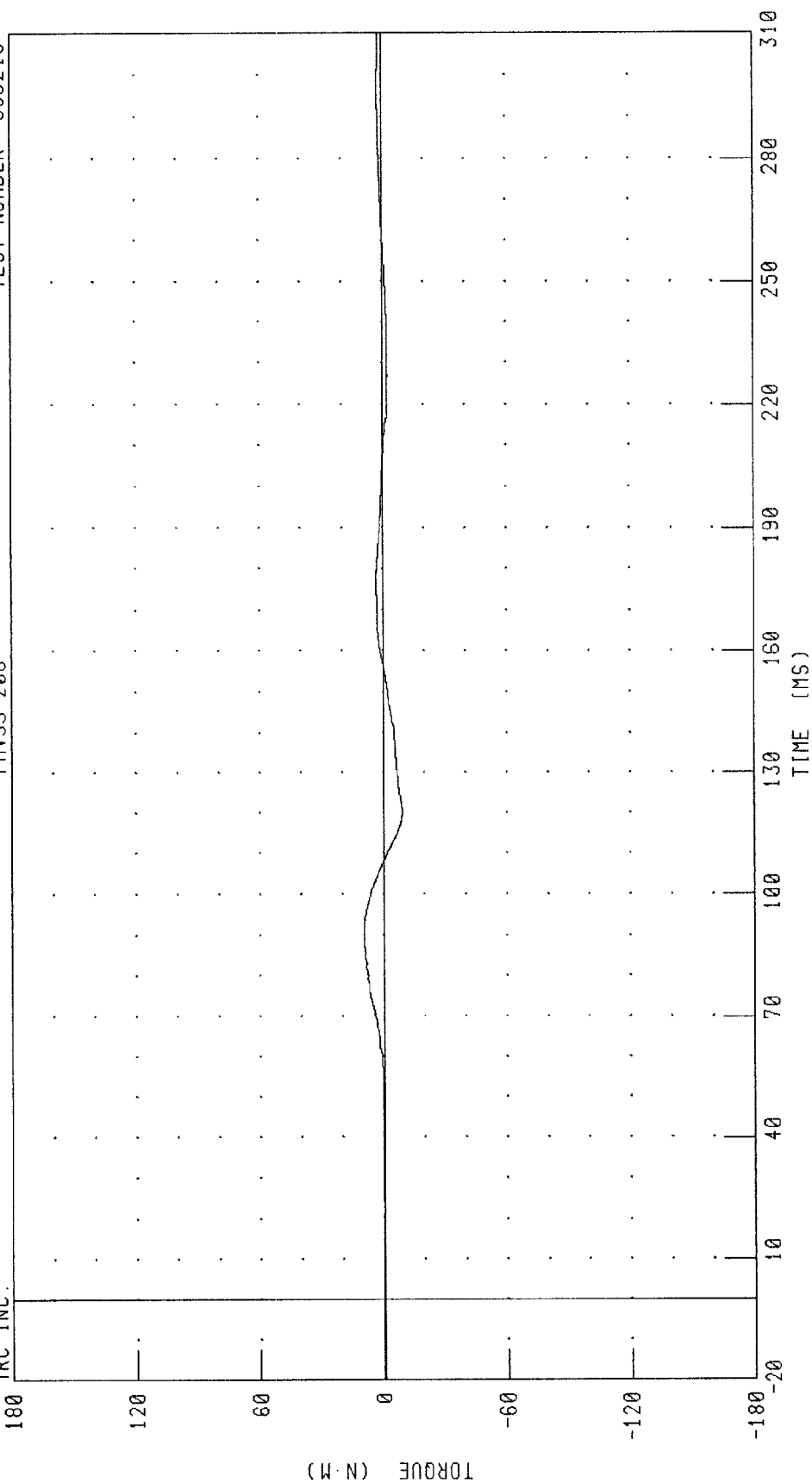
CHANNEL: NEKYM2 FILTER: CH. CLASS 600

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK MOMENT ABOUT Z AXIS

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 9.69 N·M @ 91.12 MS; -9.20 N·M @ 120.80 MS

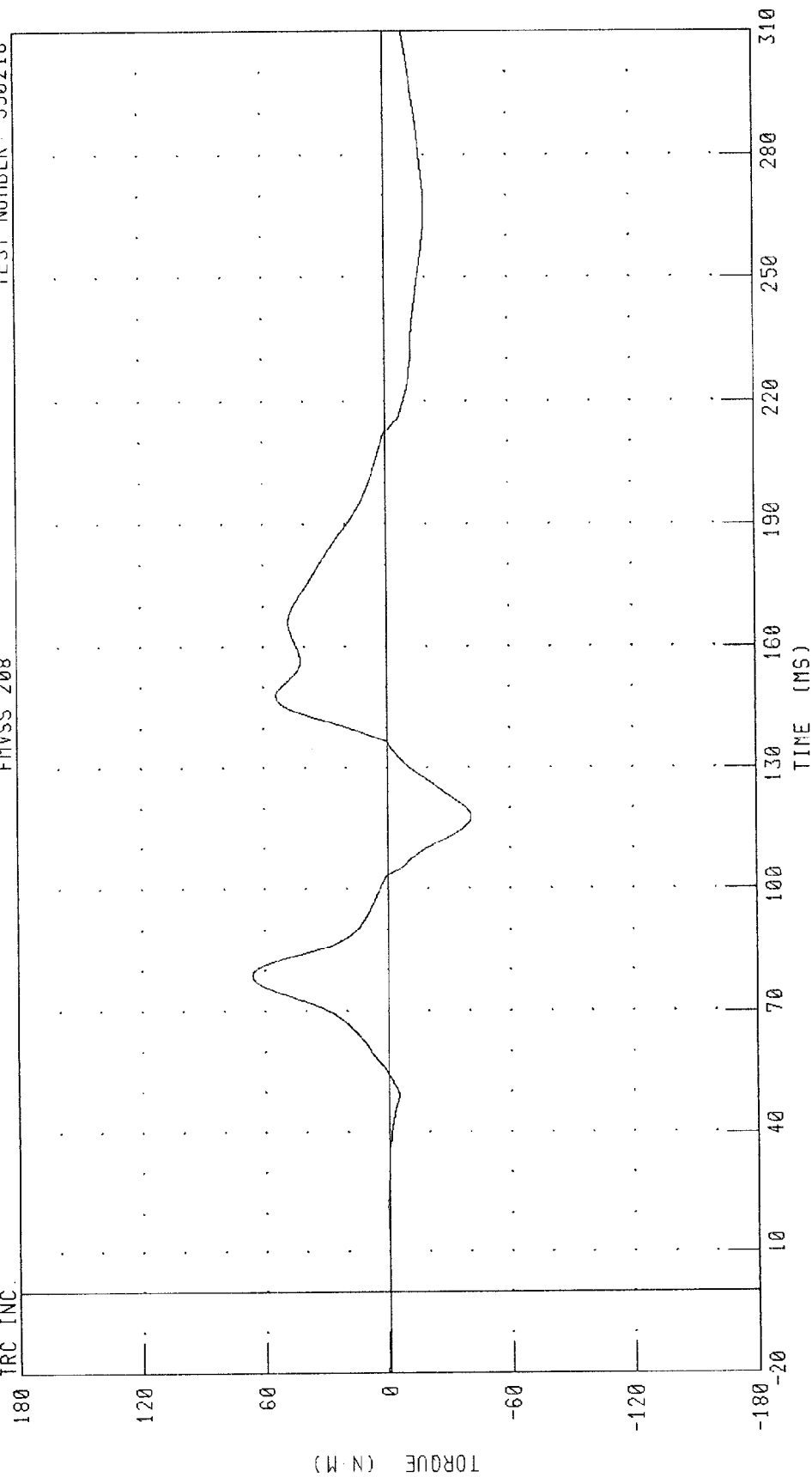
CHANNEL: NEKZM2 FILTER: CH. CLASS 600

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER NECK OCCIPITAL CONDYLE

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: NEKOM2 FILTER: CH. CLASS 600

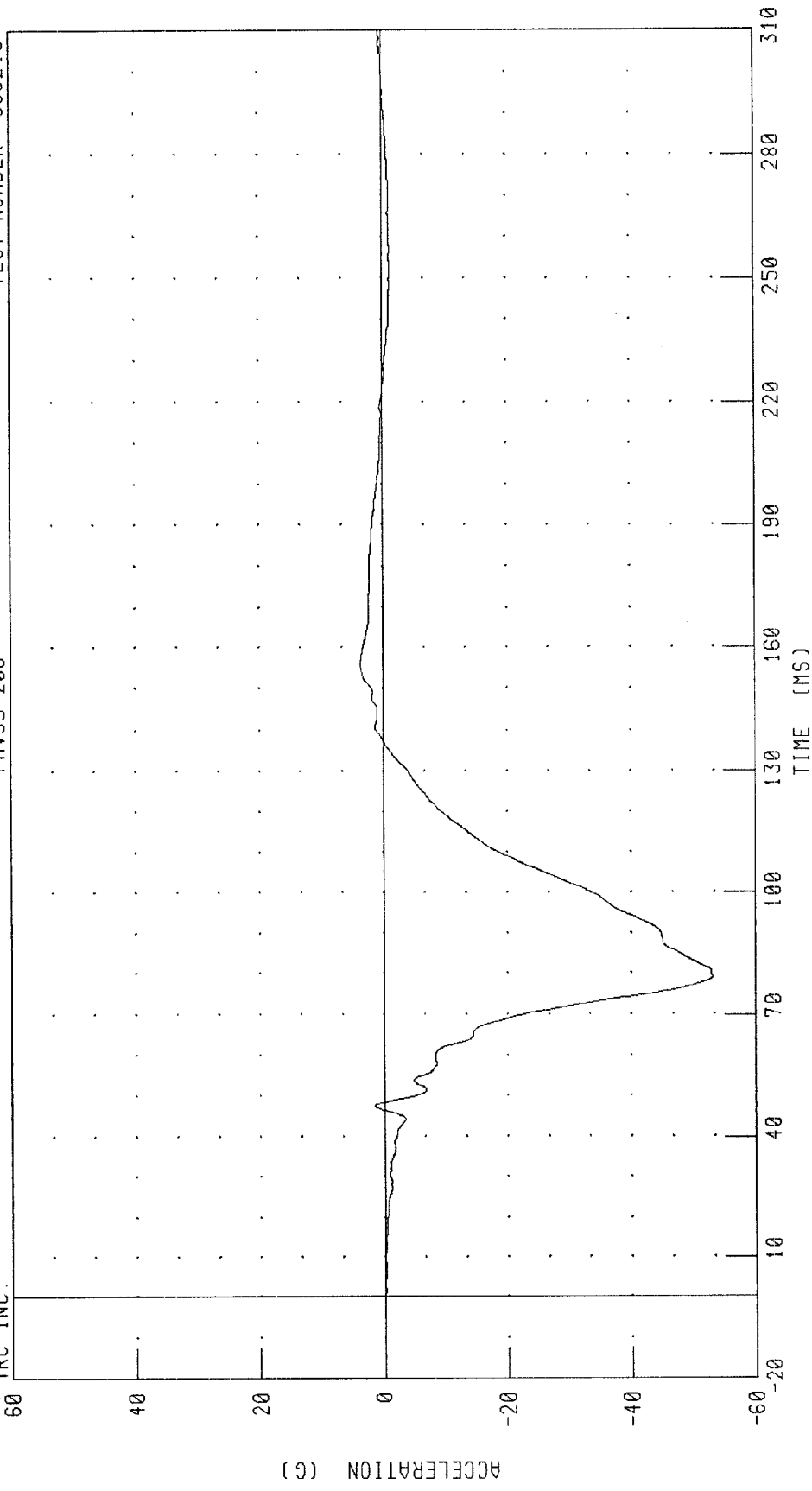
PEAK DATA: 66.08 N·M @ 78.88 MS, -41.01 N·M @ 118.00 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER CHEST X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: CSTXG2 FILTER: CH. CLASS 180

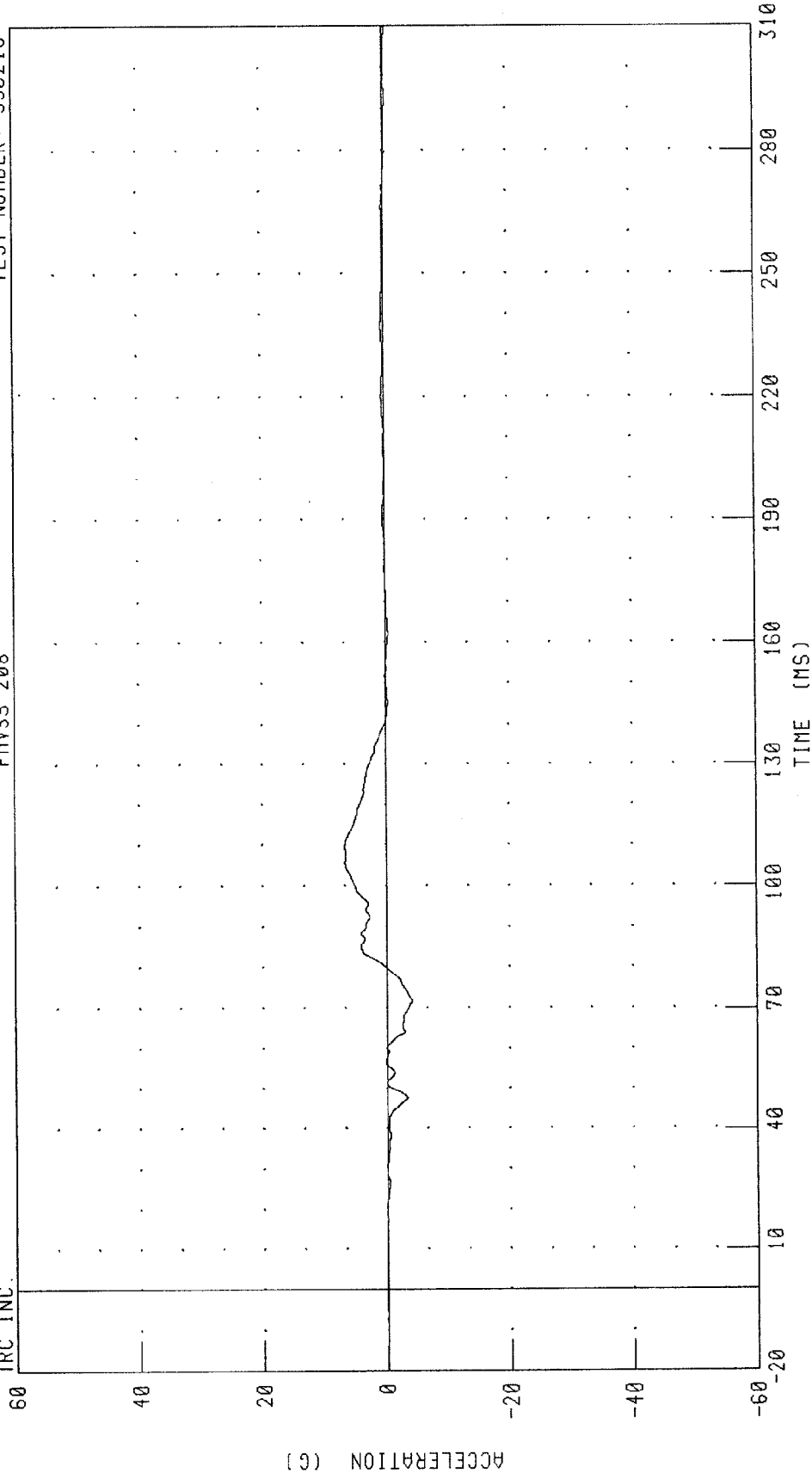
PEAK DATA: 3.65 G @ 156.16 MS; -53.07 G @ 79.12 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER CHEST Y-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: CSTYC2 FILTER: CH. CLASS 180

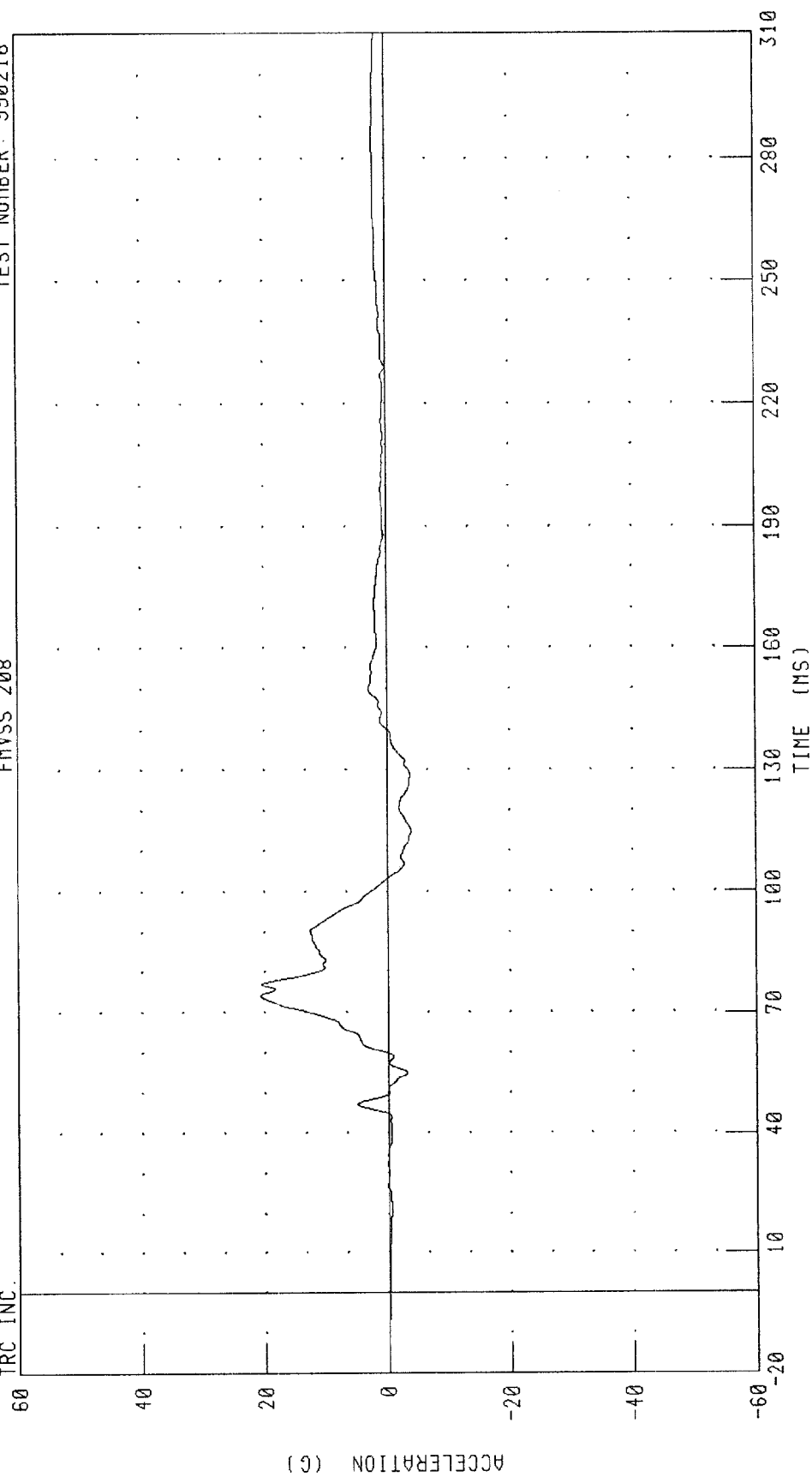
PEAK DATA: 6.70 G @ 109.52 MS, -4.19 G @ 71.84 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER CHEST Z-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 20.77 G @ 74.16 MS, -3.95 G @ 115.12 MS

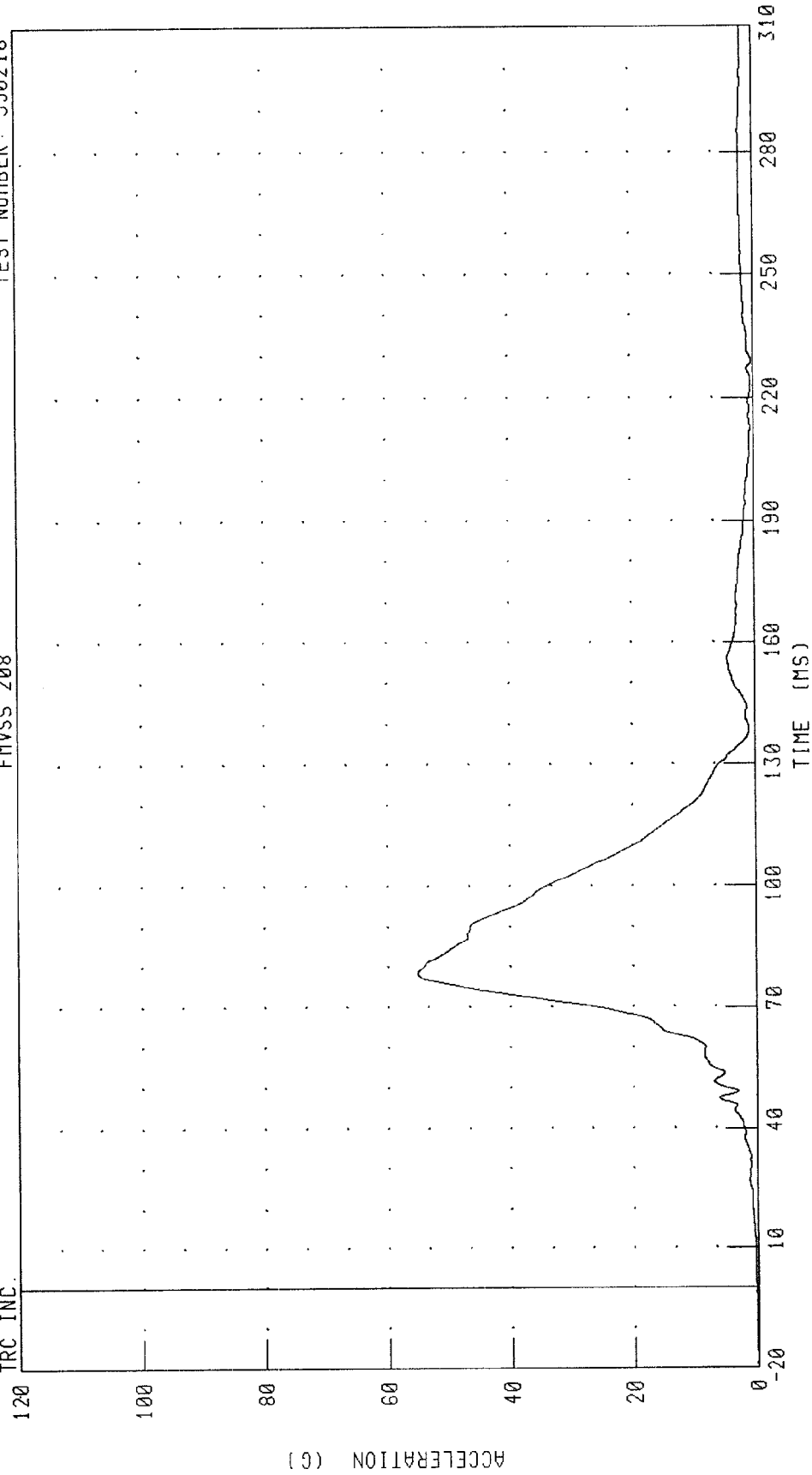
CHANNEL: CSTZC2 FILTER: CH. CLASS 180

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER CHEST RESULTANT ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: CSTRC2 FILTER: CH. CLASS 180

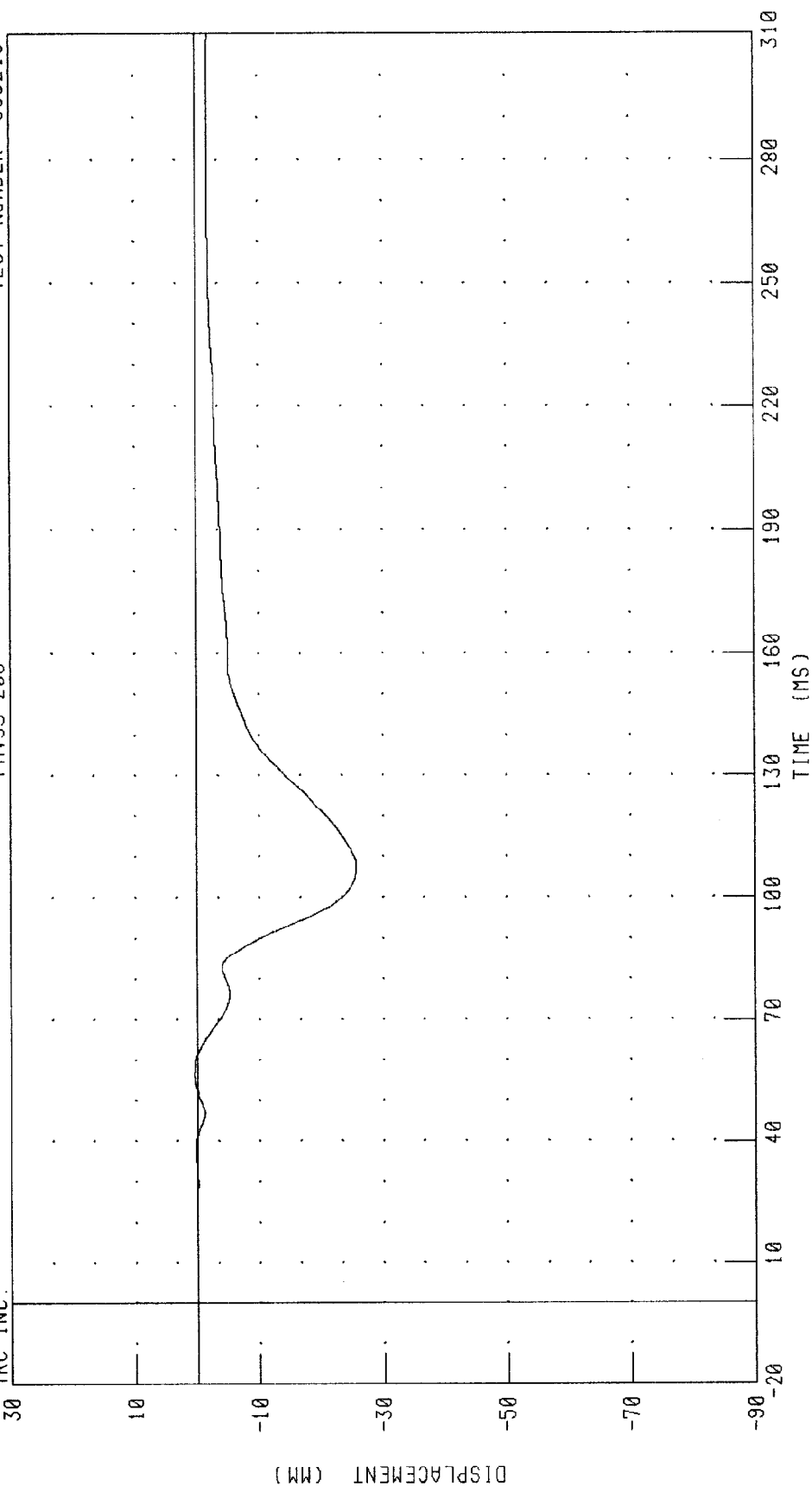
PEAK DATA: 55.09 G @ 78.56 MS; 0.01 G @ -20.00 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER CHEST DEFLECTION

TEST NUMBER: 990216

FMVSS 208

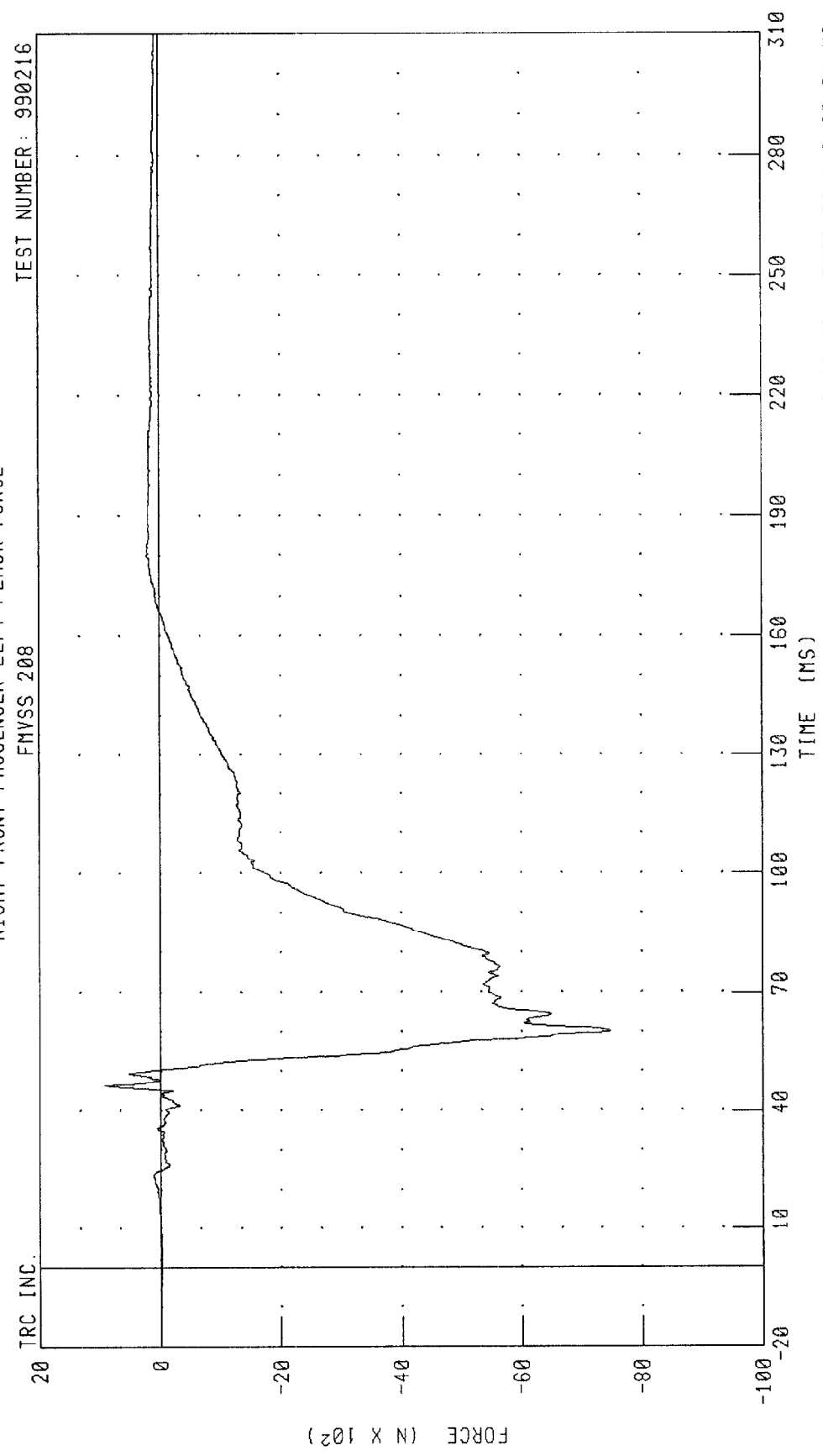
TRC INC.



PEAK DATA: 0.52 MM @ 56.48 MS, -25.69 MM @ 107.04 MS

CHANNEL: CSTXD2 FILTER: CH. CLASS 180

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER LEFT FEMUR FORCE



CHANNEL: LFMF2 FILTER: CH. CLASS 600

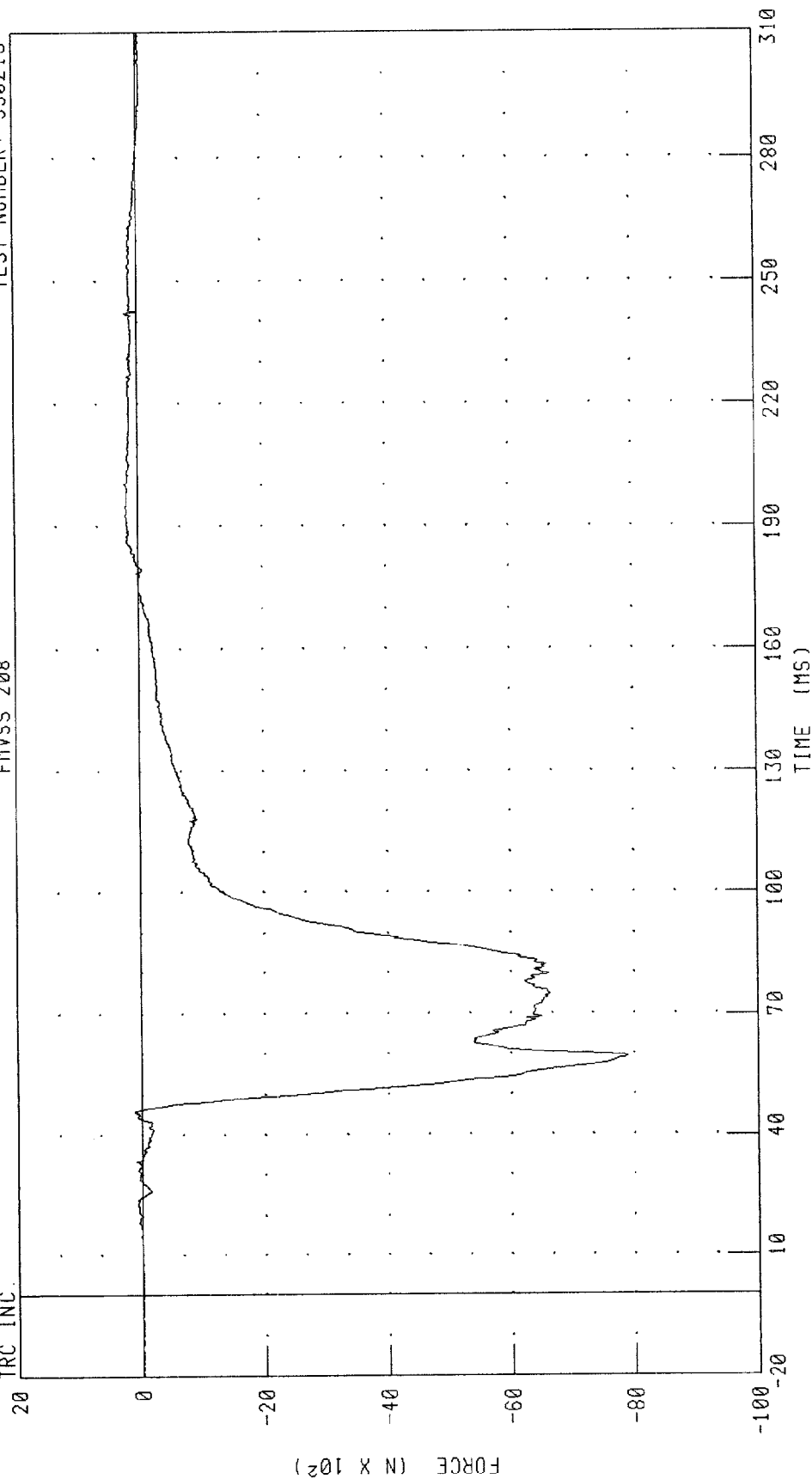
PEAK DATA: 916.37 N @ 46.48 MS, -7486.30 N @ 60.24 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT FRONT PASSENGER RIGHT FEMUR FORCE

TEST NUMBER: 990216

FMYSS 208

TRC INC.



CHANNEL: RFMF2 FILTER: CH. CLASS 600

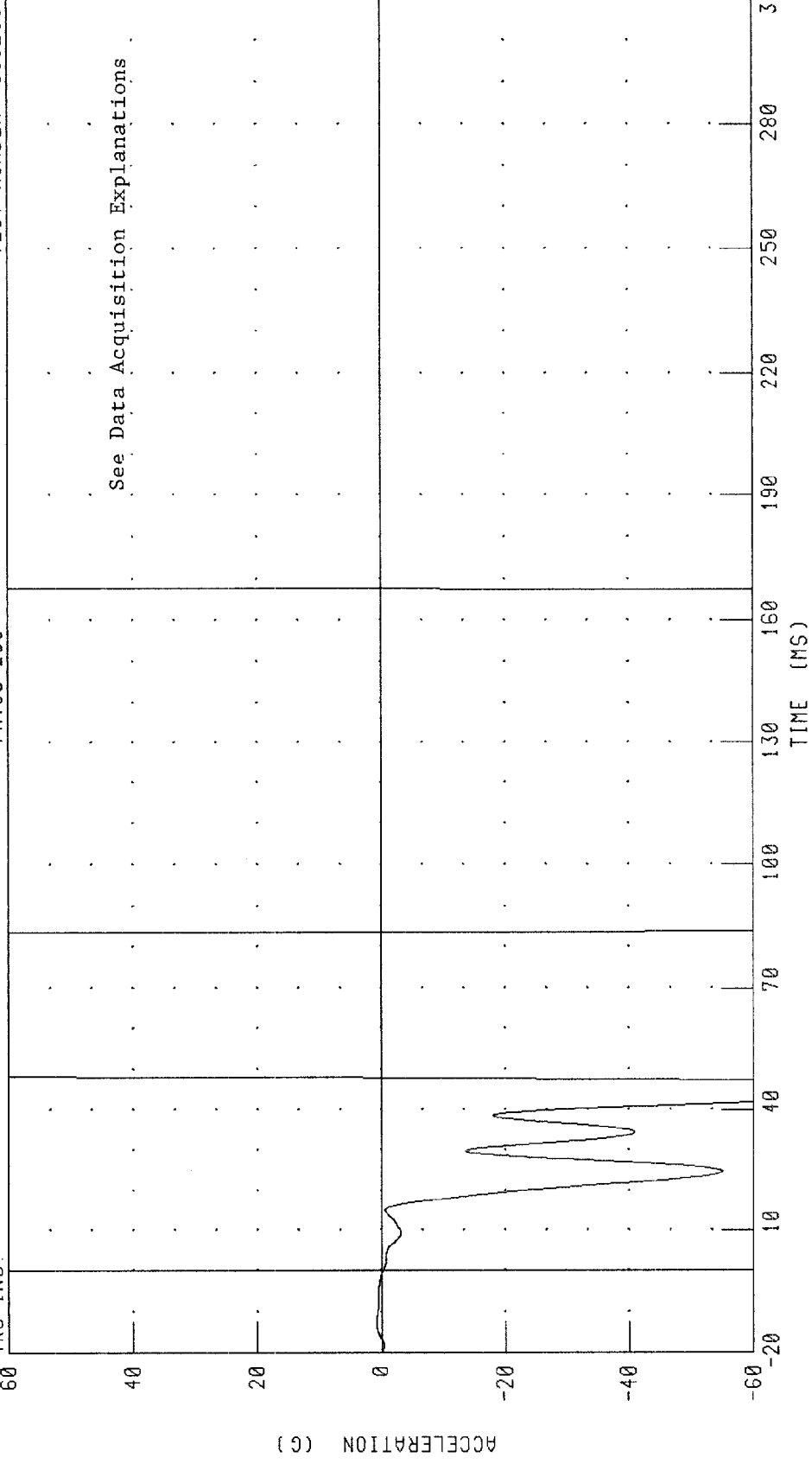
PEAK DATA: 224.30 N @ 200.40 MS; -7889.96 N @ 59.28 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
LEFT BRAKE CALIPER X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 1060.06 G @ 78.80 MS, -1038.56 G @ 88.08 MS

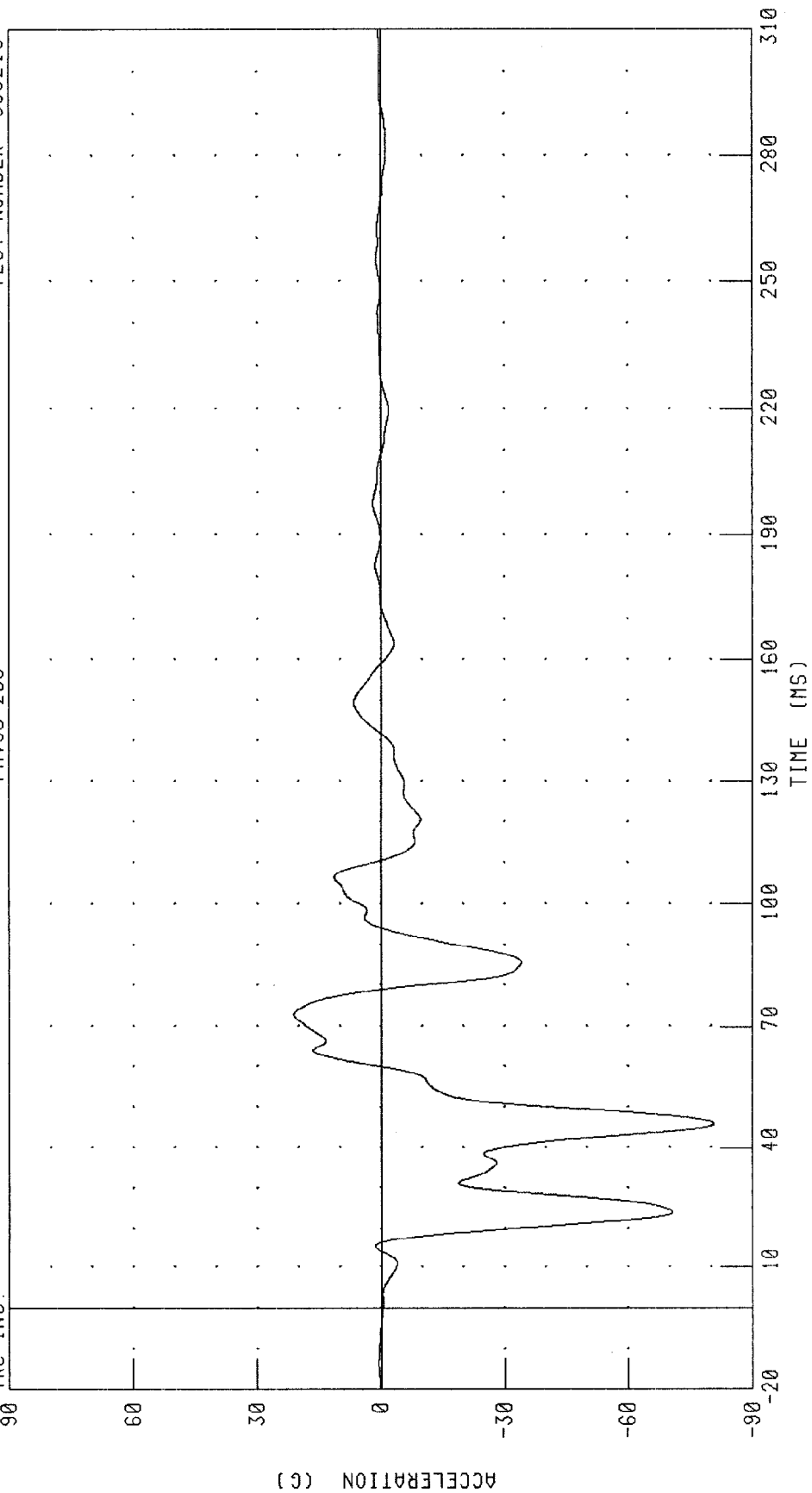
CHANNEL: BCLXG1 FILTER: CH. CLASS 60

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT BRAKE CALIPER X-AXIS ACCELERATION

TRC INC.

FMVSS 208

TEST NUMBER: 990216



CHANNEL: BCRXC1 FILTER: CH. CLASS 60

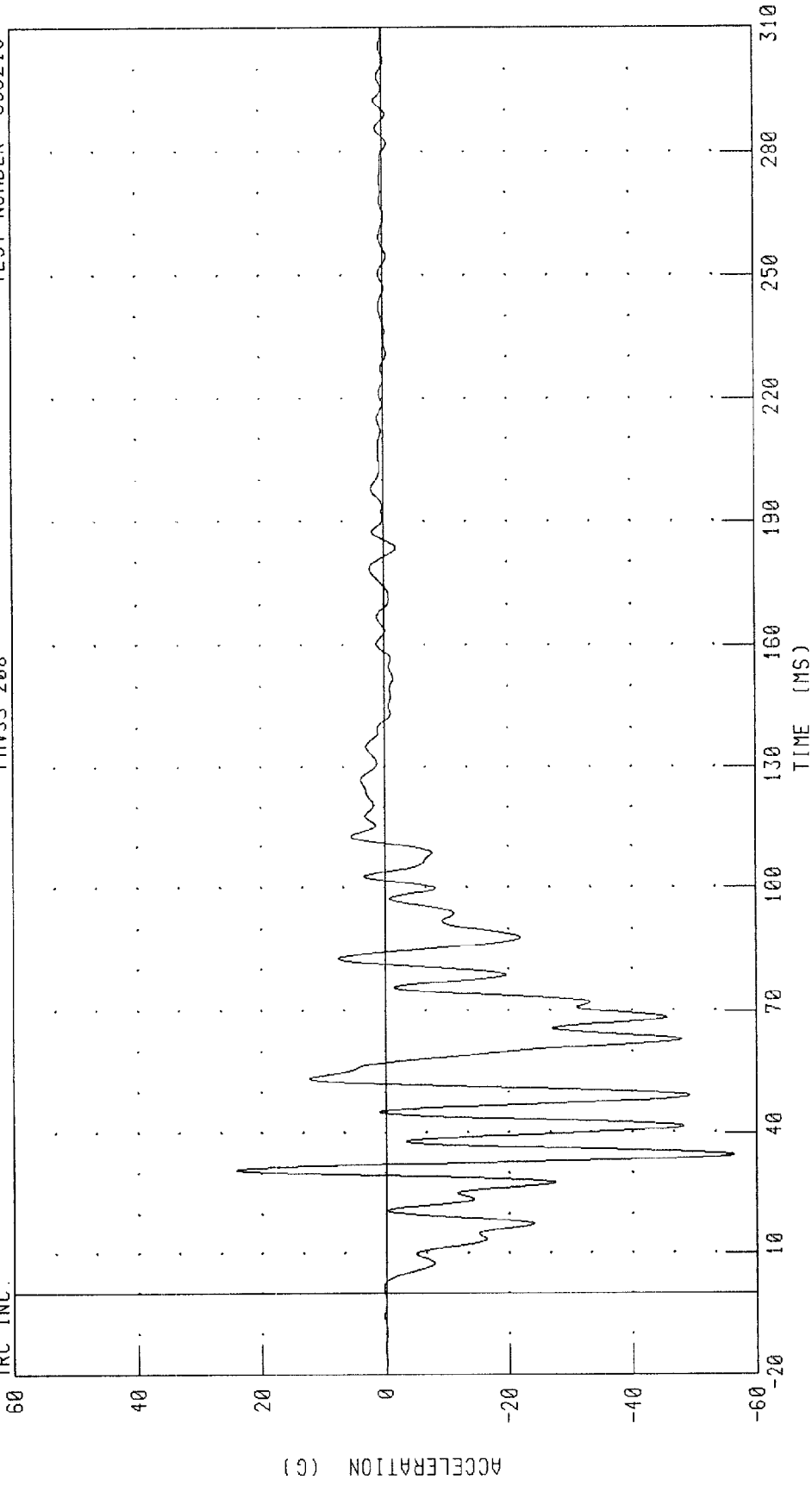
PEAK DATA: 21.18 G @ 72.88 MS, -80.64 G @ 45.84 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
DASH PANEL CENTER X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: DPCXG1 FILTER: CH. CLASS 60

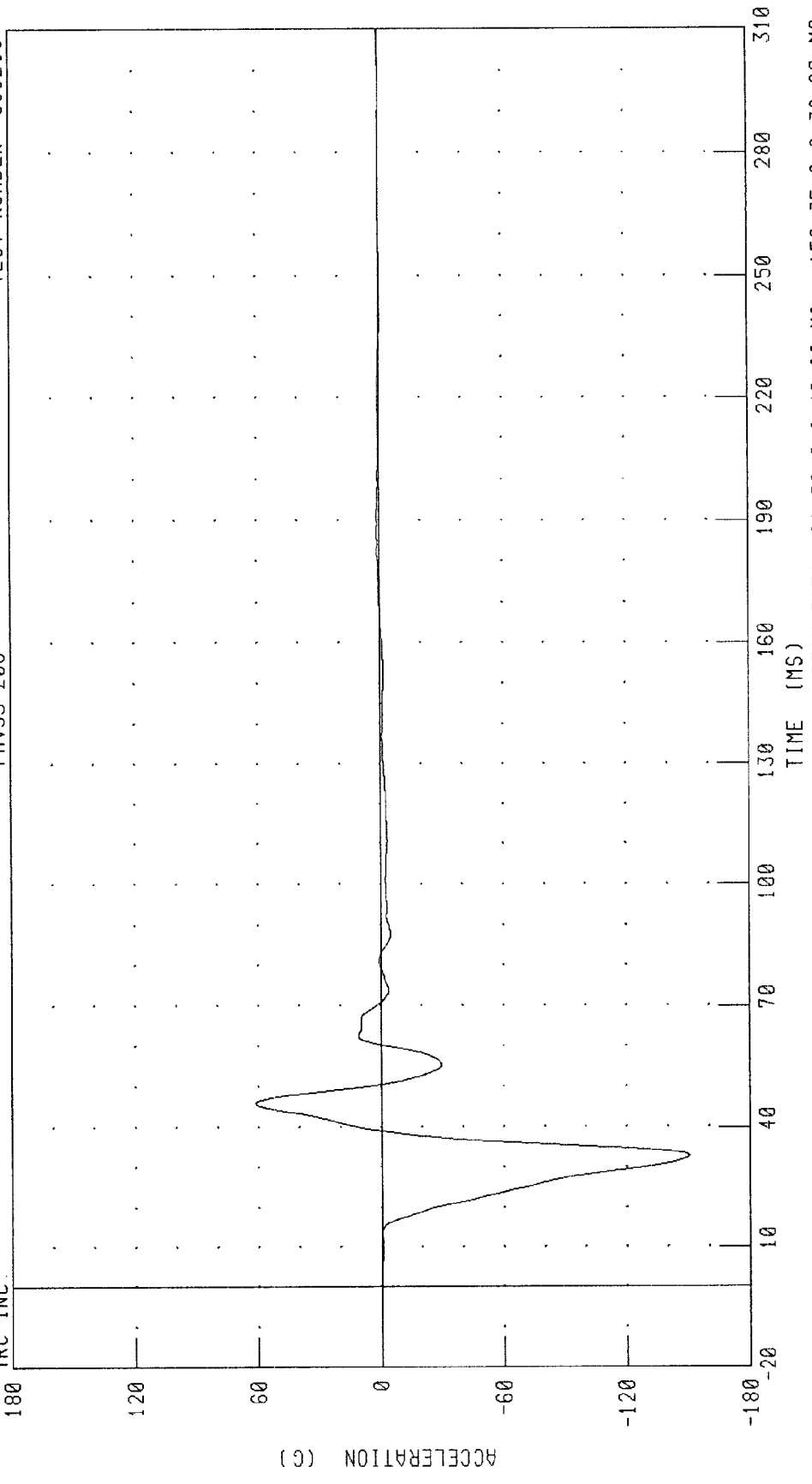
PEAK DATA: 24.15 G @ 30.88 MS; -56.21 G @ 34.64 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
ENGINE TOP X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 61.36 G @ 46.00 MS; -150.35 G @ 32.80 MS

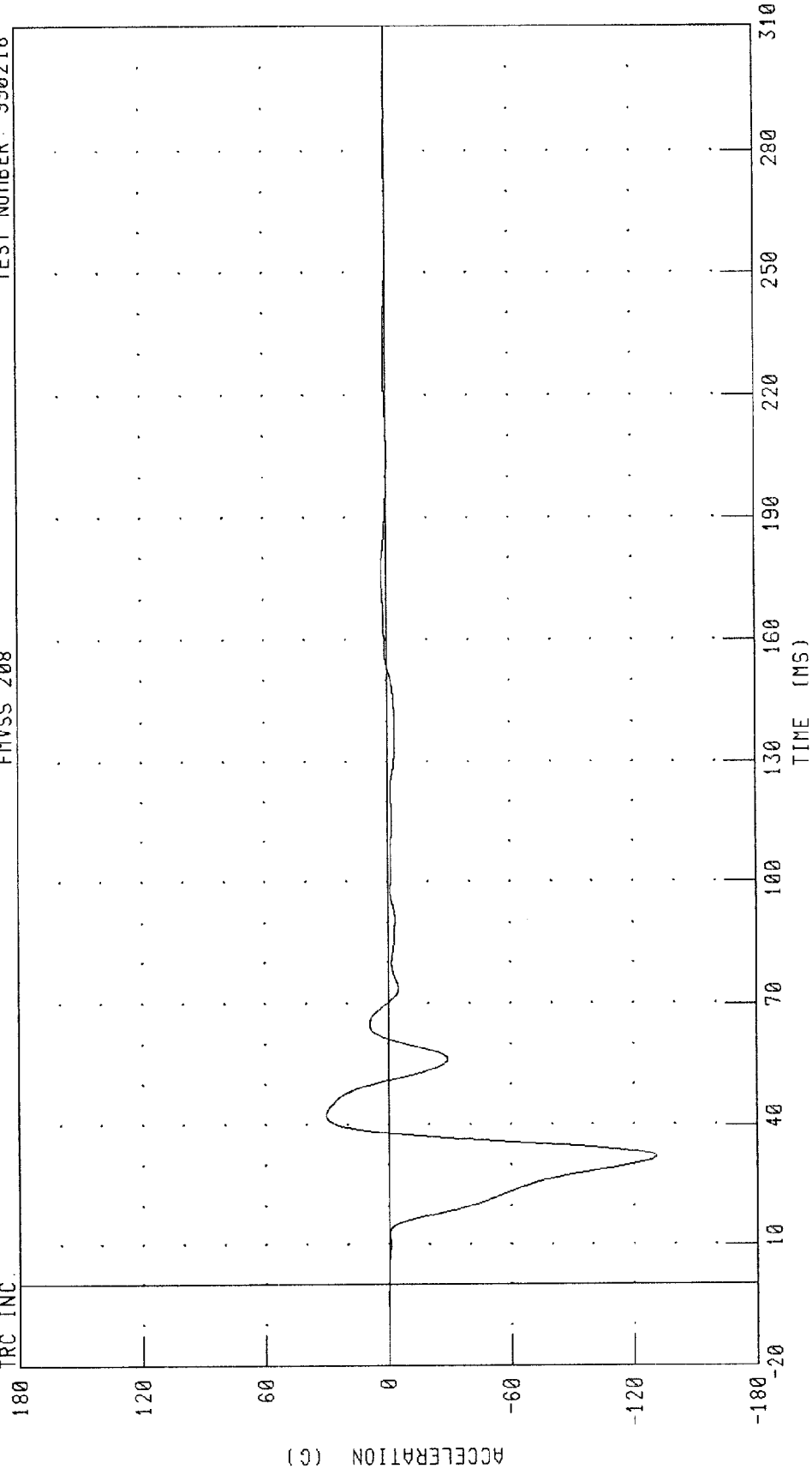
CHANNEL: ENGXC1 FILTER: CH. CLASS 60

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
ENGINE BOTTOM X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: ENCXC2 FILTER: CH. CLASS 60

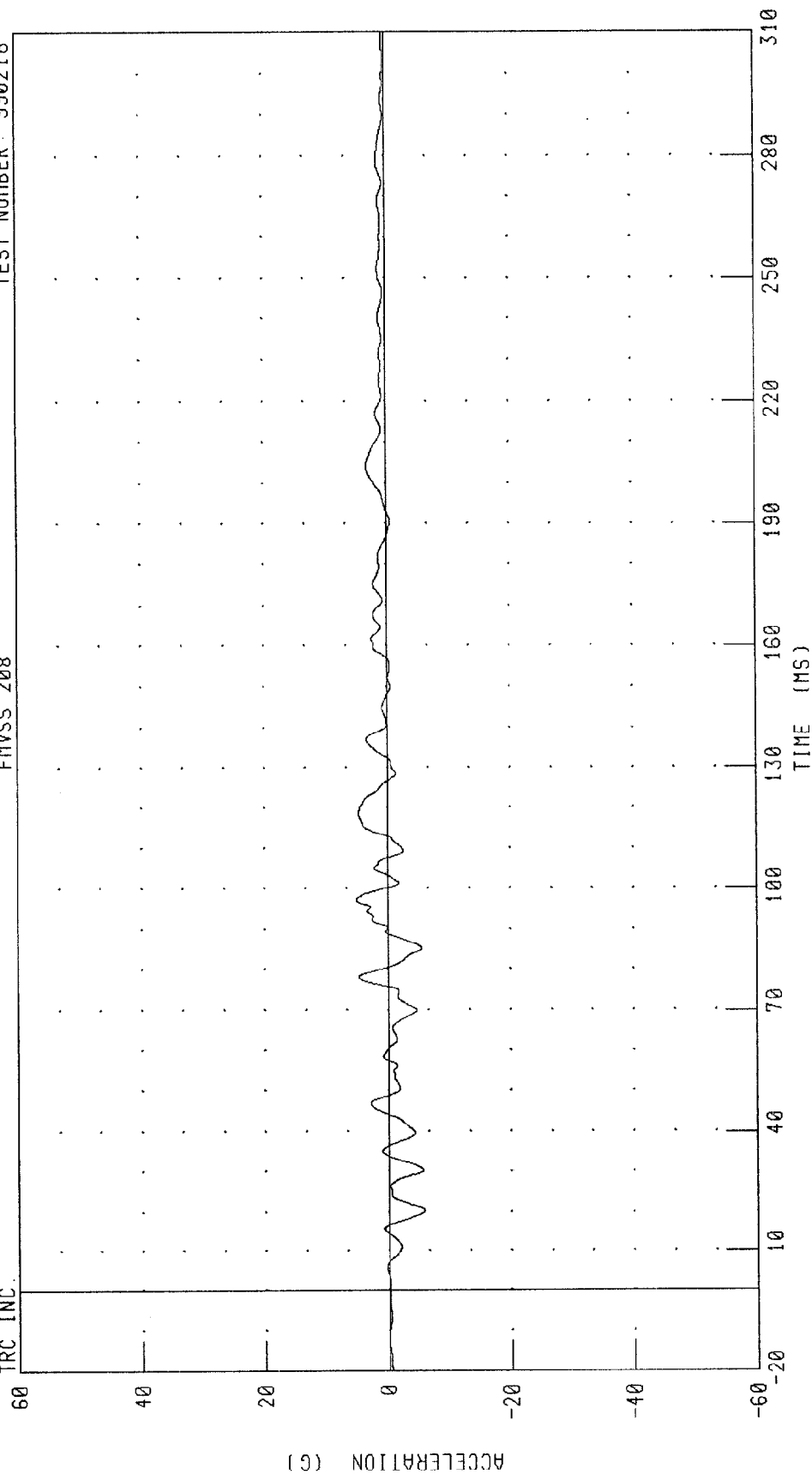
PEAK DATA: 30.38 G @ 42.56 MS, -130.93 G @ 32.16 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
VEHICLE REAR CENTER Z-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



PEAK DATA: 5.06 G @ 97.20 MS; -5.89 G @ 20.48 MS

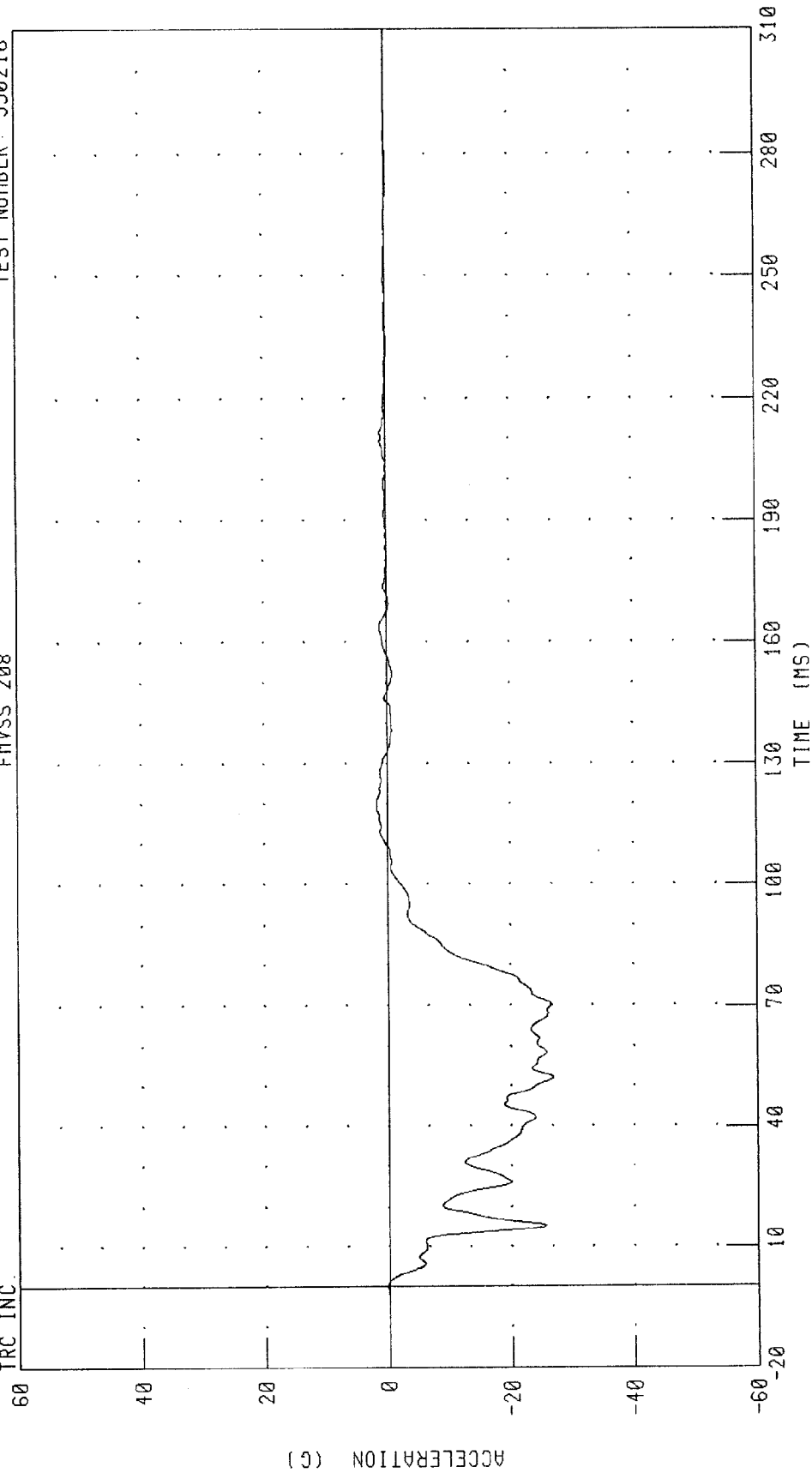
CHANNEL: RDKZG1 FILTER: CH. CLASS 60

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
LEFT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: TLRXC1 FILTER: CH. CLASS 60

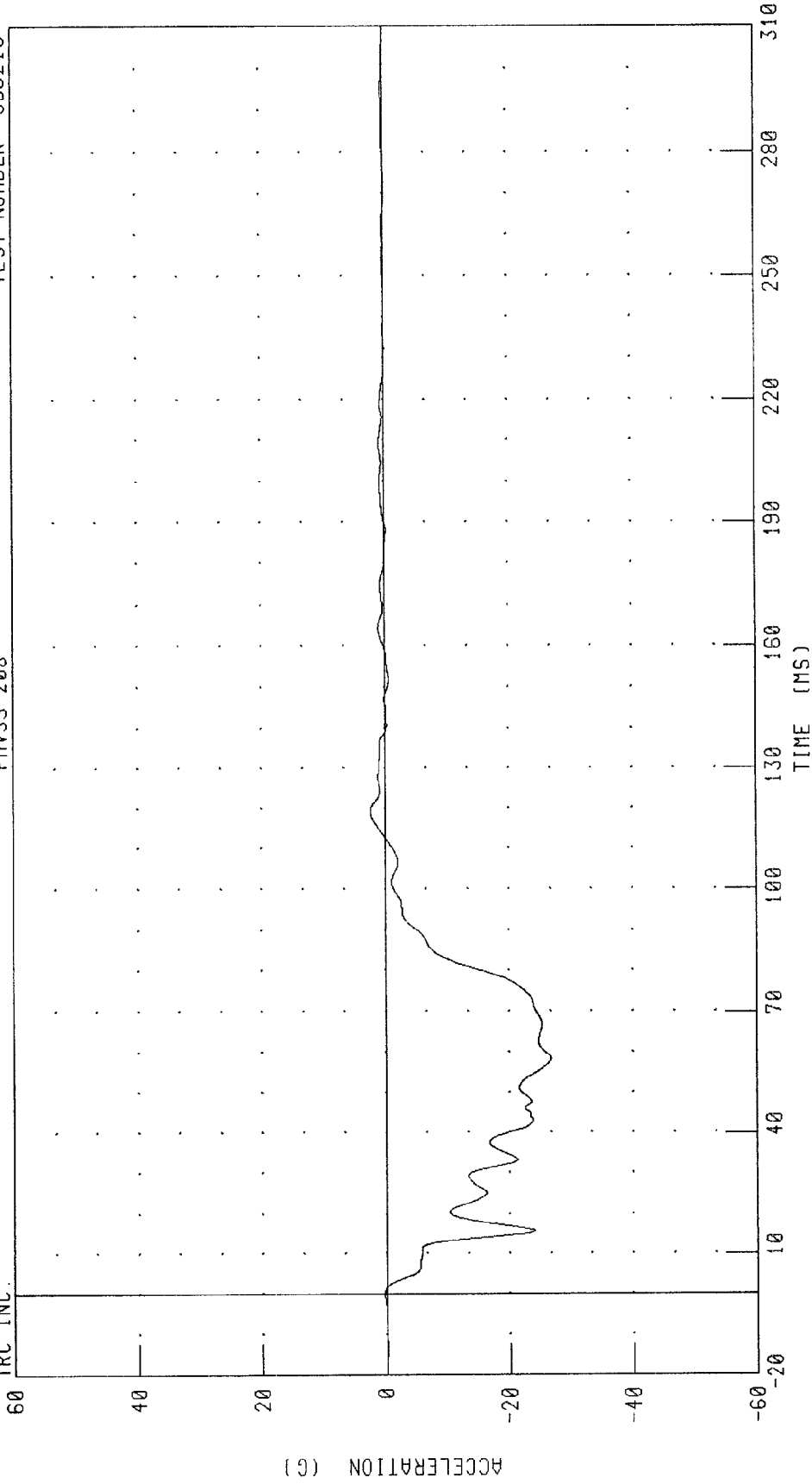
PEAK DATA: 1.62 G @ 120.72 MS, -26.83 G @ 52.08 MS

1999 DODGE INTREPID INTO A FLAT FRONTAL BARRIER AT 30 MPH
RIGHT REAR SEAT X-AXIS ACCELERATION

TEST NUMBER: 990216

FMVSS 208

TRC INC.



CHANNEL: TRRXG1 FILTER: CH. CLASS 60

PEAK DATA: 2.32 G @ 119.44 MS, -26.76 G @ 58.32 MS

Appendix C

Dummy Certification

Pre-Test Dummy Certification

Driver Dummy S/N 168

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th

05-FEB-99

TRC INC.

TEST NO: 168C6HD1

572E SN168 HEAD DROP CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	260.95 G
PEAK LATERAL ACCELERATION	15 G MAX	4.32 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

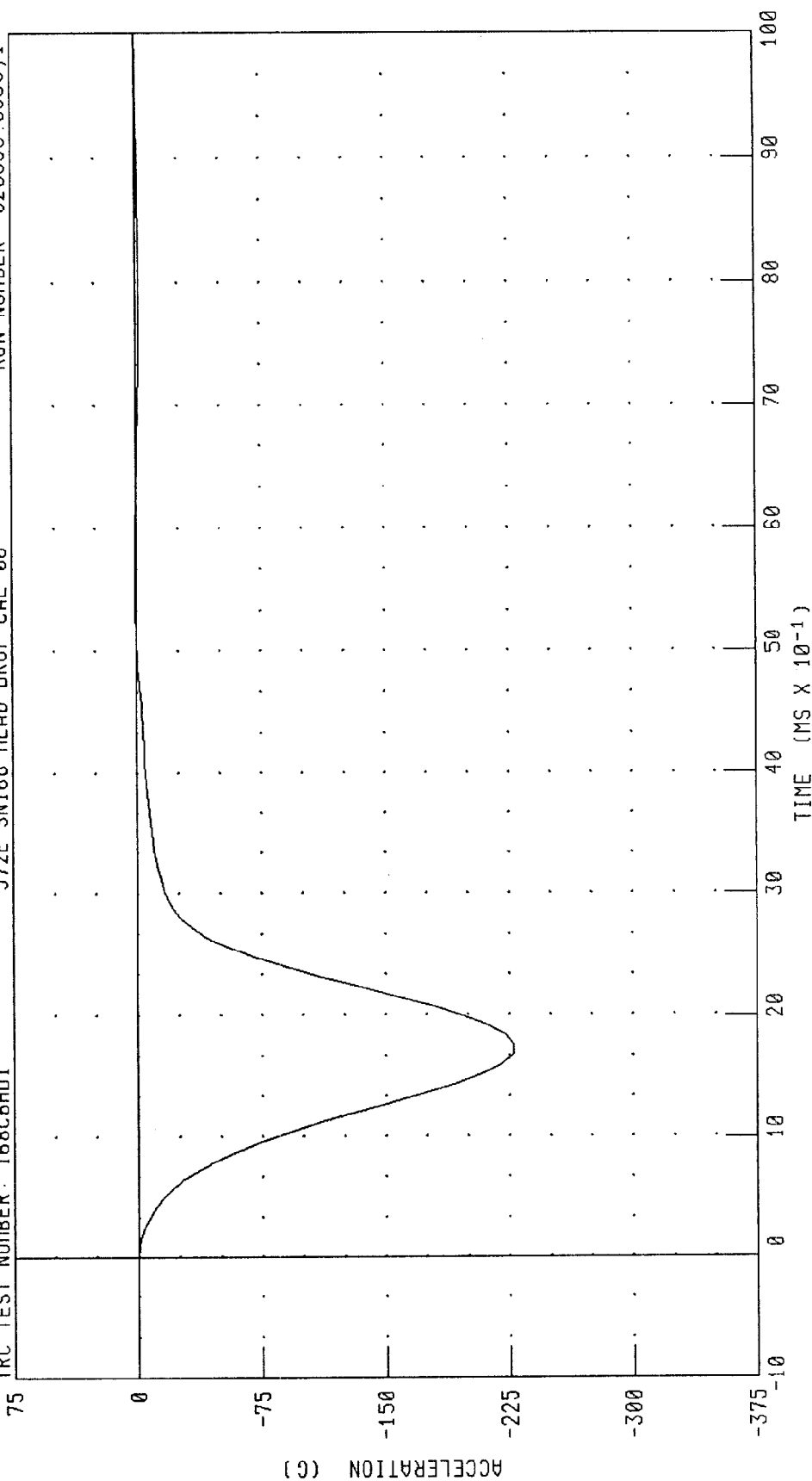
By [Signature]

RUN NUMBER: 020599.0805;1

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

572E SN168 HEAD DROP CAL 06 RUN NUMBER: 020599 0805;1

TRC TEST NUMBER: 168C6HD1



PEAK DATA: 0.79 G @ 5.60 MS; -228.07 G @ 1.76 MS

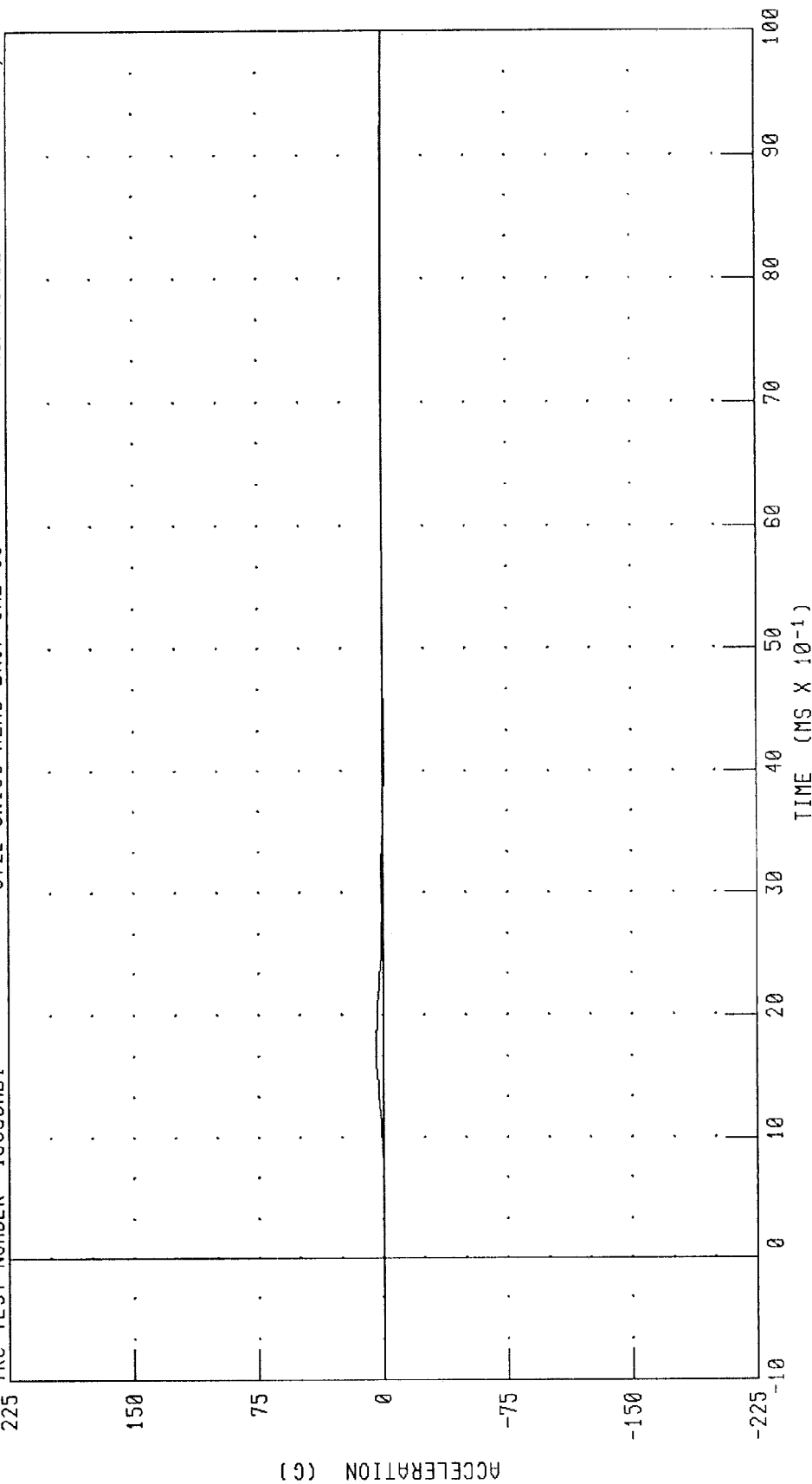
CHANNEL: HEDXC FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 168C6HD1

572E SN168 HEAD DROP CAL 06

RUN NUMBER: 020599 0805,1



CHANNEL: HEDYC FILTER: CH. CLASS 1000

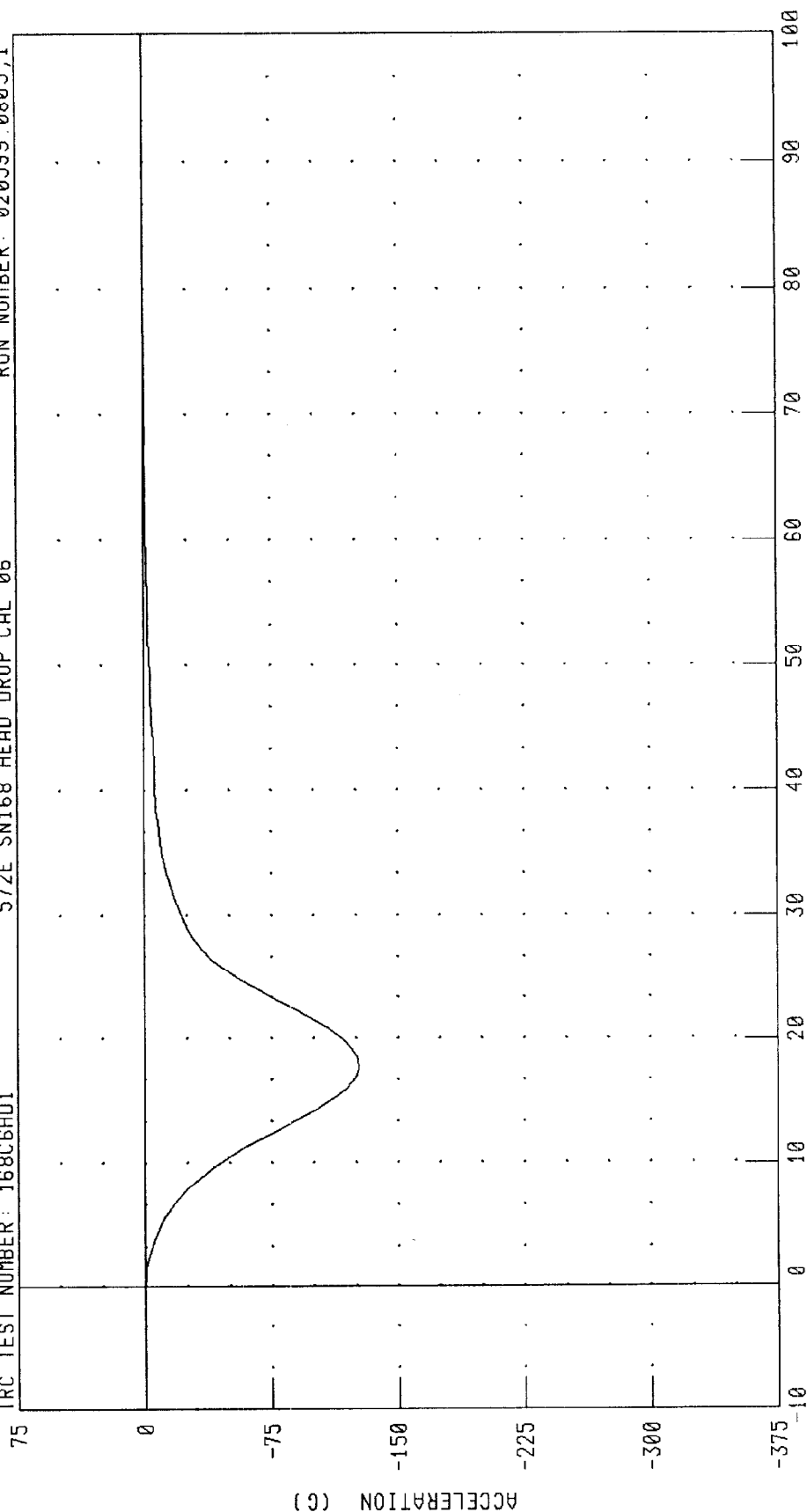
PEAK DATA: 4.33 G @ 1.68 MS; -0.78 G @ 4.00 MS

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

TRC TEST NUMBER: 168C6HD1

572E SN168 HEAD DROP CAL 06

RUN NUMBER: 020599.0805;1



CHANNEL: HEDZC FILTER: CH. CLASS 1000

PEAK DATA: 0.20 G @ 10.00 MS, -126.75 G @ 1.76 MS

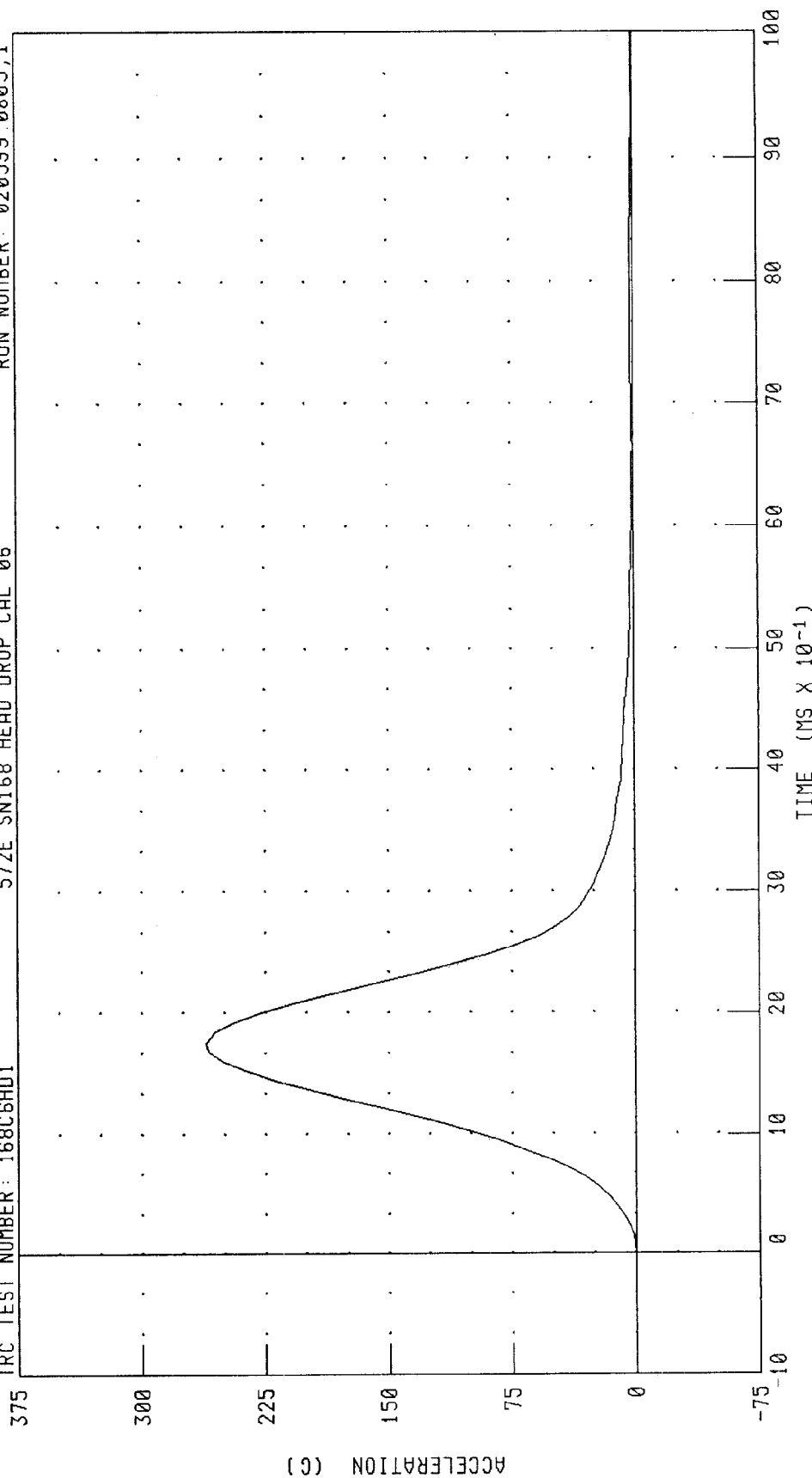
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SN168 HEAD DROP CAL 06

RUN NUMBER: 020599 0805;1

TRC TEST NUMBER: 168C6HD1



PEAK DATA: 260.95 G @ 1.76 MS; 0.01 G @ -0.96 MS

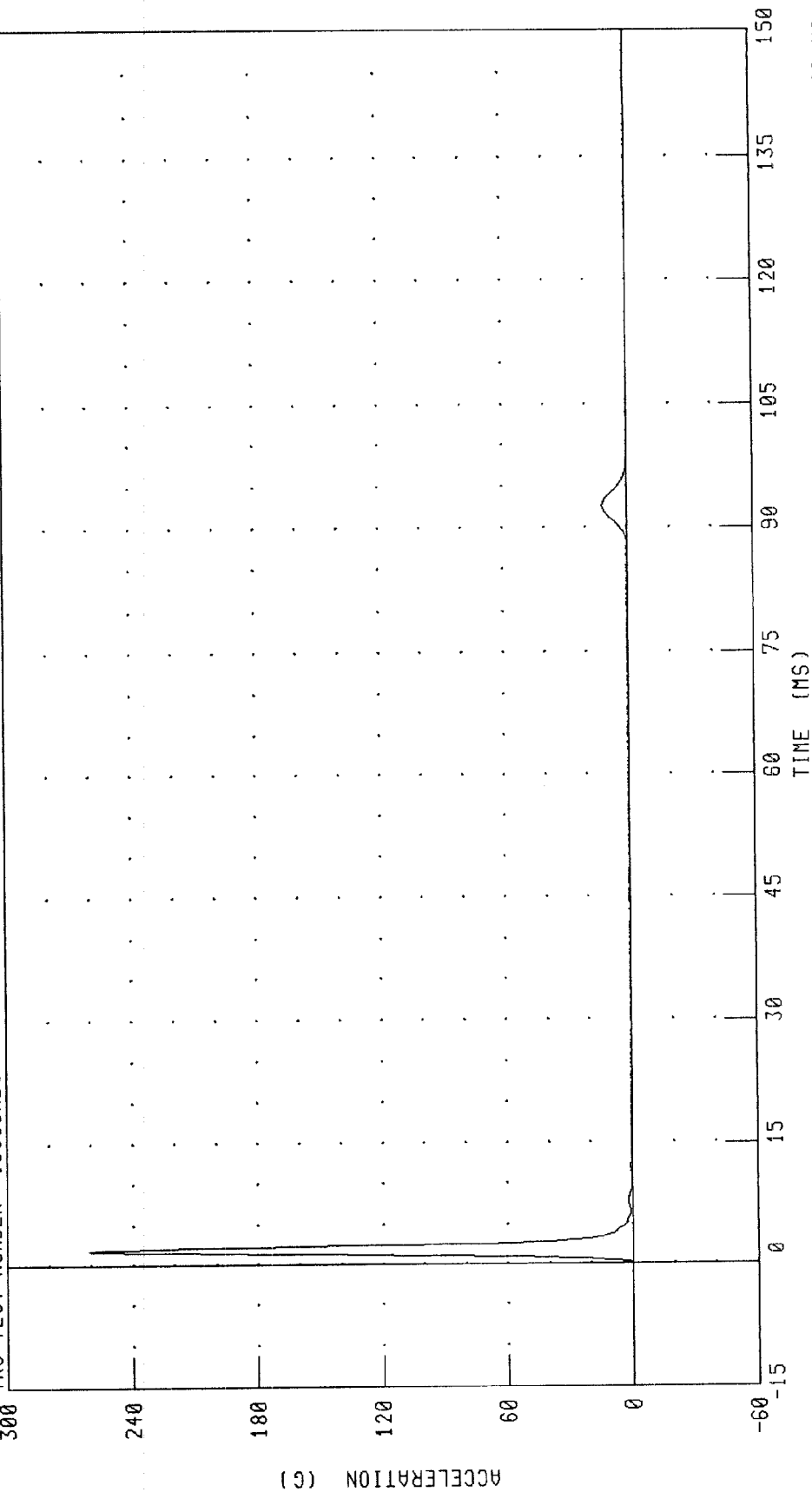
CHANNEL: HEDRC FILTER: CH. CLASS 1000

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

572E SN168 HEAD DROP CAL 06

TRC TEST NUMBER: 168C6HD1

RUN NUMBER: 020599 0805;1



PEAK DATA: 260.95 G @ 1.76 MS; 0.01 G @ -14.96 MS

CHANNEL: HEDRC FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

12-FEB-99

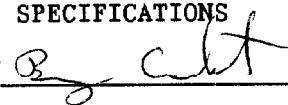
NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 168C6NF2 572E SN168 NECK FLEXION CAL06

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.66 G
	20 MS	17.60 - 22.60 G	21.42 G
	30 MS	12.50 - 18.50 G	16.49 G
MAX PENDULUM G		29 G MAX	24.44 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.45 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	38.16 MS
D PLANE	MAX	64 - 78 DEG.	68.16 DEG.
ROTATION	TIME	57 - 64 MS	60.00 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	96.91 NM
	TIME	47 - 58 MS	50.56 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	114.48 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	102.24 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



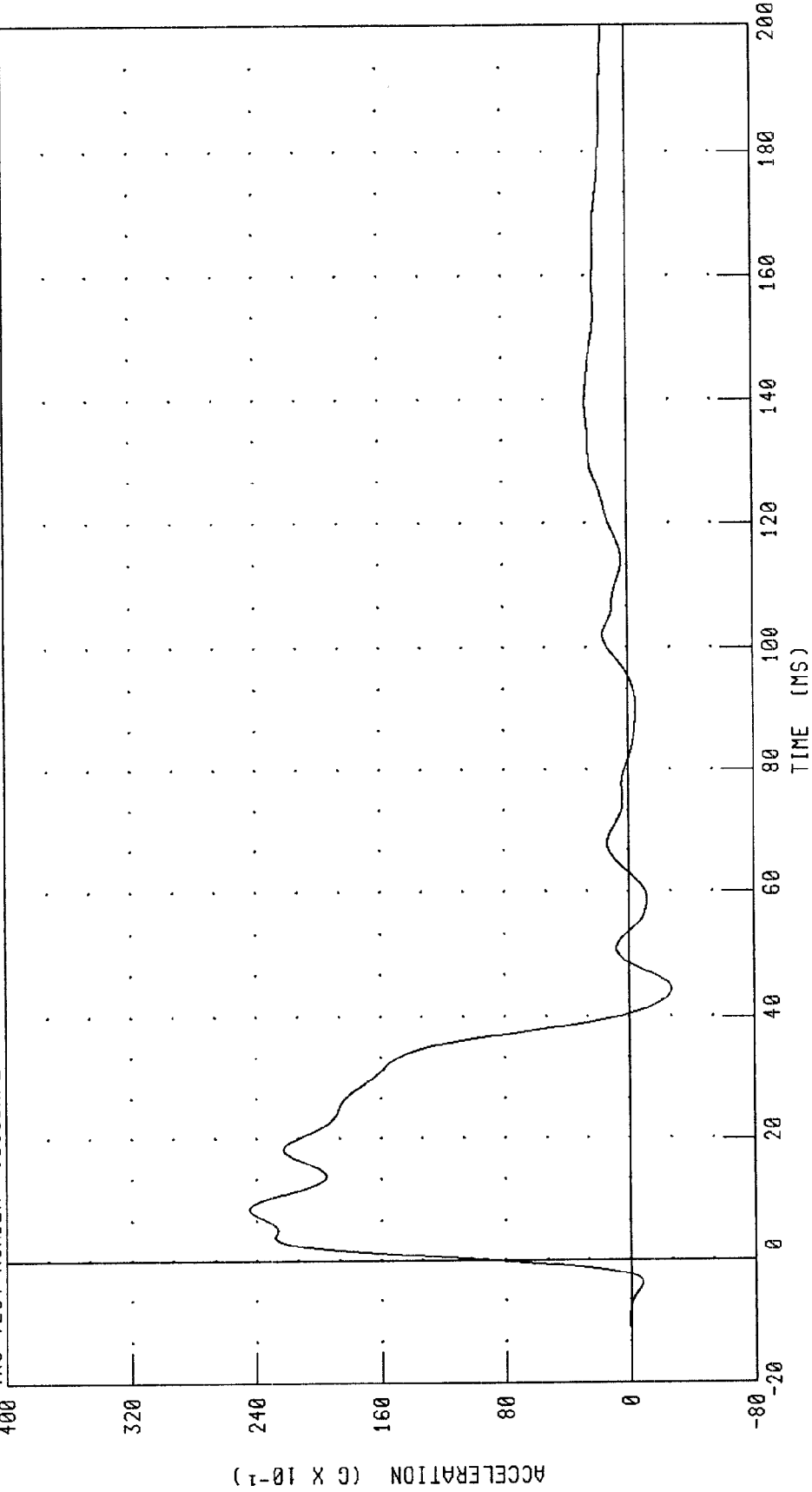
RUN NUMBER: 021299.1302;1

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 168C6NF2

572E SN168 NECK FLEXION CAL06

RUN NUMBER: 021299.1309;1



PEAK DATA: 24.45 C @ 8.72 MS; -2.71 G @ 44.40 MS

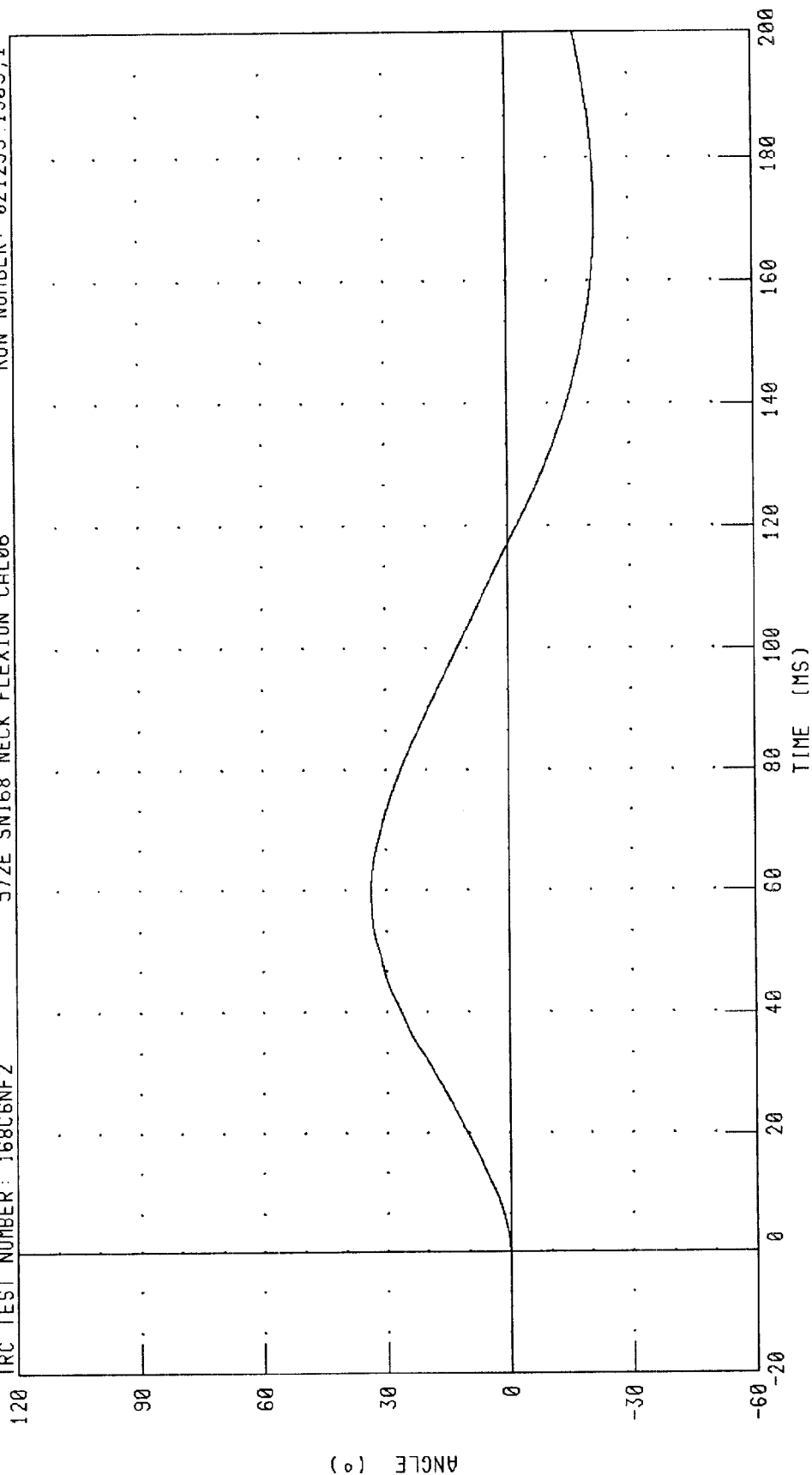
CHANNEL: PENXC FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 168C6NF2

572E SN168 NECK FLEXION CAL06

RUN NUMBER: 021299.1309;1



PEAK DATA: 33.64 ° @ 59.92 MS; -21.65 ° @ 170.96 MS

FILTER: CH. CLASS 60

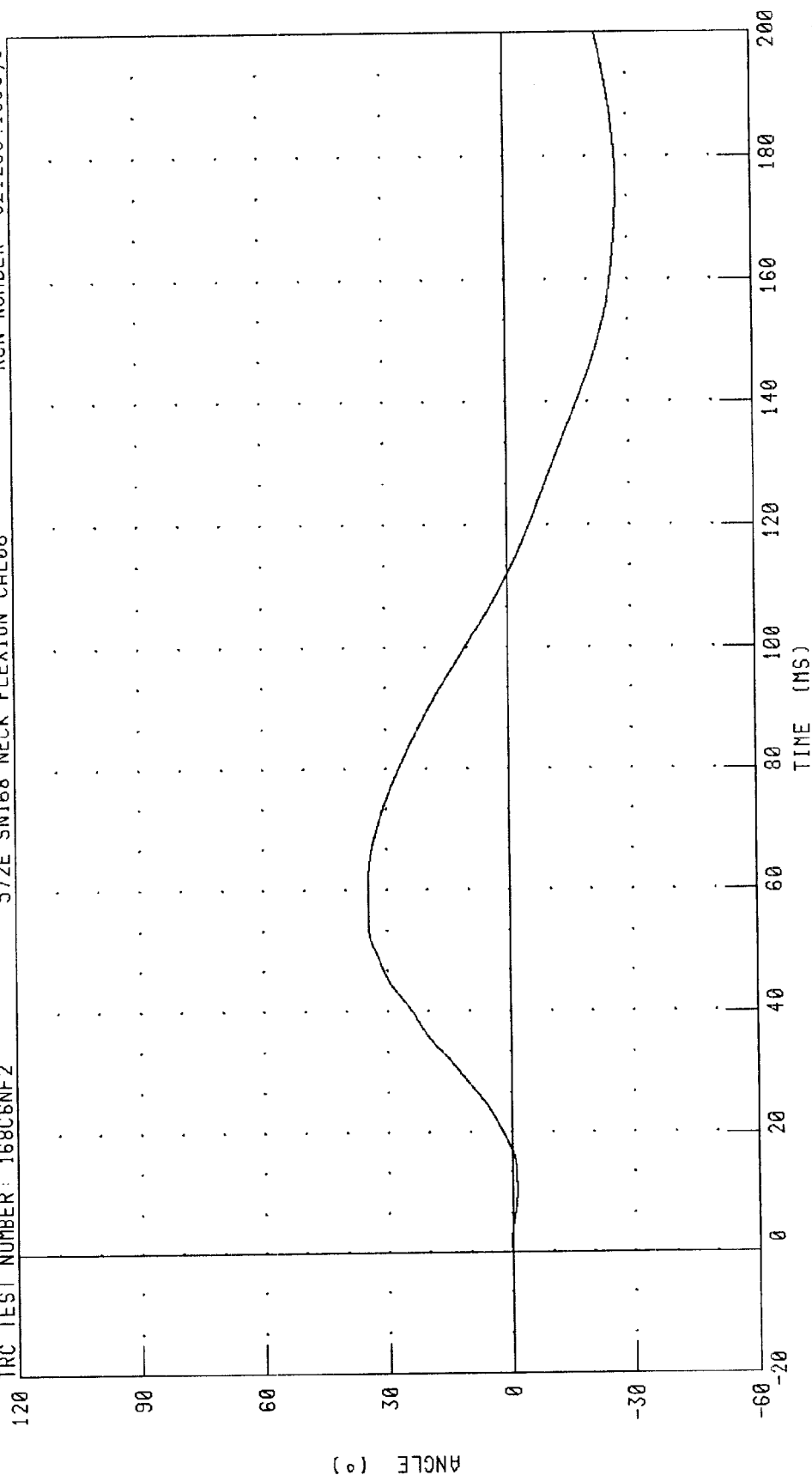
CHANNEL: BETA

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

TRC TEST NUMBER: 168C6NF2

572E SN168 NECK FLEXION CAL06

RUN NUMBER: 021299.1309,1



PEAK DATA: 34.57 ° @ 55.12 MS; -27.27 ° @ 176.24 MS

CHANNEL: THETA FILTER: CH. CLASS 60

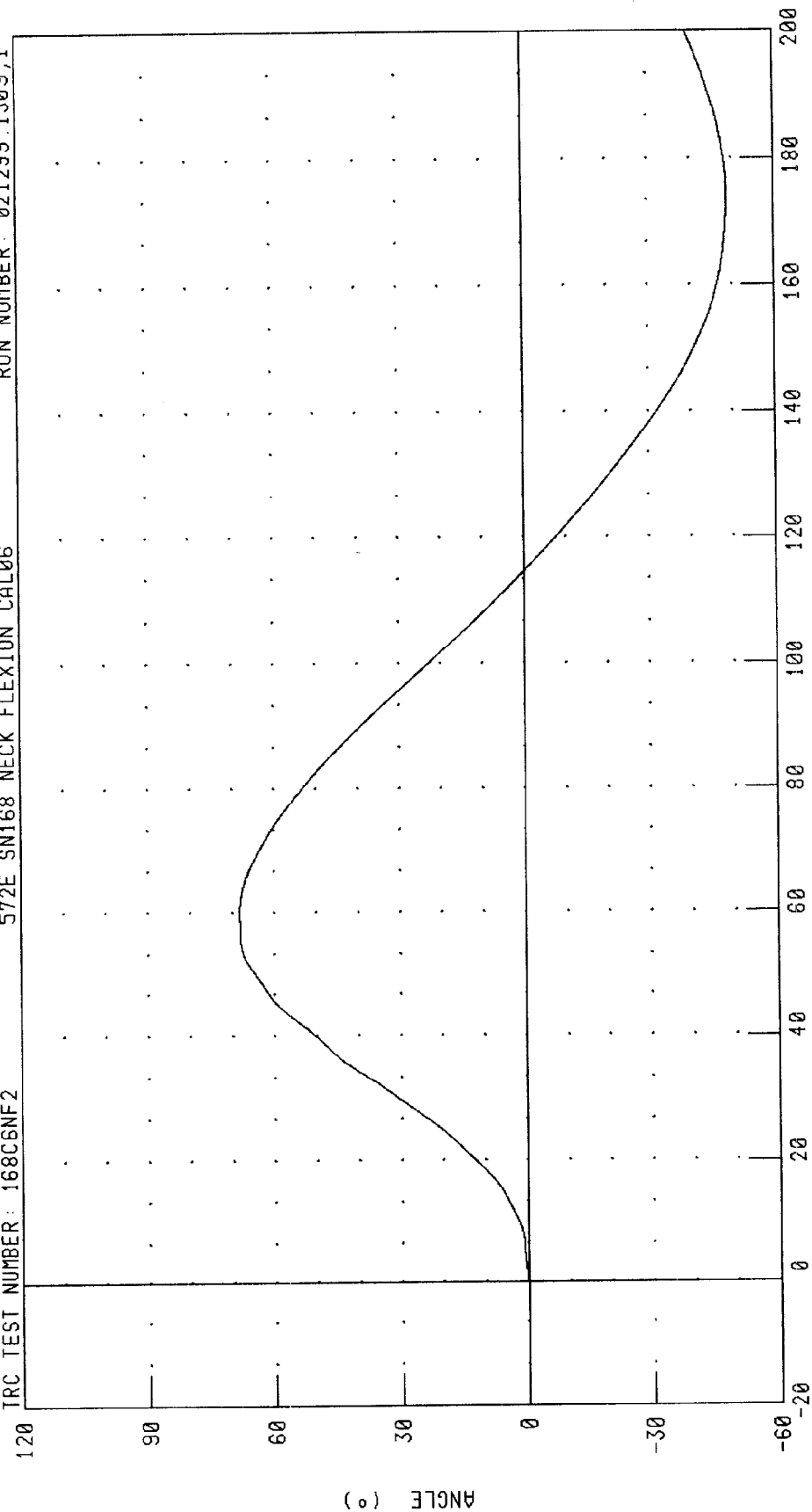
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 168C6NF2

572E SN168 NECK FLEXION CAL06

RUN NUMBER: 021299.1309;1



CHANNEL: TOTAN FILTER: CH. CLASS 60

PEAK DATA: 68.16 ° @ 60.00 MS, -48.84 ° @ 174.40 MS

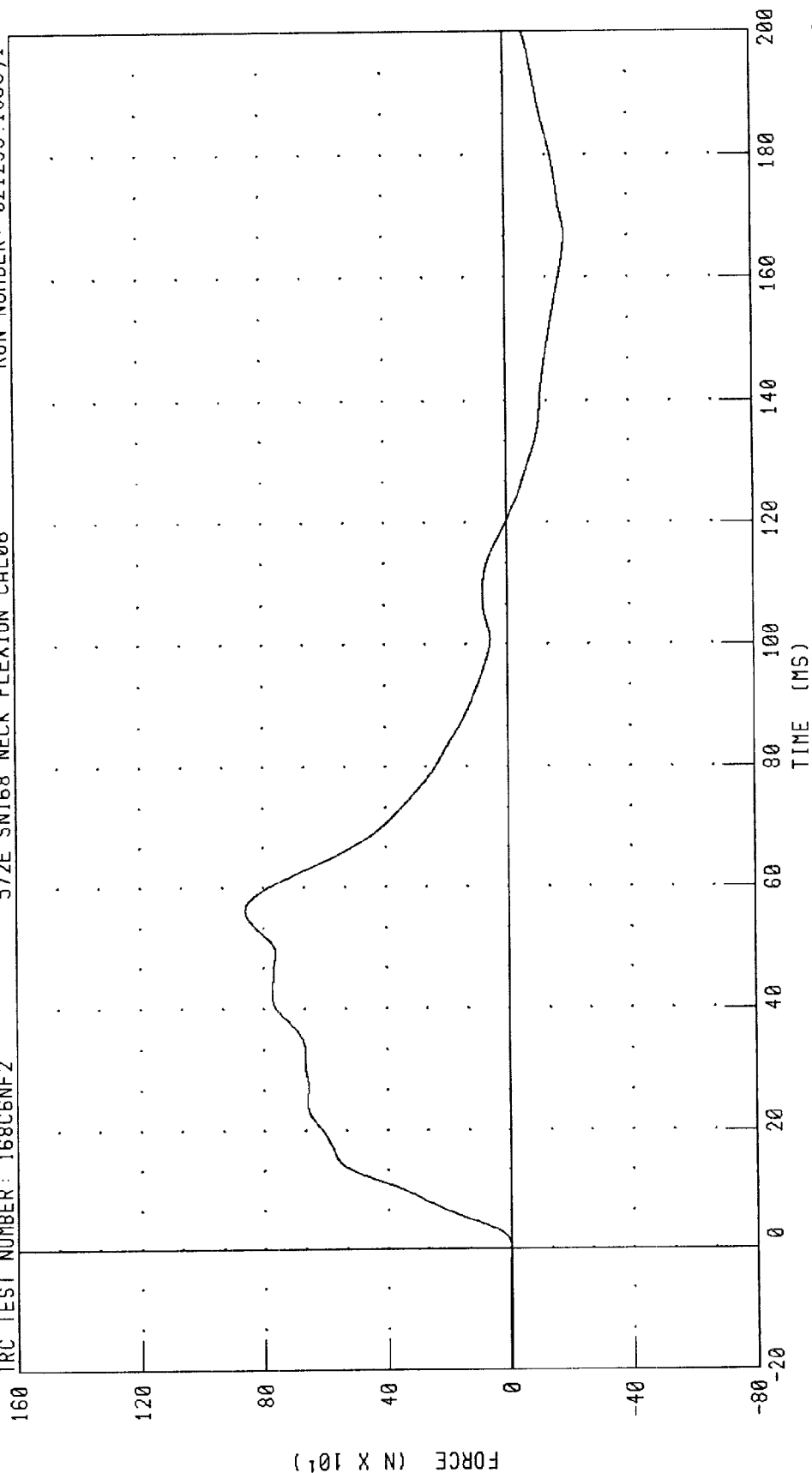
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

RUN NUMBER: 021299.1309;1

TRC TEST NUMBER: 168C6NF2

572E SN168 NECK FLEXION CAL06



PEAK DATA: 857.74 N @ 56.32 MS; -194.14 N @ 166.96 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

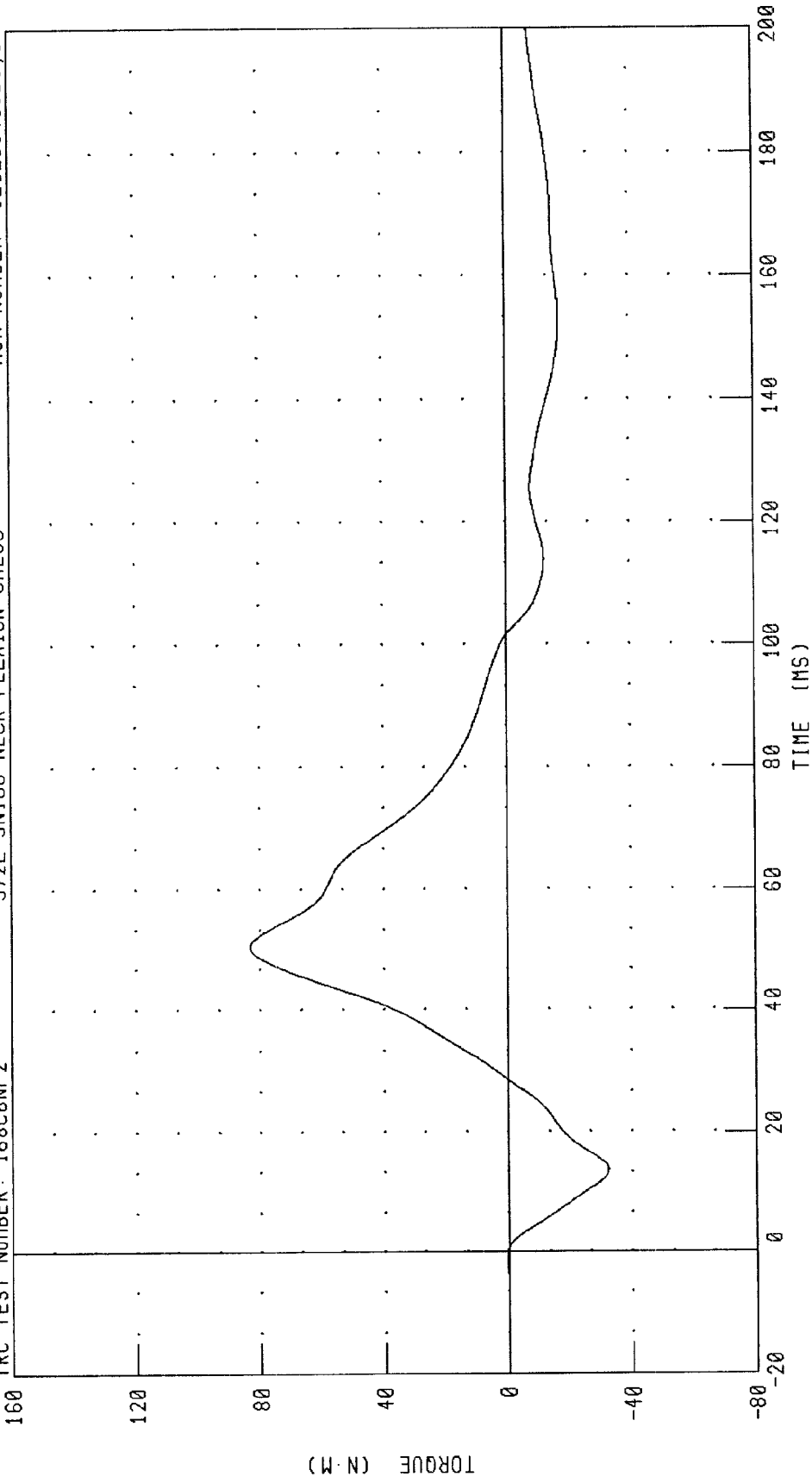
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

TRC TEST NUMBER: 168C6NF2

572E SN168 NECK FLEXION CAL06

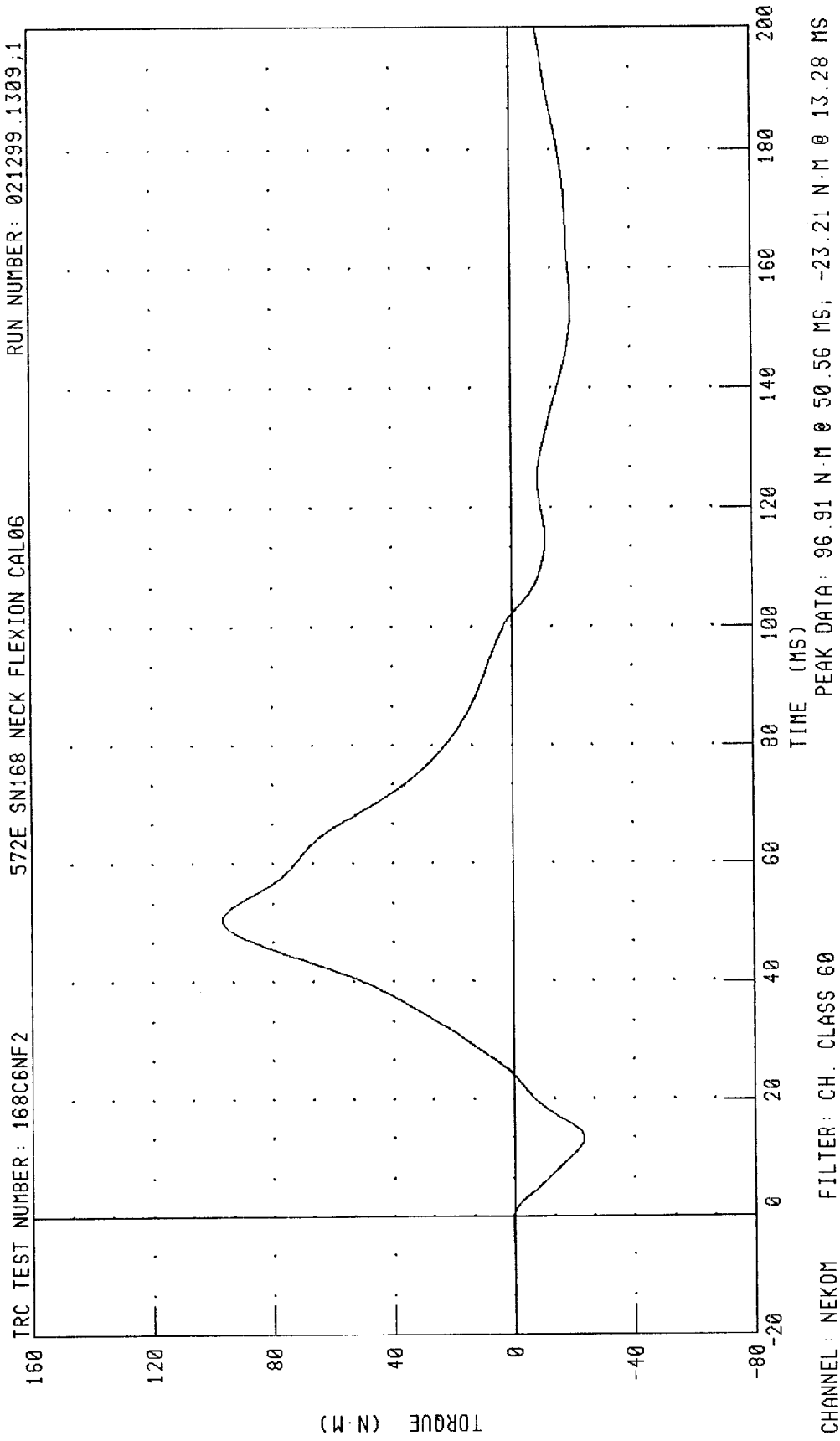
RUN NUMBER: 021299.1309,1



PEAK DATA: 83.25 N·M @ 50.48 MS, -32.47 N·M @ 13.76 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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



TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

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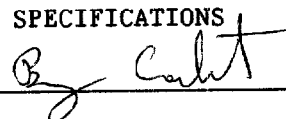
NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 168C6NE1 572E SN168 NECK EXT CAL06

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.38 G
	20 MS	14.00 - 19.00 G	17.77 G
	30 MS	11.00 - 16.00 G	14.06 G
MAX PENDULUM G		22 G MAX	18.92 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.03 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	41.28 MS
D PLANE	MAX	81 - 106 DEG.	94.83 DEG.
ROTATION	TIME	72 - 82 MS	76.72 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-64.42 NM
	TIME	65 - 79 MS	71.12 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	155.92 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	143.20 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



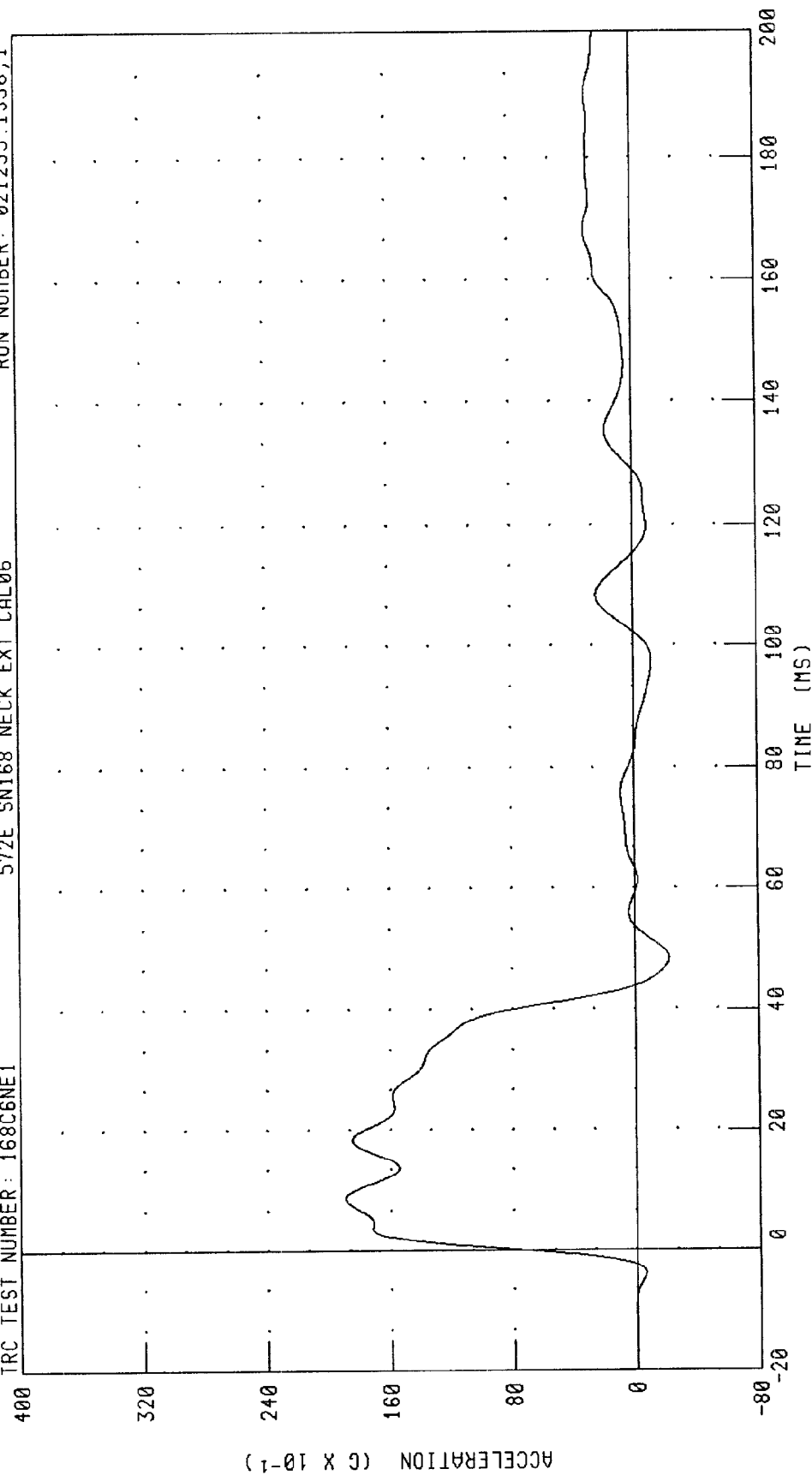
RUN NUMBER: 021299.1336;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 168C6NE1

572E SN168 NECK EXT CAL06

RUN NUMBER: 021299.1336,1



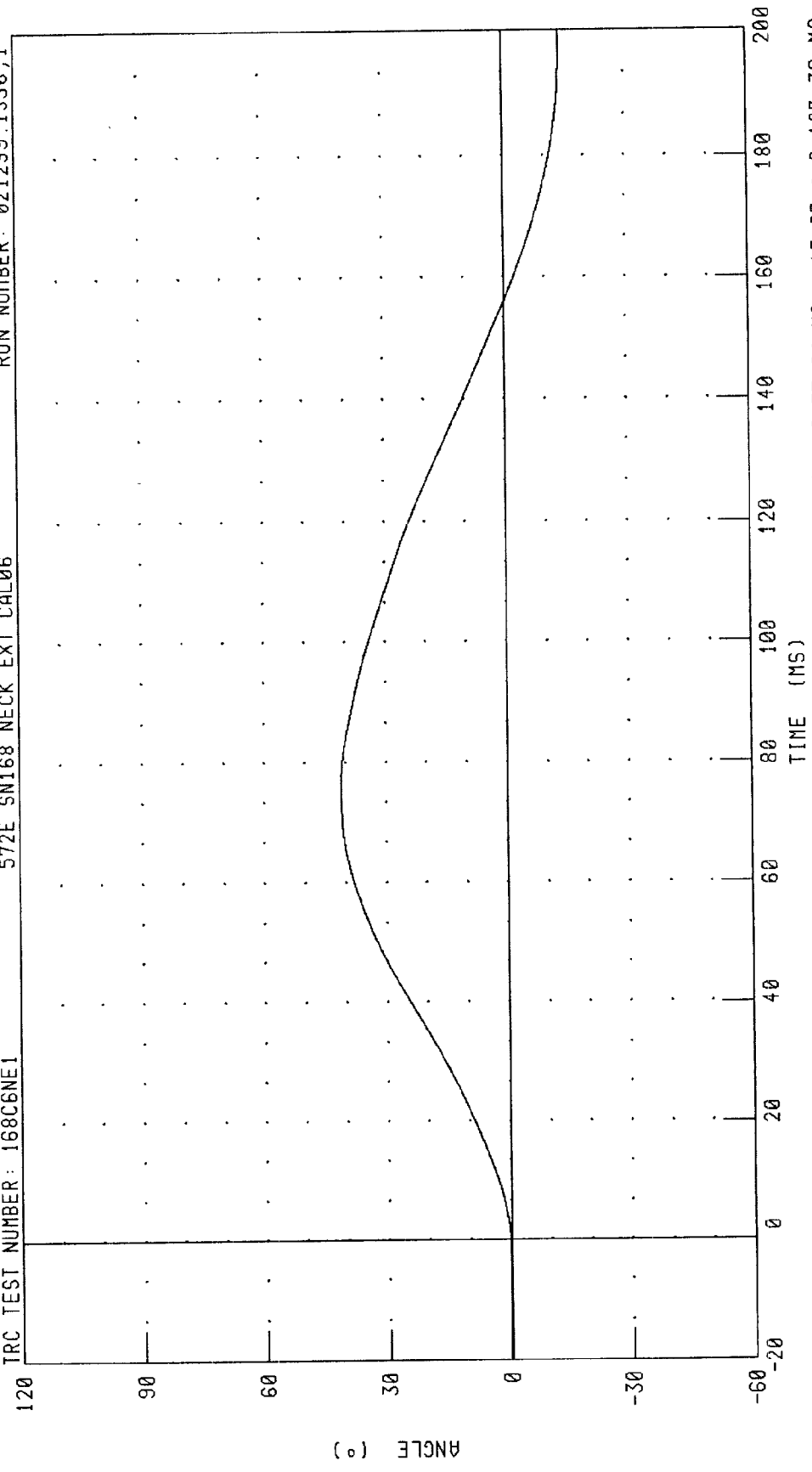
PEAK DATA: 18.93 G @ 8.72 MS; -2.22 G @ 48.48 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
ROTATION ABOUT BASE OF NECK
572E SN168 NECK EXT CAL06

TRC TEST NUMBER: 168C6NE1

RUN NUMBER: 021299.1336;1



PEAK DATA: 41.08 ° @ 75.04 MS, -13.97 ° @ 197.36 MS

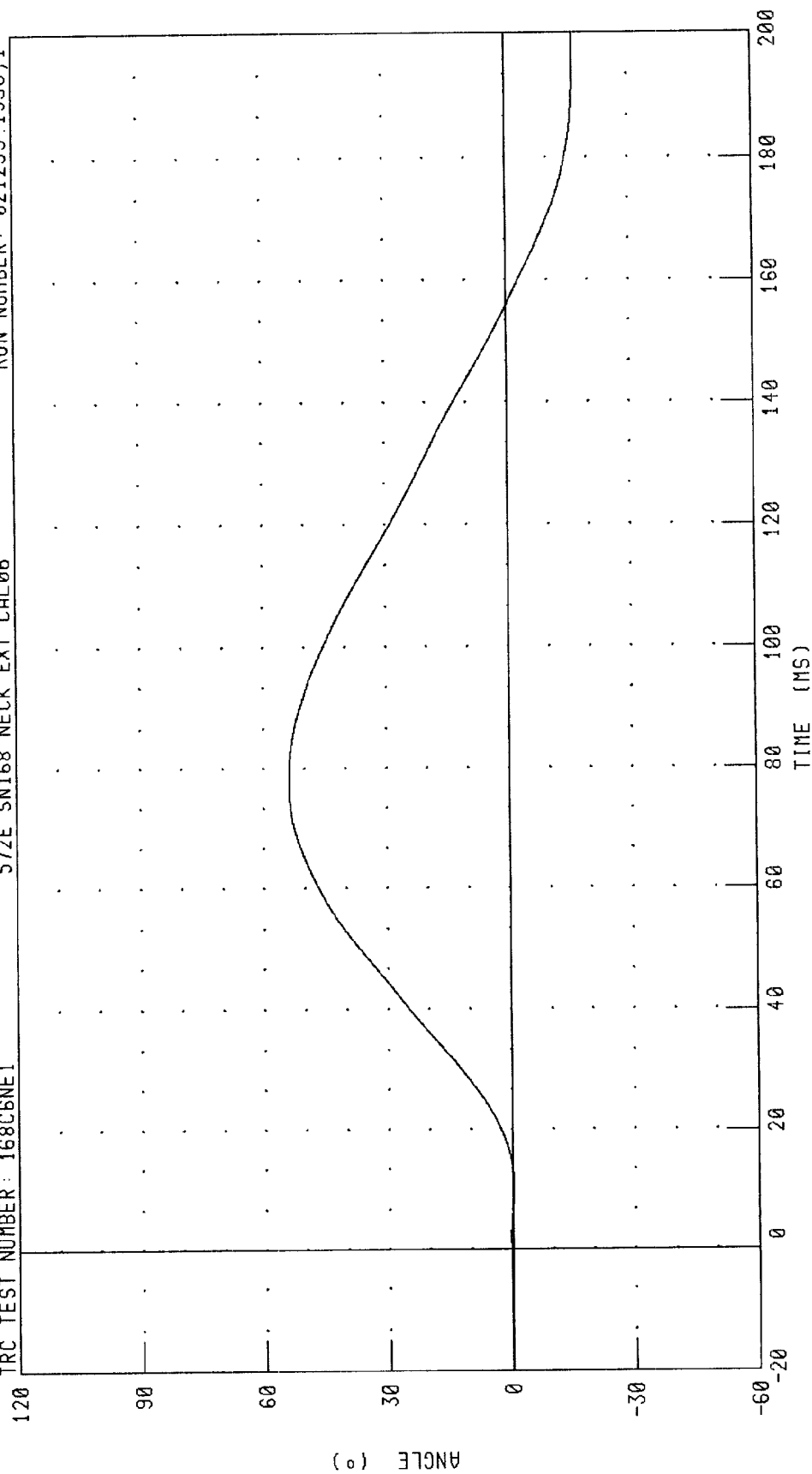
CHANNEL: BETA FILTER: CH. CLASS 60

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

572E SN168 NECK EXT CAL06

TRC TEST NUMBER: 16806NE1

RUN NUMBER: 021299.1336;1



PEAK DATA: 53.84 ° @ 78.40 MS; -16.61 ° @ 195.44 MS

CHANNEL: THETA FILTER: CH. CLASS 60

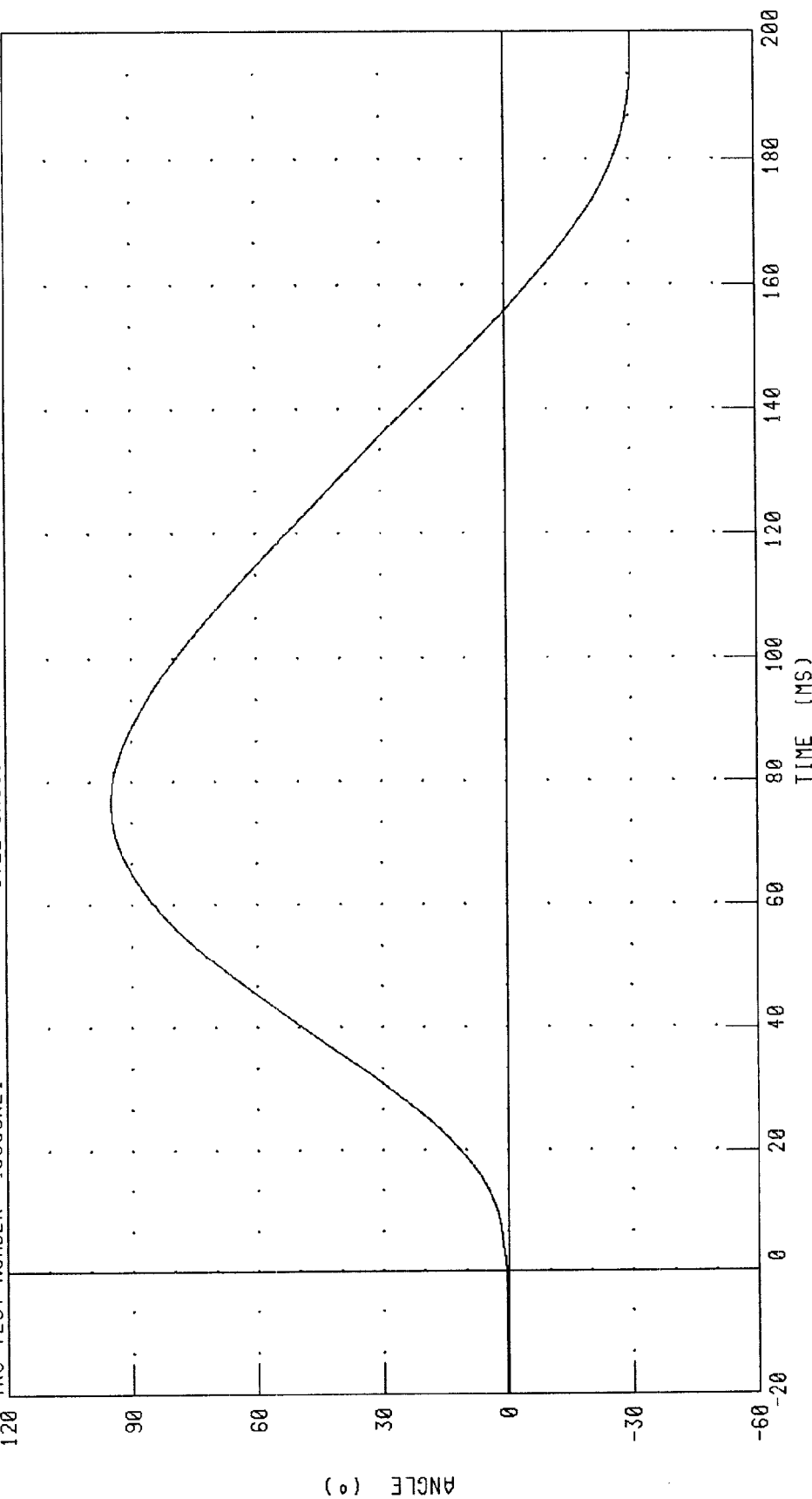
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 168C6NE1

572E SN168 NECK EXT CAL06

RUN NUMBER: 021299.1336;1



PEAK DATA: 94.84 ° @ 76.72 MS; -30.57 ° @ 196.08 MS

CHANNEL: TOTAL FILTER: CH. CLASS 60

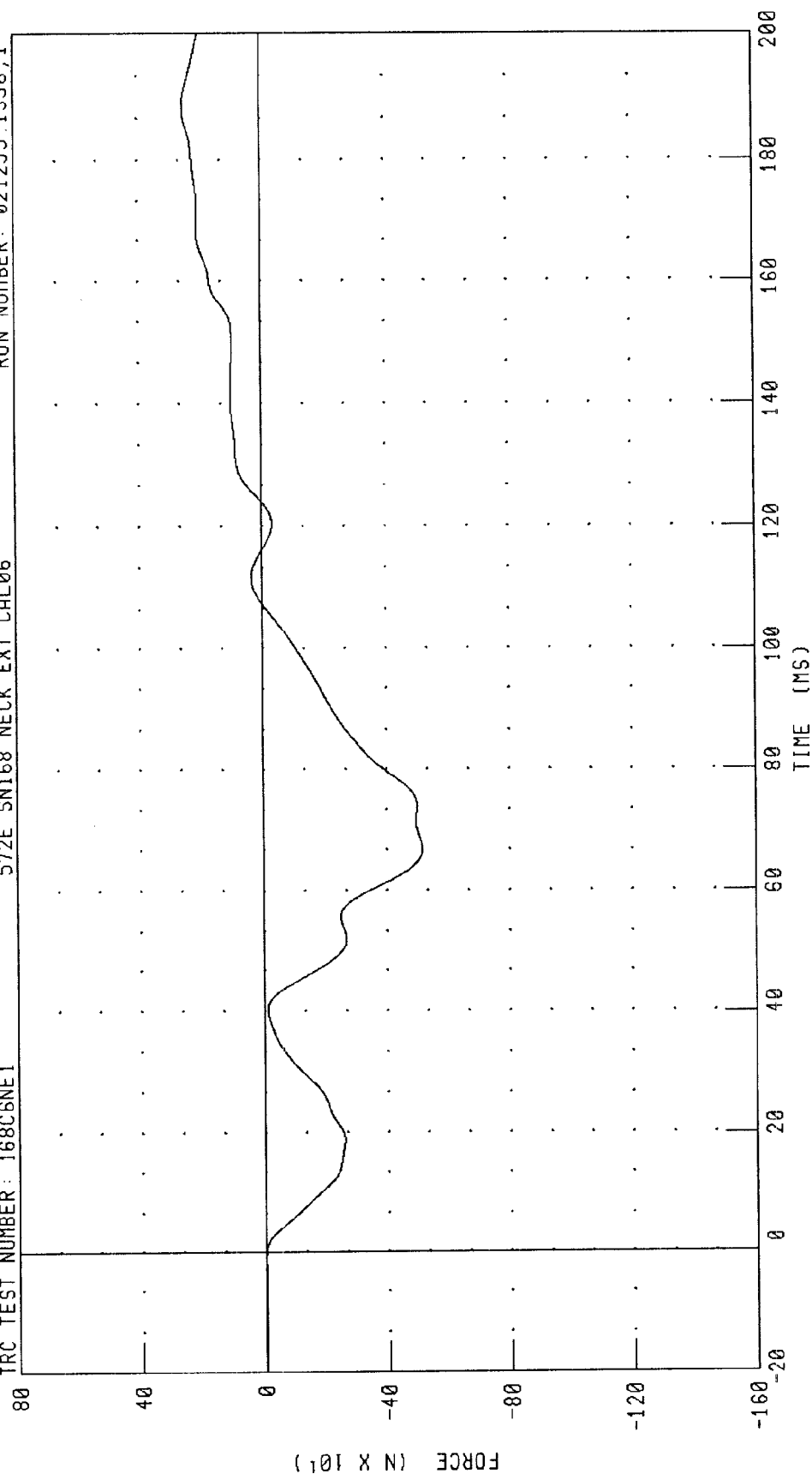
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

TRC TEST NUMBER: 168C6NE1

572E SN168 NECK EXT CAL06

RUN NUMBER: 021299.1336;1



PEAK DATA: 252.80 N @ 188.56 MS; -516.19 N @ 66.80 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

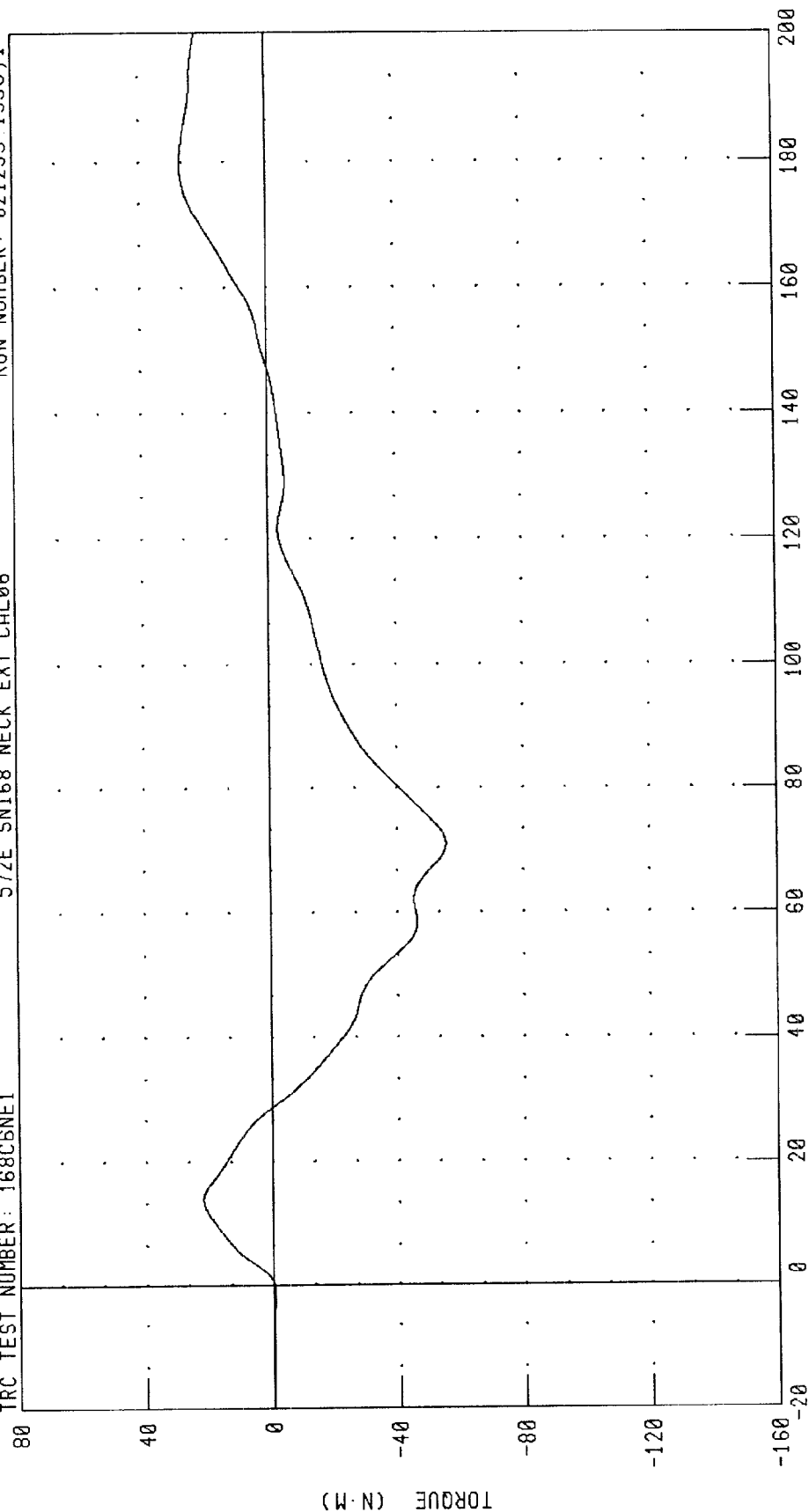
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

RUN NUMBER: 021299 1336;1

572E SN168 NECK EXT CAL06

TRC TEST NUMBER: 168C6NE1



PEAK DATA: 27.24 N·M @ 179.68 MS; -55.60 N·M @ 71.12 MS

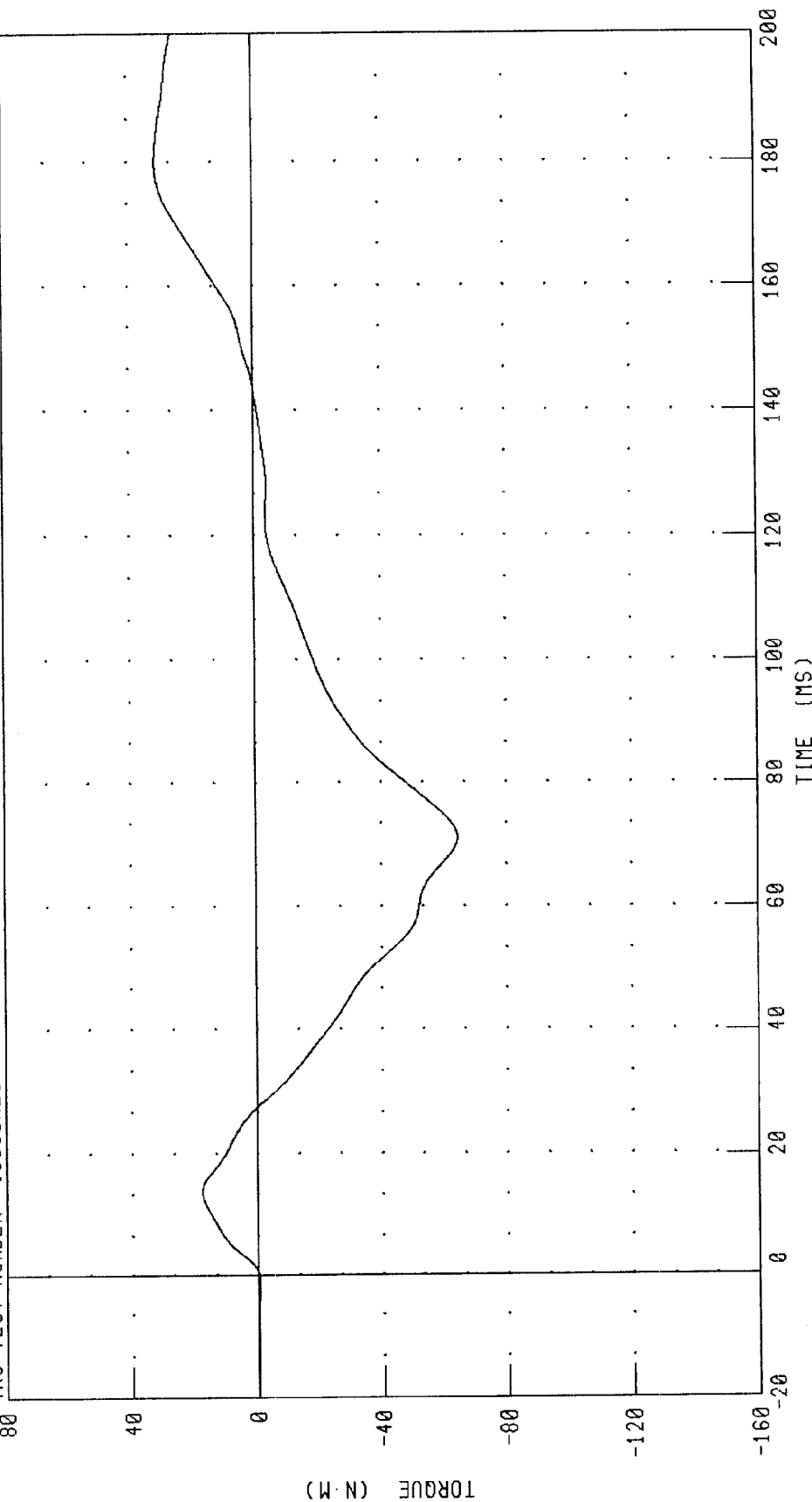
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 168C6NE1

572E SN168 NECK EXT CAL06

RUN NUMBER: 021299.1336;1



PEAK DATA: 31.20 N·M @ 180.00 MS; -64.42 N·M @ 71.12 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th

15-FEB-99

TRC INC.

TEST NO: 168C6TH3

572E SN168 H.S.THORAX CAL06

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
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	5805. N
INTERNAL HYSTERESIS	69% - 85%	69.8%

TEST MEETS SPECIFICATIONS

TECHNICIAN

B. C. Holt

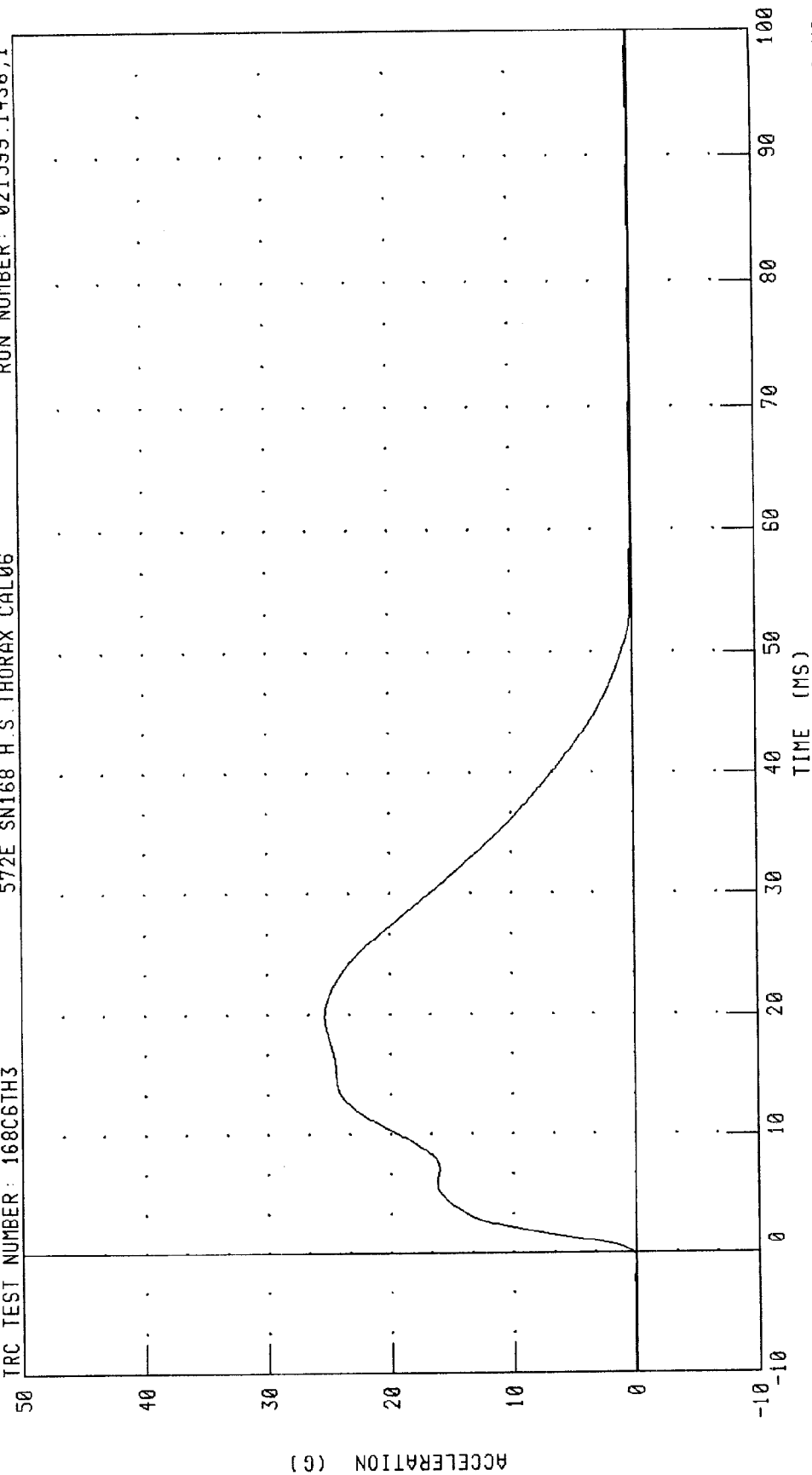
RUN NUMBER: 021599.1436;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 168C6TH3

572E SN168 H.S. THORAX CAL06

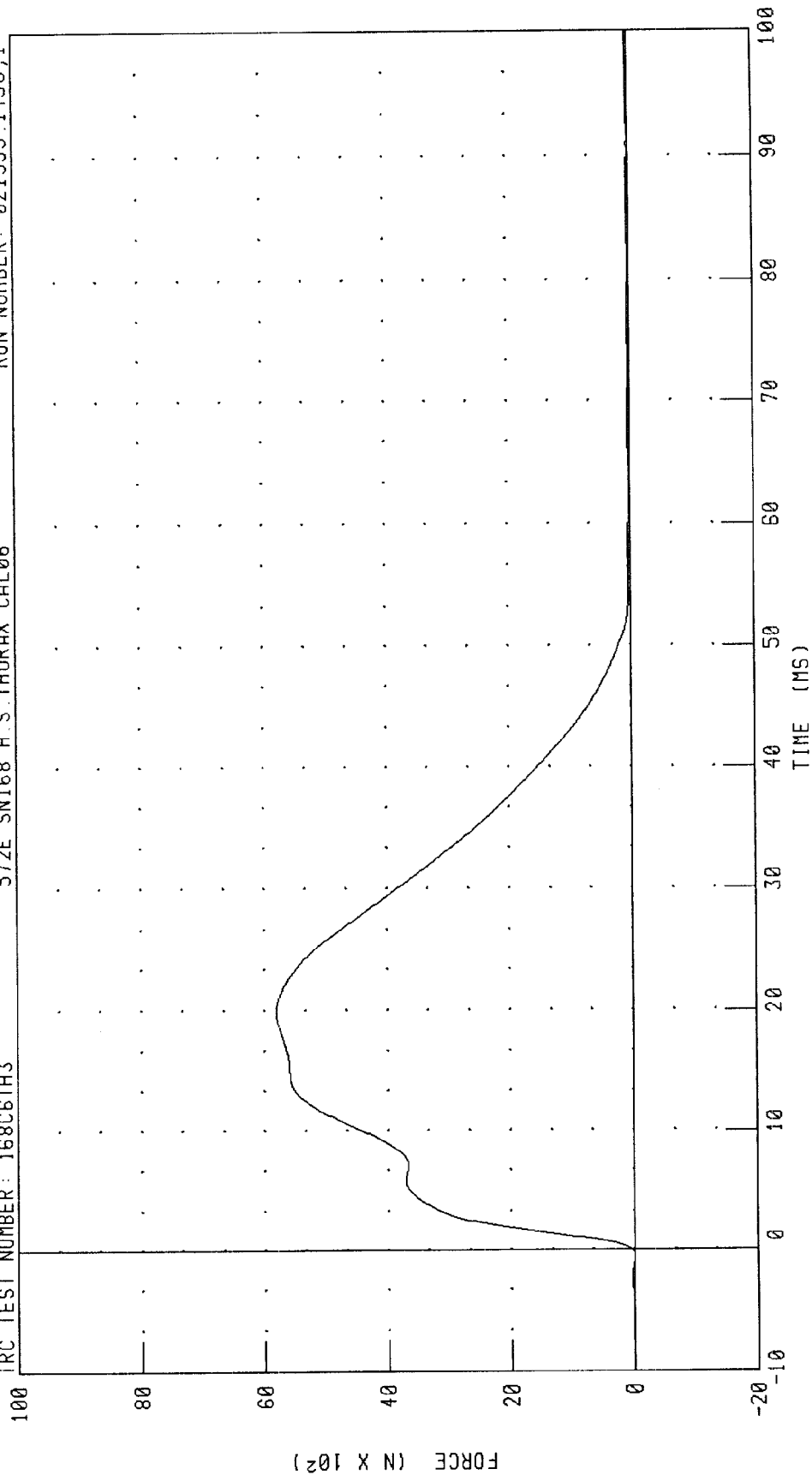
RUN NUMBER: 021599.1436;1



CHANNEL: PENXC FILTER: CH. CLASS 180 PEAK DATA: 25.34 G @ 19.92 MS; -0.03 G @ -0.56 MS

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 16806TH3 572E SN168 H.S. THORAX CAL06 RUN NUMBER: 021599.1436,1



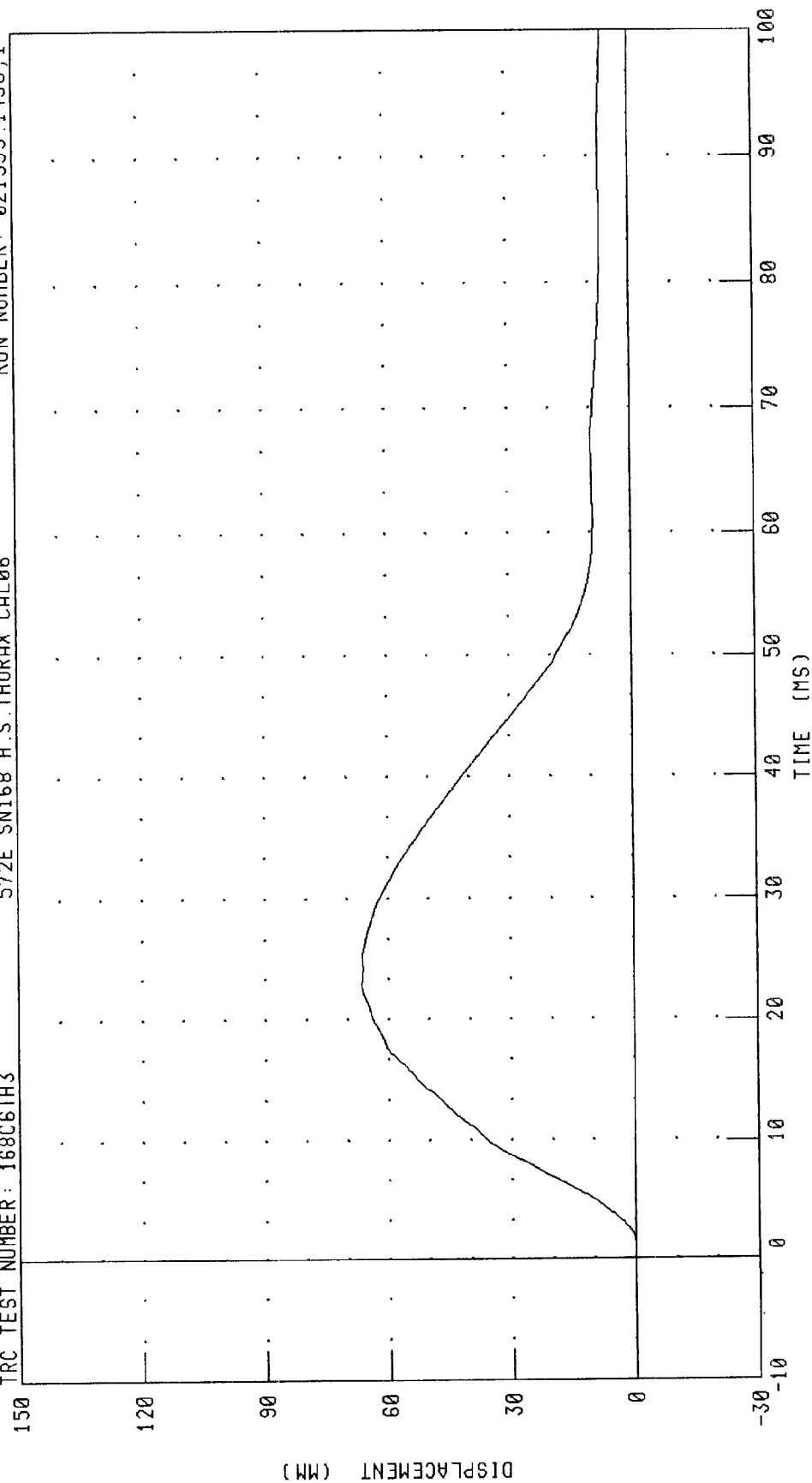
CHANNEL: PENXF FILTER: CH. CLASS 180 PEAK DATA: 5805.87 N @ 19.92 MS; -7.94 N @ -0.56 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 168C6TH3

572E SN168 H.S.THORAX CAL06

RUN NUMBER: 021599.1436;1



PEAK DATA: 66.40 MM @ 22.96 MS; -0.02 MM @ 0.80 MS

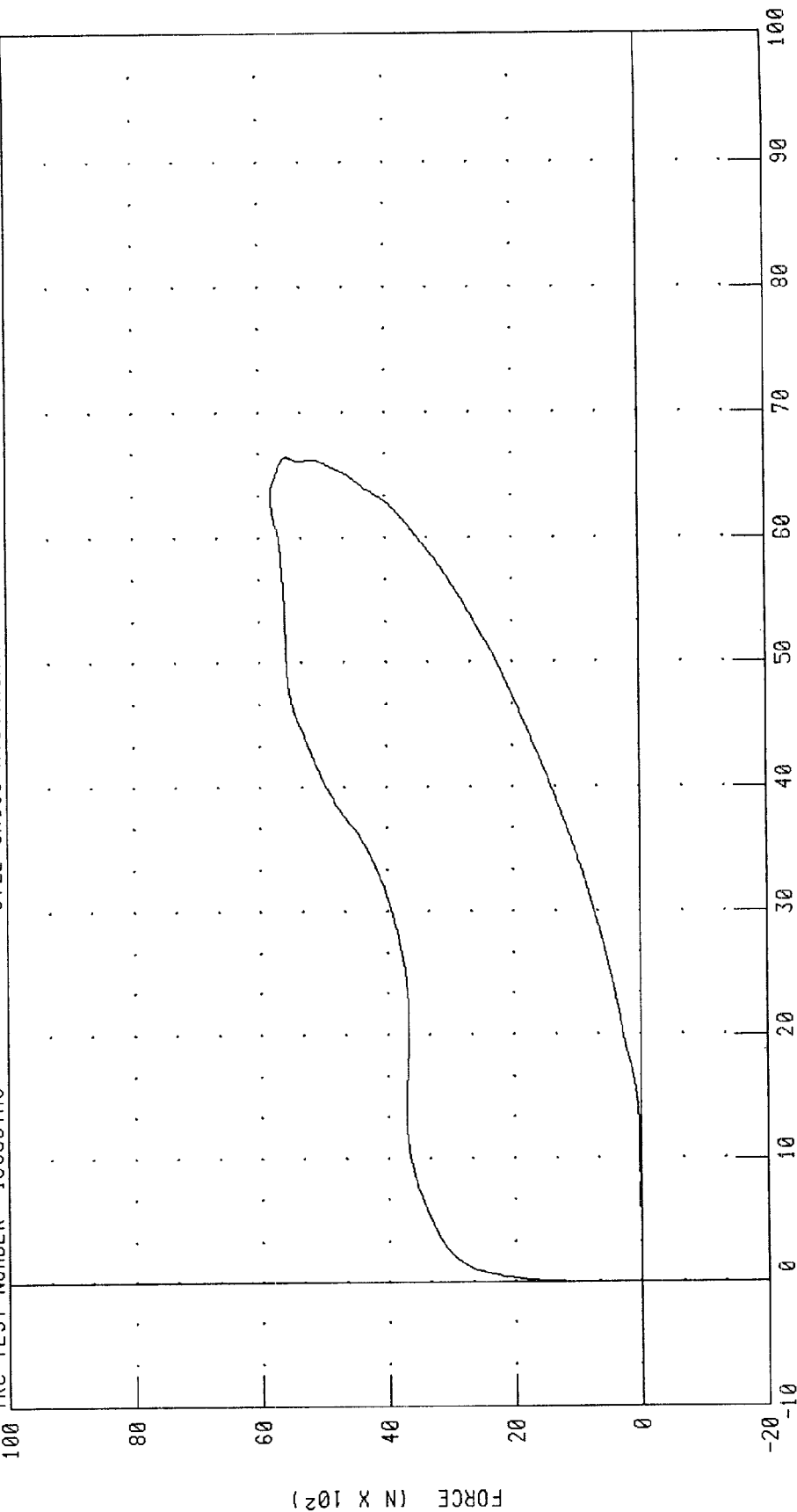
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 168CSTH3

572E SN168 H.S.THORAX CAL06

RUN NUMBER: 021599.1436;1



CHANNEL: CSTXD
PENXF

PEAK DATA:

66.40 MM @ 22.96 MS;
5805.87 N @ 19.92 MS;
-0.02 MM @ 0.80 MS;
-7.94 N @ -0.56 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

12-FEB-99

TRC 3NC.

TEST NO: 168C6HR1

572E SN 168 HIPFLEX CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	65.9 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	46.3 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN B. C. Calt

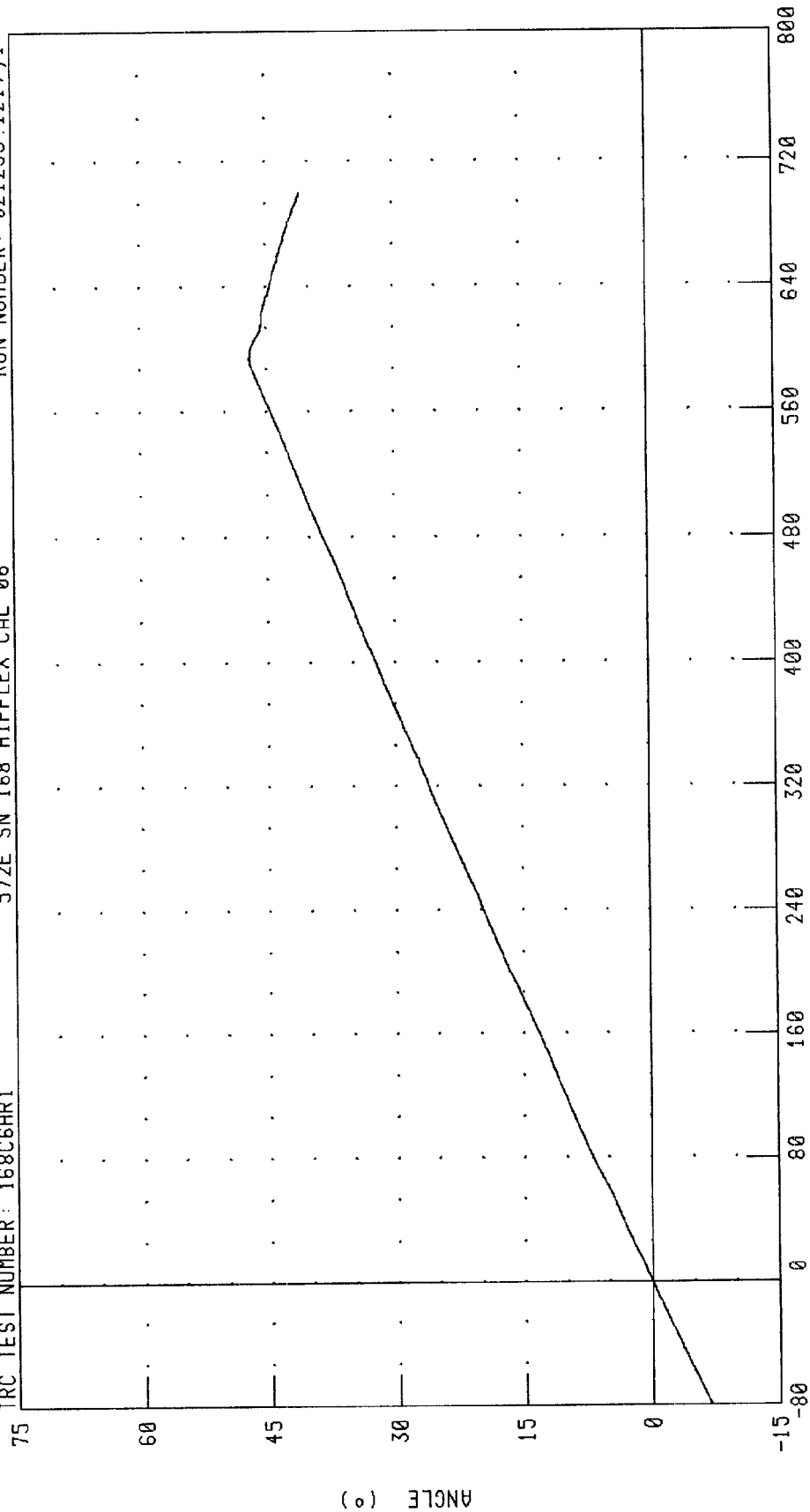
RUN NUMBER: 021299.1216;1

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
RIGHT HIP FLEXION ROTATION

RUN NUMBER: 021299.1217,1

572E SN 168 HIPFLEX CAL 06

TRC TEST NUMBER: 16806HR1



PEAK DATA: 47.09 ° @ 5.94 S; -9.95 ° @ -1.00 S

CHANNEL: RHPXD FILTER: CH. CLASS 60

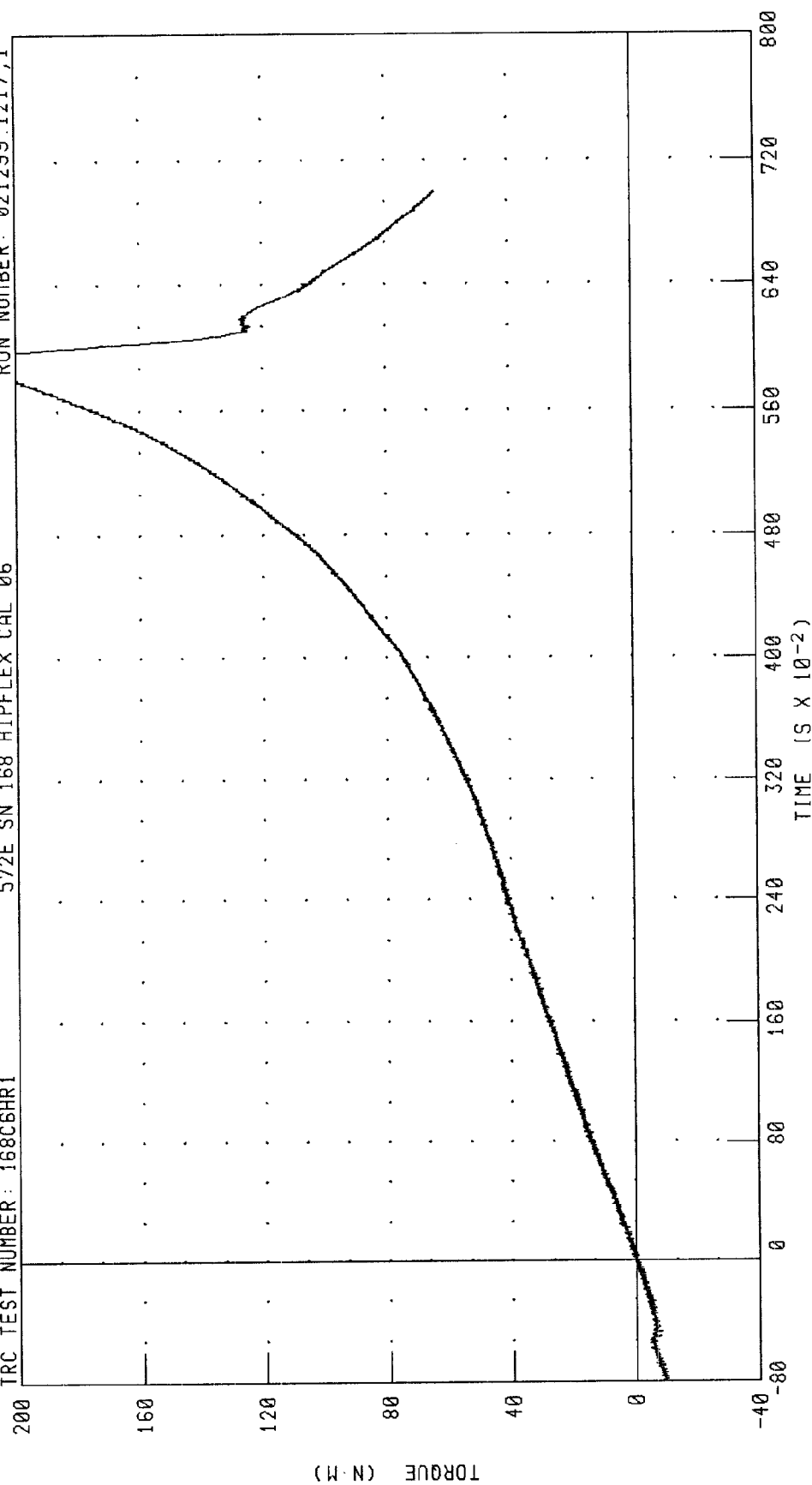
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

RIGHT HIP FLEXION MOMENT

TRC TEST NUMBER: 168C6HR1

572E SN 168 HIPFLEX CAL 06

RUN NUMBER: 021299.1217,1



PEAK DATA: 218.05 N·m @ 5.93 s; -14.02 N·m @ -0.97 s

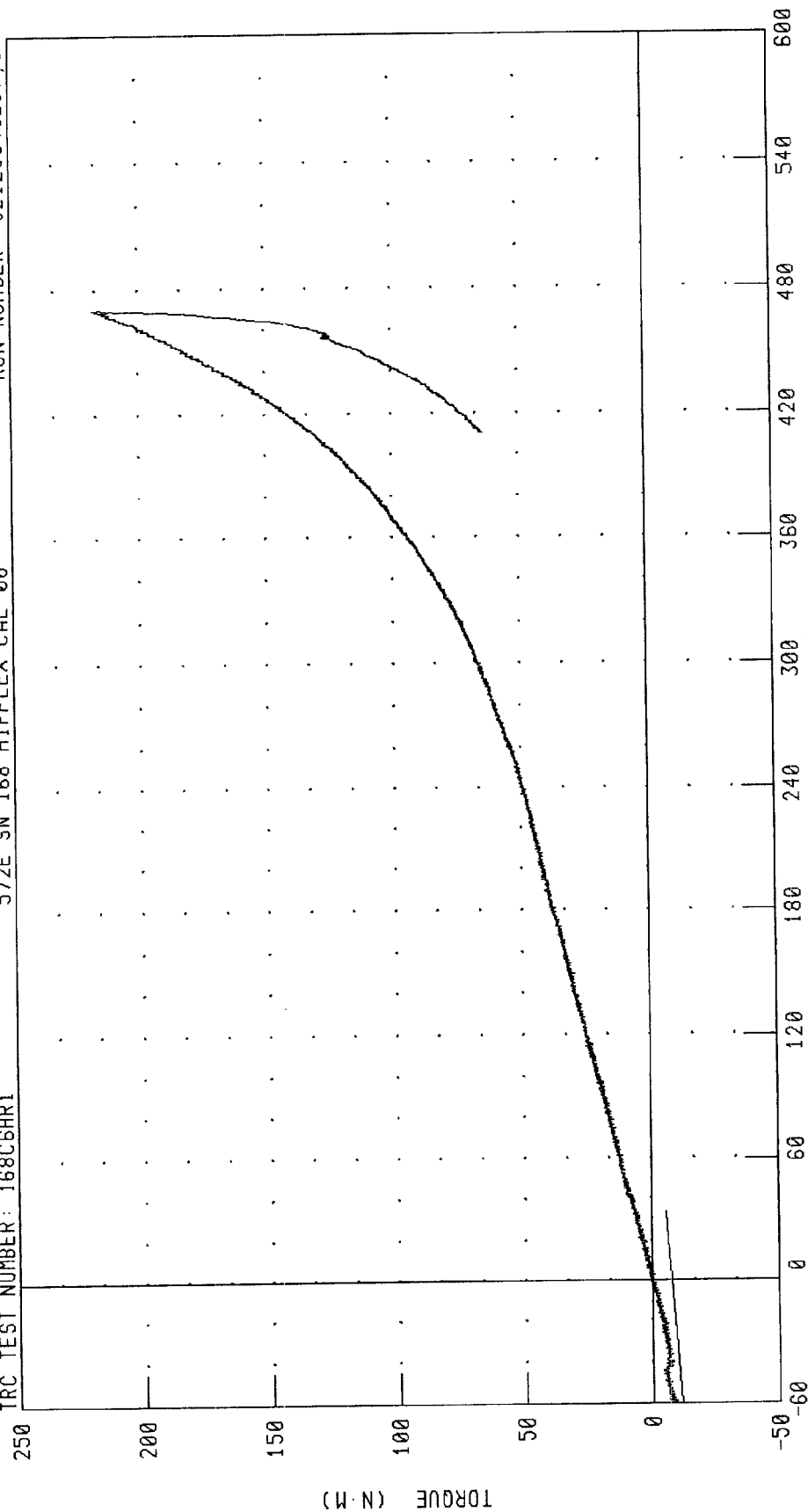
CHANNEL: RHPYM FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
 RIGHT HIP FLEXION MOMENT VS ROTATION ANGLE

TRC TEST NUMBER: 168C6HR1

572E SN 168 HIPFLEX CAL 06

RUN NUMBER: 021299.1217;1



ANGLE (° X 10⁻¹)

PEAK DATA: 47.09 ° 0 5.94 S; -9.95 ° 0 -1.00 S
 218.05 N·M 0 5.93 S; -14.02 N·M 0 -0.97 S

CHANNEL: RHPXD
 RHPYM

FILTER: CH. CLASS 60
 CH. CLASS 60

TORQUE (N·M)

TRANSPORTATION RESEARCH CENTER INC.

LEFT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

12-FEB-99

TRC INC.

TEST NO: 168C6HL1

572E SN 168 HIPFLEX CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	68.4 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	44.2 deg.

TEST MEETS SPECIFICATIONS

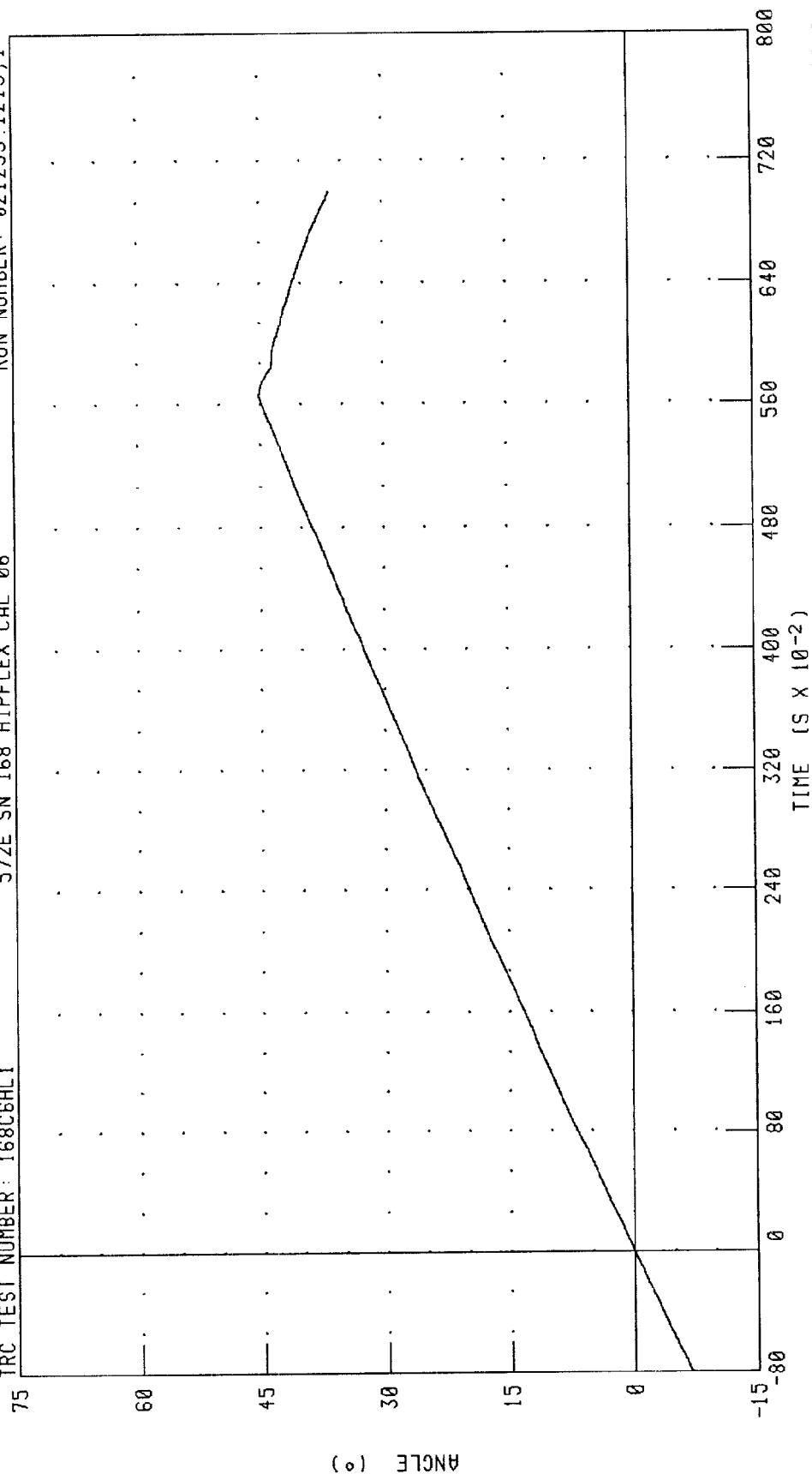
TECHNICIAN Ry Calt

RUN NUMBER: 021299.1213;1

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
 LEFT HIP FLEXION ROTATION
 572E SN 168 HIPFLEX CAL 06

RUN NUMBER: 021299.1213;1

TRC TEST NUMBER: 168C6HL1

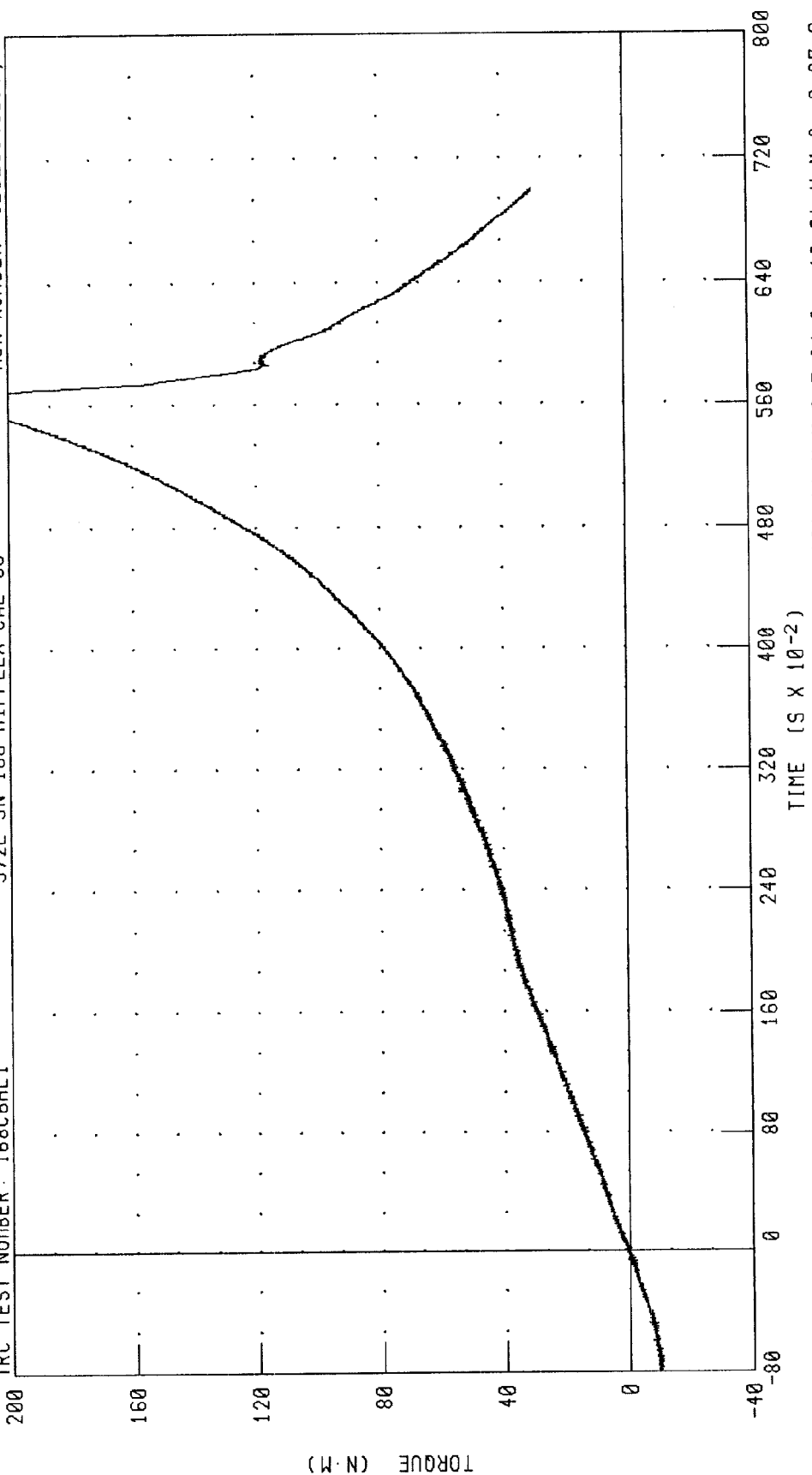


PEAK DATA: 45.18 ° @ 5.66 S; -10.10 ° @ -1.00 S

CHANNEL: LHPXD FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
LEFT HIP FLEXION MOMENT

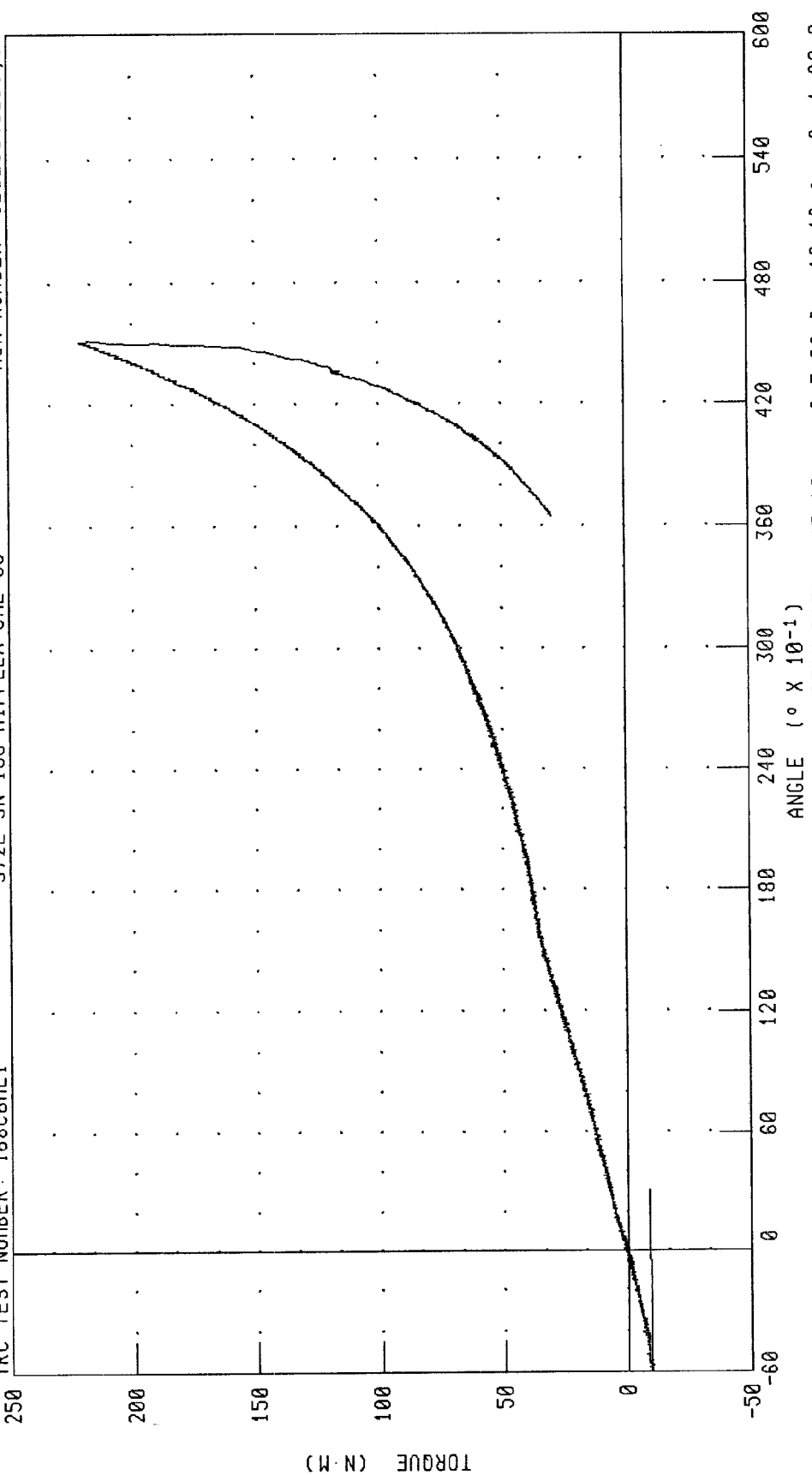
TRC TEST NUMBER: 168C6HL1 572E SN 168 HIPFLEX CAL 06 RUN NUMBER: 021299.1213,1



CHANNEL: LHPYM FILTER: CH. CLASS 60 PEAK DATA: 221.11 N·M @ 5.64 S, -10.91 N·M @ -0.97 S

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
LEFT HIP FLEXION MOMENT VS ROTATION ANGLE

TRC TEST NUMBER: 168C6HL1 572E SN 168 HIPFLEX CAL 06 RUN NUMBER: 021299.1213;1



CHANNEL: LHPXD FILTER: CH. CLASS 60
LHPYM CH. CLASS 60

PEAK DATA: 45.18 ° 0 5.66 S; -10.10 ° 0 -1.00 S
221.11 N·M 0 5.64 S; -10.91 N·M 0 -0.97 S

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th

12-FEB-99

TRC INC.

TEST NO: 168C6RK1

572E SN168 RIGHT KNEE CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5376.5 N

TEST MEETS SPECIFICATIONS

TECHNICIAN B. E. L. T.

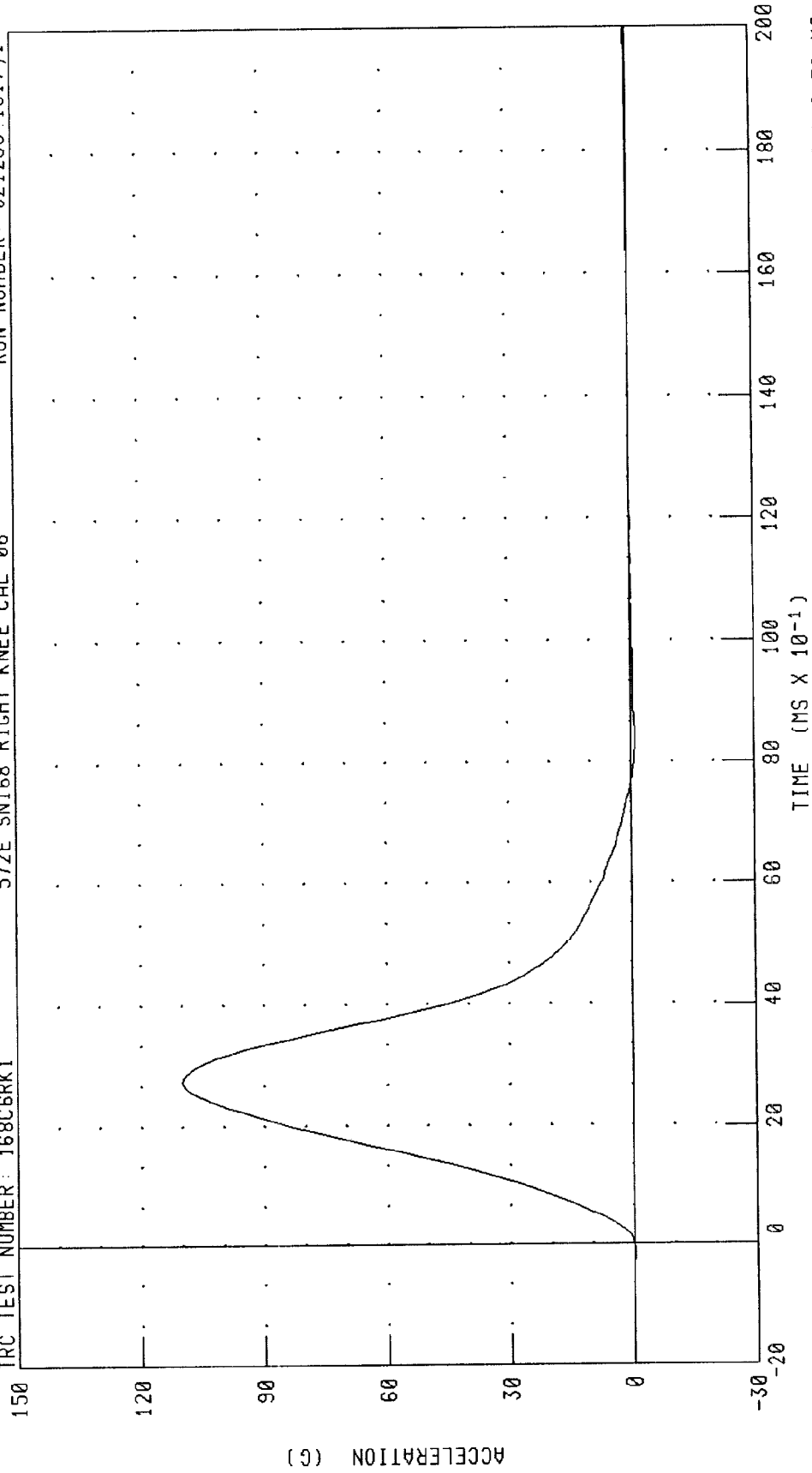
RUN NUMBER: 021299.1017;1

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

572E SN168 RIGHT KNEE CAL 06

TRC TEST NUMBER: 168C6RK1

RUN NUMBER: 021299.1017;1



CHANNEL: PENXC

FILTER: CH. CLASS 600

PEAK DATA:

109.89 G @ 2.72 MS; -0.99 G @ 8.32 MS

PART 572-E HYBRID III RIGHT KNEE CALIBRATION

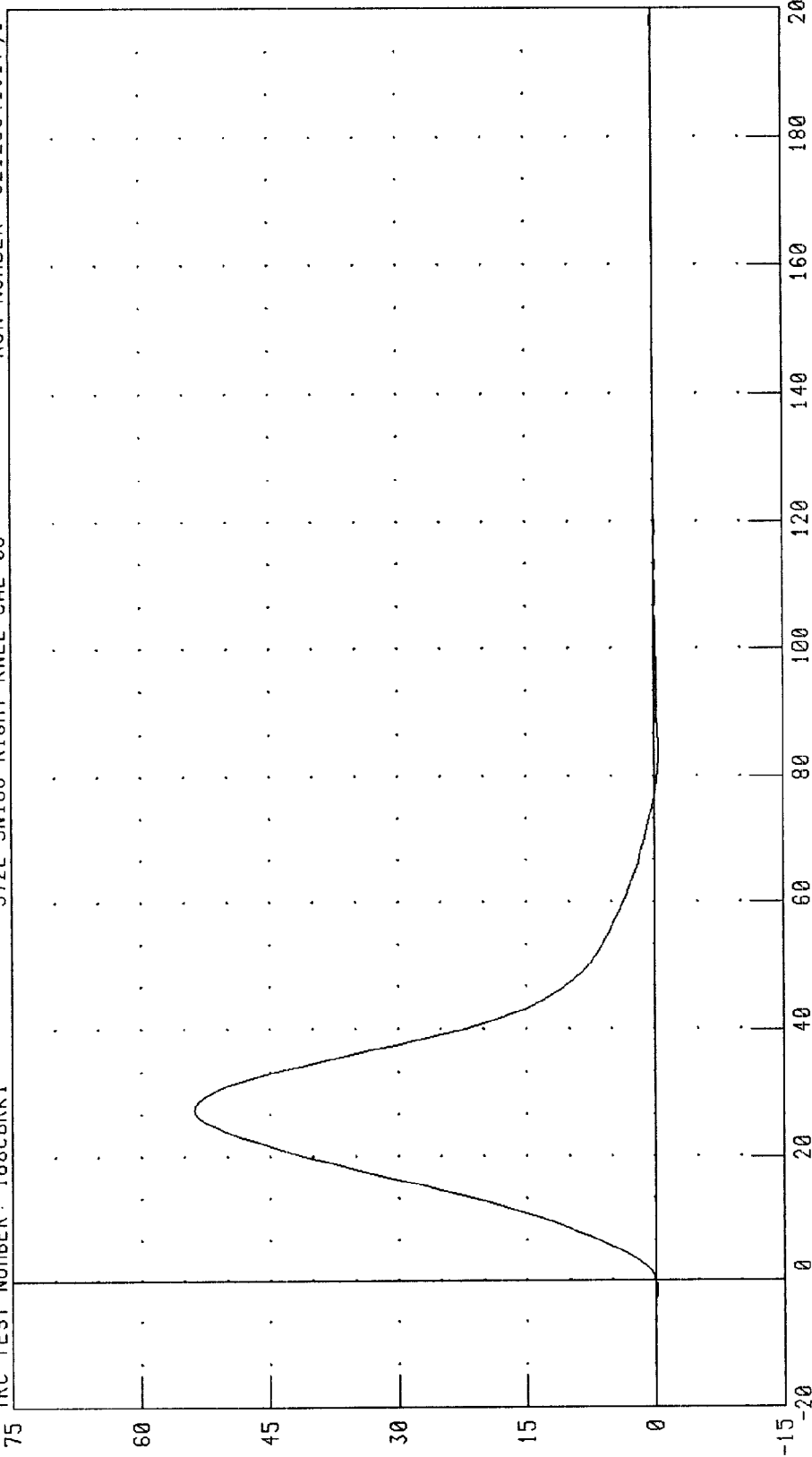
PENDULUM FORCE (5 KC PEND.)

572E SN168 RIGHT KNEE CAL 06

RUN NUMBER: 021299.1017;1

TRC TEST NUMBER: 168C6RK1

75



FORCE (N X 10²)

TIME (MS X 10⁻¹)

PEAK DATA: 5376.51 N @ 2.72 MS; -48.32 N @ 8.32 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th

12-FEB-99

TRC INC.

TEST NO: 168C6LK1

572E SN168 LEFT KNEE CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5652.8 N

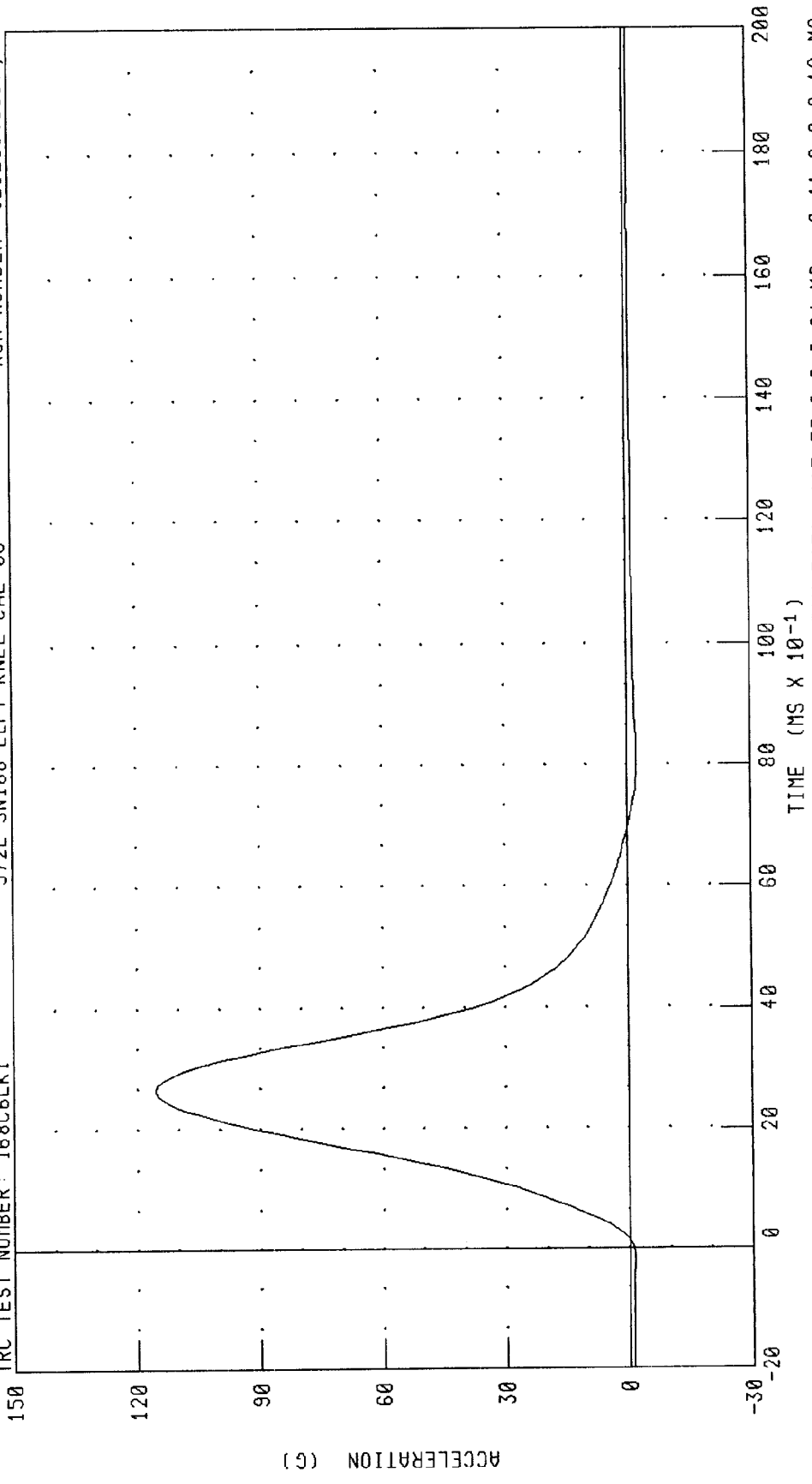
TEST MEETS SPECIFICATIONS

TECHNICIAN B. C. L. T.

RUN NUMBER: 021299.1014;1

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

TRC TEST NUMBER: 168C6LK1 572E SN168 LEFT KNEE CAL 06 RUN NUMBER: 021299.1015,1



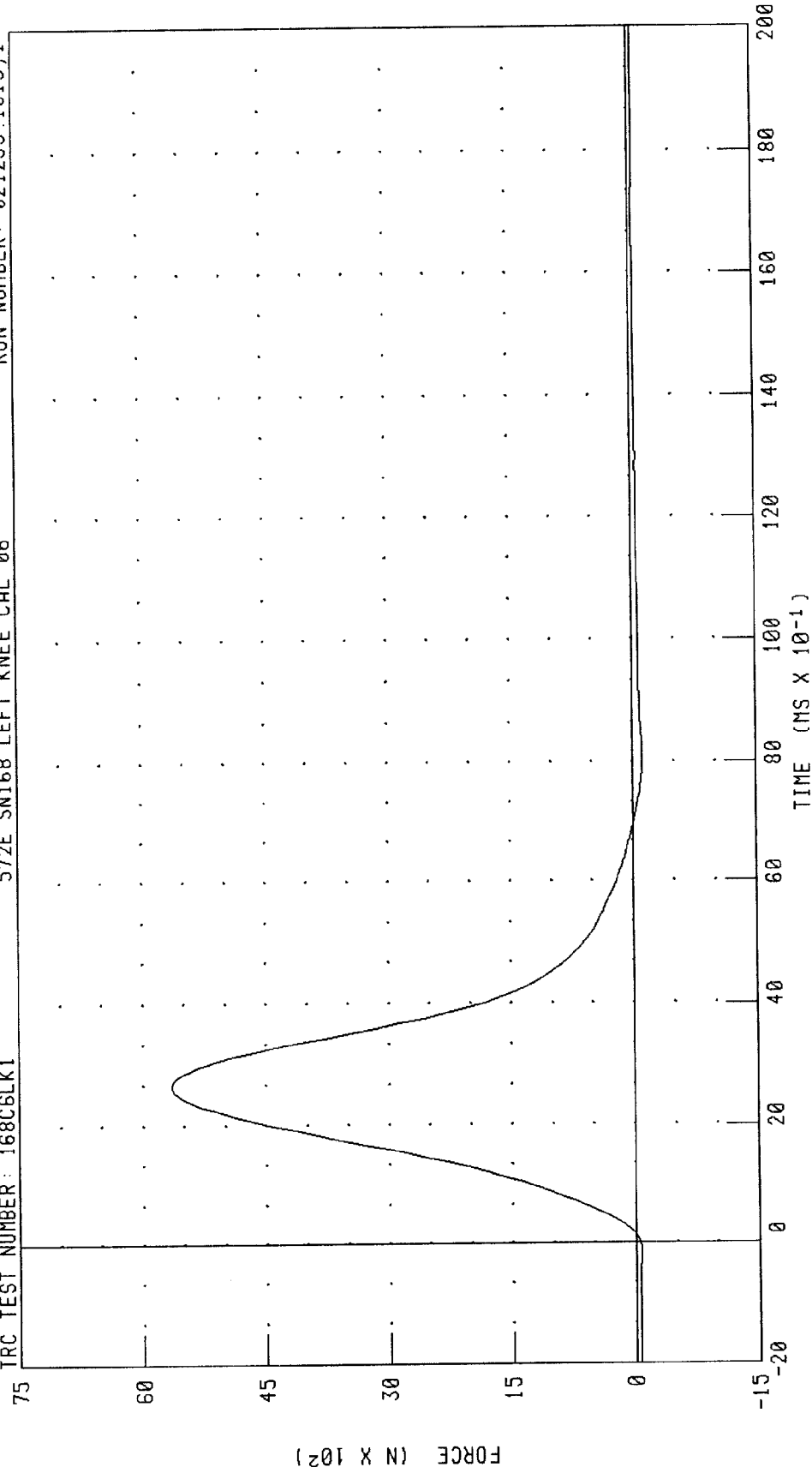
CHANNEL: PENXC FILTER: CH. CLASS 600 PEAK DATA: 115.53 G @ 2.64 MS, -2.41 G @ 8.16 MS

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

TRC TEST NUMBER: 168C6LK1

572E SN168 LEFT KNEE CAL 06

RUN NUMBER: 021299.1015;1



PEAK DATA: 5652.81 N @ 2.64 MS, -118.16 N @ 8.16 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

Pre-Test Dummy Certification

Passenger Dummy S/N 169

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th

05-FEB-99

TRC INC.

TEST NO: 169C4HD1

572E SN169 HEAD DROP CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	245.33 G
PEAK LATERAL ACCELERATION	15 G MAX	0.78 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

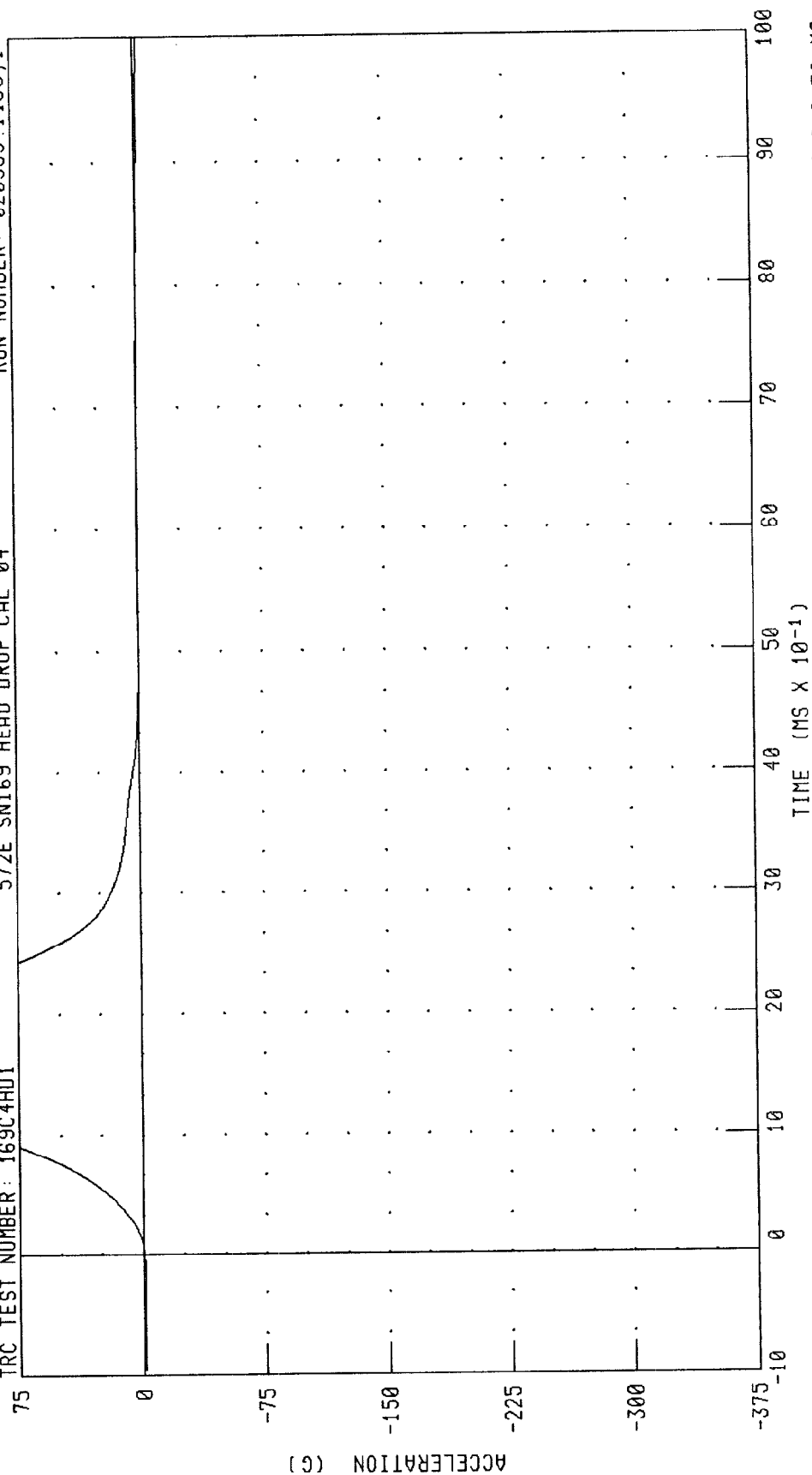
TECHNICIAN Kevin Watkins

RUN NUMBER: 020599.1105;1

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION X AXIS
 572E SN169 HEAD DROP CAL 04

TRC TEST NUMBER: 169C4HD1

RUN NUMBER: 020599.1105;1

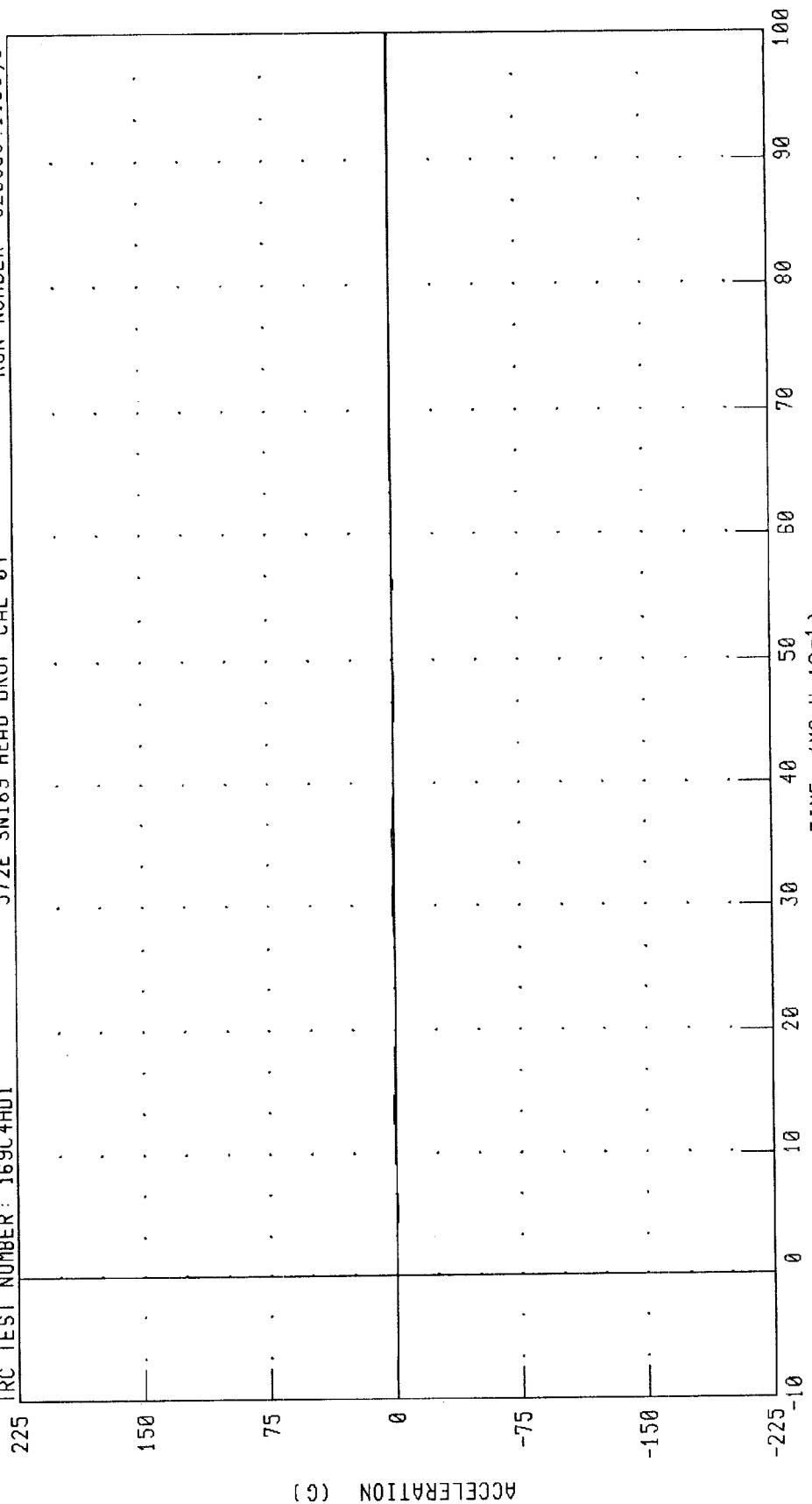


CHANNEL: HEDXC FILTER: CH. CLASS 1000 PEAK DATA: 214.80 G @ 1.68 MS; -1.37 G @ 9.76 MS

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION Y AXIS
 572E SN169 HEAD DROP CAL 04

RUN NUMBER: 020599.1105,1

TRC TEST NUMBER: 169C4HD1



TIME (MS X 10⁻¹)

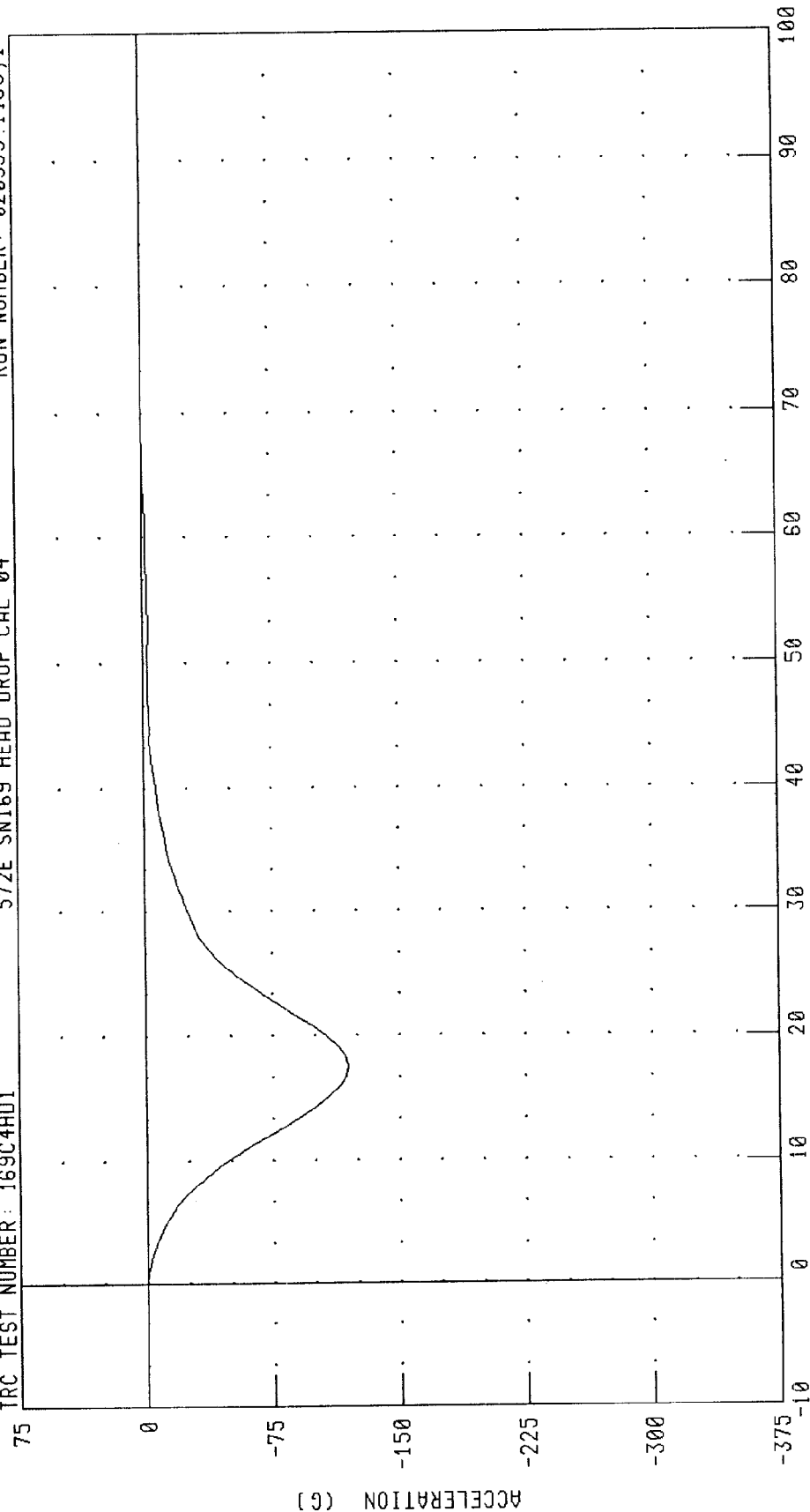
PEAK DATA: 0.79 G @ 1.28 MS; -0.59 G @ 0.48 MS

CHANNEL: HEDYC FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD ACCELERATION Z AXIS
 572E SN169 HEAD DROP CAL 04

RUN NUMBER: 020599.1105;1

TRC TEST NUMBER: 169C4HD1



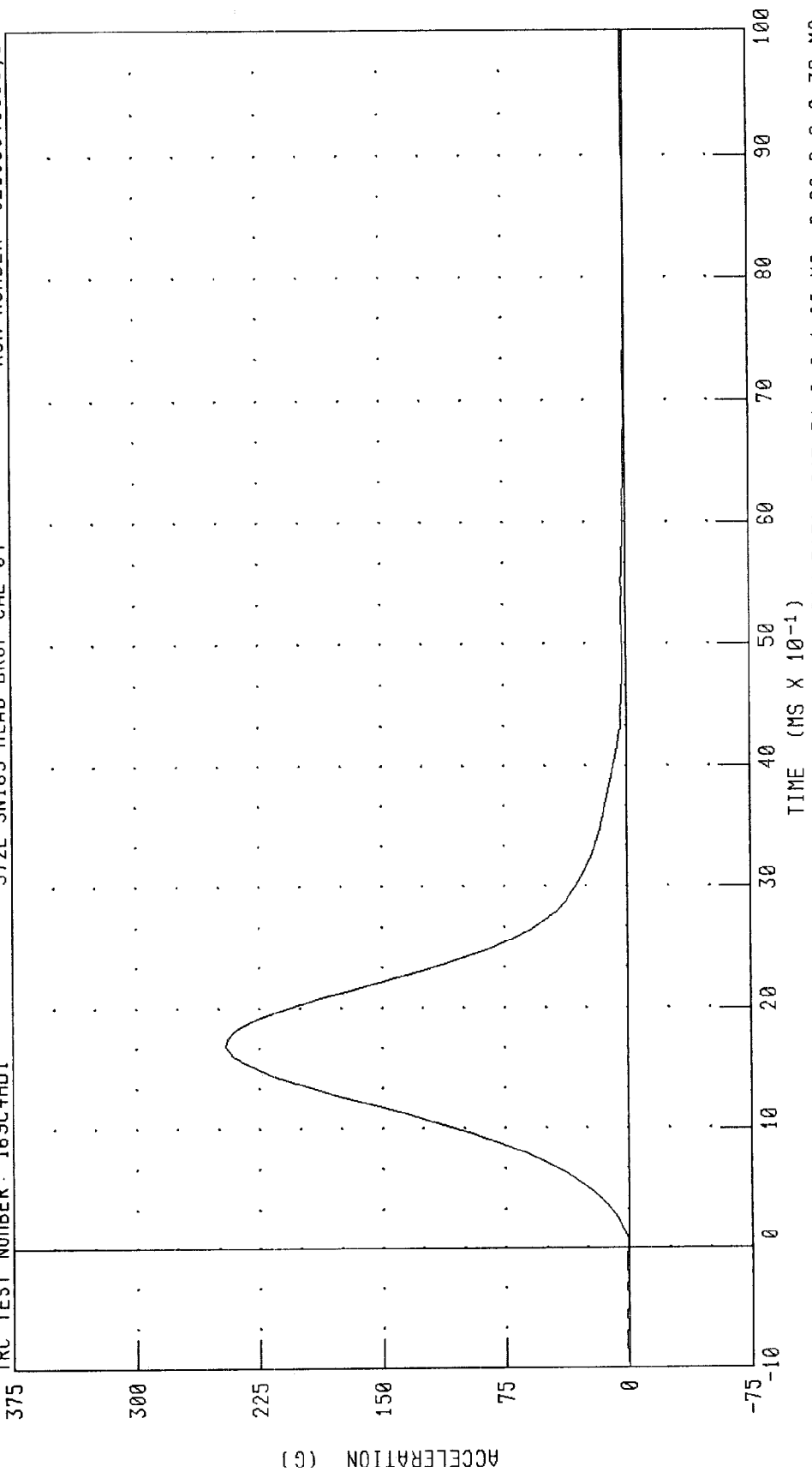
TIME (MS X 10⁻¹)

CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 0.39 G @ 7.12 MS, -119.52 G @ 1.76 MS

PART 572-E HYBRID III HEAD CALIBRATION
 HEAD RESULTANT ACCELERATION
 572E SN169 HEAD DROP CAL 04

RUN NUMBER: 020599.1105;1

TRC TEST NUMBER: 169C4HD1

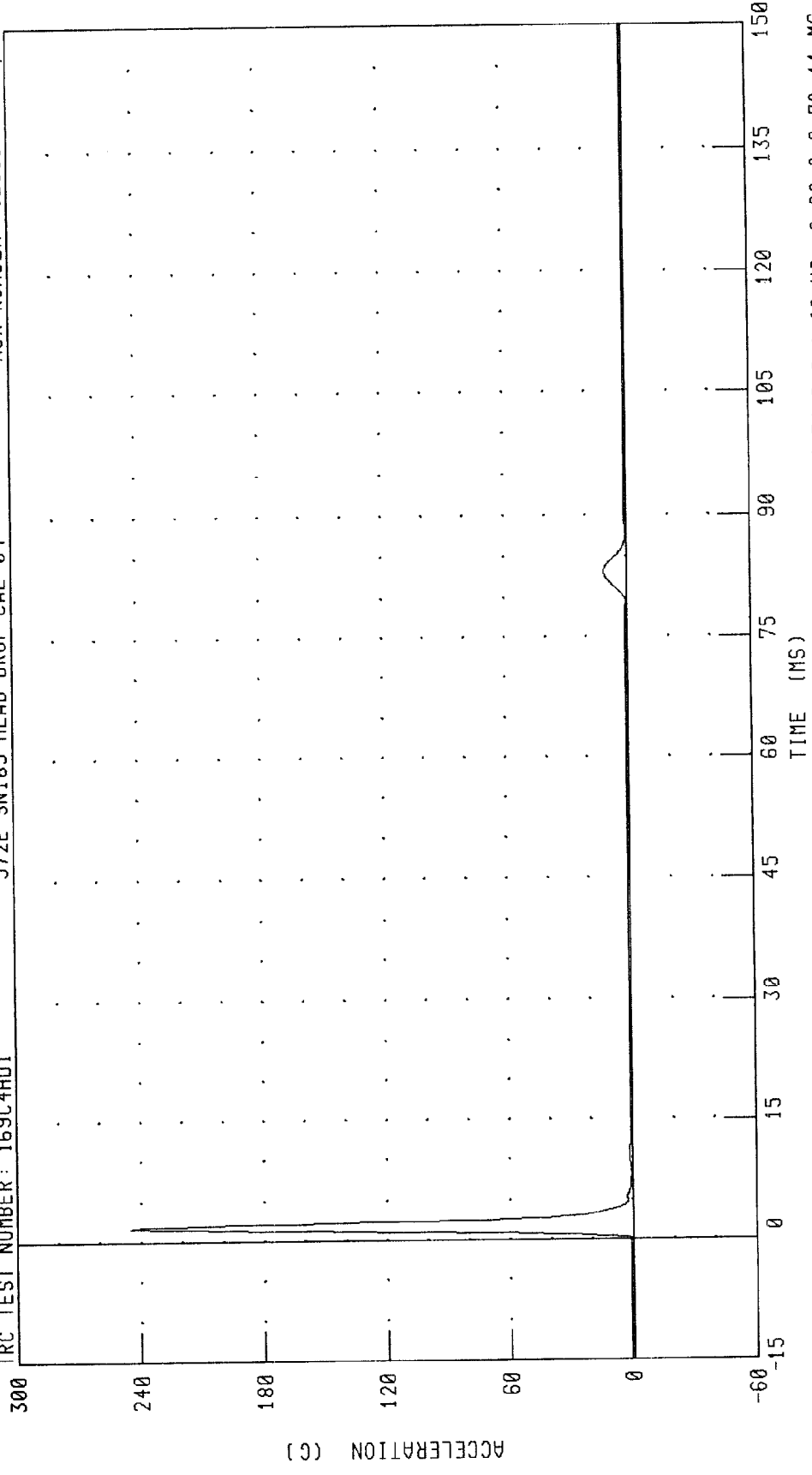


PEAK DATA: 245.34 G @ 1.68 MS; 0.28 G @ 8.32 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 169C4HD1 572E SN169 HEAD DROP CAL 04 RUN NUMBER: 020599.1105;1



CHANNEL: HEADRG FILTER: CH. CLASS 1000 PEAK DATA: 245.34 G @ 1.68 MS; 0.00 G @ 79.44 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

12-FEB-99

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 169C4NF2 572E SN169 NECK FLEXION CAL4

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.43 G
	20 MS	17.60 - 22.60 G	21.83 G
	30 MS	12.50 - 18.50 G	16.02 G
MAX PENDULUM G		29 G MAX	24.07 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	15.97 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	39.52 MS
D PLANE	MAX	64 - 78 DEG.	66.44 DEG.
ROTATION	TIME	57 - 64 MS	57.20 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	97.97 NM
	TIME	47 - 58 MS	52.48 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	113.28 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	104.48 MS

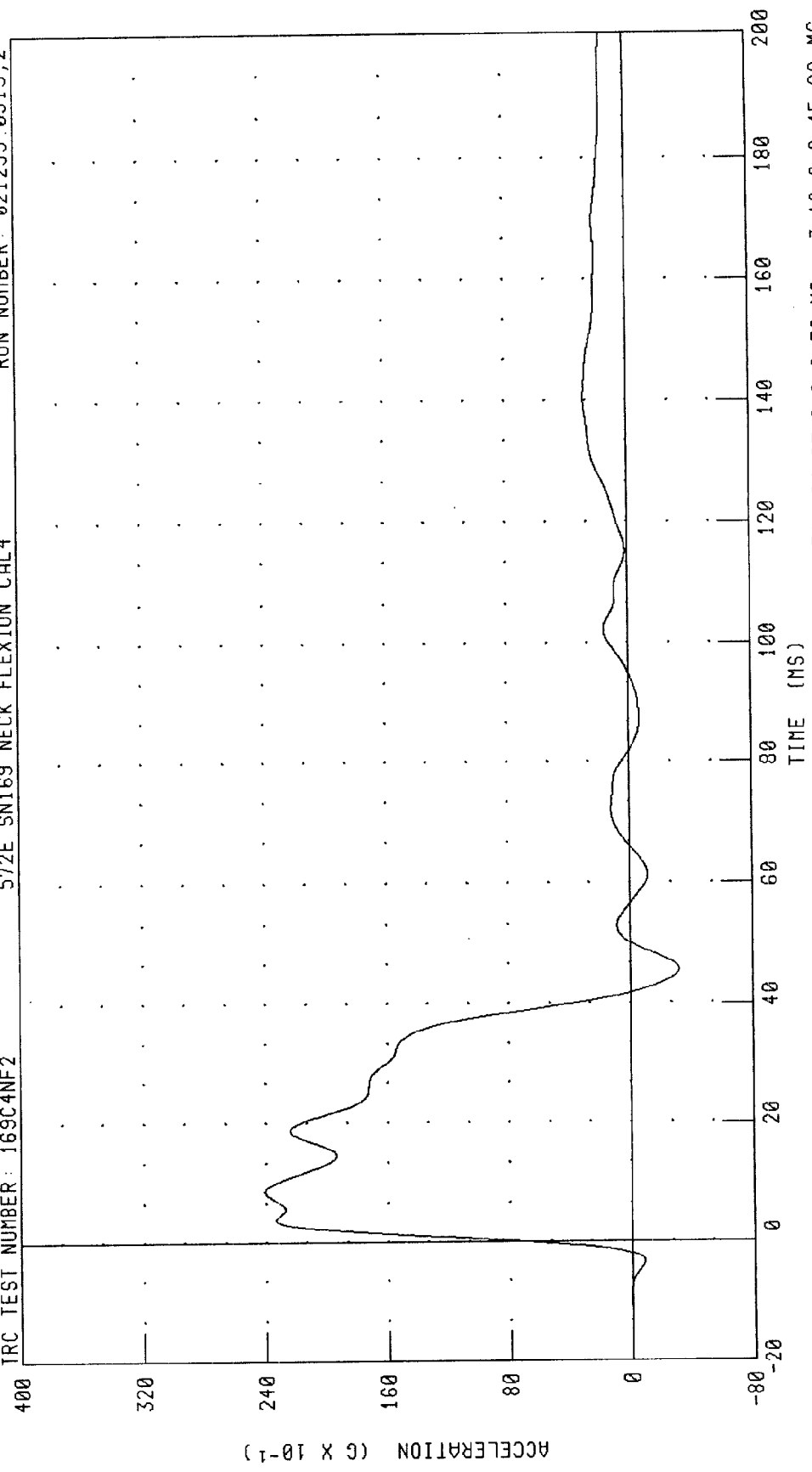
TEST MEETS SPECIFICATIONS

TECHNICIAN B. Calt

RUN NUMBER: 021299.0918;2

PART 572-E HYBRID III NECK FLEXION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 169C4NF2 572E SN169 NECK FLEXION CAL4 RUN NUMBER: 021299.0919;2



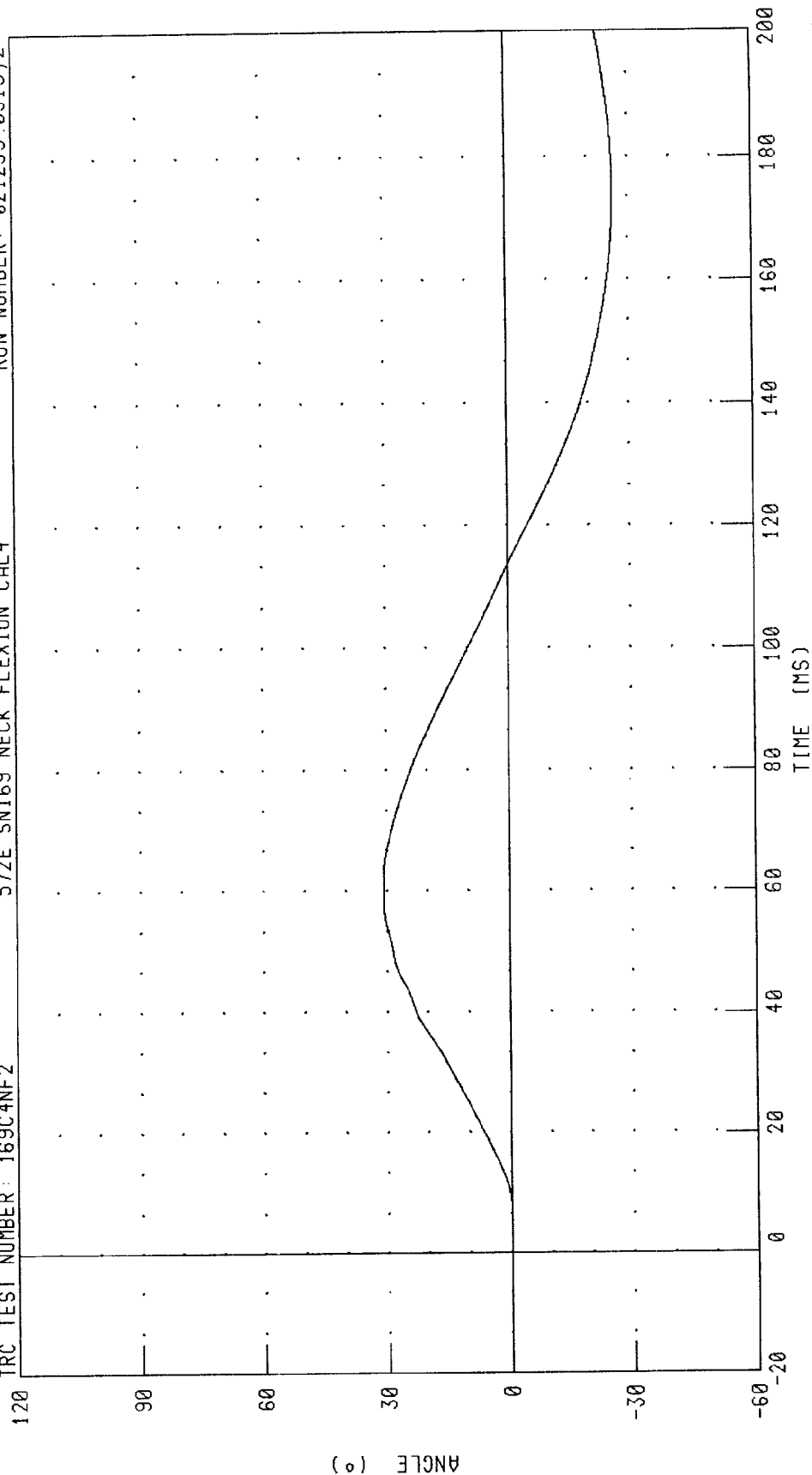
PEAK DATA: 24.07 G @ 8.72 MS; -3.18 G @ 45.68 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
 ROTATION ABOUT BASE OF NECK
 572E SN169 NECK FLEXION CAL4

RUN NUMBER: 021299.0919;2

TRC TEST NUMBER: 169C4NF2



PEAK DATA: 30.68 ° @ 62.48 MS; -26.36 ° @ 173.68 MS

CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 169C4NF2

572E SN169 NECK FLEXION CAL4

RUN NUMBER: 021299.0919;2

120

90

60

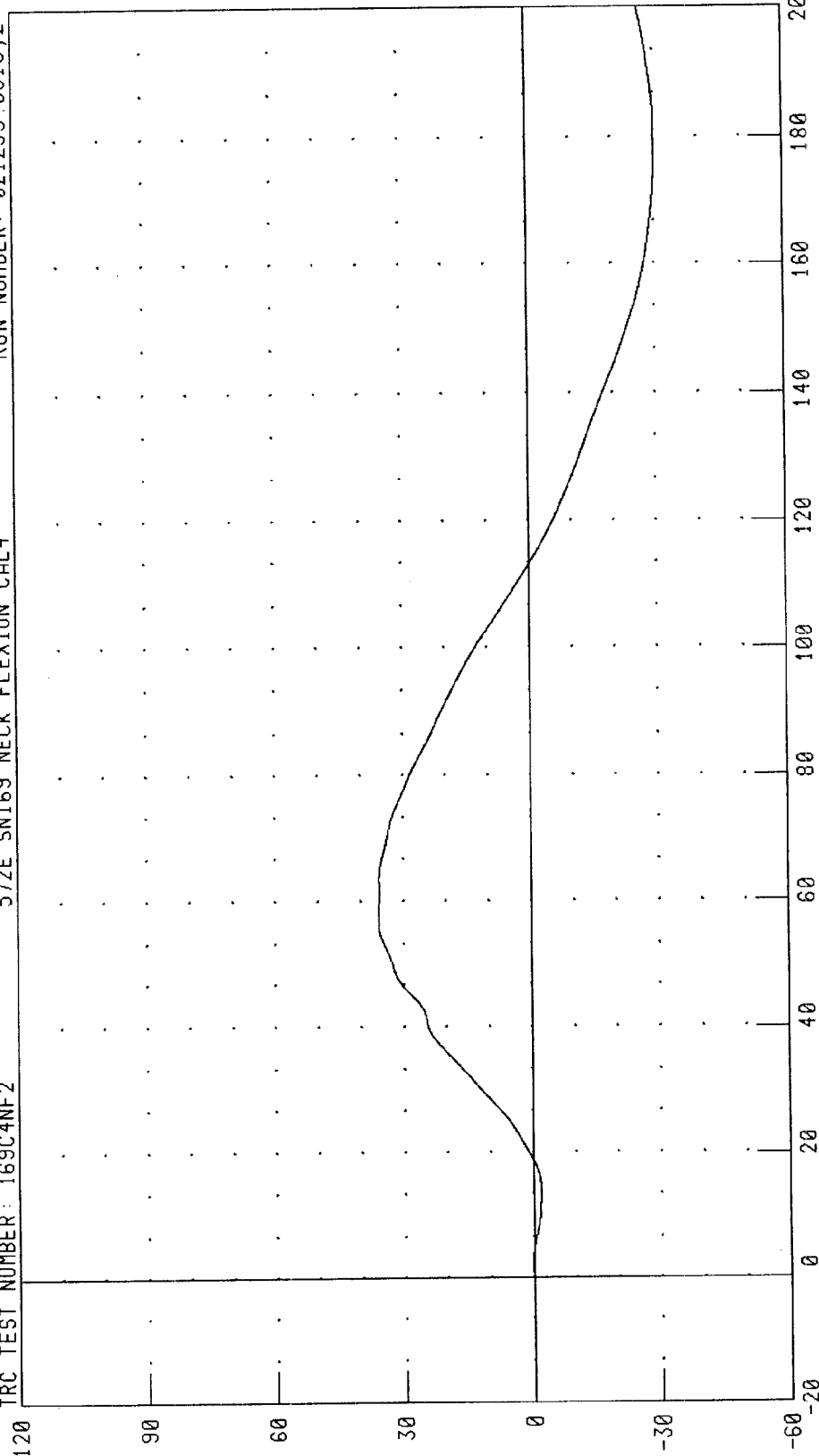
30

0

-30

-60

ANGLE (°)



TIME (MS)

PEAK DATA: 35.85 ° @ 56.96 MS; -30.16 ° @ 180.48 MS

CHANNEL: THETA FILTER: CH. CLASS 60

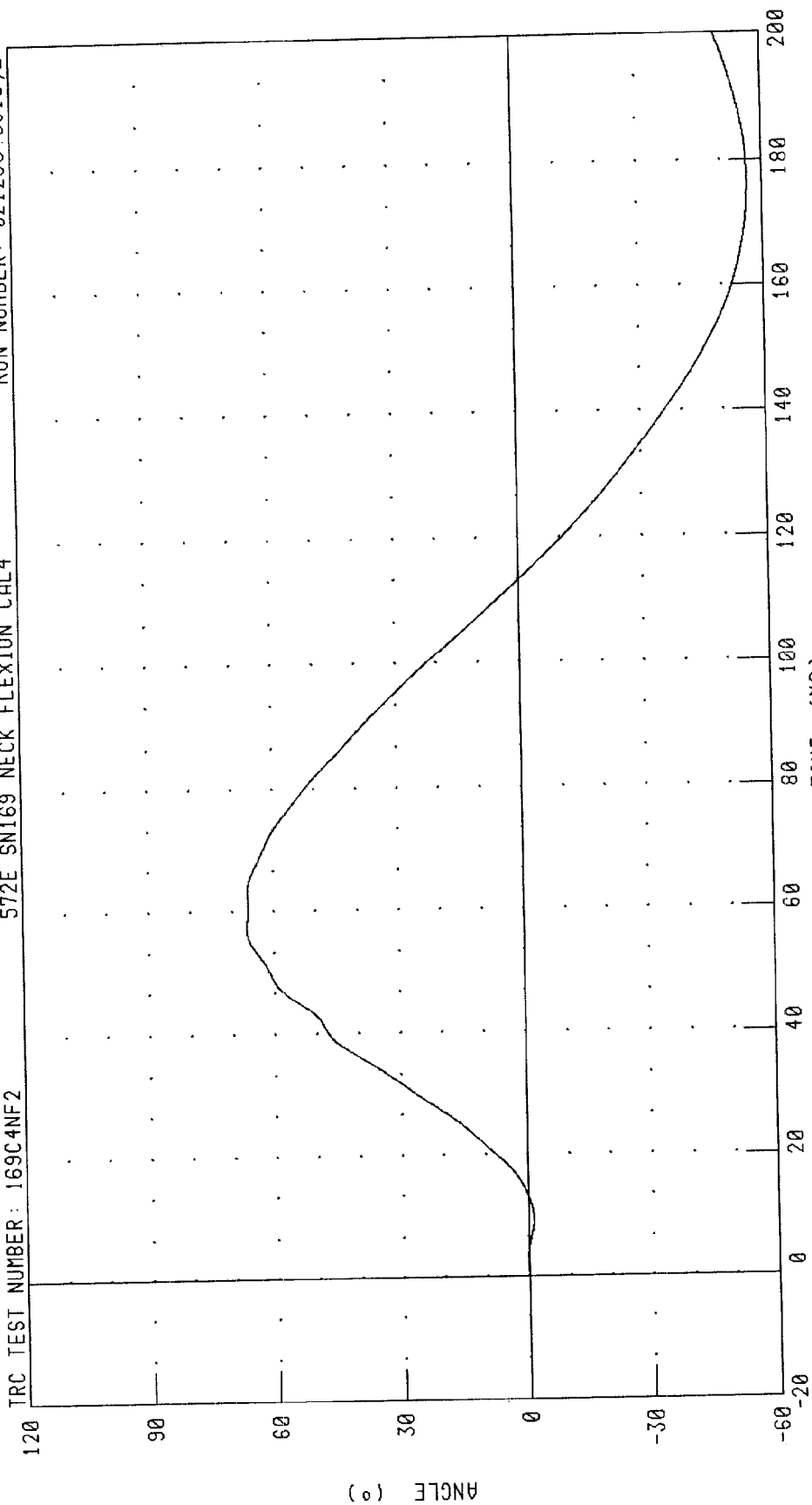
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

RUN NUMBER: 021299 0919;2

572E SNI69 NECK FLEXION CAL4

TRC TEST NUMBER: 169C4NF2



PEAK DATA: 66.44 ° @ 57.20 MS; -56.38 ° @ 177.12 MS

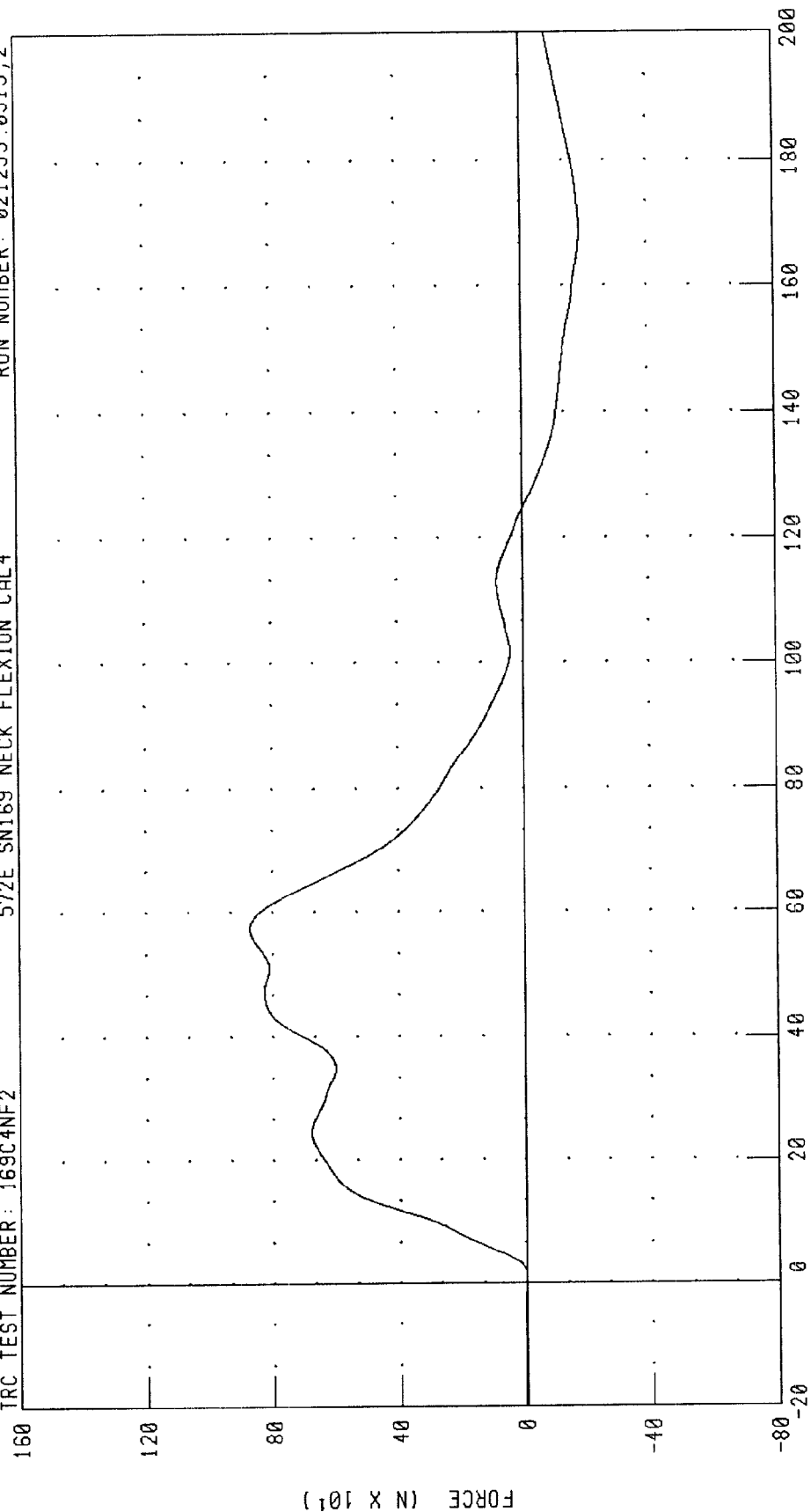
CHANNEL: TOTAL FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION
NECK FORCE X AXIS

TRC TEST NUMBER: 169C4NF2

572E SN169 NECK FLEXION CAL4

RUN NUMBER: 021299.0919;2

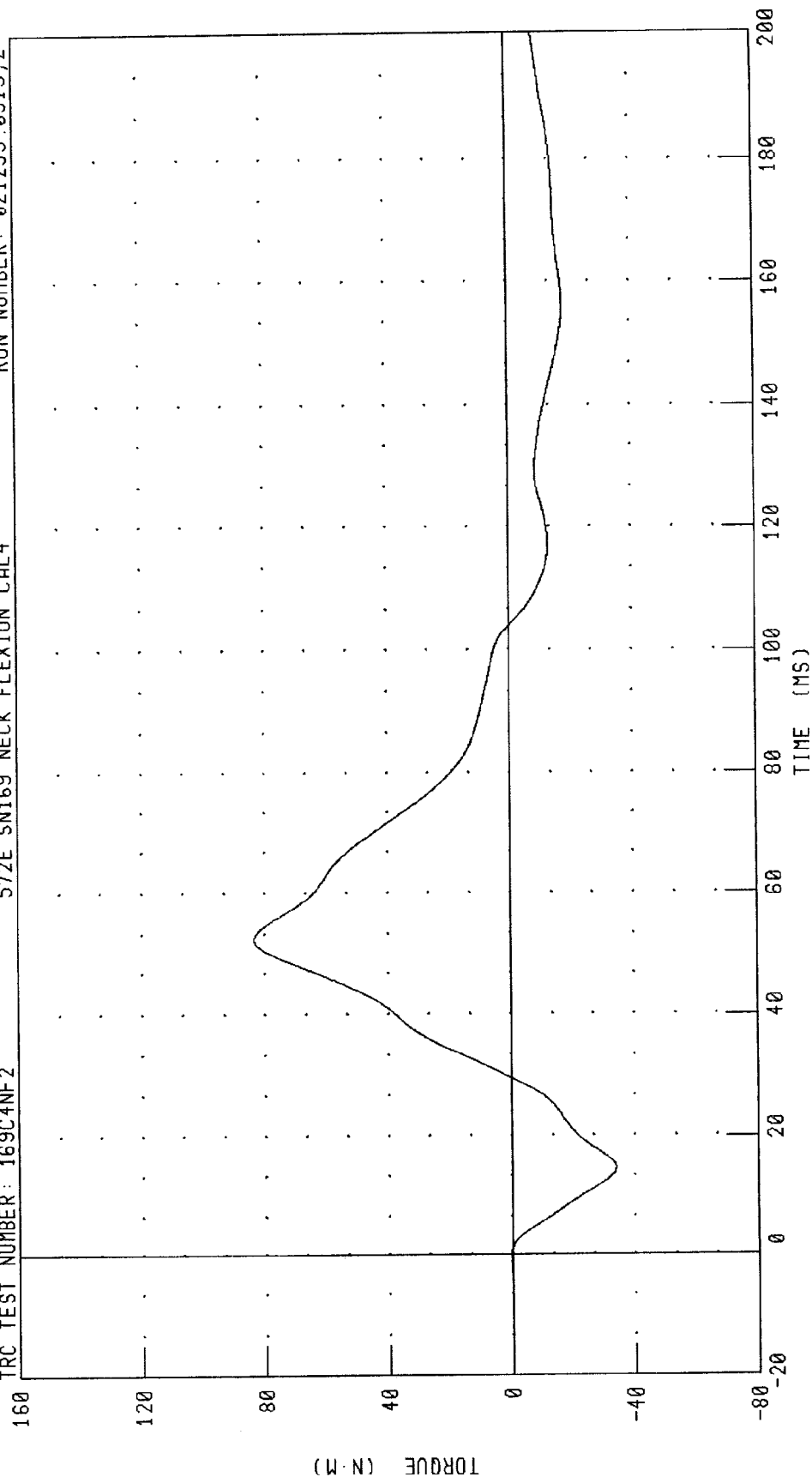


CHANNEL: NEKXF FILTER: CH. CLASS 60

PEAK DATA: 872.00 N @ 57.44 MS, -186.80 N @ 168.88 MS

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

TRC TEST NUMBER: 169C4NF2 572E SN169 NECK FLEXION CAL4 RUN NUMBER: 021299.0919;2



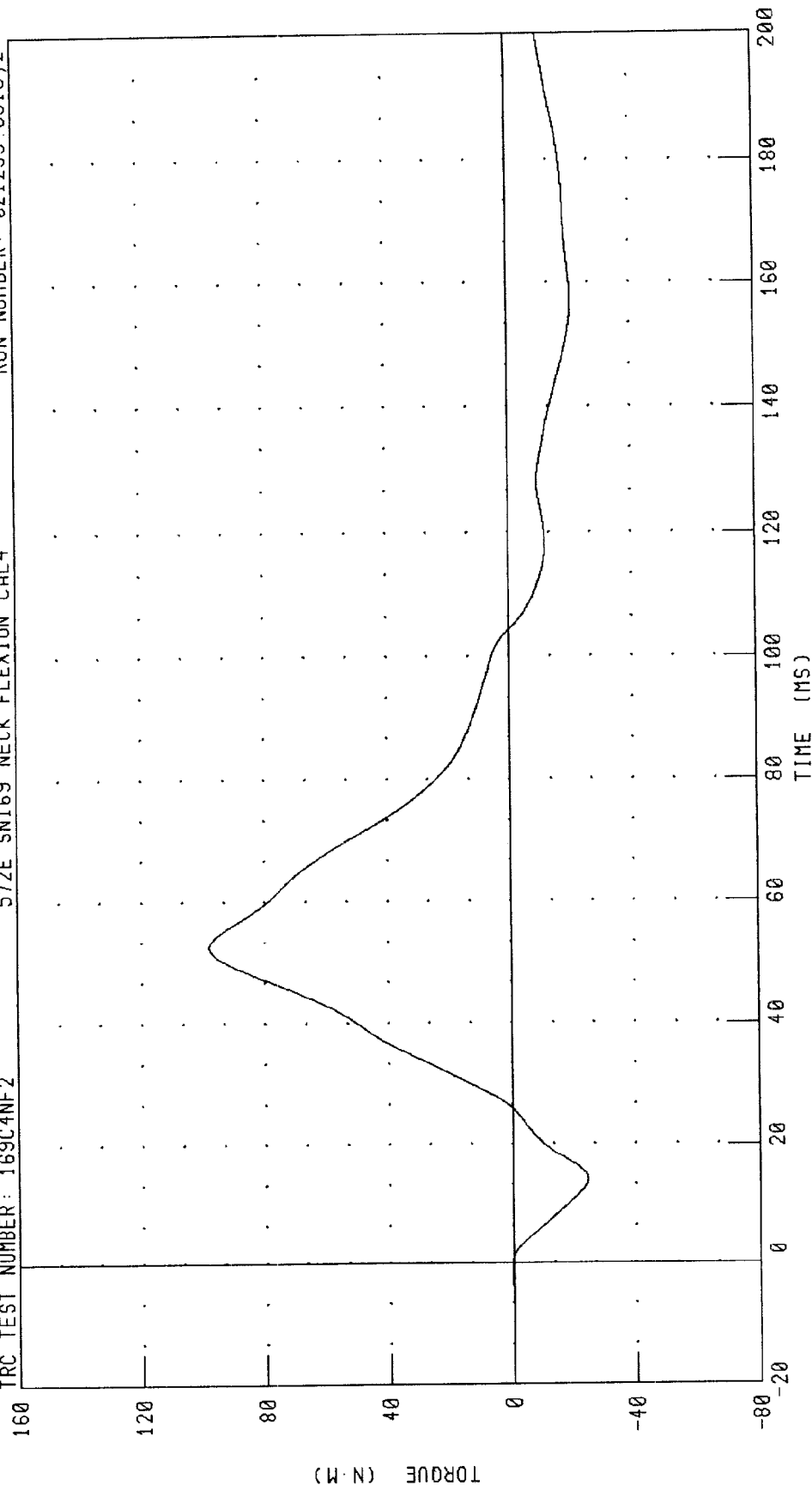
CHANNEL: NEKYM FILTER: CH. CLASS 60 PEAK DATA: 83.43 N·M @ 52.40 MS; -33.88 N·M @ 14.64 MS

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

TRC TEST NUMBER: 169C4NF2

572E SN169 NECK FLEXION CAL4

RUN NUMBER: 021299 0919;2



CHANNEL: NEKOM

FILTER: CH. CLASS 60

PEAK DATA: 97.97 N·M @ 52.48 MS; -24.35 N·M @ 14.16 MS

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

12-FEB-99

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 169C4NE1 572E SN 169 NECK EXT CAL4

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.00 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	19.05 G
	20 MS	14.00 - 19.00 G	17.16 G
	30 MS	11.00 - 16.00 G	15.82 G
MAX PENDULUM G		22 G MAX	19.38 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	15.78 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.72 MS
D PLANE	MAX	81 - 106 DEG.	98.72 DEG.
ROTATION	TIME	72 - 82 MS	76.64 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-68.58 NM
	TIME	65 - 79 MS	70.08 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	158.24 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	144.48 MS

TEST MEETS SPECIFICATIONS

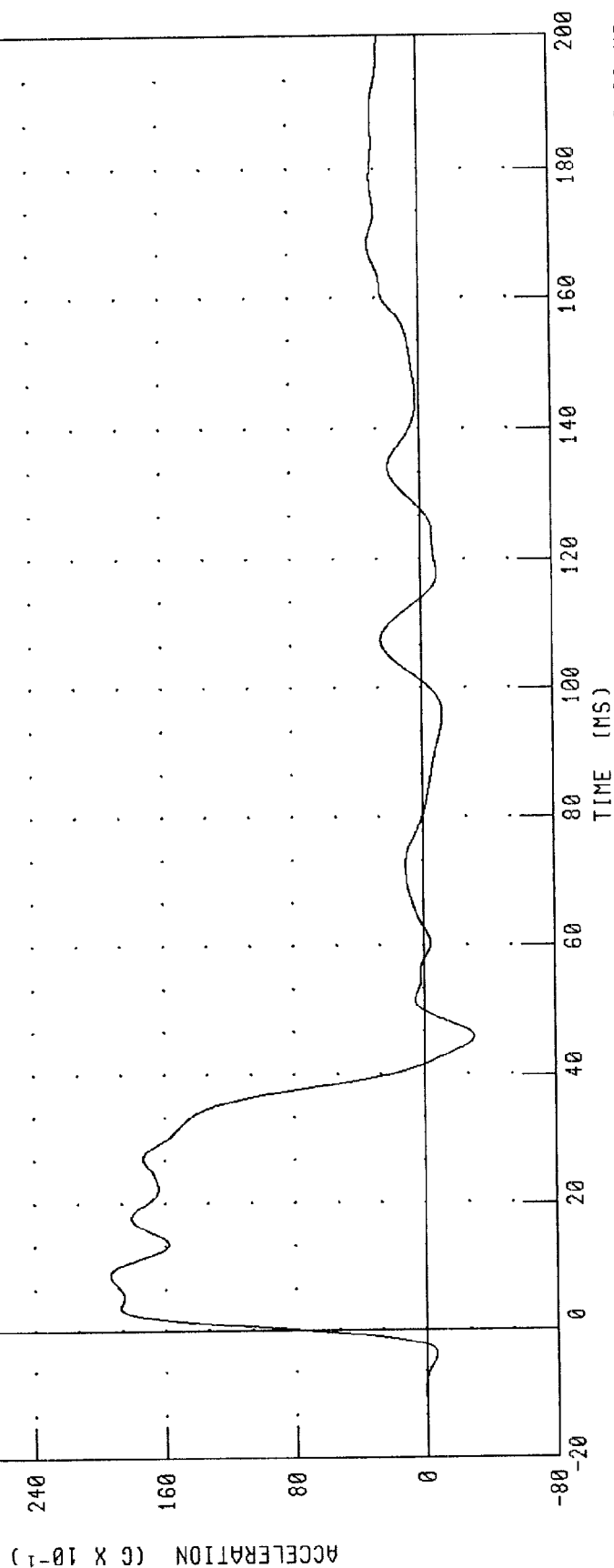
TECHNICIAN

B. cult

RUN NUMBER: 021299.1024;1

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 169C4NE1 572E SN 169 NECK EXT CAL4 RUN NUMBER: 021299.1024;1

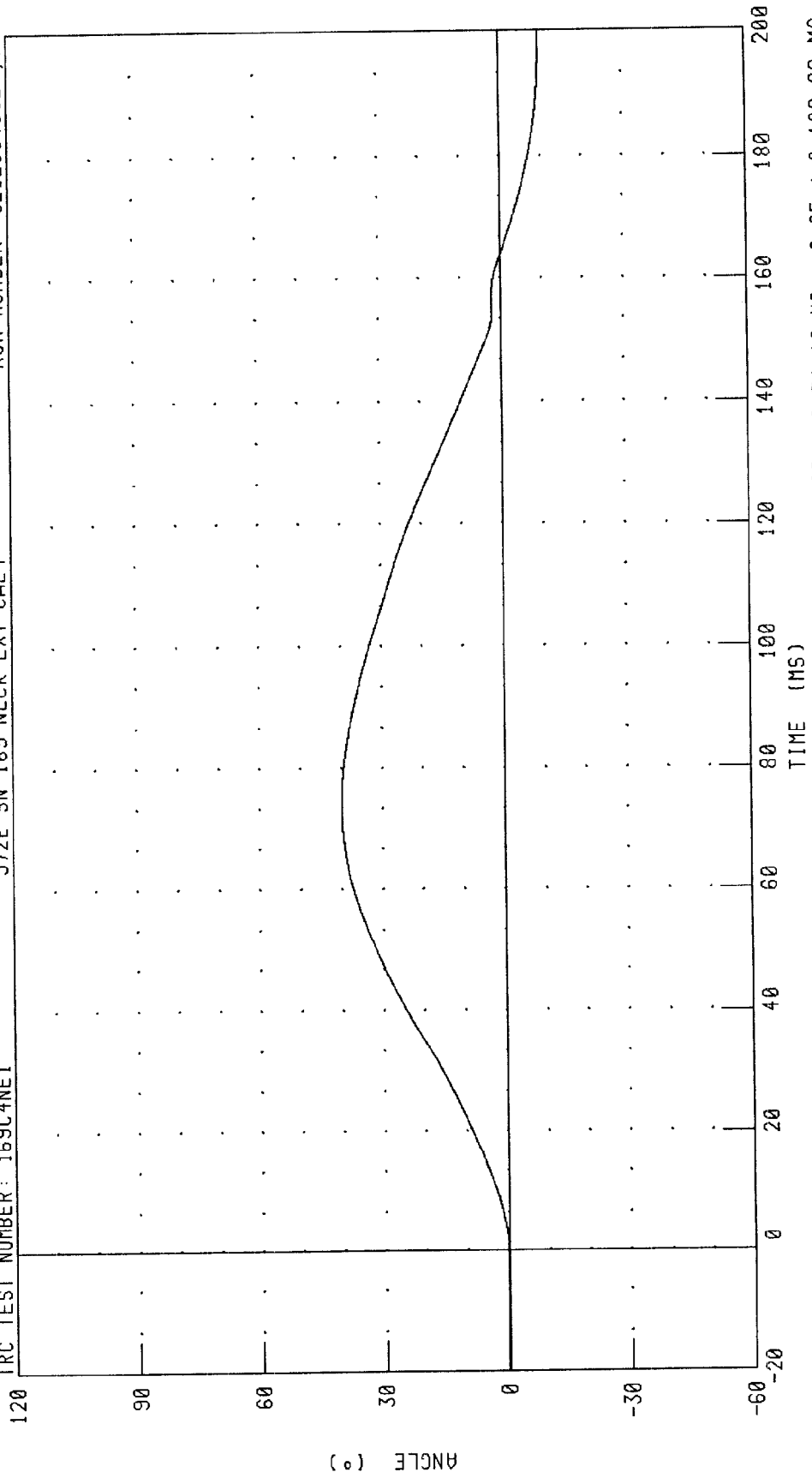


CHANNEL: PENXC FILTER: CH. CLASS 60

PEAK DATA: 19.39 G @ 8.96 MS; -3.05 G @ 45.92 MS

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

TRC TEST NUMBER: 169C4NE1 572E SN 169 NECK EXT CAL4 RUN NUMBER: 021299.1024,1



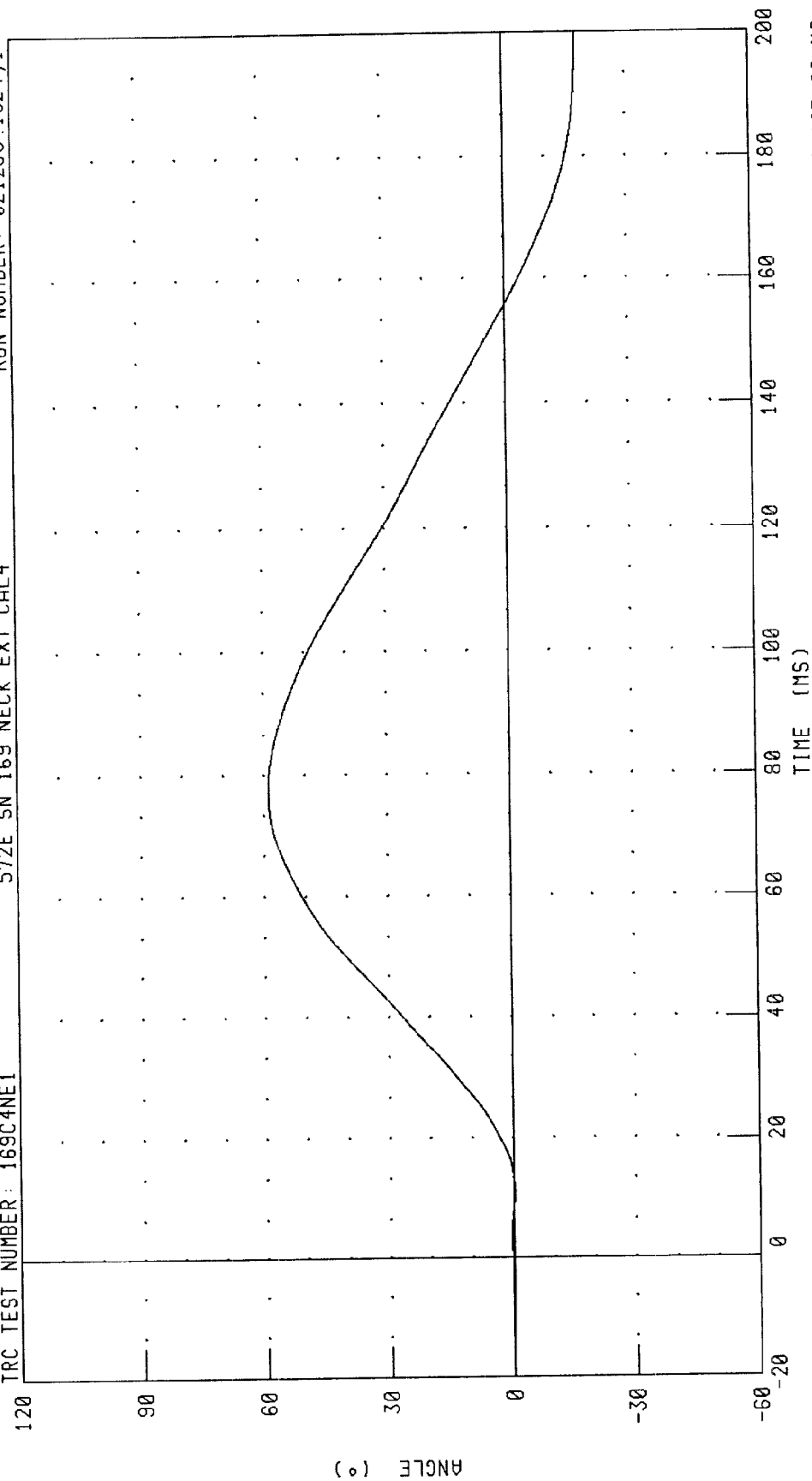
CHANNEL: BETA FILTER: CH. CLASS 60 PEAK DATA: 39.82 ° @ 74.16 MS; -9.65 ° @ 198.00 MS

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

TRC TEST NUMBER: 169C4NE1

572E SN 169 NECK EXT CAL4

RUN NUMBER: 021299.1024;1

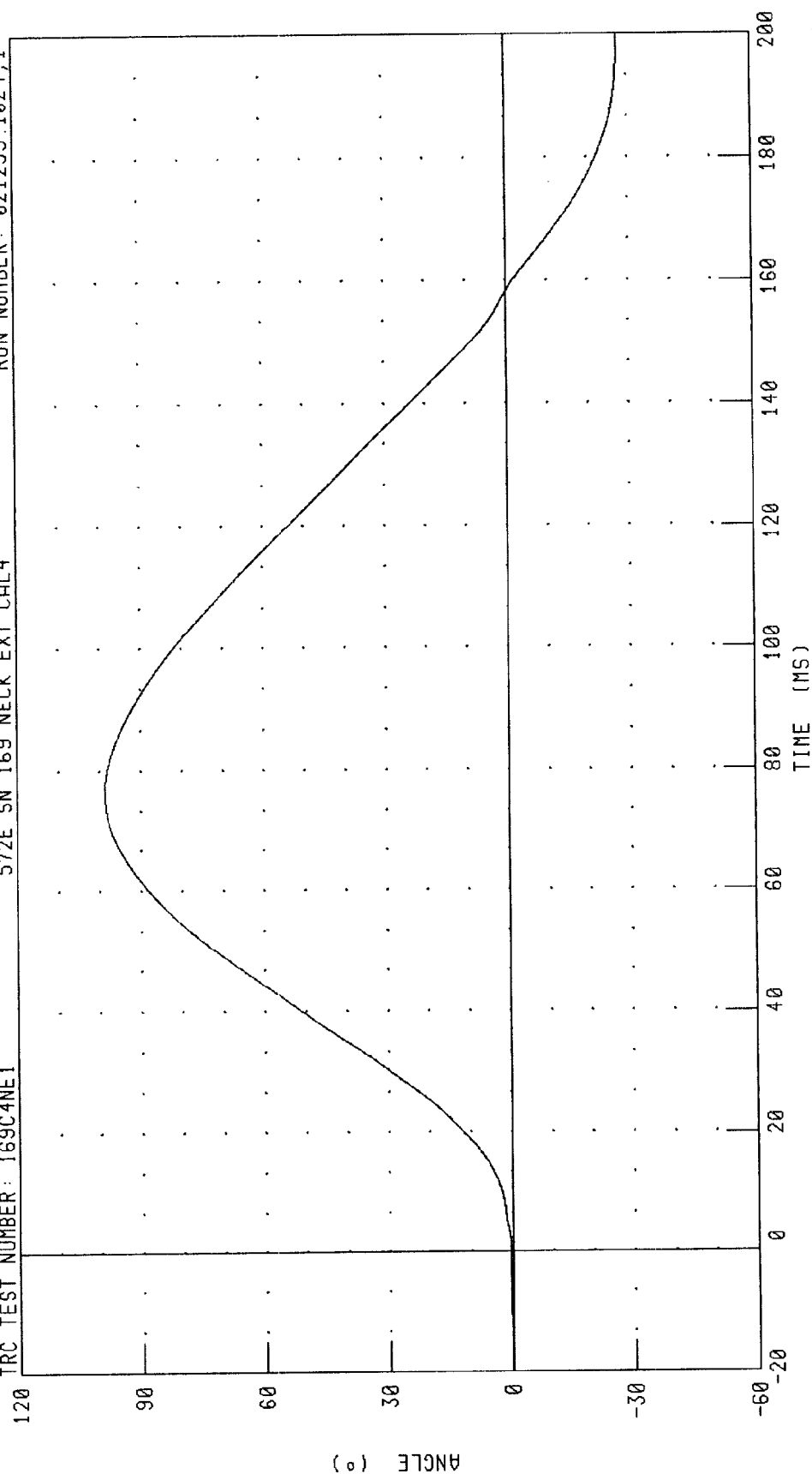


CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 58.96 ° @ 77.44 MS; -17.80 ° @ 197.20 MS

PART 572-E HYBRID III NECK EXTENSION CALIBRATION
TOTAL ROTATION

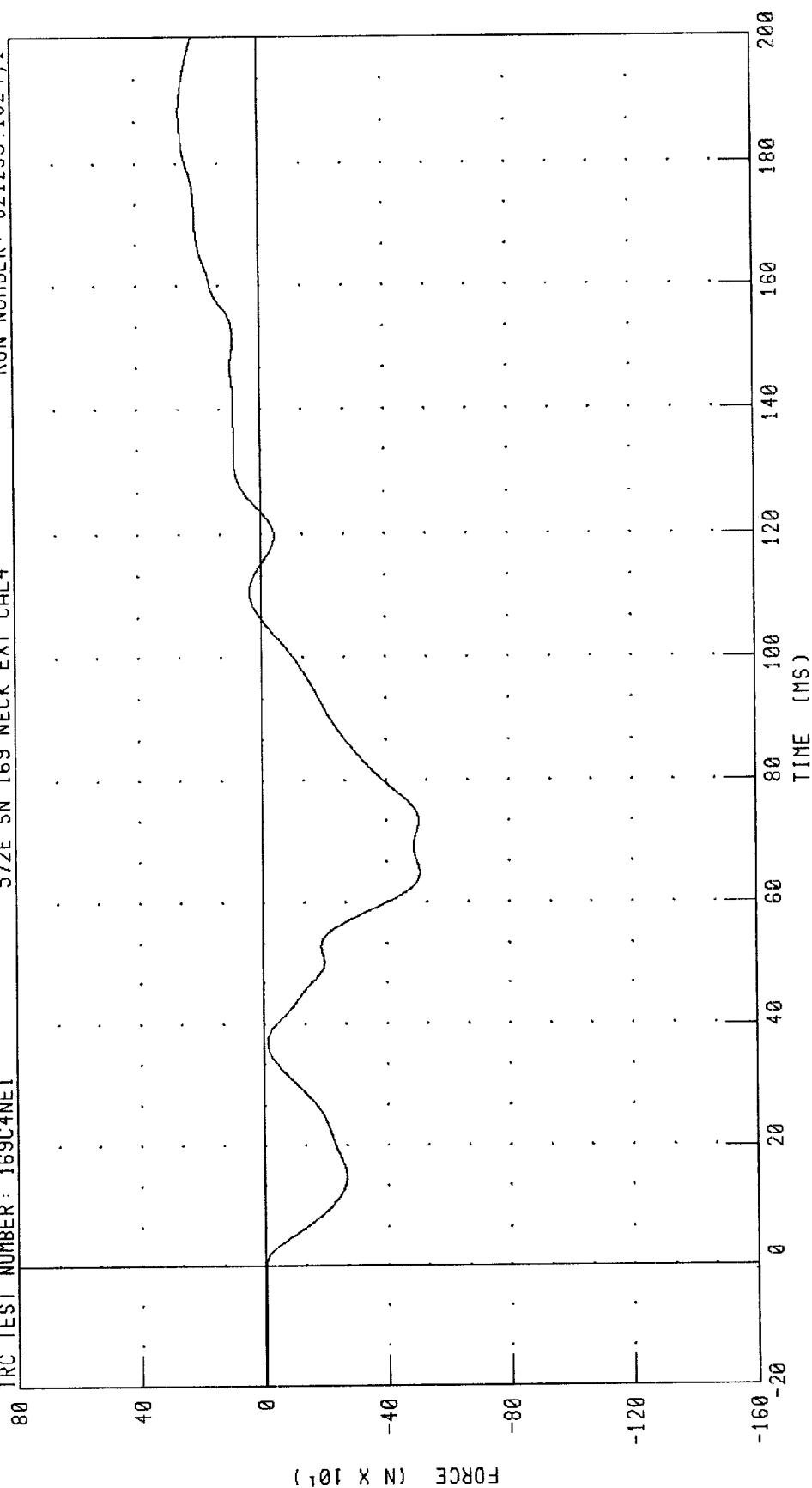
TRC TEST NUMBER: 169C4NE1 572E SN 169 NECK EXT CAL4 RUN NUMBER: 021299.1024,1



CHANNEL: TOTAL FILTER: CH. CLASS 60 PEAK DATA: 98.72 ° @ 76.64 MS, -27.45 ° @ 197.68 MS

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

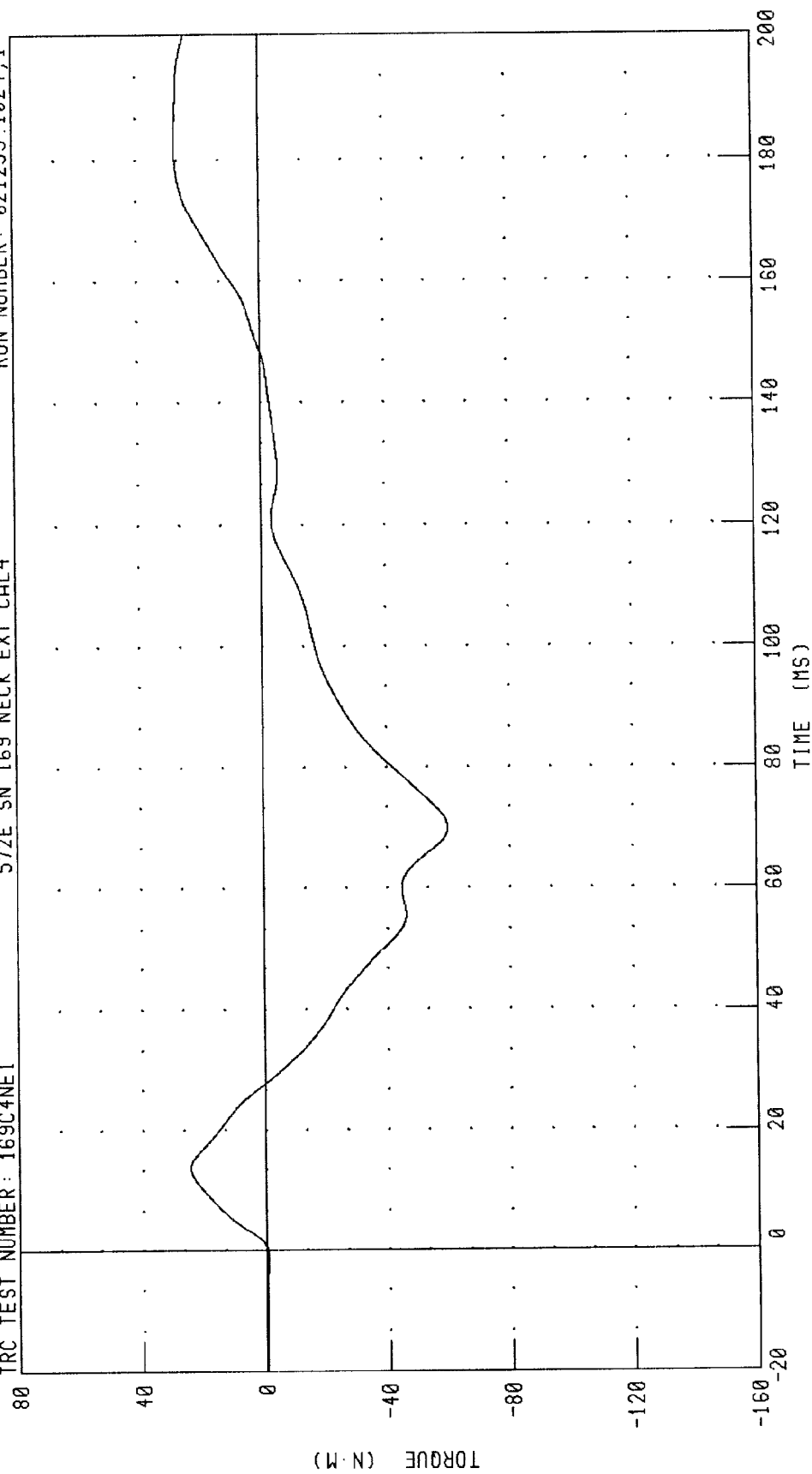
TRC TEST NUMBER: 169C4NE1 572E SN 169 NECK EXT CAL4 RUN NUMBER: 021299.1024;1



CHANNEL: NEKXF FILTER: CH. CLASS 60 PEAK DATA: 257.56 N @ 188.24 MS; -509.11 N @ 64.88 MS

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

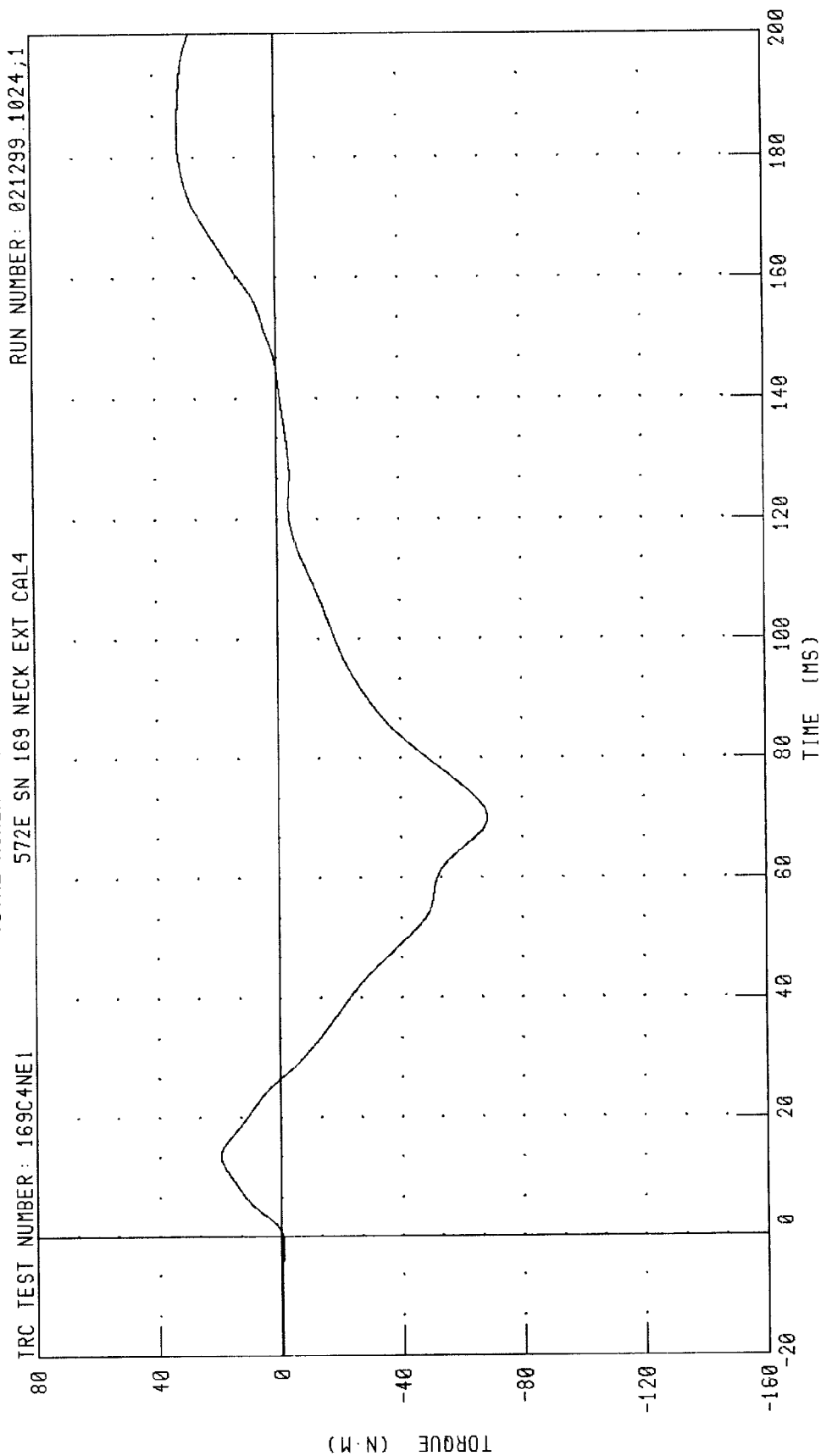
TRC TEST NUMBER: 169C4NE1 572E SN 169 NECK EXT CAL4 RUN NUMBER: 021299.1024;1



PEAK DATA: 27.67 N.M @ 182.88 MS; -59.86 N.M @ 70.00 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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



PEAK DATA: 32.12 N·M @ 183.76 MS, -68.58 N·M @ 70.08 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th

15-FEB-99

TRC INC.

TEST NO: 169C4TH2

572E SN169 H.S.THORAX CAL04

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.74 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	63.8 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5751. N
INTERNAL HYSTERESIS	69% - 85%	71.0%

TEST MEETS SPECIFICATIONS

TECHNICIAN

Ray Calt

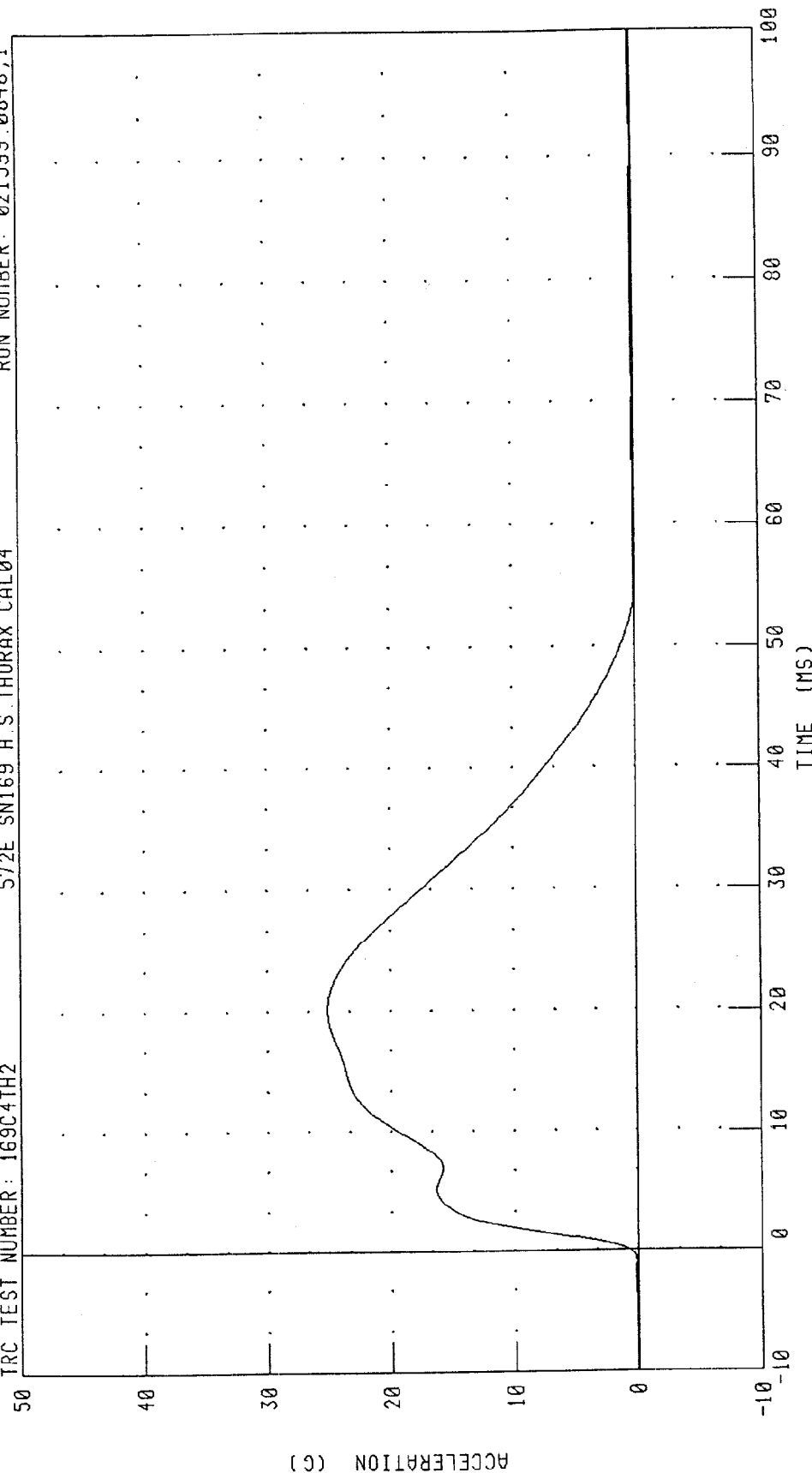
RUN NUMBER: 021599.0846;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION

TRC TEST NUMBER: 169C4TH2

572E SN169 H.S. THORAX CAL04

RUN NUMBER: 021599.0846;1



CHANNEL: PENXG FILTER: CH. CLASS 180

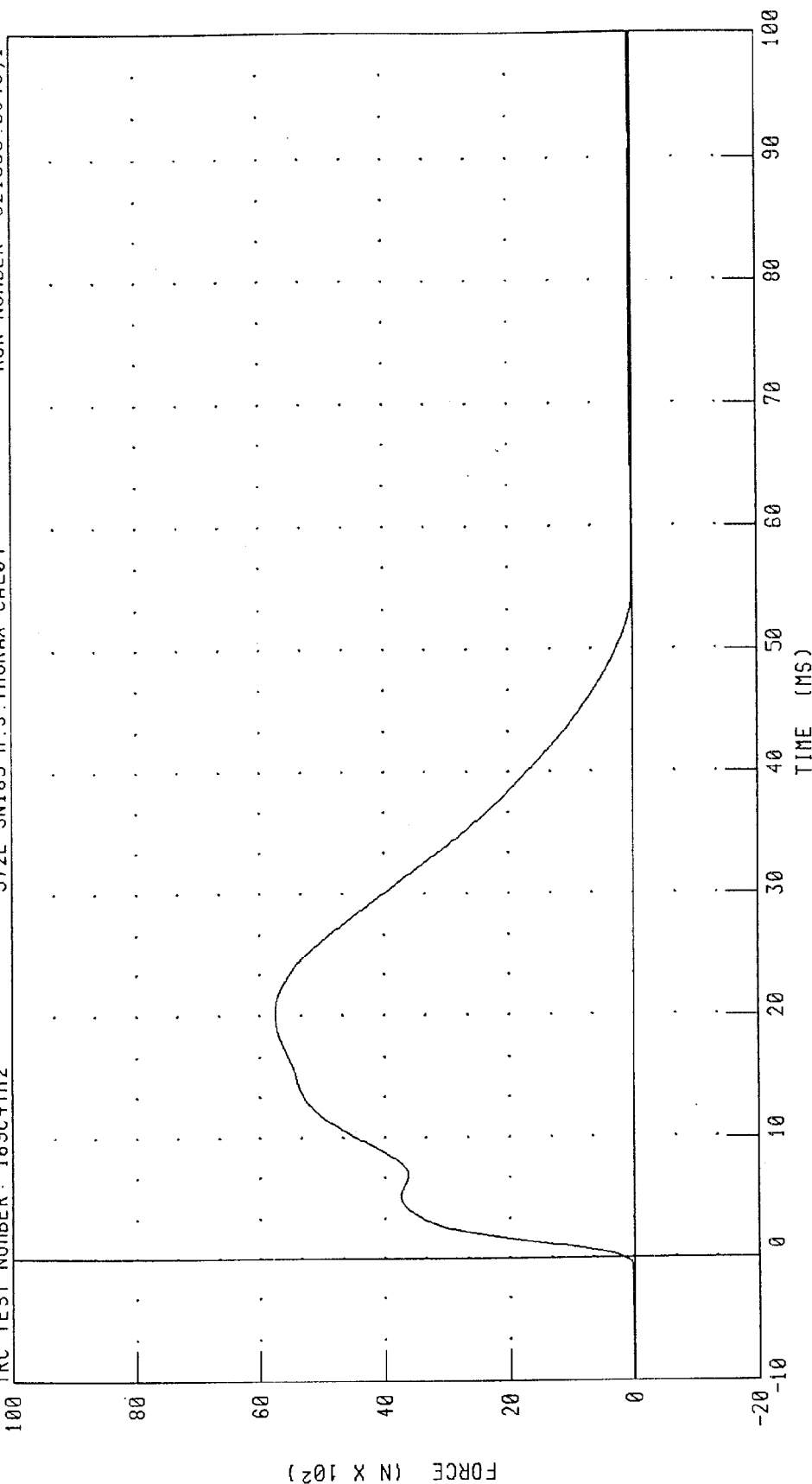
PEAK DATA: 25.11 G @ 20.24 MS; 0.04 G @ 54.88 MS

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM FORCE

TRC TEST NUMBER: 169C4TH2

572E SN169 H.S. THORAX CAL04

RUN NUMBER: 021599.0846;1



CHANNEL: PENXF FILTER: CH. CLASS 180

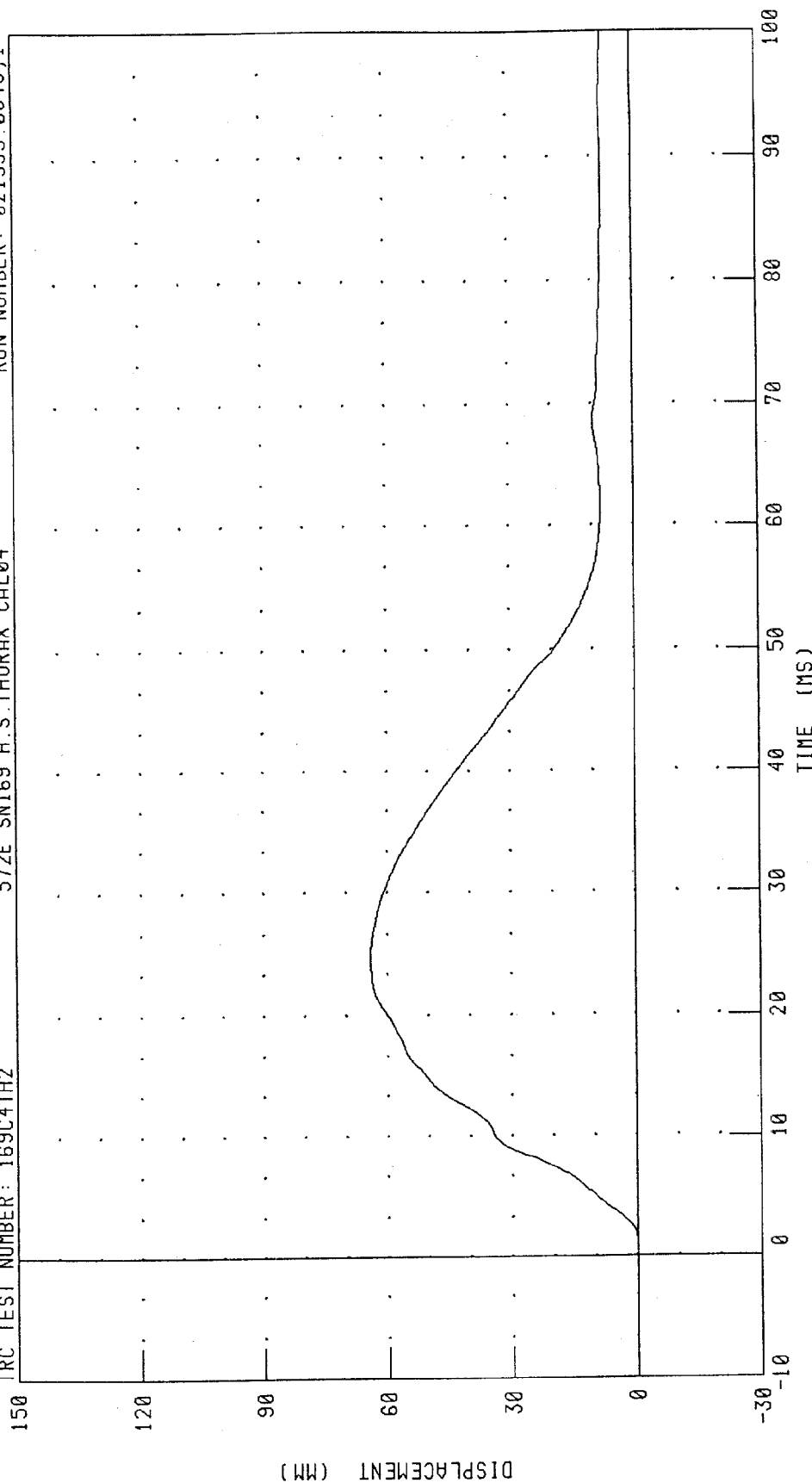
PEAK DATA: 5751.42 N @ 20.24 MS; 9.35 N @ 54.88 MS

PART 572-E HYBRID III THORAX CALIBRATION
STERNUM DISPLACEMENT

TRC TEST NUMBER: 169C4TH2

572E SN169 H.S. THORAX CAL04

RUN NUMBER: 021599.0846;1



CHANNEL: CSTXD FILTER: CH. CLASS 180 PEAK DATA: 63.88 MM @ 24.96 MS; -0.02 MM @ 1.04 MS

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

IRC TEST NUMBER: 169C4TH2

572E SN169 H.S. THORAX CAL04

RUN NUMBER: 021599.0846;1

100

80

60

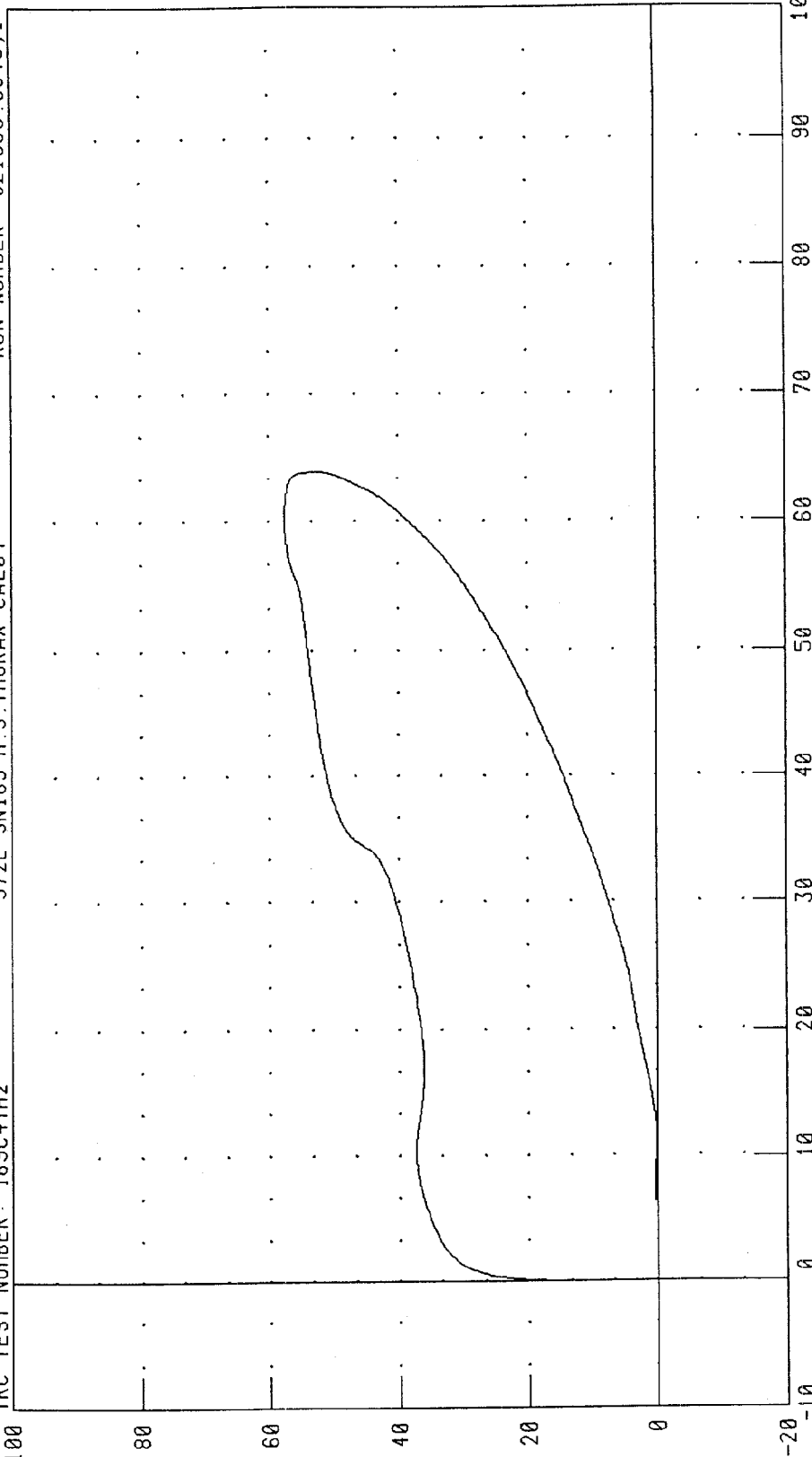
40

20

0

-20

FORCE (N X 10²)



DISPLACEMENT (MM)

CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA:

63.88 MM @ 24.96 MS; -0.02 MM @ 1.04 MS
5751.42 N @ 20.24 MS; 9.35 N @ 54.88 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

12-FEB-99

TRC INC.

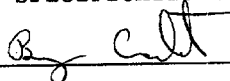
TEST NO: 169C4HR1

572E SN 169 HIPFLEX CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	68.7 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	45.4 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN



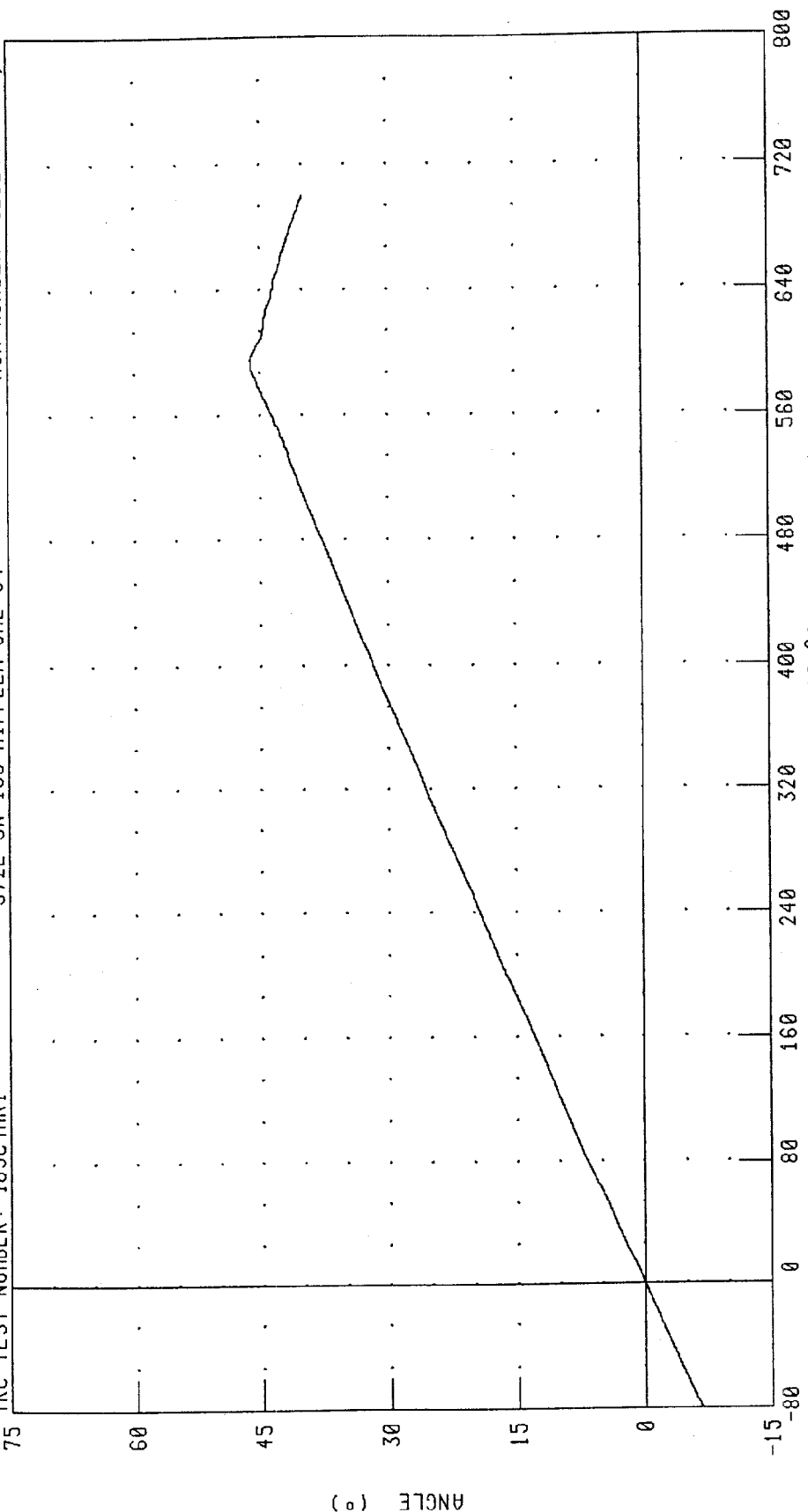
RUN NUMBER: 021299.1057;1

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES RIGHT HIP FLEXION ROTATION

TRC TEST NUMBER: 169C4HR1

572E SN 169 HIPFLEX CAL 04

RUN NUMBER: 021299.1057.1



PEAK DATA: 46.18 ° @ 5.95 S; -9.79 ° @ -1.00 S

CHANNEL: RHPXD FILTER: CH. CLASS 60

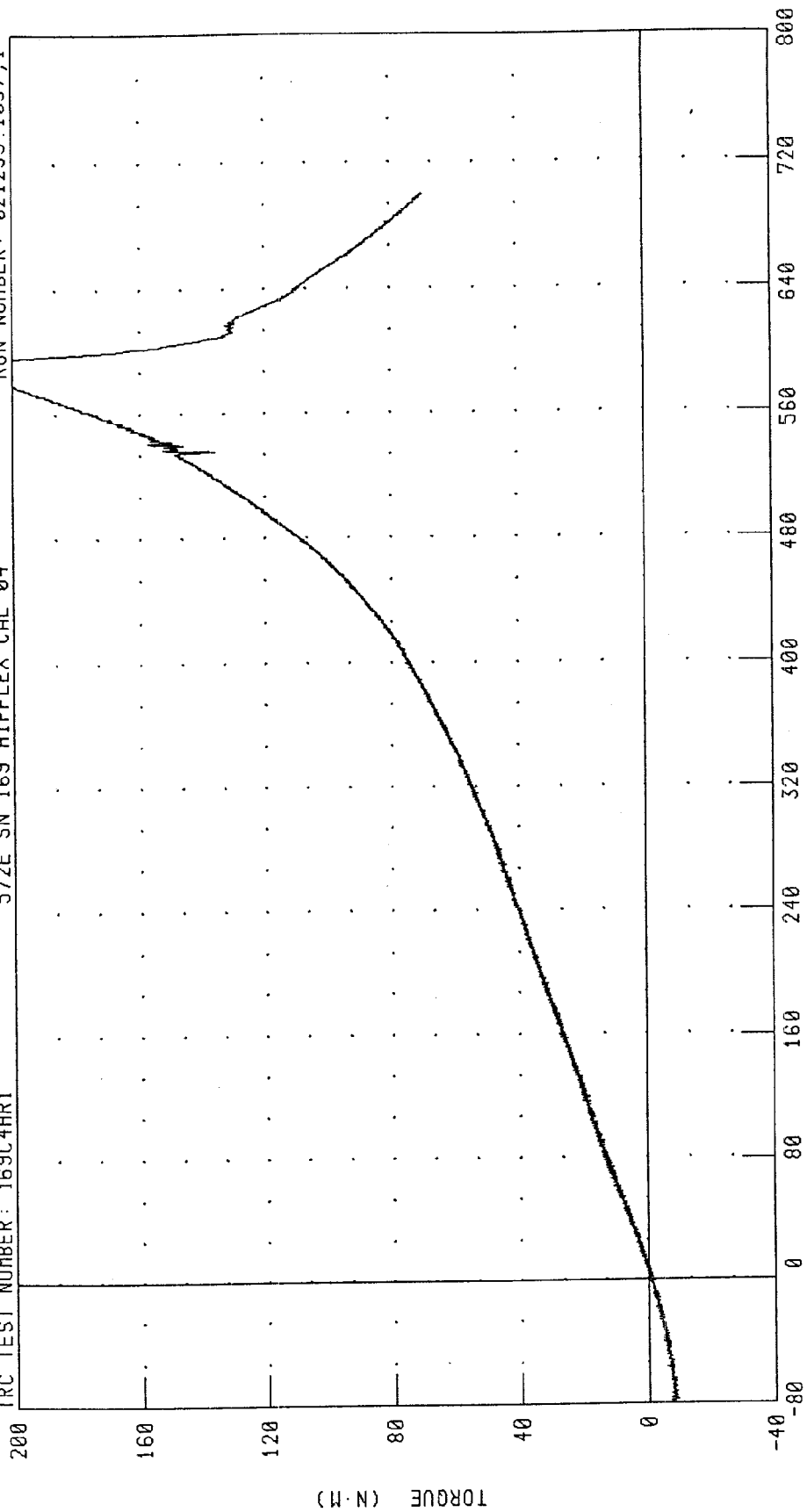
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

RIGHT HIP FLEXION MOMENT

TRC TEST NUMBER: 169C4HR1

572E SN 169 HIPFLEX CAL 04

RUN NUMBER: 021299.1057;1



PEAK DATA: 216.16 N-M @ 5.91 S; -11.13 N-M @ -1.00 S

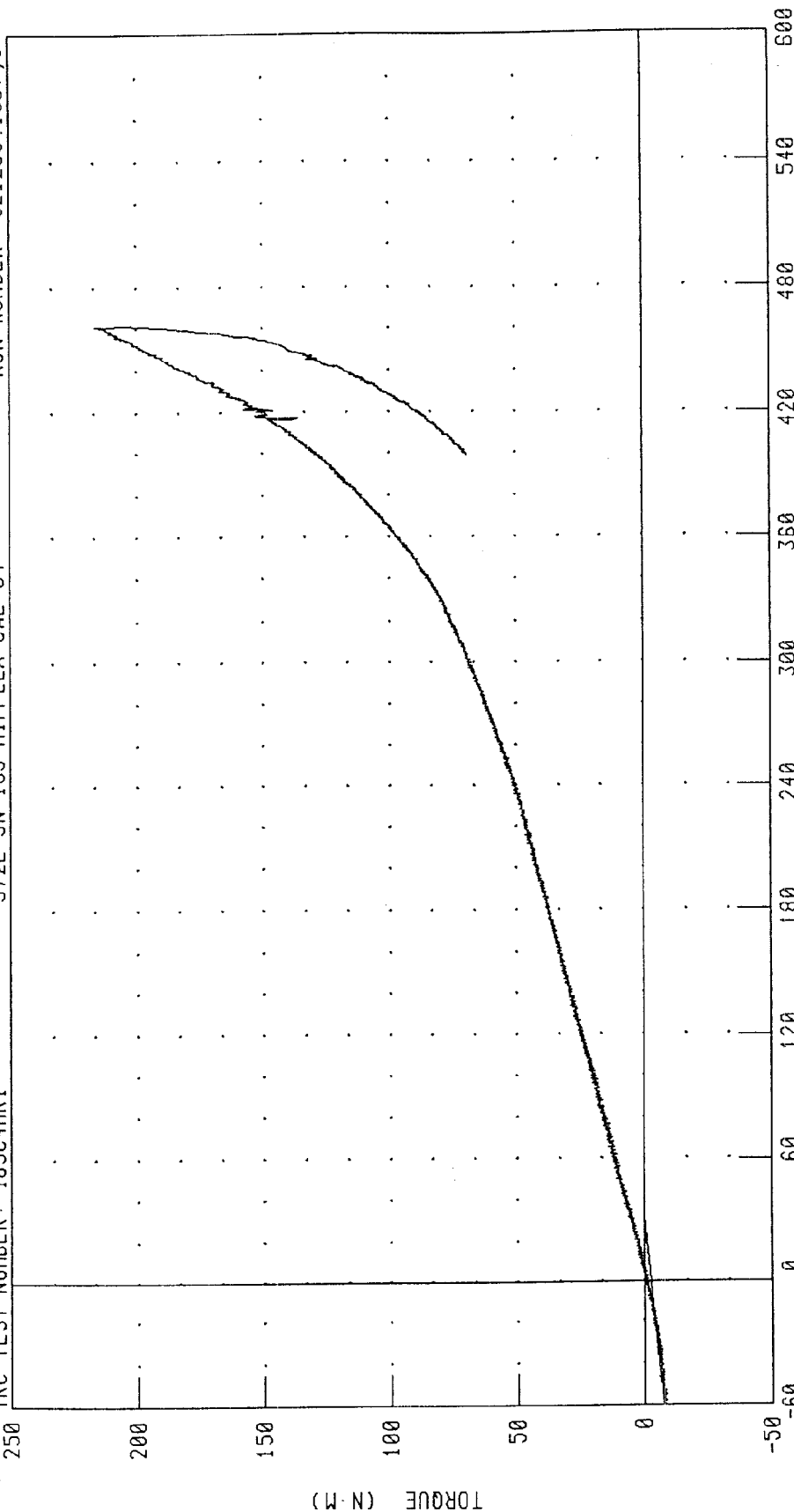
CHANNEL: RHPYM FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES RIGHT HIP FLEXION MOMENT VS ROTATION ANGLE

TRC TEST NUMBER: 169C4HR1

572E SN 169 HIPELEX CAL 04

RUN NUMBER: 021299.1057;1



CHANNEL: RHPXD
 RHPYM

FILTER: CH. CLASS 60
 CH. CLASS 60

ANGLE (° X 10⁻¹)

PEAK DATA: 46.18 ° 216.16 N·M 5.95 S;
 -9.79 ° -11.13 N·M 5.91 S

TRANSPORTATION RESEARCH CENTER INC.

LEFT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

12-FEB-99

TRC INC.

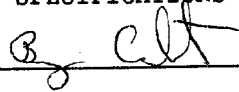
TEST NO: 169C4HL1

572E SN 169 HIPFLEX CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	65.7 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	44.8 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 021299.1048;1

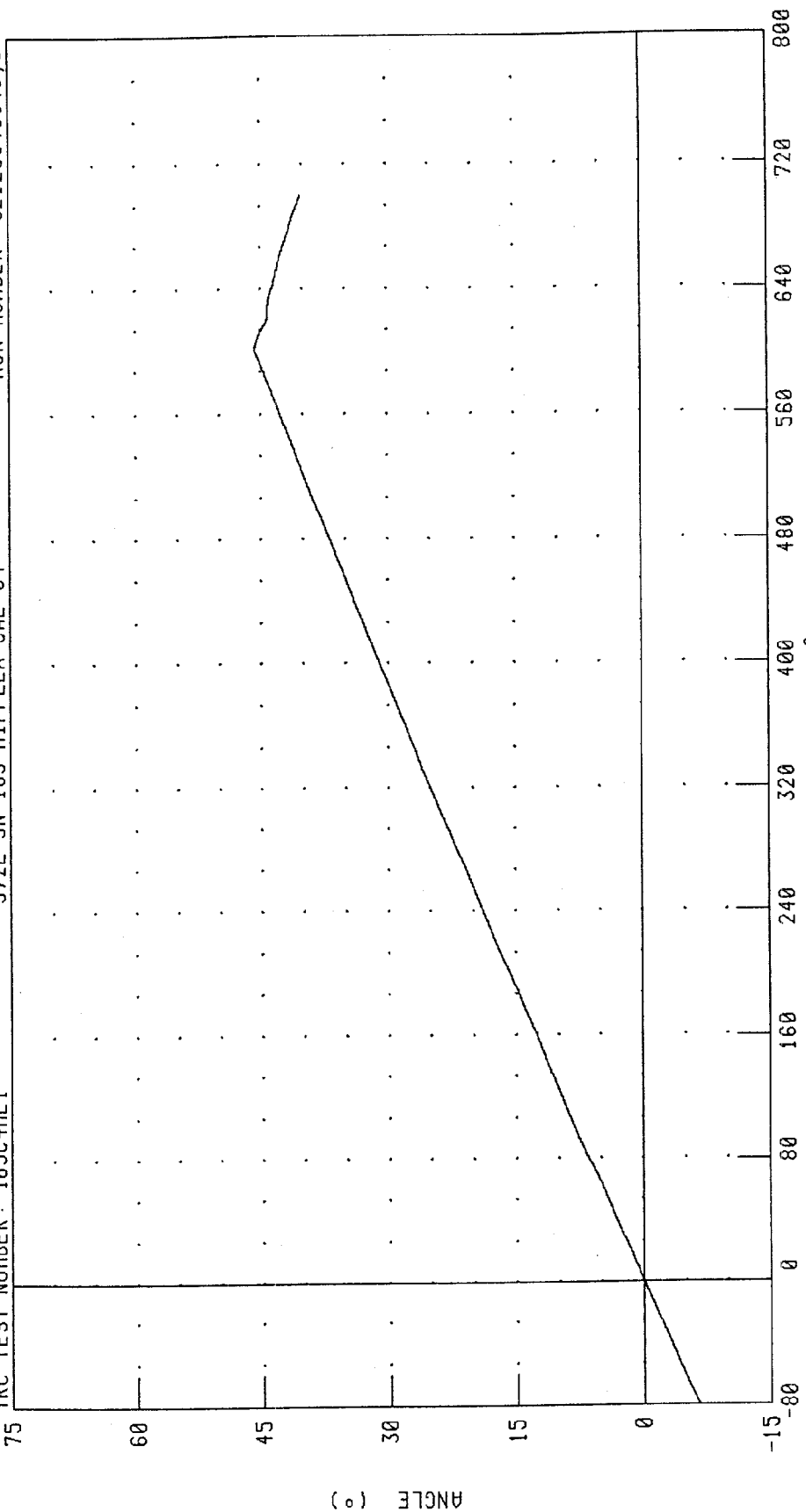
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

LEFT HIP FLEXION ROTATION

TRC TEST NUMBER: 169C4HL1

572E SN 169 HIPFLEX CAL 04

RUN NUMBER: 021299.1049.1



PEAK DATA: 45.71 ° @ 6.01 S; -9.44 ° @ -1.00 S

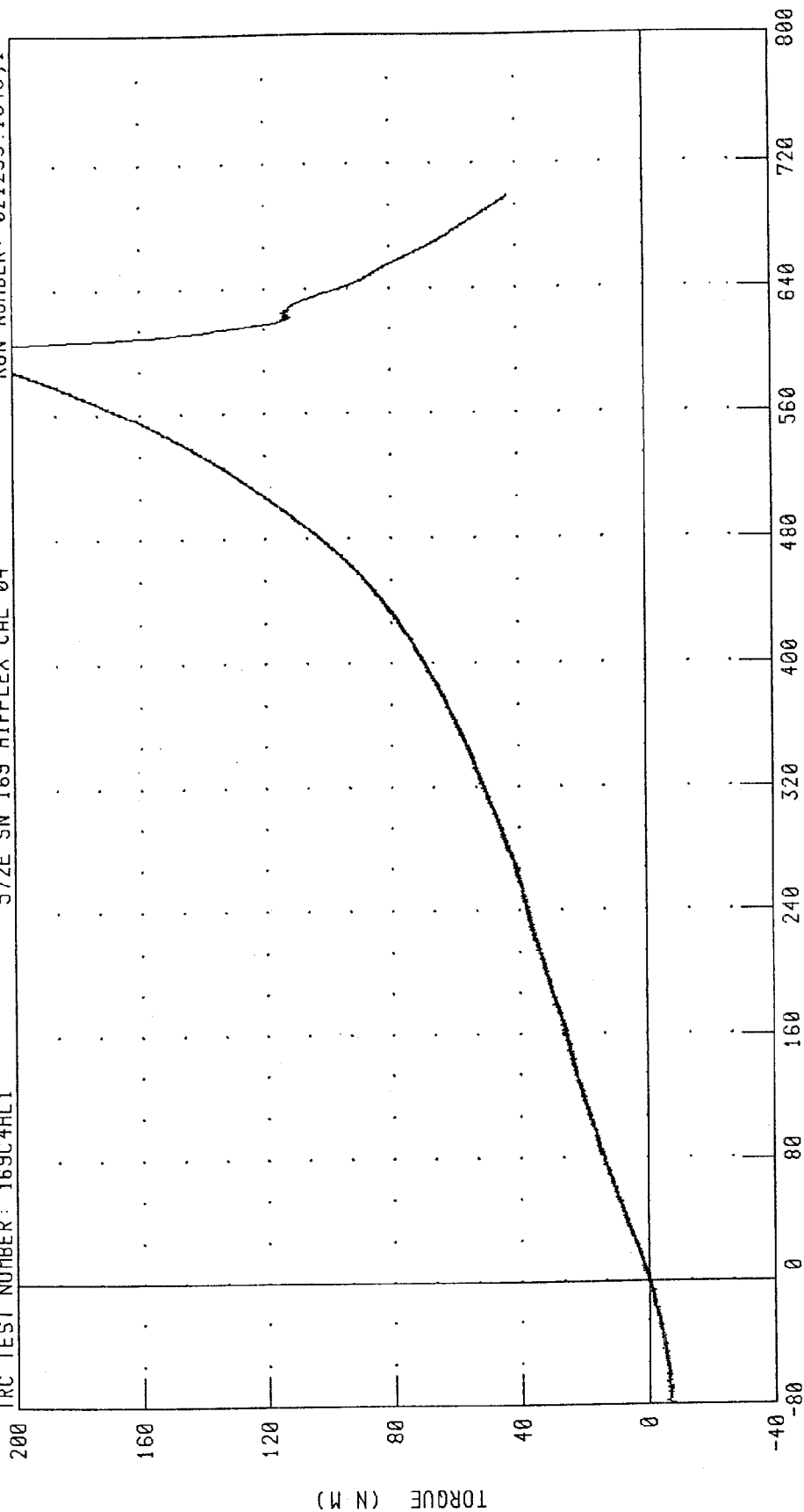
CHANNEL: LHPXD FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
LEFT HIP FLEXION MOMENT

TRC TEST NUMBER: 169C4HL1

572E SN 169 HIPFLEX CAL 04

RUN NUMBER: 021299.1049;1

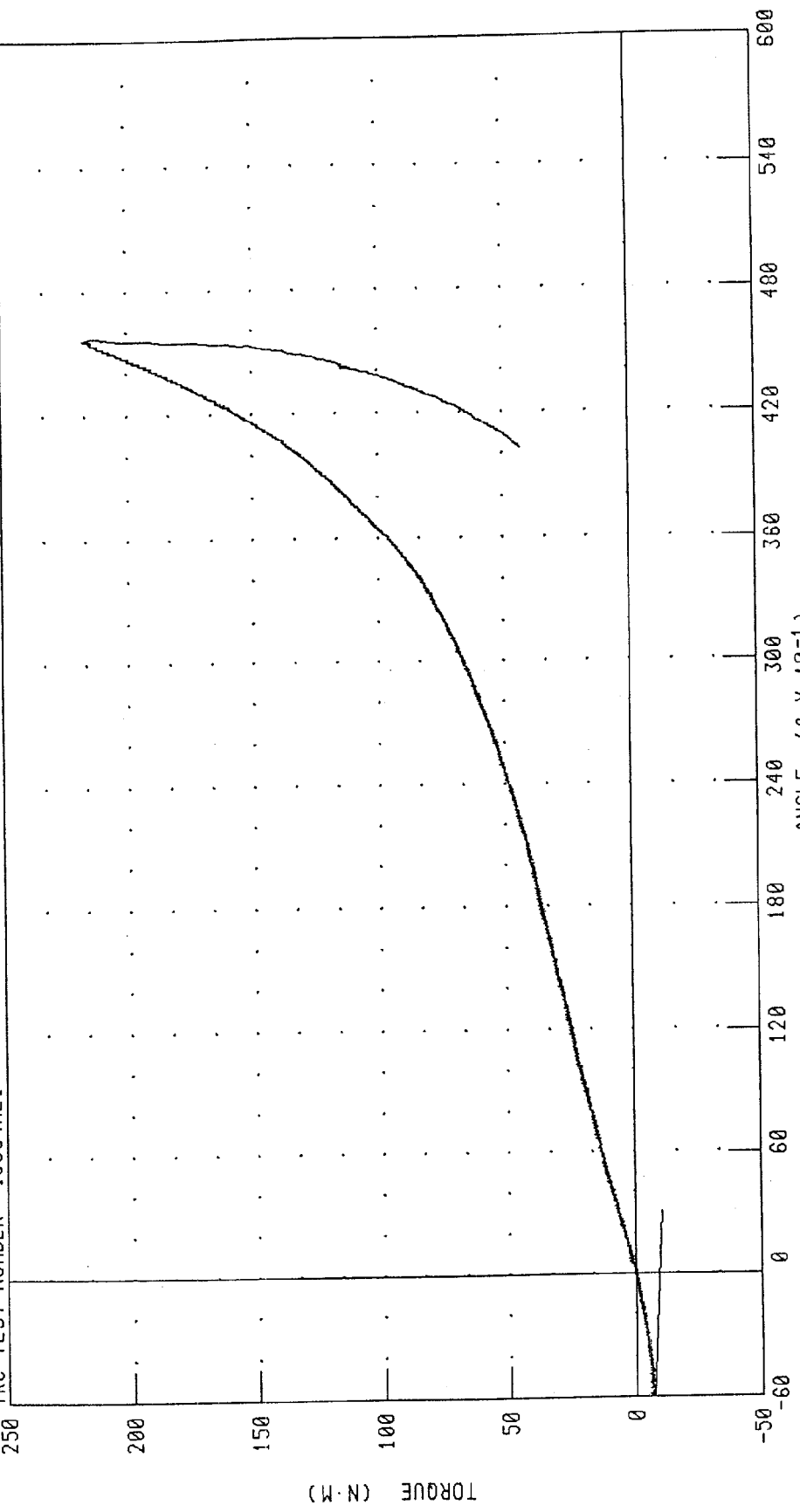


PEAK DATA: 217.58 N.M @ 5.99 S; -10.47 N.M @ -1.00 S

CHANNEL: LHPYM FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
 LEFT HIP FLEXION MOMENT VS ROTATION ANGLE

TRC TEST NUMBER: 169C4HL1 572E SN 169 HIPFLEX CAL 04 RUN NUMBER: 021299.1049,1



CHANNEL: LHPXD FILTER: CH: CLASS 60
 LHPYH CH: CLASS 60

PEAK DATA: 45.71 ° 0 6.01 S; -9.44 ° 0 -1.00 S
 217.58 N.M 0 5.99 S; -10.47 N.M 0 -1.00 S

TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th

12-FEB-99

TRC INC.

TEST NO: 169C4RK1

572E SN169 RIGHT KNEE CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5758.5 N

TEST MEETS SPECIFICATIONS

TECHNICIAN By *alt*

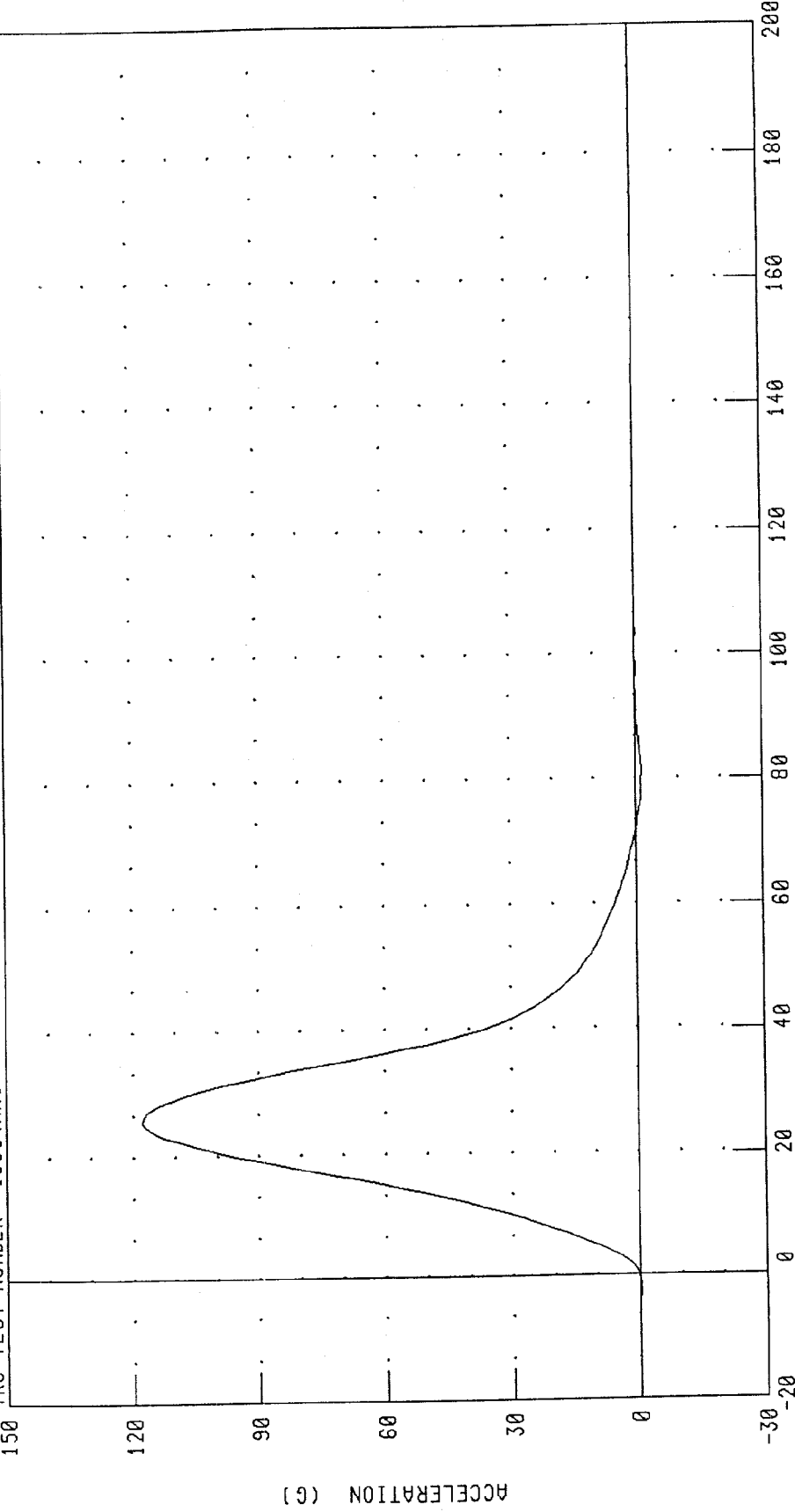
RUN NUMBER: 021299.1009;1

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

TRC TEST NUMBER: 169C4RK1

572E SN169 RIGHT KNEE CAL 4

RUN NUMBER: 021299.1009;1



CHANNEL: PENXG FILTER: CH. CLASS 600 PEAK DATA: 117.69 G @ 2.56 MS; -1.52 G @ 8.16 MS

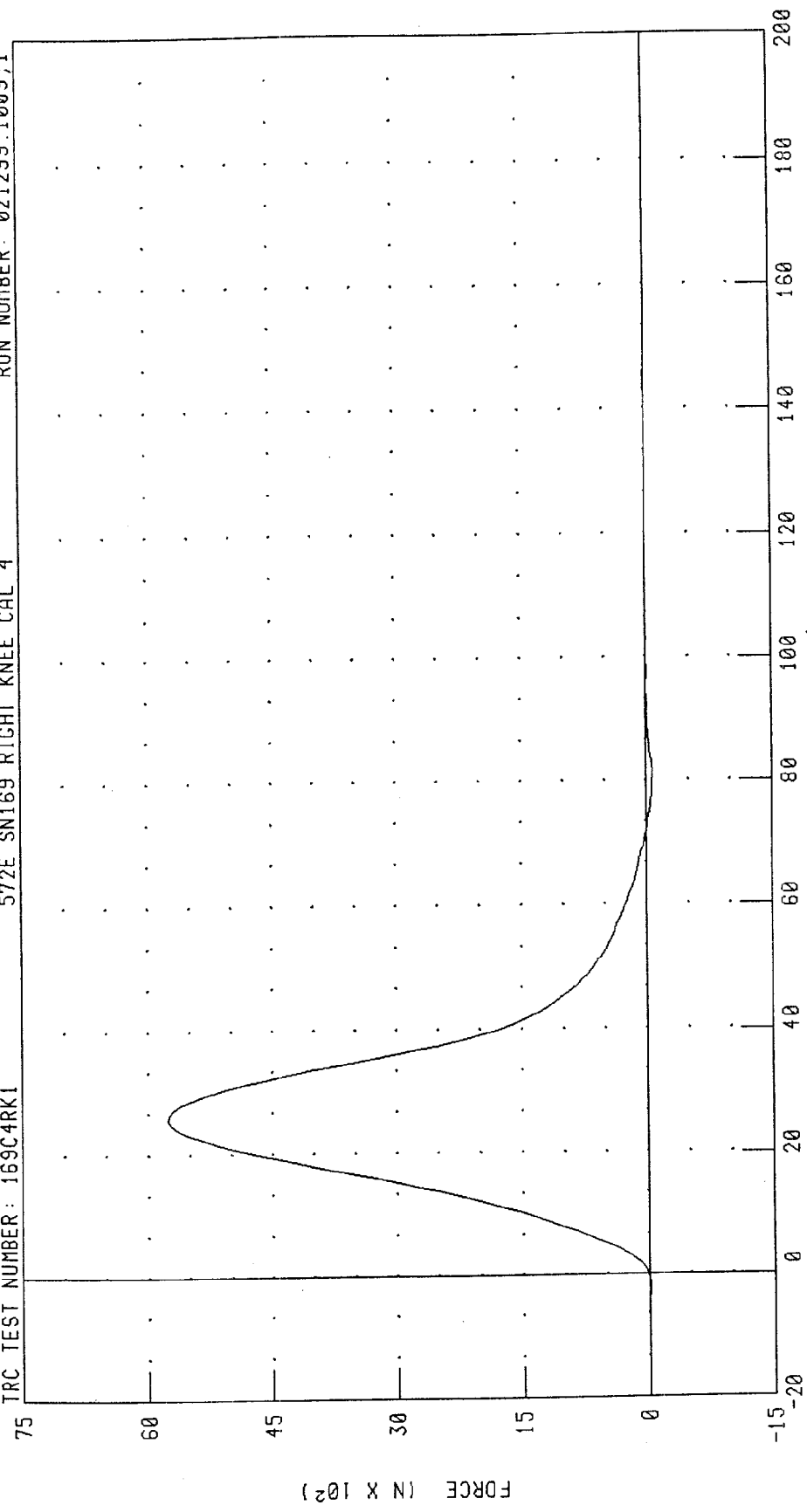
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN169 RIGHT KNEE CAL 4

RUN NUMBER: 021299.1009;1

TRC TEST NUMBER: 169C4RK1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5758.52 N @ 2.56 MS; -74.36 N @ 8.16 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th

12-FEB-99

TRC INC.

TEST NO: 169C4LK1

572E SN169 LEFT KNEE CAL 4

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.11 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5704.2 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

B. Calt

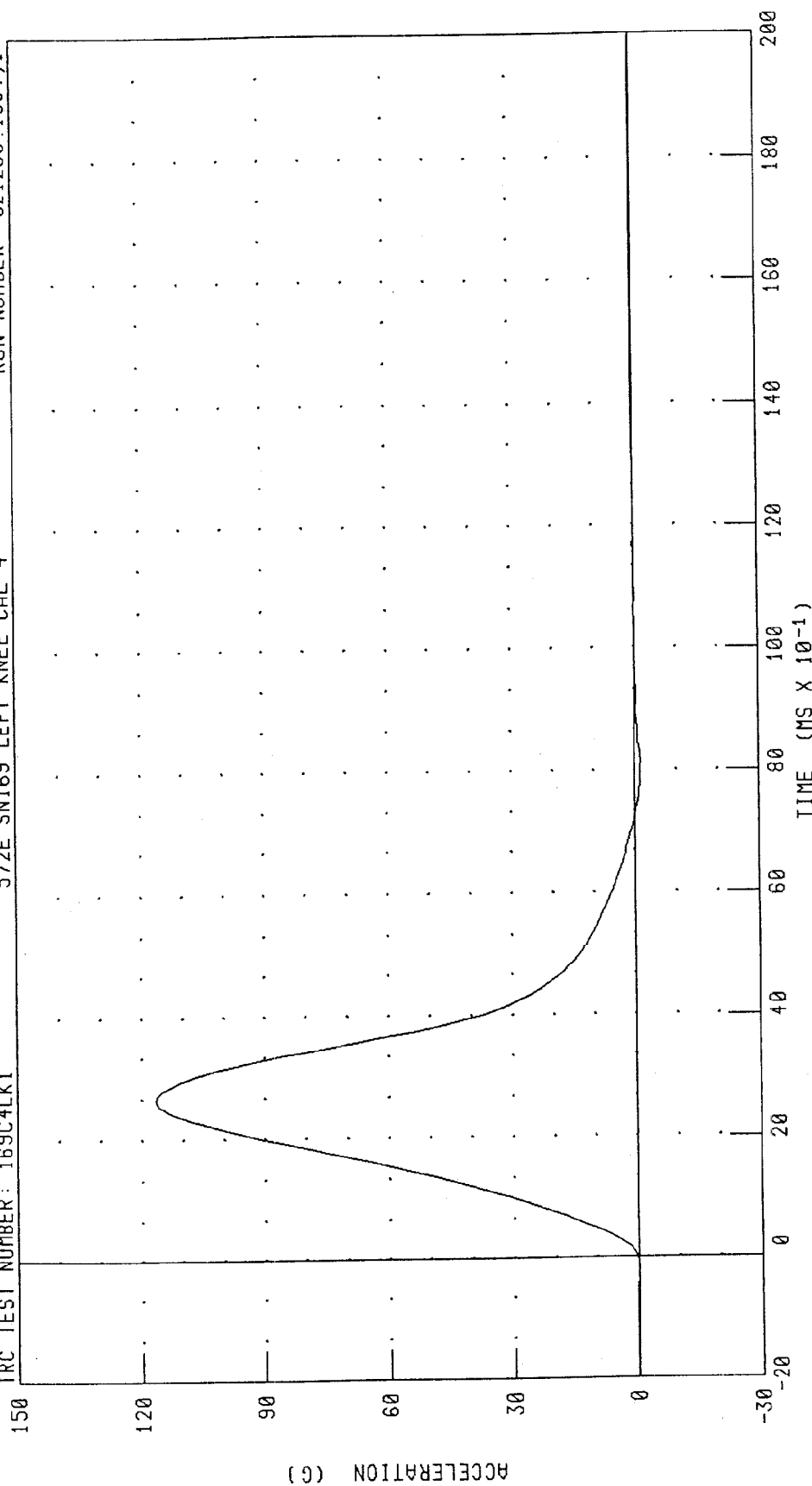
RUN NUMBER: 021299.1003;1

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

TRC TEST NUMBER: 169C4LK1

572E SN169 LEFT KNEE CAL 4

RUN NUMBER: 021299.1004;1



CHANNEL: PENXC

FILTER: CH. CLASS 600

PEAK DATA: 116.59 G @ 2.64 MS; -1.46 G @ 8.16 MS

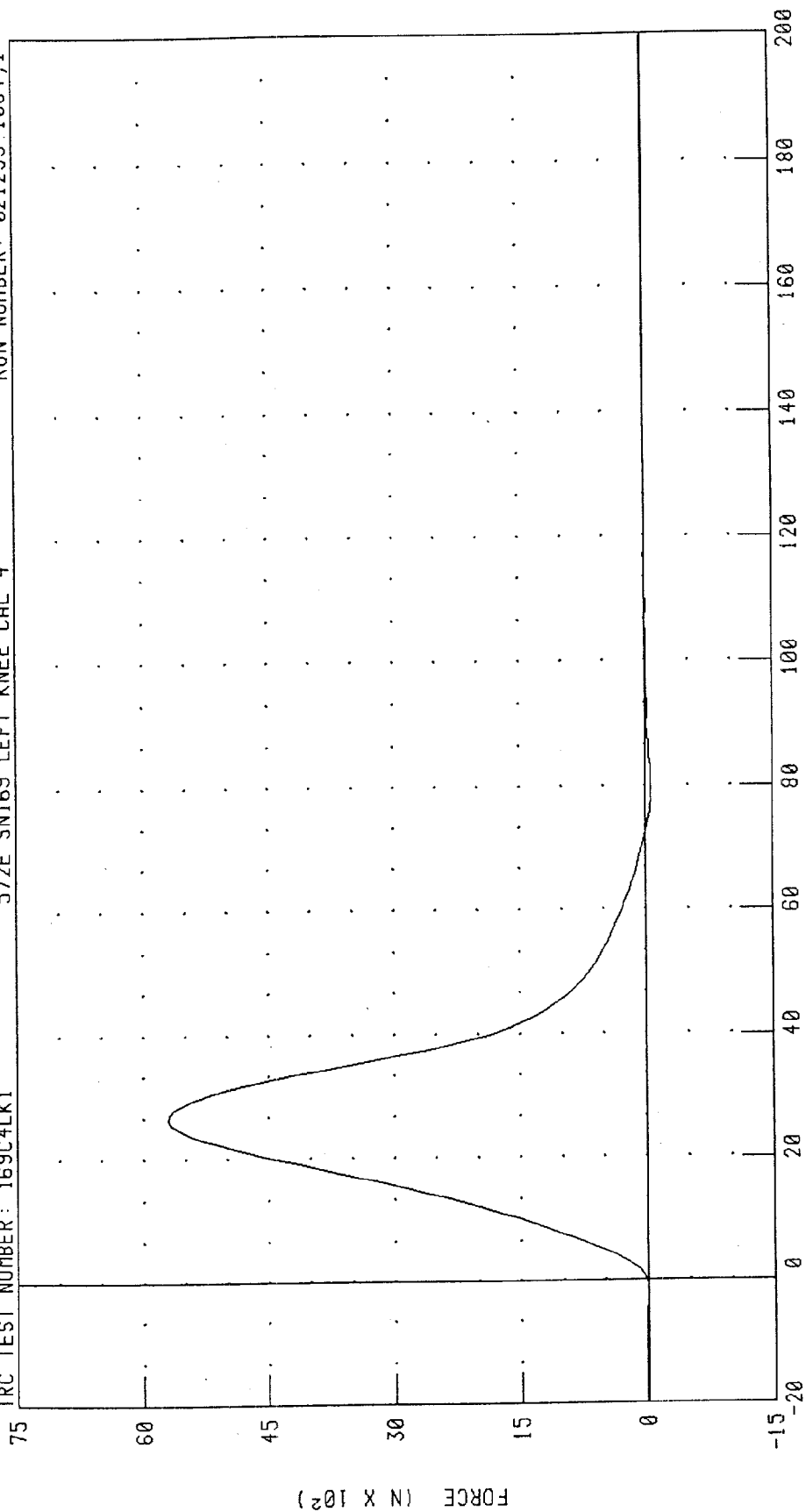
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN169 LEFT KNEE CAL 4

RUN NUMBER: 021299.1004.1

TRC TEST NUMBER: 169C4LK1



PEAK DATA: 5704.30 N @ 2.64 MS; -71.32 N @ 8.16 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

Post-Test Dummy Certification

Driver Dummy S/N 168

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th

20-FEB-99

TRC INC.

TEST NO: 168C7HD1

572E SN168 HEAD DROP CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	260.95 G
PEAK LATERAL ACCELERATION	15 G MAX	4.32 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

Bj Cull

RUN NUMBER: 022099.1150;1

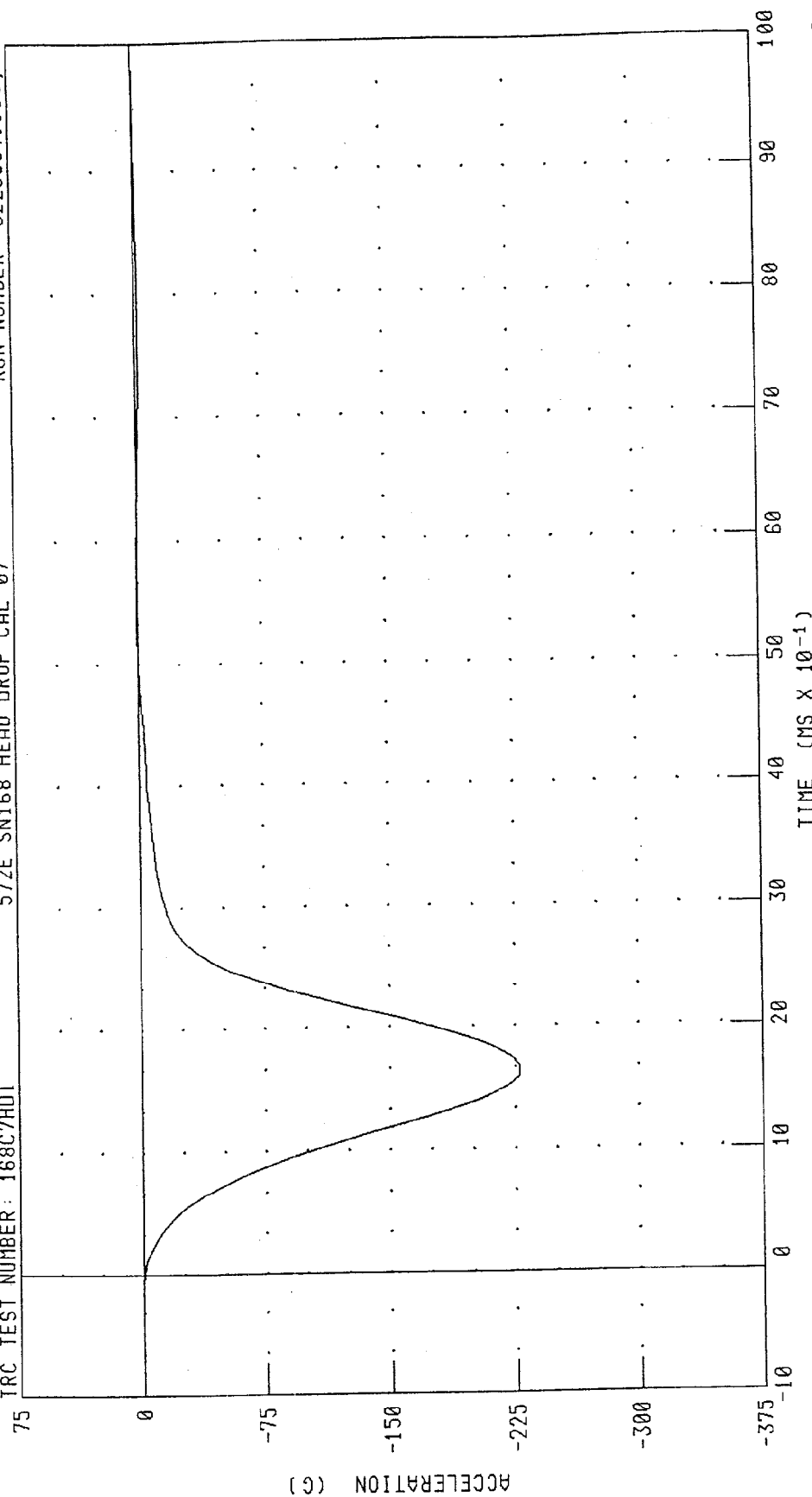
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

572E SN168 HEAD DROP CAL 07

RUN NUMBER: 022099.1150;1

TRC TEST NUMBER: 168C7HD1



PEAK DATA: 0.79 G @ 5.52 MS; -228.07 G @ 1.68 MS

CHANNEL: HEDXC FILTER: CH. CLASS 1000

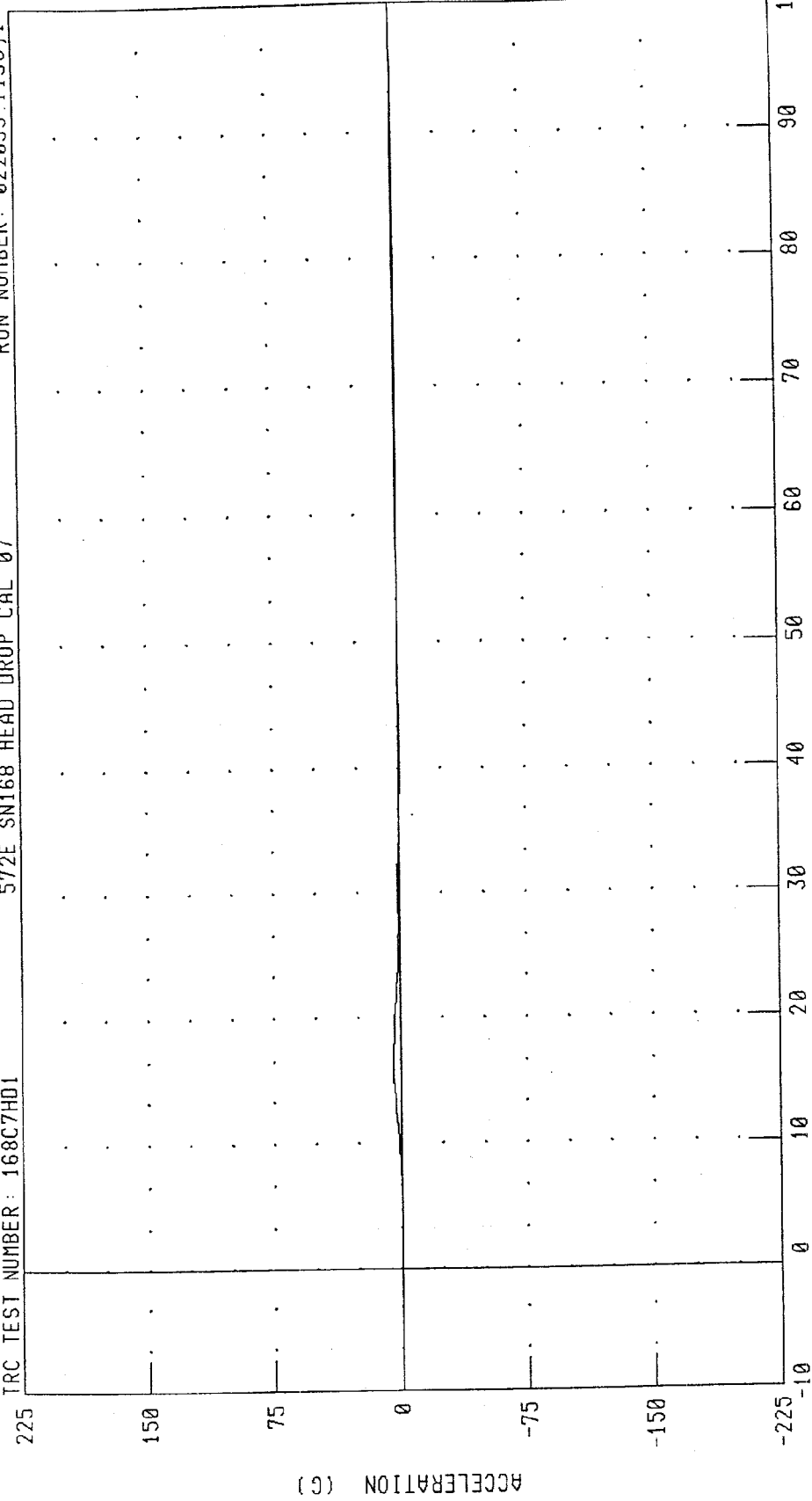
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

572E SN168 HEAD DROP CAL 07

RUN NUMBER: 022099.1150.1

TRC TEST NUMBER: 168C7HD1

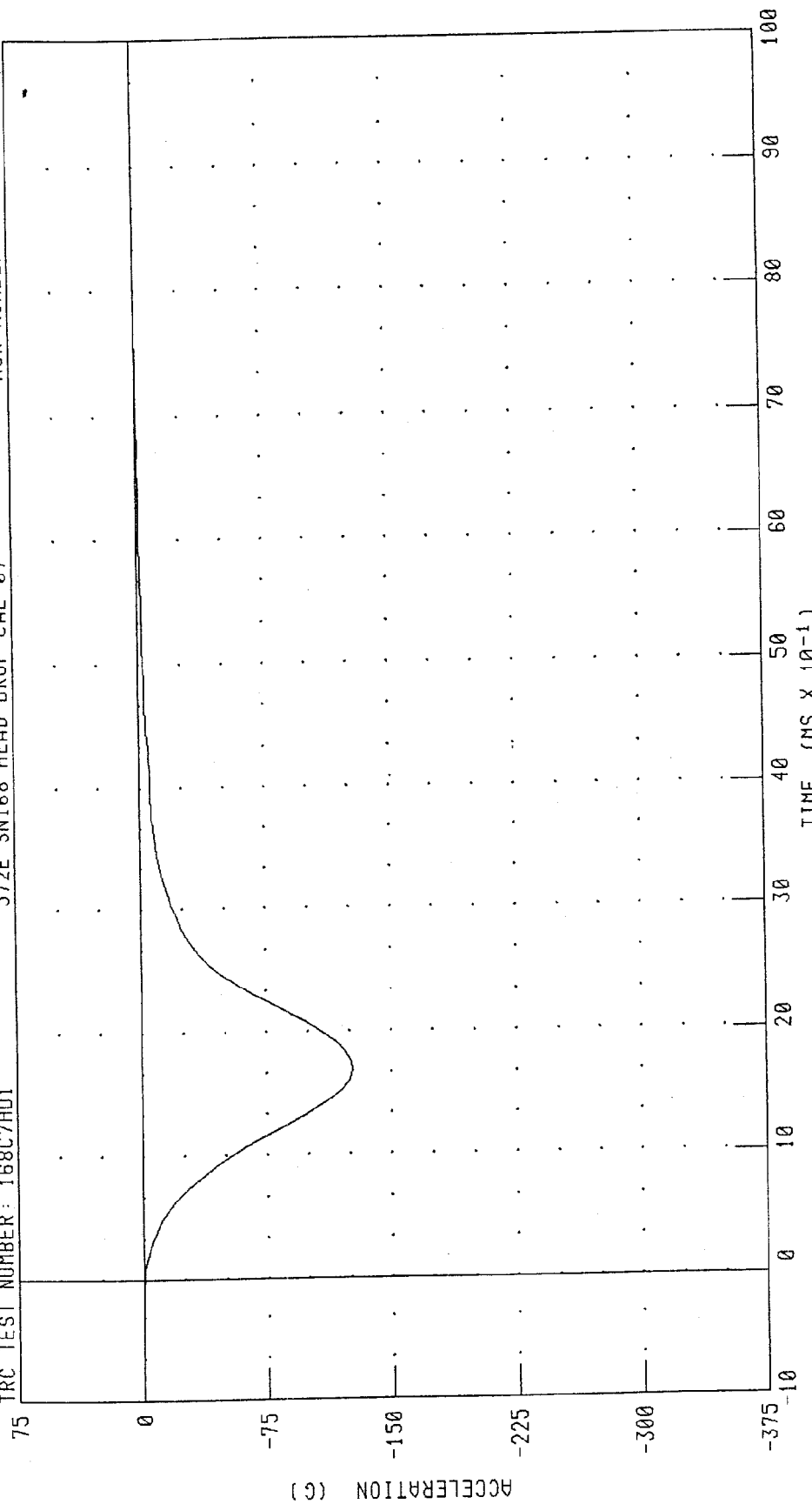


PEAK DATA: 4.33 G @ 1.60 MS; -0.78 G @ 3.92 MS

CHANNEL: HEDYG FILTER: CH. CLASS 1000

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

TRC TEST NUMBER: 168C7HD1 572E SN168 HEAD DROP CAL 07 RUN NUMBER: 022099.1150;1



CHANNEL: HEDZG FILTER: CH. CLASS 1000 PEAK DATA: 0.20 G @ 10.00 MS; -126.75 G @ 1.68 MS

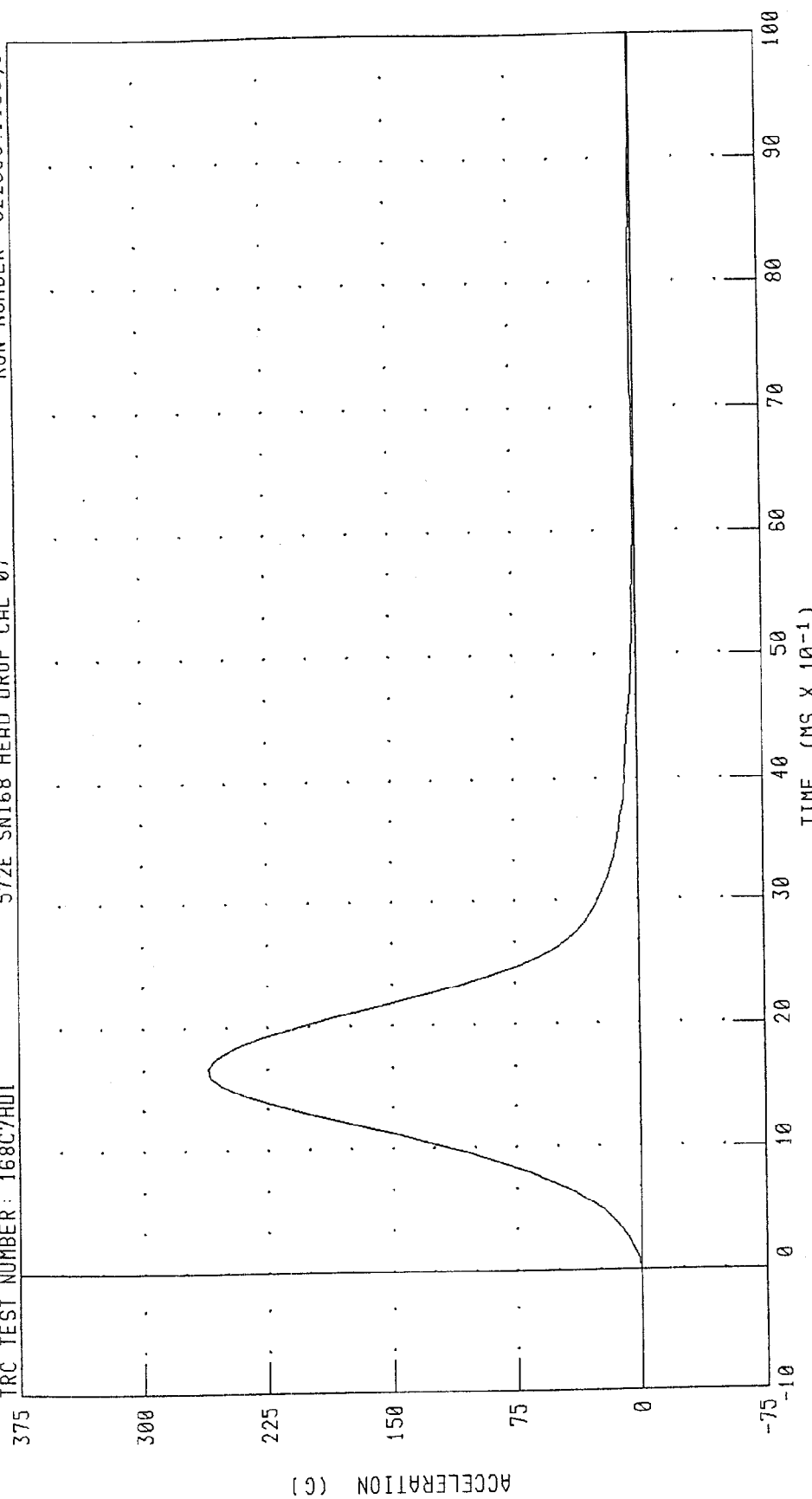
PART 572-E HYBRID III HEAD CALIBRATION

HEAD RESULTANT ACCELERATION

572E SNI68 HEAD DROP CAL 07

RUN NUMBER: 022099.1150;1

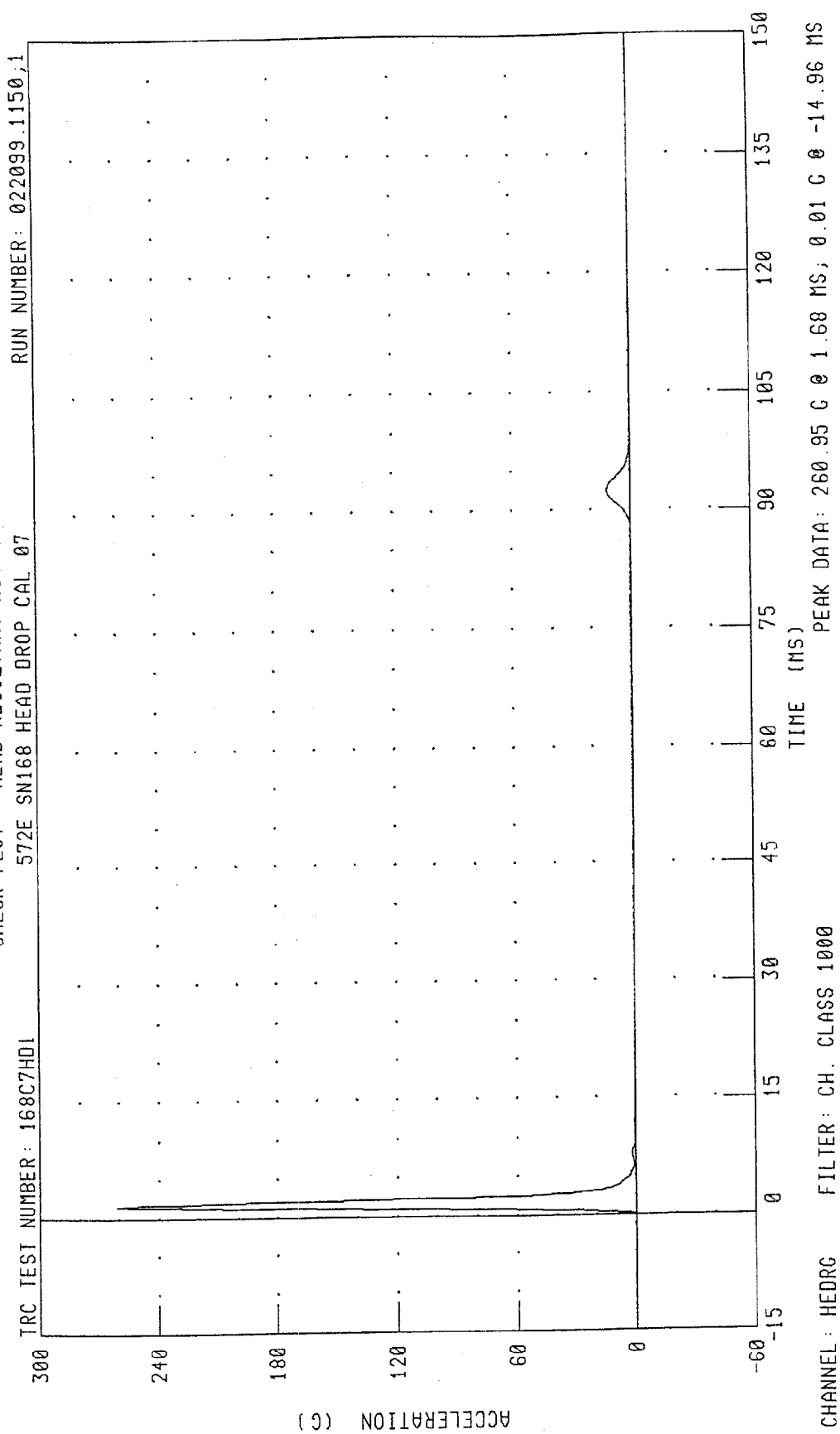
TRC TEST NUMBER: 168C7HD1



PEAK DATA: 260.95 G @ 1.68 MS; 0.01 G @ -0.96 MS

CHANNEL: HEDRG FILTER: CH. CLASS 1000

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



TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

22-FEB-99

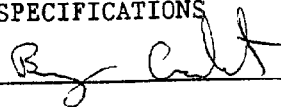
NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 168C7NF1 572E SN168 NECK FLEXION CAL07

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.87 G
	20 MS	17.60 - 22.60 G	21.33 G
	30 MS	12.50 - 18.50 G	13.41 G
MAX PENDULUM G		29 G MAX	24.38 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	13.38 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	40.88 MS
D PLANE	MAX	64 - 78 DEG.	72.71 DEG.
ROTATION	TIME	57 - 64 MS	60.64 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	90.95 NM
	TIME	47 - 58 MS	54.24 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	117.52 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	103.84 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 022299.1318;1

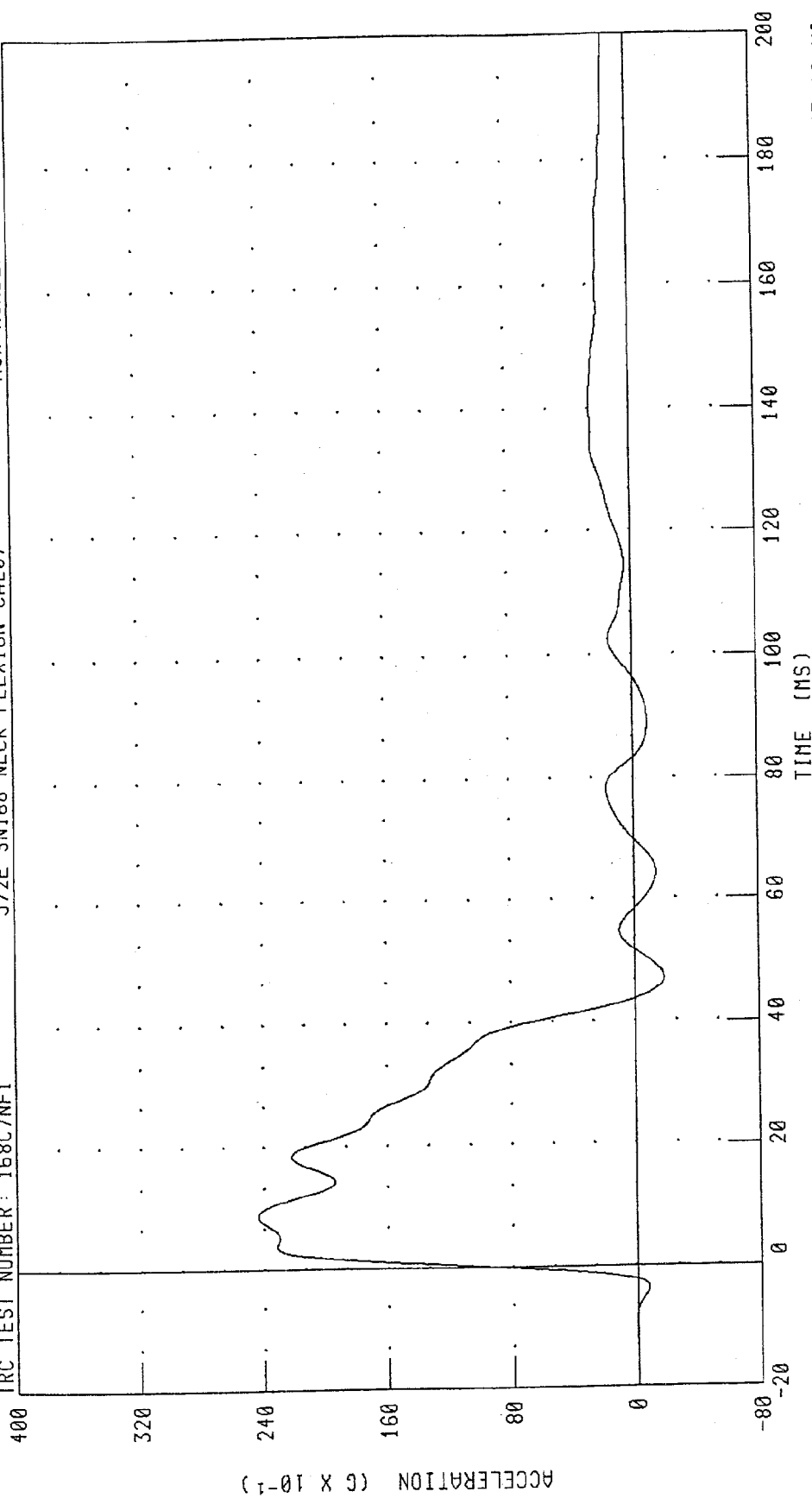
PART 572-E-HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 168C7NF1

572E SN168 NECK FLEXION CAL07

RUN NUMBER: 022299.1318,1



PEAK DATA: 24.38 G @ 8.72 MS; -1.95 G @ 47.12 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

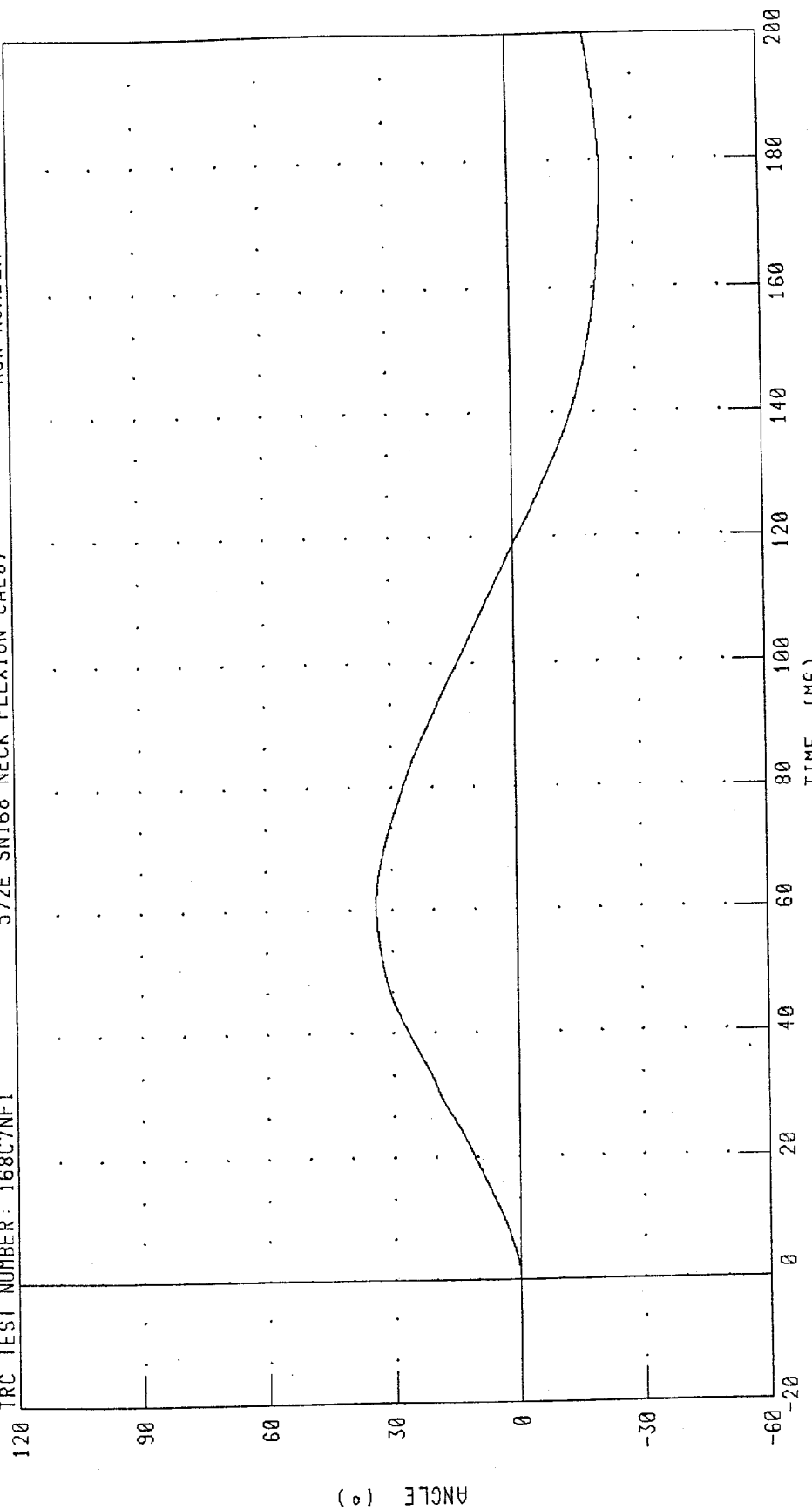
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN168 NECK FLEXION CAL07

RUN NUMBER: 022299.1318;1

TRC TEST NUMBER: 168C7NF1



CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 33.64 ° @ 60.72 MS; -22.19 ° @ 176.80 MS

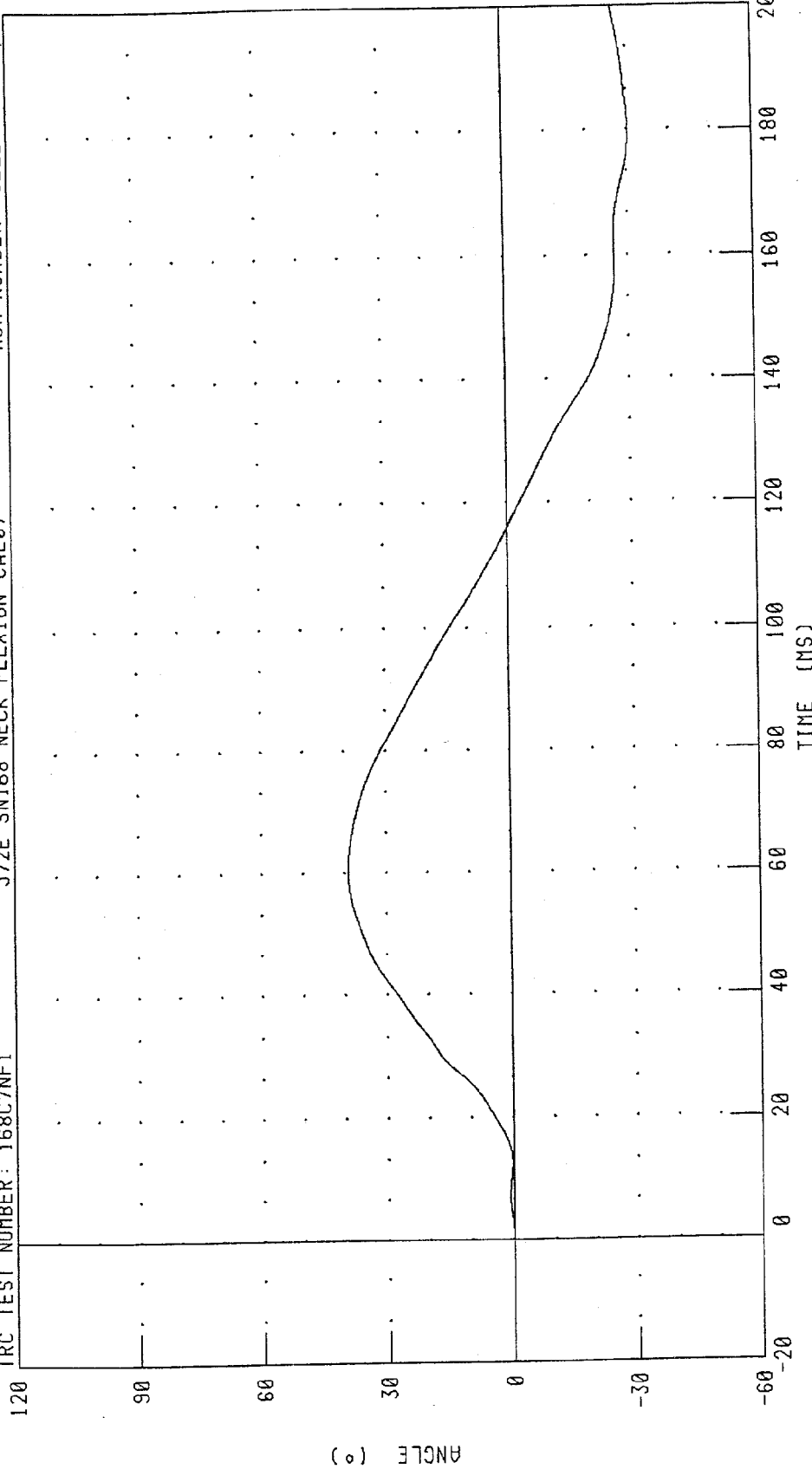
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

572E SN168 NECK FLEXION CAL07

RUN NUMBER: 022299.1318,1

TRC TEST NUMBER: 168C7NF1



PEAK DATA: 39.08 ° @ 60.56 MS; -30.27 ° @ 179.76 MS

CHANNEL: THETA FILTER: CH. CLASS 60

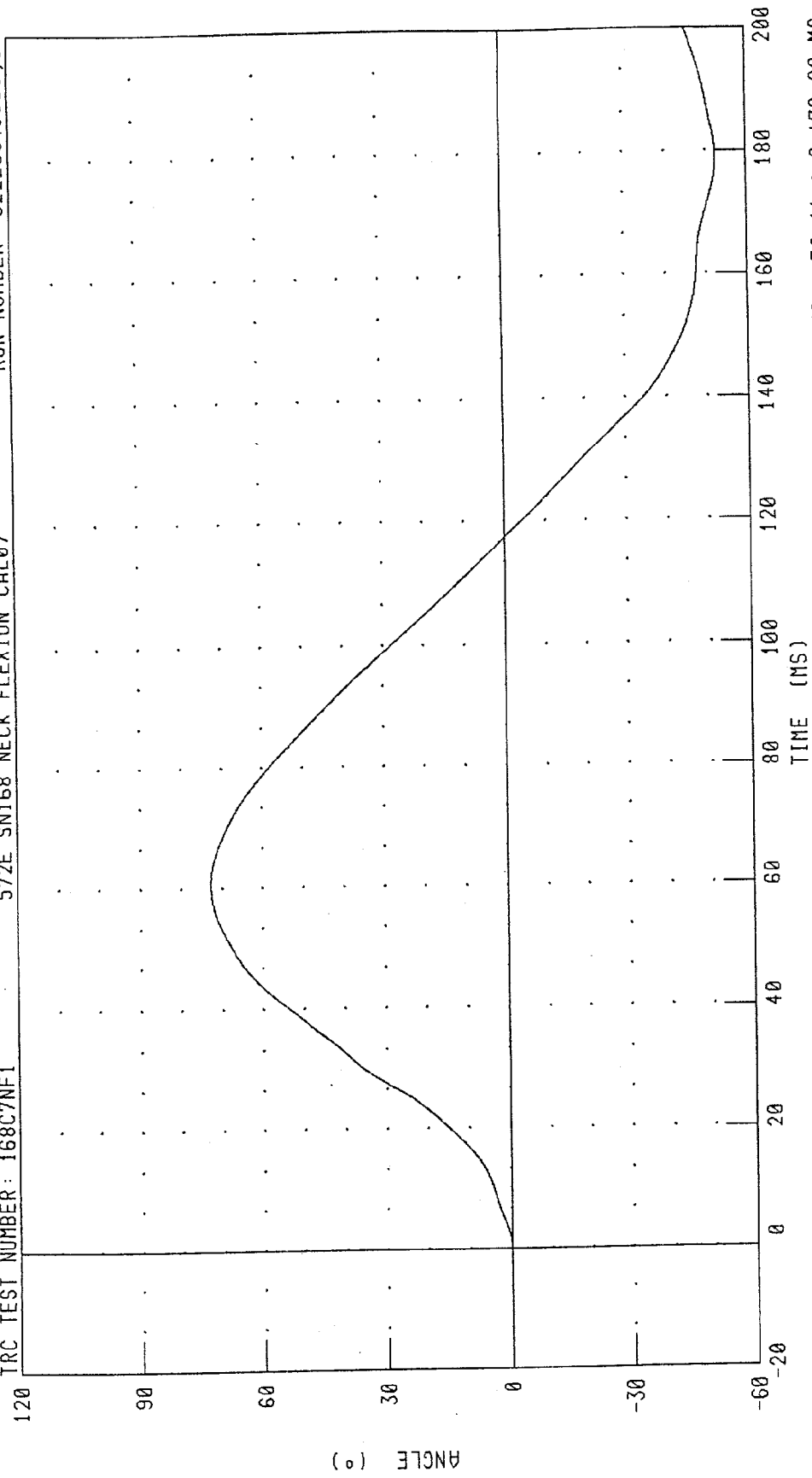
PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

TRC TEST NUMBER: 168C7NF1

572E SNI68 NECK FLEXION CAL07

RUN NUMBER: 022299.1318;1



PEAK DATA: 72.72 ° @ 60.64 MS; -52.41 ° @ 178.80 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

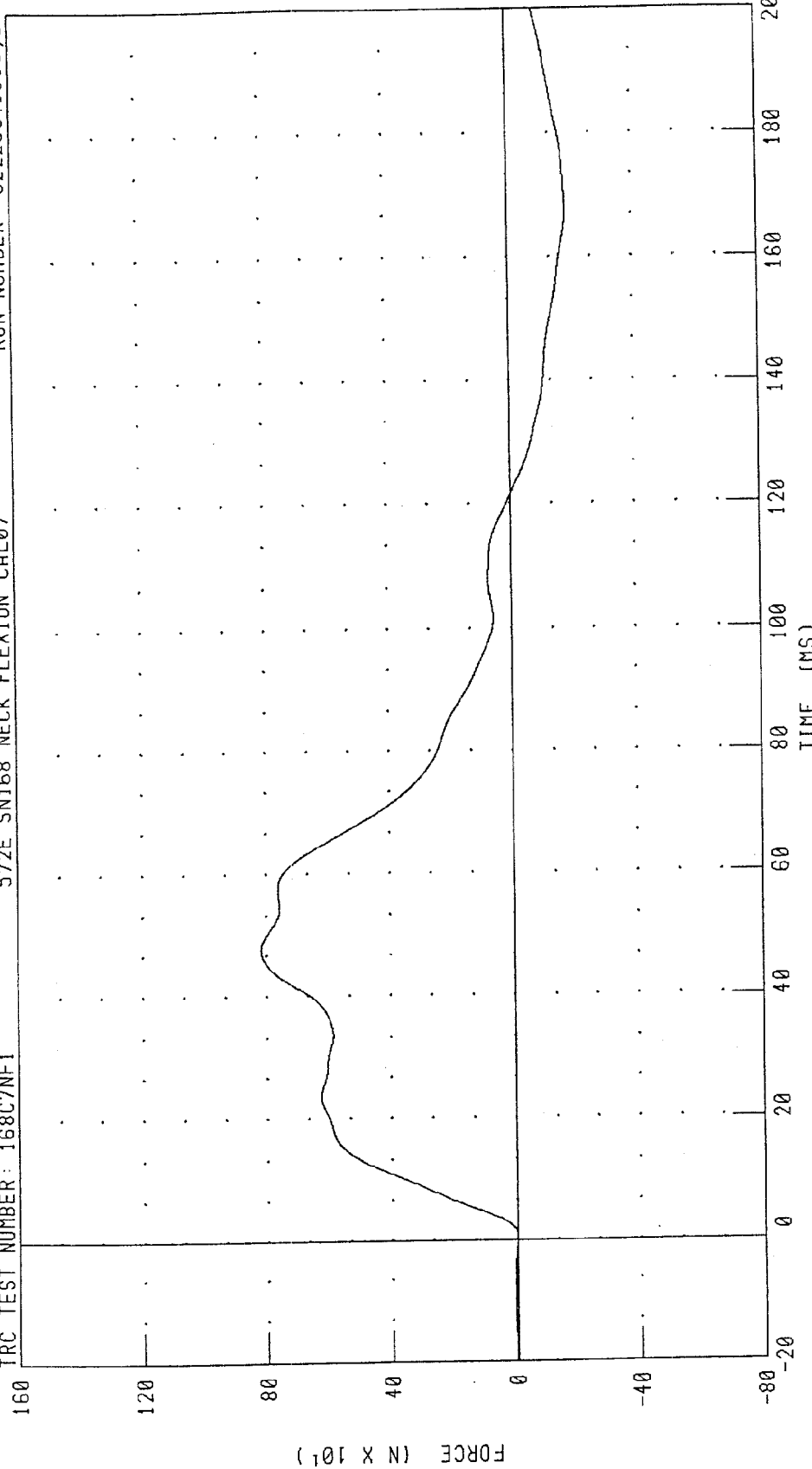
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

RUN NUMBER: 022299.1318,1

572E SN168 NECK FLEXION CAL07

TRC TEST NUMBER: 168C7NF1



PEAK DATA: 816.79 N @ 47.68 MS; -187.42 N @ 167.60 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

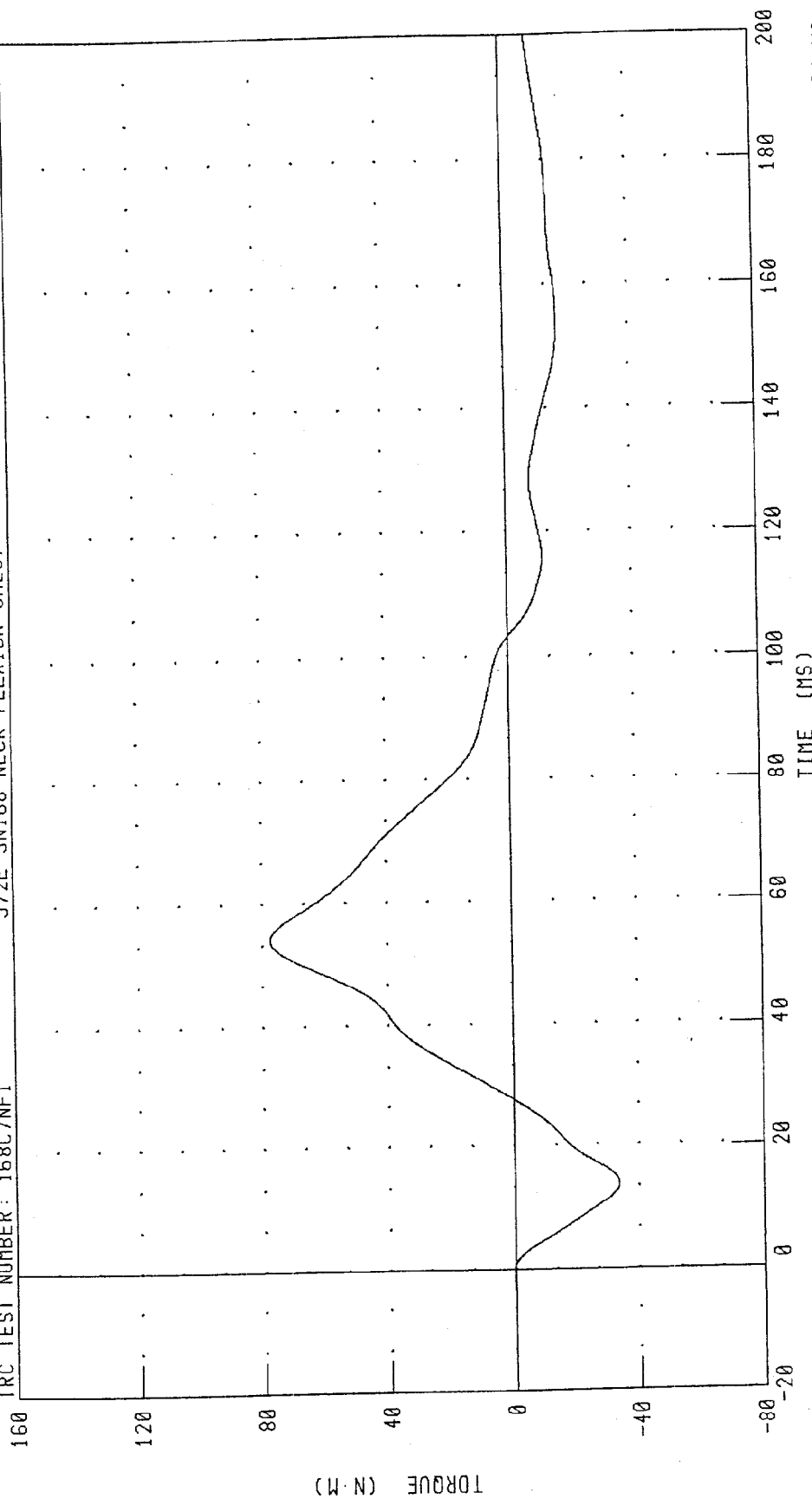
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

RUN NUMBER: 022299.1318;1

572E SN168 NECK FLEXION CAL07

TRC TEST NUMBER: 168C7NF1



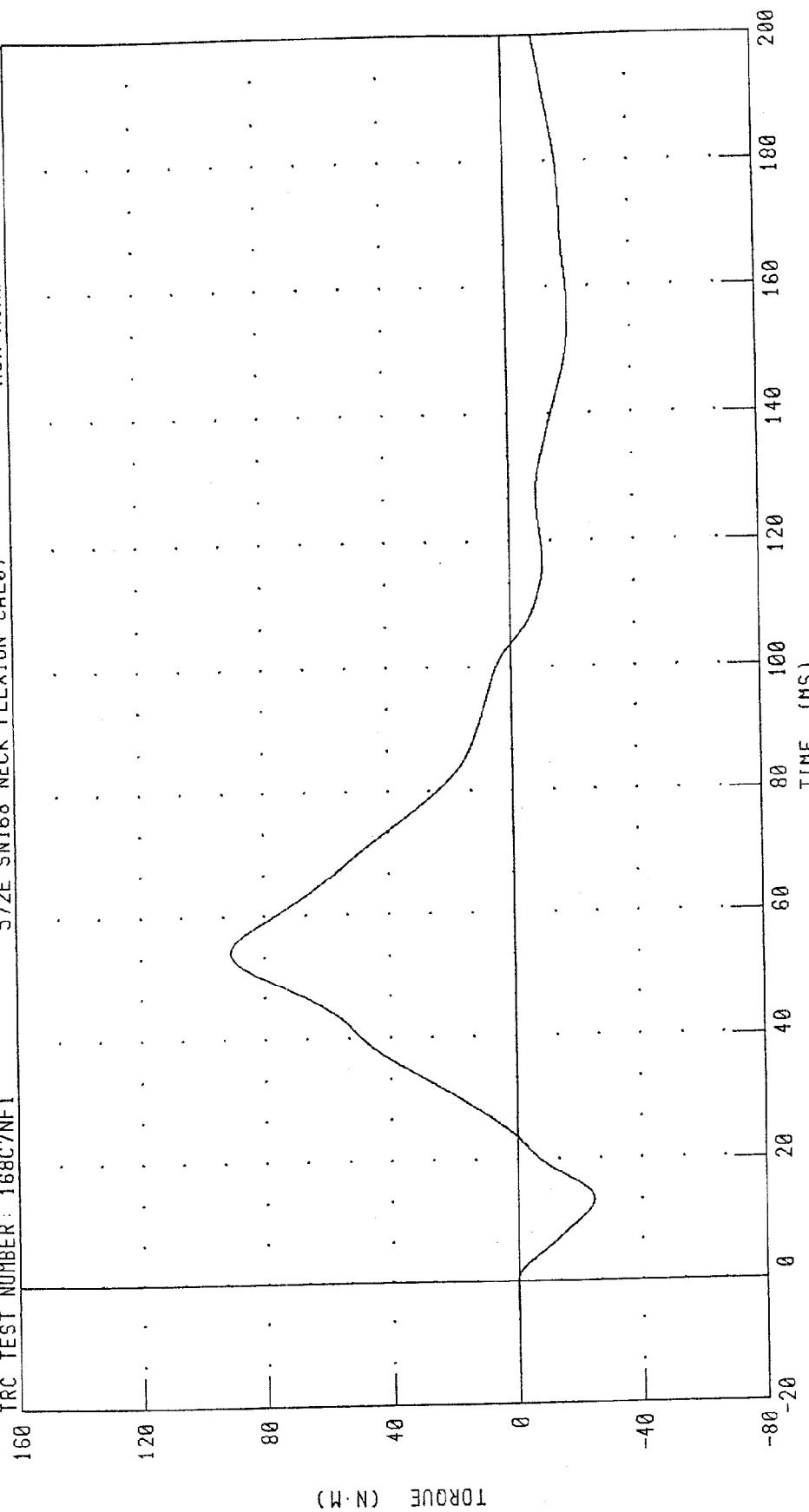
PEAK DATA: 77.50 N·M @ 54.24 MS; -33.74 N·M @ 13.84 MS

CHANNEL: NEKYM FILTER: CH. CLASS 60

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

572E SN168 NECK FLEXION CAL07
RUN NUMBER: 022299.1318;1

TRC TEST NUMBER: 168C7NF1



PEAK DATA: 90.95 N·M @ 54.24 MS; -24.67 N·M @ 13.44 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

22-FEB-99

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 168C7NE2

572E SN168 NECK EXT CAL07

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.71 G
	20 MS	14.00 - 19.00 G	17.20 G
	30 MS	11.00 - 16.00 G	15.45 G
MAX PENDULUM G		22 G MAX	18.99 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	15.45 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	40.88 MS
D PLANE	MAX	81 - 106 DEG.	98.22 DEG.
ROTATION	TIME	72 - 82 MS	77.28 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-67.56 NM
	TIME	65 - 79 MS	72.24 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	160.24 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	144.64 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN Kevin Watkins

RUN NUMBER: 022299.1403;1

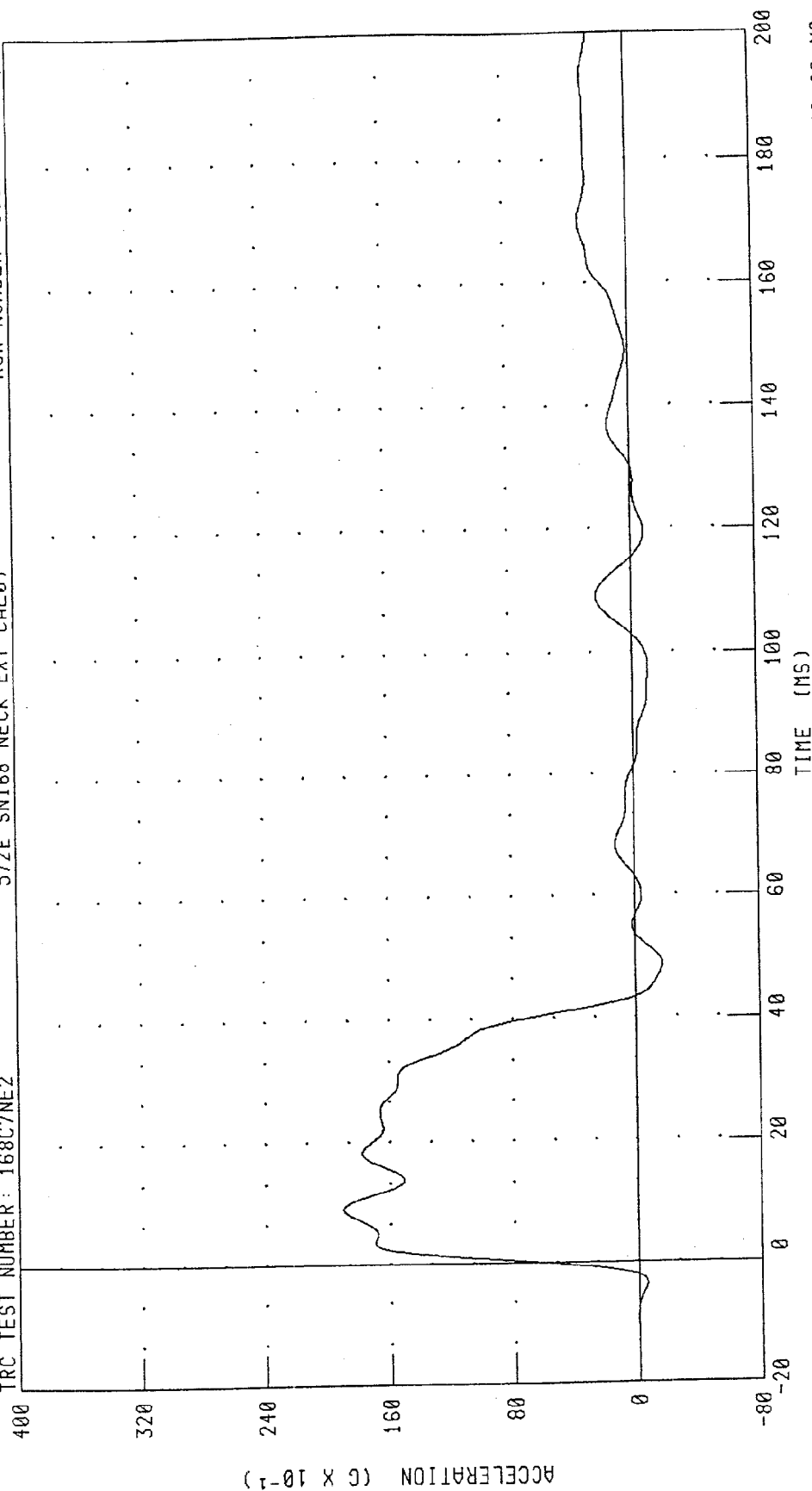
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

572E SN168 NECK EXT CAL07

RUN NUMBER: 030899.1031;1

TRC TEST NUMBER: 168C7NE2



PEAK DATA: 18.99 G @ 9.20 MS, -1.78 G @ 48.88 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

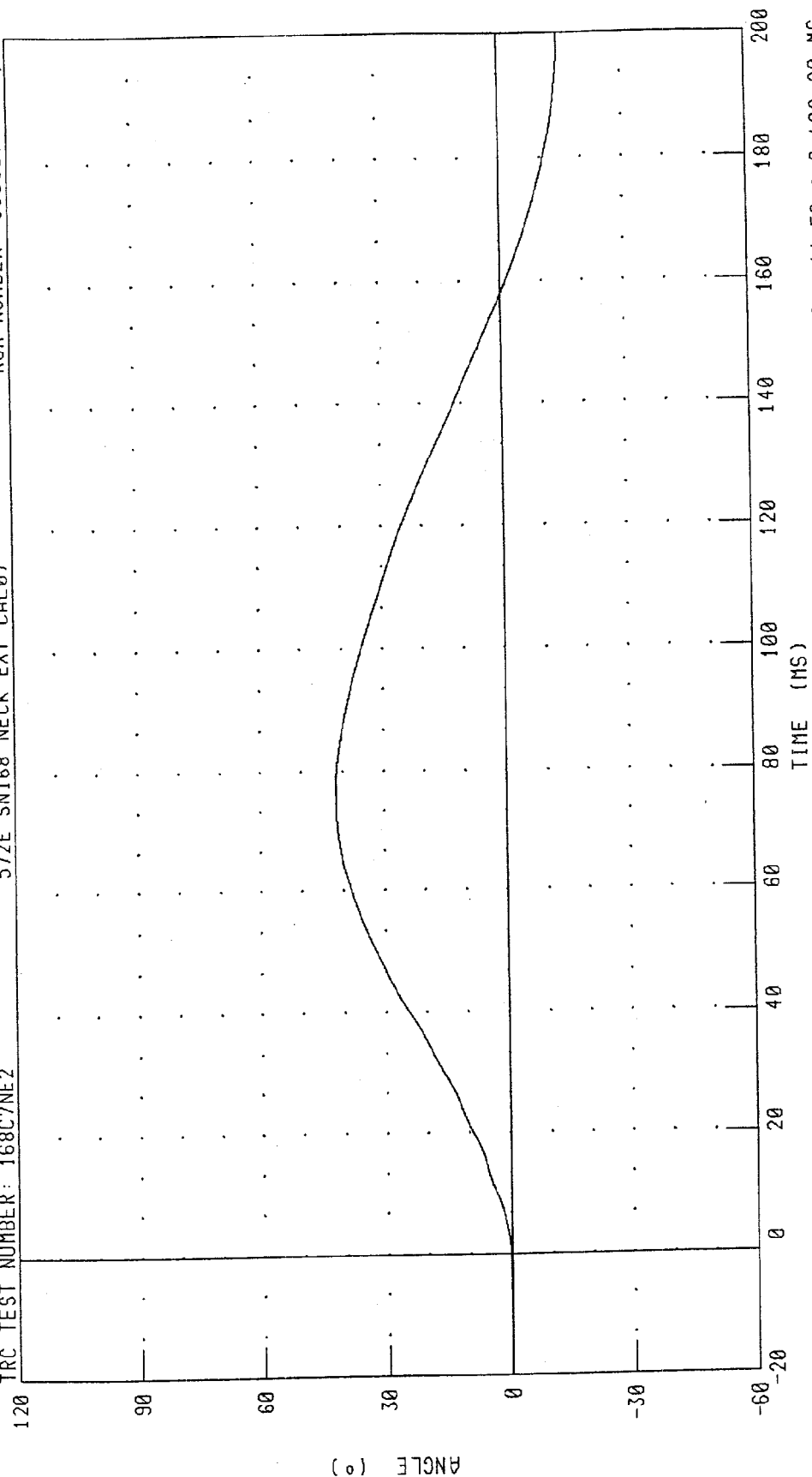
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

RUN NUMBER: 030899.1031.1

TRC TEST NUMBER: 168C7NE2

572E SN168 NECK EXT CAL07



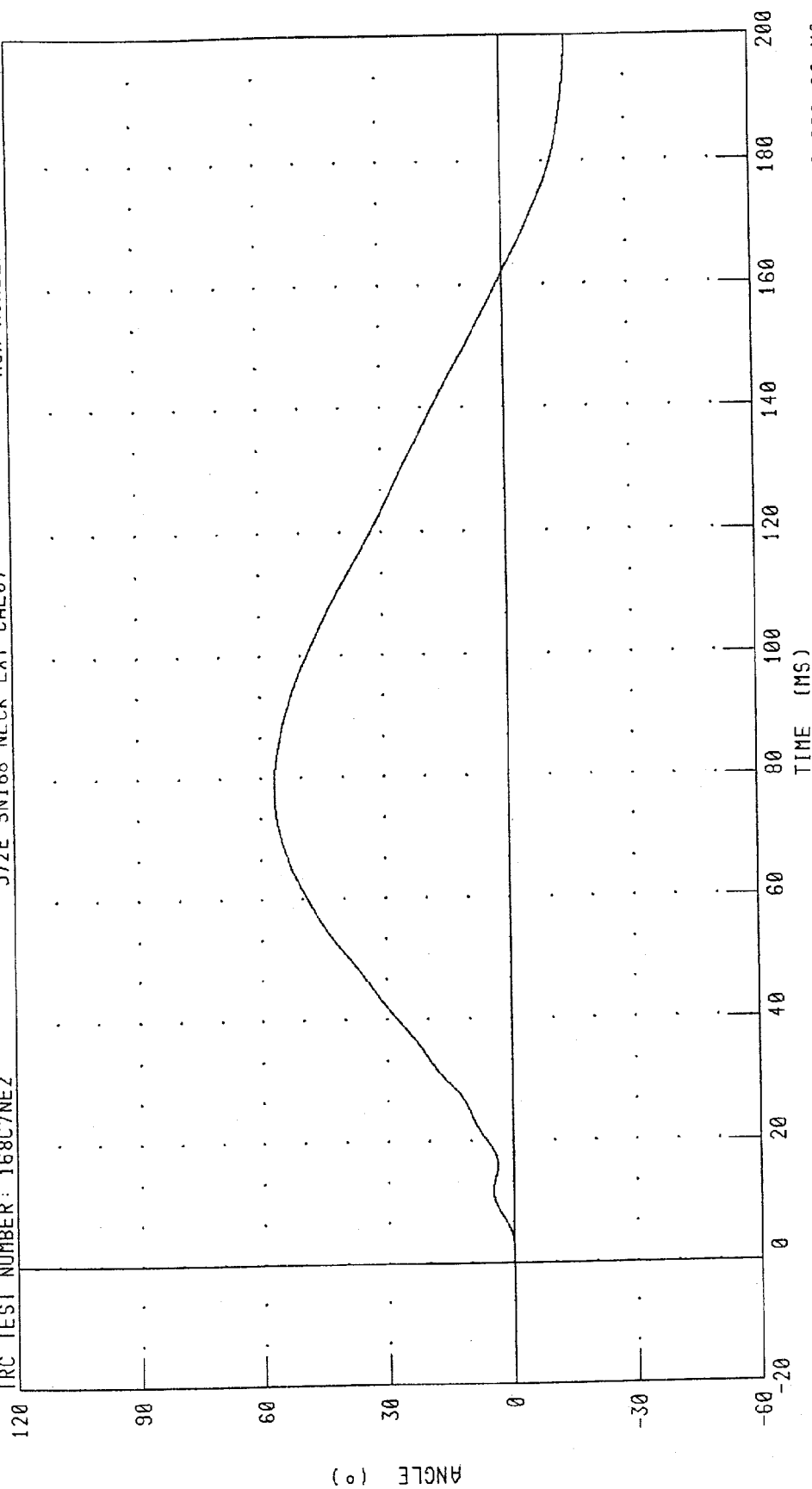
CHANNEL: BETA FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 168C7NE2

572E SN168 NECK EXT CAL07

RUN NUMBER: 030899.1031,1



CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 56.64 ° @ 78.64 MS; -15.88 ° @ 200.00 MS

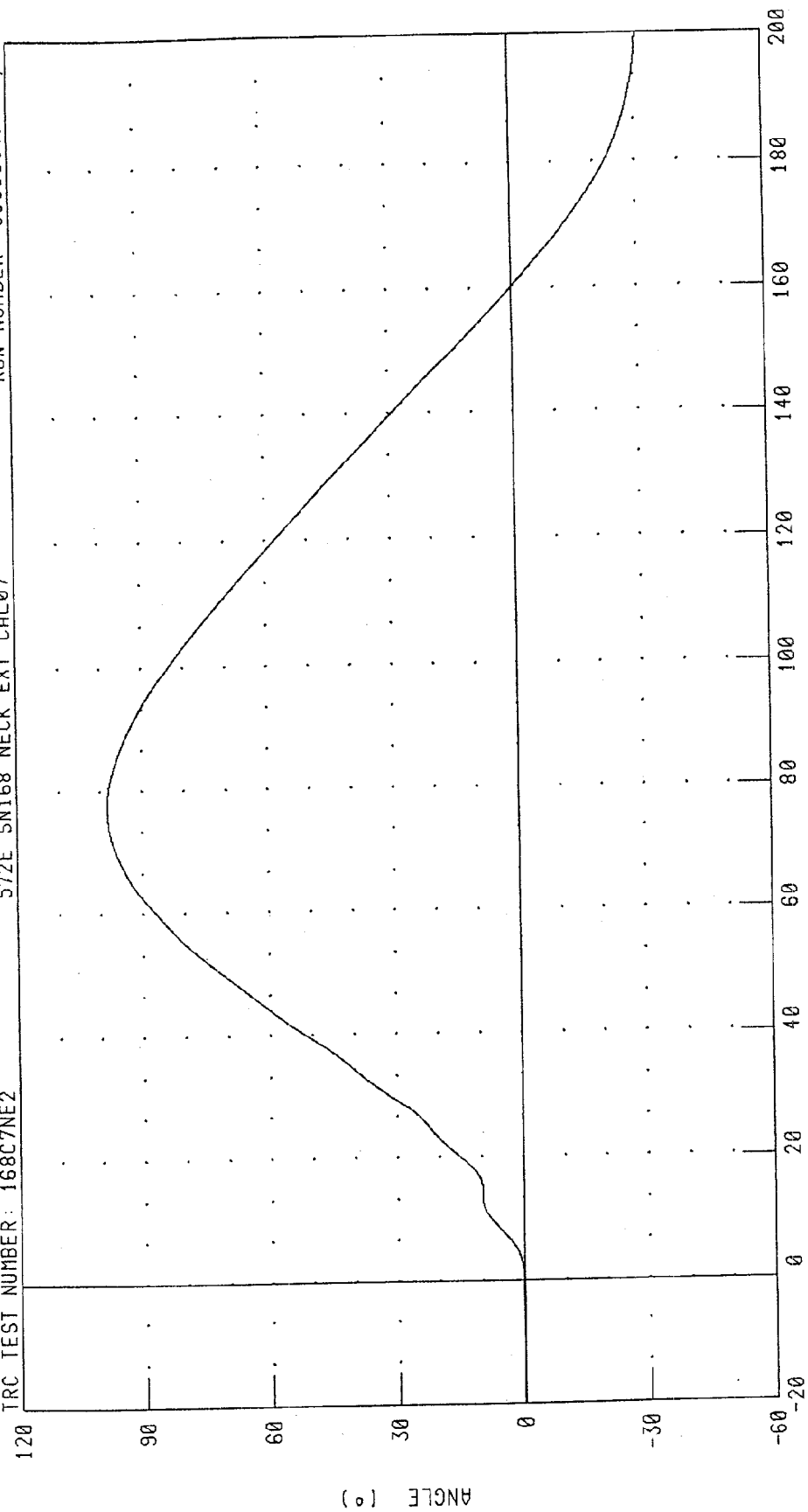
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

RUN NUMBER: 030899.1031.1

572E SN168 NECK EXT CAL07

TRC TEST NUMBER: 168C7NE2



PEAK DATA: 98.23 ° @ 77.28 MS, -30.46 ° @ 200.00 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

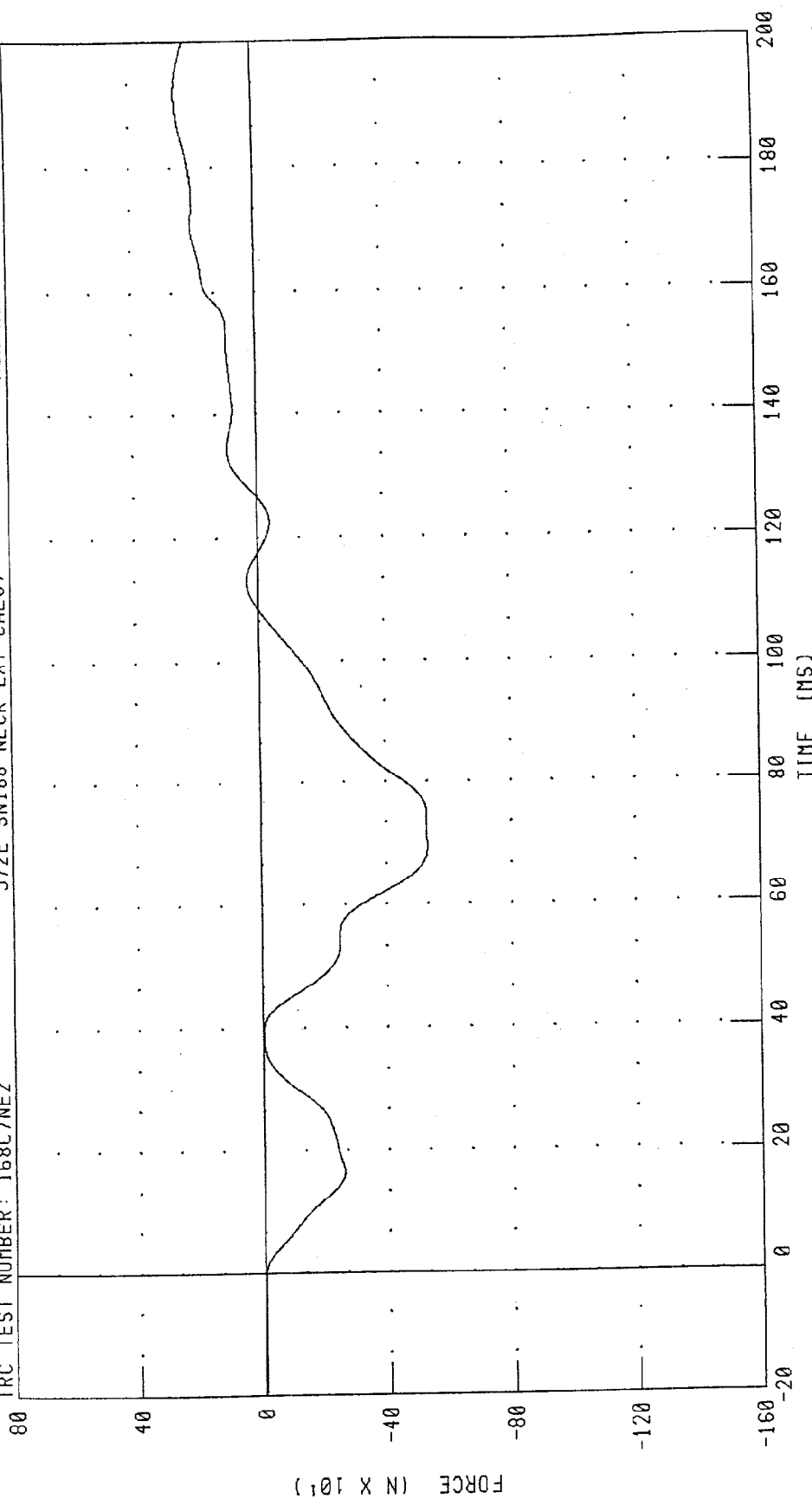
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

RUN NUMBER: 030899.1031;1

572E SN168 NECK EXT CAL07

TRC TEST NUMBER: 168C7NE2



PEAK DATA: 250.98 N @ 191.84 MS; -532.77 N @ 69.36 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th

22-FEB-99

TRC INC.

TEST NO: 168C7TH1

572E SN168 H.S.THORAX CAL07

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	22.2 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.59 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	67.2 MM
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5773. N
INTERNAL HYSTERESIS	69% - 85%	69.0%

TEST MEETS SPECIFICATIONS

TECHNICIAN

B. C. L.

RUN NUMBER: 022299.1601;1

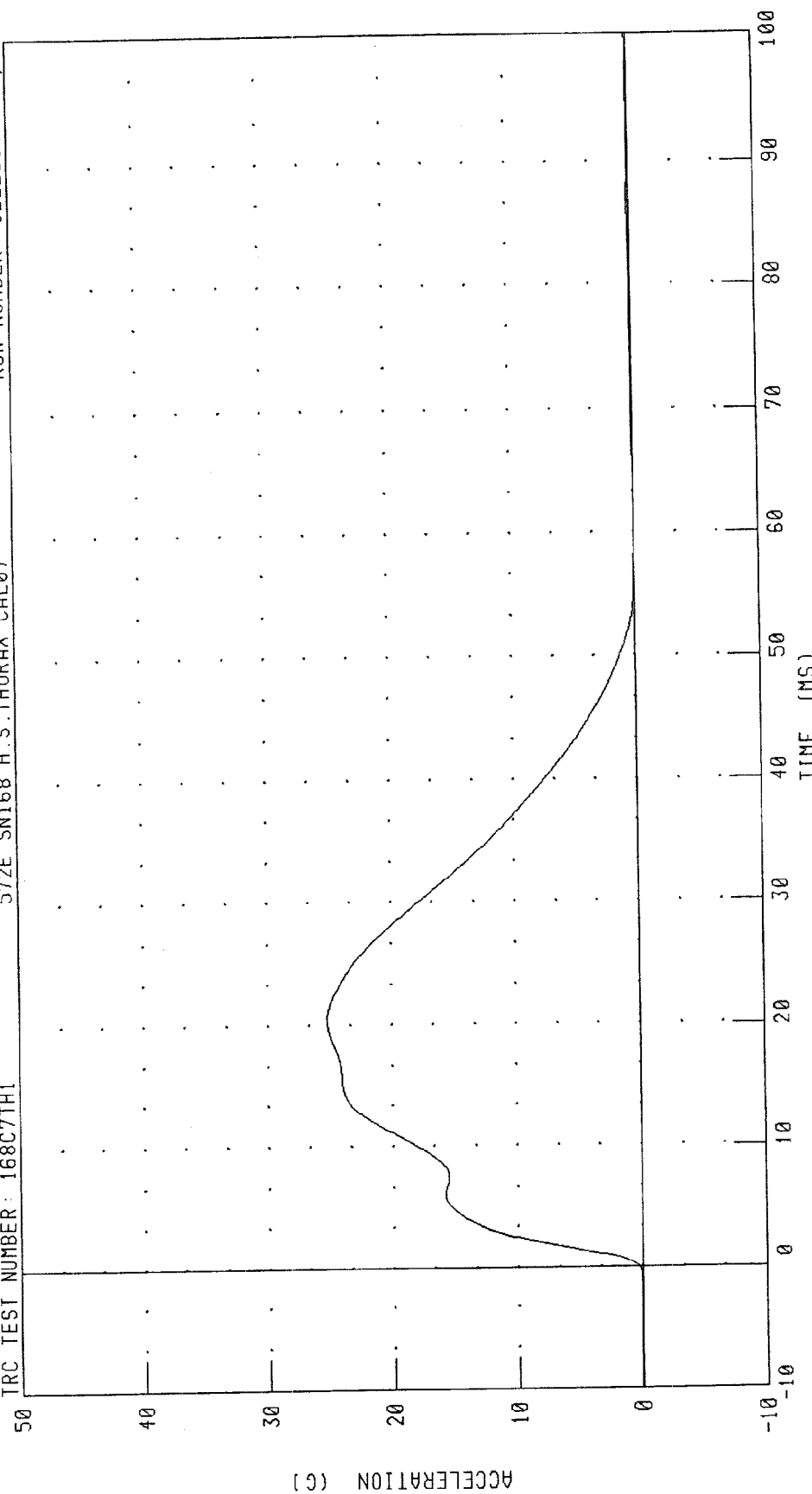
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM DECELERATION

RUN NUMBER: 022299.1602;1

572E SN168 H.S.THORAX CAL07

TRC TEST NUMBER: 168C7TH1



PEAK DATA: 25.20 G @ 20.40 MS; -0.05 G @ 61.52 MS

CHANNEL: PENXG FILTER: CH. CLASS 180

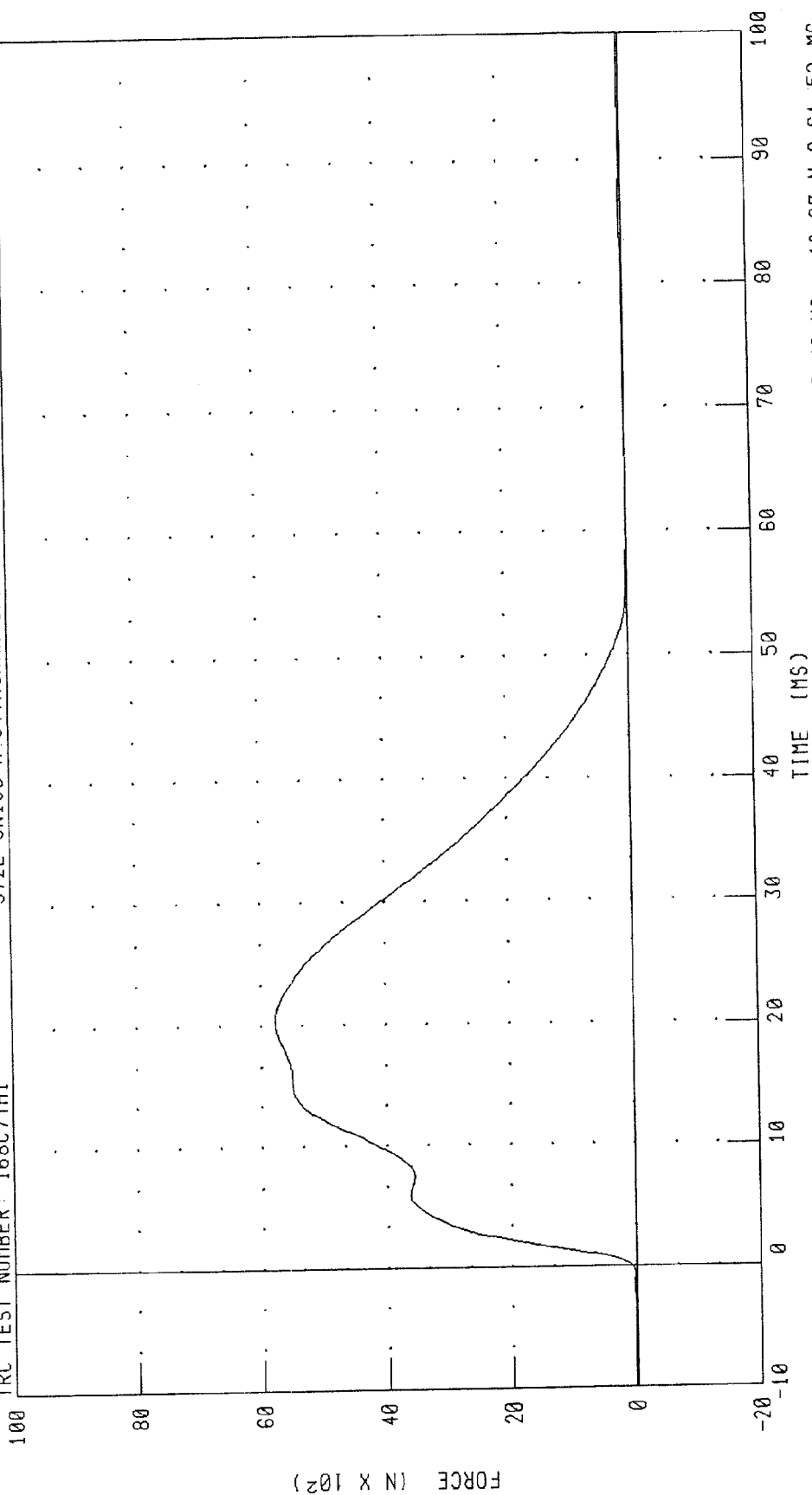
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

RUN NUMBER: 022299.1602;1

572E SN168 H.S. THORAX CAL07

TRC TEST NUMBER: 168C7IH1



PEAK DATA: 5773.94 N @ 20.40 MS; -10.87 N @ 61.52 MS

CHANNEL: PENXF FILTER: CH. CLASS 180

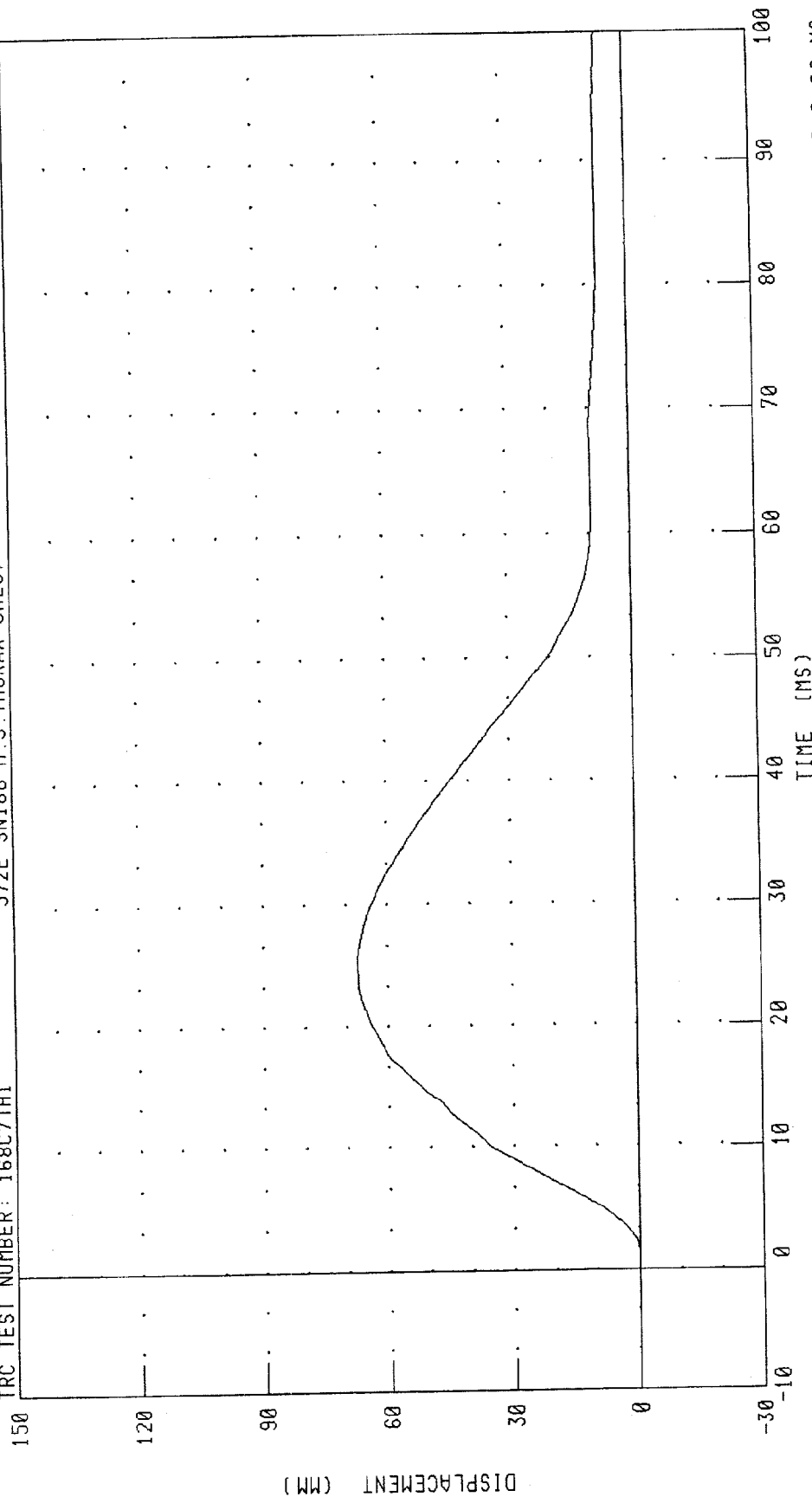
PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

RUN NUMBER: 022299.1602;1

TRC TEST NUMBER: 168C7TH1

572E SN168 H.S.THORAX CAL07



CHANNEL: CSTXD FILTER: CH. CLASS 180

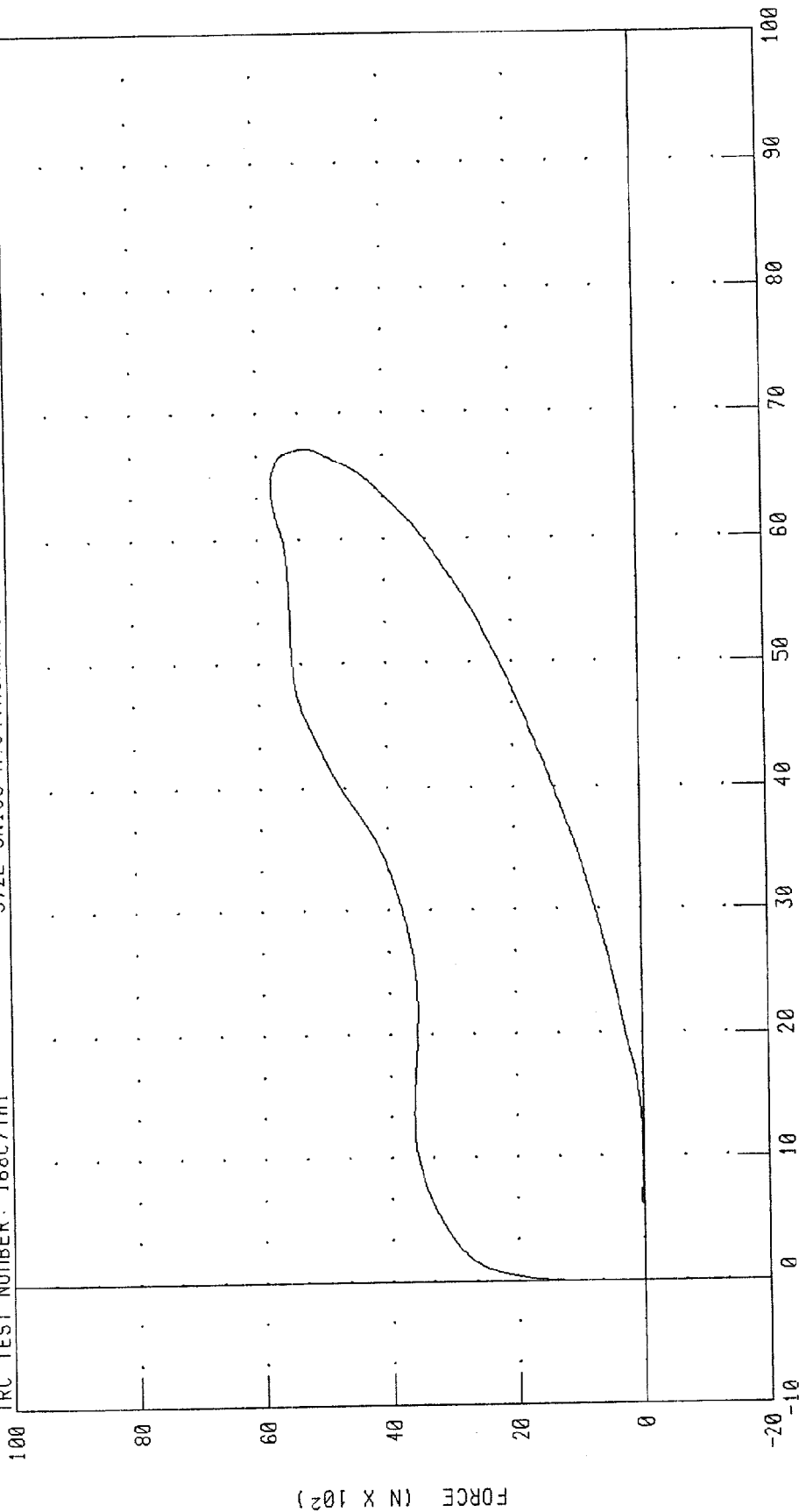
PEAK DATA: 67.23 MM @ 25.36 MS; -0.03 MM @ 0.96 MS

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

RUN NUMBER: 0222299.1602;1

TRC TEST NUMBER: 168C7TH1

572E SN168 H.S.THORAX CAL07



CHANNEL: CSTXD
PENXF

FILTER: CH. CLASS 180
CH. CLASS 180

PEAK DATA:

67.23 MM @ 25.36 MS; -0.03 MM @ 0.96 MS
5773.94 N @ 20.40 MS; -10.87 N @ 61.52 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

20-FEB-99

TRC 3NC.

TEST NO: 168C7HR1

572E SN 168 HIPFLEX CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	64.3 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	45.1 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN

B. Calt

RUN NUMBER: 022099.1203;3

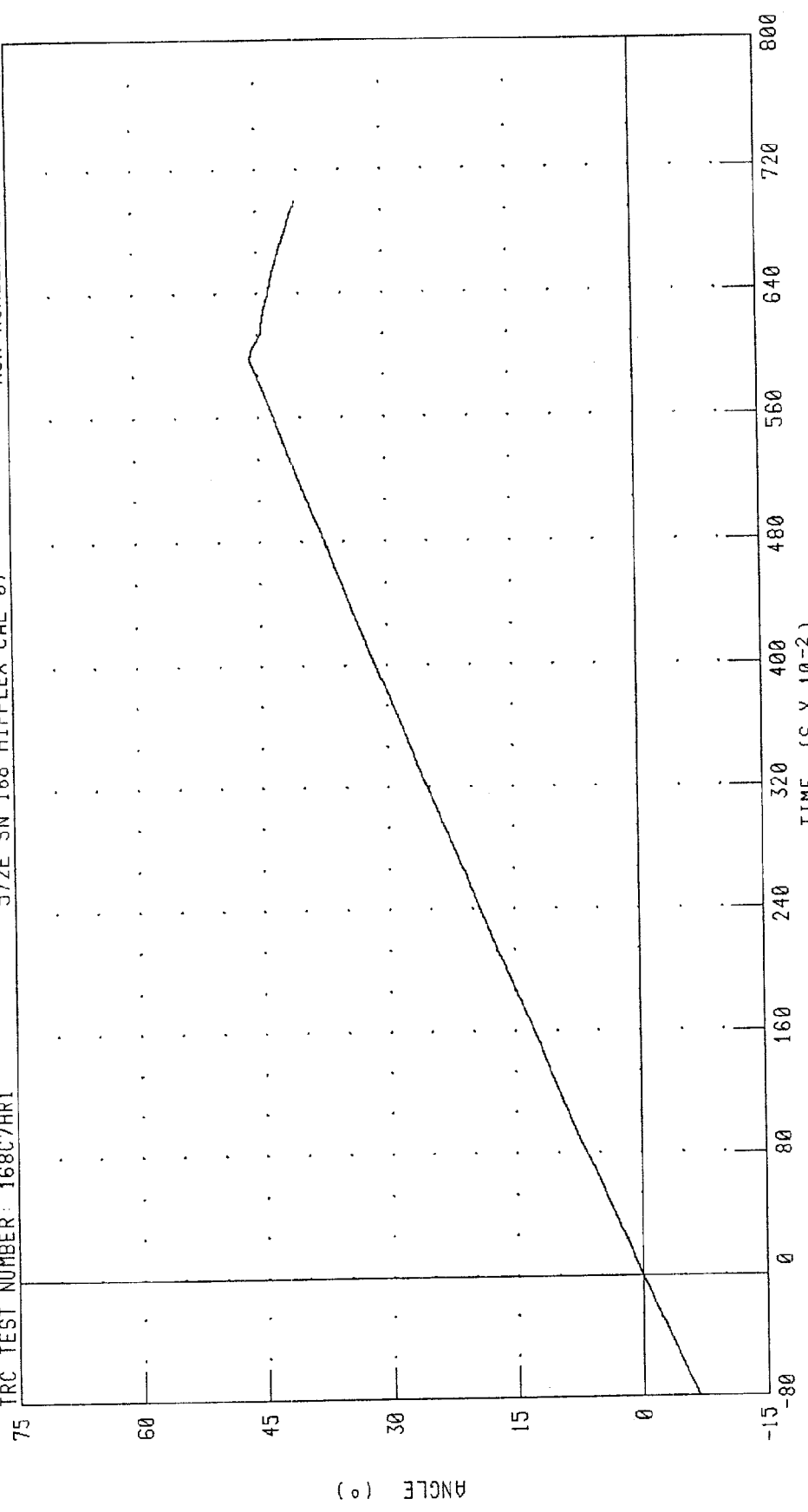
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

RIGHT HIP FLEXION ROTATION

RUN NUMBER: 022099.1203,3

TRC TEST NUMBER: 168C7HR1

572E SN 168 HIPFLEX CAL 07



PEAK DATA: 45.97 ° @ 5.99 S; -9.74 ° @ -1.00 S

CHANNEL: RHPXD FILTER: CH. CLASS 60

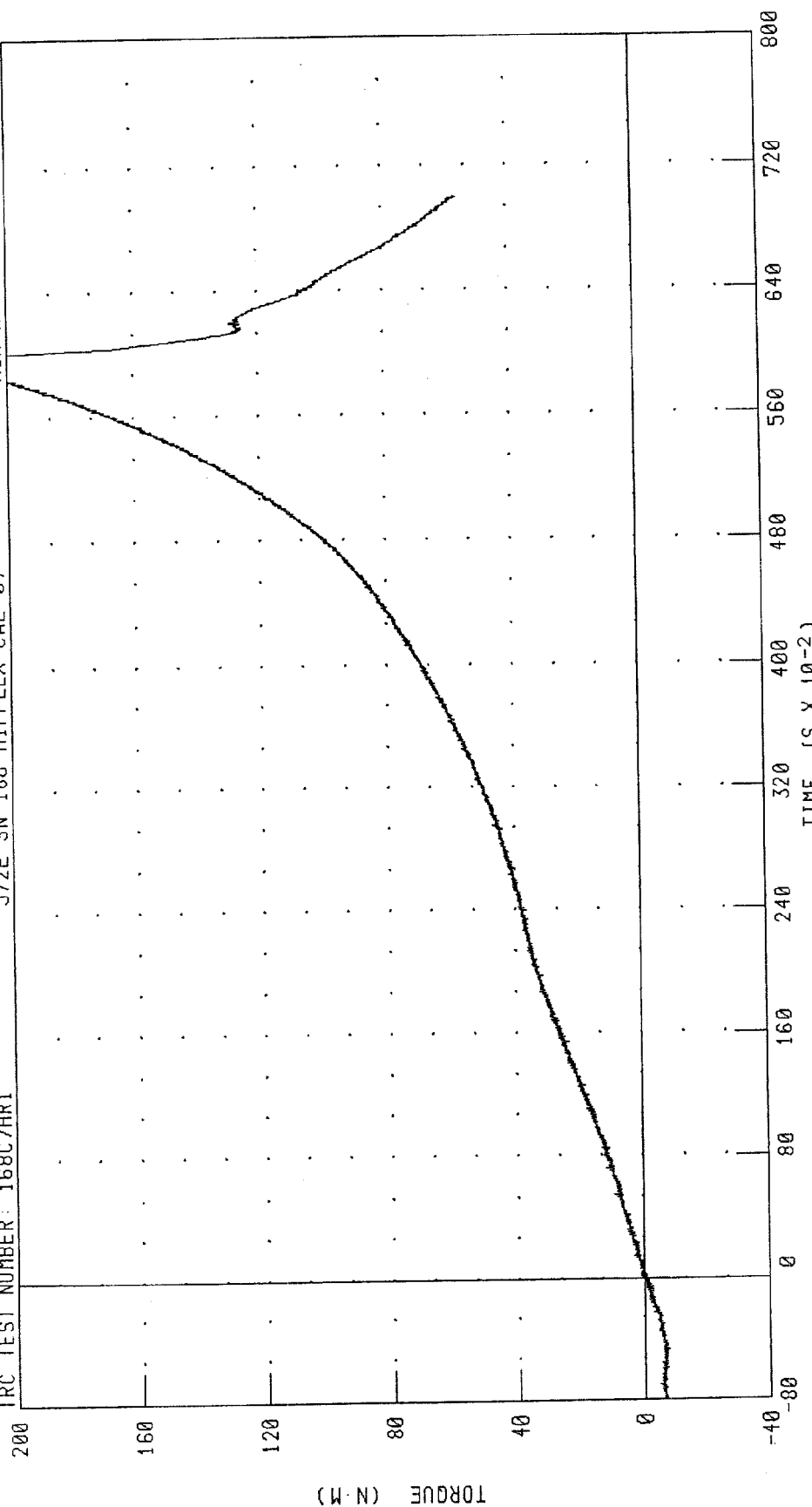
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

RIGHT HIP FLEXION MOMENT

572E SN 168 HIPFLEX CAL 07

RUN NUMBER: 022099.1203,3

TRC TEST NUMBER: 168C7HR1

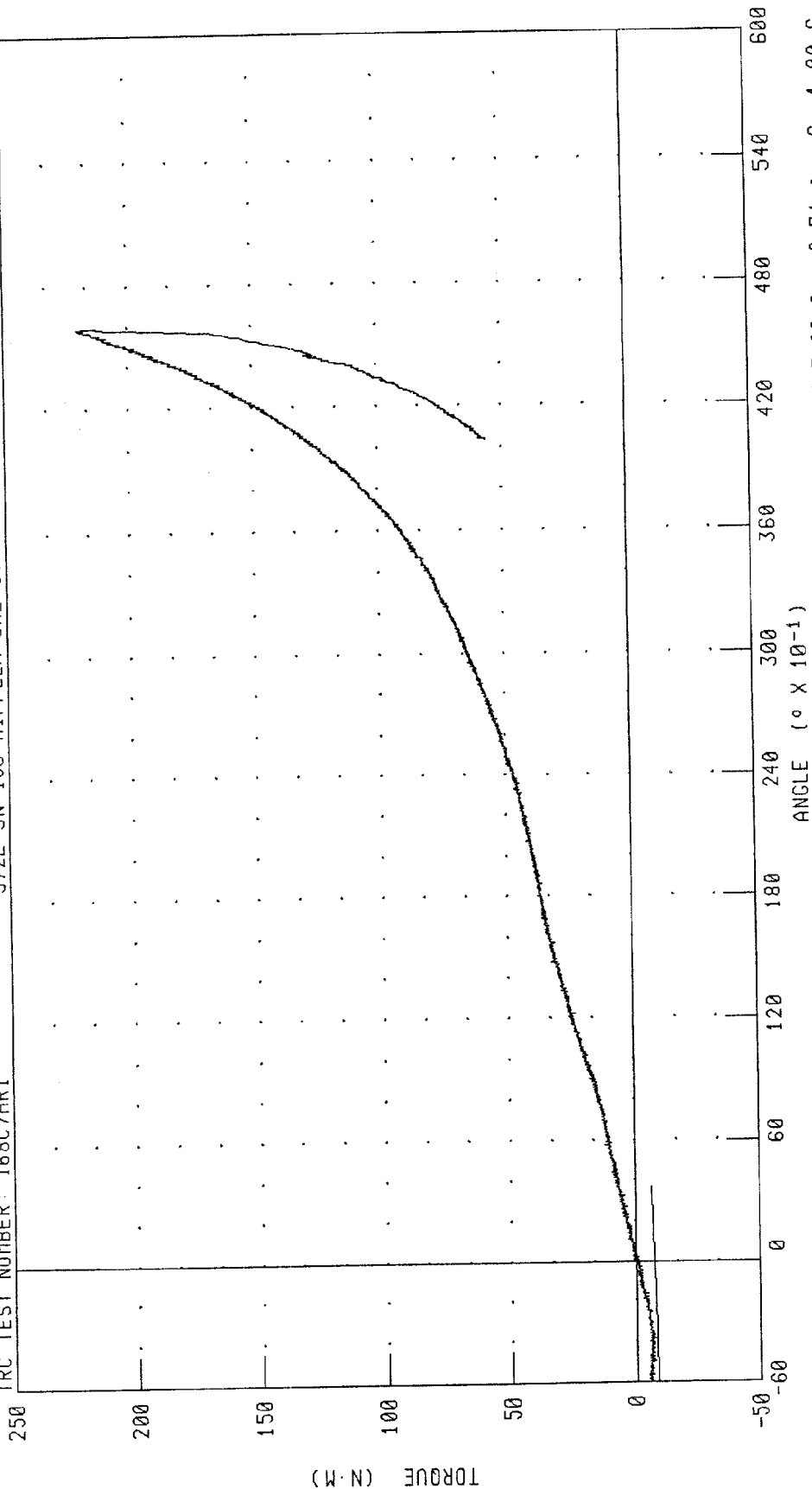


PEAK DATA: 220.58 N.M @ 5.96 S; -9.85 N.M @ -0.99 S

CHANNEL: RHPYM FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
 RIGHT HIP FLEXION MOMENT VS ROTATION ANGLE

TRC TEST NUMBER: 168C7HR1 572E SN 168 HIPFLEX CAL 07 RUN NUMBER: 022099.1203;3



CHANNEL: RHPXD FILTER: CH. CLASS 60
 RHPYM CH. CLASS 60

PEAK DATA: 45.97 ° 0 5.99 S; -9.74 ° 0 -1.00 S
 220.58 N·M 0 5.96 S; -9.85 N·M 0 -0.99 S

TRANSPORTATION RESEARCH CENTER INC.

LEFT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

20-FEB-99

TRC INC.

TEST NO: 168C7HL1

572E SN 168 HIPFLEX CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	64.3 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	45.1 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN

B. C. L. T.

RUN NUMBER: 022099.1155;2

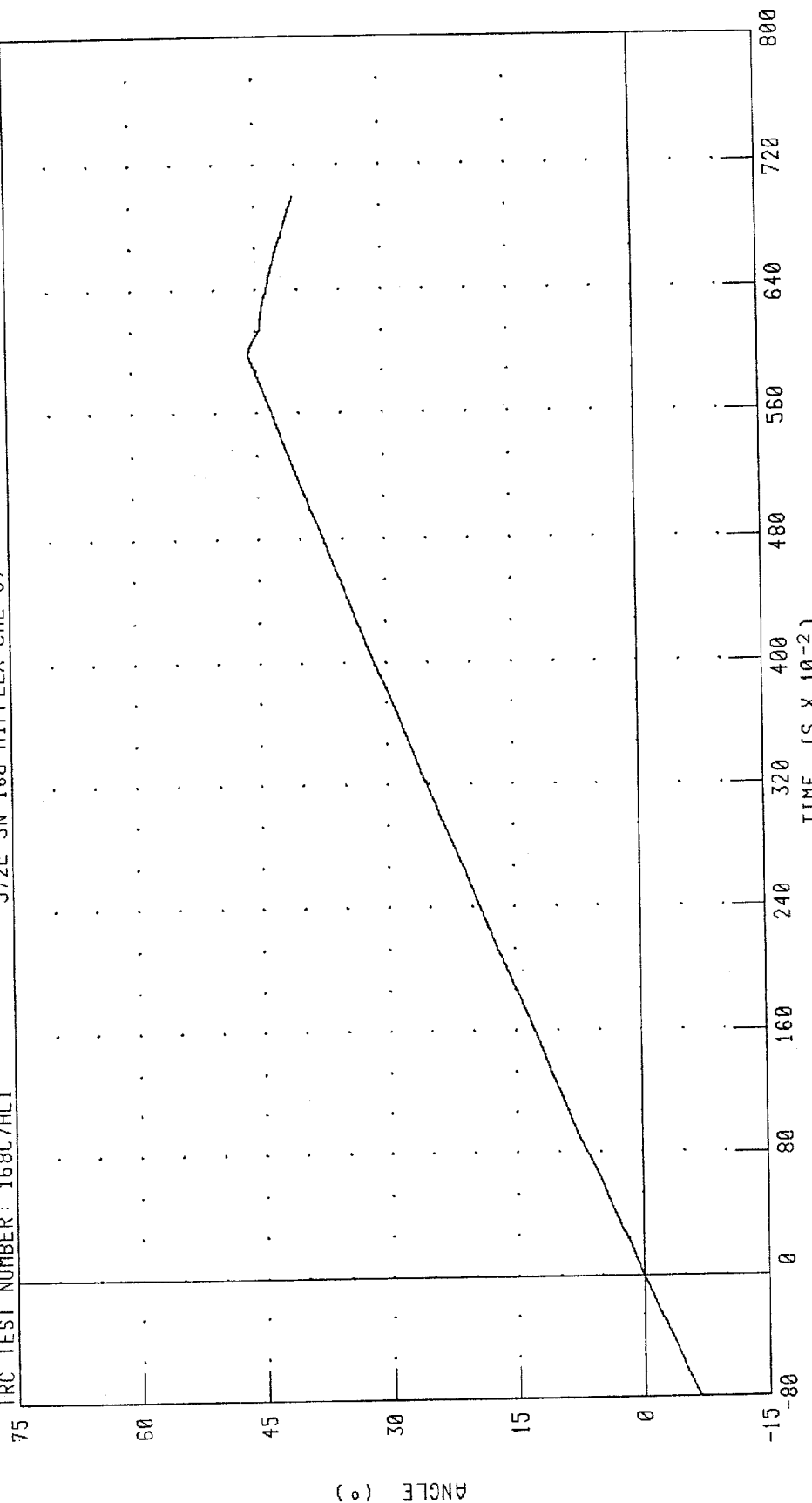
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

LEFT HIP FLEXION ROTATION

RUN NUMBER: 022099.1155;2

TRC TEST NUMBER: 168C7HL1

572E SN 168 HIPFLEX CAL 07



PEAK DATA: 45.97 ° @ 5.99 S; -9.67 ° @ -1.00 S

CHANNEL: LHPXD FILTER: CH. CLASS 60

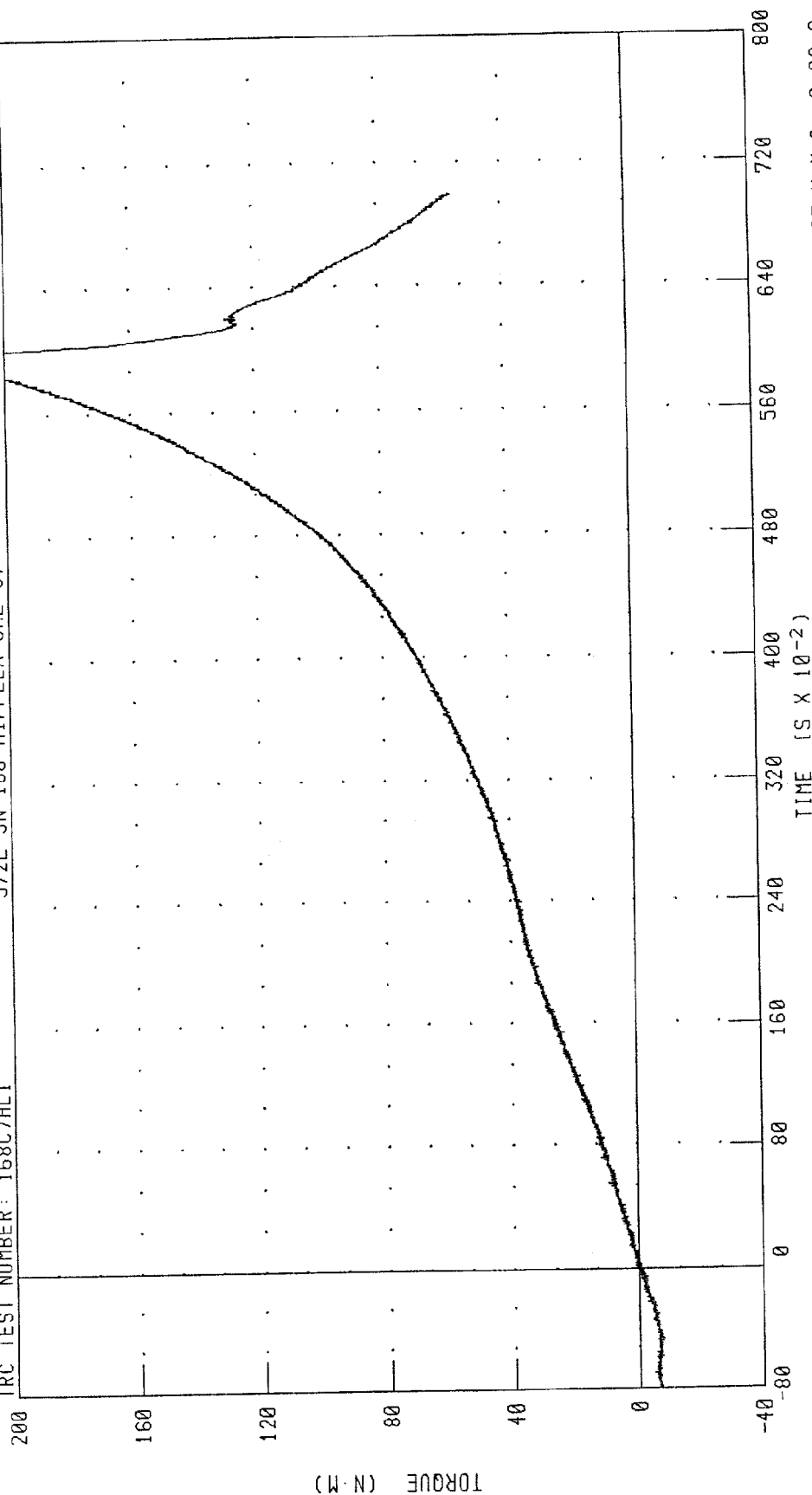
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

LEFT HIP FLEXION MOMENT

TRC TEST NUMBER: 168C7HL1

572E SN 168 HIPFLEX CAL 07

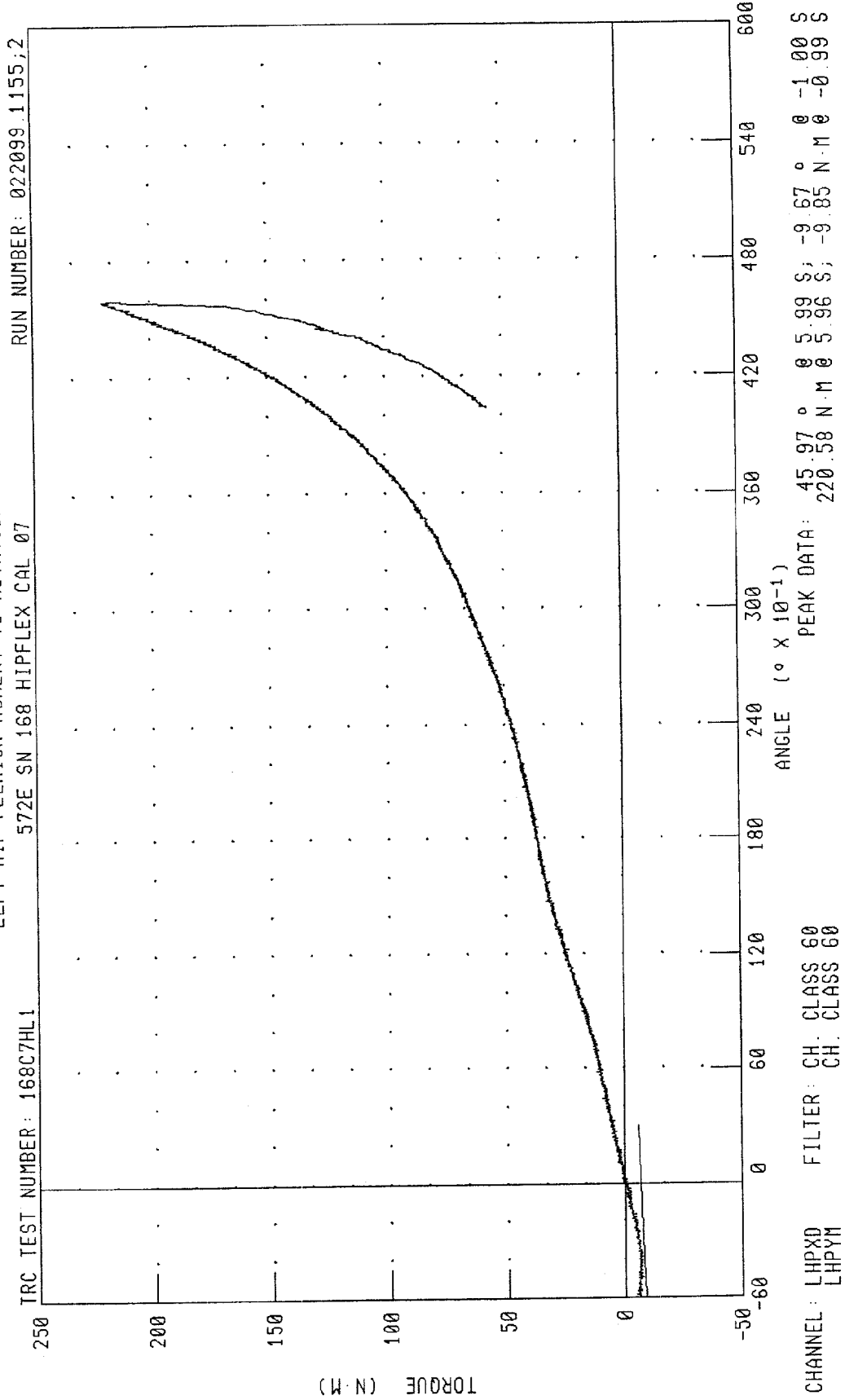
RUN NUMBER: 022099.1155;2



PEAK DATA: 220.58 N·M @ 5.96 S; -9.85 N·M @ -0.99 S

CHANNEL: LHPVN FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES
LEFT HIP FLEXION MOMENT VS ROTATION ANGLE



TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th

20-FEB-99

TRC INC.

TEST NO: 168C7RK1

572E SN168 RIGHT KNEE CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5249.8 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

Bj. Calt

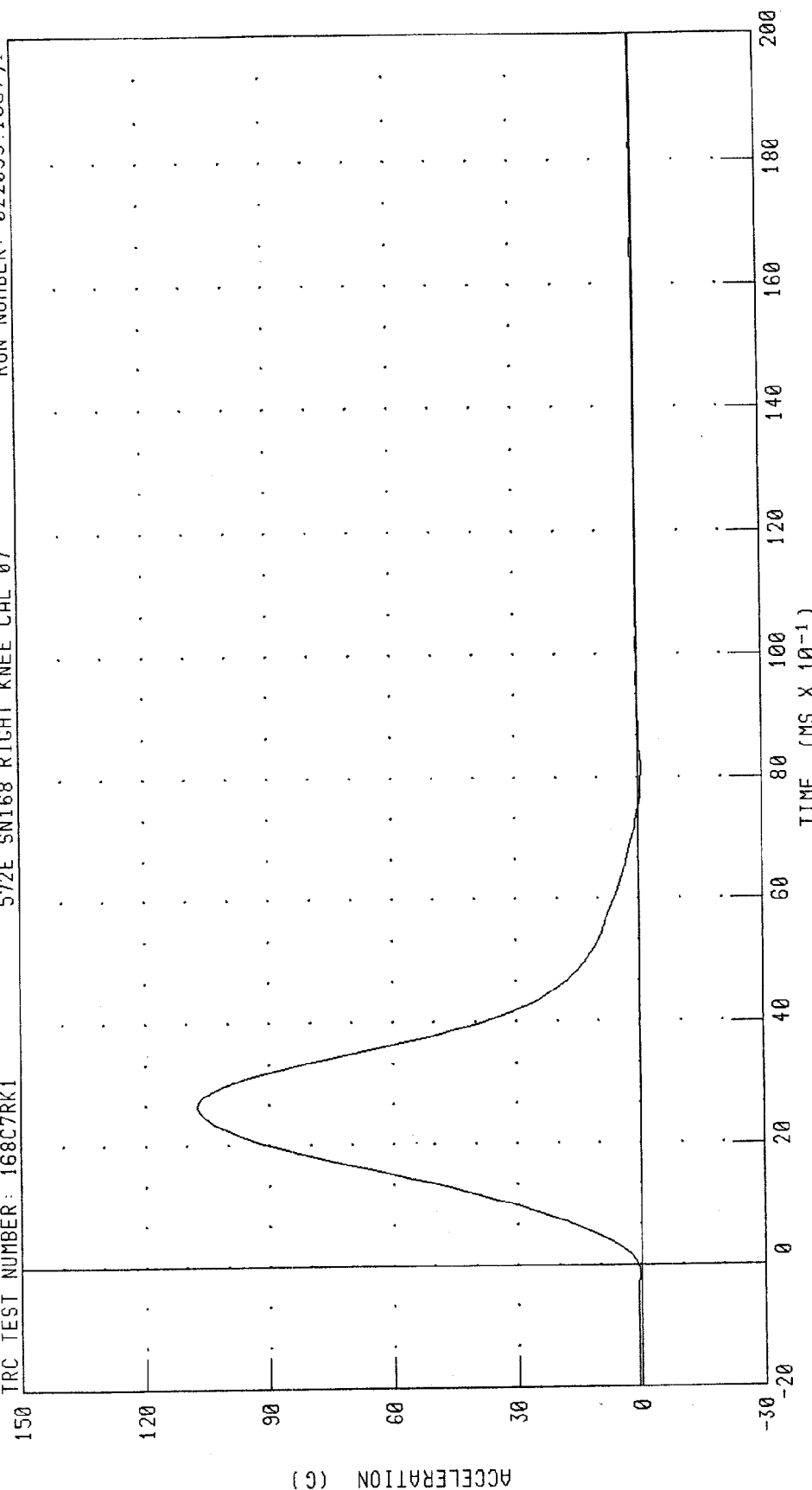
RUN NUMBER: 022099.1057;1

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

TRC TEST NUMBER: 168C7RK1

572E SN168 RIGHT KNEE CAL 07

RUN NUMBER: 022099.1057.1



CHANNEL: PENXG FILTER: CH. CLASS 600

PEAK DATA: 107.30 G @ 2.64 MS; -0.76 G @ 8.16 MS

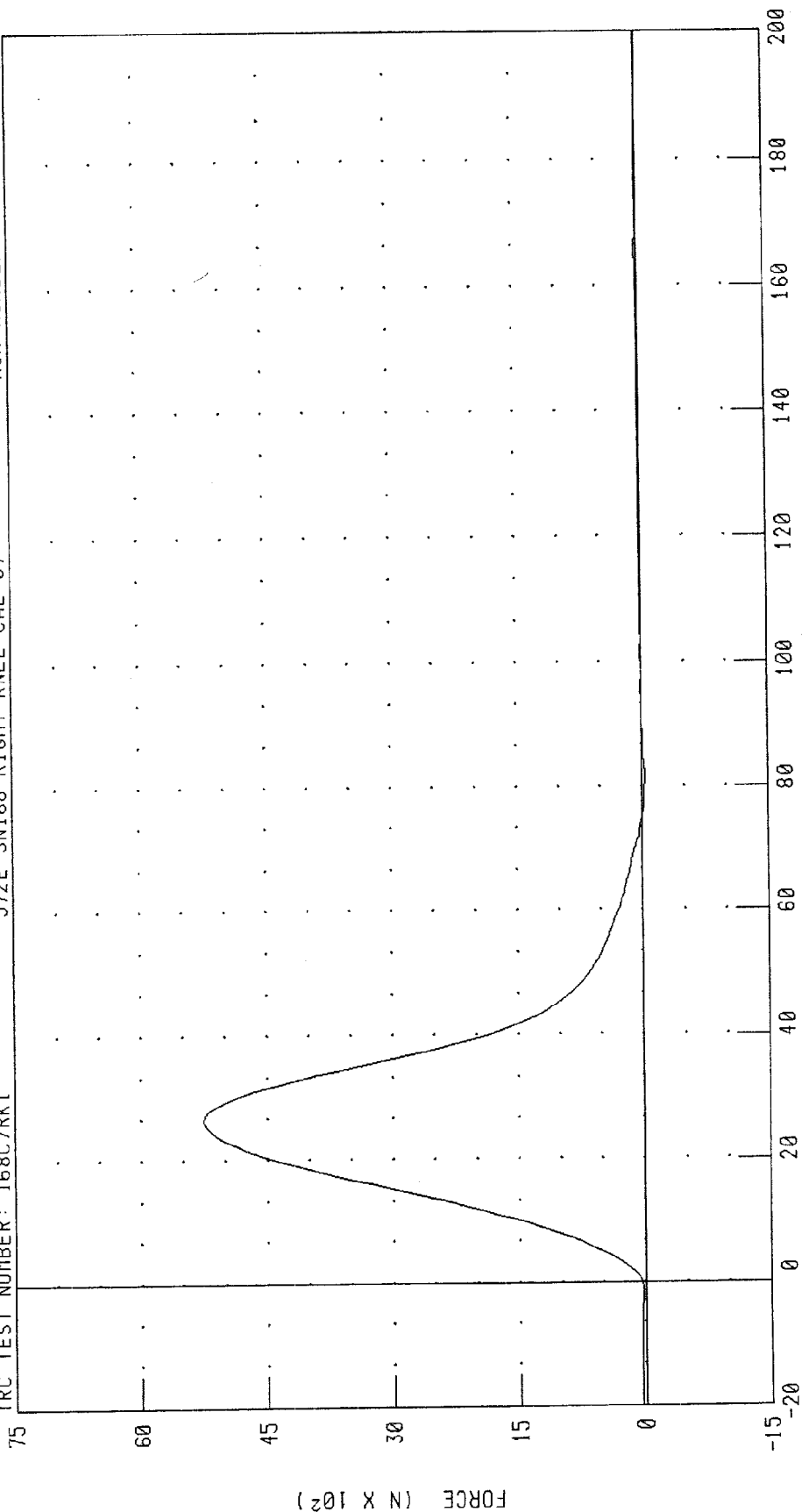
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN168 RIGHT KNEE CAL 07

RUN NUMBER: 022099.1057;1

TRC TEST NUMBER: 168C7RK1



CHANNEL: PENXF FILTER: CH. CLASS 600 PEAK DATA: 5249.88 N @ 2.64 MS; -37.40 N @ 8.16 MS

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th

20-FEB-99

TRC INC.

TEST NO: 168C7LK1

572E SN168 LEFT KNEE CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5838.0 N *

* TEST DOES NOT MEET SPECIFICATIONS

TECHNICIAN Kevin Watkins

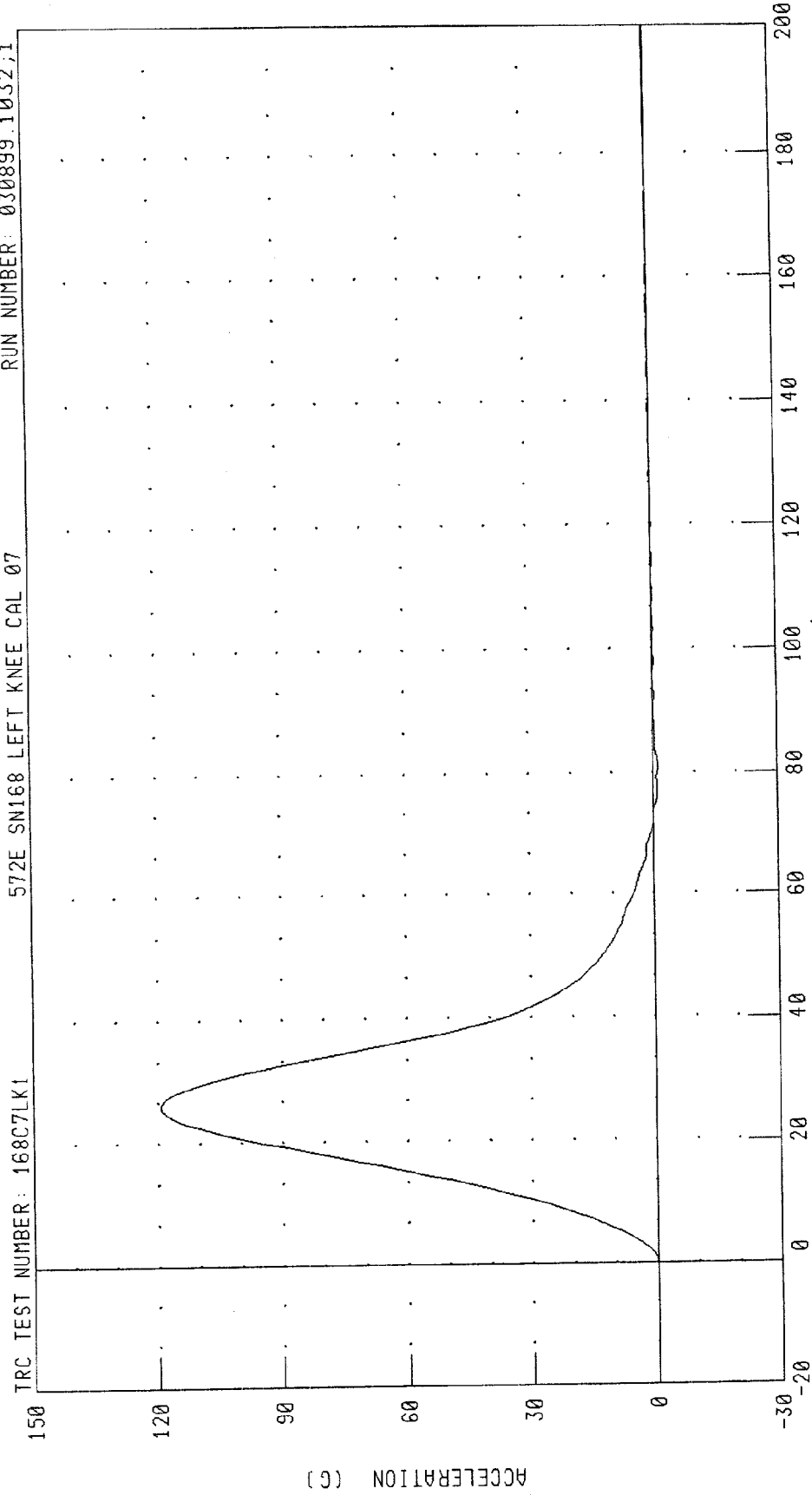
RUN NUMBER: 022099.1054;1

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

TRC TEST NUMBER: 168C7LK1

572E SN168 LEFT KNEE CAL 07

RUN NUMBER: 030899.1032;1



PEAK DATA: 119.32 G @ 2.64 MS; -1.28 G @ 8.16 MS

CHANNEL: PENXC FILTER: CH. CLASS 600

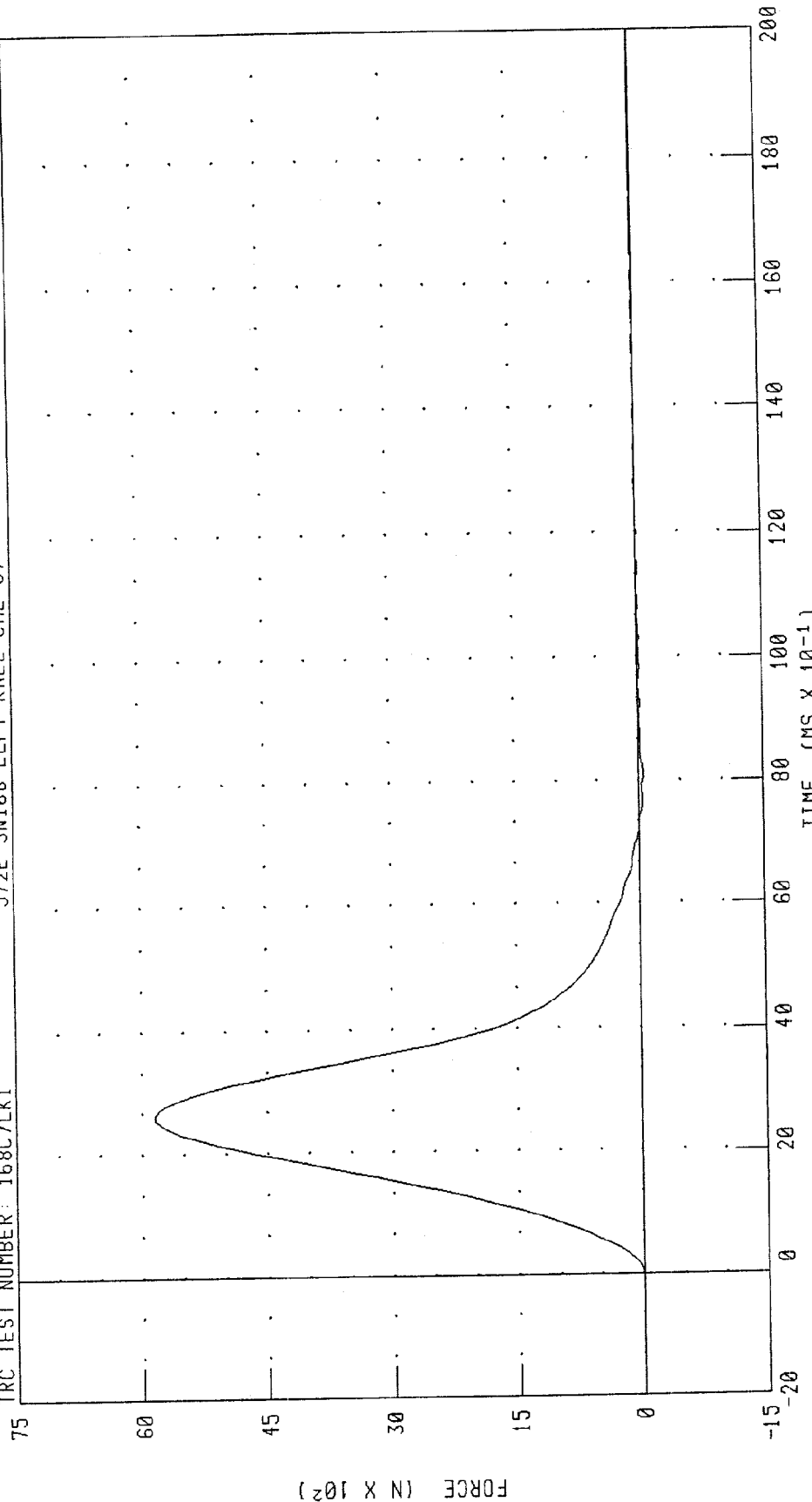
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN168 LEFT KNEE CAL 07

RUN NUMBER: 030899.1032.1

TRC TEST NUMBER: 168C7LK1



CHANNEL: PENXF FILTER: CH. CLASS 600

PEAK DATA: 5838.04 N @ 2.64 MS; -62.83 N @ 8.16 MS

Post-Test Dummy Certification

Passenger Dummy S/N 169

TRANSPORTATION RESEARCH CENTER INC.

HEAD DROP TEST

HYBRID III 50th

22-FEB-99

TRC INC.

TEST NO: 169C5HD1

572E SN169 HEAD DROP CAL 05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PEAK RESULTANT ACCELERATION	225 - 275 G	246.25 G
PEAK LATERAL ACCELERATION	15 G MAX	-4.69 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

B. J. Calt

RUN NUMBER: 022299.1306;1

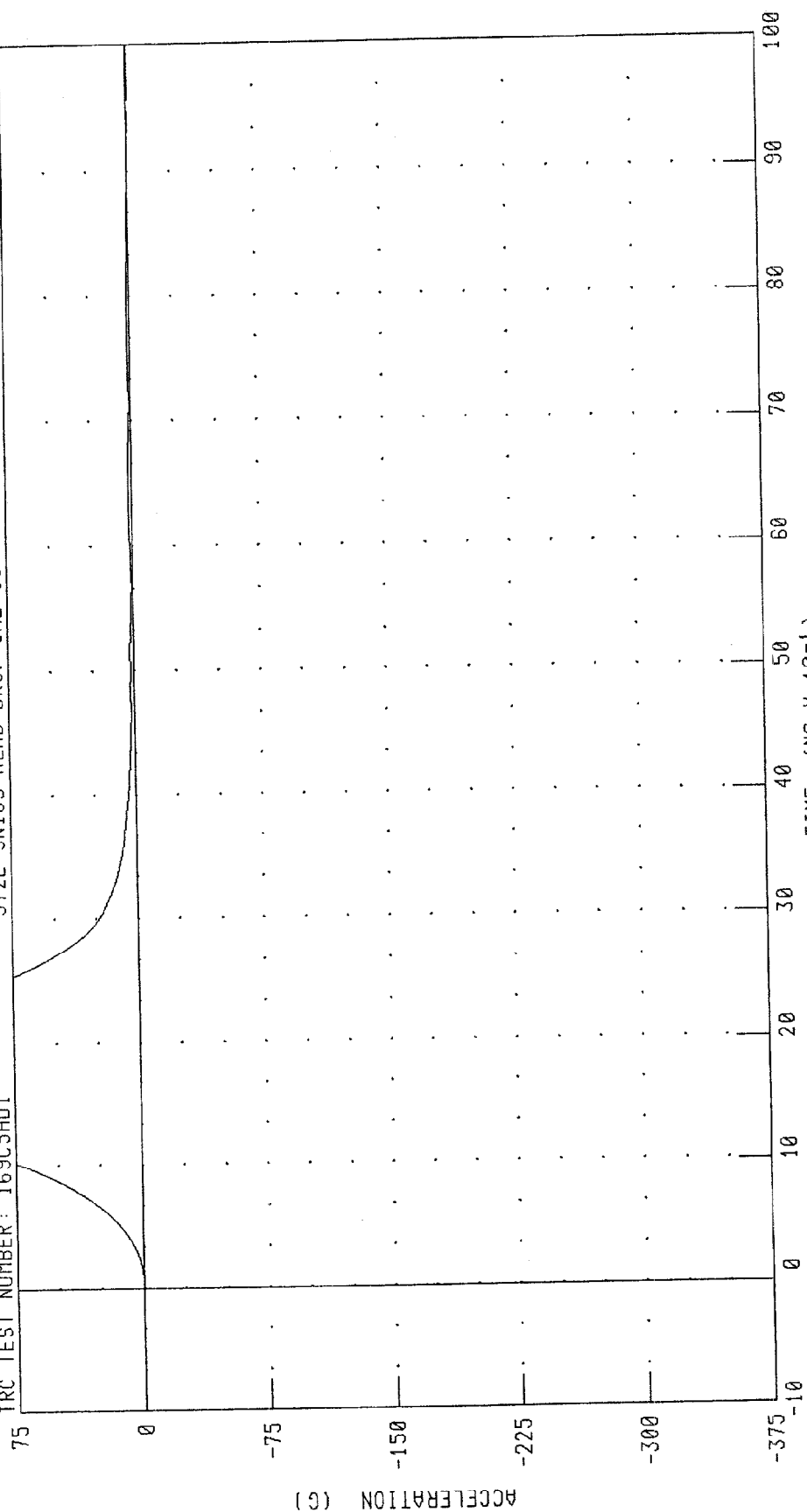
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION X AXIS

572E SN169 HEAD DROP CAL 05

RUN NUMBER: 022299.1307;1

TRC TEST NUMBER: 169C5HD1



PEAK DATA: 213.99 G @ 1.84 MS; -0.39 G @ 10.00 MS

FILTER: CH. CLASS 1000

CHANNEL: HEDXC

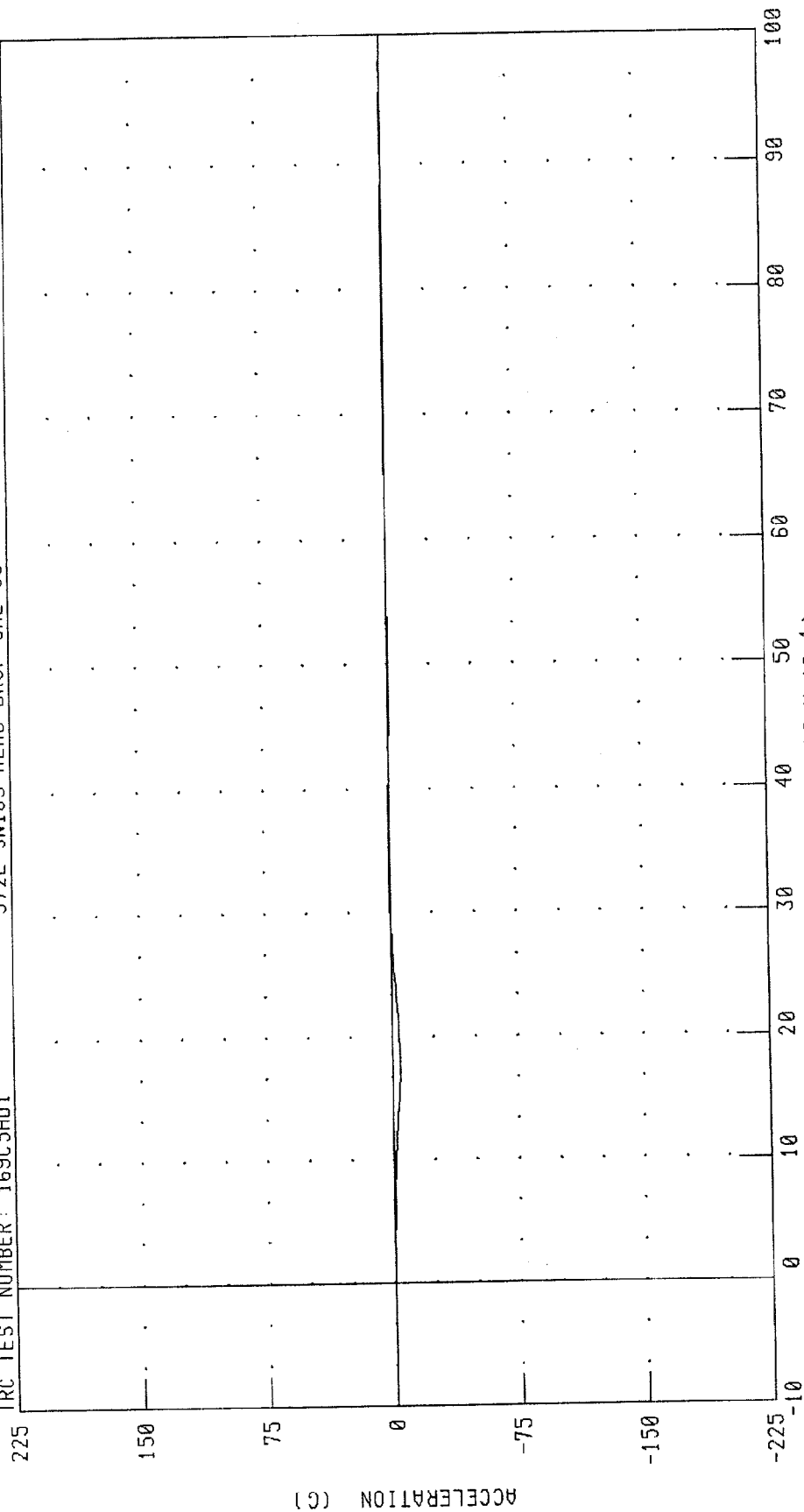
PART 572-E HYBRID III HEAD CALIBRATION

HEAD ACCELERATION Y AXIS

572E SN169 HEAD DROP CAL 05

RUN NUMBER: 022299.1307.1

TRC TEST NUMBER: 169C5HD1



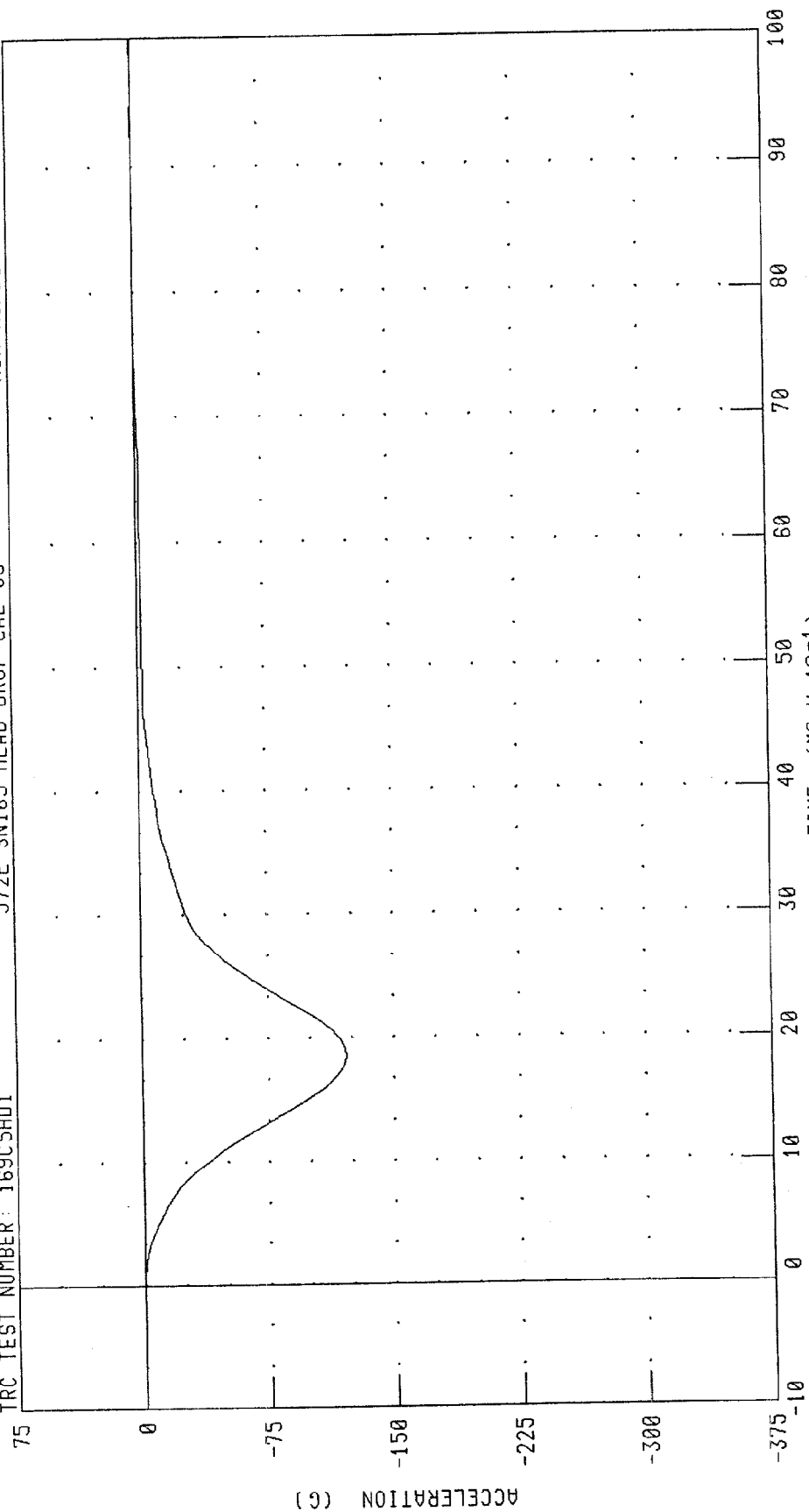
PEAK DATA: 0.59 C @ 3.84 MS; -4.70 G @ 1.76 MS

CHANNEL: HEDYC FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
HEAD ACCELERATION Z AXIS
572E SN169 HEAD DROP CAL 05

RUN NUMBER: 022299.1307;1

TRC TEST NUMBER: 169C5HD1



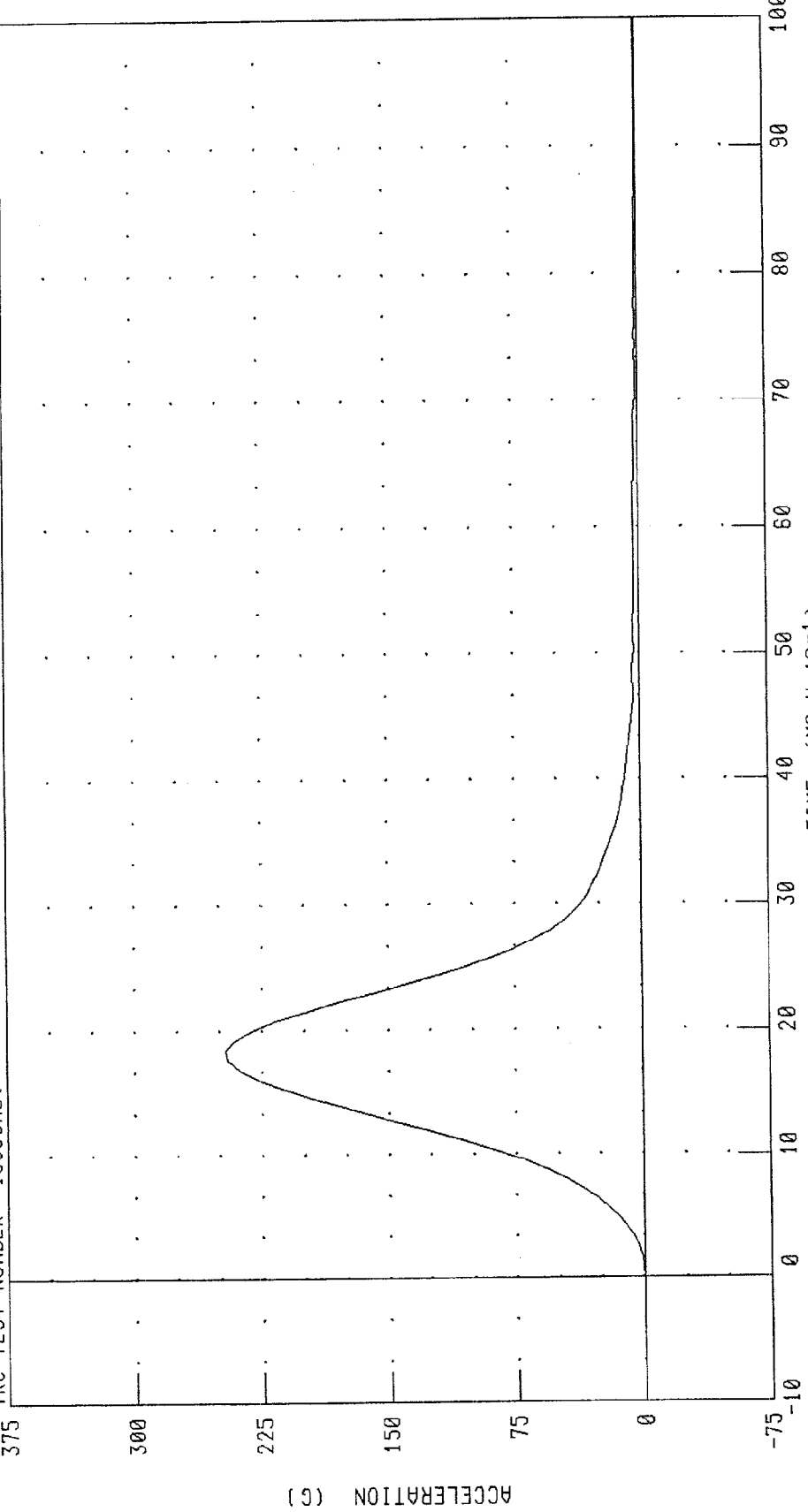
PEAK DATA: 0.57 G @ 10.00 MS; -121.77 G @ 1.84 MS

CHANNEL: HEDZG FILTER: CH. CLASS 1000

PART 572-E HYBRID III HEAD CALIBRATION
HEAD RESULTANT ACCELERATION
572E SN169 HEAD DROP CAL 05

RUN NUMBER: 022299.1307,1

TRC TEST NUMBER: 16905HD1



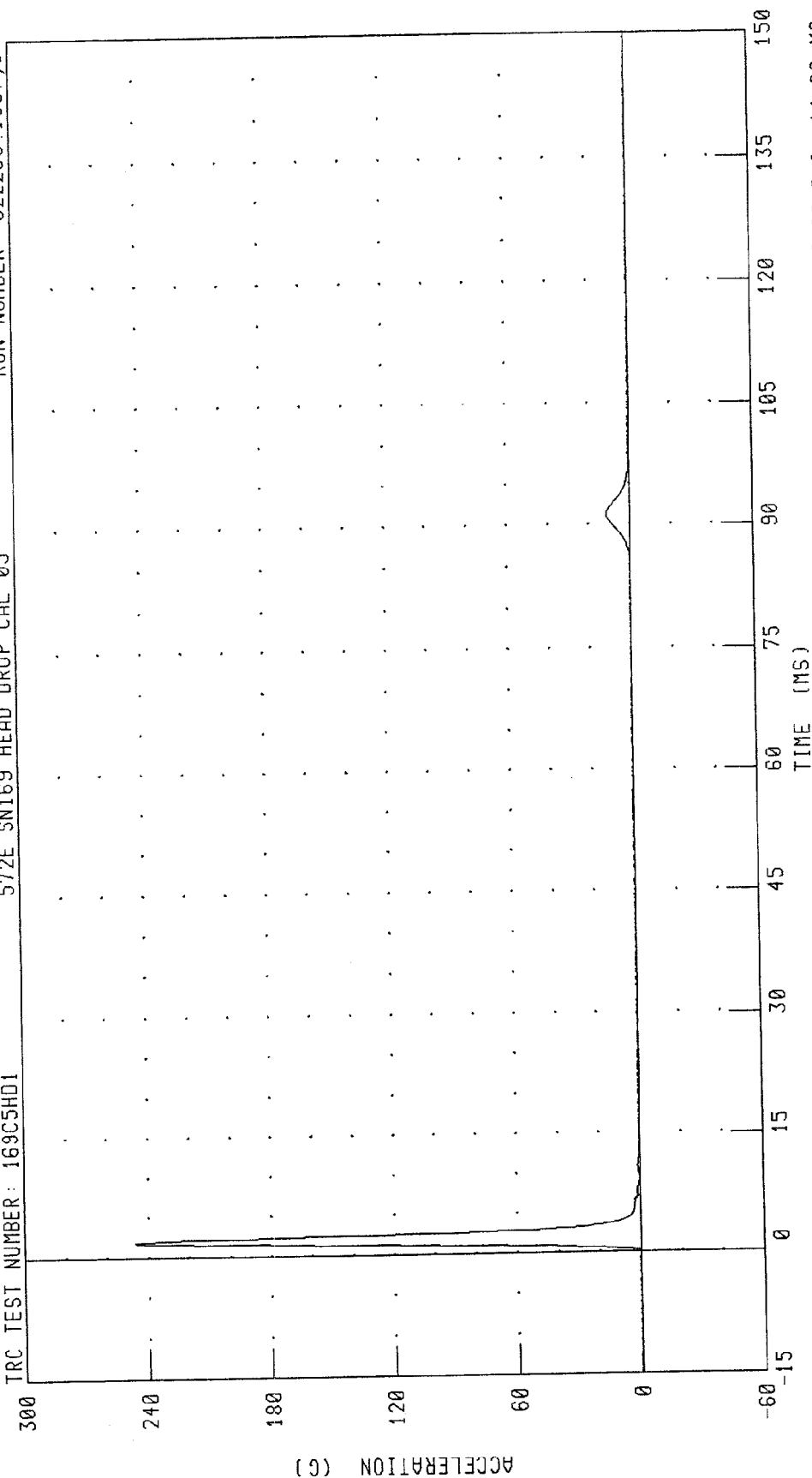
CHANNEL: HEDRC FILTER: CH. CLASS 1000 PEAK DATA: 246.25 G @ 1.84 MS; 0.02 G @ -0.56 MS

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

RUN NUMBER: 022299.1307,1

572E SN169 HEAD DROP CAL 05

TRC TEST NUMBER: 169C5HD1



CHANNEL: HEDRG FILTER: CH. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

22-FEB-99

NECK FLEXION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 169C5NF1 572E SN169 NECK FLEXION CAL5

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6-22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
PENDULUM DECELERATION	10 MS	22.50 - 27.50 G	23.62 G
	20 MS	17.60 - 22.60 G	20.78 G
	30 MS	12.50 - 18.50 G	16.40 G
MAX PENDULUM G		29 G MAX	24.25 G
MAX PENDULUM G ABOVE 30 MS		29 G MAX	16.37 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		34 - 42 MS	39.28 MS
D PLANE	MAX	64 - 78 DEG.	74.81 DEG.
ROTATION	TIME	57 - 64 MS	59.52 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MAX	88.2 - 108.5 NM	90.55 NM
	TIME	47 - 58 MS	52.80 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		113 - 128 MS	118.88 MS
POSITIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		97 - 107 MS	106.24 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

By Calt

RUN NUMBER: 022299.1500;1

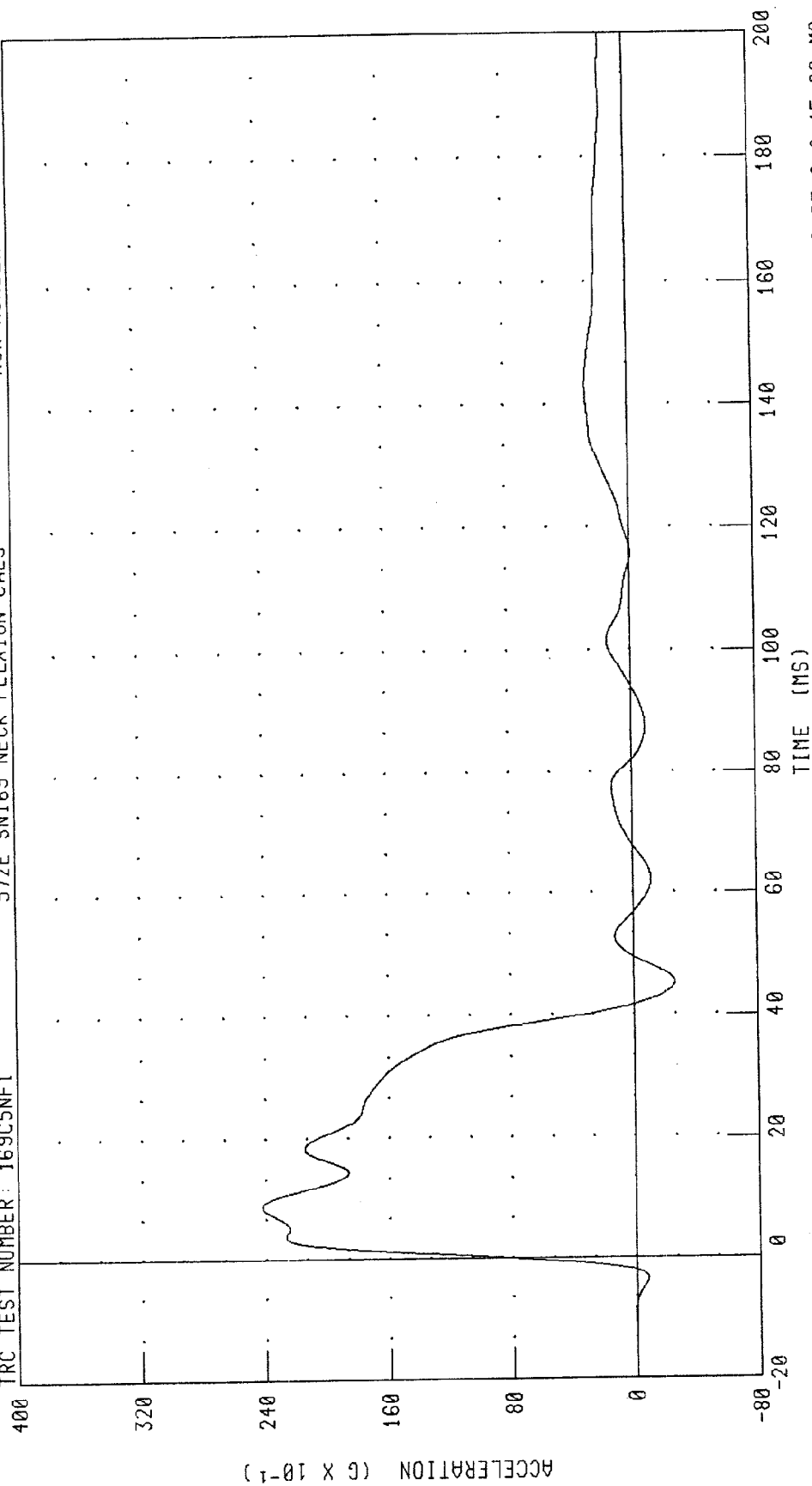
PART 572-E HYBRID III NECK FLEXION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 169C5NF1

572E SN169 NECK FLEXION CAL5

RUN NUMBER: 022299.1501;1



PEAK DATA: 24.26 G @ 8.80 MS; -2.67 G @ 45.28 MS

CHANNEL: PENXC FILTER: CH. CLASS 60

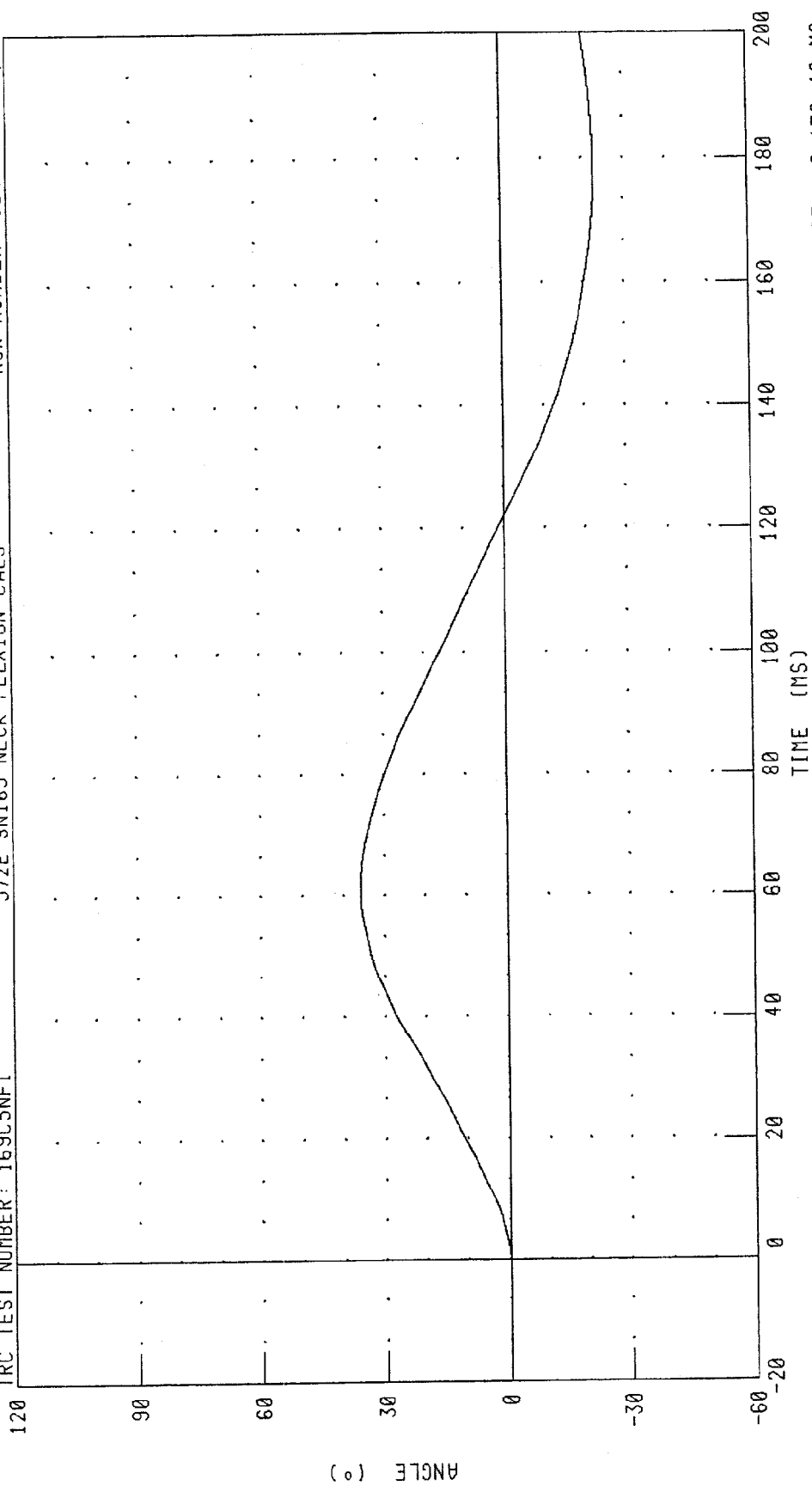
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN169 NECK FLEXION CAL5

TRC TEST NUMBER: 169C5NF1

RUN NUMBER: 022299.1501;1



PEAK DATA: 35.79 ° @ 60.40 MS; -22.75 ° @ 178.16 MS

CHANNEL: BETA FILTER: CH. CLASS 60

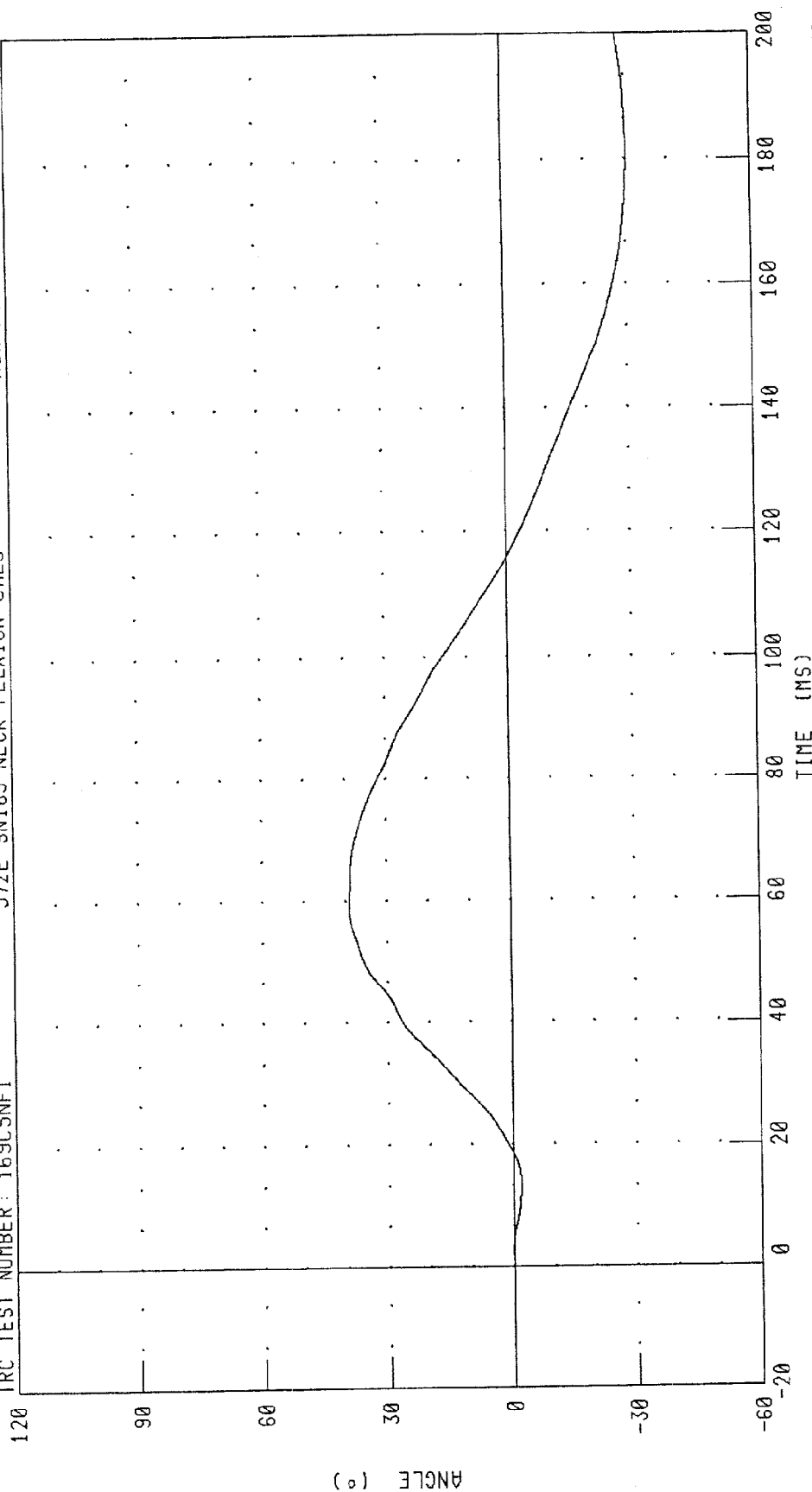
PART 572-E HYBRID III NECK FLEXION CALIBRATION

ROTATION ABOUT OCCIPITAL CONDYLE

572E SN169 NECK FLEXION CAL5

RUN NUMBER: 0222299.1501.1

TRC TEST NUMBER: 169C5NF1



PEAK DATA: 39.05 ° @ 58.96 MS, -30.34 ° @ 181.20 MS

CHANNEL: THETA FILTER: CH. CLASS 60

PART 572-E HYBRID III NECK FLEXION CALIBRATION

TOTAL ROTATION

RUN NUMBER: 022299.1501;1

572E SN169 NECK FLEXION CAL5

TRC TEST NUMBER: 169C5NF1



PEAK DATA: 74.81 ° @ 59.52 MS; -53.05 ° @ 180.64 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

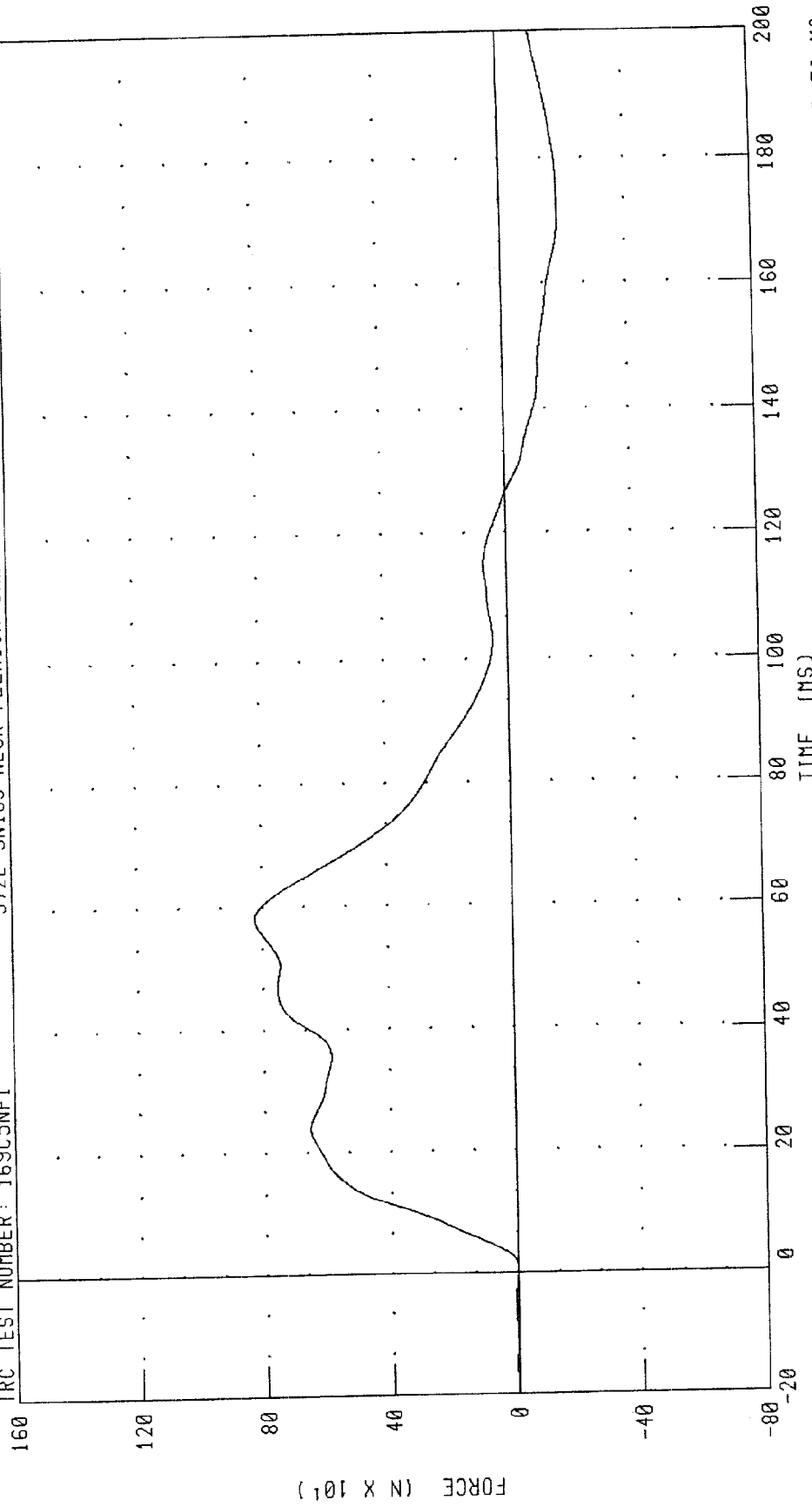
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK FORCE X AXIS

RUN NUMBER: 022299.1501,1

572E SN169 NECK FLEXION CAL5

TRC TEST NUMBER: 169C5NF1



PEAK DATA: 823.33 N @ 58.08 MS, -183.47 N @ 170.56 MS

CHANNEL: NEKXF FILTER: CH. CLASS 60

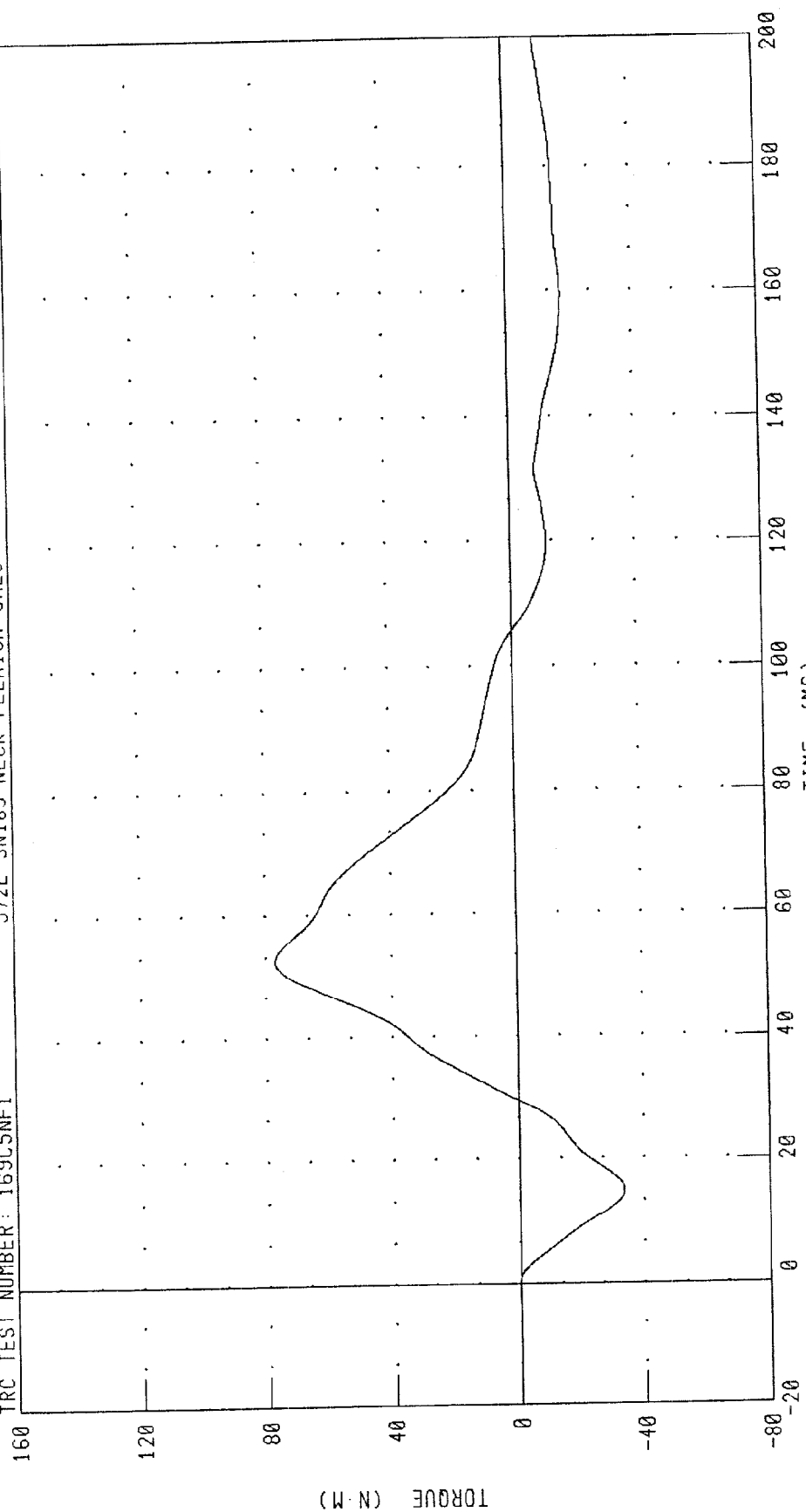
PART 572-E HYBRID III NECK FLEXION CALIBRATION

NECK MOMENT Y AXIS

RUN NUMBER: 022299.1501,1

572E SN169 NECK FLEXION CAL5

TRC TEST NUMBER: 169C5NF1



TIME (MS)

PEAK DATA: 77.05 N·M @ 52.64 MS; -33.73 N·M @ 14.96 MS

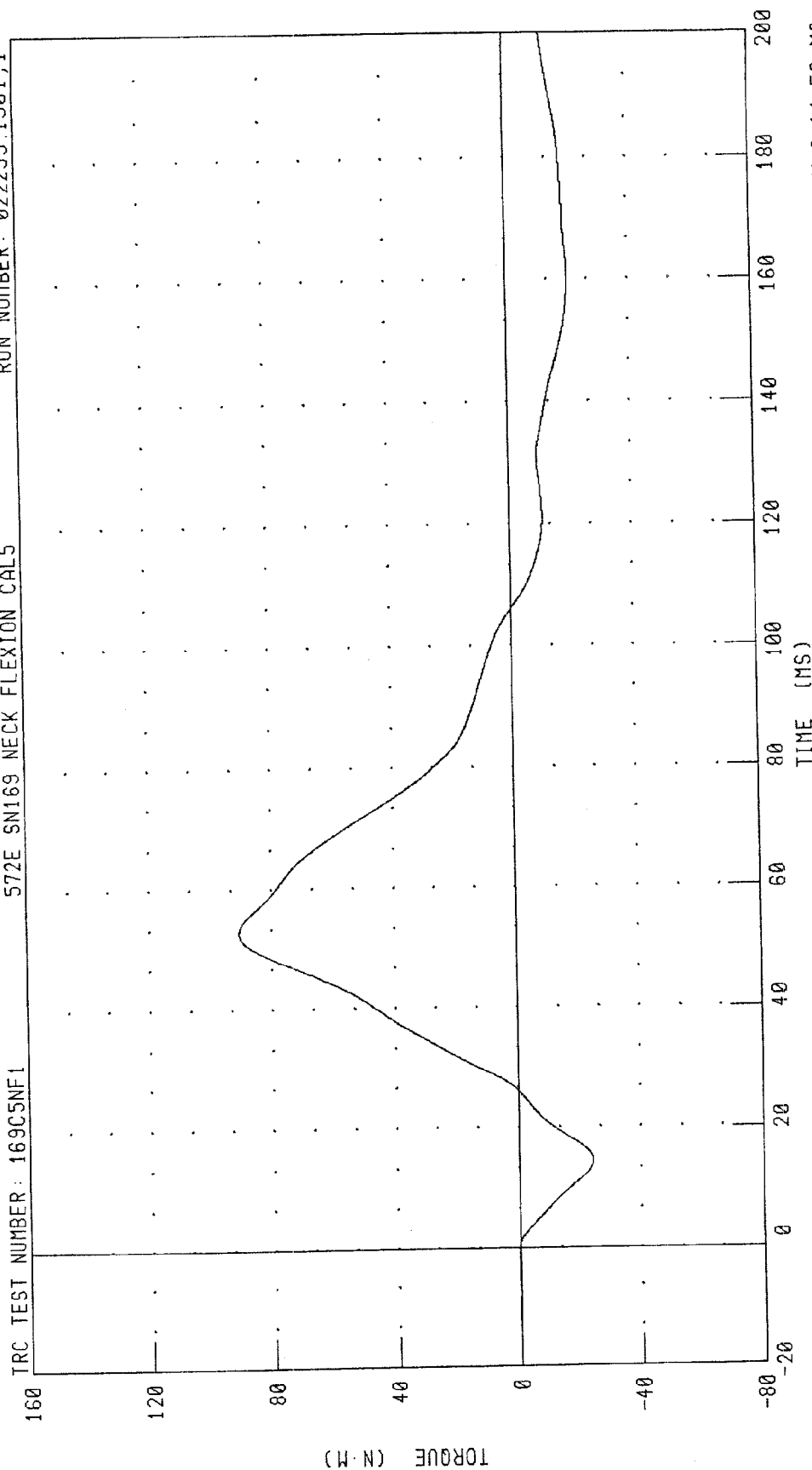
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

572E SNI69 NECK FLEXION CALS

TRC TEST NUMBER: 169C5NF1

RUN NUMBER: 022299.1501,1



PEAK DATA: 90.55 N·M @ 52.80 MS; -24.21 N·M @ 14.56 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

HYBRID III 50th

22-FEB-99

NECK EXTENSION TEST - 6 CHANNEL TRANSDUCER

TRC INC. TEST NO: 169C5NE3 572E SN 169 NECK EXT CAL5

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY		10 - 70 %	22.0 %
IMPACT VELOCITY		5.95 - 6.19 M/S	6.05 M/S
PENDULUM DECELERATION	10 MS	17.20 - 21.20 G	18.21 G
	20 MS	14.00 - 19.00 G	17.55 G
	30 MS	11.00 - 16.00 G	14.23 G
MAX PENDULUM G		22 G MAX	19.25 G
MAX PENDULUM G ABOVE 30 MS		22 G MAX	14.48 G
DECELERATION-TIME CURVE DECAY TIME TO 5 G		38 - 46 MS	38.72 MS
D PLANE	MAX	81 - 106 DEG.	103.66 DEG.
ROTATION	TIME	72 - 82 MS	76.72 MS
MOMENT ABOUT OCCIPITAL CONDYLE	MIN	-80.0/-52.9 NM	-72.77 NM
	TIME	65 - 79 MS	70.64 MS
ROTATION ANGLE-TIME CURVE DECAY TIME TO ZERO		147 - 174 MS	159.60 MS
NEGATIVE MOMENT-TIME CURVE DECAY TIME TO ZERO		120 - 148 MS	148.00 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

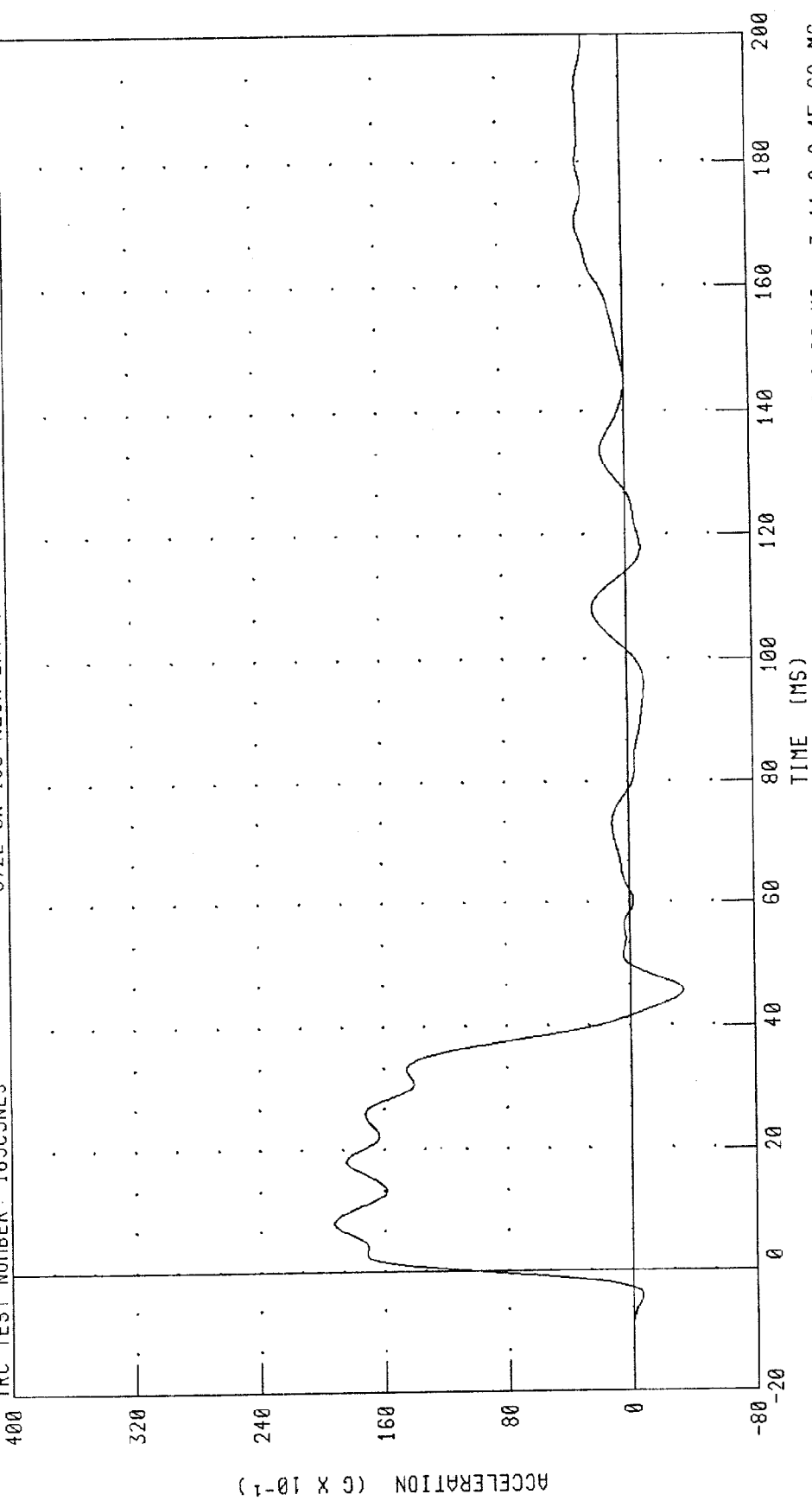
B. Galt

RUN NUMBER: 022299.1647;2

PART 572-E HYBRID III NECK EXTENSION CALIBRATION

PENDULUM DECELERATION

TRC TEST NUMBER: 169C5NE3 572E SN 169 NECK EXT CAL5 RUN NUMBER: 022299.1647,2



CHANNEL: PENXG FILTER: CH. CLASS 60 PEAK DATA: 19.26 G @ 8.08 MS; -3.44 G @ 45.68 MS

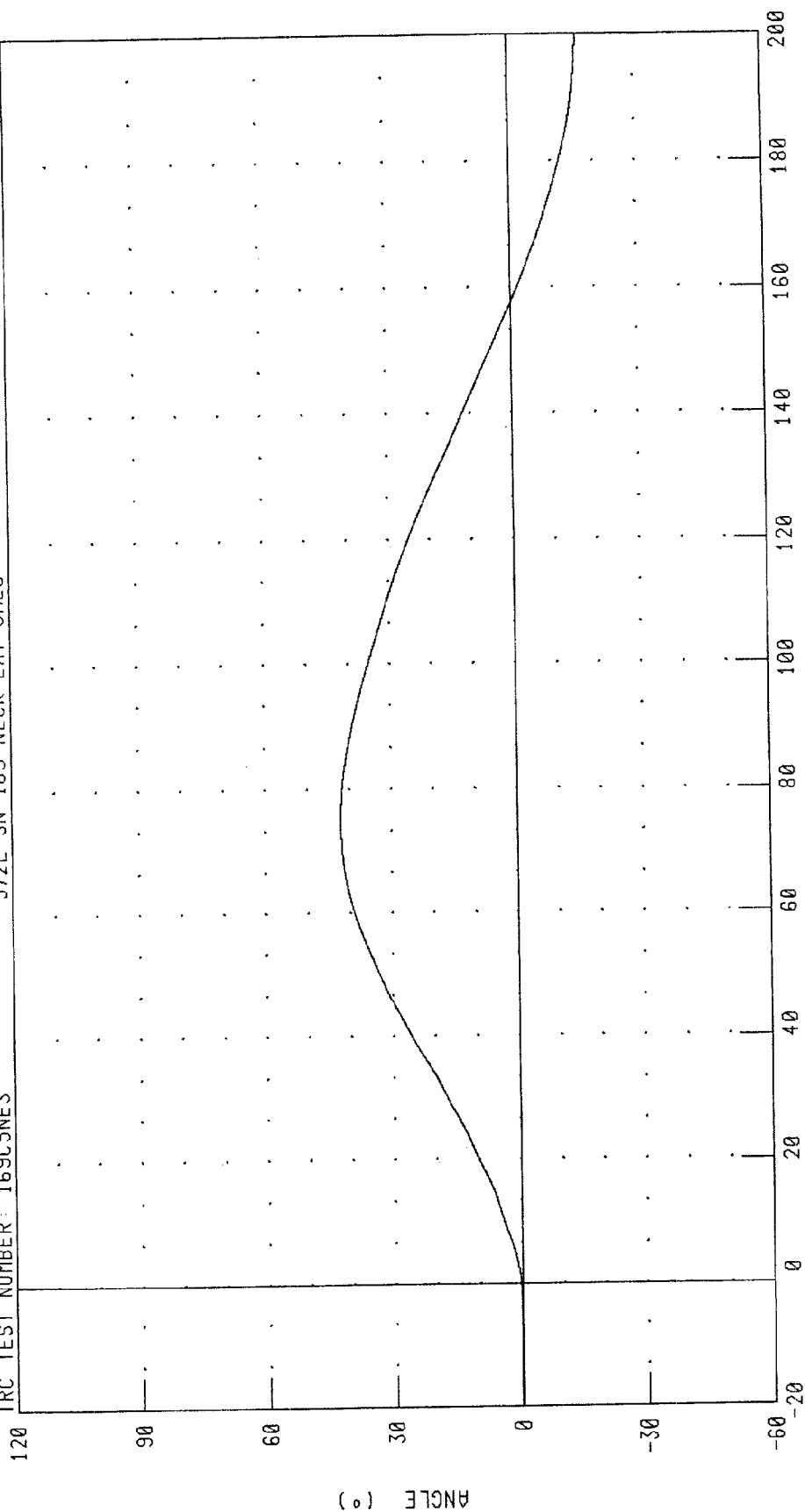
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

ROTATION ABOUT BASE OF NECK

572E SN 169 NECK EXT CAL5

RUN NUMBER: 0222299.1647,2

TRC TEST NUMBER: 169C5NE3



PEAK DATA: 42.03 ° @ 75.20 MS; -16.28 ° @ 200.00 MS

FILTER: CH. CLASS 60

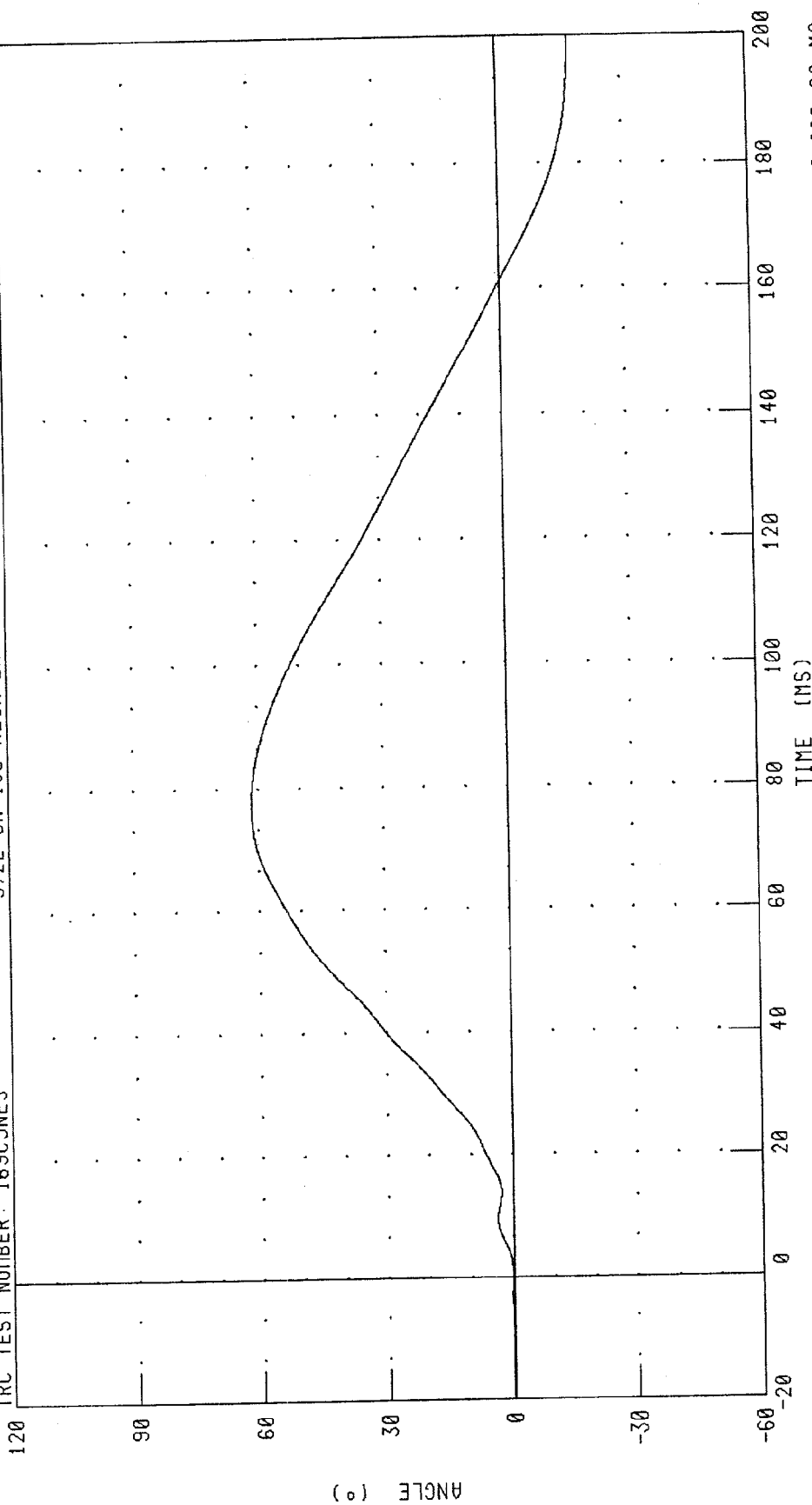
CHANNEL: BETA

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

572E SN 169 NECK EXT CAL5

TRC TEST NUMBER: 169C5NE3

RUN NUMBER: 022299.1647;2



PEAK DATA: 61.67 ° @ 77.28 MS, -17.40 ° @ 200.00 MS

CHANNEL: THETA FILTER: CH. CLASS 60

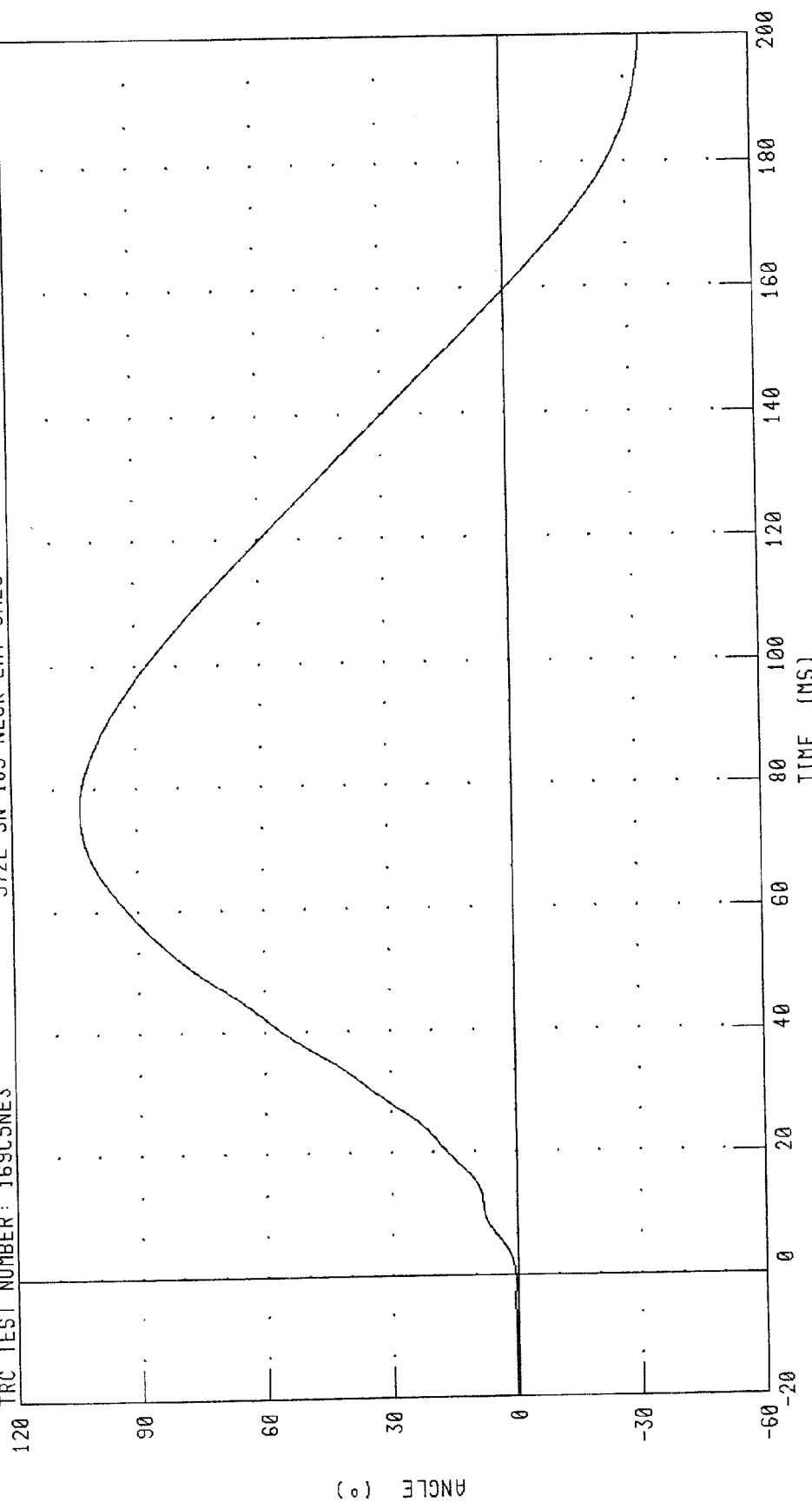
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

TOTAL ROTATION

RUN NUMBER: 022299.1647;2

572E SN 169 NECK EXT CAL5

TRC TEST NUMBER: 169C5NE3



PEAK DATA: 103.66 ° @ 76.72 MS; -33.68 ° @ 200.00 MS

CHANNEL: TOTAN FILTER: CH. CLASS 60

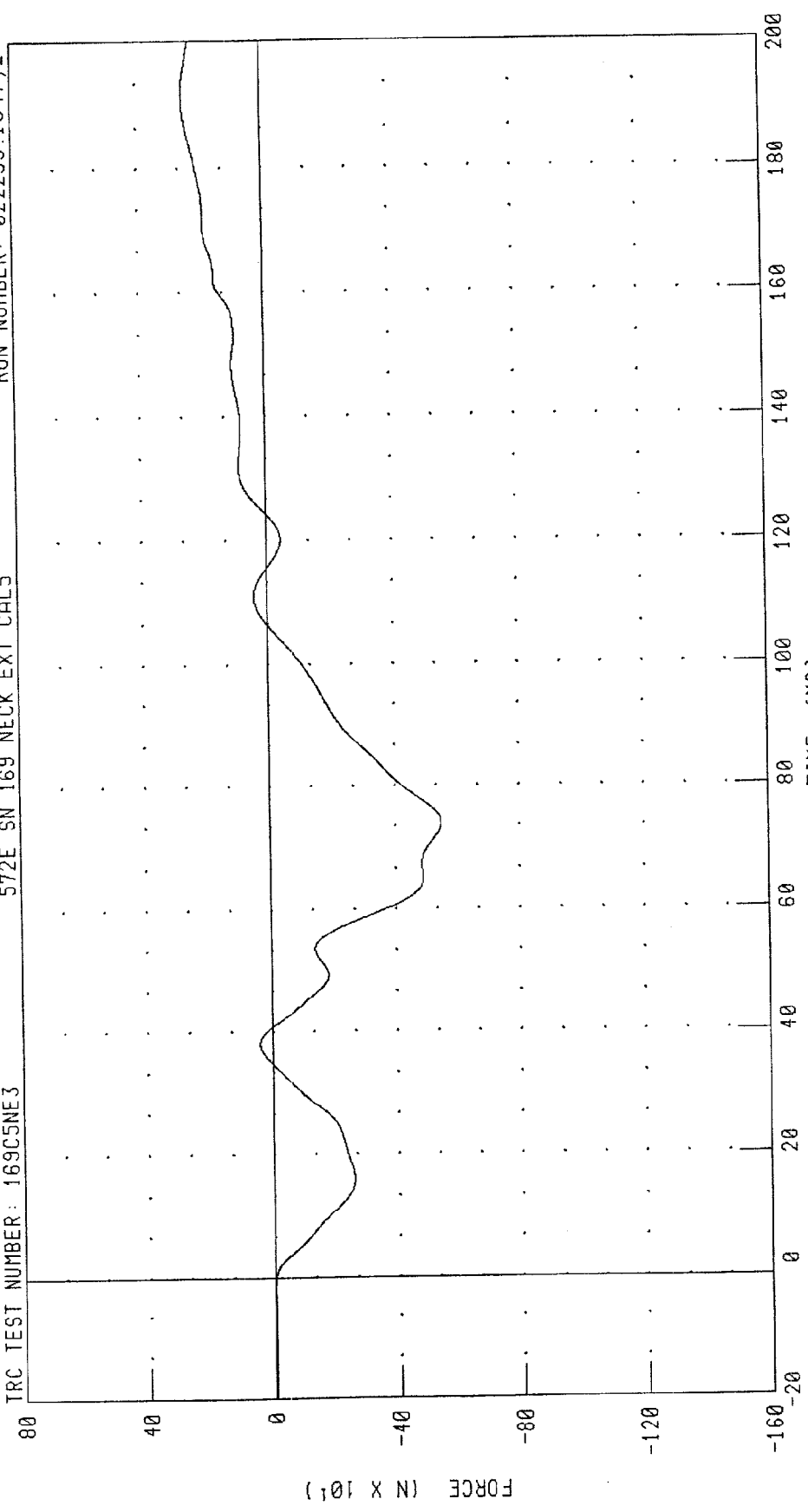
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK FORCE X AXIS

RUN NUMBER: 0222299.1647;2

572E SN 169 NECK EXT CAL5

TRC TEST NUMBER: 169C5NE3



PEAK DATA: 253.49 N @ 191.60 MS; -548.59 N @ 73.92 MS

CHANNEL: NEKXF FILTER: CH CLASS 60

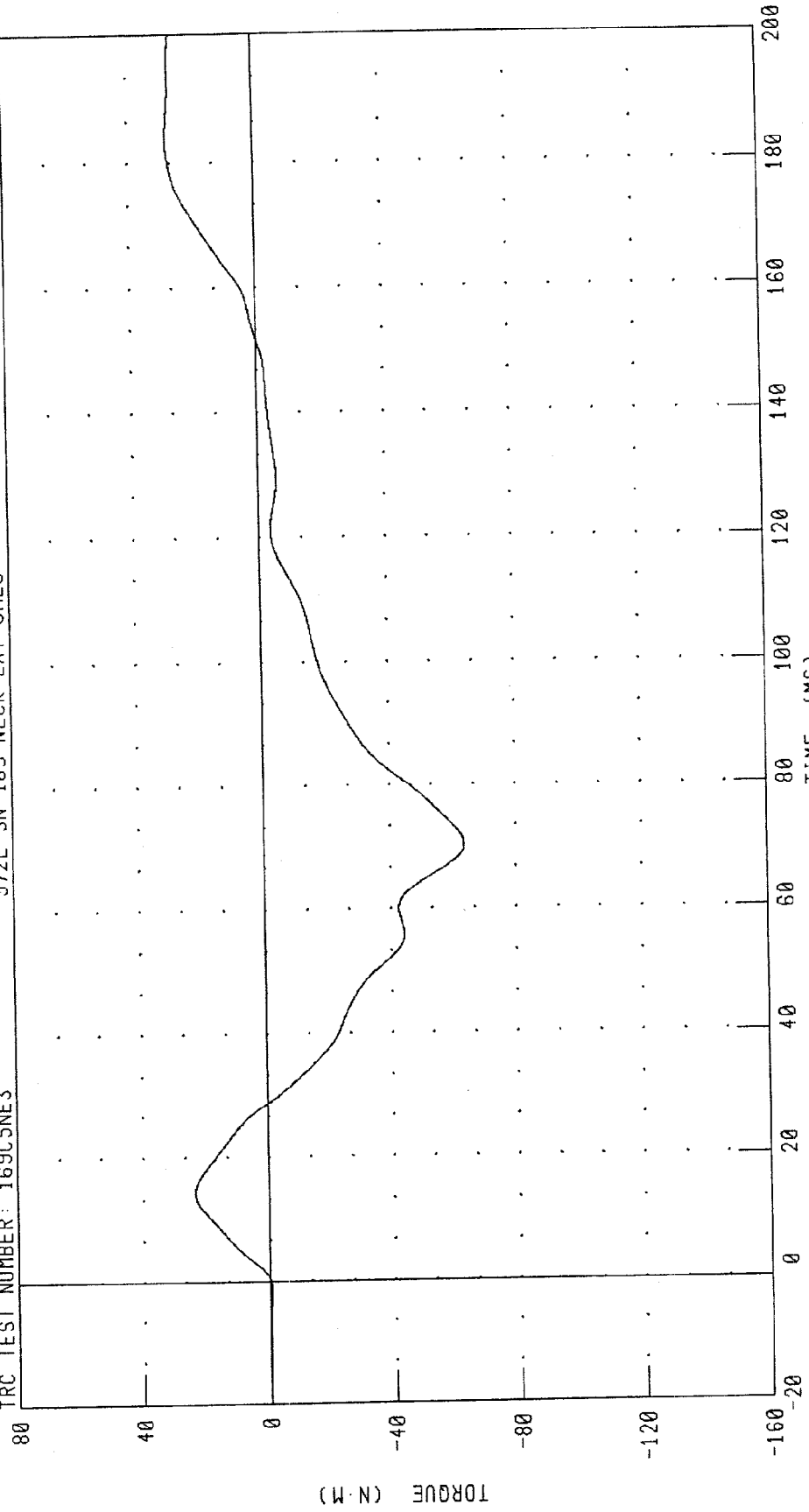
PART 572-E HYBRID III NECK EXTENSION CALIBRATION

NECK MOMENT Y AXIS

RUN NUMBER: 022299 1647;2

572E SN 169 NECK EXT CAL5

TRC TEST NUMBER: 169C5NE3



TIME (MS)

PEAK DATA: 27.88 N·M @ 183.76 MS; -63.68 N·M @ 70.32 MS

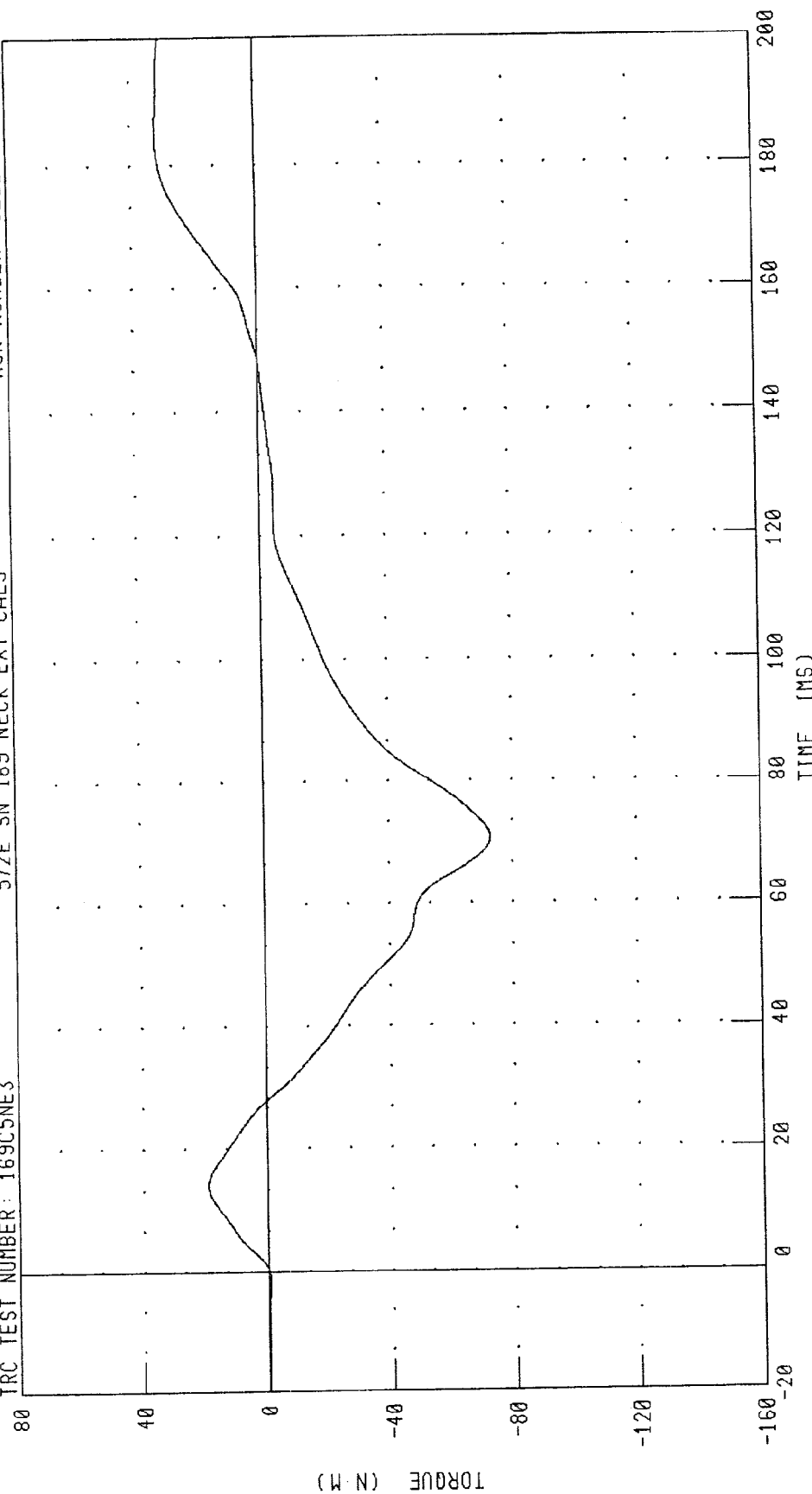
CHANNEL: NEKYM FILTER: CH. CLASS 60

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

TRC TEST NUMBER: 169C5NE3

572E SN 169 NECK EXT CAL5

RUN NUMBER: 022299.1647;2



PEAK DATA: 32.00 N·M @ 185.12 MS, -72.77 N·M @ 70.64 MS

CHANNEL: NEKOM FILTER: CH. CLASS 60

TRANSPORTATION RESEARCH CENTER INC.

THORAX IMPACT TEST

HYBRID III 50th

23-FEB-99

TRC INC.

TEST NO: 169C5TH3

572E SN169 H.S.THORAX CAL05

TEST PARAMETER	HIGH SPEED TEST	TEST RESULTS
	SPECIFICATION	
TEMPERATURE	20.6-22.2 DEG. C	22.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PENDULUM VELOCITY	6.59 - 6.83 M/S	6.71 M/S
MAXIMUM DEFLECTION	63.5 - 72.6 MM	61.1 MM *
MAXIMUM RESISTIVE FORCE	5159 - 5894 N	5818. N
INTERNAL HYSTERESIS	69% - 85%	70.7%

* TEST DOES NOT MEET SPECIFICATIONS

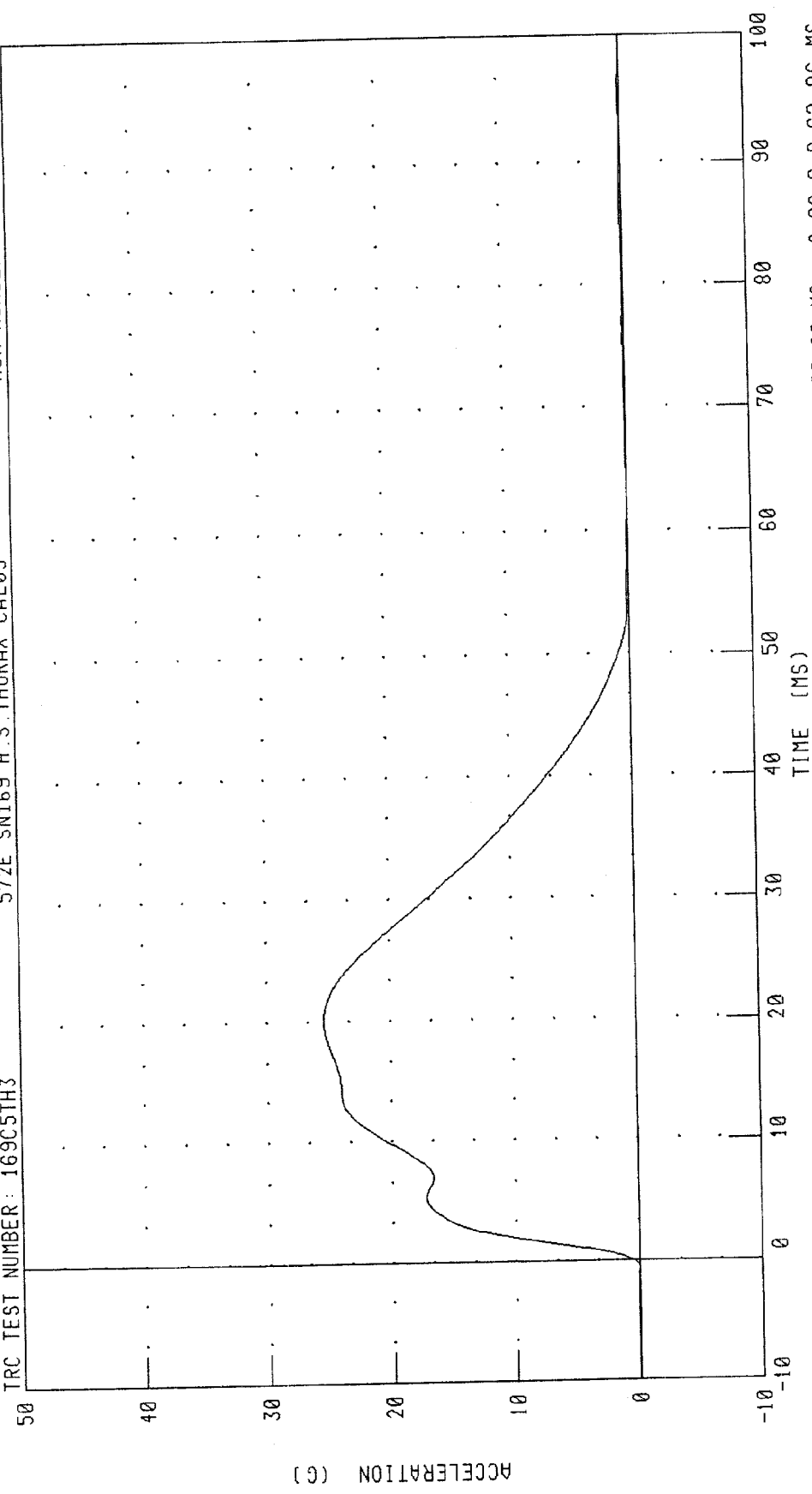
TECHNICIAN Kevin Watkins

RUN NUMBER: 022399.0719;1

PART 572-E HYBRID III THORAX CALIBRATION
PENDULUM DECELERATION
572E SN169 H.S. THORAX CAL05

RUN NUMBER: 022399.0734,1

TRC TEST NUMBER: 169C5TH3



PEAK DATA: 25.40 G @ 20.08 MS; -0.02 G @ 62.96 MS

CHANNEL: PENXC FILTER: CH. CLASS 180

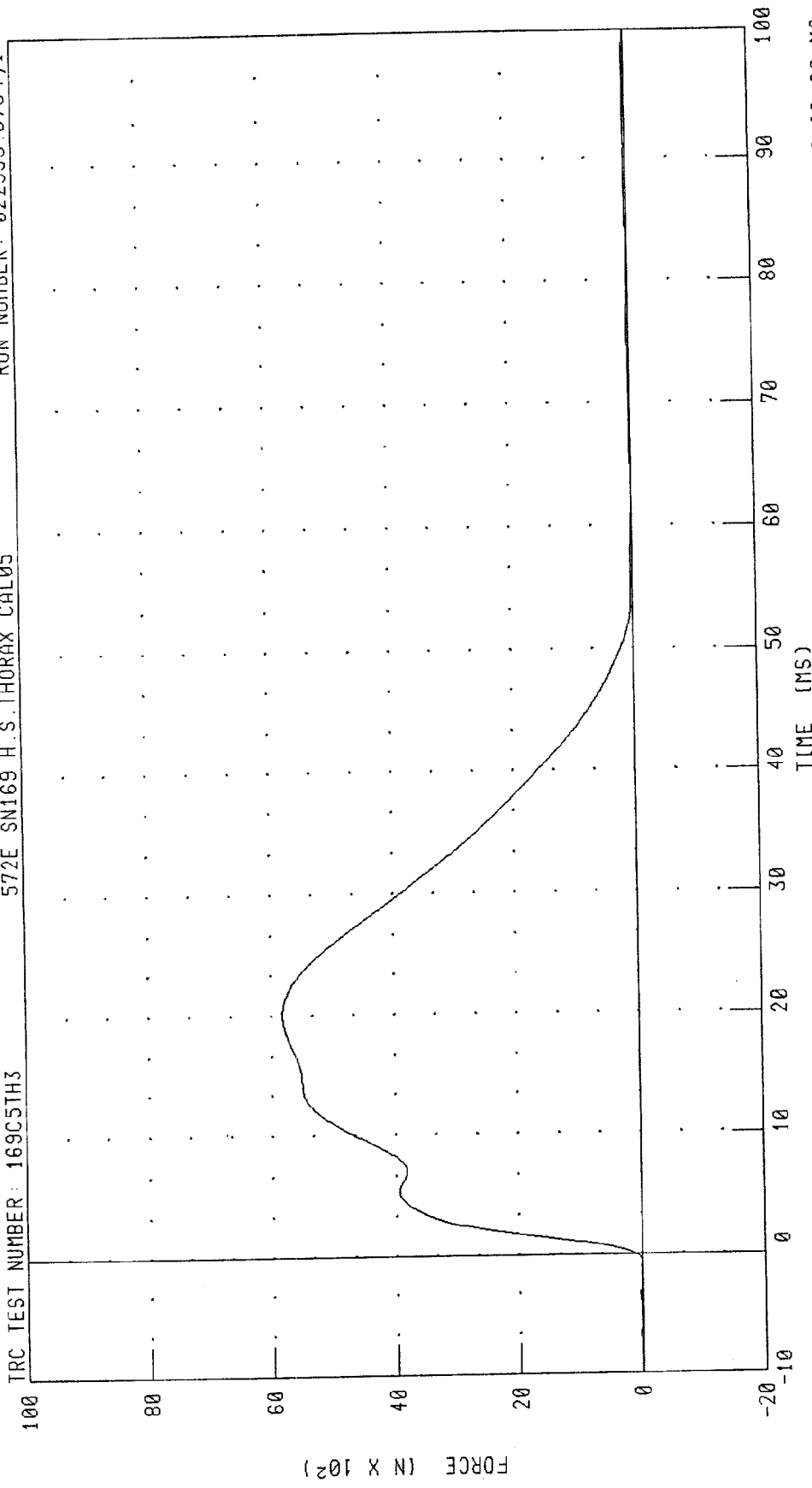
PART 572-E HYBRID III THORAX CALIBRATION

PENDULUM FORCE

TRC TEST NUMBER: 169C5TH3

572E SN169 H.S.THORAX CAL05

RUN NUMBER: 022399.0734;1



CHANNEL: PENXF FILTER: CH. CLASS 180

PEAK DATA: 5818.15 N @ 20.08 MS; -4.67 N @ 62.96 MS

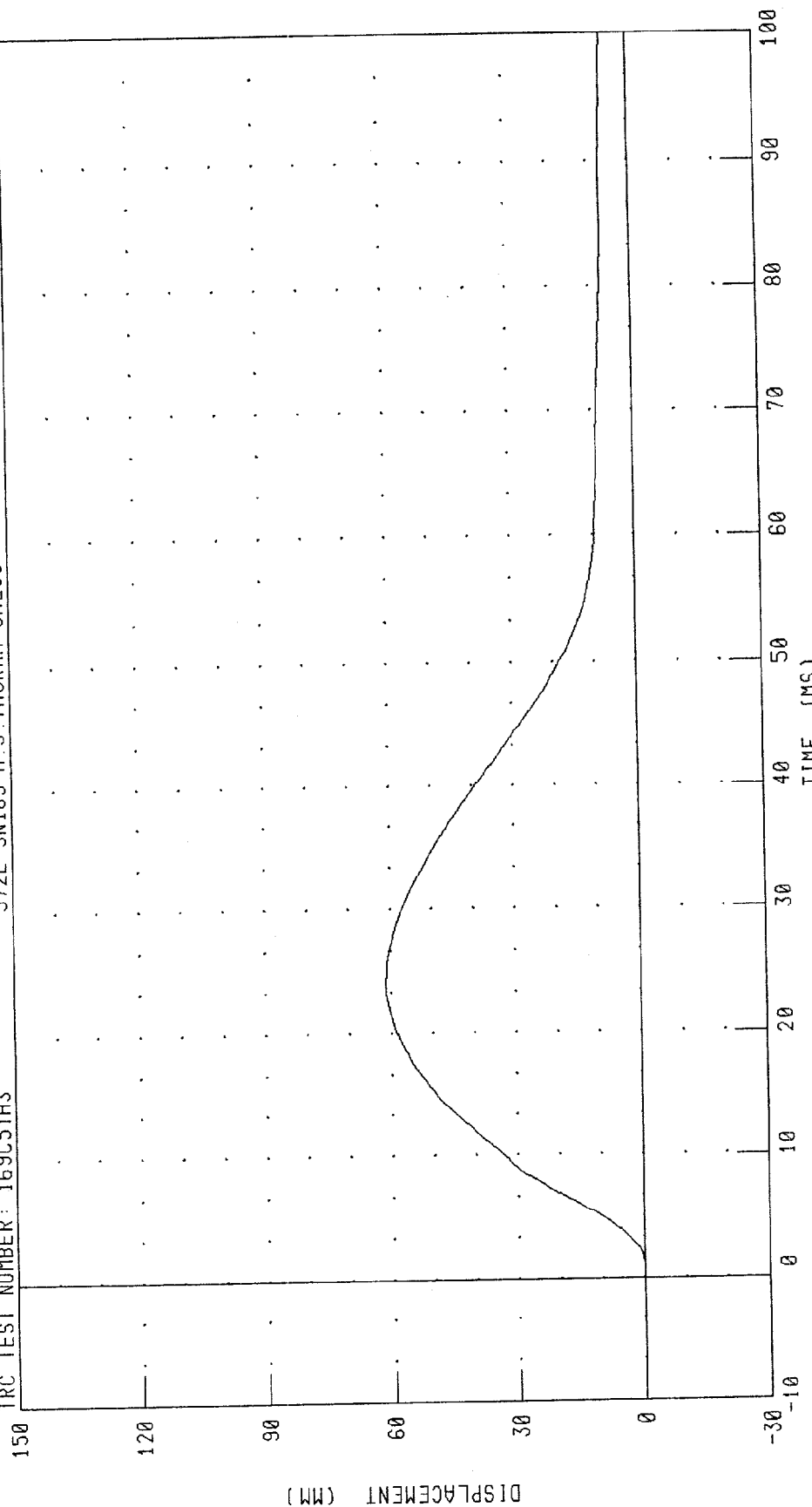
PART 572-E HYBRID III THORAX CALIBRATION

STERNUM DISPLACEMENT

RUN NUMBER: 022399.0734;1

TRC TEST NUMBER: 169C5TH3

572E SN169 H.S. THORAX CAL05



PEAK DATA: 61.12 MM @ 23.68 MS; -0.02 MM @ 0.80 MS

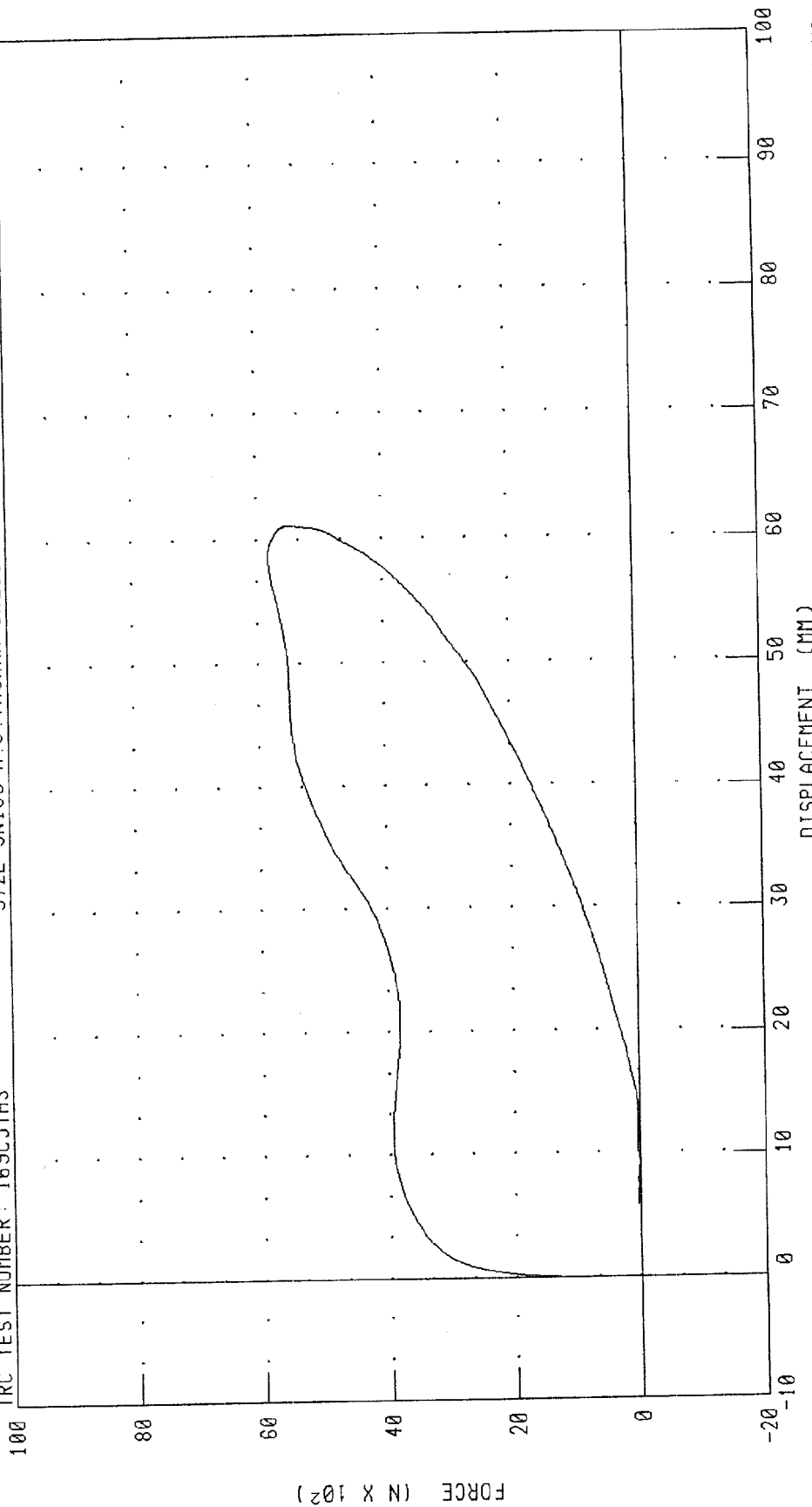
CHANNEL: CSTXD FILTER: CH. CLASS 180

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

TRC TEST NUMBER: 169C5TH3

572E SN169 H.S. THORAX CAL05

RUN NUMBER: 022399.0734,1



CHANNEL: CSTXD
PENXF

PEAK DATA:

61.12 MM @ 23.68 MS;
5818.15 N @ 20.08 MS;
-0.02 MM @ 0.80 MS;
-4.67 N @ 62.96 MS

TRANSPORTATION RESEARCH CENTER INC.

RIGHT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

22-FEB-99

TRC INC.

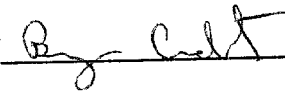
TEST NO: 169C5HR1

572E SN 169 HIPFLEX CAL 05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	67.3 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	45.7 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 022299.1314;1

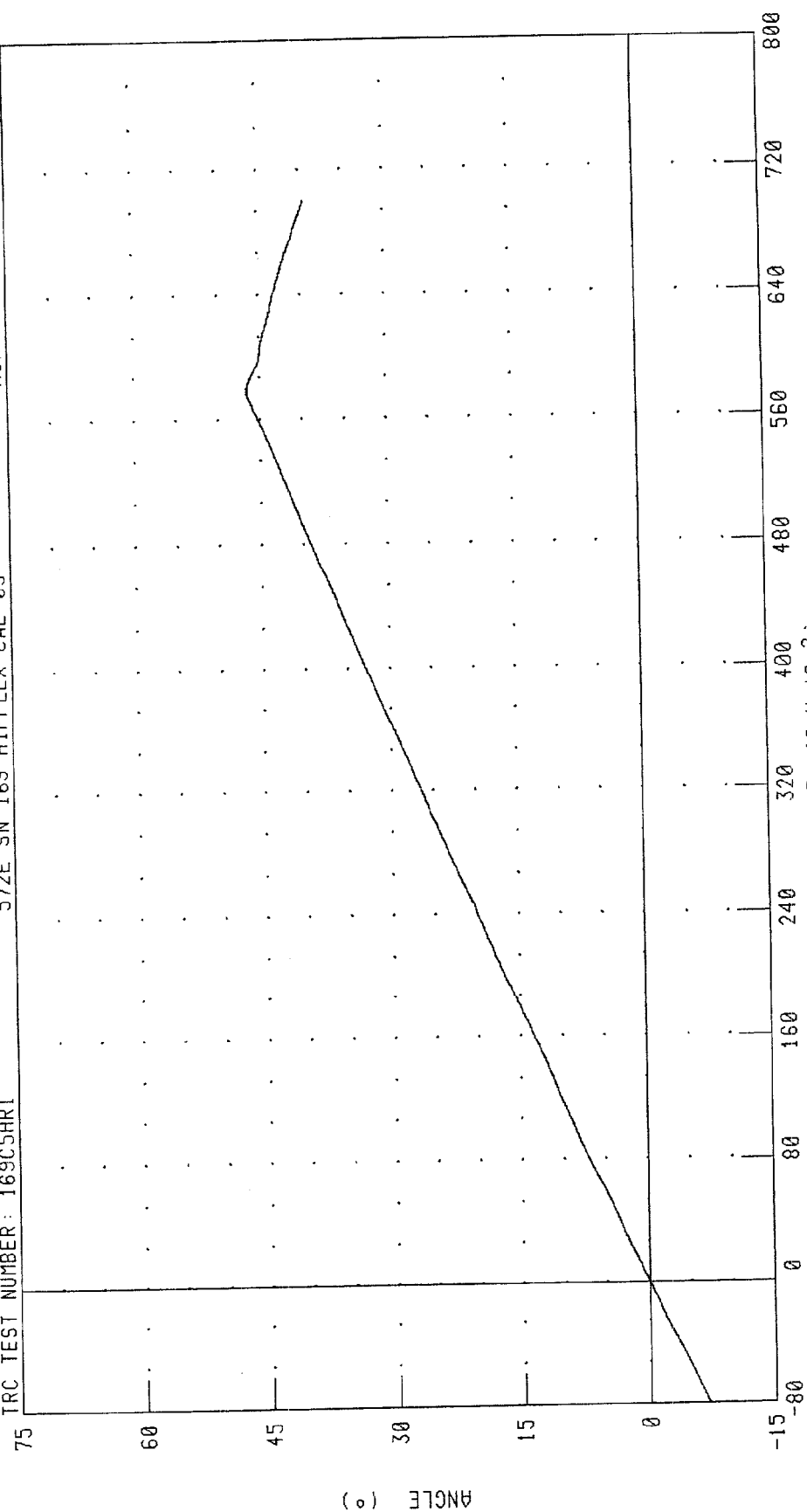
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

RIGHT HIP FLEXION ROTATION

572E SN 169 HIPFLEX CAL 05

RUN NUMBER: 022299.1314.1

TRC TEST NUMBER: 169C5HRI



PEAK DATA: 46.54 ° @ 5.80 S; -10.15 ° @ -1.00 S

CHANNEL: RHPXD FILTER: CH. CLASS 60

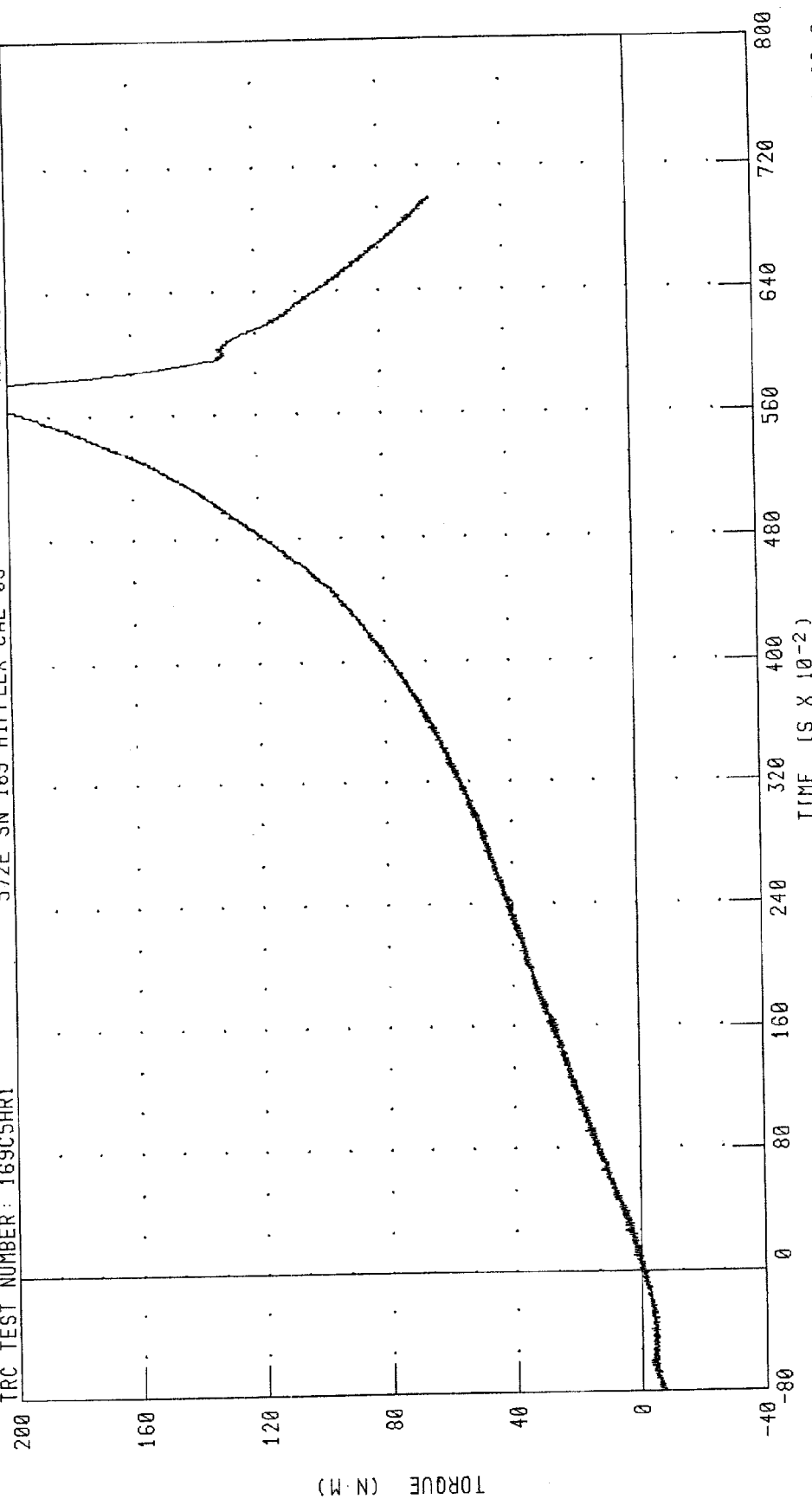
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

RIGHT HIP FLEXION MOMENT

572E SN 169 HIPFLEX CAL 05

RUN NUMBER: 022299.1314;1

TRC TEST NUMBER: 169C5HR1



PEAK DATA: 218.97 N-M @ 5.76 S; -11.32 N-M @ -1.00 S

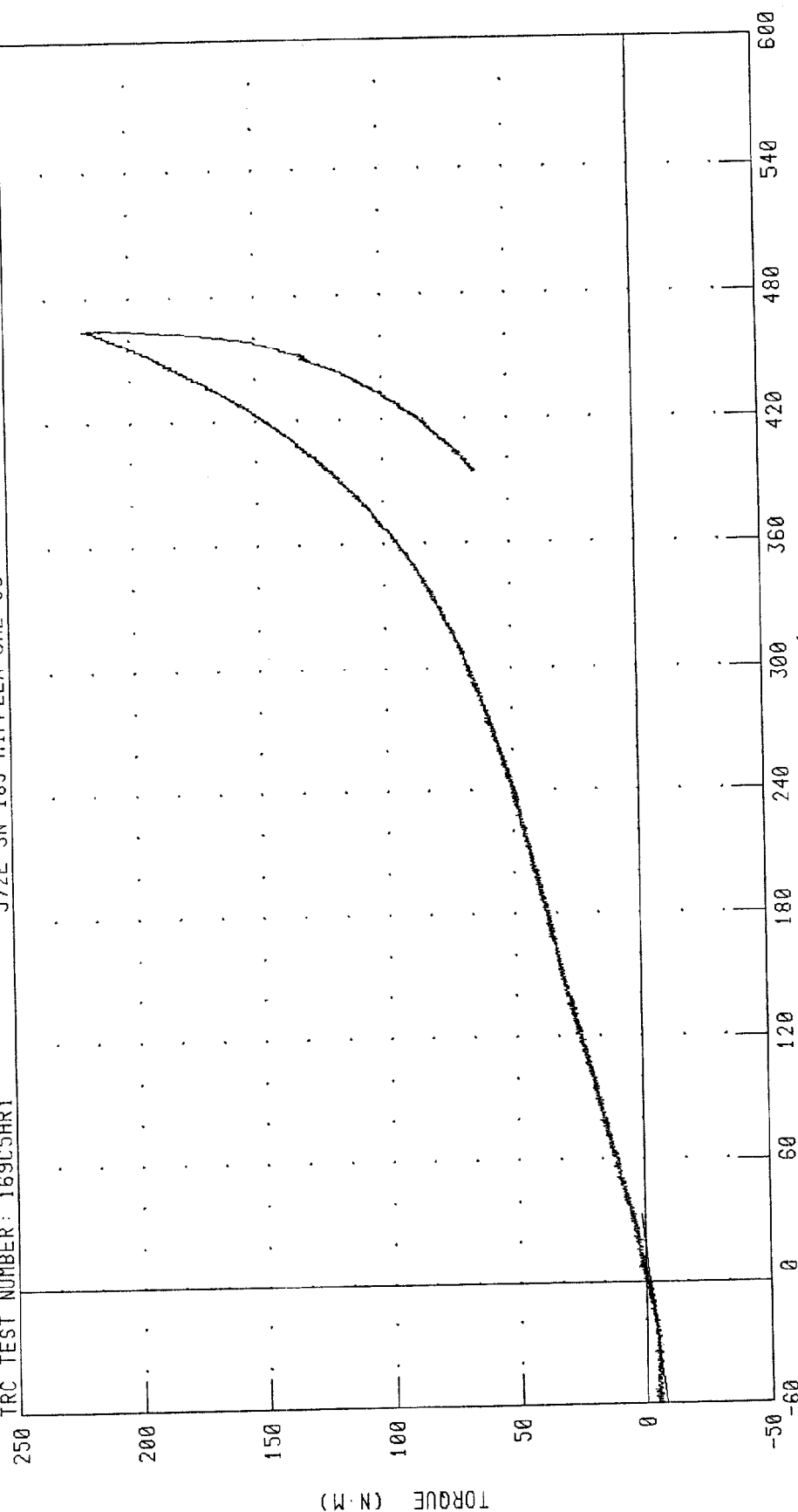
CHANNEL: RHPYM FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES RIGHT HIP FLEXION MOMENT VS ROTATION ANGLE

TRC TEST NUMBER: 169C5HR1

572E SN 169 HIPFLEX CAL 05

RUN NUMBER: 022299.1314;1



CHANNEL: RHPXD FILTER: CH. CLASS 60
 RHPYM CH. CLASS 60

PEAK DATA: 46.54 ° @ 5.80 S; -10.15 ° @ -1.00 S
 218.97 N.M @ 5.76 S; -11.32 N.M @ -1.00 S

TRANSPORTATION RESEARCH CENTER INC.

LEFT HIP JOINT FEMUR FLEXION TEST

HYBRID III PART 572E

22-FEB-99

TRC INC.

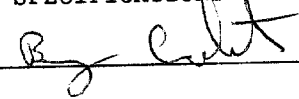
TEST NO: 169C5HL1

572E SN 169 HIPFLEX CAL 05

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
ROTATION RATE	5 - 10 deg/sec	YES
TORQUE @ 30 deg ROTATION	<= 94.9 Nm	64.3 Nm
ROTATION @ 203.4 Nm TORQUE	40 - 50 deg.	45.4 deg.

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 022299.1311;1

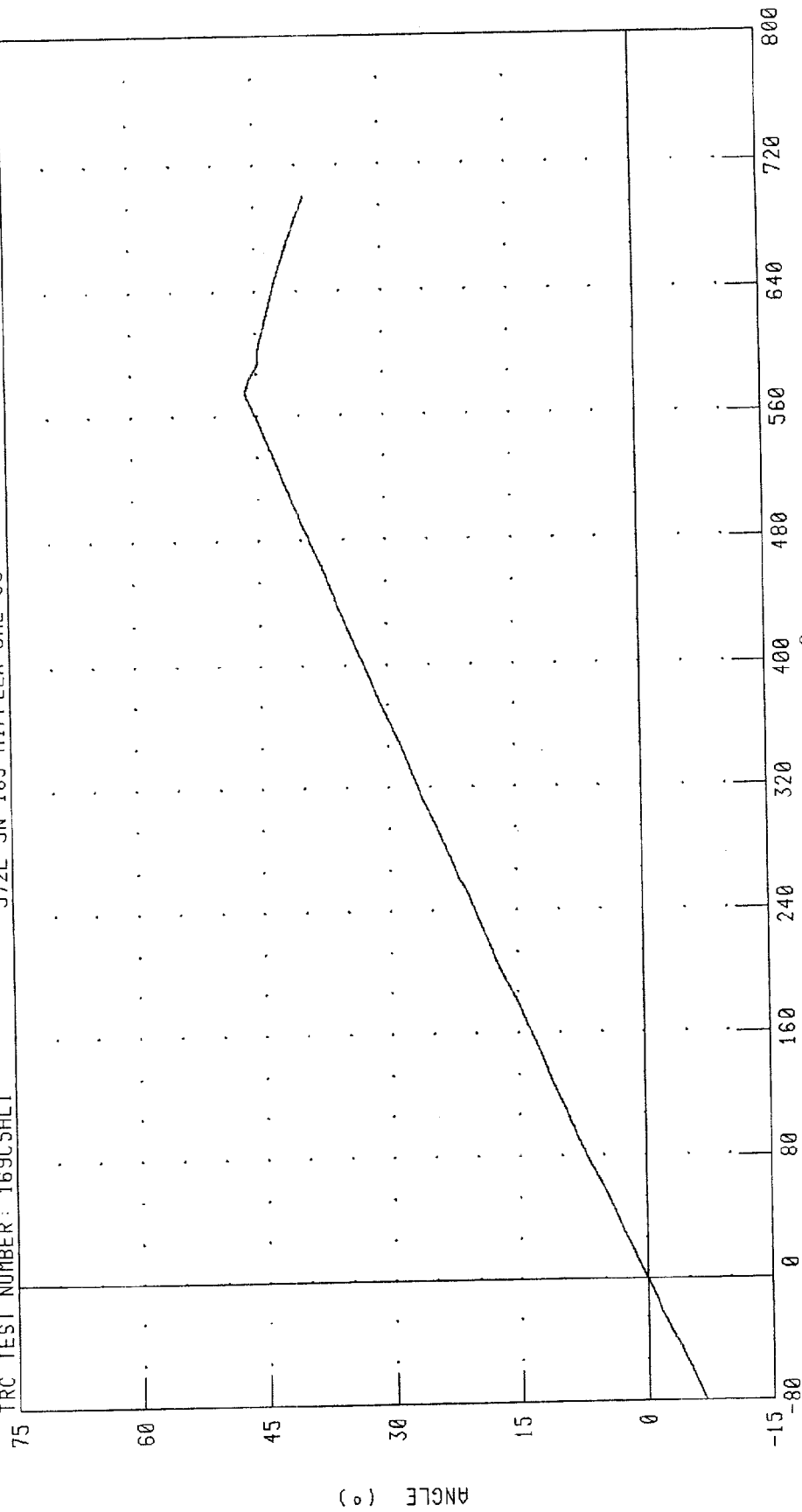
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

LEFT HIP FLEXION ROTATION

572E SN 169 HIPFLEX CAL 05

TRC TEST NUMBER: 169C5HL1

RUN NUMBER: 022299.1311,1



PEAK DATA: 46.31 ° @ 5.74 S; -10.22 ° @ -1.00 S

CHANNEL: LHPXD FILTER: CH. CLASS 60

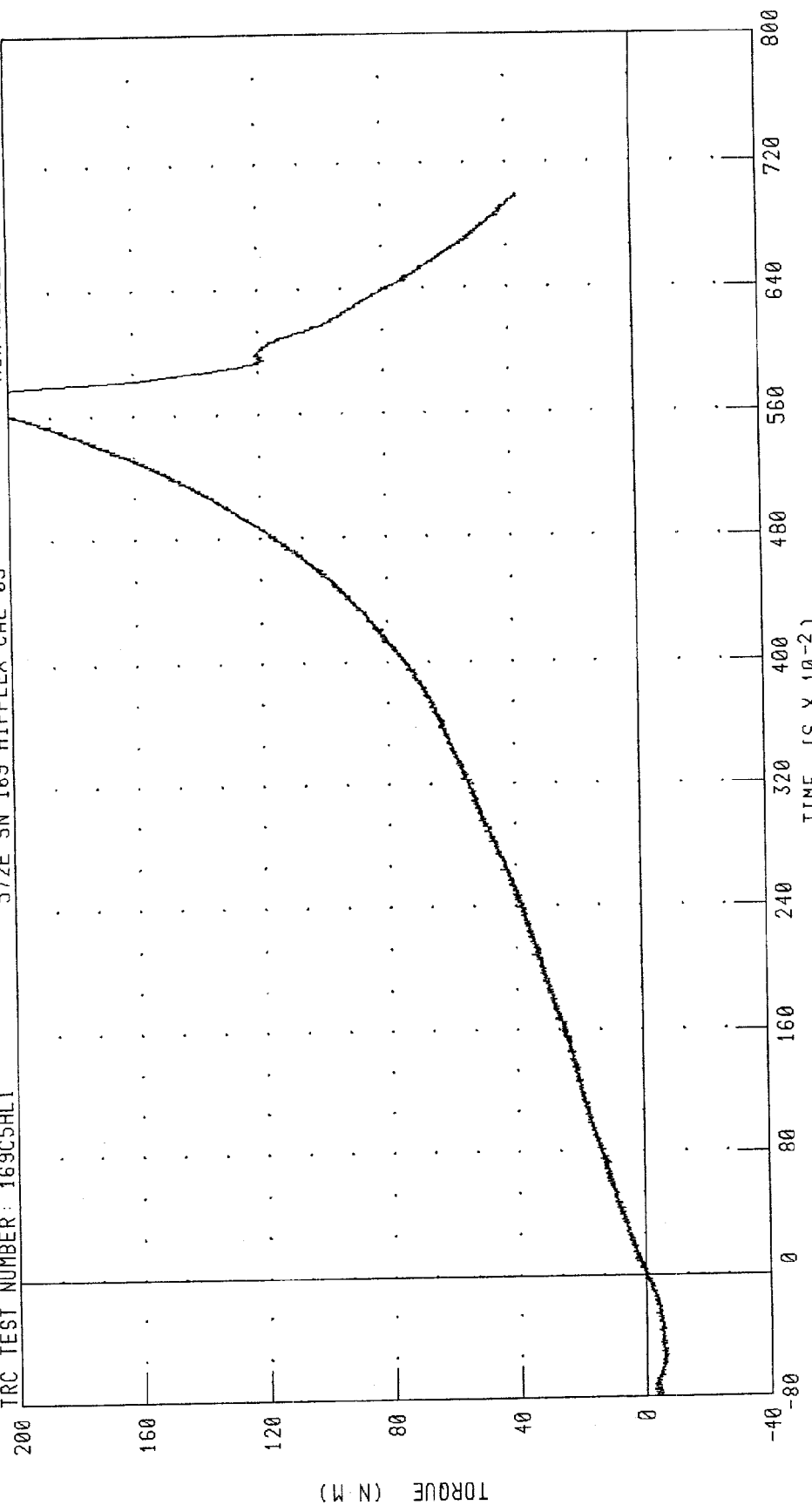
HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES

LEFT HIP FLEXION MOMENT

RUN NUMBER: 022299.1311;1

572E SN 169 HIPFLEX CAL 05

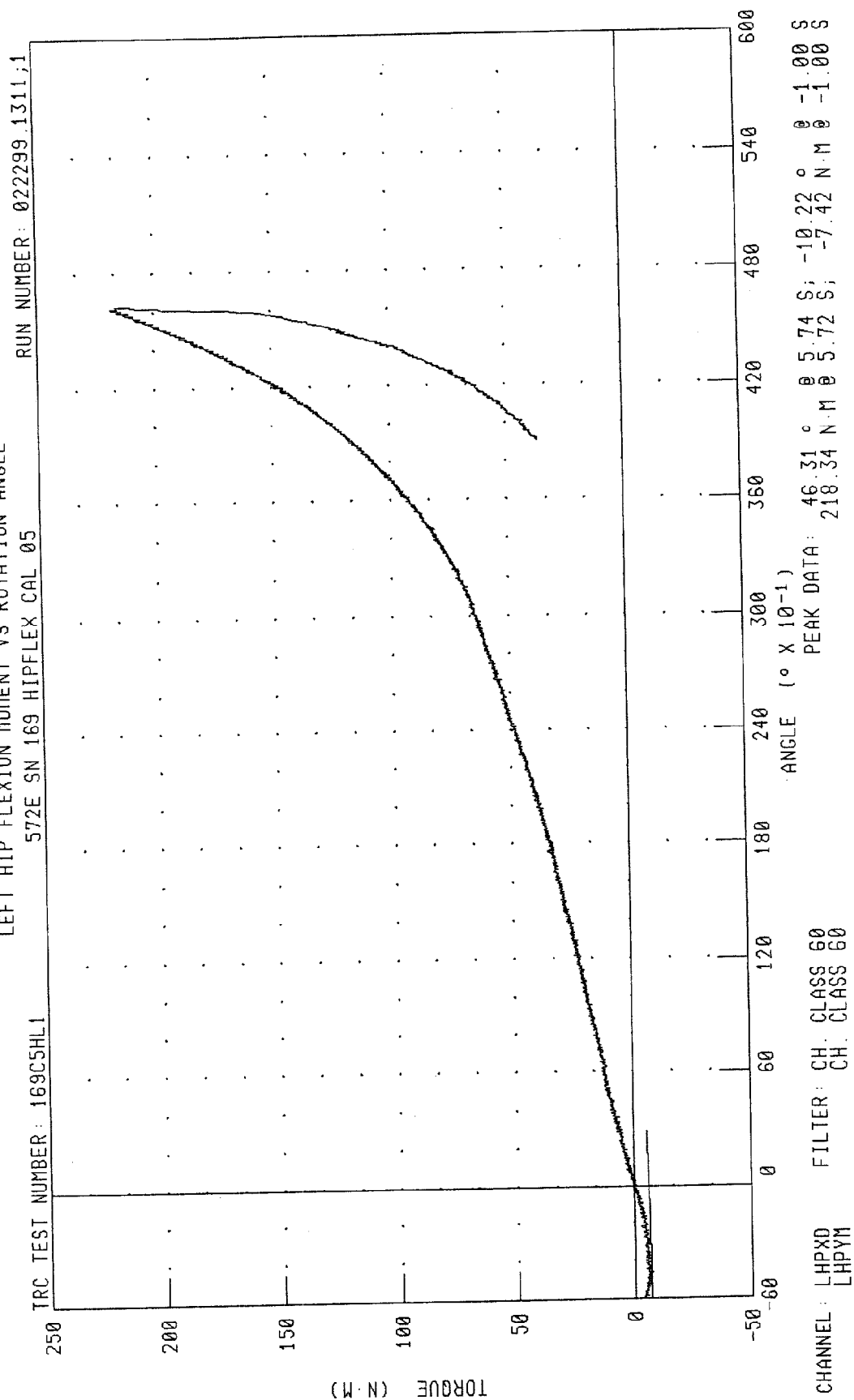
TRC TEST NUMBER: 169C5HL1



PEAK DATA: 218.34 N·m @ 5.72 s; -7.42 N·m @ -1.00 s

CHANNEL: LHPYM FILTER: CH. CLASS 60

HYBRID III HIP FLEXION VERIFICATION - 0 DEGREES LEFT HIP FLEXION MOMENT VS ROTATION ANGLE



TRANSPORTATION RESEARCH CENTER INC.

RIGHT KNEE IMPACT TEST

HYBRID III 50th

20-FEB-99

TRC INC.

TEST NO: 169C5RK1

572E SN169 RIGHT KNEE CAL 5

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5820.8 N *

* TEST DOES NOT MEET SPECIFICATIONS

TECHNICIAN

Kevin Watkins

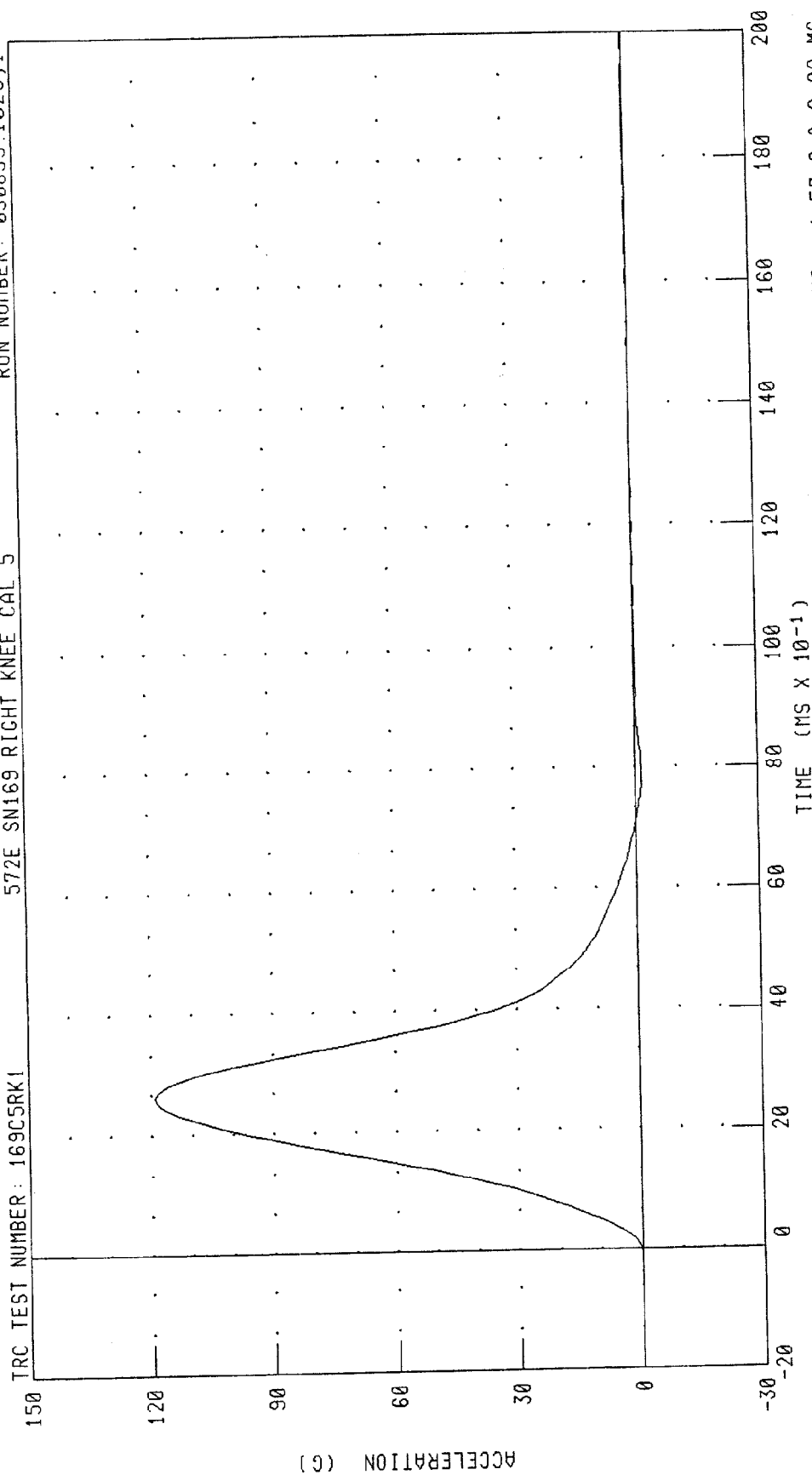
RUN NUMBER: 022099.1103;1

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

572E SN169 RIGHT KNEE CAL 5

TRC TEST NUMBER: 169C5RK1

RUN NUMBER: 030899.1029.1



PEAK DATA: 118.97 G @ 2.64 MS; -1.57 G @ 8.08 MS

CHANNEL: PENXG FILTER: CH CLASS 600

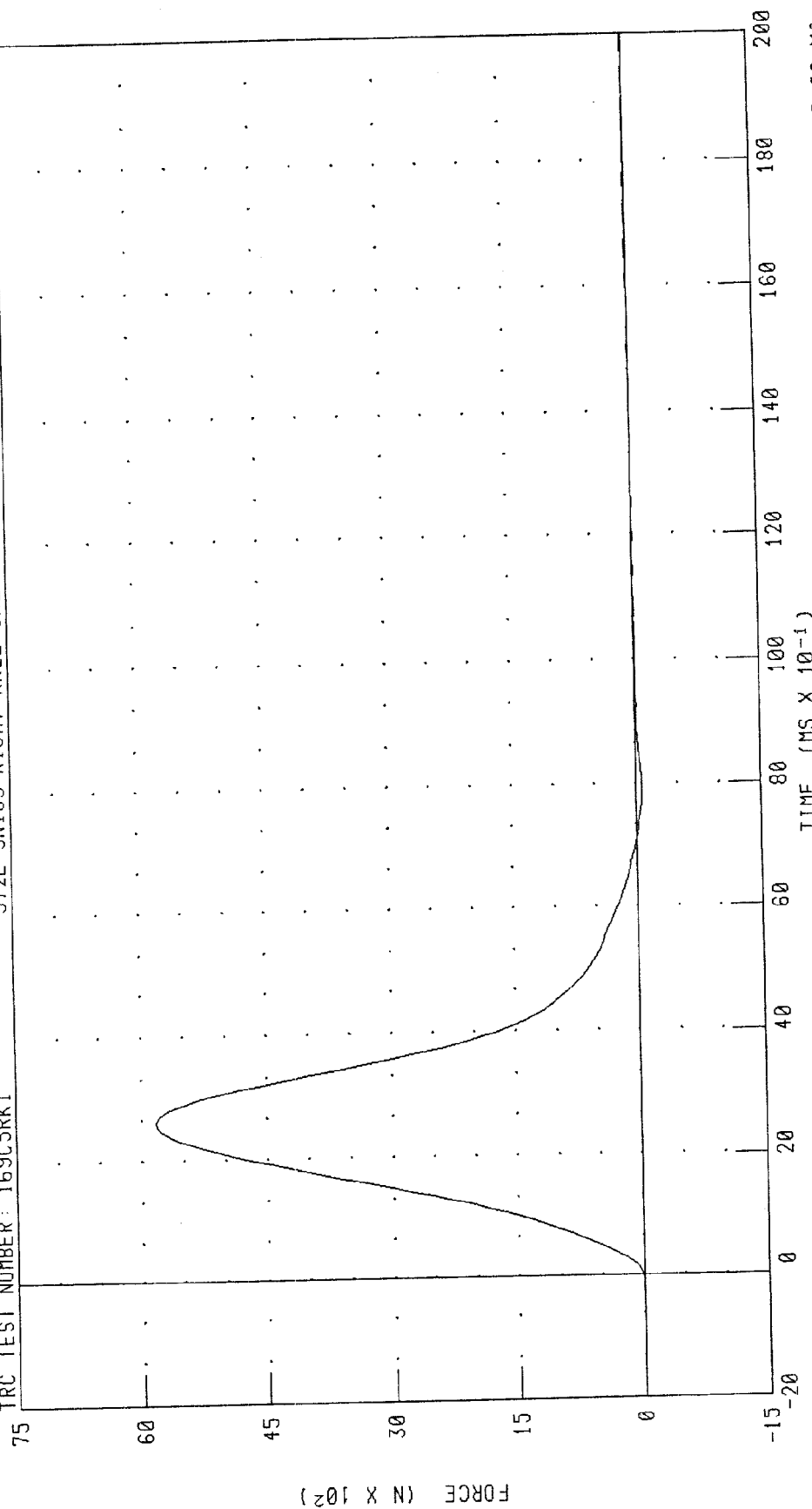
PART 572-E HYBRID III RIGHT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN169 RIGHT KNEE CAL 5

RUN NUMBER: 030899.1029,1

TRC TEST NUMBER: 169C5RK1



PEAK DATA: 5820.88 N @ 2.64 MS; -76.76 N @ 8.08 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LEFT KNEE IMPACT TEST

HYBRID III 50th

20-FEB-99

TRC INC.

TEST NO: 169C5LK1

572E SN169 LEFT KNEE CAL 5

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9-25.6 DEG. C	21.1 DEG. C
RELATIVE HUMIDITY	10 - 70 %	22.0 %
PROBE VELOCITY	2.07 - 2.13 M/S	2.12 M/S
PEAK KNEE IMPACT FORCE 5.0 KG PENDULUM	4715 - 5782 N	5670.1 N

TEST MEETS SPECIFICATIONS

TECHNICIAN

By cult

RUN NUMBER: 022099.1100;1

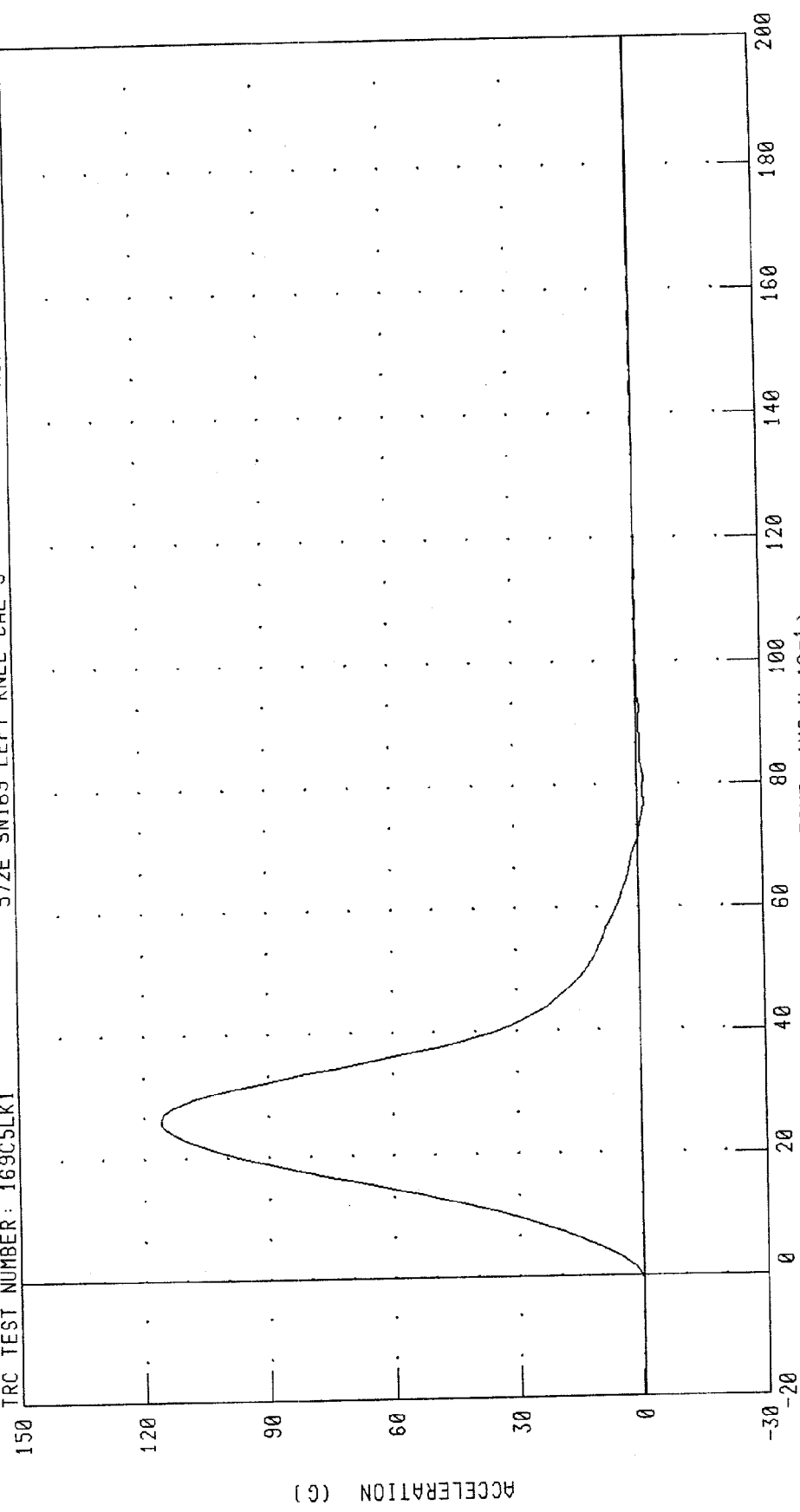
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM DECELERATION (5 KG PEND.)

572E SN169 LEFT KNEE CAL 5

RUN NUMBER: 022099.1101;1

TRC TEST NUMBER: 169C5LK1



TIME (MS X 10⁻¹)

PEAK DATA: 115.89 G @ 2.64 MS; -1.55 G @ 7.68 MS

CHANNEL: PENXG FILTER: CH. CLASS 600

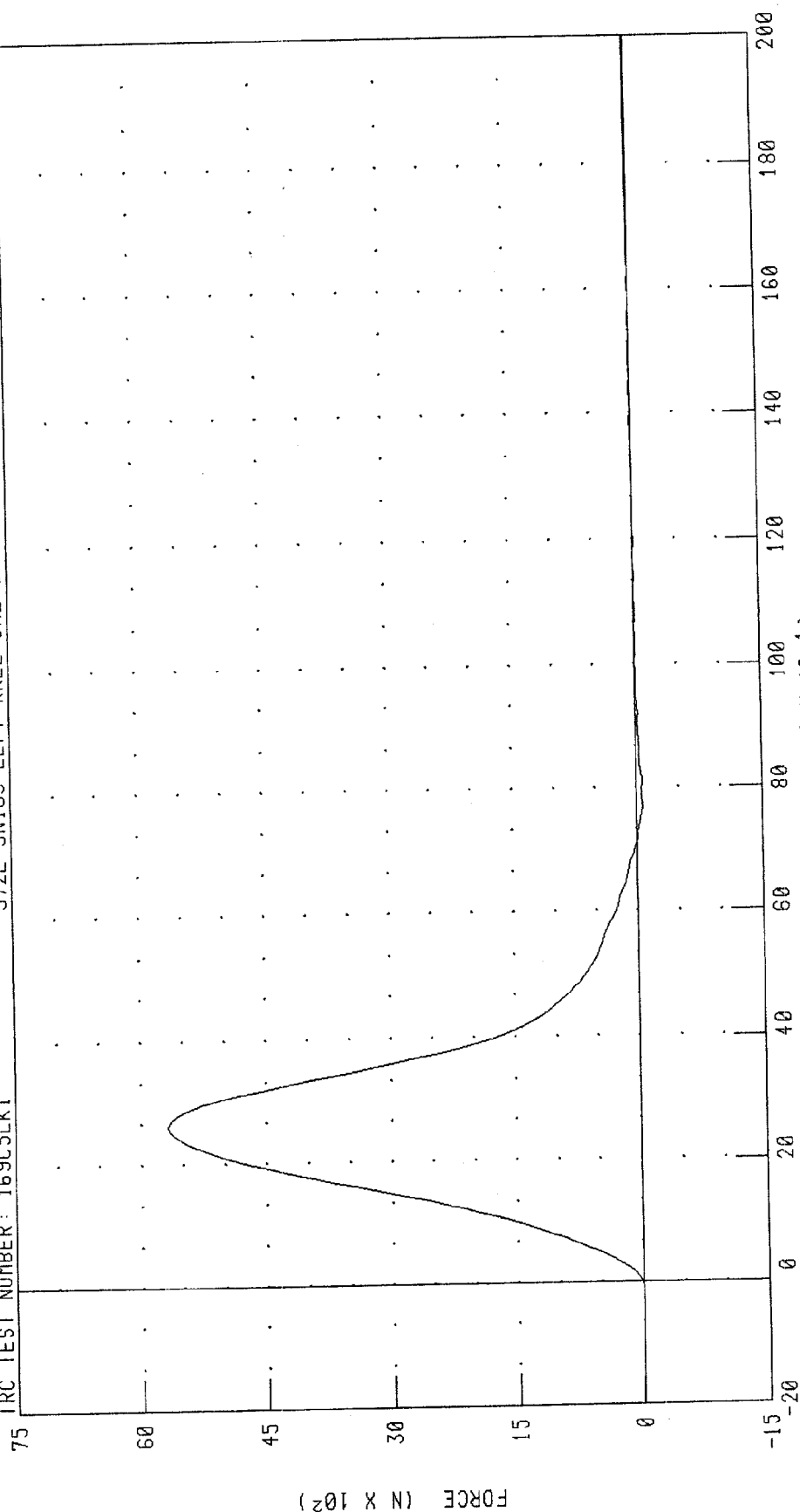
PART 572-E HYBRID III LEFT KNEE CALIBRATION

PENDULUM FORCE (5 KG PEND.)

572E SN169 LEFT KNEE CAL 5

RUN NUMBER: 022099.1101;1

TRC TEST NUMBER: 169C5LK1



TIME (MS X 10⁻¹)

PEAK DATA: 5670.14 N @ 2.64 MS; -76.02 N @ 7.68 MS

CHANNEL: PENXF FILTER: CH. CLASS 600

Appendix D

Miscellaneous Test Information

Vehicle Instrumentation Placement

Test Number 990216

<u>Number</u>	<u>Location</u>	<u>Axis</u>	<u>Manufacturer</u>	<u>Model</u>	<u>S/N</u>	<u>Orientation (+ Sensing)</u>
1	Left Brake Caliper	X	Endevco	7264	J22674	Forward
2	Right Brake Caliper	X	Endevco	7264	J22657	Forward
3	Instrument Panel Center	X	Endevco	7264	J22677	Forward
4	Engine Top	X	Endevco	7264	J21823	Forward
5	Engine Bottom	X	Endevco	7264	J26513	Forward
6	Vehicle Rear Center	Z	Endevco	7264	J22676	Up
7	Left Rear Seat Crossmember	X	Endevco	7264	J26511	Forward
8	Right Rear Seat Crossmember	X	Endevco	7264	J26484	Forward

Dummy Sign Convention

Accelerometers:

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

Potentiometers:

+Chest longitudinal deflection: Outward

Load cells:

+Femur force: Tension

Neck load cells:

+X force: Head rearward
+Y force: Head leftward
+Z force: Head upward (tension on neck)
+X moment: Left ear rotating toward left shoulder
+Y moment: Chin rotating toward chest
+Z moment: Chin rotating toward left shoulder

Filtering Data

J211 MAR95

Load Cell Barrier Forces Class 60

Vehicle Structural Accelerations Class 60

Occupant

Head Accelerometer Class 1000

Neck Class 60

Chest Accelerometer Class 180

Chest Deflection Class 180

Femur Force Class 600

Sternum Accelerometer Class 180

Lower Leg Class 600

Description Of Timing Marks On TRC High-Speed Film

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

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

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

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

Transducer Information

Hybrid III Dummy Serial No.: 168v
 Project/Segment No.: 096017-7100
 Manufacturer: Humanoid
 Engineer:
 Seating Position: Driver
 Test Date: February 16, 1999

MNEMONIC PARAMETER BEING MEASURED	TYPE OF TRANSDUCER	MODEL NO.	SERIAL NO.	MFR.	SENSITIVITY	CAL DUE DATE	FULL SCALE (ENGR. UNITS) DESIRED ACTUAL	DIRECTION OF POSITIVE POLARITY	CABLE NO.
HEDXG HAP	HEAD X-AXIS ACCEL.	7264	J19535	End.	.2649 mv/g at 10 volts	8-3- 1999	400 g	Rear	J19535
HEDYG HLR	HEAD Y-AXIS ACCEL.	"	J19548	"	.2192 mv/g at 10 volts	"	400 g	Left	J19548
HEDZG HIS	HEAD Z-AXIS ACCEL.	"	J20026	"	.2527 mv/g at 10 volts	"	400 g	Up	J20026
NEKXF NFX*	NECK X-AXIS SHEAR FORCE	1716A	0853	Dento n.	1.7387 MV/V @ 2000 LBS	"	900 Kg 2,000 lbs. 9,000 N		FX
NEKYF NFY*	NECK Y-AXIS SHEAR FORCE	"	"	"	1.6587 MV/V @2000 LBS	"	900 Kg 2,000 lbs. 9,000 N		FY
NEKZF NFZ*	NECK Z-AXIS AXIAL FORCE	"	"	"	1.2806 MV/V @3000 LBS	"	1300 Kg 3,000 lbs. 13,500 N		FZ
NEKXM NMX*	NECK MOMENT ABOUT X AXIS	"	"	"	1.6595 MV/V @2500 IN-LBS	"	30 Kg 200 ft-lbs 275 N·m		MX
NEKYM NMY*	NECK MOMENT ABOUT Y AXIS	"	"	"	1.6596 MV/V @2500 IN-LBS	"	30 Kg 200 ft-lbs 275 N·m		MY
NEKZM NMZ*	NECK MOMENT ABOUT Z AXIS	"	"	"	2.3663 MV/V @2500 IN-LBS	"	30 Kg 200 ft-lbs 275 N·m		MZ

Transducer Information

Hybrid III Dummy Serial No.: 168v
 Project/Segment No.: 096017-7100
 Manufacturer: Humanoid
 Engineer:
 Seating Position: Driver
 Test Date: February 16, 1999

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

Transducer Information

Hybrid III Dummy Serial No.: 169v

Manufacturer: Humanoid

Project/Segment No.: 096017-7100

Seating Position: Passenger

Engineer:

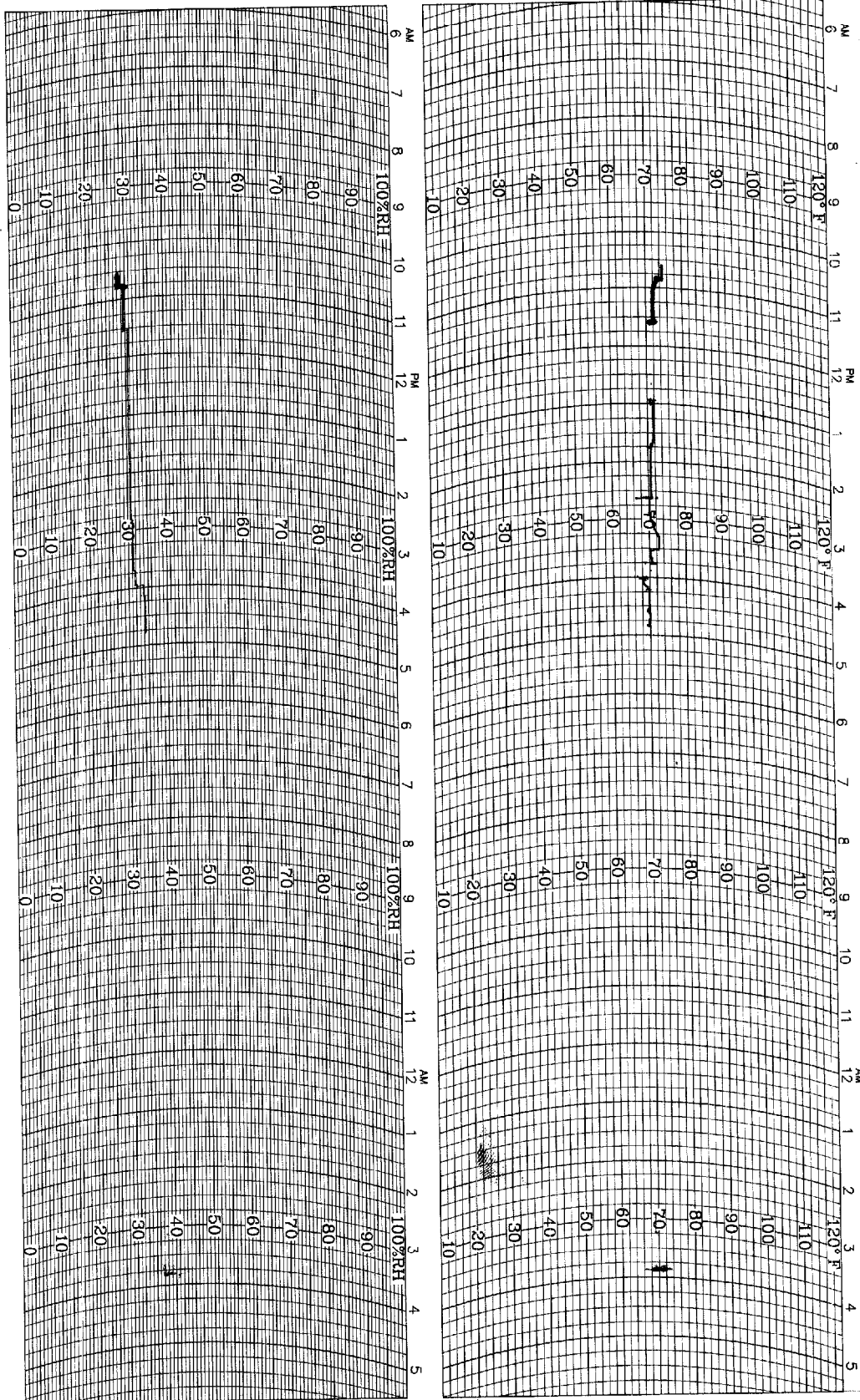
Test Date: February 16, 1999

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

Transducer Information

Hybrid III Dummy Serial No.: 169v
 Project/Segment No.: 096017-7100
 Manufacturer: Humanoid
 Engineer:
 Seating Position: Passenger
 Test Date: February 16, 1999

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



WeatherMeasure
WEATHERtronics
Division of QUALIMETRICS, Inc.

P.O. BOX 41039
SACRAMENTO, CA 95841
PHONE: (916) 923-0055

HYGROTHERMOGRAPH
1 DAY

CHART NO. M699123
C311-D-HF
ECN 2717
6-9-87

02-16-99 V.O.

STATION _____ DATE ON _____ DATE OFF _____