NAT'L INST. OF STAND & TECH R.I.C.
A11104 390928

NIST
PUBLICATIONS

NISTIR 5328

Hollow Clay Tile Prism Tests For Martin Marietta Energy Systems: Task 2 Testing

Charles W. C. Yancey

U.S. DEPARTMENT OF COMMERCE
Technology Administration
National Institute of Standards
and Technology
Structures Division
Building and Fire Research Laboratory
Gaithersburg, MD 20899

QC
100
.U56
5328
1993

NIST

NISTIR 5328

Hollow Clay Tile Prism Tests For Martin Marietta Energy Systems: Task 2 Testing

Charles W. C. Yancey

U.S. DEPARTMENT OF COMMERCE
Technology Administration
National Institute of Standards
and Technology
Structures Division
Building and Fire Research Laboratory
Gaithersburg, MD 20899

November 1993

U.S. DEPARTMENT OF COMMERCE
Ronald H. Brown, Secretary

TECHNOLOGY ADMINISTRATION
Mary L. Good, Under Secretary for Technology

NATIONAL INSTITUTE OF STANDARDS
AND TECHNOLOGY
Arati Prabhakar, Director

ABSTRACT

Forty-one Hollow Clay Tile prisms were tested in monotonic, uniaxial compression to failure as the second task in a two-task prism test program for the Department of Energy (DOE). Twenty prisms were nominally 330 mm (13 in) thick and twenty-one were nominally 200 mm (8 in) thick. Twenty-one prisms were tested with the compressive load applied normal to the axis of the hollow cores and the other twenty were subjected to compressive load acting parallel to the axis of the cores.

The objectives of the Task 2 test series were to: 1) obtain the compressive strength, 2) determine the modulus of elasticity in compression, 3) determine Poisson's ratio for the prisms, 4) study and understand the behavior of this type of masonry prism, 5) determine whether workmanship during construction of the prisms significantly affects the strength and 6) compare the results of using load control versus displacement control while loading the prisms.

Test results are presented in tabular form to report the gross and net area compressive strengths, and Secant Modulus of Elasticity on the gross and net areas. Load-displacement plots are presented to graphically report the output from vertical and horizontal Linear Variable Differential Transformers attached to the prism faces.

key words: compressive strength; compression testing; hollow clay tile units; modulus of elasticity; masonry prisms

DISCLAIMER

Certain trade names and company products are mentioned in the text in order to adequately specify the experimental procedure and equipment used. In no case does such identification imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the products are necessarily the best available for the purpose.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. SUMMARY

Forty-one Hollow Clay Tile prisms were constructed at the National Institute of Standards and Technology (NIST) Gaithersburg facility, cured for a minimum of 28 days and tested in monotonic, uniaxial compression to failure. Twenty prisms were nominally 330 mm (13 in) thick and twenty-one were nominally 200 mm (8 in) thick. Twenty-one prisms were tested with the compressive load directed normal (i.e. Normal Prisms) to the axis of the hollow cores and the other twenty were subjected to compressive load acting parallel (i.e. Parallel Prisms) to the axis of the cores. Descriptions of individual prism construction are presented in Section 3. Linear Variable Differential Transformers (LVDT's) were attached to the surfaces of the prisms to measure vertical and horizontal displacements.

Eight (8) LVDT's were attached to all Normal prisms and 200-mm (8 in) Parallel prisms and ten (10) LVDT's were attached to the 330-mm (13-in) Parallel prisms. The locations and orientations of the LVDT's for each type of prism are described in Section 3. In addition, one LVDT was attached to the upper crosshead of the universal testing machine to record crosshead displacement. The displacements and load were recorded at the rates of 20 or 30 scans per second on an electronic data acquisition system until the prisms failed.

This series of tests comprised Task 2 of a two-task prism test program conducted for the Department of Energy (DOE). Recommendations generated during Task 1 (see letter report entitled "Hollow Clay Tile Prism Tests For Martin Marietta Energy Systems: Task 1 Testing") were used in planning the 40 prism tests comprising Task 2. One extra prism was built and tested. Engineering drawings for the prisms and the test procedure handbook were prepared by Martin Marietta Energy Systems, Inc. (MMES) on behalf of DOE. All tests were conducted in accordance with the NIST quality control program approved by DOE/MMES.

2. OBJECTIVES OF TESTING

The objectives of the Task 2 test series were: 1) to test all prisms to failure and obtain the compressive strength; 2) to obtain the Secant Modulus of Elasticity; and 3) to obtain "Poisson's Ratio" for each prism, 4) study and understand the behavior of this type of masonry prism, 5) determine whether workmanship during construction of the prisms significantly affects the strength and 6) compare the results of using load control versus displacement control while loading the prisms.

3. DESCRIPTION OF PRISMS

3.1 Prism Identification

The group of 41 prisms was divided into four subgroups: 1) 200-mm (8-in) Normal, 2) 200-mm (8-in) Parallel, 3) 330-mm (13-in) Normal and 4) 330-mm (13-in) Parallel. Each prism received an alphameric identifier in the form Nabcn to indicate the test laboratory location, nominal thickness, in inches, of the prism, the orientation of the compressive load with respect to the hollow core axis, the combination of whole and cut 200-mm (8-in) Hollow Clay Tile (HCT) units, and the number of the prism fitting the aforementioned description. Thus,

N = NIST (test laboratory location)
a = 8 or 13 (prism nominal thickness)
b = Normal or Parallel (orientation of axial load)
c = A or B (A series contained only whole 200-mm (8-in) HCT units; B series contained cut and whole 200-mm (8-in) HCT units. The A and B designations were applicable to to all types of prisms except for 200-mm (8-in) Parallel)
n = 1,2,...L1,L2 (a counter to differentiate between otherwise identical prisms; the letter "L" denotes prisms tested under load control)

For example, N13NA1 indicates that a NIST-constructed (first N), 330-mm (13-in) (i.e. 13) Normal prism (second N), constructed using only whole 200-mm (8-in) HCT units (i.e. A) was assigned the number 1 (i.e. 1). The distinguishing construction feature between A series and B series prisms within the Normal prism subgroup is explained in Section 3.2.

3.2 Prism Construction

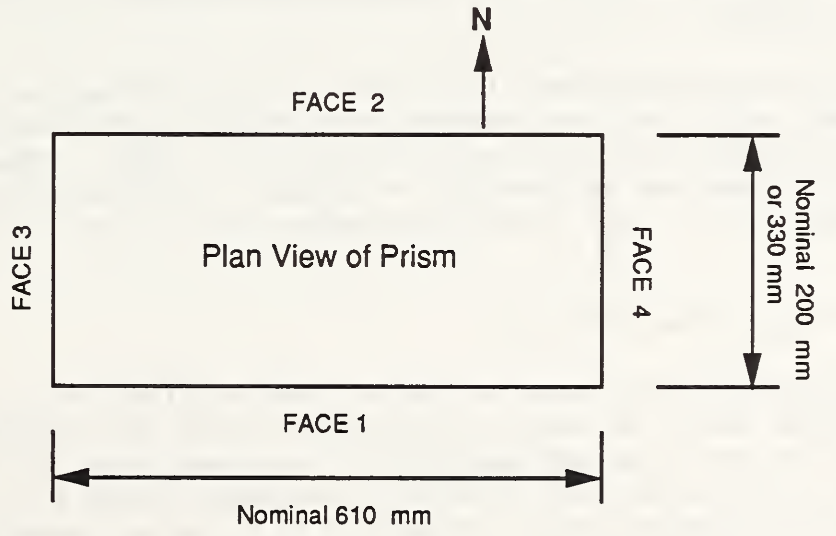
The prisms were constructed in the NIST Structures Laboratory in accordance with MMES drawings [1 and 2]. The Hollow Clay Tile units and the mortar sand were furnished by MMES and all other mortar materials were purchased locally by NIST in accordance with MMES document Y/EN-4595-R1 [3]. Schematic drawings of the nominal 200-mm (8-in) and 100-mm (4-in) Hollow Clay Tile units are presented in Figure 3.1. The lengths and widths of both types of unit were nominally 300 mm (12 in). The vertical webs were approximately 19 mm (3/4 in) thick for both types of units. As discussed below, a combination of whole and cut units were used to construct the prisms. The resulting cut units measured approximated 150 mm (6 in) in length.

Nineteen batches of mortar were used in constructing the forty-one prisms. The mortar mix design was provided by MMES document Y/EN-4675 [4]. The quantities of materials, by weight, are listed in Table 1. The table also indicates which prisms were constructed with a particular batch. Six mortar cubes were prepared in accordance with ASTM C 780-90 [5] for each of the nineteen batches of mortar. The cubes were handled in accordance with C 780 and cured in Lime water until the time of testing. The ages of the cubes at the time of testing are listed in Table 2. The prisms were constructed in three distinct time frames to facilitate storage, curing and testing. As indicated in Table 1, the construction period lasted 2 or 3 days. The prisms thus constructed formed 3 groups, hereinafter referred to as Group 1, Group 2 and Group 3. Groups 1 (built on 11/4 and 11/5/92) and 3 (built 2/1 - 2/3/93) were built by NIST personnel. Group 2 prisms (built 11/19 & 11/20) were built by a local mason contractor, with NIST providing construction oversight.

There were some noteworthy differences in the workmanship associated with Groups 1 and 3 and that associated with Group 2. While the basic masonry techniques were similar, the Group 2 mortar batches contained less water and hence were stiffer and less workable. As a result of the stiffer mortar mix, it appeared to be more difficult to maintain acceptable tolerances on the bed joint thickness in the parallel prisms and head joint thickness in the normal prisms. Visual observations of the mortar joints in the Group 2 prisms revealed more voids and hairline cracks than were apparent in the Group 1 and 3 prisms. These differences in construction notwithstanding, the workmanship associated with Group 2 prisms was probably more typical of field construction practices than that associated with Groups 1 and 3.

Figures 3.2 - 3.5 are schematic diagrams that describe some of the construction features of both normal and parallel prisms. Figure 3.2 depicts the construction of the 200-mm (8-in.) Normal prisms. Figure 3.2 (a) shows the four faces of the "A" series characterized by whole (uncut) 200-mm units placed in the bottom course. The "B" series, featuring cut 200-mm units on the bottom course, is depicted in Figure 3.2 (b). Likewise, Figures 3.3 (a) and 3.3 (b) show the construction pattern for the 330-mm (13-in.) Normal prisms. Figures 3.4 (a) and 3.4 (b) describe the "A" and "B" series respectively for 330-mm parallel prisms. As noted on the aformentioned MMES drawings, the parallel prisms were constructed in two courses, four units long, with the cores running horizontally as occurs in actual walls. Thus, the bottom course of the "A" series was constructed with one wythe of whole 200-mm units and one wythe of whole and cut 100-mm units. This pattern was reversed for the "B" series. Figure 3.5 shows the construction pattern for the 200-mm Parallel prisms. For test purposes, the 200-mm and 330-mm Parallel prisms were rotated 90° to the vertical orientation shown in Figures 3.4 and 3.5. Hereafter, any reference to the height and length of the prisms will be associated with the orientations illustrated in Figures 3.2 - 3.5.

The four faces of the prisms were assigned numbers to facilitate instrumentation assignments, photographic coverage, data collection and data processing. The nominal 610-mm (24-in.) faces were assigned the numbers 1 and 2, with Face 2 facing North when the prism was installed in the test machine. The nominal 200-mm and 330-mm faces were labeled 3 and 4 with Face 4 facing East. Following is the plan view of a typical prism to illustrate the face number assignments.



The three vertical LVDT's attached to Face 1 were labeled F1L, F1C, and F1R, indicating left, center and right when viewing the face in elevation. The horizontal LVDT attached to Face 1 was labeled F1H. The remaining four or six LVDT's were labeled using alphameric characters corresponding to the face, position and/or orientation.

Table 3 lists the length, thickness and height of the prisms as measured within the first several days after construction. The length measurements were made on Faces 1 and 2 at the 1/4, 1/2 and 3/4 height points with the bottom of the prism as the reference. Thickness measurements were generally taken along Faces 3 and 4. In some cases, measurements were taken along one face only. It is noted that the tabulated heights are exclusive of the top and bottom cap thicknesses. The prisms were capped prior to testing and the last column lists the average cap thicknesses as calculated by taking the difference between the average capped height (measured just prior to testing) and the average uncapped height (obtained from the 8th and 9th columns of Table 3) and dividing by two.

3.3 Capping and Handling Procedures

3.3.1 Capping

The top and bottom of the prisms were capped with a mixture of Hydrostone Gypsum Cement and water. The capping materials were mixed in accordance with the weight ratio specified in Table 2 of MMES document Y/EN-4595-R1 [3]. The hydrostone mixture was poured onto the surface of a plane, level, polished, steel plate which was resting directly on the laboratory floor. The mixture was confined on the sides by a rectangular-shaped dam which was taped to the top of the leveling plate. Prior to placing the capping mixture onto the plate, one end of the prism was lowered to a height approximately 6 mm (1/4 in) above the top of the plate using an overhead crane and a specially-fabricated steel handling assembly (refer to section 3.3.2 for details). Fine adjustments to the height of the prism end were made through the use of leveling screws attached to the handling assembly. The leveling screws were adjusted with reference to the leveling plate to render the bottom surface of the prism level. The prism was plumbed on all sides by a hand-held mason's level.

Once the capping mixture was placed, the entire prism/handling fixture assembly was left in place until the cap hardened and gained sufficient compressive strength to permit additional handling (a minimum of 1 hour). Then, the prism was raised with the crane and rotated 180° to prepare the other end for capping. The aforementioned leveling and plumbing procedure was repeated to apply a cap to the other end.

3.3.2 Handling Assembly Details

The NIST handling assembly was constructed to clamp a prism along each vertical edge with sufficient force to permit lifting the prism via overhead crane or forklift while at the same time not damaging the specimen prior to testing. The assembly was fabricated in the NIST Structures Laboratory using structural steel shapes, the principal elements being two MC12 x 10.6 channel sections and four pieces of 2 1/2 x 2 1/2 x 1/4 angle. Most of the construction details of the handling assembly are illustrated in the schematic drawing labeled Figure 3.6. In the lifting position, the channels are vertical members which run parallel to the vertical edges of the prism and are separated from the masonry by a layer of resilient material (12.5-mm polyethylene foam). Swivel lifting eyes were welded to the webs of the channels to permit lifting and rotating. Horizontally-oriented angle sections were welded to the tips of the channel flanges near the top and bottom of the channels. The angles extend beyond the faces of the prism far enough to receive 12.5-mm (1/2-in) diameter threaded rods bolted to the vertical legs. A clamping action is affected by tightening the nuts attached to the threaded rods. To the back face of the vertical leg of the angles are attached two threaded couplers, one near each end, that receive 12.5 mm all-thread rod. These coupler/rod attachments form the leveling mechanism mentioned above. Figure 3.7 is a photograph of a capped prism with the handling assembly attached.

3.4 LVDT Location and Orientation

The locations and orientations of the eight LVDT's used with the normal prisms are shown schematically in Figures 3.8 and 3.9. LVDT support brackets were attached to the prism surface using hot melt glue. There were three vertical LVDT's and one horizontal LVDT attached to each face. The attachment points were located in reference to the sides and top and bottom edges of the prisms in accordance with MMES document Y/EN-4595 R-1 [3].

The LVDT locations and orientations for the faces of the parallel prisms are described schematically in Figure 3.10. In addition to the eight LVDT's attached to the faces, one horizontal LVDT was attached, at mid-height, to each edge of the nominal 330-mm Parallel prisms (Figure 3.11).

LVDT's with three displacement ranges were used: ± 25 mm (1 in) and ± 12.5 mm (0.5 in) for the vertical LVDT's, ± 12.5 mm for the horizontal LVDT's on Faces 1 and 2 and ± 2.5 mm (0.1 in) for the edge mounted LVDT's.

Table 1 - Mortar Mixes by Weight - Task 2

BATCH DESCRIPTION	MORTAR MATERIAL					
	CEMENT	SAND	LIME	WATER	DATE	PRISM I.D.
BATCH #1	120.10	447.29	54.93	126.77	11/4/92	N8P1 & N8P2
BATCH #2	180.14	670.31	82.29	189.26	11/4/92	N13NA1,N13NB1,N13NB2
BATCH #3	120.10	447.29	54.93	122.32	11/4/92	N13PA1 & N13PB1
BATCH #4	180.14	670.31	82.29	190.37	11/5/92	N8NA1, N8NB1, N8NA2
BATCH #5	180.14	670.31	82.29	185.04	11/19/92	N8NA5, N8NA3, N8NA4
BATCH #6	120.10	447.29	54.93	119.65	11/19/92	N8P3 & N8P4
BATCH #7	180.14	670.31	82.29	172.58	11/19/92	N13PA2 & N13PB2
BATCH #8	180.14	670.31	82.29	182.15	11/20/92	N13NB3 & N13NA2, R*
BATCH #9	180.14	670.31	82.29	173.03	11/20/92	N8NB2, N8NB3, N8NB4
BATCH #10	120.10	447.29	54.93	121.43	11/20/92	R*, R*
BATCH #11	180.14	670.31	82.29	171.25	11/20/92	N13PA3, R*
BATCH #12	120.10	447.29	54.93	115.20	2/1/93	N8P5 & N8P6
BATCH #13	120.10	447.29	54.93	122.32	2/1/93	N8P7 & N8P8
BATCH #14	120.10	447.29	54.93	122.76	2/1/93	N8PL1 & N8PL2
BATCH #15	120.10	447.29	54.93	123.21	2/2/93	N13PA4 & N13PAL
BATCH #16	120.10	447.29	54.93	123.21	2/2/93	N13PB3 & N13PB4
BATCH #17	120.10	447.29	54.93	121.88	2/2/93	N13PBL & N13NA4
BATCH #18	180.14	670.31	82.29	177.92	2/3/93	N13NB4,N13NA3,N13NAL
BATCH #19	180.14	670.31	82.29	192.60	2/3/93	N8NBL, N8NAL, N13NBL

FOOTNOTES:
All units are in N
R* - Prism built but rejected because workmanship was unacceptable.

Table 2 – Mortar Cube Test Results

	FAILURE LOAD, kN									
COUNTER	BATCH #1	BATCH #2	BATCH #3	BATCH #4	BATCH #5	BATCH #6	BATCH #7	BATCH #8	BATCH #9	BATCH #10
1	40.52	41.90	44.48	44.75	40.08	45.64	45.80	45.51	42.57	42.66
2	40.12	41.99	43.81	45.02	39.89	46.35	46.53	45.51	43.37	41.99
3	40.57	43.06	44.13	43.68	39.77	45.82	45.73	44.97	43.59	42.66
4	40.39	43.01	43.77	39.32[2]	40.70	44.76	44.04	44.48	44.17	44.53
5	40.35	41.68	43.41	44.13	39.94	42.90	46.11	46.84	45.28	44.62
6	41.19	42.04	44.08	43.24	38.90	43.61	45.13	47.11	45.95	45.02
Mortar Age 1st 3 Mortar Age 2nd 3	28 29	28 29	29 30	28 29	28 29	28 29	28 29	27 28	31 53	31 49
Avg. Load	40.52	42.28	43.95	43.36	39.89	44.76	45.56	45.80	44.16	43.58
Avg. Strength [1]	15.71	16.38	17.03	16.80	15.46	17.35	17.66	17.75	17.11	16.89
Stand. Dev. [1]	0.14	0.23	0.14	0.81	0.23	0.53	0.34	0.40	0.49	0.50

Footnotes:

1 Values in units of N/mm^2

2 Cube mistakenly tested with rough face in contact with upper crosshead loading plate.

Table 2 - Mortar Cube Test Results

	FAILURE LOAD, kN								
COUNTER	BATCH #11	BATCH #12	BATCH #13	BATCH #14	BATCH #15	BATCH #16	BATCH #17	BATCH #18	BATCH #19
1	43.97	40.83	40.88	43.10	40.03	43.81	42.59	41.95	42.61
2	43.10	40.39	40.01	42.70	43.70	44.15	43.48	40.83	43.59
3	45.88	40.92	38.77	43.17	39.14	45.15	43.15	41.23	42.26
4	46.11	45.59	41.37	42.17	37.19	46.26	42.81	42.88	42.48
5	46.62	44.48	43.15	41.59	41.99	47.60	40.01	43.15	44.35
6	47.64	46.26	40.26	40.99	42.48	44.82	43.90	43.50	42.26
Mortar Age 1st 3 Mortar Age 2nd 3	31 49	28 32	28 32	28 37	28 35	28 30	28 36	28 36	28 33
Avg. Load	45.55	43.08	40.40	42.29	40.76	45.30	43.16	42.26	42.93
Avg. Strength [1]	17.65	16.69	15.30	16.39	15.80	17.55	16.73	16.38	16.64
Stand. Dev. [1]	0.66	1.03	0.37	0.34	0.93	0.54	0.19	0.42	0.33

Footnotes:

1 Values in units of N/mm^2

Table 3 - Prism Dimensions before Capping

PRISM I.D.	LENGTH 1/4 ht mm	LENGTH 1/2 ht mm	LENGTH 3/4 ht mm	THICKNESS 1/4 ht mm	THICKNESS 1/2 ht mm	THICKNESS 3/4 ht mm	HEIGHT Face 1 m	Face 2 m	CAP THICKNESS mm
N13NB3	593	598	597	314	316	316	1.21	1.21	6.1
	597	598	600	316	319	314	1.21	1.20	
N8NB4	595	597	595	200	200	200	1.21	1.22	5.3
	595	598	595	200	200	200	1.22	1.22	
N8NB3	597	600	595	200	200	200	1.21	1.22	5.8
	597	598	595	200	200	200	1.21	1.20	
N8NB2	597	597	597	200	200	200	1.22	1.20	5.3
	597	594	597	200	200	200	1.21	1.20	
N8P5	600	600	602	200	198	200	1.20	1.20	6.4
	600	602	603	NM	NM	NM	1.20	1.20	
N8P6	602	602	602	198	202	200	1.20	1.20	8.4
	602	602	602	NM	NM	NM	1.20	1.20	
N13PA3	600	600	602	316	316	316	1.20	1.20	6.4
	597	598	597	NM	NM	NM	1.21	1.20	
N8P7	598	598	600	200	198	198	1.20	1.20	8.6
	600	600	600	NM	NM	NM	1.20	1.20	

Footnotes

1/ For Length and Thickness Dimensions, All Measurements on One Row Taken on One Face

2/ Height Dimensions Do Not Include the Cap Thicknesses

3/ NM = Not Measured

Table 3 - Prism Dimensions Before Capping

PRISM I.D.	LENGTH 1/4 ht mm	LENGTH 1/2 ht mm	LENGTH 3/4 ht mm	THICKNESS 1/4 ht mm	THICKNESS 1/2 ht mm	THICKNESS 3/4 ht mm	HEIGHT Face 1 m	HEIGHT Face 2 m	CAP THICKNESS mm
N8NA5	597	595	594	202	202	200	1.22	1.22	6.35
	600	597	595	200	200	202	1.22	1.22	
N8NA3	595	597	597	202	198	202	1.22	1.21	6.86
	598	598	597	200	200	202	1.21	1.22	
N8NA4	597	595	597	200	200	200	1.22	1.22	5.08
	598	597	597	200	200	200	1.22	1.22	
N8P3	603	603	603	198	200	200	1.21	1.21	6.10
	600	600	602	NM	NM	NM	1.20	1.21	
N8P4	600	600	602	200	200	200	1.21	1.20	7.11
	600	600	603	NM	NM	NM	1.22	1.21	
N13PB2	598	598	600	318	318	316	1.21	1.21	6.35
	595	597	594	NM	NM	NM	1.20	1.21	
N13PA2	598	598	598	318	321	318	1.20	1.20	5.84
	595	598	598	NM	NM	NM	1.20	1.20	

Footnotes

1/ For Length and Thickness Dimensions, All Measurements on One Row Taken on One Face

2/ Height Dimensions Do Not Include the Cap Thicknesses

3/ NM = Not Measured

Table 3 - Prism Dimensions before Capping

PRISM I.D.	LENGTH 1/4 ht mm	LENGTH 1/2 ht mm	LENGTH 3/4 ht mm	THICKNESS 1/4 ht mm	THICKNESS 1/2 ht mm	THICKNESS 3/4 ht mm	HEIGHT Face 1 m	HEIGHT Face 2 m	CAP THICKNESS mm
N13NA2	597	598	597	316	316	318	1.22	1.22	
	597	598	597	316	314	314	1.21	1.21	
N8NB1	598	600	598	202	200	200	1.22	1.21	7.37
	597	598	595	200	200	202	1.22	1.22	
N8NA2	597	598	597	202	200	202	1.22	1.21	5.59
	597	598	600	200	200	200	1.22	1.22	
N8NAL	602	603	603	202	200	200	1.22	1.22	6.86
	[illegible]	603	598	202	202	202	1.22	1.21	
N8NBL	598	594	597	200	200	200	1.22	1.22	5.59
	597	602	595	202	200	202	1.22	1.22	
N8P8	603	602	602	200	198	198	1.21	1.21	9.14
	600	603	602	NM	NM	NM	1.21	1.22	

Footnotes

1/ For Length and Thickness Dimensions, All Measurements on One Row Taken on One Face

2/ Height Dimensions Do Not Include the Cap Thicknesses

3/ NM = Not Measured

Table 3 - Prism Dimensions before Capping

PRISM I.D.	LENGTH 1/4 ht mm	LENGTH 1/2 ht mm	LENGTH 3/4 ht mm	THICKNESS 1/4 ht mm	THICKNESS 1/2 ht mm	THICKNESS 3/4 ht mm	HEIGHT Face 1 m	Face 2 m	CAP THICKNESS mm
N13PB3	598	598	600	311	313	313	1.21	1.21	6.10
	602	600	600	NM	NM	NM	1.21	1.21	
N13PB4	605	605	603	314	314	313	1.21	1.21	6.60
	602	600	598	NM	NM	NM	1.21	1.21	
N13PBL	600	598	598	314	313	314	1.21	1.21	8.38
	603	598	602	NM	NM	NM	1.20	1.21	
N13NA4	597	597	594	313	313	313	1.21	1.21	7.37
	597	597	595	313	313	313	1.21	1.21	
N13NA3	597	597	595	316	314	313	1.21	1.21	6.10
	597	597	594	314	313	311	1.21	1.21	
N13NAL	602	597	598	313	313	314	1.21	1.21	6.86
	600	600	598	313	313	314	1.21	1.21	
N13NB4	597	597	595	313	313	311	1.21	1.21	7.11
	598	600	600	313	314	313	1.21	1.21	
N13NBL	597	597	595	314	314	313	1.21	1.21	7.11
	598	598	600	313	313	311	1.21	1.21	

Footnotes

1/ For Length and Thickness Dimensions, All Measurements on One Row Taken on One Face

2/ Height Dimensions Do Not Include the Cap Thicknesses

3/ NM = Not Measured

Table 3 - Prism Dimensions before Capping

PRISM I.D.	LENGTH 1/4 ht mm	LENGTH 1/2 ht mm	LENGTH 3/4 ht mm	THICKNESS 1/4 ht mm	THICKNESS 1/2 ht mm	THICKNESS 3/4 ht mm	HEIGHT Face 1 m	HEIGHT Face 2 m	CAP THICKNESS mm
N13NA1	597	597	597	316	NM	311	1.21	1.22	4.83
	595	597	598	316	NM	316	1.22	1.21	
N13NB1	597	597	598	311	311	311	1.22	1.22	6.10
	600	600	598	316	316	314	1.22	1.22	
N13NB2	597	598	597	316	NM	316	1.22	1.21	5.08
	597	598	597	314	NM	311	1.22	1.21	
N13PB1	600	602	602	311	311	311	1.21	1.21	8.13
	602	602	603	NM	NM	NM	1.21	1.21	
N13PA1	603	602	603	314	313	311	1.21	1.20	7.11
	602	603	603	NM	NM	NM	1.21	1.21	
N8P1	598	598	598	200	200	198	1.21	1.21	7.11
	600	598	597	NM	NM	NM	1.21	1.21	
N8P2	600	598	597	202	202	200	1.21	1.21	6.10
	602	602	603	NM	NM	NM	1.21	1.21	
N8NA1	597	598	314	200	200	202	1.22	1.21	
	595	598	314	200	200	200	1.22	1.22	

Footnotes

1/ For Length and Thickness Dimensions, All Measurements on One Row Taken on One Face

2/ Height Dimensions Do Not Include the Cap Thicknesses

3/ NM = Not Measured

Table 3 - Prism Dimensions before Capping

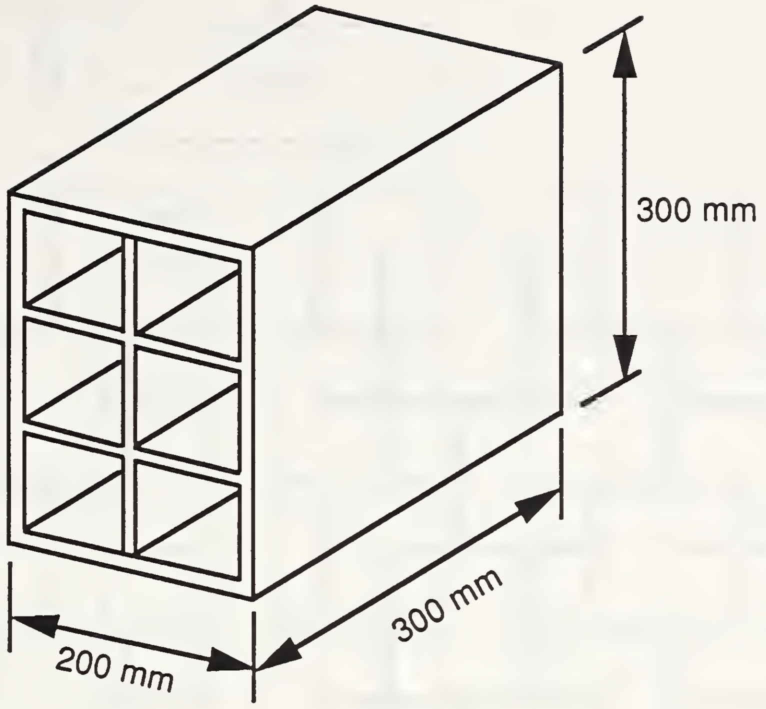
PRISM I.D.	LENGTH 1/4 ht mm	LENGTH 1/2 ht mm	LENGTH 3/4 ht mm	THICKNESS 1/4 ht mm	THICKNESS 1/2 ht mm	THICKNESS 3/4 ht mm	HEIGHT Face 1 m	HEIGHT Face 2 m	CAP THICKNESS mm
N8PL1	602	602	603	200	198	198	1.20	1.21	7.37
	602	600	598	NM	NM	NM	1.20	1.21	
N8PL2	602	600	602	198	200	200	1.21	1.21	7.37
	600	598	598	NM	NM	NM	1.21	1.21	
N13PA4	600	600	602	313	311	313	1.21	1.21	9.91
	602	602	603	NM	NM	NM	1.21	1.21	
N13PAL	602	602	602	313	314	313	1.21	1.21	7.11
	598	600	602	NM	NM	NM	1.21	1.21	

Footnotes

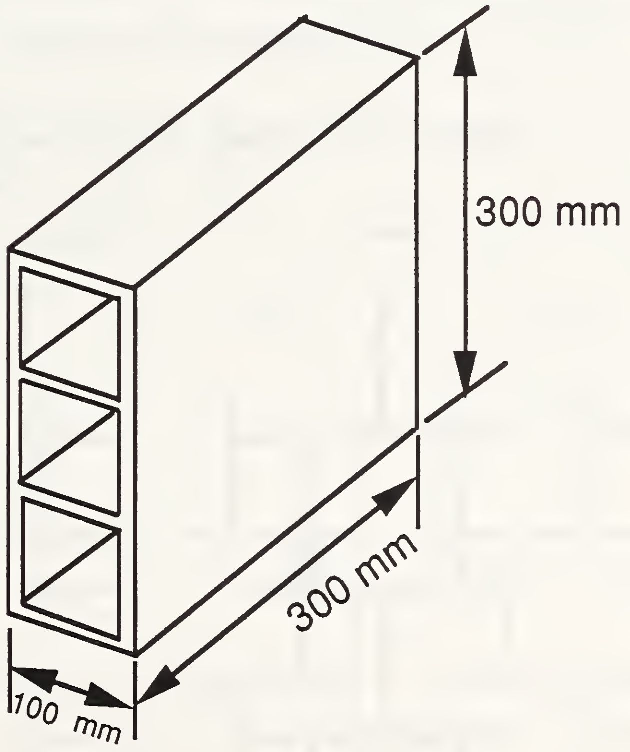
1/ For Length and Thickness Dimensions, All Measurements on One Row Taken on One Face

2/ Height Dimensions Do Not Include the Cap Thicknesses

3/ NM = Not Measured



200-mm HCT Unit



100 -mm HCT Unit

Figure 3.1 - 200-mm & 100-mm HCT Units

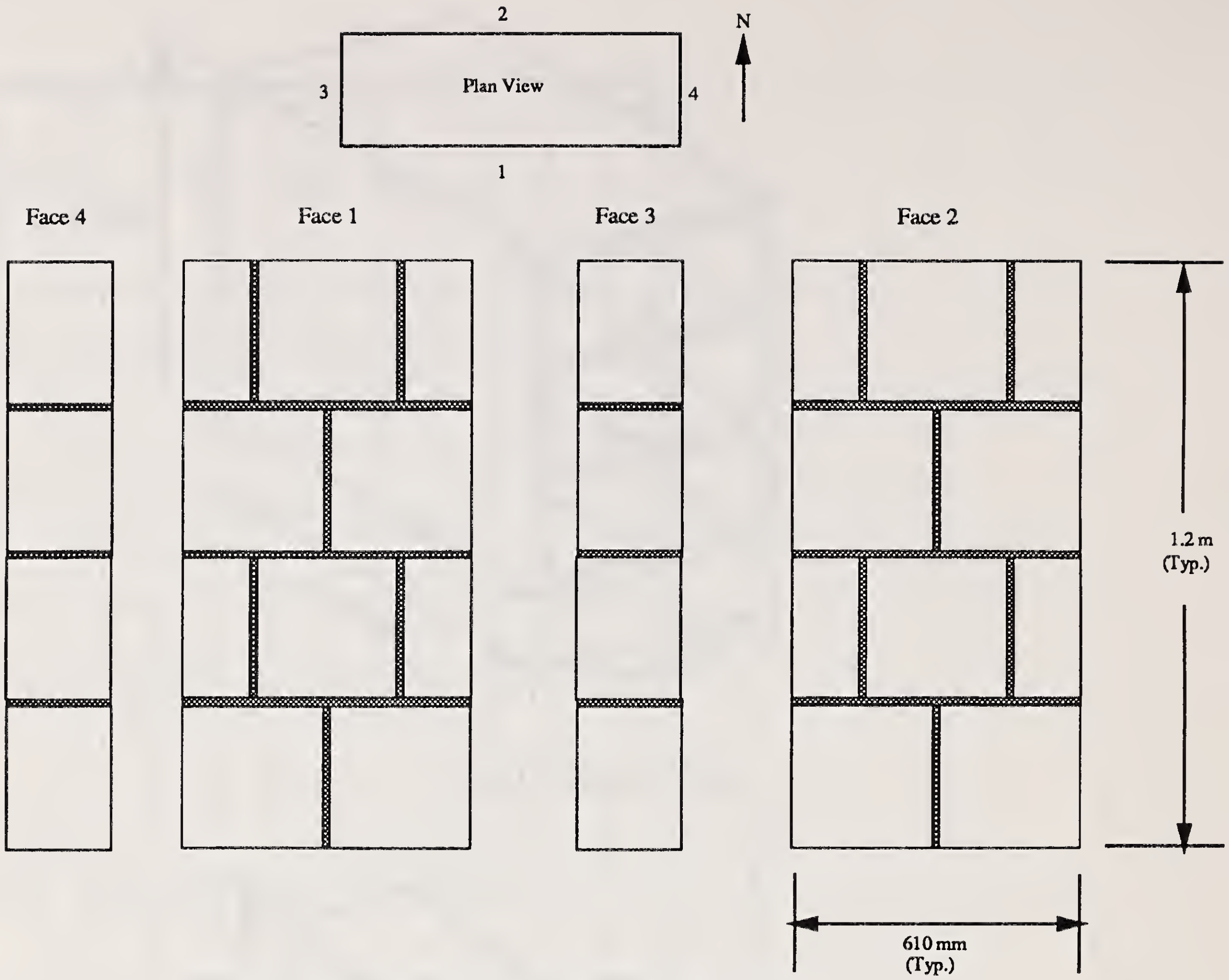


Figure 3.2 (a) - 200-mm Normal Prisms, Series A

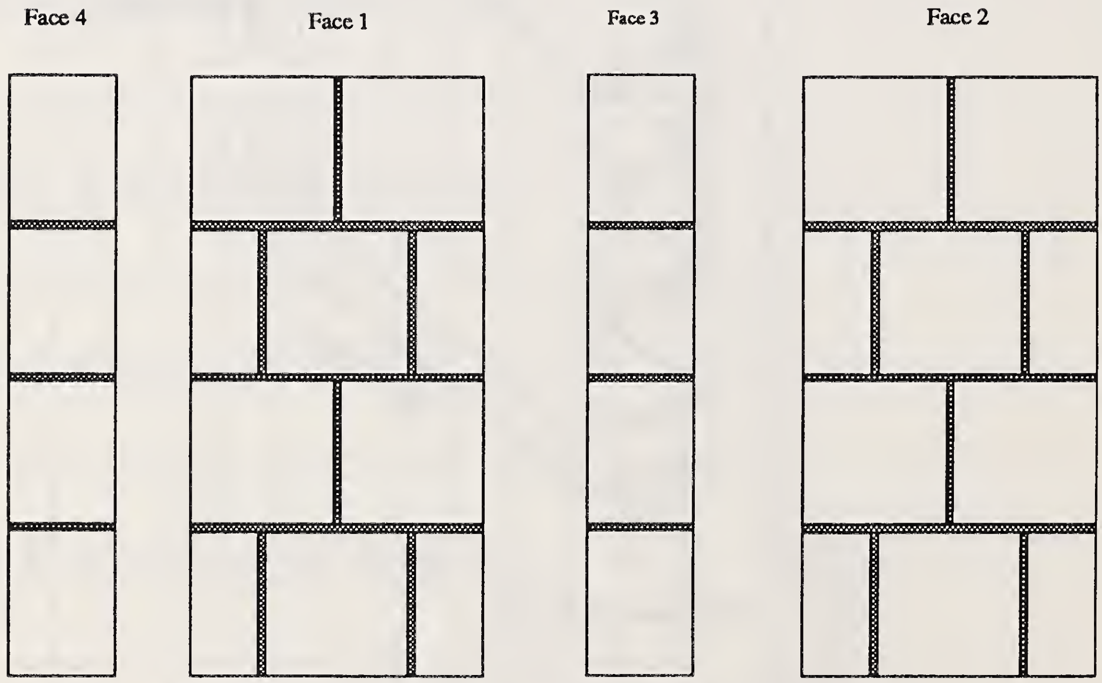


Figure 3.2 (b) - 200-mm Normal Prisms, Series B

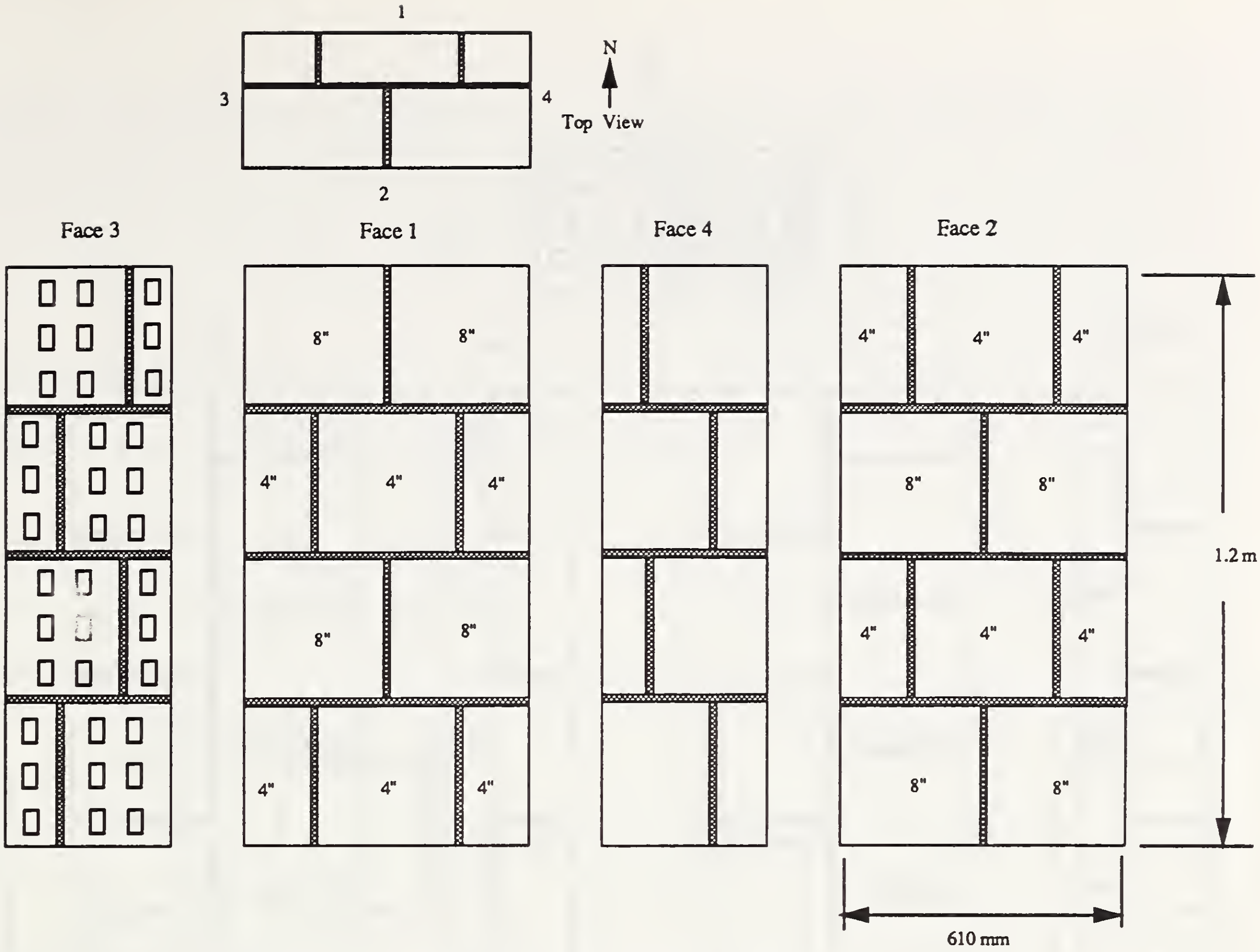


Figure 3.3 (a) - 330-mm Normal Prisms, Series A

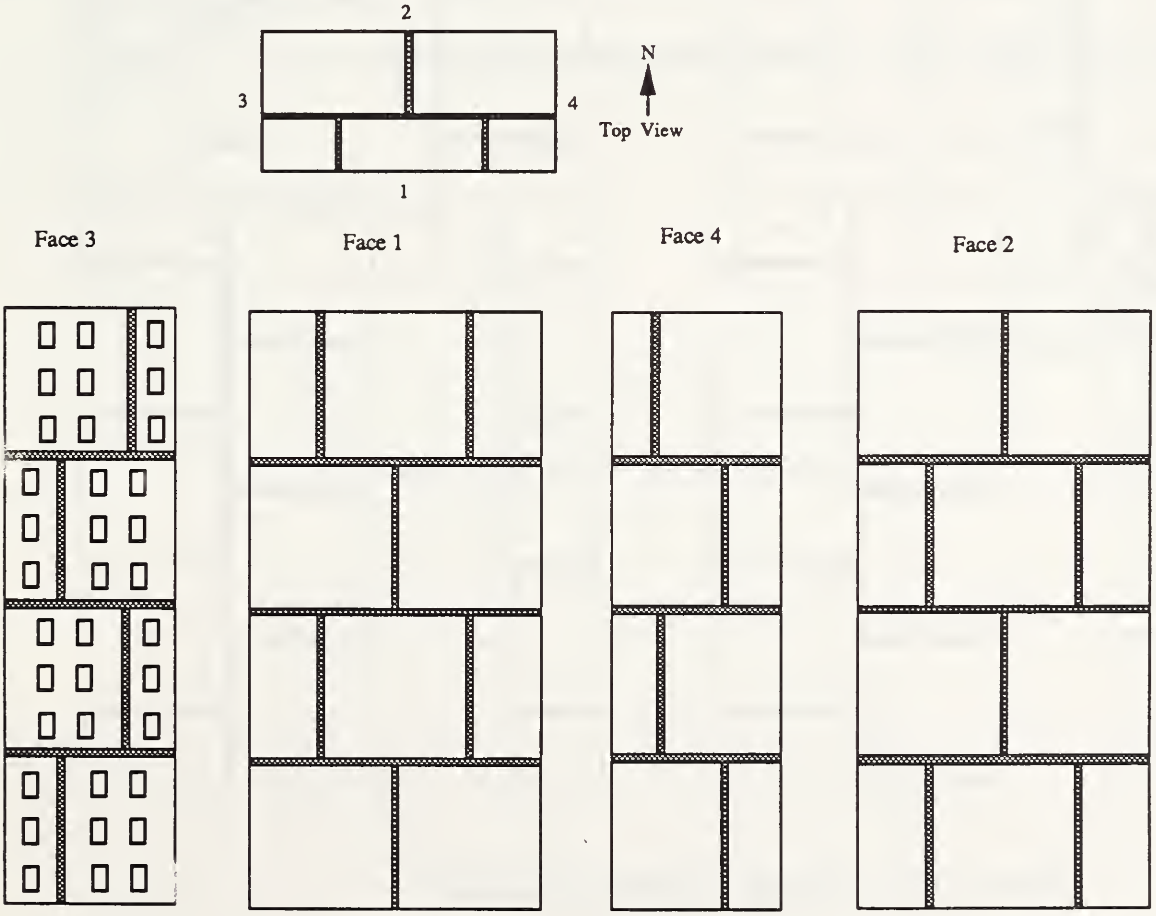


Figure 3.3 (b) - 330-mm Normal Prisms, Series B

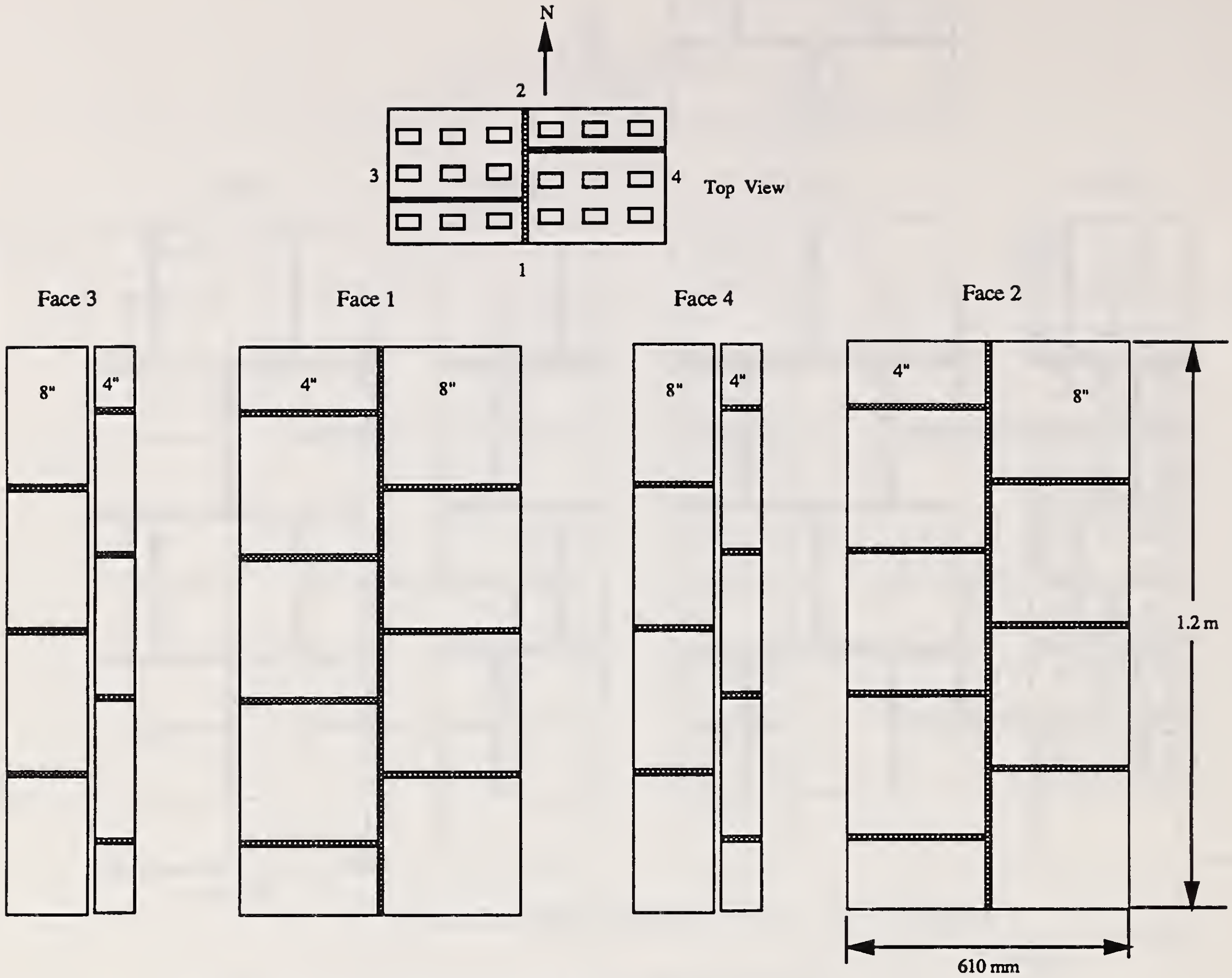


Figure 3.4 (a) - 330-mm Parallel Prisms, Series A

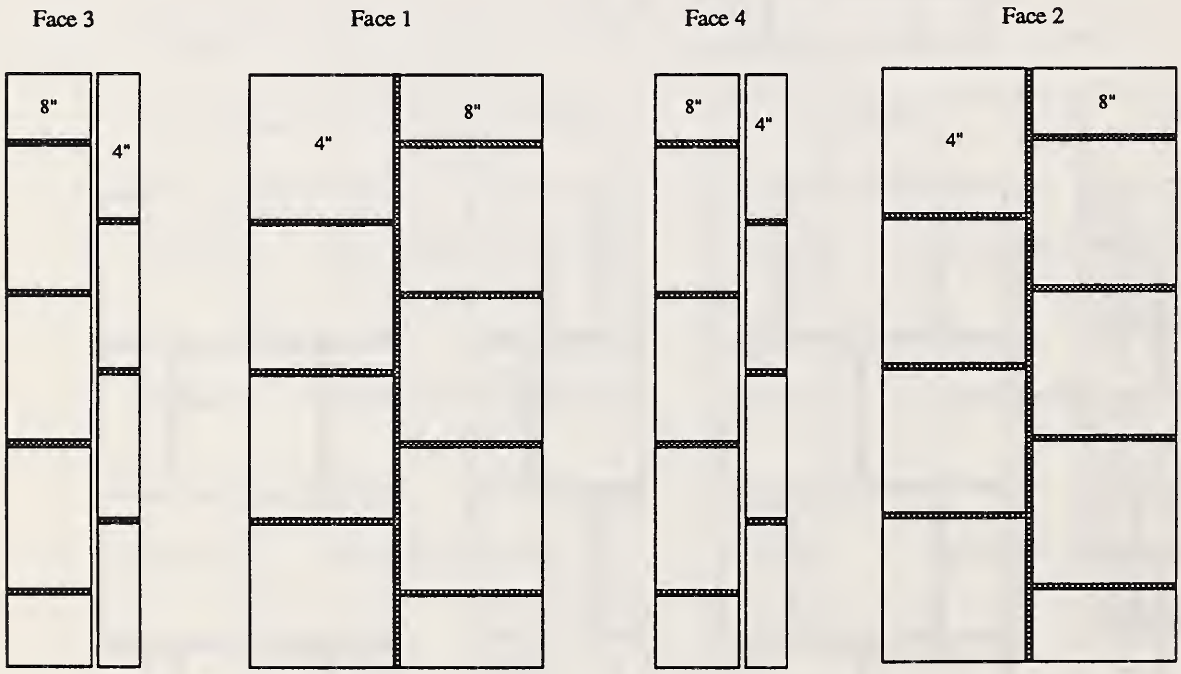


Figure 3.4 (b) - 330-mm Parallel Prisms, Series B

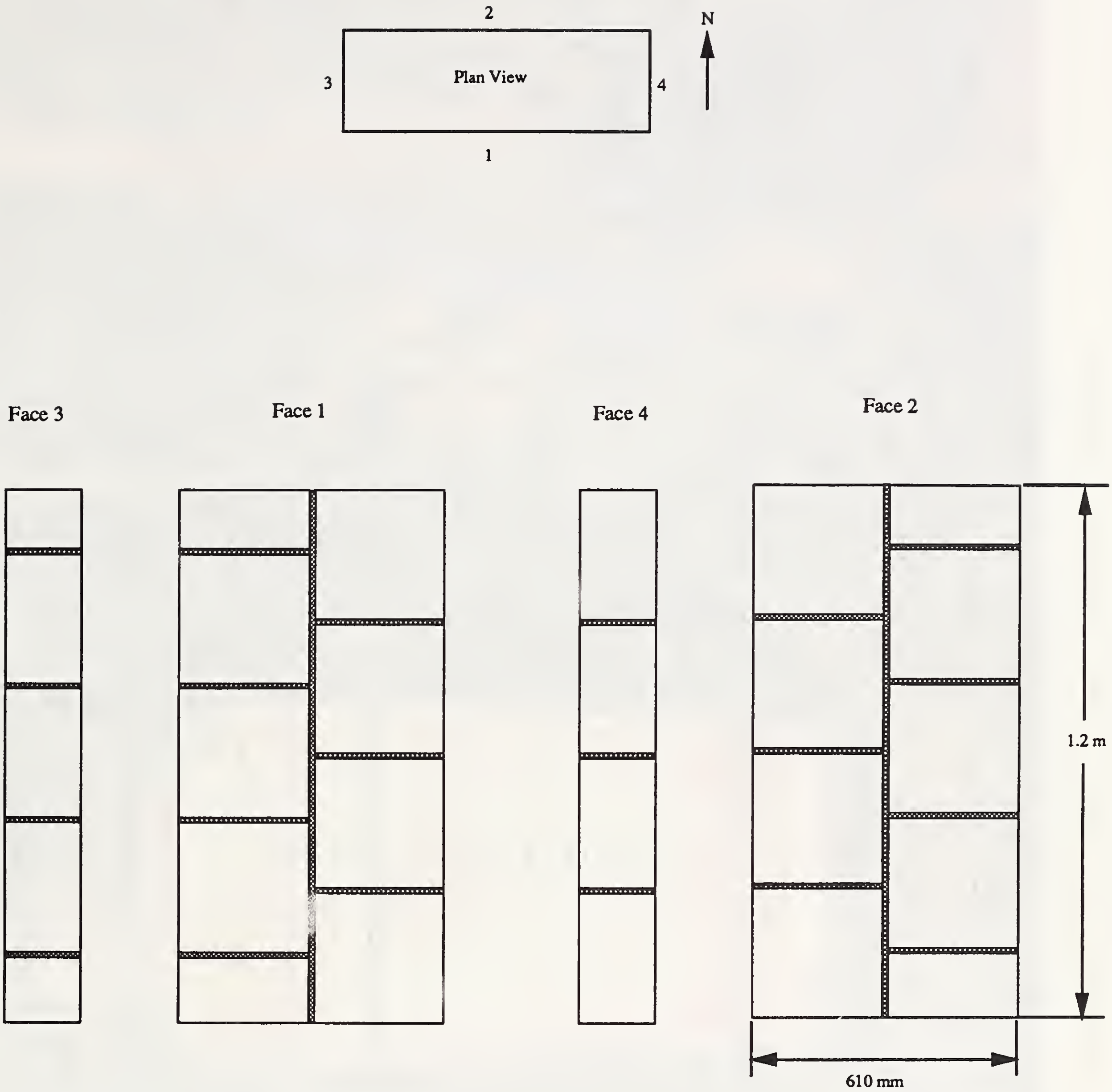


Figure 3.5 - 200-mm Parallel Prisms

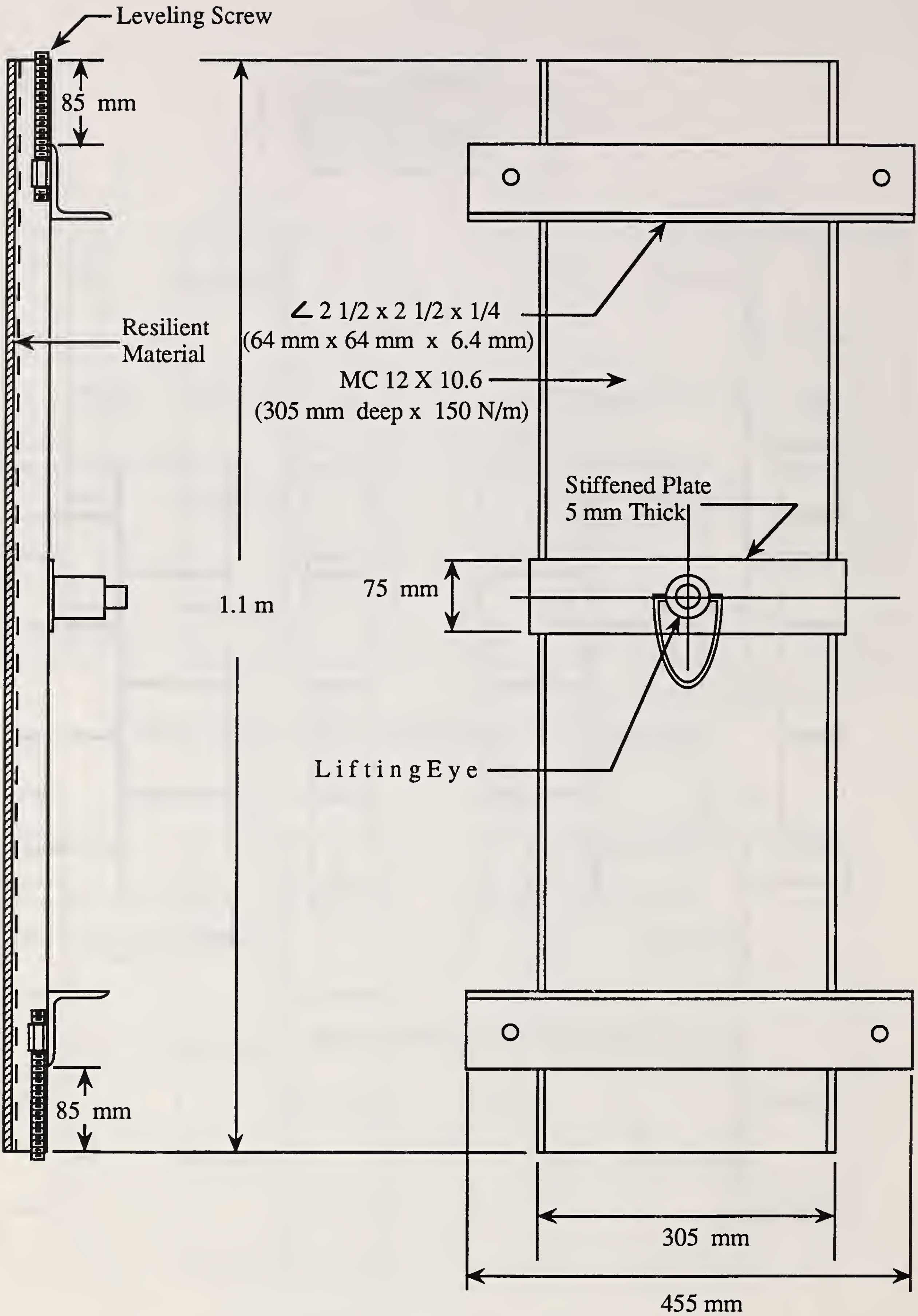


Figure 3.6 - Prism Lifting/Handling Assembly

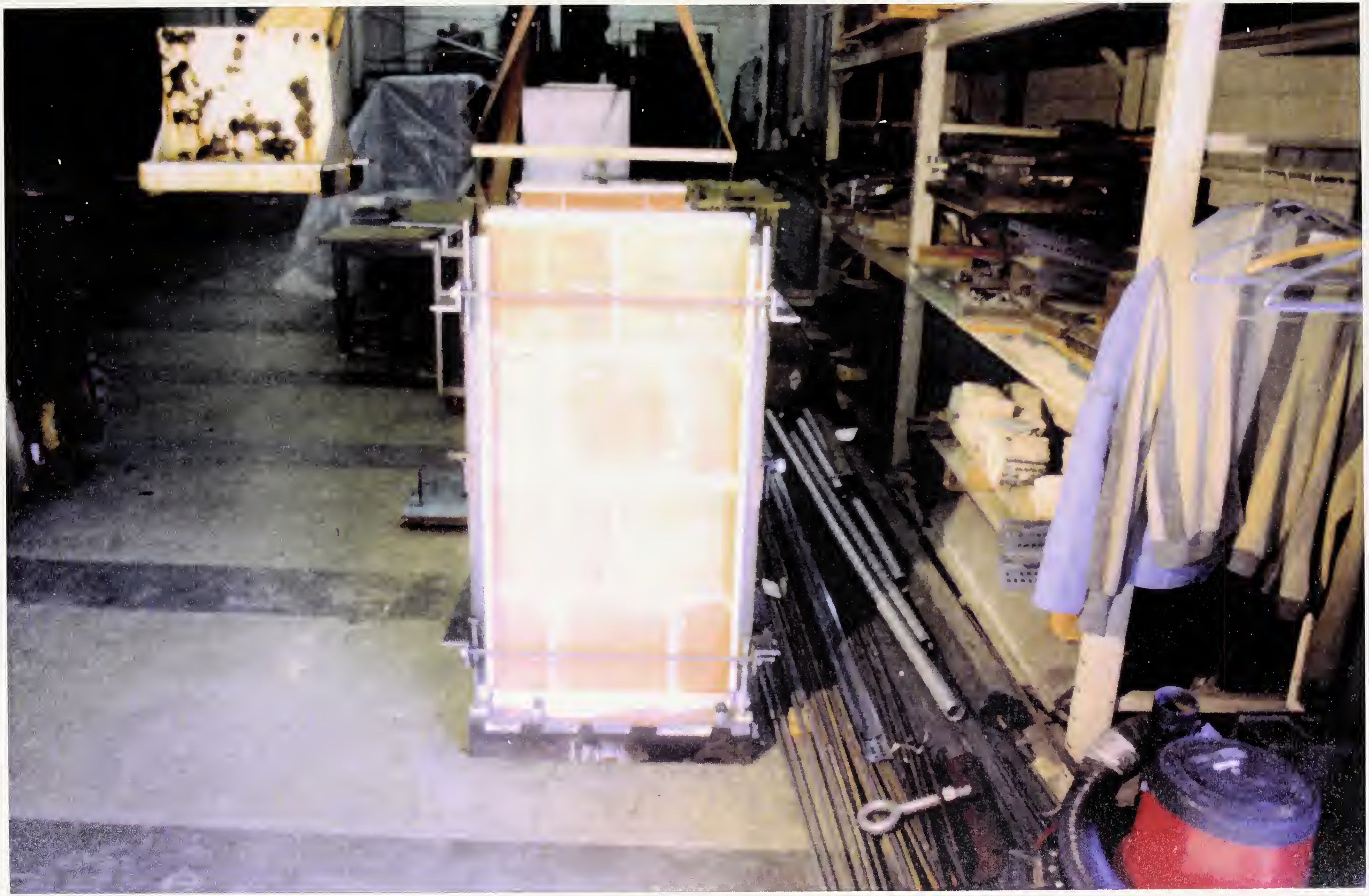


Figure 3.7 - Photograph of Prism Lifting and Handling Assembly

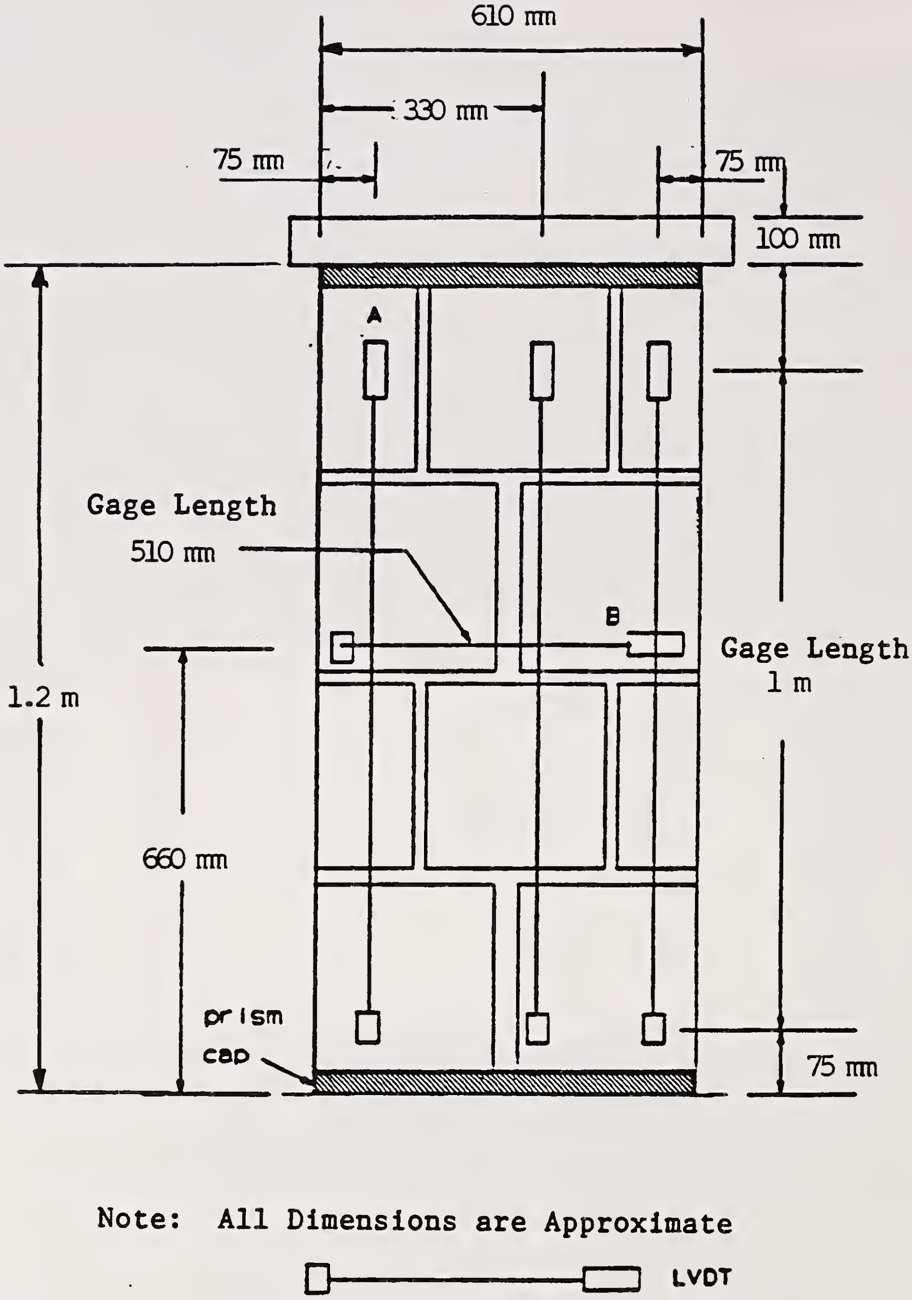


Figure 3.8 - Normal Prism LVDT Layout - Elevation View

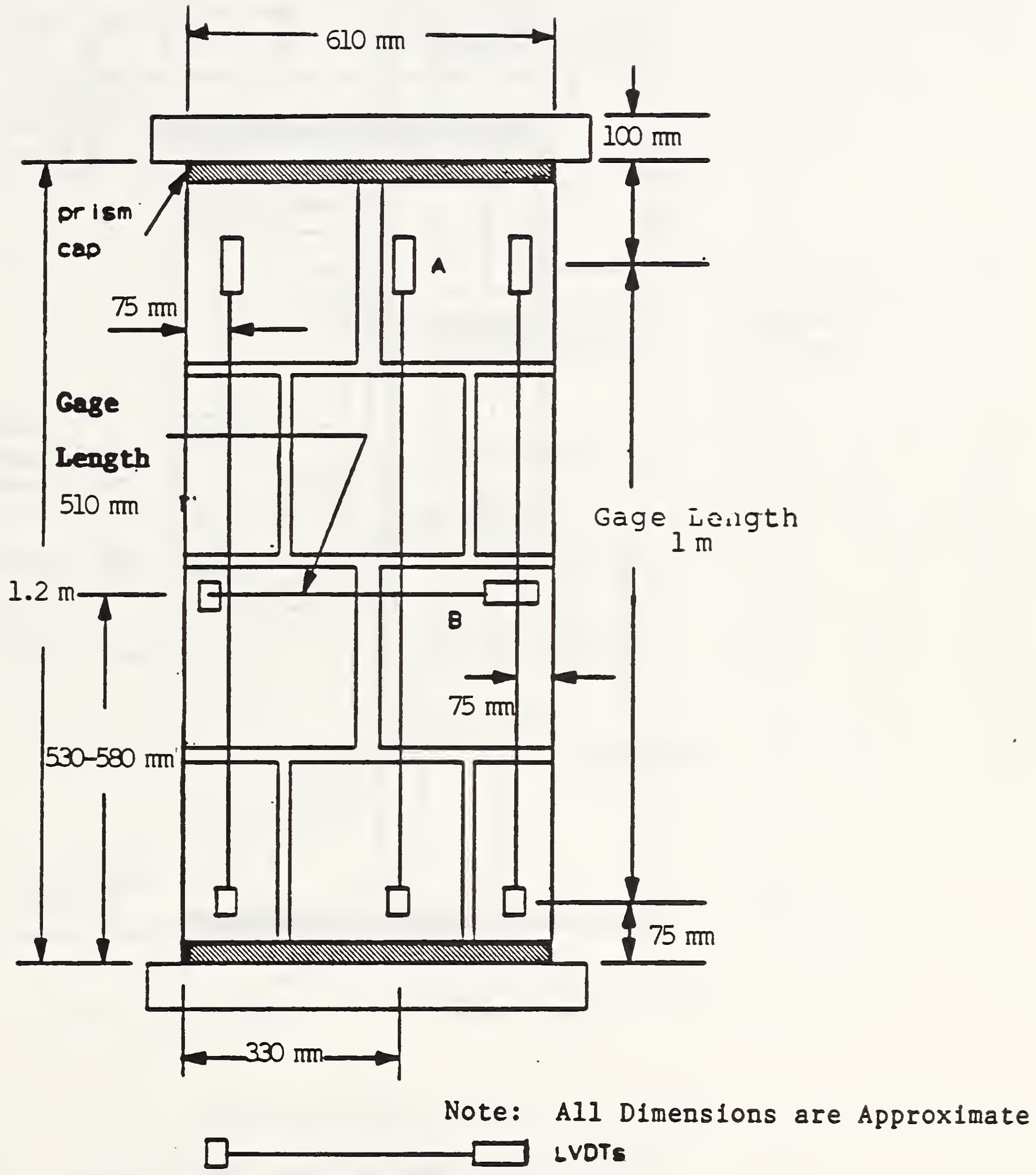
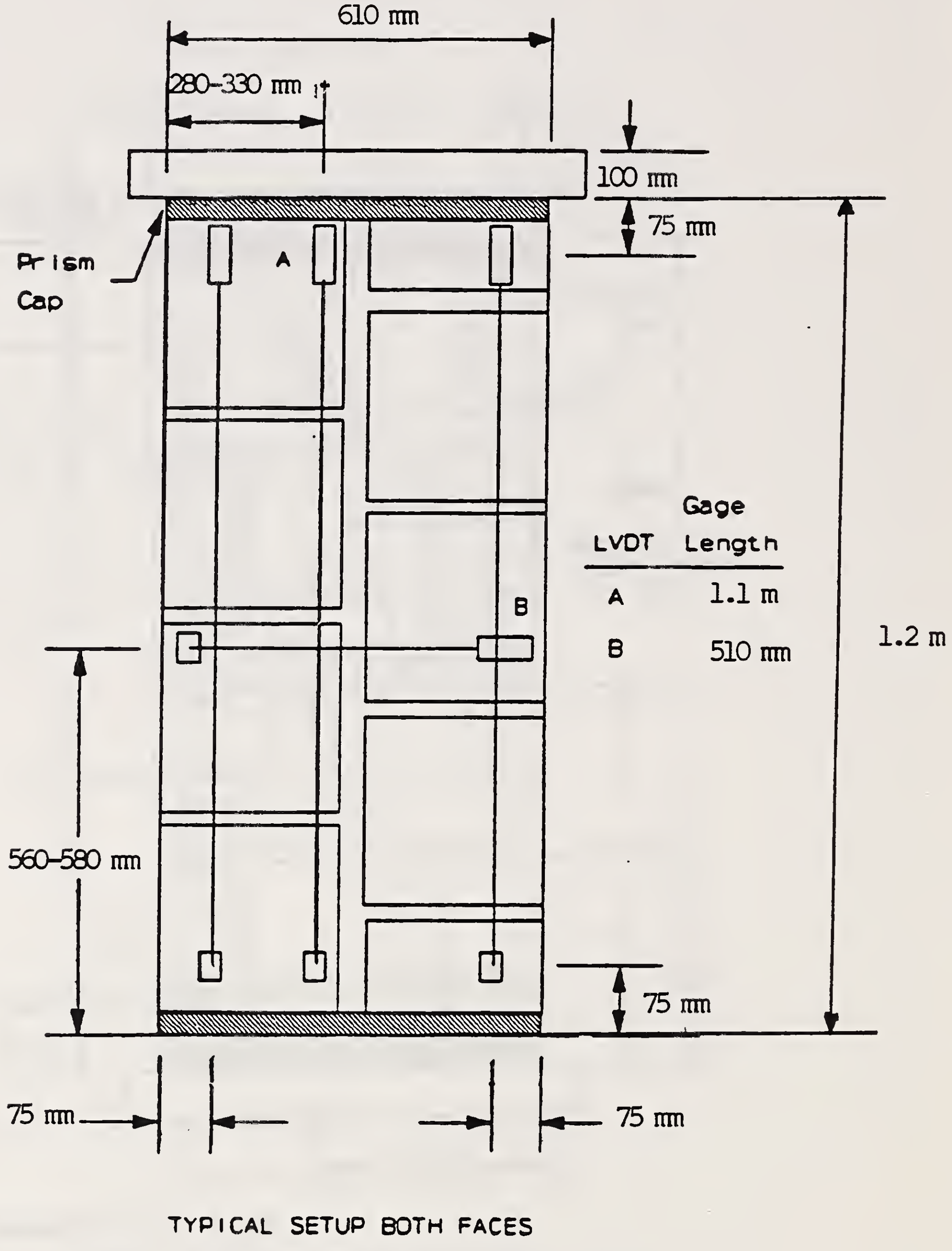


Figure 3.9 - Normal Prism LVDT Layout - Reverse Elevation



Note: All Dimensions are Approximate

Figure 3.10 - Parallel Prism LVDT Layout - Both Faces

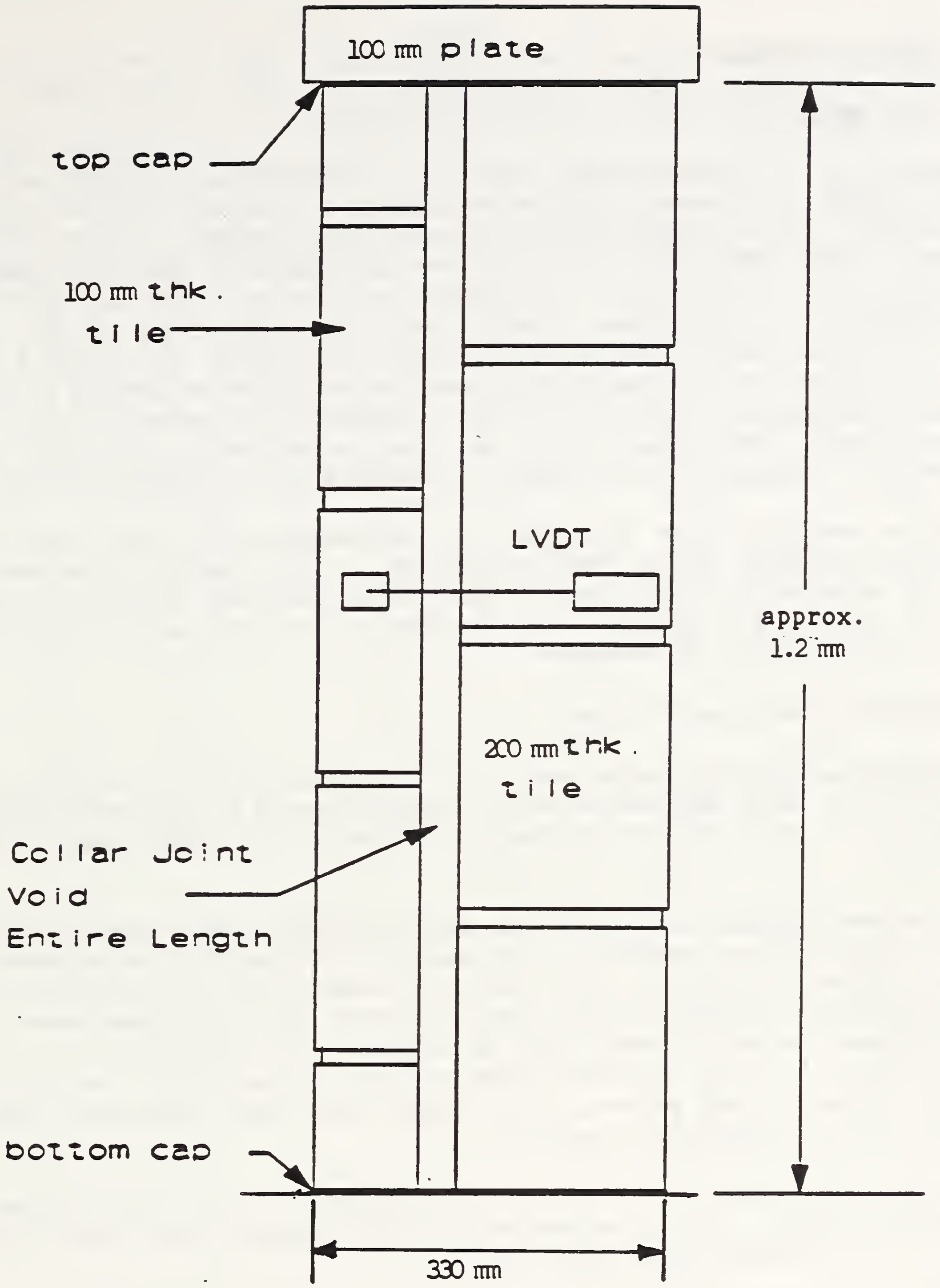


Figure 3.11 - LVDT Location on Edge of 330-mm Parallel Prism

4. TEST PROCEDURES

4.1 Test Setup

The Hollow Clay Tile prisms were tested in a Tinius Olson electric motor-driven 1800-kN (400-Kip) universal testing machine in accordance with Method A of ASTM E 447-84 [6]. The testing machine has four loading ranges: 18, 72, 360 and 1800 kN (4000, 16000, 80000 and 400000 lbf) and is capable of operating under either displacement or load control. All prisms were tested using the 1800 kN range, thirty-three under displacement control and eight under load control. The test machine had been calibrated in July 1992 in accordance with ASTM E 4-89 [7]. Twenty-one prisms were tested in the normal orientation and twenty prisms in the parallel orientation. Figure 4.1 is a photograph of a normal prism under test. A 100-mm (4-in.) thick steel plate was used to uniformly distribute the axial load from the spherical seat of the test machine to the top cap of the prism.

The bearing surface of the lower platen is perpendicular to the load line of the machine and parallel to the bearing surface of the loading crosshead. Center lines are permanently inscribed on the bearing surface in both directions to assist in centering a specimen. The intersection of the center lines coincides with the load line of the machine.

4.2 Specimen Setup and Testing

Test setup began with the prism being positioned in the test machine. The prism was centered in two orthogonal directions with respect to the lower platen of the test machine. Then, the LVDT's were attached to the prism and to the upper crosshead.

Each prism was loaded monotonically to failure using either displacement or load control. The load was applied in two stages. One half of the expected maximum load was applied at a preset rate. The displacement or load rates for the second loading stage were established to comply with the ASTM E 447 requirement that the remaining load, up to maximum load, be applied in a period of 1 to 2 minutes. Based on Task 1 testing, different first and second stage rates were established for Parallel and Normal prisms. The displacement and load rates selected for each prism are documented in Section 5.

To minimize damage to the LVDT's during testing of the Normal prisms, it was decided after Task 1 testing to remove all LVDT's except the center verticals at about 60% of the expected maximum load.

4.3 Data Acquisition

Load magnitude, crosshead displacement and vertical and horizontal displacements of the prism were recorded at predetermined time increments by an either an Optim Megadac Series 3000 or Optim Megadac Series 5000 data acquisition system. Based on Task 1 [8] recommendations, data sampling (scan) rates were 20 scans/second for Parallel prisms and 30 scans/second for Normal prisms.

An X-Y plot of the axial load versus the vertical displacement along the center of Face 1, using the F1C LVDT, was obtained for each test. The purpose of the X-Y plots was to monitor the deformation response of the prisms during the test and hard copy backup.

Figure 4.1 - Photograph of Normal Prism Under Test

5. TEST RESULTS AND DISCUSSION

5.1 Compressive Strengths and Elastic Moduli

The results of the forty-one prism tests are summarized in Tables 4 - 10. Tables 4 - 6 list the age, loading rate, scan rate, maximum load, maximum displacement and displacement at maximum load for Group 1, Group 2 and Group 3 prisms, respectively. Both displacement columns contain data obtained from LVDT F1C only. The prisms were tested between the ages of 28 and 53 days. The Stage 1 loading rates for displacement control prisms was 1.25 mm/min (0.050 in./min) for all prisms except N8P2 (see Table 4). For prisms tested under load control, the Stage 1 loading rate varied from 270 to 360 kN/min (60 to 80 kips/min). Based on Task 1 recommendations, the Stage 2 displacement rates were 0.5 mm/min (0.020 in./min) for Normal and 0.8 mm/min (0.030 in./min) for Parallel prisms. The rates for Stage 2 loading varied from 180 to 360 kN/min (40 to 80 kips/min) when under load control.

Tables 7 and 8 list the maximum loads according to prism type. The maximum load results are subdivided to show variation according to the three groups comprising Task 2 and the six prisms comprising Task 1. Table 9 presents the compressive strength and modulus of elasticity values based on both gross and net areas. The gross areas were obtained by multiplying the average length and thickness dimensions listed in Table 3. Average values for the net areas of 200-mm and 100-mm Hollow Clay Tile units were supplied by Martin Marietta Energy Systems. Figure 5.1 illustrates the derivation of the "net areas" for the Parallel and Normal prisms. For the Parallel prism units, net area refers to the mortar-bedded area, which consisted of the four face shells only. The web areas (three webs for 200-mm units and two webs for 100-mm units) comprised the net area of the units used in the Normal prisms. The net areas for 330-mm Normal and Parallel prisms were computed by adding the corresponding areas of the 200- and 100-mm units..

The modulus of elasticity values presented in the last four columns of Table 9 are the Secant Moduli from 5% to 33% (E33) and 5% to 50% (E50) of maximum stress based on both net and gross areas. For example, E33 was derived by calculating the difference in the stress/strain ratios measured at 33% and 5%, respectively, of the maximum load.

Tables 7, 8 and 9 indicate three definite trends: 1) the 200-mm Normal prisms have the highest compressive strength and the 330-mm Normal prisms have the lowest compressive strength; 2) the Group 2 prisms possessed the lowest compressive strengths for each of the four types of prisms; and 3) qualitatively speaking, there is good agreement between the Group 1 and 3 results for each of the four prism types. Figure 5.2, a bar graph presentation of the gross area and net area compressive strengths for each prism type, graphically illustrates the first trend noted above.

Table 10 presents displacement, gage length and strain data used in calculating the E33 moduli. In addition, the 5% and 33% of peak load magnitudes are listed in the 3rd and 4th columns of Table 10. The corresponding stress values were obtained by dividing these entries by the gross and net areas listed in the 6th and 7th columns respectively. The differences in stress at the 33% and 5% levels are listed in the 8th column for gross area and the 9th column for net area. The differences in strain at the 33% and 5% levels are listed in the 19th column (e_{33}). The gage lengths used in the strain calculations are listed in the 18th column. Thus, all of the values needed to compute E33 are listed in Table 10. For example, the formula for computing the net area modulus is:

$$E33_{net} = \frac{\dfrac{33\%Pmax - 5\%Pmax}{A_{net}}}{\dfrac{\delta_{33} - \delta_5}{Gage\ Length}}$$

In a similar manner, the E50 moduli values can be calculated. The corresponding stress values are listed in the 10th and 11th columns and the e_{50} values are listed in the 20th column.

Bar graphs illustrating the gross area and net area elastic moduli are presented in Figures 5.3 and 5.4 respectively. The E33 and E50 values are juxtaposed on the respective charts. There is practically no difference in the two moduli for any of the 4 prism types. Figures 5.3 and 5.4 also indicate that the 330-mm Normal prisms had the greatest stiffness followed by that of the 200-mm Normal prisms. The 200-mm Parallel prisms were only about 60% as stiff as the the 200-mm Normal prisms. Likewise, the 330-mm Parallel prisms were about 60% as stiff as the 330-mm Normal prisms.

5.2 Modes of Failure

The failure mode exhibited by the Normal prisms differed significantly from that exhibited by the Parallel prisms. Both the 200-mm and 330-mm Normal prisms experienced brittle failures resulting in almost complete destruction of the prisms as the maximum load was attained. There were audible popping sounds - apparently indicating cracking of the HCT webs - at load levels between approximately 25% and 50% of maximum load. The frequency and volume of the popping sounds increased as the peak load was approached. After reaching peak load, the failure was sudden and characterized by total or nearly total disintegration of the test specimens. Rubble consisting of broken pieces of HCT units, sandwiches of HCT units and mortar joints, and in some cases, a portion of the bottom course HCT's remained after these tests. Figure 5.5 is a photograph showing the typical remains of a Normal prism following failure.

The failure mode for the Parallel prisms was generally more ductile as characterized by a gradual decrease in the applied load after the peak load was reached. Typically, maximum load was associated with localized failures in the form of spalled or buldged face shells along the edges (Faces 3 or 4). Thereafter, the prisms remained virtually intact with Faces 1 and 2 containing a number of vertically oriented cracks indicative of a splitting failure. Figure 5.6 is a photograph of a 330-mm Parallel prism whose face shell on one edge had buldged.

5.3 Mortar Cube Strengths

The results of compression testing of the 50-mm (2-inch) square mortar cubes are listed in Table 2. Failure loads are presented for 114 cubes. The cubes were tested according to ASTM C 780-90 [4]. The test procedure specified testing 3 cubes at 28 days and 3 cubes on the day of an associated prism test. The specified procedure was followed in all but a few batches for which the 28-day strengths were not obtained. Mortar ages for the first 3 and the second 3 cubes tested are listed for each batch. Listed at the bottom of each column in Table 2 are the average compressive strength and standard deviation for the batch. The range of average compressive strengths was from 15.46 to 17.75 N/mm^2 (2242 to 2574 psi). Most of the series of mortar cube tests were tightly banded with coefficients of variation of approximately 3% or less. Batch 12 had the highest coefficient of variation (6.2%).

5.4 Load-Displacement Plots

The Appendix contains load-displacement plots generated from the digitized data obtained by the data acquisition system and processed by Dadisp software. Common to all prisms are plots of load versus displacement in the following combinations:

1.) Load vs F1C & F2C (Vert. Displ. at the Center of Faces 1 & 2)
2.) Load vs F1C, F1L & F1R (Vert. Displ. along Face 1)
3.) Load vs F2C, F2L & F2R (Vert. Displ. along Face 2)
4.) Load vs F1H & F2H (Horiz. Displ. at Midheight of Faces 1 & 2)
5.) Load vs F1C & F1H (Midline Vert. & Horiz. Displ. on Face 1)

Load versus time was the sixth plot common to all prisms. A seventh plot was generated for the 330-mm Parallel prisms, that being Load vs F3H & F4H (Horiz. Displ. at mid-height of Faces 3 and 4). For all plots, load is plotted on the ordinate in units of kilonewtons. Displacement is plotted on the abscissa in units of millimeters. For load versus time plots, time is plotted on the abscissa in units of seconds. Typical plots for the seven combinations are presented in Figures 5.7 - 5.13.

Several key questions can be addressed using the abovementioned combinations:

1.) Is there close agreement between the measurements of LVDT's F1C and F2C which were located on opposite sides of the prism (i.e. Load vs F1C & F2C);

2.) Can the vertical displacement along Faces 1 and 2 be sufficiently captured by the center LVDT's, F1C and F2C, thereby eliminating the need for the two outermost LVDT's on each face (i.e. Load vs F1C, F1L & F1R or Load vs F2C, F2L & F2R);

3) Are the horizontal displacements measured at mid-height of the prisms significant enough to warrant attachment of LVDT's at these locations (i.e. Load vs F1C & F1H).

Table 4 - Summary of Test Results - Group 1 Prisms

Prism I.D.	Age of Prism days	Loading Rate Stage 1 mm/min.	Loading Rate Stage 2 mm/min.	Scan Rate scans/sec	Maximum Load kN	Maximum Displ. mm	Displ. at Max. Load mm
N8P2	28	1.8	0.8	20	685.02	2.31	1.42
N13NB1	28	1.25	0.5	20	588.50	0.56	0.56
N8NA1	28	1.25	0.5	30	900.76	1.37	1.37
N8NB1	28	1.25	0.5	30	838.93	1.37	1.37
N13PA1	30	1.25	0.8	20	1,295.32	1.73	1.65
N13NA1	33	1.25	0.5	30	507.98	0.51	0.51
N13PB1	30	1.25	0.8	20	1,172.99	1.73	1.50
N8NA2	42	1.25	0.5	30	1,003.07	1.52	1.52
N8P1	42	1.25	0.8	20	686.36	2.74	1.75
N13NB2	33	1.25	0.5	30	600.95	0.61	0.61

Footnotes

The displacement values in the last two columns were obtained from LVDT F1C only.

Table 5 - Summary of Test Results - Group 2 Prisms

Prism I.D.	Age of Prism days	Loading Rate Stage 1 mm/min.	Stage 2	Scan Rate scans/sec	Maximum Load kN	Maximum Displ. mm	Displ. at Max. Load mm
N13NA2	27	1.25	0.5	30	512.88	0.53	0.53
N13PA2	28	1.25	0.8	20	722.39	7.11	1.57
N13PB2	28	1.25	0.8	20	680.57	5.59	2.08
N8P4	29	1.25	0.5	20	447.04	4.32	1.93
N8P5	29	1.25	0.8	20	400.34	3.56	2.03
N8NA3	29	1.25	0.5	30	727.28	1.12	1.12
N13PA3	49	1.25	0.8	20	917.66	4.83	2.67
N8NB3	53	1.25	0.5	30	844.94	1.55	1.55
N8NB4	53	1.25	0.5	30	682.35	1.32	1.17
N8NA5	53	1.25	0.5	30	903.21	1.68	1.68
N8NA4	47	1.25	0.5	30	836.26	1.37	1.37
N8NB2	53	1.25	0.5	30	773.54	1.68	1.55
N13NB3	46	1.25	0.5	30	527.11	0.76	0.76

Footnotes
The displacement values in the last two columns were obtained from LVDT F1C only.

Table 6 - Summary of Test Results - Group 3 Prisms

Prism I.D.	Age of Prism days	Loading Rate Stage 1 mm/min.	Stage 2	Scan Rate scans/sec	Maximum Load kN	Maximum Displ. mm	Displ. at Max. Load mm
N13PB3	30	1.25	0.8	20	1123.17	3.35	1.40
N13NA3	28	1.25	0.5	30	601.40	0.61	0.61
N13NA4	30	1.25	0.5	30	549.35	0.43	0.43
N13NAL	35	270 kN/min	180 kN/min	30	571.59	0.61	0.61
N13PB4	30	1.25	0.8	20	1,092.92	2.36	2.16
N13PBL	35	360 kN/min	360 kN/min	20	1,325.56	4.06	1.50
N8P5	30	1.25	0.8	20	680.57	3.56	1.83
N8PL1	37	360 kN/min	180 kN/min	20	642.76	3.00	2.16
N8P7	32	1.25	0.8	20	649.44	2.13	1.83
N8PL2	37	360 kN/min	180 kN/min	20	576.04	2.44	2.13
N8P6	32	1.25	0.8	20	524.89	2.84	2.16
N8NAL	35	330 kN/min	270 kN/min	30	924.34	0.71	0.71
N8P8	32	1.25	0.8	20	616.08	2.24	1.40
N8NBL	30	330 kN/min	200 kN/min	20	767.31	1.78	1.65
N13PA4	28	1.25	0.8	20	1,035.99	4.09	1.83
N13PAL	35	360 kN/min	360 kN/min	20	1,119.83	3.00	2.13
N13NB4	30	1.25	0.5	30	628.53	0.71	0.71
N13NBL	30	270 kN/min	180 kN/min	30	631.64	0.71	0.71

Footnotes
The displacement values in the last two columns were obtained from LVDT F1C only.

Table 7 - Prism Maximm Load Grouped According to Prism Type
200-mm Prisms

MAXIMUM LOAD ON PRISM, kN

DESCRIPTION	PRISM I.D.	TASK I PRISMS	TASK II GROUP I	TASK II GROUP 2	TASK II GROUP 3
200-mm PARALLEL	N8PT1	667.20			
	N8P1		686.36		
	N8P2		685.02		
	N8P3			400.34	
	N8P4			447.04	
	N8P5				680.57
	N8P6				524.89
	N8P7				649.44
	N8P8				616.08
	N8PL1				642.76
	N8PL2				576.04
	AVE.	667.20	685.69	423.69	614.96
200-mm NORMAL	N8NT1	911.40			
	N8NA1		900.76		
	N8NB1		838.93		
	N8NA2		1003.29		
	N8NB2			773.54	
	N8NA3			727.28	
	N8NB3			844.94	
	N8NA4			839.82	
	N8NB4			682.35	
	N8NA5			903.21	
	N8NAL				924.34
	N8NBL				767.31
	AVE.	911.40	914.33	795.19	845.83

Footnotes
Groups 1 & 3 - Built by NIST Personnel
Group 2 - Built by Mason Contractor

Table 8 - Prism Maximum Load Grouped According to Prism Type
330-mm Prisms

DESCRIPTION	PRISM I.D.	MAXIMUM LOAD ON PRISM, kN TASK I PRISMS	TASK II GROUP I	TASK II GROUP 2	TASK II GROUP 3
330-mm PARALLEL	N13PT1	991.06			
	N13PT2	920.55			
	N13PA1		1295.32		
	N13PB1		1172.99		
	N13PA2			722.39	
	N13PB2			680.57	
	N13PA3			917.66	
	N13PB3				1123.17
	N13PB4				1092.92
	N13PBL				1325.56
	N13PA4				1035.99
	N13PAL				1119.83
	AVE.	955.81	1234.15	773.54	1139.50
330-mm NORMAL	N13NT1	615.41			
	N13NT2	423.69			
	N13NB1		588.50		
	N13NA1		507.98		
	N13NB2		600.95		
	N13NA2			512.88	
	N13NB3			527.11	
	N13NA3				601.40
	N13NA4				549.35
	N13NAL				571.59
	N13NB4				628.53
	N13NBL				631.64
	AVE.	519.55	565.81	519.99	596.50

Footnotes
Groups 1 & 3 - Built by NIST Personnel
Group 2 - Built by Mason Contractor

Table 9 - Compressive Strengths & Moduli

PRISM I.D.	f'mt Gross N/mm	f'mt Net N/mm	E5%-33% Gross N/mm	E5%-33% Net N/mm	E5%-50% Gross N/mm	E5%-50% Net N/mm
N8PT1	5.52	20.14	5460	19942	4619	16872
N8P1	5.75	20.72	3763	13562	3755	13531
N8P2	5.66	20.68	4045	14770	4047	14777
N8P3	3.34	12.09	1788	6479	1864	6756
N8P4	3.72	13.50	1617	5863	2043	7408
N8P5	5.66	20.55	3641	13216	3870	14049
N8P6	4.35	15.85	2719	9901	3131	11402
N8P7	5.44	19.61	4619	16641	4545	16377
N8P8	5.17	18.60	4898	17606	4753	17086
N8PL1	5.34	19.41	4293	15612	4177	15190
N8PL2	4.81	17.39	3406	12310	3473	12552
Avg.	4.98	18.05	3659	13264	3662	13273
N8NT1	7.57	28.48	5950	22376	5954	22390
N8NA1	7.54	28.15	5569	20790	5507	20560
N8NB1	7.00	26.22	5469	20496	5497	20603
N8NA2	8.36	31.35	5758	21590	5621	21074
N8NB2	6.49	24.17	5836	21750	5543	20660
N8NA3	6.07	22.73	8903	33339	7154	26790
N8NB3	7.07	26.40	5517	20608	5542	20701
N8NA4	7.03	26.24	5500	20532	5524	20625
N8NB4	5.43	21.32	5295	20811	5104	20061
N8NA5	7.54	28.23	5566	20842	5490	20559
N8NAL	7.66	28.89	8765	33055	8852	33383
N8NBL	6.42	23.98	5908	22054	5847	21825
Avg.	7.01	26.35	6170	23187	5970	22436
N13PT1	5.24	16.60	3649	11570	4021	12749
N13PT2	4.83	15.42	5347	17083	5180	16551
N13PA1	6.88	21.70	4264	13449	4639	14630
N13PB1	6.27	19.65	3687	11562	4232	13273
N13PA2	3.79	12.10	8873	28304	7923	25272
N13PB2	3.59	11.40	5257	16690	4828	15328
N13PA3	4.83	15.37	3150	10016	3038	9659
N13PB3	5.86	18.81	3230	10361	3499	11222
N13PA4	5.52	17.35	3547	11154	3847	12098
N13PB4	5.78	18.31	3583	11342	3887	12302
N13PAL	5.95	18.76	3705	11682	3630	11445
N13PBL	7.04	22.20	6053	19090	5879	18543
Avg.	5.46	17.31	4529	14359	4550	14423
N13NT1	3.27	11.28	7004	24117	6078	20930
N13NT2	2.26	7.76	7746	26662	6348	21850
N13NA1	2.70	9.31	10256	35410	8242	28455
N13NB1	3.14	10.78	9123	31350	7309	25119
N13NA2	2.72	9.40	7774	26865	8330	28784
N13NB2	3.20	11.01	6087	20950	5870	20202
N13NA3	3.16	11.02	6946	24219	6813	23755
N13NB3	2.79	9.66	10630	36792	7323	25346
N13NA4	2.95	10.07	8554	29217	7802	26650
N13NB4	3.36	11.52	6957	23838	6556	22465
N13NAL	3.05	10.47	9288	31940	7879	27092
N13NBL	3.38	11.57	7841	26877	7160	24542
Avg.	3.00	10.32	8184	28186	7142	24599

Table 10 - Data for Computing Strengths and Moduli

PRISM I.D.	Pmax N	5% Pmax N	33% Pmax N	50% Pmax N	Area(Ag) Gross m**2	Area(An) Net m**2	f33-f05 Gross m**2	f33-f05 Net m**2	f50-f05 Gross m**2	f50-f05 Net m**2	f'mt Gross m**2	f'mt Net m**2
N8PT1	667230	33362	220186	333615	0.1210	0.0331	1.54	5.64	2.48	9.07	5.52	20.14
N8P1	686357	34318	226498	343179	0.1194	0.0331	1.61	5.80	2.59	9.32	5.75	20.72
N8P2	685023	34251	226058	342511	0.1209	0.0331	1.59	5.79	2.55	9.31	5.66	20.68
N8P3	400338	20017	132112	200169	0.1200	0.0331	0.93	3.38	1.50	5.44	3.34	12.09
N8P4	447044	22352	147525	223522	0.1201	0.0331	1.04	3.78	1.67	6.07	3.72	13.50
N8P5	680575	34029	224590	340287	0.1202	0.0331	1.58	5.75	2.55	9.25	5.66	20.55
N8P6	524888	26244	173213	262444	0.1206	0.0331	1.22	4.44	1.96	7.13	4.35	15.85
N8P7	649437	32472	214314	324719	0.1193	0.0331	1.52	5.49	2.45	8.82	5.44	19.61
N8P8	615987	30799	203276	307993	0.1191	0.0331	1.45	5.21	2.33	8.37	5.17	18.60
N8PL1	642765	32138	212112	321382	0.1205	0.0331	1.49	5.43	2.40	8.73	5.34	19.41
N8PL2	576042	28802	190094	288021	0.1197	0.0331	1.35	4.87	2.17	7.83	4.81	17.39
									Average		4.98	18.05
N8NT1	911436	45572	300774	455718	0.1203	0.0321	2.12	7.96	3.41	12.79	7.57	28.43
N8NA1	900761	45038	297251	450380	0.1195	0.0321	2.11	7.87	3.39	12.64	7.54	28.09
N8NB1	838931	41947	276847	419465	0.1199	0.0321	1.96	7.33	3.15	11.77	7.00	26.16
N8NA2	1003292	50165	331086	501646	0.1200	0.0321	2.34	8.76	3.76	14.08	8.36	31.29
N8NB2	773542	38677	255269	386771	0.1193	0.0321	1.82	6.75	2.92	10.86	6.49	24.12
N8NA3	727281	36364	240003	363640	0.1198	0.0321	1.70	6.35	2.73	10.21	6.07	22.68
N8NB3	844936	42247	278829	422468	0.1195	0.0321	1.98	7.38	3.18	11.86	7.07	26.35
N8NA4	839820	41991	277141	419910	0.1195	0.0321	1.97	7.33	3.16	11.79	7.03	26.19
N8NB4	682354	34118	225177	341177	0.1258	0.0321	1.52	5.96	2.44	9.58	5.43	21.28
N8NA5	903207	45160	298058	451604	0.1198	0.0321	2.11	7.89	3.39	12.68	7.54	28.17
N8NAL	924336	46217	305031	462168	0.1207	0.0321	2.14	8.07	3.45	12.97	7.66	28.83
N8NBL	767315	38366	253214	383657	0.1194	0.0321	1.80	6.70	2.89	10.77	6.42	23.93
									Average		7.01	26.29
N13PT1	991059	49553	327049	495529	0.1893	0.0596	1.47	4.66	2.36	7.48	5.24	16.63
N13PT2	920555	46028	303783	460277	0.1907	0.0596	1.35	4.32	2.17	6.95	4.83	15.44
N13PA1	1295316	64766	427454	647658	0.1883	0.0596	1.93	6.08	3.10	9.78	6.88	21.73
N13PB1	1172990	58650	387087	586495	0.1872	0.0596	1.75	5.51	2.82	8.85	6.27	19.68
N13PA2	722388	36119	238388	361194	0.1904	0.0596	1.06	3.39	1.71	5.45	3.79	12.12
N13PB2	680575	34029	224590	340287	0.1895	0.0596	1.01	3.20	1.62	5.14	3.59	11.42
N13PA3	917664	45883	302829	458832	0.1898	0.0596	1.35	4.31	2.18	6.93	4.83	15.39
N13PB3	1123171	56159	370646	561585	0.1915	0.0596	1.64	5.28	2.64	8.48	5.86	18.84
N13PA4	1035986	51799	341875	517993	0.1878	0.0596	1.54	4.87	2.48	7.82	5.52	17.38
N13PB4	1092923	54646	360665	546461	0.1890	0.0596	1.62	5.13	2.60	8.25	5.78	18.33
N13PAL	1119834	55992	369545	559917	0.1882	0.0596	1.67	5.26	2.68	8.45	5.95	18.79
N13PBL	1325564	66278	437436	662782	0.1883	0.0596	1.97	6.23	3.17	10.01	7.04	22.24
									Average		5.46	17.33
N13NT1	615408	30770	203085	307704	0.1879	0.0546	0.92	3.48	1.47	5.46	3.27	11.28
N13NT2	423691	21185	139818	211846	0.1879	0.0546	0.63	2.17	1.41	3.49	2.26	7.77
N13NA1	507984	25399	167635	253992	0.1884	0.0546	0.75	2.61	1.21	4.19	2.70	9.31
N13NB1	588497	29425	194204	294248	0.1876	0.0546	0.88	3.02	1.41	4.85	3.14	10.79
N13NA2	512877	25644	169250	256439	0.1886	0.0546	0.76	2.63	1.22	4.23	2.79	9.40
N13NB2	600952	30048	198314	300476	0.1879	0.0546	0.90	3.08	1.44	4.96	3.20	11.01
N13NA3	601397	30070	198461	300698	0.1903	0.0546	0.88	3.09	1.42	4.96	3.16	11.02
N13NB3	527112	26356	173947	263556	0.1889	0.0546	0.78	2.71	1.26	4.85	2.79	9.66
N13NA4	549353	27468	181286	274676	0.1864	0.0546	0.83	2.82	1.33	4.53	2.95	10.07
N13NB4	628531	31427	207415	314265	0.1870	0.0546	0.94	3.23	1.51	5.18	3.36	11.52
N13NAL	571594	28580	188626	285797	0.1877	0.0546	0.85	2.93	1.37	4.71	3.05	10.48
N13NBL	631644	31582	208443	315822	0.1871	0.0546	0.95	3.24	1.52	5.21	3.38	11.58
									Average		3.00	10.32

Table 10 - Data for Computing Strengths and Moduli

PRISM I.D.	d 5% mm	d 33% mm	d 50% mm	Gage Lgth L mm	e33 d33-d5/L	e50 d50-d5/L	E33 Gross N/mm2	E33 Net N/mm2	E50 Gross N/mm2	E50 Net N/mm2
N8PT1	0.025	0.329	0.602	1073.150	0.007	0.014	5460	19942	4619	16872
N8P1	0.076	0.535	0.815	1071.880	0.011	0.018	3763	13562	3755	13531
N8P2	0.023	0.442	0.696	1068.324	0.010	0.016	4045	14770	4047	14777
N8P3	0.023	0.581	0.882	1067.308	0.013	0.020	1788	6479	1864	6756
N8P4	0.009	0.697	0.884	1066.546	0.016	0.021	1617	5863	2043	7408
N8P5	0.054	0.516	0.752	1059.942	0.011	0.017	3641	13216	3870	14049
N8P6	0.044	0.522	0.711	1065.784	0.011	0.016	2719	9901	3131	11402
N8P7	0.047	0.399	0.622	1067.816	0.008	0.014	4619	16641	4545	16377
N8P8	0.009	0.326	0.533	1071.118	0.008	0.012	4898	17606	4753	17086
N8PL1	0.057	0.428	0.670	1066.800	0.009	0.015	4293	15612	4177	15190
N8PL2	0.063	0.488	0.732	1073.150	0.010	0.016	3406	12310	3473	12552
					Average		3659	13264	3662	13273
N8NT1	0.056	0.439	0.671	1074.674	0.009	0.015	5950	22331	5954	22345
N8NA1	0.000	0.407	0.662	1074.674	0.010	0.016	5569	20748	5507	20519
N8NB1	0.076	0.462	0.693	1077.976	0.009	0.015	5469	20455	5497	20561
N8NA2	0.025	0.462	0.745	1074.420	0.010	0.017	5758	21546	5621	21031
N8NB2	0.051	0.385	0.616	1073.150	0.008	0.013	5836	21706	5543	20618
N8NA3	0.000	0.205	0.411	1076.452	0.005	0.010	8903	33271	7154	26737
N8NB3	0.051	0.437	0.668	1073.912	0.009	0.015	5517	20567	5542	20659
N8NA4	0.051	0.437	0.668	1076.452	0.009	0.015	5500	20491	5524	20583
N8NB4	0.000	0.308	0.514	1073.912	0.007	0.012	5295	20769	5104	20020
N8NA5	0.028	0.437	0.693	1076.452	0.010	0.016	5566	20800	5490	20518
N8NAL	0.034	0.298	0.454	1077.214	0.006	0.010	8765	32988	8852	33316
N8NBL	0.013	0.340	0.544	1073.912	0.008	0.013	5908	22010	5847	21782
					Average		6170	23140	5970	22391
N13PT1	0.038	0.467	0.664	1068.578	0.010	0.015	3649	11588	4021	12768
N13PT2	0.041	0.312	0.491	1072.388	0.006	0.011	5347	17109	5180	16576
N13PA1	0.025	0.508	0.738	1068.324	0.011	0.017	4264	13470	4639	14652
N13PB1	0.102	0.611	0.815	1070.356	0.012	0.017	3687	11580	4232	13293
N13PA2	0.000	0.127	0.229	1063.752	0.003	0.005	8873	28347	7923	25310
N13PB2	0.000	0.204	0.357	1065.276	0.005	0.009	5257	16716	4828	15351
N13PA3	0.025	0.484	0.789	1066.800	0.011	0.018	3150	10032	3038	9673
N13PB3	0.063	0.607	0.871	1071.118	0.013	0.019	3230	10377	3499	11239
N13PA4	0.035	0.504	0.730	1076.960	0.011	0.016	3547	11171	3847	12116
N13PB4	0.099	0.583	0.816	1071.118	0.011	0.017	3583	11359	3887	12321
N13PAL	0.077	0.559	0.867	1071.118	0.011	0.019	3705	11700	3630	11462
N13PBL	0.035	0.384	0.612	1070.102	0.008	0.014	6053	19119	5879	18571
					Average		4529	14381	4550	14444
N13NT1	0.038	0.175	0.292	1047.750	0.003	0.006	7004	24125	6078	20937
N13NT2	0.002	0.086	0.168	1040.638	0.002	0.004	7746	26671	6348	21858
N13NA1	0.000	0.077	0.154	1046.988	0.002	0.004	10256	35422	8242	28465
N13NB1	0.000	0.101	0.203	1051.560	0.002	0.005	9123	31361	7309	25127
N13NA2	0.000	0.103	0.154	1049.020	0.002	0.004	7774	26875	8330	28794
N13NB2	0.026	0.180	0.283	1047.242	0.004	0.006	6087	20958	5870	20209
N13NA3	0.011	0.145	0.230	1046.734	0.003	0.005	6946	24227	6813	23763
N13NB3	0.000	0.077	0.180	1048.512	0.002	0.004	10630	36805	7323	25355
N13NA4	0.010	0.111	0.188	1049.274	0.002	0.004	8554	29227	7802	26660
N13NB4	0.016	0.158	0.259	1049.274	0.003	0.006	6957	23847	6556	22473
N13NAL	0.016	0.113	0.199	1049.020	0.002	0.004	9288	31951	7879	27102
N13NBL	0.011	0.138	0.234	1051.052	0.003	0.005	7841	26886	7160	24551
					Average		8184	28196	7142	24608

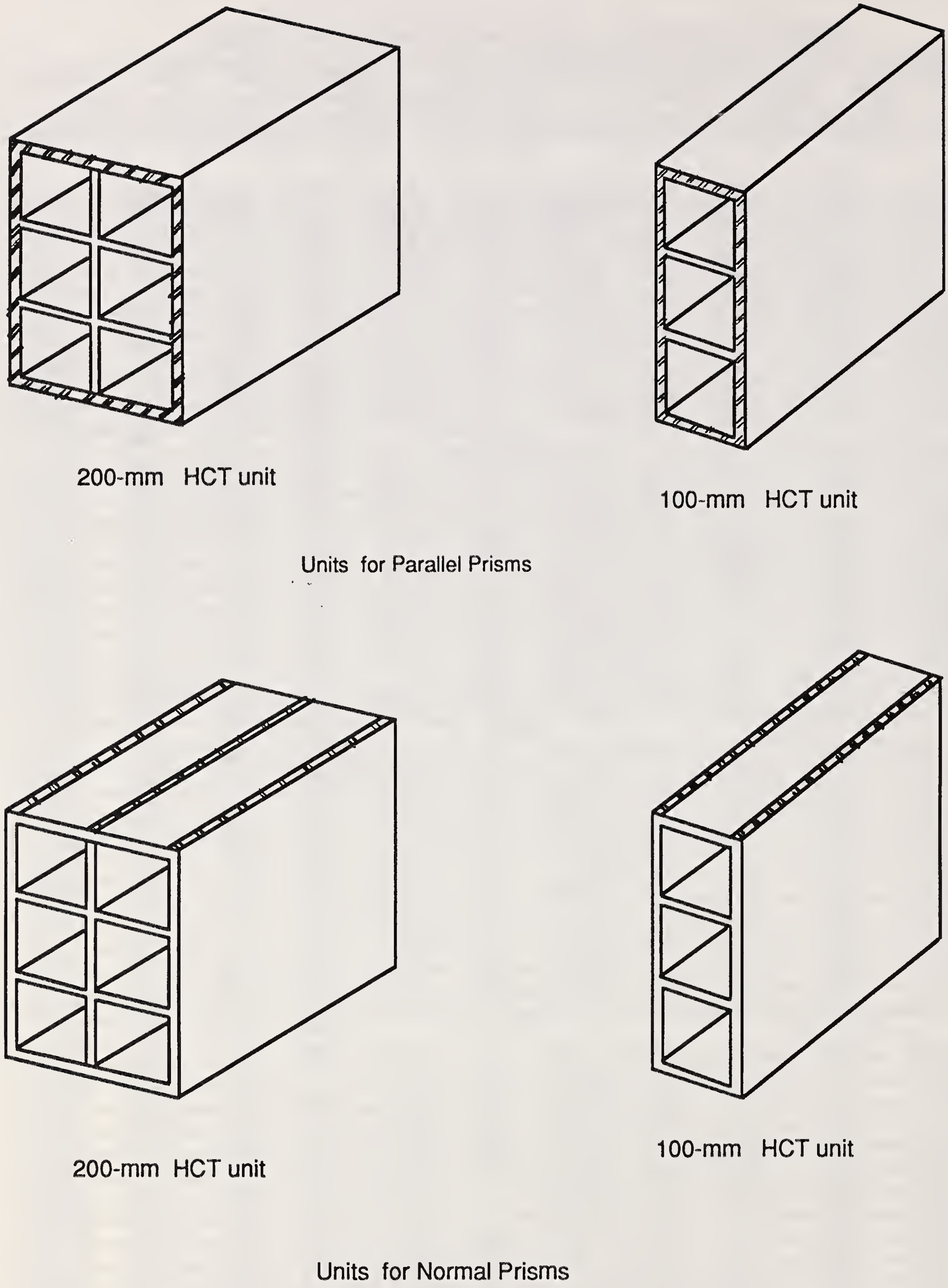


Figure 5.1 - Net Areas for Parallel and Normal Prisms

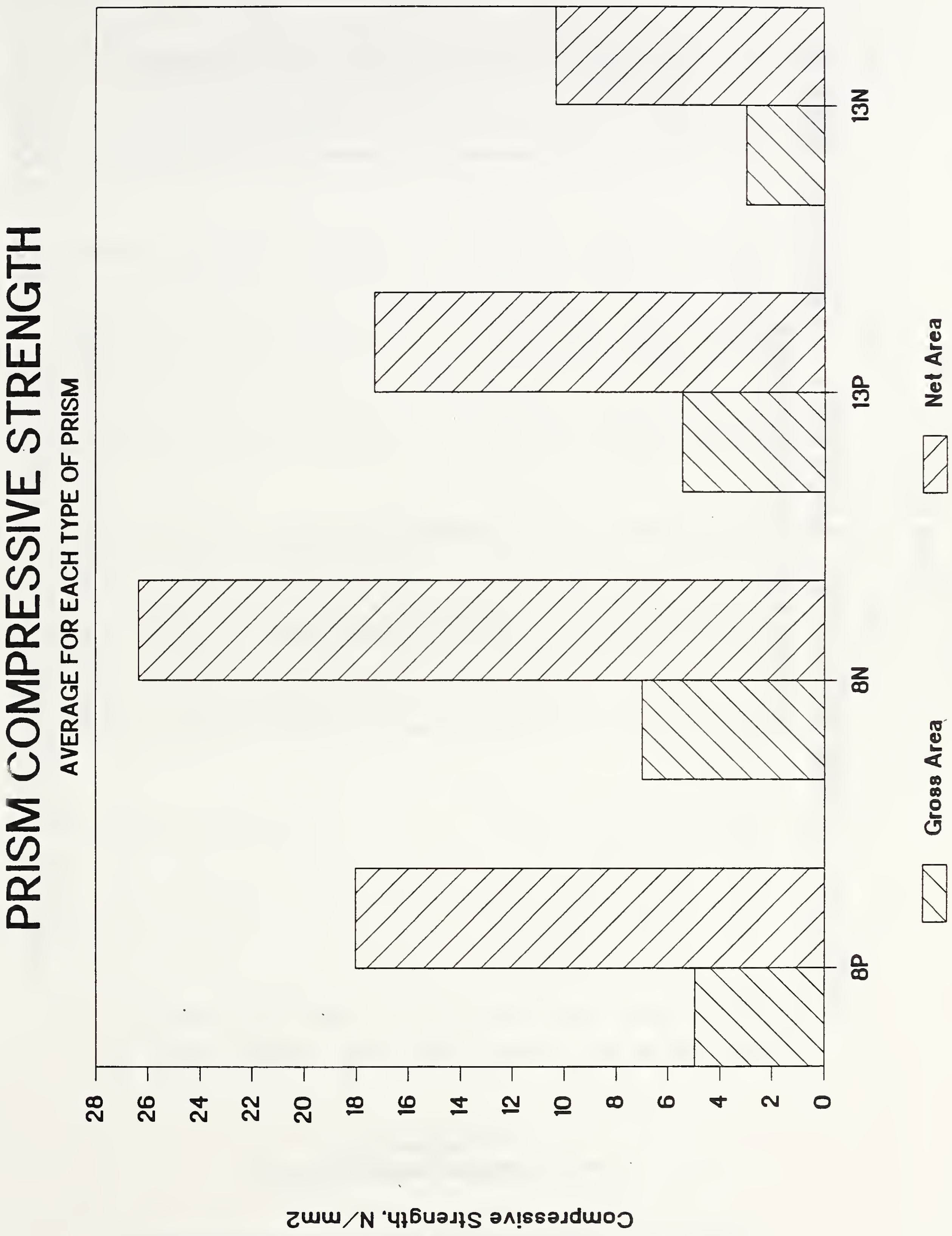


Figure 5.2 - Bar Graphs of Gross and Net Area Compressive Strengths

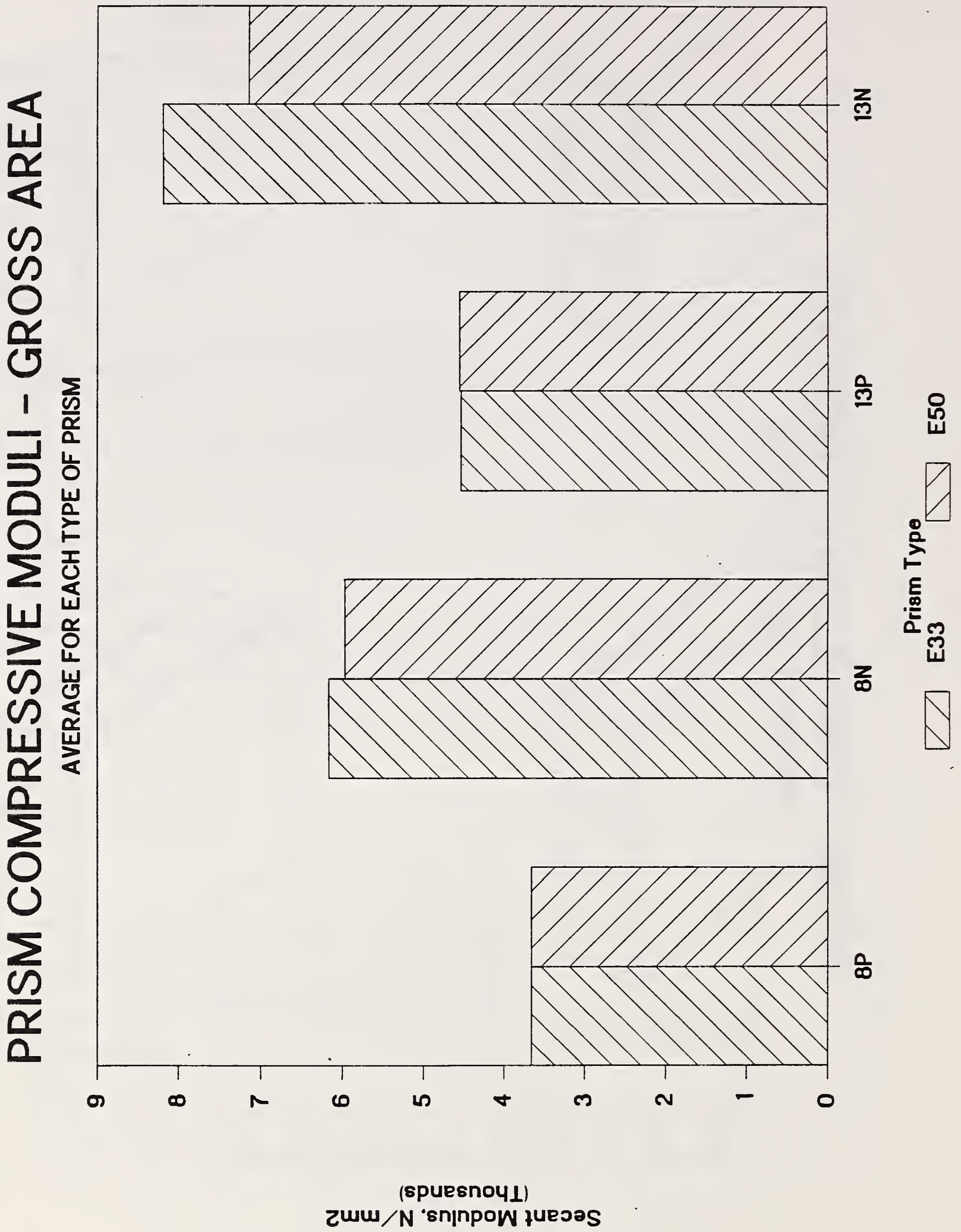


Figure 5.3 - Bar Graph of Gross Area Secant Moduli

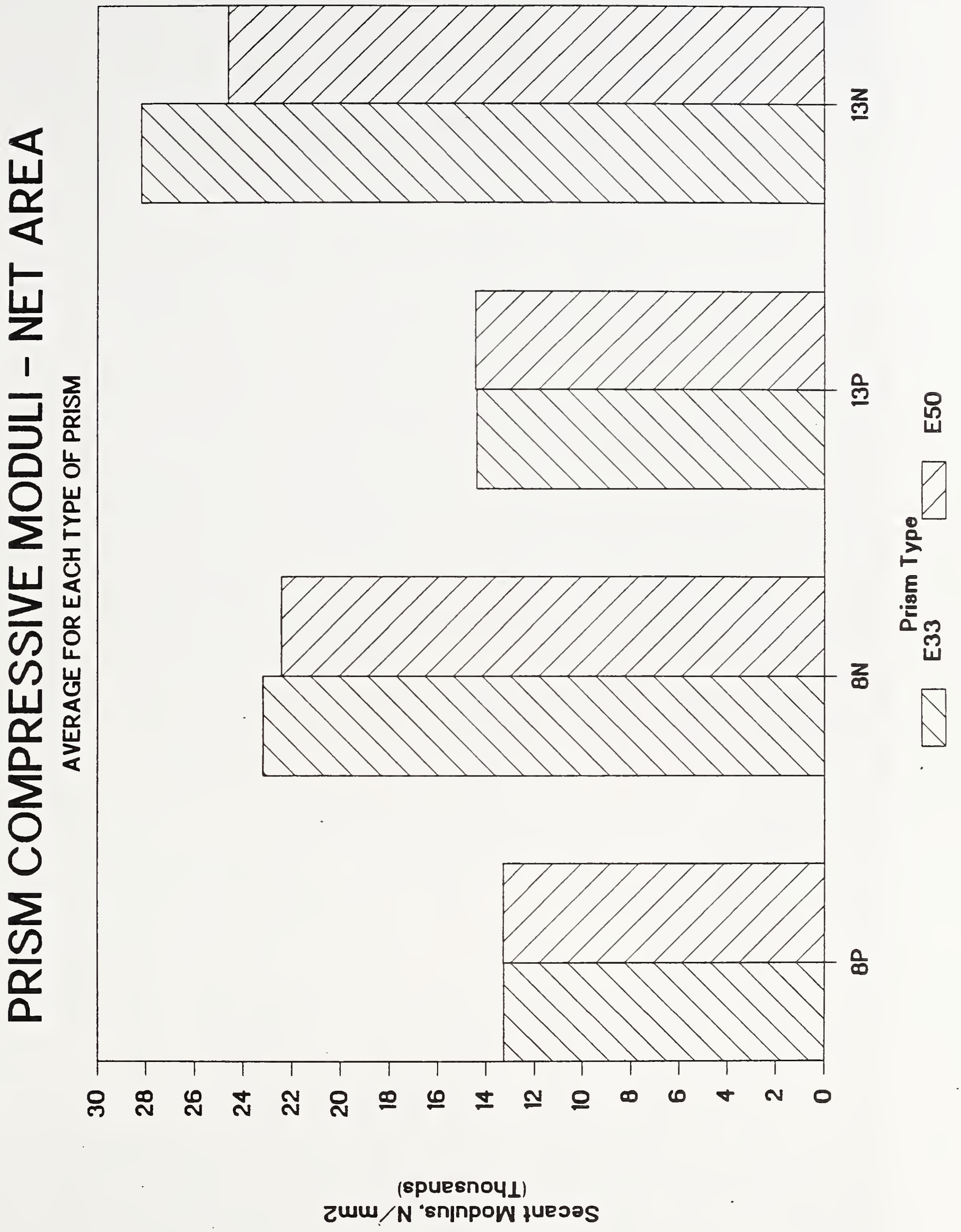


Figure 5.4 - Bar Graph of Net Area Secant Moduli

Figure 5.5 - Post Failure View of Typical Normal Prism

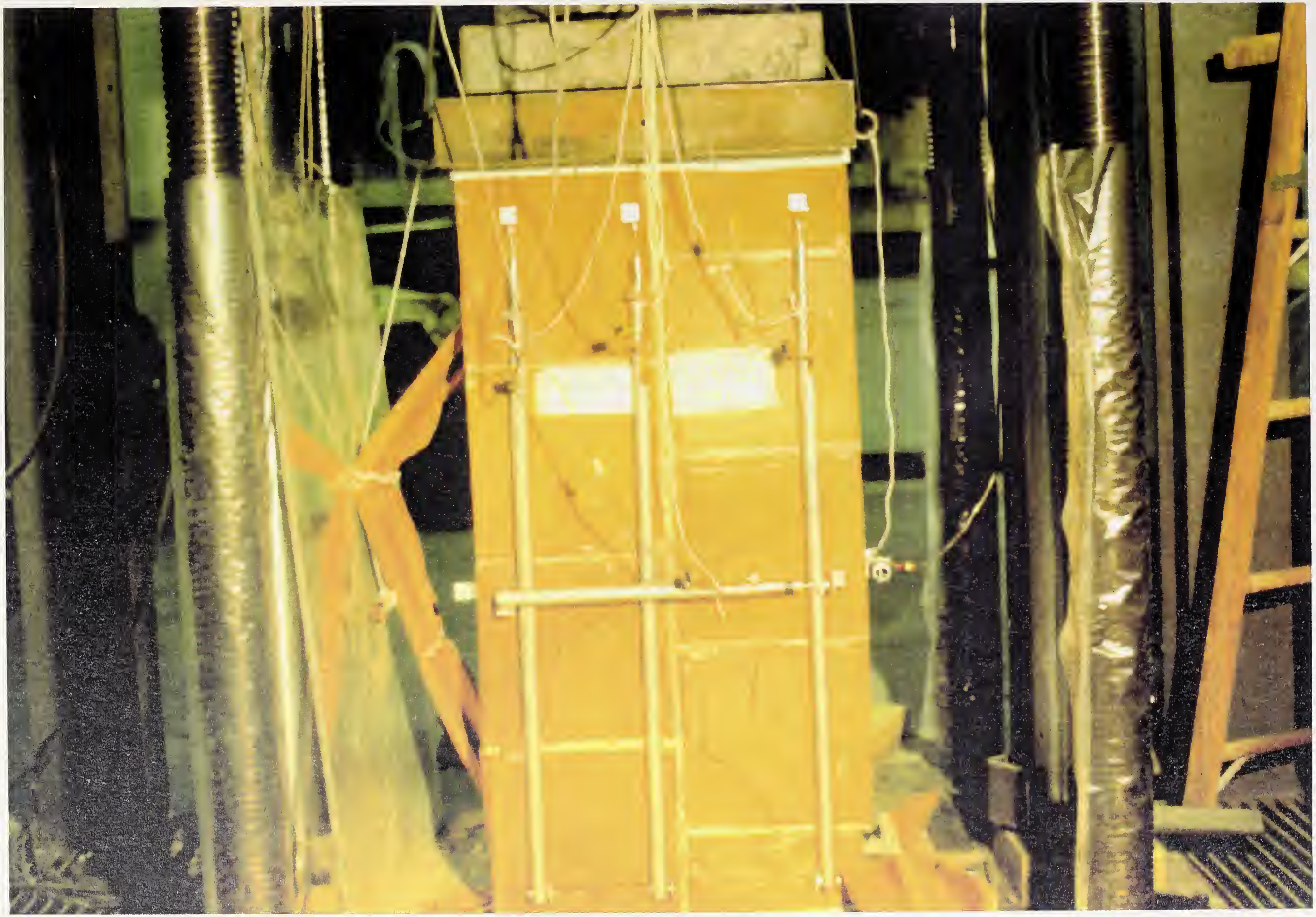


Figure 5.6 - Post Failure View of Typical Parallel Prism

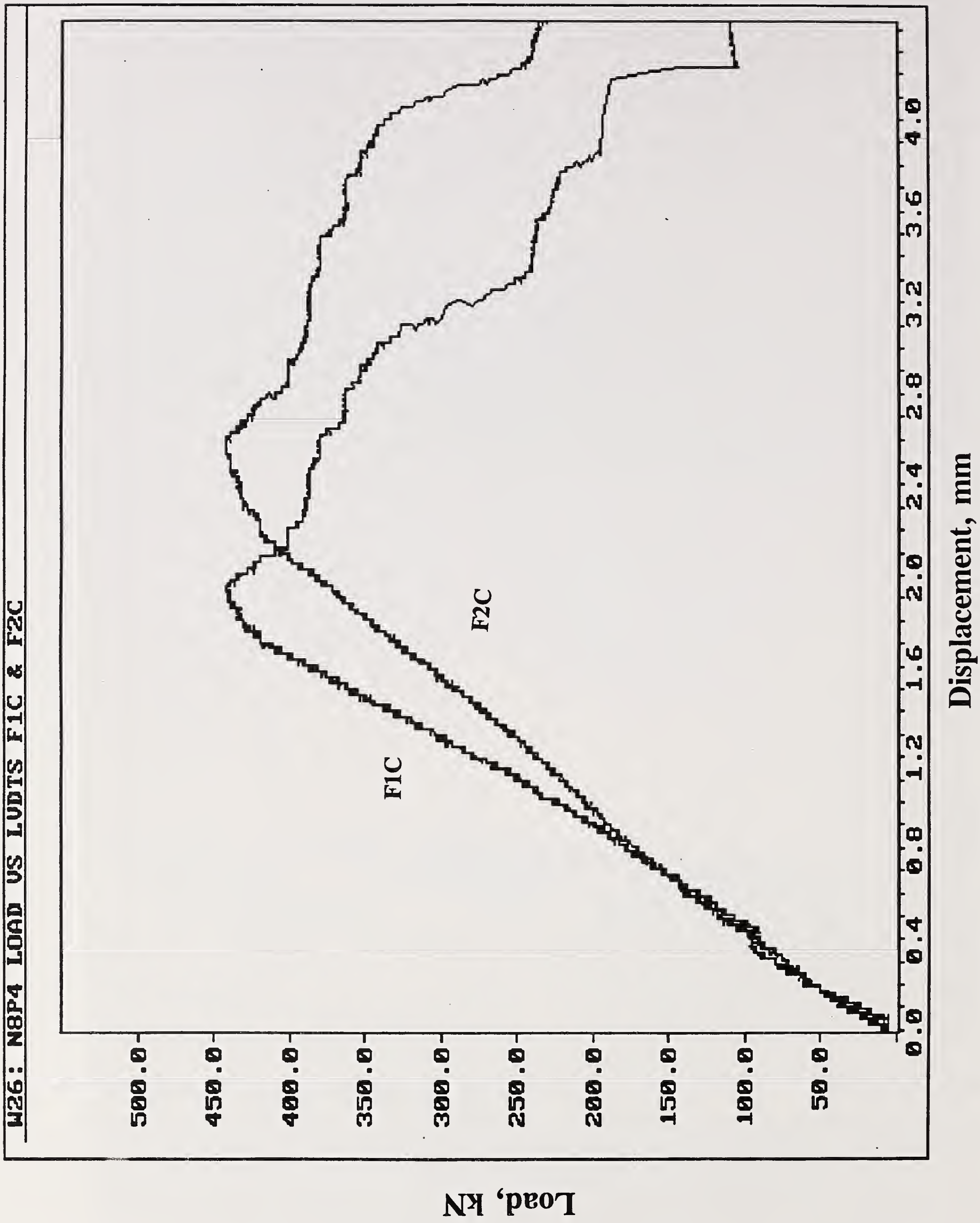


Figure 5.7 - Load vs Vertical Displacement at Center of Prism

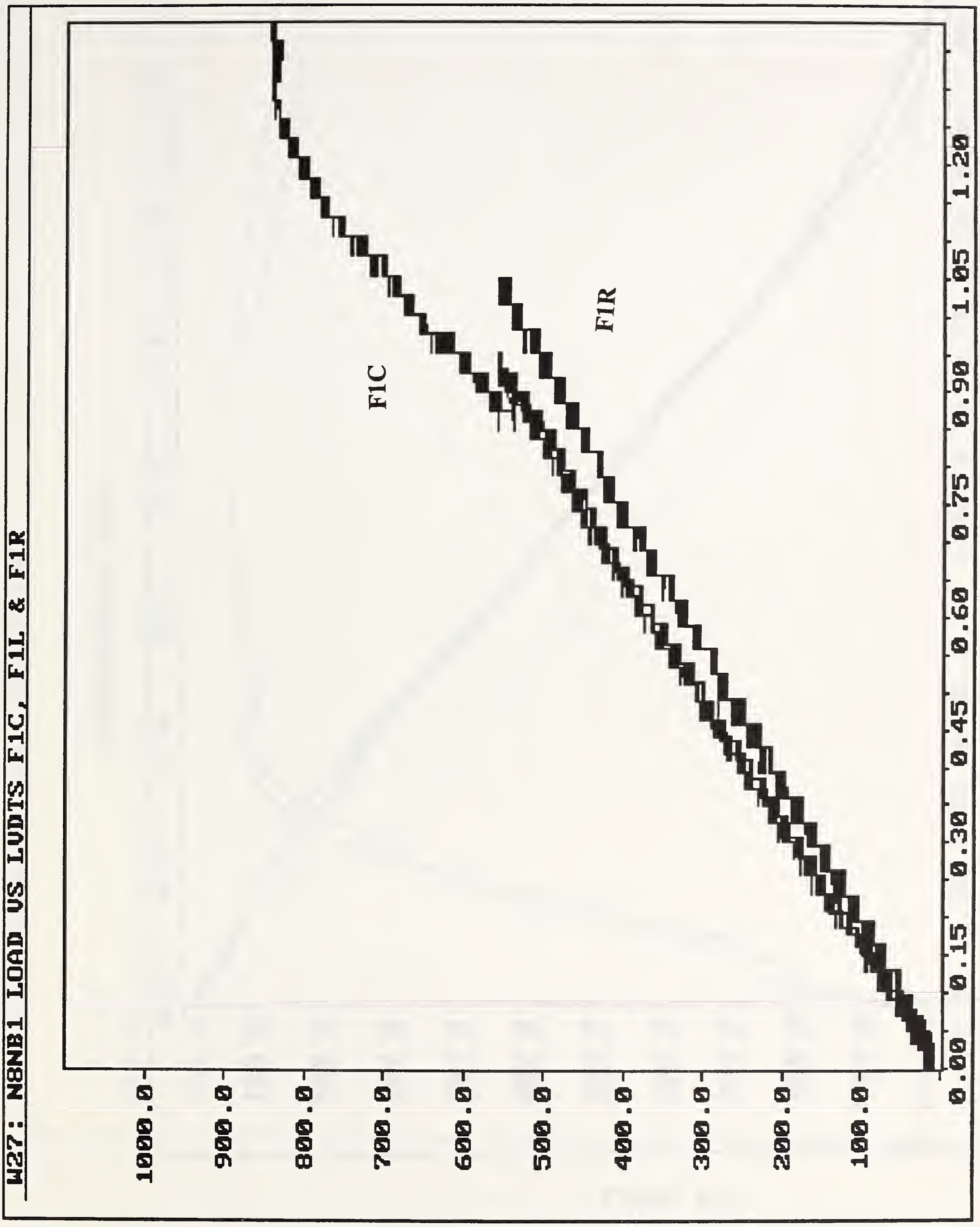


Figure 5.8 - Load vs Vertical Displacement on Face 1

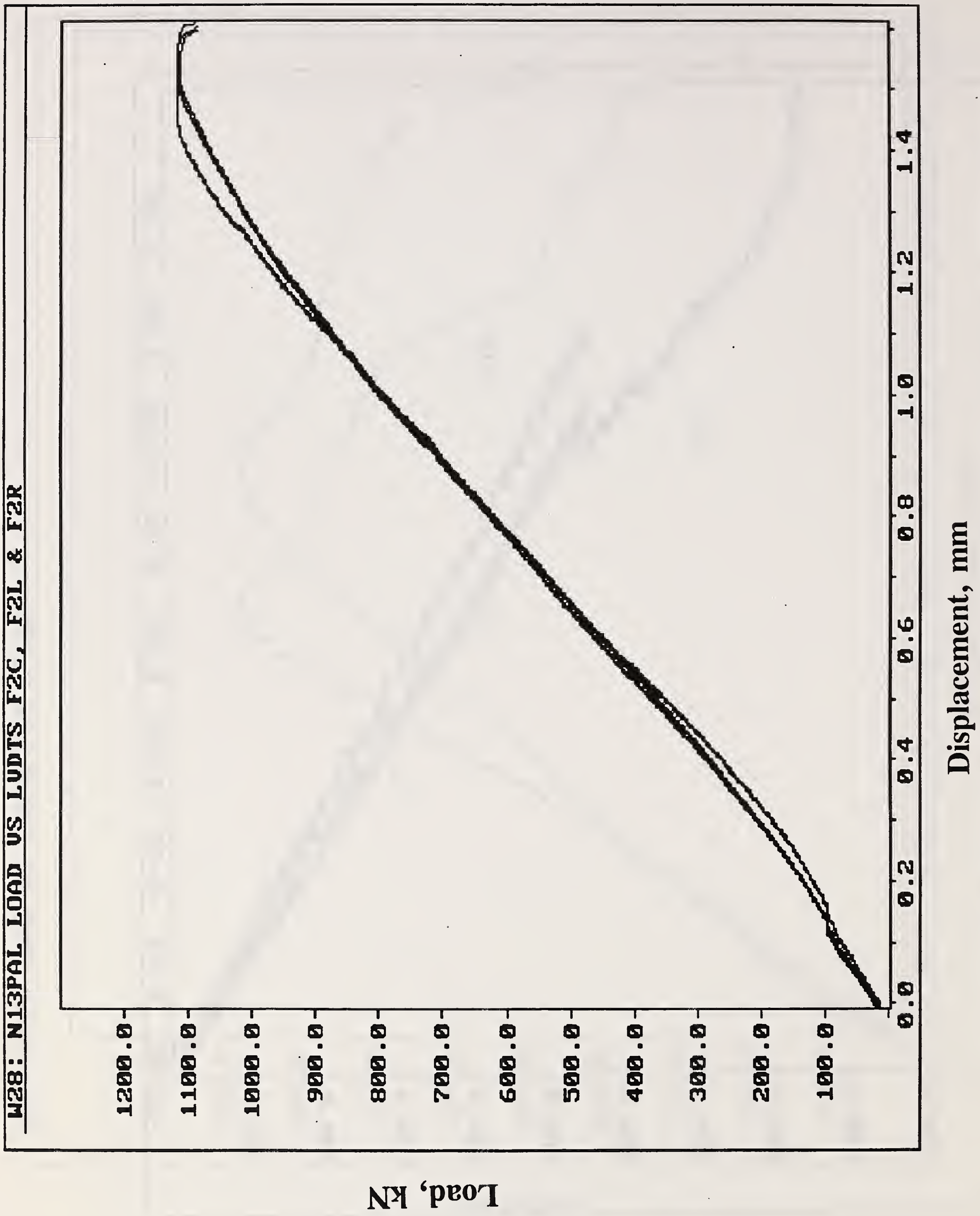


Figure 5.9 - Load vs Vertical Displacement on Face 2

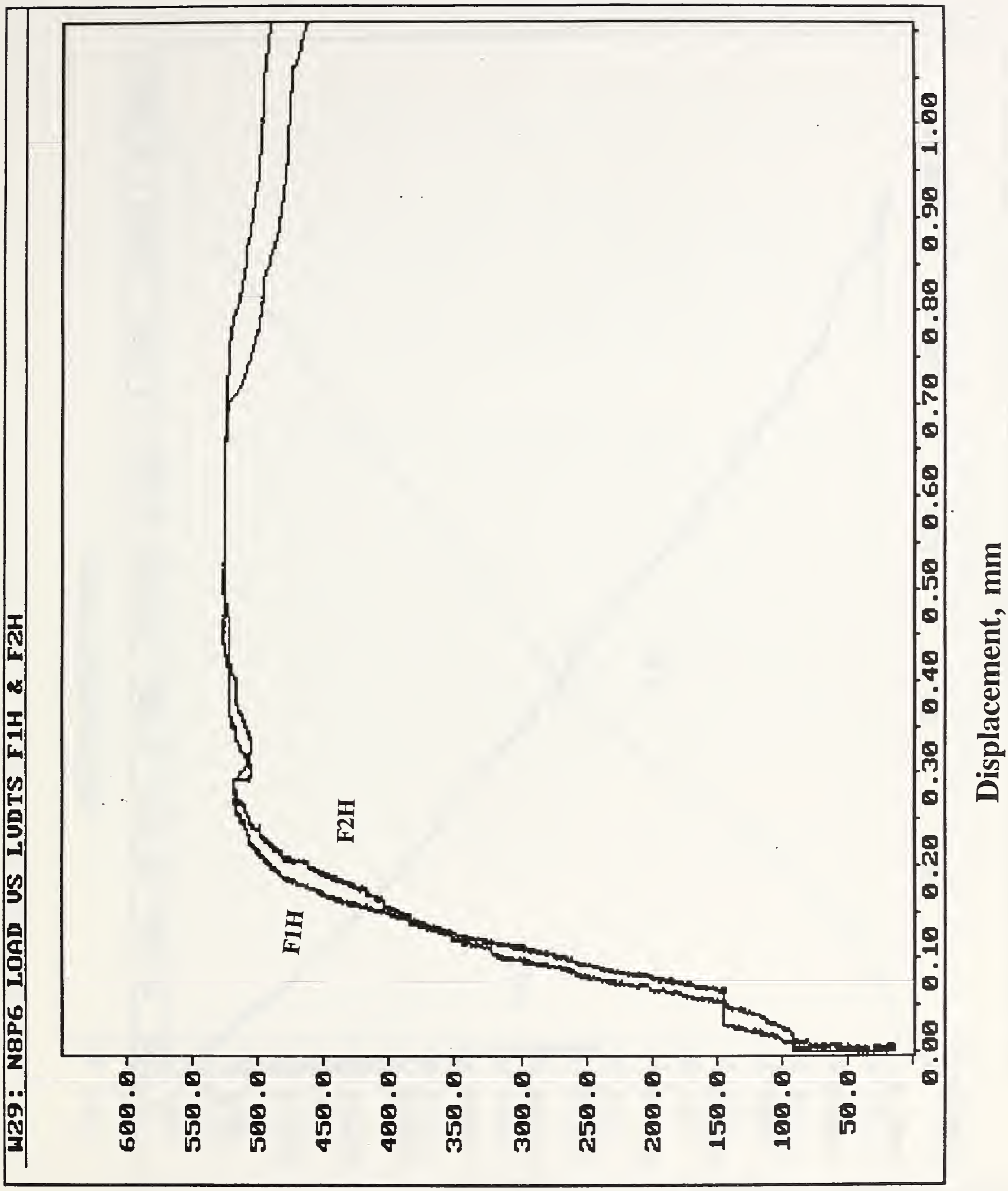


Figure 5.10 - Load vs Horizontal Displacement at Center of Prism

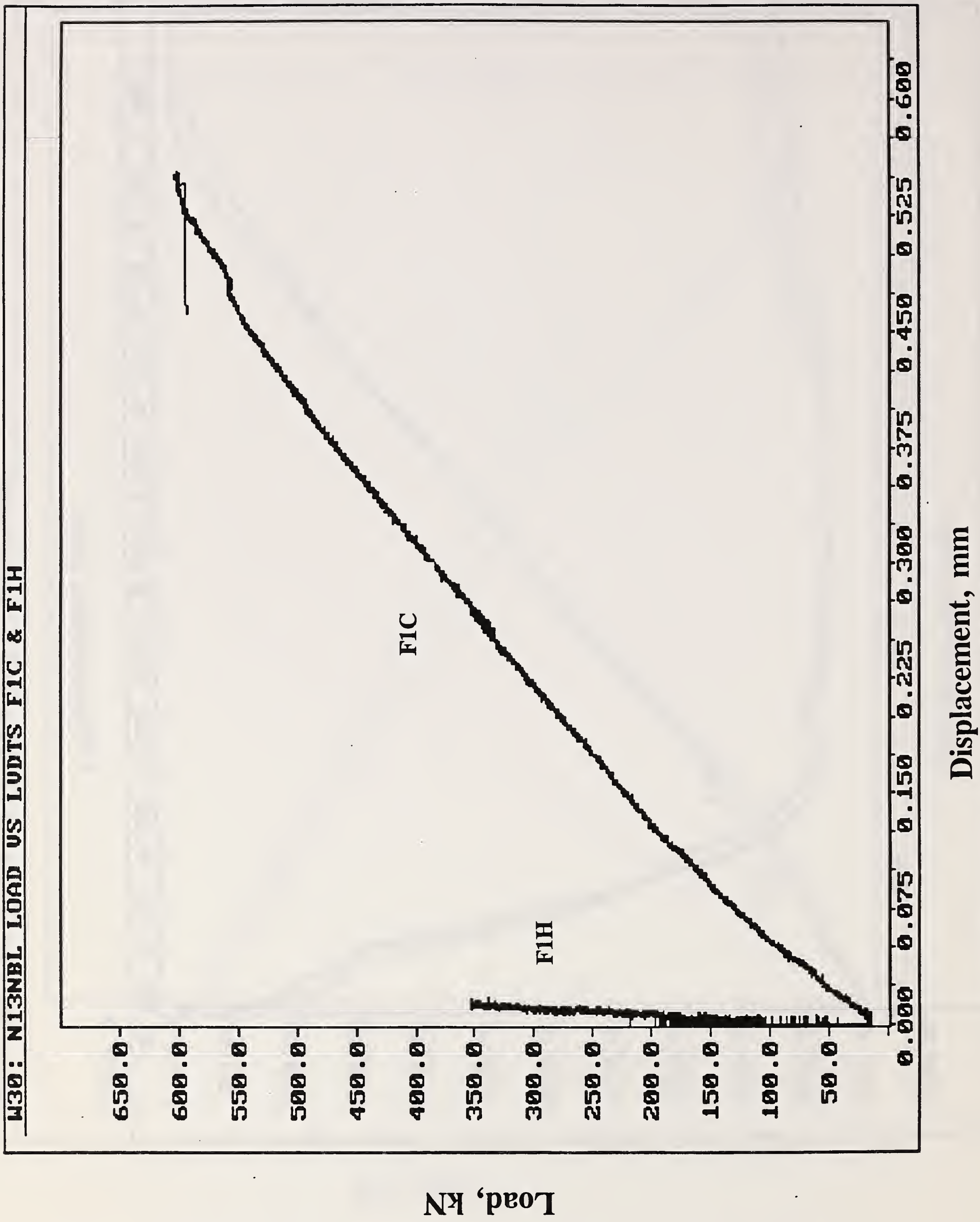


Figure 5.11 - Load vs Vert. & Horiz. Displacement on Face 1

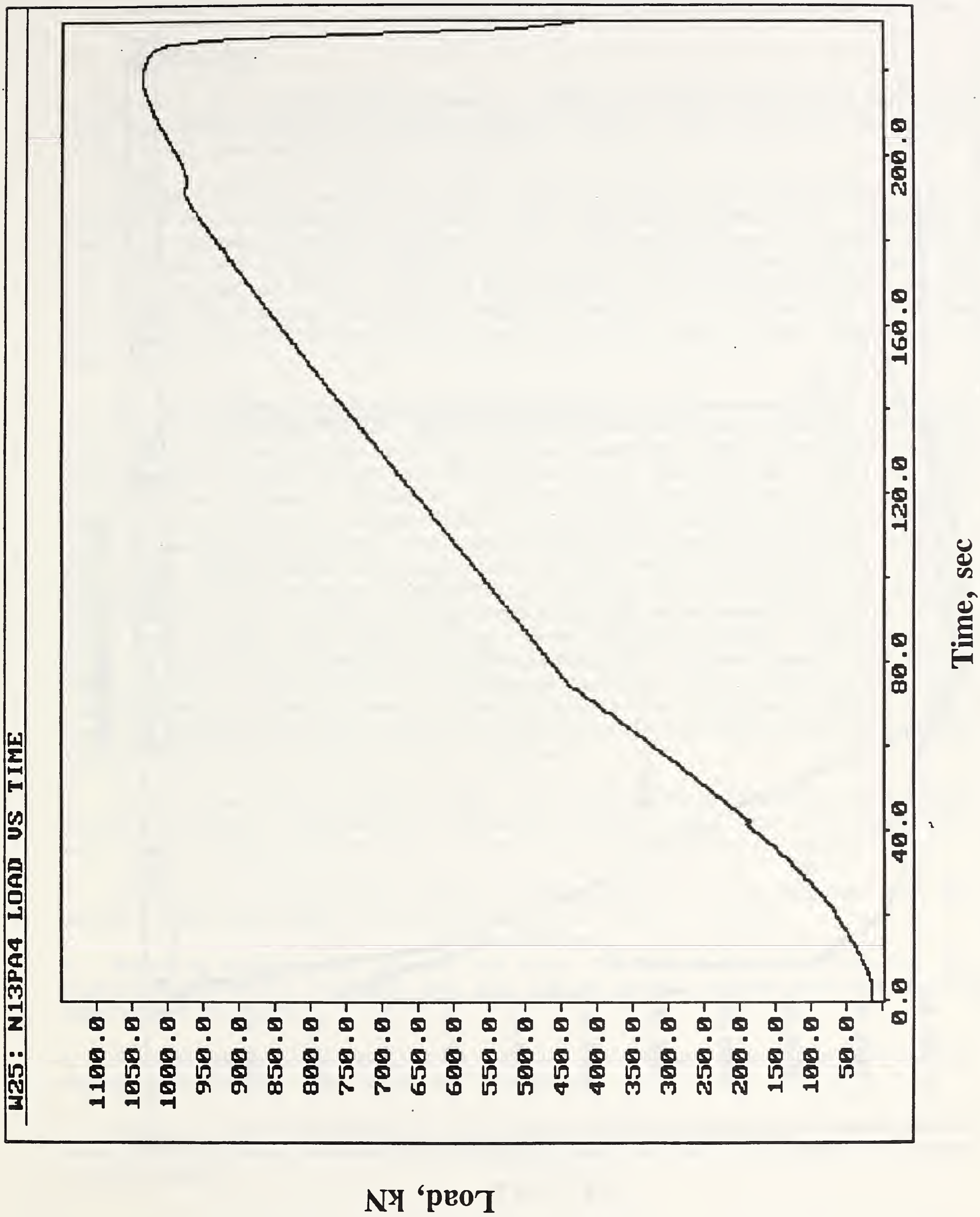


Figure 5.12 - Load vs Time

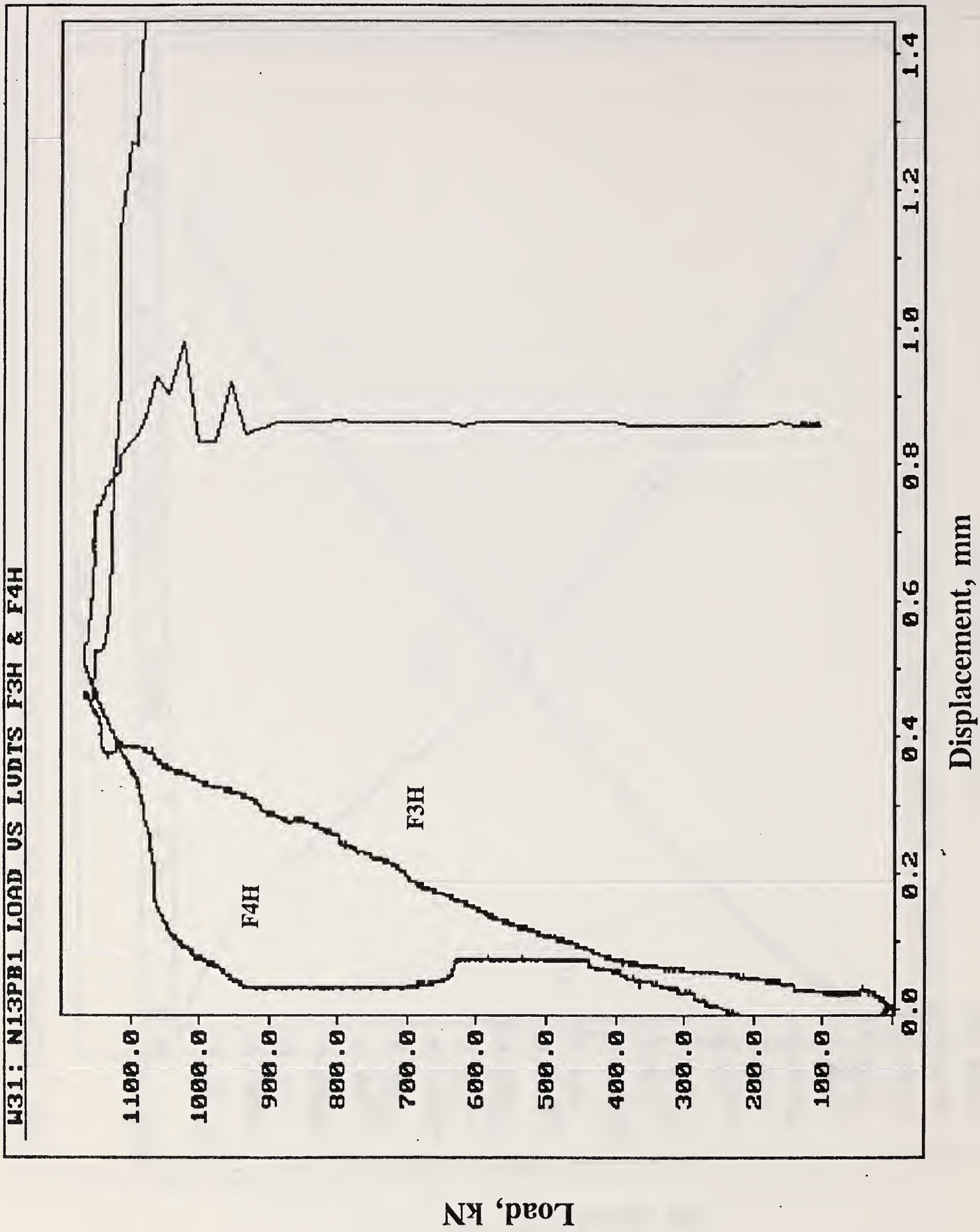


Figure 5.13 - Load vs Horizontal Displacement on Edges of Prism

6. CONCLUSIONS

a. The plots in the Appendix of Load vs LVDT F1C & F2C confirm that there was close agreement between the center vertical LVDT's. This result is indicative of the axial load being applied uniformly.

b. For Normal prisms, comparison of the output from the center and outside LVDT's extends from zero loading up to 60% of the expected maximum load. Generally, over the limited range of comparison, there was close agreement between center and outside LVDT's for the Normal prisms. For Parallel prisms, the plots for F1C, F1L and F1R and for F2C, F2L and F2R indicate close agreement between center and outside LVDT's over the entire range of loading. It is therefore concluded that the center LVDT's alone can be used to measure the vertical shortening of the prisms.

c. The displacement readings from the horizontal LVDT's mounted at midheight (F1H & F2H) of the 200-mm and 330-mm Normal prisms remained virtually unchanged over the entire load range to which they were exposed. The approximate average readings were 0.05 mm (0.002 in.) for 200-mm Normal and 0.02 mm (0.0008 in.) for 330-mm Normal prisms. Based on the fact that the readings were constant throughout a given test, no conclusion is drawn with regard to a Poisson effect. For 200-mm Parallel prisms, the plots of F1C & F1H vs Load indicate that the horizontal displacement was generallly linear over the entire load range. Comparison of the relative displacements at peak load results in an average F1H/F1C ratio of 0.16. The readings from F1H & F2H were somewhat erratic in the upper half of the load range for the 330-mm Parallel prisms. Therefore, the ratio of F1H/F1C was computed at approximately 50% of peak load. The ratios varied from 0.06 to 0.23 with the average being 0.12. It is concluded that there was a Poisson's effect present in the Parallel prisms parallel to Faces 1 & 2. There is no known historical data on Poisson's ratio for Hollow Clay Tile prisms against which these results can be compared.

d. Based on the output of LVDT's F3H & F4H, there is no evidence of a transverse Poisson's effect. Horizontal deflection values along the two edges were relatively insignifcant for most of the 330-mm Parallel prism tests.

e. Based on the secant moduli values listed in Table 9, it is observed that the Normal prisms were about 67% stiffer than the Parallel prisms.

f. Based on either gross area or net area, the 200-mm Normal prisms had the highest compressive strength and the 330-mm Normal prisms had the lowest compressive strength.

g. The 200-mm Parallel and 330-mm Parallel prisms had comparable compressive strengths based on either gross or net area.

h. Based on the relatively low strengths exhibited by Group 2 prisms, it is concluded that mason workmanship can significantly affect the strengths realized by the prisms.

i. Comparing the results listed in Tables 7 and 8, it is concluded that there is no significant difference between the failure loads obtained under displacement control and those obtained under load control. However, the number of prisms tested under load control within each prism type is too small to perform rigorous statistical analysis.

7. REFERENCES

1. MMES Drawing S2E800800A003-Rev. 1 for Normal Prisms, Martin Marietta Energy Systems, Oak Ridge, TN.

2. MMES Drawing S2E800800A004-Rev. 1 for Parallel Prisms, Martin Marietta Energy Systems, Oak Ridge, TN.

3. MMES Document Y/EN-4595-Rev. 1, "Test Procedure for Prism Compression Testing of Laboratory-Built Prisms, Martin Marietta Energy Systems, Oak Ridge, TN.

4. MMES Document Y-EN-4675, "Mortar Characterization Study of Unreinforced Hollow Clay Tile Masonry, Martin Marietta Energy Systems, Oak Ridge, TN., Sept., 1992.

5. ASTM C 780-90, "Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry," Annual Book of ASTM Standards, Vol. 04.05.

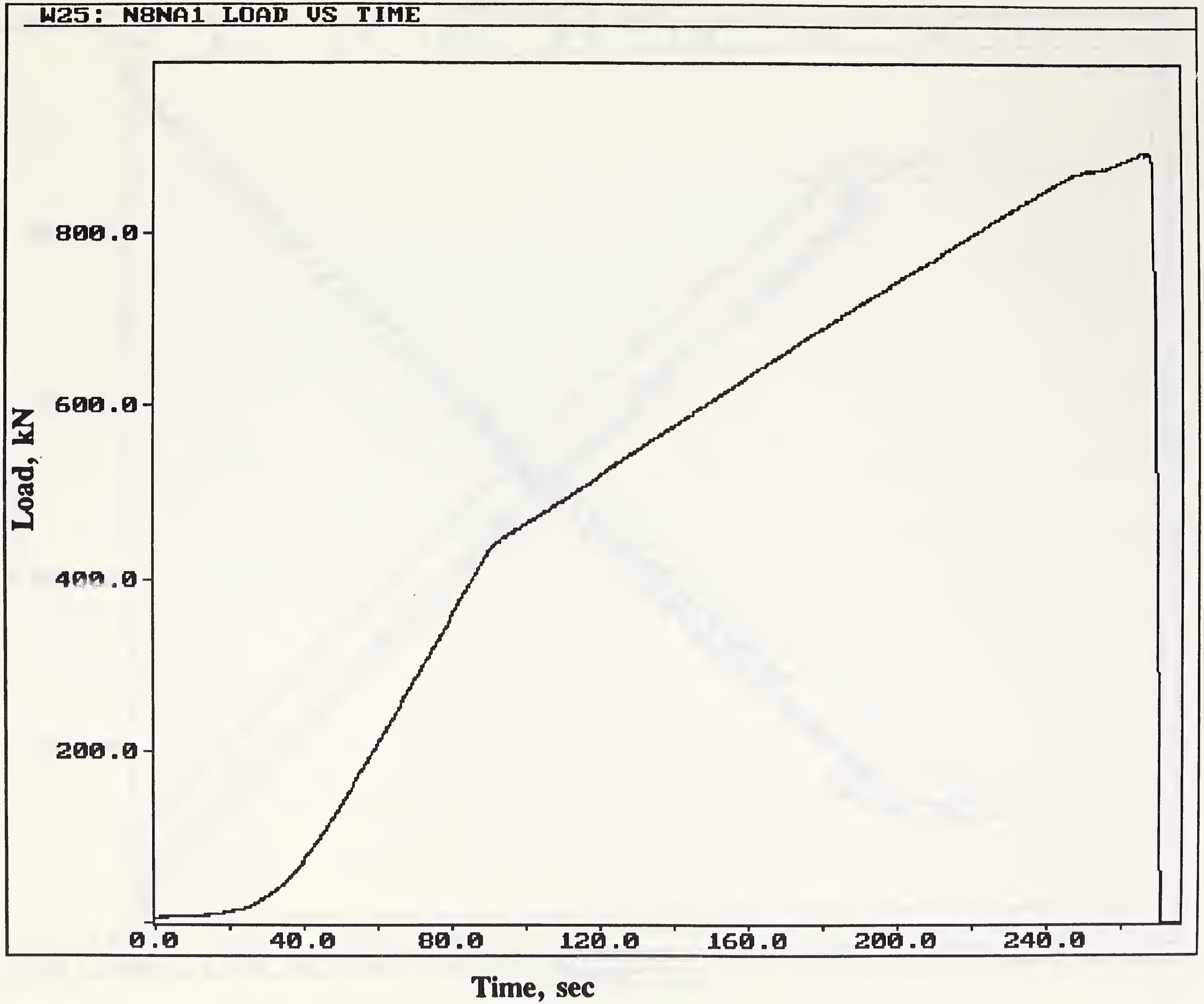
6. ASTM E 447-92, "Standard Test Methods for Compressive Strength of Masonry Prisms," Annual Book of ASTM Standards, Vol. 04.07.

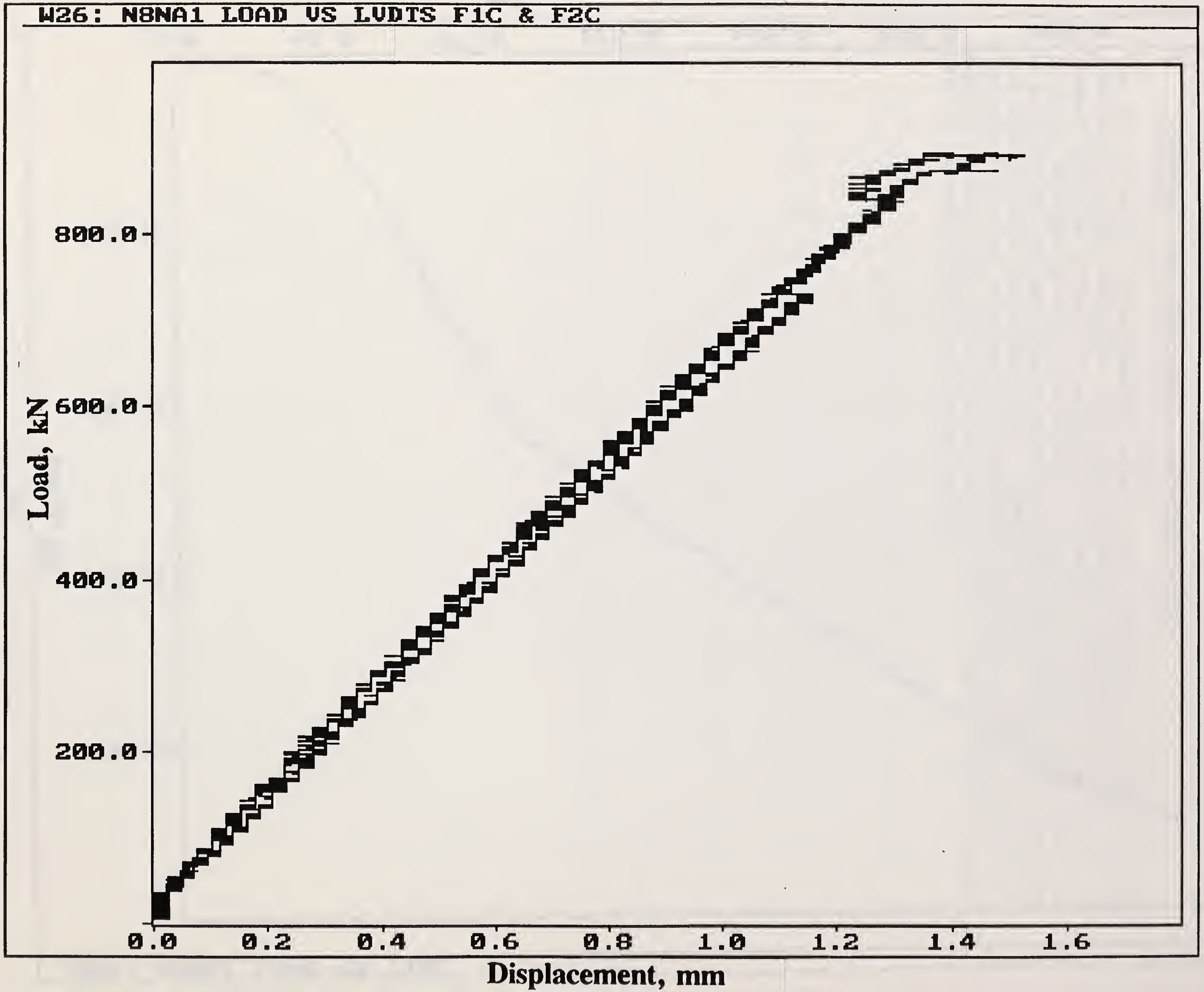
7. ASTM E 4, "Practices for Load Verification of Testing Machines," Annual Book of ASTM Standards, Vol. 04.05.

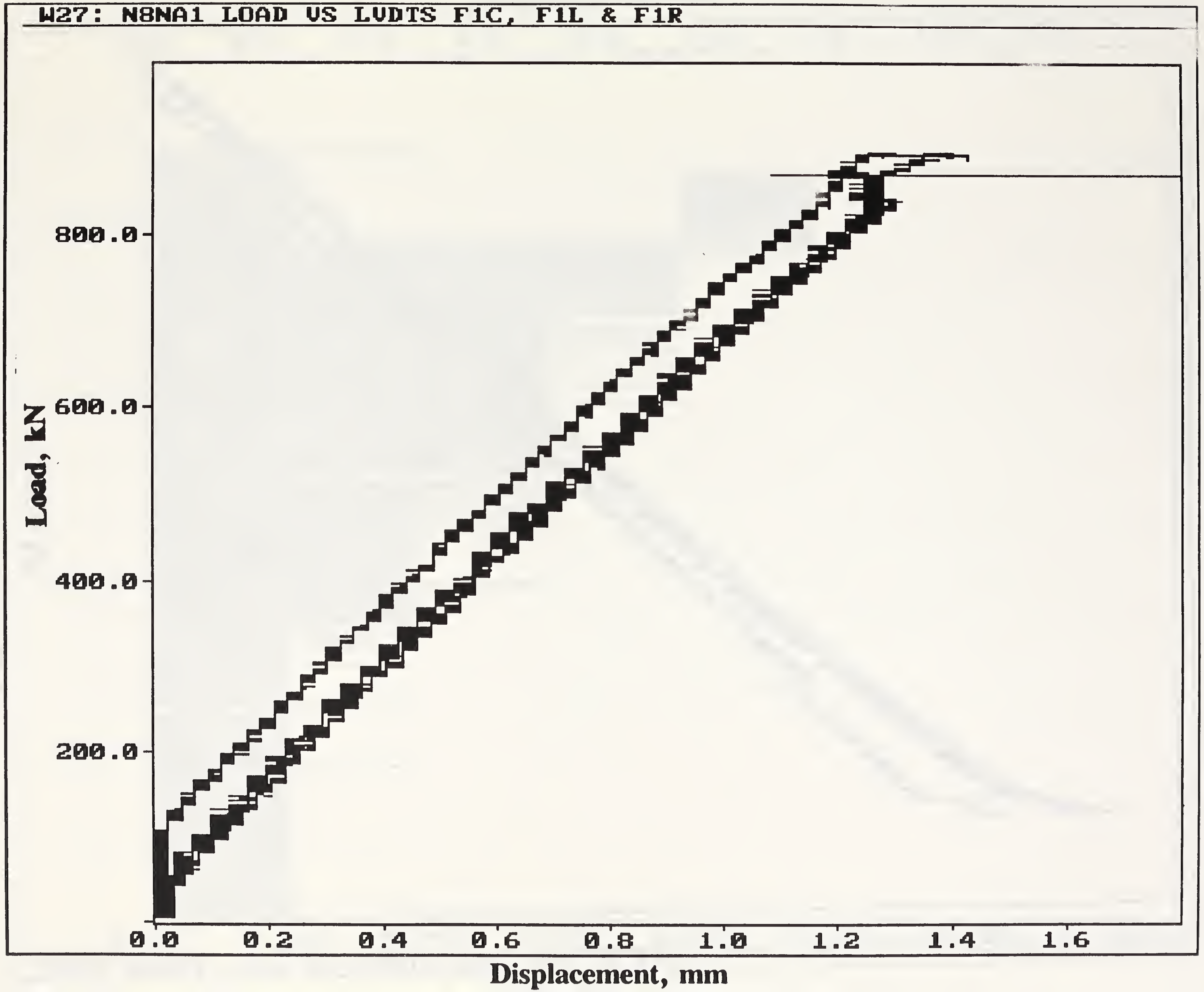
8. NIST Letter Report, "Hollow Clay Tile Prism Tests for Martin Marietta Energy Systems: Task 1 Testing," July 1993.

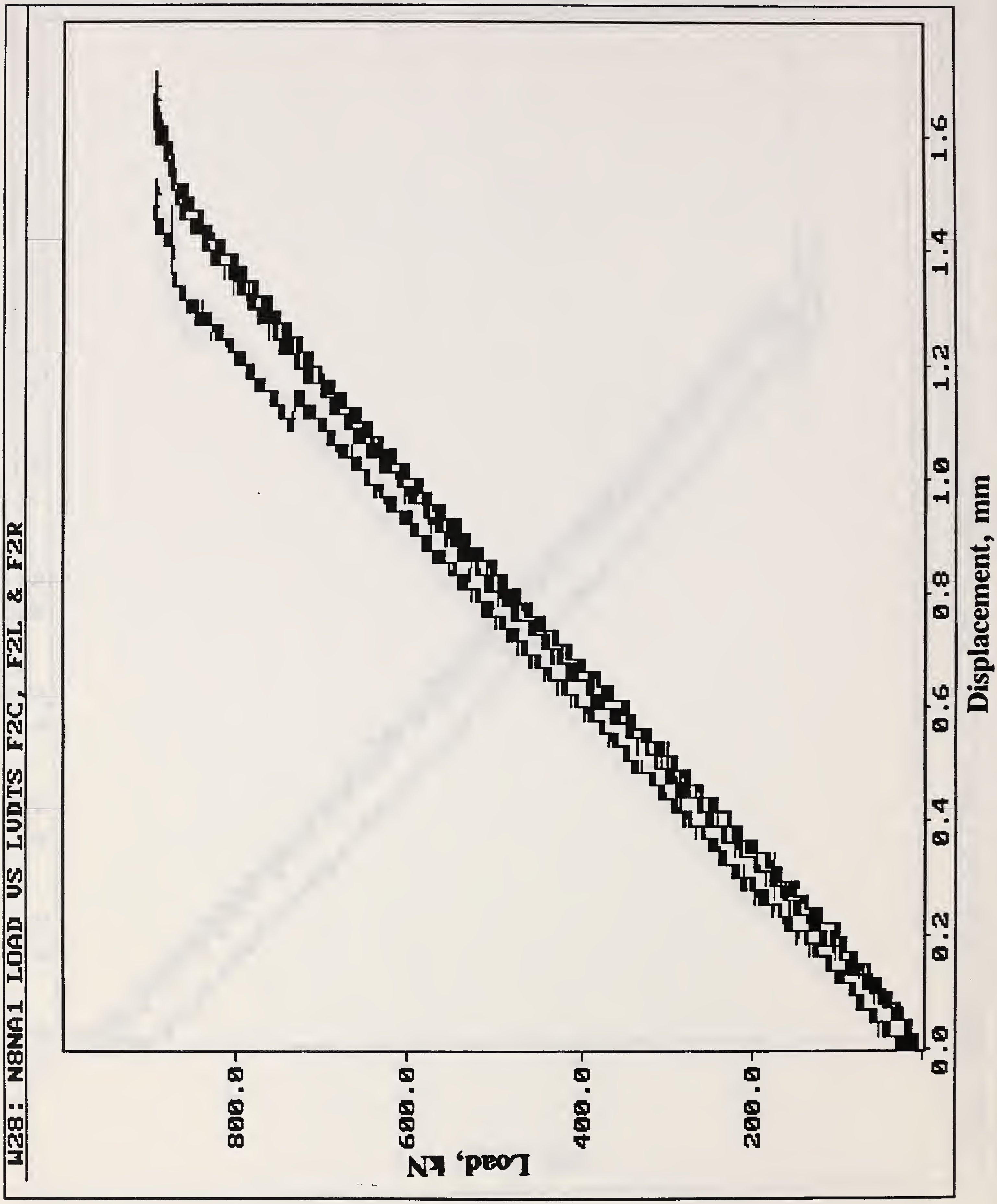
8. APPENDIX - DATA PLOTS FOR ALL FORTY-ONE PRISMS

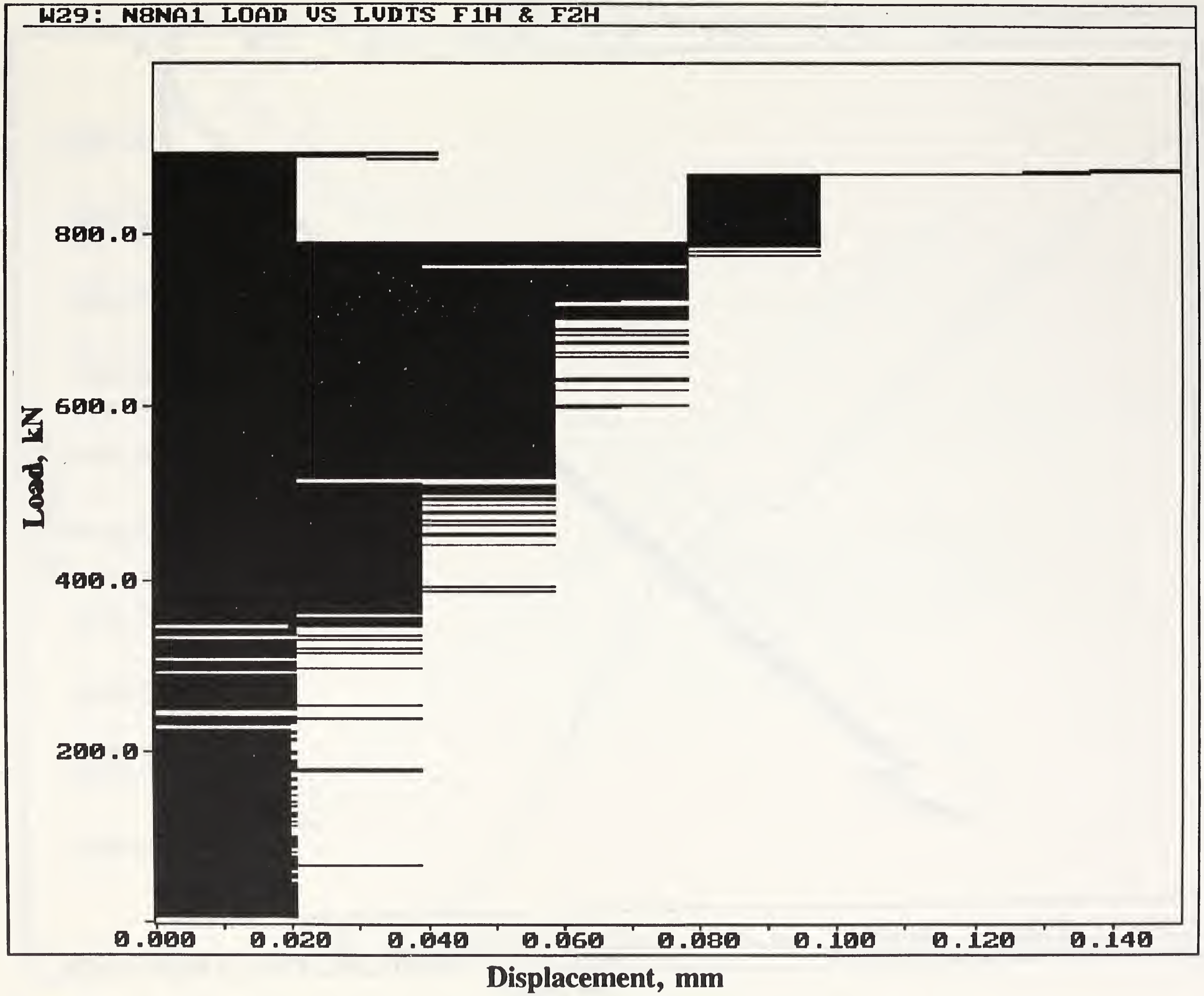
The six (seven for 330-mm Parallel prisms) plots identified in Section 5.4 are presented here for each prism. For the load versus displacement plots, load is plotted along the ordinate in units of kilonewtons and displacement is plotted along the abscissa in units of millimeters. For the load versus time plots, time is plotted along the abscissa in units of seconds. When viewing the load versus displacement plots for prisms N8NA1 - N8NBL and N13NA1 - N13NBL, it should be remembered that the exterior vertical LVDT's and the horizontal LVDT's were removed at about 60% of the expected maximum load. Only the center vertical LVDT's remained attached until prism failure.

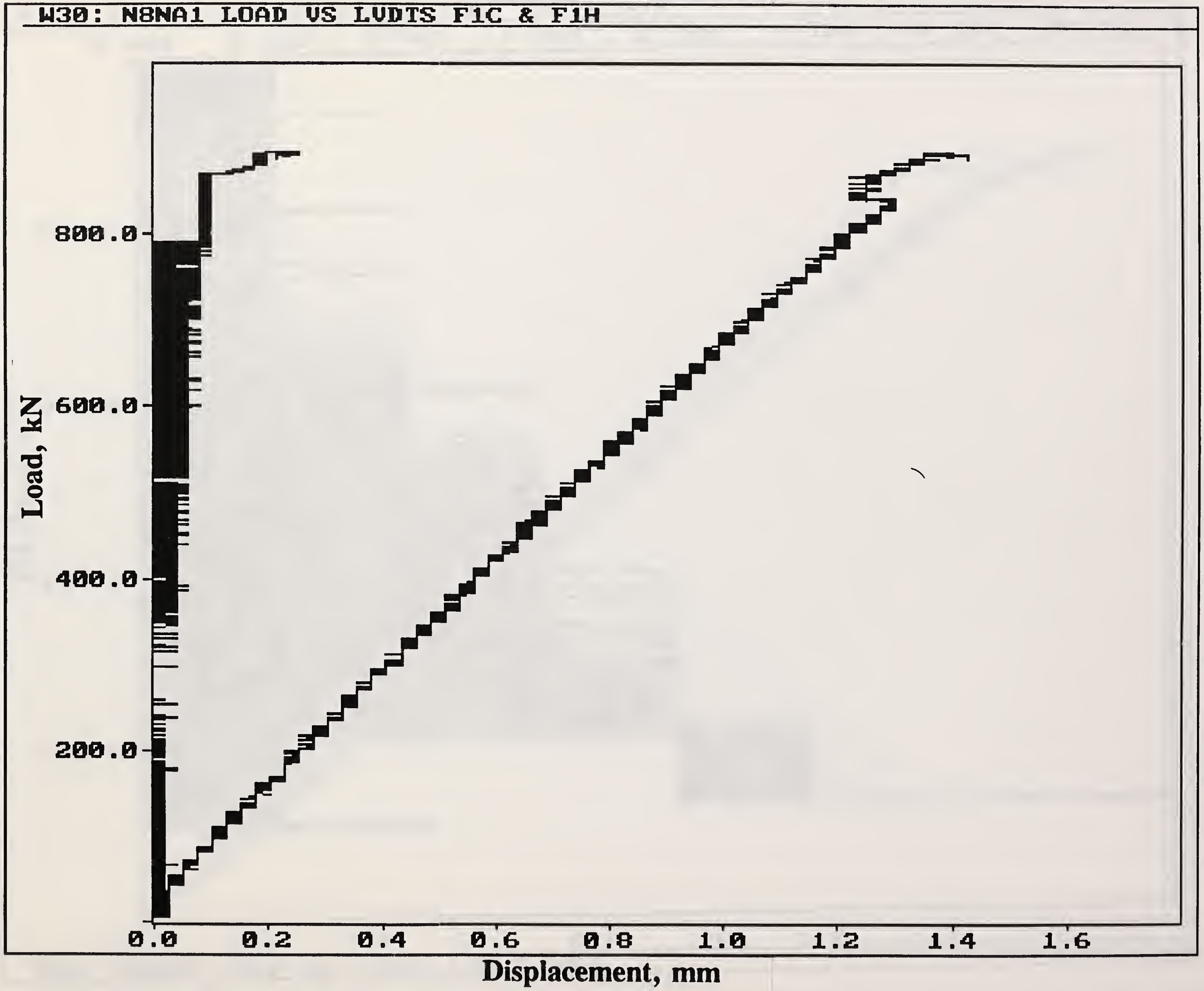

W25: N8NA1 LOAD VS TIME
Load, kN
800.0
600.0
400.0
200.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

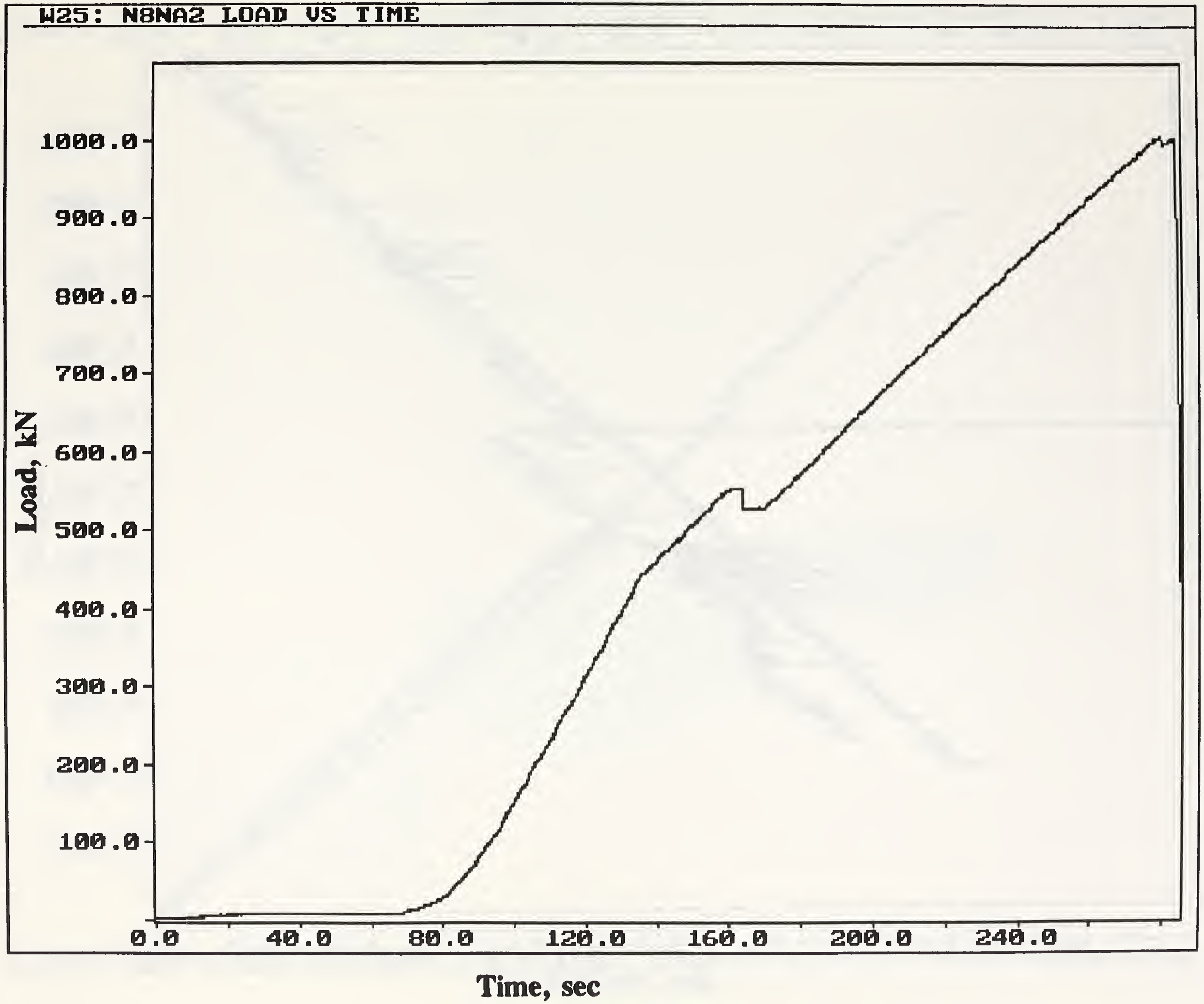

W26: N8NA1 LOAD VS LVDTS F1C & F2C
Load, kN
800.0
600.0
400.0
200.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm

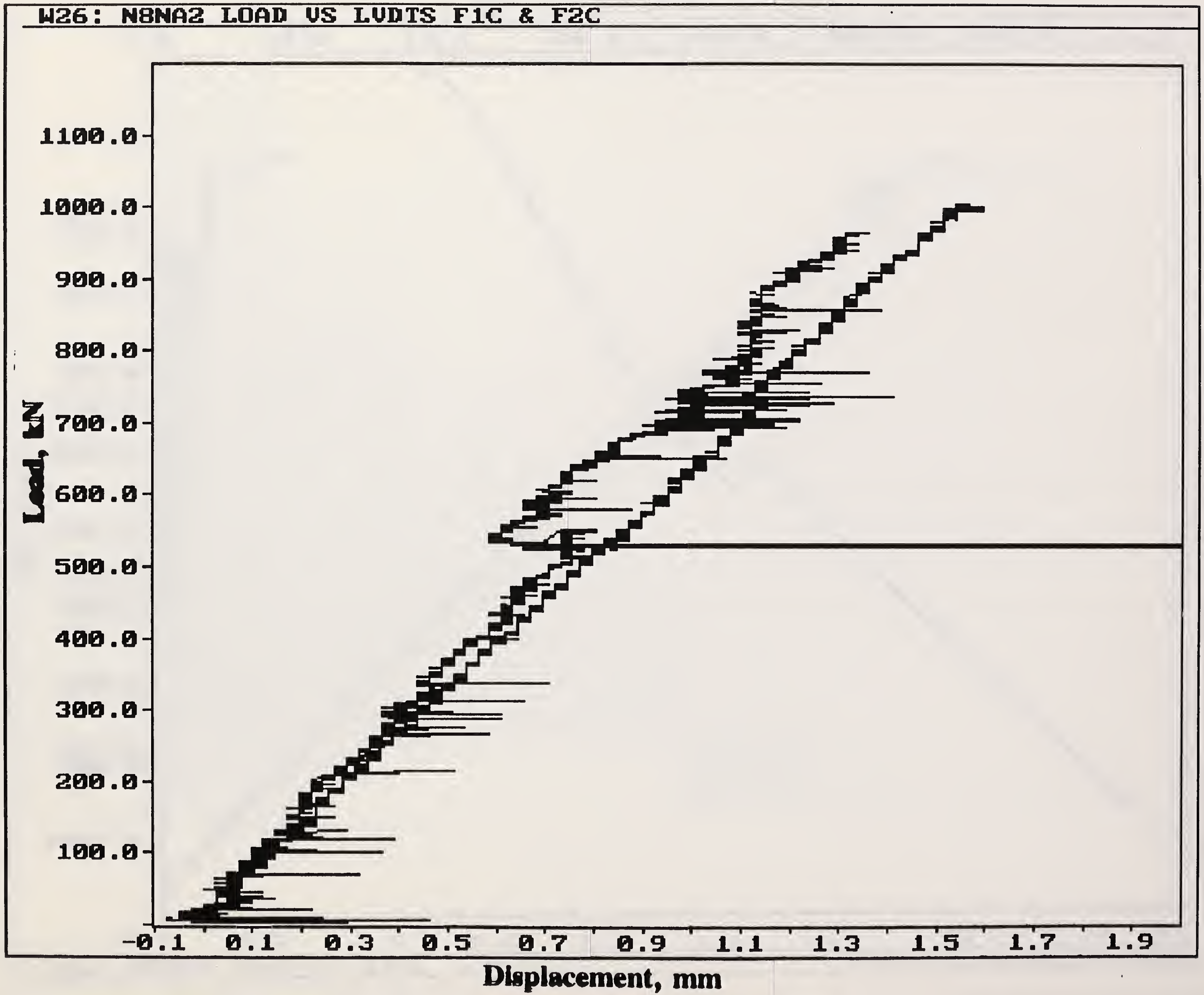

W27: N8NA1 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
800.0
600.0
400.0
200.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm

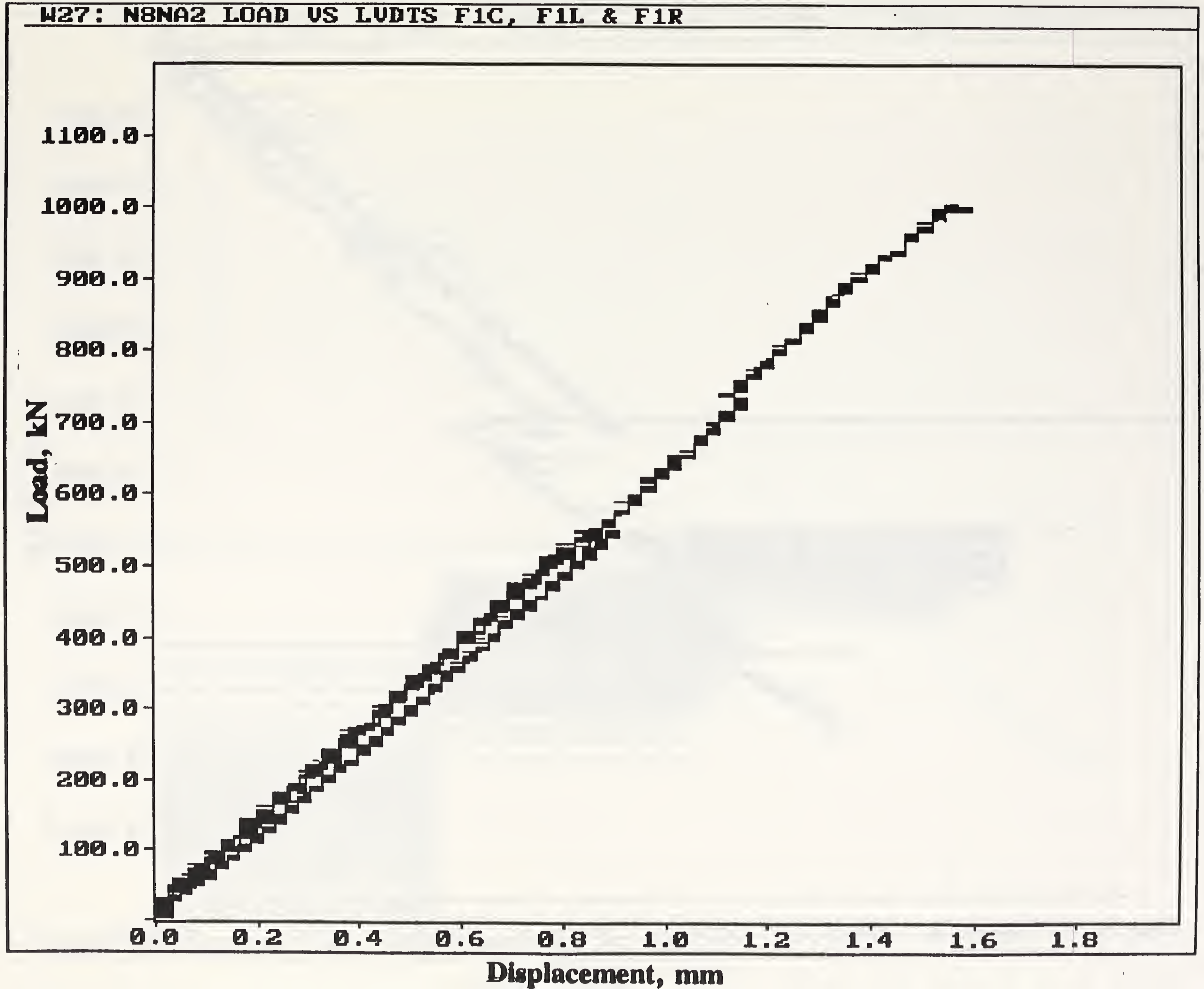

W28: N8NA1 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
800.0
600.0
400.0
200.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm

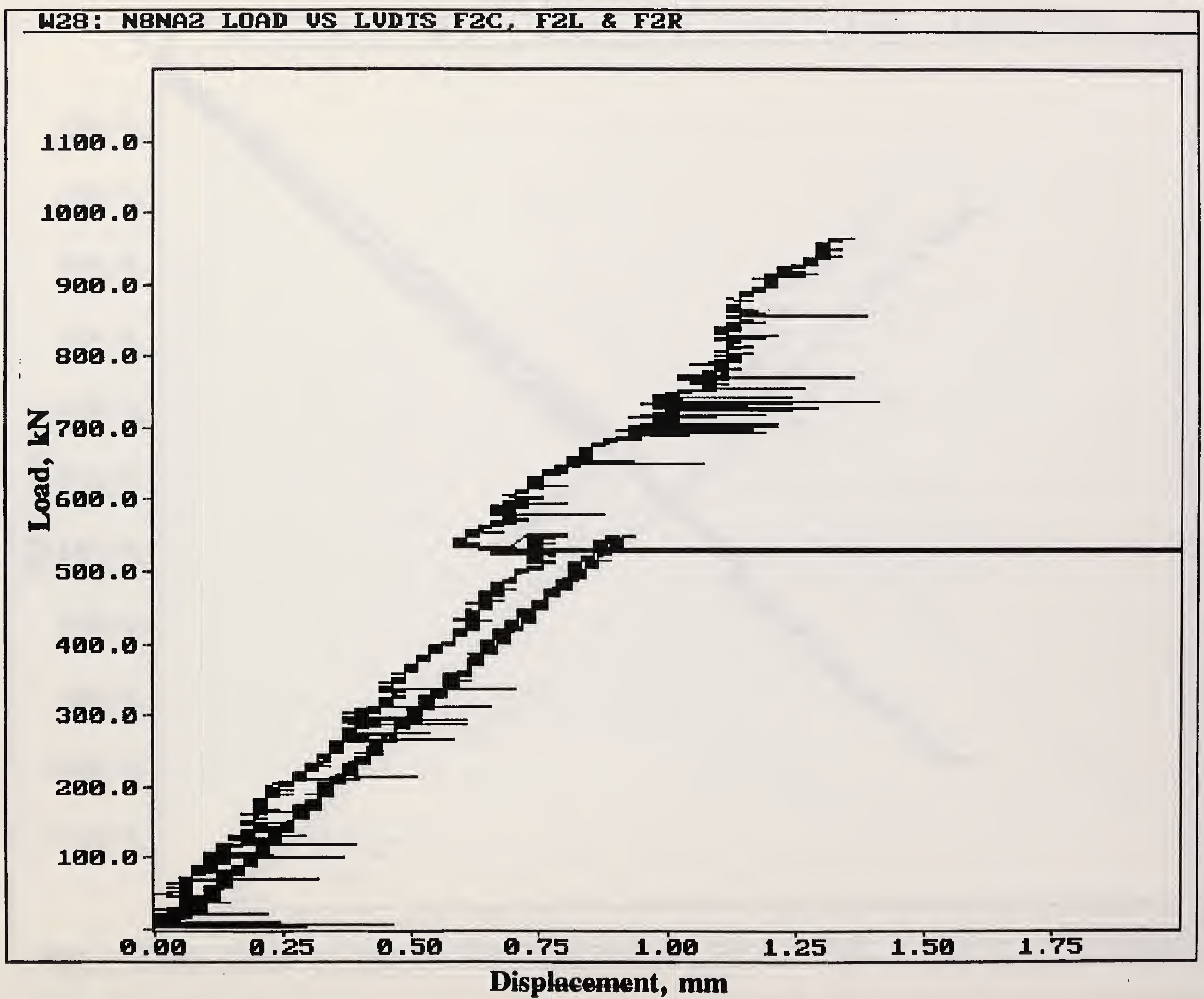

W29: N8NA1 LOAD VS LVDTS F1H & F2H
800.0
600.0
400.0
200.0
Load, kN
0.000
0.020
0.040
0.060
0.080
0.100
0.120
0.140
Displacement, mm


W30: N8NA1 LOAD VS LVDTS F1C & F1H
Load, kN
800.0
600.0
400.0
200.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm

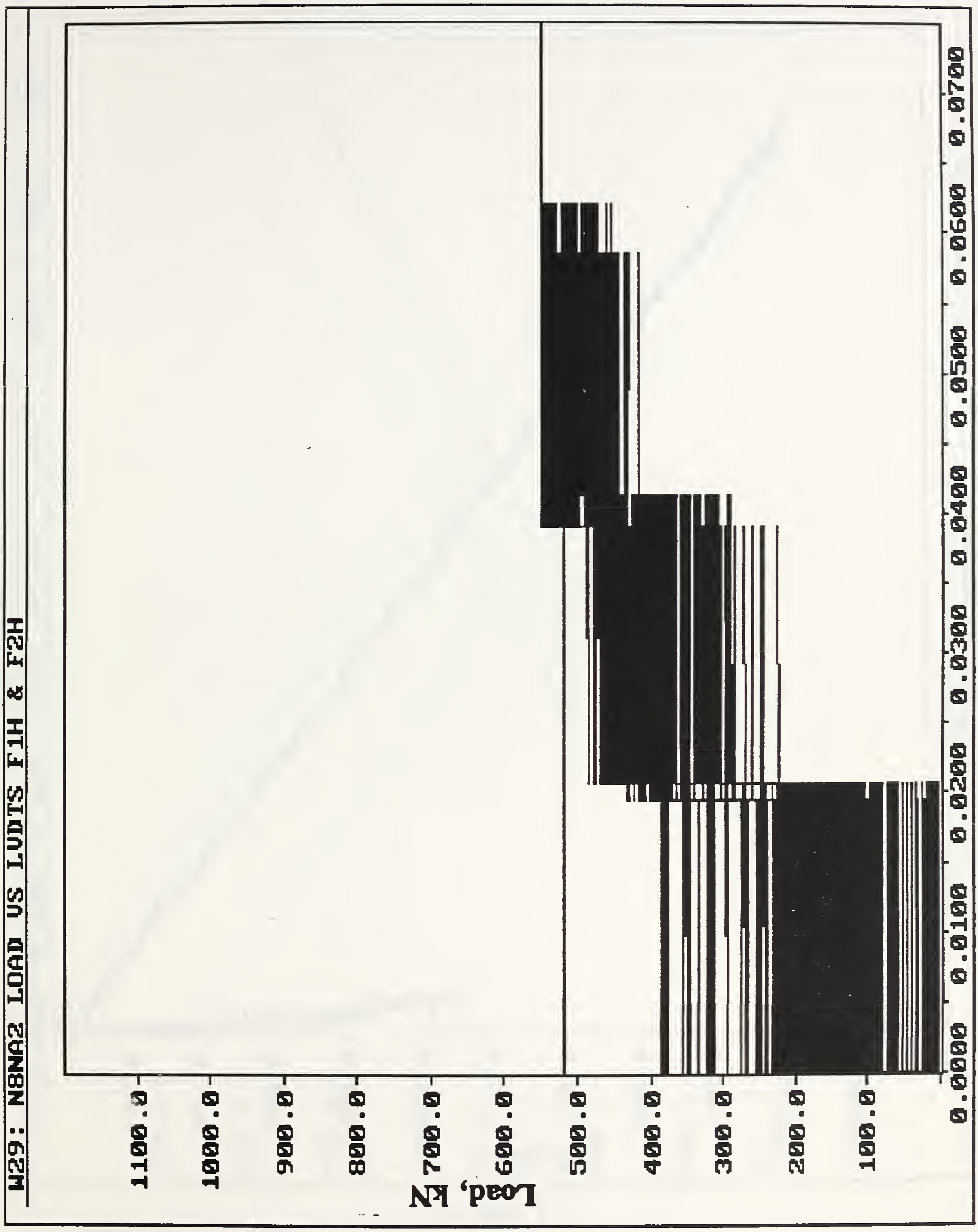

W25: N8NA2 LOAD VS TIME
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

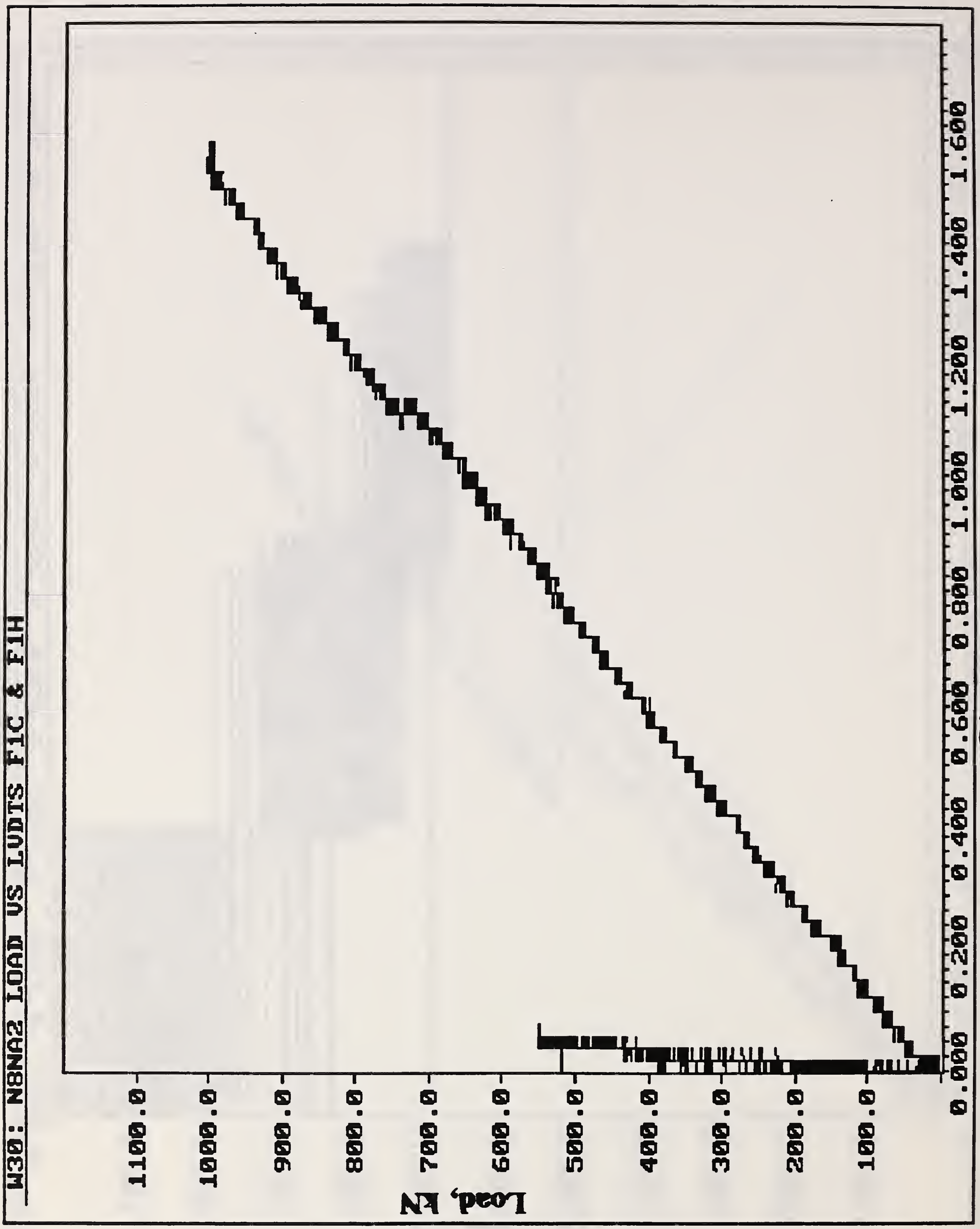

W26: N8NA2 LOAD VS LVDTS F1C & F2C
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
-0.1
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Displacement, mm


W27: N8NA2 LOAD VS LVDTS F1C, F1L & F1R
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

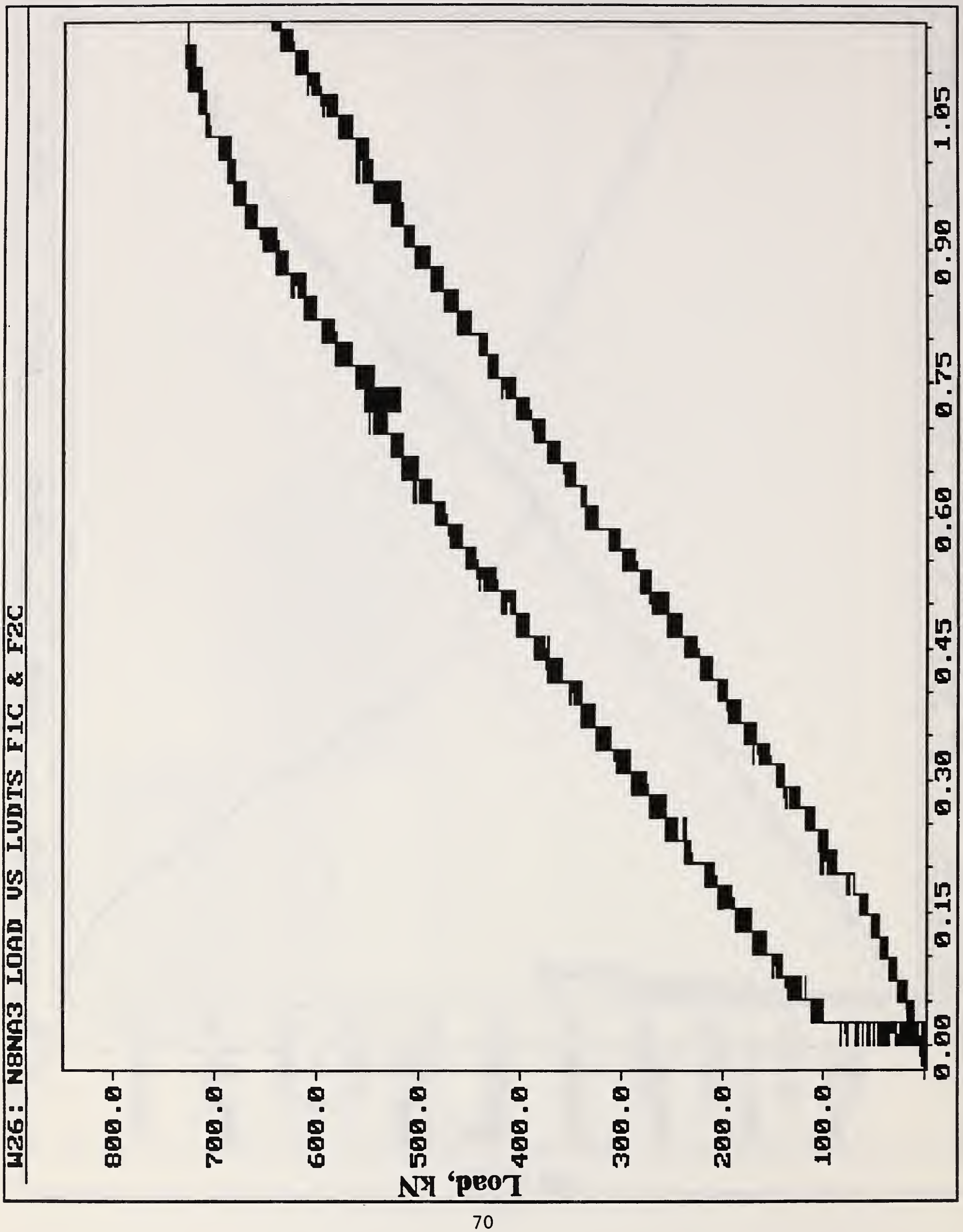


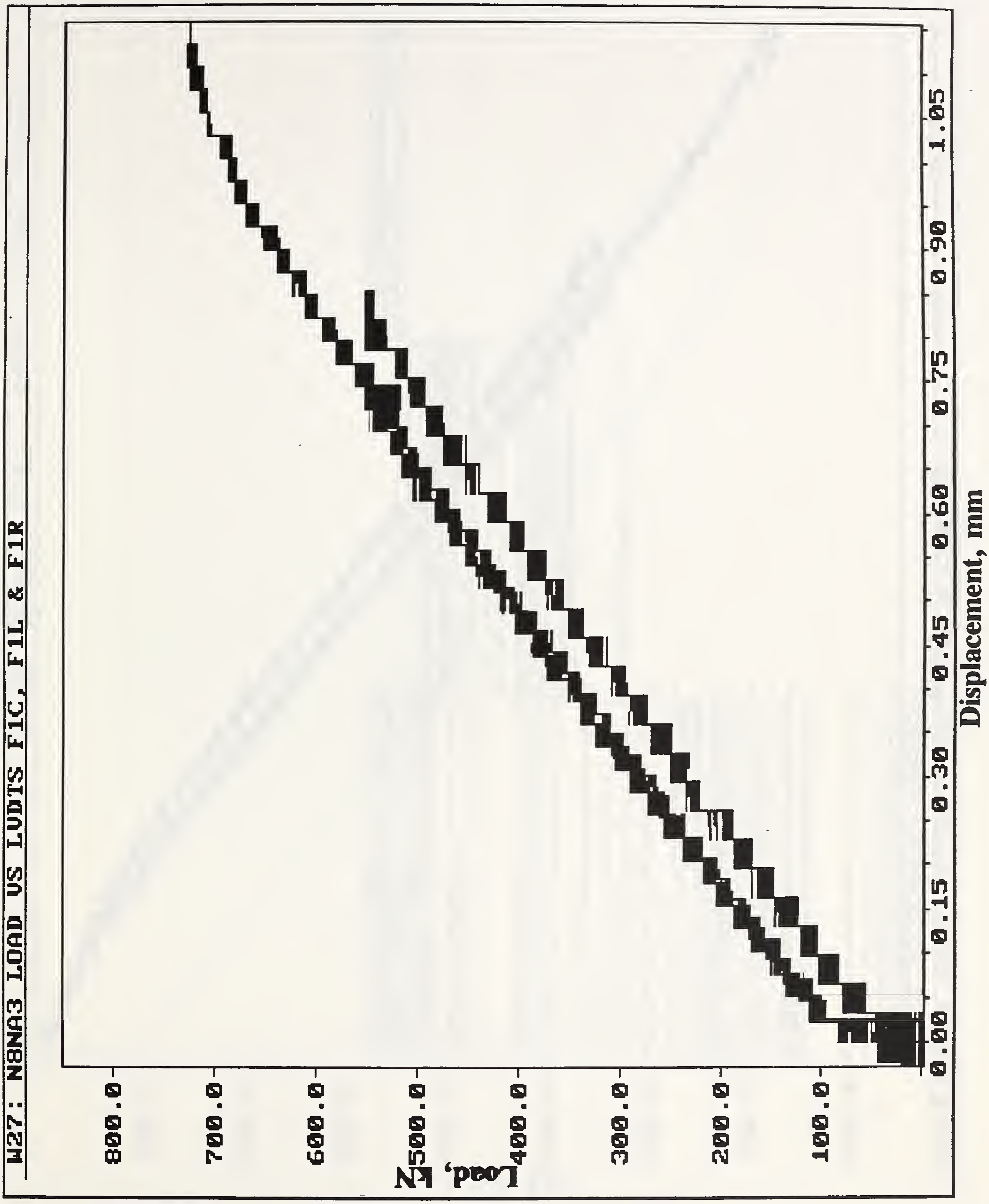
W28: N8NA2 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.25
0.50
0.75
1.00
1.25
1.50
1.75
Displacement, mm


W29: N8NA2 LOAD VS LVDTS F1H & F2H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0000
0.0100
0.0200
0.0300
0.0400
0.0500
0.0600
0.0700
Displacement, mm

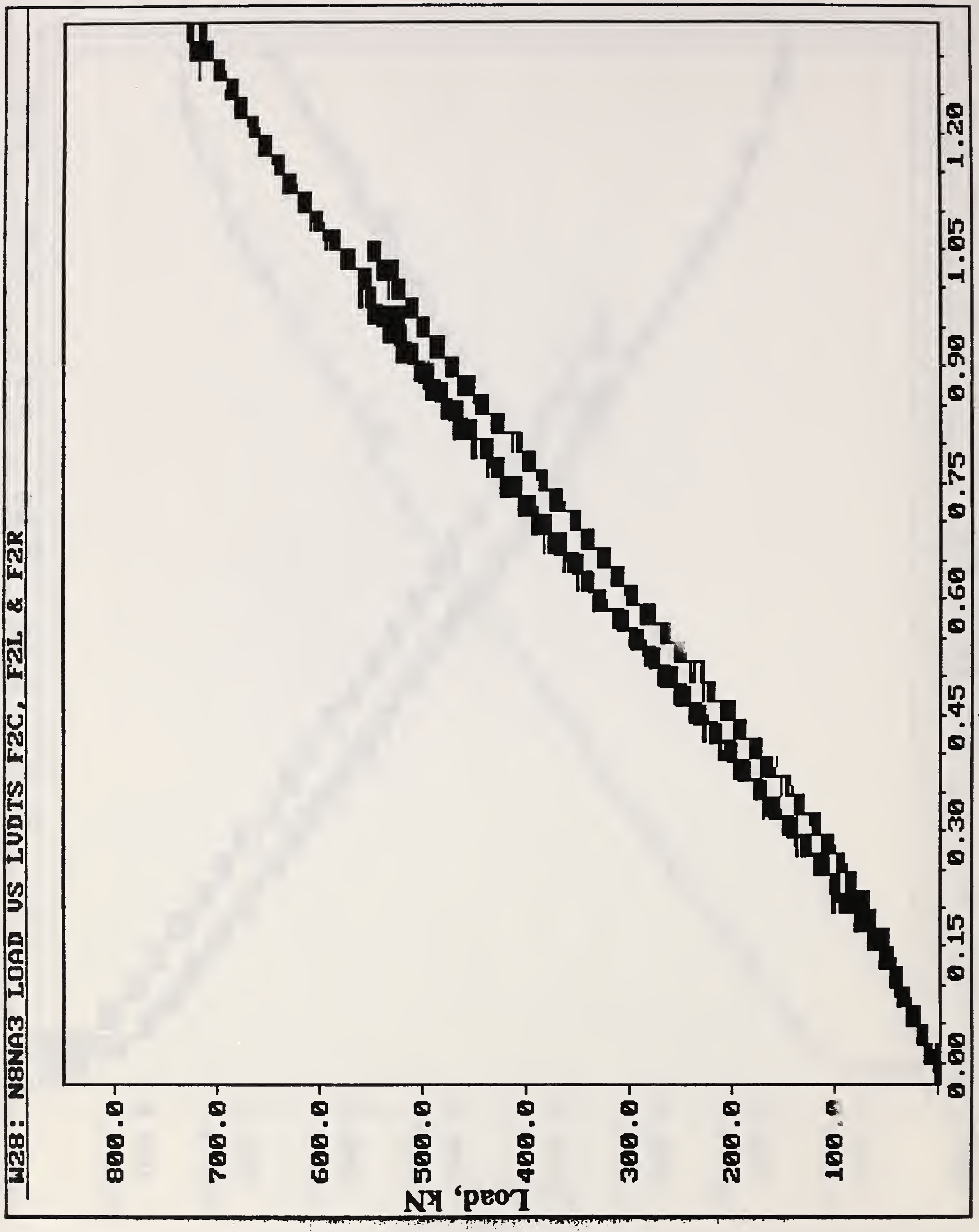

W30: N8NA2 LOAD VS LVDTS F1C & F1H
Load, kN
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
Displacement, mm
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
1.600

W25: N8NA3 LOAD VS TIME
Load, kN
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

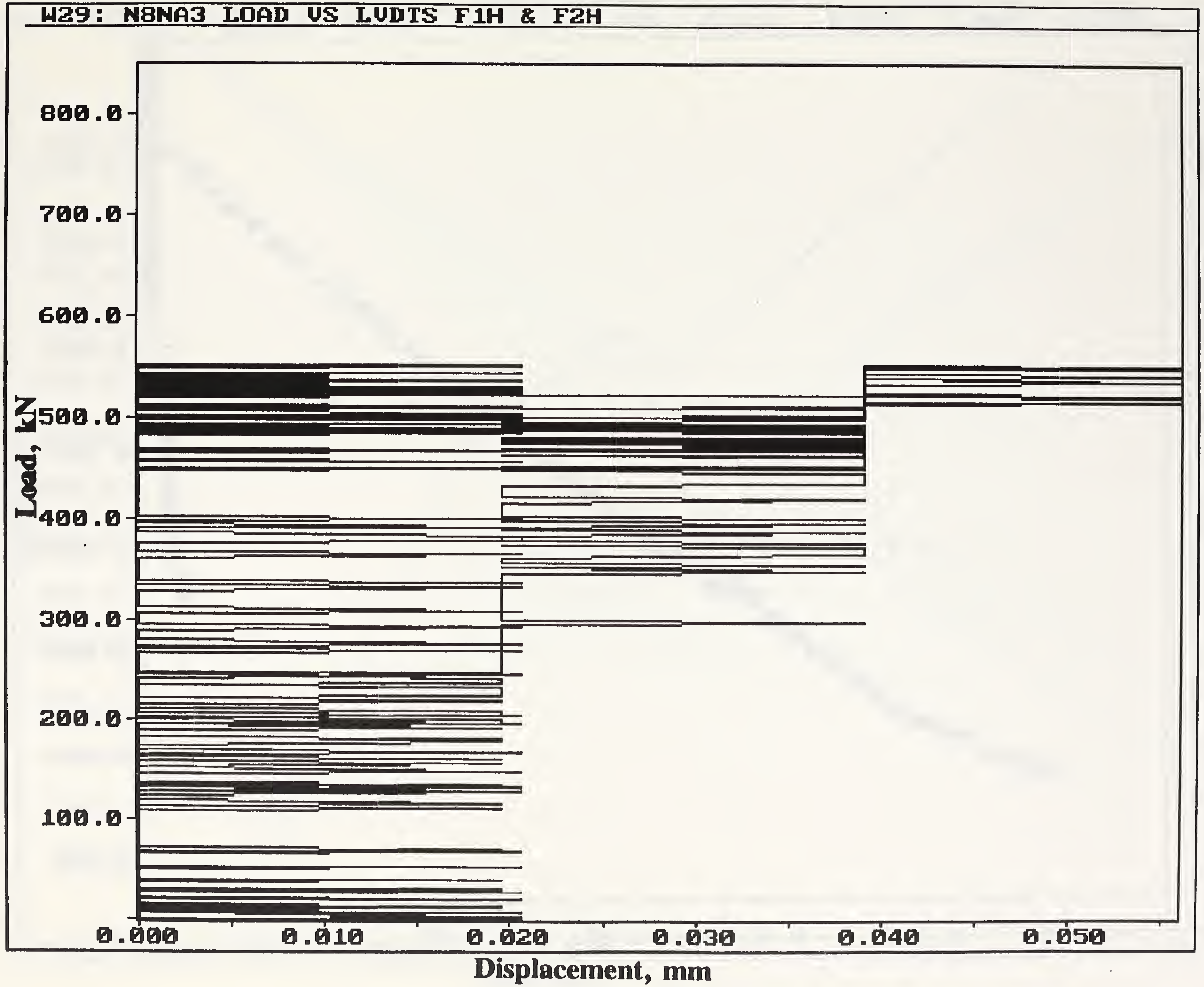

W26: N8NA3 LOAD VS LVDTS F1C & F2C
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05

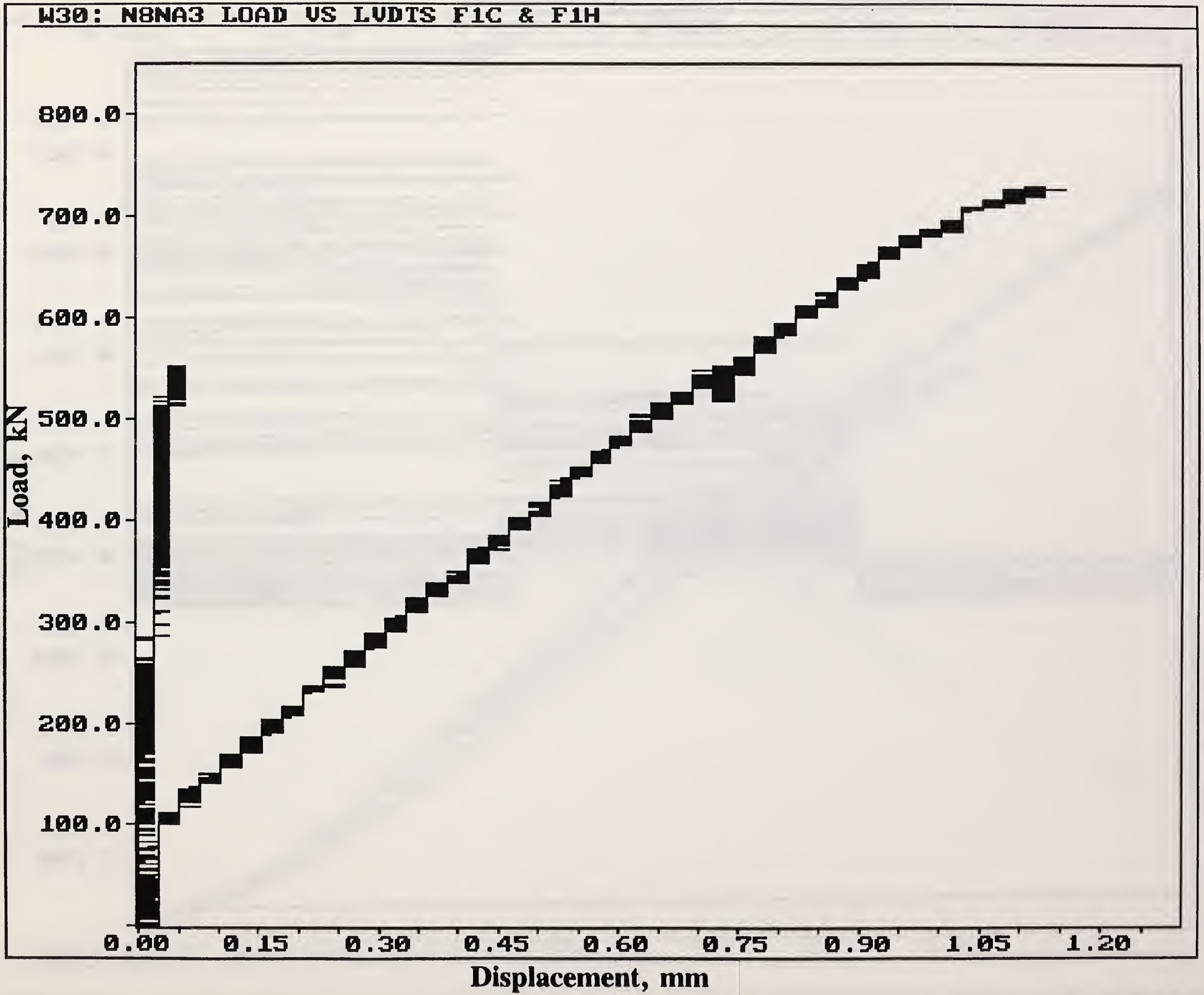


W27: N8NA3 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05

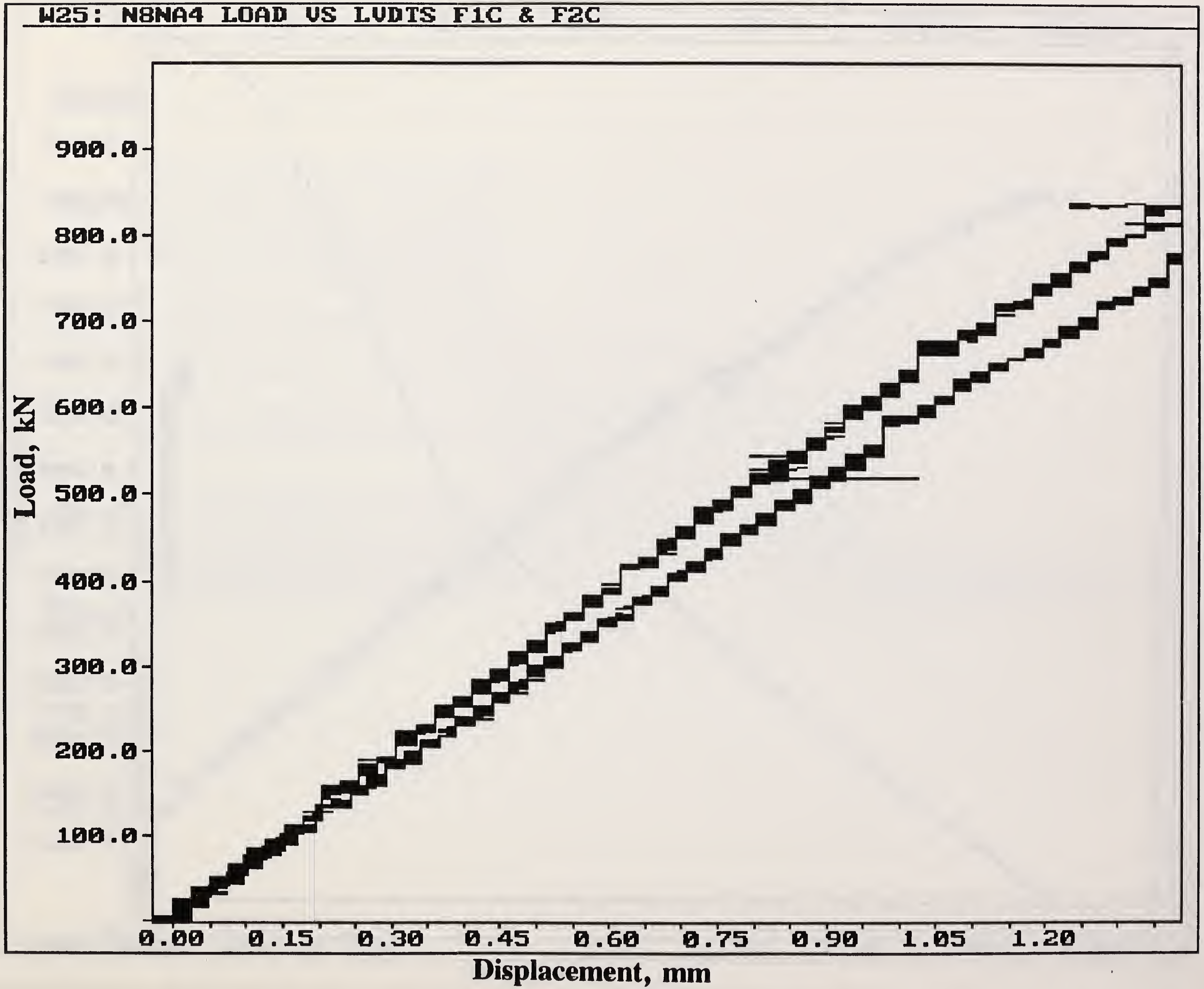


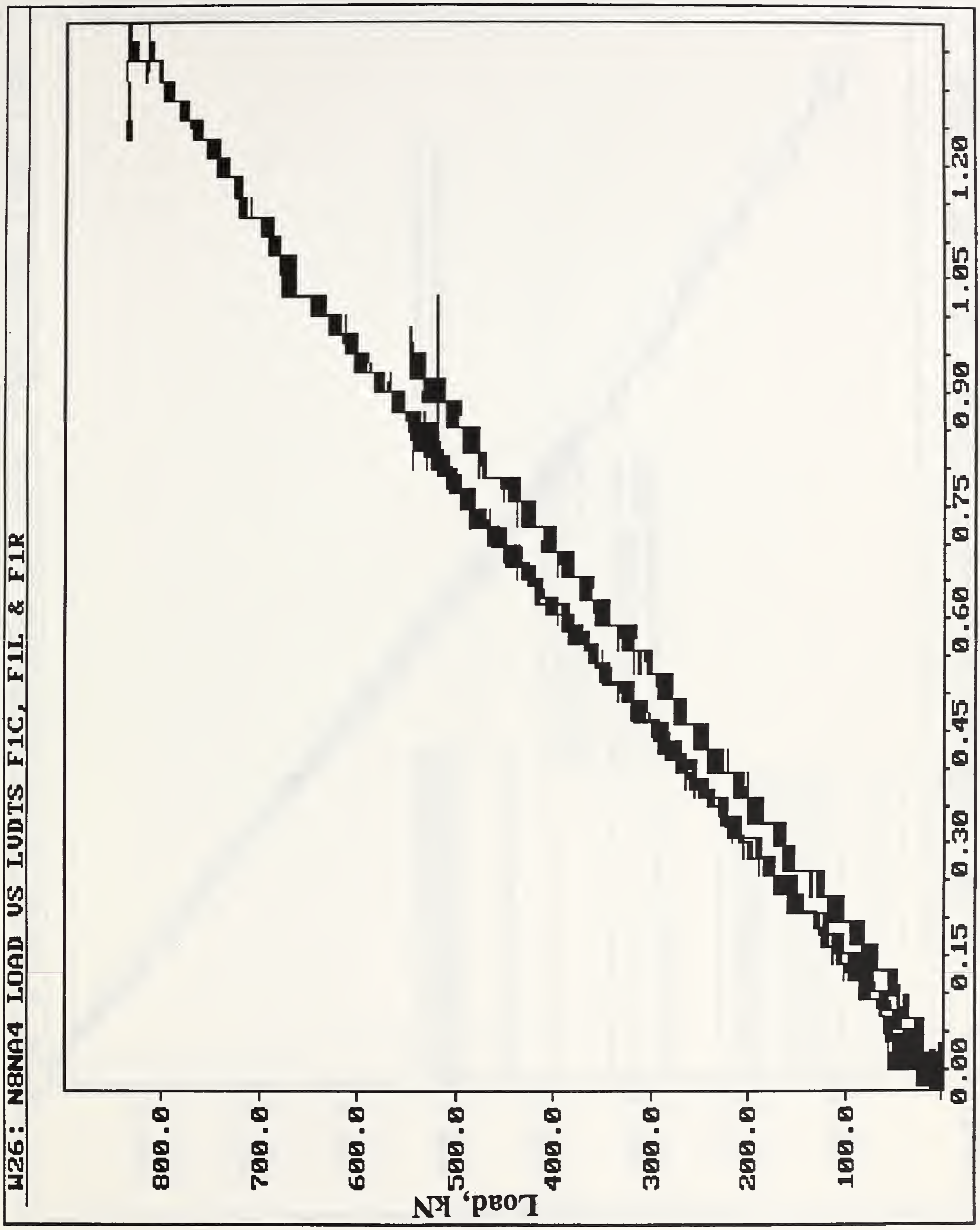
W28: N8NA3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20

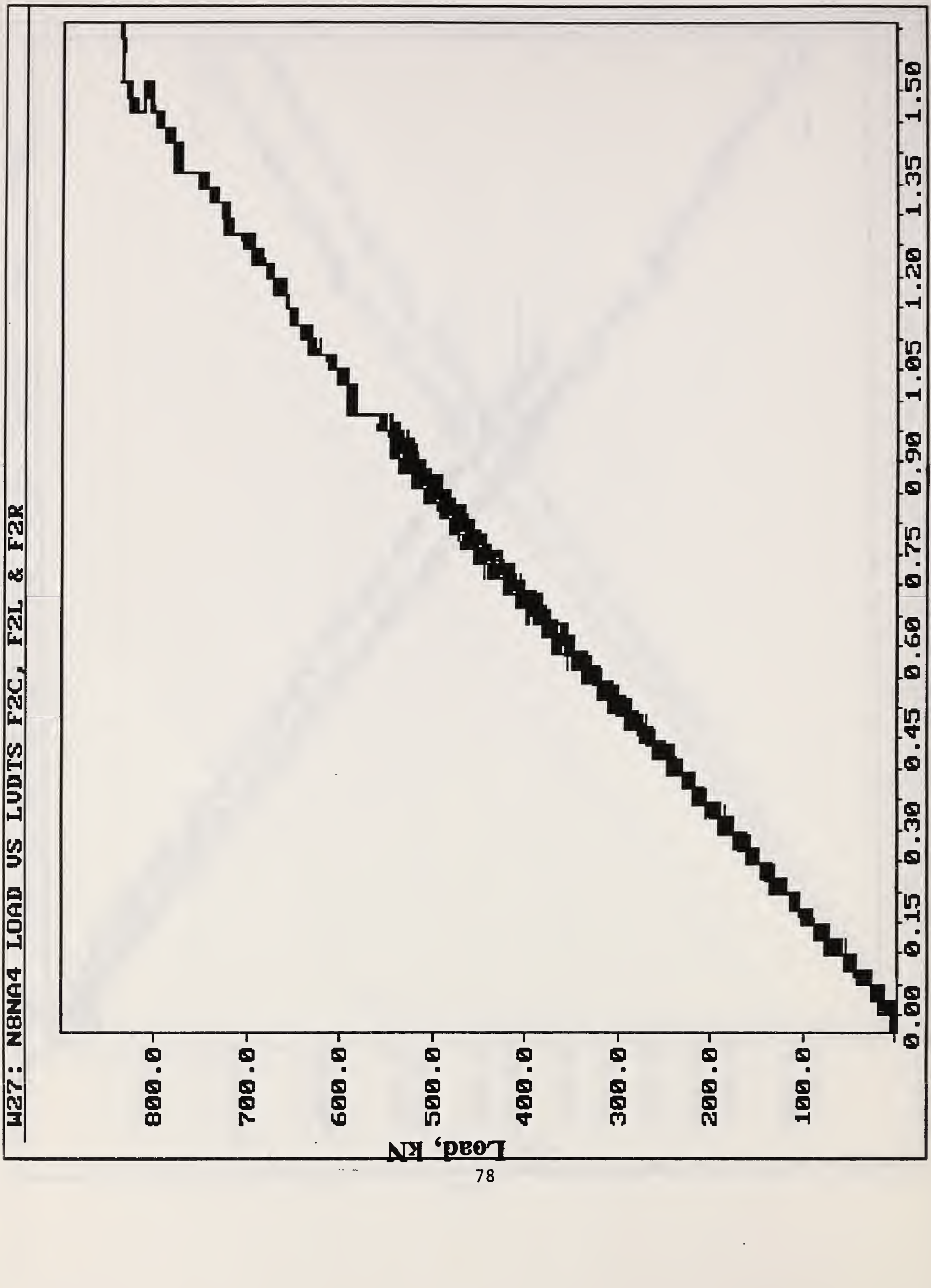

W29: N8NA3 LOAD VS LVDTS F1H & F2H
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.000
0.010
0.020
0.030
0.040
0.050
Displacement, mm

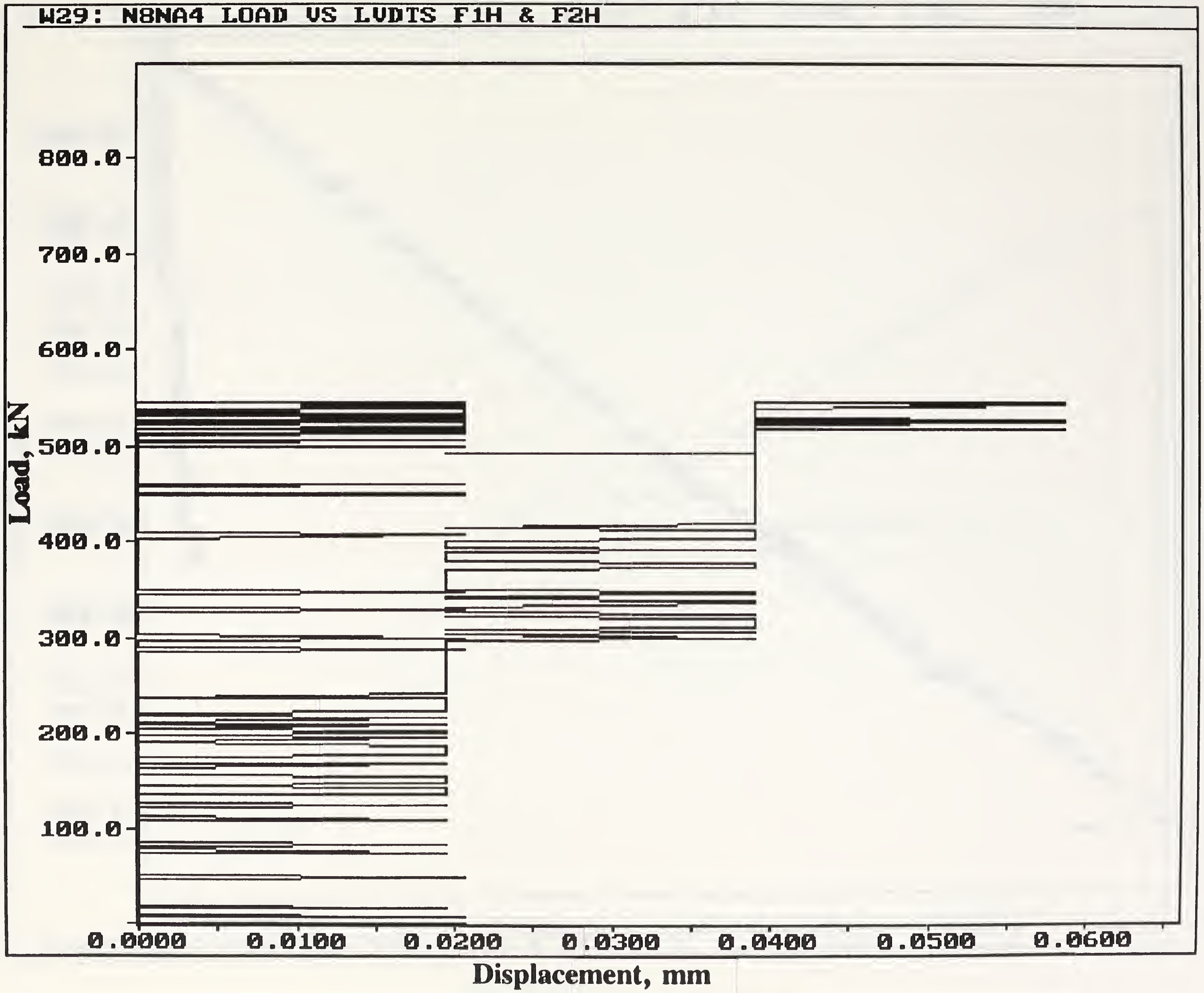

W30: N8NA3 LOAD VS LVDTS F1C & F1H
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

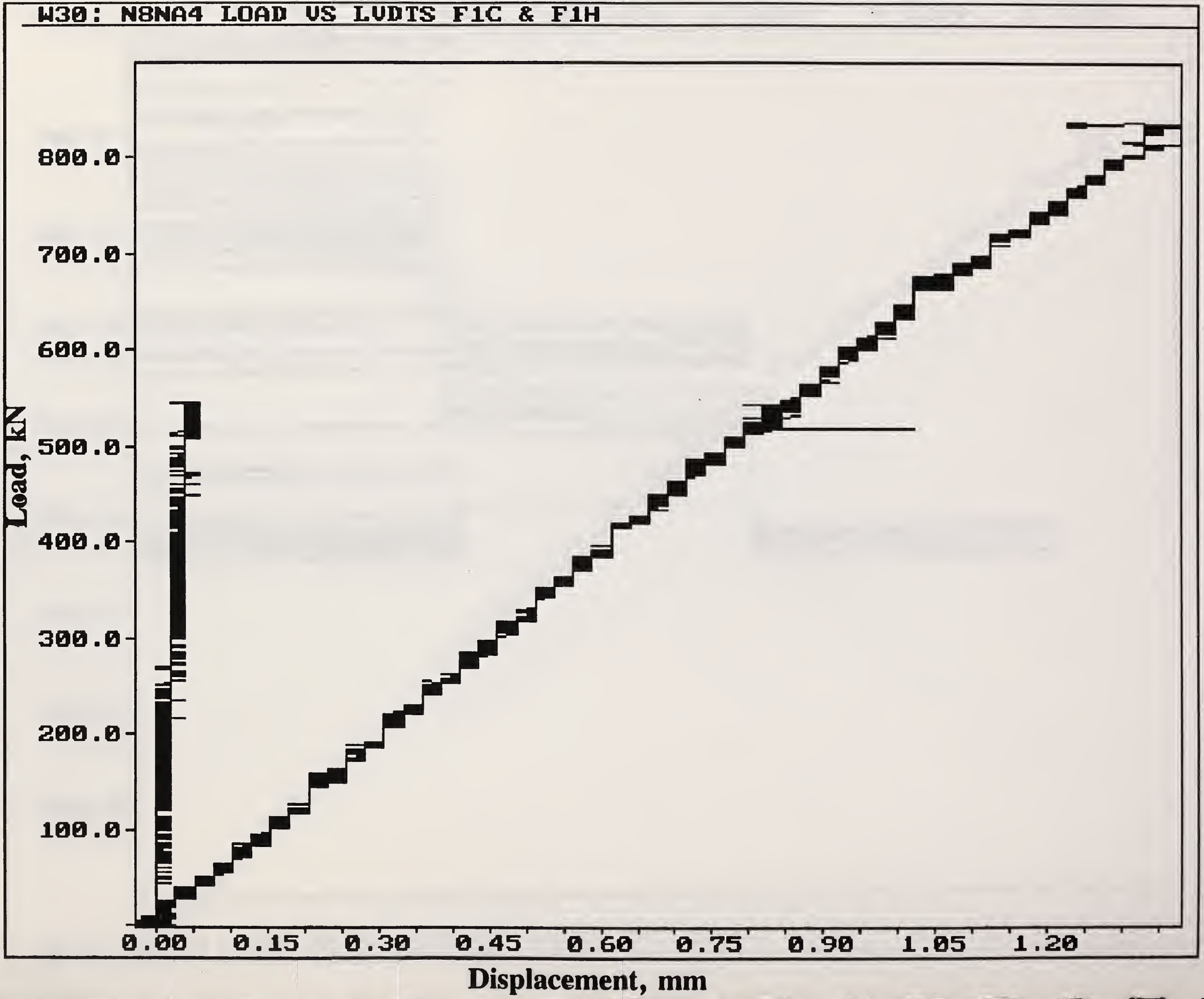

W24: N8NA4 LOAD VS TIME
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec


W25: N8NA4 LOAD VS LVDTS F1C & F2C
Load, kN
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

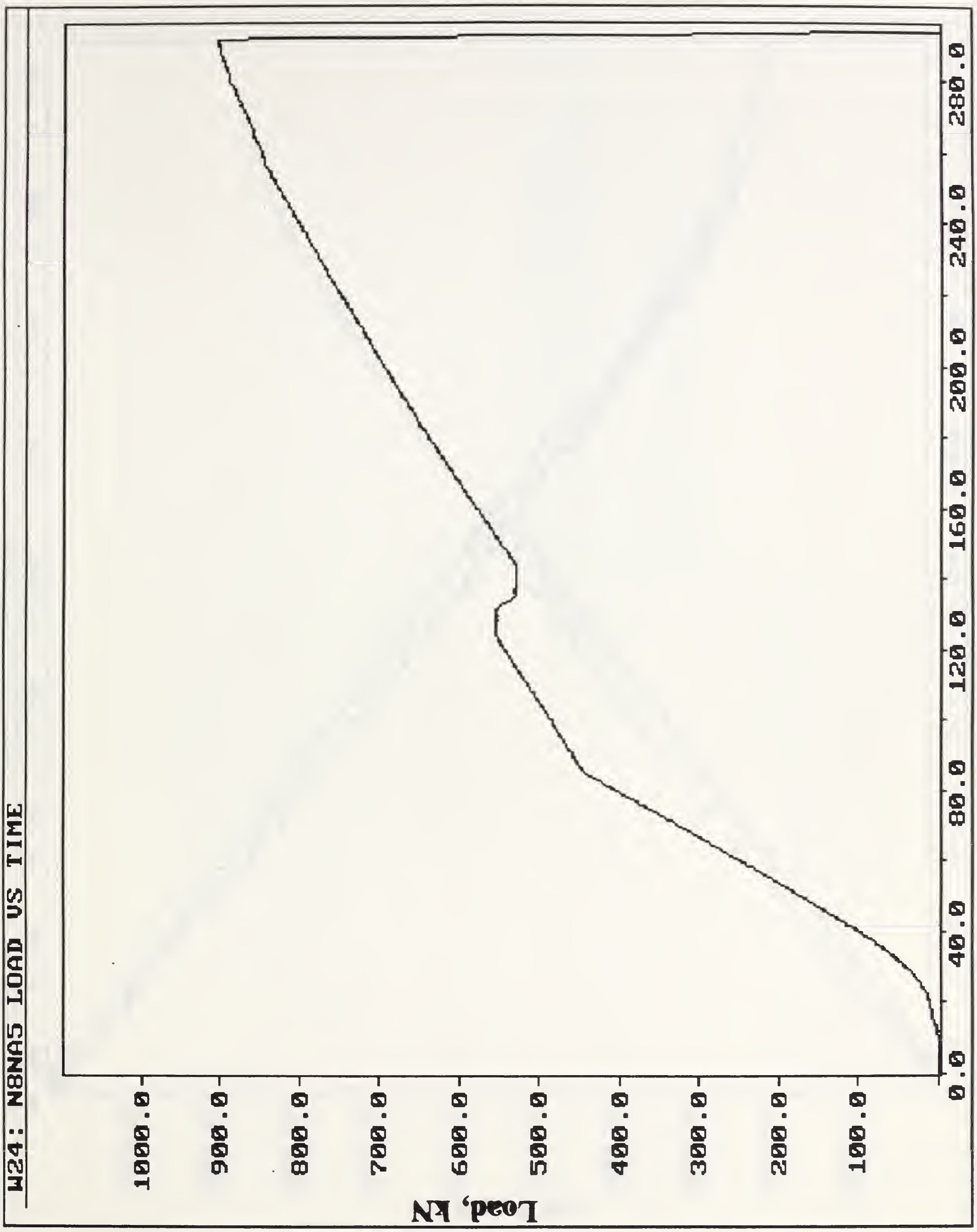

W26: N8NA4 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20


W27: N8NA4 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
1.35
1.50
Displacement, mm

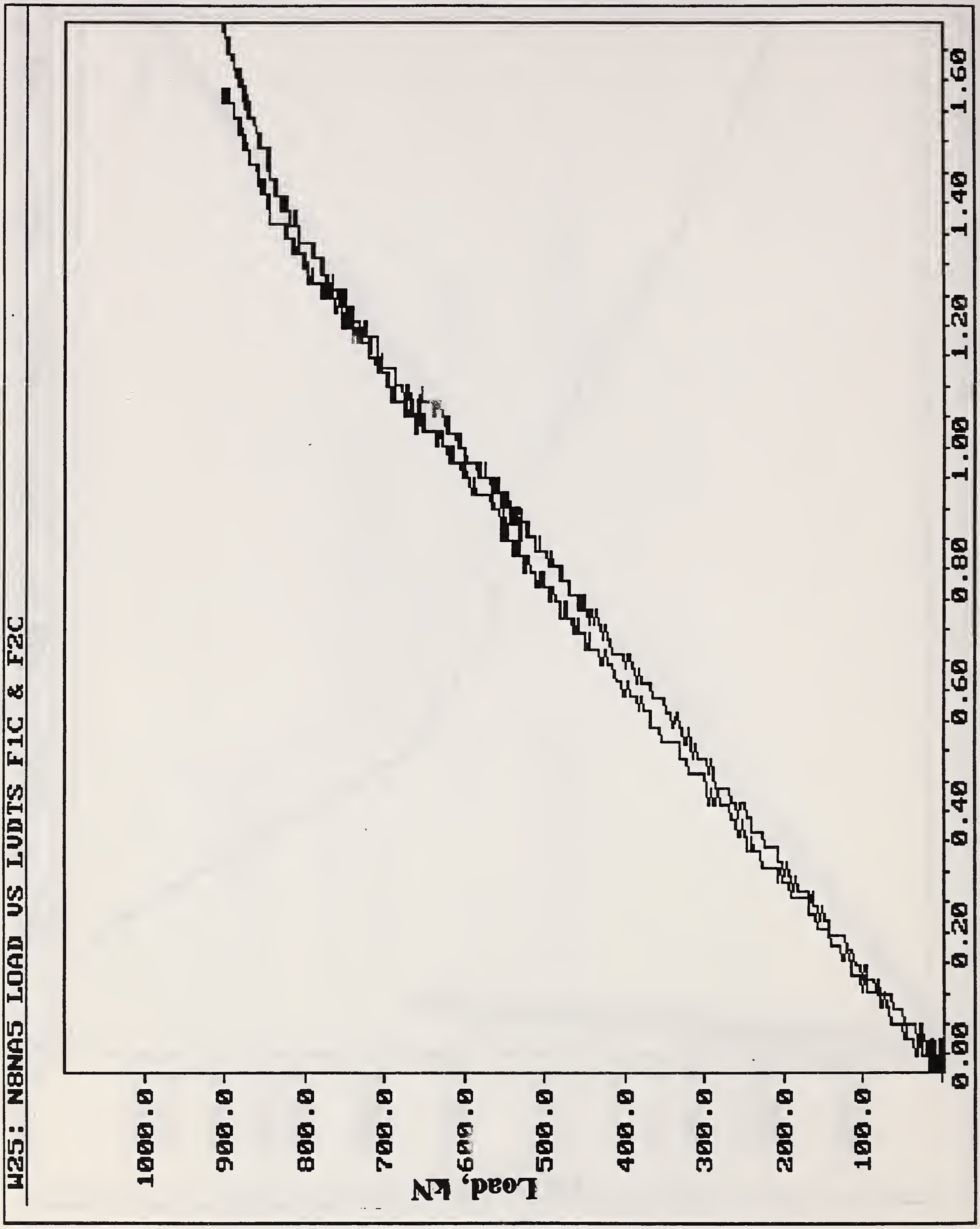

W29: N8NA4 LOAD VS LVDTS F1H & F2H
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0000
0.0100
0.0200
0.0300
0.0400
0.0500
0.0600
Displacement, mm

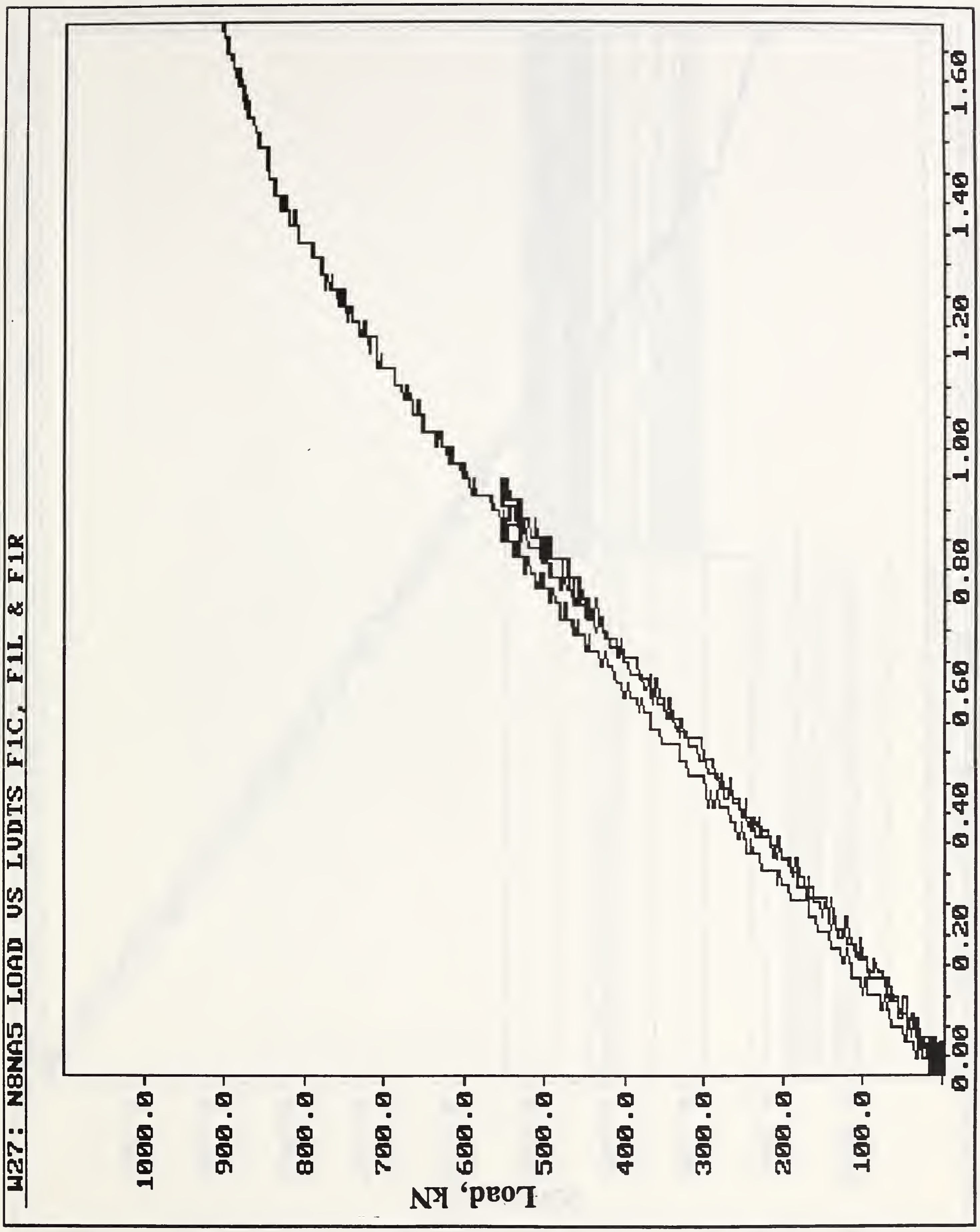


W30: N8NA4 LOAD VS LVDTS F1C & F1H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

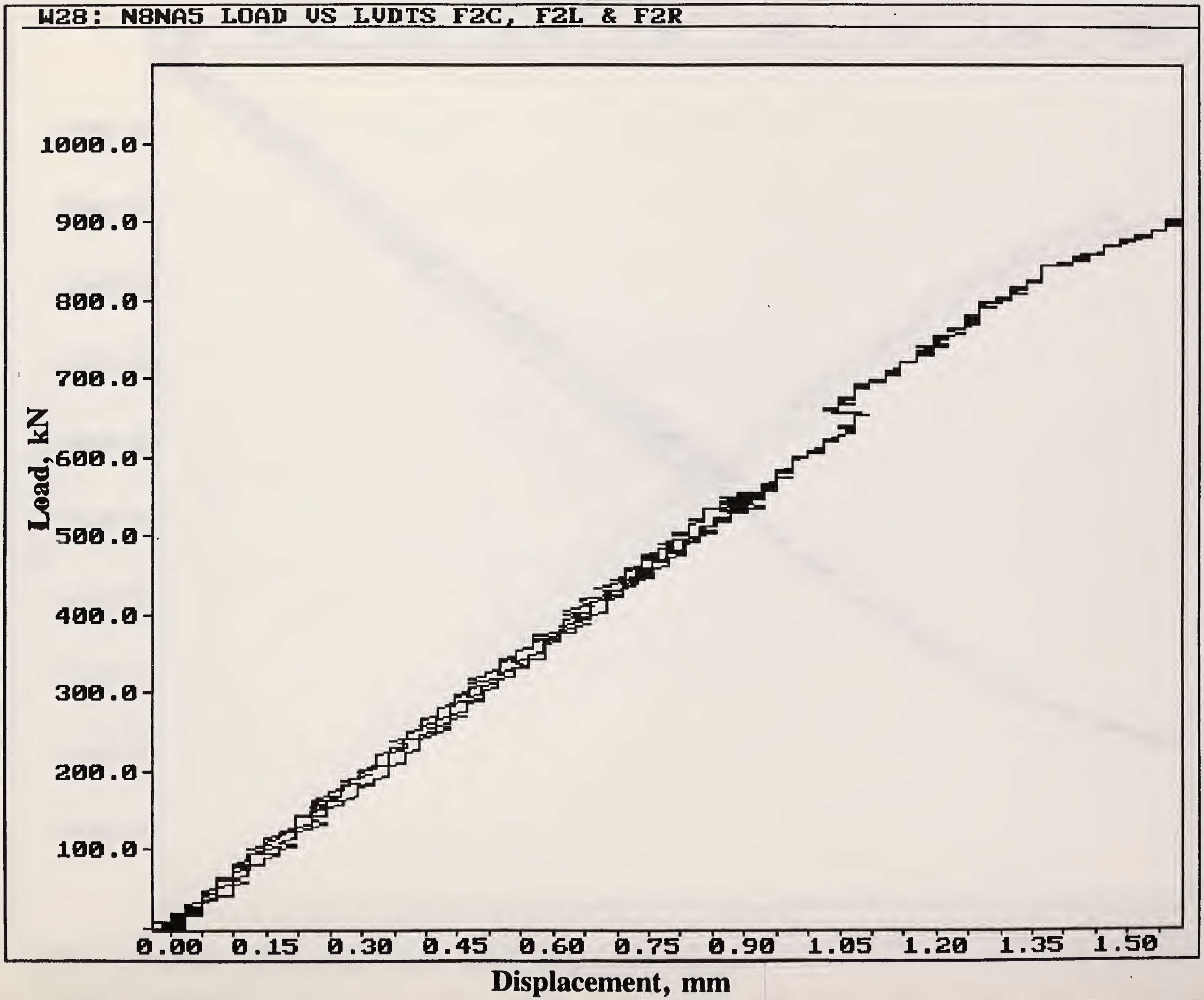


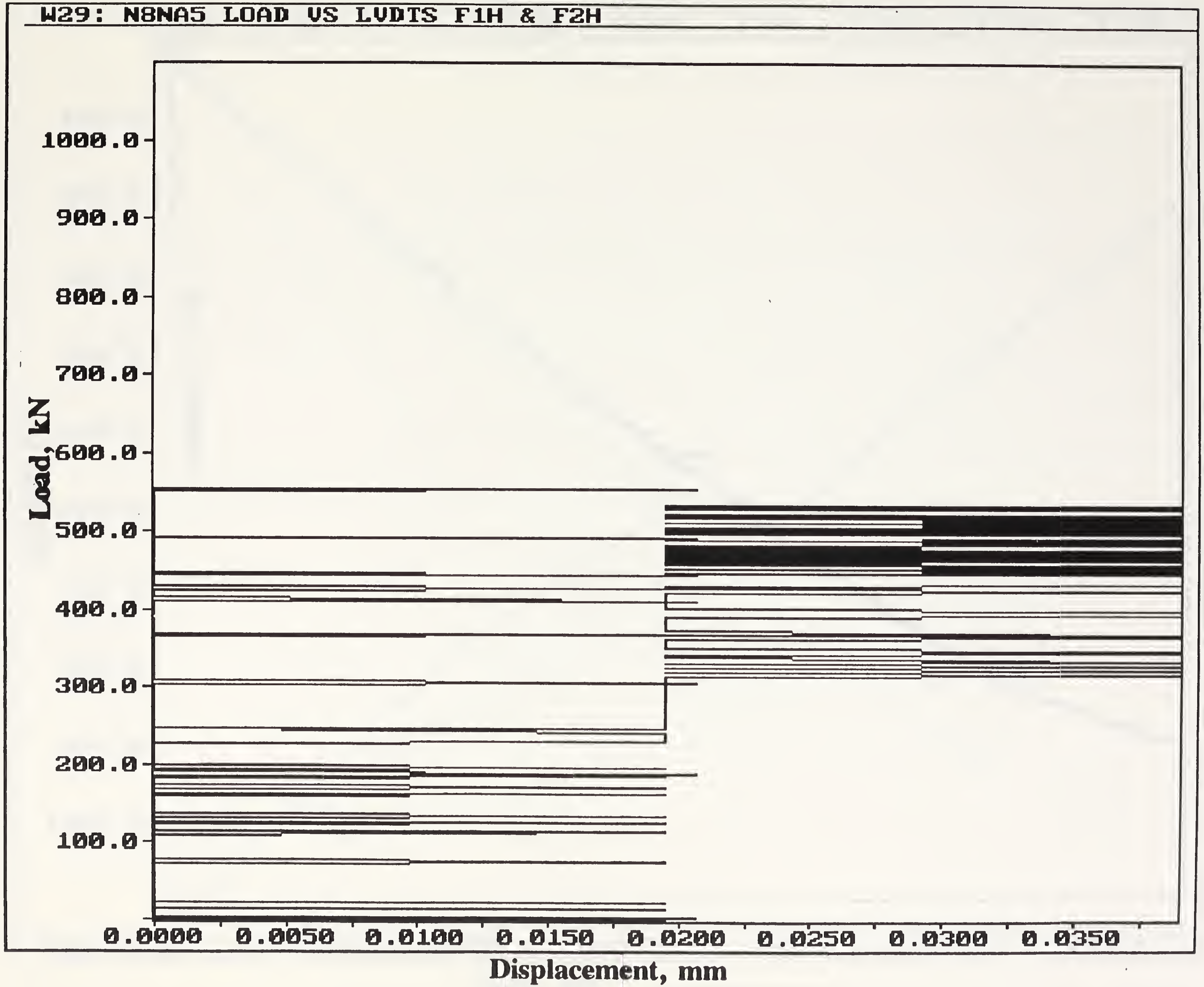
W24: N8NA5 LOAD VS TIME
Load, kN
Time, sec
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
280.0

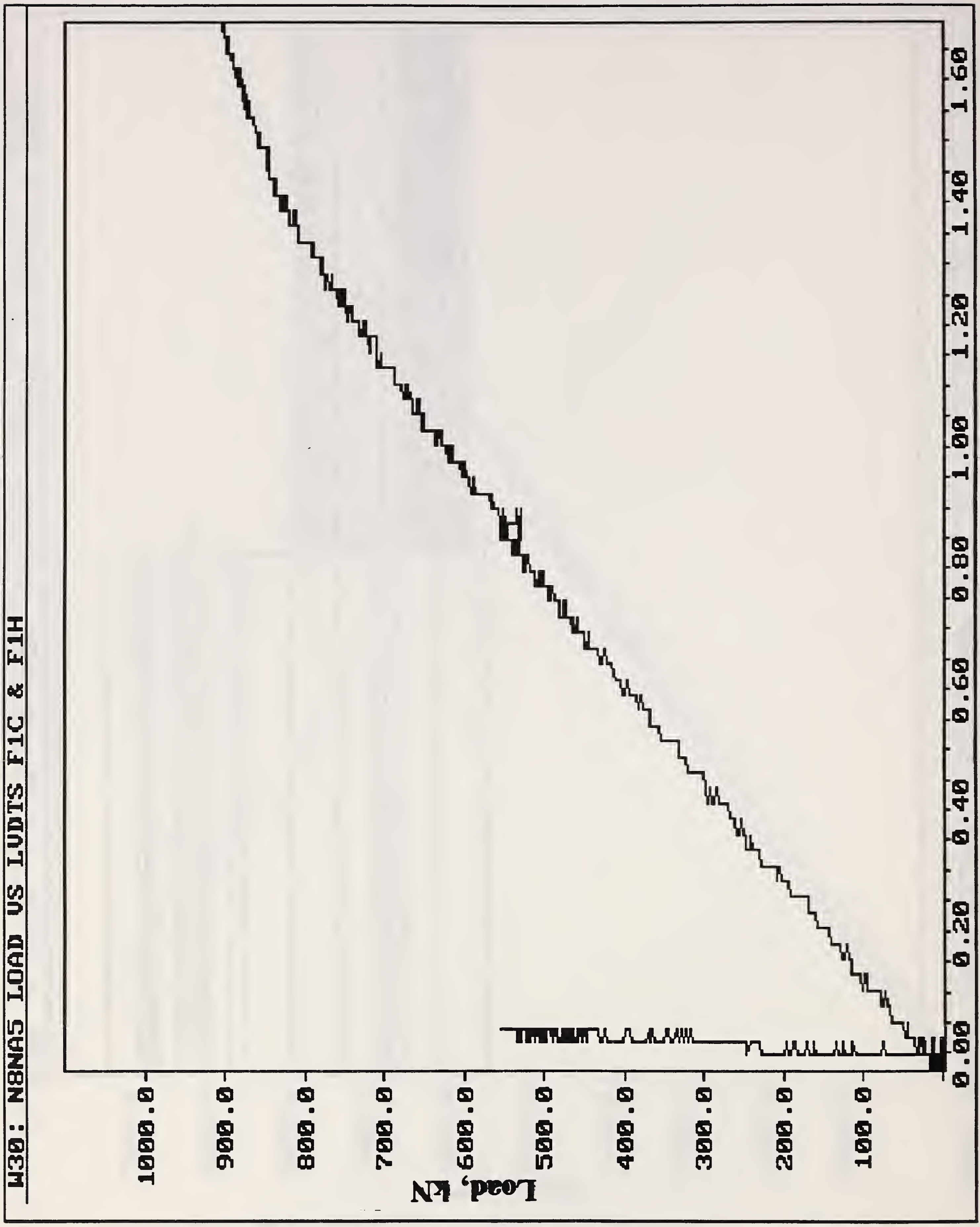

W25: N8NAS LOAD VS LVDTS F1C & F2C
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60



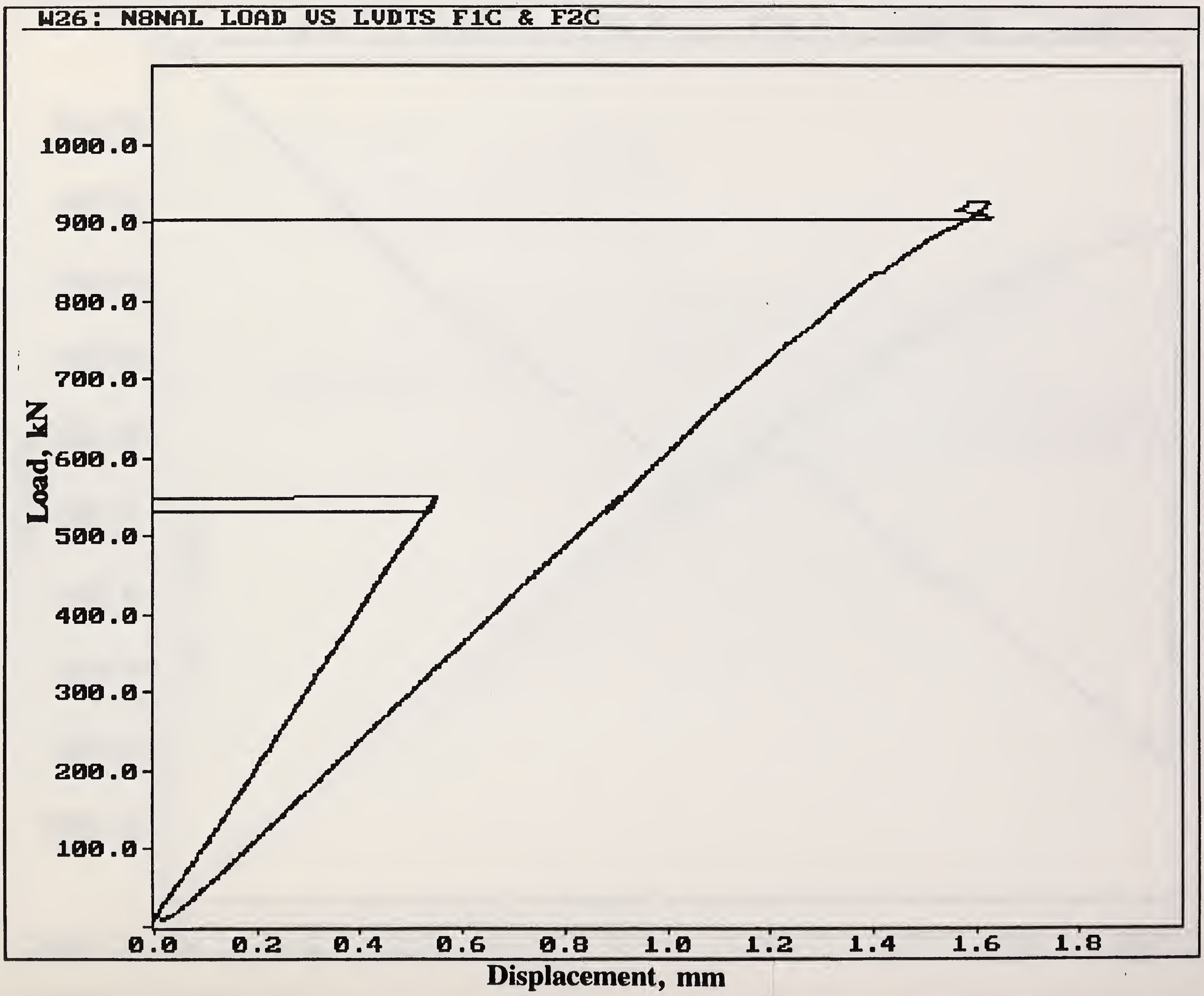
W27: N8NA5 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
Displacement, mm

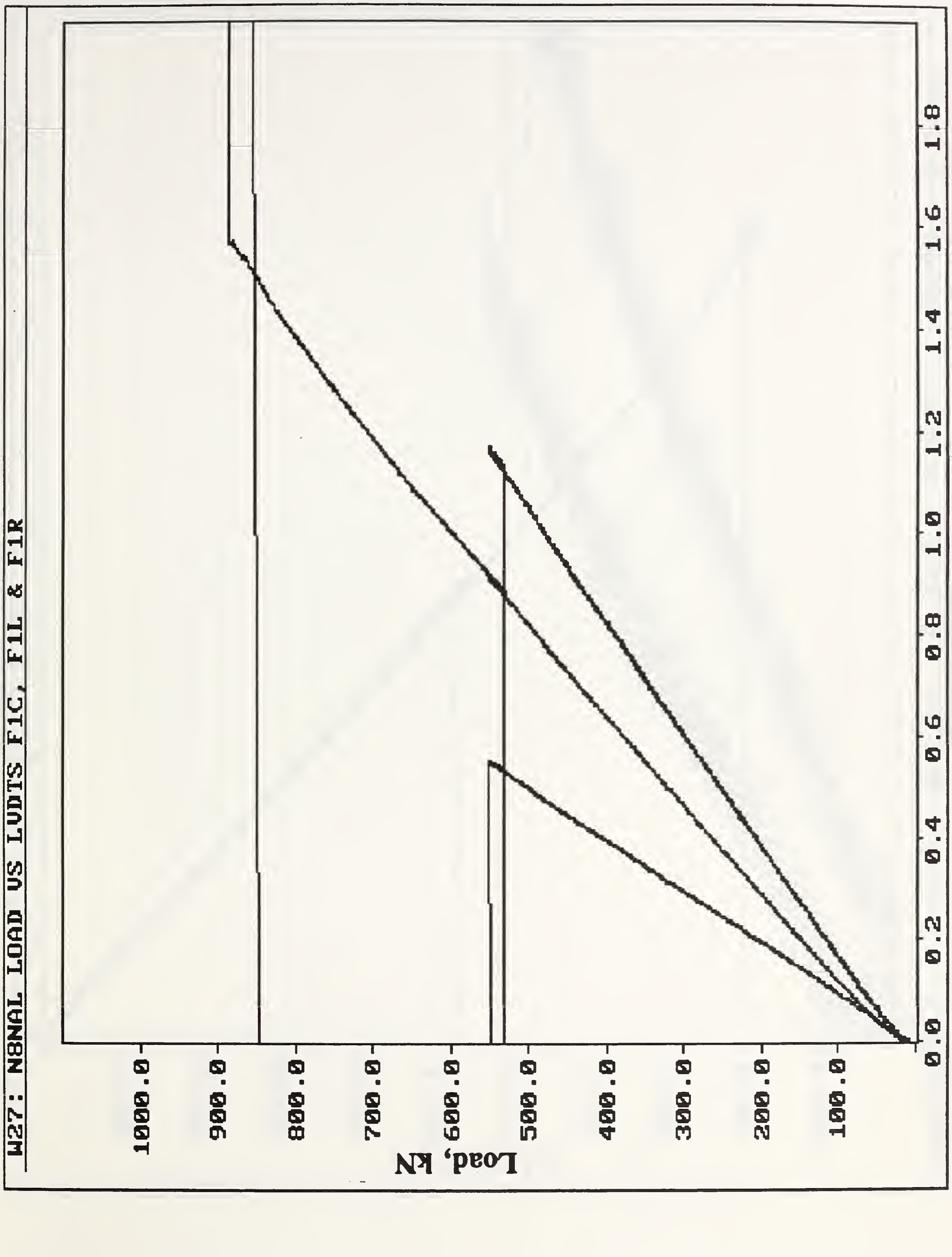

W28: N8NA5 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
1.35
1.50
Displacement, mm

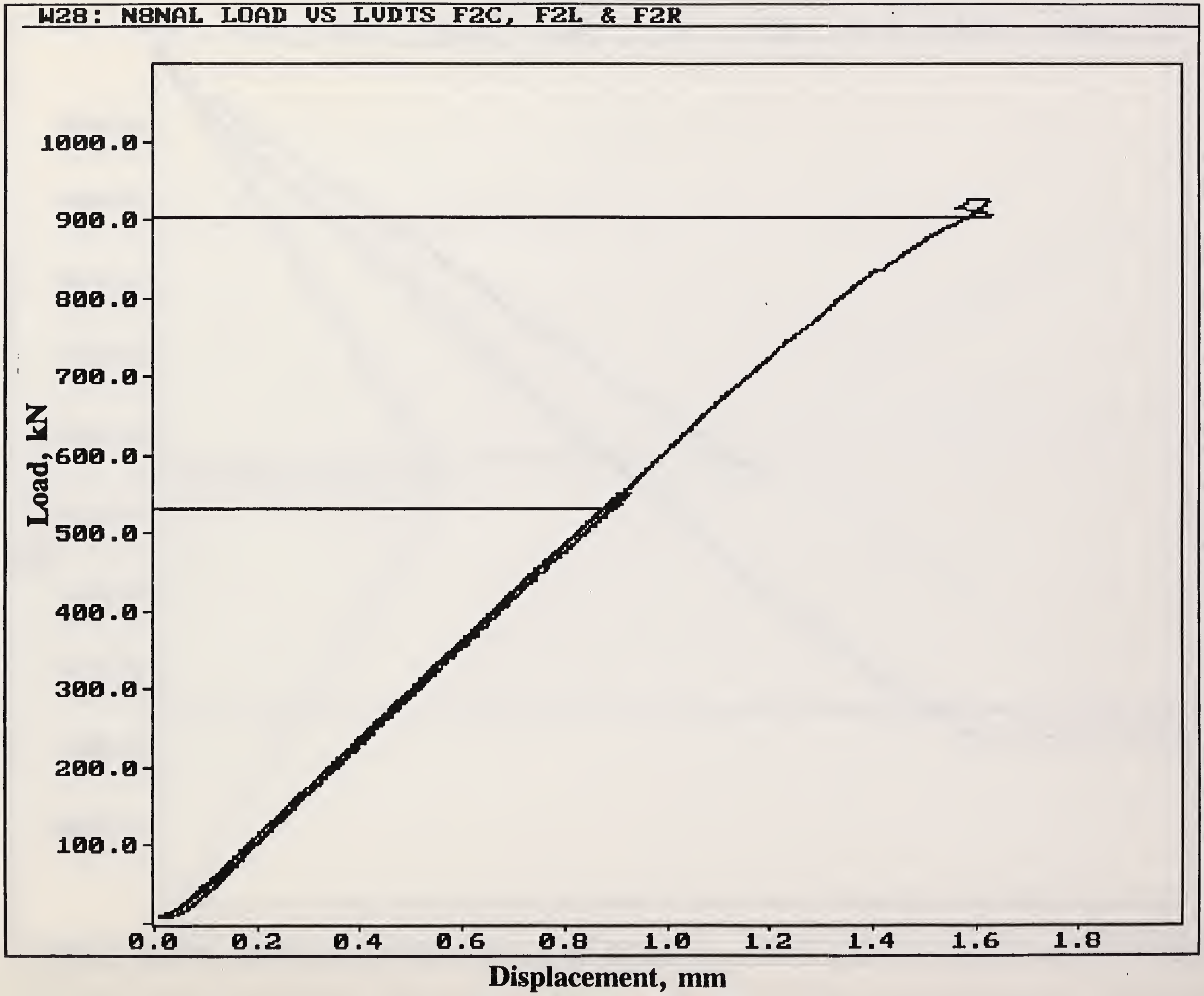

W29: N8NA5 LOAD VS LVDTS F1H & F2H
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Displacement, mm

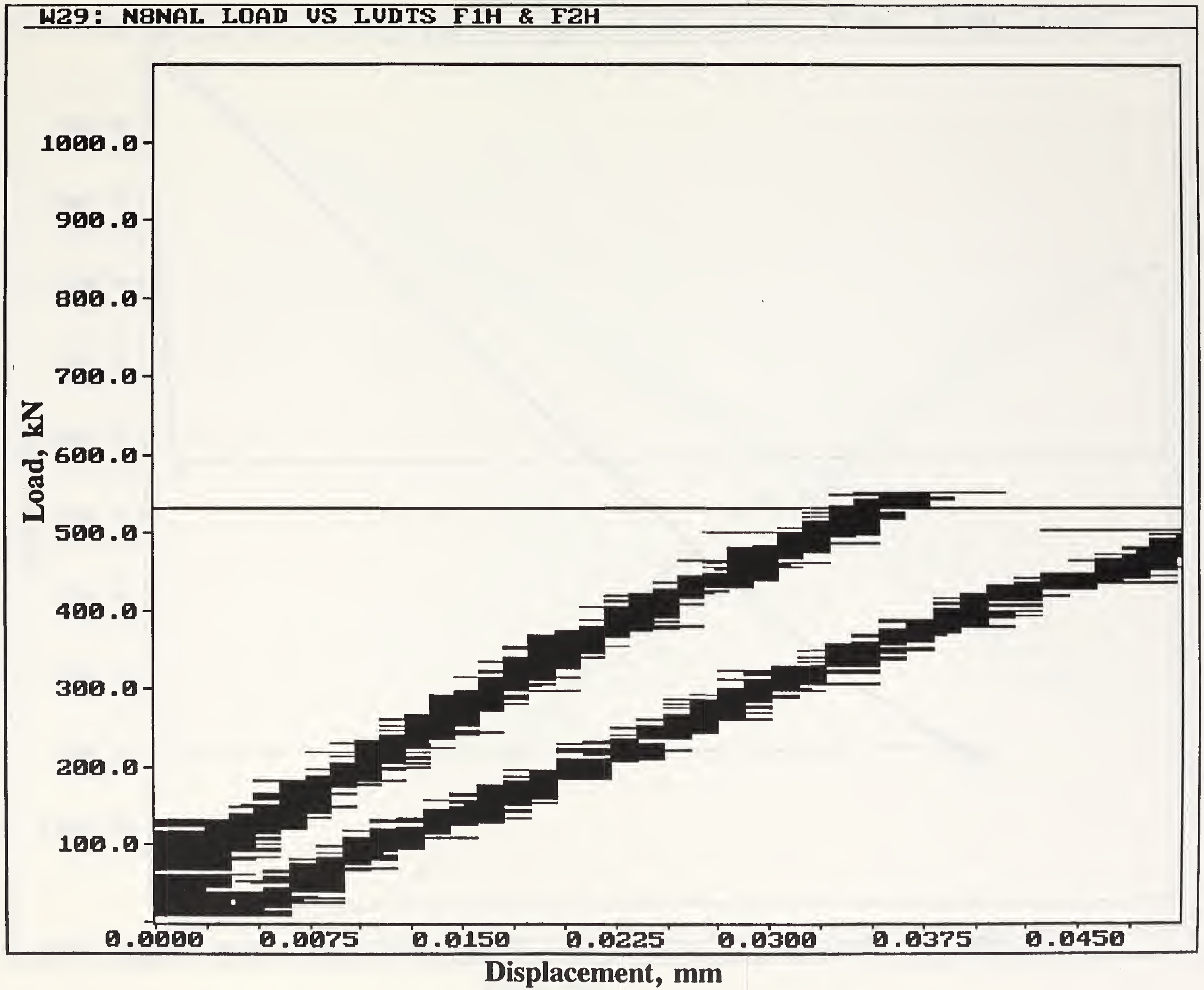

W30: N8NA5 LOAD VS LVDTS F1C & F1H
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60

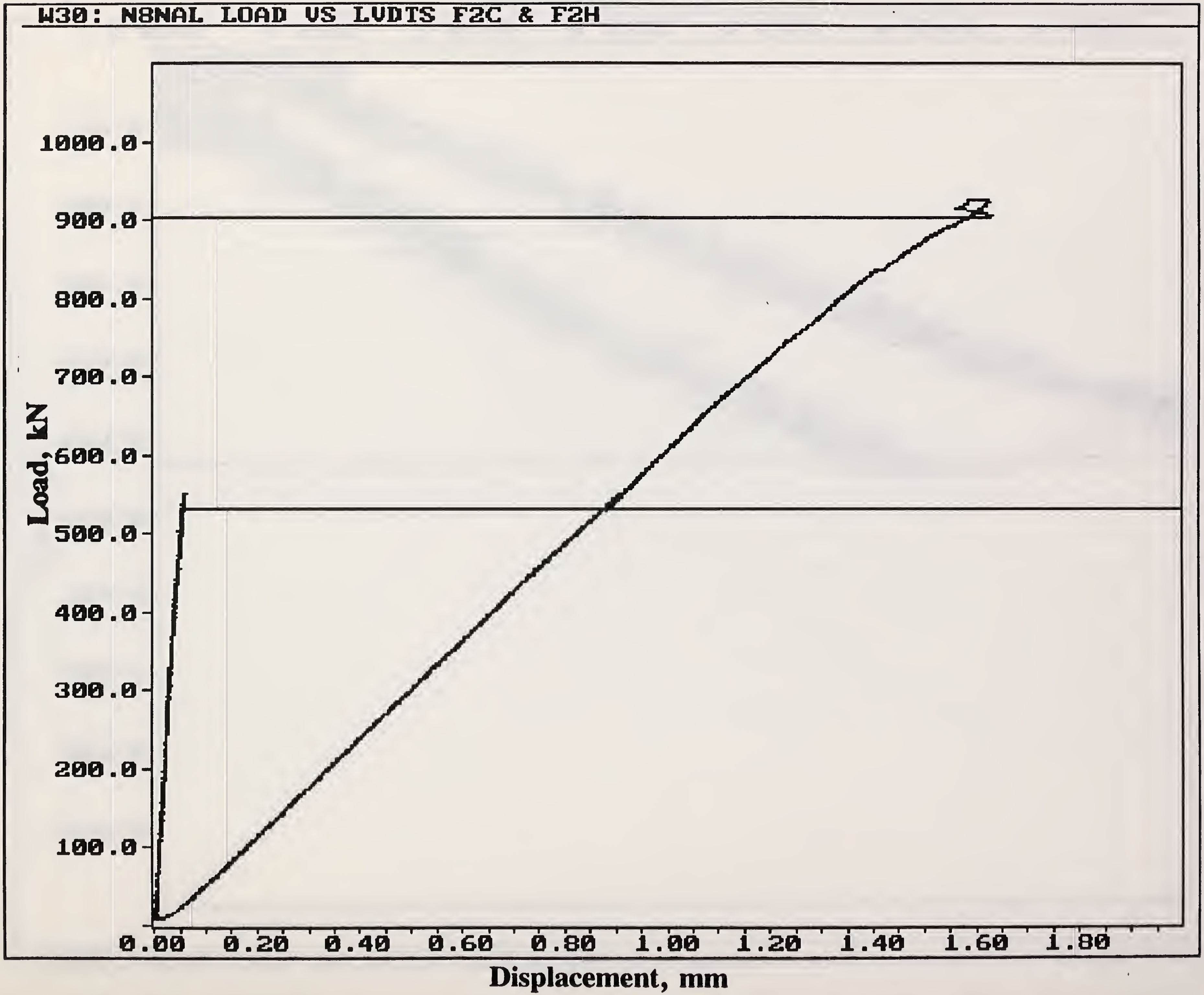
W25: N8NAL LOAD VS TIME
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

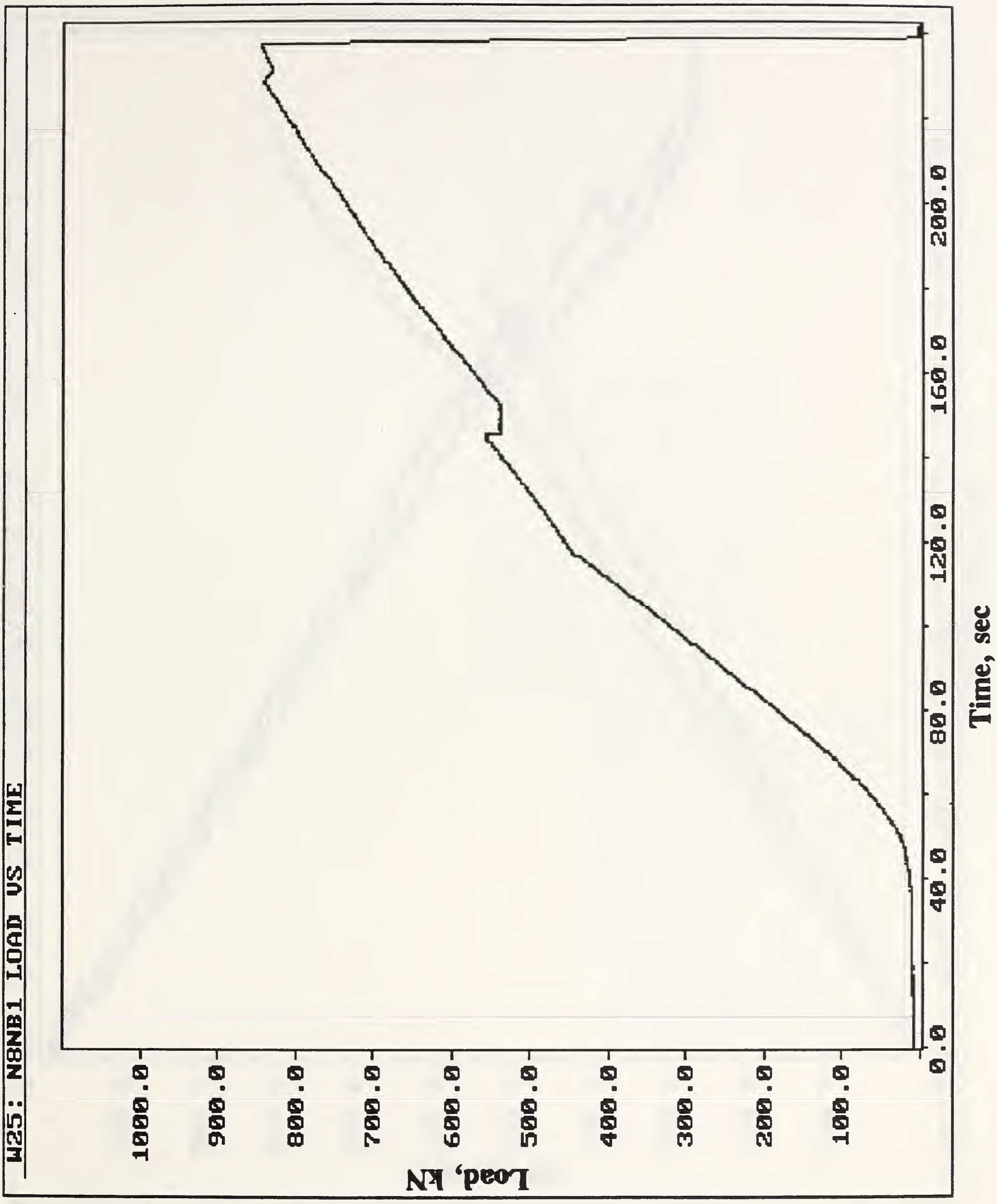

W26: N8NAL LOAD VS LVDTS F1C & F2C
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

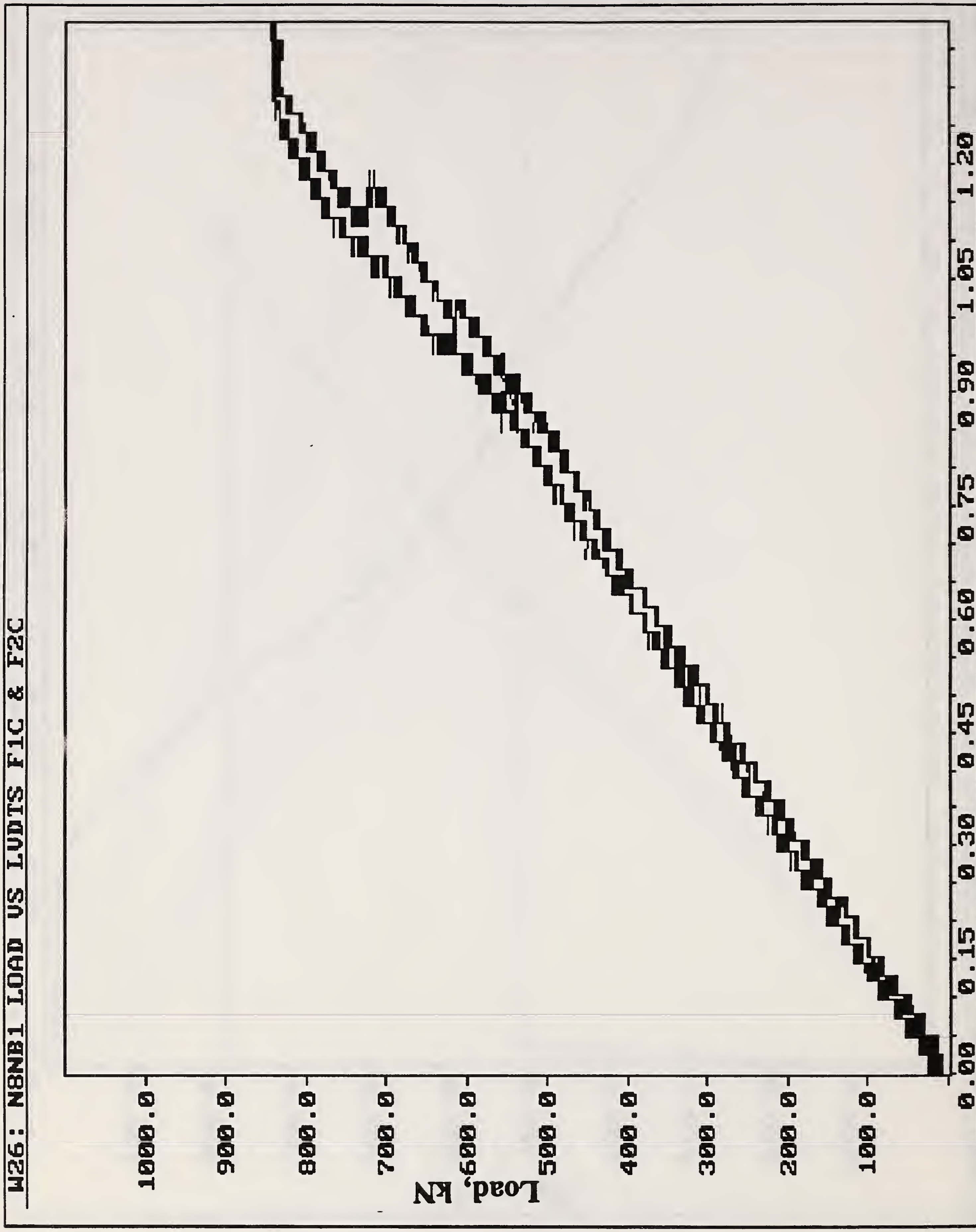

W27: N8NAL LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

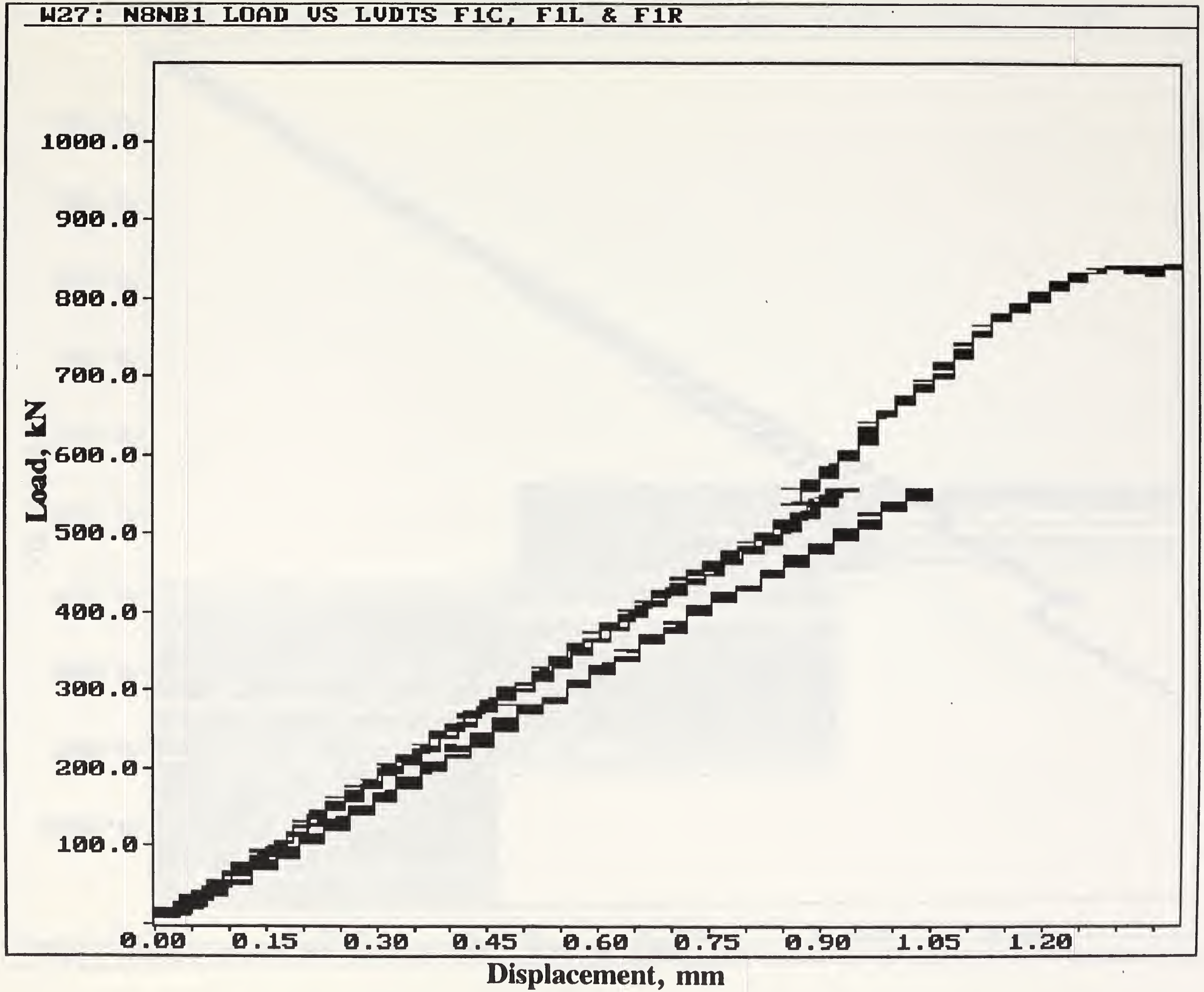

W28: N8NAL LOAD VS LVDTS F2C, F2L & F2R
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

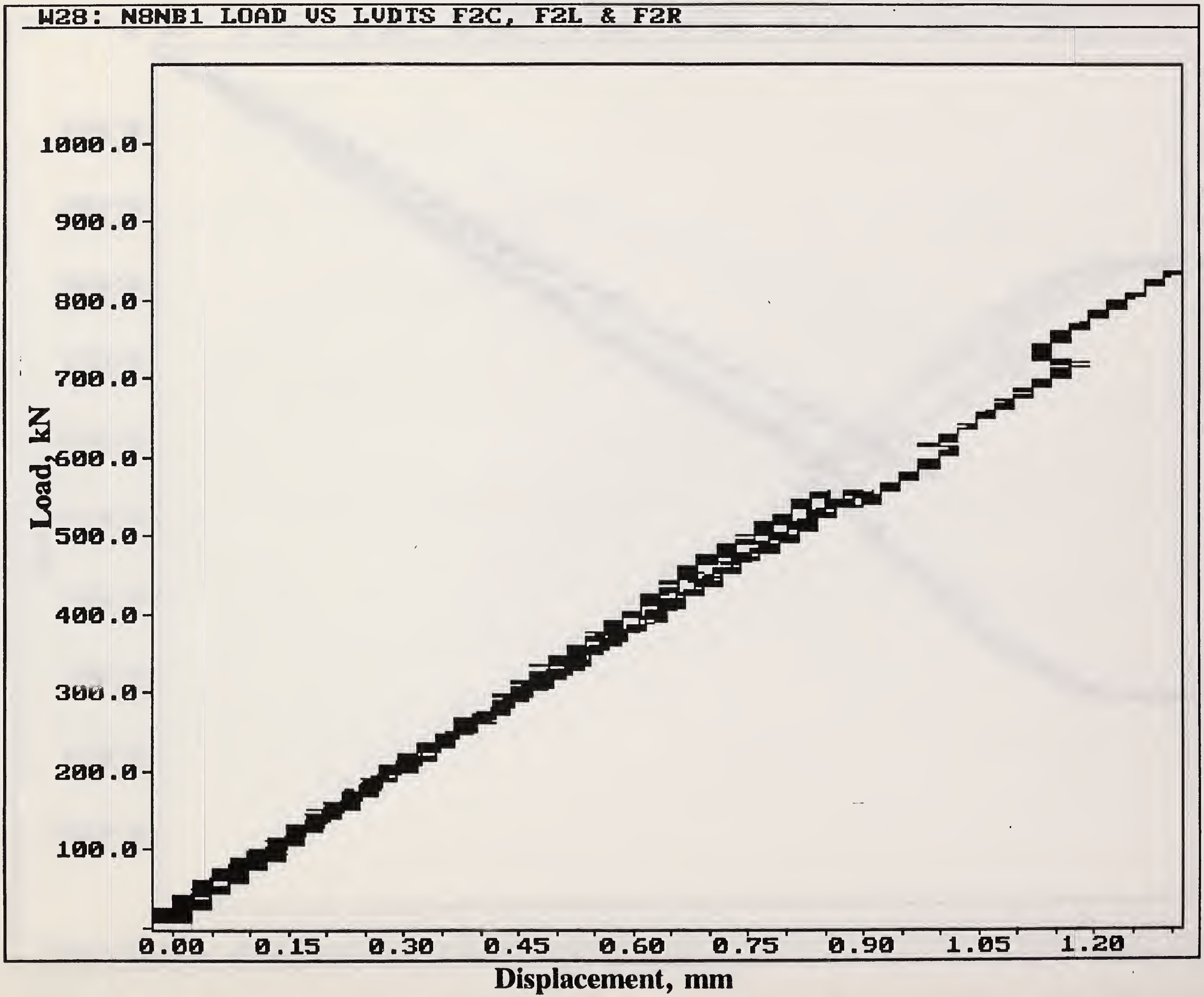

W29: N8NAL LOAD VS LVDTS F1H & F2H
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0000
0.0075
0.0150
0.0225
0.0300
0.0375
0.0450
Displacement, mm

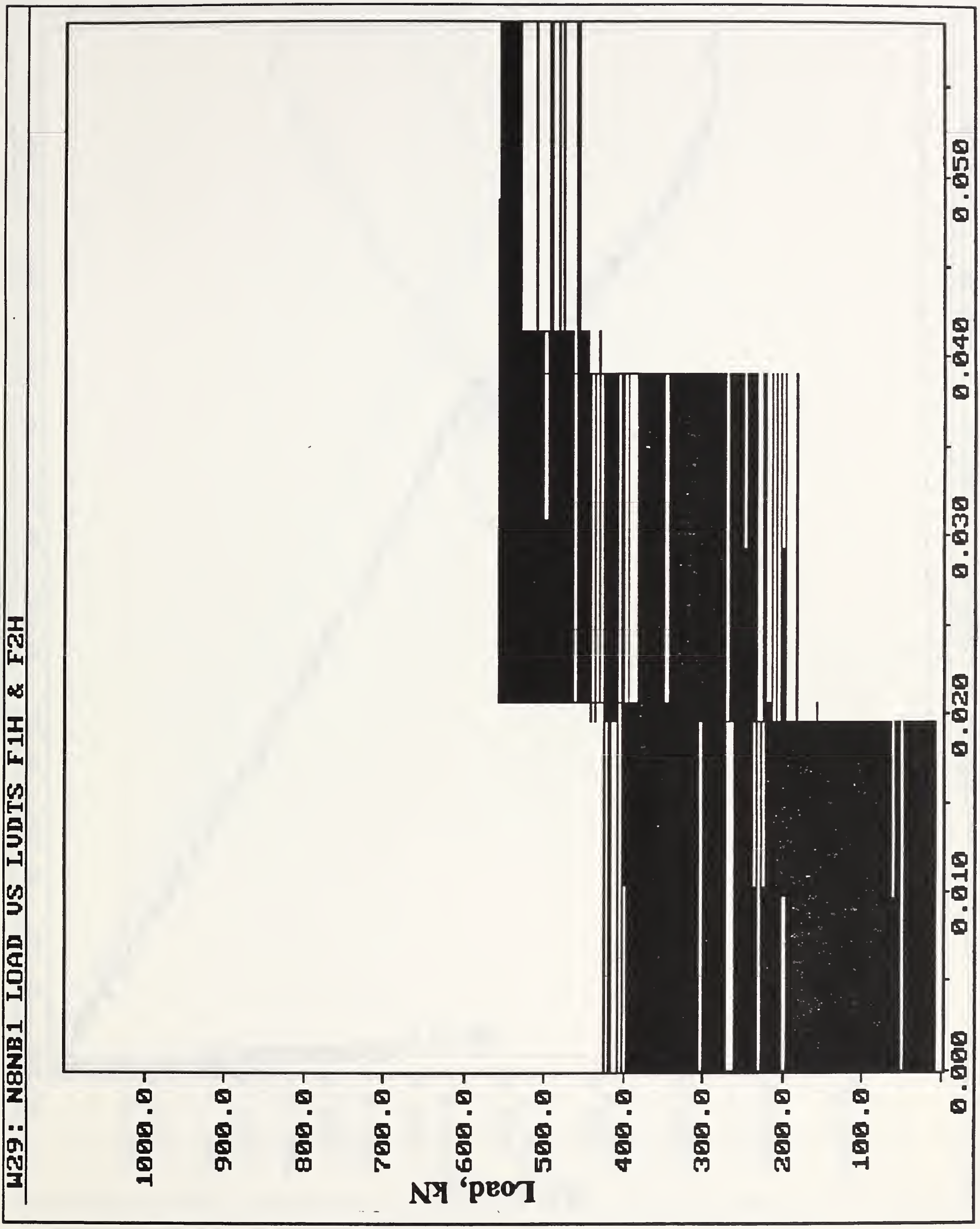

W30: N8NAL LOAD VS LVDTS F2C & F2H
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
Displacement, mm

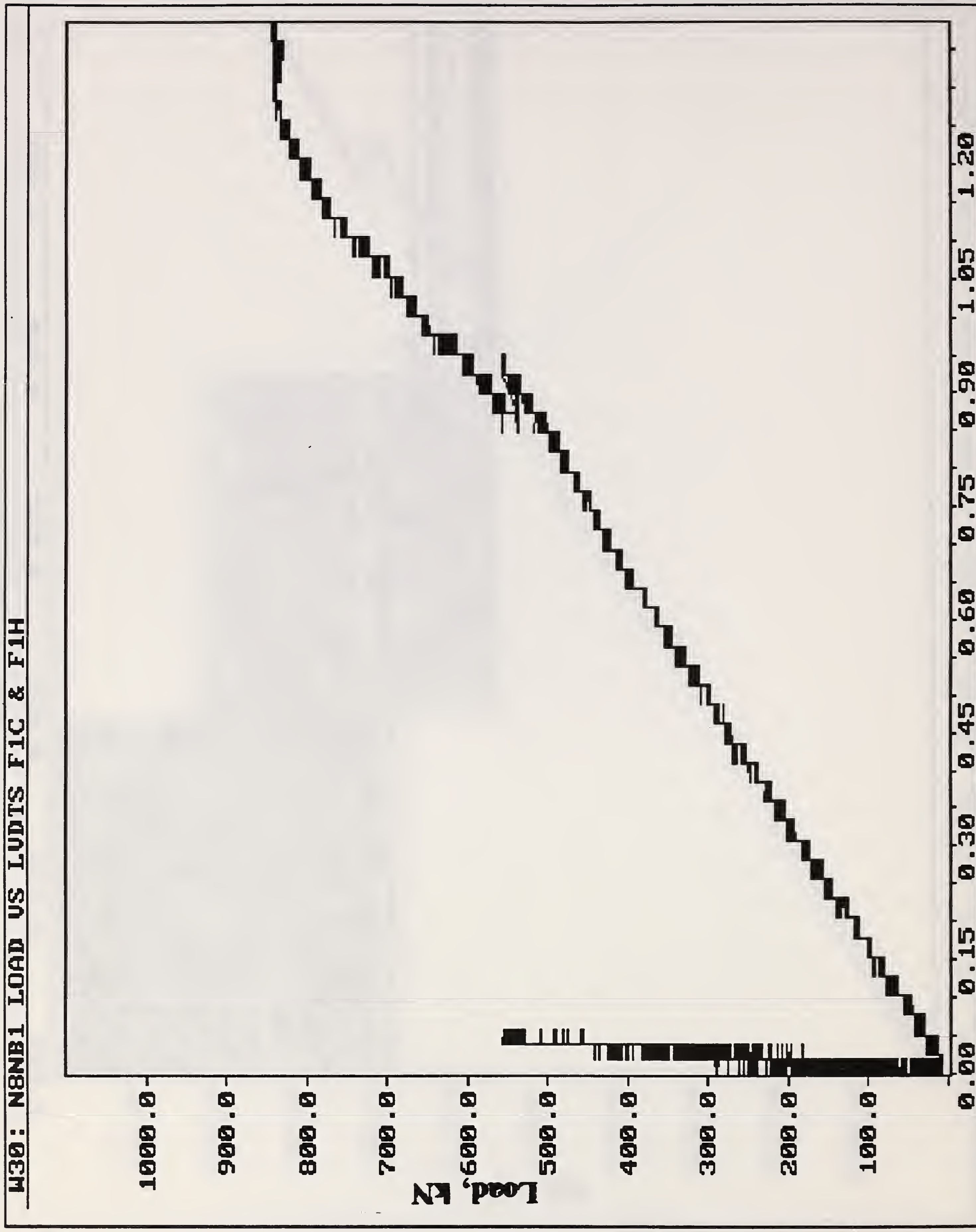

W25: N8NB1 LOAD VS TIME
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec


W26: N8NB1 LOAD VS LVDTS F1C & F2C
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

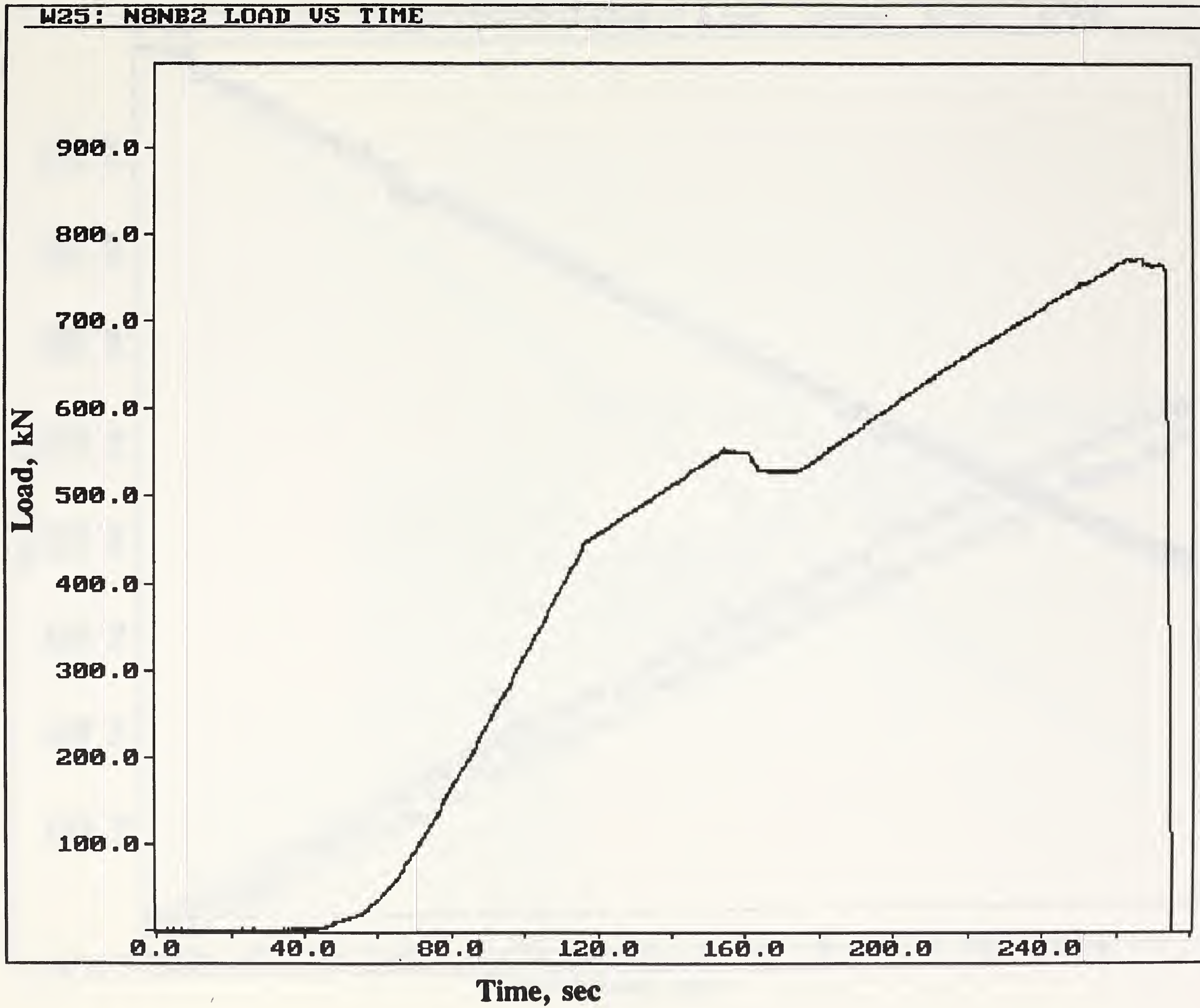

W27: N8NB1 LOAD VS LVDTS F1C, F1L & F1R
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

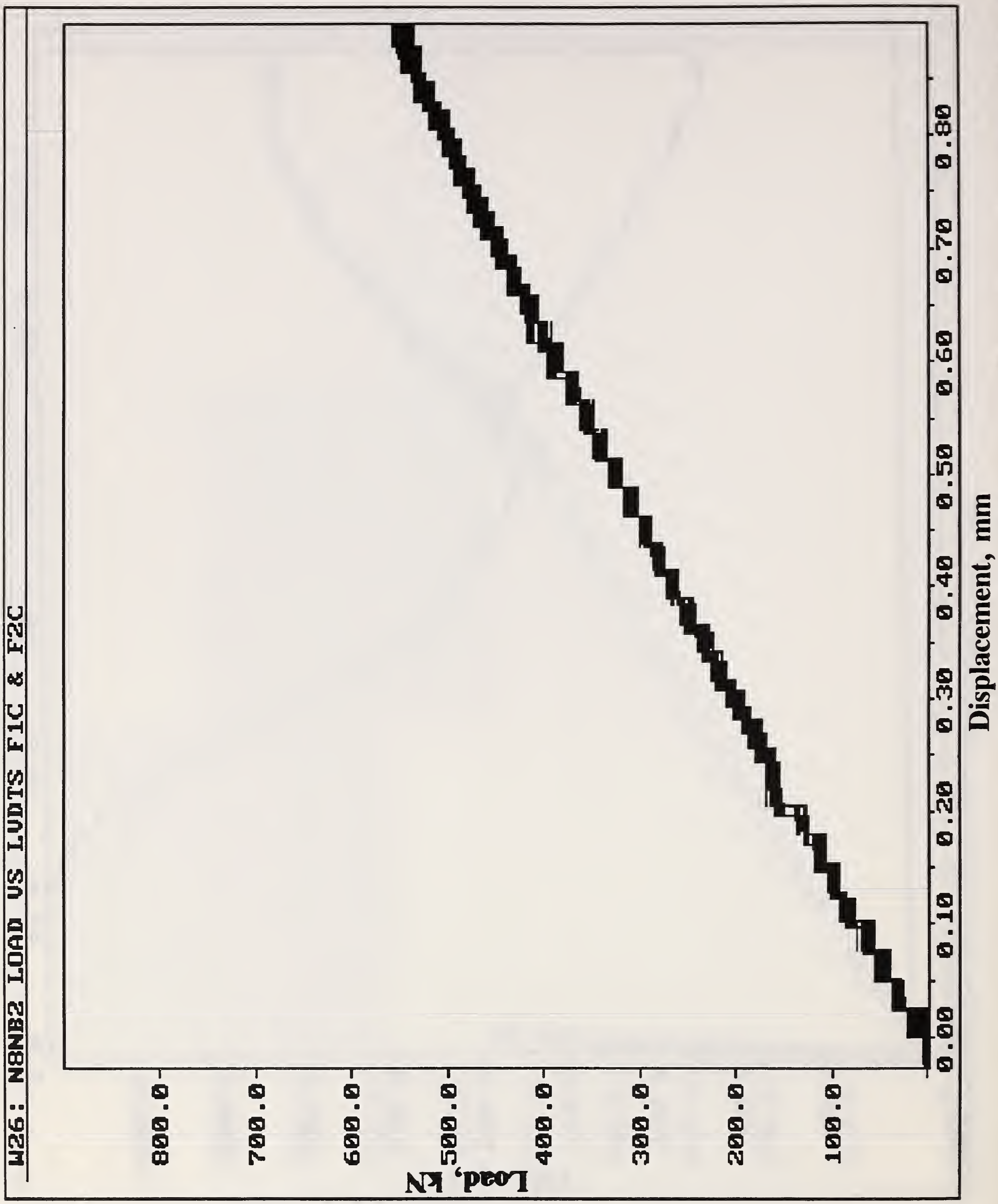

W28: N8NB1 LOAD VS LVDTS F2C, F2L & F2R
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

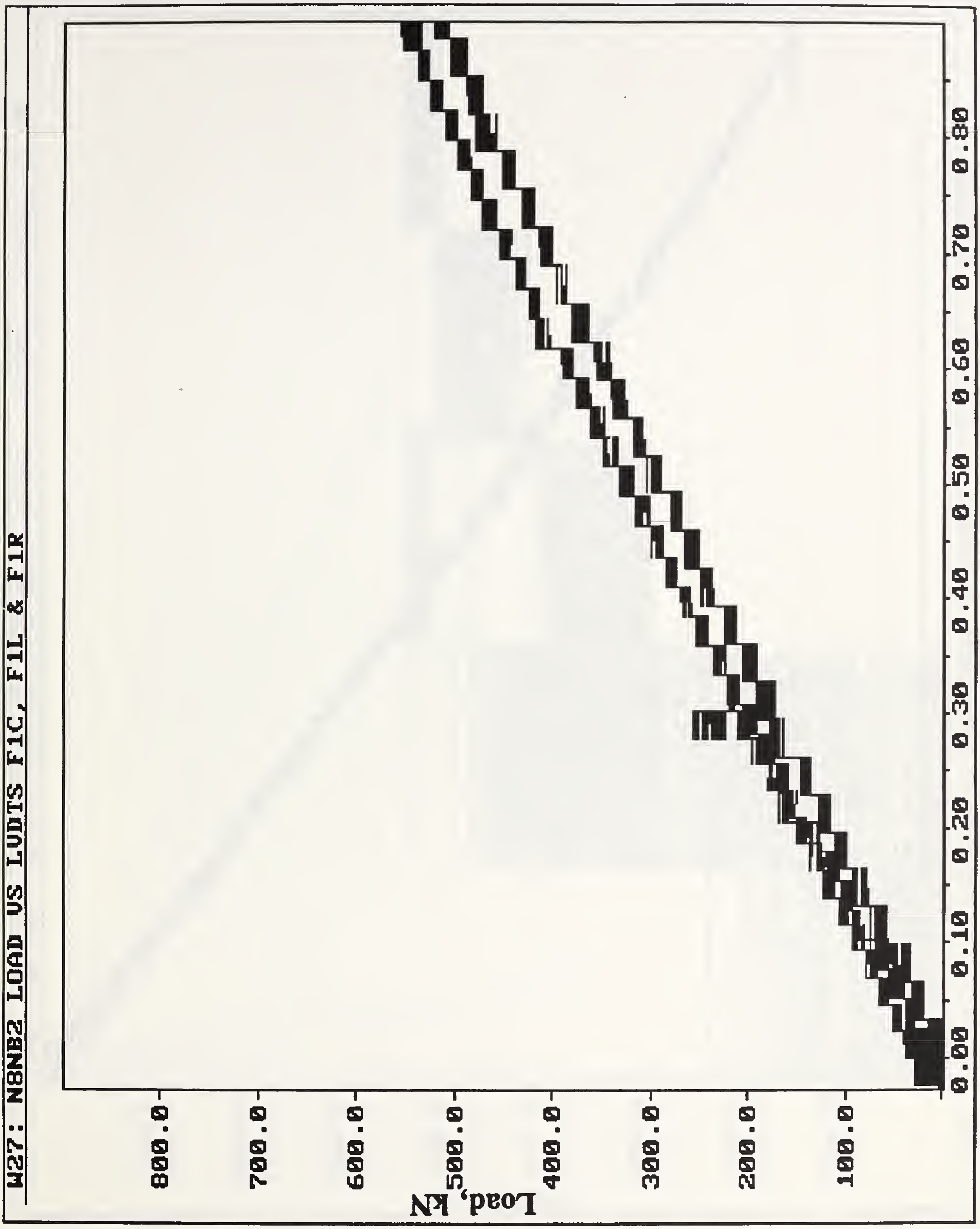

W29: N8NB1 LOAD VS LVDTS F1H & F2H
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.000
0.010
0.020
0.030
0.040
0.050
Displacement, mm



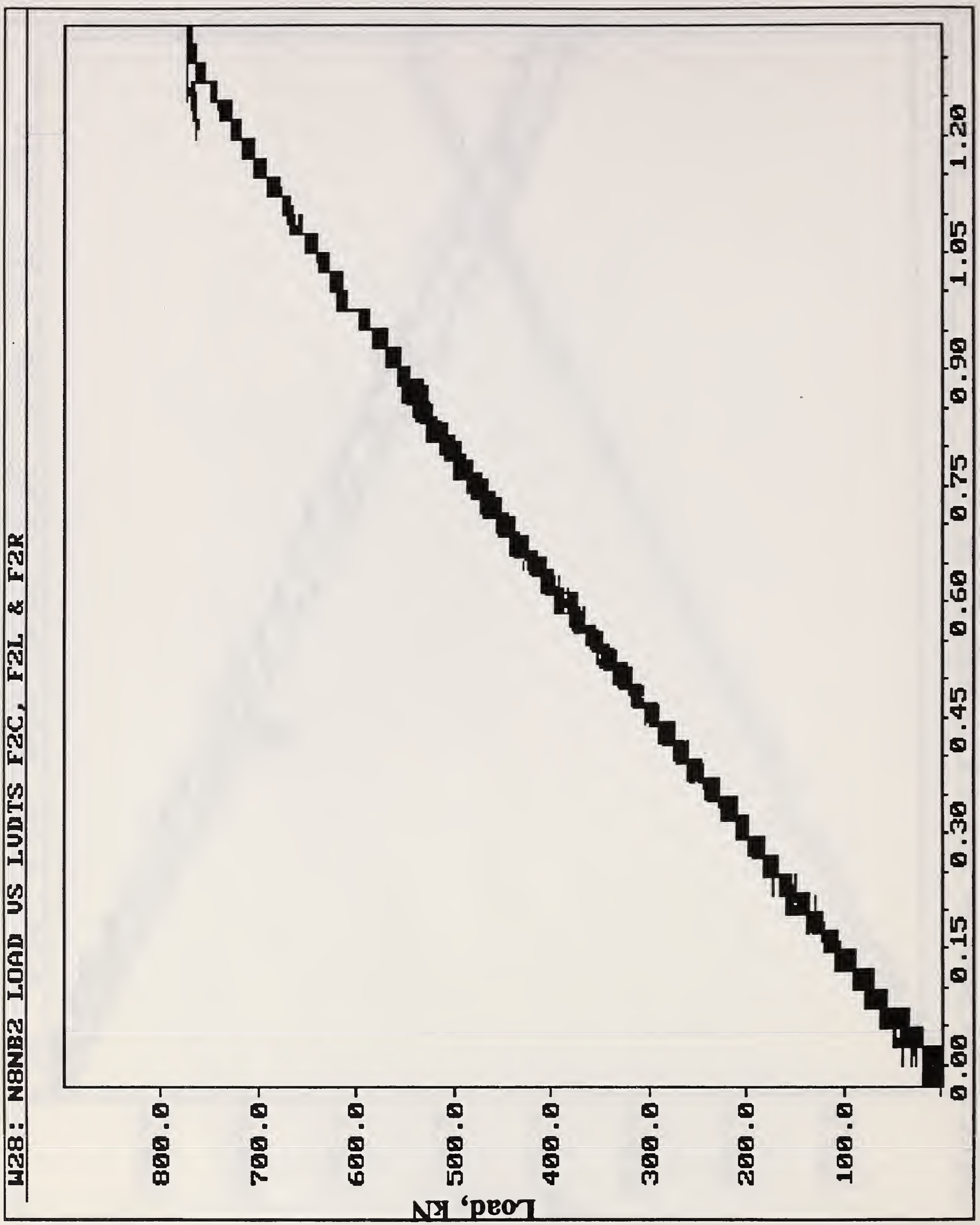
W30: N8NB1 LOAD VS LVDTS F1C & F1H
Load, kN
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm


W25: N8NB2 LOAD VS TIME
Load, kN
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

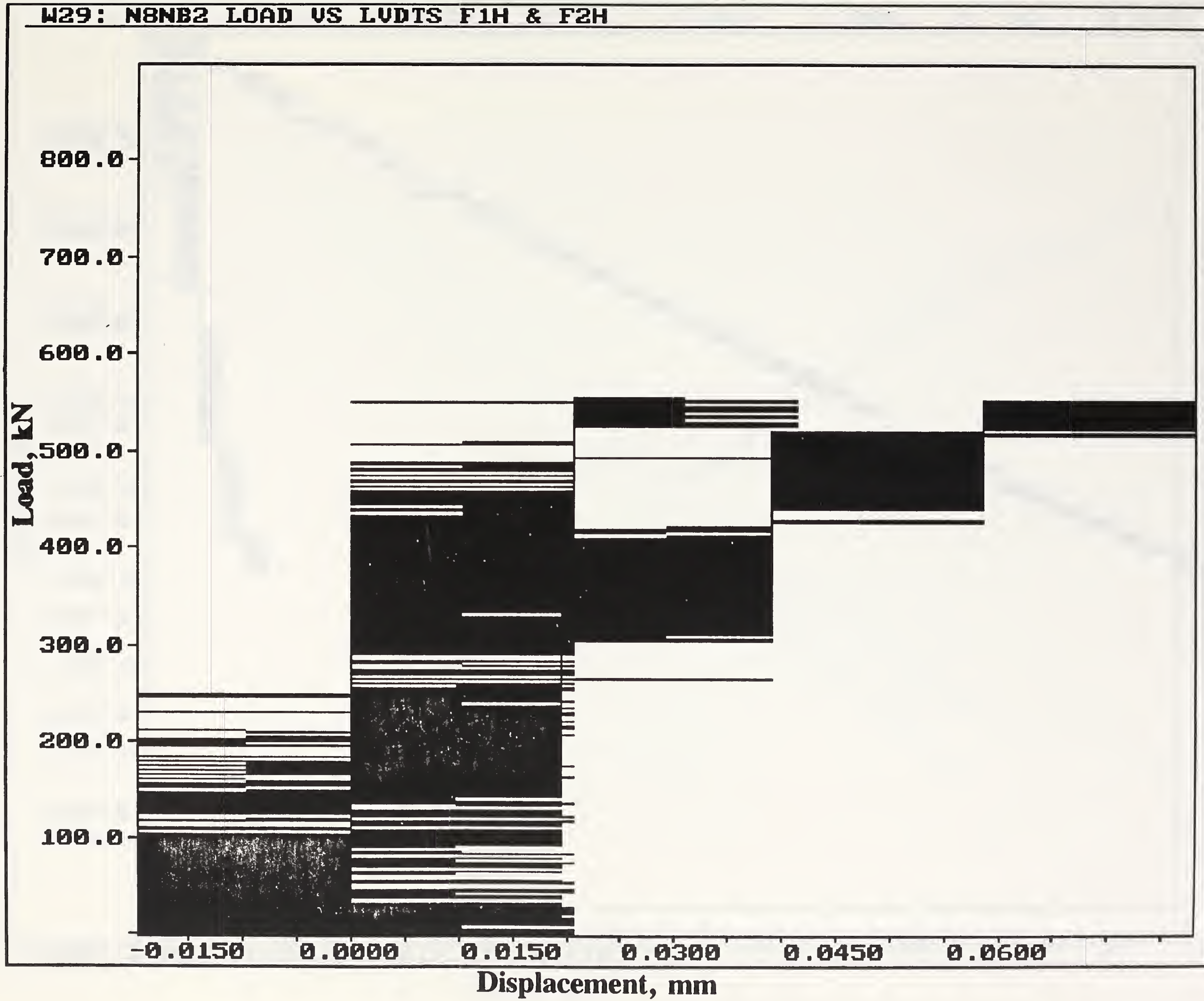

W26: N8NB2 LOAD VS LVDTS F1C & F2C
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
Displacement, mm

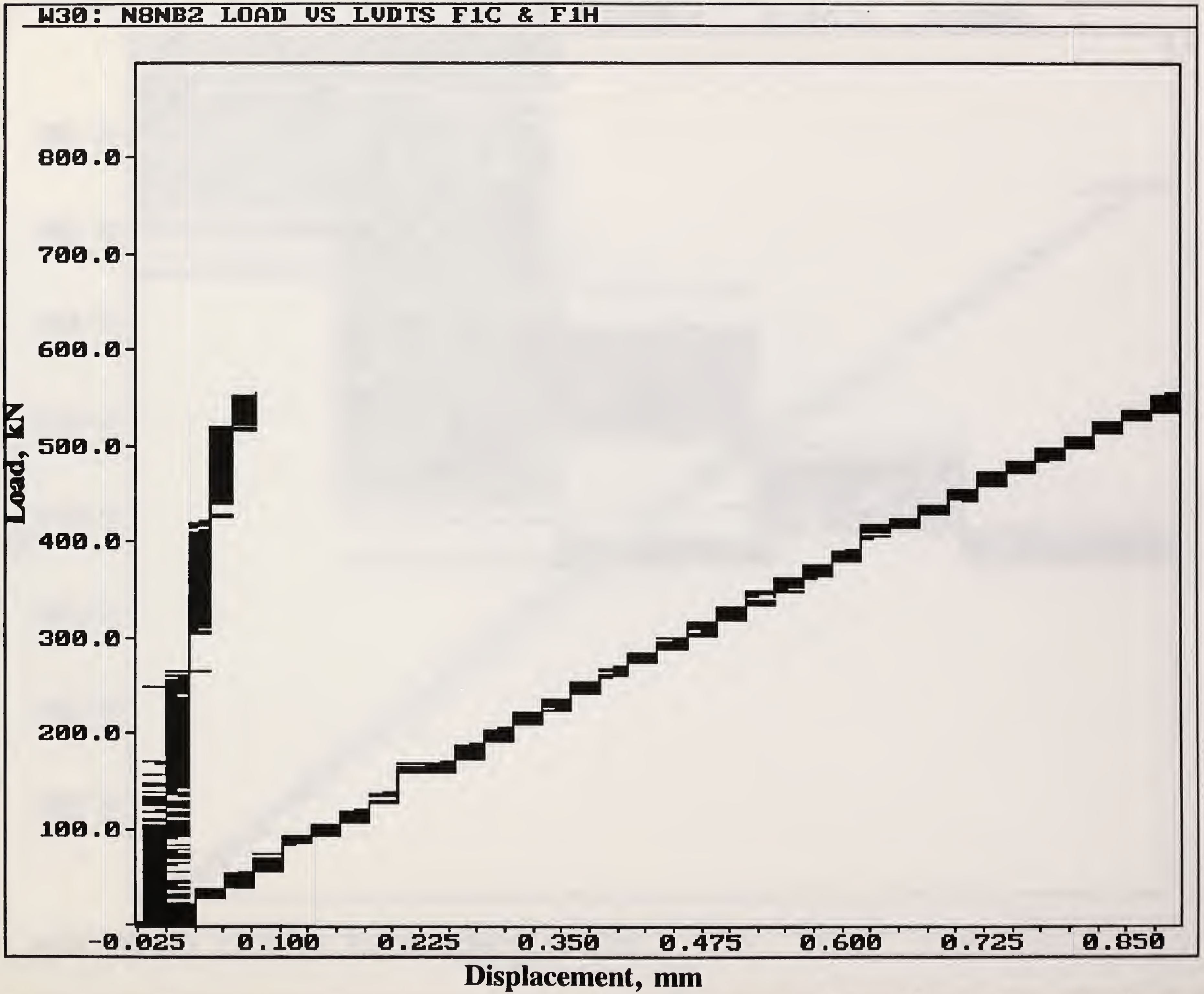


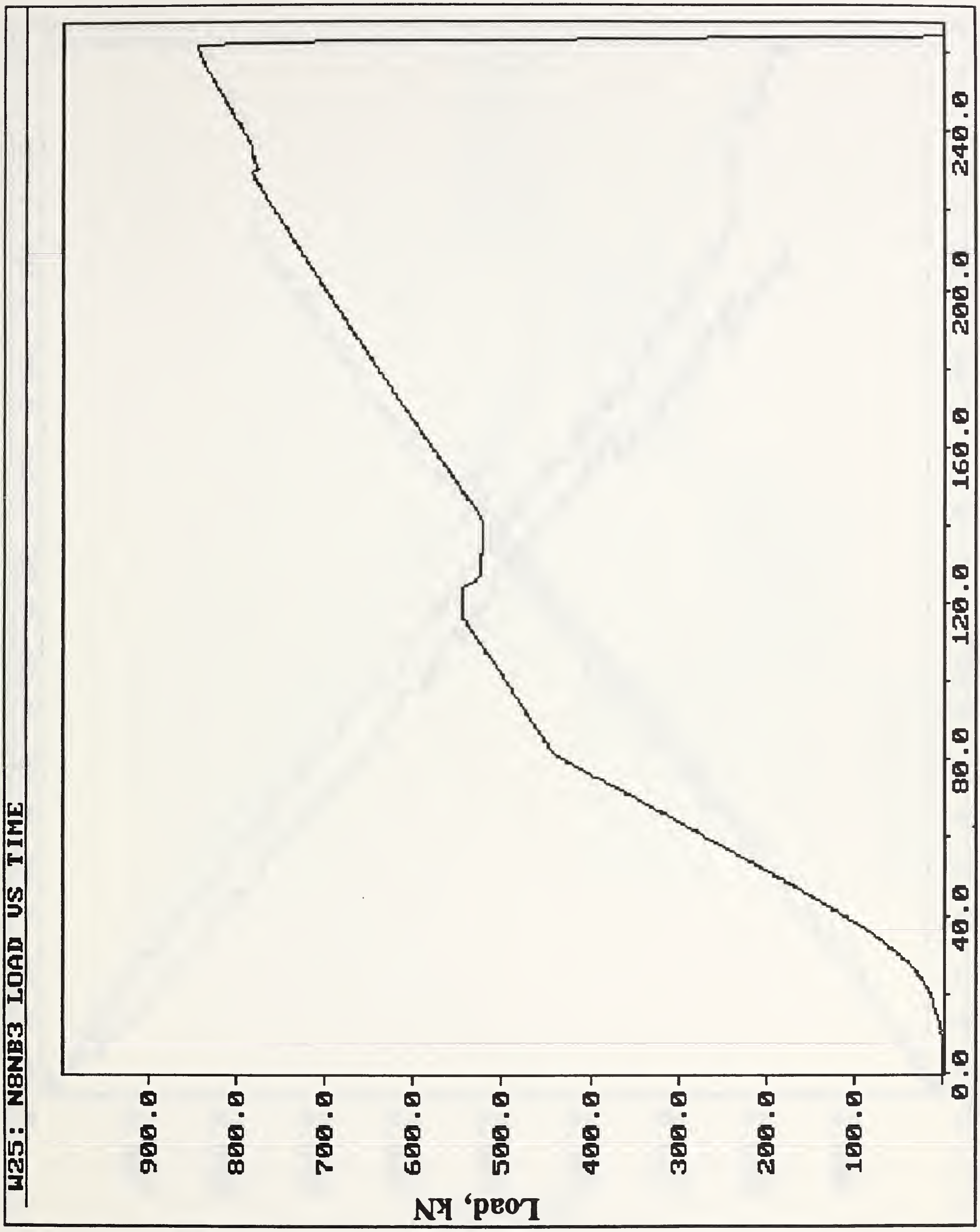
W27: N8NB2 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80

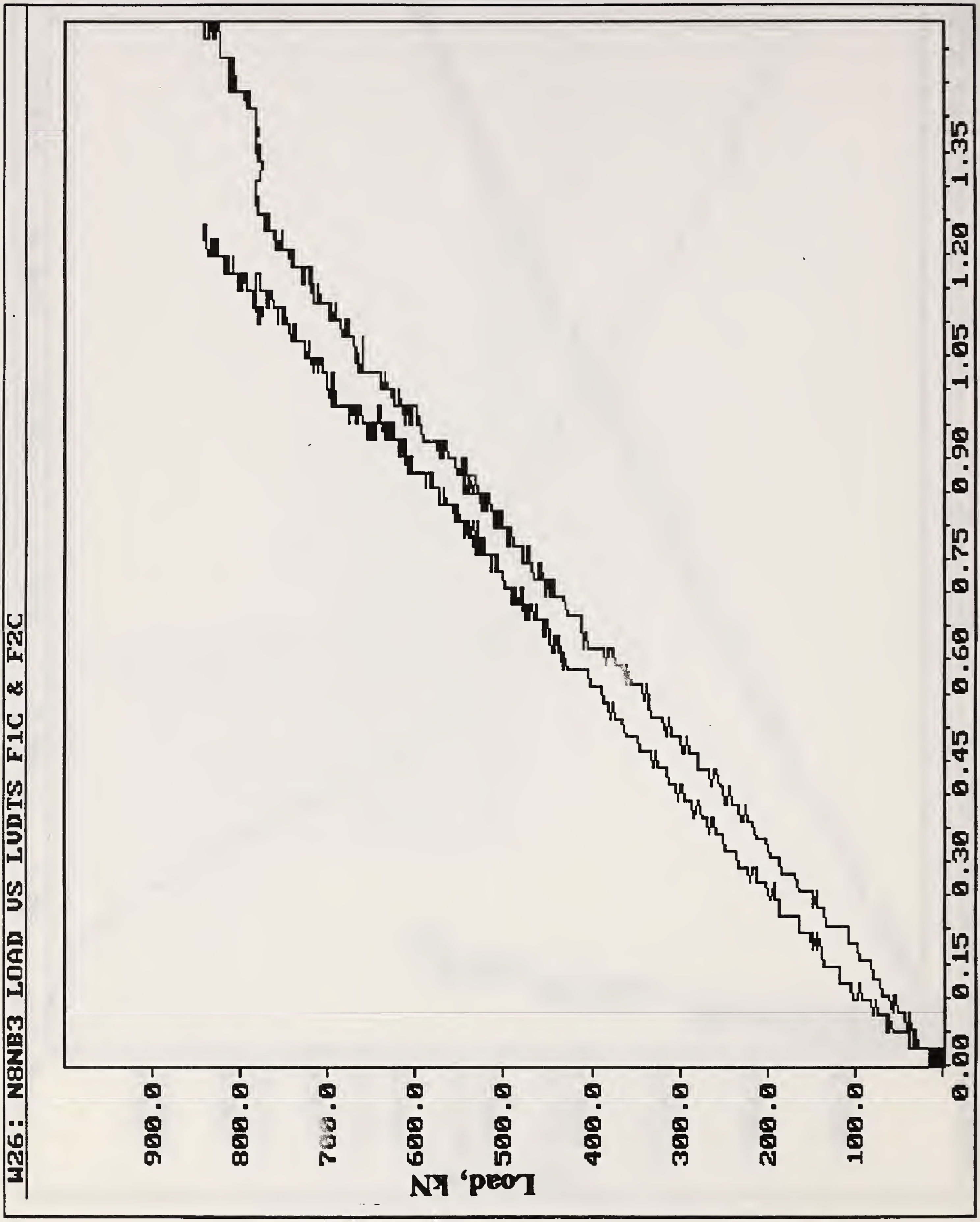


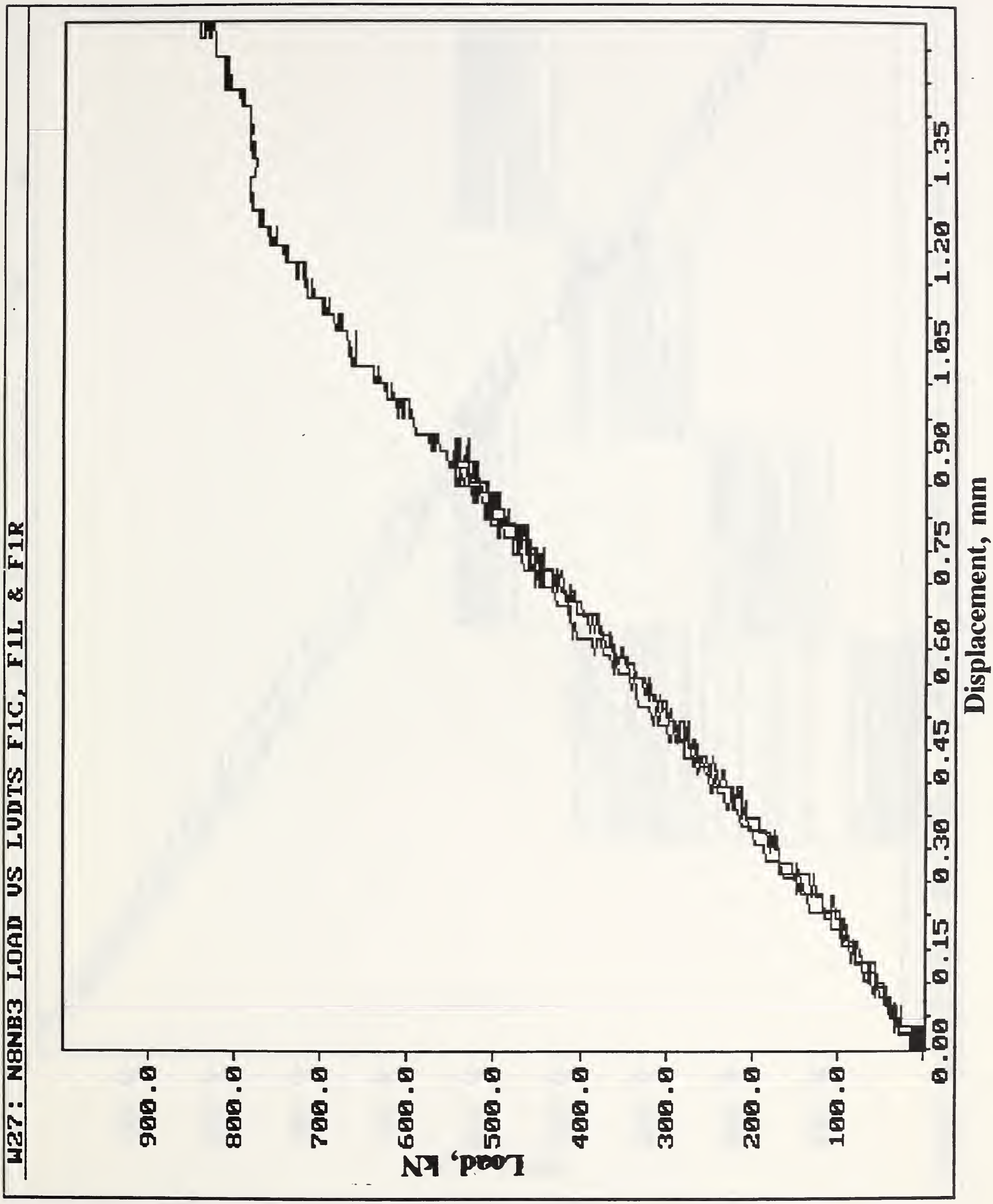
W28: N8NB2 LOAD VS LVDTS F2C, F2L & F2R
Load, KN
Displacement, mm
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20

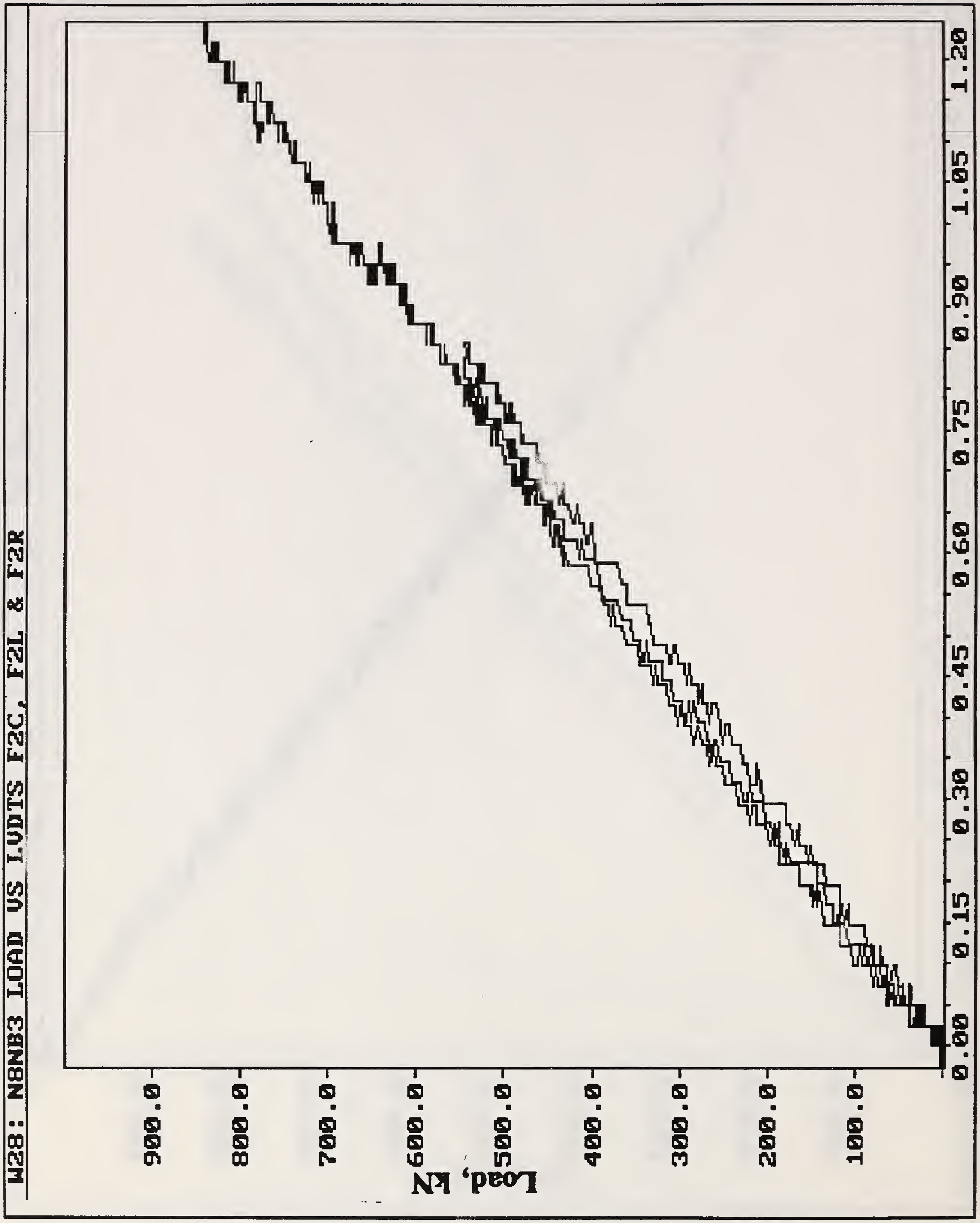

W29: N8NB2 LOAD VS LVDTS F1H & F2H
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
-0.0150
0.0000
0.0150
0.0300
0.0450
0.0600
Displacement, mm

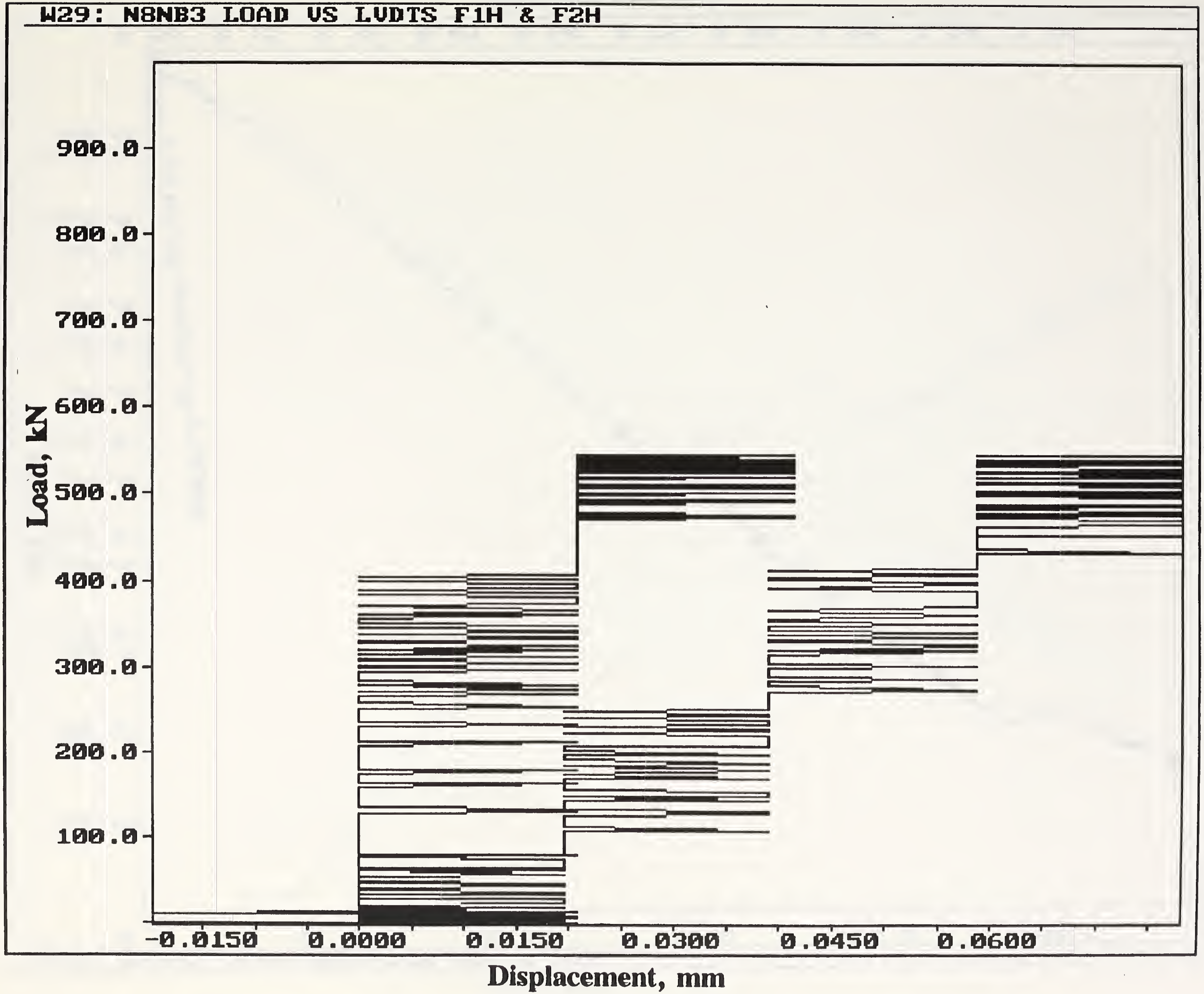

W30: N8NB2 LOAD VS LVDTS F1C & F1H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
-0.025
0.100
0.225
0.350
0.475
0.600
0.725
0.850
Displacement, mm

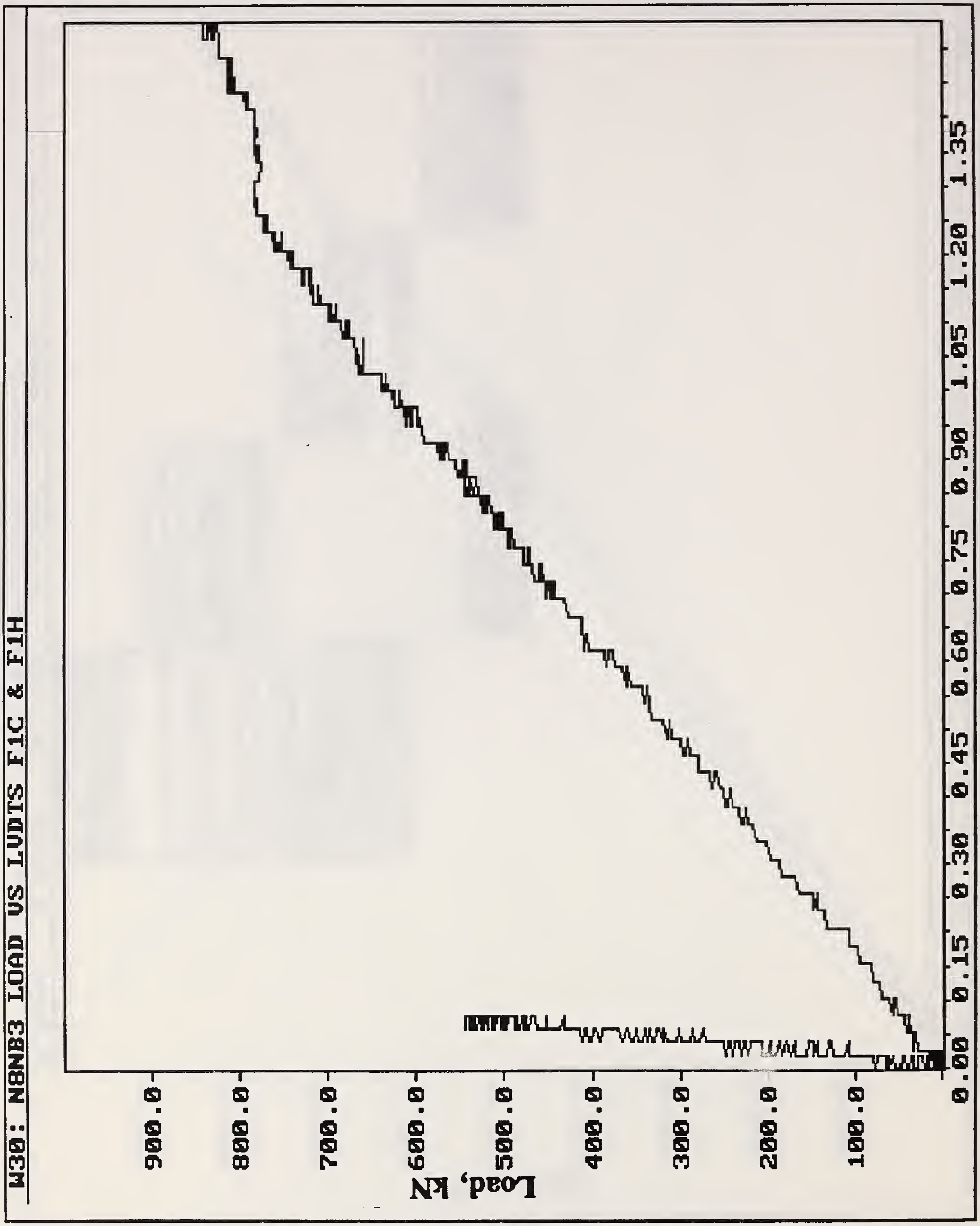

W25: N8NB3 LOAD VS TIME
Load, kN
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec


W26: N8NB3 LOAD VS LVDTS F1C & F2C
Load, kN
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
1.35


W27: N8NB3 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
1.35

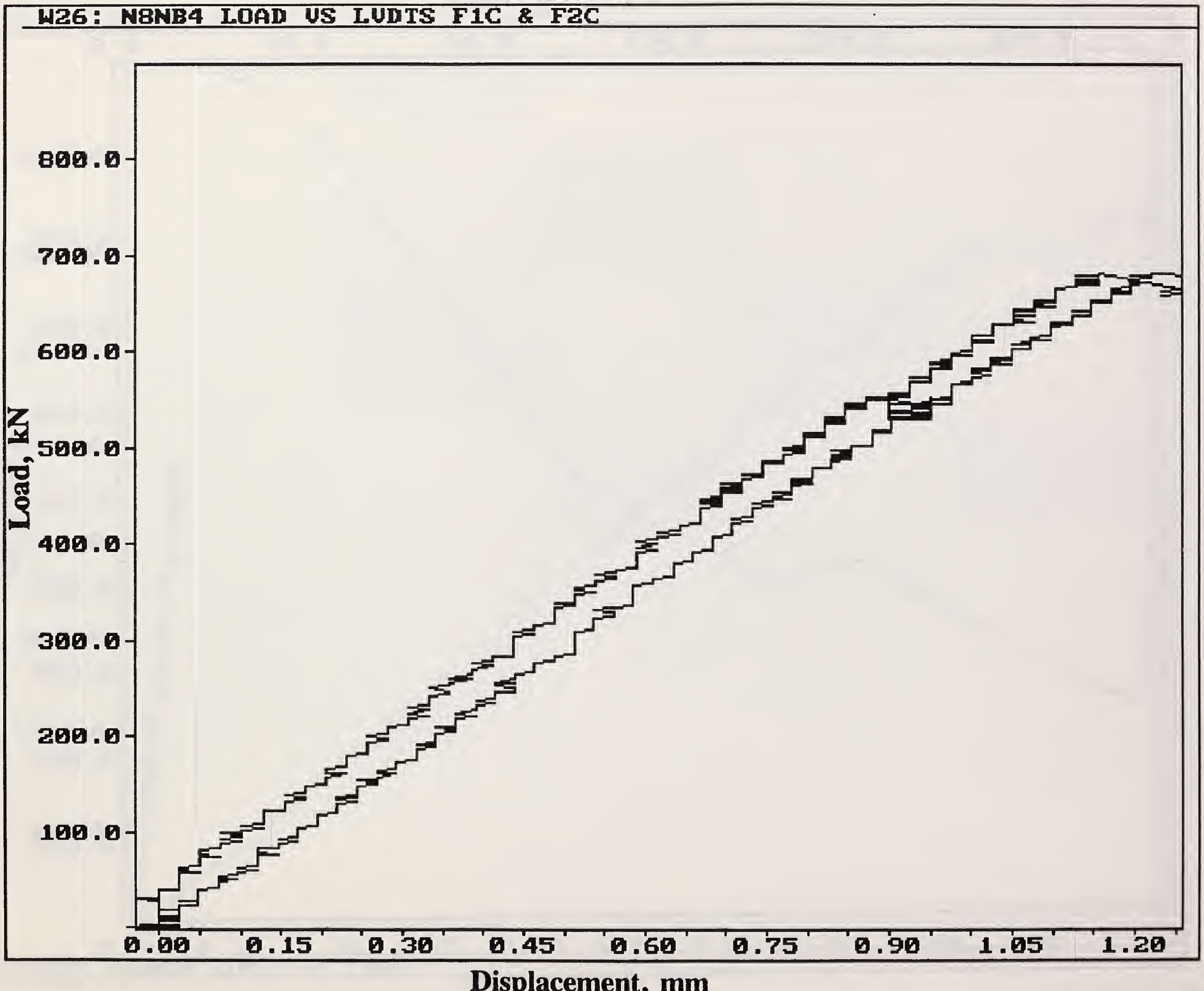

W28: N8NB3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20

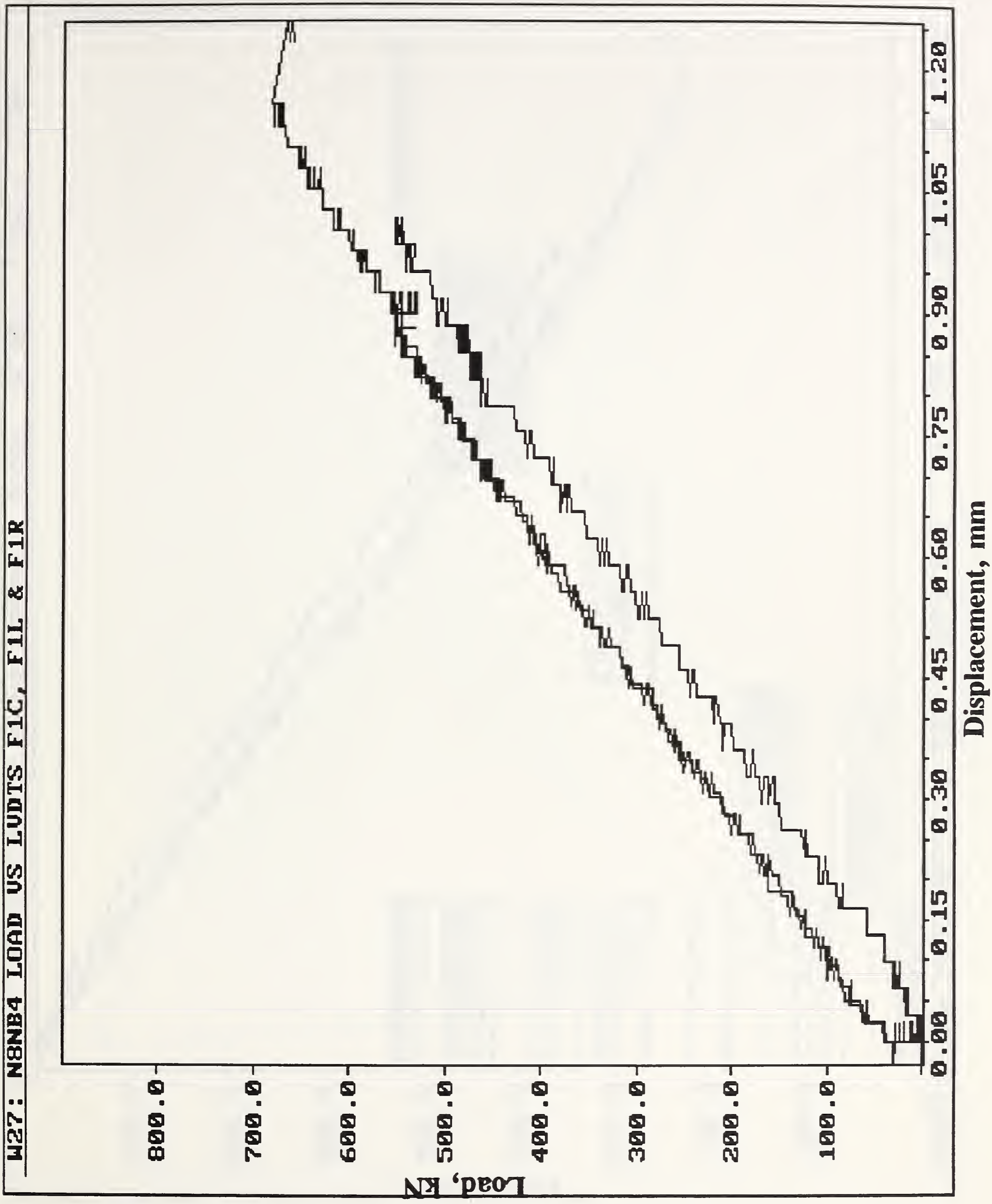

W29: N8NB3 LOAD VS LVDTS F1H & F2H
Load, kN
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
-0.0150
0.0000
0.0150
0.0300
0.0450
0.0600
Displacement, mm

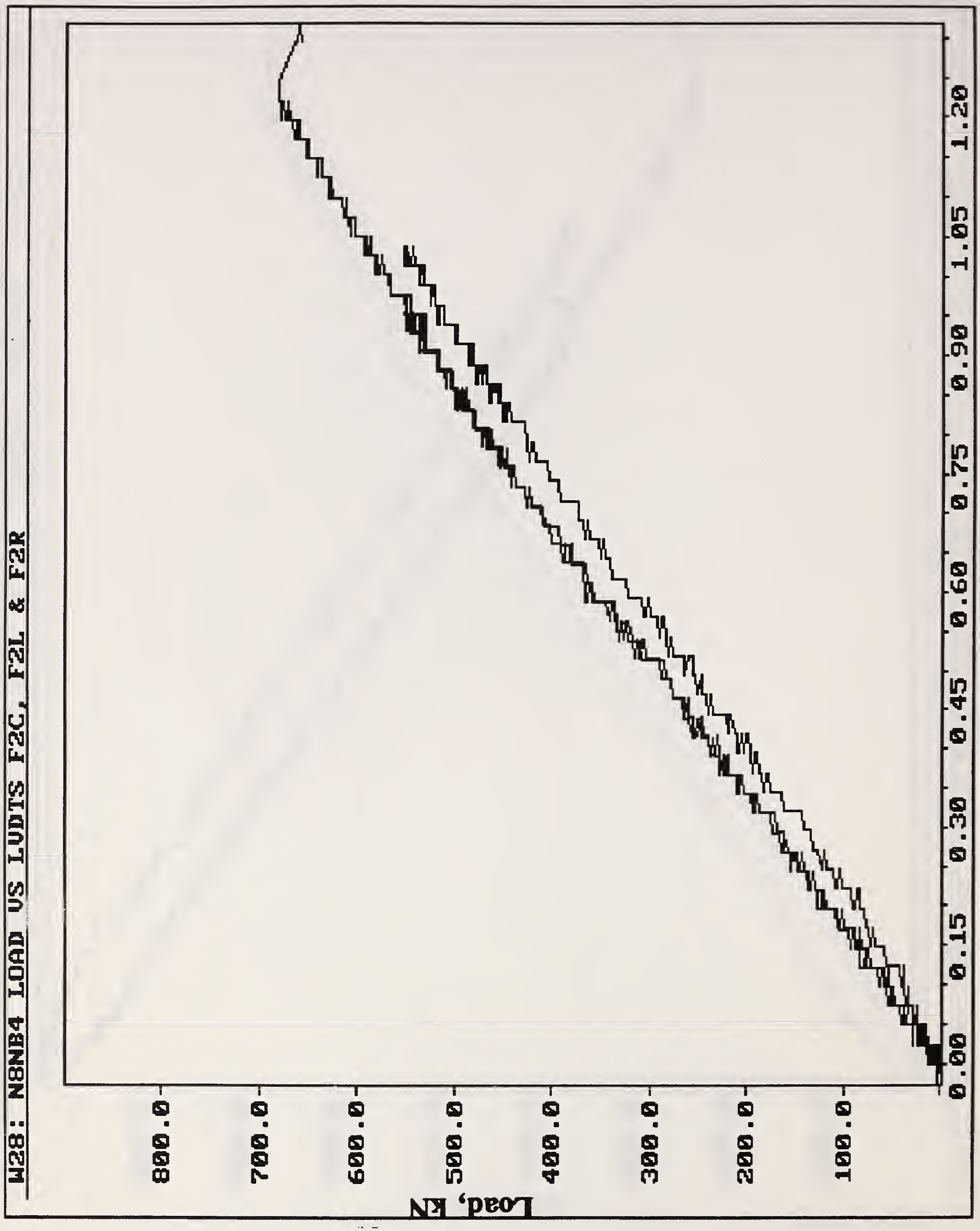


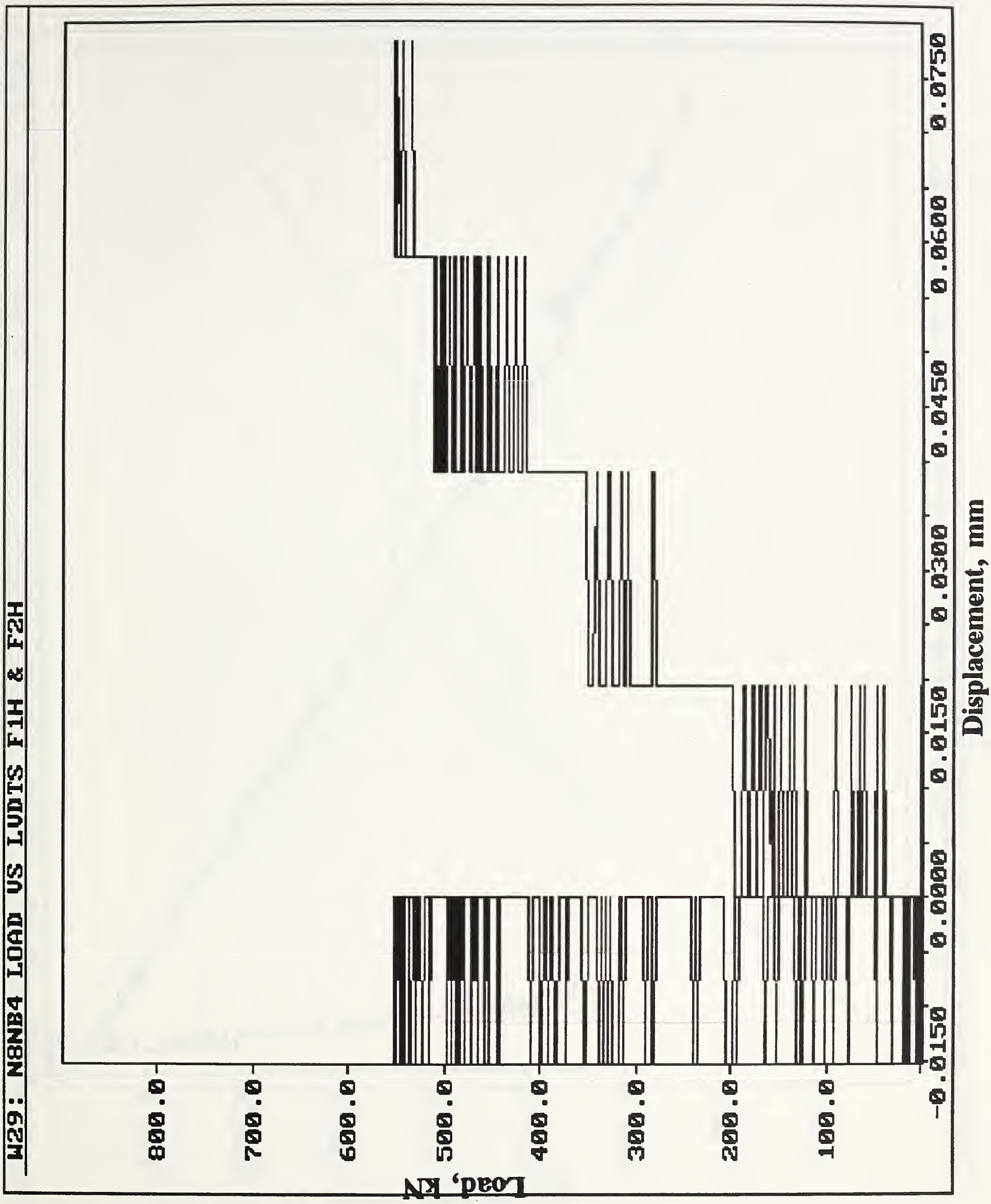
W30: N8NB3 LOAD VS LVDTS F1C & F1H
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
1.35

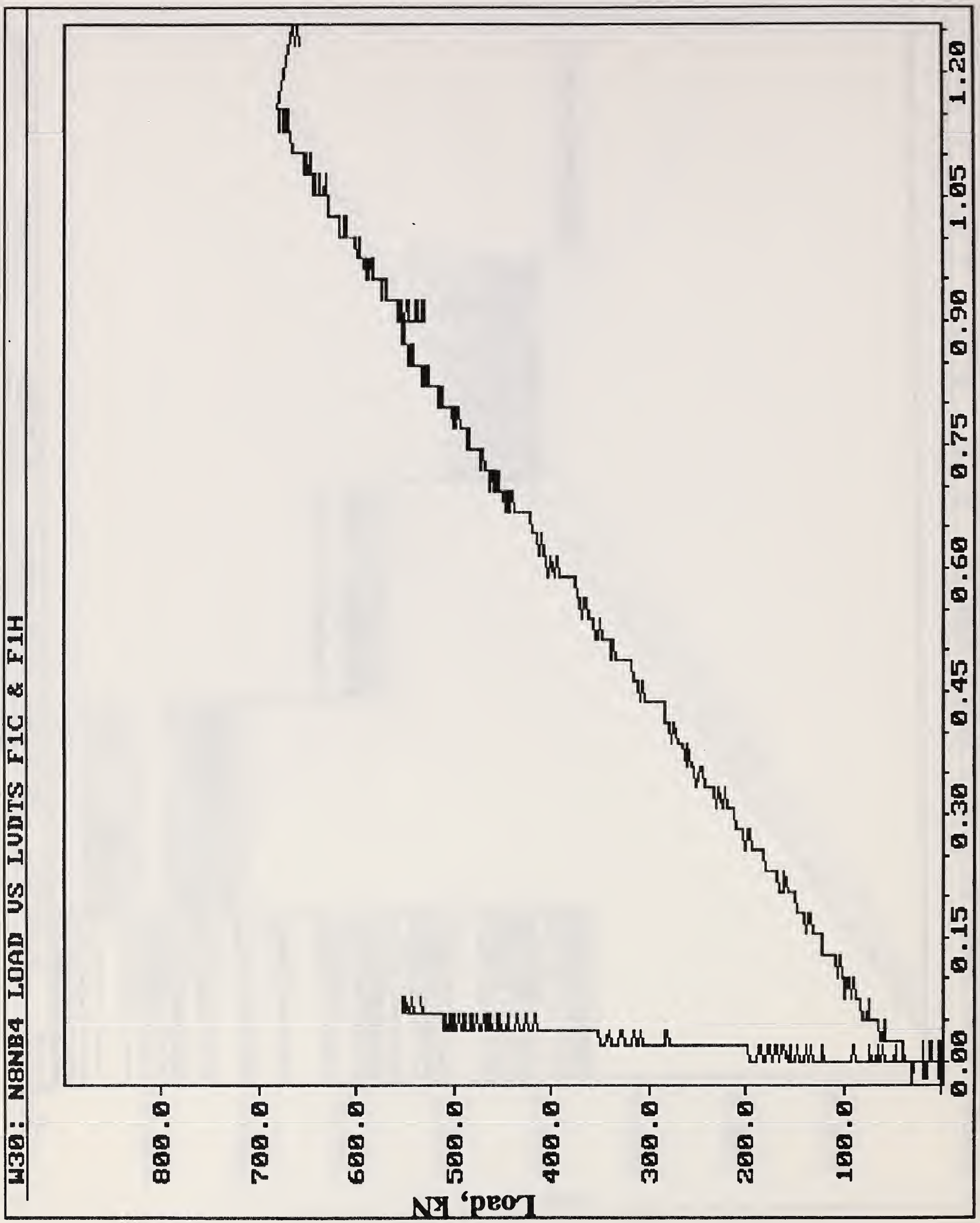

W25: N8NB4 LOAD VS TIME
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

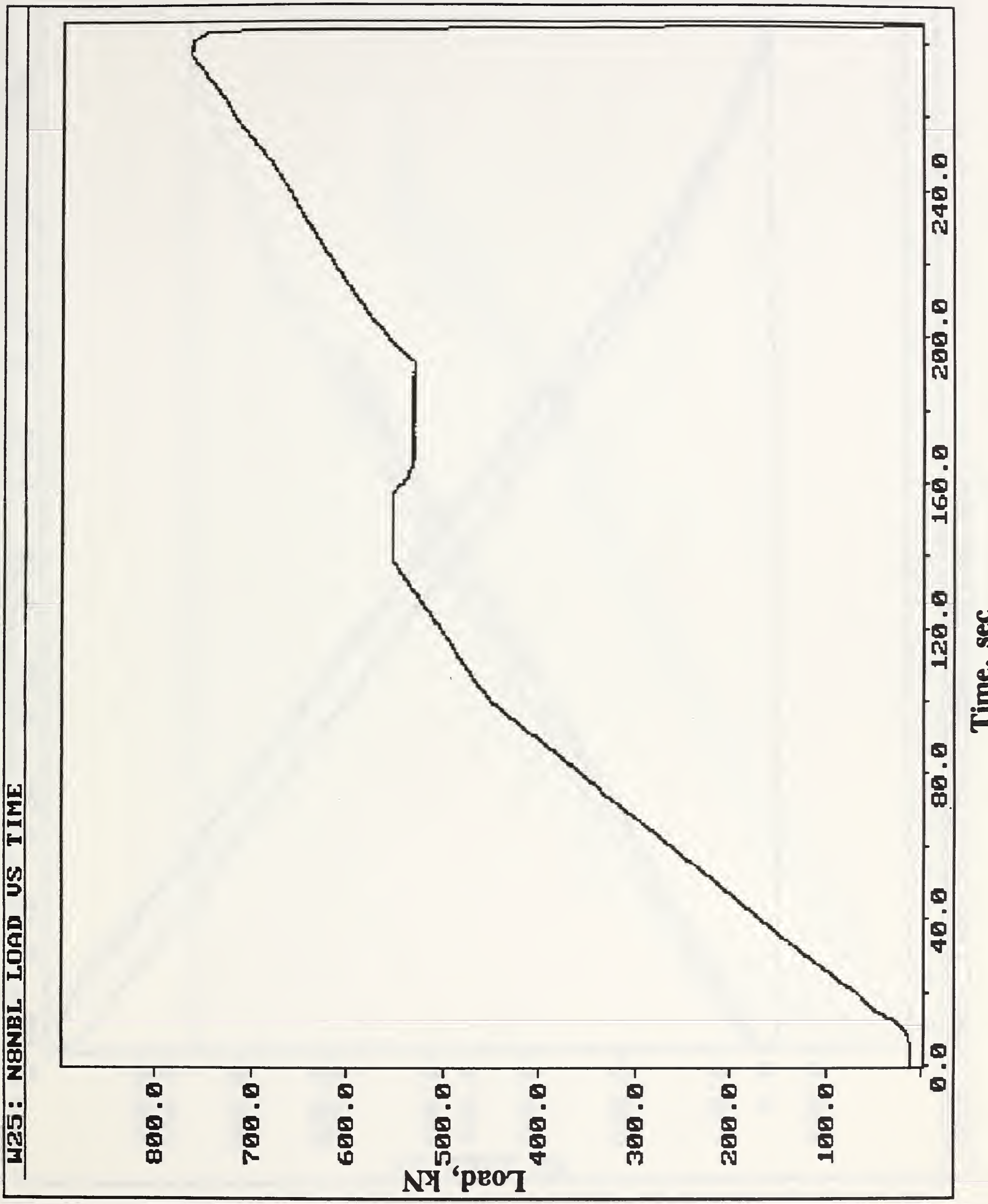

W26: N8NB4 LOAD VS LVDTS F1C & F2C
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm


W27: N8NB4 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20

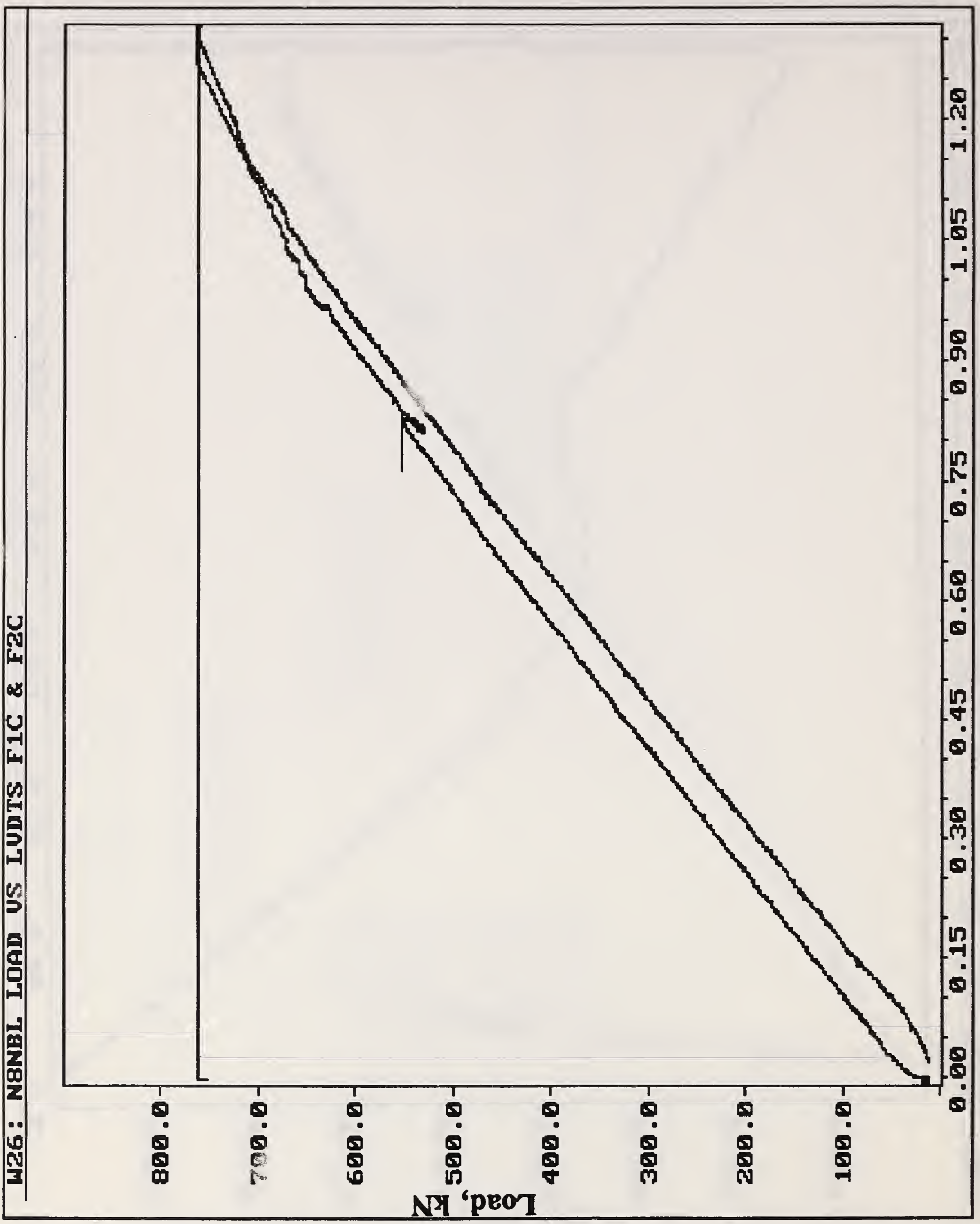

W28: N8NB4 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

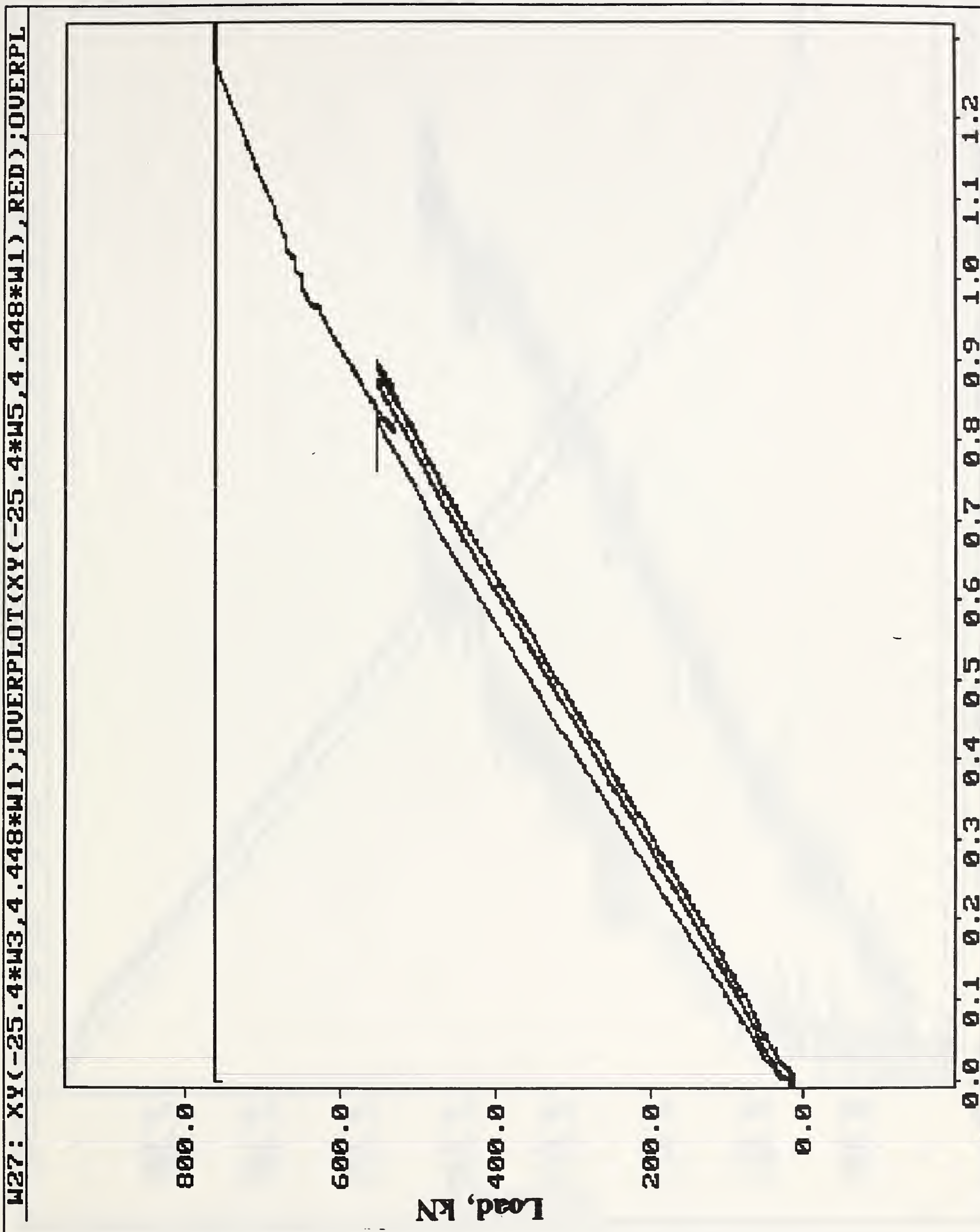

W29: N8NB4 LOAD VS LVDTS F1H & F2H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
-0.0150
0.0000
0.0150
0.0300
0.0450
0.0600
0.0750

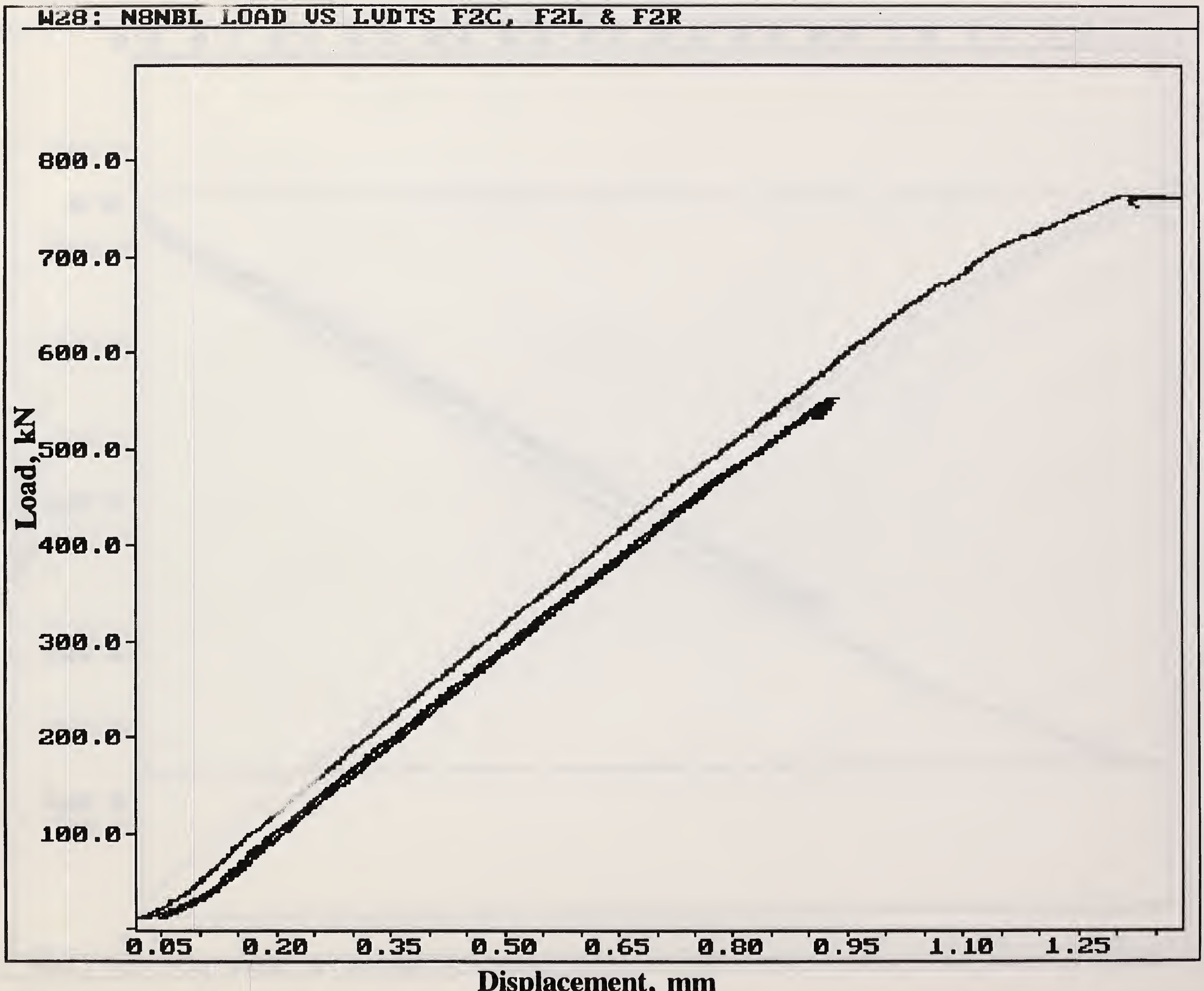

W30: N8NB4 LOAD VS LVDTS F1C & F1H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20

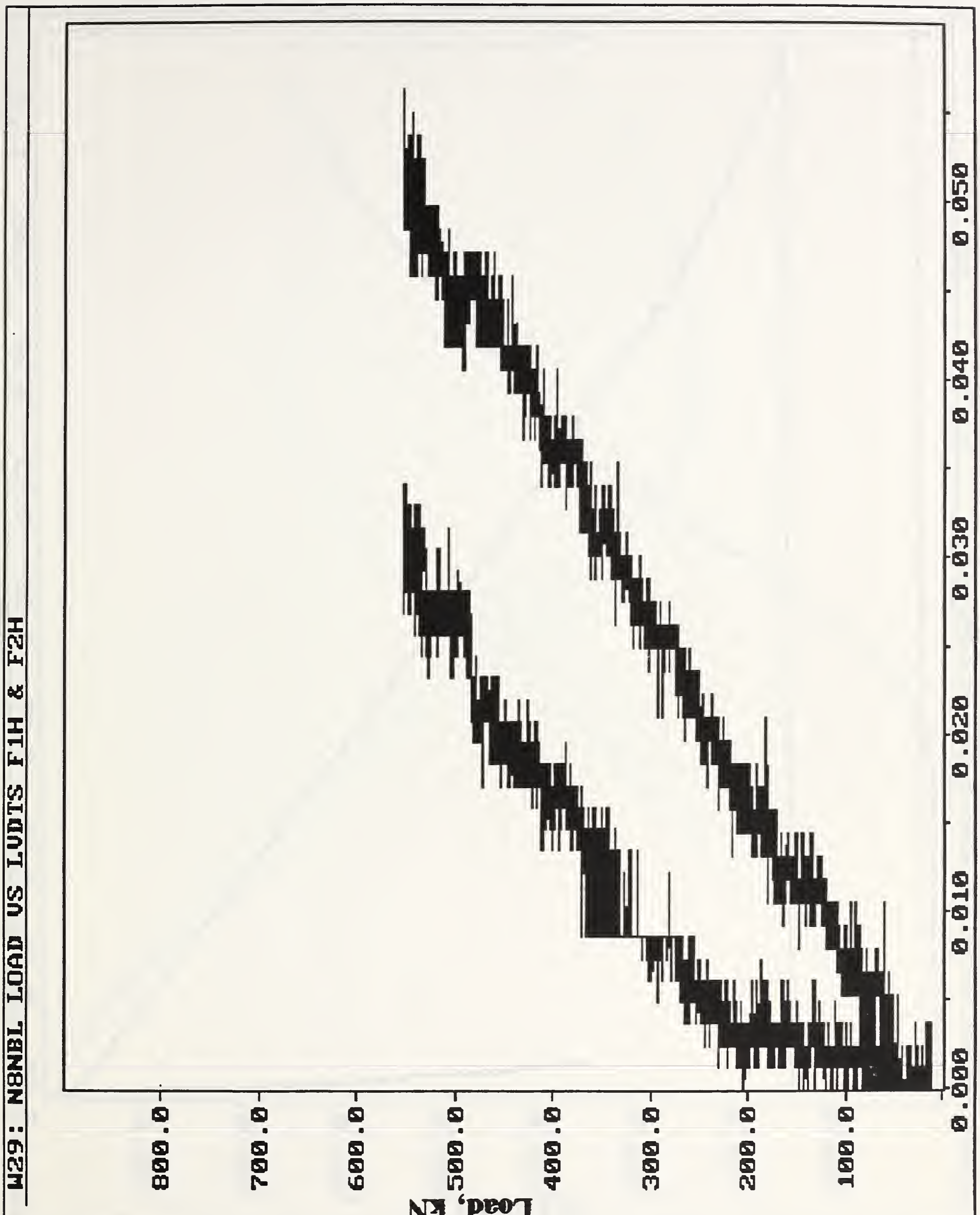


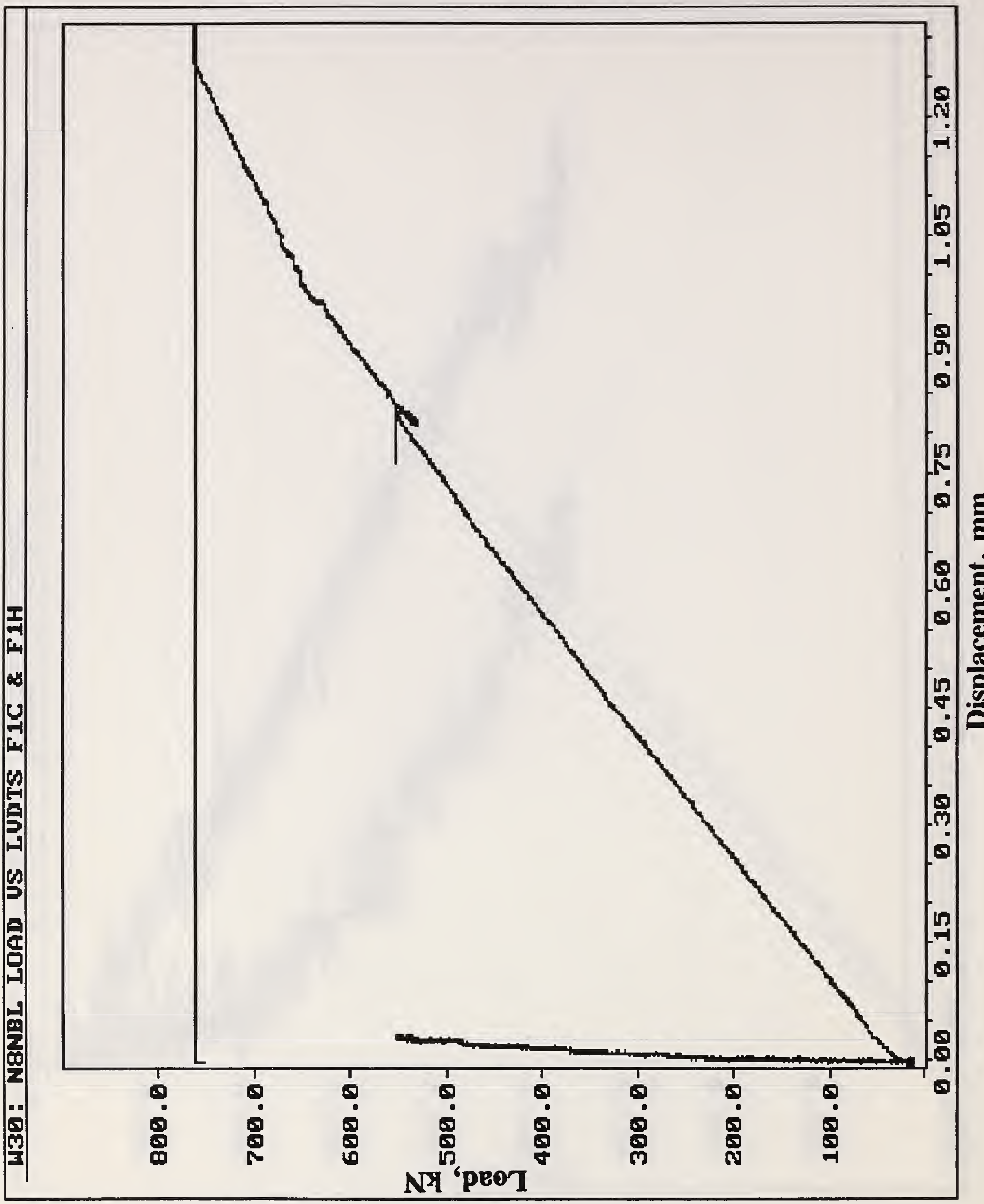
W25: N8NBL LOAD VS TIME
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

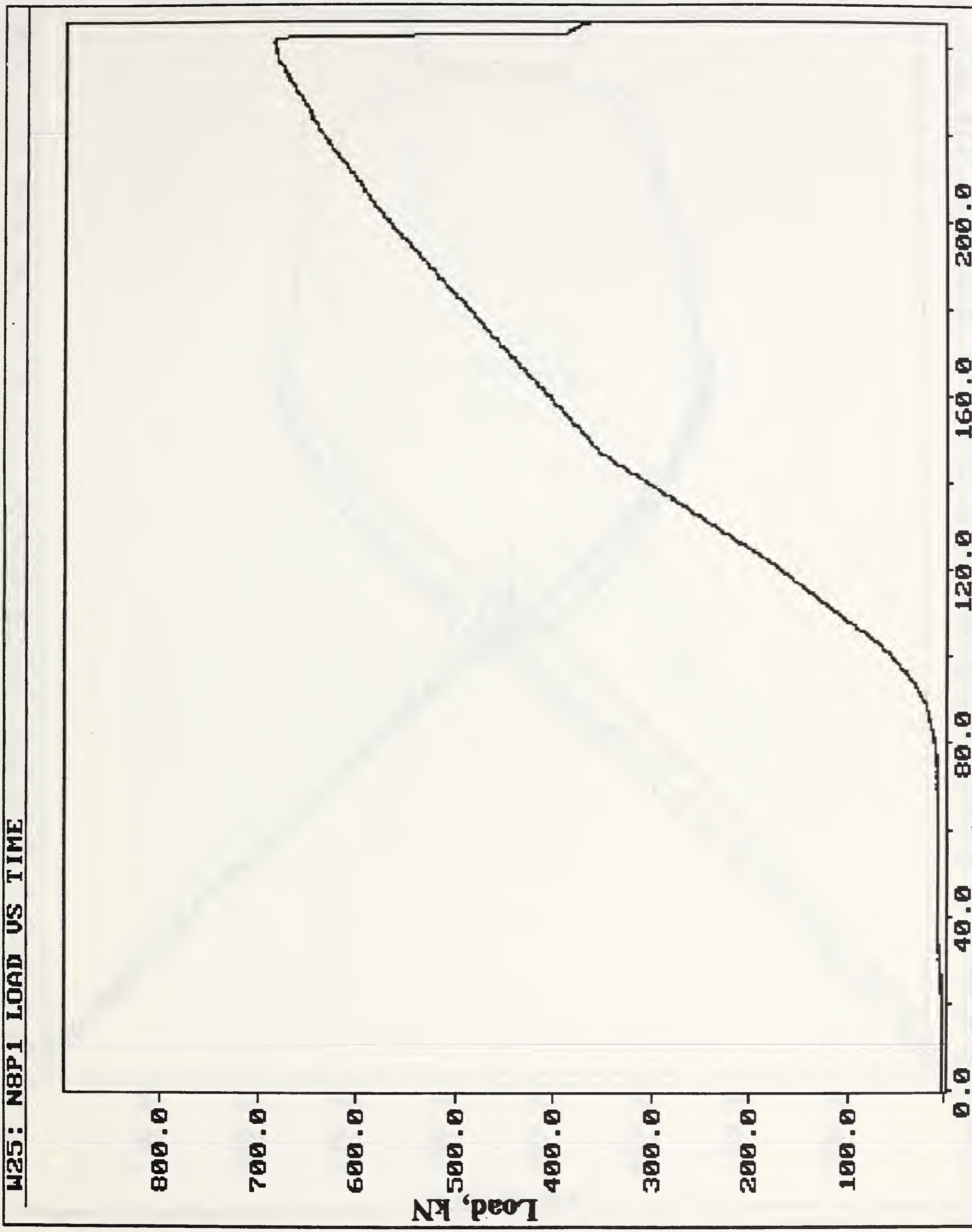

W26: N8NBL LOAD VS LVDTS F1C & F2C
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm

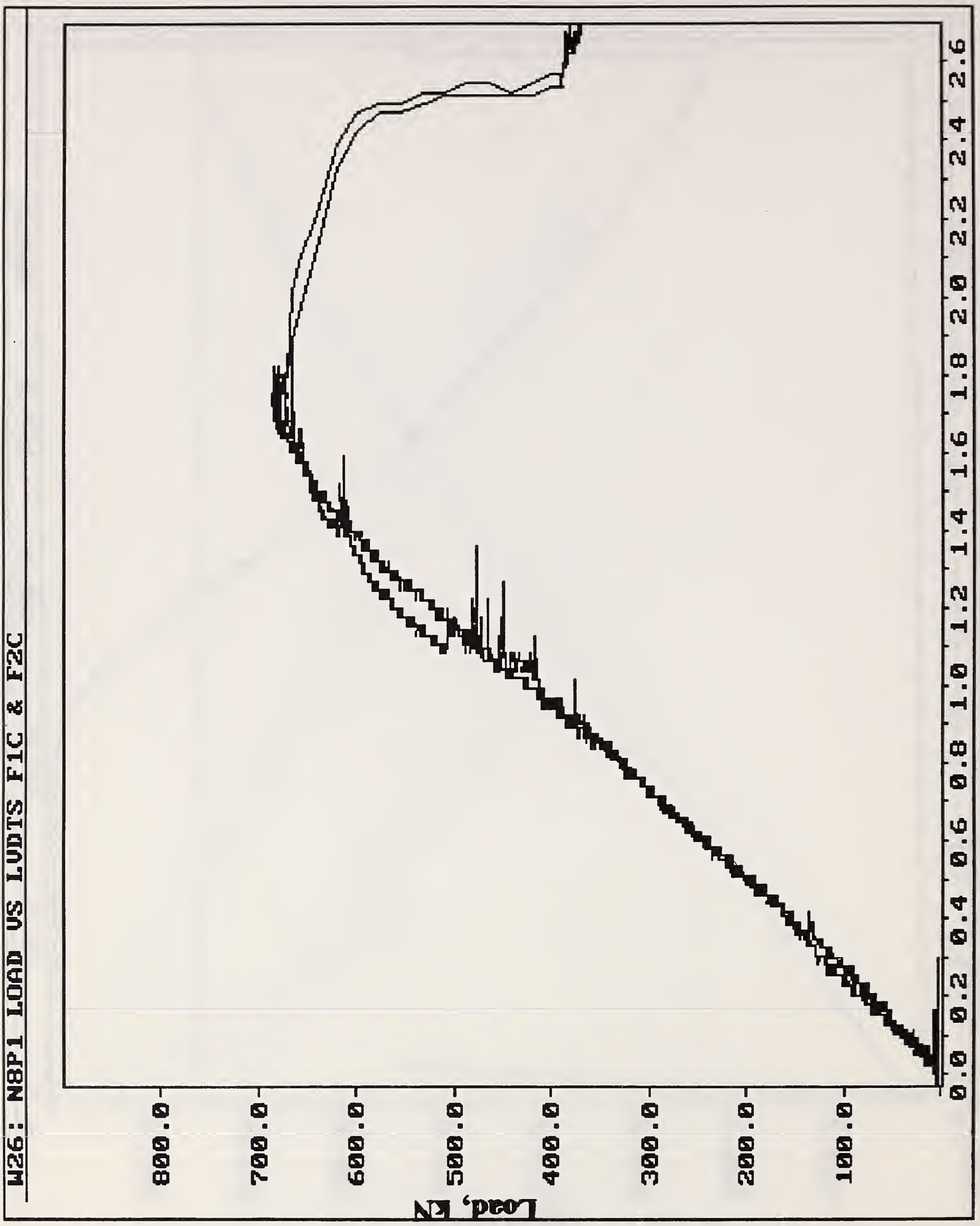

W27: XY(-25.4*W3,4.448*W1);OVERPLOT(XY(-25.4*W5,4.448*W1),RED);OVERPL
Load, kN
800.0
600.0
400.0
200.0
0.0
Displacement, mm
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
1.2

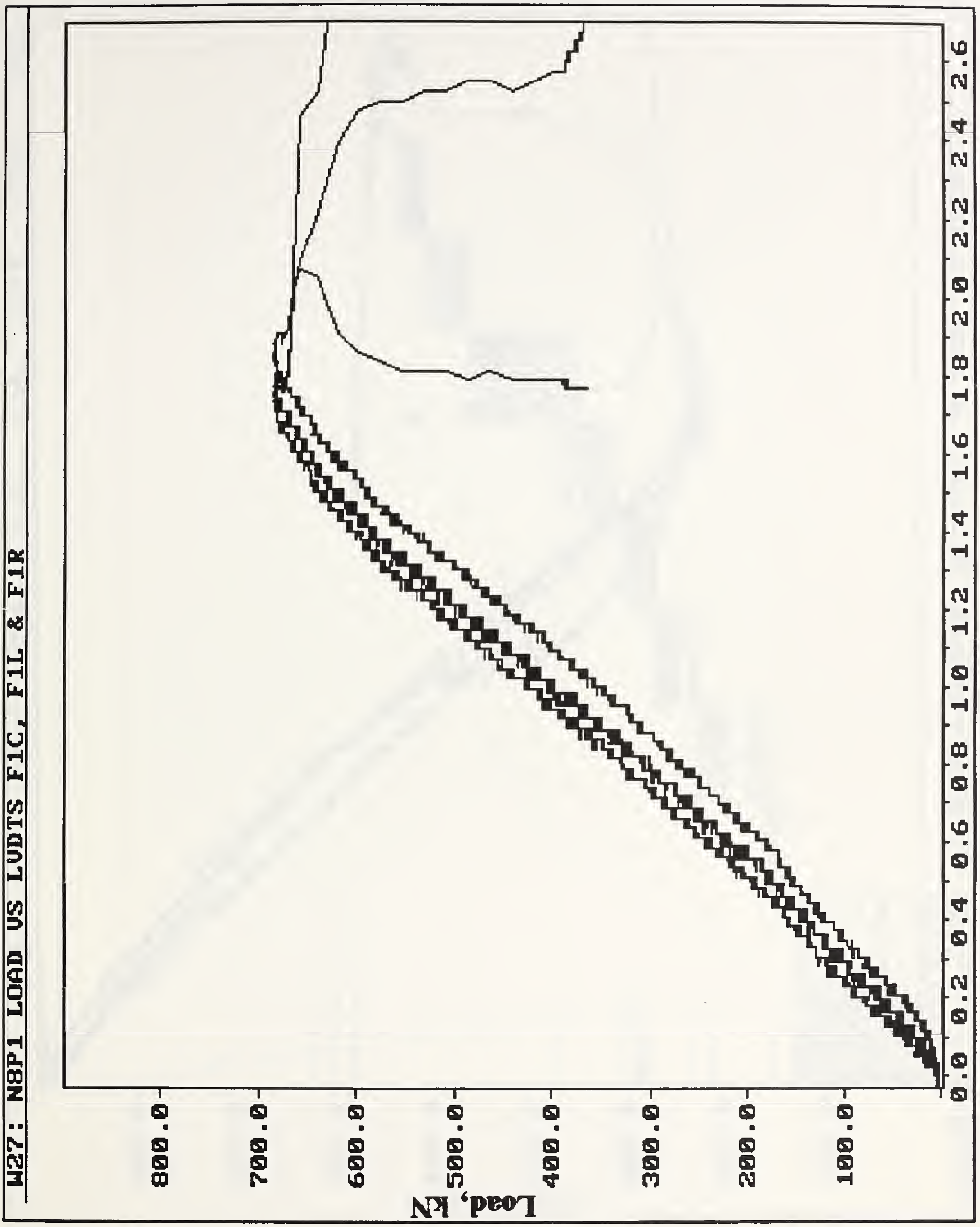

W28: N8NBL LOAD VS LVDTS F2C, F2L & F2R
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.05
0.20
0.35
0.50
0.65
0.80
0.95
1.10
1.25
Displacement, mm

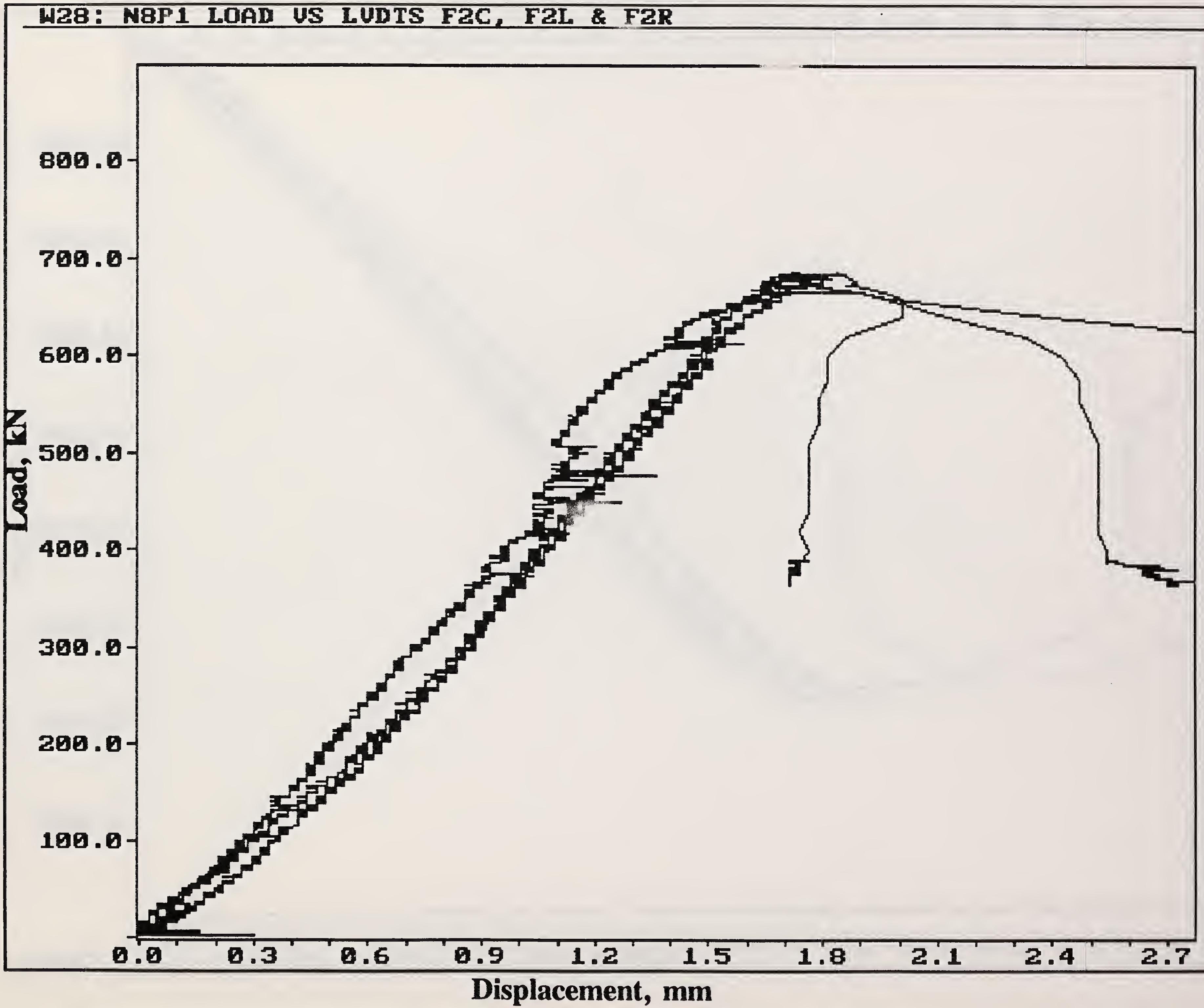

W29: N8NBL LOAD VS LVDTS F1H & F2H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.000
0.010
0.020
0.030
0.040
0.050
Displacement, mm

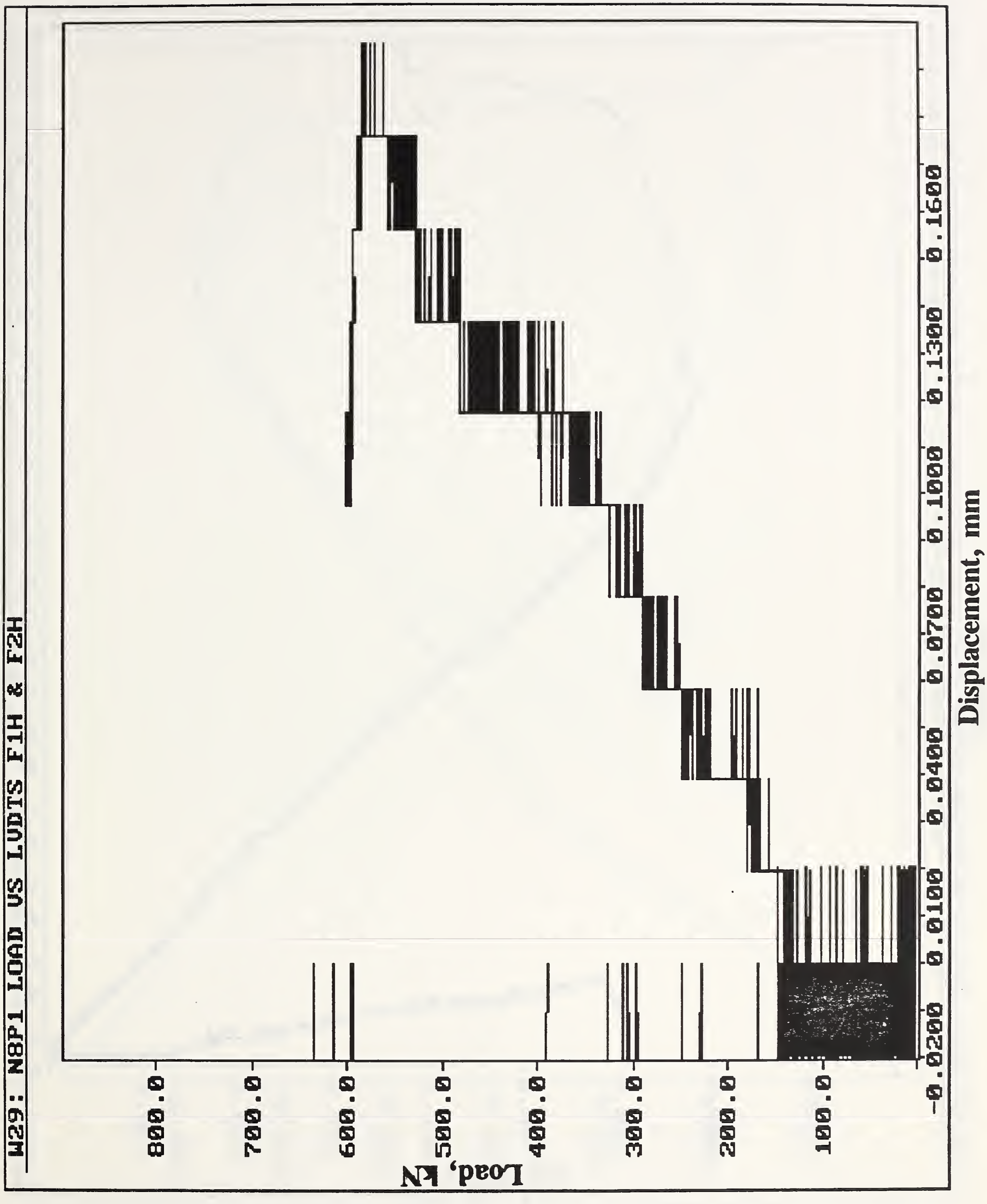

W30: N8NBL LOAD VS LVDTS F1C & F1H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.00
0.15
0.30
0.45
0.60
0.75
0.90
1.05
1.20
Displacement, mm


W25: N8P1 LOAD VS TIME
Load, kN
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

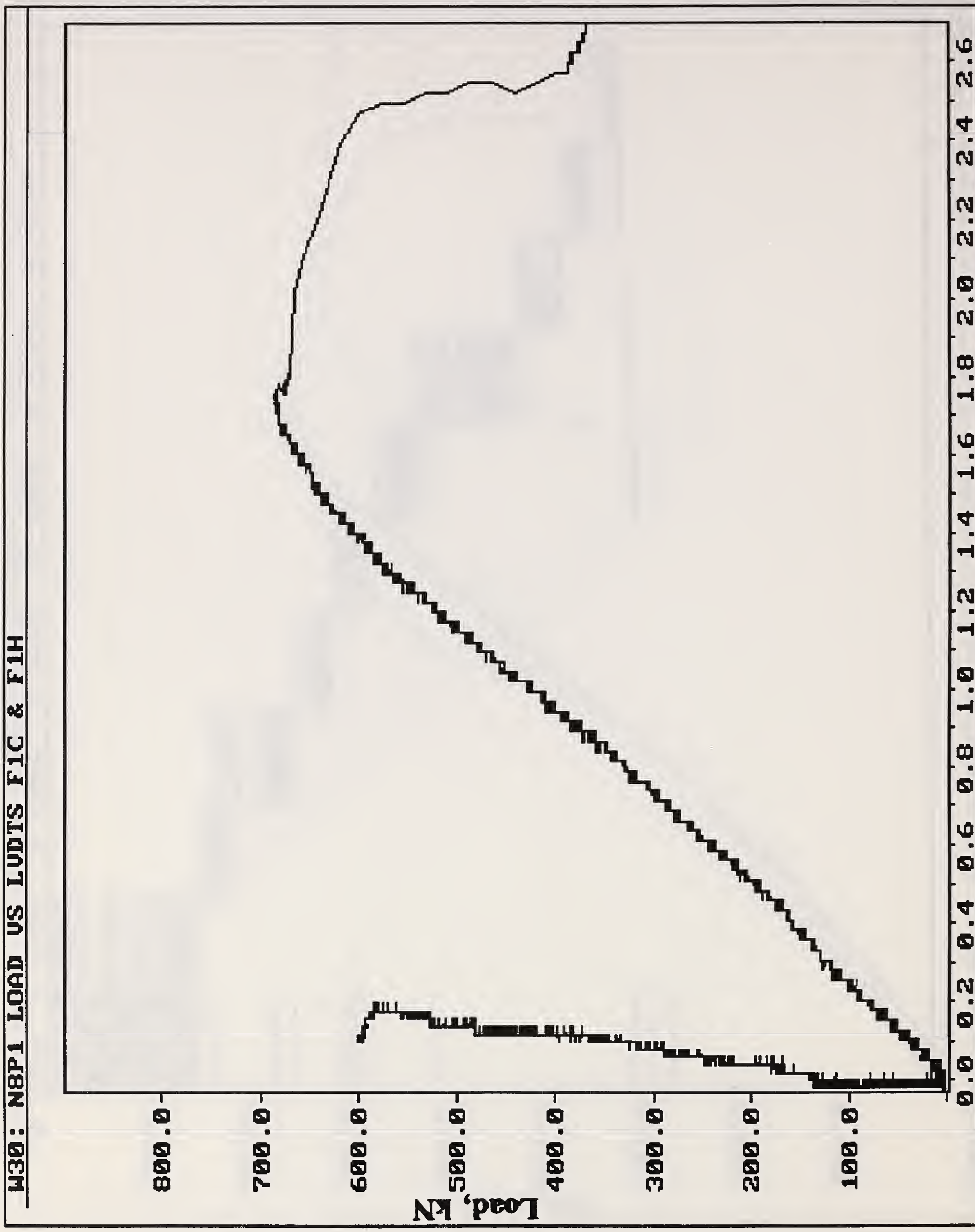

W26: N8P1 LOAD VS LVDTS F1C & F2C
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6
Displacement, mm

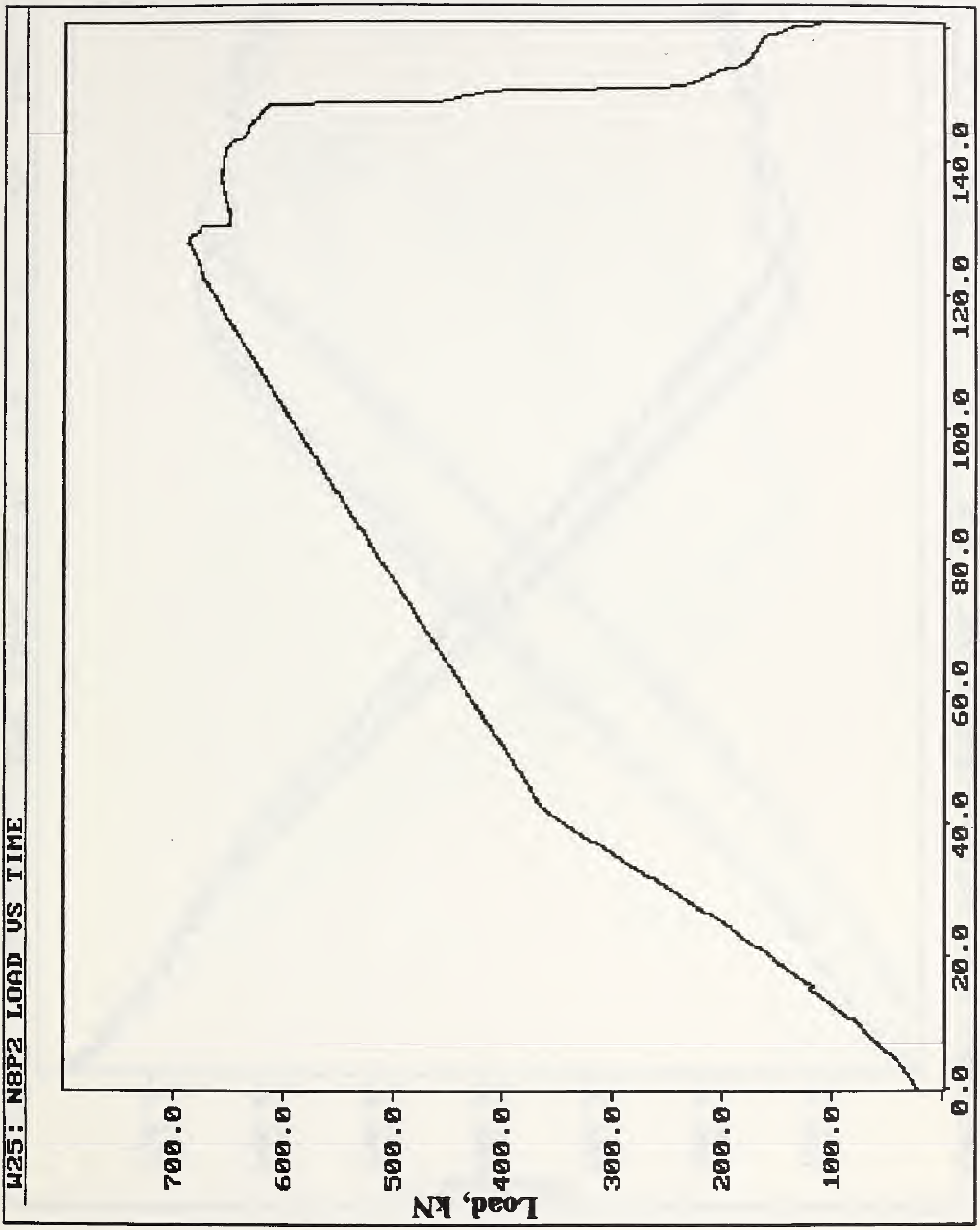

W27: N8P1 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6

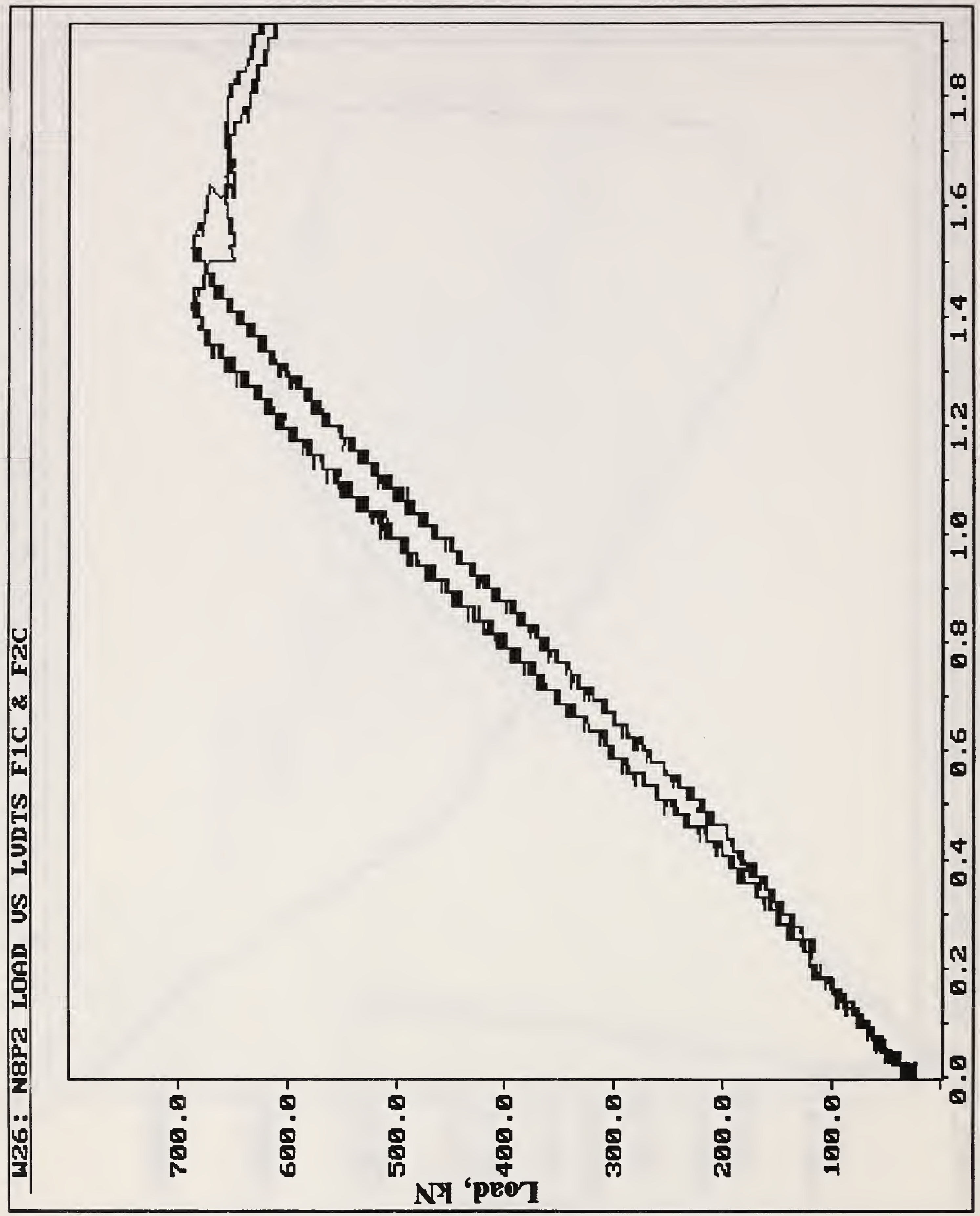

W28: N8P1 LOAD VS LVDTS F2C, F2L & F2R
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
Displacement, mm

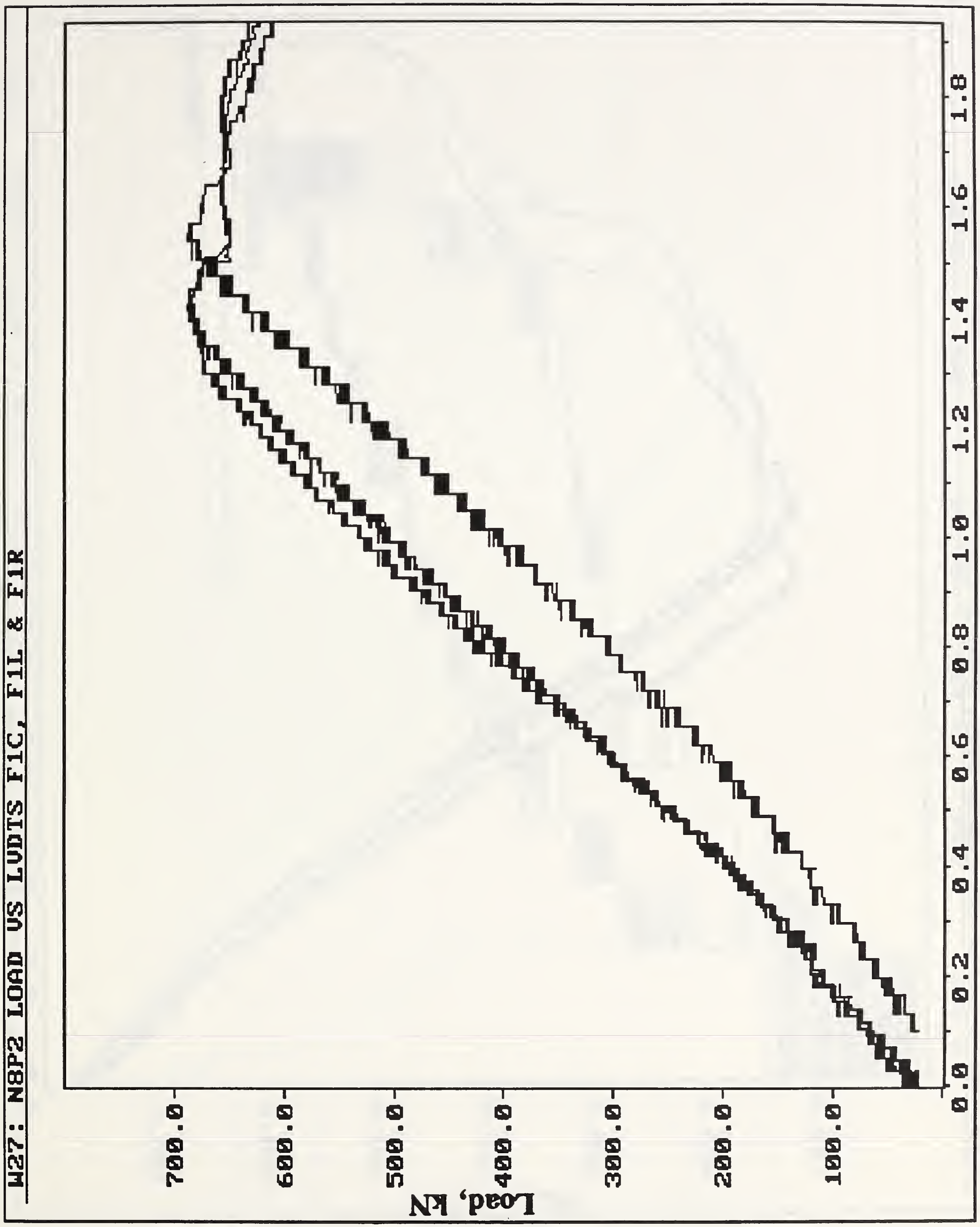


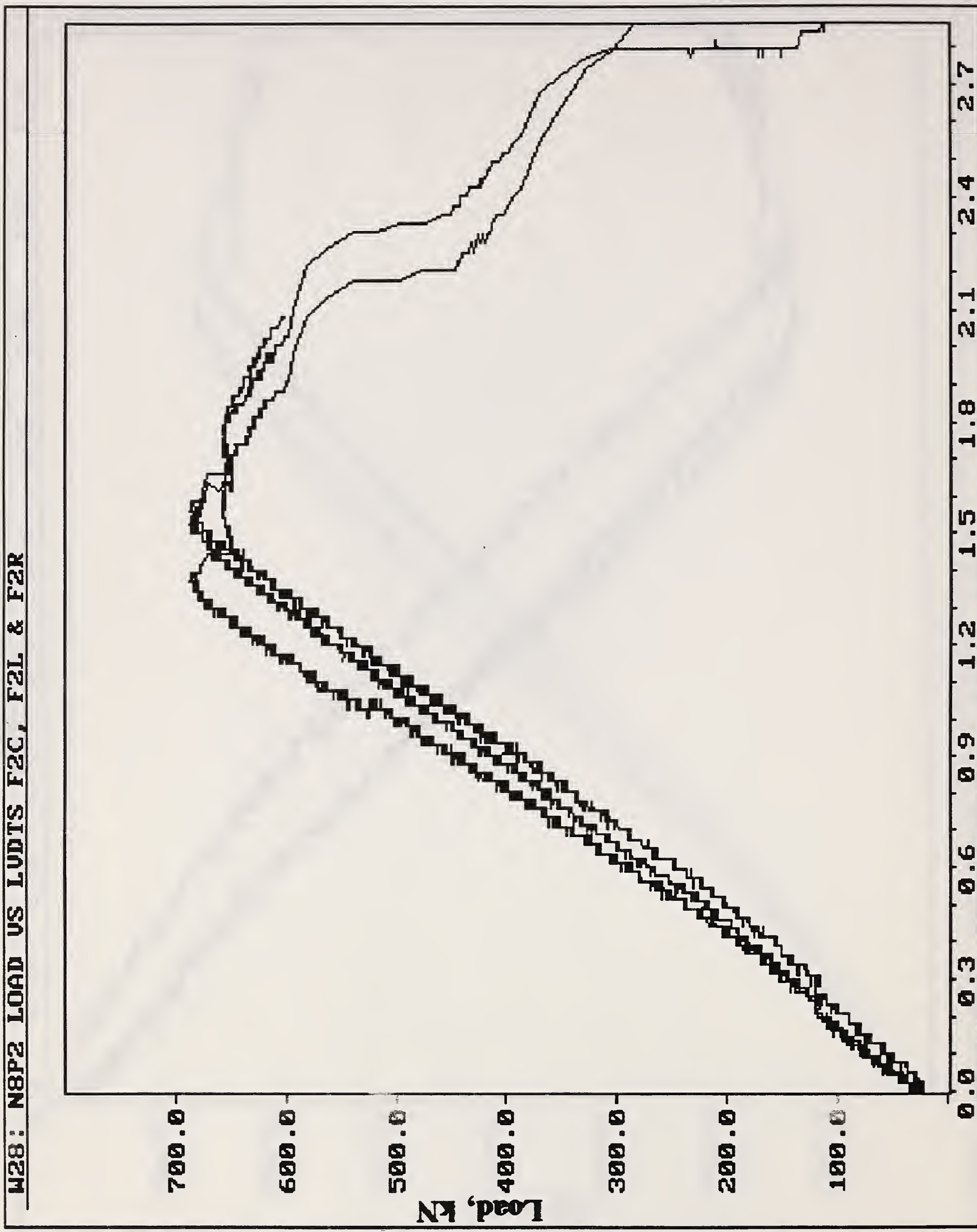
W29: N8P1 LOAD VS LVDTS F1H & F2H
Load, kN
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
-0.0200
0.0100
0.0400
0.0700
0.1000
0.1300
0.1600
Displacement, mm


W30: N8P1 LOAD VS LVDTS F1C & F1H
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
2.6

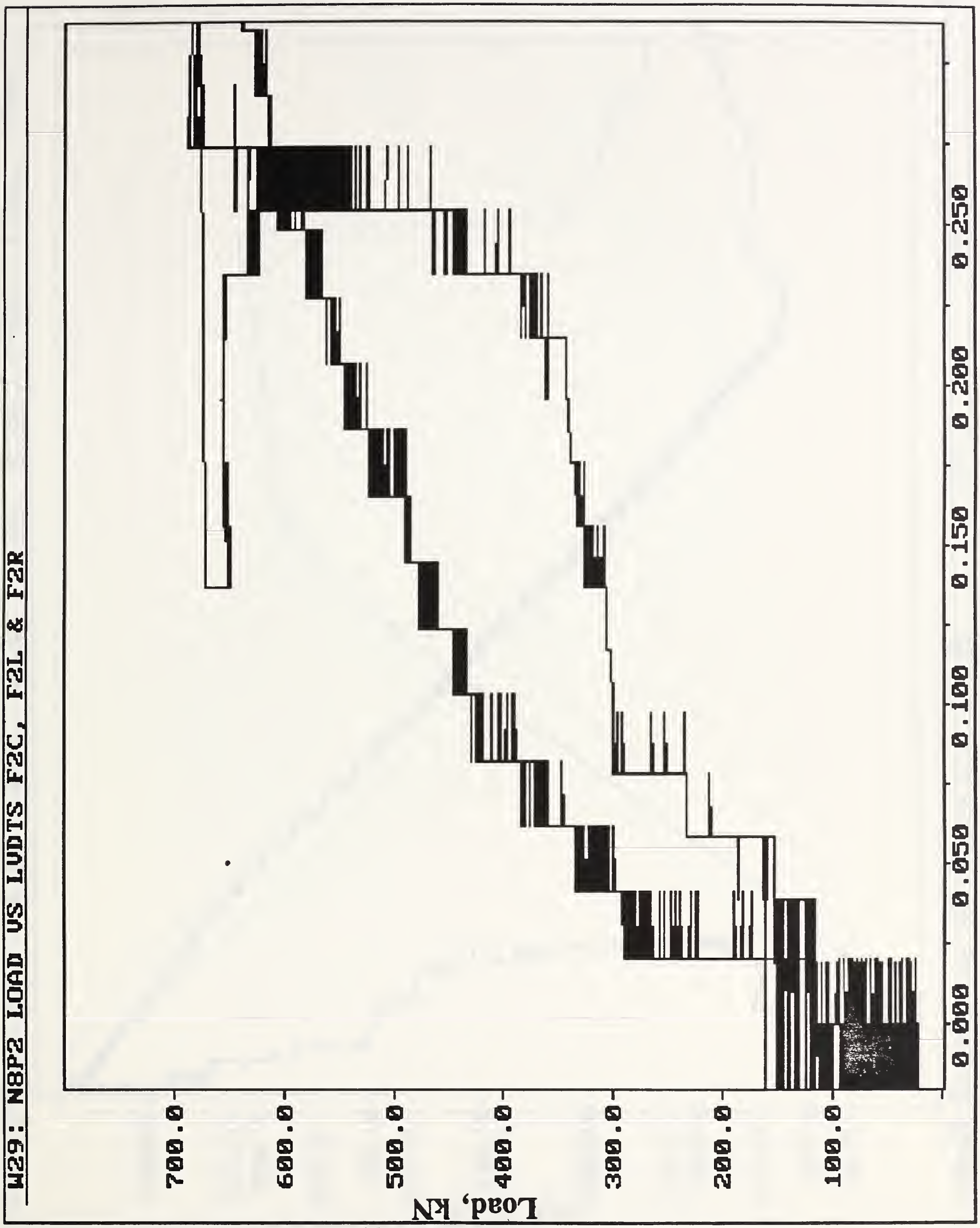

W25: N8P2 LOAD VS TIME
Load, kN
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time, sec


W26: N8P2 LOAD VS LVDTS F1C & F2C
Load, kN
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

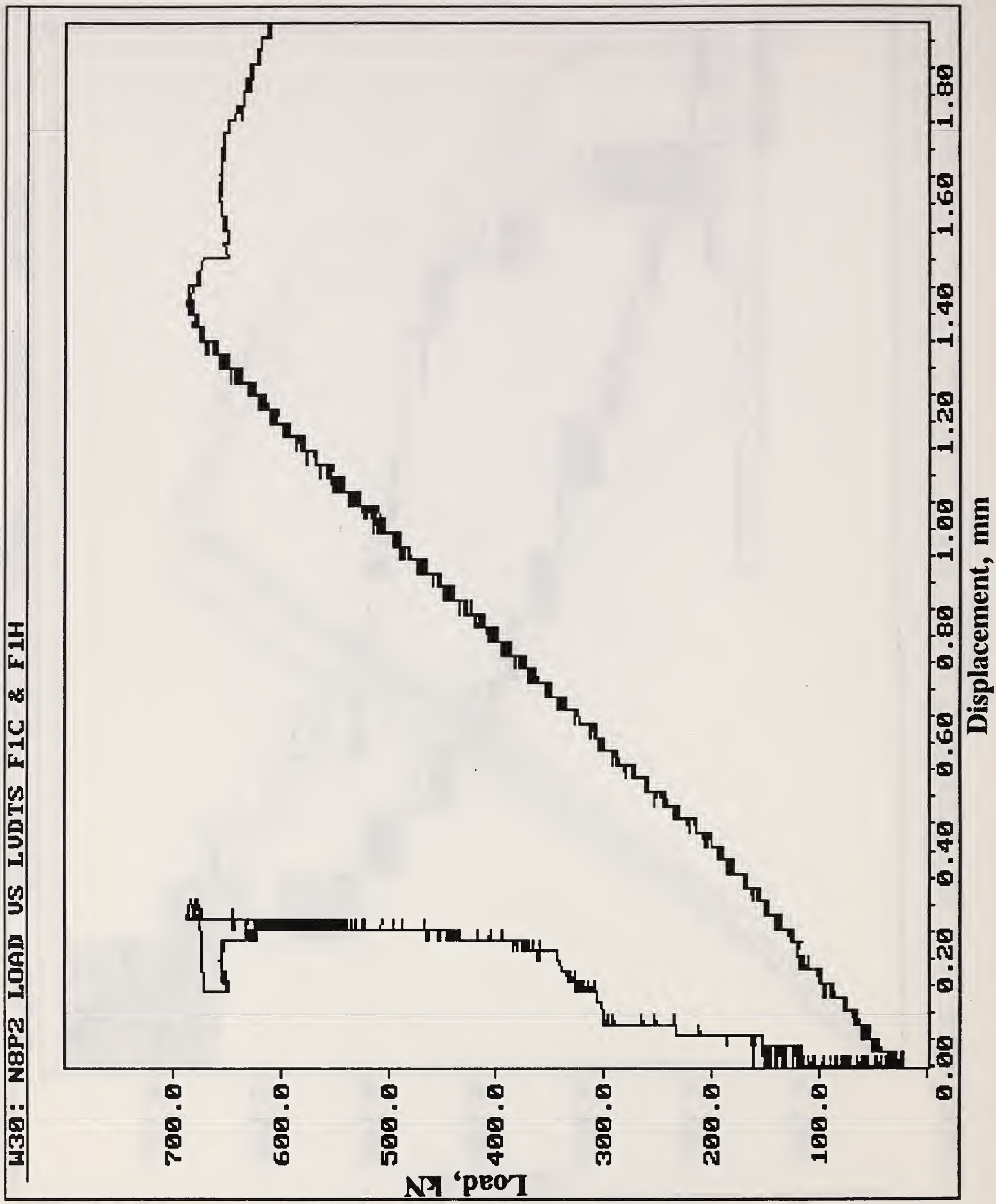

W27: N8P2 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

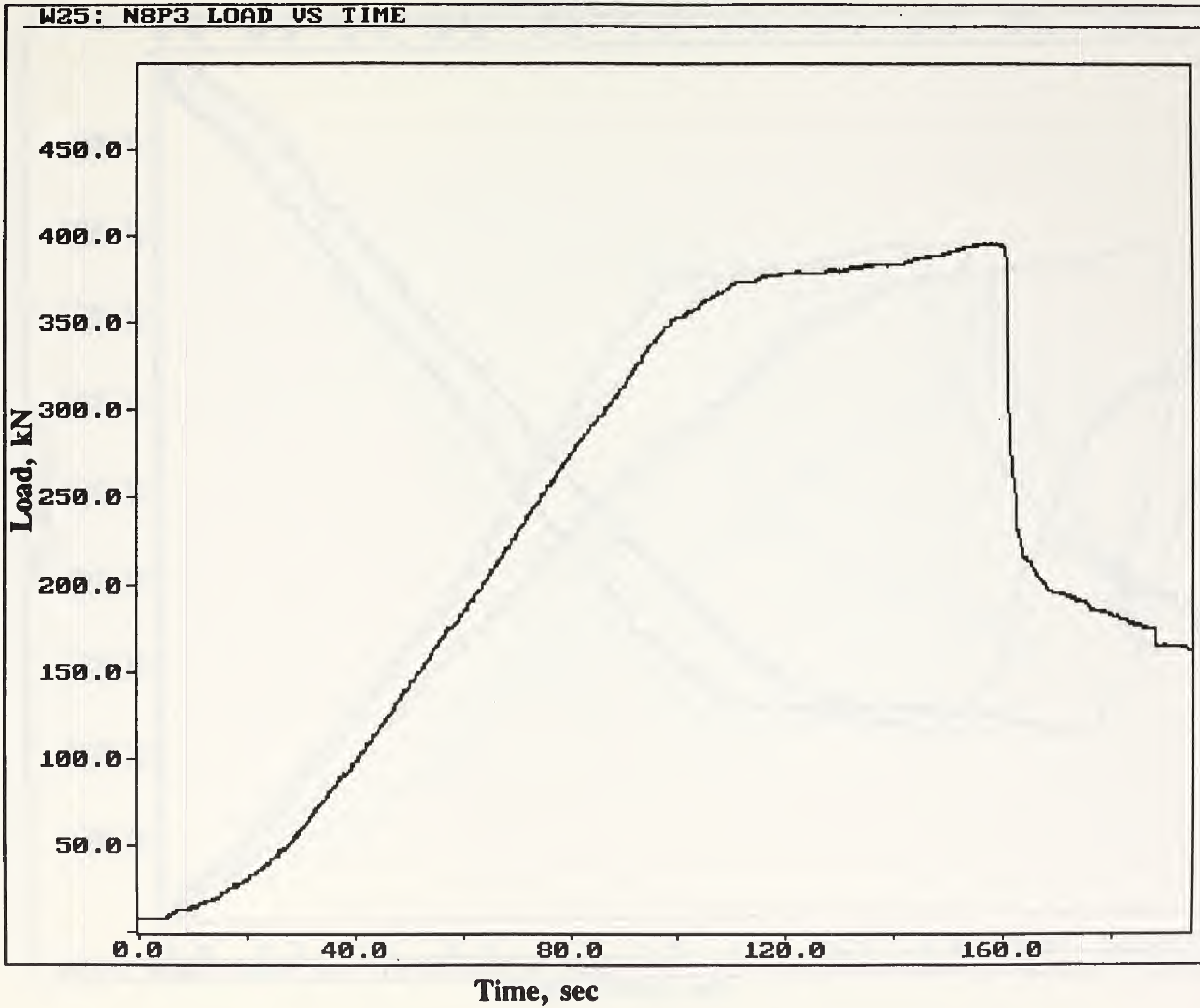


W28: N8P2 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
Displacement, mm

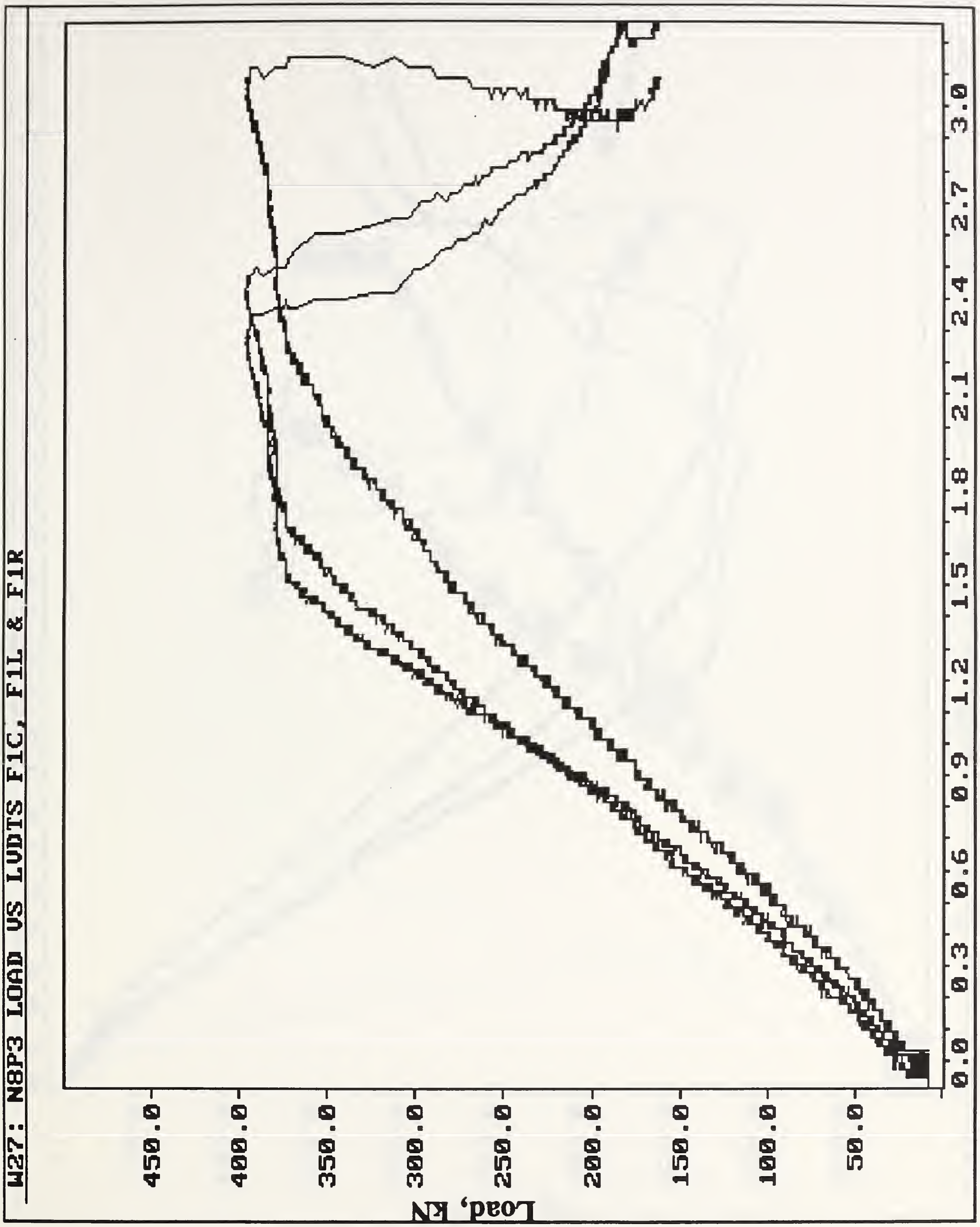


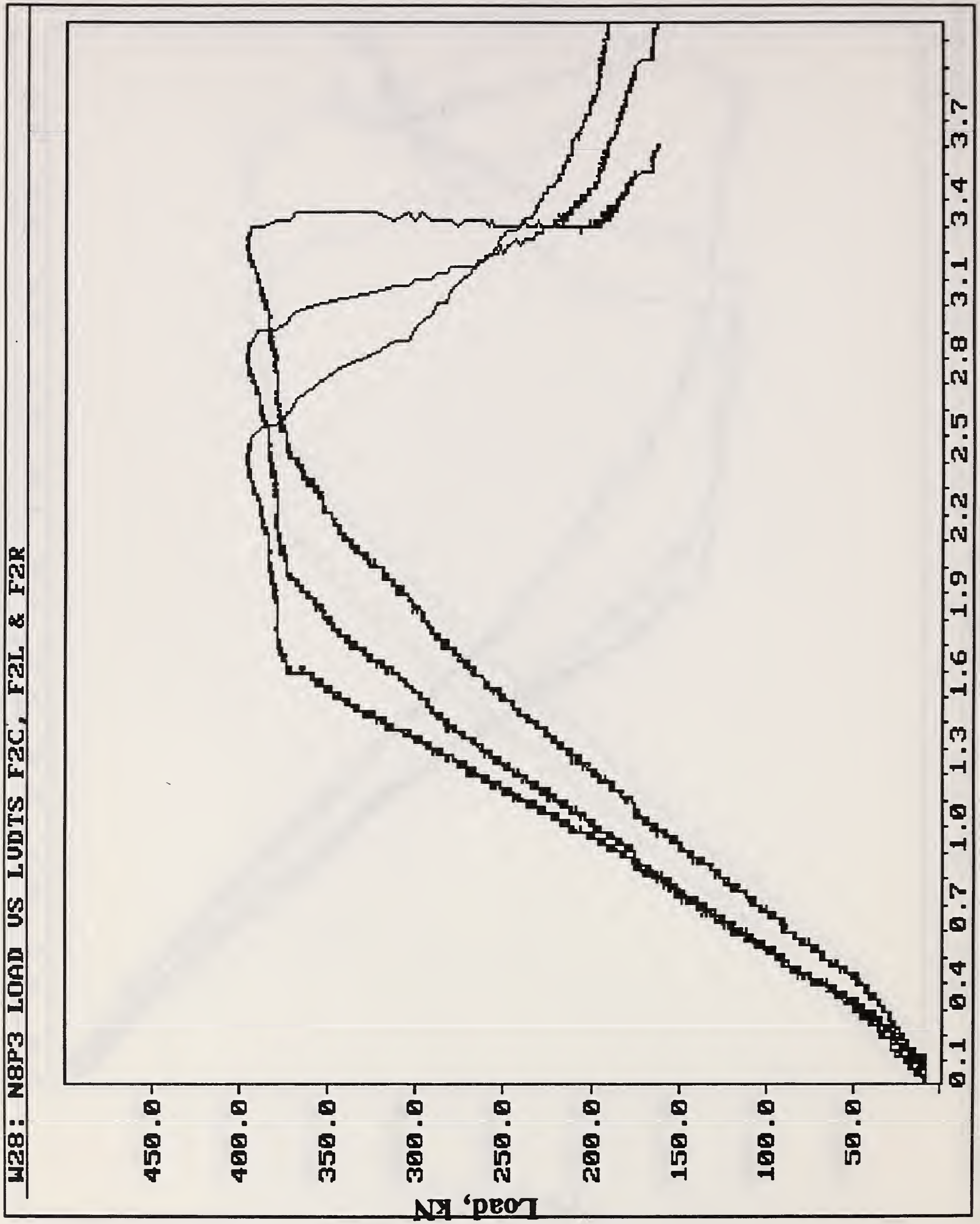
W29: N8P2 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
Displacement, mm
0.000
0.050
0.100
0.150
0.200
0.250


W30: N8P2 LOAD VS LVDTS F1C & F1H
Load, kN
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60
1.80
Displacement, mm

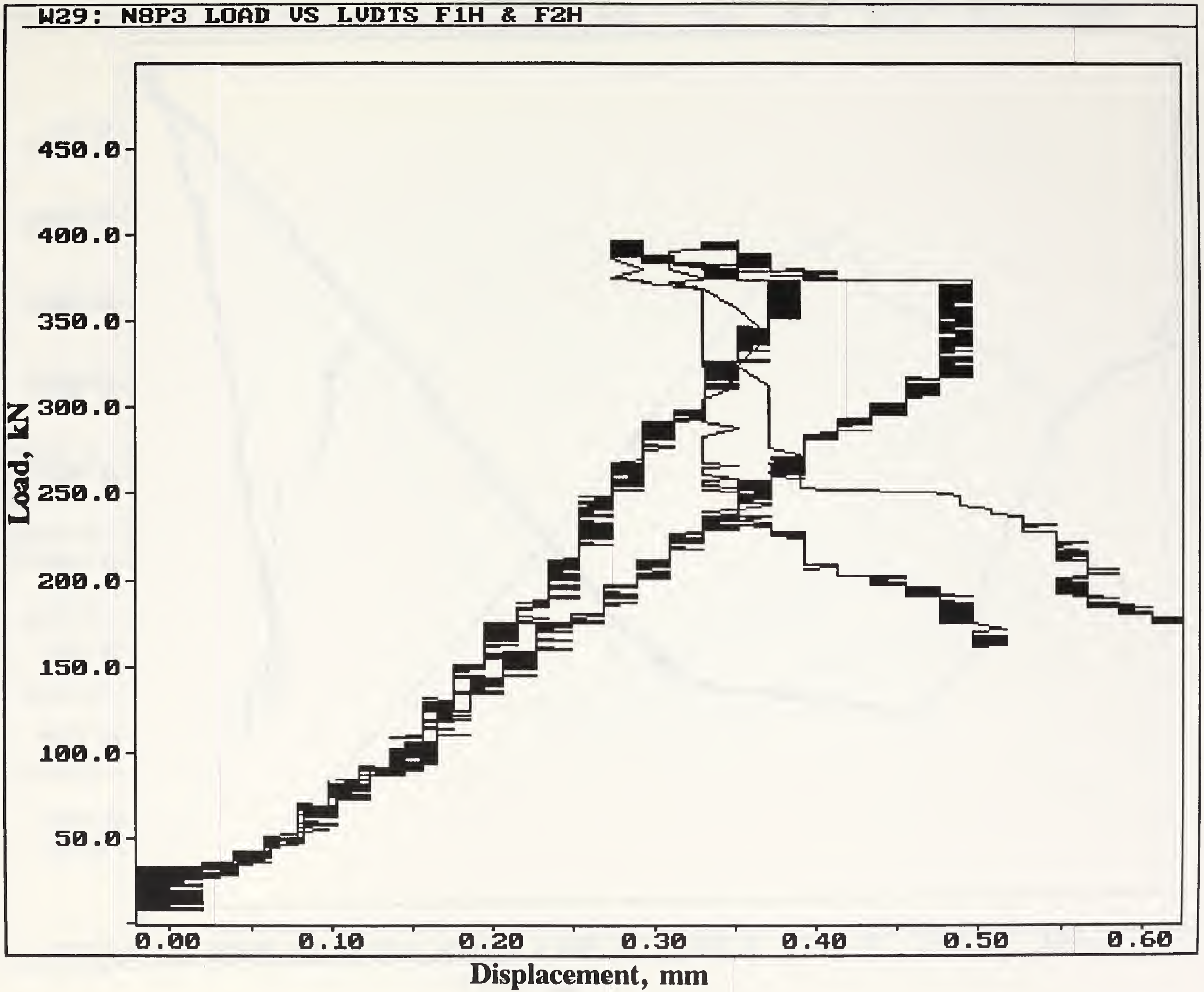

W25: N8P3 LOAD VS TIME
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.0
40.0
80.0
120.0
160.0
Time, sec

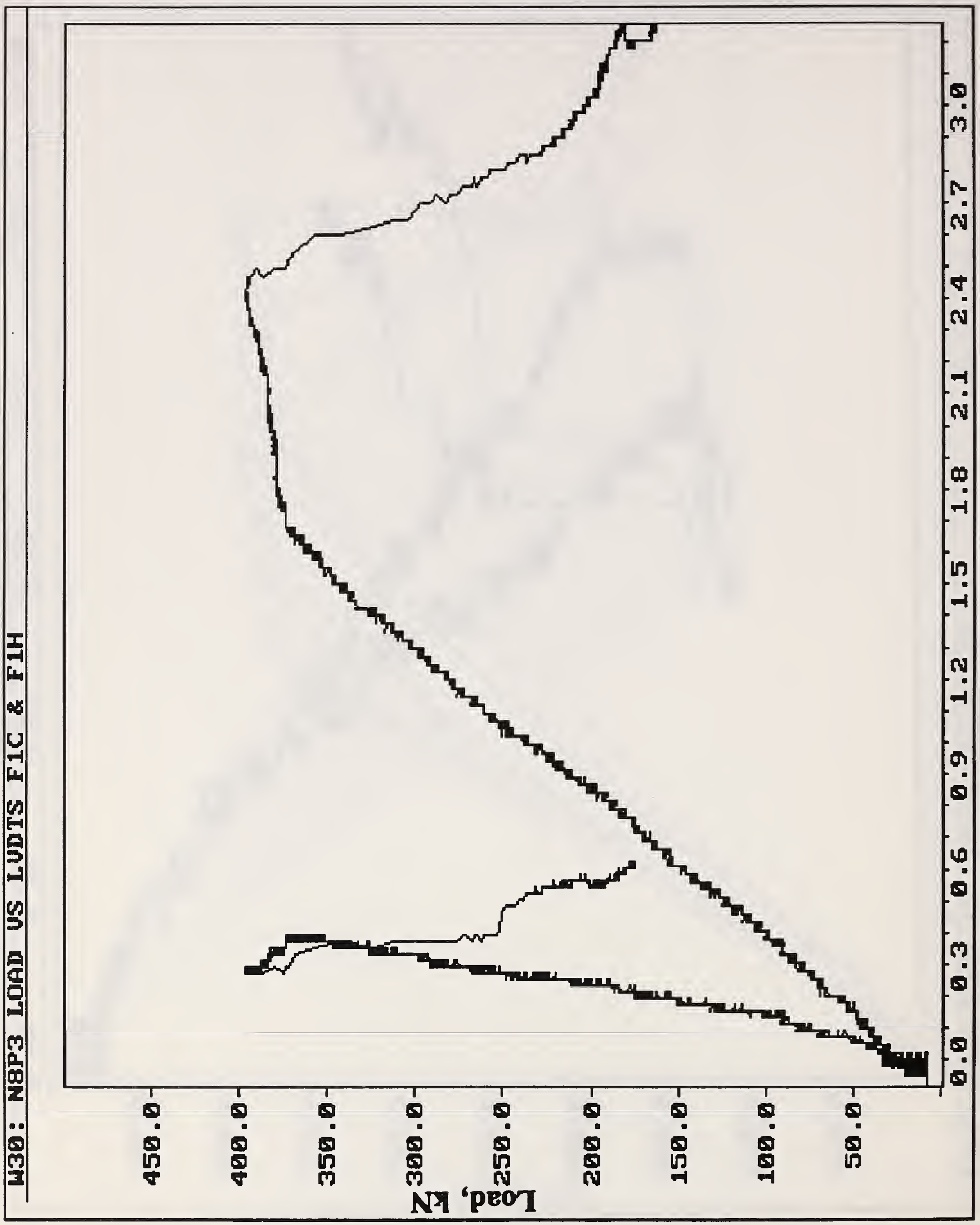

W26: N8P3 LOAD VS LVDTS F1C & F2C
Load, kN
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
3.0
Displacement, mm

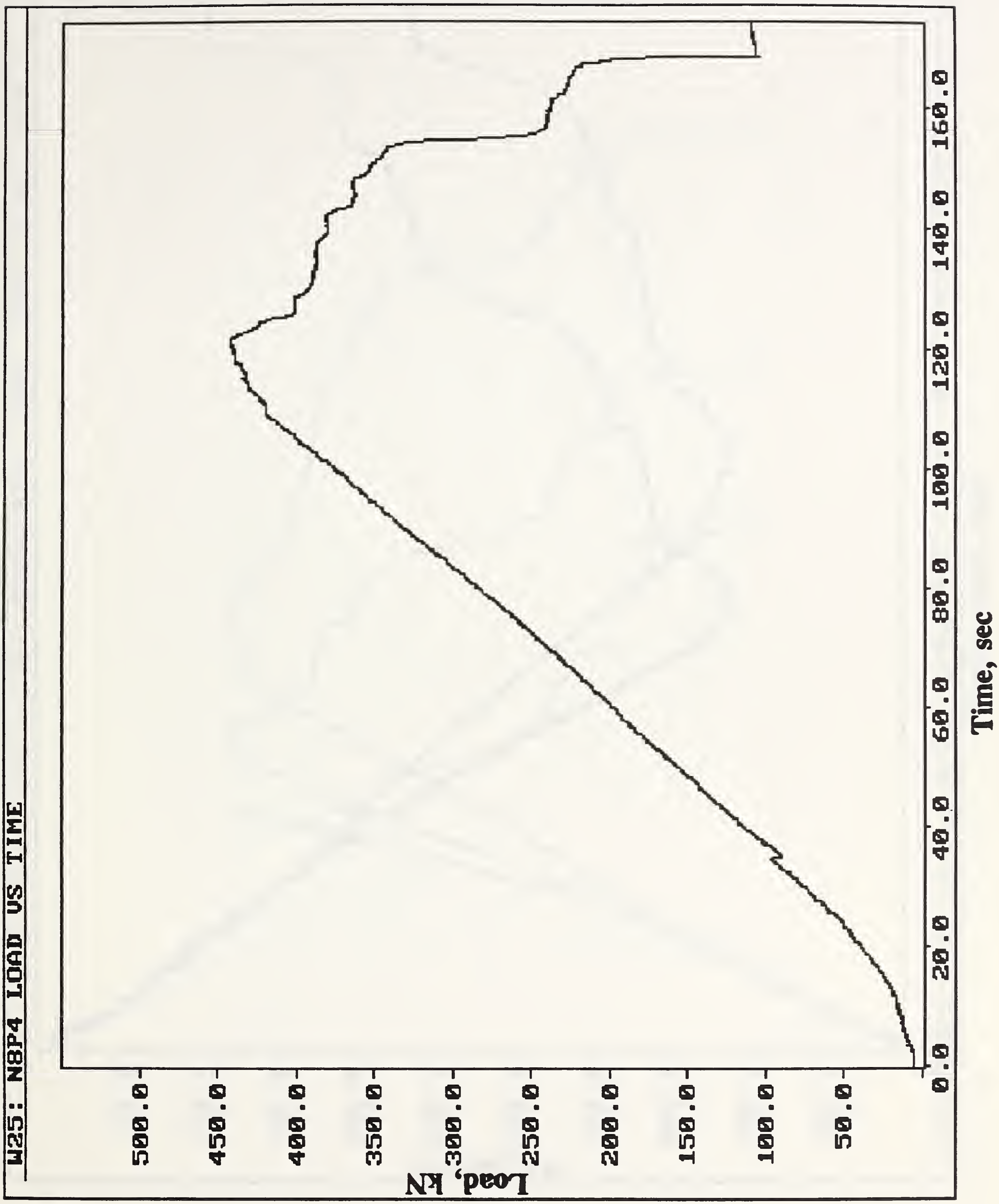

W27: N8P3 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
3.0
Displacement, mm

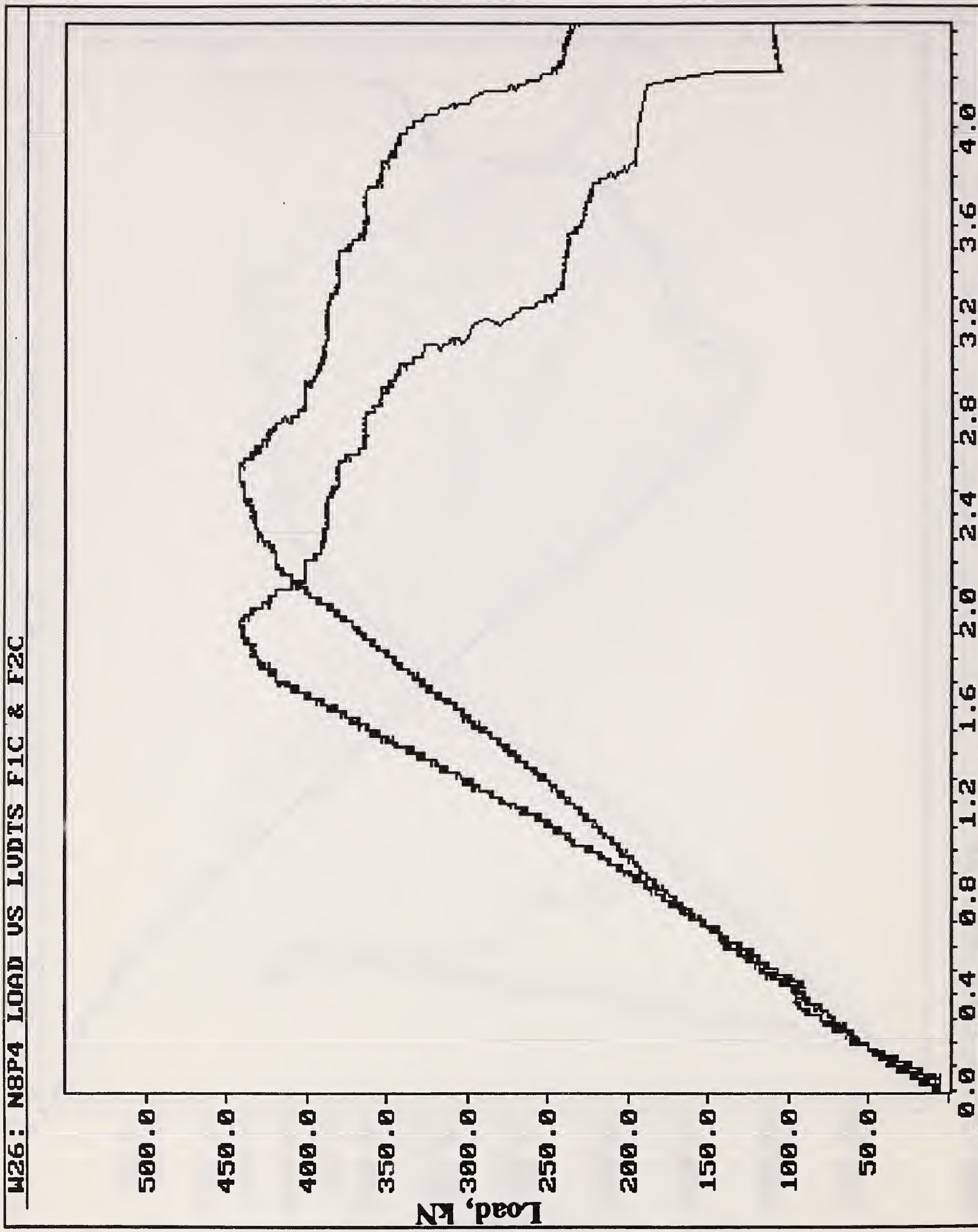


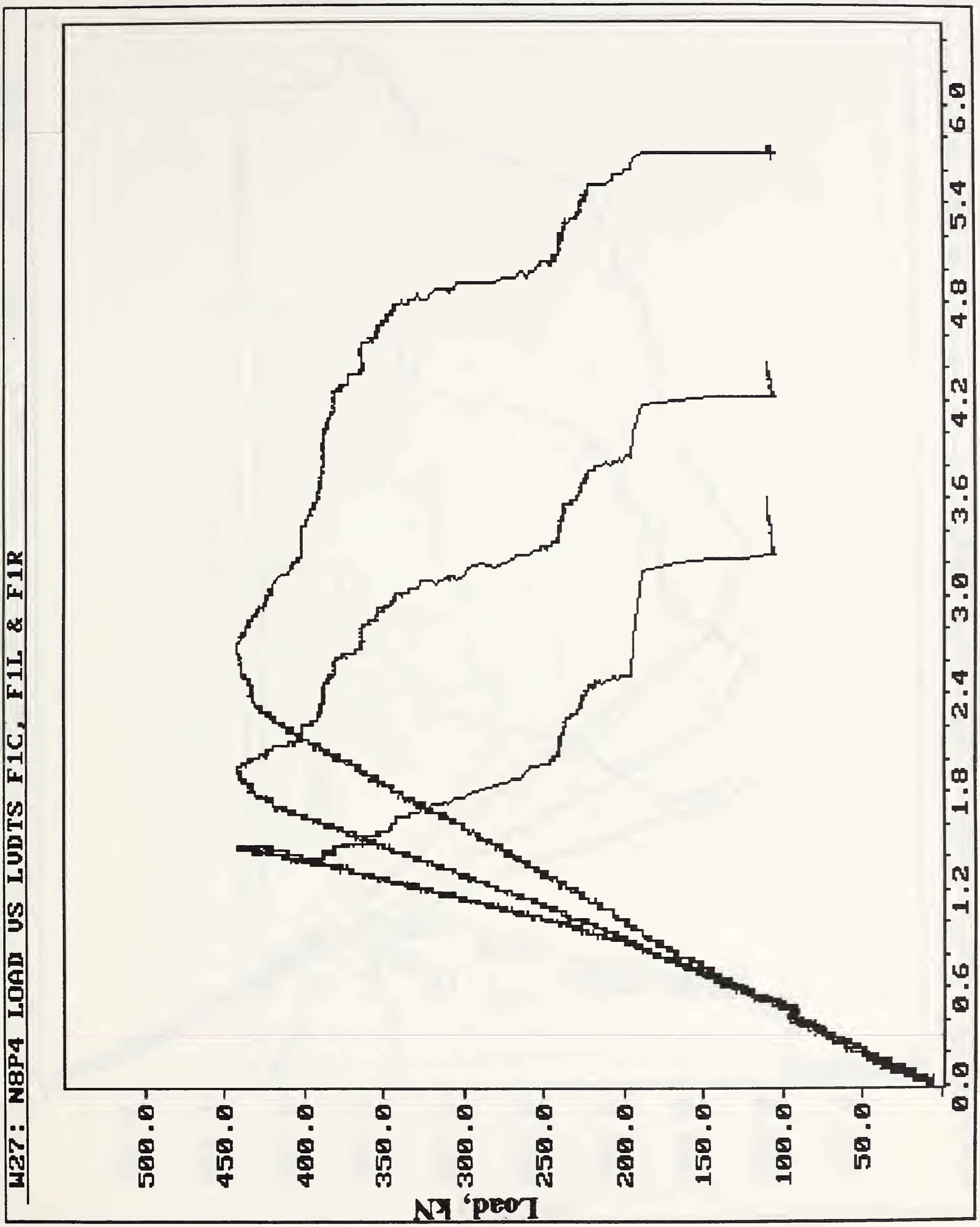
W28: N8P3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.1
0.1
0.4
0.7
1.0
1.3
1.6
1.9
2.2
2.5
2.8
3.1
3.4
3.7


W29: N8P3 LOAD VS LVDTS F1H & F2H
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.00
0.10
0.20
0.30
0.40
0.50
0.60
Displacement, mm

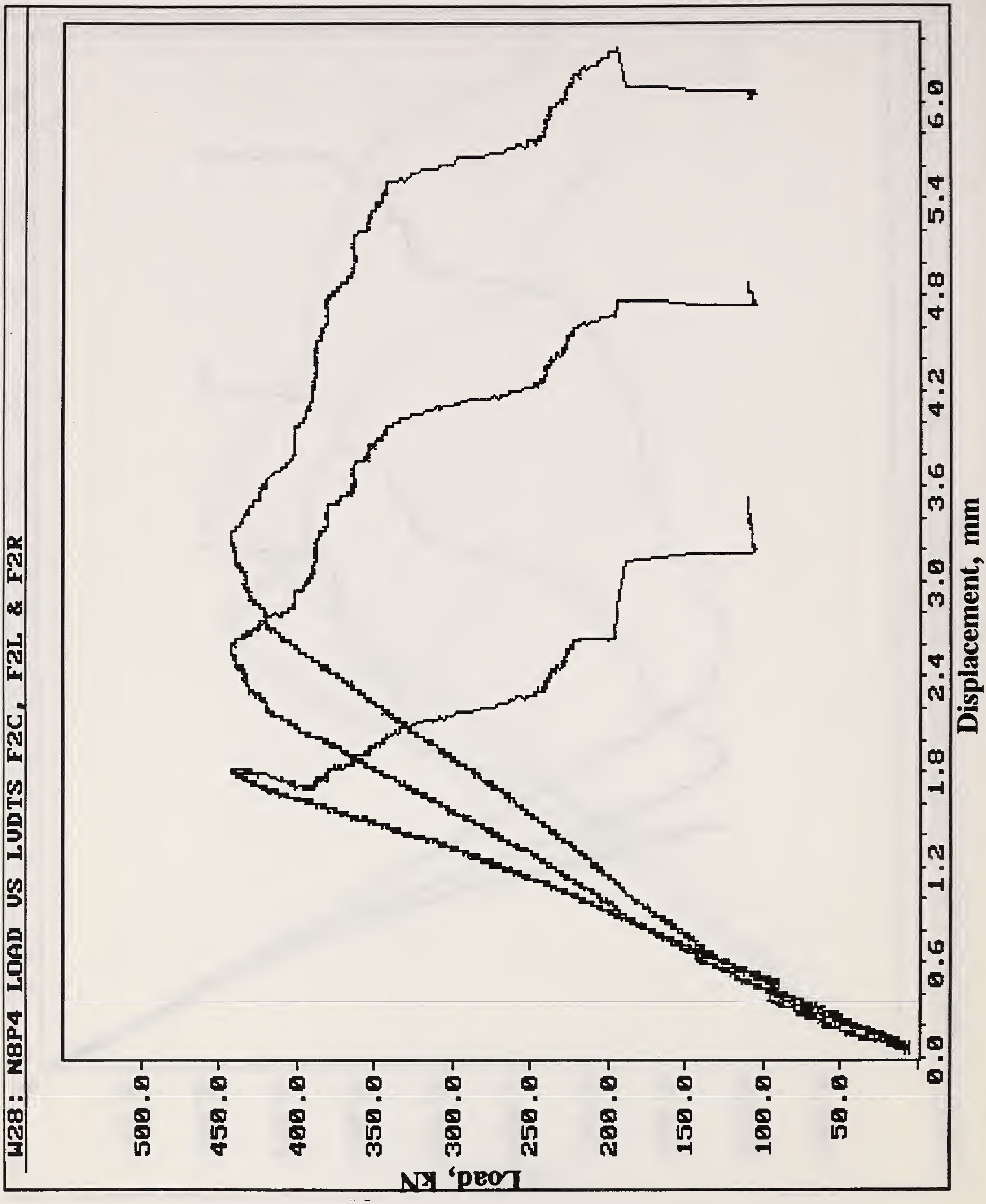

W30: N8P3 LOAD VS LVDTS F1C & F1H
Load, kN
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
3.0

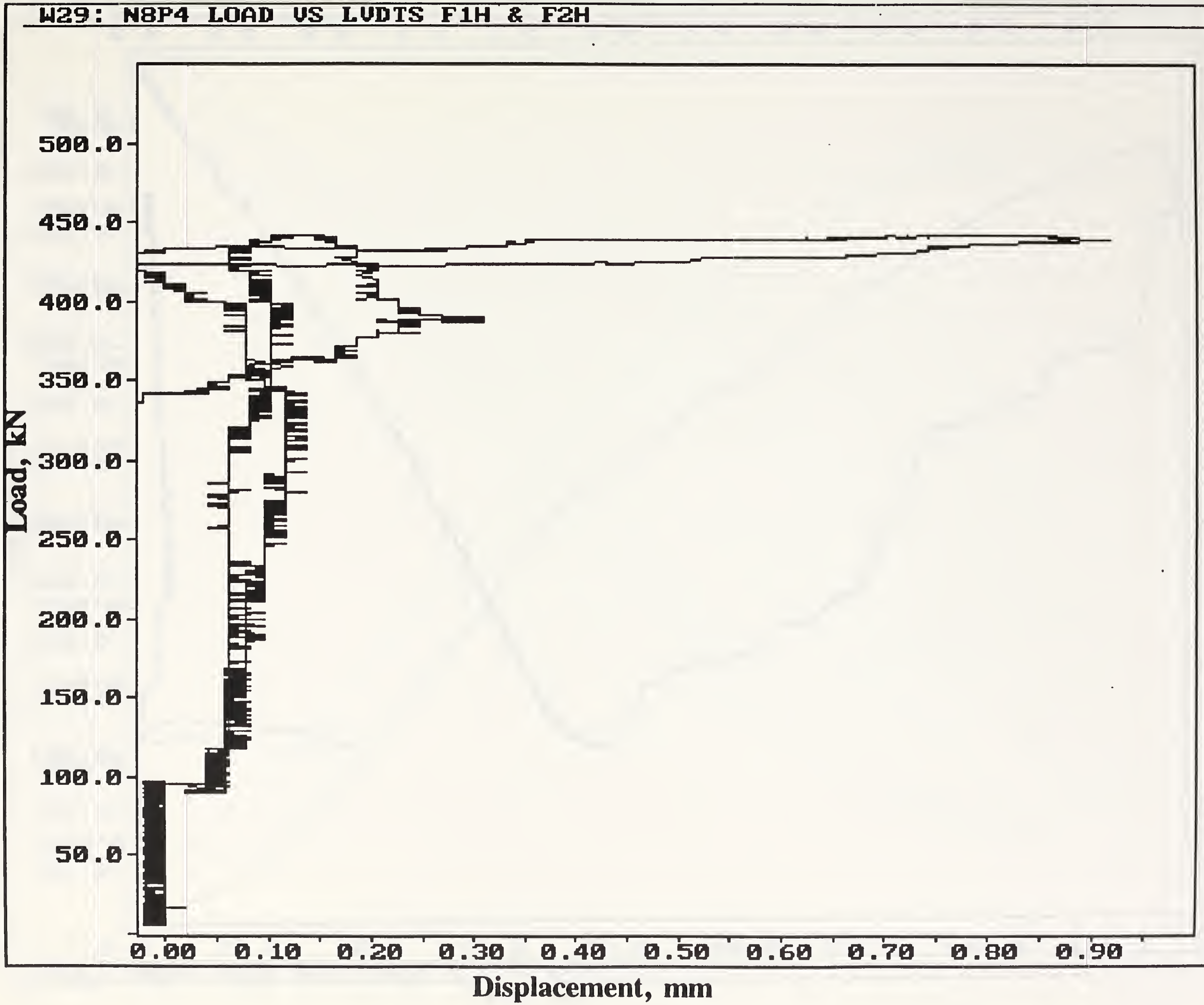

W25: N8P4 LOAD VS TIME
Load, kN
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time, sec

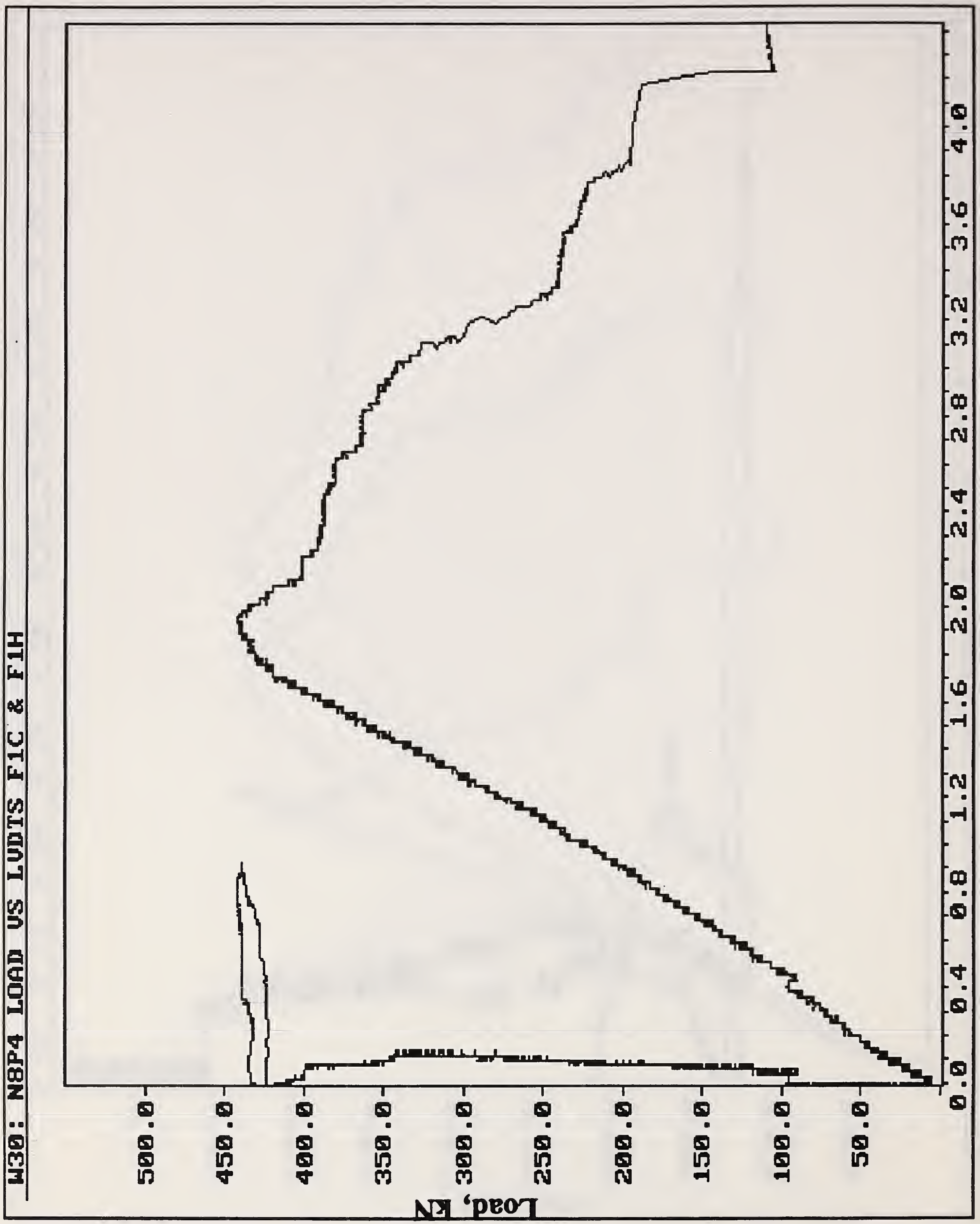

W26: N8P4 LOAD VS LVDTS F1C & F2C
Load, kN
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
3.2
3.6
4.0

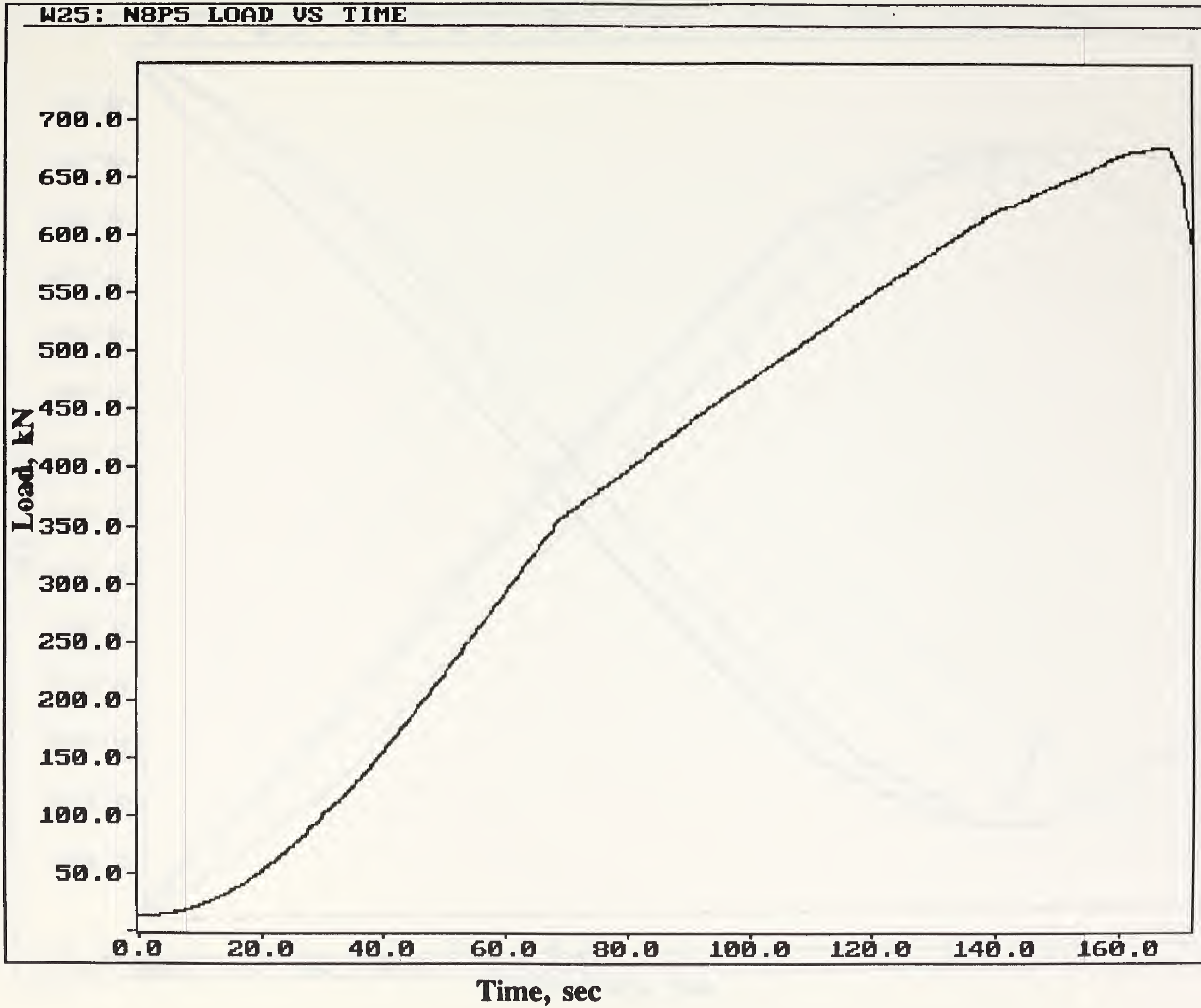


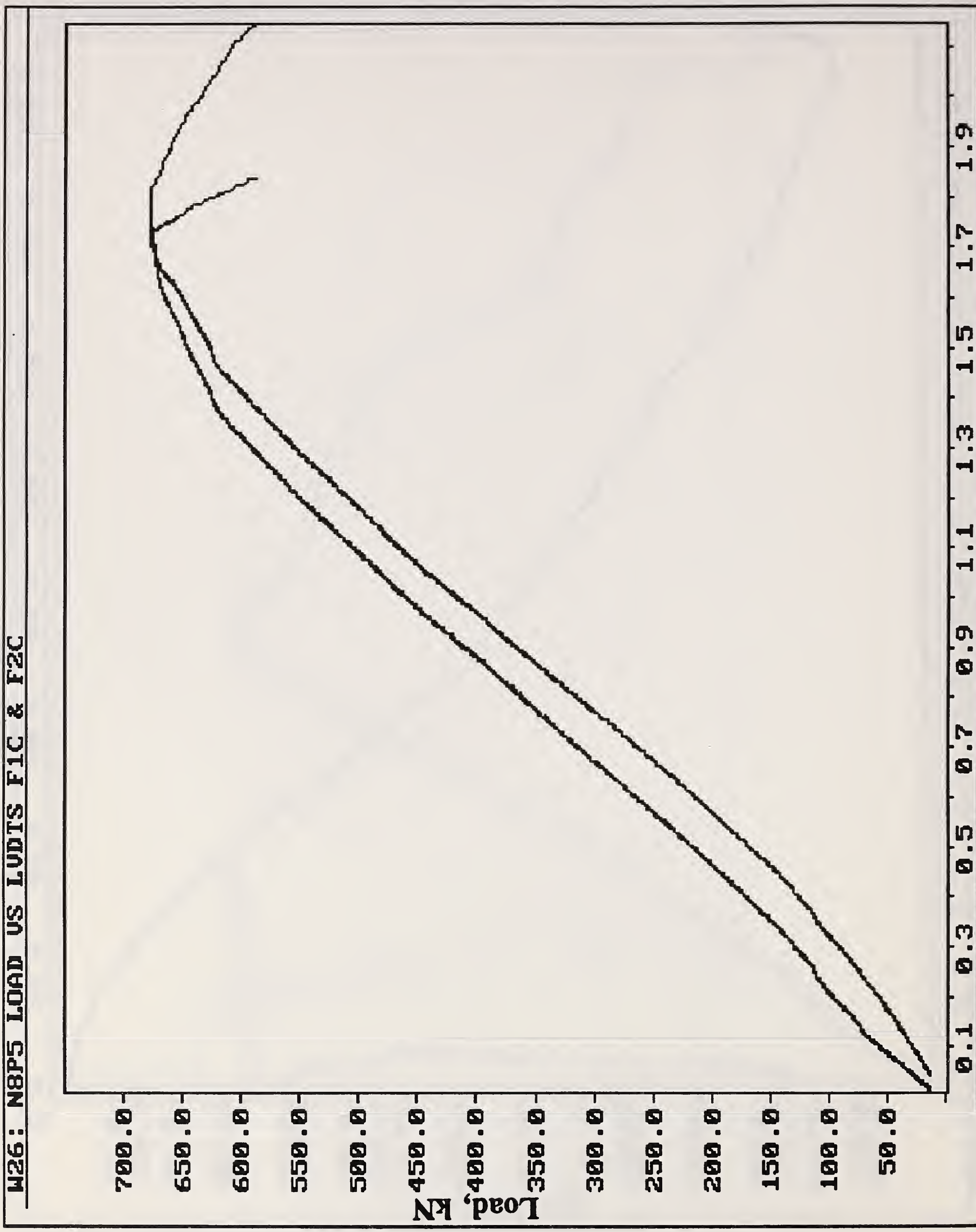
W27: N8P4 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
5.4
6.0
Displacement, mm


W28: N8P4 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
5.4
6.0
Displacement, mm

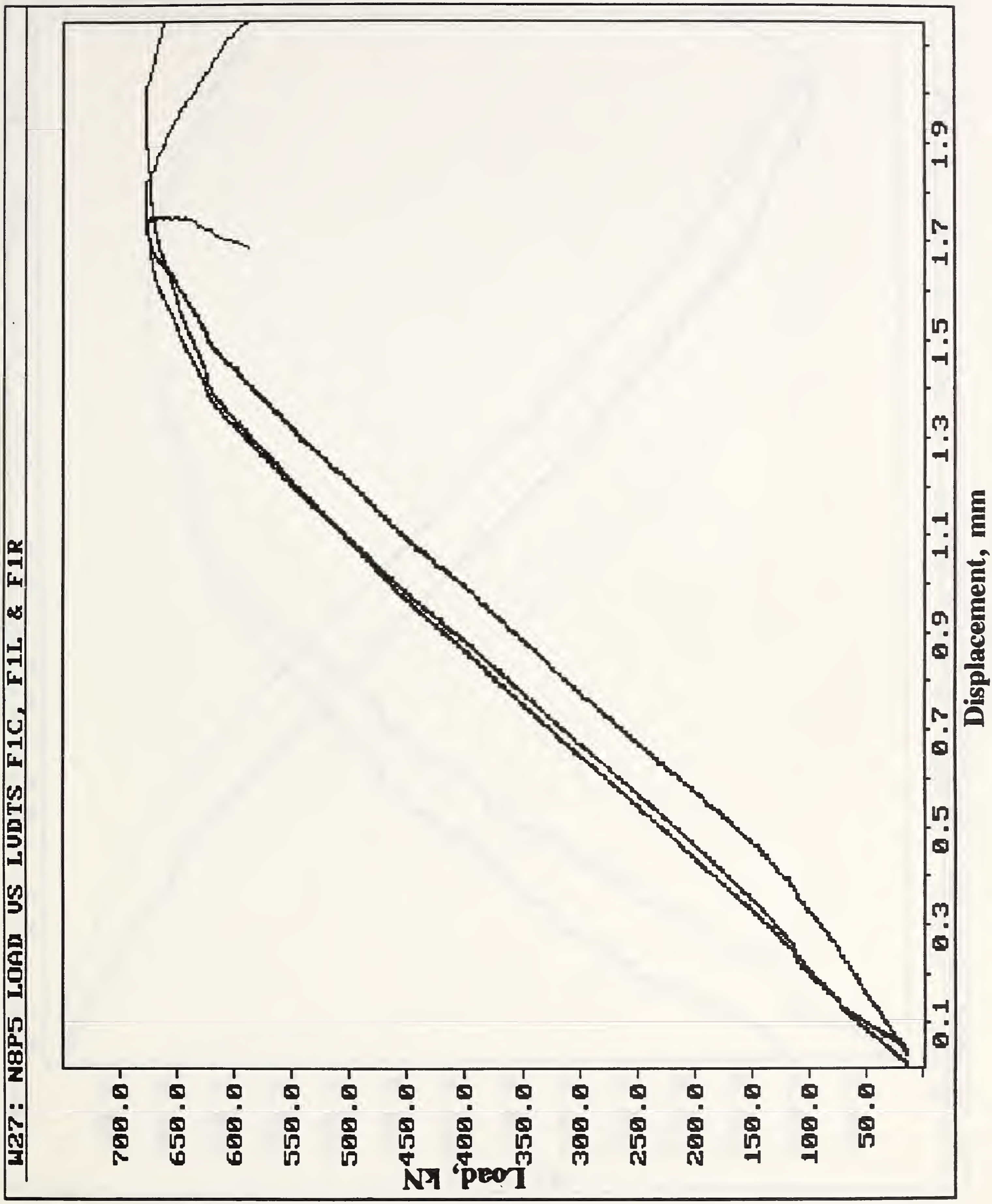

W29: N8P4 LOAD VS LVDTS F1H & F2H
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
Displacement, mm

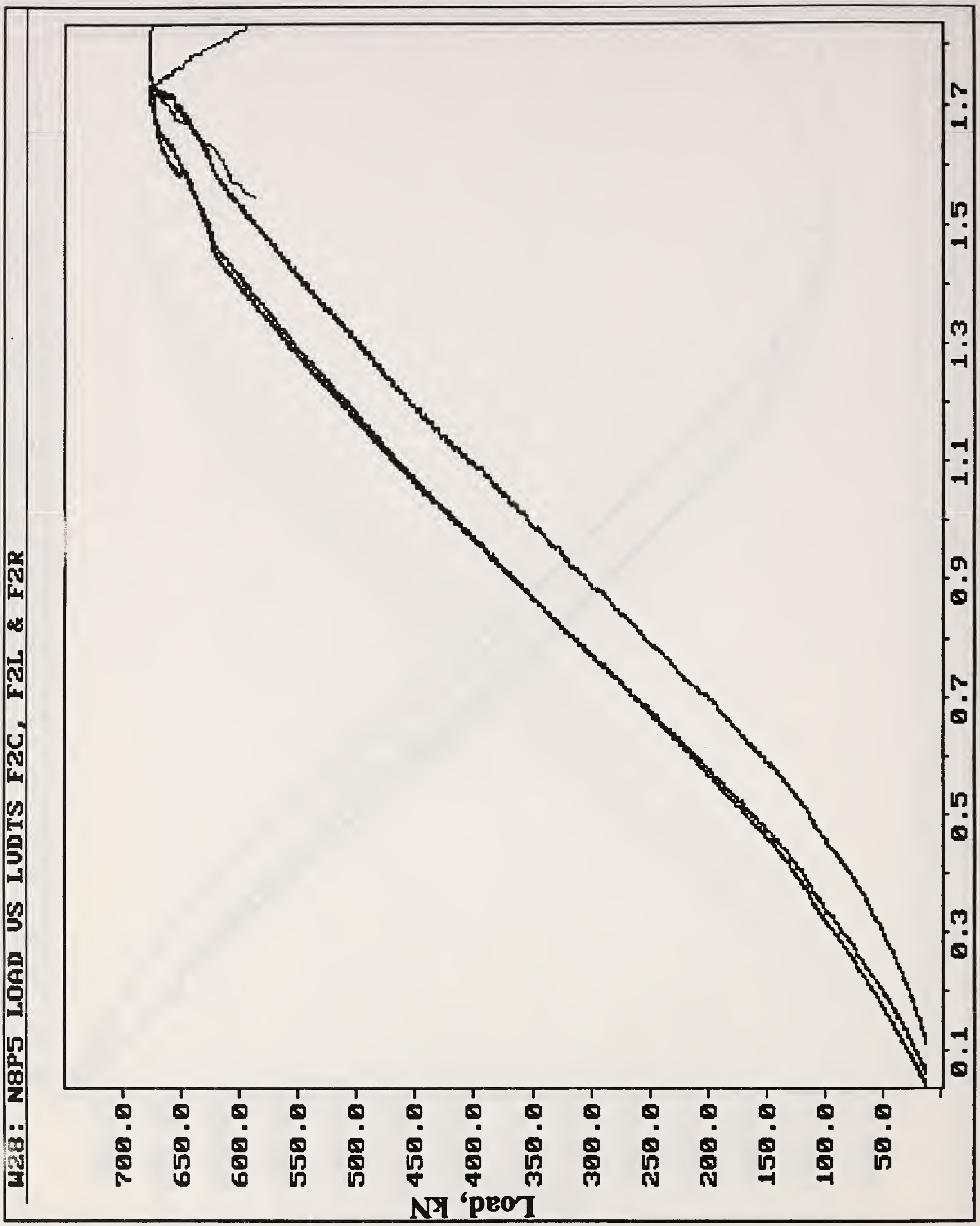

W30: N8P4 LOAD VS LVDTS F1C & F1H
Load, KN
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
3.2
3.6
4.0

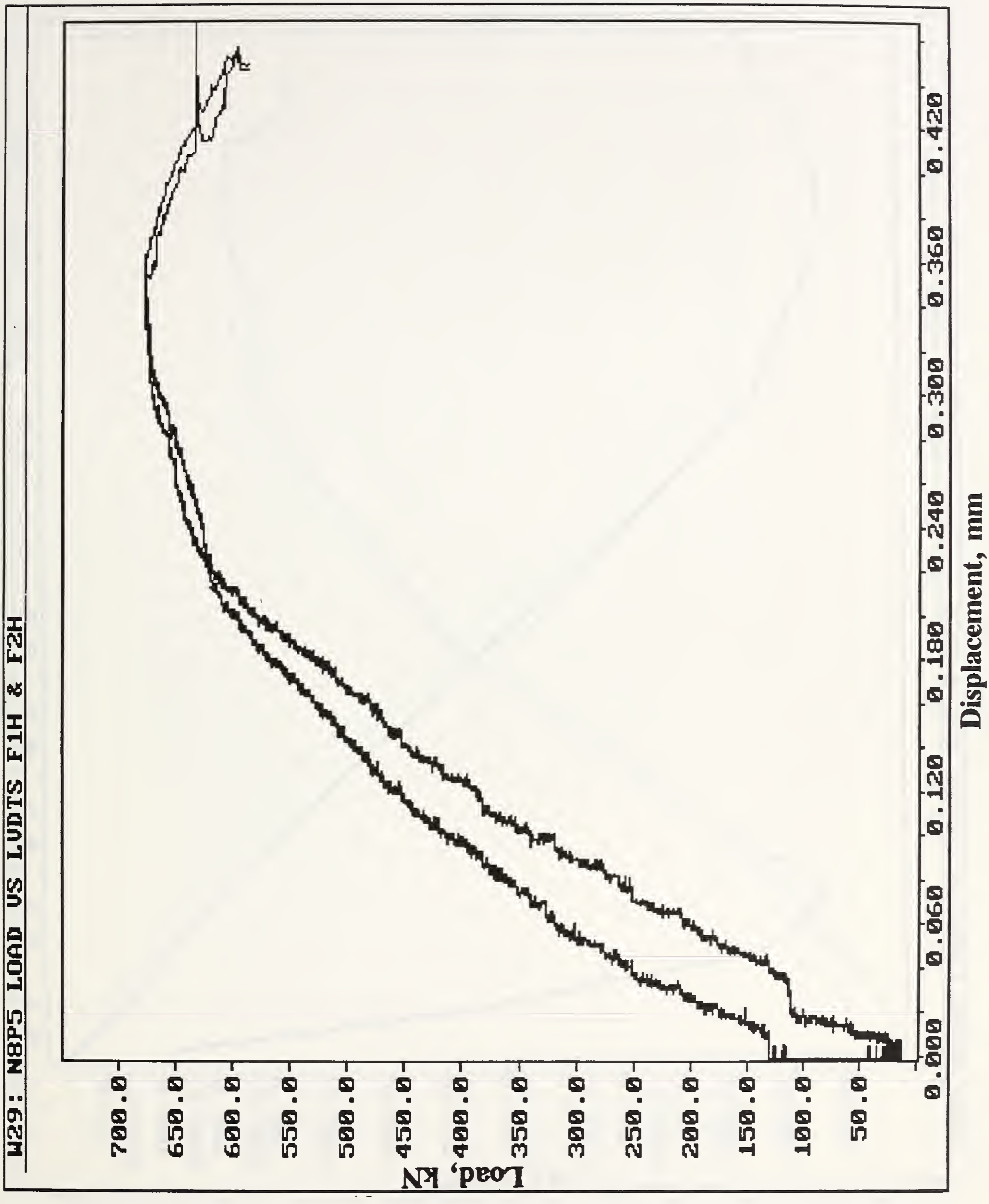

W25: N8P5 LOAD VS TIME
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time, sec



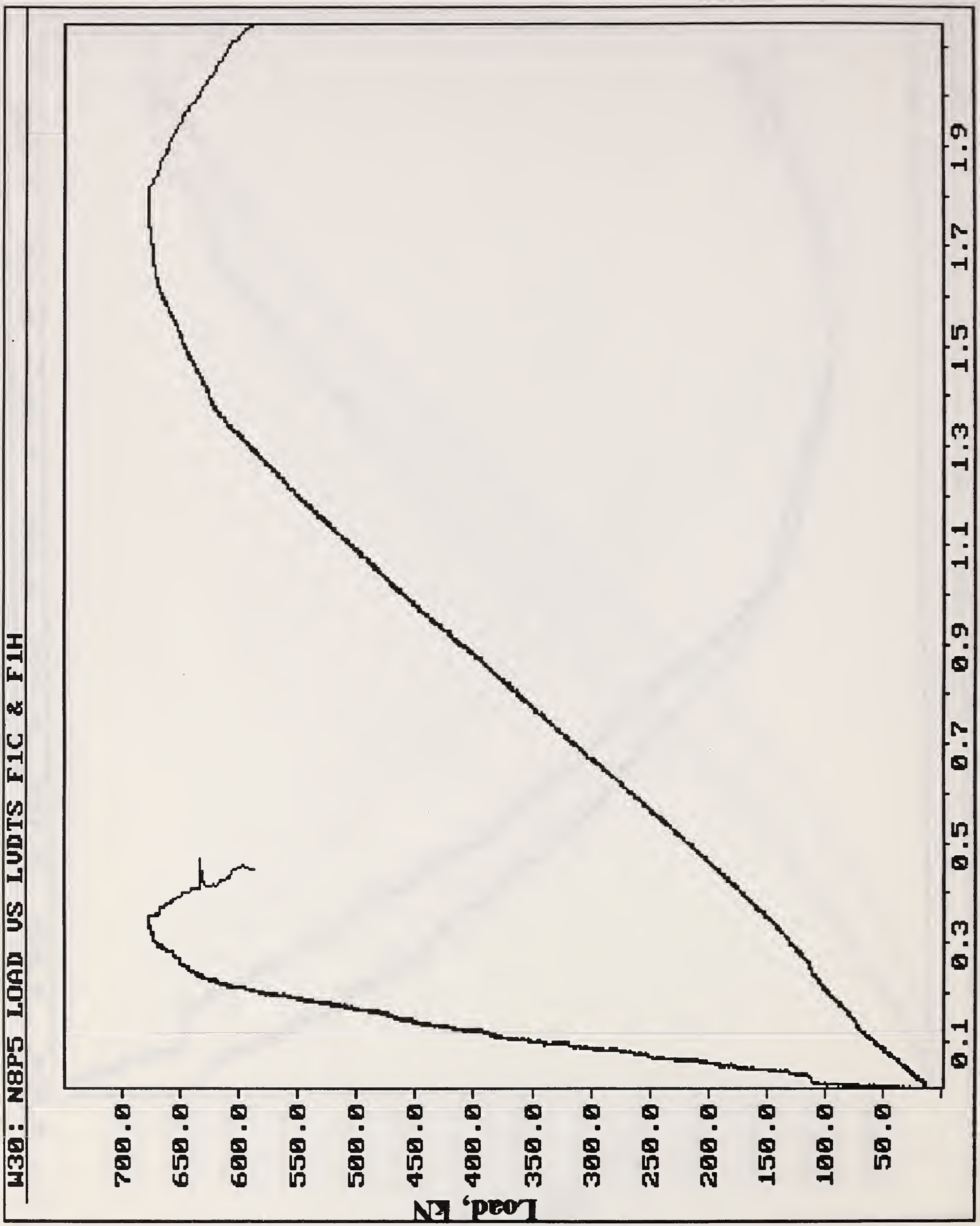
W26: N8P5 LOAD VS LVDTS F1C & F2C
Load, kN
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Displacement, mm

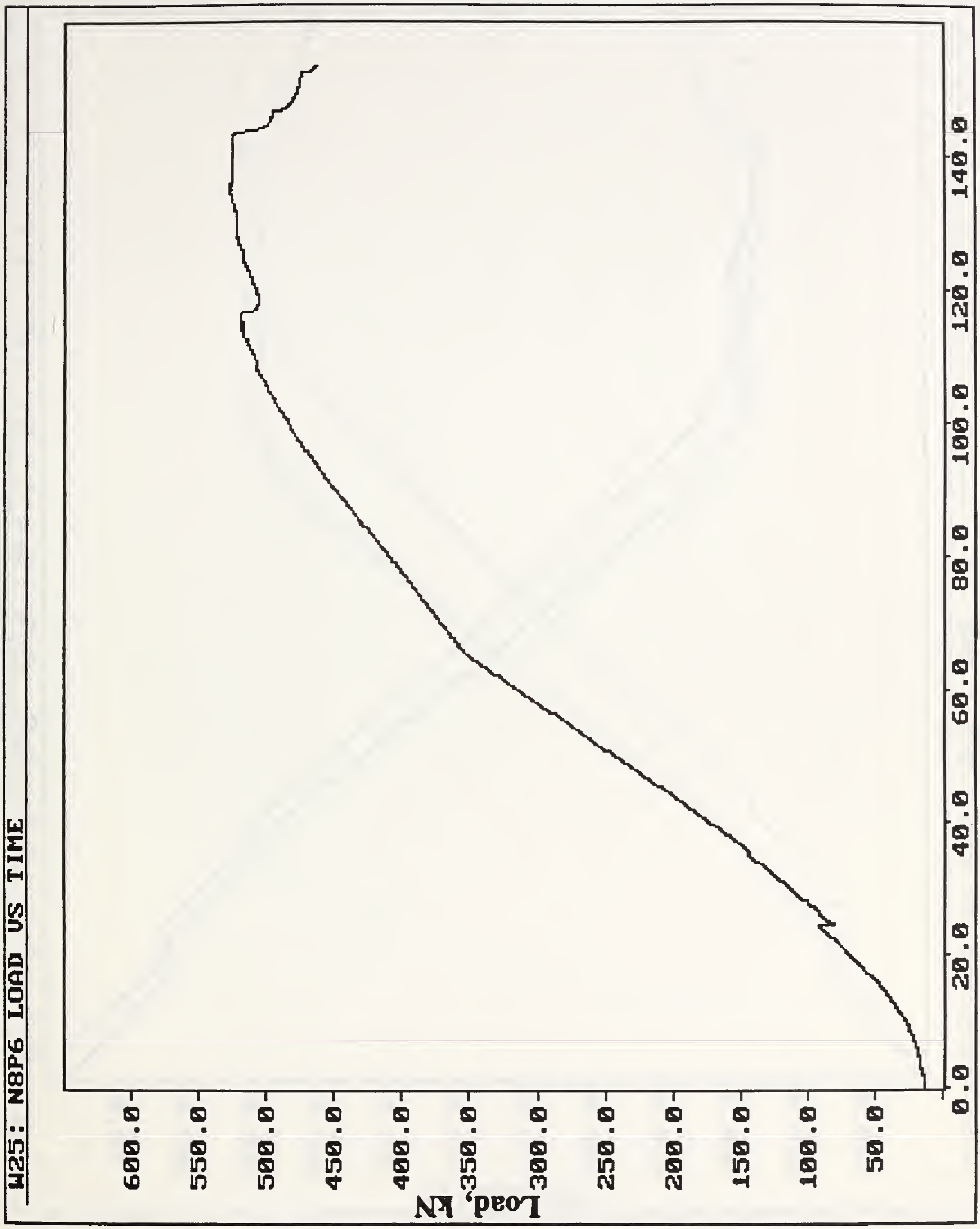

W27: N8P5 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Displacement, mm


W28: N8P5 LOAD VS LVDTS F2C, F2L & F2R
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
Displacement, mm

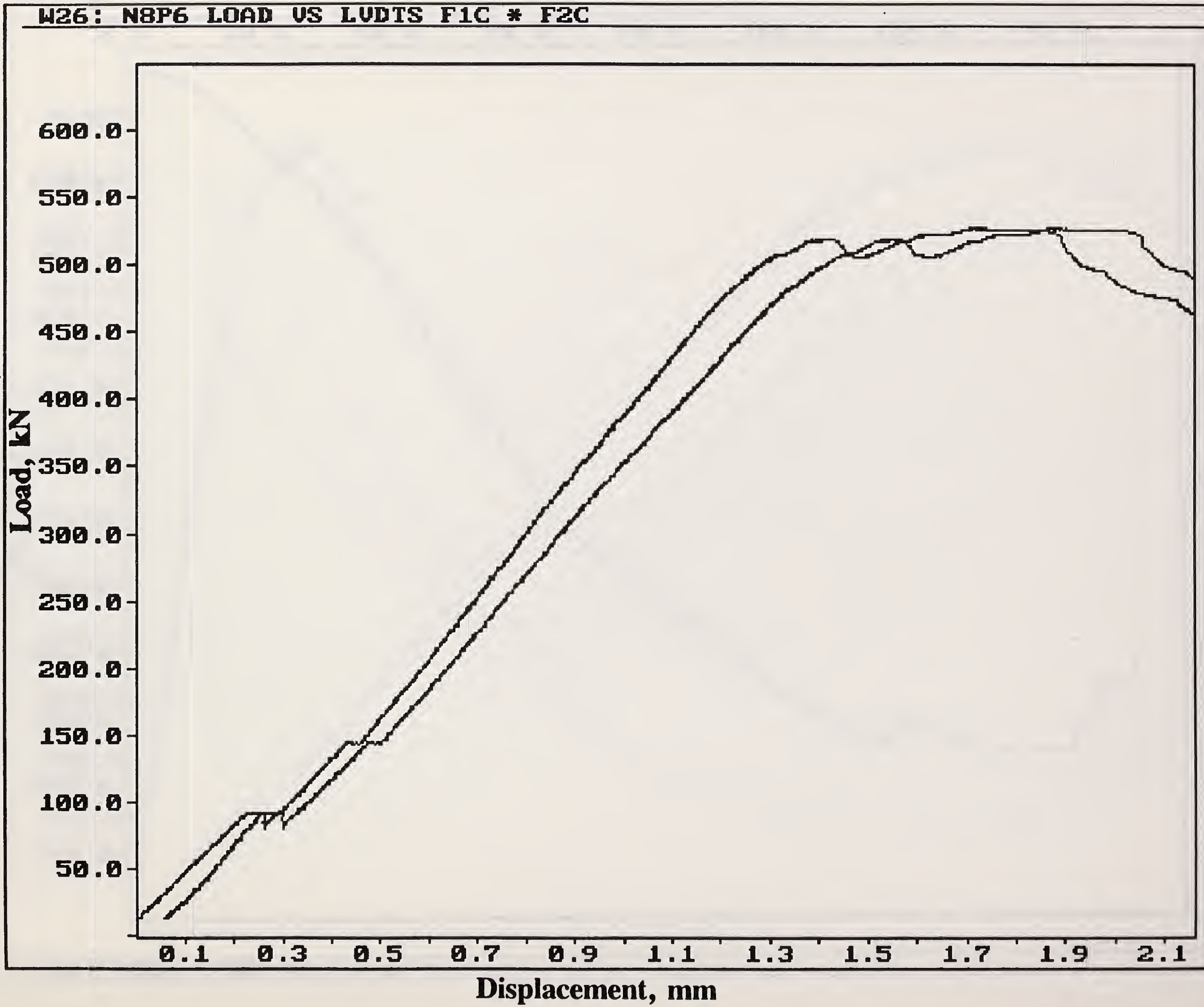


W29: N8P5 LOAD VS LVDTS F1H & F2H
Load, kN
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.000
0.060
0.120
0.180
0.240
0.300
0.360
0.420
Displacement, mm

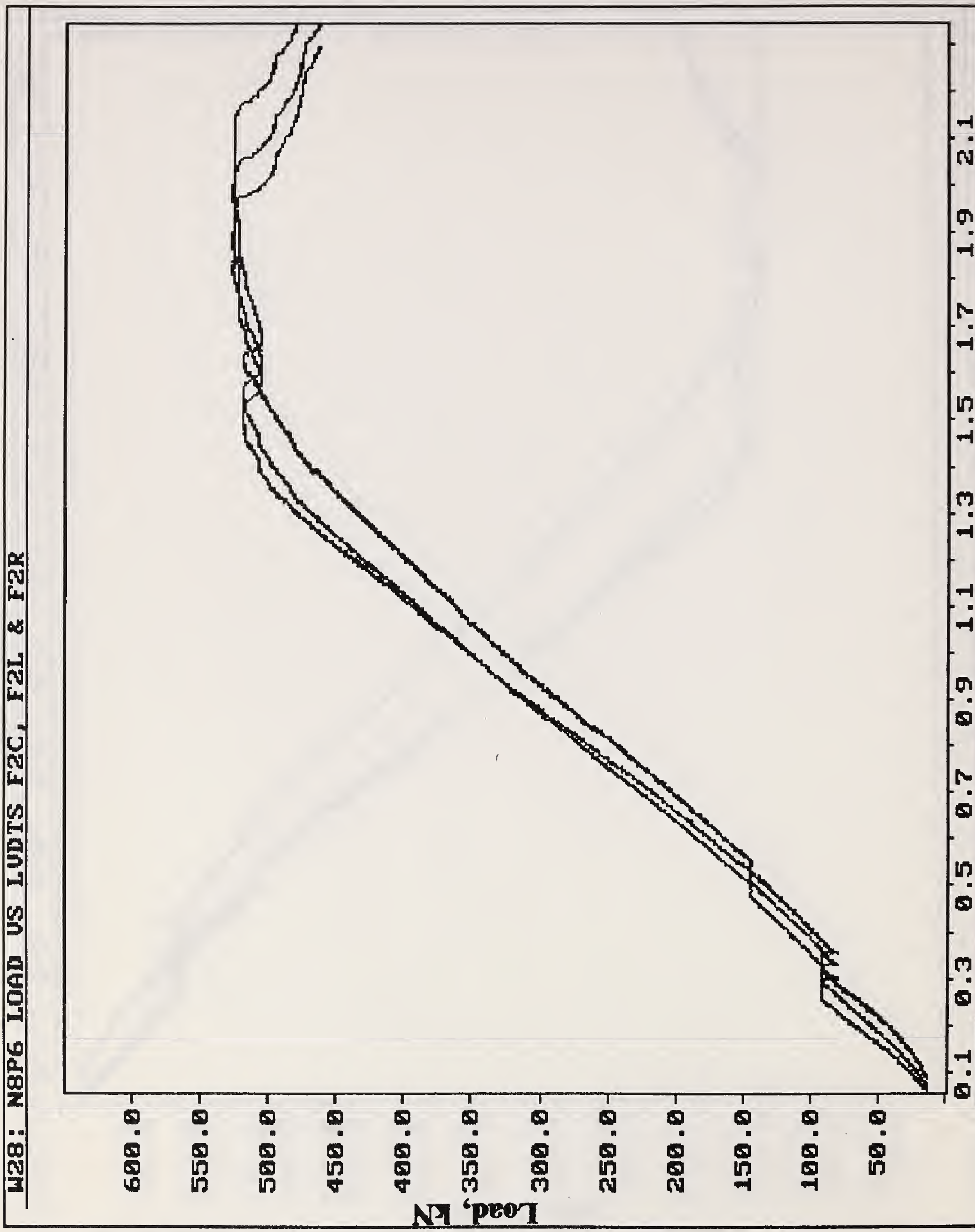

W30: N8P5 LOAD VS LVDTS F1C & F1H
Load, kN
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9



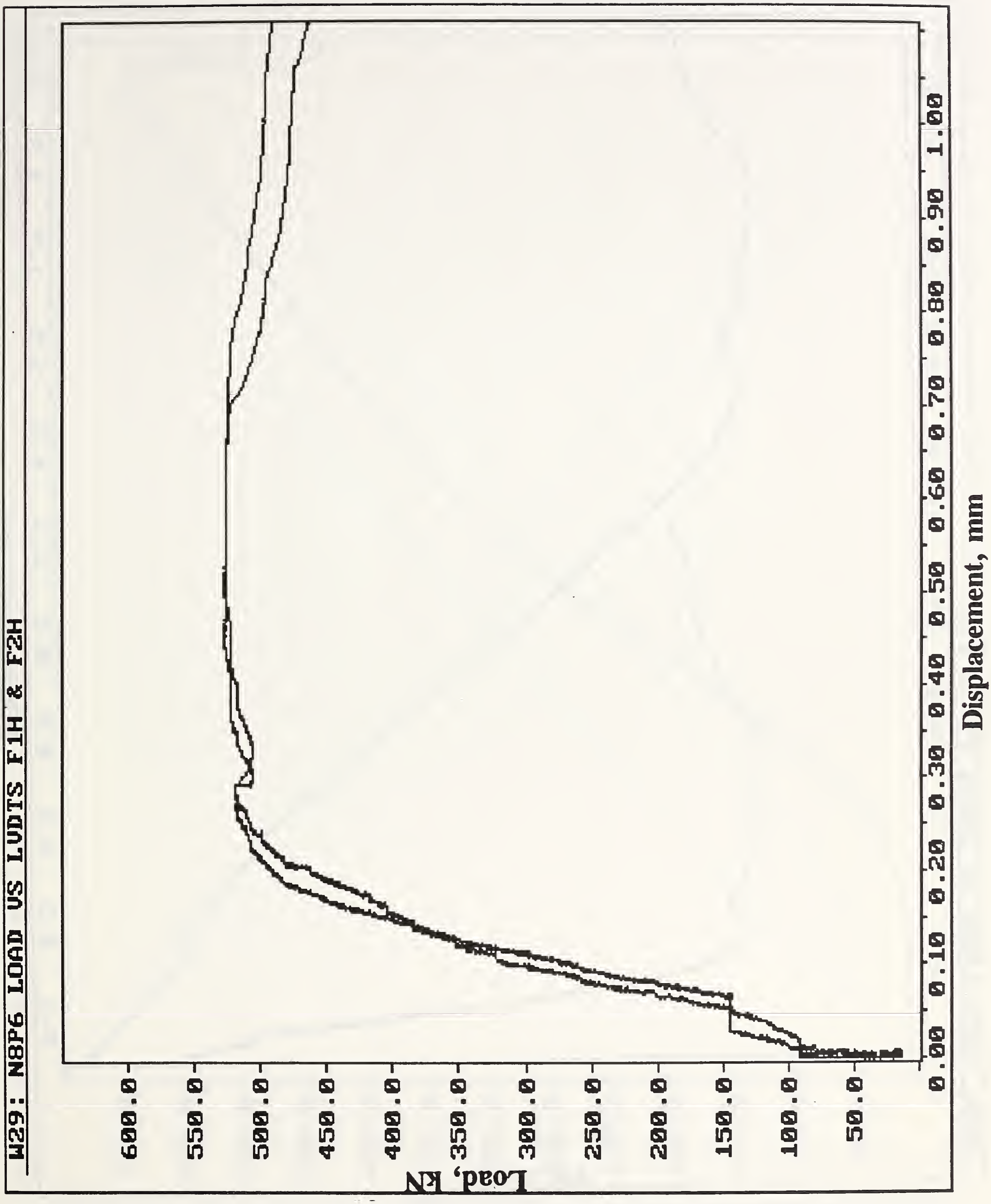
W25: N8P6 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time, sec

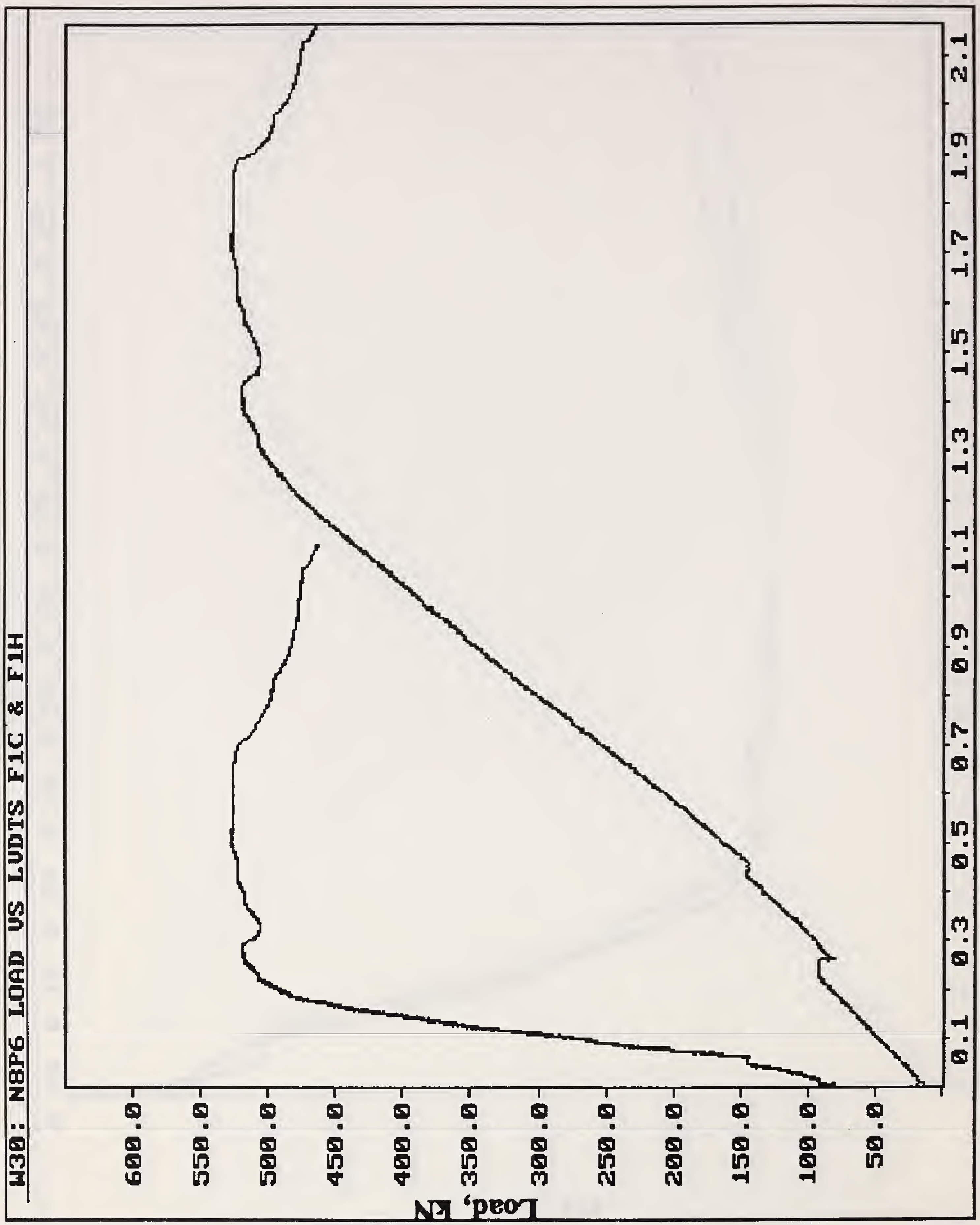

W26: N8P6 LOAD VS LVDTS F1C * F2C
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1
Displacement, mm

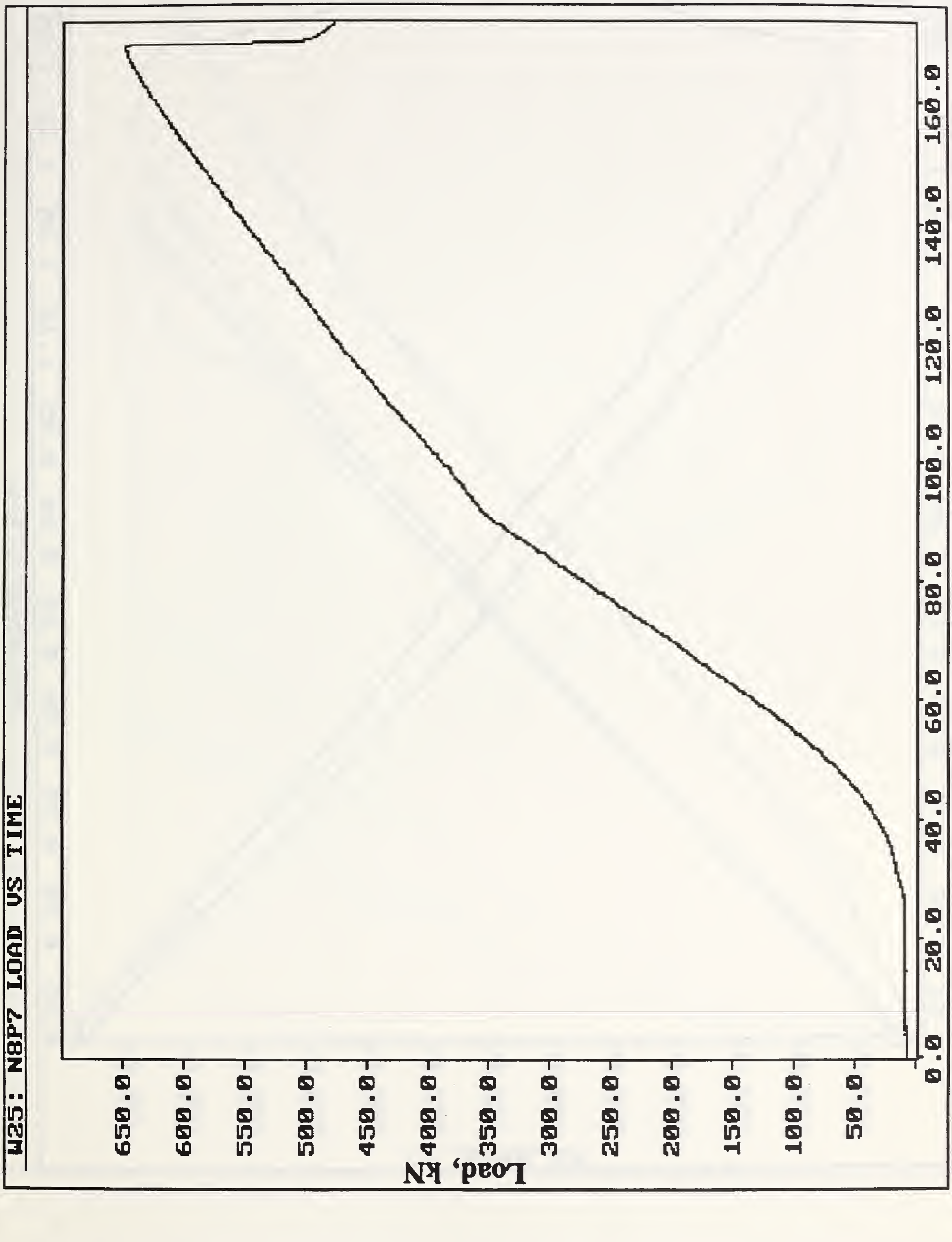

W27: N8P6 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1

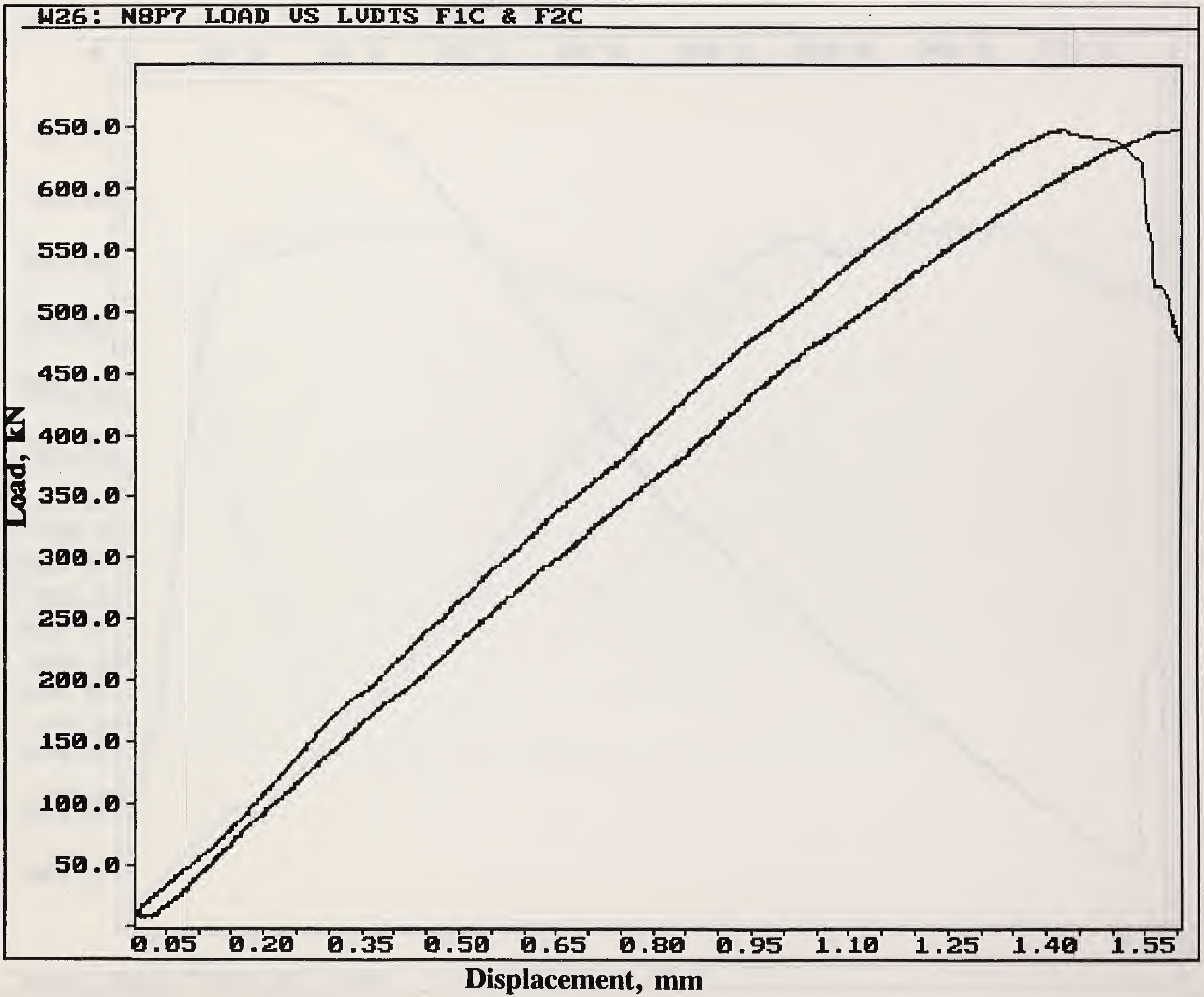


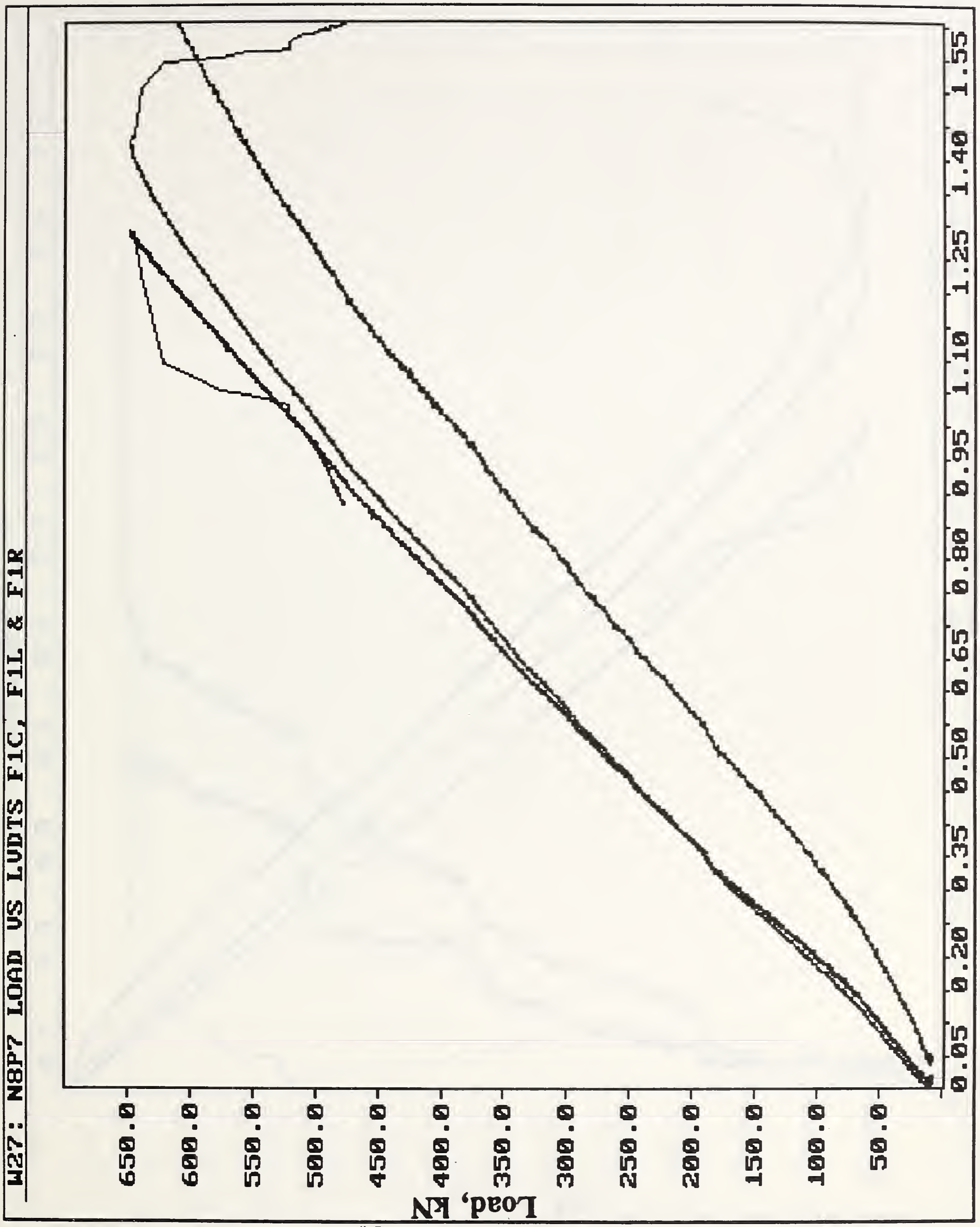
W28: N8P6 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1
Displacement, mm

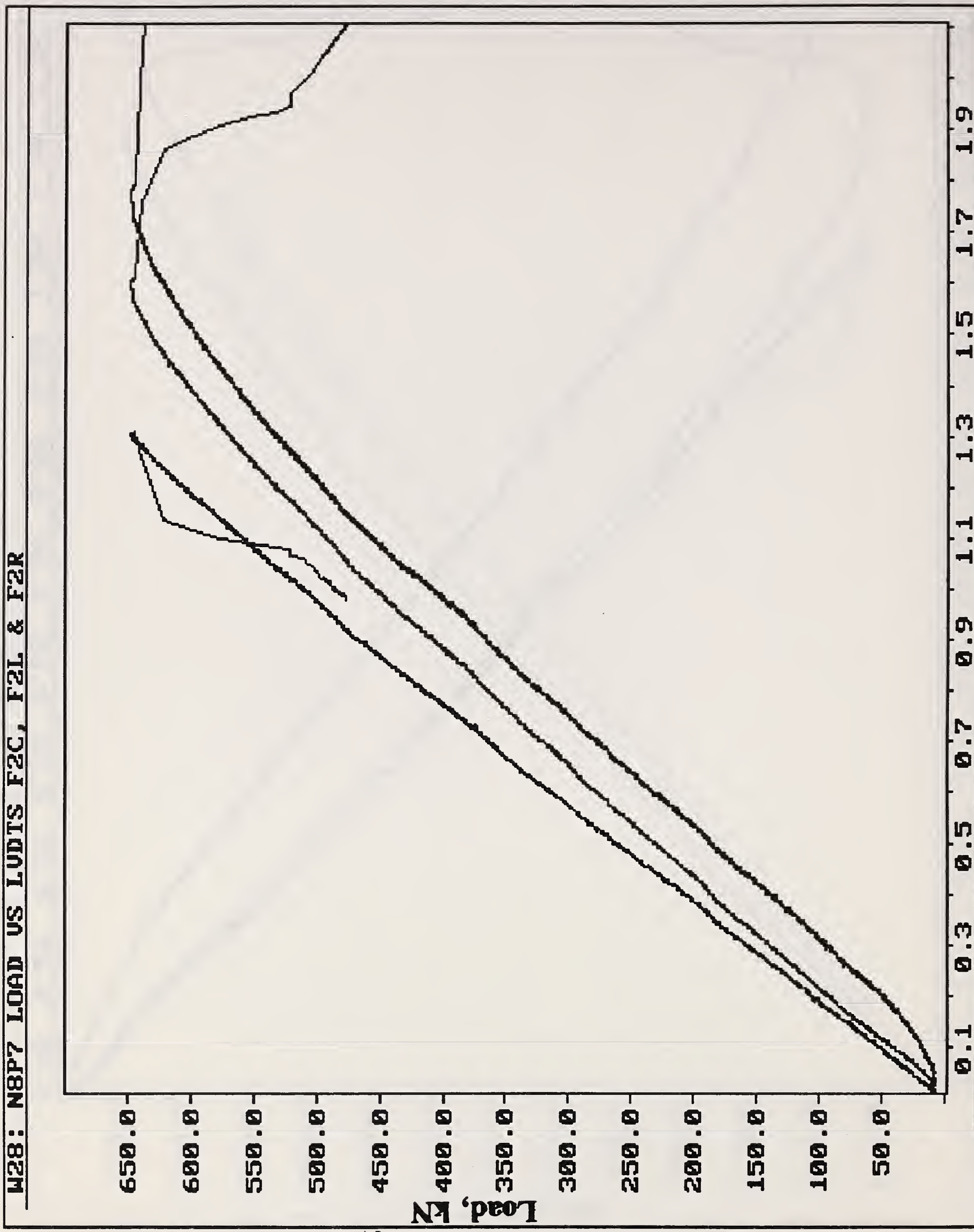

W29: N8P6 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00

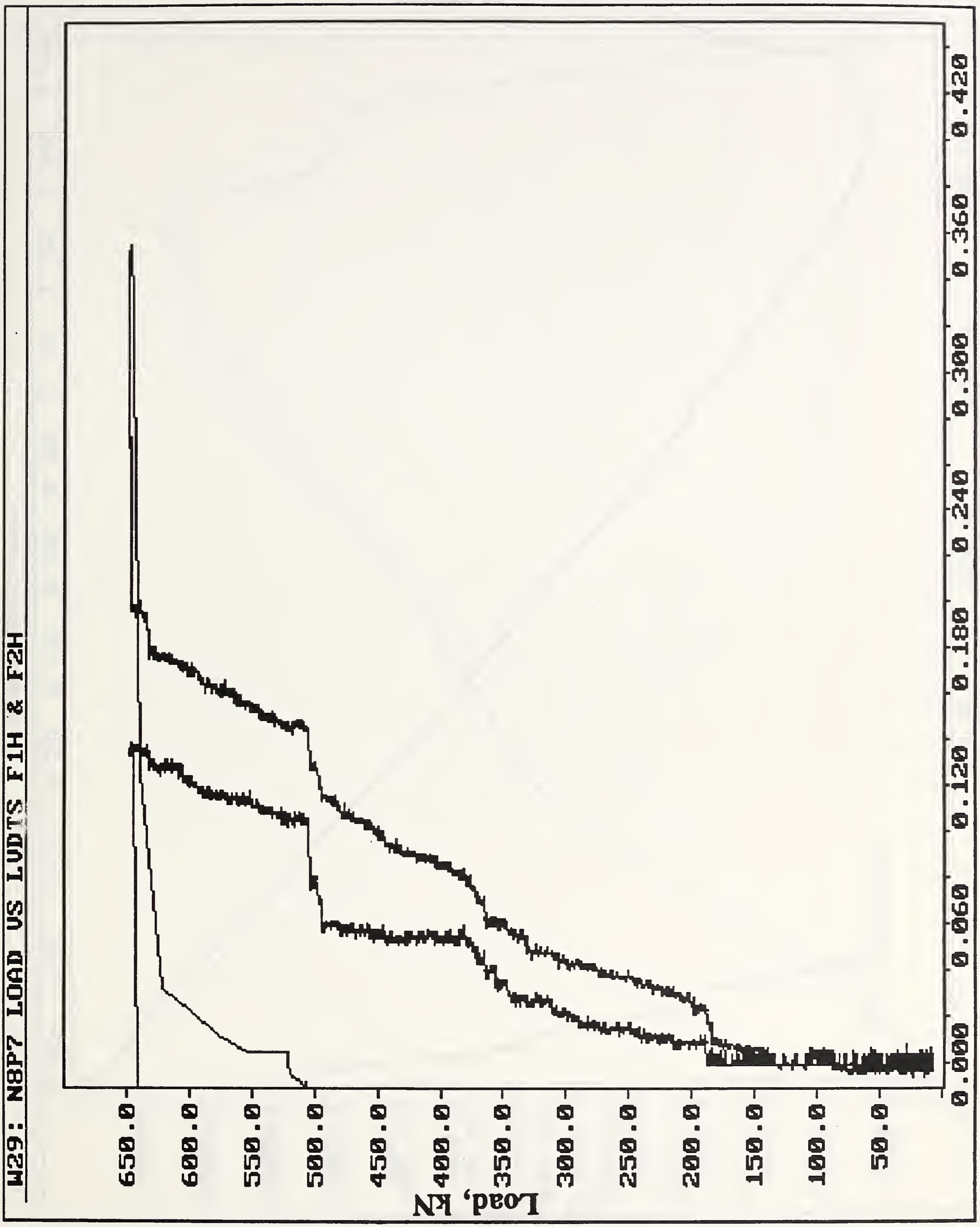

W30: N8P6 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1

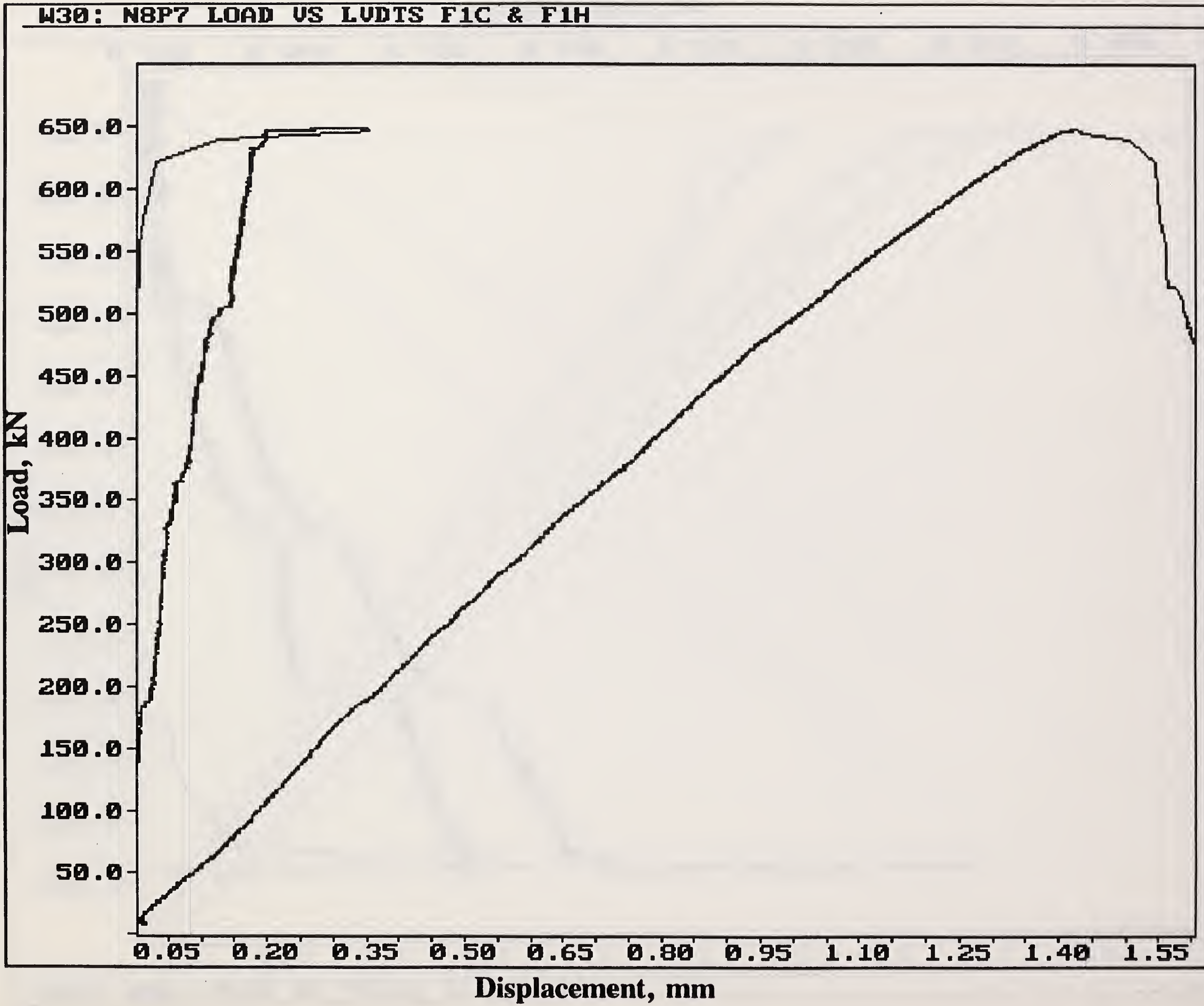

W25: N8P7 LOAD VS TIME
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time, sec

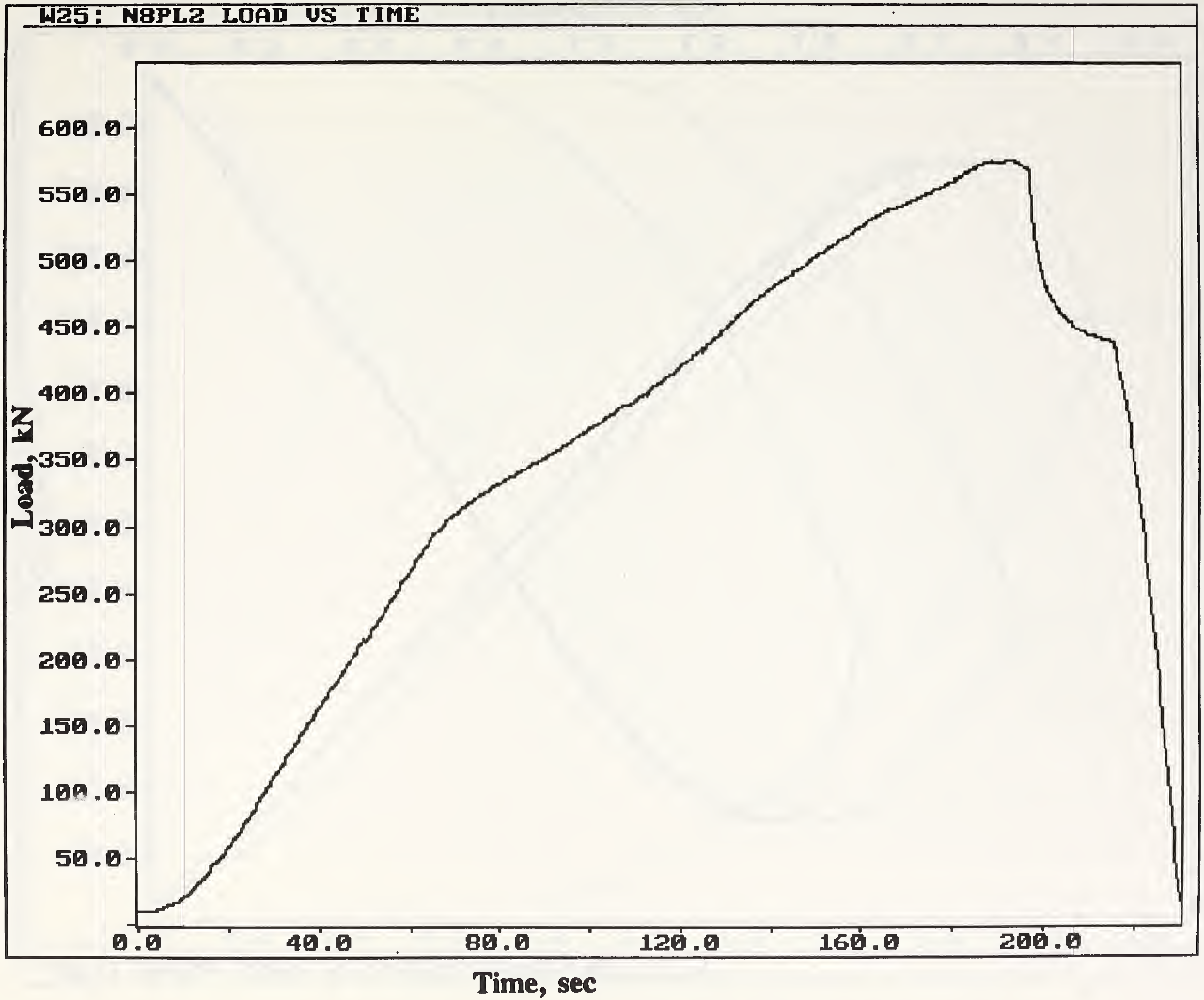

W26: N8P7 LOAD VS LVDTS F1C & F2C
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.05
0.20
0.35
0.50
0.65
0.80
0.95
1.10
1.25
1.40
1.55
Displacement, mm

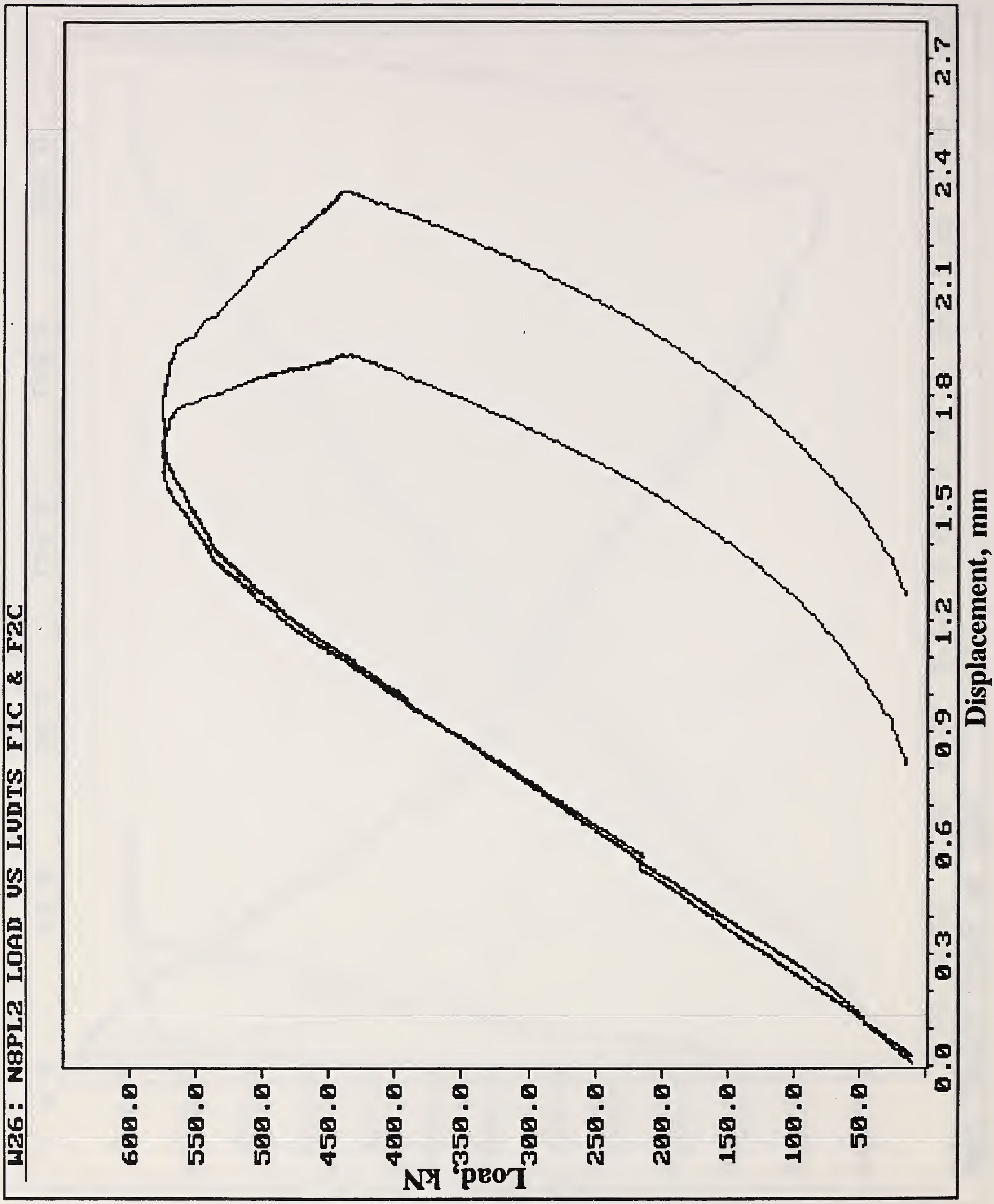

W27: N8P7 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.05
0.20
0.35
0.50
0.65
0.80
0.95
1.10
1.25
1.40
1.55

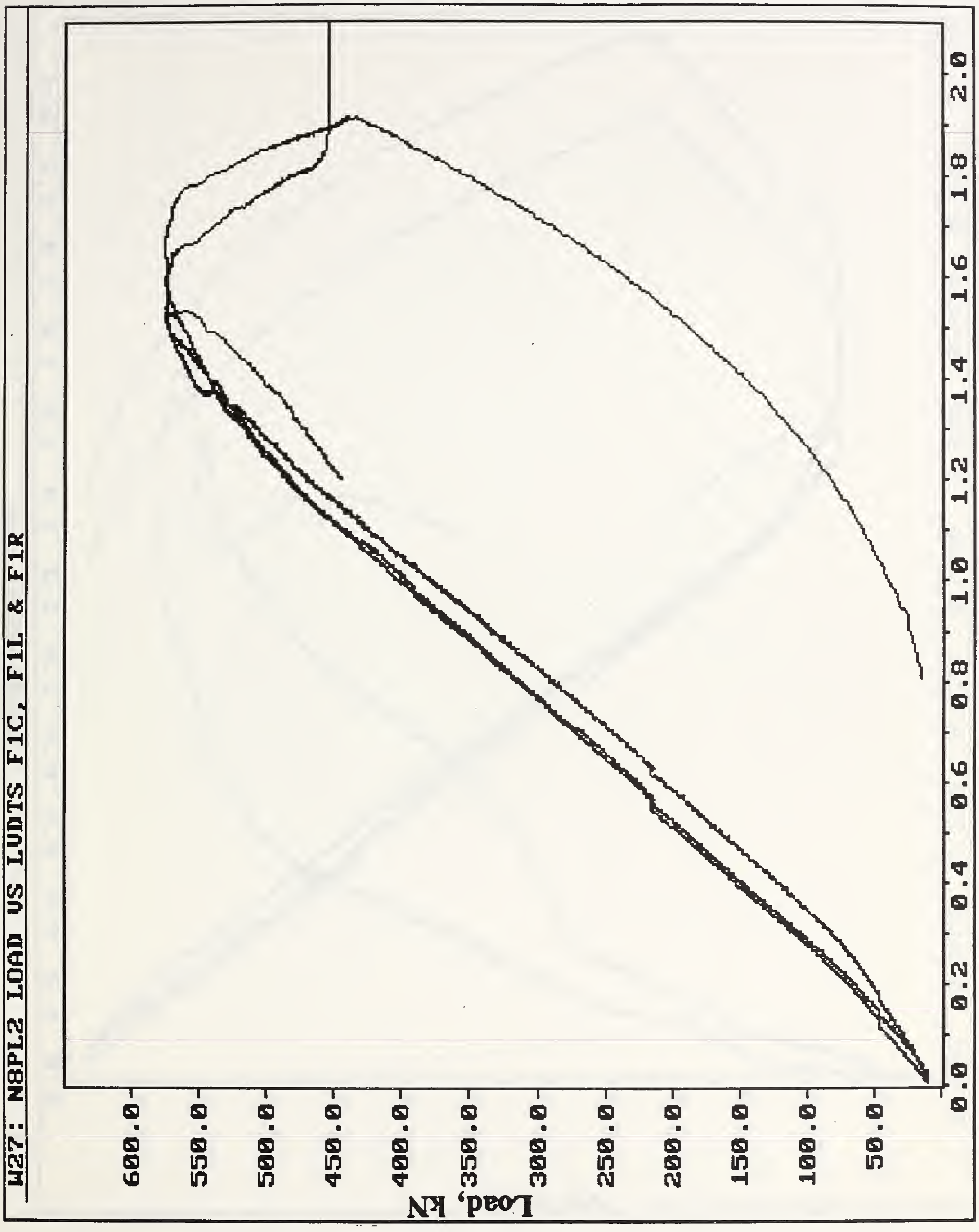

W28: N8P7 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9

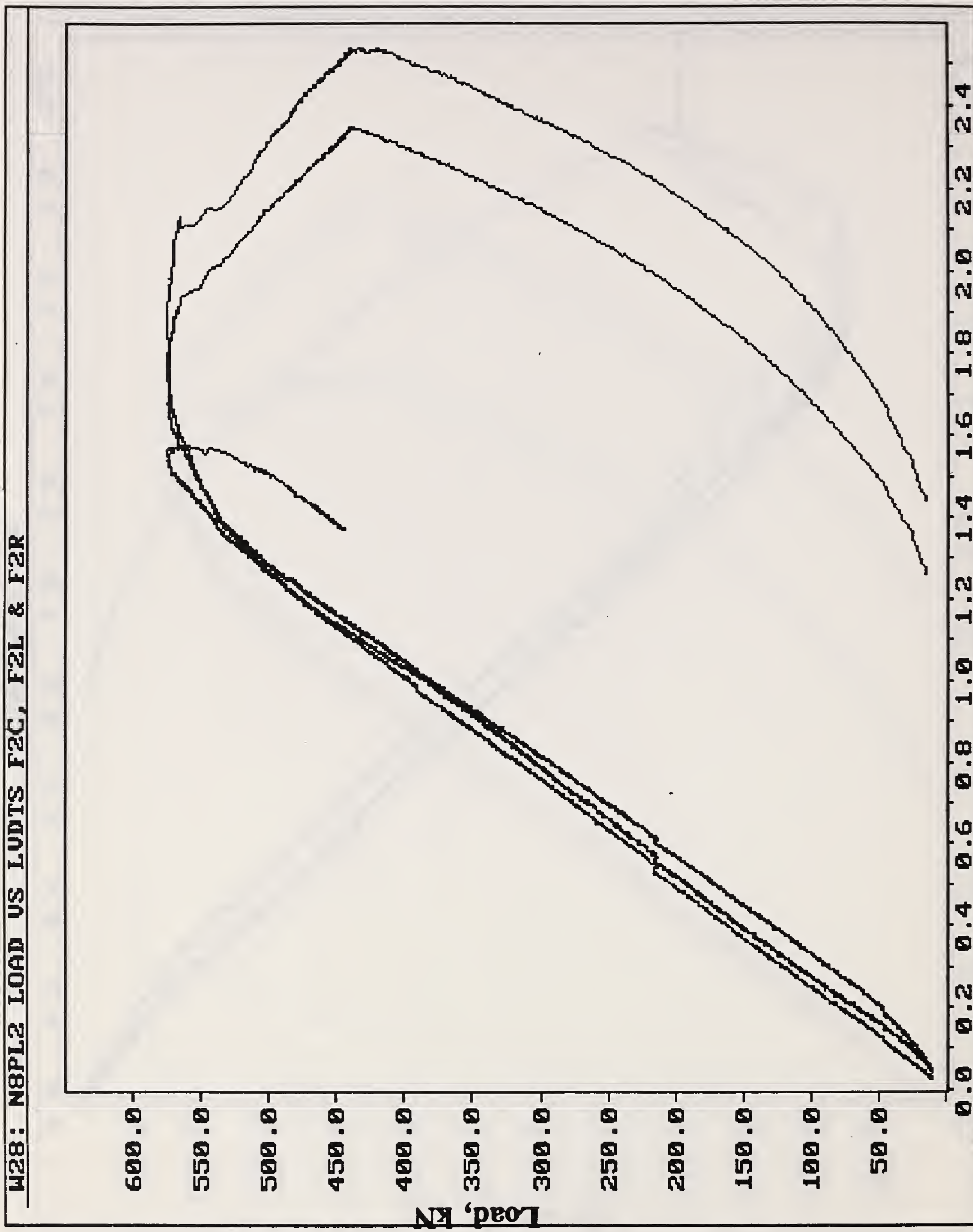

W29: N8P7 LOAD VS LVDTS F1H & F2H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.000
0.060
0.120
0.180
0.240
0.300
0.360
0.420

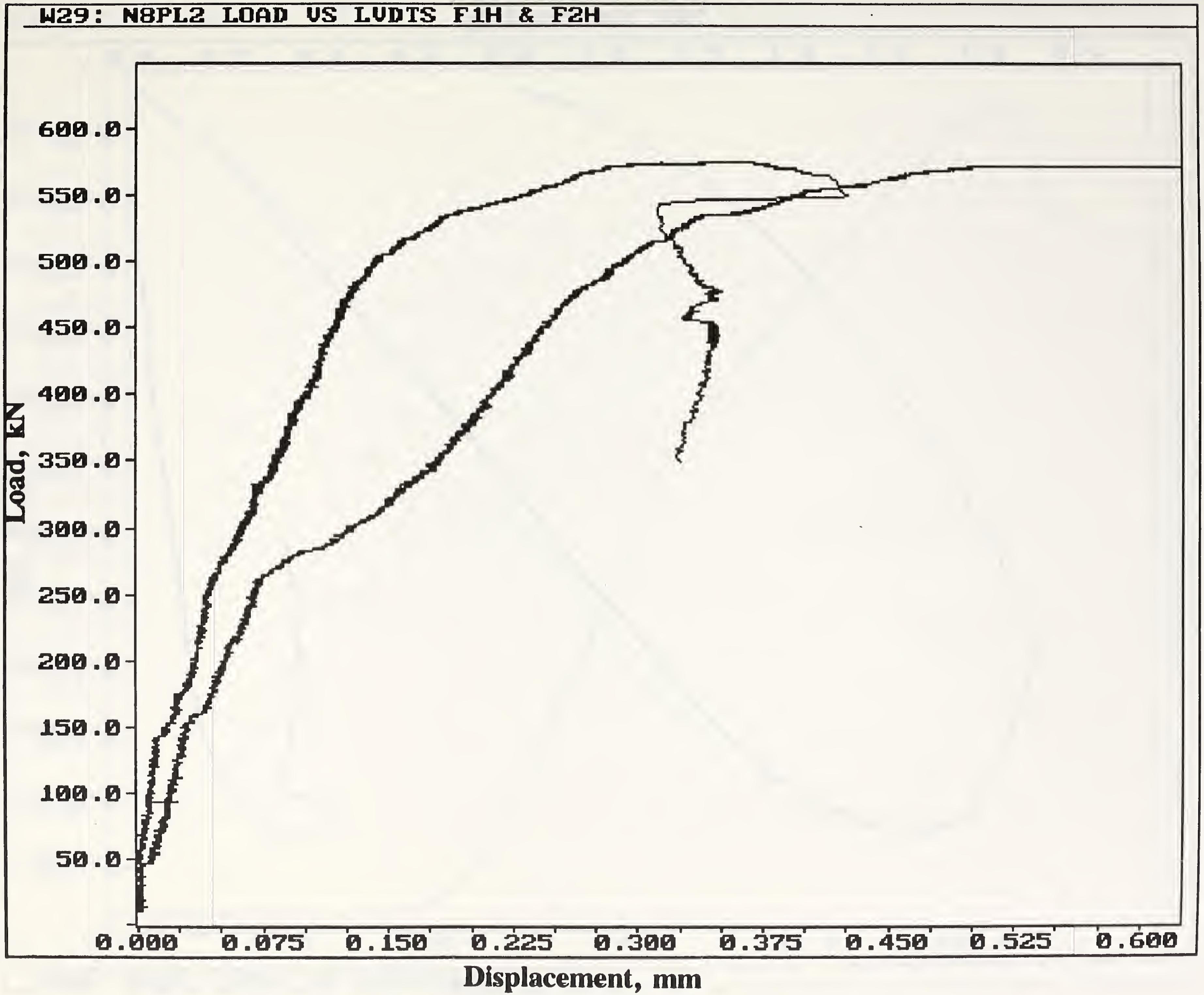

W30: N8P7 LOAD VS LVDTS F1C & F1H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.05
0.20
0.35
0.50
0.65
0.80
0.95
1.10
1.25
1.40
1.55
Displacement, mm


W25: N8PL2 LOAD VS TIME
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

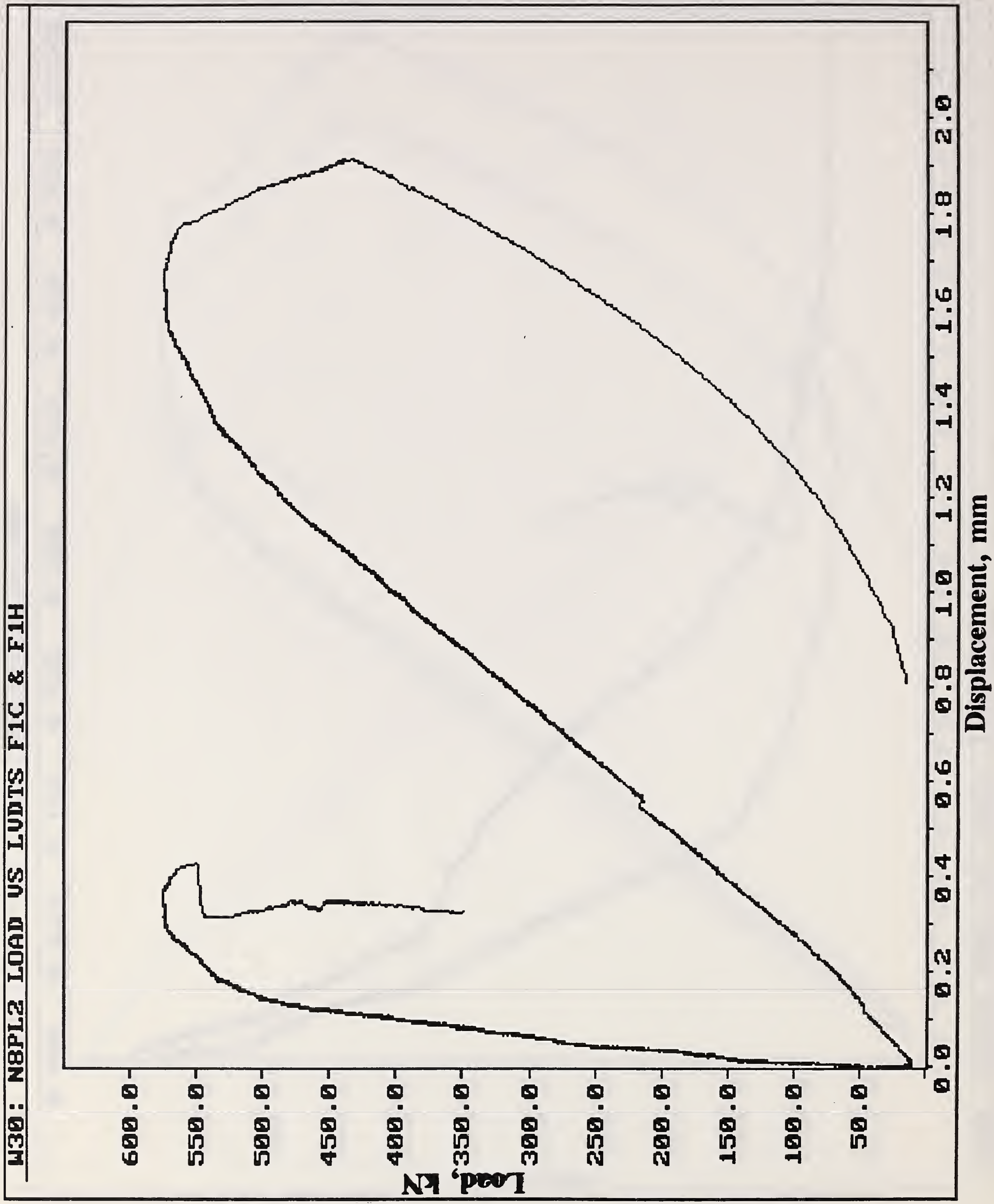

W26: N8PL2 LOAD VS LVDTS F1C & F2C
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
Displacement, mm


W27: N8PL2 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

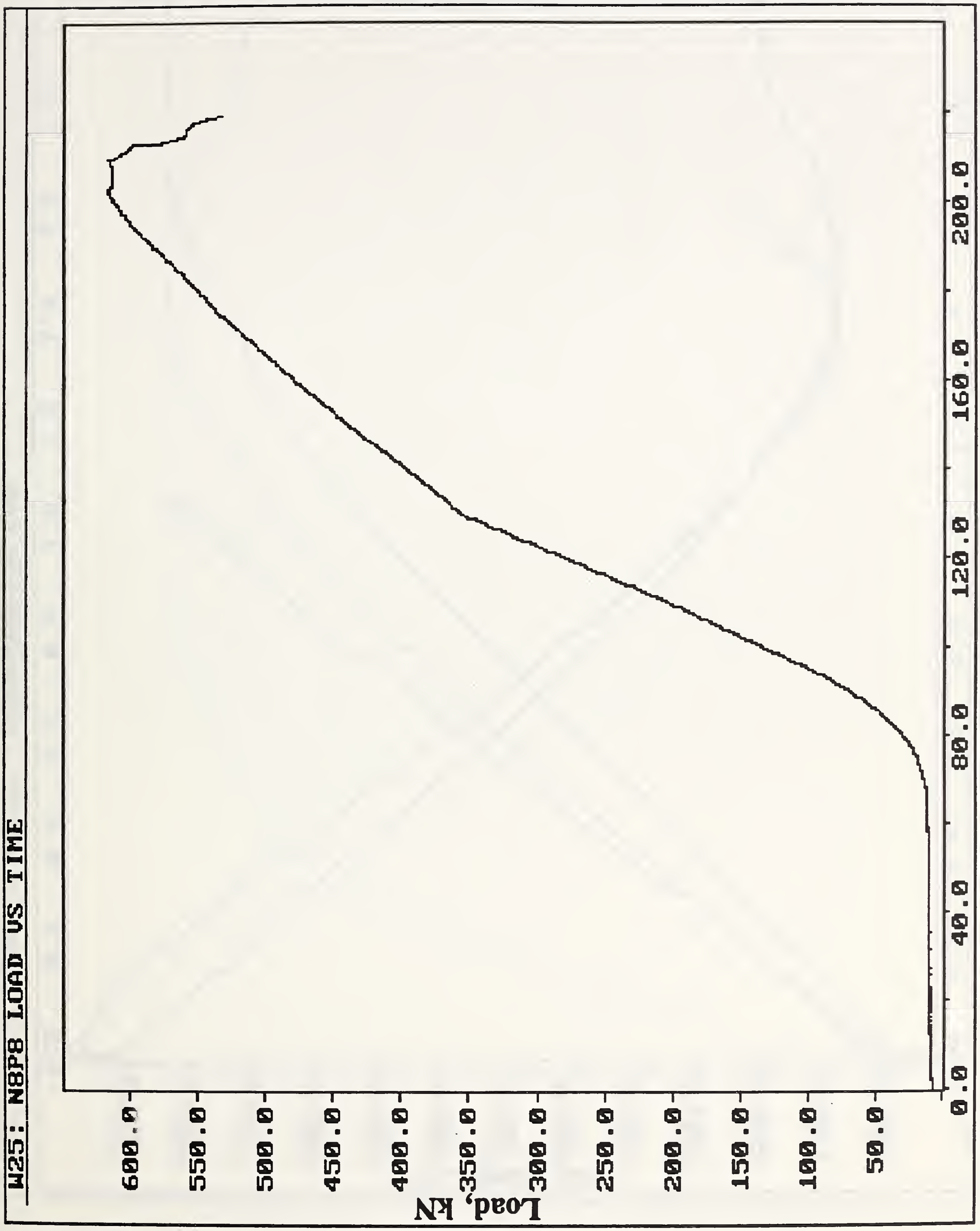

W28: N8PL2 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
Displacement, mm

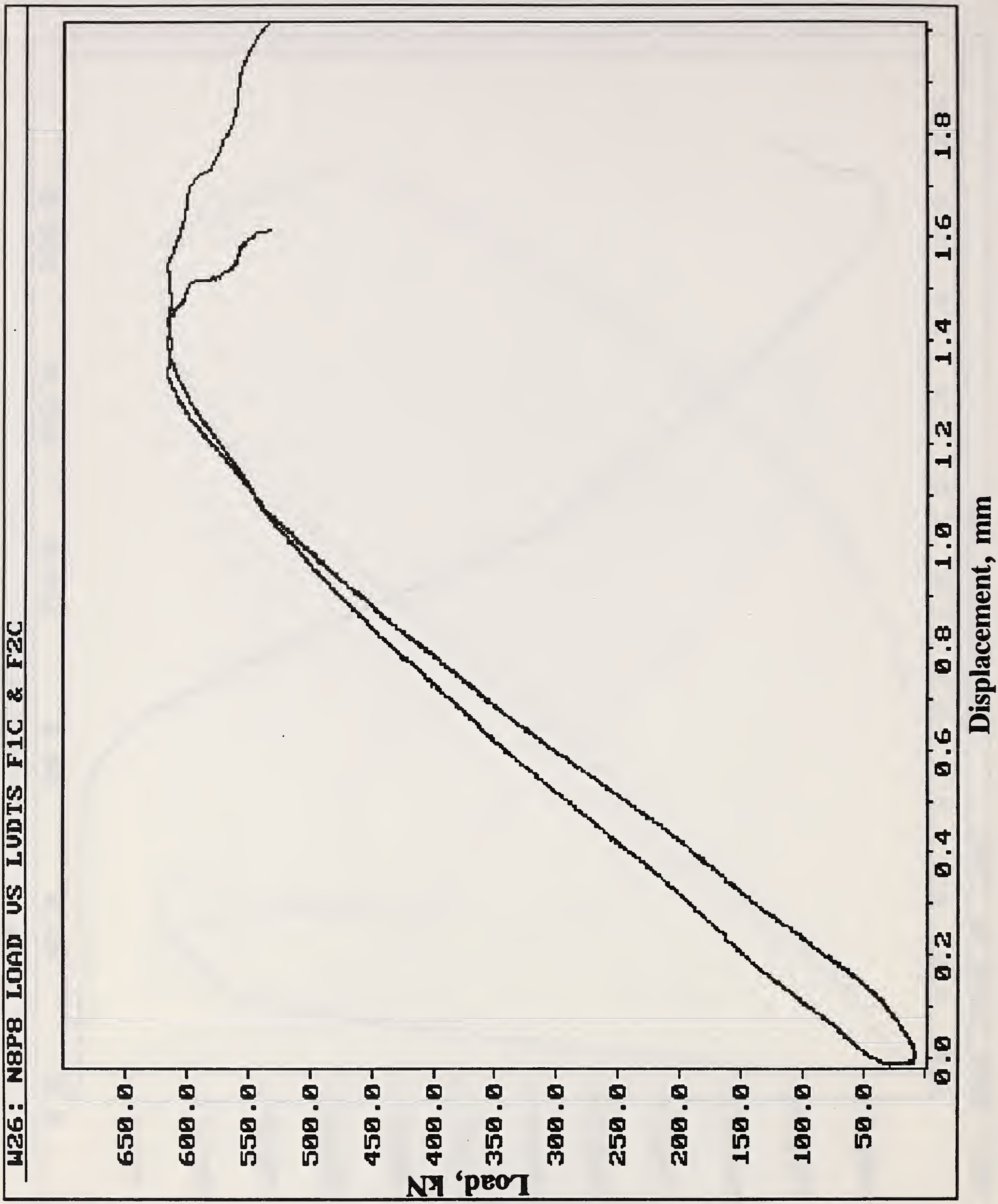


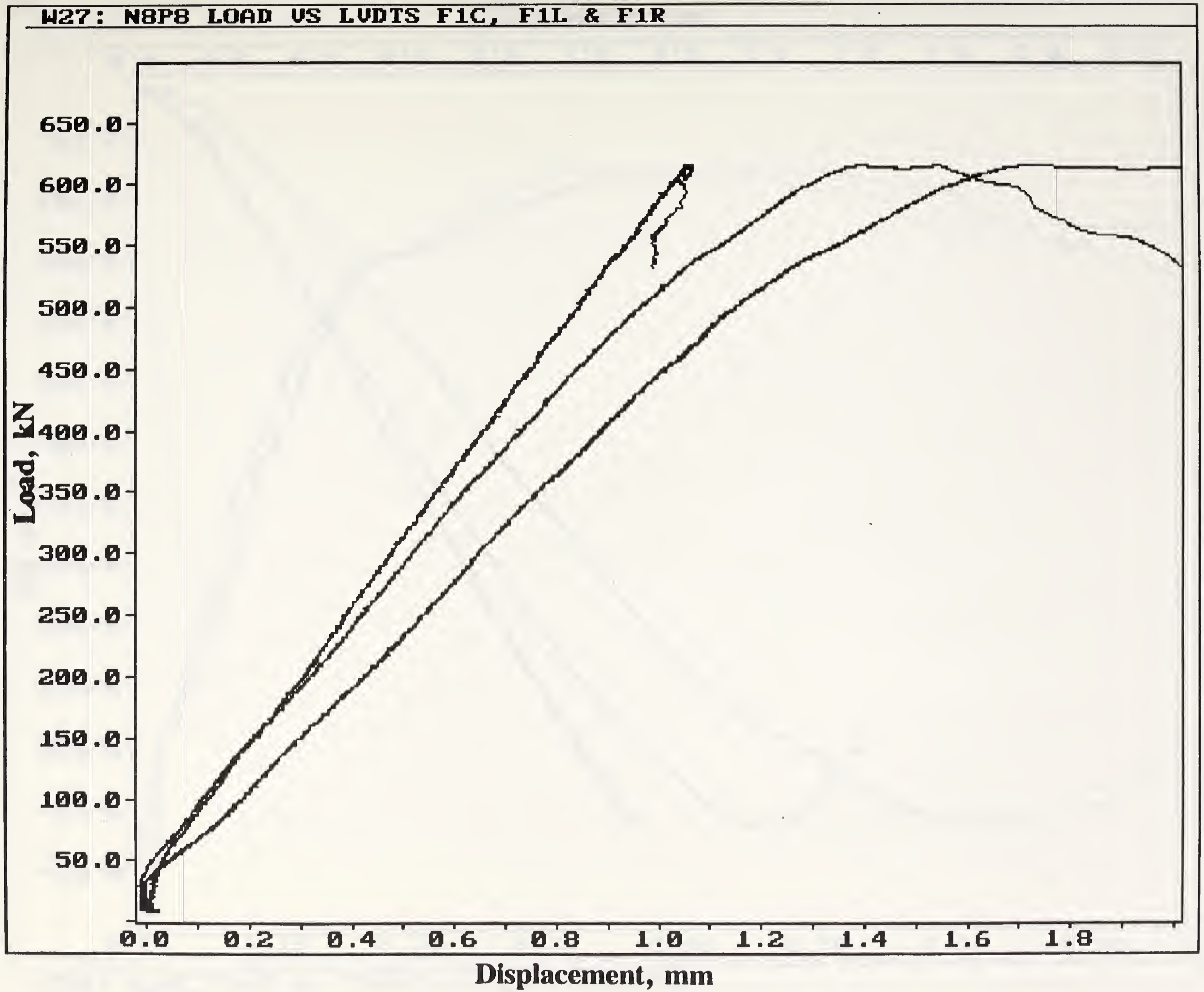
W29: N8PL2 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm



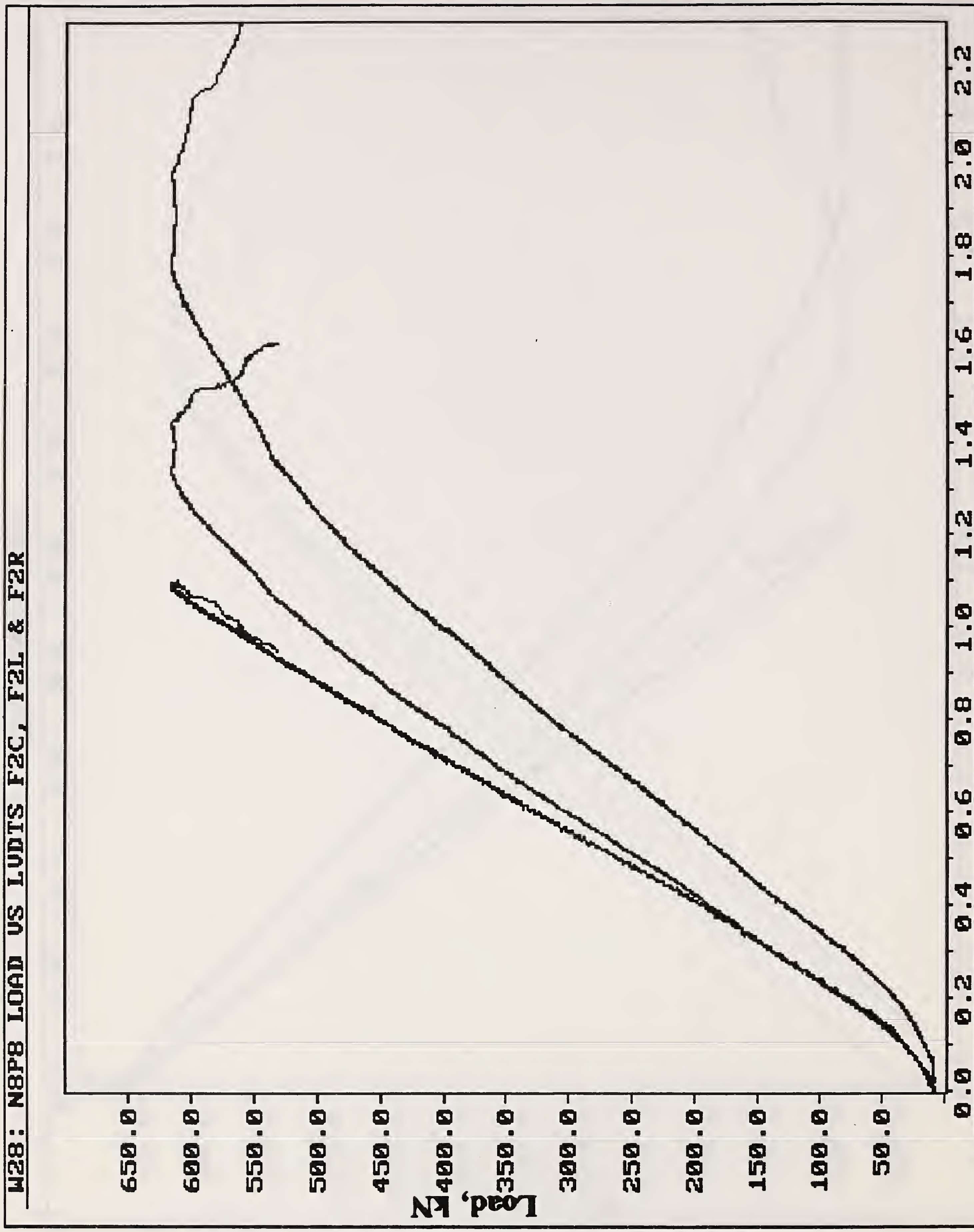
W30: N8PL2 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

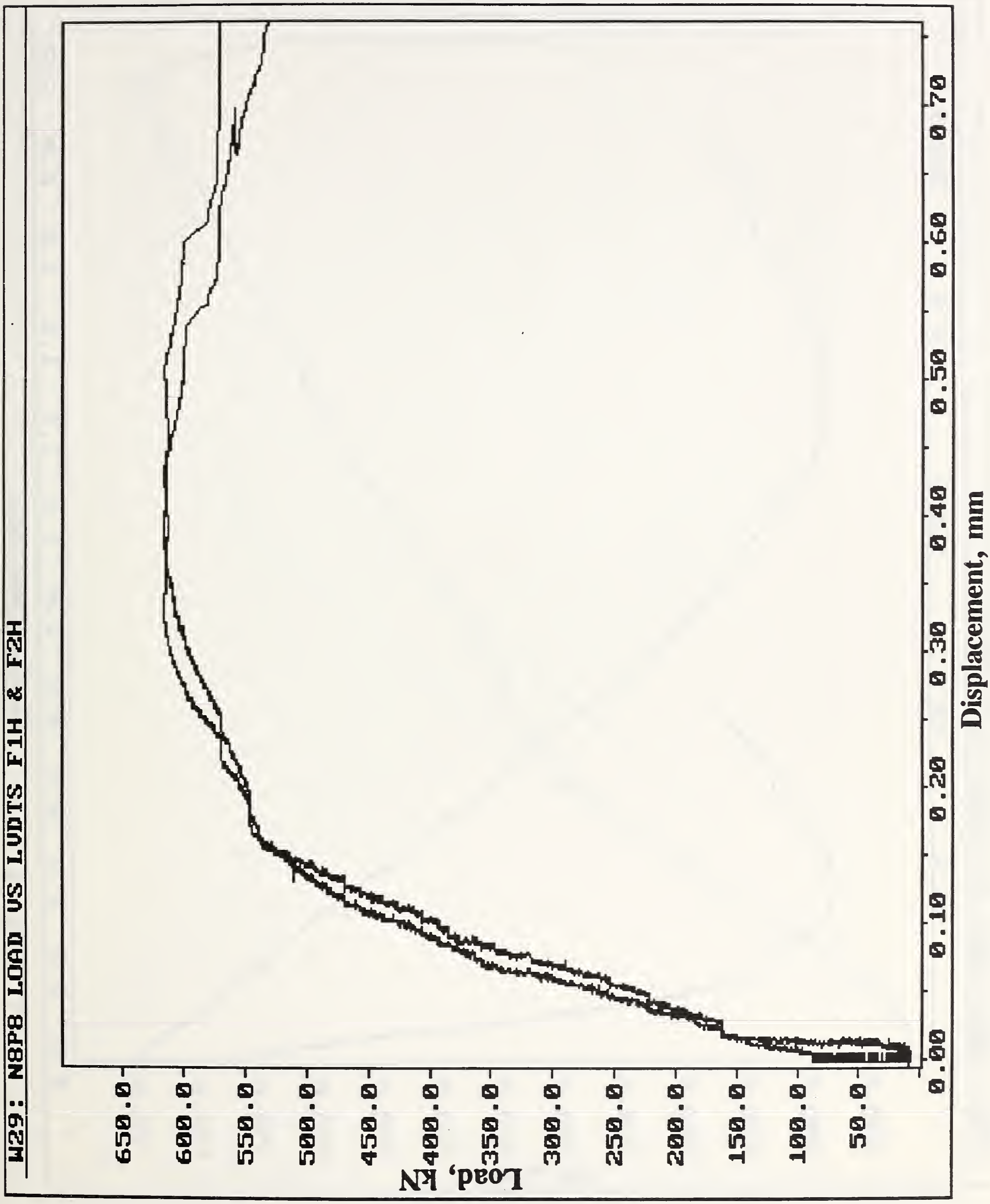

W25: N8P8 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

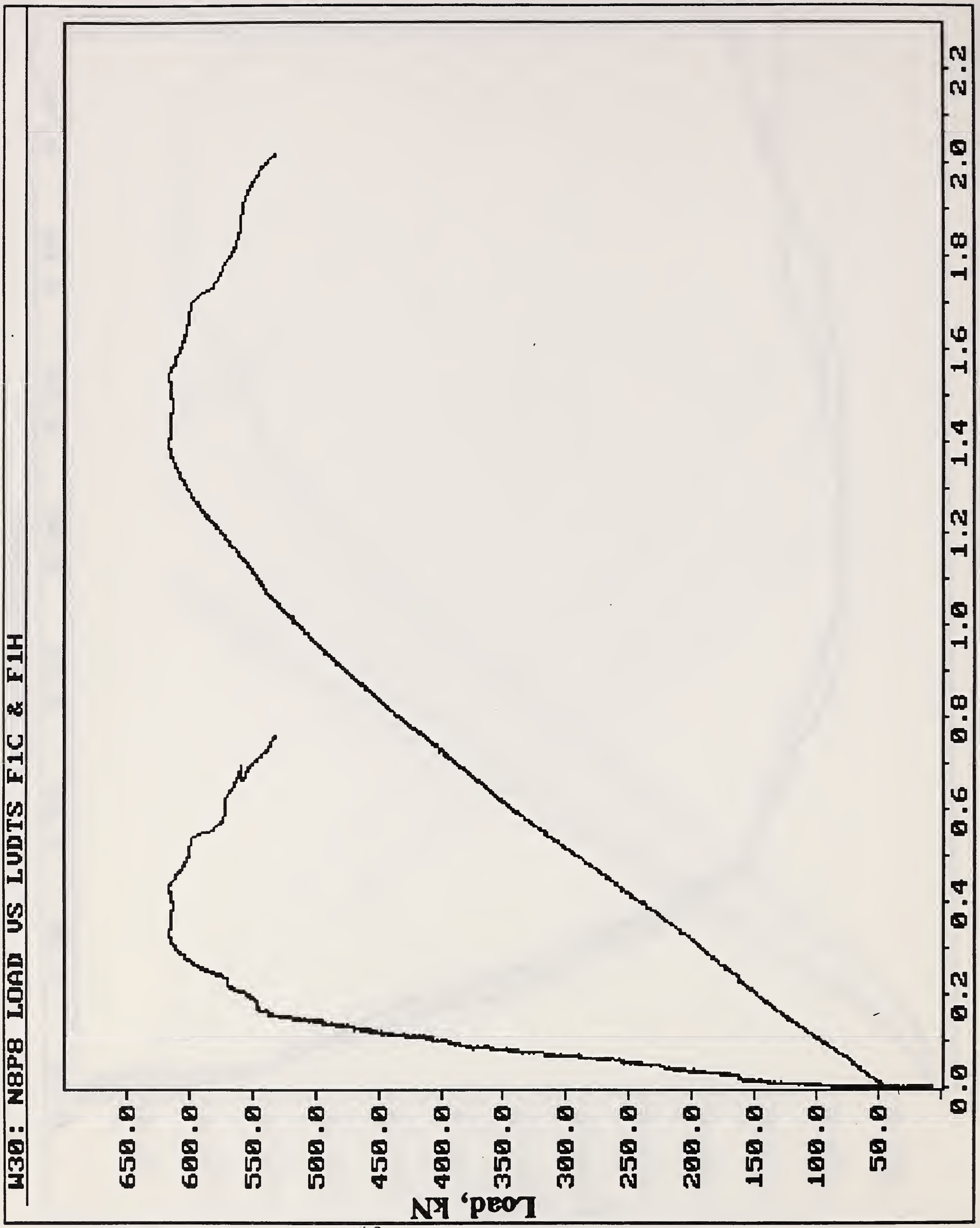

W26: N8P8 LOAD VS LVDTS F1C & F2C
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

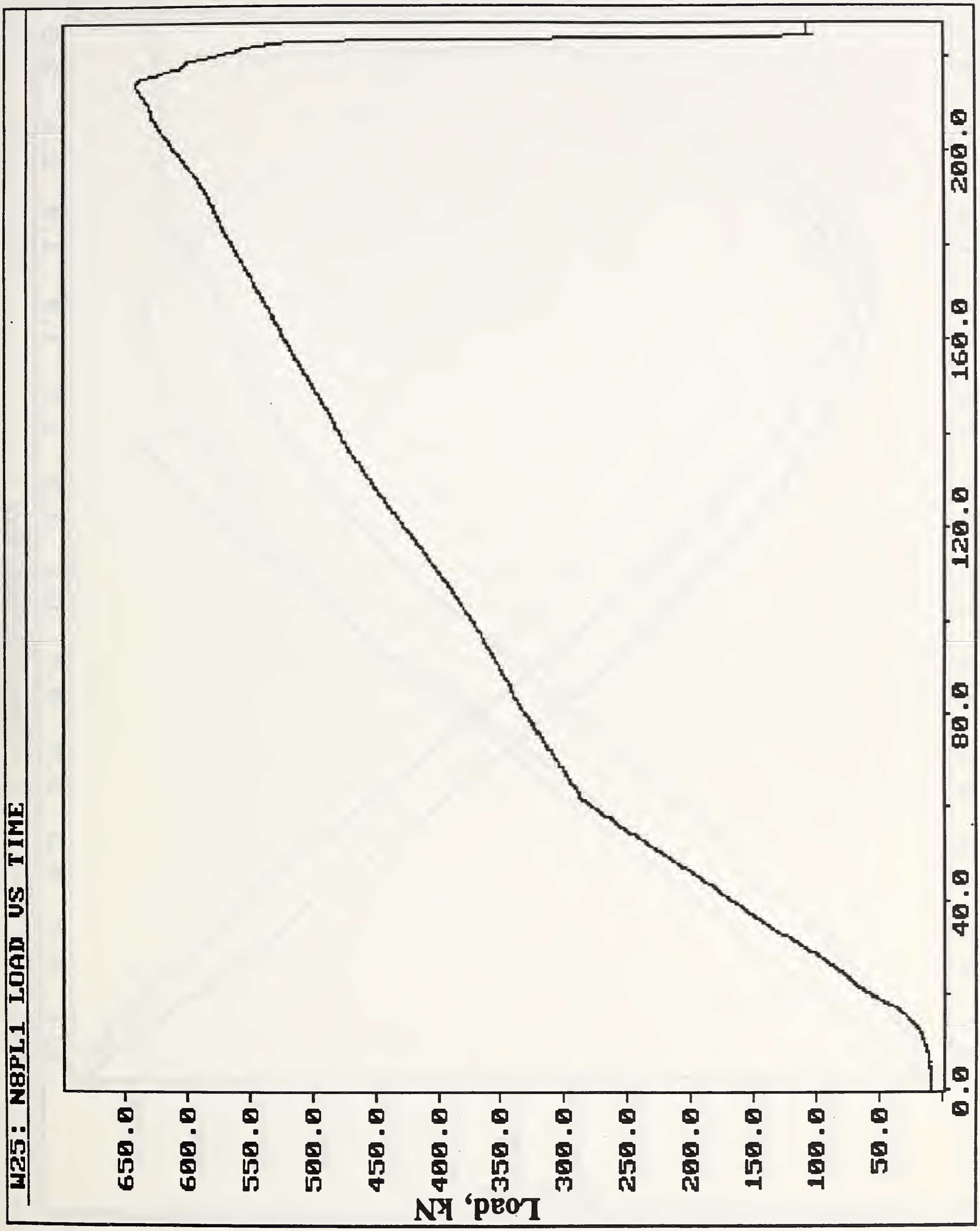


W27: N8P8 LOAD VS LVDTS F1C, F1L & F1R
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

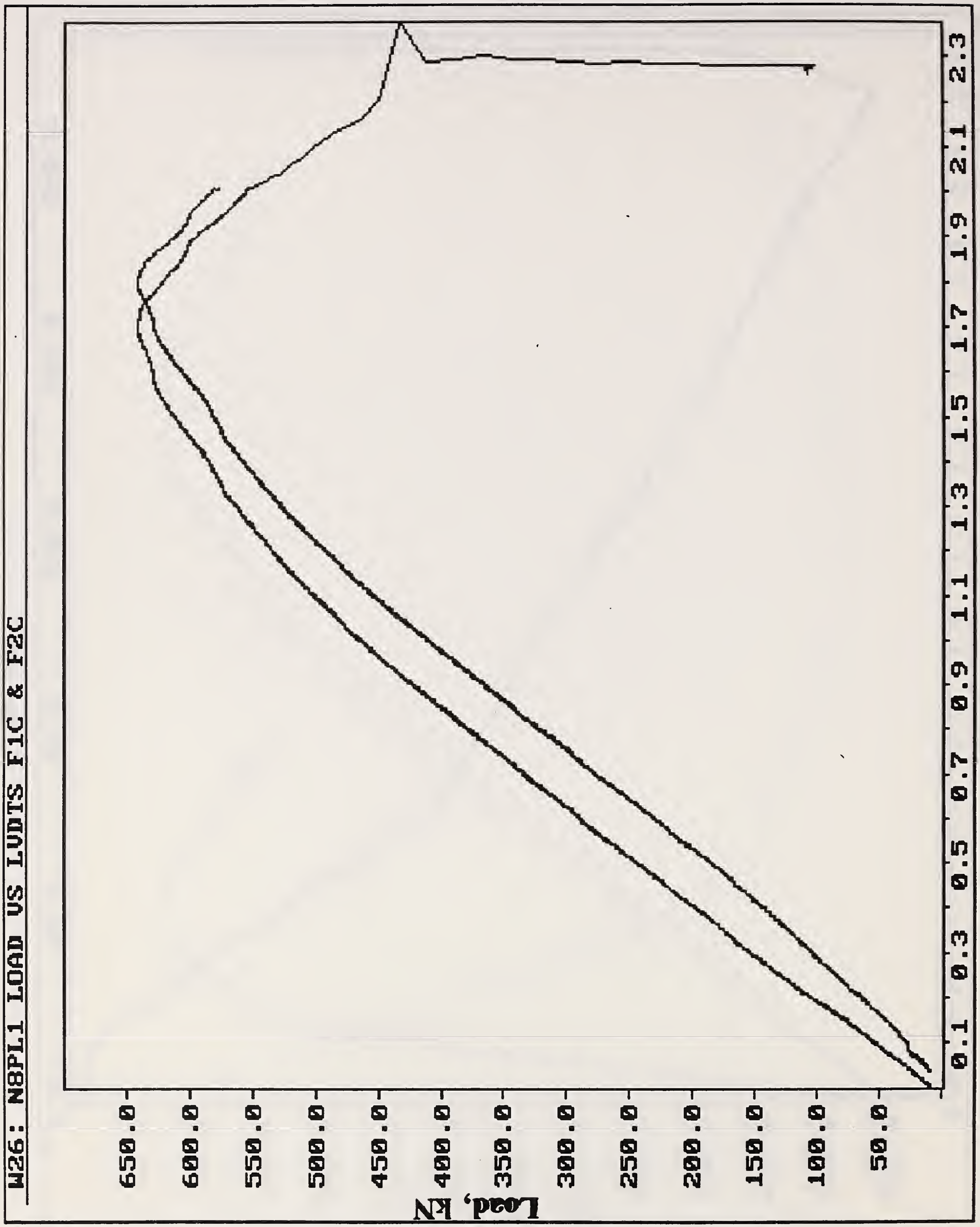

W28: N8P8 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2

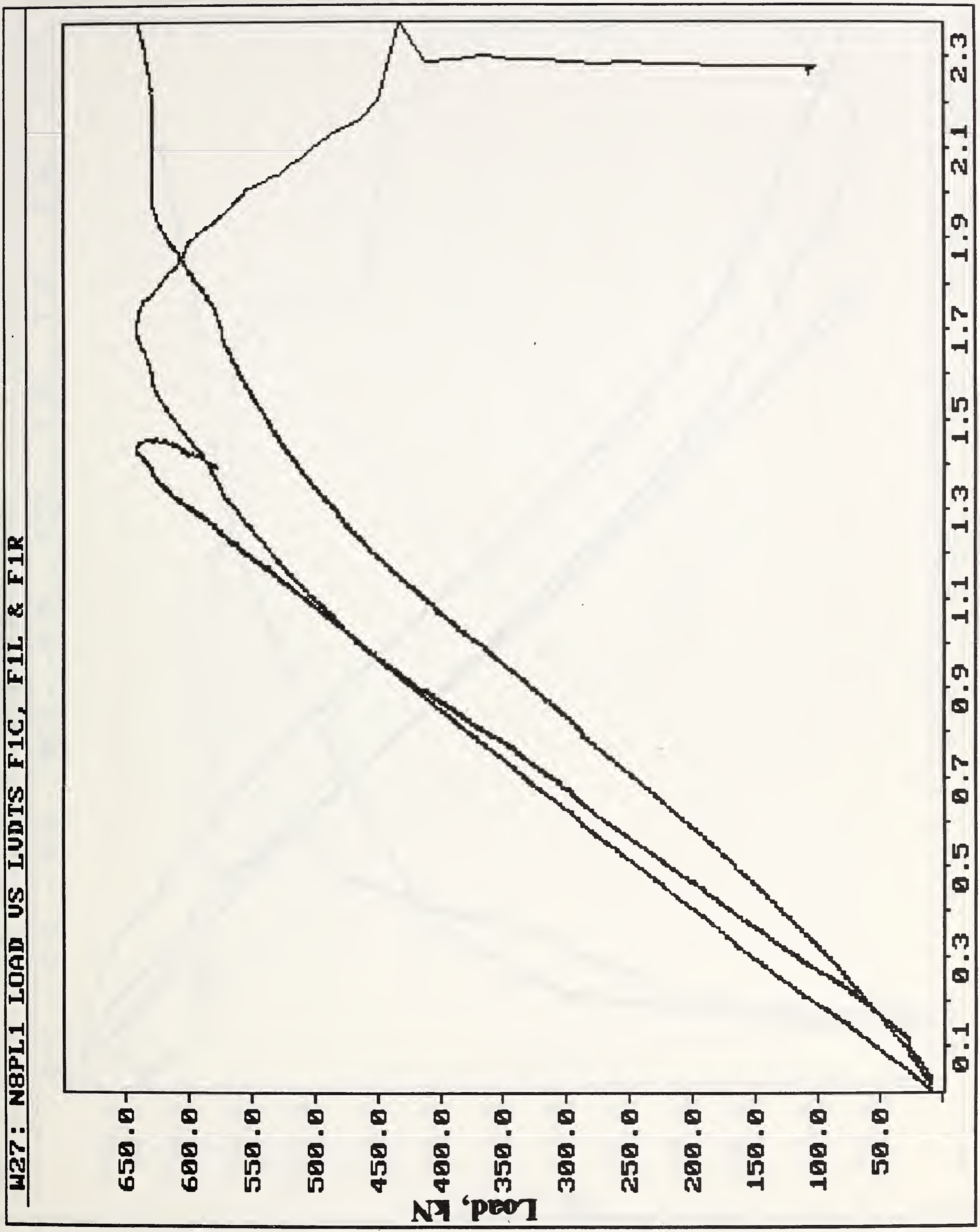

W29: N8P8 LOAD VS LVDTS F1H & F2H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70

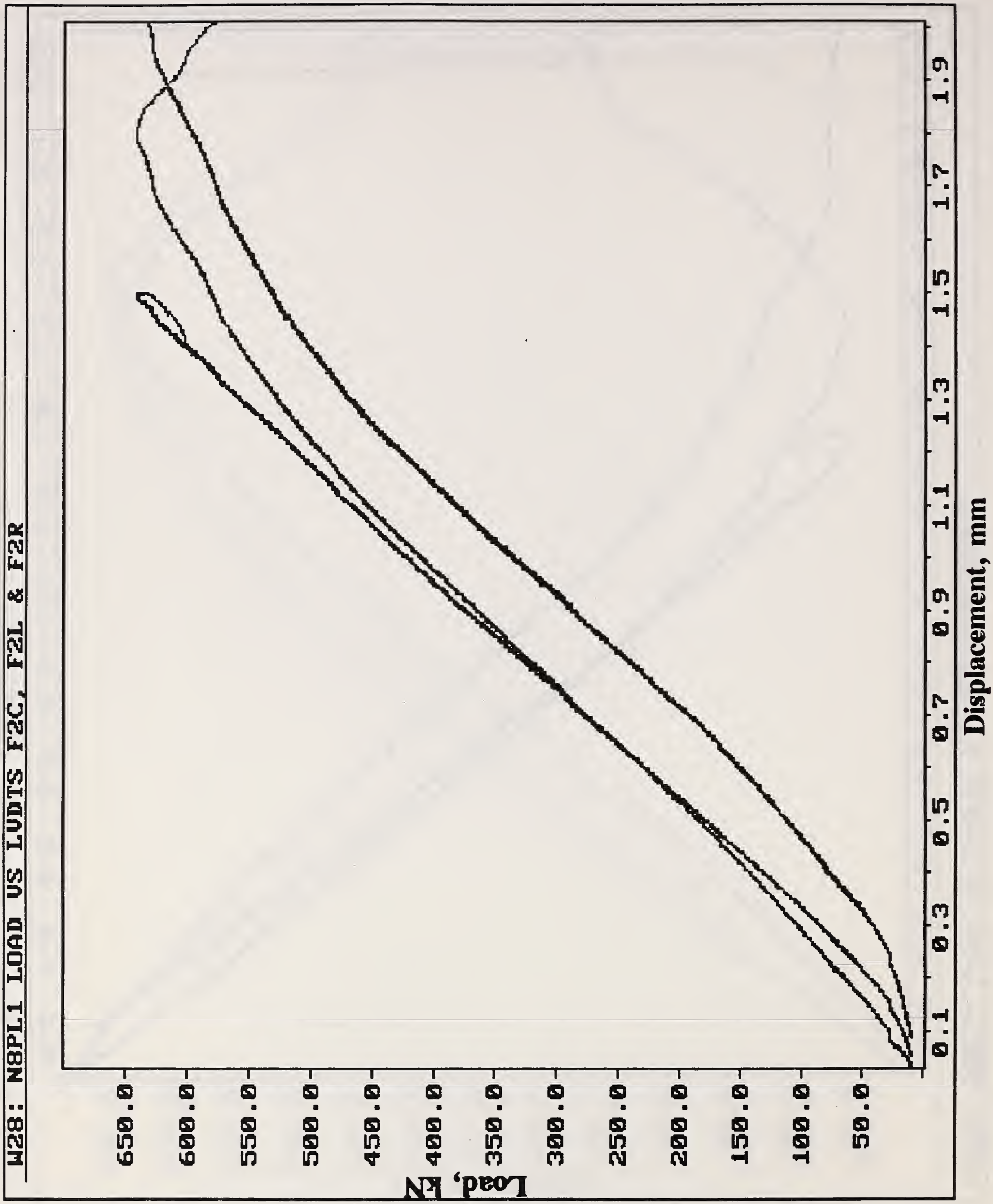

W30: N8P8 LOAD VS LVDTS F1C & F1H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2



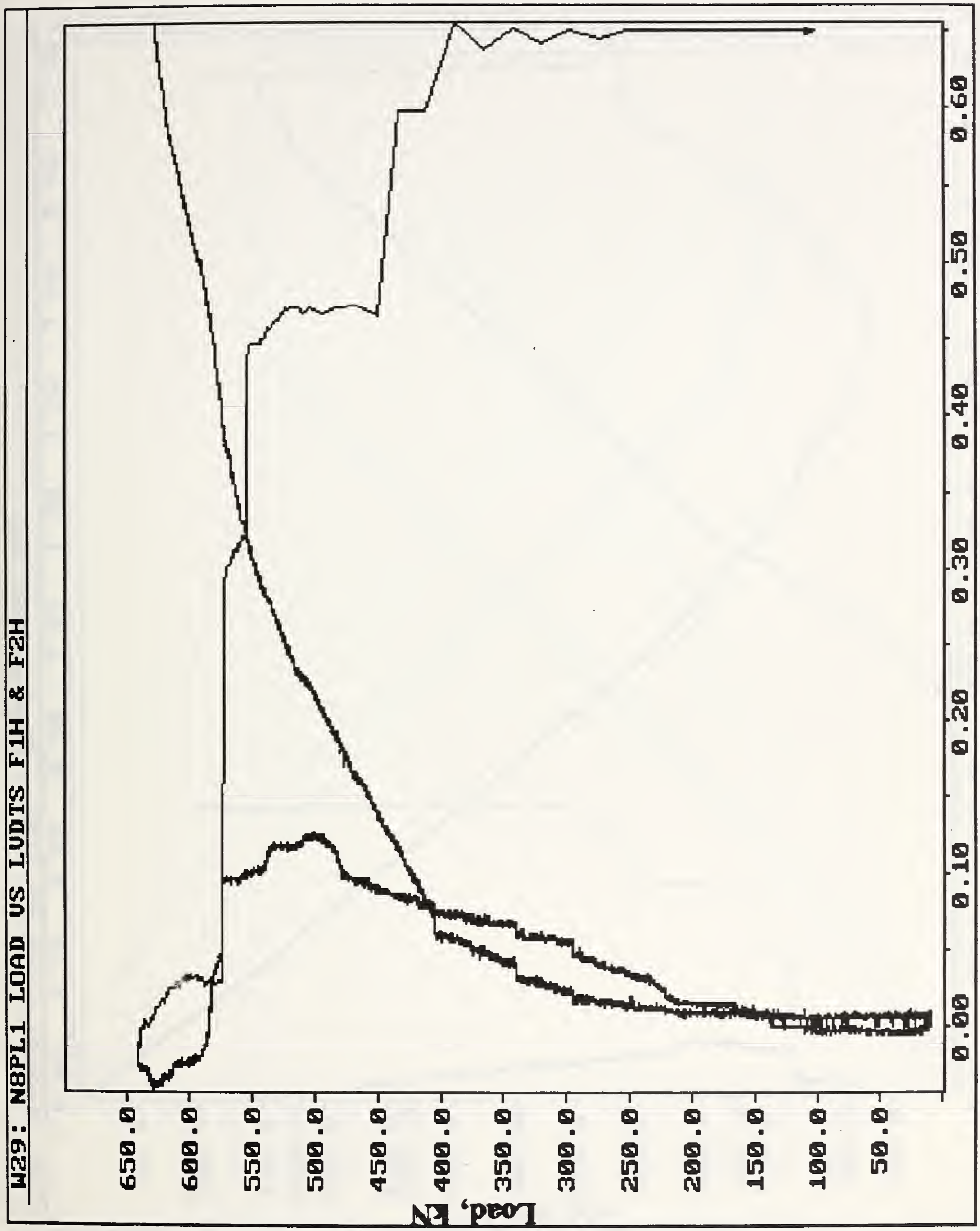
W25: N8PL1 LOAD VS TIME
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

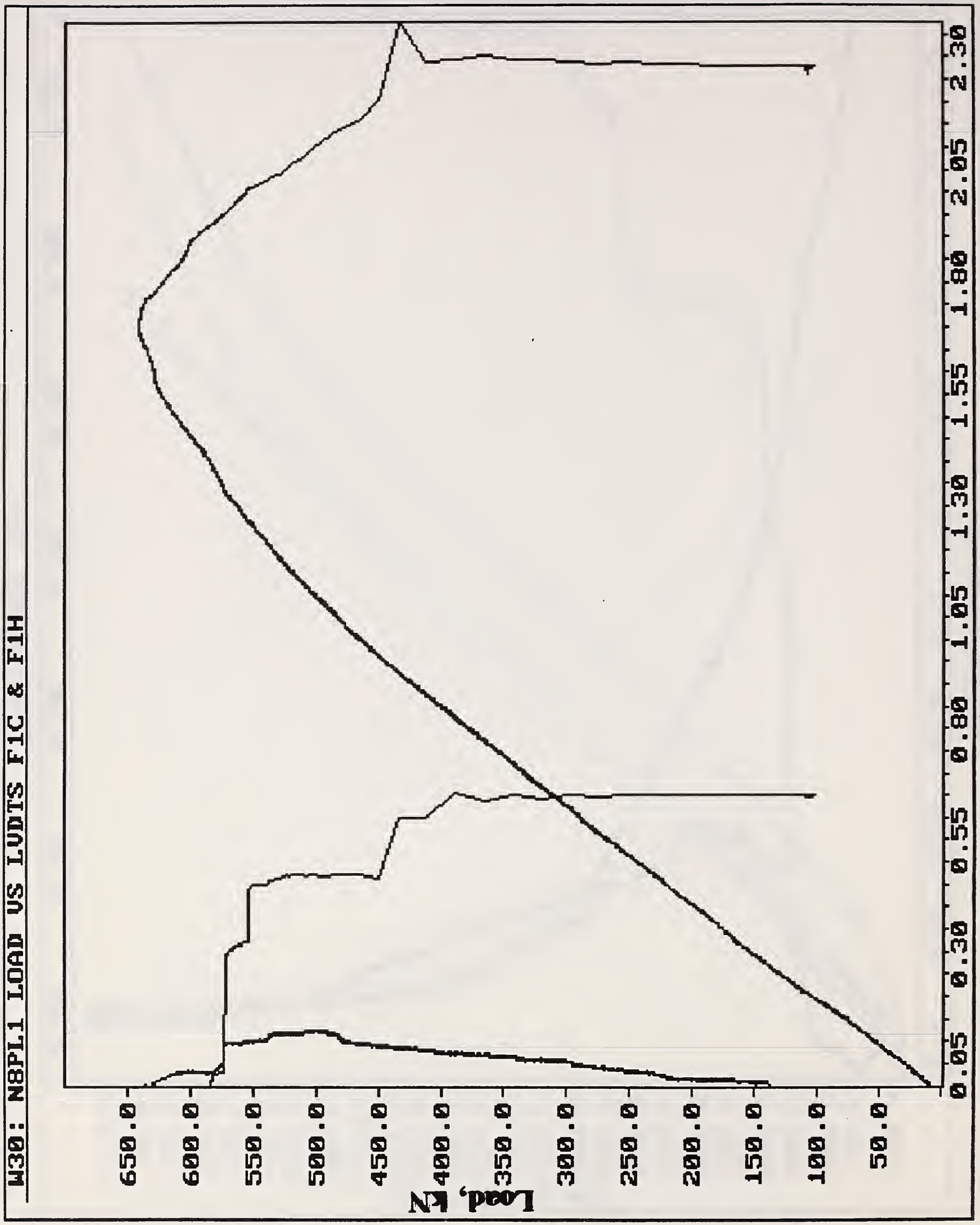

W26: N8PL1 LOAD VS LVDTS F1C & F2C
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1
2.3


W27: N8PL1 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
2.1
2.3
Displacement, mm

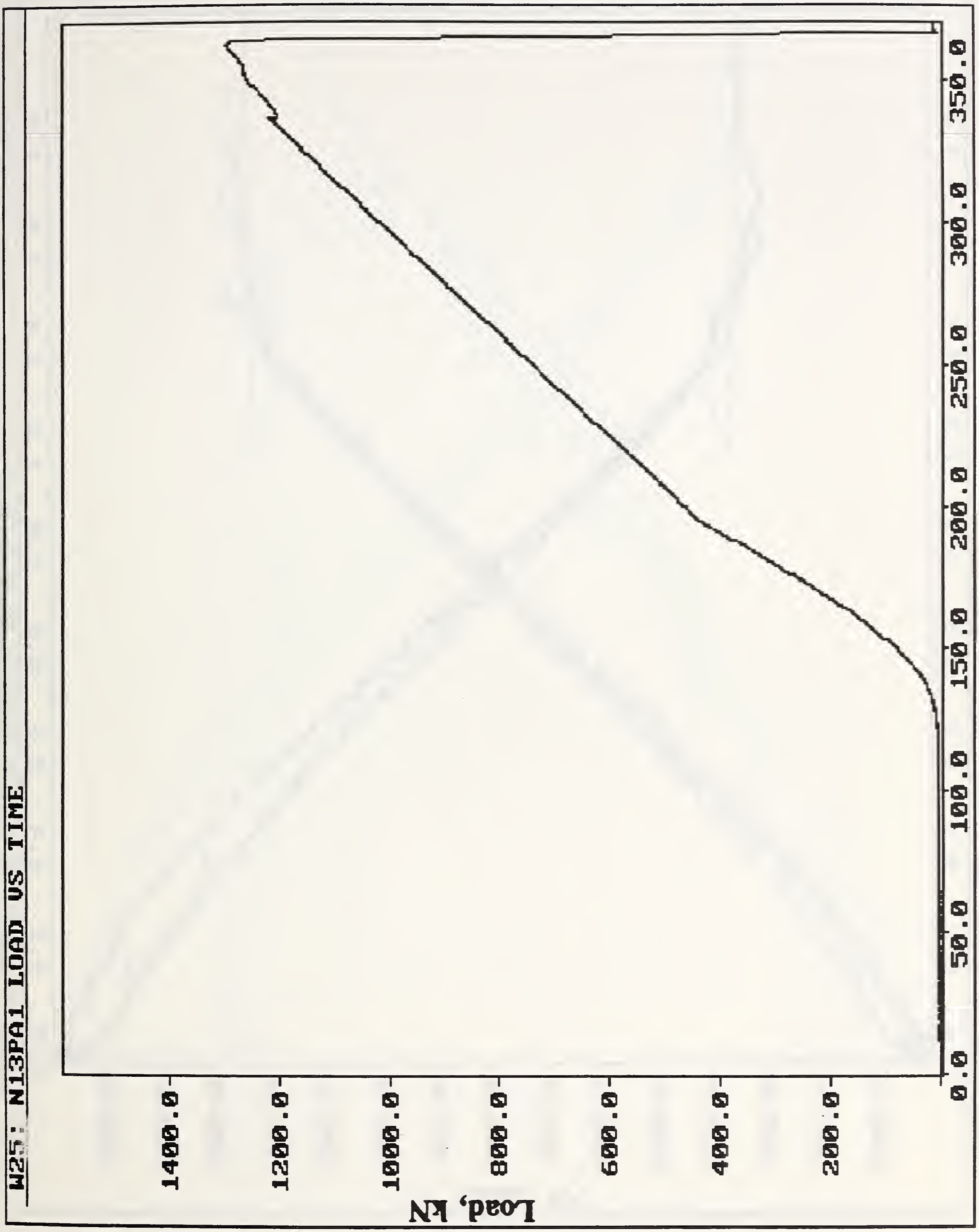


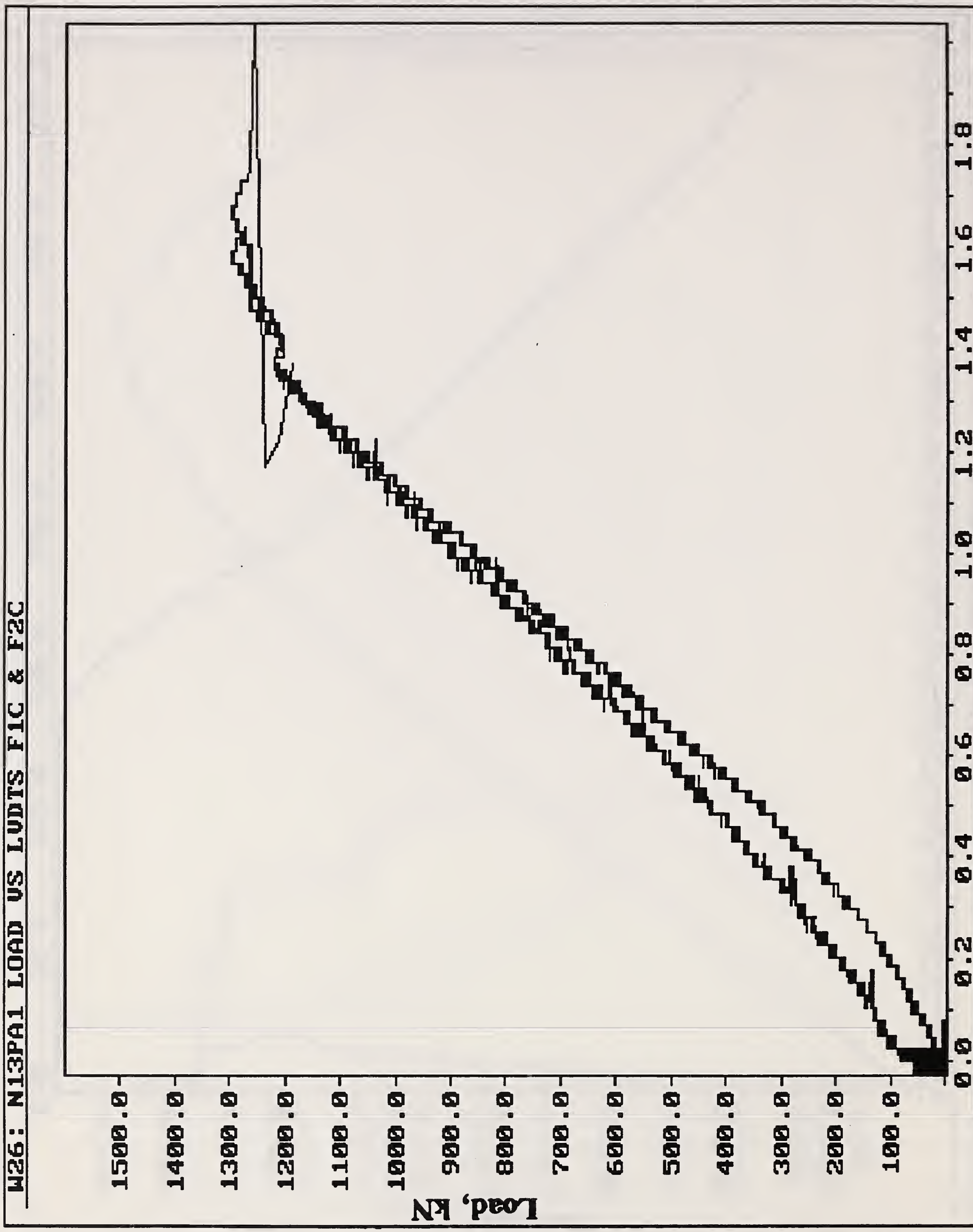
W28: N8PL1 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.1
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7
1.9
Displacement, mm

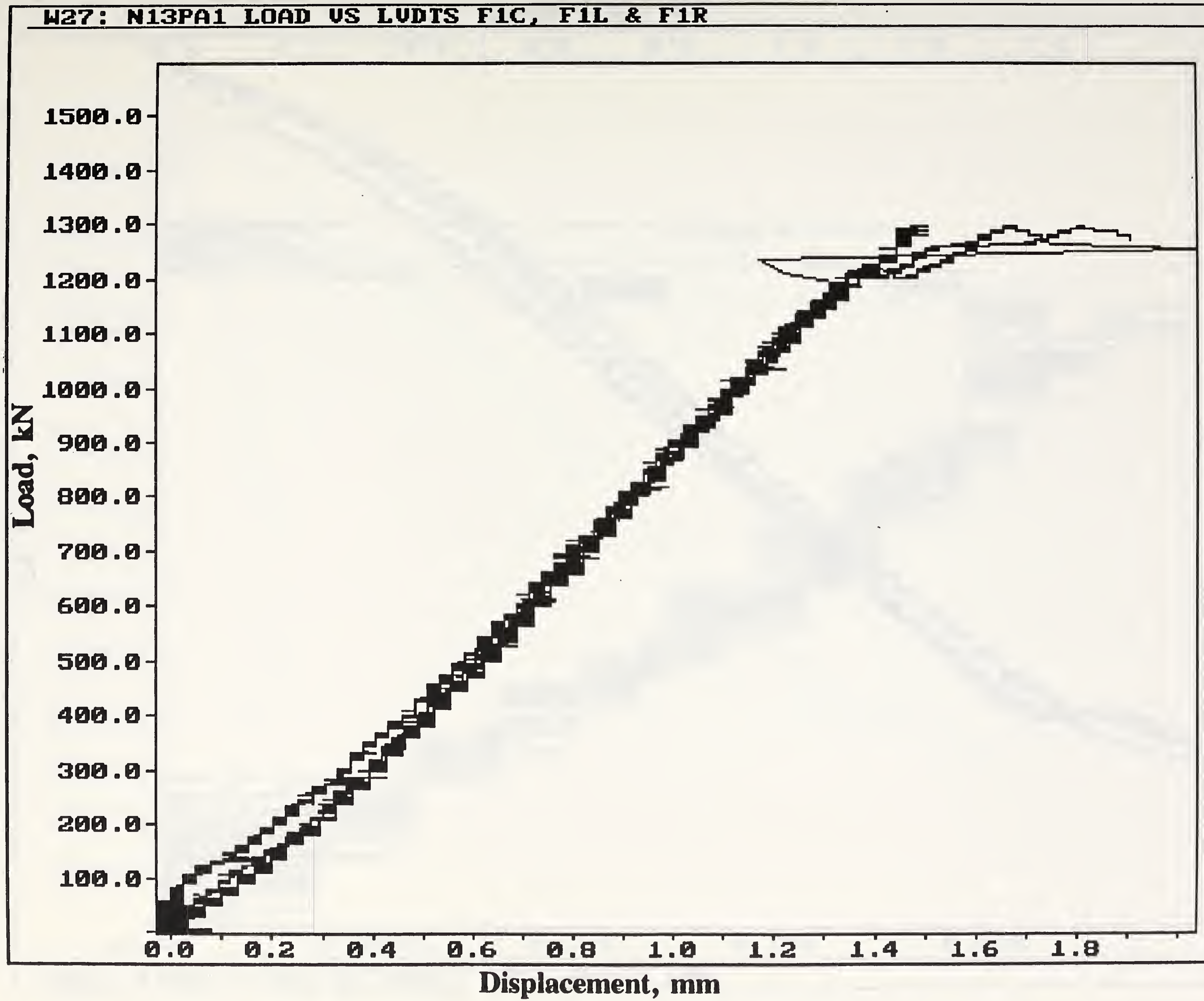

W29: N8PL1 LOAD VS LVDTS F1H & F2H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60

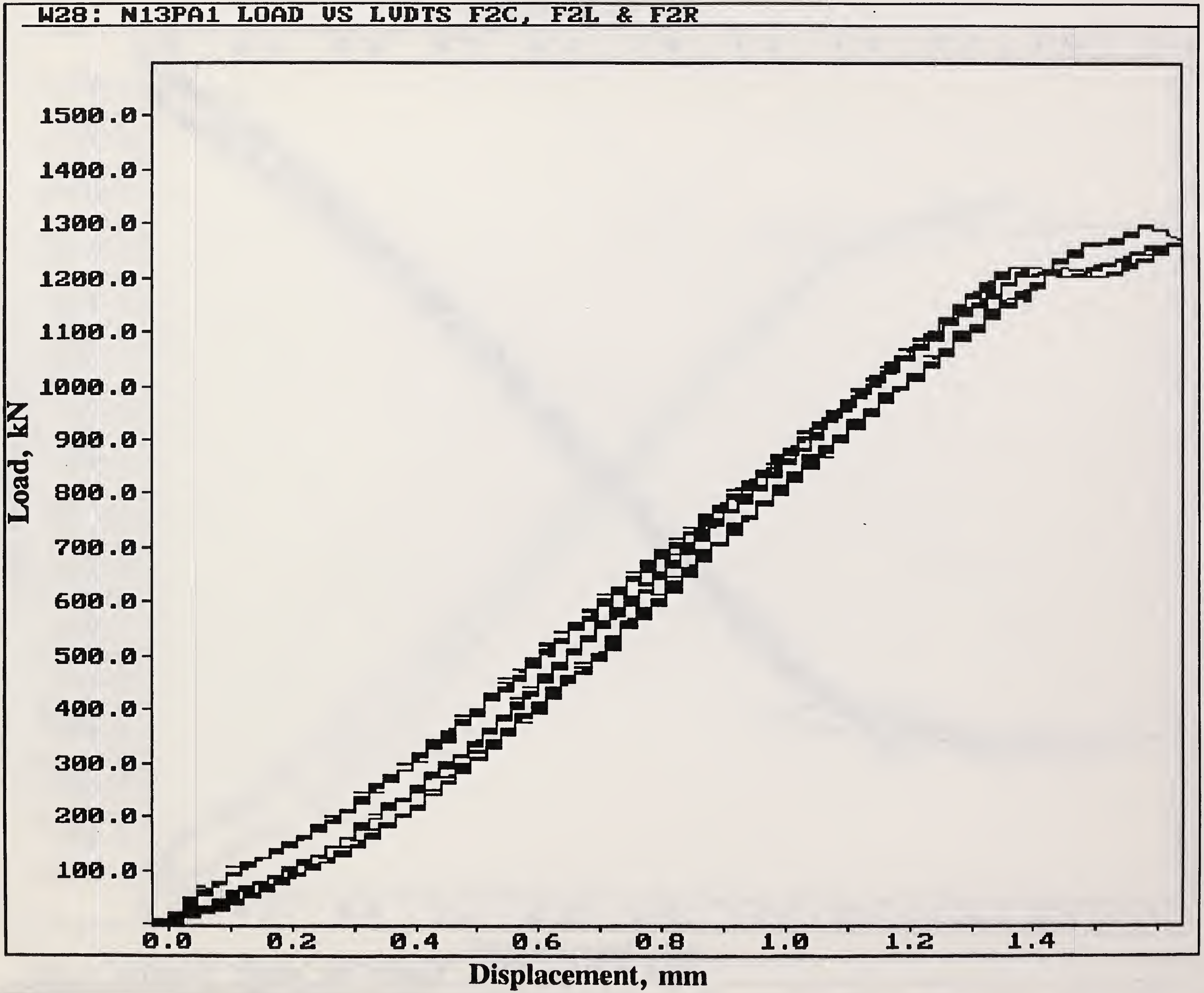


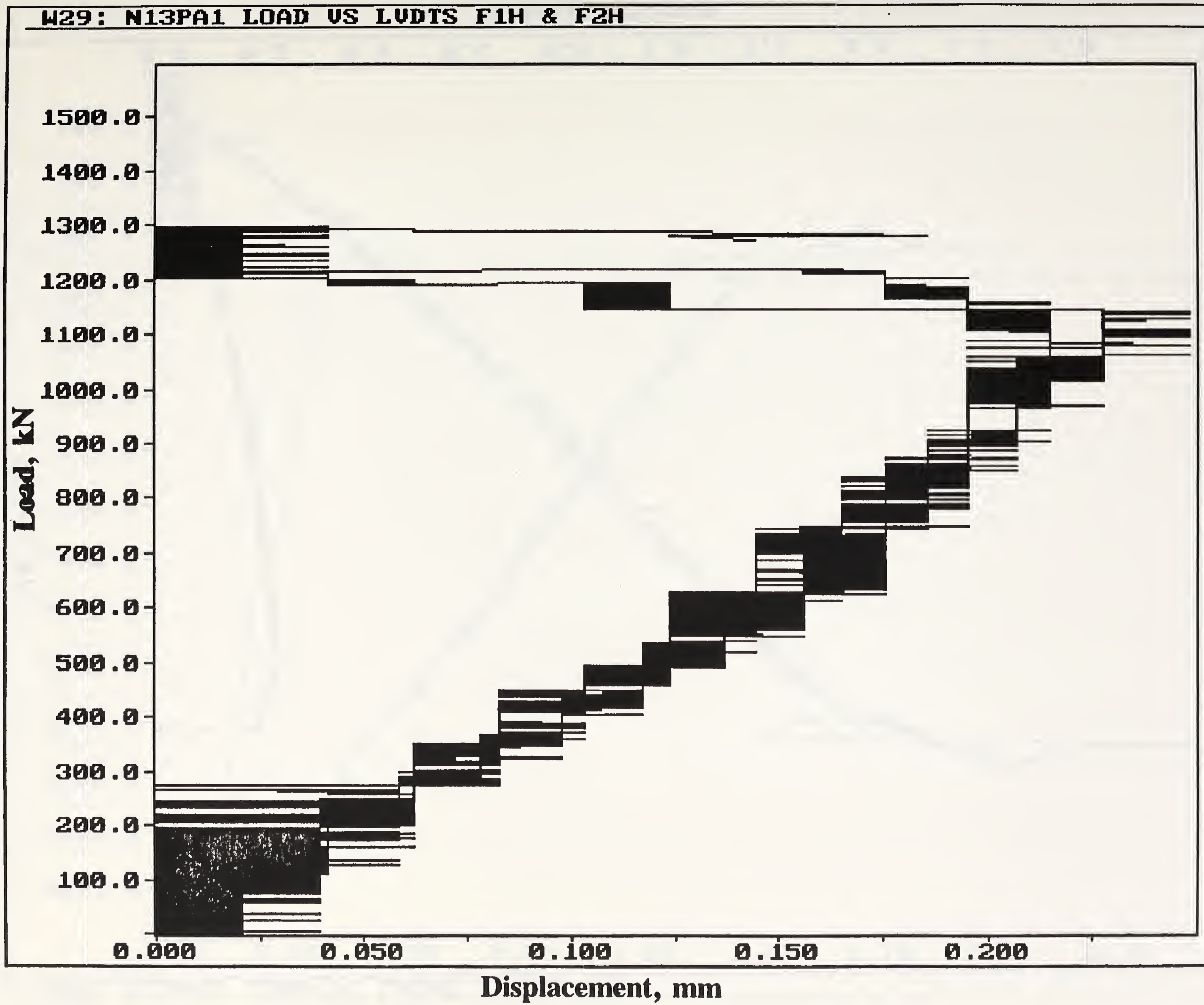
W30: N8PL1 LOAD VS LVDTS F1C & F1H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.05
0.30
0.55
0.80
1.05
1.30
1.55
1.80
2.05
2.30
Displacement, mm

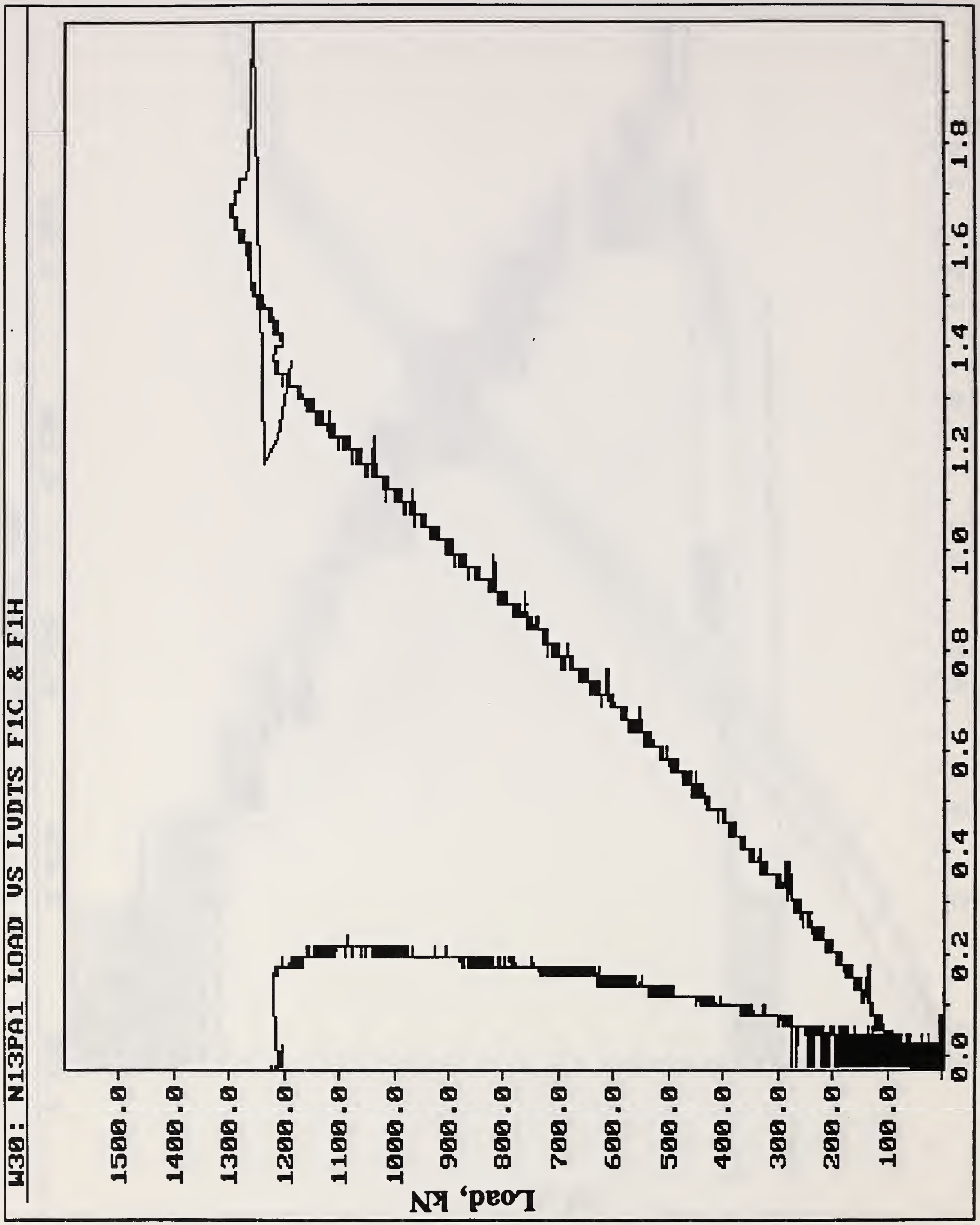

W25: N13PA1 LOAD VS TIME
Load, kN
0.0
200.0
400.0
600.0
800.0
1000.0
1200.0
1400.0
Time, sec
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0


W26: N13PA1 LOAD VS LVDTS F1C & F2C
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
1400.0
1500.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

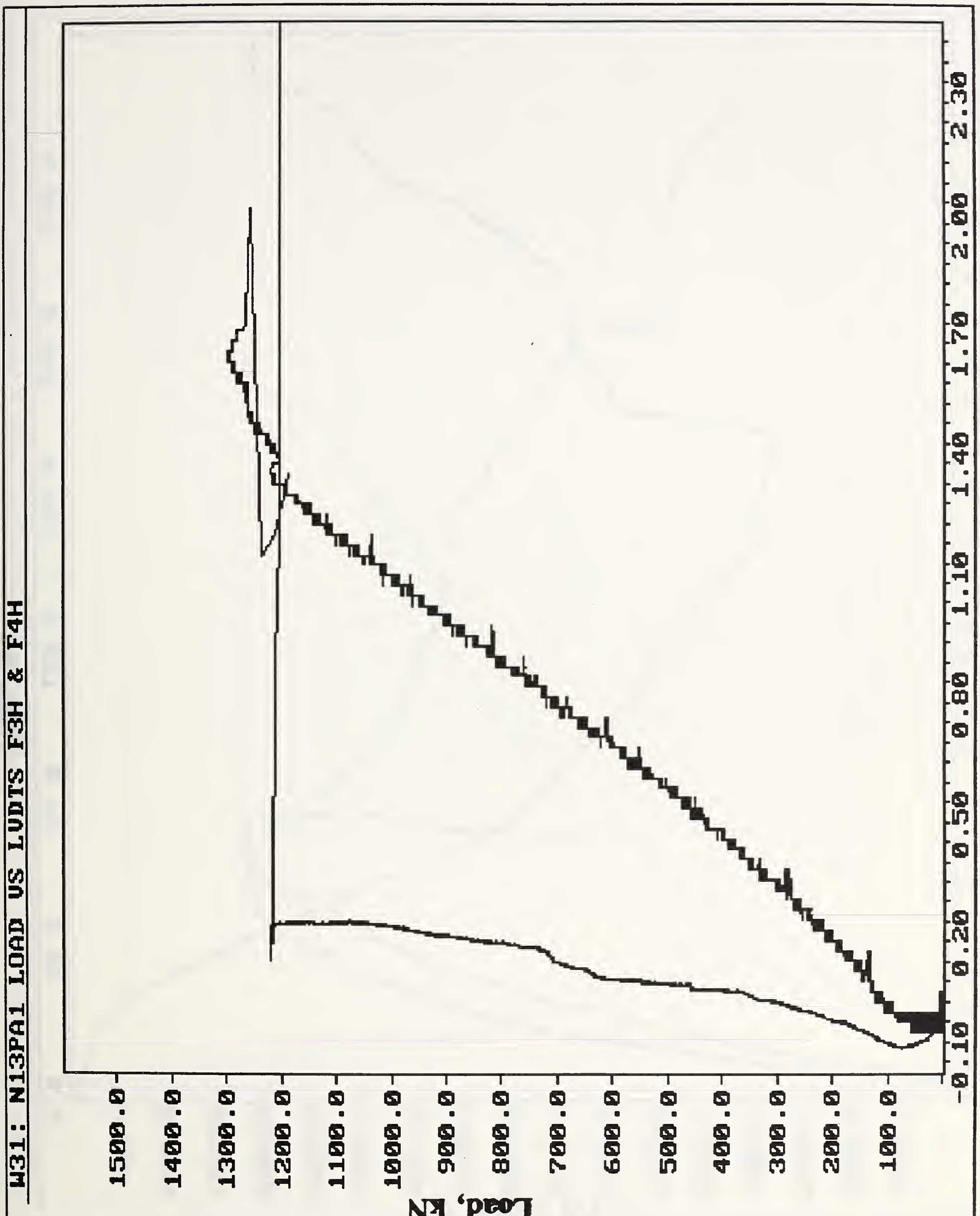

W27: N13PA1 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1500.0
1400.0
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

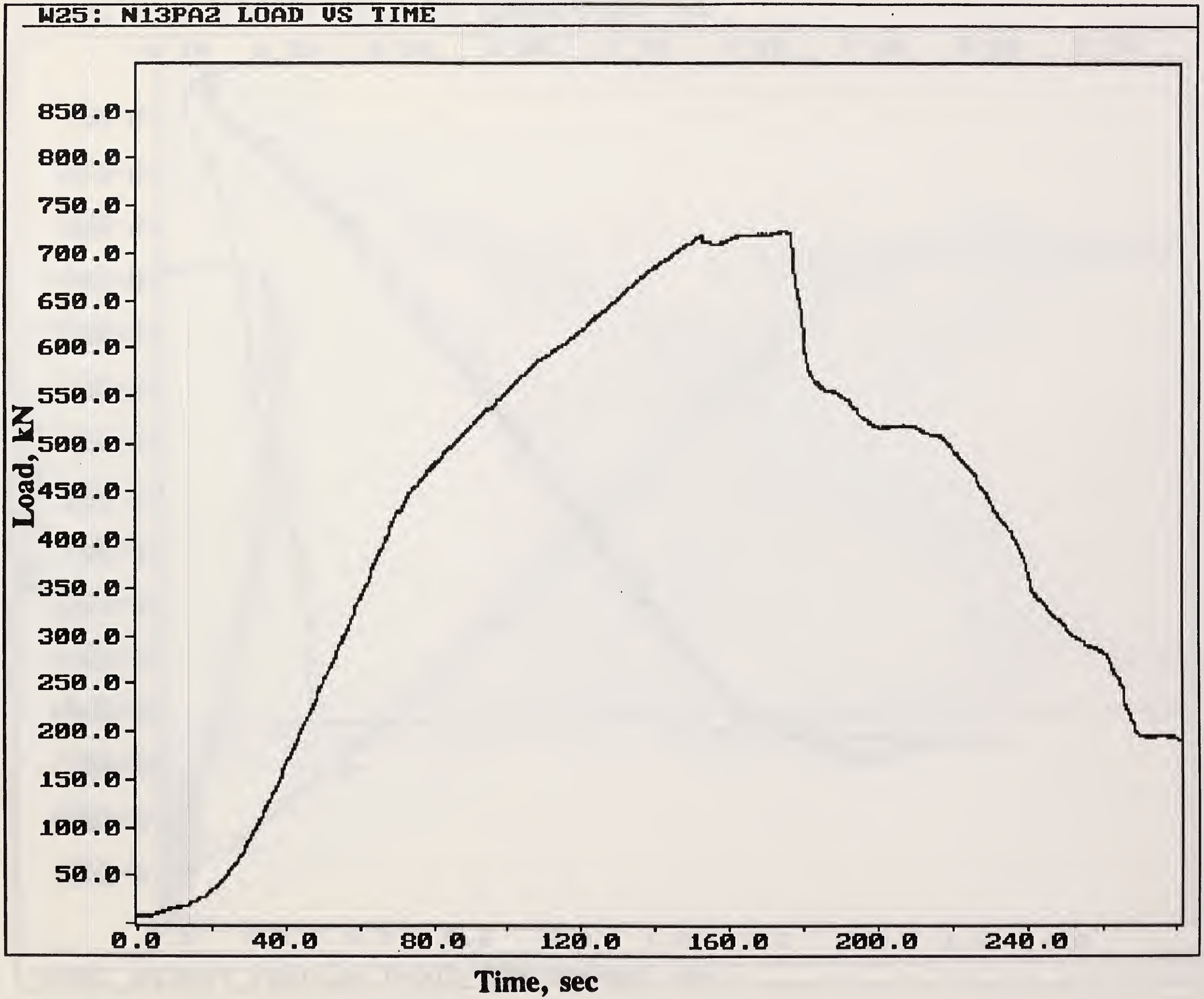

W28: N13PA1 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
1500.0
1400.0
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Displacement, mm

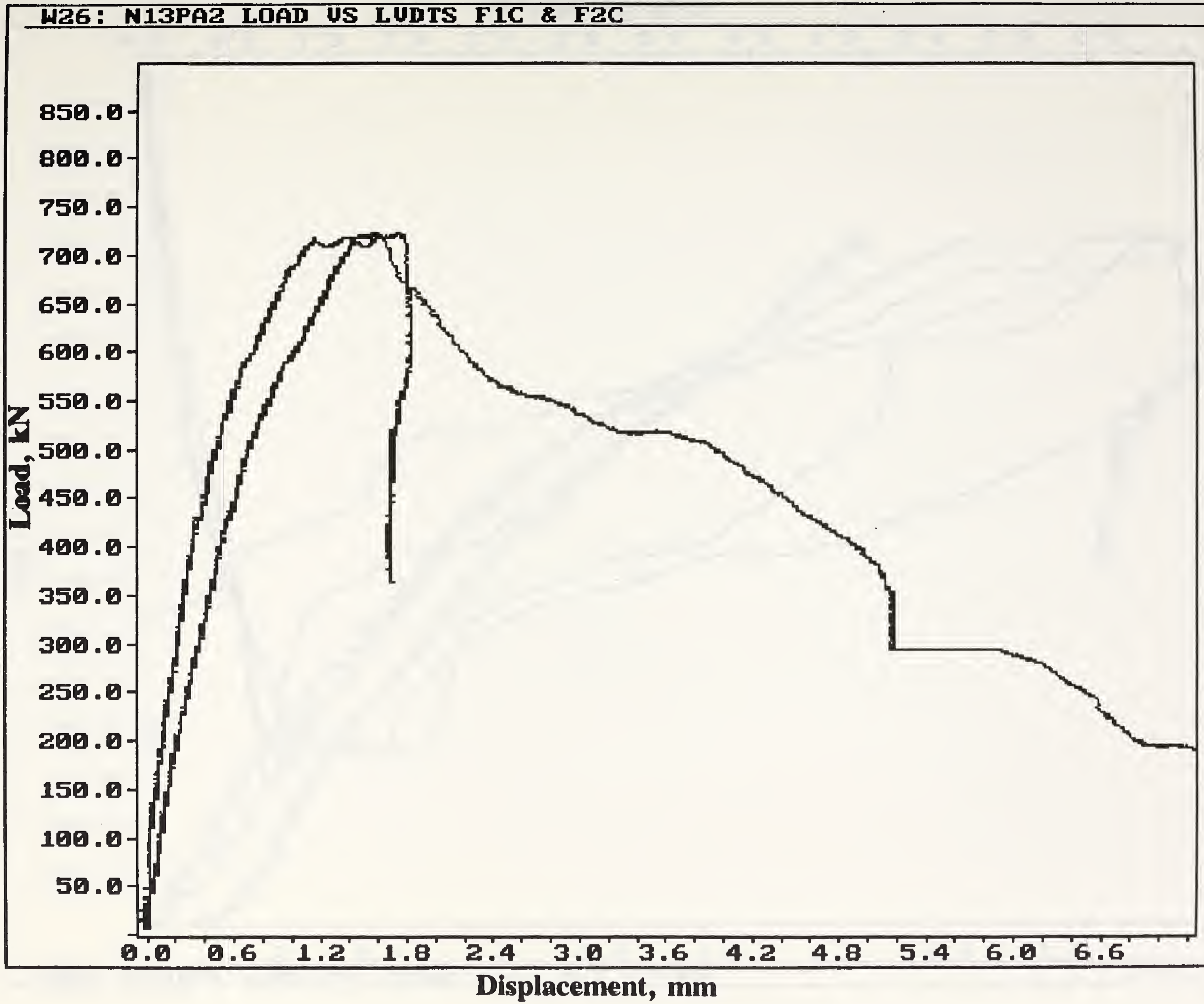

W29: N13PA1 LOAD VS LVDTS F1H & F2H
Load, kN
1500.0
1400.0
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.000
0.050
0.100
0.150
0.200
Displacement, mm

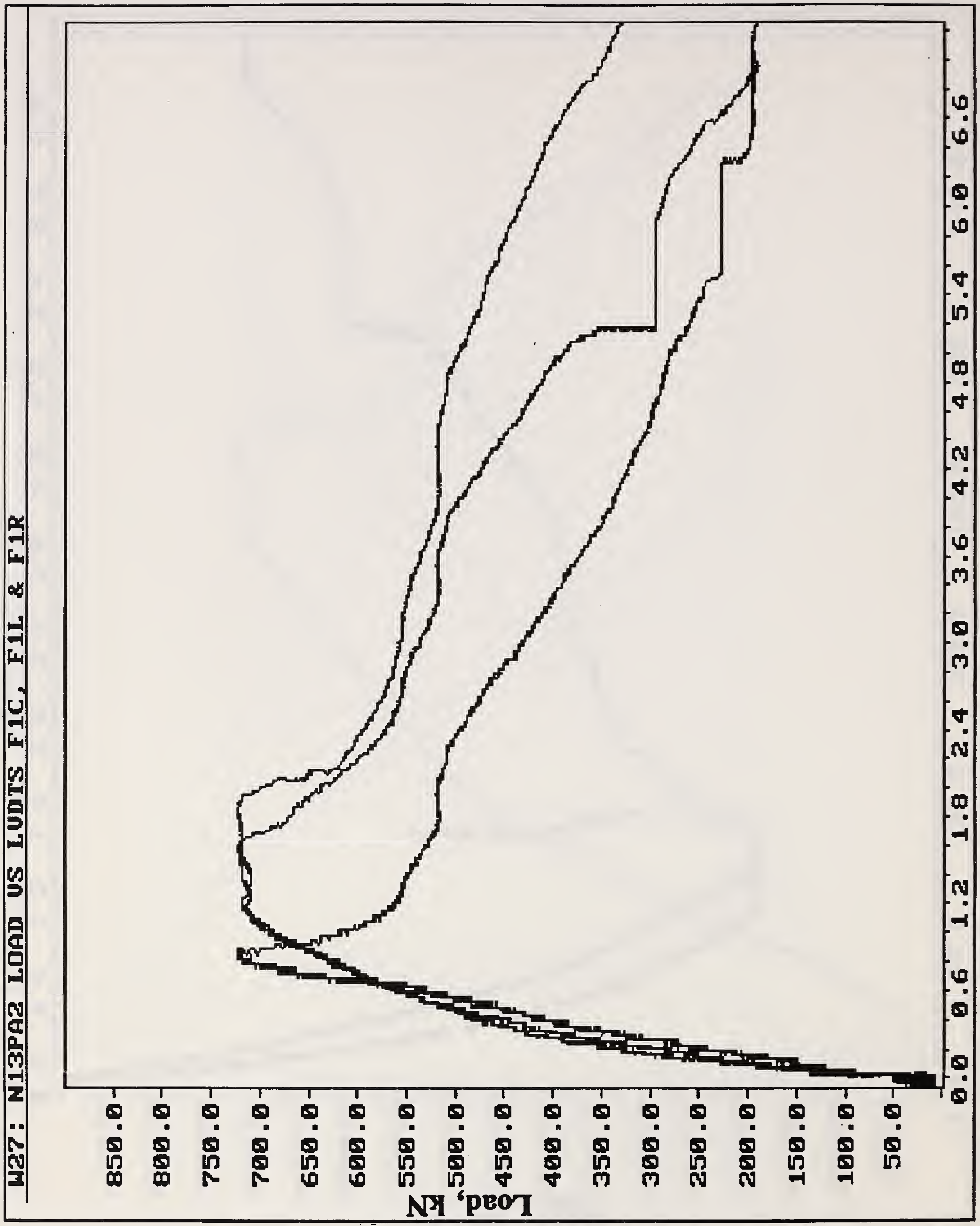


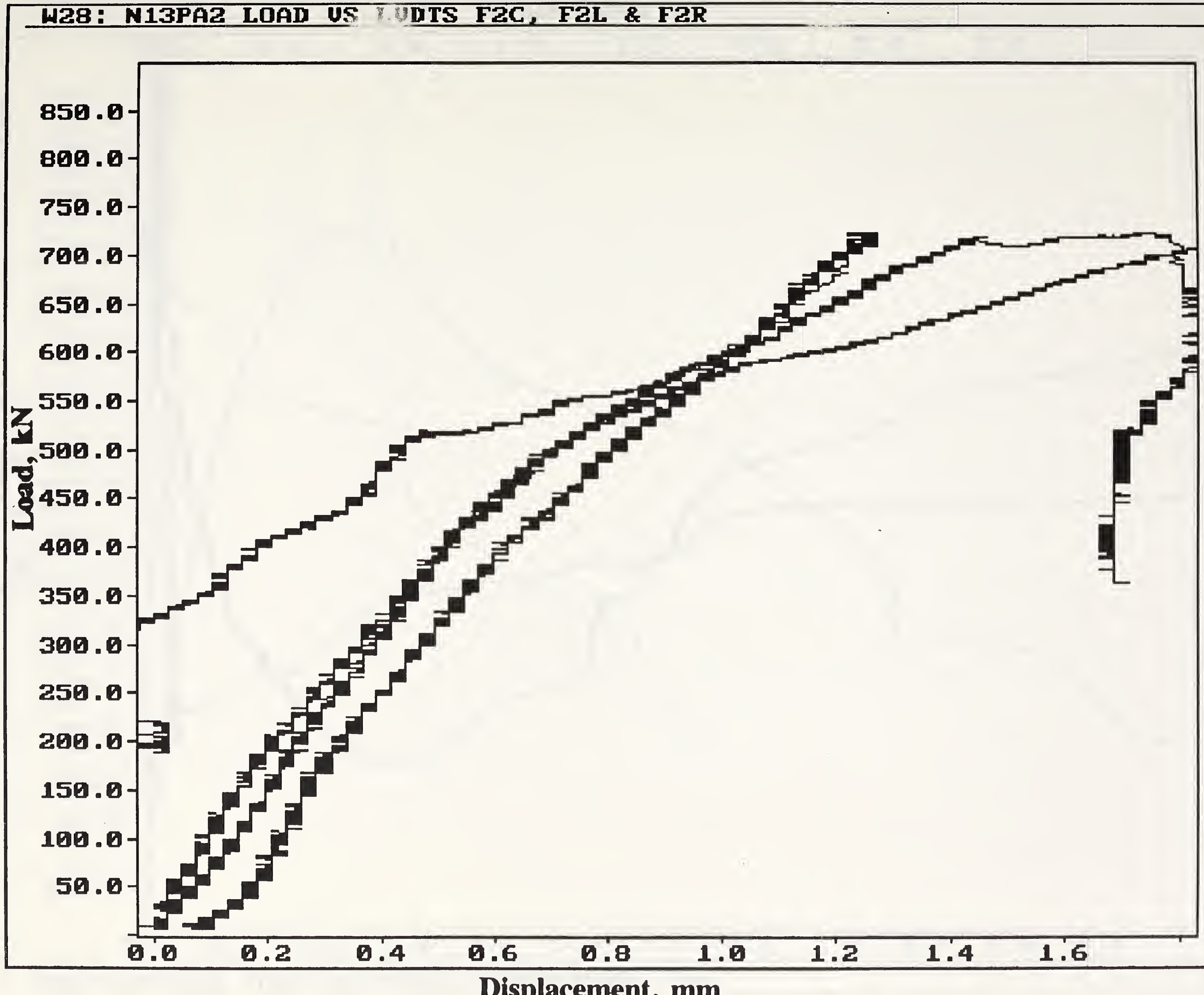
W30: N13PA1 LOAD VS LVDTS F1C & F1H
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
1300.0
1400.0
1500.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

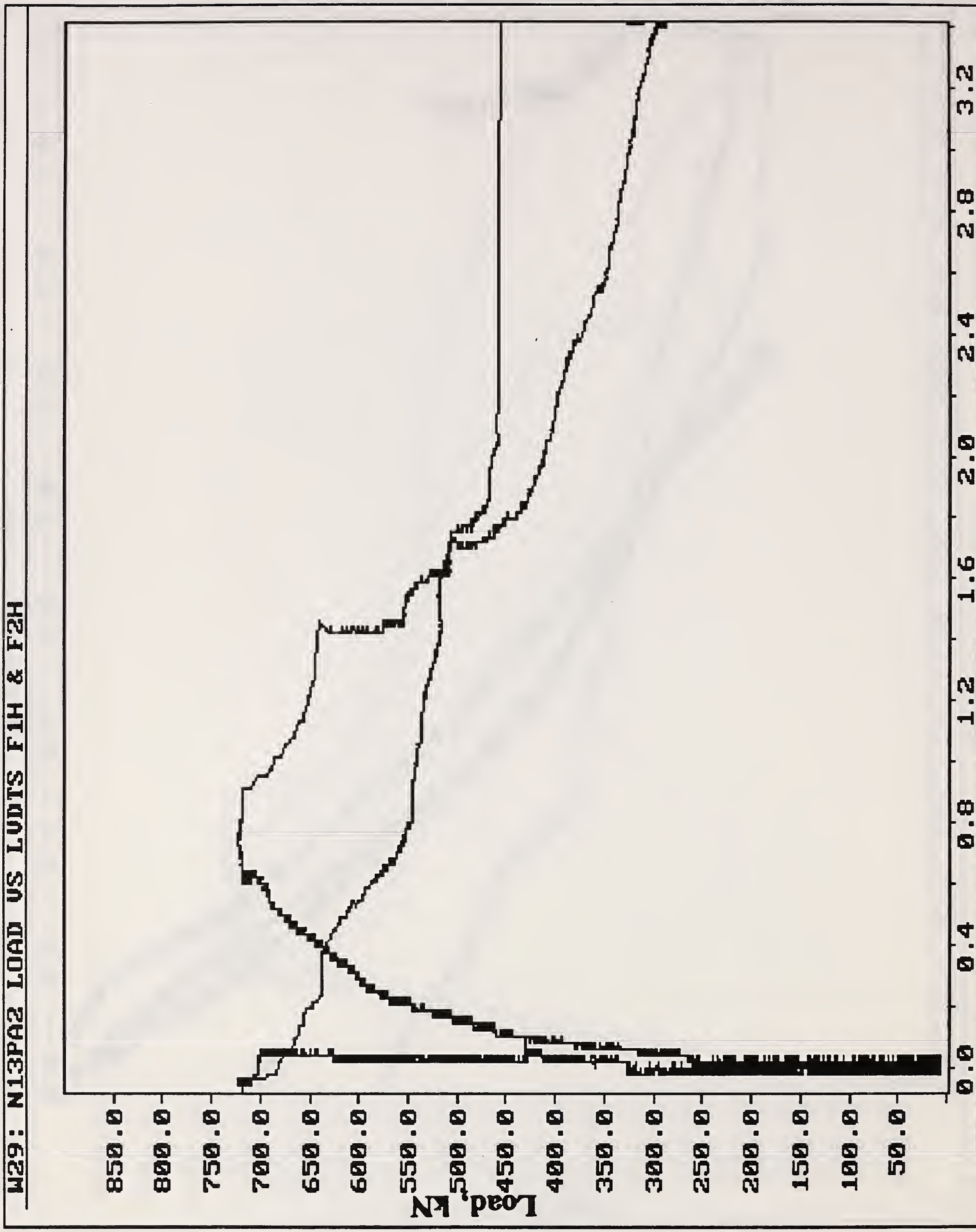

W31: N13PA1 LOAD VS LVDTS F3H & F4H
Load, kN
1500.0
1400.0
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
-0.10
0.20
0.50
0.80
1.10
1.40
1.70
2.00
2.30

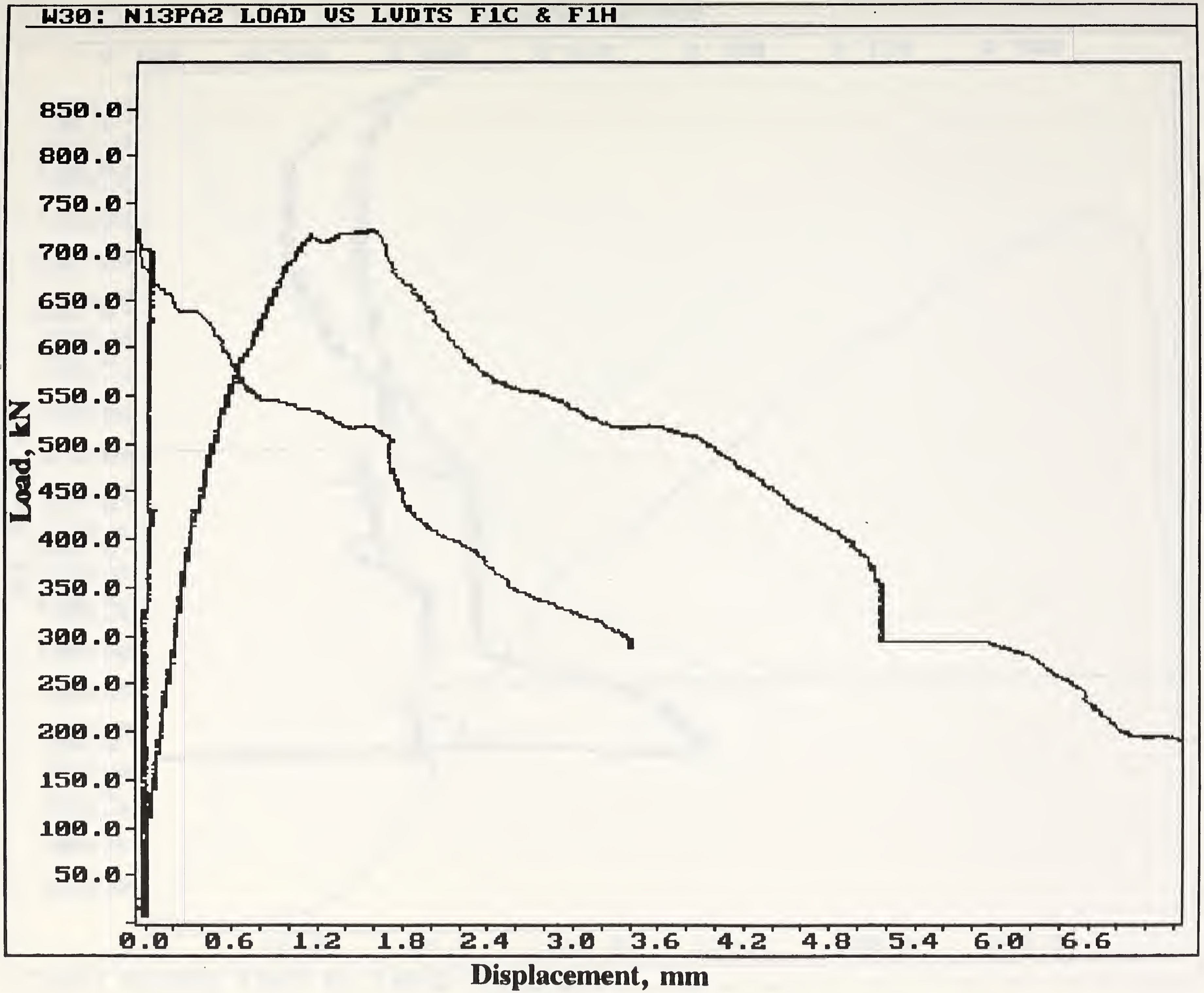

W25: N13PA2 LOAD VS TIME
Load, kN
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

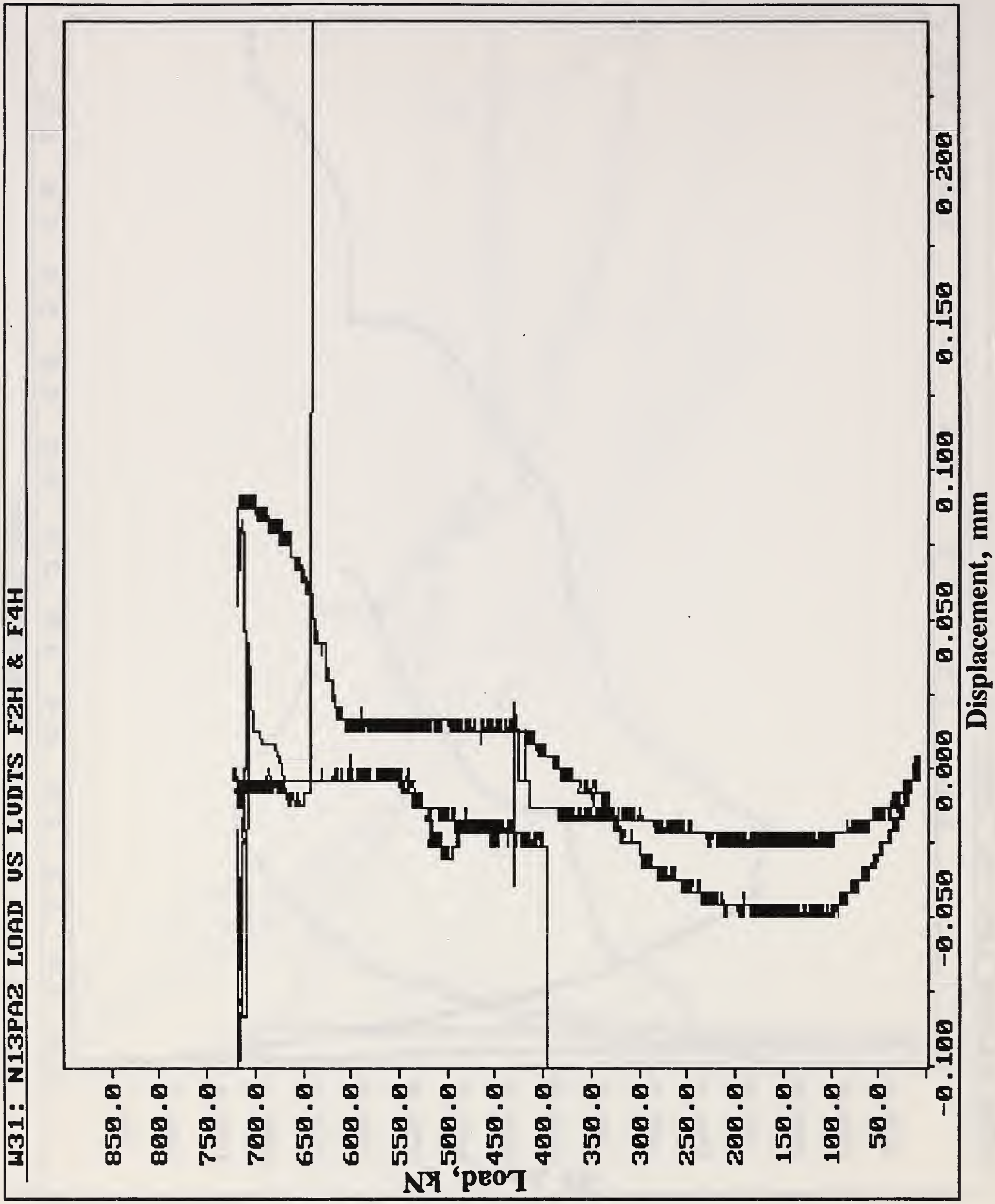

W26: N13PA2 LOAD VS LVDTS F1C & F2C
Load, kN
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
5.4
6.0
6.6
Displacement, mm

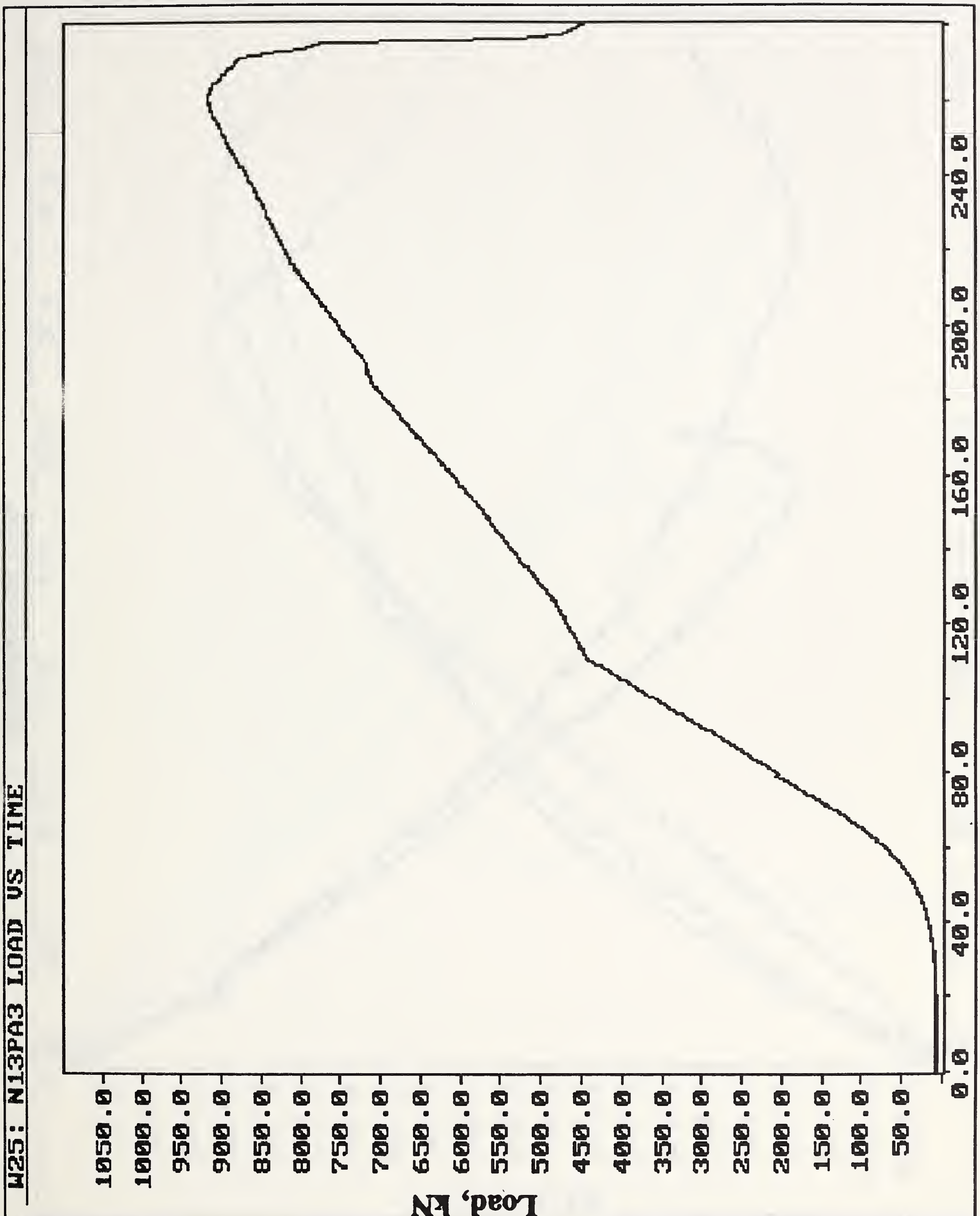

W27: N13PA2 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
5.4
6.0
6.6

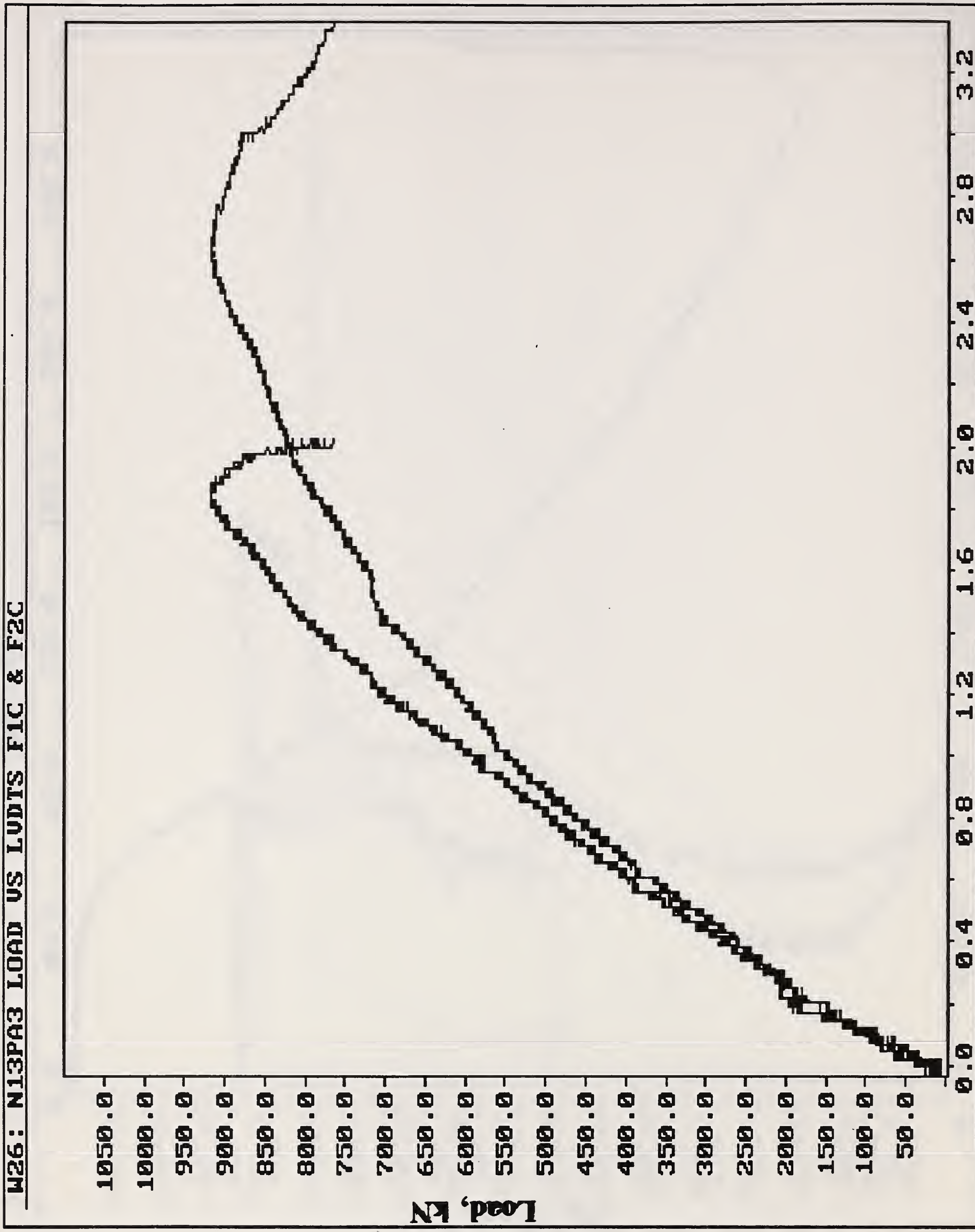

W28: N13PA2 LOAD VS
DTS F2C, F2L & F2R
Load, kN
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm

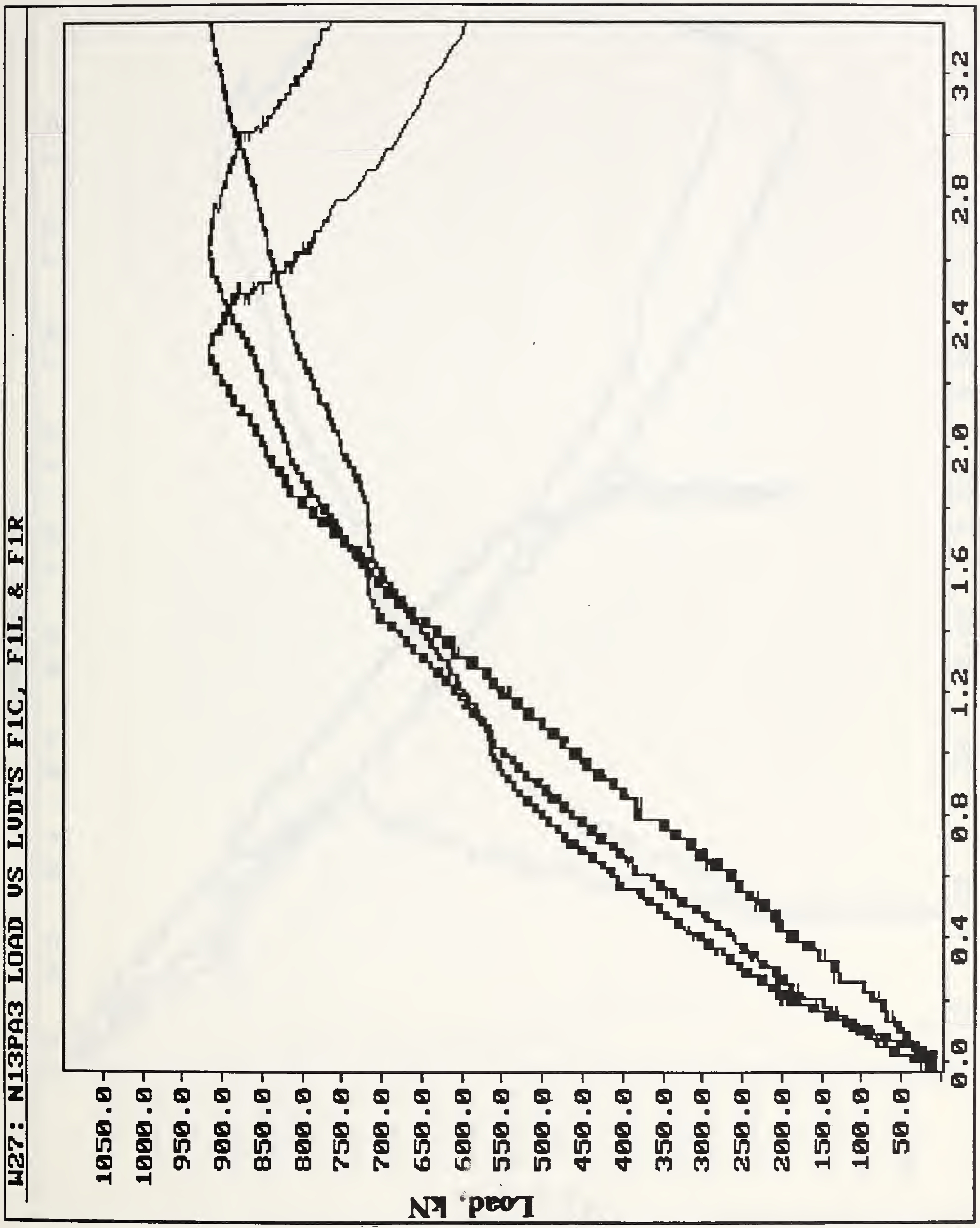

W29: N13PA2 LOAD VS LVDTS F1H & F2H
Load, kN
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
3.2


W30: N13PA2 LOAD VS LVDTS F1C & F1H
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
5.4
6.0
6.6
Displacement, mm

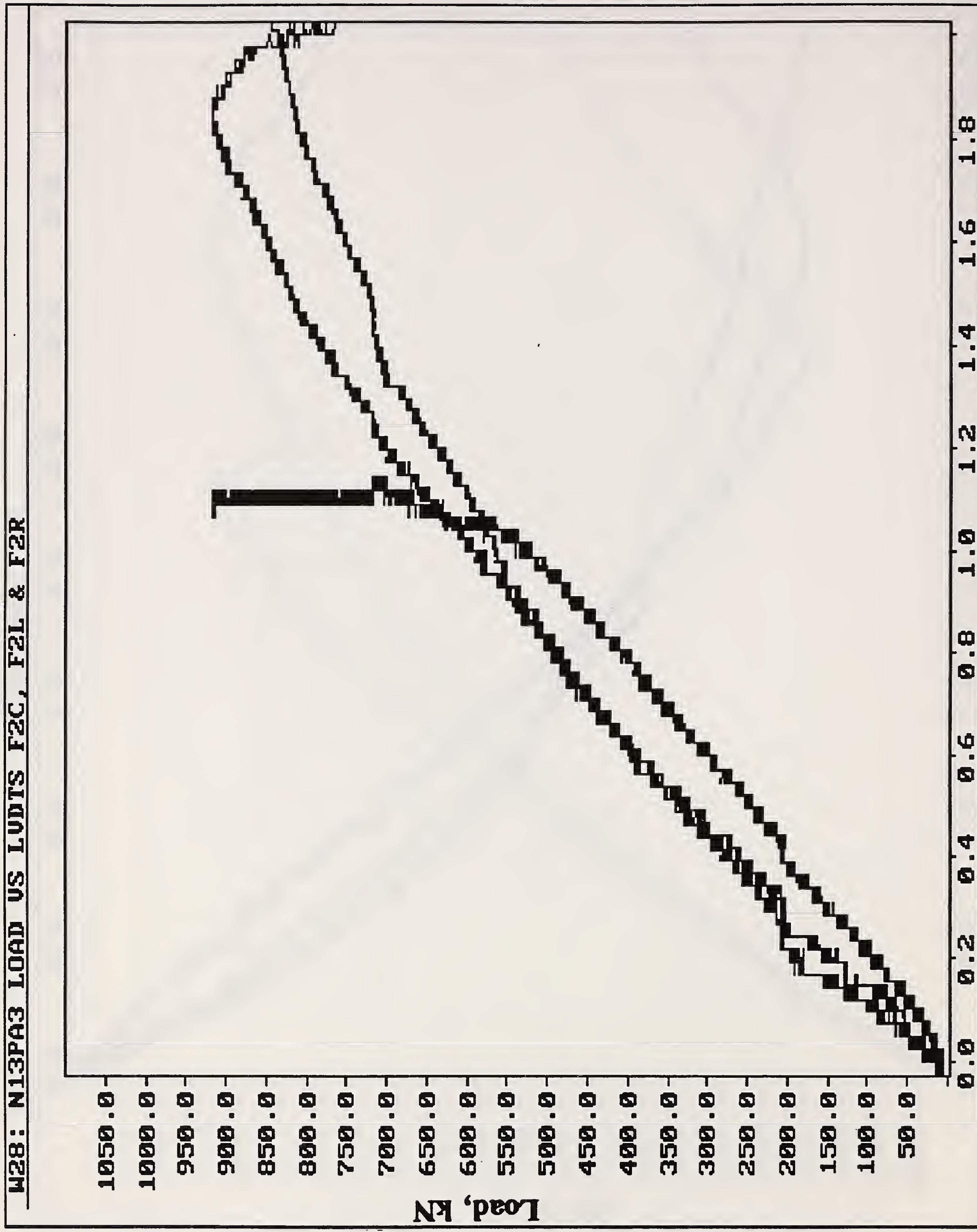

W31: N13PA2 LOAD VS LVDTS F2H & F4H
Load, kN
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
-0.100
-0.050
0.000
0.050
0.100
0.150
0.200

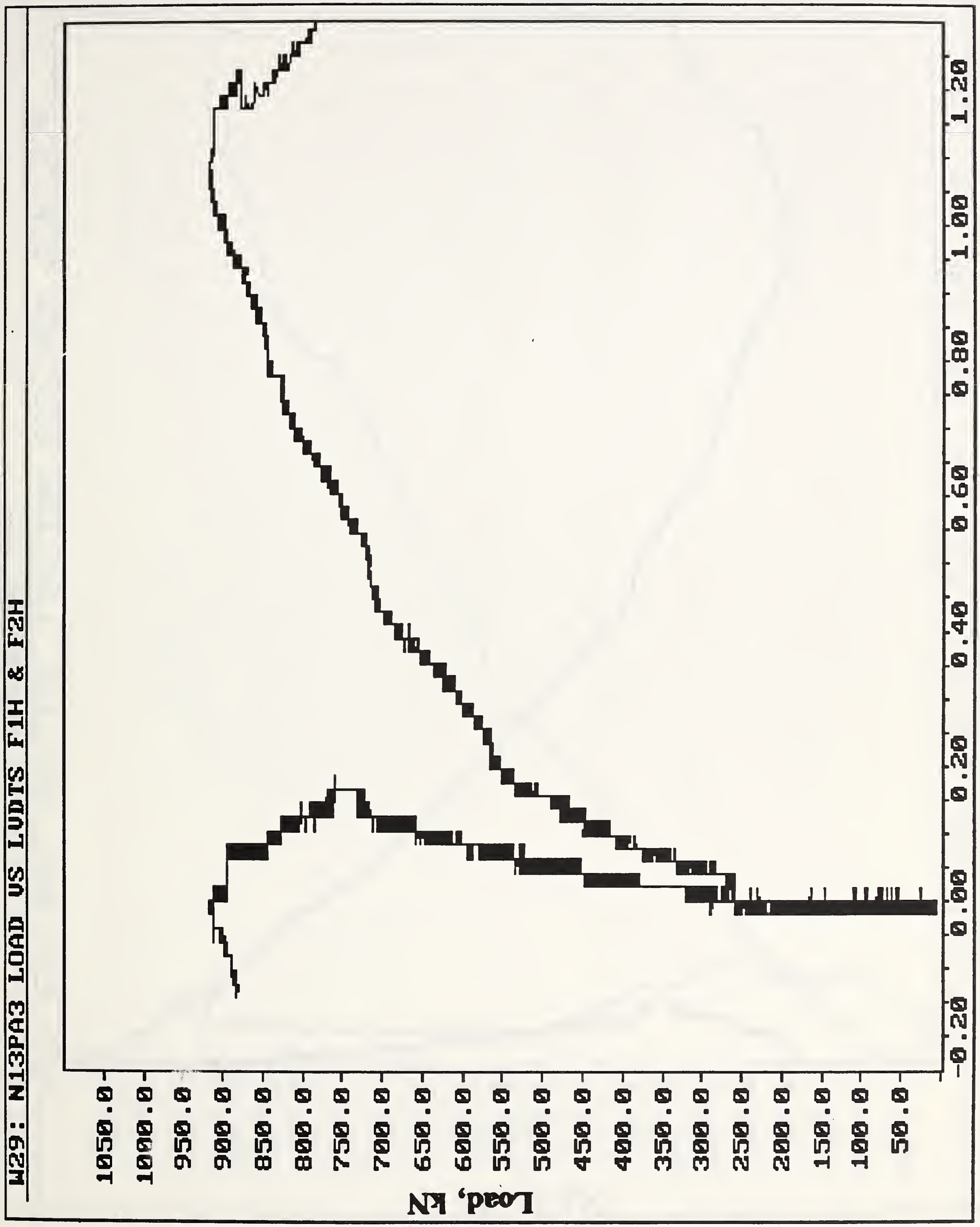

W25: N13PA3 LOAD VS TIME
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

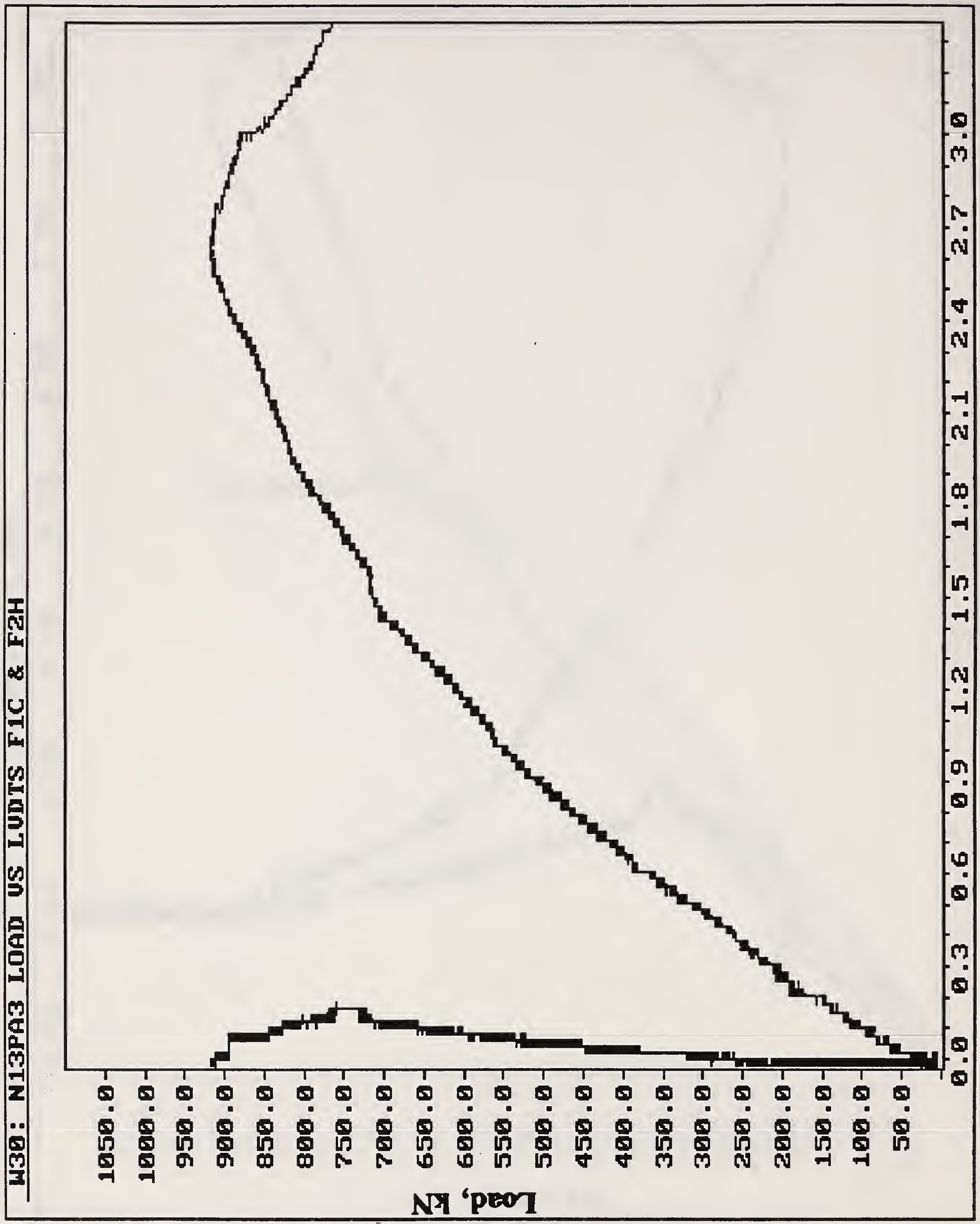

W26: N13PA3 LOAD VS LVDTS F1C & F2C
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
3.2
Displacement, mm

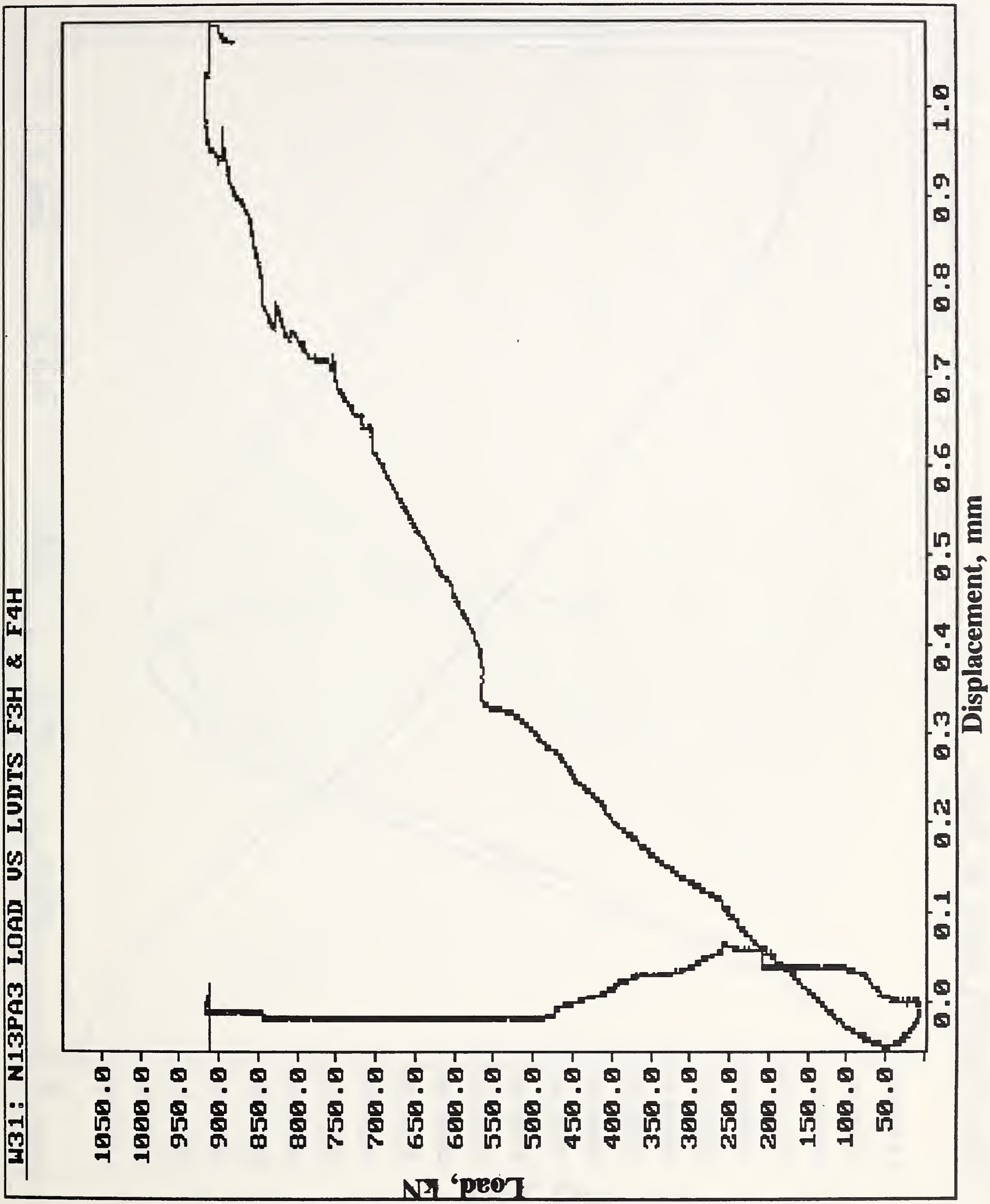


W27: N13PA3 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
3.2
Displacement, mm

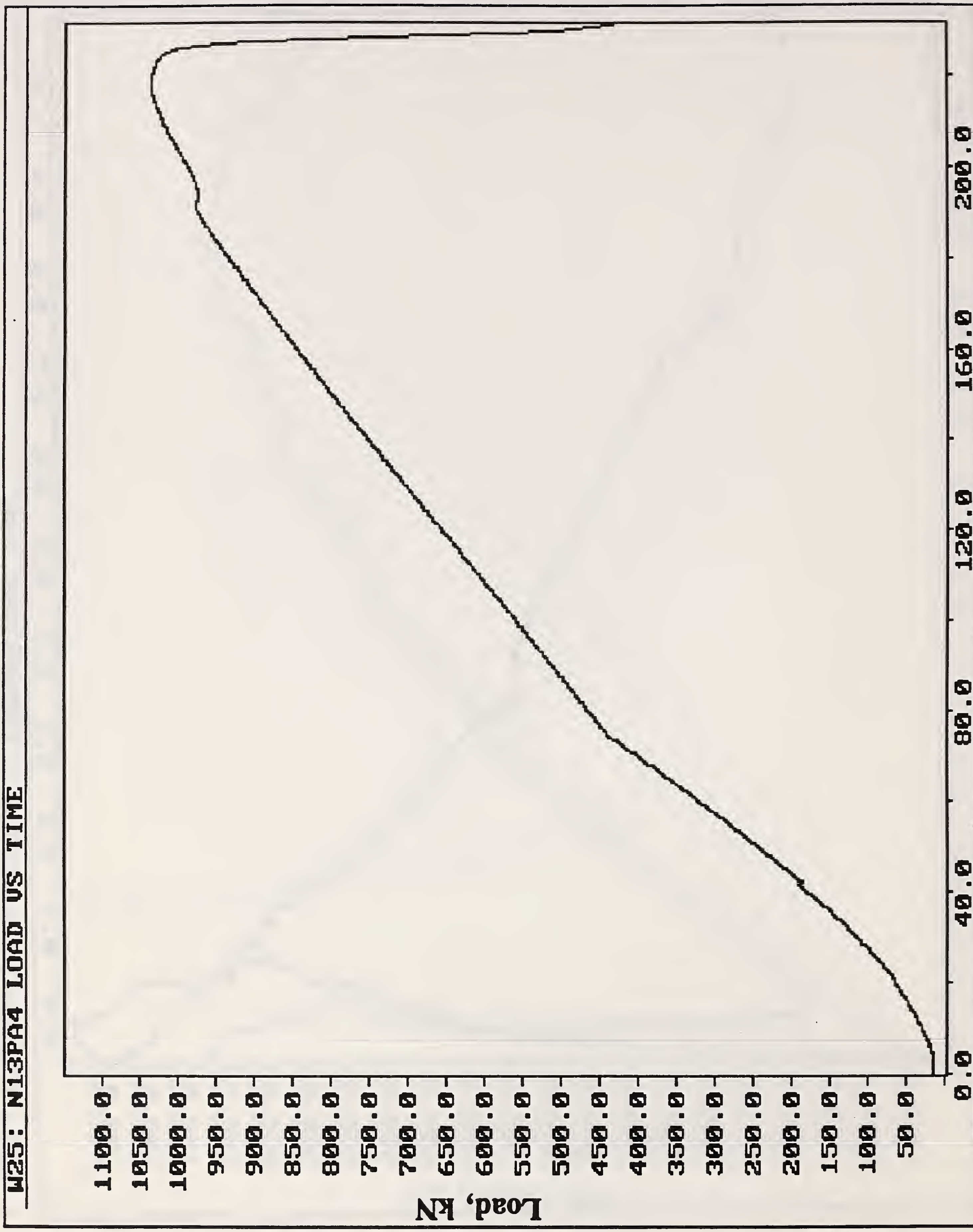

W28: N13PA3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
Displacement, mm

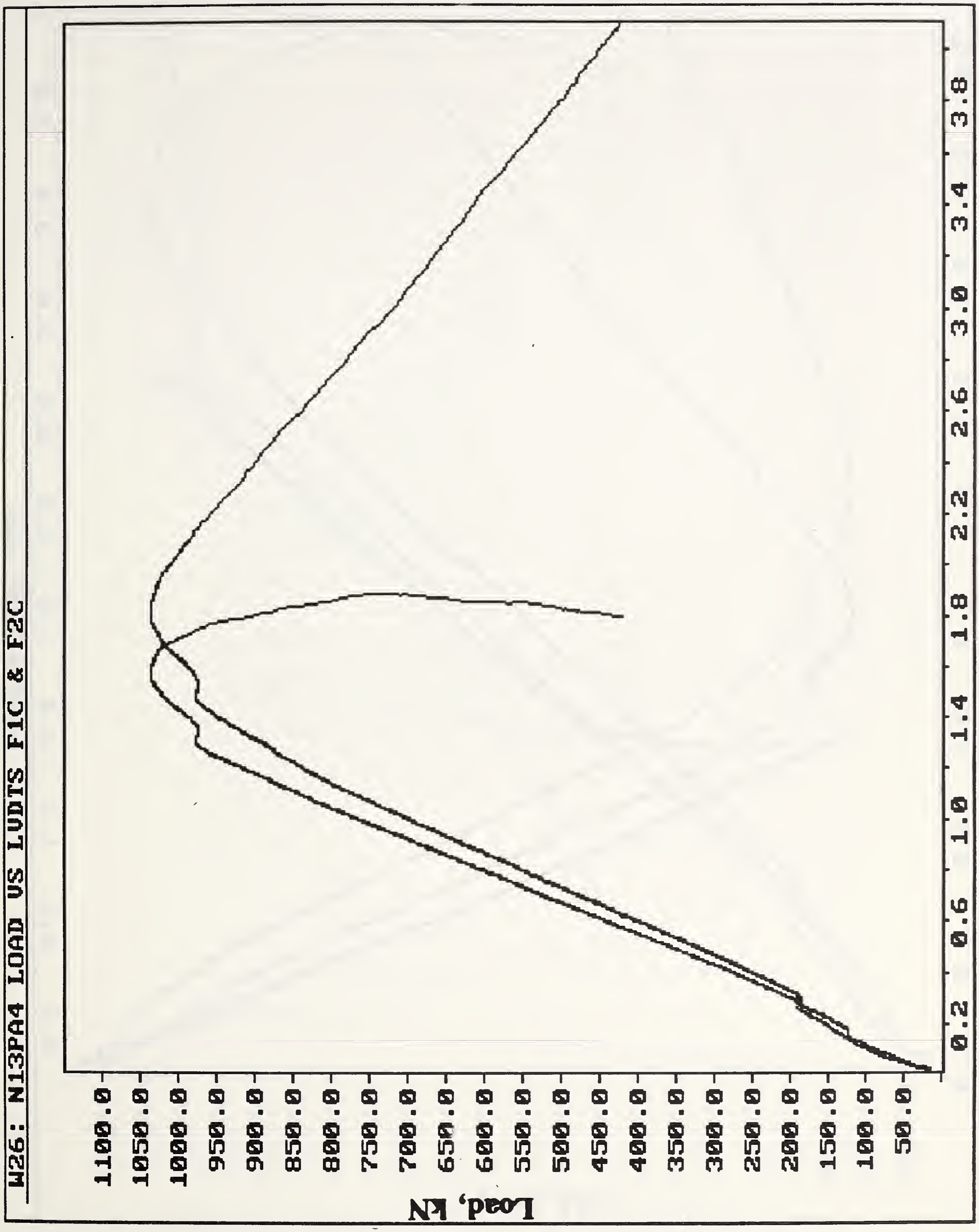

W29: N13PA3 LOAD VS LVDTS F1H & F2H
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
-0.20
0.00
0.20
0.40
0.60
0.80
1.00
1.20

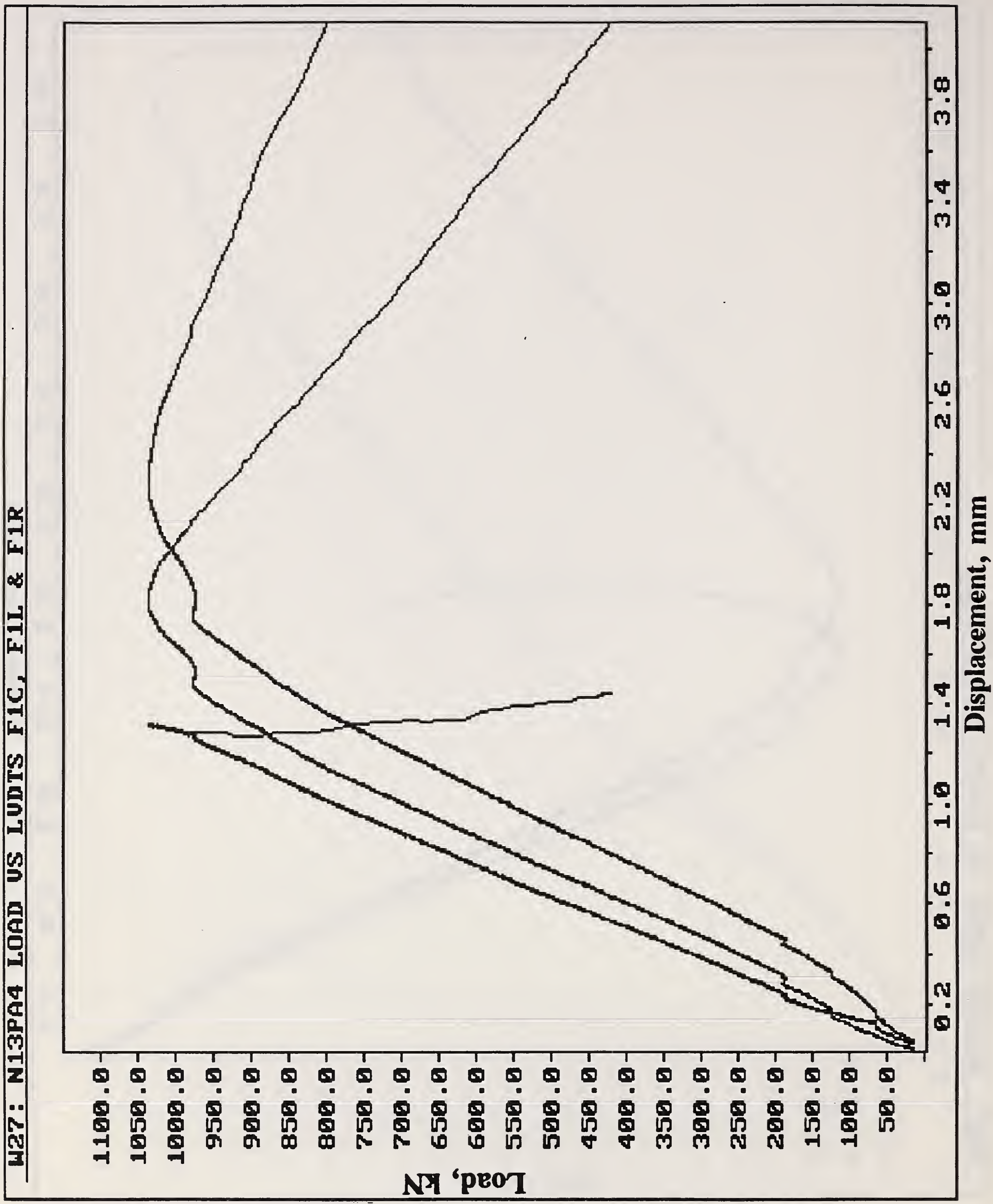

W30: N13PA3 LOAD VS LVDTS F1C & F2H
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
3.0
Displacement, mm

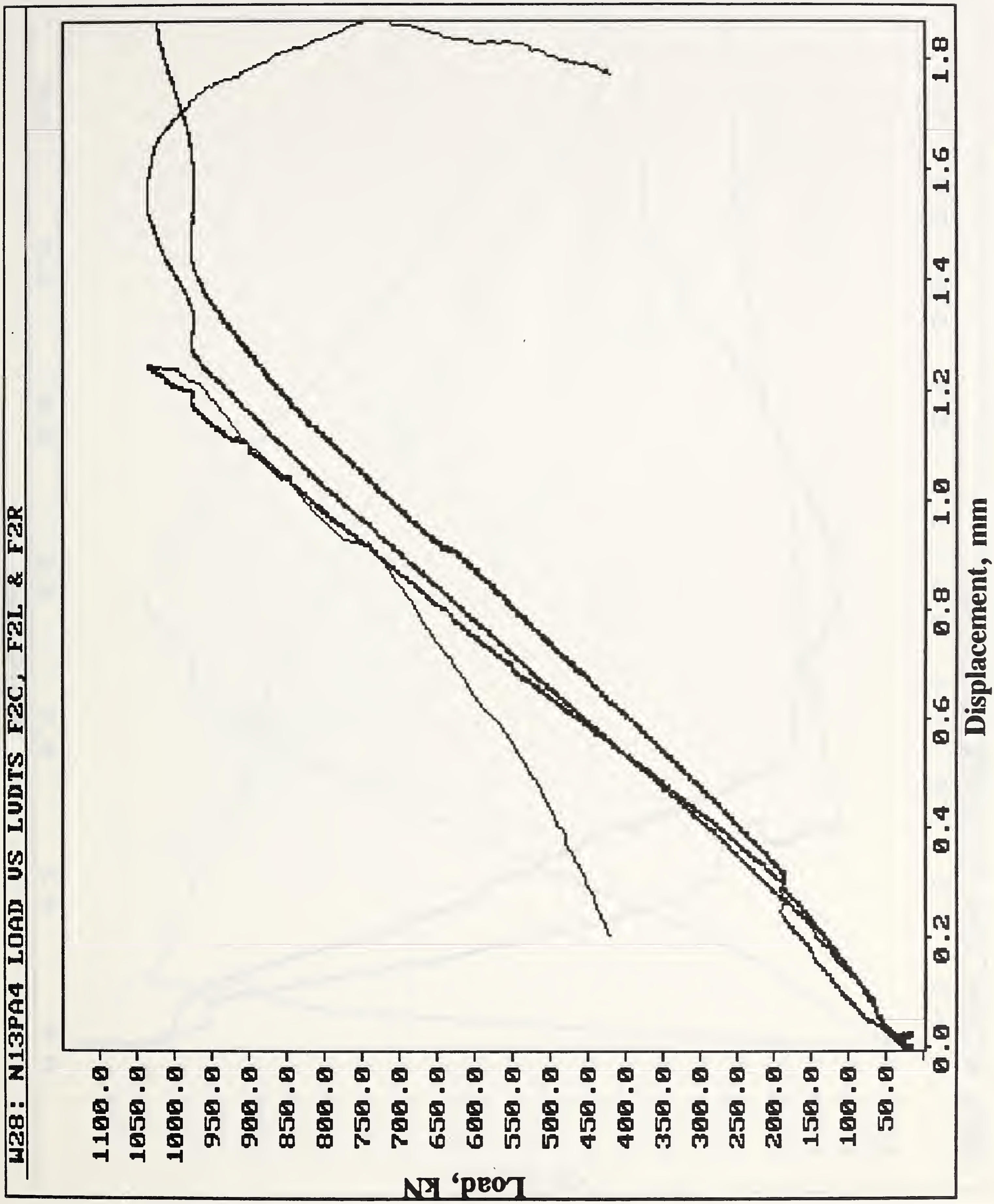


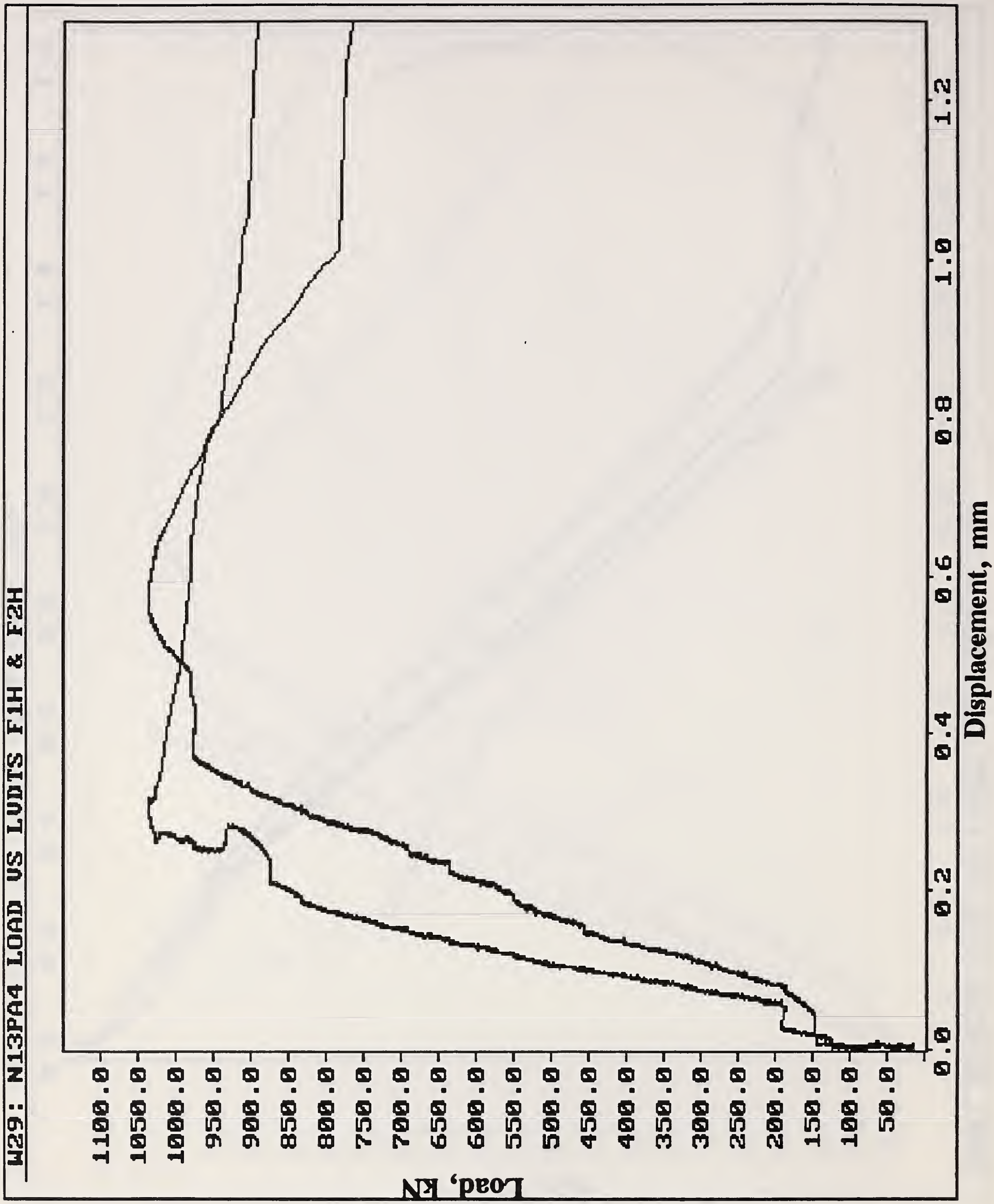
W31: N13PA3 LOAD VS LVDTS F3H & F4H
Load, kN
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0

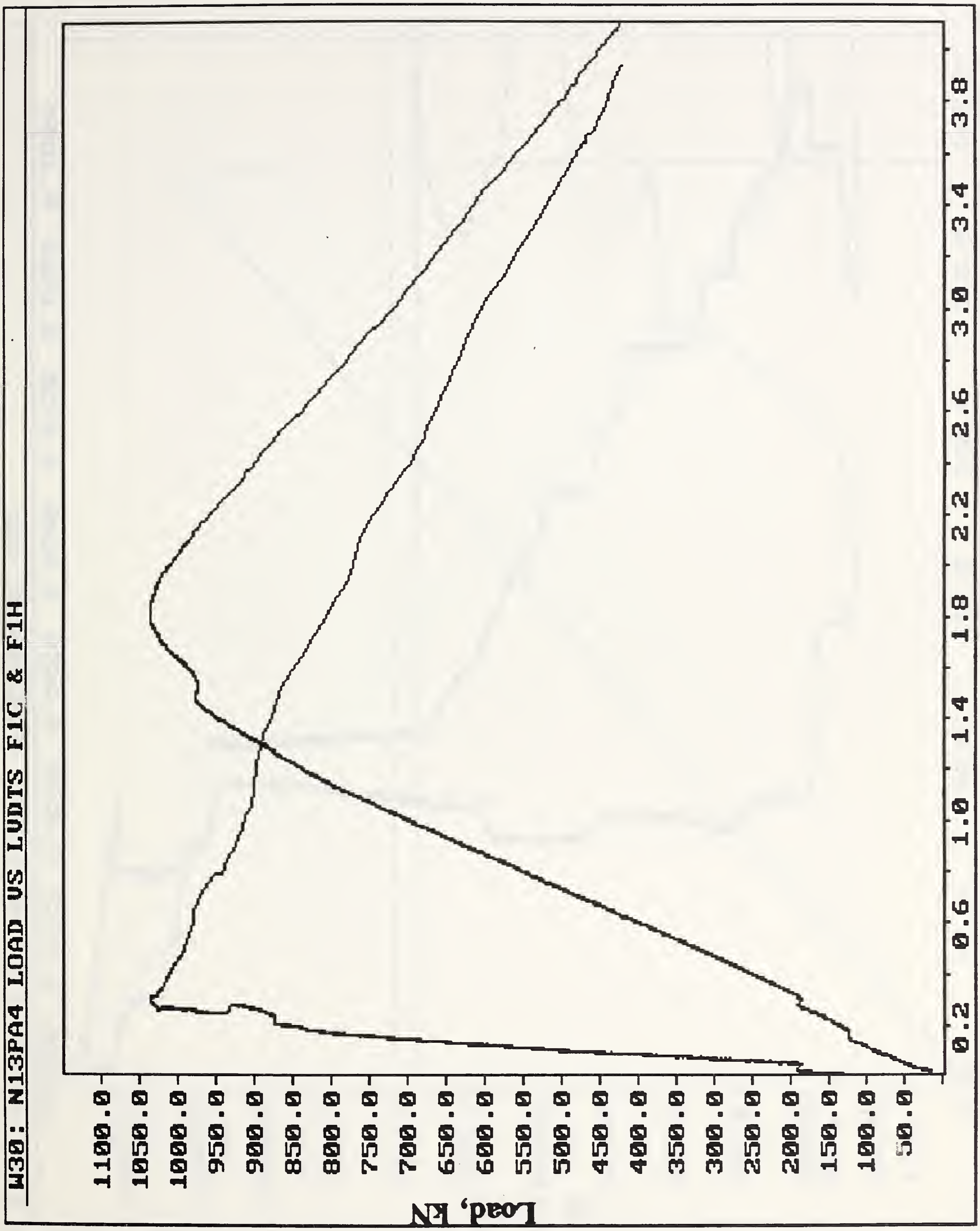

W25: N13PA4 LOAD VS TIME
Load, kN
1100.0
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

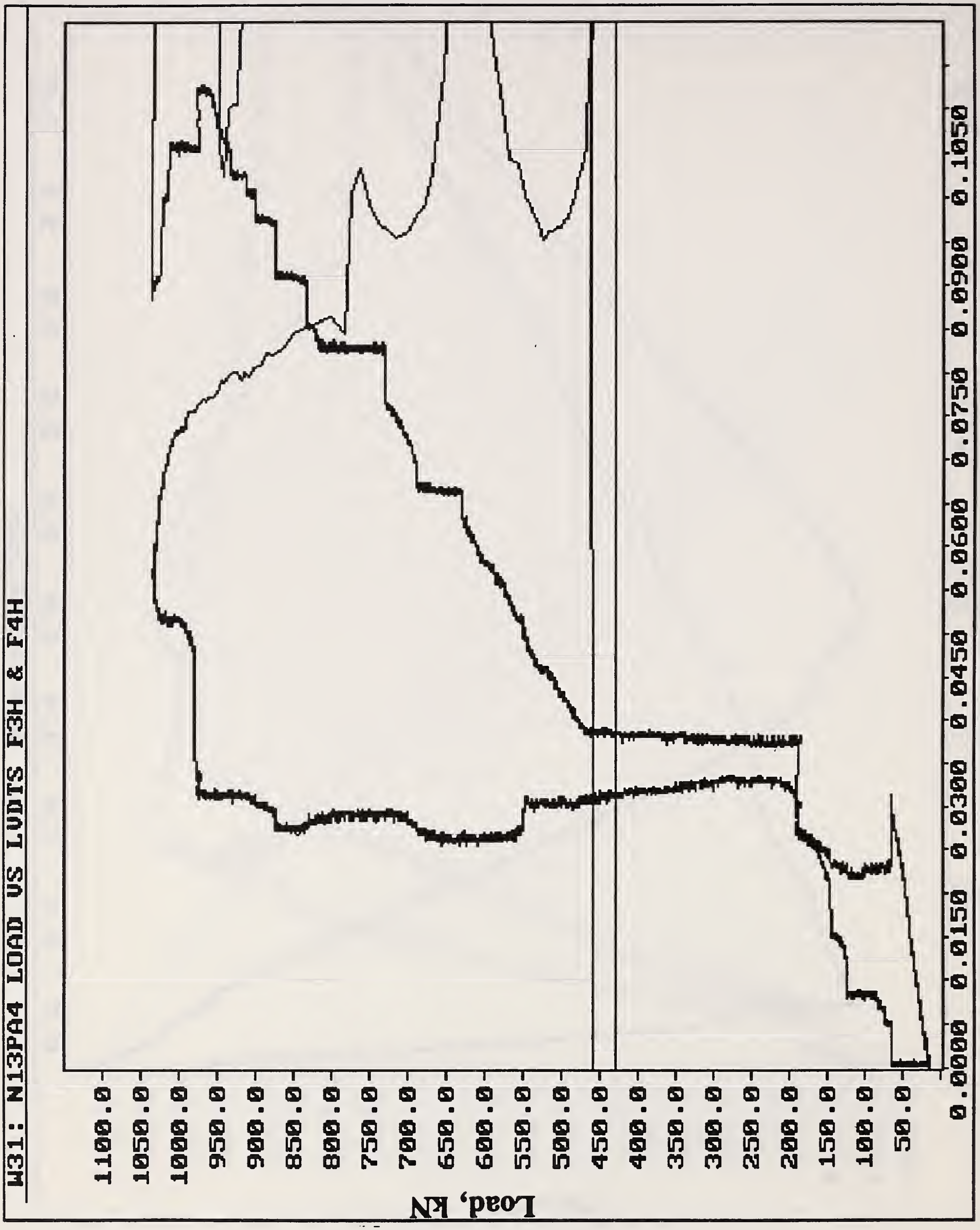

W26: N13PA4 LOAD VS LVDTS F1C & F2C
Load, kN
1100.0
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.2
0.6
1.0
1.4
1.8
2.2
2.6
3.0
3.4
3.8
Displacement, mm

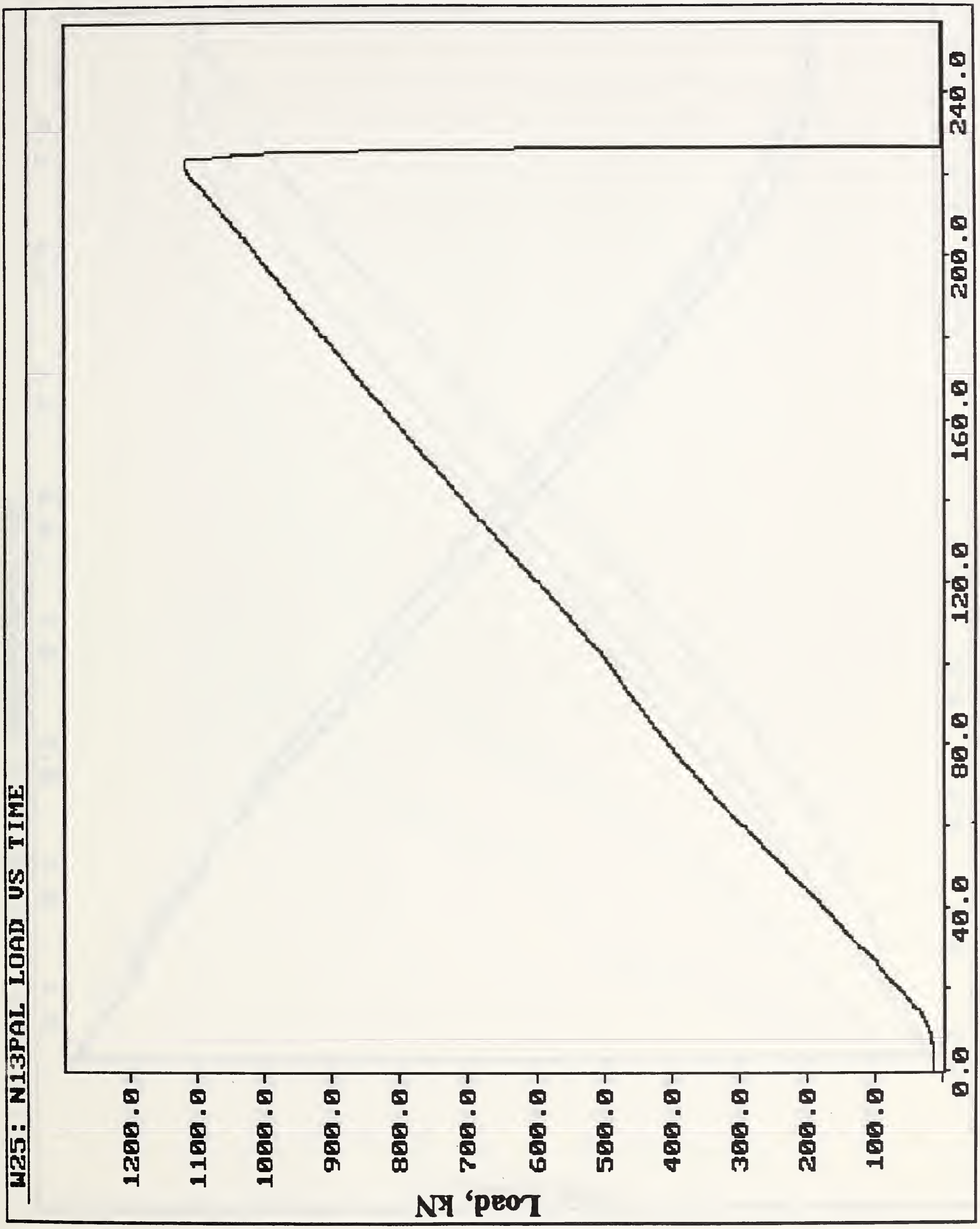

W27: N13PA4 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1100.0
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.2
0.6
1.0
1.4
1.8
2.2
2.6
3.0
3.4
3.8


W28: N13PA4 LOAD VS LVDTS F2C, F2L & F2R
Load, KN
1100.0 1050.0 1000.0 950.0 900.0 850.0 800.0 750.0 700.0 650.0 600.0 550.0 500.0 450.0 400.0 350.0 300.0 250.0 200.0 150.0 100.0 50.0
Displacement, mm
0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8

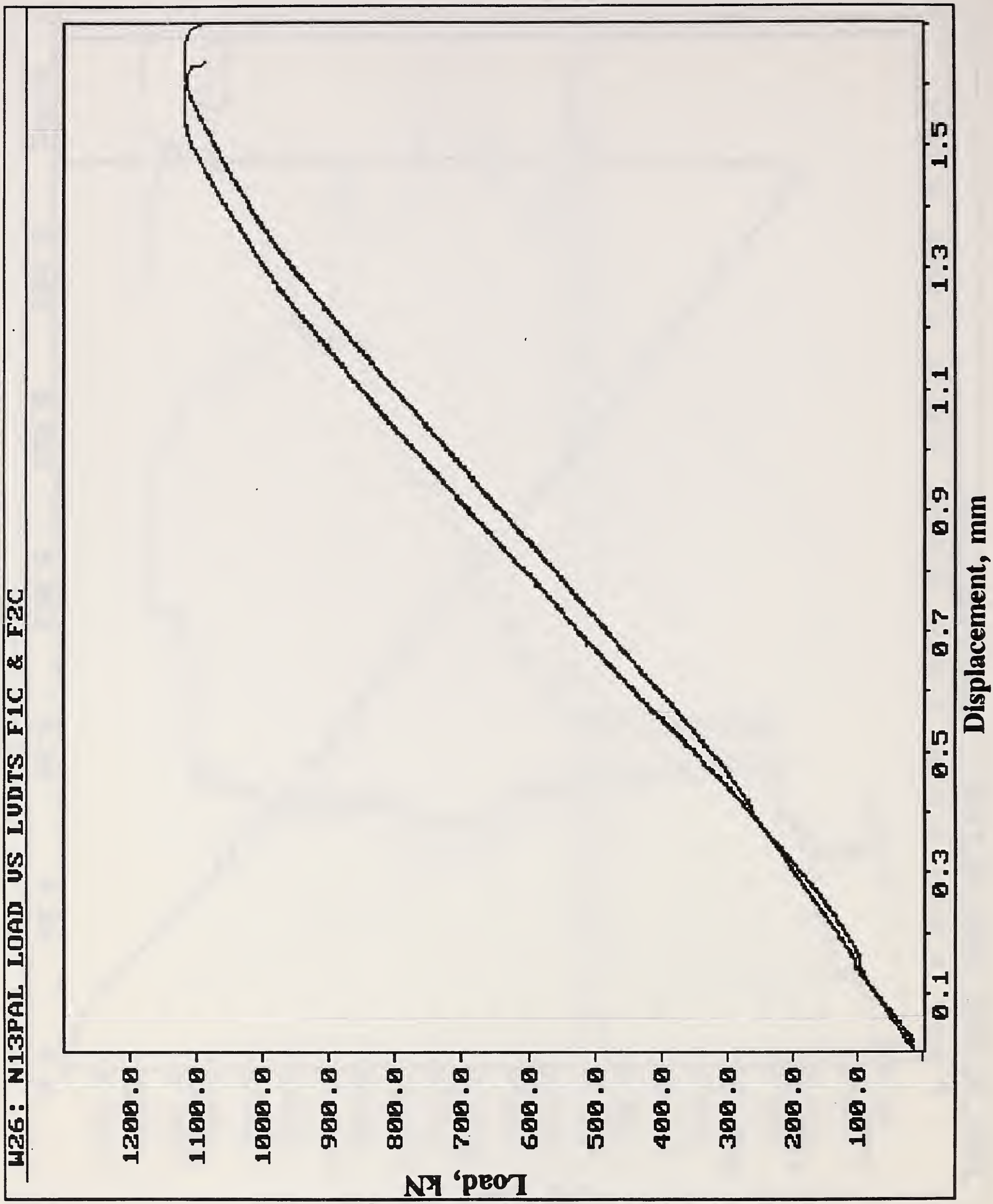

W29: N13PA4 LOAD VS LVDTS F1H & F2H
Load, KN
Displacement, mm
1100.0
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2

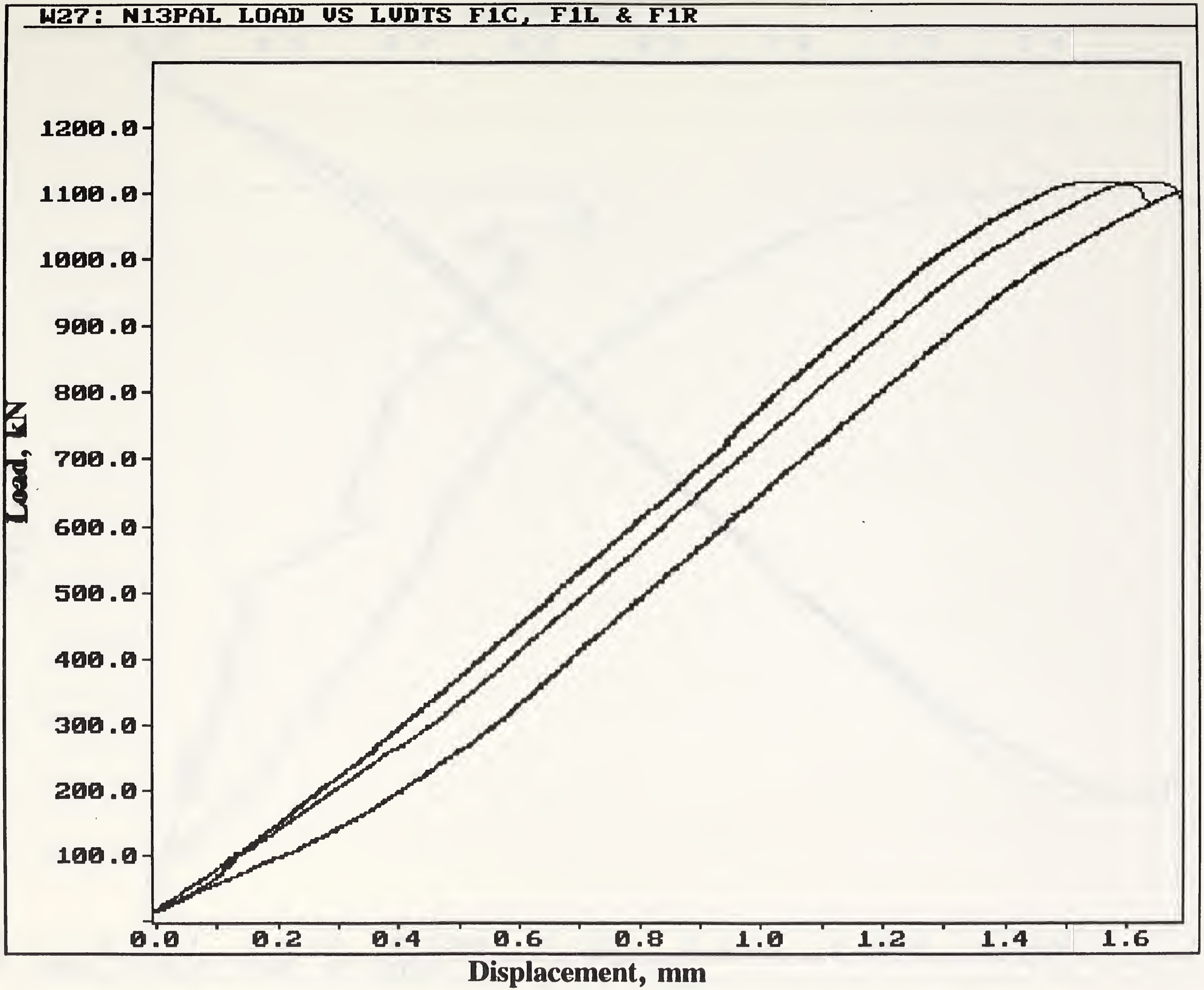

W30: N13PA4 LOAD VS LVDTS F1C & F1H
Load, kN
1100.0
1050.0
1000.0
950.0
900.0
850.0
800.0
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.2
0.6
1.0
1.4
1.8
2.2
2.6
3.0
3.4
3.8
Displacement, mm

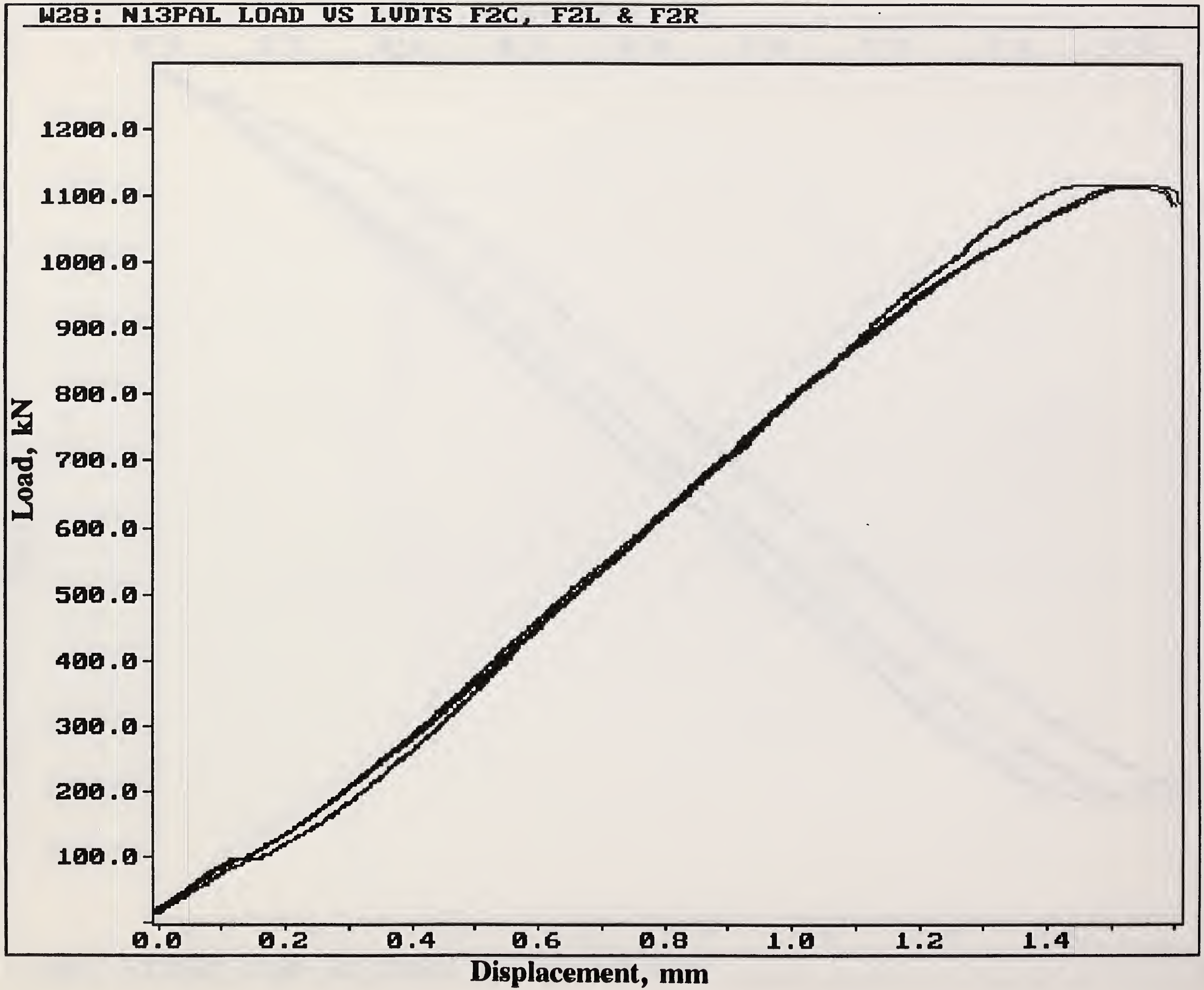

W31: N13PA4 LOAD VS LVDTS F3H & F4H
Load, kN
Displacement, mm
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
450.0
500.0
550.0
600.0
650.0
700.0
750.0
800.0
850.0
900.0
950.0
1000.0
1050.0
1100.0
0.0000
0.0150
0.0300
0.0450
0.0600
0.0750
0.0900
0.1050

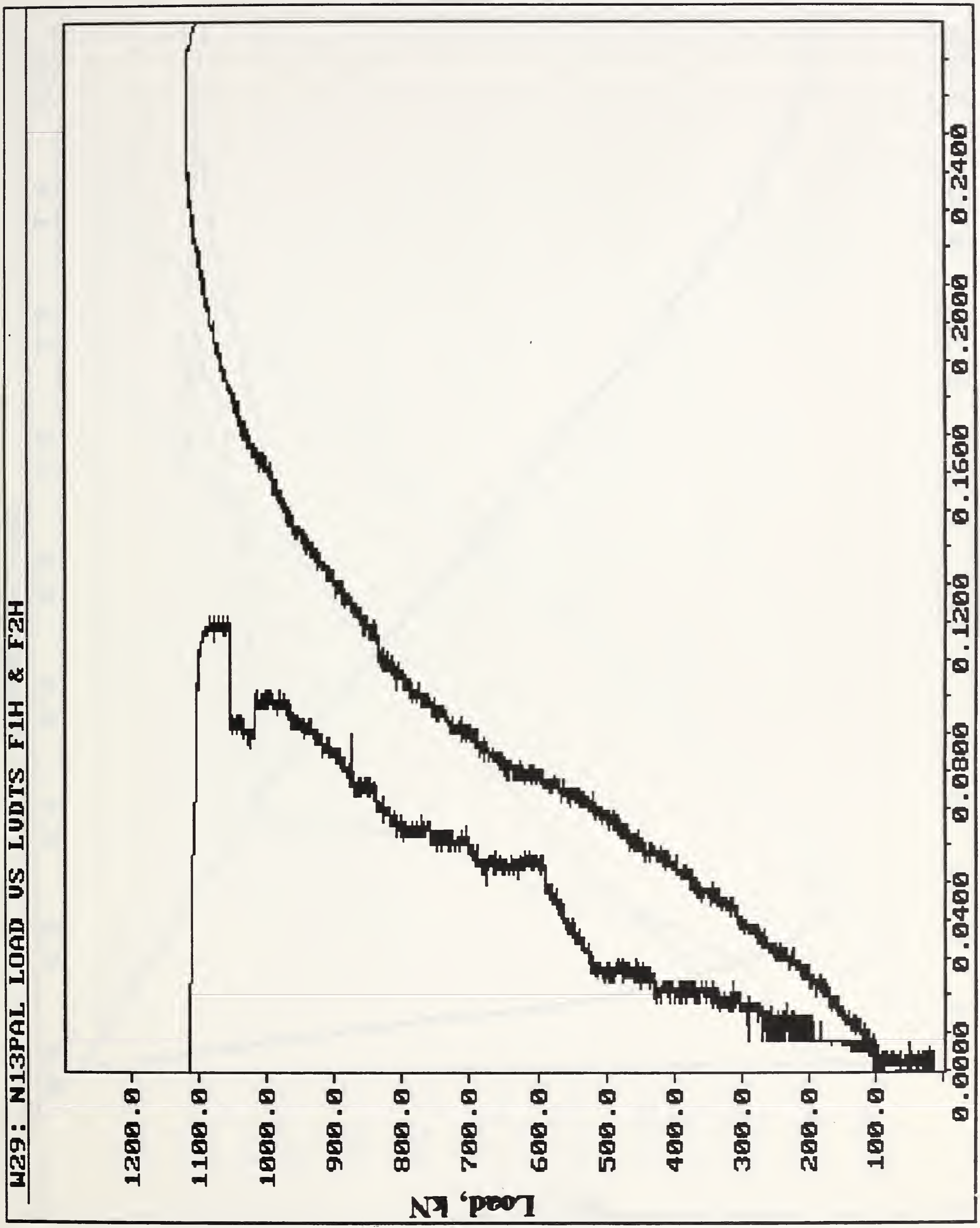


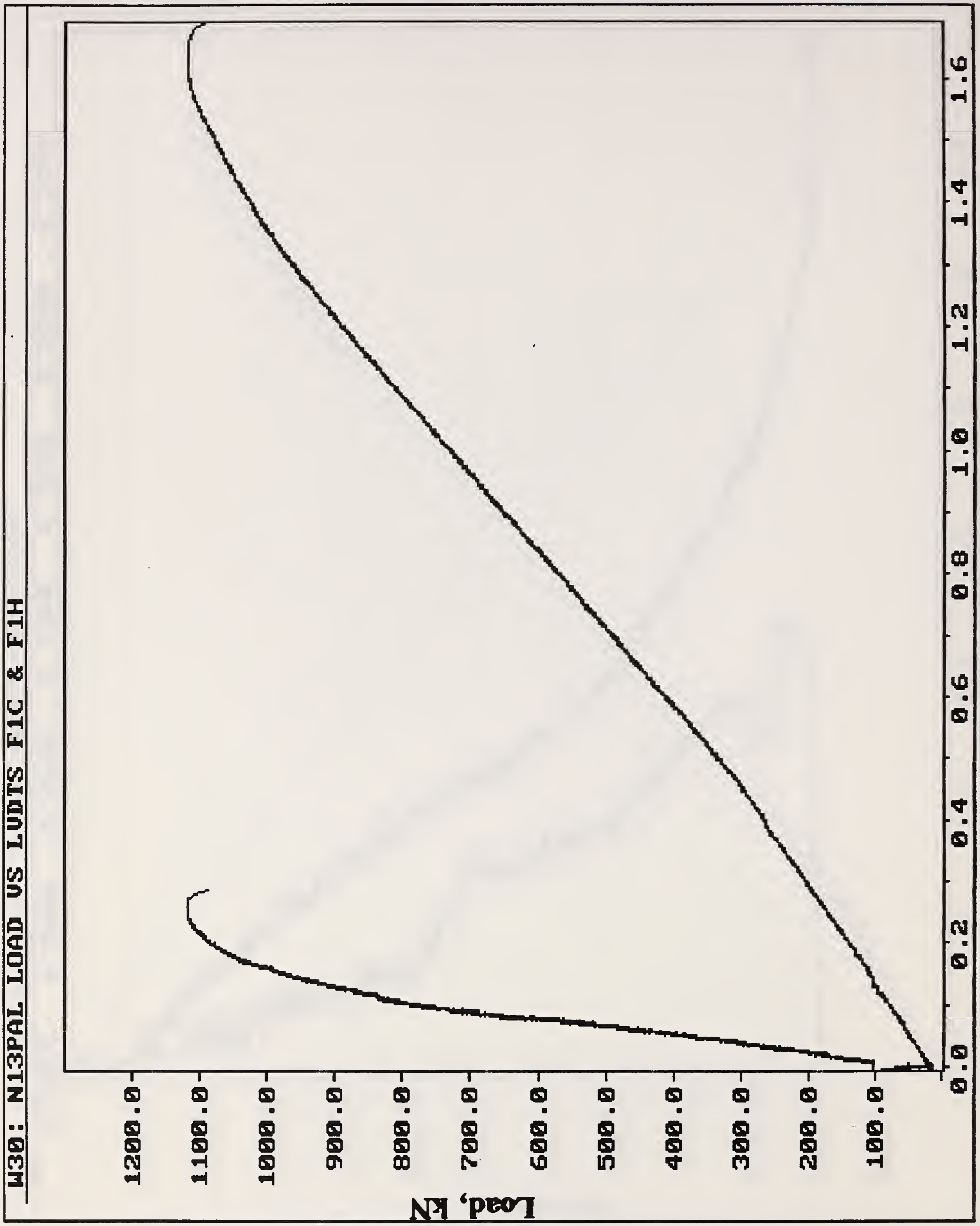
W25: N13PAL LOAD VS TIME
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

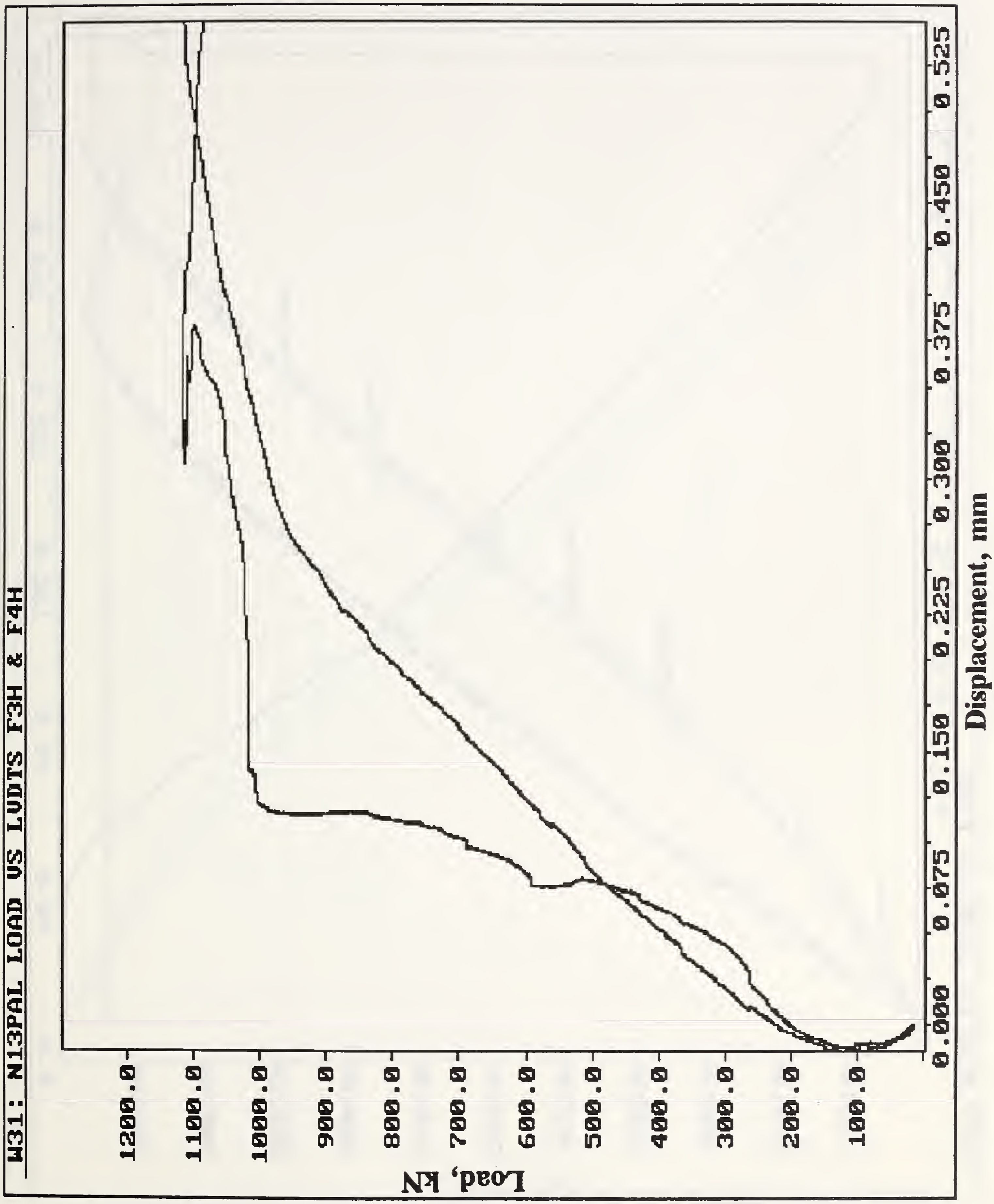

W26: N13PAL LOAD VS LVDTS F1C & F2C
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5

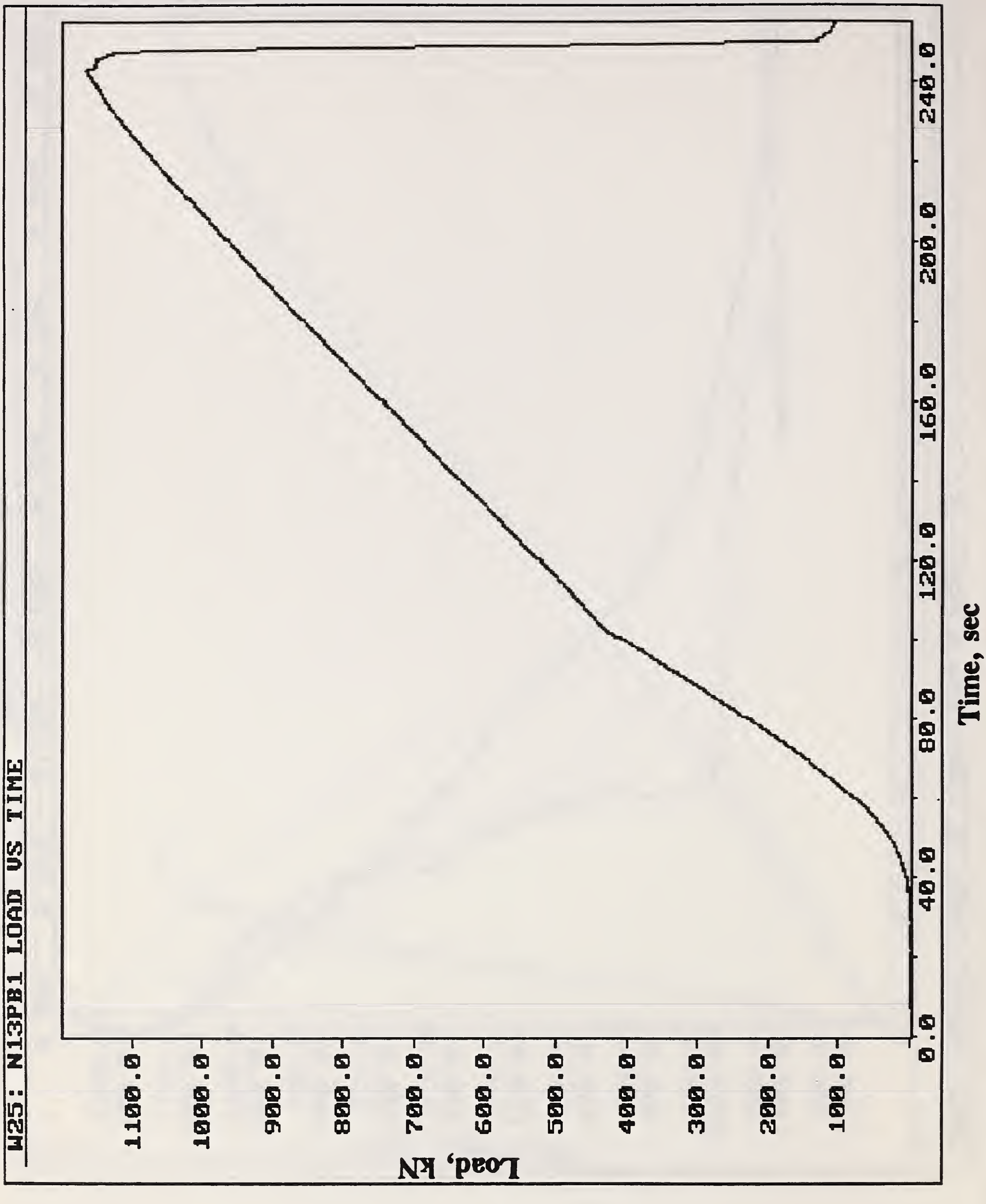

W27: N13PAL LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm


W28: N13PAL LOAD VS LVDTS F2C, F2L & F2R
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
Displacement, mm

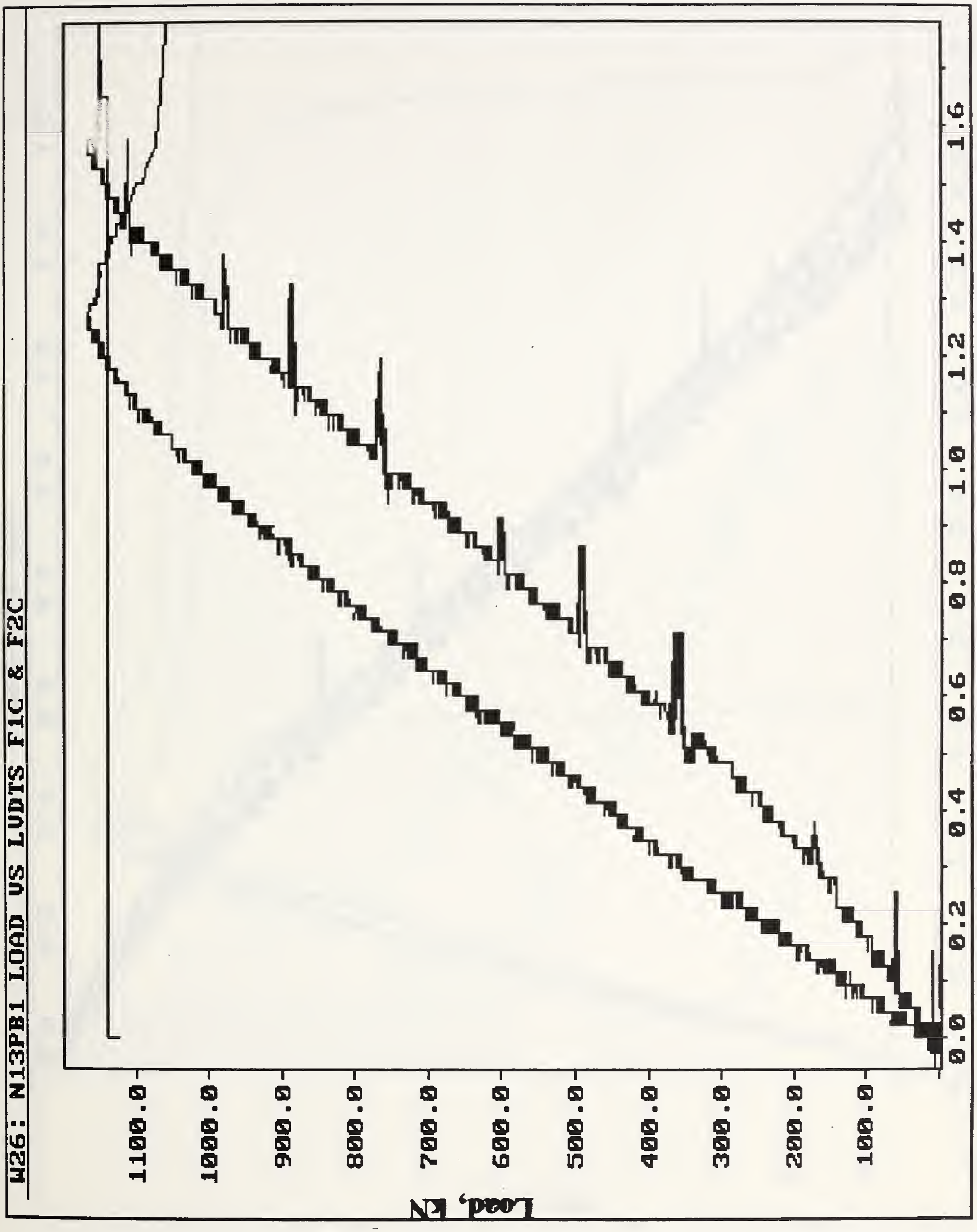

W29: N13PAL LOAD VS LVDTS F1H & F2H
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0000
0.0400
0.0800
0.1200
0.1600
0.2000
0.2400
Displacement, mm

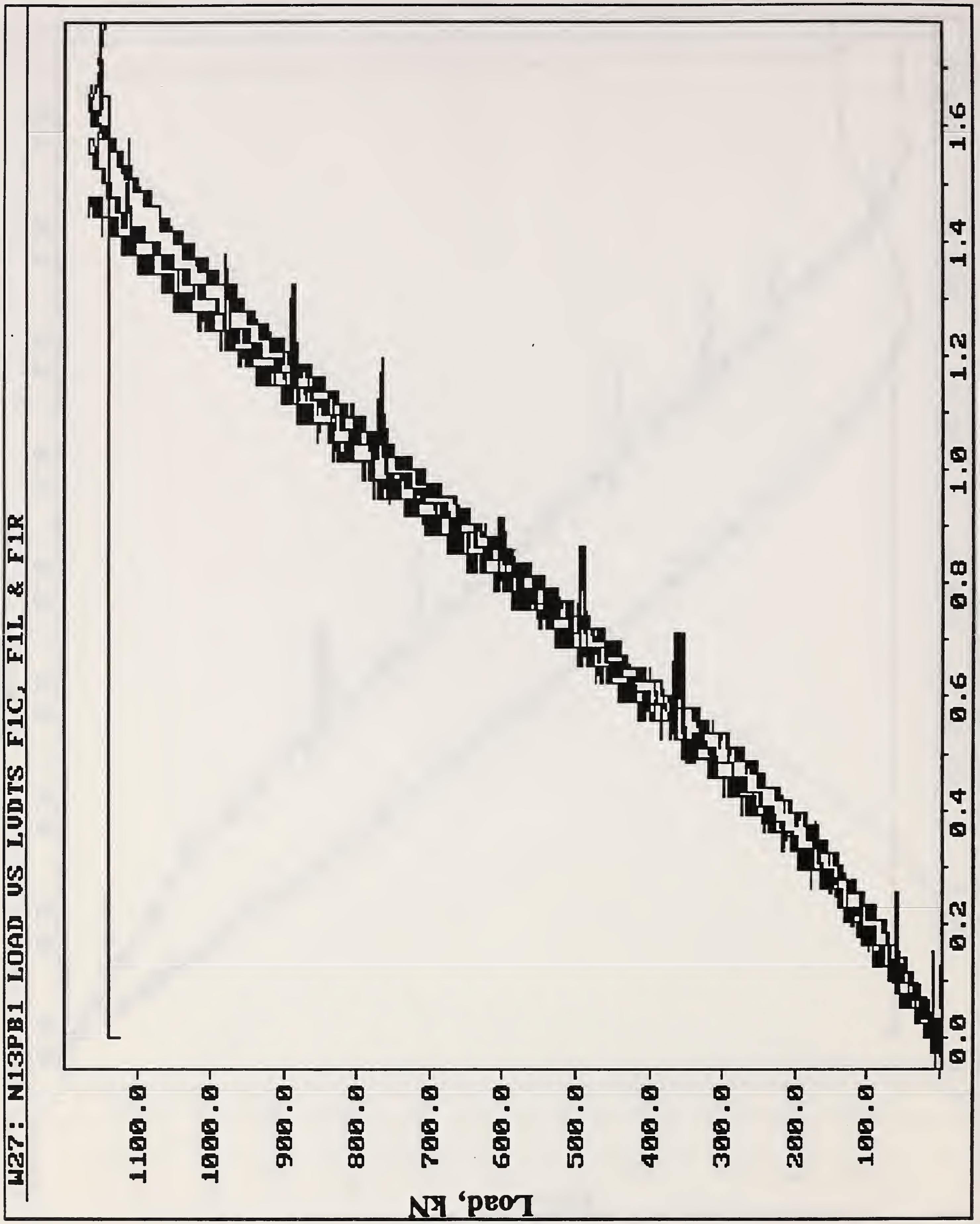

W30: N13PAL LOAD VS LVDTS F1C & F1H
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm


W31: N13PAL LOAD VS LVDTS F3H & F4H
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525

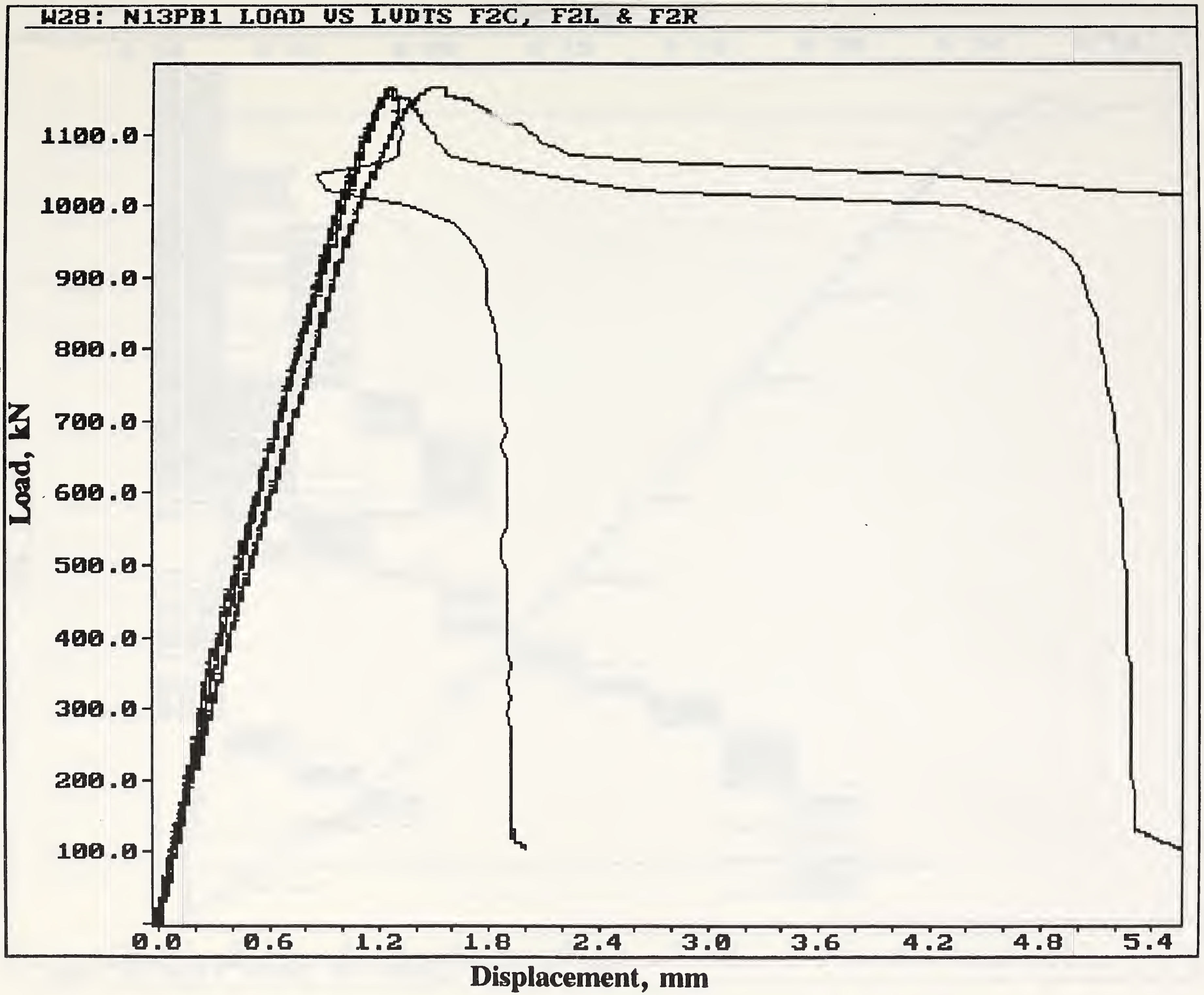


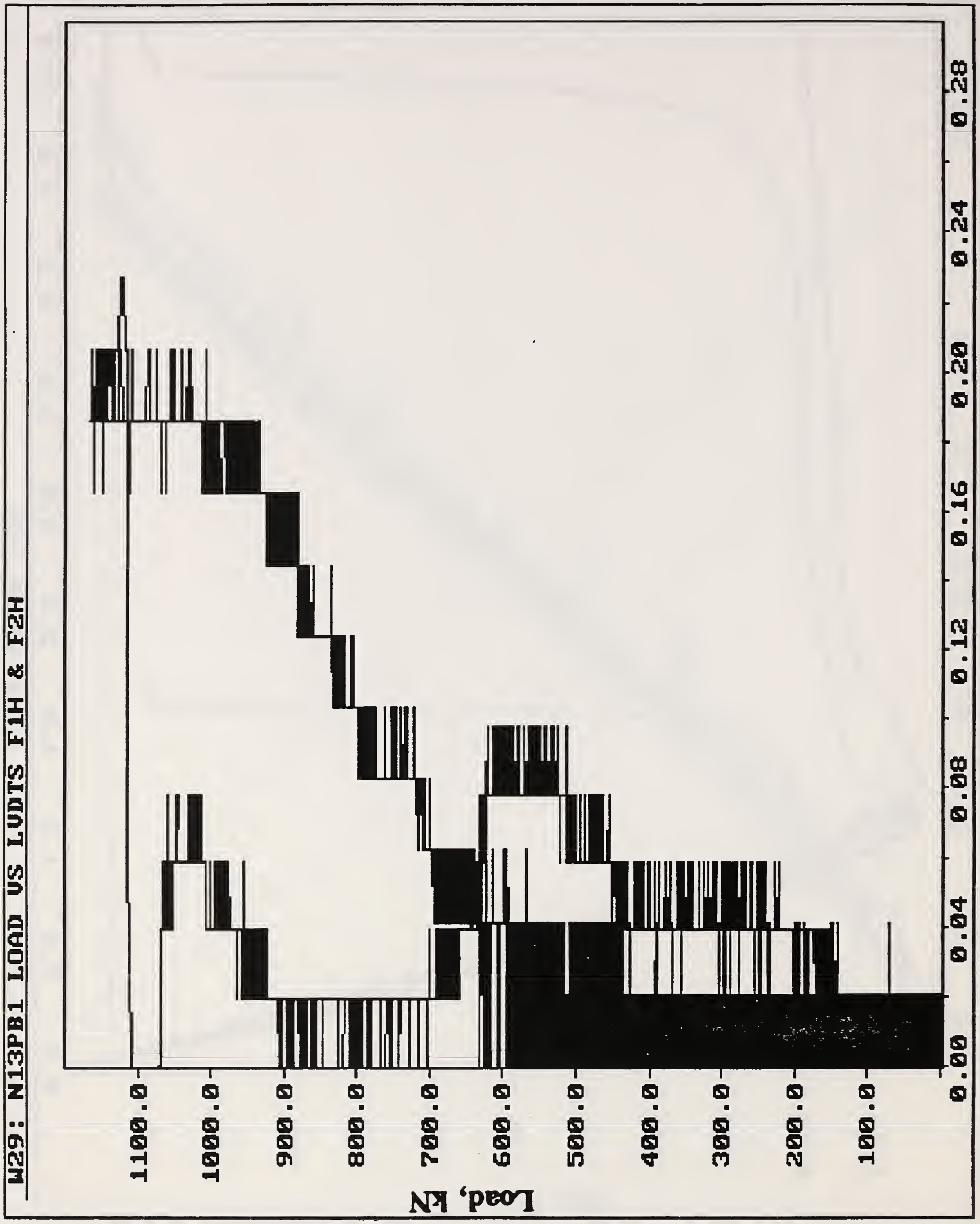
W25: N13PB1 LOAD VS TIME
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec


W26: N13PB1 LOAD VS LVDTS F1C & F2C
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6

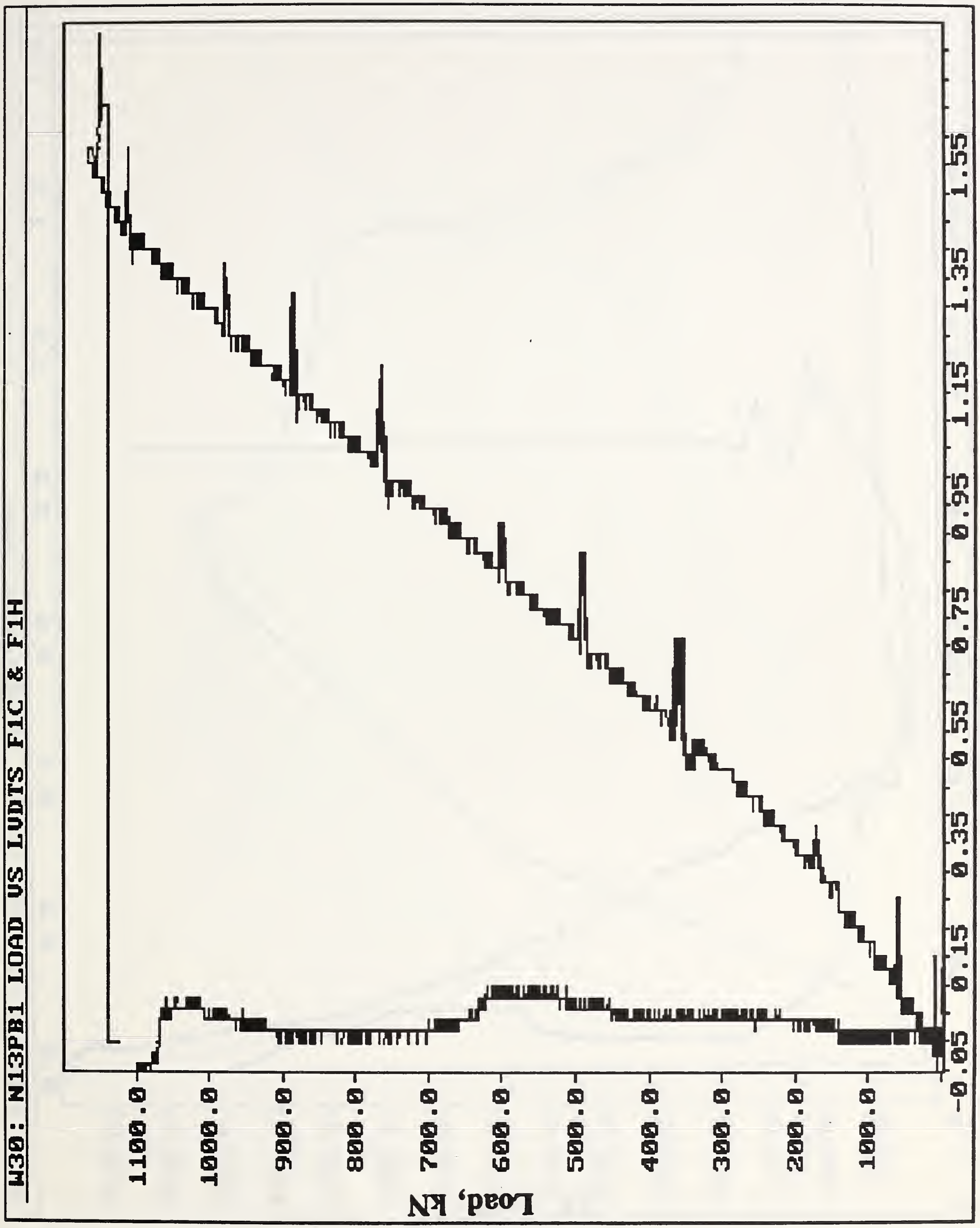


W27: N13PB1 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Displacement, mm

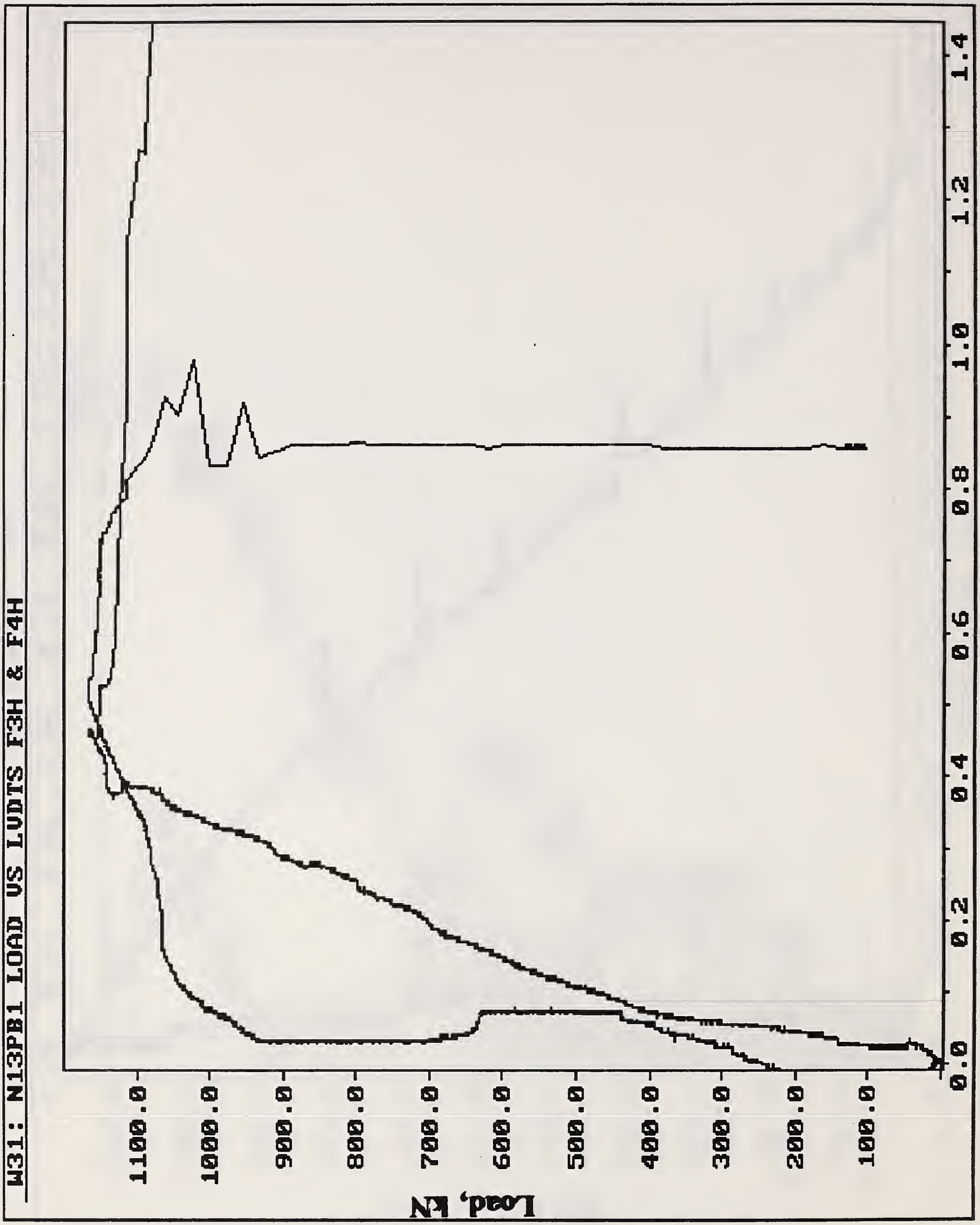

W28: N13PB1 LOAD VS LVDTS F2C, F2L & F2R
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
5.4
Displacement, mm

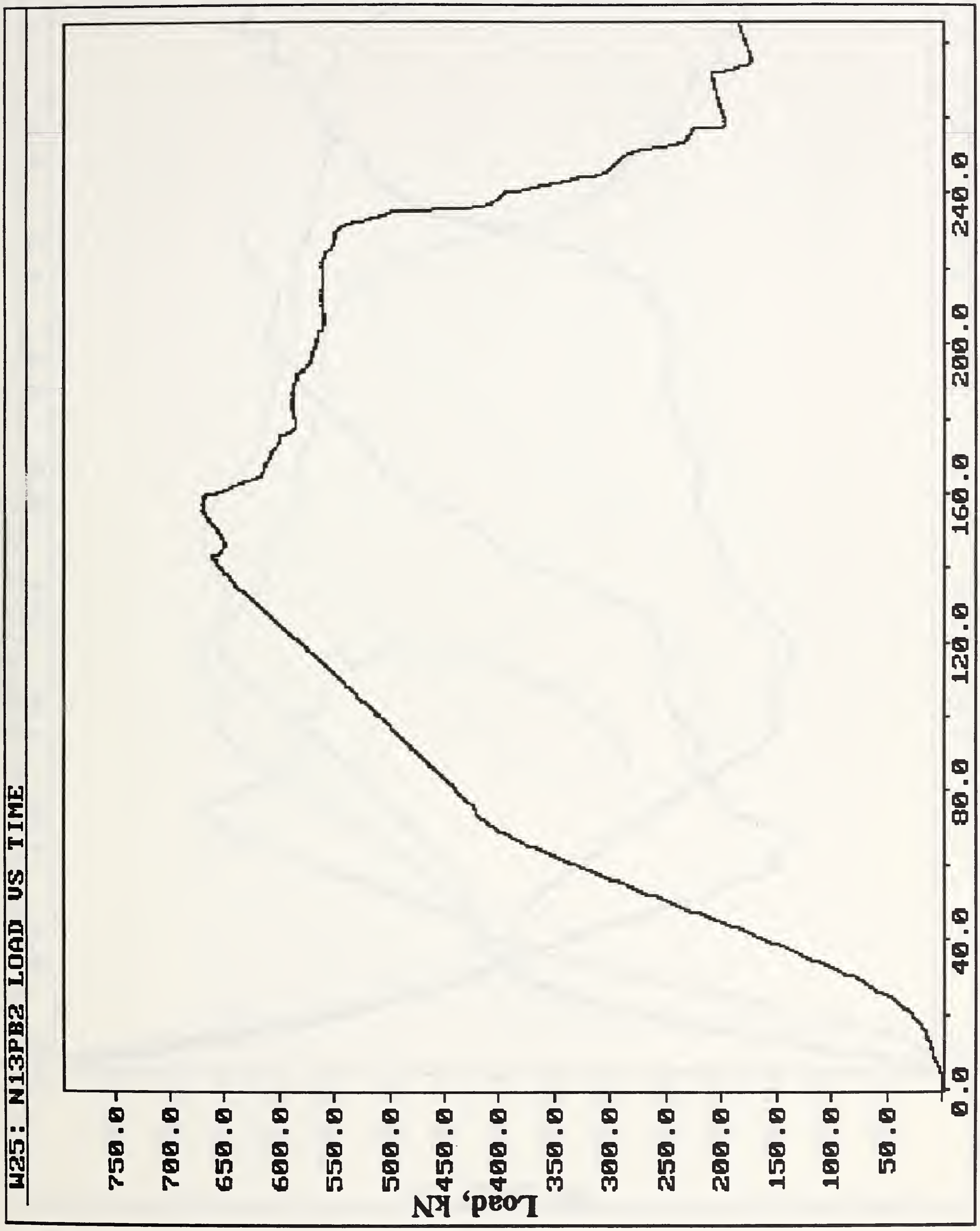


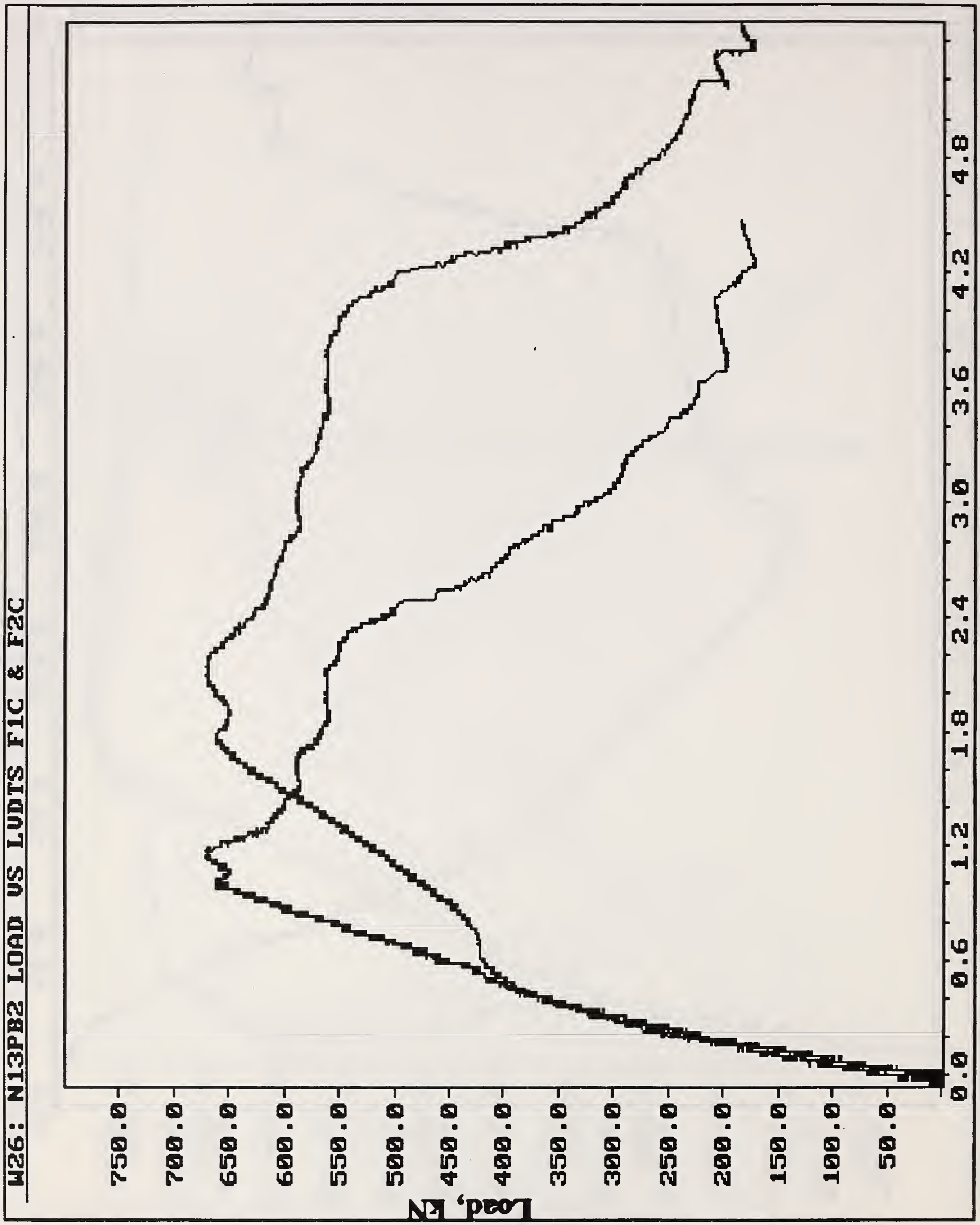
W29: N13PB1 LOAD VS LVDTS F1H & F2H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.00
0.04
0.08
0.12
0.16
0.20
0.24
0.28
Displacement, mm

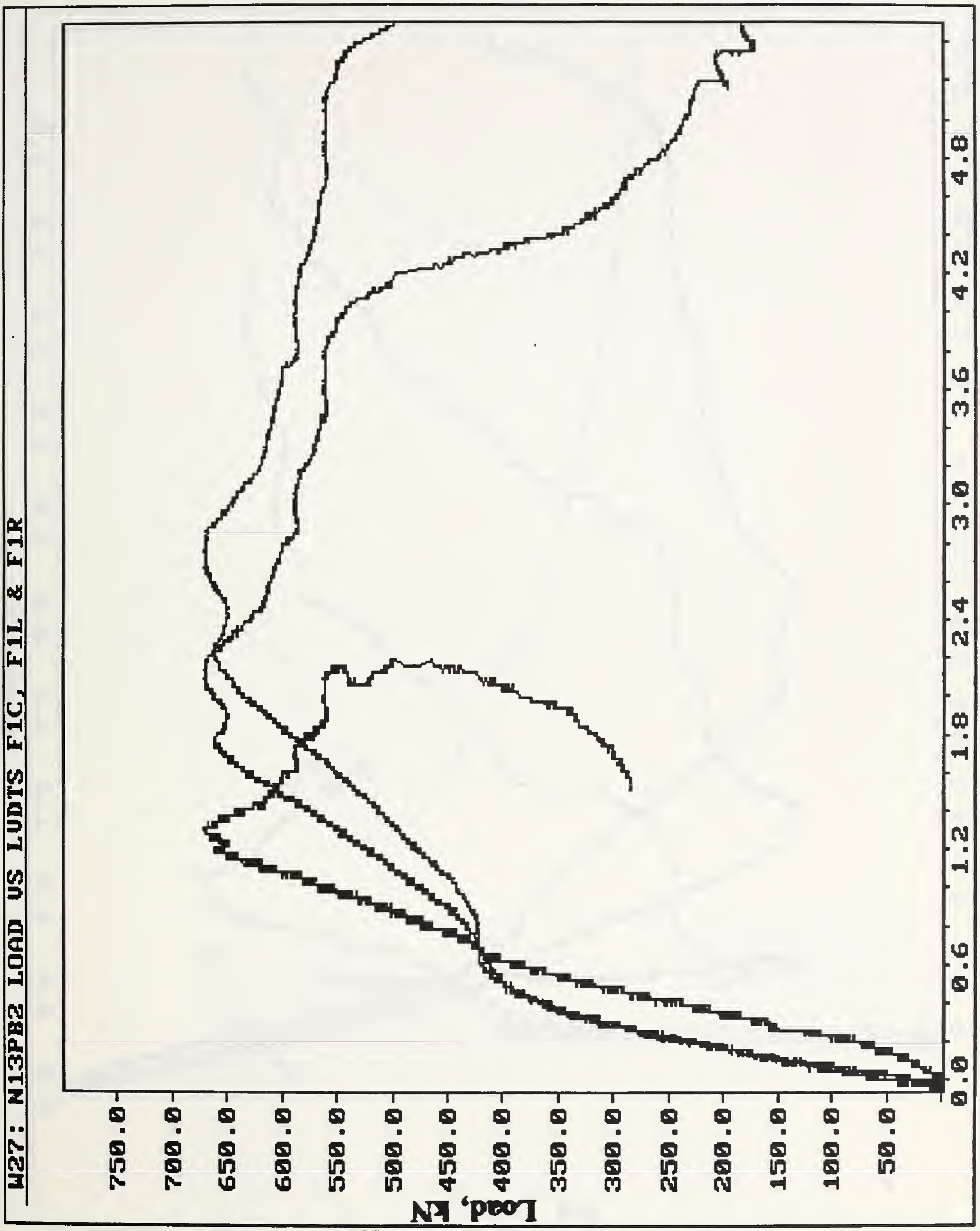


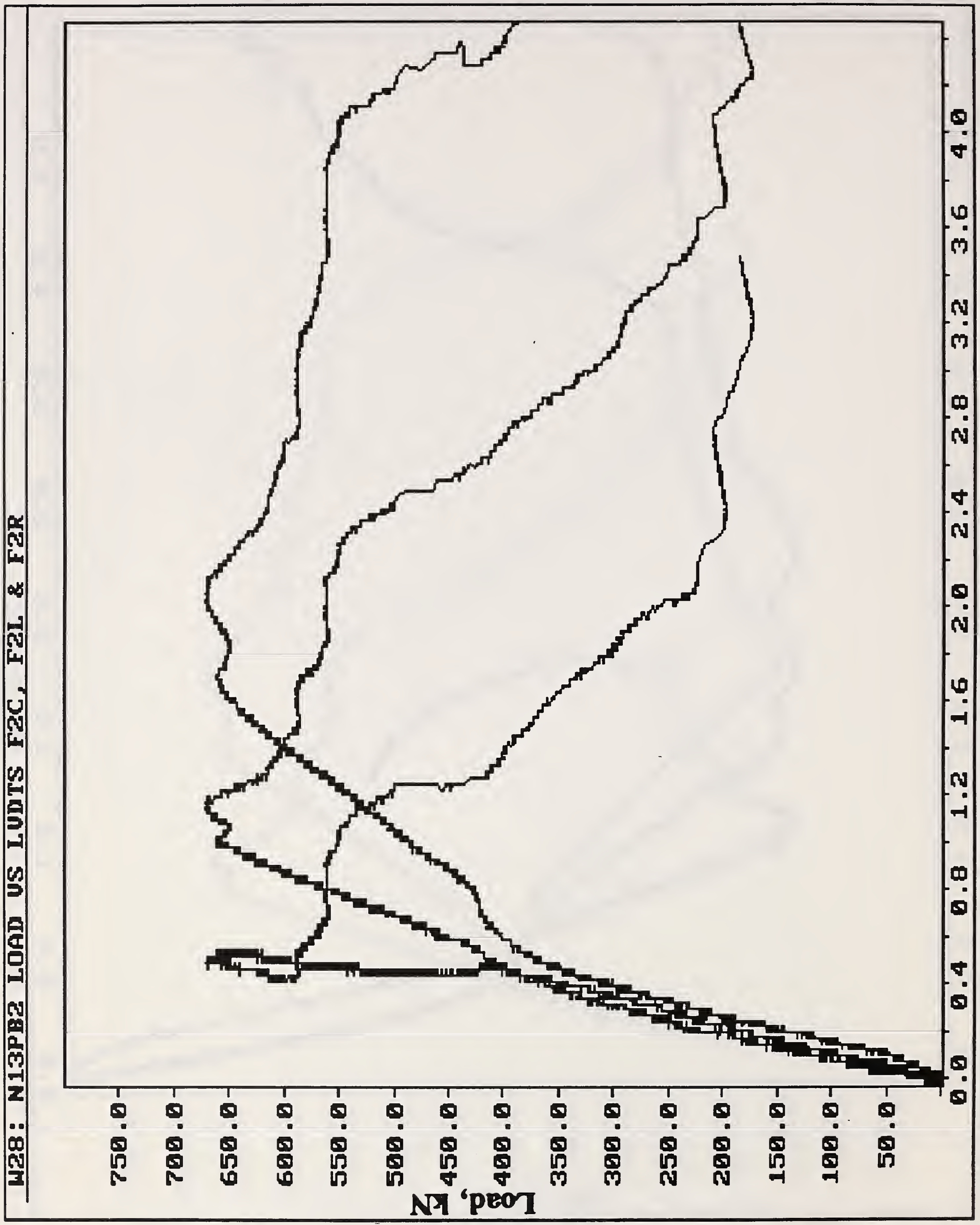
W30: N13PB1 LOAD VS LVDTS F1C & F1H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
-0.05
0.05
0.15
0.35
0.55
0.75
0.95
1.15
1.35
1.55


W31: N13PB1 LOAD VS LVDTS F3H & F4H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

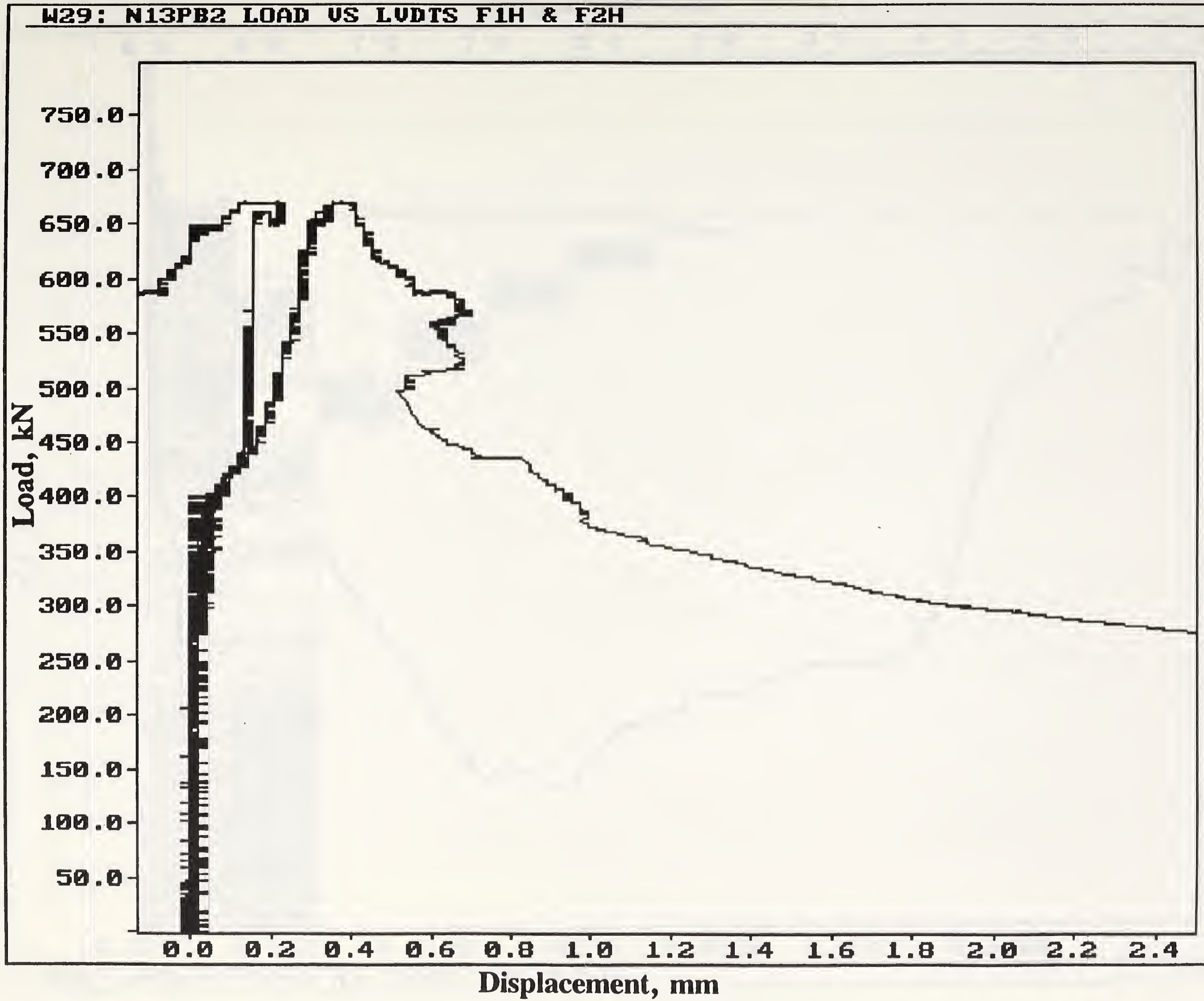

W25: N13PB2 LOAD VS TIME
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec


W26: N13PB2 LOAD VS LVDTS F1C & F2C
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
Displacement, mm

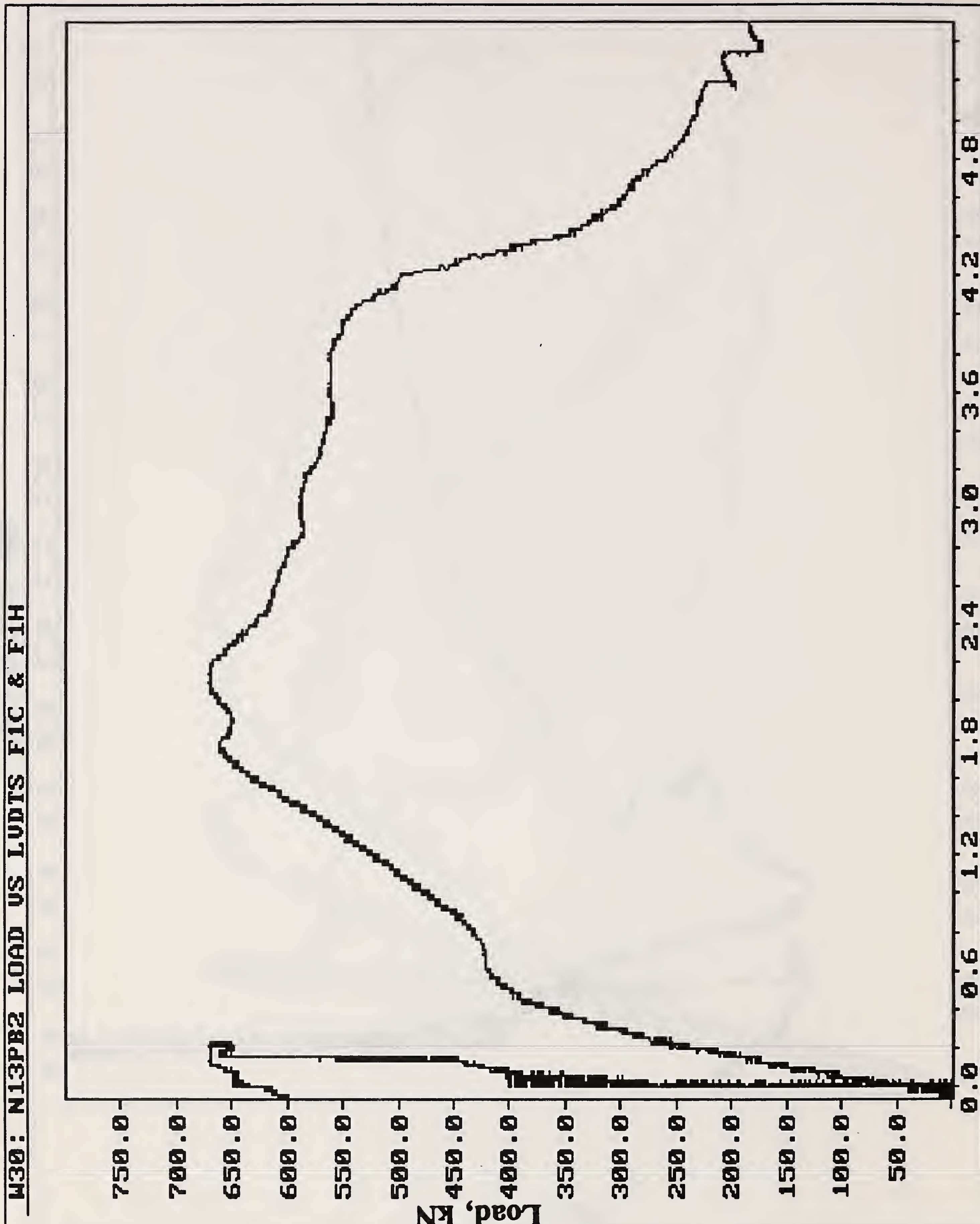

W27: N13PB2 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
Displacement, mm

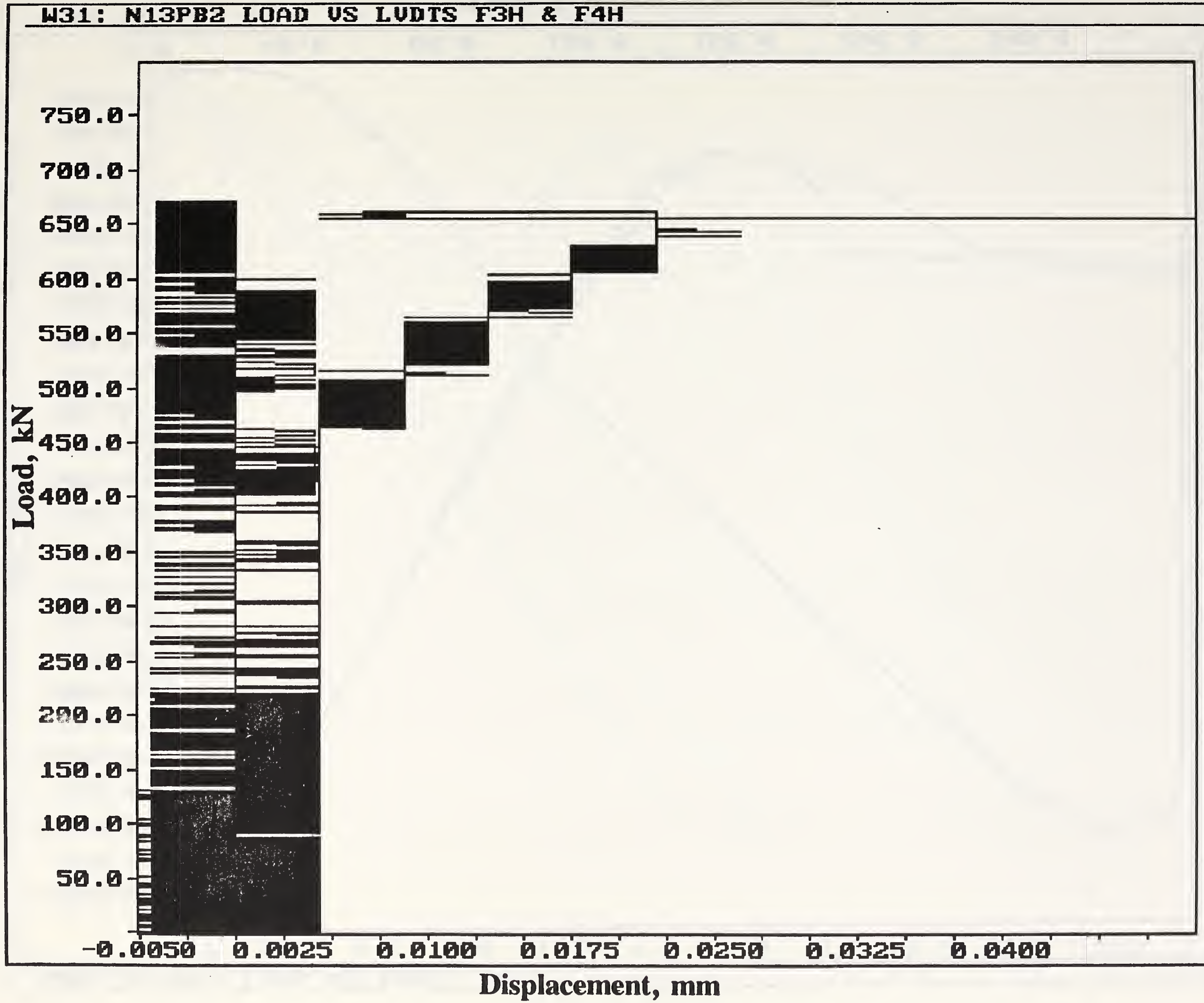


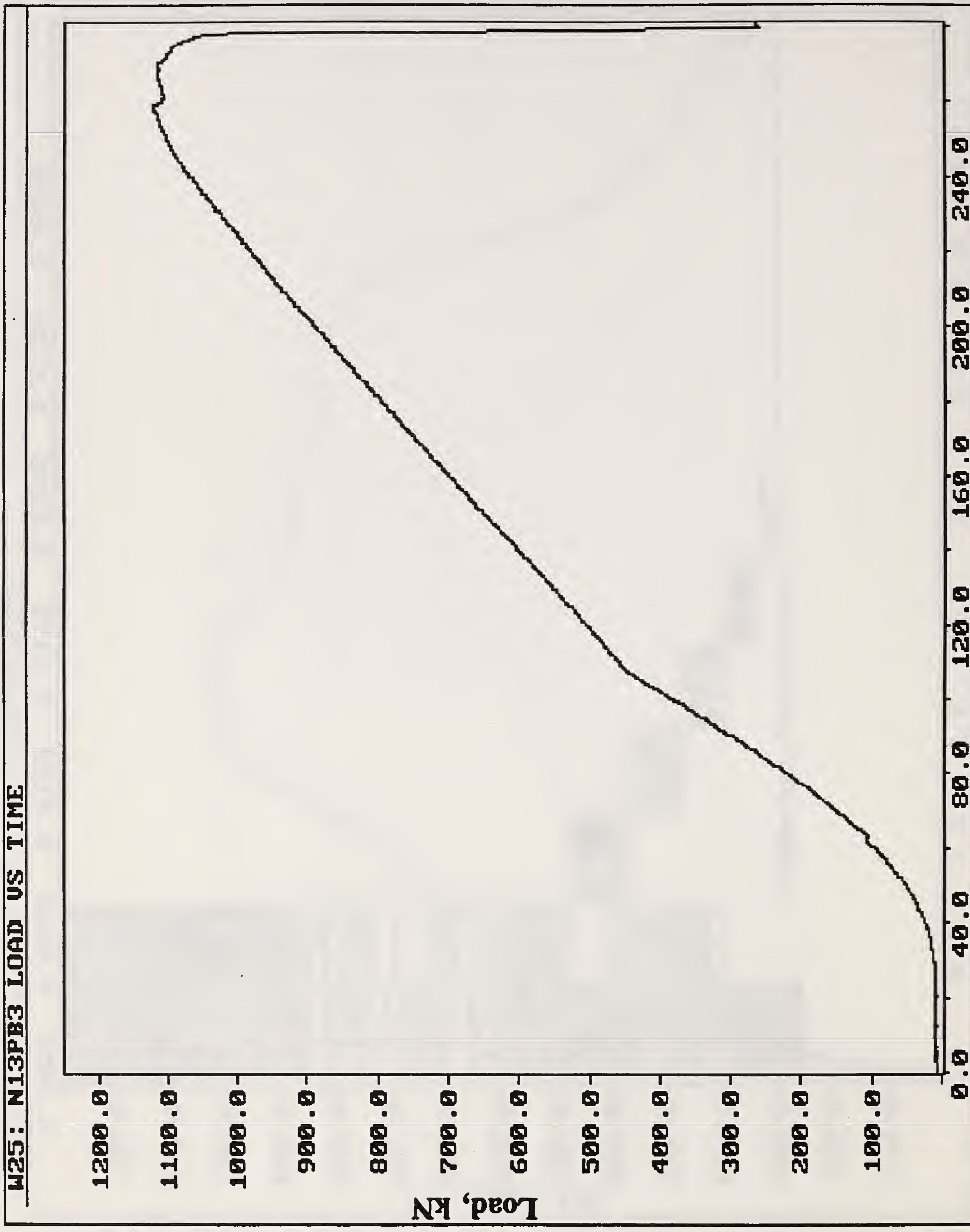
W28: N13PB2 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.4
0.8
1.2
1.6
2.0
2.4
2.8
3.2
3.6
4.0
Displacement, mm



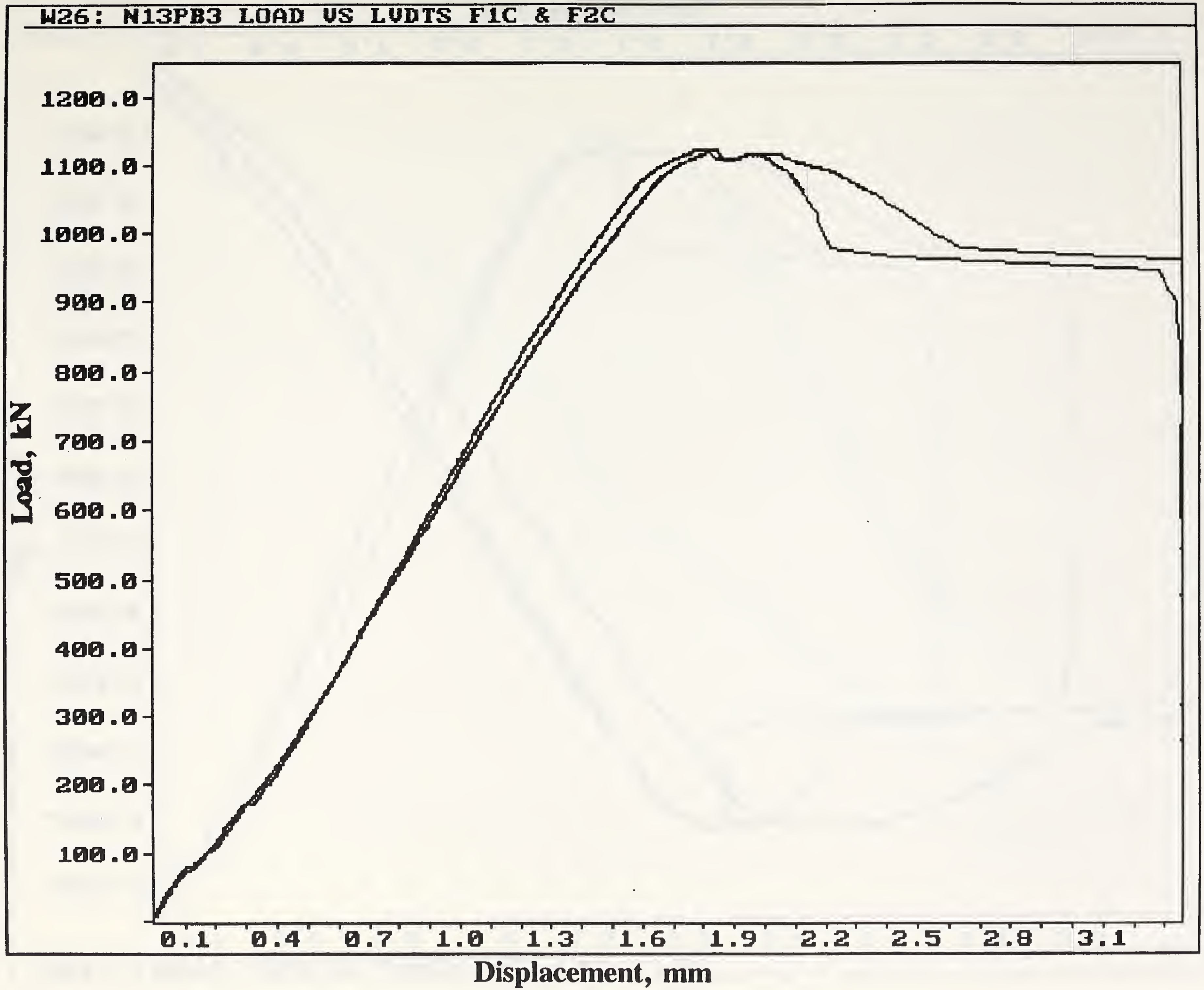
W29: N13PB2 LOAD VS LVDTS F1H & F2H
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
2.2
2.4
Displacement, mm

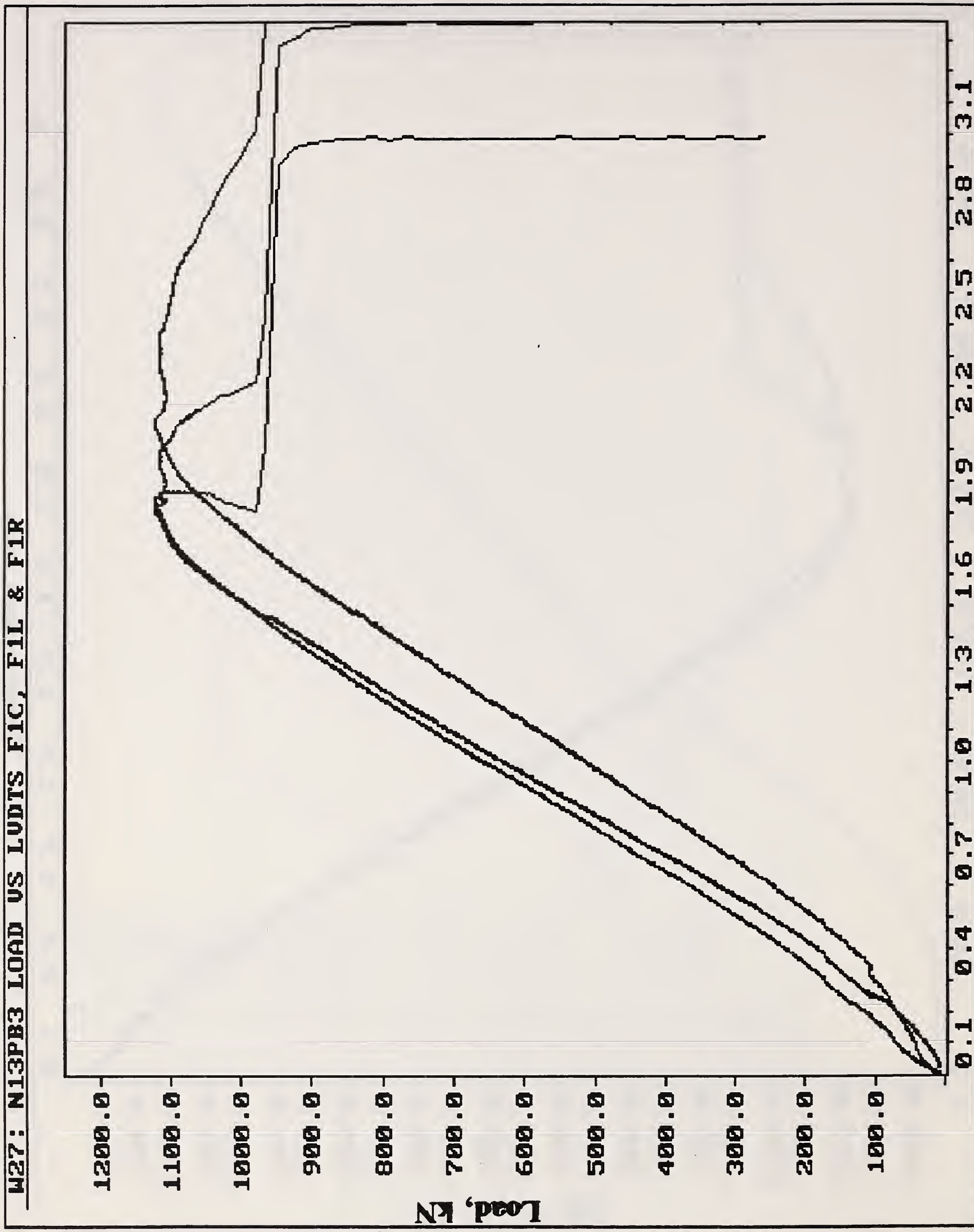

W30: N13PB2 LOAD VS LVDTS F1C & F1H
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.6
1.2
1.8
2.4
3.0
3.6
4.2
4.8
Displacement, mm

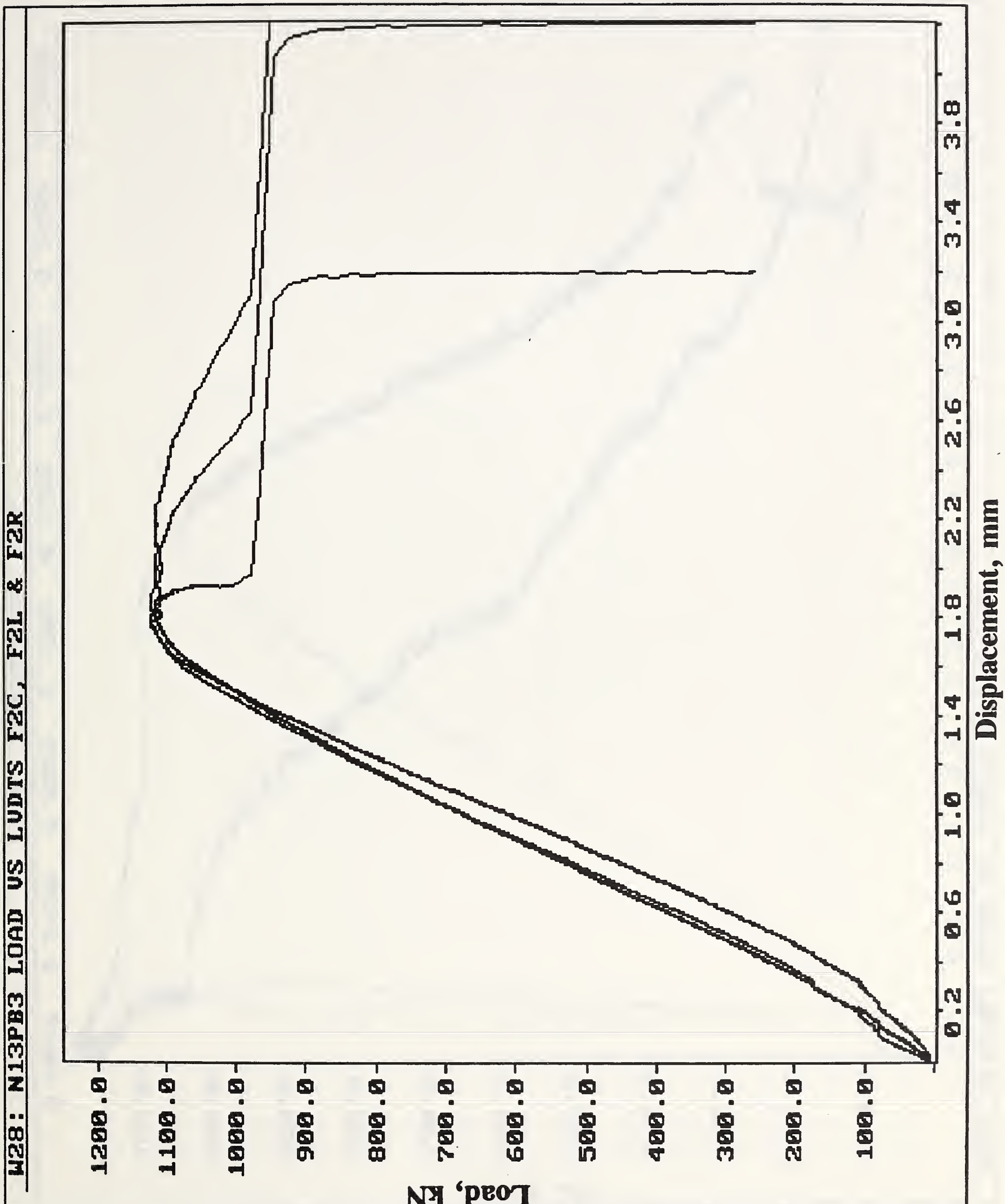

W31: N13PB2 LOAD VS LVDTS F3H & F4H
Load, kN
750.0
700.0
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
-0.0050
0.0025
0.0100
0.0175
0.0250
0.0325
0.0400
Displacement, mm

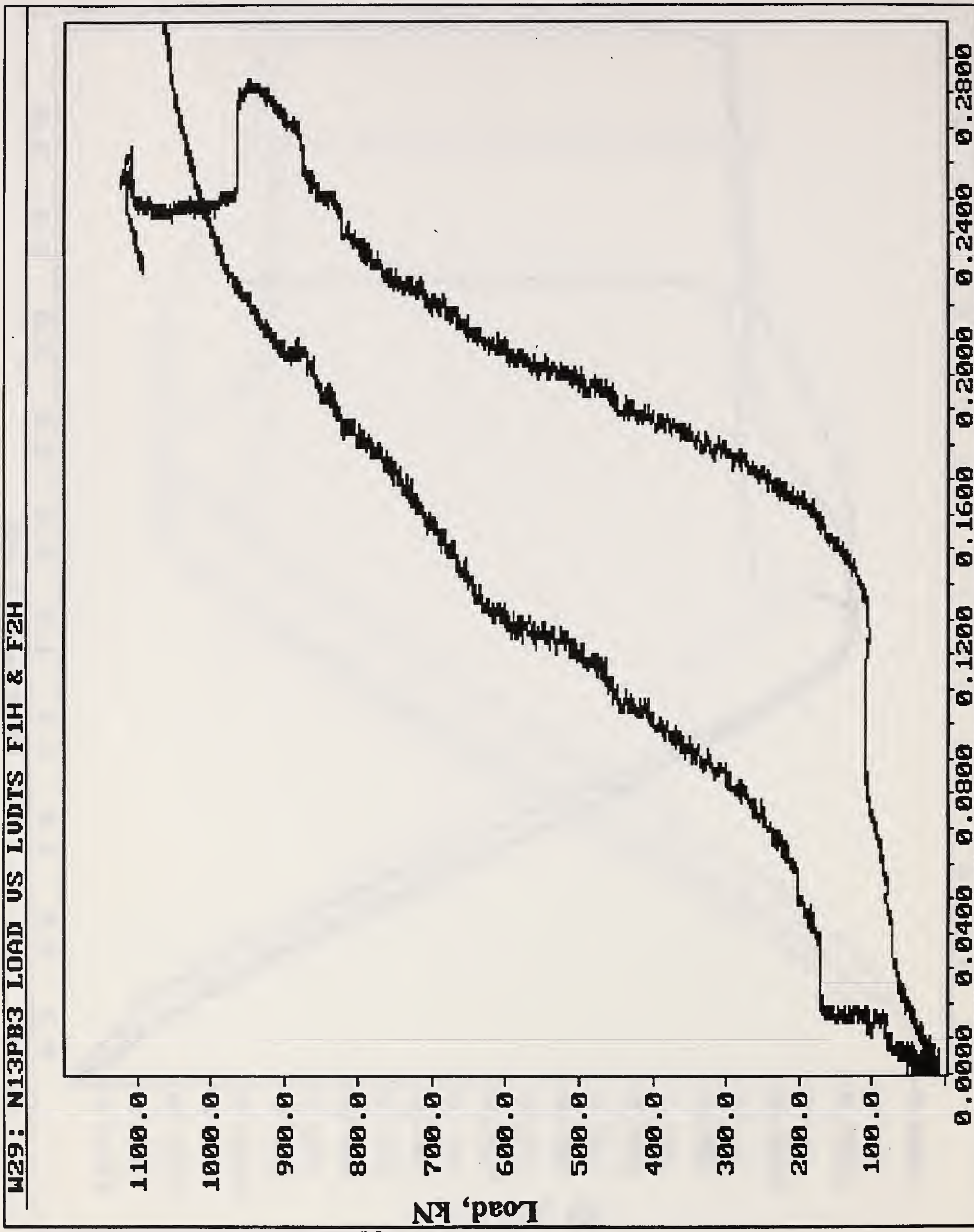


W25: N13PB3 LOAD VS TIME
Load, kN
0.0
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

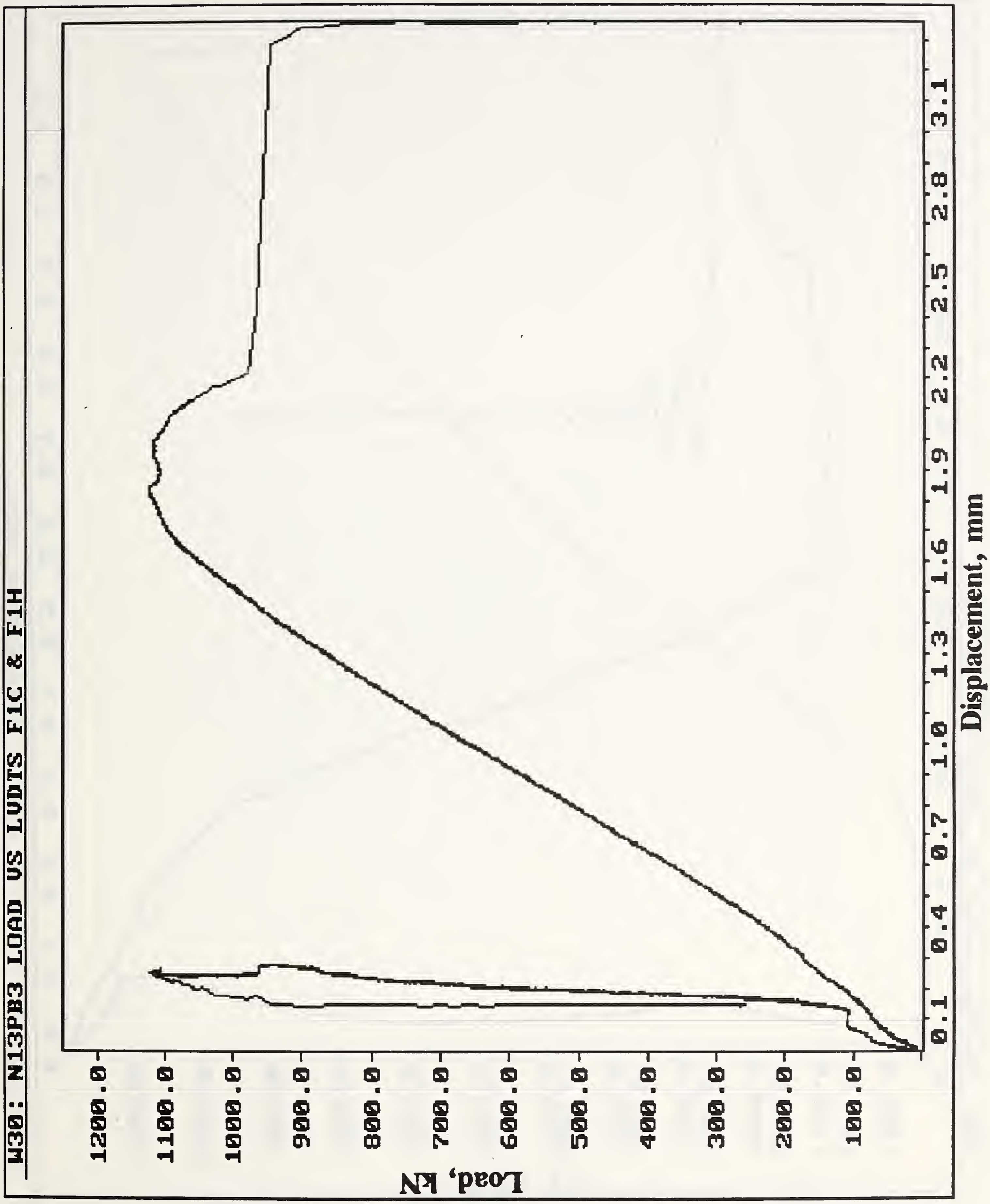

W26: N13PB3 LOAD VS LVDTS F1C & F2C
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.1
0.4
0.7
1.0
1.3
1.6
1.9
2.2
2.5
2.8
3.1
Displacement, mm

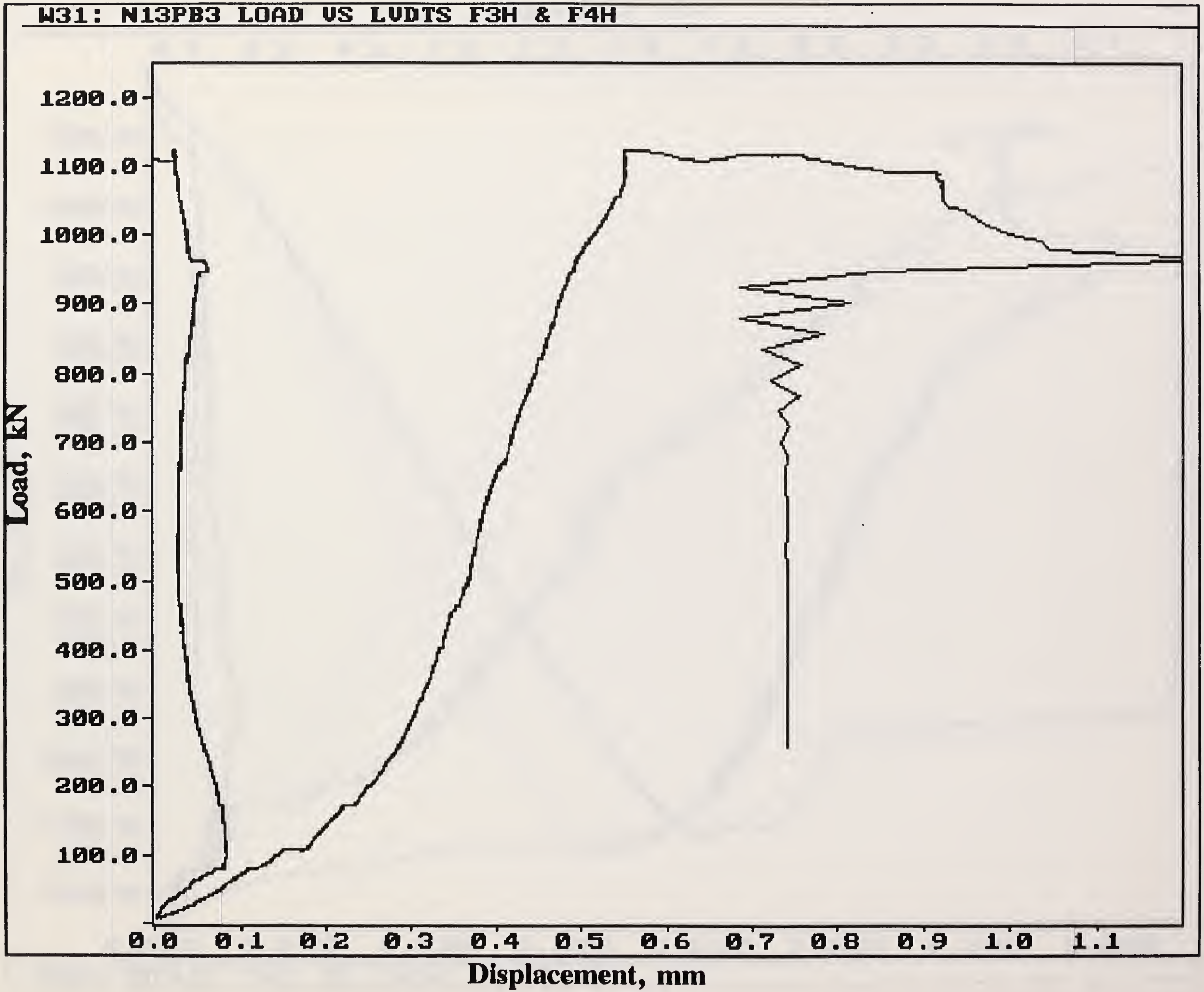

W27: N13PB3 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.1
0.4
0.7
1.0
1.3
1.6
1.9
2.2
2.5
2.8
3.1

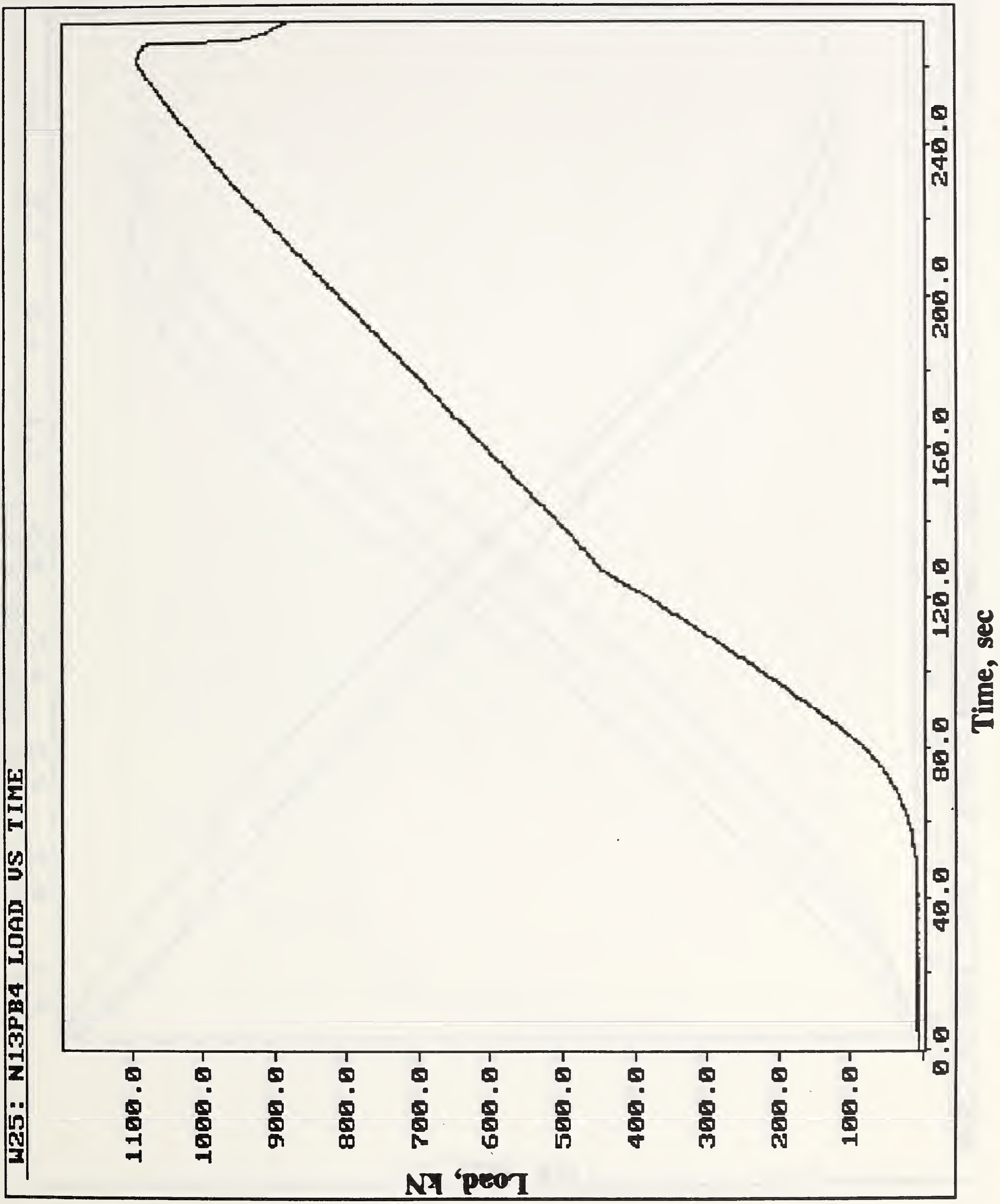

W28: N13PB3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
1200.0
Displacement, mm
0.2
0.6
1.0
1.4
1.8
2.2
2.6
3.0
3.4
3.8

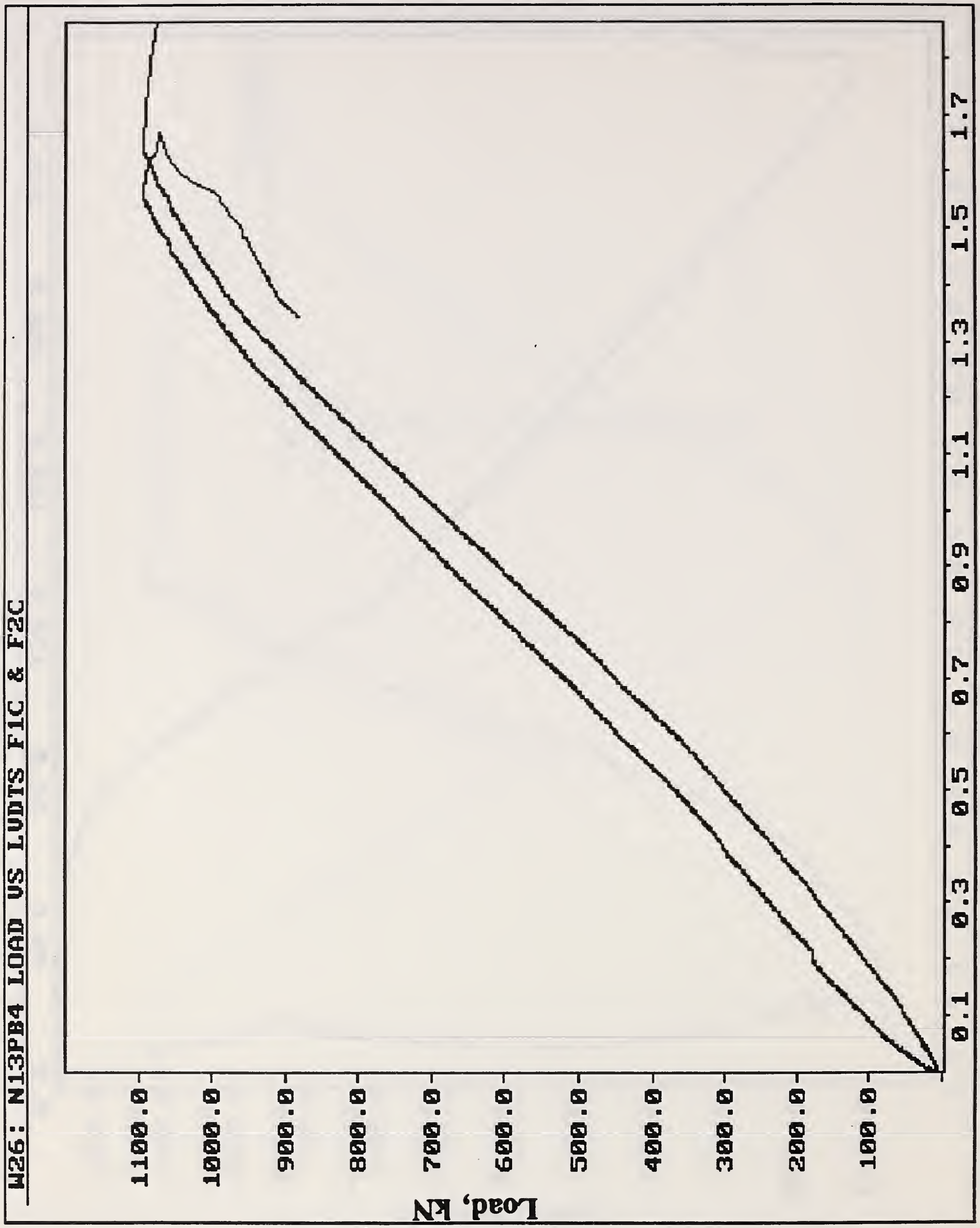


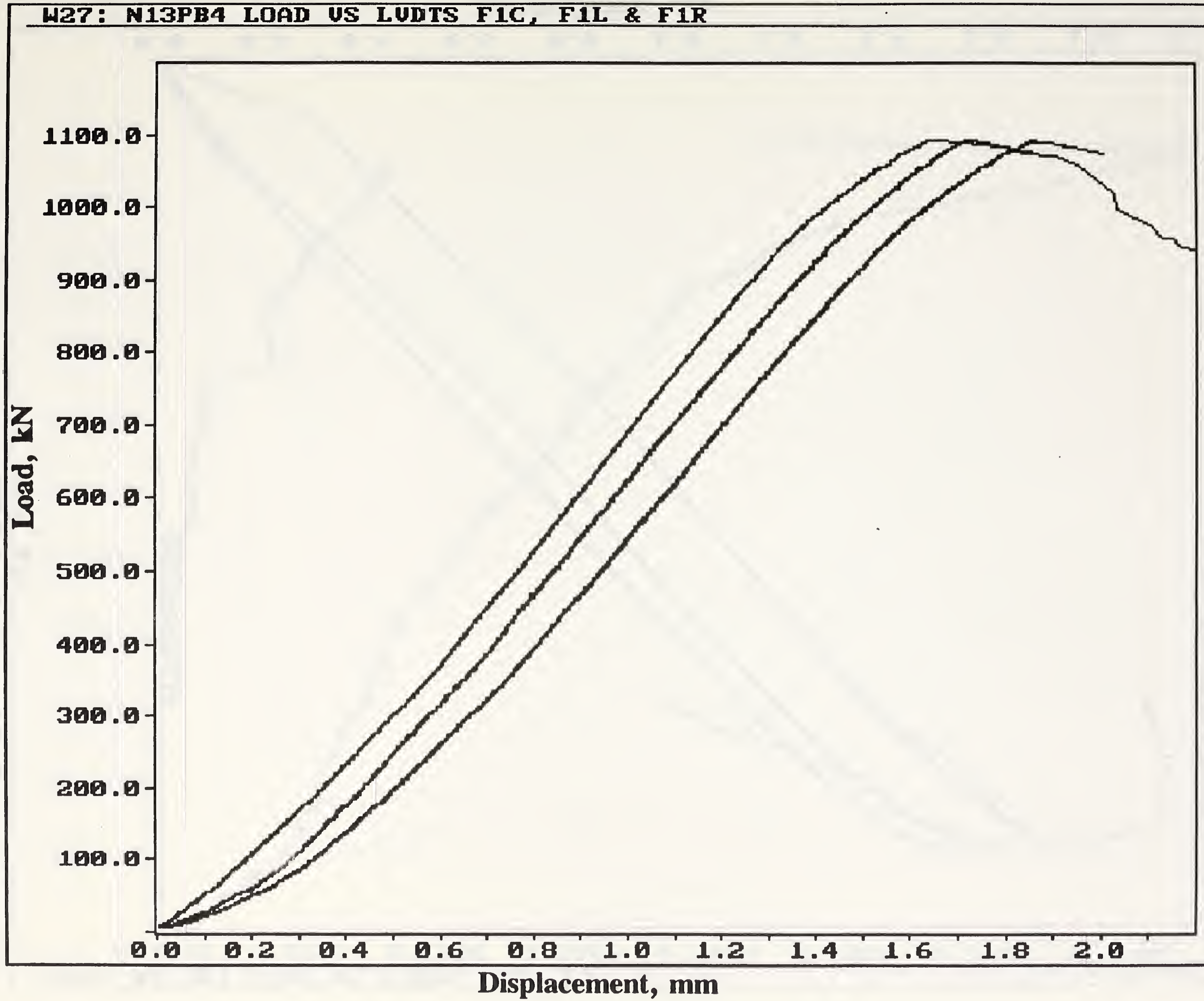
W29: N13PB3 LOAD VS LVDTS F1H & F2H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0000
0.0400
0.0800
0.1200
0.1600
0.2000
0.2400
0.2800
Displacement, mm

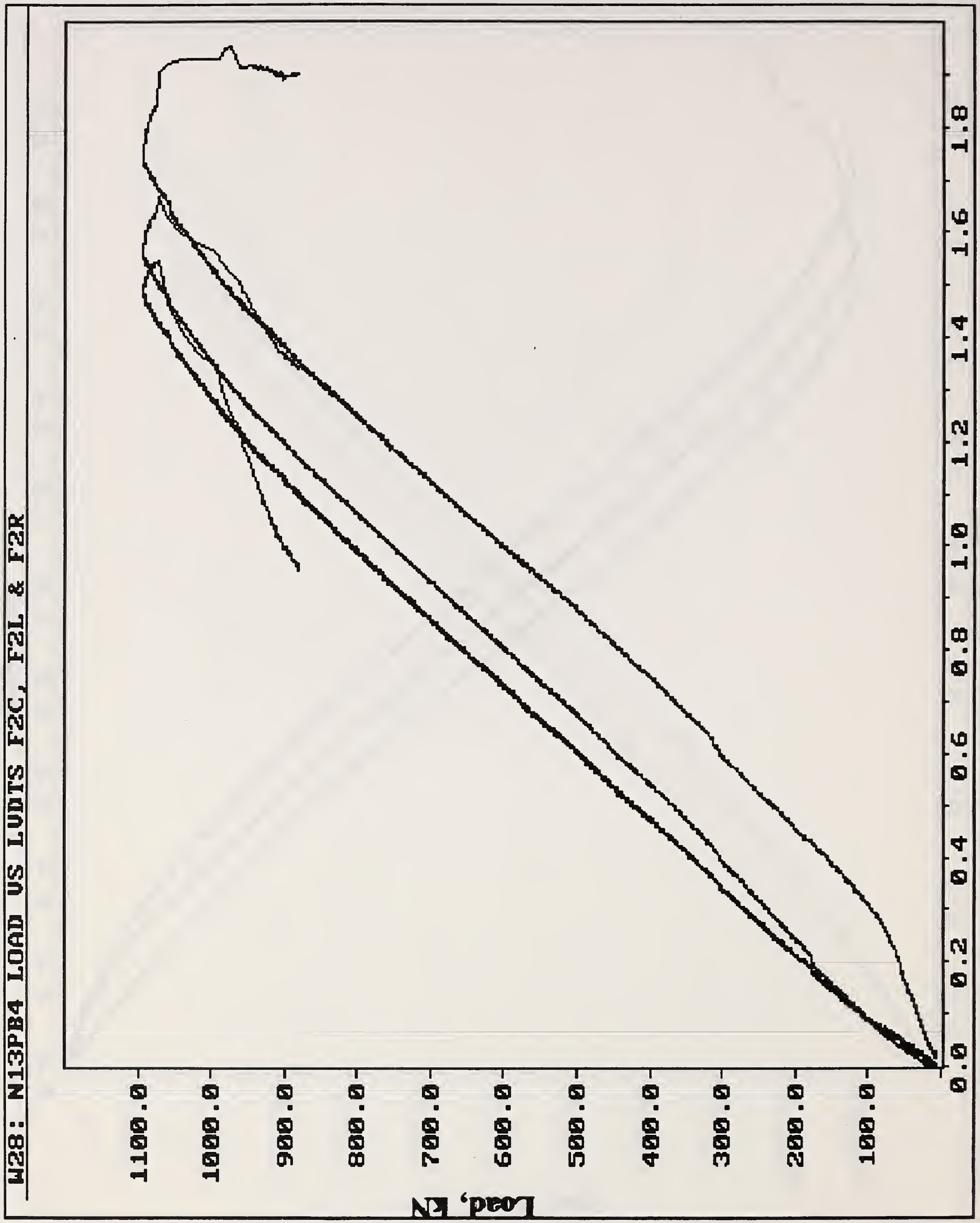

W30: N13PB3 LOAD VS LVDTS F1C & F1H
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.1
0.1
0.4
0.7
1.0
1.3
1.6
1.9
2.2
2.5
2.8
3.1

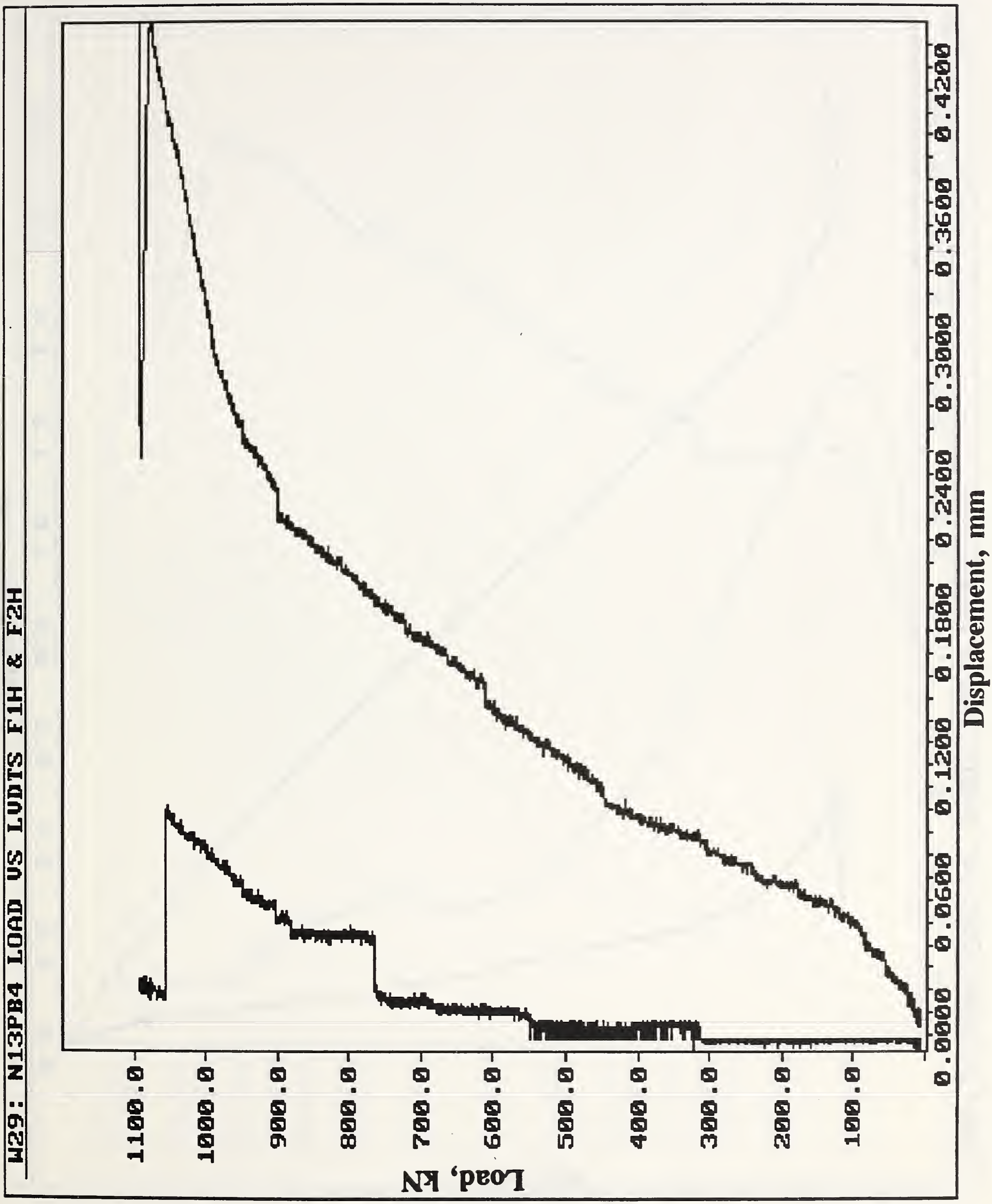

W31: N13PB3 LOAD VS LVDTS F3H & F4H
Load, kN
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
1.1
Displacement, mm

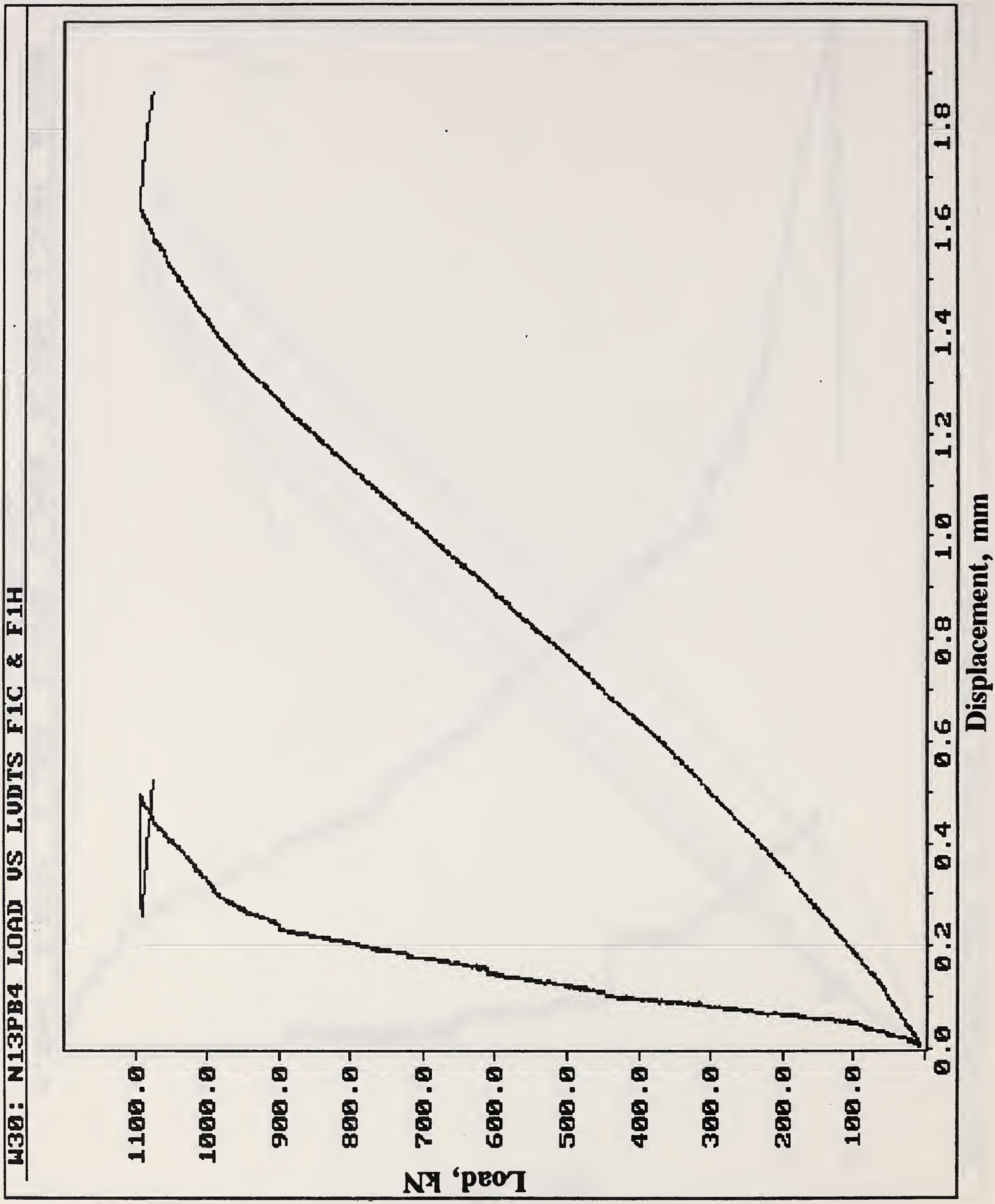

W25: N13PB4 LOAD VS TIME
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec


W26: N13PB4 LOAD VS LVDTS F1C & F2C
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.1
0.3
0.5
0.7
0.9
1.1
1.3
1.5
1.7

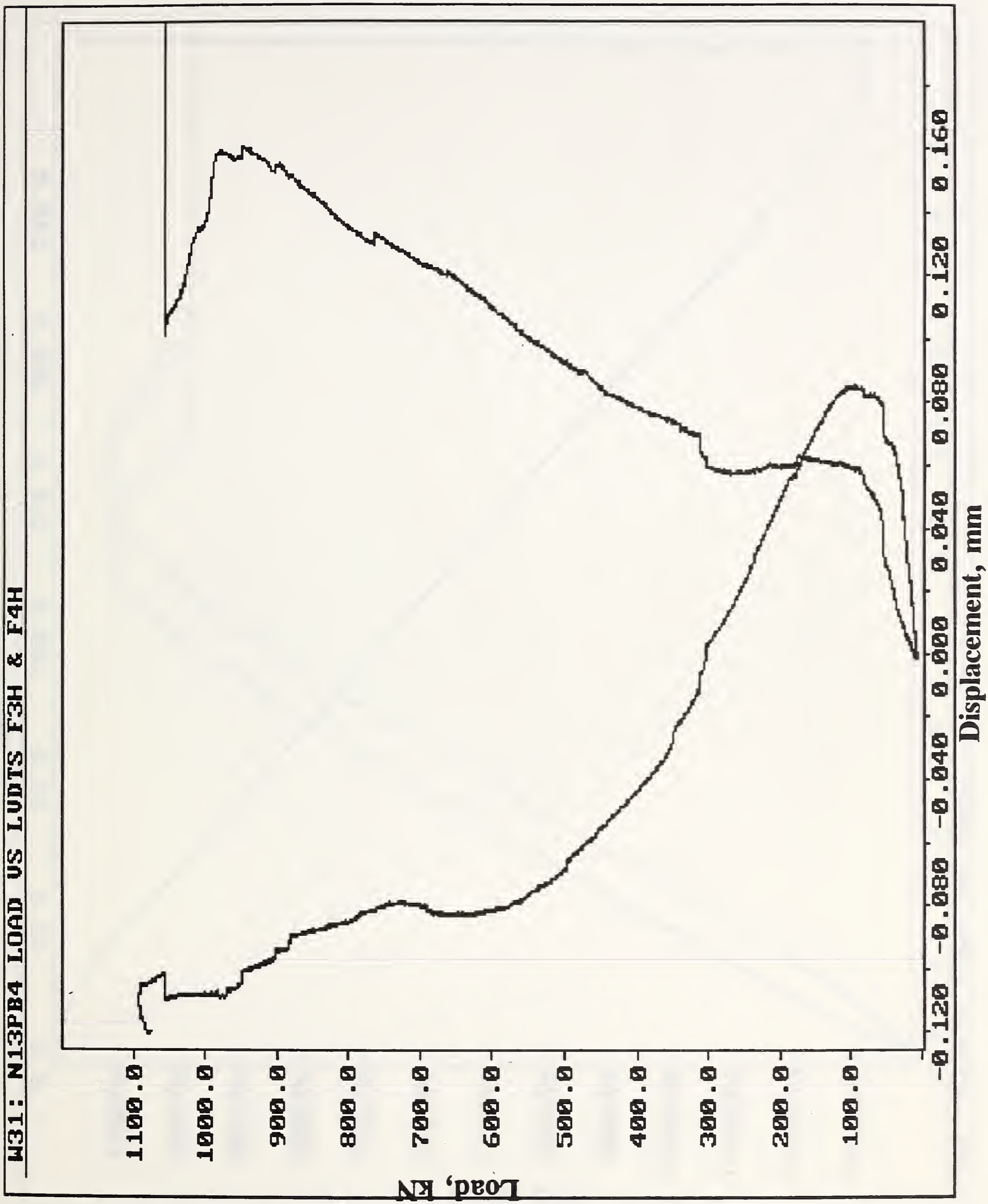

W27: N13PB4 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
Displacement, mm

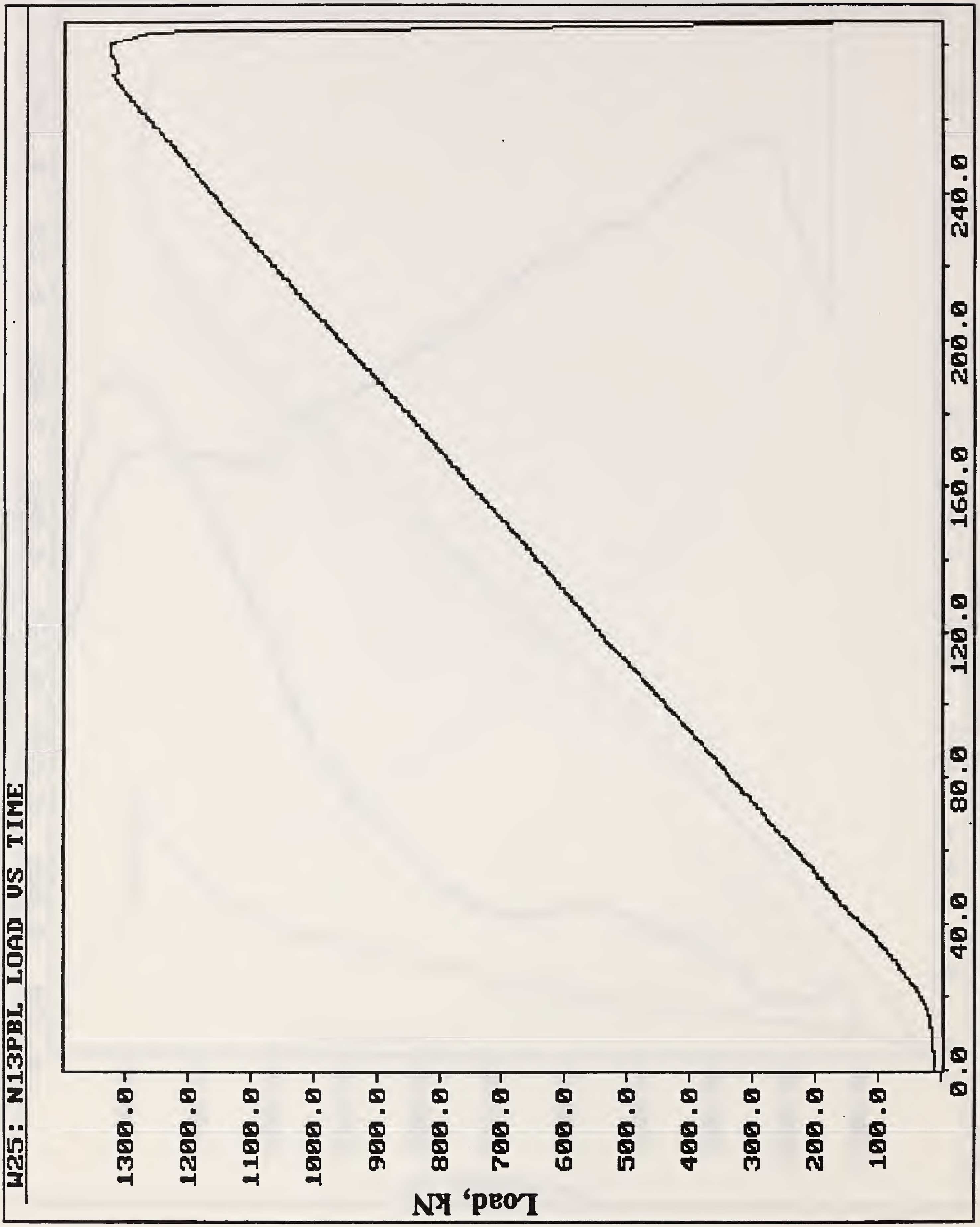

W28: N13PB4 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
100.0
200.0
300.0
400.0
500.0
600.0
700.0
800.0
900.0
1000.0
1100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

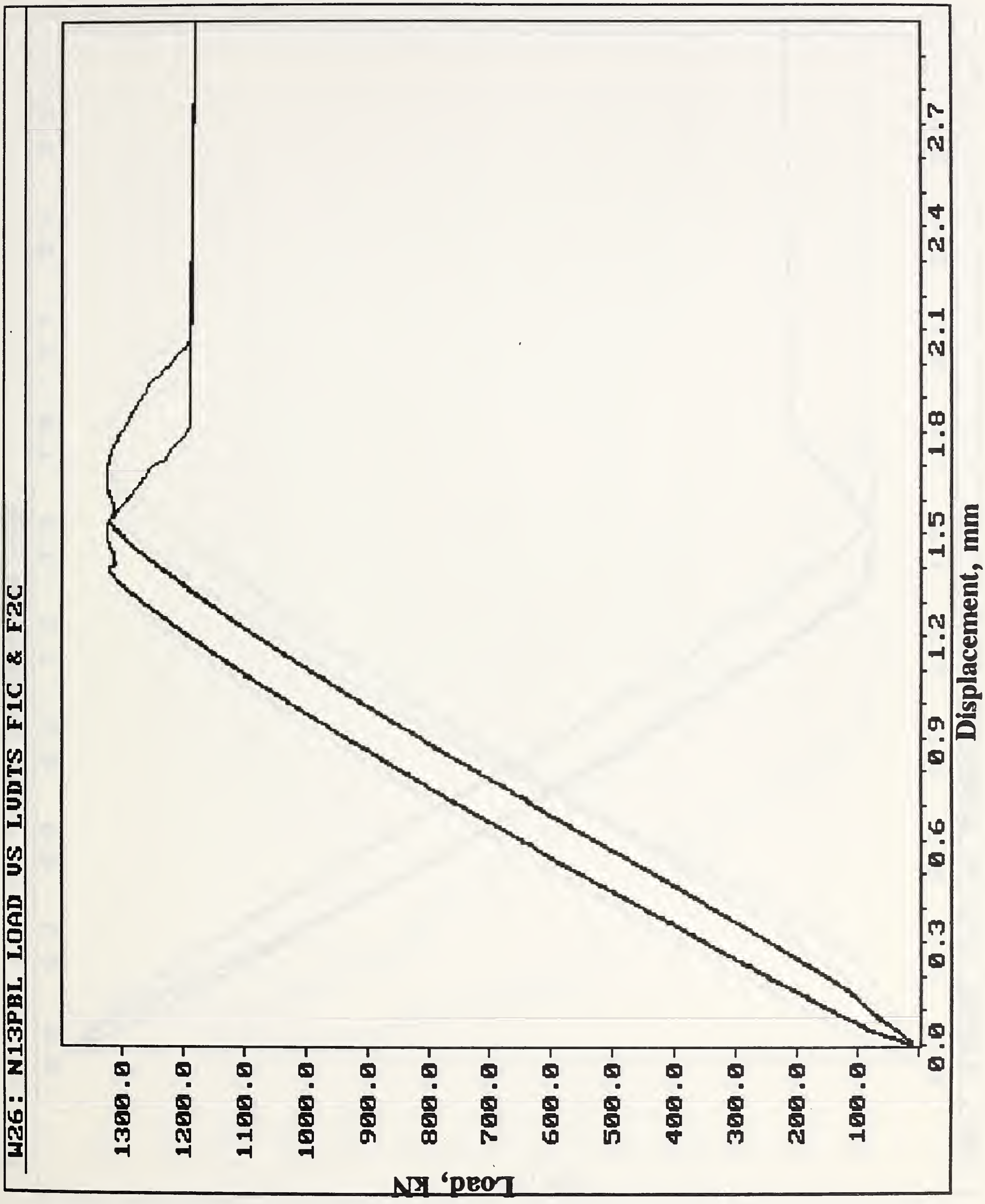

W29: N13PB4 LOAD VS LVDTS F1H & F2H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0000
0.0600
0.1200
0.1800
0.2400
0.3000
0.3600
0.4200
Displacement, mm

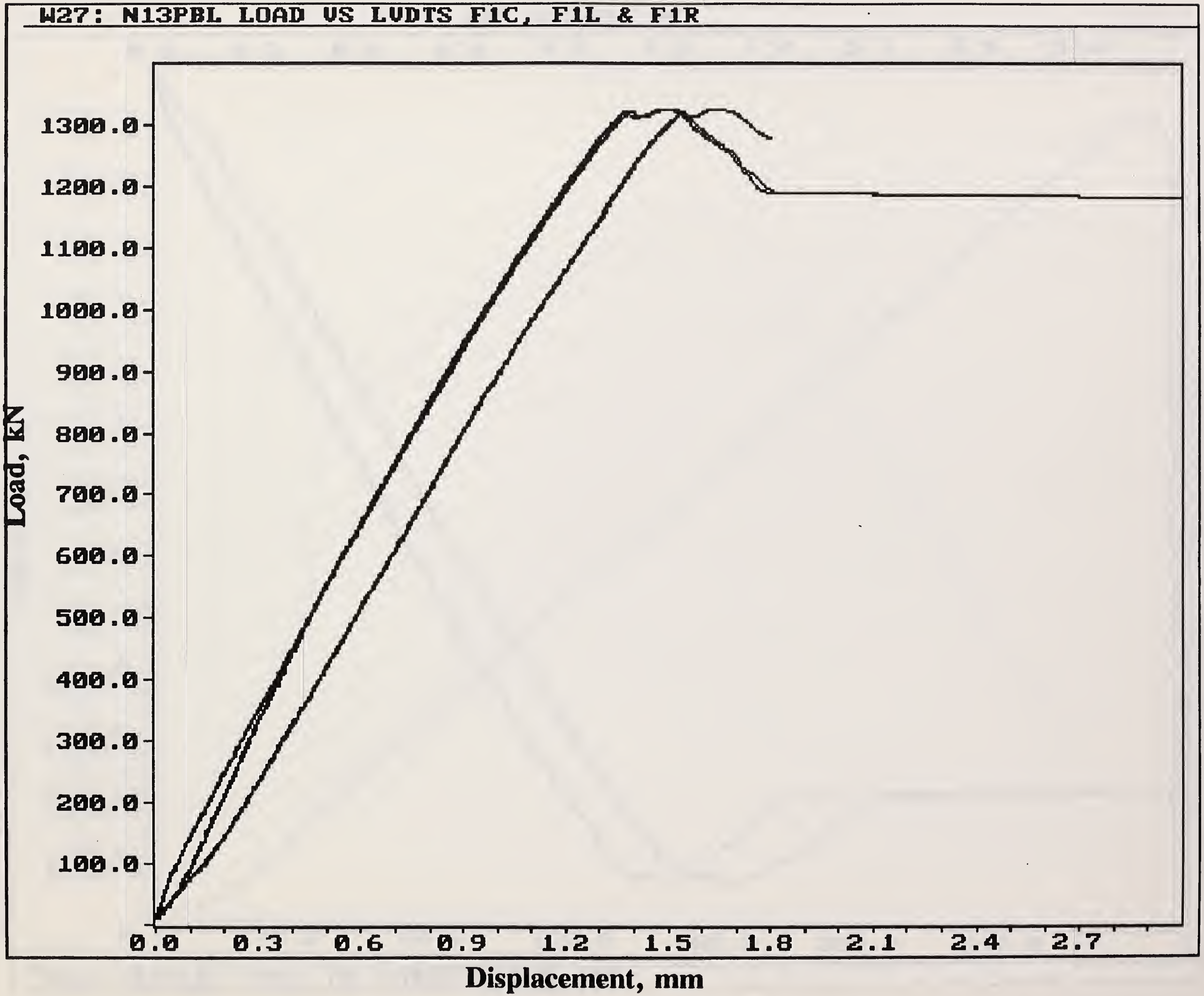


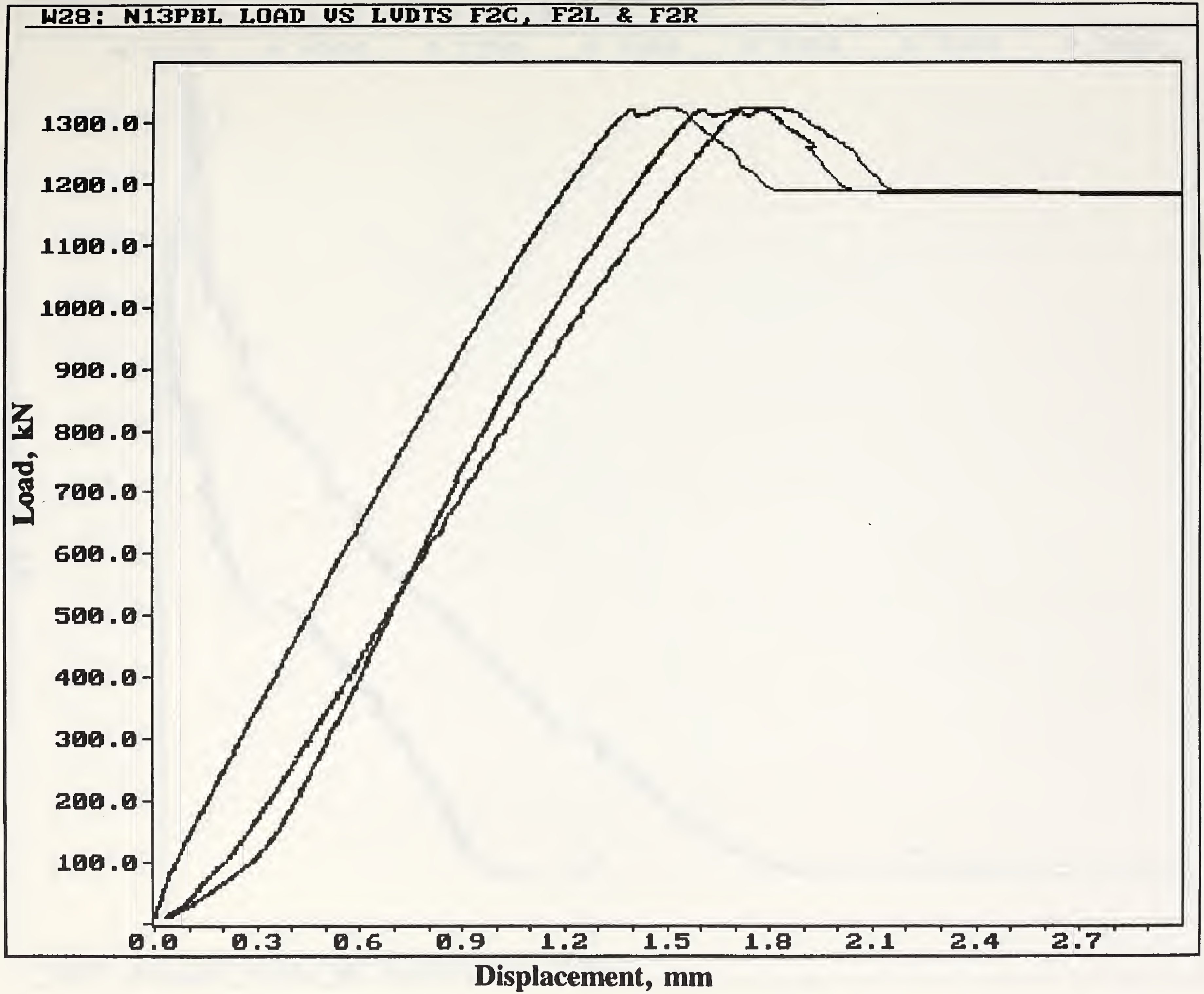
W30: N13PB4 LOAD VS LVDTS F1C & F1H
Load, kN
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8

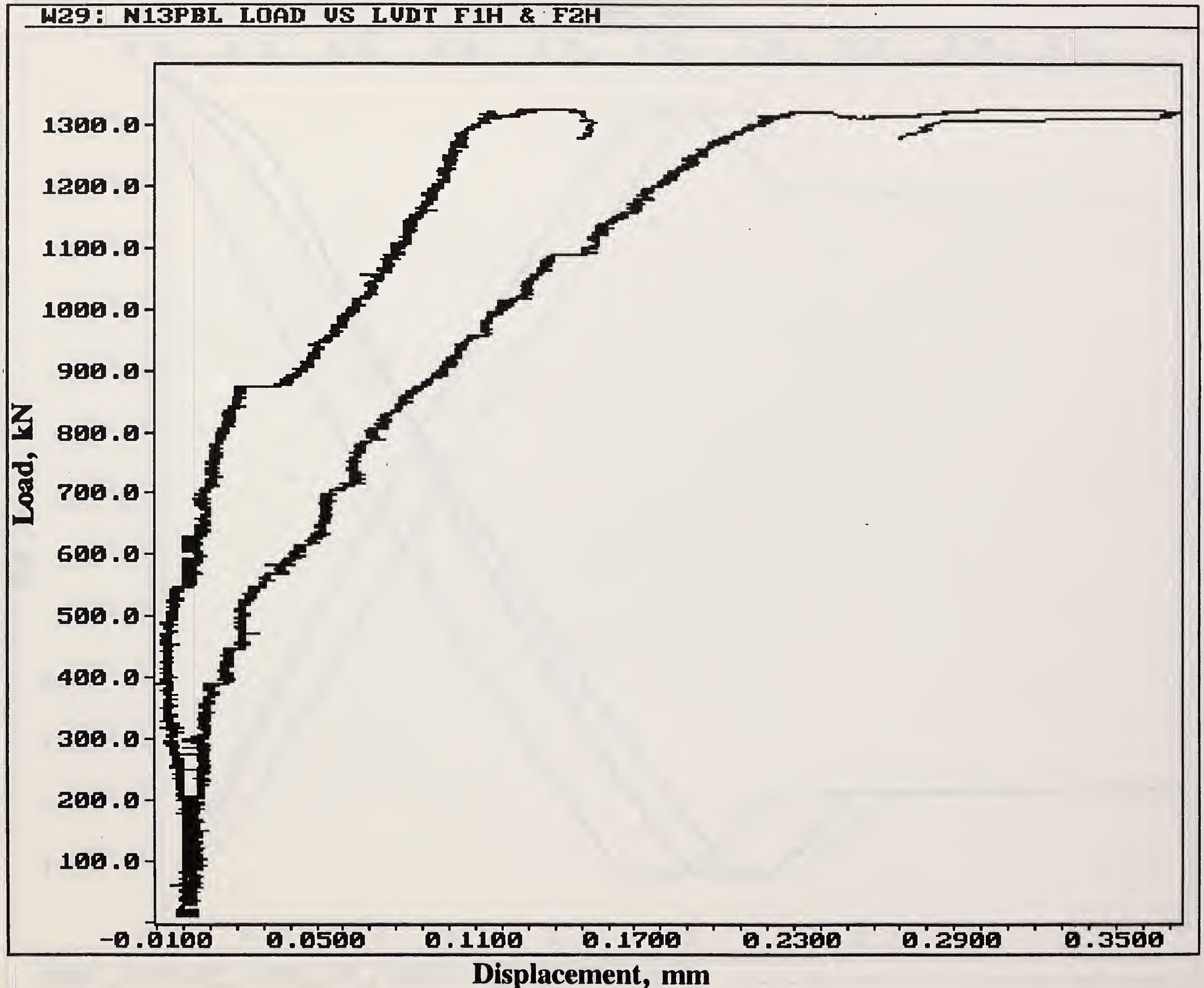

W31: N13PB4 LOAD VS LVDTS F3H & F4H
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
-0.120
-0.080
-0.040
0.000
0.040
0.080
0.120
0.160
Displacement, mm

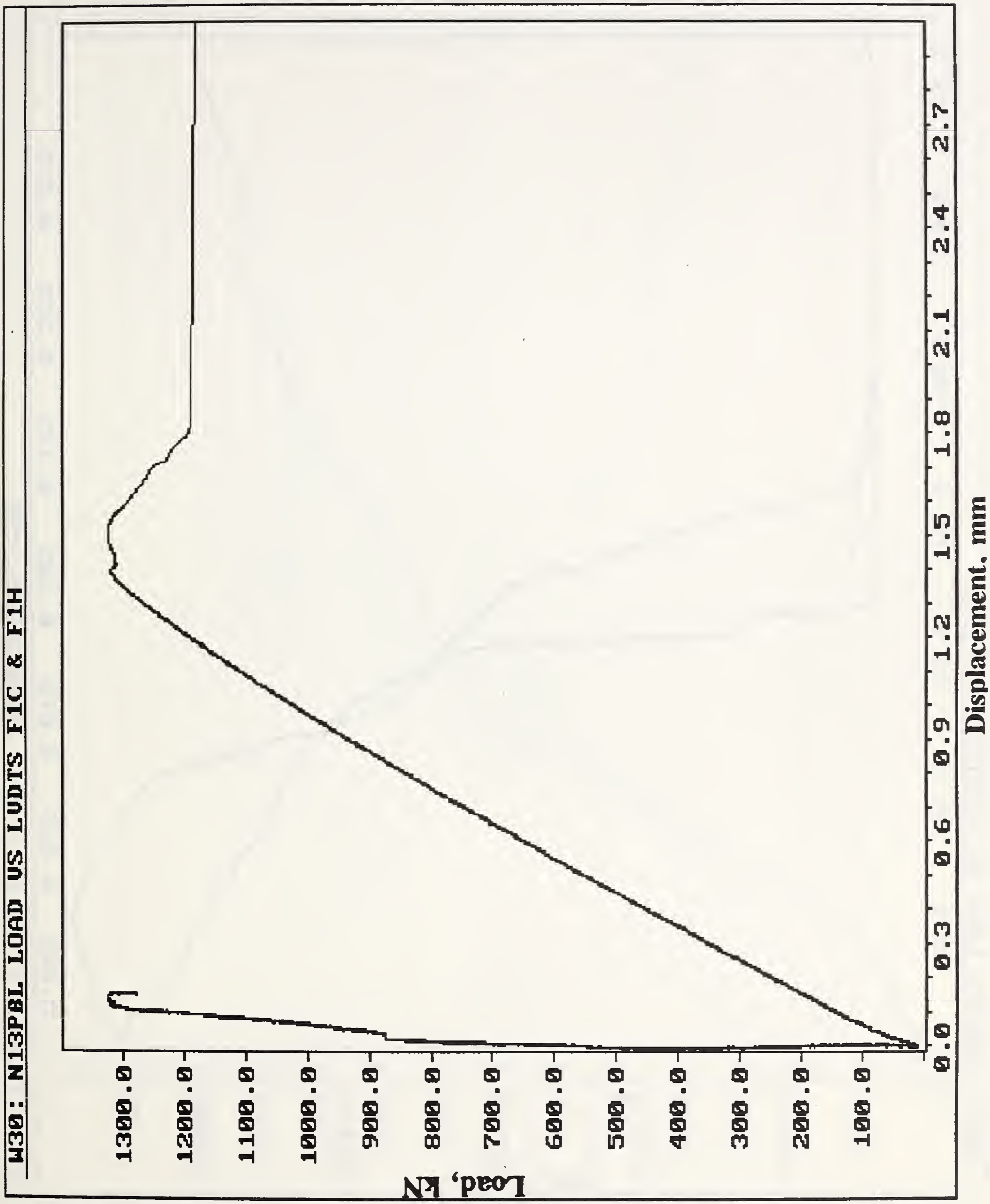

W25: N13PBL LOAD VS TIME
Load, kN
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec


W26: N13PBL LOAD VS LVDTS F1C & F2C
Load, KN
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
Displacement, mm

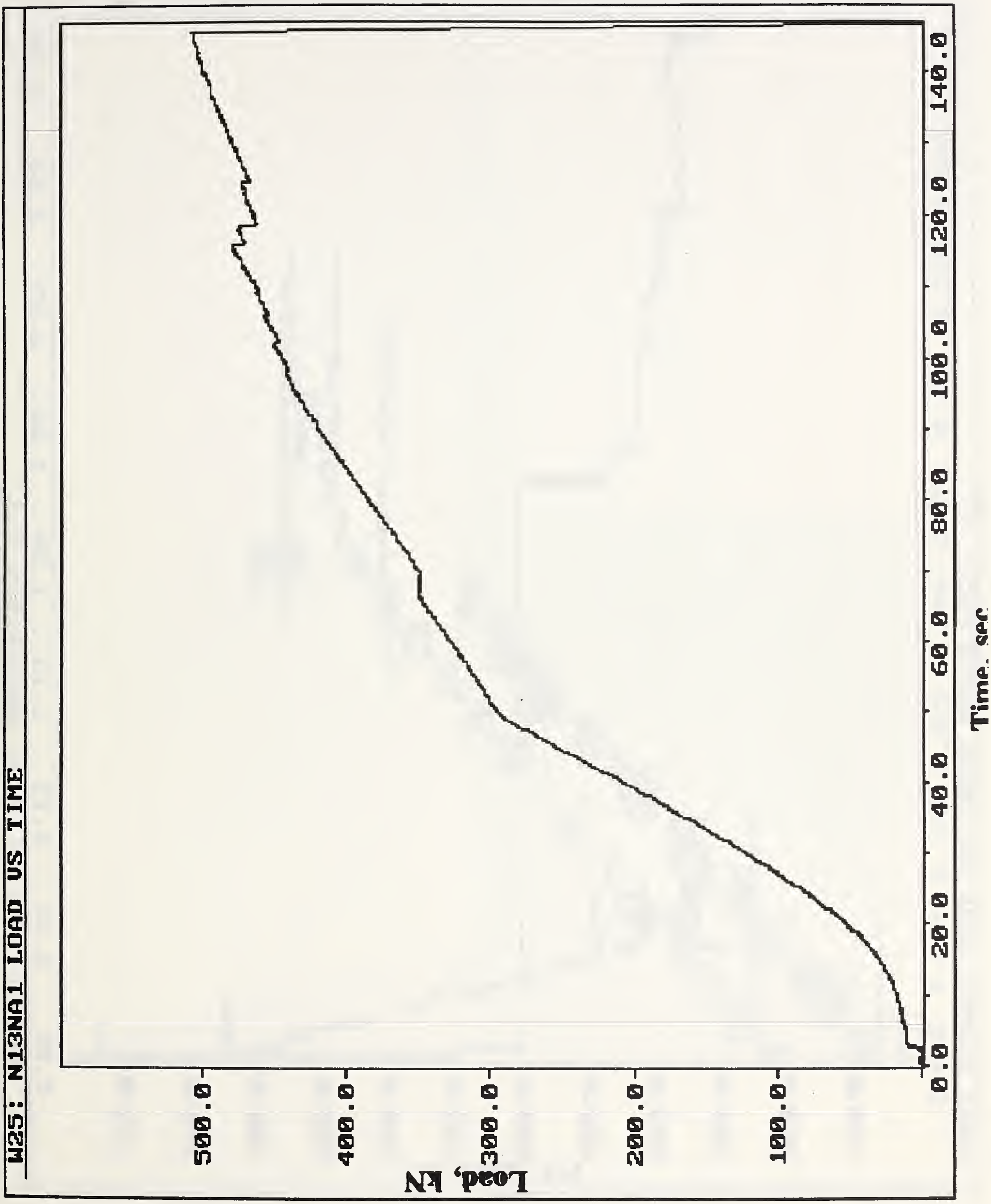

W27: N13PBL LOAD VS LVDTS F1C, F1L & F1R
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Load, kN
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
Displacement, mm

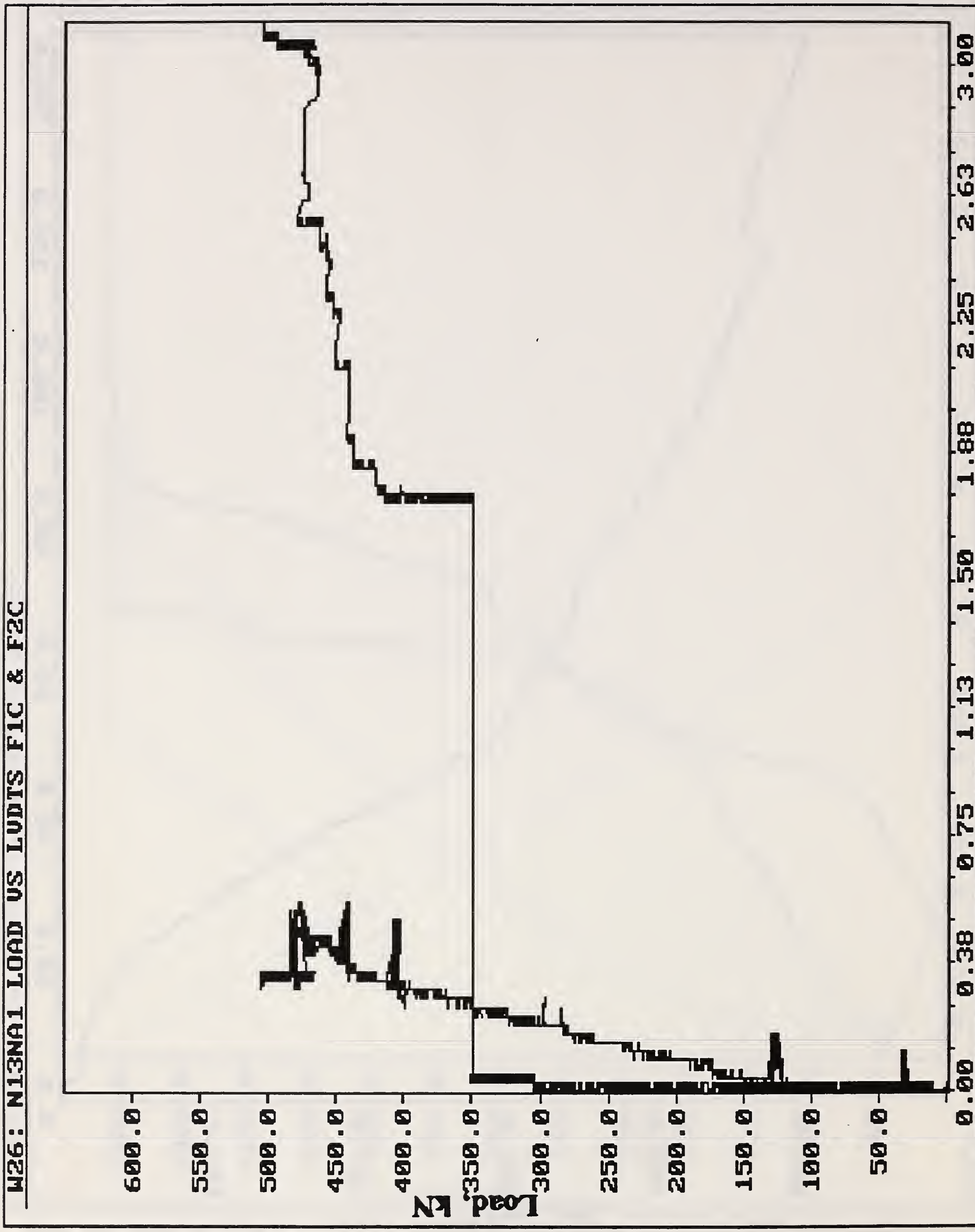

W28: N13PBL LOAD VS LVDTS F2C, F2L & F2R
Load, kN
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7
Displacement, mm

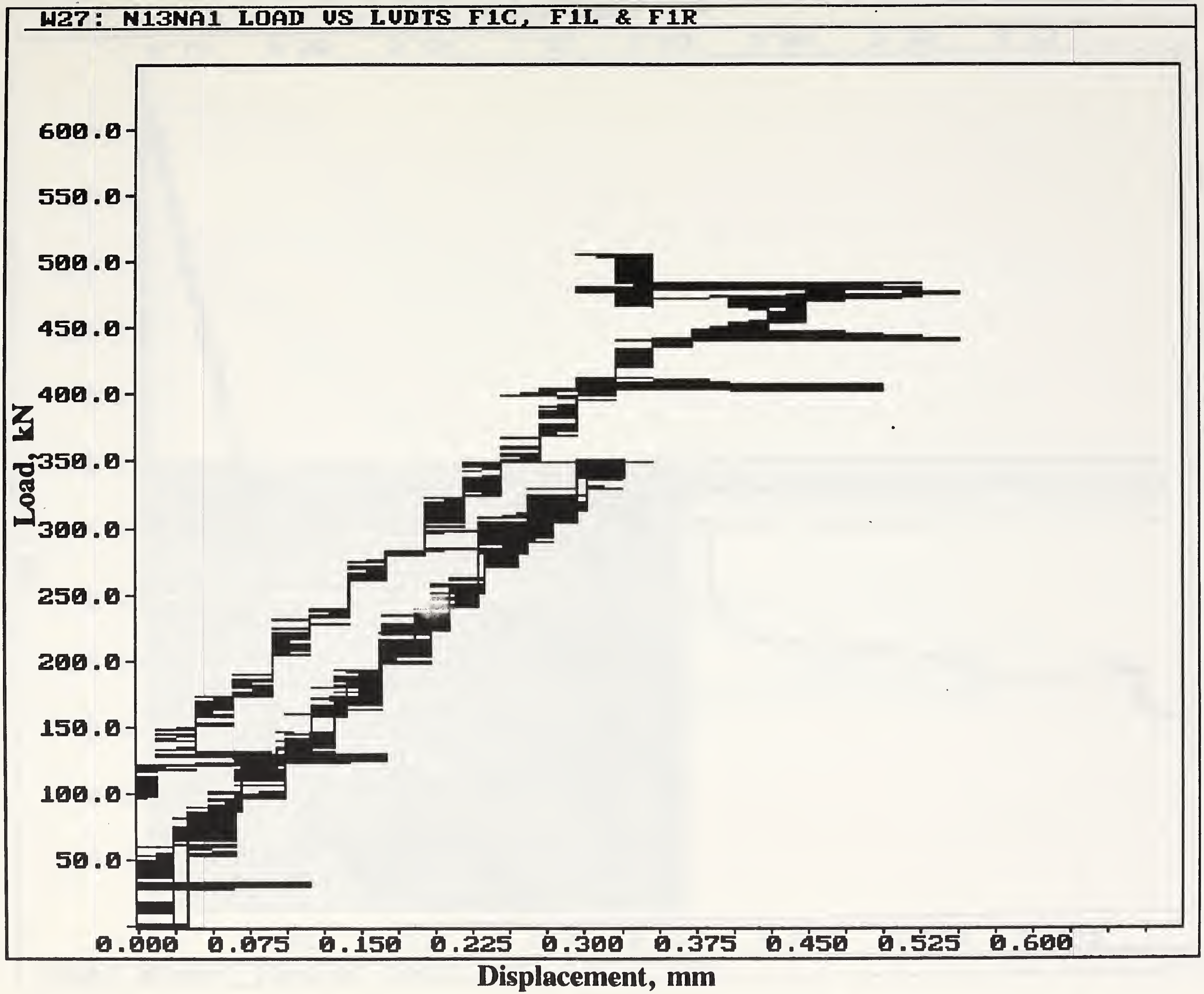

W29: N13PBL LOAD VS LVDT F1H & F2H
Load, kN
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
-0.0100
0.0500
0.1100
0.1700
0.2300
0.2900
0.3500
Displacement, mm

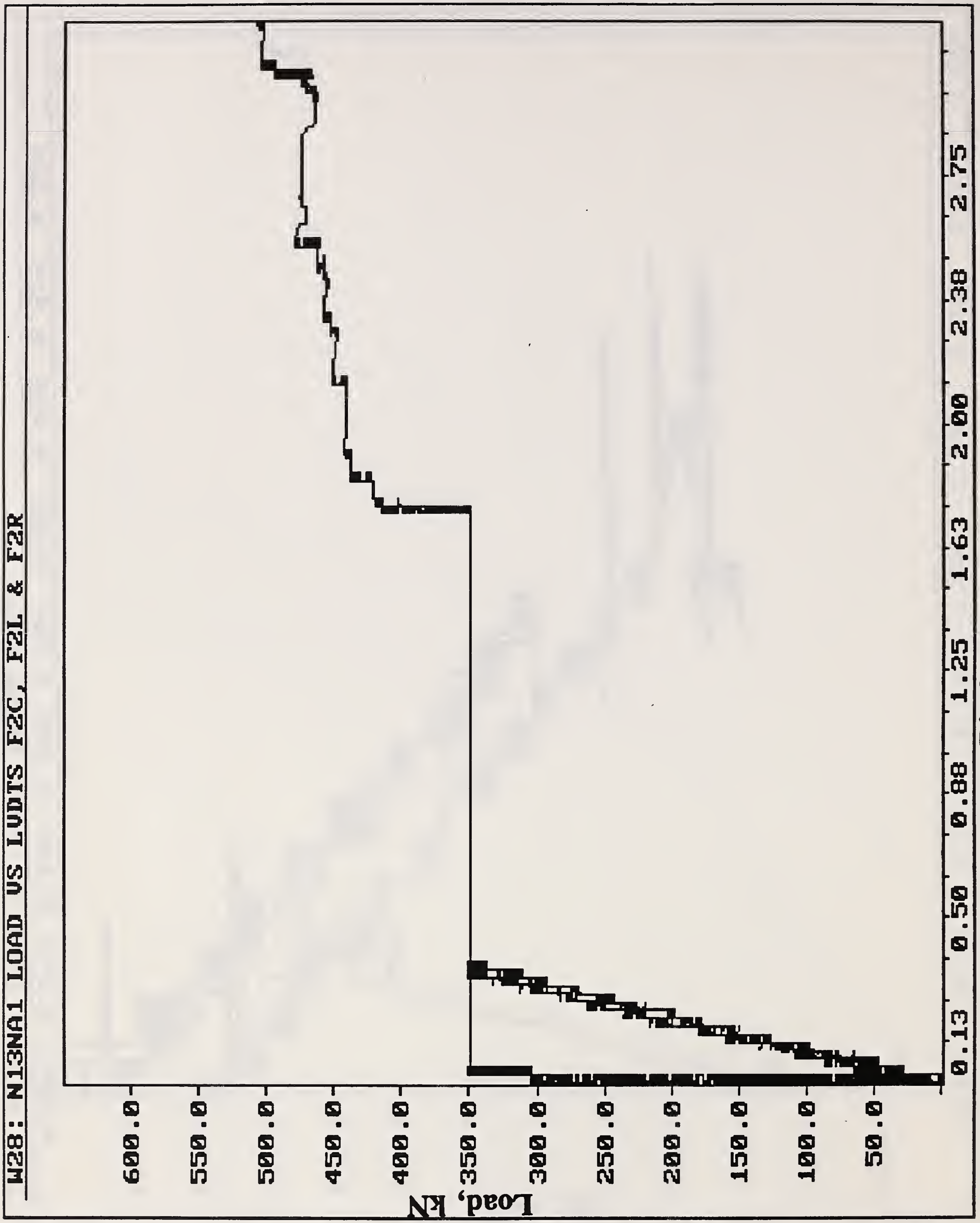

W30: N13PBL LOAD VS LVDTS F1C & F1H
Load, kN
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
0.0
0.3
0.6
0.9
1.2
1.5
1.8
2.1
2.4
2.7

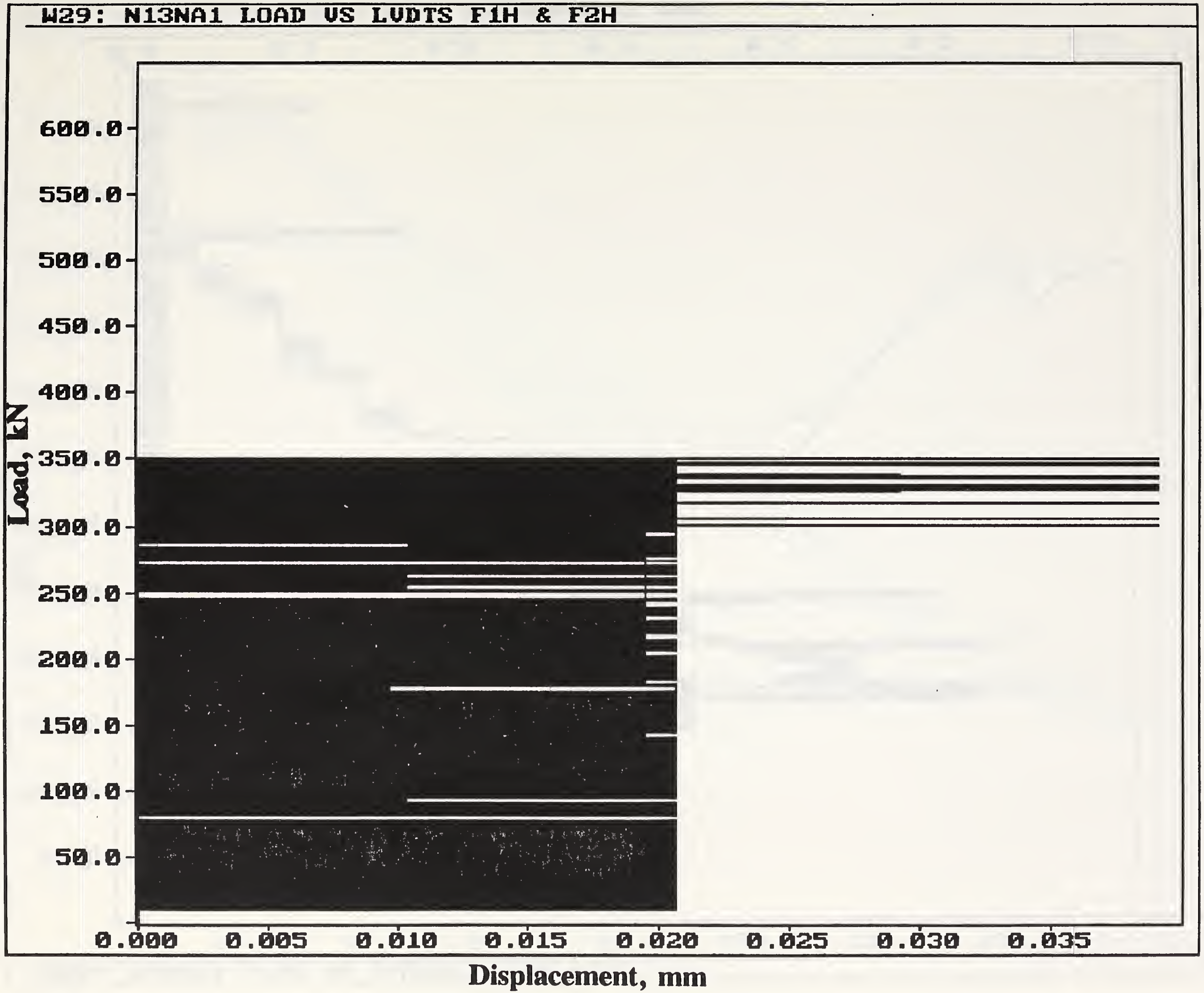

W31: N13PBL LOAD VS LVDTS F3H & F4H
Load, kN
1300.0
1200.0
1100.0
1000.0
900.0
800.0
700.0
600.0
500.0
400.0
300.0
200.0
100.0
Displacement, mm
-0.025
0.025
0.075
0.125
0.175
0.225
0.275

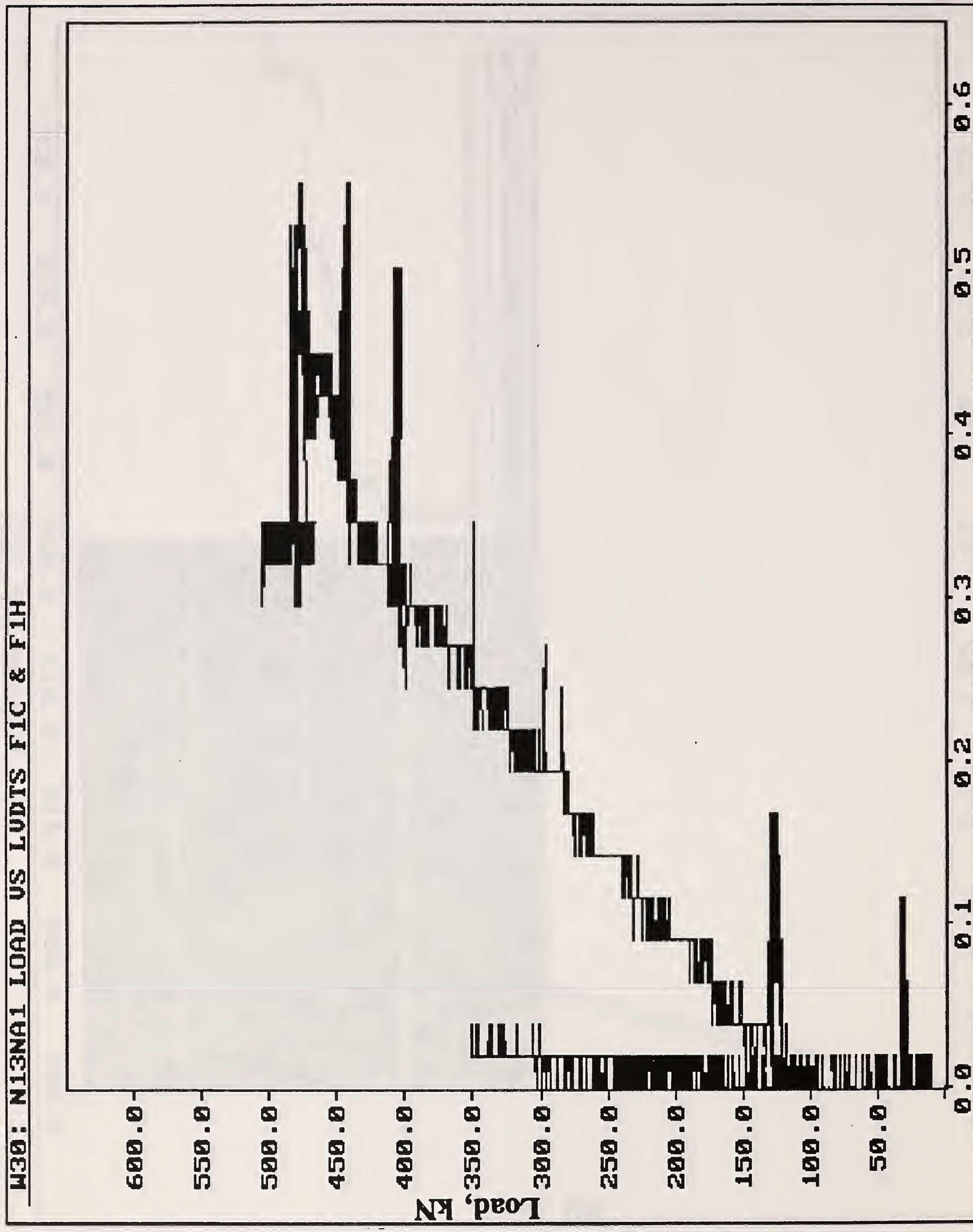

W25: N13NA1 LOAD VS TIME
Load, kN
500.0
400.0
300.0
200.0
100.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time, sec


W26: N13NA1 LOAD VS LVDTS F1C & F2C
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.00
0.38
0.75
1.13
1.50
1.88
2.25
2.63
3.00
Displacement, mm

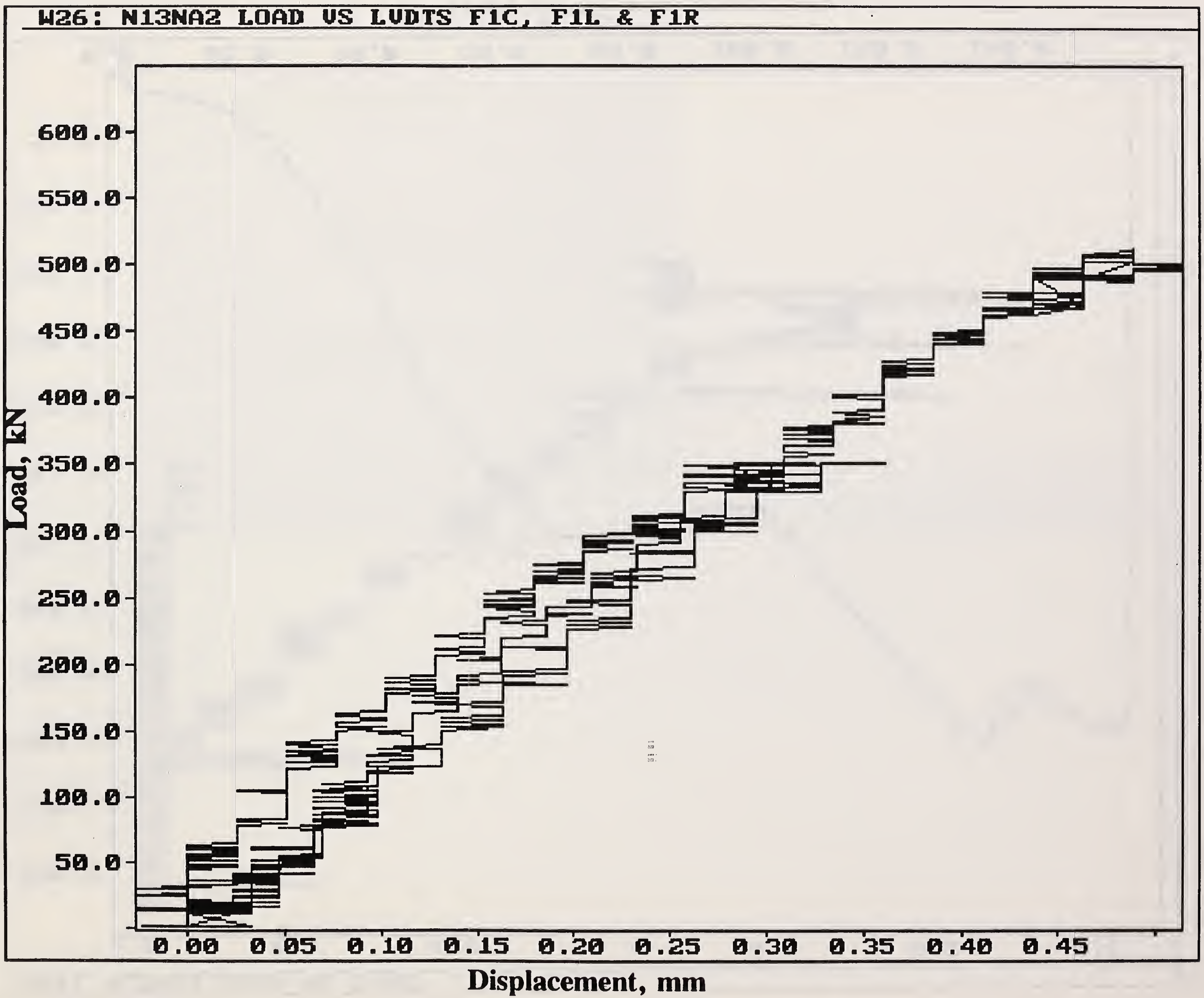

W27: N13NA1 LOAD VS LVDTS F1C, F1L & F1R
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm

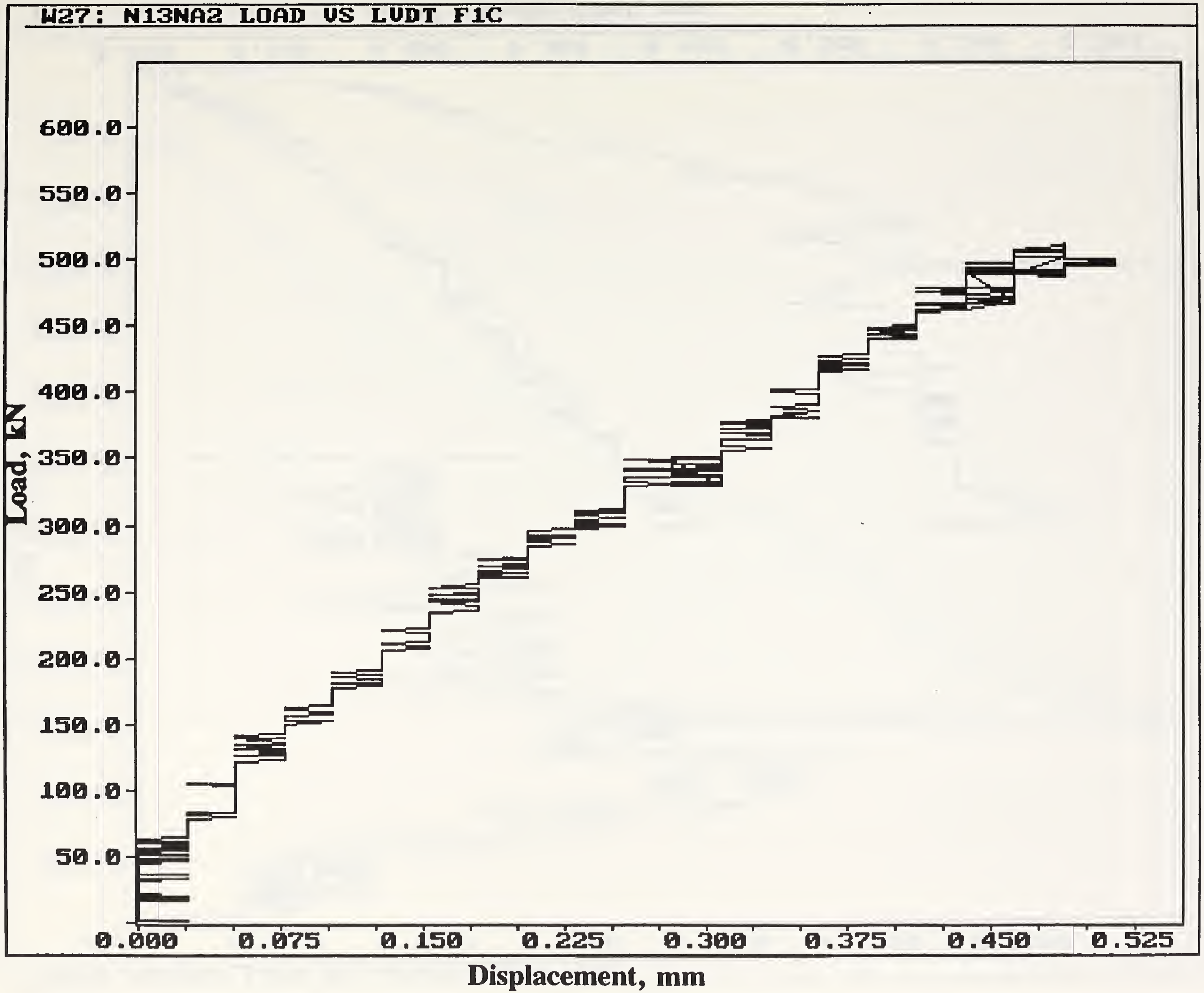

W28: N13NA1 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.13
0.50
0.88
1.25
1.63
2.00
2.38
2.75

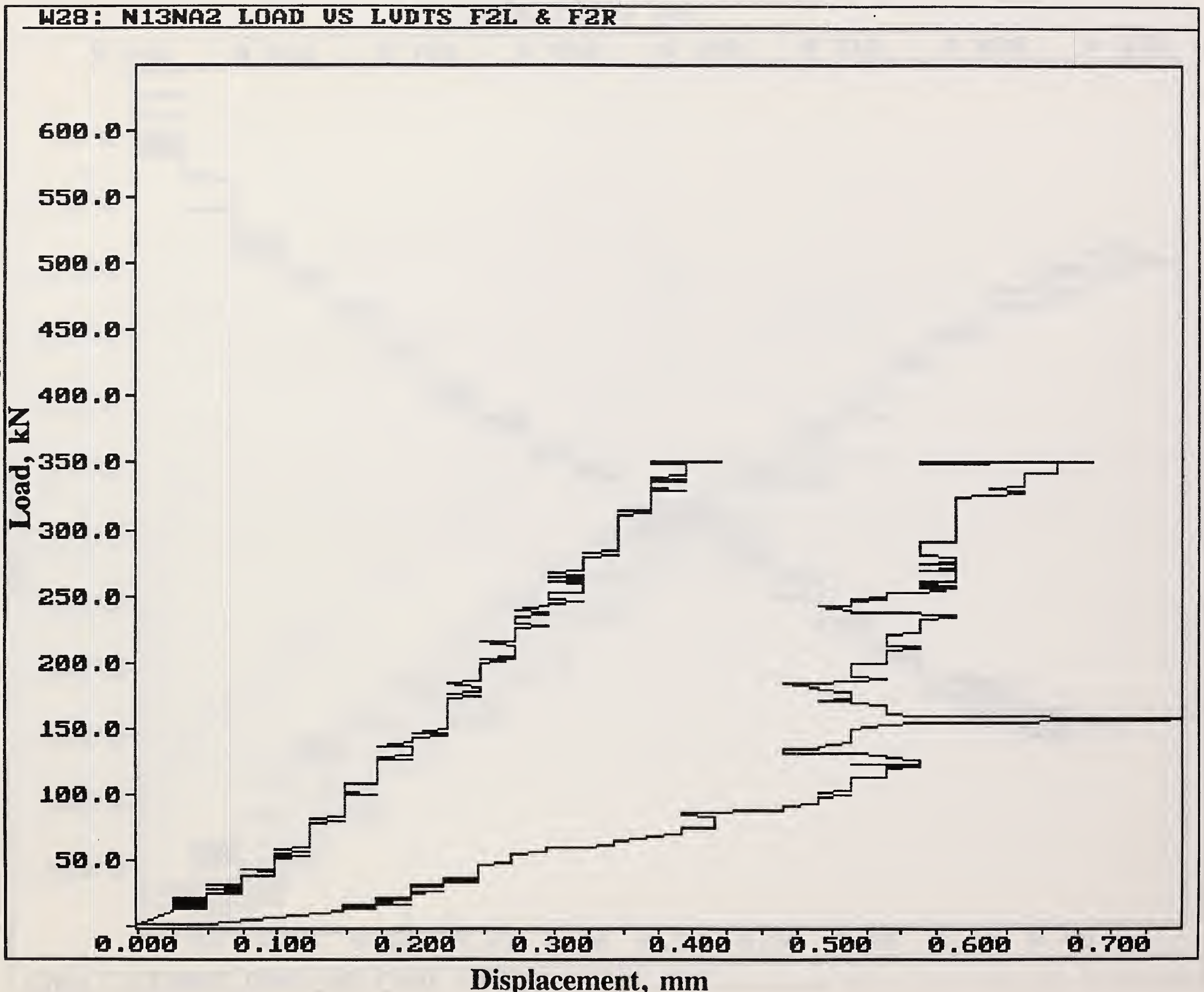

W29: N13NA1 LOAD VS LVDTS F1H & F2H
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.000
0.005
0.010
0.015
0.020
0.025
0.030
0.035
Displacement, mm

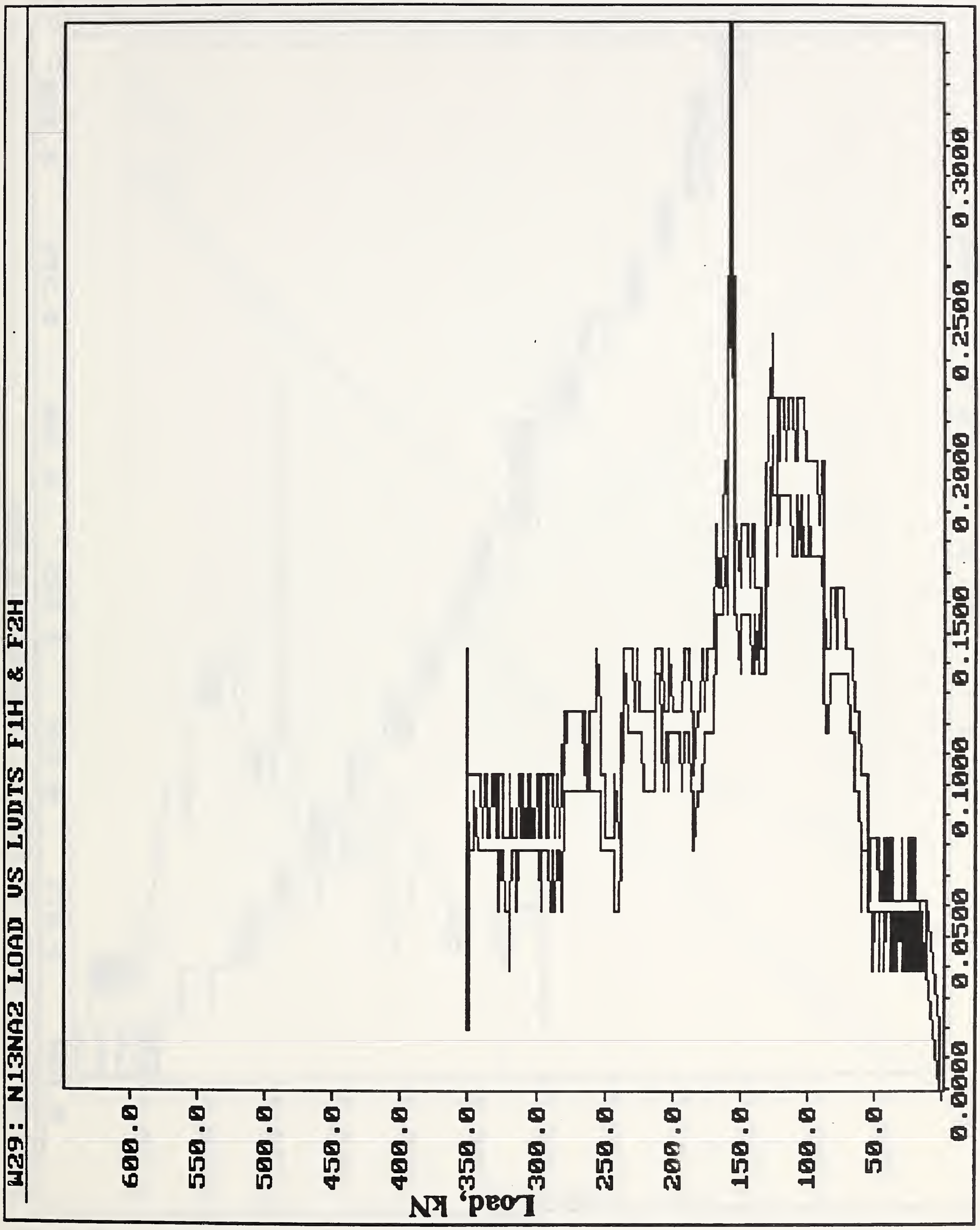

W30: N13NA1 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Displacement, mm

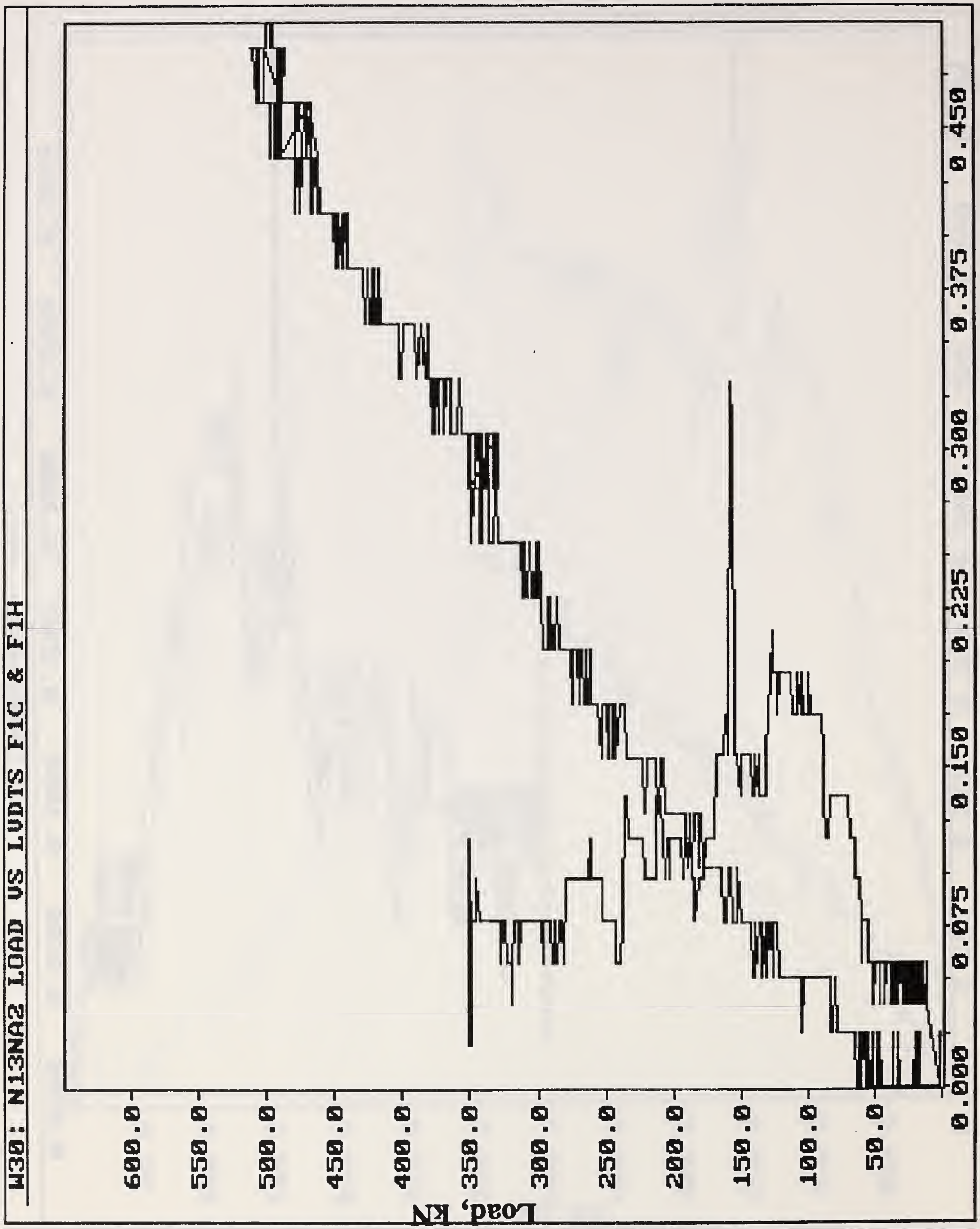

W25: N13NA2 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time, sec

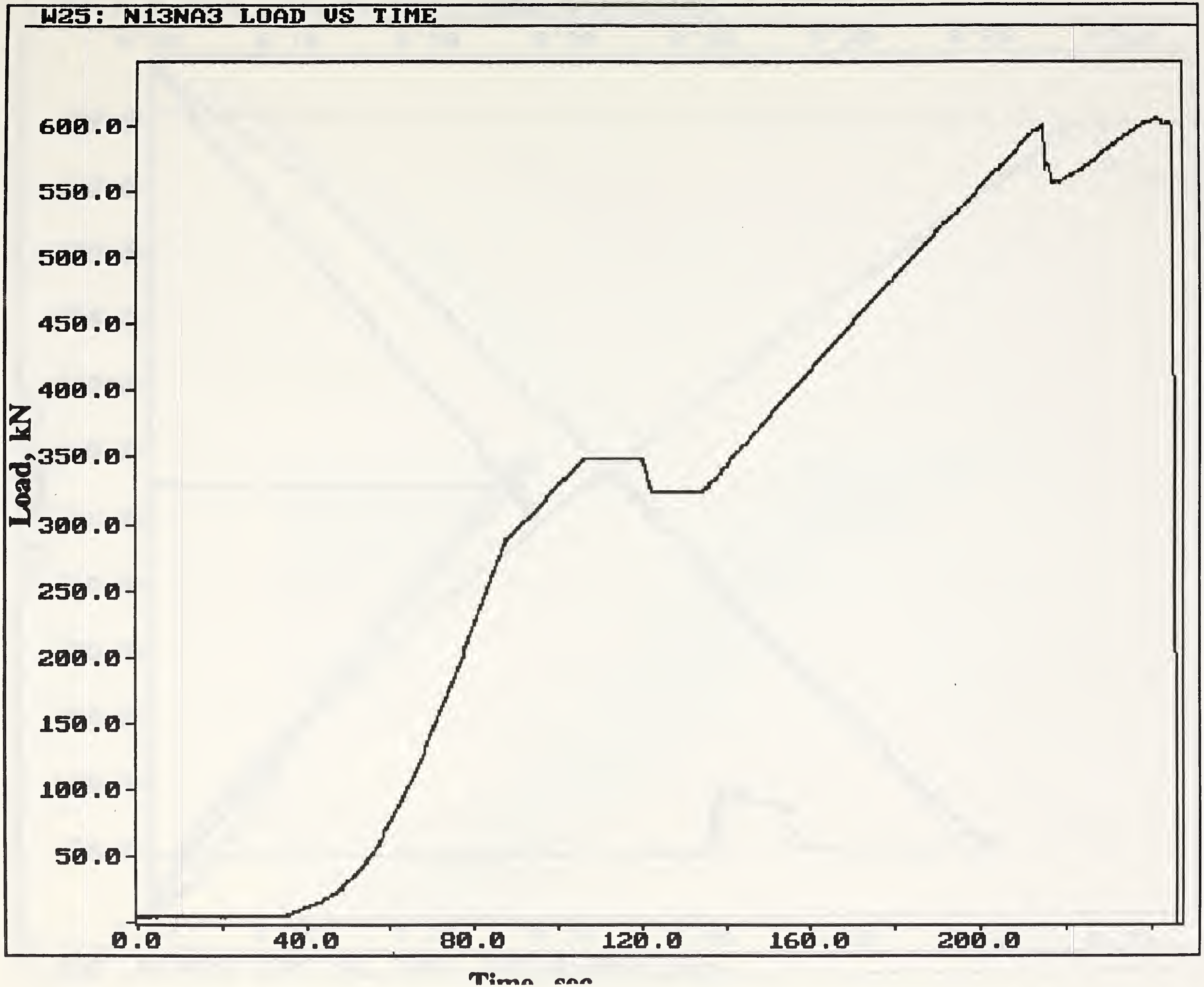

W26: N13NA2 LOAD VS LVDTS F1C, F1L & F1R
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
Displacement, mm

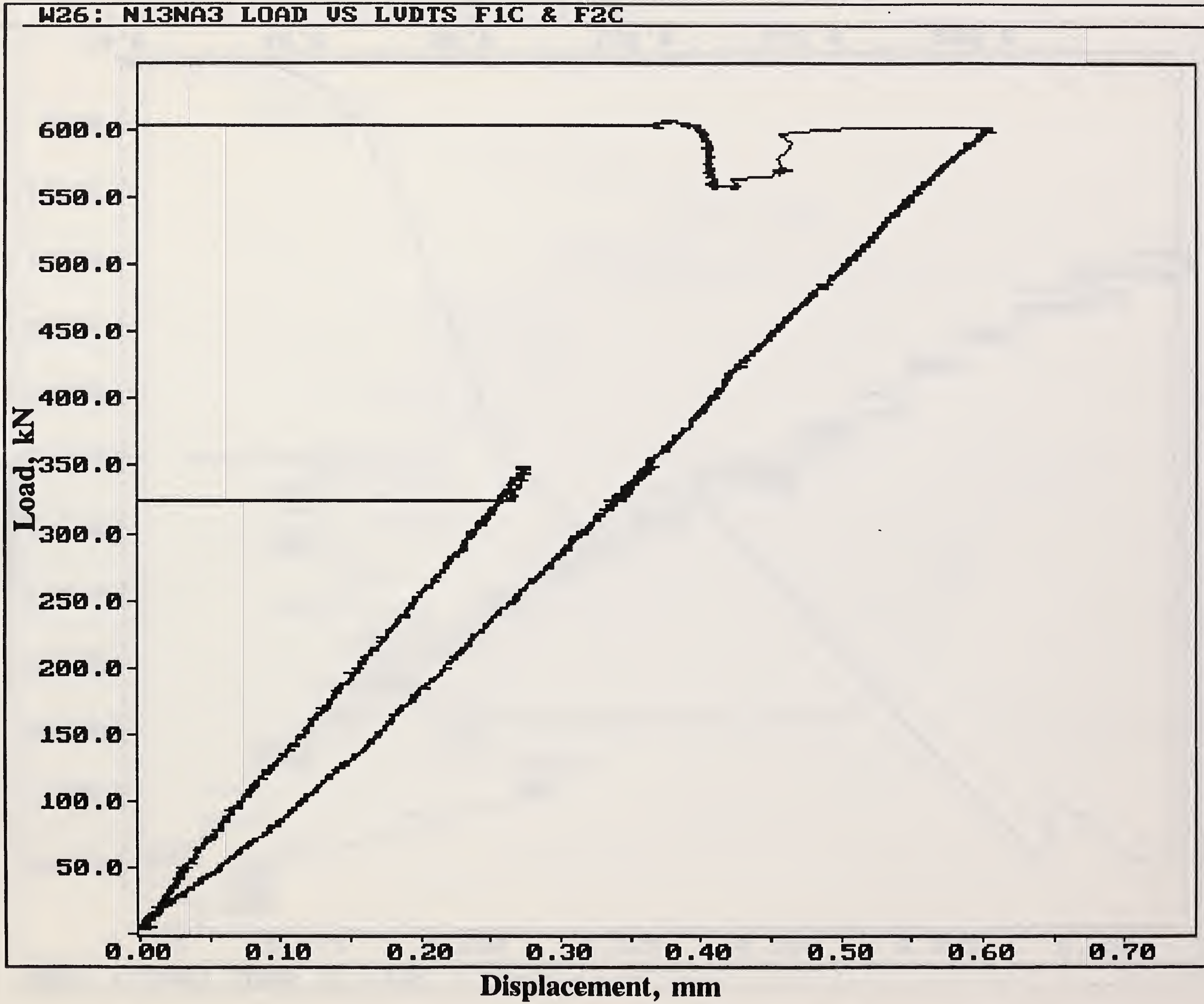

W27: N13NA2 LOAD VS LVDT F1C
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
Displacement, mm

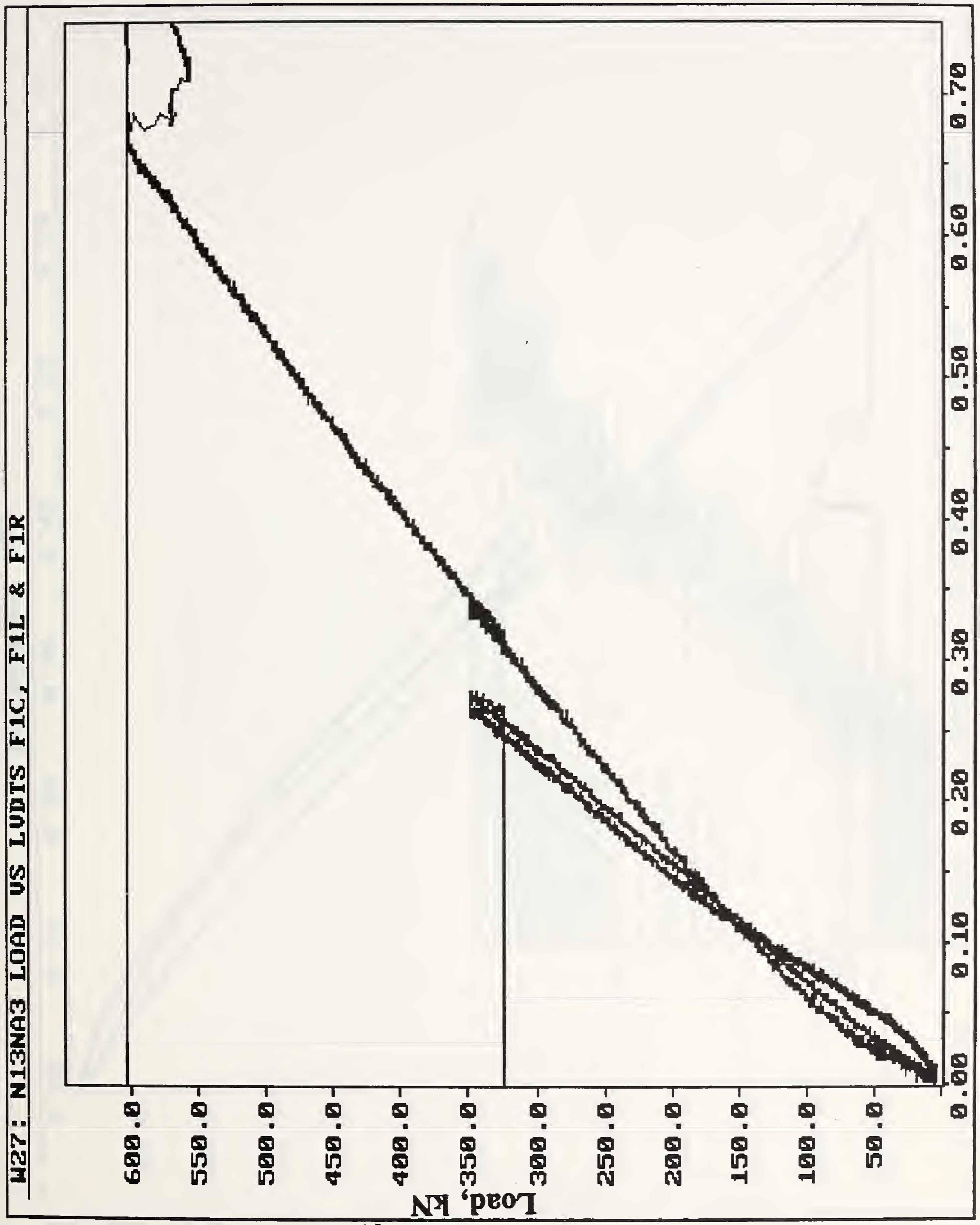

W28: N13NA2 LOAD VS LVDTS F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
Displacement, mm

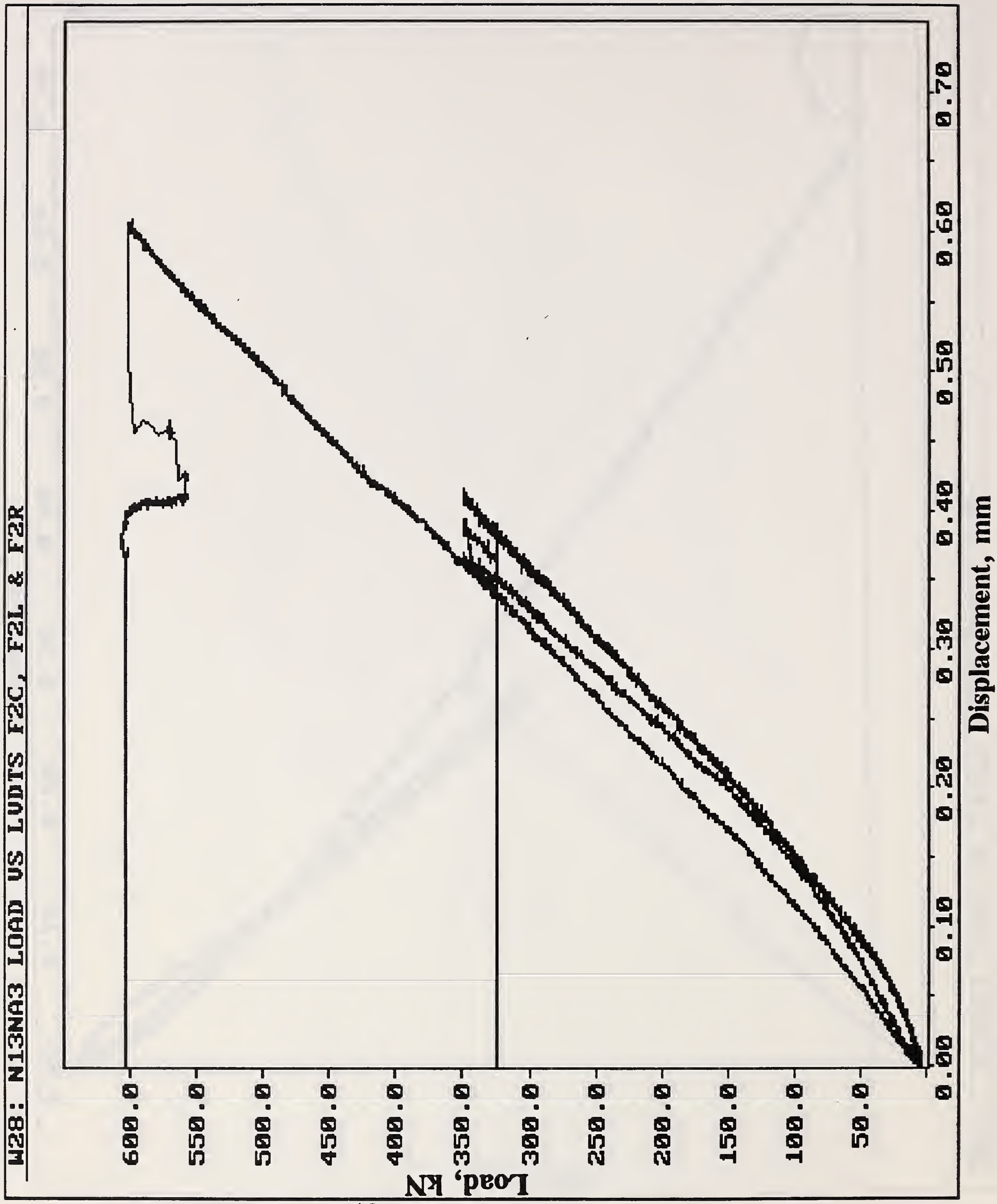

W29: N13NA2 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.0000
0.0500
0.1000
0.1500
0.2000
0.2500
0.3000
Displacement, mm

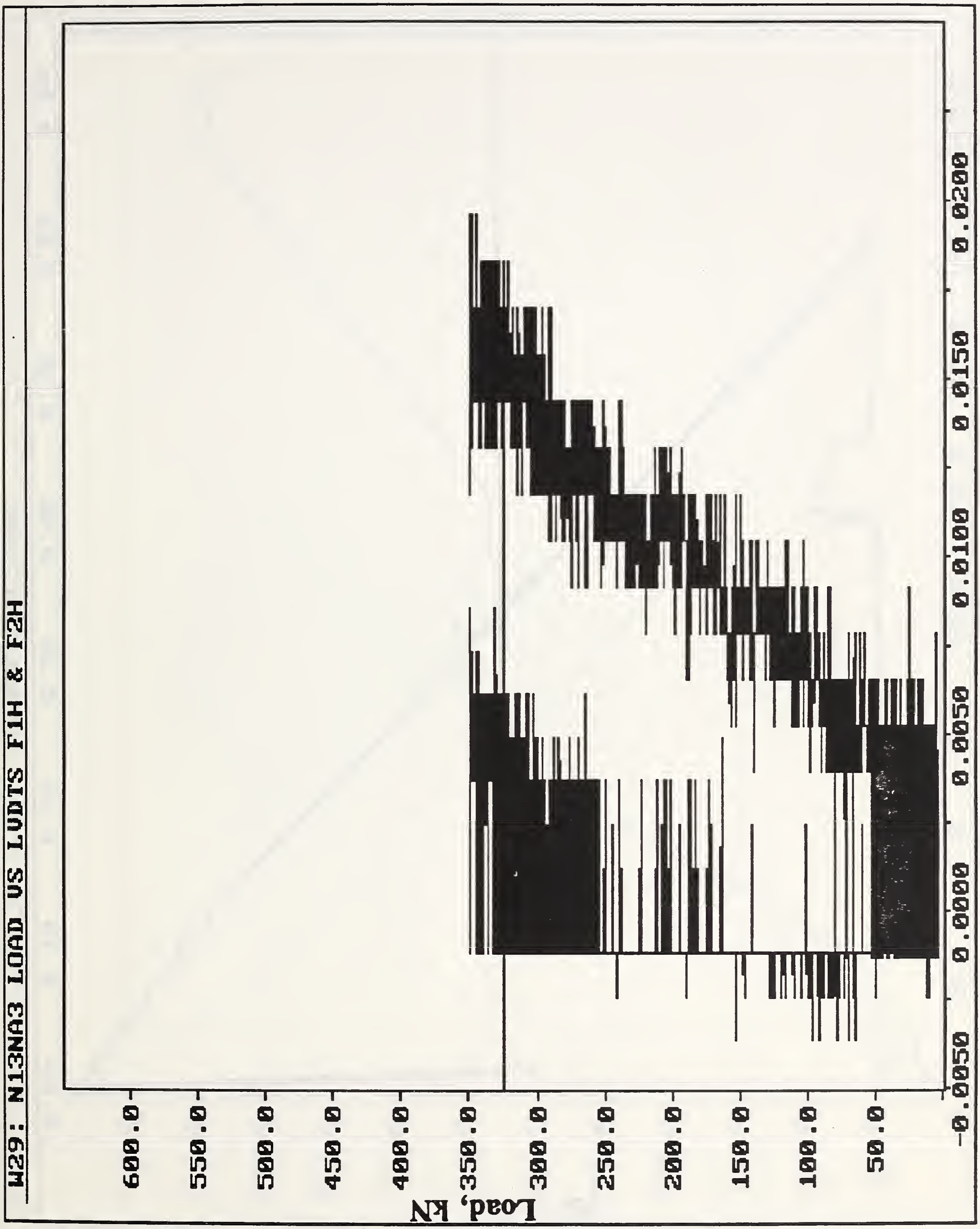

W30: N13NA2 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
Displacement, mm

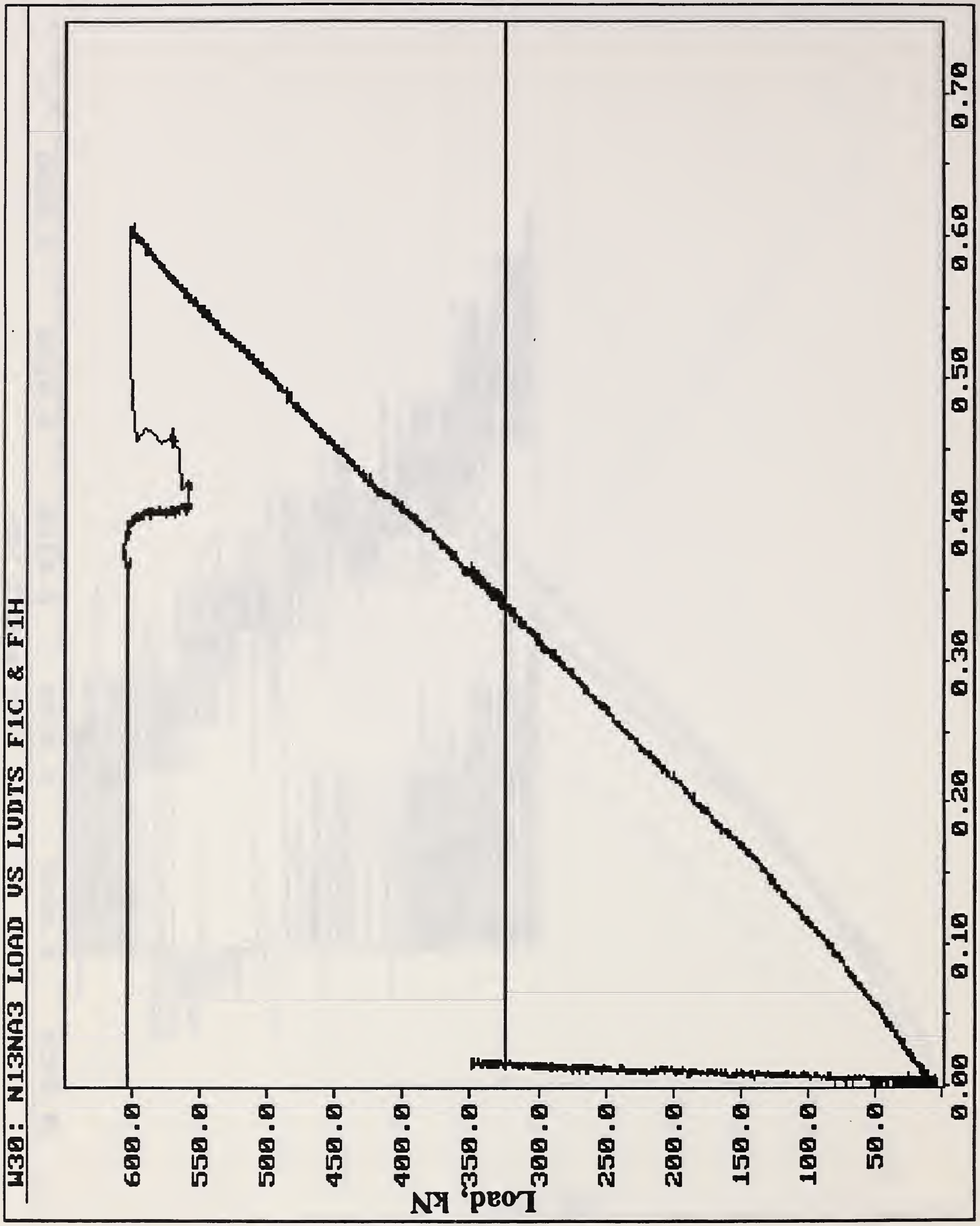

W25: N13NA3 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0

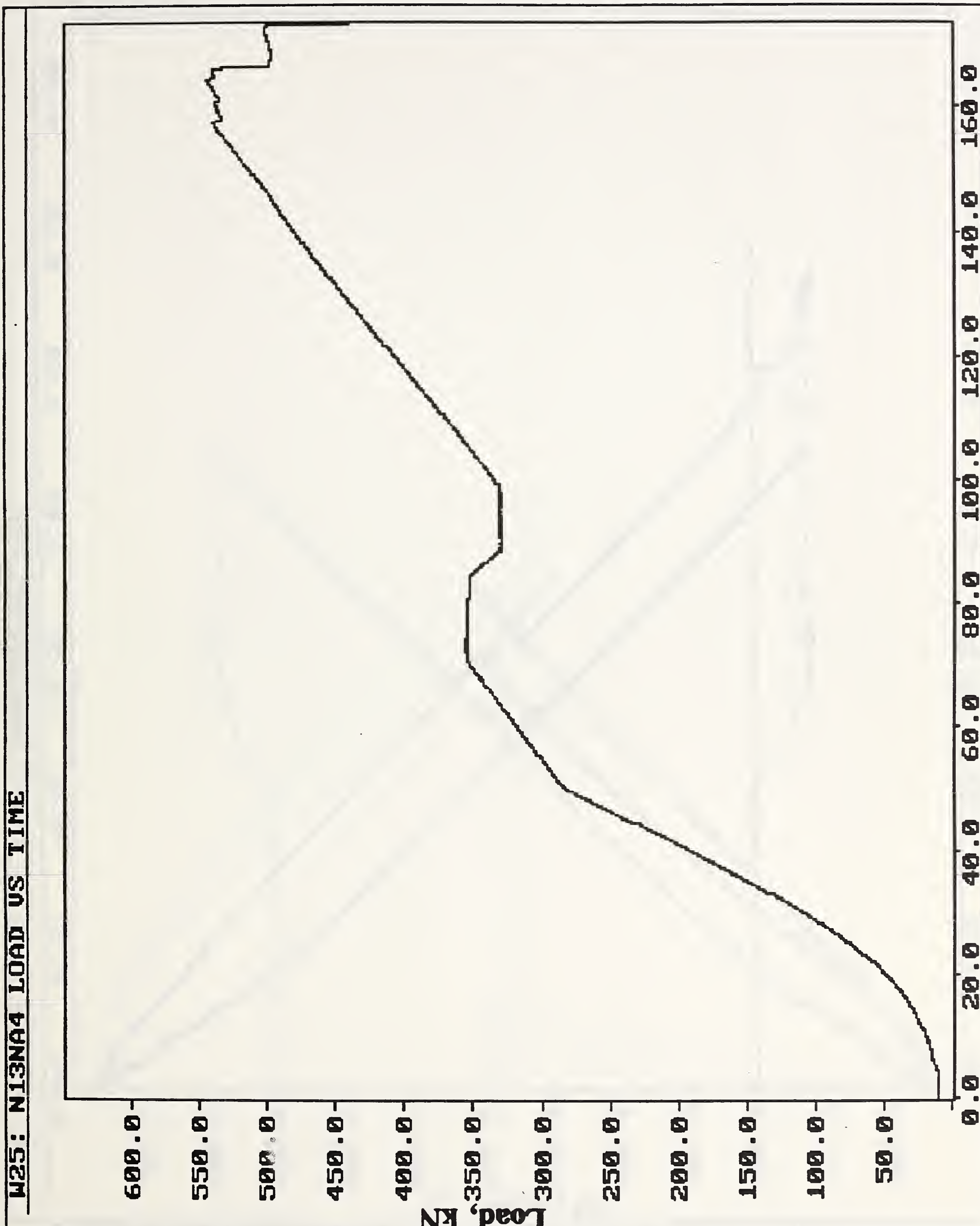

W26: N13NA3 LOAD VS LVDTS F1C & F2C
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

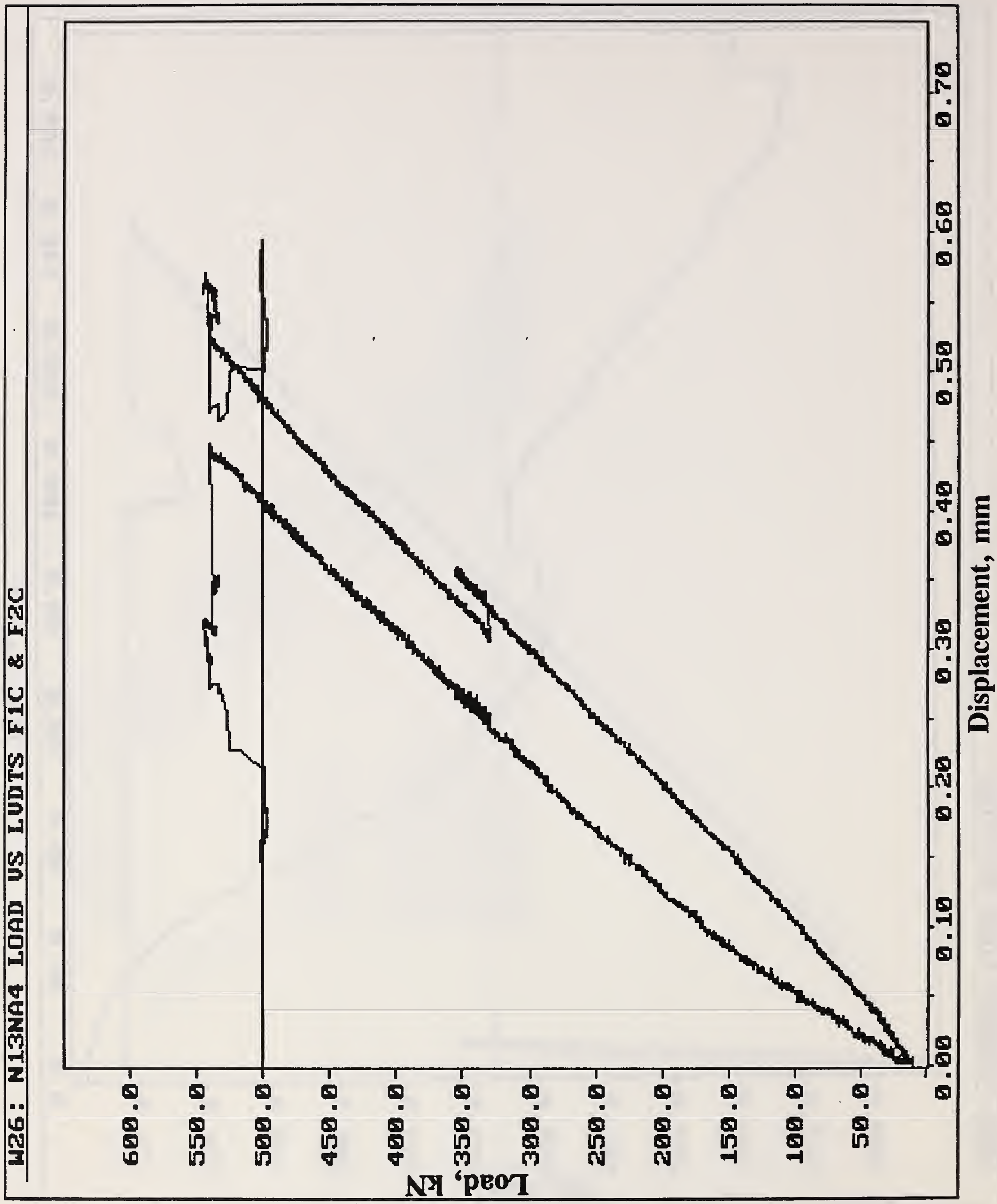

W27: N13NA3 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70


W28: N13NA3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

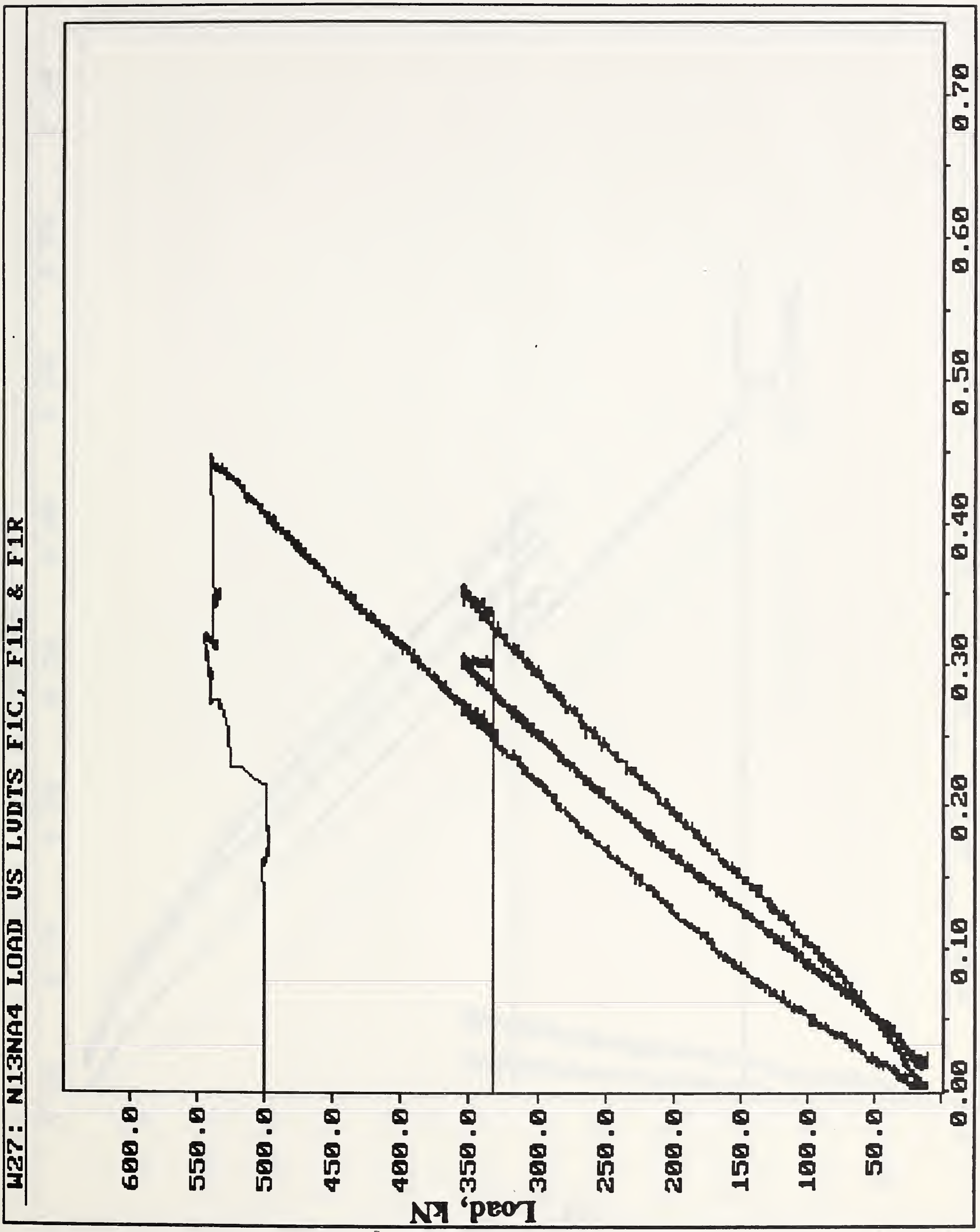

W29: N13NA3 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
-0.0050
0.0000
0.0050
0.0100
0.0150
0.0200
Displacement, mm

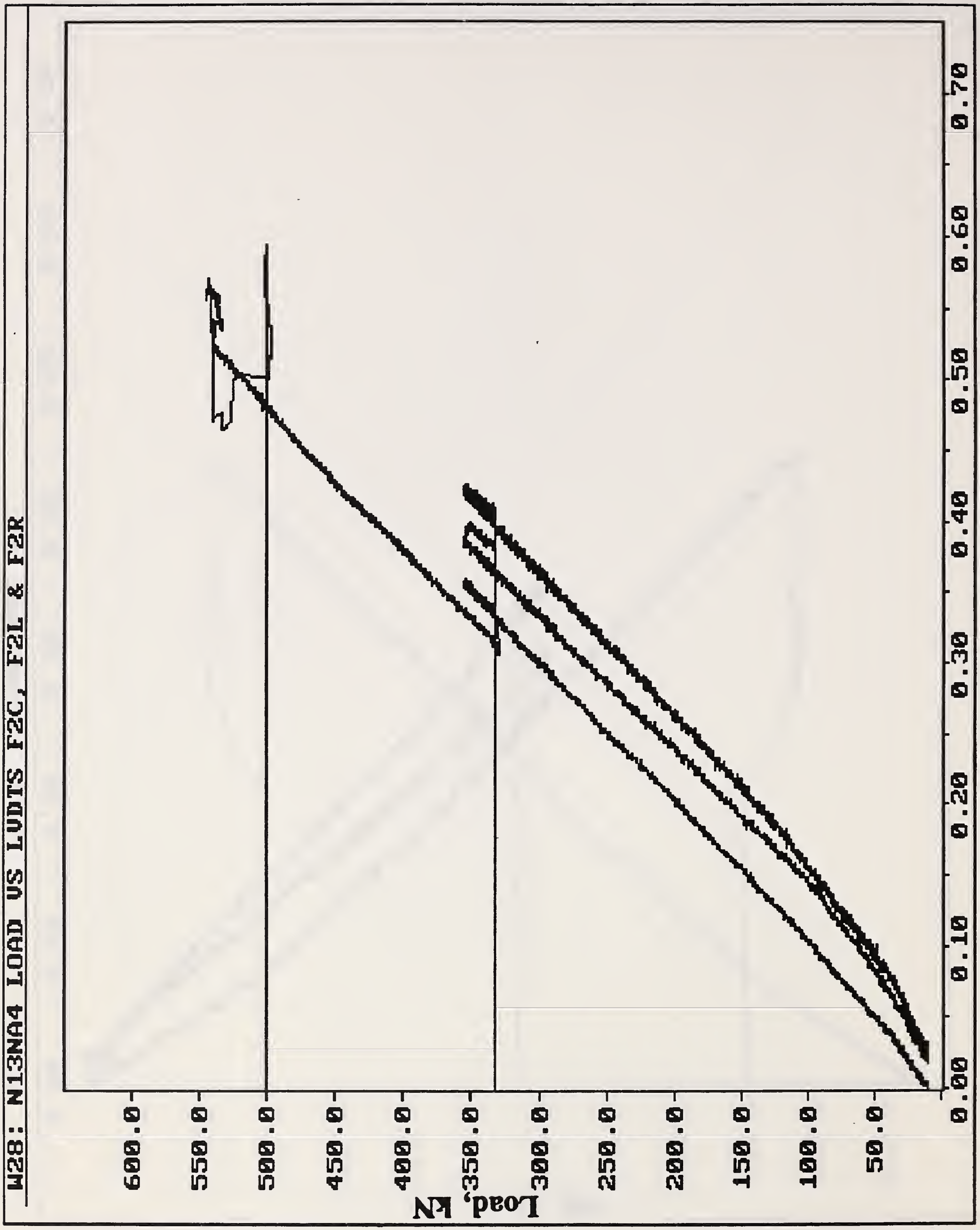

W30: N13NA3 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

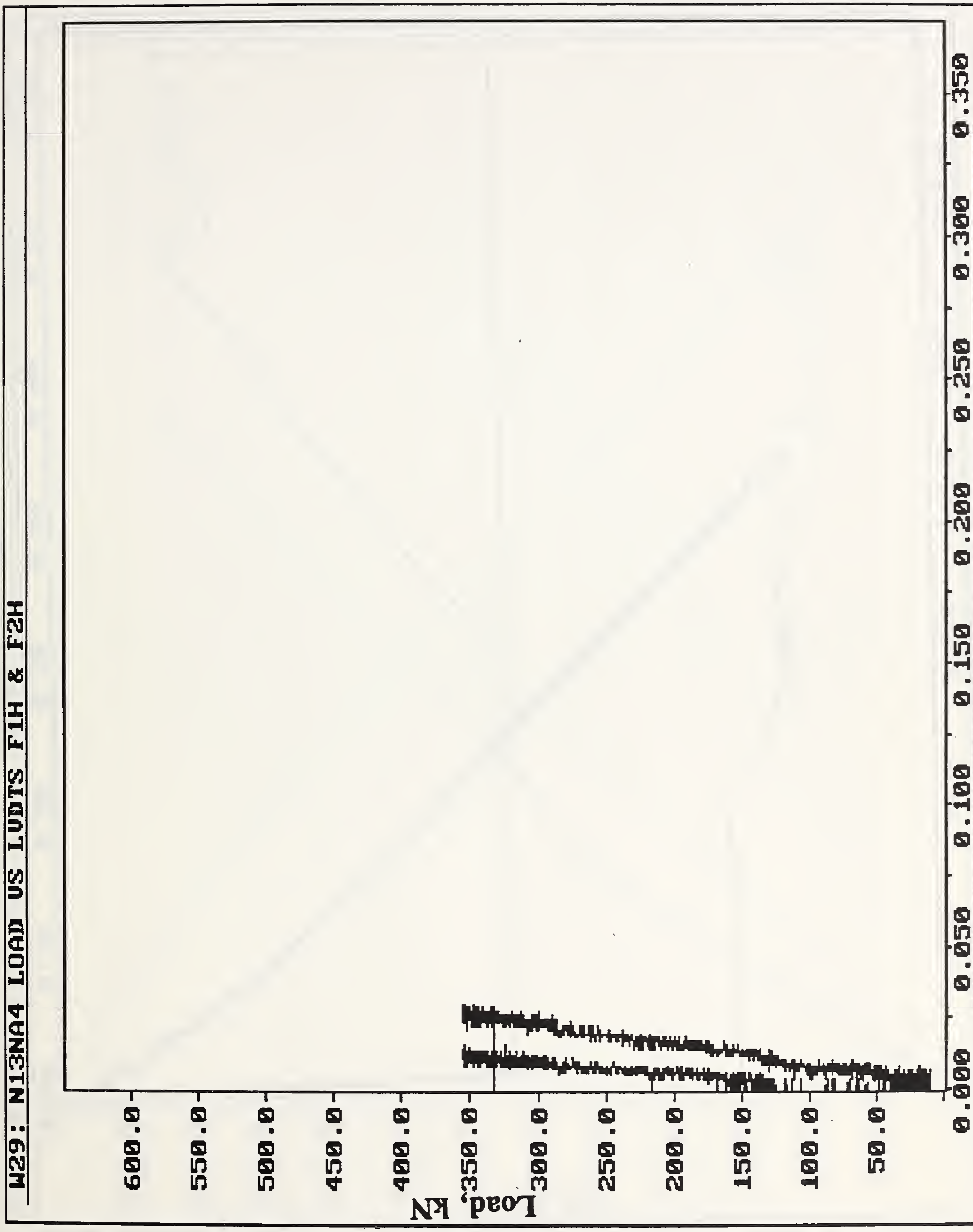

W25: N13NA4 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time. sec

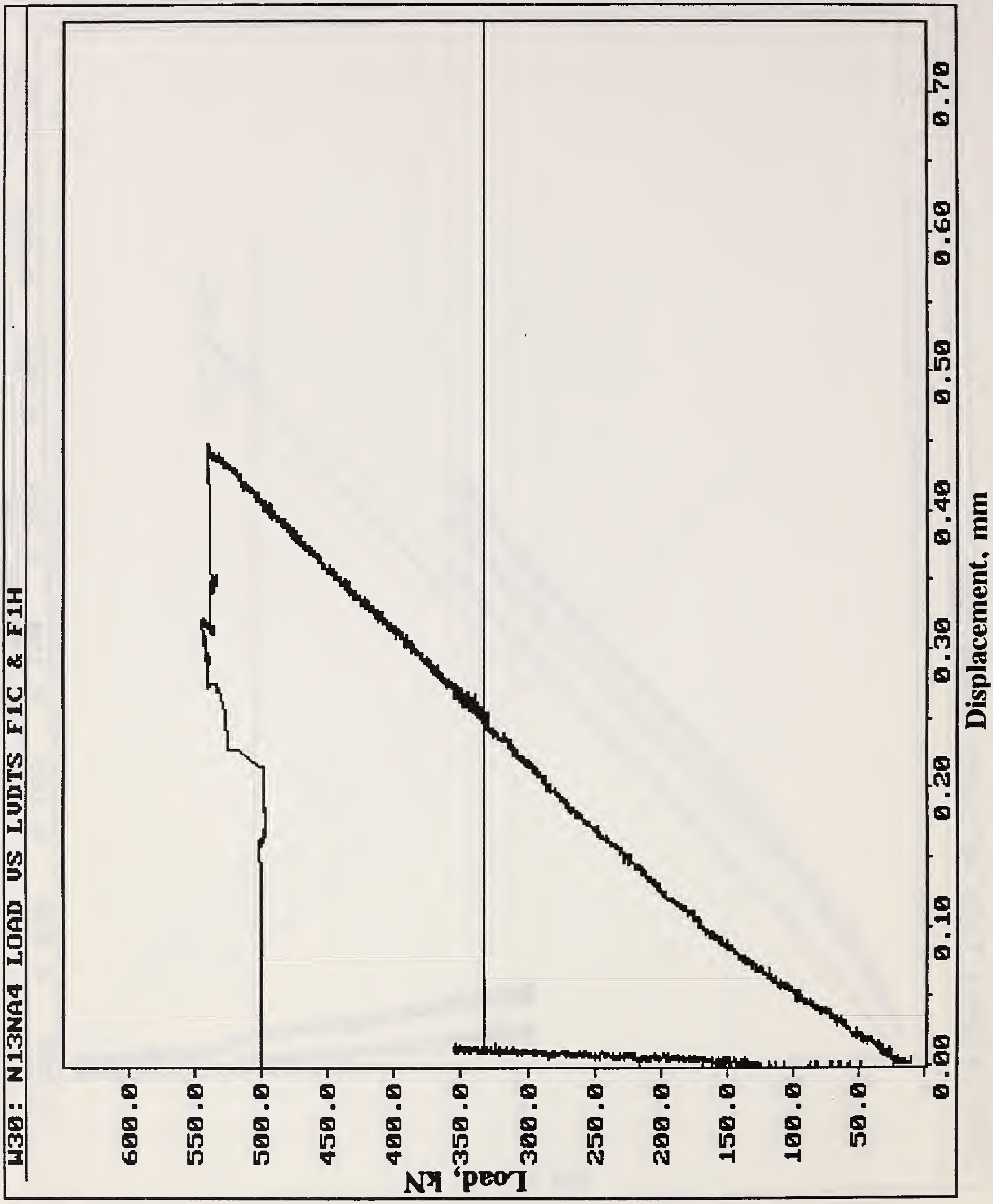


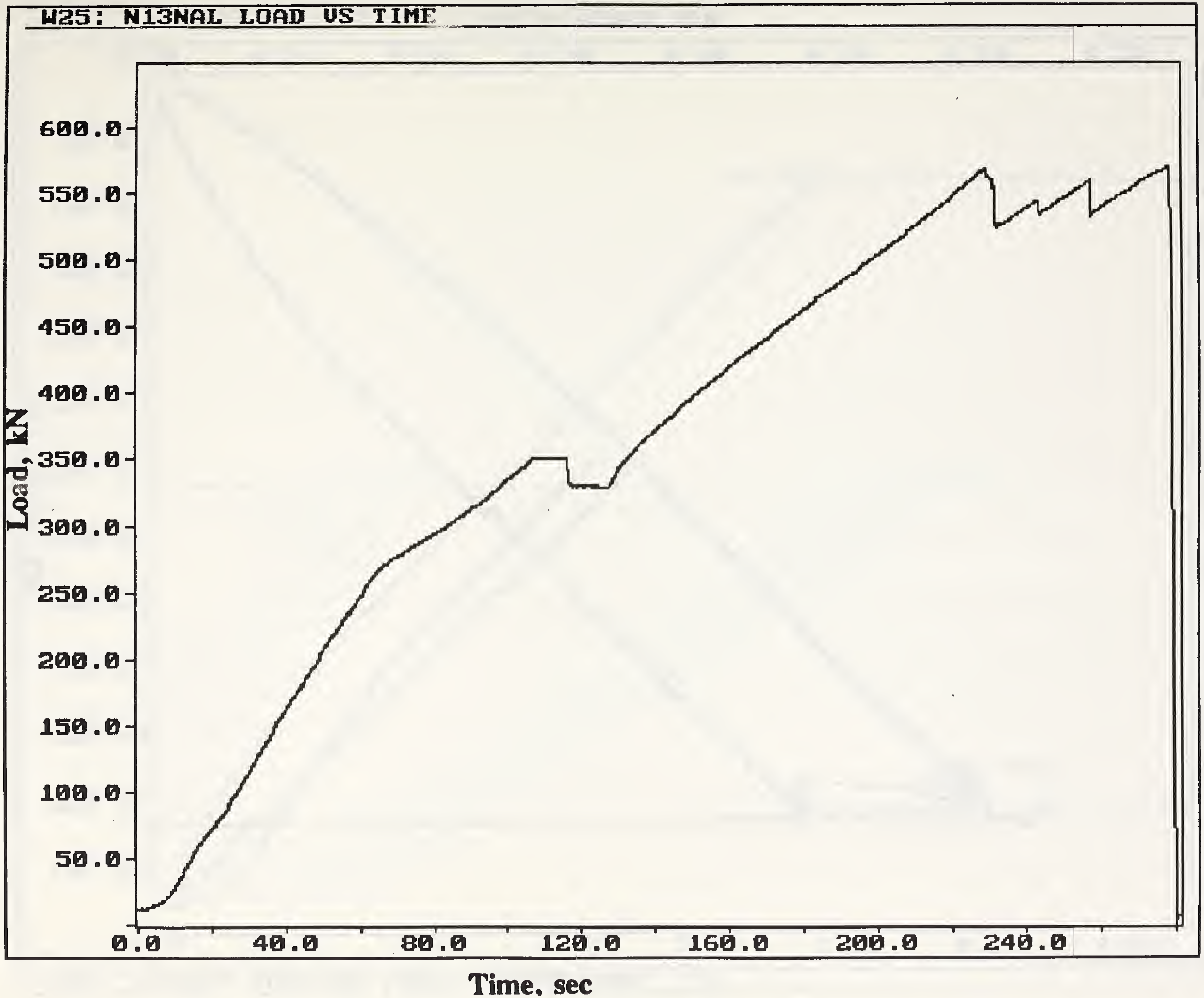
W26: N13NA4 LOAD VS LVDTS F1C & F2C
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

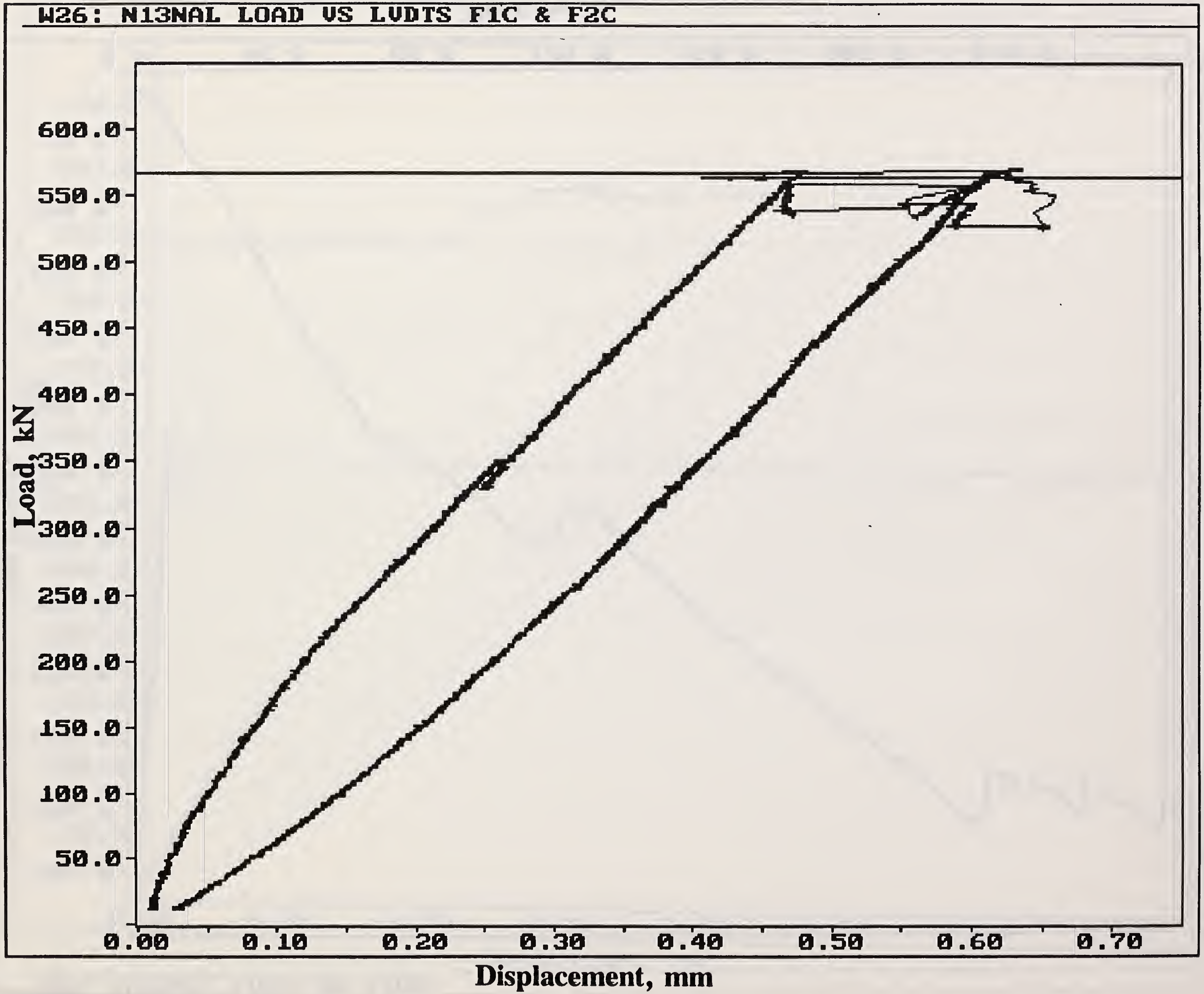

W27: N13NA4 LOAD VS LVDTS F1C, F1L & F1R
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Load, kN
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

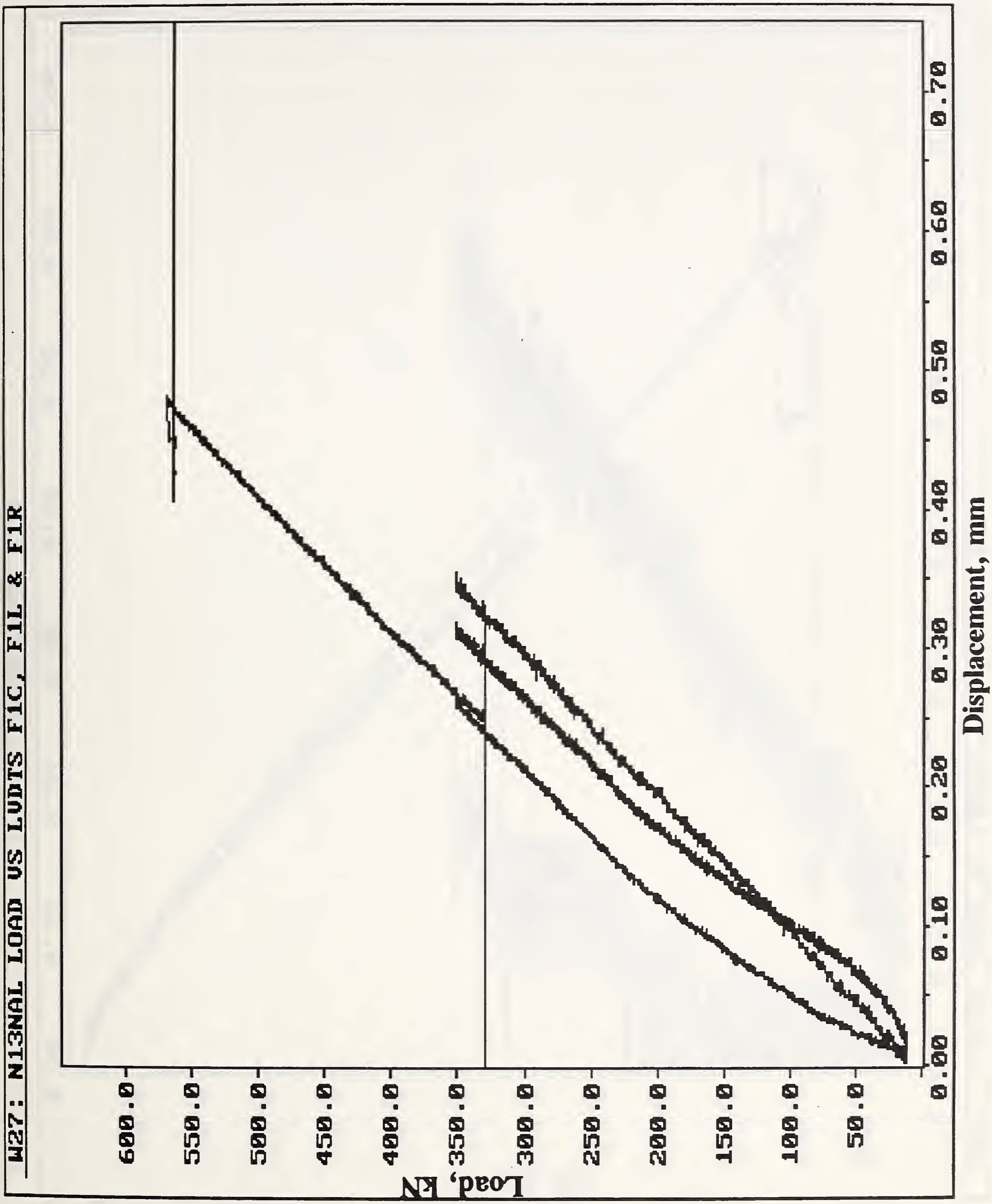

W28: N13NA4 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70

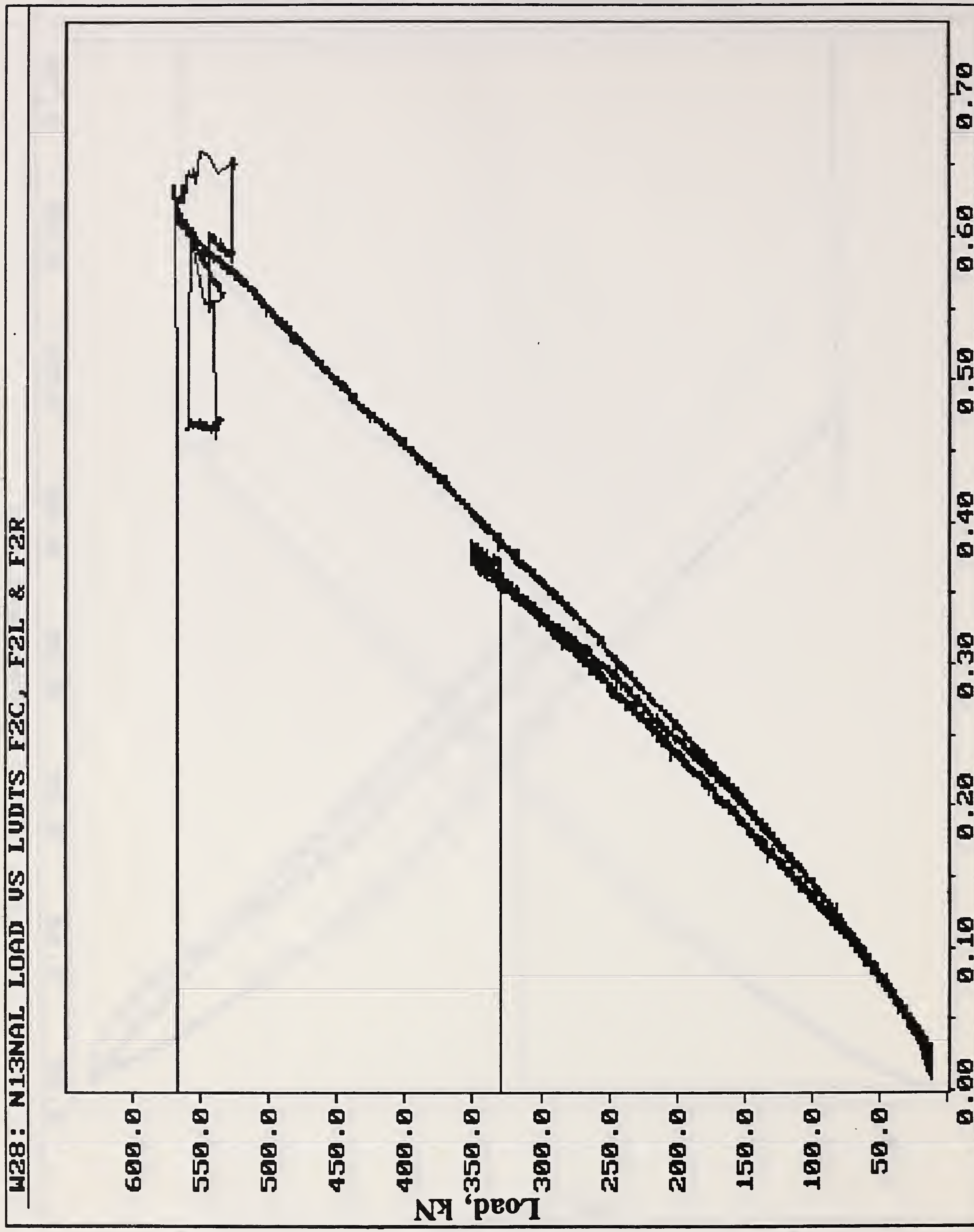

W29: N13NA4 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.000
0.050
0.100
0.150
0.200
0.250
0.300
0.350

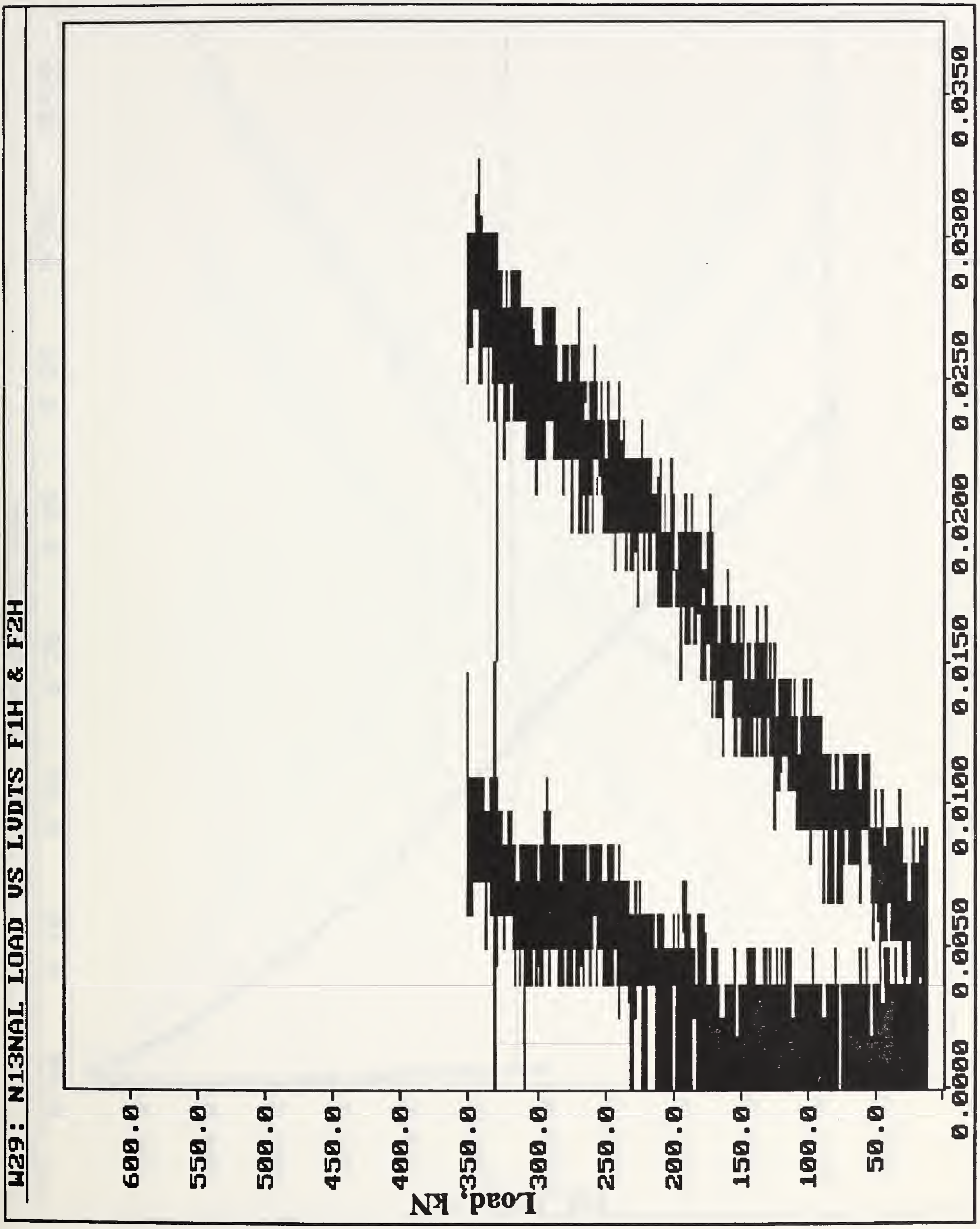

W30: N13NA4 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70

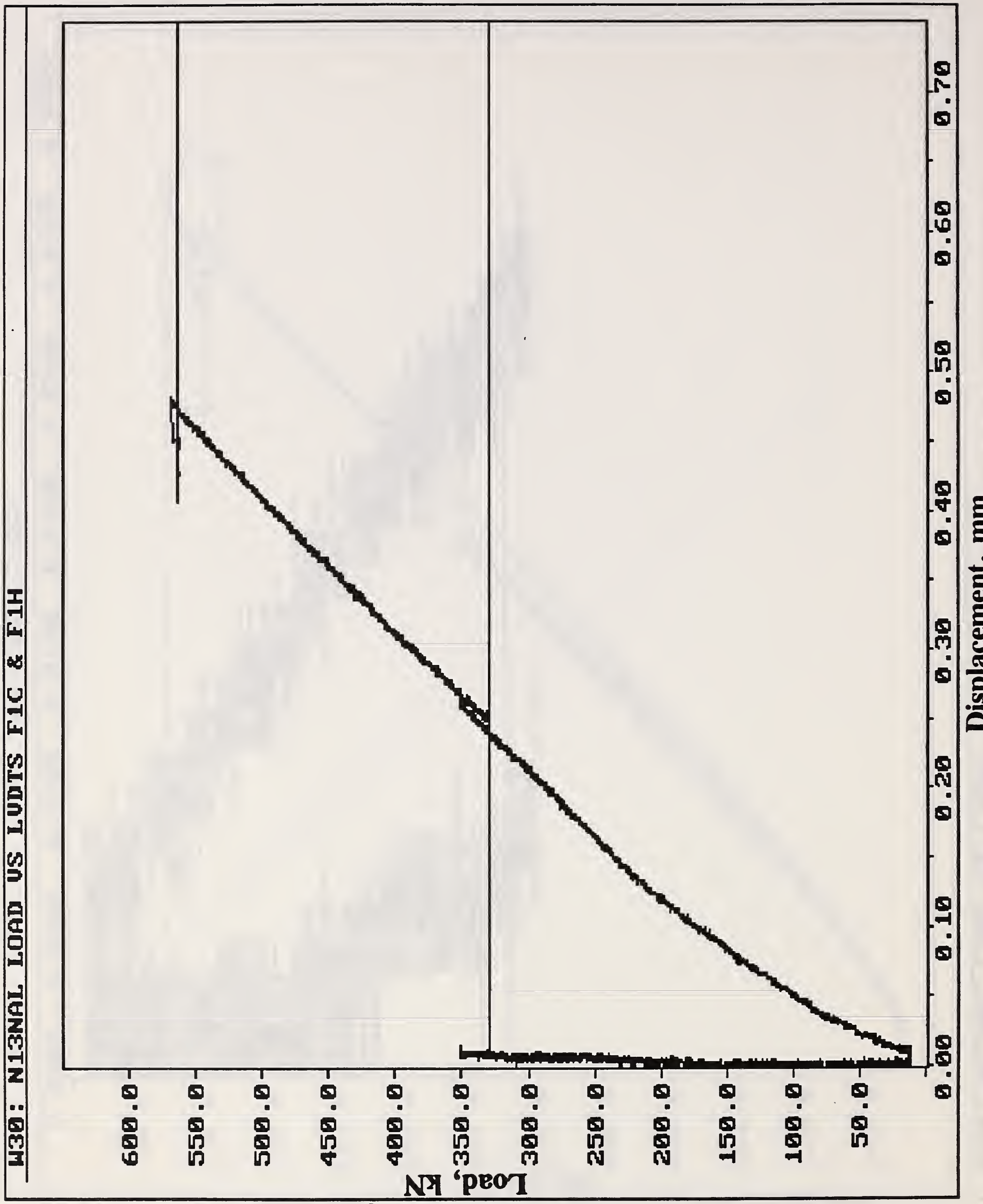

W25: N13NAL LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
240.0
Time, sec

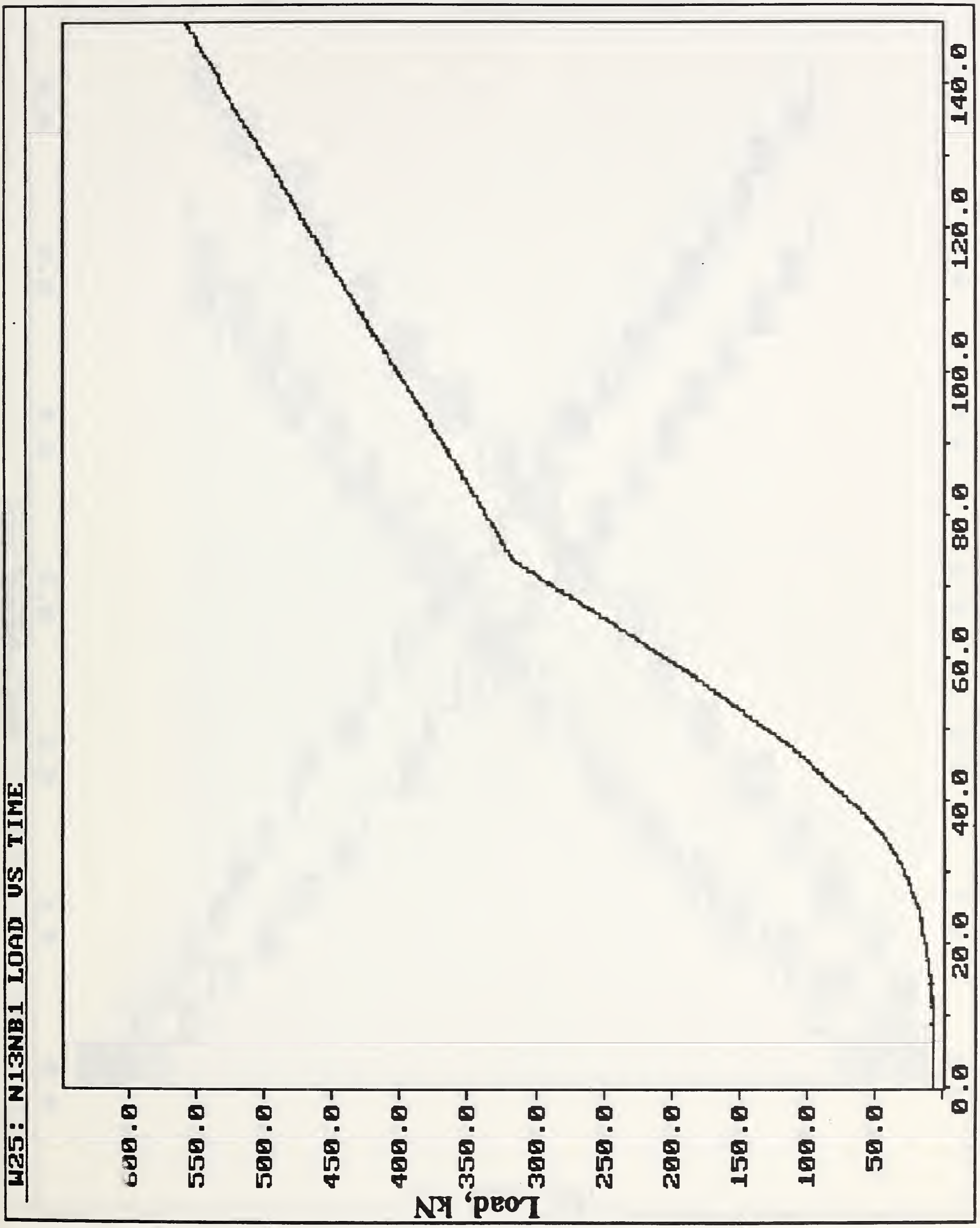

W26: N13NAL LOAD VS LVDTS F1C & F2C
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

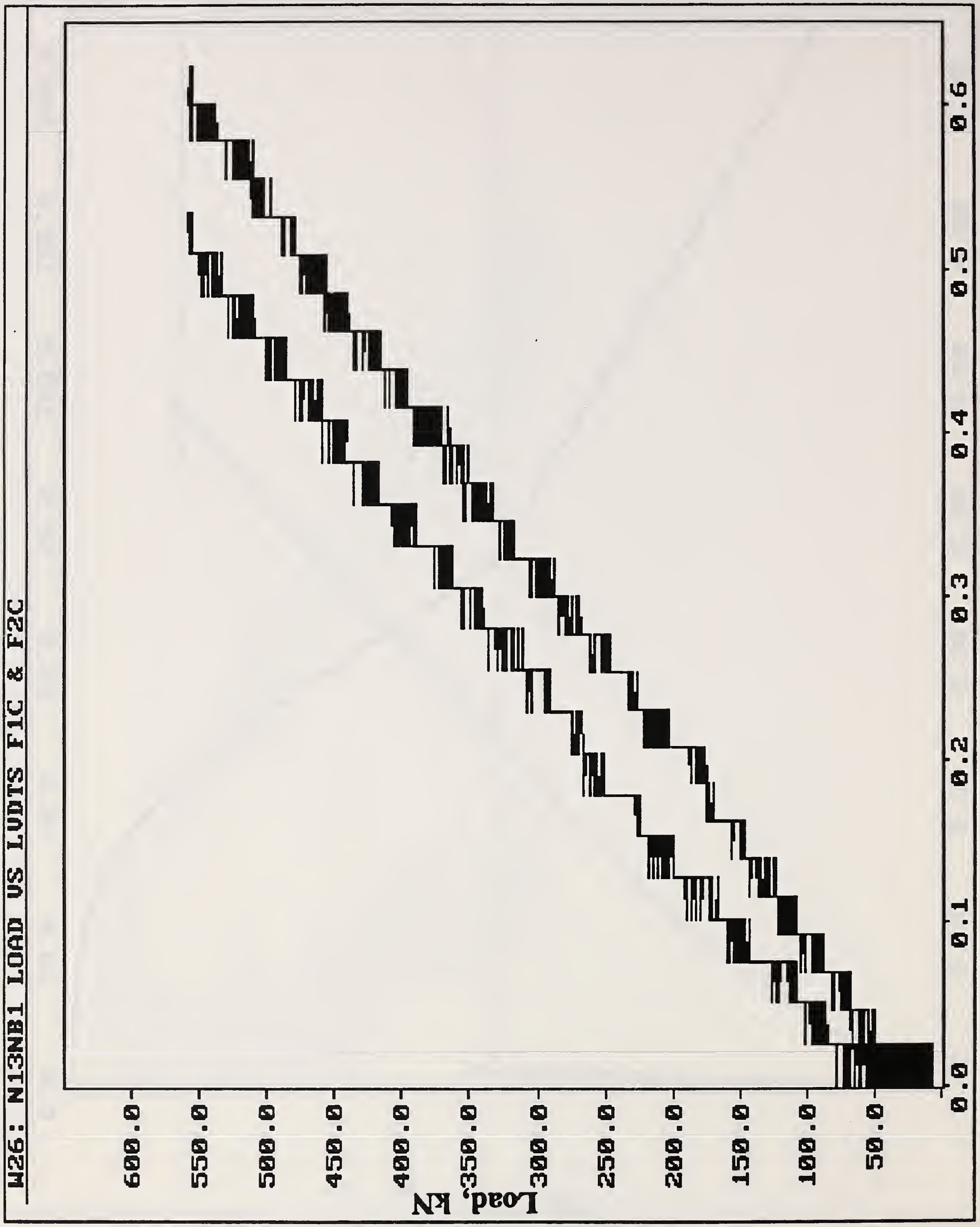

W27: N13NAL LOAD VS LVDTS F1C, F1L & F1R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70


W28: N13NAL LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Displacement, mm
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70

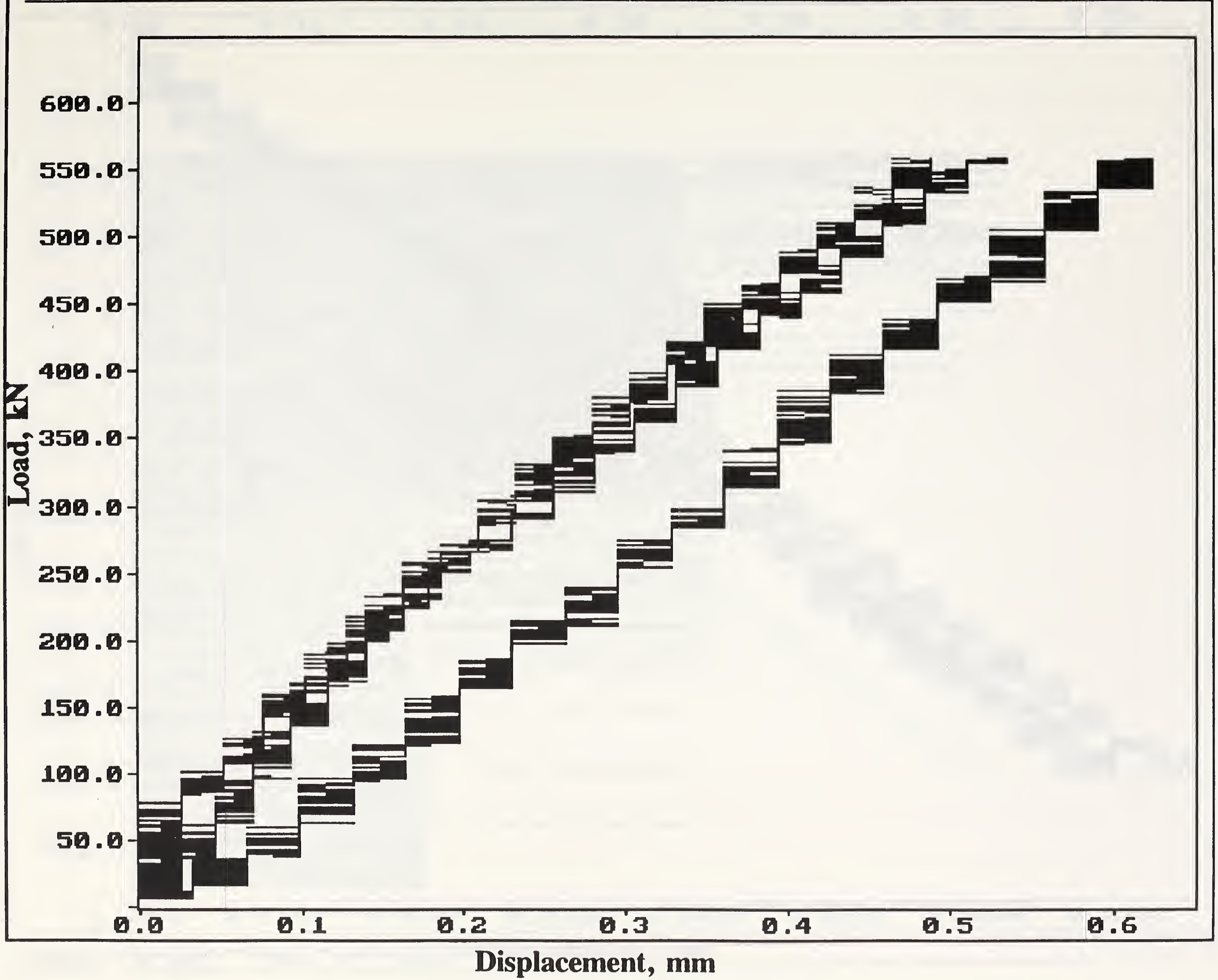

W29: NI3NAL LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0000
0.0050
0.0100
0.0150
0.0200
0.0250
0.0300
0.0350
Displacement, mm

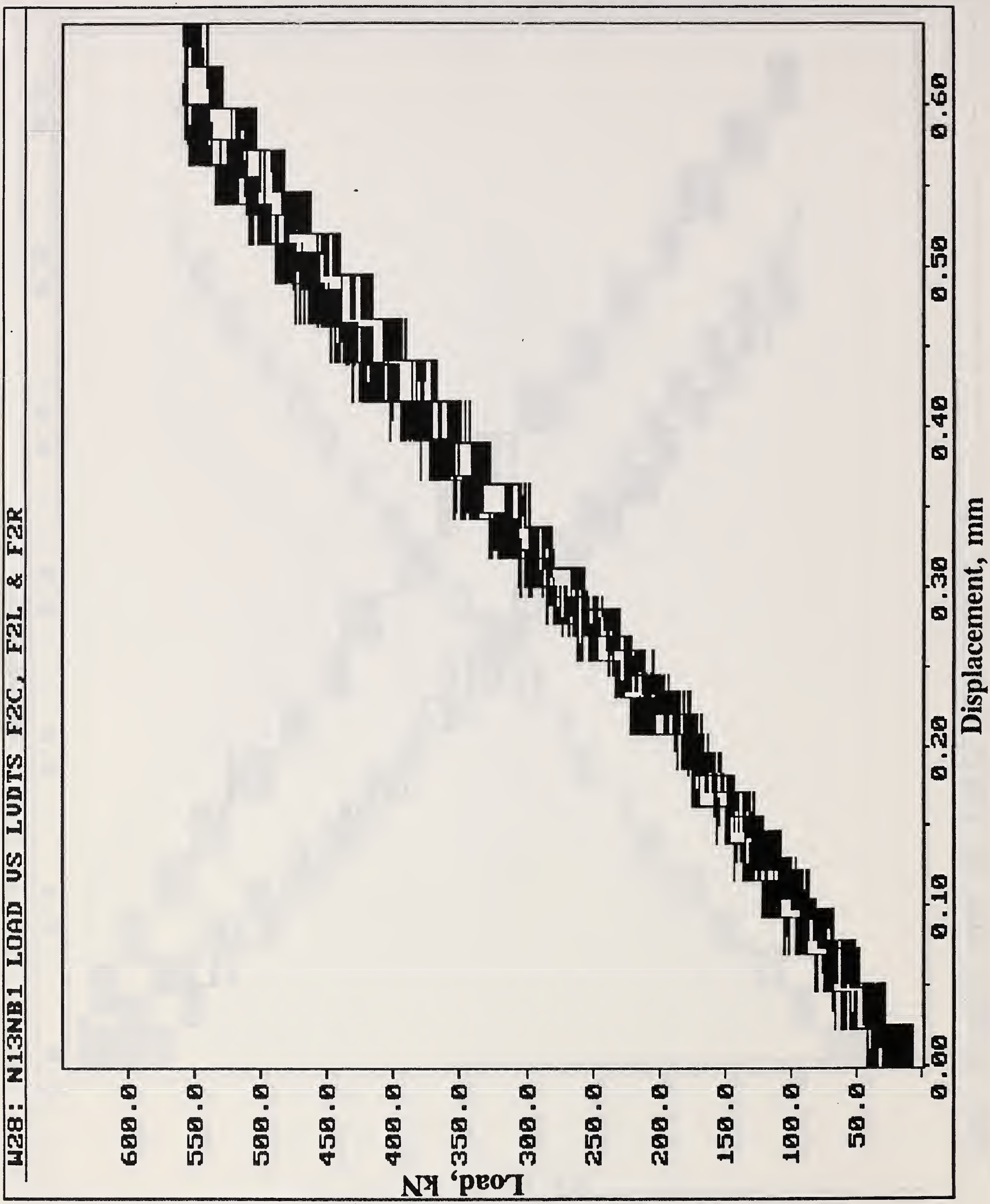

W30: N13NAL LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
Displacement, mm

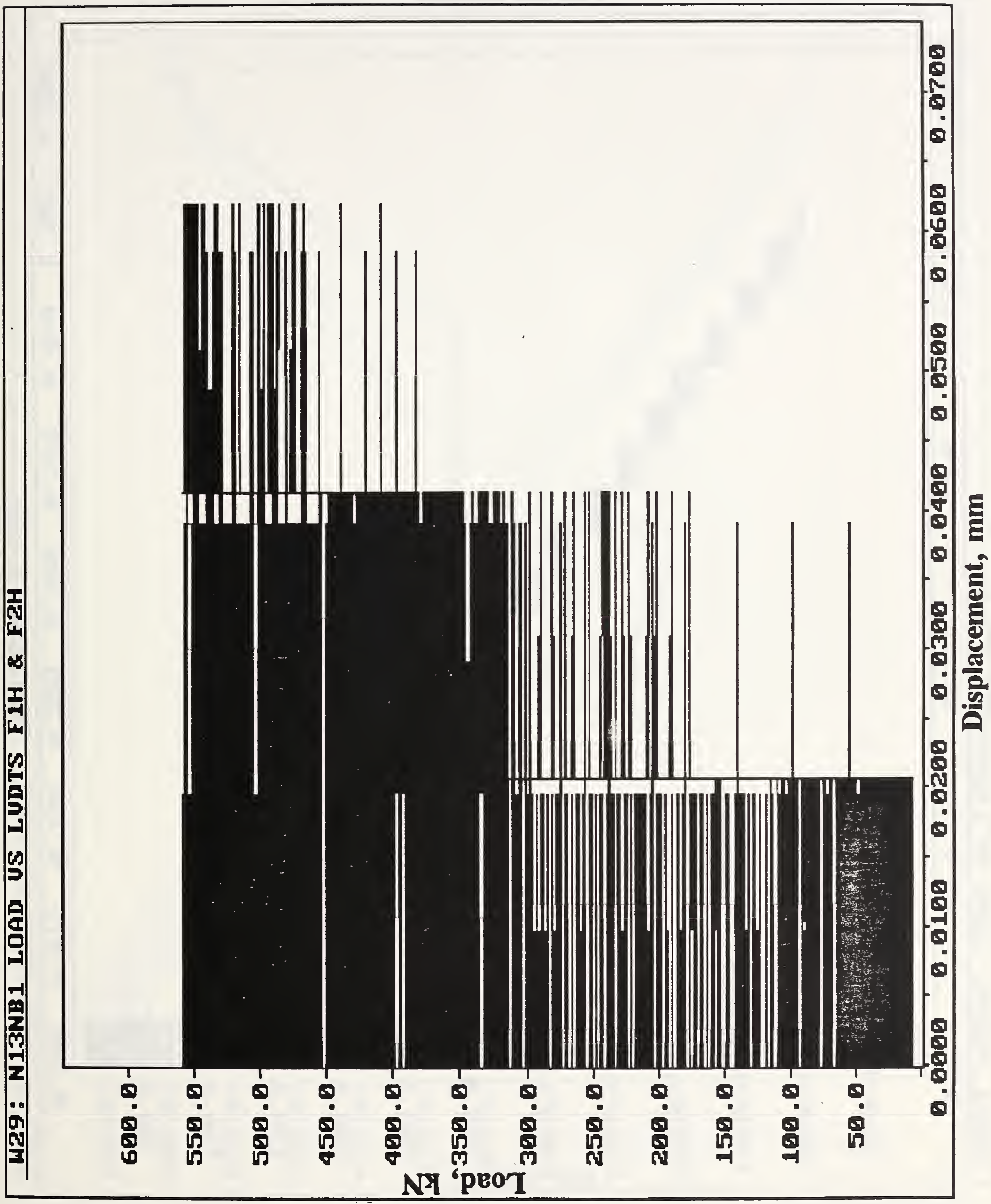

W25: N13NB1 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time, sec


W26: N13NB1 LOAD VS LVDTS F1C & F2C
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
0.1
0.2
0.3
0.4
0.5
0.6
Displacement, mm

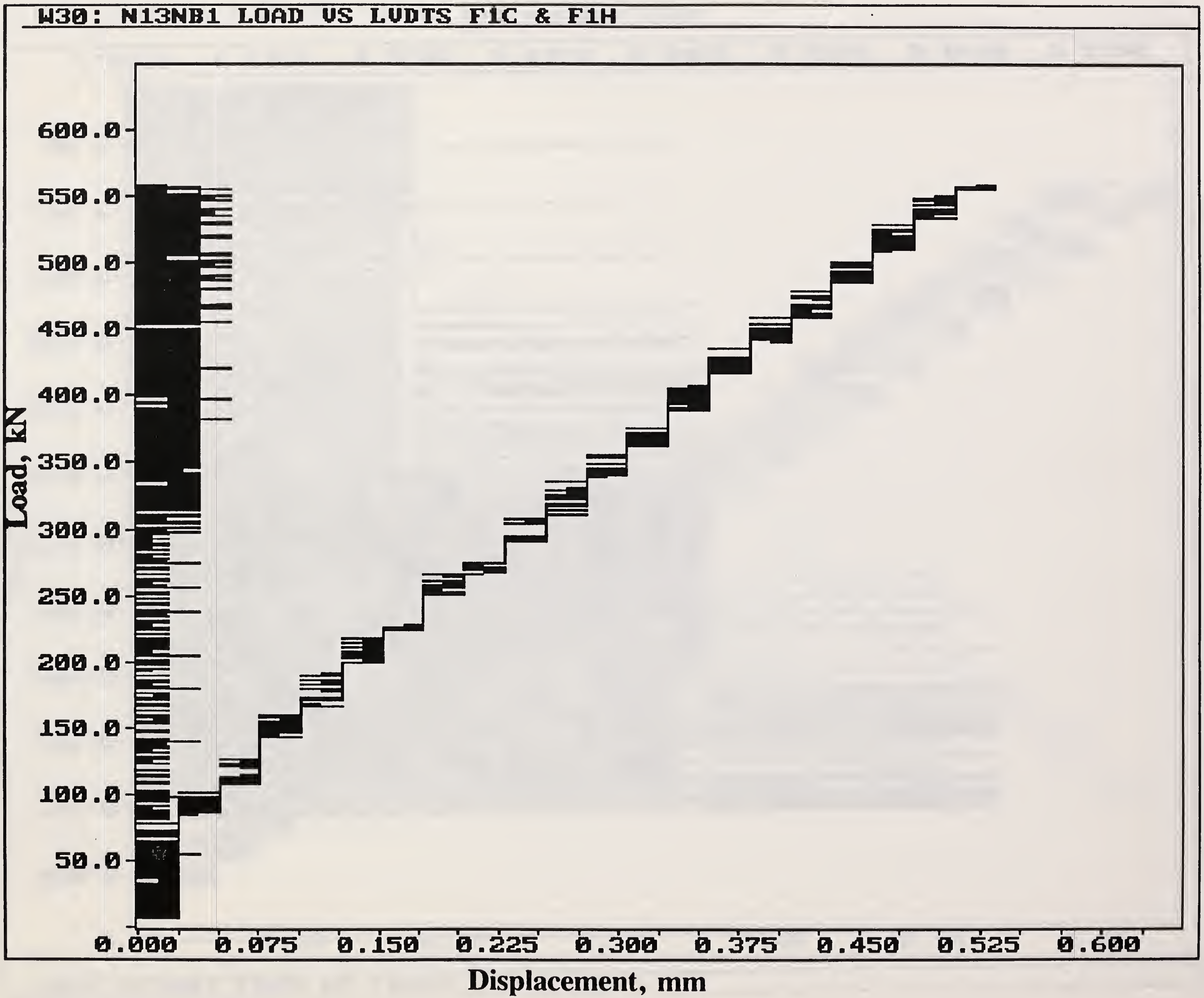
W27: N13NB1 LOAD VS LVDTS F1C, F1L & F1R

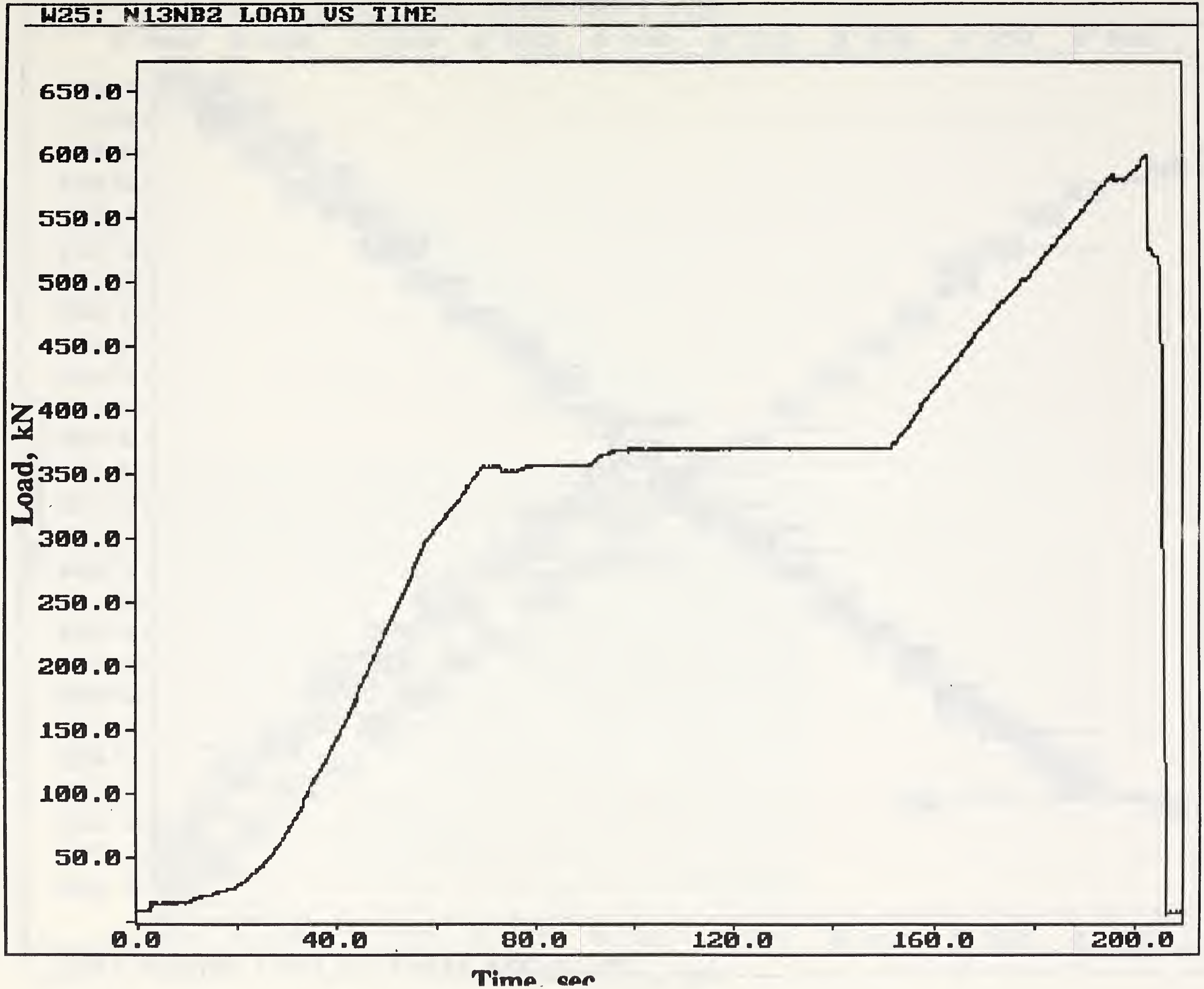


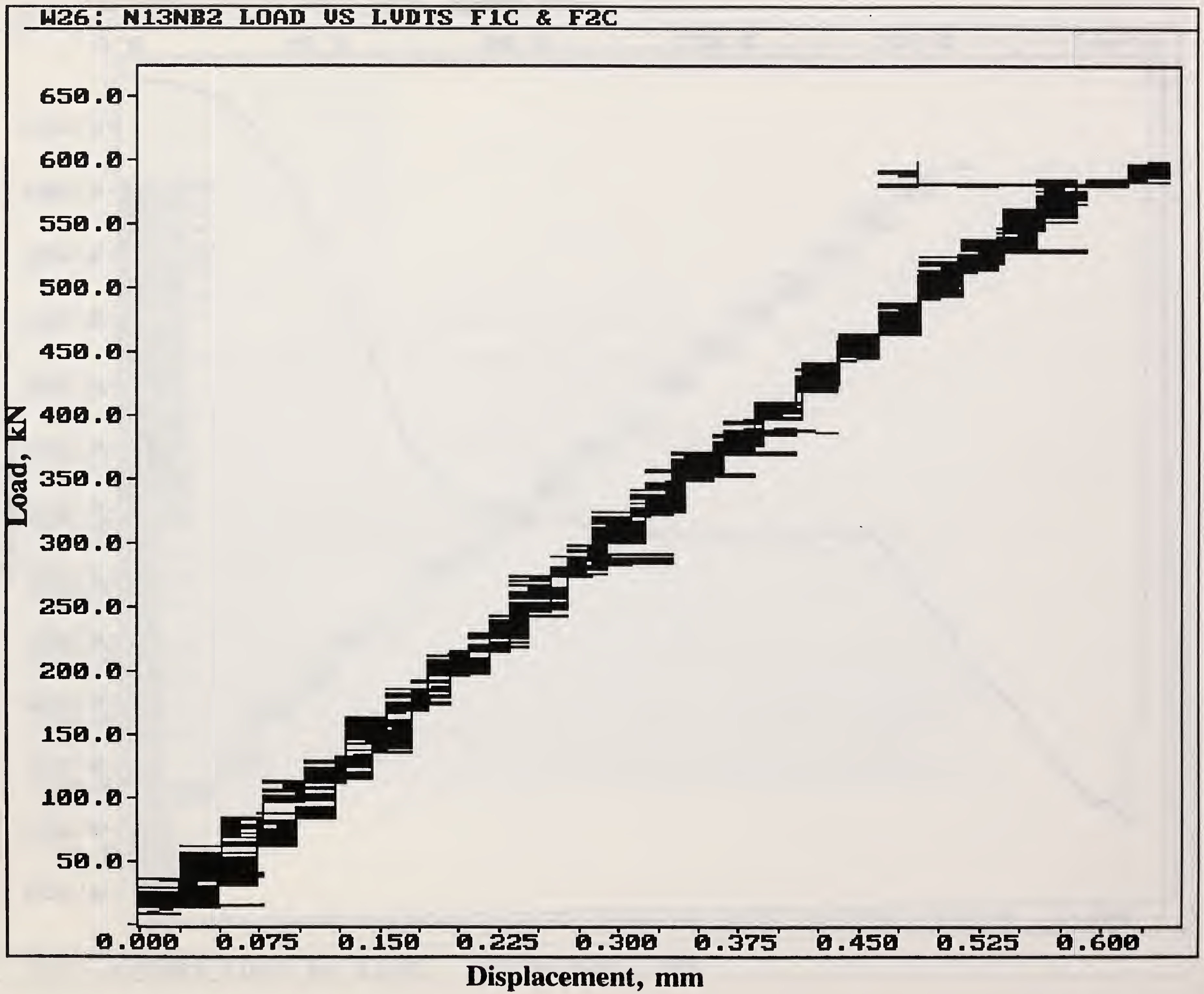

W28: N13NB1 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.00
0.10
0.20
0.30
0.40
0.50
0.60
Displacement, mm

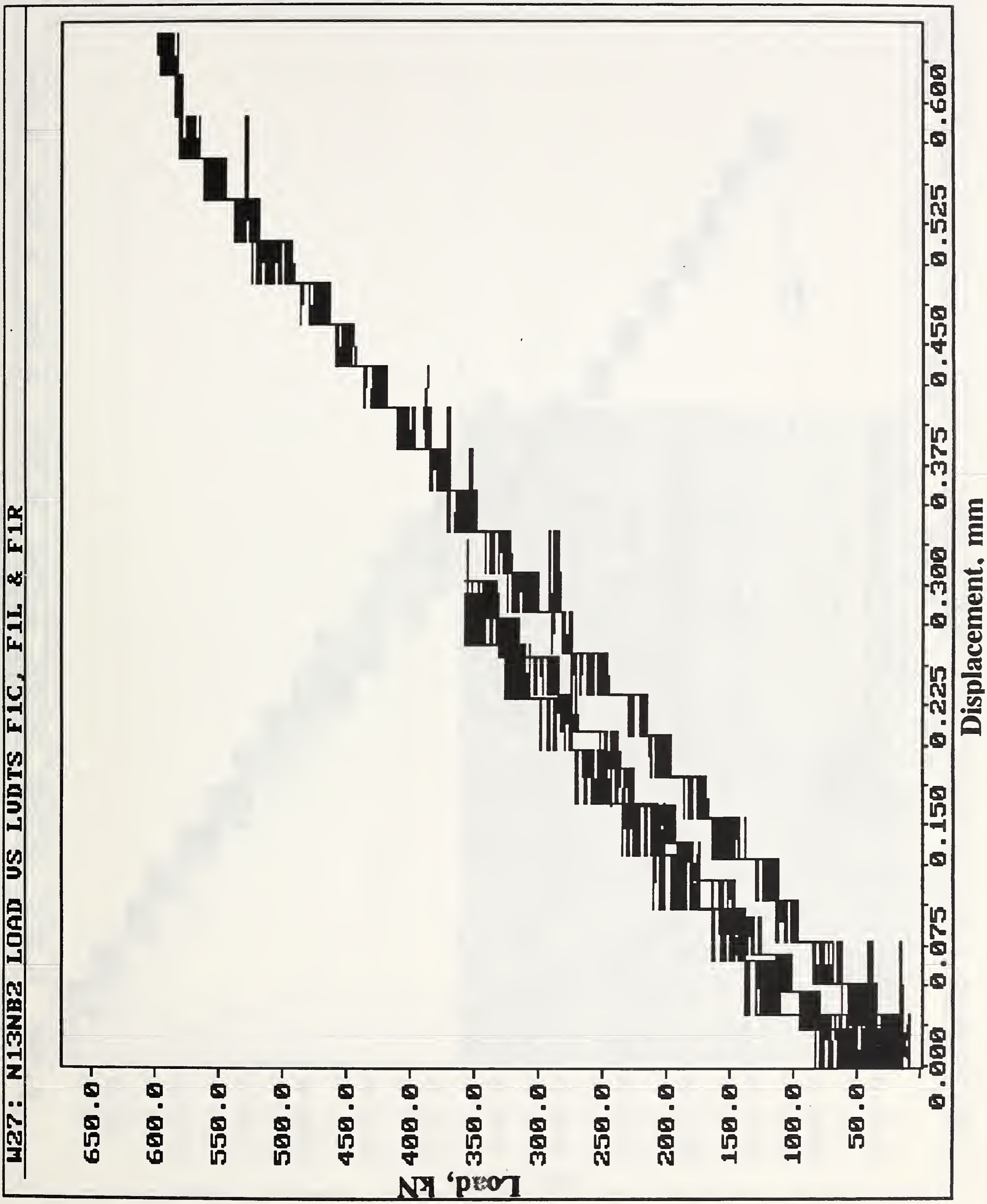


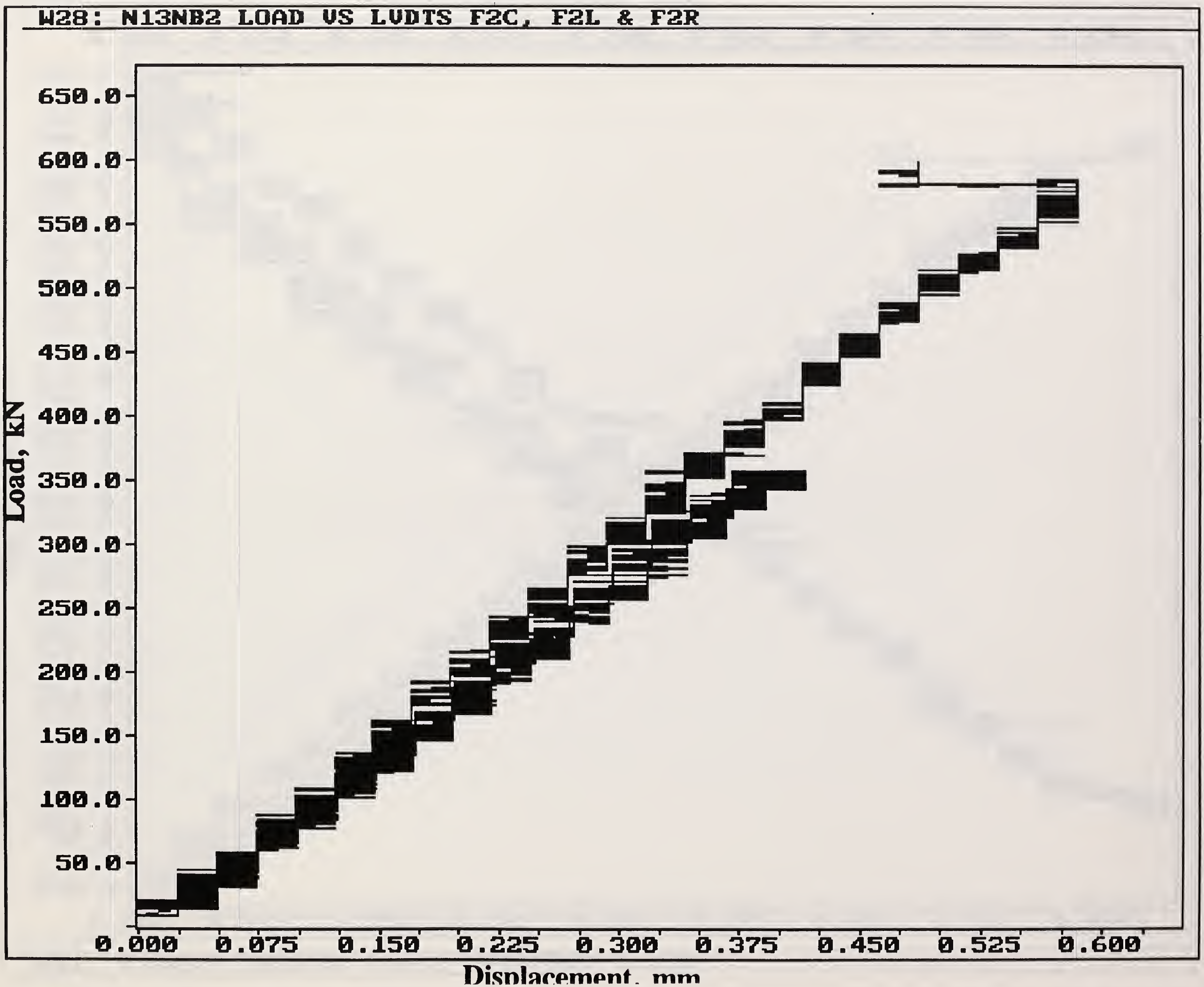
W29: N13NB1 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.0000
0.0100
0.0200
0.0300
0.0400
0.0500
0.0600
0.0700

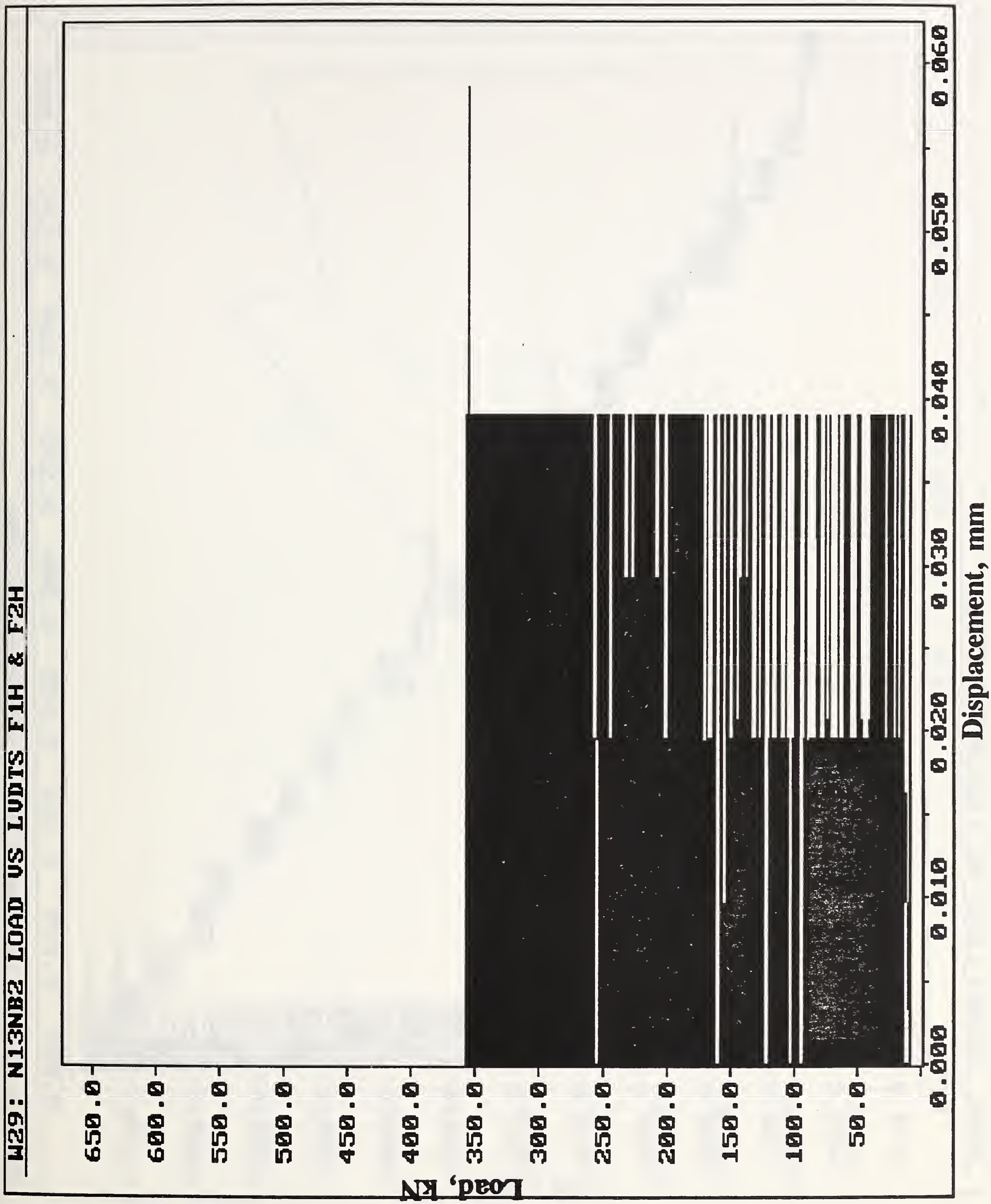

W30: N13NB1 LOAD VS LVDTS F1C & F1H
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm

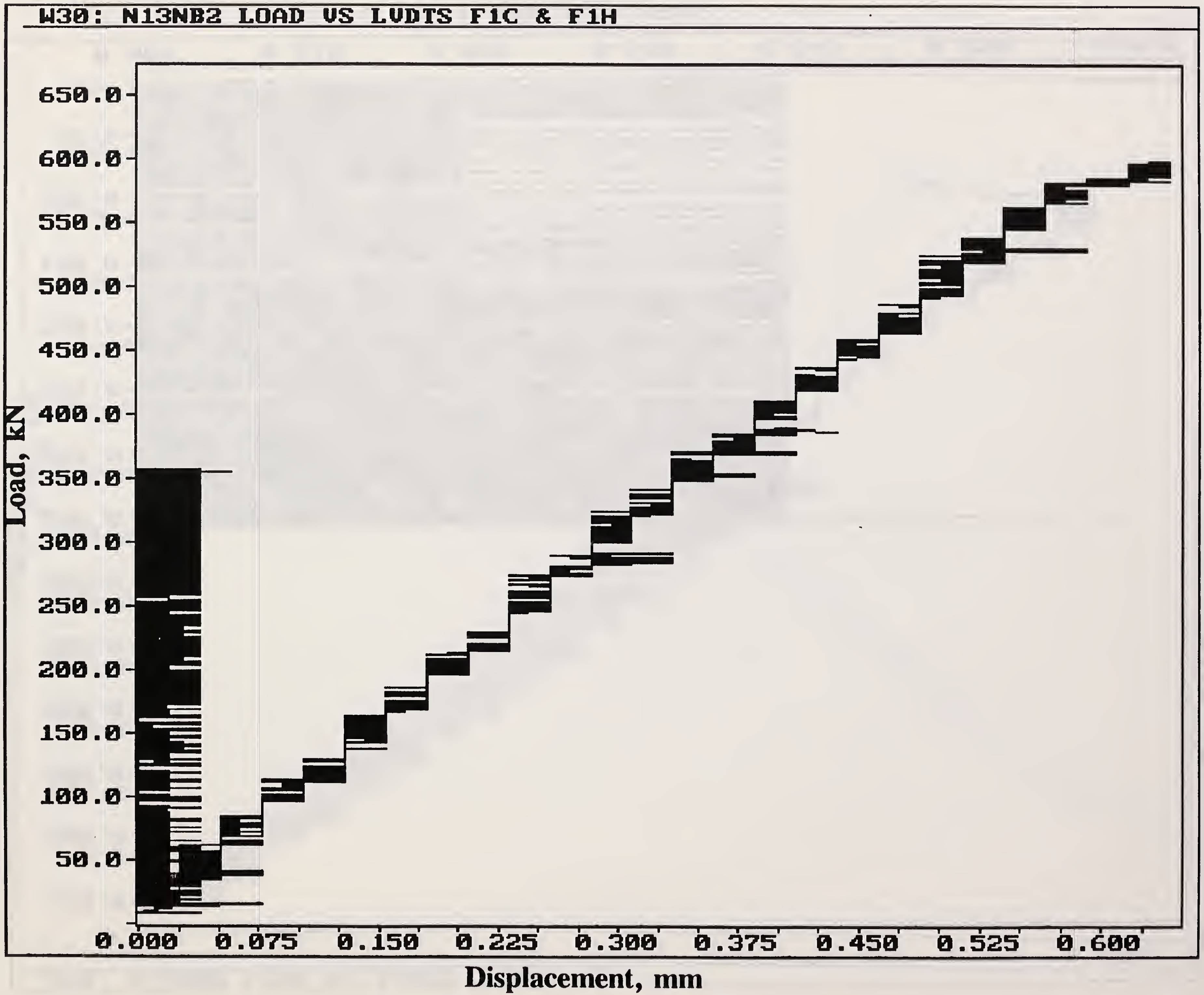

W25: N13NB2 LOAD VS TIME
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0
200.0
Time, sec

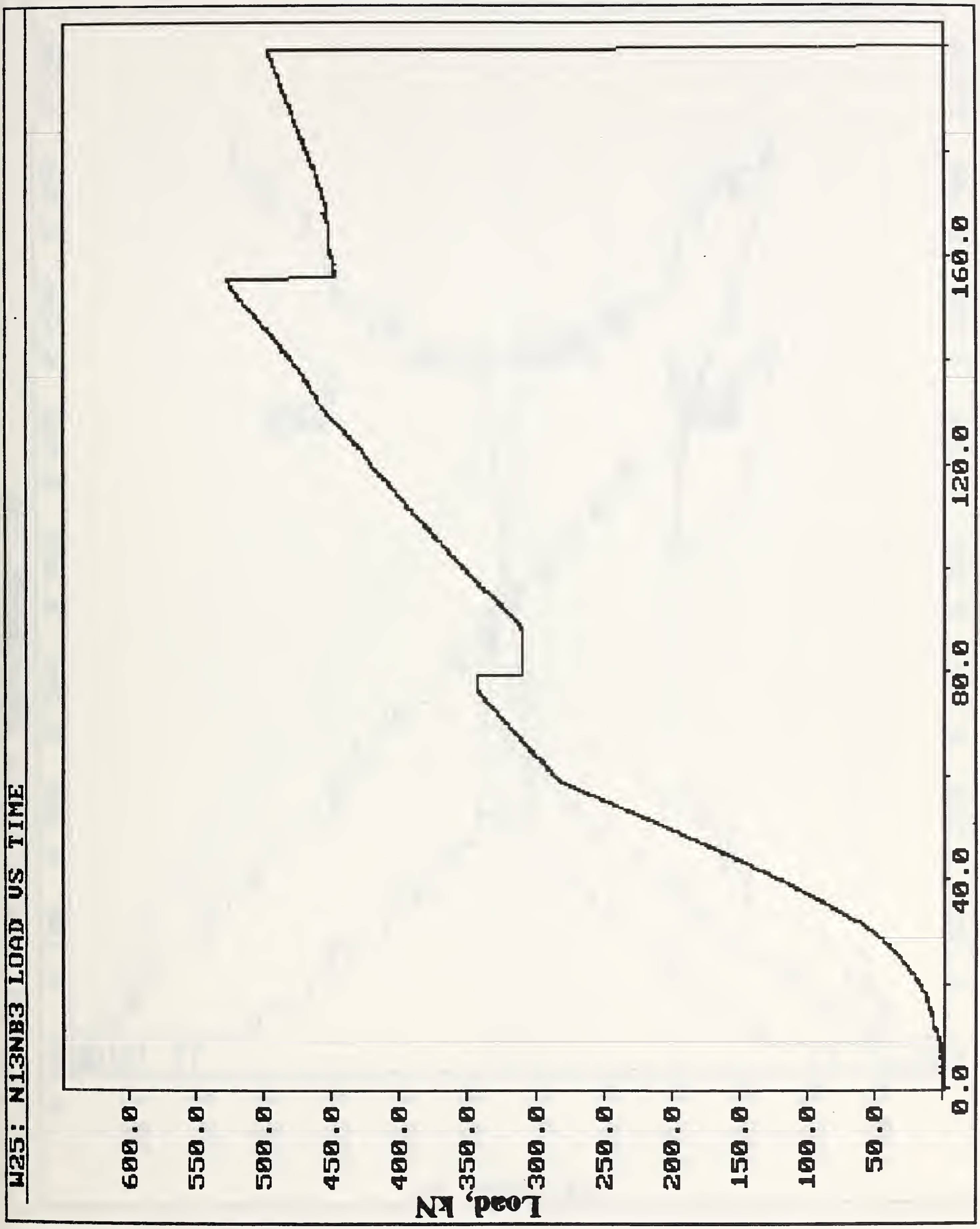

W26: N13NB2 LOAD VS LVDTS F1C & F2C
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm

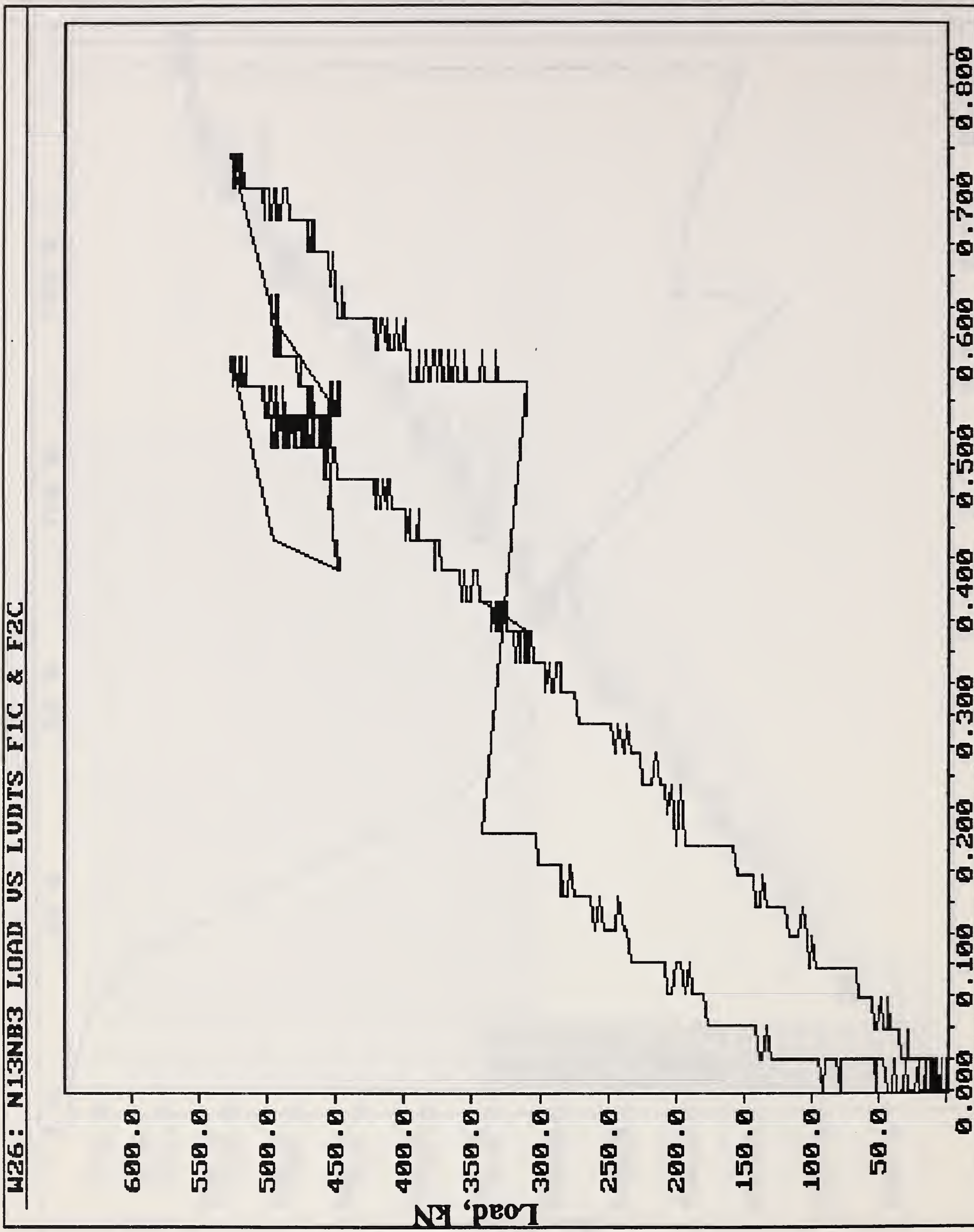

W27: N13NB2 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm

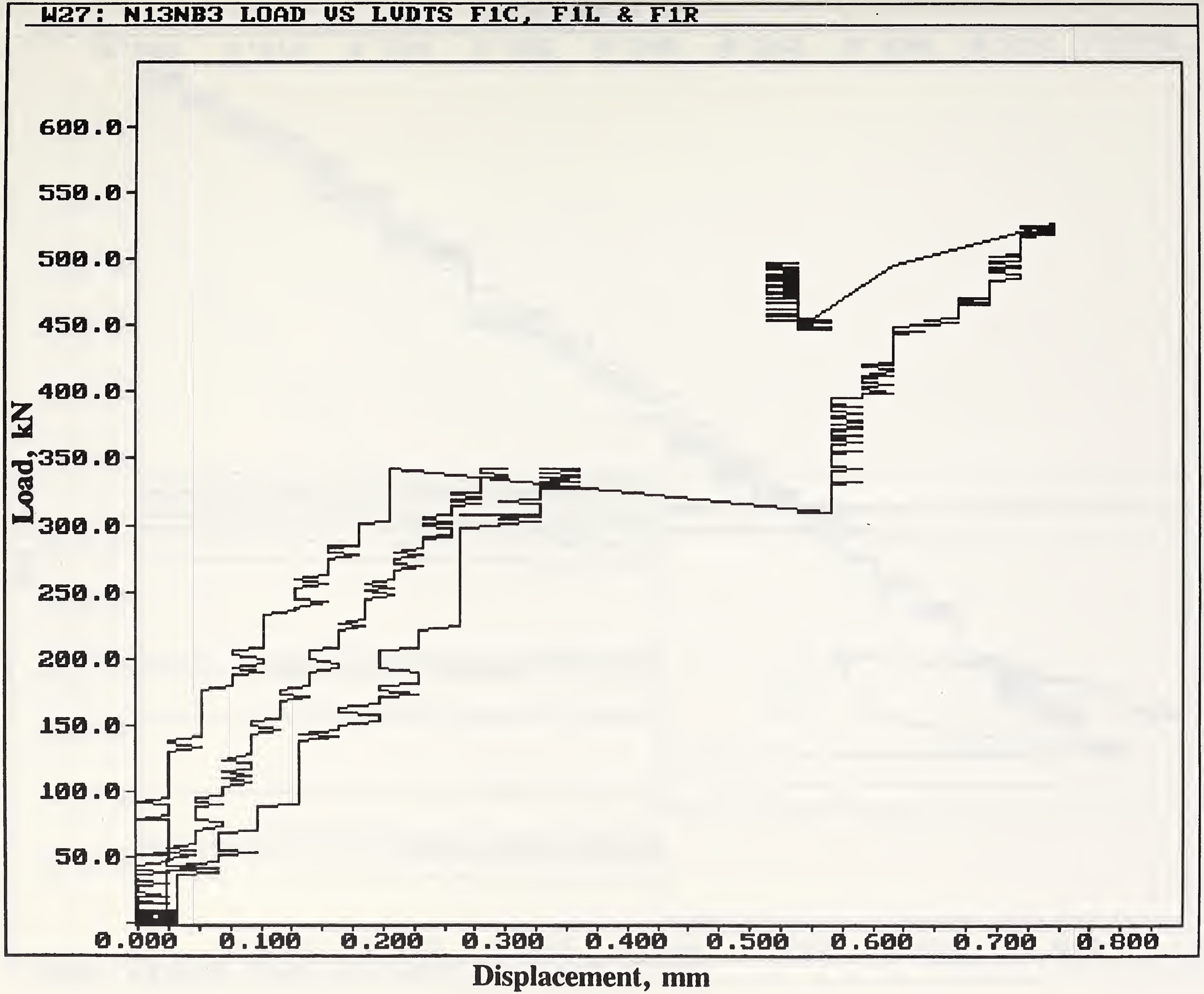

W28: N13NB2 LOAD VS LVDTS F2C, F2L & F2R
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm


W29: N13NB2 LOAD VS LVDTS F1H & F2H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.010
0.020
0.030
0.040
0.050
0.060
Displacement, mm

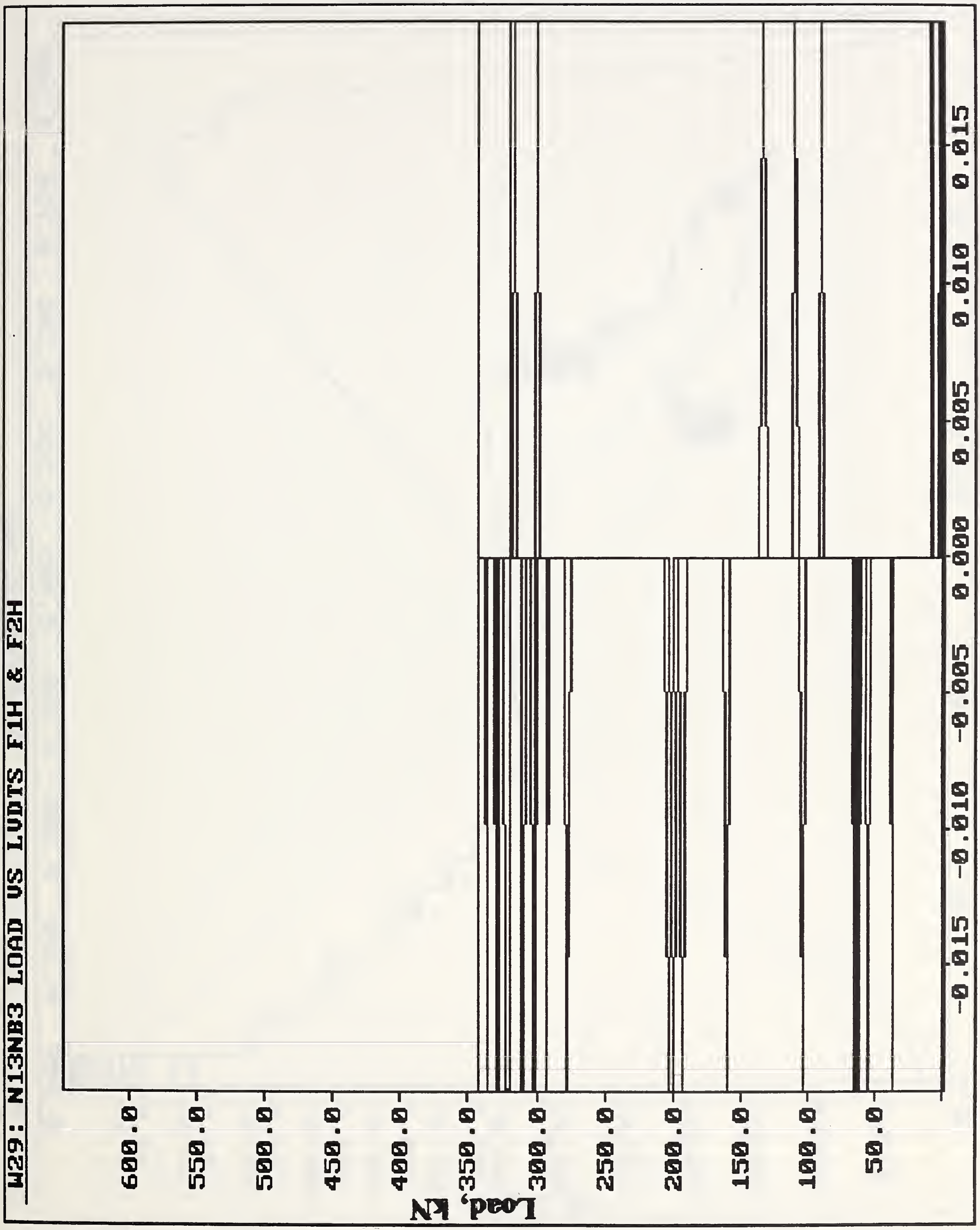

W30: N13NB2 LOAD VS LVDTS F1C & F1H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm

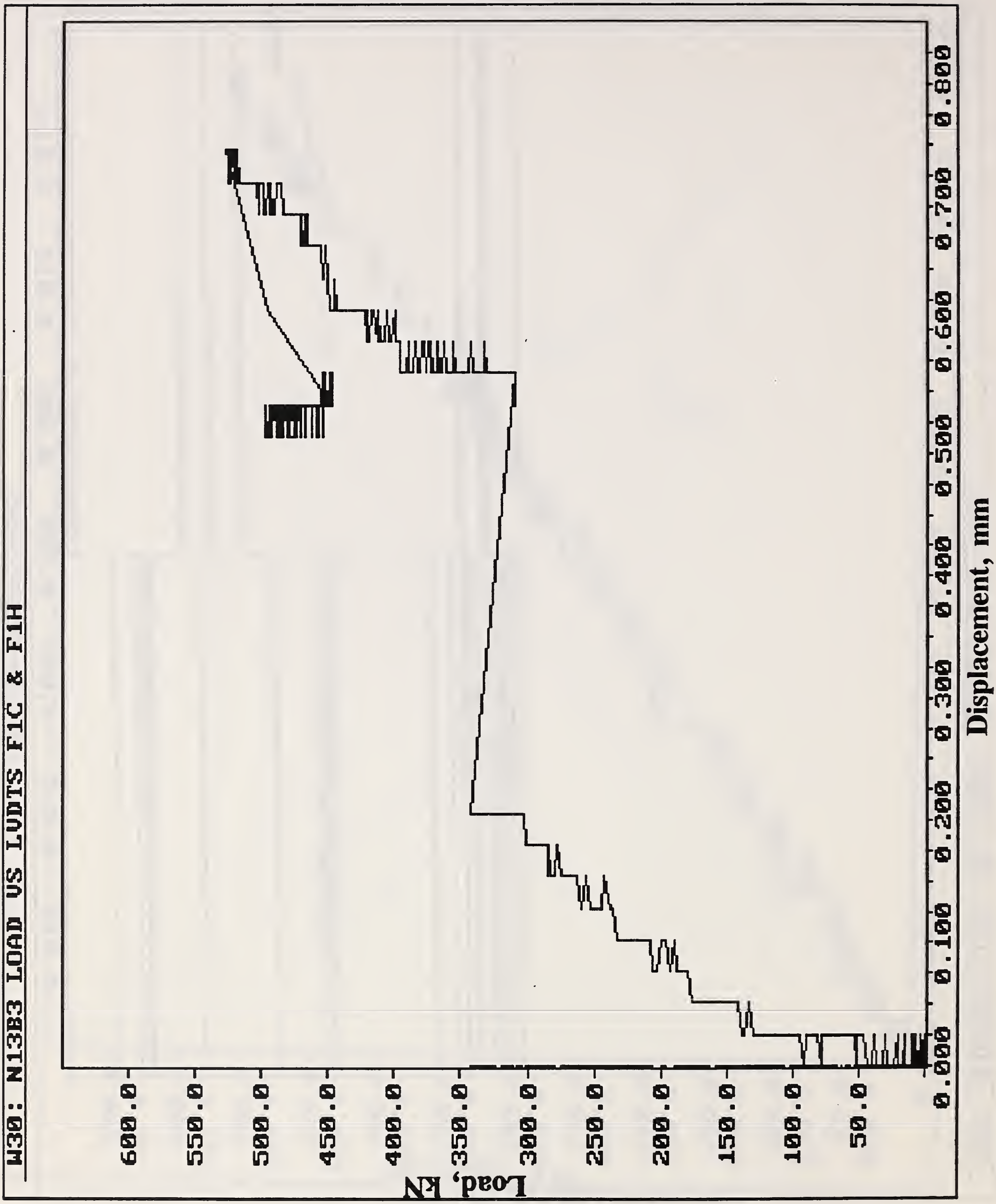

W25: N13NB3 LOAD VS TIME
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
40.0
80.0
120.0
160.0

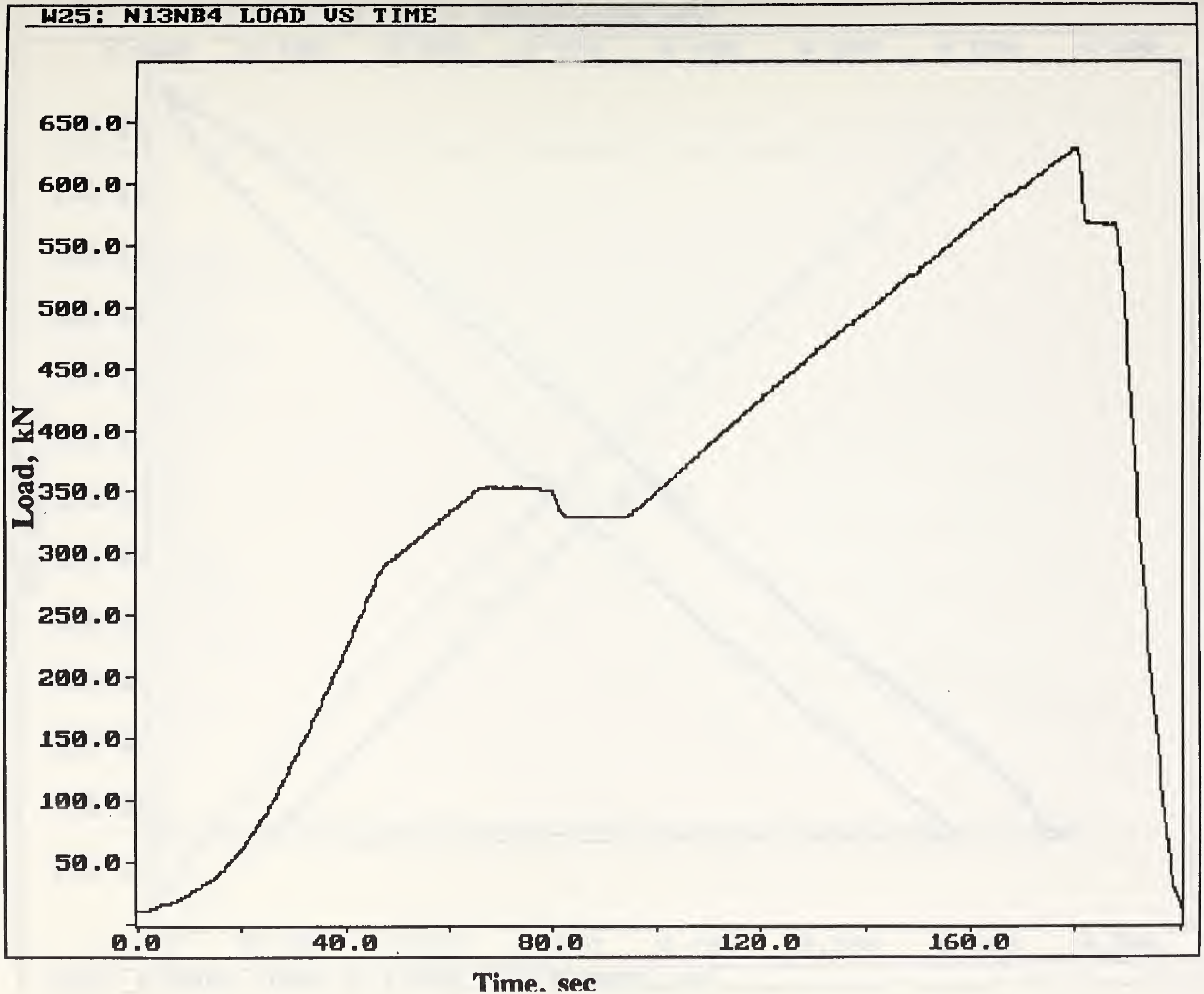

W26: N13NB3 LOAD VS LVDTS F1C & F2C
Load, kN
Displacement, mm
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800

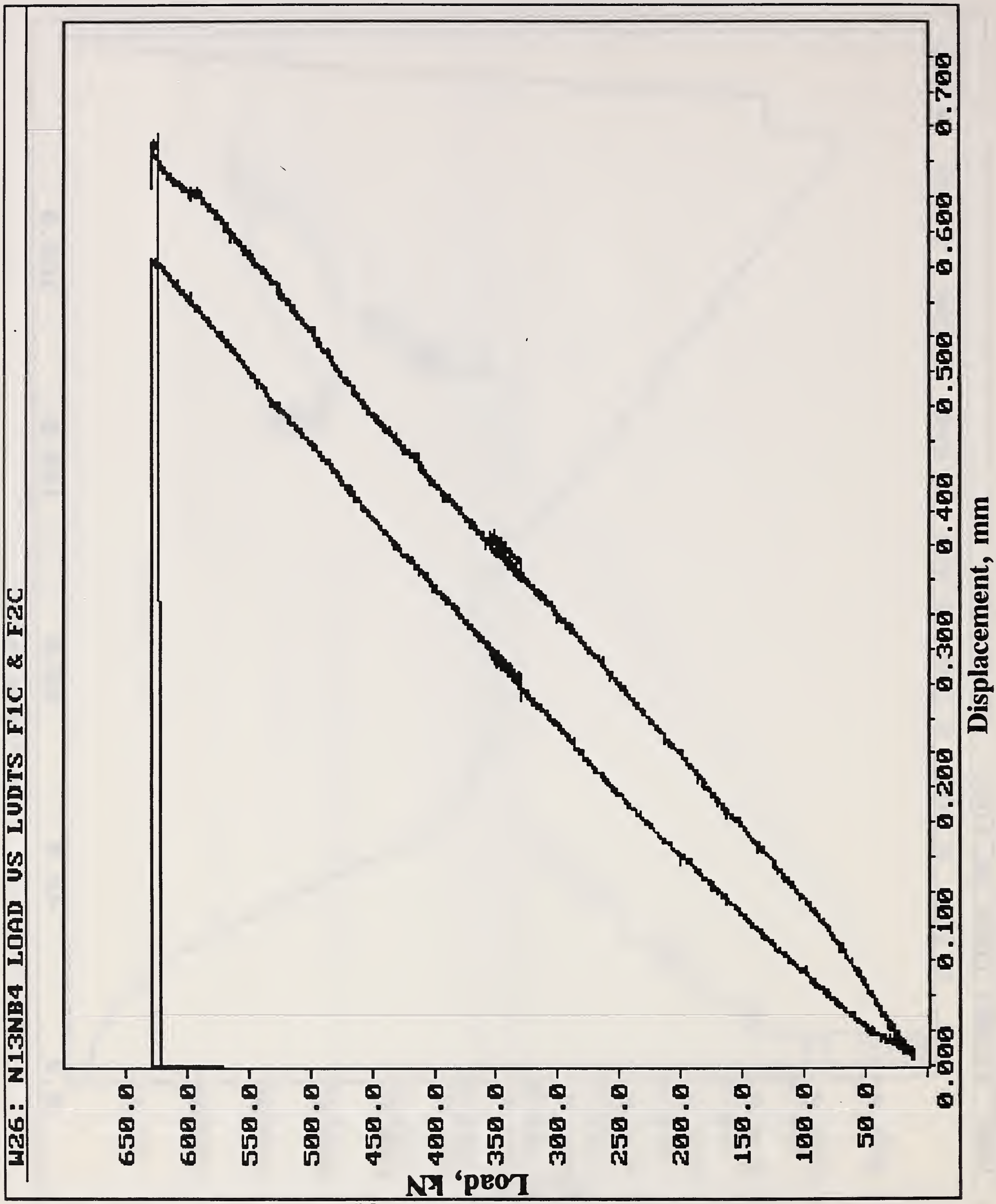

W27: N13NB3 LOAD VS LVDTS F1C, F1L & F1R
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800
Displacement, mm

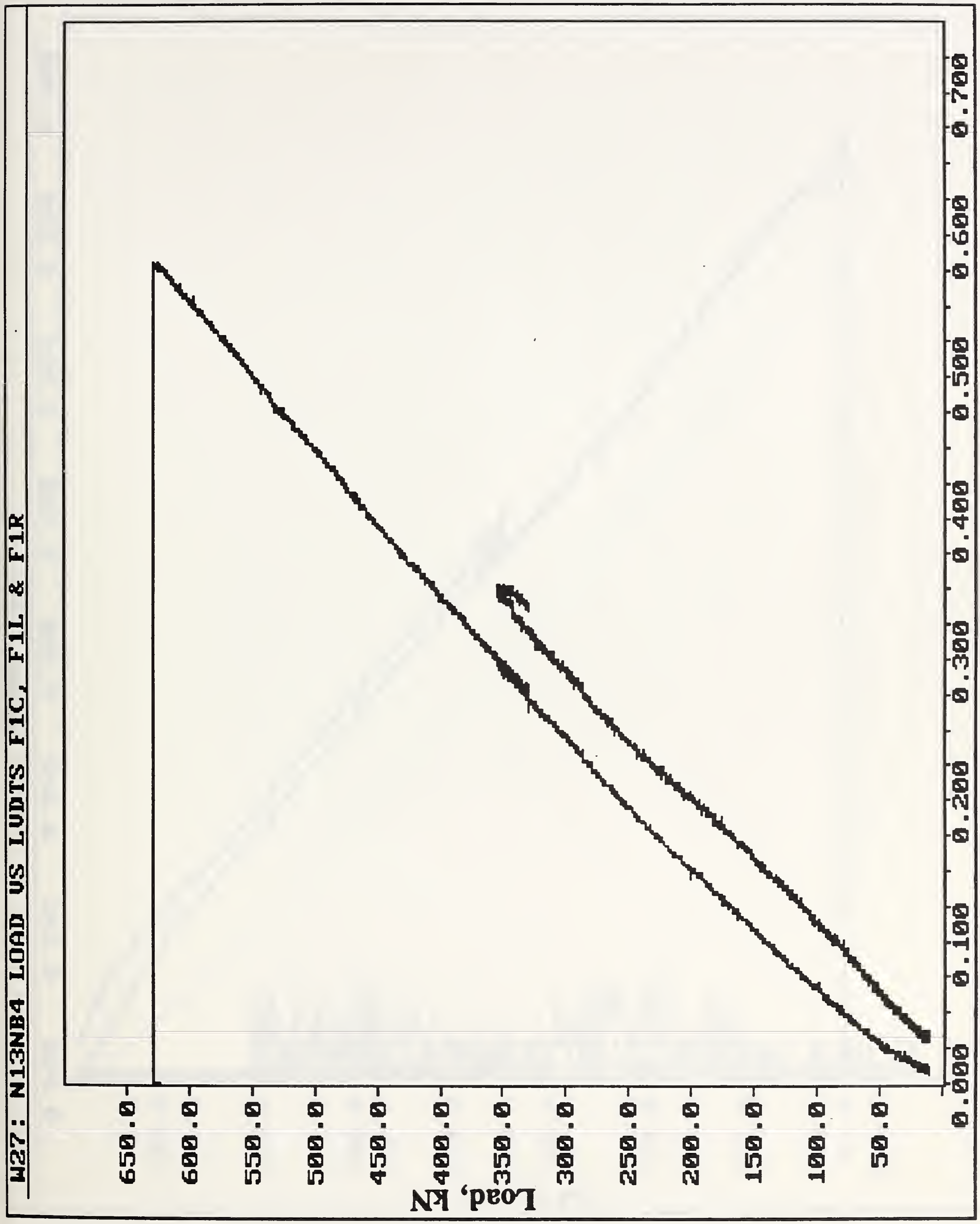

W28: N13NB3 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm


W29: N13NB3 LOAD VS LVDTS F1H & F2H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
-0.015
-0.010
-0.005
0.000
0.005
0.010
0.015

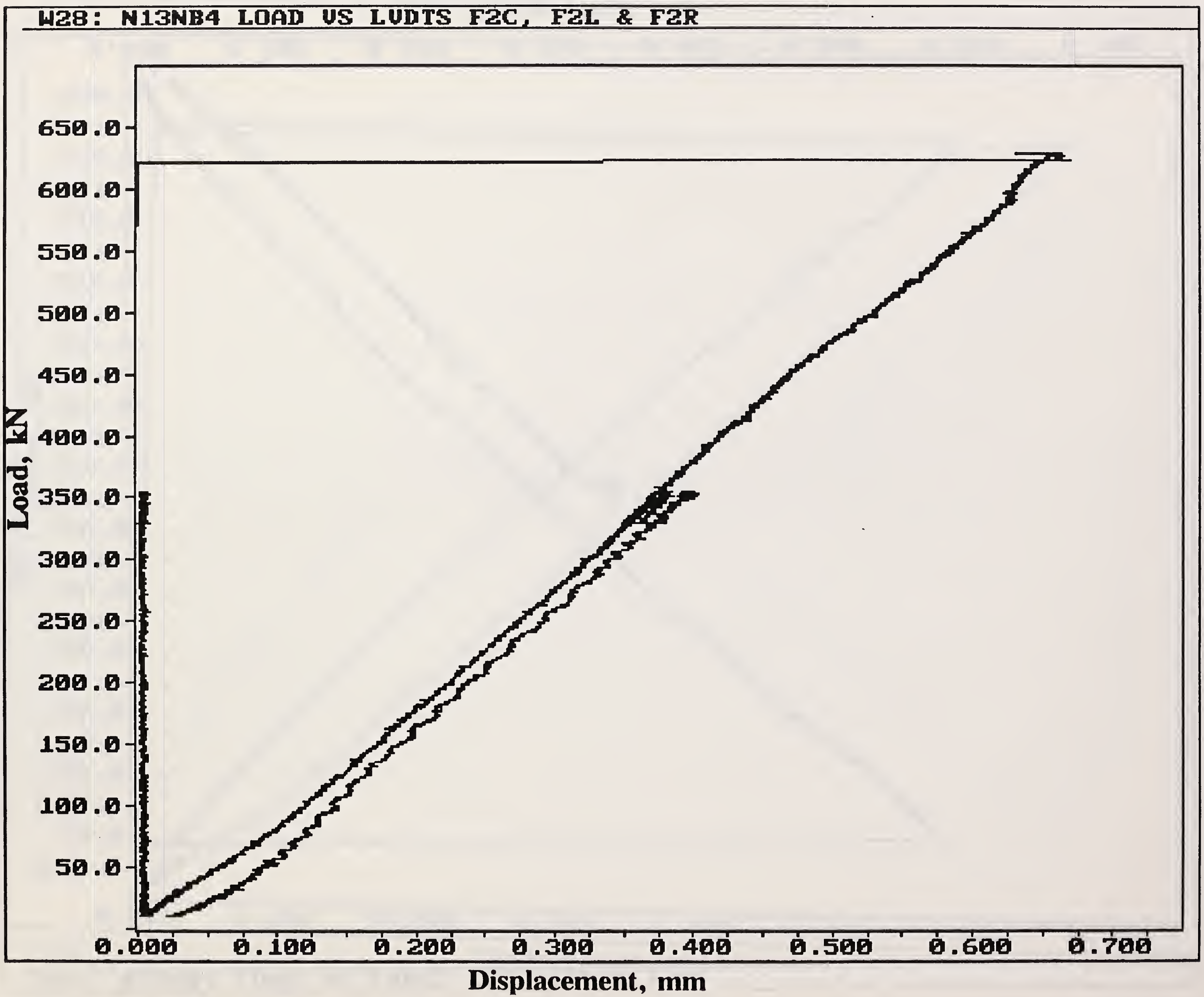

W30: N13B3 LOAD VS LVDTS F1C & F1H
Load, kN
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
0.800
Displacement, mm

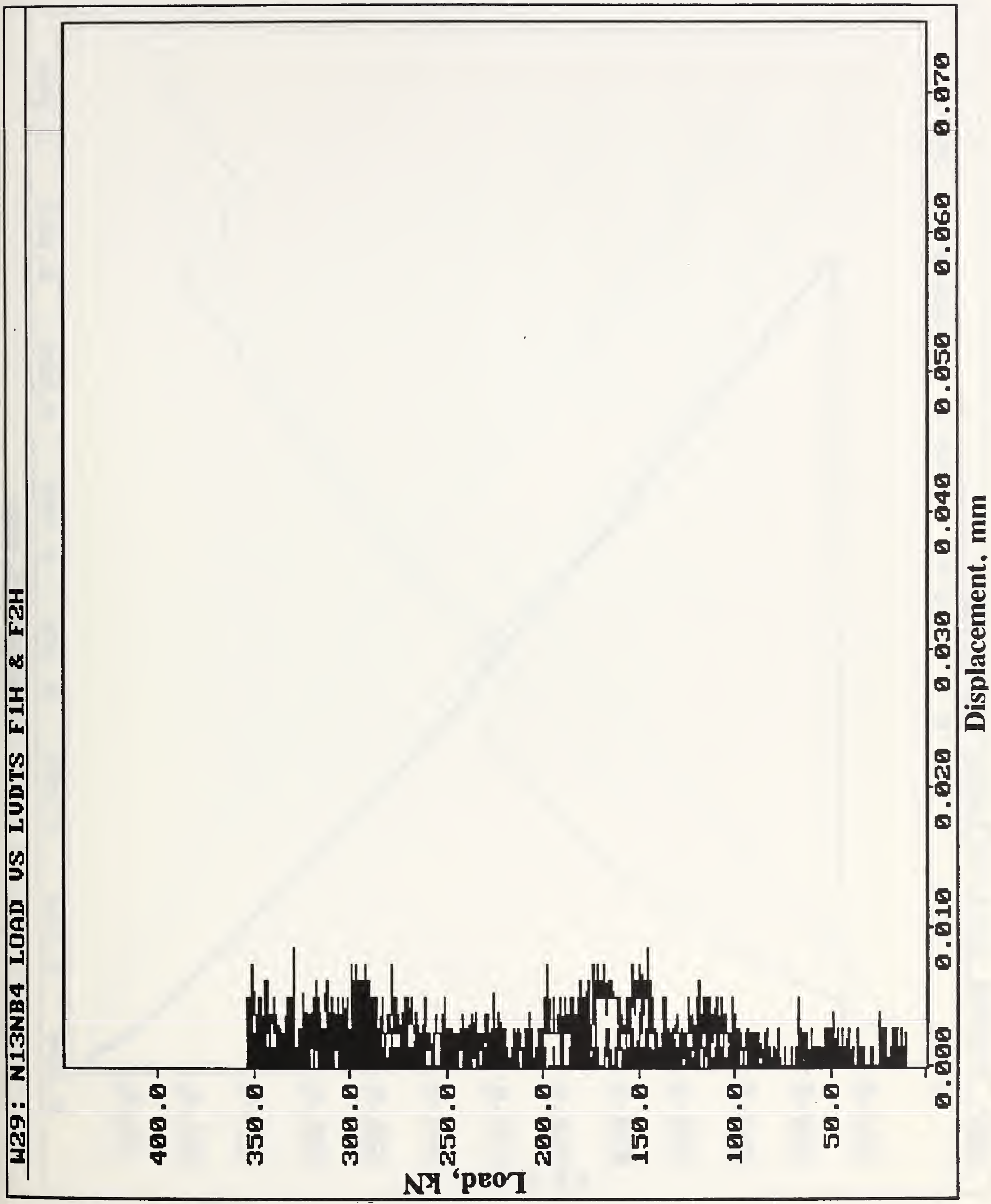

W25: N13NB4 LOAD VS TIME
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.0
40.0
80.0
120.0
160.0
Time, sec

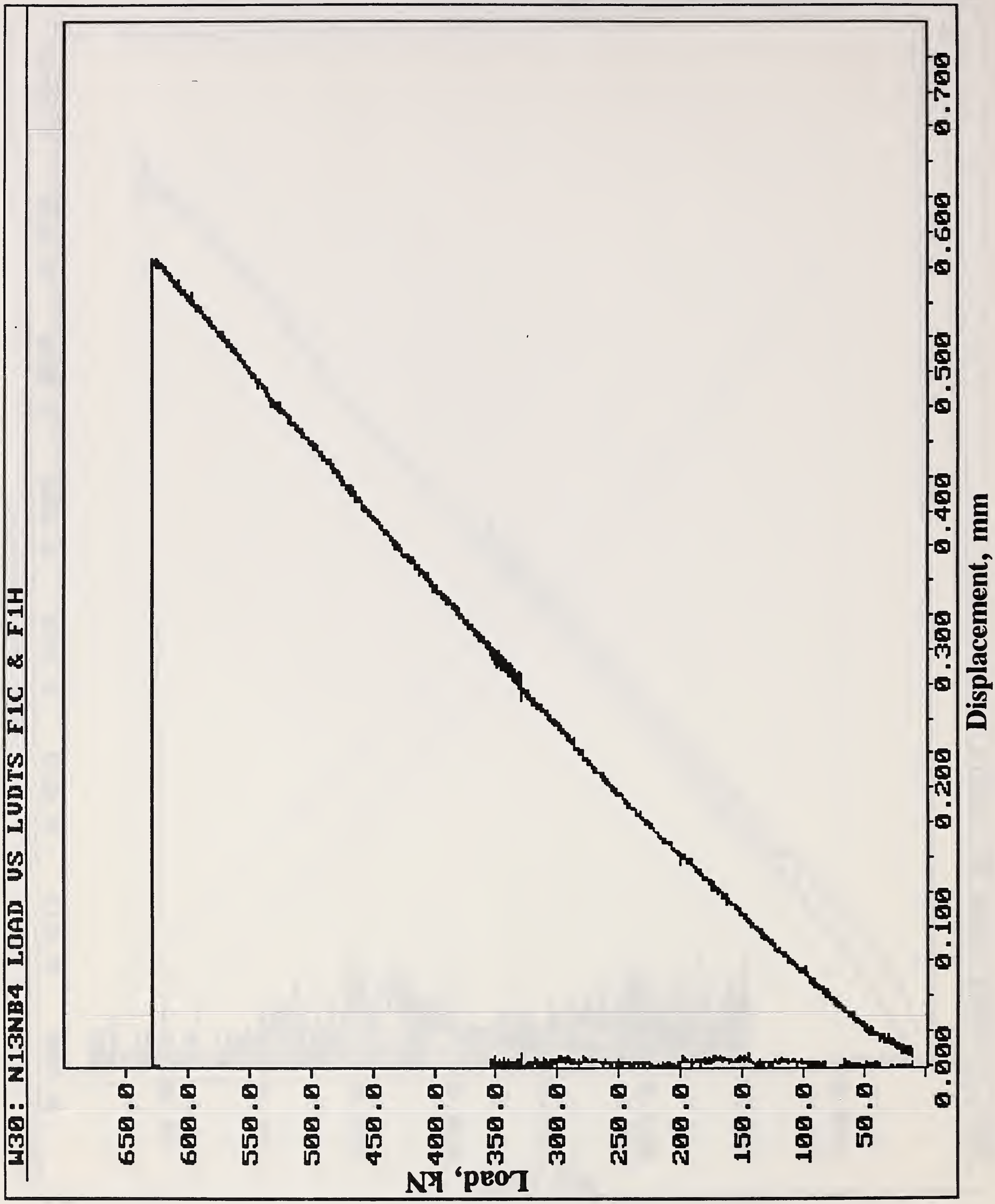

W26: N13NB4 LOAD VS LVDTS F1C & F2C
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Load, kN
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
Displacement, mm

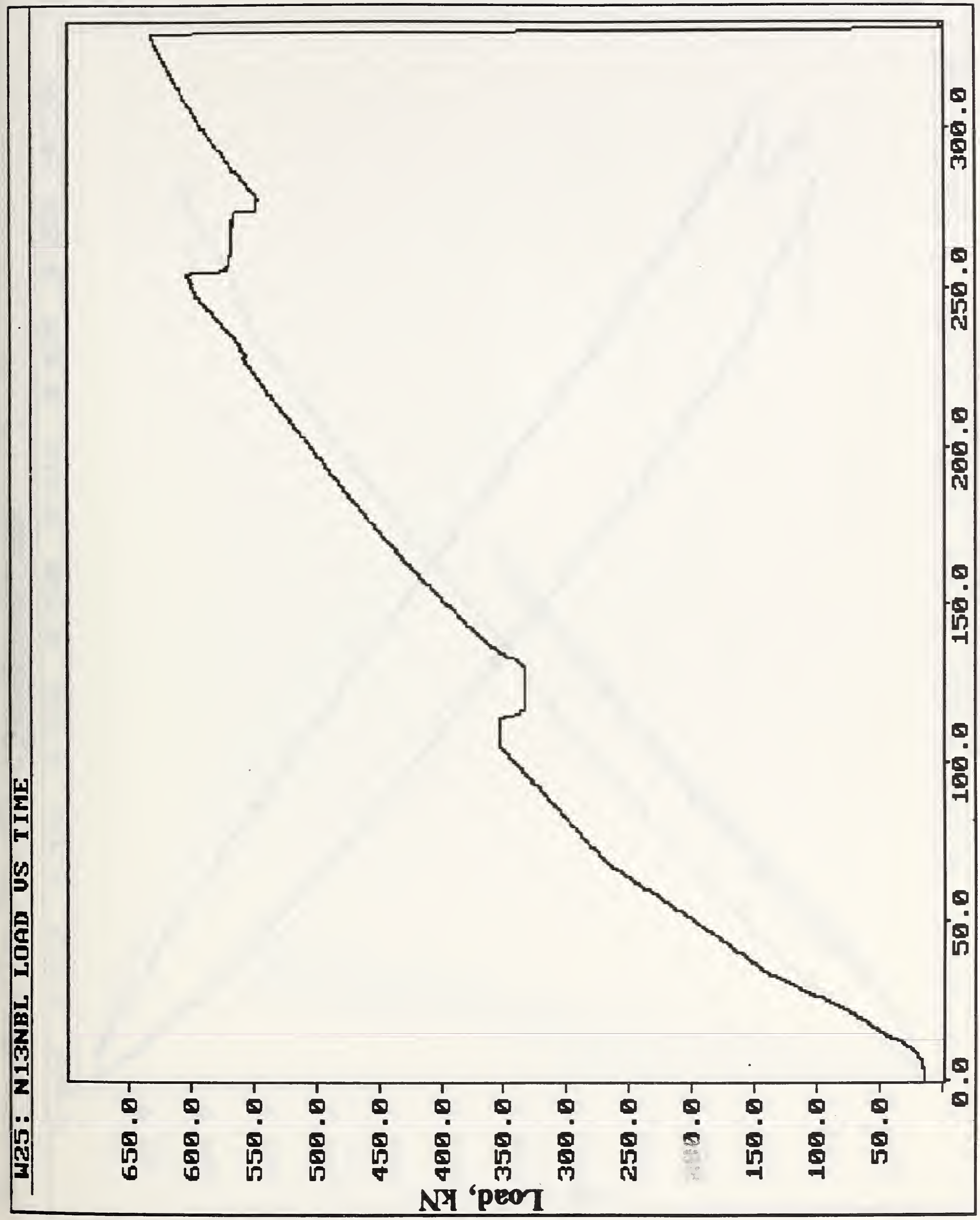


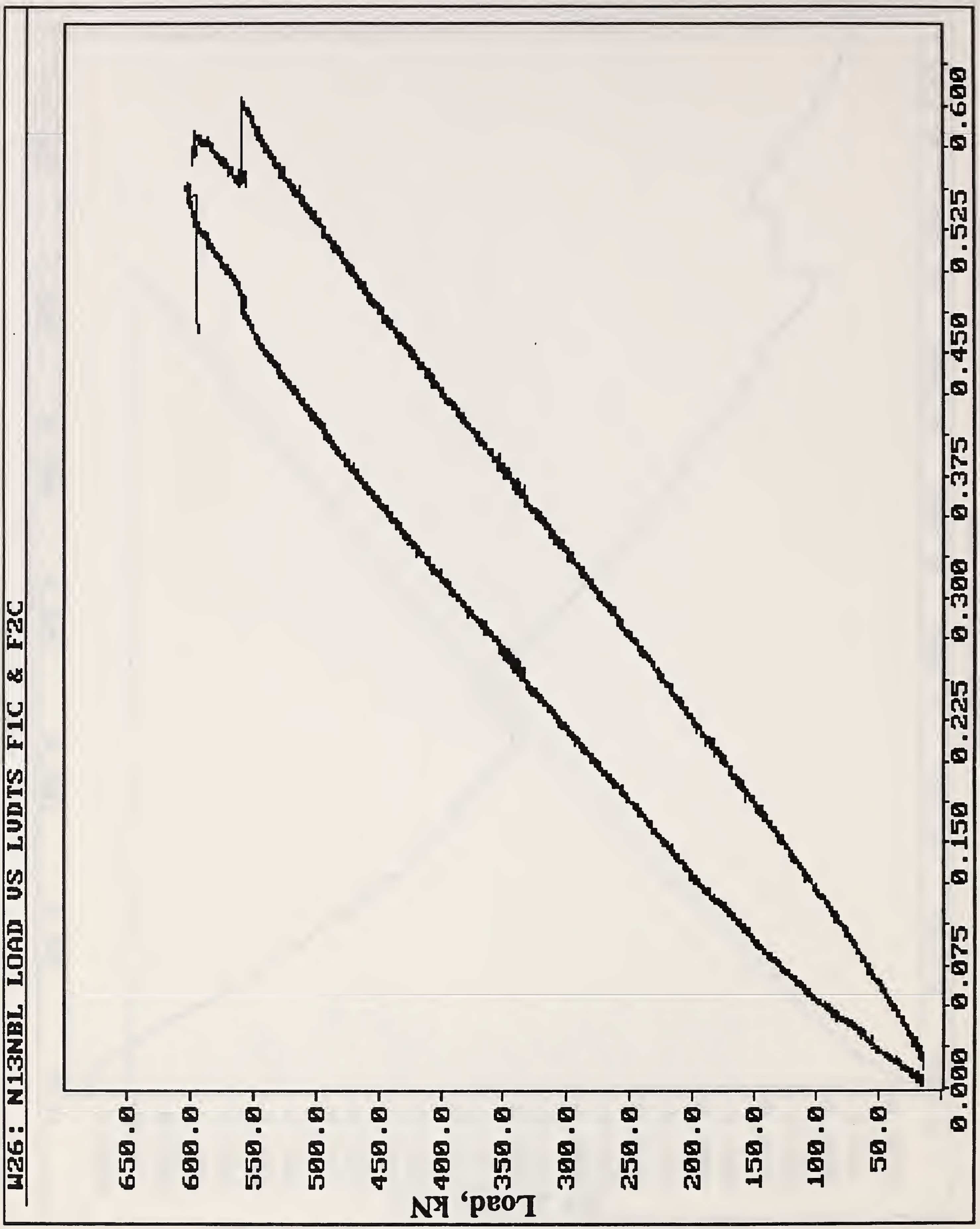
W27: N13NB4 LOAD VS LVDTS F1C, F1L & F1R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
Displacement, mm

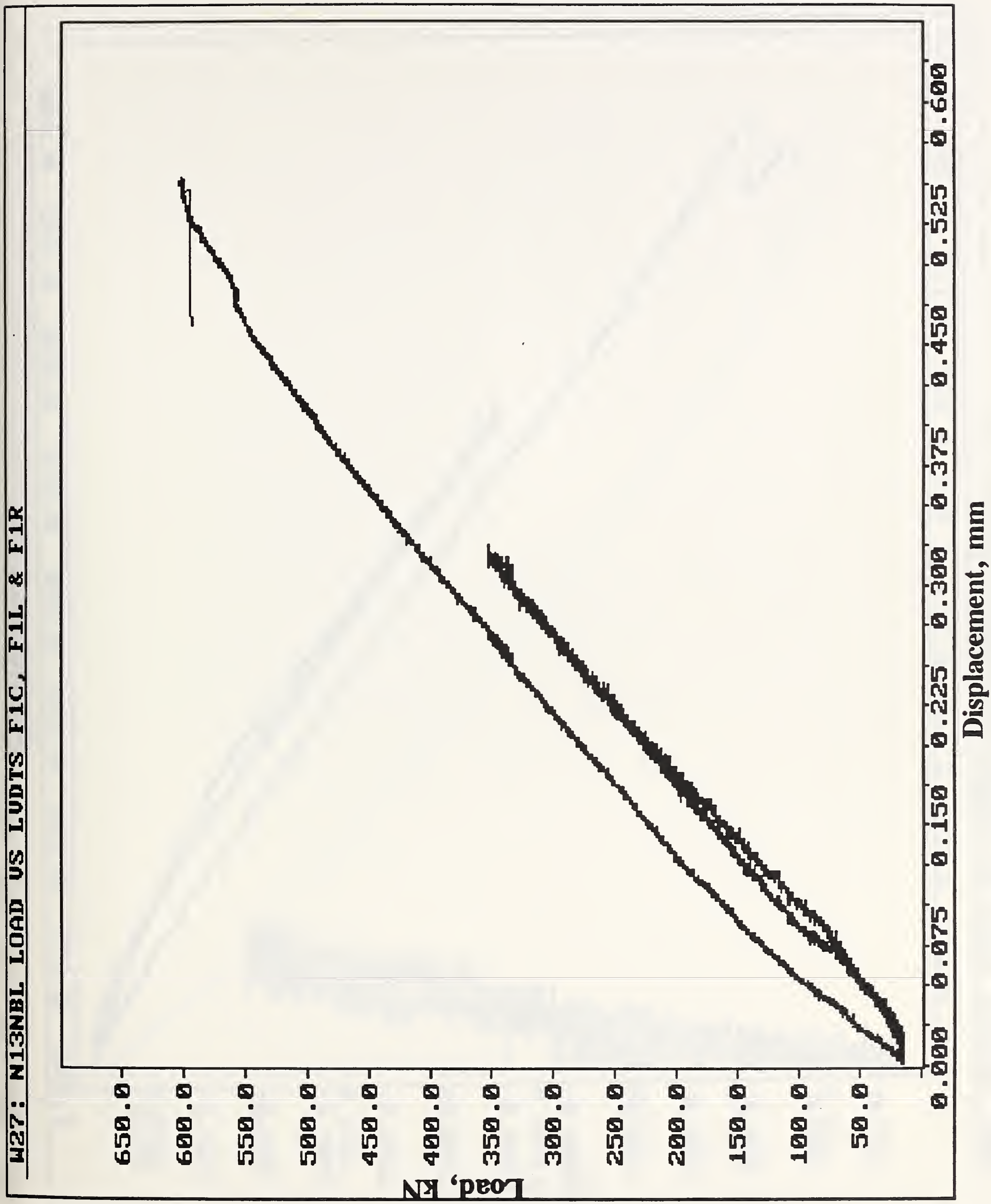

W28: N13NB4 LOAD VS LVDTS F2C, F2L & F2R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700
Displacement, mm


W29: N13NB4 LOAD VS LVDTS F1H & F2H
Load, kN
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.010
0.020
0.030
0.040
0.050
0.060
0.070
Displacement, mm

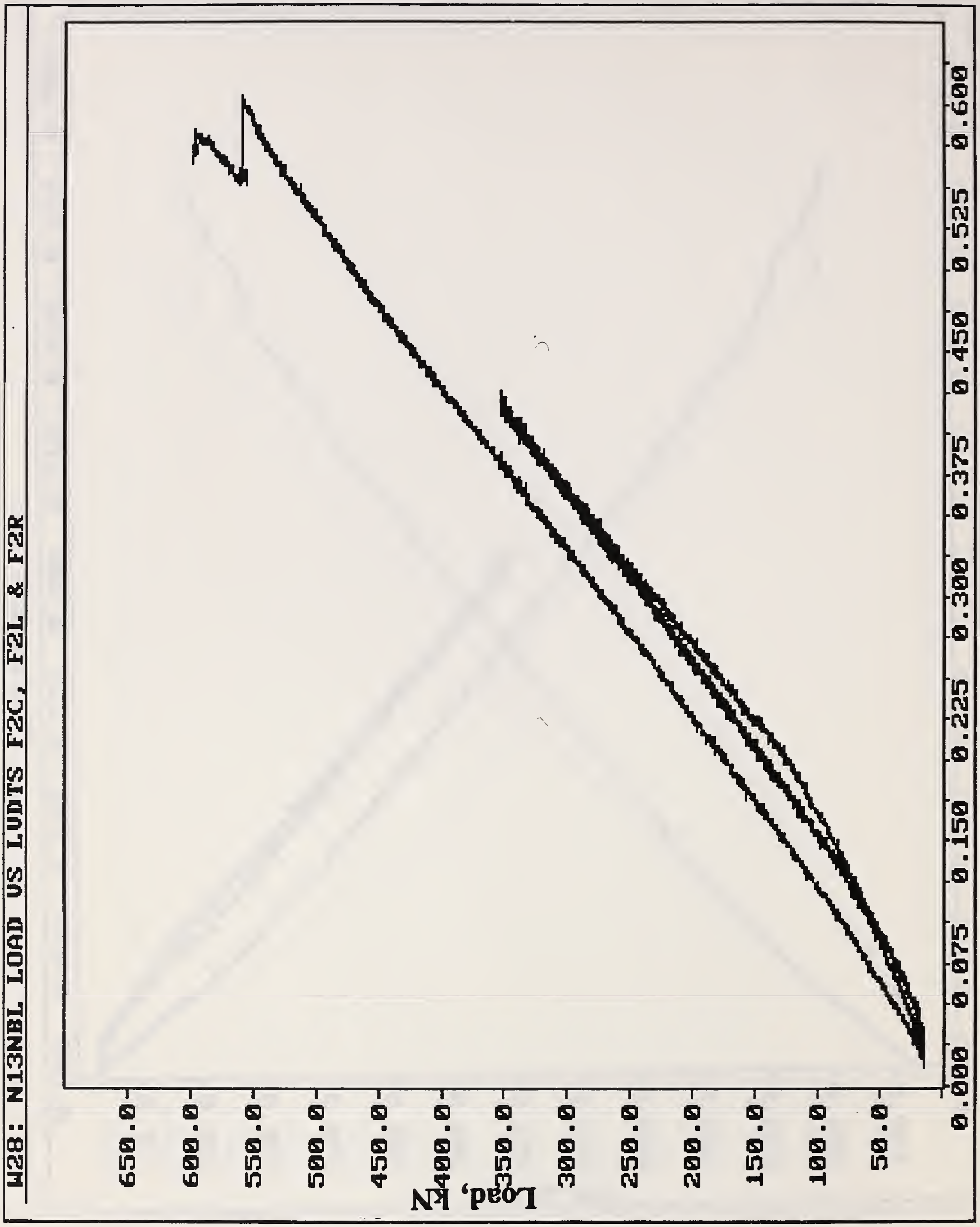

W30: N13NB4 LOAD VS LVDTS F1C & F1H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.000
0.100
0.200
0.300
0.400
0.500
0.600
0.700


W25: N13NBL LOAD VS TIME
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
150.0
100.0
50.0
0.0
50.0
100.0
150.0
200.0
250.0
300.0

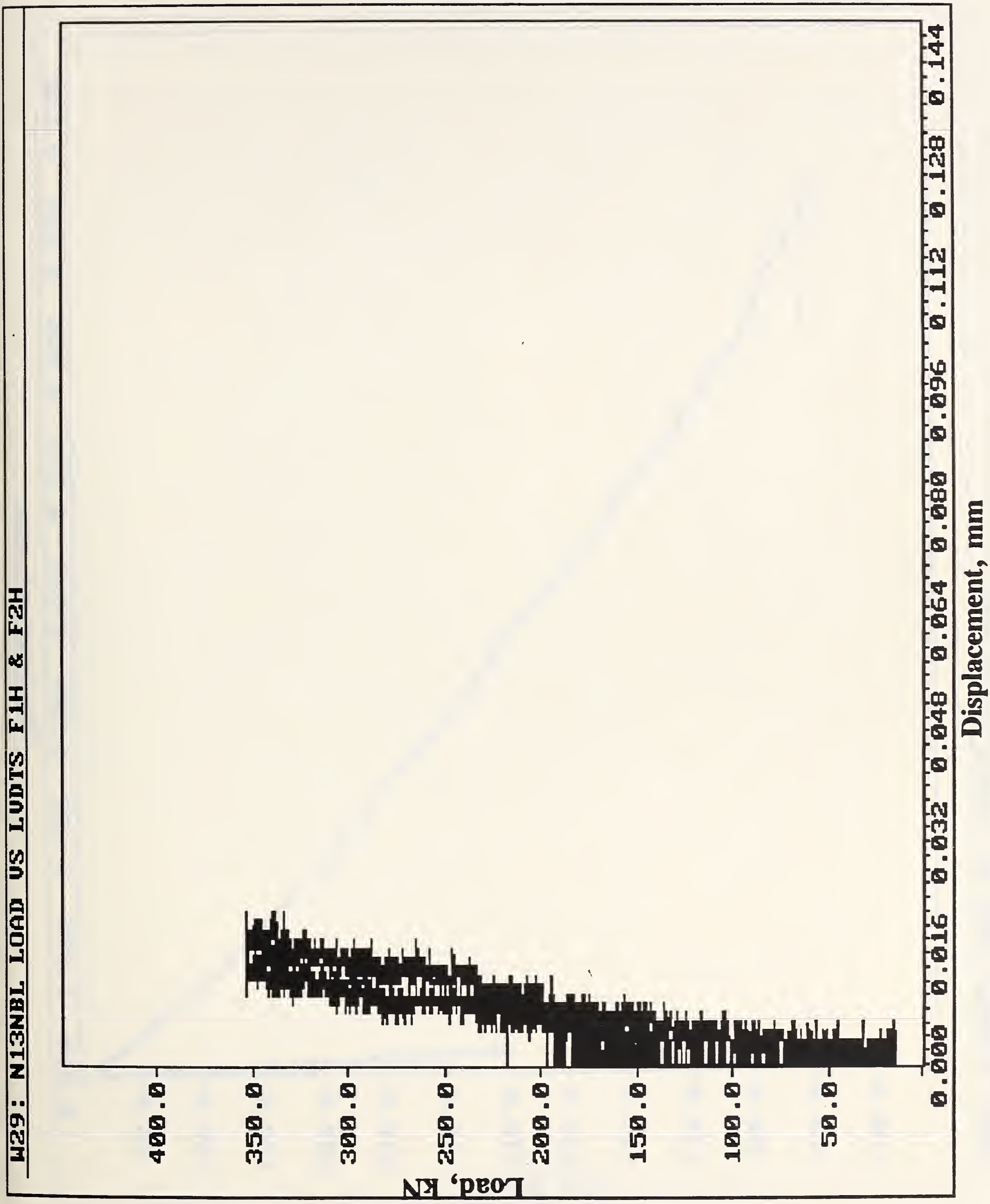

W26: N13NBL LOAD VS LVDTS F1C & F2C
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm

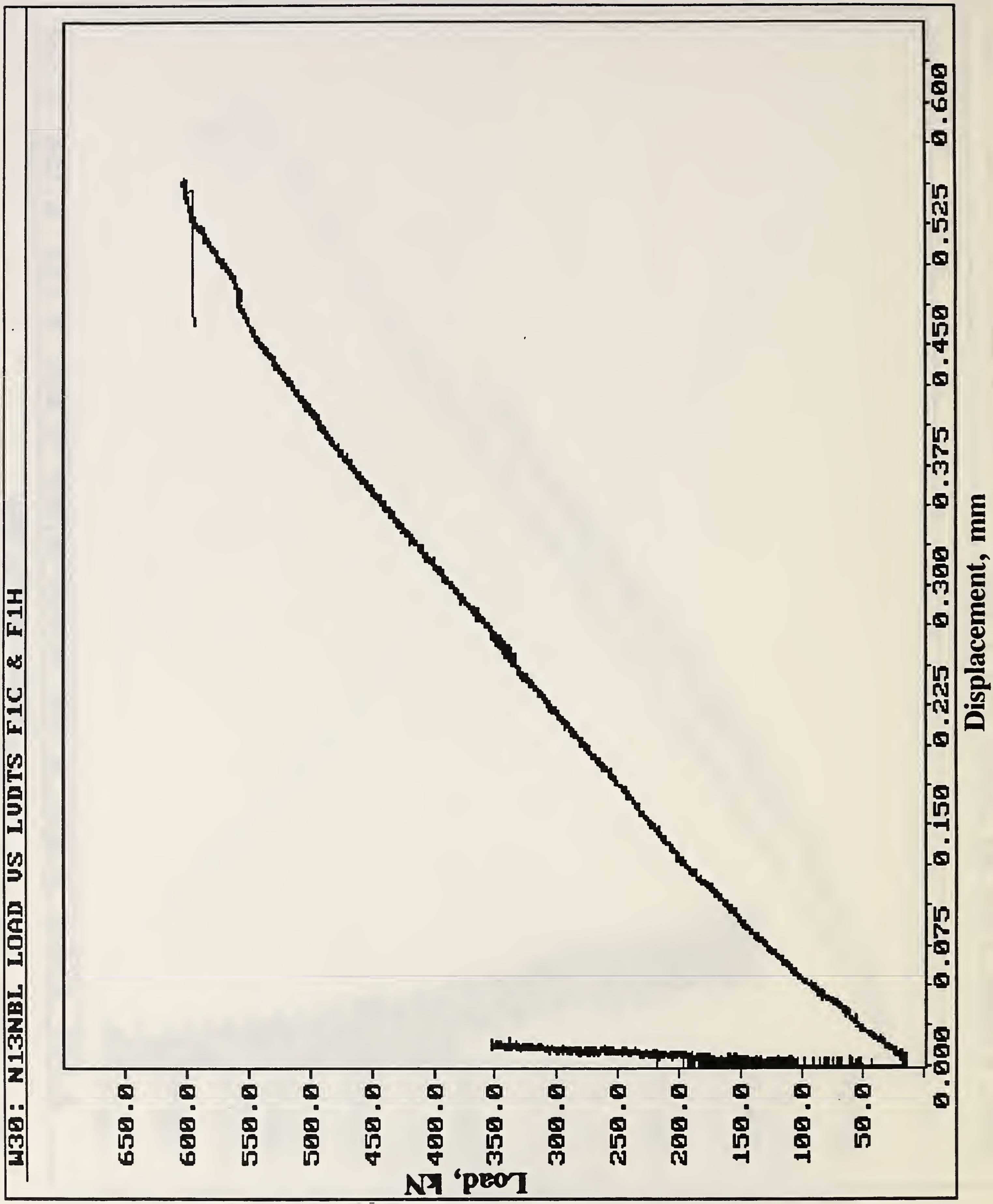


W27: N13NBL LOAD VS LVDTS F1C, F1L & F1R
Load, KN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600
Displacement, mm



W28: N13NBL LOAD VS LVDTS F2C, F2L & F2R
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
0.0
Displacement, mm
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600


W29: N13NBL LOAD VS LVDTS F1H & F2H
Load, kN
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.000
0.016
0.032
0.048
0.064
0.080
0.096
0.112
0.128
0.144


W30: N13NBL LOAD VS LVDTS F1C & F1H
Load, kN
650.0
600.0
550.0
500.0
450.0
400.0
350.0
300.0
250.0
200.0
150.0
100.0
50.0
Displacement, mm
0.000
0.075
0.150
0.225
0.300
0.375
0.450
0.525
0.600