

636896

Report Number: 214-TRC-03-006

Safety Compliance Testing For FMVSS 214

Side Impact Protection

Indicant

Saturn Corporation

2003 Saturn Ion 4-door sedan

NHTSA Number: C30111

Transportation Research Center Inc.

10820 State Route 347

P. O. Box B-67

East Liberty, OH 43319



Test Date: April 8, 2003

Final Report: April 22, 2003

U. S. Department Of Transportation

National Highway Traffic Safety Administration

Office of Enforcement

Office of Vehicle Safety Compliance

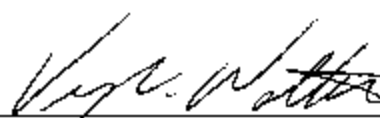
400 Seventh Street, S. W.

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Washington, DC 20590

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16. Abstract This 56/28 km/h 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject vehicle, a 2003 Saturn Ion 4-door sedan in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-06 (except the test was conducted 8 km/h (5 mph) faster than the standard specifies) to determine FMVSS 214 Side Impact Protection compliance. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on April 4, 2003. The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck (driver's side) side of the target vehicle at the time of impact was 21° C. The target vehicle's post-test maximum crush was 335 mm at Level 2. The test or target vehicle's performance is given below (with FIR filter): <table border="0"> <thead> <tr> <th></th> <th><u>Front SID-IIII</u></th> <th></th> <th><u>Rear SID-IIII</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td><u>78.5</u></td> <td>g's</td> <td><u>80.8</u></td> <td>g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td><u>91.4</u></td> <td>g's</td> <td><u>86.0</u></td> <td>g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td><u>102.0</u></td> <td>g's</td> <td><u>77.9</u></td> <td>g's</td> </tr> <tr> <td>Thoracic Trauma Index, (TTI):</td> <td><u>96.7</u></td> <td>g's</td> <td><u>81.9</u></td> <td>g's</td> </tr> <tr> <td>Pelvis Acceleration (PRV):</td> <td><u>103.4</u></td> <td>g's</td> <td><u>63.8</u></td> <td>g's</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event. The rear door on the struck side became unlatched, but remained jammed shut. A small section of the front door panel was removed and may have affected the front SID-IIII test results (see Appendix E).					<u>Front SID-IIII</u>		<u>Rear SID-IIII</u>		Left Upper Rib Acceleration:	<u>78.5</u>	g's	<u>80.8</u>	g's	Left Lower Rib Acceleration:	<u>91.4</u>	g's	<u>86.0</u>	g's	Lower Spine Acceleration:	<u>102.0</u>	g's	<u>77.9</u>	g's	Thoracic Trauma Index, (TTI):	<u>96.7</u>	g's	<u>81.9</u>	g's	Pelvis Acceleration (PRV):	<u>103.4</u>	g's	<u>63.8</u>	g's
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17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID-IIII)		18. Distribution Statement Copies of this report are available from: NHTSA Technical Reference Division Room 5108 (NAD-52), 400 Seventh Street, S.W. Washington, DC 20590 Telephone No. (202) 366-4946 Attn: Robert Hornicle																															
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Section 1

Purpose and Test Procedure

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-11114. The purpose of this test was to evaluate side impact protection in a 2003 Saturn Ion 4-door sedan. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 2001) with the exception of test speed, which was at the NCAP High-Speed Lateral Impact level (61.2 km/h).

Section 2

Summary of Side Impact Test

A 2003 Saturn Ion 4-door sedan was impacted on the driver's left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.0 km/h (38.5 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on April 8, 2003. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SID-HIIs) are included in Appendix A.

Two restrained Side Impact Dummies (SID-HIIs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-06, dated July 2001). Both SID-HIIs were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID-HIIs were instrumented with the following accelerometers:

1. Head (HED) triaxial and redundant accelerometers (X, Y, and Z-directions)
2. Neck (NEK) triaxial force and moment load cells (X, Y, and Z-directions)
3. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
4. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
5. Lower Thoracic Spine (T₁₂) uniaxial and redundant accelerometer (Y-direction)
6. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact dummy (SID-HII) configuration and verification test data can be found in Appendix C. A total of 69 channels of data were recorded. Appendix B contains the vehicle, MDB, and dummy response data traces.

The following tables summarize the results of the test:

Injury Criteria	Front SID-HIII	Rear SID-HIII
TTI (g)	96.7	81.9
PEV (g)	103.4	63.8

Head Injury Criteria (HIC)

Injury Criteria	Front SID-HIII	Rear SID-HIII
HIC ¹	683	405
t ₁ (ms)	44.6	49.8
t ₂ (ms)	80.6	63.7
Average Acceleration t ₁ - t ₂ (g)	51.3	61.8

HIC is as defined in FMVSS 208. The maximum time interval t₁ to t₂ is 36 ms.

Neck Injury Criteria

Maximum Values	Front SID-HIII	Rear SID-HIII
Neck X-axis Force (N)	-1078	279
Neck Y-axis Force (N)	1030	468
Neck Z-axis Force (N)	2761	-1665
Moment About X-axis (Nm) ²	109	-151
Moment About Y-axis (Nm)	40	-49
Moment About Z-axis (Nm)	32	24

¹ See Data Acquisition Explanations

² Calculated about the occipital condyle with the following formula: $M_{occ} = M_x + 0.01778F_y$.

Data Acquisition Explanations

The driver's head Y-axis acceleration channel, HEDYG1, recorded a questionable data spike at approximately 33 ms. This affected the driver's head Y-axis velocity and head resultant acceleration calculations. The Head Injury Criteria (HIC) calculation was not affected because the HIC time interval did not include this spike.

The driver's redundant head X-axis acceleration channel, HEDXR1, recorded a questionable data spike at approximately 33 ms. This affected the driver's redundant head X-axis velocity and redundant head resultant acceleration calculations. The redundant Head Injury Criteria (HIC) calculation was not affected.

The driver's redundant head Y-axis acceleration channel, HEDYR1, recorded a questionable data spike at approximately 33 ms. This affected the driver's redundant head Y-axis velocity and redundant head resultant acceleration calculations. The redundant Head Injury Criteria (HIC) calculation was not affected.

The driver's redundant head Z-axis acceleration channel, HEDZR1, recorded a questionable data spike at 33 ms. This affected the driver's redundant head Z-axis velocity and redundant head resultant acceleration calculations. The redundant Head Injury Criteria (HIC) calculation was not affected.

The driver's redundant left upper rib Y-axis acceleration channel, LURYR1, exceeded full-scale at approximately 47 ms and recorded no valid data after that. This affected the driver's redundant left upper rib Y-axis velocity calculation.

The vehicle's left rear seat track Y-axis acceleration channel, LRTYG1, recorded questionable data after approximately 43 ms and recorded no valid data after exceeding full-scale at approximately 59 ms. This affected the driver's left rear seat track Y-axis velocity measurement.

The vehicle's left lower A-post Y-axis acceleration channel, LLAYG1, recorded no valid data after approximately 44 ms. This affected the driver's lower left A-post Y-axis velocity measurement.

The vehicle's left middle B-post Y-axis acceleration channel, LMBYGI, exceeded full-scale at approximately 22 ms and recorded no valid data after that. This affected the driver's left middle B-post Y-axis velocity measurement.

Section 3

Summary of Test Results

Data Sheet 1

General Test Vehicle Parameter Data

Test Vehicle Information:

Vehicle Year/Make/Model: 2003 Saturn Ion
Vehicle Body Style/Color: 4-door sedan/Silver VIN: 1G8AF52F43Z145425
Vehicle NHTSA No.: C30111 Build Date: 01/03
Engine Data: 4 Cylinders; CID; 2.2 Liters; cc
Placement: - Longitudinal; or X Lateral; or - Horizontal
Transmission: 5 Speed; X Manual; - Automatic; - Overdrive
Final Drive: - RWD; X FWD; - Four-Wheel Drive
Odometer Reading: 127 km
Options: X A/C; X Power steering; X Pwr. brakes; - Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity)* 210 kPa Front; 210 kPa Rear
Recommended Tire Size: P185/70 R14
Tires on Test Vehicle: P185/70 R14 Manufacturer: Firestone FR690

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; 0 3rd seat; 5 Total
Type of Front Seats: X Bucket; - Bench; - Split bench
Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob
Vehicle Max. Capacity Loading = 408.0 kg (A)
No. of Occupants x 68.04 kg. = 340.0 kg (B)
Vehicle Cargo Capacity (A-B) = 68 kg

Test Vehicle Delivered Weight With Maximum Fluids:

Left Front	=	<u>346.5</u> kg	Left Rear	=	<u>275.5</u> kg
Right Front	=	<u>382.5</u> kg	Right Rear	=	<u>235</u> kg
Total Front	=	<u>729</u> kg	Total Rear	=	<u>510.5</u> kg
Front % of Total Weight	=	<u>58.8</u> %	Rear % of Total Weight	=	<u>41.2</u> %
Total Weight	=	<u>1239.5</u> kg			

* Tire pressure used in test.

Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Calculation Of Vehicle's Target Test Weight:

Total Test Vehicle Delivered Weight With Max. Fluids = 1239.5 kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle = 68.0 kg (B)
Weight of Instrumented Side Impact Dummies (2 X 84.0 kg) = ... 168.0 kg (C)
Test Vehicle Target Weight: = 1475.5 kg (A+B+C)

Fully Loaded Test Vehicle (UDW - 2 SID-HIII(s) + Cargo):

Left Front	=	<u>383.5</u> kg	Left Rear	=	<u>355.5</u> kg
Right Front	=	<u>421.5</u> kg	Right Rear	=	<u>315.0</u> kg
Total Front	=	<u>805.0</u> kg	Total Rear	=	<u>670.5</u> kg
Front % of Total Weight	=	<u>54.6</u> %	Rear % of Total Weight	=	<u>45.4</u> %
Total Weight	=	<u>1475.5</u> kg			

As Tested Weight of Test Vehicle (2 SID-HIII(s) + Cargo + Equipment & Instrumentation):

Left Front	=	<u>423.4</u> kg	Left Rear	=	<u>328.0</u> kg
Right Front	=	<u>403.2</u> kg	Right Rear	=	<u>314.8</u> kg
Total Front	=	<u>826.6</u> kg	Total Rear	=	<u>642.8</u> kg
Front % of Total Weight	=	<u>56.3</u> %	Rear % of Total Weight	=	<u>43.7</u> %
Total Weight	=	<u>1469.4</u> kg			

Test Vehicle Attitude (all dimensions in millimeters):

As Delivered	Fully Loaded	Ready For Test
Right Front <u>703</u>	Right Front <u>678</u>	Right Front <u>677</u>
Left Front <u>706</u>	Left Front <u>675</u>	Left Front <u>675</u>
Right Rear <u>694</u>	Right Rear <u>653</u>	Right Rear <u>657</u>
Left Rear <u>691</u>	Left Rear <u>644</u>	Left Rear <u>660</u>

Test Vehicle Wheelbase: 2617 mm

C.G. = 1144 mm rearward of front wheel centerline

Total Vehicle Length:

Right Side = 4457 mm
Left Side = 4466 mm
Centerline = 4648 mm

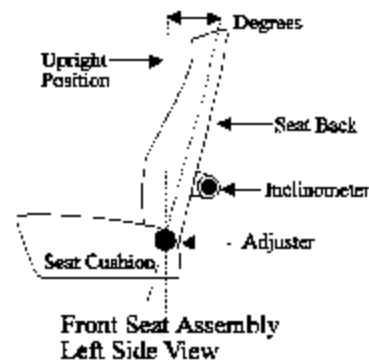
Data Sheet 1 (continued)

General Test Vehicle Parameter Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Front Seat Cushion Placement: Mid

Total Length of Fore/Aft Adjustment Travel: 260 mm

Total Number of Adjustment Positions or Detents: 27

Front Seat Back Adjustment Position: The back was adjusted to 9.1° measured on the head rest post

Seat Back Torso Angle: N/A degrees

Second Position Seat Placement: N/A, not adjustable

Total Length Of Fore/Aft Adjustment Travel: None

Seat Back Adjustment Position: N/A, not adjustable

Adjustable Steering Column Position: 17.9°

Window Positions:

Right Front: Open

Right Rear: Open

Left Front: Closed

Left Rear: Closed

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent In Fuel Tank:

51.5 liters (fuel tank usable capacity)

48.1 liters used in test (92% - 94% of fuel tank usable capacity)

Location of Impact Point On Test Vehicle Side To Be Impacted:

Wheelbase = 2617 millimeters

Intended impact point is 368 millimeters rearward of front axle centerline
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 391 millimeters rearward of front axle centerline

Data Sheet 2

Test Vehicle Summary of Results

Vehicle Year/Make/Model: 2003/Saturn /Ion

Body Style: 4-door sedan

VIN: 1G8AF52F43Z145425

NHTSA No.: C30111

Build Date: January, 2003

Test Date: 04/08/03

Vehicle Overall Length = 4648 mm

Overall Width = 1708 mm

Vehicle Test Weight (Pre-Test):

Left Front = 423.4 kg Left Rear = 328.0 kg

Right Front = 403.2 kg Right Rear = 314.8 kg

Total Front = 826.6 kg Total Rear = 642.8 kg

Total Weight = 1469.4 kg

Wheelbase = 2617 mm

Longitudinal C.G. From Center Of Front Axle = 1144 mm

Impact Angle With Respect To Impactor = 90 degrees

Impact Point:

Actual Impact Point is 23 mm Right of nominal impact ref. line (Lateral)

Actual Impact Point is 5 mm Up from nominal impact point (Vertical)

Maximum Exterior Static Crush:

1. Level 1 (250 mm above ground) = 136 mm

2. Level 2 (513 mm above ground) = 335 mm

3. Level 3 (630 mm above ground) = 287 mm

4. Level 4 (870 mm above ground) = 232 mm

5. Level 5 (1384 mm above ground) = 45 mm

Maximum Post-Test Intrusion = 335 mm

Occupants:

Front Passenger

Rear Passenger

Dummy Identification 028

066

Restraints Used Seatbelt, front airbag

Seatbelt

Instrumentation:

Number of Vehicle Data Channels: - 22

Number of Cameras: Onboard = 3 Offboard = 8 Total = 11

Data Sheet 3

Moving Deformable Barrier(MDB) Summary

MDB Face Manufacturer And Serial Number:

Plascore, 004A0203-2, 046B0103

Position Of Impactor (MDB) On Monorail:

Crabbed 27° to the left

MDB Specifications:

Overall Width of Framework Carriage = 1251 mm

Overall Length of MDB (Incl. honeycomb impact face) = 4014 mm

Wheelbase of Framework Carriage = 2591 mm

Track of Framework Carriage (Front & Rear) = 1881 mm

C.G. Location Rearward of Front Axle = 1115 mm

MDB Weight:

Left Front = 382 kg Left Rear = 301.6 kg

Right Front = 393.6 kg Right Rear = 284.2 kg

Total Front = 775.6 kg Total Rear = 585.8 kg

Total MDB Weight = 1361.4 kg

Impact Angle (MDB C/L to Target Vehicle C/L) = 90 degrees

Impact Speed = 62.0 km/h

Maximum Static Crush of Honeycomb Impact Face:

1. Row A at Center of Bumper Level = 174 millimeters

2. Row B at Top of Bumper Level = 98 millimeters

3. Row C at Mid Level = 126 millimeters

4. Row D at Top of Stack Level = 159 millimeters

Instrumentation:

Number of MDB Data Channels = 5

Data Sheet 4

Post-Test Observations

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Visible Dummy Contact Points:

Left Front SID-HIII

Left Rear SID-HIII

Head: Upper edge of door panel,
right side of driver head
restraint, left shoulder

Side header

Upper Torso: Door panel

Door panel

Lower Torso: Door panel

Door panel

Left Knee: Door panel

Door panel

Right Knee: None

None

Door Opening:

Left Side

Right Side

Front: Latched and jammed shut

Easy

Rear: Unlatched and jammed shut
(no separation)

Easy

MDB Distance From Target Impact Point:

Vertical: 5 mm up from target

Horizontal: 23 mm right from target

Arm Rest Locations:

Front: 282 mm below the bottom of the window

Rear: 288 mm below the bottom of the window

Seat Movement:

Front: Pushed inboard

Rear: None

Glazing Damage:

Windshield: Cracked at upper A-pillar

Window: Both side windows shattered

Pillar Separation: No

Sill Separation: No

Other Notable Impact Effects:

The driver and passenger frontal airbags deployed.

Section 4

Occupant and Vehicle Information

Data Sheet 5

SID-HH Instrumentation Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

TEST NUMBER: 030408-1

DRIVER DUMMY SERIAL NUMBER: 028

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	9.1 g	@	196.4 ms	33.2 g	@	71.8
LATERAL ¹	---- g	@	---- ms	---- g	@	----
VERTICAL	66.8 g	@	45.2 ms	11.0 g	@	35.8
RESULTANT ¹	---- g	@	---- ms			
HIC	683 from 40.2 to 76.2 ms					

HEAD REDUNDANT ACCELERATION

LONGITUDINAL ¹	---- g	@	---- ms	---- g	@	----
LATERAL ¹	---- g	@	---- ms	---- g	@	----
VERTICAL ¹	---- g	@	---- ms	---- g	@	----
RESULTANT ¹	---- g	@	---- ms			
HIC	748 from 40.4 to 76.4 ms					

NECK FORCE

X-AXIS SHEAR	209.7 N	@	198.1 ms	1078.0 N	@	67.9
Y-AXIS SHEAR	1030.2 N	@	73.2 ms	304.0 N	@	29.1
Z-AXIS AXIAL	2760.6 N	@	49.3 ms	423.6 N	@	36.2

NECK MOMENT

ABOUT X-AXIS	95.2 N-m	@	67.4 ms	106.4 N-m	@	38.3
ABOUT Y-AXIS	40.4 N-m	@	77.9 ms	33.4 N-m	@	43.8
ABOUT Z-AXIS	32.2 N-m	@	68.6 ms	16.8 N-m	@	33.9
OCCIPITAL COND	109.0 N-m	@	67.3 ms	95.6 N-m	@	37.8

LEFT UPPER RIB ACCELERATION

LATERAL (P) ¹	78.5 g	@	29.4 ms	25.5 g	@	66.3
LATERAL (R) ¹	---- g	@	---- ms	---- g	@	----

LEFT LOWER RIB ACCELERATION

LATERAL (P)	91.4 g	@	28.7 ms	23.0 g	@	62.5
LATERAL (R)	92.6 g	@	28.7 ms	23.6 g	@	62.5
TTI d (P)	76.2					
TTI d (R)	76.0					

LOWER SPINE ACCELERATION

LATERAL (P)	102.0 g	@	29.4 ms	17.2 g	@	77.5
LATERAL (R)	103.2 g	@	29.4 ms	21.9 g	@	58.8

PELVIS ACCELERATION

LATERAL (P)	103.4 g	@	23.1 ms	8.8 g	@	44.4
LATERAL (R)	103.7 g	@	23.1 ms	8.9 g	@	44.4

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

: See DATA ACQUISITION EXPLANATION 4-2

030408-1

Data Sheet 5 (Continued)

SID-11111 Instrumentation Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

TEST NUMBER: 030408-1

PASSENGER DUMMY SERIAL NUMBER: 066

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

HEAD ACCELERATION

LONGITUDINAL	10.8 g	@	180.2 ms	16.2 g	@	61.8
LATERAL	78.3 g	@	51.8 ms	13.9 g	@	181.3
VERTICAL	14.3 g	@	42.3 ms	33.3 g	@	58.0
RESULTANT	80.0 g	@	51.8 ms			
HIC	405 from 44.7 to 62.7 ms					

HEAD REDUNDANT ACCELERATION

LONGITUDINAL	10.7 g	@	180.9 ms	15.7 g	@	61.6
LATERAL	77.7 g	@	51.8 ms	13.6 g	@	181.4
VERTICAL	13.9 g	@	42.8 ms	33.4 g	@	58.0
RESULTANT	79.4 g	@	51.8 ms			
HIC	402 from 44.8 to 62.7 ms					

NECK FORCE

X-AXIS SHEAR	278.8 N	@	66.2 ms	159.5 N	@	98.0
Y-AXIS SHEAR	468.1 N	@	51.8 ms	425.9 N	@	75.8
Z-AXIS AXIAL	432.0 N	@	35.7 ms	1665.2 N	@	58.3

NECK MOMENT

ABOUT X-AXIS	16.8 N-m	@	184.7 ms	156.7 N-m	@	53.2
ABOUT Y-AXIS	22.2 N-m	@	115.7 ms	49.4 N-m	@	57.0
ABOUT Z-AXIS	23.7 N-m	@	77.1 ms	6.7 N-m	@	52.3
OCCIPITAL COND	15.0 N-m	@	124.2 ms	150.9 N-m	@	53.3

LEFT UPPER RIB ACCELERATION

LATERAL (P)	80.8 g	@	33.7 ms	9.5 g	@	55.6
LATERAL (R)	80.1 g	@	33.7 ms	8.6 g	@	55.6

LEFT LOWER RIB ACCELERATION

LATERAL (P)	86.0 g	@	33.7 ms	10.6 g	@	88.8
LATERAL (R)	85.7 g	@	33.7 ms	10.7 g	@	89.4
TTI d (P)	72.6					
TTI d (R)	70.7					

LOWER SPINE ACCELERATION

LATERAL (P)	77.9 g	@	37.5 ms	29.2 g	@	69.4
LATERAL (R)	77.1 g	@	37.5 ms	29.1 g	@	69.4

PELVIS ACCELERATION

LATERAL (P)	63.8 g	@	34.4 ms	11.3 g	@	72.5
LATERAL (R)	63.8 g	@	34.4 ms	11.3 g	@	71.9

POSITIVE DIRECTION

LONGITUDINAL: FORWARD
LATERAL: RIGHTWARD
VERTICAL: DOWNWARD

NEGATIVE DIRECTION

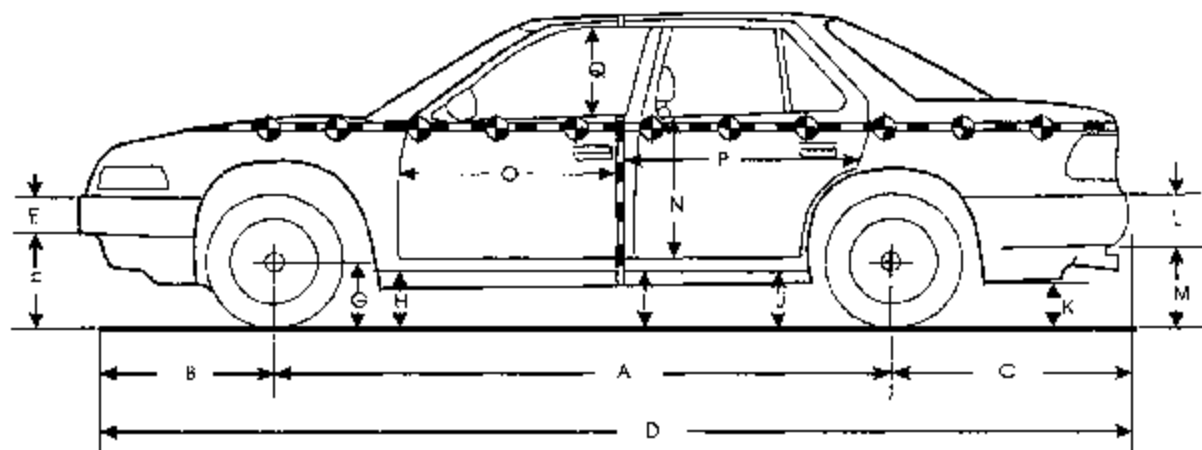
LONGITUDINAL: REARWARD
LATERAL: LEFTWARD
VERTICAL: UPWARD

Data Sheet 6

Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



Left Side View

Note: All dimensions are in millimeters with tolerance of ± 3 mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2617	2617	2605	12
B	985	985	995	-10
C	1046	1046	1046	0
D	4648	4648	4640	8
E	171	171	171	0
F	400	385	402	-17
G	287	283	289	-6
H	250	245	237	8
I	257	250	370	-120
J1	210	170	195	-25
J2	250	245	307	-62
K	298	262	270	-8
L	315	315	315	0
M	348	310	318	-8
N	717	717	670	47
O	735	735	740	-5
P	1276	1276	1010	266
Q	415	415	359	56
R	4457	4457	4465	-8
S	4466	4466	4475	-9
T	1275	1275	1055	220

D = Length at centerline
T = Width at B-pillar

F&L = Bumper Thickness
J1 = To Pinch Weld

R = Right Side Length
J2 = To Sill

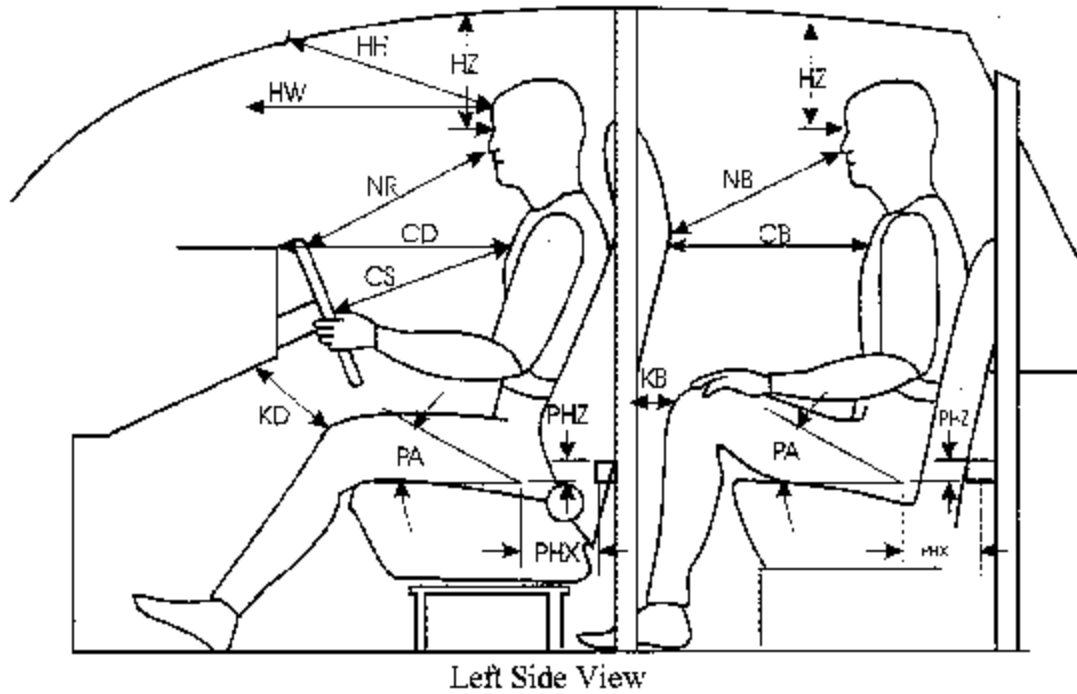
S = Left Side Length

Data Sheet 7

SID-HIII Longitudinal Clearance Dimensions

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID-HIII # 28	Left Rear Pass. SID-HIII # 66
HH	429	N/A
HW	726	N/A
HZ	210	164
NR/NB	450	550
CD/CB	760	481
CS	381	N/A
KDL(KDA°)/KBL(KBA°)	94/33°	96/23.8°
KDR(KDA°)/KBR(KBA°)	95/35°	103/24.6°
PA°	24.5°	23.9°
PHX	187	228
PHZ	120	300

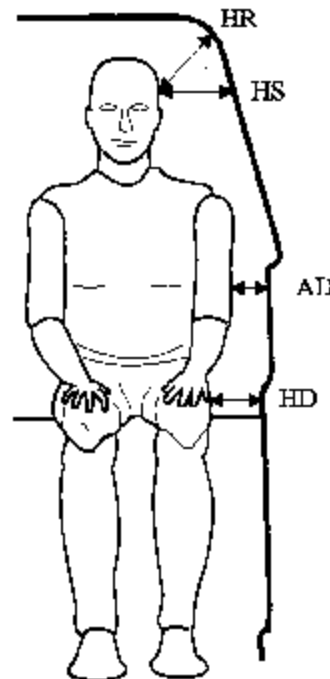
Note: 2-door vehicle shown. Rear dummy PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Data Sheet 8

SID-HIII Lateral Clearance Dimensions

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



Note: All measurements are in millimeters with tolerance of ± 3 mm

Measurement	Driver SID-HIII # 28		Left Rear Pass. SID-HIII # 66	
HR	203		186	
HS	353		351	
AD*	Lower: 88	Upper: 99	Lower: 81	Upper: 87
HD	112		126	

* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID-HIII arm segment to the closest part of the vehicle side.

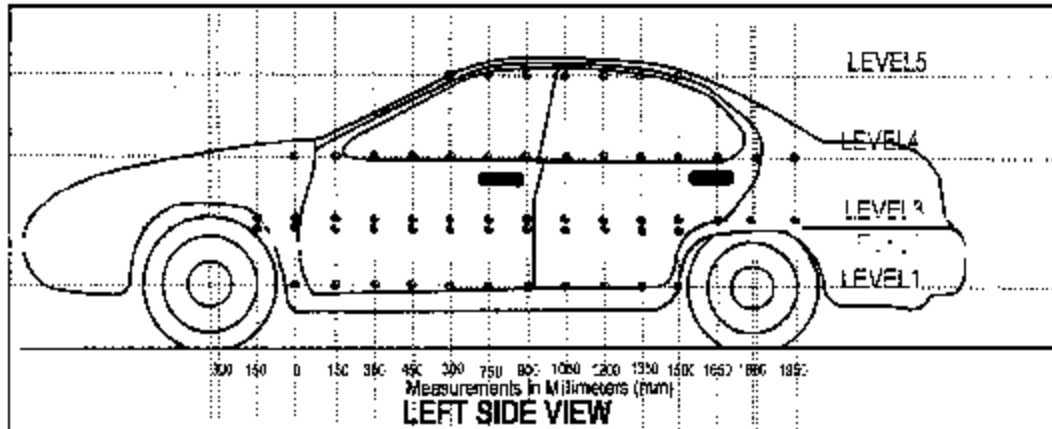
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID-HIII arm segment to the closest part of the vehicle side.

Data Sheet 9

Vehicle Side Measurements

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



Level 5 - Window Top

Level 4 - Window Sill

Level 3 - Mid-Door

Level 2 - Occupant H-Point

Level 1 - Axle Centerline Height or Sill Top Height

Measurements Are Taken When The Vehicle Is In The "As Tested" Configuration.

Measurements along the vertical 750 mm line shown above:

Level 5 @ Window Top	=	<u>1384</u>	mm
Level 4 @ Window Sill	=	<u>870</u>	mm
Level 3 @ Mid Door	=	<u>630</u>	mm
Level 2 @ Occupant H-Point	=	<u>513</u>	mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>250</u>	mm

Data Sheet 10

Vehicle Exterior Crush Profiles - All Levels

NHTSA No.: C30111

Vehicle: 2003 Saturn Ion 4-door sedan

Location	Height	(mm) From Impact Point														
		-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	
Level 1 Side Sill	Pre	---	765	718	---	---	---	---	---	---	700	700	696	700	696	
	Post	---	768	726	---	---	---	---	---	---	716	733	755	776	795	
	Crush	---	3	8	---	---	---	---	---	---	16	33	59	76	99	
Level 2 H-Point	Pre	---	734	691	662	---	---	---	---	650	656	653	650	649	645	
	Post	---	741	699	676	---	---	---	---	691	921	935	944	947	950	
	Crush	---	7	8	14	---	---	---	---	41	265	282	294	298	305	
Level 3 Mid-Door	Pre	---	745	704	768	646	---	---	---	653	656	651	646	645	642	
	Post	---	754	709	689	659	---	---	---	696	880	894	914	907	911	
	Crush	---	9	5	-79	13	---	---	---	43	224	243	268	262	269	
Level 4 Window Sill	Pre	---	---	794	756	735	721	714	702	691	689	682	681	767	675	
	Post	---	---	800	767	749	740	735	730	730	798	830	861	866	872	
	Crush	---	---	6	11	14	19	21	28	39	109	148	180	99	197	
Level 5 Window Top	Pre	---	---	---	---	---	---	---	---	---	---	---	---	---	909	
	Post	---	---	---	---	---	---	---	---	---	---	---	---	---	934	
	Crush	---	---	---	---	---	---	---	---	---	---	---	---	---	25	

Data Sheet 10 (Continued)

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2003 Saturn Ion 4-door sedan

NIITSA No.: C30111

Location	Height	(mm) From Impact Point															
		900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700			
Level 1 Side Sill	Pre	696	696	695	697	703	702	700	---	---	---	---	---	---	---	---	---
	Post	822	830	831	820	763	741	713	---	---	---	---	---	---	---	---	---
	Crush	126	134	136	123	60	39	13	---	---	---	---	---	---	---	---	---
Level 2 H-Point	Pre	647	649	649	647	649	650	650	---	---	---	---	---	---	---	---	677
	Post	979	956	942	982	871	878	---	---	---	---	---	---	---	---	---	680
	Crush	332	307	293	335	222	228	---	---	---	---	---	---	---	---	---	3
Level 3 Mid-Door	Pre	647	653	647	648	648	647	650	640	---	---	---	---	---	---	---	680
	Post	922	940	917	875	869	874	752	714	---	---	---	---	---	---	---	686
	Crush	275	287	270	227	221	227	102	74	---	---	---	---	---	---	---	6
Level 4 Window Sill	Pre	675	677	670	668	670	672	675	675	680	683	689	698	710			
	Post	879	891	902	885	894	865	857	739	667	717	713	719	727			
	Crush	204	214	232	217	224	193	182	64	-13	34	24	21	17			
Level 5 Window Top	Pre	908	906	896	895	895	899	910	923	---	---	---	---	---	---	---	---
	Post	931	937	941	935	933	935	937	953	---	---	---	---	---	---	---	---
	Crush	23	31	45	40	38	36	27	30	---	---	---	---	---	---	---	---

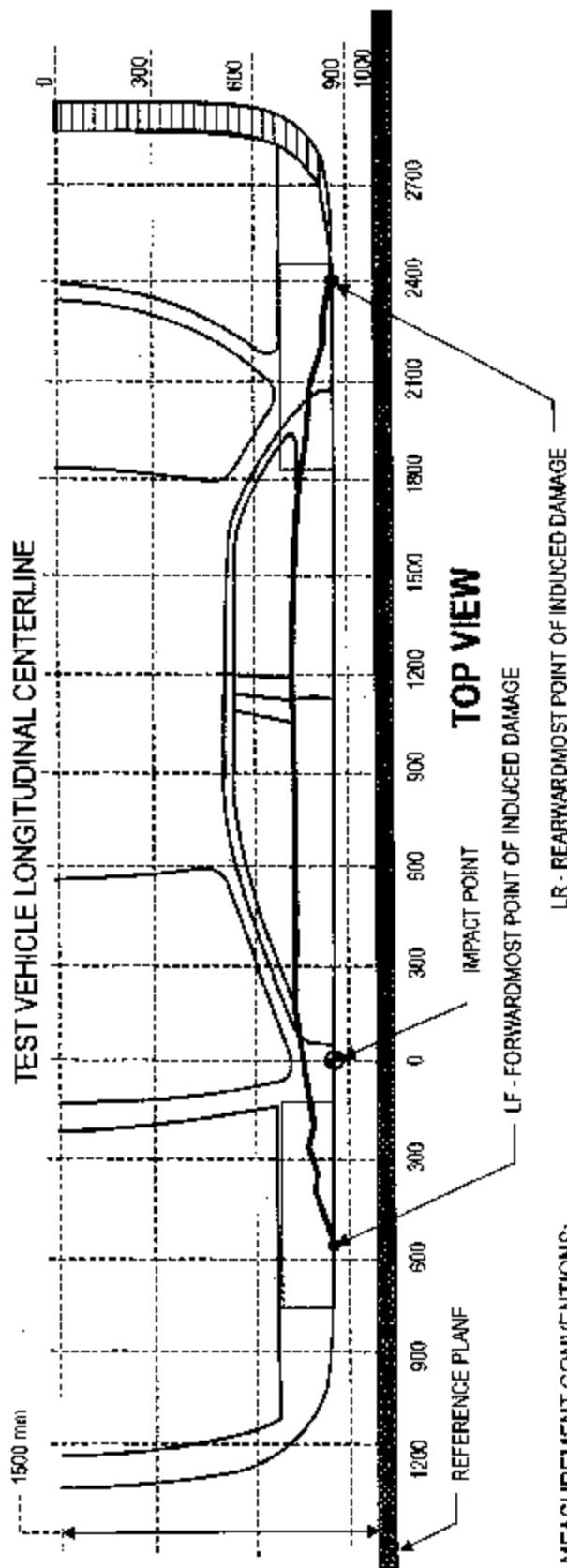
Data Sheet II

Vehicle Damage Profile Distances

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

NOTE: All measurements are in millimeters (mm) and should be accurate to plus or minus 3mm.



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-)

Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

DPD Measurements	Post-Test (mm)	Pre-Test (mm)	Static Crush (mm)
6: LF = 0 mm (Level 3)	696	653	43
5: 450 mm (Level 2)	944	650	294
4: 750 mm (Level 2)	950	645	305
3: 1050 mm (Level 2)	956	649	307
2: 1500 mm (Level 2)	871	649	222
1: LR = 1950 mm (Level 3)	714	640	74

Full length of induced damage was 0 to 1950 mm.

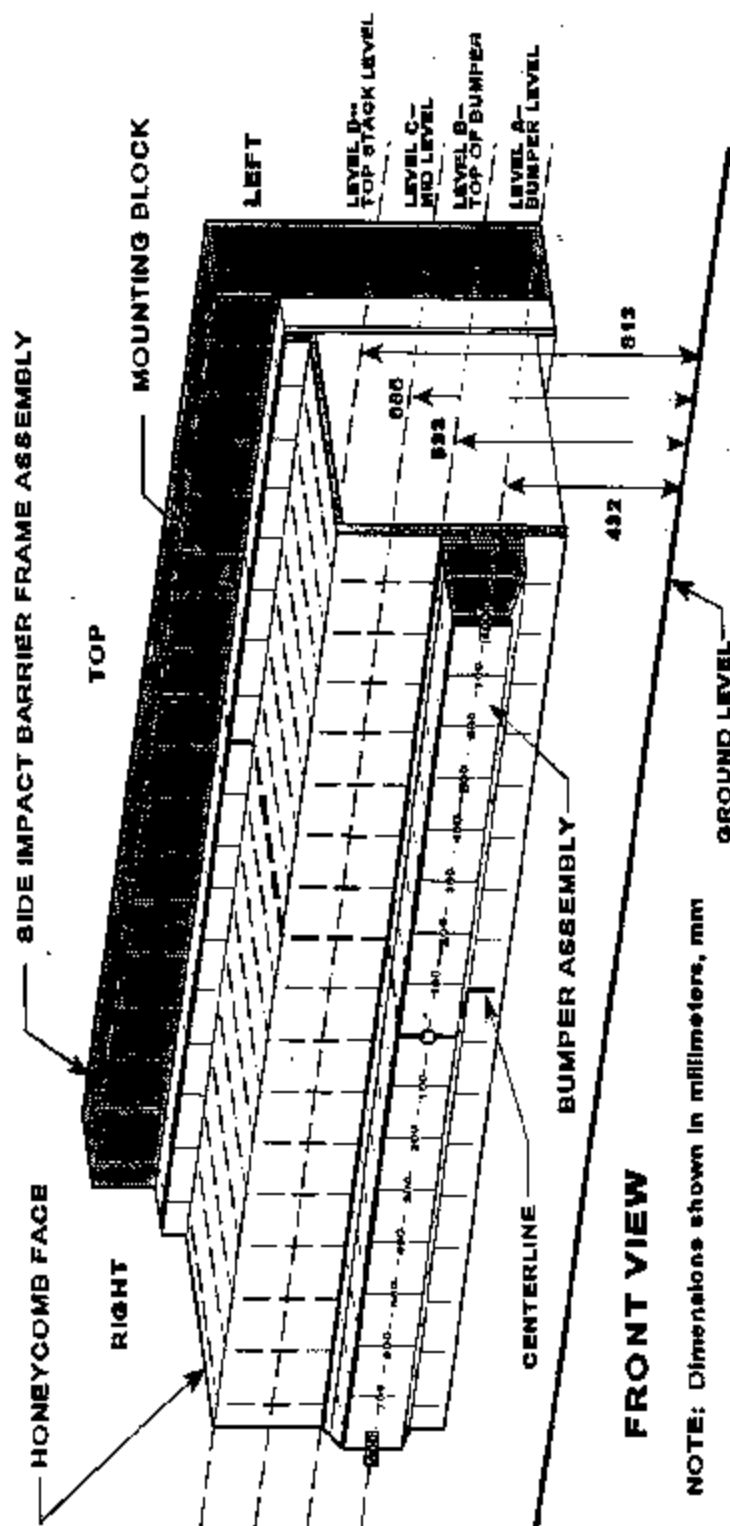
Data Sheet 12

Exterior Static Crush For Impactor Face

(Grid as looking at MDB from front)

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



FRONT VIEW

NOTE: Dimensions shown in millimeters, mm

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

		Distance Right of Center (mm)									Distance Left of Center (mm)								
		Height At Cl.	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
Location																			
Top Stack Level - Level D	814	-74	-26	-5	4	3	-1	-19	-24	-24	-19	-17	-18	-23	-37	-65	-113	-159	
Mid Level Level C	684	-26	-13	-3	-2	-4	-7	-18	-12	-10	-9	-10	-13	-16	-19	-28	-59	-126	
Top Bumper Level - Level B	559	-98	-78	-49	-29	-27	-30	-30	-22	-23	-22	-23	-28	-27	-33	-39	-48	-64	
Mid Bumper Level - Level A	432	-174	-140	-103	-83	-80	-88	-89	-84	-82	-81	-79	-83	-86	-90	-100	-118	-138	

All measurements are in millimeters and have a tolerance of ± 3 mm.

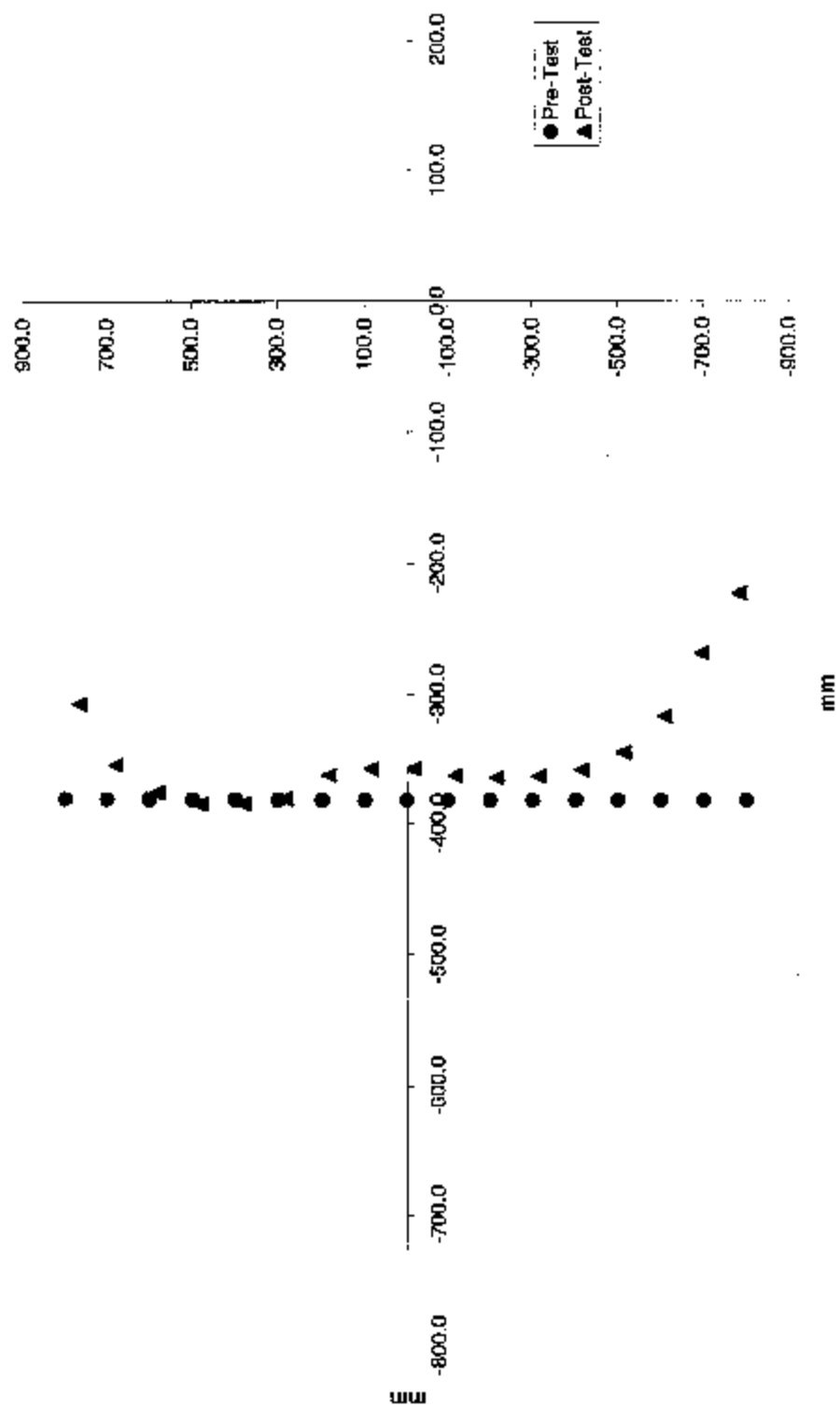
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NIITSA No.: C30111

Level D - Deformable Barrier Face Profile 1-17



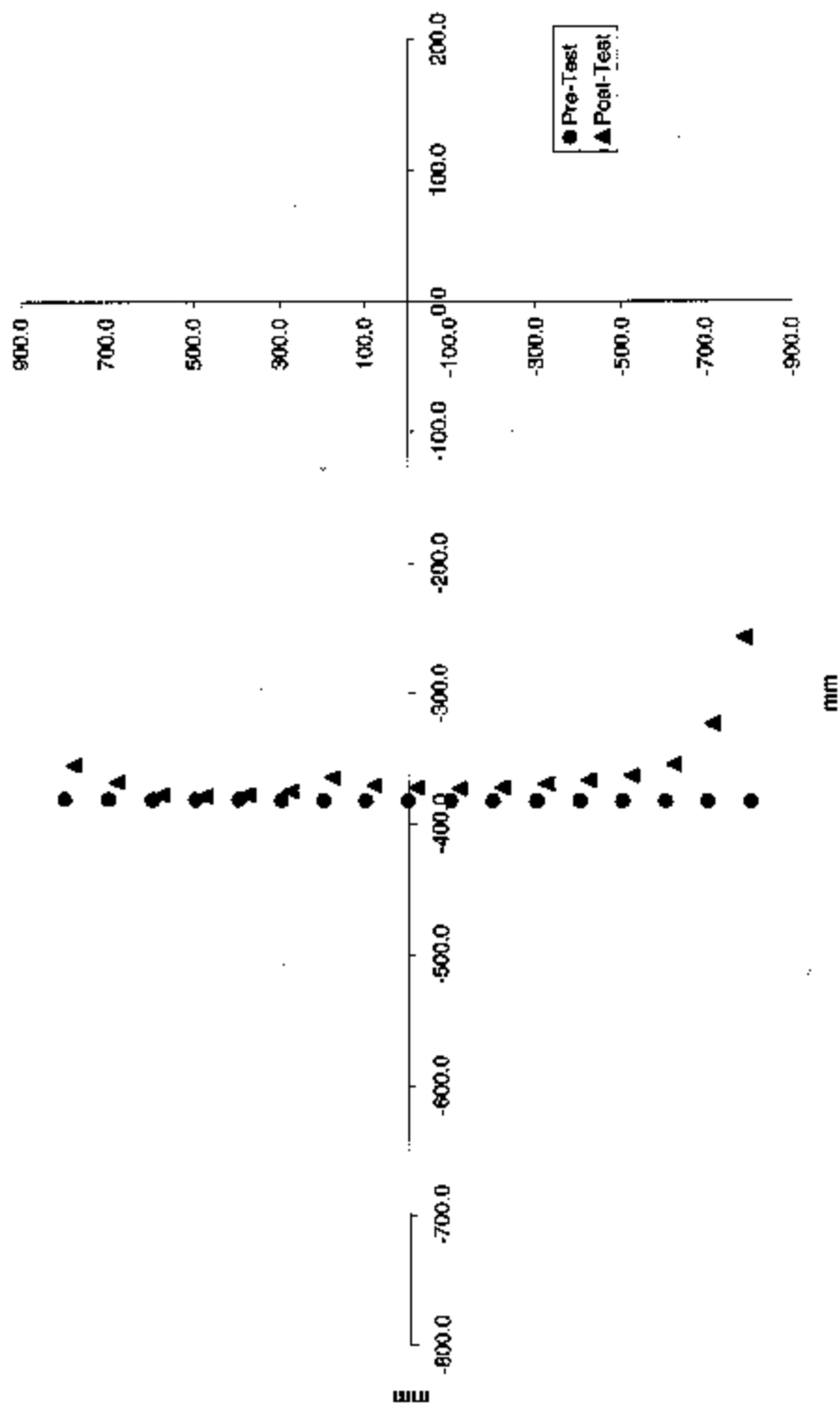
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Level C - Deformable Barrier Face Profile 18-34



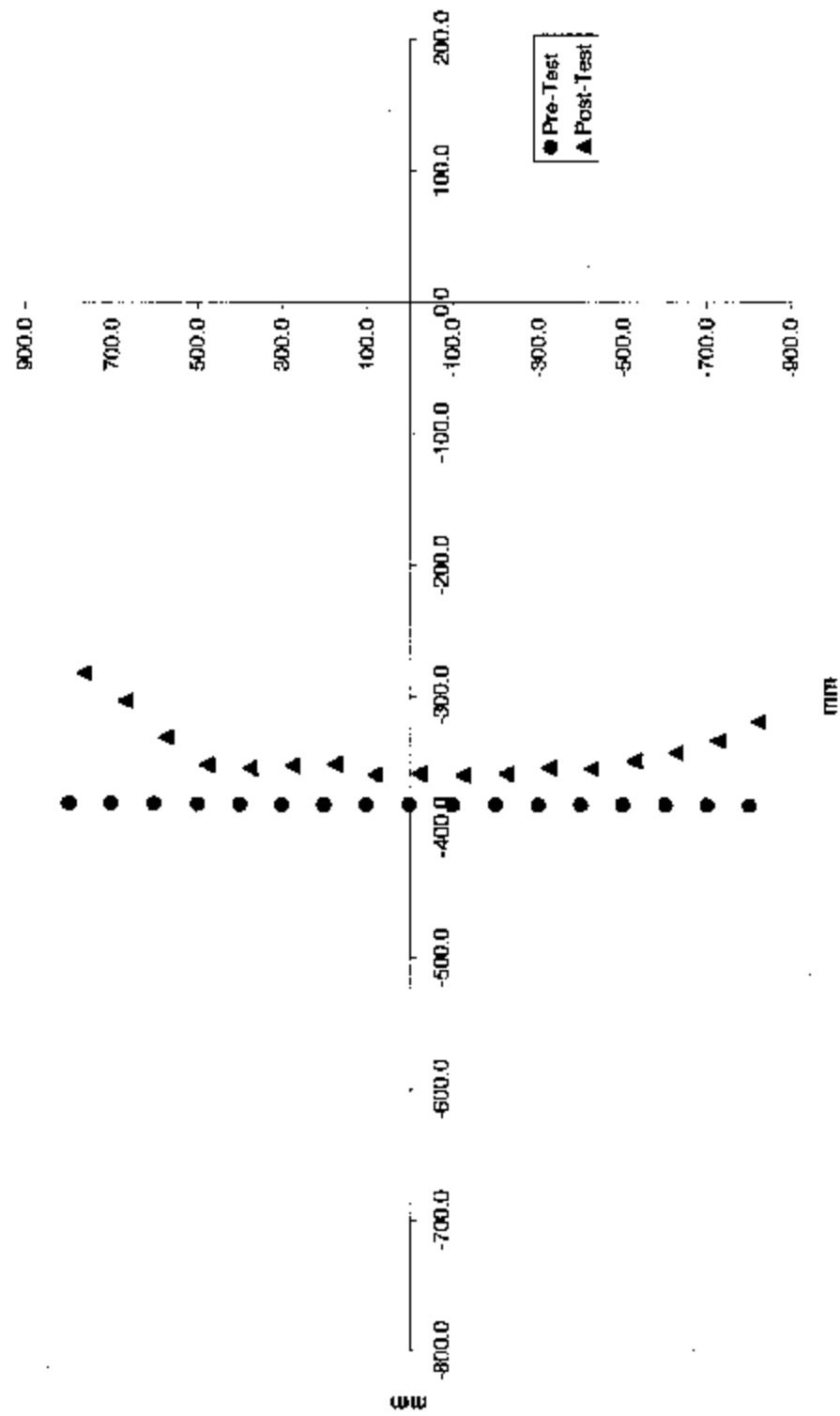
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Level B - Deformable Barrier Face Profile 35-51



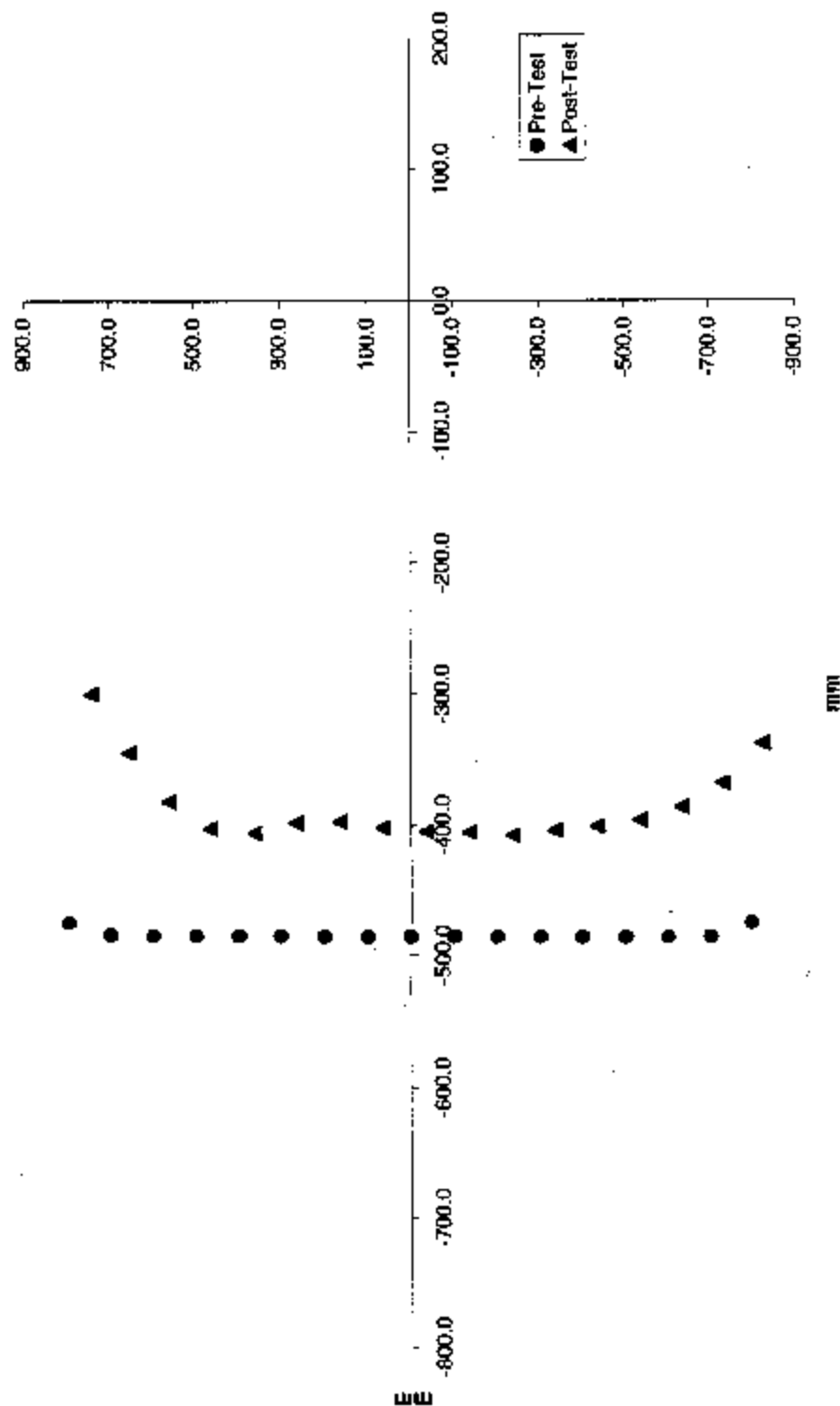
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Level A - Deformable Barrier Face Profile 52-68



Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Deformable Barrier Face Profile

Level D - Top Stack

Pre-Test

Index	Xmm	Ymm	Zmm
1	-380.1	798.7	-40.1
2	-380.2	698.5	-40.6
3	-380.6	598.8	-40.7
4	-380.8	498.1	-41.3
5	-381.1	398.6	-41.6
6	-381.2	299.3	-41.7
7	-381.5	199.3	-41.9
8	-381.6	99.5	-42.4
9	-381.7	-0.6	-42.1
10	-381.8	-101.0	-43.0
11	-382.0	-201.2	-43.9
12	-382.1	-300.7	-44.3
13	-382.1	-400.9	-44.7
14	-382.4	-500.8	-44.7
15	-382.4	-600.2	-44.7
16	-382.6	-701.1	-45.2
17	-382.8	-801.3	-45.2

Post-Test

Index	Xmm	Ymm	Zmm
1	-306.6	763.6	-99.6
2	-354.2	676.5	-87.9
3	-375.9	580.2	-83.5
4	-384.9	480.3	-81.4
5	-384.4	381.0	-79.1
6	-380.4	281.8	-75.5
7	-362.5	183.0	-72.1
8	-357.8	83.6	-69.1
9	-357.5	-16.3	-65.6
10	-363.1	-116.3	-62.0
11	-364.7	-216.3	-58.5
12	-363.7	-315.6	-54.4
13	-358.9	-415.7	-51.0
14	-345.5	-514.3	-47.8
15	-317.7	-609.5	-48.3
16	-269.7	-697.0	-57.4
17	-223.9	-785.3	-70.0

Difference

Index	Xmm	Ymm	Zmm
1	-73.5	35.1	59.5
2	-26.0	22.0	47.3
3	-4.7	18.6	42.8
4	4.0	17.8	40.1
5	3.3	17.5	37.6
6	-0.8	17.5	33.8
7	-19.0	16.3	30.2
8	-23.9	15.9	26.7
9	-24.2	15.7	23.4
10	-18.7	15.2	19.0
11	-17.3	15.1	14.6
12	-18.4	14.9	10.2
13	-23.2	14.8	6.3
14	-36.8	13.5	3.1
15	-64.8	9.3	3.6
16	-112.9	-4.1	12.1
17	-158.9	-16.0	24.8

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Deformable Barrier Face Profile Cont'd.

Level C - Mid Level

Pre-Test

Index	Xmm	Ymm	Zmm
18	-380.3	799.3	-169.4
19	-380.5	699.0	-170.1
20	-380.9	599.2	-170.6
21	-380.9	499.1	-170.8
22	-381.1	399.3	-170.8
23	-381.5	299.3	-170.5
24	-381.8	199.7	-171.6
25	-381.7	100.2	-172.1
26	-381.9	0.3	-172.1
27	-382.1	-100.1	-172.5
28	-382.1	-200.2	-172.8
29	-382.3	-300.0	-173.1
30	-382.4	-399.4	-173.8
31	-382.4	-499.5	-173.8
32	-382.7	-599.8	-174.0
33	-382.8	-700.3	-174.4
34	-382.9	-800.5	-175.0

Post-Test

Index	Xmm	Ymm	Zmm
18	-354.7	776.7	-215.9
19	-367.7	677.2	-214.5
20	-377.5	577.9	-212.7
21	-378.6	477.8	-210.0
22	-377.3	377.9	-207.1
23	-374.4	278.0	-203.6
24	-364.3	178.8	-201.9
25	-370.2	79.8	-197.9
26	-372.0	-20.3	-194.7
27	-372.7	-120.6	-190.2
28	-372.0	-220.8	-186.8
29	-369.3	-320.6	-182.8
30	-366.5	-420.3	-179.4
31	-363.0	-520.6	-175.3
32	-354.4	-620.2	-171.6
33	-323.4	-714.7	-173.8
34	-257.2	-786.2	-193.1

Difference

Index	Xmm	Ymm	Zmm
18	-25.6	22.6	46.4
19	-12.8	21.8	44.3
20	-3.4	21.3	42.1
21	-2.3	21.3	39.1
22	-3.8	21.3	36.3
23	-7.1	21.3	33.1
24	-17.5	20.9	30.3
25	-11.5	20.4	25.8
26	-9.8	20.6	22.7
27	-9.4	20.5	17.8
28	-10.2	20.6	14.1
29	-13.0	20.6	9.7
30	-15.9	20.8	5.6
31	-19.4	21.1	1.5
32	-28.3	20.4	-2.5
33	-59.4	14.4	-0.5
34	-125.6	-14.3	18.1

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Deformable Barrier Face Profile Cont'd.

Level B - Top of Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
35	-380.9	800.2	-294.3
36	-381.0	700.4	-294.8
37	-381.3	600.1	-295.6
38	-381.6	499.4	-295.8
39	-382.0	400.1	-296.0
40	-382.5	299.6	-296.5
41	-382.2	201.0	-296.8
42	-382.3	100.6	-296.9
43	-382.4	0.3	-297.1
44	-382.6	-100.0	-297.4
45	-382.6	-200.0	-297.8
46	-382.7	-300.3	-298.1
47	-382.8	-399.7	-298.5
48	-383.0	-499.7	-298.7
49	-383.2	-599.9	-298.7
50	-383.5	-700.0	-299.7
51	-383.9	-800.5	-299.3

Post-Test

Index	Xmm	Ymm	Zmm
35	-282.6	762.6	-316.1
36	-303.2	666.4	-317.3
37	-332.2	572.8	-328.3
38	-352.6	475.8	-330.8
39	-354.9	374.5	-325.9
40	-353.0	274.6	-322.1
41	-352.3	175.6	-318.6
42	-359.9	79.8	-317.6
43	-359.1	-24.7	-314.5
44	-360.3	-125.2	-311.1
45	-359.2	-225.1	-307.2
46	-354.8	-325.8	-305.2
47	-355.8	-426.2	-299.0
48	-350.3	-527.9	-295.6
49	-344.2	-626.7	-291.8
50	-335.2	-725.6	-286.0
51	-320.4	-823.0	-289.7

Difference

Index	Xmm	Ymm	Zmm
35	-98.3	37.6	21.8
36	-77.8	34.1	22.5
37	-49.0	27.3	32.8
38	-29.0	23.6	35.0
39	-27.1	25.5	29.9
40	-29.5	25.0	25.5
41	-29.9	25.3	21.7
42	-22.4	20.9	20.6
43	-23.4	25.0	17.4
44	-22.3	25.2	13.7
45	-23.4	25.1	9.3
46	-27.9	25.5	7.1
47	-27.0	26.5	0.4
48	-32.7	28.3	-3.1
49	-38.9	26.9	-7.0
50	-48.3	25.6	-13.7
51	-63.5	22.6	-9.6

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

Deformable Barrier Face Profile Cont'd.

Level A - Mid Bumper

Pre-Test

Index	Xmm	Ymm	Zmm
52	-474.1	796.6	-421.3
53	-484.4	697.4	-421.5
54	-484.7	597.6	-421.9
55	-484.9	497.7	-422.2
56	-485.1	397.6	-422.7
57	-485.4	298.4	-423.3
58	-485.6	198.7	-423.5
59	-485.8	99.1	-423.9
60	-486.0	-0.7	-424.3
61	-486.1	-101.4	-424.7
62	-486.2	-201.3	-424.9
63	-486.4	-301.7	-425.5
64	-486.5	-401.7	-426.0
65	-486.5	-501.3	-426.2
66	-486.5	-601.4	-426.1
67	-486.6	-701.6	-426.1
68	-475.1	-798.9	-426.8

Post-Test

Index	Xmm	Ymm	Zmm
52	-300.2	742.9	-451.0
53	-344.2	654.0	-462.5
54	-382.1	560.8	-469.2
55	-402.0	463.4	-472.2
56	-405.5	362.4	-469.4
57	-397.5	263.7	-464.4
58	-396.7	164.4	-460.8
59	-401.4	64.8	-458.0
60	-404.4	-36.1	-455.1
61	-405.2	-135.6	-453.7
62	-407.5	-236.4	-450.3
63	-403.8	-335.8	-446.9
64	-400.8	-435.7	-442.7
65	-396.2	-535.1	-437.9
66	-386.4	-634.7	-431.4
67	-368.5	-731.6	-422.2
68	-337.6	-824.8	-409.6

Difference

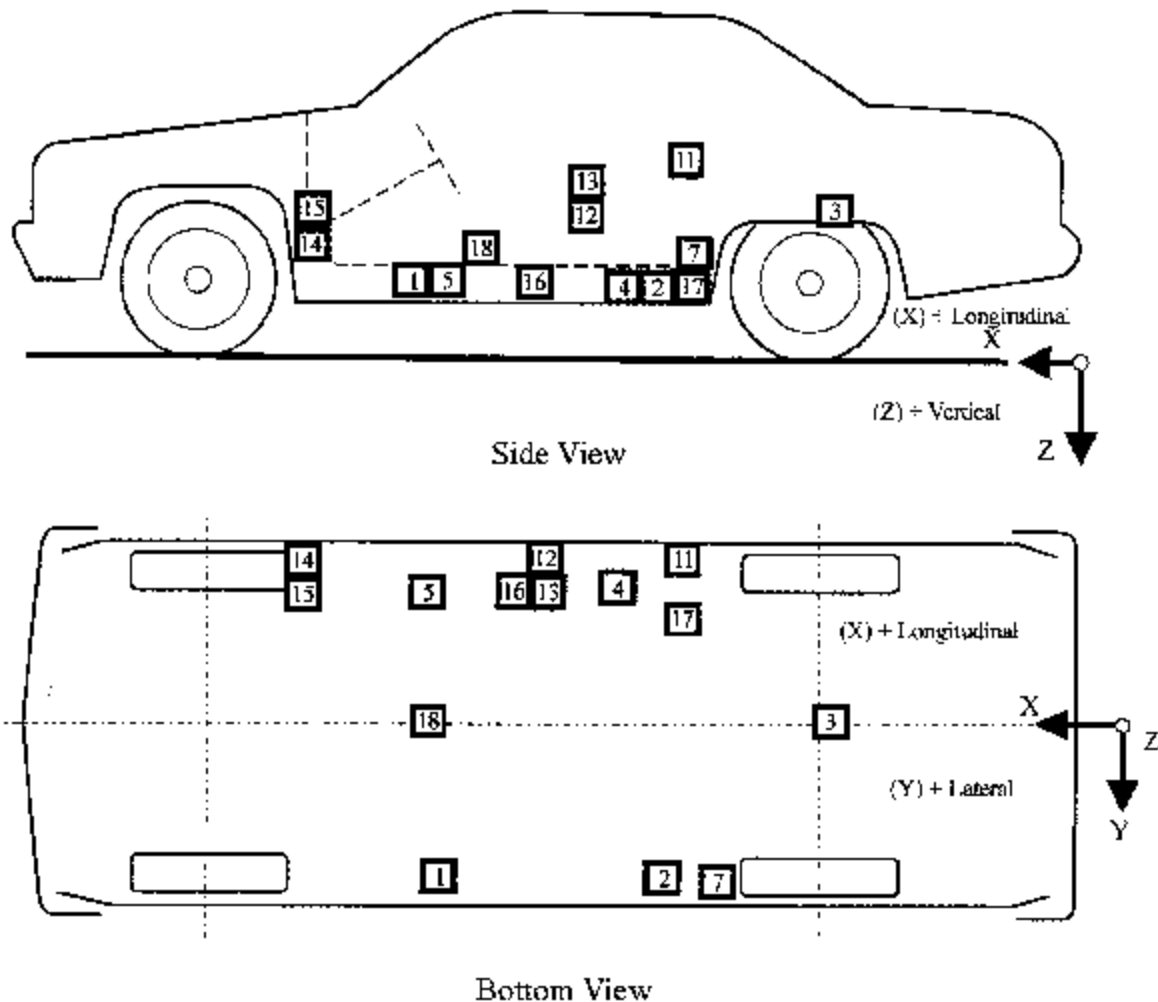
Index	Xmm	Ymm	Zmm
52	-173.9	53.7	29.7
53	-140.2	43.4	41.0
54	-102.6	36.8	47.3
55	-83.0	34.3	50.0
56	-79.7	35.3	46.8
57	-87.9	34.7	41.1
58	-88.9	34.3	37.3
59	-84.4	34.3	34.1
60	-81.5	35.4	30.8
61	-80.9	34.2	29.0
62	-78.7	35.1	25.4
63	-82.5	34.1	21.4
64	-85.7	33.9	16.8
65	-90.3	33.8	11.8
66	-100.1	33.2	5.3
67	-118.1	30.0	-3.9
68	-137.6	25.9	-17.2

Data Sheet 13

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



1-Right Front Side Sill	10-Left Rear Door Mid Rear (Omitted)
2-Right Side Sill at Rear Seat	11-Left Rear Door Upper Centerline
3-Rear Floorpan above Axle	12-Left Side Lower B-pillar
4-Left Side Sill at Rear Seat	13-Left Side Middle B-pillar
5-Left Front Side Sill	14-Left Side Lower A-pillar
6-Left Front Door on Centerline (Omitted)	15-Left Side Middle A-pillar
7-Right Rear Occupant Compartment	16-Left Side Front Seat Track at H-point
8-Left Front Door Mid Rear (Omitted)	17-Left Rear Seat Track at H-point
9-Left Front Door Upper Centerline (Omitted)	18-Vehicle Center of Gravity

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

TEST NUMBER: 030408-1
No. LOCATION

POSITIVE
DIRECTION

NEGATIVE
DIRECTION

X	Y	Z	
2977 mm	653 mm	-269 mm	
1 RIGHT SIDE SILL AT FRONT SEAT			
LONGITUDINAL	3.1 g	@ 66.0 ms	6.3 g @ 13.3 ms
LATERAL	32.8 g	@ 6.9 ms	2.9 g @ 142.2 ms
VERTICAL	4.9 g	@ 15.9 ms	5.8 g @ 7.6 ms
RESULTANT	33.2 g	@ 6.9 ms	
2 RIGHT SIDE SILL AT REAR SEAT			
1987 mm	657 mm	-232 mm	
LONGITUDINAL	3.6 g	@ 33.0 ms	5.8 g @ 13.3 ms
LATERAL	34.4 g	@ 31.4 ms	2.6 g @ 138.1 ms
VERTICAL	10.4 g	@ 31.8 ms	6.6 g @ 10.3 ms
RESULTANT	36.0 g	@ 31.4 ms	
3 REAR FLOORPAN ABOVE AXLE			
1174 mm	0 mm	-459 mm	
LONGITUDINAL	5.7 g	@ 61.7 ms	11.4 g @ 12.5 ms
LATERAL	28.8 g	@ 7.8 ms	2.2 g @ 2.2 ms
VERTICAL	15.5 g	@ 27.8 ms	11.2 g @ 7.0 ms
RESULTANT	31.6 g	@ 7.6 ms	
4 LEFT SIDE SILL AT REAR SEAT			
2007 mm	-657 mm	-197 mm	
LATERAL	80.4 g	@ 5.3 ms	18.3 g @ 27.7 ms

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

TEST NUMBER: 030408-1

No. LOCATION

X

Y

Z

POSTTIVE
DIRECTION

NEGATIVE
DIRECTION

5 LEFT SIDE SILL AT FRONT SEAT LATERAL	2972 mm	-653 mm	-270 mm	87.1 g	@ 3.4 ms	21.2 g	@ 18.9 ms
7 RIGHT REAR OCCUPANT COMPARTMENT LATERAL	1747 mm	673 mm	-340 mm	26.7 g	@ 8.1 ms	2.5 g	@ 137.8 ms
11 LEFT REAR DOOR UPPER CENTERLINE LATERAL	1719 mm	-704 mm	-928 mm	128.3 g	@ 21.0 ms	142.0 g	@ 29.6 ms
12 LEFT LOWER B-POST LATERAL	2157 mm	-665 mm	-540 mm	297.5 g	@ 4.7 ms	80.0 g	@ 11.6 ms
13 LEFT MIDDLE B-POST LATERAL	2127 mm	-677 mm	-831 mm	----- g	@ ----- ms	----- g	@ ----- ms
14 LEFT LOWER A-POST LATERAL	3162 mm	-738 mm	-482 mm	----- g	@ ----- ms	----- g	@ ----- ms
15 LEFT MIDDLE A-POST LATERAL	3152 mm	-715 mm	-821 mm	56.3 g	@ 12.3 ms	15.9 g	@ 27.8 ms
16 LEFT FRONT SEAT TRACK LATERAL	2372 mm	588 mm	-290 mm	84.7 g	@ 13.1 ms	18.3 g	@ 19.4 ms

Data Sheet 13 (Continued)
Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

TEST NUMBER: 030408-1				POSITIVE		NEGATIVE	
No. LOCATION	X	Y	Z	DIRECTION		DIRECTION	
17 LEFT REAR SEAT TRACK LATERAL ¹	1482 mm	-635 mm	-320 mm	----- g	@	----- ms	@
18 VEHICLE CENTER OF GRAVITY	2617 mm	0 mm	-367 mm				
LONGITUDINAL				5.6 g	@	5.1 ms	@
LATERAL				26.4 g	@	17.4 ms	@
VERTICAL				9.3 g	@	8.4 ms	@
RESULTANT				27.8 g	@	17.5 ms	@

REFERENCE: X: + FORWARD FROM REAR BUMPER
Y: + RIGHTWARD FROM VEHICLE CENTERLINE
Z: + DOWNWARD FROM GROUND LEVEL

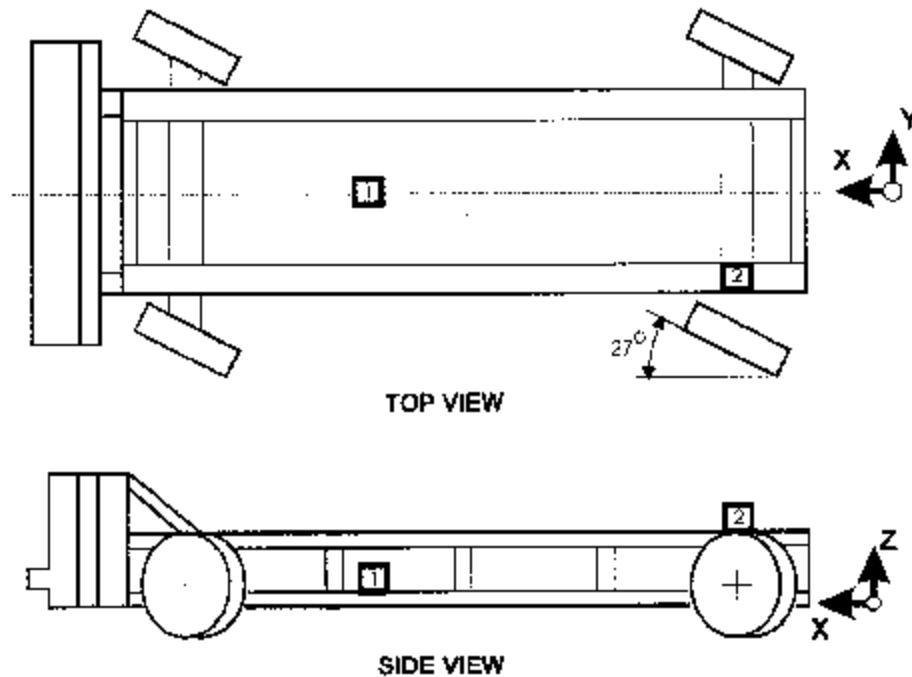
For acceleration data sign convention see Report Sign Convention in Appendix D.
¹ See DATA ACQUISITION EXPLANATIONS

Data Sheet 14

MDB Accelerometer Locations and Data Summary

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



Accel. No.	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X*	Y*	Z*	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1	MDB Center of Gravity	1855	0	-520				
	Longitudinal X				2.7	125.3	25.6	36.9
	Lateral Y				6.3	60.9	10.6	29.8
	Vertical Z				6.5	12.2	5.9	21.3
	Resultant R				26.1	36.7		
2	Rear Frame Member	412	-677	-625				
	Longitudinal X				2.5	100.3	22.8	30.3
	Lateral Y				3.0	28.7	2.4	58.3

*Reference: X = Rear Bumper (- Forward)

Y = Vehicle Centerline (+ To Right)

Z = Ground Level (+ Down)

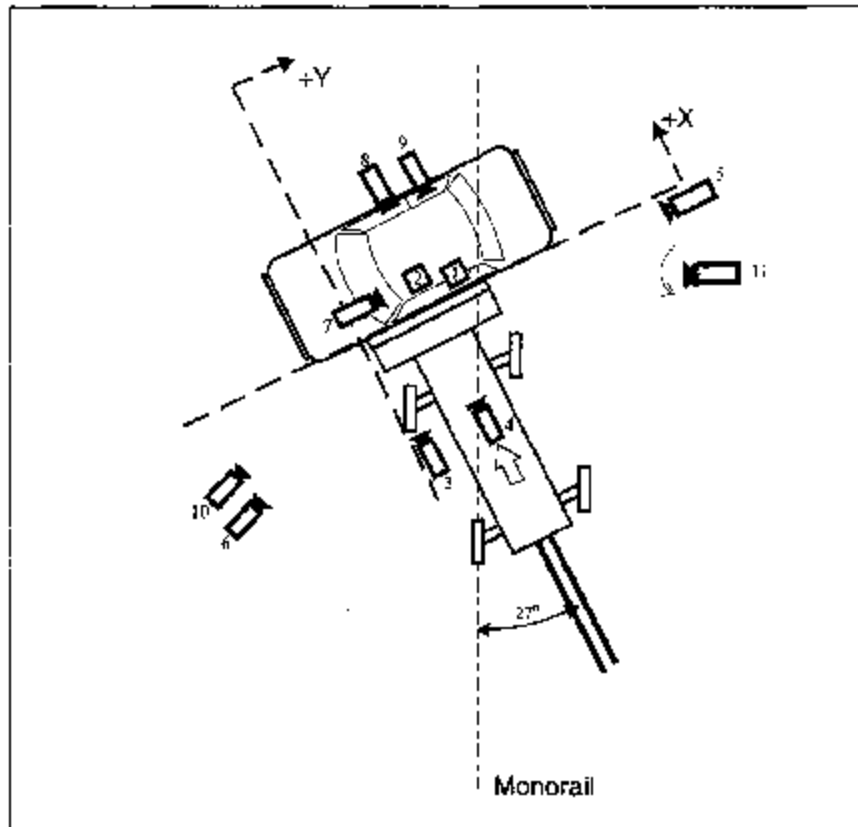
All measurements accurate to within ± 3 mm.

Data Sheet 15

High-Speed Camera Locations and Data Summary

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111



Impact
Area

Camera Number	Location	Location, mm			Angle (deg)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Overhead wide	250	2150	-5750	74.0	8.5	300
2	Overhead tight	370	1800	-5750	86.6	17	N/A ¹
3	Onboard MDB left side	-1750	-40	-720	-6.8	13	1020
4	Onboard MDB center	-2480	830	-1353	-0.3	25	N/A ¹
5	Right side of MDB	70	11,632	-1185	-1.1	13	1020
6	Left side of MDB	-2116	-5,119	-1096	-2.0	13	1000
7	Onboard vehicle front	555	-557	-1209	-1.9	8	1000
8	Onboard side front door	1578	670	1015	-7.5	8	1000
9	Onboard side rear door	1590	1615	1052	-2.4	8	405
10	Digital overall event	-1759	-5405	-990	-0.3	13	1000
11	Real-time Panning-Video	N/A	N/A	N/A	N/A	Zoom	30

+X: Forward (referenced to MDB) from impact point

+Y: Rightward (referenced to MDB) from impact point

+Z: Downward from ground level

¹ Unable to determine actual speed, no LEDs in view.

Section 5

Vehicle Fuel System Integrity

Data Sheet 16

FMVSS 301 Fuel System Integrity Data

NHTSA No.: C30111

Test Date: 04/08/03

Vehicle Year/Make/Model/Body Style: 2003 Saturn Ion 4-door sedan

Test Vehicle Impact Type :

- ☐ Frontal (48.28 km/h)
☐ Oblique (48.28 km/h) with ____° barrier
face first contacting the (driver/passenger) side
☐ Rear Moving Barrier (48.28 km/h)
☐ Lateral Moving Barrier (32.19 km/h)
☒ Side Impact Moving Deformable Barrier
(38.5 mph) contacting the driver's side

Fuel Spillage Measurement:

1. From impact until vehicle motion ceases
2. For five-minute period after vehicle motion ceases
3. For next 25 minutes.

Actual	Maximum Allowed
0 g	28 g
0 g	142 g
0 g	28 g/1 minute

Solvent Spillage Details :

N/A

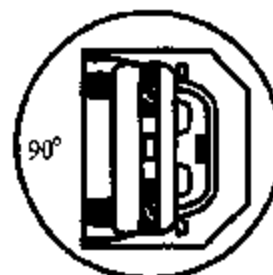
Data Sheet 17

FMVSS 301 Rollover Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

0 - 90 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>30</u>	seconds
(Spec. Range = 1 to 3 minutes)				
FMVSS 301 Position Hold Time +	<u>5</u>	minutes	<u>0</u>	seconds
Total	<u>6</u>	minutes	<u>30</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

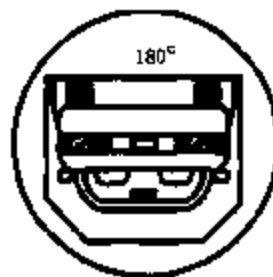
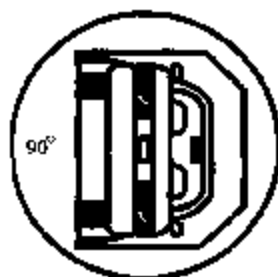
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

90 - 180 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>30</u> seconds
(Spec. Range = 1 to 3 minutes)		
FMVSS 301 Position Hold Time +	<u>5</u> minutes	<u>0</u> seconds
Total	<u>6</u> minutes	<u>30</u> seconds
Next whole minute interval	<u>7</u> minutes	

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

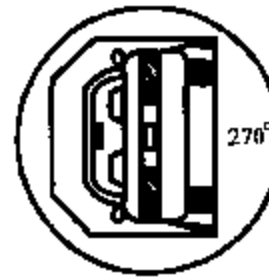
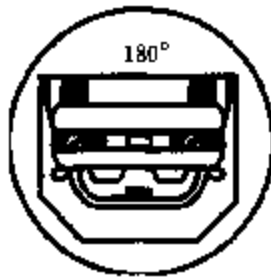
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

180 - 270 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

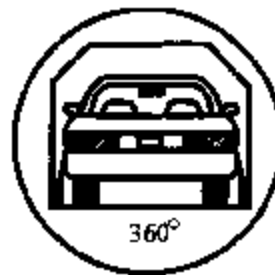
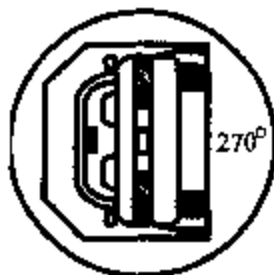
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2003 Saturn Ion 4-door sedan

NHTSA No.: C30111

270 - 360 Degrees



1. Determination Of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time 1 minutes 30 seconds
(Spec. Range = 1 to 3 minutes)
FMVSS 301 Position Hold Time + 5 minutes 0 seconds
Total 6 minutes 30 seconds
Next whole minute interval 7 minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

Appendix A

Photographs

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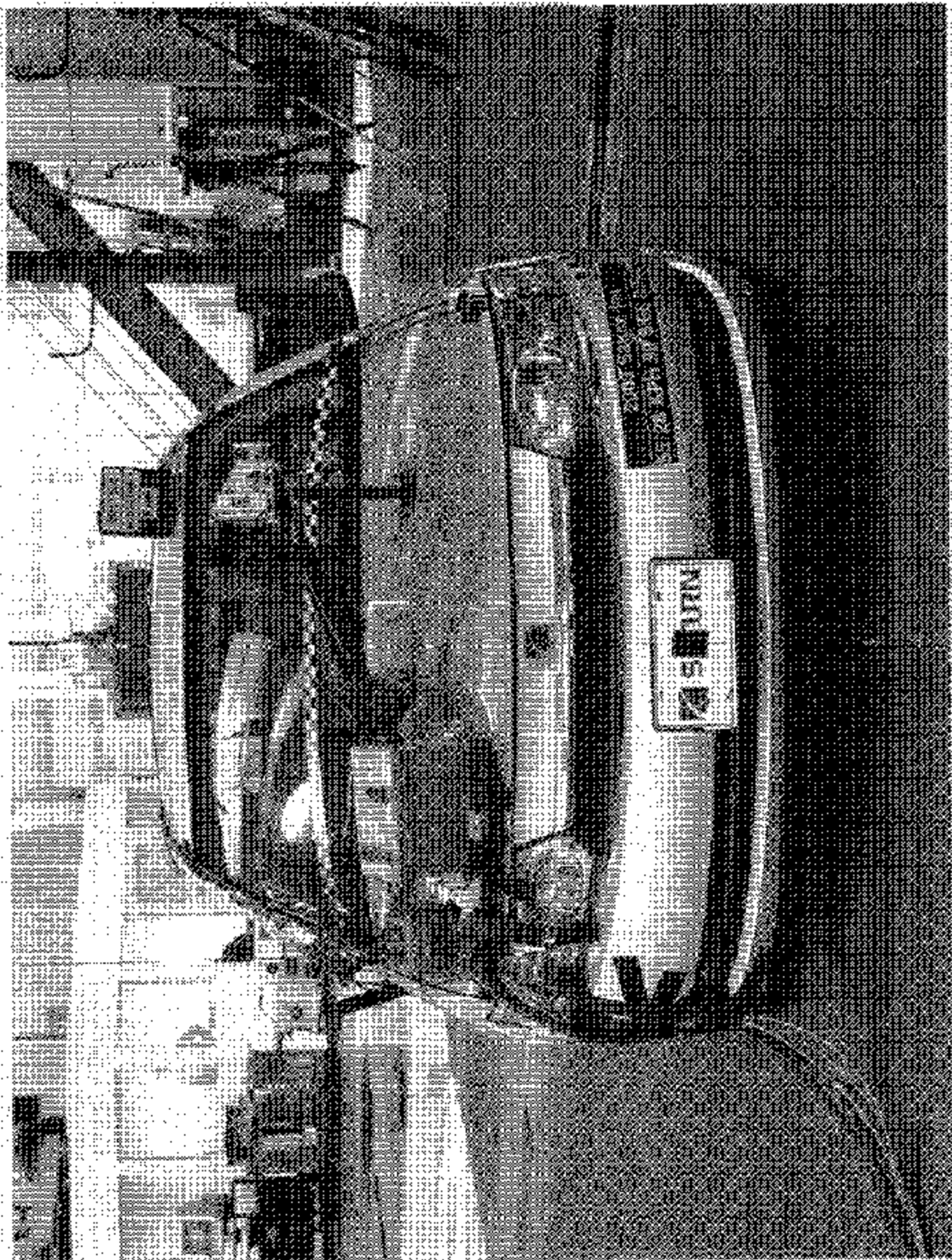


Figure A-1 Pre-Test Front View of Test Vehicle

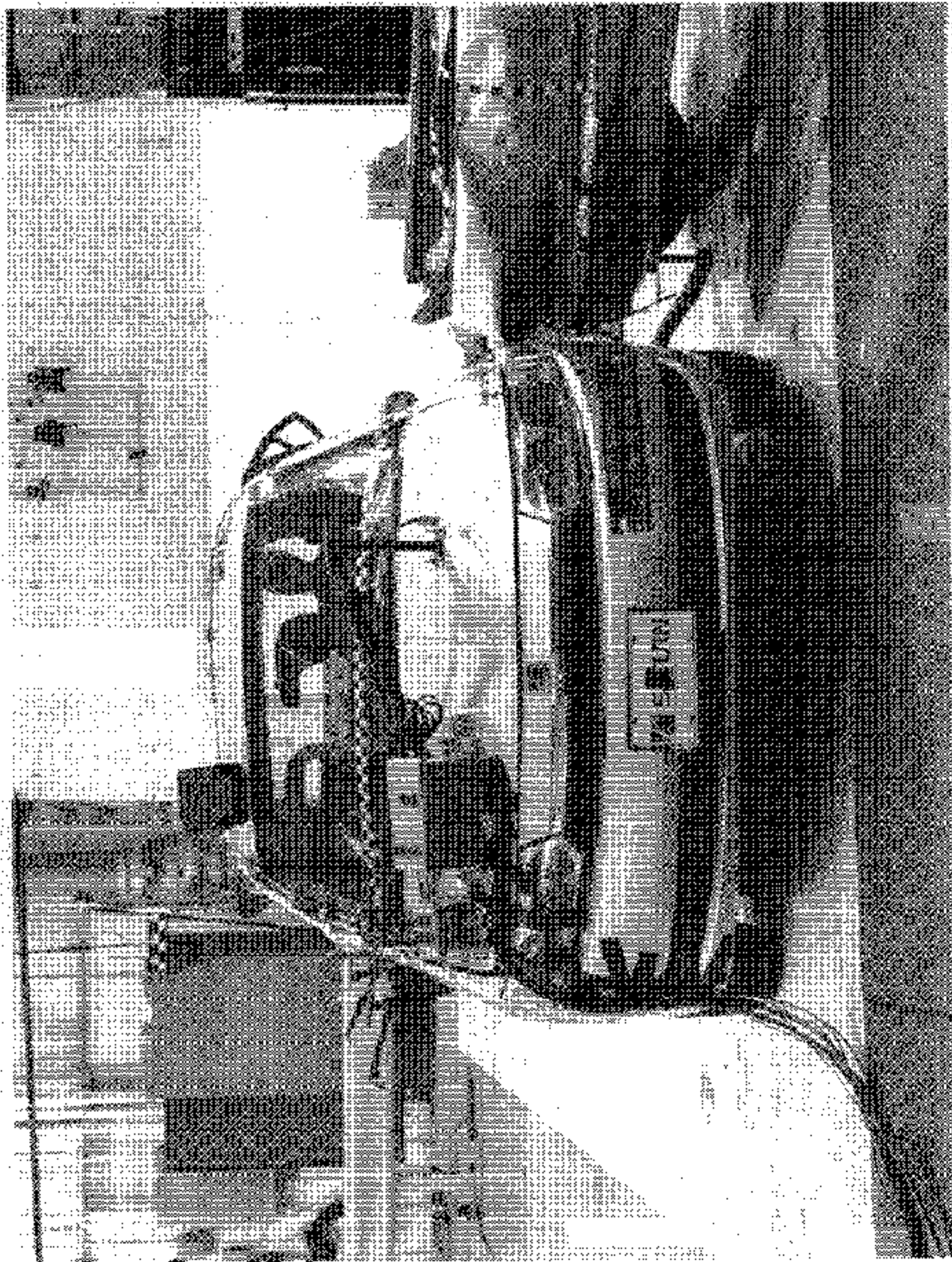


Figure A-2 Post-Test Front View of Test Vehicle

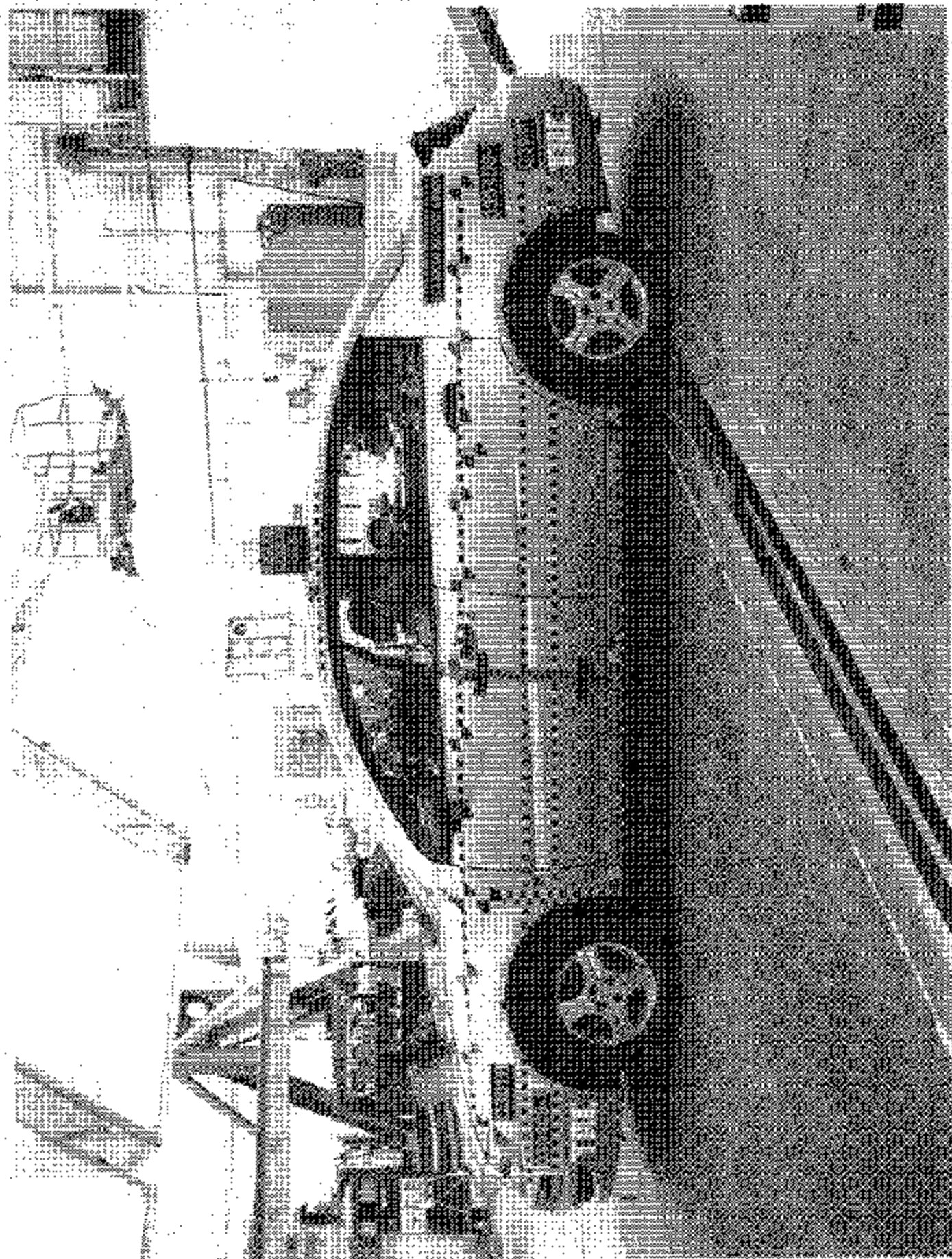


Figure A-3. Pre-Test Impacted Side View of Test Vehicle

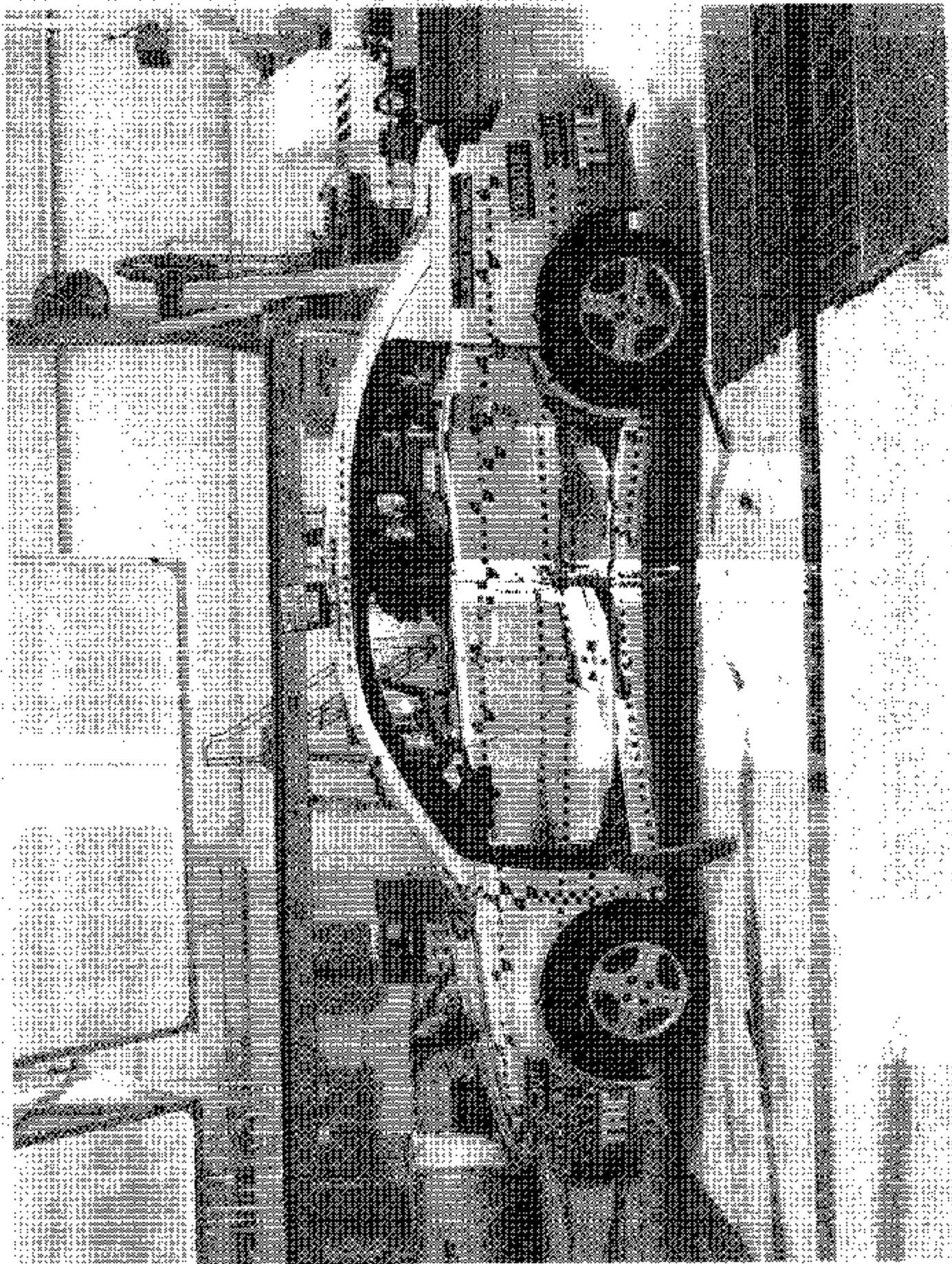


Figure A-4 Post-Test Impacted Side View of Test Vehicle

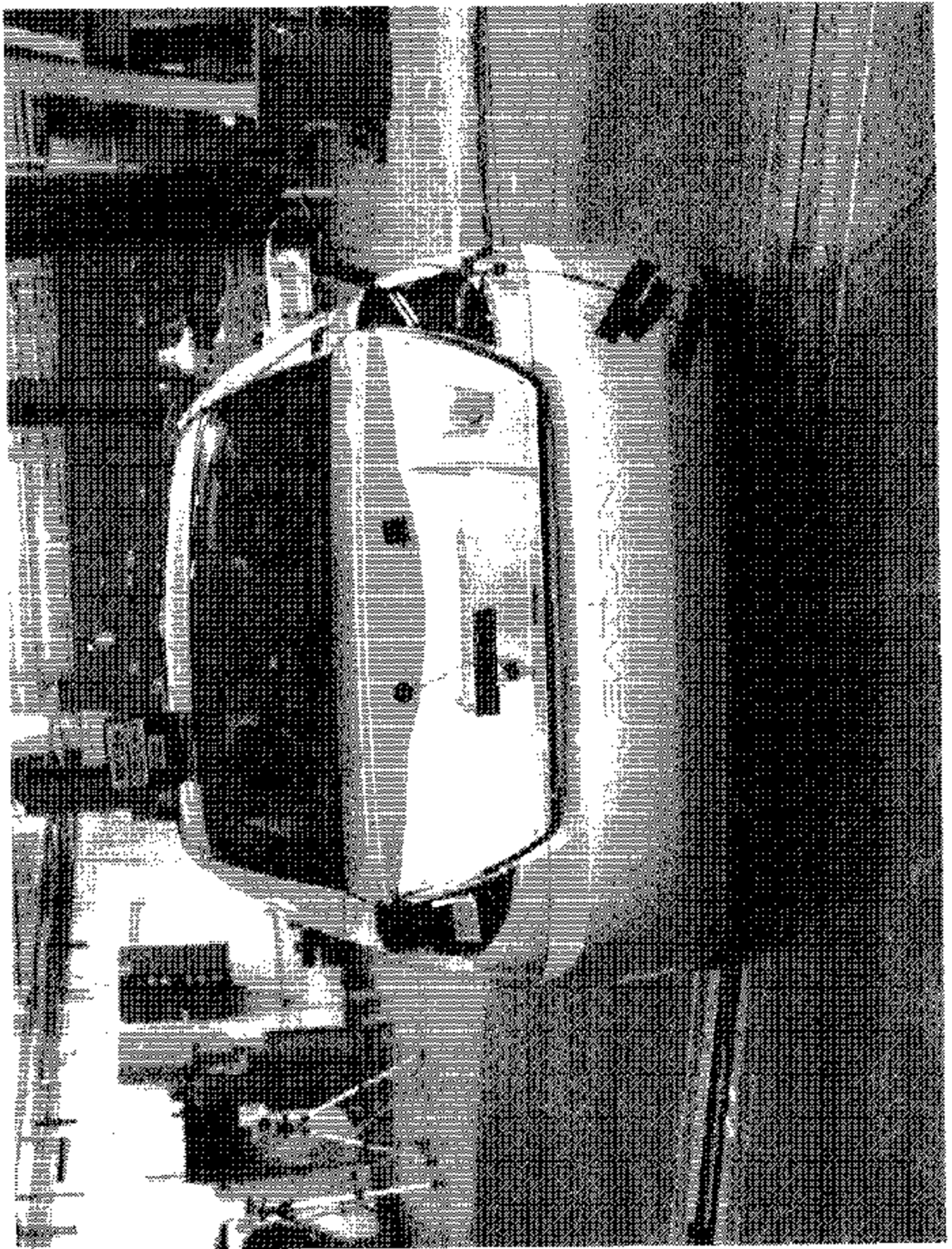


Figure A-5 Pre-Test Rear View of Test Vehicle

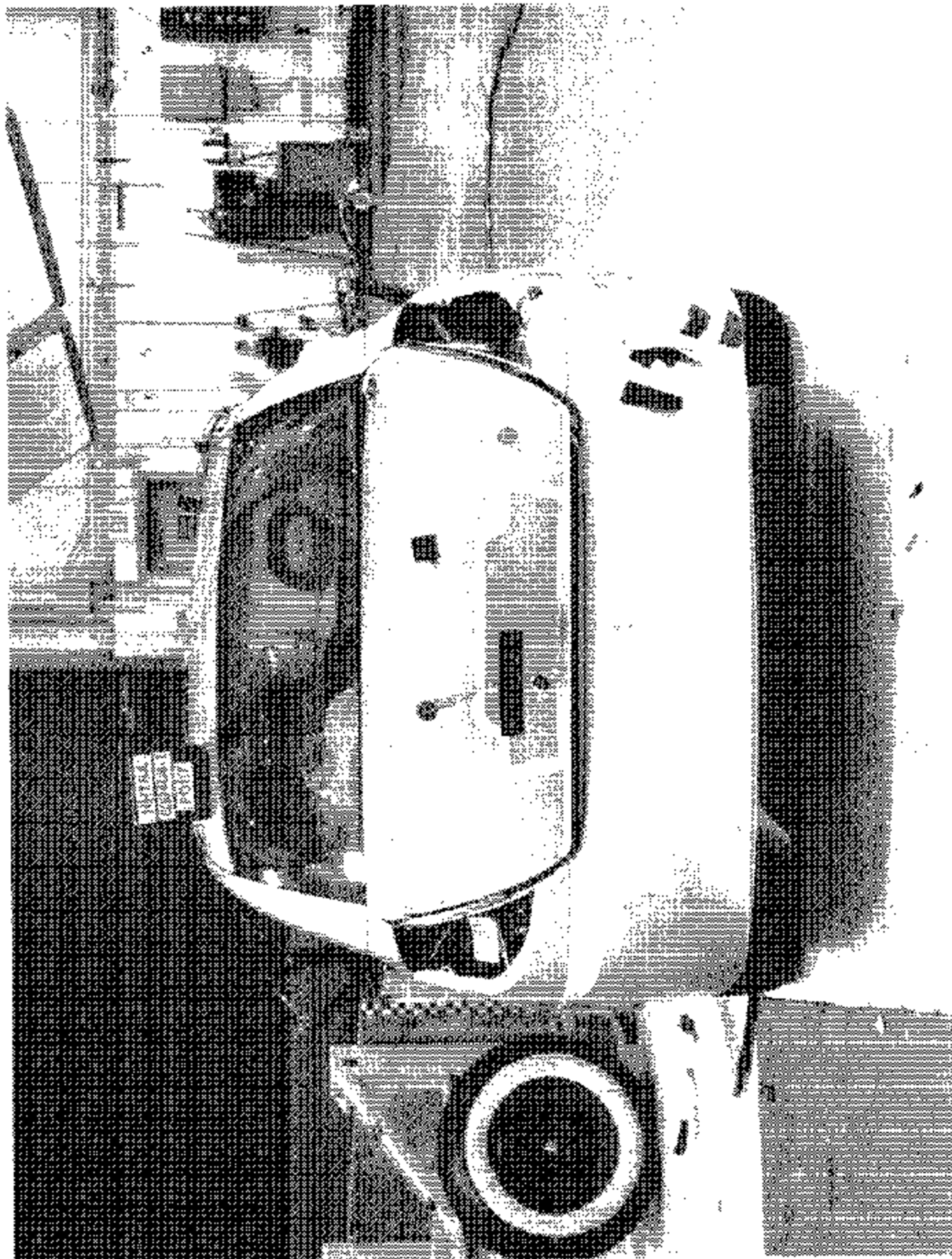


Figure A-6 Post-Test Rear View of Test Vehicle

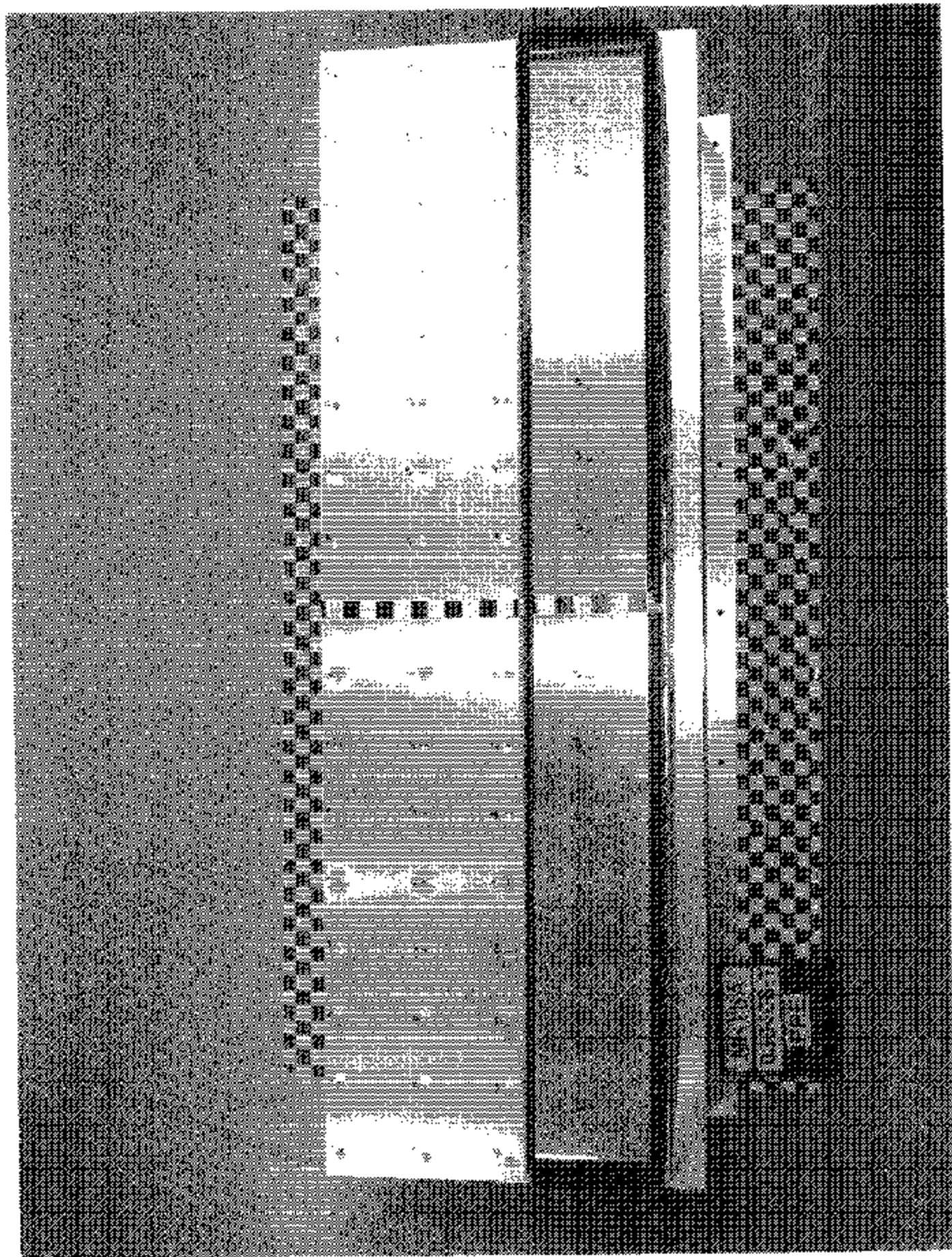


Figure A-7 Pre-Test Frontal View of Impactor Face

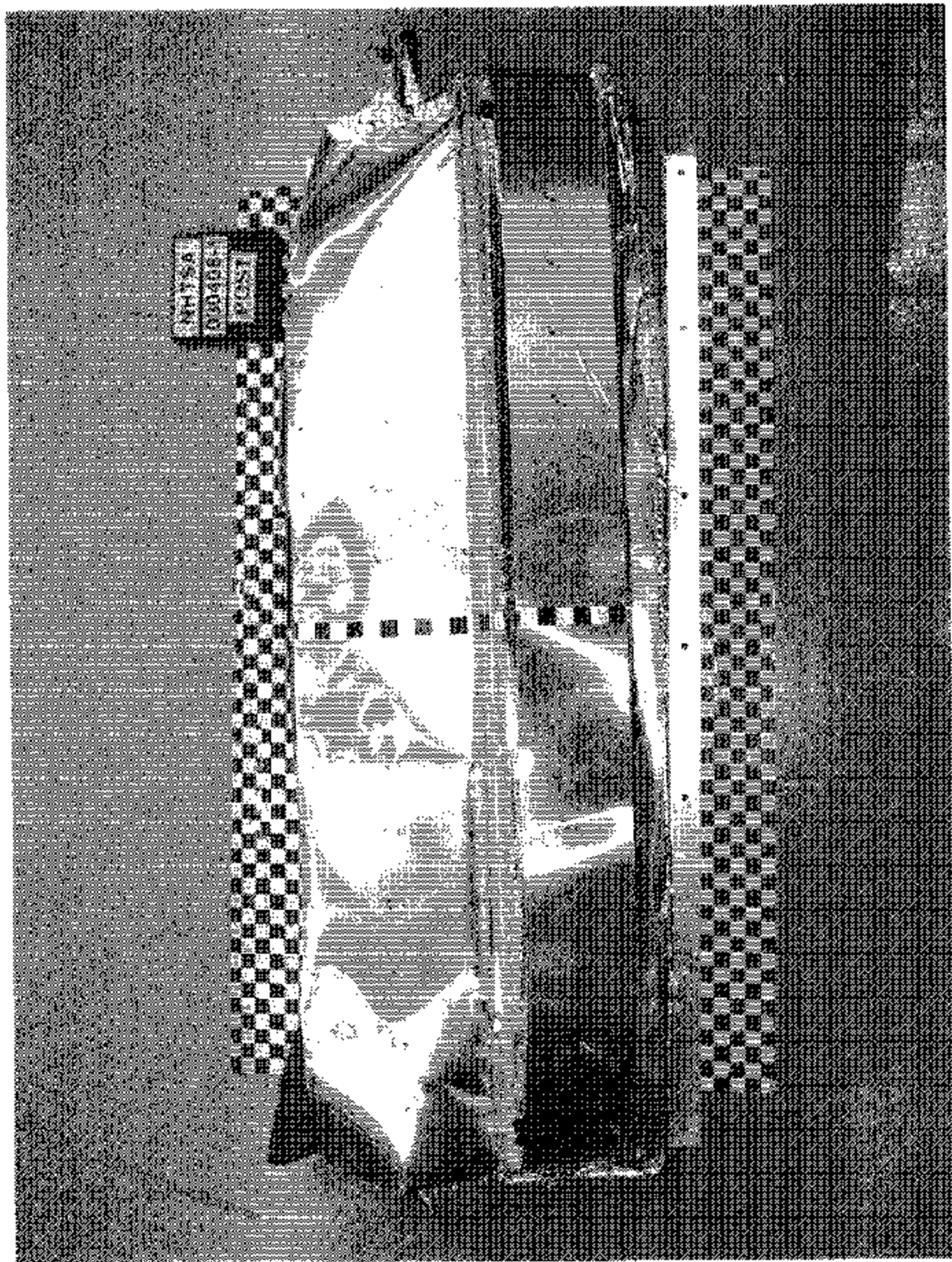


Figure A-8 Post-Test Frontal View of Impactor Face

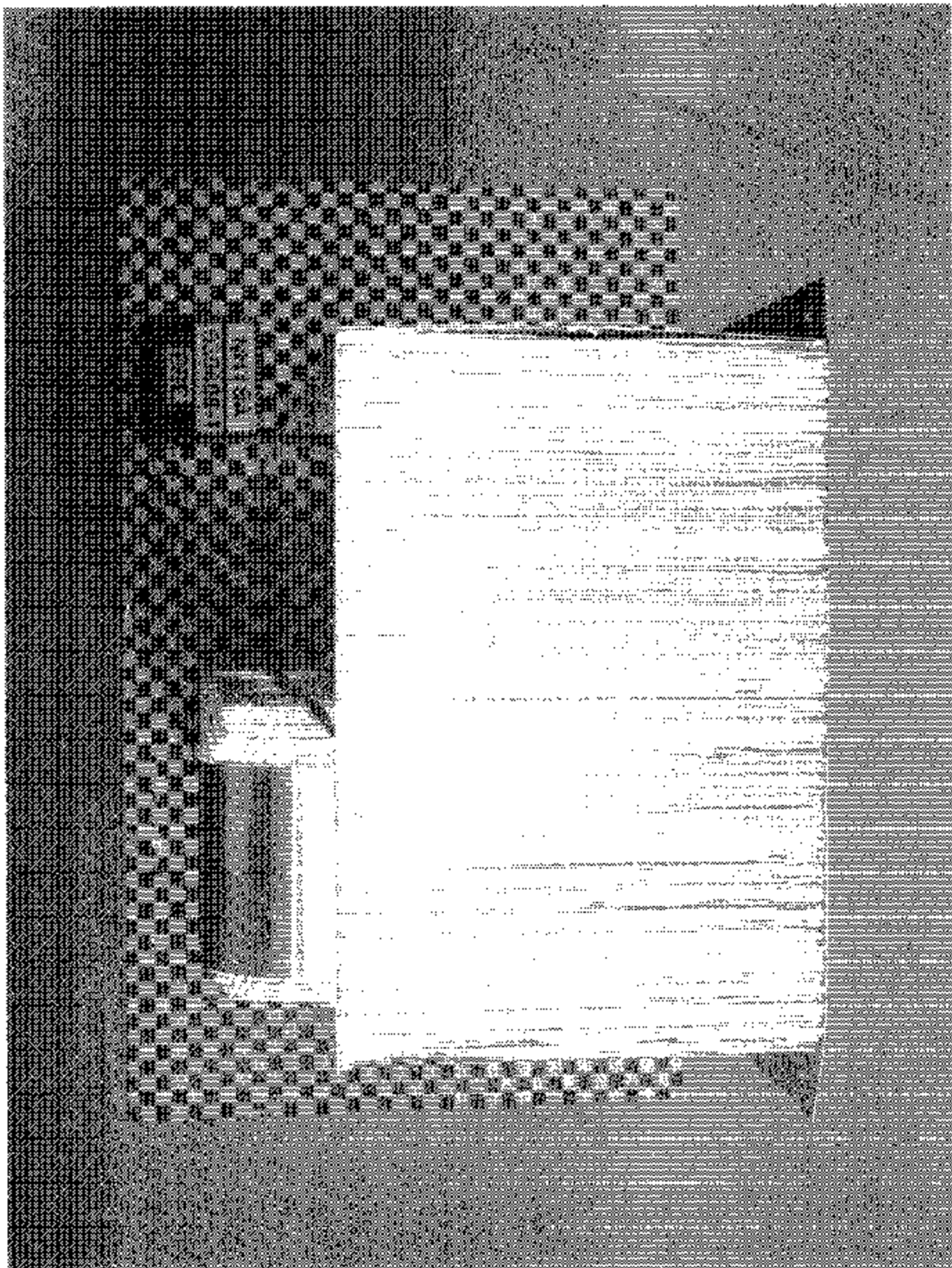


Figure A-9 Pre-Test Left Side View of Impactor Face

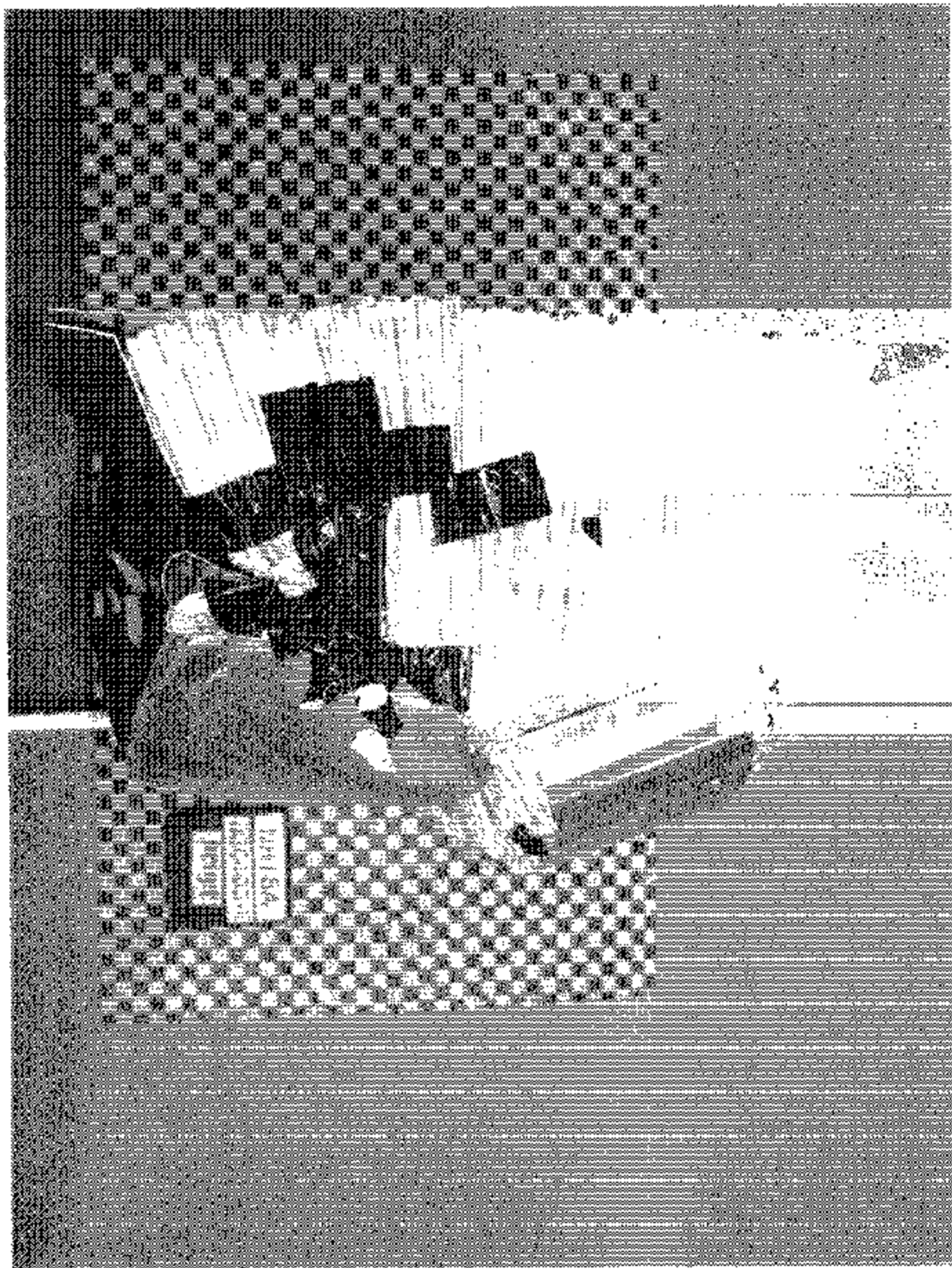


Figure A-10 Post-Test Left Side View of Impactor Face

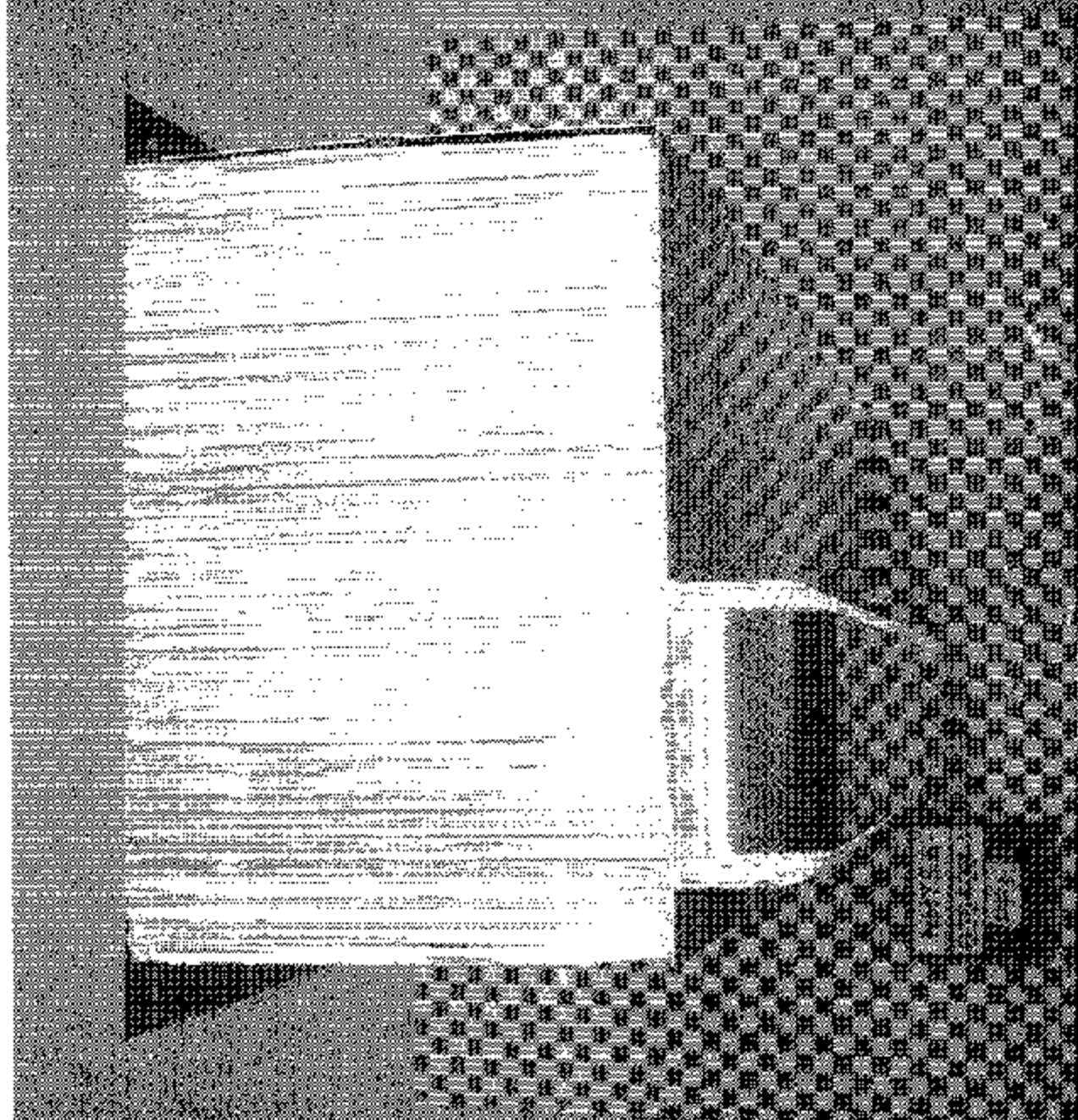


Figure A-11 Pre-Test Right Side View of Impactor Face

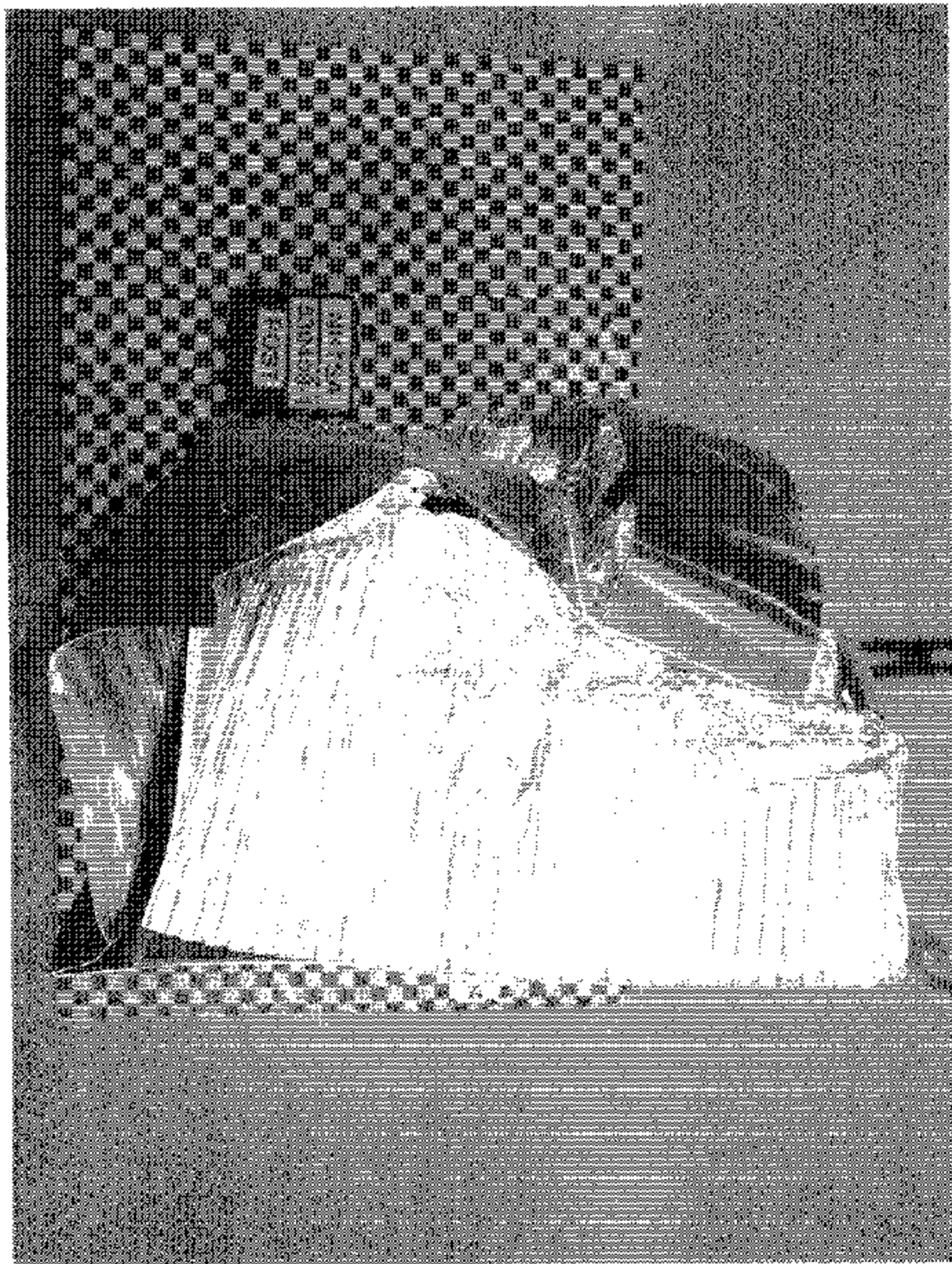


Figure A-12 Post-Test Right Side View of Impactor Face

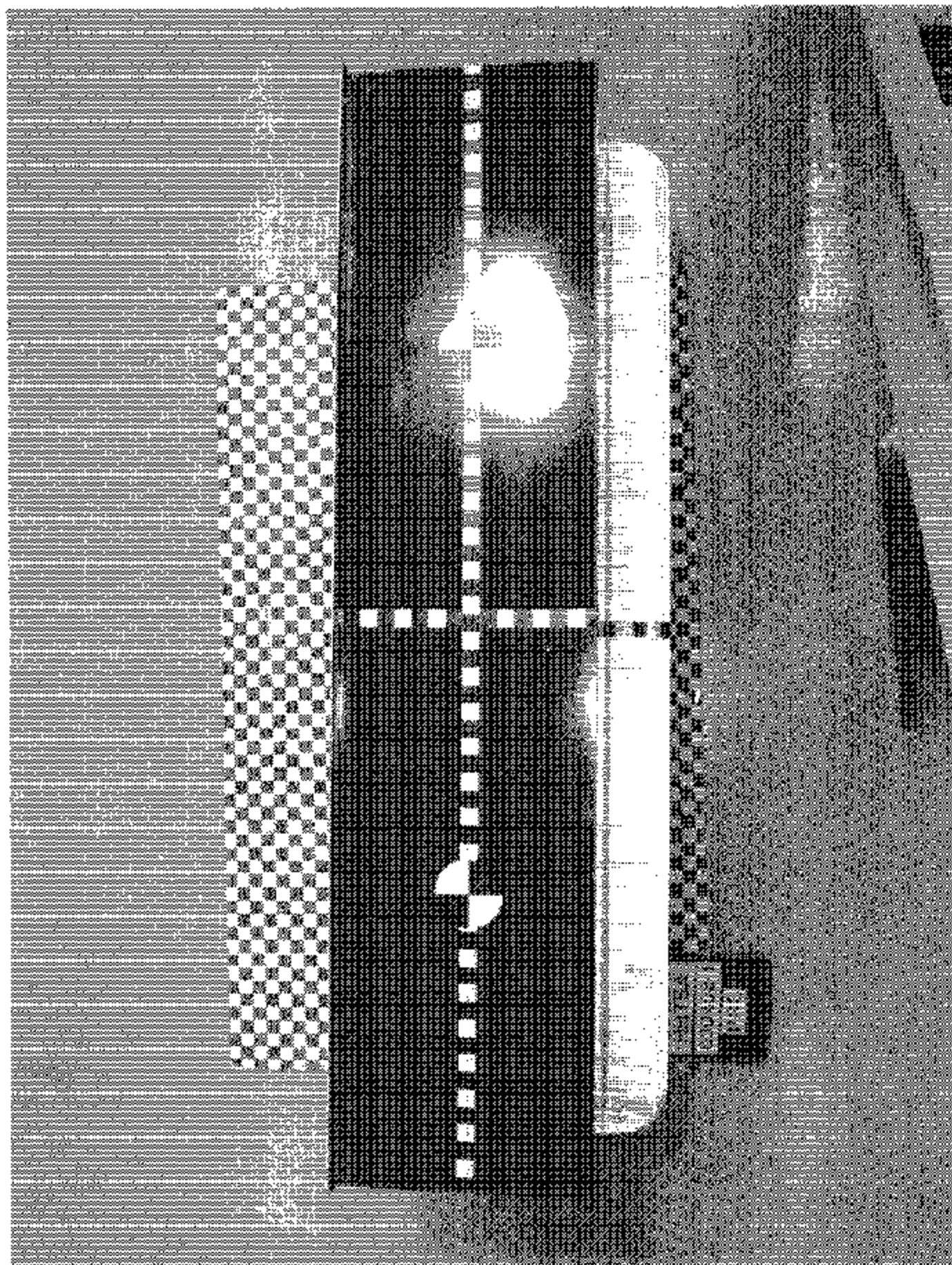


Figure A-13 Pre-Test Top View of Impactor Face

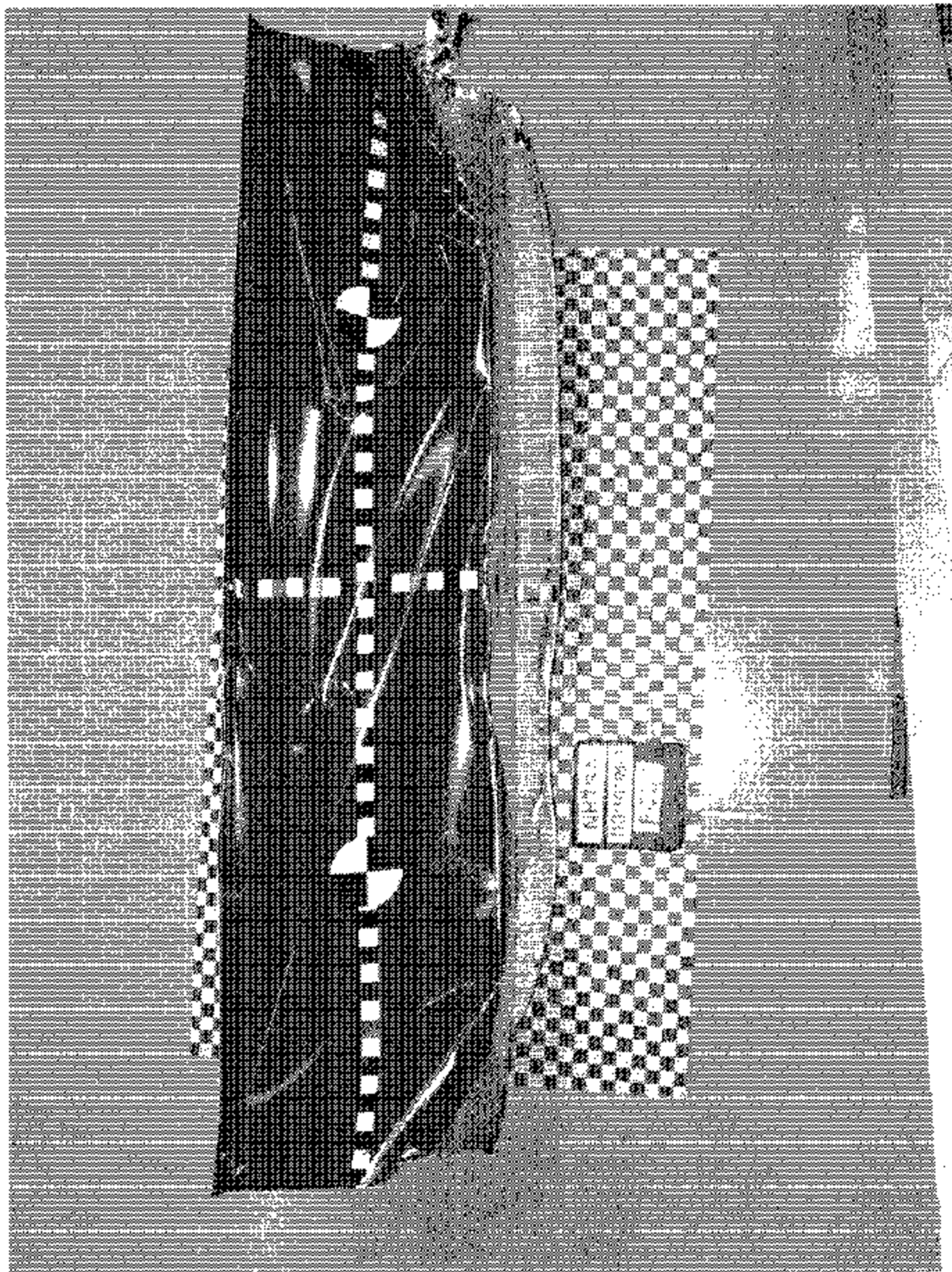


Figure A-14 Post-Test Top View of Impactor Face

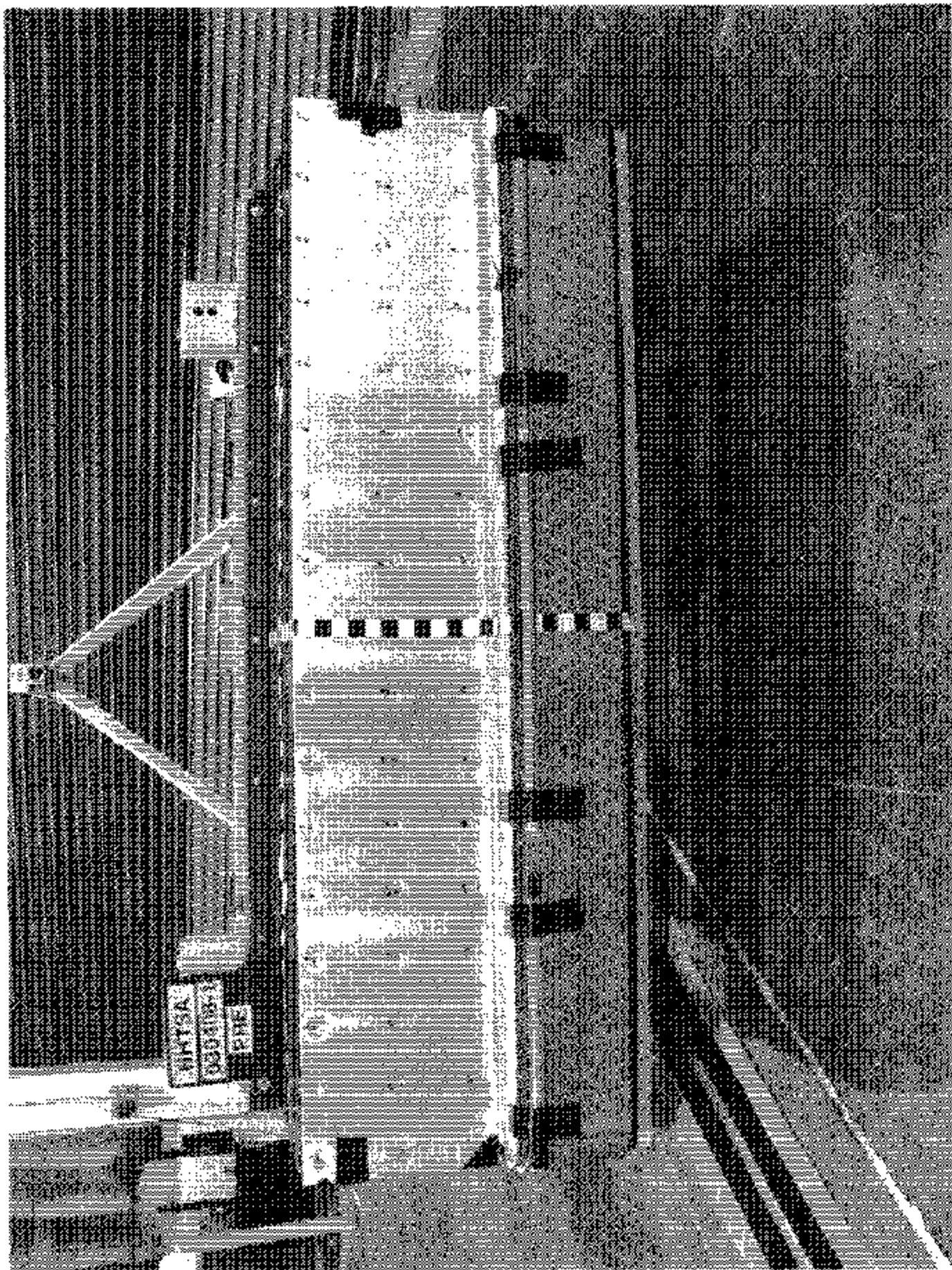


Figure A-13 Pre-Test View of MDB Showing Contact Switches in Place



Figure A-16 Post-Test Overhead View of MDB and Vehicle - View 1



Figure A-17 Post-Test Overhead View of MDB and Vehicle - View 2

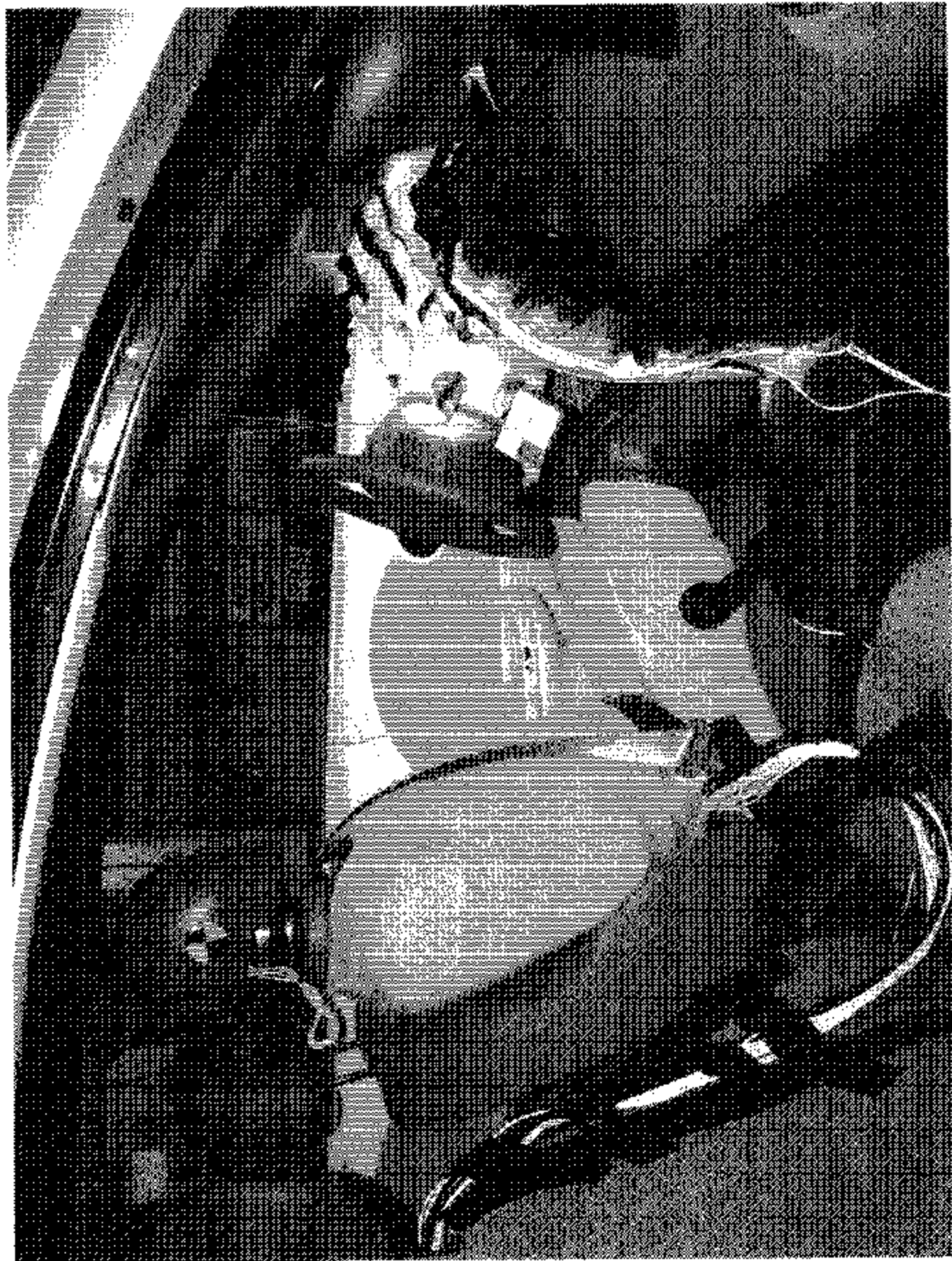


Figure A-18 Pre-Test Right Occupant Compartment View of Front SID



Figure A-19 Post-Test Right Occupant Compartment View of Front SID

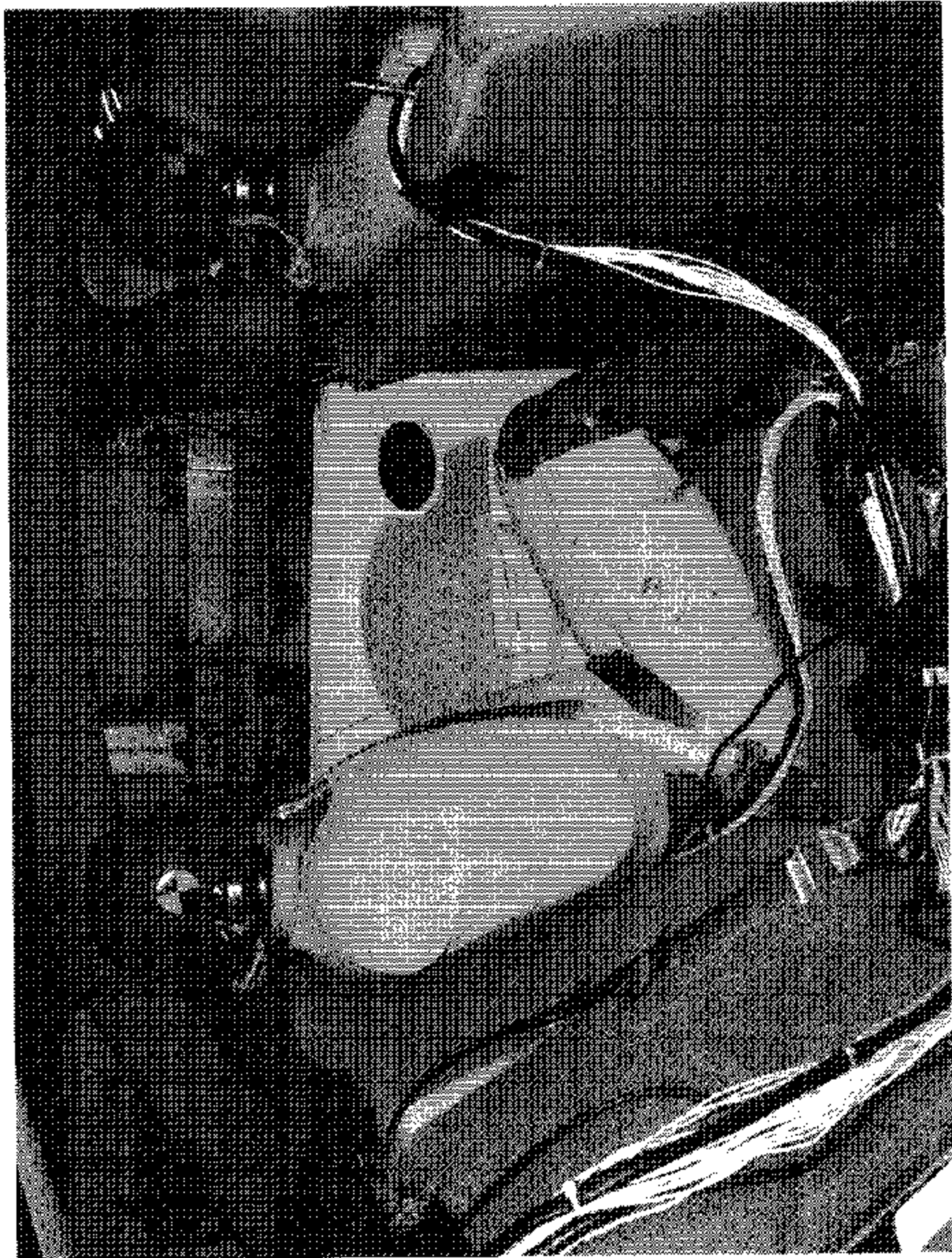


Figure A-20 Pre-Test Right Occupant Compartment View of Rear SID

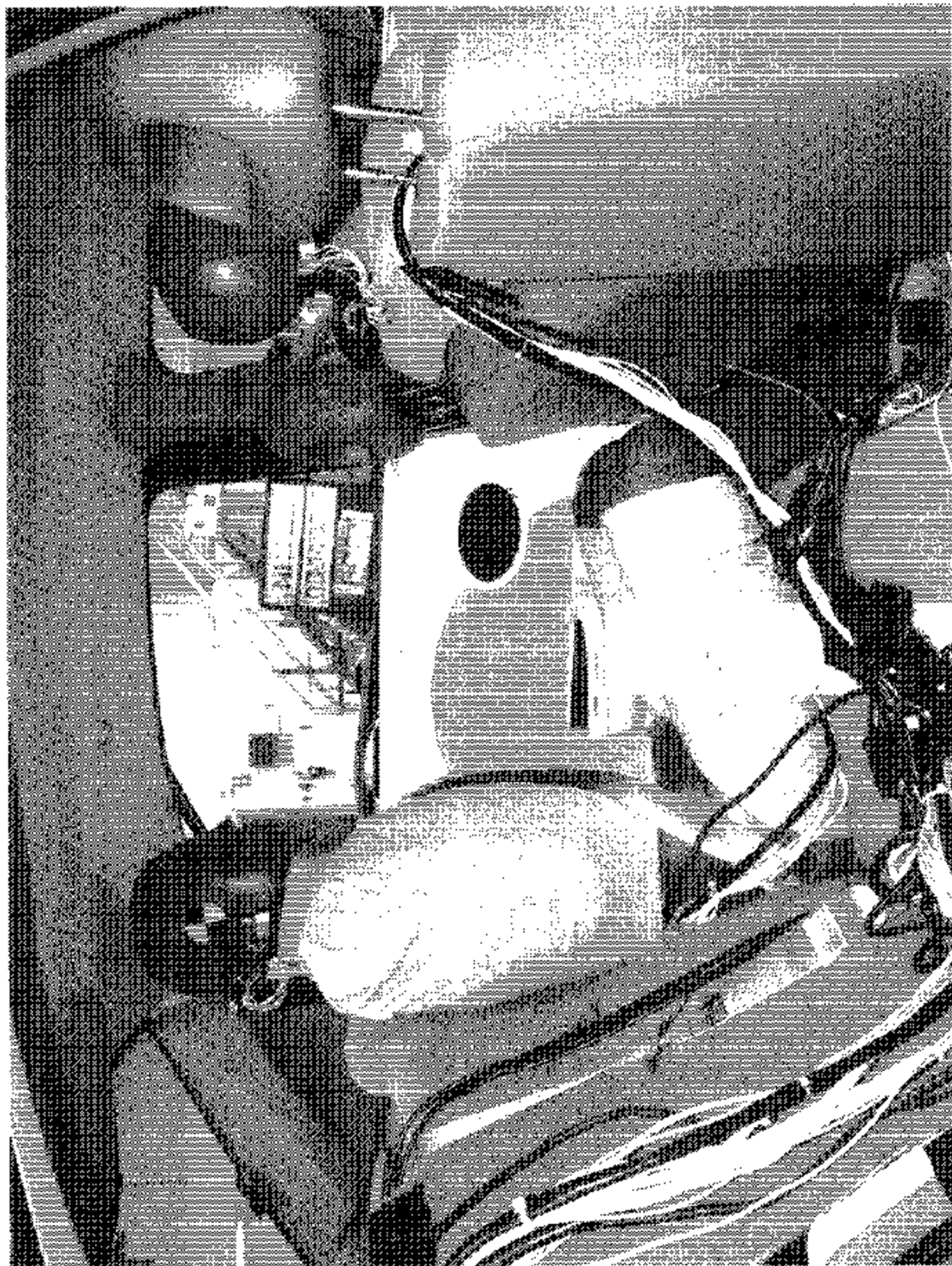


Figure A-21 Post-Test Right Occupant Compartment View of Rear STD

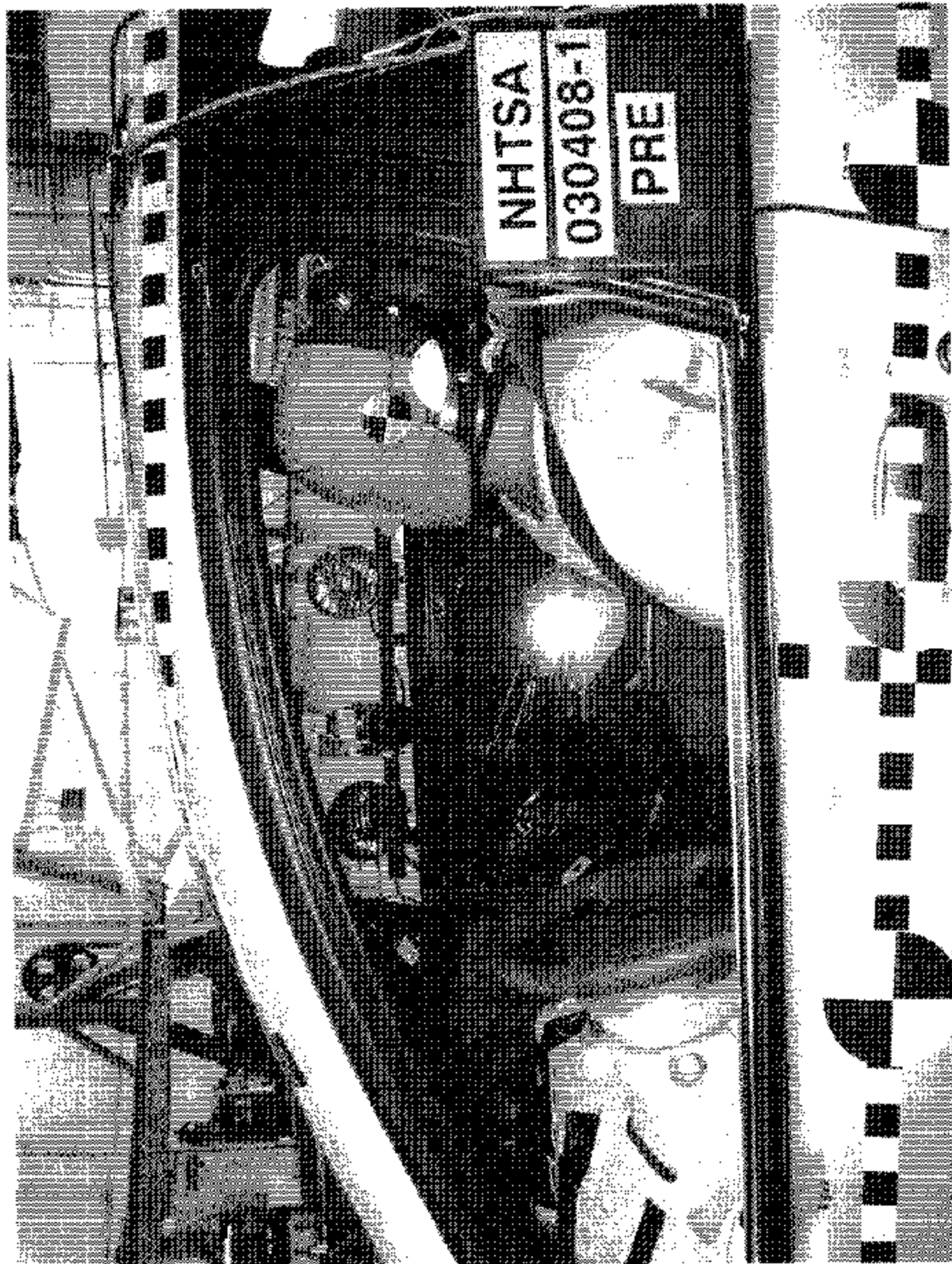


Figure A-22 Pre-Test Left View of Front SID

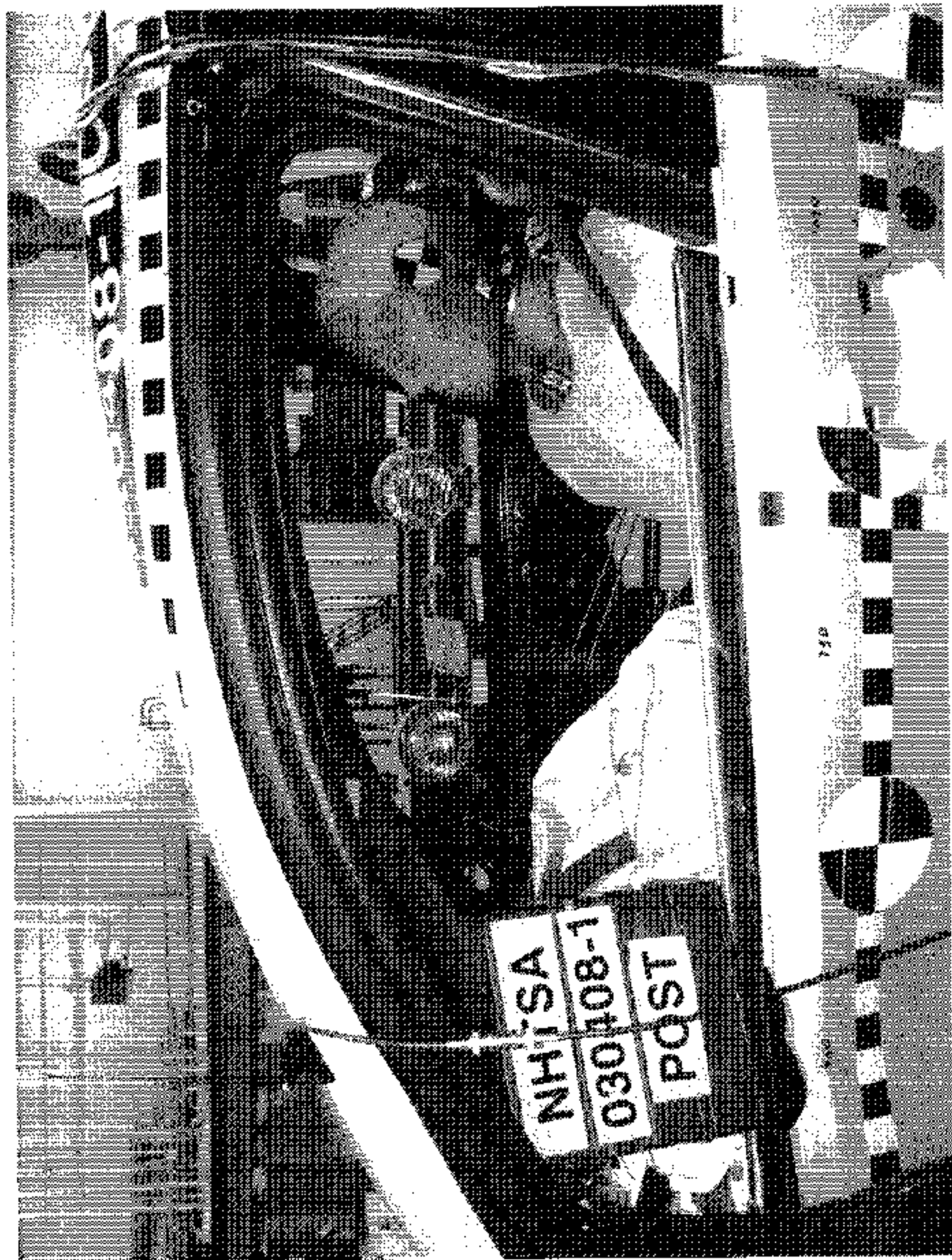


Figure A-23 Post-Test Left View of Front SID

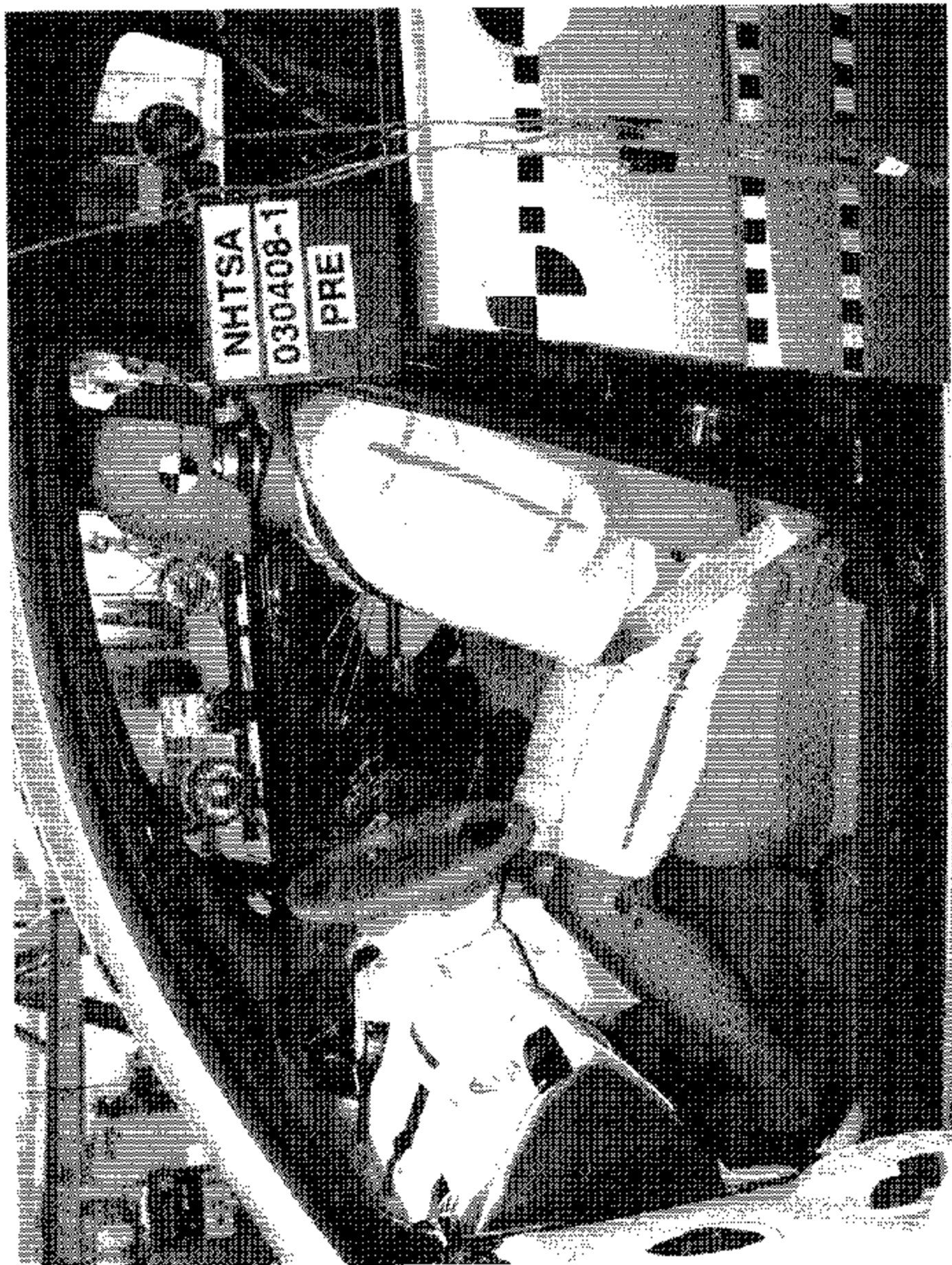


Figure A-24 Pre-Test Left View of Front SID and Belt Position



Figure A-25 Pre-Test Left View of Front SID and Door Clearance



Figure A-26 Post-Test Left View of Front SID and Door Clearance

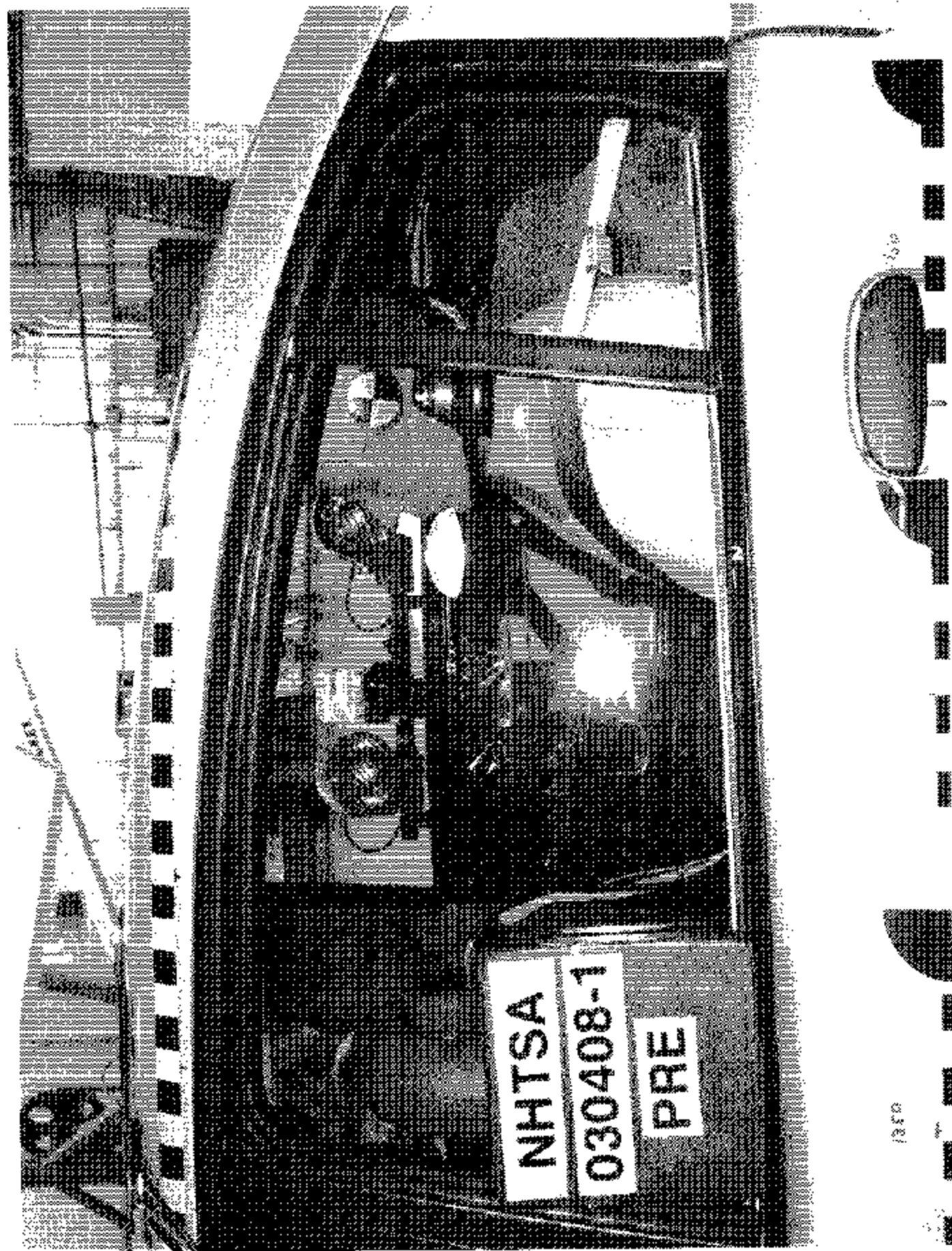


Figure A-27 Pre-Test Left View of Rear SID

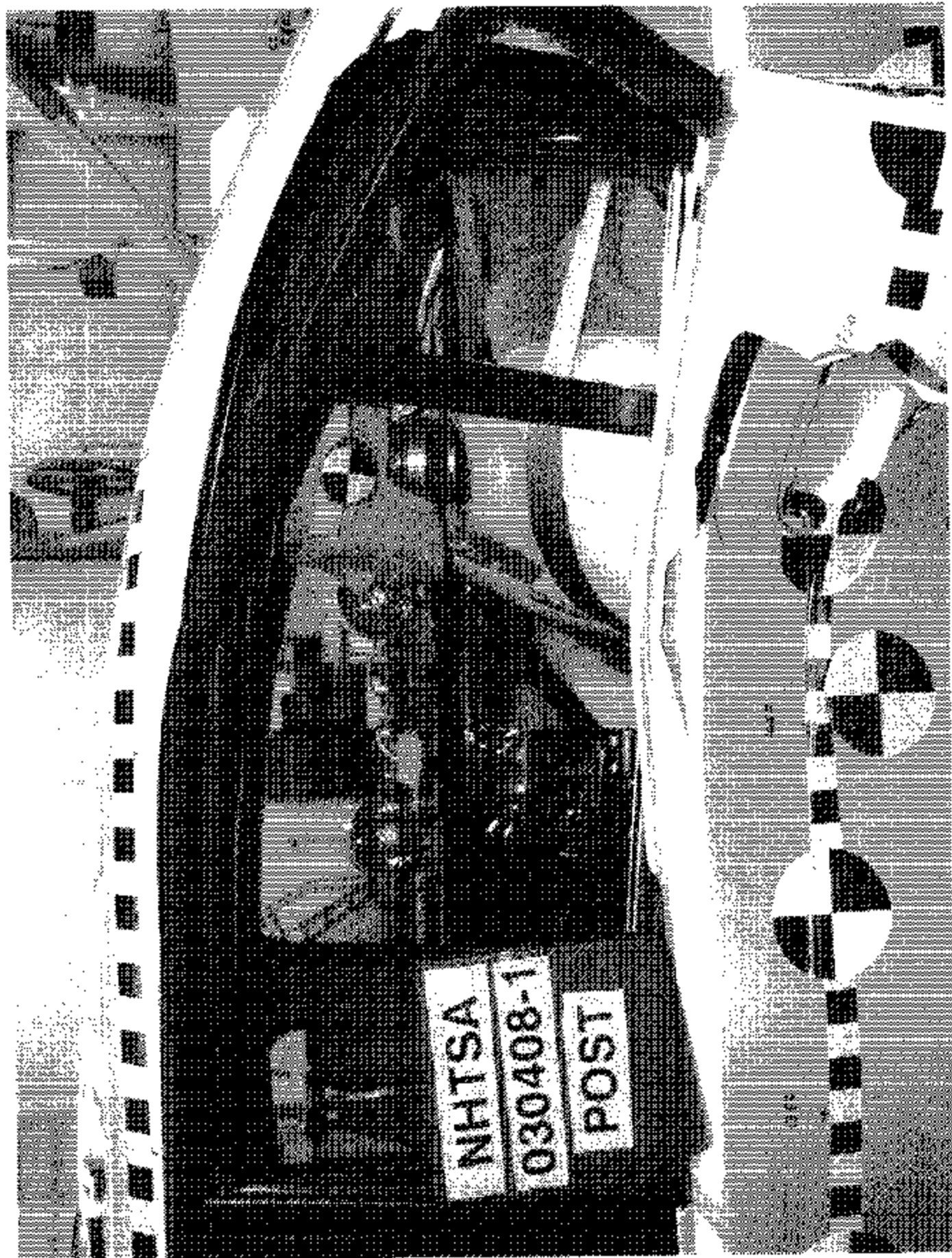


Figure A-28 Post-Test Left View of Rear SID

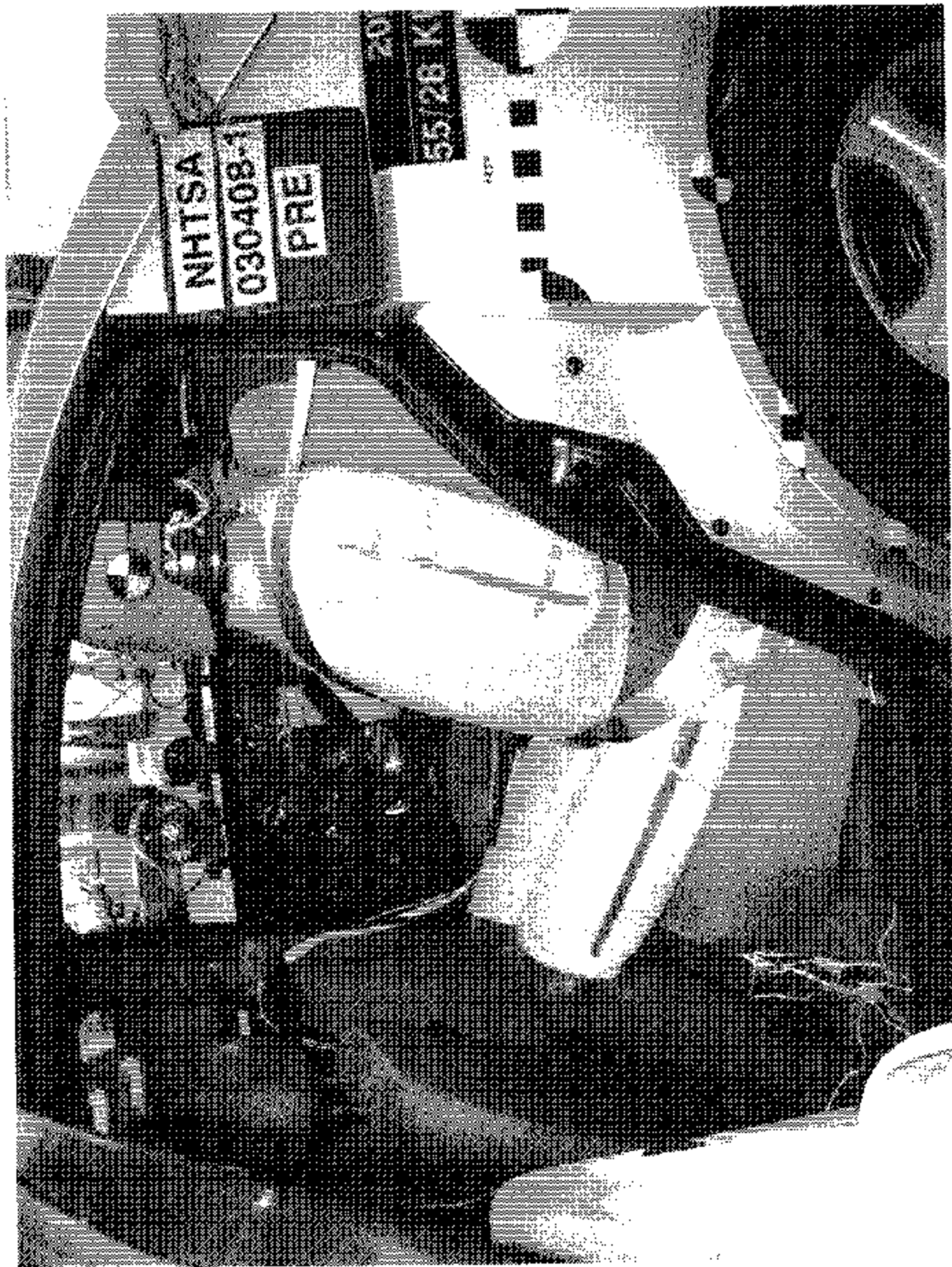


Figure A-29 Pre-Test Left of Rear SID and Belt Position

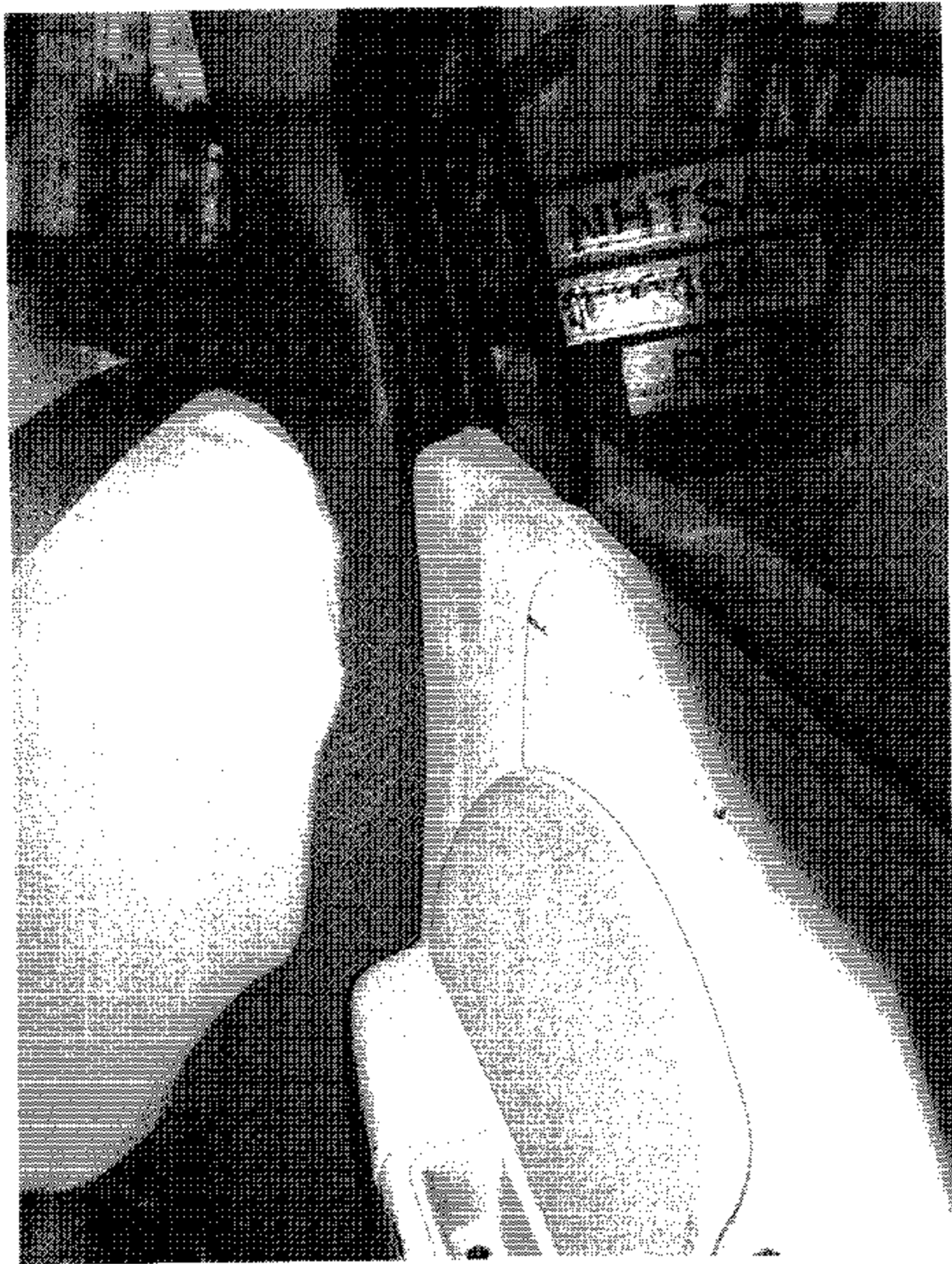


Figure A-30 Pre-Test Left View of Rear SID and Door Clearance

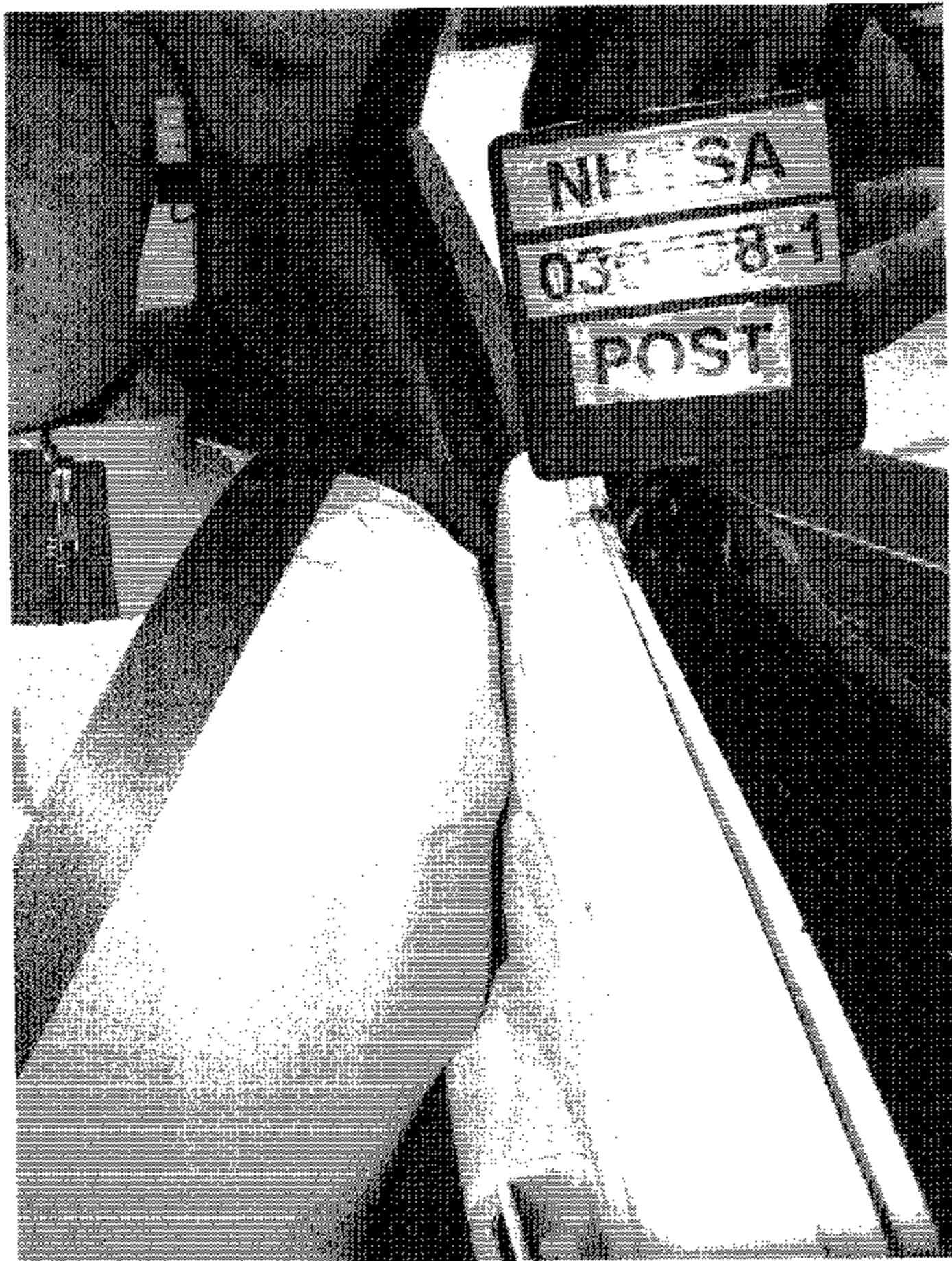


Figure A-31 Post-Test Left View of Rear SID and Door Clearance

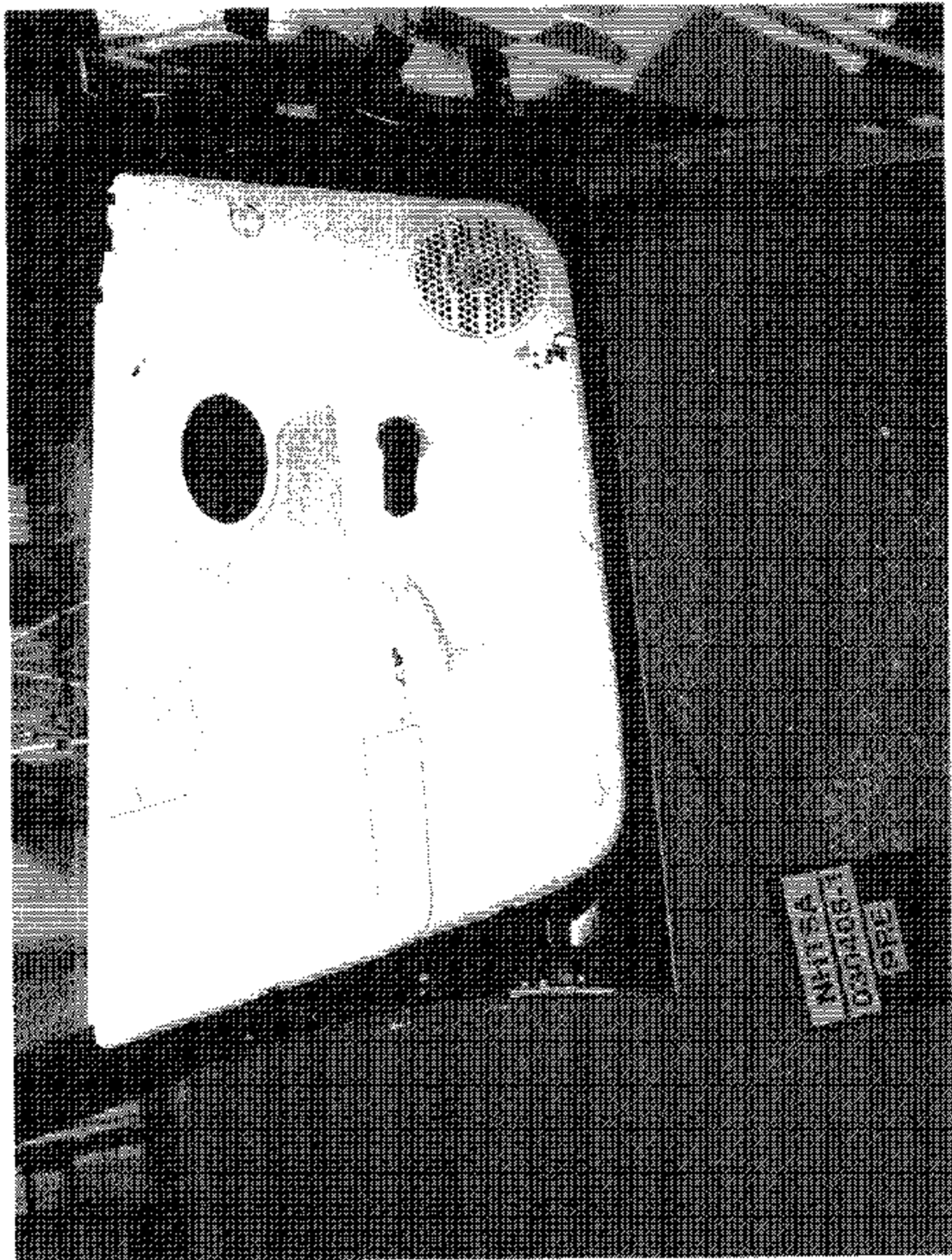


Figure A-32 Pre-Test Interior of Front Door



Figure A-33 Post-Test Interior of Front Door Showing SID Impact Locations

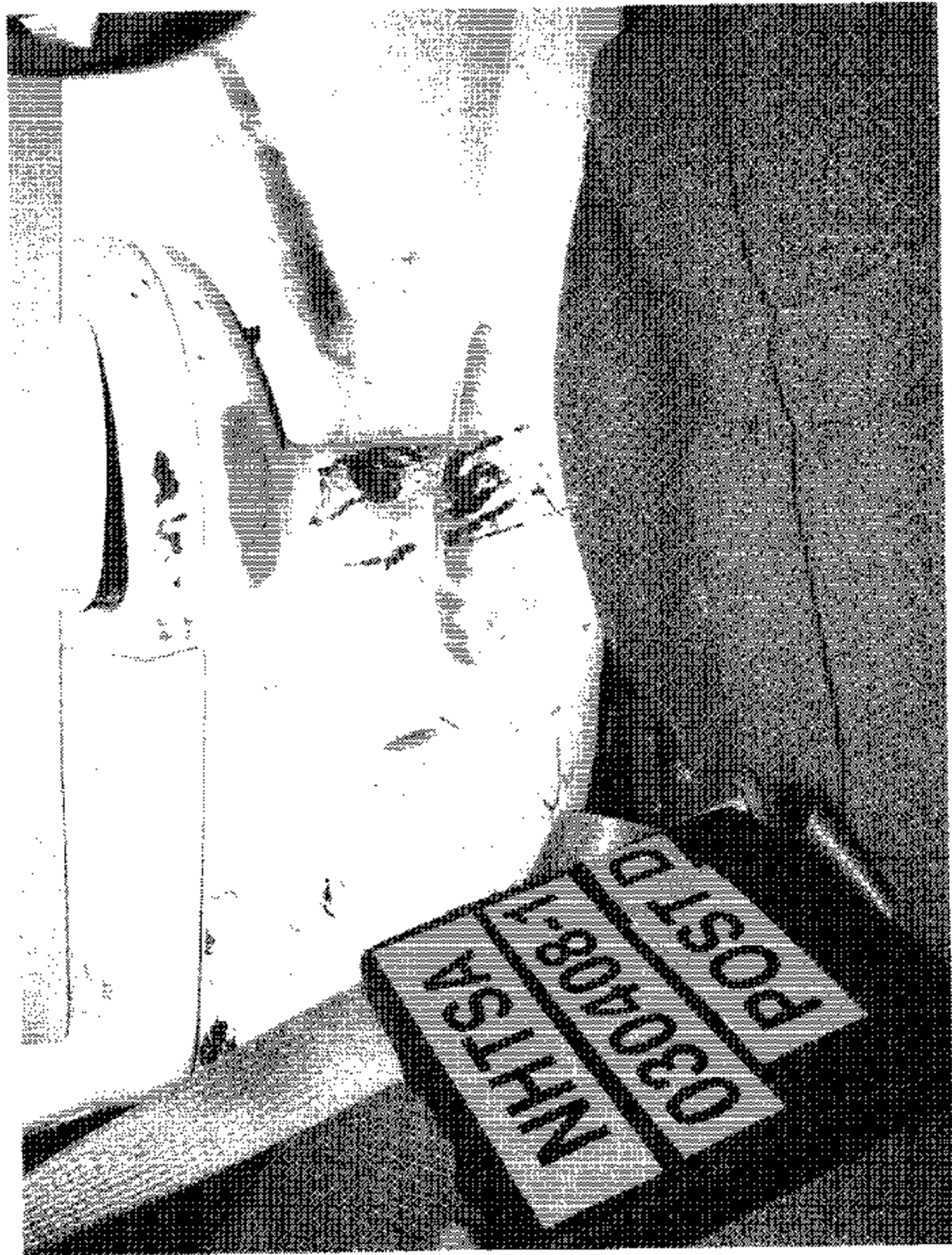


Figure A-34 Post-Test Front SID Contact - View 1



Figure A-35 Post-Test Front SID Contact - View 2

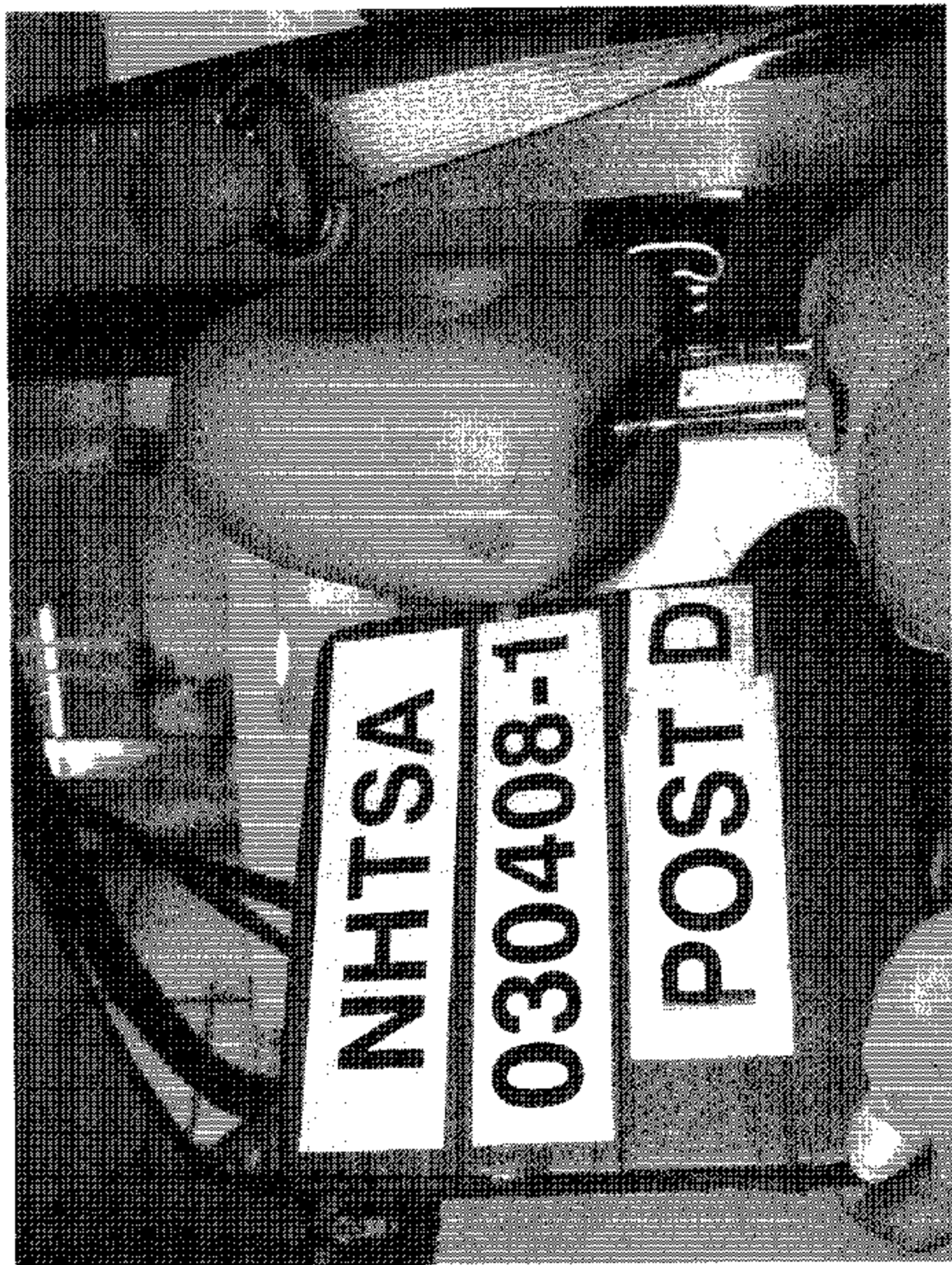


Figure A-36 Post-Test Front SID Contact - View 3



Figure A-37 Pre-Test Interior of Rear Door

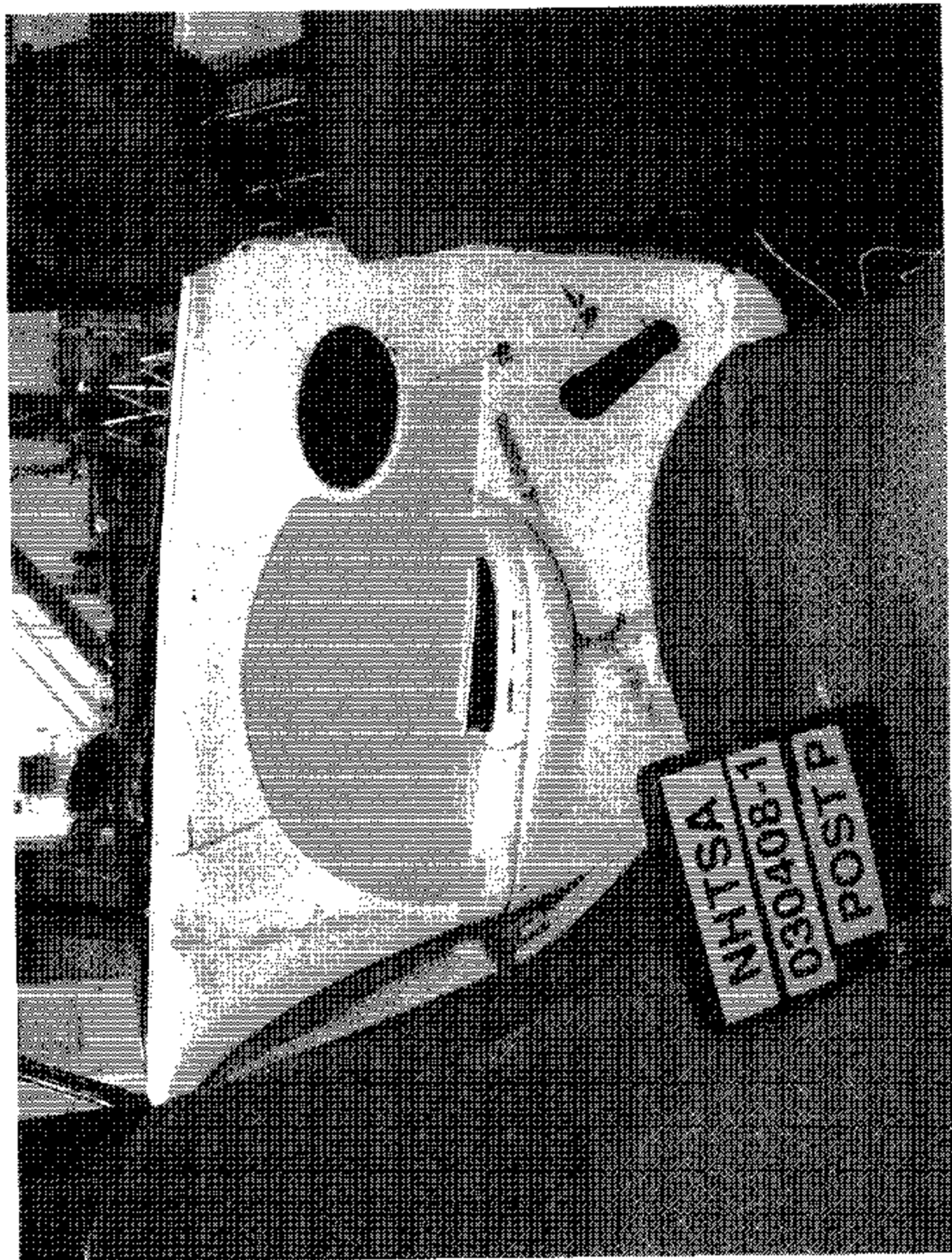


Figure A-38 Post-Test Interior of Rear Door Showing SID Impact Locations

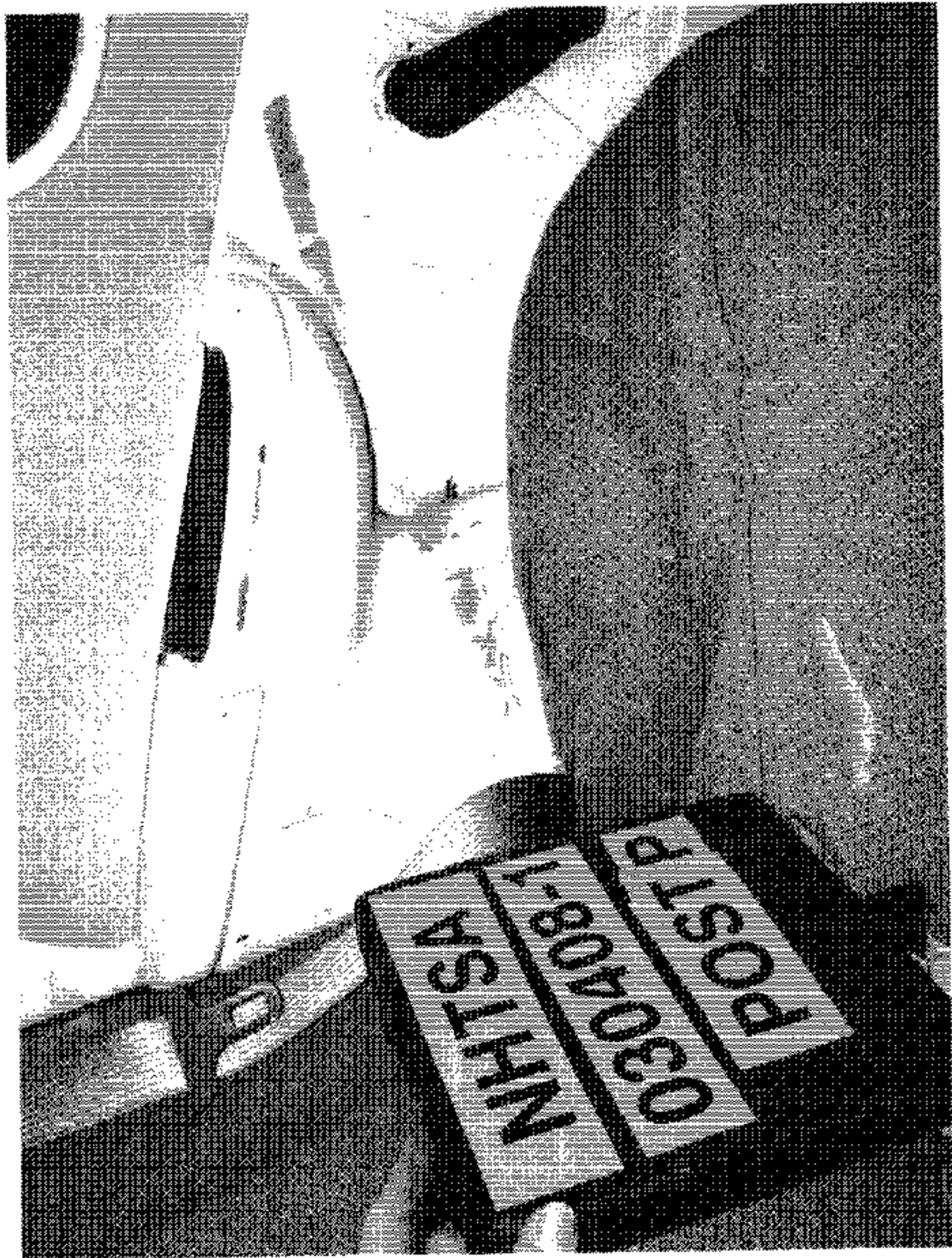


Figure A-39 Post-Test Rear SID Contact - View 1

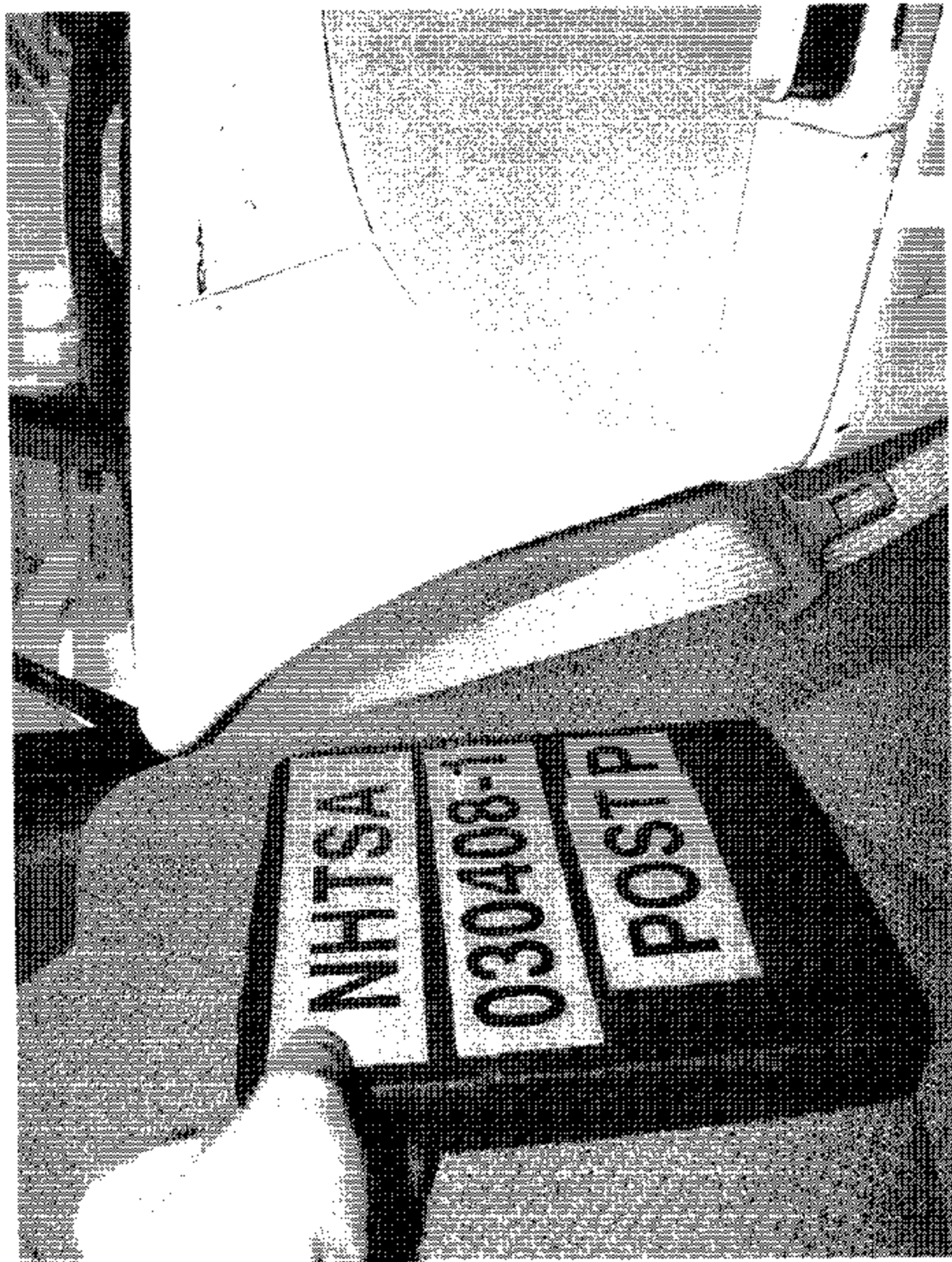


Figure A-40 Post-Test Rear SID Contact - View 2



Figure A-41 Post-Test Rear SID Contact - View 3

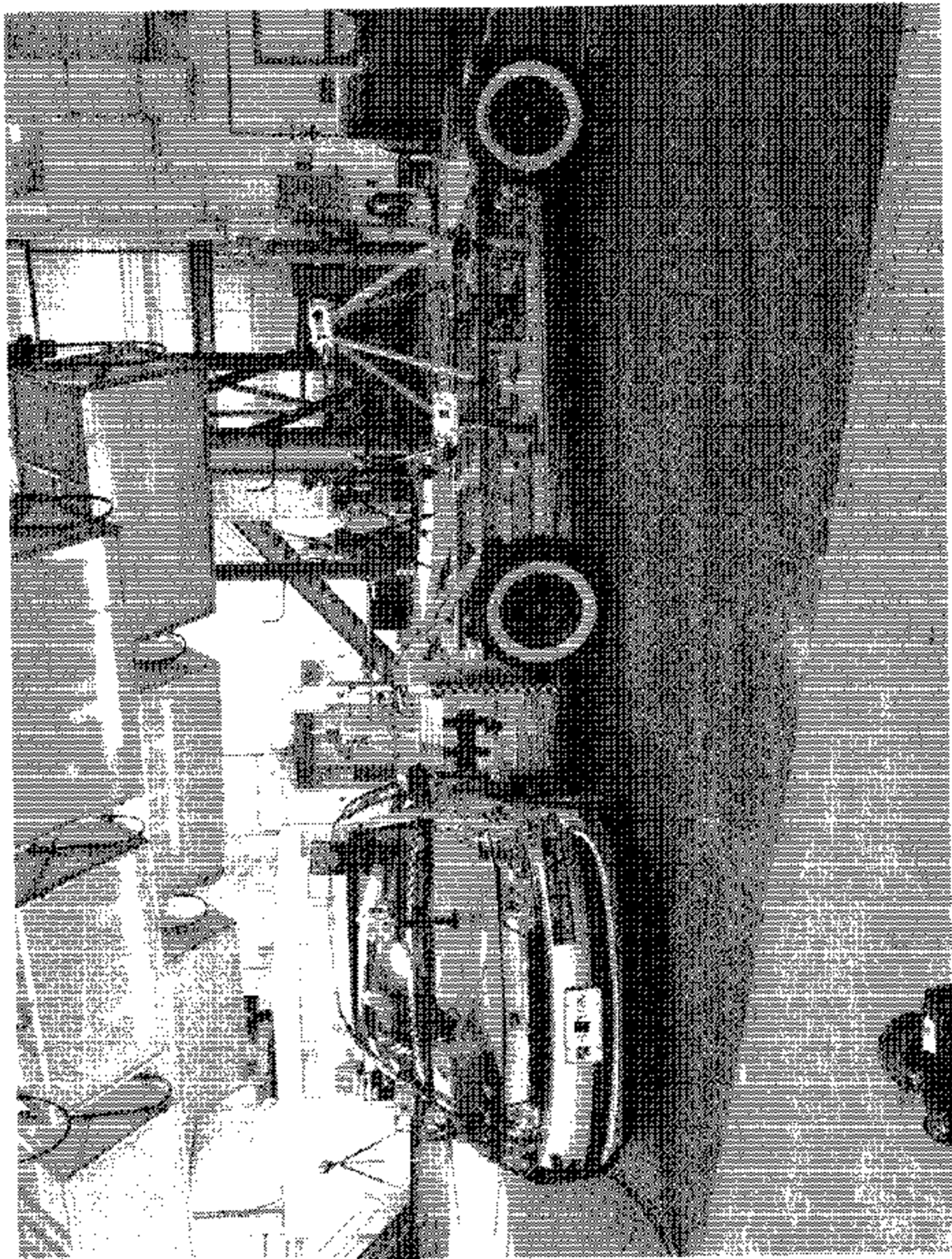


Figure A-42 Pre-Test Left Side View of MDB With Impactor Face in Position

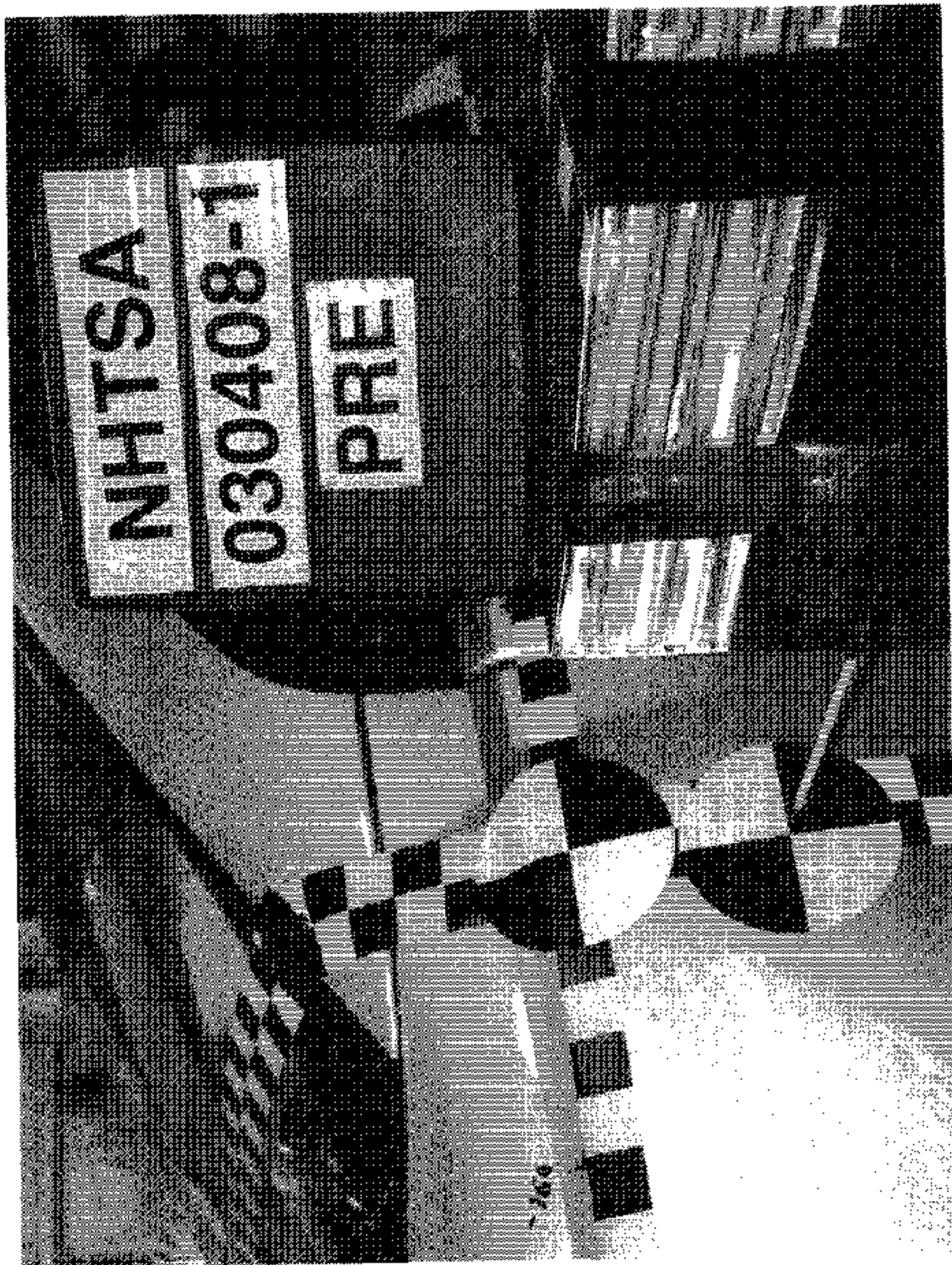


Figure A-43 Pre-Test Primary Impact Point View



Figure A-44 Post-Test Primary Impact Point View

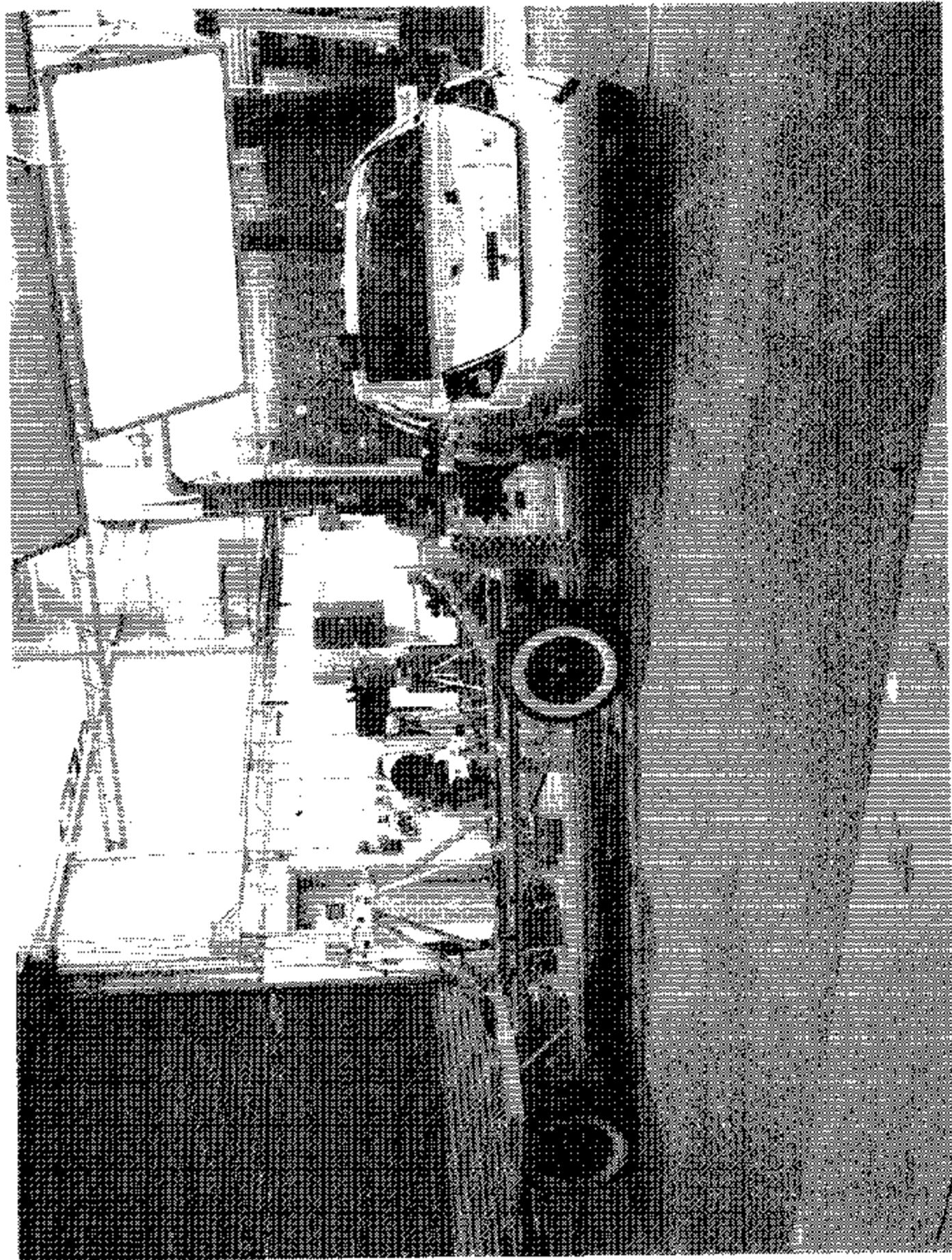


Figure A-45 Pre-Test Right Side View of MDR With Impactor Face in Position

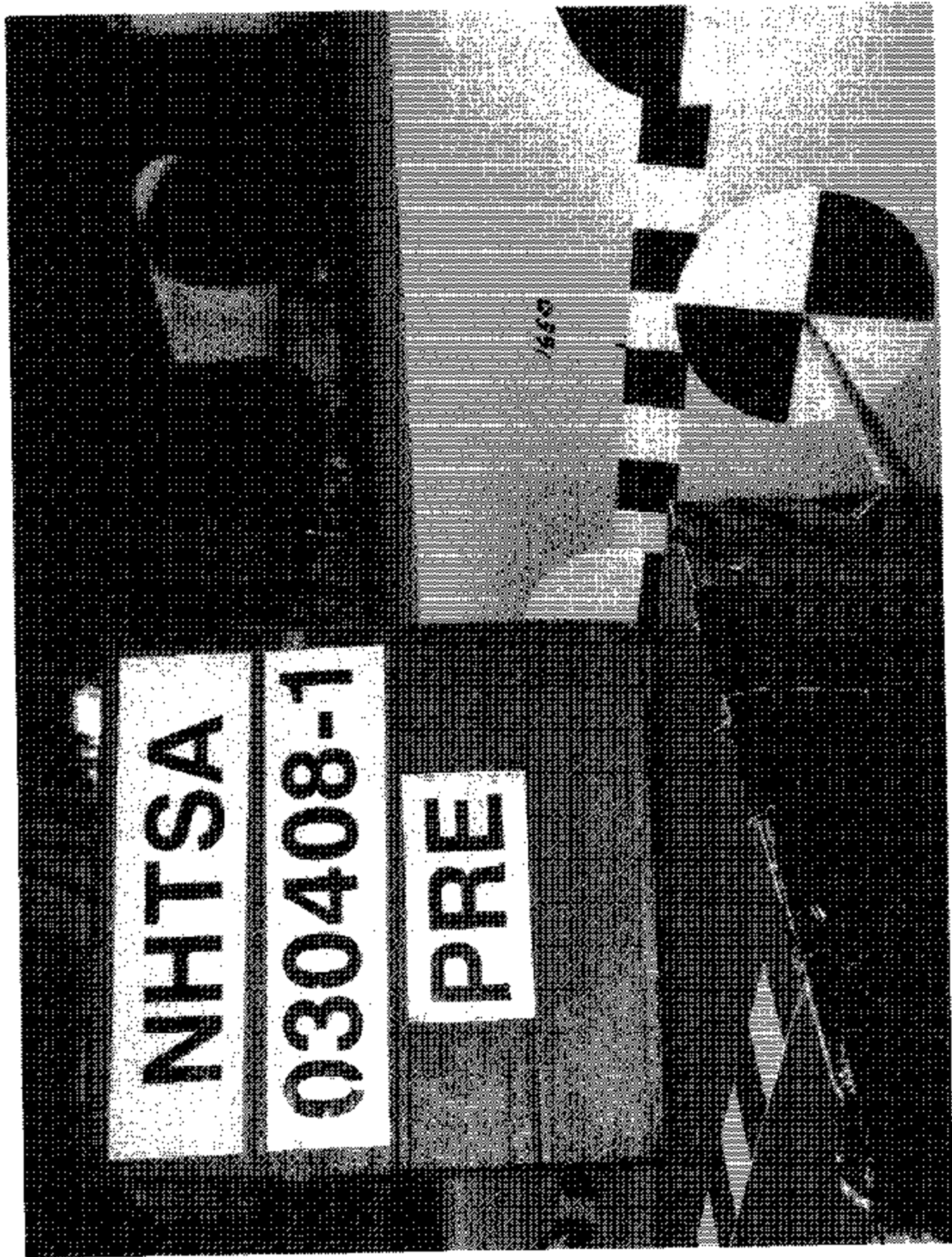


Figure A-46 Pre-Test Secondary Impact Point View



Figure A-47 Post-Test Secondary Impact Point View



MFED BY SATURN CORPORATION
DATE GWR GWR FRT GWR RR
01/03 3655LB 1963LB 1792LB
1658KG 0945KG 0913KG

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

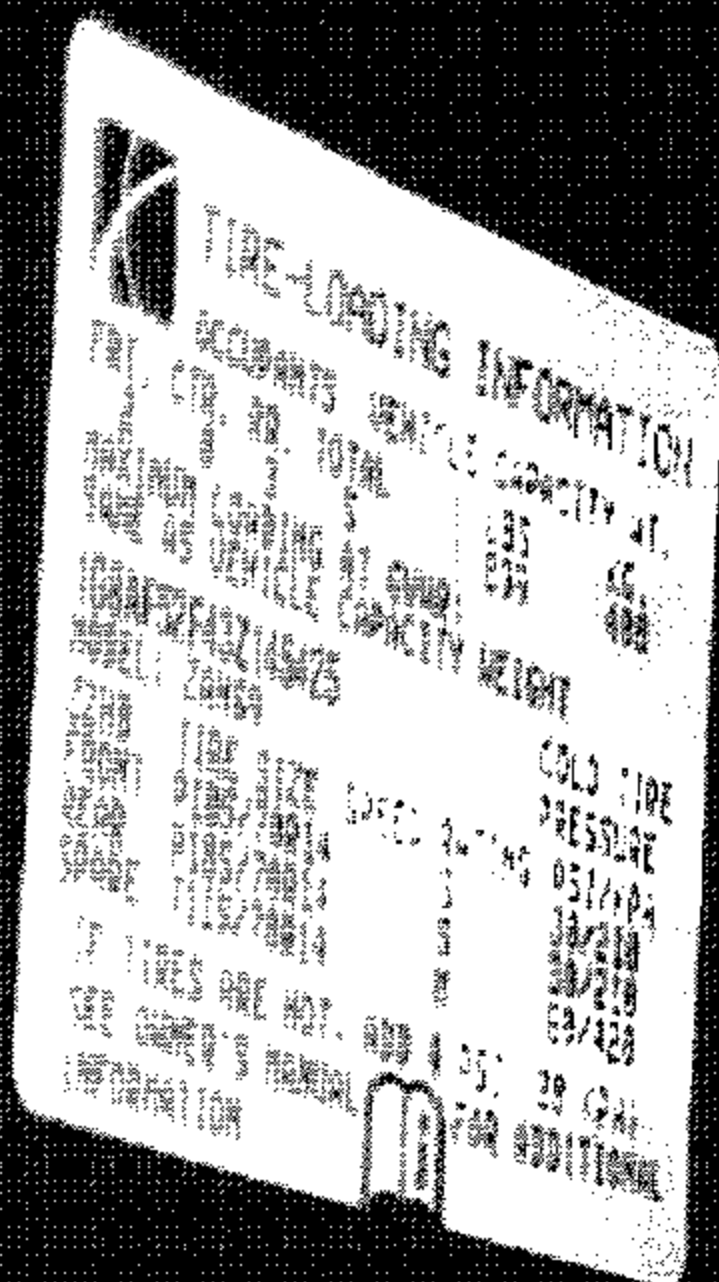
PASS CAR

1G8AF52F43Z145425



C307171

Figure A 48 Pre-Test Vehicle Certification Label View



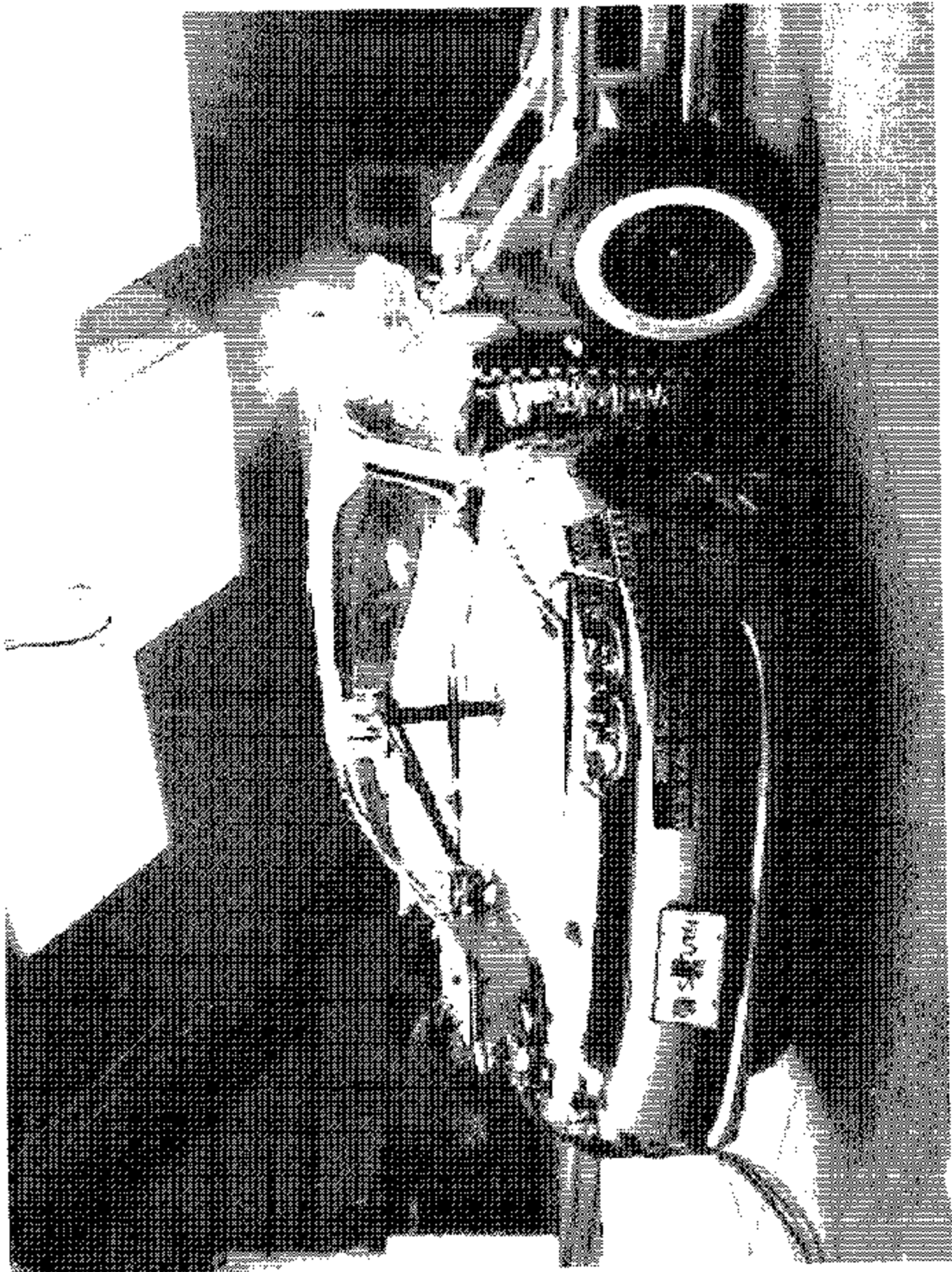


Figure A-50 Impact Event

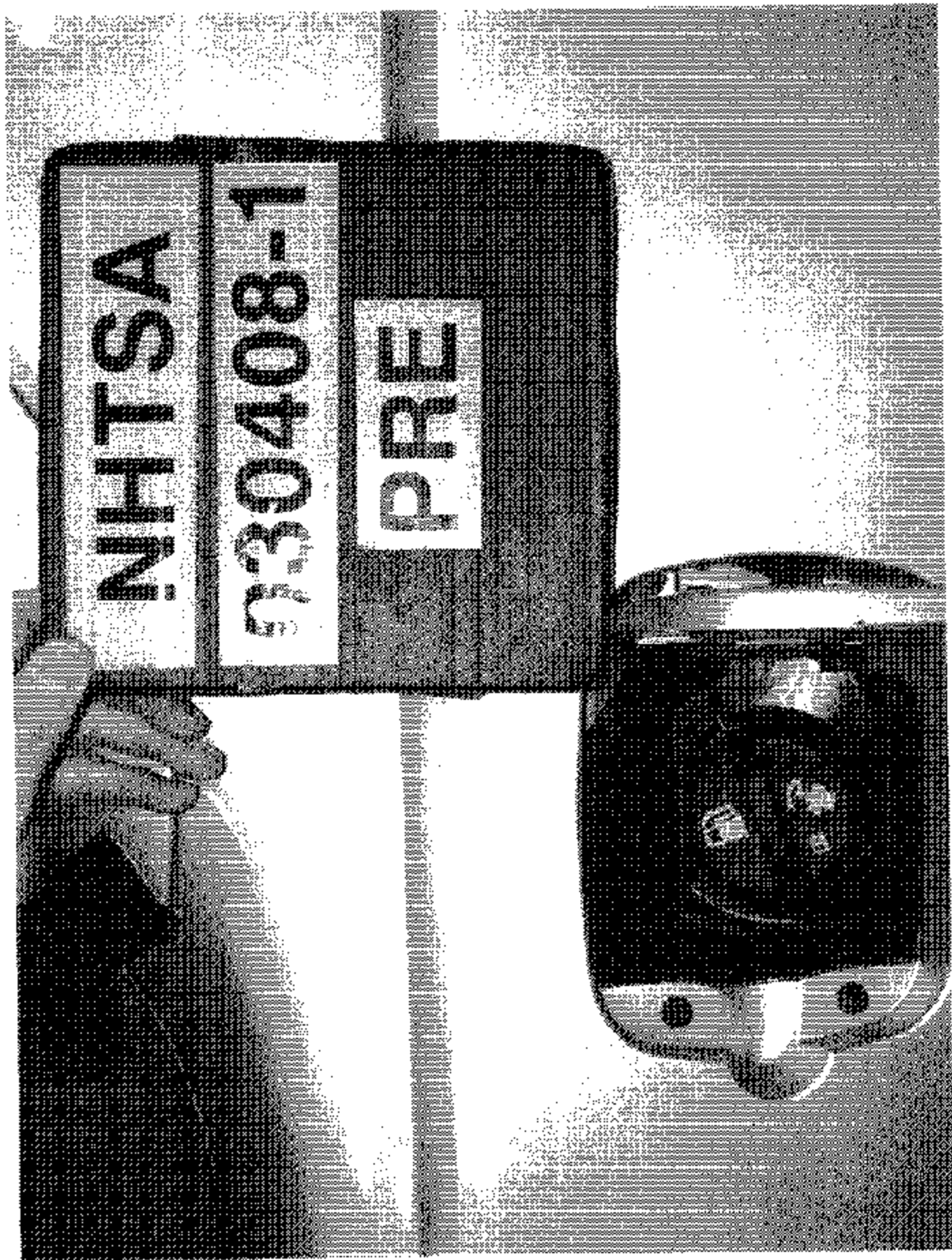


Figure A-51 Pre-Test Fuel Cap



Figure A-52 Post-Test Fuel Cap

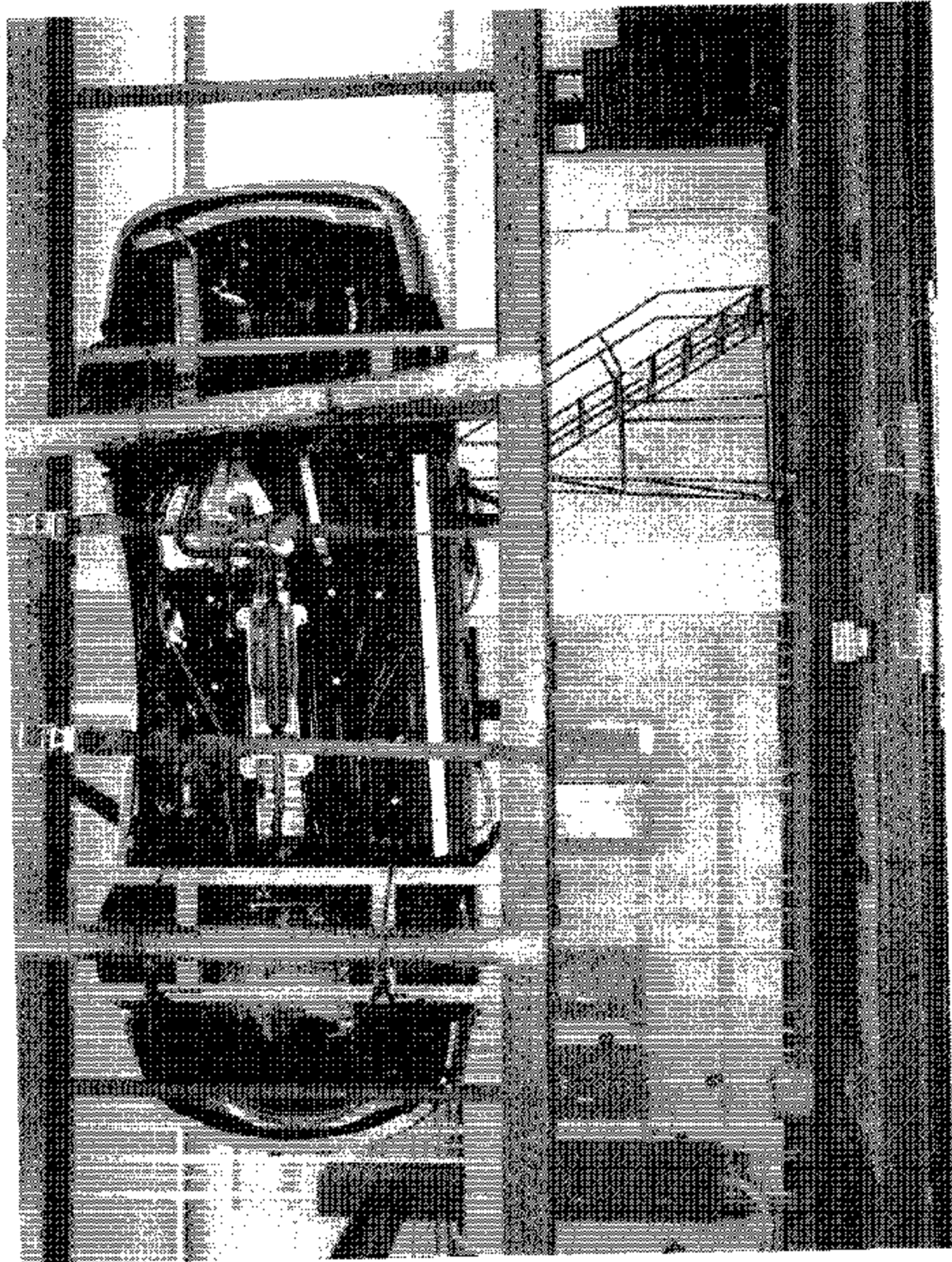


Figure A-53 FMVSS 301 Rollover View at 90°

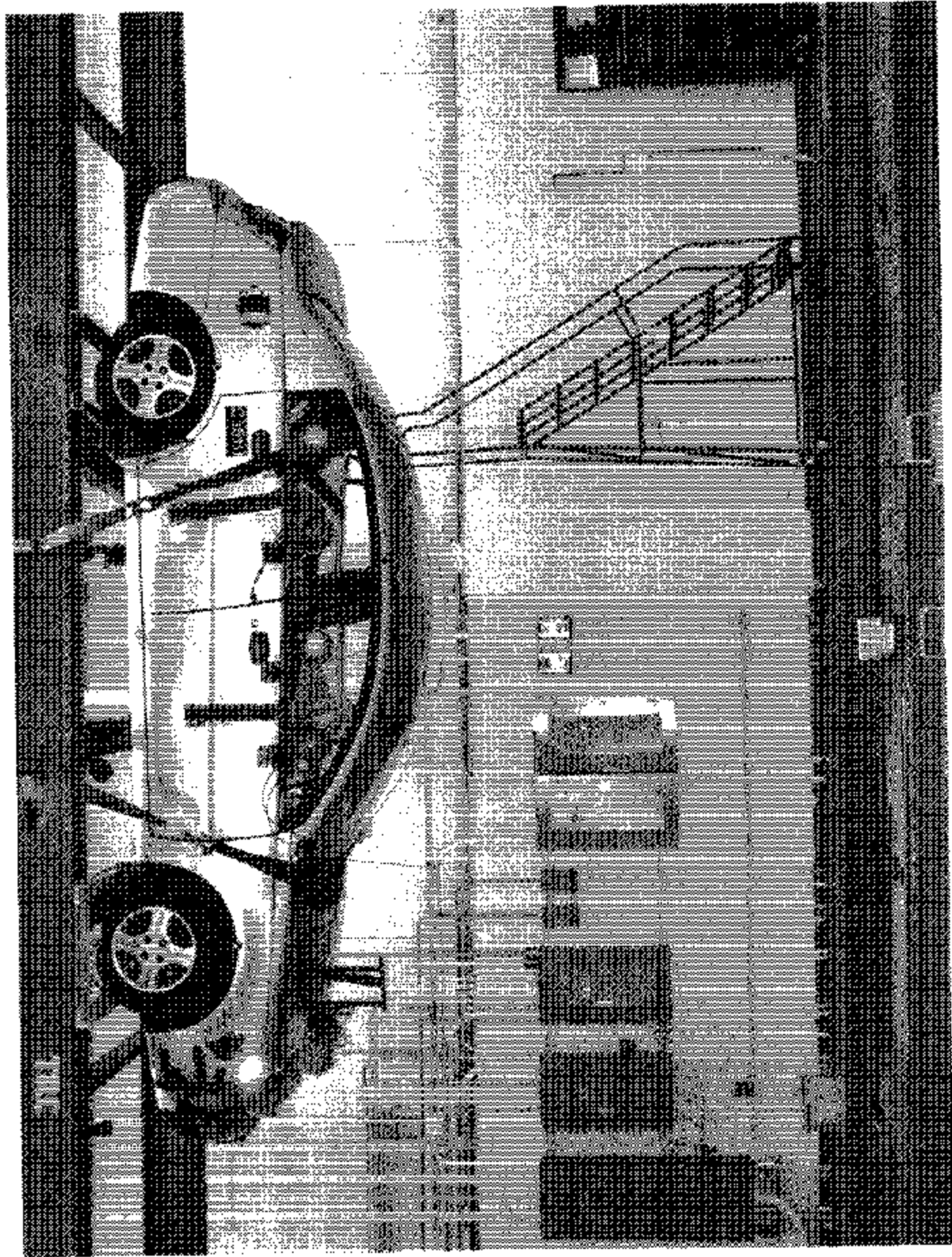


Figure A-54 FMVSS 301 Rollover View at 180°

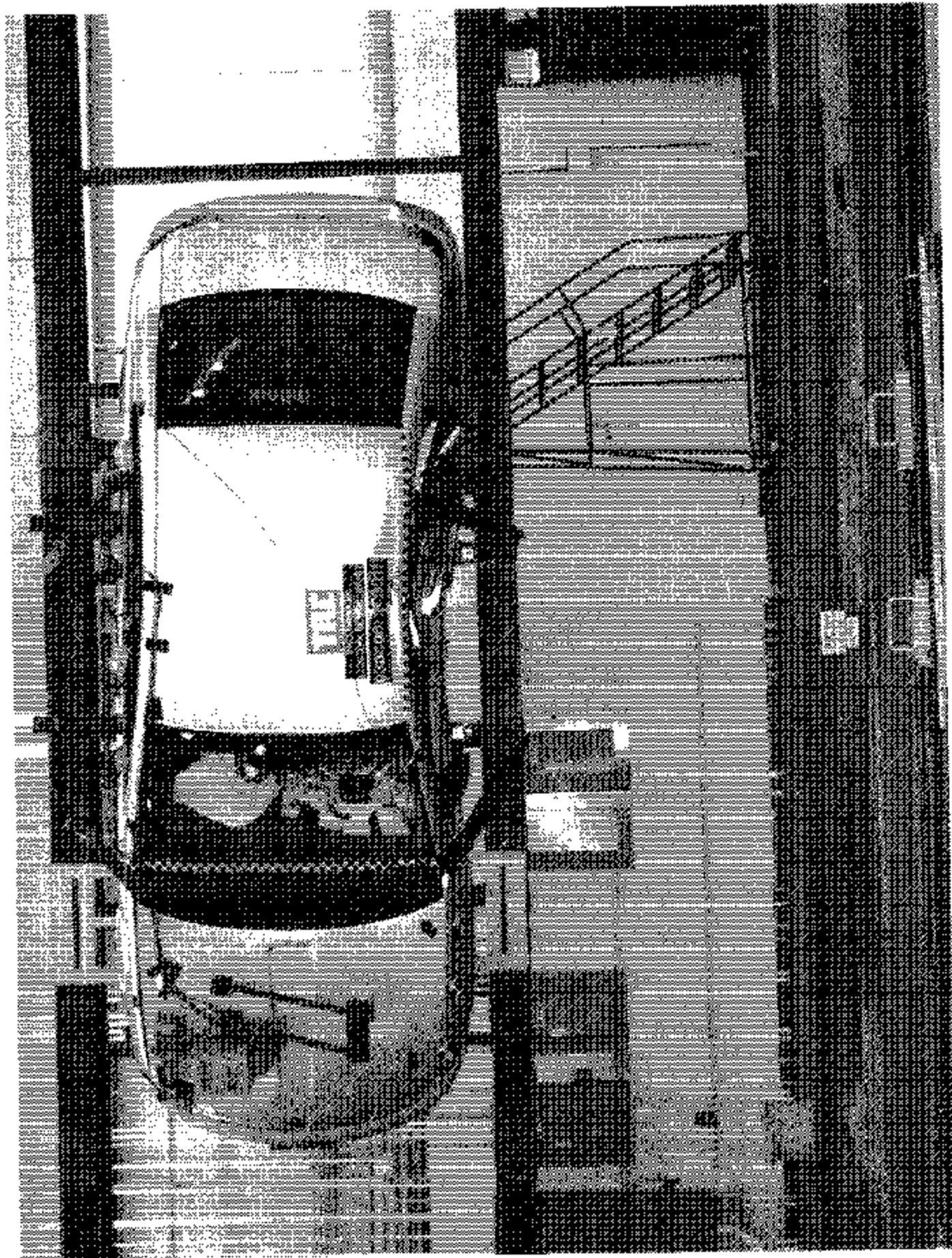


Figure A-55 FMVSS 301 Rollover View at 270°

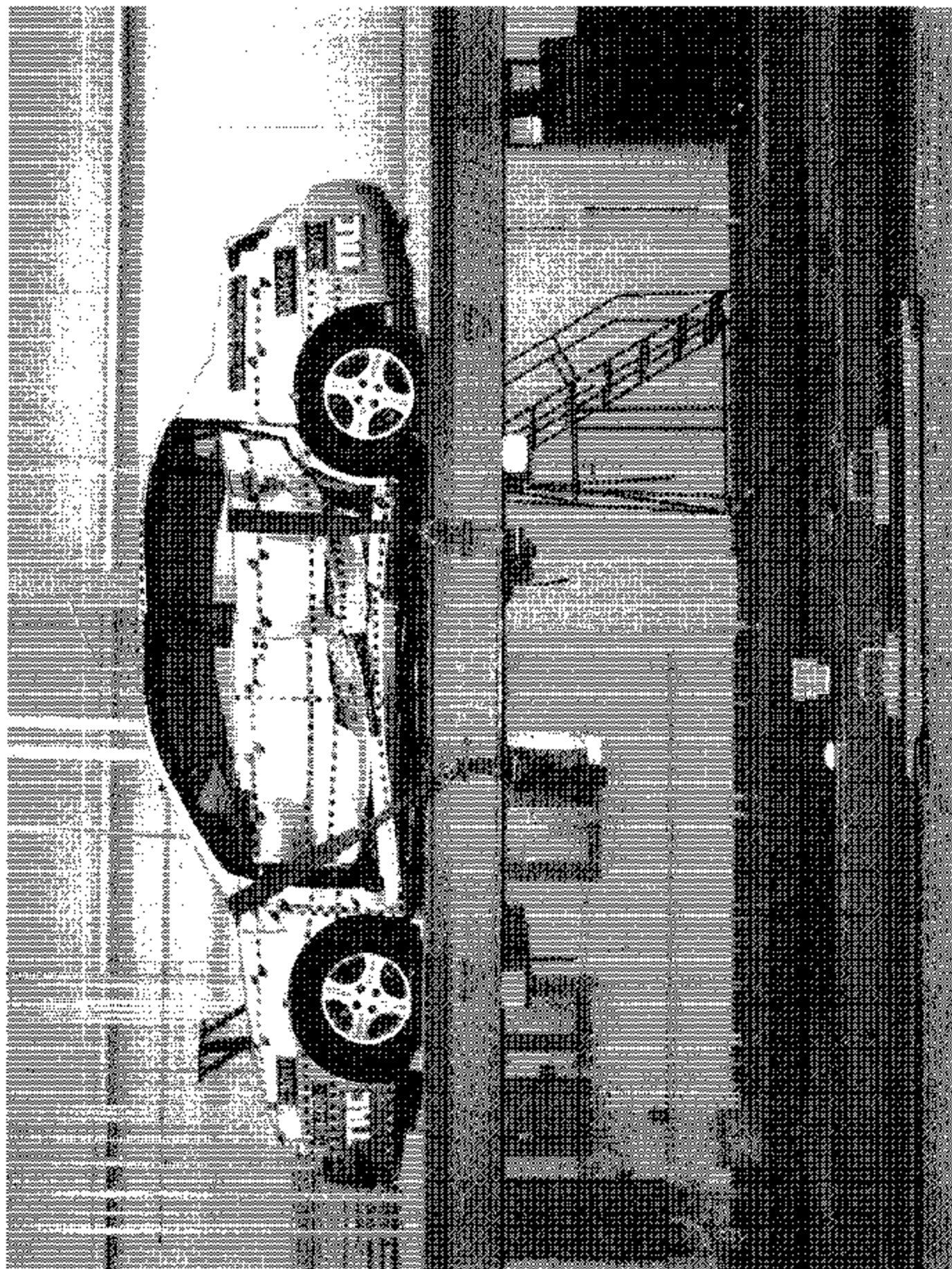


Figure A-56 FMVSS 301 Rollover View at 360°

Appendix B

Data Plots

Table of Data Plots

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	Driver Head X-Axis Acceleration	B-10
2	Driver Head X-Axis Velocity	B-11
3	Driver Head Y-Axis Acceleration	B-12
4	Driver Head Y-Axis Velocity	B-13
5	Driver Head Z-Axis Acceleration	B-14
6	Driver Head Z-Axis Velocity	B-15
7	Driver Head Resultant Acceleration	B-16
8	Driver Neck X-Axis Shear Force	B-17
9	Driver Neck Y-Axis Shear Force	B-18
10	Driver Neck Z-Axis Axial Force	B-19
11	Driver Neck Moment about X Axis	B-20
12	Driver Neck Moment about Y Axis	B-21
13	Driver Neck Moment about Z Axis	B-22
14	Driver Neck Occipital Condyle Moment about X Axis	B-23
15	Driver Upper Rib Y-Axis Acceleration	B-24
16	Driver Upper Rib Y-Axis Velocity	B-25
17	Driver Lower Rib Y-Axis Acceleration	B-26
18	Driver Lower Rib Y-Axis Velocity	B-27
19	Driver Lower Spine Y-Axis Acceleration	B-28
20	Driver Lower Spine Y-Axis Velocity	B-29
21	Driver Pelvis Y-Axis Acceleration	B-30
22	Driver Pelvis Y-Axis Velocity	B-31
23	Left Rear Passenger Head X-Axis Acceleration	B-32
24	Left Rear Passenger Head X-Axis Velocity	B-33
25	Left Rear Passenger Head Y-Axis Acceleration	B-34
26	Left Rear Passenger Head Y-Axis Velocity	B-35
27	Left Rear Passenger Head Z-Axis Acceleration	B-36

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
28	Left Rear Passenger Head Z-Axis Velocity	B-37
29	Left Rear Passenger Head Resultant Acceleration	B-38
30	Left Rear Passenger Neck X-Axis Shear Force	B-39
31	Left Rear Passenger Neck Y-Axis Shear Force	B-40
32	Left Rear Passenger Neck Z-Axis Axial Force	B-41
33	Left Rear Passenger Neck Moment about X Axis	B-42
34	Left Rear Passenger Neck Moment about Y Axis	B-43
35	Left Rear Passenger Neck Moment about Z Axis	B-44
36	Left Rear Passenger Neck Occipital Condyle Moment about X Axis	B-45
37	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-46
38	Left Rear Passenger Upper Rib Y-Axis Velocity	B-47
39	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-48
40	Left Rear Passenger Lower Rib Y-Axis Velocity	B-49
41	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-50
42	Left Rear Passenger Lower Spine Y-Axis Velocity	B-51
43	Left Rear Passenger Pelvis Y-Axis Acceleration	B-52
44	Left Rear Passenger Pelvis Y-Axis Velocity	B-53

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
45	Driver Head X-Axis Redundant Acceleration	B-55
46	Driver Head X-Axis Redundant Velocity	B-56
47	Driver Head Y-Axis Redundant Acceleration	B-57
48	Driver Head Y-Axis Redundant Velocity	B-58

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
49	Driver Head Z-Axis Redundant Acceleration	B-59
50	Driver Head Z-Axis Redundant Velocity	B-60
51	Driver Head Resultant Redundant Acceleration	B-61
52	Driver Upper Rib Y-Axis Redundant Acceleration	B-62
53	Driver Upper Rib Y-Axis Redundant Velocity	B-63
54	Driver Lower Rib Y-Axis Redundant Acceleration	B-64
55	Driver Lower Rib Y-Axis Redundant Velocity	B-65
56	Driver Lower Spine Y-Axis Redundant Acceleration	B-66
57	Driver Lower Spine Y-Axis Redundant Velocity	B-67
58	Driver Pelvis Y-Axis Redundant Acceleration	B-68
59	Driver Pelvis Y-Axis Redundant Velocity	B-69
60	Left Rear Passenger Head X-Axis Redundant Acceleration	B-70
61	Left Rear Passenger Head X-Axis Redundant Velocity	B-71
62	Left Rear Passenger Head Y-Axis Redundant Acceleration	B-72
63	Left Rear Passenger Head Y-Axis Redundant Velocity	B-73
64	Left Rear Passenger Head Z-Axis Redundant Acceleration	B-74
65	Left Rear Passenger Head Z-Axis Redundant Velocity	B-75
66	Left Rear Passenger Head Resultant Redundant Acceleration	B-76
67	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-77
68	Left Rear Passenger Upper Rib Y-Axis Redundant Velocity	B-78
69	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-79
70	Left Rear Passenger Lower Rib Y-Axis Redundant Velocity	B-80
71	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-81
72	Left Rear Passenger Lower Spine Y-Axis Redundant Velocity	B-82
73	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-83
74	Left Rear Passenger Pelvis Y-Axis Redundant Velocity	B-84

Table of Data Plots (Continued)
Test Vehicle Instrumentation Plots
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
75	Right Side Sill at Front Seat X-Axis Acceleration	B-86
76	Right Side Sill at Front Seat X-Axis Velocity	B-87
77	Right Side Sill at Front Seat Y-Axis Acceleration	B-88
78	Right Side Sill at Front Seat Y-Axis Velocity	B-89
79	Right Side Sill at Front Seat Z-Axis Acceleration	B-90
80	Right Side Sill at Front Seat Z-Axis Velocity	B-91
81	Right Side Sill at Front Seat Resultant Acceleration	B-92
82	Right Side Sill at Rear Seat X-Axis Acceleration	B-93
83	Right Side Sill at Rear Seat X-Axis Velocity	B-94
84	Right Side Sill at Rear Seat Y-Axis Acceleration	B-95
85	Right Side Sill at Rear Seat Y-Axis Velocity	B-96
86	Right Side Sill at Rear Seat Z-Axis Acceleration	B-97
87	Right Side Sill at Rear Seat Z-Axis Velocity	B-98
88	Right Side Sill at Rear Seat Resultant Acceleration	B-99
89	Rear Floorpan Above Axle X-Axis Acceleration	B-100
90	Rear Floorpan Above Axle X-Axis Velocity	B-101
91	Rear Floorpan Above Axle Y-Axis Acceleration	B-102
92	Rear Floorpan Above Axle Y-Axis Velocity	B-103
93	Rear Floorpan Above Axle Z-Axis Acceleration	B-104
94	Rear Floorpan Above Axle Z-Axis Velocity	B-105
95	Rear Floorpan Above Axle Resultant Acceleration	B-106
96	Left Side Sill at Front Seat Y-Axis Acceleration	B-107
97	Left Side Sill at Front Seat Y-Axis Velocity	B-108
98	Left Side Sill at Front Seat Y-Axis Displacement	B-109
99	Left Side Sill at Rear Seat Y-Axis Acceleration	B-110
100	Left Side Sill at Rear Seat Y-Axis Velocity	B-111
101	Left Side Sill at Rear Seat Y-Axis Displacement	B-112
102	Right Rear Occupant Compartment Y Axis Acceleration	B-113
103	Right Rear Occupant Compartment Y Axis Velocity	B-114

Table of Data Plots (Continued)
 Test Vehicle Instrumentation Plots (Continued)
 Acceleration Data - Filter Class 60
 Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
104	Right Rear Occupant Compartment Y Axis Displacement	B-115
105	Left Rear Door Upper Centerline Y-Axis Acceleration	B-116
106	Left Rear Door Upper Centerline Y-Axis Velocity	B-117
107	Left Rear Door Upper Centerline Y-Axis Displacement	B-118
108	Left Lower A-Post Y-Axis Acceleration	B-119
109	Left Lower A-Post Y-Axis Velocity	B-120
110	Left Middle A-Post Y-Axis Acceleration	B-121
111	Left Middle A-Post Y-Axis Velocity	B-122
112	Left Lower B-Post Y-Axis Acceleration	B-123
113	Left Lower B-Post Y-Axis Velocity	B-124
114	Left Middle B-Post Y-Axis Acceleration	B-125
115	Left Middle B-Post Y-Axis Velocity	B-126
116	Left Front Seat Track Y-Axis Acceleration	B-127
117	Left Front Seat Track Y-Axis Velocity	B-128
118	Left Rear Seat Track Y-Axis Acceleration	B-129
119	Left Rear Seat Track Y-Axis Velocity	B-130
120	Vehicle Center of Gravity X-Axis Acceleration	B-131
121	Vehicle Center of Gravity X-Axis Velocity	B-132
122	Vehicle Center of Gravity Y-Axis Acceleration	B-133
123	Vehicle Center of Gravity Y-Axis Velocity	B-134
124	Vehicle Center of Gravity Z-Axis Acceleration	B-135
125	Vehicle Center of Gravity Z-Axis Velocity	B-136
126	Vehicle Center of Gravity Resultant Acceleration	B-137

MDB Instrumentation Plots
Acceleration Data - Filter Class 60
Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
127	MDB Center of Gravity X-Axis Acceleration	B-139
128	MDB Center of Gravity X-Axis Velocity	B-140
129	MDB Center of Gravity Y-Axis Acceleration	B-141
130	MDB Center of Gravity Y-Axis Velocity	B-142
131	MDB Center of Gravity Z-Axis Acceleration	B-143
132	MDB Center of Gravity Z-Axis Velocity	B-144
133	MDB Center of Gravity Resultant Acceleration	B-145
134	MDB Left Rear X-Axis Acceleration	B-146
135	MDB Left Rear X-Axis Velocity	B-147
136	MDB Left Rear Y-Axis Acceleration	B-148
137	MDB Left Rear Y-Axis Velocity	B-149
138	MDB Right Side Contact Switch	B-150
139	MDB Left Side Contact Switch	B-151

Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
140	Driver Upper Rib Y-Axis Acceleration	B-153
141	Driver Lower Rib Y-Axis Acceleration	B-154
142	Driver Lower Spine Y-Axis Acceleration	B-155
143	Driver Pelvis Y-Axis Acceleration	B-156
144	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-157
145	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-158
146	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-159
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Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
148	Driver Upper Rib Y-Axis Redundant Acceleration	B-162
149	Driver Lower Rib Y-Axis Redundant Acceleration	B-163
150	Driver Lower Spine Y-Axis Redundant Acceleration	B-164
151	Driver Pelvis Y-Axis Redundant Acceleration	B-165
152	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-166
153	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-167
154	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-168
155	Left Rear Passenger Pelvis Y-Axis Redundant Acceleration	B-169

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

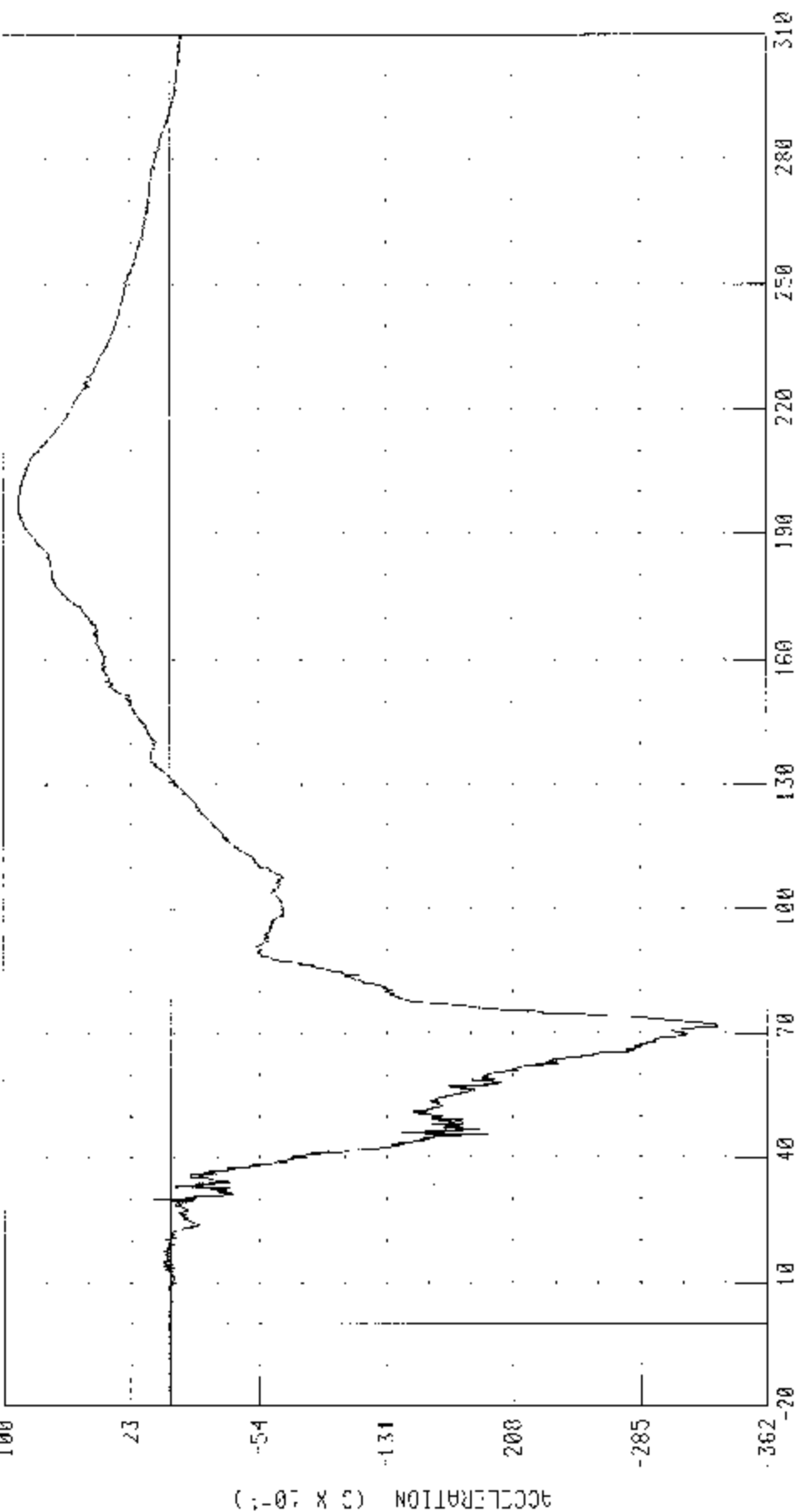
55.28 KPA 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INFO FILE 100 OF 2007 SATURN ION

DRIVER HEAD X-AXIS ACCELERATION

FRVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1

TRC INC.



CHANNEL: IEDXG1 FILTER: CH CLASS: 1000

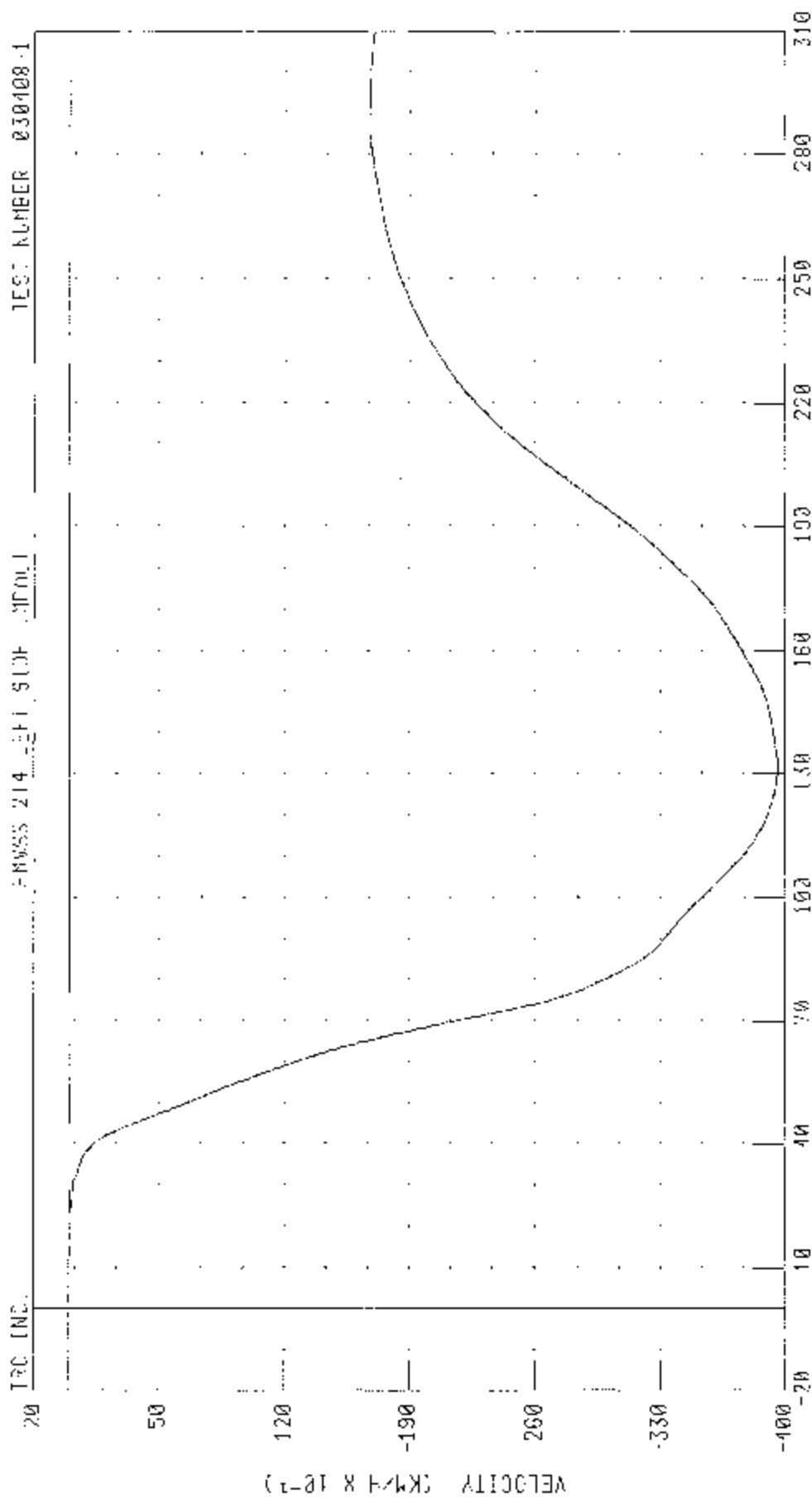
PEAK: JAI9 9.15 G @ 195.40 MS; -33.22 G @ 71.84 MS

55/28 KPII 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

DRIVER HEAD X-AXIS VELOCITY

PMWS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



TIME (MS)

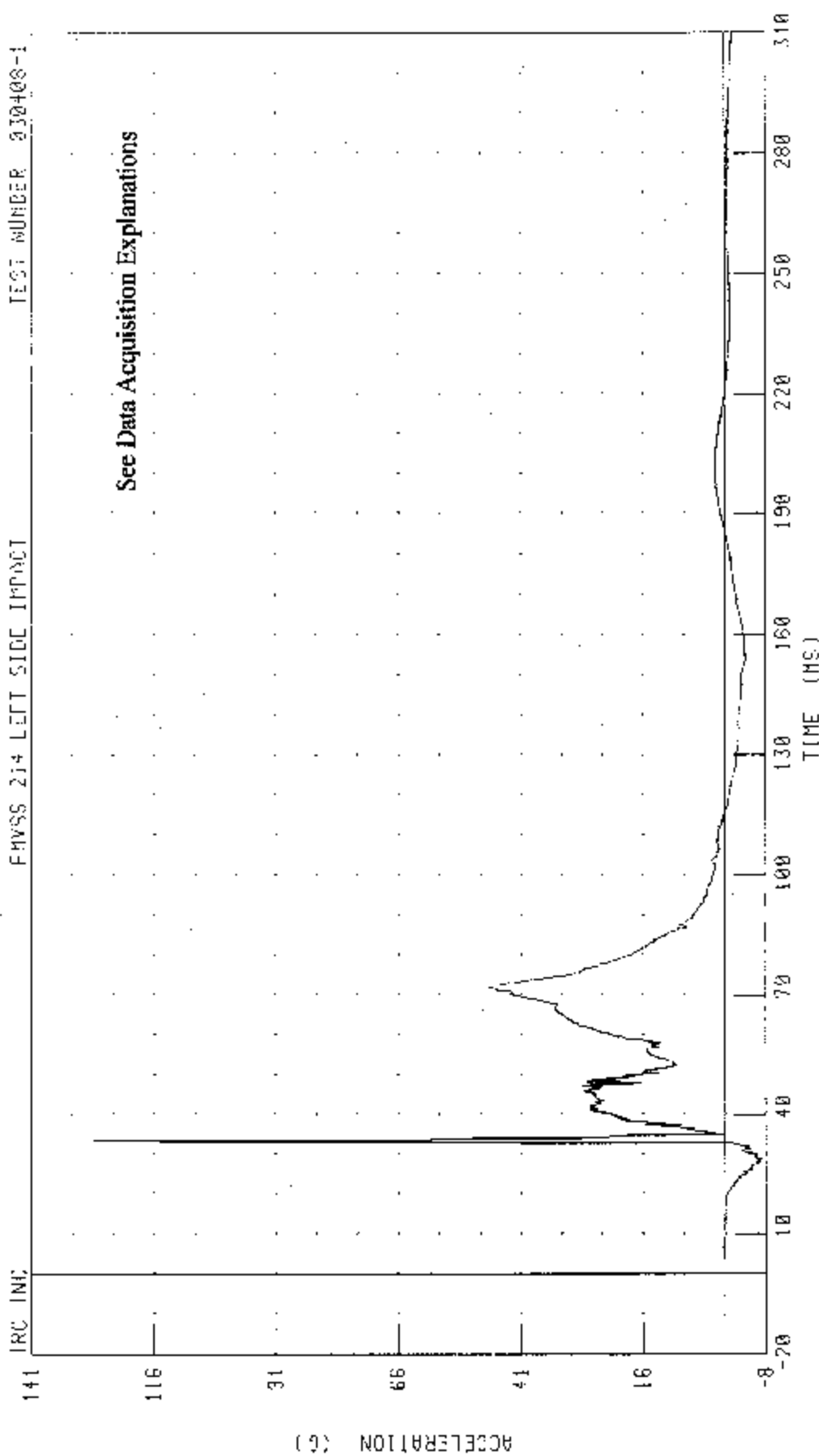
PEAK DATA V.01 XH-11 @ 29.24 MS; -39.56 KM/H @ 131.84 MS

C:INCNEL - MEDXV) FILTER CII. CLASS 100

55/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARREL) INTO LEFT SIDE OF 2003 SATURN ION

DRIVER HEAD X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1



CHANNEL HEDYC1 FILTER CH CLASS 1000

PEAK DATA: 128 MS @ 33.52 MS, -7.73 G @ 28.72 MS

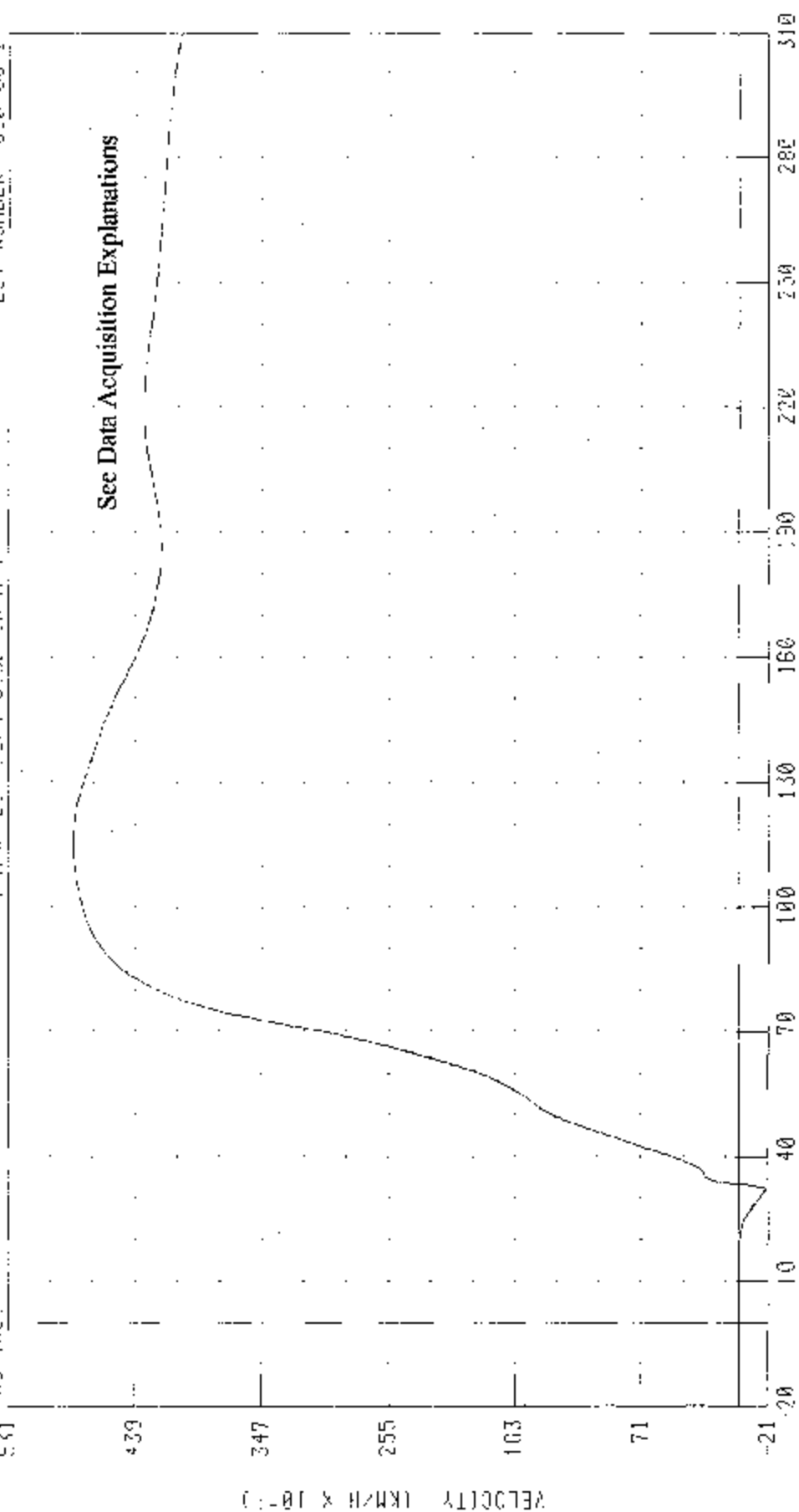
55/20 MPH 00 DEVIATED SIDE SIGNAL CONTINUING INFORMATION BARREL LEFT SIDE OF 2025 PATTERN 10H

DEVIATED SIDE SIGNAL CONTINUING INFORMATION BARREL LEFT SIDE OF 2025 PATTERN 10H

DEVIATED SIDE SIGNAL CONTINUING INFORMATION BARREL LEFT SIDE OF 2025 PATTERN 10H

TRC (NC)

TEST NUMBER 030408-1



TIME (MS)

CHANNEL HEDV1 FILTER CH CLASS 100

PEAK DATA 48.48 CH 100 115.06 MS 1.94 KM/H @ 32.08 MS

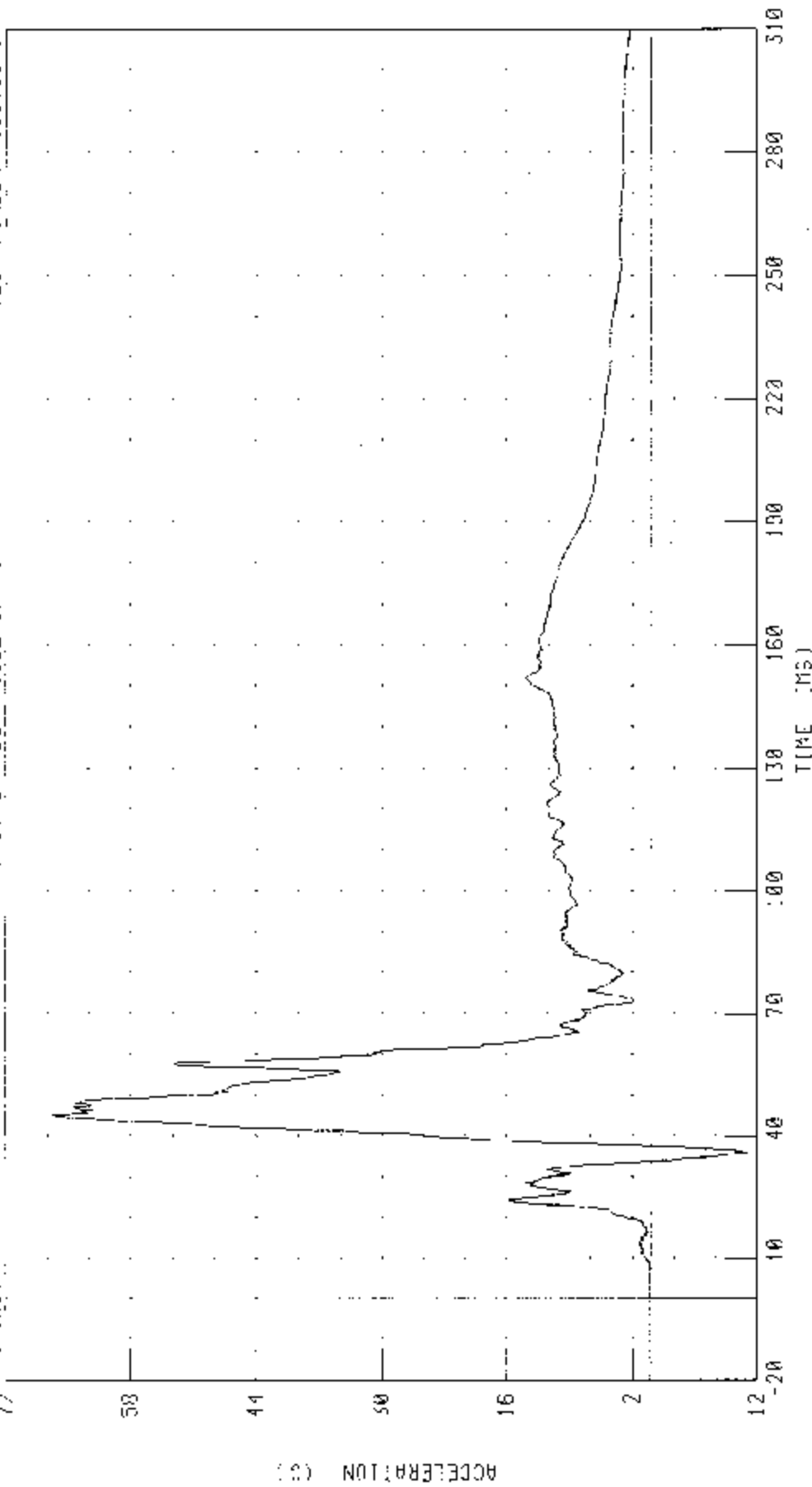
55/20 MPH 00 DEGREE SIDE IMPACT MOVING DETECTABLE BARRIER, INDOOR, SIDE OF 200' 54" HIGH 10H

DRIVER HEAD Z-AXIS ACCELERATION

INVS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1

72 TAC INC.



CHANNEL HEDZ01 FILTER CH CLASS 1000

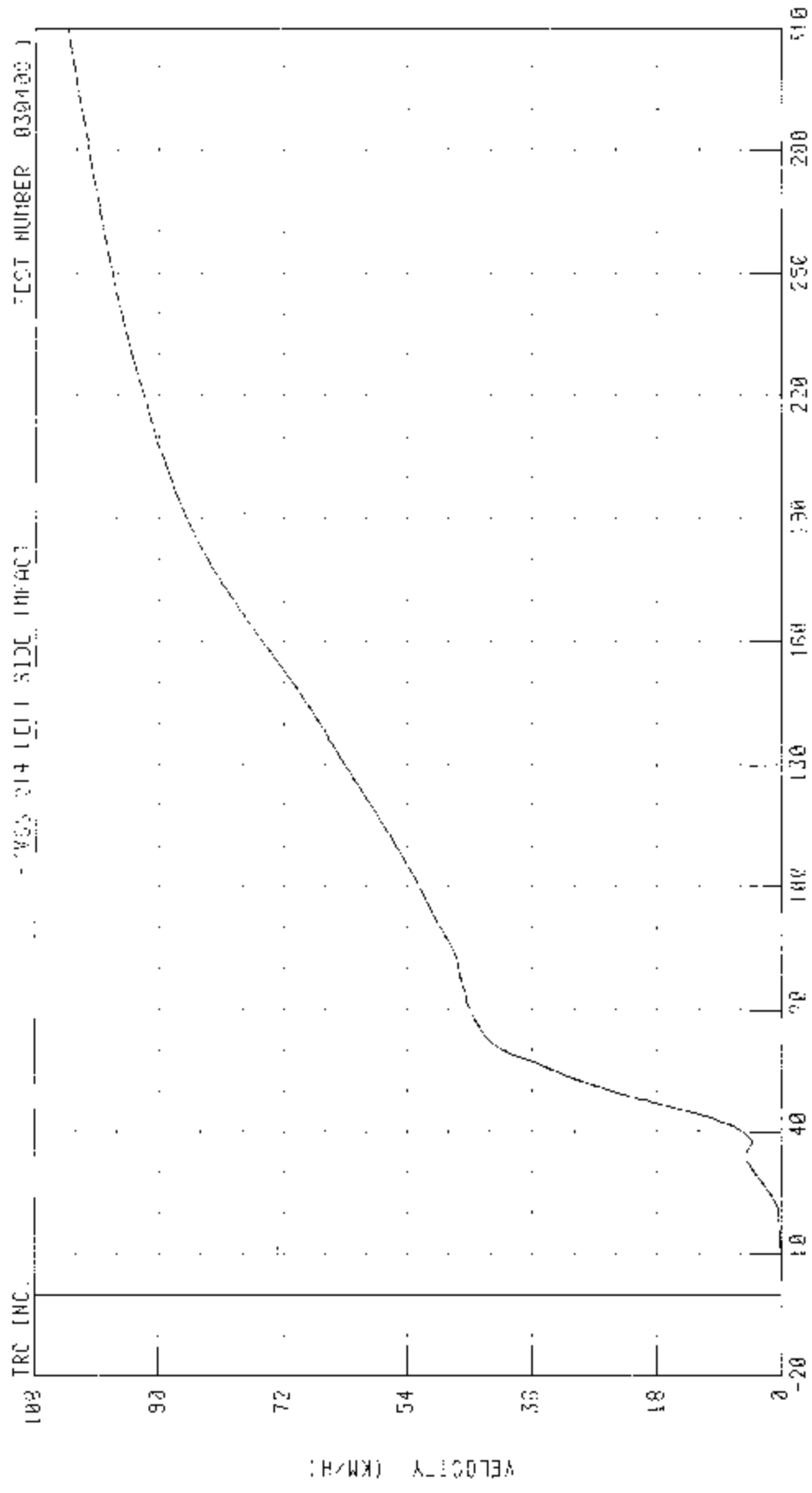
PEAK DATA: 66.75 G @ 45.20 MS; -10.96 G @ 35.84 MS

55/25 KPH 90 DEGREE SIDE IMPACT - ADVISORY INFORMATION BARRELLED INTO LEFT SIDE OF 2005 SATURN ION

DRIVER SEAT 2 AXIS VELOCITY

-XVS 014 LEFT SIDE IMPACT

TEST NUMBER 030408



TIME (MS)

CHANNEL: HEDZV FILTER: CH CLASS 120

PEAK DATA 103 15 KPH @ 310 00 MS; 0.20 KPH @ 0 40 MS

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 BATHUR 10H

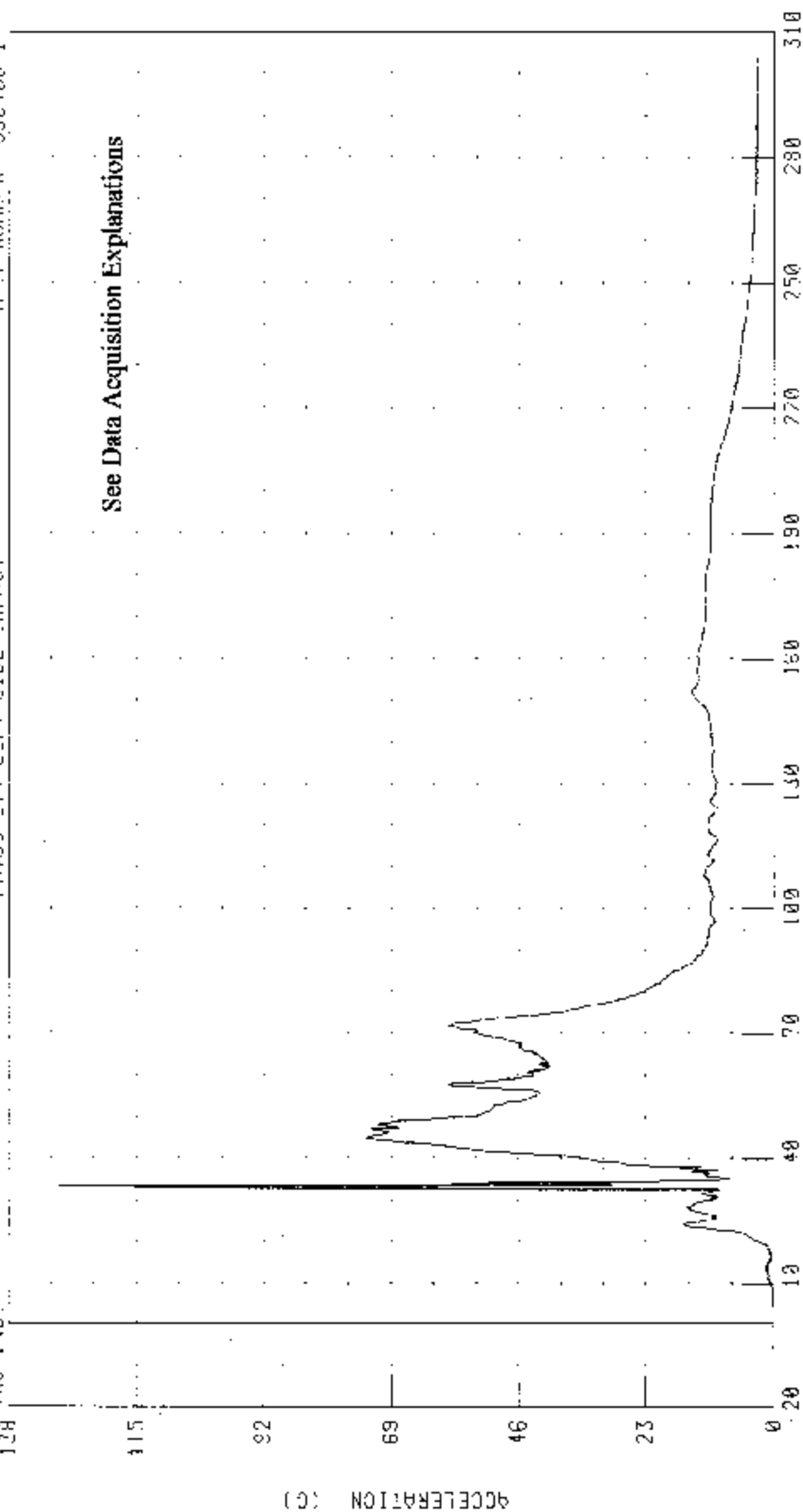
DRIVER HEAD RESULTANT ACCELERATION

TEST NUMBER 030408-1

FMVSS 214 LEFT SIDE IMPACT

IRC INC

See Data Acquisition Explanations



TIME (MS)

CHANNEL HEADG1 FILTER CH CLASS 1000

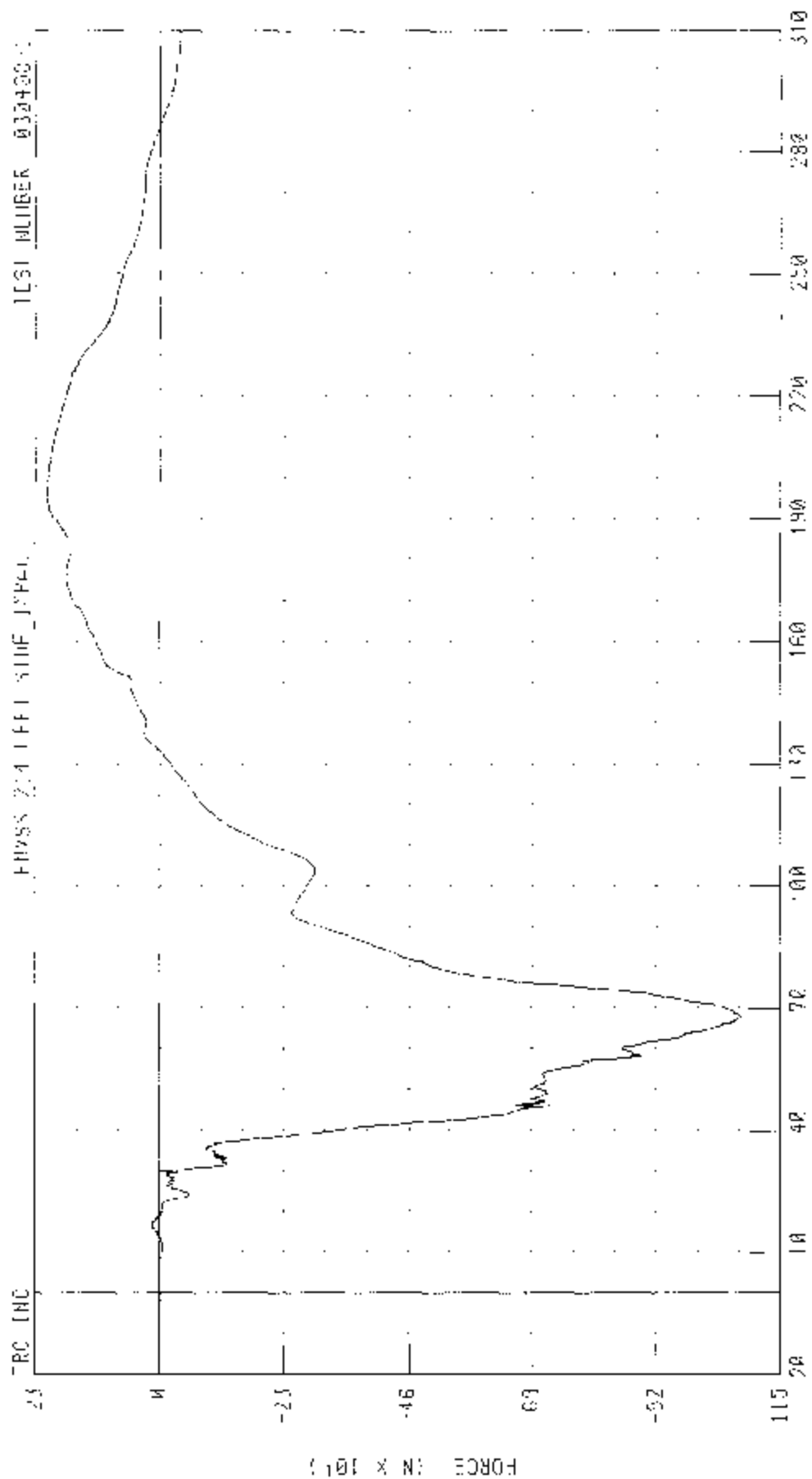
PEAK DATA: 128.93 G @ 33.52 MS. @ 01 G @ 10.00 MS

5000 RPM 90 DEGREE SLIP IMPACT CHUWING MECHANISM REPORT INTO LEFT SIDE OF 2003 SAT.PH 10A

DRIVER HEAD X AXIS BLEND FORCE

FRYSS 2.0 LEFT SIDE IMPACT

TEST NUMBER 030408



CHANNEL NCKX11 FILTER CH CLASS 1300

TIME (MS)

2003 SAT.PH 10A 030408 030408 030408

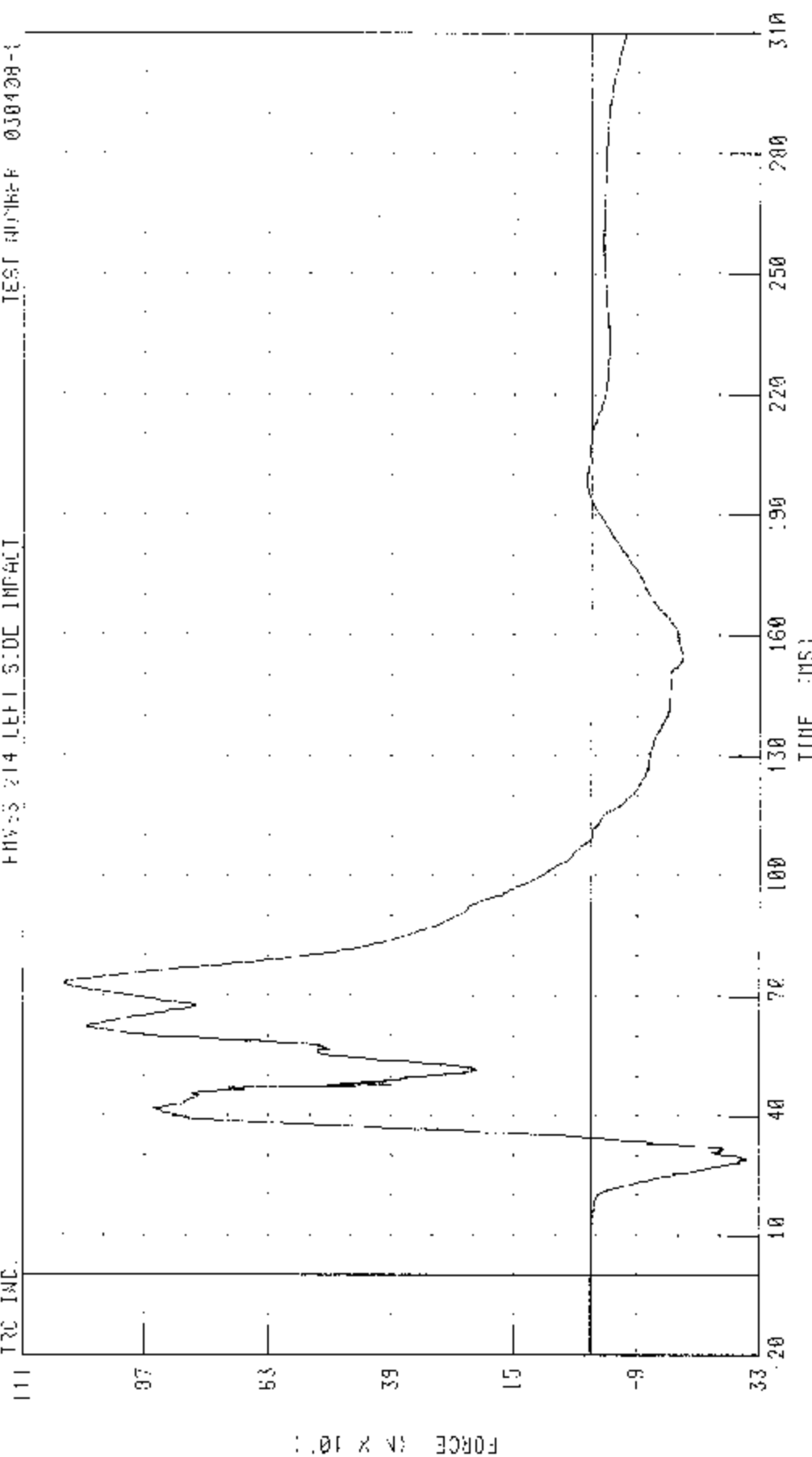
55/28 MPH SW CORNER SIDE IMPACT CRASHED DEFORMABLE BARRIER - INTO LEFT SIDE OF 2003 SECTION FOR

DRIVE-2 BACK Y-AXIS SHEAR FORCE

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



TIME (MS)

CHANNEL: MEYF1 FILTER: CH CLASS 1000

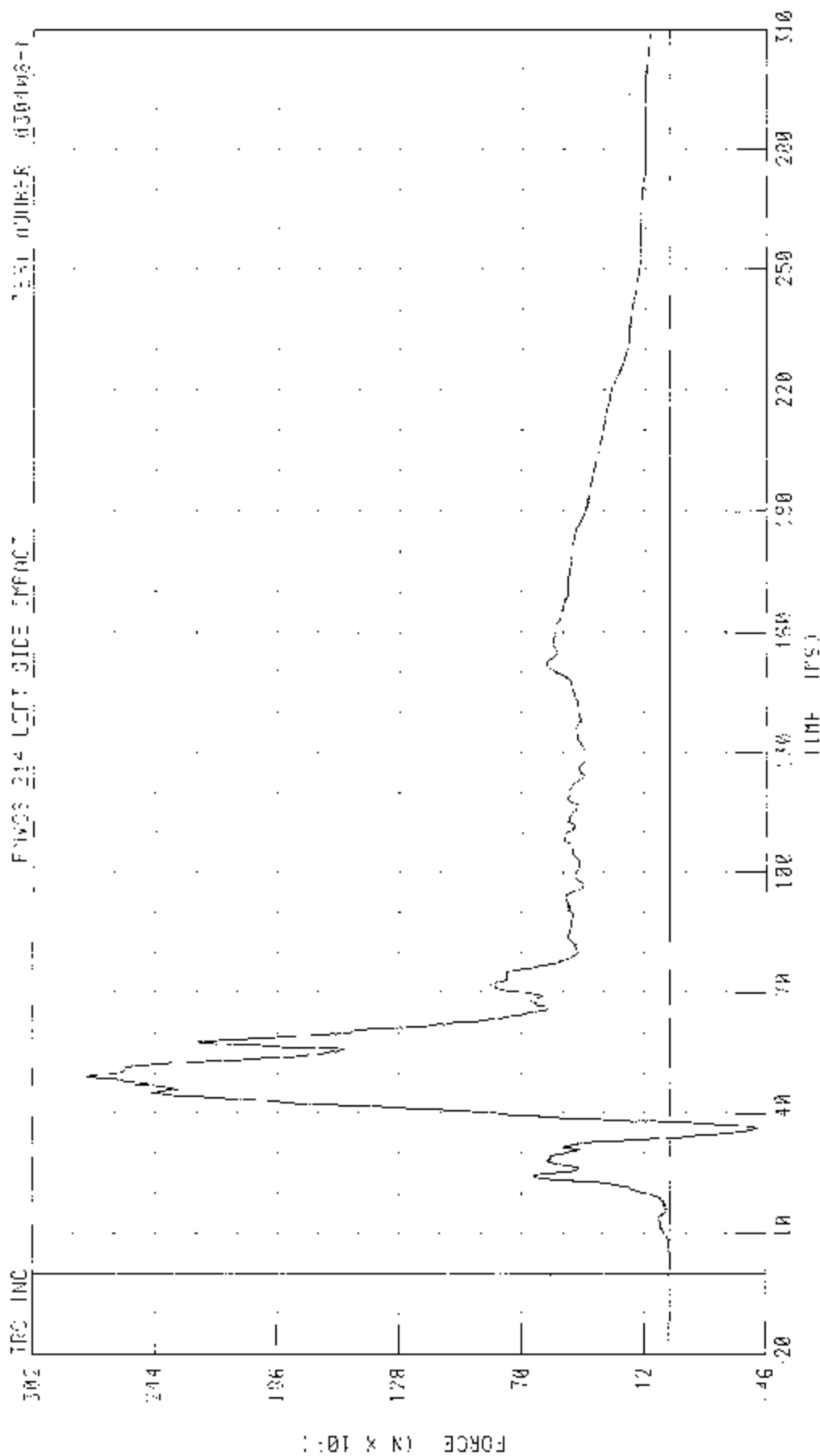
PEAK DATA: 1030 22 N 0 73 20 MS; 304.01 N 0 29 12 MS

55.28 314 90 DEGREE SIDE IMPACT IMPACT DEPARTMENT BARBERS INTO LEFT SIDE OF 2007 COLLAP 10N

CRICK 1012 / 1013 1014 1015 1016 1017

FW28 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



CHANNEL: NEKZF1 FILTER: CH CROSS: 1000

TIME (ms)

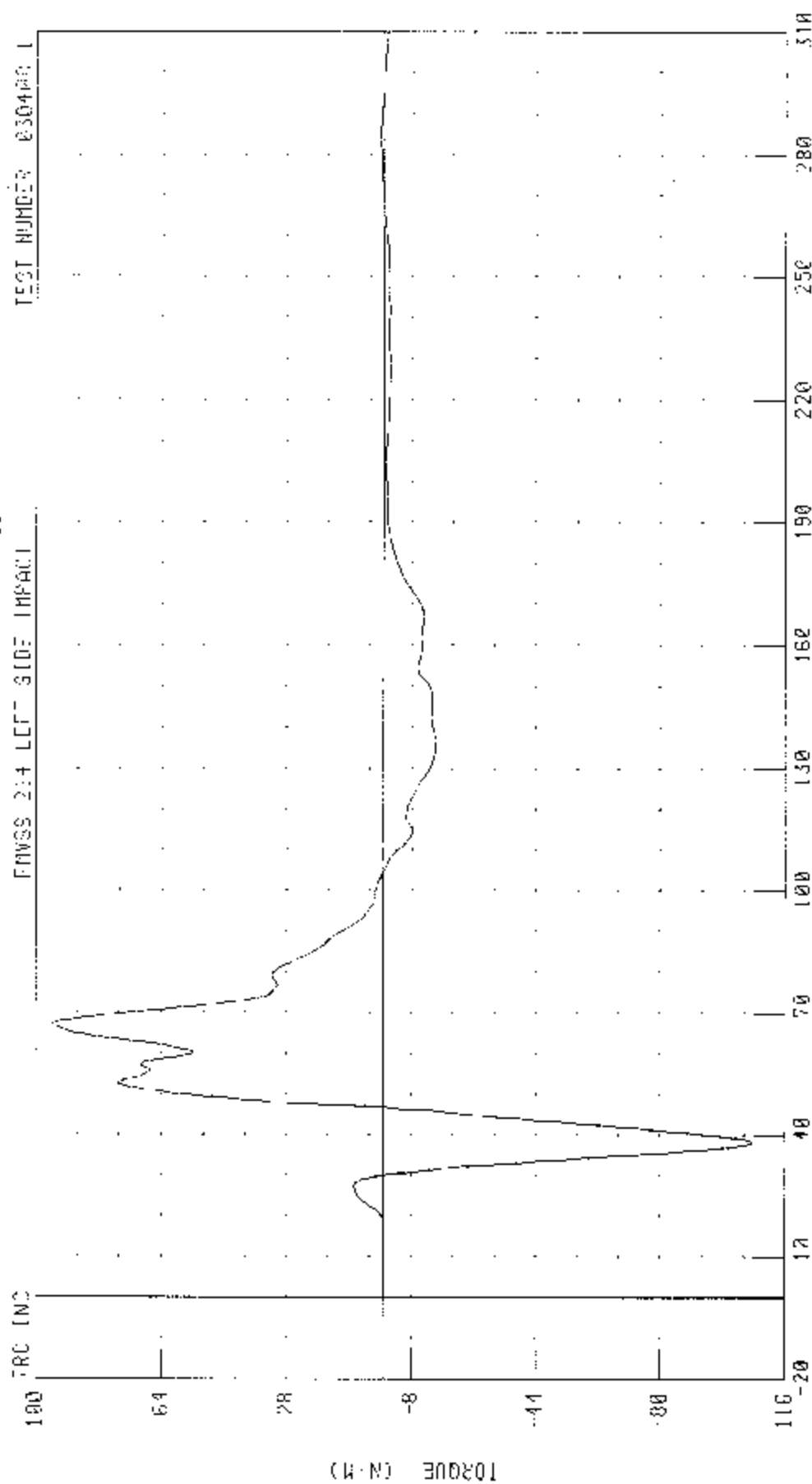
PLAK DEIA 2700 55 1 0 49.28 MS; -425 55 1 0 36 18 15

55.20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ILM

DRIVER NECK MOMENT ABOUT X AXIS

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1



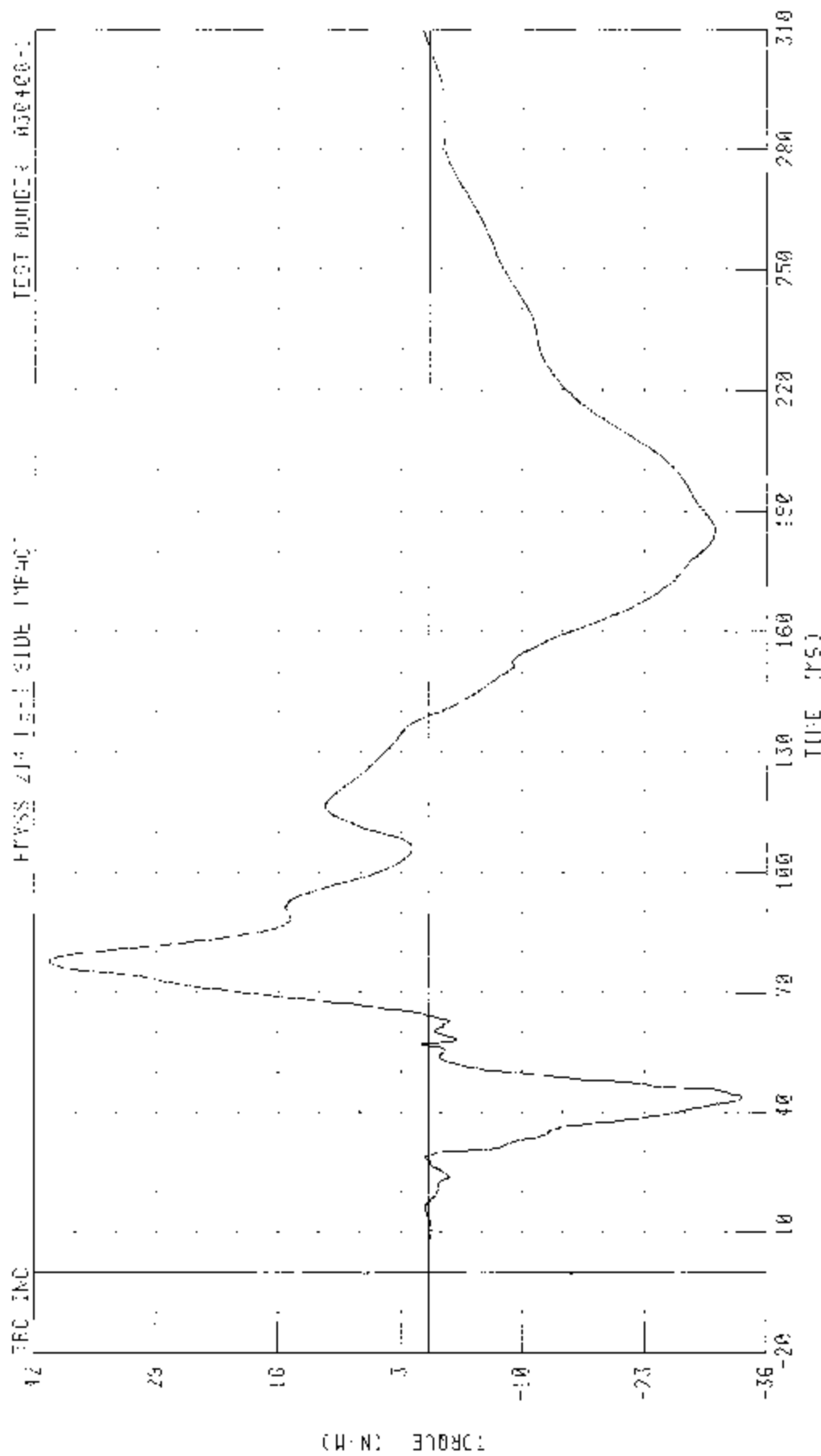
CHANNEL: NEKX11 FILTER: CH. CLASS: 600

TIME: 1MS

PEAK DATA: 55.20 N M @ 67.36 MS, -10E 38 N M @ 38.52 MS

55/28 KPH 30 STORED SIDE IMPACT (MOVING OFFSHORE) BARRELS 1775 LEFT SIDE OF 2000 SOUTH 100

DEVELOP REEF HEIGHT ABOUT Y AXIS



TIME (PS)

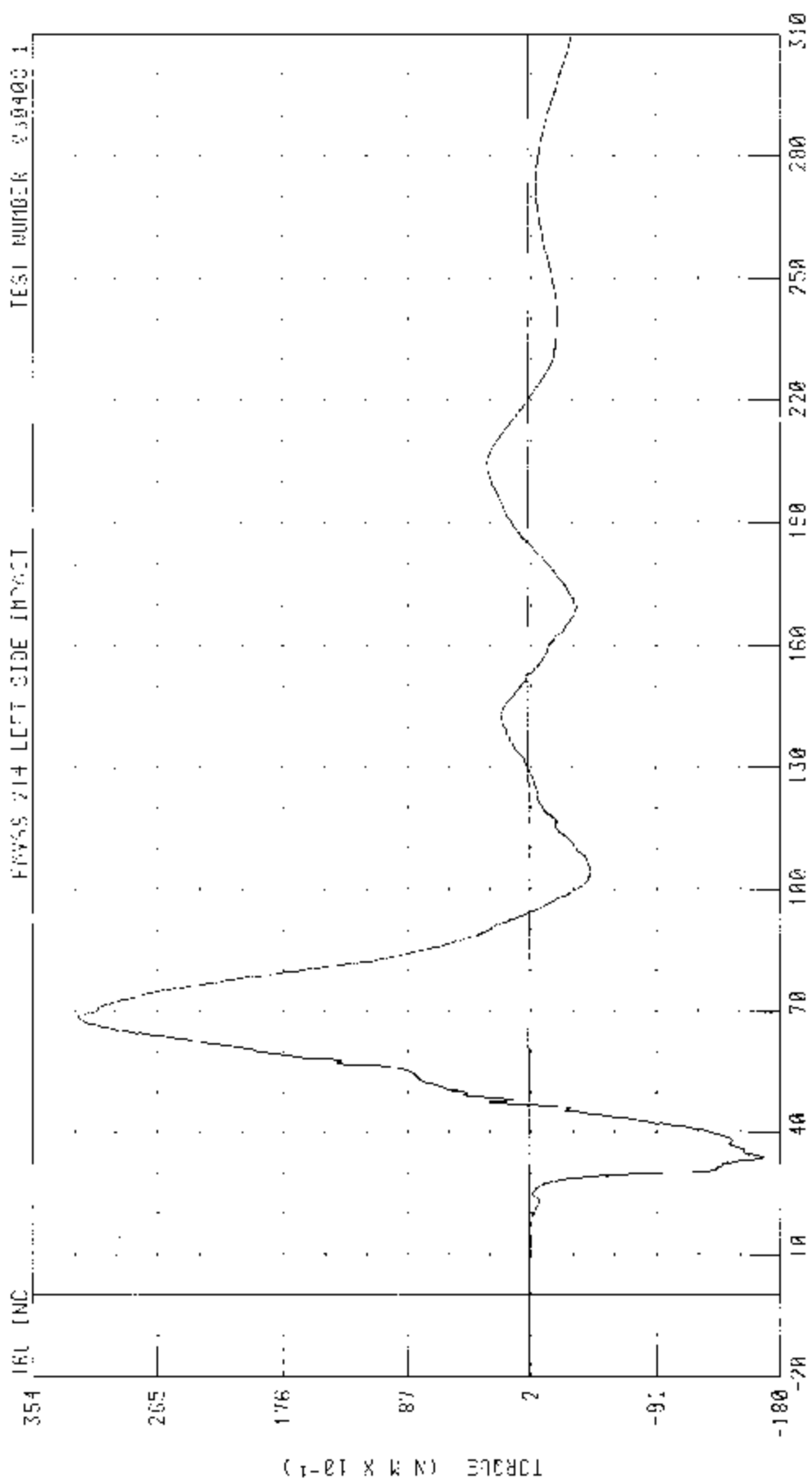
CHUNK1 - NEKYH1 FILTER: C-1 CLASS: 600

PEAK DATA 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SAUBER 100

DRIVER SEAT MOMENT ABOUT Z AXIS

FMVSS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1



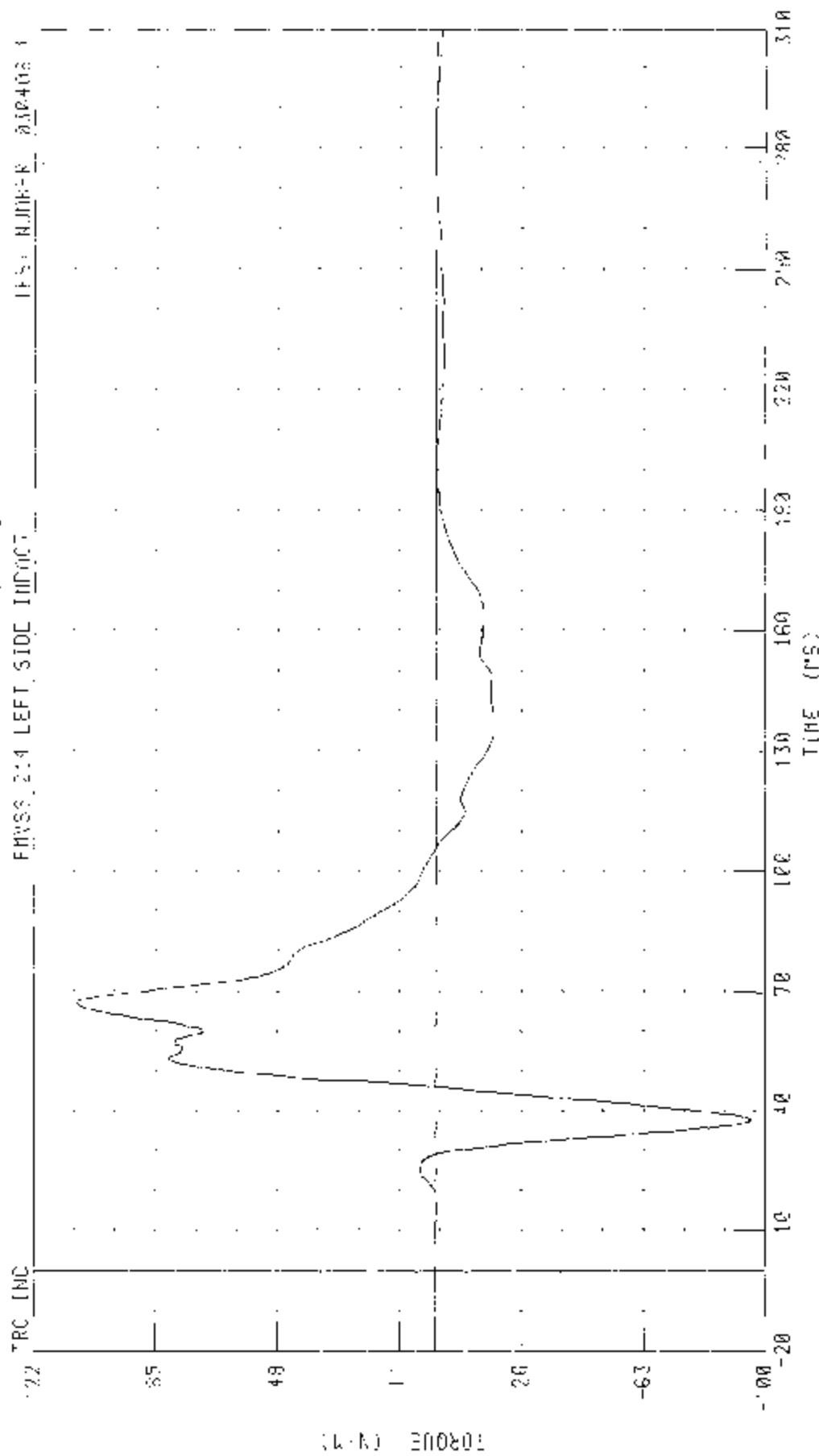
TIME (MS)

CHANNEL: NEKZM1 FILTER: CHL CLASS 600

PEAK DATA 32.15 N M @ 68.55 MS, -16.79 N M @ 33.92 MS

55/28 KPII 50 DEGREE SIDE IMPACT INVOLVING REFLECTORLESS PARTICLES 1x10 LEFT SIDE OF 1003 SP-1000 IN

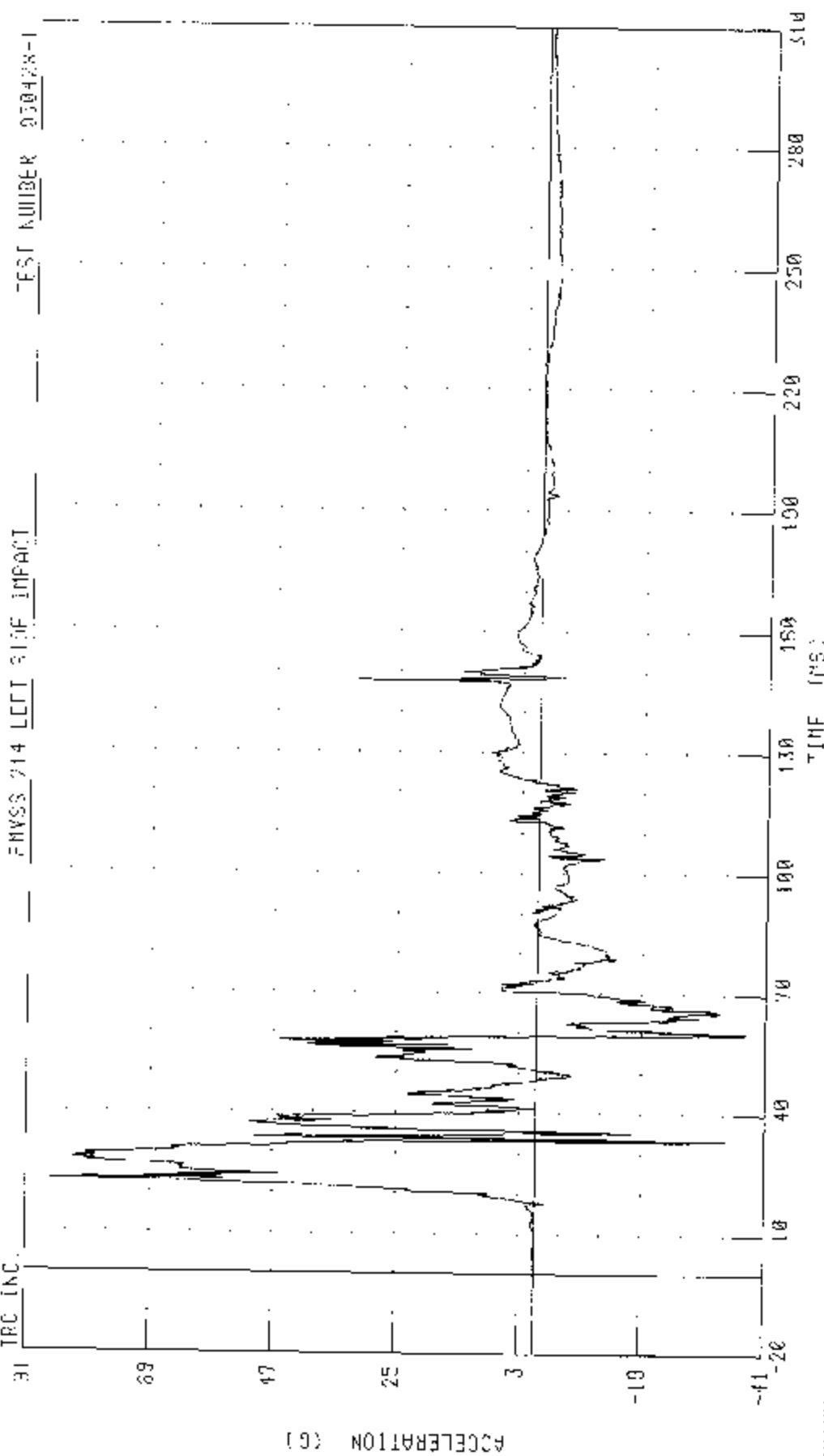
DRIVER MECH OCCUPANT 40 CONDUCTOR MOMENT 4800 X AXIS



CHANNEL 1 NK0001 FILTER CH CLASS 000

55/20 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT LANE OF 2003 SATURN ION

DRIVER UPPER RIB 2-AXIS ACCELERATION



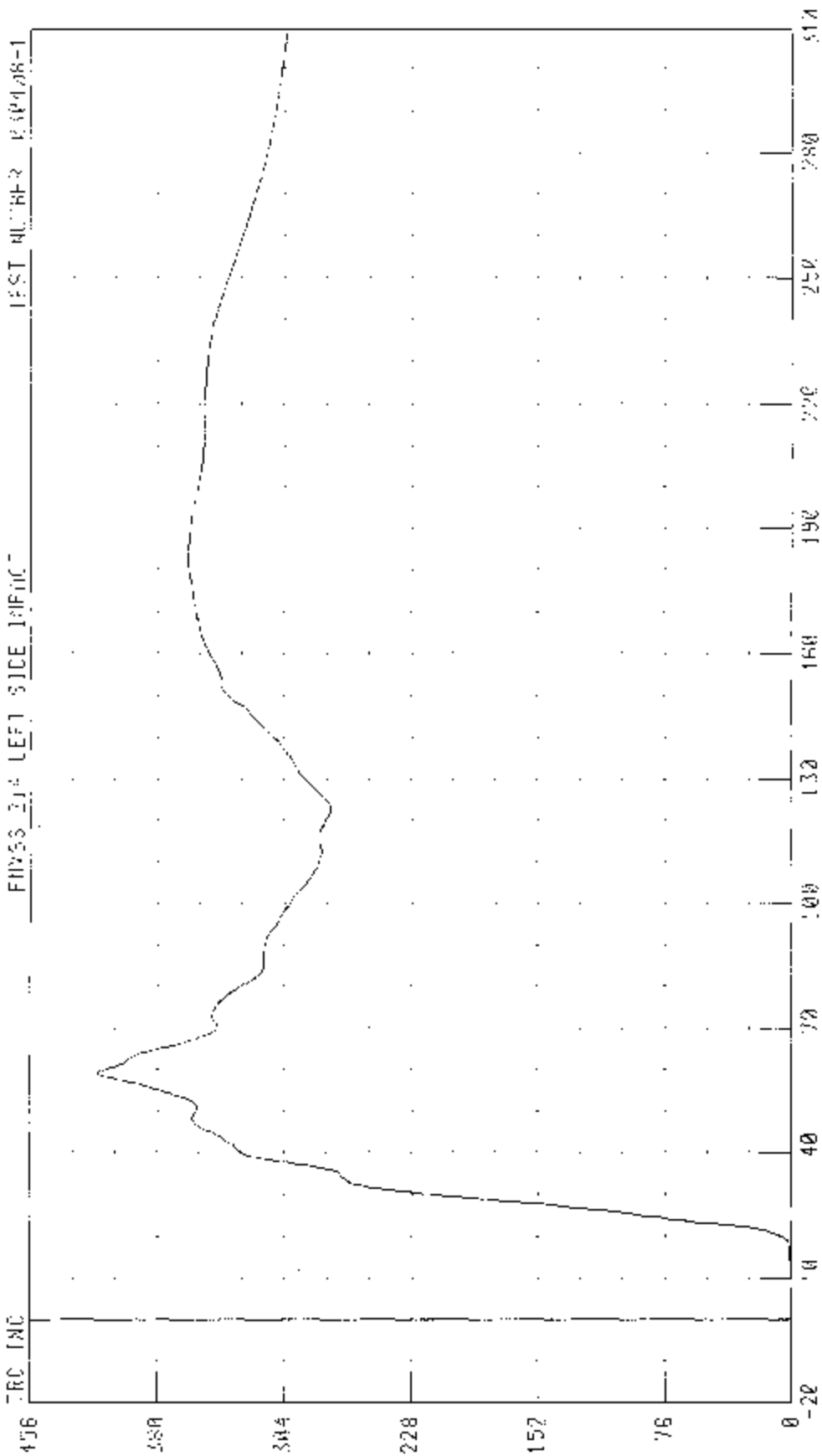
CHANNEL: LURYC1 FILTER: CH CLASS 1000

PERK DATA 86 79 0 23 12 MS, -37.39 G @ 60 16 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF MODS SAMPLE 100

DRIVER UPPER RIB 3 AXIS VELOCITY

FINISH 2nd LEFT SIDE IMPACT



VELOCITY (KPH X 10-1)

TIME (MS)

PEAK DATA 11.00 KPH 3 50 20 MS, 0 00 KPH 3 3.15 MS

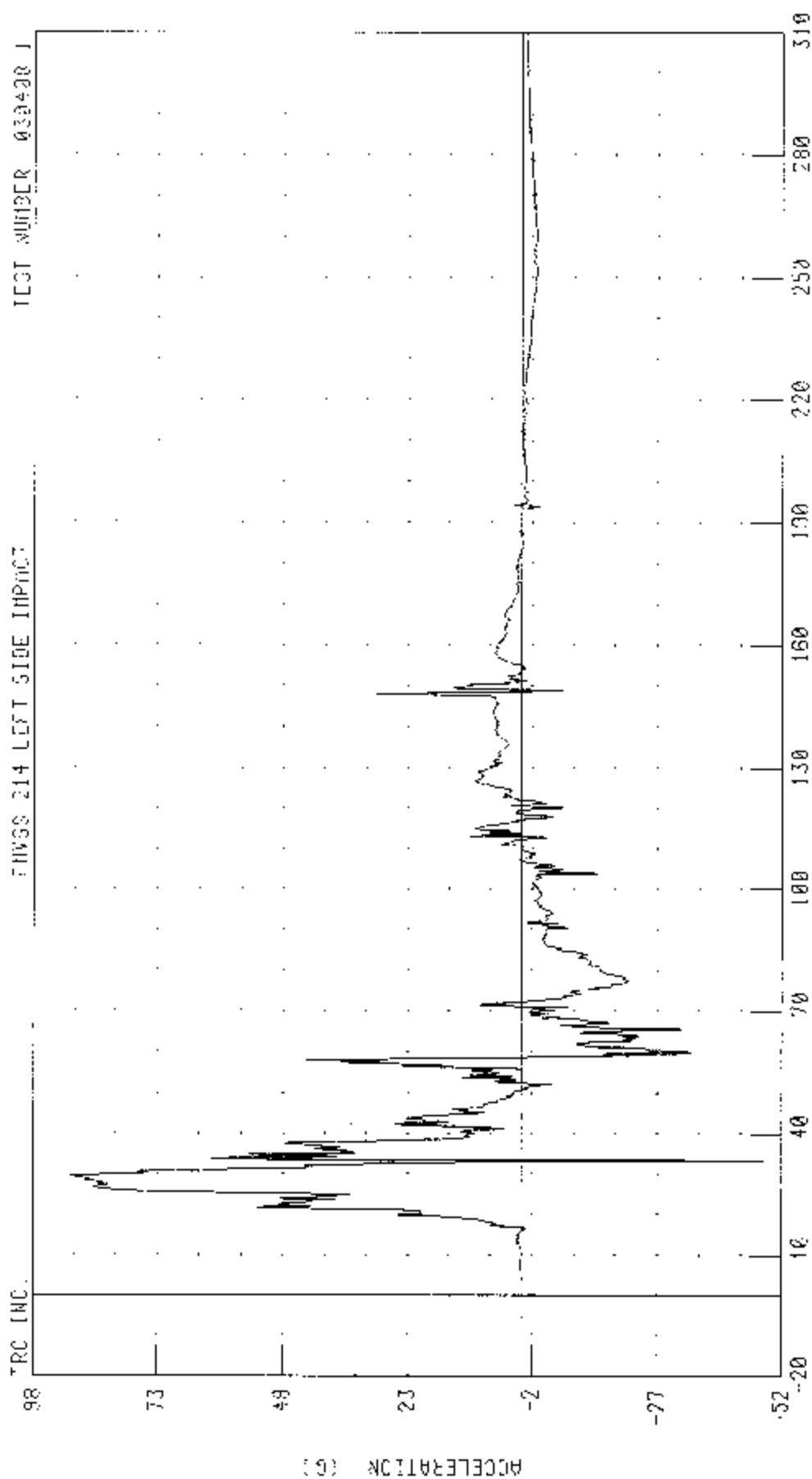
CHANNEL: LURYV1 FILTER: CH CLASS 100

55.28 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARREL INTO LEFT SIDE OF 2003 SATURN (IN)

DRIVER LOWER RIB Y-AXIS ACCELERATION

TEST NUMBER 030408

THISS 214 LEFT SIDE IMPACT



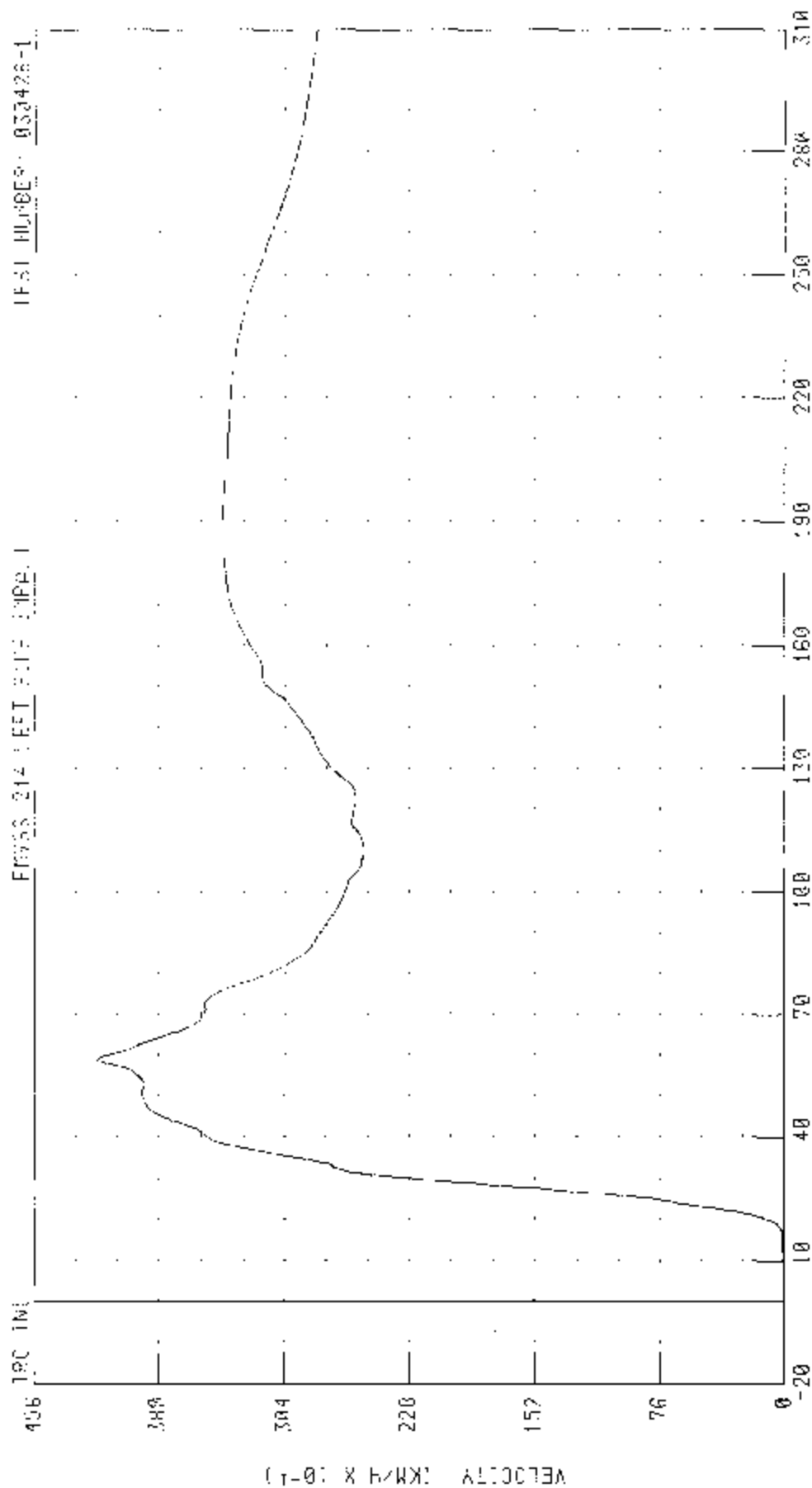
CHANNEL: ELRYG1 FILTER: CH CLASS 1000 PEAK UA-A 90.65 G @ 29.60 MS; -48 12 G @ 33.28 MS

55/20 40-50 GEORGE SIDE IMPACT MOVING OBSERVABLE SPARKS: INITIAL 5000 00 0000 SATUR 10H

DRIVER LOWER RIG Y AXIS VELOCITY

FRAMES 214 1000000000

IFSI NUMBER 030426-1

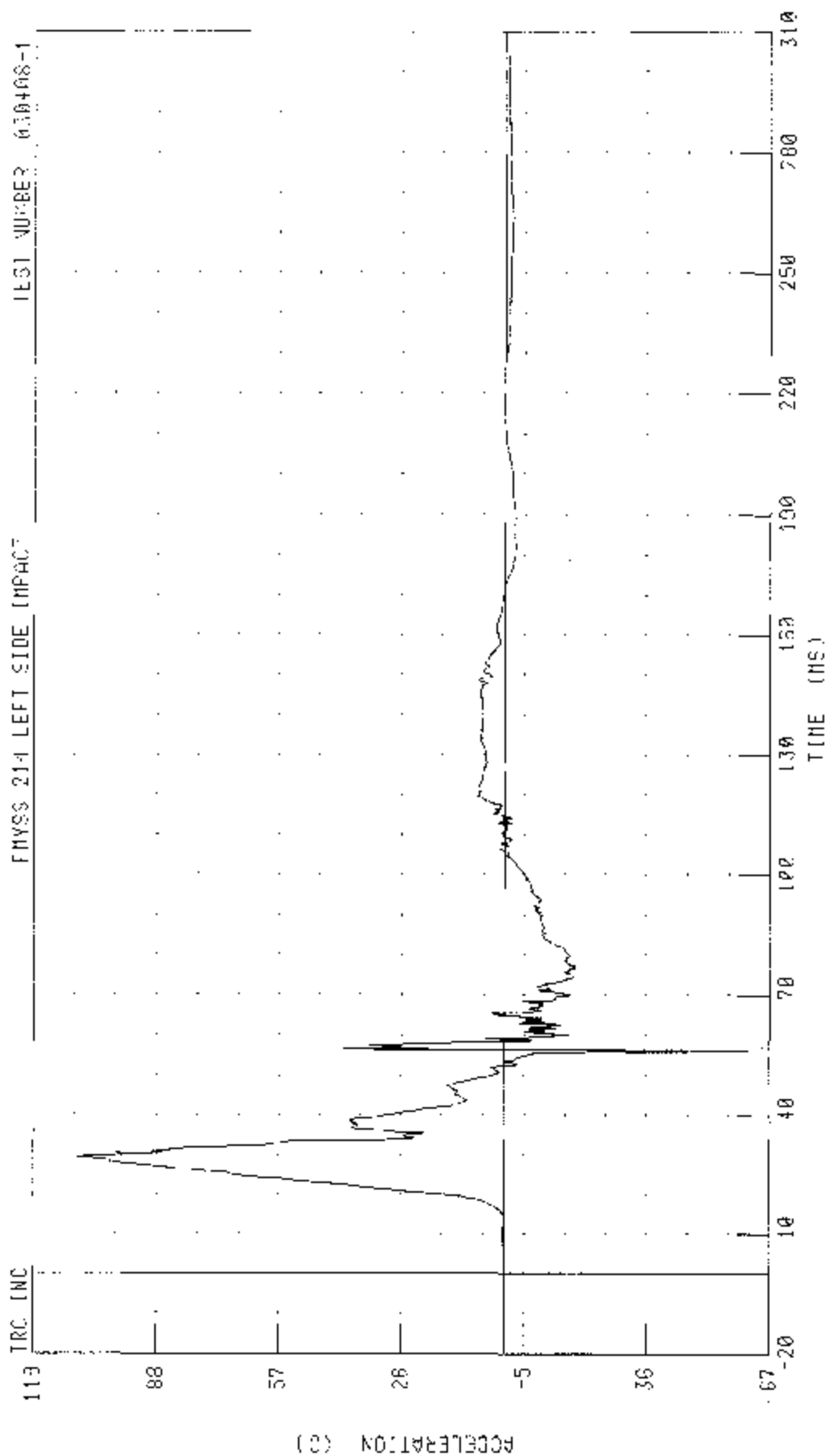


TIME (MS)

CHANNEL LLRYV1 FILTER: CH. CLASS 100

PEAK DATA 5: 75 KPH 5 58 80 US. 8 00 KPH 8 1 80 US

55.28 KPH 90 DEGREE SID- IMPACT MOVING DEFORMABLE BARRIER) INTO THE SIDE OF 2003 SATURN ION
 DRIVER LOWER SPINE Y-AXIS ACCELERATION

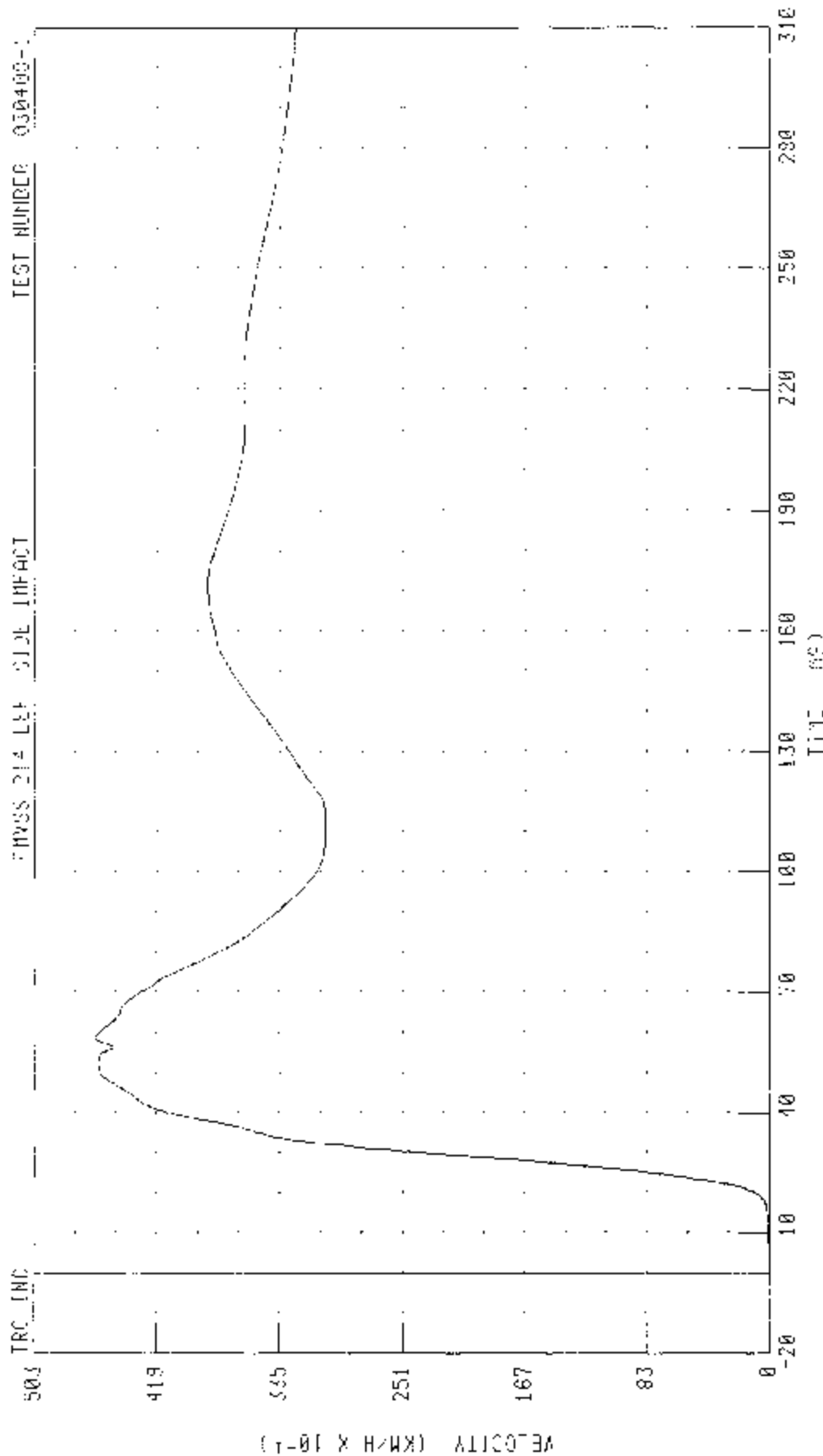


CHANNEL T12Y61 FILTER: CIL CLASS 1000

PEAK DATA: 127.75 G @ 20.52 MS; -51.67 G @ 56.16 MS

55.28 KPH 90 DEGRS- SLIP IMPACT MOVING DETECTABLE ENERGY MID LEFT SIDE OF 2003 SATURN TM

DRIVER LOWER SPINE Y-AXIS VELOCITY



THRUSS DIA LEFT SIDE IMPACT

TEST NUMBER 030408-1

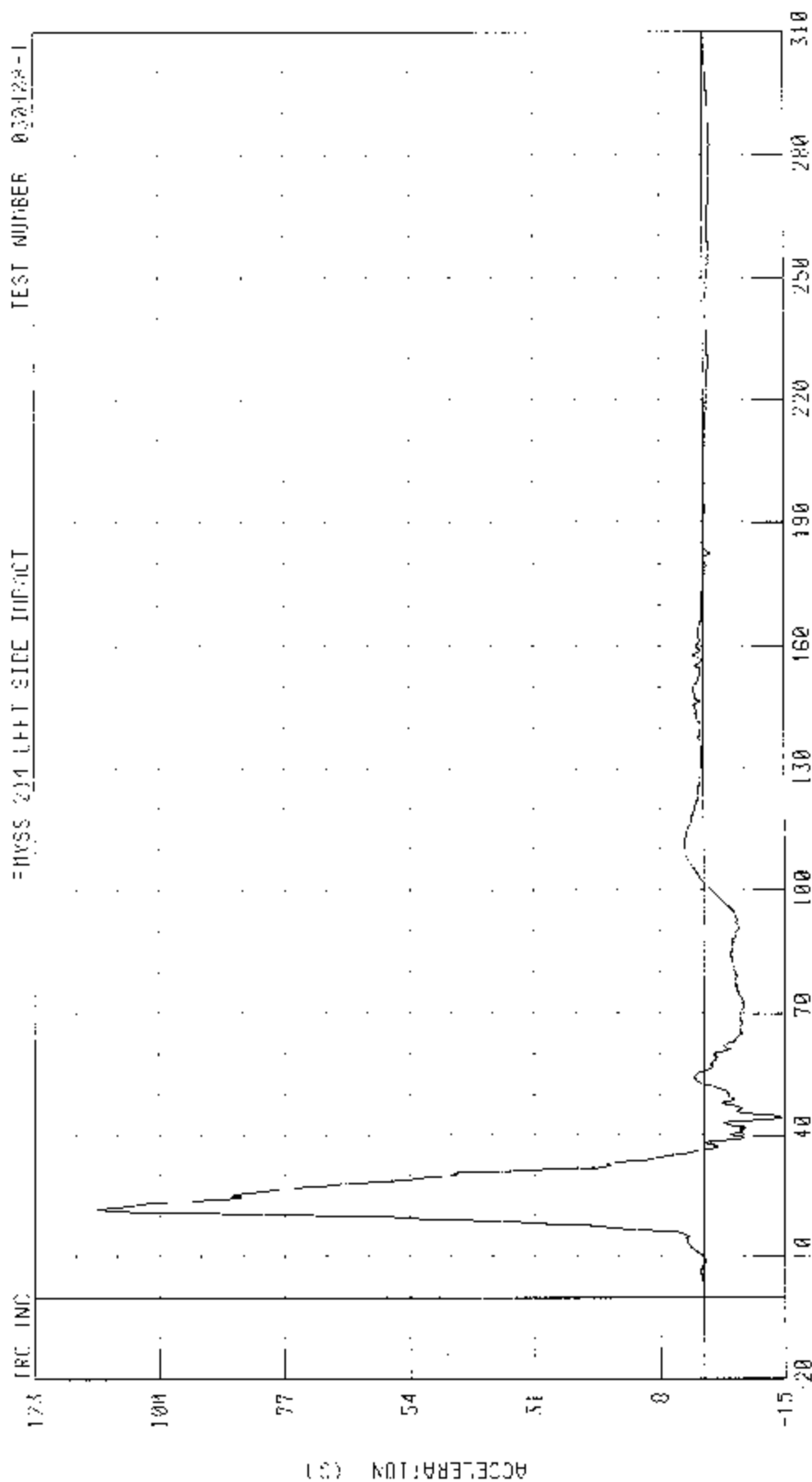
CHANNEL: T12YV1 FILTER: CH CLASS: 160

PLCK: 1010 40 70 KM/H @ 58 80 MS, 0 00 KM/H @ 0.00 MS

55/28 MPH 24 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2000 SAAB 900

DRIVER PELVIS X AXIS ACCELERATION

HYSS 204 LEFT SIDE IMPACT TEST NUMBER 002128-1



CHANNEL: PEY61 FILTER CH. CLASS 1000

TIME 1'S:

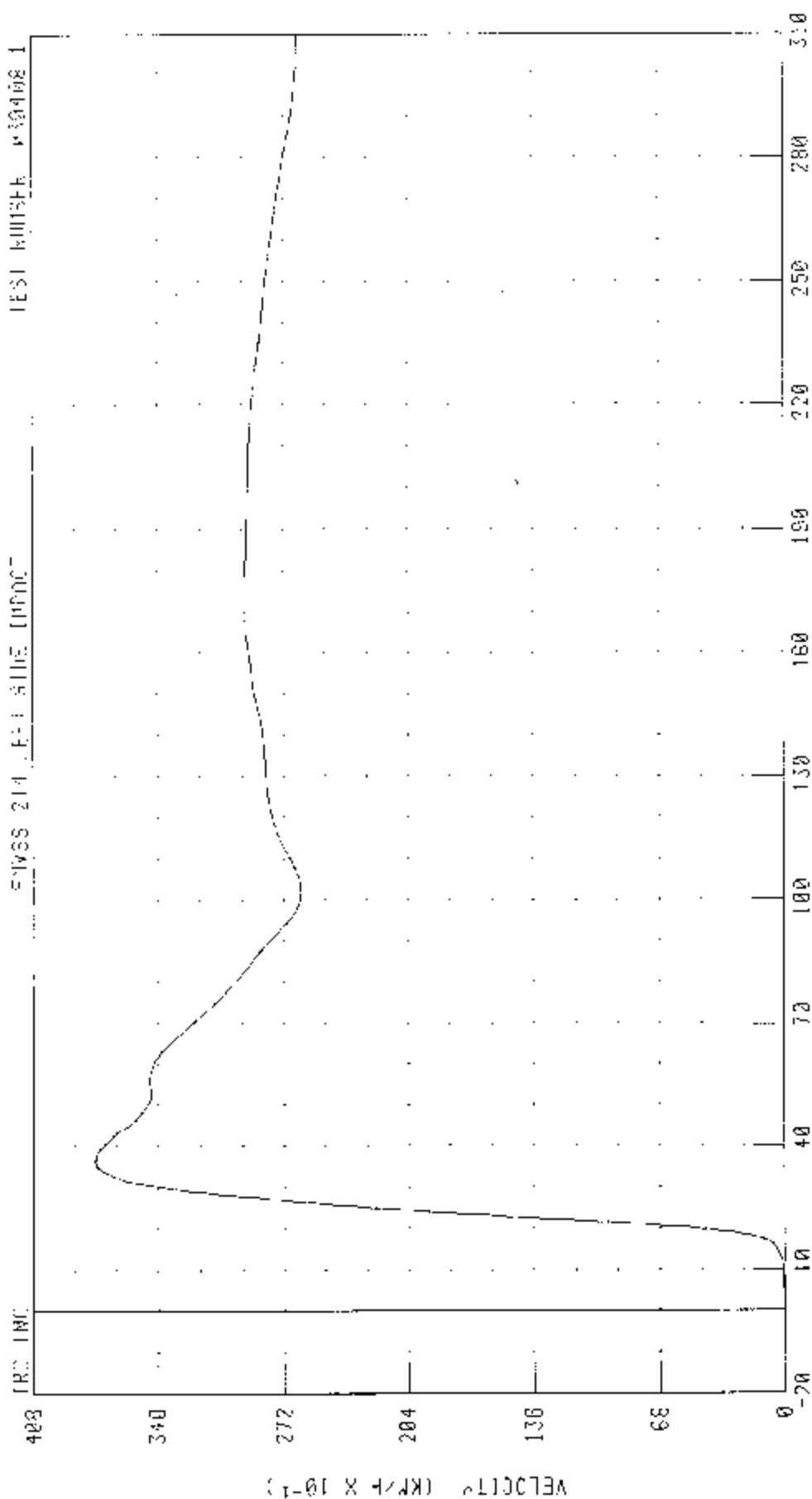
PEAK DATA: 1.1 53 0 0 21 76 MS; -14 18 G @ 44 15 MS

55-28 KPA 30 DEGRT GIFF 11P20 1 MOVING DEFORMABLE BARRETER INTO LEFT SIDE OF 200X 500X24 13A

32.8HR PELVIS X AXIS VELOCITY

SVSS 214 .F-1 3115 IMPACT

TEST NUMBER 030408 1



VELOCITY (KPA X 10⁻¹)

TIME (MS)

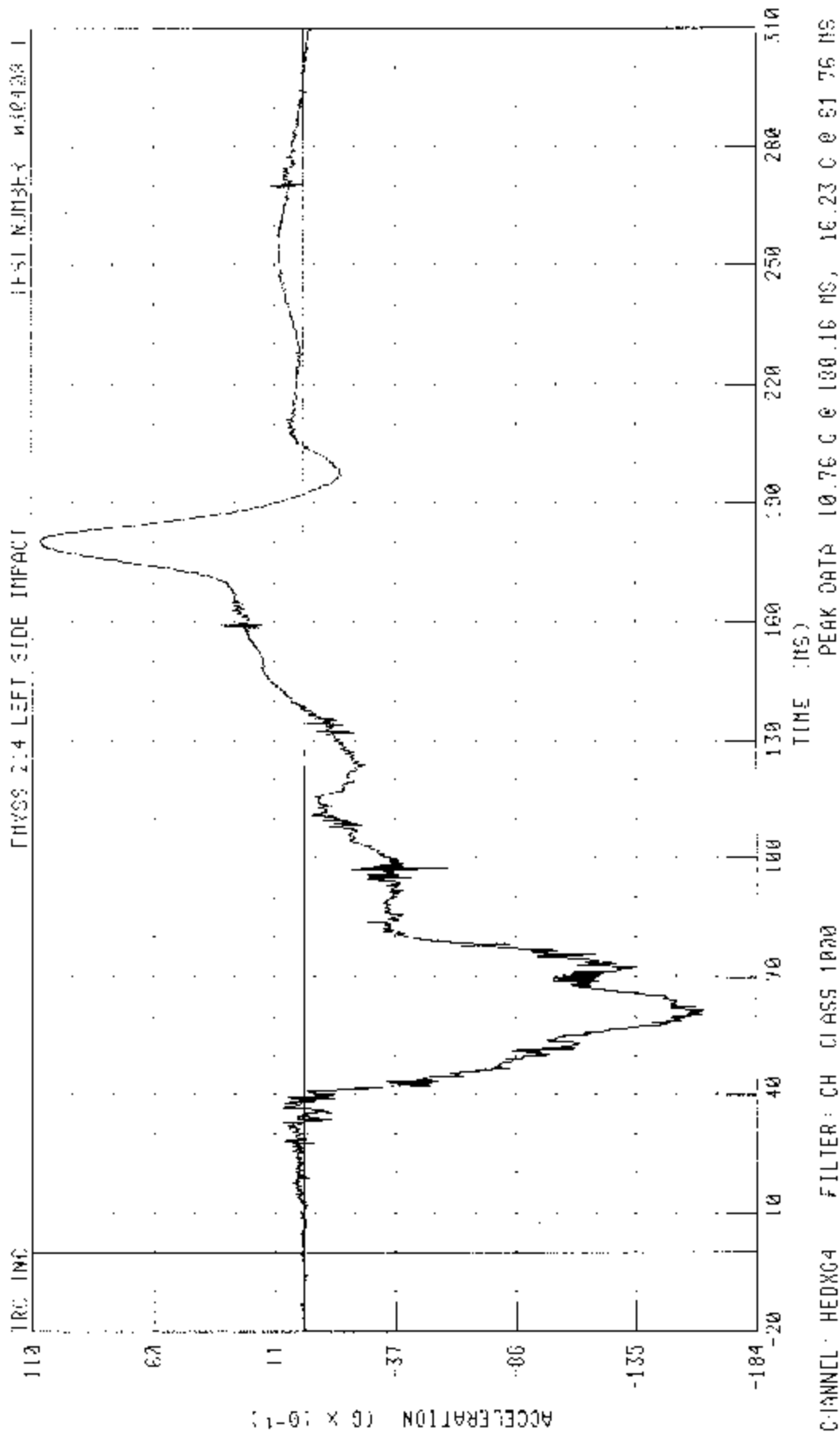
CHANNEL: PEVYV1

FILTER CH C: NSS 180

PLAY UNIT 57 59 KPA/H 0 35 32 MS 0 00 KII/II 0 0 24 MS

55/26 KFH 90 DEGREE SIDE IMPACT SHOWING THERMAL BARRIER IN10 PFI SIDE OF 2003 SALLER 10K

LEFT REAR PASSENGER HEAD X AXIS ACCELERATION



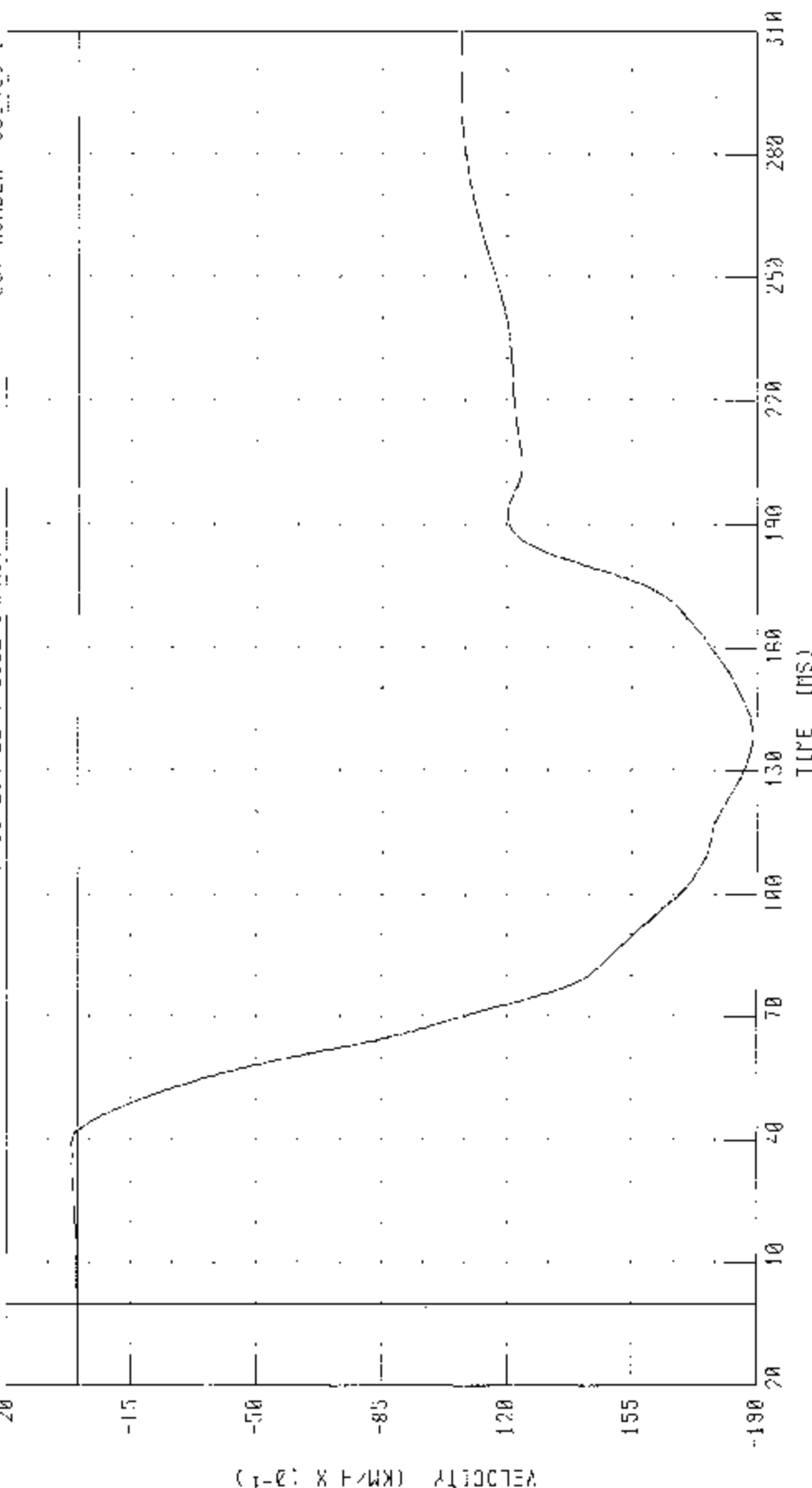
55/28 4PH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER HEAD 4-AXIS VELOCITY

IRC INC

FRVSS 214 LEFT SIDE IMPACT

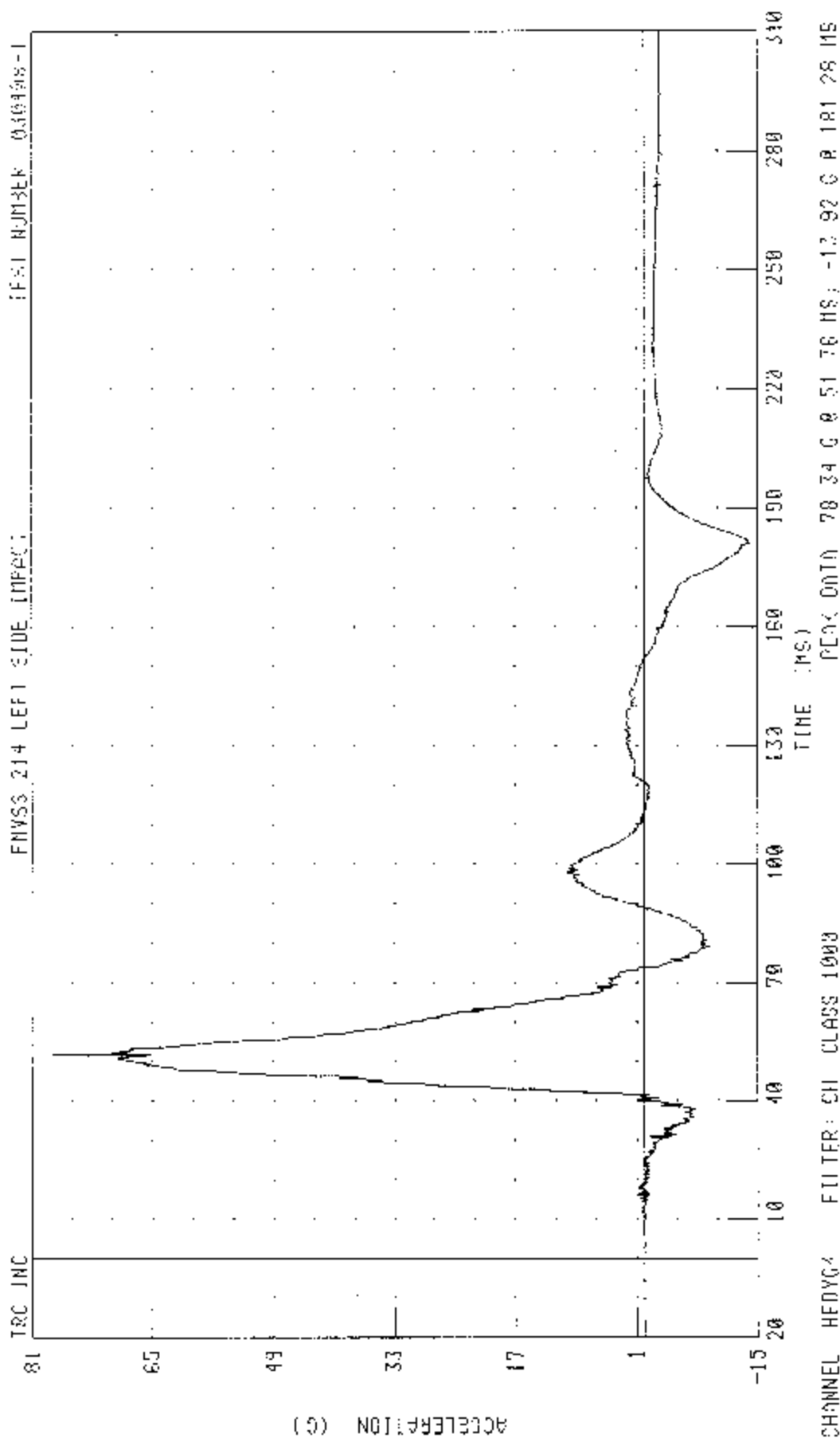
TEST NUMBER: 030408-1



PEAK DATA: 0 18 KM/H @ 33 20 MS; -18 20 KM/H @ 130.32 MS

CHANNEL HEADV4 FILTER: CH CLASS 100

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BAR) INTO LEFT SIDE OF 2003 SATURN (CV
 LEFT REAR PASSENGER SEAT Y AXIS ACCELERATION



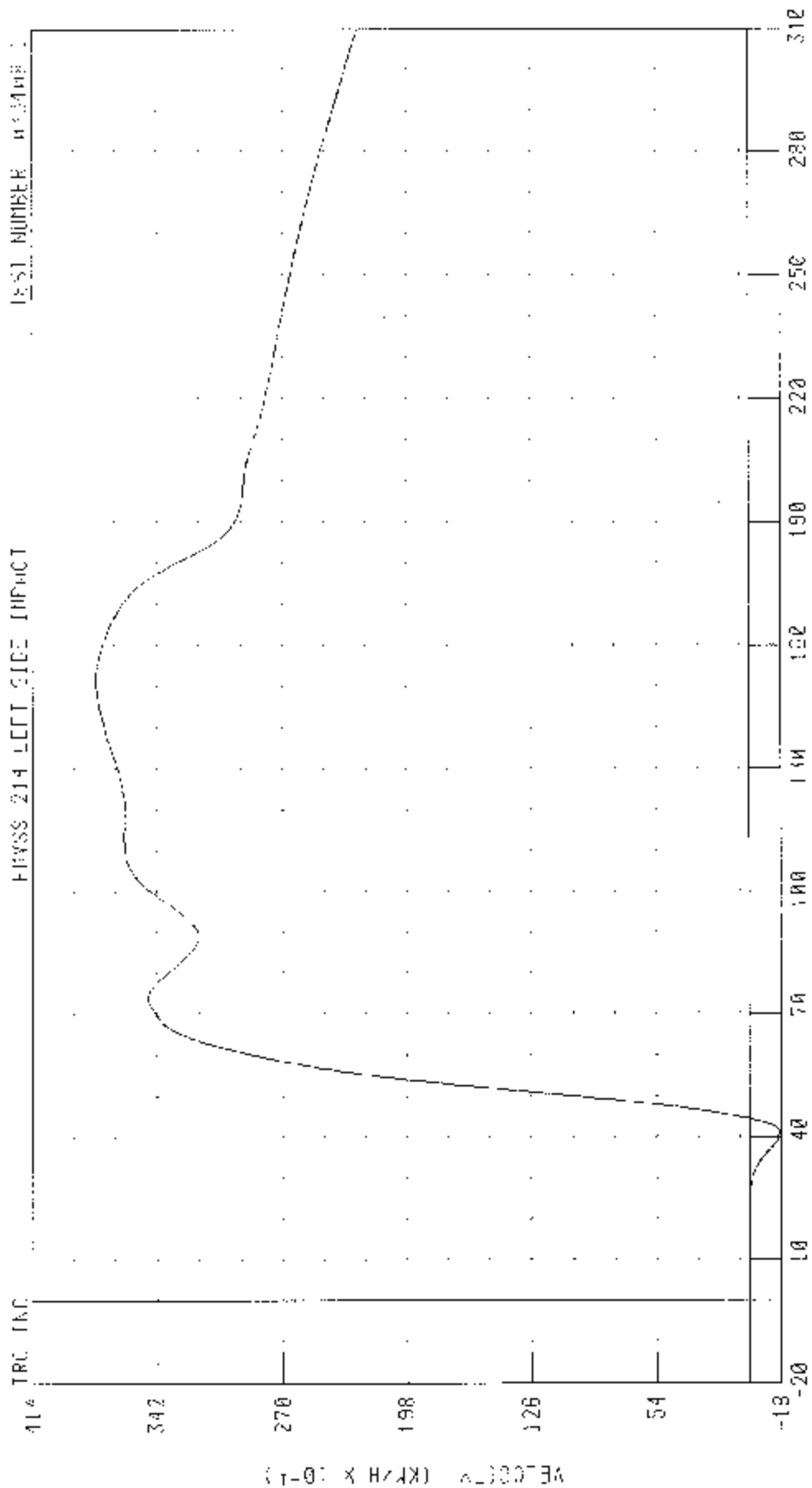
ACCELERATION (G)

55.28 KPH 90 DEGREE SIDE IMPACT MOVING EQUIPMENT ROBERT INFO .F4 SIDE OF 2023 SATURN ION

LEFT REAR PASSENGER HEAD X-VEL. VELOCITY

TRC INC. HISS 214 LEFT SIDE IMPACT

TEST NUMBER 113448



TIME (MS)

PEAK DATA: 37.69 KPH @ 151.04 MS, 1.00 KPH @ 214 MS

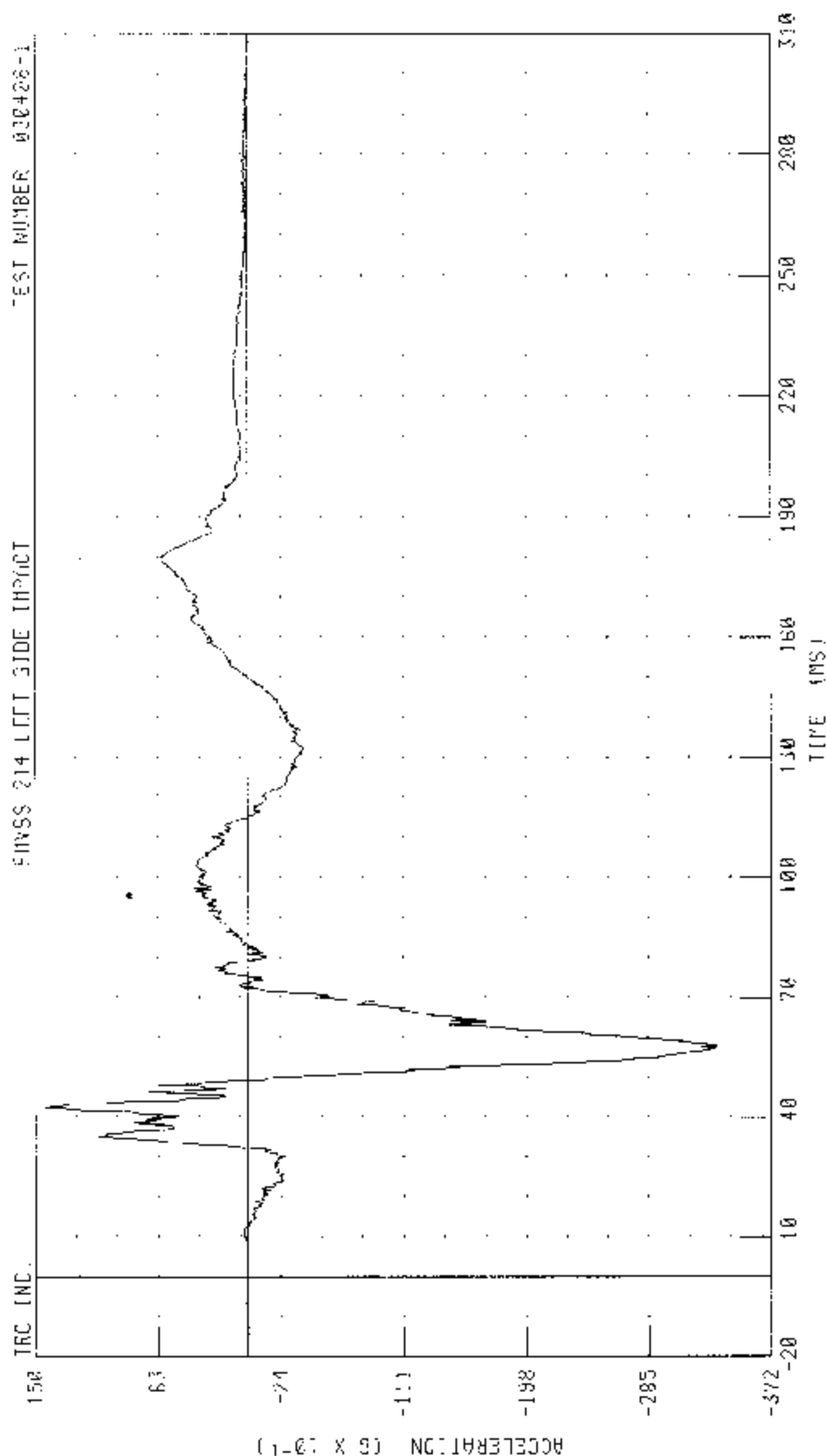
CHANNEL HECV2 FILTER: CH CLASS 100

55/28 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMER - PASSENGER SIDE LEFT SIDE OF JMW Saturn IIR

FFT RFR3 PASSENGER HEAD Z-AXIS ACCELERATION

TEST NUMBER 030408-1

SINUS 214 LEFT SIDE IMPACT



CHANNEL HEADZC4 FILTER: CII CLASS 1000

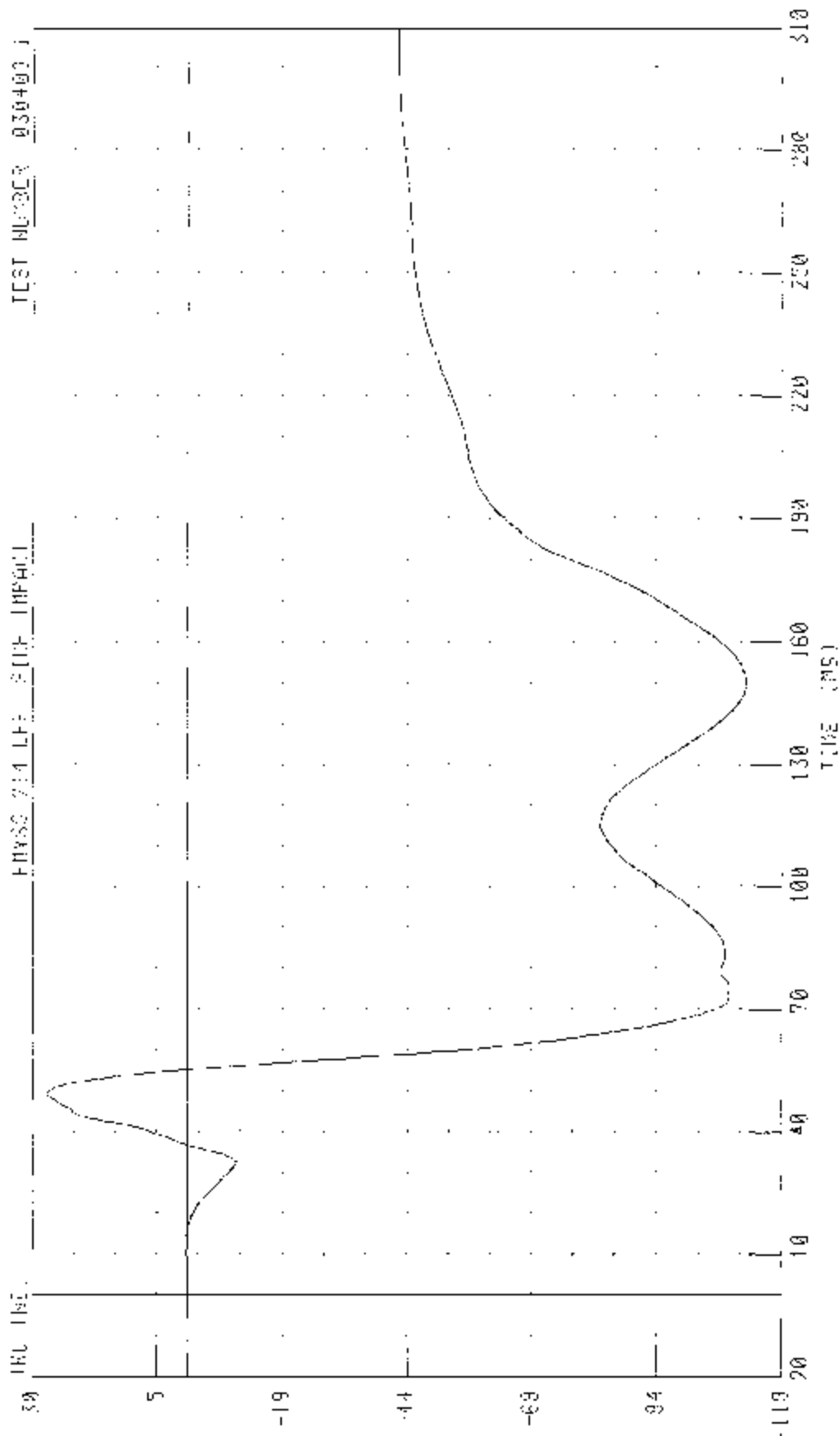
PEAK DATA: 14 32 6 42 32 MS, -33 27 6 50 00 MS

55/20 KPH 90 DEGREE SIDE IMPACT MOVING CARRIER INTO LEFT SIDE OF 2003 CARRIER 100

LEFT REAR TRANSCARRIER HEAD Z AXIS VELOCITY

PHYS 214 LF SIDE IMPACT

TEST NUMBER 030400 J



PEAK DATA: 2.82 KM/H @ 40.52 MS, 11.20 KM/H @ 150.00 MS

CHANNEL: HDZV4 FILTER: CH. CLASS: 180

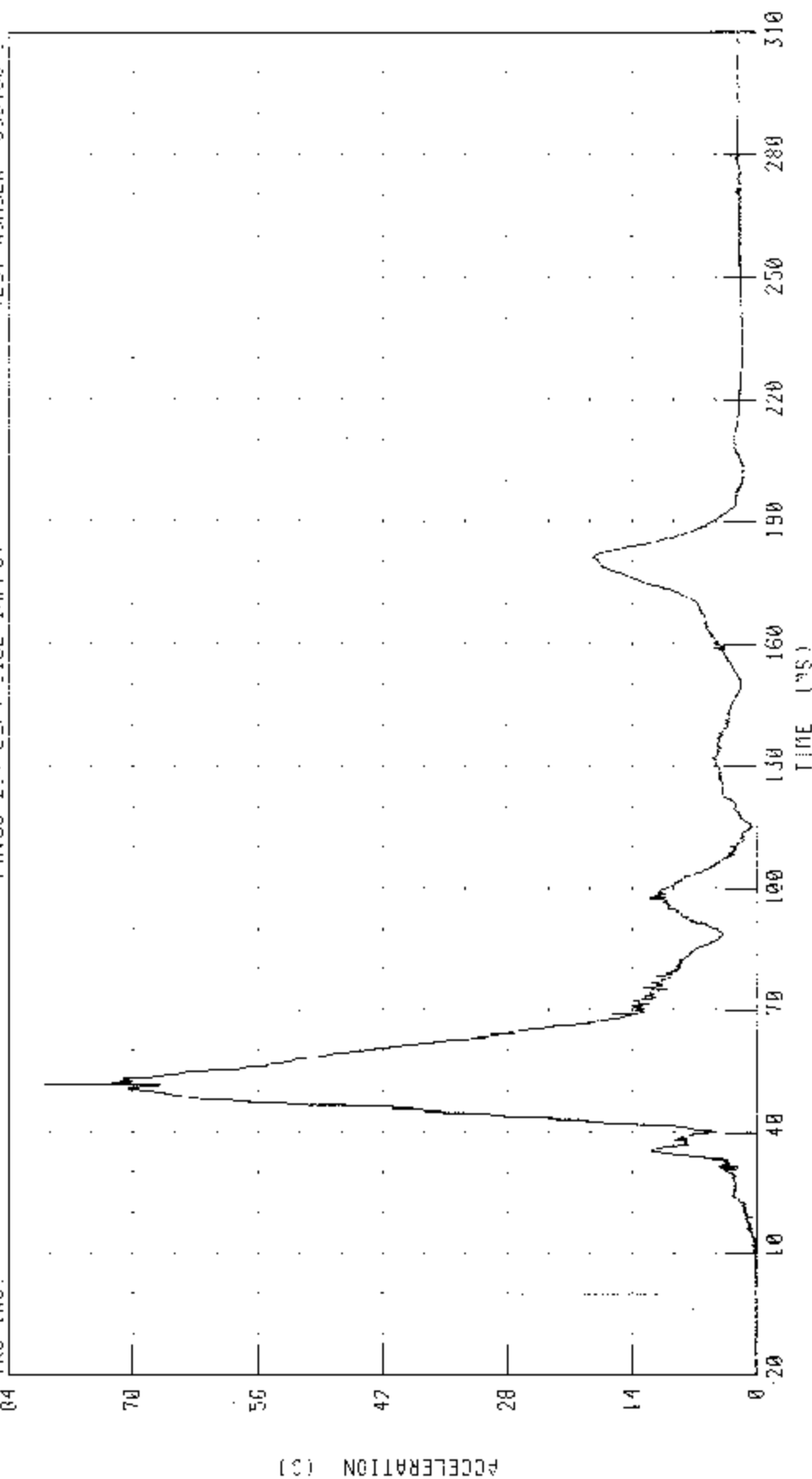
55-20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN IONIC

FFI REAR PASSENGER HEAD RESTRAINT ACCELERATION

TRC INC.

PHYSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408



CHANNEL: HED004 FILTER: CH CLASS: 1000

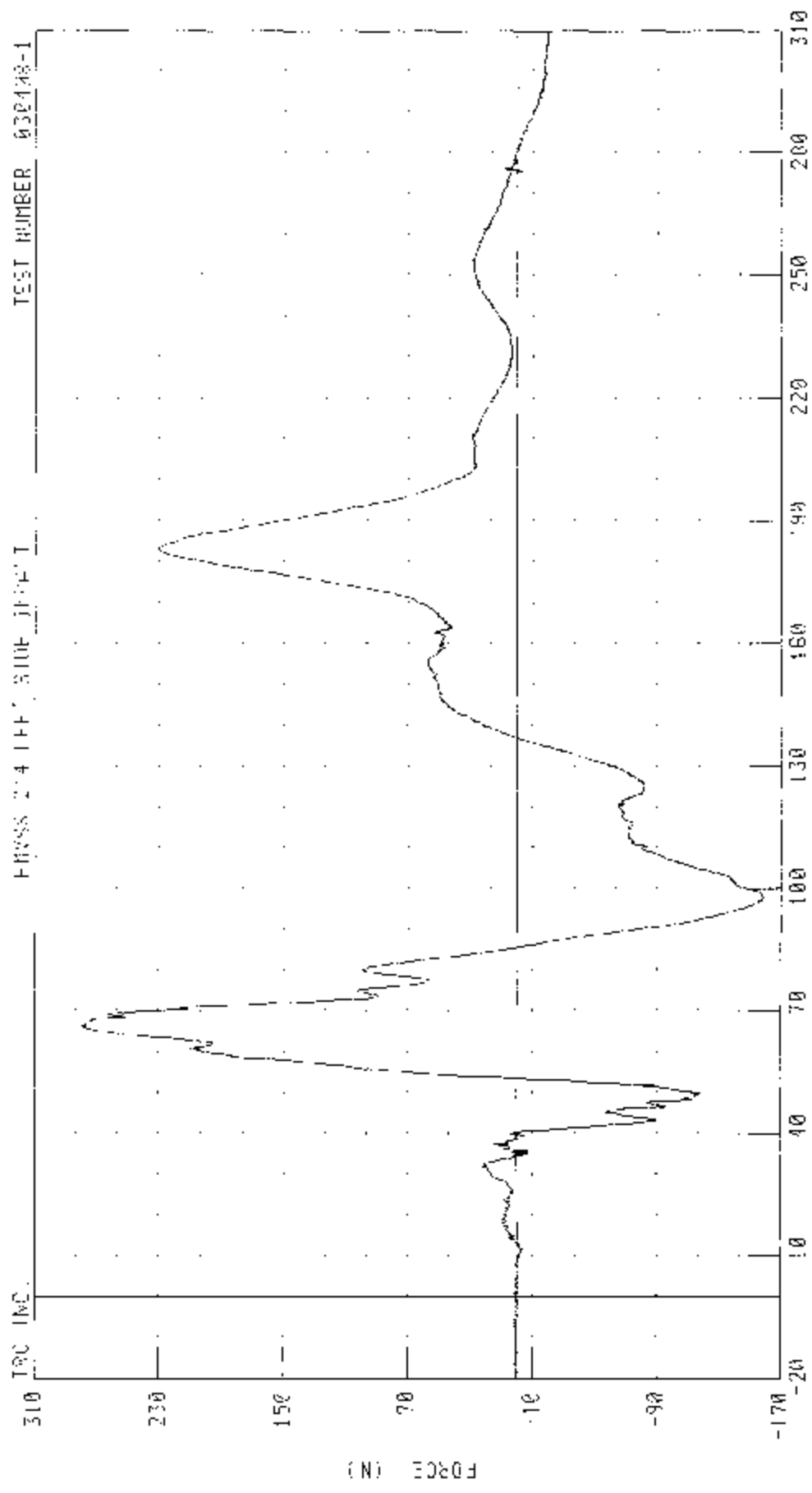
PEAK DATA: 78.98 0.0 51.76 MS; 0.00 0.0 -7.04 MS

55.73 KPH 90 DEGREE SIDE IMPACT PROVIDE JE-KRIBUE BARRIER 1 M LEFT SIDE OF 2003 04 10H 10A

LEFT REAR PASSENGER SEAT X-AXIS SHEAR -CMMS

HYSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



1 PE 135)

CHANNEL NEKXF1 FILTER: CH CLASS 1000

PEAK DATA 229.79 N 26.24 MS; -159.51 N 28.00 MS

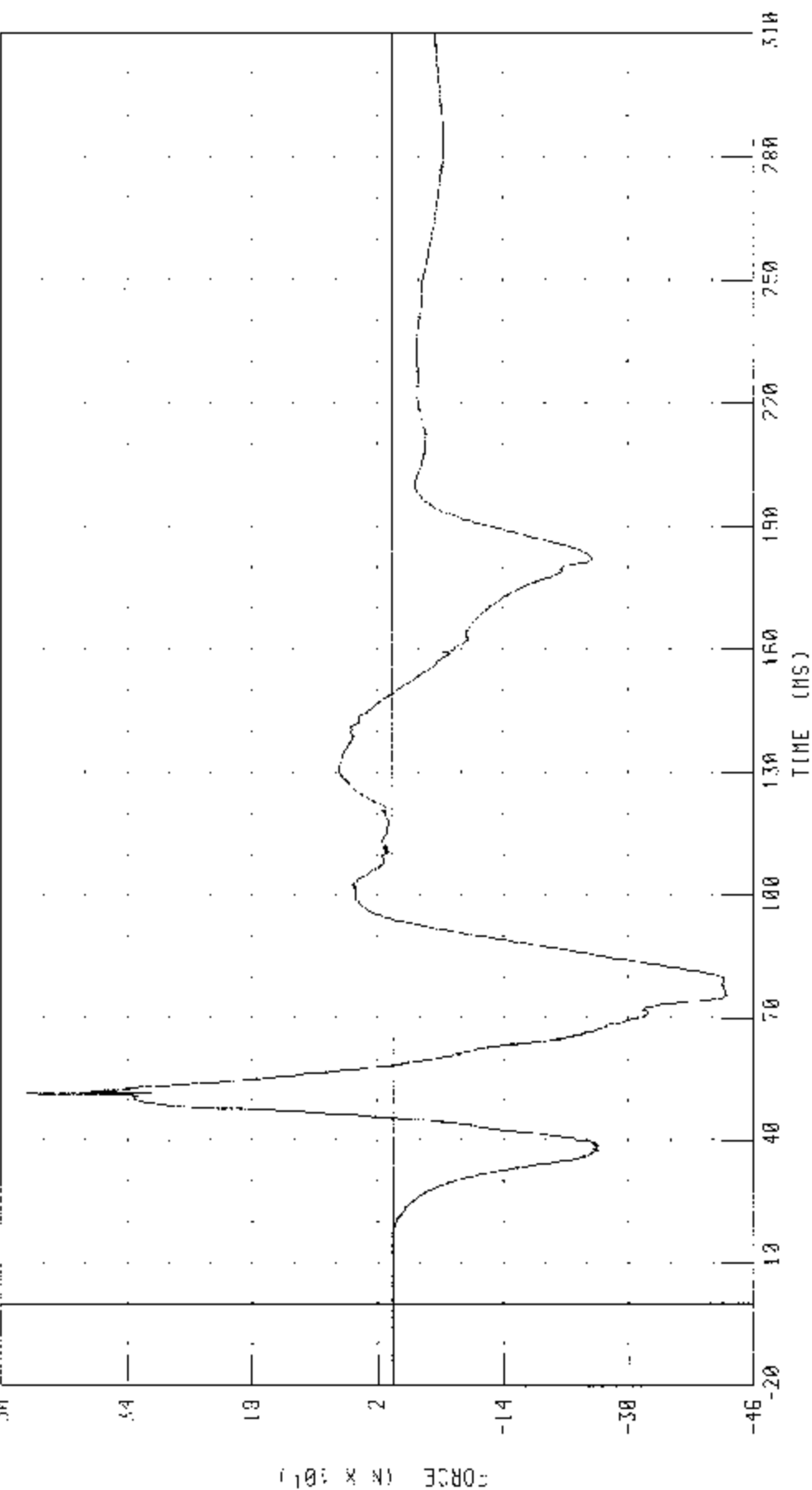
55/20 XPII 00 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN 10N

LEFT REAR PASSENGER NECK Y-AXIS SHEAR FORCE

TEST NUMBER 030400 :

PIVOT 214 LEFT SIDE IMPACT

IRC INC.



CHANNEL : NFKYF4 FILTER : CH CLASS 1000

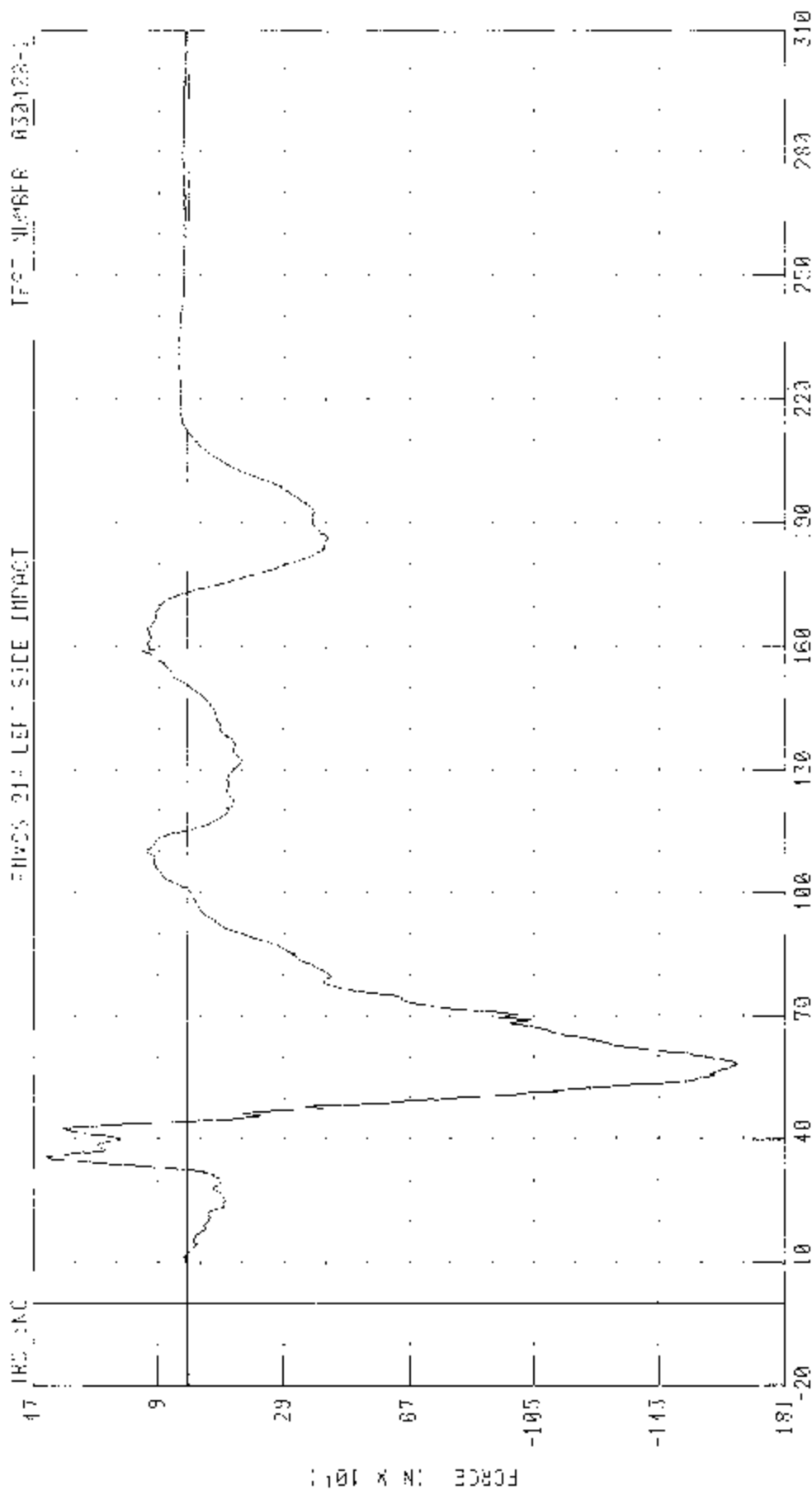
PEAK DATA 400.00 N @ 5: 76 MS, -425.00 N @ 75 76 MS

5500'S MPH 40 DEGREE SIDE IMPACT MOVING DEFORMABLE BARREL (16" DIA) SIDE OF CAR'S FRONT END

LEFT REAR PASSENGER NECK / -FX-3 EX-41 FORCE

CHUCKS 212 LEFT SIDE IMPACT

TEST NUMBER 032022-1



TIME (msec)

CHANNEL 1 NECK/74 FILTER CH. CROSS 1000

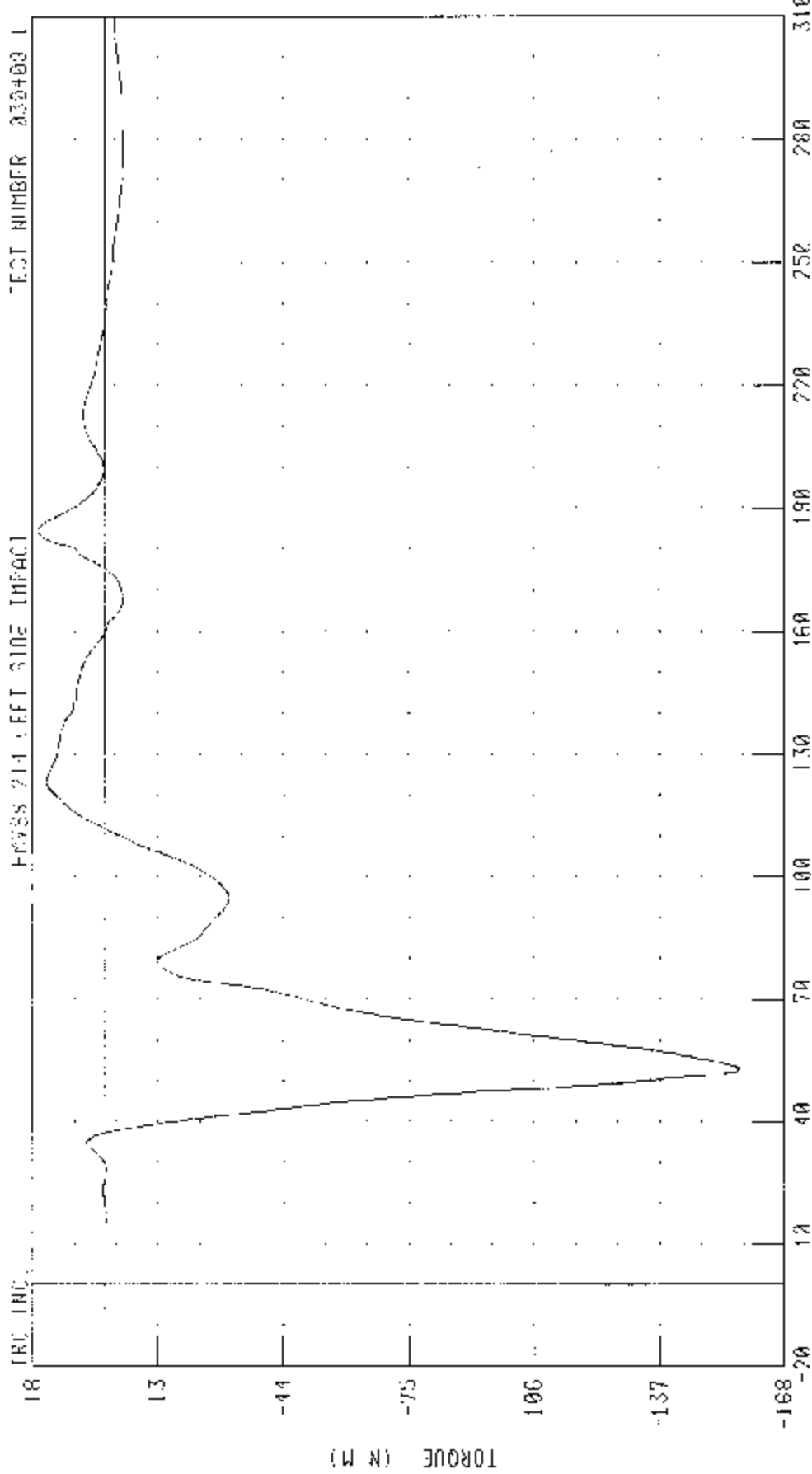
PEAK DATA 432.03 N @ 35.05 MS; -1665.19 N @ 59.32 MS

55.28 KPH 90 DEGREE SIDE IMPACT (MOVING BARRIER) INTO LEFT SIDE OF 2027 SATURN ION

LEFT REAR PASSENGER NECK MOMENT ABOUT Y AXIS

TEST NUMBER 232400 1

PCVSS 214 LEFT SIDE IMPACT



CHANNEL: NEKX14 FILTER: CH CLASS 600

TIME (MS)

PEAK DATA: 16.80 N.M @ 184.92 MS, -156.66 N.M @ 53.20 MS

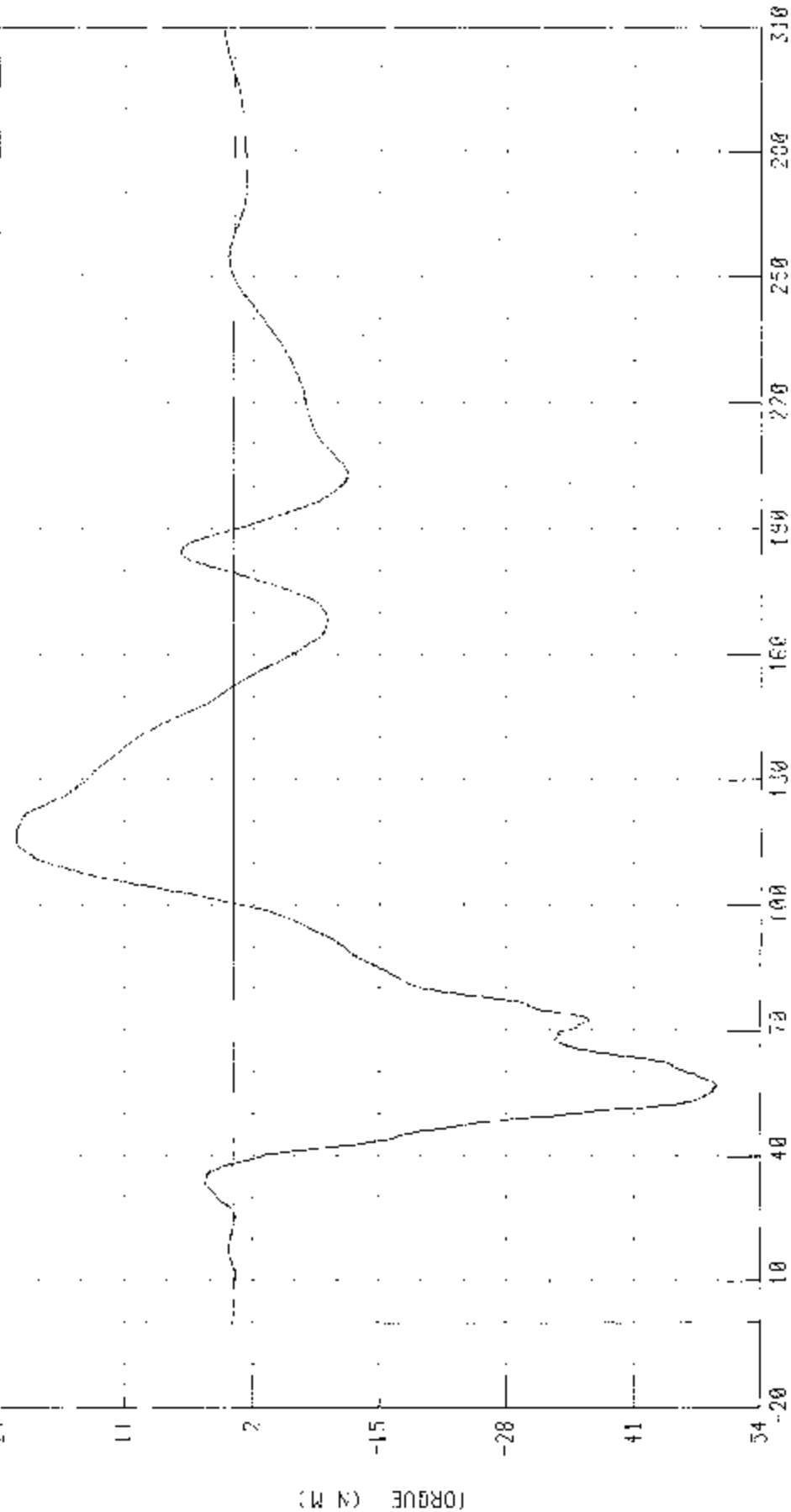
30/25 MPH 30 DEGREE SIDE IMPACT MOVING CENTERABLE AIRBAG INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER NECK FORCE (HORIZONTAL AXIS)

TEST NUMBER: 030408-1

TRC INC

FMVSS 214 LEFT SIDE IMPACT



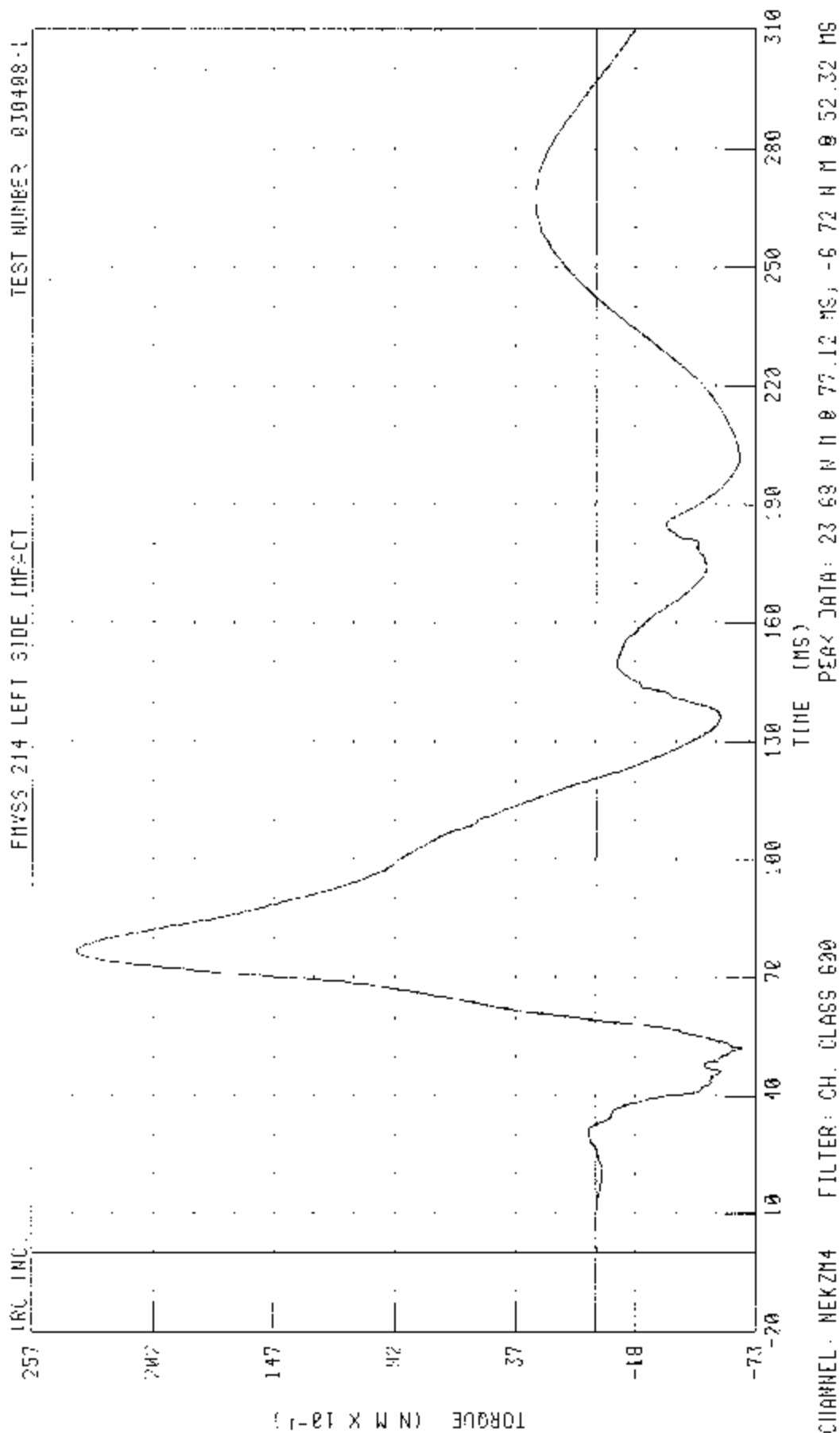
TIME (MS)

PEAK DATA: 22 16 N-M 2 115 68 MS, -19 13 N-M 57 04 MS

CHANNEL: NEXUS4 FILTER: CH CLASS: 500

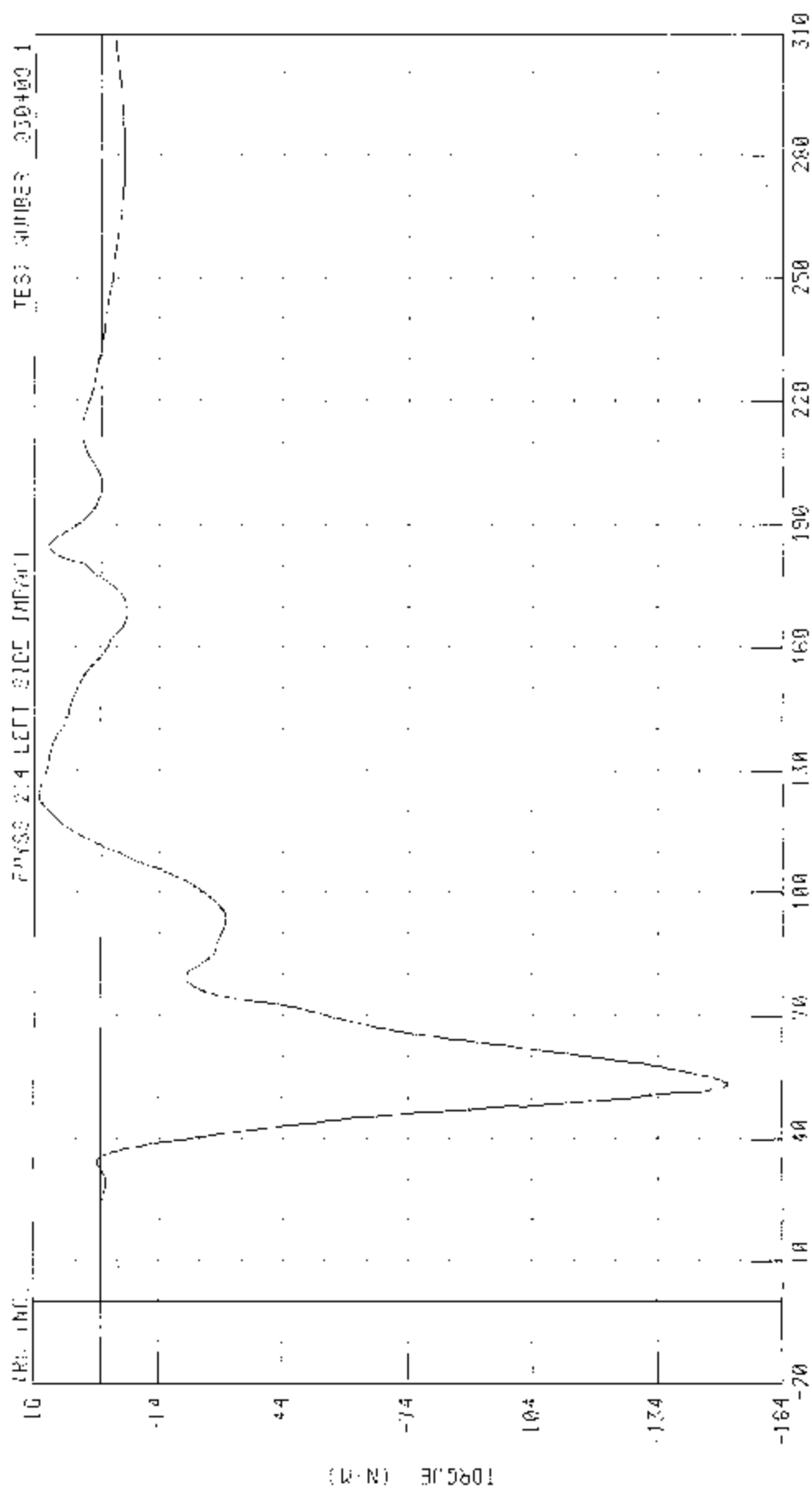
50-78 KPH 90 DEGREE SIDE IMPACT (MOVING DEFURABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER RECK MOMENT ABOUT Z AXIS



55/28 KPII 30 DEGREE SIDE IMPACT IMPROVING DEFORMABLE BARRIER INTO THE SIDE OF 2040 VEHICLE 109

LEFT REAR PASSSENGER SIDE MULTIPLE COLLISION POINTS ABOUT 8 INCHES



TIME (MS)

FFOX DATA 15 02 N 0 124.24 KS, -150 00 N 0 53.28 MS

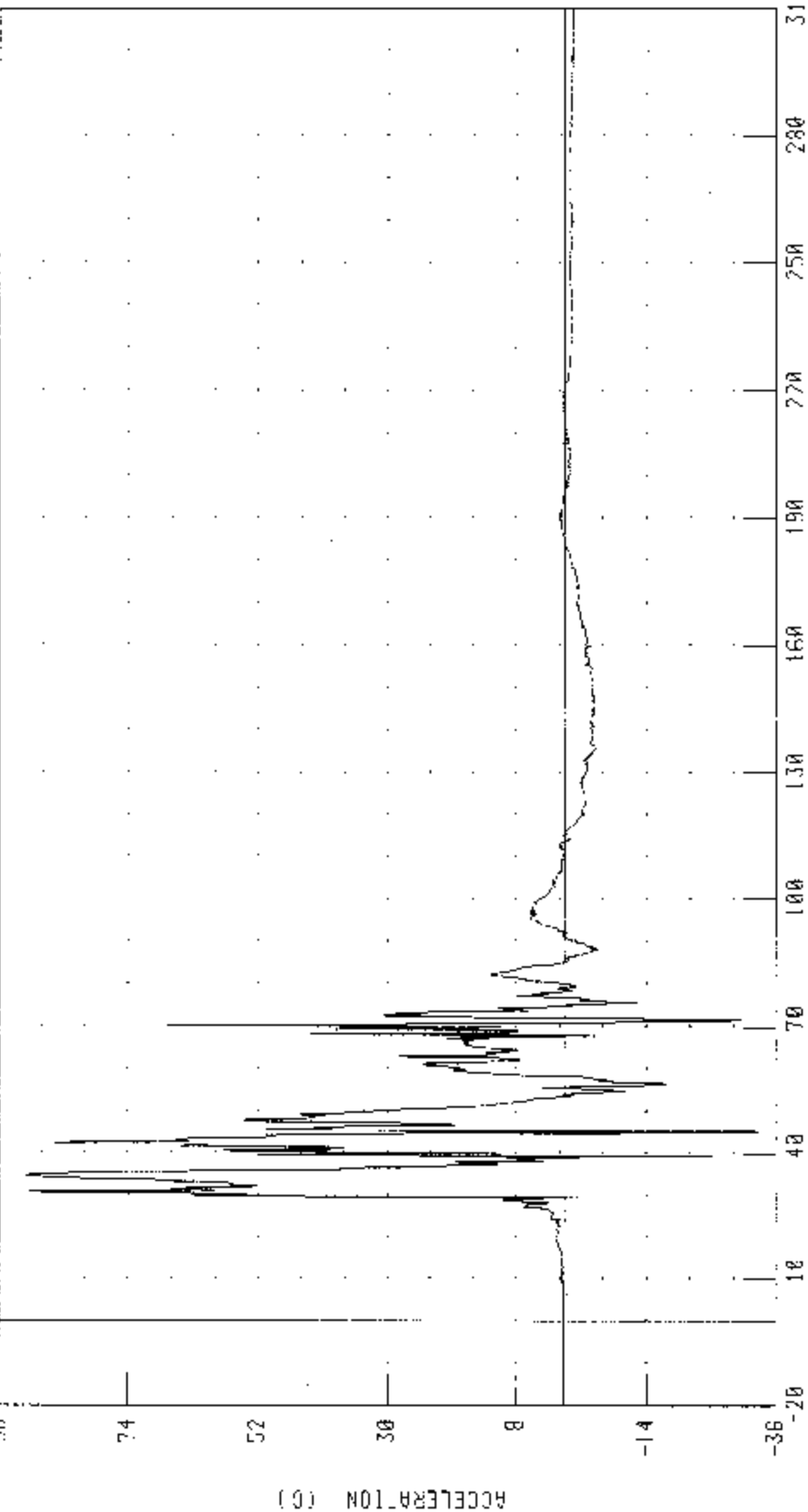
CHANNEL: NK0X114 FILTER: CH CLASS 630

55/20 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARREL) INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER UPPER RIB Y AXIS ACCELERATION

TEST NUMBER 030408-1

TRC INC.



TIME (MS)

CHANNEL: IURVC4 FILTER: CH CLASS 1000

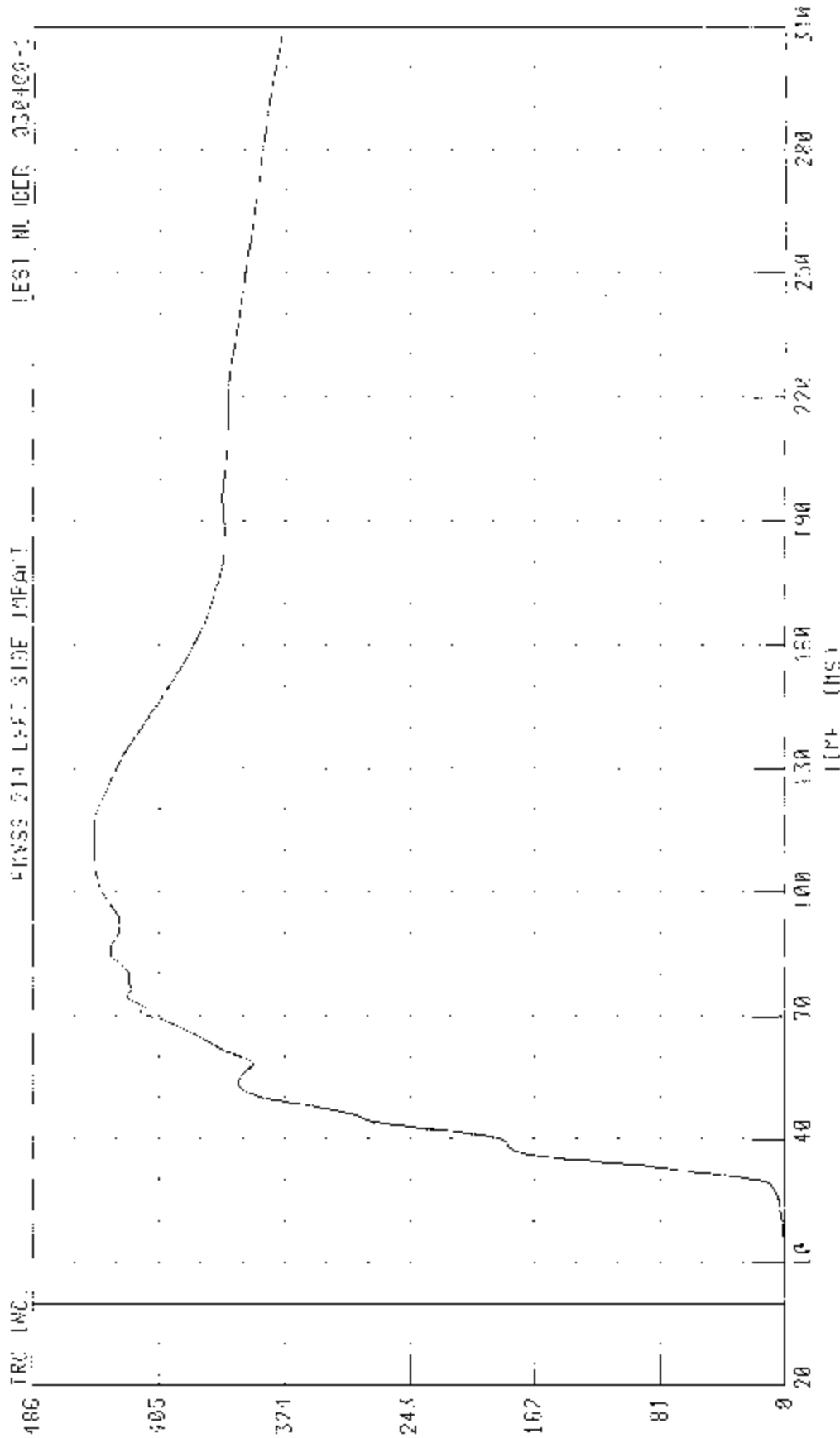
PEAK DATA 91.37 G @ 34.64 MS, -33.07 G @ 45.04 MS

55/73 KPH 9M (60000) SINE 174.1 (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 50. JRS .CH

LEFT REP3 PASSENGER UPPER R13 (4019 YELLOW)

FINSS 214 LEFT SIDE INFANT

IES1 ML ICR 030400-1



PEAK L41A 44 66 KPH @ 1.3 52 MS: 0 20 40 60 80 100

CHANNEL: IURV4 FILTER: CH CLASS 103

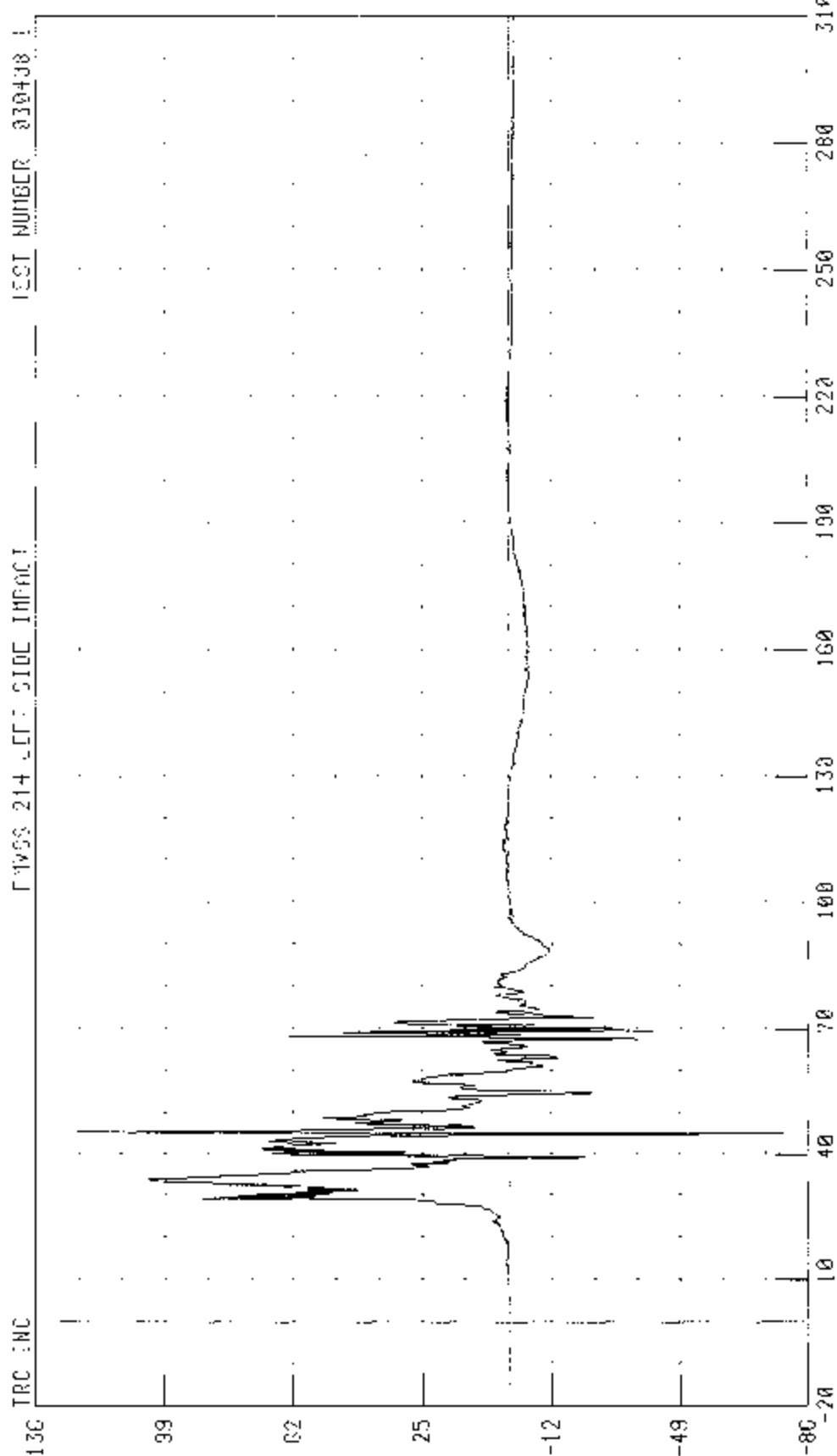
(-01 X H/WX) ALLOCATED

55-28 MPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER IN C LEFT SIDE OF 200' SATURN 10N

114 REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION

TEST NUMBER 030438

TRUSS 214 LEFT SIDE IMPACT



TIME (MS)

PEAK DATA: 124.42 @ 45.52 MS, -78.06 @ 44.50 MS

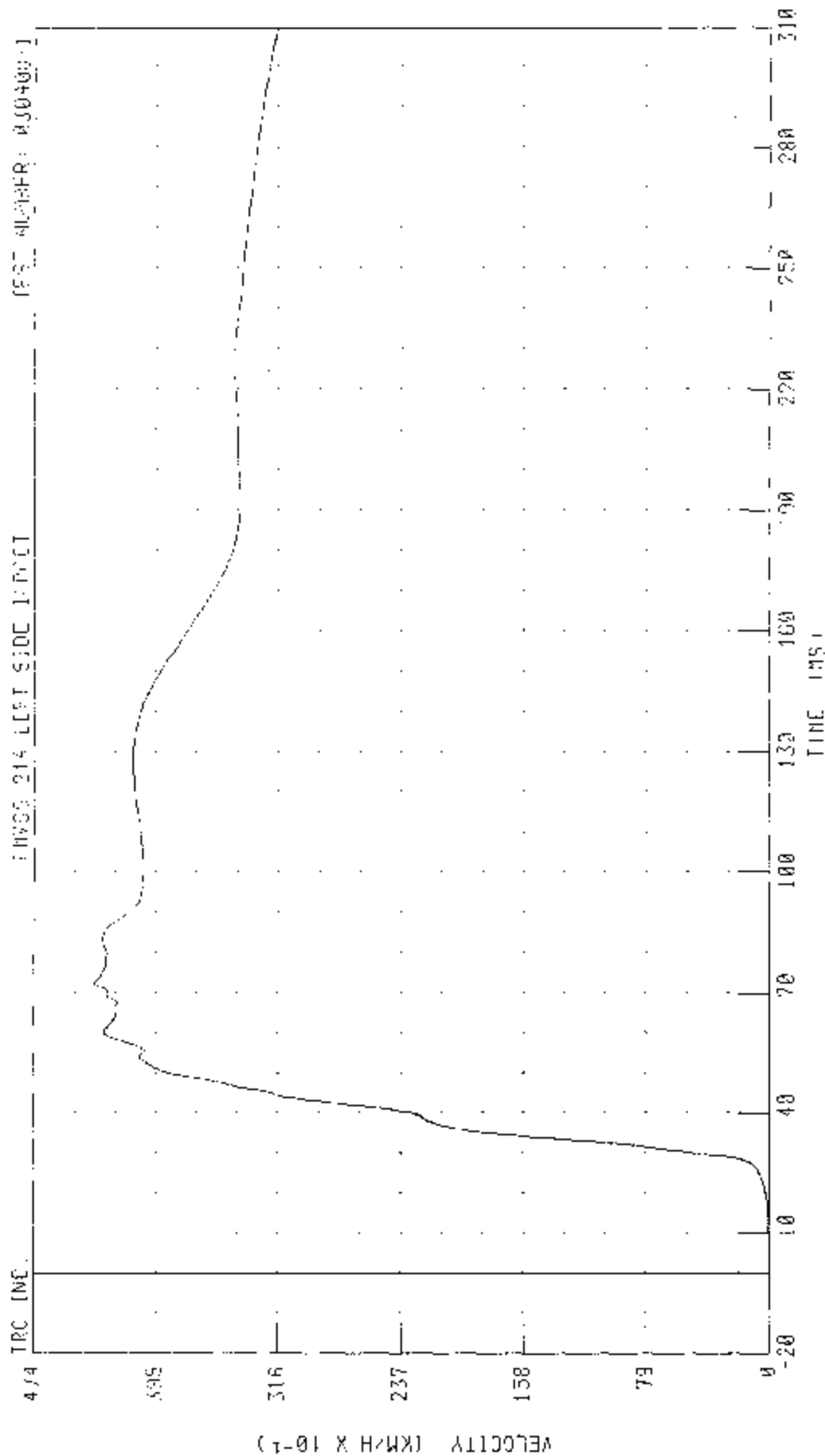
CHANNEL: LLRYC4 FILTER: CH CLASS 1300

55/28 PM 00 SOURCE SIDE IMPACT IMPACTING INFURNACE BP-RT-RT (IMPACT SIDE OF 2003 SOUTHERN 108)

LCF BLAR PASSENGER LOWER RIE - 20% VELOCITY

EVENT 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1



CHANNEL: L1RYV4

FILTER CH CLASS 180

PLAK DATA 43 51 60 68 77 86 95 104 113 122 131 140 149 158 167 176 185 194 203 212 221 230 239 248 257 266 275 284 293 302 311

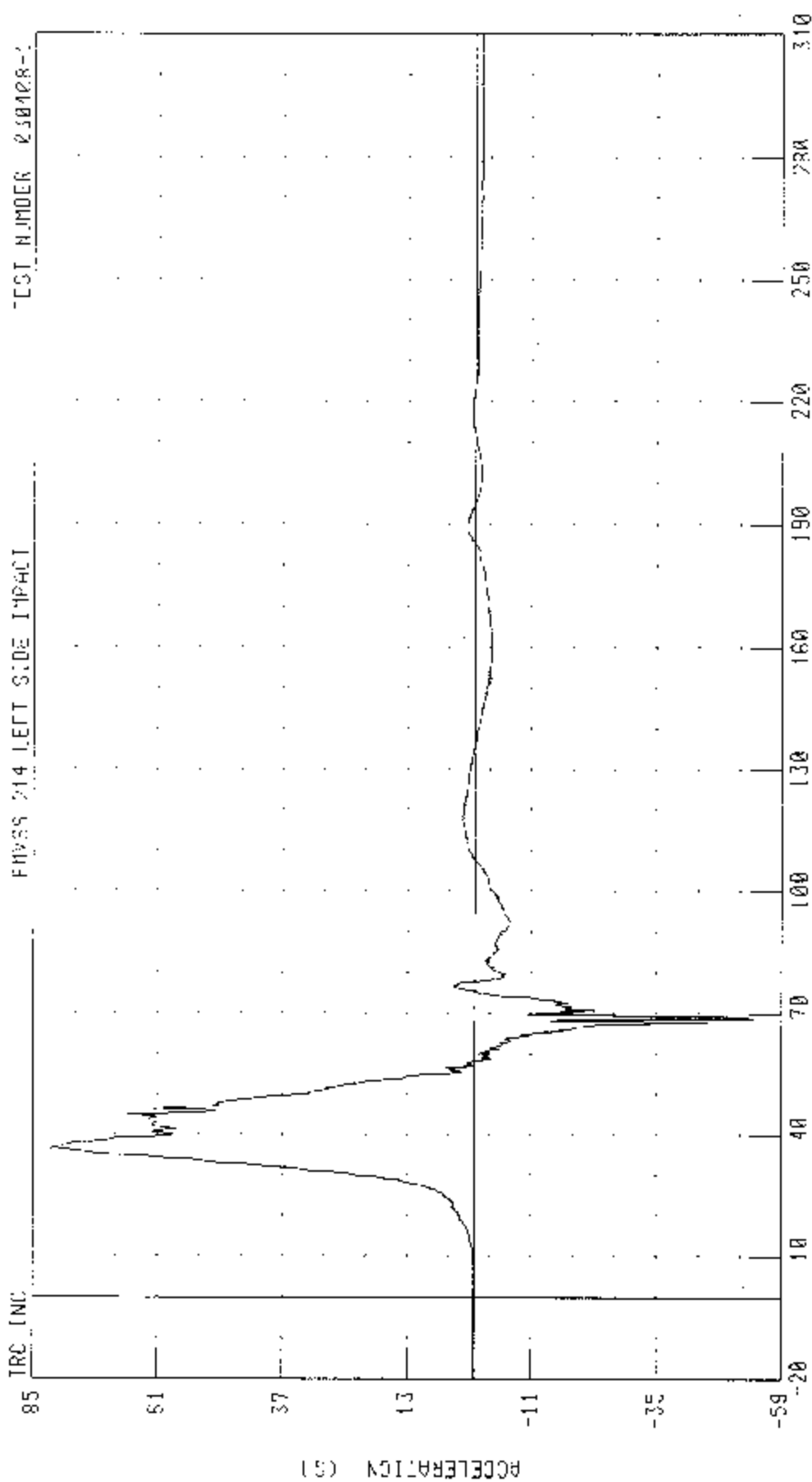
55/28 KP+ 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

FFT R-03 PASSENGER LOWER SPINE Y-AXIS ACCELERATION

PHYS 214 LEFT SIDE IMPACT

TRC INC

TEST NUMBER 050408-1



TIME (MS)

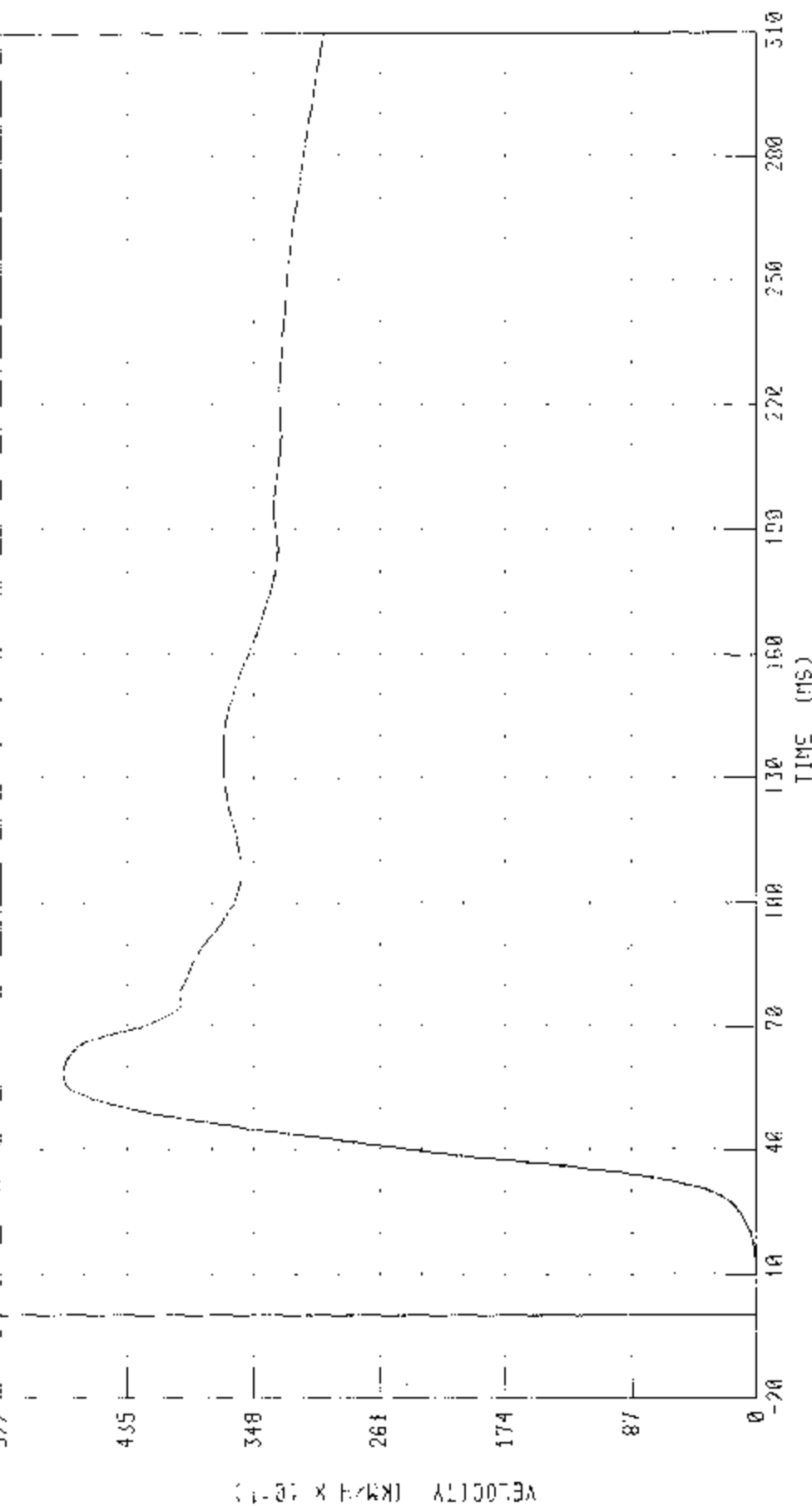
CHANNEL 1: 712VCA FILTER CH. CLASS 1000

PEAK DATA: 01 59 G @ 38 64 MS, 53 69 G @ 68 96 MS

55/26 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2001 SCORPIO LUN

LEFT REAR PASSENGER LOWER SPINE 7-AXIS VELOCITY

TRC INC. 522 --- TEST NUMBER: 030408-1



CHANNEL: I12YV4 F.L.TER: CH CLASS 100 FEOK 0670: 47 84 KM/H @ 58 10 MS: 0.00 KM/H @ 0 00 MS

55/28 MPH 90 DEGREE SIDE IMPACT HITTING DEFENDABLE BARRIER INTC LEFT SIDE OF 20MS 24 TURN 104

LEFT REAR PASSENGER PLANTS V-Axis ACCELERATION

TEST NUMBER 030408-1

FMVSS 214 LEFT SIDE IMPACT

IRC INC

72

58

44

30

16

2

-12

-20

ACCELERATION (G)

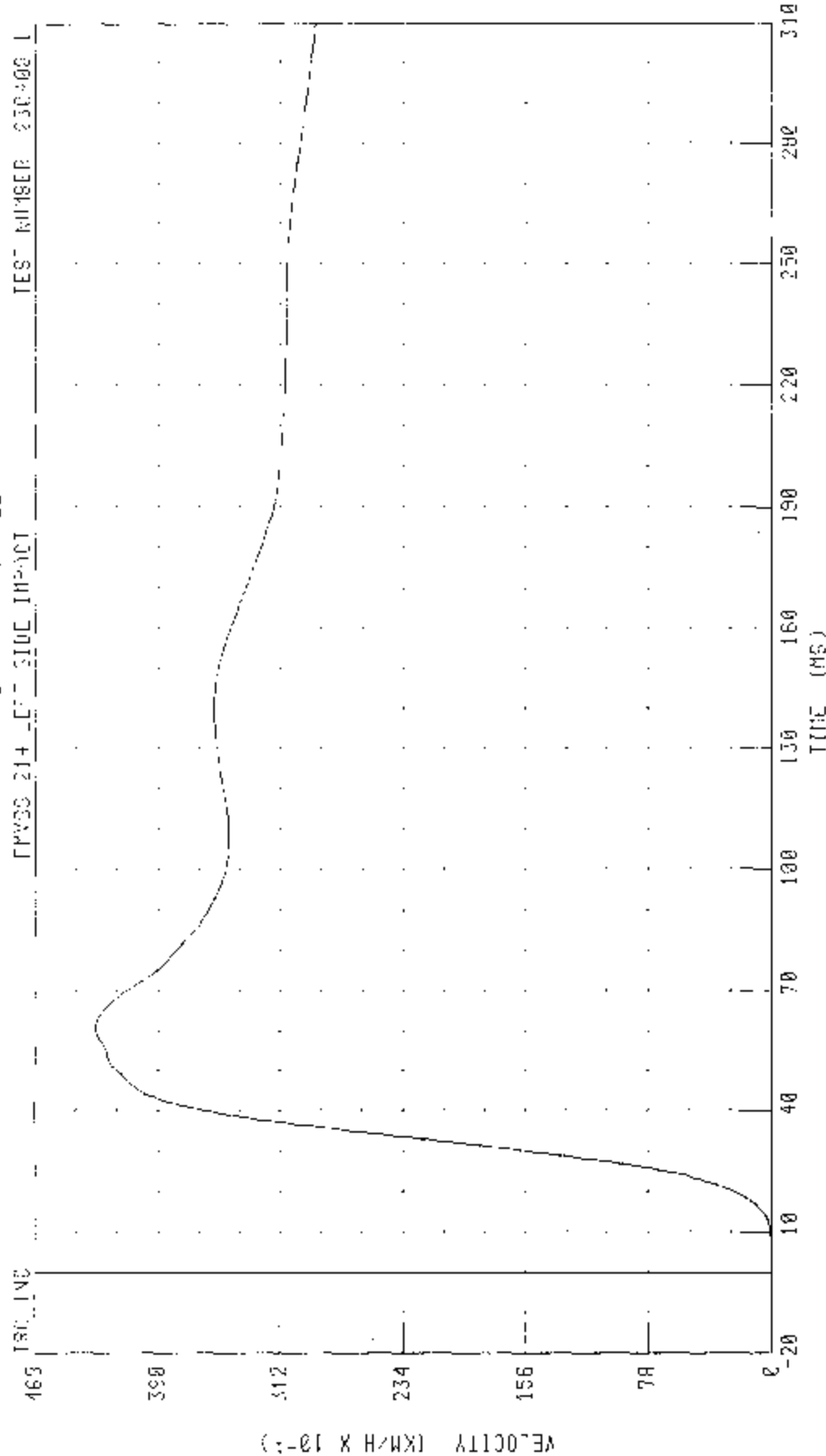
TIME (MS)

CHANNEL: PEVYC4 FILTER: CII, CLASS 1000

PEAK POSITION: 67.56 C @ 36.88 MS; -31.52 G @ 77.40 MS

55/28 KPH 50 DEGREE SIDE IMPACT (MOVING, LEFT-TO-RIGHT) INTO I-415 I-5 0- 2MM/3 SALLER HILL

LEFT REAR PASSENGER PEDESTAL 2-AXIS VELOCITY



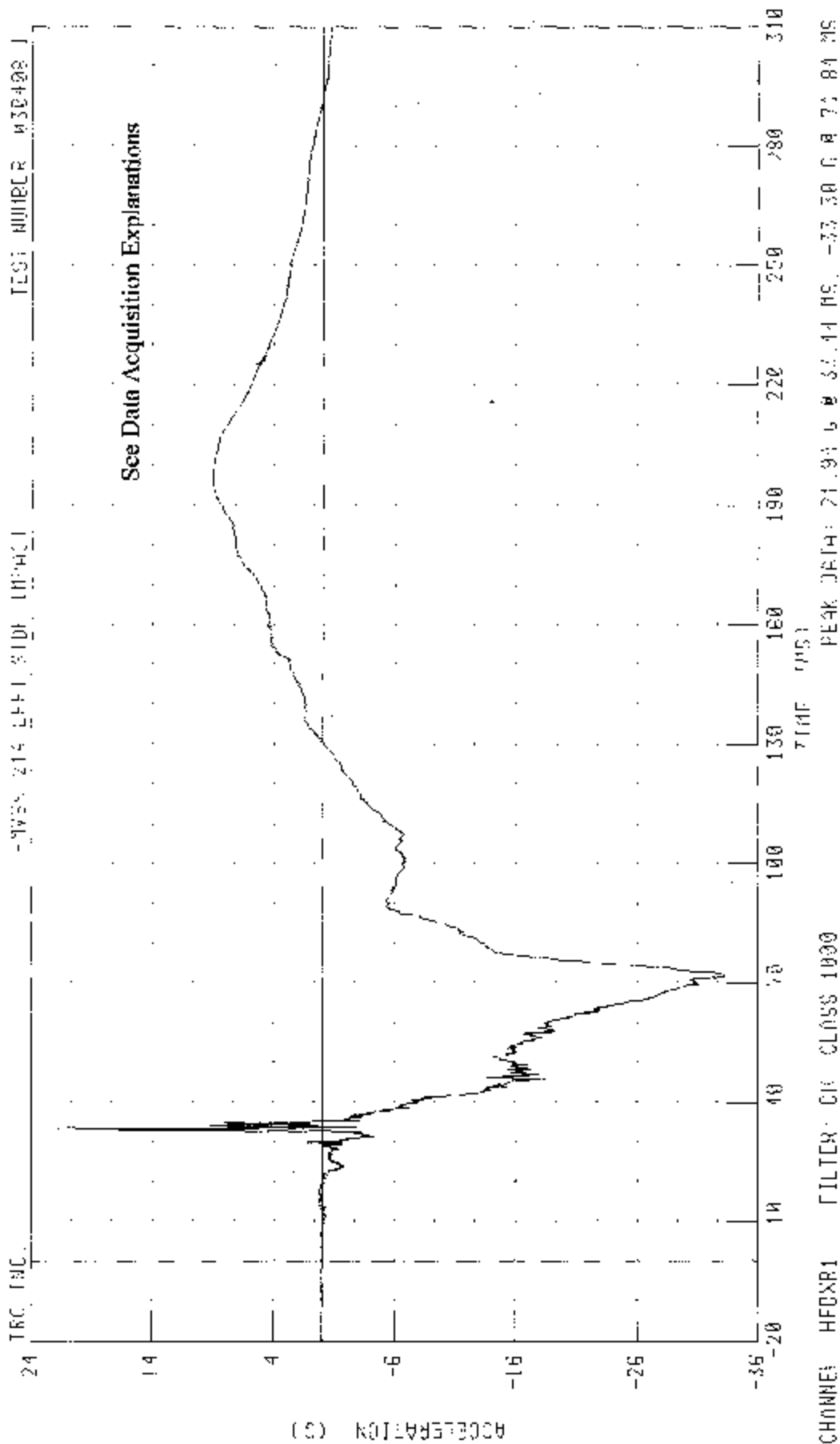
CHANNEL 02VYV4 FILTER CH CLASS 100 PEAK DATA: 42.98 KPH/10 60.89 MS, 3 20 KPH/4 5 0 00 MS

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000 - Redundant

Integration Data - Filter Class 180 - Redundant

55728 KPS-90 DEGREE SIDE IMPACT MOVING PERFORMANCE EXPERIMENT 1401111 510F OF 2003 307JUN 1009
 DRIVER HEAD X AXIS REDUNDANT ACCE POSITION

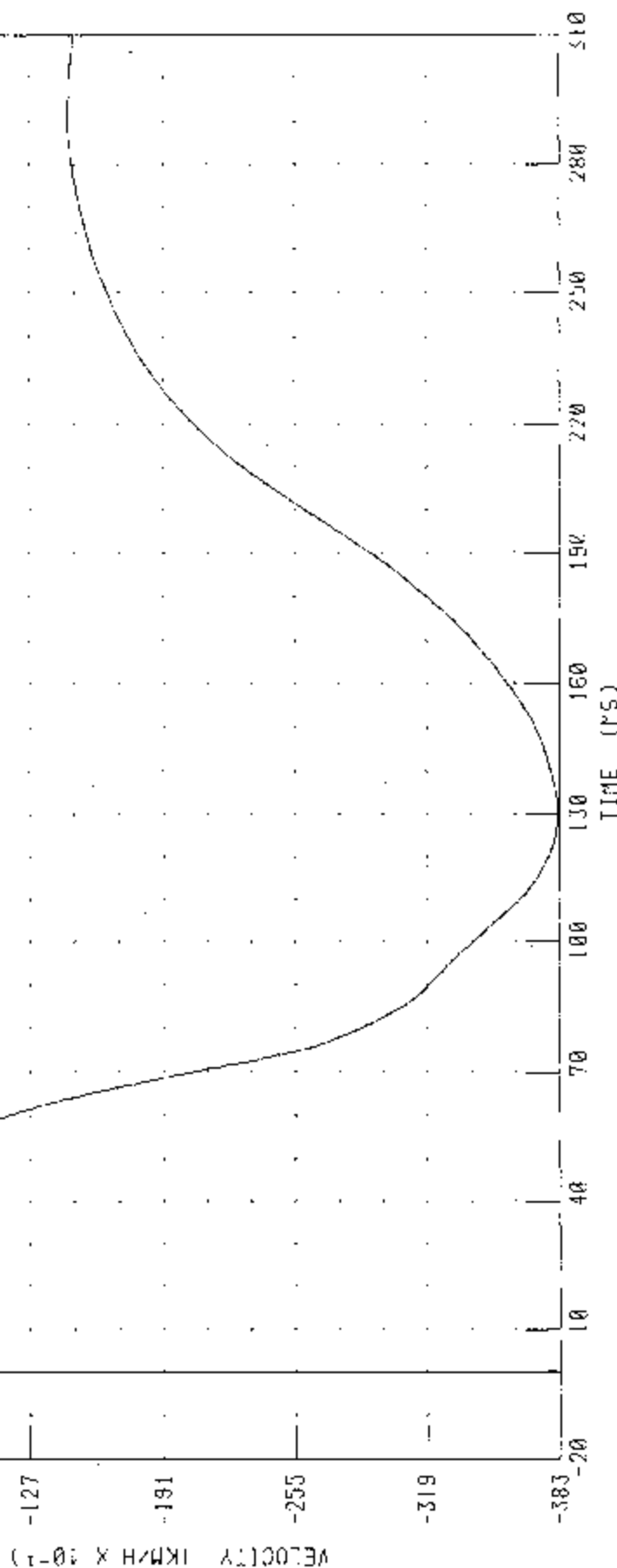


55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO (FH) SIDE OF 2003 SATURN ION

DRIVER HEAD X-AXIS REOUNDANT VELOCITY

TRC INC. HYSS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1

See Data Acquisition Explanations



CHANNEL: FEECVI FILTER: CH. CLASS 180

PEAK DATA: 0 00 KM/H @ 35.35 MS; -38.23 KM/H @ 130 48 MS

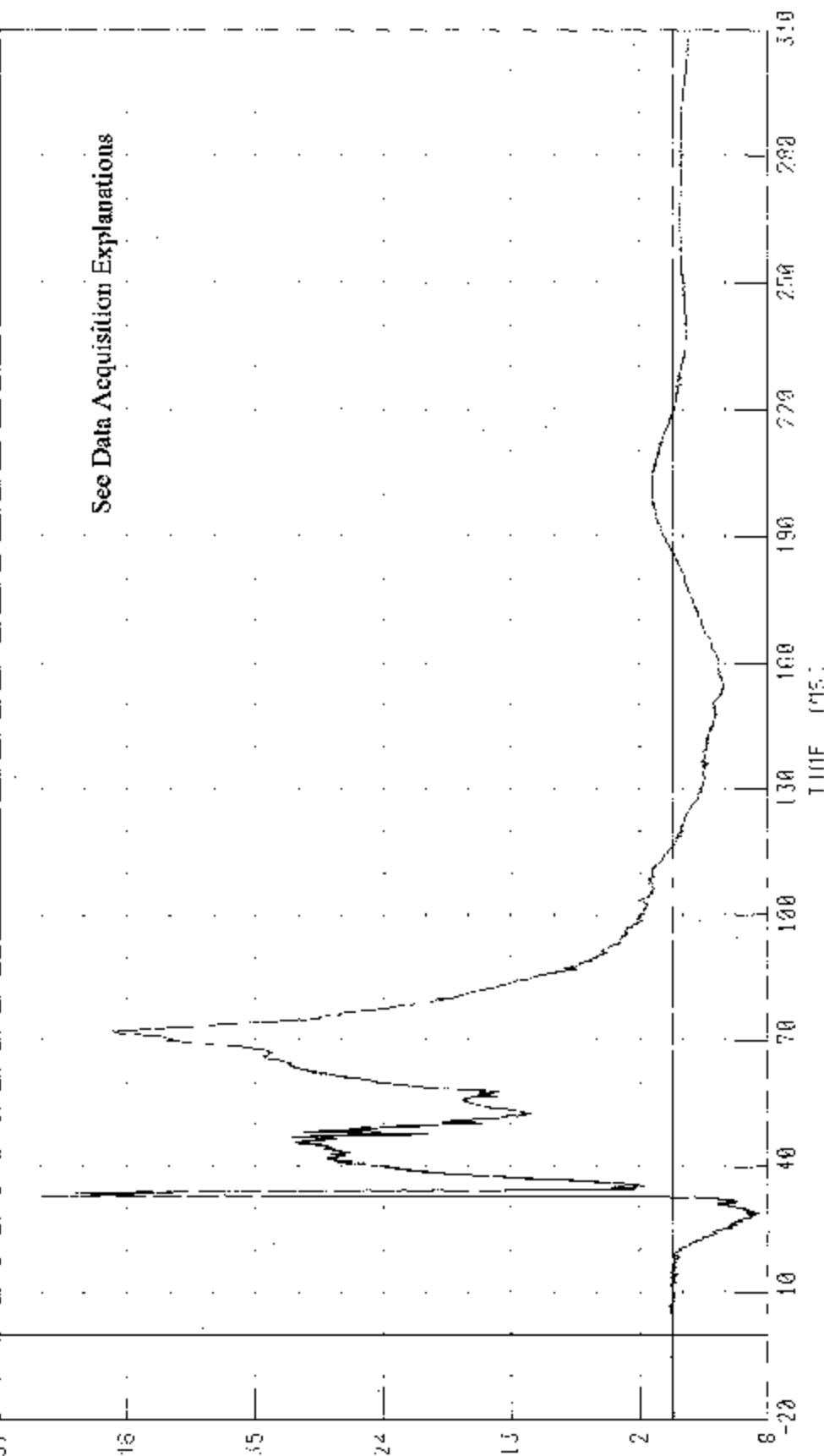
55/23 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER TEST FET 311F OF 2003 RETURN FOR

DRIVER HEAD Y AXIS PENDULUM ACCELERATION

CHASS 214 LEFT SIDE IMPACT

TRC INC.

See Data Acquisition Explanations



55/20 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

DRIVER -EAO Y-AXIS REDUNDANT VELOCITY

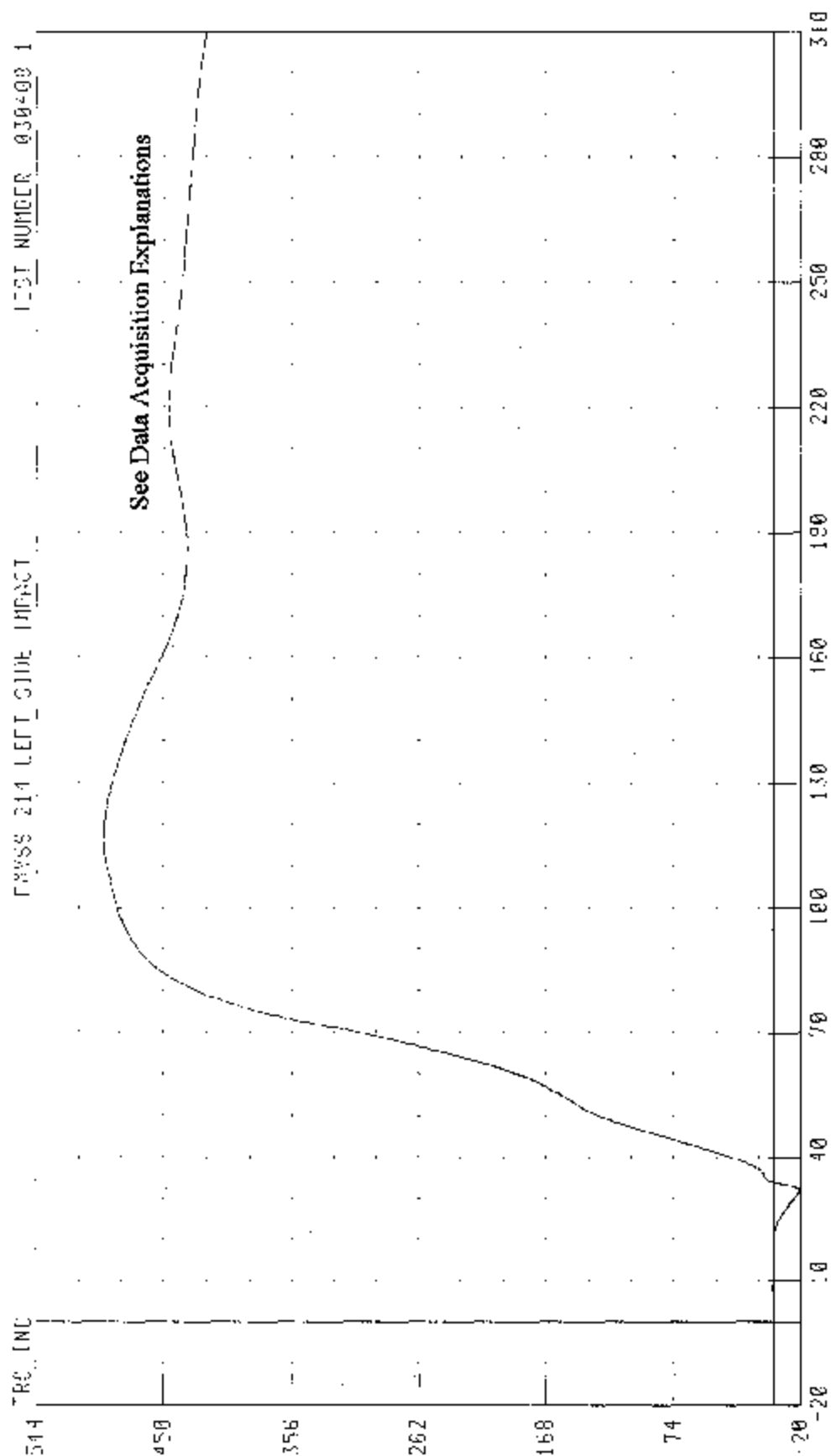
TRUSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408 1

TRC INC

See Data Acquisition Explanations

VELOCITY (KPH X 10⁻³)



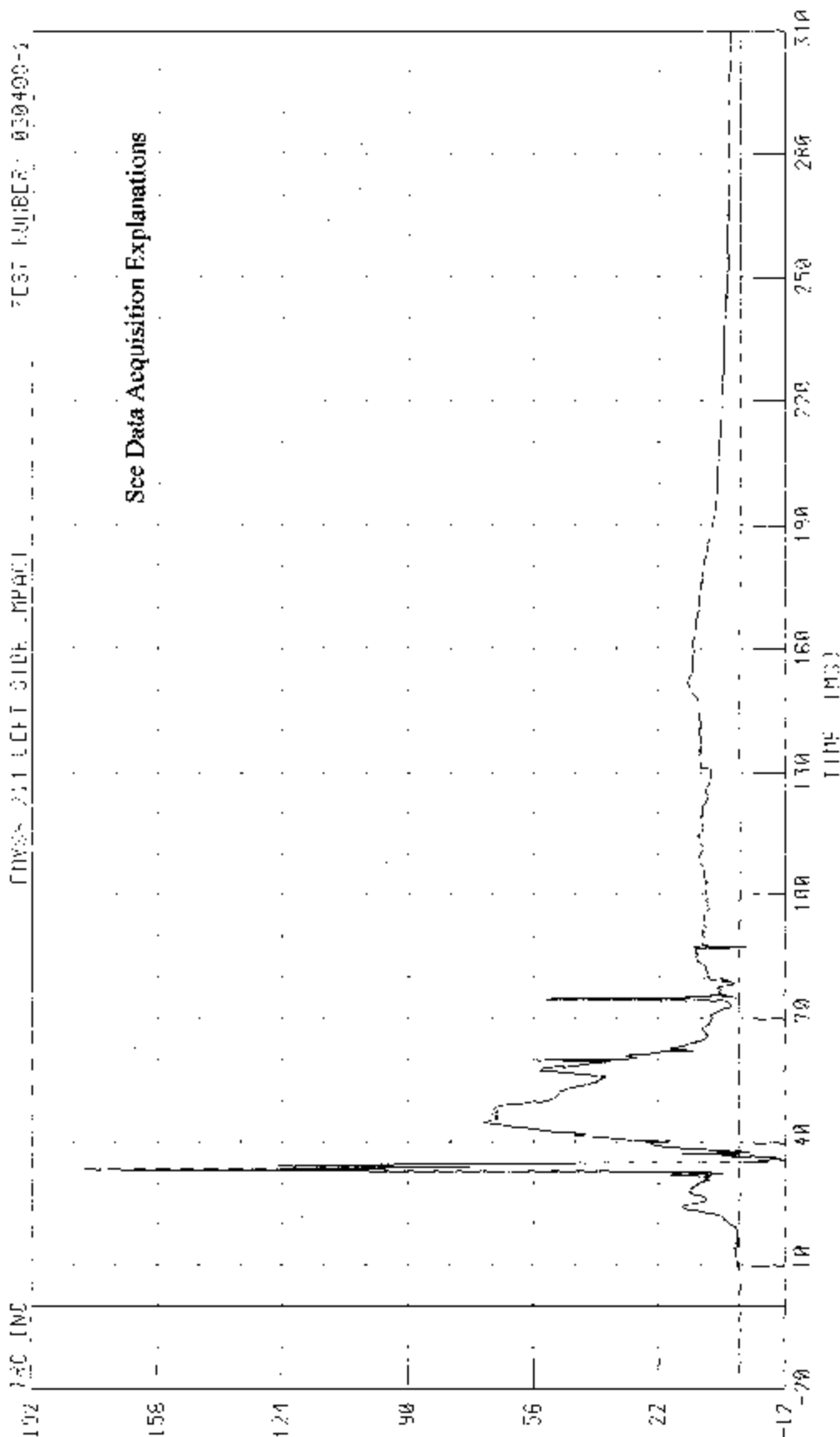
TIME (MS)

PEAK DATA: 49.37 KPH @ 116.48 MS; -1.91 KPH @ 32.10 MS

CHANNEL: HELYVI FILTER: 34 CLASS: 180

55/23 K911 9% BECKETT 5 (HF IMPACT MOVING DEFENSIBLE BARRIER) INTO LEFT SIDE OF 2023 SA LRM .JUN
 0976R HEAD 2-AXIS RECORDING ACCELERATION

CHASS 211 LEFT SIDE IMPACT TEST EQUIPMENT: 030408-1



CHANNEL: HEDZRI FILTER: CH CLASS 1000 PEAK DATA: 177.78 G @ 33.44 MS. 1: 61.0 @ 35.82 MS

(9) NOIT10801700CH

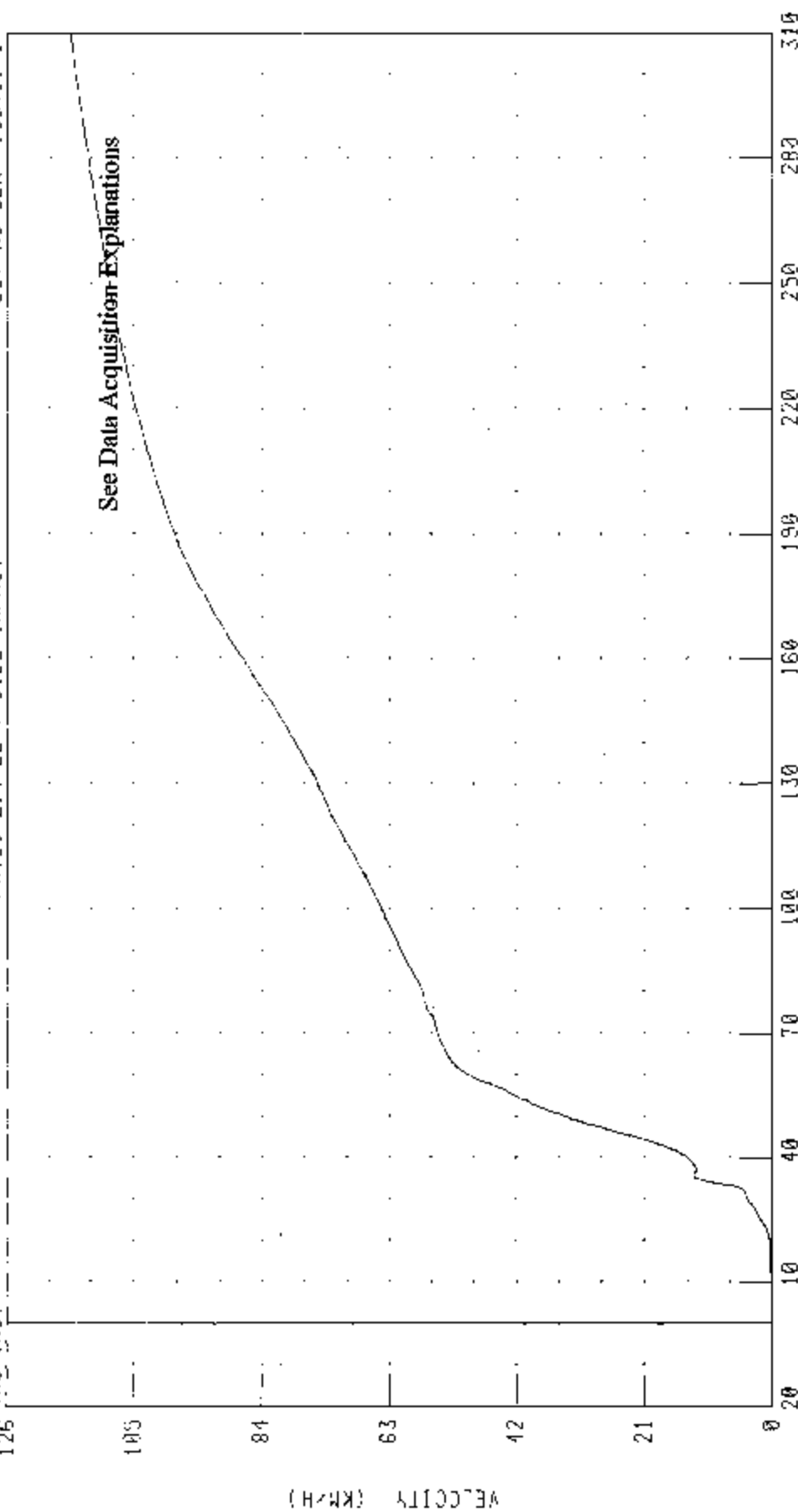
55/26 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

DRIVER REAR Z-AXIS REBOUND VELOCITY

PHYSS 214 LEFT SIDE IMPACT

TEST NUMBER 030400 1

TRC INC

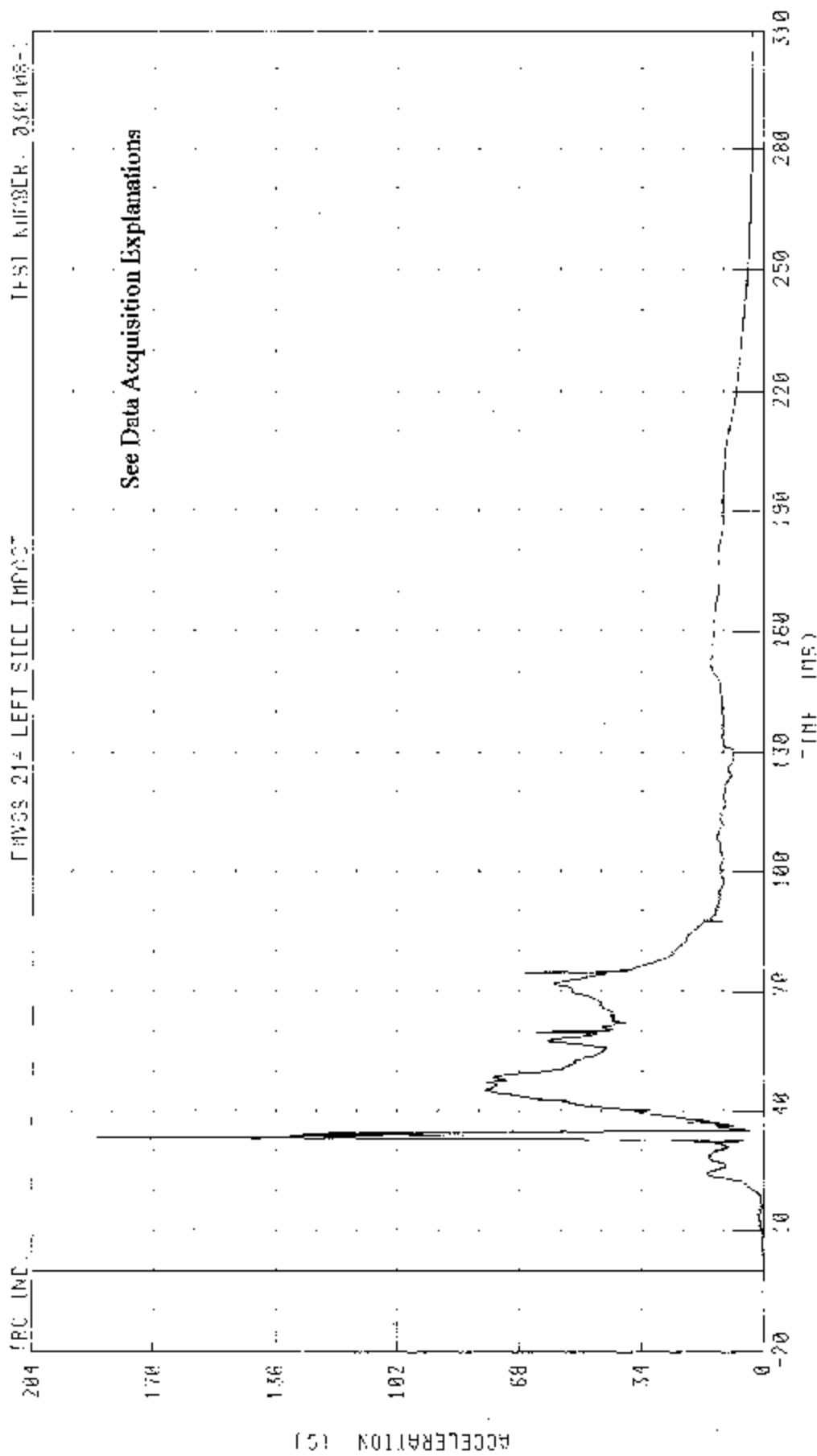


TIME (MS)

PEAK DATA: 115.48 X1/H @ 310.00 MS: 0.00 X1/H @ 4.06 MS

CHANNEL HED7V1 FILTER CH CLASS 180

55/28 KPH 90 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 D4100H IGN
 DRIVER HEAD RESULTANT REDUNDANT ACCELERATION



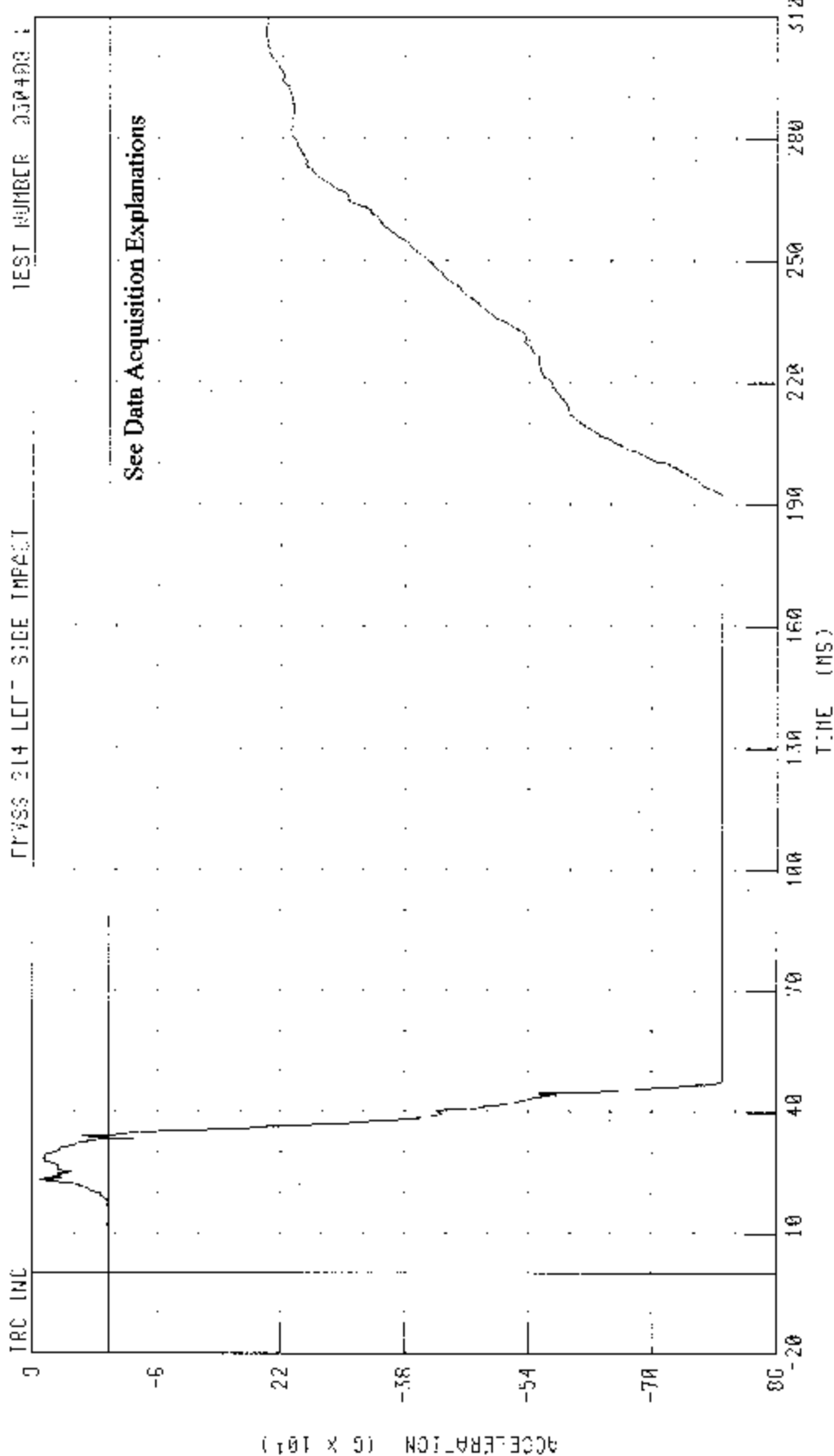
CHANNEL: HFERR1 FILTER: CH CLASS: 1000 PEAK DATA: 185.71 G @ 44 MS; 0.01 G @ 18.32 MS

55/28 KFH 90 DEGREE SIDE IMPACT HGV NO DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 SATURN ION

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

TEST NUMBER 030408

RVSS 214 LEFT SIDE IMPACT

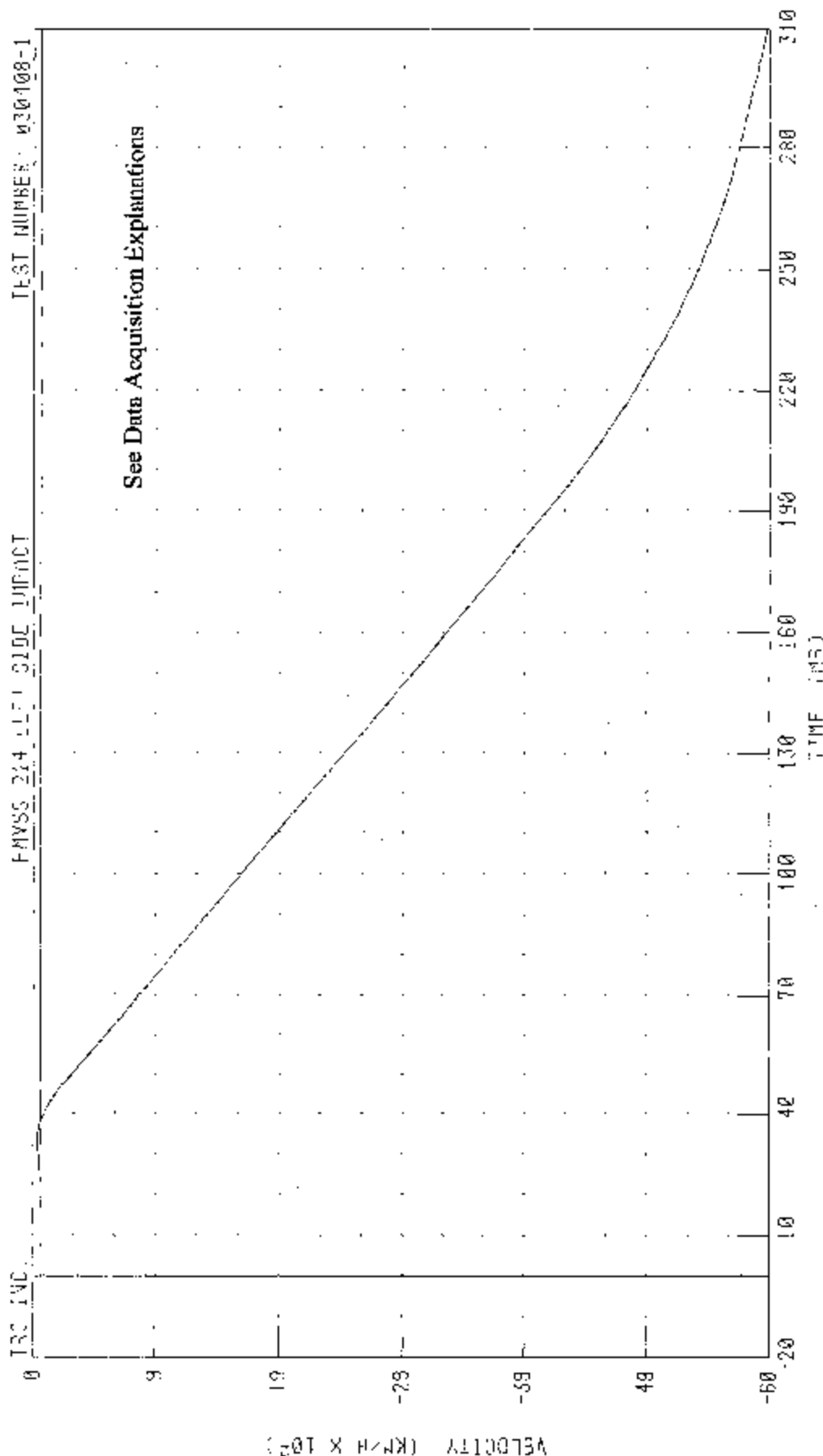


CHANNEL: LURVH1 FILTER: CH CLASS: 1A00

PEAK DATA 98 45 6 23.12 MS; -192 21 6 47 44 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO THE SIDE OF 2003 SATURN ION
 DRIVES UPPER RIB 7-4X75 REDUCED/NO. EFFICIENCY

FMVSS 214 LEFT SIDE IMPACT TEST NUMBER: W30408-1



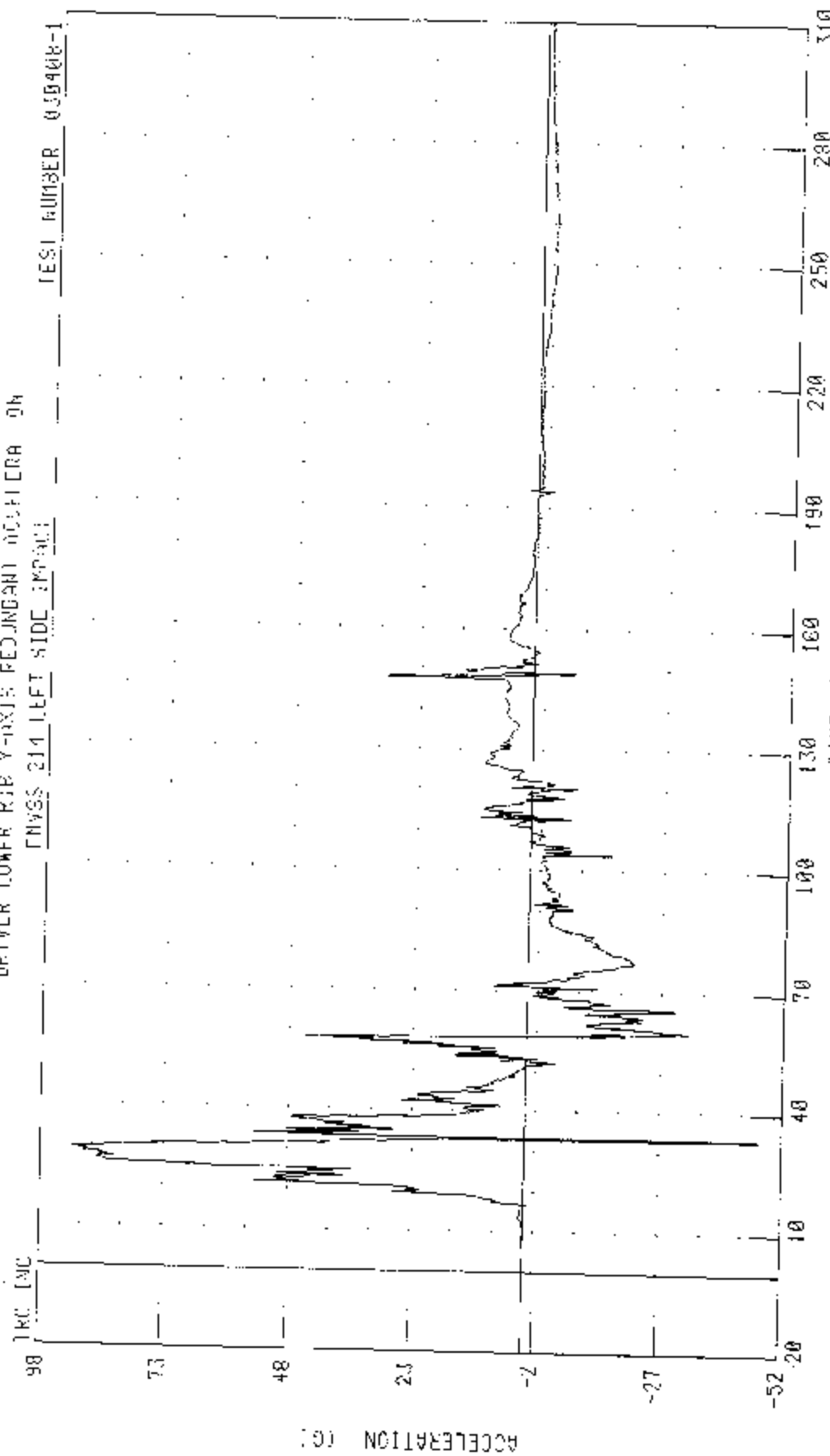
PEAK DATA 27 19 KPH/H @ 34 MS; -5001 20 KPH/H @ 310 MS

CHANNEL: LDRV1 FILTER: CW CLASS: 100

55/28 MPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2000 SATURN (DM)
 DRIVER LOWER RIB Y-AXIS PEELING AND OCCUPANT ON

INVEST 214 LEFT SIDE IMPACT

TEST NUMBER 059408-1



CHANNEL 1 FRYR: FILTER CH CLASS 1003

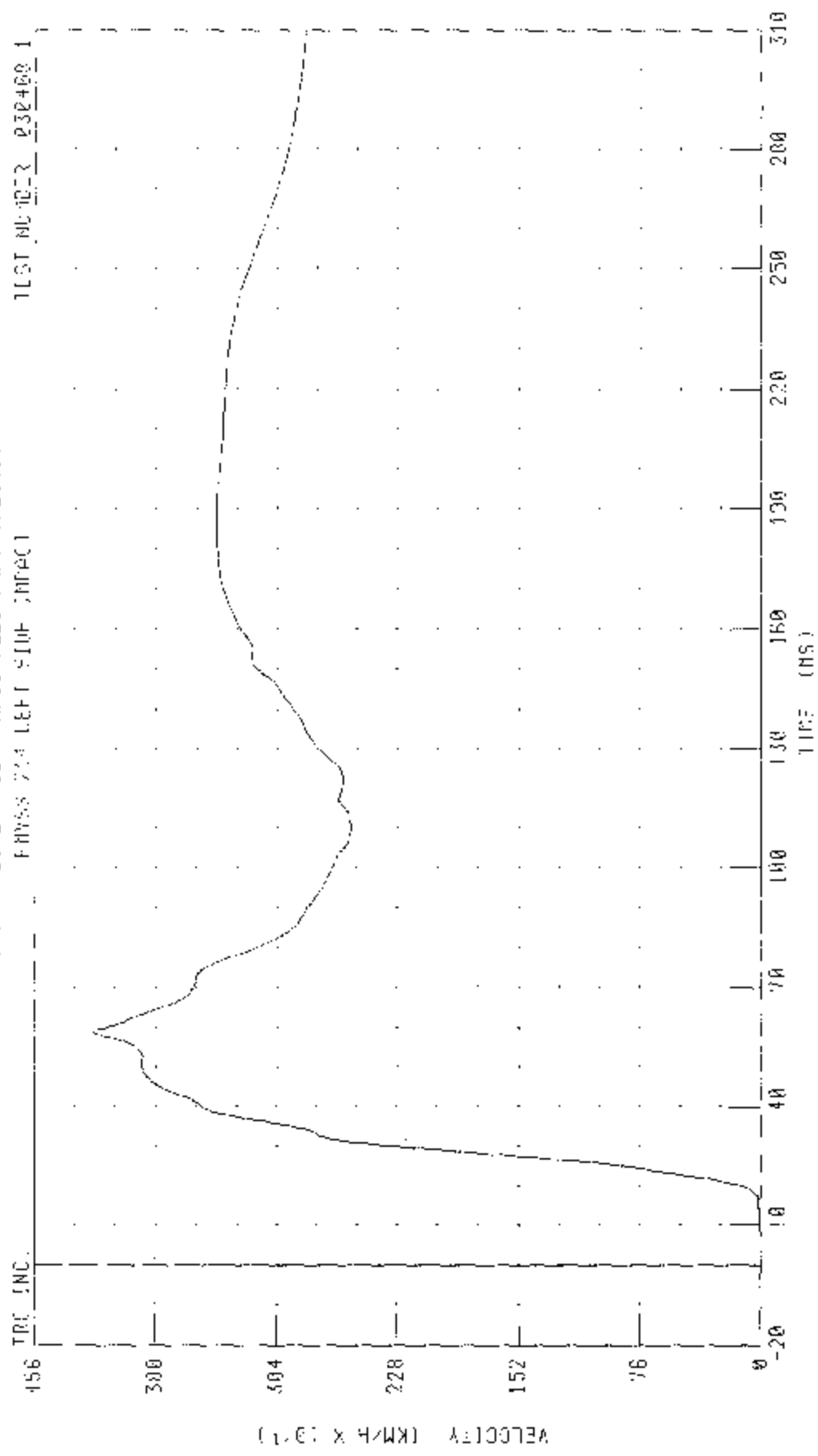
TIME (MS)

PEAK DATA: 31 74 G @ 29 60 MS; 47 41 G @ 33 28 MS

55/20 KPH 90 DEGREE SIDE IMPACT MOVING DEFENDABLE BARRIER INTO LEFT SIDE OF ROAD 5A102H 104
 DRIVER LOWER SIG Y AXIS REDUCED VELOCITY

PHYS 224 LEFT SIDE IMPACT

TEST NUMBER 0304001



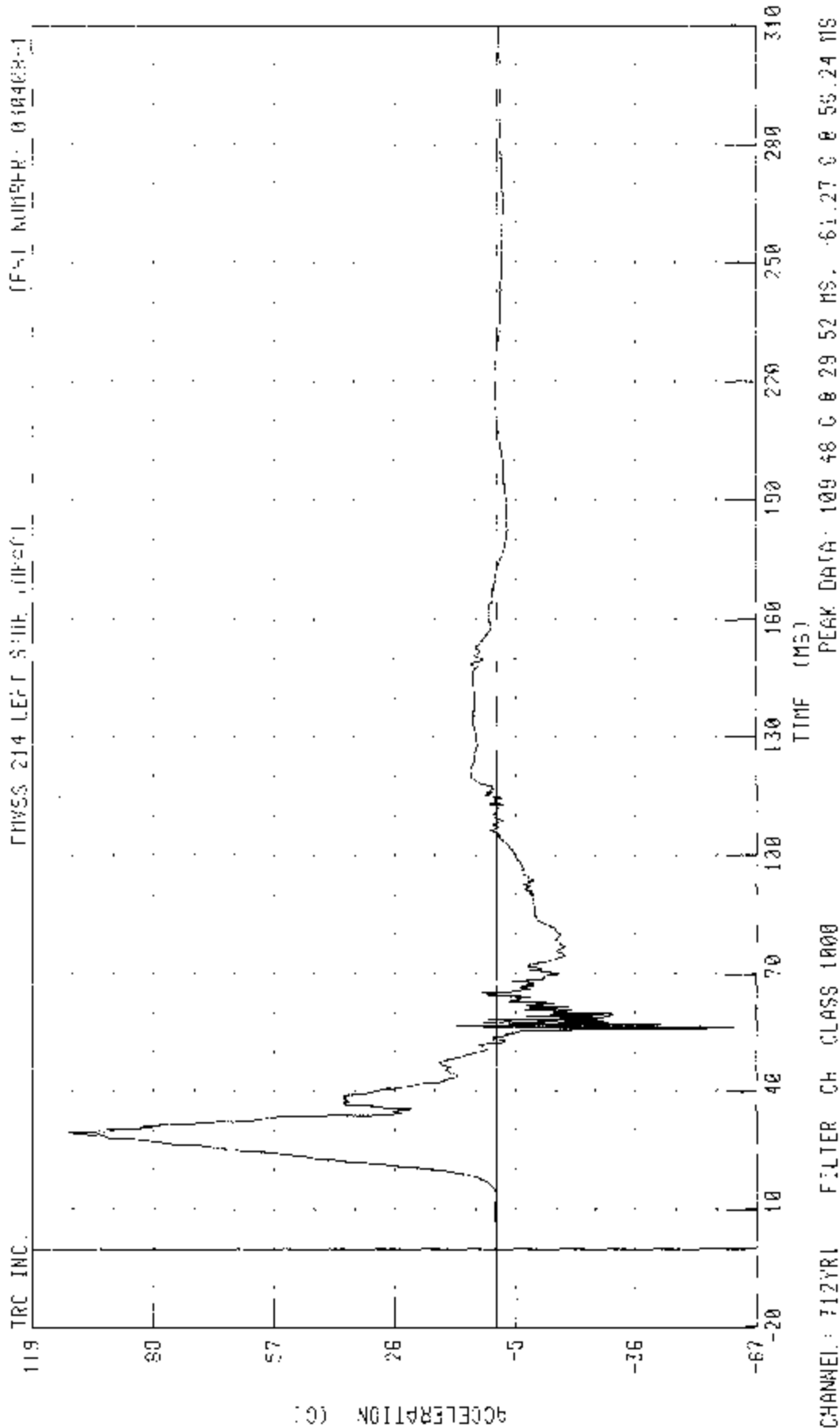
TIME (MS)

PLAK DATA 11 92 KM/H @ 58 88 MS, 0 88 KM/H @ 4 72 MS

CHANNEL LRYVI FILTER 3-1 CLASS 180

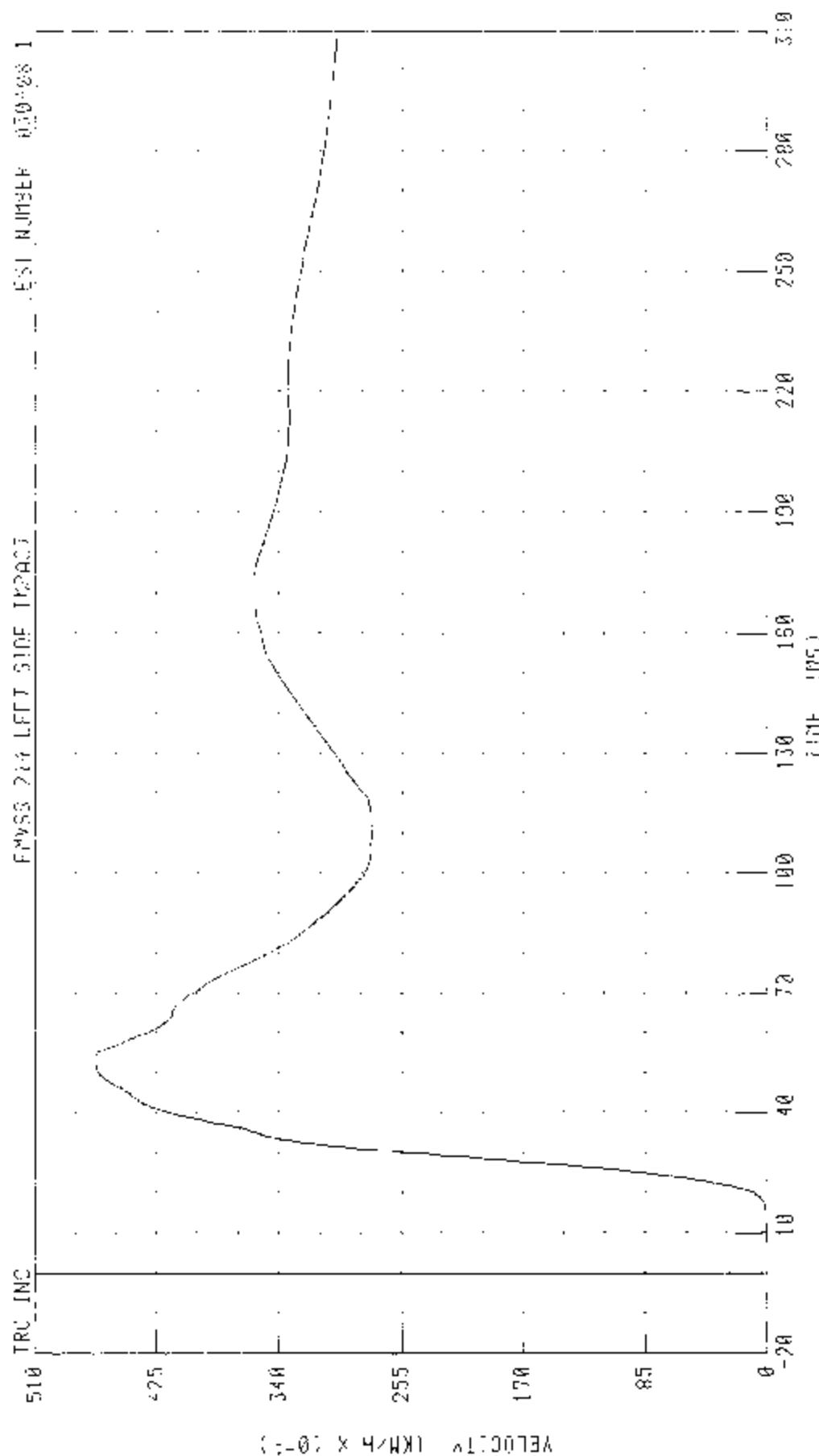
55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARREL) INTO LEFT SIDE OF 2003 SATURN ION

DRIVER LOWER SPINE X-AXIS RECUMBENT ACCELERATION



55/23 <PH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO THE SIDE OF 2053 SOUTH 10N

CRIVER LOWER SPINE Y-AXIS REBOUND VELOCITY

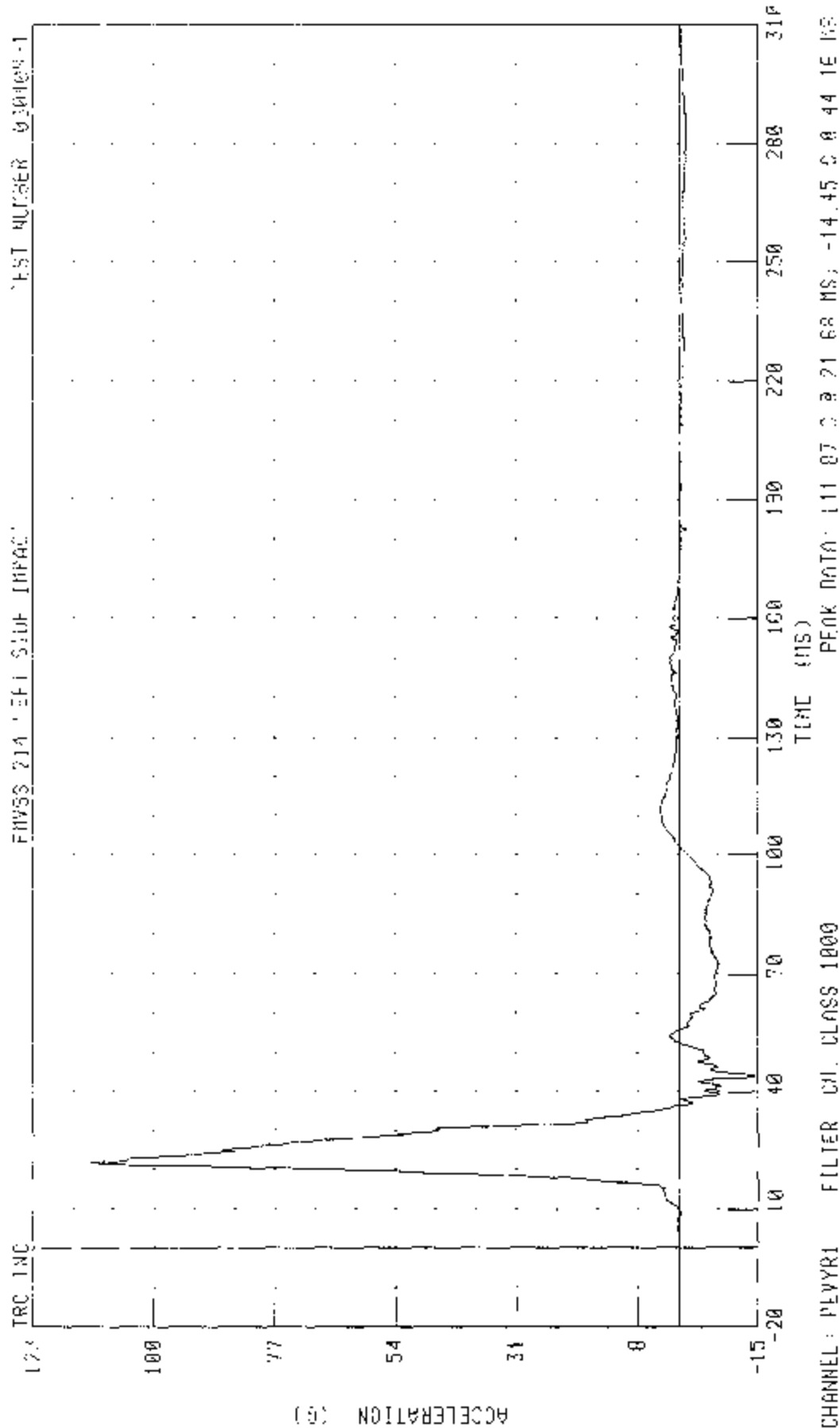


CIRNNEL 112YV1 FILTER: CH. CLASS 180

PEAK DATA: 46 79 KPH @ 52.56 MS. 0 00 KPH @ 0 00 MS

5/2/28 4PH 90 DEGREE SIDE IMPACT (MOVING ULTIMATE BARRIER) INTO LEFT SIDE OF 2003 SATURN FOR

DEVELOPER PEVYRIS Y-AXIS REDUNDANT ACCELERATION



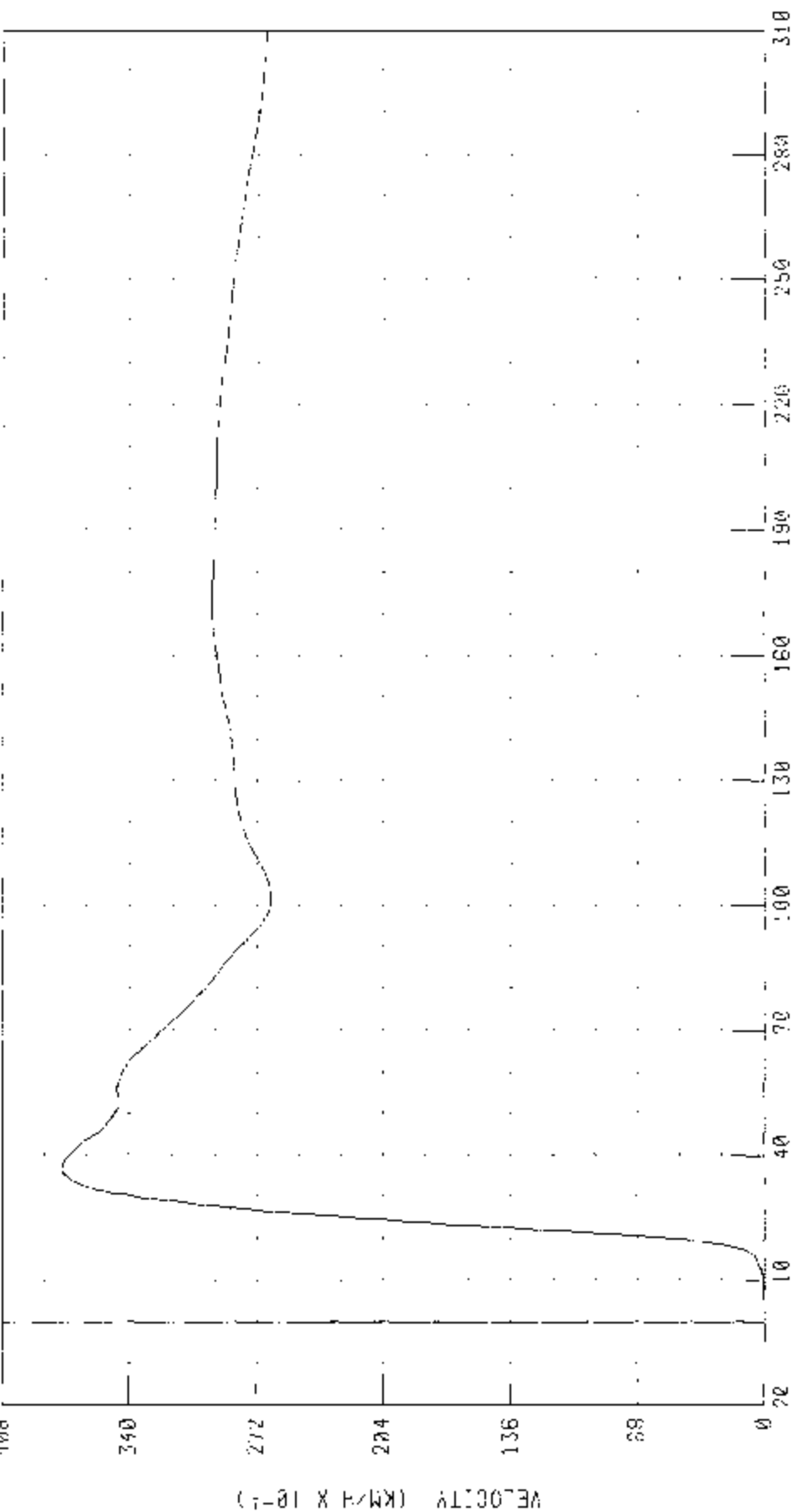
5-7-78 EPH 30 DEGR-F 3000 IMPACT SHOWING DEFORMABLE BARREL INTO LEFT SIDE OF 2003 GALILEX 100

DRIVER PEVVI'S X AXIS FOUNDATION VIBRATION

FIGURE 14 LEFT SIDE IMPACT

HC INC

FILE NUMBER 030408-1



TIME (MS)

PEVVI DATA: 37 50 KPH 0 36 40 MS, 0.00 KPH 0 0 00 MS

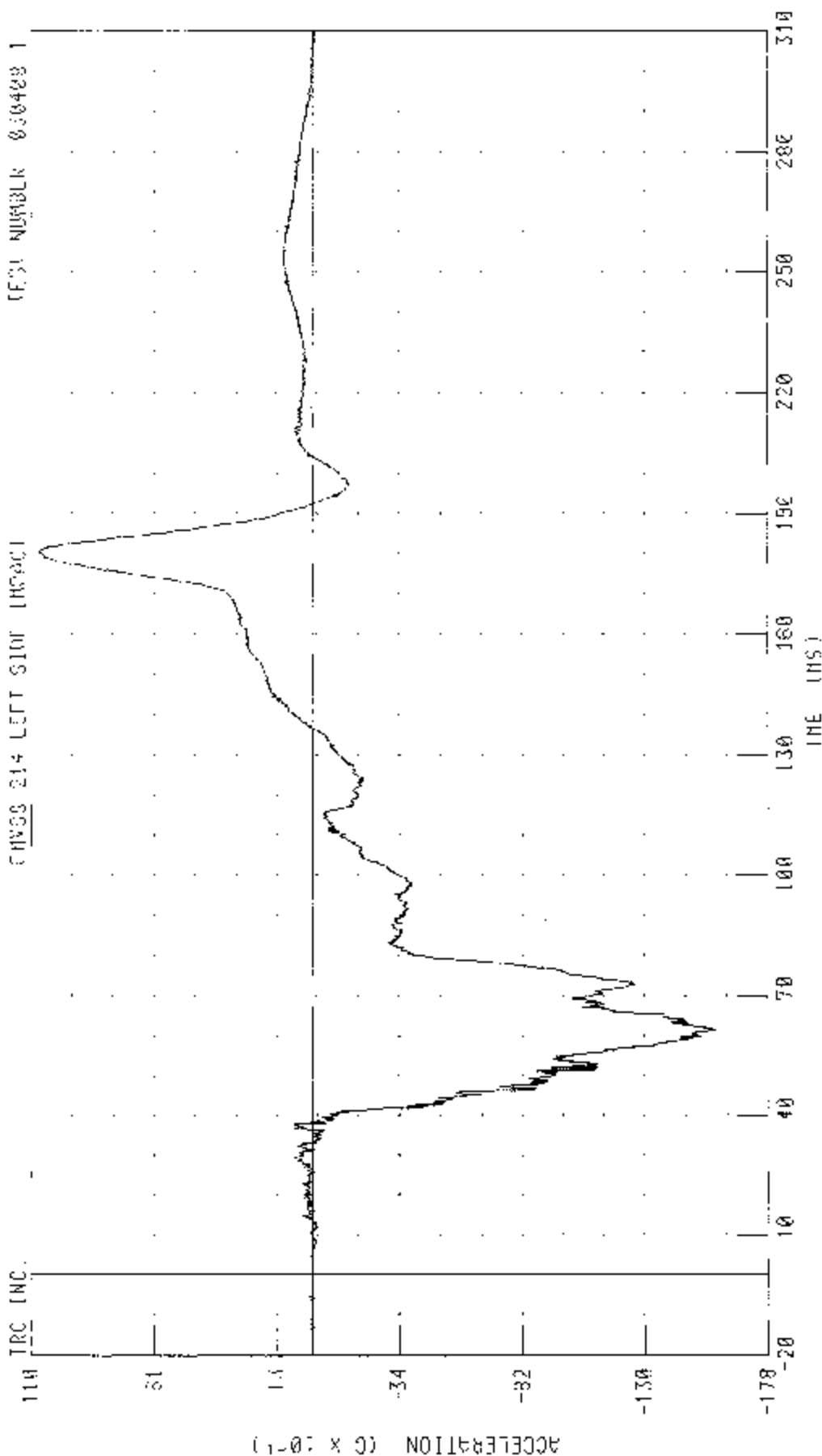
CHANNEL PEVVI FILTER CH. CLASS 130

55/20 MPH 90 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER INTO LEFT SIDE OF 1993 SATURN ION

REF REAR PASSENGER HEAD X AXIS REDUNDANT ACCELERATION

CHV50 214 LEFT SIDE IMPACT

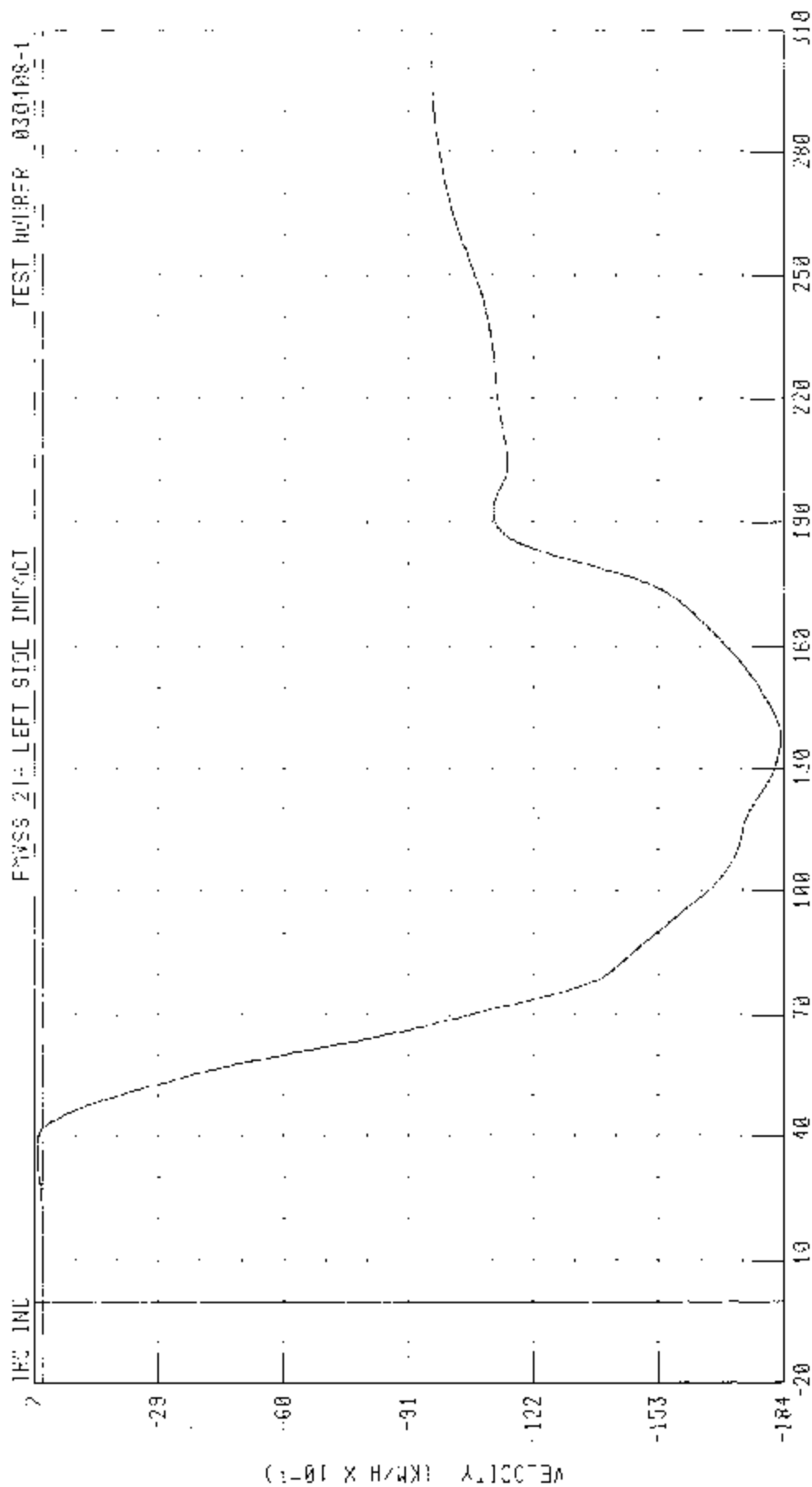
TEST NUMBER 030408-1



CHANNEL: HEDXR4 FILTER: CH, CLASS 1000

PLAY DATA: 10.68 G @ 180.08 MS, 15.71 G @ 150.08 MS

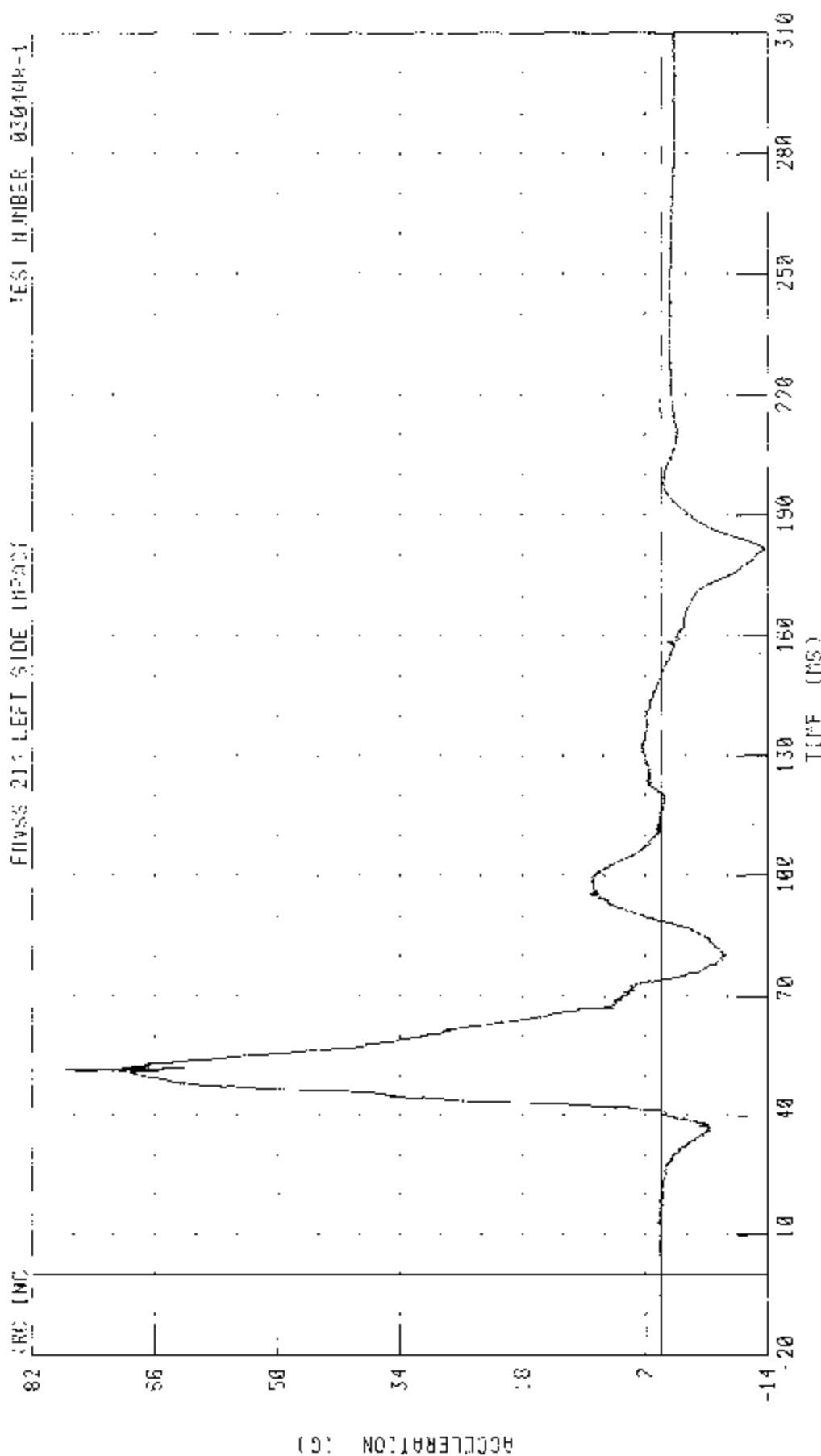
55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SEQUIN 100
 LEFT REAR PASSENGER HEAD X-AXIS RESIDUAL VELOCITY



CHANNEL: HDXVJ FILTER: CH CLOSS: 80 PLOT DATA @ 10 KHZ @ 30 74 MS, -10 35 KHZ @ 136 88 MS

55-28 MPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 CADILLAC ECT
LEFT REAR PASSENGER HEAD Y-AXIS RECORDED ACC ELATION

FINISH 213 LEFT SIDE IMPACT TEST NUMBER 030408-1



CHANNEL HEADYK4 FILTER CH. CLASS 1000

PEAK DATA: 77.67 G @ 51.78 MS; -13.62 G @ 181.44 MS

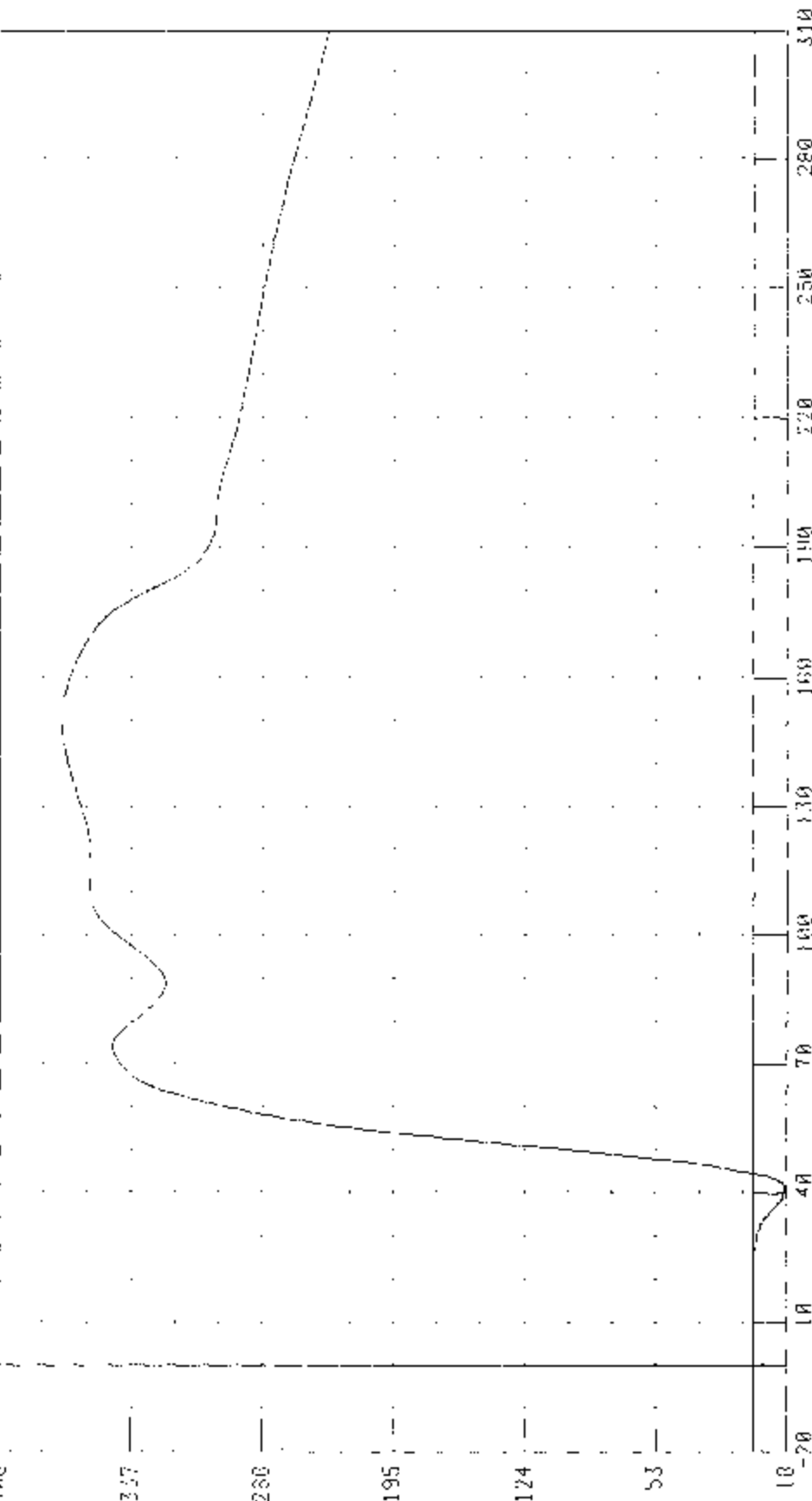
55428 KPH 90 DEGREE SIDE IMPACT PROVIDING DEFORMABLE PAPER (IMP) LEFT SIDE OF 2025 SATURN 10A

LEFT REAR PASSENGER HEAD X-AXIS REDUCED VELOCITY

TEST NUMBER: 030408

PROCESS 214 LEFT SIDE IMPACT

TRC INC



(1.0) X 10^3

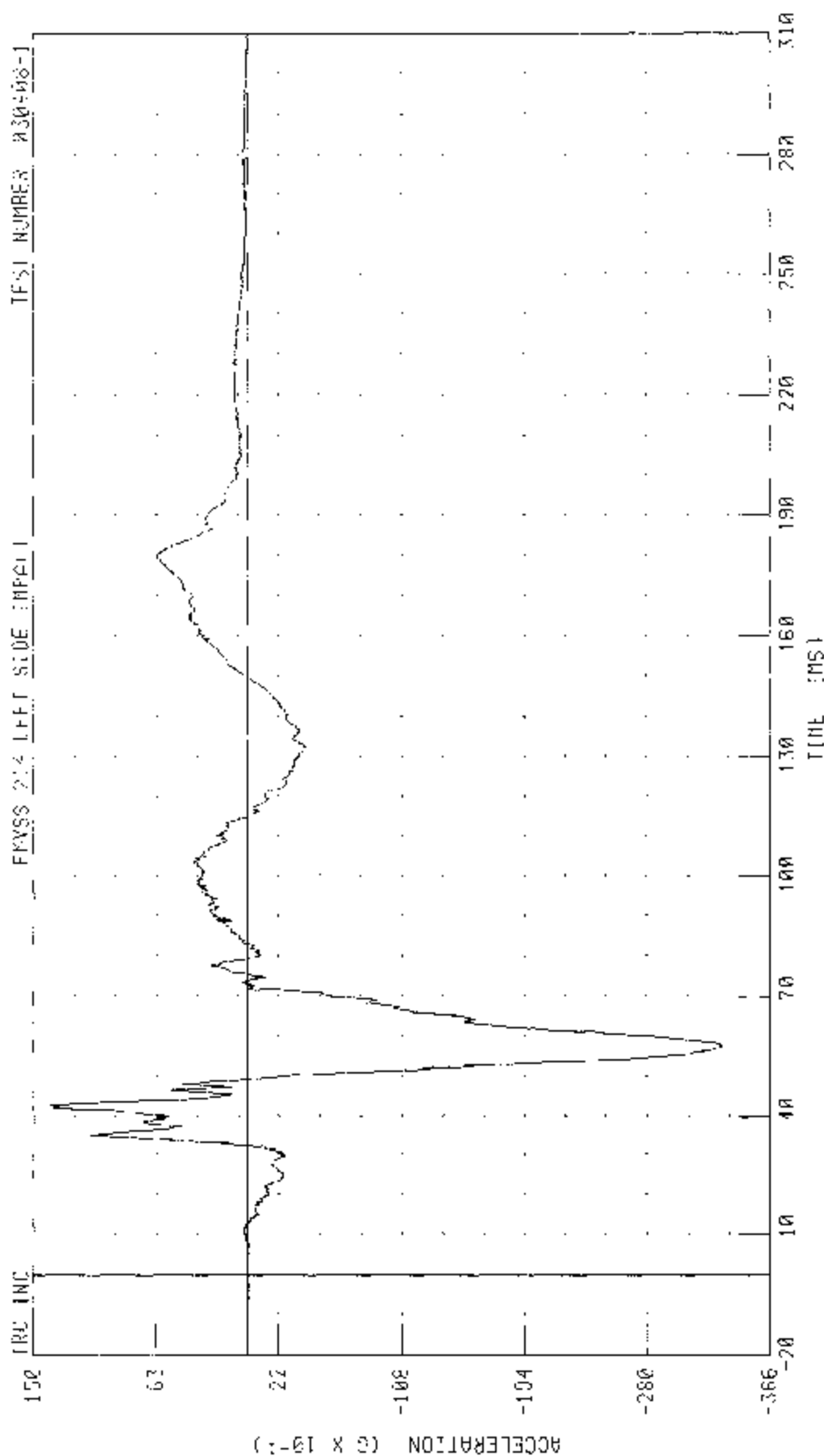
TIME (MS)

CHANNEL: HF00VJ FILTER: CII C/6SS 100

PEAK DATA 37 40 KPH @ 149.92 MS, -1 63 KPH @ 41 26 MS

55/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN JON

LEFT RLP8 PASSENGER HEAD Z-AXIS REDUNDANT ACCELERATION

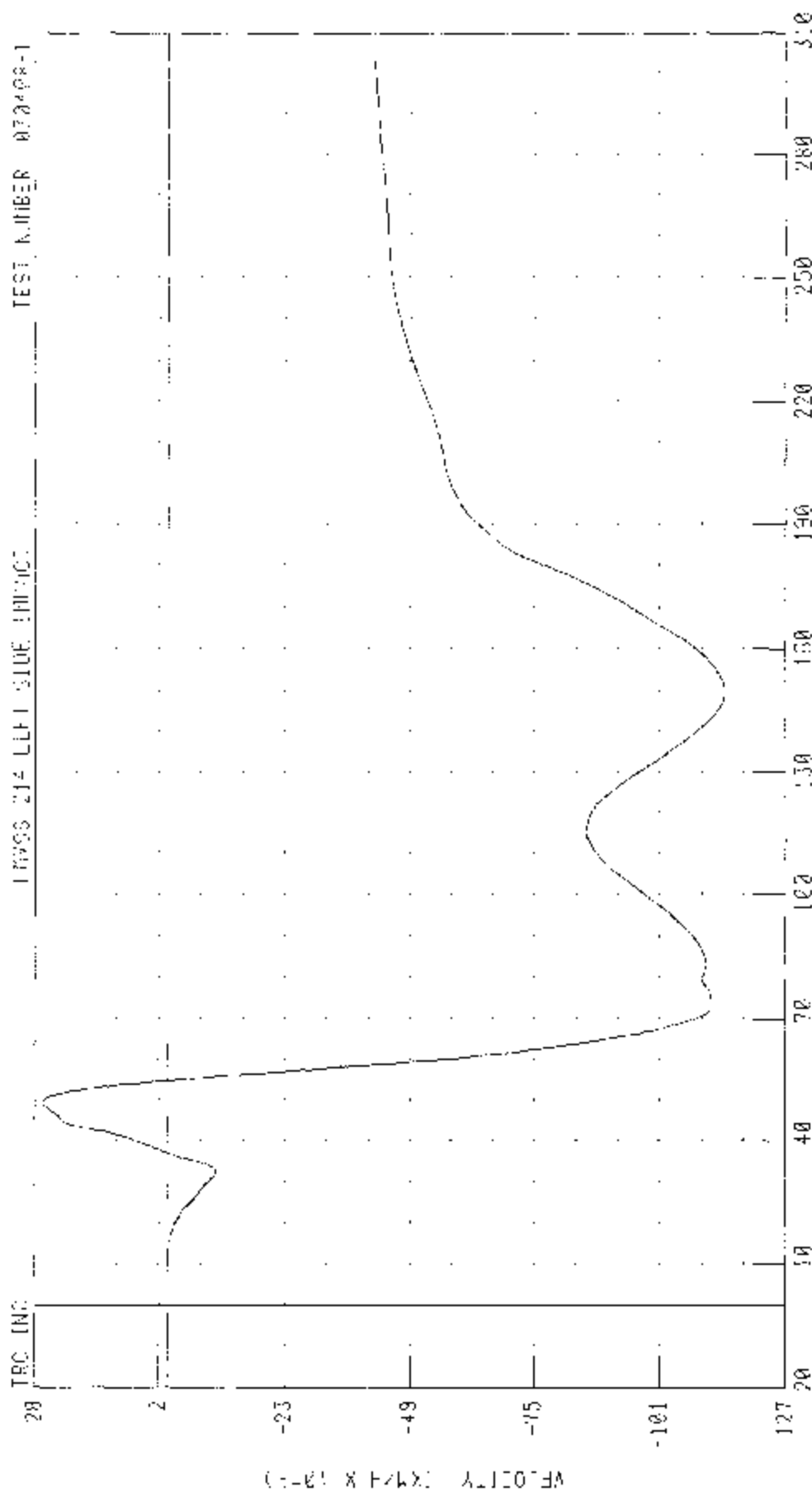


CHANNEL HEDZ04 FILTER CH CLASS 1800

PEAK DATA 13.88 C @ 42.82 MS; -33.16 C @ 58.60 MS

55/20 K2 - 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER HEAD 2 AXIS RECONSTRUCT VELOCITY



TIME (MS)

PLAX DATA 2 63 KM/H @ 49 36 MS, -11 55 KM/H @ 149 84 MS

CHANNEL HEAD2VZ FILTER CH. CLASS 130

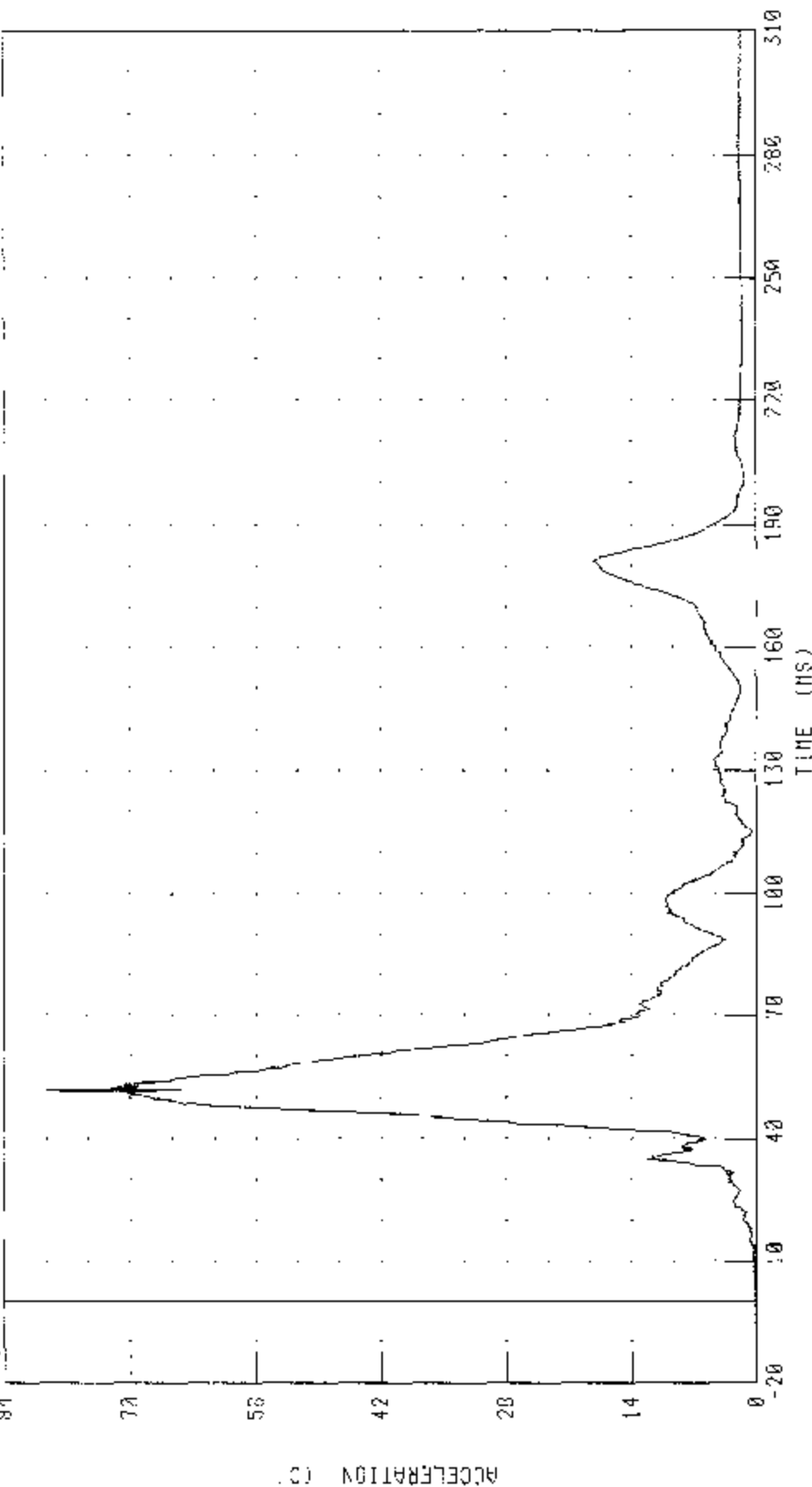
55/28 KPII 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) THIR LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER HEAD RESULTANT REDUNDANT OCCUPANTION

IRC INC.

FWSS 214 LEFT SIDE IMPACT

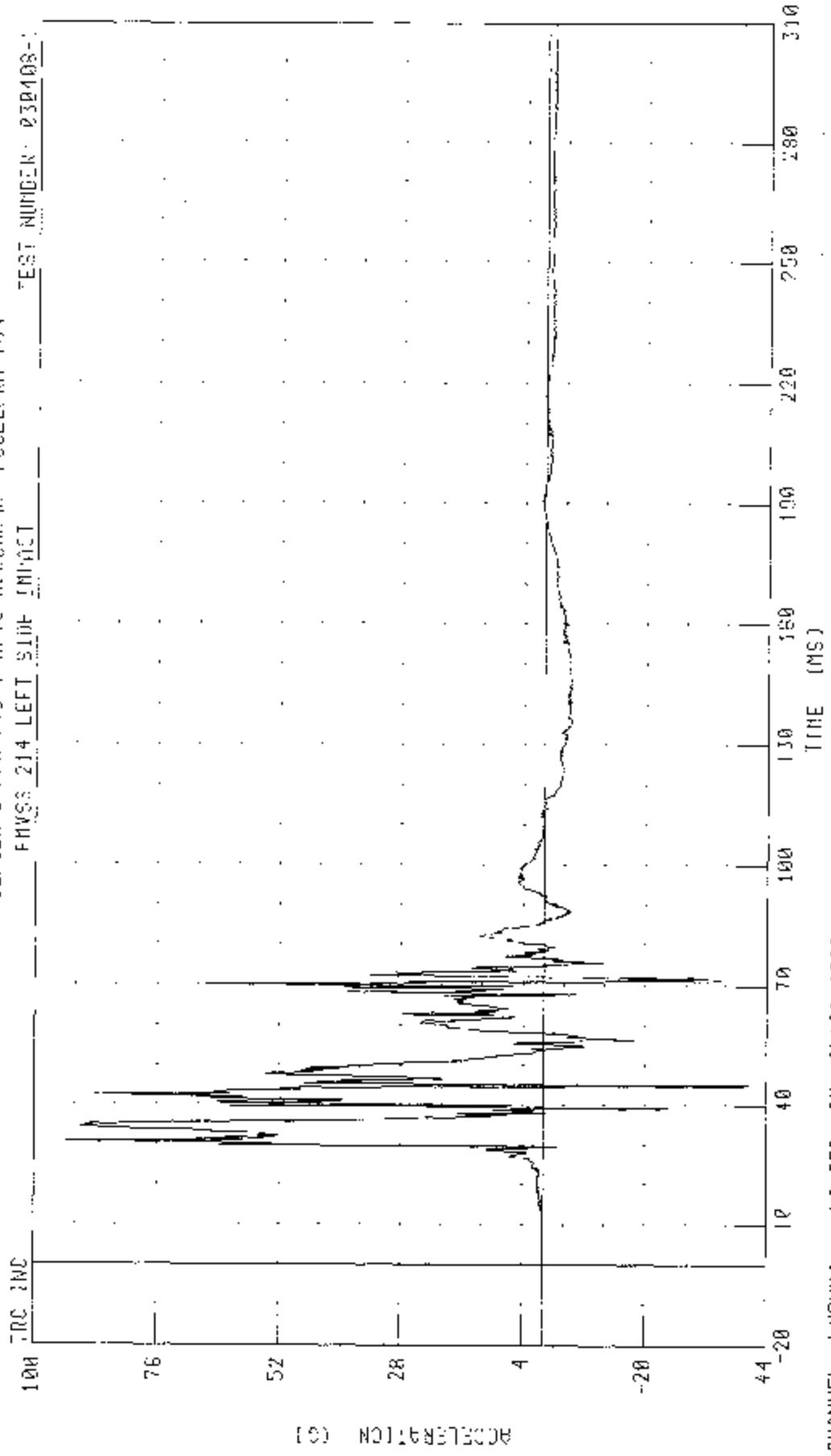
TEST NUMBER: #10403-1



CHANNEL HEADR4 FILTER: CH. CLASS 1000

PEAK DATA: 79.45 G @ 51.75 MS, 0.01 G @ -17.12 MS

55/70 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE ENERGY INTO LEFT SIDE OF 2003 SATURN ION
 LEFT REAR PASSENGER JOINT R18 Y-AXIS RADIOMOUNT ACCELERATION



TEST NUMBER: 030408-1

PEAK DATA: 93.59 @ 38.95 MS; -40.50 @ 15.12 MS

CHANNEL: LURY14 FILTER: CII CLASS: 1800

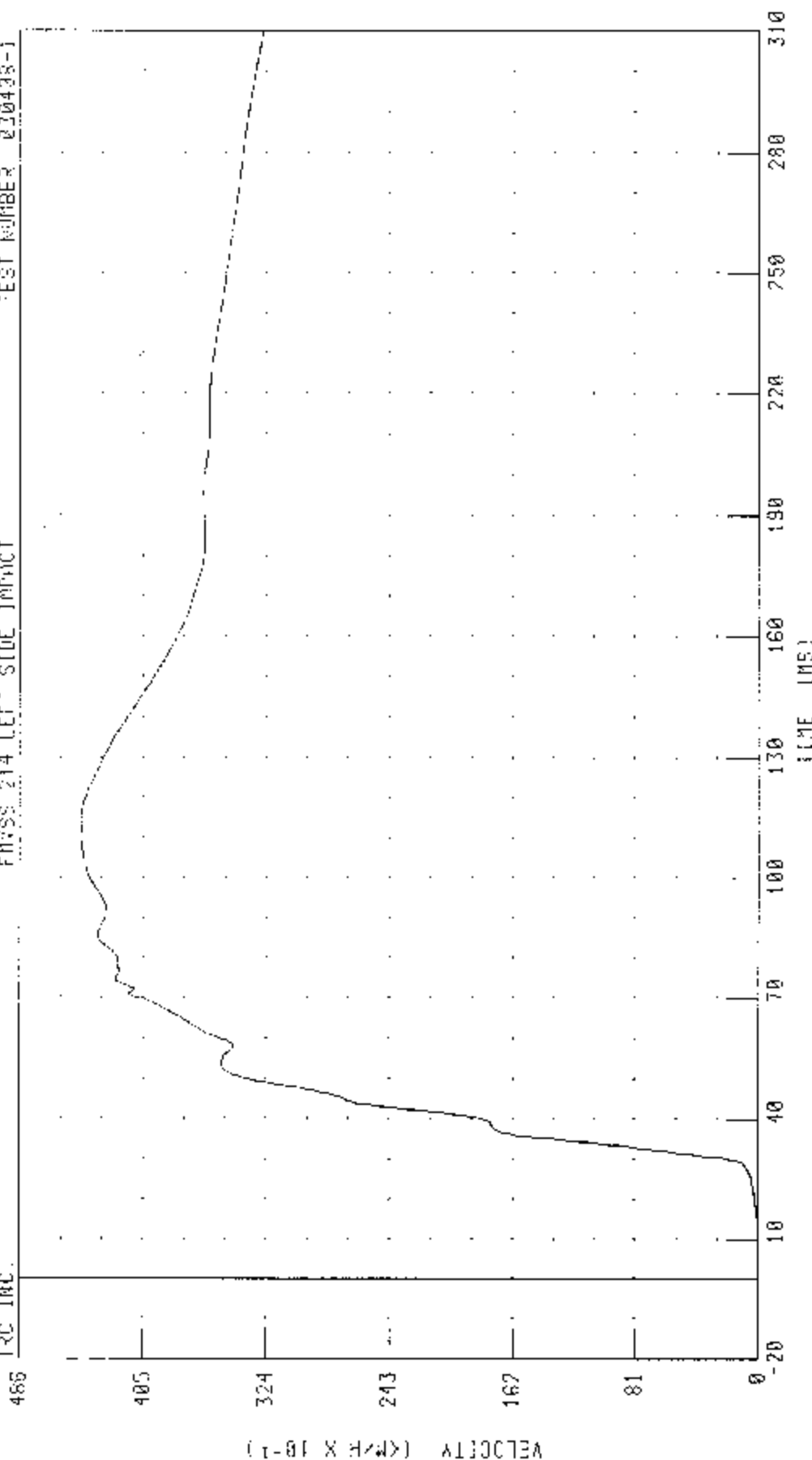
55/28 KPH 50 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2007 SATURN ION

LEFT REAR PASSENGER UPPER RIB Y-DATA REDUNDANT VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



CHANNEL: LURYVJ FILTER: CH CLASS 1B2

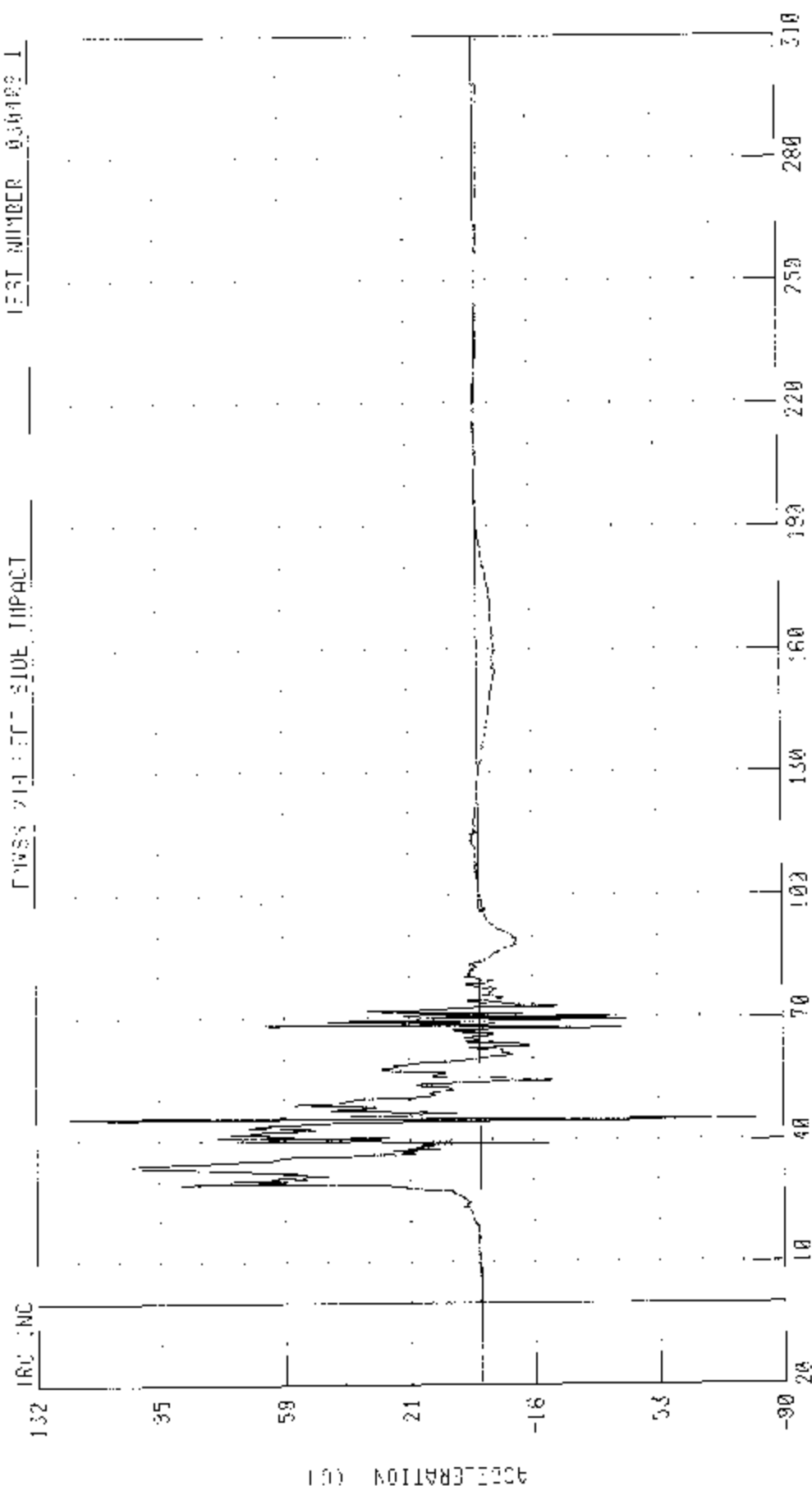
PEAK DATA 44.55 KPH/H @ 13.76 MS: 0.00 KPH/H @ 0.00 MS

55-20 300 50 DEGREE SIDE IMPACT MOVING OFFROAD/F ROPS/IER) INTO FF SIDE OF CURV SAFETY 100.

LEFT REAR PASSENGER LOWER RIA A AXIS REBOUND/OUT ACCELERATION

TEST NUMBER 030408-1

MOVING VEHICLE SIDE IMPACT



CHANNEL 110YR4 FILTER: CII CLASS 10000
 PEAK DATA 174.61 G @ 45.52 MS, -81.98 G @ 44.95 MS

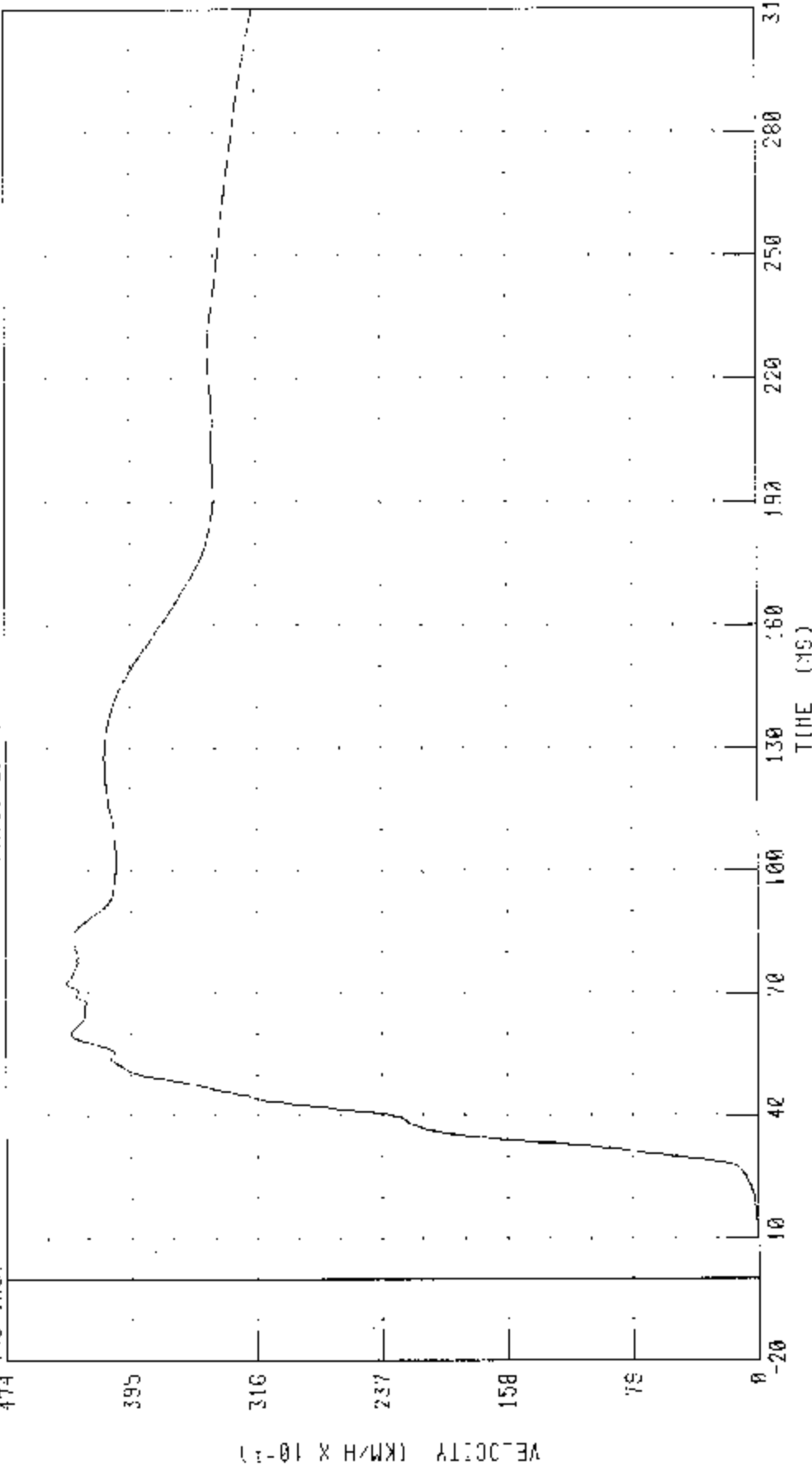
55.28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE CARRIER) INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR PASSENGER LOWER RLD Y AXIS REDUNDANT VELOCITY

TRC INC.

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



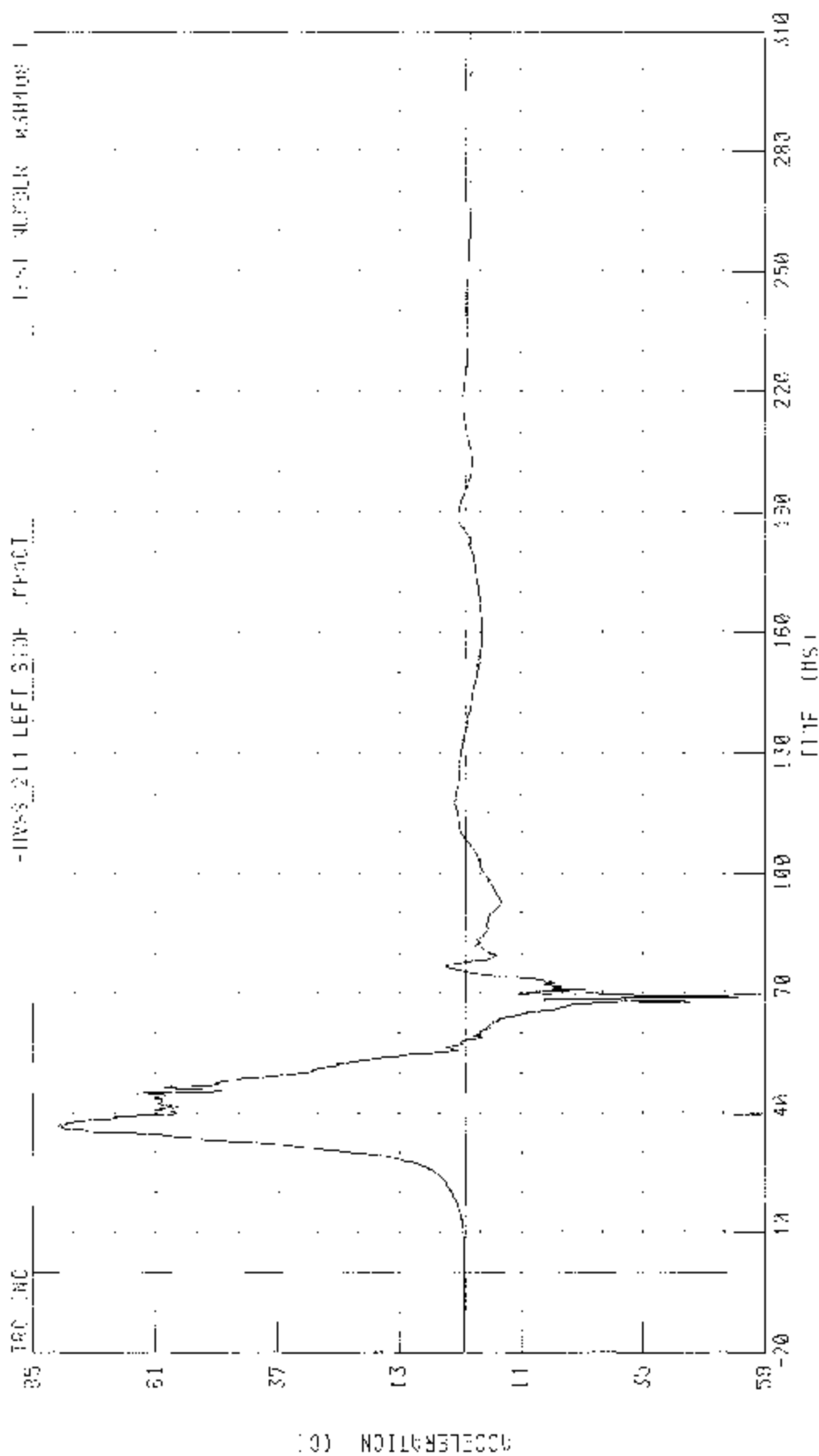
CHANNEL LLRYV3 FILTER: CH CLASS 1R0

PEAK DATA 43 55 KM/H @ 72 56 MS; 0 00 KM/H @ 0 00 MS

55/28 KPH 90 DEGREE SIDE IMPACT INVOLVING BARRIER. IMPACT SIDE OF 2009 GATEWAY FOR
LEFT BEAR PASSAGE. 2009 SERVICE ROAD SIX FEET REINFORCED ACCIDENTLY.

13644 - 46:5 JFF7 115 5001 - 1055 211 LEFT 5:34 Page

Abstract



JOHANNI 17YR 11TF 01 CLASS 1989

FFAK DPA 50 0.5 @ 30 15. 55 82 15 58 96 15

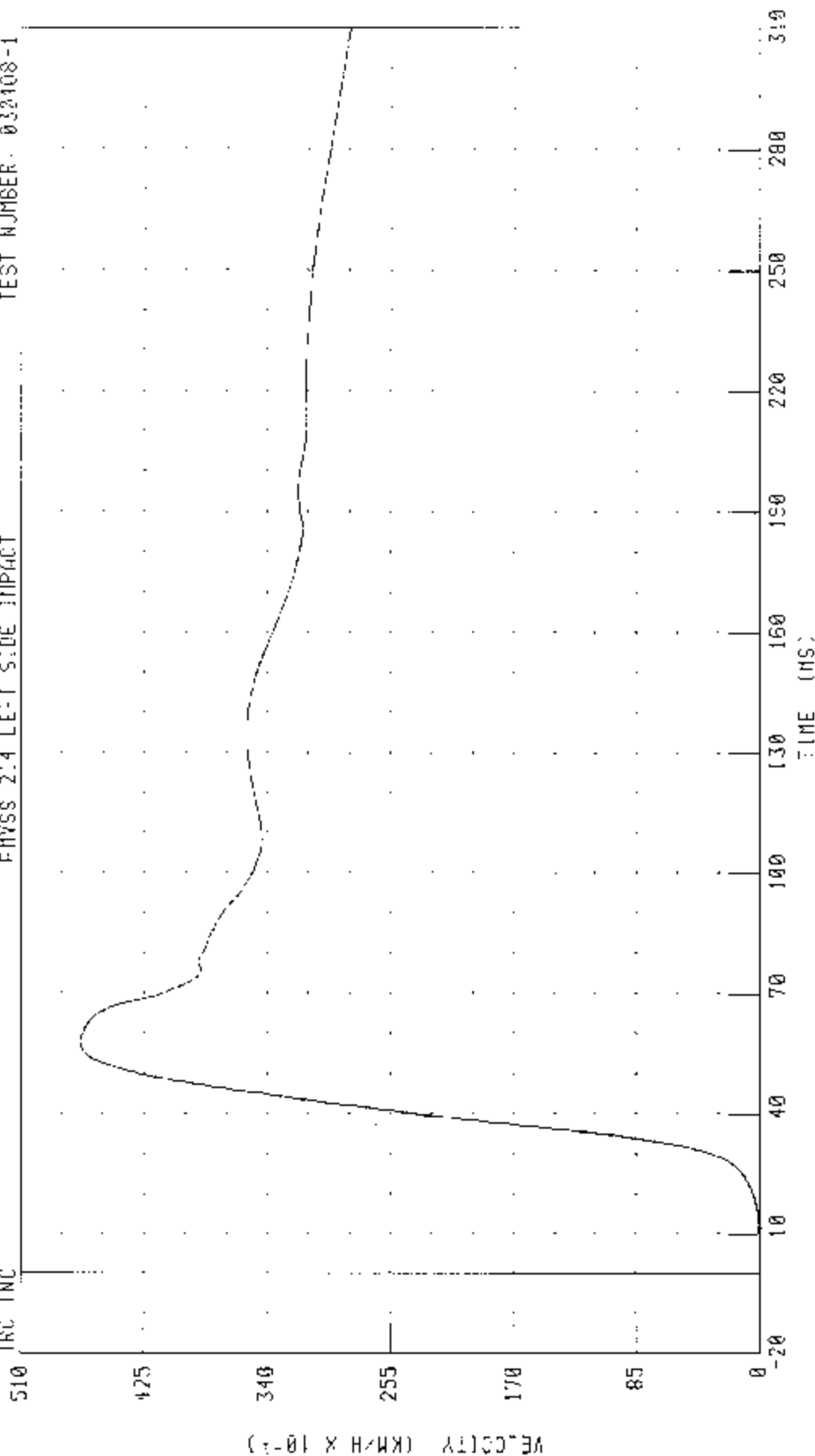
55/23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) (RHD LEFT SIDE OF 2003 SATURN ION)

LEFT REAR PASSENGER LOWER SPINE Y AXIS REDUNDANT VELOCITY

TEST NUMBER: 032408-1

PHYSS 214 LEFT SIDE IMPACT

TRC INC

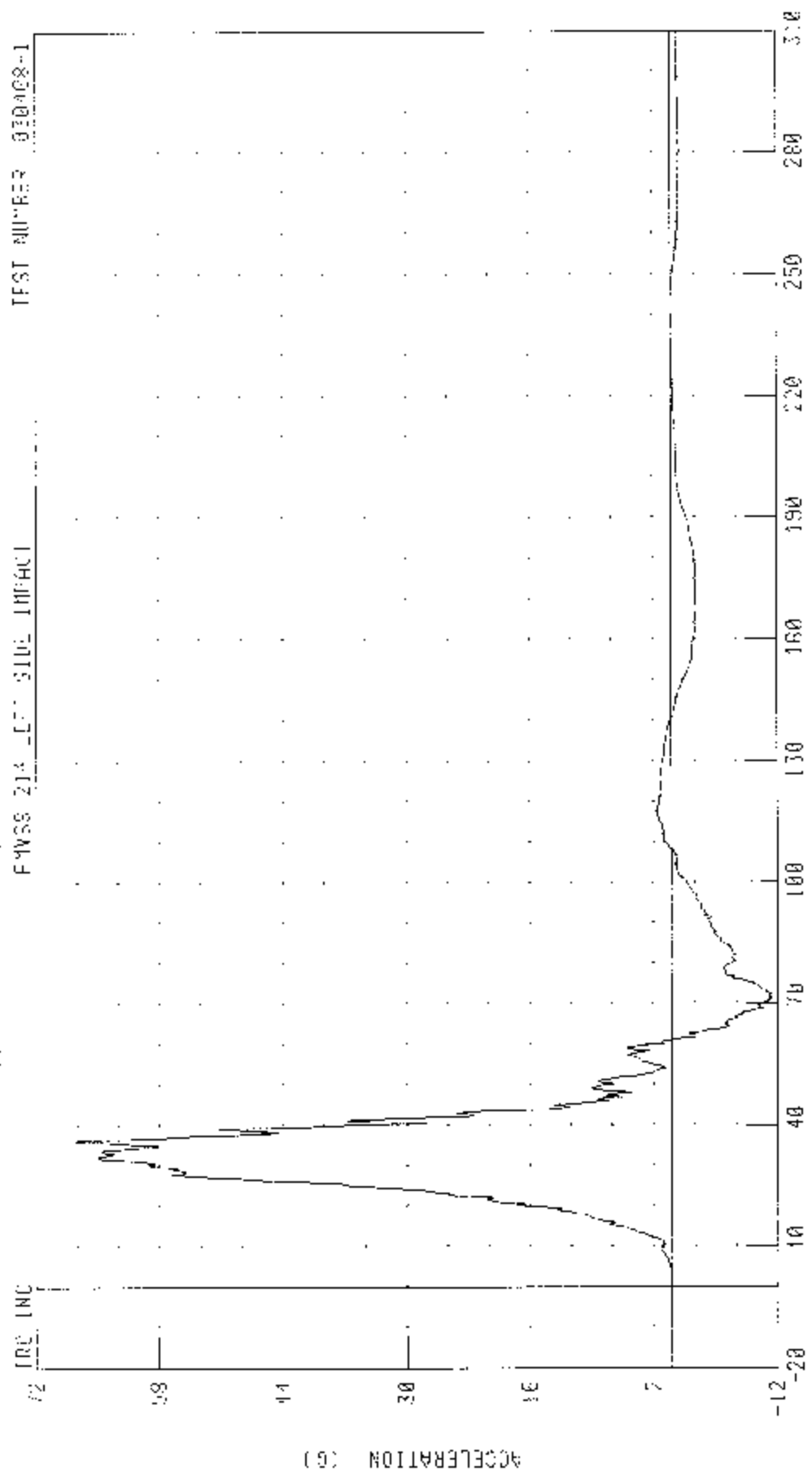


CHANNEL: T12YVJ, FILTER: CHL CLASS 100

PEAK DA 4 46.89 KM/H @ 58.00 MS, 0 00 KM/H @ 0 00 MS

55-28 3P4 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE SKEWER) INTO LEFT SIDE OF 200' SANDWICH

LIST OF RECORDING PHYSICALS Y-AXIS RECORDING ACCELERATION



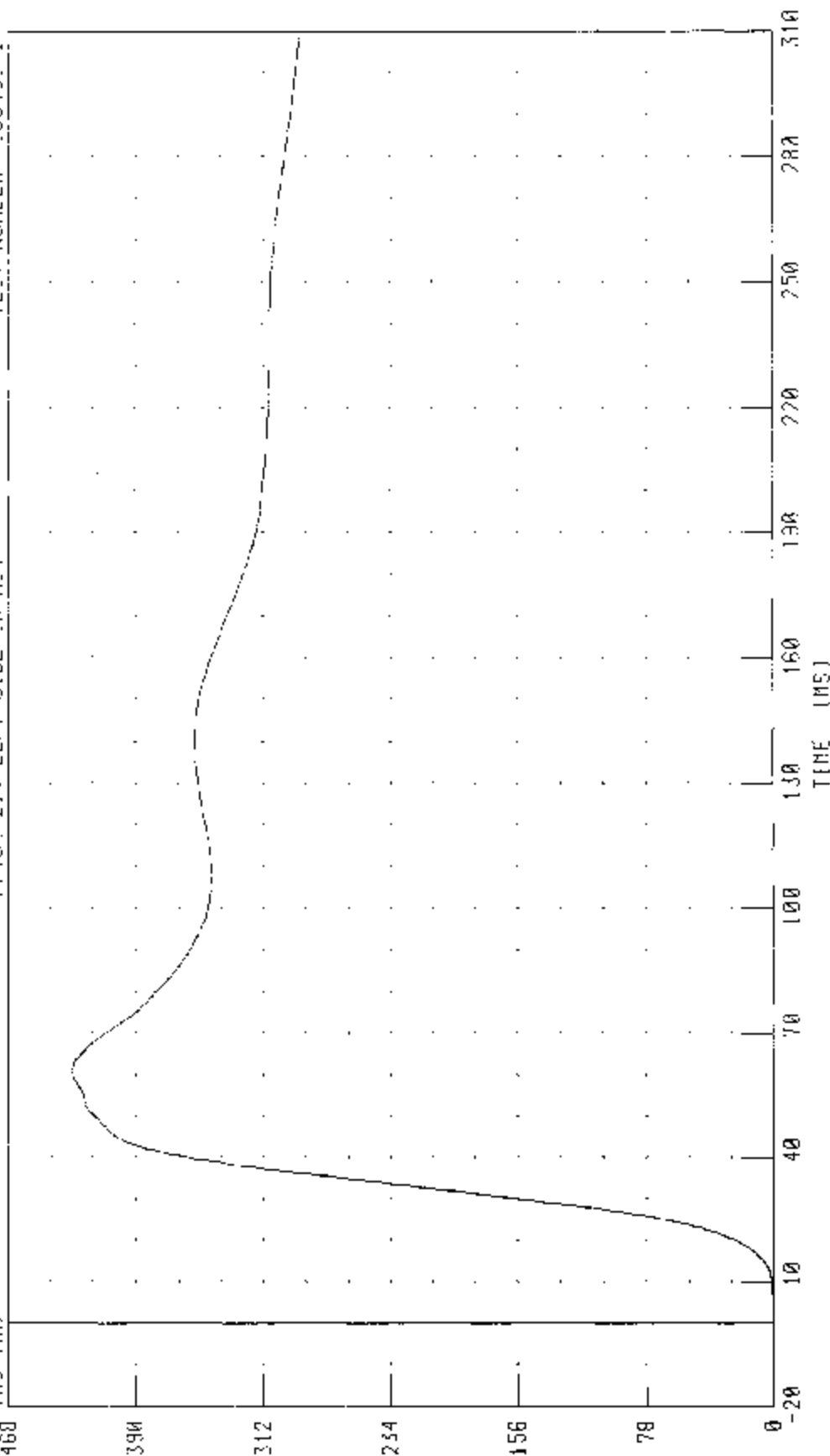
CHANNEL: PEVYR4 - FILTER: 0.1 CLASS 1000 PLAY DATA 0.0 6.0 12.0 18.0 24.0 30.0 36.0 42.0 48.0 54.0 60.0 66.0 72.0 78.0 84.0 90.0 96.0 102.0 108.0 114.0 120.0 126.0 132.0 138.0 144.0 150.0 156.0 162.0 168.0 174.0 180.0 186.0 192.0 198.0 204.0 210.0 216.0 222.0 228.0 234.0 240.0 246.0 252.0 258.0 264.0 270.0 276.0 282.0 288.0 294.0 300.0

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION
 LEFT REAR PASSENGER PEDESTAL Y-AXIS REDUNDANT VELOCITY

TEST NUMBER 030408-1

FRVS 214 LEFT SIDE IMPACT

IRC INC



CHANNEL: PEVYVJ FILTER: CH CLASS 180

PEAK DATA 42 87 K/H & 60 96 MS, 0 00 K/H & 0 00 MS

Test Vehicle Instrumentation Plots

Acceleration Data - Filter Class 60

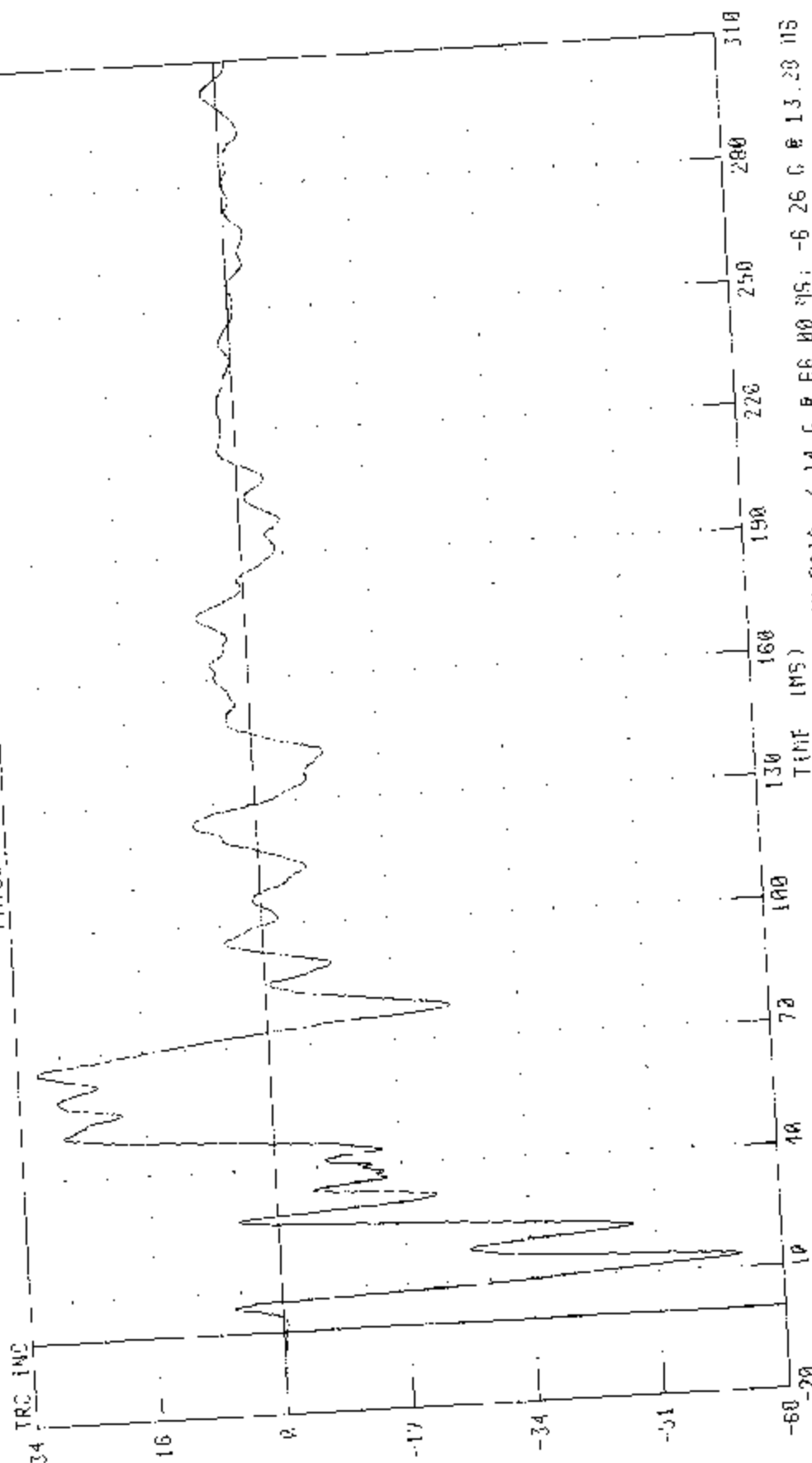
Integration Data - Filter Class 180

55/20 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2000 SATURN 10N

RIGHT SIDE CLJ AT FRONT SEAT X-AXIS ACCELERATION

TEST NUMBER 030408-1

TRUSS 214 LEFT SIDE IMPACT



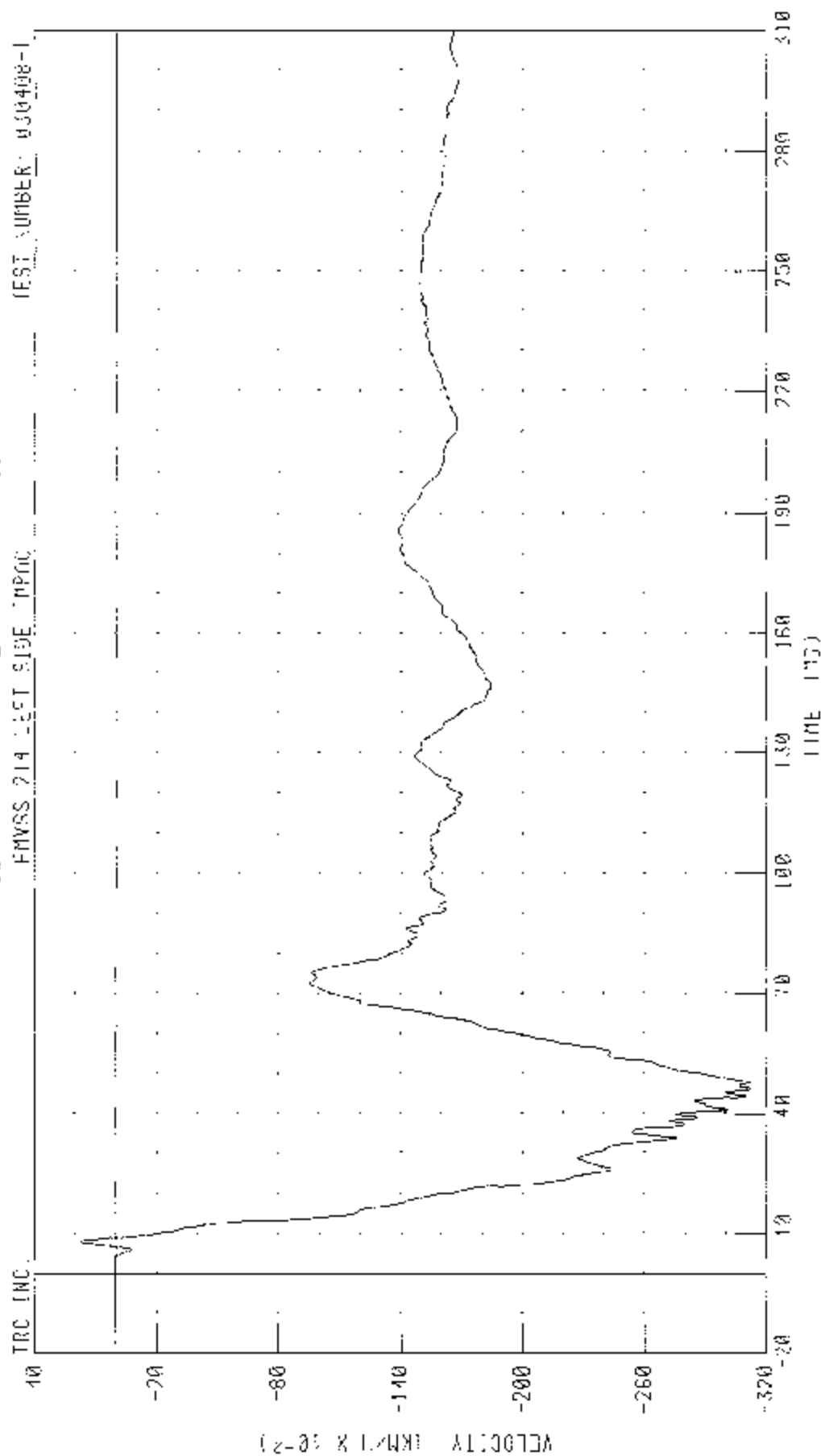
PEAK DATA 3.14 G @ 66 MS; -6.26 G @ 13.23 MS

CHANNEL: RFSXC1 FILTER: CH CLASS: CO

ACCELERATION (G X 10^-1)

55/20 KPH 20 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 SQUAW 10W

RIGHT SIDE SCL. AT FRONT SEAT A-AXIS VELOCITY



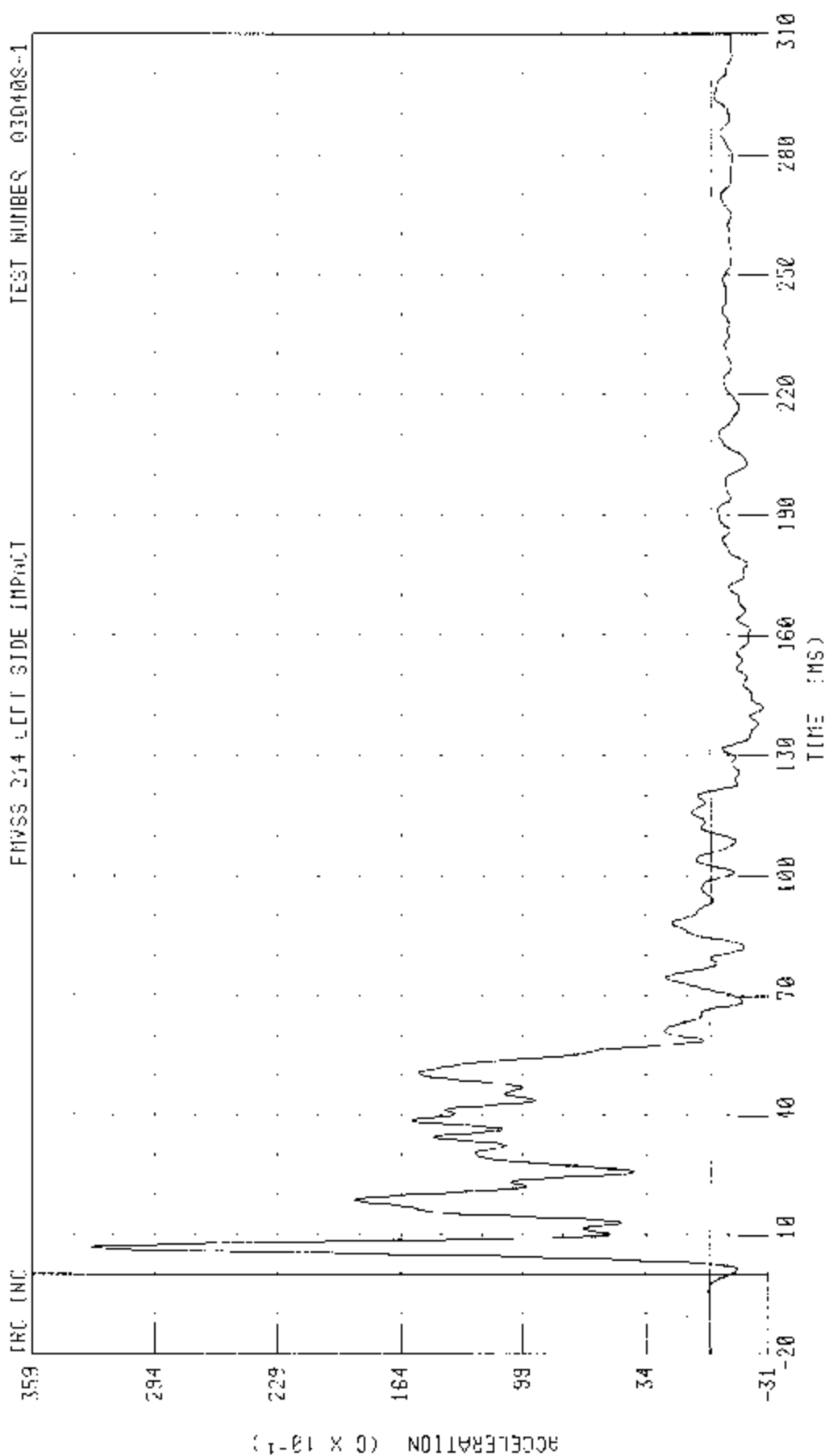
PEAK DATA: 0 17 KPH @ 7.84 MS, -3.13 KPH @ 246.24 MS

CHANNEL: RTSXV1 FILTER: CII, CLASS 180

05:29 4PH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) IN C LEFT SIDE OF 2007 SATURN ICH

RIGHT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1



CHANNEL: RFSYC1 FILTER: CII, CLASS 60

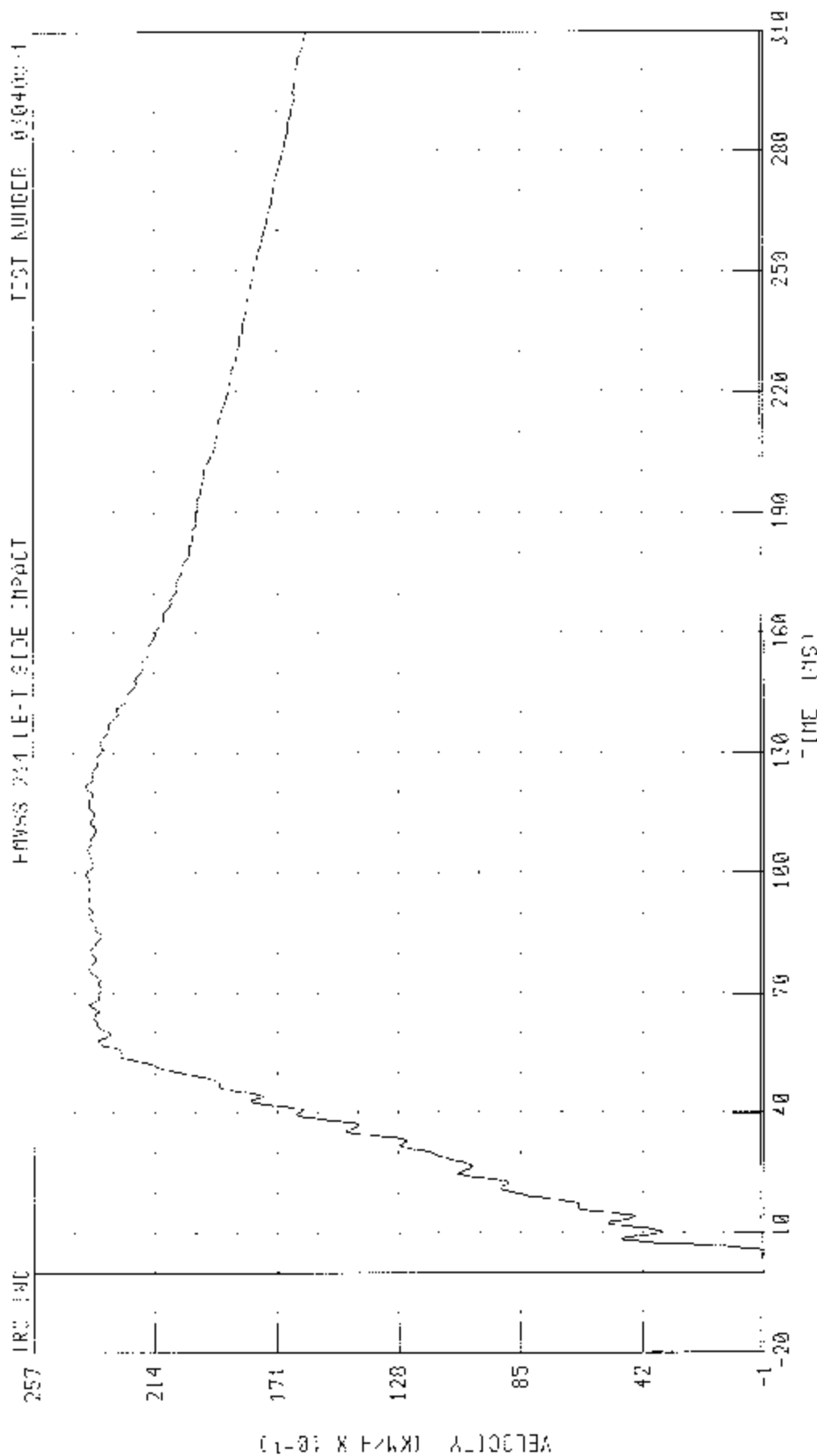
PEAK DATA: 32.78 G @ 6.88 MS, -2.86 G @ 142.16 MS

55.28 KM/H 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2025 SATURN 100H

RIGHT SIDE SILL 5" FRONT SEAT (FIXED VELOCITY)

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



CHANNEL: R15Y01 FILIER CH. CLASS 180
 PEAK DATA 25.06 KM/H @ 121.44 MS -0.13 KM/H @ 5.17 MS

55.29 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE REVEALER IN THE LEFT SIDE OF 2003 SATURN ION

RIGHT SIDE STILL AT FRONT SEAT 7 AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 032438-1

53 TRC INC.

34

15

3

-22

-41

-60

ACCELERATION (G X 10⁻¹)

TIME (MS)

CHANNEL R55761 FILTER CH CLASS 60

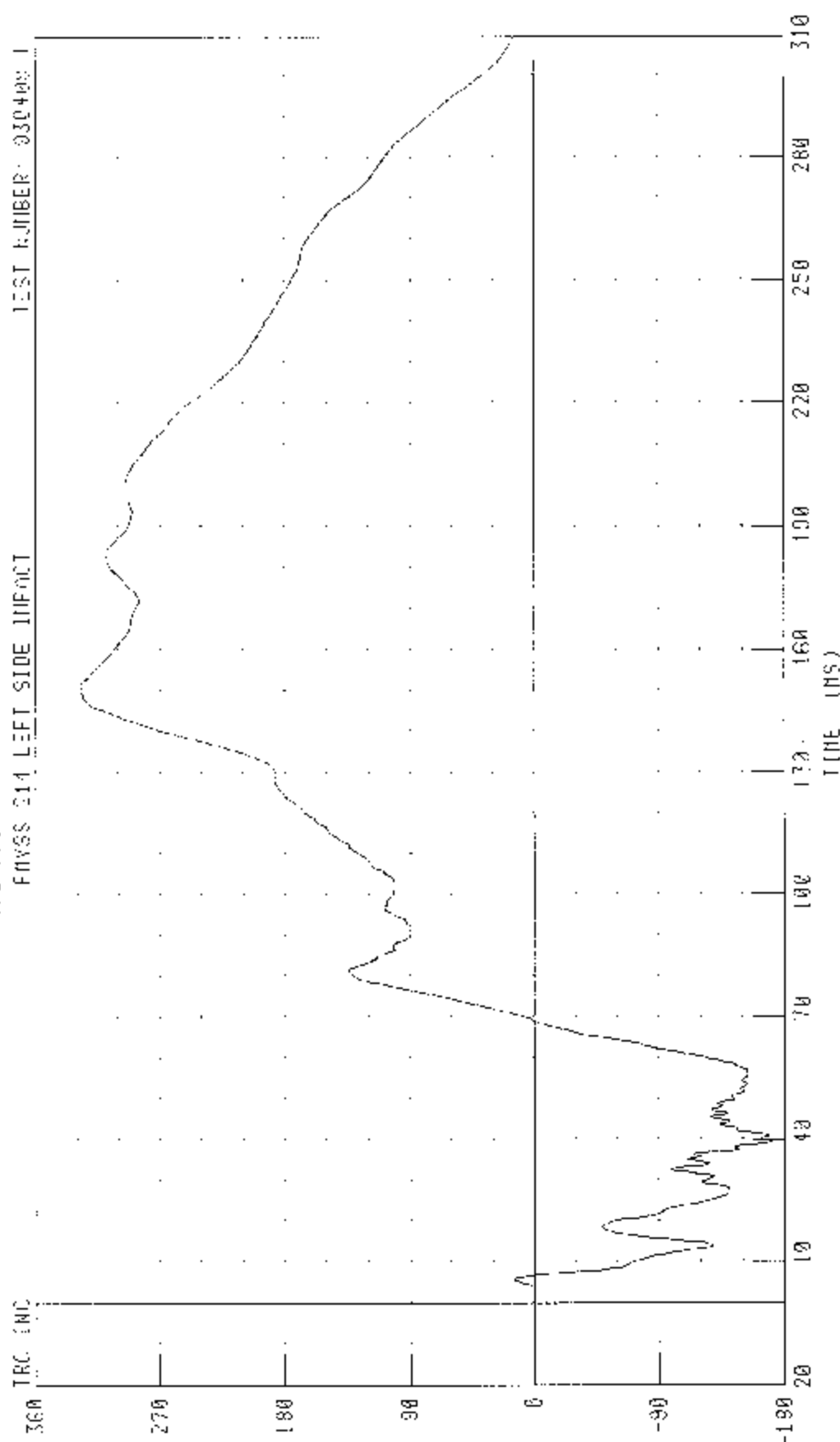
PEAK DATA: 4 91 3 @ 15.92 MS, -5.82 G @ 7 60 MS

55.23 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE OBJECT) INTO LEFT SIDE C 2003 CRASH IN CM

RIGHT SIDE SILL AT FRONT SEAT /-HX'S VELOCITY

PHYS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



TIME (MS)

P=4K DATE 3 27 KPH 0 100 08 MS, 1.71 KPH 0 39.28 MS

CHANNEL 162V1 FILTER CH CLASS 100

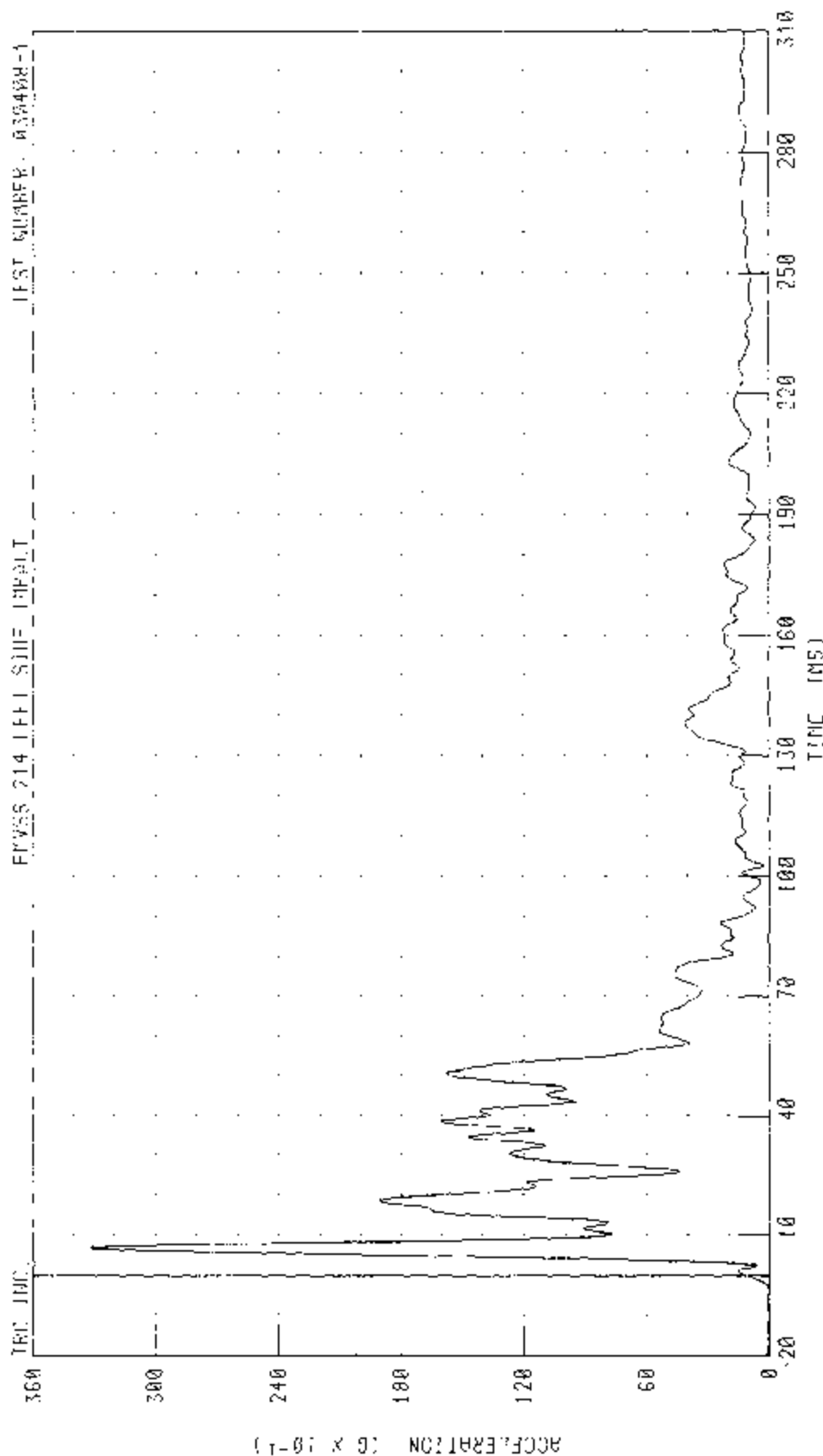
(2-01 X H/LX) ALLOC 3A

55.28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION

FRVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1



PEAK DATA: 33.22 9 6 63 MS; 0.01 6 0 -16 90 MG

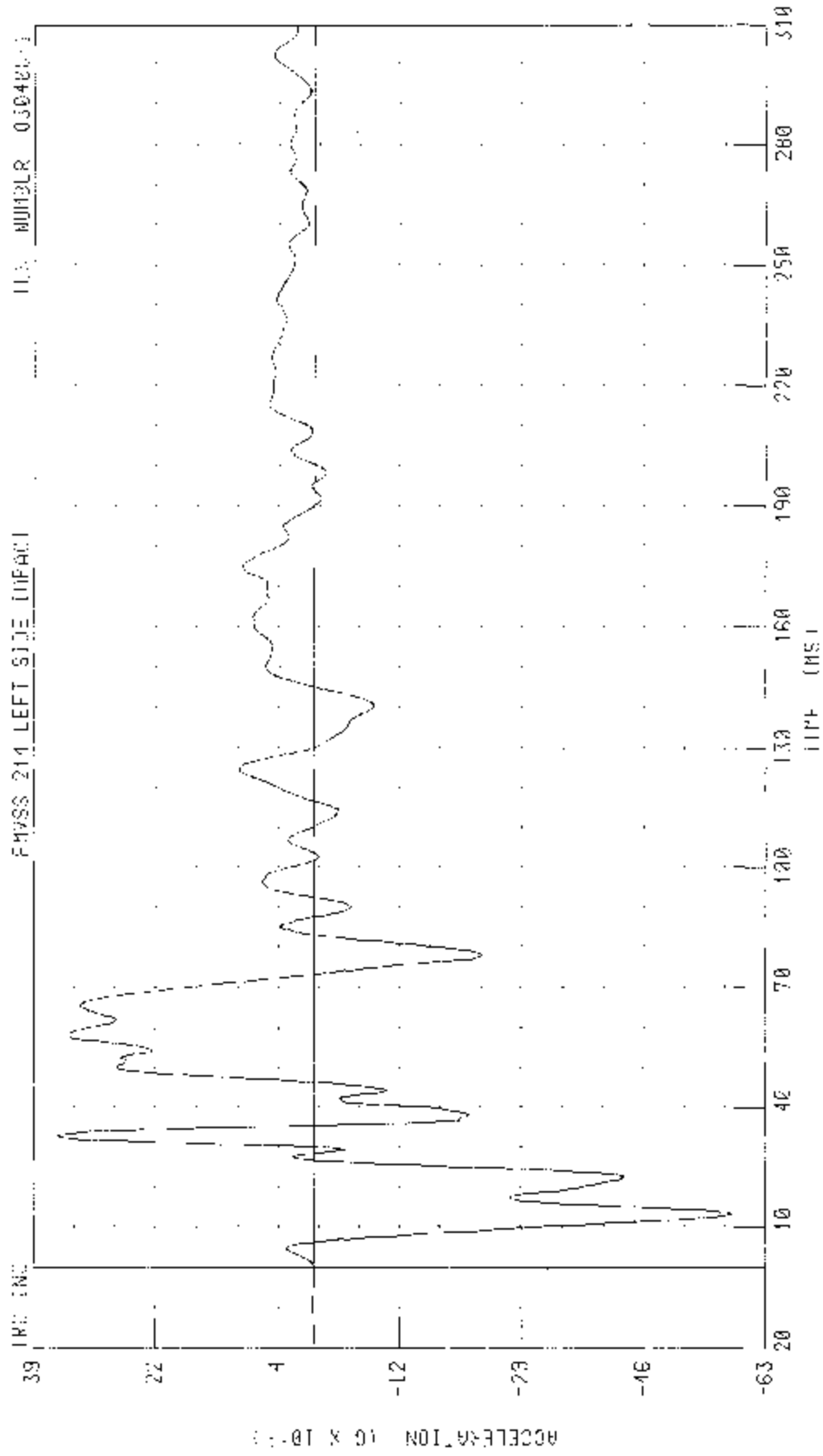
CHANNEL: RFSRG1 FILTER: CH. CLASS 60

55.28 KPH 90 DEGREE SIDE IMPACT (MOVING OTTORPABLE BARRELS) RIC 1F-1 W/VE OF 2005 SATURN ION

RIGHT SIDE COLL HIT REAR SEAT X-AXIS ACCELERATION

PHYS 214 LEFT SIDE IMPACT

IL3 MUH3LR 030420-1

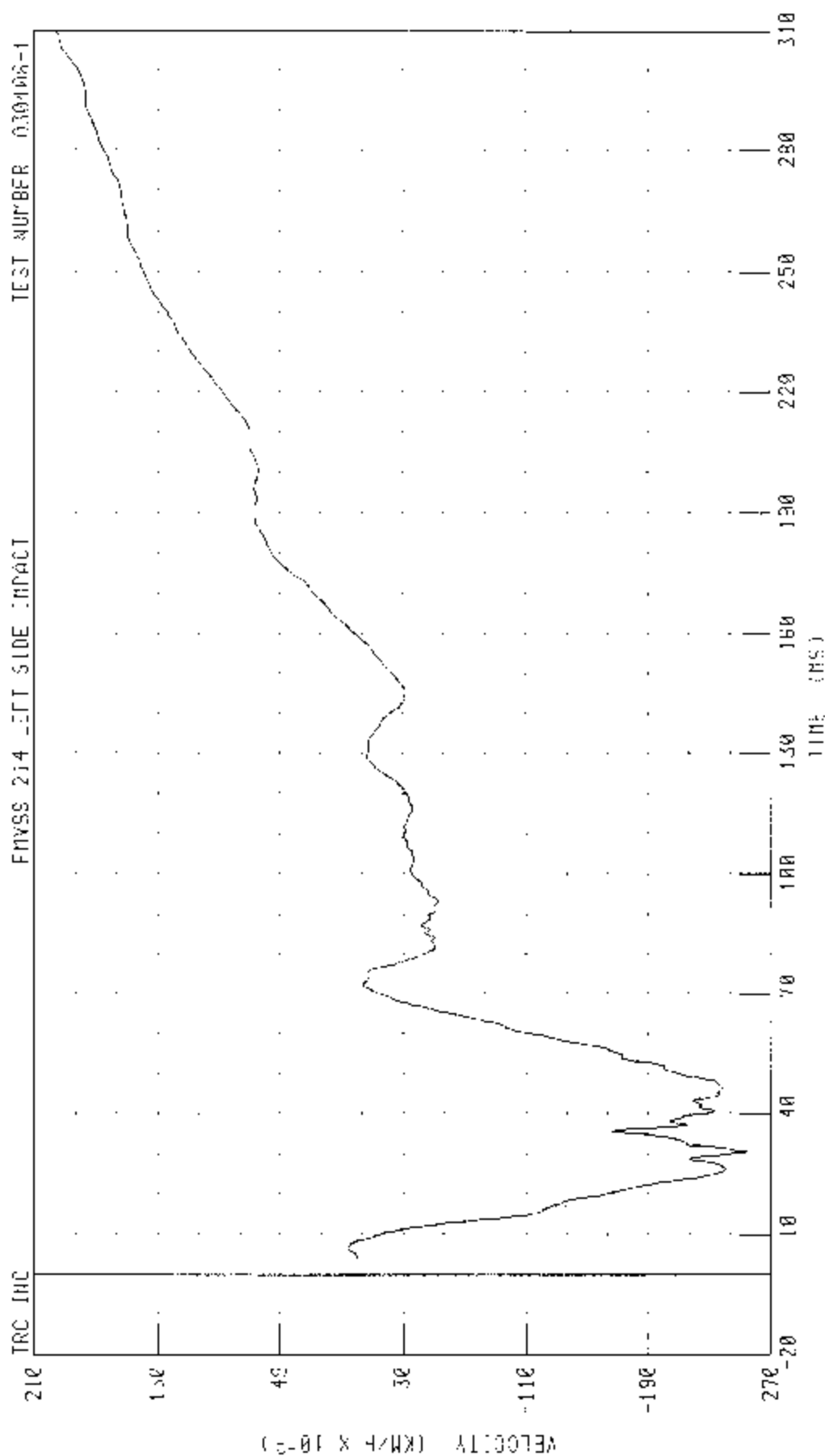


CHANNEL: RR5XG FILTER: CH CLASS: F0

PEAK DATA: 3.05 G @ 33.04 MS; 5.83 G @ 13.28 MS

55-58 MPH 90 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2023 SATURN ION

RIGHT SIDE SLIT ON RHOV 400 X-AXIS VELOCITY



CHANNEL: RRSXVL FILTER: CIL CLASS 180

PEAK DATA: 1 95 474 0 310 00 MS, -2 55 KM/H @ 30 64 MS

75.00 KHZ 90 DEGREE SIDE IMPACT (MOVING DEFORMATION BARREL) INTO LEFT SIDE OF 2007 SEJURD 001

RIGHT SIDE SILENT PEAK SEAT & AXES ACCELERATION

TRUSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1

274

TRC INC

307

ACCELERATION (G X 10⁻¹)

240

B-95

173

106

39

-28

TIME (MS)

CHANNEL 4RSYC1 FILTER ON CLASS 60

PEAK DATA: 34.43 G @ 31.44 MS; -2.60 G @ 138.00 MS

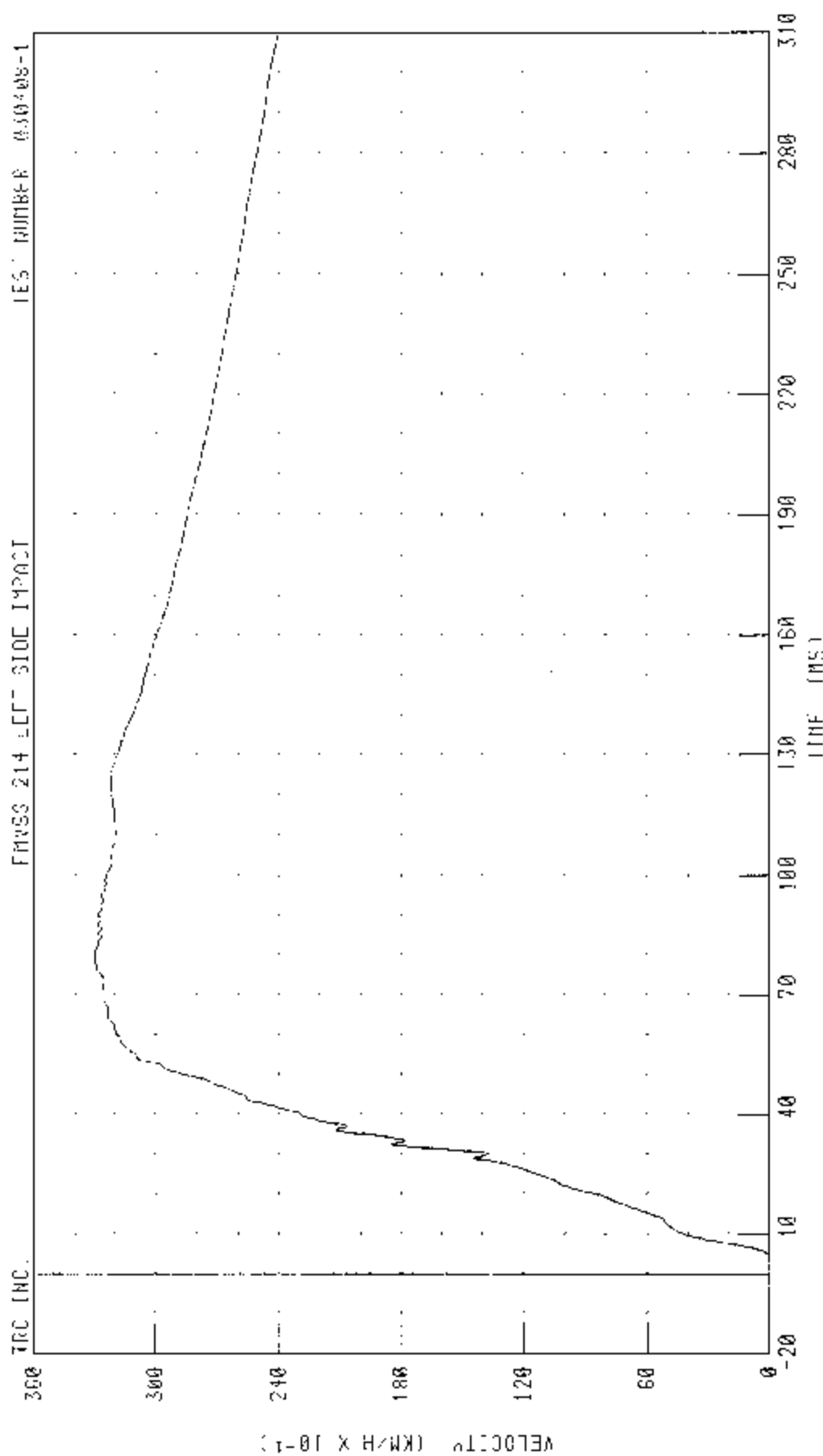
030408-1

55/20 KM/H 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 SATURN ION

RIGHT SIDE CILL AT REAR SEAT X-AXIS VELOCITY

FRSS 214 LEFT SIDE IMPACT

IES NUMBER 030408-1



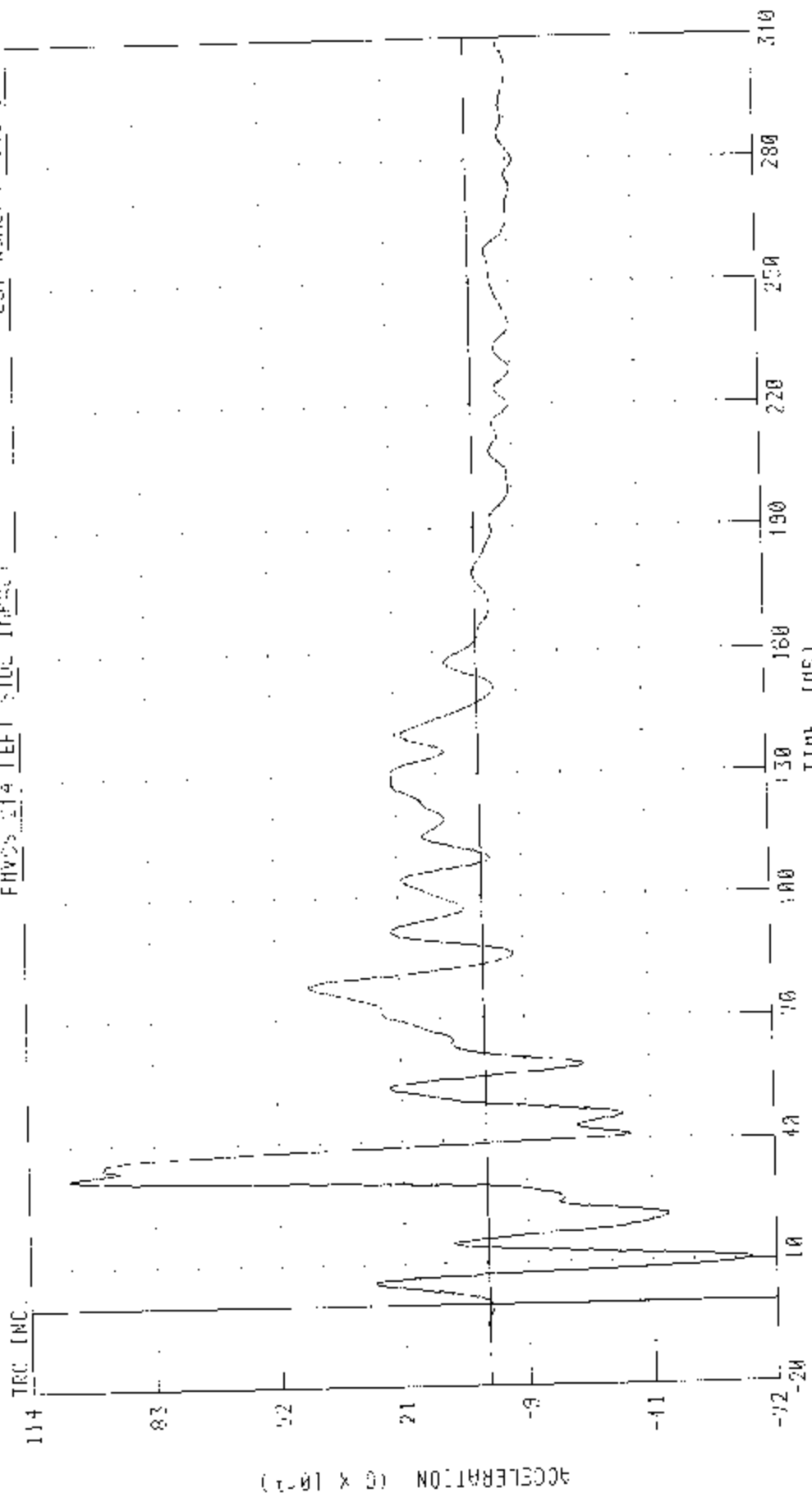
CHANNEL: RRSYV1 FILTER: CH. CLASS 180

PEAK DATA: 33.03 KM/H @ 80.40 MS. -2.01 KM/H @ 3.76 MS

50020 KPH 00 IMPACT SIDE 17001 MOVING DEFORMABLE BARREL INTO LEFT SIDE OF 2003 SATURN 001

21 FT SIDE SILL AT 4000 SPT 7-AXIS ACCELERATION

PHYS 114 LEFT SIDE IMPACT TEST NUMBER 050408-1



PEAK DATA 19 38 0 31.76 MS. 5 51 0 6 10 32 MS

CHANNEL 485701 FILTER ON CLASS 00

ACCELERATION (G x 10^-1)

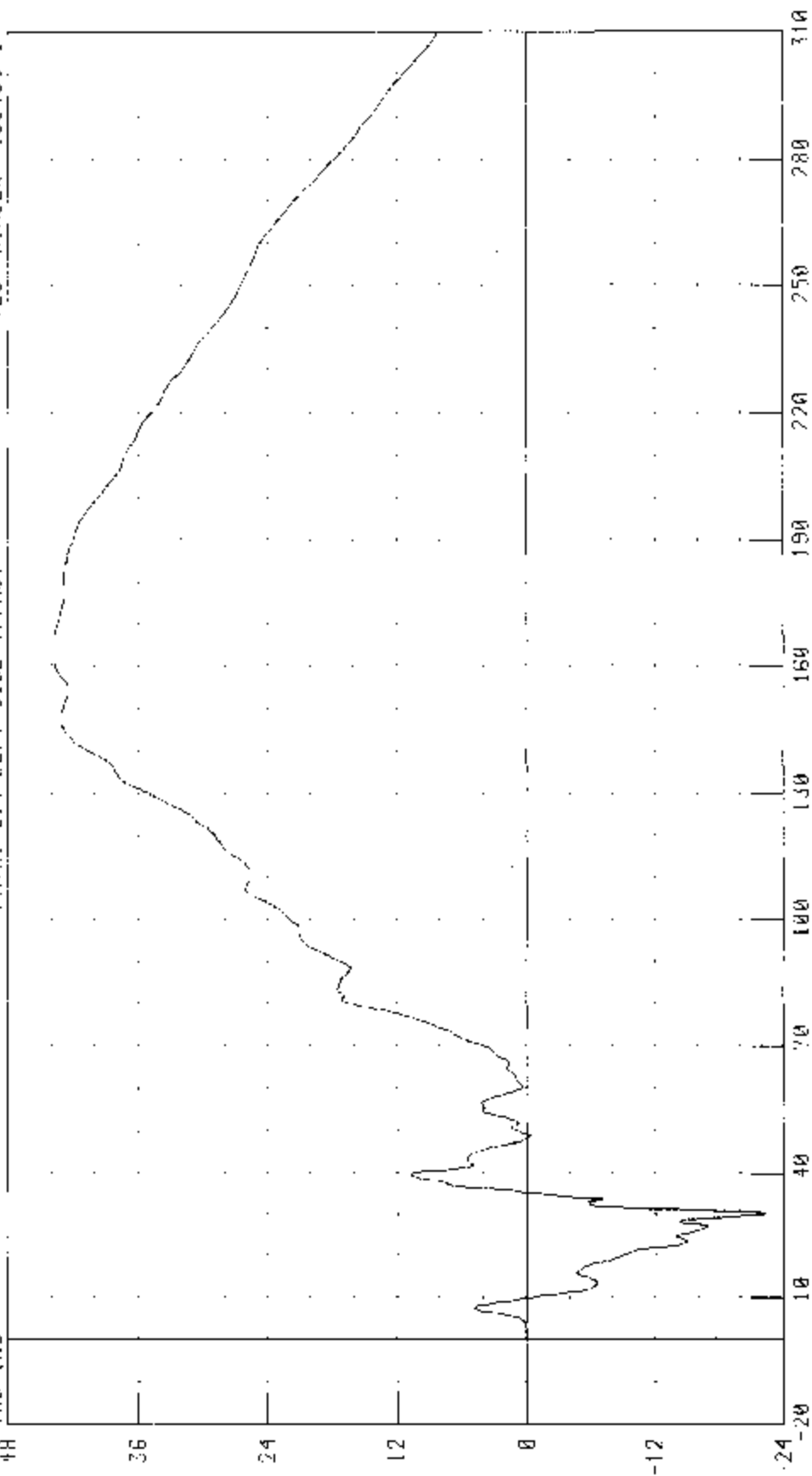
55/28 MPH 20 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SCALPH 10H

RIGHT SIDE CLIP 01 REAR SHOT Z-AXIS VELOCITY

TRC INC

FMVS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



CHANNEL: R3ZV1 FILTER CH. CLASS 180

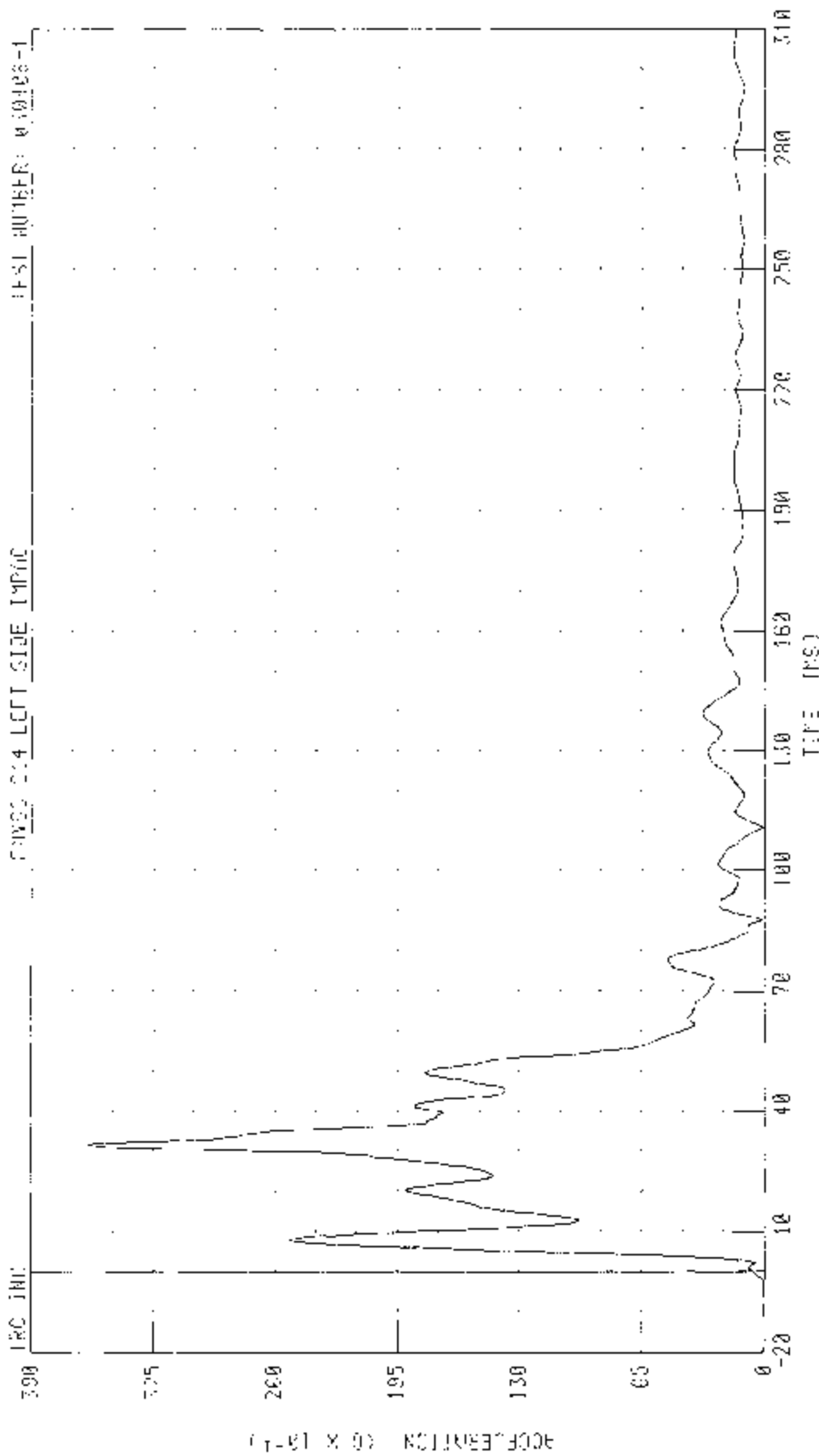
PEAK DATA 4 38 27-H @ 161.92 MS; 2.22 KM/H @ 30 24 MS

55/20 KPH 90 DEGREE SIDE IMPACT INVOLVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 DATUMS CON

RIGHT SIDE SILL OF PEAK 5647 RESURFING PROJECTION

CHASSIS 014 LEFT SIDE IMPACT

TEST NUMBER: 010108-1



CHANNEL: RESRC1 FILTER: ON CLASS: 60

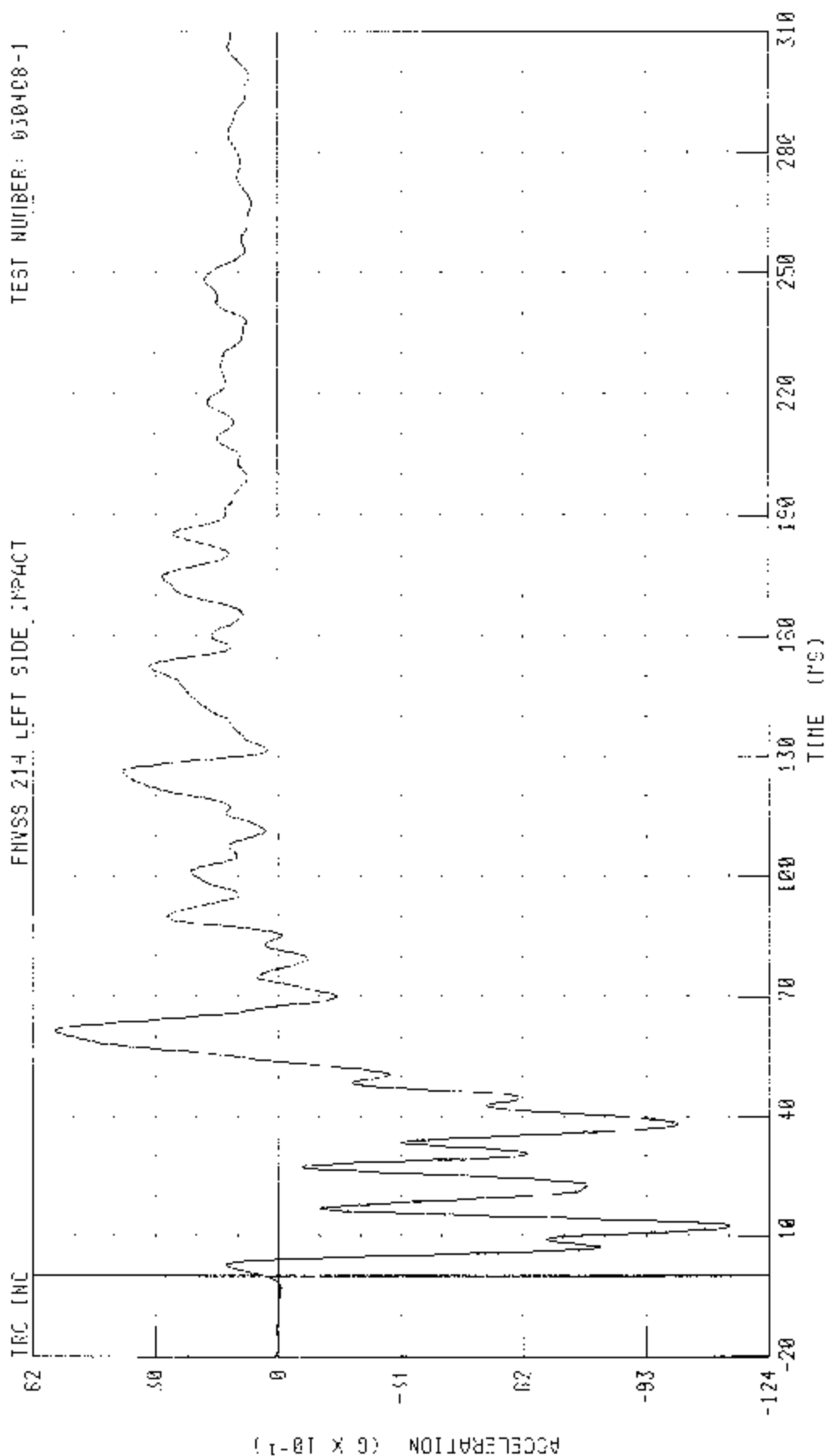
PEAK DATA: 35.96 G @ 31.44 MS; A 0; C 0 -18.28 MS

55/20 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE PARTNER INTO LEFT SIDE OF 2000 SATURN ION)

REAR FLOORSPAN ABOVE AXLE X AXIS ACCELERATION

TEST NUMBER: 030408-1

ENVSS 214 LEFT SIDE IMPACT



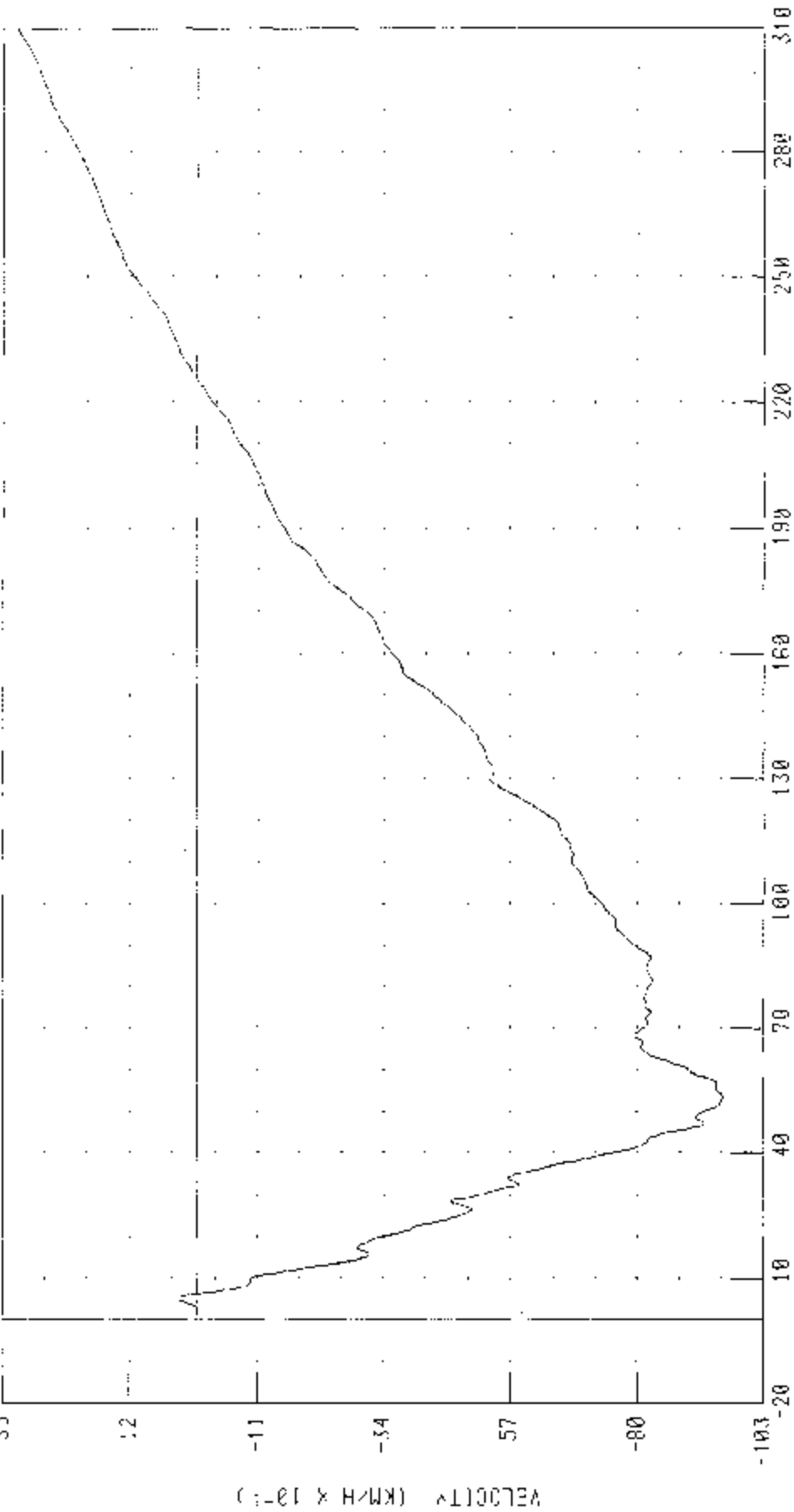
CHANNEL: R04XC1 FILTER: CIL CLASS 00

PEAK DATA: 5.65 C 6.61 68 MS, -11.41 C 6.12 48 MS

55/28 KPH 9W DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRELS) INTO LEFT WHEEL 2003 04 08 17N

REF: FOUNDATION 230%L AXLE X 40%S VELOCITY

FRQ. NO. 35 12 11 34 57 80 103



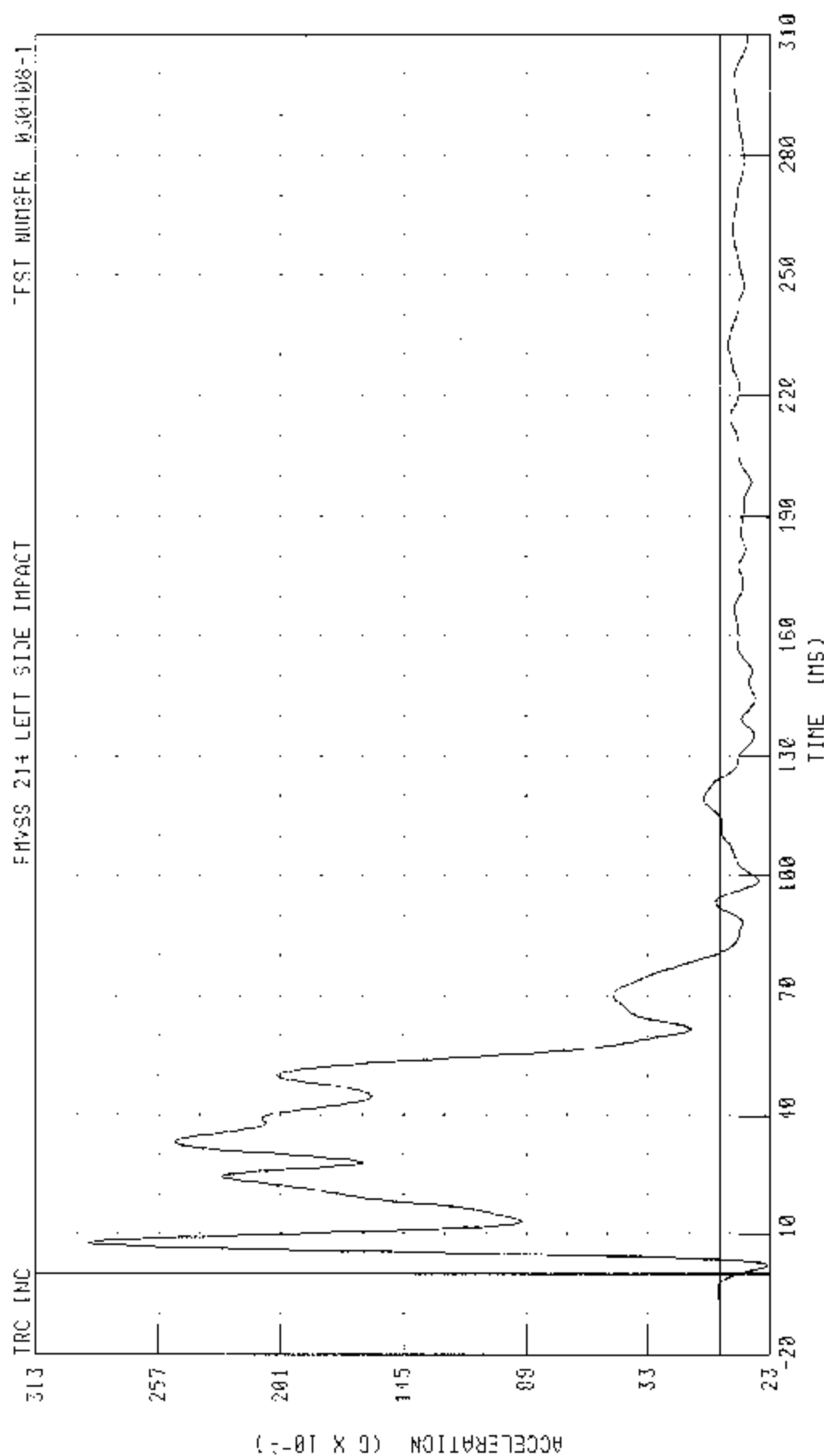
CHANNEL: RUXXY1 FILTER: CH CLASS: 100

PEAK DATA 3.24 KPH @ 310 MS, 0.50 KPH @ 53 MS

55/20 RPM 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2004 SATURN LIN

REAR FLOORPAN ABOVE AXLE Y-AXIS ACCELERATION

TRC INC FMS 214 LEFT SIDE IMPACT TEST NUMBER W30408-1



CHANNEL: RDKYC1 FILTER: CH. CLASS 60

PEAK DATA 28.84 G @ 7.76 MS, -2.17 G @ 2.16 MS

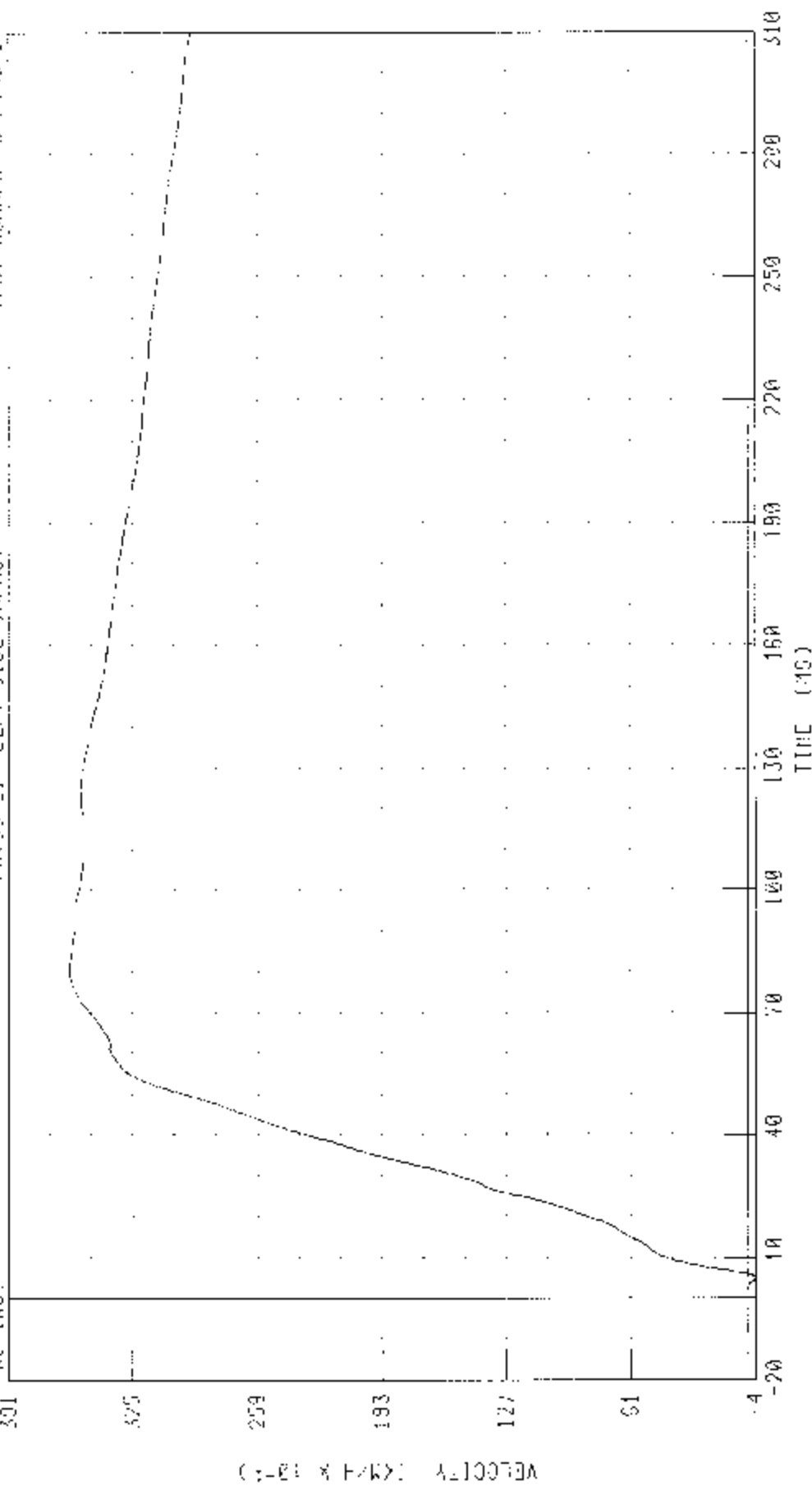
55-23 KPH 90 DEGREE SIDE IMPACT (MOVING COTTONWHELE BARRIER) INTO LEFT SIDE OF 2003 DATUM 19H

PEAK F ORKED ABOVE AXLE Y AXIS VERTICALITY

CHASS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1

TRC INC.



TIME (MS)

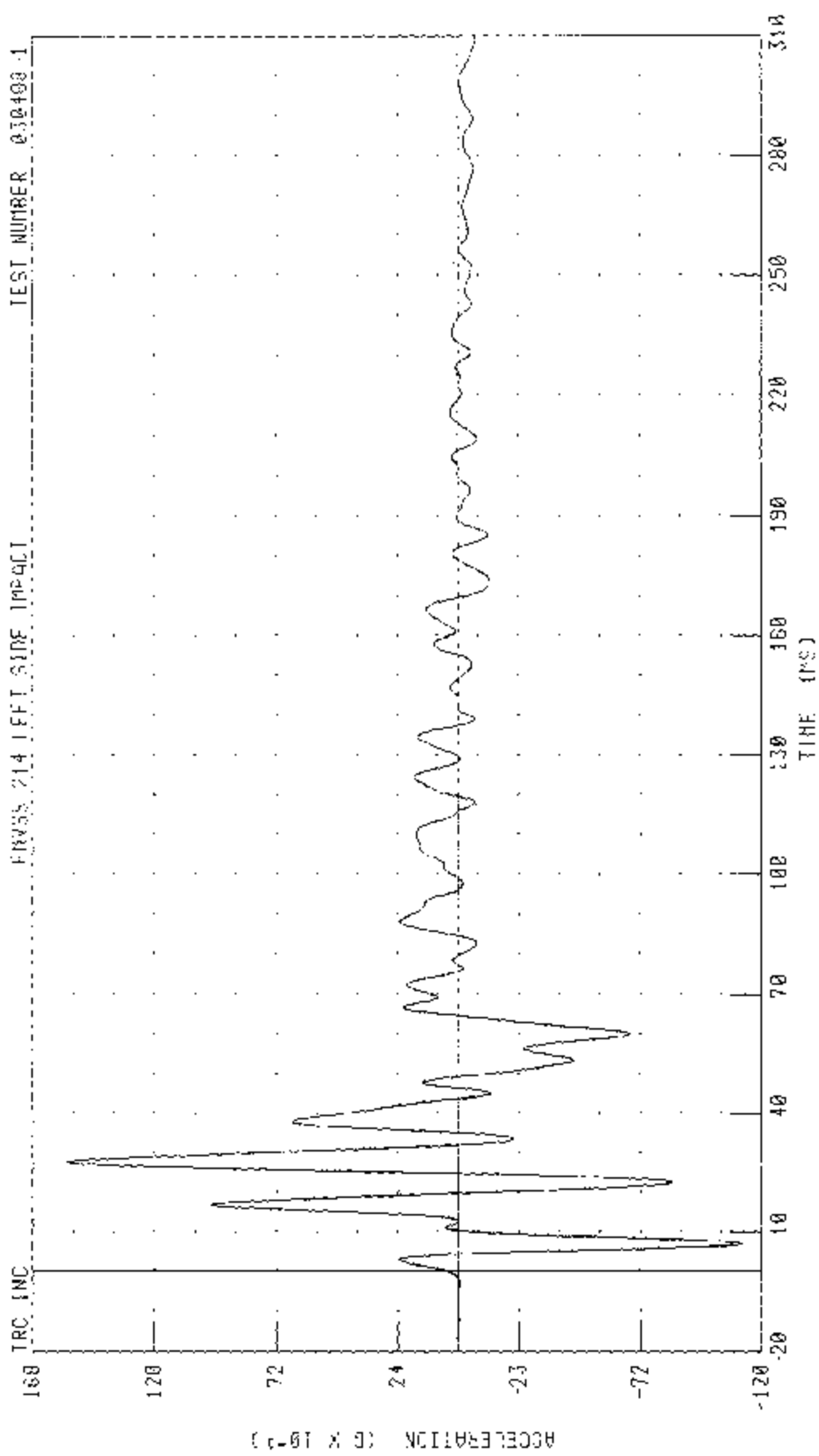
PEAK DATE: 35 07 KPH @ 32 MS: 0 40 CH 11 @ 4.88 MS

CHANNEL: RDRYY 1 JUL 01 08:08:160

55/28 KPI 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

REAR FLOORPAN ABOVE AXLE Z AXIS ACCELERATION

FRYSS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1



CHANNEL RDKZC1 FILTER CH. CLASS 60

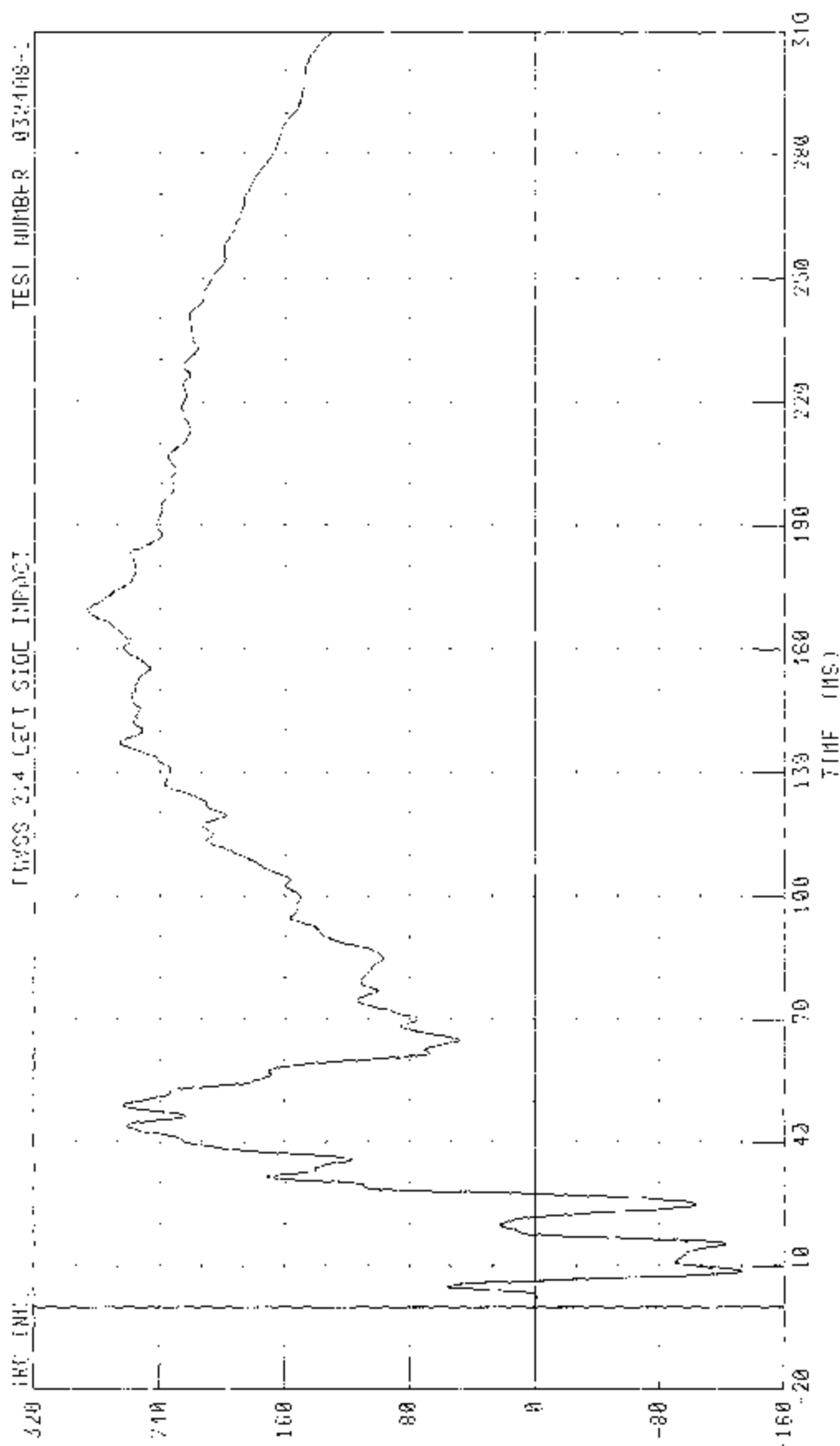
PEAK DATA: 15.46 G @ 27.76 MS; -11.24 G @ 7.04 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIERS) INTO 14-1 STOP UP 2303 SATURN 104

REFR FLUORESCENT WAVE AXIAL 7-AXIS VELOCITY

TEST NUMBER 032408-1

TRUSS 234 LEFT SIDE IMPACT



CHANNEL: REF/V1 FILTER: CH. CLASS 100

TEST DATE: 7 07 2011 @ 100 76 MS, 1 34 KPH @ 8 00 PS

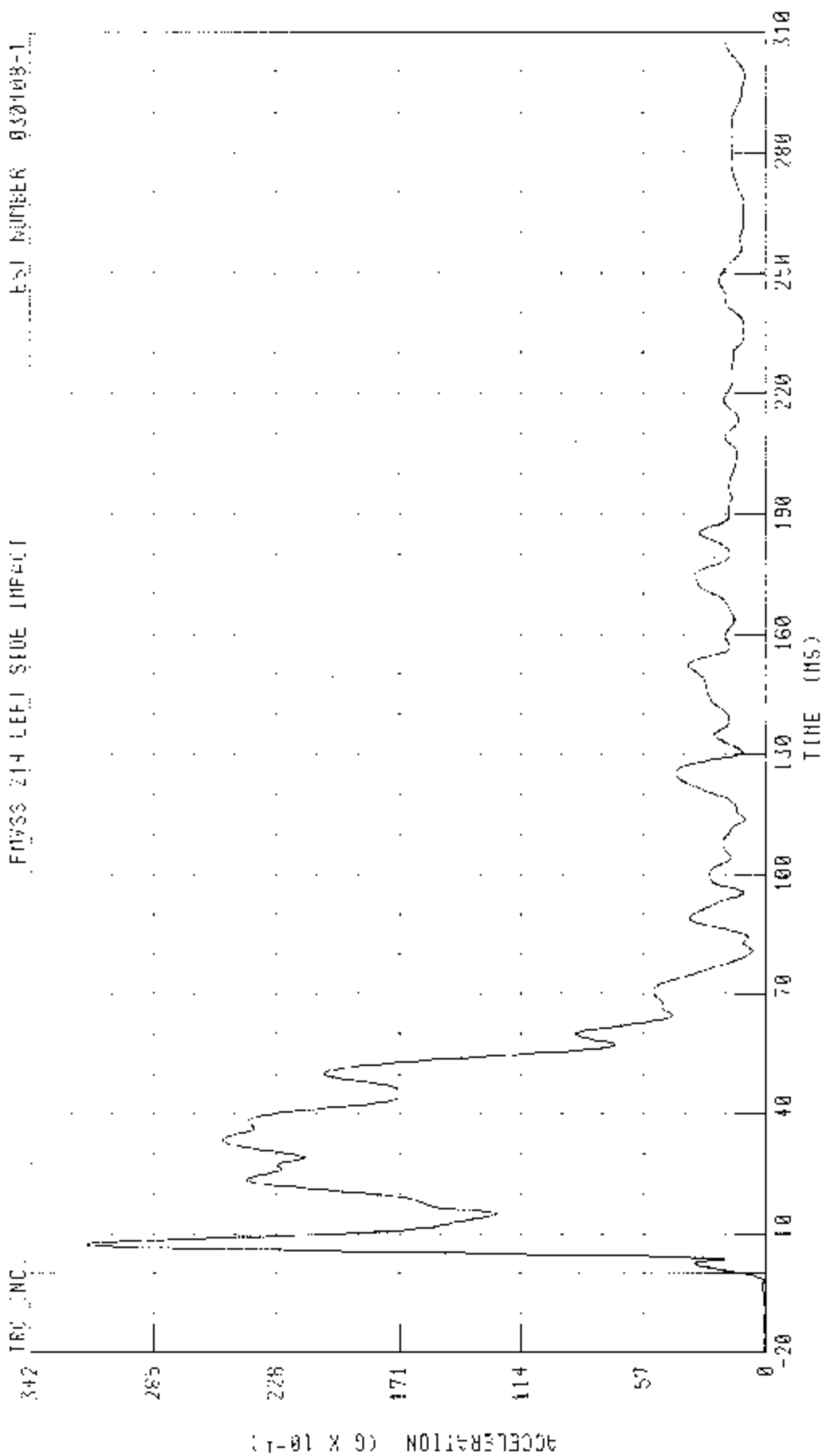
VELOCITY (M/S) X 10⁻²

55/28 RF-93 GIFFORD SIDE TRAIL - MOVING DEFORMATION REPORTS WITH SITE OF 2003 SATURN ION

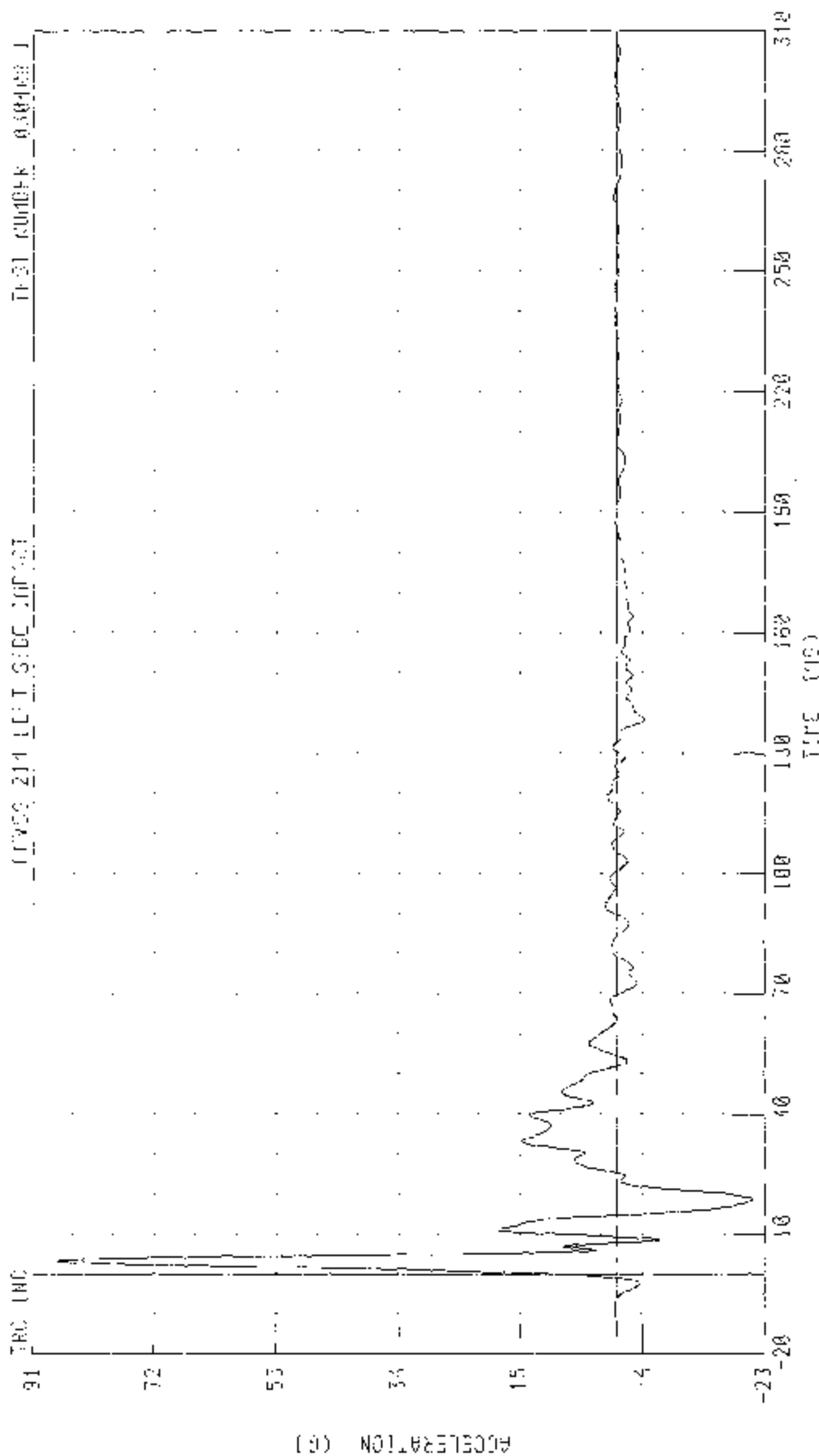
REFR FLCCPAP ABOVE AX_E RESULTANT ACCELERATION

FRASS 214 LEFT SIDE INFECT

1-871-055 4771114



55/20 YRU 90 DEGREE SIDC REPORT (NOV 10) DEFENSE/AFIP HARRIS INTL FT 400 OF 2000 SECTION 104
 LEFT SIDE SHUT OFF FROM SENT Y AXIS ACCELERATION



CHANNEL 1 FSVC1 FILTER CH CLASS 60 PFMK DATA 03 10 0 0 3 44 MS, -21 10 0 0 10 00 MS

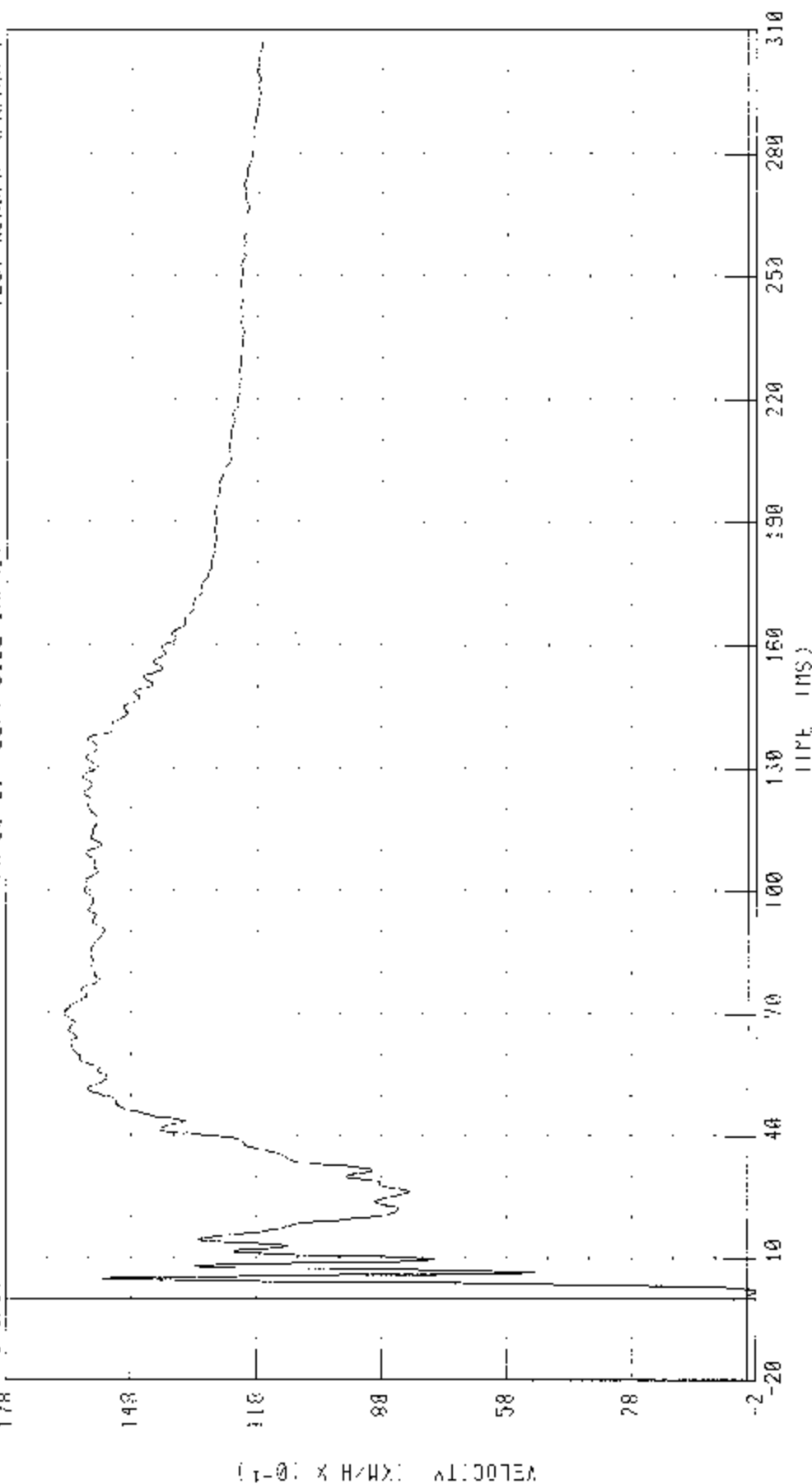
55/20 KPH 30 DEGREE STOP IMPACT (MOVING OCCUPANT BARREL) INTO LEFT SIDE OF 2003 RETURN TRN

LEFT SIDE SILL AT FRONT SEAT 7-4KIS VELOCITY

TEST NUMBER 030408-1

PHYS 214 LEFT SIDE IMPACT

TRC INC.

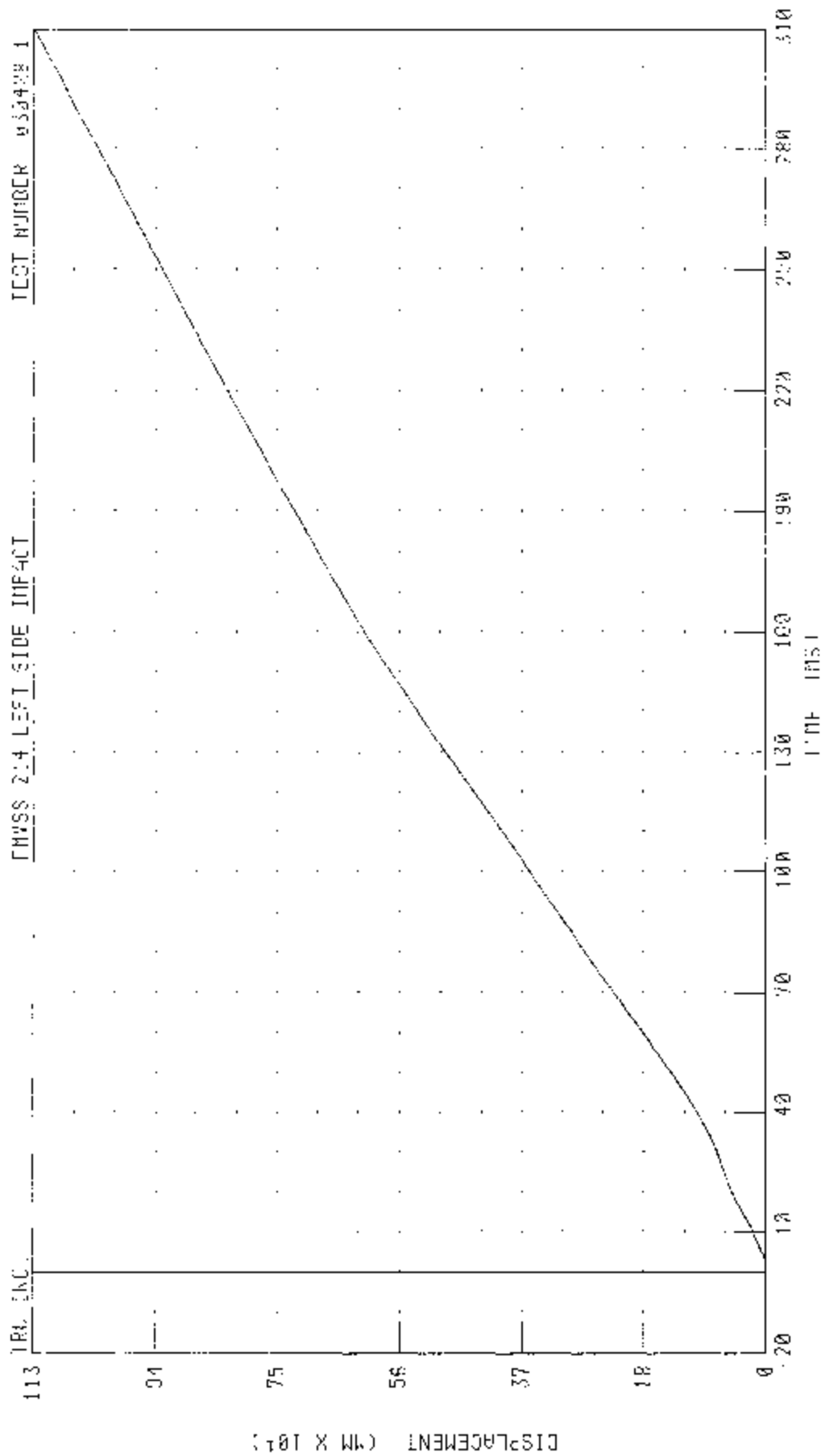


CHANNEL E1UYV1 FILTER: CH. CLASS 180

PEAK DATA 10 42 KPH @ 70.00 MS, -0.22 KPH @ 91.92 MS

55/20 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER: INITIAL VELOCITY OF 2003 SATURN ION

LEFT SIDE STILL AT FRONT SEAT Y AXIS DISPLACEMENT



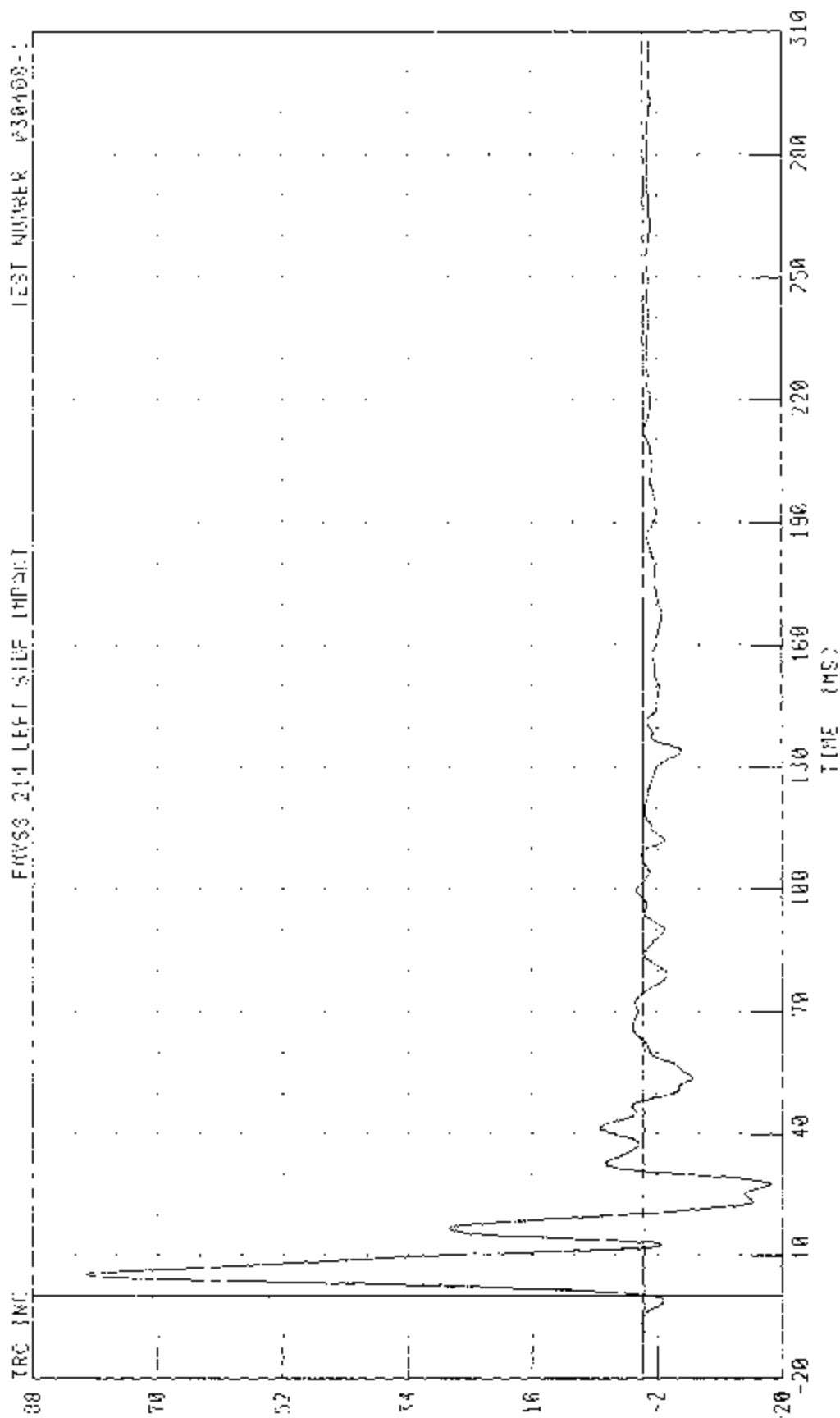
CHANNEL: LISYD1 FILTER: CH CLASS: 190

PEAK DATA: 1136.57 V 310.00 MS: -0.06 NH 0.2 10 MS

50/20 KPH 90 DEGREE SIDE IMPACT: MOVING DEFORMABLE BARRIER (WITH 1453 SINE OF 2803 SATURN ION

LEFT SIDE SILL AT REAR SEAT X-AXIS ACCELERATION

FWVS3 214 LEFT SIDE IMPACT TEST NUMBER P30400

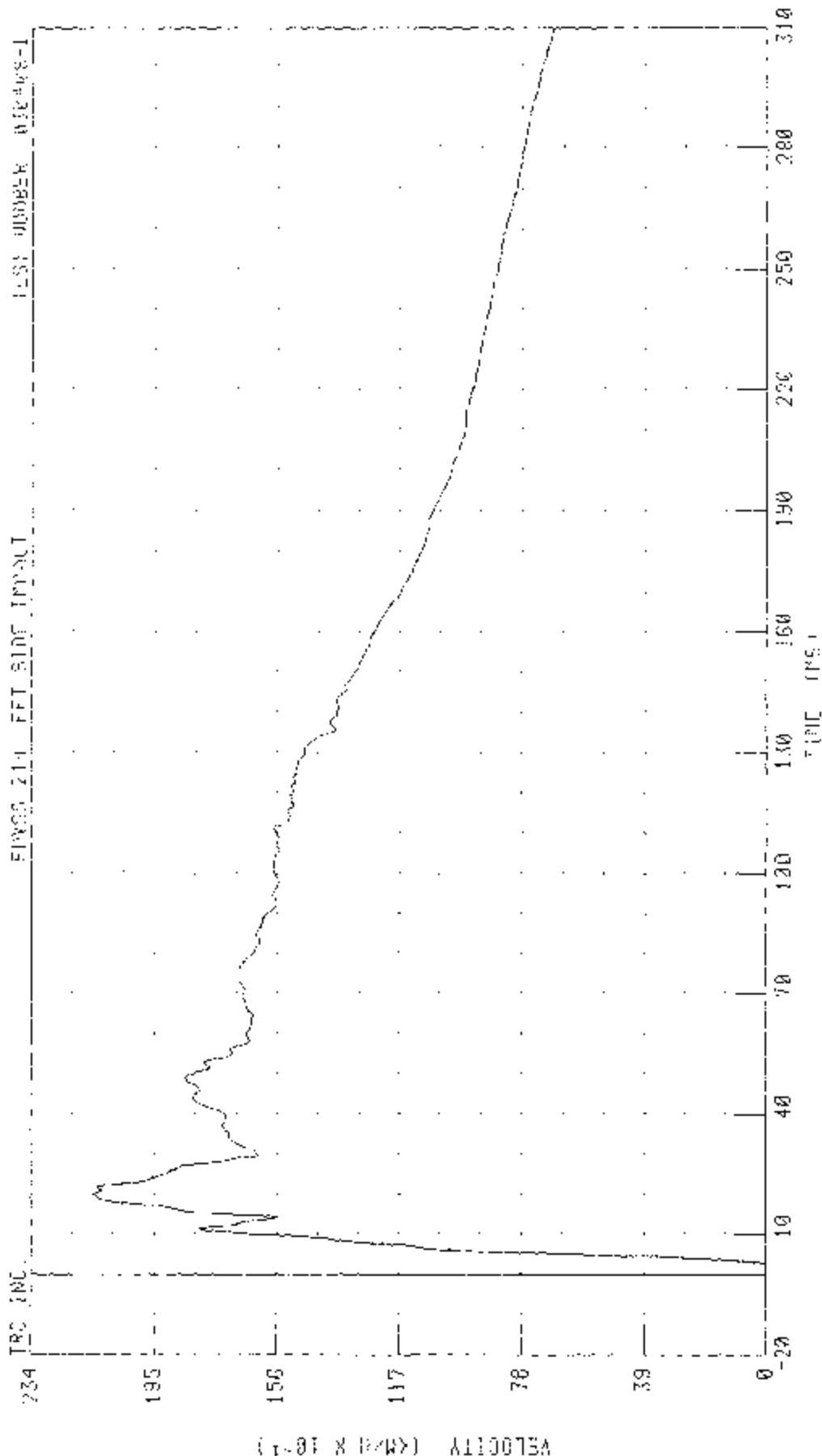


CHANNEL: LRSYG1 FILTER: C11 CLOS: 00

PEAK DATA: 80.43 G @ 5.28 MS; -18.32 G @ 27.68 MS

55/20 KPH 20 DEGREE SIDE IMPACT MOVING DETECTOR BEARING INTO LEFT SIDE OF 2003 SATURN I00

LEFT SIDE STILL AT REAR SEAT VEHICLE VULNERABILITY



PEAK DATA: 21.41 KPH @ 20.24 IN, @ 07.20 IN @ 2.24 IN

CHANNEL: LRSVY FILTER: CH. CLASS: I00

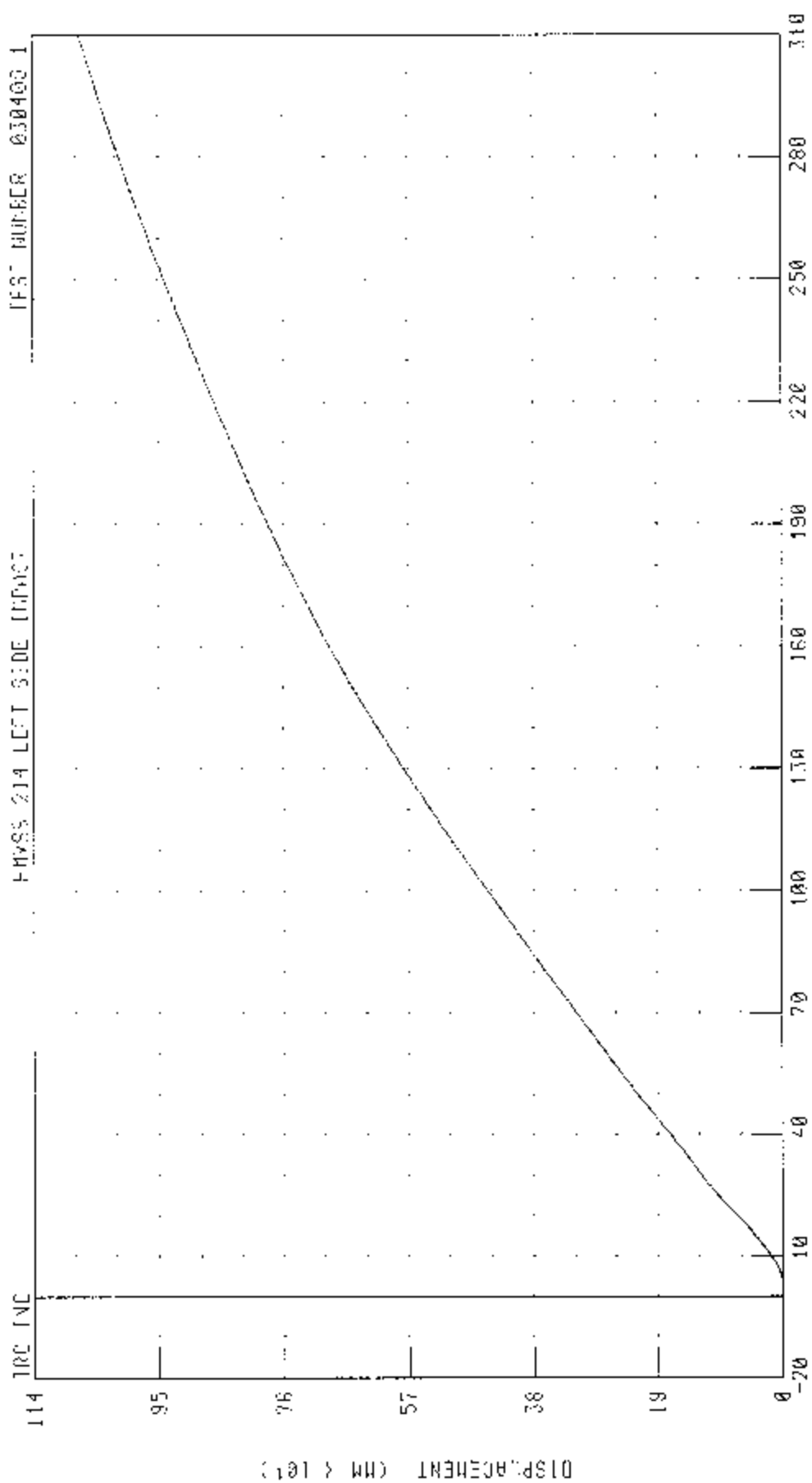
(1-01 X 10/40) A110073A

55/28 xPII 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE CARPET) INTO LEFT SIDE OF 2003 CADURN 119

LEFT SIDE STEEL 91 REAR SPAT Y-AXIS DISPLACEMENT

TEST NUMBER 030400 1

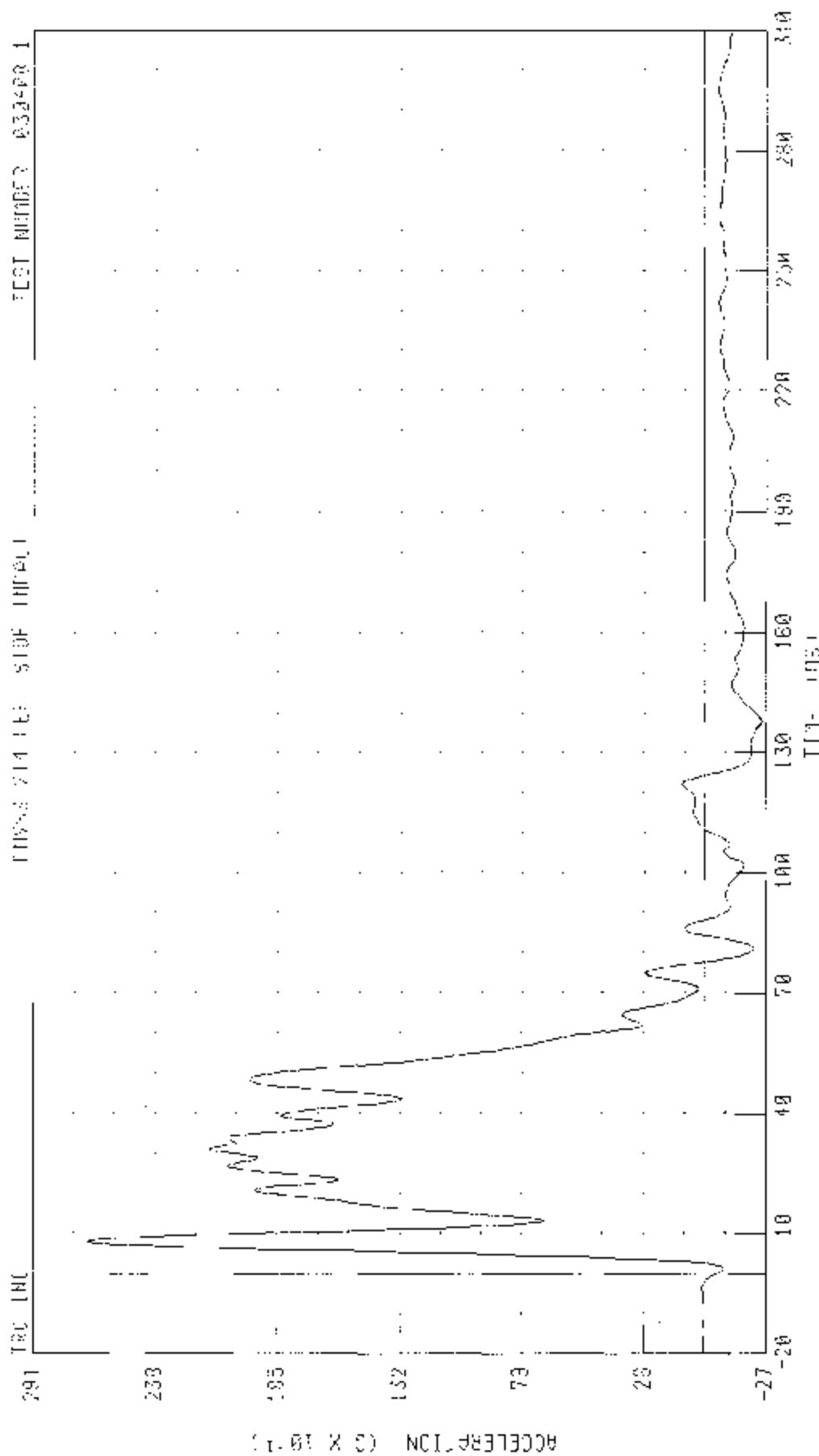
PHASE 214 LEFT SIDE IMPACT



CHANNEL LR5Y01 FILTER: CH CLASS 180
PEAK POSITION: 1070 MS @ 310.00 MS, 0 02 MM @ 2 72 75

55/28 R2H 90 DEGRS SIDE IMPACT COVERING WITH 15000 REFLECTED INTO LEFT SIDE OF 2000 500000 10K

RIGHT WITH OCCUPANT COMPARTMENT X-AXIS ACCELERATION



CHANNEL 1: RTY01 FILTER ON CROSS 60 PLAK DATA: 26 75 0 0 0 08 MS; -2 51 0 0 137 84 MS

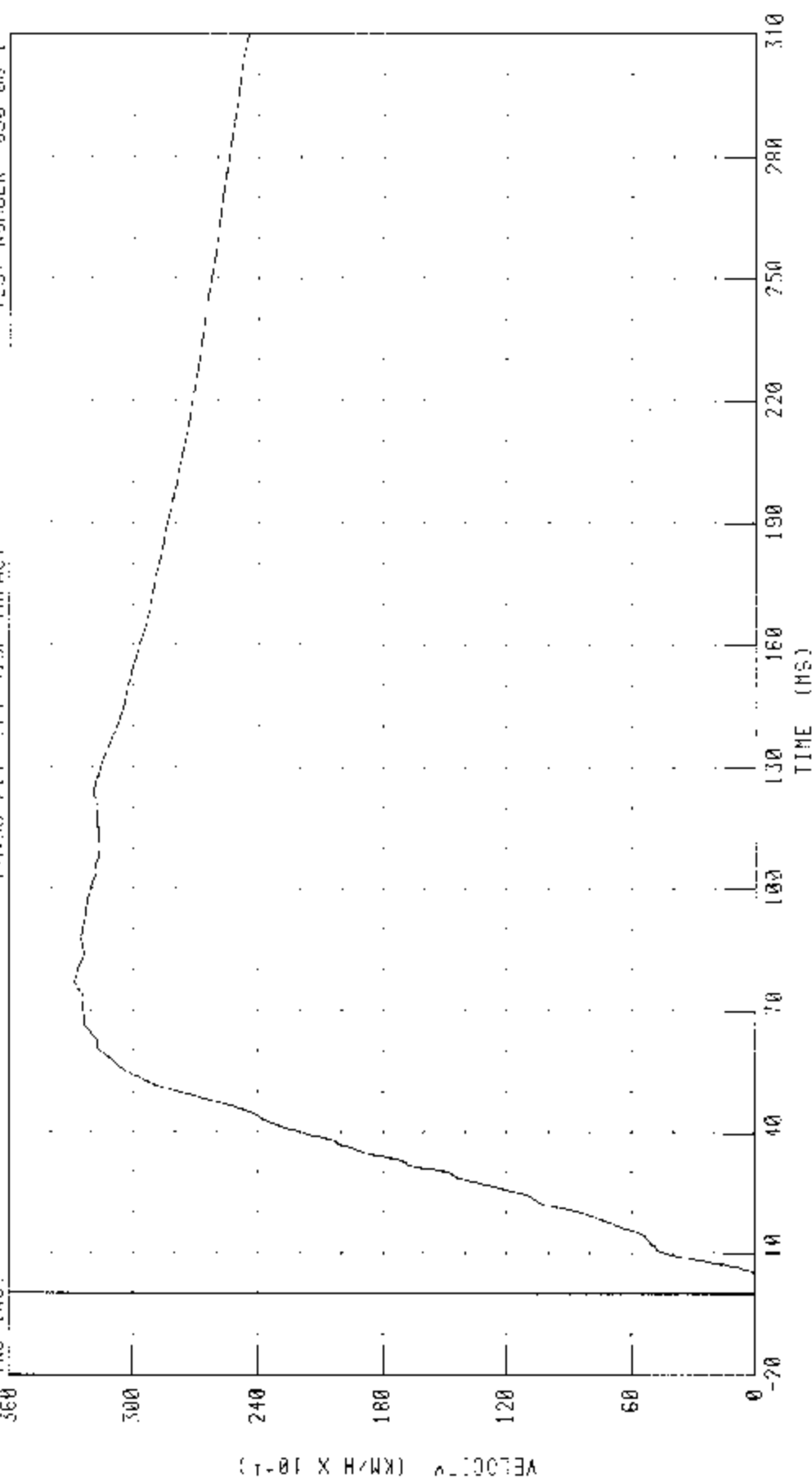
55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFENDABLE ENVELOPE) INTO LEFT SIDE OF 2000 SATURN FOR

RIGHT REAR OCCUPANT OCCUPANT X-AXIS VELOCITY

TRC INC.

MASS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



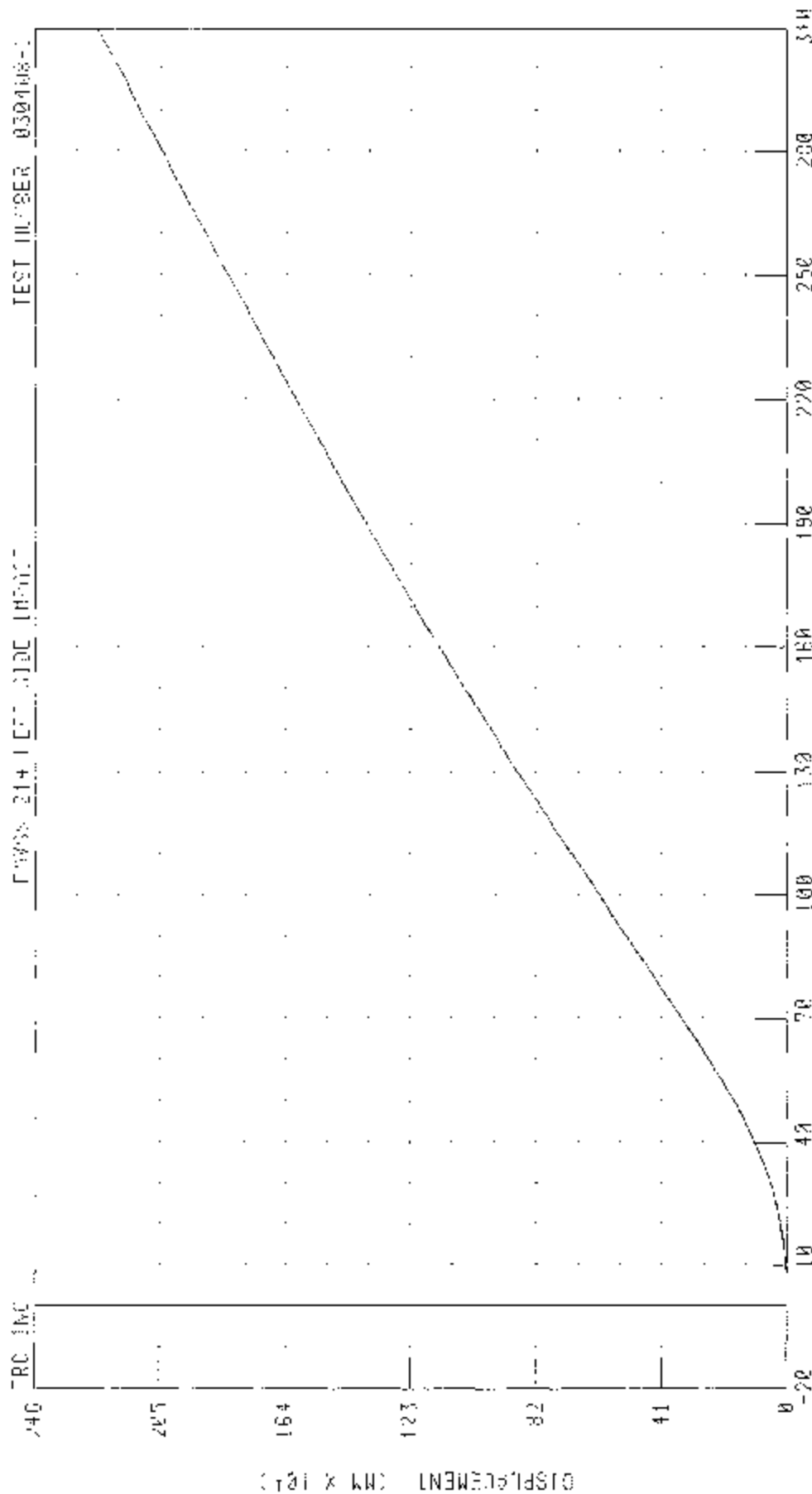
TIME (MS)

CHANNEL RRTYV1 FILTER: CH CLASS 180

PEAK DATA: 32 82 KM/H @ 77 30 MS, 0 00 KM/H @ 4.16 FS

55/28 RPM 20 BURST STOP INPUT (MOVING AVERAGE) INTO LEFT SIDE OF 2000 CHANNEL LOG

RIGHT REAR OUTPUT COMPARE WITH 7-BOXES DISCREPANCY



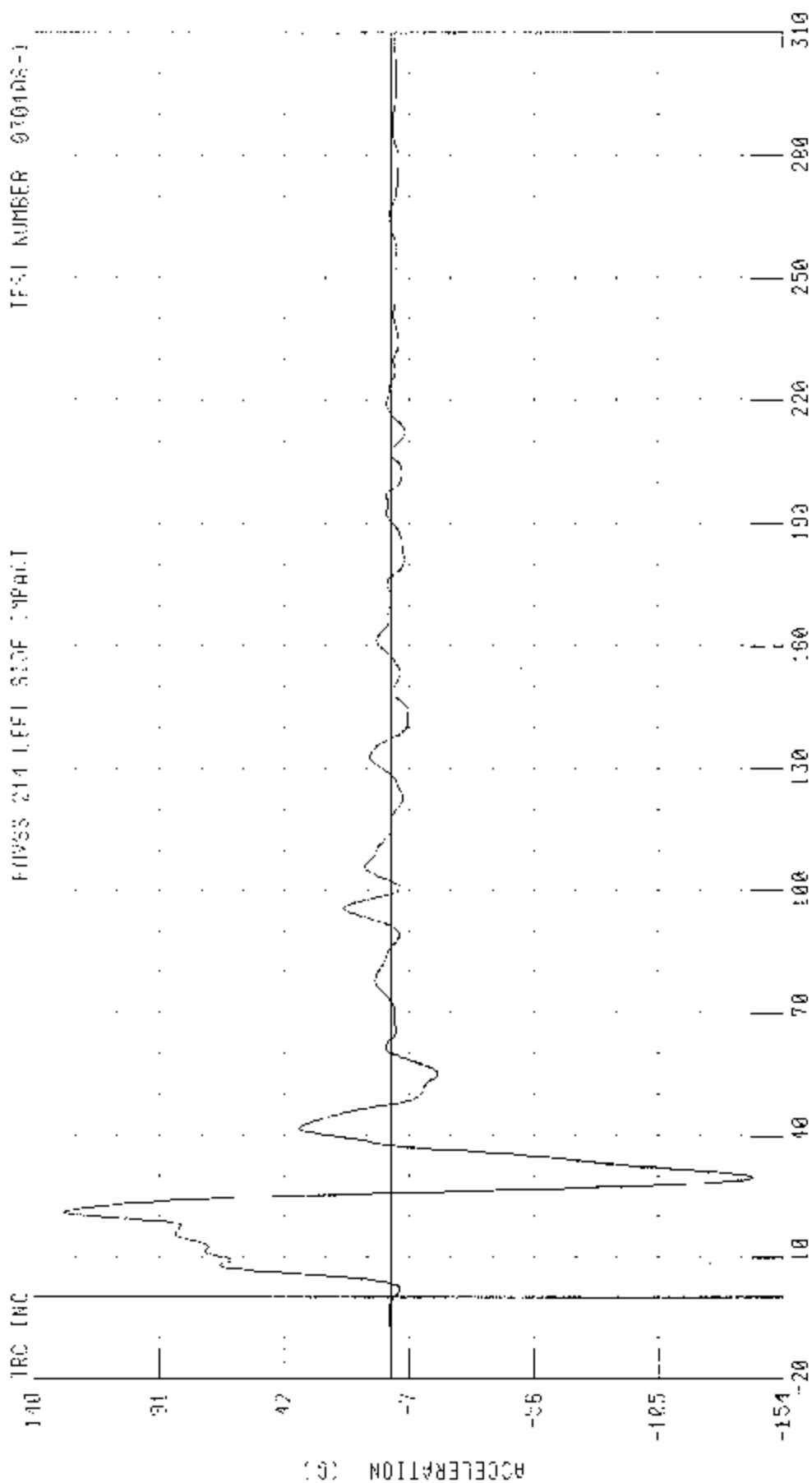
CHANNEL: RFTY91 FILTER CAL CLASS 190

33712 KPH 90 DEGREE SIDE IMPACT: COLLISION DEFORMABLE PARTIES: ENJO LEFT SIDE OF 2003 SATURN ION

LEFT REAR QUARTER UPPER CENTER IMPACT: IMPACT DIRECTION: 104

TEST NUMBER 070408-1

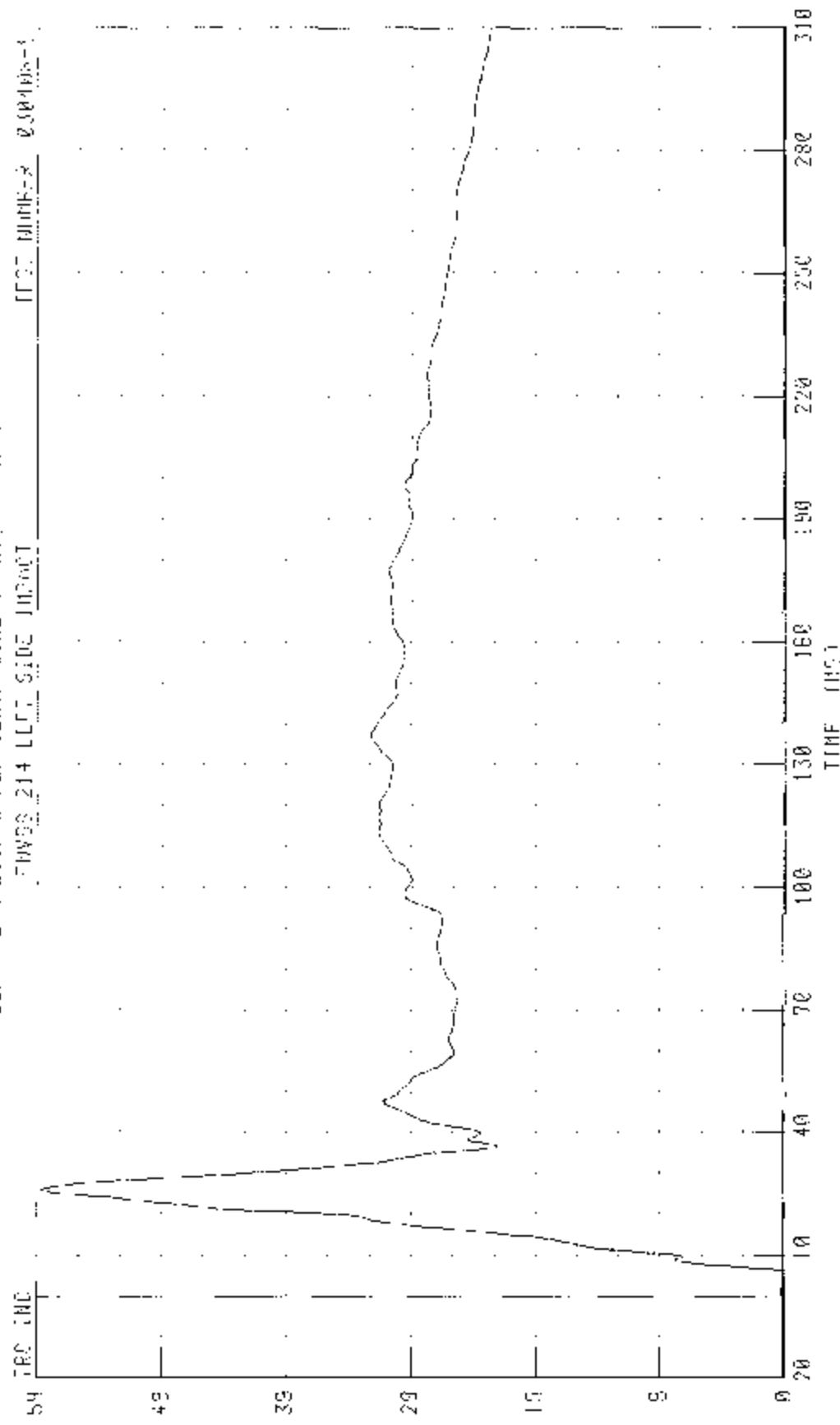
IMPACT 214 LEFT SIDE IMPACT



CHANNEL: LKJY31 FILTER: CH. CLASS: 60

PEAK DATA: 120 29 3 9 21 04 MS; -141 96 0 0 29 50 MS

55-28 MPH 30 DEGREE SIDE IMPACT MOVING LEFTWARD - REFER TO LEFT SIDE OF 2000 GATES FOR
LEFT REAR DOOR UPPER CENTRAL LINE 7-8000 VS. 0000



CHANNEL - LRUYY1 FILTER - CII CLASS 180 PEAK DATA 59.43 KHZ/HZ CS 00 NS. -0.24 KHZ/HZ 0.00 NS

(F-48) 6110013A

55/28 MPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 SUBJURN ION
LEFT REAR DOOR UPPER CENTERLINE Y-AXIS 0 SPINOFFENT

TEST NUMBER: Q30408-1

FWSS 214 LEFT SIDE IMPACT

TRC INC.

250

205

160

115

70

25

-20

DISPLACEMENT (MM X 10¹)

TIME (MS)

310 280 250 220 190 160 130 100 70 40 10

CHANNEL LRIIYD1 FILTER CH. CLASS 120

PEAK DATA 2438 17 MM @ 310 00 MS; -0 13 MM @ 5.40 MS

55.28 PPH 50 DEGREE SIDE IMPACT MOVING DEFORMABLE BARREL IMPACT SITE OF 2003 SATURN I04

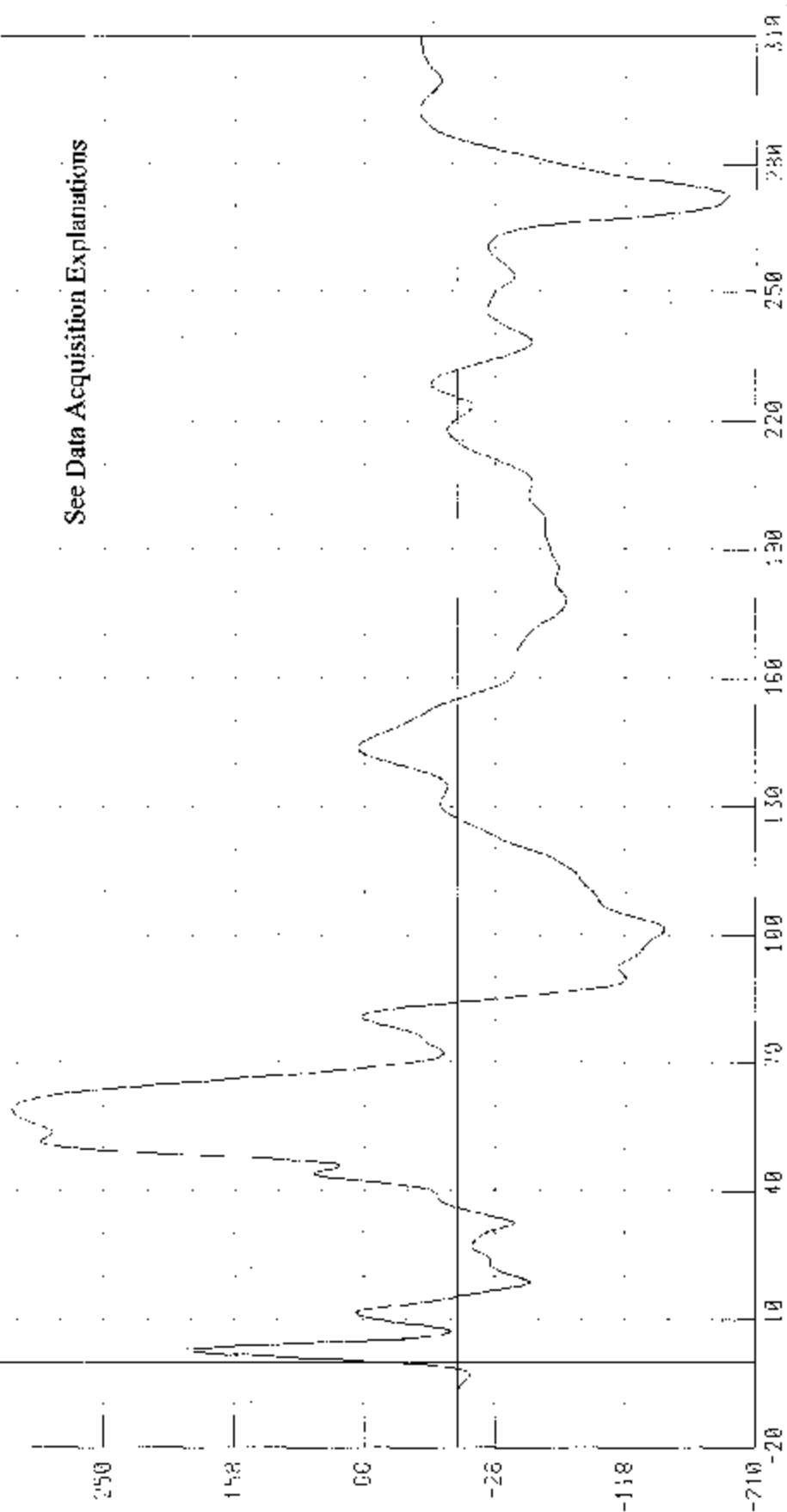
LEFT LOWER 4 FIFTY AXIS ACCELERATION

PROCESS THE SIDE IMPACT

TEST NUMBER 030408-1

TRC INC.

See Data Acquisition Explanations



CHANNEL L1AY0 FILTR: CH CLASS S0

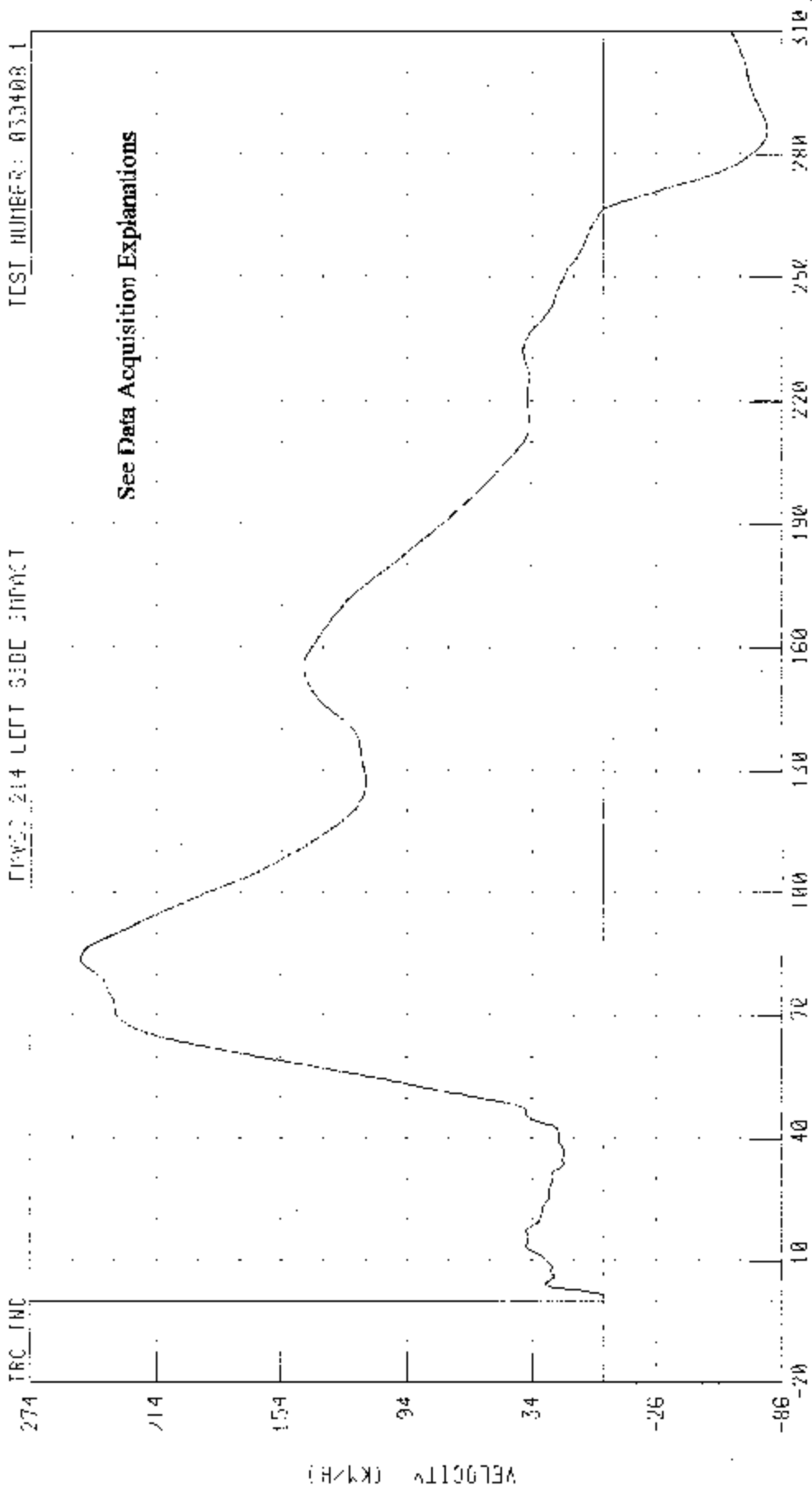
PEAK DATA 314 57 6 0 59 98 78; -191 12 6 9 297 48 78

55/20 KPH SP DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2411 VEHICLE TIA

LEFT LOWER A-POST Y AXIS VELOCITY

TRC 214 LEFT SIDE IMPACT

TEST NUMBER: 030408 1



TIME (MS)

PEAK DATA 249.75 KPH @ 83.76 MS, 78.62 KPH @ 285.75 MS

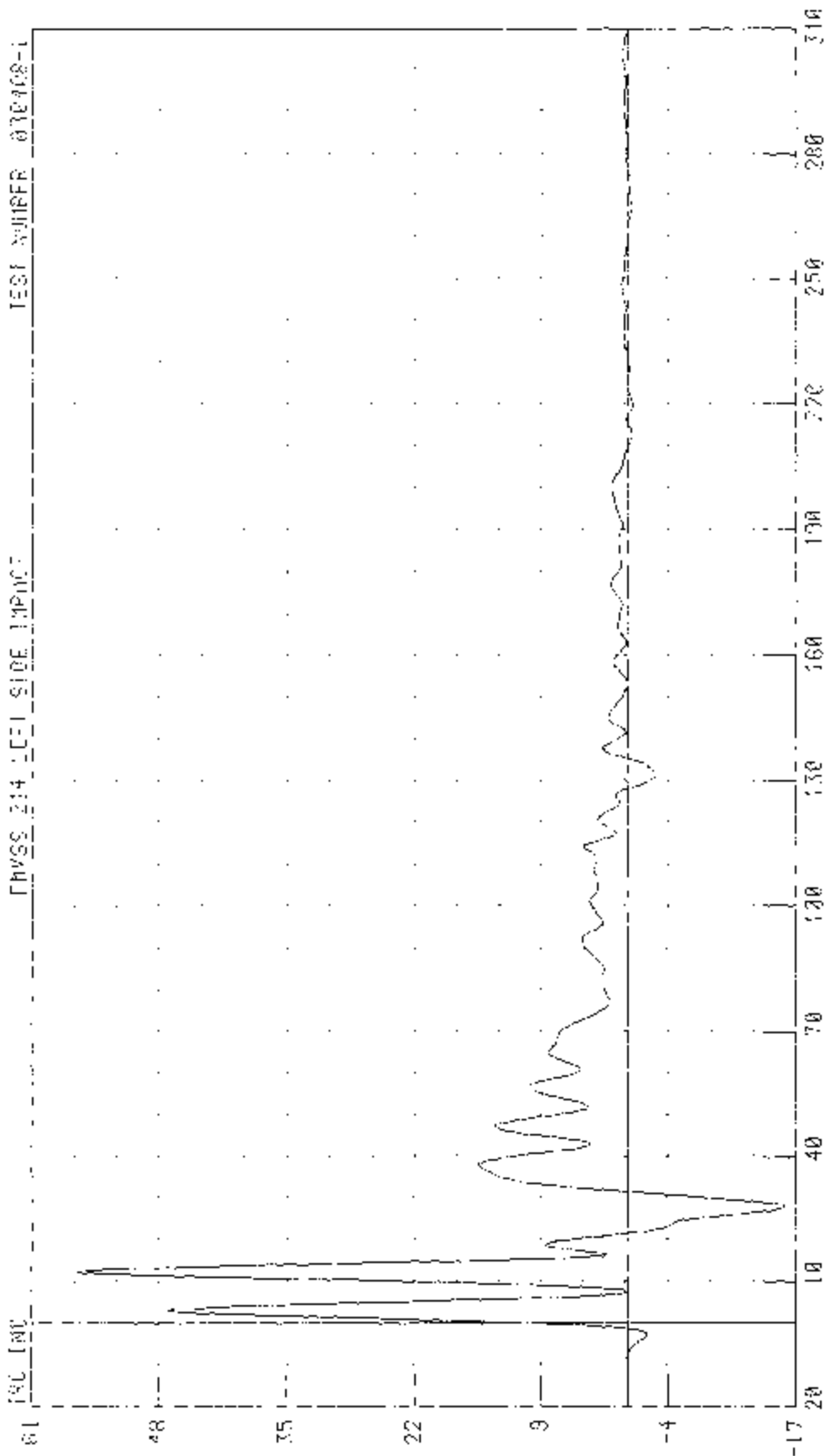
CHANNEL LLOYD FILTER CH CLASS 130

55.28 PSH 9H 0508E SIDE IMPACT (MOVING DEFORMED DEFLECT) 1450 L-11 SIDE OF ROAD SAMPLE 024

LEFT CHANNEL 4-POST Y-AXIS INTERFERING

TEST NUMBER 030408-1

CHASS 214 LEFT SIDE IMPACT



CHANNEL 1: 100V; FILTER CH. 0.055 60

TIME (MS)

PLAK DATA DE 32 S @ 12.52 MS; -15.85 G @ 27.76 MS

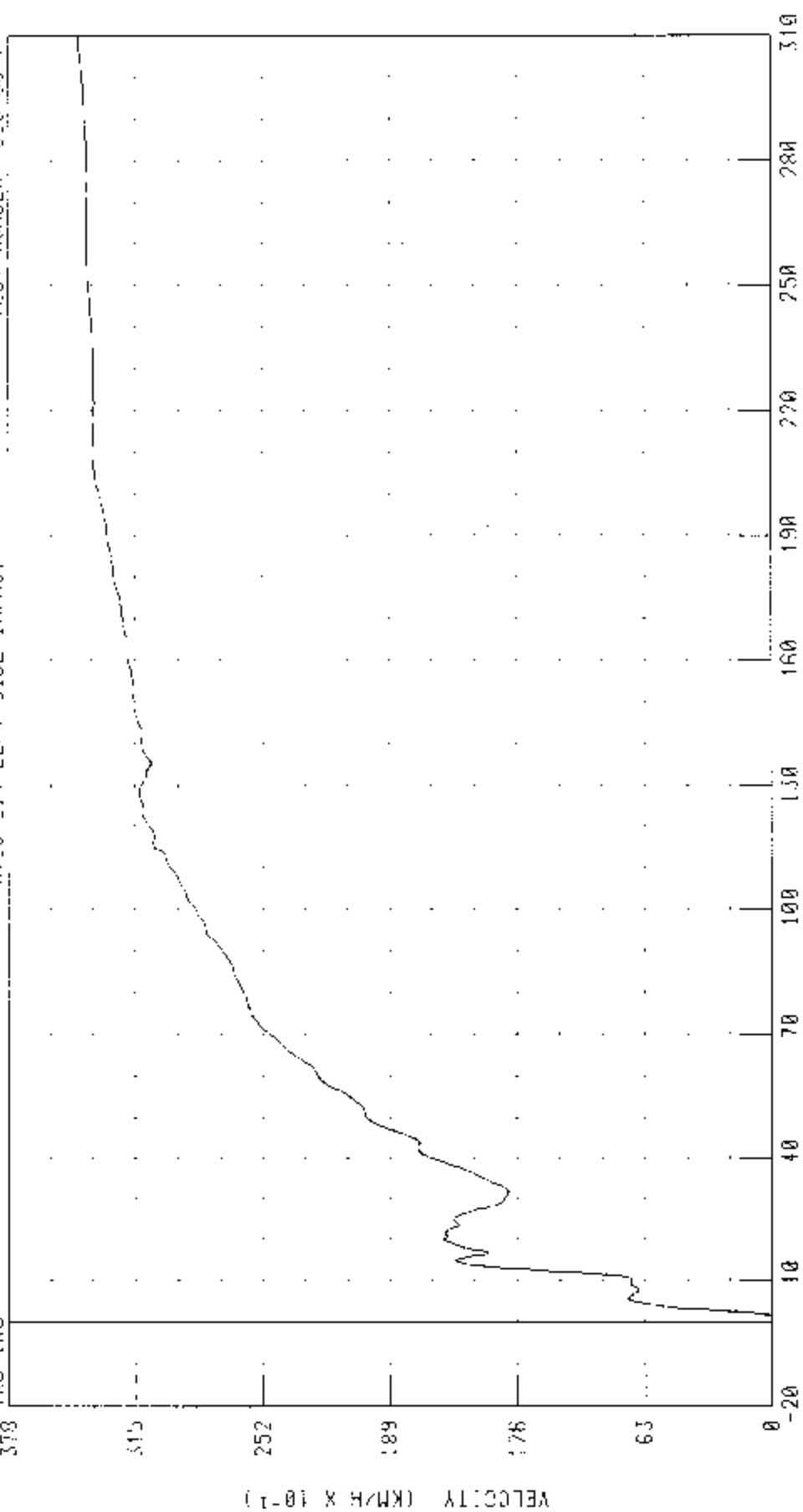
55/28 VP-1 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 SATURN ION

LEFT MIDDLE A-POST Y-AXIS VELOCITY

IRC INC

CHVSS 014 LEFT SIDE IMPACT

TEST NUMBER 030408-1



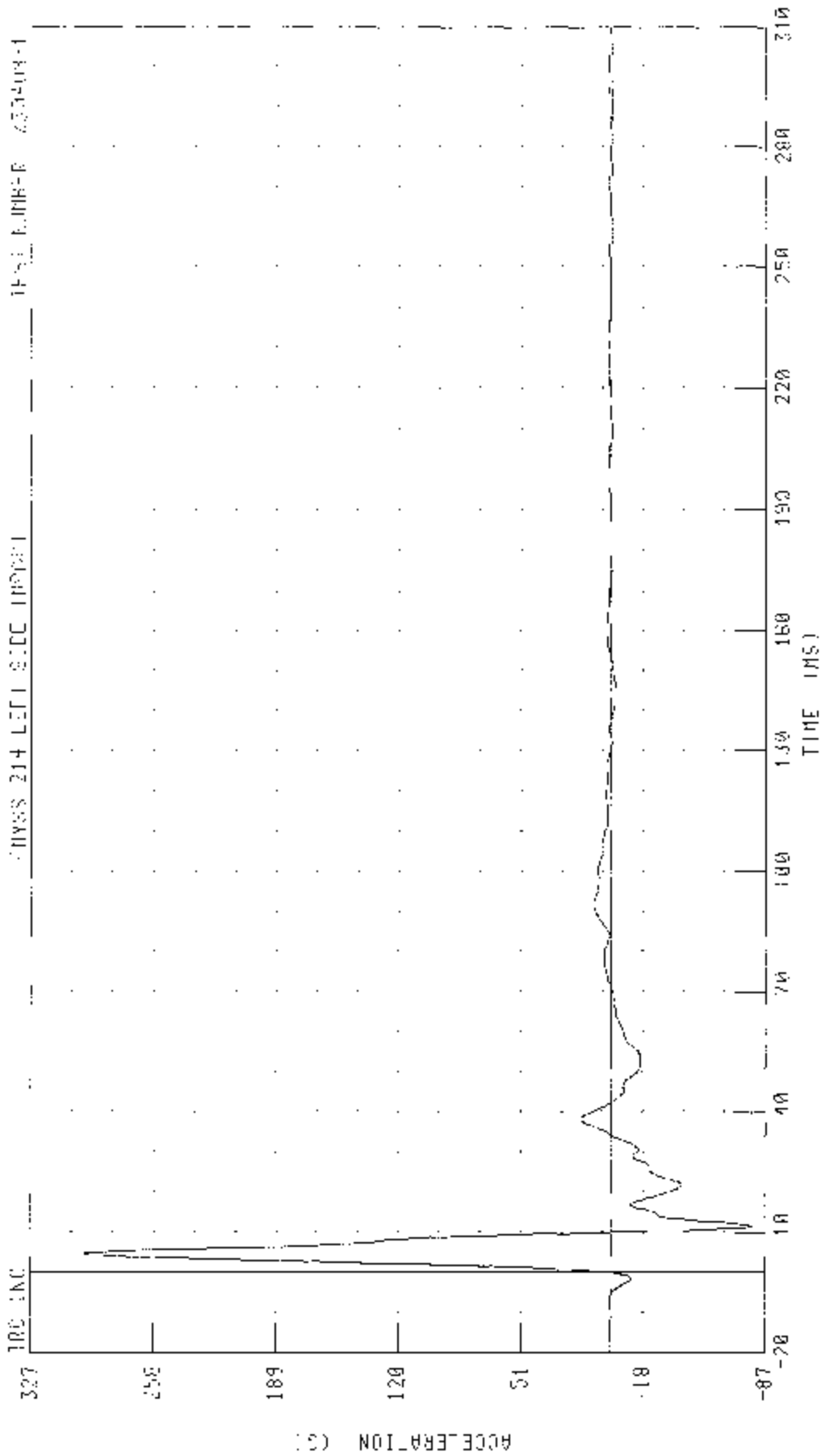
TIME (MS)

CHANNEL LMAYV1 FILTER CH CLASS 180

PEAK DATA: 24.35 KM/H @ 310 00 MS. @ 07 KM/H @ 1 04 MS

THE UNIVERSITY OF CHICAGO

ITC: L.H.F. 02413-1



CHANNEL: 18301 FILTER CH C-155 C0

PCAK DATA: 247 48 0 8 / '72 MS; -79.97 C 3 1 J 60 HS

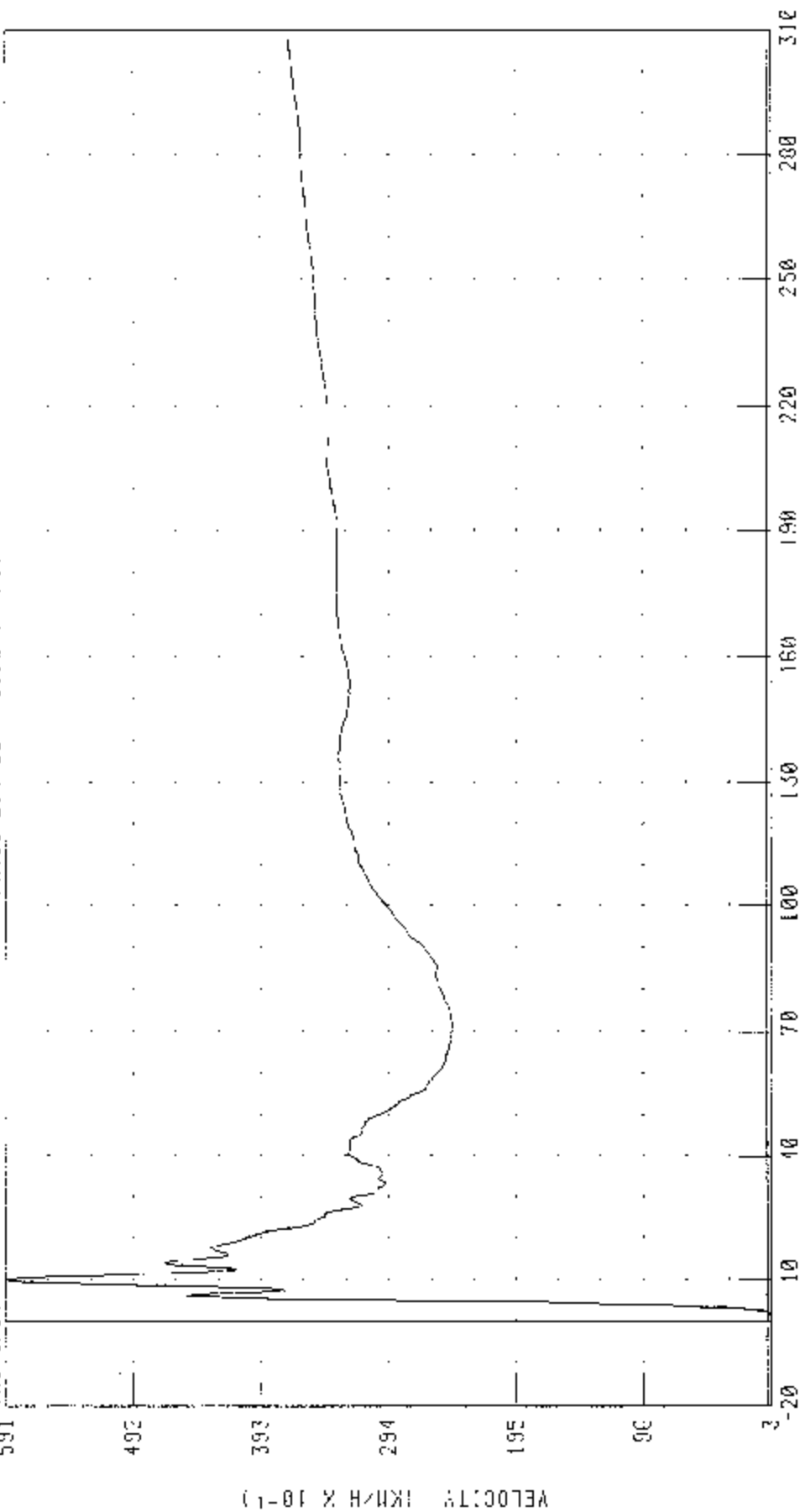
35/28 KPH 90 DEGREE SIDE IMPACT (MOVING OFFROAD: F BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

LEFT LOWER 0 POST Y-AXIS VELOCITY

CHVS 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1

TRC INC.



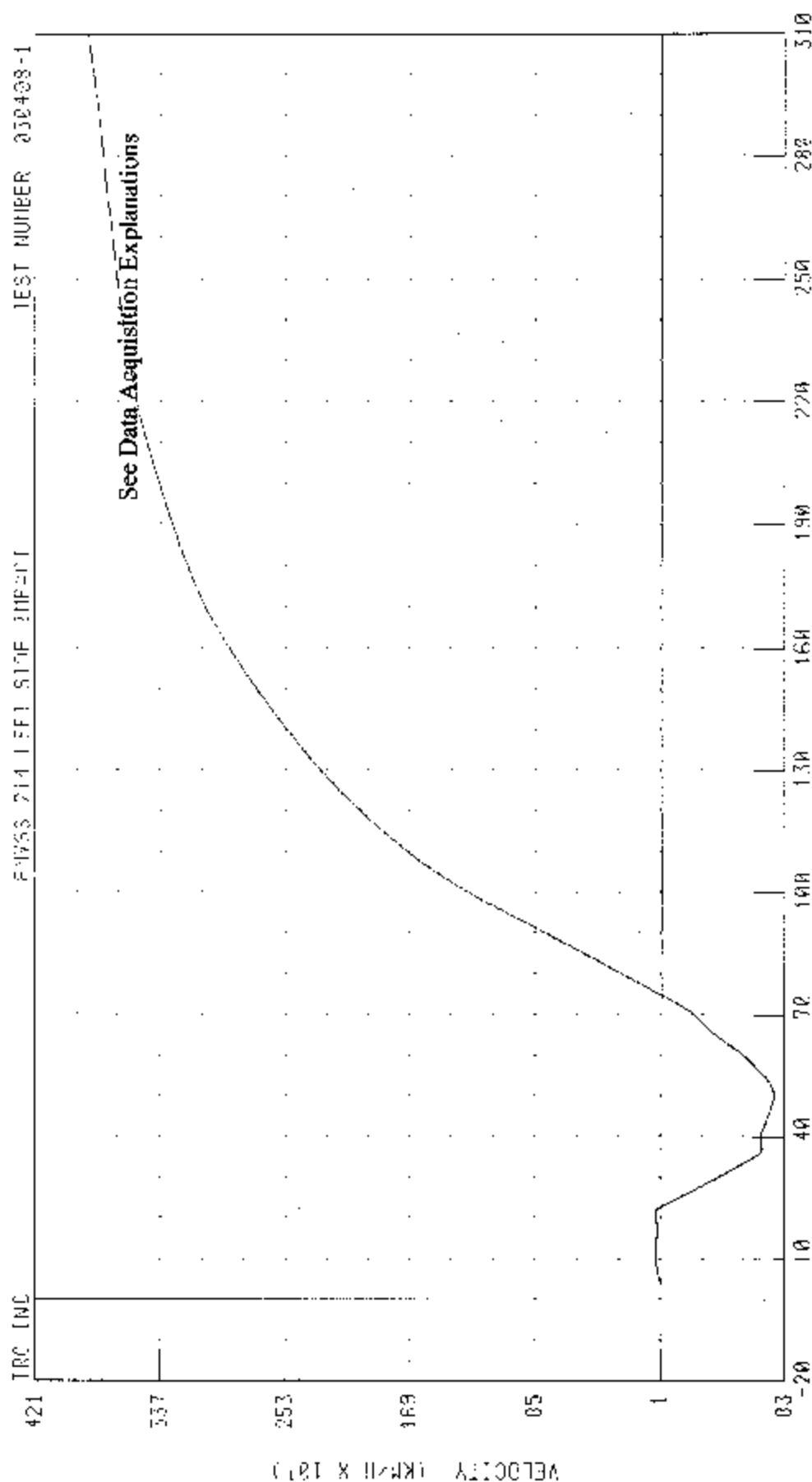
CHANNEL: LLDVW1 FILTER CH: CLASS 180

PEAK DATA: 59 01 KM/H @ 9.92 MS; -0 24 KM/H @ 1.84 MS

55/28 MPH 30 DEGREE SIDE IMPACT MOVING DEFORMABLE BARREL INTO LEFT SIDE OF 2003 SEATER 17H

LEFT MIDDLE B-POST X-AXIS VELOCITY

TRC INC PIVSS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1

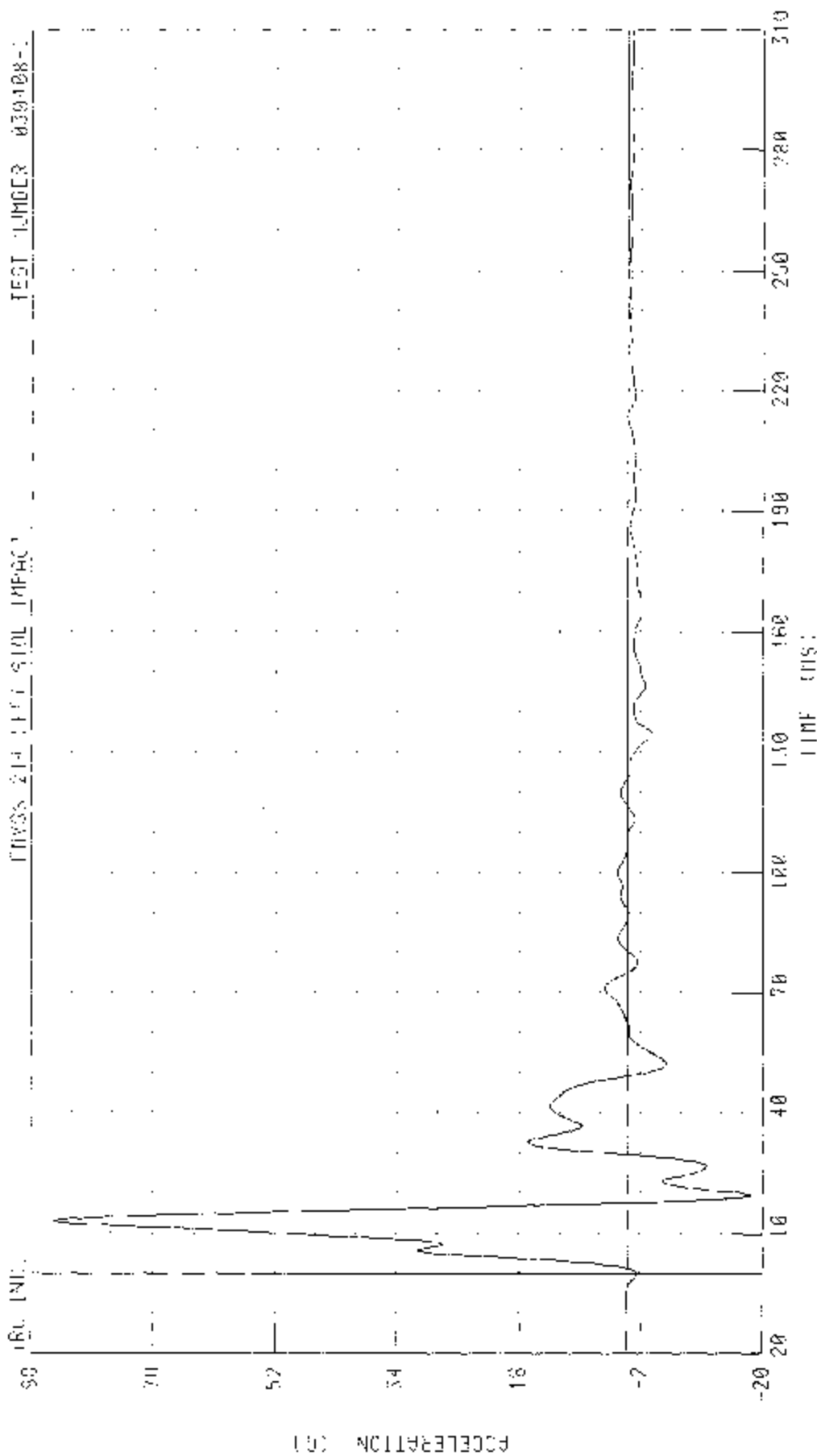


TIME (MS)

CHANNEL: LMBYV1 FILTER: CIL CLASS 130

PEAK DATA: 3847.87 MPH @ 310.00 MS, -760.76 MPH @ 50.00 MS

55/23 KPII 30 DICKED SIND MPAC: HITTING DEFENDABLE BARRIERS: INFLUENCE OF 2007 SAFETY 1 IN
 11-11-2007 15:00:00 2007 0310 ACCELERATION



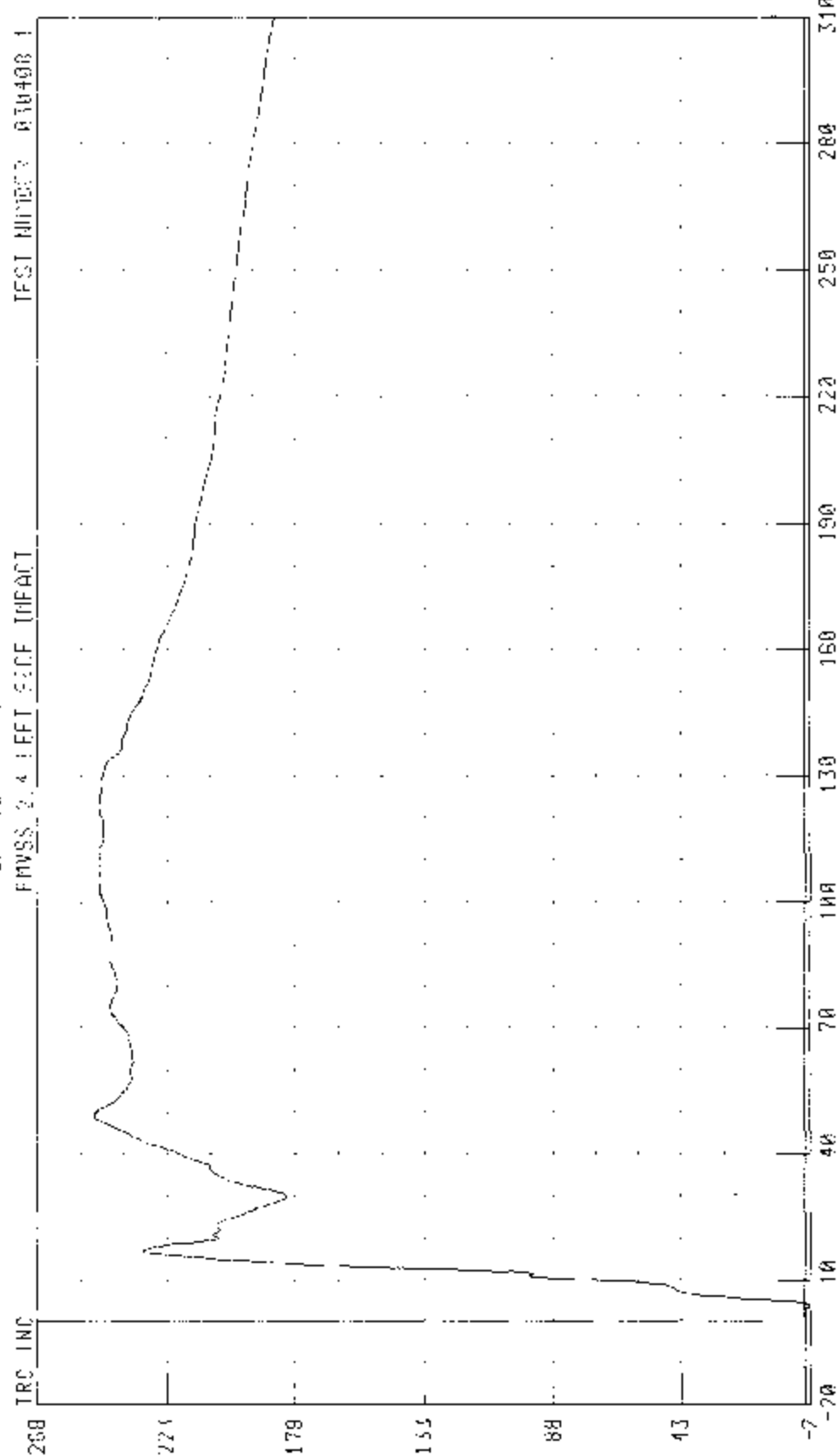
CHANNEL LFTY61 FILTER CH CLASS 60 PEAK DATA 84.71 0.0 13.12 1.5: -10.50 0.0 19.30 1.0

55/28 MPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 60M3 SATURN L06

LEFT FRONT SEAT TRACK Y-AXIS VELOCITY

TEST NUMBER: 030408-1

FMVSS 2.4 LEFT SIDE IMPACT



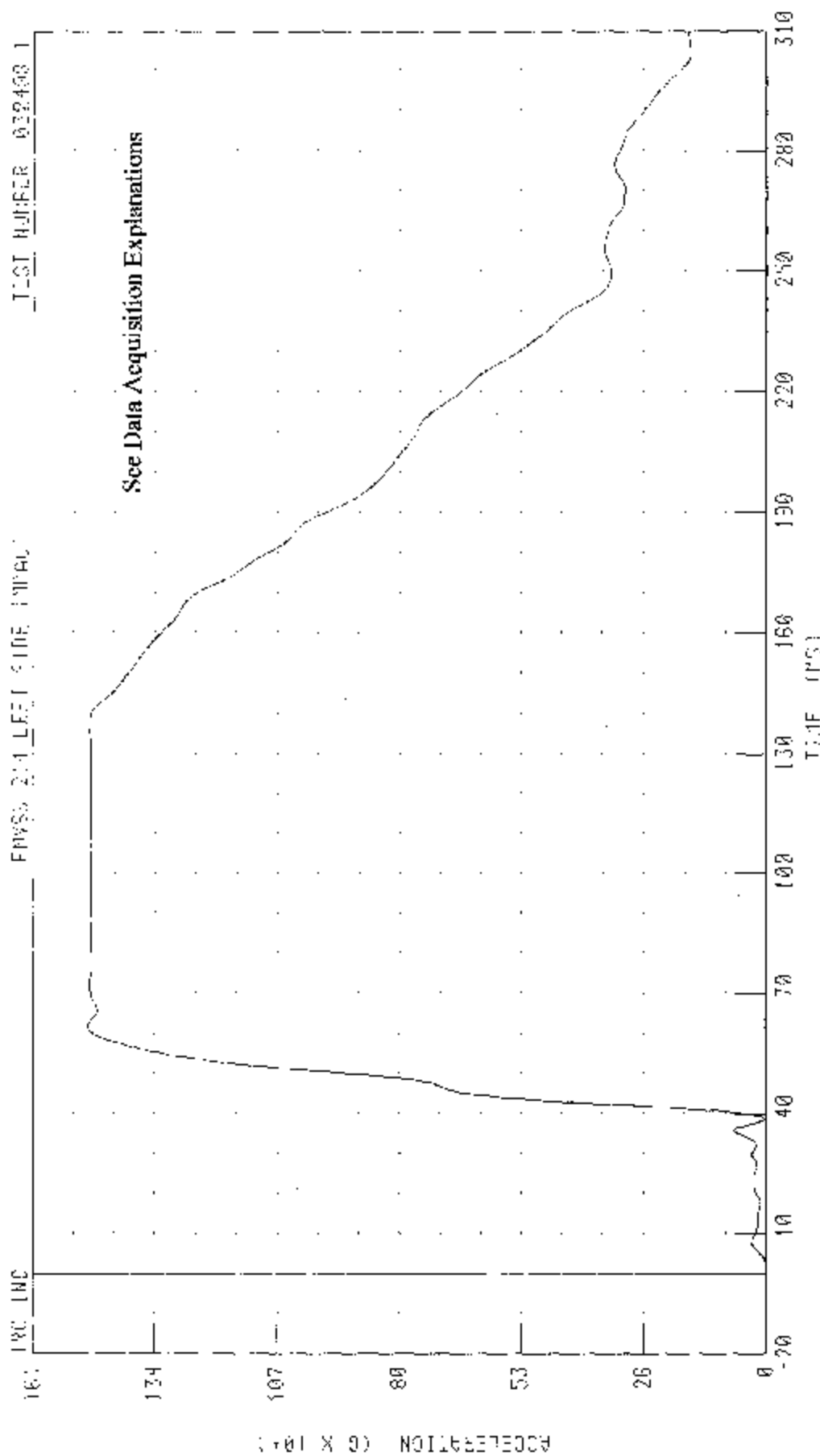
TIME (MS)

CHANNEL: LFTYV1 FILTER: CH CLASS: 130

PEAK DATA: 24.81 KM/H @ 40.20 MS, @ 19 KM/H @ 3.00 MS

VELOCITY (KM/H X 10^-3)

55/23 RPM 50 DEGREE SIDE IMPACT DRIVER (REUSABLE BARREL) INTO LEFT SIDE OF 2007 SATURN ION
 LEFT REAR SEAT BACK 3-AXIS ACCELERATION



CHANNEL: LRV01 FILTER: CH. CLASS: 60 TIME (MS) PEAK DATA: 1494 75.0 61.68 MS; 149.0 1.52 1.8

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

LEFT REAR LEFT TRACK Y AXIS VELOCITY

FNVS3 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1

IRC INC.

See Data Acquisition Explanations

VELOCITY (KM/H X 10²)

TIME (MS)

CHANNEL: LRTYV1 FILTER: CH CLASS 180

PEAK DATA 9087.41 KM/H @ 318.20 MS; -0.24 KM/H @ 4.48 MS

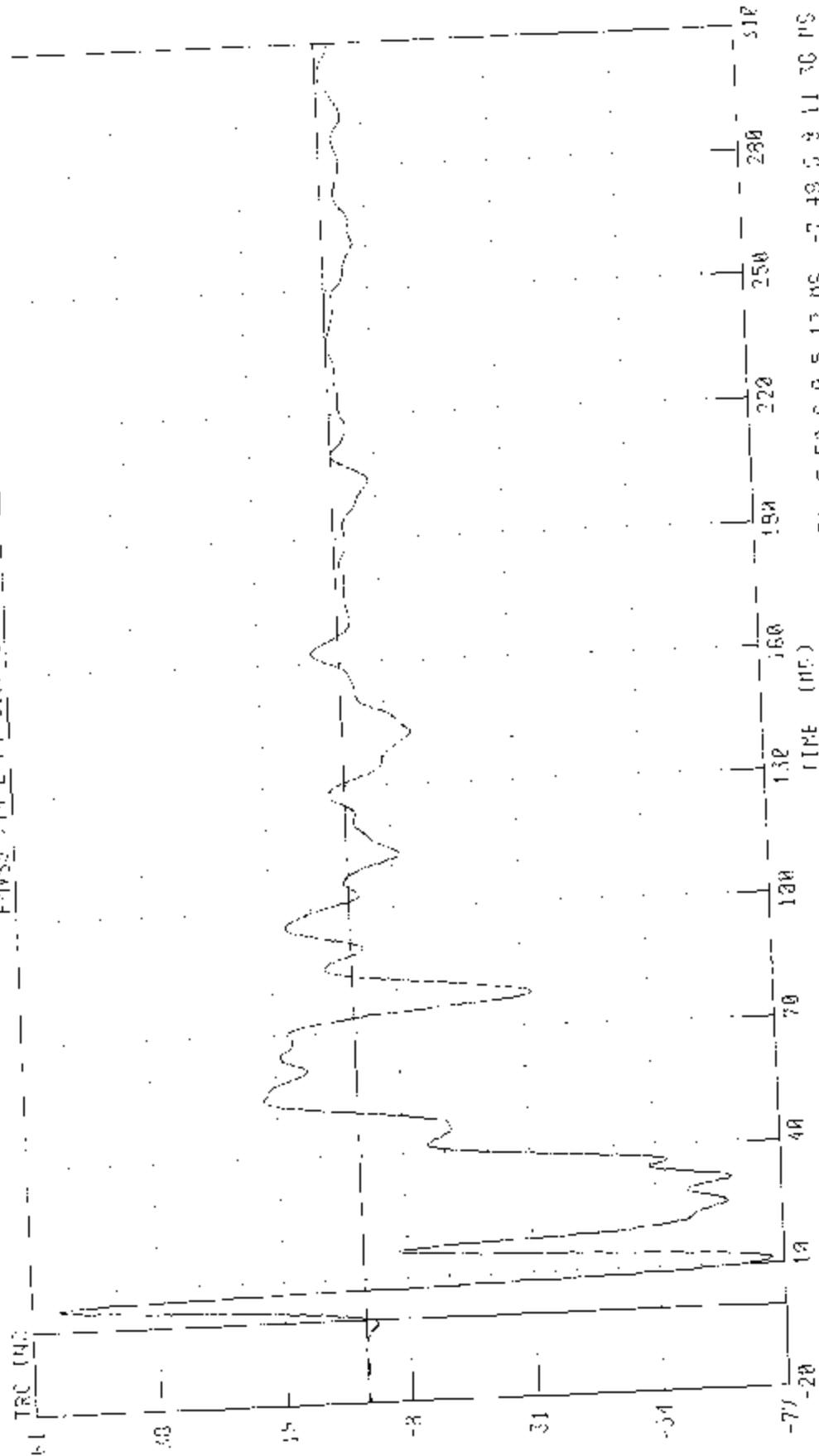
NOV 26 1968 09:00Z

50-23 MPH 90 DEGREE SIDE IMPACT (MOVING REFERENCE IMPACT) INTO LEFT SIDE OF 1967 SEATTLE VAN

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION

TEST NUMBER 8010188-1

IMPACT 511 LEFT SIDE IMPACT



VEHICLE DATA 500 0 0 5 17 MS. -7.48 5 3 11 70 MS

TIME (MS)

CHANNEL 1 VCGXG1 FILTER: 0.1 CLASS 00

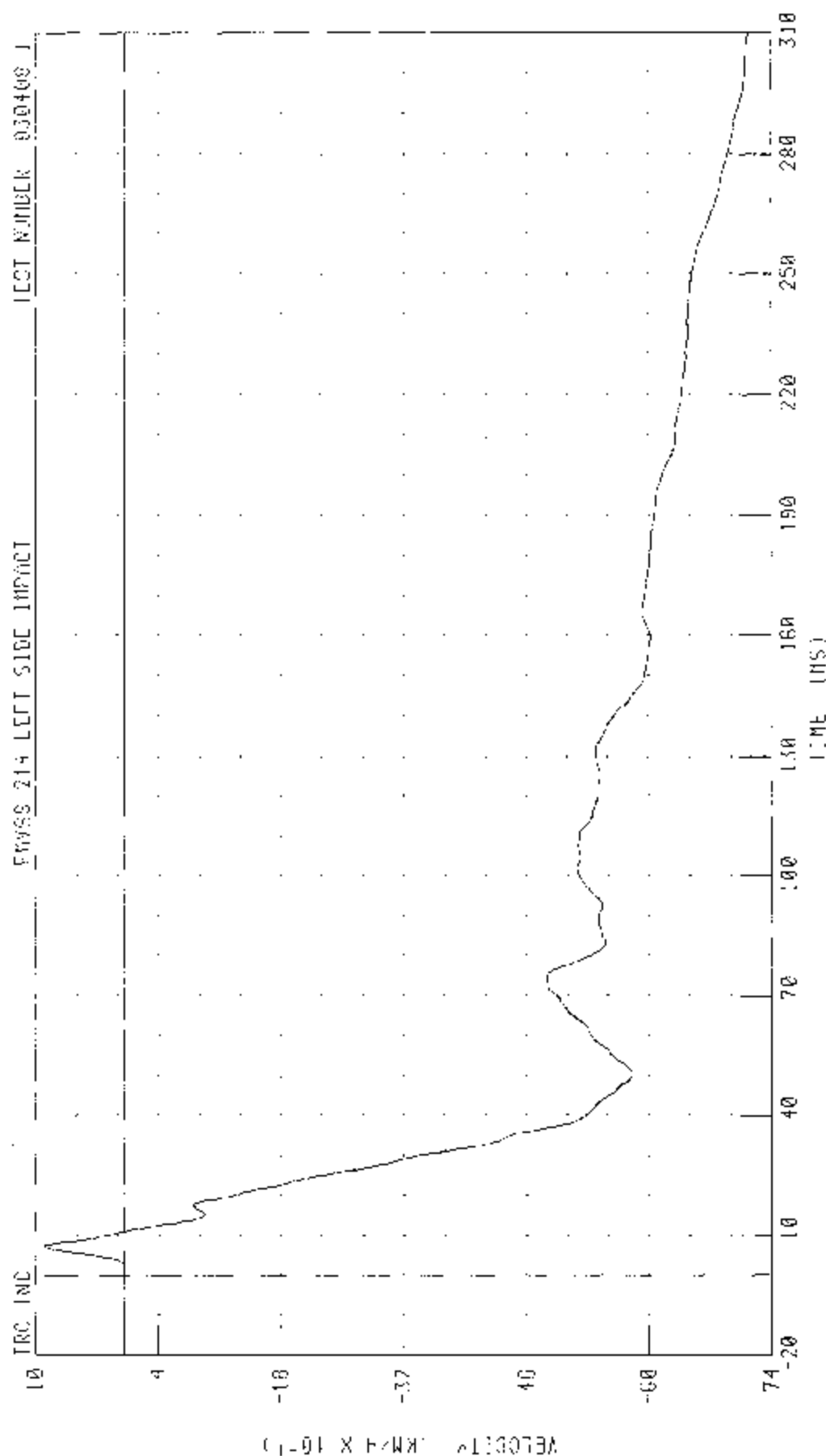
ACCELERATION (G X 10⁻¹)

B-131

030408-1

55/28 MPH 30 DEGREE SIDE IMPACT (MOVING CHURNABLE BARRIERS) INTO LEFT SIDE OF 2903 SATURN ION

VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY



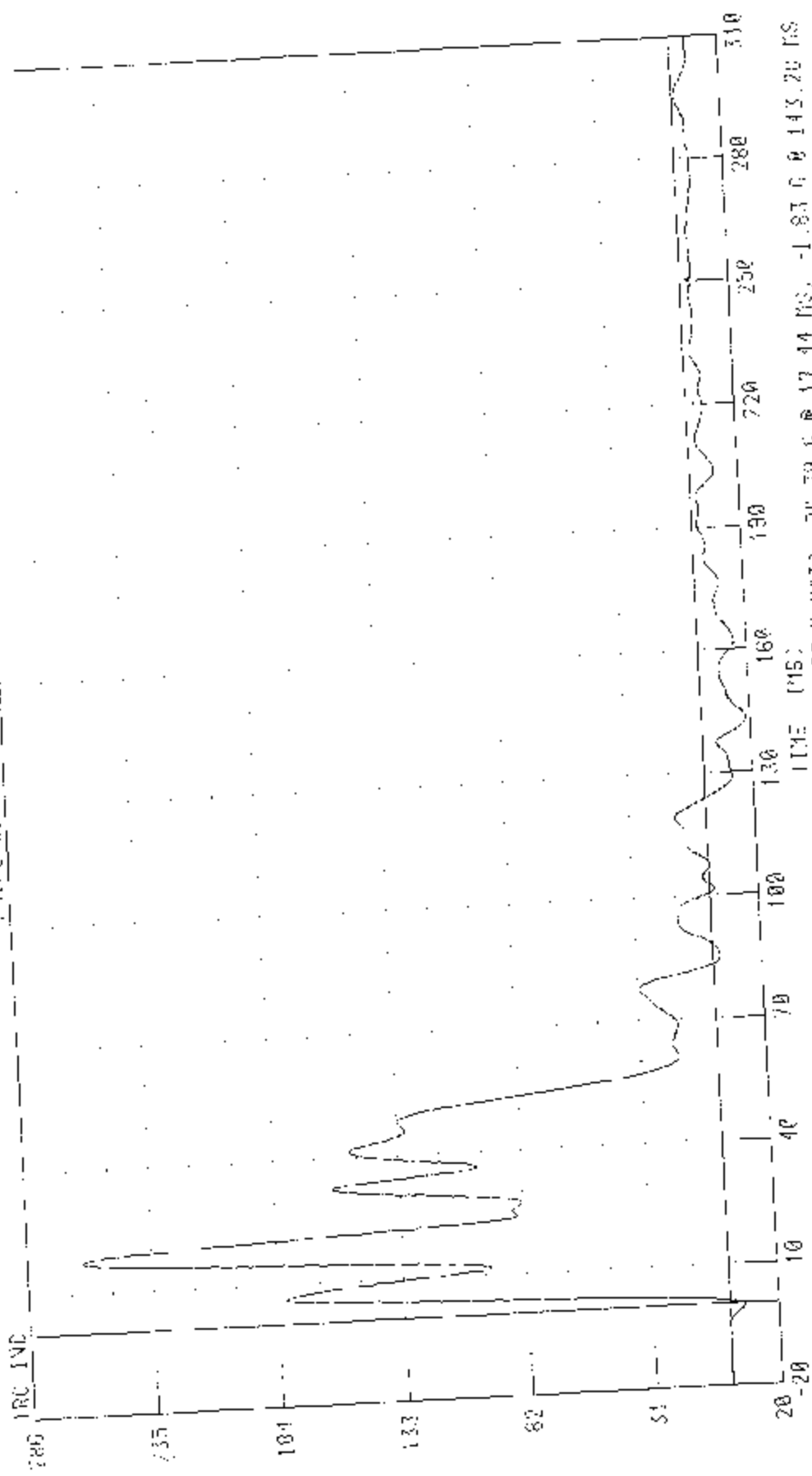
CHANNEL: V06XV1 FILTER: CH. CLASS 190

PEAK DATA 0 91 KM/H @ 7 44 MS; -7 15 KM/H @ 510 00 MS

55-28 KFH 90 DE REC SIDE IMPACT 1100 LBS DETONABLE CARTRIDGE 1000 LBS SIDE 2007 NATURA 100

VEHICLE CENTER OF GRAVITY 7-9000 AL. F. 1000 ON TEST NUMBER 030408-1

FORCE 214 LBS SIDE IMPACT



PEAK VALUE 26.39 G @ 17.44 MS, -1.83 G @ 143.20 MS

CHANNEL: VCCY61 FILTER: CP CLASS: 60

ACCELERATION (G X 10^-3)

51/29 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 DATUM 100

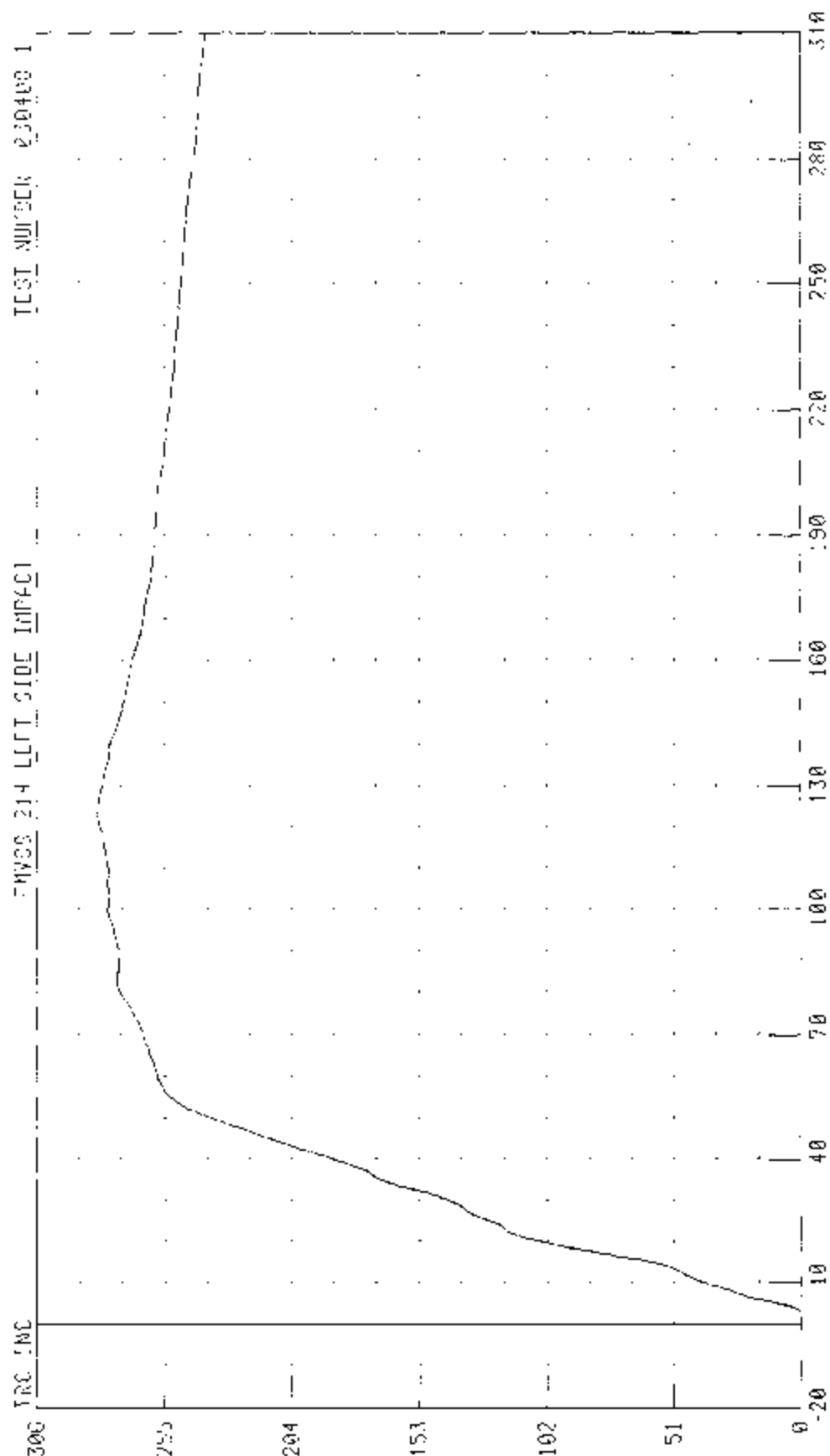
VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY

TRC INC

THUS 214 LEFT SIDE IMPACT

TEST NUMBER 230408 1

VELOCITY (KM/H X 10⁻¹)

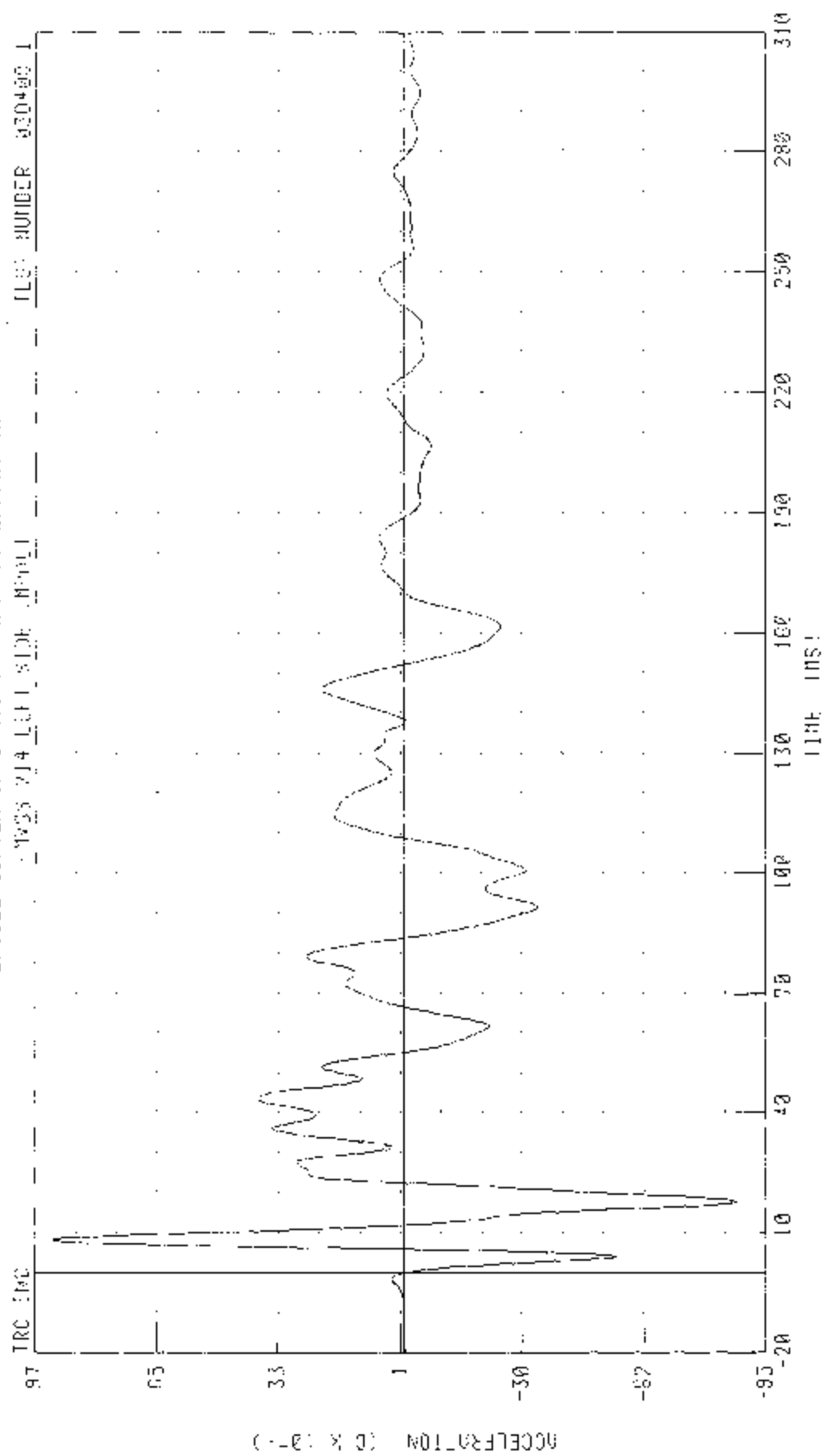


TIME (MS)

CHANNEL VCCVY1 FILTER: CH CLASS 180

PERC DATA 28.14 KM/H @ 124.16 MS, -0.02 KM/H @ 2.72 MS

55220 KPH BY HIGHEST SIDE IMPACT PROVIDES DEFORMATION PARALLEL INTO LEFT SIDE OF CORE SATURN TOR
VEHICLE CENTER OF GRAVITY Z AXIS ACCELERATION



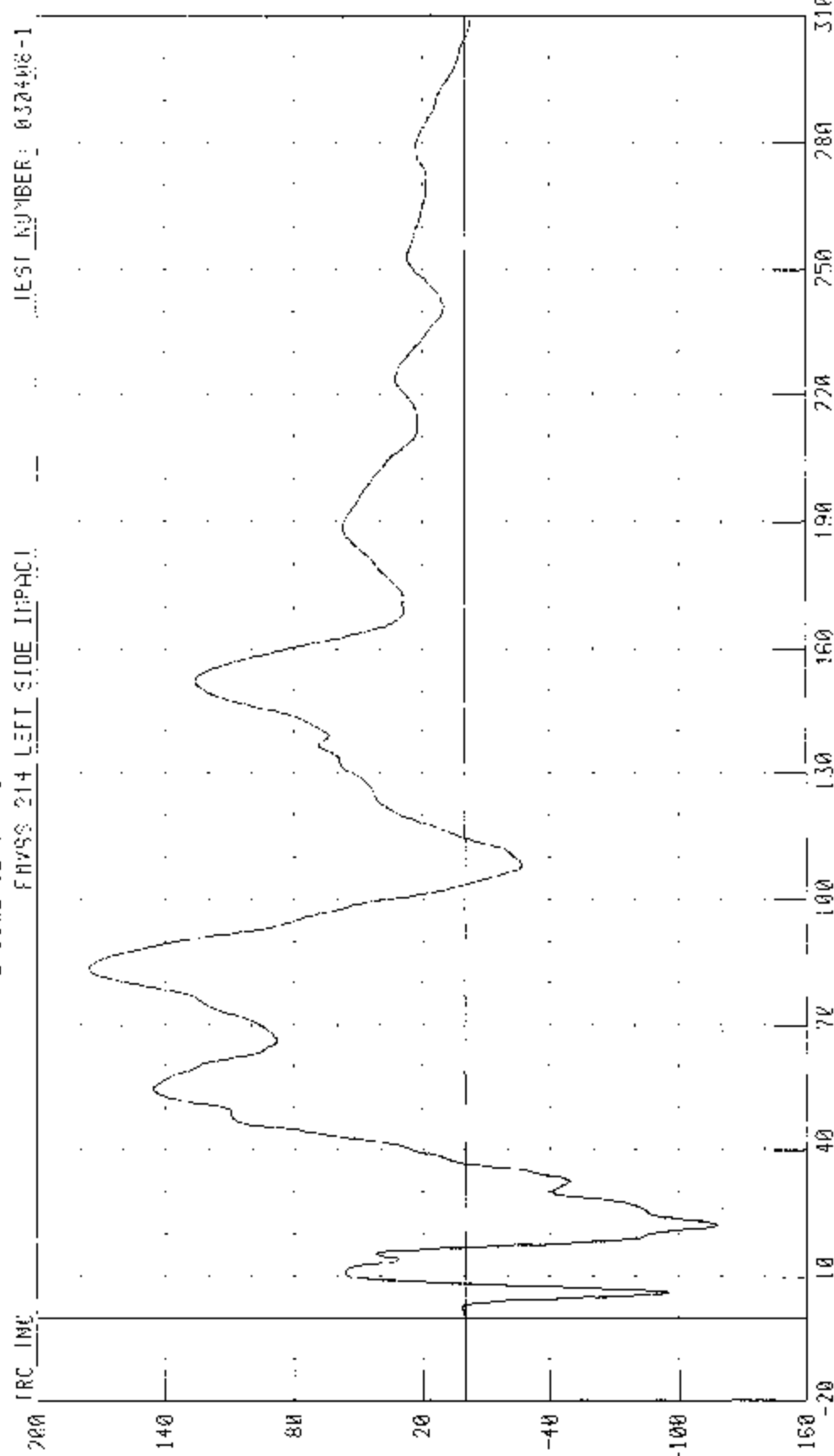
CHANNEL - Y00201 FT. IFR - CH CLASS 60 PEAK DATA: 9 25 3 0 3 40 MS, -0 71 0 0 17 52 MS

5.1/28 KPH 30 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIFT OF 2003 SATURN ION

VEHICLE CENTER OF GRAVITY 7-AXIS VELOCITY

TEST NUMBER: 032408-1

FRVS 214 LEFT SIDE IMPACT



TIME (MS)

CHANNEL: VCCZY1 FILTER: CH CLASS: 1R0

PEAK DATA: 1 70 KPH @ 83.44 MS; -1 18 KPH @ 22.16 MS

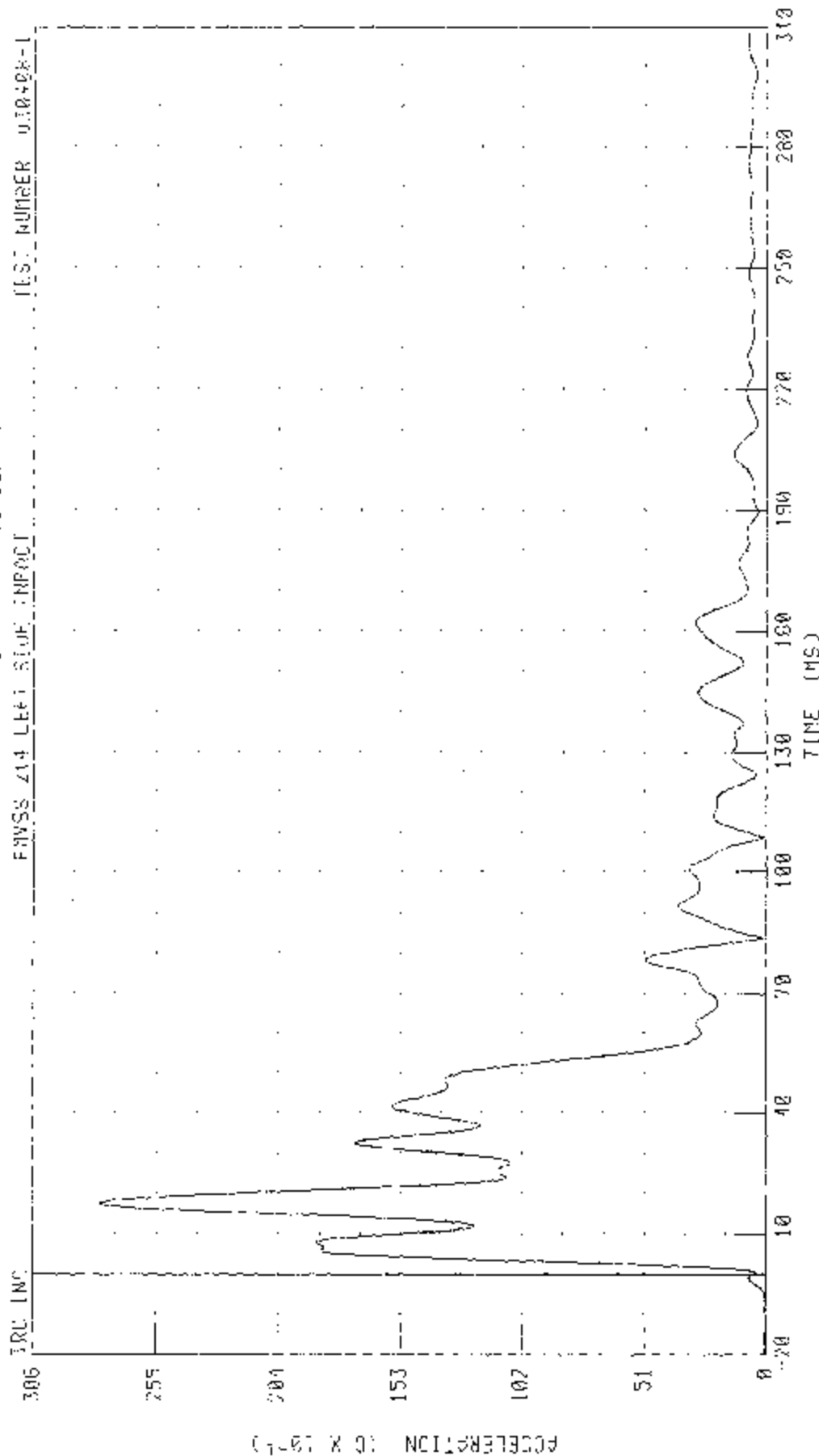
VELOCITY (KM/H X 10^-2)

55/28 KPH 90 DEGREE SIDE IMPACT PROVING DEFORMABLE BARRIER (NIO LEFT SIDE OF 4803 SATURN 103)

VEHICLE CENTER OF GRAVITY RESIDUAL ACCELERATION

TEST NUMBER 030408-1

FRVSS 214 LEFT SIDE IMPACT



CHANNEL V00001 FILTER CH. CLASS 00

PEAK (MHA) 77 82 10 17 52 MS; 0 00 11 9 -13 28 MS

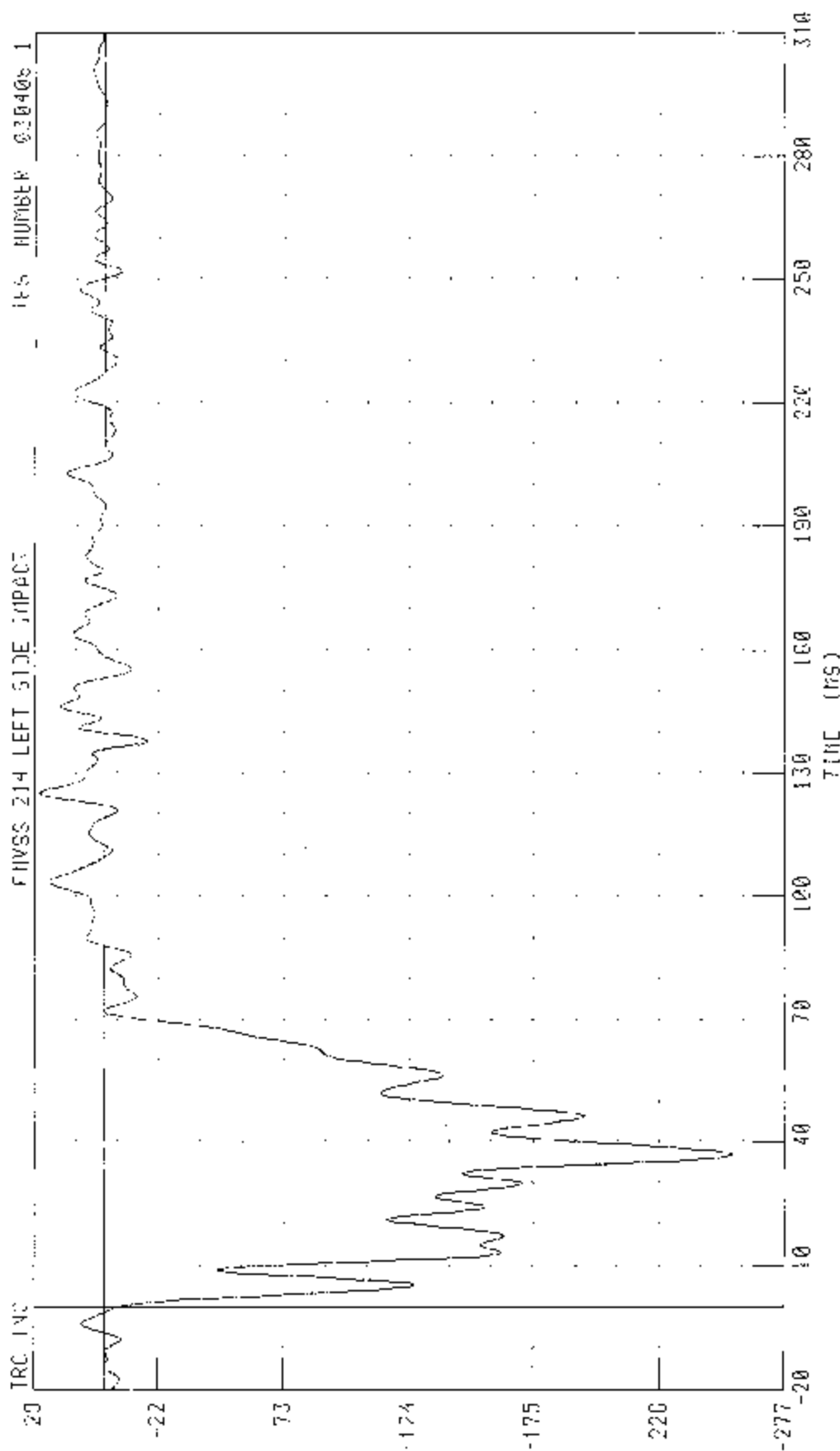
MDB Instrumentation Plots

Acceleration Data - Filter Class 60

Integration Data - Filter Class 180

54/25 FPH 30 DEGREE SIDE IMPACT (MOVING DEFURBANT BARRIER) INTO LEFT SIDE OF 2033 SOUTHON 104

FLR CENTER OF GRAVITY X-AXIS ACCELERATION



CHANNEL - DCCXG1 FILTER - CH CLASS 50

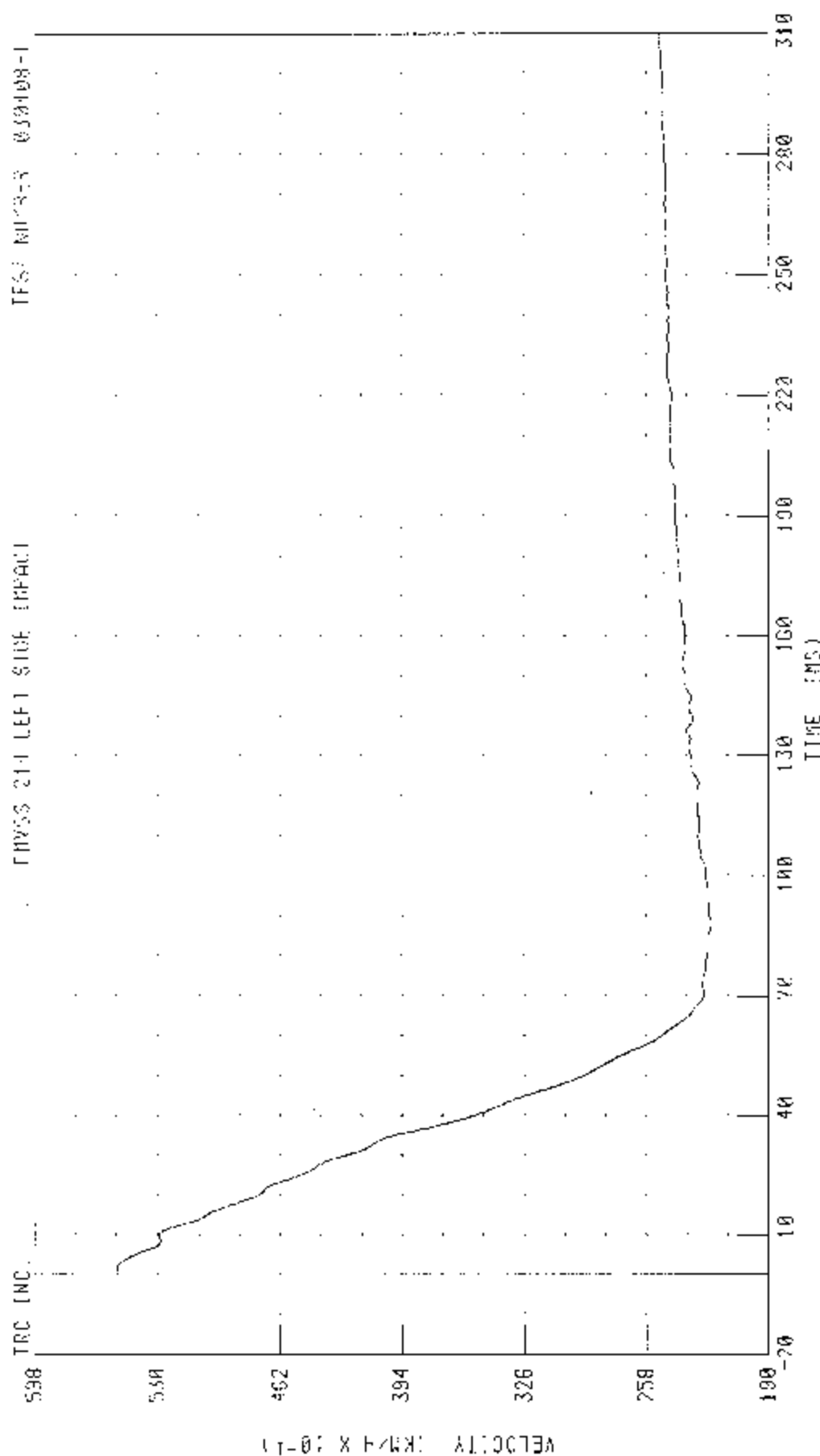
SEOK DATA 2.68 G @ 125 MS, -25.55 G @ 30.88 MS

55/28 KPH 90 DEGREE SIDE IMPACT MOVING DEFORMABLE BARRIER INTO LEFT SIDE OF 2003 SAT JUN 10M

FOR CENTER OF GRAVITY X AXIS VELOCITY

TRUSS 211 LEFT SIDE IMPACT

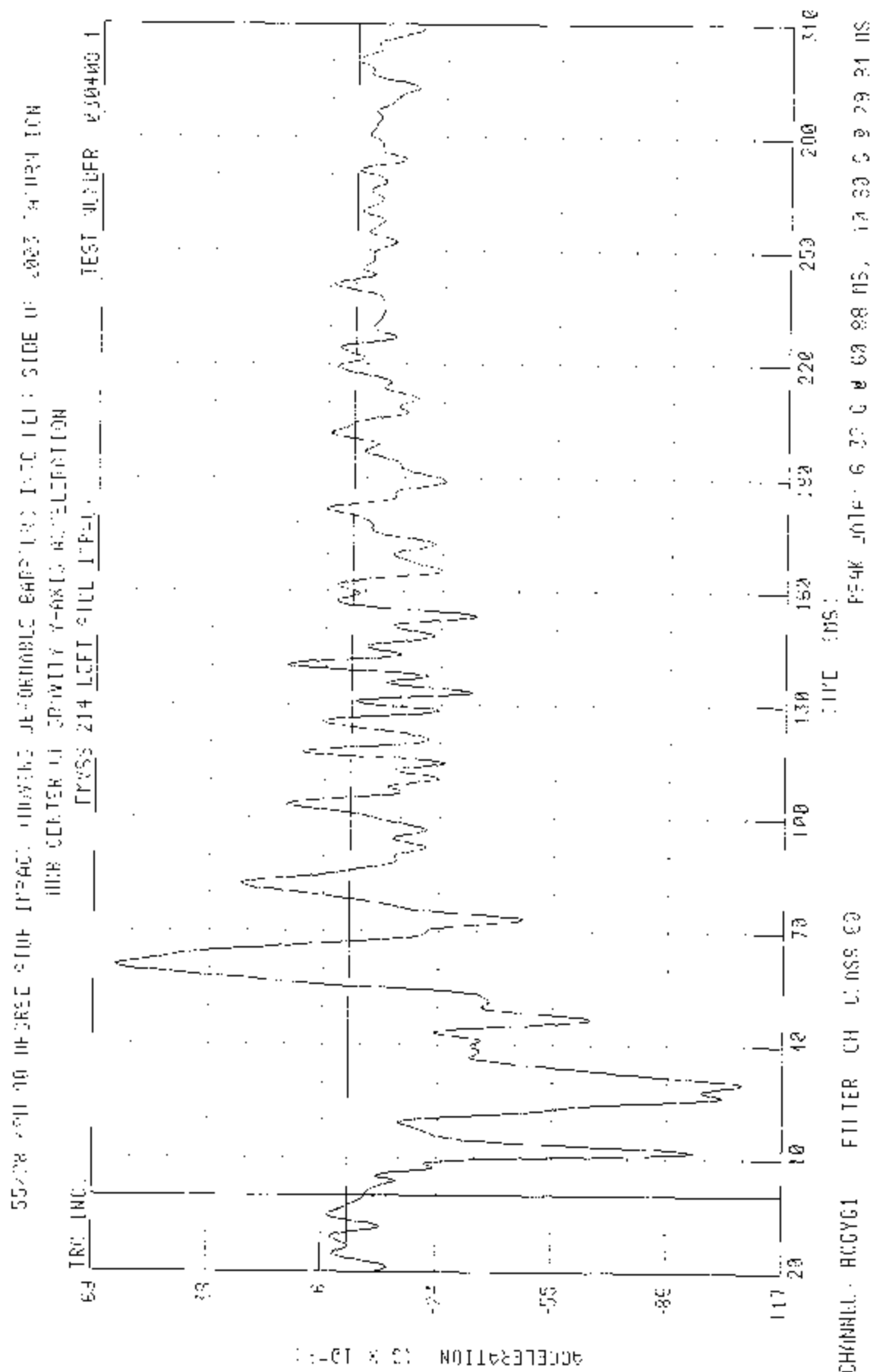
TFS# 00000000 030408-1



TIME (MS)

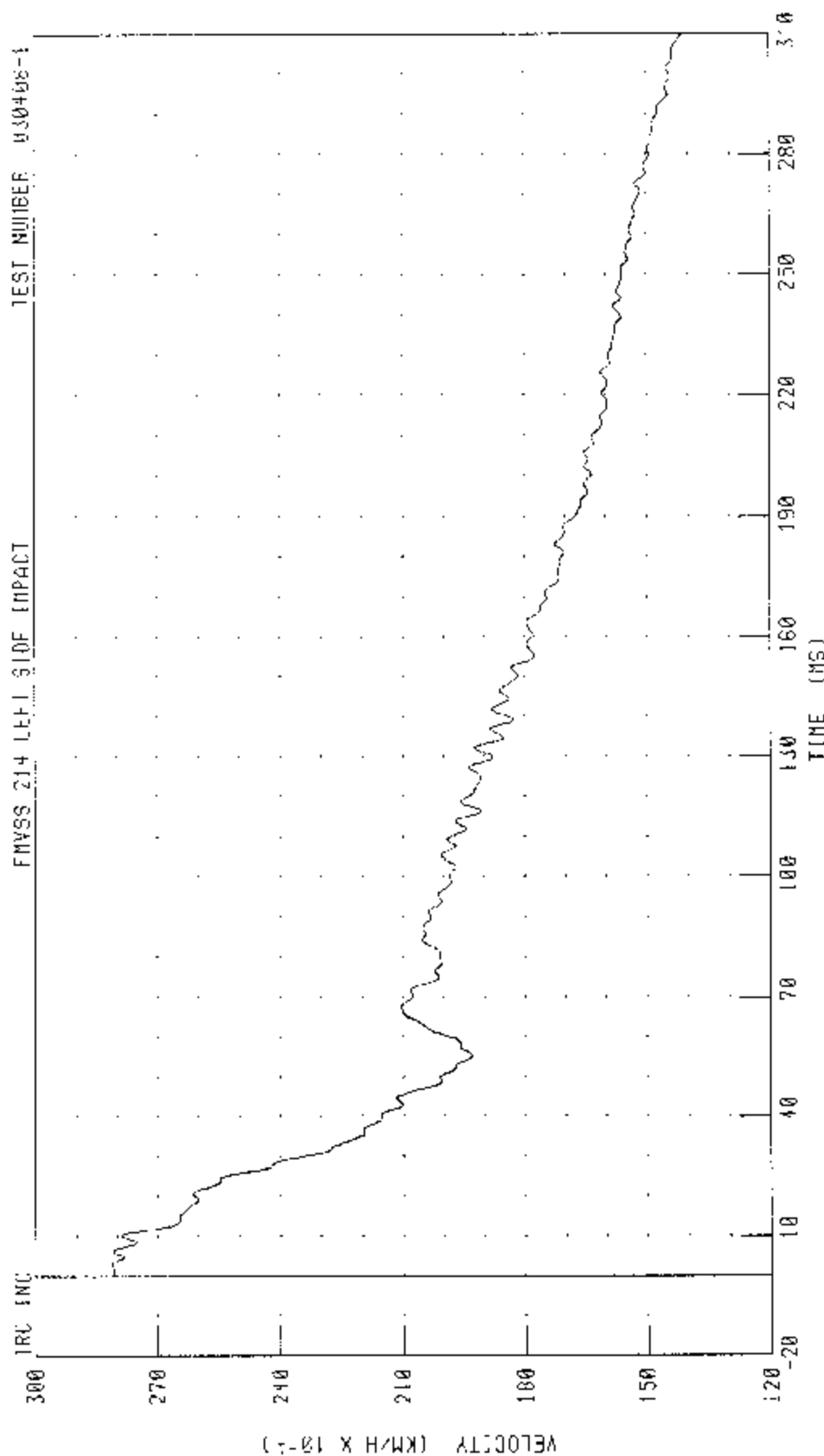
CHANNEL: BCCXY1 FILTER: CH. CLASS 130

PEAK DATA: 55.21 KPH @ 1.84 MS; 27.17 KPH @ 88.08 MS



55/28 KPH 90 DEGREE SIDE IMPACT (MOVING, Y-DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN 10H

100 CENTER OF GRAVITY Y-AXIS VELOCITY



CHANNEL: 8CCYV1 FILTER: CH CLASS 100

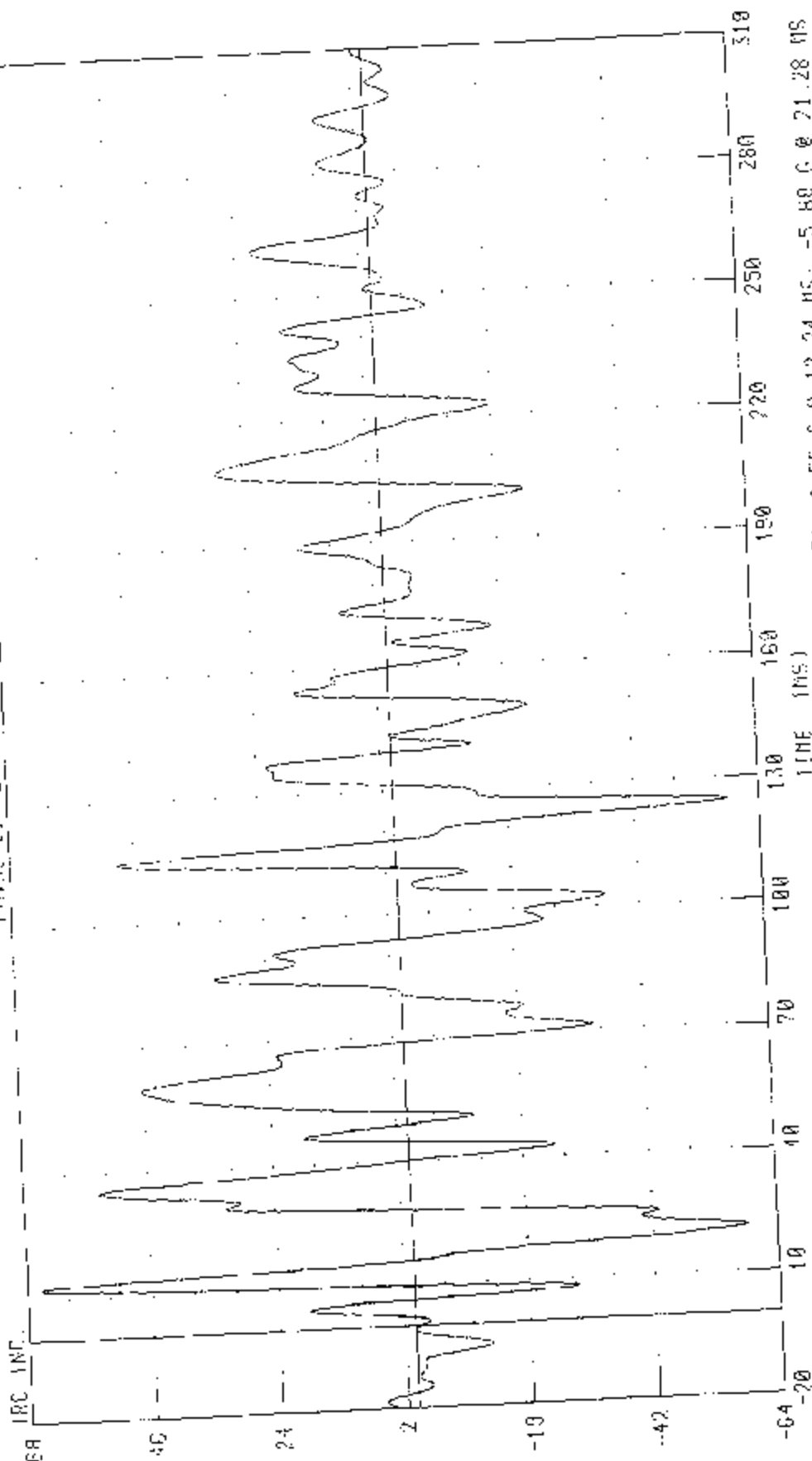
PEAK DATA 28 12 KM/H @ 3.04 MS, 14.12 KM/H @ 3.0 00 MS

05/28 KTH 30 DEGREE SLIDE IMPACT (MOVING DEFORMABLE CARTRIDGE) INTO 1CF SIDE OF 2003 SATURN VEH

1008 CENTER OF GRAVITY Z-AXIS ACCELERATION

TEST NUMBER: 030128-1

PHASE 214 LEFT SLIDE IMPACT



FLAK DATA: 6.55 G @ 12.24 MS; -5.80 G @ 21.28 MS

FILTER CH. CLOSS 60

CHANNEL: DCC761

ACCELERATION (G X 10⁻¹)

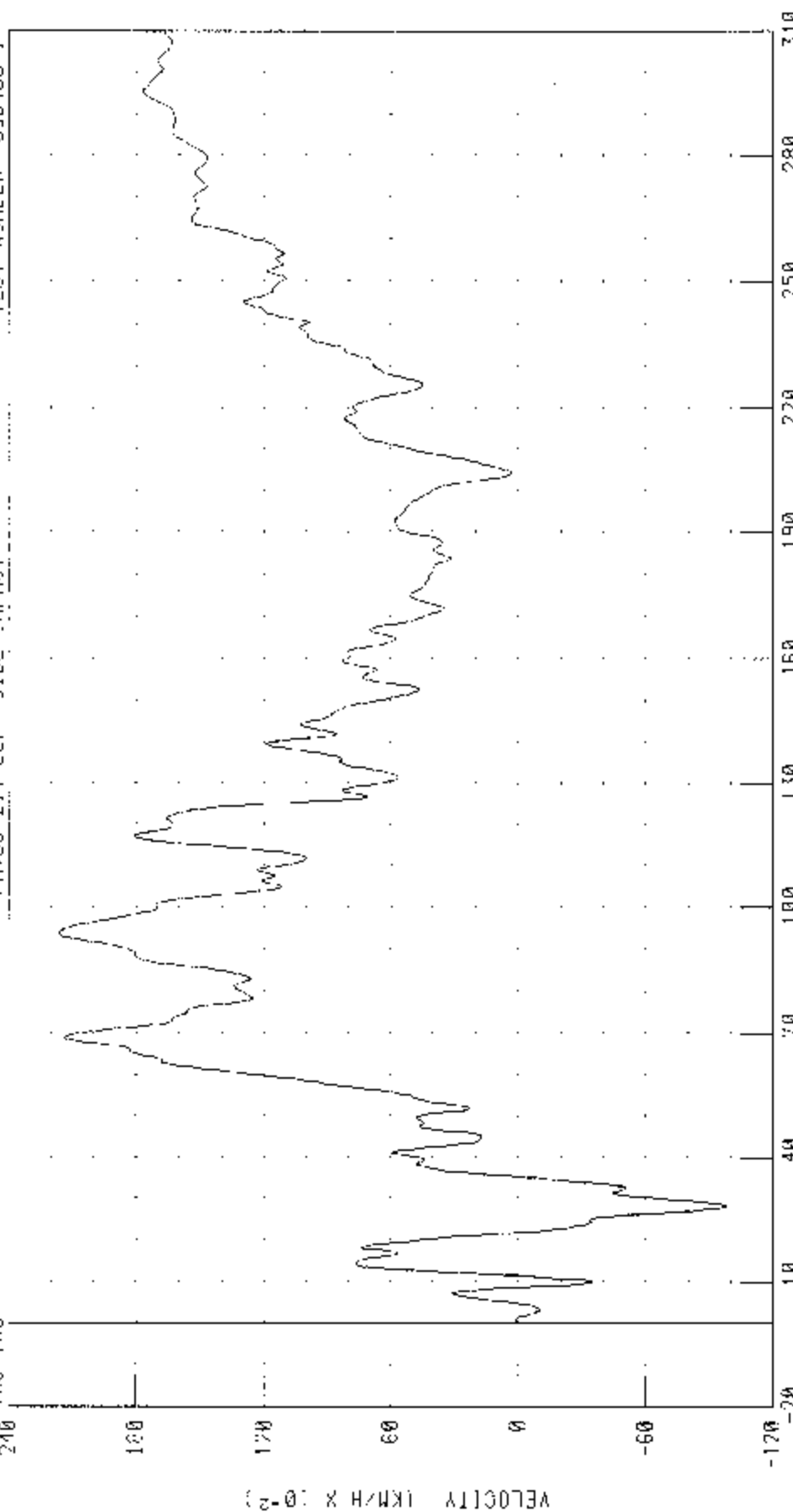
55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

FOR CENTER OF GRAVITY Z-HIGH VELOCITY

IRC INC

FNVS0 214 LEFT SIDE IMPACT

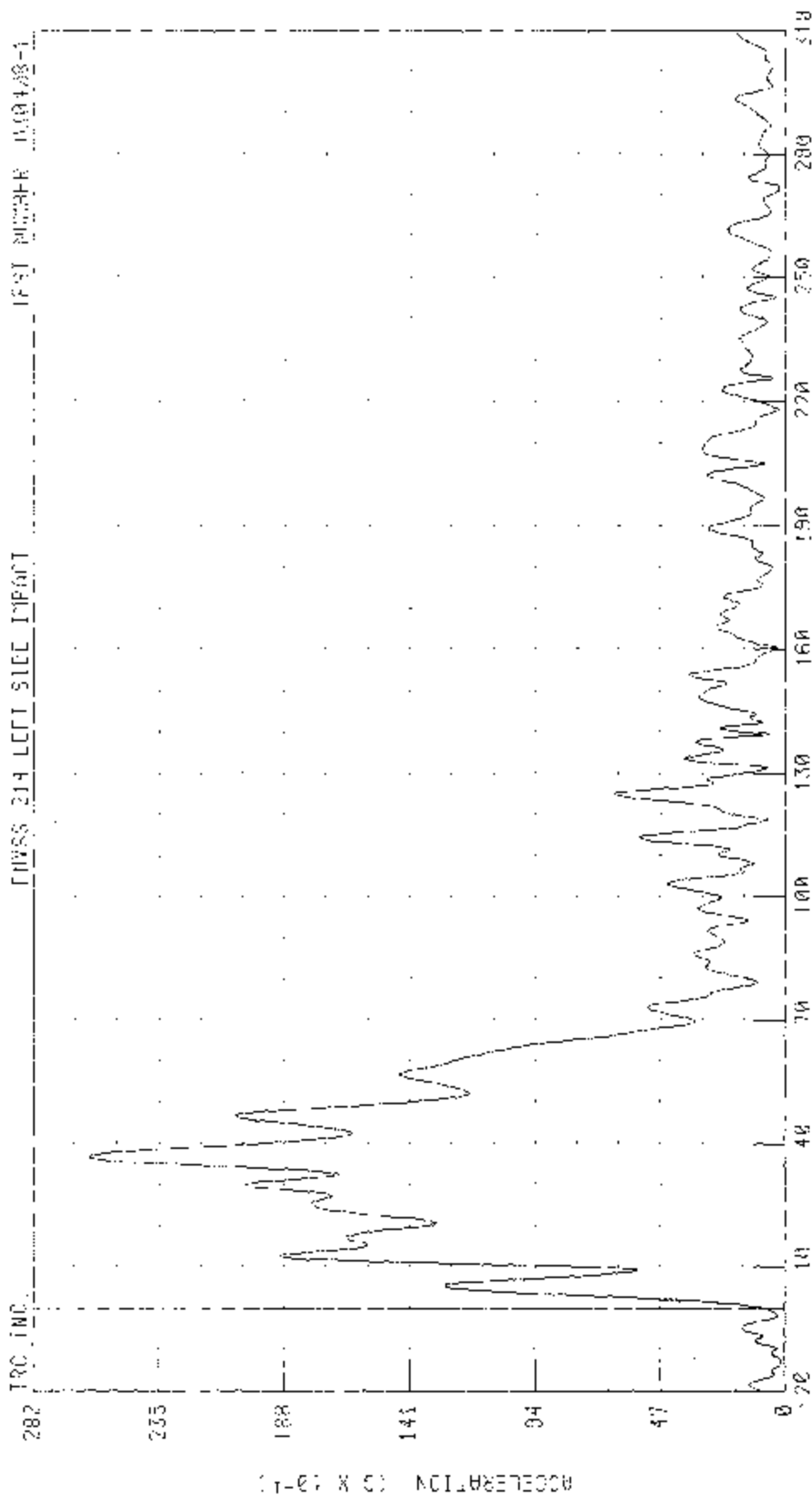
TEST NUMBER 030408 1



PEAK DATA: 2 16 K1/H @ 93.84 MS, -0.98 K1/H @ 28.24 MS

CHANNEL: BCCZV1 FILTER CH CLASS 180

55/20 40- 90 DEGREE SIDE VIEW - 100.15 DIFFUSIBLE ROCKET IMPACT SIDE OF 2003 SATURN 101
 200 CENTER OF GRAVITY RECORDING ACCELERATION



TRC INC. FUS 214 LEFT SIDE IMPACT 100.15 DEGREE SIDE VIEW

TIME (MS)

CHANNEL HXERO1 FILTER CH CLOSS 60

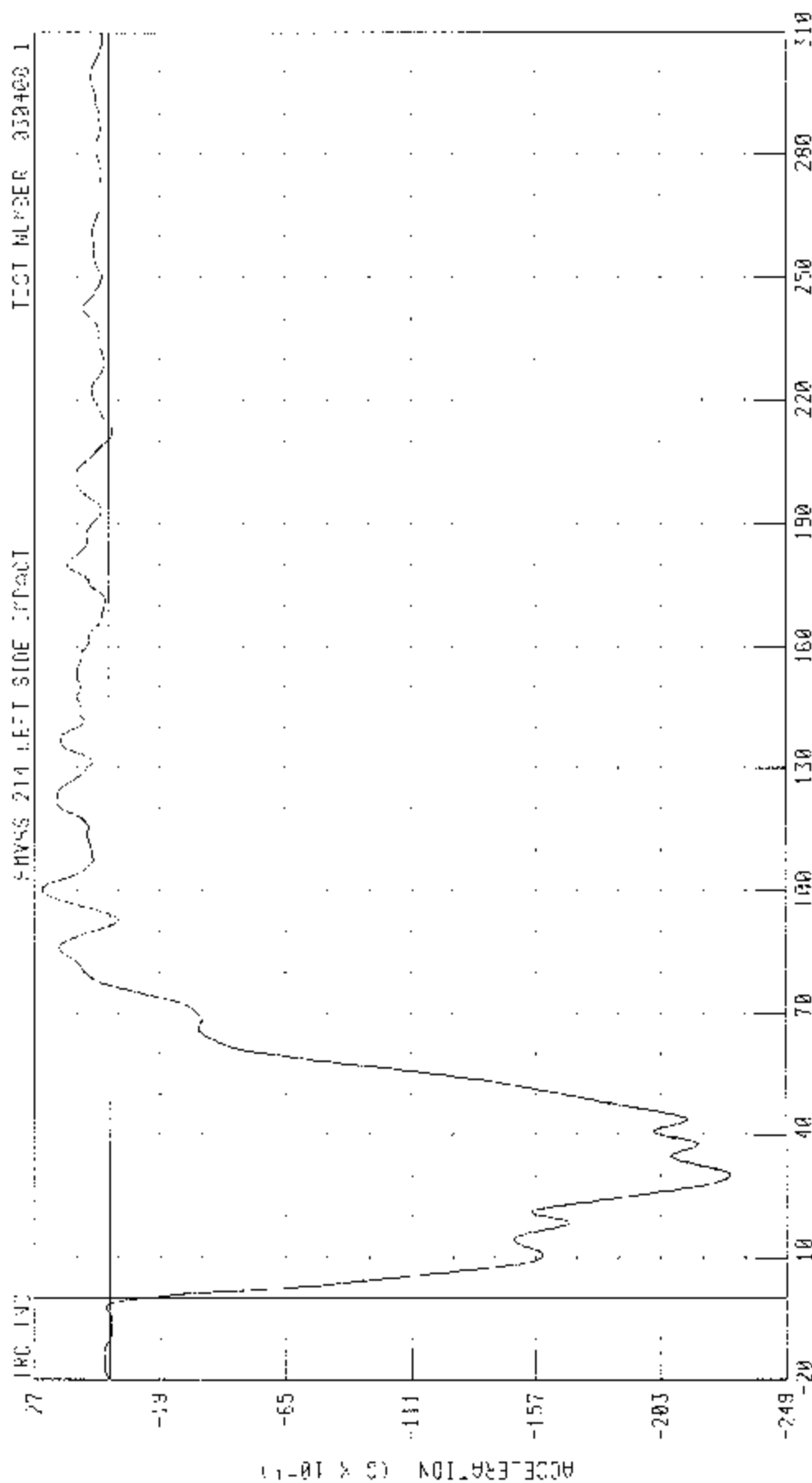
END DATA 25.12 5 0 30 72 55. 8.15 0 0 12 54 MS

50000 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

1000 LEFT REAR X-AXIS ACCELERATION

TEST NUMBER 332403 1

SENS 214 LEFT SIDE IMPACT



CHANNEL: RRXG3 FILTER: CH CLASS 60

PEAK DATA 2.46 G @ 100.32 MS. -22.89 G @ 30.32 MS

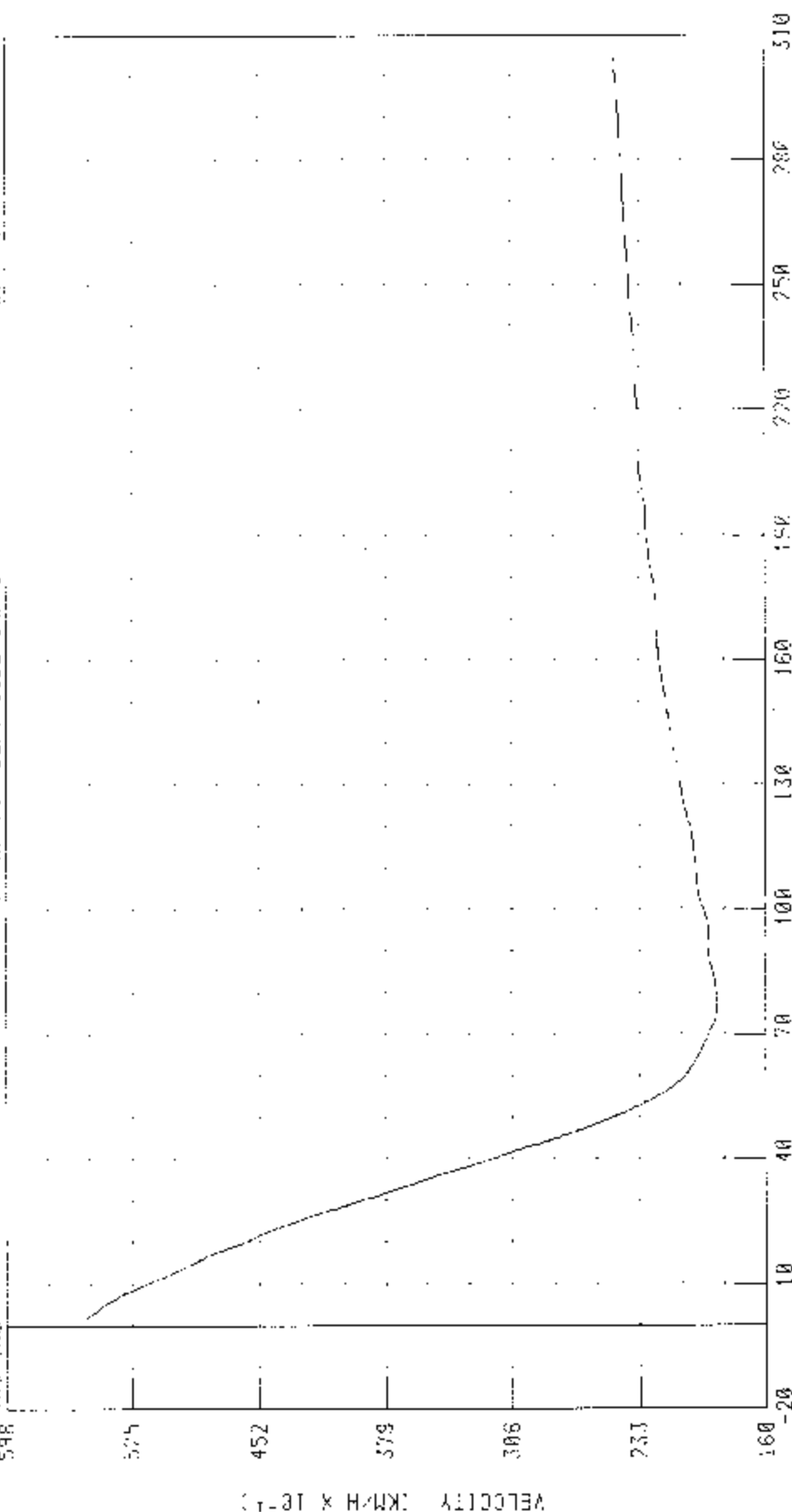
55/20 KPH 90 DEGREE SIDE IMPACT (MOVING PEDESTAL + BARRIER) INTO LEFT SIDE CT 2003 DATCH 110

NDB LEFT PEAK X AXIS VELOCITY

FILE: KUMS-A 030408 1

PEAKS 214 LEFT SIDE IMPACT

TRC (MC)



TIME (MS)

CHANNEL: IRRXV1 FILTER: CH. CLASS 100

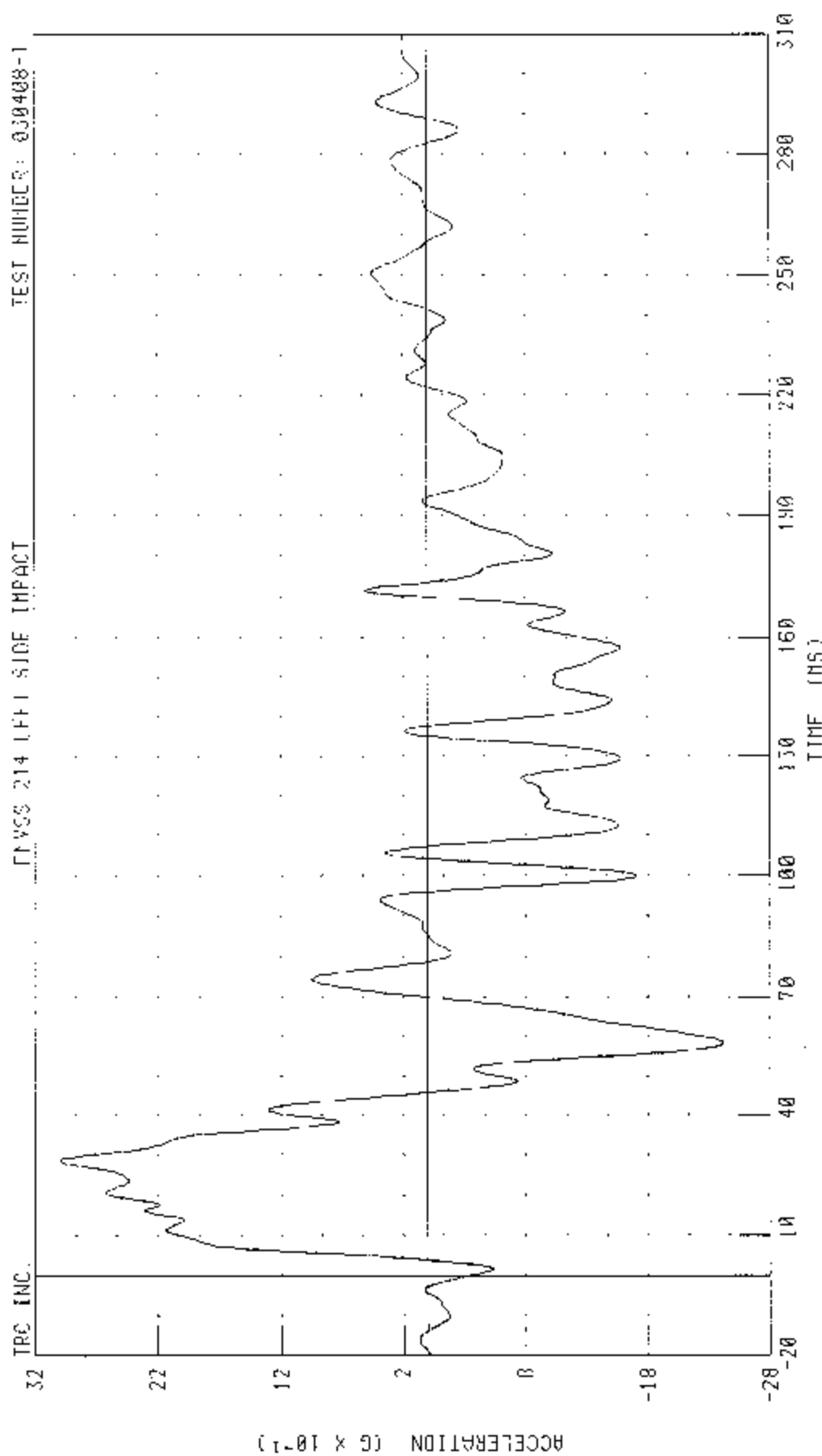
PEAK DATA 55 20 KPH 90 DEGREE SIDE IMPACT 18 81 KPH 90 DEGREE SIDE IMPACT

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

HUB LEFT REAR Y AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1



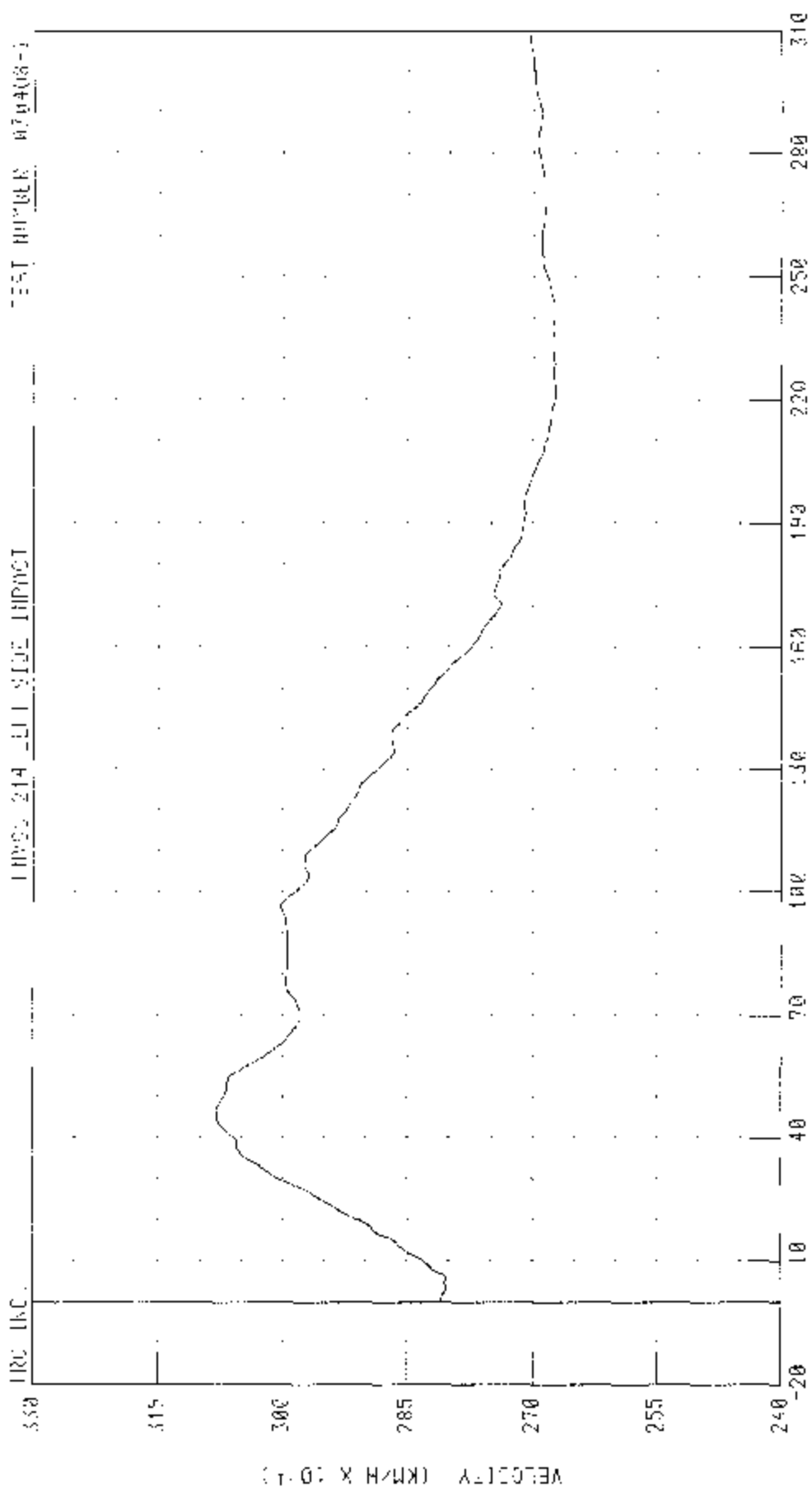
CHANNEL: LRRYC1 FILTER: CH CLASS 60

PEAK DATA 3 20 0 0 28 72 MS; -2 47 0 0 58 32 MS

55.29 62H 90 DEGREE 4004 IMPACT (MOVING DEFORMABLE BAR) INTO LEFT SIDE OF 2007 SAJLER 10K

100 LEFT REAR Y AXIS VELOCITY

IMPACT 214 LEFT SIDE IMPACT TEST NUMBER 070408-1



CHANNEL: 11R1V1 FILTER: CH CLASS 100

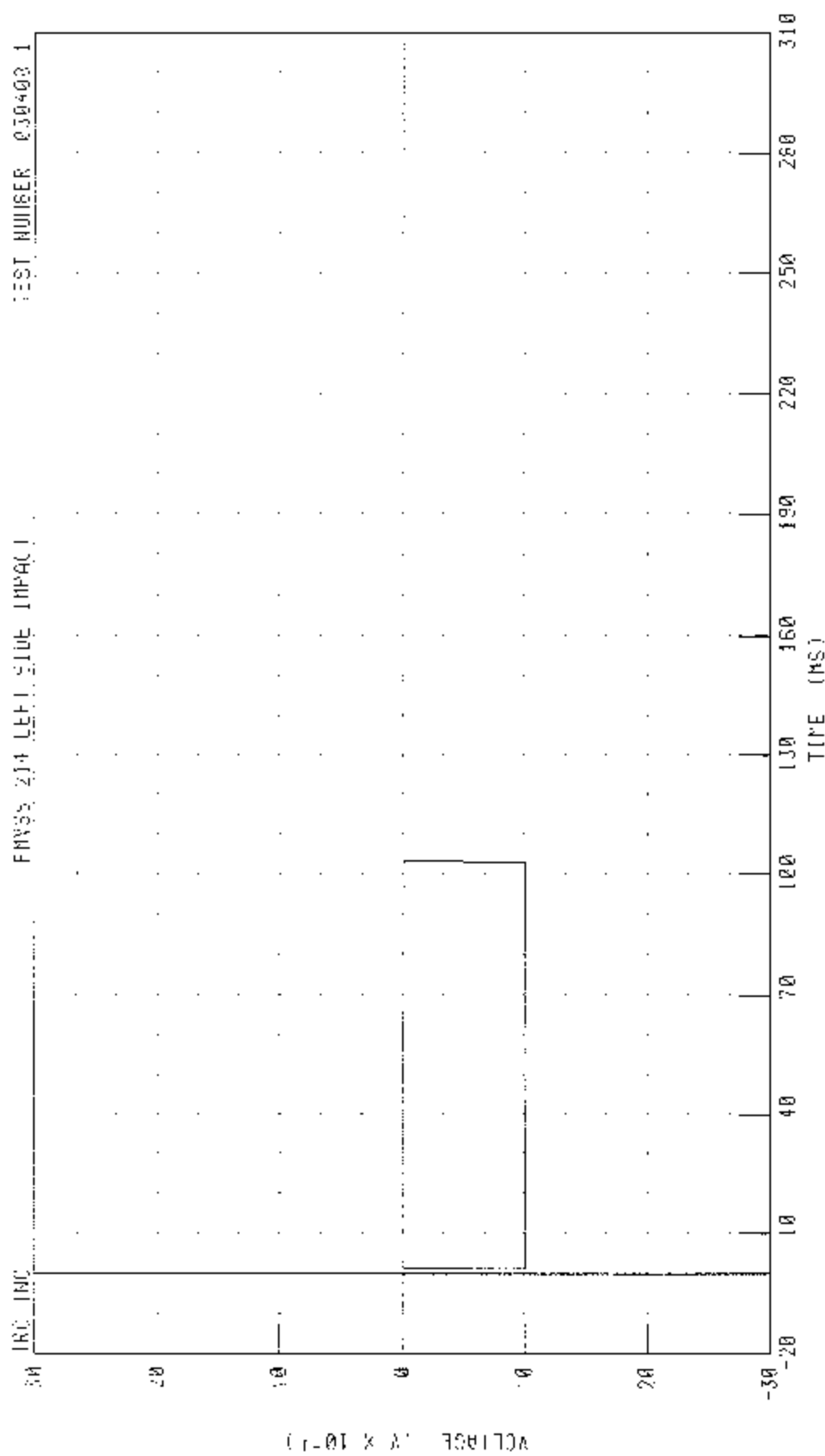
TIME (MS)

PEAK 3010 30.80 KPH 18 40 90 18, 20 73 KPH 2 222 16 MS

55-28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION

100 R15 IT SIDE CONTACT SWITCH

FNVS 214 LEFT SIDE IMPACT TEST NUMBER 030403 1



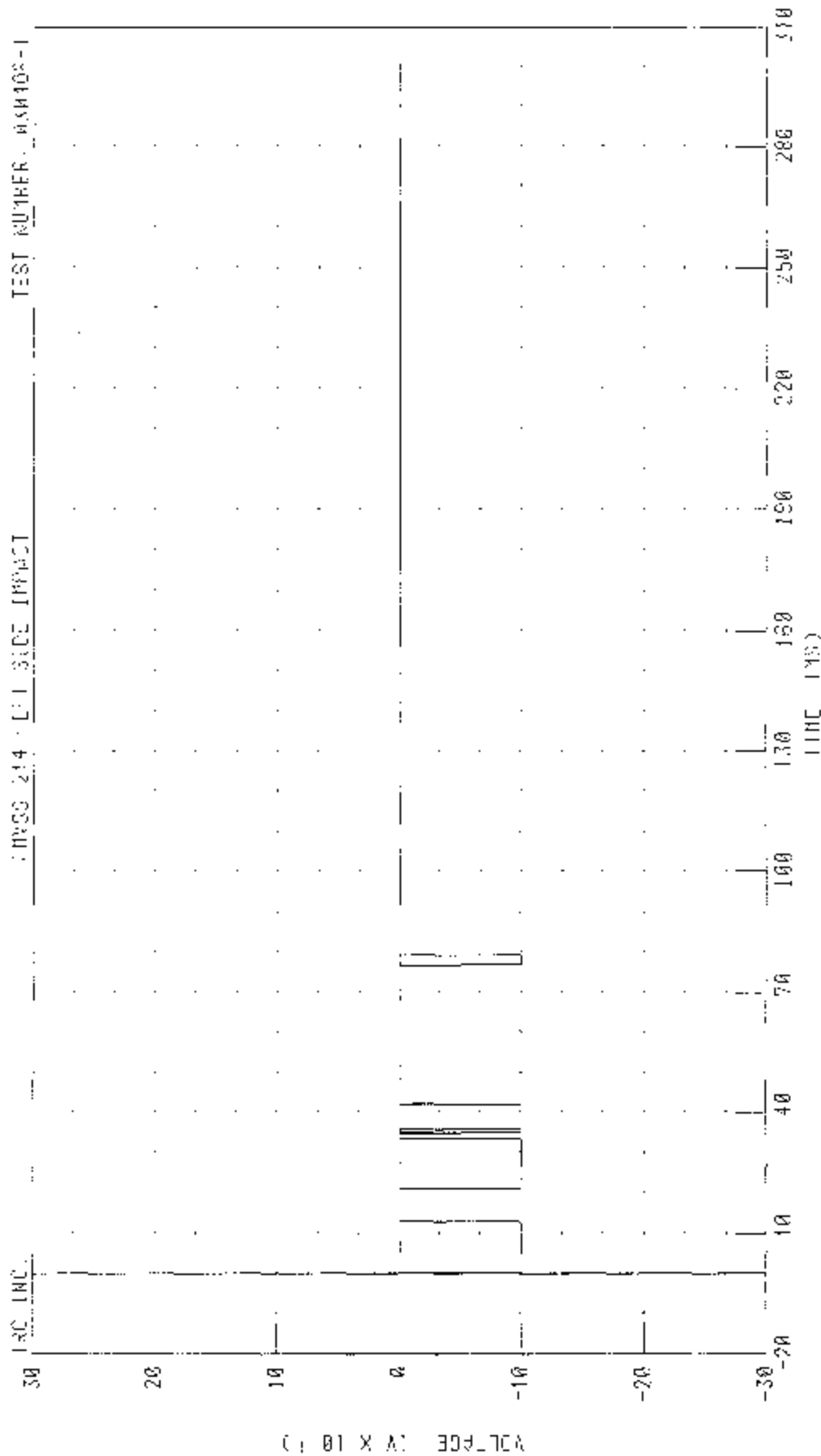
PEAK DATA 0.00 V 0.00 MS; -1.00 V 3.12 MS

CHANNEL NOBR1 FILTER CII CLASS 1000

45/20 4FH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO (FET 51) - OF 2807 SATURN 000

K08 LEFT SIDE CURB/GOAL SWITCH

CROSS 214 LEFT SIDE IMPACT TEST NUMBER: 000408-1



CHANNEL 0001 0.15V CH. GAIN 1000

PEAK DATA 0.00 V @ 210 MS; -1.00 V @ 0.10 MS

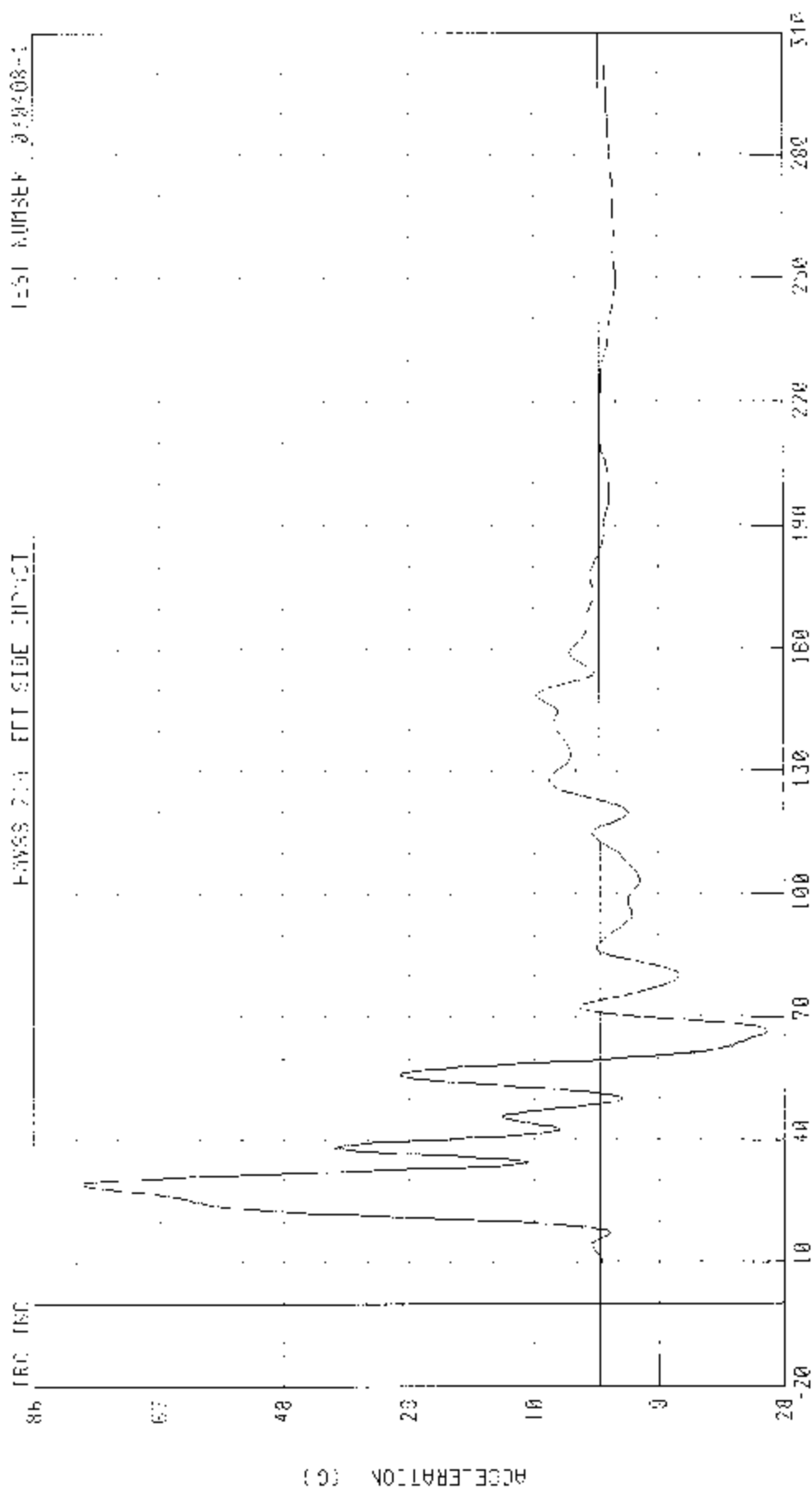
Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered

55.28 4PH 80 DEGREE SIDE IMPACT MOVING DUTY BELT SHOOTER'S INTO THE SIDE OF 2903 GATLING 104

BAIWE9 UPPER RIB 3-6-81S ACCELERATION

TEST NUMBER 049408-1

PHASE 214 FFT SIDE IMPACT



TIME (MS)

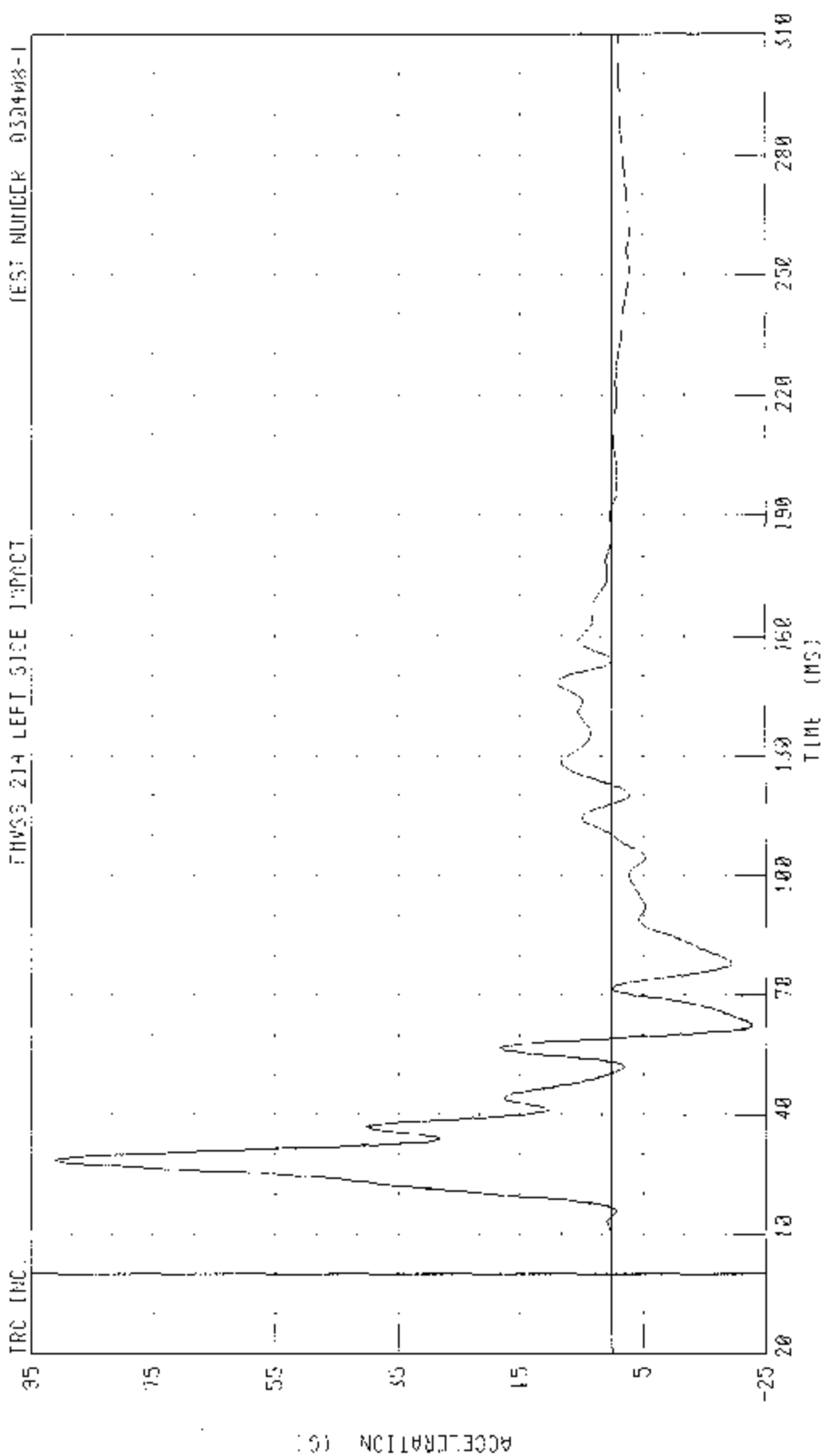
CHANNEL LUEY61 FILTER FIR 100

PEAK DATA 70.53 0 0 29.38 115; -25.46 0 0 25.46

55.28 KPH 50 FRONT SIDE IMPACT (MOVING DEFORMABLE FARTER) INTO THE SIDE OF 2003 SUBURB 100

DRIVER LOWER RIB X-AXIS ACCELERATION

TRC INC. FHV03 214 LEFT SIDE IMPACT TEST NUMBER 030408-1



CHANNEL: LLRVC: FILTER: FIR 100

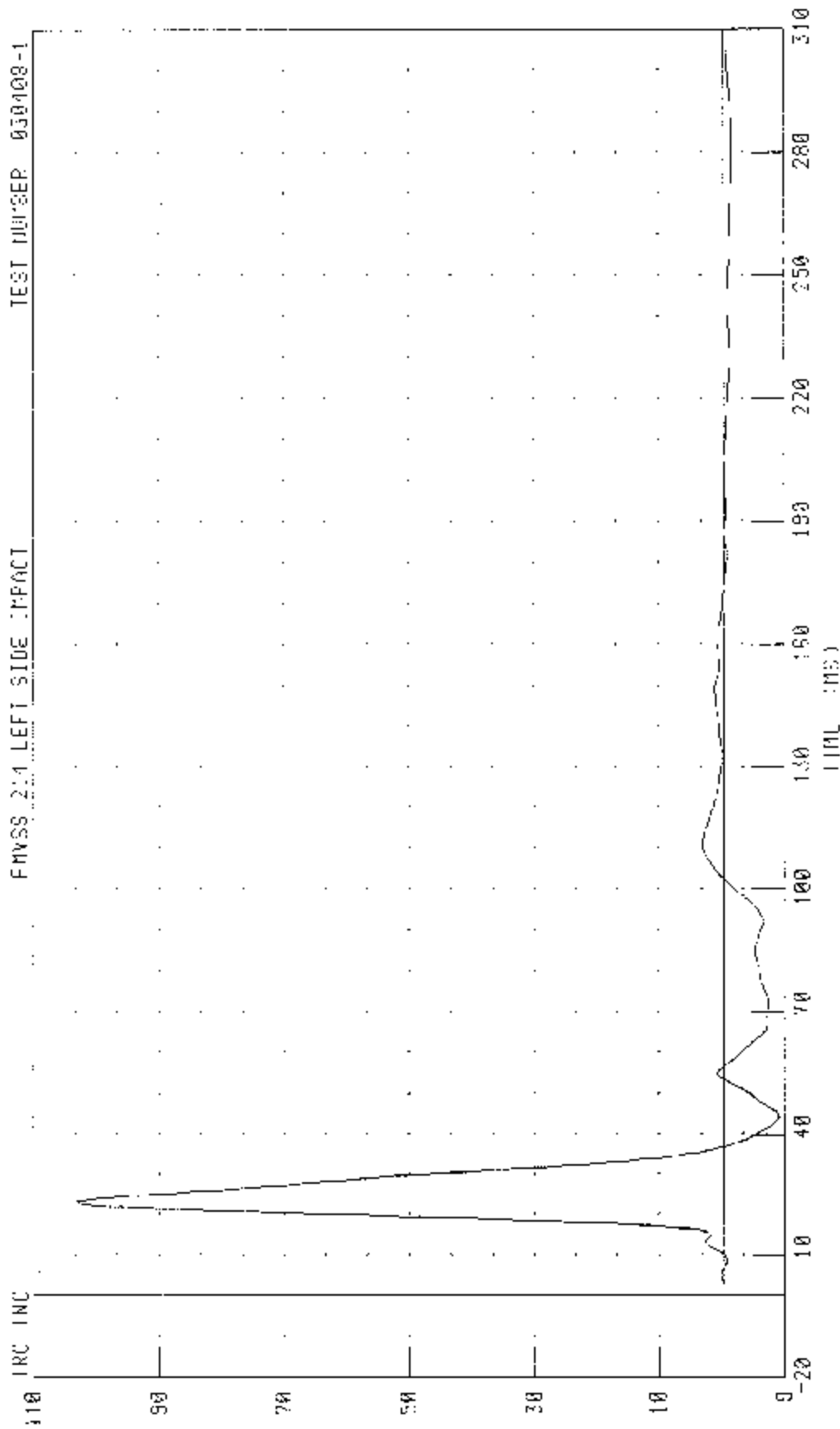
PEAK DATA: 91 36 6 6 28 75 MS, -23 03 0 0 62 50 MS

55/28 KPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2001 SATURN ION

DRIVER PELVIS X-AXIS ACCELERATION

FMVSS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



(C) NO1168373306

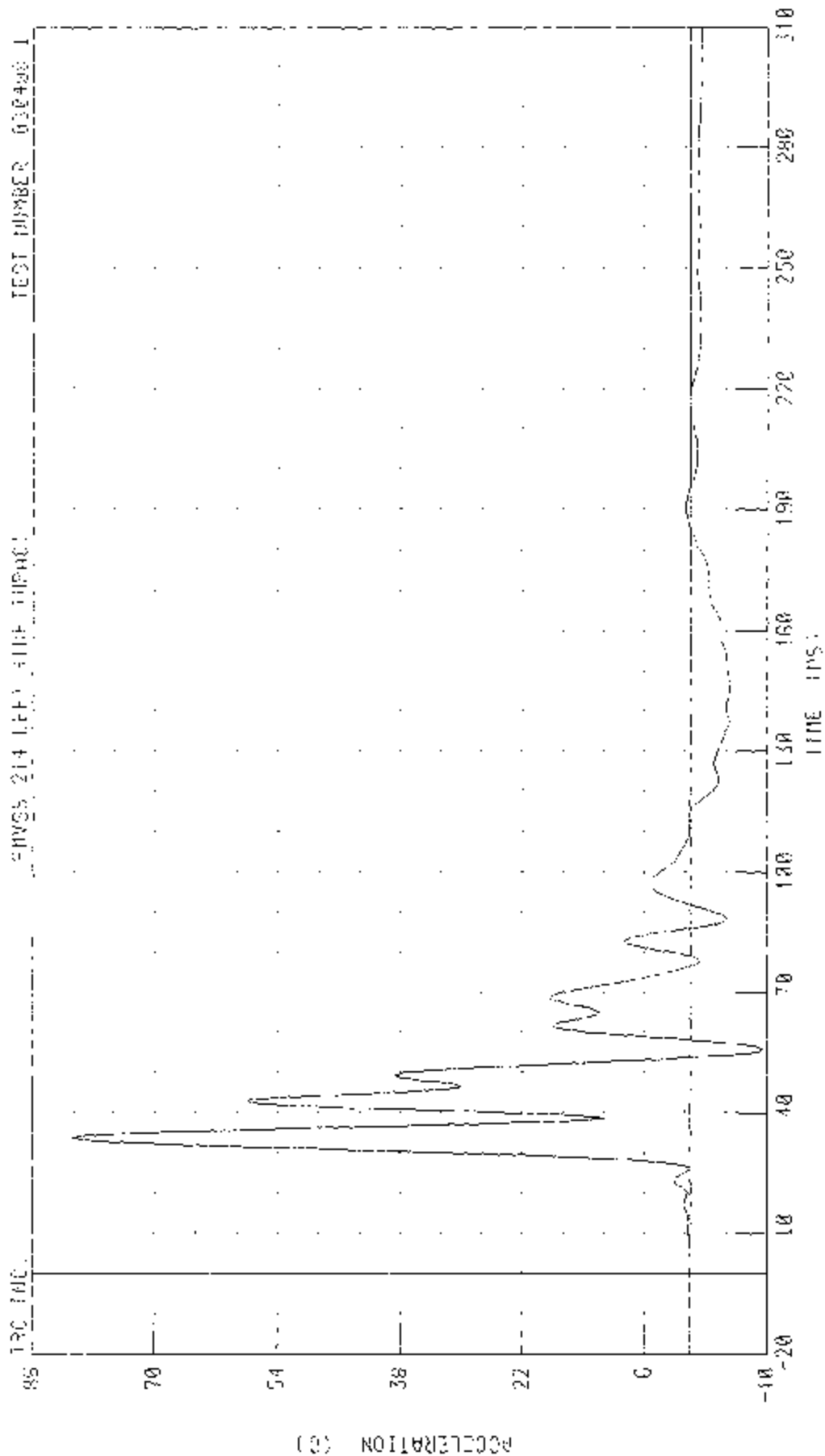
CHANNEL: PEVVC1 FILTER: FIR 100

PEAK DATA: 105.42 G @ 23.13 MS, -8.78 G @ 24.39 MS

55-28 KPH 90 DEGREE 9100 IMPACT MOVING FORWARD SEVERELY INTO LEFT SIDE OF 2003 SATURN 100

LEFT REAR PASSENGER WHEEL R/O Y AXIS ACCELERATION

SNVS 214 LEFT SIDE IMPACT TEST NUMBER 030408-1



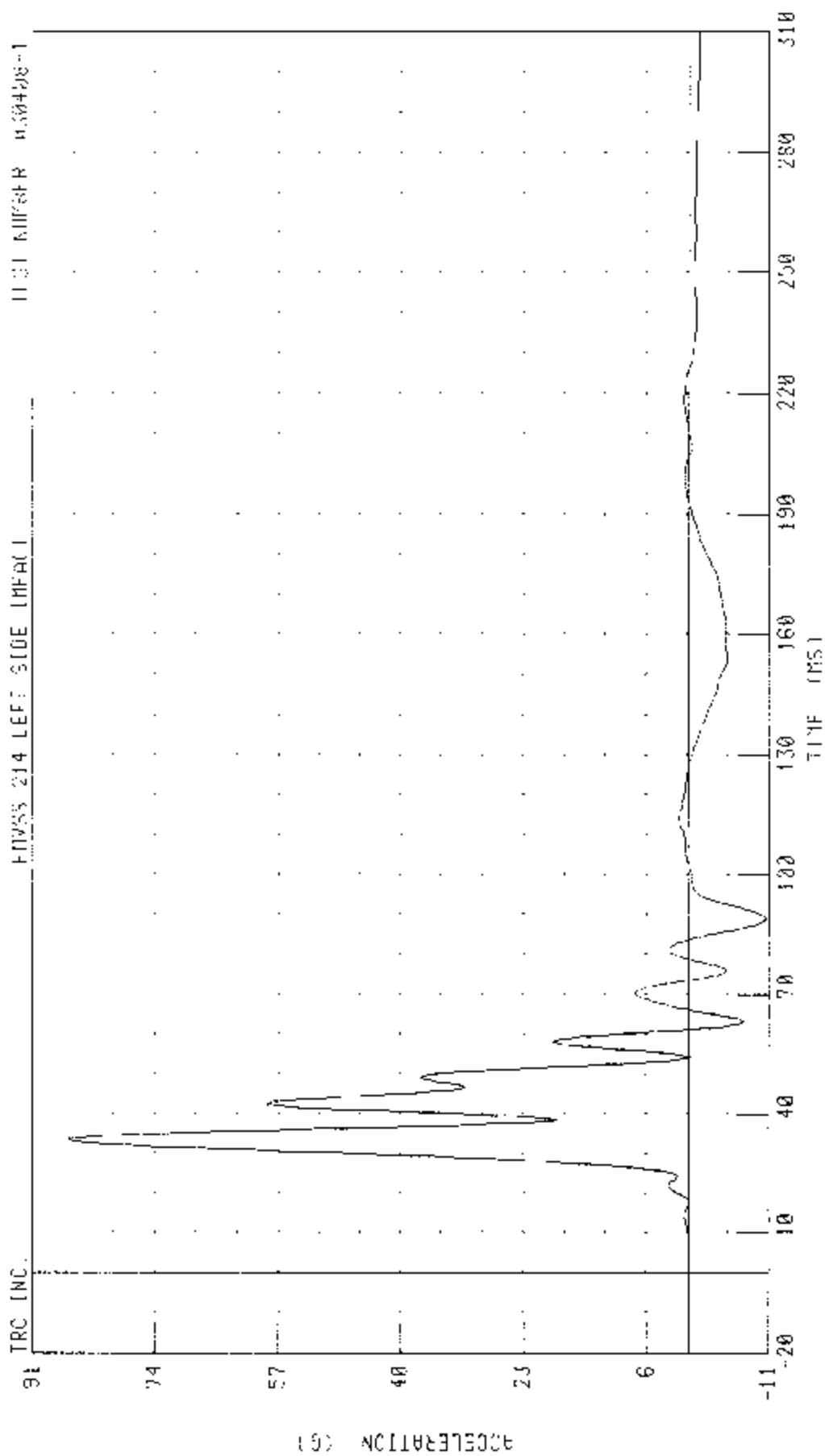
TIME (MS)

CHANNEL: LURYS4 FILTER: FLP 100

PEAK DATA 89.00 5.6 33.75 19.1 -3.16 0.0 55.63 NO

55-28 KPH 90 °FORCE SIDE (PRACT MOVING DEFENSIBLE SUPPLIES) INTO LEFT SIDE OF 2003 SATURN ION

LET-REAR-PAGE-LOWER-RIB-Y-AXIS-ACCELERATION

[illegible]

CITARNEL - L_2Y64 FILE: 118 100

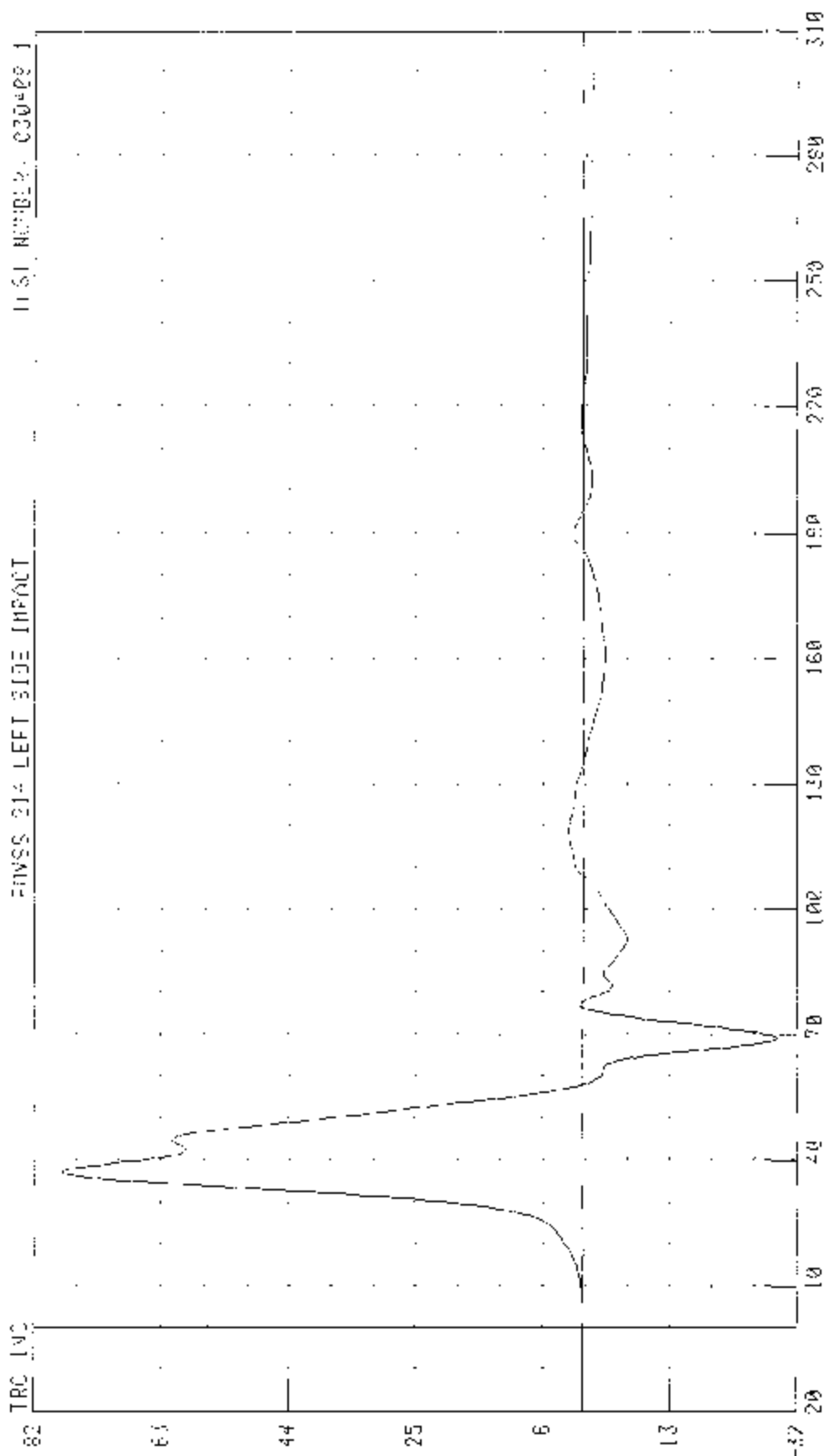
PEAK DATA: 85.98 ; 9.33 75 MS, -10.65 C @ 88.75 MS

55 20 KPH 90 DEGREE SIDE IMPACT MOVING VEHICLE: BARF PK 1110 LEFT SIDE OF ROAD OUTSIDE LCM

FIR FOR PASSENGER OVER SEINF Y-AXIS ACCELERATION

RVSS 214 LEFT SIDE IMPACT

TEST NUMBER: 030408-1



TIME (MS)

CHANNEL T12YC4 FILTER FIR 100

PLK UP 10 77 87 8 8 37 50 15: -28 22 0 3 69 38 19

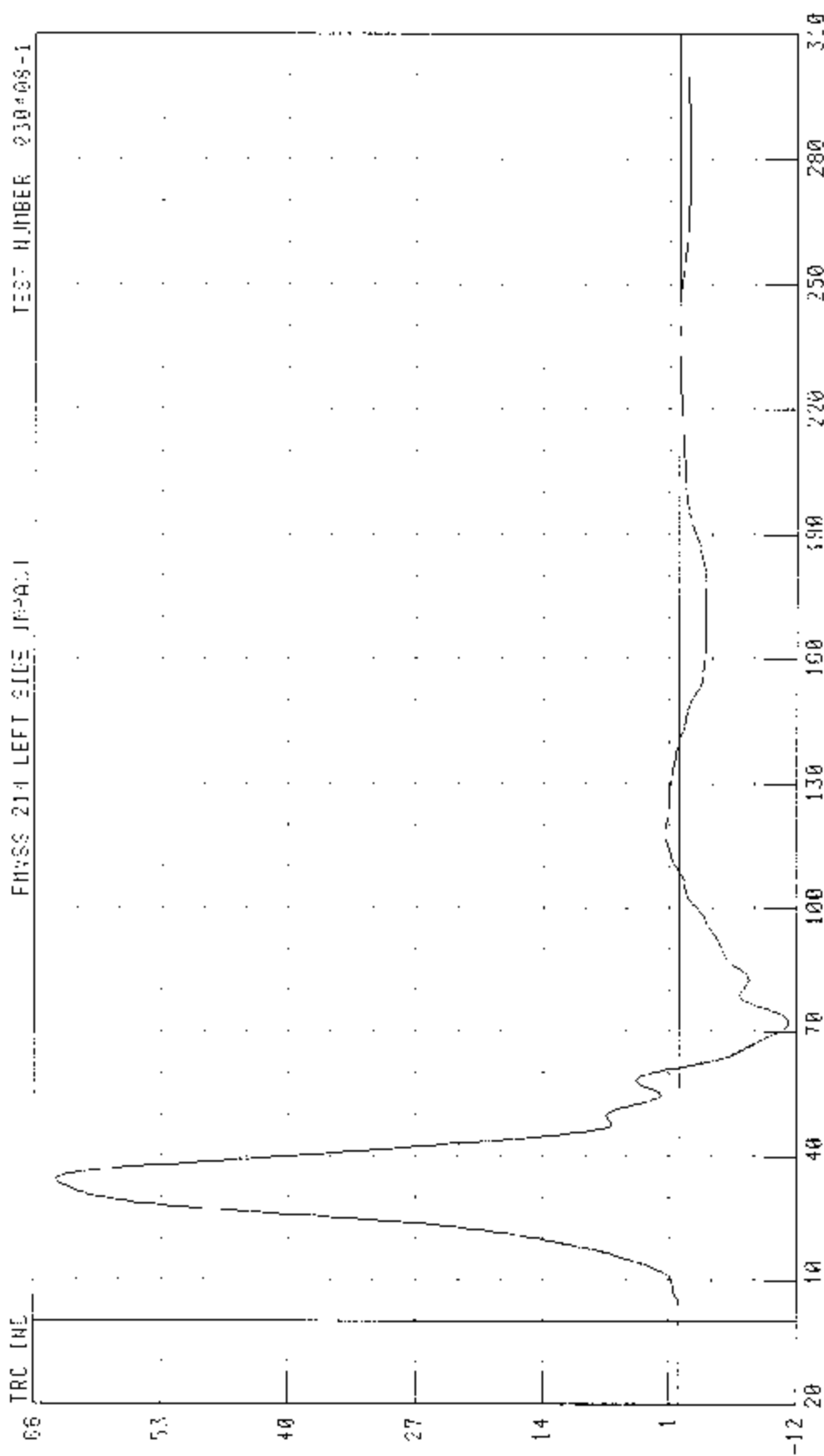
ACCELERATION (G)

55/29 RPM 20 DEGREE SIDE IMPACT (MOVING OFFROAD) MARKED INTO LEFT SIDE OF 2007 SATURN ION

LEFT REAR PASSENGER SEAT VIBRATION

PHYS 214 LEFT SIDE IMPACT

TEST NUMBER 030408-1



CHANNEL: PHYS64 FILTER: FIR 100

TIME (MS)

PEAK DATA: 63.83 G @ 34.38 MS, -11.29 G @ 125.50 MS

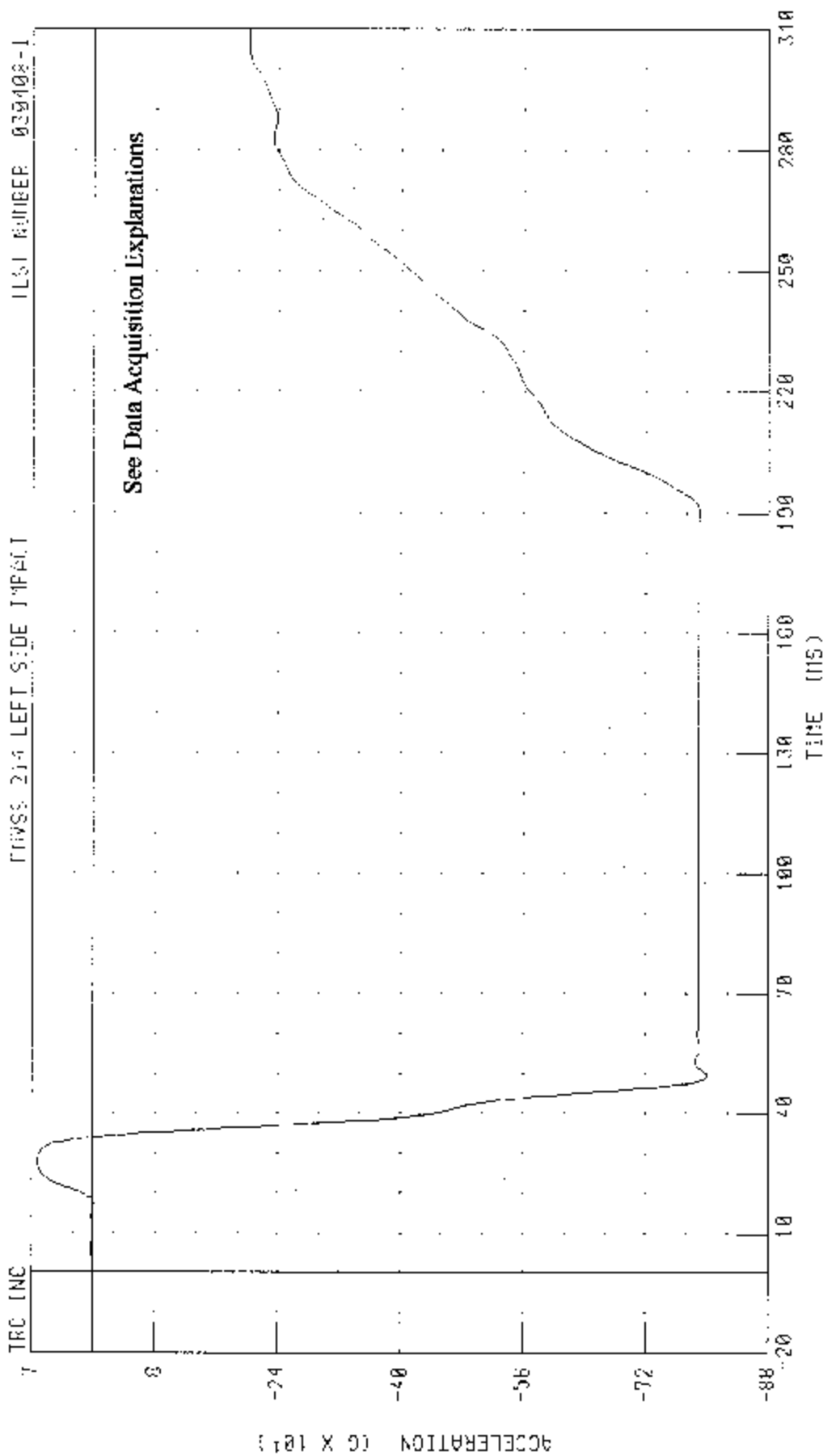
Driver and Passenger Dummy Instrumentation Plots
Acceleration Data - FIR Filtered - Redundant

55/70 MPH 90 DEGREE SIDE IMPACT MOVING UCF ORBARI BARRIER INTO LEFT SIDE OF 2003 CADILLAC 10N

DRIVER UPPER RIF Y-AXIS FORWARD ACCELERATION

TRUSS 214 LEFT SIDE IMPACT

ILSI NUMBER 030408-1



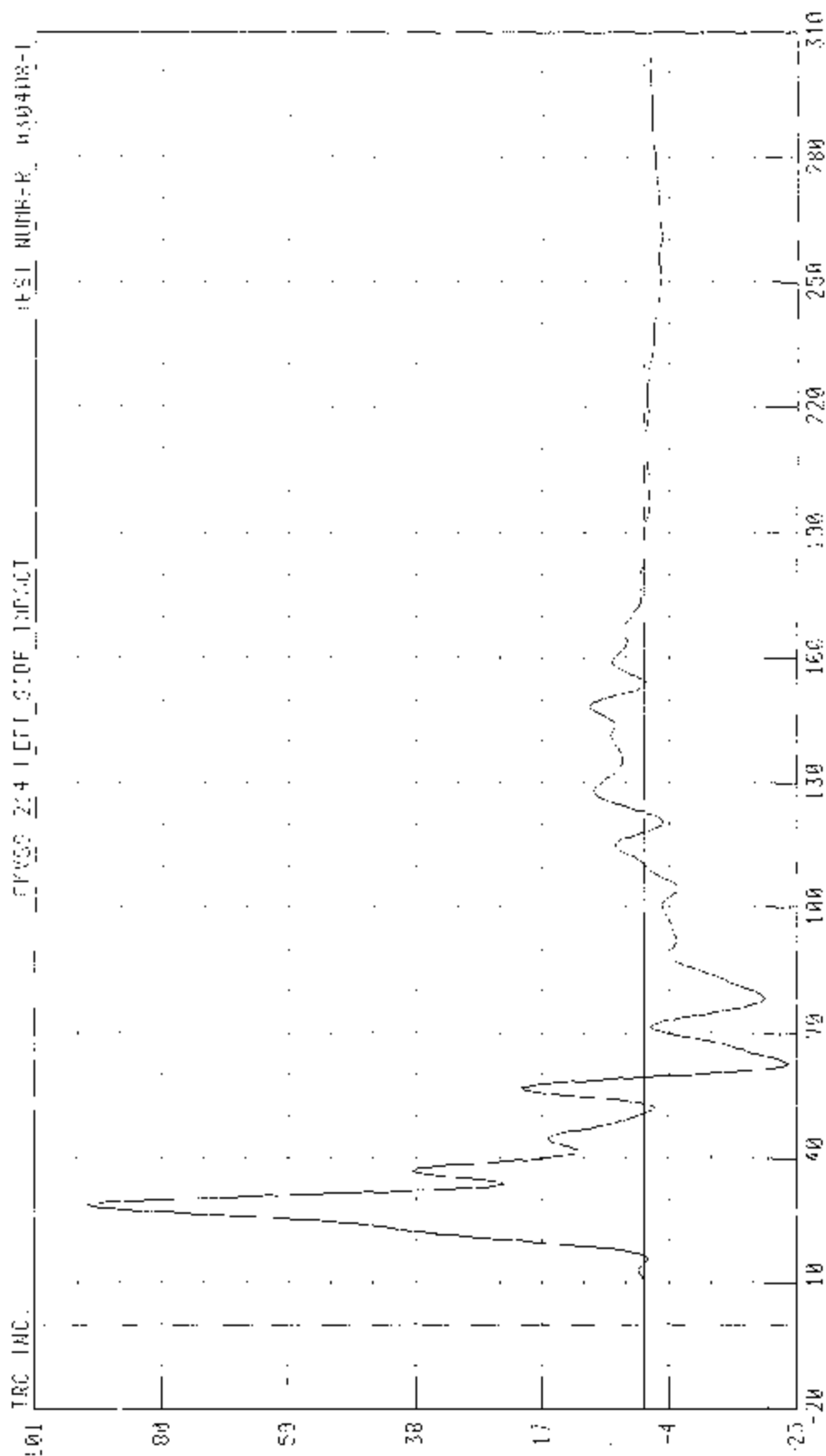
See Data Acquisition Explanations

CHANNEL 1:URYR1 FILTER FIR 100

PEAK DATA 77 18 G @ 28 13 MS; -801 23 G @ 49 37 MS

55/28 MPH 40 DEGREE SIDE IMPACT MOVING DELETABLE BARRIER INTO LEFT SIDE OF 2027 SATURN FOR

DRIVER LOWER RIB X AXIS REDUCED ACCELERATION



CHANNEL LARY81 FILTER F10 100

FLAG DATA 92 55 0 0 28 75 10: -23 59 0 0 62.50 MS

(0) 00119857300H

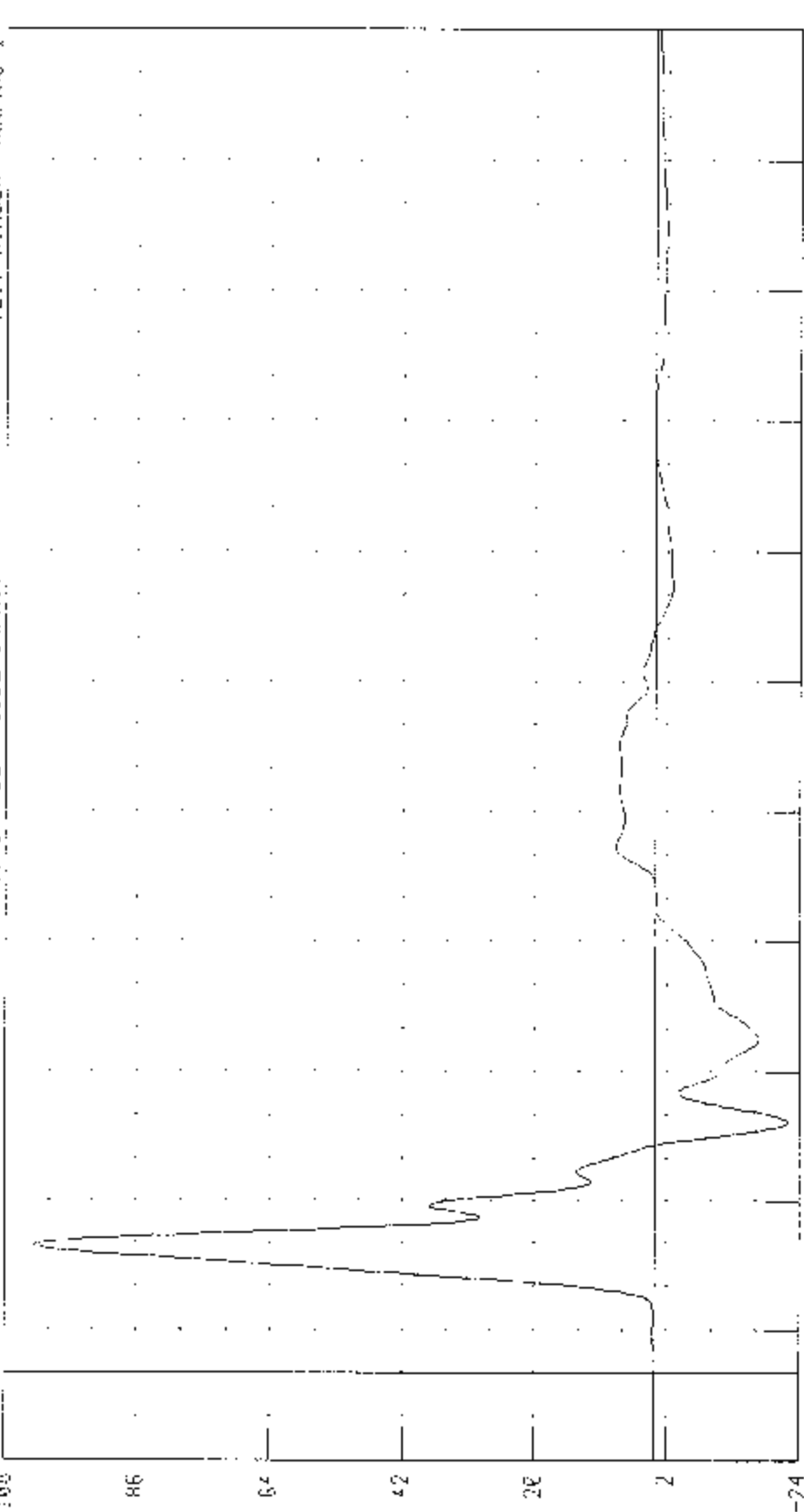
55/28 KPH RA UPRHT SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF JMWAS SOUTH 10N

DRIVER LOWER SPINE Y-AXIS BROADBAND ACCELERATION

180 JNC

HY55 214 LEFT SIDE IMPACT

TEST NUMBER R30408-1



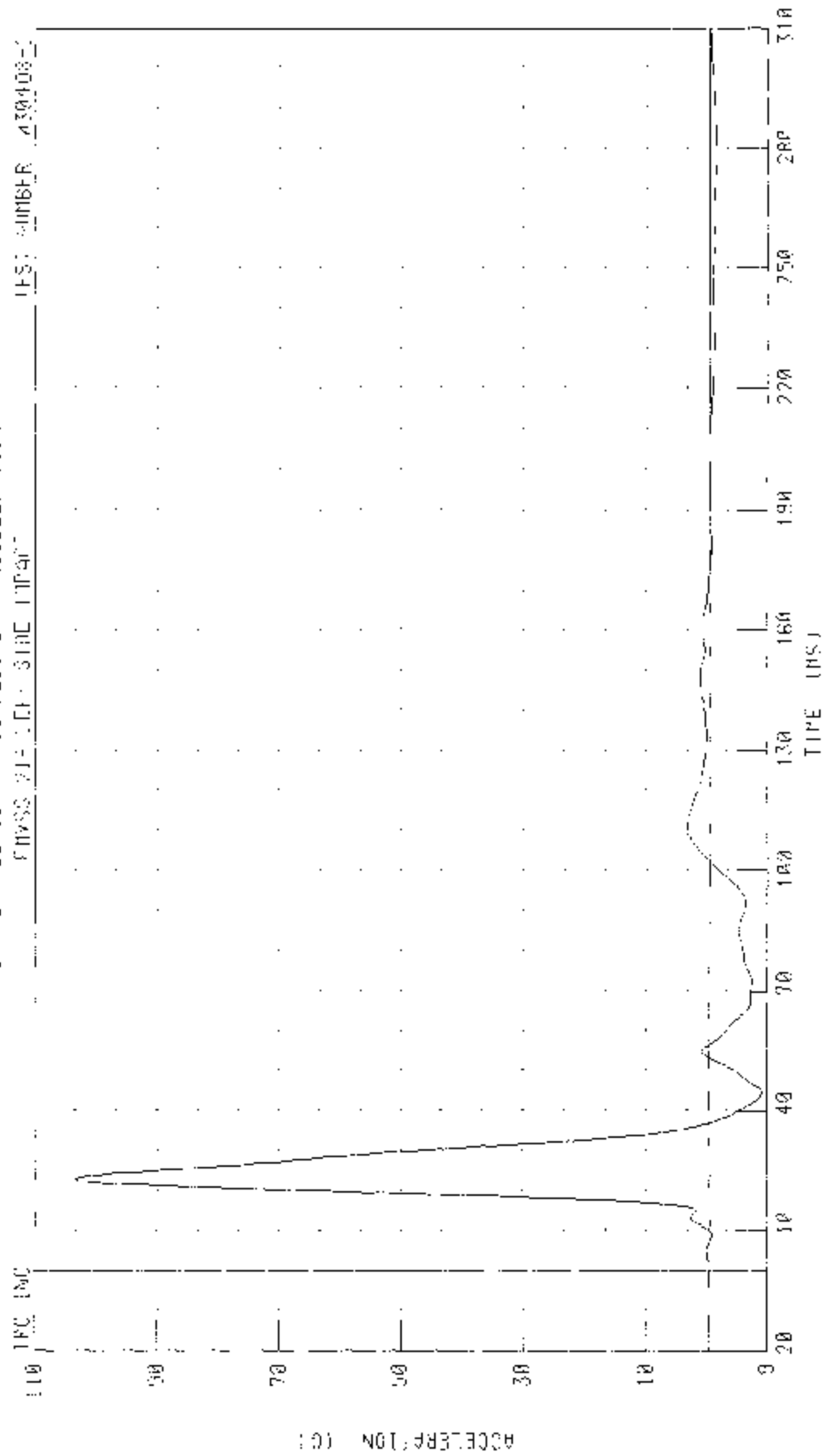
CHANNEL T12YR1 FILTER: FIR 100

TIME (MS)

PEAK DATA 103.21 G @ 29.38 MS; -21.95 G @ 58.75 MS

ACCELERATION (G)

55/200 MPH 90 DEGREE STOP IMPACT MOVING OCCURABLE BARRIER INTO LEFT SIDE OF 2003 BARRIER 100
 DRIVER OCCUPANT 70 IS REBOUNDING ACCELERATION

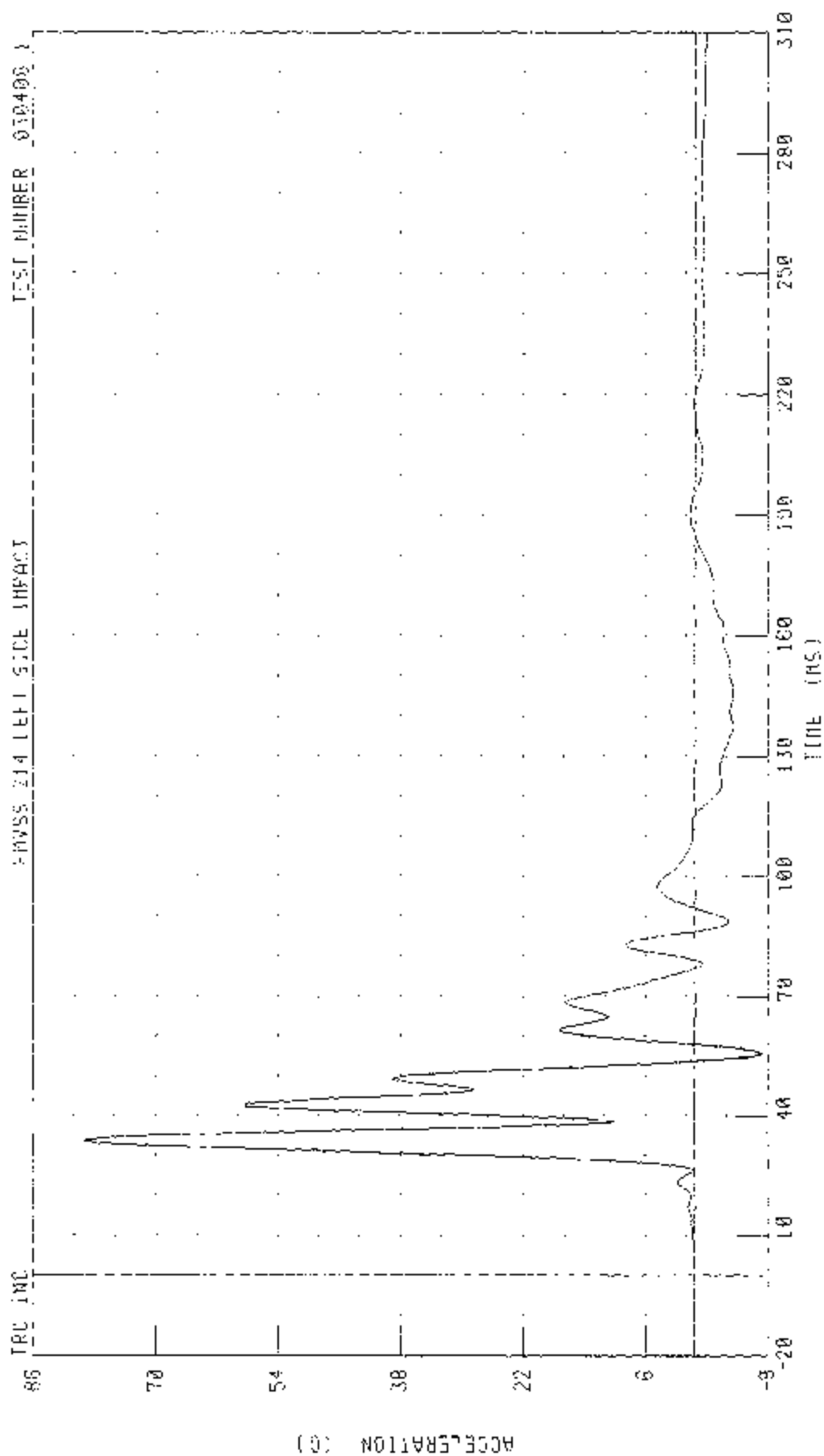


PHASE VII - LEFT SIDE IMPACT TEST NUMBER 430408-1

CHANNEL 1 - FFV83 FILTER FIR 100

PEAK DATA 193.72 G @ 23.13 MS; -8.85 G @ 44.38 MS

55/28 MPH 90 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 2003 SATURN ION
 LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION



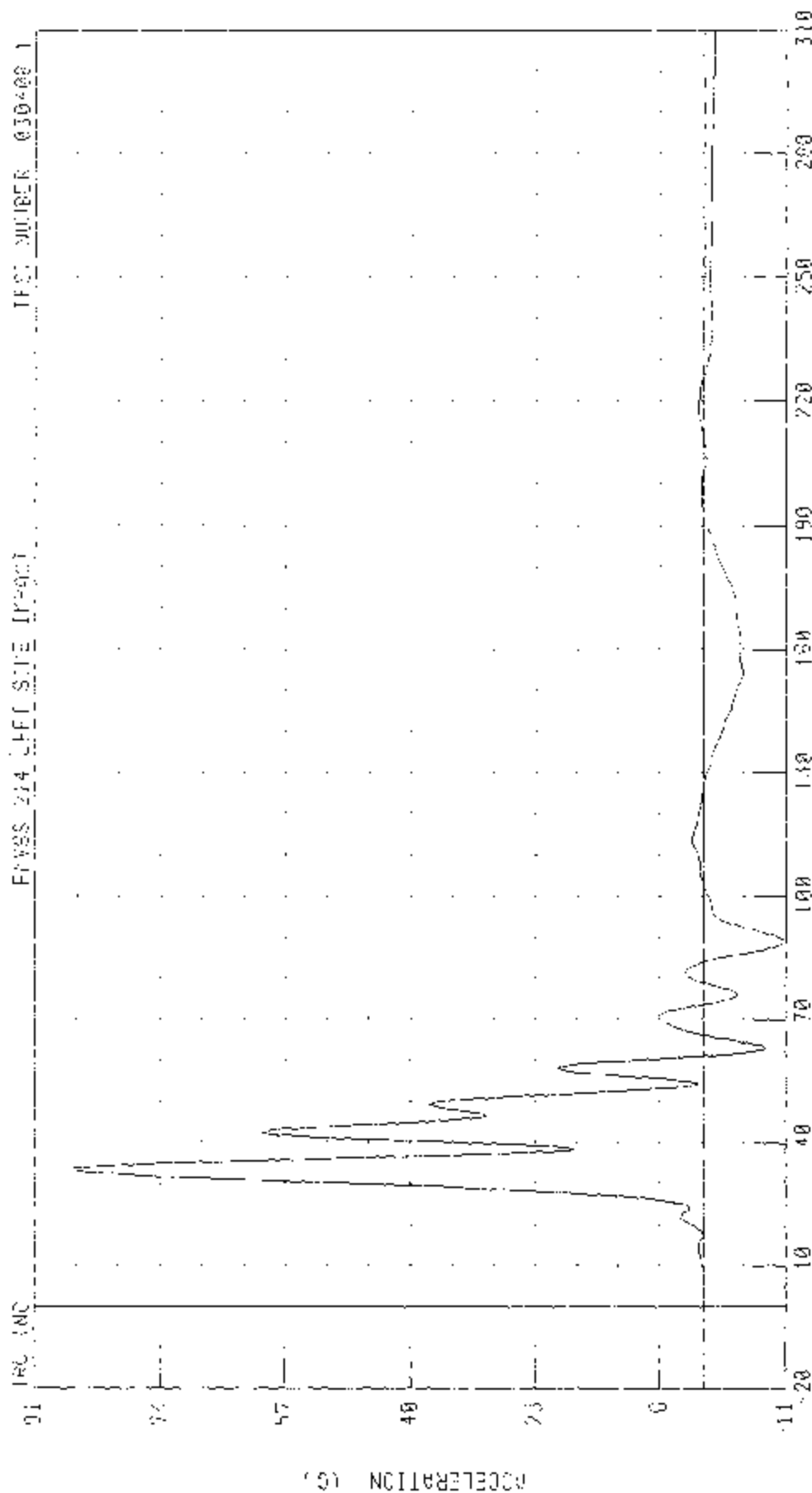
CHANNEL: LUHY84 FILTER: FIR 100

PRY 2010-80 08 08 33 75 NS, -8 61 0 6 55 63 NS

55-20 (PI 90) OBSERVING OCTOBER 10, 1970 17:15:00 OF 2000 540000 100

LEFT REAR PASSENGER LOWER RIE X AXIS REDUNDANT ACCELERATION

PIVOTS 214 LEFT SIDE (P=00) TFC NUMBER 030408-1



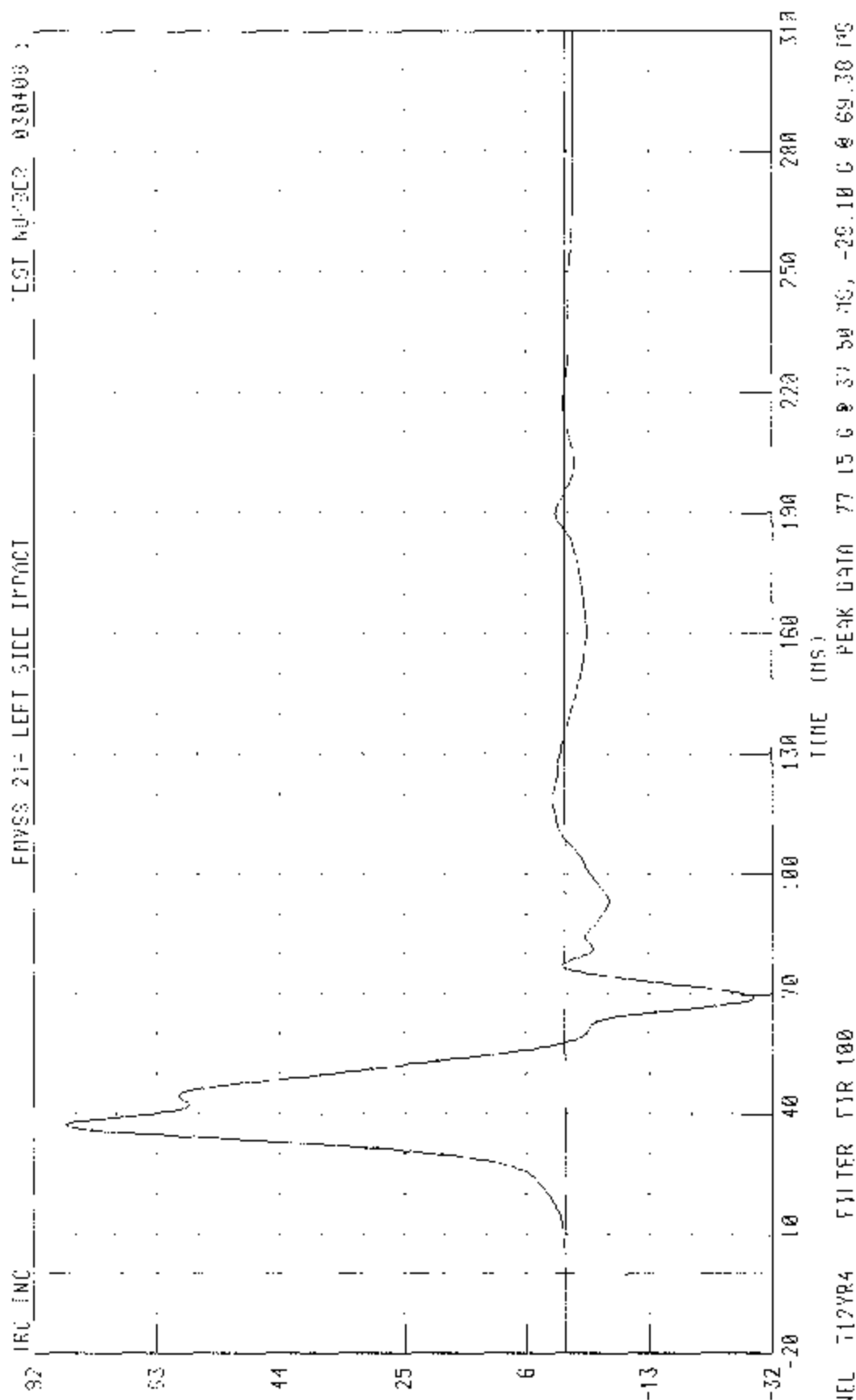
TIME (MS)

CHANNEL: LARRY4 FILTER: FIR 100

PEAK DATA: 85.68 G @ 33.75 MS, -10.69 G @ 33.32 MS

55-20 KPH 00 DEGREE SIDE IMPACT (MOVING DEFORMABLE BARRIER) INTO LEFT SIDE OF 1903 SAJURN 10K

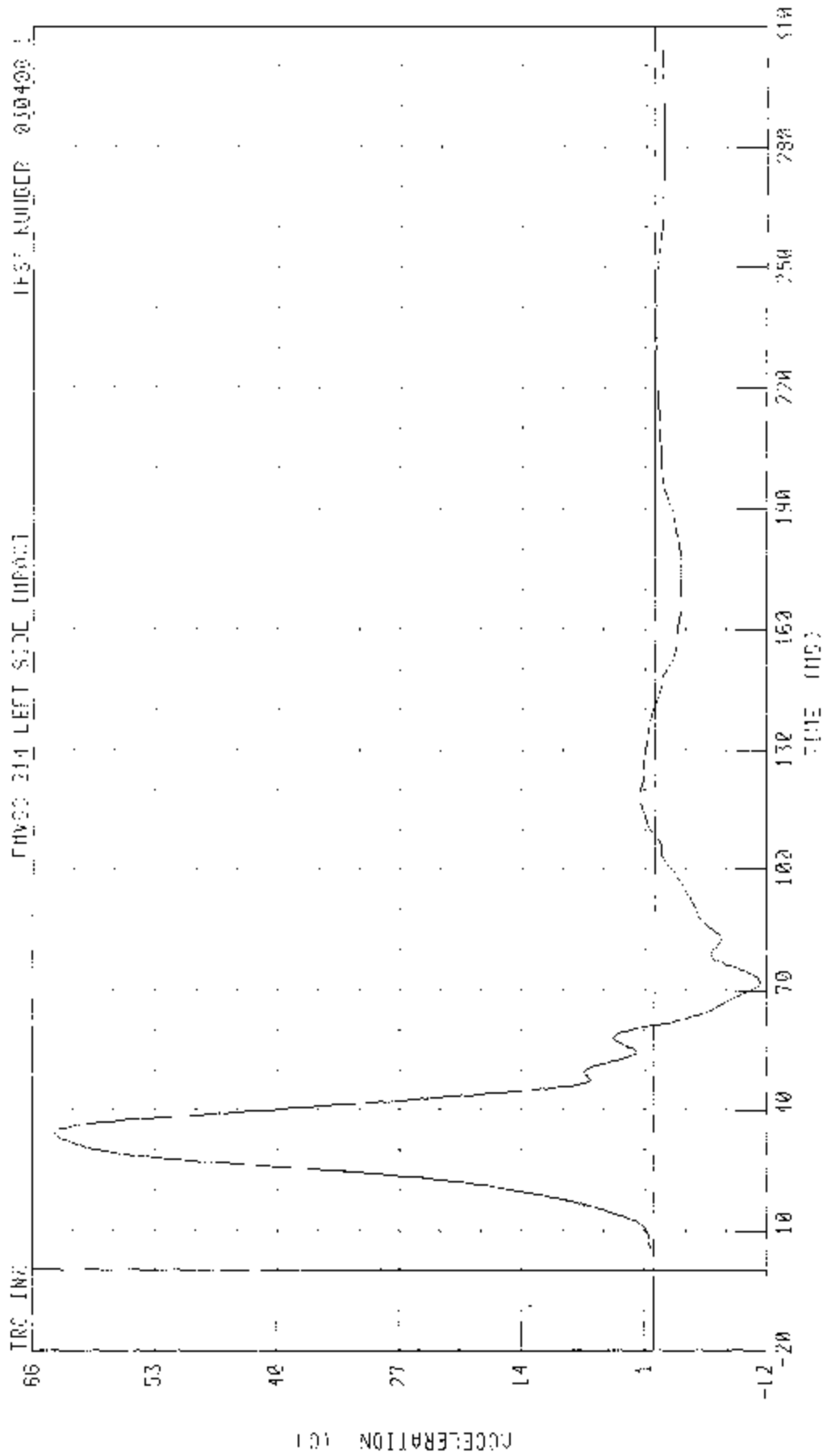
LEFT REAR PASSENGER LOWER SPINE Y AXIS REDUNDANT ACCELERATION



(C) NO110821300H

55.70 MPH @ FLARE 3100 IMPACT 11/10/00 REFORMING BARRELS INTO LEFT SIDE OF 2003 DATUM 10W

LEFT REAR POSITION 3100 VIBS 4-1-15 FOUNDING! ACCELERATION



CHANNEL 1: PEYVIM FILTER: 512 100 PEAK DATA: 03 00 00 34 33 MS, 11 30 00 71 58 MS

Appendix C

SID-HIII Configuration And Performance Verification Data

Summary
SID-HIII Pre-Test And Post-Test Calibration

Configured For Left Side Impact

Date: March 21 – April 14, 2003 TRC Inc. Test Number: 028C03/C04 & 066C06/C07

Laboratory Technician: Jack Willeke, Chris Roberts

Test Parameter	Specification	SID-HIII 028		SID-HIII 066	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH - seated height (mm)	889-909	898	896	901	903
RH - Rib Height (mm)	502-520	506	504	507	508
HP - Hip Pivot Height (mm)	99 ref	99.1	99.1	99.1	99.1
RD - Rib from Back Line (mm)	229-241	235	233	236	237
KJL - Knee Pivot from Back Line (mm)	511-526	513	514	518	519
KV - Knee Pivot to Floor (mm)	490-505	499	498	499	498
HW - Hip Width (mm)	356-391	374	373	387	388
Thorax Impacts					
Temperature (°C)	18.9-25.5	21.7	21.7	21.7	21.7
Relative Humidity (%)	10-70	46	40	44	38
Probe Speed (m/s)	4.27-4.33	4.27	4.30	4.26	4.26
Upper Rib (g's)	37-46	39.2	39.6	40.6	39.9
Lower Rib (g's)	37-46	38.5	39.1	42.9	40.6
Lower Spine (g's)	15-22	17.4	16.4	20.2	18.7
Pelvis Impacts					
Temperature (°C)	18.9-25.5	21.7	21.7	21.7	21.7
Relative Humidity (%)	10-70	46	38	44	38
Probe Speed (m/s)	4.27-4.33	4.28	4.26	4.28	4.26
Pelvis (g's)	40-60	45.5	47.0	53.2	42.6

Calibration Test Results

Pre-Test

SID-HIII: 028

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thorax passed all shock absorber requirements (tested on February 3, 2003, for a previous calibration series).
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.

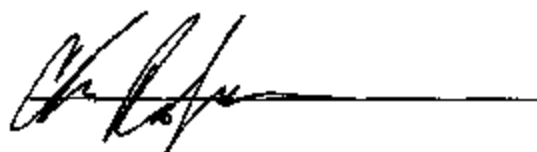
572F SID Dummy

External Dimensions

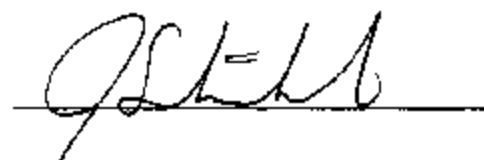
Serial No. 028 Calibration No. 03

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	898 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	506 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	235 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	513 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	499 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	374 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	173 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	172 mm	Yes
Difference Between Top & Bottom Rib Width from CL		≤ 2.5 mm	1.0 mm	Yes

Technician



Approved



TRE

TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDIII SID DUMMY

24-MAR-03

LEFT SIDE CONFIGURATION

TRC INC.

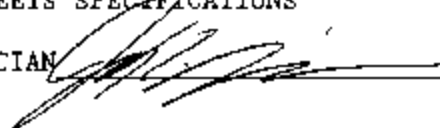
TEST NO. HDL02803

572M SID/HIII SN028 HEAD CAL03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	44.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	147.14 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-7.01 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042103.1026;2

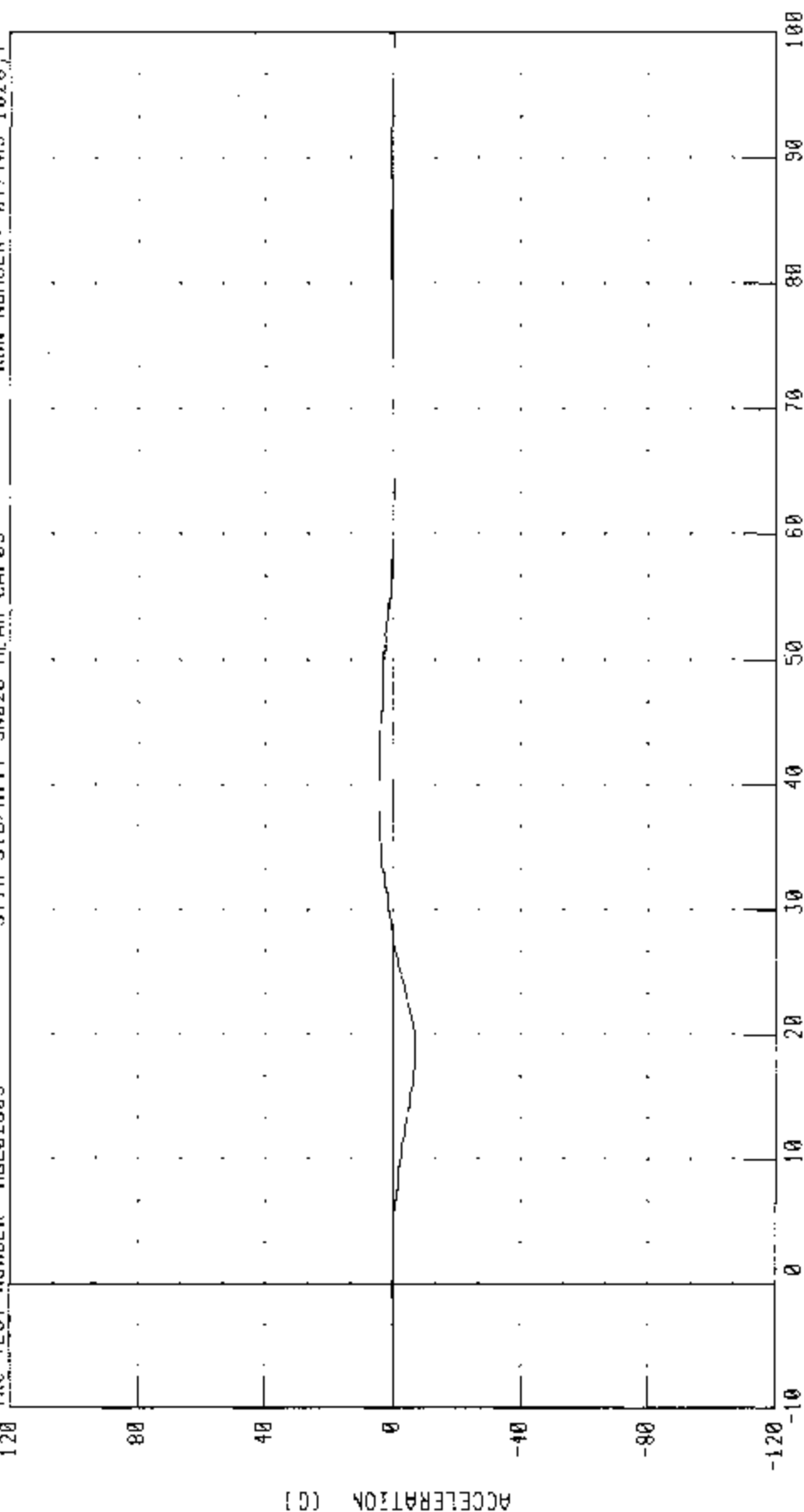
572M 510/H111 DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL02803

572M 510/H111 SN028 HEAD CAL03

RUN NUMBER: 047103 1026.1



CHANNEL: HEDXC FILTER: CH CLASS 1000

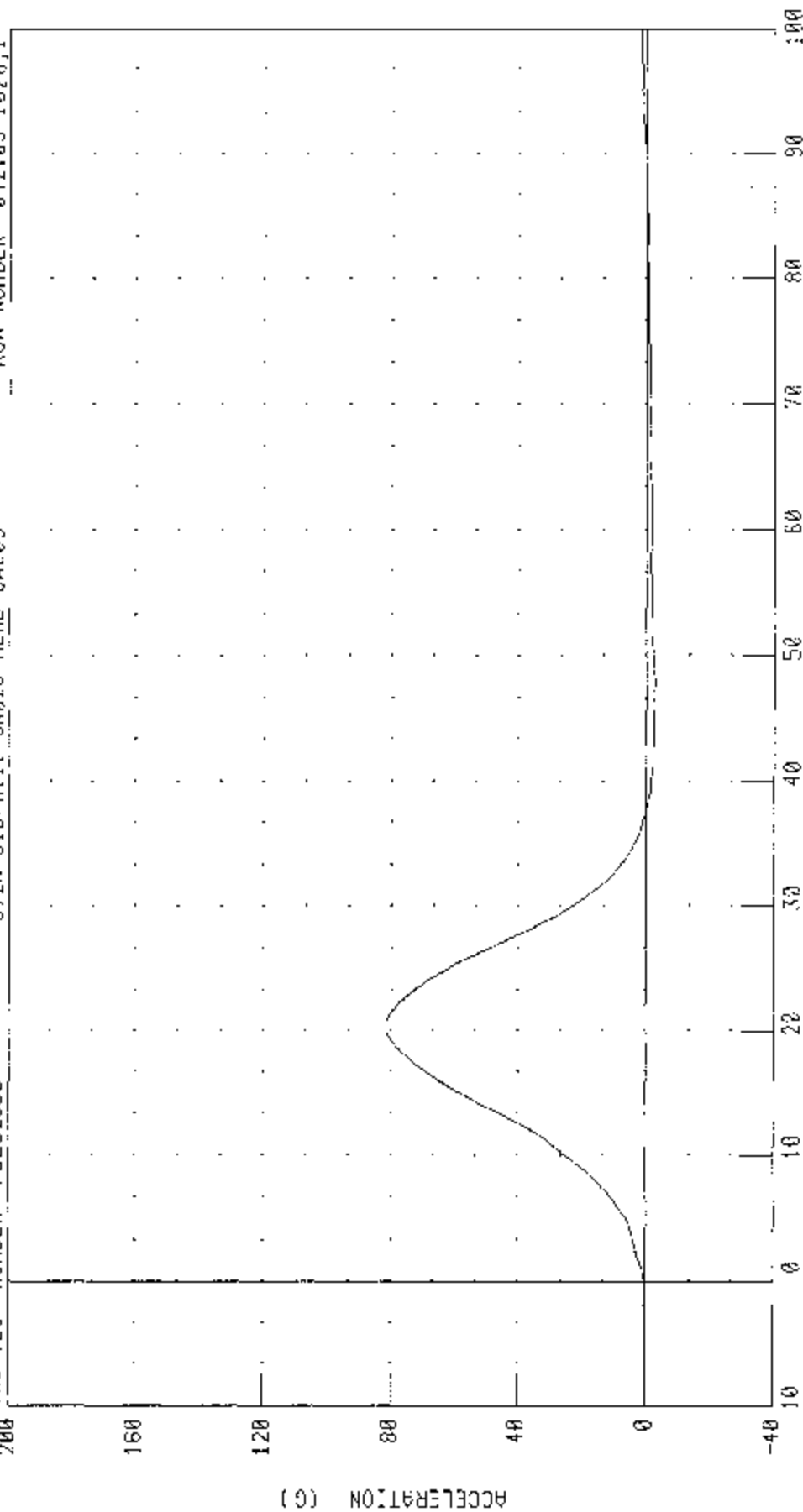
PEAK DATA: 4.39 G @ 4.32 MS, -7.01 G @ 1.84 MS

572N SID/HIII DUMMY CALIBRATION 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: 572N SID/HIII SN028 HEAD CAL03

200 RUN NUMBER: 042103 1026,1



TIME (MS X 10⁻¹¹)

CHANNEL: HEADY

FILTER: GP CLASS 1000

PEAK DATA: 81 49 0 2 00 MS; -2.70 3 0 4.80 MS

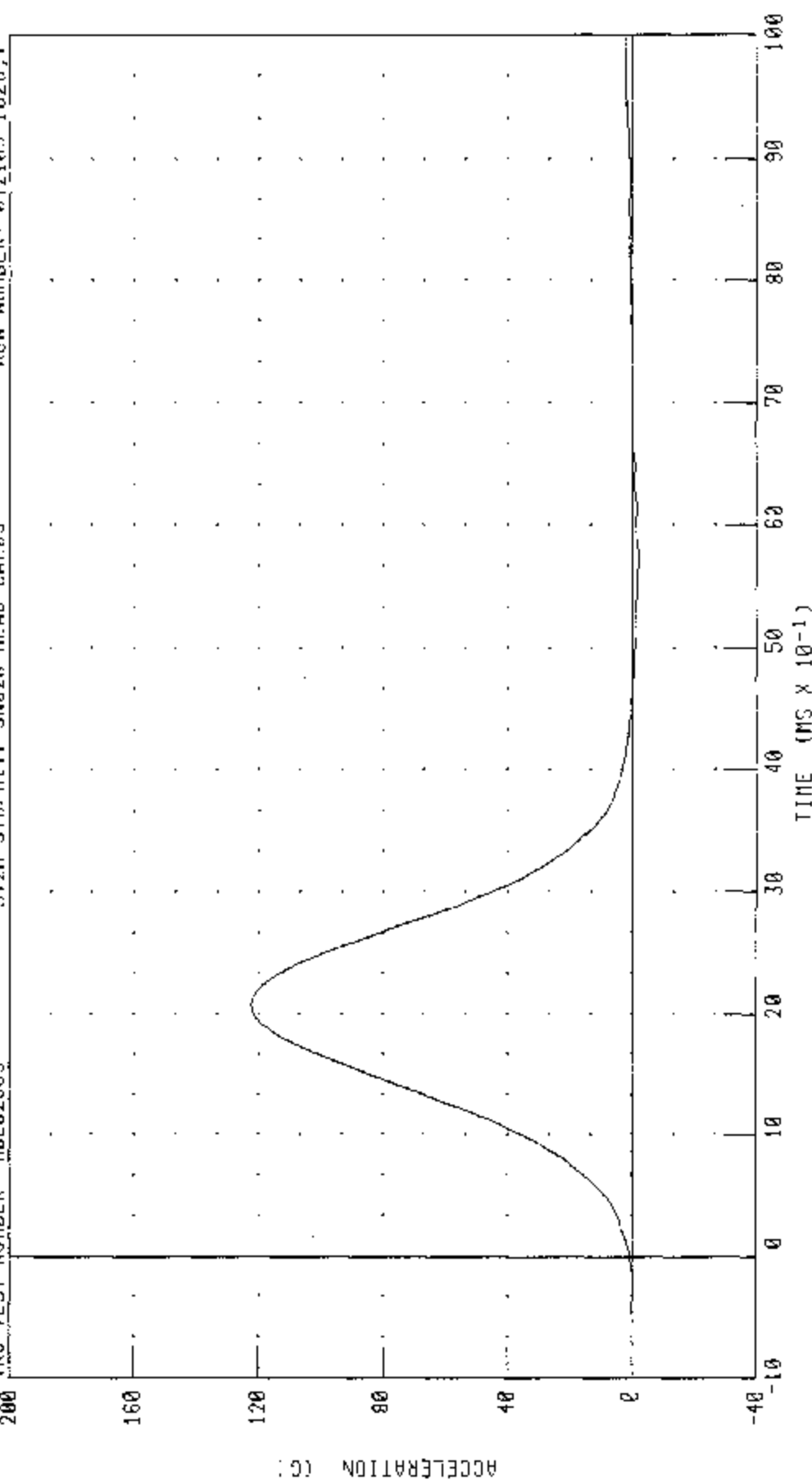
572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HDL02803

572M SID/HILL SN028 HEAD CAL03

RUN NUMBER: 042103 1026,1



CHANNEL: HEDZG FILTER: CIL CLASS 1000

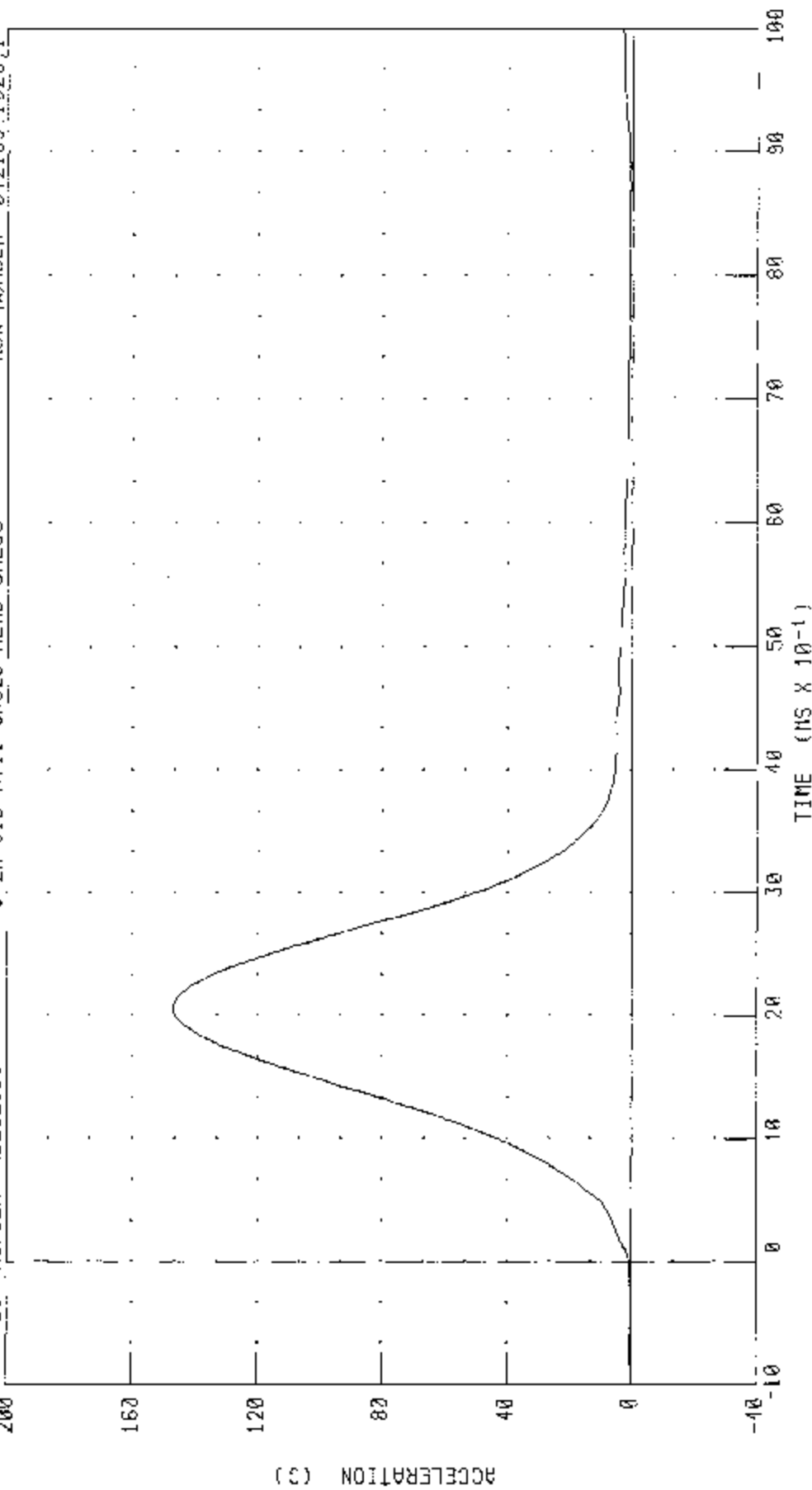
TIME (MS X 10⁻¹)

PEAK DATA: 172 41 6 9 2 08 MS; -2 10 0 0 5 76 MS

572M SID/HIII DUMMY CALIBRATION --- 33 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: JDL02803 572M SID/HIII 0N020 HEAD CAL03 RUN NUMBER: 042103 1026.1



CHANNEL HEORC FILTER CH CLASS 1000

PEAK DATA: 147.14 G @ 2.08 NS, 0.03 G @ -0.40 NS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDI III SID DUMMY

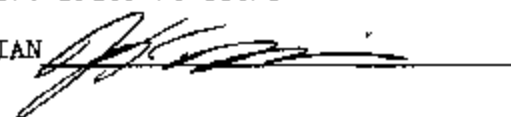
25-MAR-03

LEFT SIDE CONFIGURATION

TRC INC. TEST NO. NFL02803 572M SID/HIII SN028 NECK LEFT CAL03

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY		10 - 70 %	43.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.32 M/S
	20 MS	4.12 - 5.10 M/S	4.55 M/S
	30 MS	5.73 - 7.01 M/S	6.43 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.16 - 7.29 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	69.00 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	59.20 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	83.15 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	52.56 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	9.04 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042103.1008;1

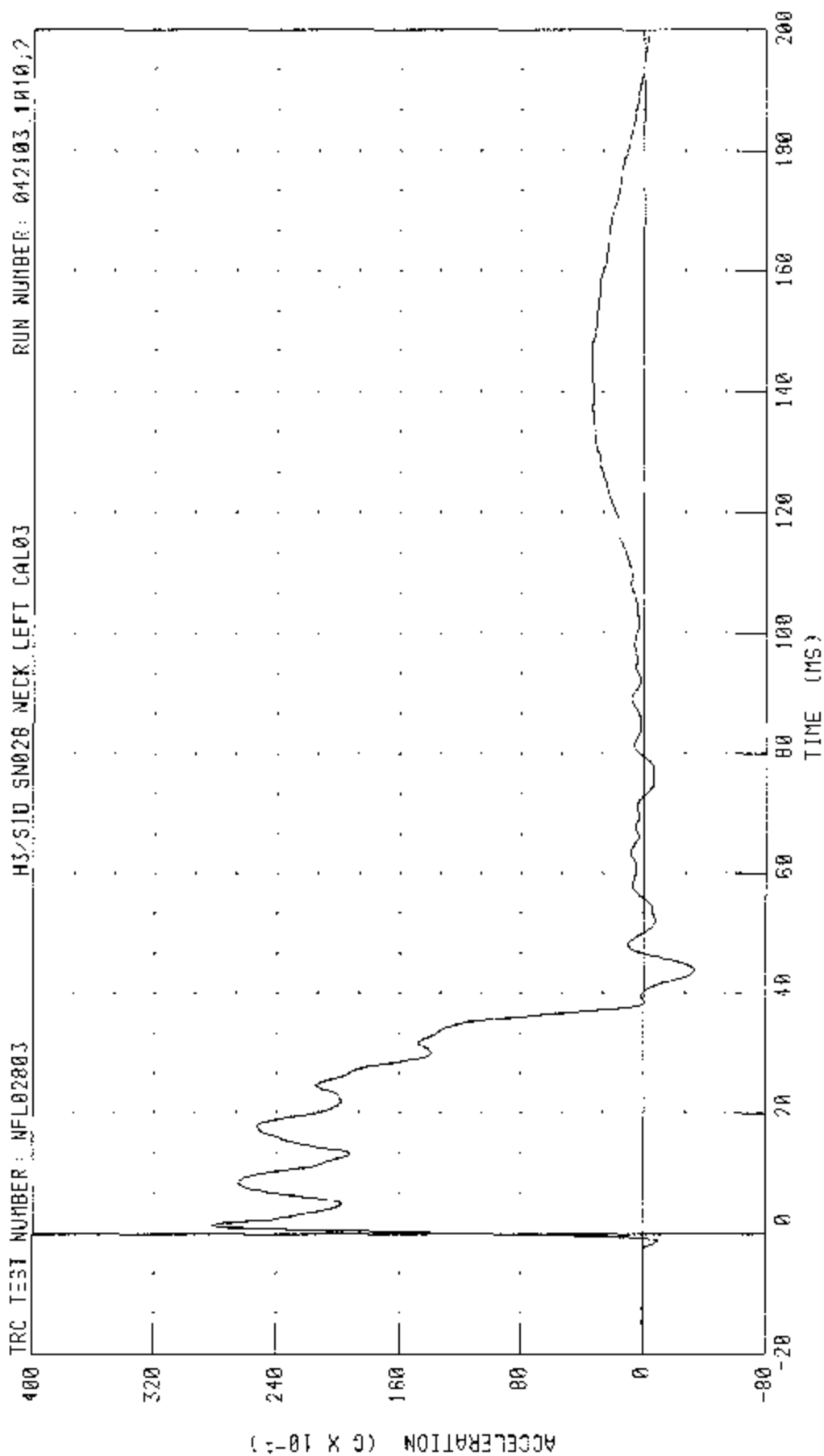
572M S10/H111 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

TRC TEST NUMBER: NFL02803

H3/S10 SN028 NECK LEFT CAL03

RUN NUMBER: 042103.1H10.2



CHANNEL PENXG FILTER: CII. CLASS 180

PEAK ENTH 20.13 G @ 1.44 MS, -3.29 G @ 14.00 MS

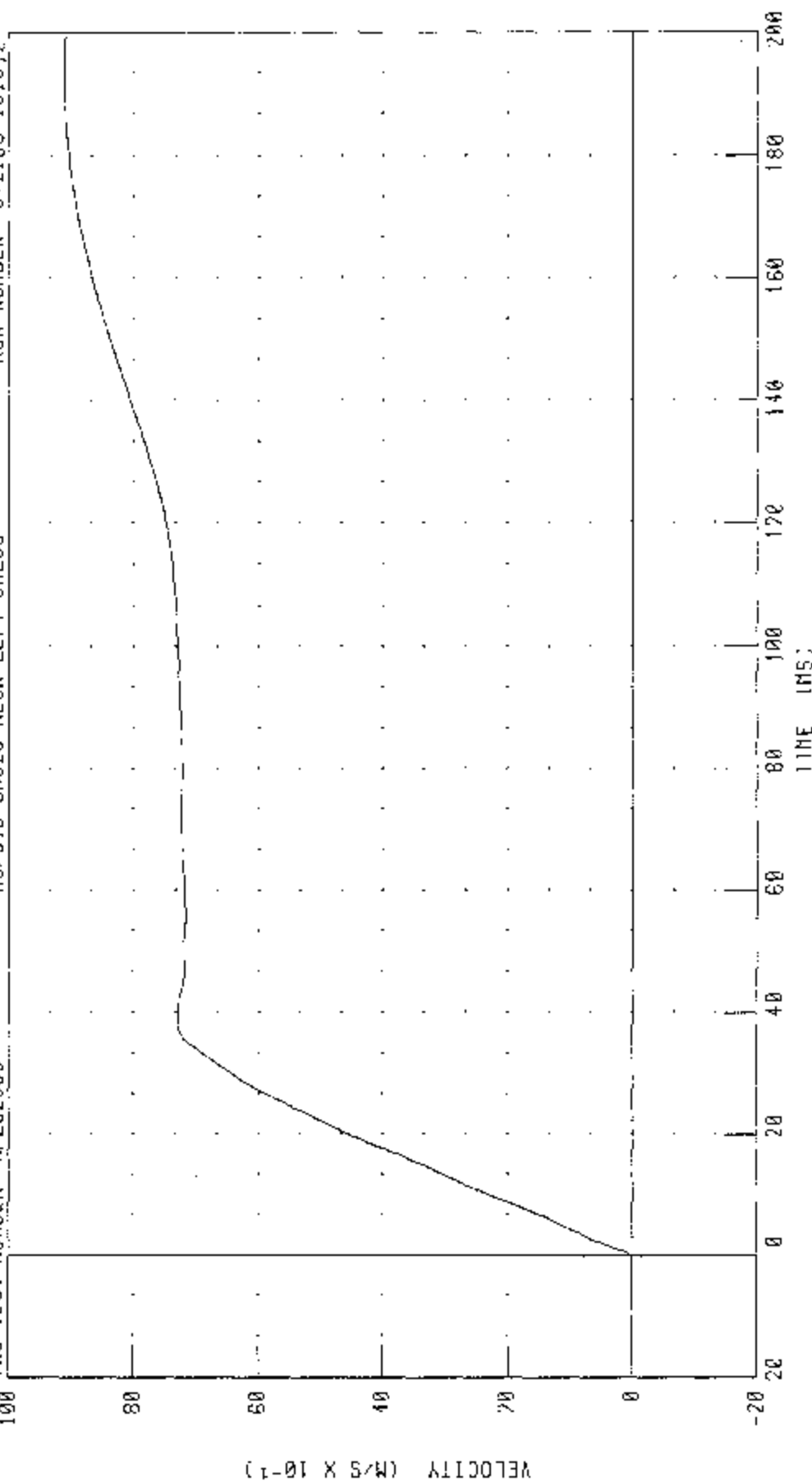
572N SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENNUM VELOCITY

TRC TEST NUMBER: NFL02803

H3/SID SN028 NECK LEFT CAL03

RUN NUMBER 042103 1010;2



CHANNEL: PENXVI FILTER: CH. CLASS 180

PEAK DATA: 9.11 N/S @ 193.44 MS, -0.01 N/S @ 0.72 MS

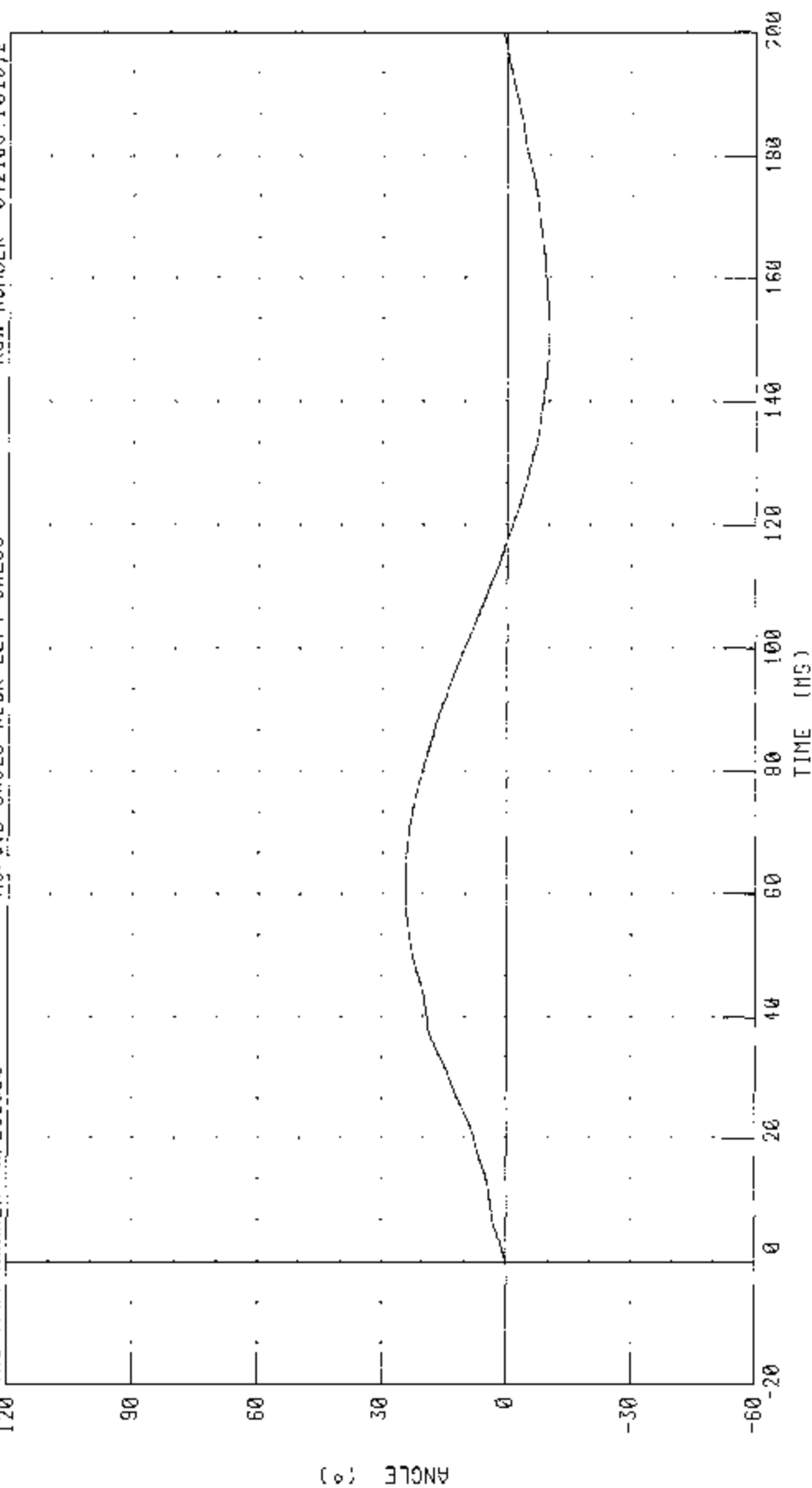
572H SID/INITIAL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: WFL02803

H3/SID SN028 NECK LEFT CAL03

RUN NUMBER: 042103.1010.2



PEAK DATA: 24.39 ° @ 61.30 MS, 9.04 ° @ 150.00 MS

CHANNEL BETH FILTER: CH CLASS 60

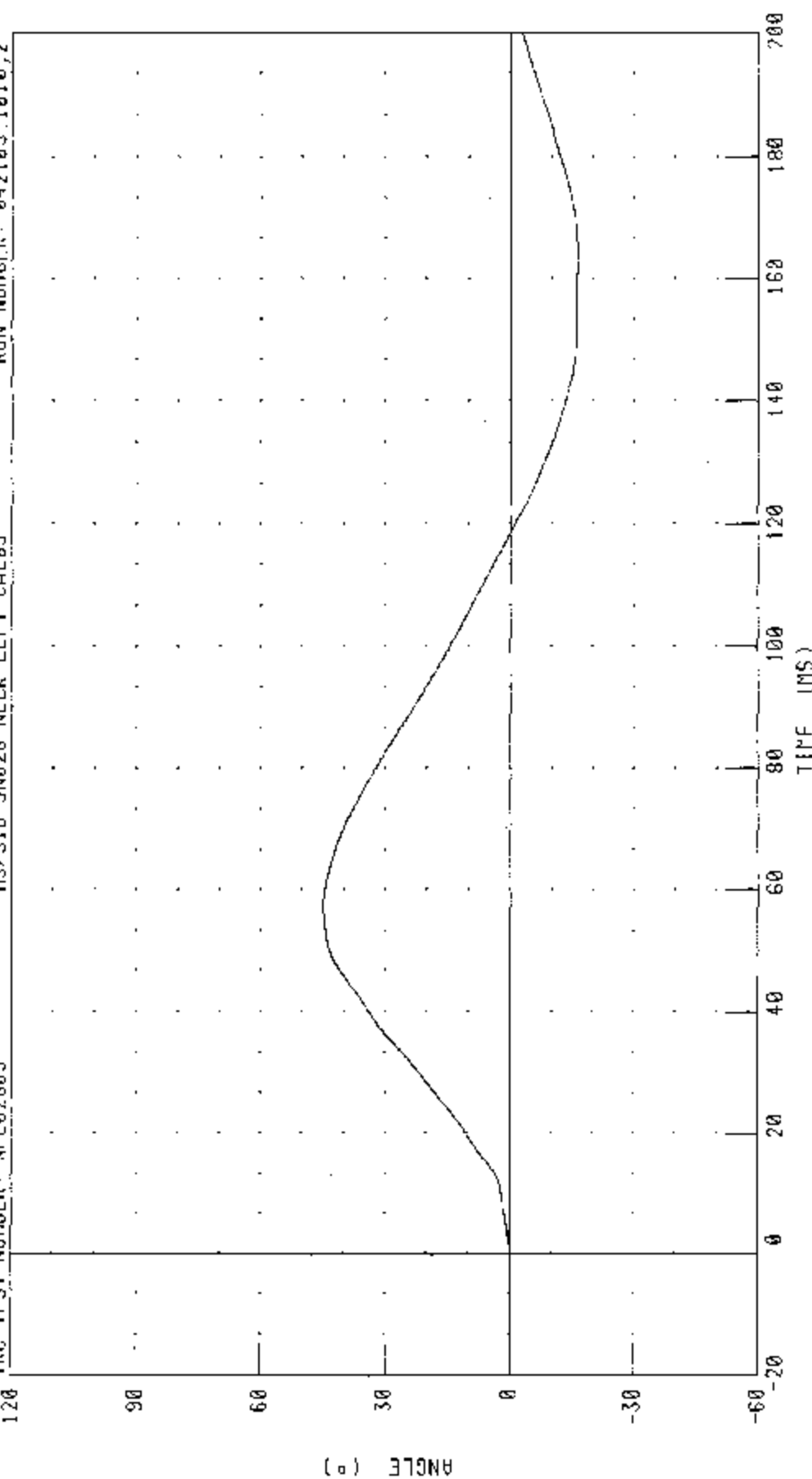
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL02803

W3/SID SN028 NECK LEFT CAL03

RUN NUMBER: 042103.1010;2



TIME (MS)

CHANNEL: THETA FILTER: CH. CLASS 60

PEAK DATA: 44.79 ° @ 57.44 MS; -16.22 ° @ 164.88 MS

ANGLE (°)

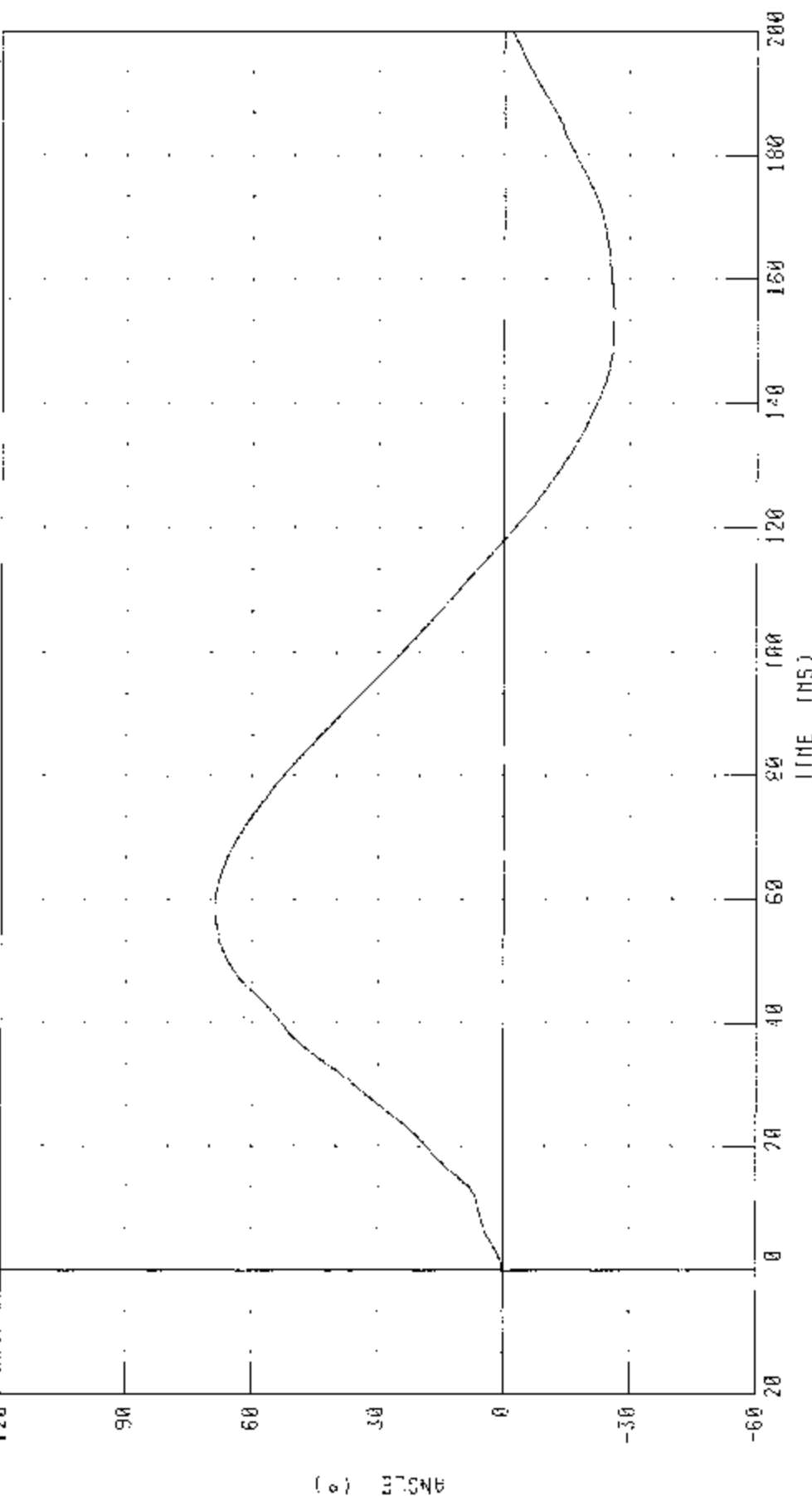
572M SID-11111 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL02803

113/SID SN028 NECK LEFT CAL03

RUN NUMBER 042103.1010,2



CHANNEL 1010V 1111F3 CH CLASS 00

PEAK DATA: 63.00 ° @ 58.80 MS; -26.30 ° @ 171.60 MS

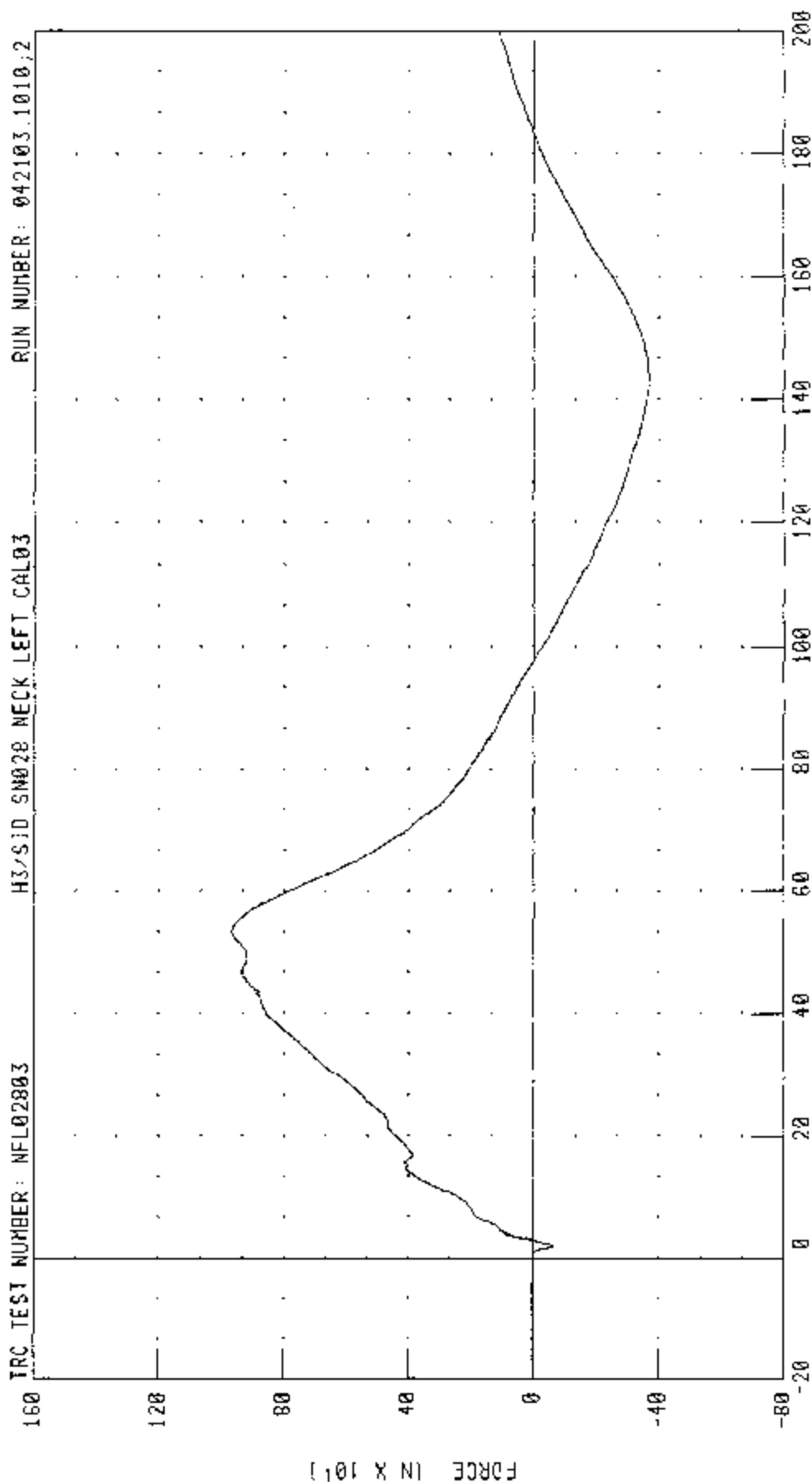
572N SJ0/H111 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER: NFL02803

H3/SID SN028 NECK LEFT CAL03

RUN NUMBER: 042103.1010.2



TIME (MS)

CHANNEL: NEKYF FILTER: CIL CLASS 1000

PEAK DATA: 956 31 N @ 53 52 MS, -369 27 N @ 143 04 MS

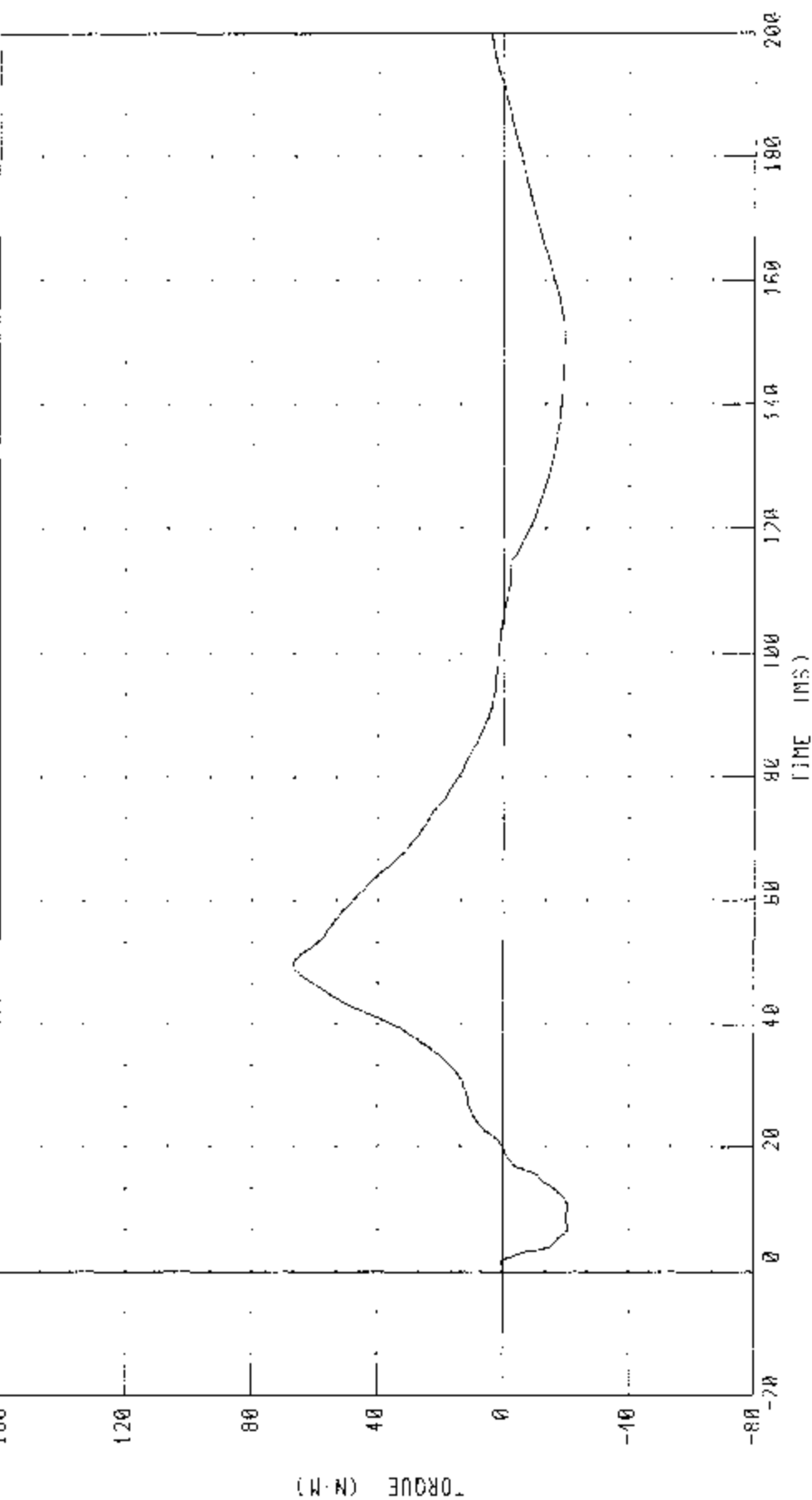
572M SID/HILI DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: MFL02803

H3/SID SW028 NECK LEFT CAL03

RUN NUMBER: 042103.1010.2



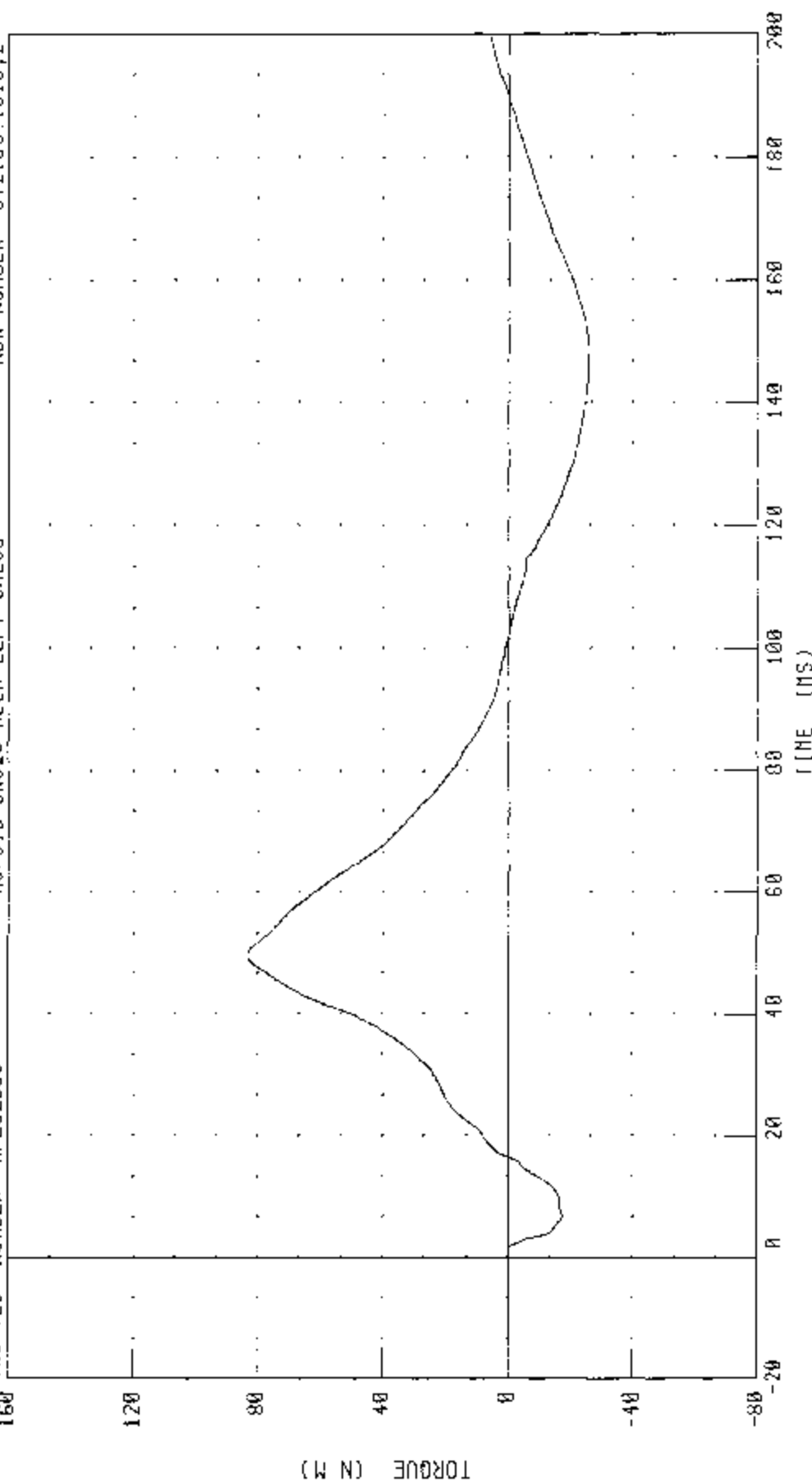
CHANNEL: NECKM FILTER: CH CLASS 800

PEAK DATA 66.78 N M @ 49.76 MS, -20.52 N M @ 5.96 MS

572N SID/HJII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

IRC TEST NUMBER: NFL02803 H3/SID SN028 NECK LEFT CAL03 RUN NUMBER: 042103.1010.2



TIME (MS) PEAK DATA 83 15 N M @ 49 76 MS; -25.83 N M @ 147 52 MS

CHANNEL: NEKOM FJ1 FER. CII CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

21-MAR-03

LEFT SIDE CONFIGURATION

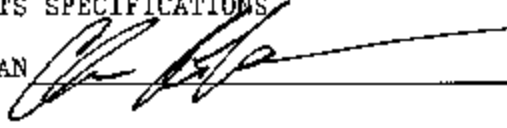
TRC INC.

TEST NO: STL02803A

572F SID SN028 L.THORAX CAL03

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	46.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.27 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	39.2 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	38.5 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	17.4 G

TEST MEETS SPECIFICATIONS

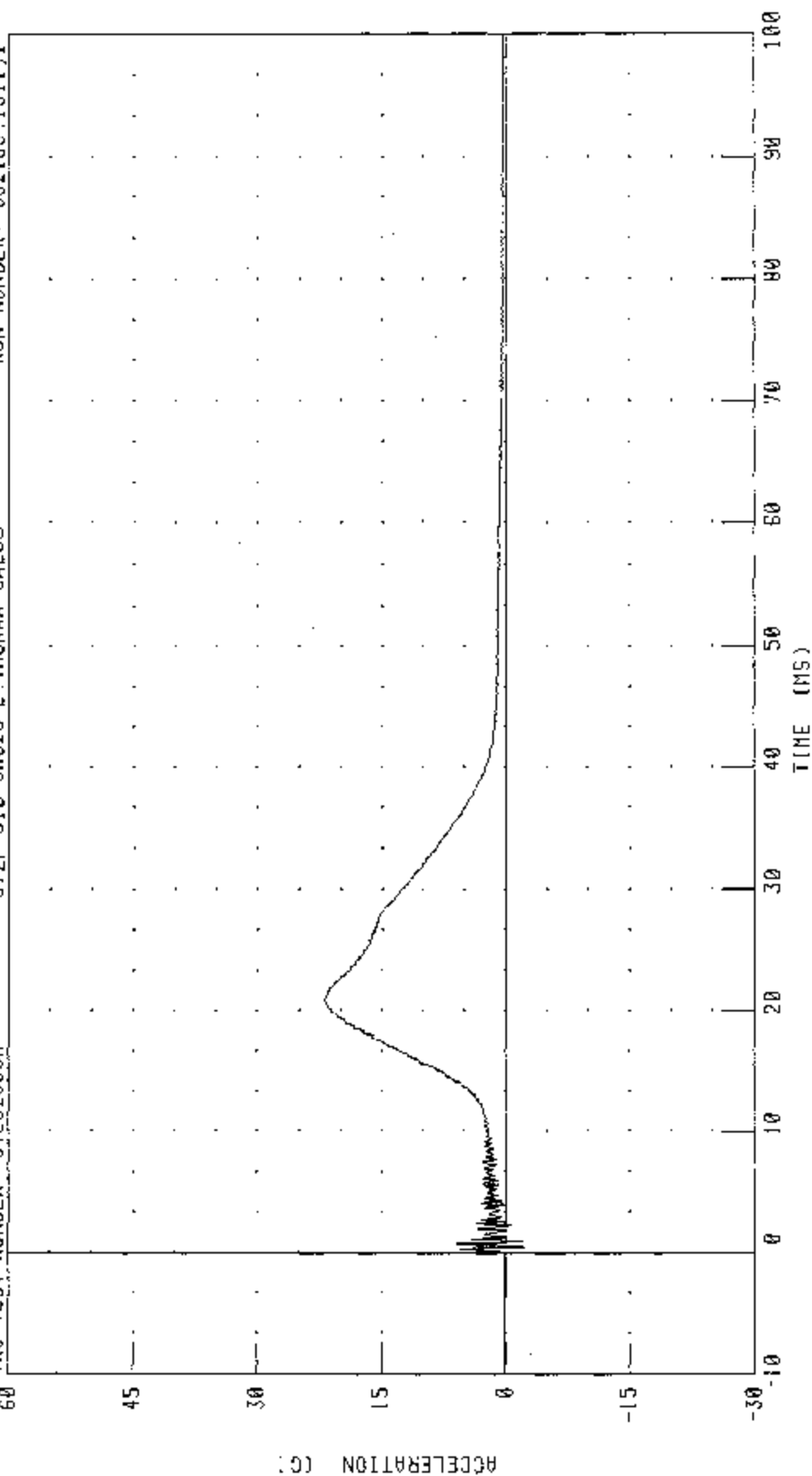
TECHNICIAN 

RUN NUMBER: 032103.1310;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: STL02803A 572F SID SN028 L THORAX CAL03 RUN NUMBER: 032103.1311,1

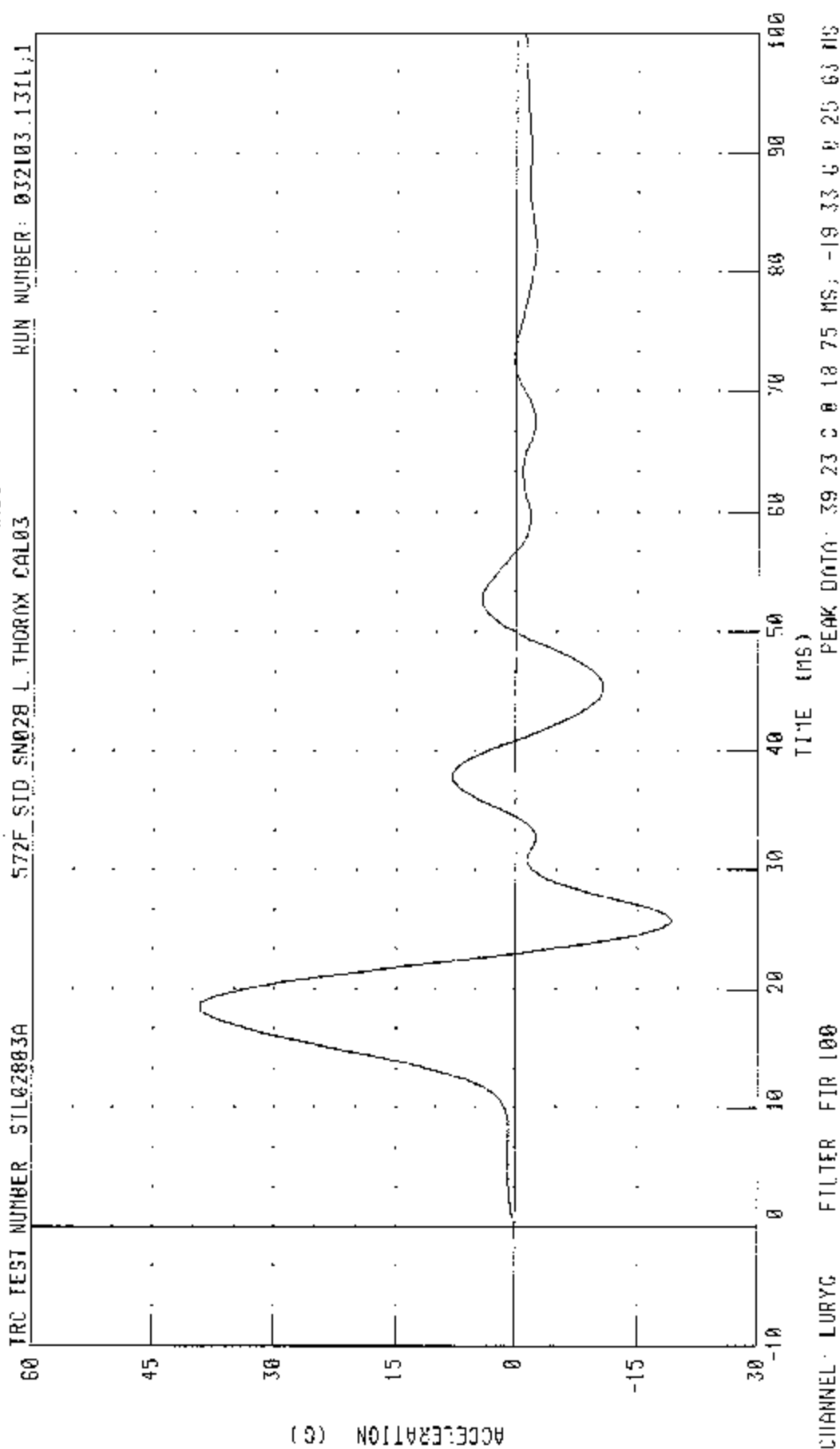


PEAK DATA: 21.79 G @ 20.80 MS; -2.30 G @ 0.48 MS

CHANNEL: PENXG FILTER: CH. CLASS 1000

PART 572-F S I D THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS



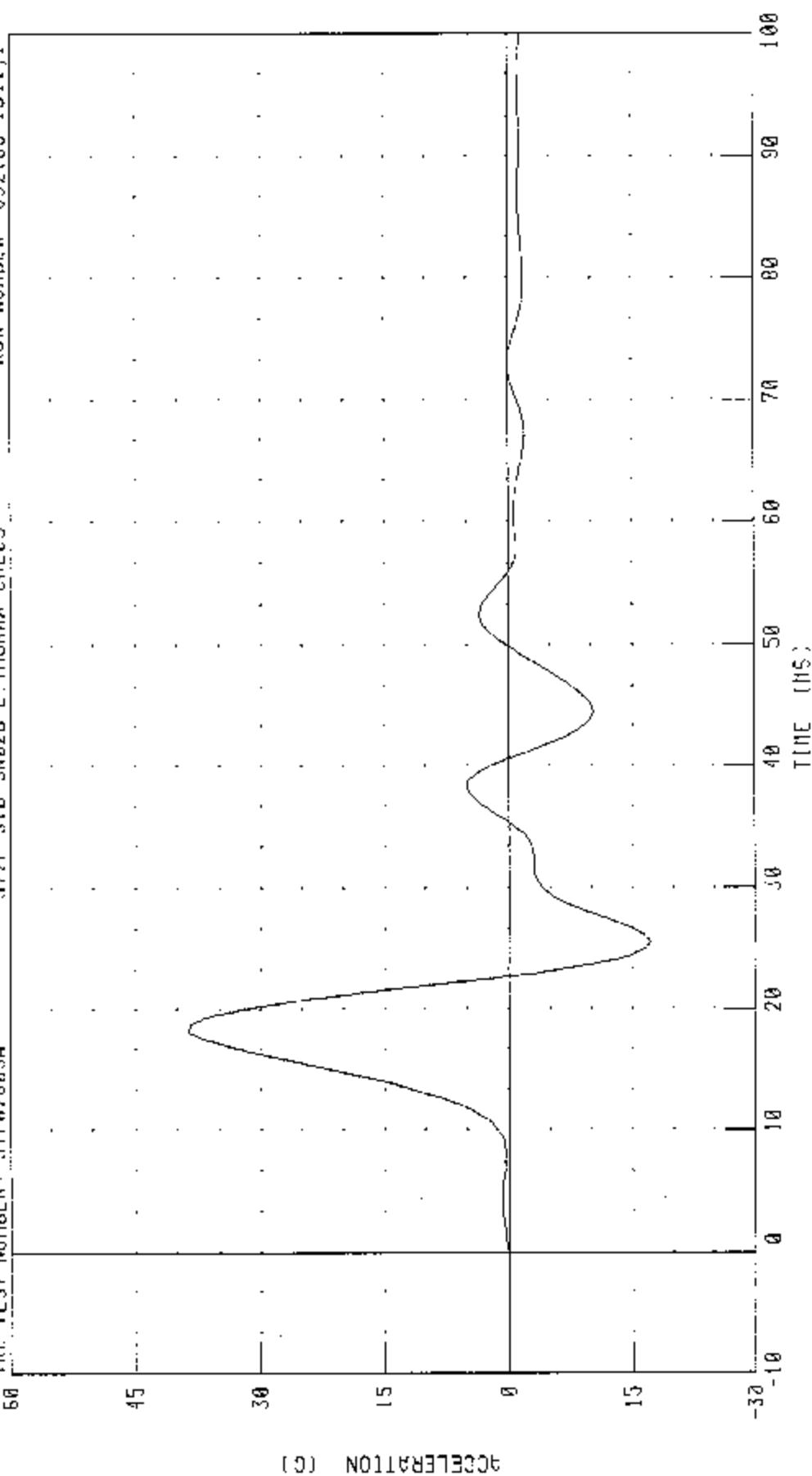
PART 572-F S.I.O. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: ST102803A

572F SID SNO2B L THORAX COL03

RUN NUMBER 032103 1311,1



PEAK DATA: 30 51 0 0 18 13 MS, -17.15 G @ 25.63 MS

CHANNEL L1RYC FILTER: FIR 100

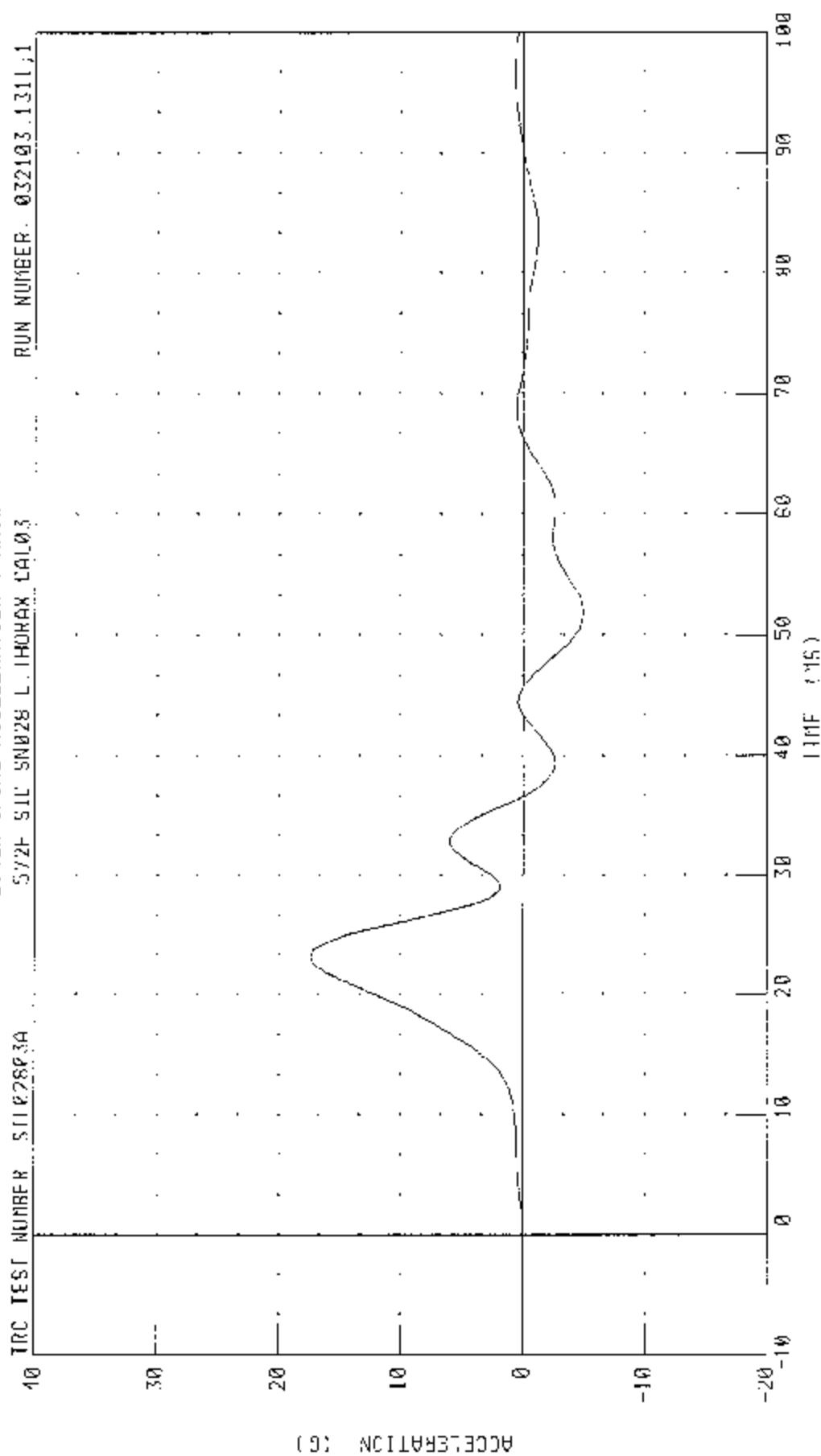
PART 572 F 5 I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER 51102803A

5/24/51L SN028 L THORAX CAL03

RUN NUMBER 032103.1311.1



CHANNEL T12YG FILTER: FTR 100

PEAK DATA: 17.43 G @ 23.13 MS; -4.99 G @ 51.08 MS

Transportation Research Center Inc.

572B Abdomen Compression Test

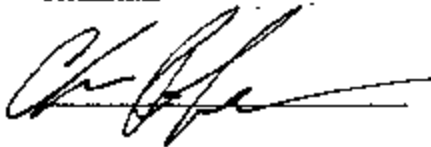
HHH SID Serial No. 028 Calibration No. 03 - 1

Test Date 03/24/2003

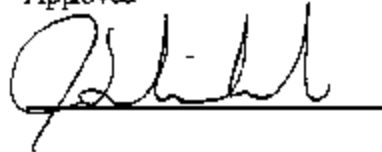
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	45 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	6.7 - 8.7 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



03.24.2003 10:47:49 183

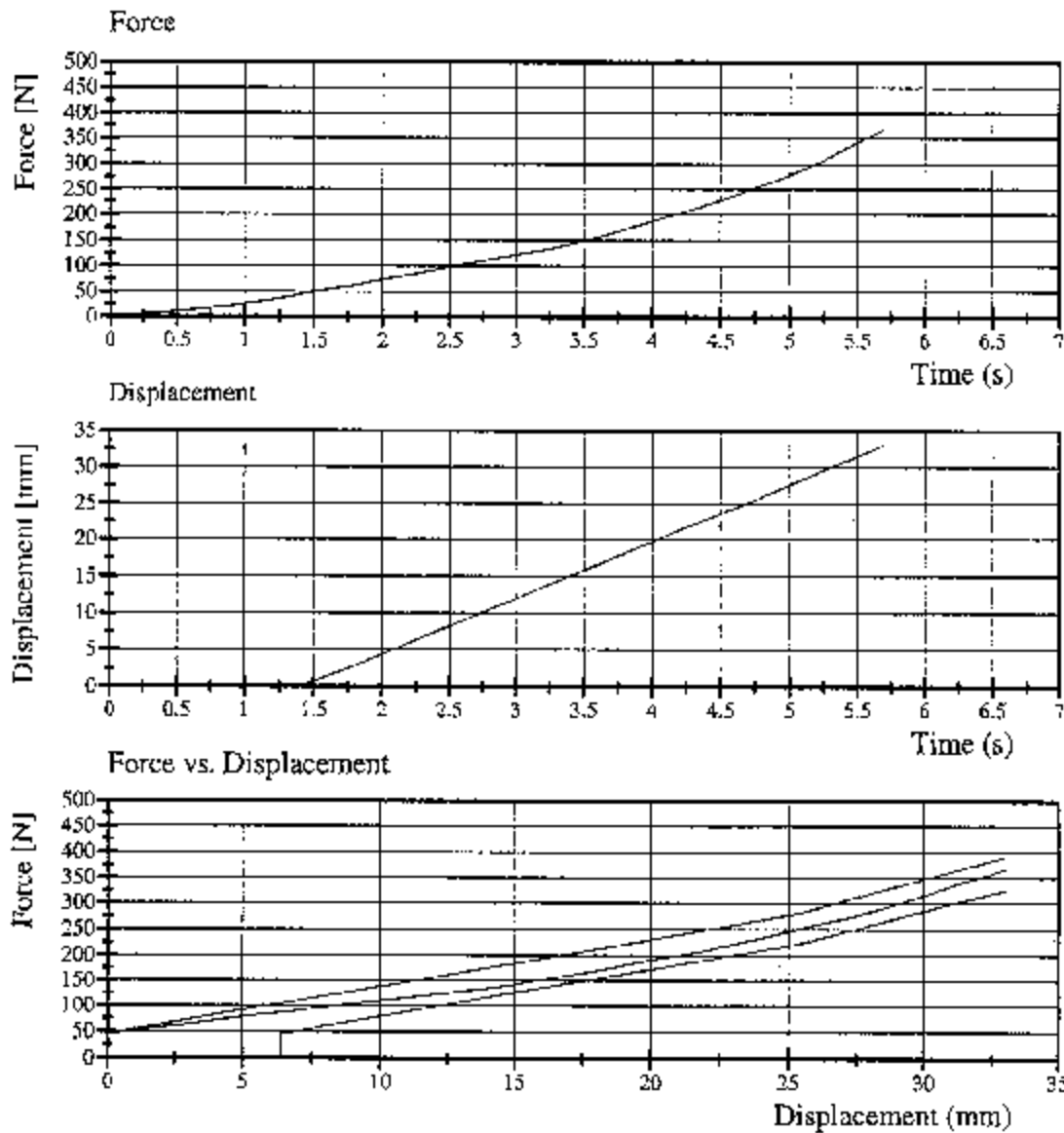
TRE

Transportation Research Center Inc.

572B Abdomen Compression Test

III SID Serial No. 028 Calibration No. 03 - 1

Test Date 03/24/2003



03/24/2003 10:47:51 183



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 24-Mar-03

TRC, INC.

TEST NO: 028C03LF1

572B SN 028 TORSO FLEX CAL 03

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 - 70 %	44 %
FORCE AT 0 DEG. FLEXION	-27 - 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 - 151 N	120.1 N
FORCE AT 30 DEG OF FLEXION	151 - 205 N	173.5 N
FORCE AT 40 DEG OF FLEXION	205 - 258 N	235.8 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	7 °

TEST MEETS SPECIFICATIONS

TECHNICIAN 

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

21-MAR-03

LEFT SIDE CONFIGURATION

TRC INC.

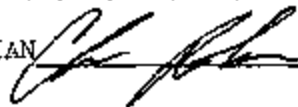
TEST NO: SPL02803

572F SN028 LEFT PELVIS CAL

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	46.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.28 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	45.5 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.2 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

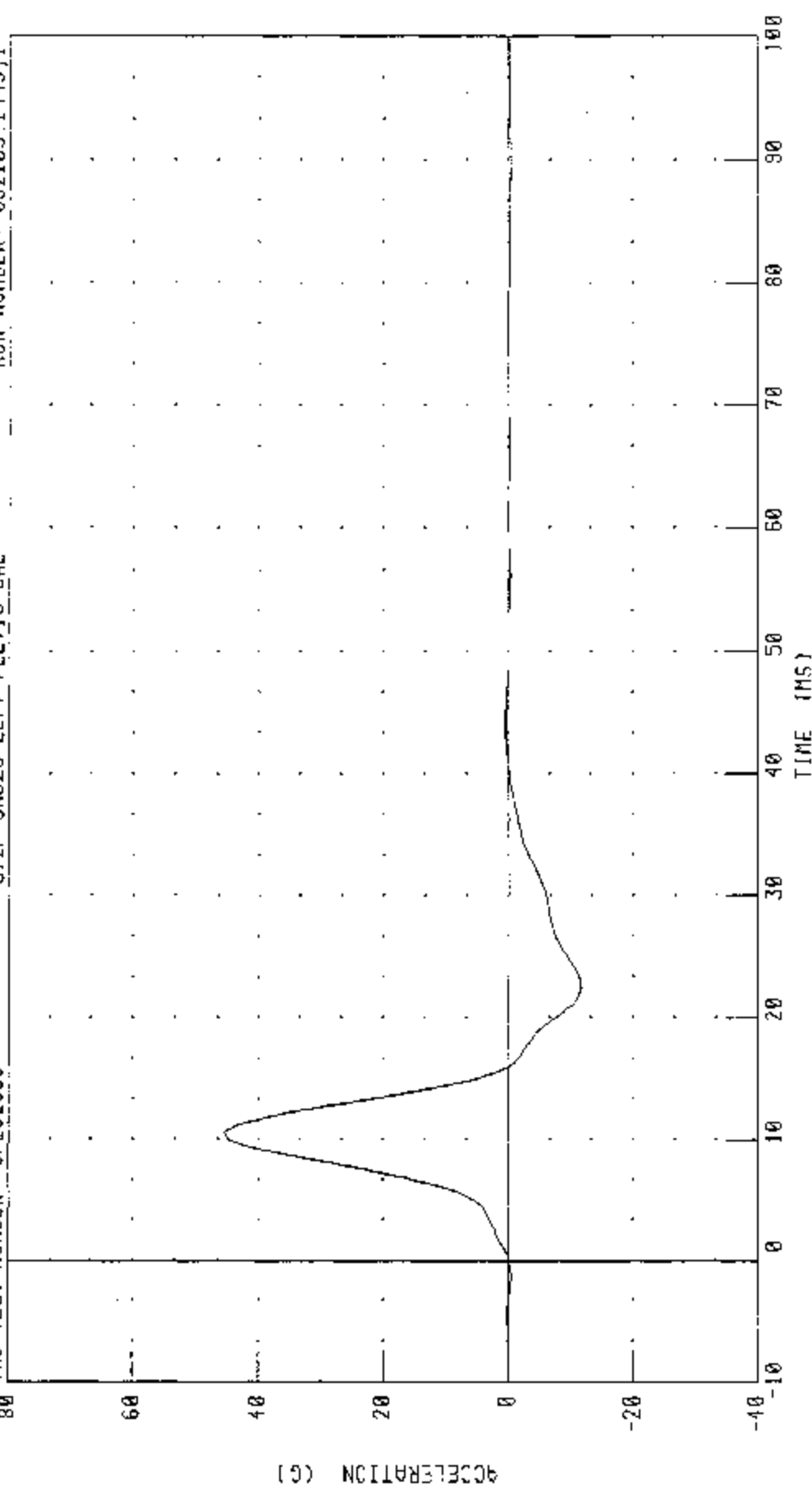


RUN NUMBER: 032103.1445;1

PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL02803 572F SN028 LEFT PELVIS CAL RUN NUMBER: 032103.1445,1



PEAK DATA: 45.50 G @ 10.63 MS; 11 72 G @ 22.50 MS

CHANNEL: PEVYC FILIER: FJR 100

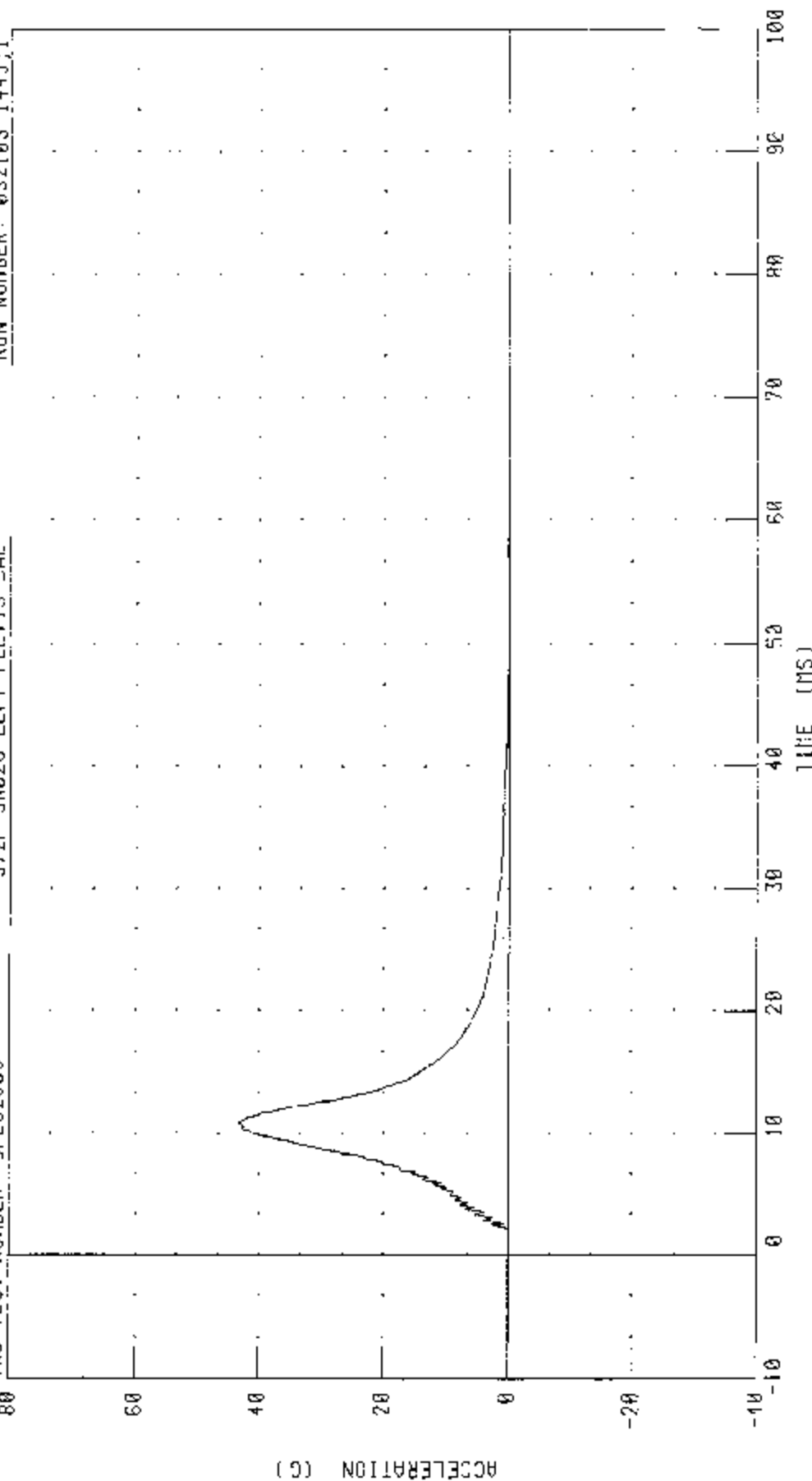
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL02803

572F SN028 LEFT PELVIS CAL

RUN NUMBER: 032103 1445.1



TIME (MS)

CHANNEL: PINXG FILTER: CH. CLASS 1000

PEAK DATA: 43.35 G @ 10.88 MS; -0.13 G @ 11.68 MS

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

03-FEB-03

TRC INC.

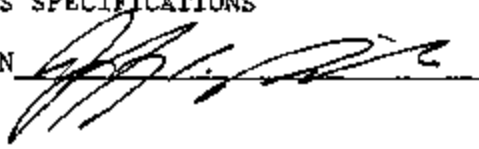
572F SN028 DAMPER TEST CAL01

TEST NUMBERS: DP02801A,DP02801B,DP02801C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	46.0 %
VELOCITY	FORCE	667 - 925 N	750 N
2.69 M/S	DISPLACEMENT	29.7 - 34.5 MM	29.9 MM
VELOCITY	FORCE	1733 - 2100 N	1791 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	34.9 MM
VELOCITY	FORCE	3784 - 4495 N	4259 N
6.12 M/S	DISPLACEMENT	33.3 - 39.6 MM	37.8 MM

DAMPER SETTING = 5.6

TEST MEETS SPECIFICATIONS

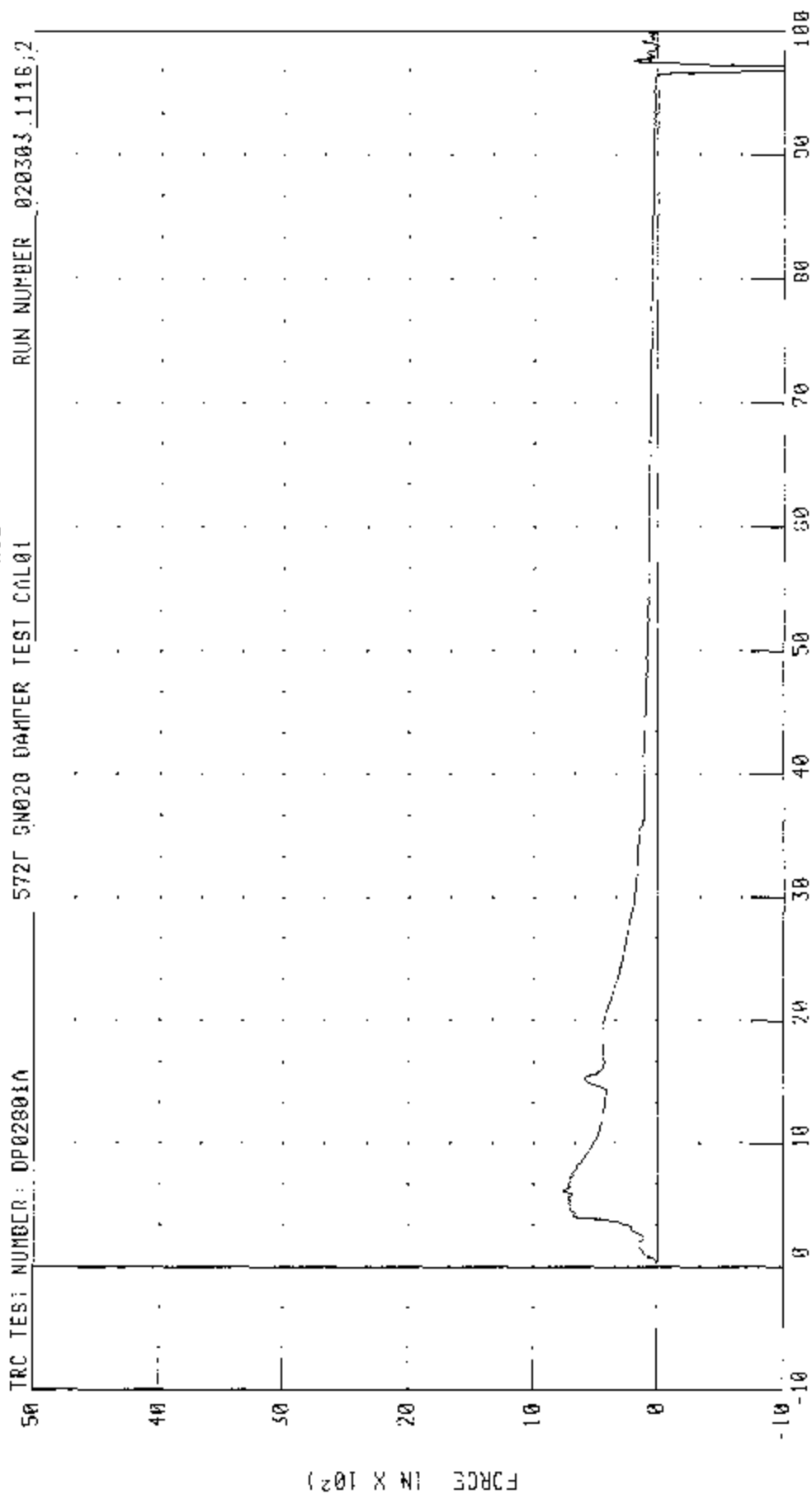
TECHNICIAN 

RUN NUMBER: 020303.1116;2

PART 572 F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP02801A 572F GN020 DAMPER TEST CAL01 RUN NUMBER 020303.1116;2



TIME (MS)

CHANNEL: DAMPF FILTER: CIE CLASS 1000 PEAK DATA: 749.74 N @ 5.16 MS; -1712.81 N @ 96.80 MS

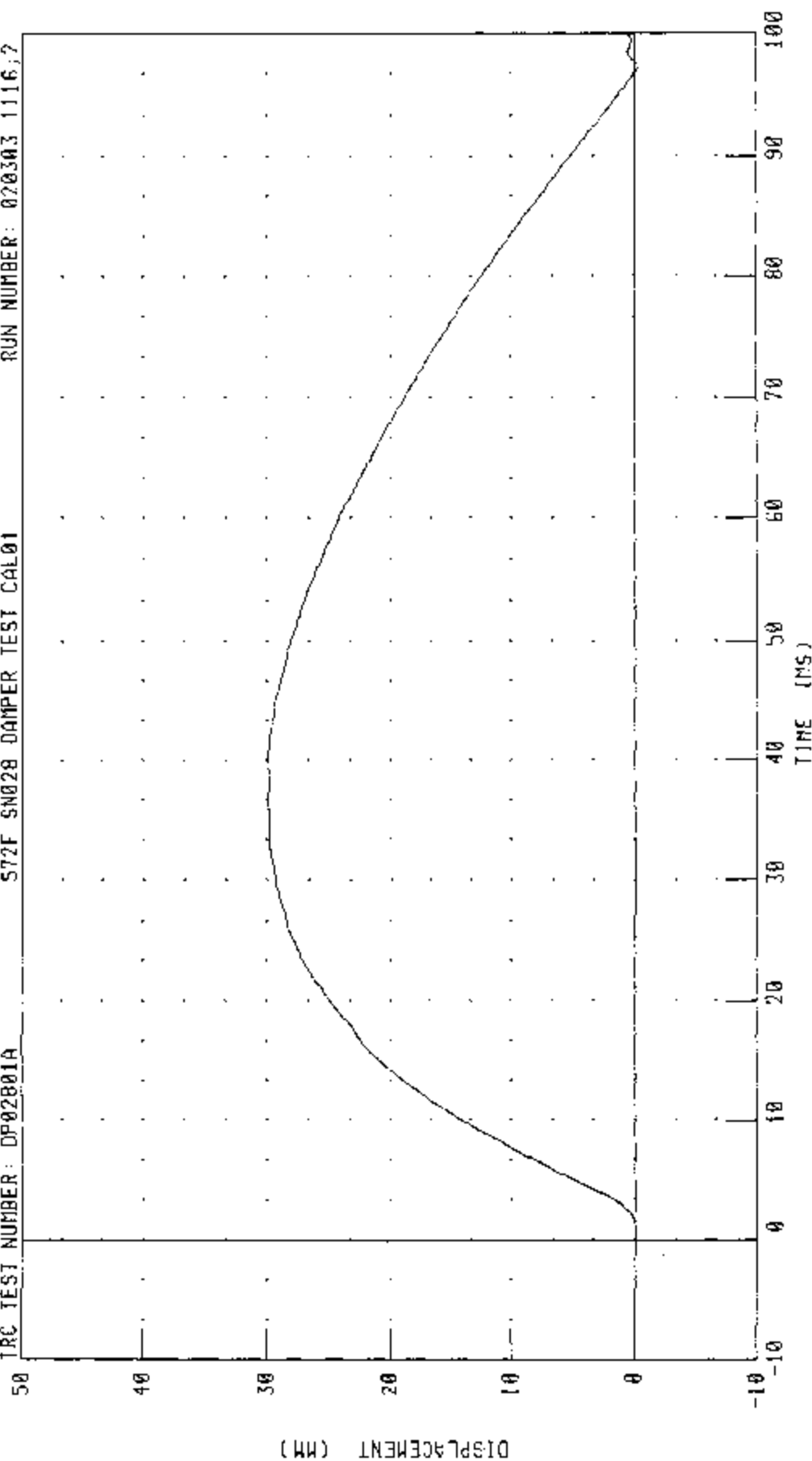
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SN028 DAMPER TEST CAL01

TRC TEST NUMBER: DF02801A

RUN NUMBER: 020303 1116.2



CHANNEL: CSTVD FILTER: CH. CLASS 1000

PEAK DATA: 29.87 MM @ 35.20 MS, -0.31 MM @ 97.20 MS

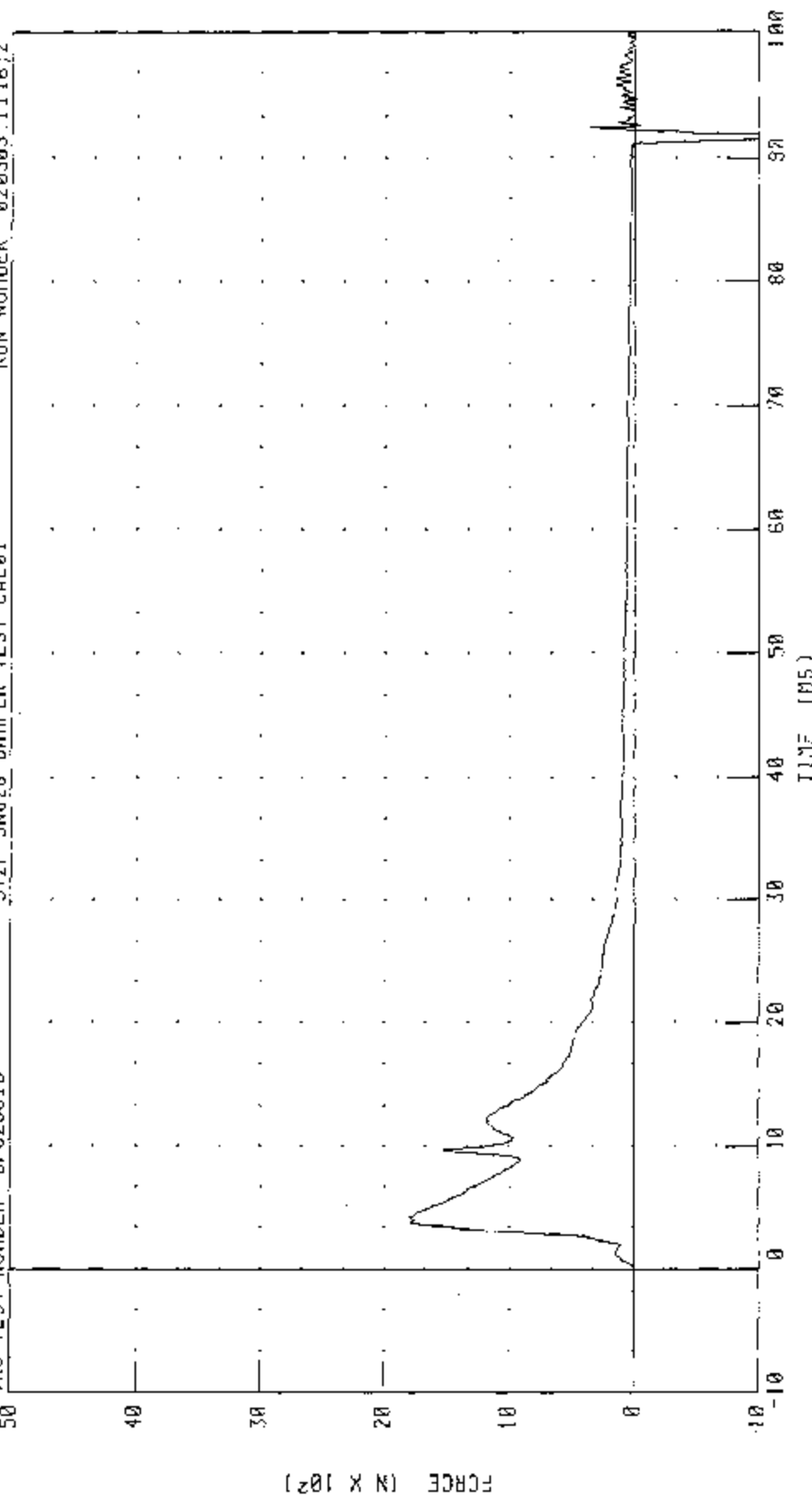
PART 572-F S.T.R. HYDRAULIC SHOCK ABSORBER CALIBRATION (4.3 N/SEC)

SHOCK ABSORBER RESISTIVE FORCE

IRC TEST NUMBER: DP02801B

572F SN020 DAMPER TEST CAL01

RUN NUMBER: 020303.1116.2



CHANNEL: DAMPF FILTER: CUF, CLASS 1000

PEAK DATA: 1791.40 V @ 4.16 MS, -2164.23 N @ 91.68 MS

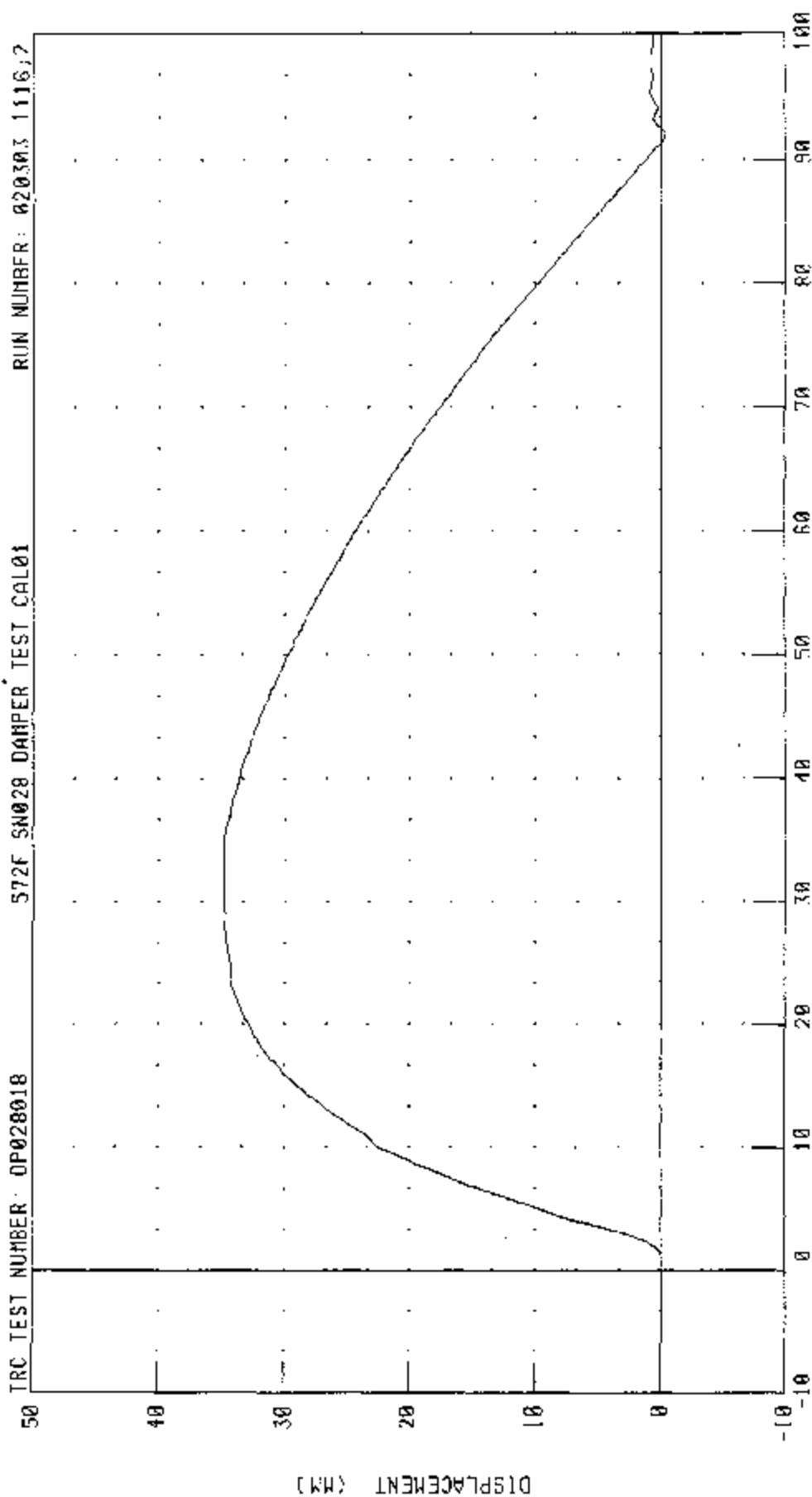
PART 572-F S.I.D. THORNIC SHOCK ABSORBER CALIBRATION (4.3 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: 0P028018

572F SN028 DAMPER TEST CAL01

RUN NUMBER: 020303 1116,2



TIME (MS)

CHANNEL: CSTVD FILTER: CH. CLASS 1000

PEAK DATA: 34.90 MM @ 30.64 MS, -0.40 MM @ 92.00 MS

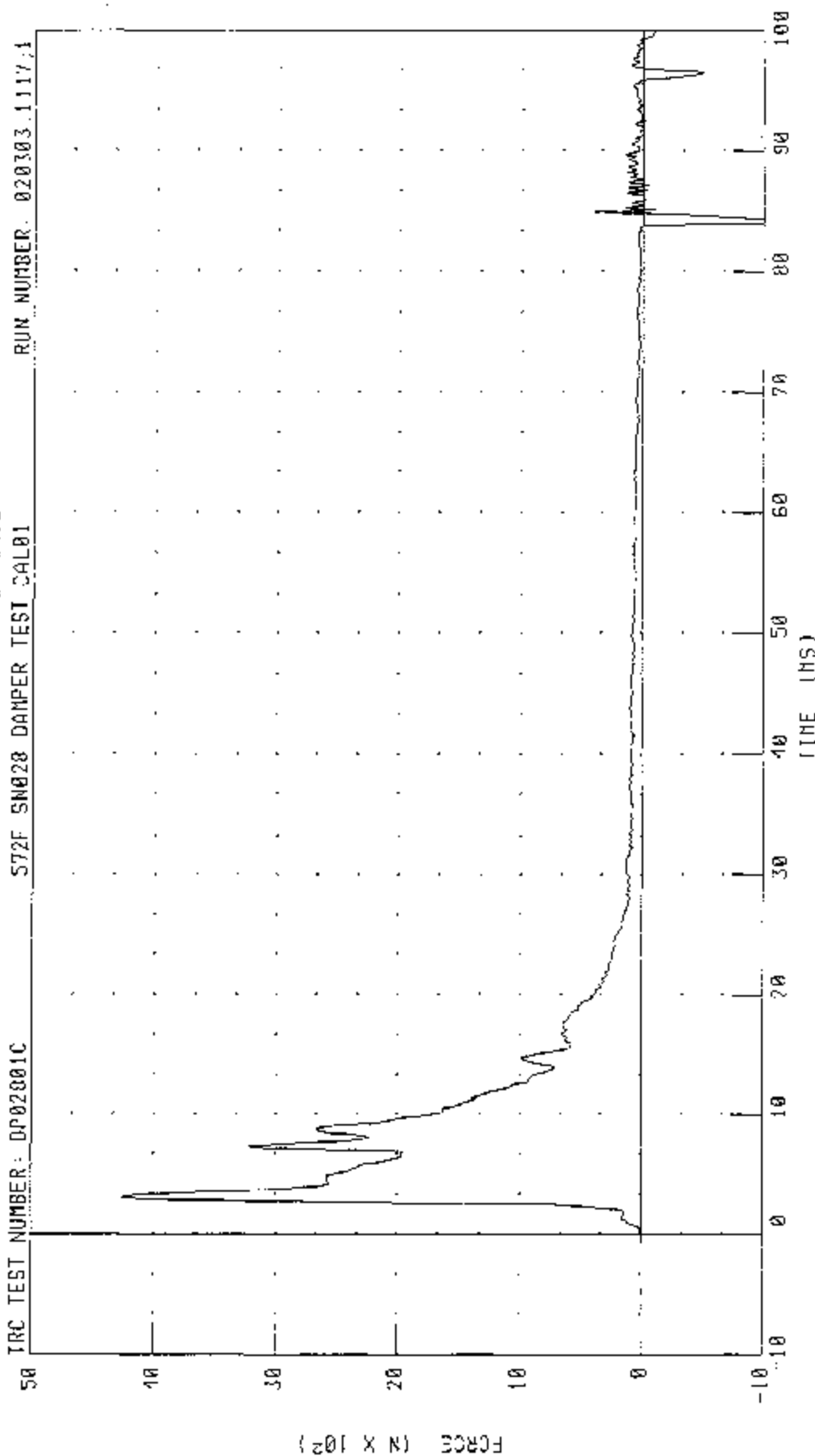
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

IRC TEST NUMBER: DP02001C

572F SN020 DAMPER TEST CAL01

RUN NUMBER: 020303.1117.1



TIME (MS)

CHANNEL: DAMPF FILTER: CH. CLASS 1000

PEAK DATA: 4259.31 N @ 3.12 MS; -2213.42 N @ 84.21 MS

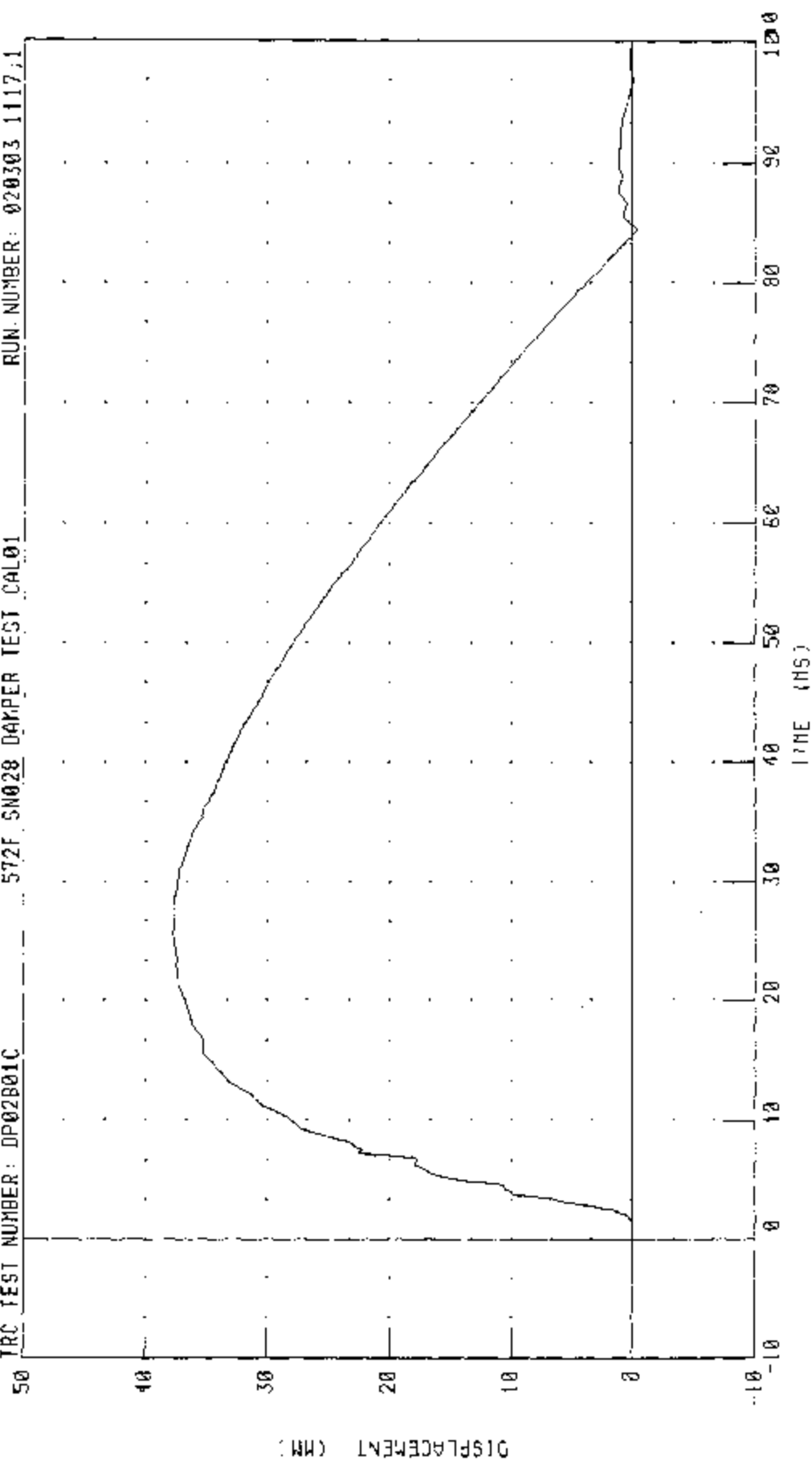
PART 572-F S.I.D. THORACIC SHOCK ABSORBER CALIBRATION (6.1 M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP02B01C

572F SN028 DAMPER TEST CAL01

RUN NUMBER: 020303 1117.1



TIME (MS)

CHANNEL: CSIY0 FILTER: CH CLASS 1000

PEAK DATA: 37.75 MM @ 26.56 MS; -0.36 MM @ 84.48 MS

Calibration Test Results

Pre-Test

SID-HIII: 066

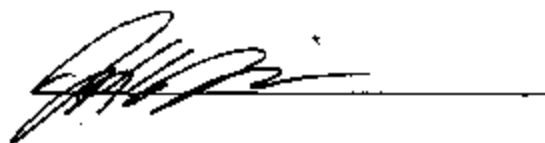
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thorax passed all shock absorber requirements (tested on February 3, 2003, for a previous calibration series).
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

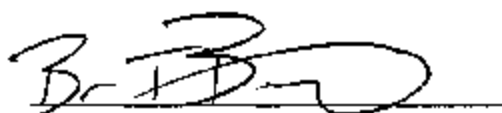
Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 066 Calibration No. 06

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	901 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	507 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	236 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	518 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	499 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	387 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	170 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	170 mm	Yes
Difference Between Top & Bottom Rib Width from CL		<= 2.5 mm	0.0 mm	Yes

Technician



Approved



TRE

TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDIII SID DUMMY

03-APR-03

LEFT SIDE CONFIGURATION

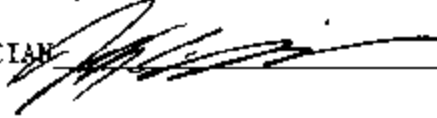
TRC INC.

TEST NO. HDL06606

572M SID/HIII SN066 HEAD CAL06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	44.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	135.92 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-8.38 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

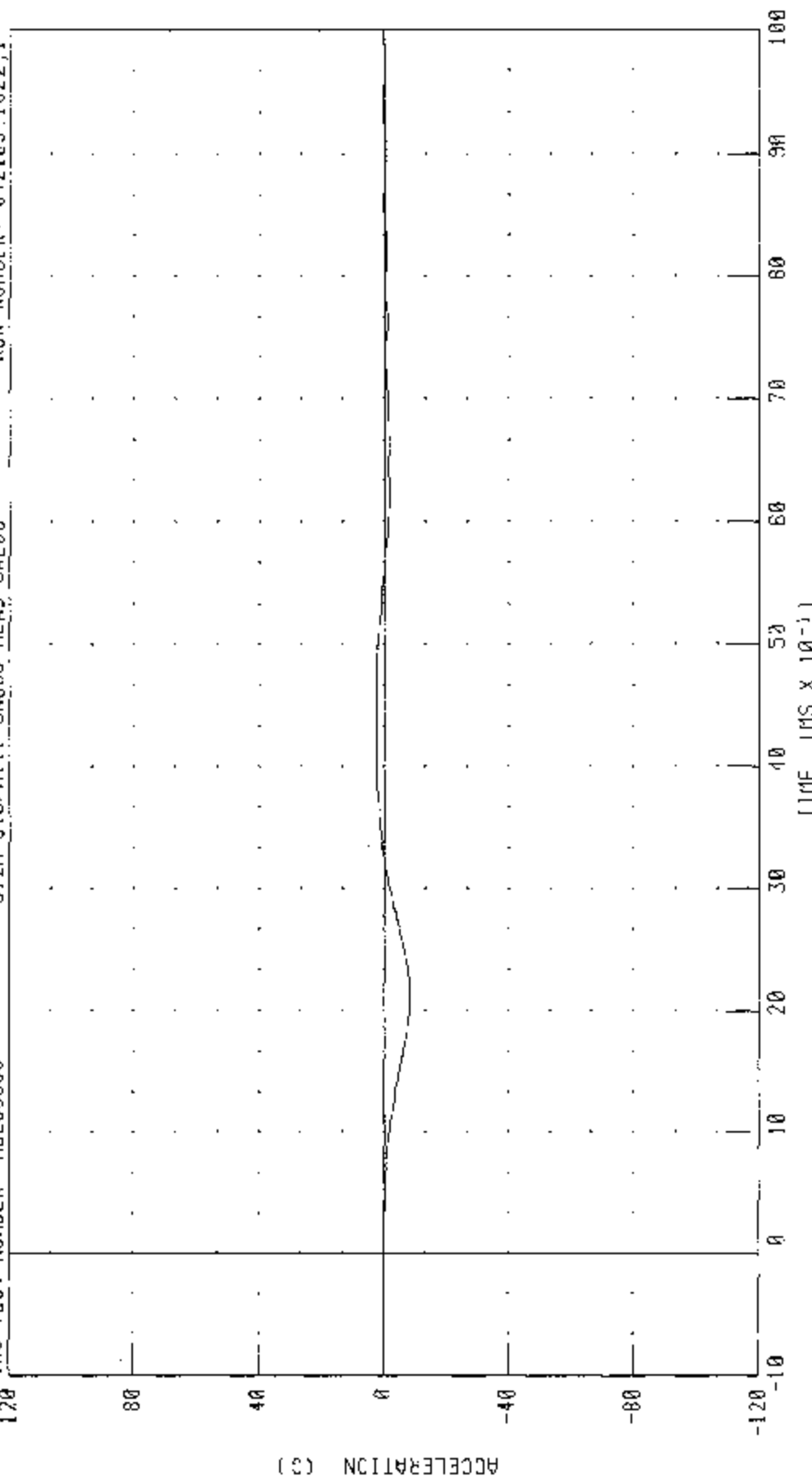
TECHNICIAN 

RUN NUMBER: 042103.1033;1

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LAFFRAL HEAD DROP

HEAD ACCELERATION X AXIS

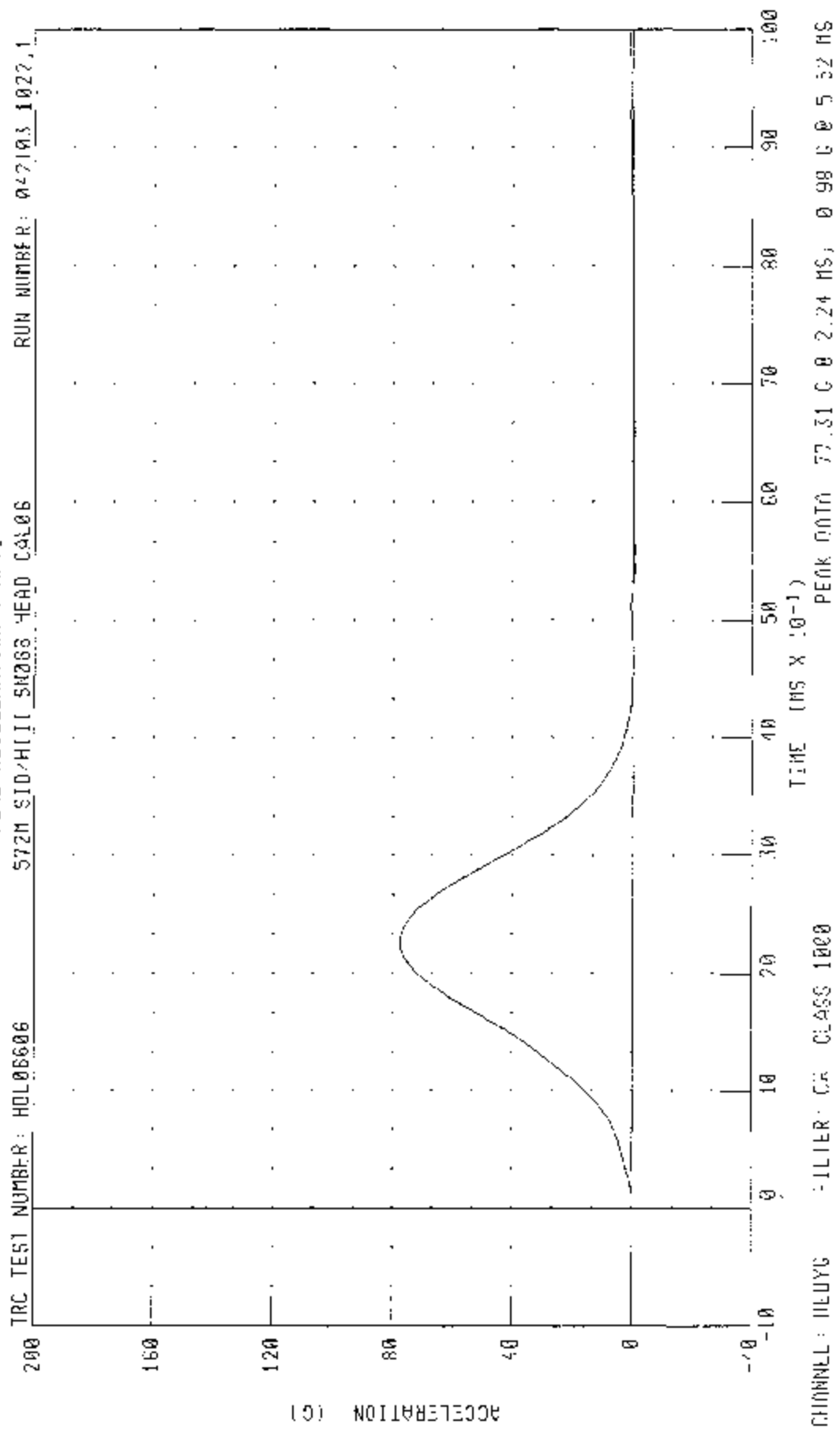
TRC TEST NUMBER: HOL06606 572M SID/HIII SN066 HEAD CAL06 RUN NUMBER: 042103.1022.1



CHANNEL: NEDXC FILTER: CH. CLASS 1000

PEAK DATA: 2.68 G @ 4.08 MS, -8.38 G @ 2.16 MS

572M SID/HIT; DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP
 LEAD ACCELERATION Y AXIS



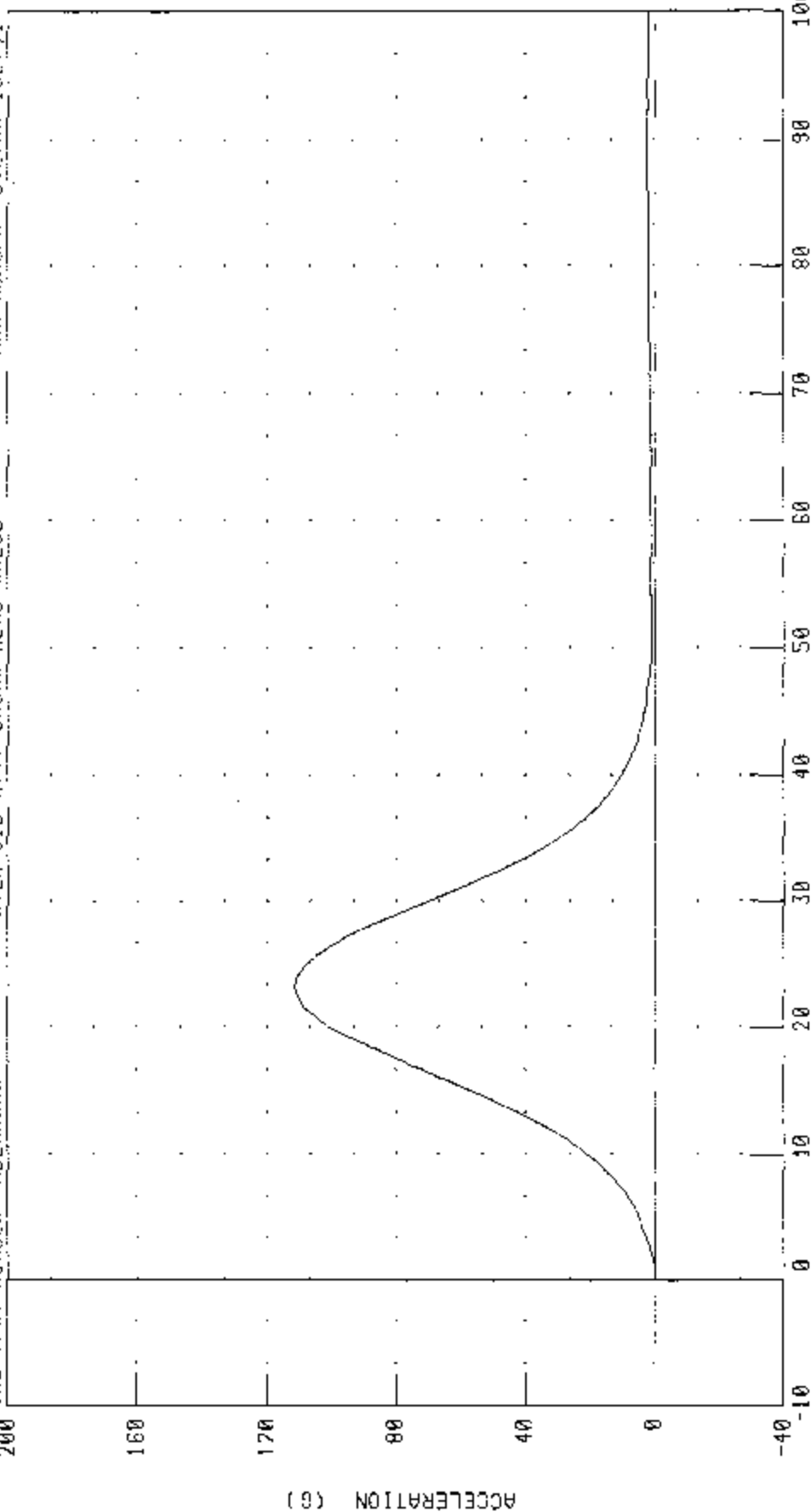
572M STD/HIT DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: H006606

572M STD/HIT SN066 HEAD CAL06

RUN NUMBER: 042103 1022.1



LINE (MS X 10¹)

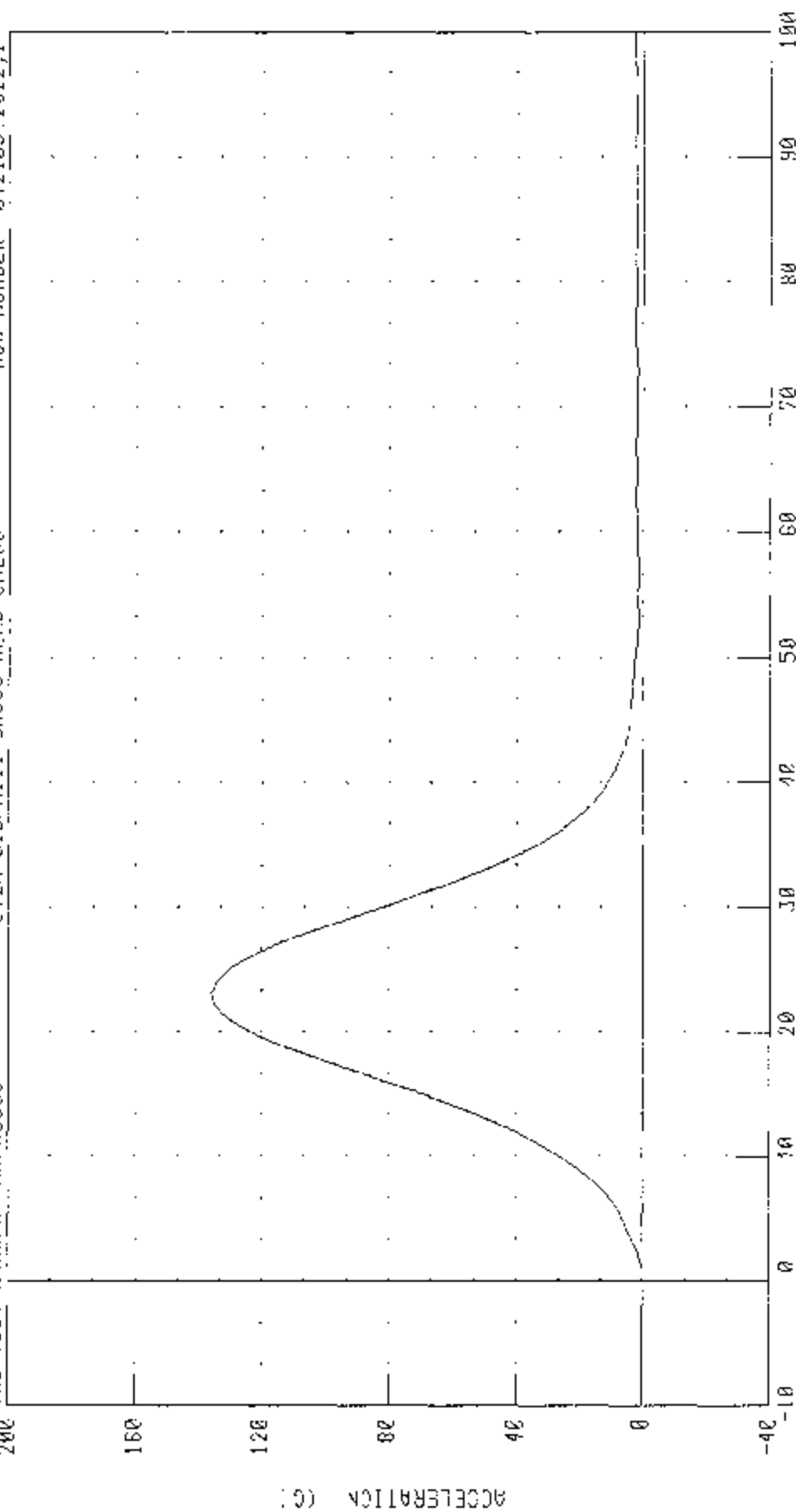
CHANNEL: HED/C FILTER: CH. CLASS 1000

PEAK DATA 111.63 G @ 2.32 MS; -0.03 G @ -0.96 MS

572M SID/HILL GUNNY COLLIMATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESONANT ACCELERATION

TRC TEST NUMBER: H0106606 572M SID/HILL SH066 HEAD CAL06 RUN NUMBER: 042103.1022,1



CHANNEL: HEORS FILTER CU. CLASS 1000

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

03-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

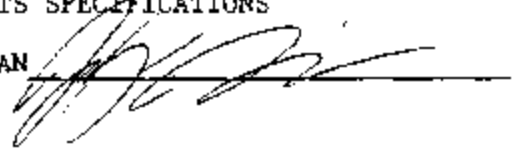
TEST NO. NFL06606A

572M SID/HIII SN066 NECK CAL06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	48.00 %
IMPACT VELOCITY	6.89 - 7.13 M/S	6.99 M/S
INTEGRATED VELOCITY	10 MS 1.96 - 2.55 M/S	2.36 M/S
	20 MS 4.12 - 5.10 M/S	4.80 M/S
	30 MS 5.73 - 7.01 M/S	6.78 M/S
	40 - 70 MS 6.27 - 7.64 M/S	7.07 - 7.16 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION	66 - 82 deg.	73.54 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO	58 - 67 MS	62.64 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE	73 - 88 NM	76.04 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO	49 - 64 MS	58.80 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT	2 - 16 MS	10.96 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042103.1020;1

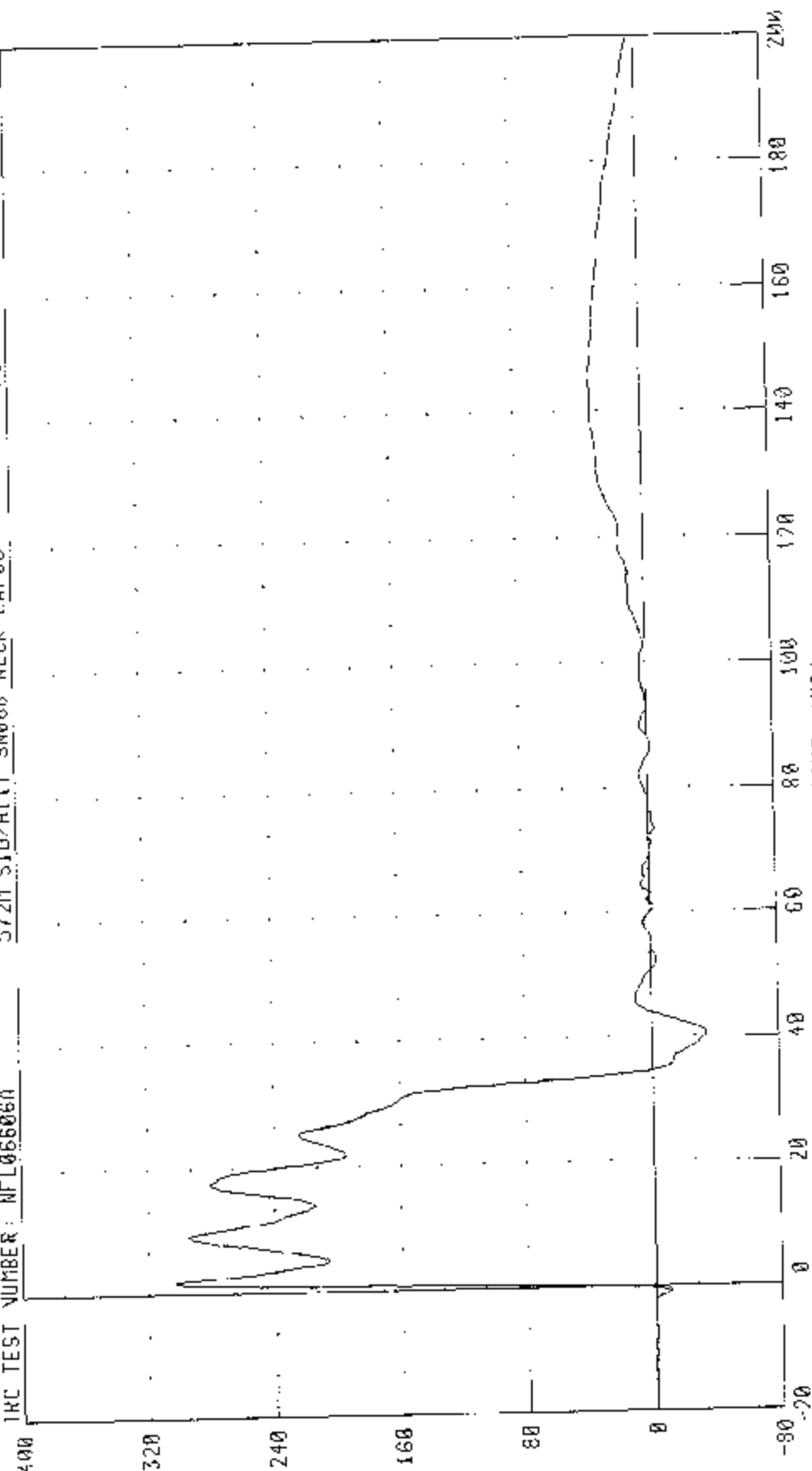
572M HJ/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

RUN NUMBER 042103 1021,1

IRC TEST NUMBER: NFL06506A

572M SID/HIC1 SN066 NECK CAL06



ACCELERATION ($G \times 10^{-1}$)

TIME (MS)

CHANNEL PENXG FILTER: CH. 0 155 180

200V DATA 30.30 G 0 76 MS, 3.41 G 0 40 04 MS

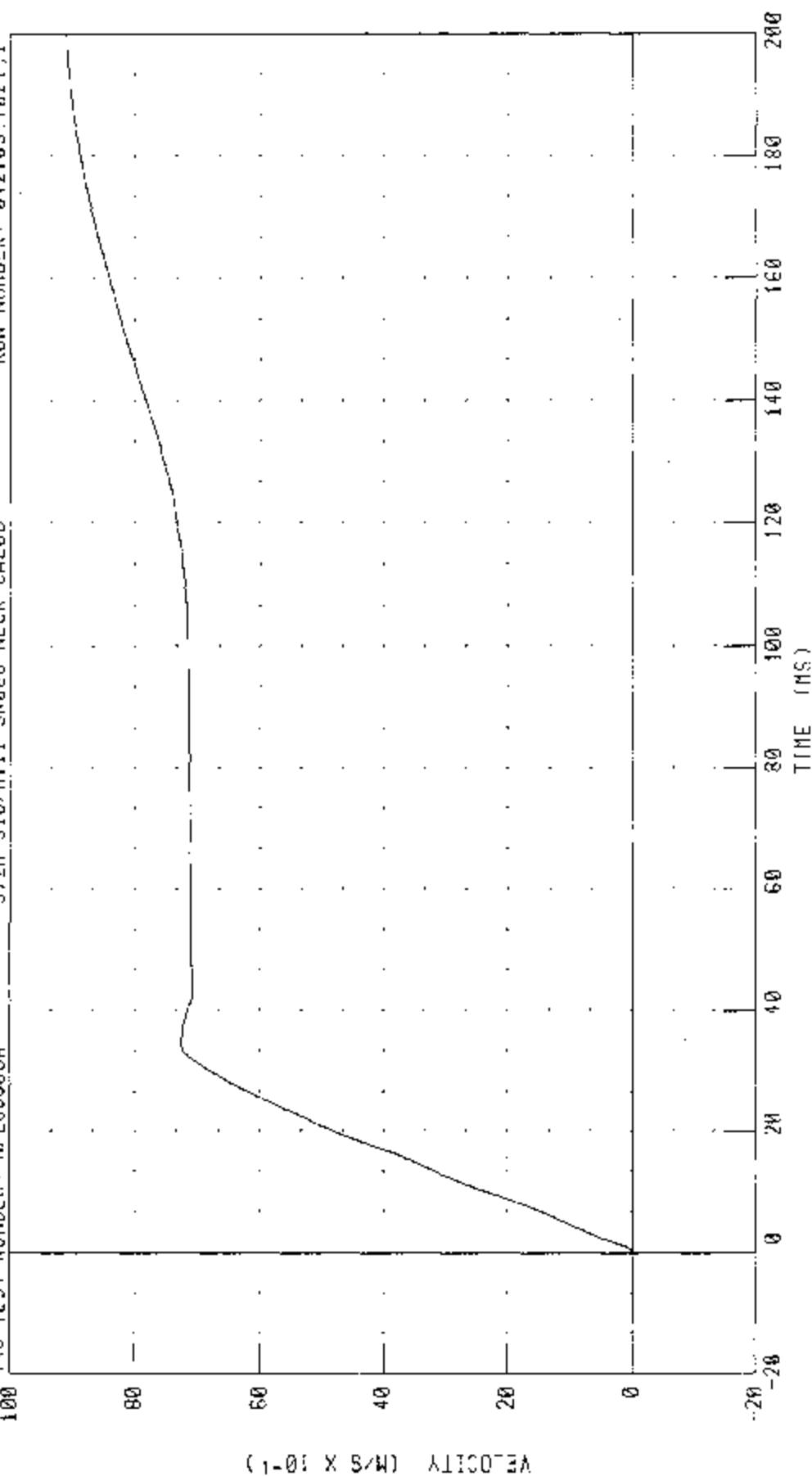
572P H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

TQC TEST NUMBER: NFL06606A

572M S10/HIII SN066 NECK CAL06

RUN NUMBER: 012103.1021.1



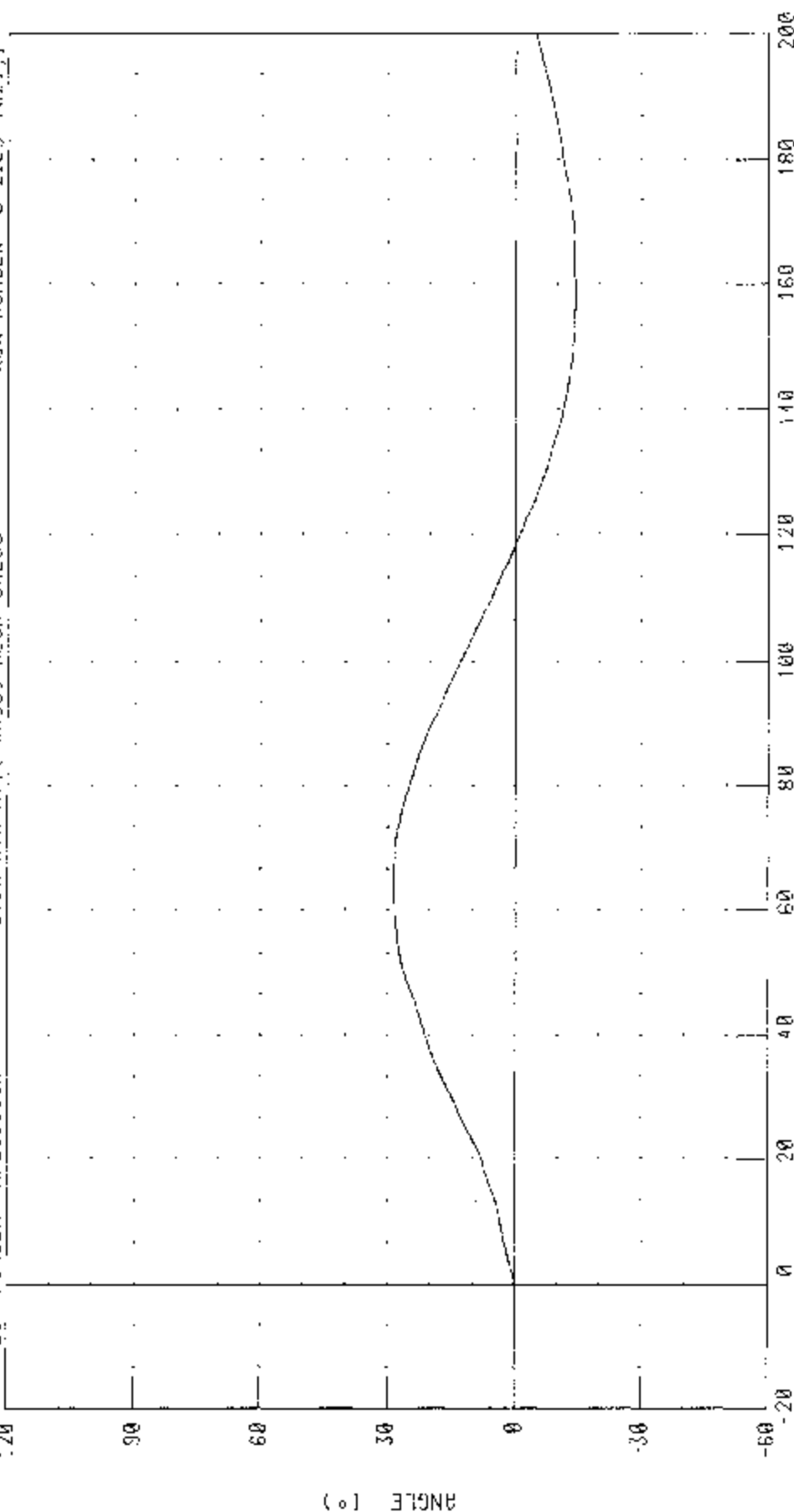
CHANNEL PENXVI FILTER: CH. CLASS 1B0

PEAK DATA 9.10 M/S @ 200.00 MS; 0.01 M/S @ 0.32 MS

572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NFL06606A 572M S10/HIT SN365 NECK CAL06 RUN NUMBER: 002105 1421.f



TIME (MS)

CHANNEL BE10 FILTER OFF CLASS 60

PEAK DATA 20.40 @ 0.67.20 MS, 14.30 @ 0.153.40 MS

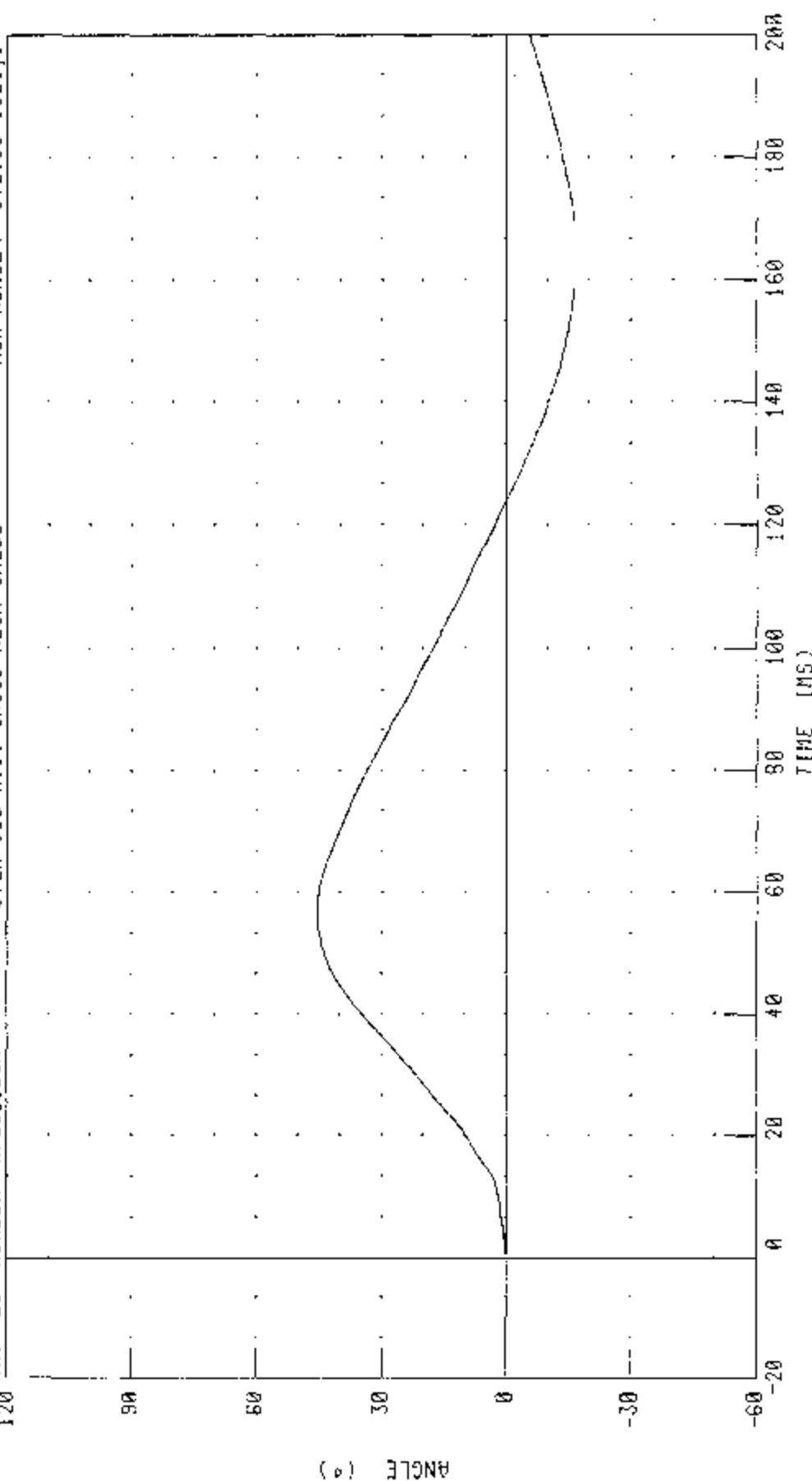
572M H3/S10 DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06606A

572M S10/H111 SN066 NECK COL06

RUN NUMBER 042103 1021;1



TIME (MS)

PEAK DATA: 45 42 0 0 57 52 MS; -16.69 0 0 165 36 MS

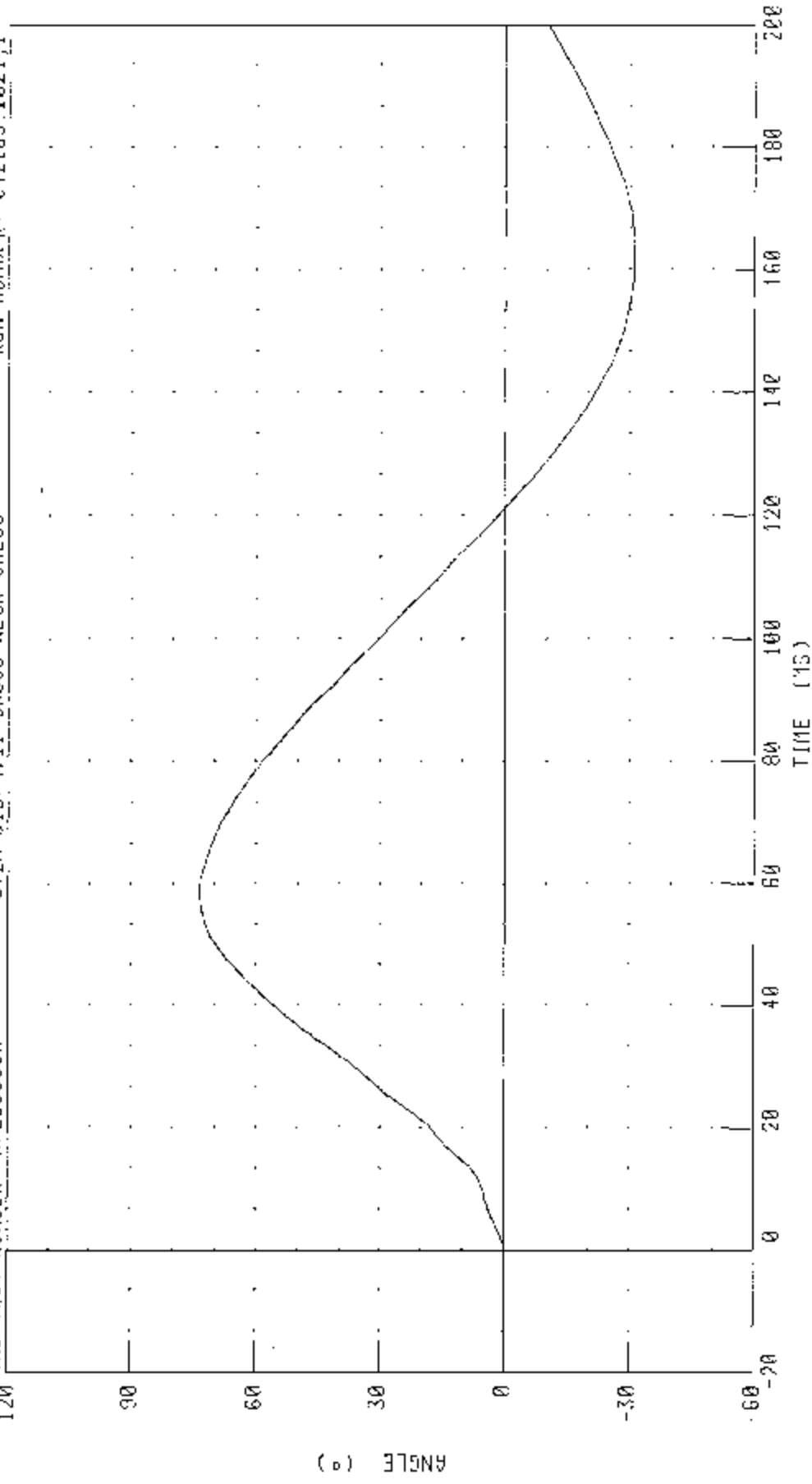
CHANNEL: THETA FILTER: CII, CLASS 60

ANGLE (°)

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NFL080060 572M SID/HLL SN060 NECK CAL06 RUN NUMBER: 042103 1021 1



CHANNEL 101AN FILTER CH. CLASS 60 PEAK DATA 73.54 ° @ 58.64 MS, -30.02 ° @ 159.04 MS

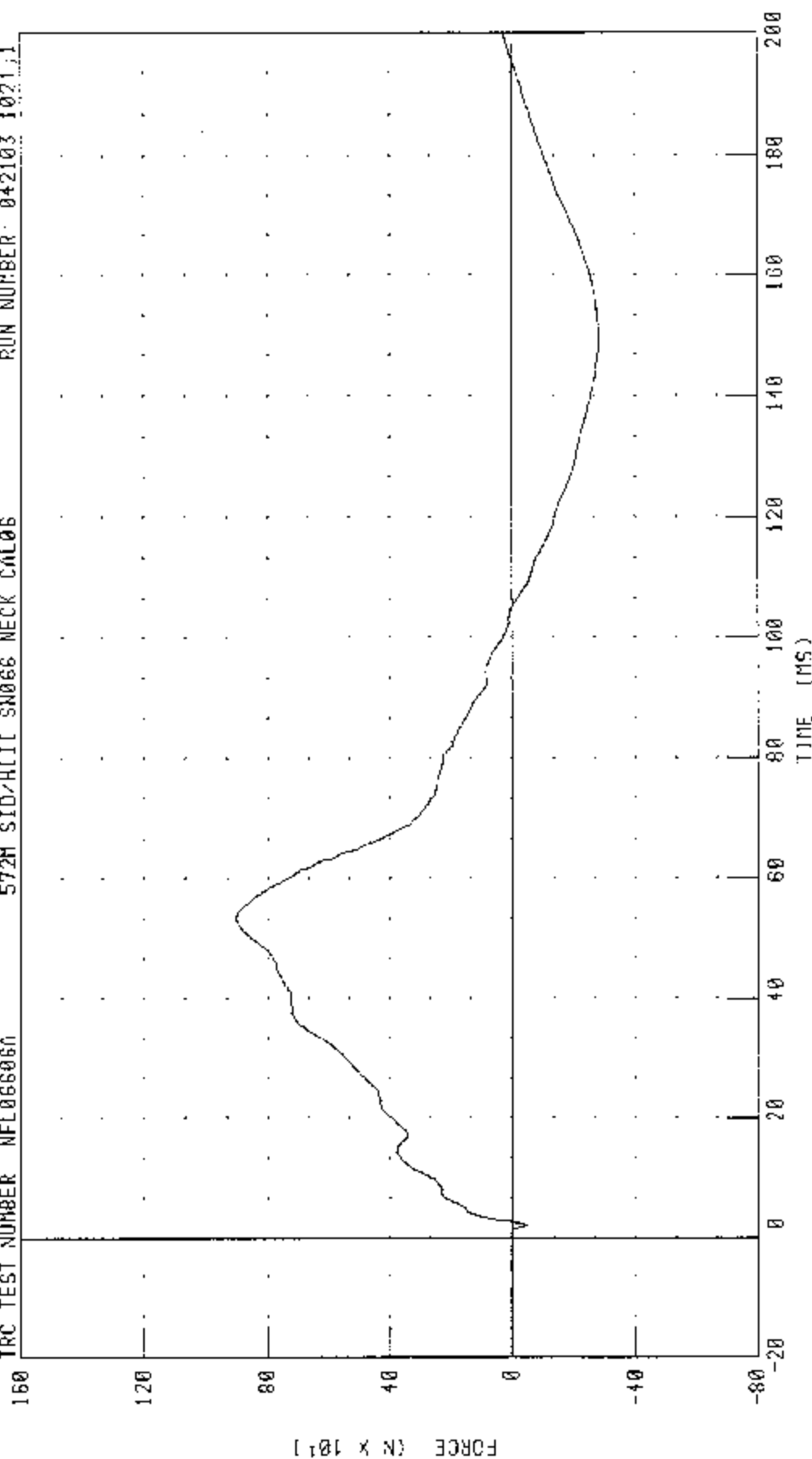
572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

TRC TEST NUMBER NPL066060

572M SID/HIL SN066 NECK CAL06

RUN NUMBER 042103 1021.1



TIME (MS)

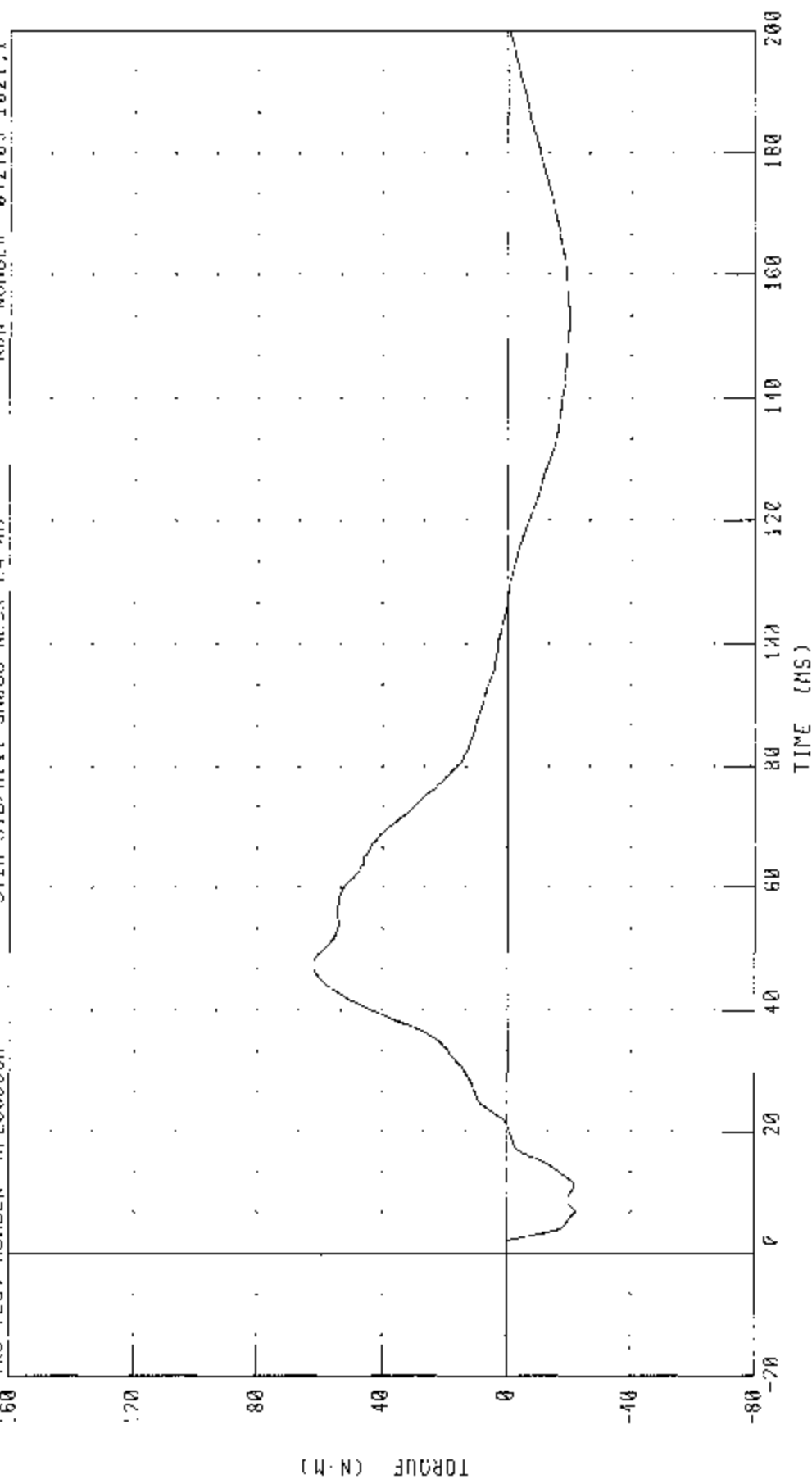
CHANNEL NEKYI FILTER CH. CLASS 1000

PEAK DATA 902.73 N @ 53.14 MS; -279.97 N @ 149.52 MS

572M H3/SID DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NFL06B06A 572M SID/HILL SN066 NECK CA 06 RUN NUMBER 042103 1021,1



CHANNEL: NEKXM FILTER: CH. CLASS: EDW

PEAK DATA: 61.00 N H 47.36 MS, 22.12 N H 6 6 30 MS

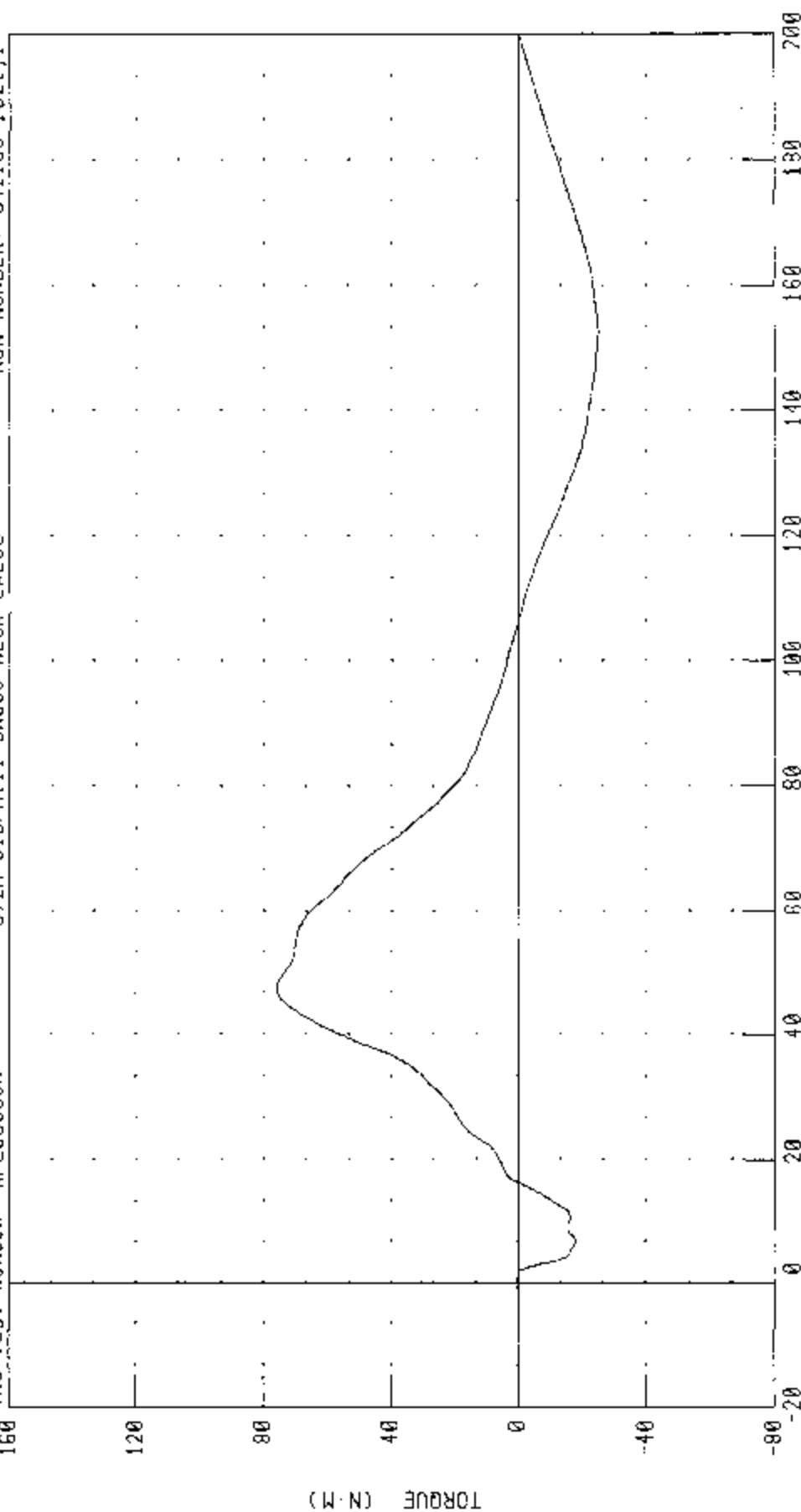
572M H3/SID DUMMY CALIBRATION --- LEFT LATERAL NECK TEST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL06506A

572M SID/HIII SN066 NECK CAL06

RUN NUMBER: 042103 102L,1



TIME (MS)

CHANNEL: NFKOM FILTER: CH. CLASS: 600

PEAK DATA: 75.04 N.M @ 47.68 MS, -25.02 N.M @ 152.88 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

02-APR-03

LEFT SIDE CONFIGURATION

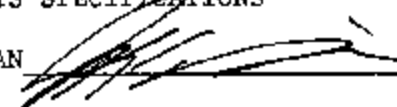
TRC INC.

TEST NO: STLO6606

572F SID SNO66 L.THORAX CAL06

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	44.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	40.6 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	42.9 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	20.2 G

TEST MEETS SPECIFICATIONS

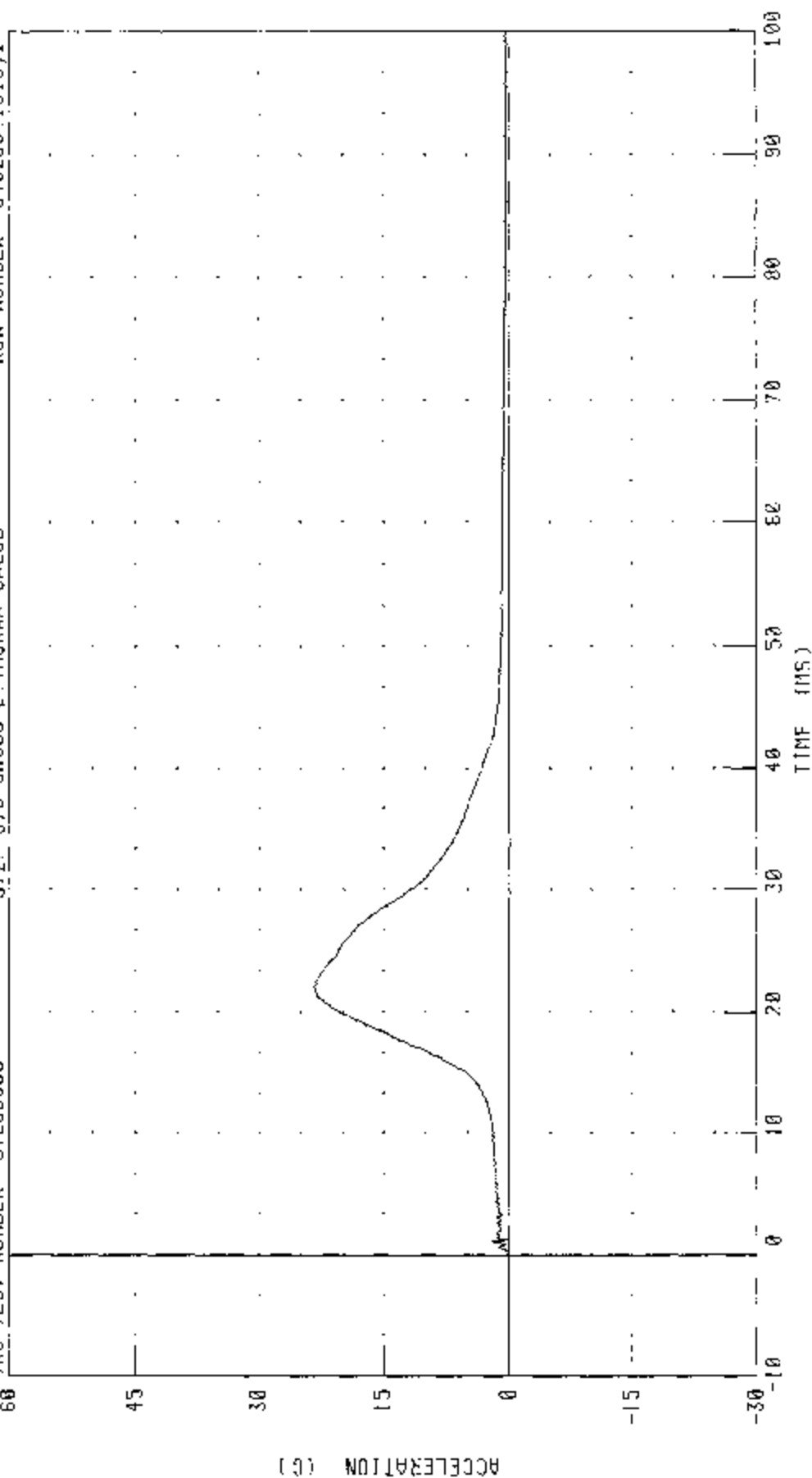
TECHNICIAN 

RUN NUMBER: 040203.1515;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENULUM DECELERATION

IRC TEST NUMBER: STL06606 572F SJD SN066 L THORAX CAL06 RUN NUMBER 040203.1515.1

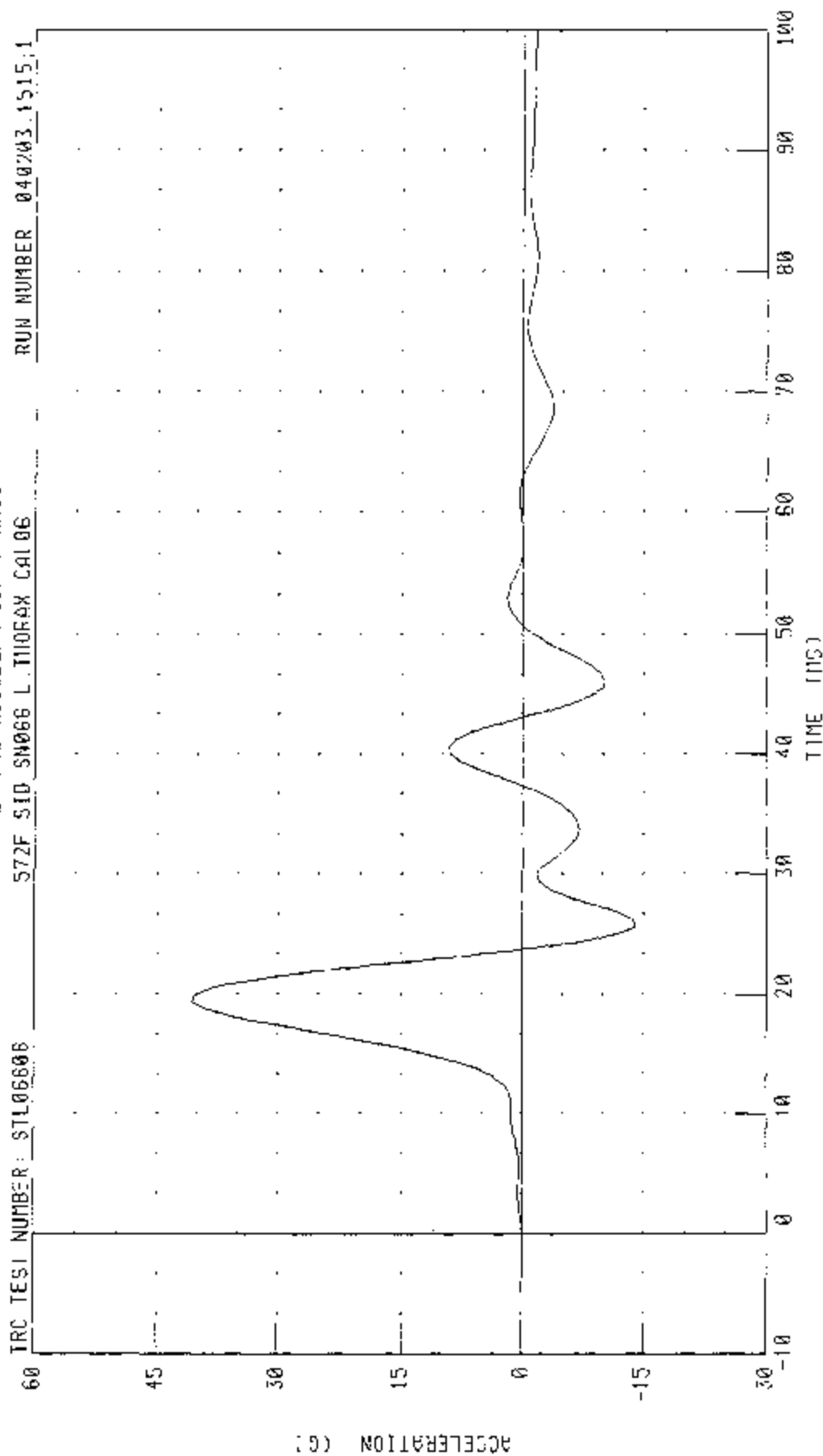


CHANNEL: PENXC FILTER: VII. CLASS 1000

PEAK DATA: 23 28 6 22 00 MS, 0 00 0 0 -7.60 MS

PART 572-F S.I.O. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS



PEAK DATA: 40.036 @ 19.30 MS; 13.953 @ 25.53 MS

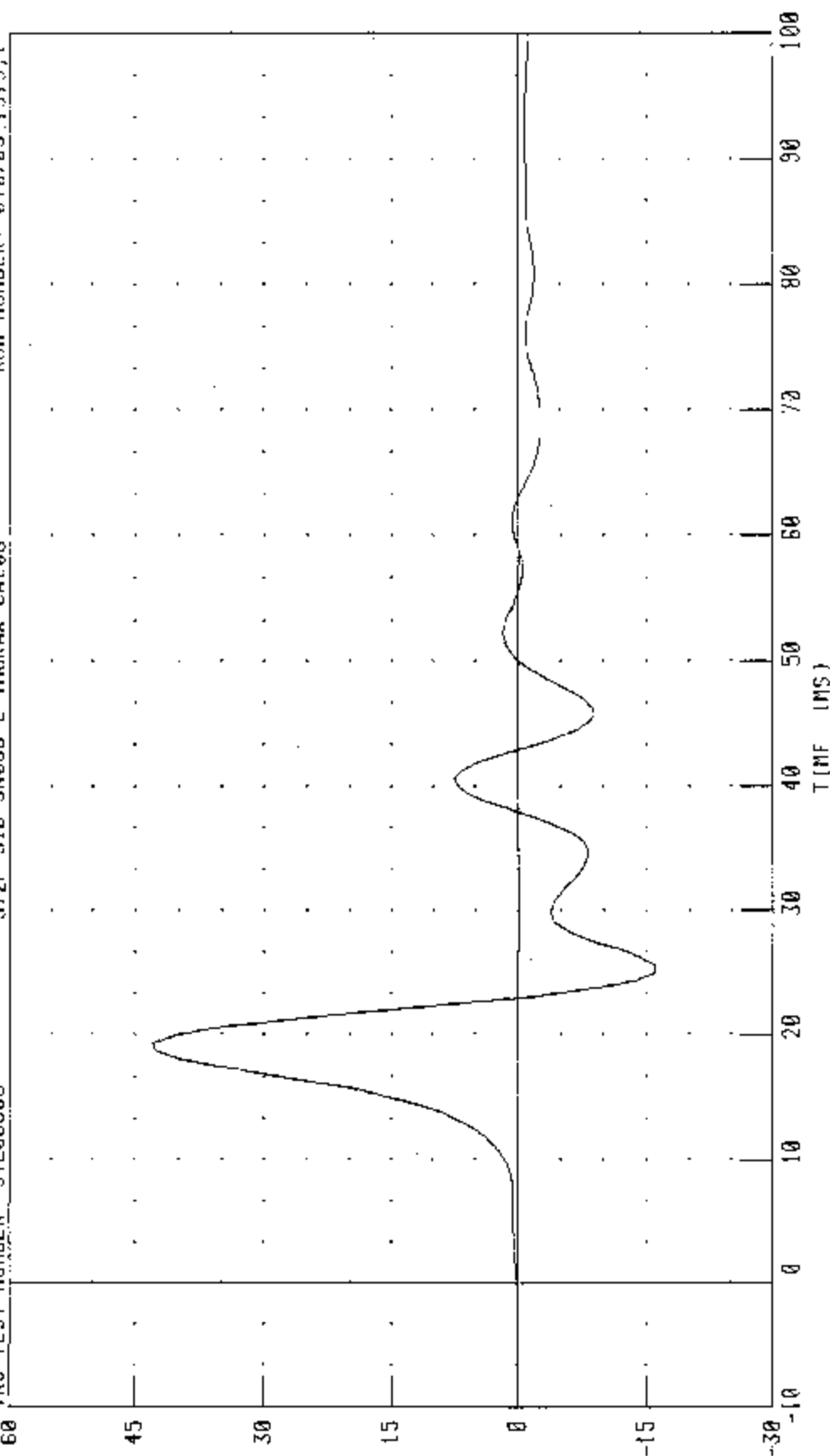
CHANNEL: LURYG FILTER: F.R. 100

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)
 LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: STL06606

572F SID SN066 L THORAX CAL06

RUN NUMBER: 040703.1515.1



TIME (MS)

CHANNEL: LLRYG FILTER: FIR 100

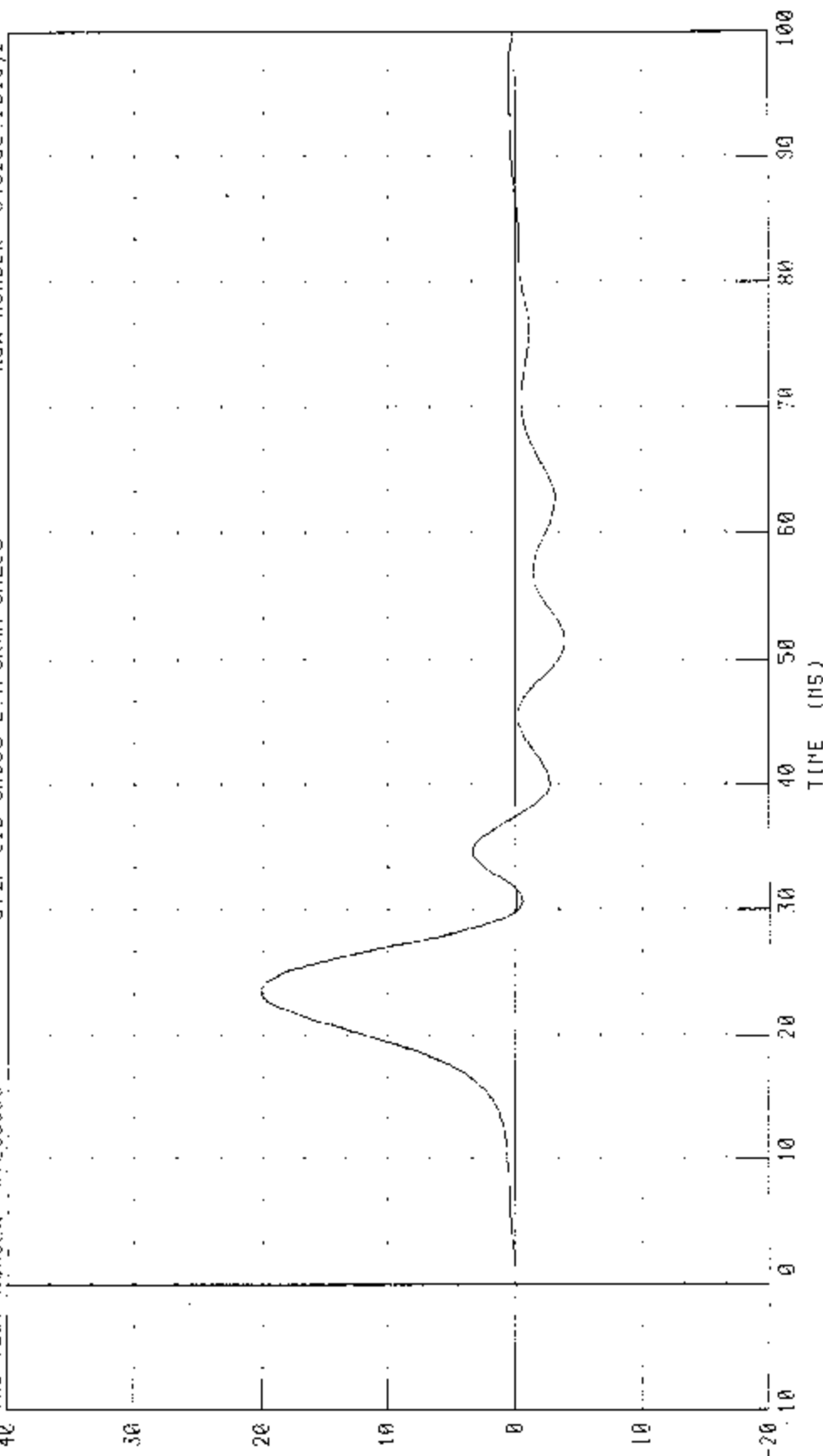
PEAK DATA: 42.92 G @ 19.30 MS, -16.10 G @ 25.63 MS

ACCELERATION (G)

PART 572-F S.I.3 THORAX CALIBRATION (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: S1106606 572F STD S0666 L THORAX CAL06 RUN NUMBER: 040203.1515.1



ACCELERATION (G)

C-57

030408-

CHANNEL: 412YG

FILTER: FIR 100

TIME (MS)

PEAK DATA 20.23 G @ 23.75 MS, -3.85 G @ 51.25 MS

Transportation Research Center Inc.

572B Abdomen Compression Test

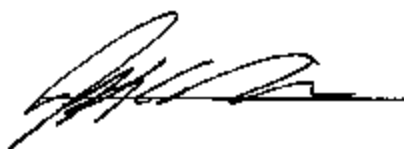
HIII SJD Serial No. 066 Calibration No. 06 - 1

Test Date 04/03/2003

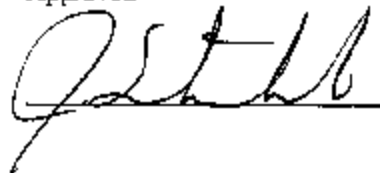
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	48 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	6.9 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.03.2003 12:42:46 5

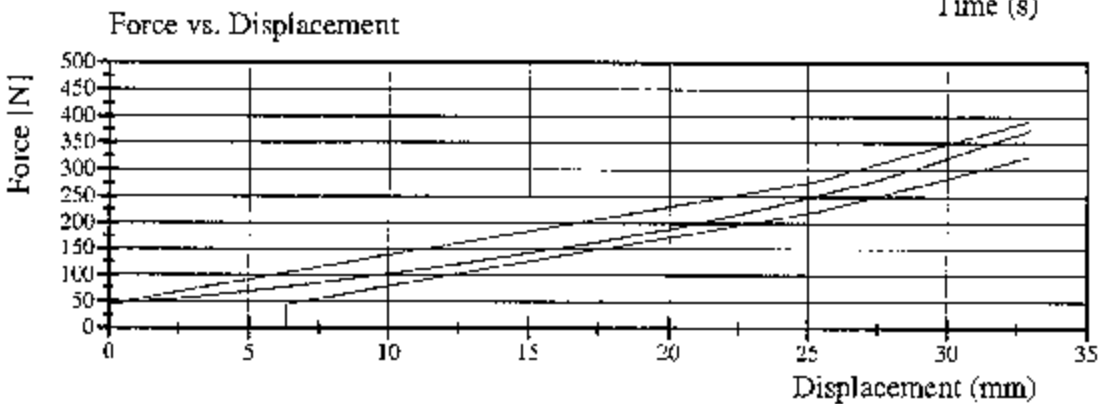
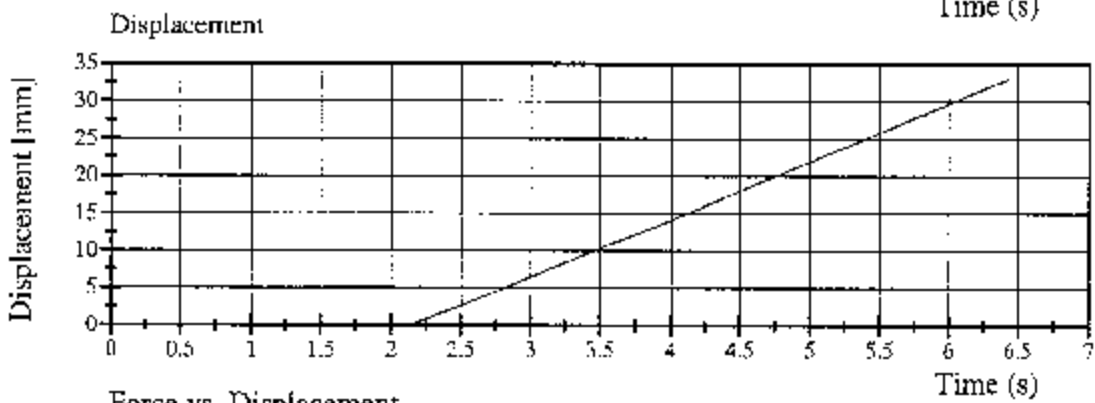
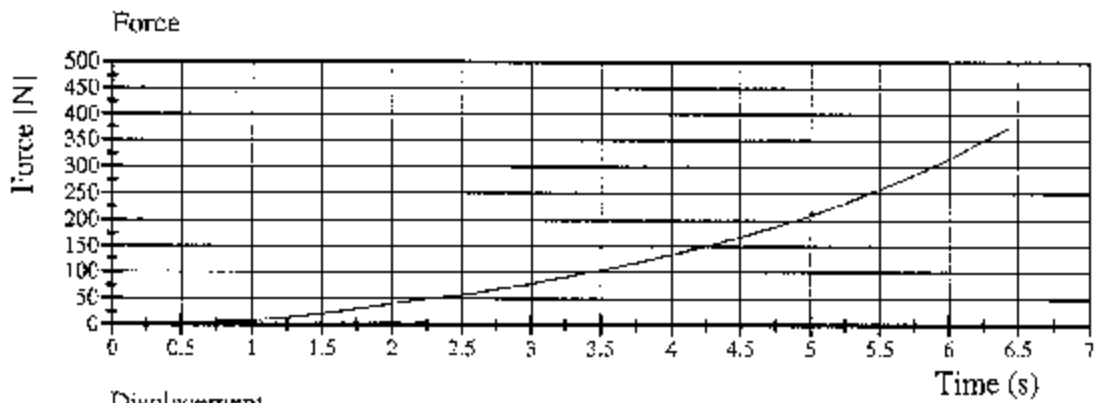


Transportation Research Center Inc.

572B Abdomen Compression Test

HTI SID Serial No. 066 Calibration No. 06 - 1

Test Date 04/03/2003



04.03.2003 12:42:47 5



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 03-Apr-03

TRC, INC.

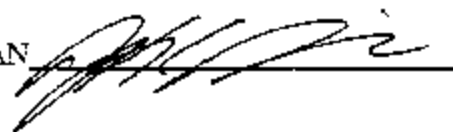
TEST NO: 066C06TF1

572B SN 066 TORSO FLEX CAL 06

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 - 70 %	49 %
FORCE AT 0 DEG. FLEXION	-27 - 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 - 151 N	124.6 N
FORCE AT 30 DEG OF FLEXION	151 - 205 N	173.5 N
FORCE AT 40 DEG OF FLEXION	205 - 258 N	222.4 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	7 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

02-APR-03

LEFT SIDE CONFIGURATION

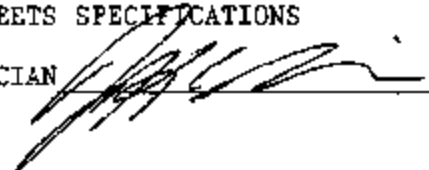
TRC INC.

TEST NO: SPL06606

572F SN066 LEFT PELVIS CAL06

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	44.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.28 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	53.2 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.1 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 040203.1508;1

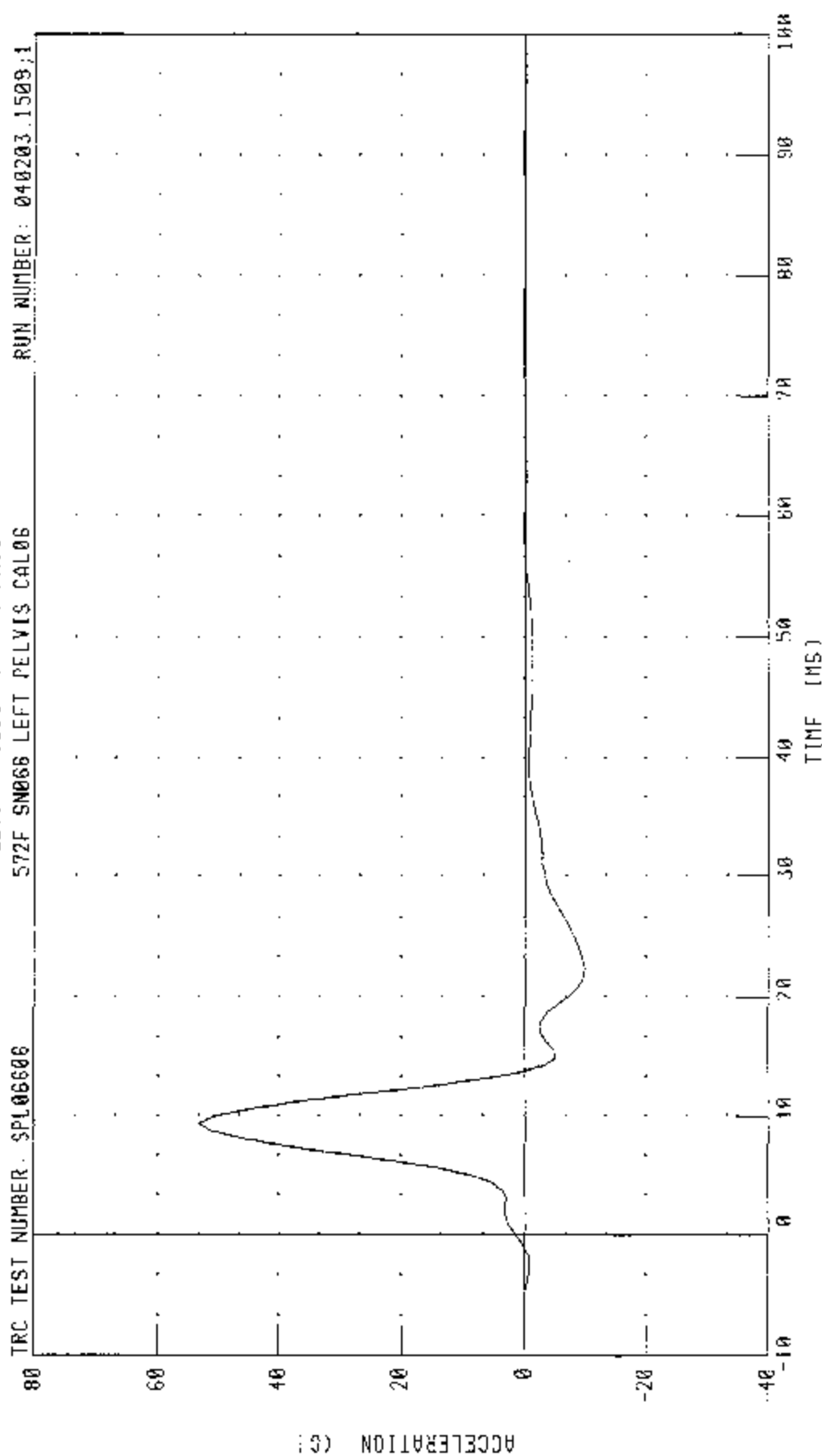
PART 572-F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06600

572F SN066 LEFT PELVIS CAL06

RUN NUMBER: 040203.1509.1



TIME (MS)

CHANNEL PELVIS FILTER: FIR 100

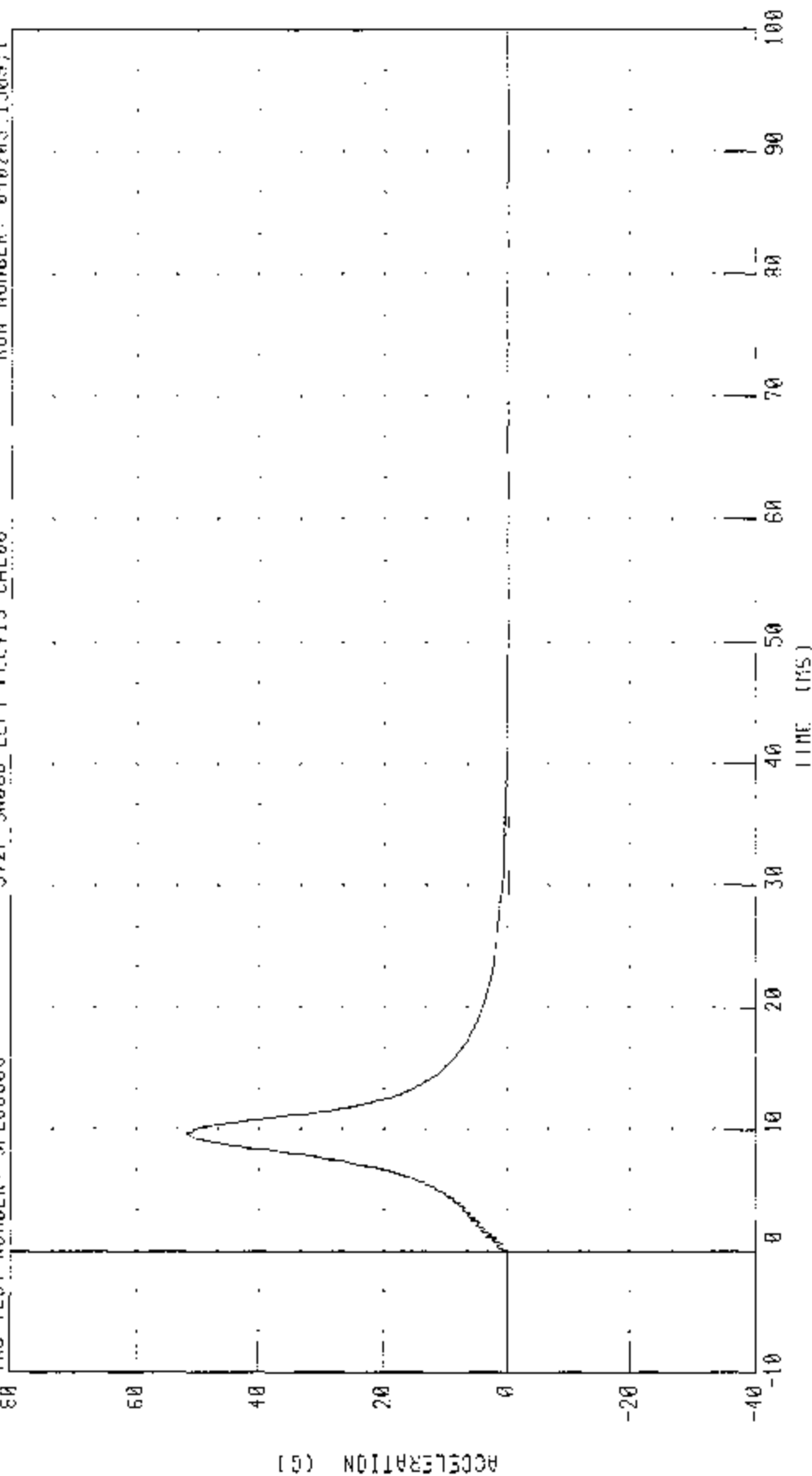
PEAK DATA: 53.23 G @ 9.37 MS; 3.82 G @ 22.50 MS

ACCELERATION (G)

PART 572 F S I D PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL066600 572F SN066 LEFT PELVIS CAL06 RUN NUMBER: 040203 1509.1



CHANNEL: PENXC FILTER: 0.1 CLASS 1000

PEAK DATA: 51 70 C 0 9 68 MS; -0 12 C 0 70 16 MS

TRANSPORTATION RESEARCH CENTER INC.

THORACIC SHOCK ABSORBER TESTS

SIDE IMPACT DUMMY

03-FEB-03

TRC INC.

572F SN066 DAMPER TEST CAL02

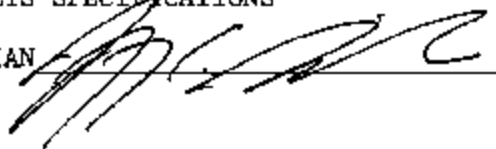
TEST NUMBERS: DP06602A, DP06602B, DP06602C

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY		10 - 70 %	46.0 %
VELOCITY	FORCE	667 - 925 N	797 N
2.70 M/S	DISPLACEMENT	29.7 - 34.5 MM	29.9 MM
VELOCITY	FORCE	1733 - 2100 N	1877 N
4.26 M/S	DISPLACEMENT	31.6 - 37.2 MM	35.9 MM
VELOCITY	FORCE	3703 - 4402 N	4387 N
6.07 M/S	DISPLACEMENT	33.3 - 39.5 MM	37.8 MM

DAMPER SETTING = 5.0

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 020303.0731;1

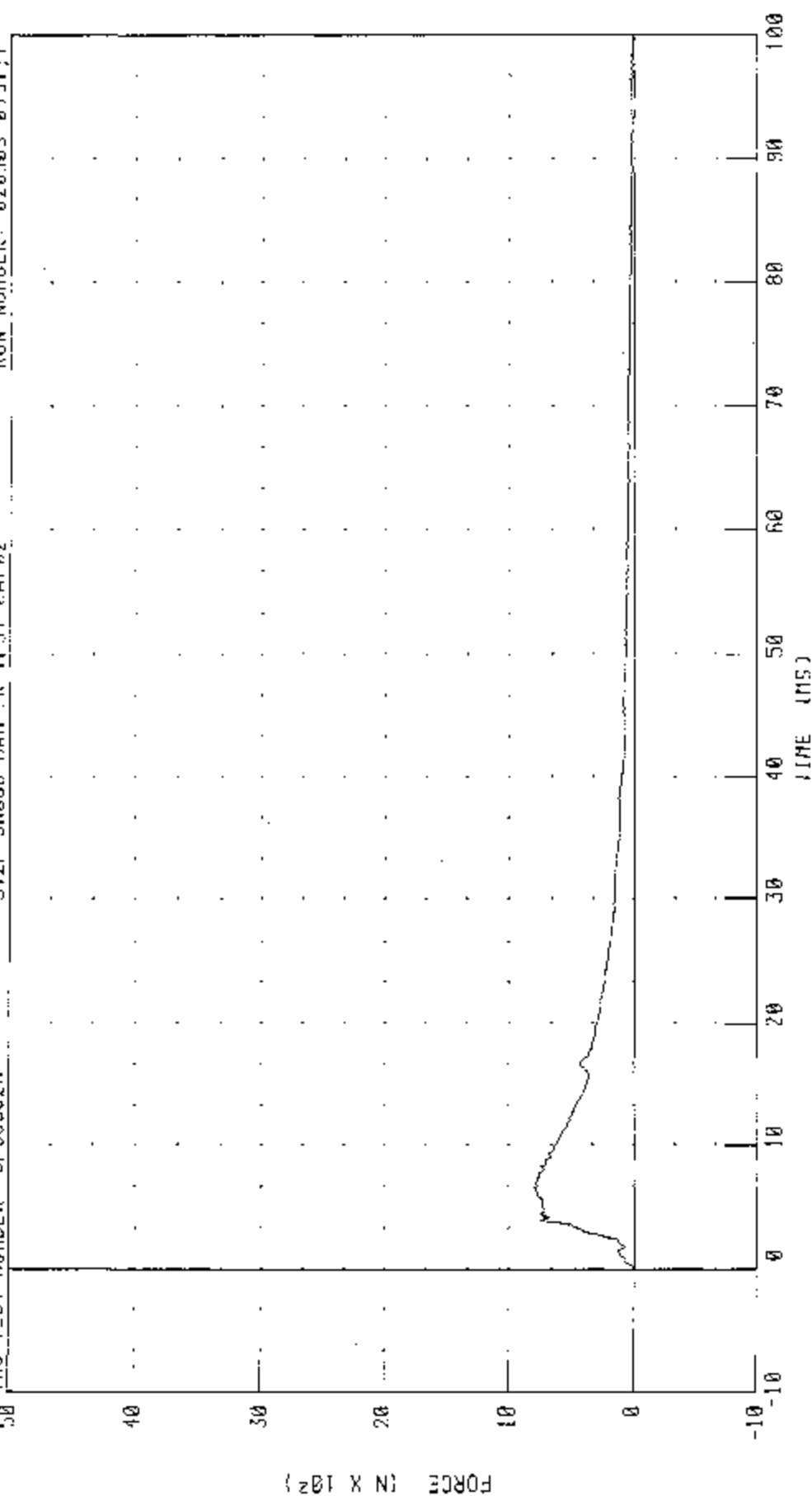
PART 572-F S.I.D. THERACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06602A

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020403 07/11/1



CIRCUIT: DAMPF FILTER: CH. CLASS 1000

TIME (MS)

PLAK HALL: 790.77 M H 6.40 MS, 2.00 M H -10.00 MS

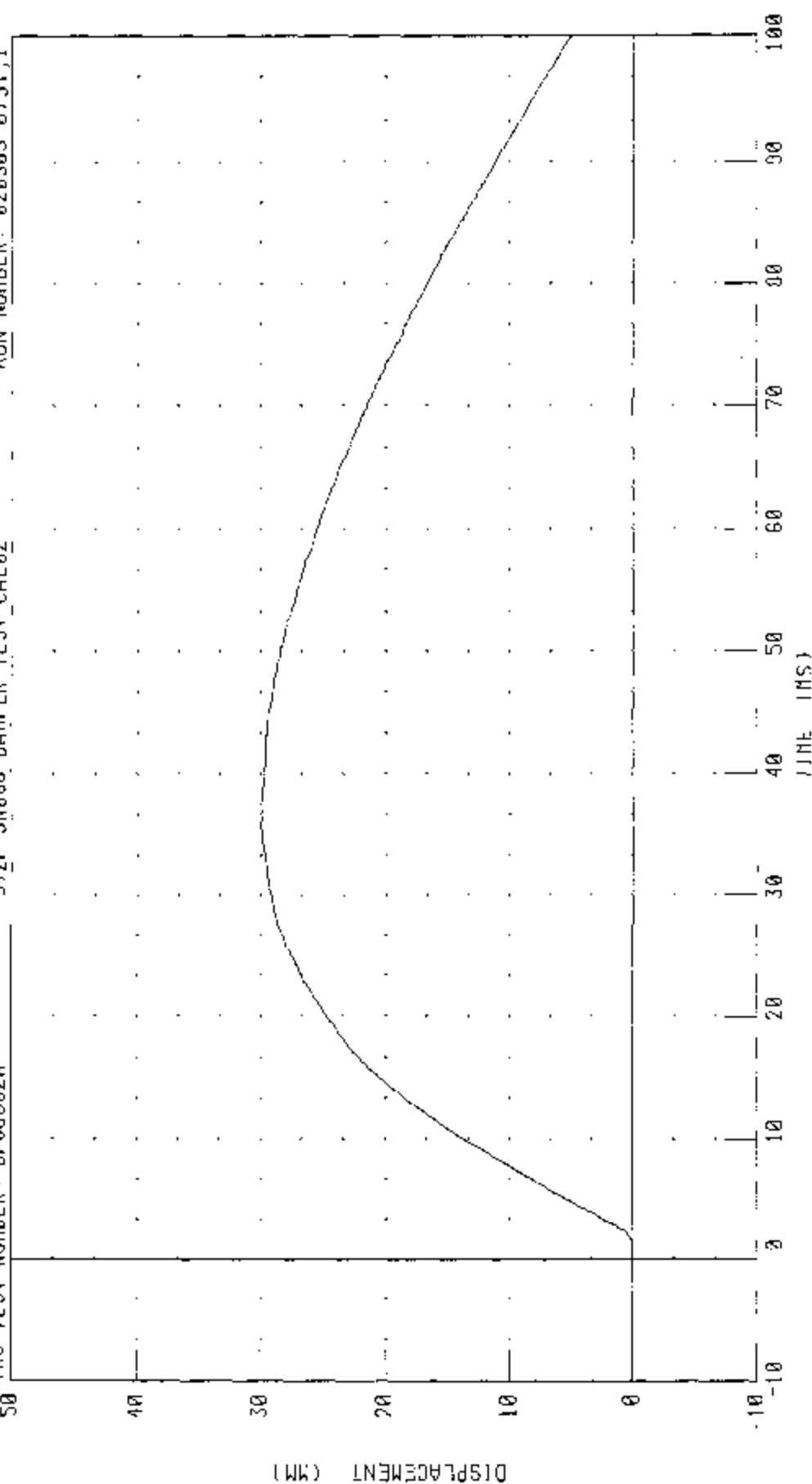
PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (3.0 M/SEC)

SHOCK ABSORBER DISPLACEMENT

572F SH066 DAMPER TEST CAL02

TRC TEST NUMBER: DP06602A

RUN NUMBER: 020303 0731,1



TIME (MS)

CHANNEL: CSTVD FILTER: CH. CLASS 1000

PEAK DATA: 29.94 MM @ 36.24 MS, 0.00 MM @ -1.10 MS

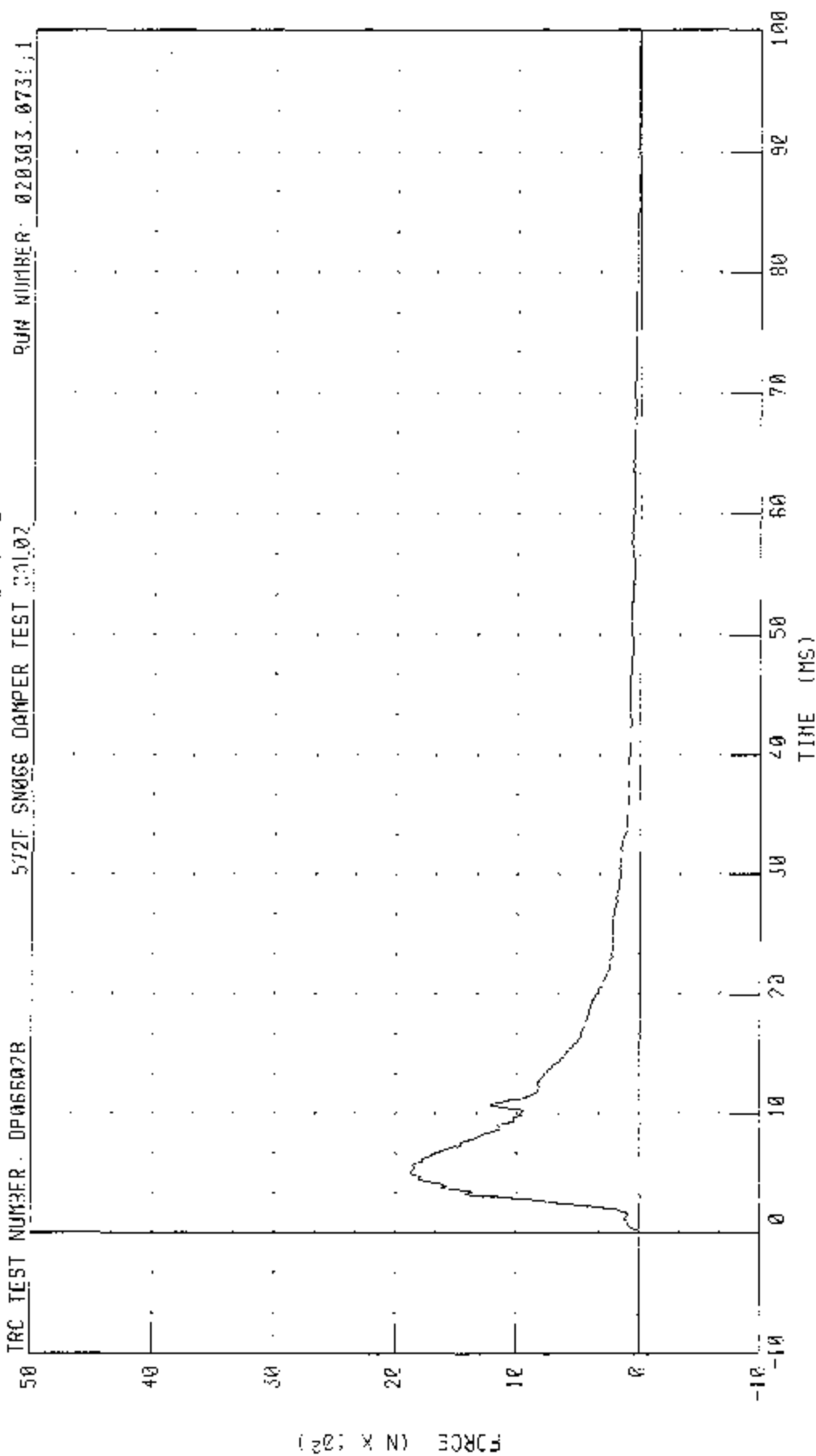
PART 572-F S.I.D. THORACIC SHOCK ADSORBER CALIBRATION (4.3 N/SEC)

SHOCK ADSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06507B

572F SN066 DAMPER TEST 3102

RUN NUMBER: 020303.07311



CHANNEL: DMPF FILTER: CH. CLASS 1000

TIME (MS)

PEAK VALUE: 187676 N X 10^3, 2.32 N X 10^3, -8.96 MS

PART 572-F S I D. THORACIC SHOCK ABSORBER CALIBRATION (4 3 M/SEC)

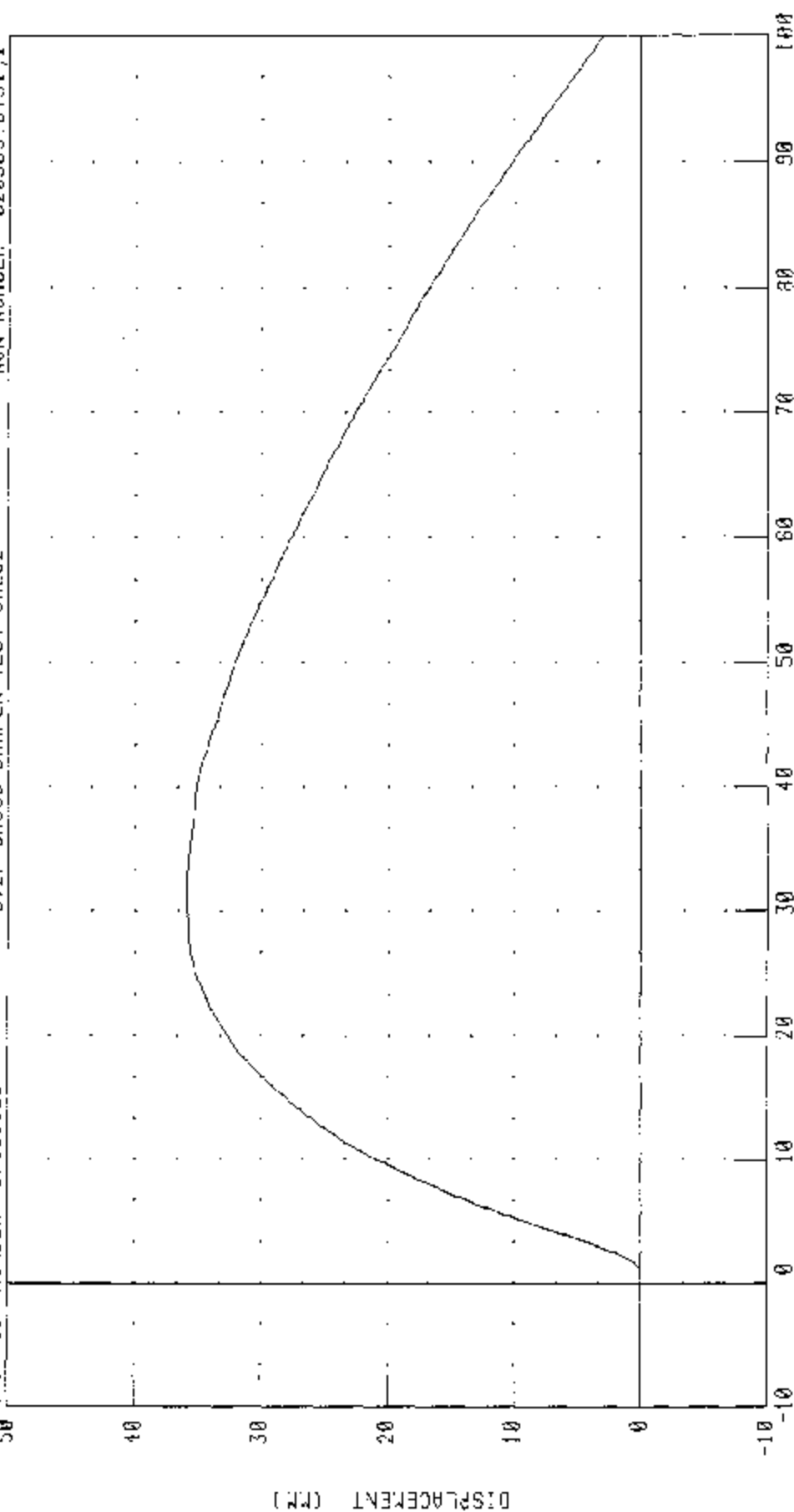
SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06602B

572F SM066 DAMPER TEST CAL02

50

RUN NUMBER: 020303.0731;1



CHANNEL: CSTYD FILTER: CH CLASS 1000

TIME (MS)

PEAK DATA: 35.94 MM @ 31.12 MS, 0.00 MM @ -7.68 MS

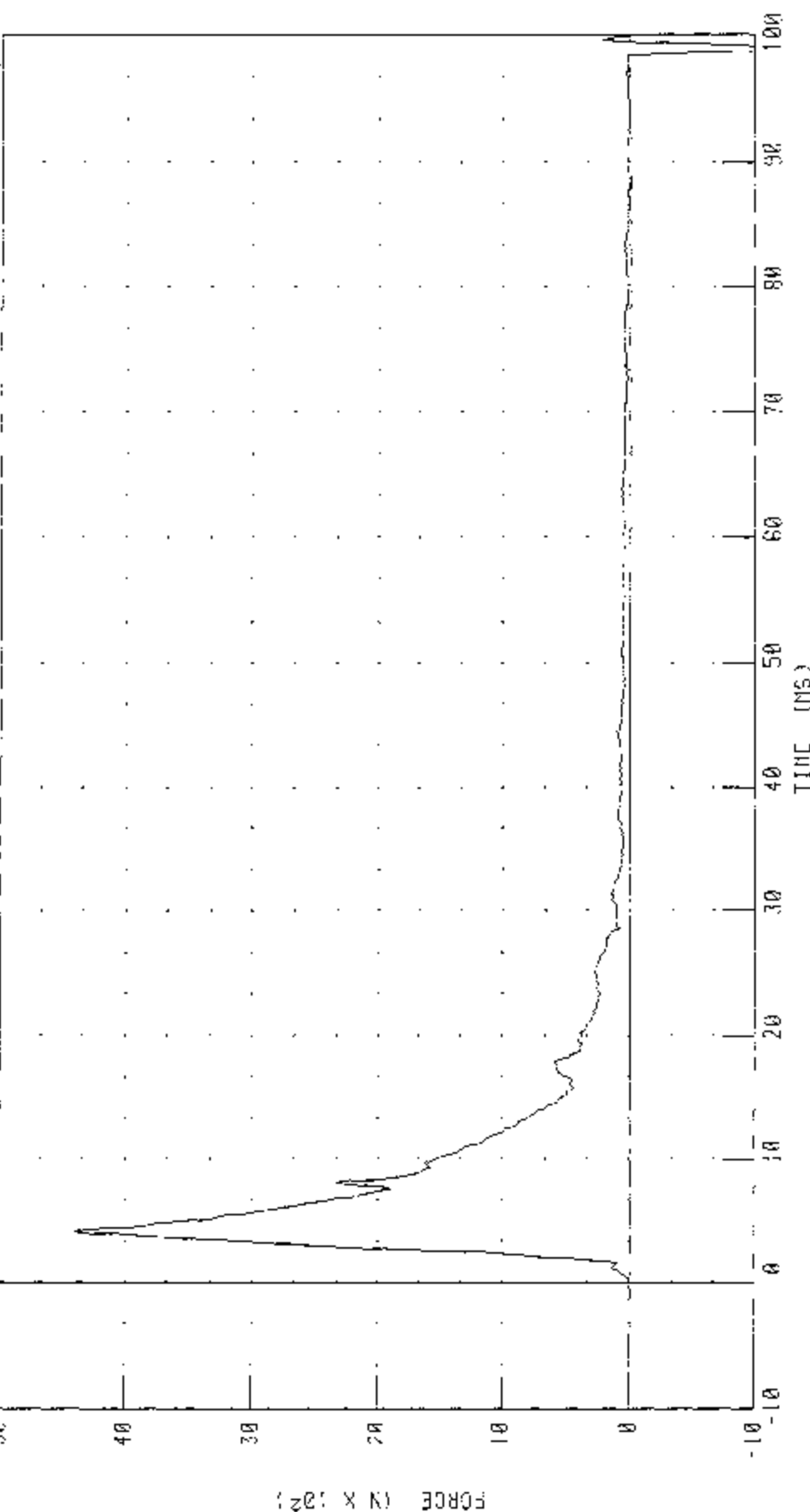
PART 572-F S J D. THORACIC SHOCK ABSORBER CALIBRATION (G 1 M/SEC)

SHOCK ABSORBER RESISTIVE FORCE

TRC TEST NUMBER: DP06602C

572F SN066 DAMPER TEST CALIB

RUN NUMBER: 020303 0732,1



CHANNEL: DAMPF FILTER: CH CLASS: 1000

PEAK DATA: 4387 36 N @ 4 16 MS; -16.55 36 H @ 94 88 MS

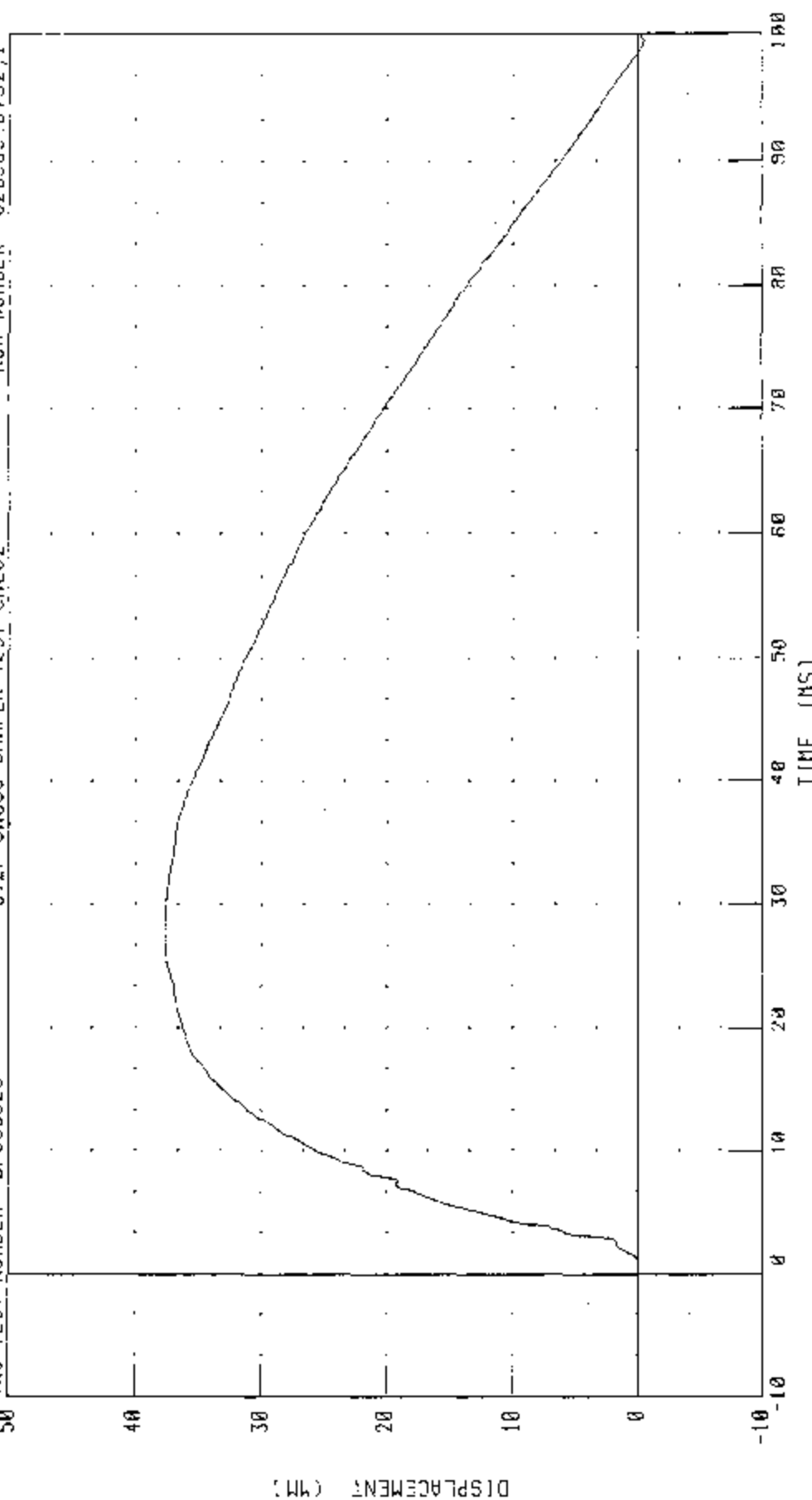
PART 572-F S I O. HYDRAVIC SHOCK ABSORBER CALIBRATION (6 ± M/SEC)

SHOCK ABSORBER DISPLACEMENT

TRC TEST NUMBER: DP06602C

572F SN066 DAMPER TEST CAL02

RUN NUMBER: 020303.0732.1



CHANNEL: CS1YD FILTER: CH CLASS 100K

TIME (MS)

PEAK DATA: 57.76 MM @ 27.76 MS; -0.52 MM @ 99.55 MS

Calibration Test Results

Post-Test

STD-HIII: 028

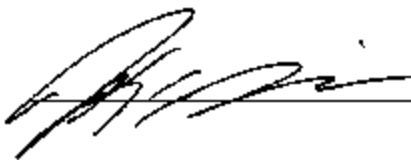
Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was not tested at this time.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

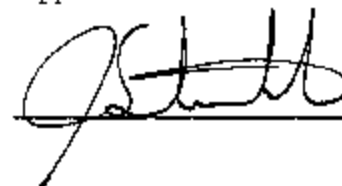
Transportation Research Center Inc.
572F SID Dummy
External Dimensions
Serial No. 028 Calibration No. 04

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	896 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	504 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	233 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	514 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	373 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	172 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	170 mm	Yes
Difference Between Top & Bottom Rib Width from CL		<= 2.5 mm	2.0 mm	Yes

Technician



Approved



TRE

TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDIII SID DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

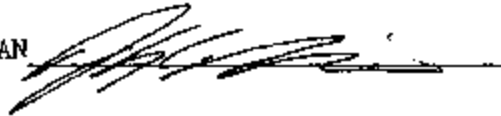
TEST NO. HDL02804

572M SID/HIII SN028 HEAD CAL04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	38.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	143.81 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-8.93 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN



RUN NUMBER: 042103.0934;1

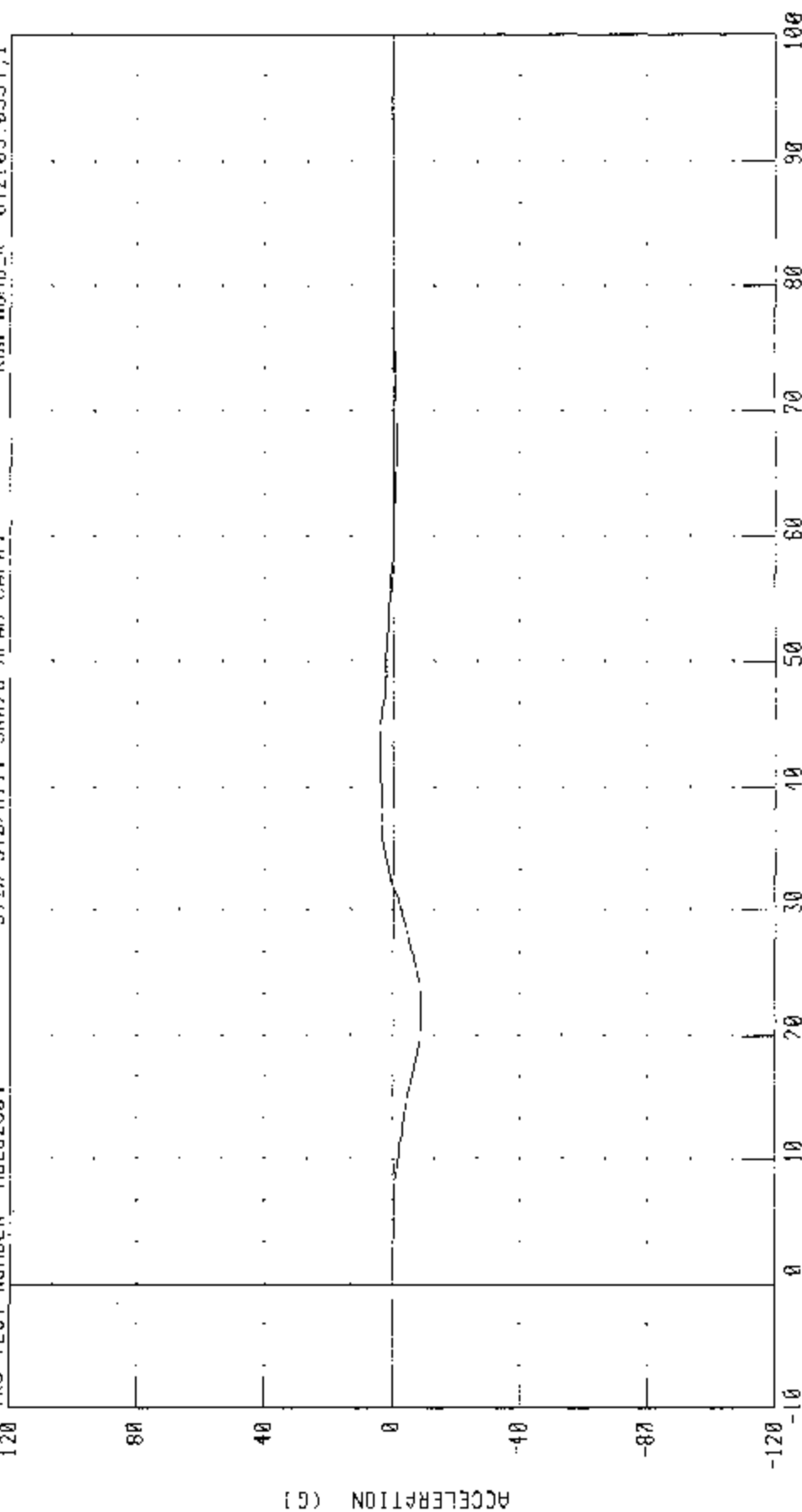
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT INTERAX HEAD DROP

HEAD ACCELERATION X AXIS

TRC TEST NUMBER: HDL02804

572M SID/HIII SNA28 HEAD CALIB

RUN NUMBER: 042:03.0934;1



CHANNEL: HEDXC FILTER: CH CLASS 1000

SPAK DATA 3.86 G @ 24 MS; -8.93 G @ 2.24 MS

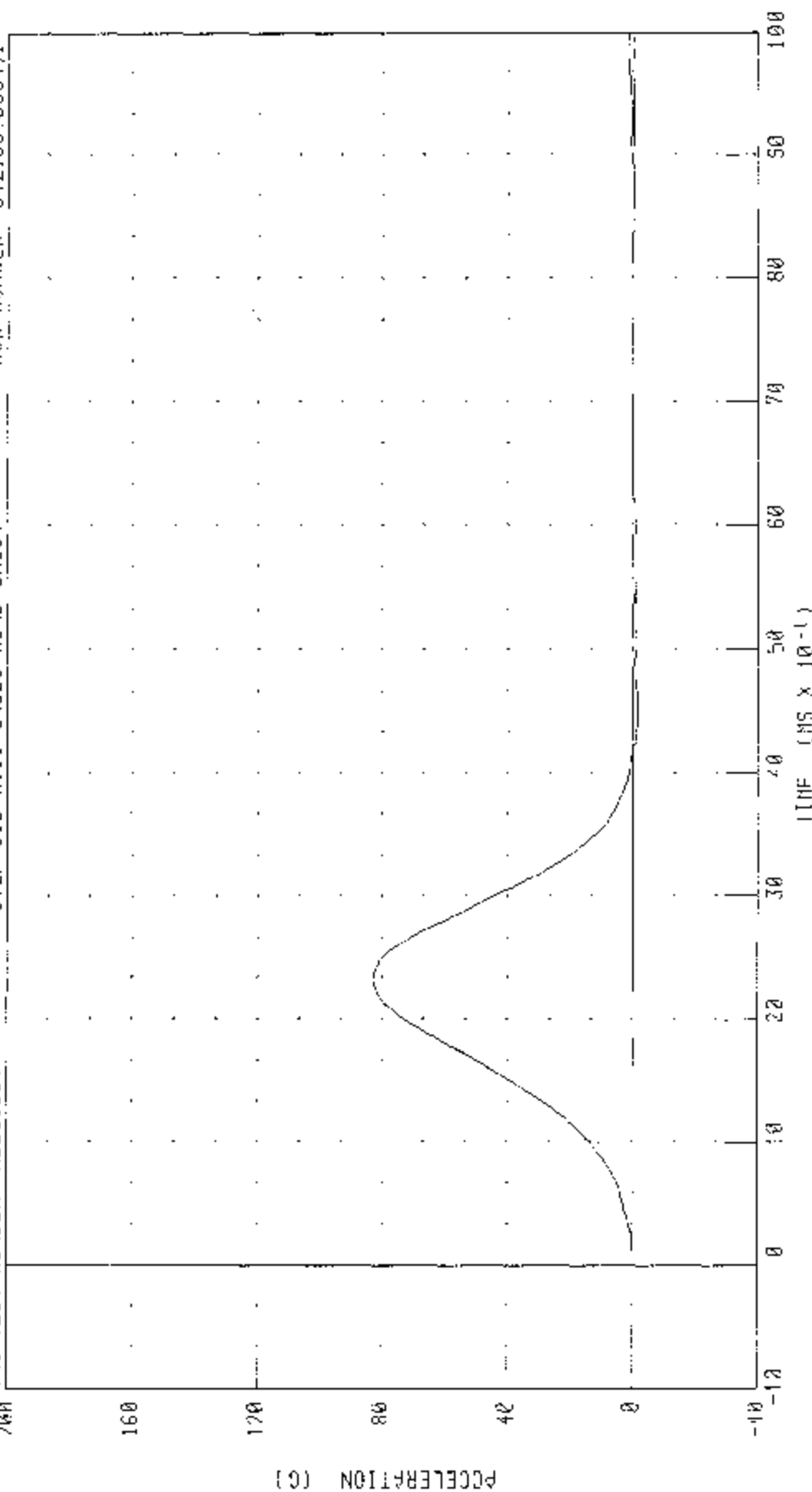
572P SID/HILL BUNNY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HDL02804

572P SID/HILL SN028 HEAD CA-04

RUN NUMBER: 042103.0934.1



CHANNEL: HEDYC

FILTER: CH CLASS 1000

TIME (MS X 10⁻¹)

PEAK DATA: 83.05 G @ 2.32 MS; -; 50 G @ 4.43 MS

572H SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

TRC TEST NUMBER: HDL02804

572M SID/HILL SN028 HEAD CAL04

RUN NUMBER 042103.0934,1

200

160

120

80

40

0

-40

-100

ACCELERATION (G)

TIME (MS X 10⁻¹)

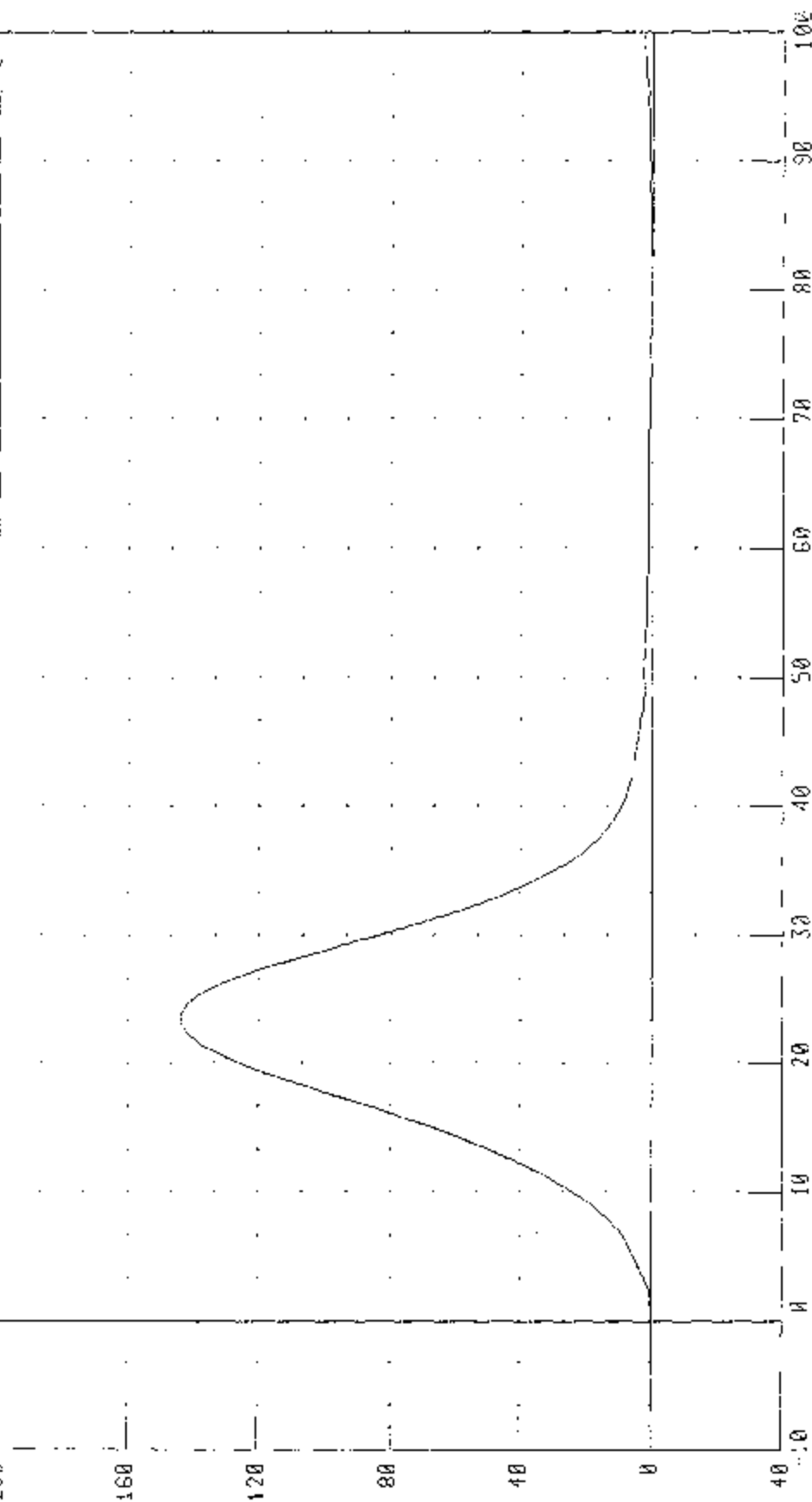
CHANNEL: HF07C FILTER CH. CLASS 1000

PEAK DATA: 117.44 MS, -1.39 G @ 5.60 MS

572N SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER H0L02604 572N SID/HILL SH020 HEAD CAL04 RUN NUMBER 042103 003421



ACCELERATION (G)

TIME (MS X 10⁻¹)

CHANNEL HEADG FILTER: CH. CLASS 1000

PF0K UN10 143 BI G @ 2.32 MS, @ 07 G @ -0.24 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

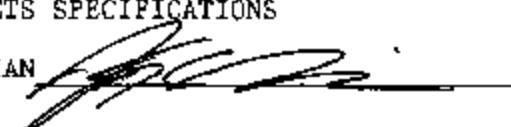
TEST NO. NFL02804

572M SID/HIII SN028 NECK CAL04

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY		10 - 70 %	35.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	6.99 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.43 M/S
	20 MS	4.12 - 5.10 M/S	4.84 M/S
	30 MS	5.73 - 7.01 M/S	6.71 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.12- 7.23 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	71.91 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	59.44 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NH	83.95 NH
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	52.56 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.48 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN

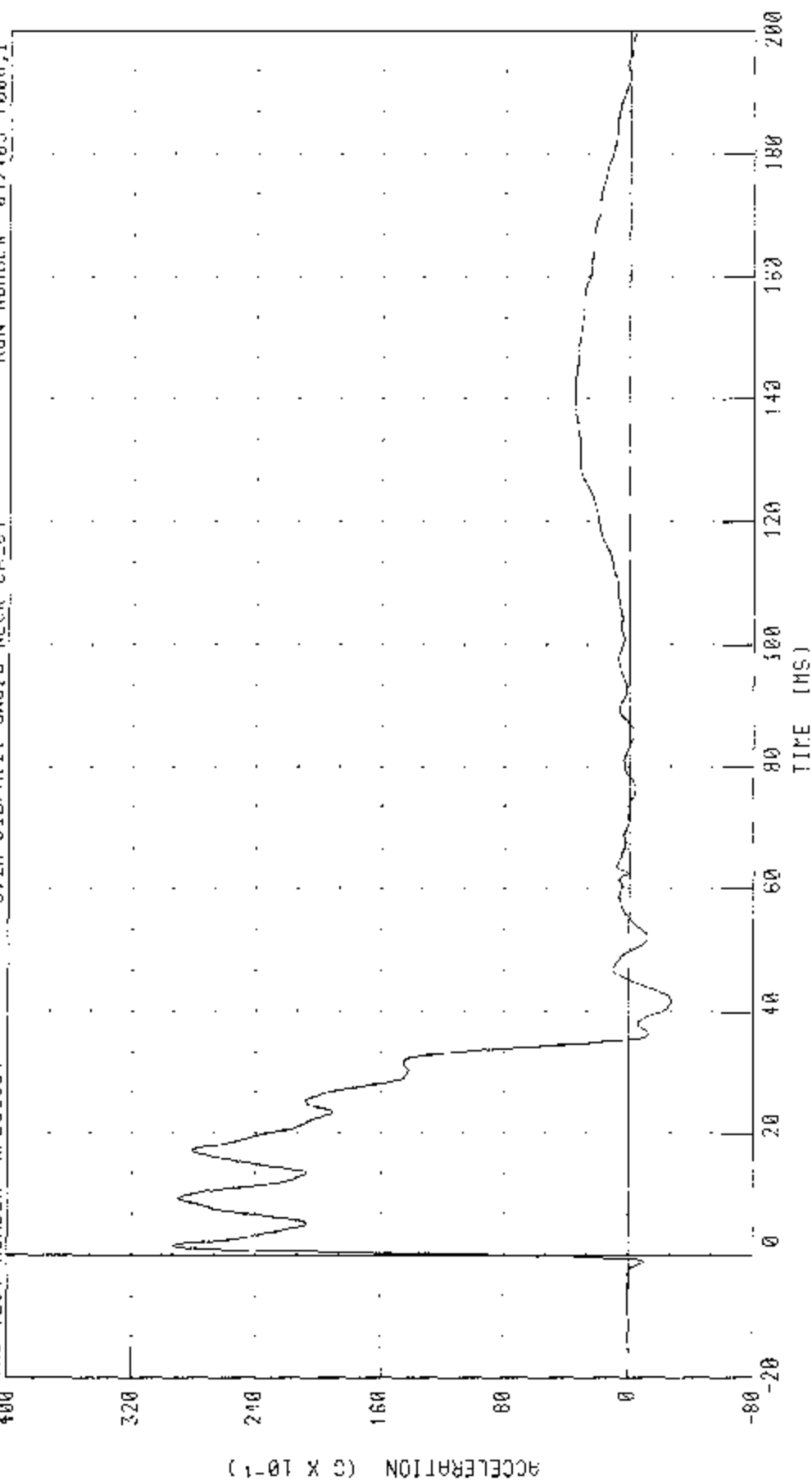


RUN NUMBER: 042103.1004;1

572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

PENDULUM ACCELERATION

TRC TEST NUMBER NFL02804 572M SID/HILL SN028 NECK CA_04 RUN NUMBER 047103 1006.1



CHANNEL: PENXIC FILTER: CH. CLASS 180

PEAK DATA: 28.25 G @ 1.60 MS, -2.71 G @ 11.81 MS

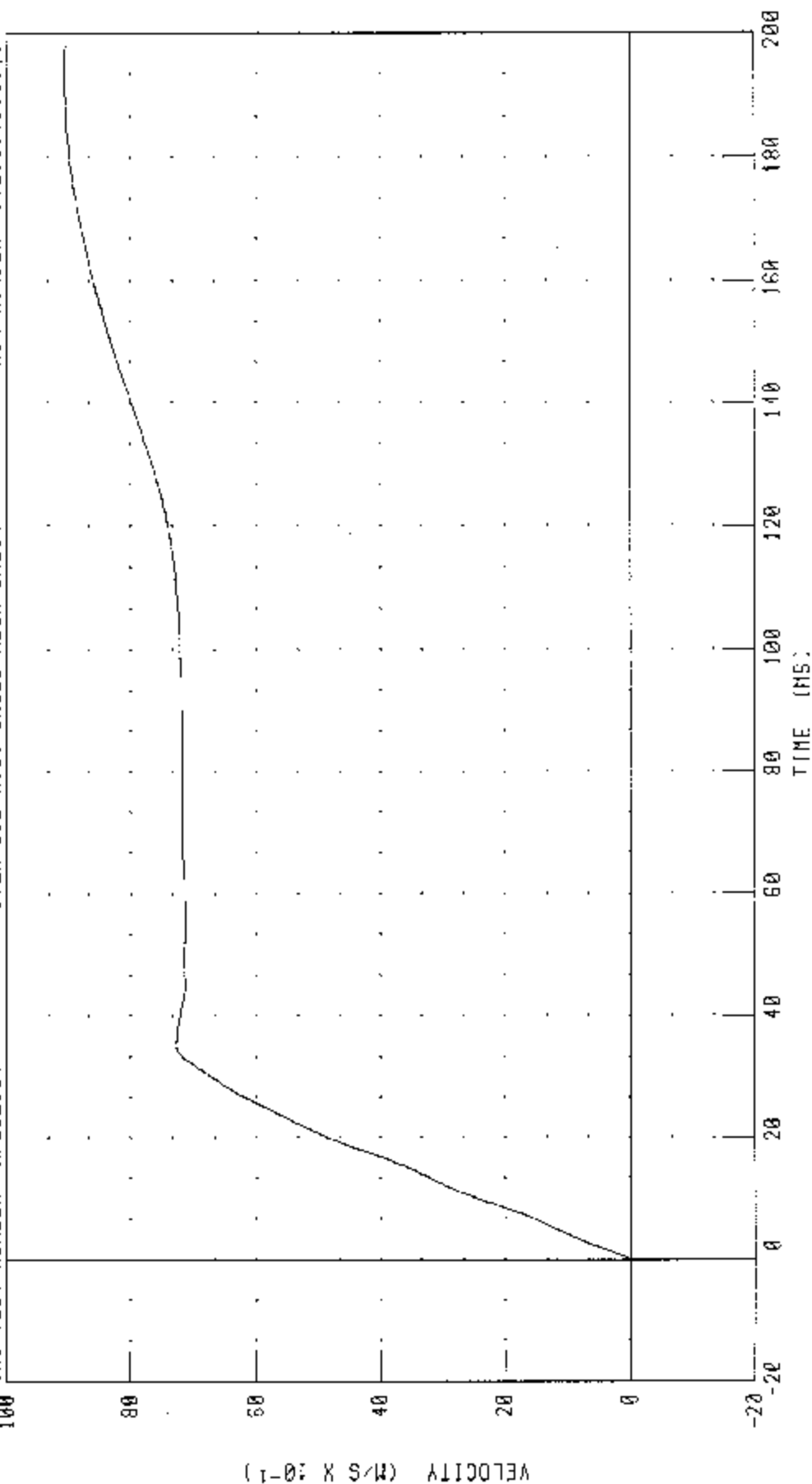
572M SID/HIII DUMMY CALIBRATION LEFT LATERAL NECK IES1

INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER NFL02804

572M SID/HIII SN028 NECK CAL34

RUN NUMBER 042103.1006.1



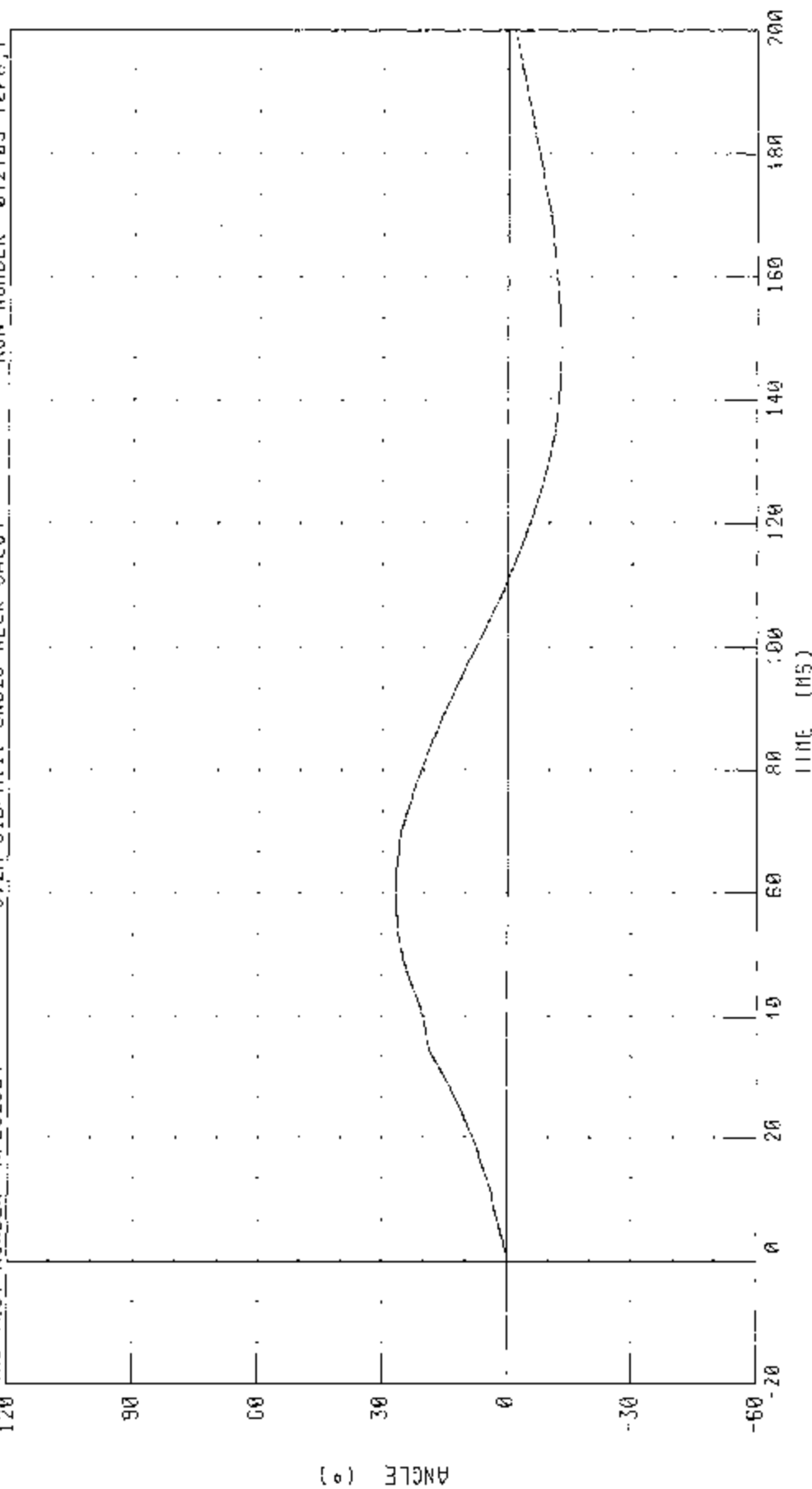
CHANNEL PENXYI FILTER CH CLASS 180

PEAK DATA 9 05 M/S @ 195.20 MS, -0.01 M/S @ 0 64 MS

572H SID/HIII GUMFY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER MFL02804 572H SID/HIII SN028 NECK CAL04 RUN NUMBER 042103 10P6.1



CHANNEL: BETA FILTER ON CLASS 60 PEAK DATA 20.65 @ 60.40 MS, -12.76 @ 147.57 MS

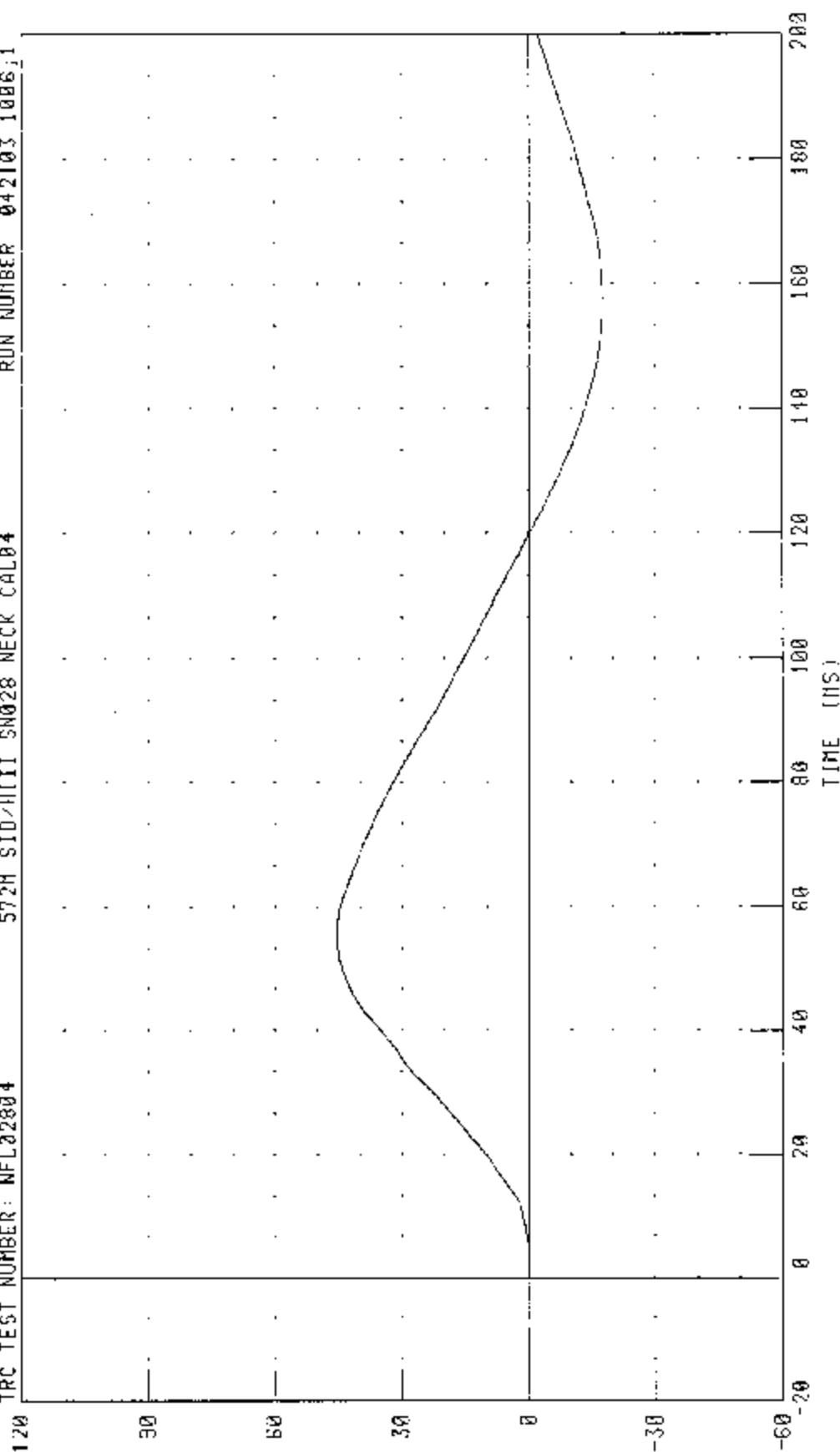
572M SID/HJII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL02804

572M SID/HJII SN028 NECK CAL04

RUN NUMBER 042103 1006.1



CHANNEL THETA FILTER CH. CLASS 60

PEAK DATA: 45 48 ° @ 55 60 MS. 17 58 ° @ 156 80 MS

ANGLE (°)

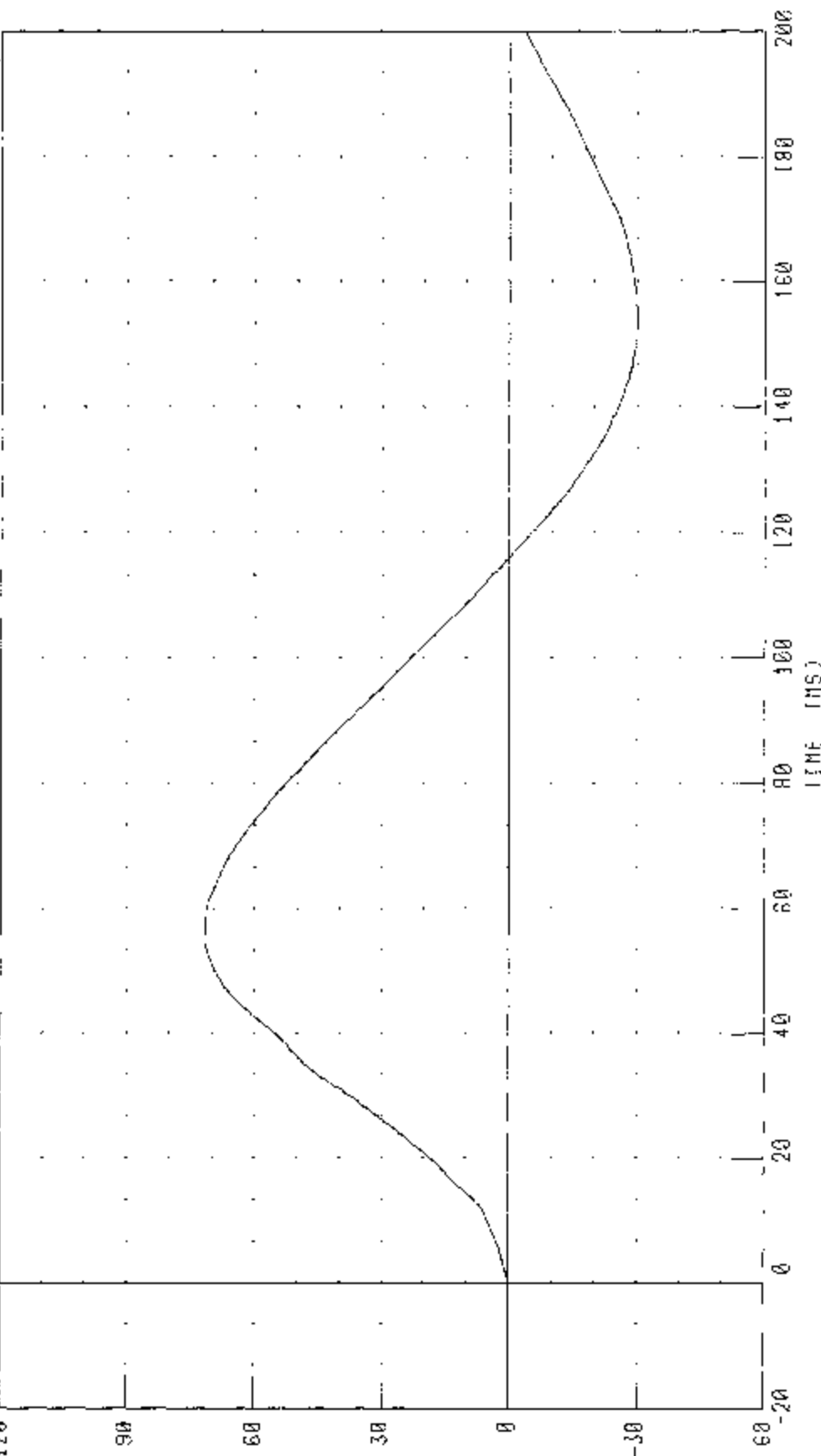
572M SID/HILL DUMMY COLLISION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

TRC TEST NUMBER: NF102804

572M SID/HILL SN028 NECK CA104

RUN NUMBER 042103 1006,1



ANGLE (°)

TIME (MS)

PEAK DATA 71 91 ° 0 56 64 MS: -30 31 ° 0 154.32 MS

CHANNEL 101AH FILTER: CH CLASS 60

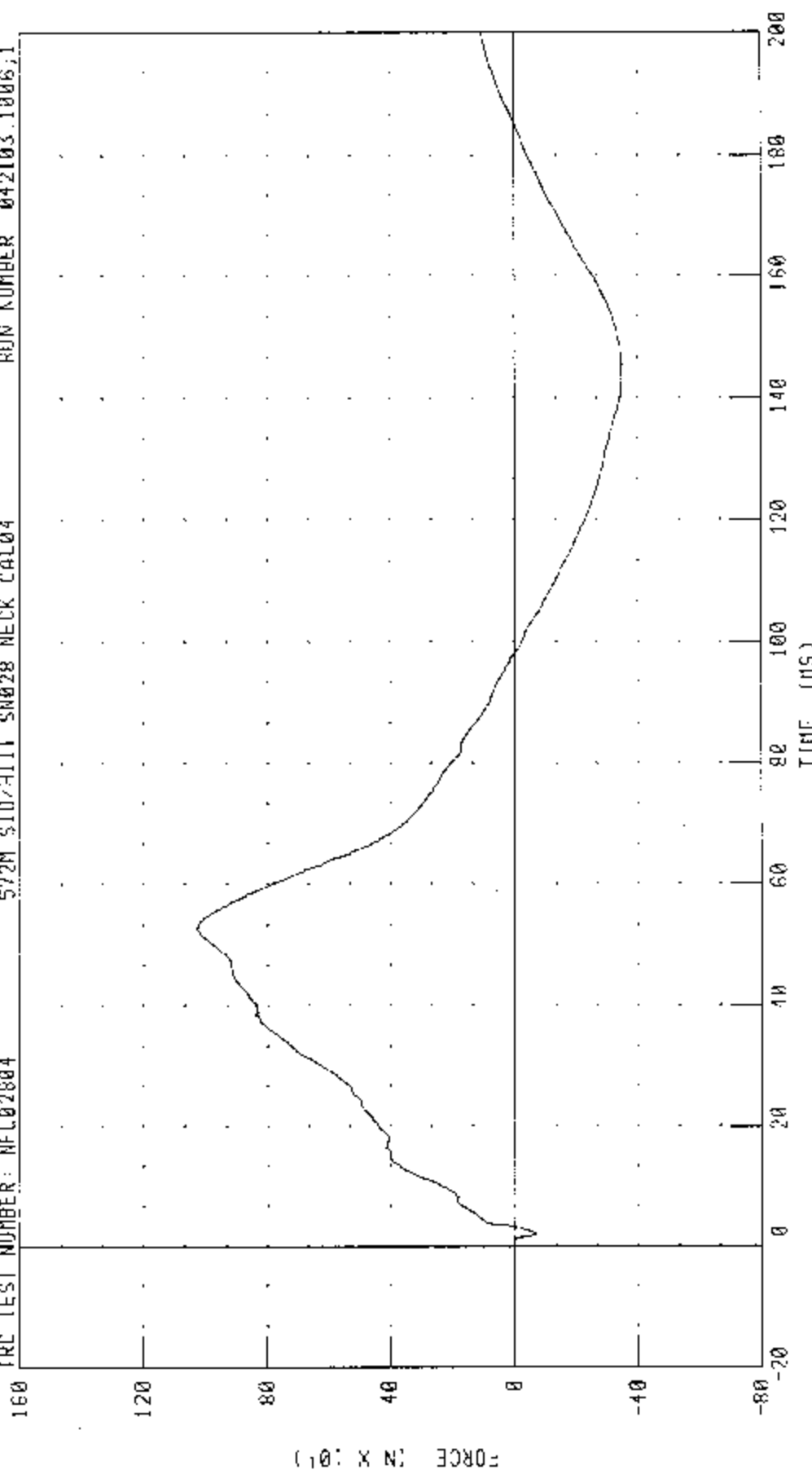
S72M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK FORCE Y AXIS

IRC TEST NUMBER: NFL02804

S72M SID/HIII SN028 NECK CAL04

RUN NUMBER 042103.1006,1



TIME (MS)

CHANNEL: NEKYI FILTER: CH CLASS: 1000

PEAK DATA: 1027.94 N @ 57.54 MS, 340.30 N @ 145.68 MS

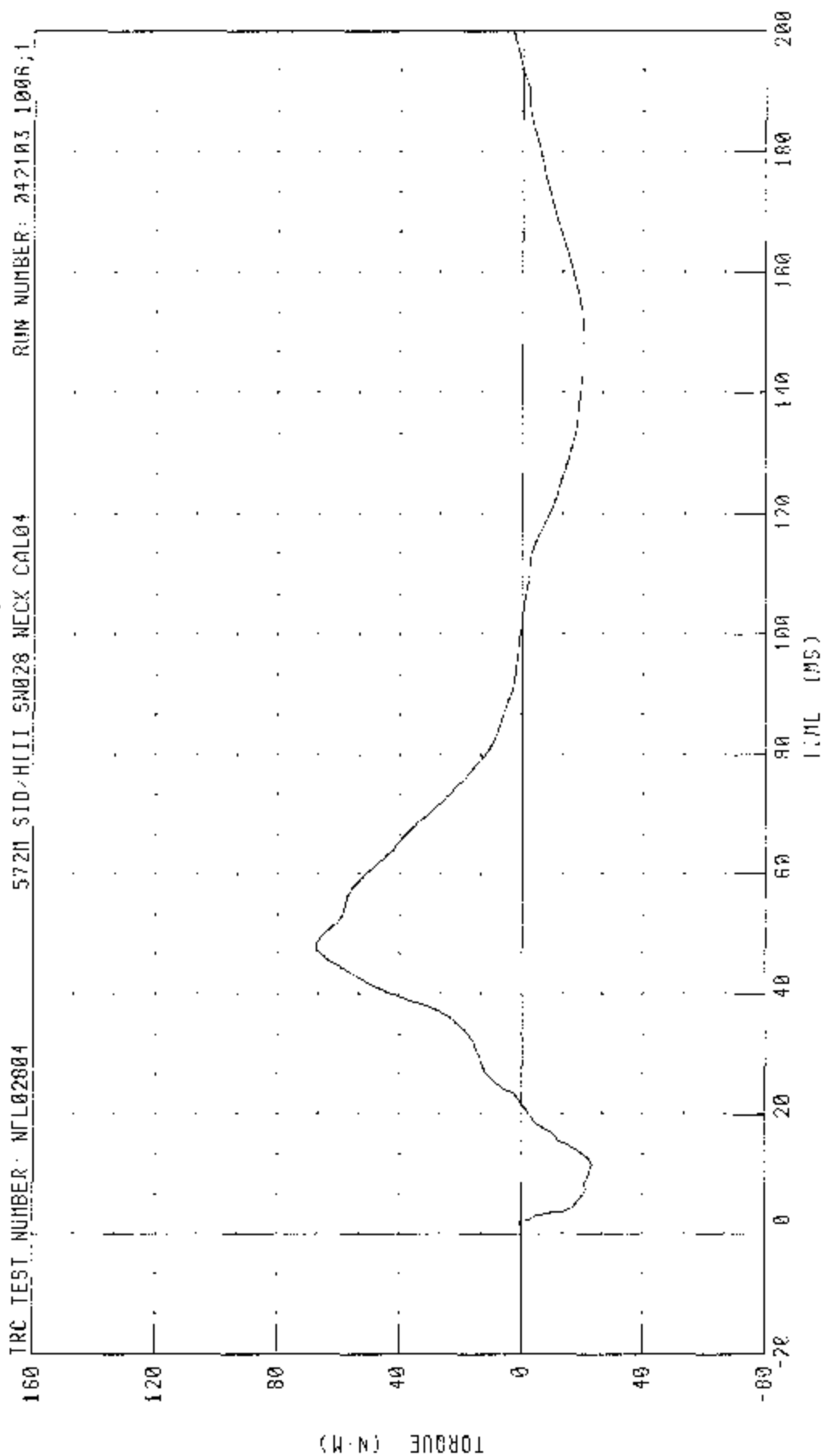
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NFL02804

572M SID/HILL SM028 NECK CAL04

RUN NUMBER: 242103 100R;1



TIME (MS)

CHANNEL: NECKXN FILTER: CH. CLASS 600

PEAK DATA 67.41 N M @ 40.00 MS; 23.00 N M @ 17.52 MS

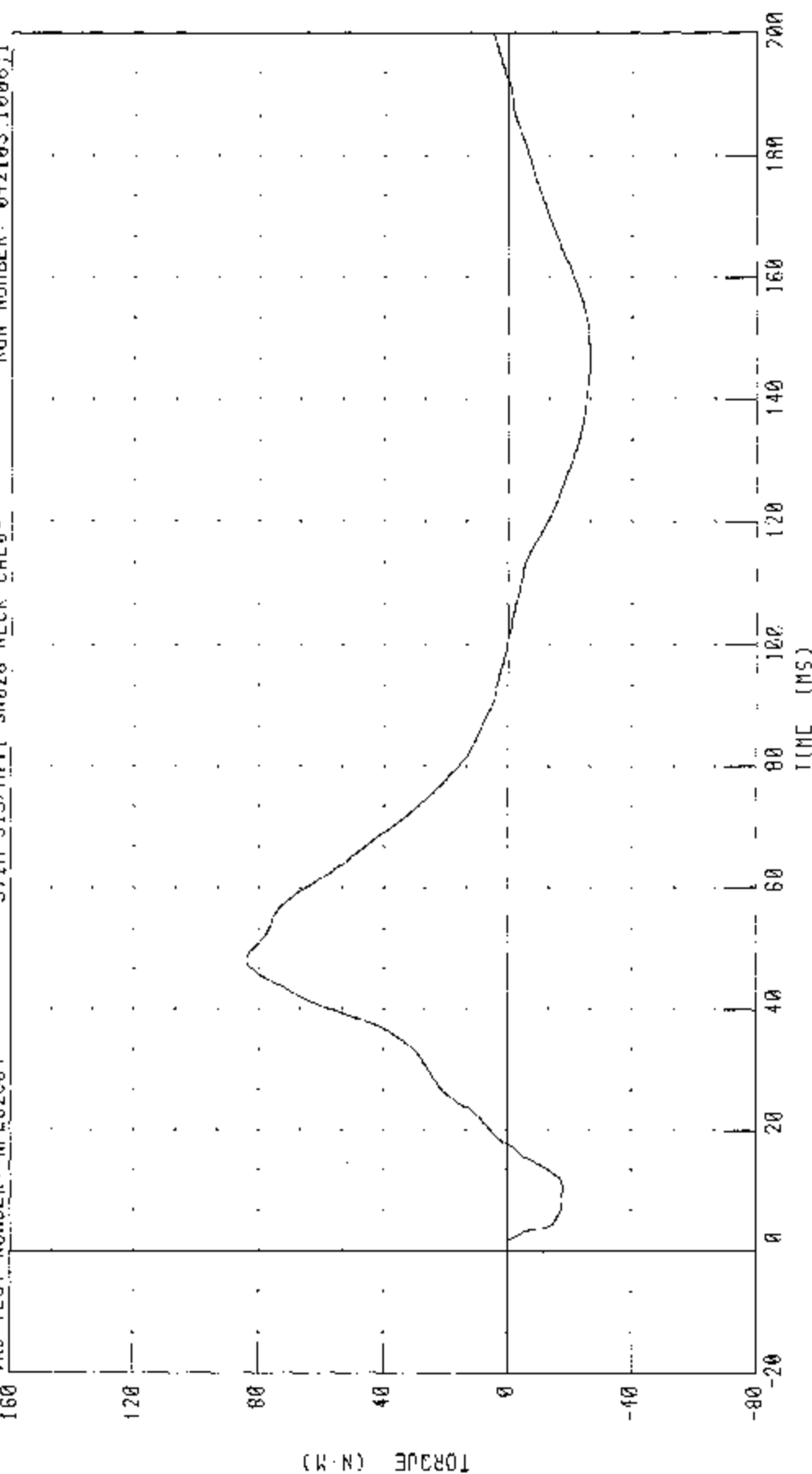
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

IRC TEST NUMBER: NFL02804

572M SID/HILL SN020 NECK CAL04

RUN NUMBER: 042103.1006.1



CHANNEL: NEKOM ILLIER: CII CLASS: 000

PEAK DATA 93.95 N-M @ 48.16 MS; -26.41 N-M @ 145.92 MS

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

11-APR-03

LEFT SIDE CONFIGURATION

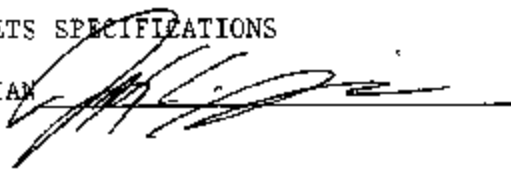
TRC INC.

TEST NO: STL02804

572F SID SNO28 L.THORAX CAL04

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	40.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.30 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	39.6 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	39.1 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	16.4 G

TEST MEETS SPECIFICATIONS

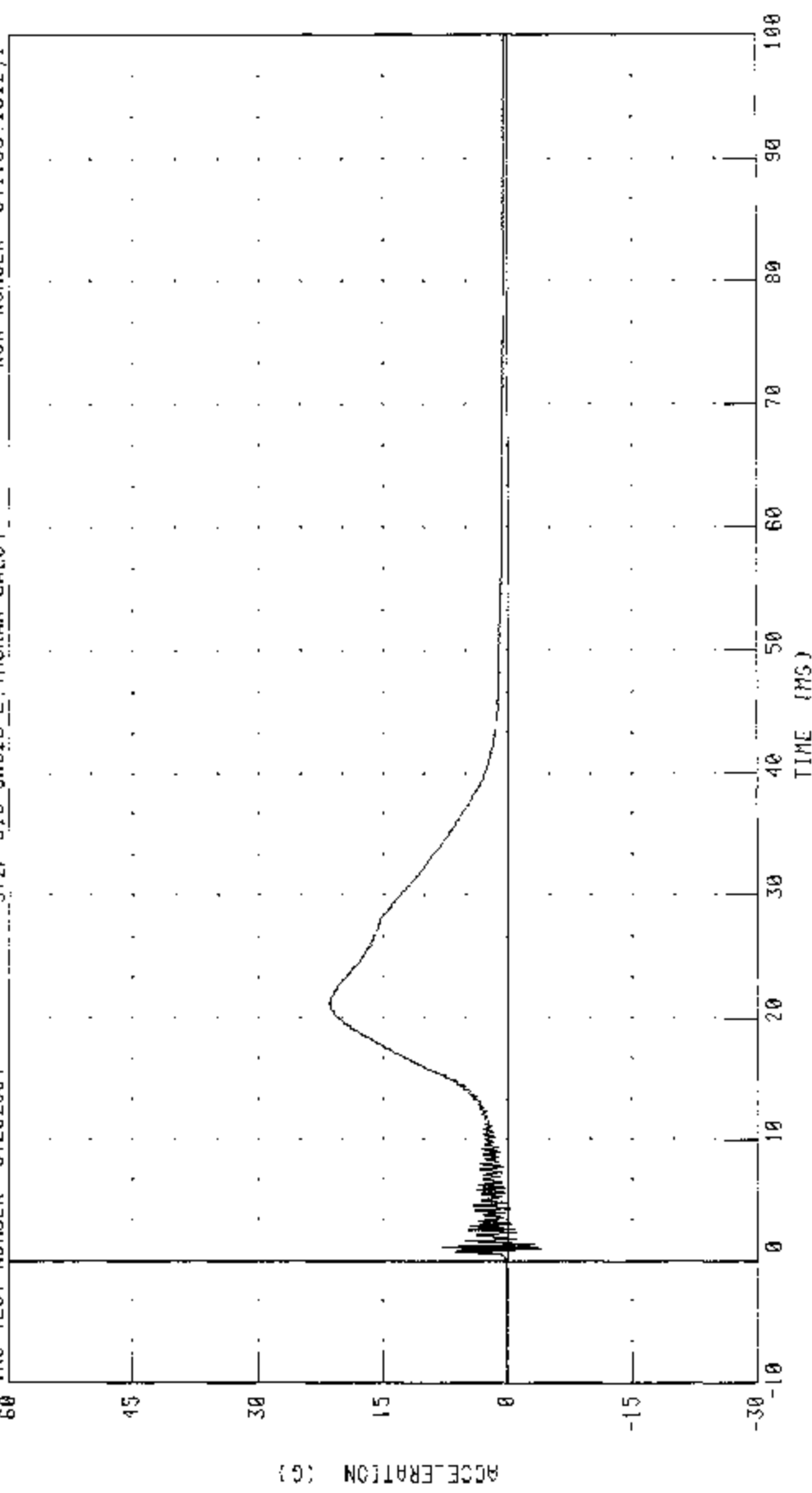
TECHNICIAN 

RUN NUMBER: 041103.1311;1

PART 572-F S I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: STL02804 572F SID SN028 L THORAX CAL04 RUN NUMBER: 041103.1312.1



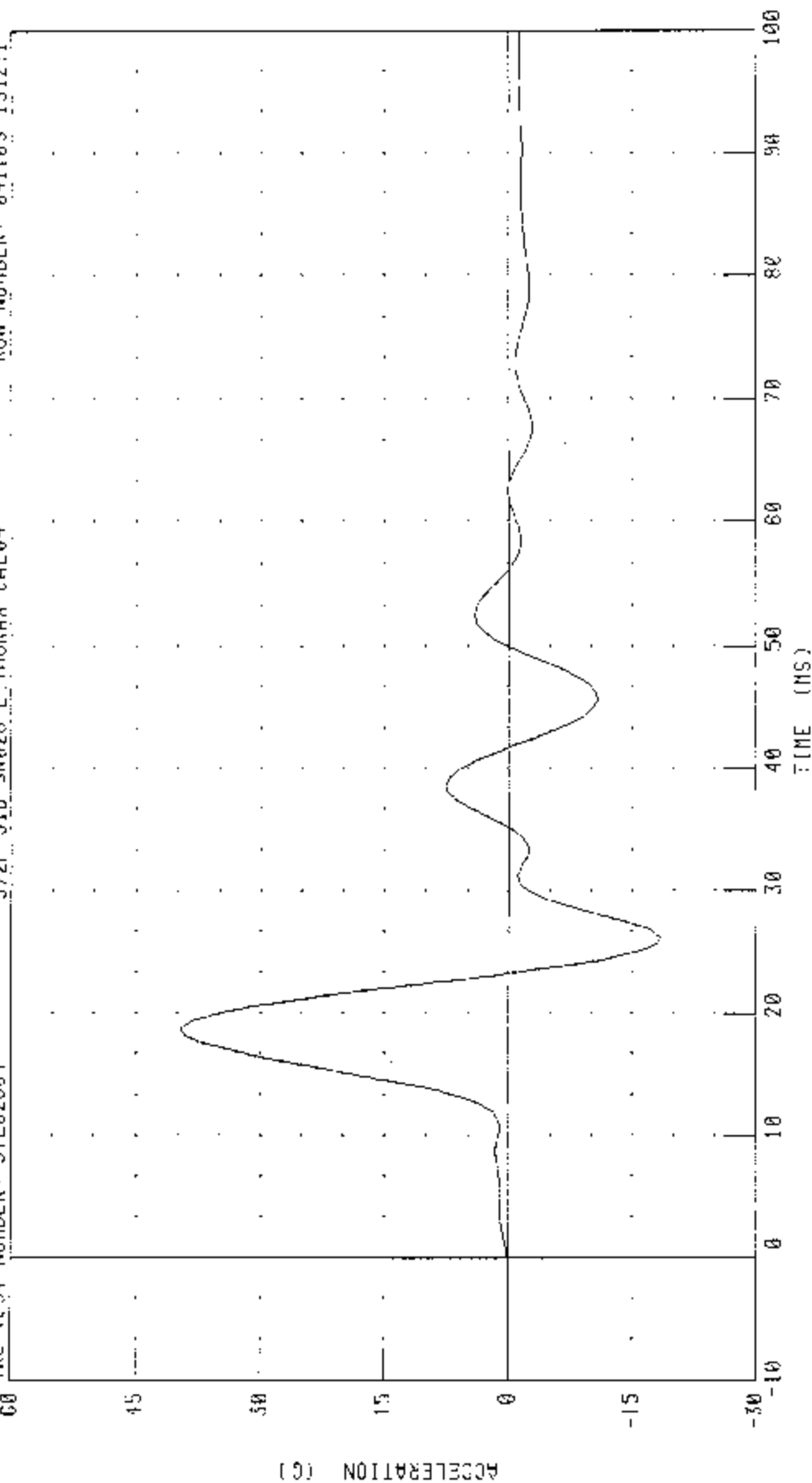
CHANNEL: PFNXC FILTER: CH CLASS 1000

PEAK DATA: 21.49 G @ 21.28 MS; 3.99 G @ 0.96 MS

PARI 577-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

IRC TEST NUMBER: STL02004 572F SID SN028 L THORAX CAL04 RUN NUMBER: 241103 1312:1



TIME (NS)

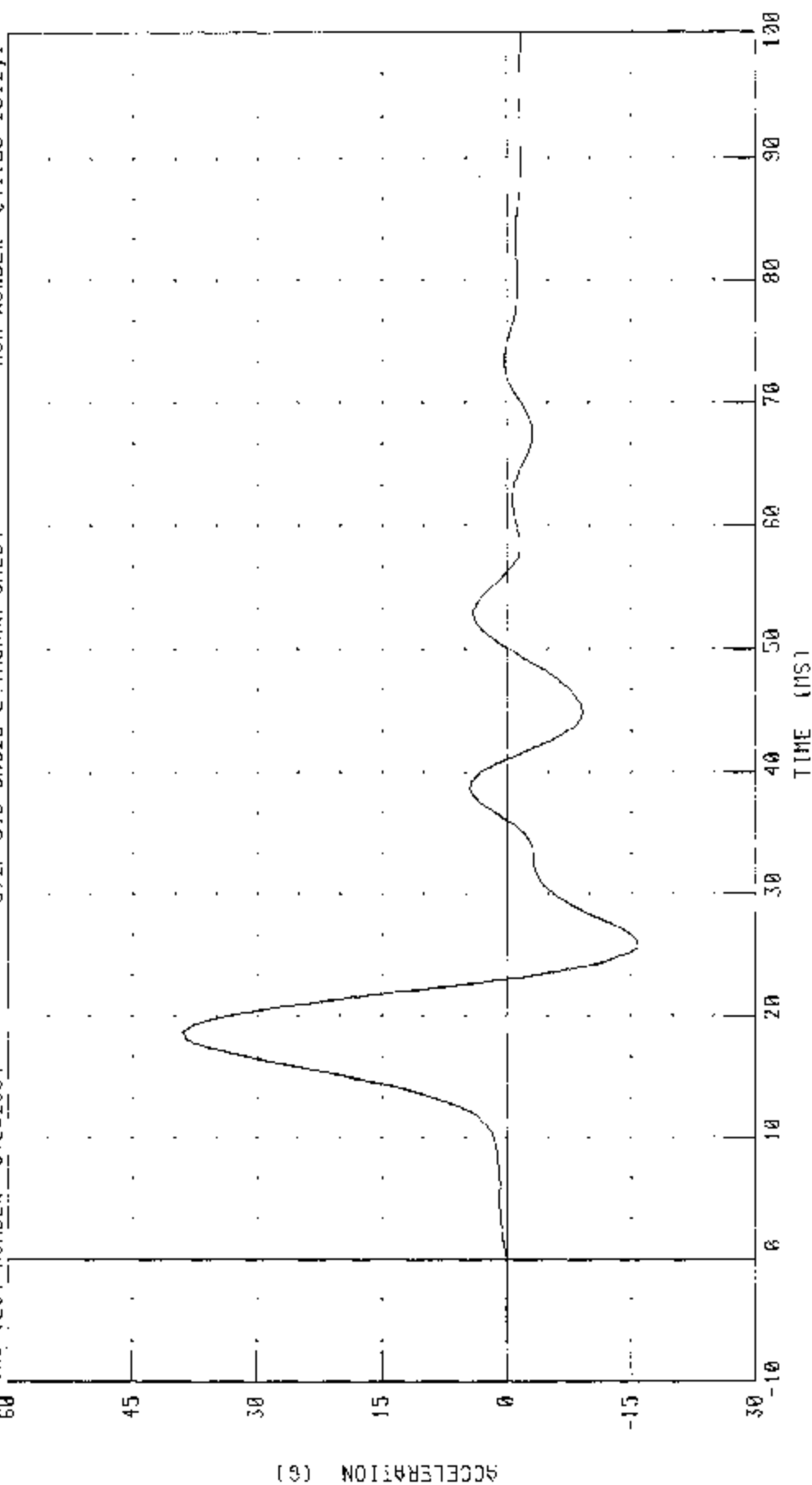
CHANNEL: LURYC FILTER: FIR 100

PEAK DATA: 39.58 G @ 18.75 NS, -18.46 G @ 26.25 NS

PARF 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: SIL02804 572F SID SN028 L THORAX CAL04 RUN NUMBER 041103 1312,1



CHANNEL: LIRYC FILTER: FIR 100

PEAK DATA: 39 13 G @ 18 75 MS; -15 74 G @ 25 63 MS

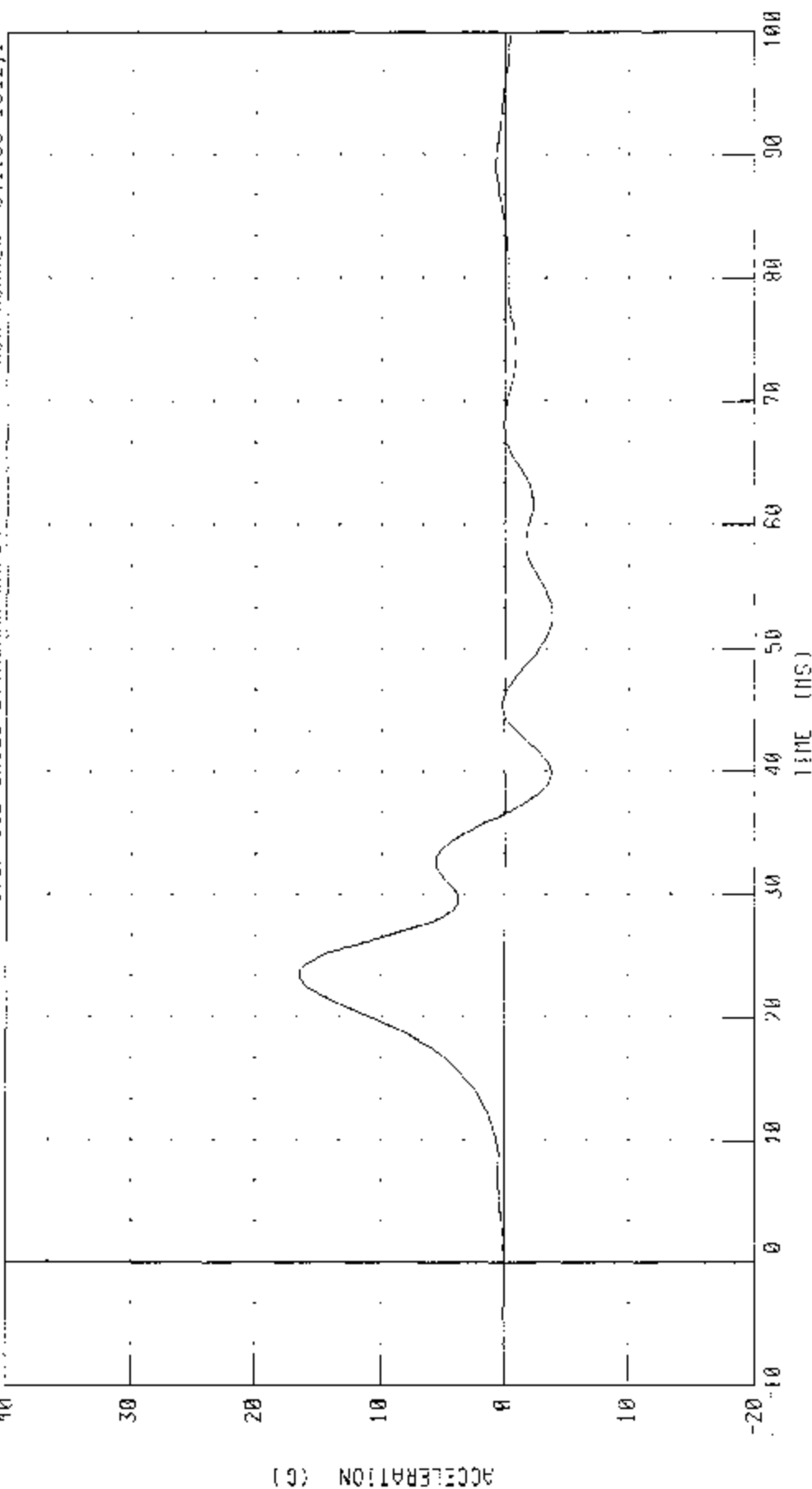
PART 572-F S.I.U. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

572F S.I.U. SN020 L THORAX CAL 04

RUN NUMBER: 041103 1312,1

IRC TEST NUMBER: STL02004



PEAK DATA 10 44 0 23 75 MS; -3 07 3 0 53 12 MS

FILTER FIR 100

CHANNEL: T12YC

ACCELERATION (G)

Transportation Research Center Inc.

572B Abdomen Compression Test

HIH SID Serial No. 028 Calibration No. 04 - 8

Test Date 04/14/2003

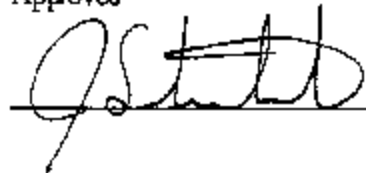
Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	39 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	6.8 - 8.0 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.14.2003 12:57:56 11

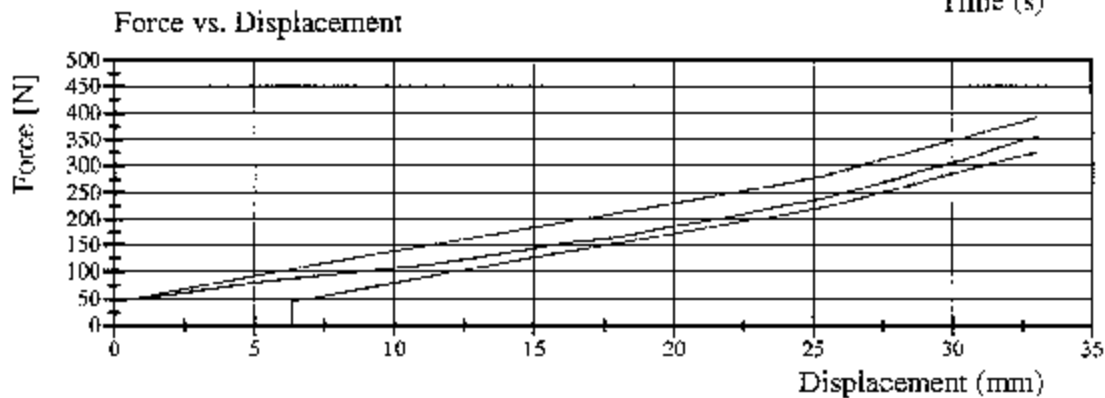
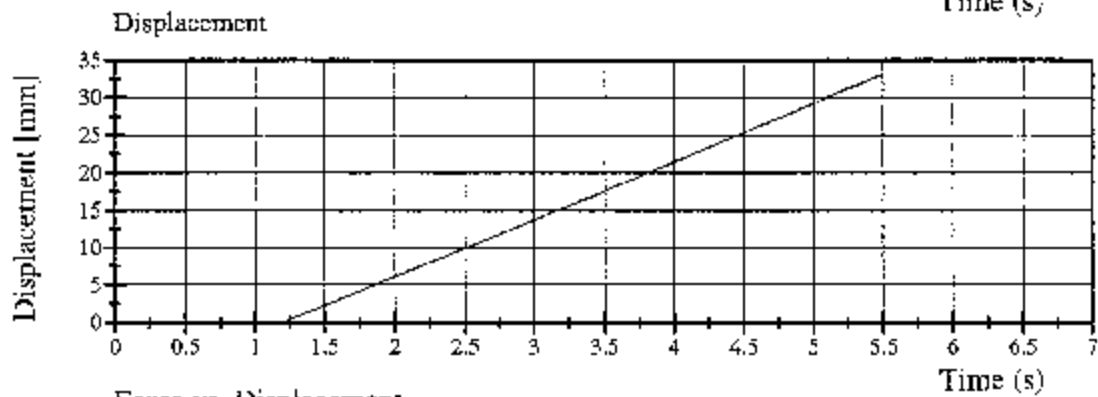
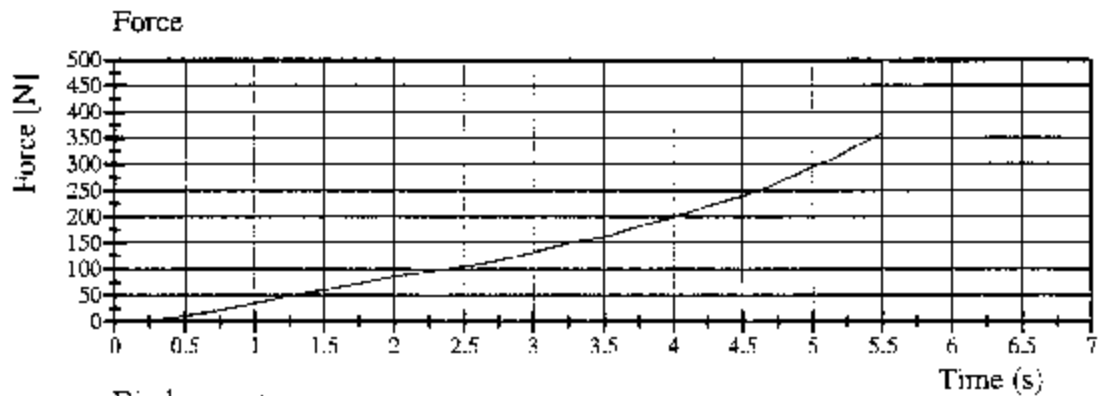


Transportation Research Center Inc.

572B Abdomen Compression Test

HII SID Serial No. 028 Calibration No. 04 - 8

Test Date 04/14/2003



04.14.2003 12:37:57 11



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 14-Apr-03

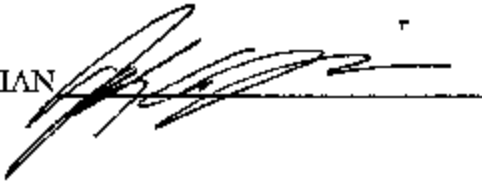
TRC, INC.

TEST NO: 028C04LF1

572B SN 028 TORSO FLEX CAL 04

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 - 70 %	39 %
FORCE AT 0 DEG. FLEXION	-27 - 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 - 151 N	124.6 N
FORCE AT 30 DEG OF FLEXION	151 - 205 N	182.4 N
FORCE AT 40 DEG OF FLEXION	205 - 258 N	226.9 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	8.0 °

TEST MEETS SPECIFICATIONS

TECHNICIAN 

TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

11-APR-63

LEFT SIDE CONFIGURATION

TRC INC.

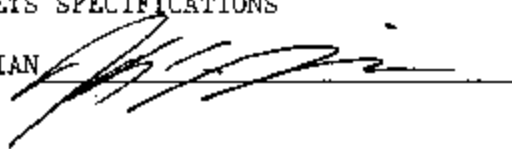
TEST NO: SPL02804

572F SN028 LEFT PELVIS CAL04

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	38.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	47.0 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.3 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN

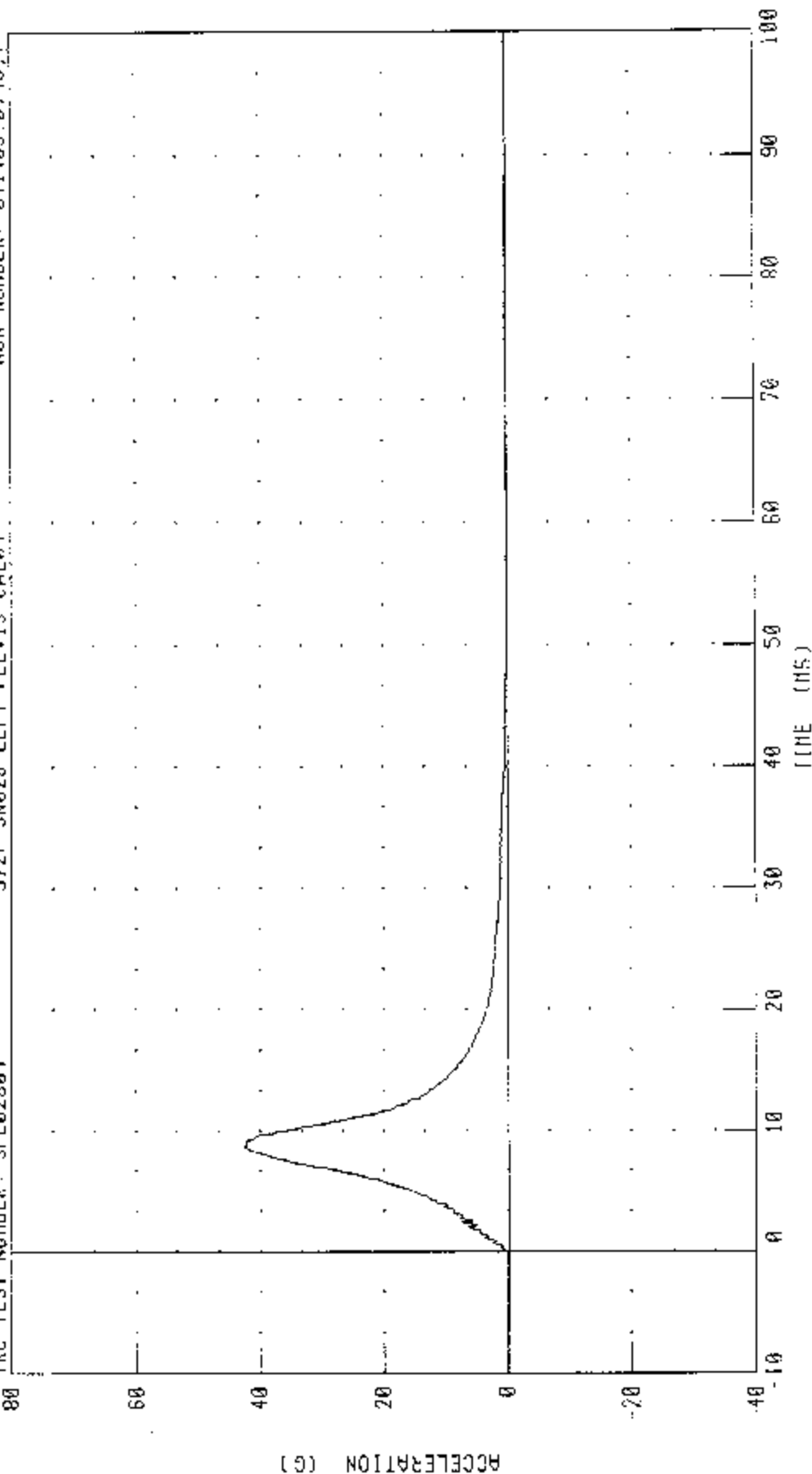


RUN NUMBER: 041103.1318;1

PART 572-F S I D PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL02804 572F SN028 LEFT PELVIS CAL04 RUN NUMBER: 041403.0746.1



CHANNEL: PENXS FILTER: CH CLASS 1000

PEAK DATA 42.65 G @ 8.00 MS; -0.10 G @ 68.00 MS

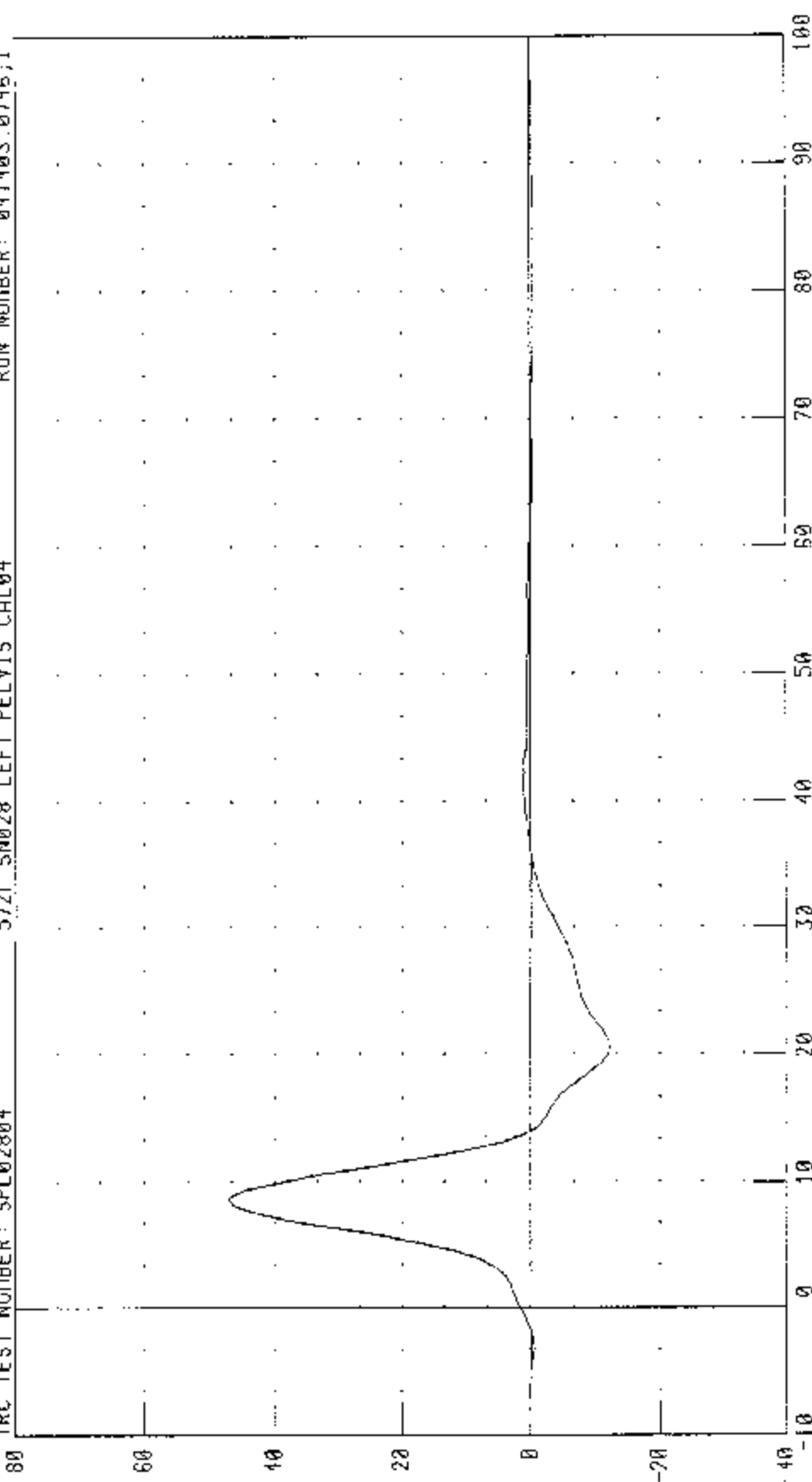
PART 572-F S I D PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL02804

572F SN028 LEFT PELVIS CAL04

RUN NUMBER: 041403.0746,1



TIME (MS)

CHANNEL: PELVIS FILTER: FIR 100

PEAK DATA: 47.01 G @ 8.73 MS, 12.17 G @ 20.62 MS

ACCELERATION (G)

Calibration Test Results

Post-Test

SID-HIII: 066

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was not tested at this time.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.

Transportation Research Center Inc.

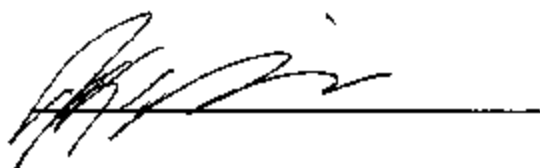
572F SID Dummy

External Dimensions

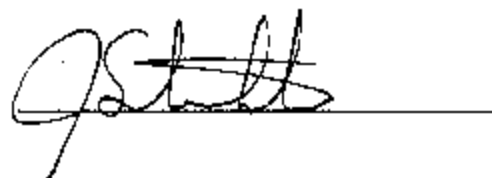
Serial No. 066 Calibration No. 07

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	903 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	508 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Rib From Backline	RD	228.6 - 241.3 mm	237 mm	Yes
Knee Pivot From Backline	KH	510.5 - 525.8 mm	519 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	388 mm	Yes
Top Rib Width From CAL	RW-1	165.1 - 180.3 mm	171 mm	Yes
Bottom Rib Width From CAL	RW-2	165.1 - 180.3 mm	170 mm	Yes
Difference Betwsen Top & Bottom Rib Width from CAL		<= 2.5 mm	1.0 mm	Yes

Technician



Approved




TRANSPORTATION RESEARCH CENTER INC.

LATERAL HEAD DROP TEST

HYBRIDIII SID DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO. HDL06607

572M SID/HIII SNO66 HEAD CAL07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6 deg. C	21.67 deg. C
RELATIVE HUMIDITY	10 - 70 %	38.00 %
PEAK RESULTANT ACCELERATION	120 - 150 G	147.32 G
PEAK LONGITUDINAL ACCELERATION	15 G MAX	-5.50 G
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042103.0959;1

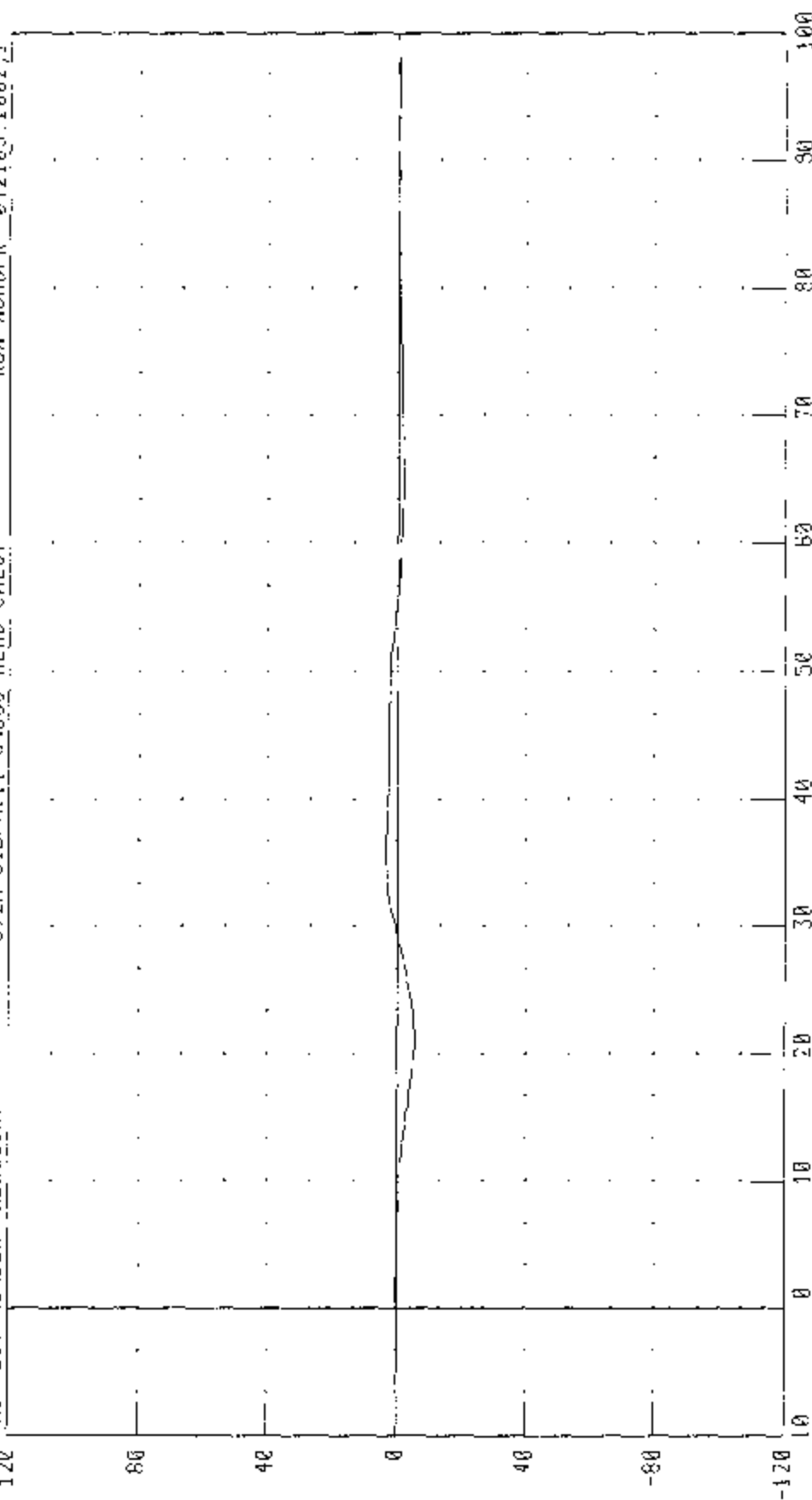
572M SID/HILL DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

TRC TEST NUMBER: HDL06607

572M SID/HILL SN066 HEAD CAL07

RUN NUMBER 042103.1002.1



ACCELERATION (G)

TIME (MS X 10⁻¹)

CHANNEL: WFOXC FILTER: CB CLASS 1000

PEAK DATA 3.03 G @ 3.60 MS, -5.50 G @ 2.16 MS

572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Y AXIS

RUN NUMBER: 042103 1002,1

TRC TEST NUMBER HDL06607

572M SID/HIII SN066 HEAD CAL07

200

160

120

80

40

0

-40

ACCELERATION (G)

TIME (MS X 10⁻¹)

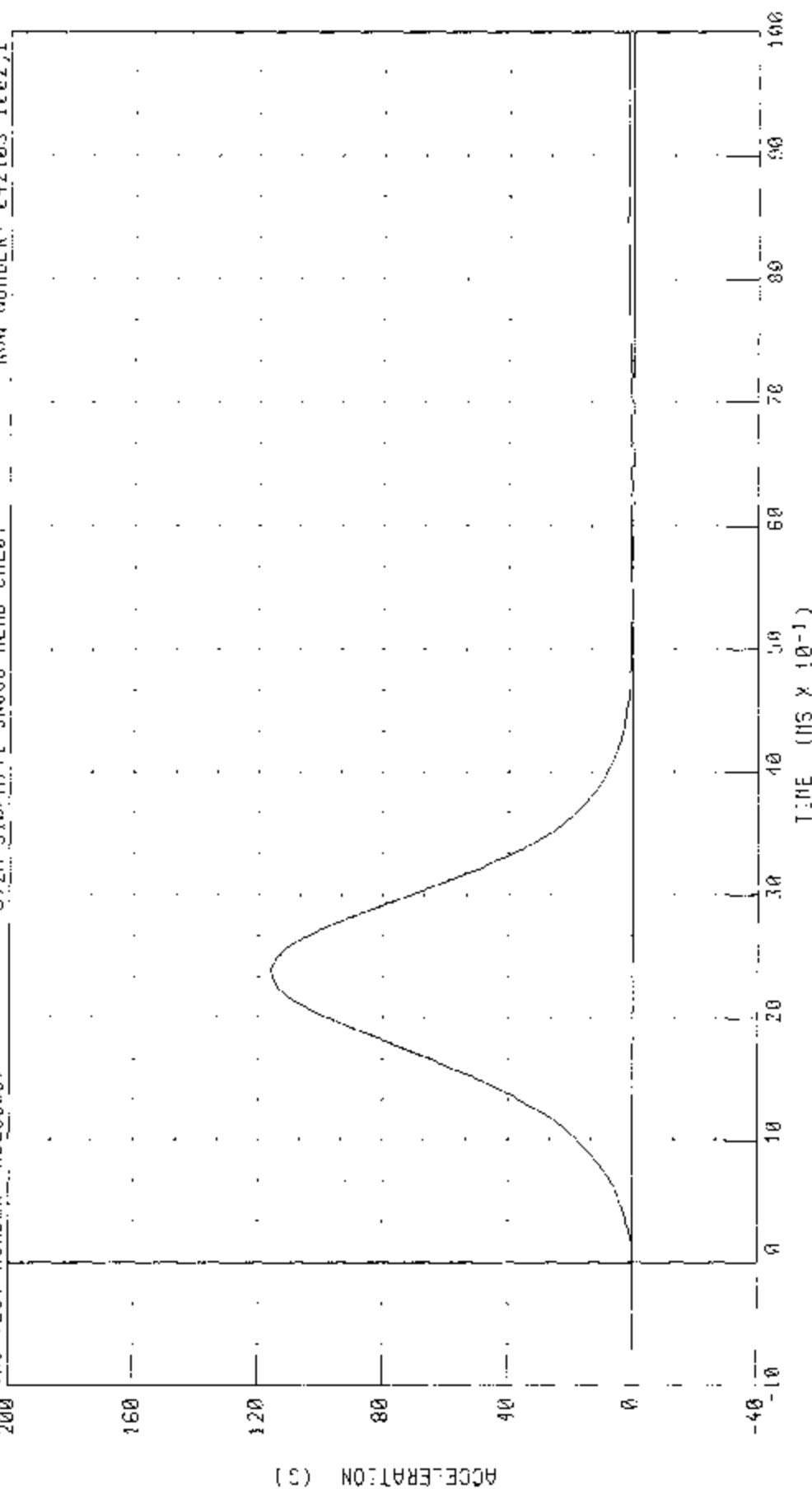
CHANNEL: HEDYC FILTER: CH CLASS 1000

PEAK DATA: 90 92 G @ 2.32 MS; -0.86 G @ 0.96 MS

572M SID/HILL LUMPY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD ACCELERATION Z AXIS

IRC TEST NUMBER: H0000007 572M SID/HILL SN000 HEAD CAL07 RUN NUMBER: 042103 1002,1



CHANNEL: HEDZC FILTER: CII CLASS 1000

PEAK DATA 115.98 G @ 2.43 MS; -0.03 G @ -0.96 MS

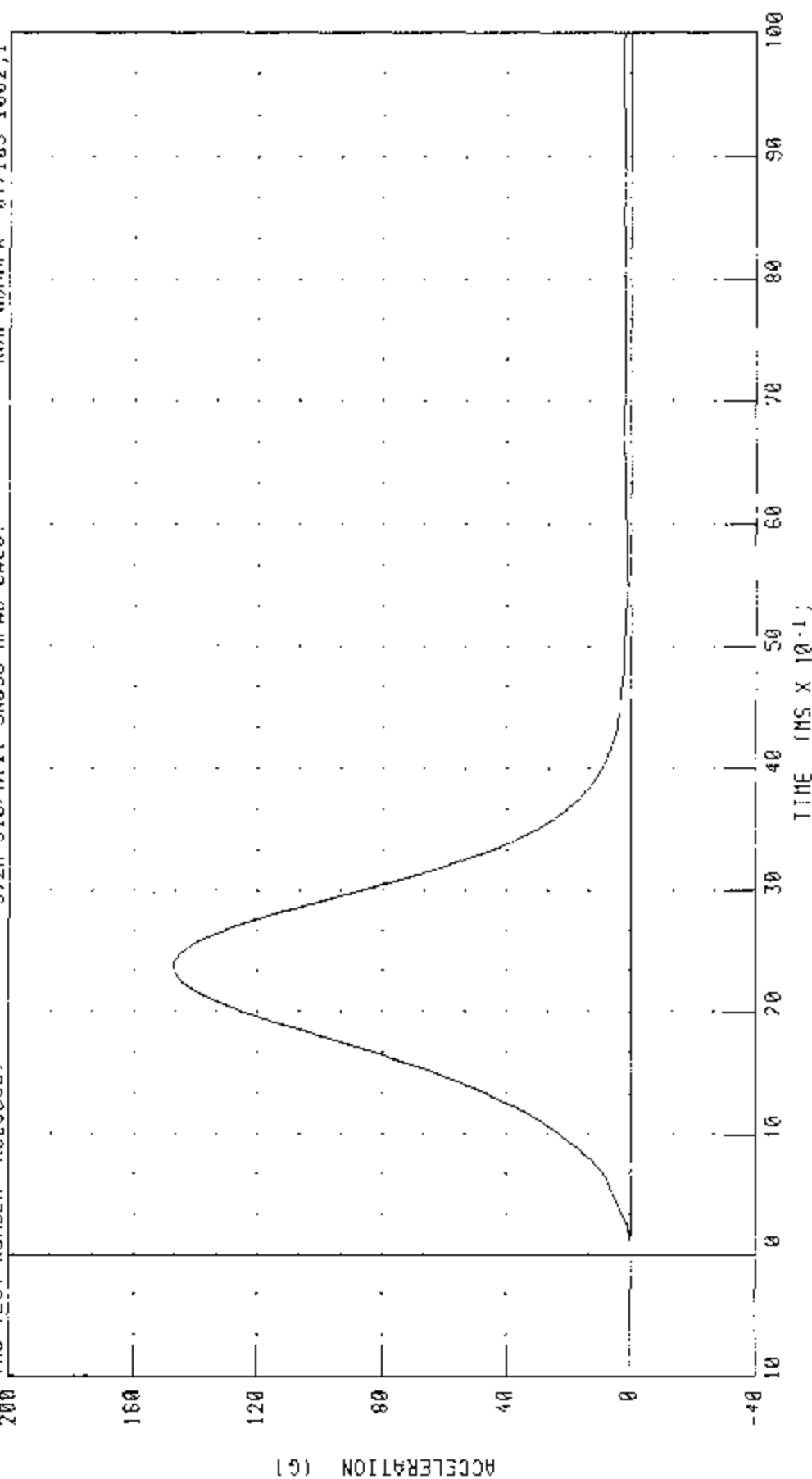
572M SID/HIII DUMMY CALIBRATION -- 35 DEGREE LEFT LATERAL HEAD DROP

HEAD RESULTANT ACCELERATION

TRC TEST NUMBER: HD106687

572M SID/HIII SN066 HEAD CAL07

RUN NUMBER: 047103 1002,1



TIME (MS X 10⁻¹)

CHANNEL: HEADG FILTER: CH1 CLASS 1000

PEAK DATA: 147.32 G @ 2.48 MS; 0.03 G @ 0.00 MS

ACCELERATION (G)

TRANSPORTATION RESEARCH CENTER INC.

LATERAL NECK TEST

HYBRIDIII SID DUMMY

14-APR-03

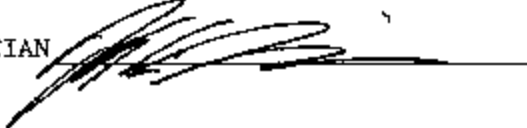
LEFT SIDE CONFIGURATION

TRC INC. TEST NO. NFL06607

572M SID/HIII SN066 NECK CAL07

TEST PARAMETER		SPECIFICATION	TEST RESULTS
TEMPERATURE		20.6 - 22.2 deg. C	21.67 deg. C
RELATIVE HUMIDITY		10 - 70 %	37.00 %
IMPACT VELOCITY		6.89 - 7.13 M/S	7.06 M/S
INTEGRATED VELOCITY	10 MS	1.96 - 2.55 M/S	2.44 M/S
	20 MS	4.12 - 5.10 M/S	4.86 M/S
	30 MS	5.73 - 7.01 M/S	6.78 M/S
	40 - 70 MS	6.27 - 7.64 M/S	7.11 - 7.19 M/S
MAXIMUM MIDSAGGITAL PLANE ROTATION		66 - 82 deg.	71.63 deg.
ROTATION ANGLE DECAY TIME FROM PEAK TO ZERO		58 - 67 MS	61.68 MS
MAXIMUM MOMENT ABOUT OCCIPITAL CONDYLE		73 - 88 NM	77.82 NM
POSITIVE MOMENT DECAY TIME FROM PEAK TO ZERO		49 - 64 MS	57.68 MS
TIME OF MAXIMUM ROTATION AFTER MAXIMUM MOMENT		2 - 16 MS	8.40 MS

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 042103.1001;1

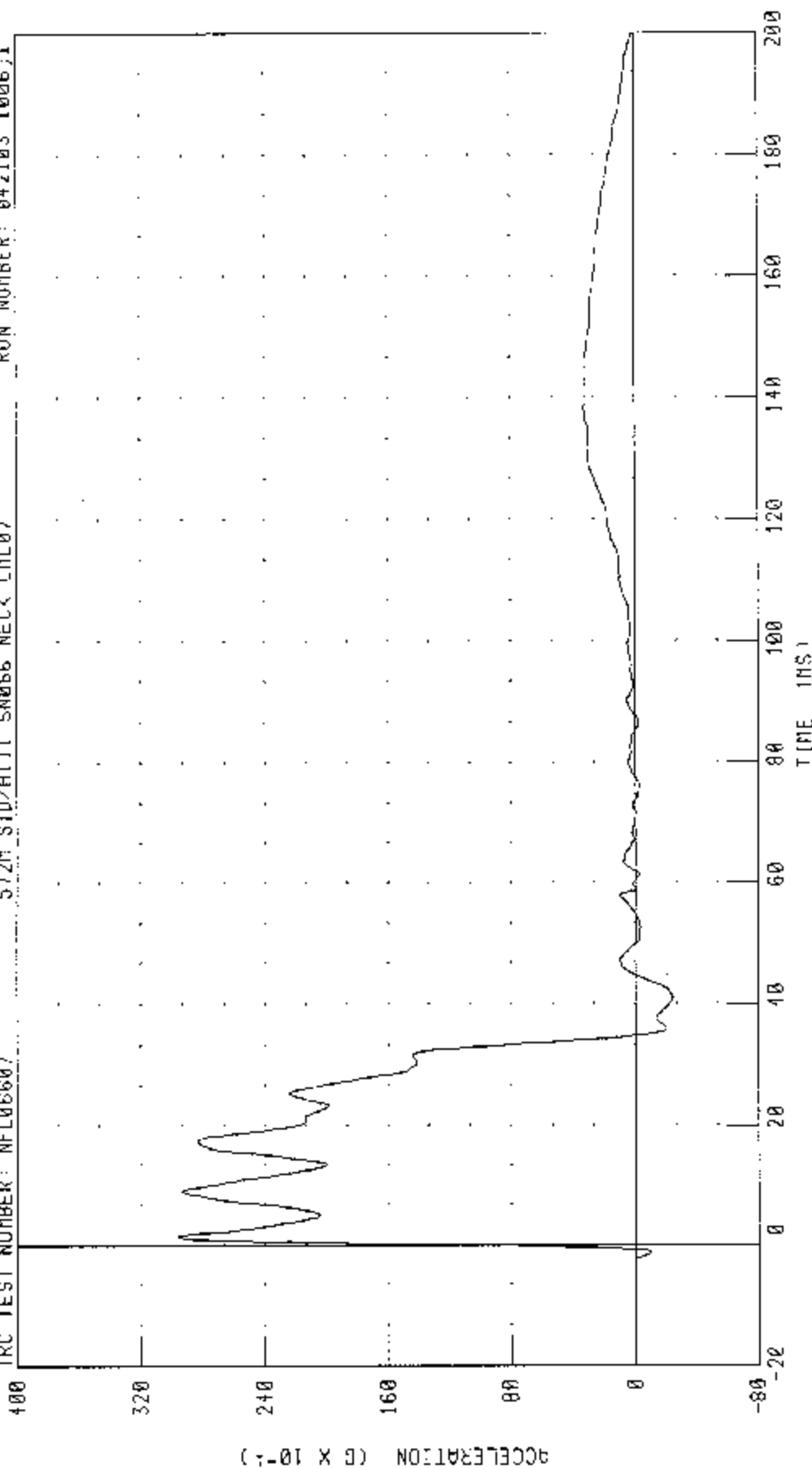
572M SID/HILL DUMMY CALIBRATION --- LEFT LATERAL NECK TEST

PENDULUM DECELERATION

TRC TEST NUMBER: NFL06607

572M SID/HILL SN066 NECK CAL07

RUN NUMBER: 042103 1006;1



CHANNEL PENXC FILTER CH CLASS 1B0

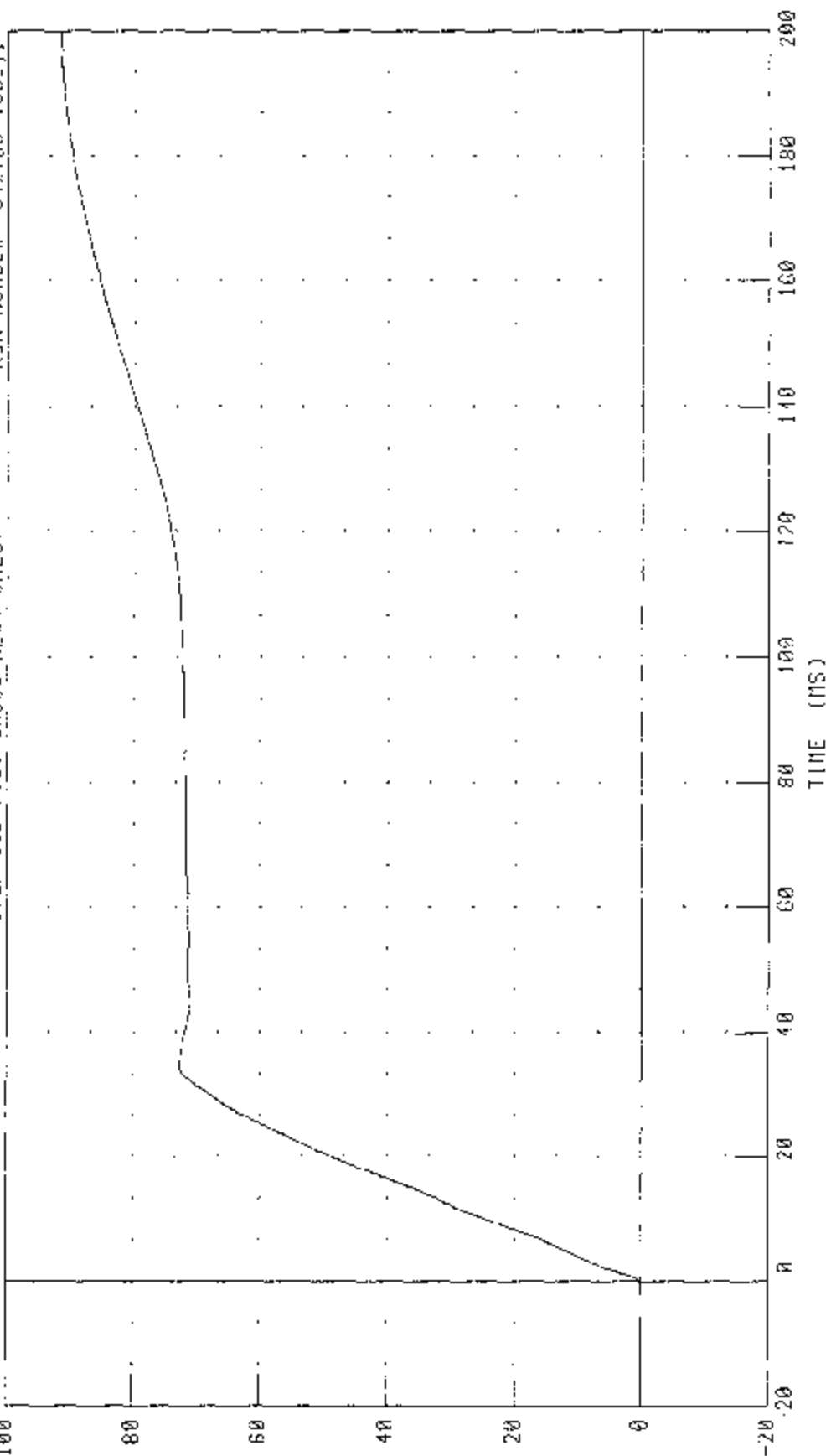
TIME (MS)

PEAK DATA 79 56 G @ 1.44 MS; -2.44 G @ 41 12 MS

572M SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

INTEGRATED PENDULUM VELOCITY

TRC TEST NUMBER NFL06607 572M SID/HIII SH066 NECK CAL07 RUN NUMBER 012103 1005,1



VELOCITY (M/S X 10⁻²)

TIME (MS)

CHANNEL PENXYI FILTER CH CLASS 180 PEAK DATA 9.16 M/S 3 200 00 MS, -0 01 M/S 0 -0 72 MS

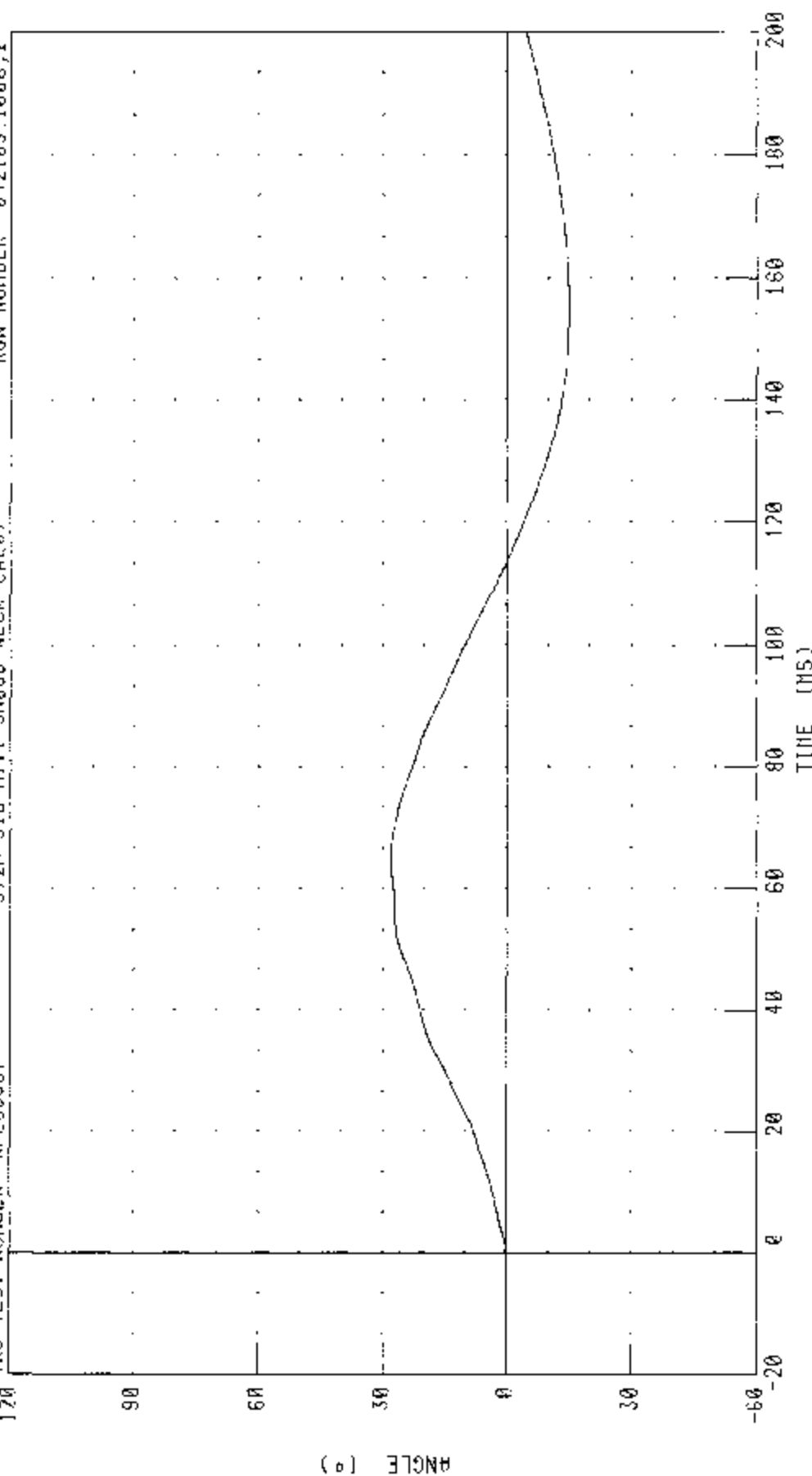
572M SID/HII: DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

ROTATION ABOUT BASE OF NECK

TRC TEST NUMBER: NPL06607

572M SID/HII SN066 NECK CAL07

RUN NUMBER: 042183.1006,1



CHANNEL: BETA FILTER: CH. CLASS 60

PEAK DATA: 28.73 ° @ 61.77 MS; -15.00 ° @ 155.76 MS

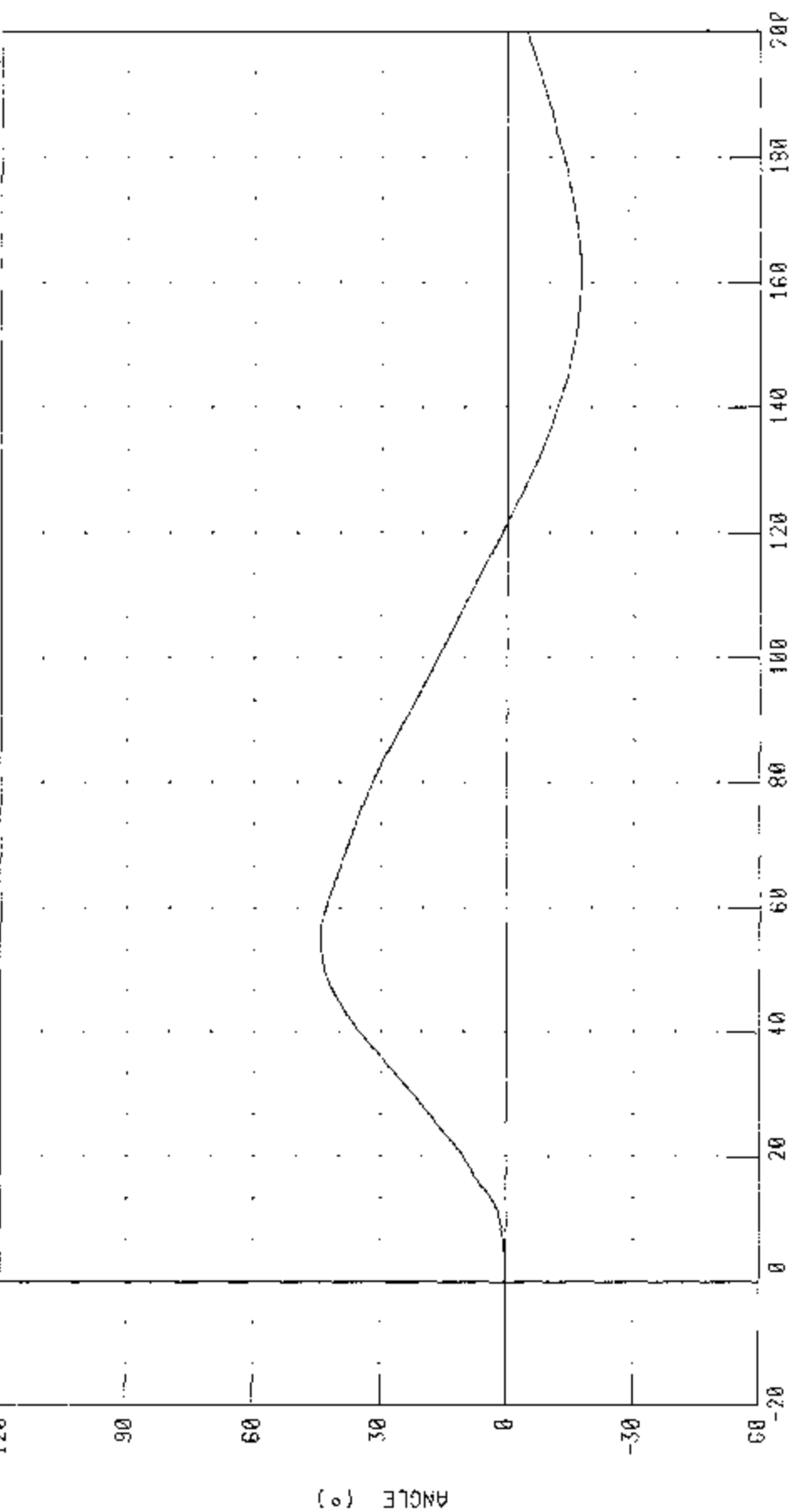
572N SID/HIT DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

POSITION ABOVE OCCIPITAL CONDYLE

RUN NUMBER: 042103 1006.1

TRC TEST NUMBER: NFL06607

572N SID/HIT SMOGG NECK CAL07



TIME (MS)

PEAK DATA 44.10 ° @ 55.52 MS, 17.33 ° @ 161.12 MS

CHANNEL: THETA FILTER: CH CLASS: 60

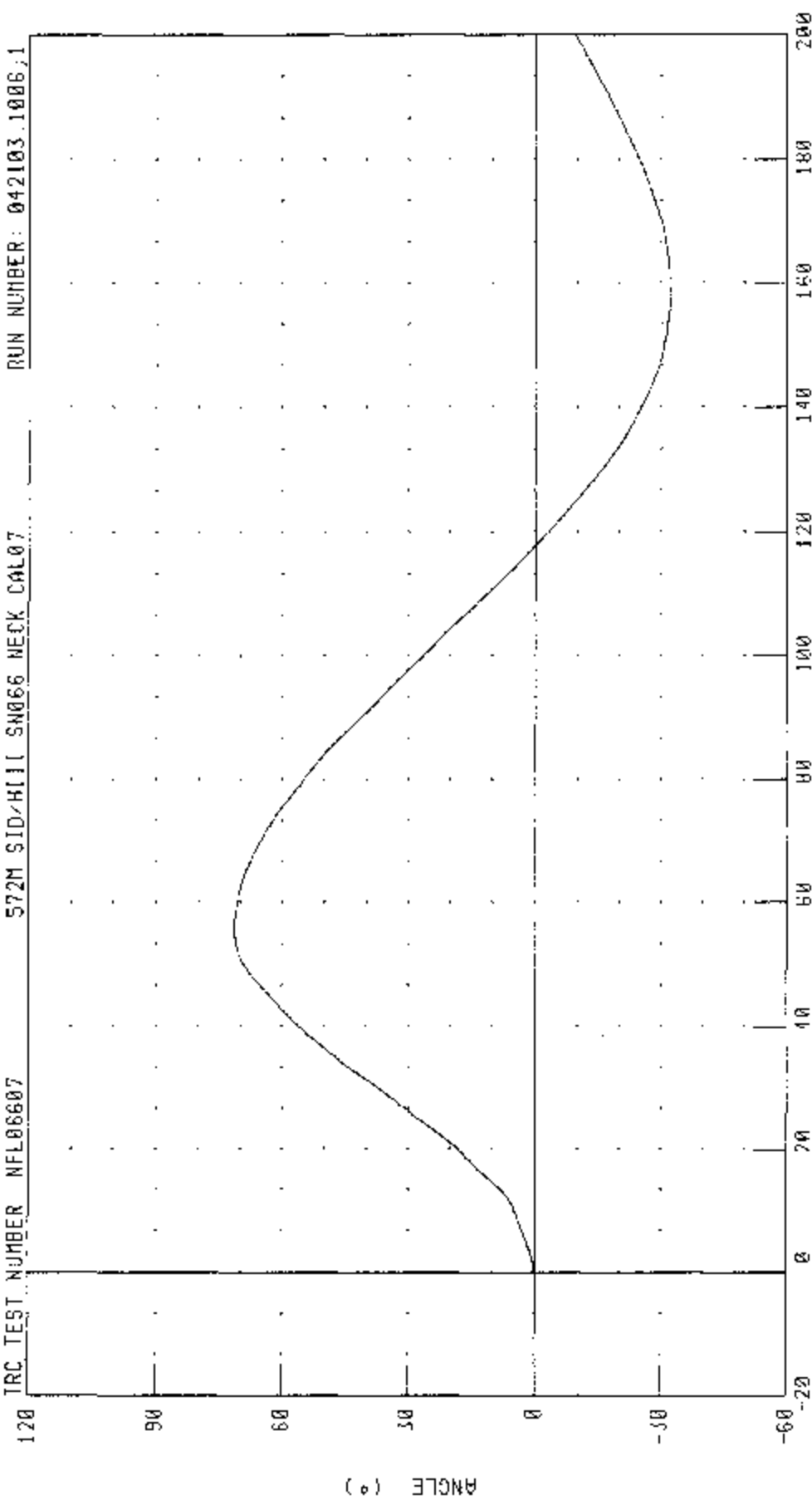
572M SID/HILL DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

TOTAL ROTATION

RUN NUMBER: 042103.1006;1

TRC TEST NUMBER NPL06607

572M SID/HILL SN066 NECK CAL07



CHANNEL: TOTAL FILTER: CH. CLASS G0

PEAK DATA: 71 63 ° @ 56 16 MS; -52.71 ° @ 159 04 MS

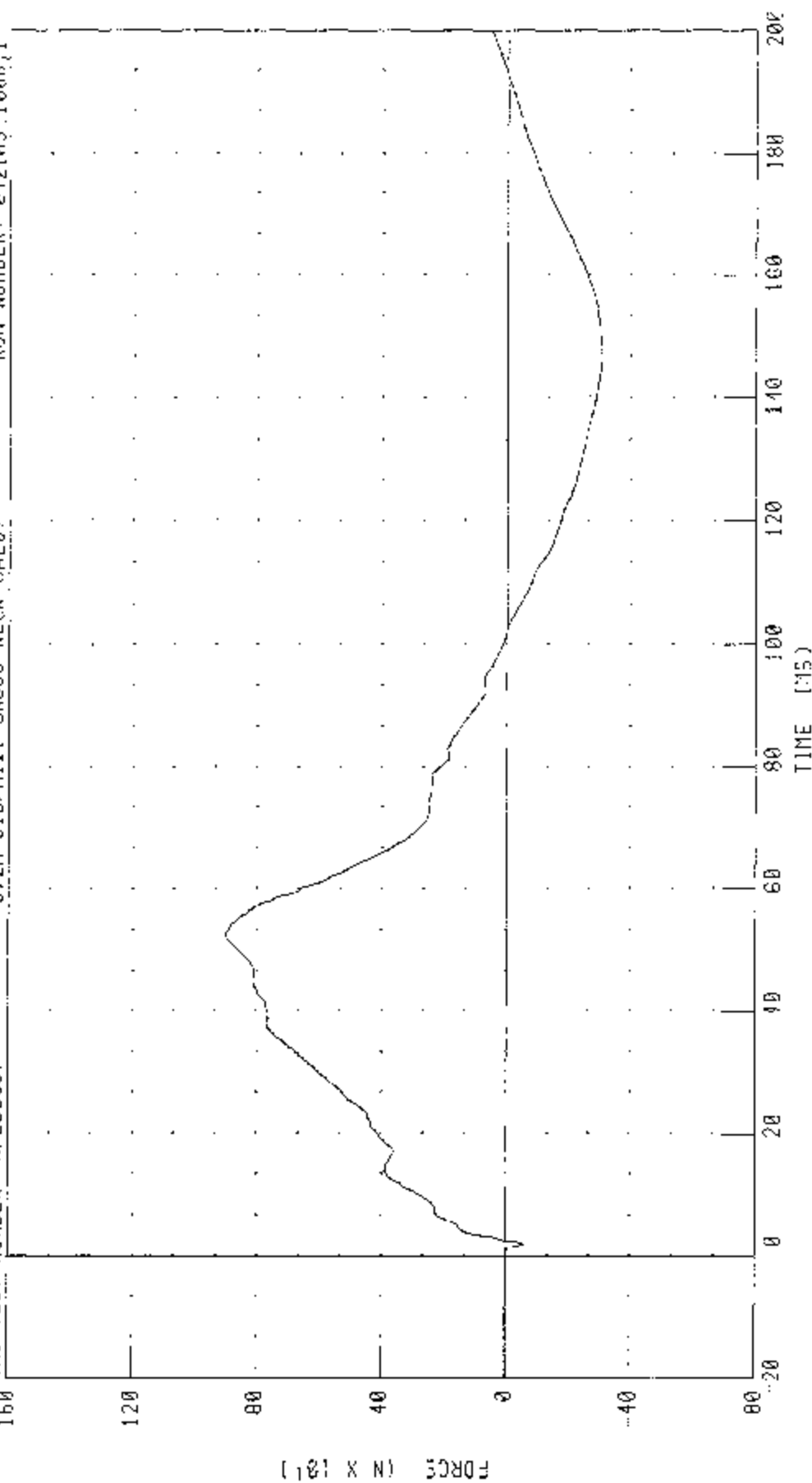
572M SID/HILL DUMMY CALIBRATION -CFT LATERAL NECK TFS-

NECK FORCE Y AXIS

TRC TEST NUMBER NFL06607

572M SID/HILL SW066 NECK CAL07

RUN NUMBER: 042103.1006.1



TIME (MS)

CHANVLL: NEKYF FILTER CR CLASS 1000

PEAK DATA 090.03 N 3 57 48 MS, -306 53 N @ 147 36 MS

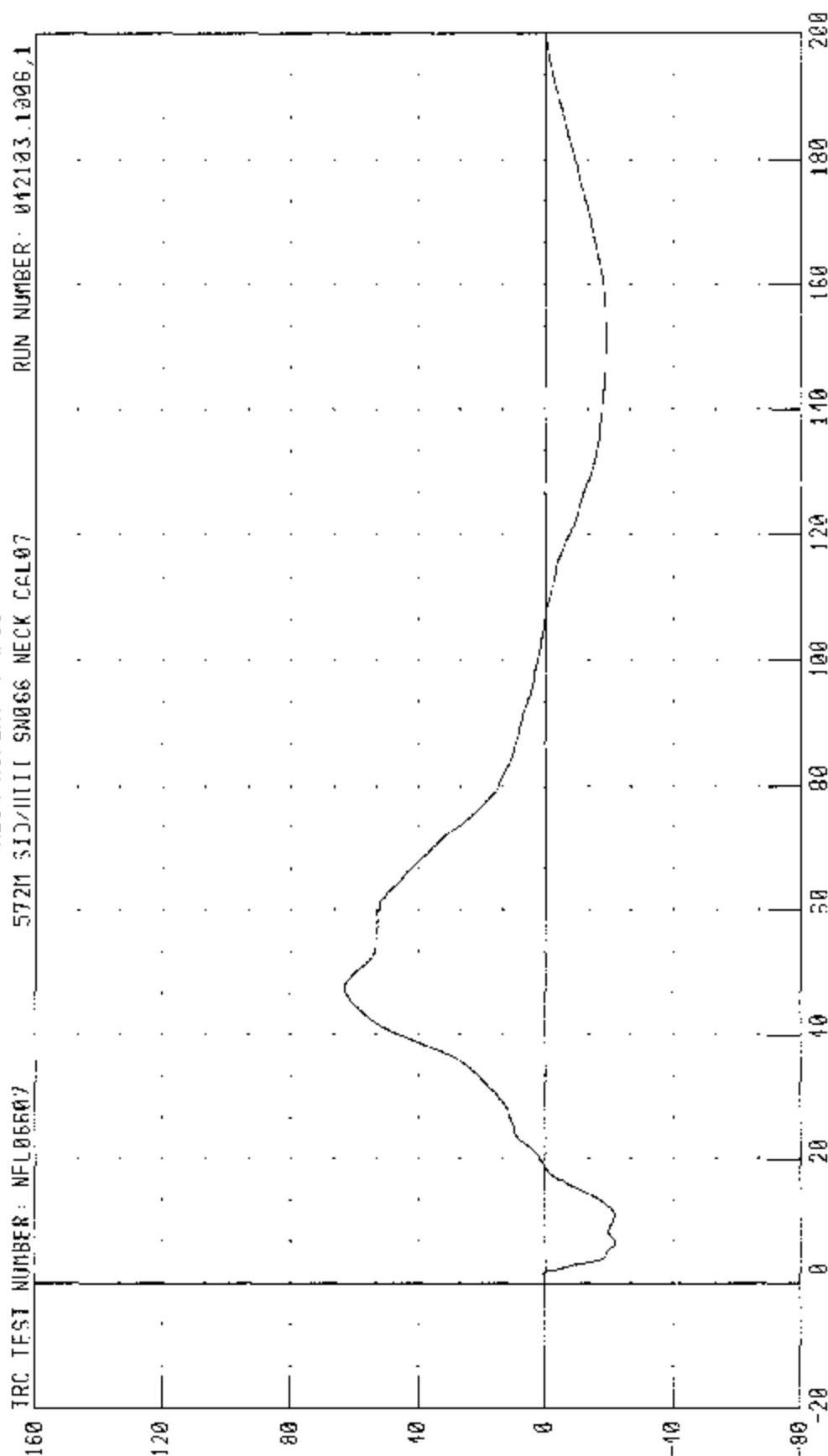
572M SID/IIII DUMMY CALIBRATION -- LEFT LATERAL NECK TEST

NECK MOMENT X AXIS

TRC TEST NUMBER: NFL06607

572M SID/IIII SN066 NECK CAL07

RUN NUMBER: 042103.1006.1



(U-N) 300801

TIME (MS)

PEAK UNT0 63.36 V.1 9 47 52 MS; -21 97 N M 0 6 56 MS

CHANNEL: NEKXII FILTER: CH CLASS 600

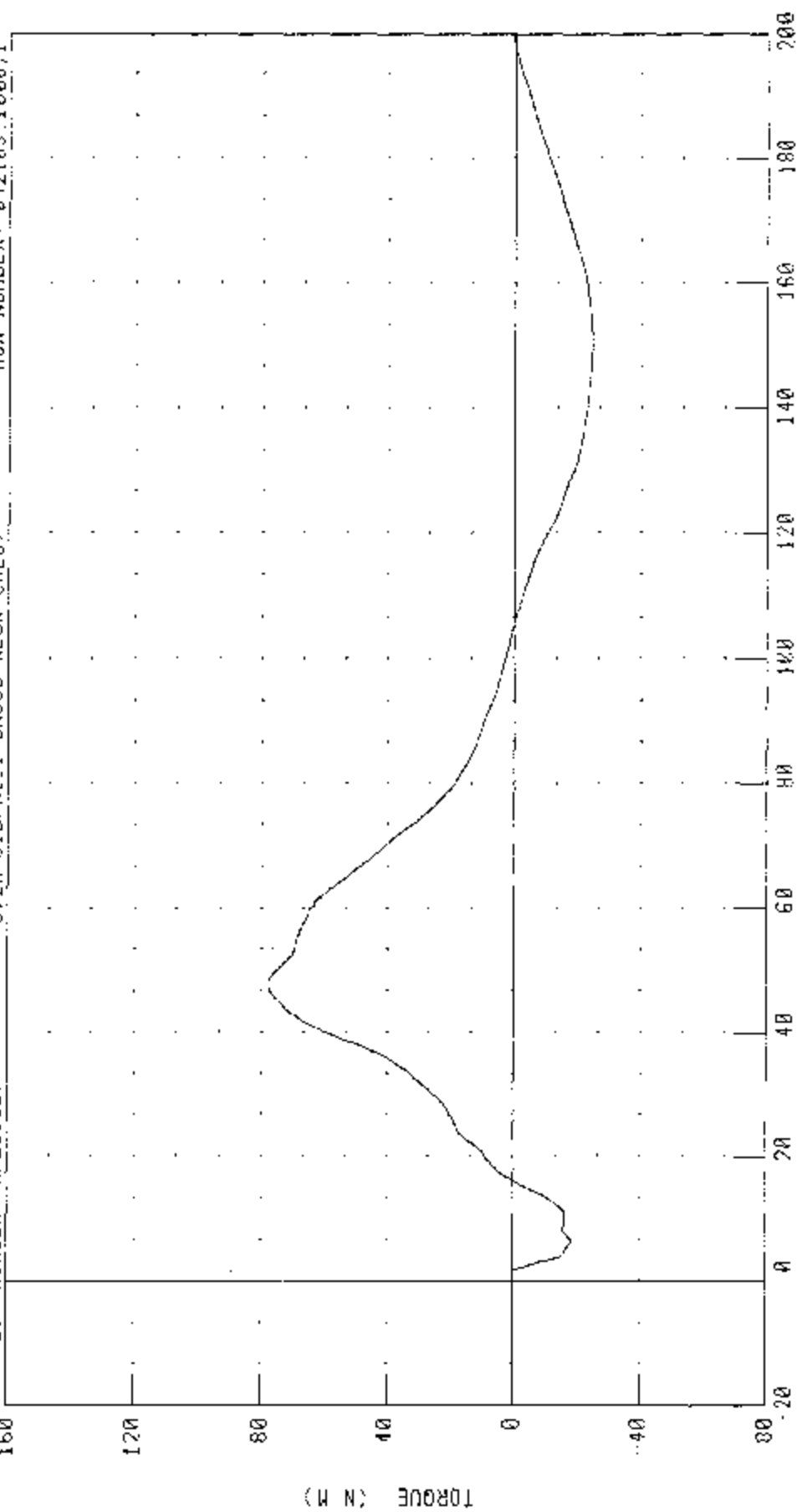
572F SID/HIII DUMMY CALIBRATION -- LEFT LATERAL NECK IFST

TOTAL MOMENT ABOUT OCCIPITAL CONDYLE

TRC TEST NUMBER: NFL08687

572H SID/HIII SN066 NECK CAL07

RUN NUMBER: 042103.1006.1



TIME (MS)

PEAK DATA 77.82 N·m @ 17.76 MS; 24.41 N·m @ 150.00 MS

CHANNEL: NEKOM FILTER: CIL CLASS 600

TRANSPORTATION RESEARCH CENTER INC.

LATERAL THORAX IMPACT TEST

SIDE IMPACT DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

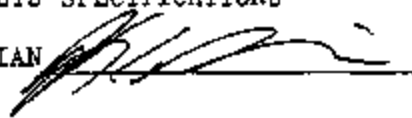
TRC INC.

TEST NO: STL06607

572F SID SN066 L.THORAX CAL07

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	38.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK ACCELERATION: UPPER RIB BAR	37 - 46 G	39.9 G
PEAK ACCELERATION: LOWER RIB BAR	37 - 46 G	40.6 G
PEAK ACCELERATION: LOWER THORACIC SPINE	15 - 22 G	18.7 G

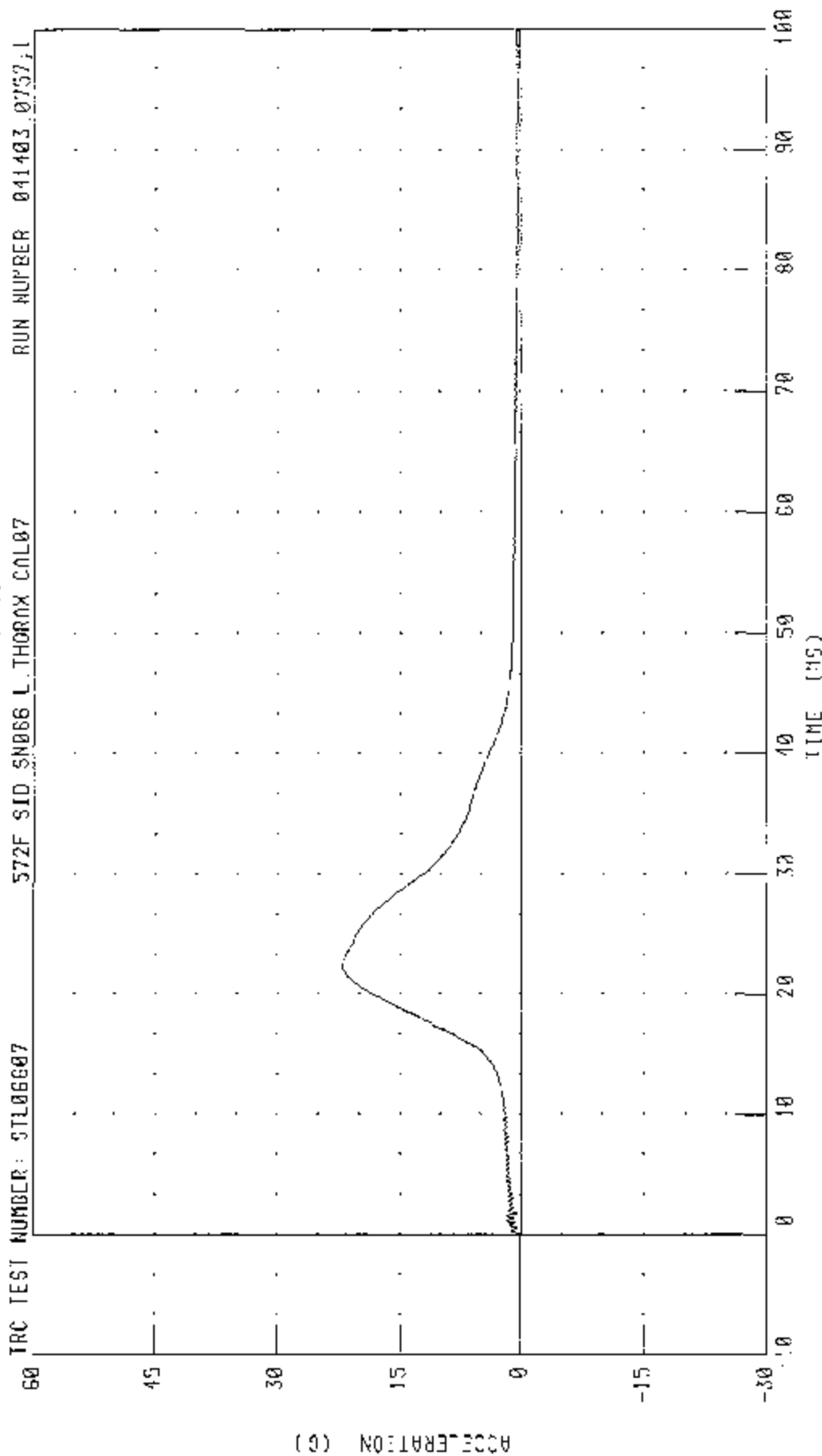
TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 041403.0757;1

PART 572-F S.I.D. THORAX CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION



PEAK DATA: 22.00 G @ 22.19 MS, 0.02 G @ -9.92 MS

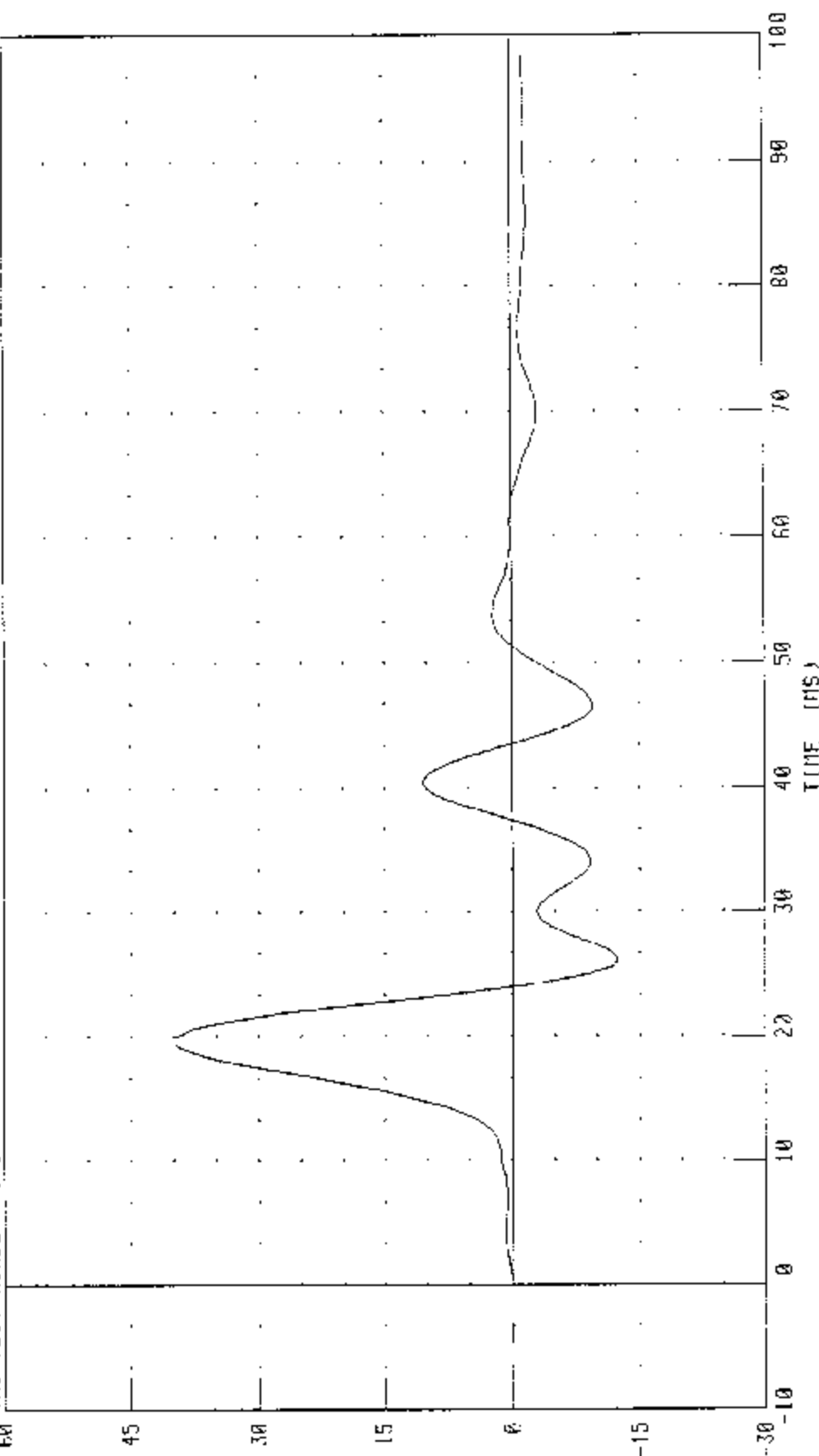
CHANNEL: PENK6 FILTER: CIP. CLASS 1000

PART 572-F S.I.U. THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT UPPER RIB ACCELERATION Y AXIS

TRC TEST NUMBER: 572F SID SN066 L THORAX CAL07

RUN NUMBER: 041403.0757;1



ACCELERATION (G)

CHANNEL: LURYG FILTER: FIR 100

TIME (MS)

PEAK DATA: 39.89 G @ 20.00 MS; -12.32 G @ 26.75 MS

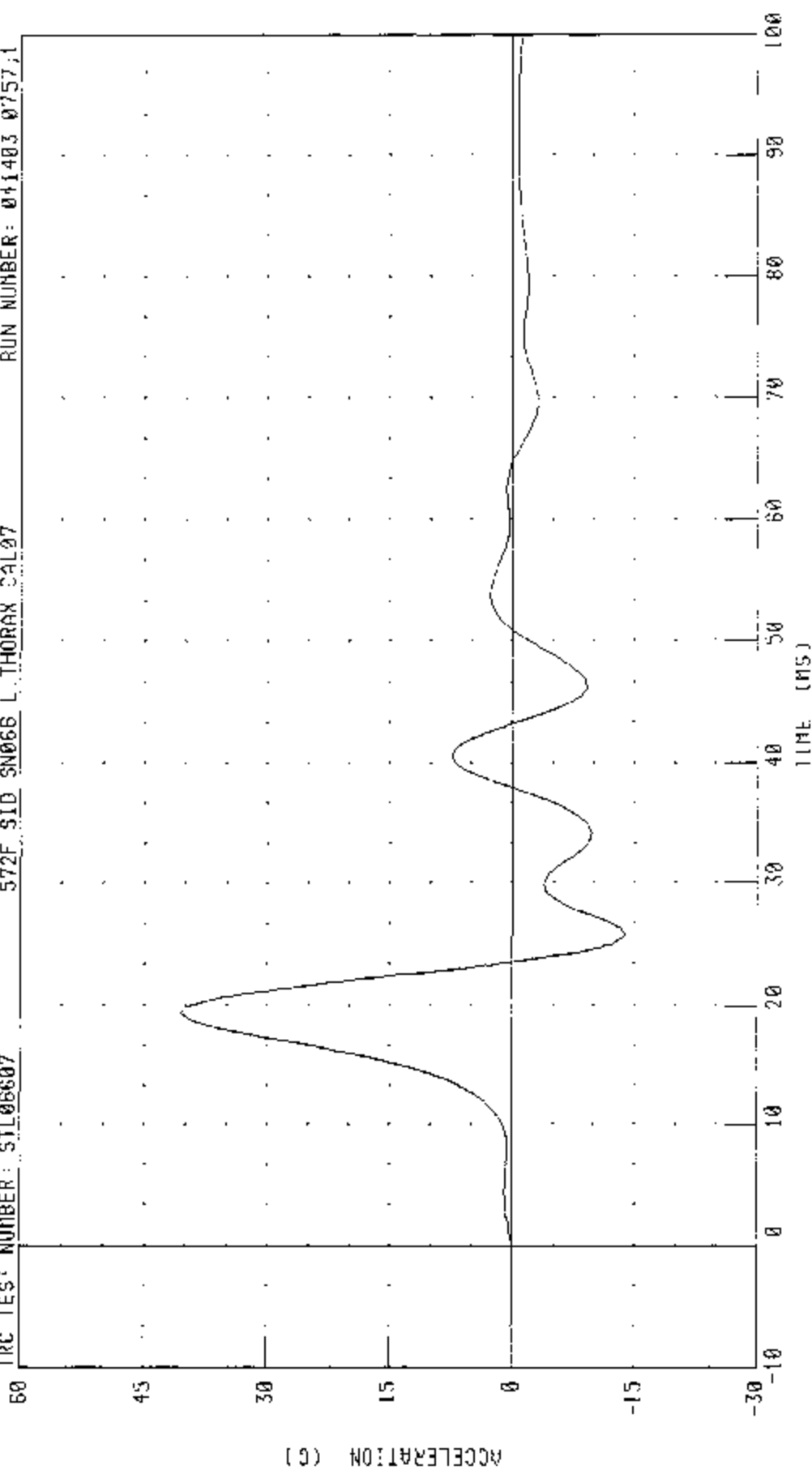
PART 512-F S T O THORAX CALIBRATION - (LEFT SIDE IMPACT)

LEFT LOWER RIB ACCELERATION Y AXIS

RUN NUMBER: 011403 0757.1

572F SID SN068 L THORAX CAL07

TRC 1ES: NUMBER: STL06607



PEAK DATA - 40.61 G @ 13.38 MS; -13.90 G @ 25.63 MS

CHANNEL LUTG FILTER: FIR 100

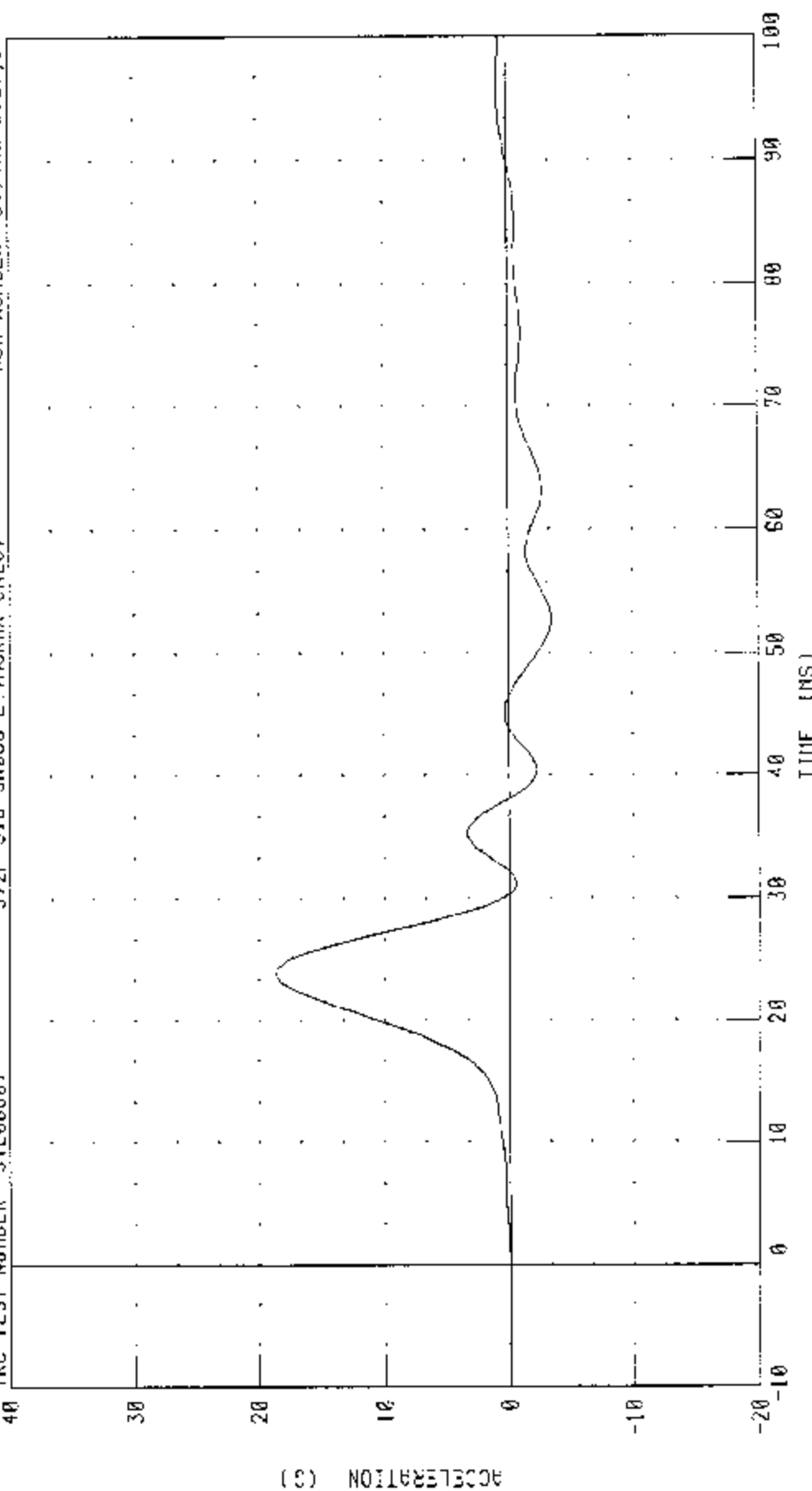
P01 572-F S.I.D. THORAX CALIBRATION (LEFT SIDE IMPACT)

LOWER SPINE ACCELERATION Y AXIS

TRC TEST NUMBER: STL06607

572F SID SN066 L THORAX CAL07

RUN NUMBER: 041403 0757,1



CHANNEL T12YC FILTER: FIR 100

PEAK DATA: 18.70 G @ 23.75 MS; -3.53 G @ 53.12 MS

Transportation Research Center Inc.

572B Abdomen Compression Test

HIII SID Serial No. 066 Calibration No. 07 - 1

Test Date 04/14/2003

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Displacement Rate	6.35 - 8.89 mm/s	7.1 - 8.9 mm/s	Yes
Data Within Required Corridor	Yes	Yes	Yes

Comments:

Technician



Approved



04.14.2003 09:18:50 11

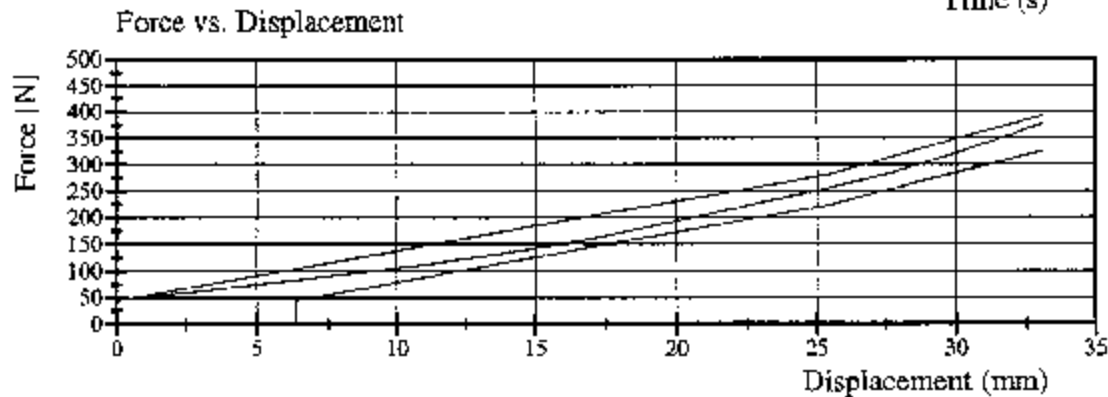
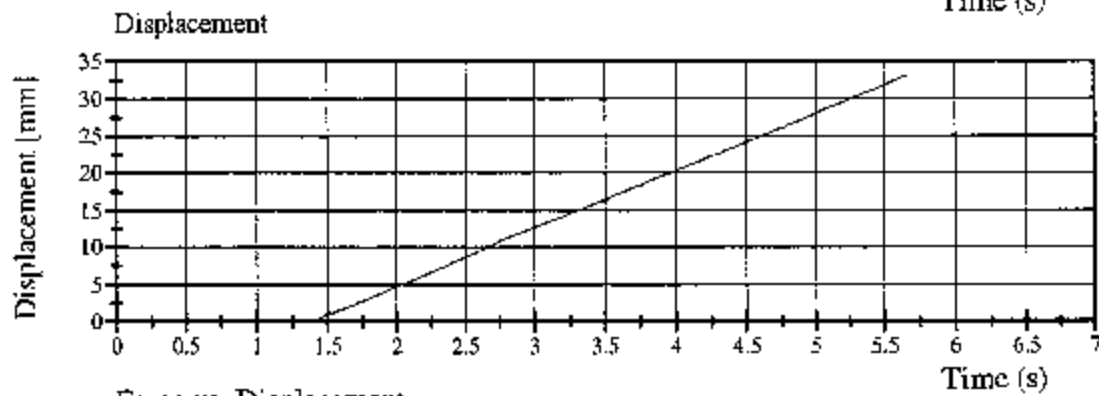
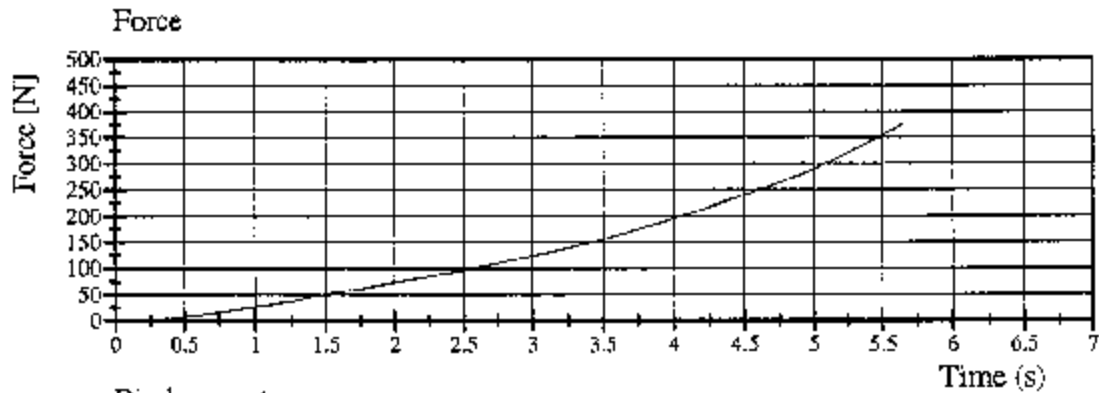


Transportation Research Center Inc.

572B Abdomen Compression Test

HIH STD Serial No. 066 Calibration No. 07 - 1

Test Date 04/14/2003



04.14.2003 09:18:52 11



TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 14-Apr-03

TRC, INC.

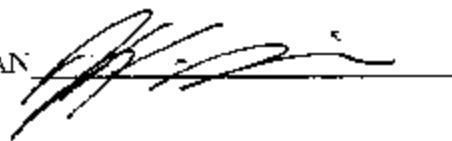
TEST NO: 066C07TF1

572B SN 066 TORSO FLEX CAL 07

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TEMPERATURE	18.9 - 25.6° C	21.7 °C
RELATIVE HUMIDITY	10 - 70 %	49 %
FORCE AT 0 DEG. FLEXION	-27 - 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 - 151 N	115.7 N
FORCE AT 30 DEG OF FLEXION	151 - 205 N	169.0 N
FORCE AT 40 DEG OF FLEXION	205 - 258 N	231.3 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6 "

TEST MEETS SPECIFICATIONS

TECHNICIAN



TRANSPORTATION RESEARCH CENTER INC.

LATERAL PELVIS IMPACT TEST

SIDE IMPACT DUMMY

14-APR-03

LEFT SIDE CONFIGURATION

TRC INC.

TEST NO: SPL06607

572F SN066 LEFT PELVIS CAL07

TEST PARAMETER	SPECIFICATION (ABSOLUTE VALUE)	TEST RESULTS
TEMPERATURE	18.9 - 25.5 C	21.7 DEG. C
RELATIVE HUMIDITY	10 - 70 %	38.0 %
PENDULUM VELOCITY	4.21 - 4.33 M/S	4.26 M/S
PEAK PELVIC ACCELERATION	40 - 60 G	42.6 G
TIME ABOVE 20 G LEVEL	3 - 7 MS	6.2 MS
IS ACCELERATION CURVE UNIMODAL?	YES	YES

TEST MEETS SPECIFICATIONS

TECHNICIAN 

RUN NUMBER: 041403.0753;1

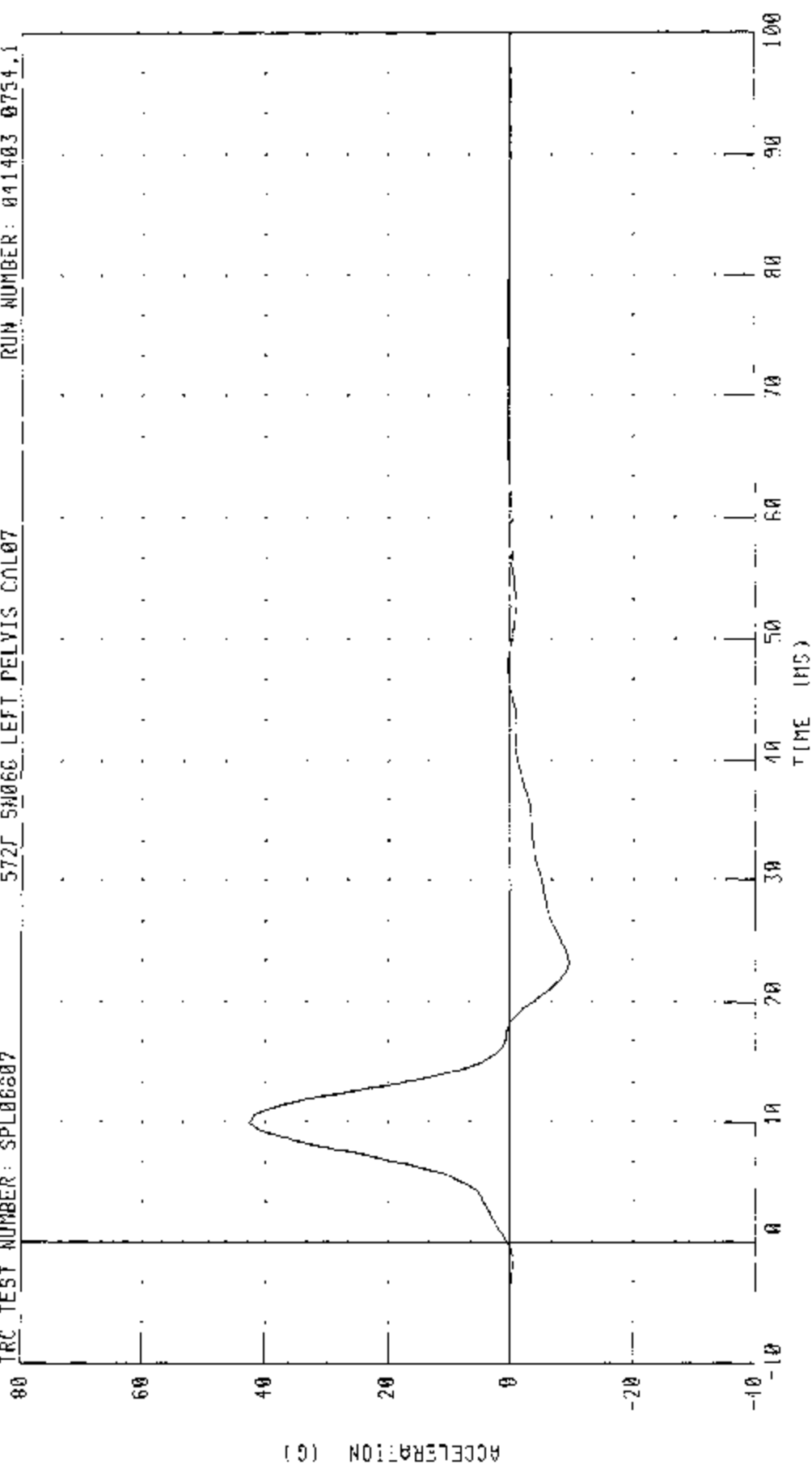
PART 572 F S.I.D. PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PELVIS ACCELERATION Y AXIS

TRC TEST NUMBER: SPL06607

572F 5H066 LEFT PELVIS COL07

RUN NUMBER: 041403 0754.1



CHANNEL: PEVYC FILTER: FIR 100

TIME (MS)

PEAK DATA: 47.63 G @ 10.00 MS; -9.35 G @ 23.13 MS

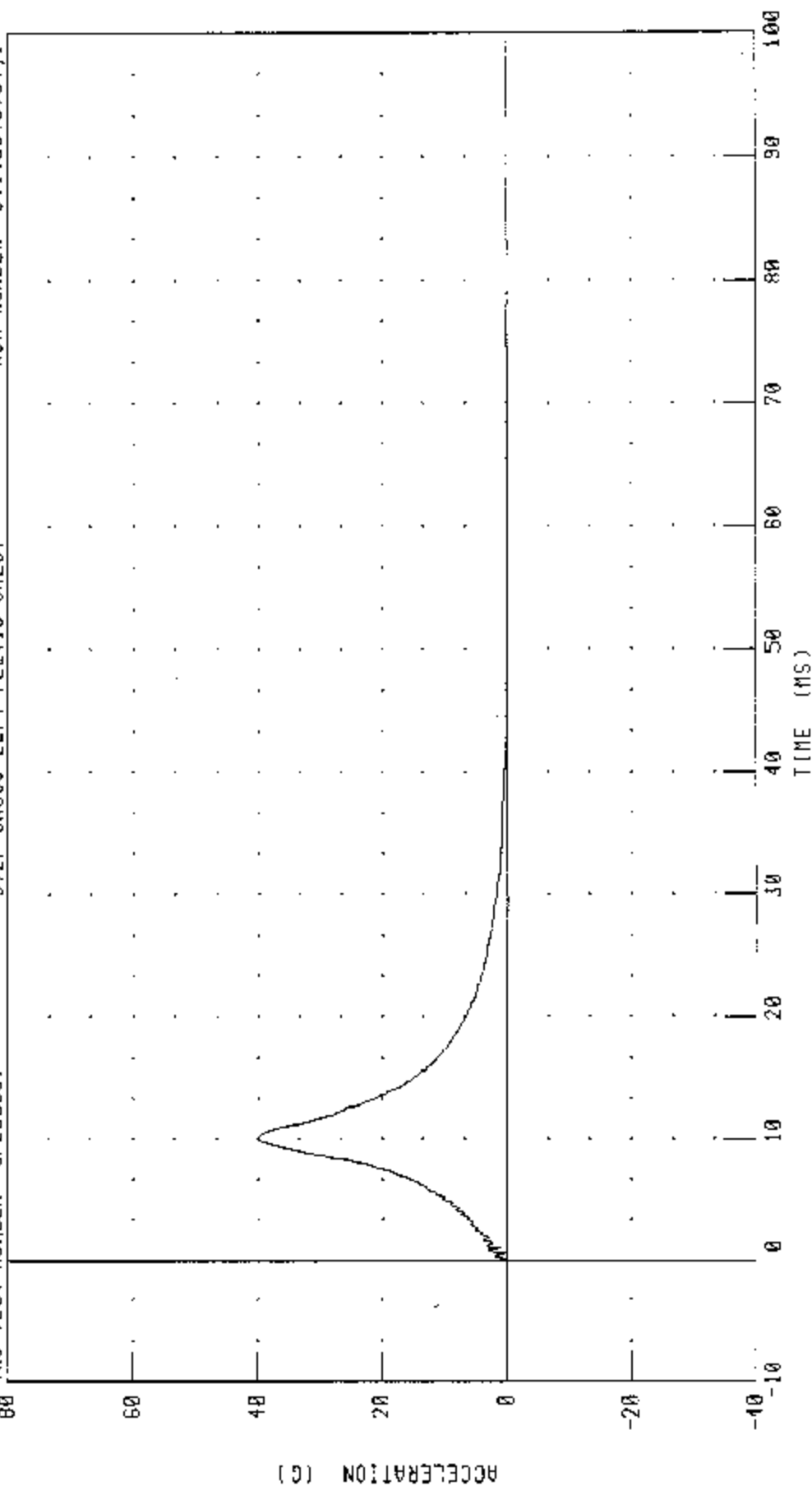
PART 572-F 510 PELVIS CALIBRATION - (LEFT SIDE IMPACT)

PENDULUM DECELERATION

TRC TEST NUMBER: SPL06607

572F SN066 LEFT PELVIS CAL07

RUN NUMBER: 041103.0754,1



CHANNEL: PENXG FILTER: CH. CLASS 1000

PEAK DATA: 40 10 0 10 00 MS; -0.11 G B 52.32 MS

Type: HIII SID S/N: 028Mfr: VectorTest Date: 04/08/03Proj./Seg. No.: 20020455-1120Test Eng.: G. Watters

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left)	(Right)
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX: Left Side Configuration		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars Left	X	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (40 ft/lbs)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. ClaridgeDate: 04/07/03

Type: HIH SID S/N: 066 Mfr: Denton Test Date: 04/08/03Proj./Seg. No.: 20020455-1120 Test Eng.: G. Watters

ITEM	PRE-USE	
HEAD:		
Head Ballast Condition	X	
Accel. Mount Bolts and Cables	X	
Skull Cap Bolts	X	
Head Skin Condition	X	
Accel. Cable Exit (left or right)	(Left)	(Right)
NECK:		
Rubber Condition and Separation From End Caps	X	
THORAX: Left Side Configuration		
Stacked Shoulder Foams and Bolts	X	
* Rib Cage Spring and Support Assembly	X	
* Rib Cage Bolts	X	
* Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	
* Location and Adjustment of Chest Pot Bracket and Collars Left	N/A	
* Chest Pot Rod End Nuts and Eyebolt	X	
Arm Foam Orientation	X	
Thorax/Lumbar Spine Bolts	X	
PELVIS:		
Tightness and Alignment of H-Point Tool Insert	X	
* Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
Check Spine Kits (Yellow tape = Kits/No tape = No kits)	(With) X	(Without)
LEGS AND FEET:		
Femur Load Cell Bolts (40 ft/lbs)	X	
Breakaway Femur Bolts (5-6 ft/lbs)	X	
Knee Joint Function and Range of Motion	X	
Leg Skin Condition and Position	X	
Ankle Range of Motion	X	
Foot Condition	X	
OTHER:		
Cleanliness	X	
Target Position	X	
Clothes	X	
Shoes	X	
Knee & Ankle One G Joint Adjustments	X	

Inspection Completed By: J. Clarridge Date: 04/07/03

Transportation Research Center Inc.

SID Post-Use Inspection

Type: Hill SID S/N: 028 Mfr: Vector Test Date: 04/08/03

Proj./Seg. No.: 20020455-1120 Test Eng.: G. Watters

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX: Left Side Configuration	
Jacket Condition	X
Arm Foam Condition	X
Damper and Chest Pot Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: No damage to report.

Inspection Completed By: J. Clarridge

Date: 04/09/03

Transportation Research Center Inc.

SID Post-Use Inspection

Type: HIH SID S/N: 066Mfr: DentonTest Date: 04/08/03Proj./Seg. No.: 2002455-1120Test Eng.: G. Watters

ITEM	POST-USE
HEAD:	
Head Skin Condition	X
Head Ballast Condition	X
NECK:	
Rubber Condition and Separation From End Caps	X
THORAX: Left Side Configuration	
Jacket Condition	X
Arm Foam Condition	X
Damper and Chest Pot Movement and Condition	X
Rib Cage Spring and Support Assembly Condition	X
Rib Wrap Condition	X
Abdomen condition	X
Thorax/Lumbar Spine Bolts	X
Lumbar Spine Condition and Separation From End Caps	X
PELVIS:	
Iliac Crest bone	X
Flesh Condition	X
Hip Range of Motion	X
LEGS AND FEET:	
Knee Skins and Castings Condition	X
Leg Skin Condition	X
Foot Condition	X
Knee Joint Range of Motion	X
Ankle Range of Motion	X

NOTES: No damage to report.Inspection Completed By: J. ClarridgeDate: 04/09/03

Appendix D

Test Equipment List and Calibration Information

Sign Convention
SAE J211 MAR95

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

Potentiometers: +Chest longitudinal deflection: Outward
 +Chest lateral deflection: Rightward
 +Seat belt displacement: Outward
 +Seat belt extension: Elongation
 -Knee slider displacement: Distance between femur and tibia
 increased (in relation to a seated
 dummy)

Rotation potentiometers:

 +About the X-axis: Left foot-eversion
 Right foot-inversion
 +About the Y-axis: Left/right foot-dorsiflexion
 +About the Z-axis: Left foot-internal
 Right foot-external

Load cells: +Femur force: Tension
 +Seat belt force: Tension
 +Barrier force: Tension

Neck load cells: +X force: Head pushed rearward
 +Y force: Head pushed leftward
 +Z force: Head pulled 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

Tibia load cells: +X force: Ankle forward, knee rearward
 +Y force: Ankle rightward, knee leftward
 +Z force: Tension
 +X moment: Bottom of tibia moving leftward
 +Y moment: Bottom of tibia moving rearward

Sign Convention. Cont'd.
SAE J211 MAR95

Lumbar load cells:

+X force:	Chest rearward, pelvis forward
+Y force:	Chest leftward, pelvis rightward
+Z force:	Chest upward, pelvis downward
-X moment:	Left shoulder toward left hip
+Y moment:	Sternum toward front of legs
+Z moment:	Right shoulder forward, left shoulder rearward

Frequency Response Classes
SAE J211 MAR95

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	600
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head form Accelerations	1000

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. The polarity column indicates whether a polarity change occurred during data acquisition to conform to J211 MAR95. See Report Sign Convention sheet for description of data output as presented in the report; occasionally channels have been adjusted in post-acquisition processing to conform to J211 MAR95.

Dummy	028rdr	Type	SID/H3	Description	NHTSA - 028a SID-LEFT IMP. CONFIG. w/REFD ACCELS CAL DUE 6-19-03(DKS 2-21-03)J21					
Chasname	Location		Model	Name	Manufacturer	Sens./mV/V/U	Fullscale	Caldate	Pos Output	Flip
HEDXG	Head Accel X		7264C-2K-2-18	P25307	Endevco	g	2000	1/22/03	Rwd	1
HEDYG	Head Accel Y		7264C-2K-2-18	P25326	Endevco	g	2000	1/22/03	Lt	1
HEDZG	Head Accel Z		7264C-2K-2-18	P25298	Endevco	g	2000	1/22/03	Up	1
HEDXR	Head Accel X Red		7264C-2K-2-18	P25318	Endevco	g	2000	1/22/03	Rwd	1
HEDYR	Head Accel Y Red		7264C-2K-2-18	P25301	Endevco	g	2000	1/22/03	Lt	1
HEDZR	Head Accel Z Red		7264C-2K-2-18	P25305	Endevco	g	2000	1/21/03	Up	1
NEKXP	Neck Force X		1716A	1716A-1532-FX	Denton	0.000197066	N	8896.4	8/29/02	1
NEKYF	Neck Force Y		1716A	1716A-1532-FY	Denton	0.000187489	N	8896.4	8/29/02	0
NEKZF	Neck Force Z		1716A	1716A-1532-FZ	Denton	9.73546E-05	N	13344.6	8/29/02	0
NEKXM	Neck Moment X		1716A	1716A-1532-MX	Denton	0.005922124	N-m	282.5	8/29/02	1
NEKYM	Neck Moment Y		1716A	1716A-1532-MY	Denton	0.005901239	N-m	282.5	8/29/02	0
NEKZM	Neck Moment Z		1716A	1716A-1532-MZ	Denton	0.008294159	N-m	282.5	8/29/02	0
LURYG	Left Upper Rib Y		7264C-2K-2-18	P25231	Endevco	g	2000	12/13/02	Rgt	0
LURYR	Left Upper Rib Red Y		7264C-2K-2-18	P25371	Endevco	g	2000	12/19/02	Rgt	0
LLRYG	Left Lower Rib Y		7264C-2K-2-18	P25075	Endevco	g	2000	12/19/02	Rgt	0
LLRYR	Left Lower Rib Red Y		7264C-2K-2-18	P25076	Endevco	g	2000	12/19/02	Rgt	0
T12YG	Lower Spine Y		7264C-2K-2-18	P25261	Endevco	g	2000	11/21/02	Lt	1
T12YR	Lower Spine Red Y		7264C-2K-2-18	P25374	Endevco	g	2000	12/19/02	Lt	1
PEVYG	Pelvis Accel Y		7264C-2K-2-18	P25063	Endevco	g	2000	12/19/02	Lt	1
PEVYR	Pelvis Accel Red Y		7264C-2K-2-18	P25074	Endevco	g	2000	12/19/02	Lt	1

Daumy 066nh Type SID Description NHTSA - 066n SID-LEFT IMP W/ RED ACCEL CAL DUE 5-21-03(DKS 3-12-03)J211

Clientname	Location	Model	Name	Manufacturer	Sens/m/V/V/U	Fullscale	Caldate	Pos Output	Fltp
HEDXG	Head Accel X	7264-2000TZ	126980	Endevco	g	2000	3/11/2003	Rwd	1
HEDYG	Head Accel Y	7264-2000TZ	127048	Endevco	g	2000	3/11/2003	Lft	1
HEDZG	Head Accel Z	7264-2000TZ	126896	Endevco	g	2000	3/11/2003	Up	1
HEDXR	Head Accel X Red	7264C-2K-2-18	P22890	Endevco	g	2000	3/11/2003	Rwd	1
HEDYR	Head Accel Y Red	7264C-2K-2-18	P16213	Endevco	g	2000	3/11/2003	Lft	1
HEDZR	Head Accel Z Red	7264C-2K-2-18	P18941	Endevco	g	2000	3/11/2003	Up	1
NEKXF	Neck Force X	1716A	1716A-1220-FX	Denton	0.000194393	N	8896.4	Hd Pd,Cst Rt	1
NEKYF	Neck Force Y	1716A	1716A-1220-FY	Denton	0.000189043	N	8896.4	Hd Li,Cst Rt	0
NEKZF	Neck Force Z	1716A	1716A-1220-FZ	Denton	0.000998459	N	13344.6	Hd Up,Cst Dn	0
NEKXM	Neck Moment X	1716A	1716A-1220-MX	Denton	0.006002832	N-m	282.5	Rt Bar to Rt Shld	1
NEKYM	Neck Moment Y	1716A	1716A-1220-MY	Denton	0.005908673	N-m	282.5	Chn to Stran	0
NEKZM	Neck Moment Z	1716A	1716A-1220-MZ	Denton	0.008456991	N-m	282.5	Chn to L1 Shld	0
LURYG	Left Upper Rib Y	7264C-2K-2-18	P24511	Endevco	g	2000	11/21/2002	Rgt	0
LURYR	Left Upper Rib Red Y	7264C-2K-2-18	P21652	Endevco	g	2000	11/21/2002	Rgt	0
LLRYG	Left Lower Rib Y	7264C-2K-2-18	P24508	Endevco	g	2000	11/21/2002	Rgt	0
LLRYR	Left Lower Rib Red Y	7264C-2K-2-18	P24627	Endevco	g	2000	11/21/2002	Rgt	0
T12YG	Lower Spine Y	7264C-2K-2-18	P21635	Endevco	g	2000	11/21/2002	Lft	1
T12YR	Lower Spine Red Y	7264C-2K-2-18	P24564	Endevco	g	2000	11/21/2002	Lft	1
PEVYG	Pelvis Accel Y	7264C-2K-2-18	P24393	Endevco	g	2000	11/21/2002	Lft	1
PEVYR	Pelvis Accel Red Y	7264C-2K-2-18	P24559	Endevco	g	2000	11/21/2002	Lft	1

Channel Report

4/21/2003 2:39:29 PM

Name of Test 030408-1

Name of DAU DAU6

System MUNIDAU

Chan.#	Sensor #	Mnemonic	Description	System	Dir.	Range	Pol. Cal.	Group	Mfg.	Model
6001	P25307	HEDXG1	Head Accel X		Rwd	809.10240	-	028ntr	Endevco	7264C-2K-2-180
6002	P25326	HEDYG1	Head Accel Y		Lft	808.84676	-	028ntr	Endevco	7264C-2K-2-180
6003	P25298	HEDZG1	Head Accel Z		Up	807.64741	-	028ntr	Endevco	7264C-2K-2-180
6004	P25318	HEDXR1	Head Accel X Red		Rwd	810.61397	-	028ntr	Endevco	7264C-2K-2-180
6005	P25301	HEDYR1	Head Accel Y Red		Lft	802.80983	-	028ntr	Endevco	7264C-2K-2-180
6006	P25305	HEDZR1	Head Accel Z Red		Up	807.23993	-	028ntr	Endevco	7264C-2K-2-180
6007	1716A-1532-FX	NEKXF1	Neck Force X		Hd	8897.6474	-	028ntr	Denton	1716A
6008	1716A-1532-FY	NEKYF1	Neck Force Y		Hd	8895.2129	-	028ntr	Denton	1716A
6009	1716A-1532-FZ	NEKZF1	Neck Force Z		Hd	13348.030	-	028ntr	Denton	1716A
6010	1716A-1532-MX	NEKXM1	Neck Moment X		Rt Ear	282.53421	-	028ntr	Denton	1716A
6011	1716A-1532-MY	NEKYM1	Neck Moment Y		Chn	282.61056	-	028ntr	Denton	1716A
6012	1716A-1532-MZ	NEKZM1	Neck Moment Z		Chn	281.87299	-	028ntr	Denton	1716A
6013	P25231	LURYG1	Left Upper Rib Y		Rgt	806.24842	-	028ntr	Endevco	7264C-2K-2-180
6014	P25371	LURYR1	Left Upper Rib Red Y		Rgt	791.95668	-	028ntr	Endevco	7264C-2K-2-180
6015	P25075	LLRYG1	Left Lower Rib Y		Rgt	801.25195	-	028ntr	Endevco	7264C-2K-2-180
6016	P25076	LLRYR1	Left Lower Rib Red Y		Rgt	797.43326	-	028ntr	Endevco	7264C-2K-2-180
6017	P25261	T12YG1	Lower Spine Y		Lft	401.56862	-	028ntr	Endevco	7264C-2K-2-180
6018	P25374	T12YR1	Lower Spine Red Y		Lft	396.97923	-	028ntr	Endevco	7264C-2K-2-180
6019	P25063	PEVYG1	Pelvis Accel Y		Lft	400.40353	-	028ntr	Endevco	7264C-2K-2-180
6020	P25074	PEVYR1	Pelvis Accel Red Y		Lft	397.60196	-	028ntr	Endevco	7264C-2K-2-180
6021	J26980	HEDXG4	Head Accel X		Rwd	790.56265	-	066ntr	Endevco	7264-2000T7
6022	J27048	HEDYG4	Head Accel Y		Lft	800.20005	-	066ntr	Endevco	7264-2000T7
6024	J26896	HEDZG4	Head Accel Z		Up	788.48078	-	066ntr	Endevco	7264-2000T7
6025	P22890	HEDXR4	Head Accel X Red		Rwd	796.35419	-	066ntr	Endevco	7264C-2K-2-180
6026	P16213	HEDYR4	Head Accel Y Red		Lft	805.41135	-	066ntr	Endevco	7264C-2K-2-180
6027	P18941	HEDZR4	Head Accel Z Red		Up	808.42530	-	066ntr	Endevco	7264C-2K-2-180
6028	1716A-1220-FX	NEKXF4	Neck Force X		Hd	8898.1070	-	066ntr	Denton	1716A
6029	1716A-1220-FY	NEKYF4	Neck Force Y		Hd	8909.1398	-	066ntr	Denton	1716A
6030	1716A-1220-FZ	NEKZF4	Neck Force Z		Hd	13353.677	-	066ntr	Denton	1716A
6031	1716A-1220-MX	NEKXM4	Neck Moment X		Rt Ear	282.42740	-	066ntr	Denton	1716A
6032	1716A-1220-MY	NEKYM4	Neck Moment Y		Chn	282.25499	-	066ntr	Denton	1716A

D-8

030408-1

Channel Report

4/21/2003 2:39:29 PM

Name of Test 030408-1

System MINIDAU

Name of DAU DAU8

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol. Cal.	Group	Mfg.	Model
8001	1716A-1220-MZ	NEKZM4	Neck Moment Z	Chn	282.90480	Nm	OK	Denton	1716A
8002	P24511	LURYG4	Left Upper Rib Y	Rgt	799.87501	g	OK	Endevco	7264C-2K-2-180
8003	P21652	LURYR4	Left Upper Rib Red Y	Rgt	803.23805	g	OK	Endevco	7264C-2K-2-180
8004	P24508	LLRYG4	Left Lower Rib Y	Rgt	803.12465	g	OK	Endevco	7264C-2K-2-180
8005	P24627	LLRYR4	Left Lower Rib Red Y	Rgt	801.56555	g	OK	Endevco	7264C-2K-2-180
8006	P21635	T12YG4	Lower Spine Y	Lft	401.99742	g	OK	Endevco	7264C-2K-2-180
8007	P24564	T12YR4	Lower Spine Red Y	Lft	401.56862	g	OK	Endevco	7264C-2K-2-180
8008	P24393	PEVYG4	Pelvis Accel Y	Lft	401.26964	g	OK	Endevco	7264C-2K-2-180
8009	P24559	PEVYR4	Pelvis Accel Red Y	Lft	402.26272	g	OK	Endevco	7264C-2K-2-180
8010	03C03C14-J01	RFSXG1	RGT SIDE SILL FRNT ST X	FWD	400.34404	g	OK	Entran	EGE-73B6Q-200
8011	03C03C14-F24	RFSYG1	RGT SIDE SILL FRNT ST Y	LT	1020.7336	g	OK	Entran	EGE-73B6Q-200
8012	03C03C14-F13	RFSZG1	RGT SIDE SILL FRNT ST Z	UP	401.00250	g	OK	Entran	EGE-73B6Q-200
8013	03C03C14-F06	RESXG1	RGT SIDE SILL RR ST X	FWD	396.89922	g	OK	Entran	EGE-73B6Q-200
8014	03C03C14-F21	RRSYG1	RGT SIDE SILL RR ST Y	LT	1015.8730	g	OK	Entran	EGE-73B6Q-200
8015	03C03C14-F08	RRSZG1	RGT SIDE SILL RR ST Z	UP	398.07183	g	OK	Entran	EGE-73B6Q-200
8016	03C03C14-N15	RDKXG1	RR FLR PAN ABV AXLE X	FWD	1003.9215	g	OK	Entran	EGE-73B6Q-200
8017	03C03C14-F12	RDKYG1	RR FLR PAN ABV AXLE Y	LT	980.65504	g	OK	Entran	EGE-73B6Q-200
8018	03C03C14-J14	RDKZG1	RR FLR PAN ABV AXLE Z	UP	1016.2763	g	OK	Entran	EGE-73B6Q-200
8019	03C03C14-J04	JRSYG1	LFT SIDE SILL RR ST Y	RT	999.02439	g	OK	Entran	EGE-73B6Q-200
8020	03C03C14-F05	JFSYG1	LFT SIDE SILL FRNT ST Y	RT	992.24806	g	OK	Entran	EGE-73B6Q-200
8022	03C03C14-F22	RRLYG1	RGT RR OCT COMP Y	LT	1545.8937	g	OK	Entran	EGE-73B6Q-200
8026	03C03C14-F10	LRLYG1	LFT RR DR UPPER CL Y	RT	1543.0982	g	OK	Entran	EGE-73B6Q-200
8027	03C03C14-F09	JJBYG1	LFT LOWER B-POST Y	RT	1509.4339	g	OK	Entran	EGE-73B6Q-200
8028	03C03C14-F19	LUBYG1	LFT MID B-POST Y	RT	1467.8899	g	OK	Entran	EGE-73B6Q-200
8029	03C03C14-F17	LJAYG1	LFT LOWER A-POST Y	LT	1530.6427	g	OK	Entran	EGE-73B6Q-200
8030	03C03C14-N17	LJAYG1	LFT MID A-POST Y	LT	1502.3474	g	OK	Entran	EGE-73B6Q-200
8031	03C03C14-N28	LFTYG1	LFT FRNT ST TRK Y	LT	1488.3720	g	OK	Entran	EGE-73B6Q-200
8032	03C03C14-J03	LRTYG1	LFT RR ST TR Y	LT	1488.3720	g	OK	Entran	EGE-73B6Q-200

Channel Report

4/21/2003 2:39:29 PM

Name of Test 030408-1

Name of DAU DAU9

System MINIDAU

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol. Cal.	Group	Mfg.	Model
9001	03C03C14-F02	VCGXG1	VEH C/G X	FWD	999.02439	- 3/31/2003	-1	Entran	EGE-73B6Q-200
9002	03C03C14-F18	VCGYG1	VEH C/G Y	LT	1007.2791	- 3/27/2003	-1	Entran	EGE-73B6Q-200
9003	03C03C14-F20	VCGZG1	VEH C/G Z	UP	1011.0584	- 3/27/2003	-1	Entran	EGE-73B6Q-200

Channel Report

4/21/2003 2:39:30 PM

Name of Test 030408-1

Name of DAU DAUD

System MINIDAU

Chan.#	Sensor #	Mnemonic	Description	Dir.	Range	Pol.	Cal.	Group	Mfg.	Model
0002	EVENT	EVENT	EVENT		5.12	V				
0003	P34118	BCGXG1	MDB CENTER OF GRAVITY	FWD	599.77742	g	-	10/15/2002	OK	-1
0004	P35750	BCGYG1	MDB CENTER OF GRAVITY	RT	606.39079	g	-	3/4/2003	OK	-1
0005	J12272	BCGZG1	MDB CENTER OF GRAVITY	UP	596.11130	g	+	3/13/2003	OK	-1
0006	P23380	LRRXG1	MDB LEFT REAR X-AXIS	FWD	603.49603	g	-	3/4/2003	OK	-1
0007	P23188	LRRYG1	MDB LEFT REAR Y-AXIS	LT	599.46142	g	+	3/3/2003	OK	-1
							-	3/3/2003	OK	-1
									TRC	Event
									Endevco	7264-2000TZ
									Endevco	7264-2000TZ
									Endevco	7264-2000T
									Endevco	7264C-2K-2-180
									Endevco	7264C-2K-2-180

Digital and System Channel Report

2003-04-21 14:39:16

Name of Test		030408-1		System		MINIDAU		Name of DAU		DAUD		description	
enable Channel		Short Name		Type				Data File		Module Type			
Yes 0501		DIGD		dig0				DAUD0501		KM3710 Controller			
bit position	bit	short		long		description							
MSB = bit 15	1	MDBR1		MDB RIGHT SIDE CONTACT SWITCH		R							
bit 14	1	MDBR1		MDB LEFT SIDE CONTACT SWITCH		L							
bit 13	0												
bit 12	0												
bit 11	0												
bit 10	0												
bit 09	0												
bit 08	0												
bit 07	0												
bit 06	0												
bit 05	0												
bit 04	0												
bit 03	0												
bit 02	0												
bit 01	0												
LSB = bit 00	0												

SIDE IMPACTOR BARRIER CERTIFICATION

Date: March 11, 2003
To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

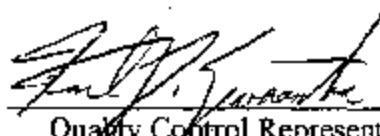
Customer P.O. Number: 022451
Work Order Number: 16059
Quantity: 01 piece

CORE INFORMATION

Core Type: PCGA-1/4-5.2-P-3003-T
Measured Cell Size: 0.250 inches
Measured Density: 5.2 pcf

Unit Number: 046B0103

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 232 - 250 psi as per DWG# DSL-1285.


Quality Control Representative
Kari D. Zwaanstra





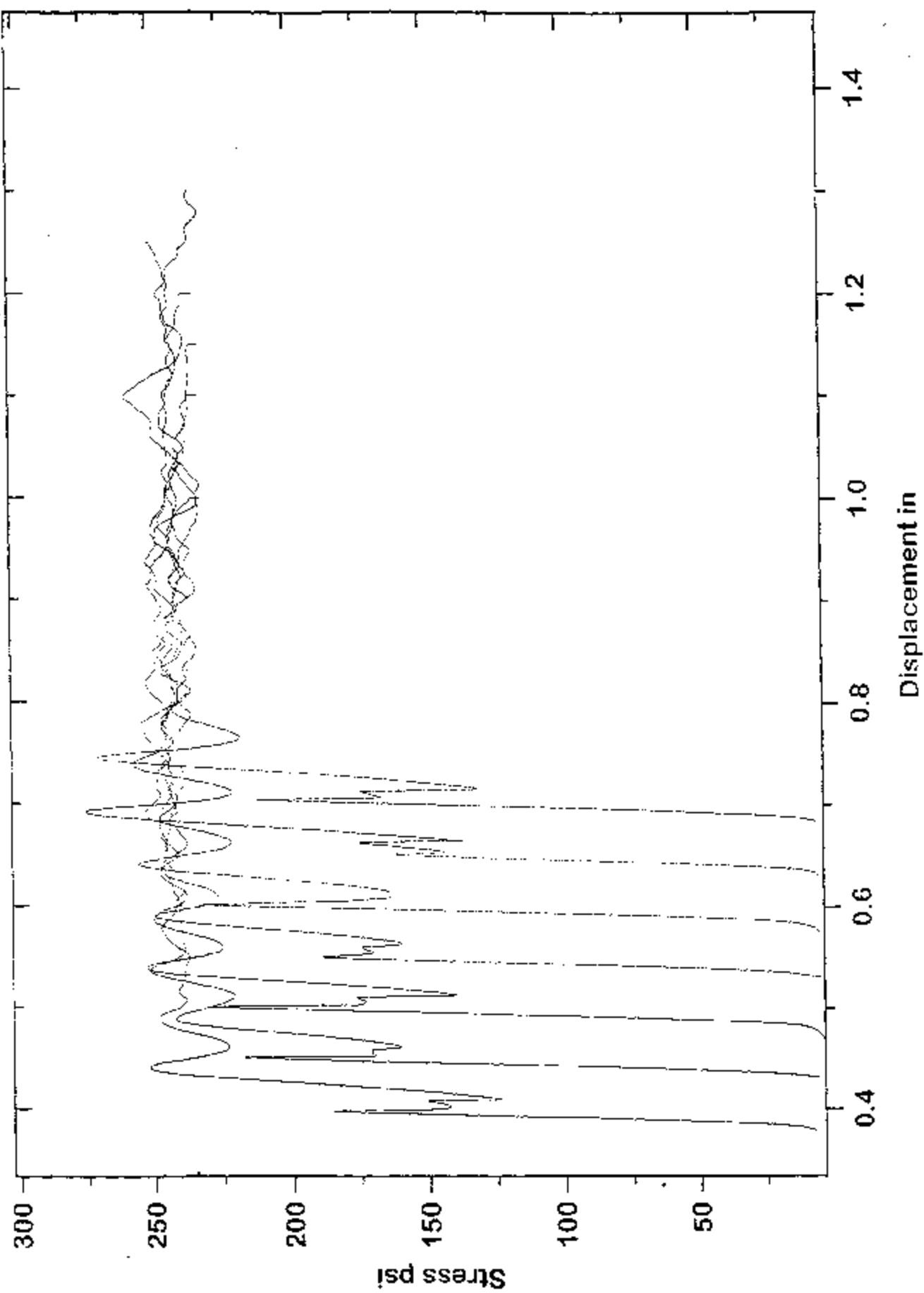
Crush Data

232 - 250 psi per DWG # DSL-1285

Block Number: 046B0103

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	241.78	238.32	238.98
2	244.12	237.80	235.41
3	246.33	246.94	239.45
4	242.25	240.86	236.53
5	241.20	243.39	240.85
6	247.03	242.20	243.97
7	241.00	246.36	237.47

BLOCK # 04GB0103 Sample ID: IN226387





PLASCORE

SIDE IMPACTOR BARRIER CERTIFICATION

Date: March 11, 2003
To: Transportation Research
Ship & Rec Bldg 50
10820 St. Route 347
East Liberty, OH 43319-0367

PURCHASE ORDER INFORMATION

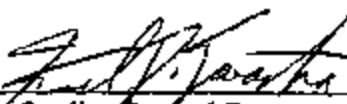
Customer P.O. Number: 02245
Work Order Number: 16059
Quantity: 01 piece

CORE INFORMATION

Core Type: PAMG-3/8-1.6-001-P-5052-T
Measured Cell Size: 0.375 inches
Measured Density: 1.6 pcf

Unit Number: 004A0203

This is to certify that the aluminum honeycomb core supplied, under the unit number provided, meets the crush requirements of 45 psi +/- 2.5 psi as per DWG# DSL-1285.


Quality Control Representative
Karl D. Zwaanstra





PLAScore

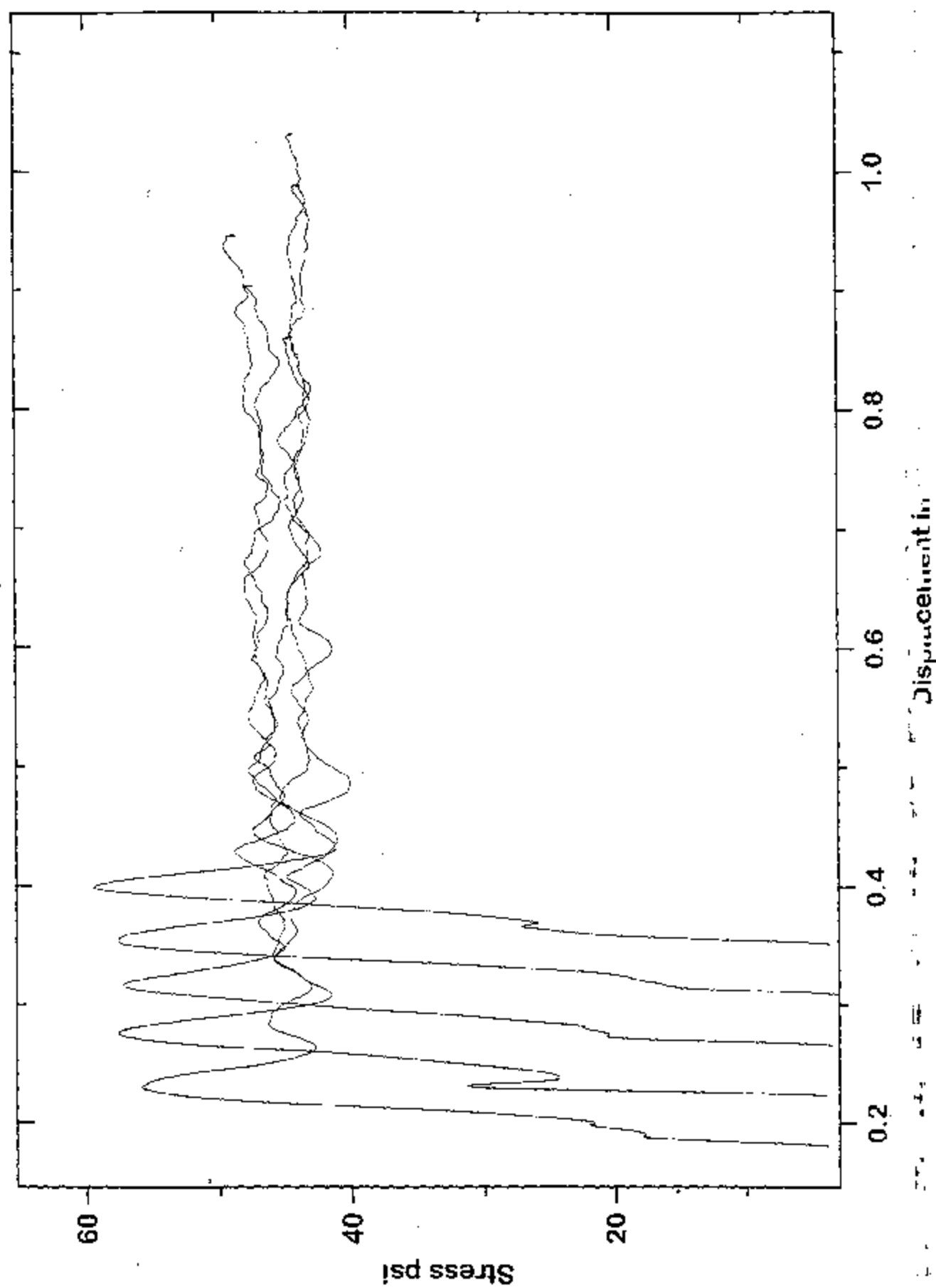
Crush Data

45 psi +/- 2.5 psi per DWG # DSL-1285

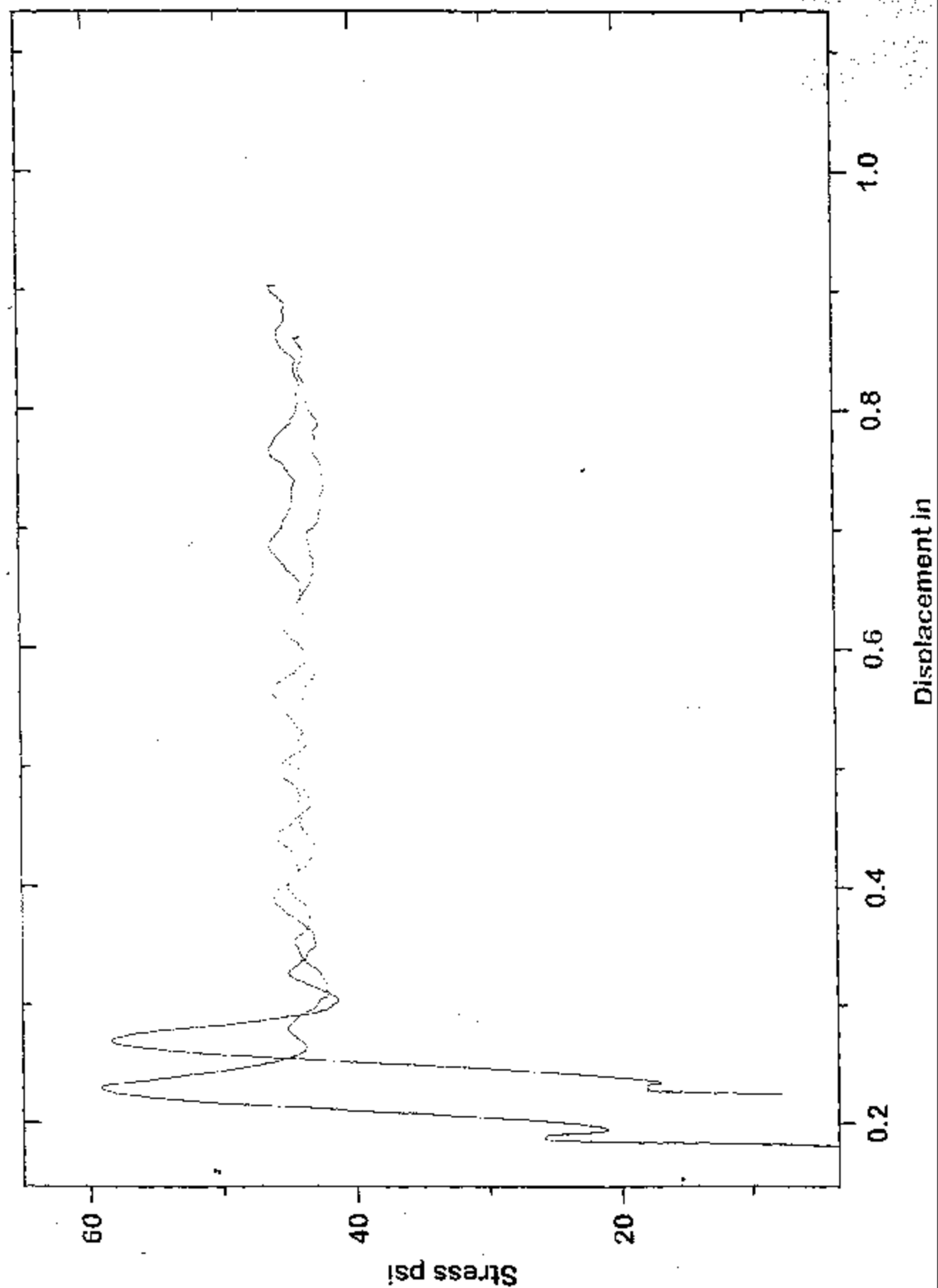
Block Number: 004A0203

<u>Specimen Number</u>	<u>Zone 1</u>	<u>Zone 2</u>	<u>Zone 3</u>
1	45.94	44.51	43.78
2	46.56	46.60	47.13
3	47.12	46.74	46.23
4	43.84	43.54	43.78
5	43.26	44.20	44.25
6	44.02	43.28	42.51
7	44.74	44.90	44.94

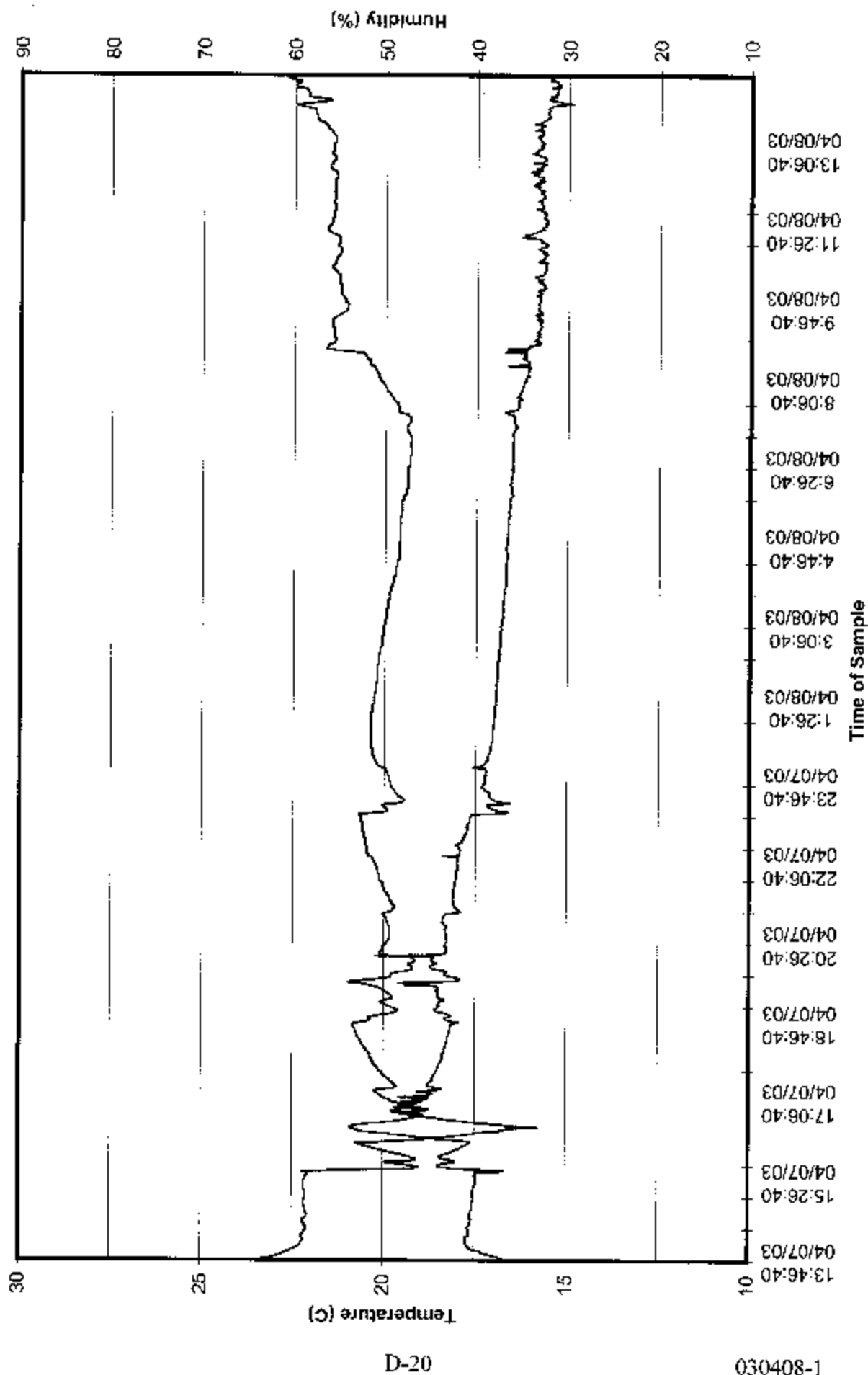
BLOCK # 004A0203 Sample ID: IN226630



BLOCK # 004A0203 Sample ID: IN226631



C30111 / 2003 SATURN ION



Appendix E

Analysis of Test Results

TRC cut a small section out of the inner door trim panel of the left front door so that an accelerometer could be installed. The door trim was removed from an area of the door panel that may interact with the front dummy lower rib and spine during impact. GM presented information and data indicating that by removing this small section of trim, the force/deflection characteristics of the panel were changed. GM surmised that the removal of the trim may have contributed to the increased lower rib and lower spine accelerations recorded by the front dummy as compared with GM data. However, GM did not provide any specific data to quantify what affect the removal of the trim had on front dummy injury measures. OVSC concludes that because the trim was removed, the test may not have fully evaluated the production design of the Saturn Ion as it relates to the front outboard position. The rear passenger dummy test results indicate that the vehicle would comply with the standard's requirements at 33.5 mph.