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STRUCTURAL TEST REPORT ON LAUNCH ESCAPE TOWER (ATR 500)

21 December 1964

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NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION

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Mattson
Launch Escape

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FOREWORD

Static structural tests were conducted on the Apollo launch escape tower by North American Aviation, Inc. Tests were conducted at Space and Information Systems Division, Engineering Development Laboratory, Downey, California, during the period of 29 July 1963 to 13 September 1963. Testing was performed in general accordance with Apollo Test Requirement (ATR) 500 and the Apollo General Test Plan, SID 62-109.

The statement of test requirement was generated by Apollo Structures and Materials. Engineering Development Laboratory was responsible for design and fabrication of test fixtures, instrumentation, and data acquisition and reduction.

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TECHNICAL REPORT INDEX/ABSTRACT

ACCESSION NUMBER	DOCUMENT SECURITY CLASSIFICATION
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Structural Test Report on Launch Escape Tower (ATR 500)	

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	NAS9-150

DESCRIPTIVE TERMS

Tower, Launch Escape Tower, and Launch Escape System

ABSTRACT

Static structural tests were conducted on the Apollo launch escape tower by NAA, S&ID, Downey, California. The objectives of the tests were: to verify the structural integrity of the launch escape tower for critical flight loading conditions; determine the ultimate strength and failure characteristics; and determine the deflection characteristics. The tests were successfully completed on 13 September 1963, and the structural integrity of the tower was verified.

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SUMMARY

The objectives of the tests were (1) to verify the structural integrity of the launch escape tower for critical flight loading conditions, (2) to determine ultimate strength and failure characteristics of the tower, and (3) to determine deflection characteristics of the tower.

Structural integrity of the tower was verified by application of static loads simulating the critical loading environments of pad abort tumbling and maximum "q" abort tumbling. Deflection characteristics of the tower were determined for unit shear loading and for unit bending moment.

Analysis of test data verified structural integrity of the launch escape tower.

It was concluded from analysis of deflection data that tower analysis should be altered to include interaction between the tower, skirt, and command module (tower end support stiffness characteristics).

CONTENTS

Section		Page
	INTRODUCTION	1
I	DESCRIPTION OF TEST ARTICLE	3
II	TEST SETUP	5
III	TEST CONDITIONS	13
	Deflection Tests	13
	Strength Verification Tests	13
IV	PROCEDURE	15
V	RESULTS	17
	Phase A - Deflection Tests	17
	Phase B - Strength Verification	17
	APPENDIXES	
	A. INSTRUMENTATION LIST AND LOCATIONS	A-1
	B. PHASE A—DEFLECTION PLOTS	B-1
	Part 1 - Unit Bending Moment	B-1
	Part 2 - Unit Shear Load	B-13
	C. PHASE B—STRESS DATA	C-1

ILLUSTRATIONS

Figure		Page
1	Test Setup - Loading Fixture to Skirt Attachment . .	6
2	Test Setup - Bending Deflection	7
3	Test Setup - Shear Deflections	8
4	Test Setup - Test Condition I, Pad Abort	9
5	Test Setup - Test Condition II, Max q Abort Tumbling .	10
6	Test Setup - Test Condition III, Max q Abort Tumbling .	11
7	Loading Configuration—Deflection Tests	14
8	Loading Configuration—Strength Verification Tests . .	14
9	Skirt Assembly After Failure	19

INTRODUCTION

This report documents the launch escape tower static structural test activity conducted in the S&ID Engineering Development Laboratories, Downey, California. Test data and conclusions based on analysis of the data are included in the report.

The launch escape tower structurally connects the launch escape system rocket motors to the command module and will transmit thrust, aerodynamic, and inertia loads during abort.

Critical loading for the tower will occur during tumbling abort from the launch pad and also during tumbling abort at maximum "q". Two critical load combinations exist for maximum "q" tumbling abort. The subject tests verified structural integrity of the tower for each of the three critical conditions and also determined deflection characteristics under unit loading.

Static loads were incrementally applied to the tower at various locations to simulate each of the three critical flight loading environments. Room temperature test load magnitudes were increased to compensate for elevated flight temperature.

Analysis of the test data indicated that the test article successfully withstood design limit loads without yielding and design ultimate loads without failure.

I. DESCRIPTION OF TEST ARTICLE

The test article was a complete launch escape tower structural assembly (B15-300002) consisting of a skirt-tower combination 135 inches in length (over-all). The assembly followed the prototype design with the exception that it did not include insulation or protective coating of any kind.

The skirt is a semi-monocoque structure in the form of a truncated cone. The skin is 0.140-inch 6AL-4V titanium sheet, which is attached to four titanium longerons tapering up from the four tower attach points. This structure was assembled according to Drawing V15-300202-61.

The escape tower is a 6AL-4V titanium welded truss structure. It has four main longitudinal members of 0.125-inch (thick) tubing, 3.5 inches in diameter. Connecting members are of 0.050-inch tubing, 2.5 inches in diameter. The skirt is attached to the tower at the upper ends of the longitudinal members by four 5B502-26 H16 bolts. The V15-300108-3 separation housings are welded to the lower ends of the longitudinal members. The tower truss structure is 118 inches long and approximately 36 by 36 inches wide at the top and 47 by 51 inches at the base. The tower structure was manufactured according to Drawing V15-300100-41.

II. TEST SETUP

The tower was mounted horizontally and attached to a steel test fixture by four MS 20018-64 bolts at the separation housings. These high-strength bolts were torqued to 580-1120 foot-pound. The separation housing lip was inserted into a matching recess in such a manner that shear loads were transferred to the test fixture through the housing lip, similar to the launch escape tower-command module attachment configuration. A steel loading fixture was attached to the skirt through which loads were applied to the tower structure as shown in Figure 1. The fixture was attached to the skirt through the rocket engine attach bolt ring. The weights of the loading apparatus and test specimen were counterbalanced to negate weight effects induced into the test specimen. Calibrated strain gage bending beams were used to measure structural deflections at the 20 locations shown in Figure A-1, Appendix. The instrumentation requirements also included 148 room temperature axial strain gages and two shear rosettes (installed at the locations shown in Figures A-2 through A-4, Appendix).

The test setups for Phase A, bending and shear deflection tests, are shown in Figures 2 and 3. Strain and deflection gages were recorded during the deflection tests.

The test setups for test conditions I and II, of the strength verification tests (Phase B), are shown in Figures 4 and 5 respectively. For test condition III, it was necessary to apply additional shear loads to the tower at stations $X_L = 34$ and $X_L = 59$, as shown in Figure 6.

During Phase B testing, a 10-channel Edison load maintainer was used to control the load in each hydraulic cylinder. Strain data were recorded on two 100-channel Consolidated Systems Corporation digital strain recorders.

The pyrotechnic bolts connecting the launch escape tower to the command module are insulated from the high temperatures of the tower structure. Since the bolts are designed for room temperature allowables, they were incapable of withstanding the increased loads for tower structure tests. For this reason, the spacecraft bolts could not be used.

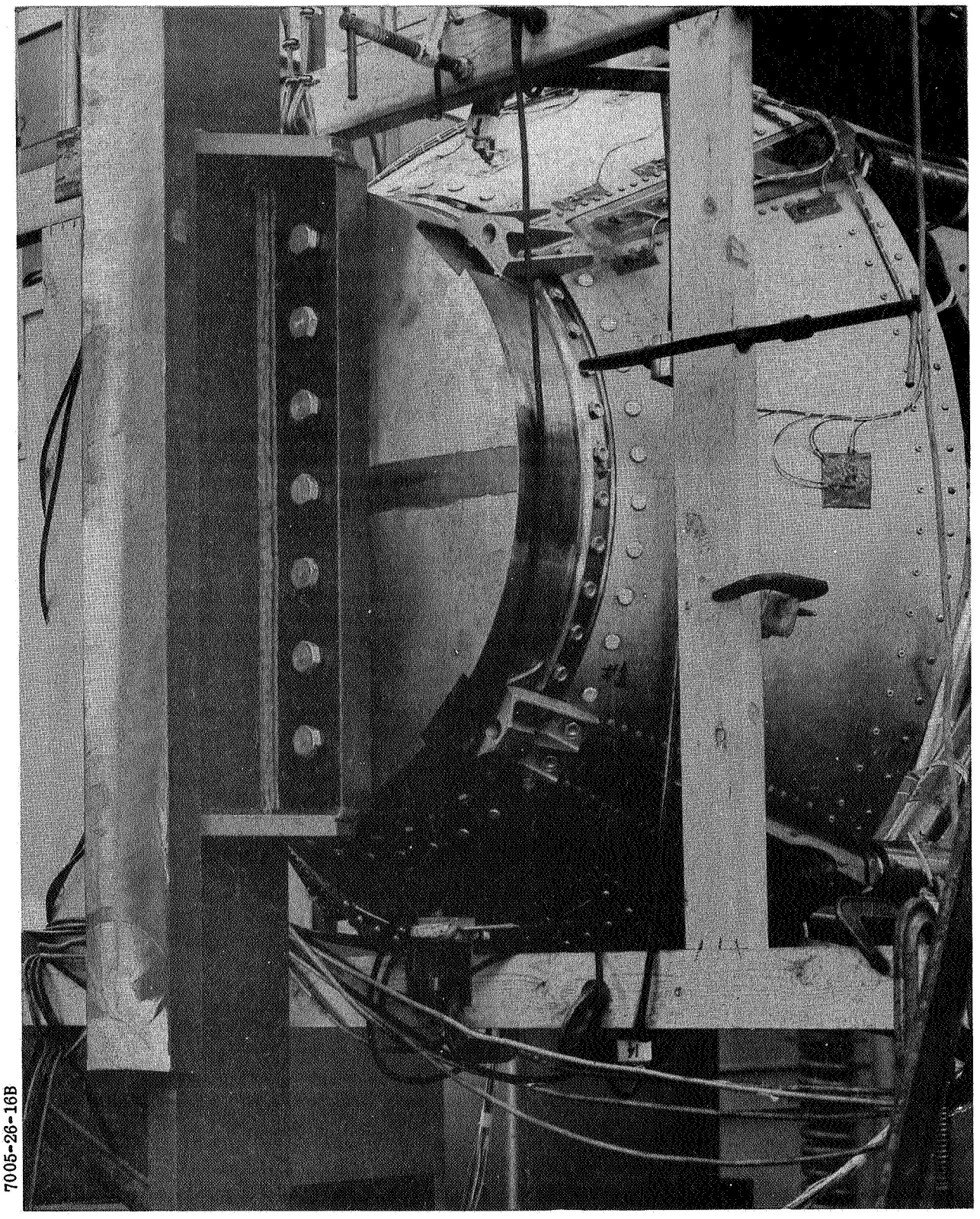

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Figure 1. Test Setup - Loading Fixture to Skirt Attachment

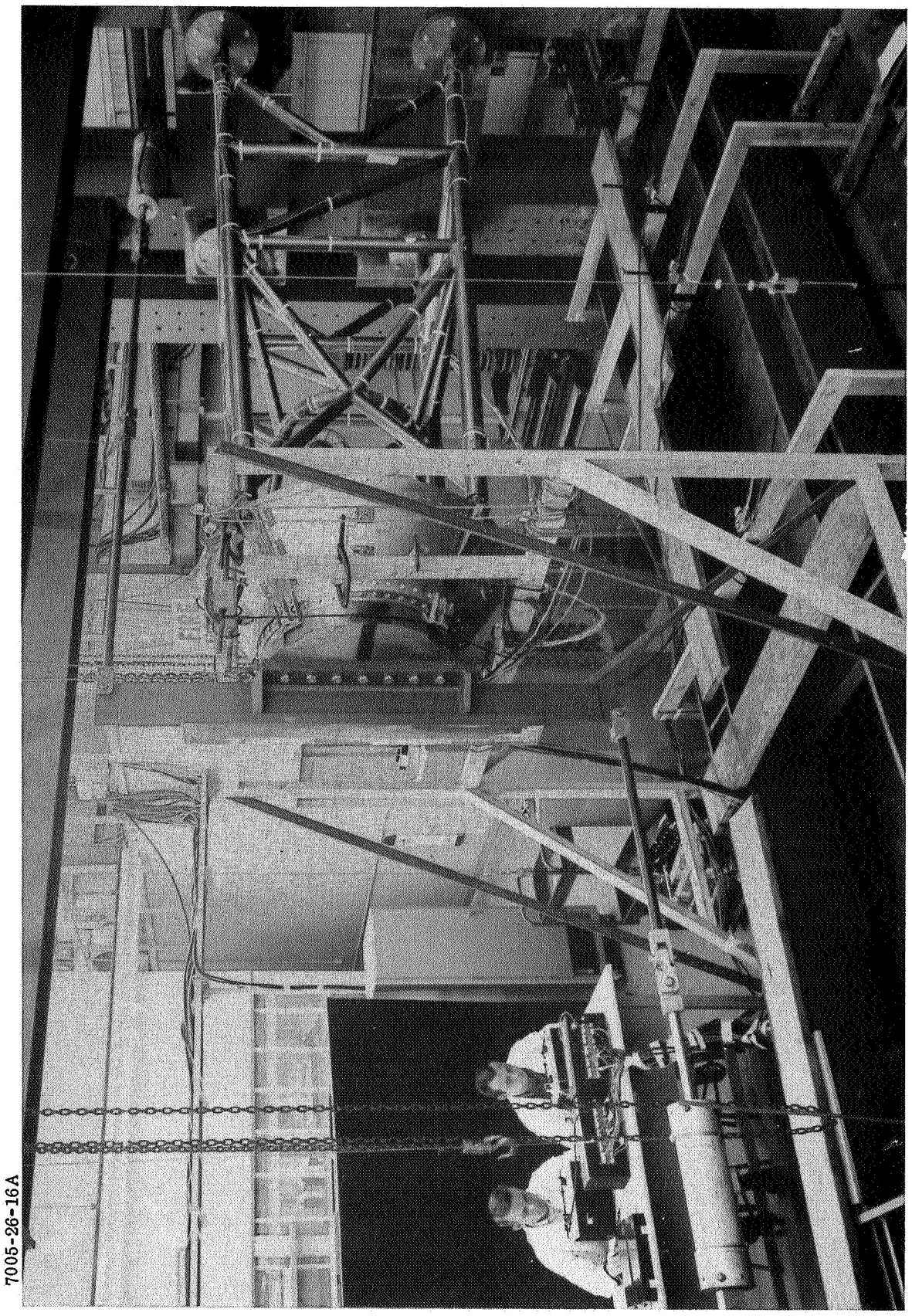

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Figure 2. Test Setup - Bending Deflection

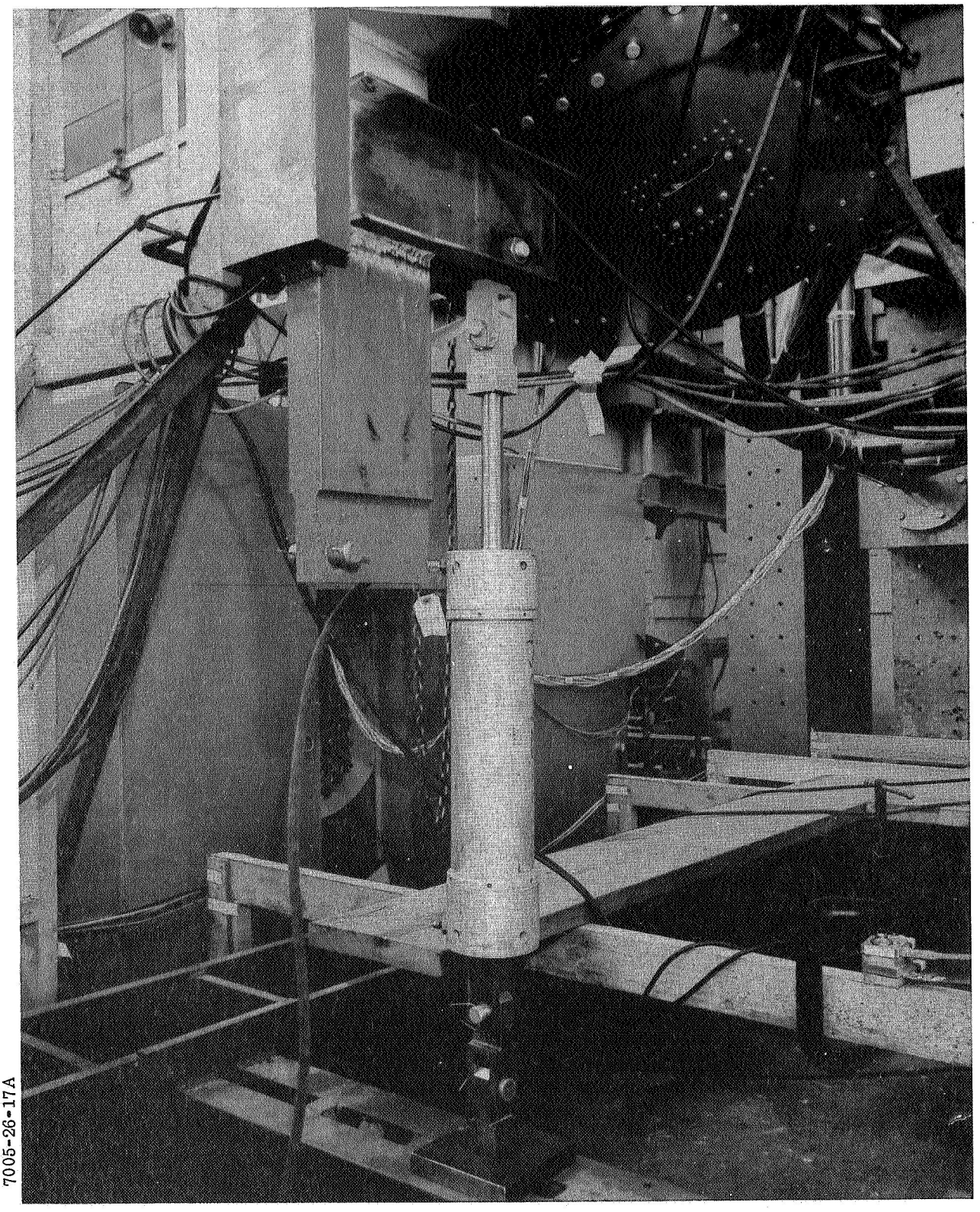

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Figure 3. Test Setup - Shear Deflections

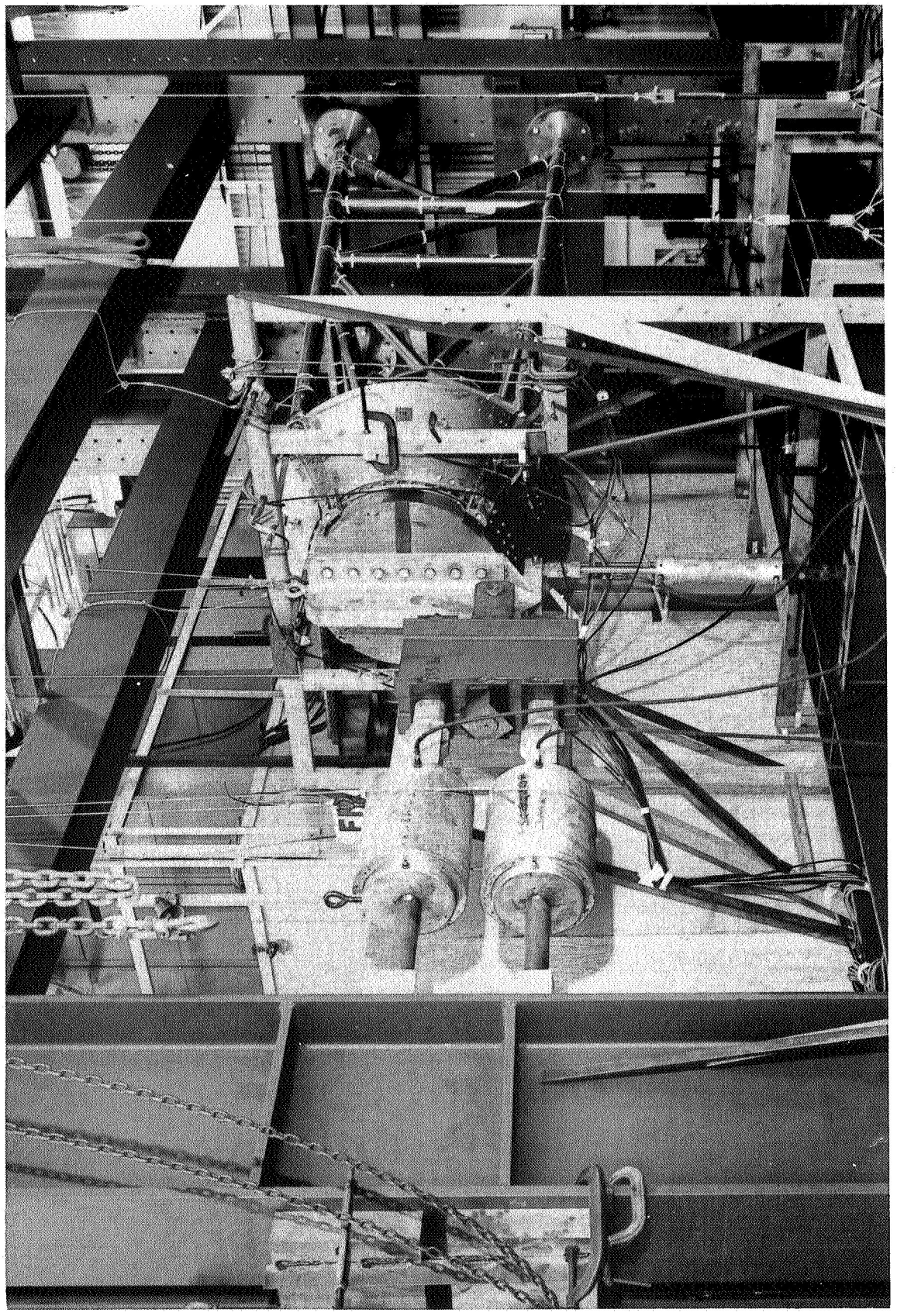

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Figure 4. Test Setup - Test Condition I Pad Abort

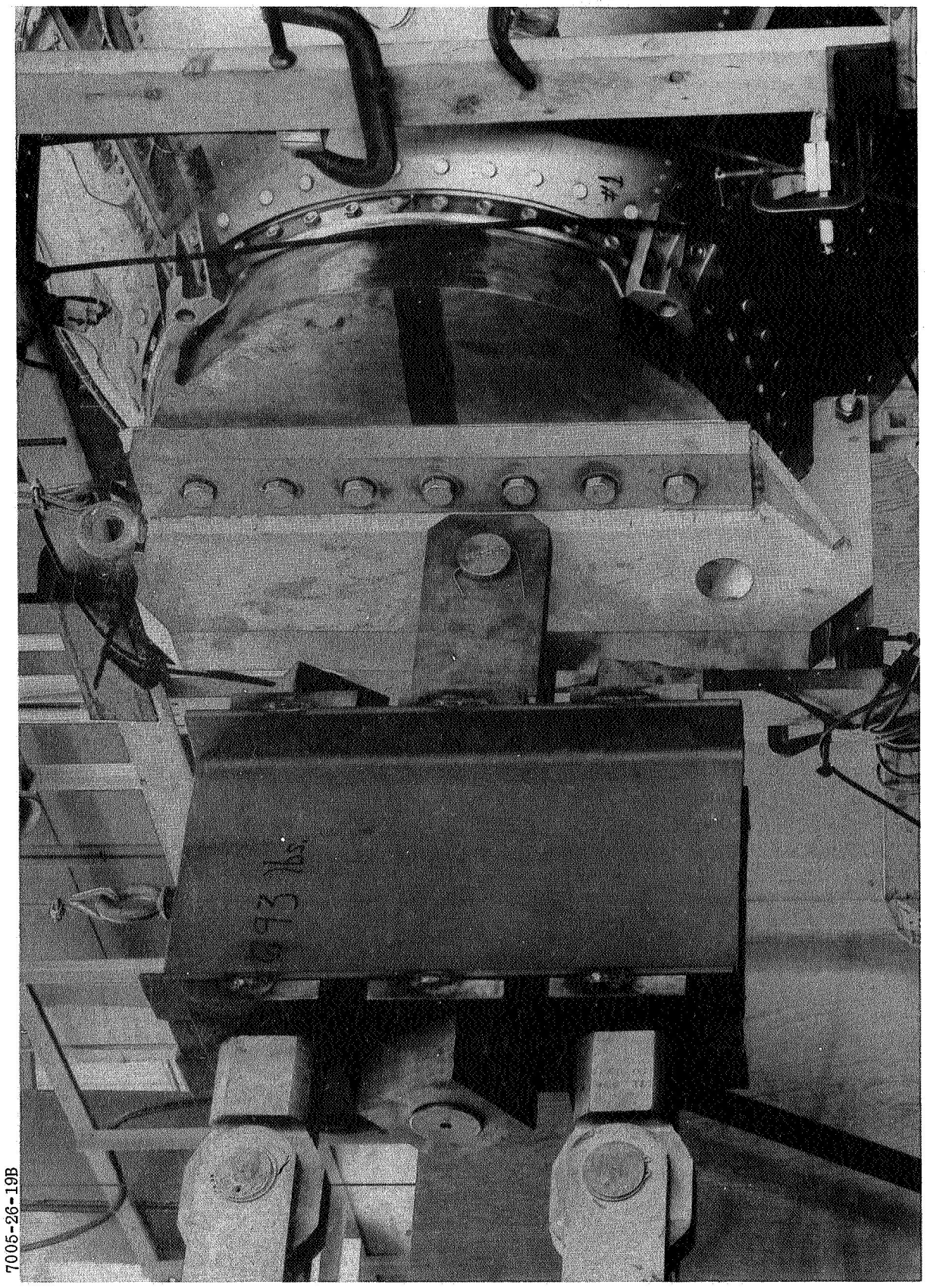

Figure 5. Test Setup - Test Condition II Max q Abort Tumbling

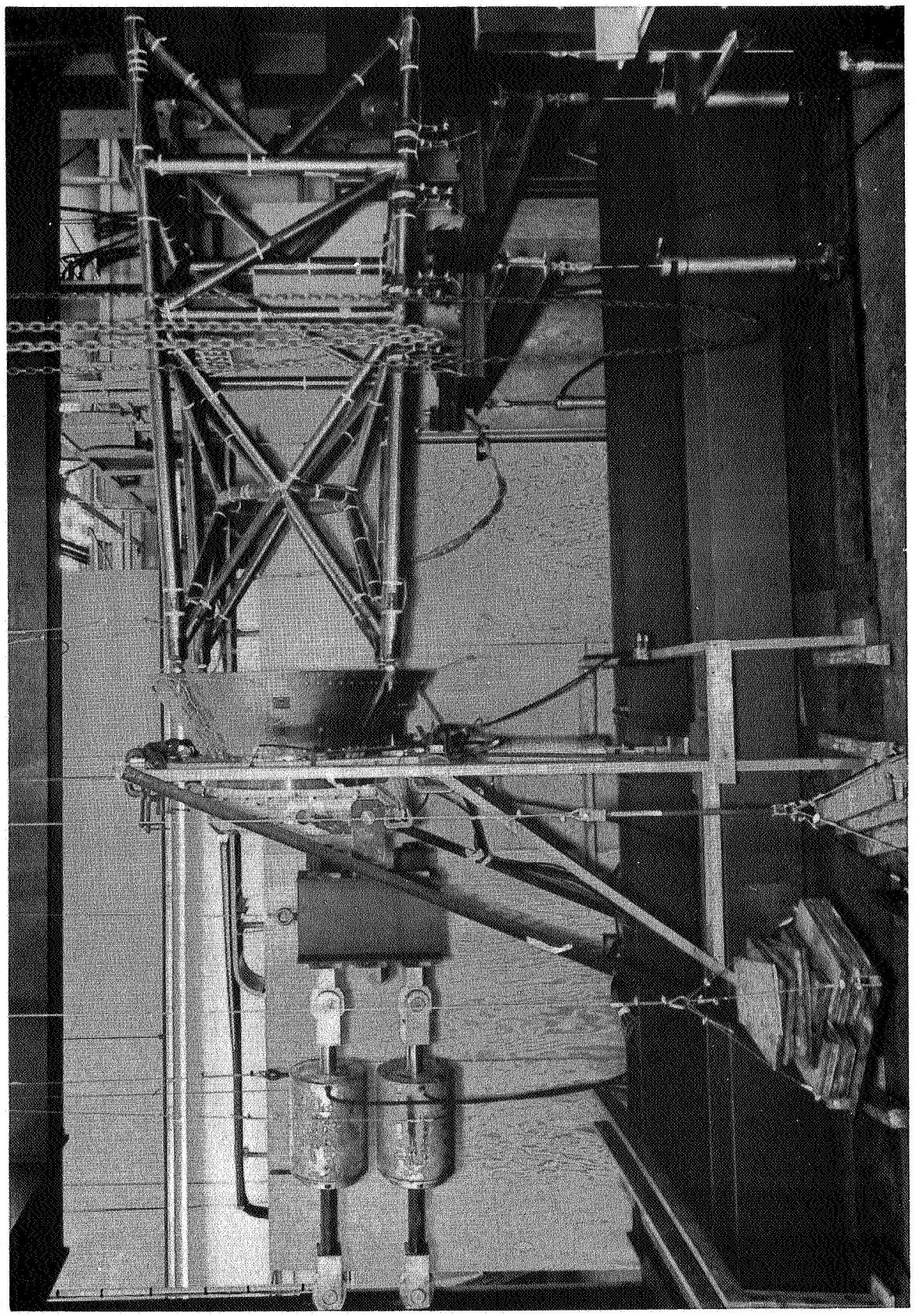

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Figure 6. Test Setup - Test Condition III Max q Abort Tumbling

III. TEST CONDITIONS

The test activity was performed in two phases. All tests were performed at room temperature.

DEFLECTION TESTS

The deflection tests were performed in two parts. The first consisted of incremental application of pure bending moment about the YY axis. The moment was applied as a couple up to 2,000,000 inch-pounds (Figure 7).

The second part of the deflection tests consisted of incremental application of shear force in the -Z direction. Force was applied up to 20,000 pounds (Figure 7).

STRENGTH VERIFICATION TESTS

Test load magnitudes for the strength verification tests were increased by factors derived from ratioing the allowable tensile strengths at 600 F (design temperature) and room temperature (Figure 8).

$$\text{For limit load: } \frac{120,000 \text{ psi (R. T.)}}{79,000 \text{ psi (600 F)}} = 1.52$$

$$\text{For ultimate load: } \frac{130,000 \text{ psi (R. T.)}}{97,000 \text{ psi (600 F)}} = 1.34$$

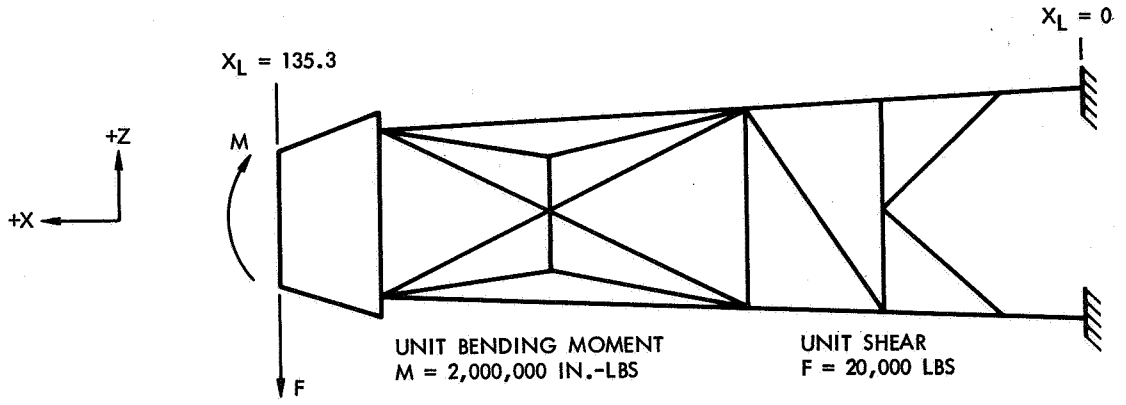
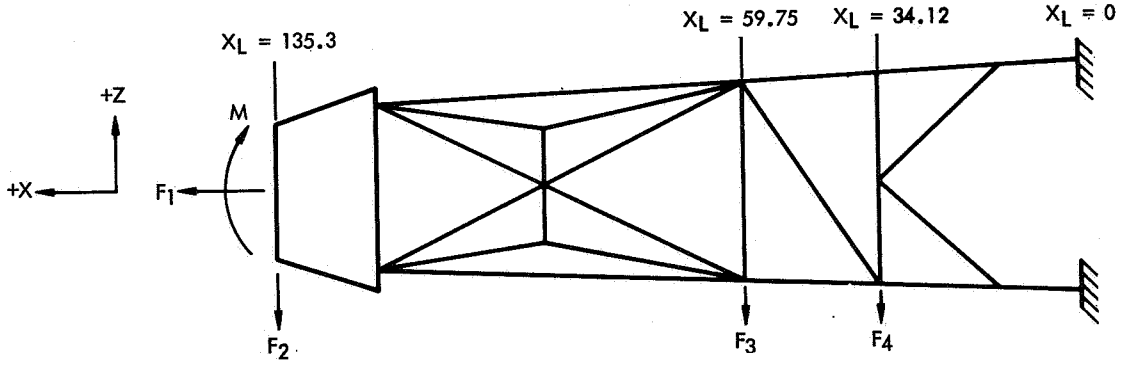


Figure 7. Loading Configuration—Deflection Tests



CONDITION	CONDITION I • TUMBLING PAD ABORT	CONDITION II • TUMBLING MAX "q" ABORT	CONDITION III •• TUMBLING MAX "q" ABORT
M (IN.-LB)	3,400,000	735,000	2,915,000
F_1 (LB)	247,000	354,000	212,000
F_2 (LB)	13,800	20,000	24,600
F_3 (LB)	—	—	11,600
F_4 (LB)	—	—	7,220

• REF. IOL-ALC-62-79 (CASES ID247 AND ID41) 28 SEPTEMBER 1962
FROM: R.F. STEVENSON TO: THOSE LISTED
SUBJECT: LOADS ON THE LAUNCH ESCAPE CONFIGURATION DURING PAD, MAX "q" AND VACUUM ABORTS

•• ARM-6 (CASE 4MqT - 119B)

Figure 8. Loading Configuration—Strength Verification Tests

IV. PROCEDURE

Testing was performed at room temperature in the following sequence:

Phase A - Deflection tests

1. Unit bending moment
2. Unit shear

Phase B - Strength verification tests

1. Condition II, tumbling max "q" abort (limit)
2. Condition I, tumbling pad abort (limit)
3. Condition I, tumbling pad abort (ultimate)
4. Condition II, tumbling max "q" abort (ultimate)
5. Condition III, tumbling max "q" abort (limit, ultimate, and destruction)

The test article was installed in the basic test setup and instrumented as described under Section II Test Setup.

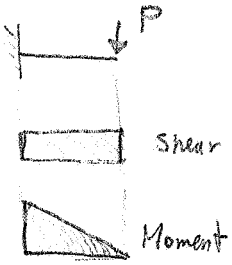
The specified unit bending moment was applied in ten equal increments. Deflection measurements were recorded at each stabilized load increment.

The unit shear test was similarly performed to complete the Phase A deflection tests.

For Phase B, test conditions I and II (both limit and ultimate runs), the loading environments were increased to specified magnitudes in increments of 10 percent.

Test condition III loads were applied in 10-percent increments of ultimate to 140-percent ultimate. (Structural failure occurred in the skirt assembly at 140 percent.)

second order effect for four-legged tines. RAP



applied tip load does not produce a unit shear analytically, it produces combined bending and shear; ~~and~~ deflections and rotations will be generally 90% bending and 10% shear

What about bending deflection in negative direction near root for pure moment case, fig B-1, p. B-1. This condition appears to violate all rules of engineering mechanics

RAPride 12-30-64

V. RESULTS

PHASE A - DEFLECTION TESTS

A comparison of the test data with the predicted deflection characteristics of the tower structure shows that the test specimen was somewhat stiffer than anticipated. This difference is largely due to the fact that the analytical model used in the predictions was a two-dimensional truss with pinned joints at the skirt and command module interfaces. Therefore, the mounting of the test specimen to the structural skirt at the top and to a heavy jig at the base produced considerable end fixity of the tower legs and resulted in correspondingly low deflections.

An incongruity was evident in the tower rotations measured during part 2 (shear loading) of Phase A. The data indicate that the structure was considerably less stiff in this mode than predicted. It can be demonstrated analytically for any elastic structure that the lateral deflection under a unit moment must be equal to the rotation for a unit shear load. The tower rotations measured in part 2 are in significant variance with this principle and with the predictions.

Deflection data plots are enclosed as Appendix B of this report.

PHASE B - STRENGTH VERIFICATION

The structure was subjected to three separate loading conditions during the test. These conditions are representative of the critical design loads which were current at the time of the test.

Actual design loads were produced at a critical station, on the structure, for each of the three test conditions. Conditions I and II represent critical design loading at the top of the tower (X_L 118.3) and condition III produces critical loading at the base (X_L0).

All test objectives of Phase B were satisfied. Strain data recorded during the test show that all measured strains increased in proportion to the load up to 100 percent of limit. Stress readings did not exceed the yield point of the material, and all stress versus load plots were linear below limit loads; this indicated no load redistribution. Maximum recorded stress was 90,790 psi. There were no significant residual stresses after the loads were removed. No structural failure occurred up to 100 percent of ultimate load.

Loading condition III was continued after reaching ultimate load in order to satisfy the test objective, which called for determining the maximum load capability and mode of failure of the structure. The loads were increased by 10-percent increments until at 140 percent of ultimate load, a failure occurred in the structural skirt (Figure 9). The rivets which attach the skin to the skirt longeron failed in shear. This propagated failures in the attachments of the skin to the lower ring and the longeron to the upper ring. After this failure the structure was incapable of carrying further loads, and the test was stopped.

The complete reduced stress data for the ultimate conditions are enclosed as Appendix C of this report.

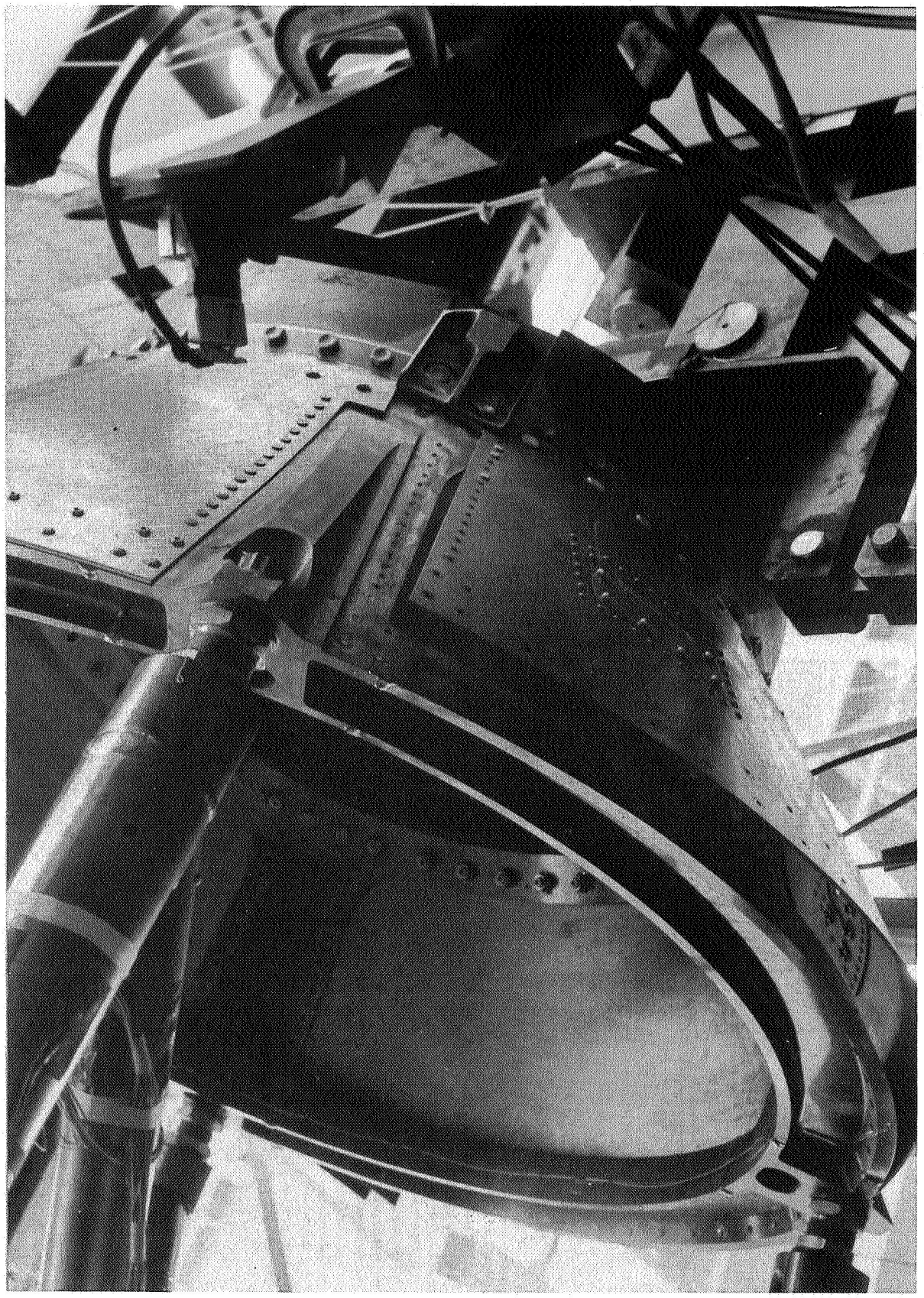


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Figure 9. Skirt Assembly After Failure (Sheet 1 of 4)

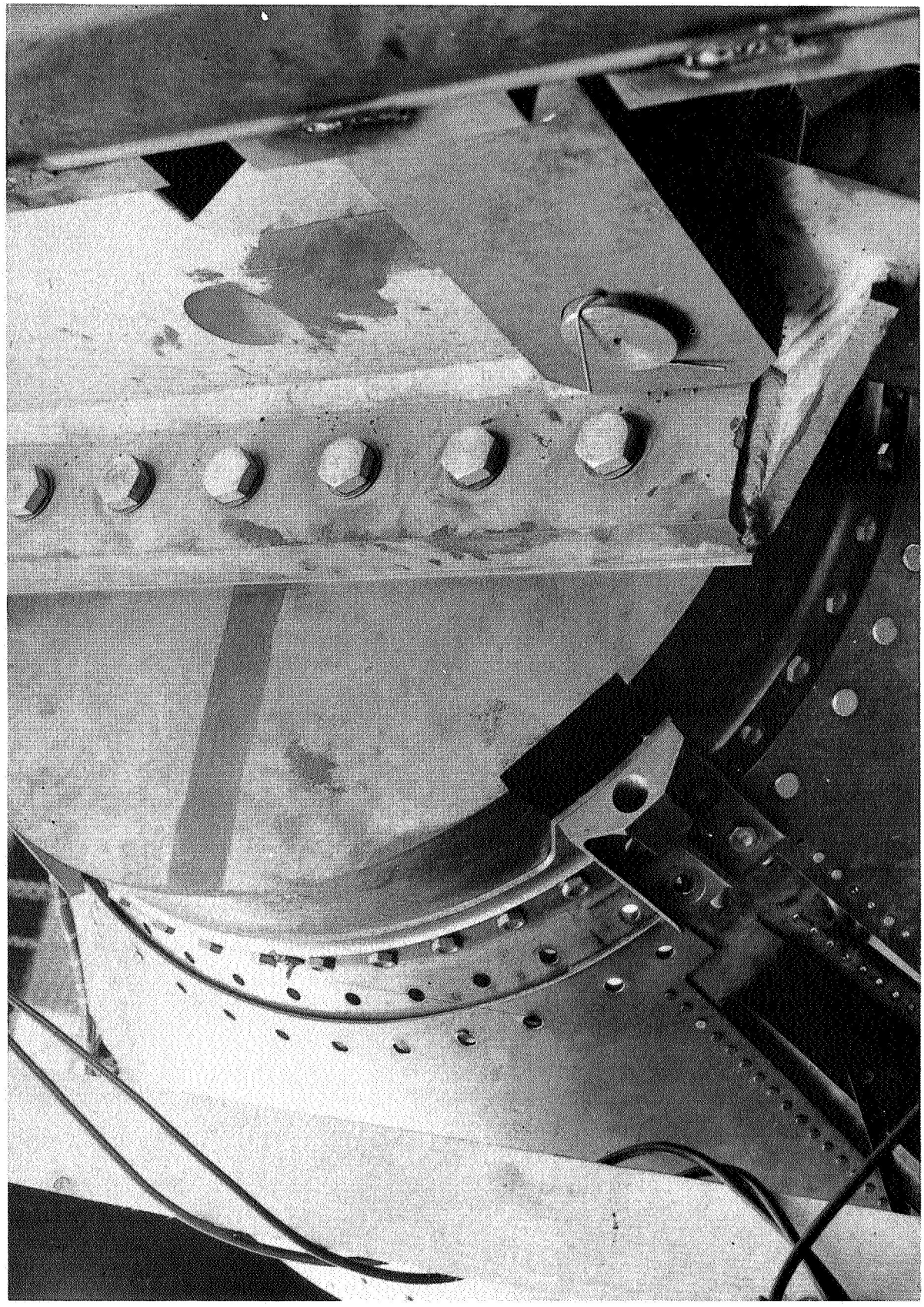

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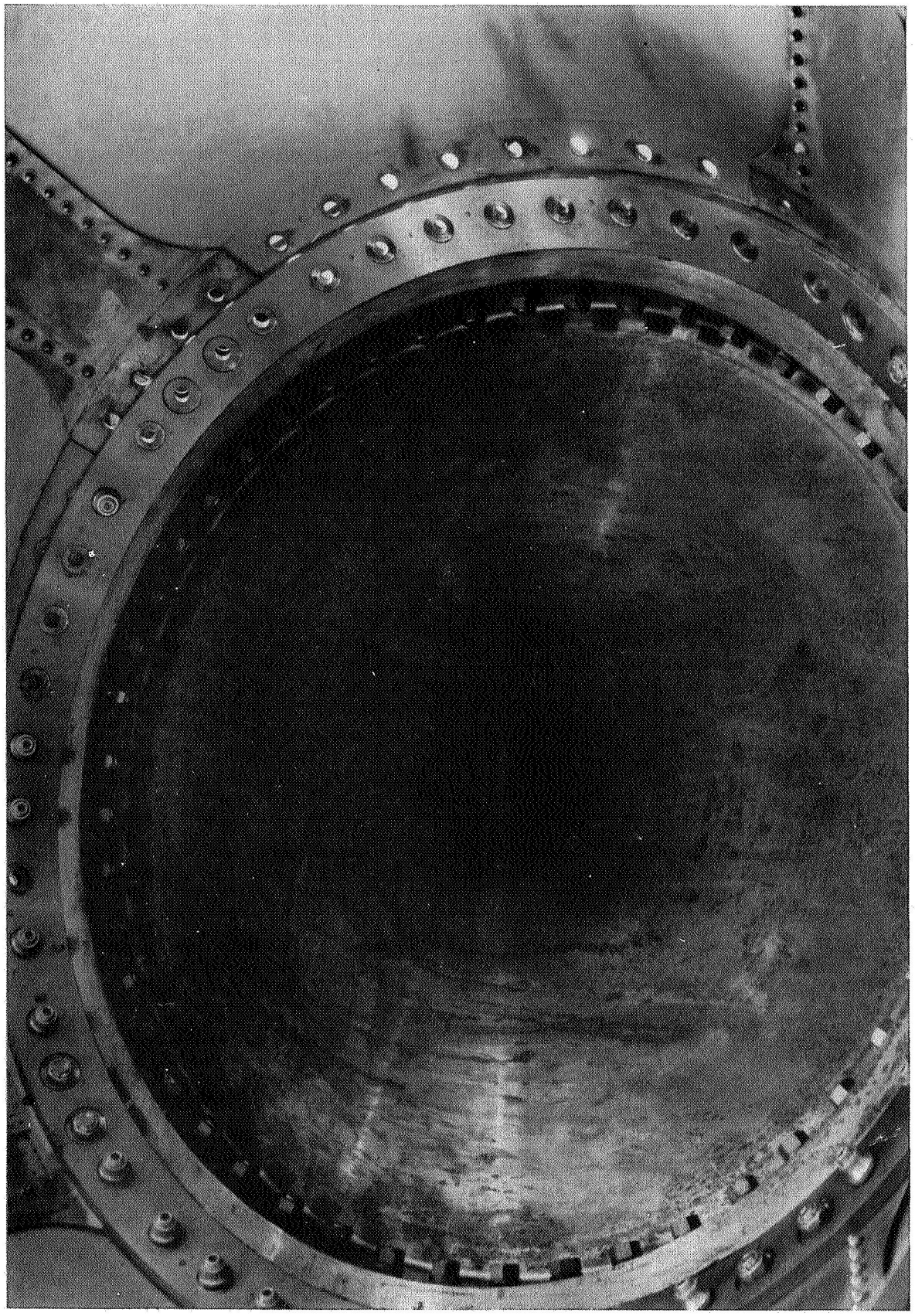
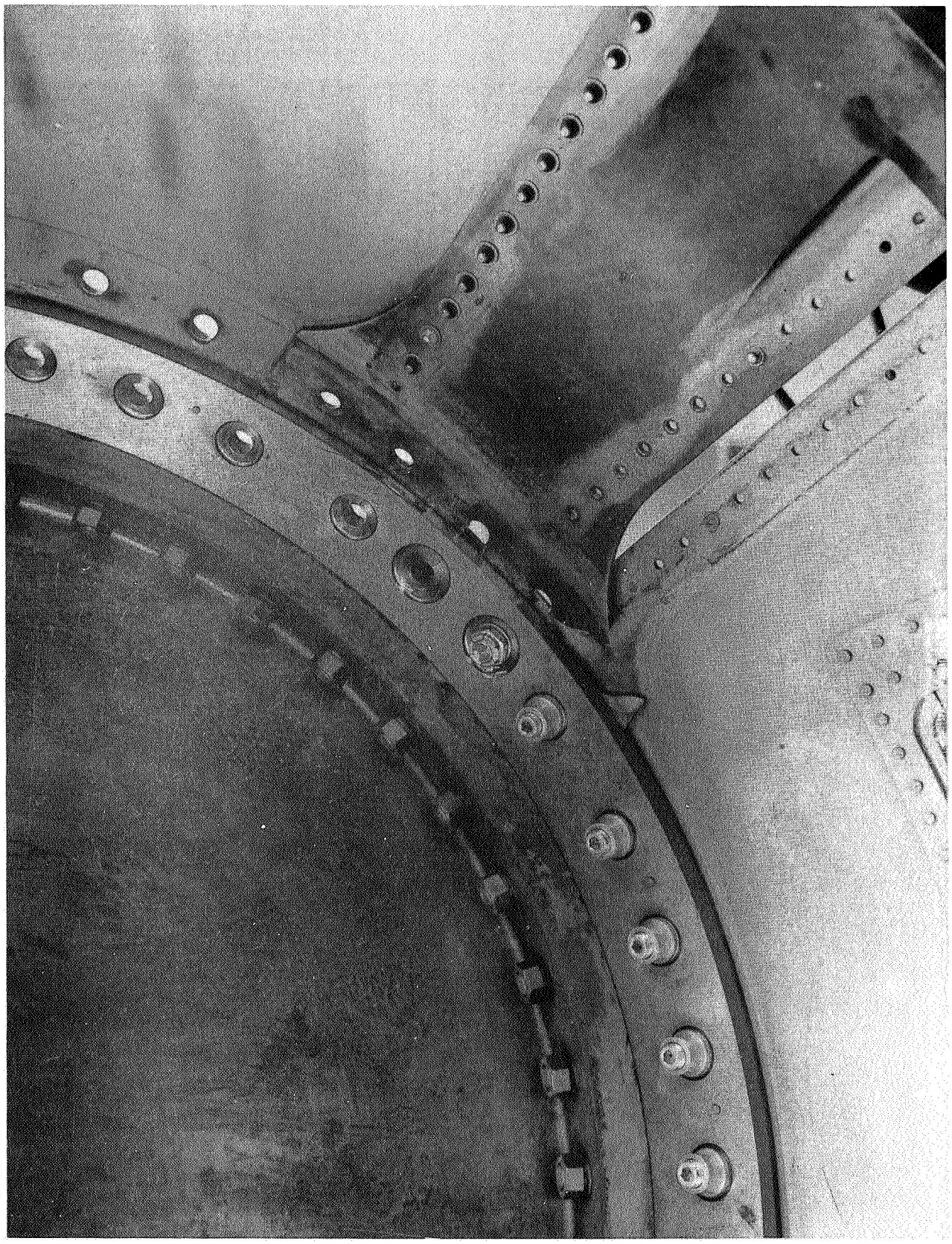
Figure 9. Skirt Assembly After Failure (Sheet 2 of 4)



7005-26-27C

Figure 9. Skirt Assembly After Failure (Sheet 3 of 4)



7005-26-27E

Figure 9. Skirt Assembly After Failure (Sheet 4 of 4)

APPENDIX A

INSTRUMENTATION LIST AND LOCATIONS

STRAIN GAGE CONVERSION TABLE

Gage No.	Description	Location In Figure
1	Skirt	1
2	Skirt	2
3	Skirt	3
4	Skirt	4
5	Skirt	5
6	Skirt	6
7	Skirt	7
8	Skirt	8
9	Skirt	9
10	Skirt	10
11	Skirt	11
12	Skirt	12
13	Skirt	13
14	Skirt	14
15	Skirt	15
16	Skirt	16
17	Skirt	17
18	Skirt	18
19	Skirt	19
20	Skirt	20
21	Skirt	21
22	Skirt	22
23	Leg	23
24	Leg	23
25	Leg	23
26	Leg	23
27	Leg	24
28	Leg	24
29	Leg	24
30	Leg	24
31	Leg	25
32	Leg	25
33	Leg	25
34	Leg	25
35	Leg	26

Gage No.	Description	Location In Figure
36	Leg	26
37	Leg	26
38	Leg	26
39	Leg	27
40	Leg	27
41	Leg	27
42	Leg	27
43	Leg	28
44	Leg	28
45	Leg	28
46	Leg	28
47	Leg	29
48	Leg	29
49	Leg	29
50	Leg	29
51	Leg	30
52	Leg	30
53	Leg	30
54	Leg	30
55	Leg	31
56	Leg	31
57	Leg	31
58	Leg	31
59	Leg	32
60	Leg	32
61	Leg	32
62	Leg	32
63	Leg	33
64	Leg	33
65	Leg	33
66	Leg	33
67	Leg	34
68	Leg	34
69	Leg	34
70	Leg	34
71	Ring	35
72	Ring	35
73	Ring	35
74	Ring	35
75	Ring	36
76	Ring	36
77	Ring	36

Gage No.	Description	Location In Figure
78	Ring	36
79	Ring	37
80	Ring	37
81	Ring	37
82	Ring	37
83	Ring	38
84	Ring	38
85	Ring	38
86	Ring	38
87	Ring	39
88	Ring	39
89	Ring	39
90	Ring	39
91	Ring	40
92	Ring	40
93	Ring	40
94	Ring	40
95	Strut	41
96	Strut	42
97	Strut	43
98	Strut	44
99	Strut	45
100	Strut	46
101	Strut	47
102	Strut	48
103	Strut	49
104	Strut	50
105	Strut	51
106	Strut	52
107	Strut	53
108	Leg	54
109	Strut	55
110	Leg	56
111	Strut	57
112	Leg	58
113	Strut	59
114	Leg	60
115	Strut	61
116	Strut	61
117	Strut	61
118	Strut	62
119	Strut	62
120	Strut	62

Gage No.	Description	Location In Figure
121	Strut	63
122	Strut	63
123	Strut	63
124	Strut	64
125	Strut	64
126	Strut	64
127	Strut	65
128	Leg	66
129	Strut	67
130	Strut	68
131	Leg	69
132	Leg	70
133	Strut	71
134	Strut	72
135	Strut	73
136	Strut	74
137	Leg	75
138	Strut	76
139	Leg	77
140	Leg	77
141	Leg	77
142	Leg	77
143	Leg	78
144	Leg	78
145	Leg	78
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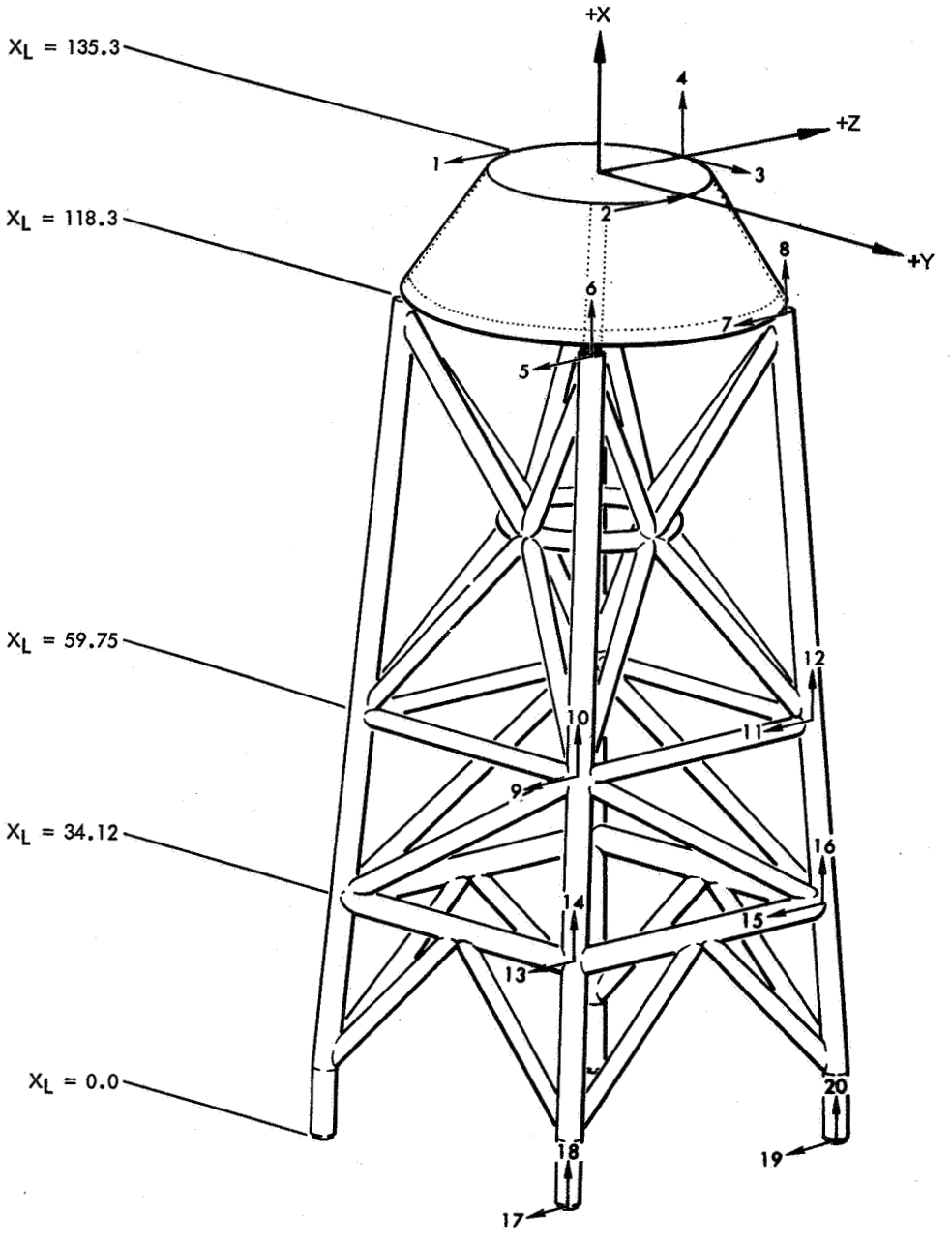
153	Leg	80
154	Leg	80



ARROW INDICATES DIRECTION OF POSITIVE DEFLECTION

Figure A-1. Deflection Indicator Location

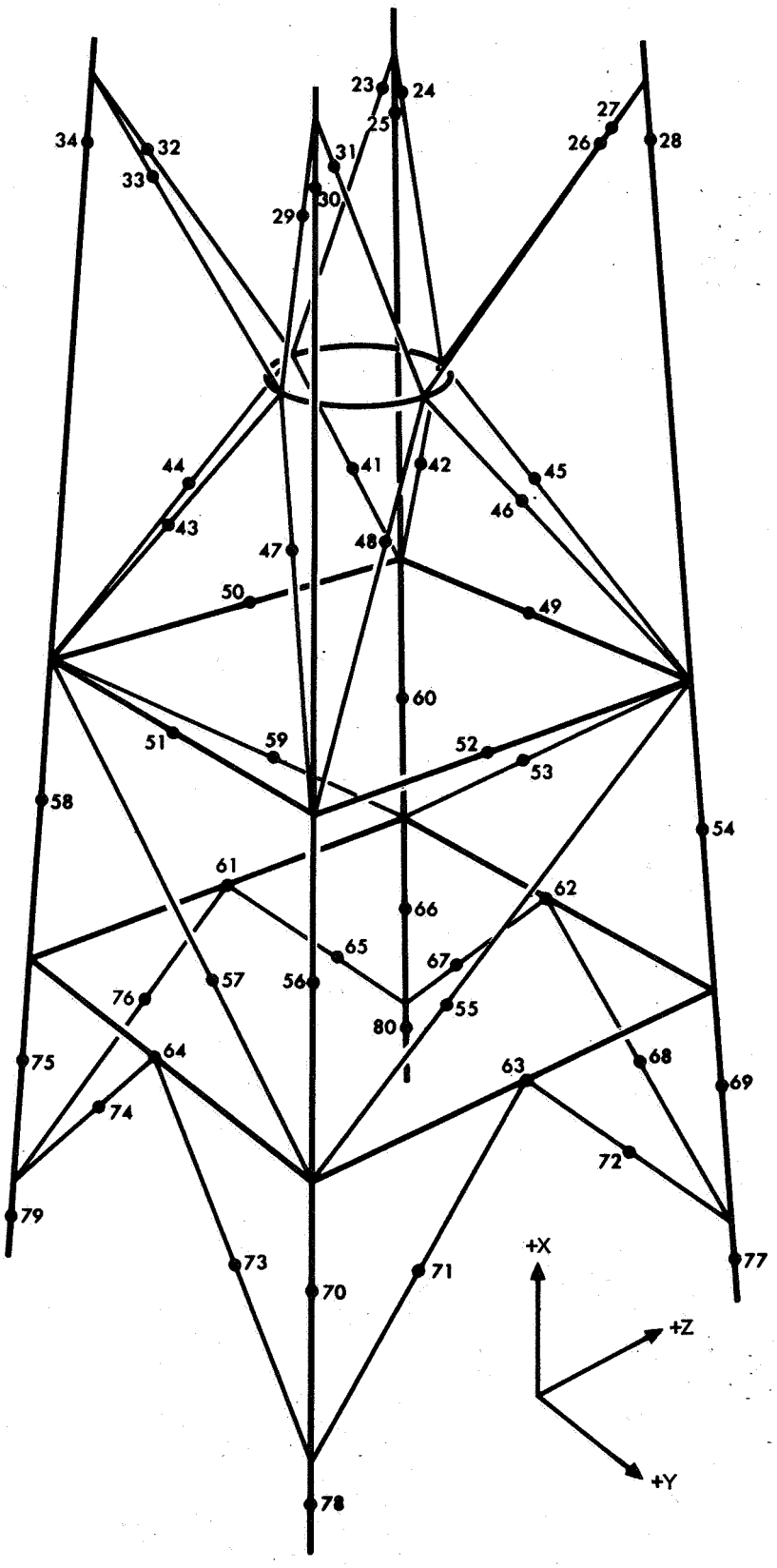


Figure A-2. Tower Truss Strain Gage Location

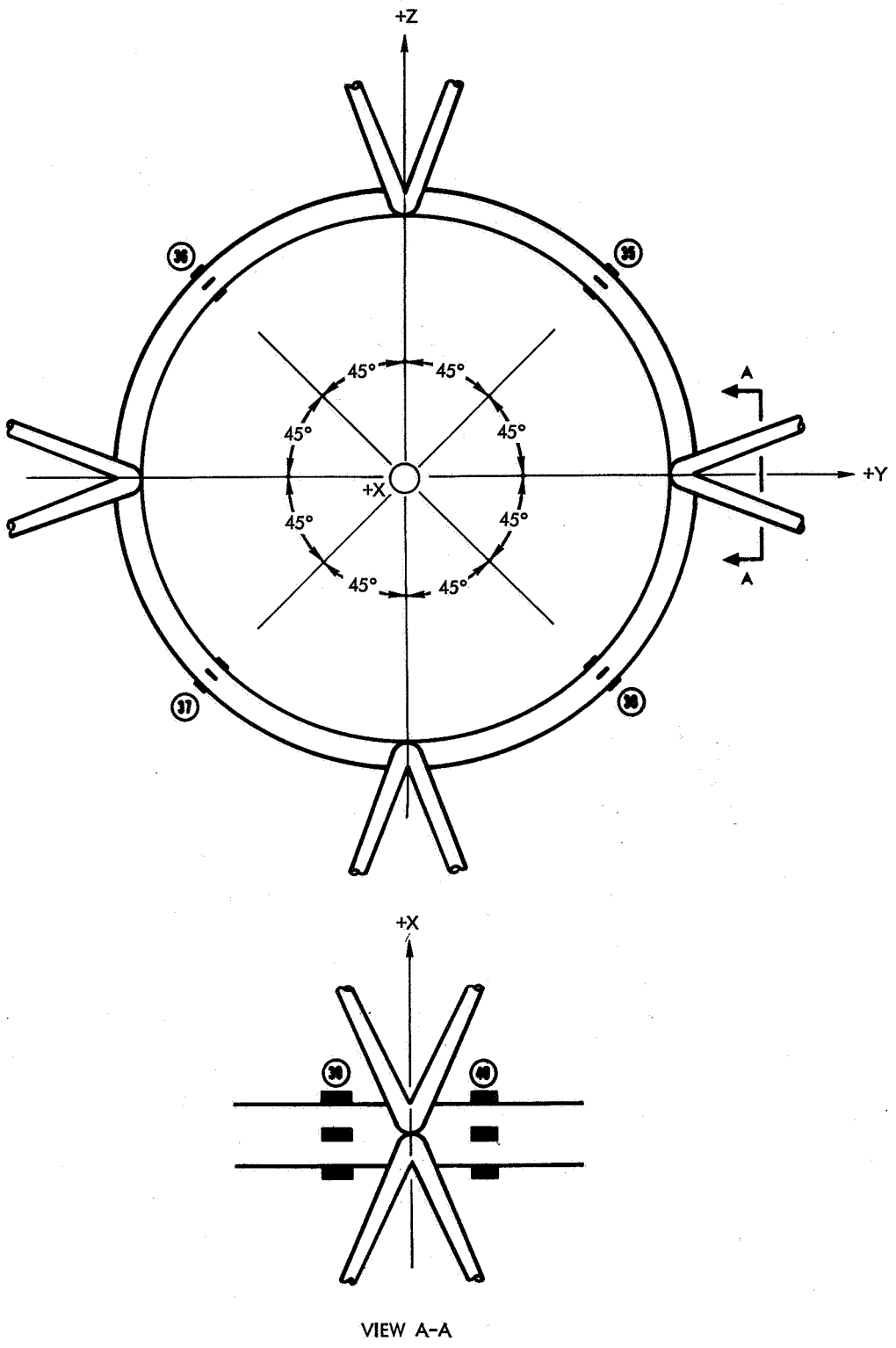
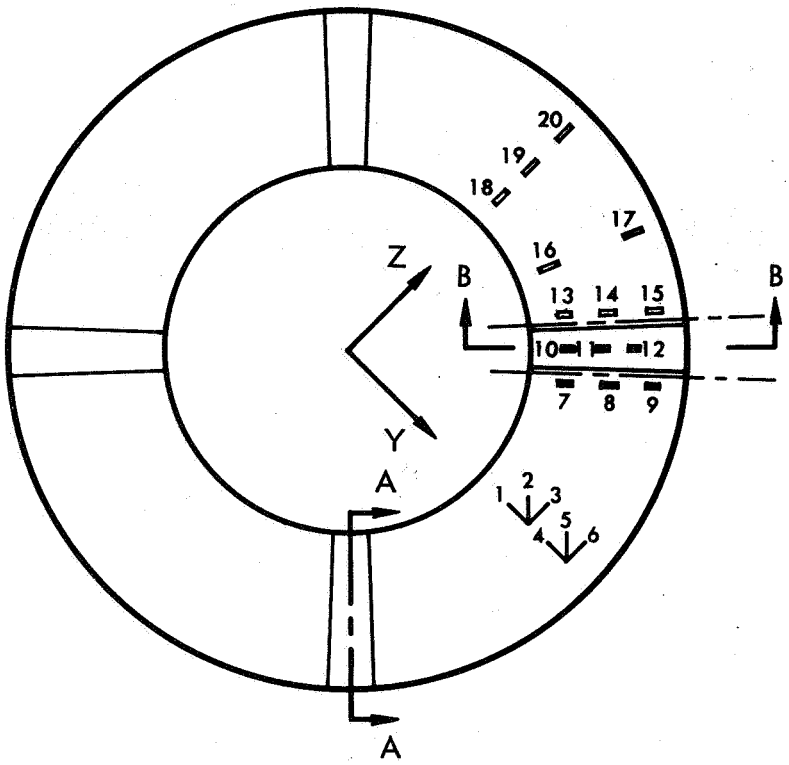
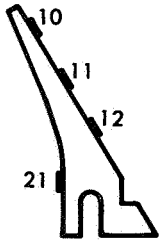
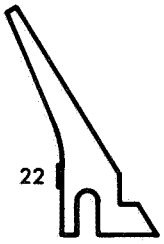


Figure A-3. Tower Ring Strain Gage Locations





SECTION B-B



SECTION A-A

NOTE:
GAGES 21 AND 22 MEASURE STRAIN PERPENDICULAR TO PLANE OF PAPER

Figure A-4. Skirt Strain Gage Locations

APPENDIX B

PHASE A - DEFLECTION PLOTS

PART I

UNIT BENDING MOMENT

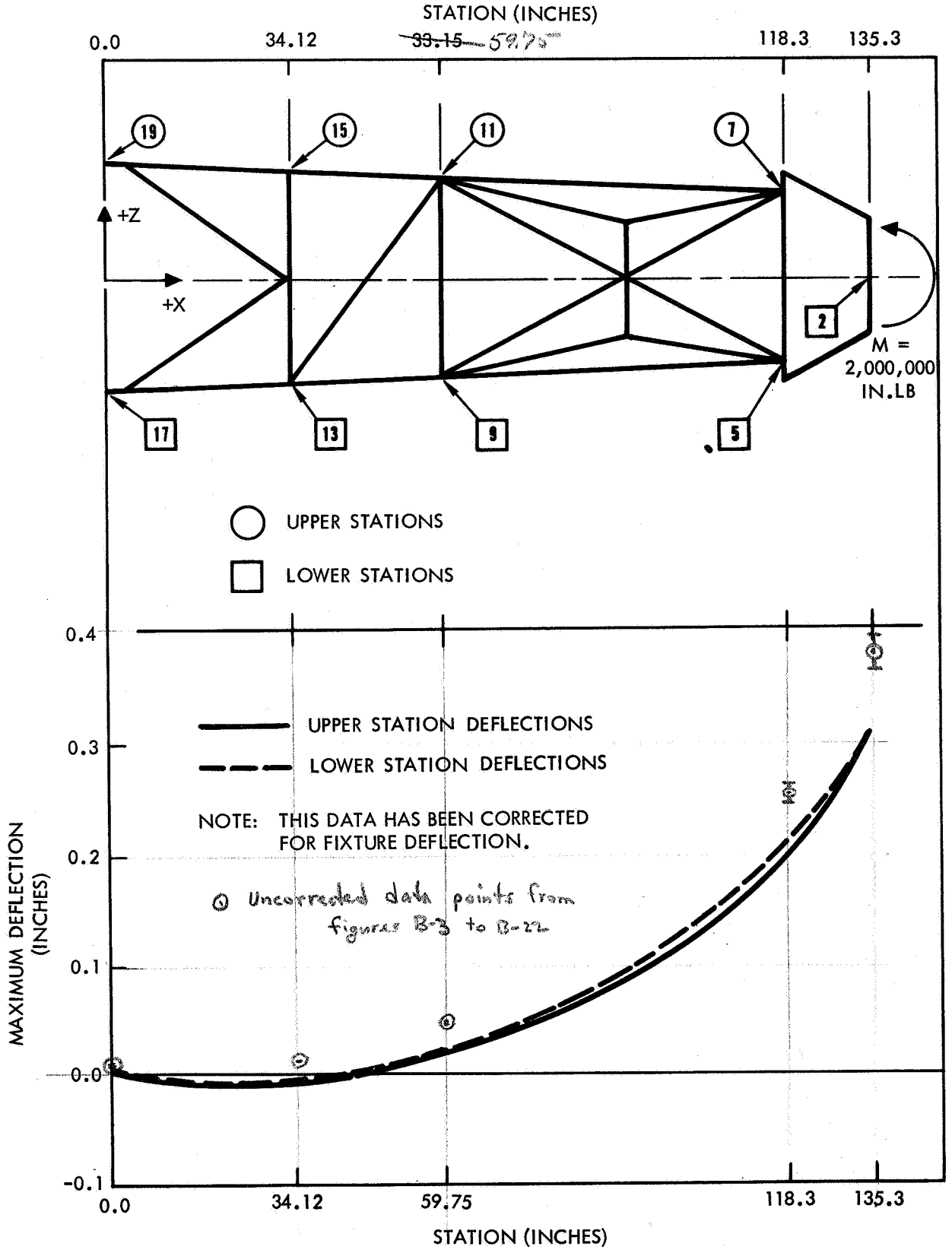


Figure B-1. Deflections Resulting From Bending Moment

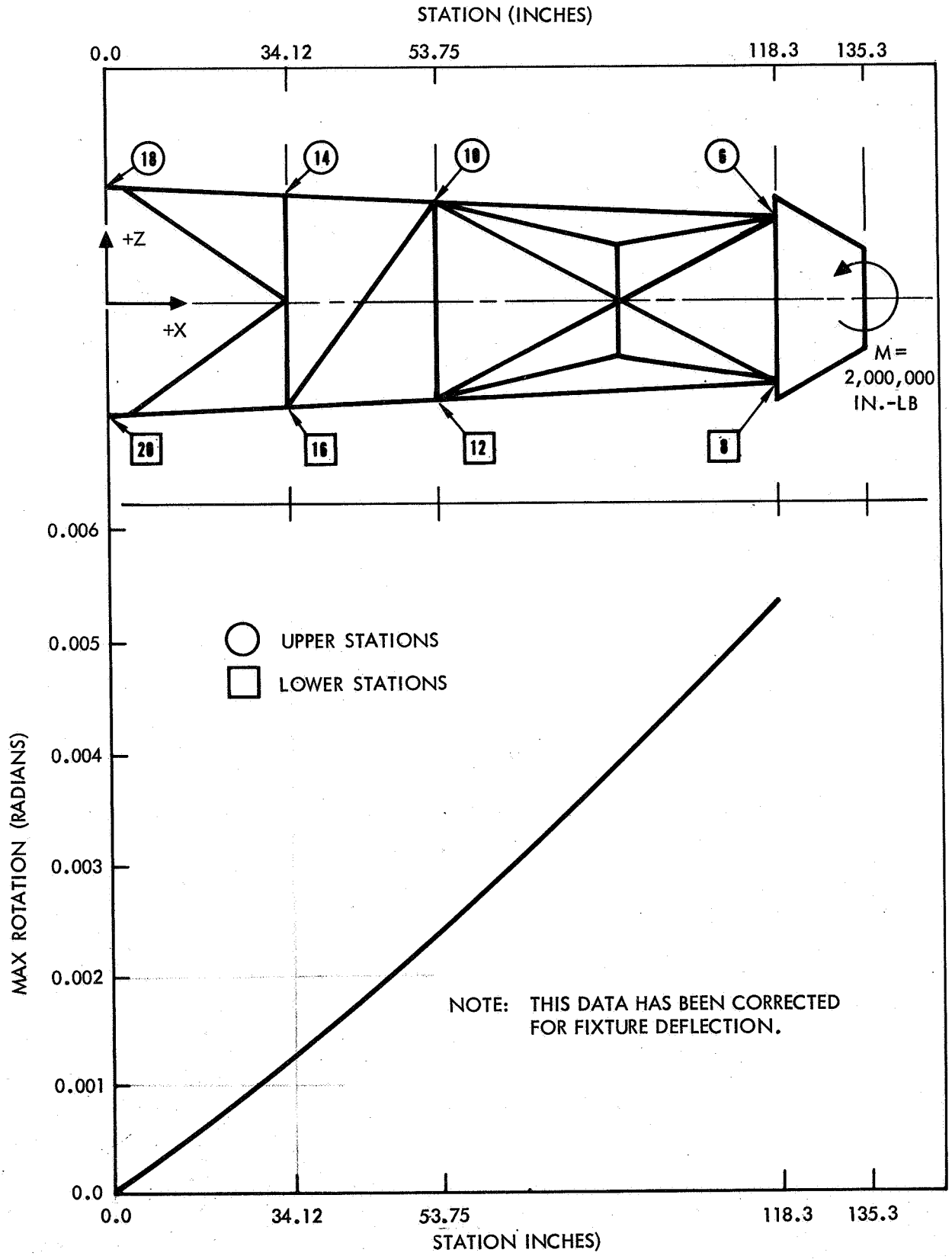


Figure B-2. Rotations Resulting From Bending Moment

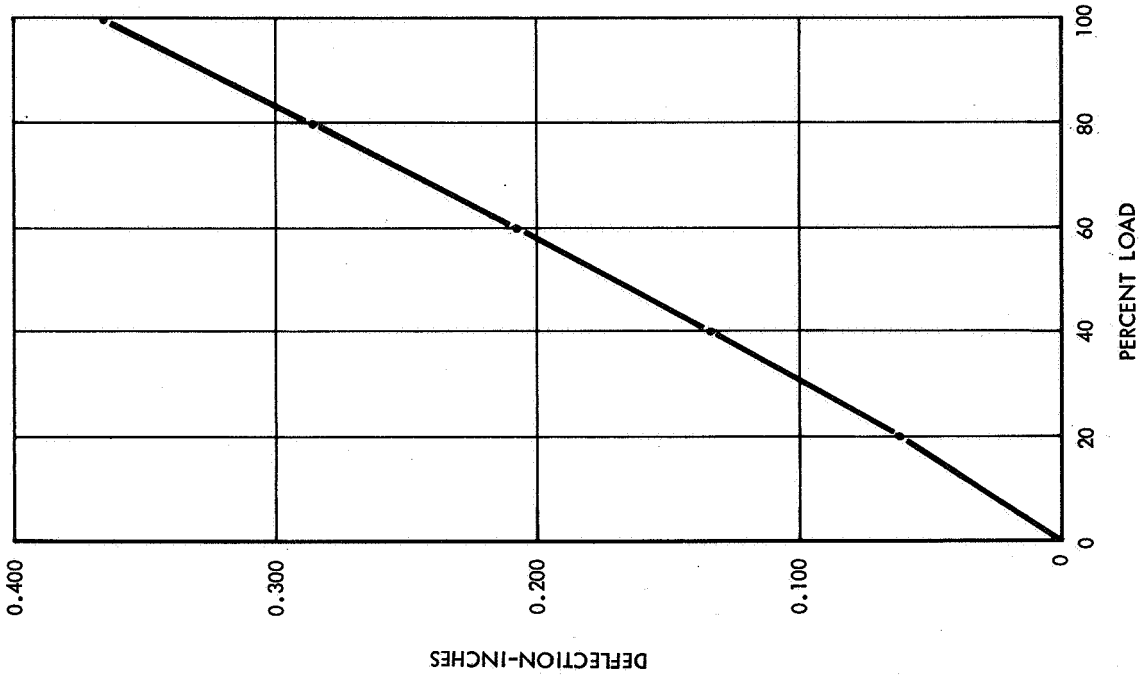


Figure B-4. Tower Location 2

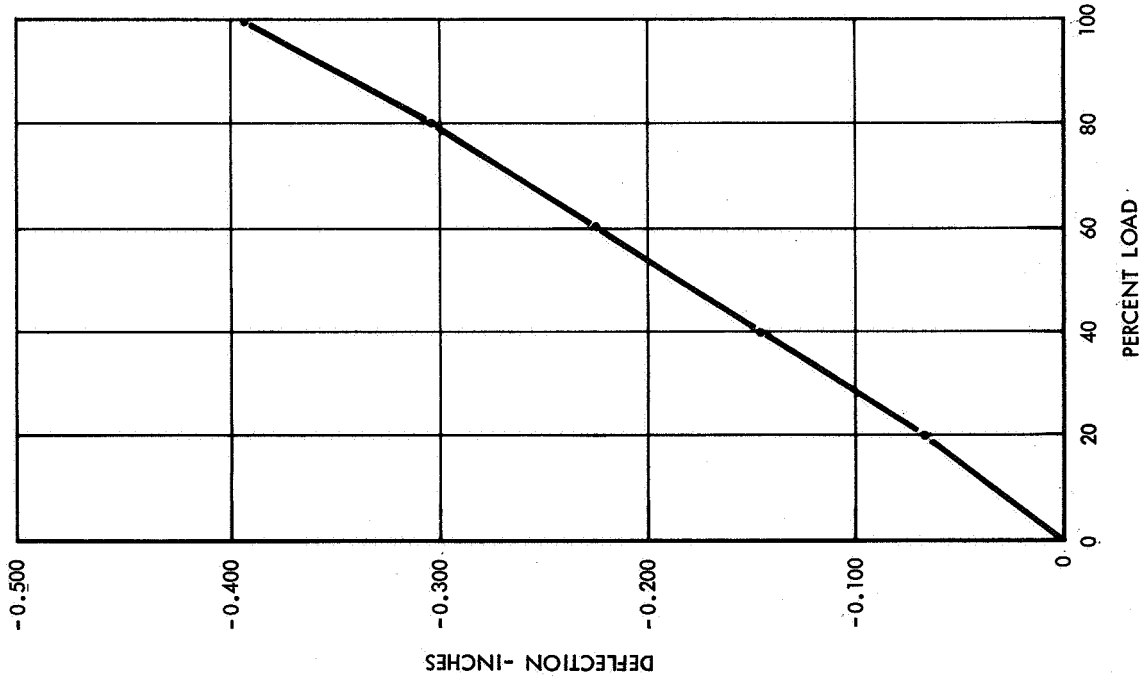


Figure B-3. Tower Location 1

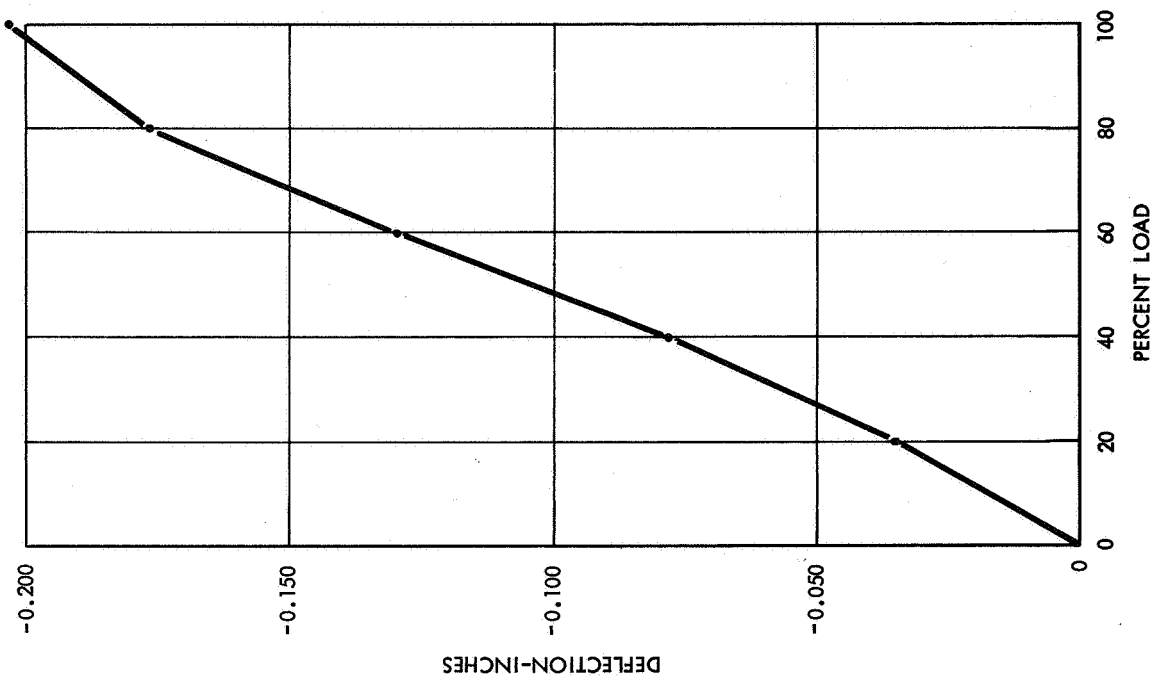


Figure B-6. Tower Location 4

Figure B-5. Tower Location 3

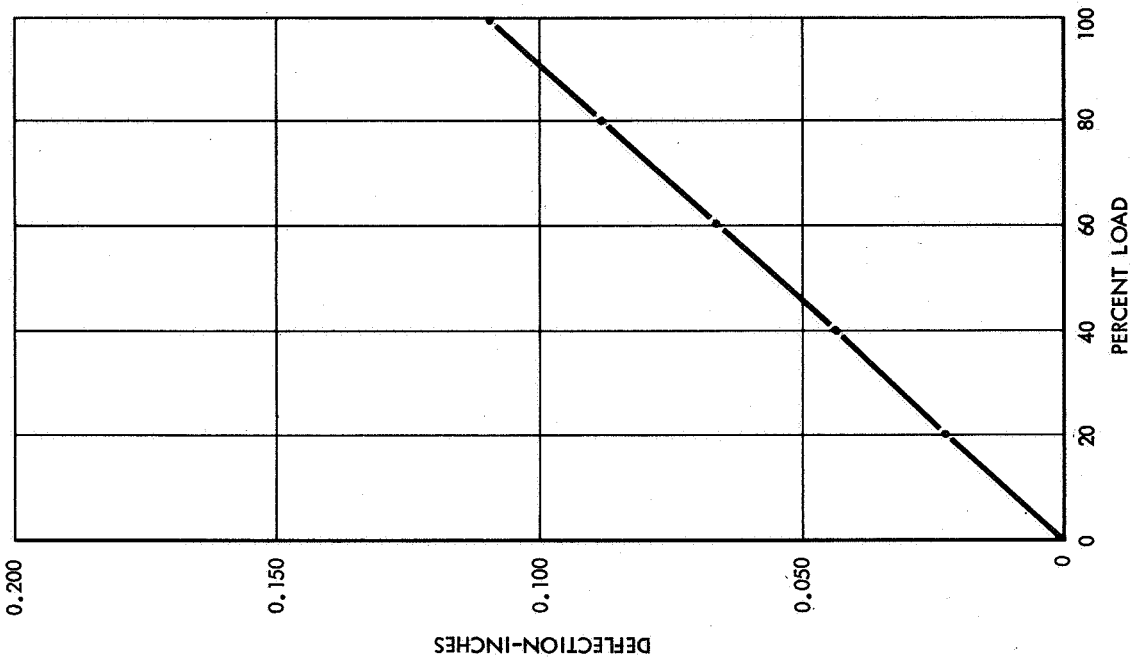


Figure B-8. Tower Location 6

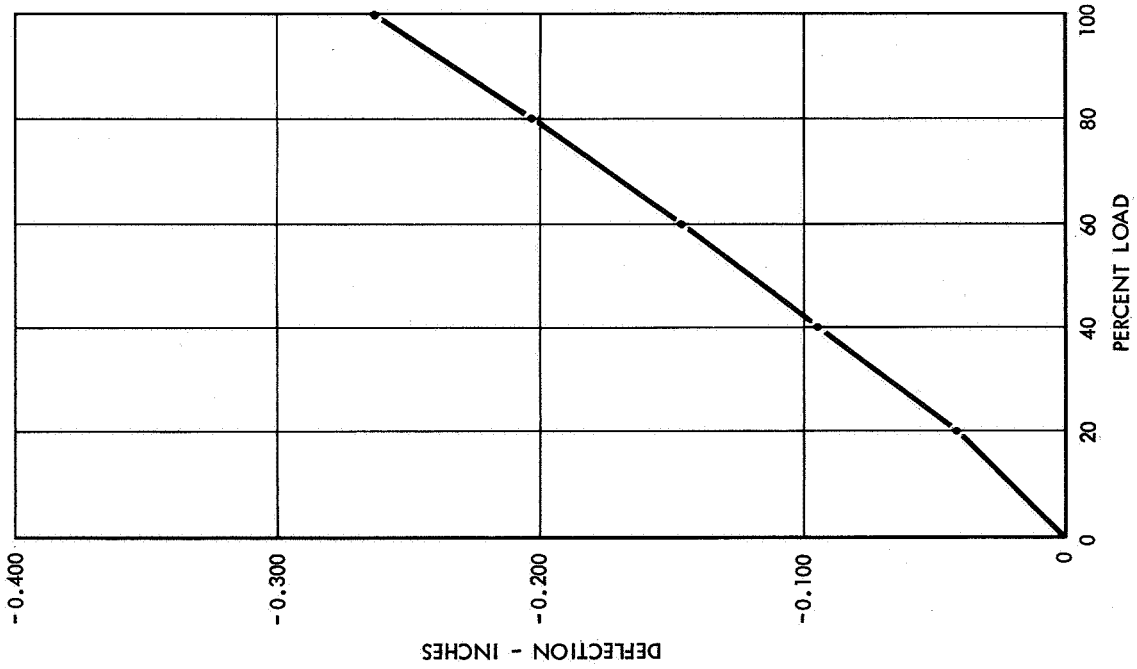


Figure B-7. Tower Location 5

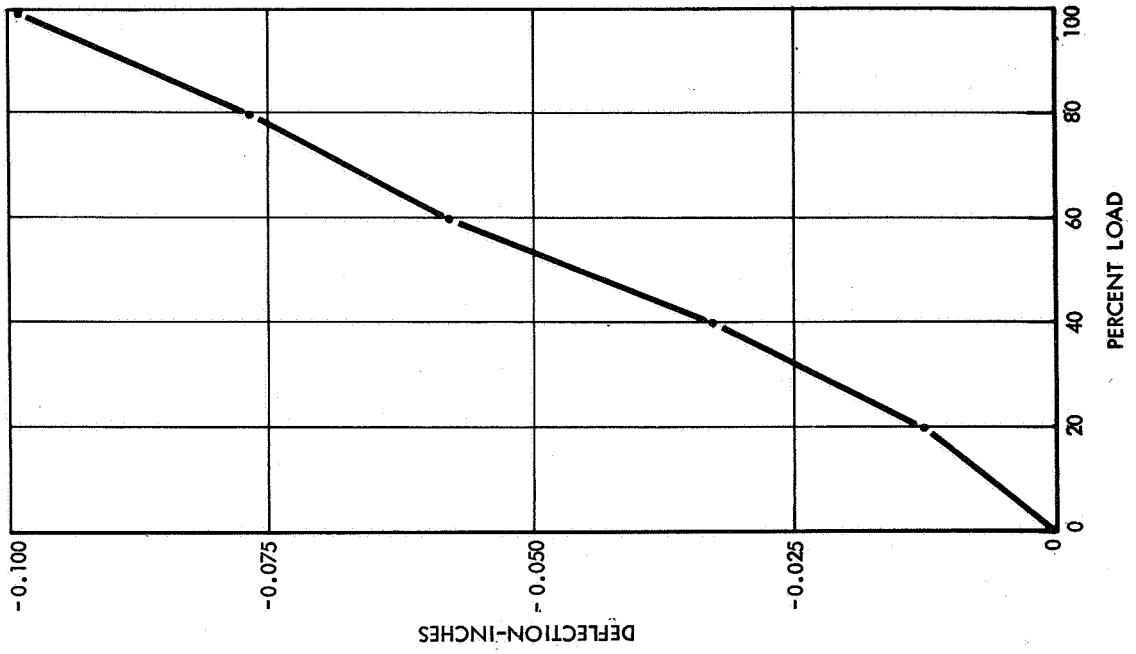


Figure B-10. Tower Location 8

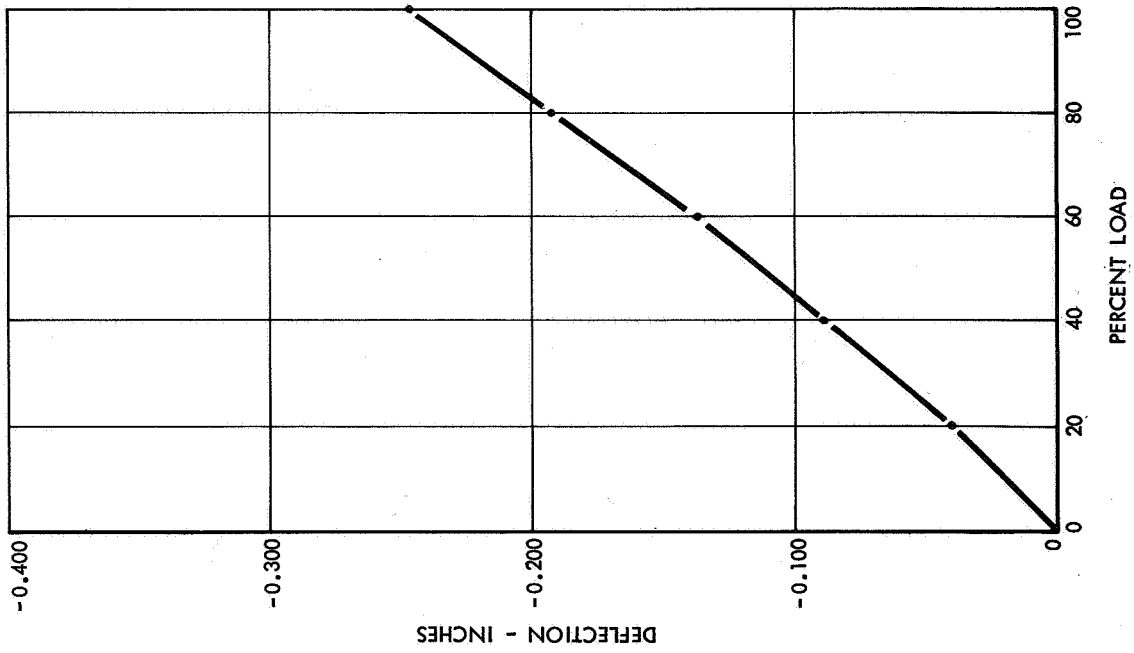


Figure B-9. Tower Location 7

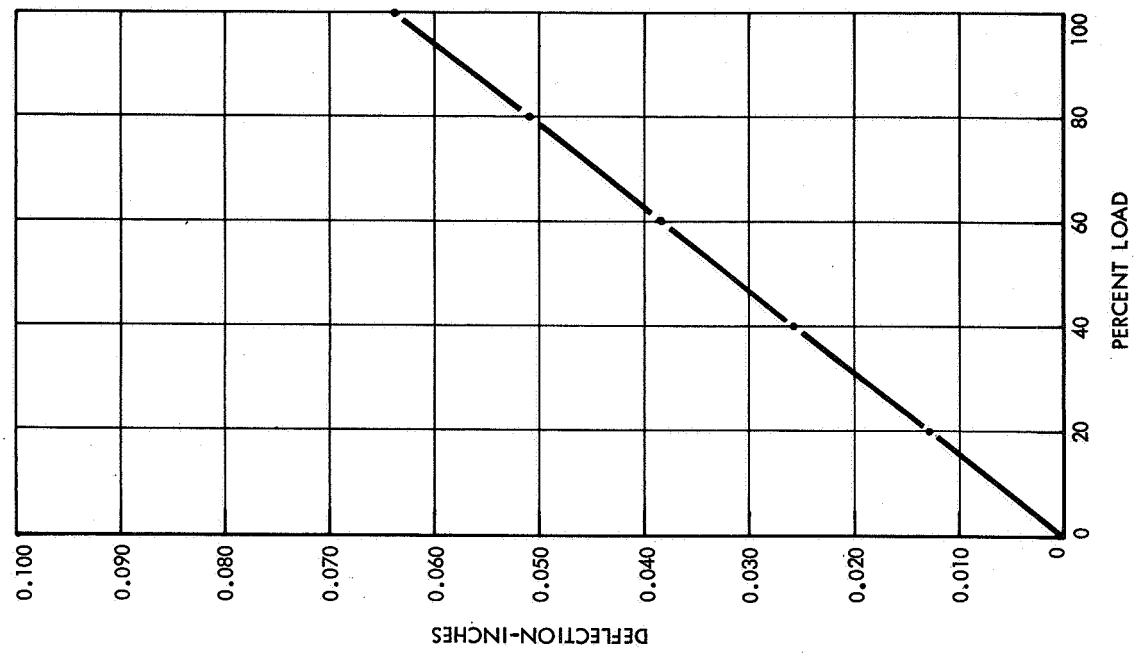


Figure B-12. Tower Location 10

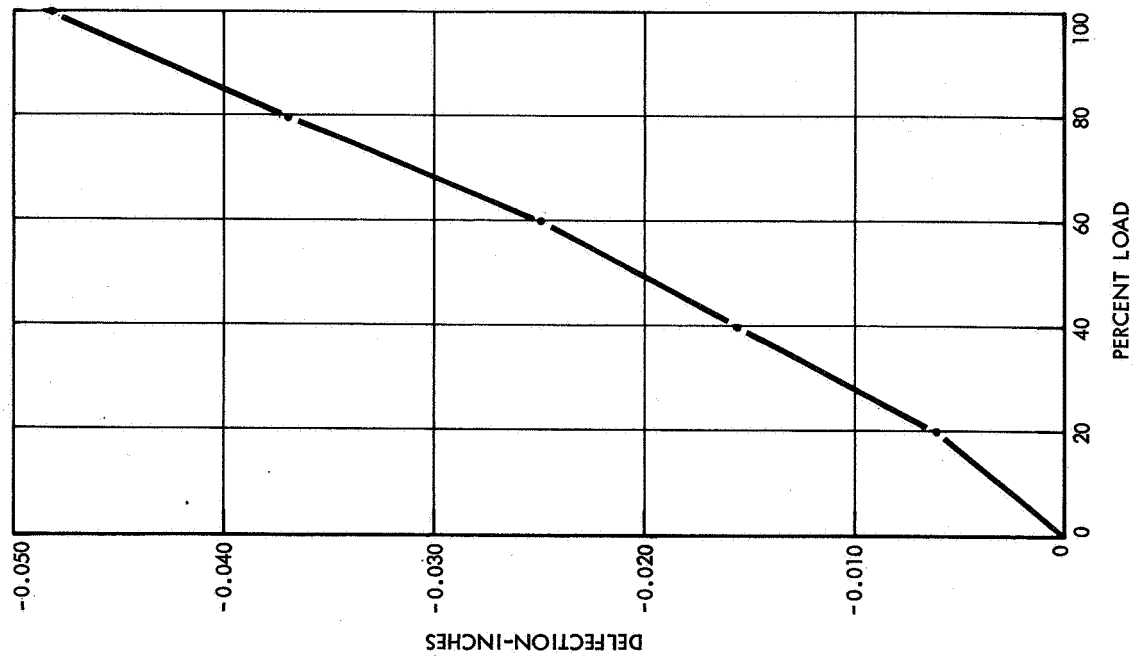


Figure B-11. Tower Location 9

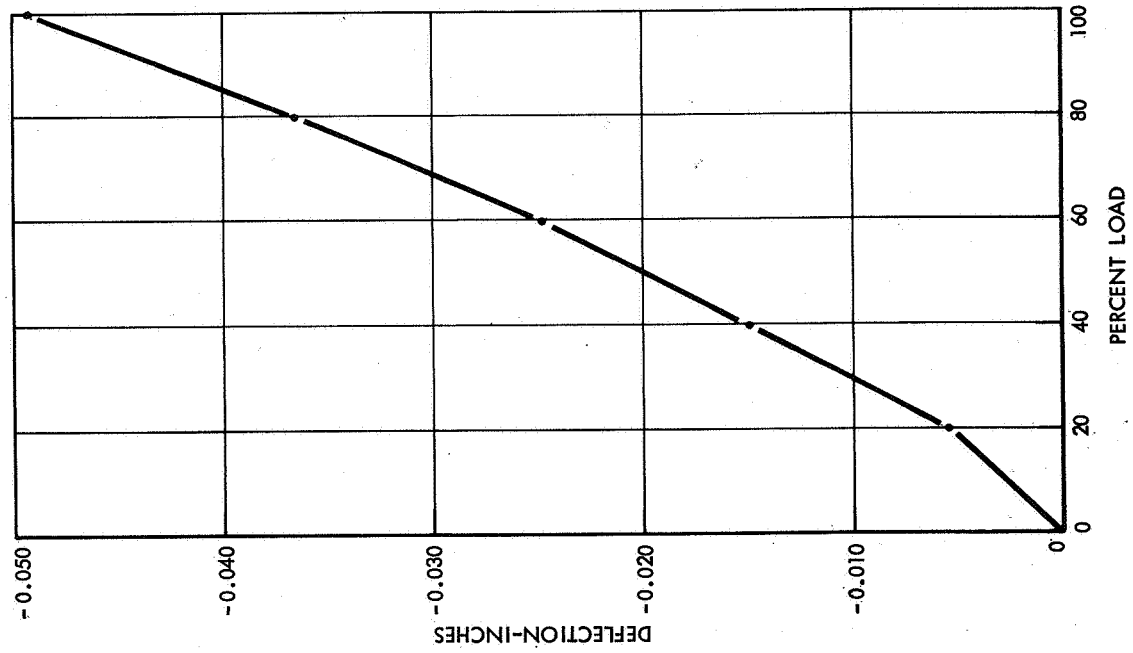


Figure B-13. Tower Location 11

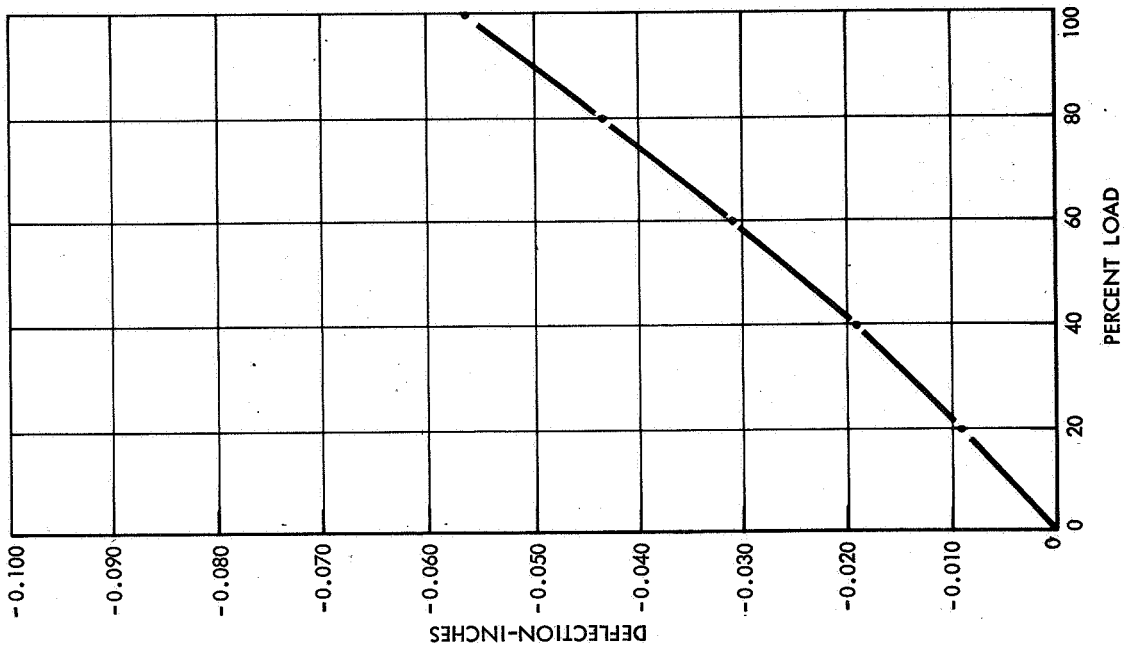


Figure B-14. Tower Location 12

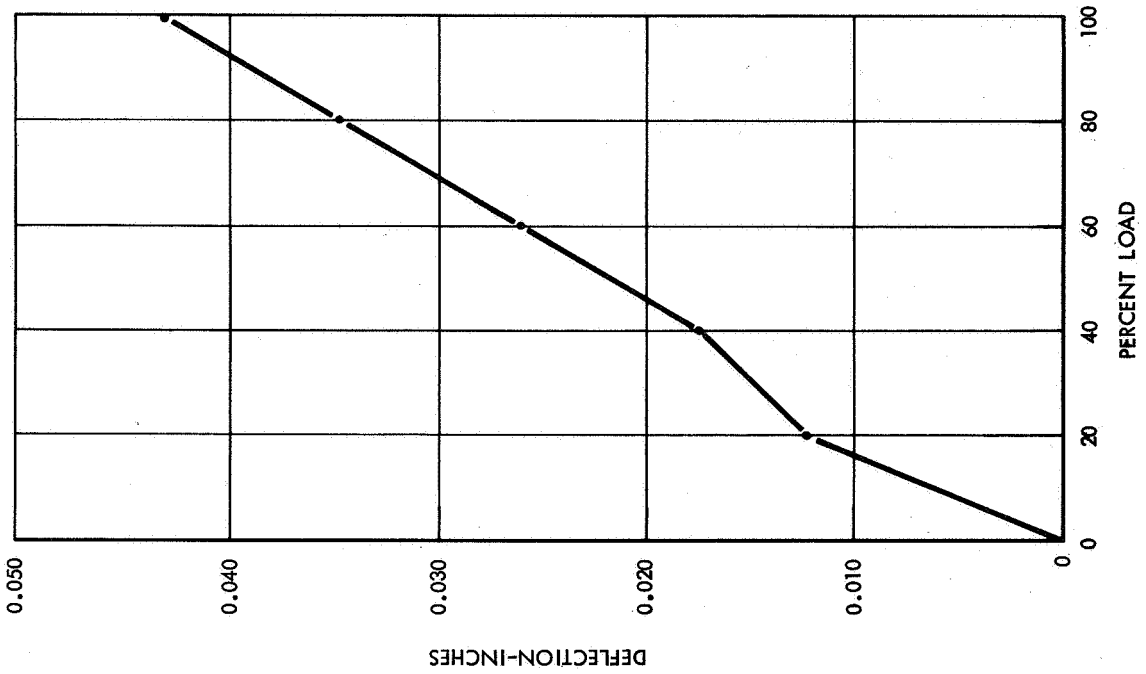


Figure B-16. Tower Location 14

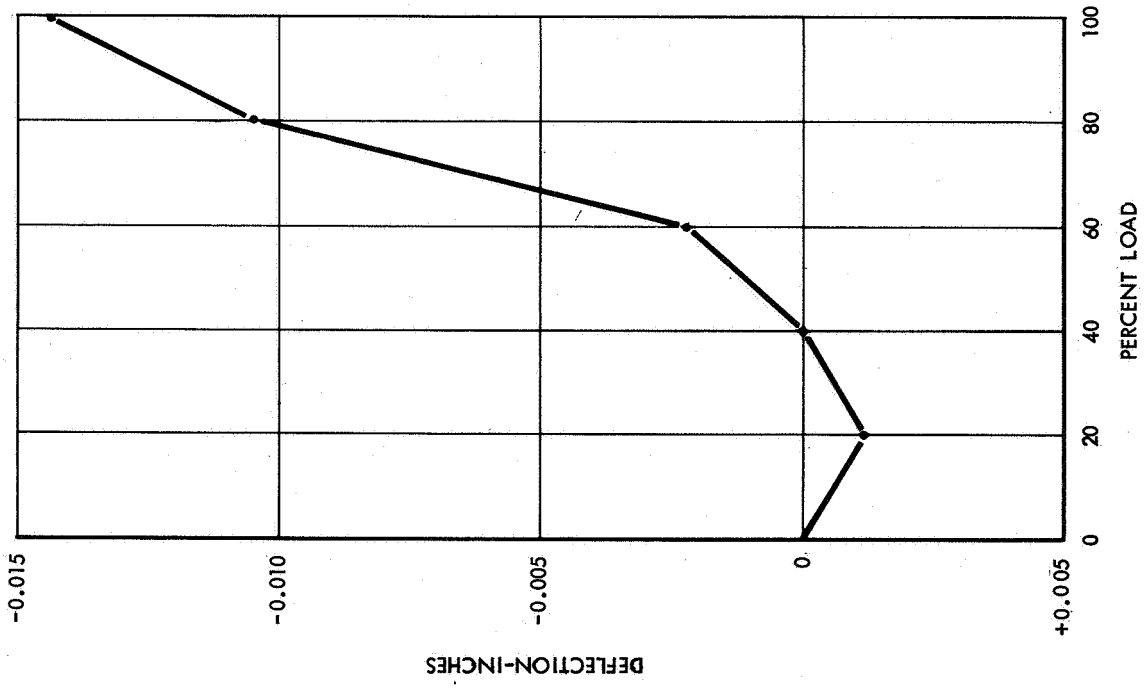


Figure B-15. Tower Location 13

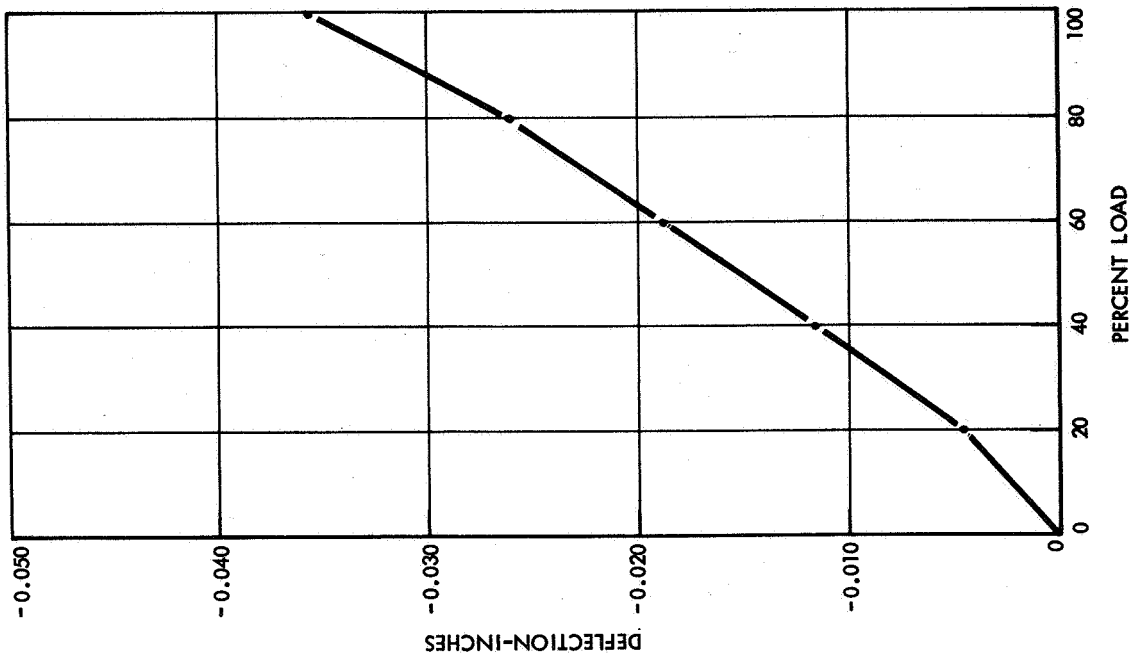


Figure B-18. Tower Location 16

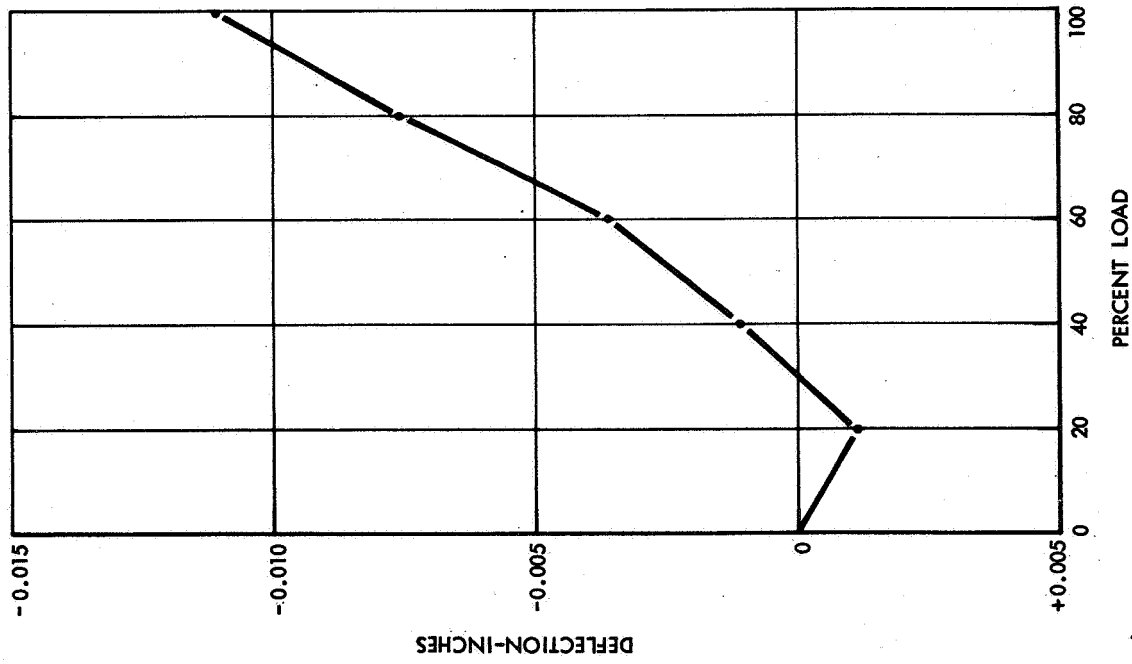


Figure B-17. Tower Location 15

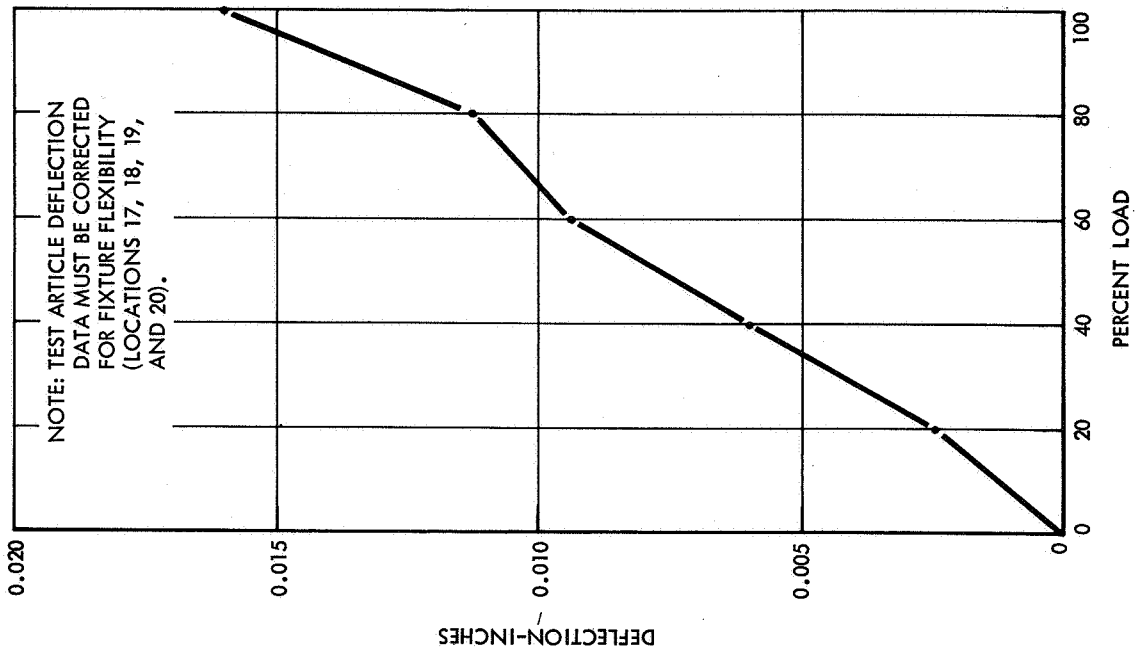


Figure B-20. Tower Location 18

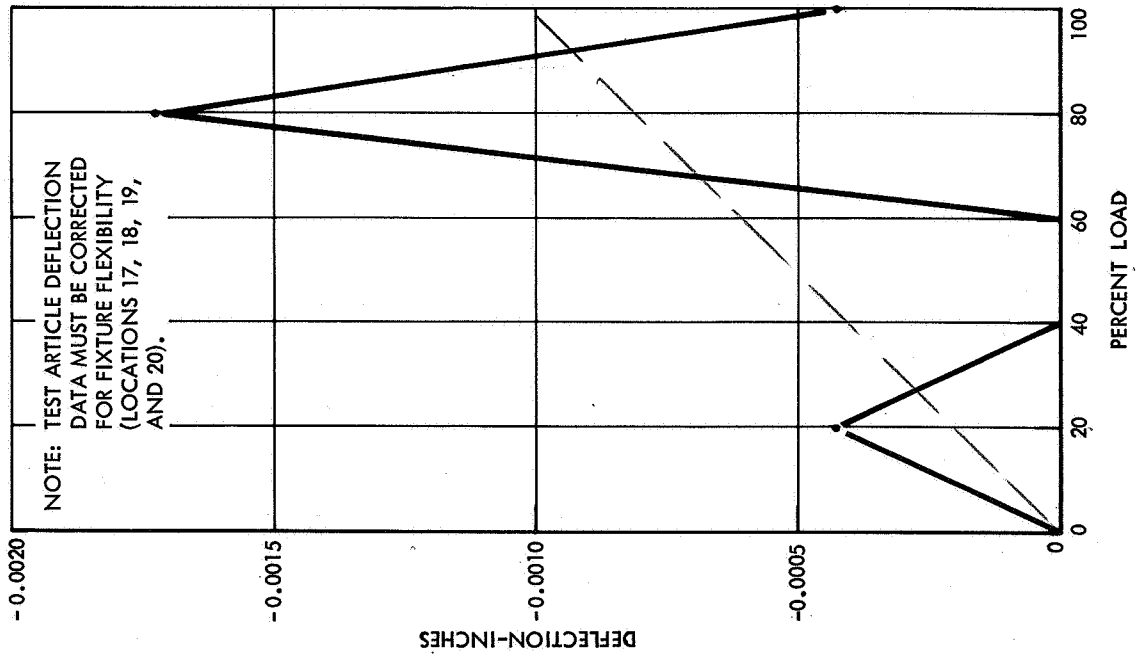


Figure B-19. Tower Location 17

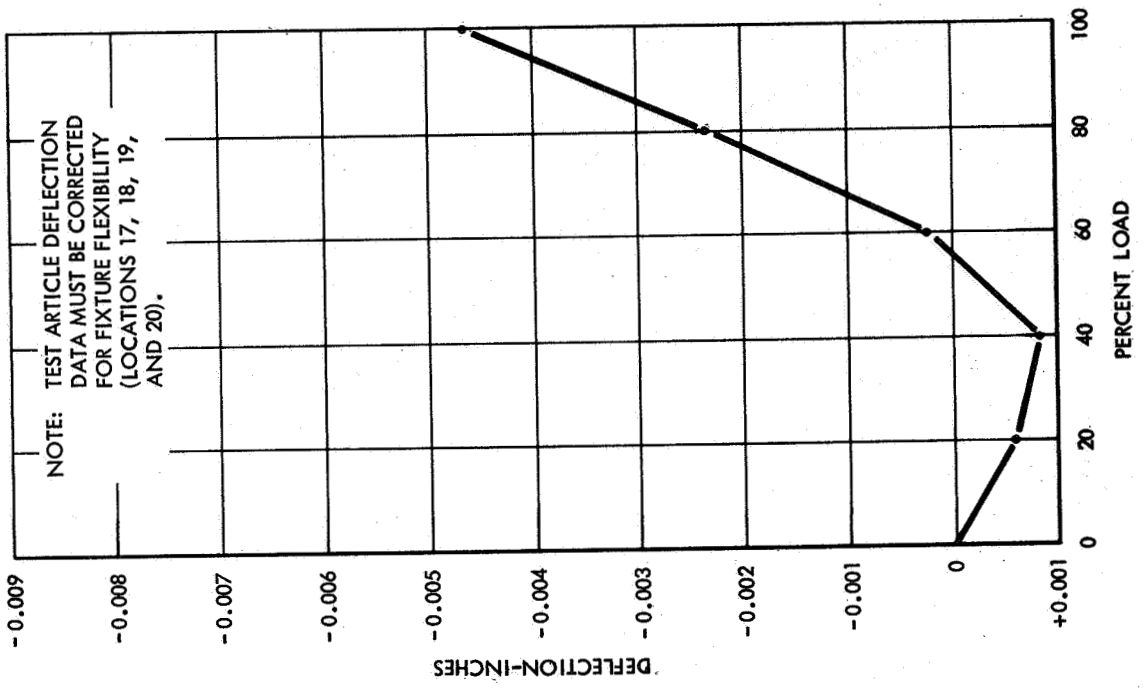


Figure B-22. Tower Location 20

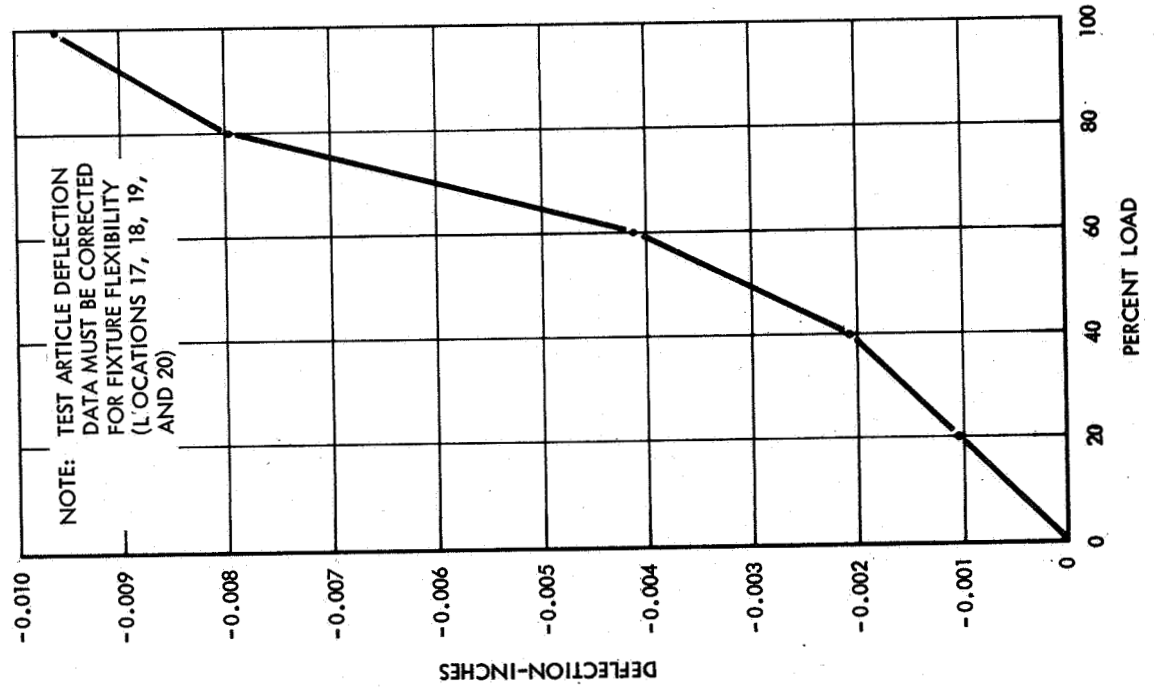


Figure B-21. Tower Location 19

PART II

UNIT SHEAR LOAD

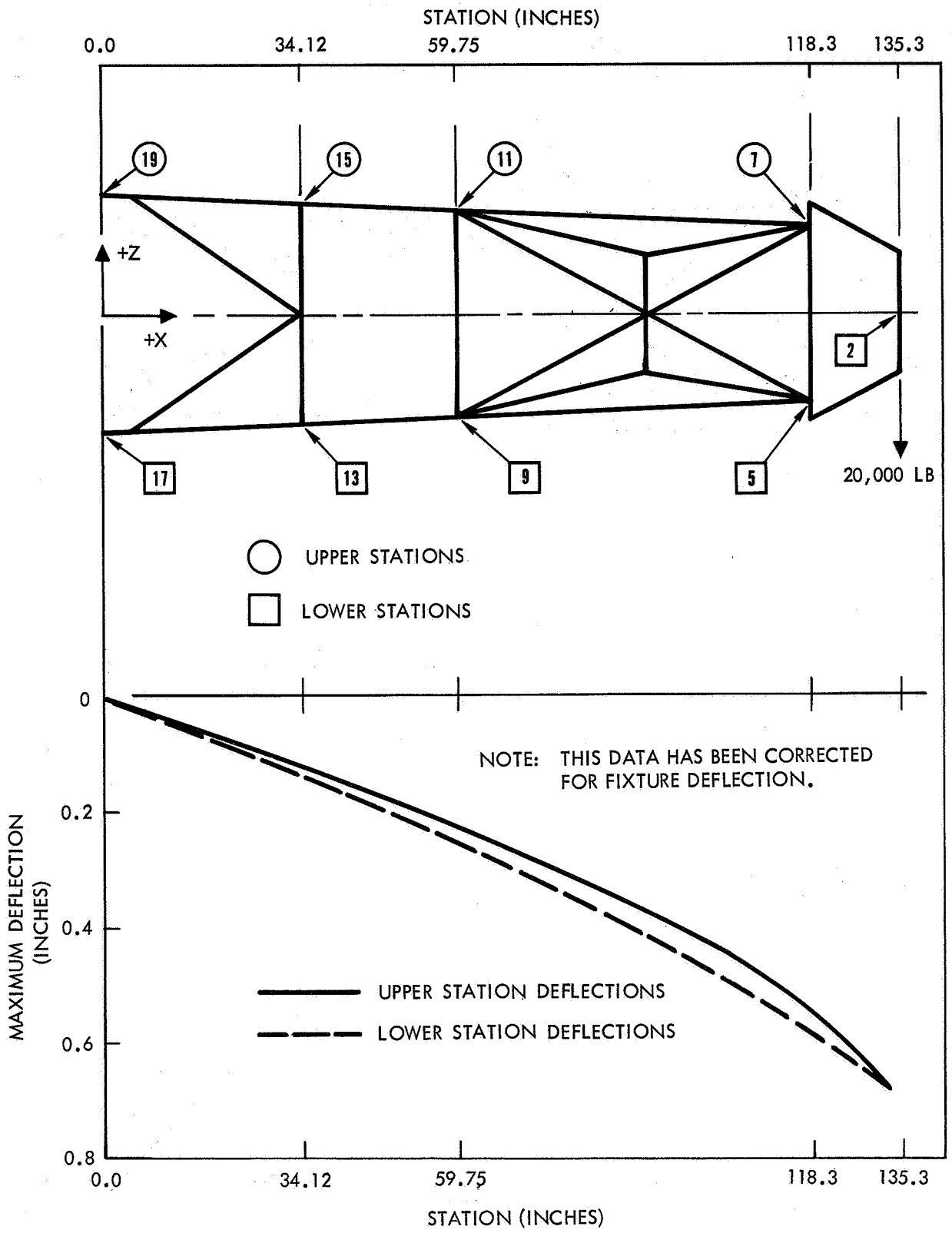


Figure B-23. Deflections Resulting From Shear Load

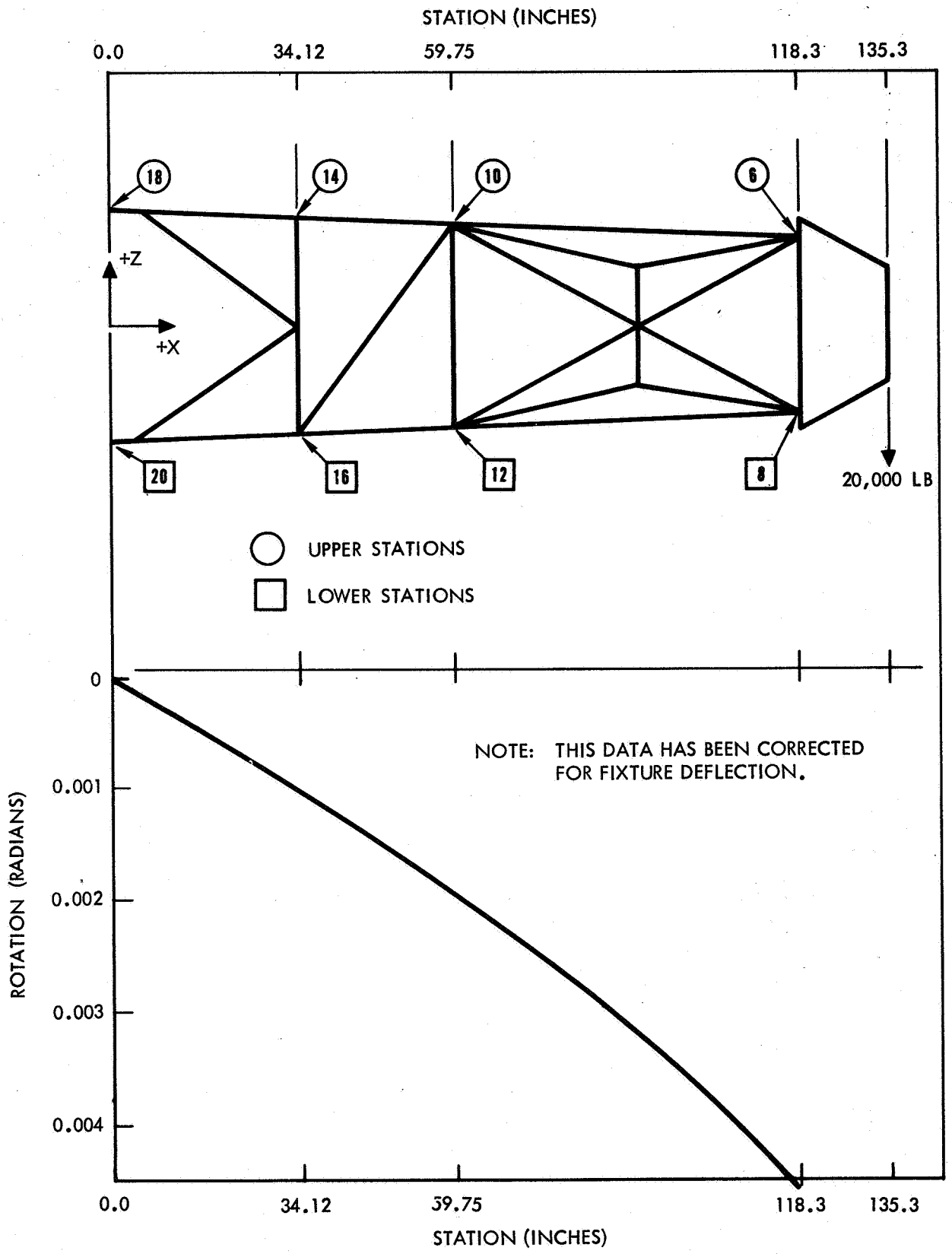


Figure B-24. Rotations Resulting From Shear Load

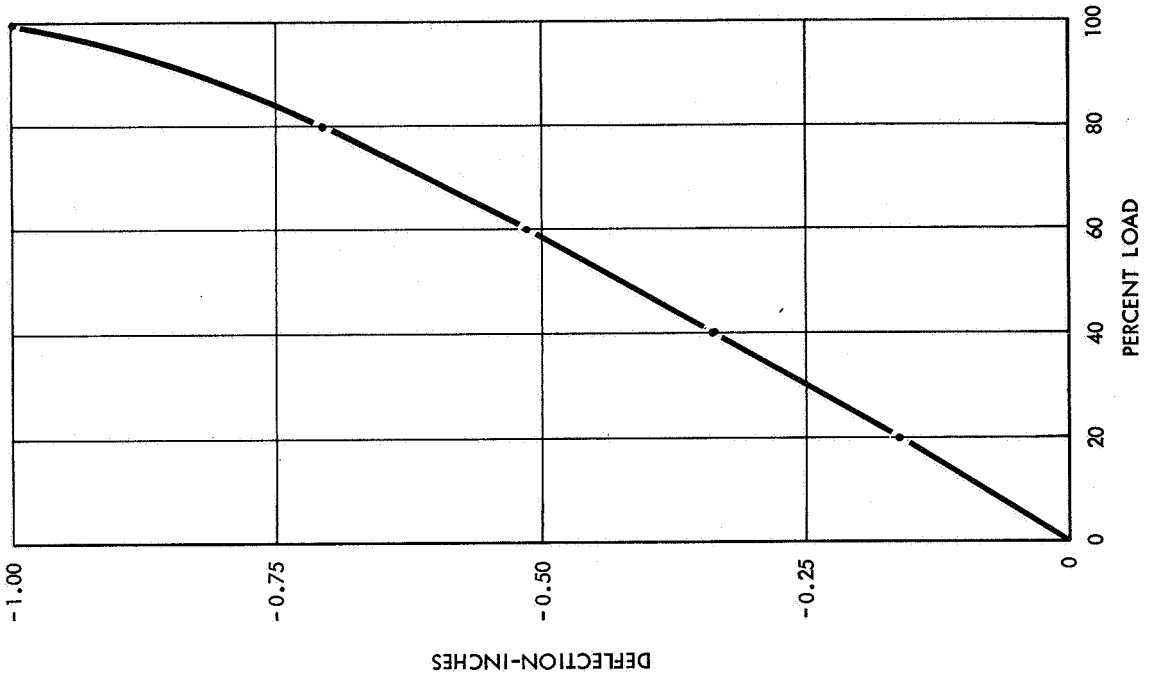


Figure B-26. Tower Location 2

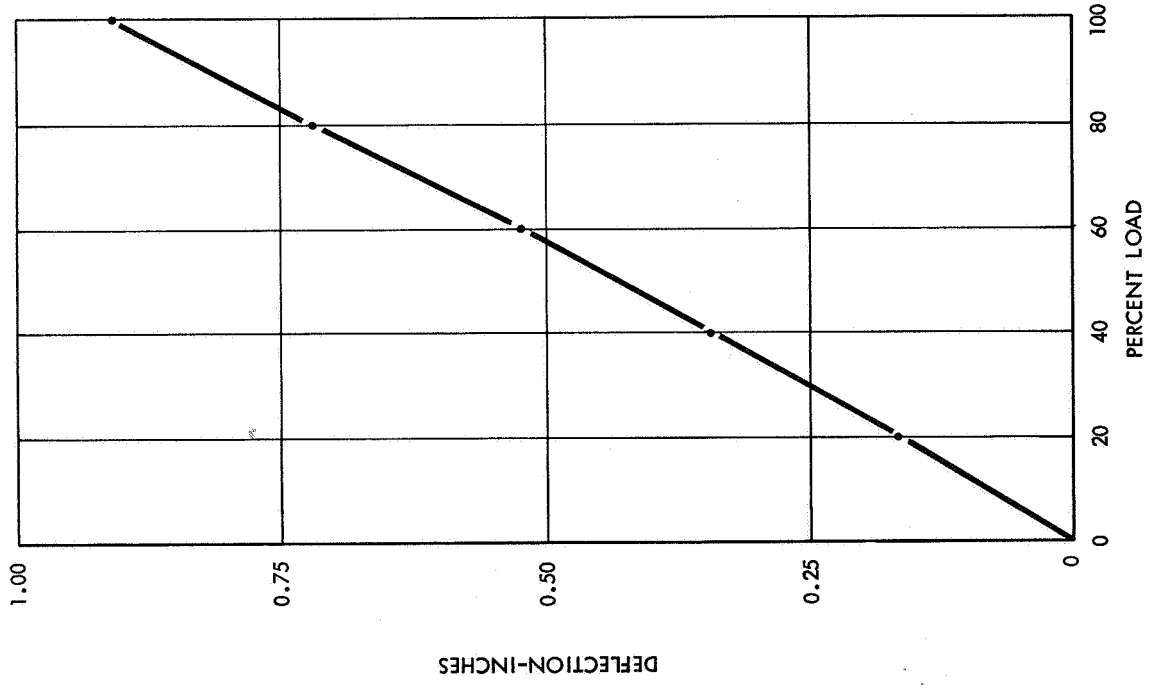


Figure B-25. Tower Location 1

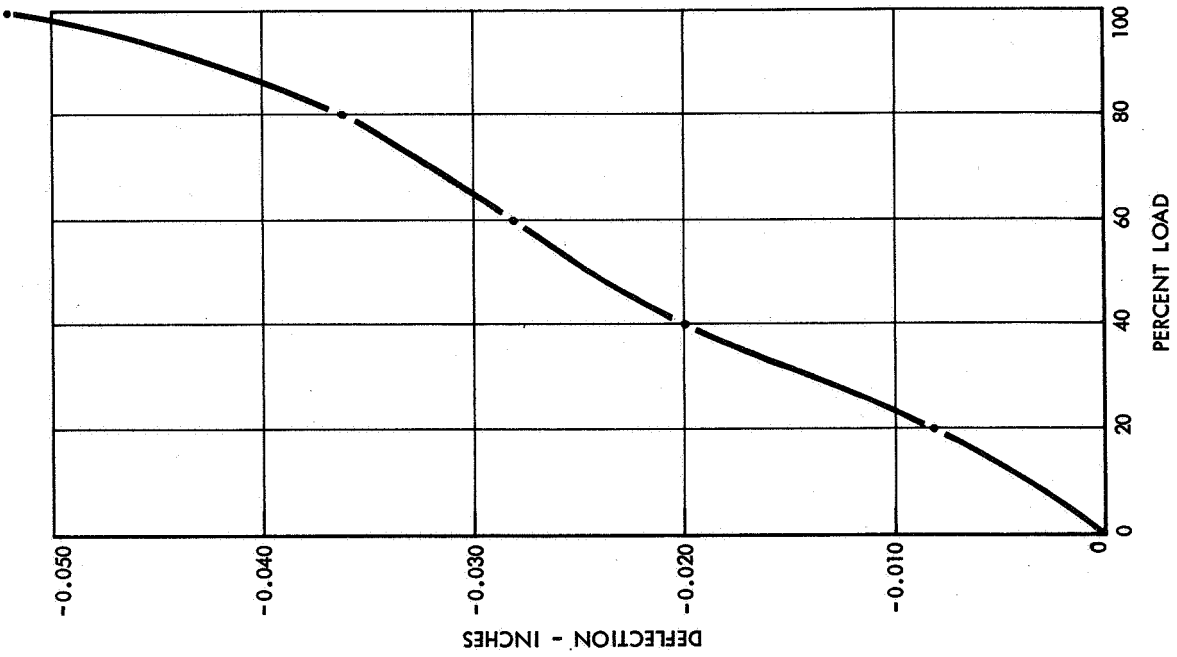


Figure B-27. Tower Location 3

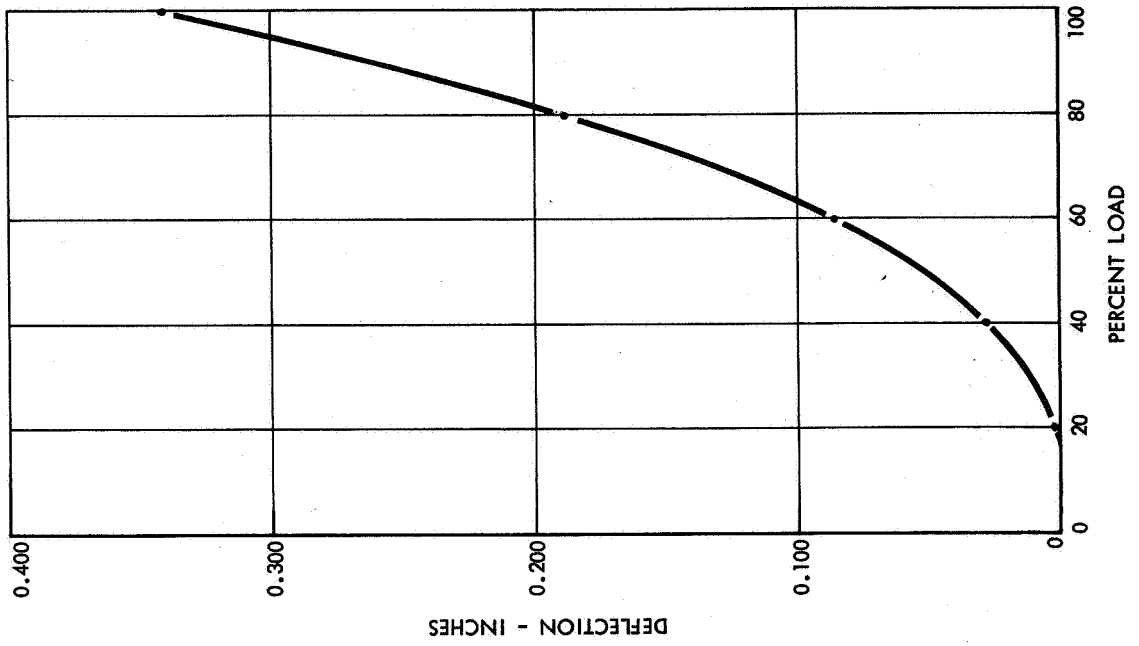


Figure B-28. Tower Location 4

Figure B-30. Tower Location 6

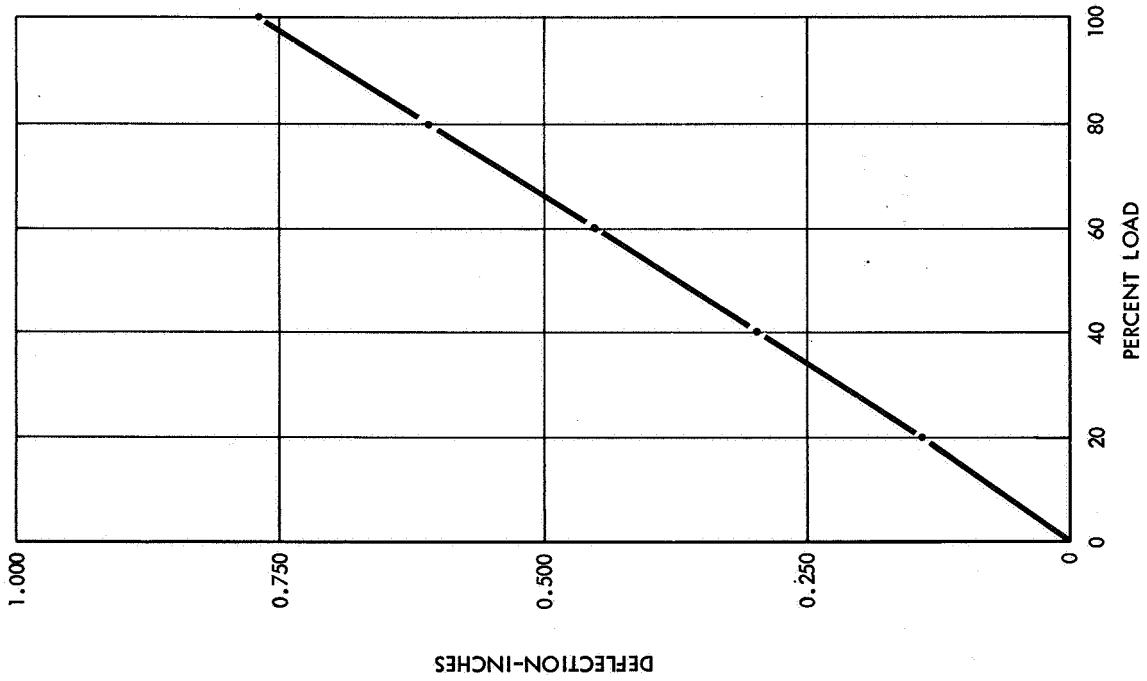


Figure B-29. Tower Location 5

Figure B-31. Tower Location 7

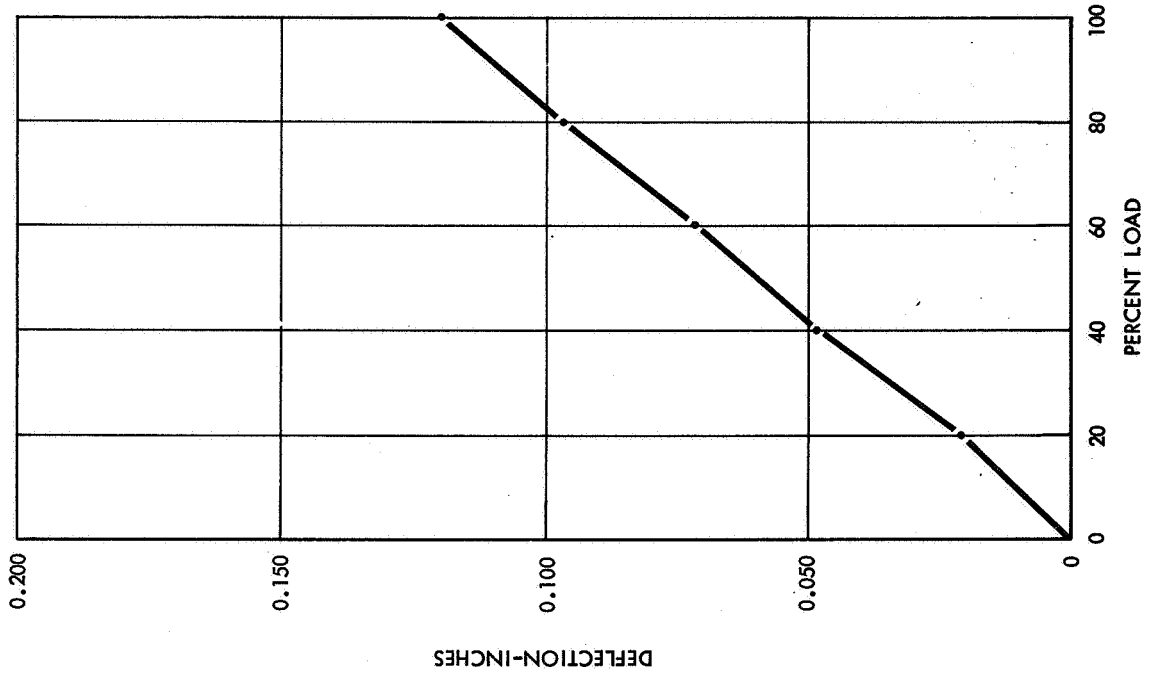


Figure B-32. Tower Location 8

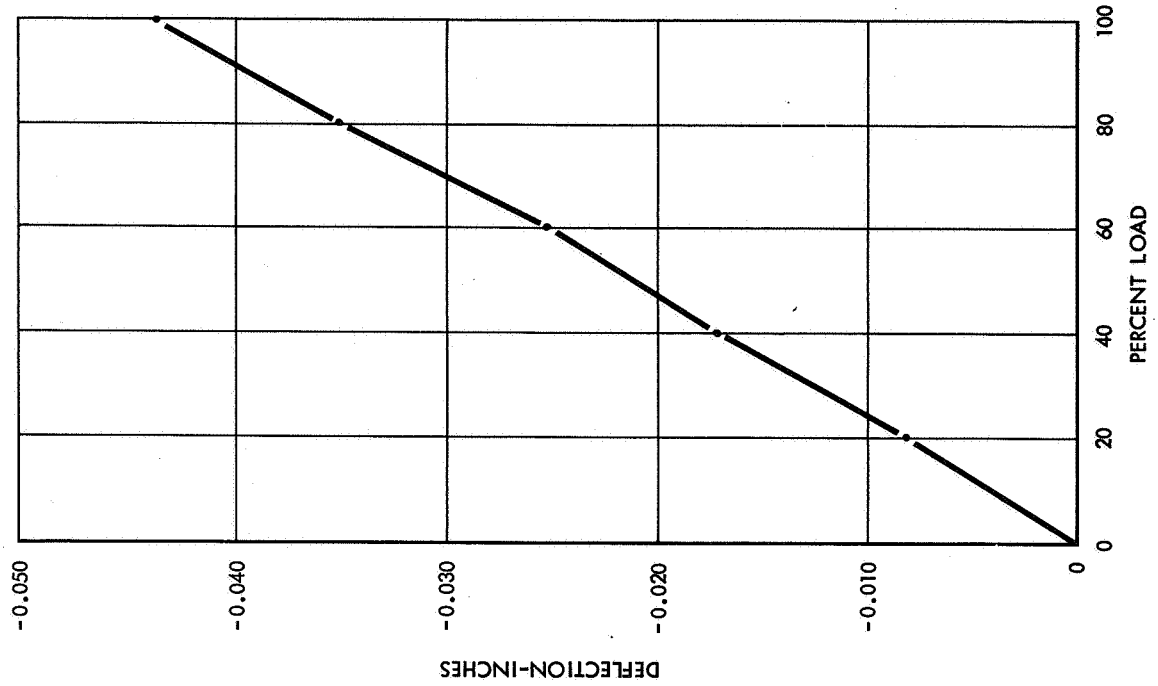


Figure B-34. Tower Location 10

Figure B-33. Tower Location 9

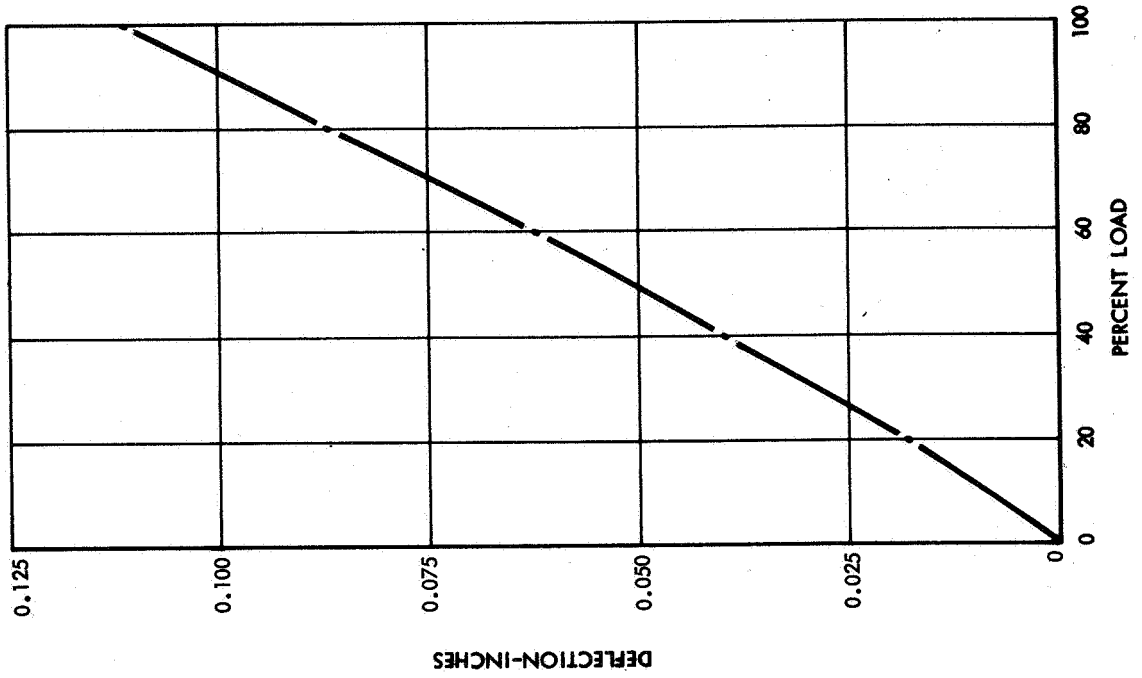


Figure B-36. Tower Location 12

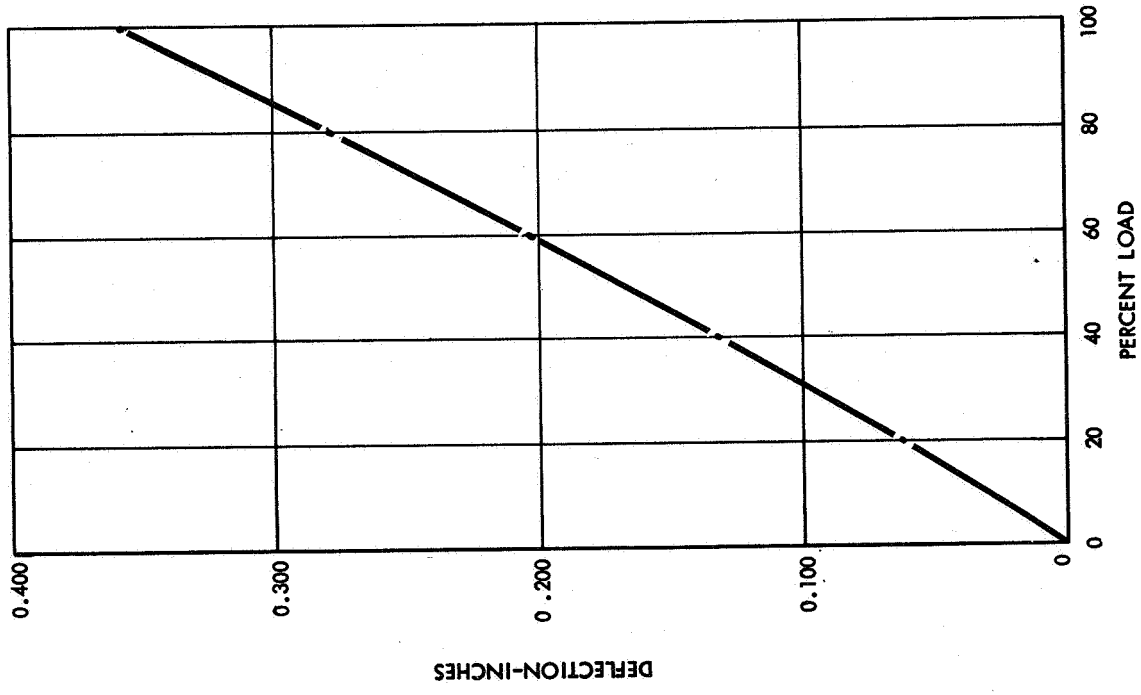


Figure B-35. Tower Location 11

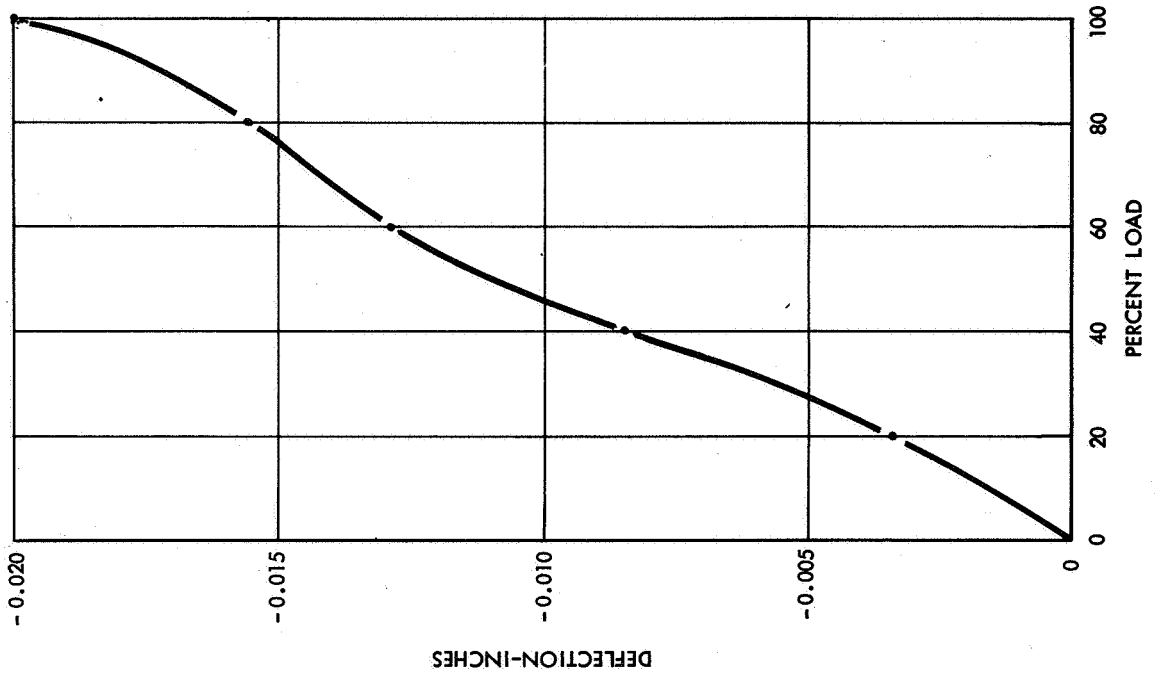


Figure B-38. Tower Location 14

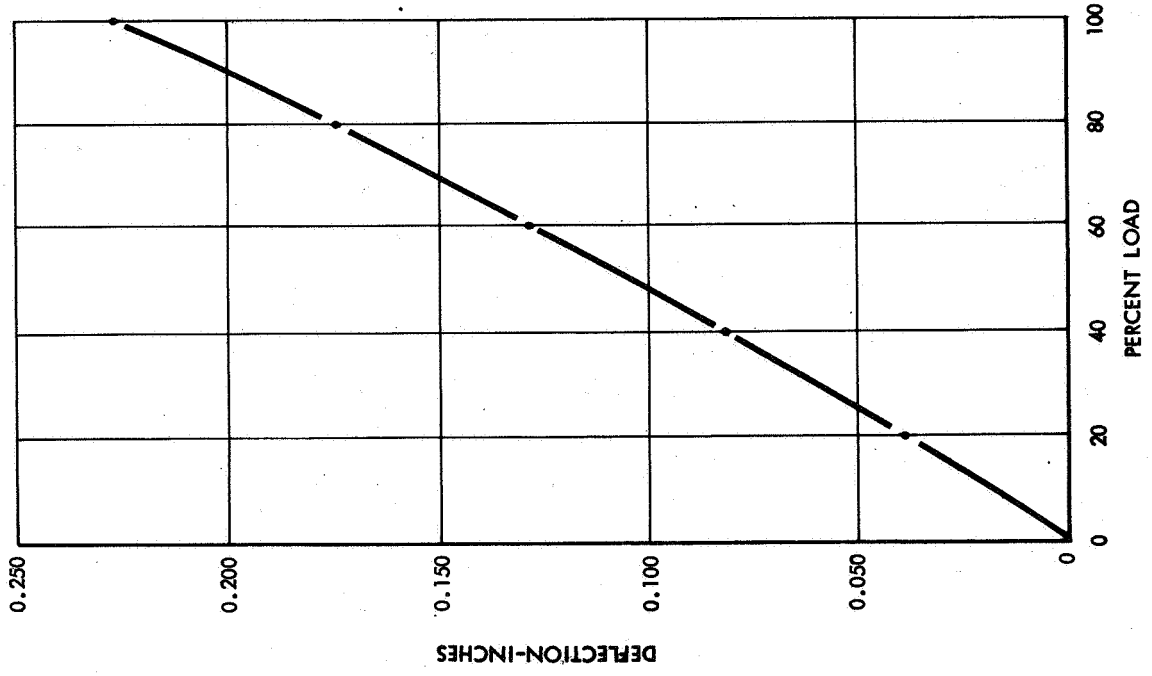


Figure B-37. Tower Location 13

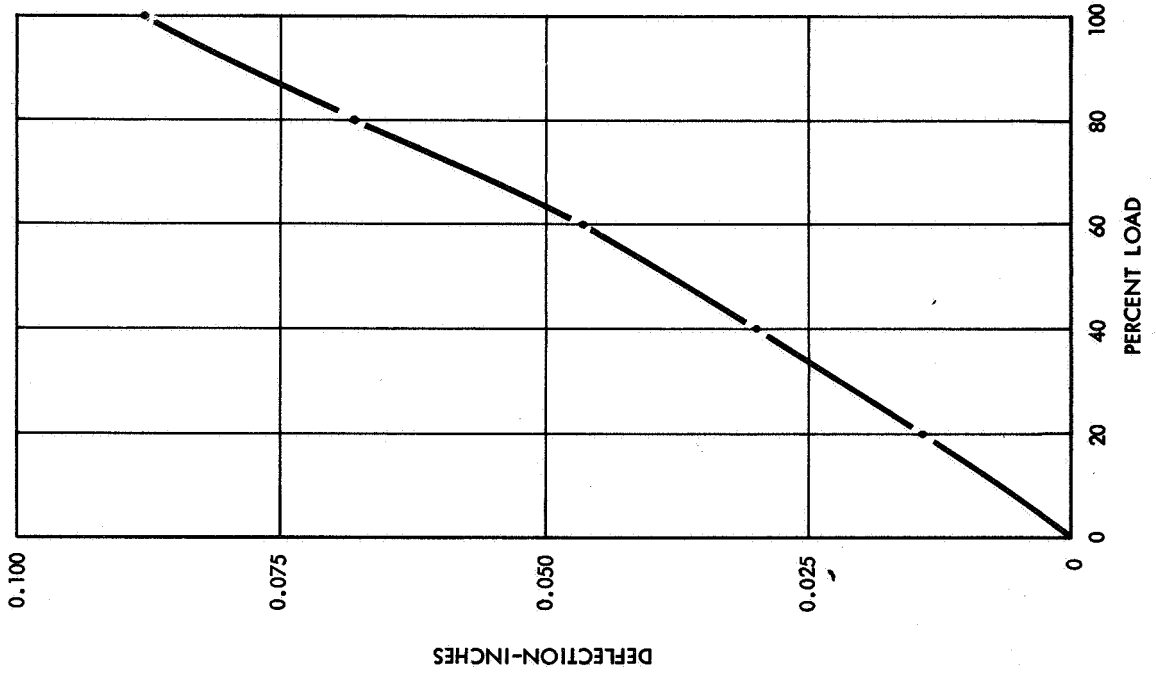


Figure B-40. Tower Location 16

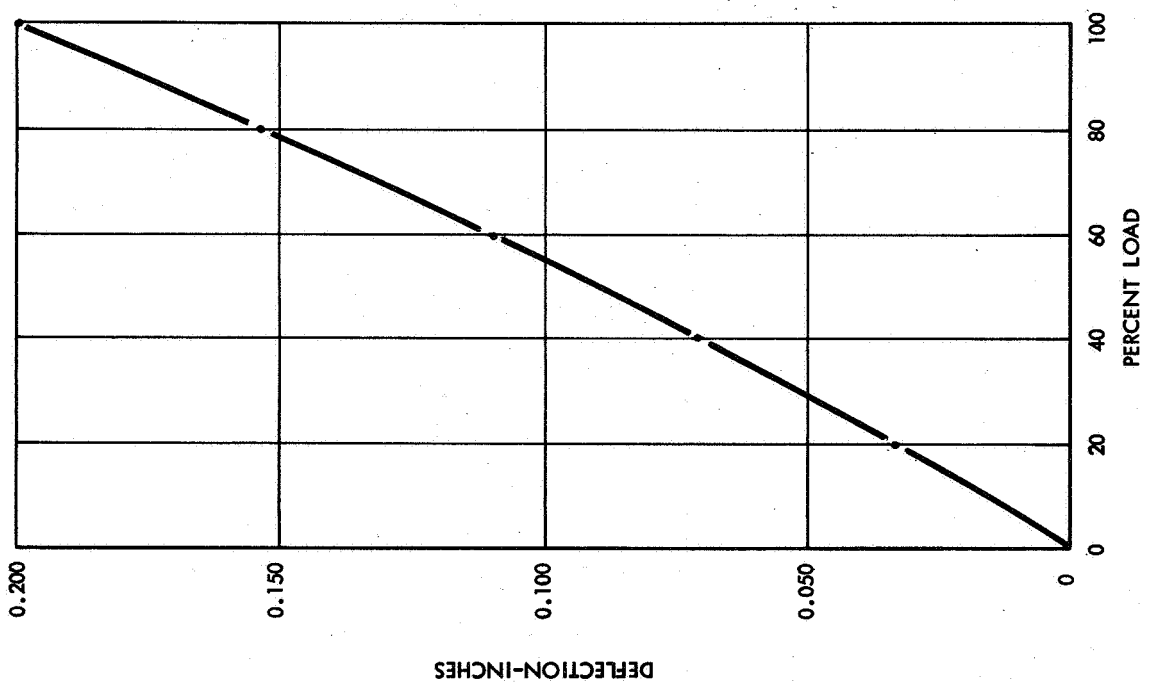


Figure B-39. Tower Location 15

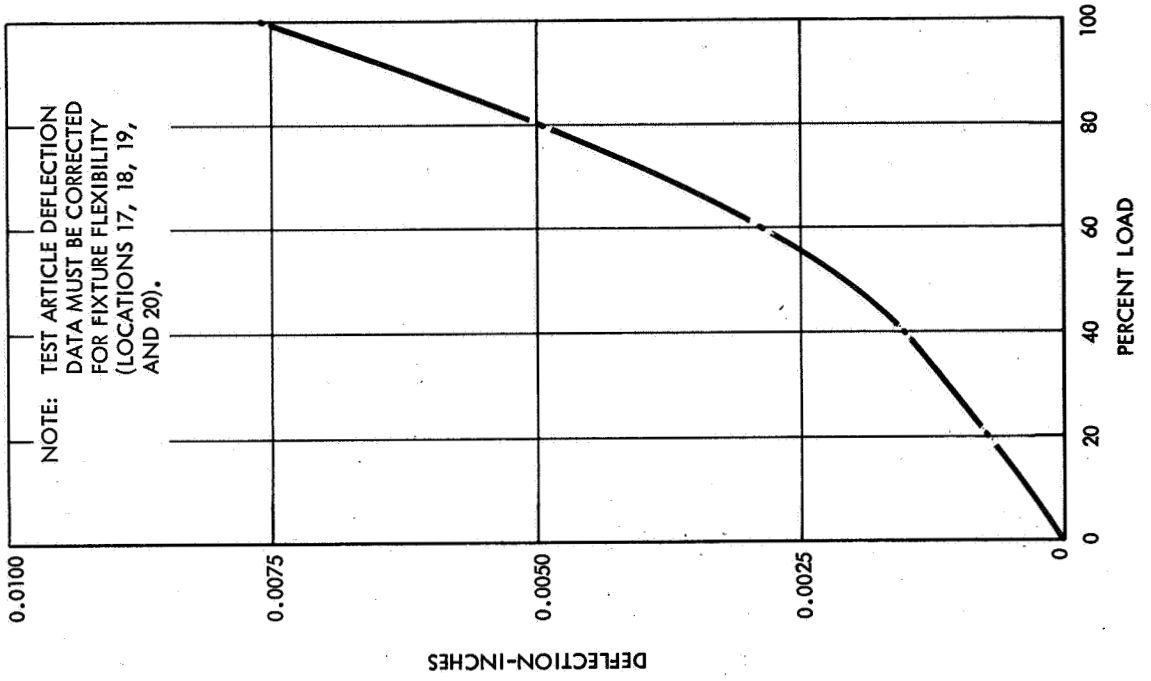


Figure B-42. Tower Location 18

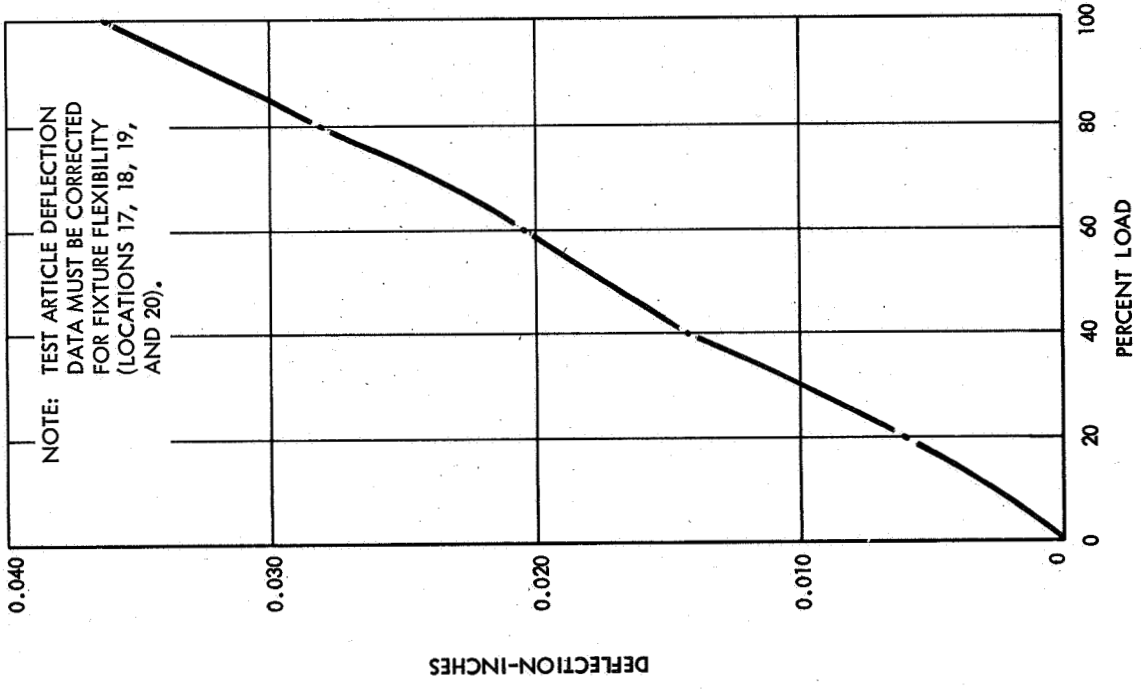


Figure B-41. Tower Location 17

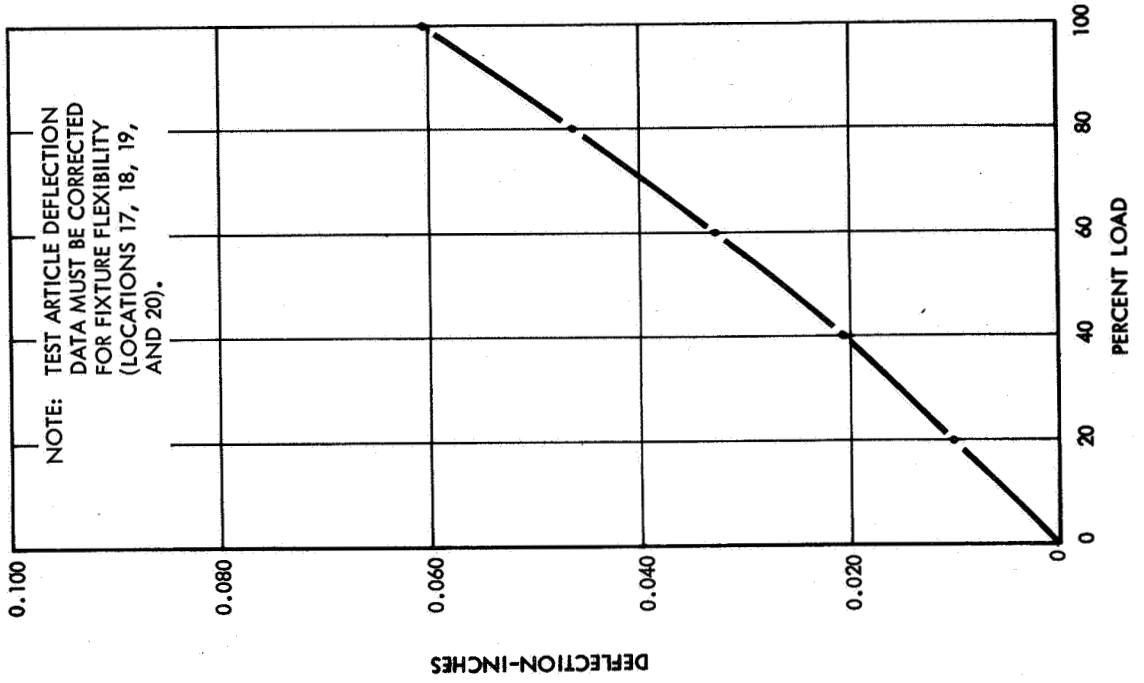


Figure B-44. Tower Location 20

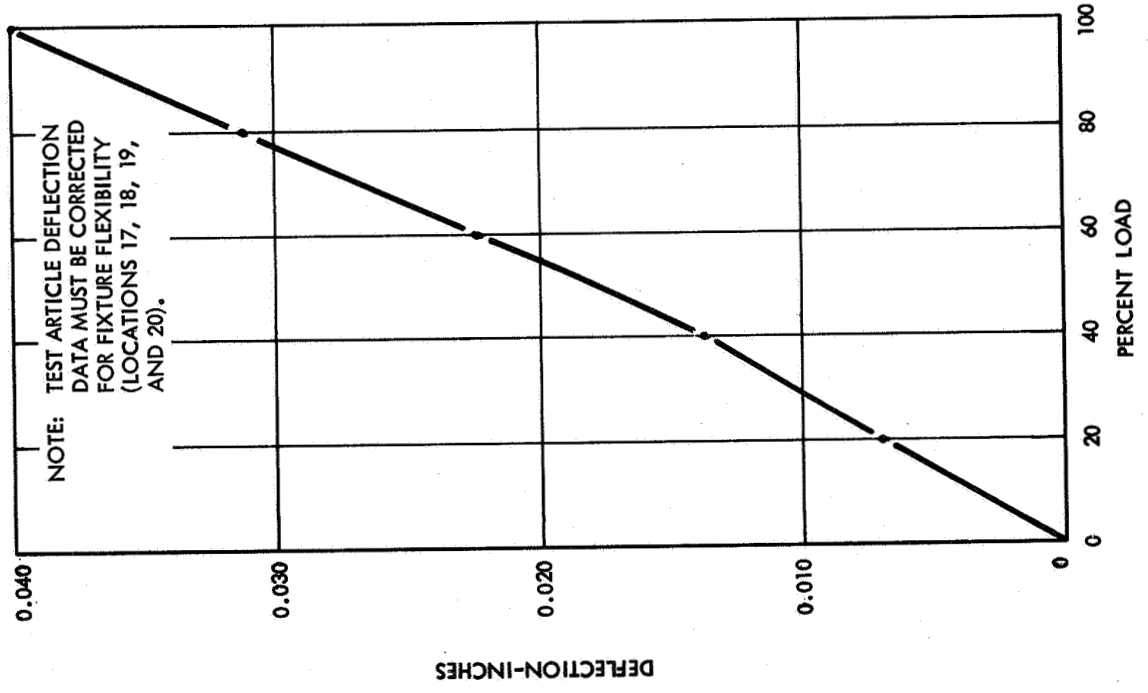


Figure B-43. Tower Location 19

APPENDIX C

PHASE B - STRESS DATA

(Ultimate Conditions Only)

ATR 500 - ESCAPE TOWER STATIC TEST

CONDITION I - PAD ABORT (ULTIMATE)

(All stress values are in ksi
Load values are in percent
of ultimate design loads.)

SIGMA MAX IS LOCATED THETA DEGREES FROM GAGE 1 TOWARDS GAGES 2 AND 3

GAGES 1, 2 AND 3

GAGE FACTOR = 2.070 AUX. GAGE FACTOR = 1/ 47. MU = 0.290 ** E(TEN) = 16.000 E(COMP) = 16.000 MILLION PSI

LOAD	SIG(2)	SIG(4)	TAU(2- 4)	SIGMAX	SIGMIN	TAUMAX	THETA
0.	0.	0.	0.	0.	0.	0.	0.
10.	0.290	-0.077	-1.407	1.526	-1.313	1.419	139.
20.	0.793	0.059	-2.937	3.386	-2.534	2.960	139.
30.	1.297	0.195	-4.345	5.125	-3.634	4.379	139.
40.	1.968	0.377	-5.936	7.161	-4.817	5.989	139.
50.	2.258	0.300	-7.221	8.565	-6.008	7.287	139.
60.	2.974	0.649	-8.751	10.639	-7.016	8.828	139.
70.	3.309	0.739	-10.097	12.203	-8.154	10.178	139.
80.	3.813	0.875	-11.504	13.942	-9.254	11.598	139.
90.	4.651	1.102	-13.034	16.031	-10.278	13.154	139.
100.	5.490	1.329	-14.564	18.121	-11.302	14.712	139.
20.	1.464	0.240	-3.182	4.093	-2.388	3.240	140.
0.	0.290	-0.077	-0.061	0.300	-0.087	0.194	171.
20.	1.297	0.195	-3.121	3.915	-2.423	3.169	140.

SIGMA MAX IS LOCATED THETA DEGREES FROM GAGE 4 TOWARDS GAGES 5 AND 6

GAGES 4, 5 AND 6

GAGE FACTOR = 2.070 AUX. GAGE FACTOR = 1/ 47. MU = 0.290 ** E(TEN) = 16.000 E(COMP) = 16.000 MILLION PSI

LOAD	SIG(5)	SIG(7)	TAU(5- 7)	SIGMAX	SIGMIN	TAUMAX	THETA
0.	0.	0.	0.	0.	0.	0.	0.
10.	0.213	0.213	-1.101	1.315	-0.888	1.101	45.
20.	0.594	0.472	-2.264	2.798	-1.732	2.265	136.
30.	0.762	0.517	-3.304	3.946	-2.667	3.307	136.
40.	1.143	0.775	-4.345	5.308	-3.390	4.349	136.
50.	1.523	1.034	-5.507	6.791	-4.234	5.513	136.
60.	1.736	1.247	-6.609	8.105	-5.122	6.613	136.
70.	2.117	1.505	-7.772	9.589	-5.966	7.778	136.
80.	2.330	1.718	-8.873	10.903	-6.854	8.878	136.
90.	2.711	1.977	-9.913	12.264	-7.576	9.920	136.
100.	3.260	2.281	-11.137	13.918	-8.378	11.148	136.
20.	0.929	0.562	-2.387	3.139	-1.648	2.394	137.
0.	0.213	0.213	-0.122	0.335	0.091	0.122	45.
20.	0.807	0.685	-2.387	3.133	-1.641	2.387	136.

GAGE 7		GAGE 8		GAGE 9		GAGE 10		GAGE 11	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	-0.	0.	0.	0.	0.	0.	0.
10.	0.158	10.	0.158	10.	0.158	10.	0.	10.	-0.
20.	0.317	20.	0.792	20.	0.158	20.	0.158	20.	-0.317
30.	0.475	30.	1.267	30.	0.158	30.	0.475	30.	-0.475
40.	0.634	40.	1.743	40.	0.158	40.	0.634	40.	-0.634
50.	0.792	50.	2.218	50.	0.317	50.	0.792	50.	-0.475
60.	0.950	60.	2.693	60.	0.317	60.	1.109	60.	-0.475
70.	1.267	70.	3.327	70.	0.475	70.	1.426	70.	-0.317
80.	1.426	80.	3.802	80.	0.792	80.	1.743	80.	-0.317
90.	1.743	90.	4.436	90.	0.950	90.	2.059	90.	-0.158
100.	1.901	100.	4.911	100.	1.267	100.	2.376	100.	-0.158
20.	0.792	20.	1.109	20.	-0.	20.	0.475	20.	-0.158
0.	0.158	0.	0.158	0.	0.	0.	0.158	0.	0.
20.	0.317	20.	0.950	20.	0.158	20.	0.317	20.	-0.317

GAGE 12		GAGE 13		GAGE 14		GAGE 15		GAGE 16	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	-0.	0.	0.
10.	-0.317	10.	-0.	10.	-0.	10.	0.	10.	-0.158
20.	-0.634	20.	-0.	20.	-0.	20.	0.	20.	-0.317
30.	-1.109	30.	-0.	30.	-0.158	30.	0.	30.	-0.475
40.	-1.267	40.	0.	40.	-0.158	40.	0.	40.	-0.634
50.	-1.426	50.	0.317	50.	-0.158	50.	-0.	50.	-0.475
60.	-1.584	60.	0.634	60.	-0.158	60.	-0.	60.	-0.317
70.	-1.743	70.	0.950	70.	-0.158	70.	0.	70.	-0.317
80.	-1.743	80.	1.109	80.	-0.158	80.	0.	80.	-0.158
90.	-1.901	90.	1.109	90.	-0.158	90.	0.	90.	0.
100.	-1.901	100.	1.109	100.	-0.317	100.	-0.	100.	-0.
20.	-0.792	20.	-0.	20.	-0.158	20.	-0.158	20.	0.475
0.	0.	0.	-0.317	0.	0.	0.	0.	0.	0.317
20.	-0.634	20.	-0.475	20.	-0.	20.	0.	20.	-0.

GAGE 17		GAGE 18		GAGE 19		GAGE 20		GAGE 21	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	-0.	0.	0.	0.	0.	0.	0.
10.	0.158	10.	-0.317	10.	-0.158	10.	0.158	10.	5.228
20.	0.317	20.	-0.634	20.	-0.317	20.	0.317	20.	10.772
30.	0.475	30.	-0.950	30.	-0.634	30.	0.317	30.	16.634
40.	0.634	40.	-1.267	40.	-0.950	40.	0.475	40.	22.495
50.	0.792	50.	-1.584	50.	-1.267	50.	0.475	50.	28.198
60.	0.950	60.	-1.743	60.	-1.584	60.	0.634	60.	34.059
70.	1.109	70.	-1.901	70.	-1.743	70.	0.634	70.	39.762
80.	1.267	80.	-1.901	80.	-1.901	80.	0.792	80.	45.624
90.	1.426	90.	-1.901	90.	-2.218	90.	0.792	90.	51.644
100.	1.743	100.	-1.901	100.	-2.535	100.	0.792	100.	58.139
20.	0.317	20.	-0.	20.	-0.634	20.	0.158	20.	12.198
0.	0.	0.	0.317	0.	0.	0.	0.	0.	0.317
20.	0.317	20.	-0.317	20.	-0.475	20.	0.317	20.	11.564

GAGE 22		GAGE 23		GAGE 24		GAGE 25		GAGE 26	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	0.	10.	-1.901	10.	-1.901	10.	-1.109	10.	-0.634
20.	0.158	20.	-3.802	20.	-3.802	20.	-2.693	20.	-1.901
30.	0.158	30.	-5.861	30.	-5.545	30.	-4.277	30.	-3.327
40.	0.475	40.	-7.762	40.	-7.287	40.	-5.703	40.	-4.594
50.	0.634	50.	-9.822	50.	-9.030	50.	-7.129	50.	-5.703
60.	0.792	60.	-11.723	60.	-10.772	60.	-8.554	60.	-6.812
70.	0.950	70.	-13.624	70.	-12.515	70.	-9.980	70.	-7.921
80.	1.109	80.	-15.525	80.	-14.257	80.	-11.564	80.	-9.188
90.	1.267	90.	-17.584	90.	-16.158	90.	-13.149	90.	-10.455
100.	1.426	100.	-19.644	100.	-17.901	100.	-14.574	100.	-11.564
20.	-0.	20.	-3.644	20.	-3.010	20.	-2.693	20.	-2.693
0.	0.	0.	0.158	0.	0.158	0.	0.317	0.	0.317
20.	0.	20.	-3.802	20.	-3.644	20.	-2.535	20.	-1.743

GAGE 27		GAGE 28		GAGE 29		GAGE 30		GAGE 31	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	-0.	0.	0.
10.	0.792	10.	1.901	10.	1.267	10.	0.317	10.	1.267
20.	1.584	20.	3.485	20.	2.535	20.	1.109	20.	2.535
30.	2.376	30.	5.069	30.	3.960	30.	2.059	30.	3.960
40.	3.168	40.	6.812	40.	5.386	40.	2.851	40.	5.386
50.	3.960	50.	8.396	50.	6.812	50.	3.644	50.	6.812
60.	4.594	60.	9.980	60.	8.079	60.	4.277	60.	8.396
70.	5.228	70.	11.406	70.	9.347	70.	5.069	70.	9.822
80.	6.020	80.	12.990	80.	10.614	80.	5.861	80.	11.564
90.	6.812	90.	14.574	90.	11.881	90.	6.653	90.	13.149
100.	7.604	100.	16.158	100.	13.307	100.	7.446	100.	14.733
20.	1.584	20.	3.010	20.	2.693	20.	2.218	20.	2.535
0.	0.158	0.	0.158	0.	0.158	0.	0.	0.	0.
20.	1.901	20.	3.802	20.	2.851	20.	1.267	20.	2.535

GAGE 32		GAGE 33		GAGE 34		GAGE 35		GAGE 36	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	1.267	10.	1.426	10.	1.267	10.	1.426	10.	1.426
20.	2.535	20.	2.851	20.	2.535	20.	3.010	20.	2.693
30.	3.960	30.	4.436	30.	4.119	30.	4.752	30.	4.436
40.	5.228	40.	6.020	40.	5.545	40.	6.495	40.	6.020
50.	6.653	50.	7.604	50.	7.129	50.	8.396	50.	7.762
60.	8.238	60.	9.188	60.	8.713	60.	10.297	60.	9.347
70.	9.663	70.	10.772	70.	10.139	70.	12.198	70.	11.248
80.	11.248	80.	12.356	80.	11.723	80.	14.099	80.	12.990
90.	12.832	90.	13.941	90.	13.307	90.	16.000	90.	14.574
100.	14.416	100.	15.525	100.	14.891	100.	18.059	100.	16.317
20.	2.218	20.	2.535	20.	2.535	20.	2.693	20.	2.535
0.	-0.	0.	-0.	0.	0.	0.	-0.158	0.	0.
20.	2.535	20.	3.010	20.	2.693	20.	2.851	20.	2.693

GAGE 37		GAGE 38		GAGE 39		GAGE 40		GAGE 41	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	-0.	0.	0.	0.	0.	0.	0.
10.	1.901	10.	1.901	10.	-0.	10.	0.950	10.	1.901
20.	3.802	20.	3.960	20.	0.	20.	1.743	20.	3.644
30.	5.861	30.	6.178	30.	0.158	30.	2.693	30.	5.386
40.	7.762	40.	8.079	40.	0.317	40.	3.644	40.	7.129
50.	9.663	50.	10.139	50.	0.792	50.	4.752	50.	8.554
60.	11.564	60.	12.040	60.	1.426	60.	5.861	60.	9.980
70.	13.307	70.	14.099	70.	1.901	70.	6.812	70.	11.406
80.	15.050	80.	16.000	80.	2.376	80.	7.921	80.	12.990
90.	16.792	90.	17.901	90.	2.693	90.	8.871	90.	14.574
100.	18.851	100.	20.119	100.	3.168	100.	9.822	100.	16.158
20.	4.119	20.	4.436	20.	0.475	20.	1.584	20.	3.168
0.	0.317	0.	0.317	0.	0.	0.	0.	0.	0.158
20.	3.960	20.	4.436	20.	-0.158	20.	1.743	20.	3.802

GAGE 42		GAGE 43		GAGE 44		GAGE 45		GAGE 46	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	-0.	0.	0.	0.	0.
10.	0.634	10.	-1.584	10.	-0.950	10.	-2.218	10.	-2.218
20.	1.267	20.	-3.327	20.	-1.901	20.	-4.594	20.	-4.594
30.	1.901	30.	-5.069	30.	-3.168	30.	-6.812	30.	-6.812
40.	2.535	40.	-6.812	40.	-4.436	40.	-9.030	40.	-8.871
50.	3.010	50.	-8.554	50.	-5.545	50.	-11.089	50.	-10.772
60.	3.644	60.	-10.139	60.	-6.970	60.	-12.990	60.	-12.515
70.	4.277	70.	-12.040	70.	-8.238	70.	-14.891	70.	-14.257
80.	4.752	80.	-13.782	80.	-9.505	80.	-16.950	80.	-16.000
90.	5.386	90.	-15.525	90.	-10.931	90.	-18.851	90.	-18.059
100.	6.020	100.	-17.426	100.	-12.198	100.	-21.069	100.	-19.960
20.	1.267	20.	-3.010	20.	-2.376	20.	-4.594	20.	-3.802
0.	-0.158	0.	0.317	0.	0.158	0.	0.	0.	0.158
20.	1.267	20.	-3.010	20.	-1.584	20.	-4.594	20.	-4.594

GAGE 47		GAGE 48		GAGE 49		GAGE 50		GAGE 51	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	3.168	10.	1.426	10.	-3.010	10.	0.317	10.	7.762
20.	6.020	20.	2.693	20.	-5.386	20.	1.109	20.	15.525
30.	9.030	30.	4.119	30.	-7.762	30.	1.901	30.	23.446
40.	12.040	40.	5.545	40.	-9.980	40.	2.693	40.	31.208
50.	15.050	50.	7.129	50.	-12.040	50.	3.644	50.	38.970
60.	18.218	60.	8.713	60.	-14.099	60.	4.594	60.	46.574
70.	21.228	70.	10.297	70.	-16.000	70.	5.545	70.	53.861
80.	23.921	80.	11.723	80.	-17.426	80.	6.653	80.	61.149
90.	26.139	90.	12.990	90.	-17.901	90.	8.079	90.	68.277
100.	28.198	100.	14.257	100.	-17.743	100.	9.822	100.	75.248
20.	4.119	20.	1.743	20.	-1.109	20.	2.693	20.	15.208
0.	-0.317	0.	0.475	0.	1.584	0.	-0.	0.	-0.
20.	4.911	20.	2.693	20.	-1.584	20.	2.376	20.	15.525

GAGE 52		GAGE 53		GAGE 54		GAGE 55		GAGE 56	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	7.921	10.	5.228	10.	5.545	10.	6.495	10.	5.545
20.	15.366	20.	10.455	20.	11.406	20.	13.149	20.	10.455
30.	22.970	30.	15.842	30.	17.426	30.	19.644	30.	15.683
40.	30.416	40.	21.386	40.	23.446	40.	26.139	40.	20.594
50.	38.020	50.	26.772	50.	29.149	50.	32.475	50.	25.663
60.	45.465	60.	32.317	60.	35.168	60.	38.970	60.	30.733
70.	52.594	70.	37.703	70.	40.871	70.	45.149	70.	35.644
80.	59.564	80.	43.089	80.	46.891	80.	51.168	80.	40.238
90.	65.743	90.	48.158	90.	53.069	90.	56.871	90.	43.881
100.	71.604	100.	53.703	100.	59.881	100.	62.257	100.	47.208
20.	13.149	20.	10.772	20.	12.990	20.	11.248	20.	6.653
0.	-0.475	0.	-0.	0.	0.	0.	-0.634	0.	-0.950
20.	13.307	20.	9.822	20.	12.356	20.	12.198	20.	7.921

GAGE 57		GAGE 58		GAGE 59		GAGE 60		GAGE 61	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	3.485	10.	0.475	10.	5.386	10.	2.376	10.	0.
20.	7.287	20.	0.950	20.	10.614	20.	5.228	20.	0.158
30.	11.406	30.	1.743	30.	16.158	30.	8.396	30.	0.
40.	15.366	40.	2.376	40.	21.545	40.	11.881	40.	0.158
50.	19.327	50.	3.168	50.	26.772	50.	15.208	50.	0.475
60.	23.446	60.	4.119	60.	32.000	60.	18.535	60.	0.792
70.	27.406	70.	5.069	70.	37.069	70.	21.861	70.	1.426
80.	31.842	80.	6.178	80.	41.980	80.	25.505	80.	2.059
90.	36.594	90.	7.446	90.	46.574	90.	29.624	90.	2.851
100.	41.980	100.	9.188	100.	50.851	100.	34.218	100.	3.960
20.	9.822	20.	1.901	20.	9.347	20.	6.970	20.	0.158
0.	0.158	0.	0.475	0.	-0.634	0.	-0.317	0.	0.
20.	9.030	20.	1.584	20.	9.822	20.	6.495	20.	-0.

GAGE 62		GAGE 63		GAGE 64		GAGE 65		GAGE 66	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
10.	4.119	10.	3.802	10.	2.851	10.	-2.218	10.	-0.475
20.	8.238	20.	7.446	20.	5.545	20.	-4.436	20.	-0.634
30.	12.040	30.	11.089	30.	7.921	30.	-6.495	30.	-0.634
40.	15.842	40.	14.416	40.	10.297	40.	-8.238	40.	-0.317
50.	19.644	50.	17.584	50.	12.515	50.	-9.822	50.	-0.317
60.	23.604	60.	20.911	60.	15.050	60.	-11.406	60.	-0.158
70.	27.564	70.	23.921	70.	17.267	70.	-12.990	70.	-0.158
80.	31.208	80.	26.931	80.	19.485	80.	-14.257	80.	0.158
90.	34.218	90.	29.307	90.	21.386	90.	-14.733	90.	1.267
100.	36.594	100.	31.525	100.	22.970	100.	-14.416	100.	2.693
20.	5.545	20.	6.653	20.	4.911	20.	-1.267	20.	2.376
0.	-0.475	0.	0.475	0.	0.792	0.	0.634	0.	0.475
20.	5.861	20.	6.970	20.	5.386	20.	-1.743	20.	2.059

GAGE 67		GAGE 68		GAGE 69		GAGE 70		GAGE 71	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
10.	6.970	10.	5.069	10.	5.545	10.	7.446	10.	-0.158
20.	13.941	20.	10.455	20.	11.248	20.	14.891	20.	-0.475
30.	21.228	30.	16.158	30.	16.792	30.	22.337	30.	-0.634
40.	28.515	40.	22.020	40.	22.337	40.	29.465	40.	-0.950
50.	35.485	50.	27.881	50.	27.881	50.	36.594	50.	-1.267
60.	42.614	60.	33.743	60.	33.743	60.	43.564	60.	-1.426
70.	49.426	70.	39.446	70.	39.287	70.	50.535	70.	-1.584
80.	56.238	80.	45.465	80.	44.832	80.	57.188	80.	-1.743
90.	62.891	90.	51.802	90.	50.218	90.	63.208	90.	-1.901
100.	69.386	100.	58.297	100.	55.921	100.	68.911	100.	-2.218
20.	14.257	20.	11.881	20.	10.614	20.	13.465	20.	-0.317
0.	0.	0.	-0.317	0.	0.	0.	0.317	0.	0.
20.	14.257	20.	11.248	20.	10.297	20.	13.624	20.	-0.317

GAGE 72		GAGE 73		GAGE 74		GAGE 75		GAGE 76	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
10.	-0.158	10.	0.634	10.	0.950	10.	-0.	10.	-0.
20.	-0.475	20.	1.109	20.	2.059	20.	-0.317	20.	-0.
30.	-0.634	30.	1.743	30.	3.010	30.	-0.475	30.	-0.158
40.	-0.950	40.	2.376	40.	3.960	40.	-0.475	40.	-0.158
50.	-1.109	50.	2.851	50.	4.911	50.	-0.634	50.	-0.317
60.	-1.267	60.	3.327	60.	5.881	60.	-0.792	60.	-0.475
70.	-1.584	70.	3.960	70.	6.653	70.	-0.792	70.	-0.475
80.	-1.743	80.	4.436	80.	7.446	80.	-0.950	80.	-0.634
90.	-1.901	90.	4.911	90.	8.396	90.	-0.950	90.	-0.792
100.	-2.218	100.	5.386	100.	9.347	100.	-1.109	100.	-0.792
20.	-0.317	20.	1.267	20.	2.218	20.	-0.158	20.	0.
0.	-0.	0.	0.	0.	0.	0.	0.	0.	0.
20.	-0.475	20.	1.267	20.	2.218	20.	-0.317	20.	0.

GAGE 77		GAGE 78		GAGE 79		GAGE 80		GAGE 81	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	0.	0.	0.	0.	0.
10.	0.317	10.	0.317	10.	0.158	10.	-0.158	10.	-0.
20.	0.158	20.	0.792	20.	0.317	20.	-0.317	20.	-0.158
30.	0.158	30.	1.426	30.	0.475	30.	-0.634	30.	-0.317
40.	-0.	40.	2.059	40.	0.792	40.	-0.792	40.	-0.317
50.	-0.158	50.	2.693	50.	0.950	50.	-0.950	50.	-0.475
60.	-0.317	60.	3.327	60.	1.109	60.	-1.109	60.	-0.634
70.	-0.634	70.	3.960	70.	1.267	70.	-1.426	70.	-0.634
80.	-0.950	80.	4.594	80.	1.584	80.	-1.584	80.	-0.792
90.	-1.109	90.	5.228	90.	1.743	90.	-1.743	90.	-0.792
100.	-1.426	100.	5.861	100.	1.901	100.	-1.901	100.	-0.950
20.	-1.901	20.	0.792	20.	0.475	20.	-0.317	20.	-0.158
0.	-2.059	0.	-0.	0.	0.	0.	0.	0.	0.
20.	-2.059	20.	0.634	20.	0.475	20.	-0.475	20.	-0.158

GAGE 82		GAGE 83		GAGE 84		GAGE 85		GAGE 86	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	-0.	0.	0.	0.	-0.
10.	0.792	10.	0.158	10.	-0.	10.	-0.	10.	0.475
20.	1.743	20.	0.317	20.	-0.	20.	-0.	20.	0.950
30.	2.535	30.	0.475	30.	-0.158	30.	-0.158	30.	1.584
40.	3.327	40.	0.634	40.	-0.158	40.	-0.158	40.	2.376
50.	4.277	50.	0.950	50.	-0.317	50.	-0.158	50.	3.168
60.	5.228	60.	1.109	60.	-0.475	60.	-0.317	60.	3.802
70.	6.020	70.	1.267	70.	-0.634	70.	-0.317	70.	4.594
80.	6.970	80.	1.584	80.	-0.792	80.	-0.475	80.	5.386
90.	7.762	90.	1.743	90.	-0.950	90.	-0.475	90.	6.178
100.	8.713	100.	2.059	100.	-0.950	100.	-0.634	100.	6.970
20.	2.059	20.	0.475	20.	-0.	20.	0.	20.	1.267
0.	0.158	0.	0.	0.	0.	0.	0.	0.	0.
20.	2.218	20.	0.475	20.	-0.	20.	-0.	20.	1.426

GAGE 87		GAGE 88		GAGE 89		GAGE 90		GAGE 91	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	-0.	0.	0.	0.	0.
10.	0.158	10.	0.158	10.	0.317	10.	-0.	10.	-0.158
20.	0.317	20.	0.317	20.	0.792	20.	-0.	20.	-0.158
30.	0.634	30.	0.317	30.	1.109	30.	-0.158	30.	-0.158
40.	0.950	40.	0.475	40.	1.584	40.	-0.158	40.	-0.317
50.	1.267	50.	0.634	50.	2.059	50.	-0.158	50.	-0.317
60.	1.584	60.	0.792	60.	2.535	60.	-0.158	60.	-0.317
70.	1.901	70.	0.792	70.	3.010	70.	-0.317	70.	-0.475
80.	2.218	80.	0.950	80.	3.485	80.	-0.317	80.	-0.475
90.	2.535	90.	1.109	90.	3.960	90.	-0.158	90.	-0.475
100.	2.693	100.	1.109	100.	4.436	100.	-0.158	100.	-0.634
20.	0.158	20.	0.158	20.	0.950	20.	0.317	20.	-0.317
0.	-0.158	0.	-0.	0.	0.158	0.	0.317	0.	-0.158
20.	0.158	20.	0.158	20.	1.109	20.	0.317	20.	-0.158

GAGE 92		GAGE 93		GAGE 94		GAGE 95		GAGE 96	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	0.317	10.	0.792	10.	0.	10.	3.010	10.	0.950
20.	0.475	20.	1.426	20.	0.158	20.	6.020	20.	2.059
30.	0.792	30.	2.218	30.	0.317	30.	9.347	30.	3.010
40.	1.109	40.	2.851	40.	0.475	40.	12.356	40.	4.119
50.	1.426	50.	3.485	50.	0.634	50.	15.683	50.	5.069
60.	1.743	60.	4.119	60.	0.634	60.	18.851	60.	6.178
70.	2.059	70.	4.752	70.	0.792	70.	22.178	70.	7.129
80.	2.218	80.	5.386	80.	0.950	80.	25.505	80.	8.079
90.	2.376	90.	6.020	90.	1.109	90.	28.673	90.	9.030
100.	2.535	100.	6.495	100.	1.426	100.	31.842	100.	9.980
20.	0.317	20.	1.426	20.	0.792	20.	5.861	20.	2.059
0.	-0.158	0.	0.158	0.	0.317	0.	-0.	0.	0.158
20.	0.158	20.	1.426	20.	0.792	20.	6.020	20.	2.059

GAGE 97

LOAD	STRESS
0.	0.
10.	0.475
20.	1.267
30.	2.059
40.	3.010
50.	3.960
60.	5.069
70.	6.020
80.	7.129
90.	8.396
100.	9.663
20.	1.901
0.	0.317
20.	2.218

GAGE 98

LOAD	STRESS
0.	0.
10.	-1.267
20.	-3.010
30.	-4.752
40.	-6.337
50.	-7.921
60.	-9.347
70.	-10.931
80.	-12.515
90.	-14.099
100.	-15.842
20.	-3.168
0.	0.
20.	-3.327

GAGE 99

LOAD	STRESS
0.	0.
10.	0.792
20.	1.743
30.	2.693
40.	3.644
50.	4.594
60.	5.703
70.	6.653
80.	7.762
90.	8.713
100.	9.822
20.	1.901
0.	0.
20.	1.901

GAGE 100

LOAD	STRESS
0.	0.
10.	3.401
20.	6.833
30.	10.311
40.	13.836
50.	17.391
60.	21.024
70.	24.533
80.	28.058
90.	31.397
100.	34.814

GAGE 101

LOAD	STRESS
0.	0.
10.	1.484
20.	2.922
30.	4.390
40.	5.843
50.	7.266
60.	8.703
70.	10.079
80.	11.455
90.	0.510
100.	14.439

GAGE 102

LOAD	STRESS
0.	0.
10.	-1.190
20.	-2.458
30.	-3.757
40.	-4.931
50.	-6.075
60.	-7.157
70.	-8.255
80.	-10.929
90.	-4.437
100.	-11.965

GAGE 103

LOAD	STRESS
0.	0.
10.	-0.881
20.	-1.747
30.	-2.659
40.	-3.447
50.	-4.375
60.	-6.709
70.	-5.983
80.	-6.833
90.	-7.621
100.	-8.425

GAGE 104

LOAD	STRESS
0.	0.
10.	-1.469
20.	-2.953
30.	-4.545
40.	-6.029
50.	-7.529
60.	-9.028
70.	-5.874
80.	-12.027
90.	-13.449
100.	-14.949

GAGE 105

LOAD	STRESS
0.	0.
10.	-0.464
20.	-0.850
30.	-1.329
40.	-1.731
50.	-2.164
60.	-2.551
70.	-2.999
80.	-3.416
90.	-3.834
100.	-4.251

GAGE 106

LOAD	STRESS
0.	0.
10.	0.402
20.	0.788
30.	1.051
40.	1.407
50.	1.731
60.	2.087
70.	2.381
80.	2.690
90.	2.984
100.	3.293

GAGE 107		GAGE 108		GAGE 109		GAGE 110		GAGE 111	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	0.325	10.	2.875	10.	-1.871	10.	5.998	10.	0.603
20.	0.634	20.	5.905	20.	-3.772	20.	11.934	20.	1.129
30.	0.850	30.	9.074	30.	-5.782	30.	18.056	30.	1.608
40.	1.129	40.	12.274	40.	-7.590	40.	24.162	40.	2.087
50.	1.360	50.	15.490	50.	-9.445	50.	30.207	50.	2.551
60.	1.654	60.	18.736	60.	-11.223	60.	36.267	60.	3.030
70.	1.901	70.	21.936	70.	-13.016	70.	42.126	70.	3.494
80.	2.180	80.	25.121	80.	-14.763	80.	48.031	80.	3.896
90.	2.365	90.	28.243	90.	-16.510	90.	53.596	90.	4.329
100.	2.613	100.	31.552	100.	-18.319	100.	59.362	100.	4.715

GAGE 112		GAGE 113		GAGE 114		GAGE 115		GAGE 116	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	-0.	0.	0.
10.	5.318	10.	2.582	10.	2.102	10.	-0.897	10.	-0.232
20.	10.852	20.	5.241	20.	4.329	20.	-1.886	20.	-0.510
30.	16.649	30.	7.807	30.	6.632	30.	-2.875	30.	-0.773
40.	22.400	40.	10.342	40.	9.013	40.	-3.849	40.	-1.005
50.	28.073	50.	12.862	50.	11.440	50.	-4.916	50.	-1.345
60.	33.793	60.	15.443	60.	13.867	60.	-5.967	60.	-1.654
70.	39.389	70.	17.901	70.	16.294	70.	-7.018	70.	-1.963
80.	44.955	80.	20.390	80.	18.736	80.	-8.100	80.	-2.288
90.	50.242	90.	22.864	90.	21.163	90.	-9.198	90.	-2.582
100.	55.699	100.	25.322	100.	23.683	100.	-10.342	100.	-2.906

GAGE 117		GAGE 118		GAGE 119		GAGE 120		GAGE 121	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	-0.216	10.	-0.479	10.	-0.015	10.	-0.077	10.	-0.526
20.	-0.479	20.	-0.989	20.	0.015	20.	-0.170	20.	-1.051
30.	-0.742	30.	-1.515	30.	0.	30.	-0.247	30.	-1.654
40.	-0.974	40.	-1.932	40.	0.015	40.	-0.232	40.	-2.164
50.	-1.252	50.	-2.365	50.	0.031	50.	-0.216	50.	-2.628
60.	-1.530	60.	-2.798	60.	0.077	60.	-0.201	60.	-3.076
70.	-1.809	70.	-3.215	70.	0.124	70.	-0.170	70.	-3.571
80.	-2.133	80.	-3.679	80.	0.139	80.	-0.155	80.	-4.050
90.	-2.535	90.	-4.112	90.	0.139	90.	-0.124	90.	-4.560
100.	-2.968	100.	-4.576	100.	0.170	100.	-0.124	100.	-5.132

GAGE 122		GAGE 123		GAGE 124		GAGE 125		GAGE 126	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	0.108	10.	0.046	10.	-0.835	10.	0.015	10.	0.093
20.	0.201	20.	0.093	20.	-1.670	20.	0.015	20.	0.155
30.	0.201	30.	0.124	30.	-2.535	30.	0.077	30.	0.201
40.	0.356	40.	0.186	40.	-3.324	40.	0.139	40.	0.294
50.	0.495	50.	0.294	50.	-4.112	50.	0.247	50.	0.356
60.	0.665	60.	0.402	60.	-4.931	60.	0.340	60.	0.402
70.	0.804	70.	0.479	70.	-5.735	70.	0.417	70.	0.417
80.	0.974	80.	0.572	80.	-6.570	80.	0.448	80.	0.479
90.	1.113	90.	0.603	90.	-7.328	90.	0.479	90.	0.572
100.	1.206	100.	0.634	100.	-8.100	100.	0.510	100.	0.649

GAGE 127		GAGE 128		GAGE 129		GAGE 130		GAGE 131	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	1.577	10.	2.257	10.	0.186	10.	0.139	10.	2.582
20.	3.277	20.	4.669	20.	0.340	20.	0.340	20.	5.302
30.	5.040	30.	7.157	30.	0.340	30.	0.479	30.	8.147
40.	6.957	40.	9.646	40.	0.186	40.	0.526	40.	10.899
50.	8.889	50.	12.213	50.	0.015	50.	0.587	50.	13.604
60.	10.914	60.	14.779	60.	-0.077	60.	0.757	60.	16.371
70.	12.862	70.	17.299	70.	-0.232	70.	0.804	70.	19.030
80.	14.841	80.	19.896	80.	-0.356	80.	0.897	80.	21.797
90.	16.819	90.	22.462	90.	-0.495	90.	1.005	90.	24.502
100.	18.798	100.	25.136	100.	-0.665	100.	1.082	100.	27.300

GAGE 132		GAGE 133		GAGE 134		GAGE 135		GAGE 136	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	-0.	0.	0.
10.	6.369	10.	-1.360	10.	1.577	10.	0.587	10.	-0.108
20.	12.846	20.	-2.767	20.	3.324	20.	1.221	20.	-0.077
30.	19.648	30.	-4.452	30.	5.163	30.	1.824	30.	0.062
40.	26.327	40.	-6.060	40.	7.049	40.	2.288	40.	0.232
50.	32.943	50.	-7.683	50.	8.843	50.	2.752	50.	0.587
60.	39.559	60.	-9.275	60.	10.775	60.	3.277	60.	1.036
70.	45.913	70.	-10.914	70.	12.568	70.	3.664	70.	1.422
80.	52.236	80.	-12.444	80.	14.408	80.	4.097	80.	1.809
90.	58.311	90.	-13.975	90.	16.232	90.	4.421	90.	2.071
100.	64.510	100.	-15.536	100.	18.102	100.	4.761	100.	2.365

GAGE 137		GAGE 138		GAGE 139		GAGE 140		GAGE 141	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	4.870	10.	-1.407	10.	2.102	10.	2.180	10.	3.076
20.	9.925	20.	-2.844	20.	4.329	20.	4.437	20.	6.338
30.	15.181	30.	-4.390	30.	6.199	30.	6.771	30.	10.172
40.	20.375	40.	-6.014	40.	6.987	40.	9.414	40.	14.655
50.	25.523	50.	-7.745	50.	7.467	50.	12.197	50.	19.355
60.	30.701	60.	-9.399	60.	7.884	60.	15.088	60.	24.162
70.	35.726	70.	-11.100	70.	8.240	70.	17.886	70.	28.862
80.	40.765	80.	-12.692	80.	8.657	80.	20.669	80.	33.530
90.	45.604	90.	-14.191	90.	9.090	90.	23.436	90.	38.214
100.	50.582	100.	-15.706	100.	9.585	100.	26.342	100.	43.007

GAGE 142		GAGE 143		GAGE 144		GAGE 145		GAGE 146	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	0.557	10.	2.999	10.	5.333	10.	2.118	10.	2.087
20.	1.190	20.	5.550	20.	10.651	20.	4.560	20.	4.066
30.	1.932	30.	7.668	30.	16.062	30.	7.405	30.	5.194
40.	2.473	40.	9.925	40.	21.302	40.	10.203	40.	5.905
50.	3.014	50.	12.336	50.	26.450	50.	12.939	50.	6.539
60.	3.586	60.	14.763	60.	31.552	60.	15.660	60.	7.173
70.	4.112	70.	17.159	70.	36.375	70.	18.272	70.	7.853
80.	4.730	80.	19.664	80.	41.244	80.	20.885	80.	8.642
90.	5.318	90.	21.921	90.	45.820	90.	23.467	90.	9.353
100.	6.029	100.	24.301	100.	50.520	100.	26.187	100.	10.157

GAGE 147

LOAD	STRESS
0.	0.
10.	3.509
20.	6.601
30.	9.507
40.	11.996
50.	13.913
60.	15.784
70.	17.577
80.	19.324
90.	20.746
100.	22.446

GAGE 148

LOAD	STRESS
0.	0.
10.	3.045
20.	6.276
30.	9.708
40.	13.202
50.	16.742
60.	20.329
70.	23.776
80.	27.300
90.	30.671
100.	34.025

GAGE 149

LOAD	STRESS
0.	-0.
10.	1.546
20.	3.463
30.	5.658
40.	8.116
50.	10.883
60.	13.743
70.	16.572
80.	19.602
90.	22.833
100.	26.048

GAGE 150

LOAD	STRESS
0.	0.
10.	3.988
20.	8.178
30.	12.584
40.	16.989
50.	21.472
60.	26.048
70.	30.485
80.	34.937
90.	39.204
100.	43.641

GAGE 151

LOAD	STRESS
0.	0.
10.	3.509
20.	6.987
30.	10.574
40.	14.068
50.	17.500
60.	21.040
70.	24.425
80.	27.842
90.	38.895
100.	34.535

GAGE 152

LOAD	STRESS
0.	-0.
10.	0.186
20.	0.402
30.	0.665
40.	0.850
50.	1.051
60.	1.299
70.	1.561
80.	1.855
90.	2.164
100.	2.535

GAGE 153

LOAD	STRESS
0.	0.
10.	2.814
20.	5.921
30.	9.816
40.	14.037
50.	18.427
60.	22.895
70.	27.192
80.	31.505
90.	35.772
100.	40.193

GAGE 154

LOAD	STRESS
0.	0.
10.	2.133
20.	4.313
30.	6.694
40.	9.183
50.	11.687
60.	14.253
70.	16.757
80.	19.324
90.	21.859
100.	24.502

ATR 500 - ESCAPE TOWER STATIC TEST

CONDITION II - MAXIMUM Q TUMBLING ABORT (ULTIMATE) -

(All stress values are in ksi.
Load values are in percent of
ultimate design load.)

SIGMA MAX IS LOCATED THETA DEGREES FROM GAGE 1 TOWARDS GAGES 2 AND 3

GAGES 1, 2 AND 3

GAGE FACTOR = 2.070 AUX. GAGE FACTOR = 1/ 47. MU = 0.290 ** E(TEN) = 16.000 E(COMP) = 16.000 MILLION PSI

LOAD	SIG(2)	SIG(4)	TAU(2- 4)	SIGMAX	SIGMIN	TAUMAX	THETA
0.	0.	0.	0.	0.	0.	0.	0.
10.	0.503	0.136	-0.551	0.900	-0.261	0.581	144.
20.	1.297	0.195	-1.285	2.144	-0.652	1.398	147.
30.	2.212	0.132	-1.652	3.124	-0.780	1.952	151.
40.	3.128	0.068	-2.264	4.331	-1.134	2.733	152.
50.	4.089	0.173	-2.815	5.560	-1.298	3.429	152.
60.	4.669	0.019	-3.304	6.385	-1.697	4.041	153.
70.	5.463	0.078	-3.916	7.523	-1.982	4.753	152.
80.	6.088	0.091	-4.467	8.470	-2.290	5.380	152.
90.	6.759	0.273	-5.079	9.542	-2.510	6.026	151.
100.	7.385	0.287	-5.507	10.388	-2.716	6.552	151.
20.	1.419	0.073	-1.285	2.197	-0.705	1.451	149.
0.	-0.335	-0.091	-0.	-0.091	-0.335	0.122	45.
20.	0.961	0.104	-1.285	1.887	-0.822	1.355	144.

SIGMA MAX IS LOCATED THETA DEGREES FROM GAGE 4 TOWARDS GAGES 6 AND 7

GAGES 4, 5 AND 6

GAGE FACTOR = 2.070 AUX. GAGE FACTOR = 1/ 47. MU = 0.290 ** E(TEN) = 16.000 E(COMP) = 16.000 MILLION PSI

LOAD	SIG(5)	SIG(7)	TAU(5- 7)	SIGMAX	SIGMIN	TAUMAX	THETA
0.	0.	0.	0.	0.	0.	0.	0.
10.	0.	0.	-0.245	0.245	-0.245	0.245	45.
20.	0.335	0.091	-0.734	0.958	-0.531	0.744	140.
30.	0.671	0.181	-1.101	1.555	-0.702	1.128	141.
40.	1.006	0.272	-1.469	2.153	-0.875	1.514	142.
50.	1.220	0.485	-1.958	2.845	-1.140	1.992	140.
60.	1.555	0.576	-2.448	3.562	-1.431	2.496	141.
70.	1.723	0.621	-2.754	3.980	-1.636	2.808	141.
80.	1.936	0.834	-3.243	4.675	-1.905	3.290	140.
90.	2.271	0.925	-3.610	5.271	-2.074	3.673	140.
100.	2.484	1.138	-4.100	5.966	-2.343	4.155	140.
20.	0.716	0.349	-0.796	1.349	-0.284	0.816	141.
0.	0.	0.	0.	0.	0.	0.	0.
20.	0.381	0.258	-0.796	1.118	-0.478	0.798	137.

GAGE 7		GAGE 8		GAGE 9		GAGE 10		GAGE 11	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10.	1.743	10.	1.743	10.	1.426	10.	2.218	10.	1.109
20.	3.485	20.	3.485	20.	2.535	20.	4.119	20.	2.535
30.	4.752	30.	5.386	30.	3.802	30.	6.337	30.	4.277
40.	6.020	40.	7.287	40.	5.228	40.	8.554	40.	6.178
50.	7.129	50.	9.188	50.	6.653	50.	10.772	50.	7.921
60.	8.396	60.	11.089	60.	8.396	60.	13.149	60.	9.822
70.	9.663	70.	13.149	70.	9.980	70.	15.525	70.	11.723
80.	10.931	80.	15.050	80.	11.564	80.	18.059	80.	13.941
90.	12.040	90.	16.792	90.	12.832	90.	20.752	90.	16.317
100.	13.149	100.	18.059	100.	13.782	100.	23.287	100.	18.535
20.	1.743	20.	2.218	20.	0.950	20.	4.277	20.	3.010
0.	-0.317	0.	-0.792	0.	-0.634	0.	-0.	0.	-0.317
20.	2.693	20.	2.693	20.	1.584	20.	4.436	20.	3.485

GAGE 12		GAGE 13		GAGE 14		GAGE 15		GAGE 16	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
10.	0.634	10.	1.901	10.	1.426	10.	1.426	10.	1.109
20.	1.584	20.	3.644	20.	2.693	20.	2.535	20.	2.218
30.	3.010	30.	4.911	30.	4.119	30.	3.960	30.	3.485
40.	4.594	40.	6.178	40.	5.861	40.	5.228	40.	4.752
50.	6.337	50.	7.446	50.	7.604	50.	6.653	50.	6.020
60.	8.079	60.	8.713	60.	9.505	60.	8.079	60.	7.446
70.	9.822	70.	10.139	70.	11.248	70.	9.505	70.	8.713
80.	11.881	80.	11.406	80.	13.149	80.	10.772	80.	9.980
90.	14.574	90.	12.832	90.	14.891	90.	11.881	90.	11.248
100.	17.426	100.	13.941	100.	16.475	100.	12.832	100.	12.198
20.	3.327	20.	1.901	20.	2.376	20.	1.109	20.	1.901
0.	0.	0.	-0.	0.	-0.317	0.	-0.792	0.	-0.317
20.	3.327	20.	3.168	20.	2.376	20.	1.426	20.	1.901

GAGE 17		GAGE 18		GAGE 19		GAGE 20		GAGE 21	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	0.	0.	-0.	0.	0.
10.	0.317	10.	0.317	10.	0.158	10.	-0.158	10.	5.069
20.	0.792	20.	1.109	20.	0.475	20.	-0.	20.	10.297
30.	1.267	30.	2.218	30.	1.109	30.	0.	30.	15.525
40.	1.584	40.	3.010	40.	1.584	40.	0.158	40.	20.752
50.	2.059	50.	3.802	50.	2.059	50.	0.158	50.	25.822
60.	2.535	60.	4.277	60.	2.376	60.	0.317	60.	31.050
70.	2.851	70.	4.752	70.	2.693	70.	0.317	70.	36.277
80.	3.168	80.	5.386	80.	3.168	80.	0.475	80.	41.347
90.	3.644	90.	5.861	90.	3.485	90.	0.475	90.	46.416
100.	3.802	100.	6.337	100.	3.960	100.	0.634	100.	51.327
20.	1.267	20.	0.634	20.	0.792	20.	0.317	20.	10.139
0.	0.158	0.	-0.475	0.	0.	0.	0.	0.	-0.
20.	0.950	20.	0.634	20.	0.475	20.	-0.	20.	10.139

GAGE 22		GAGE 23		GAGE 24		GAGE 25		GAGE 26	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	-0.	0.	0.
10.	3.010	10.	-3.168	10.	-0.634	10.	0.158	10.	-0.317
20.	6.495	20.	-6.653	20.	-1.267	20.	0.317	20.	-0.792
30.	9.980	30.	-9.663	30.	-1.584	30.	0.475	30.	-1.426
40.	13.624	40.	-12.356	40.	-1.743	40.	0.634	40.	-1.901
50.	17.267	50.	-14.891	50.	-1.743	50.	0.950	50.	-2.218
60.	20.752	60.	-17.426	60.	-1.901	60.	1.267	60.	-2.535
70.	24.396	70.	-19.960	70.	-1.743	70.	1.901	70.	-2.535
80.	28.040	80.	-22.020	80.	-1.584	80.	2.376	80.	-2.693
90.	31.842	90.	-23.762	90.	-1.267	90.	2.693	90.	-2.693
100.	35.327	100.	-25.030	100.	-0.792	100.	3.010	100.	-2.851
20.	6.653	20.	-5.545	20.	-1.426	20.	-1.267	20.	-2.059
0.	-0.317	0.	-0.	0.	0.	0.	0.	0.	0.
20.	6.495	20.	-5.228	20.	-0.634	20.	-0.	20.	-0.950

GAGE 27		GAGE 28		GAGE 29		GAGE 30		GAGE 31	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	-0.	0.	0.	0.	0.	0.	-0.
10.	-0.317	10.	2.693	10.	3.644	10.	1.901	10.	5.228
20.	-0.950	20.	5.703	20.	7.287	20.	3.960	20.	10.772
30.	-1.584	30.	8.396	30.	10.772	30.	6.178	30.	16.475
40.	-2.059	40.	10.931	40.	14.257	40.	8.396	40.	22.020
50.	-2.376	50.	13.465	50.	17.584	50.	10.614	50.	27.723
60.	-2.851	60.	16.000	60.	20.752	60.	12.832	60.	33.267
70.	-3.327	70.	18.535	70.	24.079	70.	15.050	70.	38.812
80.	-3.485	80.	20.752	80.	27.089	80.	17.426	80.	44.356
90.	-3.644	90.	22.970	90.	30.099	90.	19.802	90.	50.218
100.	-3.485	100.	24.713	100.	32.475	100.	22.020	100.	55.446
20.	-0.158	20.	4.911	20.	6.495	20.	4.911	20.	11.406
0.	0.	0.	0.	0.	0.158	0.	0.158	0.	-0.475
20.	-0.317	20.	5.069	20.	6.812	20.	4.752	20.	10.772

GAGE 32		GAGE 33		GAGE 34		GAGE 35		GAGE 36	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	0.	0.	0.	0.	0.
10.	4.752	10.	5.861	10.	6.178	10.	6.020	10.	6.653
20.	9.980	20.	12.040	20.	12.673	20.	12.356	20.	13.465
30.	14.891	30.	17.901	30.	18.851	30.	18.693	30.	20.119
40.	19.960	40.	23.604	40.	25.030	40.	25.030	40.	26.614
50.	25.030	50.	29.465	50.	31.208	50.	31.366	50.	33.109
60.	30.099	60.	35.168	60.	37.228	60.	37.703	60.	39.446
70.	35.010	70.	40.871	70.	43.248	70.	43.723	70.	45.782
80.	39.921	80.	46.416	80.	48.950	80.	49.901	80.	51.960
90.	44.990	90.	51.644	90.	54.653	90.	56.238	90.	57.980
100.	49.743	100.	56.238	100.	59.723	100.	62.099	100.	63.208
20.	9.822	20.	10.455	20.	11.406	20.	12.832	20.	12.515
0.	-0.475	0.	-0.317	0.	-0.158	0.	-0.634	0.	-0.158
20.	9.347	20.	10.614	20.	11.723	20.	12.198	20.	12.515

GAGE 37		GAGE 38		GAGE 39		GAGE 40		GAGE 41	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	-0.
10.	6.812	10.	6.020	10.	0.950	10.	2.693	10.	2.059
20.	13.307	20.	12.040	20.	2.218	20.	5.703	20.	4.277
30.	19.485	30.	18.059	30.	3.960	30.	8.713	30.	6.178
40.	25.505	40.	23.921	40.	5.545	40.	11.406	40.	8.396
50.	31.683	50.	29.782	50.	7.129	50.	14.099	50.	10.455
60.	37.703	60.	35.644	60.	8.554	60.	16.950	60.	12.515
70.	43.723	70.	41.505	70.	10.297	70.	19.644	70.	14.574
80.	49.426	80.	47.050	80.	12.040	80.	22.337	80.	16.634
90.	54.812	90.	52.752	90.	13.941	90.	25.030	90.	18.376
100.	59.406	100.	57.822	100.	15.842	100.	27.248	100.	19.960
20.	11.564	20.	11.723	20.	3.327	20.	4.911	20.	3.485
0.	0.	0.	-0.317	0.	0.158	0.	0.158	0.	0.
20.	11.723	20.	11.406	20.	3.168	20.	5.228	20.	3.802

GAGE 42		GAGE 43		GAGE 44		GAGE 45		GAGE 46	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	0.	0.	-0.	0.	-0.
10.	-0.950	10.	0.158	10.	-0.475	10.	-3.485	10.	-0.634
20.	-1.743	20.	0.158	20.	-0.950	20.	-6.653	20.	-1.267
30.	-2.376	30.	0.158	30.	-1.743	30.	-9.347	30.	-1.584
40.	-2.851	40.	0.158	40.	-2.218	40.	-12.040	40.	-2.059
50.	-3.327	50.	0.158	50.	-2.535	50.	-14.574	50.	-2.535
60.	-3.802	60.	0.475	60.	-2.851	60.	-17.109	60.	-2.693
70.	-4.119	70.	0.792	70.	-3.010	70.	-19.485	70.	-2.851
80.	-4.436	80.	1.109	80.	-3.010	80.	-21.545	80.	-2.851
90.	-4.436	90.	1.109	90.	-3.168	90.	-23.287	90.	-2.851
100.	-4.277	100.	1.267	100.	-3.327	100.	-24.713	100.	-2.693
20.	-0.792	20.	-1.426	20.	-2.218	20.	-5.386	20.	-1.267
0.	-0.	0.	0.317	0.	0.	0.	-0.	0.	0.
20.	-0.950	20.	-0.317	20.	-1.267	20.	-5.069	20.	-0.792

GAGE 47		GAGE 48		GAGE 49		GAGE 50		GAGE 51	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	-0.	0.	-0.	0.	0.
10.	2.218	10.	0.792	10.	-0.475	10.	1.584	10.	7.287
20.	5.545	20.	2.218	20.	-2.535	20.	2.851	20.	14.891
30.	8.871	30.	3.644	30.	-4.594	30.	3.960	30.	22.337
40.	12.198	40.	5.228	40.	-6.495	40.	5.228	40.	29.782
50.	15.525	50.	6.812	50.	-8.396	50.	6.337	50.	37.069
60.	18.693	60.	8.554	60.	-10.139	60.	7.446	60.	44.198
70.	22.020	70.	10.297	70.	-11.881	70.	8.713	70.	51.327
80.	25.347	80.	12.040	80.	-13.307	80.	9.980	80.	58.297
90.	28.673	90.	14.099	90.	-14.733	90.	11.248	90.	65.426
100.	31.842	100.	16.000	100.	-16.158	100.	12.515	100.	72.079
20.	5.069	20.	1.743	20.	-2.376	20.	2.376	20.	13.782
0.	-0.	0.	0.	0.	-0.	0.	-0.317	0.	-0.317
20.	5.545	20.	2.376	20.	-2.535	20.	2.693	20.	14.416

GAGE 52		GAGE 53		GAGE 54		GAGE 55		GAGE 56	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	0.	0.	-0.	0.	-0.
10.	5.386	10.	3.960	10.	6.178	10.	6.337	10.	3.644
20.	12.356	20.	8.396	20.	11.406	20.	13.307	20.	8.713
30.	19.485	30.	12.990	30.	16.634	30.	20.119	30.	13.782
40.	26.455	40.	17.743	40.	21.861	40.	26.772	40.	18.693
50.	33.426	50.	22.495	50.	27.089	50.	33.109	50.	23.446
60.	40.396	60.	27.248	60.	32.475	60.	39.446	60.	28.356
70.	47.366	70.	32.317	70.	37.703	70.	45.465	70.	33.109
80.	54.337	80.	37.228	80.	42.931	80.	51.327	80.	37.703
90.	61.149	90.	42.297	90.	48.317	90.	57.030	90.	42.297
100.	67.960	100.	47.525	100.	53.545	100.	62.574	100.	46.733
20.	11.564	20.	7.921	20.	10.614	20.	13.465	20.	8.871
0.	-0.158	0.	-0.158	0.	-0.158	0.	-0.	0.	0.
20.	12.198	20.	8.079	20.	10.931	20.	13.465	20.	8.871

GAGE 57		GAGE 58		GAGE 59		GAGE 60		GAGE 61	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	-0.	0.	-0.
10.	5.069	10.	0.792	10.	5.703	10.	3.802	10.	-0.475
20.	9.505	20.	1.426	20.	11.248	20.	7.762	20.	-0.158
30.	13.782	30.	2.218	30.	16.792	30.	11.406	30.	0.
40.	18.059	40.	3.010	40.	22.178	40.	14.891	40.	0.317
50.	22.020	50.	3.802	50.	27.406	50.	18.376	50.	0.792
60.	26.139	60.	4.594	60.	32.634	60.	21.703	60.	1.267
70.	29.941	70.	5.545	70.	37.545	70.	25.030	70.	1.743
80.	33.901	80.	6.337	80.	42.297	80.	28.356	80.	2.376
90.	37.861	90.	7.446	90.	47.050	90.	31.683	90.	3.010
100.	41.663	100.	8.396	100.	51.485	100.	34.851	100.	3.485
20.	10.455	20.	2.376	20.	11.248	20.	8.238	20.	0.634
0.	0.	0.	0.158	0.	-0.	0.	0.	0.	0.
20.	9.663	20.	1.743	20.	11.248	20.	7.921	20.	0.

GAGE 62		GAGE 63		GAGE 64		GAGE 65		GAGE 66	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	-0.	0.	-0.	0.	0.
10.	2.693	10.	3.644	10.	2.059	10.	-0.792	10.	1.584
20.	6.178	20.	7.129	20.	4.436	20.	-1.901	20.	2.376
30.	9.822	30.	10.772	30.	6.812	30.	-3.168	30.	2.851
40.	13.624	40.	14.416	40.	9.347	40.	-4.594	40.	3.168
50.	17.267	50.	17.901	50.	11.881	50.	-5.861	50.	3.485
60.	21.069	60.	21.228	60.	14.416	60.	-7.287	60.	3.960
70.	24.713	70.	24.554	70.	16.792	70.	-8.396	70.	4.277
80.	28.356	80.	27.723	80.	19.327	80.	-9.663	80.	4.752
90.	32.158	90.	31.050	90.	21.861	90.	-10.772	90.	5.069
100.	35.644	100.	34.218	100.	24.396	100.	-11.723	100.	5.545
20.	6.653	20.	6.495	20.	4.277	20.	-1.584	20.	1.743
0.	0.	0.	-0.	0.	-0.	0.	-0.	0.	-0.
20.	6.337	20.	7.129	20.	4.277	20.	-1.901	20.	2.218

GAGE 67		GAGE 68		GAGE 69		GAGE 70		GAGE 71	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	0.	0.	-0.	0.	-0.
10.	6.970	10.	5.069	10.	3.802	10.	5.703	10.	-0.317
20.	13.624	20.	10.455	20.	8.554	20.	12.040	20.	-0.634
30.	20.277	30.	15.683	30.	13.307	30.	18.535	30.	-0.950
40.	26.931	40.	20.752	40.	18.218	40.	25.188	40.	-1.109
50.	33.584	50.	25.980	50.	23.287	50.	31.842	50.	-1.267
60.	40.079	60.	31.366	60.	28.356	60.	38.337	60.	-1.584
70.	46.733	70.	36.594	70.	33.584	70.	44.990	70.	-1.743
80.	53.228	80.	41.980	80.	38.812	80.	51.485	80.	-1.901
90.	59.881	90.	47.683	90.	44.356	90.	58.297	90.	-2.059
100.	66.218	100.	53.069	100.	49.743	100.	64.792	100.	-2.218
20.	12.673	20.	9.980	20.	7.921	20.	11.089	20.	-0.634
0.	-0.158	0.	-0.317	0.	-0.317	0.	-0.317	0.	-0.
20.	13.307	20.	9.980	20.	8.079	20.	11.723	20.	-0.475

GAGE 72		GAGE 73		GAGE 74		GAGE 75		GAGE 76	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	-0.	0.	-0.	0.	-0.	0.	-0.
10.	-0.475	10.	0.475	10.	1.426	10.	-0.158	10.	-0.158
20.	-0.792	20.	1.267	20.	2.851	20.	-0.158	20.	-0.317
30.	-1.267	30.	1.901	30.	4.436	30.	-0.158	30.	-0.475
40.	-1.584	40.	2.535	40.	5.861	40.	-0.	40.	-0.792
50.	-1.901	50.	3.168	50.	7.446	50.	-0.	50.	-0.950
60.	-2.218	60.	3.802	60.	8.871	60.	0.	60.	-1.267
70.	-2.535	70.	4.436	70.	10.297	70.	0.	70.	-1.584
80.	-2.851	80.	5.069	80.	11.723	80.	0.158	80.	-1.743
90.	-3.168	90.	5.703	90.	13.307	90.	0.475	90.	-1.901
100.	-3.485	100.	6.178	100.	14.733	100.	0.634	100.	-2.218
20.	-0.792	20.	1.267	20.	3.010	20.	-0.	20.	-0.475
0.	-0.	0.	-0.	0.	-0.	0.	-0.	0.	-0.
20.	-0.792	20.	1.267	20.	3.010	20.	-0.	20.	-0.475

GAGE 77		GAGE 78		GAGE 79		GAGE 80		GAGE 81	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	-0.	0.	-0.
10.	-0.	10.	0.475	10.	0.	10.	-0.475	10.	-0.
20.	-0.	20.	1.584	20.	0.158	20.	-0.634	20.	-0.
30.	-0.158	30.	2.535	30.	0.158	30.	-0.950	30.	-0.
40.	-0.158	40.	3.644	40.	0.317	40.	-1.267	40.	-0.
50.	-0.317	50.	4.752	50.	0.475	50.	-1.426	50.	-0.
60.	-0.475	60.	5.861	60.	0.634	60.	-1.743	60.	-0.
70.	-0.634	70.	6.970	70.	0.634	70.	-1.901	70.	0.
80.	-0.950	80.	8.238	80.	0.792	80.	-2.218	80.	0.
90.	-1.267	90.	9.347	90.	0.950	90.	-2.535	90.	0.158
100.	-1.584	100.	10.455	100.	1.109	100.	-2.693	100.	0.158
20.	-1.743	20.	1.743	20.	0.158	20.	-0.634	20.	-0.158
0.	-1.901	0.	-0.	0.	-0.	0.	-0.158	0.	-0.
20.	-2.059	20.	1.743	20.	0.158	20.	-0.792	20.	-0.

GAGE 82		GAGE 83		GAGE 84		GAGE 85		GAGE 86	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	-0.	0.	-0.
10.	1.109	10.	0.	10.	-0.	10.	-0.	10.	0.634
20.	2.218	20.	0.158	20.	-0.158	20.	-0.	20.	1.426
30.	3.485	30.	0.317	30.	-0.158	30.	-0.	30.	2.376
40.	4.594	40.	0.475	40.	-0.475	40.	0.	40.	3.168
50.	5.703	50.	0.634	50.	-0.475	50.	0.	50.	4.119
60.	6.812	60.	0.792	60.	-0.634	60.	0.	60.	5.069
70.	7.921	70.	0.950	70.	-0.792	70.	0.	70.	6.020
80.	9.030	80.	1.109	80.	-0.950	80.	0.158	80.	7.129
90.	10.297	90.	1.267	90.	-1.267	90.	0.158	90.	8.079
100.	11.564	100.	1.426	100.	-1.426	100.	0.158	100.	9.030
20.	2.059	20.	0.158	20.	-0.158	20.	-0.158	20.	1.426
0.	-0.	0.	-0.	0.	-0.	0.	-0.158	0.	-0.
20.	2.376	20.	0.158	20.	-0.158	20.	-0.	20.	1.584

GAGE 87		GAGE 88		GAGE 89		GAGE 90		GAGE 91	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	0.	0.	0.
10.	0.	10.	0.158	10.	0.475	10.	-0.158	10.	0.
20.	0.317	20.	0.475	20.	1.109	20.	-0.475	20.	0.
30.	0.634	30.	0.792	30.	1.743	30.	-0.634	30.	0.158
40.	0.950	40.	1.267	40.	2.218	40.	-0.950	40.	0.158
50.	1.267	50.	1.584	50.	2.851	50.	-1.109	50.	0.317
60.	1.584	60.	1.901	60.	3.327	60.	-1.267	60.	0.317
70.	1.901	70.	2.218	70.	3.802	70.	-1.426	70.	0.475
80.	2.218	80.	2.693	80.	4.436	80.	-1.584	80.	0.634
90.	2.693	90.	3.010	90.	4.911	90.	-1.901	90.	0.792
100.	3.168	100.	3.485	100.	5.386	100.	-2.059	100.	1.109
20.	0.317	20.	0.475	20.	0.792	20.	-0.475	20.	0.
0.	-0.	0.	-0.	0.	-0.158	0.	-0.	0.	0.
20.	0.475	20.	0.634	20.	0.792	20.	-0.634	20.	0.158

GAGE 92		GAGE 93		GAGE 94		GAGE 95		GAGE 96	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	0.	0.	-0.
10.	0.	10.	0.475	10.	0.317	10.	3.168	10.	1.426
20.	0.317	20.	1.426	20.	0.475	20.	6.495	20.	3.168
30.	0.634	30.	2.218	30.	0.792	30.	9.822	30.	4.911
40.	0.950	40.	3.168	40.	0.950	40.	13.149	40.	6.653
50.	1.267	50.	3.960	50.	1.267	50.	16.317	50.	8.396
60.	1.584	60.	4.752	60.	1.426	60.	19.644	60.	9.980
70.	1.901	70.	5.545	70.	1.584	70.	22.812	70.	11.723
80.	2.218	80.	6.337	80.	1.901	80.	26.139	80.	13.465
90.	2.693	90.	7.129	90.	2.059	90.	29.307	90.	15.366
100.	3.168	100.	7.762	100.	2.218	100.	32.317	100.	16.950
20.	0.317	20.	1.584	20.	0.634	20.	6.812	20.	3.168
0.	0.	0.	-0.	0.	-0.	0.	0.	0.	0.
20.	0.475	20.	1.426	20.	0.475	20.	6.653	20.	3.327

GAGE 97

LOAD	STRESS
0.	-0.
10.	0.950
20.	2.059
30.	3.168
40.	4.436
50.	5.545
60.	6.653
70.	7.921
80.	9.347
90.	10.614
100.	11.881
20.	1.901
0.	-0.
20.	2.218

GAGE 98

LOAD	STRESS
0.	-0.
10.	-0.950
20.	-1.901
30.	-2.693
40.	-3.168
50.	-3.802
60.	-4.119
70.	-4.436
80.	-4.594
90.	-4.752
100.	-4.752
20.	-2.218
0.	0.
20.	-1.426

GAGE 99

LOAD	STRESS
0.	-0.
10.	1.584
20.	3.485
30.	5.386
40.	7.129
50.	9.030
60.	10.931
70.	12.832
80.	14.891
90.	16.792
100.	18.535
20.	3.644
0.	0.
20.	3.644

GAGE 100

LOAD	STRESS
0.	0.
10.	3.432
20.	7.065
30.	10.682
40.	14.114
50.	17.639
60.	21.086
70.	24.456
80.	27.842
90.	31.088
100.	34.303

GAGE 101

LOAD	STRESS
0.	-0.
10.	1.994
20.	3.726
30.	5.457
40.	7.142
50.	8.827
60.	10.466
70.	12.120
80.	13.774
90.	15.443
100.	17.082

GAGE 102

LOAD	STRESS
0.	0.
10.	-0.433
20.	-0.804
30.	-1.036
40.	-1.221
50.	-1.345
60.	-1.422
70.	-13.774
80.	-1.206
90.	-1.051
100.	-0.773

GAGE 103

LOAD	STRESS
0.	-0.
10.	-1.329
20.	-2.582
30.	-3.834
40.	-5.071
50.	-6.276
60.	-7.482
70.	-8.672
80.	-9.724
90.	-10.914
100.	-12.012

GAGE 104

LOAD	STRESS
0.	0.
10.	-1.809
20.	-3.509
30.	-5.117
40.	-6.709
50.	-8.301
60.	-9.925
70.	-11.471
80.	-12.908
90.	-14.392
100.	-15.799

GAGE 105

LOAD	STRESS
0.	-0.
10.	-0.665
20.	-1.329
30.	-1.994
40.	-2.690
50.	-3.386
60.	-4.128
70.	-4.854
80.	-5.596
90.	-6.385
100.	-7.188

GAGE 106

LOAD	STRESS
0.	-0.
10.	-0.170
20.	-0.247
30.	-0.309
40.	-0.433
50.	-0.587
60.	-0.757
70.	-0.958
80.	-1.113
90.	-1.422
100.	-1.716

GAGE 107

LOAD	STRESS
0.	-0.
10.	0.479
20.	0.989
30.	1.530
40.	1.963
50.	2.473
60.	2.953
70.	3.401
80.	3.927
90.	4.406
100.	4.792

GAGE 108

LOAD	STRESS
0.	0.
10.	7.575
20.	15.397
30.	23.142
40.	30.655
50.	38.137
60.	45.527
70.	52.777
80.	59.826
90.	66.690
100.	73.476

GAGE 109

LOAD	STRESS
0.	-0.
10.	-1.438
20.	-2.953
30.	-4.205
40.	-5.503
50.	-6.740
60.	-7.930
70.	-9.074
80.	-9.940
90.	-10.960
100.	-11.811

GAGE 110

LOAD	STRESS
0.	0.
10.	5.380
20.	10.991
30.	16.711
40.	22.431
50.	28.151
60.	33.917
70.	39.745
80.	45.542
90.	51.447
100.	57.368

GAGE 111

LOAD	STRESS
0.	-0.
10.	0.603
20.	1.190
30.	1.731
40.	2.226
50.	2.736
60.	3.185
70.	3.633
80.	4.128
90.	4.545
100.	4.978

GAGE 112

LOAD	STRESS
0.	-0.
10.	4.839
20.	10.002
30.	15.351
40.	20.808
50.	26.311
60.	31.892
70.	37.550
80.	43.192
90.	49.067
100.	54.879

GAGE 113

LOAD	STRESS
0.	0.
10.	2.412
20.	4.947
30.	7.451
40.	9.755
50.	12.027
60.	14.253
70.	16.417
80.	18.520
90.	20.545
100.	22.462

GAGE 114

LOAD	STRESS
0.	0.
10.	6.415
20.	13.217
30.	19.942
40.	26.450
50.	33.020
60.	39.498
70.	45.867
80.	52.066
90.	58.327
100.	64.294

GAGE 115

LOAD	STRESS
0.	0.
10.	-1.237
20.	-2.489
30.	-3.664
40.	-4.962
50.	-6.292
60.	-7.683
70.	-9.074
80.	-10.373
90.	-11.733
100.	-13.016

GAGE 116

LOAD	STRESS
0.	0.
10.	-0.278
20.	-0.464
30.	-0.649
40.	-0.866
50.	-1.159
60.	-1.469
70.	-1.747
80.	-2.010
90.	-2.257
100.	-2.473

GAGE 117

LOAD	STRESS
0.	0.
10.	-0.278
20.	-0.495
30.	-0.696
40.	-0.974
50.	-1.268
60.	-1.577
70.	-1.932
80.	-2.211
90.	-2.613
100.	-2.988

GAGE 118

LOAD	STRESS
0.	-0.
10.	-1.221
20.	-2.319
30.	-3.339
40.	-4.390
50.	-5.472
60.	-6.570
70.	-7.637
80.	-8.642
90.	-9.677
100.	-10.636

GAGE 119

LOAD	STRESS
0.	0.
10.	0.015
20.	0.108
30.	0.170
40.	0.216
50.	0.216
60.	0.216
70.	0.216
80.	0.247
90.	0.216
100.	0.186

GAGE 120

LOAD	STRESS
0.	0.
10.	-0.139
20.	-0.108
30.	0.015
40.	0.062
50.	0.139
60.	0.139
70.	0.216
80.	0.263
90.	0.294
100.	0.325

GAGE 121

LOAD	STRESS
0.	-0.
10.	-0.989
20.	-1.932
30.	-2.829
40.	-3.726
50.	-4.669
60.	-5.612
70.	-6.586
80.	-7.436
90.	-8.271
100.	-9.105

GAGE 122

LOAD	STRESS
0.	0.
10.	-0.077
20.	-0.108
30.	-0.062
40.	0.
50.	0.062
60.	0.139
70.	0.139
80.	0.216
90.	0.263
100.	0.325

GAGE 123

LOAD	STRESS
0.	-0.
10.	-0.031
20.	0.015
30.	0.093
40.	0.046
50.	0.062
60.	0.077
70.	0.077
80.	0.093
90.	0.093
100.	0.108

GAGE 124

LOAD	STRESS
0.	-0.
10.	-0.850
20.	-1.685
30.	-2.489
40.	-3.246
50.	-4.050
60.	-4.870
70.	-5.720
80.	-6.616
90.	-7.513
100.	-8.410

GAGE 125

LOAD	STRESS
0.	-0.
10.	-0.031
20.	-0.031
30.	0.031
40.	0.093
50.	0.186
60.	0.232
70.	0.278
80.	0.309
90.	0.247
100.	0.247

GAGE 126

LOAD	STRESS
0.	0.
10.	0.
20.	0.031
30.	0.124
40.	0.186
50.	0.232
60.	0.232
70.	0.263
80.	0.309
90.	0.309
100.	0.340

GAGE 127

LOAD	STRESS
0.	0.
10.	1.623
20.	3.602
30.	5.596
40.	7.529
50.	9.538
60.	11.501
70.	13.372
80.	15.227
90.	16.974
100.	18.613

GAGE 128

LOAD	STRESS
0.	-0.
10.	5.998
20.	12.274
30.	18.504
40.	24.549
50.	30.593
60.	36.653
70.	42.605
80.	48.448
90.	54.292
100.	59.950

GAGE 129

LOAD	STRESS
0.	0.
10.	0.309
20.	0.340
30.	0.356
40.	0.278
50.	0.247
60.	0.201
70.	0.186
80.	0.278
90.	0.232
100.	0.216

GAGE 130

LOAD	STRESS
0.	0.
10.	0.587
20.	1.175
30.	1.530
40.	1.855
50.	2.226
60.	2.613
70.	3.014
80.	3.447
90.	3.710
100.	4.050

GAGE 131

LOAD	STRESS
0.	0.
10.	6.508
20.	13.140
30.	19.556
40.	25.909
50.	32.263
60.	38.570
70.	44.815
80.	50.937
90.	57.074
100.	63.026

GAGE 132

LOAD	STRESS
0.	-0.
10.	5.843
20.	12.151
30.	18.767
40.	25.183
50.	31.567
60.	37.890
70.	44.243
80.	50.489
90.	56.827
100.	63.103

GAGE 133

LOAD	STRESS
0.	0.
10.	-1.159
20.	-2.690
30.	-4.344
40.	-5.859
50.	-7.374
60.	-8.781
70.	-10.141
80.	-11.316
90.	-12.614
100.	-13.789

GAGE 134

LOAD	STRESS
0.	0.
10.	1.577
20.	3.355
30.	5.318
40.	7.157
50.	9.013
60.	10.837
70.	12.553
80.	14.315
90.	15.861
100.	17.407

GAGE 135

LOAD	STRESS
0.	-0.
10.	0.572
20.	1.206
30.	1.901
40.	2.427
50.	2.891
60.	3.339
70.	3.757
80.	4.189
90.	4.560
100.	4.885

GAGE 136

LOAD	STRESS
0.	0.
10.	-0.155
20.	-0.170
30.	-0.186
40.	0.062
50.	0.356
60.	0.665
70.	1.005
80.	1.329
90.	1.577
100.	1.855

GAGE 137

LOAD	STRESS
0.	0.
10.	4.545
20.	9.306
30.	14.176
40.	19.138
50.	24.116
60.	29.109
70.	34.180
80.	39.219
90.	44.506
100.	49.685

GAGE 138

LOAD	STRESS
0.	-0.
10.	-1.314
20.	-2.906
30.	-4.514
40.	-6.075
50.	-7.637
60.	-9.152
70.	-10.528
80.	-11.795
90.	-12.955
100.	-14.006

GAGE 139

LOAD	STRESS
0.	0.
10.	5.905
20.	10.837
30.	13.666
40.	16.680
50.	19.726
60.	22.817
70.	25.894
80.	28.986
90.	32.062
100.	35.169

GAGE 140

LOAD	STRESS
0.	0.
10.	5.643
20.	11.903
30.	18.473
40.	24.688
50.	30.918
60.	37.055
70.	43.100
80.	48.835
90.	54.354
100.	59.811

GAGE 141

LOAD	STRESS
0.	0.
10.	5.782
20.	12.692
30.	20.993
40.	28.955
50.	36.777
60.	44.414
70.	51.849
80.	58.960
90.	65.886
100.	72.672

GAGE 142

LOAD	STRESS
0.	-0.
10.	2.056
20.	3.988
30.	5.689
40.	7.513
50.	9.414
60.	11.362
70.	13.434
80.	15.567
90.	17.809
100.	20.081

GAGE 143

LOAD	STRESS
0.	0.
10.	2.906
20.	5.271
30.	7.281
40.	9.755
50.	12.367
60.	15.057
70.	17.983
80.	20.962
90.	23.977
100.	27.177

GAGE 144

LOAD	STRESS
0.	0.
10.	4.947
20.	10.141
30.	15.474
40.	20.622
50.	25.755
60.	30.887
70.	35.973
80.	40.982
90.	46.052
100.	51.138

GAGE 145

LOAD	STRESS
0.	0.
10.	1.932
20.	4.390
30.	7.157
40.	9.786
50.	12.336
60.	14.841
70.	17.329
80.	19.757
90.	22.276
100.	24.750

GAGE 146

LOAD	STRESS
0.	0.
10.	5.828
20.	9.894
30.	13.650
40.	17.082
50.	20.684
60.	24.471
70.	28.305
80.	32.046
90.	35.942
100.	39.760

GAGE 147

LOAD	STRESS
0.	0.
10.	3.262
20.	6.199
30.	8.951
40.	11.177
50.	13.156
60.	15.150
70.	17.206
80.	19.355
90.	21.751
100.	24.286

GAGE 148

LOAD	STRESS
0.	0.
10.	2.814
20.	5.859
30.	9.090
40.	12.460
50.	15.954
60.	19.478
70.	23.034
80.	26.558
90.	30.207
100.	33.762

GAGE 149

LOAD	STRESS
0.	-0.
10.	1.376
20.	3.138
30.	5.101
40.	7.482
50.	10.064
60.	12.738
70.	15.490
80.	18.303
90.	21.241
100.	24.193

GAGE 150

LOAD	STRESS
0.	-0.
10.	3.540
20.	7.374
30.	11.316
40.	15.490
50.	19.772
60.	24.193
70.	28.707
80.	33.252
90.	38.014
100.	42.790

GAGE 151

LOAD	STRESS
0.	0.
10.	3.277
20.	6.694
30.	10.110
40.	13.465
50.	16.804
60.	20.205
70.	23.606
80.	27.038
90.	30.531
100.	33.994

GAGE 152

LOAD	STRESS
0.	-0.
10.	1.252
20.	2.458
30.	3.757
40.	5.024
50.	6.323
60.	7.729
70.	9.167
80.	10.651
90.	12.104
100.	13.527

GAGE 153

LOAD	STRESS
0.	0.
10.	5.581
20.	13.078
30.	20.638
40.	28.135
50.	35.540
60.	42.713
70.	49.700
80.	56.441
90.	63.042
100.	69.380

GAGE 154

LOAD	STRESS
0.	0.
10.	5.271
20.	11.254
30.	17.129
40.	22.987
50.	28.769
60.	34.443
70.	40.008
80.	45.434
90.	50.984
100.	56.301

ATR 500 - ESCAPE TOWER STATIC TEST

CONDITION III - MAXIMUM Q TUMBLING ABORT (FAILURE) -

(All stress values are in ksi.
Load values are in percent
of ultimate design.)

SIGMA MAX IS LOCATED THETA DEGREES FROM GAGE 1 TOWARDS GAGES 2 AND 3

GAGES 1, 2 AND 3

GAGE FACTOR = 2.070 AUX. GAGE FACTOR = 1/ 47. MU = 0.290 ** E(TEN) = 16.000 E(COMP) = 16.000 MILLION PSI

LOAD	SIG(2)	SIG(4)	TAU(2- 4)	SIGMAX	SIGMIN	TAUMAX	THETA
0.	0.	0.	0.	0.	0.	0.	0.
20.	-0.360	-0.237	-2.533	2.236	-2.832	2.534	134.
30.	0.218	-0.112	-3.947	4.004	-3.897	3.950	136.
40.	1.526	0.179	-5.618	6.510	-4.805	5.658	138.
50.	1.088	-0.001	-6.652	7.217	-6.131	6.674	137.
60.	1.360	0.026	-7.998	8.718	-7.333	8.026	137.
70.	1.747	0.192	-9.405	10.407	-8.468	9.437	137.
80.	2.040	0.241	-10.715	11.893	-9.613	10.753	137.
90.	2.430	0.362	-12.073	13.513	-10.722	12.118	137.
100.	2.822	0.545	-13.401	15.133	-11.766	13.450	137.
110.	3.200	0.679	-14.686	16.680	-12.801	14.740	137.
120.	3.817	0.892	-16.027	18.448	-13.738	16.093	138.
130.	5.008	1.214	-17.465	20.679	-14.456	17.567	138.

SIGMA MAX IS LOCATED THETA DEGREES FROM GAGE 4 TOWARDS GAGES 5 AND 6

GAGES 4, 5 AND 6

GAGE FACTOR = 2.070 AUX. GAGE FACTOR = 1/ 47. MU = 0.290 ** E(TEN) = 16.000 E(COMP) = 16.000 MILLION PSI

LOAD	SIG(5)	SIG(7)	TAU(5- 7)	SIGMAX	SIGMIN	TAUMAX	THETA
0.	0.	0.	0.	0.	0.	0.	0.
20.	0.658	0.535	-2.240	2.837	-1.644	2.241	136.
30.	0.194	0.488	-2.790	3.135	-2.453	2.794	133.
40.	1.162	0.905	-4.351	5.386	-3.319	4.353	136.
50.	1.403	1.048	-5.391	6.619	-4.169	5.394	136.
60.	1.666	1.275	-6.474	7.948	-5.007	6.477	136.
70.	1.882	1.442	-7.258	8.923	-5.599	7.261	136.
80.	2.079	1.650	-8.536	10.404	-6.675	8.539	136.
90.	2.283	1.830	-9.540	11.599	-7.486	9.543	136.
100.	2.546	2.057	-10.562	12.866	-8.263	10.565	136.
110.	2.814	2.300	-11.602	14.162	-9.048	11.605	136.
120.	3.200	2.575	-12.636	15.528	-9.753	12.640	136.
130.	3.800	2.955	-13.775	17.159	-10.403	13.781	136.

GAGE 7		GAGE 8		GAGE 9		GAGE 10		GAGE 11	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
20.	0.570	20.	0.570	20.	0.	20.	0.048	20.	-0.539
30.	0.475	30.	0.919	30.	-0.127	30.	0.602	30.	-0.808
40.	0.887	40.	1.251	40.	-0.222	40.	0.808	40.	-0.998
50.	1.030	50.	1.632	50.	-0.253	50.	1.030	50.	-1.188
60.	1.347	60.	1.980	60.	-0.190	60.	1.172	60.	-1.362
70.	1.663	70.	2.360	70.	0.032	70.	1.410	70.	-1.521
80.	2.059	80.	2.788	80.	0.253	80.	1.648	80.	-1.648
90.	2.503	90.	3.216	90.	0.539	90.	1.901	90.	-1.790
100.	2.851	100.	3.644	100.	0.792	100.	2.154	100.	-1.885
110.	3.168	110.	4.166	110.	1.061	110.	2.360	110.	-2.978
120.	3.263	120.	4.721	120.	1.347	120.	2.503	120.	-2.250
130.	3.042	130.	5.370	130.	1.600	130.	2.661	130.	-2.455

GAGE 12		GAGE 13		GAGE 14		GAGE 15		GAGE 16	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	-0.	0.	0.	0.	0.
20.	-0.855	20.	-0.143	20.	-0.158	20.	-0.016	20.	-0.554
30.	-1.204	30.	-0.079	30.	-0.269	30.	-0.063	30.	-0.539
40.	-1.584	40.	0.143	40.	-0.285	40.	-0.190	40.	-0.618
50.	-1.917	50.	0.475	50.	-0.412	50.	-0.285	50.	-0.523
60.	-2.297	60.	0.713	60.	-0.475	60.	-0.048	60.	-0.063
70.	-2.661	70.	0.792	70.	-0.507	70.	-0.032	70.	-0.206
80.	-3.026	80.	0.919	80.	-0.618	80.	-0.380	80.	0.
90.	-3.358	90.	0.998	90.	-0.681	90.	-0.396	90.	0.206
100.	-3.707	100.	1.093	100.	-0.745	100.	-0.396	100.	0.301
110.	-4.040	110.	1.141	110.	-0.808	110.	-0.111	110.	-0.032
120.	-4.436	120.	1.125	120.	-0.998	120.	-0.428	120.	0.269
130.	-4.848	130.	0.919	130.	-1.251	130.	-0.475	130.	0.143

GAGE 17		GAGE 18		GAGE 19		GAGE 20		GAGE 21	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	0.	0.	-0.	0.	-0.
20.	0.269	20.	-0.824	20.	-0.618	20.	0.174	20.	10.059
30.	0.079	30.	-1.204	30.	-0.887	30.	1.267	30.	15.335
40.	0.586	40.	-1.552	40.	-1.172	40.	0.396	40.	20.451
50.	0.745	50.	-1.806	50.	-1.505	50.	0.475	50.	25.600
60.	0.887	60.	-1.822	60.	-1.695	60.	0.539	60.	30.685
70.	1.046	70.	-1.774	70.	-1.600	70.	0.554	70.	35.802
80.	1.204	80.	-1.790	80.	-2.139	80.	0.602	80.	40.903
90.	1.331	90.	-1.774	90.	-2.360	90.	0.650	90.	46.051
100.	1.457	100.	-1.774	100.	-2.630	100.	0.713	100.	51.073
110.	1.600	110.	-1.774	110.	-2.851	110.	0.760	110.	56.143
120.	1.758	120.	-1.806	120.	-3.137	120.	0.808	120.	61.497
130.	1.901	130.	-1.869	130.	-3.517	130.	0.871	130.	67.295

GAGE 22		GAGE 23		GAGE 24		GAGE 25		GAGE 26	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	0.	0.	-0.	0.	-0.	0.	0.
20.	-0.048	20.	-4.974	20.	-5.735	20.	-5.798	20.	-4.356
30.	-0.063	30.	-7.509	30.	-8.444	30.	-8.776	30.	-6.986
40.	0.	40.	-10.028	40.	-11.184	40.	-11.786	40.	-9.378
50.	0.016	50.	-12.531	50.	-13.972	50.	-14.669	50.	-11.691
60.	0.032	60.	-15.018	60.	-16.713	60.	-17.489	60.	-13.988
70.	0.048	70.	-17.568	70.	-19.438	70.	-20.309	70.	-15.952
80.	0.111	80.	-20.024	80.	-22.115	80.	-22.986	80.	-18.329
90.	0.174	90.	-22.479	90.	-24.713	90.	-26.012	90.	-20.483
100.	0.206	100.	-24.950	100.	-28.182	100.	-28.325	100.	-22.479
110.	0.253	110.	-27.501	110.	-29.750	110.	-30.859	110.	-24.586
120.	0.206	120.	-29.956	120.	-32.444	120.	-33.584	120.	-26.535
130.	0.158	130.	-32.634	130.	-35.200	130.	-36.008	130.	-28.309

GAGE 27

LOAD	STRESS
0.	-0.
20.	2.186
30.	3.279
40.	4.277
50.	5.006
60.	6.337
70.	7.255
80.	8.238
90.	9.220
100.	10.107
110.	11.057
120.	12.024
130.	13.069

GAGE 28

LOAD	STRESS
0.	0.
20.	3.232
30.	5.164
40.	6.764
50.	8.016
60.	9.505
70.	11.248
80.	12.721
90.	14.337
100.	15.810
110.	17.362
120.	18.947
130.	20.800

GAGE 29

LOAD	STRESS
0.	-0.
20.	2.281
30.	3.533
40.	4.737
50.	5.830
60.	6.590
70.	7.984
80.	9.077
90.	10.234
100.	11.311
110.	12.420
120.	13.497
130.	14.669

GAGE 30

LOAD	STRESS
0.	0.
20.	1.505
30.	2.582
40.	3.453
50.	4.277
60.	5.069
70.	5.814
80.	6.543
90.	7.303
100.	7.952
110.	8.713
120.	9.283
130.	9.790

GAGE 31

LOAD	STRESS
0.	-0.
20.	3.976
30.	6.178
40.	8.317
50.	10.503
60.	12.657
70.	14.733
80.	16.824
90.	18.931
100.	20.927
110.	22.954
120.	25.077
130.	27.057

GAGE 32

LOAD	STRESS
0.	-0.
20.	3.327
30.	5.022
40.	6.764
50.	8.491
60.	10.170
70.	11.881
80.	13.655
90.	15.446
100.	17.109
110.	18.867
120.	20.673
130.	22.543

GAGE 33

LOAD	STRESS
0.	-0.
20.	2.471
30.	3.786
40.	5.069
50.	6.289
60.	7.604
70.	8.824
80.	10.154
90.	12.689
100.	12.879
110.	14.305
120.	15.731
130.	17.283

GAGE 34

LOAD	STRESS
0.	-0.
20.	2.804
30.	4.499
40.	6.051
50.	7.651
60.	9.236
70.	10.788
80.	12.404
90.	14.036
100.	15.588
110.	17.204
120.	18.772
130.	20.420

GAGE 35

LOAD	STRESS
0.	-0.
20.	4.737
30.	7.255
40.	9.584
50.	11.960
60.	14.257
70.	16.459
80.	18.693
90.	20.958
100.	23.097
110.	25.251
120.	27.137
130.	29.592

GAGE 36

LOAD	STRESS
0.	-0.
20.	3.216
30.	4.958
40.	6.669
50.	9.489
60.	10.075
70.	11.707
80.	13.434
90.	15.176
100.	16.808
110.	18.503
120.	20.150
130.	21.814

GAGE 37

LOAD	STRESS
0.	-0.
20.	2.962
30.	4.531
40.	6.051
50.	7.636
60.	9.220
70.	10.772
80.	12.388
90.	14.067
100.	15.651
110.	17.267
120.	18.899
130.	20.657

GAGE 38

LOAD	STRESS
0.	0.
20.	4.341
30.	6.590
40.	8.745
50.	10.820
60.	12.927
70.	15.002
80.	17.141
90.	19.263
100.	21.244
110.	23.350
120.	25.442
130.	27.691

GAGE 39

LOAD	STRESS
0.	-0.
20.	0.491
30.	0.935
40.	1.331
50.	1.743
60.	2.154
70.	2.487
80.	2.931
90.	3.390
100.	3.707
110.	4.135
120.	4.356
130.	4.404

GAGE 40

LOAD	STRESS
0.	0.
20.	1.156
30.	1.853
40.	2.630
50.	3.390
60.	4.214
70.	5.053
80.	5.925
90.	6.780
100.	7.620
110.	8.444
120.	9.251
130.	9.964

GAGE 41

LOAD	STRESS
0.	0.
20.	3.010
30.	4.642
40.	6.210
50.	7.826
60.	9.362
70.	10.883
80.	12.420
90.	14.004
100.	15.525
110.	17.014
120.	18.661
130.	20.467

GAGE 42

LOAD	STRESS
0.	0.
20.	1.568
30.	2.503
40.	3.374
50.	4.230
60.	4.673
70.	5.782
80.	6.543
90.	7.271
100.	8.048
110.	8.776
120.	9.521
130.	10.313

GAGE 43

LOAD	STRESS
0.	0.
20.	-6.257
30.	-9.552
40.	-12.705
50.	-15.683
60.	-18.630
70.	-21.529
80.	-24.317
90.	-27.073
100.	-29.703
110.	-32.364
120.	-35.152
130.	-37.782

GAGE 44

LOAD	STRESS
0.	0.
20.	-4.483
30.	-6.859
40.	-9.093
50.	-11.263
60.	-13.418
70.	-15.509
80.	-17.568
90.	-19.628
100.	-21.560
110.	-23.446
120.	-25.473
130.	-27.232

GAGE 45

LOAD	STRESS
0.	0.
20.	-4.863
30.	-7.430
40.	-9.949
50.	-12.436
60.	-14.891
70.	-17.267
80.	-19.675
90.	-22.051
100.	-24.412
110.	-26.661
120.	-29.212
130.	-31.842

GAGE 46

LOAD	STRESS
0.	-0.
20.	-5.640
30.	-8.539
40.	-11.311
50.	-14.051
60.	-16.697
70.	-19.248
80.	-21.766
90.	-24.253
100.	-26.582
110.	-29.576
120.	-31.477
130.	-34.091

GAGE 47

LOAD	STRESS
0.	0.
20.	4.800
30.	7.651
40.	10.424
50.	13.164
60.	15.857
70.	18.487
80.	21.149
90.	23.762
100.	26.360
110.	28.863
120.	30.939
130.	32.333

GAGE 48

LOAD	STRESS
0.	-0.
20.	2.994
30.	3.343
40.	4.705
50.	6.083
60.	7.493
70.	8.919
80.	10.313
90.	11.802
100.	13.228
110.	14.432
120.	15.160
130.	15.826

GAGE 49

LOAD	STRESS
0.	0.
20.	-3.137
30.	-5.545
40.	-7.873
50.	-10.123
60.	-12.277
70.	-14.289
80.	-16.301
90.	-18.170
100.	-19.913
110.	-21.354
120.	-21.766
130.	-21.022

GAGE 50

LOAD	STRESS
0.	-0.
20.	1.442
30.	1.790
40.	2.012
50.	2.297
60.	2.519
70.	2.772
80.	3.105
90.	3.422
100.	3.802
110.	4.388
120.	5.370
130.	6.606

GAGE 51

LOAD	STRESS
0.	0.
20.	13.053
30.	19.754
40.	26.297
50.	32.855
60.	39.160
70.	45.481
80.	51.754
90.	57.980
100.	64.079
110.	70.194
120.	76.451
130.	82.107

GAGE 52

LOAD	STRESS
0.	0.
20.	10.709
30.	16.919
40.	22.954
50.	29.117
60.	36.246
70.	41.141
80.	47.160
90.	53.117
100.	59.026
110.	64.729
120.	70.036
130.	74.598

GAGE 53

LOAD	STRESS
0.	0.
20.	6.574
30.	10.139
40.	13.719
50.	17.473
60.	21.228
70.	25.077
80.	29.038
90.	33.030
100.	37.117
110.	40.998
120.	44.895
130.	49.077

GAGE 54

LOAD	STRESS
0.	0.
20.	9.378
30.	13.750
40.	18.012
50.	22.099
60.	26.836
70.	31.271
80.	35.739
90.	40.174
100.	44.689
110.	49.933
120.	54.669
130.	60.594

GAGE 55

LOAD	STRESS
0.	-0.
20.	15.366
30.	23.335
40.	30.527
50.	37.798
60.	44.927
70.	51.739
80.	58.614
90.	65.457
100.	71.541
110.	78.305
120.	83.533
130.	88.602

GAGE 56

LOAD	STRESS
0.	0.
20.	10.519
30.	16.681
40.	22.717
50.	29.149
60.	34.582
70.	40.428
80.	46.147
90.	51.739
100.	56.950
110.	61.766
120.	65.442
130.	68.087

GAGE 57

LOAD	STRESS
0.	0.
20.	9.521
30.	14.954
40.	19.584
50.	24.143
60.	28.689
70.	33.299
80.	37.830
90.	42.376
100.	46.780
110.	51.390
120.	56.665
130.	61.956

GAGE 58

LOAD	STRESS
0.	0.
20.	3.279
30.	5.069
40.	6.891
50.	8.729
60.	10.725
70.	12.721
80.	14.733
90.	16.776
100.	18.788
110.	20.673
120.	22.717
130.	25.030

GAGE 59

LOAD	STRESS
0.	-0.
20.	11.786
30.	17.869
40.	23.794
50.	29.703
60.	35.453
70.	41.109
80.	46.638
90.	52.135
100.	57.220
110.	62.368
120.	67.184
130.	70.986

GAGE 60

LOAD	STRESS
0.	0.
20.	8.222
30.	12.420
40.	16.507
50.	20.499
60.	24.539
70.	28.531
80.	32.491
90.	36.515
100.	40.396
110.	44.578
120.	49.378
130.	54.131

GAGE 61

LOAD	STRESS
0.	0.
20.	1.457
30.	3.057
40.	4.388
50.	5.671
60.	7.065
70.	8.539
80.	9.885
90.	11.438
100.	12.879
110.	14.182
120.	15.556
130.	17.141

GAGE 62

LOAD	STRESS
0.	0.
20.	8.079
30.	12.752
40.	17.442
50.	22.083
60.	26.756
70.	31.461
80.	36.008
90.	40.634
100.	44.895
110.	48.855
120.	51.929
130.	54.115

GAGE 63

LOAD	STRESS
0.	-0.
20.	4.800
30.	7.952
40.	11.105
50.	13.861
60.	15.984
70.	19.343
80.	21.956
90.	24.602
100.	27.137
110.	29.624
120.	31.620
130.	33.014

GAGE 64

LOAD	STRESS
0.	0.
20.	3.691
30.	5.703
40.	7.747
50.	9.457
60.	11.770
70.	13.814
80.	15.762
90.	17.822
100.	19.707
110.	21.323
120.	22.511
130.	23.572

GAGE 65

LOAD	STRESS
0.	-0.
20.	-2.788
30.	-4.610
40.	-6.416
50.	-7.921
60.	-9.949
70.	-11.659
80.	-13.307
90.	-14.828
100.	-16.285
110.	-17.521
120.	-17.964
130.	-17.489

GAGE 66

LOAD	STRESS
0.	-0.
20.	-0.032
30.	-0.650
40.	-1.299
50.	-2.044
60.	-2.693
70.	-3.311
80.	-3.897
90.	-4.467
100.	-4.927
110.	-4.974
120.	-4.246
130.	-2.962

GAGE 67

LOAD	STRESS
0.	-0.
20.	11.992
30.	17.917
40.	23.842
50.	29.735
60.	35.564
70.	41.378
80.	47.065
90.	52.832
100.	58.487
110.	64.269
120.	70.226
130.	75.802

GAGE 68

LOAD	STRESS
0.	-0.
20.	8.808
30.	12.879
40.	17.584
50.	21.956
60.	26.408
70.	30.923
80.	35.390
90.	40.000
100.	44.531
110.	49.236
120.	54.543
130.	60.388

GAGE 69

LOAD	STRESS
0.	0.
20.	7.018
30.	11.026
40.	15.081
50.	19.168
60.	23.287
70.	27.533
80.	31.762
90.	36.103
100.	40.380
110.	44.436
120.	48.380
130.	52.547

GAGE 70

LOAD	STRESS
0.	0.
20.	10.709
30.	15.873
40.	22.321
50.	28.150
60.	33.299
70.	39.747
80.	45.529
90.	51.311
100.	56.950
110.	62.432
120.	67.485
130.	71.968

GAGE 71

LOAD	STRESS
0.	-0.
20.	-0.665
30.	-0.032
40.	-1.267
50.	-1.584
60.	-1.901
70.	-2.154
80.	-2.392
90.	-2.661
100.	-2.947
110.	-3.232
120.	-3.501
130.	-3.802

GAGE 72

LOAD	STRESS
0.	-0.
20.	-0.016
30.	-0.966
40.	-1.204
50.	-1.537
60.	-1.806
70.	-2.059
80.	-2.345
90.	-2.598
100.	-2.851
110.	-3.105
120.	-3.374
130.	-3.707

GAGE 73

LOAD	STRESS
0.	0.
20.	1.204
30.	1.838
40.	2.535
50.	3.105
60.	3.675
70.	4.277
80.	4.816
90.	5.434
100.	5.956
110.	6.543
120.	7.113
130.	7.636

GAGE 74

LOAD	STRESS
0.	-0.
20.	2.123
30.	3.232
40.	4.293
50.	5.244
60.	6.226
70.	7.192
80.	8.143
90.	9.172
100.	10.059
110.	10.994
120.	11.834
130.	12.752

GAGE 75

LOAD	STRESS
0.	0.
20.	-0.523
30.	-0.729
40.	-0.903
50.	-1.188
60.	-1.378
70.	-1.521
80.	-1.743
90.	-1.949
100.	-2.154
110.	-2.345
120.	-2.598
130.	-2.836

GAGE 76

LOAD	STRESS
0.	-0.
20.	-0.127
30.	-0.174
40.	0.079
50.	-0.428
60.	-0.475
70.	-0.570
80.	-0.697
90.	-0.776
100.	-0.950
110.	-1.014
120.	-1.093
130.	-1.093

GAGE 77		GAGE 78		GAGE 79		GAGE 80		GAGE 81	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	-0.	0.	0.
20.	0.824	20.	0.840	20.	0.539	20.	-0.491	20.	-0.222
30.	0.982	30.	1.410	30.	1.125	30.	-0.729	30.	-0.301
40.	1.188	40.	1.996	40.	1.046	40.	-0.950	40.	-0.998
50.	1.267	50.	2.582	50.	1.251	50.	-1.125	50.	-1.220
60.	1.426	60.	3.184	60.	1.473	60.	-1.299	60.	-1.410
70.	1.568	70.	3.818	70.	1.695	70.	-1.505	70.	-1.568
80.	1.711	80.	4.372	80.	1.885	80.	-1.695	80.	-1.743
90.	1.838	90.	4.974	90.	2.170	90.	-1.933	90.	-1.964
100.	1.838	100.	5.529	100.	2.376	100.	-2.091	100.	-2.139
110.	1.869	110.	6.147	110.	2.661	110.	-2.265	110.	-2.345
120.	1.869	120.	6.638	120.	2.883	120.	-2.424	120.	-2.566
130.	1.917	130.	6.986	130.	3.168	130.	-2.693	130.	-2.788

GAGE 82		GAGE 83		GAGE 84		GAGE 85		GAGE 86	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	0.	0.	-0.	0.	-0.	0.	0.
20.	1.568	20.	0.539	20.	-0.127	20.	-0.396	20.	0.982
30.	2.234	30.	0.808	30.	-0.158	30.	-0.634	30.	1.442
40.	2.931	40.	1.093	40.	-0.238	40.	-0.824	40.	1.933
50.	3.279	50.	1.347	50.	-0.919	50.	-1.030	50.	2.440
60.	4.246	60.	1.584	60.	-0.396	60.	-1.204	60.	2.947
70.	4.895	70.	1.838	70.	-0.507	70.	-1.394	70.	3.200
80.	5.576	80.	2.123	80.	-0.539	80.	-1.584	80.	4.024
90.	6.305	90.	2.360	90.	-0.634	90.	-1.758	90.	4.547
100.	6.939	100.	2.630	100.	-0.729	100.	-1.917	100.	5.133
110.	7.667	110.	2.851	110.	-0.808	110.	-2.075	110.	5.671
120.	8.285	120.	3.168	120.	-0.855	120.	-2.281	120.	6.210
130.	9.077	130.	3.453	130.	-0.871	130.	-2.455	130.	6.527

GAGE 87		GAGE 88		GAGE 89		GAGE 90		GAGE 91	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	-0.	0.	-0.	0.	-0.	0.	0.	0.	0.
20.	0.459	20.	0.285	20.	0.745	20.	-0.285	20.	-0.048
30.	0.697	30.	0.396	30.	1.125	30.	-0.459	30.	-0.523
40.	0.950	40.	0.602	40.	1.489	40.	-0.602	40.	-0.681
50.	1.236	50.	0.713	50.	1.853	50.	-0.760	50.	-0.792
60.	1.505	60.	0.855	60.	2.234	60.	-0.887	60.	-0.871
70.	1.743	70.	0.950	70.	2.582	70.	-1.030	70.	-0.966
80.	2.012	80.	1.109	80.	2.994	80.	-1.220	80.	-1.077
90.	2.297	90.	1.251	90.	3.390	90.	-1.347	90.	-1.109
100.	2.598	100.	1.378	100.	3.770	100.	-1.457	100.	-1.251
110.	2.899	110.	1.521	110.	4.135	110.	-1.552	110.	-1.394
120.	3.121	120.	1.552	120.	4.531	120.	-1.568	120.	-1.663
130.	3.216	130.	1.521	130.	4.958	130.	-1.505	130.	-2.028

GAGE 92		GAGE 93		GAGE 94		GAGE 95		GAGE 96	
LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS	LOAD	STRESS
0.	0.	0.	-0.	0.	-0.	0.	0.	0.	0.
20.	0.444	20.	1.378	20.	0.475	20.	7.224	20.	1.949
30.	0.745	30.	2.154	30.	0.681	30.	11.073	30.	3.057
40.	1.046	40.	2.867	40.	0.871	40.	14.923	40.	4.119
50.	1.315	50.	3.295	50.	0.998	50.	18.693	50.	5.164
60.	1.616	60.	4.246	60.	1.125	60.	22.828	60.	6.194
70.	1.917	70.	4.879	70.	1.220	70.	26.281	70.	7.160
80.	2.218	80.	5.529	80.	1.378	80.	30.067	80.	8.206
90.	2.503	90.	6.194	90.	1.552	90.	33.869	90.	9.283
100.	2.788	100.	6.859	100.	1.711	100.	37.481	100.	10.250
110.	3.010	110.	7.477	110.	1.869	110.	41.014	110.	11.232
120.	3.089	120.	8.127	120.	2.218	120.	44.451	120.	12.214
130.	2.978	130.	8.729	130.	2.804	130.	47.588	130.	13.133

GAGE 97

LOAD	STRESS
0.	-0.
20.	1.600
30.	2.250
40.	2.931
50.	3.675
60.	4.325
70.	5.893
80.	5.814
90.	6.622
100.	7.414
110.	8.238
120.	9.188
130.	10.218

GAGE 98

LOAD	STRESS
0.	0.
20.	-4.943
30.	-7.572
40.	-10.028
50.	-12.515
60.	-14.923
70.	-17.331
80.	-19.675
90.	-22.036
100.	-24.269
110.	-26.566
120.	-29.006
130.	-31.481

GAGE 99

LOAD	STRESS
0.	-0.
20.	1.695
30.	2.646
40.	3.564
50.	4.483
60.	5.386
70.	6.321
80.	7.208
90.	8.095
100.	8.998
110.	9.568
120.	10.788
130.	11.707

GAGE 100

LOAD	STRESS
0.	0.
10.	3.865
20.	8.008
30.	12.073
40.	16.139
50.	20.158
70.	28.197
80.	32.186
90.	36.143
100.	39.791
110.	43.501
120.	46.995
130.	50.118

GAGE 101

LOAD	STRESS
0.	0.
10.	1.314
20.	2.489
30.	3.509
40.	4.576
50.	5.612
70.	7.699
80.	8.781
90.	9.847
100.	10.868
110.	12.012
120.	13.047
130.	14.238

GAGE 102

LOAD	STRESS
0.	-0.
10.	-1.731
20.	-3.540
30.	-5.488
40.	-7.219
50.	-8.966
70.	-12.213
80.	-13.619
90.	-15.227
100.	-16.696
110.	-18.133
120.	-19.803
130.	-21.426

GAGE 103

LOAD	STRESS
0.	0.
10.	-0.943
20.	-1.855
30.	-2.875
40.	-3.911
50.	-4.808
70.	-6.694
80.	-7.559
90.	-8.533
100.	-9.368
110.	-10.141
120.	-10.945
130.	-11.656

GAGE 104

LOAD	STRESS
0.	-0.
10.	-1.561
20.	-3.215
30.	-5.086
40.	-6.802
50.	-8.502
70.	-11.811
80.	-13.403
90.	-15.072
100.	-16.634
110.	-18.133
120.	-19.648
130.	-21.055

GAGE 105

LOAD	STRESS
0.	0.
10.	-0.046
20.	-0.232
30.	-0.510
40.	-0.587
50.	-0.773
70.	-1.175
80.	-1.484
90.	-1.762
100.	-2.041
110.	-2.211
120.	-2.412
130.	-2.582

GAGE 106

LOAD	STRESS
0.	0.
10.	1.871
20.	3.772
30.	5.519
40.	7.312
50.	9.090
70.	12.599
80.	14.392
90.	16.000
100.	17.577
110.	19.123
120.	20.638
130.	22.261

GAGE 107

LOAD	STRESS
0.	0.
10.	0.402
20.	0.835
30.	1.144
40.	1.515
50.	1.840
70.	2.535
80.	2.875
90.	3.185
100.	3.494
110.	3.834
120.	4.128
130.	4.452

GAGE 108

LOAD	STRESS
0.	0.
10.	3.540
20.	7.343
30.	11.053
40.	14.732
50.	18.381
70.	25.662
80.	29.295
90.	32.850
100.	36.344
110.	39.838
120.	43.285
130.	46.748

GAGE 109

LOAD	STRESS
0.	0.
10.	-3.386
20.	-7.034
30.	-10.852
40.	-14.439
50.	-18.010
70.	-24.843
80.	-28.120
90.	-31.366
100.	-34.412
110.	-37.194
120.	-40.023
130.	-42.775

GAGE 110

LOAD	STRESS
0.	0.
10.	4.529
20.	9.600
30.	14.176
40.	18.674
50.	23.142
70.	31.954
80.	36.406
90.	40.765
100.	45.264
110.	49.731
120.	54.323
130.	59.038

GAGE 111

LOAD	STRESS
0.	0.
10.	0.402
20.	0.850
30.	1.144
40.	1.484
50.	1.840
70.	2.535
80.	2.922
90.	3.215
100.	3.586
110.	3.988
120.	4.313
130.	4.746

GAGE 112

LOAD	STRESS
0.	0.
10.	3.246
20.	7.003
30.	10.605
40.	14.346
50.	18.118
70.	25.786
80.	29.666
90.	33.530
100.	37.411
110.	41.275
120.	45.186
130.	49.036

GAGE 113

LOAD	STRESS
0.	0.
10.	4.205
20.	8.750
30.	13.171
40.	17.577
50.	21.905
70.	30.485
80.	34.690
90.	38.879
100.	42.914
110.	46.949
120.	50.906
130.	54.926

GAGE 114

LOAD	STRESS
0.	0.
10.	2.489
20.	5.333
30.	8.054
40.	10.837
50.	13.573
70.	18.999
80.	21.689
90.	24.379
100.	26.976
110.	29.619
120.	32.278
130.	34.875

GAGE 115

LOAD	STRESS
0.	0.
10.	-0.649
20.	-1.407
30.	-2.396
40.	-3.277
50.	-4.298
70.	-6.261
80.	-7.204
90.	-8.271
100.	-9.368
110.	-10.512
120.	-11.687
130.	-12.846

GAGE 116

LOAD	STRESS
0.	0.
10.	-0.124
20.	-0.247
30.	-0.603
40.	-0.912
50.	-1.329
70.	-2.071
80.	-2.381
90.	-2.752
100.	-2.999
110.	-3.370
120.	-3.679
130.	-3.880

GAGE 117

LOAD	STRESS
0.	0.
10.	-0.031
20.	-0.155
30.	-0.433
40.	-0.634
50.	-0.958
70.	-1.577
80.	-1.901
90.	-2.350
100.	-2.814
110.	-3.262
120.	-3.787
130.	-4.313

GAGE 118

LOAD	STRESS
0.	0.
10.	-0.572
20.	-1.113
30.	-1.778
40.	-2.334
50.	-2.984
70.	-4.112
80.	-4.684
90.	-5.318
100.	-5.874
110.	-6.446
120.	-6.972
130.	-7.451

GAGE 119

LOAD	STRESS
0.	0.
10.	0.046
20.	0.062
30.	-0.031
40.	0.
50.	-0.046
70.	-0.046
80.	-0.046
90.	-0.124
100.	-0.139
110.	-0.155
120.	-0.201
130.	-0.170

GAGE 120

LOAD	STRESS
0.	-0.
10.	-0.031
20.	-0.046
30.	-0.186
40.	-0.186
50.	-0.278
70.	-0.356
80.	-0.356
90.	-0.448
100.	-0.433
110.	-0.402
120.	-0.402
130.	-0.309

GAGE 121

LOAD	STRESS
0.	-0.
10.	0.278
20.	0.572
30.	0.649
40.	0.804
50.	0.835
70.	0.866
80.	0.711
90.	0.433
100.	0.155
110.	-0.031
120.	-0.294
130.	-0.649

GAGE 122

LOAD	STRESS
0.	0.
10.	0.634
20.	1.175
30.	1.561
40.	1.994
50.	2.319
70.	3.215
80.	3.602
90.	3.818
100.	4.112
110.	4.468
120.	4.761
130.	8.224

GAGE 123

LOAD	STRESS
0.	0.
10.	0.479
20.	0.974
30.	1.283
40.	1.670
50.	1.979
70.	2.412
80.	2.535
90.	2.504
100.	2.535
110.	2.597
120.	2.535
130.	4.019

GAGE 124

LOAD	STRESS
0.	-0.
10.	-0.417
20.	-0.943
30.	-1.608
40.	-2.102
50.	-2.674
70.	-3.695
80.	-4.267
90.	-4.870
100.	-5.457
110.	-5.952
120.	-6.524
130.	-7.127

GAGE 125

LOAD	STRESS
0.	0.
10.	0.062
20.	0.108
30.	0.046
40.	0.186
50.	0.247
70.	0.433
80.	0.526
90.	0.541
100.	0.587
110.	0.696
120.	0.727
130.	0.773

GAGE 126

LOAD	STRESS
0.	-0.
10.	0.108
20.	0.278
30.	0.247
40.	0.263
50.	0.232
70.	0.325
80.	0.402
90.	0.371
100.	0.402
110.	0.526
120.	0.557
130.	0.618

GAGE 127

LOAD	STRESS
0.	0.
10.	3.710
20.	8.023
30.	12.259
40.	16.696
50.	21.040
70.	29.666
80.	33.963
90.	38.199
100.	42.373
110.	46.593
120.	50.767
130.	54.879

GAGE 128

LOAD	STRESS
0.	0.
10.	2.860
20.	6.091
30.	9.152
40.	12.321
50.	15.397
70.	21.565
80.	24.657
90.	27.733
100.	30.717
110.	33.747
120.	36.823
130.	39.838

GAGE 129

LOAD	STRESS
0.	-0.
10.	0.046
20.	-0.186
30.	-0.572
40.	-0.819
50.	-1.129
70.	-1.546
80.	-1.685
90.	-1.932
100.	-2.164
110.	-2.319
120.	-2.535
130.	-2.613

GAGE 130

LOAD	STRESS
0.	0.
10.	0.062
20.	-0.124
30.	-0.464
40.	-0.665
50.	-0.912
70.	-1.268
80.	-1.453
90.	-1.747
100.	-1.901
110.	-2.025
120.	-2.149
130.	-2.396

GAGE 131

LOAD	STRESS
0.	0.
10.	3.401
20.	6.725
30.	9.894
40.	13.248
50.	16.495
70.	22.972
80.	26.218
90.	29.403
100.	32.495
110.	35.617
120.	38.740
130.	41.755

GAGE 132

LOAD	STRESS
0.	-0.
10.	4.854
20.	10.899
30.	16.680
40.	22.508
50.	28.321
70.	39.776
80.	45.449
90.	51.030
100.	56.518
110.	61.929
120.	67.447
130.	72.889

GAGE 133

LOAD	STRESS
0.	-0.
10.	-3.432
20.	-7.529
30.	-11.872
40.	-16.015
50.	-20.143
70.	-27.857
80.	-31.459
90.	-35.138
100.	-38.493
110.	-41.724
120.	-44.877
130.	-47.706

GAGE 134

LOAD	STRESS
0.	0.
10.	3.679
20.	7.745
30.	11.780
40.	15.892
50.	19.988
70.	28.027
80.	32.077
90.	36.066
100.	39.869
110.	43.702
120.	47.459
130.	50.798

GAGE 135

LOAD	STRESS
0.	0.
10.	0.510
20.	1.175
30.	1.716
40.	2.381
50.	2.968
70.	4.081
80.	4.684
90.	5.148
100.	5.612
110.	6.075
120.	6.477
130.	7.018

GAGE 136

LOAD	STRESS
0.	-0.
10.	0.201
20.	0.356
30.	0.464
40.	0.835
50.	1.268
70.	2.180
80.	2.643
90.	3.045
100.	3.494
110.	4.004
120.	4.452
130.	4.854

GAGE 137

LØAD	STRESS
0.	0.
10.	3.092
20.	6.678
30.	9.986
40.	13.326
50.	16.757
70.	23.668
80.	27.223
90.	30.686
100.	34.242
110.	37.813
120.	41.384
130.	45.016

GAGE 138

LØAD	STRESS
0.	0.
10.	-3.664
20.	-7.915
30.	-12.352
40.	-16.665
50.	-20.931
70.	-29.109
80.	-33.051
90.	-37.009
100.	-40.688
110.	-44.197
120.	-47.629
130.	-50.968

GAGE 139

LØAD	STRESS
0.	0.
10.	1.608
20.	0.804
30.	-0.232
40.	-1.113
50.	-1.932
70.	-3.246
80.	-3.818
90.	-4.375
100.	-4.700
110.	-4.761
120.	-4.916
130.	-4.854

GAGE 140

LØAD	STRESS
0.	0.
10.	2.412
20.	5.720
30.	8.951
40.	12.135
50.	15.351
70.	21.782
80.	24.873
90.	27.996
100.	31.042
110.	34.180
120.	37.287
130.	40.332

GAGE 141

LØAD	STRESS
0.	0.
10.	5.843
20.	13.836
30.	21.766
40.	29.604
50.	37.333
70.	52.344
80.	59.594
90.	66.814
100.	73.492
110.	79.784
120.	85.689
130.	90.790

GAGE 142

LØAD	STRESS
0.	-0.
10.	0.634
20.	0.897
30.	1.113
40.	1.453
50.	1.840
70.	2.814
80.	3.401
90.	3.927
100.	4.545
110.	5.225
120.	5.983
130.	6.786

GAGE 143

LØAD	STRESS
0.	0.
10.	0.510
20.	0.278
30.	-0.618
40.	-1.407
50.	-2.242
70.	-3.741
80.	-4.329
90.	-4.962
100.	-5.333
110.	-5.735
120.	-6.184
130.	-6.616

GAGE 144

LØAD	STRESS
0.	0.
10.	2.597
20.	5.782
30.	8.611
40.	11.455
50.	14.361
70.	20.035
80.	22.941
90.	25.801
100.	28.692
110.	31.583
120.	34.582
130.	37.735

GAGE 145

LØAD	STRESS
0.	0.
10.	1.469
20.	3.787
30.	6.168
40.	8.611
50.	11.130
70.	16.356
80.	19.030
90.	21.673
100.	24.363
110.	27.100
120.	29.944
130.	32.757

GAGE 146

LØAD	STRESS
0.	0.
10.	0.618
20.	0.093
30.	-0.557
40.	-0.974
50.	-1.391
70.	-1.917
80.	-2.071
90.	-2.303
100.	-2.458
110.	-2.365
120.	-2.319
130.	-2.288

GAGE 147

LOAD	STRESS
0.	0.
10.	1.407
20.	2.412
30.	2.551
40.	2.195
50.	1.623
70.	0.464
80.	-0.062
90.	-0.757
100.	-1.329
110.	-2.056
120.	-3.138
130.	-4.236

GAGE 148

LOAD	STRESS
0.	0.
10.	1.469
20.	3.154
30.	4.808
40.	6.725
50.	8.672
70.	12.754
80.	14.856
90.	16.897
100.	19.092
110.	21.349
120.	23.776
130.	26.187

GAGE 149

LOAD	STRESS
0.	0.
10.	0.819
20.	2.180
30.	3.849
40.	5.998
50.	8.301
70.	13.109
80.	15.675
90.	18.226
100.	20.947
110.	23.807
120.	26.976
130.	30.253

GAGE 150

LOAD	STRESS
0.	0.
10.	2.025
20.	4.421
30.	6.616
40.	8.966
50.	11.471
70.	16.541
80.	19.138
90.	21.673
100.	24.332
110.	26.991
120.	29.650
130.	32.247

GAGE 151

LOAD	STRESS
0.	0.
10.	2.164
20.	4.854
30.	7.389
40.	10.048
50.	12.707
70.	18.118
80.	20.823
90.	23.498
100.	26.157
110.	28.846
120.	31.583
130.	34.443

GAGE 152

LOAD	STRESS
0.	-0.
10.	-0.124
20.	-0.340
30.	-0.680
40.	-0.866
50.	-1.020
70.	-1.113
80.	-1.082
90.	-1.082
100.	-0.958
110.	-0.742
120.	-0.603
130.	-0.309

GAGE 153

LOAD	STRESS
0.	0.
10.	6.029
20.	13.758
30.	21.349
40.	28.893
50.	36.313
70.	50.814
80.	57.940
90.	65.036
100.	71.729
110.	78.083
120.	84.174
130.	89.878

GAGE 154

LOAD	STRESS
0.	-0.
10.	-0.
20.	-0.
30.	-0.
40.	14.021
50.	17.515
70.	24.487
80.	27.996
90.	31.521
100.	34.937
110.	38.385
120.	42.079
130.	46.222