[redacted]

UNCLASSIFIED

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
DOWNGRADING AND DECLASSIFICATION STAMP
CLASSIFICATION CHANGED TO: U
Emelda Selph 6/15/98
PERSON CHANGING MARKING & DATE
WC Layne 6-15-98
PERSON VERIFYING MARKING & DATE
AUTHORITY: W.C. Layne
RECORD ID: 98SN237
DATED: 6-11-98

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW
1st Review Date: 5/22/98
Authority: ADD
Name: R.B. Lawner
2nd Review Date: 6-11-98
Authority: ADD
Name: WC Layne
Determination (Circle Number)
Classification Retained
Classification Changed to: UNCL
Contains No DOE Classified Information
Contains Wtd.
Contains UCAI
Comments: DECLASSIFY

CENTRAL RECORD FILE
ACCOUNTABILITY CARD | BB
FILE No. XW49 | 3-2

MAY 21 1962

File No: XW-49, 3-2
T-18525
Date Completed: 3-24-62
RS 7321/9952

RECEIVED
MAY 22 1962
CENTRAL RECORD FILE

INVENTORIED
SEP 14 '65
3428-3

MR. E. L. HARLEY - 7118
Attn: R. E. Marsh

Re: Static Test of XW-49 Mounting Flange (U)

Summary of Test

To determine the ability of a re-designed XW-49 Mounting Flange to withstand inertial loads resulting from launch acceleration, four separate tests were performed.

Test condition No. 1 - A longitudinal fwd load of 16,220 pounds was applied to the mounting flange through the XW-49, with no indication of yielding.

Test Condition No. 2 - A longitudinal fwd load of 16,220 pounds and a transverse load of 5,920 pounds, gave no indication of yielding.

Test Condition No. 3 - A longitudinal aft load of 30,550 pounds was applied to the mounting flange through the XW-49, with no indication of yielding.

Test Condition No. 4 - A longitudinal aft load of 30,550 pounds and a transverse load of 6,720 pounds, gave no indication of yielding.

Object of Test

The object of this test was to determine the ability of a redesigned XW-49 Mounting Flange to withstand inertial loads resulting from launch acceleration.

Authorization for Test

This test was requested in an Environmental Test Order from Division 7118 to Division 7321, dated March 7, 1962. Mr. R. E. Marsh, 7118 and [illegible] J. [illegible] Schumann, 7182-1 were the consultants.

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Test Equipment and Instrumentation

The following equipment was used:

1 - Calibrated pull bar, No. 4
1 - Baldwin SR-4 load cell, 10,000 pound capacity, Serial No. 6049
1 - Baldwin SR-4 load cell, 50,000 pound capacity, Serial No. 1115
1 - Automatic strain gage readout system
2 - Hydraulic cylinders
2 - Hydraulic pumps

Procedure

With the flange mounted to an XW-49 warhead the setup was completed as shown in Figure 1. Instrumented washers were installed on two of the mounting bolts which attached the XW-49 flange to the barrel jig fixture for the purpose of determining the load in the mounting bolts during the test. The bolts were torqued to 120 in-lbs prior to loading the unit. Three dial indicators were used to measure displacement. For displacement gages and instrumented washer locations see Figures 2 and 3. Strain gages were mounted at locations as shown in Figures 4 through 7. A longitudinal forward load was applied to the XW-49 in increments to a maximum load of 16,220 pounds. Deflection readings, strain gage readings and readings from the two instrumented washers were taken at each increment of load.

With the setup as shown in Figure 8, with instrumentation the same as test No. 1, a longitudinal forward load combined with a transverse load was applied to the XW-49 in increments to a maximum load of P1 = 16,220 pounds, and P2 = 5,920 pounds.

With the setup as shown in Figure 9, instrumentation the same as test No. 1, a longitudinal aft load was applied to the XW-49 in increments to a maximum load of 30,550 pounds.

With the setup as shown in Figure 10, instrumentation the same as test No. 1, a longitudinal aft load combined with a transverse load was applied to the XW-49 in increments to a maximum load of P1 = 30,550 pounds, P2 = 6,720 pounds.

Results

There was no indication of yielding from the four tests performed on the XW-49 Mounting Flange. The four test conditions performed and the maximum principal stresses that occurred are as follows:

Test Condition No. 1 - At a longitudinal fwd load of 16,220 pounds a maximum principal stress of 3,447 psi (tension) occurred at gage Nos. 25, 26 and 27. (See Figure 9). For force washer data see Table I, for load-deflection data see Table II, for strain strain data see Table III.

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Test Condition No. 2 - At a longitudinal fwd load of 16,220 pounds combined with a transverse load of 5,920 pounds, a maximum principal stress of 9,595 psi (tension) occurred at gage Nos. 34, 35 and 36 (see Figure 10). For force washer data see Table IV, for load-deflection data see Table V, for stress-strain data see Table VI.

Test Condition No. 3 - At a longitudinal aft load of 30,550 pounds, a maximum principal stress of 23,372 psi (compression) occurred at gage Nos. 34, 35 and 36 (see Figure 10). For force washer data see Table VII, for load-deflection data see Table VIII, for stress-strain data see Table IX

Test Condition No. 4 - At a longitudinal aft load of 30,550 pounds combined with a transverse load of 6,720 pounds, a maximum principal stress of 20,689 psi (compression) occurred at gage Nos. 25, 26 and 27 (see Figure 9). For force washer data see Table X, for load-deflection data see Table XI, for stress-strain data see Table XII.

H. A. Warrick
H. A. WARRICK - 7322-1

R. G. Hamilton
Test Project Engineer: R. G. HAMILTON - 7321-5

Approved By: R. S. ROOPER - 7321-5

[illegible]:7322-1:mm

Distribution:
[illegible] - E. L. Marley, 7118
[illegible] - D. M. Bruce, 7182, Attn: J. T. Schamaun
[illegible] - J. M. Nissen, 1442
[illegible] - [illegible], 2344
[illegible] - [illegible], 7321
[illegible] - [illegible], 7321
[illegible] - [illegible], 1431-[illegible]

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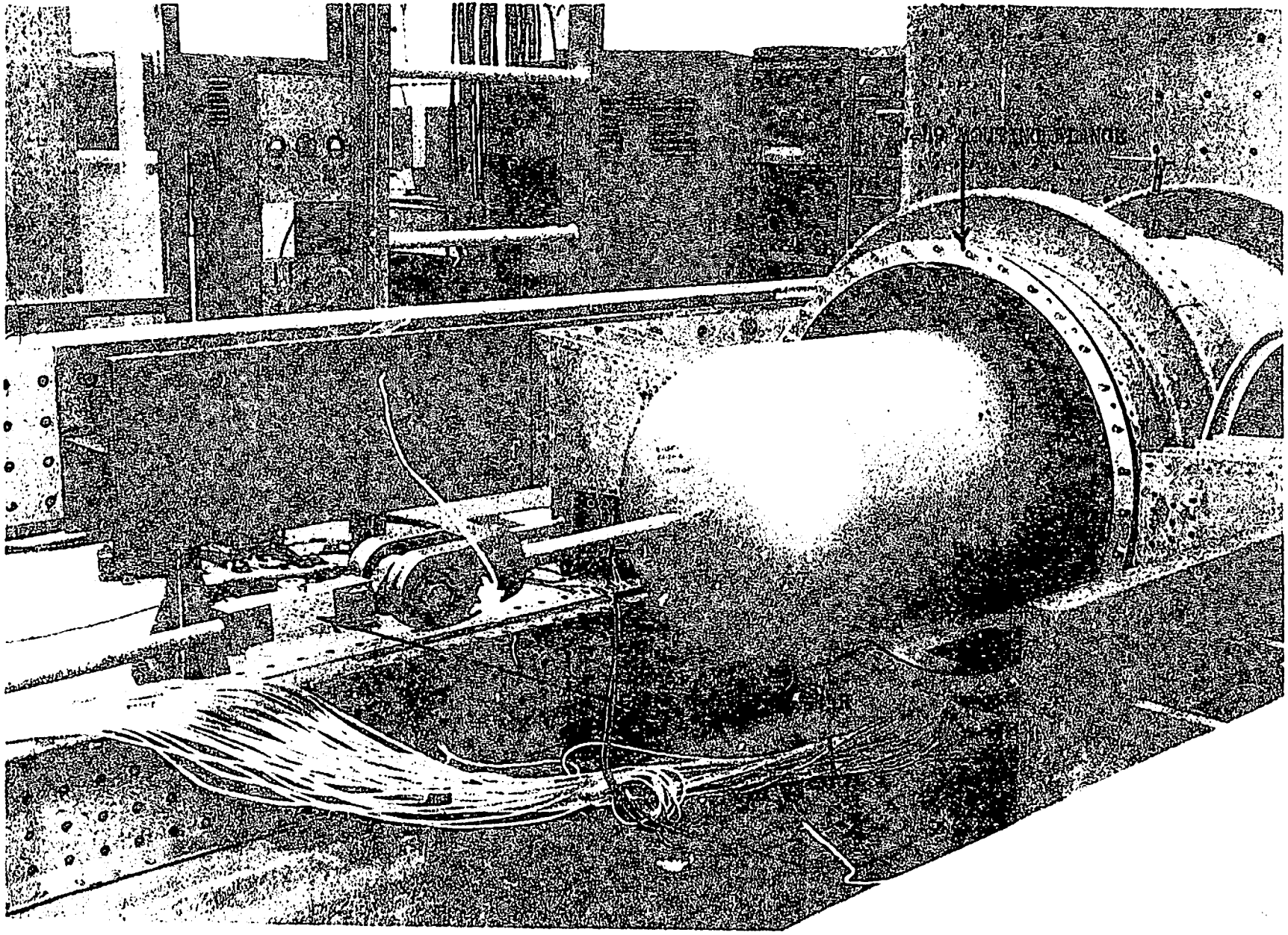

FIG. 1--TEST SET-UP, TEST CONDITION NO. 1--STATIC TEST OF XW-49 MOUNTING FLANGE

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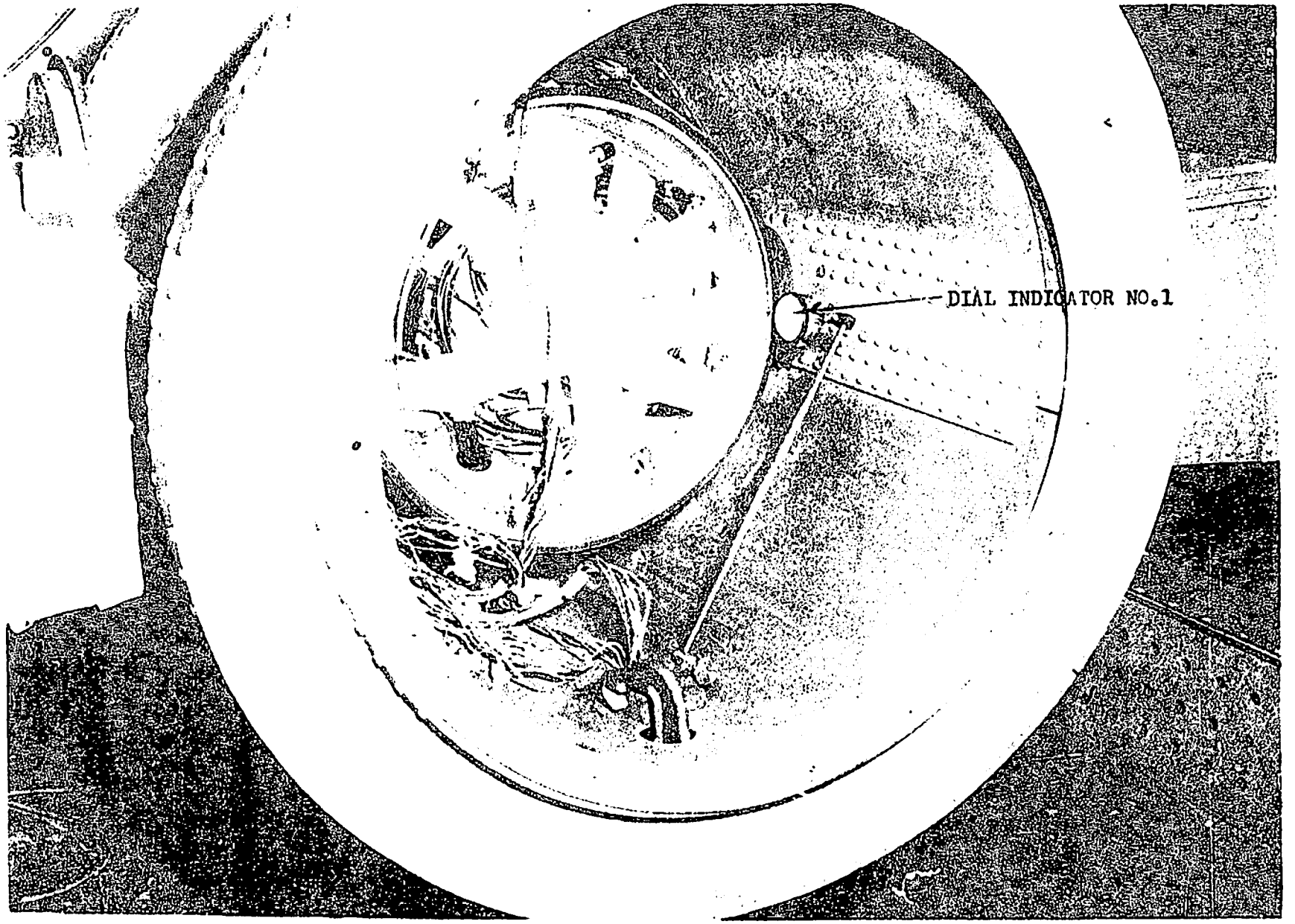

FIG.2--DIAL INDICATOR LOCATIONS--STATIC TEST OF XW-49 MOUNTING FLANGE

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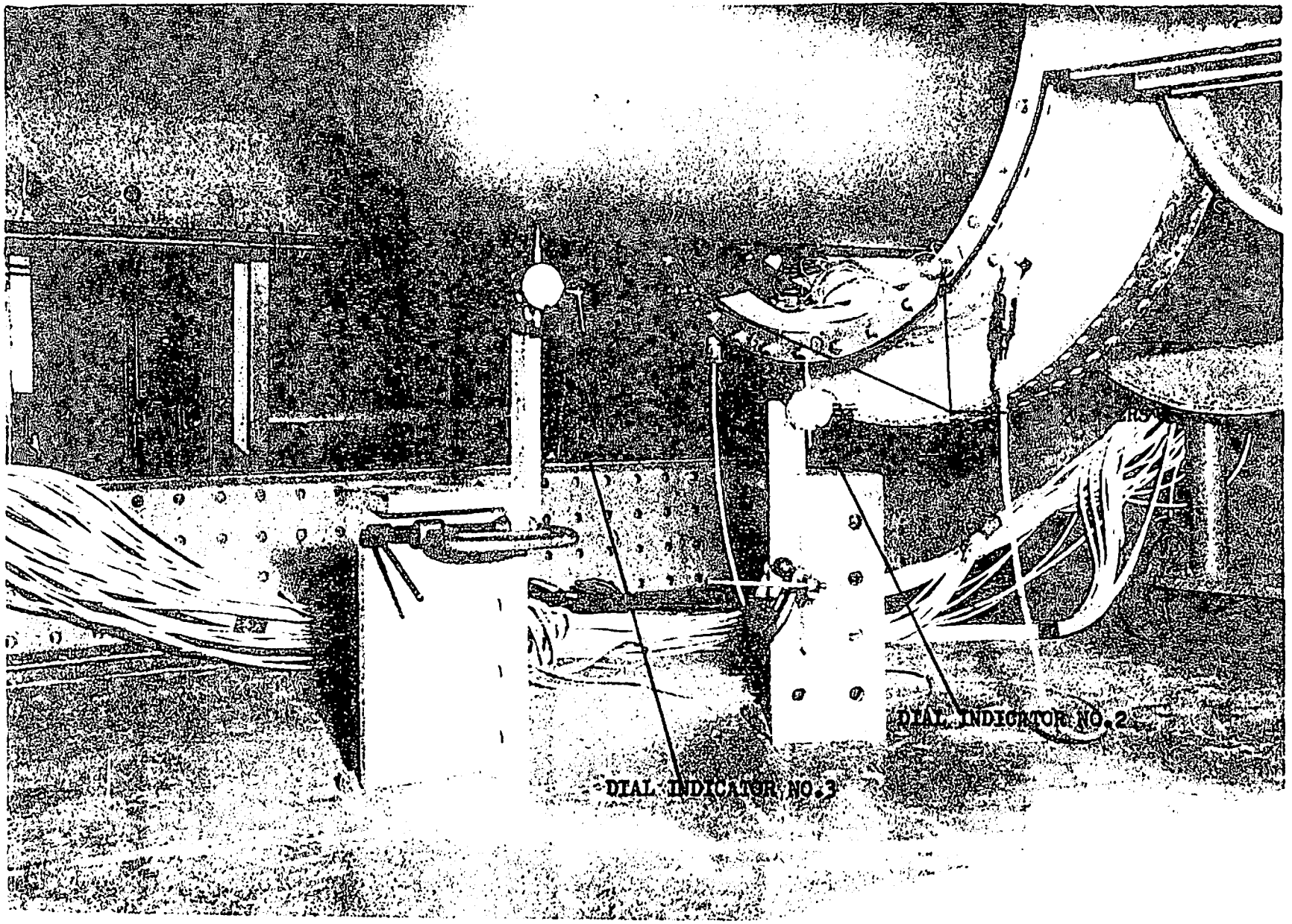

FIG. --DIAL INDICATOR AND LOAD WASHER LOCATIONS--STATIC TEST OF XW-49 MOUNTING FLANGE

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FIG. --STRAIN [illegible] LOCATIONS--STATIC TEST OF XW-[illegible] MOUNTING FLANGE

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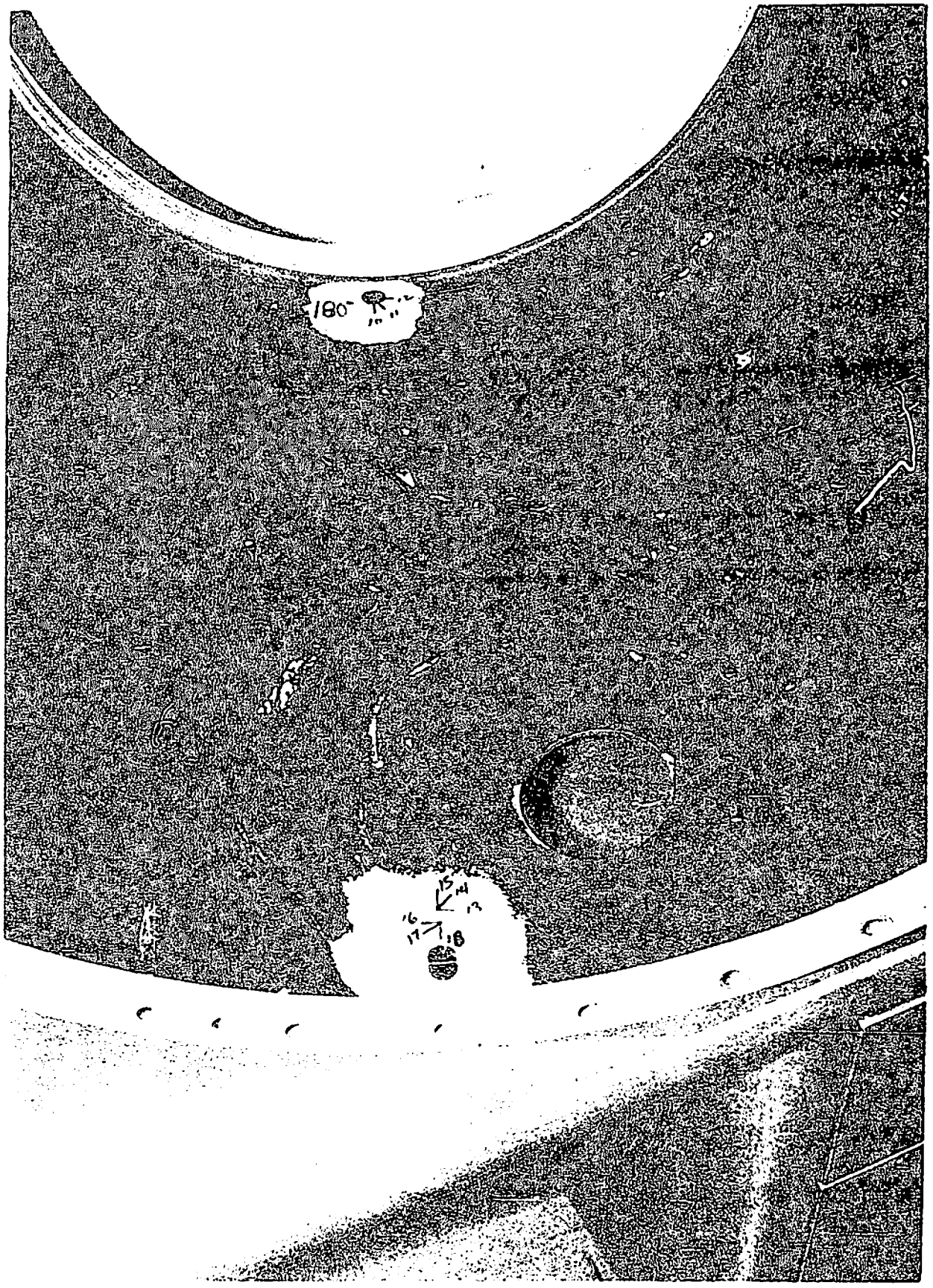

FIG. 5--STRAIN GAGE LOCATIONS--STATIC TEST OF XW-49
MOUNTING FLANGE

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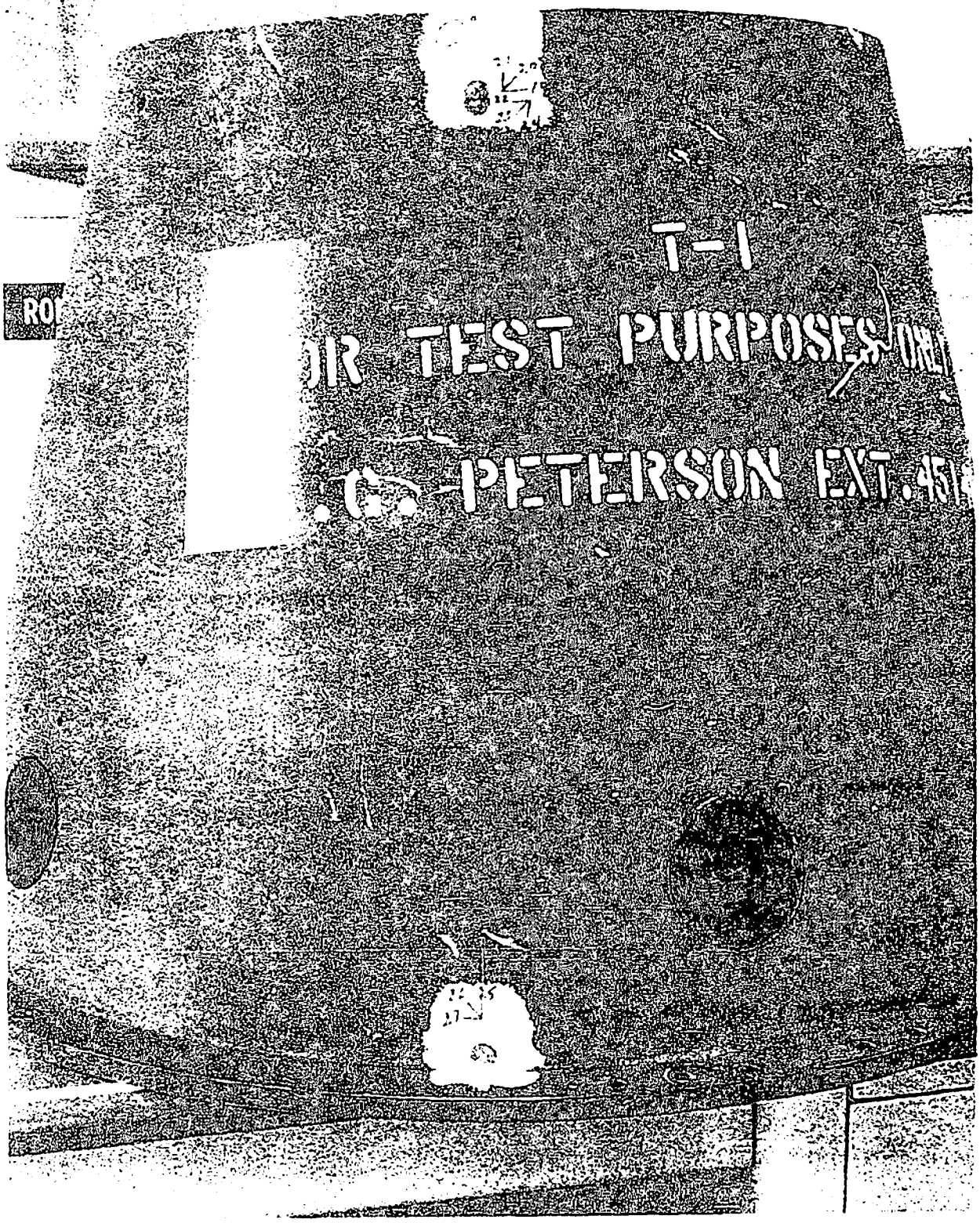

FIG. 1 --STRAIN GAGE LOCATIONS--STATIC TEST OF XW-40
MOUNTING PLATE

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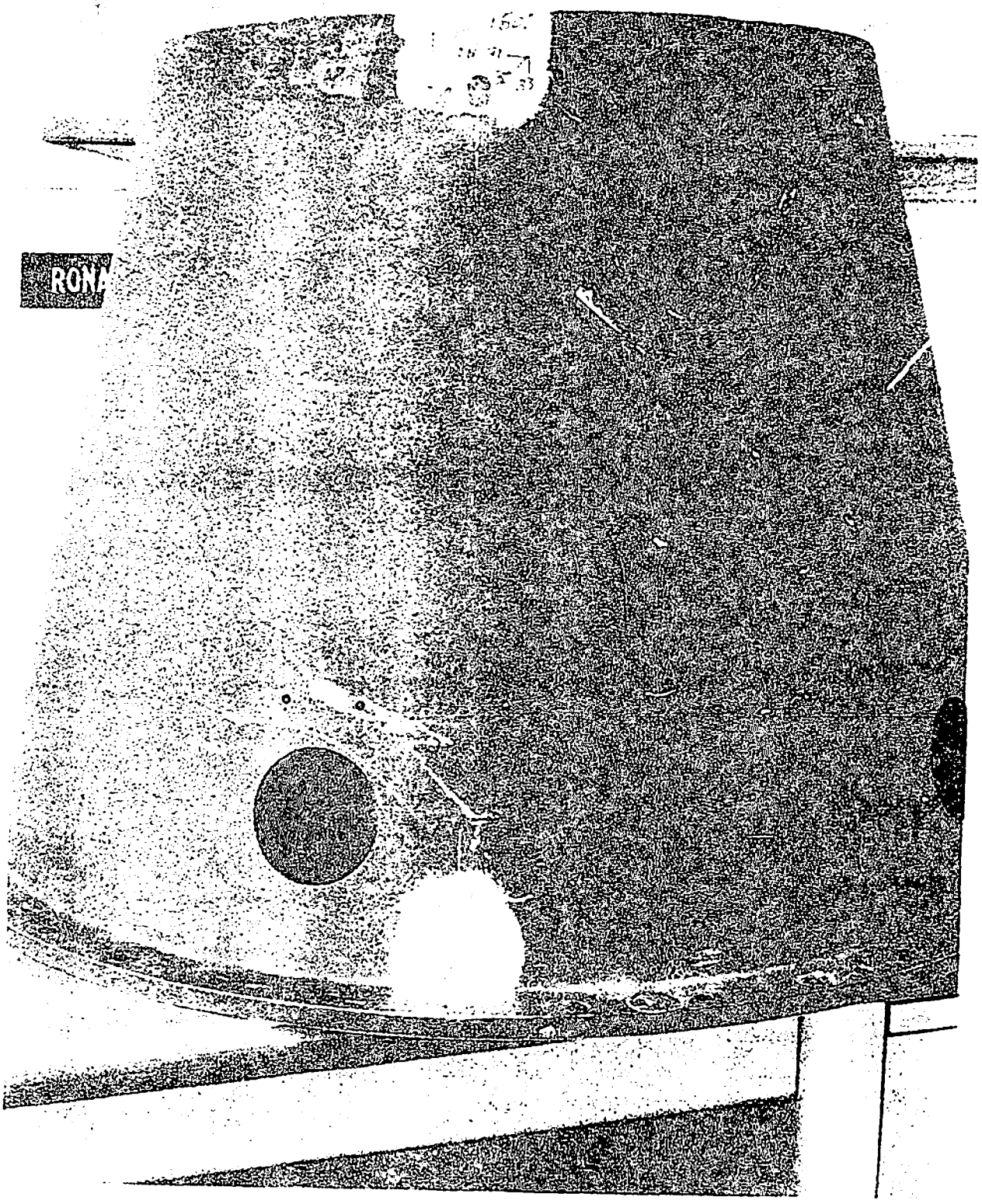

FIG. [illegible]--STRAIN GAGE LOCATIONS--STATIC TEST OF XW-49 MOUNTING FLANGE

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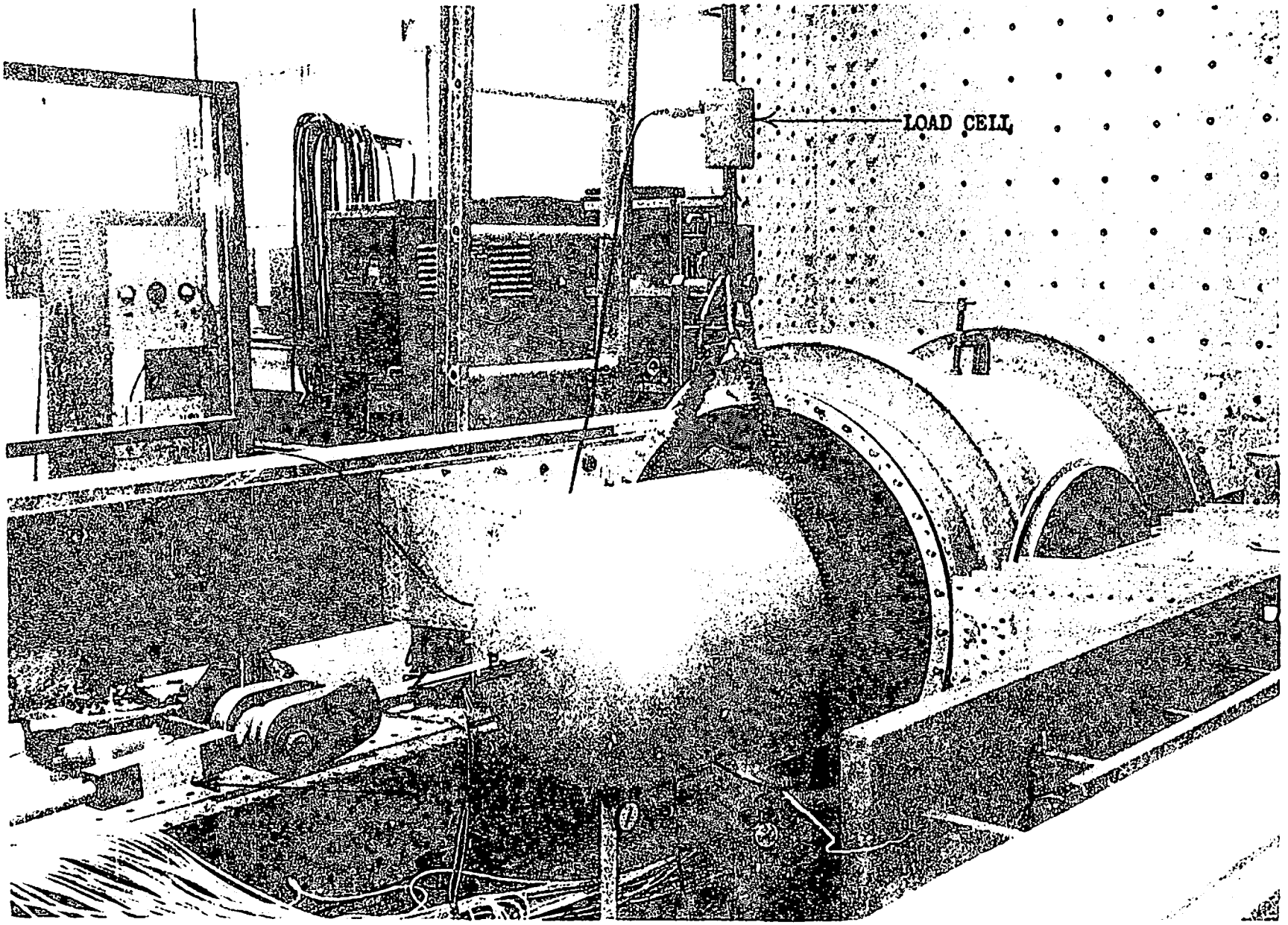

FIG. --TEST SET-UP, TEST CONDITION NO. 2--STATIC TEST OF XW-49 MOUNTING FLANGE

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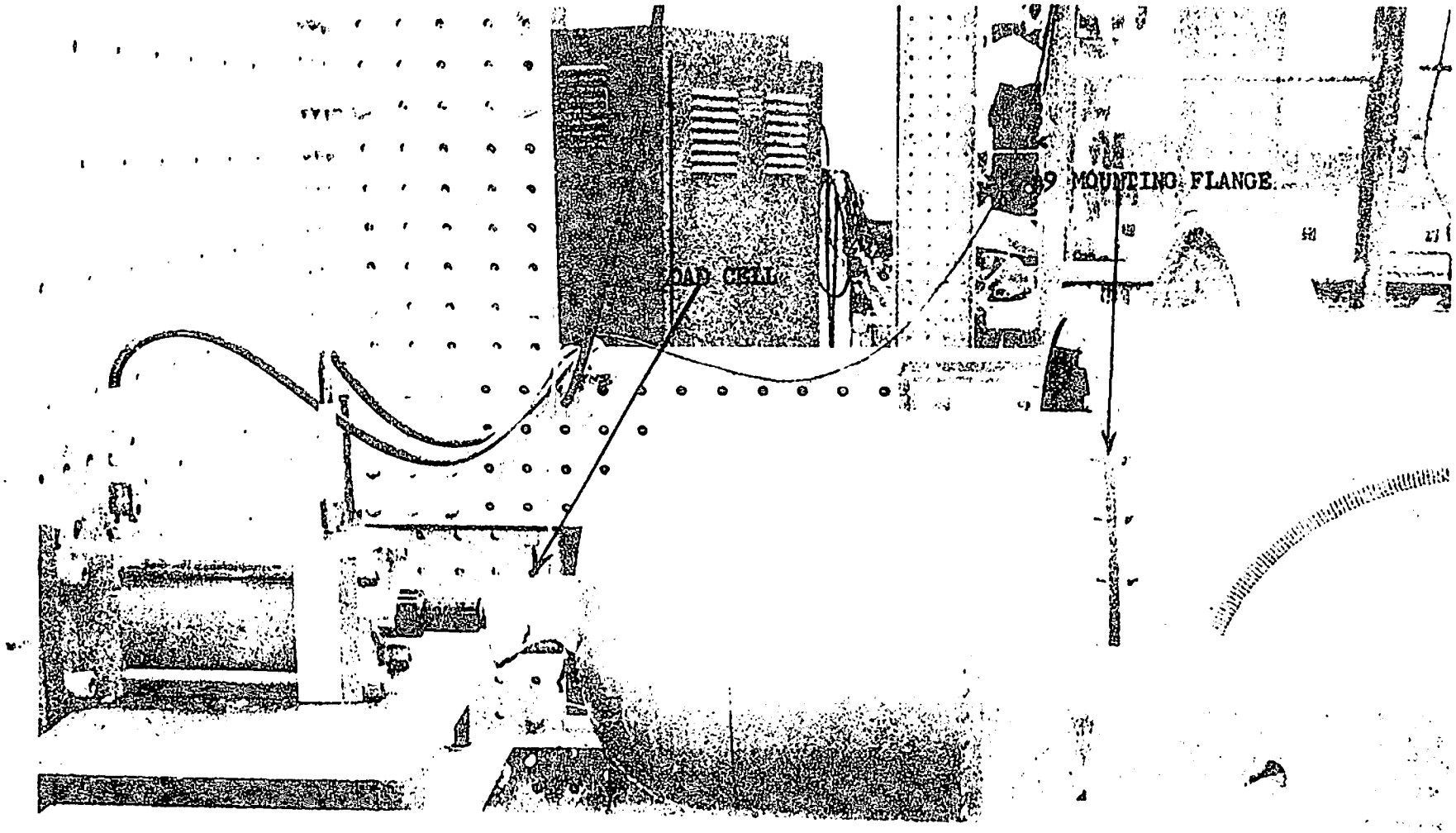

FIG.9--TEST SET-UP,TEST CONDITION NO.3--STATIC TEST OF XW-49 MOUNTING FLANGE

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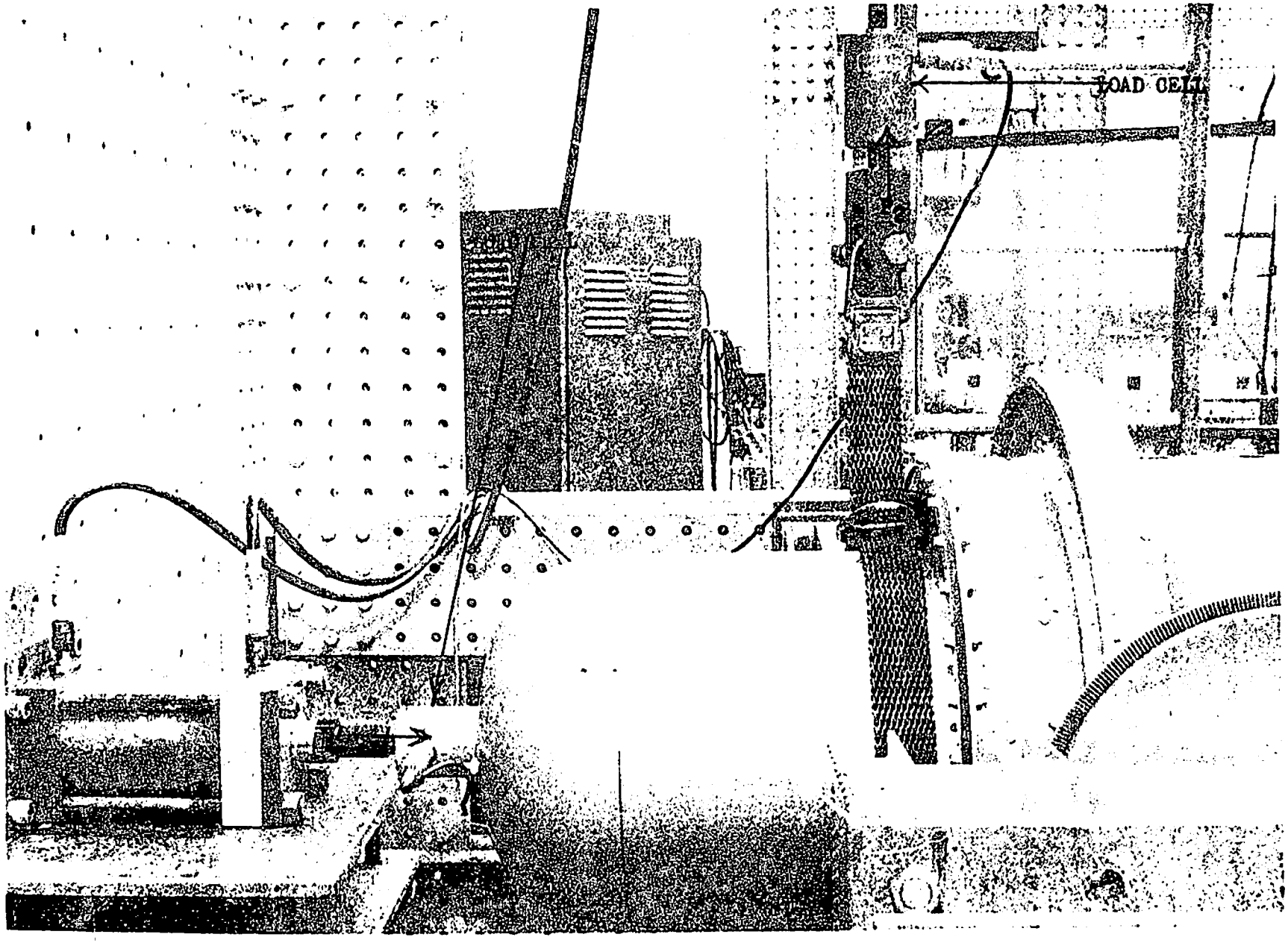

FIG.10-TEST SET-UP,TEST CONDITION NO.4--STATIC TEST OF XW-49 MOUNTING FLANGE

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TABLE I

Load Measured with Force Washers, Test Condition No. 1
Static Test of XN-49 Mounting Flange

Load (percent)	Bolt Load (lbs) No. 1	Bolt Load (lbs) No. 2
Bolts torqued to 120 in-lbs	1420	965
20	1415	954
50	1415	943
80	1415	943
100	1415	943
115	1420	928
20	1405	943
100	1415	928
115	1415	922
130	1415	922
140	1420	922
150	1420	922
20	1405	938
100	1410	922
130	1415	922
150	1415	922
160	1420	922
170	1420	917
180	1420	917
190	1420	917
200	1420	912
20	1394	938
Bolts torqued to 120 in-lbs	1389	938

TABLE II

Load-Deflection Data, Test Condition No. 1
Static Test of XW-49 Mounting Flange

Load (percent)	Load (lbs)	Deflection (inches) No. 1
0	0	0
20	1,630	0
50	4,060	0.003
80	6,480	0.012
100	8,110	0.016
115	9,330	0.017
20	1,630	0.004
100	8,110	0.016
115	9,330	0.017
130	10,540	0.019
140	11,340	0.020
150	12,160	0.021
20	1,630	0.004
100	8,110	0.016
130	10,530	0.019
150	12,150	0.021
160	12,980	0.022
170	13,700	0.022
180	14,600	0.024
190	15,400	0.024
200	16,220	0.025
20	1,630	0.005

Note: Plus readings denote movement towards dial.

TABLE I.1
STRESS-STRAIN DATA, TEST CONDITION NO. 1 - STATIC TEST OF XW-49 MOUNTING FLANGE

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
[illegible]	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8	CH 9	CH 10	CH 11	CH 12	CH 13	CH 14	CH 15
[illegible]	1[illegible]	1[illegible]	-1	10	10	10	20	10	10	10	-1	-1	-1	1	1
[illegible]	1	1[illegible]	-1	1	-1	-1	-1	-1	-1	10	-1	-1	-1	-1	-1
[illegible]	30	4[illegible]	-2[illegible]	-1	-10	-50	-20	-30	-40	170	50	-10	-20	-20	-50
[illegible]	1[illegible]0	17[illegible]	-5[illegible]	-20	-50	-100	-50	-60	-90	230	100	-20	-30	-4[illegible]	-100
[illegible]	2[illegible]0	2[illegible]	-4[illegible]	-30	-60	-160	-70	-80	-110	240	100	-20	-30	-5[illegible]	-150
[illegible]	270	22[illegible]	-1[illegible]	-30	-70	-210	-50	-100	-140	270	120	-30	-30	-6[illegible]	-210
[illegible]	2[illegible]	5[illegible]	-1	1	-1	-1	-1	-1	-1	50	20	-1	-1	-1	-1
[illegible]	22[illegible]	3[illegible]	-5[illegible]	-20	-50	-14[illegible]	-20	-60	-100	280	130	-20	-30	-5[illegible]	-160
[illegible]	2[illegible]0	22[illegible]	-4[illegible]	-20	-70	-190	-40	-80	-140	300	80	-30	-30	-6[illegible]	-200
[illegible]	2[illegible]	24[illegible]	-8[illegible]	-30	-90	-220	-100	-110	-170	320	90	-30	-40	-7[illegible]	-210
[illegible]	3[illegible]0	25[illegible]	-8[illegible]	-30	-100	-230	-100	-120	-190	330	90	-40	-40	-8[illegible]	-230
[illegible]	3[illegible]	26[illegible]	-7[illegible]	-30	-100	-25[illegible]	-110	-130	-220	350	160	-40	-40	-9[illegible]	-240
[illegible]	3[illegible]	3[illegible]	-1	10	1	-1	1	-1	-1	6[illegible]	20	10	-1	1	-1
[illegible]	2[illegible]0	22[illegible]	-[illegible]	-1[illegible]	-50	-14[illegible]	-40	-60	-100	290	130	-20	-30	-4[illegible]	-150
[illegible]	2[illegible]	25[illegible]	-6[illegible]	-20	-80	-220	-90	-110	-160	320	90	-30	-30	-7[illegible]	-200
[illegible]	3[illegible]0	26[illegible]	-[illegible]	-3[illegible]	-100	-250	-100	-130	-210	350	110	-40	-40	-9[illegible]	-240
[illegible]	3[illegible]	27[illegible]	-8[illegible]	-30	-140	-250	-110	-140	-220	360	160	-40	-50	-10[illegible]	-250
[illegible]	3[illegible]0	25[illegible]	-6[illegible]	-30	-140	-29[illegible]	-110	-140	-240	38[illegible]	170	-50	-40	-10[illegible]	-260
[illegible]	3[illegible]	25[illegible]	-1[illegible]	-30	-170	-31[illegible]	-100	-170	-250	41[illegible]	130	-50	-50	-14[illegible]	-290
[illegible]	37[illegible]	2[illegible]	-1[illegible]	-40	-190	-33[illegible]	-110	-170	-260	43[illegible]	140	-50	-50	-15[illegible]	-310
[illegible]	3[illegible]	3[illegible]	-1[illegible]	-40	-200	-34[illegible]	-110	-200	-270	460	150	-60	-60	-17[illegible]	-320
[illegible]	[illegible]	[illegible]	-1	20	1	-1	1	-1	-1	60	20	1	-1	1	-1
[illegible]	-1	3[illegible]	[illegible]	30	30	21	20	30	30	30	10	10	10	20	10

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TABLE III (Con 'd)

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
[illegible]	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
[illegible]	130	[illegible]	[illegible]	154	154		285	176	23	[illegible]	[illegible]	23	11	-11	[illegible]
[illegible]	75	-74	[illegible]	11	-11	23	-15	-15		[illegible]	[illegible]	23	[illegible]	[illegible]	
[illegible]	411	-[illegible]	[illegible]	-[illegible]57	-617	[illegible]	-[illegible]	-539		[illegible]	492	[illegible]	-[illegible]	[illegible]	[illegible]
[illegible]	2[illegible]	-[illegible]	[illegible]	-[illegible]92	-1242	[illegible]	-[illegible]	-1249	167	2535	642	1	-[illegible]	-[illegible]	162
[illegible]	2[illegible]	-[illegible]	[illegible]	-[illegible]86	-2033	[illegible]	-[illegible]	-1556	167	2713	678	[illegible]	-[illegible]	-[illegible]	[illegible]
[illegible]	3[illegible]	-[illegible]	[illegible]	-1[illegible]44	-2643	165	-[illegible]	-1911	3	[illegible]	679		-[illegible]	-[illegible]	[illegible]
[illegible]	471	-[illegible]	[illegible]	11	-11	23	-15	-15		578	175	5	-15	-15	
[illegible]	2583	-[illegible]	[illegible]	-[illegible]38	-1750	167	-[illegible]	-1533	150	3162	833		-[illegible]	-[illegible]	[illegible]
[illegible]	2[illegible]	-[illegible]	[illegible]	-[illegible]39	-2327	[illegible]	-[illegible]	-1773	174	3425	726	[illegible]	-[illegible]	-[illegible]	164
[illegible]	3[illegible]	-[illegible]	[illegible]	-1[illegible]34	-2717	[illegible]	-1[illegible]	-2408	162	3652	803	[illegible]	-1134	-[illegible]	164
[illegible]	3268	[illegible]	[illegible]	-1187	-2808	172	-1428	-2623	165	3727	729	8	-1[illegible]	-[illegible]	165
[illegible]	3577	[illegible]	[illegible]	-1242	-3060	[illegible]	-2029	-3141	164	3836	867	179	-1283	-[illegible]	167
[illegible]	[illegible]	-[illegible]	[illegible]	25	19	[illegible]	11	-11	23	744	313	15		-31	45
[illegible]	3[illegible]	[illegible]	[illegible]	-[illegible]12	-1623	[illegible]	-[illegible]	-1321	171	3279	57	1	-[illegible]	-[illegible]	[illegible]
[illegible]	3463	[illegible]	[illegible]	-1[illegible]7	-2680	[illegible]	-1[illegible]	-2216	168	3652	833	2	-1[illegible]	-[illegible]	166
[illegible]	3532	-[illegible]	[illegible]	-1242	-3040	[illegible]	-1[illegible]	-2851	168	3936	828	6	-1283	-[illegible]	167
[illegible]	3789	-[illegible]	[illegible]	-1334	-3122	[illegible]	-2[illegible]	-3004	168	4012	905		-1437	-[illegible]	167
[illegible]	3961	[illegible]	[illegible]	-1437	-3480	[illegible]	-2[illegible]	-3269	166	4215	865	179	-1366	-[illegible]	166
[illegible]	4130	-[illegible]	[illegible]	-1525	-3699		-2[illegible]	-3273	178	4594	936	6	-1652	-[illegible]	173
[illegible]	4265	-[illegible]	[illegible]	-1716	-3969	1	-2249	-3436	174	4823	1016	6	-1[illegible]	-[illegible]	174
[illegible]	4434	[illegible]	[illegible]	-1752	-4097	2	-2[illegible]	-3546	4	5139	1017	5	-1[illegible]	-[illegible]	176
[illegible]	579	-[illegible]	[illegible]	251	41	[illegible]	11	-11	23	712	225	10		-31	45
[illegible]	233	-[illegible]	[illegible]	439	329	157	439	329	113	417	197	23	231	76	45

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LARGEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE III (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
0/2	CH 16	CH 17	CH 18	CH 19	CH 20	CH 21	CH 22	CH 23	CH 24	CH 25	CH 26	CH 27	CH 28	CH 29	CH 30
000	10	10	10	10	1	10	1	10	10	10	1	10	1	10	-1
020	1	-1	-1	-1	-1	-1	-1	-1	-1	50	40	20	10	1	-10
050	-20	-30	-50	-20	-20	-20	-20	-10	-10	190	120	20	-20	-20	-60
080	-50	-60	-110	-70	-60	-70	-60	-40	-50	300	180	20	-30	-30	-90
100	-50	-80	-140	-90	-100	-100	-90	-50	-60	370	200	10	-30	-30	-80
115	-50	-100	-180	-100	-100	-110	-100	-60	-70	420	240	20	-30	-40	-100
020	1	-1	-1	-1	-1	-1	-1	-1	-1	70	50	20	-1	-1	-20
100	-50	-80	-140	-80	-80	-80	-80	-40	-50	370	210	20	-30	-40	-90
115	-70	-100	-190	-100	-90	-100	-80	-50	-50	410	240	20	-40	-40	-100
130	-70	-120	-210	-100	-100	-100	-80	-50	-60	480	260	20	-50	-50	-110
140	-70	-120	-230	-100	-100	-110	-100	-50	-60	520	270	20	-50	-50	-130
150	-80	-140	-240	-100	-110	-120	-100	-60	-60	550	290	20	-60	-50	-120
020	10	1	-1	-1	-1	-1	-1	10	-1	90	70	30	1	1	-10
100	-40	-70	-130	-70	-70	-80	-60	-40	-50	390	230	30	-30	-30	-80
130	-50	-110	-210	-90	-100	-100	-80	-50	-60	490	270	30	-40	-50	-110
150	-70	-130	-240	-100	-100	-100	-80	-50	-60	560	290	1	-50	-50	-120
160	-90	-180	-250	-100	-100	-110	-100	-60	-60	590	320	20	-50	-50	-150
170	-90	-170	-260	-100	-100	-120	-100	-60	-70	630	310	20	-60	-60	-160
180	-100	-190	-280	-100	-110	-130	-100	-60	-70	660	330	-1	-70	-70	-180
190	-100	-210	-300	-100	-110	-130	-100	-60	-70	690	350	10	-80	-80	-200
200	-120	-230	-320	-120	-120	-140	-120	-80	-90	730	360	1	-90	-90	-210
020	10	1	-1	1	-1	-1	1	10	1	110	80	40	1	1	-10
000	30	20	20	20	10	10	10	20	10	20	10	20	10	20	-1

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TABLE III (Cont'd)

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
[illegible]	154	154		224	44	45	134	35	113	224	84	45	78	-78	138
[illegible]	11	-11	28	-15	-15		-15	-15		661	415	171	78	-78	177
[illegible]	-415	-461	171	-307	-307		-176	-285	113	2284	943	175	-395	-334	157
[illegible]	-749	-1553	163	-998	-1153	45	-722	-968	126	3557	1360	176	-592	-1251	157
[illegible]	-1191	-1423	172	-1405	-1515	23	-926	-1379	120	4319	1519	178	-571	-1120	157
[illegible]	-1353	-2333	172	-1558	-1668	157	-1080	-1532	120	4941	1819	177	-665	-1333	162
[illegible]	11	-11	28	-15	-15		-15	-15		889	493	174	-57	-266	157
[illegible]	-1191	-1353	172	-1229	-1229		-773	-1225	120	4360	1632	178	-642	-1202	163
[illegible]	-1477	-2515	172	-1459	-1614	45	-834	-1163	113	4836	1777	176	-746	-1405	157
[illegible]	-1585	-2719	172	-1537	-1537		-902	-1249	122	5629	2053	179	-900	-1559	157
[illegible]	-1641	-2763	172	-1558	-1668	157	-949	-1509	118	5090	2207		-944	-1622	157
[illegible]	-1719	-2797	173	-1613	-1768		-1010	-1449	113	5437	2321	179	-995	-1771	153
[illegible]	123	13	16	-15	-15		78	-101	45	1167	676	171	-9	-130	157
[illegible]	-738	-1574	171	-1207	-1207	157	-722	-968	126	4633	1820	177	-571	-1120	157
[illegible]	-1465	-2664	171	-1405	-1515	23	-902	-1249	122	5783	2207	179	-818	-1486	162
[illegible]	-1594	-3171	172	-1537	-1537		-902	-1249	122	6482	2138	179	-922	-1590	157
[illegible]	-1765	-3233	4	-1558	-1668	157	-1010	-1449	113	6900	2473	1	-987	-2086	157
[illegible]	-2128	-3451	176	-1580	-1800	157	-1080	-1532	120	7365	2622	1	-1141	-2239	157
[illegible]	-2220	-3613		-1644	-1800	171	-1080	-1532	120	7629	2496	180	-1317	-2525	157
[illegible]	-2293	-3453	3	-1613	-1768		-1080	-1532	120	8018	2737		-1492	-2810	157
[illegible]	-2500	-4161	3	-1888	-2107	157	-1387	-1840	120	8447	2785		-1646	-2964	157
[illegible]	120	13	16	11	-11	23	85	-55	45	1427	878	176	-9	-130	157
[illegible]	439	323	15	285	176	23	231	76	45	385	230	45	197	-59	145

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE III (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
	CH 31	CH 32	CH 33	CH 34	CH 35	CH 36	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0
000	1	1	-1	1	-1	1									
020	-1	-1	-1	30	10	1									
060	-50	-50	-50	160	80	-1									
080	-50	-50	-50	300	160	-1									
100	-50	-50	-50	350	180	-1									
110	-70	-60	-60	390	200	-1									
020	-1	-10	-10	50	20	10									
130	-50	-60	-60	360	190	-1									
150	-50	-60	-60	410	220	-1									
170	-50	-60	-60	460	240	-1									
190	-50	-70	-80	500	250	-1									
150	-100	-80	-80	540	260	-1									
020	-1	-1	-1	50	30	10									
170	-50	-50	-50	380	200	-1									
190	-50	-70	-70	480	250	-1									
150	-100	-80	-70	540	260	-1									
160	-100	-80	-90	580	280	-1									
170	-110	-90	-90	610	280	-1									
180	-110	-100	-100	640	300	-10									
190	-130	-100	-110	670	320	-10									
200	-140	-120	-110	700	320	-10									
020	-1	-1	-1	60	30	10									
000	1	1	-1	10	1	10									

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TABLE III (Cont'd)

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
O/O	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	11	-11	157	31		45									
020	-15	-15		359	118	13									
050	-768	-768		1847	596	180									
080	-844	-1000	15	3469	1126	173									
100	-790	-900	113	4045	1318	179									
110	-944	-1054	113	4507	1470	179									
020	-35	-134	23	635	287	13									
100	-765	-1185	113	4162	1354	173									
110	-1097	-1207	67	4743	1542	179									
130	-984	-1317	113	5318	1734	179									
140	-1183	-1429	126	5779	1888	180									
150	-1273	-1493	113	6243	2039	1									
020	-15	-15		616	306										
100	-790	-900	113	4393	1430	178									
130	-1097	-1207	113	5549	1811	179									
150	-1183	-1429	99	6243	2039	1									
160	-1337	-1582	126	6705	2191	1									
170	-1427	-1646	113	7059	2299	2									
180	-1558	-1663	113	7366	2314	1									
190	-1570	-2017	122	7712	2429	1									
200	-1794	-2043	99	8065	2537	2									
020	-15	-15		736	340	5									
000	11	-11	157	224	84	45									

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE IV

Load Measured with Force Washers, Test Condition No. 2
Static Test of XW-49 Mounting Flange

Load (percent)	Bolt Load (lbs) No. 1	Bolt Load (lbs) No. 2
Bolts torqued to 120 in-lbs	1495	1458
20	1495	1447
50	1500	1442
80	1505	1436
100	1511	1431
115	1511	1431
20	1489	1442
100	1505	1431
115	1505	1431
130	1511	1431
140	1511	1431
150	1511	1431
20	1489	1436
100	1505	1426
130	1511	1426
150	1516	1426
160	1516	1426
170	1516	1426
180	1516	1426
190	1521	1426
200	1473	1426
20	1484	1436
Bolts torqued to 120 in-lbs	1470	1431

[redacted]

TABLE V

Load-Deflection Data, Test Condition No. 2
Static Test of XW-49 Mounting Flange

Load (percent)	Load P_1 (lbs)	Load P_2 (lbs)	Deflection (inches) No. 1	No. 2	No. 3
0	0	0	0	0	0
20	1,630	590	0.002	-0.015	-0.019
50	4,060	1,480	0.004	-0.019	-0.038
80	6,480	2,370	0.012	-0.062	-0.104
100	8,110	2,960	0.013	-0.093	-0.141
115	9,330	3,400	0.016	-0.116	-0.173
20	1,630	590	0.001	-0.016	-0.021
100	8,110	2,960	0.013	-0.094	-0.143
115	9,330	3,400	0.014	-0.119	-0.176
130	10,540	3,850	0.016	-0.147	-0.212
140	11,340	4,140	0.017	-0.160	-0.227
150	12,160	4,440	0.018	-0.166	-0.245
20	1,630	590	0.011	-0.065	-0.021
100	8,110	2,960	0.015	-0.123	-0.185
130	10,530	3,850	0.018	-0.148	-0.218
150	12,150	4,440	0.019	-0.164	-0.247
160	12,980	4,730	0.021	-0.184	-0.259
170	13,700	5,030	0.022	-0.197	-0.273
180	14,600	5,320	0.022	-0.208	-0.286
190	15,400	5,620	0.023	-0.220	-0.300
200	16,220	5,920	0.024	-0.236	-0.320
20	1,630	590	0.011	-0.086	-0.040

Note: Plus readings denote movement towards dial.
Plus (-) readings denote movement away from dial.

[redacted]

TABLE VI

STRESS-STRAIN DATA, TEST CONDITION NO. 2 - STATIC TEST OF XW-49 MOUNTING FLANGE

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
0/0	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8	CH 9	CH 10	CH 11	CH 12	CH 13	CH 14	CH 15
000	-10	-1	-1	-1	-1	-1	-1	-1	-10	-1	-1	-1	-1	-1	-1
020	-10	-1	-1	-10	-20	-30	-30	-30	-30	-1	-1	-10	-10	-20	-30
050	20	20	1	-1	-20	-40	-40	-40	-40	110	40	-30	-20	-40	-100
080	220	160	-10	-20	-40	-80	-60	-60	-80	70	20	-20	-20	-100	-180
100	280	180	-20	-30	-50	-130	-100	-100	-110	50	10	-30	-30	-130	-250
115	320	200	-20	-30	-60	-180	-120	-120	-120	60	20	-30	-30	-140	-270
020	30	50	10	-1	-20	-40	-30	-30	-30	-20	-10	-20	-10	-10	-20
020	-20	-10	-10	-10	-20	-40	-30	-30	-30	-20	-20	-20	-20	-30	-40
100	270	170	-20	-30	-60	-140	-110	-100	-110	50	10	-40	-30	-110	-250
115	300	200	-20	-30	-70	-160	-100	-100	-120	40	10	-30	-40	-160	-280
130	350	230	-20	-30	-90	-200	-140	-140	-150	60	10	-40	-40	-190	-320
140	350	230	-30	-40	-100	-200	-160	-130	-140	80	10	-40	-30	-200	-330
150	410	250	-30	-40	-100	-220	-120	-130	-160	100	20	-50	-40	-200	-360
020	30	30	10	-1	-20	-40	-30	-30	-40	-30	-20	-20	-10	-20	-30
100	310	190	-10	-20	-60	-140	-110	-100	-110	20	1	-30	-30	-130	-250
130	330	200	-30	-50	-100	-200	-160	-150	-160	60	10	-60	-50	-190	-340
150	400	220	-30	-50	-100	-220	-170	-170	-180	100	20	-70	-60	-220	-400
160	420	230	-40	-50	-110	-230	-180	-160	-180	120	30	-70	-60	-230	-430
170	450	250	-30	-50	-110	-240	-120	-140	-180	150	40	-70	-60	-240	-460
180	450	250	-30	-50	-120	-240	-190	-190	-200	200	60	-100	-70	-250	-500
190	500	260	-40	-50	-120	-250	-190	-170	-200	220	70	-100	-70	-260	-520
200	540	280	-40	-50	-140	-260	-140	-160	-220	250	80	-110	-70	-280	-540
020	20	30	10	-1	-20	-50	-30	-30	-30	-20	-20	-20	-10	-10	-30
000	-10	-1	10	1	-1	-1	-1	-1	-1	-1	-10	-1	-1	1	-1

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TABLE VI (Cont'd)

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
DEG	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	-35	-134	113	-15	-15		-35	-134	157	-15	-15		-15	-15	
020	-35	-134	113	-230	-385		-461	-461		-35	-134	157	-230	-385	
050	266	57	157	-164	-466	179	-615	-615		1158	71		-575	-1269	167
080	2603	423	167	-523	-1014	171	-966	-1185	157	736	33	3	-915	-2158	
100	3225	770	171	-776	-1682	165	-1558	-1668	157	464	-157		-1293	-3009	177
115	3681	929	172	-934	-2293	165	-1844	-1844		582	-121	177	-1370	-3240	178
020	353	62	144	-164	-466	179	-461	-461		-230	-385	45	-176	-285	157
020	-176	-285	113	-261	-507	171	-461	-461		-307	-307		-383	-539	
100	3100	543	173	-837	-1775	168	-1613	-1768	45	428	-275	177	-1266	-3137	172
115	3478	-24	172	-919	-2000	169	-1580	-1900	157	351	-198	176	-1527	-3390	
130	4159	1269	171	-1079	-2455	172	-2173	-2283	157	542	-235		-1676	-3856	2
140	4131	939	171	-1203	-2484	173	-2131	-2478	122	780	-165	5	-1591	-3941	4
150	4590	1149	172	-1261	-2734	171	-1977	-2325	167	968	-200	2	-1831	-4316	
020	417	197	157	-164	-466	179	-483	-593	157	-329	-439	113	-230	-385	
100	3585	1024	173	-738	-1720	171	-1613	-1768	45	123	-276	173	-1293	-3009	177
130	3755	-54	172	-1307	-2535	171	-2381	-2536	45	472	-472	175	-1870	-4123	179
150	4534	1151	175	-1360	-2788	169	-2634	-2744	157	892	-431	178	-2212	-4856	178
160	4732	1106	175	-1414	-2888	171	-2610	-2921	45	1123	-355	178	-2323	-5206	178
170	5116	1337	175	-1442	-3014	170	-2659	-2550	171	1469	-240		-2434	-5556	177
180	5447	1467	177	-1465	-2991	173	-2941	-3051	157	1936	-399	178	-2687	-6071	175
190	5544	1424	177	-1494	-3116	172	-2798	-3194	141	2167	-323	178	-2764	-6301	176
200	6105	1577	177	-1558	-3205	176	-2418	-3113	167	2476	-324	178	-2851	-6522	177
020	353	108	144	-197	-587	174	-461	-461		-307	-307		-197	-417	157
000	78	-78	82	11	-11	23	-15	-15		55	-85	45		-31	45

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES
"E" = 10.3×10^6
"μ" = .333
Gages mounted on 6061-T6 aluminum, 41,000 psi ultimate

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TABLE VI (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
0/2	CH 16	CH 17	CH 18	CH 19	CH 20	CH 21	CH 22	CH 23	CH 24	CH 25	CH 26	CH 27	CH 28	CH 29	CH 30
000	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
020	-20	-20	-30	-20	-10	-10	-10	-1	-1	1	1	-1	-10	-10	-10
050	-50	-60	-90	-30	-20	-20	-10	-1	-1	80	60	-1	-20	-20	-40
080	-90	-110	-170	-70	-50	-50	-40	-20	-30	180	130	-1	-10	-10	-30
100	-120	-160	-240	-100	-70	-80	-60	-40	-40	240	150	-10	-20	-20	-30
115	-130	-190	-260	-110	-90	-100	-70	-40	-50	280	180	-10	-20	-20	-30
020	-20	-10	-20	-20	-10	-10	-10	1	-1	60	50	1	10	10	1
020	-30	-30	-50	-30	-10	-10	-10	-10	-1	10	10	-1	-1	-1	-10
100	-120	-150	-240	-110	-80	-80	-60	-30	-40	240	150	-10	-20	-20	-40
115	-130	-190	-270	-120	-90	-100	-70	-40	-50	280	170	-10	-20	-20	-30
130	-150	-220	-300	-120	-100	-110	-80	-40	-60	320	190	-10	-30	-20	-40
140	-150	-230	-320	-130	-110	-120	-80	-50	-60	330	200	-10	-30	-20	-40
150	-150	-250	-340	-120	-110	-130	-90	-50	-60	370	200	-20	-30	-20	-50
020	-20	-10	-20	-20	-10	-10	-10	1	-1	70	50	1	10	10	-1
100	-110	-150	-240	-100	-80	-100	-50	-40	-40	280	170	-10	-10	-10	-30
130	-150	-240	-330	-140	-120	-130	-100	-60	-70	320	180	-20	-30	-30	-60
150	-130	-260	-370	-140	-130	-140	-110	-70	-80	360	200	-20	-40	-40	-70
160	-150	-270	-420	-140	-130	-150	-110	-70	-90	360	210	-20	-40	-40	-70
170	-140	-300	-440	-100	-120	-150	-110	-70	-100	380	210	-20	-40	-30	-80
180	-130	-320	-480	-130	-140	-170	-120	-80	-100	410	230	-20	-50	-40	-100
190	-150	-330	-490	-120	-140	-190	-120	-100	-110	420	240	-20	-60	-50	-110
200	-150	-340	-520	-110	-160	-210	-140	-100	-120	450	250	-20	-50	-50	-120
020	-10	-10	-20	-20	-10	-10	-1	10	-1	80	60	10	10	10	-1
000	-1	-1	-1	-1	1	1	10	20	10	10	10	1	10	20	1

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TABLE VI (Cont'd)

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
G/P	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	-15	-15		-15	-15		-15	-15		-15	-15		-15	-15	
020	-329	-433	157	-176	-285	113	-35	-134	113	11	-11	157	-154	-154	
050	-988	-1317	157	-329	-439	113	-35	-134	113	959	254	167	-351	-571	157
080	-1550	-2345	167	-812	-1032	113	-415	-661	126	2145	605	168	-197	-417	157
100	-2275	-3257	171	-1209	-1556	122	-658	-878	113	2775	759	172	-329	-439	157
115	-2490	-3522	176	-1491	-1736	126	-748	-1096	122	3253	895	171	-329	-439	157
020	-230	-335	45	-176	-285	113	-23	-146	116	743	194	163	134	35	157
020	-461	-461		-197	-417	113	-35	-134	67	132	0	157	-35	-134	157
100	-2245	-3287	157	-1295	-1624	113	-595	-942	122	2775	759	172	-351	-571	157
115	-2524	-3622	176	-1517	-1864	122	-748	-1096	122	3233	916	173	-329	-439	157
130	-2973	-4041	176	-1644	-1890	126	-830	-1321	126	3691	1072	174	-415	-661	144
140	-3162	-4314	176	-1798	-2043	126	-922	-1249	122	3815	1102	173	-415	-661	144
150	-3142	-4547		-1798	-2043	144	-926	-1379	120	4216	1162	176	-441	-748	148
020	-230	-335	45	-176	-285	113	-23	-146	118	836	255	169	132	0	157
100	-2148	-3233	157	-1381	-1692	45	-657	-746	113	3233	916	173	-197	-417	157
130	-3103	-4125	176	-1951	-2197	126	-1080	-1532	120	3645	964	175	-527	-356	157
150	-2905	-4776	2	-2073	-2229	45	-1233	-1686	120	4106	1118	176	-683	-1319	157
160	-3434	-5477	176	-2105	-2351	144	-1291	-1782	126	4120	1104	174	-683	-1319	157
170	-3268	-5623	2	-1723	-2119	174	-1359	-1868	131	4336	1195	176	-642	-1202	152
180	-3322	-6057	2	-2131	-2478	157	-1445	-1936	126	4686	1305	175	-858	-1466	153
190	-3594	-6232	2	-2186	-2677	168	-1444	-1890	126	4839	1337	175	-972	-1543	153
200	-3710	-6584	1	-2270	-2847		-1752	-2243	126	5149	1458	176	-922	-1598	157
020	-176	-285	157	-176	-285	113	70	-101	45	987	396	168	139	0	157
000	-15	-15		11	-11	113	231	76	45	134	35	157	202	-33	144

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE VI (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
0/0	CH 31	CH 32	CH 33	CH 34	CH 35	CH 36	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0
000	-1	-1	-10	-10	-1	-10									
020	-10	-20	-30	20	20	-20									
050	-40	-40	-40	200	160	-20									
060	-20	-20	-30	330	220	-30									
100	-20	-30	-40	390	250	-40									
115	-20	-30	-30	480	270	-40									
020	10	-1	-10	10	20	-10									
020	-1	-20	-30	20	20	-30									
100	-30	-40	-40	390	250	-40									
115	-20	-40	-40	470	270	-40									
130	-30	-40	-50	530	290	-40									
140	-30	-40	-50	570	310	-50									
150	-40	-50	-60	620	330	-50									
020	1	-1	-10	10	10	-20									
100	-20	-30	-40	400	250	-40									
130	-50	-60	-70	520	280	-60									
150	-50	-60	-70	610	320	-70									
160	-50	-60	-80	650	360	-70									
170	-50	-60	-80	720	390	-60									
180	-70	-70	-90	780	420	-60									
190	-80	-80	-100	820	430	-60									
200	-80	-90	-100	850	450	-70									
020	-1	-1	-20	10	20	-10									
000	10	-1	-10	-1	1	-10									

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TABLE VI (Cont'd)

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
[illegible]	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
[illegible]	-35	-[illegible]	[illegible]	-84	-224	45									
[illegible]	-230	-[illegible]		220	-220	157									
[illegible]	-515	-[illegible]		2395	370	164									
[illegible]	-529	-[illegible]	[illegible]	3605	805	169									
[illegible]	-583	-[illegible]		4457	921	172									
[illegible]	-529	-[illegible]	[illegible]	5436	1324	175									
[illegible]	79	-24	3	174	-174	148									
[illegible]	-129	-356	6	198	-351	157									
[illegible]	-583	-[illegible]	[illegible]	4457	921	172									
[illegible]	-351	-[illegible]	[illegible]	5329	1278	174									
[illegible]	-537	-[illegible]		6065	1524	176									
[illegible]	-537	-[illegible]		6433	1556	175									
[illegible]	-591	-[illegible]		7204	1754	176									
[illegible]	-19	-12[illegible]	15[illegible]	88	-242	157									
[illegible]	-583	-[illegible]		4559	973	171									
[illegible]	-944	-1[illegible]		5819	1249	175									
[illegible]	-944	-1054	157	6817	1490	176									
[illegible]	-965	-1185	157	7304	1608	174									
[illegible]	-965	-1185	157	8135	2006	176									
[illegible]	-1119	-1539	157	8826	2237	176									
[illegible]	-1273	-1495	157	9278	2400	177									
[illegible]	-1305	-1461		9595	2390	176									
[illegible]	-57	-266	157	174	-174	148									
[illegible]	79	-79	3	-23	-146	152									

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE VII

Load Measured with Force Washers, Test Condition No. 3
Static Test of XN-49 Mounting Flange

Load (percent)	Bolt Load (lbs) No. 1	Bolt Load (lbs) No. 2
Bolts torqued to 120 in-lbs	1564	1378
20	1574	1410
40	1595	1473
60	1595	1569
80	1617	1675
100	1632	1775
20	1537	1389
100	1617	1776
110	1638	1884
120	1654	1897
125	1680	1924
20	1521	1373
Bolts torqued to 120 in-lbs	1505	1304

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TABLE VIII

Load-Deflection Data, Test Condition No. 3
Static Test of XW-49 Mounting Flange

Load (percent)	Load (lbs)	Deflection (inches) No. 1
0	0	0
20	4,880	-0.006
40	9,760	-0.017
60	14,650	-0.023
80	19,550	-0.030
100	24,400	-0.035
20	4,880	-0.013
100	24,400	-0.036
110	26,850	-0.040
120	29,300	-0.042
125	30,550	-0.043
20	4,880	-0.015
0		-0.004

Note: Minus (-) readings denote movement away from stud.

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TABLE IX

STRESS-STRAIN DATA, TEST CONDITION NO. 3- STATIC TEST OF XW-49 MOUNTING FLANGE

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
0/2	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8	CH 9	CH 10	CH 11	CH 12	CH 13	CH 14	CH 15
000	10	1	10	-1	-1	-1	-1	-1	-1	-1	10	1	10	1	-1
020	-130	-80	60	50	60	180	130	140	140	-1	-1	-1	20	70	170
040	-230	-120	100	110	210	350	230	250	280	-20	-10	1	50	210	350
060	-270	-160	140	180	350	580	310	370	450	-70	-20	10	100	370	590
080	-310	-170	190	210	490	820	410	500	620	-110	-30	30	160	480	820
100	-340	-190	210	220	590	990	460	600	790	-190	-40	40	250	580	980
020	-50	-40	50	30	80	290	130	120	140	-10	-1	1	20	90	290
100	-340	-190	210	240	620	1030	470	620	810	-190	-40	50	210	600	1000
110	-350	-190	220	250	690	1150	490	680	880	-220	-30	50	270	650	1110
120	-400	-210	270	270	760	1280	520	760	960	-240	-50	70	280	740	1230
125	-410	-200	280	280	800	1360	530	800	1000	-240	-40	80	300	780	1300
020	-50	-40	70	20	90	320	120	90	120	-10	-1	10	30	100	310
000	20	1	10	-20	-10	10	-20	-10	-1	-1	1	-1	-1	-1	-1

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
0/2	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	224	84	45	-15	-15		-15	-15		78	-78	132	120	19	16
020	279	-1364	77	2428	1106	70	2129	2019	113	-15	-15		2074	846	81
040	352	-2349	81	4479	2589	85	4116	3720	84	-64	-228	89	4240	1906	92
060	755	-2753	78	7409	4268	86	6388	5290	86	-141	-781	97	7213	3389	93
080	1199	-3343	78	10289	5537	88	8737	7089	86	-65	-1164	94	10093	4965	89
100	1219	-3370	78	12286	6304	89	10899	8307	86	-219	-2086	98	12297	6602	87
020	429	-583	74	3644	1273	74	2197	1951	54	-19	-120	106	3545	1218	77
100	1347	-3345	78	12826	6687	89	11163	8504	87	-115	-2036	97	12364	6228	90
110	1362	-3513	79	14251	7260	89	12040	9010	89	-174	-2436	101	13878	7326	87
120	1505	-3803	79	15831	7985	89	13086	9655	93	-72	-2540	96	15291	7910	89
125	1578	-3876	79	16796	8403	89	13599	9909	94	52	-2510	97	16178	8406	89
020	565	-720	77	3932	1292	76	2077	1611	45	78	-78	87	3828	1397	77
000	345	115	35	46	-200	81	-87	-235	92		-31	45	-15	-15	

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES
" E " = 10.3×10^6
"μ" = .333
Gages mounted on 6061-T6 aluminum, 41,000 psi ultimate

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TABLE IX (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
PSI	CH 16	CH 17	CH 18	CH 19	CH 20	CH 21	CH 22	CH 23	CH 24	CH 25	CH 26	CH 27	CH 28	CH 29	CH 30
000	1	10	10	10	-1	10	1	10	1	1	1	1	-1	-1	-1
020	110	150	220	130	80	90	90	70	60	-230	-100	20	1	-1	-1
040	170	300	370	90	80	130	130	100	90	-510	-190	50	20	10	20
060	270	470	630	50	60	180	130	100	100	-840	-310	80	50	20	40
080	350	630	870	40	60	220	120	100	110	-1170	-490	130	90	5	80
100	420	790	1030	20	60	270	120	90	110	-1470	-650	200	130	7	100
020	130	260	290	40	10	70	40	30	30	-240	-110	10	10	10	10
100	420	810	1070	30	60	250	120	100	130	-1510	-660	110	110	60	100
110	450	870	1140	30	70	260	140	120	150	-1670	-730	210	150	90	140
120	470	950	1320	50	90	300	140	140	180	-1880	-810	170	170	100	170
125	510	980	1330	60	100	310	160	140	190	-1970	-840	200	180	120	190
020	100	280	320	50	20	80	50	50	50	-250	-130	1	10	1	10
000	-10	10	30	-1	-10	-1	-1	-1	-1	-1	-1	-1	-1	-1	-10

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
PSI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	134	35	115	239	68	45	85	-55	45	15	15		-15	-15	
020	2278	2053	32	1970	1410	28	1275	1030	9	-642	-2585	91	11	-11	23
040	5118	3586	96	1970	1410	62	1864	1517	13	-1338	-5730	94	385	230	45
060	8521	5504	93	2428	1106	70	1932	1602	23	-2225	-9452	94	889	493	39
080	11433	7464	92	2893	1112	71	1990	1644	36	-2933	-13047	92	1581	1031	41
100	13568	8764	95	3402	1054	73	1965	1569	39	-3272	-16242	89	2135	1399	36
020	3913	2233	102	1213	477	54	593	483	23	-796	-2738	91	154	154	
100	14021	8873	96	3601	1142	71	2119	1723	51	-4458	-17053	91	1965	1262	42
110	15422	9777	94	3555	1298	73	2426	2030	51	-5916	-18517	90	2657	1799	42
120	17147	10664	93	3963	1515	73	2678	2230	67	-5170	-21105	91	3156	2168	45
125	17909	11131	92	4016	1669	73	2985	2393	57	-5165	-22031	91	3349	2336	47
020	4239	2214	100	1367	630	54	768	769		-937	-2886	89	224	84	45
000	309	-2	90	55	-85	45	-15	-15		-15	-15		-35	-134	157

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE IX (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
0/0	CH 31	CH 32	CH 33	CH 34	CH 35	CH 36	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0
000	-1	-1	-1	-10	-1	-10									
020	10	-1	1	-280	-130	-1									
040	10	10	10	-610	-230	-1									
060	40	30	30	-970	-390	10									
080	80	50	60	-1280	-560	40									
100	90	70	70	-1560	-720	60									
020	10	10	10	-310	-150	-1									
100	90	70	70	-1600	-730	60									
110	130	100	90	-1790	-810	90									
120	150	120	120	-1960	-870	90									
125	160	130	130	-2080	-940	180									
020	10	1	10	-330	-160	-20									
000	-1	-1	-1	-10	-1	-20									

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
0/0	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	-15	-15		-84	-224	45									
020	146	23	26	-1072	-3245	92									
040	154	154		-2258	-7130	97									
060	593	483	23	-3506	-11244	95									
080	1249	902	32	-4380	-14673	93									
100	1339	1119	23	-5302	-18053	91									
020	154	154		-1189	-3590	91									
100	1339	1119	23	-5378	-18284	91									
110	1864	1517	13	-5754	-20367	91									
120	2239	1910	23	-6391	-22342	92									
125	2393	2063	23	-5821	-23372	90									
020	224	84	45	-1480	-3898	93									
000	-15	-15		-115	-346	145									

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES

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TABLE X

Load Measured with Force Washers, Test Condition No. 4
Static Test of XW-49 Mounting Flange

Load (percent)	Bolt Load (lbs) No. 1	Bolt Load (lbs) No. 2
Bolts torqued to 120 in-lbs	1500	1299
20	1511	1330
40	1521	1420
60	1542	1532
80	1564	1654
100	1595	1781
20	1505	1352
100	1595	1776
110	1622	1839
120	1654	1903
125	1670	1929
20	1505	1346
100	1590	1770
111	1622	1850
20	1500	1346
Bolts torqued to 120 in-lbs	1495	1288

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TABLE XI

Load-Deflection Data, Test Condition No. 4
Static Test of XW-49 Mounting Flange

Load (percent)	Load P_1 (lbs)	Load P_2 (lbs)	Deflection (inches) No. 1	No. 2	No. 3
0	0	0	0	0	0
20	4,880	810	-0.006	-0.030	-0.036
40	9,760	1,630	-0.014	-0.072	-0.092
60	14,650	2,440	-0.018	-0.126	-0.155
80	19,550	3,250	-0.024	-0.196	-0.234
100	24,400	4,070	-0.030	-0.269	-0.317
20	4,880	810	-0.010	-0.015	-0.051
100	24,400	4,070	-0.031	-0.290	-0.353
110	26,850	4,470	-0.034	-0.485	-0.217
120	29,300	4,880	-0.037	-0.518	-0.248
125	30,550	5,080	-0.038	-0.536	-0.256
20	4,880	810	-0.010	-0.125	-0.183
100	30,550	5,080	-0.031	-0.477	-0.205
111	26,892	6,720	-0.034	-0.466	-0.431
20	4,880	810	-0.010	-0.248	-0.204

Note: Minus (-) readings denote movement away from dial.

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[redacted]

TABLE XII
STRESS-STRAIN DATA, TEST CONDITION NO. 4 - STATIC TEST OF XW-49 MOUNTING FLANGE

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
PCT	CH 1	CH 2	CH 3	CH 4	CH 5	CH 6	CH 7	CH 8	CH 9	CH 10	CH 11	CH 12	CH 13	CH 14	CH 15
000	-1	-1	-1	-30	-20	-1	-30	-20	-10	-10	-1	-10	-10	-10	-1
020	-230	-140	90	1	50	190	50	50	90	10	10	-1	1	60	170
040	-310	-18[illegible]	13[illegible]	40	200	410	120	220	290	40	10	1	30	200	350
060	-460	-21[illegible]	23[illegible]	110	380	650	250	330	460	10	1	10	60	350	560
080	-540	-24[illegible]	27[illegible]	170	520	870	330	500	650	-10	1	20	130	480	780
100	-750	-26[illegible]	31[illegible]	220	630	1090	420	610	830	-40	1	30	210	570	950
020	-270	-170	130	10	70	250	90	70	90	-40	-1	30	20	60	210
100	-670	-260	230	210	630	1110	420	620	850	-20	10	50	210	560	930
110	-740	-290	310	220	700	1220	450	670	900	-50	1	50	230	620	1030
120	-810	-300	330	240	770	1350	490	750	970	-50	10	60	250	680	1140
125	-840	-310	350	240	810	1410	510	790	1020	-60	10	70	290	730	1190
020	-270	-170	130	10	70	240	70	60	90	-50	-1	40	10	60	210
100	-640	-250	250	190	630	1110	420	600	820	-30	20	60	200	560	950
110	-970	-340	310	220	700	1230	450	670	890	230	160	20	220	620	1040
020	-230	-170	130	1	80	230	60	60	80	-50	-1	40	10	60	210
000	-1	-1	10	-20	-10	20	-20	-10	-1	-40	-1	10	-1	-1	10

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 1			ROSETTE 2			ROSETTE 3			ROSETTE 4			ROSETTE 5		
PCT	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	-10	-10		-120	-356	81	-230	-385	90	-84	-224	45	-35	-134	67
020	171	-2622	80	2282	653	77	1295	856	67	130	9	157	1999	628	82
040	463	-3222	79	4907	2007	86	3820	2480	95	487	143	14	4164	1674	92
060	839	-4220	81	7935	3742	90	6293	4616	83	224	84	45	6729	2797	95
080	1175	-5323	83	10708	5272	90	8774	6284	92	197	-44	63	9522	4460	92
100	1122	-7022	86	13448	6681	88	11199	8007	88	199	-353	95	11786	6037	89
020	474	-2932	78	3039	956	77	1538	1228	45	197	-350	93	2619	915	75
100	948	-6686	86	13643	6639	88	11430	8083	88	505	-44	86	11555	5961	89
110	728	-7642	87	14949	7177	89	12119	8624	89	388	-388	91	12787	6573	89
120	644	-8273	87	16529	7901	89	13087	9346	92	506	-352	93	14136	7221	89
125	884	-8412	87	17299	8360	89	13744	9765	93	583	-429	92	14866	7875	89
020	474	-2932	78	2911	931	77	1403	1056	58	274	-428	93	2558	822	77
100	526	-6445	86	13563	6412	89	11087	7965	87	582	-121	93	11749	5920	89
110	250	-9930	89	15066	7213	89	12003	8586	90	2780	1061	171	12865	6495	89
020	474	-2932	78	2706	844	81	1185	968	67	274	-428	93	2558	822	77
000	130	9	67	174	-174	77	-87	-235	92	-8	-453	105	130	9	67

UNSIGNED NUMBER SIGNIFIES TENSION
NUMBER SIGNED (-) SIGNIFIES COMPRESSION
SU IS THE MAXIMUM PRINCIPAL STRESS (LARGEST ALGEBRAIC VALUE)
SV IS THE MINIMUM PRINCIPAL STRESS (SMALLEST ALGEBRAIC VALUE)
PHI IS THE ANGLE FROM LOWEST NUMBERED GAGE IN ROSETTE TO SU MEASURED OPPOSITE TO SYSTEM OF GAGES
" E " = 10.3×10^6
" μ " = .333

Gages mounted on 6061-T6 aluminum, 41,000 psi ultimate

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TABLE XII (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
PSF	CH 16	CH 17	CH 18	CH 19	CH 20	CH 21	CH 22	CH 23	CH 24	CH 25	CH 26	CH 27	CH 28	CH 29	CH 30
[illegible]	-60	[illegible]	[illegible]	-10	-20	-1	-1	-1	-10	-10	-1	-10	-10	-10	-10
[illegible]	-[illegible]	14	[illegible]	[illegible]	50	[illegible]	90	60	60	-230	-110	-1	-10	-10	-10
[illegible]	[illegible]	[illegible]	[illegible]	70	50	180	110	80	80	-550	-220	1	-1	-10	-1
[illegible]	[illegible]	[illegible]	[illegible]	80	120	250	180	160	170	-890	-360	30	10	-1	10
[illegible]	[illegible]	[illegible]	[illegible]	170	220	320	240	210	220	-1250	-540	60	20	1	20
[illegible]	[illegible]	[illegible]	[illegible]	260	300	390	280	270	270	-1600	-720	160	50	10	40
[illegible]	[illegible]	[illegible]	[illegible]	100	70	160	140	110	100	-240	-110	-1	20	10	30
[illegible]	[illegible]	[illegible]	[illegible]	270	280	370	300	270	260	-1630	-730	110	20	-20	30
[illegible]	[illegible]	[illegible]	[illegible]	290	310	390	310	270	270	-1410	-790	170	20	-30	30
[illegible]	[illegible]	[illegible]	[illegible]	330	330	420	350	290	290	-1990	-850	120	30	-20	40
[illegible]	[illegible]	[illegible]	[illegible]	330	350	440	370	300	300	-2080	-900	190	40	-20	50
[illegible]	[illegible]	[illegible]	[illegible]	90	70	160	140	110	100	-230	-110	-1	20	10	40
[illegible]	[illegible]	[illegible]	[illegible]	280	280	360	300	260	260	-1610	-720	80	20	-20	30
[illegible]	[illegible]	[illegible]	[illegible]	340	370	450	390	320	310	-1820	-790	100	-10	-40	-20
[illegible]	[illegible]	[illegible]	[illegible]	100	70	160	140	100	80	-230	-110	-1	20	10	40
[illegible]	-60	[illegible]	[illegible]	10	-1	10	20	10	1	-1	-1	-1	10	10	20

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 6			ROSETTE 7			ROSETTE 8			ROSETTE 9			ROSETTE 10		
PSF	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
[illegible]	44	-197	77	33	-202	54	-35	-134	157	-84	-224	45	-154	-154	
[illegible]	3744	1812	89	1828	1091	54	1317	988	23	-884	-2665	91	-154	-154	
[illegible]	5292	3154	95	2643	1198	63	1624	1295	23	-2037	-6399	96	55	-85	45
[illegible]	8701	4966	97	3282	1788	76	2812	2566	36	-2994	-10220	94	239	68	45
[illegible]	10901	6715	94	4378	3151	81	3708	3360	32	-4038	-14247	92	455	160	45
[illegible]	13137	8223	96	5482	4351	82	4280	4170	23	-4229	-17897	90	966	417	41
[illegible]	3315	1148	98	2777	1525	60	2017	1670	13	-920	-2783	93	507	261	54
[illegible]	12949	8402	96	5414	4420	71	4476	4129	13	-4917	-18438	91	736	33	48
[illegible]	14297	9054	96	5677	4771	75	4676	4236	23	-4908	-20291	91	813	-45	48
[illegible]	15564	9942	95	6256	5268	67	5246	4587	23	-6147	-22586	92	967	109	48
[illegible]	16541	10347	94	6422	5409	74	5532	4763	23	-5699	-23341	91	1198	185	47
[illegible]	3210	1230	96	2427	1414	61	2017	1670	13	-884	-2665	91	635	287	58
[illegible]	13223	8284	96	5356	4478	67	4522	4083	23	-5183	-18325	92	736	33	48
[illegible]	14265	8835	96	6538	5600	78	5766	4989	18	-5739	-20689	92	-32	-428	39
[illegible]	3326	1283	94	2518	1477	58	1936	1445	9	-884	-2665	91	635	287	58
[illegible]	527	-13	83	239	68	45	235	87	2	-15	-15		285	176	67

UNSIGNED NUMBER SIGNIFIES TENSION
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TABLE XII (Cont'd)

STRAIN - MICROINCHES PER INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
0/0	CH 31	CH 32	CH 33	CH 34	CH 35	CH 36	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0	CH 0
000	-10	-21	-20	-20	-10	-40									
020	-10	-10	-10	-280	-130	-40									
040	-1	-10	-1	-560	-230	-20									
060	1	-1	-1	-870	-340	-1									
080	10	1	10	-1190	-510	30									
100	20	11	20	-1540	-690	70									
020	20	20	20	-260	-120	-30									
100	-10	-1	20	-1510	-670	90									
110	-10	-1	10	-1680	-760	90									
120	-10	-1	20	-1860	-820	80									
125	-10	-1	20	-1940	-850	140									
020	30	21	20	-250	-130	-40									
100	-10	-1	20	-1500	-670	60									
111	-40	-31	-10	-1650	-740	60									
020	30	21	30	-260	-130	-30									
000	20	11	10	-10	-1	-40									

STRESS - POUNDS PER SQUARE INCH

LOAD	ROSETTE 11			ROSETTE 12			ROSETTE 13			ROSETTE 14			ROSETTE 15		
0/0	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI	SU	SV	PHI
000	-176	-285	23	-287	-635	148									
020	-154	-154		-1498	-3419	97									
040	55	-85	45	-2308	-6604	96									
060	11	-11	23	-3237	-10146	96									
080	224	84	45	-4144	-13680	93									
100	385	230	45	-5032	-17554	92									
020	307	307		-1314	-3142	96									
100	202	-49	79	-4689	-17129	91									
110	79	-79	87	-5337	-19093	91									
120	202	-49	79	-6123	-21227	92									
125	202	-49	79	-5743	-21914	91									
020	439	329	23	-1404	-3052	94									
100	202	-49	79	-4993	-17132	92									
110	-261	-507	83	-5562	-18869	92									
020	539	383	45	-1327	-3129	94									
000	285	176	23	-164	-604	151									

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