**Stress Analyses of Flat Plates
with Attached Nozzles**

**Vol. 2. Experimental Stress Analyses
of a Flat Plate with
One Nozzle Attached**

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OAK RIDGE NATIONAL LABORATORY

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Printed in the United States of America. Available from
National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Road, Springfield, Virginia 22161
Price: Printed Copy \$5.45; Microfiche \$2.25

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Contract No. W-7405-eng-26

REACTOR DIVISION

STRESS ANALYSES OF FLAT PLATES WITH ATTACHED NOZZLES

VOL. 2. EXPERIMENTAL STRESS ANALYSES OF A FLAT
PLATE WITH ONE NOZZLE ATTACHED

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JULY 1975

Subcontract No. 2670
for
OAK RIDGE NATIONAL LABORATORY
Oak Ridge, Tennessee 37830
operated by
UNION CARBIDE CORPORATION
for the
U.S. ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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FOREWORD

The work reported here was performed for the Oak Ridge National Laboratory at Auburn University under Union Carbide Corporation, Nuclear Division, subcontract No. 2670 as part of the ORNL Nozzles Analysis Program under the direction of W. L. Greenstreet, Technical Director, Solid Mechanics Department, and J. W. Bryson, Program Coordinator. The program is funded by the U.S. Energy Research and Development Administration (formerly the USAEC) as the ERDA-supported portion of an ERDA-industry cooperative effort for the development of analytical methods for pressure vessel design. This joint effort is coordinated by the Pressure Vessel Research Committee of the Welding Research Council under the Subcommittee on Reinforced Openings and External Loadings. The ERDA cognizant engineer is B. C. Wei, Division of Reactor Research and Development.

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ABSTRACT

Volume 1 of this report compares experimental results with theoretical stress distributions for a flat plate with one nozzle configuration and for a flat plate with two closely spaced nozzles attached. This volume contains the complete test results for a flat plate with one nozzle attached that was subjected to 1:1 and 1:2 biaxial planar loadings on the plate, to a thrust loading on the nozzle, and to a moment loading on the nozzle. The plate tested was $30 \times 36 \times 0.375$ in., and the attached nozzle had an outer diameter of 1.625 in. and a 0.250-in.-thick wall. The nozzle was located in the center of the plate and was considered to be free of weld distortions and irregularities in the junction area.

Key words: Stress analysis, flat plate, nozzles, pressure-vessel code, ORNL Nozzles Analysis Program, penetrations, nozzle clusters, holes.

1. INTRODUCTION

Purpose and Scope

The Mechanical Engineering Department of Auburn University in cooperation with the Solid Mechanics Department of the Reactor Division, Oak Ridge National Laboratory, is conducting studies of flat plates and hemispherical shells having closely spaced clusters of holes or nozzles. The purposes of these studies are to develop a better understanding of the interaction of closely spaced holes or nozzles under applied loads

and to develop reliable experimental data to be used for verification of theoretical stress analyses of these configurations.

In the case of relatively small nozzles attached to large-diameter cylindrical or spherical vessels, the assumption that the effect of curvature can be neglected is often made. Consequently, flat plates with attached nozzle clusters are convenient models for studying these particular configurations. The models being studied in the overall project are listed in Table 1. Of these, flat-plate models 1P through 5P were tested at The University of Tennessee,^{1,2,3,4} and unpierced flat-plate model 2P was tested at both Auburn University and The University of Tennessee. This report contains the results of the testing of a flat plate with one nozzle attached (model 6P).

Stress-strain responses under four loadings were measured on both surfaces of the plate and of the nozzle. The loadings were 1:1 biaxial planar tension on the plate, 1:2 biaxial planar tension, thrust on the nozzle, and bending moment on the nozzle.

The nomenclature and the mathematical equations used in this report are listed in the remainder of this chapter. The geometry of the test specimen and its instrumentation are described in Chap. 2, and the manner in which various loads were imposed and some of the characteristics of the applied loads are detailed in Chap. 3. A brief discussion of the test results is presented in Chap. 4, and the actual test data are given in the appendices.

Table 1. Experimental investigations of hole and nozzle clusters in shells

Specimen type	Dimensions (in.)		Opening	Model number	Hole diameter (in.)	Nozzle dimensions (in.)	
	Outer diameter	Thickness				Outer diameter	Wall thickness
Flat plate (36 × 36 in.)		0.375	Unpierced	1P ^a			
			Unpierced	2P ^{a,b}			
			One hole	3P1 ^a	2.625		
			Two holes	3P2 ^a	2.625		
			Three holes	4P ^a	2.625		
			Five holes	5P ^a	2.625		
			One nozzle	6P ^b		2.625	0.250
			Two nozzles	7P ^b		2.625	0.250
			Five nozzles	10P ^b		2.625	0.250
Hemisphere	40.90	0.503	Two holes	AU1	1.572		
			Three holes	AU1	1.572		
			Four holes	AU1	1.572		
			Five holes	AU1	1.572		
	41.19	0.500	Two nozzles	AU11		7.002	0.333
			Four nozzles	AU11		7.002	0.333
			Five nozzles	AU11		7.002	0.333

^aModels tested at The University of Tennessee.^bModels tested at Auburn University.

Nomenclature

The symbols used in this report are as follows:

- E = modulus of elasticity (psi)
- F = force (lb)
- M = moment (in.-lb)
- P = pressure (psi)
- SI = stress intensity
- ϵ = strain (lin./in.)
- μ = Poisson's ratio
- σ = normal stress (psi)
- τ = shear stress (psi)
- θ = principal stress angle (referenced to meridional or axial direction in degrees)

The symbols used as subscripts or superscripts are:

- B = bending stress
- i = inner surface of plate or nozzle
- m = meridional direction
- M = membrane stress
- o = outer surface of plate or nozzle
- p = direction of maximum stress
- q = direction of minimum stress
- t = tangential direction
- T = total stress

Equations and Constants Used in Calculating Stresses

Total stresses on the outside and inside surfaces for meridional and tangential directions are calculated by Eqs. (1) and (2), respectively:

$$\tau_m^T = \frac{E}{3(1 - \nu^2)} [(3 - \nu)\epsilon_1 + 2(\epsilon_2 + \epsilon_3)] ; \quad (1)$$

$$\tau_t^T = \frac{E}{3(1 - \nu^2)} [(3\nu - 1)\epsilon_1 + 2(\epsilon_2 + \epsilon_3)] . \quad (2)$$

The membrane stresses for tangential and meridional directions are

$$\tau_m^M = \frac{1}{2} (\tau_{mo}^T + \tau_{mi}^T) \quad (3)$$

and

$$\tau_t^M = \frac{1}{2} (\tau_{to}^T + \tau_{ti}^T) . \quad (4)$$

The bending stresses for the outside surface are

$$\tau_{mo}^B = \tau_{mo}^T - \tau_m^M \quad (5)$$

and

$$\tau_{to}^B = \tau_{to}^T - \tau_t^M . \quad (6)$$

The equations for the principal stresses are

$$\tau_{\max} = \frac{E \sqrt{2}}{3(1 + \mu)} [(\epsilon_1 - \epsilon_2)^2 + (\epsilon_1 - \epsilon_3)^2 + (\epsilon_2 - \epsilon_3)^2]^{1/2},$$

$$\sigma_p = \frac{E(\epsilon_1 + \epsilon_2 + \epsilon_3)}{3(1 - \mu)} + \tau_{\max},$$

$$\sigma_q = \frac{E(\epsilon_1 + \epsilon_2 + \epsilon_3)}{3(1 - \mu)} - \tau_{\max},$$

and

$$\theta_p = \frac{1}{2} \tan^{-1} \left[\frac{\sqrt{3} (\epsilon_2 - \epsilon_3)}{2\epsilon_1 - \epsilon_2 - \epsilon_3} \right].$$

The stress intensity, which is twice the maximum shear stress in three dimensions, is taken as the largest of the following three expressions:

$$SI = 2\tau_{\max},$$

$$SI = \sigma_p - \text{pressure normal to surface},$$

or

$$SI = \text{pressure normal to surface} - \sigma_q,$$

where E = modulus of elasticity = 30×10^6 psi and μ = Poisson's ratio = 0.28.

2. FLAT PLATE WITH ONE NOZZLE ATTACHED (MODEL 6P)

Dimensions and Characteristics

The dimensions of this model are noted in Table 1 and include a $36 \times 36 \times 0.375$ -in. plate with a nozzle (2.625-in. in OD and 0.250-in.

wall) centrally attached (Fig. 1). The plate was machined at Oak Ridge National Laboratory from a large 2.5-in.-thick plate such that the nozzle junction region was an integral part of the plate. This approach led to an ideal junction, free of weld distortions and irregularities. The 8.5-in.-long nozzle was obtained by welding an extension to the integral nozzle as noted in Fig. 1. The mechanical material properties include a modulus of elasticity of 30×10^6 psi and a Poisson's ratio of 0.28.

Fig. 1. Flat plate with one nozzle attached.

Instrumentation and Measuring

Micro-measurements type EA-06-030YB-120, option SE, strain gages were mounted on the plate and nozzle in the junction region. There were 318 gages (or 106 rosettes) mounted. The locations of these gages are

shown in Figs. 2, 3, and 4. Figure 2 also illustrates the strain-gage identification system used. The strain-gage rosettes consisted of gages with a 0.030-in. gage length in a "y" configuration; the total rosette grid area could be enclosed in a circle 0.11 in. in diameter. Figures 2, 3, and 4 show the typical gage alignment. For future reference, note is made of the assigned coordinate axis.

For data collection, a half-bridge circuit was used. A dummy gage was used for compensating for temperature effects. The dummy gage was insulated, as were the active gages, from air currents and other temperature influences.

In actual testing, a small preload was applied to the model (see Chap. 3). Two stringers of strain gages, the maximum capacity of the data-collecting equipment, were then read. The model was then fully loaded, and the strain gages were read again. The change in strain-gage readings was correlated with the change in load. The model was then unloaded to the preload level, and the operation was repeated to check for repeatability. (The readings were found consistent to within $\pm 8 \mu\text{in./in.}$) The two recorded strains were then averaged together. All repeatable experimental data points have been reported. It is possible that some of these data points may reflect undetected influences of a faulty gage, a nonhomogeneous material in the vicinity of the gage, peculiarities in model loadings, or possibly instrumentation irregularities. The cause of this type of erratic behavior cannot always be determined practicably.

Fig. 3. Gage locations on nozzle side of plate.

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Fig. 4. Gage locations opposite nozzle side of plate.

3. LOADING SYSTEMS FOR FLAT-PLATE MODELS

The model was tested in four ways: by applying two different bi-axial tensile loads on the plate and by applying axial-compressive and bending loads on the nozzle. To impose these loads, the frame shown in Figs. 5 and 6 was constructed.

Plate Biaxial Loading

For applying the biaxial load to the plate, the plate was held vertically to minimize the bending of the plate due to its own weight. Thirty-two hydraulic cylinders (eight pulling on each side of the plate) allowed the plate to "float" and applied a uniform load on each edge that was aligned with the plane of the plate. Each cylinder was positioned on the loading frame through a specially made, self-aligning washer, which was itself positioned in the plane of the plate.

Since the hydraulic pressure in the cylinders must overcome a certain amount of friction between the O-ring and the cylinder wall, the hydraulic pressure inside the cylinders is not equal to the force exerted on the specimen by the hydraulic cylinders. Therefore, it was necessary to increase the hydraulic pressure until the desired force was attained. Once this correction factor was determined, the cylinder forces were accurate to ± 50 lb, and when compared to approximately 10,000 lb of force on each cylinder at 2000 psi, this represents an accuracy of about 0.5%.

By varying the pressures of the hydraulic cylinders, different stress states could be induced in the plate. What was of interest here was

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Fig. 5. Flat-plate loading frame, vertical position.

PHOTO 1778-75

Fig. 6. Flat-plate nozzle loading frame, horizontal position.

simulating the pressure membrane stresses in spherical and cylindrical shells. This was done by producing 1:1 and 1:2 planar biaxial stresses, respectively. For the 1:1 biaxial load, a pressure of 2000 psi in each hydraulic cylinder was selected because it gave reasonable magnitudes of strains without causing yielding in the models; the corresponding stress was 6151 psi. For the 1:2 test, the pressure was 1000 psi in one group of parallel cylinders and 2000 psi in the other group. The stresses were 3075 and 6151 psi, respectively.

A calibration procedure was worked out to examine the biaxial stress field produced by this biaxial loading system. First, a flat plate (model 2P) was mounted in the load frame. The central area of the plate was strain gaged (the biaxial strain gages can be seen in Figs. 5 and 7), and equal loads were applied to the plate. The strain readings increased linearly with the applied load. Further, an area 14 in. in diameter in the central portion of the plate was essentially in an equibiaxial state of stress. Biaxial gage readings in this area had a nominal value of $147 \mu\text{in./in.}$ and varied $\pm 4 \mu\text{in./in.}$ The variation was considered primarily due to instrumentation errors and temperature changes since it appeared random. This biaxial strain condition corresponded to a biaxial stress field of 6151 psi and was produced by a 2000-psi pressure in the hydraulic loading cylinders.

When model 6P was tested, it was noted that the data from zero load to full load were not linear in the low-load region. This was attributed to the nozzle's producing a moment arm that induced bending stresses in the plate, to the fact that the plate was not exactly vertical, and possibly to other small alignment difficulties. Since this nonlinearity

Fig. 7. Flat plate in loading frame.

did not exist at higher loads, a preload of 500 psi (hydraulic-cylinder pressure) was applied to the plate, and then the desired load was superimposed. This procedure generated linear and repeatable data within ± 8 μ in./in.

Nozzle Thrust and Moment Loading

For applying the axial and bending loads to the end of the nozzle, the load frame was turned so that the plate was horizontal (Fig. 6). The hydraulic cylinders were removed, and the plate was bolted to the load

frame with angle-iron supports (See Fig. 7). A 1/8-in. rubber gasket separated the plate from the angle-iron supports to prevent warping of the plate.

For the axial load, a hydraulic cylinder was positioned on the load frame to apply a compressive force (through a mechanical load cell) to the nozzle along its center line. The load was read from a load cell with an accuracy of ± 25 lb. The full load applied was 2000 lb.

For the bending load, a T-shaped arm 50.44 in. long was centered and attached to the nozzle with a threaded joint. Cables were attached to the ends of the T-bar's arms, one pulling down and the other pulling up and over a pulley. Weights were then hung on these cables. This technique allowed unrestrained deflection of the nozzle with a maximum applied moment of 5246 in.-lb and an estimated accuracy of 1%.

Results of Loadings

Generally, the largest loads possible without causing yielding in the region of the nozzle-plate junction were selected. The test results are presented in graphical and tabular forms in Appendices A and B, respectively.

4. DISCUSSION OF DATA

1:1 Biaxial Loading

For 1:1 biaxial loading, normalized stress components at comparable locations on stringers 3 and 11 would be expected to be identical; computed values of σ_x 1/16 in. from the junction on stringers 3 and 11 are

0.824 and 0.839, respectively, and the values for σ_y for the same locations are 1.362 and 1.275. Similar comparisons of σ_x on stringers 1, 5, and 13 at points 1/16 in. from the junction shown $\sigma_x = 0.700, 0.776, 0.705$, respectively, and $\sigma_y = 1.232, 1.364, 1.146$. Gage placement is very influential in the region near the junction, and the variations are attributed to this. More generally, the results along stringer 1 should duplicate the results along stringer 5. Comparison of the curves (Figs. A1 and A3 in Appendix A) bears this out.

The stress along the nozzle away from the junction should reduce to zero, while the principal stresses along the plate away from the junction should reduce to unity on both the inside and outside of the plate. These trends are also evident from Figs. A1 and A3. As expected, the principal axes and the x, y, z axes coincide.

The normalized maximum shear stress in the plate should approach 0.5 away from the junction, while the stress intensity should approach 0. Figures A7 to A12 in Appendix A indicate such trends.

1:2 Biaxial Loading

Similar comments to those that were made for the 1:1 load can be made for the 1:2 load. In addition, it would be expected that the ratio of σ_x 's in stringers at right angles to each other on the plate would approach 1:2, while the ratio of σ_y 's would approach 2:1. Also, ratios of σ_x to σ_y in stringers at right angles to each other would be expected to approach a 2:1 ratio. These trends are observed.

Nozzle Loadings

For nozzle axial loading, stringers 1, 3, and 5 should be identical in response. This trend is noted in Figs. A37, A38, and A39. And for nozzle bending loadings in which the moment vector is directed along a given stringer, the plane of that stringer should behave as a neutral plane, while the peak stresses should occur in a stringer at right angles to this. These trends are evident in the data.

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APPENDIX A. STRESS-VS-PROFILE DRAWINGS

The stress data are graphically displayed in the 72 stress-vs-profile drawings in this appendix. The drawings can be grouped into 4 series of 18 graph plots each. The first series is for the 1:1 biaxial loading, the second for the 1:2 loading tests, the third for the nozzle thrust loading, and the fourth for the bending-moment loading.

Each series shows the total stress, the principal stress, the shear stress, the stress intensity, the membrane stress, and the bending stress, as registered by stringers 1, 3, and 5. These values are displayed as functions of the various positions on the plate/nozzle surfaces. In the drawings, the plate cross section at the given stringer is shown in the vertical position, and the cross section of the nozzle wall is shown in the horizontal (as if the observer were looking at the model from the side when it was set up in the vertical load frame). The ordinate lines in the plots indicate the positions on the shell for which the stress values were determined.

The symbols used in the drawings are as follows: except for principal stresses, the round data points are σ_x , and the triangular data points are σ_y ; for principal stresses, the round and triangular data points are the maximum and minimum principal stresses, respectively; N1 is an in-plane load on the plate applied parallel to stringer 1; N13 is an in-plane load on the plate applied parallel to stringer 13; and M1 is the bending moment load applied to the nozzle such that the moment vector is parallel to stringer 1.

The stresses shown in these plots are normalized stresses; three methods are used to normalize the stresses. For the biaxial planar

loadings (both 1:1 and 1:2) the stress is divided by the larger of the biaxial stress components parallel to stringer 1 or 13 in a similar but unperforated plate under a similar load. For the thrust loading on the nozzle, the stress is divided by the axial force (itself) divided by the cross-sectional area of the nozzle. And for the moment loading on the nozzle, the stress is divided by the moment times the nozzle midsurface radius, the product of which is divided by the nozzle moment of inertia.

In the figures, the data points have been connected with straight lines for clarity. The precise values of these data points are given in the tables of Appendix B.

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Fig. A1. Normalized total stress along stringer 1 for 1:1 biaxial stress on plate.

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Fig. A2. Normalized total stress along stringer 3 for 1:1 biaxial stress on plate.

ORNL DWG 75 7762

Fig. A3. Normalized total stress along stringer 5 for 1:1 biaxial stress on plate.

ORNL DWG 75-7762

Fig. A4. Normalized principal stress along stringer 1 for 1:1 biaxial stress on plate.

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Fig. A5. Normalized principal stress along stringer 3 for 1:1 biaxial stress on plate.

ORNL-DWG 75-7765

Fig. A6. Normalized principal stress along stringer 5 for 1:1 biaxial stress on plate.

ORNL DWG 75 7766

Fig. A7. Normalized shear stress along stringer 1 for 1:1 biaxial stress on plate.

ORNL DWG 75 7767

Fig. A8. Normalized shear stress along stringer 3 for 1:1 biaxial stress on plate.

Fig. A9. Normalized shear stress along stringer 5 for 1:1 biaxial stress on plate.

Fig. A10. Normalized stress intensity along stringer 1 for 1:1 biaxial stress on plate.

Fig. A11. Normalized stress intensity along stringer 3 for 1:1 biaxial stress on plate.

Fig. A12. Normalized stress intensity along stringer 5 for 1:1 biaxial stress on plate.

ORNL DWG 75-7772

Fig. A13. Normalized membrane stress along stringer 1 for 1:1 biaxial stress on plate.

ORNL DWG 75-7773

Fig. A14. Normalized membrane stress along stringer 3 for 1:1 biaxial stress on plate.

ORNL DWG 75-7774

Fig. A15. Normalized membrane stress along stringer 5 for 1:1 biaxial stress on plate

ORNL DWG 75-7775

Fig. A16. Normalized bending stress along stringer 1 for 1:1 biaxial stress on plate.

ORNL DWG 75-7776

Fig. A17. Normalized bending stress along stringer 3 for 1:1 biaxial stress on plate.

ORNL DWG 75-7777

Fig. A18. Normalized bending stress along stringer 5 for 1:1 biaxial stress on plate.

ORNL DWG 75-7778

Fig. A19. Normalized total stress along stringer 1 for 1:2 biaxial stress on plate.

ORNL DWG 75-7779

Fig. A20. Normalized total stress along stringer 3 for 1:2 biaxial stress on plate.

ORNL DWG 75-7780

Fig. A21. Normalized total stress along stringer 5 for 1:2 biaxial stress on plate.

ORNL DWG 75-7781

Fig. A22. Normalized principal stress along stringer 1 for 1:2 biaxial stress on plate.

ORNL DWG 75-7782

Fig. A23. Normalized principal stress along stringer 3 for 1:2 biaxial stress on plate.

ORNL DWG 75-7783

Fig. A24. Normalized principal stress along stringer 5 for 1:2 biaxial stress on plate

Fig. A25. Normalized shear stress along stringer 1 for 1:2 biaxial stress on plate.

Fig. A26. Normalized shear stress along stringer 3 for 1:2 biaxial stress on plate.

Fig. A27. Normalized shear stress along stringer 5 for 1:2 biaxial stress on plate.

Fig. A28. Normalized stress intensity along stringer 1 for 1:2 biaxial stress on plate.

Fig. A29. Normalized stress intensity along stringer 3 for 1:2 biaxial stress on plate.

Fig. A30. Normalized stress intensity along stringer 5 for 1:2 biaxial stress on plate.

ORNL DWG 75-7790

Fig. A31. Normalized membrane stress along stringer 1 for 1:2 biaxial stress on plate.

ORNL DWG 75-7791

Fig. A32. Normalized membrane stress along stringer 3 for 1:2 biaxial stress on plate.

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Fig. A33. Normalized membrane stress along stringer 5 for 1:2 biaxial stress on plate.

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Fig. A34. Normalized bending stress along stringer 1 for 1:2 biaxial stress on plate.

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Fig. A35. Normalized bending stress along stringer 3 for 1:2 biaxial stress on plate.

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Fig. A36. Normalized bending stress along stringer 5 for 1:2 biaxial stress on plate.

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Fig. A37. Normalized total stress along stringer 1 for axial load on nozzle.

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Fig. A38. Normalized total stress along stringer 3 for axial load on nozzle.

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Fig. A39. Normalized total stress along stringer 5 for axial load on nozzle.

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Fig. A40. Normalized principal stress along stringer 1 for axial load on nozzle.

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Fig. A41. Normalized principal stress along stringer 3 for axial load on nozzle.

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Fig. A42. Normalized principal stress along stringer 5 for axial load on nozzle.

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Fig. A43. Normalized shear stress along stringer 1 for axial load on nozzle.

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Fig. A44. Normalized shear stress along stringer 3 for axial load on nozzle.

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Fig. A45. Normalized shear stress along stringer 5 for axial load on nozzle

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Fig. A46. Normalized stress intensity along stringer 1 for axial load on nozzle

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Fig. A47. Normalized stress intensity along stringer 3 for axial load on nozzle.

ORNL DWG 75 7807

Fig. A48. Normalized stress intensity along stringer 5 for axial load on nozzle.

ORNL DWG 75-7208

Fig. A49. Normalized membrane stress along stringer 1 for axial load on nozzle.

ORNL DWG 75-7809

Fig. A50. Normalized membrane stress along stringer 3 for axial load on nozzle.

Fig. A51 Normalized membrane stress along stringer 5 for axial load on nozzle

Fig. A52 Normalized bending stress along stringer 1 for axial load on nozzle

Fig. A53. Normalized bending stress along stringer 3 for axial load on nozzle.

Fig. A54. Normalized bending stress along stringer 5 for axial load on nozzle.

ORNL DWG 75 7814

Fig. A55. Normalized total stress along stringer 1 for bending moment on nozzle end along stringer 1.

ORNL DWG 75 7815

Fig. A56. Normalized total stress along stringer 3 for bending moment on nozzle end along stringer 1.

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Fig. A57. Normalized total stress along stringer 5 for bending moment on nozzle end along stringer 1.

ORNL-DWG 75-7817

Fig. A58. Normalized principal stress along stringer 1 for bending moment on nozzle end along stringer 1.

Fig. A59. Normalized principal stress along stringer 3 for bending moment on nozzle end along stringer 1.

Fig. A60. Normalized principal stress along stringer 5 for bending moment on nozzle end along stringer 1.

Fig. A61. Normalized shear stress along stringer 1 for bending moment on nozzle end along stringer 1.

Fig. A62. Normalized shear stress along stringer 3 for bending moment on nozzle end along stringer 1.

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Fig. A63. Normalized shear stress along stringer 5 for bending moment on nozzle end along stringer 1.

ORNL DWG 75-7822

Fig. A64. Normalized stress intensity along stringer 1 for bending moment on nozzle end along stringer 1.

Fig. A65. Normalized stress intensity along stringer 3 for bending moment on nozzle end along stringer 1.

Fig. A66. Normalized stress intensity along stringer 5 for bending moment on nozzle end along stringer 1.

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Fig. A67. Normalized membrane stress along stringer 1 for bending moment on nozzle end along stringer 1.

ORNL DWG 75 7827

Fig. A68. Normalized membrane stress along stringer 3 for bending moment on nozzle end along stringer 1.

ORNL DWG 75-7828

Fig. A69. Normalized membrane stress along stringer 5 for bending moment on nozzle end along stringer 1.

ORNL DWG 75-7829

Fig. A70. Normalized bending stress along stringer 1 for bending moment on nozzle end along stringer 1.

ORNL DWG 75-7330

Fig. A71. Normalized bending stress along stringer 3 for bending moment on nozzle end along stringer 1.

ORNL DWG 75-7831

Fig. A72. Normalized bending stress along stringer 5 for bending moment on nozzle end along stringer 1.

APPENDIX B. EXPERIMENTAL DATA: STRESSES AND STRAINS IN A FLAT PLATE WITH AN ATTACHED NOZZLE

The stress and strain data for the experiments described in this volume are presented in the 120 tables of this appendix. The data for the 1:1 biaxial test are presented in the first 30 tables, the data for the 1:2 biaxial test in the second 30 tables, that for the nozzle thrust loading in the third, and for the bending-moment load in the last. Within each of these groups of 30 tables, 10 tables of data for stringer 1 appear first, followed by similar data for stringers 3 and 5 (see Fig. 3 in the text for stringer identification). Because of the repetition of results due to the effects of symmetry, only the data from stringers 1, 3, and 5 are included. For each of these stringers, stress/strain data are given for first the plate and then the nozzle (5 tables each). These data consist of the strains, total stresses, principal stresses, maximum shear stress, angle of principal stress, and stress intensity. Normalized membrane stresses and bending stresses are presented for both the "inner" and "outer" sides where appropriate.

The recorded strains are in microinches per inch, the principal angles are in degrees, and all other values in the tables are normalized. (See the discussion of normalization in the beginning of Appendix A.)

The rosette positions are given in a five-digit code, the first digit of which indicates the surface on which the rosette was located (1 = nozzle side of plate, 2 = opposite side of plate, 3 = outside of nozzle, and 4 = inside of nozzle), the second and third digits indicate the stringer number, and the fourth and fifth give the distance from the

rosette to the junction in sixteenths of an inch (e.g., "62" would indicate that the rosette was 62 sixteenths or 3.875 in. from the junction). An entry of "3000" in the tables indicates that no data were available for that location.

TABLE B1

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 1

ROS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10101	72.	188.	166.	0.700	1.232
10103	98.	180.	164.	0.795	1.191
	3000.	3000.	3000.		
10107	102.	180.	160.	0.830	1.175
	3000.	3000.	3000.		
10114	108.	156.	158.	0.813	1.082
	3000.	3000.	3000.		
10122	114.	154.	156.	0.857	1.065
10130	128.	152.	152.	0.919	1.080
10162	136.	152.	148.	0.949	1.010

TABLE B2

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 1

ROS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10101	1.236	0.695	0.270	-5.1	1.236
10103	1.198	0.752	0.201	-5.0	1.198
NO DATA AVAILABLE					
10107	1.180	0.828	0.178	-7.1	1.180
NO DATA AVAILABLE					
10114	1.082	0.813	0.138	0.9	1.082
NO DATA AVAILABLE					
10122	1.065	0.857	0.106	1.2	1.065
10130	1.080	0.919	0.061	0.0	1.080
10162	1.015	0.948	0.035	-15.0	1.015

TABLE B3

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $H1=6151$ PSI $H13=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
201-2	-54.	334.	318.	0.393	2.319
20101	-6.	280.	274.	0.525	1.950
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20107	58.	252.	218.	0.789	1.646
	3000.	3000.	3000.		
20114	92.	224.	198.	0.864	1.467
	3000.	3000.	3000.		
20122	120.	196.	192.	0.964	1.339
20130	128.	168.	176.	0.959	1.182
20162	160.	156.	163.	1.092	1.103

TABLE B4

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $H1=6151$ PSI $H13=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
201-2	2.319	0.392	0.964	-1.0	2.319
20101	1.960	0.525	0.717	-0.5	1.960
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20107	1.652	0.789	0.855	-8.7	1.652
	NO DATA AVAILABLE				
20114	1.472	0.859	0.907	-5.4	1.472
	NO DATA AVAILABLE				
20122	1.340	0.964	0.188	-1.3	1.340
20130	1.183	0.957	0.113	8.5	1.183
20162	1.124	1.071	0.027	39.6	1.124

TABLE B5

MEMBRANE AND BENDING STRESSES - PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, H1=6151 PSI H13=6151 PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
201-2	NO DATA AVAILABLE			
20101	0.613	1.596	0.007	-0.364
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20107	0.789	1.410	0.041	-0.236
	NO DATA AVAILABLE			
20114	0.839	1.275	-0.025	-0.192
	NO DATA AVAILABLE			
20122	0.911	1.202	-0.053	-0.137
20130	0.939	1.111	-0.020	-0.071
20162	1.021	1.056	-0.072	-0.046

TABLE B6

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, H1=6151 PSI H13=6151 PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30161	18.	12.	6.	0.065	0.060
30129	20.	12.	12.	0.120	0.079
	3000.	3000.	3000.		
30120	10.	6.	6.	0.060	0.040
30113	-80.	-26.	-12.	-0.230	-0.126
30109	-80.	-18.	-20.	-0.418	-0.099
30107	-104.	-10.	0.	-0.519	-0.007
30105	-130.	22.	18.	-0.603	0.177
30103	-130.	54.	46.	-0.520	0.308
30101	-116.	118.	72.	-0.367	0.703
	3000.	3000.	3000.		

TABLE 87

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $E1=6151$ PSI $E13=6151$ PSI

FLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	M. S.			
30161	0.091	0.058	0.018	23.1	0.091
30129	0.126	0.079	0.020	0.0	0.120
NO DATA AVAILABLE					
30120	0.060	0.080	0.010	0.0	0.060
30113	-0.115	-0.238	0.061	15.0	0.238
30109	-0.098	-0.819	0.160	-2.8	0.819
30107	-0.006	-0.520	0.257	2.5	0.520
30105	0.177	-0.603	0.390	-0.6	0.781
30103	0.388	-0.528	0.456	-1.1	0.913
30101	0.712	-0.376	0.588	-5.3	1.018
NO DATA AVAILABLE					

TABLE 88

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $E1=6151$ PSI $E13=6151$ PSI

FLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MEMBRANAL	TANGENTIAL
40161	-8.	6.	18.	0.005	0.086
40129	0.	2.	2.	0.008	0.018
	3000.	3000.	3000.		
40120	10.	-8.	-8.	0.080	-0.031
40113	50.	12.	6.	0.258	0.050
40109	86.	38.	30.	0.677	0.203
40107	100.	68.	68.	0.612	0.480
40105	116.	102.	98.	0.757	0.676
40103	88.	136.	136.	0.695	0.938
40101	26.	168.	182.	0.671	1.216
401-2	-108.	248.	270.	0.019	1.859

TABLE B9

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $H1=6151$ PSI $H13=6151$ PSI

FLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40161	0.094	-0.033	0.048	16.5	0.097
40129	0.014	0.004	0.005	0.0	0.014
NO DATA AVAILABLE					
40120	0.040	-0.031	0.035	0.0	0.071
40113	0.259	0.049	0.105	3.6	0.259
40109	0.477	0.203	0.137	1.8	0.477
40107	0.613	0.439	0.087	-2.9	0.613
40105	0.758	0.675	0.041	6.1	0.758
40103	0.938	0.695	0.122	0.0	0.938
40101	1.216	0.469	0.375	3.0	1.216
401-2	1.860	0.018	0.921	1.5	1.860

TABLE B10

MEMBRANE AND BENDING STRESSES - NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $H1=6151$ PSI $H13=6151$ PSI

FLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40161	0.045	0.073	0.040	-0.013
40129	0.062	0.047	0.058	0.033
NO DATA AVAILABLE				
40120	0.050	0.004	0.010	0.035
40113	0.014	-0.037	-0.244	-0.087
40109	0.029	0.352	-0.448	-0.151
40107	0.047	0.216	-0.566	-0.223
40105	0.077	0.427	-0.680	-0.249
40103	0.085	0.563	-0.609	-0.275
40101	0.052	0.959	-0.419	-0.257
401-2	NO DATA AVAILABLE			

TABLE B11

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, N1=6151 PSI N13=6151 PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SEMI-PRINCIPAL	TANGENTIAL
	3000.	3000.	3000.		
10301	90.	172.	220.	0.824	1.362
10303	96.	178.	194.	0.833	1.289
	3000.	3000.	3000.		
10307	114.	170.	166.	0.883	1.157
	3000.	3000.	3000.		
10314	132.	146.	140.	0.928	1.004
	3000.	3000.	3000.		
10322	132.	144.	140.	0.926	0.997
10330	128.	152.	152.	0.919	1.040
10362	146.	156.	160.	1.017	1.078

TABLE B12

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, N1=6151 PSI N13=6151 PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10301	1.381	0.804	0.289	10.7	1.381
10303	1.292	0.830	0.231	4.4	1.292
NO DATA AVAILABLE					
10307	1.157	0.883	0.137	-1.8	1.157
NO DATA AVAILABLE					
10314	1.004	0.928	0.038	3.3	1.004
NO DATA AVAILABLE					
10322	0.998	0.925	0.037	6.9	0.998
10330	1.040	0.919	0.061	0.0	1.040
10362	1.079	1.016	0.032	8.1	1.079

TABLE B13

STRAINS AND STRESSES-OPPOSITE HOLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE HOLE
 STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SHEDUCAL	TANGENTIAL
203-2	-52.	294.	306.	0.350	2.135
20301	-32.	264.	256.	0.366	1.807
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20307	30.	276.	226.	0.506	1.550
	3000.	3000.	3000.		
20314	72.	198.	200.	0.708	1.373
	3000.	3000.	3000.		
20322	96.	100.	182.	0.823	1.250
20330	120.	172.	172.	0.920	1.180
20362	102.	162.	152.	0.996	1.072

TABLE B14

PRINC STRESS DATA - OPPOSITE HOLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE HOLE
 STRINGER NO. 3

POS. POS.	PRINC. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRINC. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
203-2	2.135	0.350	0.892	0.0	2.135
20301	1.807	0.366	0.700	-0.7	1.807
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20307	1.555	0.506	0.800	1.3	1.555
	NO DATA AVAILABLE				
20314	1.378	0.700	0.317	1.2	1.378
	NO DATA AVAILABLE				
20322	1.250	0.823	0.215	0.6	1.250
20330	1.180	0.920	0.132	0.0	1.180
20362	1.070	0.990	0.040	-15.0	1.070

TABLE B15

MEMBRANE AND BENDING STRESSES - PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $E1=6151$ PSI $E13=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 3

ROS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MEMBRANAL	TANGENTIAL	MEMBRANAL	TANGENTIAL
203-2	NO DATA AVAILABLE			
20301	0.595	1.608	0.229	-0.262
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20307	0.735	1.356	0.149	-0.199
	NO DATA AVAILABLE			
20314	0.838	1.189	0.094	-0.185
	NO DATA AVAILABLE			
20322	0.878	1.125	0.051	-0.129
20330	0.920	1.112	-0.001	-0.072
20362	1.007	1.075	0.011	0.003

TABLE B16

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $E1=6151$ PSI $E13=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 3

ROS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MEMBRANAL	TANGENTIAL
30361	7.	8.	-8.	0.006	-0.015
30329	8.	-8.	-8.	0.026	-0.045
	3000.	3000.	3000.		
30320	3.	-8.	-20.	-0.028	-0.099
30313	-50.	-28.	-20.	-0.284	-0.142
	3000.	3000.	3000.		
30307	-100.	-8.	0.	-0.488	-0.002
	3000.	3000.	3000.		
30303	-124.	88.	68.	-0.479	0.443
	3000.	3000.	3000.		
	3000.	3000.	3000.		

TABLE B17

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, H1=6151 PSI H13=6151 PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30361	0.024	-0.037	0.028	34.5	0.056
30329	0.027	-0.046	0.037	6.5	0.073
NO DATA AVAILABLE					
30320	-0.019	-0.108	0.044	18.3	0.108
30313	-0.142	-0.285	0.071	3.5	0.285
NO DATA AVAILABLE					
30307	-0.001	-0.489	0.244	2.1	0.489
NO DATA AVAILABLE					
30303	0.445	-0.481	0.463	2.7	0.927
NO DATA AVAILABLE					
NO DATA AVAILABLE					

TABLE B18

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, H1=6151 PSI H13=6151 PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SHEDICIAL	TANGENTIAL
40361	0.	2.	10.	0.012	0.042
40329	-4.	0.	10.	-0.009	0.036
	3000.	3000.	3000.		
40320	0.	-4.	16.	0.012	0.042
40313	58.	-2.	22.	0.299	0.055
40309	72.	30.	20.	0.396	0.158
40307	96.	66.	48.	0.575	0.377
40305	94.	118.	94.	0.663	0.724
40303	94.	122.	126.	0.699	0.951
40301	0.	252.	182.	0.430	1.530
	3000.	3000.	3000.		

TABLE B19

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		PRIN. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40361	0.050	0.004	0.023	24.6	0.050
40329	0.045	-0.018	0.032	22.0	0.063
NO DATA AVAILABLE					
40320	0.074	-0.019	0.046	35.4	0.093
40313	0.309	0.044	0.133	-11.7	0.309
40309	0.398	0.154	0.121	5.2	0.398
40307	0.583	0.370	0.106	10.9	0.583
40305	0.755	0.633	0.061	-30.0	0.755
40303	0.852	0.699	0.077	3.3	0.852
40301	1.555	0.413	0.571	-7.8	1.555
NO DATA AVAILABLE					

TABLE B20

MEMBRANE AND BENDING STRESSES - NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40361	0.009	0.014	-0.003	-0.029
40329	0.009	-0.004	0.018	-0.040
	NO DATA AVAILABLE			
40320	-0.008	-0.028	-0.020	-0.071
40313	0.007	-0.043	-0.291	-0.099
40309	NO DATA AVAILABLE			
40307	0.043	0.188	-0.532	-0.189
40305	NO DATA AVAILABLE			
40303	0.110	0.647	-0.589	-0.204
40301	NO DATA AVAILABLE			
	NO DATA AVAILABLE			

TABLE B21

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10501	80.	200.	192.	0.776	1.368
10503	108.	162.	180.	0.841	1.181
	3000.	3000.	3000.		
10507	120.	166.	180.	0.922	1.191
	3000.	3000.	3000.		
10514	126.	158.	152.	0.915	1.062
	3000.	3000.	3000.		
10522	130.	148.	156.	0.928	1.040
10530	122.	146.	156.	0.888	1.035
10562	124.	144.	152.	0.891	1.013

TABLE B22

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SF/AR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10501	1.365	0.776	0.294	-1.7	1.365
10503	1.186	0.837	0.178	6.1	1.186
NO DATA AVAILABLE					
10507	1.198	0.919	0.138	6.8	1.198
NO DATA AVAILABLE					
10514	1.063	0.918	0.075	-5.1	1.063
NO DATA AVAILABLE					
10522	1.043	0.926	0.058	8.7	1.043
10530	1.038	0.885	0.077	8.3	1.038
10562	1.016	0.889	0.063	8.1	1.016

TABLE B23

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, R1=6151 PSI R13=6151 PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SHEDIONAL	TANGENTIAL
205-2	-62.	282.	298.	0.282	2.067
20501	-38.	258.	270.	0.346	1.876
20503	0.	238.	240.	0.478	1.690
	3000.	3000.	3000.		
20507	38.	198.	202.	0.583	1.404
	3000.	3000.	3000.		
20514	68.	184.	192.	0.703	1.311
	3000.	3000.	3000.		
20522	94.	172.	170.	0.793	1.184
20530	124.	178.	182.	0.956	1.239
20562	156.	166.	166.	1.081	1.132

TABLE B24

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, R1=6151 PSI R13=6151 PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
205-2	2.067	0.282	0.893	1.1	2.067
20501	1.877	0.345	0.765	1.0	1.877
20503	1.689	0.479	0.606	0.2	1.689
	NO DATA AVAILABLE				
20507	1.404	0.583	0.411	0.6	1.404
	NO DATA AVAILABLE				
20514	1.311	0.702	0.365	1.7	1.311
	NO DATA AVAILABLE				
20522	1.184	0.793	0.195	-0.6	1.184
20530	1.240	0.955	0.142	1.8	1.240
20562	1.132	1.081	0.025	0.0	1.132

TABLE B25

MEMBRANE AND BENDING STRESSES - PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 5

ROS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
205-2	NO DATA AVAILABLE			
20501	0.561	1.620	0.215	-0.256
20503	0.660	1.435	0.182	-0.256
	NO DATA AVAILABLE			
20507	0.752	1.297	0.170	-0.106
	NO DATA AVAILABLE			
20514	0.809	1.186	0.106	-0.124
	NO DATA AVAILABLE			
20522	0.861	1.112	0.067	-0.072
20530	0.922	1.137	-0.034	-0.102
20562	0.986	1.072	-0.095	-0.053

TABLE B26

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 5

ROS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30561	12.	22.	6.	0.086	0.096
30529	36.	30.	6.	0.209	0.118
	3000.	3000.	3000.		
	3000.	3000.	3000.		
	3000.	3000.	3000.		
30509	-80.	-20.	-16.	-0.420	-0.106
30507	-100.	-30.	2.	-0.508	-0.072
30505	-126.	20.	16.	-0.579	0.161
30503	-136.	56.	56.	-0.541	0.432
30501	-140.	114.	106.	-0.450	0.822
	3000.	3000.	3000.		

TABLE B27

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30561	0.126	0.055	0.035	-40.9	0.126
30529	0.233	0.094	0.070	24.6	0.233
NO DATA AVAILABLE					
NO DATA AVAILABLE					
NO DATA AVAILABLE					
30509	-0.106	-0.420	0.157	1.6	0.420
30507	-0.061	-0.519	0.229	8.9	0.519
30505	0.161	-0.579	0.370	-0.7	0.740
30503	0.432	-0.541	0.487	0.0	0.973
30501	0.822	-0.450	0.636	-1.0	1.273
NO DATA AVAILABLE					

TABLE B28

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
40561	2.	-2.	-12.	-0.006	-0.057
	3000.	3000.	3000.		
	3000.	3000.	3000.		
40520	-8.	0.	-8.	-0.046	-0.026
40513	16.	12.	-16.	0.169	-0.024
40509	88.	36.	16.	0.475	0.160
40507	68.	88.	60.	0.471	0.491
40505	74.	128.	94.	0.577	0.765
	3000.	3000.	3000.		
40501	-20.	200.	140.	0.244	1.207
	3000.	3000.	3000.		

TABLE B29

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40561	-0.001	-0.063	0.031	17.4	0.063
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
40520	-0.016	-0.057	0.020	-30.0	0.057
40513	0.197	-0.042	0.114	16.3	0.228
40509	0.481	0.154	0.163	7.8	0.481
40507	0.534	0.427	0.054	-39.6	0.534
40505	0.791	0.551	0.120	-19.3	0.791
	NO DATA AVAILABLE				
40501	1.225	0.226	0.499	-7.6	1.225
	NO DATA AVAILABLE				

TABLE B30

MEMBRANE AND BENDING STRESSES - NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=6151$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40561	0.040	0.019	0.046	0.076
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
40520	NO DATA AVAILABLE			
40513	NO DATA AVAILABLE			
40509	0.027	0.027	-0.447	-0.133
40507	-0.019	0.209	-0.489	-0.282
40505	-0.001	0.463	-0.578	-0.302
	NO DATA AVAILABLE			
40501	-0.103	1.015	-0.347	-0.193
	NO DATA AVAILABLE			

TABLE B31

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 1

ROS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10101	56.	209.	198.	0.671	1.406
10103	58.	255.	152.	0.605	1.309
	3000.	3000.	3000.		
10107	50.	198.	166.	0.604	1.273
	3000.	3000.	3000.		
10114	40.	178.	164.	0.534	1.198
	3000.	3000.	3000.		
10122	32.	164.	164.	0.482	1.151
10130	42.	170.	160.	0.532	1.155
10162	36.	170.	162.	0.505	1.164

TABLE B32

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10101	1.407	0.670	0.369	-2.4	1.407
10103	1.319	0.595	0.362	-6.7	1.319
NO DATA AVAILABLE					
10107	1.280	0.597	0.342	-5.9	1.280
NO DATA AVAILABLE					
10114	1.200	0.533	0.333	-2.6	1.200
NO DATA AVAILABLE					
10122	1.151	0.482	0.334	0.0	1.151
10130	1.156	0.531	0.312	-2.0	1.156
10162	1.164	0.505	0.330	-1.5	1.164

TABLE 913

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MEMORIAL	PERCENTIAL
201-2	-68.	356.	386.	0.386	2.535
20101	-16.	282.	272.	0.477	1.962
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20107	16.	286.	218.	0.537	1.622
	3000.	3000.	3000.		
20118	28.	200.	158.	0.523	1.368
	3000.	3000.	3000.		
20121	88.	188.	172.	0.587	1.286
20130	48.	180.	166.	0.577	1.210
20162	50.	152.	136.	0.528	1.005

TABLE 914

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
201-2	2.536	0.385	1.075	-1.2	2.536
20101	1.063	0.477	0.783	-0.2	1.963
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20107	1.626	0.533	0.587	-3.7	1.626
	NO DATA AVAILABLE				
20118	1.365	0.522	0.421	-1.8	1.365
	NO DATA AVAILABLE				
20122	1.287	0.586	0.330	-2.3	1.287
20130	1.212	0.575	0.318	-2.8	1.212
20162	1.007	0.526	0.281	-4.2	1.007

TABLE B35

MEMBRANE AND BENDING STRESSES - PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $E1=3075$ PSI $E13=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
201-2	NO DATA AVAILABLE			
20101	0.578	1.688	0.097	-0.278
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20107	0.571	1.587	0.038	-0.178
	NO DATA AVAILABLE			
20118	0.528	1.781	0.005	-0.083
	NO DATA AVAILABLE			
20122	0.538	1.198	-0.052	-0.087
20130	0.558	1.183	-0.022	-0.027
20162	0.517	1.088	-0.011	0.080

TABLE B36

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $E1=3075$ PSI $E13=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
3018.	-8.	-10.	-10.	-0.058	-0.069
30129	18.	-28.	-20.	0.082	-0.160
	3000.	3000.	3000.		
30120	20.	-18.	-20.	0.038	-0.210
30113	-20.	-88.	-52.	-0.196	-0.388
30109	-80.	-36.	-52.	-0.872	-0.290
30107	-100.	-38.	-38.	-0.556	-0.282
30105	-128.	-16.	-12.	-0.683	-0.065
30103	-144.	28.	22.	-0.641	0.215
30101	-142.	92.	92.	-0.898	0.688
	3000.	3000.	3000.		

TABLE B37

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30151	-0.058	-0.069	0.005	0.0	0.069
30129	0.043	-0.161	0.102	-2.5	0.203
NO DATA AVAILABLE					
30120	0.044	-0.216	0.130	-8.8	0.261
30113	-0.196	-0.349	0.077	3.3	0.349
30109	-0.283	-0.479	0.098	-10.5	0.479
30107	-0.242	-0.556	0.157	0.0	0.556
30105	-0.065	-0.643	0.289	0.9	0.643
30103	0.215	-0.642	0.428	-0.9	0.857
30101	0.688	-0.498	0.593	0.0	1.186
NO DATA AVAILABLE					

TABLE B38

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	NORMAL DIRECTIONAL	TANGENTIAL
40161	13.	4.	6.	0.058	0.033
40129	8.	24.	28.	0.090	0.182
	3000.	3000.	3000.		
40120	12.	32.	20.	0.110	0.181
40113	68.	48.	60.	0.435	1.364
40109	96.	100.	96.	0.657	1.467
40107	124.	132.	124.	0.451	0.872
40105	118.	162.	172.	0.901	1.149
40103	112.	212.	220.	0.970	1.497
40101	-10.	264.	164.	0.380	1.515
401-2	-100.	324.	323.	0.172	2.331

TABLE B39

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40161	0.059	0.032	0.013	-9.6	0.059
40129	0.182	0.090	0.046	5.4	0.182
NO DATA AVAILABLE					
40120	0.189	0.101	0.044	-18.3	0.189
40113	0.443	0.355	0.044	-18.3	0.443
40109	0.672	0.652	0.010	-30.0	0.672
40107	0.882	0.841	0.020	-30.0	0.882
40105	1.151	0.899	0.126	5.0	1.151
40103	1.498	0.969	0.264	1.9	1.498
40101	1.556	0.339	0.609	-10.6	1.556
401-2	2.331	0.172	1.079	0.2	2.331

TABLE B40

MEMBRANE AND BENDING STRESSES - NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40161	-0.000	-0.018	-0.058	-0.051
40129	0.046	0.011	-0.028	-0.171
NO DATA AVAILABLE				
40120	0.074	-0.015	-0.036	-0.195
40113	0.119	0.208	-0.315	-0.356
40109	0.042	0.149	-0.565	-0.478
40107	0.148	0.315	-0.704	-1.557
40105	0.129	0.542	-0.777	-0.607
40103	0.164	0.856	-0.806	-0.441
40101	-0.059	1.102	-0.439	-0.414
401-2	NO DATA AVAILABLE			

TABLE B41

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10301	88.	86.	278.	0.531	1.119
10303	88.	80.	288.	0.515	0.991
	3000.	3000.	3000.		
10307	72.	80.	218.	0.608	0.893
	3000.	3000.	3000.		
10314	90.	82.	168.	0.638	0.708
	3000.	3000.	3000.		
10322	94.	32.	152.	0.631	0.625
10330	98.	80.	170.	0.68.	0.716
10362	128.	86.	186.	0.847	0.786

TABLE B42

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

ROS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10301	1.406	0.245	0.560	29.8	1.406
10303	1.260	0.246	0.507	31.0	1.260
NO DATA AVAILABLE					
10307	1.165	0.332	0.416	38.9	1.165
NO DATA AVAILABLE					
10314	0.981	0.801	0.270	41.5	0.981
NO DATA AVAILABLE					
10322	0.898	0.367	0.263	-44.5	0.898
10330	0.984	0.413	0.286	43.2	0.984
10362	1.125	0.508	0.309	-42.2	1.125

TABLE B43

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
203-2	-46.	278.	198.	0.247	1.666
20301	-16.	268.	180.	0.327	1.432
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20307	36.	248.	98.	0.519	1.213
	3000.	3000.	3000.		
20314	68.	216.	84.	0.627	1.042
	3000.	3000.	3000.		
20322	80.	200.	60.	0.644	0.298
20330	80.	182.	60.	0.626	0.834
20362	94.	180.	68.	0.699	0.851

TABLE B44

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
203-2	1.688	0.226	0.73	-6.9	1.688
20301	1.496	0.268	0.616	-13.1	1.496
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20307	1.345	0.388	0.478	-21.7	1.345
	NO DATA AVAILABLE				
20314	1.191	0.478	0.356	-27.2	1.191
	NO DATA AVAILABLE				
20322	1.103	0.439	0.332	-32.8	1.103
20330	1.017	0.443	0.287	-34.4	1.017
20362	1.033	0.510	0.257	-36.4	1.033

TABLE B45

MEMBRANE AND BENDING STRESSES - PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $E1=3075$ PSI $E13=6151$ PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
203-2	NO DATA AVAILABLE			
20301	0.429	1.276	0.102	-0.156
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20307	0.561	1.053	0.042	-0.160
	NO DATA AVAILABLE			
20314	0.632	0.873	0.006	-0.169
	NO DATA AVAILABLE			
20322	0.640	0.761	-0.004	-0.135
20330	0.653	0.775	0.027	-0.059
20362	0.773	0.819	0.074	-0.033

TABLE B46

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $E1=3075$ PSI $E13=6151$ PSIPLAT PLATE OFF NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30361	-2.	8.	-12.	-0.014	-0.014
30329	-8.	8.	-20.	-0.050	-0.040
	3000.	3000.	3000.		
30320	-24.	6.	-28.	-0.137	-0.071
30313	-36.	4.	-30.	-0.199	-0.082
30309	-92.	-6.	-28.	-0.476	-0.096
30307	-84.	-14.	10.	-0.407	0.008
	3000.	3000.	3000.		
30303	-104.	-24.	74.	-0.449	0.204
30301	-120.	-32.	176.	-0.432	0.541
	3000.	3000.	3000.		

TABLE B47

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30361	0.030	-0.057	0.044	45.0	0.088
30329	0.016	-0.107	0.062	-42.6	0.123
NO DATA AVAILABLE					
30320	-0.023	-0.106	0.082	-33.1	0.106
30313	-0.046	-0.235	0.095	-26.0	0.235
30309	-0.090	-0.482	0.196	-7.1	0.482
30307	0.015	-0.414	0.214	7.1	0.429
NO DATA AVAILABLE					
30305	0.259	-0.514	0.391	16.7	0.783
30301	0.722	-0.613	0.667	21.6	1.334
NO DATA AVAILABLE					

TABLE B48

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30361	2.	-8.	0.	0.002	-0.029
30329	6.	0.	-8.	0.025	-0.016
	3000.	3000.	3000.		
30320	-4.	12.	-2.	-0.009	0.036
30313	26.	8.	-2.	0.131	0.014
30309	56.	28.	2.	0.219	0.091
30307	80.	40.	12.	0.436	0.162
30305	78.	60.	60.	0.495	0.403
30303	76.	100.	32.	0.559	0.665
30301	0.	128.	132.	0.260	0.919
	3000.	3000.	3000.		

TABLE 849

PRINCIPAL STRESS DATA - IN-THE SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40361	0.010	-0.037	0.023	-24.6	0.046
40329	0.027	-0.018	0.022	11.7	0.044
NO DATA AVAILABLE					
40320	0.052	-0.025	0.038	-26.7	0.077
40313	0.135	0.010	0.062	10.3	0.135
40309	0.314	0.076	0.119	14.4	0.314
40307	0.449	0.149	0.150	12.1	0.449
40305	0.495	0.403	0.046	0.0	0.495
40303	0.667	0.557	0.055	-5.9	0.667
40301	0.919	0.260	0.330	0.0	0.919
NO DATA AVAILABLE					

TABLE 850

MEMBRANE AND BENDING STRESSES - NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIPLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40350	-0.006	-0.021	-0.008	0.008
40329	-0.013	-0.028	-0.038	-0.012
NO DATA AVAILABLE				
40320	-0.073	-0.017	-0.064	-0.054
40313	-0.034	-0.034	-0.165	-0.042
40309	-0.088	-0.002	-0.387	-0.093
40307	0.014	0.085	-0.422	-0.077
40305	NO DATA AVAILABLE			
40303	0.055	0.435	-0.504	-0.230
40301	-0.086	0.730	-0.346	-0.189
NO DATA AVAILABLE				

TABLE B51

STRESS AND STRESSES - NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, 81-3075 PSI 813-6151 PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	HORIZONTAL	TANGENTIAL
	3000.	3000.	3000.		
	3000.	3000.	3000.		
10503	88.	80.	96.	0.599	0.599
	3000.	3000.	3000.		
10507	108.	80.	96.	0.695	0.593
	3000.	3000.	3000.		
10518	128.	76.	88.	0.779	0.546
	3000.	3000.	3000.		
10522	144.	80.	88.	0.859	0.555
10530	148.	80.	88.	0.879	0.554
10562	150.	88.	88.	0.856	0.841

TABLE B52

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, 81-3075 PSI 813-6151 PSI

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
10503	0.634	0.563	0.035	45.0	0.634
	NO DATA AVAILABLE				
10507	0.706	0.582	0.062	-17.4	0.706
	NO DATA AVAILABLE				
10514	0.782	0.583	0.119	-6.4	0.782
	NO DATA AVAILABLE				
10522	0.860	0.554	0.153	-3.3	0.860
10530	0.880	0.553	0.163	-3.1	0.880
10562	0.874	0.423	0.226	-11.5	0.874

TABLE B53

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $E1=3075$ PSI $E13=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	NORMAL STRESS	TANGENTIAL
205-2	-58.	104.	120.	-0.054	0.007
20501	-34.	116.	126.	0.079	0.064
20503	-8.	114.	128.	0.204	0.058
	3000.	3000.	3000.		
20507	80.	106.	138.	0.436	0.052
	3000.	3000.	3000.		
20514	70.	96.	109.	0.540	0.702
	3000.	3000.	3000.		
20522	120.	90.	104.	0.770	0.654
20530	140.	92.	100.	0.864	0.641
20562	168.	80.	92.	0.979	0.553

TABLE B54

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $E1=3075$ PSI $E13=6151$ PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
205-2	0.809	-0.056	0.432	2.3	0.864
20501	0.865	0.078	0.393	1.6	0.865
20503	0.849	0.202	0.328	2.7	0.859
	NO DATA AVAILABLE				
20507	0.863	0.425	0.219	9.3	0.863
	NO DATA AVAILABLE				
20514	0.707	0.536	0.085	9.0	0.707
	NO DATA AVAILABLE				
20522	0.770	0.646	0.066	-13.9	0.770
20530	0.866	0.640	0.113	-4.5	0.866
20562	0.980	0.561	0.209	-3.6	0.980

TABLE B55

MEMBRANE AND BENDING STRESSES - PLATE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 5

NOS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
205-2	NO DATA AVAILABLE			
20501	NO DATA AVAILABLE			
20503	0.401	0.728	0.197	-0.129
	NO DATA AVAILABLE			
20507	0.565	0.723	0.129	-0.129
	NO DATA AVAILABLE			
20518	0.659	0.624	0.119	-0.078
	NO DATA AVAILABLE			
20522	0.815	0.605	0.045	-0.049
20530	0.872	0.598	0.007	-0.043
20562	0.918	0.502	-0.061	-0.061

TABLE B56

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSIFLAT PLATE ONE NOZZLE
STRINGER NO. 5

NOS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30561	-4.	12.	6.	-0.001	0.065
30529	-16.	16.	24.	-0.037	0.146
	3000.	3000.	3000.		
	3000.	3000.	3000.		
30513	-36.	8.	16.	-0.149	0.094
30509	-60.	22.	16.	-0.250	0.150
30507	-80.	40.	36.	-0.308	0.290
30505	-90.	34.	34.	-0.364	0.264
30503	-82.	52.	52.	-0.290	0.389
30501	-96.	66.	90.	-0.305	0.577
	3000.	3000.	3000.		

TABLE 857

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30561	0.067	-0.004	0.035	-10.9	0.071
30529	0.147	-0.038	0.093	5.4	0.186
NO DATA AVAILABLE					
NO DATA AVAILABLE					
30513	0.096	-0.150	0.123	4.1	0.246
30509	0.151	-0.250	0.201	-1.9	0.401
30507	0.290	-0.308	0.299	-0.8	0.598
30505	0.264	-0.364	0.214	0.0	0.628
30503	0.389	-0.290	0.340	0.0	0.679
30501	0.580	-0.308	0.444	3.4	0.888
NO DATA AVAILABLE					

TABLE 858

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE
 BIAxIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, $\sigma_1=3075$ PSI $\sigma_{13}=6151$ PSI

FLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	RESIDUAL	TANGENTIAL
30561	-4.	-8.	-10.	-0.037	-0.063
	3000.	3000.	3000.		
	3000.	3000.	3000.		
30520	-2.	-40.	-40.	-0.090	-0.282
30513	28.	-56.	-64.	0.014	-0.432
30509	20.	-60.	-66.	-0.032	-0.458
30507	36.	-58.	-60.	0.055	-0.427
30505	28.	-22.	-32.	0.080	-0.198
30503	24.	-8.	-4.	0.103	-0.049
30501	8.	-12.	4.	0.030	-0.030
305-2	-30.	90.	90.	0.040	0.658

TABLE B59

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, N1=3075 PSI N13=6151 PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40561	-0.036	-0.063	0.013	9.6	0.063
NO DATA AVAILABLE					
NO DATA AVAILABLE					
40520	-0.090	-0.282	0.096	0.0	0.282
40513	0.015	-0.432	0.224	2.3	0.447
40509	-0.031	-0.458	0.214	2.4	0.458
40507	0.055	-0.427	0.241	0.5	0.482
40505	0.082	-0.200	0.181	4.5	0.282
40503	0.104	-0.049	0.077	-3.2	0.153
40501	0.046	-0.046	0.046	-24.6	0.093
405-2	0.658	0.040	0.309	-0.8	0.658

TABLE B60

MEMBRANE AND BENDING STRESSES - NOZZLE
 BIAXIAL STRESS APPLIED TO PLATE, DIRECTED PARALLEL
 TO STRINGER 1 AND 13, N1=3075 PSI N13=6151 PSI

PLAT PLATE ONE NOZZLE
 STRINGER NO. 5

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40561	-0.019	0.001	0.018	0.064
NO DATA AVAILABLE				
NO DATA AVAILABLE				
40520	NO DATA AVAILABLE			
40513	-0.067	-0.169	-0.082	0.263
40509	-0.141	-0.154	-0.109	0.304
40507	-0.127	-0.068	-0.181	0.358
40505	-0.142	0.033	-0.222	0.231
40503	-0.093	0.170	-0.196	0.219
40501	-0.137	0.275	-0.168	0.304
405-2	NO DATA AVAILABLE			

TABLE B61

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10101	-574.	-352.	-349.	-19.857	-13.351
10103	-522.	-322.	-305.	-17.997	-11.928
	3000.	3000.	3000.		
10107	-438.	-331.	-326.	-15.853	-12.666
	3000.	3000.	3000.		
10114	-315.	-348.	-309.	-12.461	-12.854
	3000.	3000.	3000.		
10122	-257.	-316.	-291.	-10.580	-11.948
10130	-215.	-289.	-269.	-9.135	-10.998
10162	-35.	-202.	-211.	-3.332	-8.310

TABLE B62

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10101	-13.351	-19.856	3.253	0.3	19.856
10103	-11.921	-18.005	3.042	2.0	18.005
NO DATA AVAILABLE					
10107	-12.665	-15.854	1.595	1.1	15.854
NO DATA AVAILABLE					
10114	-12.461	-13.187	0.529	-34.1	13.187
NO DATA AVAILABLE					
10122	-10.516	-12.012	0.748	-11.9	12.012
10130	-9.101	-11.031	0.965	-7.6	11.031
10162	-3.330	-8.312	2.491	1.2	8.312

TABLE B63

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE
NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
201-2	155.	378.	385.	8.705	14.358
20101	467.	408.	421.	17.641	16.113
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20107	350.	415.	412.	14.403	16.252
	3000.	3000.	3000.		
20114	319.	388.	384.	13.209	15.101
	3000.	3000.	3000.		
20122	233.	350.	347.	10.430	13.792
20130	190.	301.	334.	8.888	12.599
20162	83.	220.	203.	4.719	8.460

TABLE B64

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE
NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
201-2	14.380	8.383	2.998	-3.5	14.380
20101	17.648	16.096	0.781	-6.1	17.658
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20107	16.252	14.402	0.925	-1.2	16.252
	NO DATA AVAILABLE				
20114	15.101	13.209	0.946	0.0	15.101
	NO DATA AVAILABLE				
20122	13.792	10.430	1.681	-0.6	13.792
20130	12.645	8.882	1.902	6.3	12.645
20162	8.472	4.707	1.882	-3.3	8.472

TABLE B65
MEMBRANE AND BENDING STRESSES - PLATE
NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MEMIDIONAL	TANGENTIAL	MEMIDIONAL	TANGENTIAL
201-2	NO DATA AVAILABLE			
20101	-1.108	1.381	-18.749	-14.732
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20107	-0.725	1.793	-15.128	-14.459
	NO DATA AVAILABLE			
20114	0.374	1.124	-12.835	-13.978
	NO DATA AVAILABLE			
20122	-0.075	0.922	-10.505	-12.870
20130	-0.124	0.801	-9.011	-11.799
20162	0.693	0.075	-8.026	-8.385

TABLE B66
STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE
NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MEMIDIONAL	TANGENTIAL
30161	-20.	0.	-2.	-0.563	-0.010
30129	-26.	19.	-24.	-0.746	-0.062
	3000.	3000.	3000.		
30120	19.	13.	10.	0.656	0.438
30113	9.	-37.	-28.	-0.125	-1.333
30109	-30.	-90.	-91.	-1.867	-3.628
30107	-16.	-111.	-151.	-1.946	-5.294
30105	-145.	-198.	-197.	-6.268	-7.796
30103	-346.	-261.	-246.	-12.454	-9.762
30101	-380.	-390.	-400.	-15.018	-15.455
	3000.	3000.	3000.		

TABLE B67
 PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE
 NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30161	-0.009	-0.564	0.278	-2.6	0.564
30129	0.237	-1.045	0.641	-28.9	1.202
NO DATA AVAILABLE					
30120	0.662	0.431	0.116	9.6	0.662
30113	-0.115	-1.344	0.615	-5.3	1.344
30109	-1.867	-3.628	0.881	0.4	3.628
30107	-1.872	-5.368	1.748	8.4	5.368
30105	-6.268	-7.796	0.764	-0.5	7.796
30103	-9.749	-12.467	1.359	4.0	12.467
30101	-14.984	-15.488	0.252	15.0	15.488
NO DATA AVAILABLE					

TABLE B68
 STRAINS AND STRESSES - INNER SURFACE OF NOZZLE
 NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
 STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
40161	-29.	-4.	1.	-0.817	-0.016
40129	-14.	-83.	7.	-0.593	-0.709
	3000.	3000.	3000.		
40120	-69.	-11.	-8.	-2.012	-0.280
40113	-93.	-75.	-69.	-3.392	-2.781
40109	-20.	-111.	-108.	-1.810	-4.415
40107	80.	-104.	-129.	0.868	-4.852
40105	227.	-103.	-131.	4.916	-5.098
40103	434.	-48.	-91.	11.170	-3.487
40101	748.	43.	-2.	20.863	-0.314
401-2	495.	176.	164.	15.604	6.143

TABLE 869

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40161	-0.012	-0.022	0.005	0.5	0.022
40129	-0.018	-1.204	0.633	-42.0	1.204
NO DATA AVAILABLE					
40120	-0.273	-2.013	0.067	1.3	2.013
40113	-2.771	-3.401	0.315	6.9	3.401
40109	-1.809	-4.415	1.303	-0.8	4.415
40107	0.085	-4.069	2.077	3.1	5.754
40105	0.927	-5.110	5.019	2.0	10.037
40103	11.189	-3.506	7.347	2.1	14.695
40101	20.877	-0.328	10.602	1.5	21.205
401-2	15.606	6.102	4.732	0.9	15.606

TABLE 870

MEMBRANE AND BENDING STRESSES - NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40161	-0.690	-0.013	0.127	0.003
40129	-0.669	-0.385	-0.076	0.320
NO DATA AVAILABLE				
40120	-0.678	0.079	1.338	0.359
40113	-1.759	-2.057	1.633	0.720
40109	-1.838	-4.022	-0.029	0.393
40107	-0.539	-5.073	-1.407	-0.221
40105	-0.676	-6.487	-5.592	-1.349
40103	-0.682	-6.620	-11.812	-3.137
40101	2.923	-7.800	-17.981	-7.570
401-2	NO DATA AVAILABLE			

TABLE B71

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

NOS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	HYDRIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10301	-576.	-327.	-356.	-19.898	-12.982
10303	-506.	-321.	-345.	-17.780	-12.784
	3000.	3000.	3000.		
10307	-417.	-313.	-342.	-15.263	-12.657
	3000.	3000.	3000.		
10314	-335.	-322.	-322.	-12.938	-12.560
	3000.	3000.	3000.		
10322	-240.	-301.	-312.	-10.140	-12.076
10330	-203.	-260.	-295.	-8.787	-10.955
10362	-59.	-215.	-207.	-8.051	-8.476

TABLE B72

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

NOS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10301	-12.965	-19.827	3.432	-3.1	19.827
10303	-12.727	-17.798	2.536	-3.4	17.798
NO DATA AVAILABLE					
10307	-12.607	-15.313	1.353	-7.8	15.313
NO DATA AVAILABLE					
10314	-12.560	-12.938	0.189	0.0	12.938
NO DATA AVAILABLE					
10322	-10.130	-12.086	0.978	4.1	12.086
10330	-8.700	-11.041	1.170	11.1	11.041
10362	-8.049	-8.478	2.214	-1.3	8.478

TABLE B73

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
203-2	188.	367.	342.	9.258	14.105
20301	444.	420.	455.	17.271	17.082
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20307	403.	447.	379.	15.859	16.150
	3000.	3000.	3000.		
20314	394.	395.	371.	12.732	14.901
	3000.	3000.	3000.		
20322	214.	345.	332.	9.901	13.409
20330	165.	353.	313.	8.376	13.267
20362	100.	221.	222.	5.323	8.840

TABLE B74

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
203-2	14.125	0.234	2.443	-3.7	14.125
20301	17.624	14.725	0.451	-39.0	17.628
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20307	16.874	15.135	0.869	-40.2	16.874
	NO DATA AVAILABLE				
20314	14.917	12.716	1.101	-8.9	14.917
	NO DATA AVAILABLE				
20322	13.416	9.847	1.761	-2.7	13.416
20330	13.314	9.325	2.496	-5.8	13.318
20362	4.839	5.303	1.764	0.2	8.839

TABLE B75
MEMBRANE AND BENDING STRESSES - PLATE
NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
203-2	NO DATA AVAILABLE			
20301	-1.269	2.050	-10.500	-15.032
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20307	0.298	1.746	-15.561	-14.808
	NO DATA AVAILABLE			
20314	-0.103	1.171	-12.835	-13.730
	NO DATA AVAILABLE			
20322	-0.120	0.666	-10.021	-12.742
20330	-0.205	1.156	-8.581	-12.111
20362	0.626	0.182	-8.677	-8.650

TABLE B76
STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE
NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30361	-16.	-8.	-2.	-0.876	-3.097
30329	-30.	2.	13.	-0.781	0.350
	3000.	3000.	3000.		
30320	18.	15.	7.	0.512	0.825
30313	50.	-11.	-31.	1.138	-0.929
30309	-1.	-88.	-88.	-1.039	-3.571
30307	-85.	-254.	-254.	-8.159	-10.283
	3000.	3000.	3000.		
30302	-310.	-284.	-262.	-11.680	-10.588
30301	-383.	-351.	-351.	-13.892	-13.725
	3000.	3000.	3000.		

TABLE 877

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30361	-0.096	-0.877	0.191	3.8	0.877
30329	0.368	-0.750	0.563	7.1	1.126
NO DATA AVAILABLE					
30320	0.579	0.359	0.110	33.3	0.579
30313	1.168	-0.959	1.060	6.9	2.127
30309	-1.039	-1.571	1.266	0.0	3.571
30307	-4.160	-10.283	3.042	0.0	10.283
NO DATA AVAILABLE					
30303	-10.528	-11.781	0.607	12.9	11.781
30301	-13.892	-13.725	0.116	0.0	13.725
NO DATA AVAILABLE					

TABLE 878

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SEMIOTONAL	TANGENTIAL
30361	-52.	-2.	-2.	-1.857	-0.002
30329	-28.	0.	-1.	-0.789	-0.018
	3000.	3000.	3000.		
30320	-72.	-7.	-2.	-2.037	-0.072
30313	-77.	-82.	-69.	-2.991	-2.987
30309	-8.	-90.	-100.	-1.335	-3.926
30307	49.	-168.	-155.	-0.508	-6.632
30305	200.	-123.	-131.	8.056	-5.863
30303	825.	-72.	-89.	10.795	-3.920
30301	721.	27.	1.	20.008	-0.537
303-2	277.	239.	169.	14.119	7.628

TABLE 379

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40361	-0.002	-1.457	0.728	0.0	1.457
40329	-0.016	-2.791	0.387	-2.8	0.791
NO DATA AVAILABLE					
40320	-0.070	-2.049	0.994	1.8	2.039
40313	-2.804	-1.134	0.165	41.2	3.134
40309	-1.333	-1.429	1.297	1.7	3.928
40307	-0.500	-6.636	3.058	-1.5	6.636
40305	4.057	-5.463	0.760	0.6	9.520
40303	12.797	-3.922	7.360	0.9	14.719
40301	20.048	-0.540	10.294	0.9	20.588
403-2	14.237	7.511	3.363	7.6	14.237

TABLE 380

MEMBRANE AND BENDING STRESSES - NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MEMBRANAL	TANGENTIAL	MEMBRANAL	TANGENTIAL
40361	-0.966	-0.049	0.491	-0.048
40329	-0.765	0.166	0.024	0.184
NO DATA AVAILABLE				
40320	-0.762	0.176	1.275	0.249
40313	-0.927	-1.938	2.064	1.009
40309	-1.147	-3.744	0.148	0.177
40307	-2.132	-0.438	-1.028	-1.806
40305	NO DATA AVAILABLE			
40303	-0.442	-7.254	-11.238	-3.134
40301	3.276	-7.131	-16.748	-6.594
403-2	NO DATA AVAILABLE			

TABLE B41

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10501	-382.	-378.	-380.	-18.866	-18.721
10503	-480.	-285.	-318.	-16.678	-11.828
	3000.	3000.	3000.		
10507	-451.	-323.	-389.	-16.298	-12.950
	3000.	3000.	3000.		
10514	-336.	-322.	-323.	-12.971	-12.578
	3000.	3000.	3000.		
10522	-256.	-251.	-385.	-10.668	-12.356
10530	-208.	-279.	-236.	-9.039	-11.358
10562	-101.	-198.	-139.	-5.083	-7.823

TABLE B42

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10501	-18.689	-18.898	0.105	-23.1	18.998
10503	-11.399	-16.703	2.652	-8.0	16.703
NO DATA AVAILABLE					
10507	-12.919	-16.330	1.735	-5.5	16.330
NO DATA AVAILABLE					
10514	-12.578	-12.972	0.197	-1.8	12.972
NO DATA AVAILABLE					
10522	-10.362	-12.662	1.150	21.8	12.662
10530	-9.020	-11.373	1.177	5.2	11.373
10562	-5.082	-7.828	1.391	1.3	7.828

TABLE 883

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	HERIDICAL	TANGENTIAL
205-2	210.	390.	376.	10.300	15.300
20501	158.	027.	039.	17.091	16.062
20503	062.	075.	009.	10.955	10.069
20507	346.	005.	030.	15.103	17.203
	3990.	3090.	3000.		
	1700.	3000.	3000.		
20510	295.	392.	000.	12.700	15.707
	3090.	3000.	3000.		
20522	240.	373.	350.	11.620	10.295
20530	222.	327.	307.	9.760	12.530
20562	100.	210.	210.	5.327	0.529

TABLE 884

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

NOZZLE AXIAL LOAD - 2000 LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
205-2	15.399	10.333	2.533	-3.1	15.399
20501	17.903	16.001	0.531	-0.3	17.903
20503	10.002	17.722	0.300	-00.0	10.002
20507	17.291	15.130	1.079	-3.7	17.291
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20510	15.710	12.701	1.507	2.9	15.710
	NO DATA AVAILABLE				
20522	10.320	10.995	1.663	-5.0	10.320
20530	12.552	9.702	1.005	-5.2	12.552
20562	0.529	5.327	1.601	0.0	0.529

TABLE 545

MEMBRANE AND BENDING STRESSES - PLATE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MEMBRANAL	TANGENTIAL	MEMBRANAL	TANGENTIAL
20502	NO DATA AVAILABLE			
20501	1.506	1.971	-16.376	-15.792
20503	0.600	3.323	-17.357	-16.787
20507	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20514	-0.132	1.560	-12.840	-10.183
	NO DATA AVAILABLE			
20522	0.176	0.970	-10.000	-13.326
20530	0.363	0.500	-9.892	-11.982
20542	0.182	0.353	-5.195	-8.176

TABLE 546

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MEMBRANAL	TANGENTIAL
30561	-87.	-13.	-13.	-1.806	-0.856
30529	-18.	-2.	-12.	-0.577	-0.257
	3000.	3000.	3000.		
	3000.	3000.	3000.		
30513	18.	-39.	-38.	-0.028	-1.483
30509	16.	-112.	-198.	-0.800	-8.809
30507	-86.	-165.	-167.	-3.010	-6.678
30505	-173.	-219.	-219.	-7.287	-8.626
30503	-190.	-270.	-270.	-13.857	-10.360
30501	-800.	-360.	-378.	-15.271	-18.368
	3000.	3000.	3000.		

TABLE 887

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30561	-0.456	-1.485	0.495	0.0	1.485
30529	-0.213	-0.620	0.204	-19.1	0.620
NO DATA AVAILABLE					
NO DATA AVAILABLE					
30513	-0.026	-1.485	0.729	-2.0	1.485
30509	-0.797	-4.412	1.807	-1.6	4.412
30507	-3.011	-6.578	1.834	0.4	6.678
30505	-7.287	-8.626	0.669	0.0	8.626
30503	-10.364	-13.857	1.746	0.0	13.857
30501	-14.315	-15.324	0.505	-13.3	15.324
NO DATA AVAILABLE					

TABLE 888

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
40561	-29.	-1.	-8.	-0.351	-0.138
	3000.	3000.	3000.		
	3030.	3000.	3000.		
40520	-49.	-13.	-13.	-1.501	-0.453
40513	-85.	-119.	-79.	-3.482	-3.889
40509	-24.	-124.	-127.	-2.127	-5.140
40507	69.	-156.	-203.	-0.160	-7.393
40505	242.	-178.	-165.	4.703	-7.334
40503	474.	-193.	-83.	11.486	-6.329
40501	838.	-7.	-4.	23.047	-1.508
405-2	373.	193.	195.	12.515	7.305

TABLE 889

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40561	-0.128	-0.862	0.367	-6.9	0.862
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
40520	-0.453	-1.501	0.524	0.0	1.501
40513	-3.142	-4.229	0.544	-34.0	4.229
40509	-2.127	-5.140	1.506	-0.2	5.140
40507	-0.112	-7.441	3.665	4.7	7.441
40505	4.705	-7.335	6.020	-0.8	12.040
40503	11.592	-6.335	9.014	-4.4	18.027
40501	23.045	-1.506	12.275	-0.1	24.551
405-2	12.515	7.305	2.005	-0.3	12.515

TABLE 890

MEMBRANE AND BENDING STRESSES - NOZZLE

NOZZLE AXIAL LOAD - 2000 LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40561	-1.148	-0.297	-0.297	-0.159
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
40520	NO DATA AVAILABLE			
40513	-1.755	-2.686	1.727	1.203
40509	-1.463	-4.774	0.664	0.365
40507	-1.585	-7.036	-1.425	0.358
40505	-1.292	-7.980	-5.995	-0.646
40503	-1.186	-8.347	-12.672	-2.017
40501	3.488	-7.938	-19.159	-6.430
405-2	NO DATA AVAILABLE			

TABLE B91

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SEPDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10101	21.	154.	-133.	0.145	0.082
10103	19.	178.	-171.	0.117	0.023
	3000.	3000.	3000.		
10107	30.	197.	-197.	0.171	-0.010
	3000.	3000.	3000.		
10114	13.	174.	-156.	0.096	0.071
	3000.	3000.	3000.		
10122	8.	155.	-153.	0.048	0.006
10130	2.	128.	-116.	0.026	0.050
10162	-21.	96.	-74.	-0.094	0.099

TABLE B92

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
	NO DATA AVAILABLE				
10101	0.862	-0.636	0.749	43.8	1.498
10103	0.981	-0.841	0.911	43.5	1.822
	NO DATA AVAILABLE				
10107	1.112	-0.950	1.031	42.5	2.062
	NO DATA AVAILABLE				
10114	0.944	-0.777	0.860	44.6	1.721
	NO DATA AVAILABLE				
10122	0.930	-0.775	0.803	44.3	1.607
10130	0.674	-0.599	0.636	-44.5	1.273
10162	0.456	-0.451	0.454	-38.9	0.907

TABLE B93

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
201-2	-5.	205.	-197.	-0.019	0.035
20101	8.	245.	-262.	0.003	-0.073
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20107	35.	222.	-237.	0.182	-0.074
	3000.	3000.	3000.		
20114	9.	202.	-196.	0.058	0.022
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20130	2.	138.	-142.	0.007	-0.017
20162	2.	89.	-64.	0.041	0.104

TABLE B94

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
201-2	1.057	-1.040	1.048	-88.3	2.097
20101	1.287	-1.357	1.322	88.2	2.645
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20107	1.257	-1.150	1.204	82.0	2.407
	NO DATA AVAILABLE				
20114	1.078	-0.997	1.038	84.5	2.076
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20130	0.725	-0.736	0.730	84.5	1.460
20162	0.471	-0.327	0.400	-82.7	0.800

TABLE 895

MEMBRANE AND BENDING STRESSES - PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
201-2	NO DATA AVAILABLE			
20101	0.074	0.004	0.071	0.077
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20107	0.177	-0.042	-0.005	0.032
	NO DATA AVAILABLE			
20114	0.077	0.047	0.019	0.025
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
20130	0.016	0.016	0.010	0.034
20162	-0.026	0.102	-0.067	-0.003

TABLE 896

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.

FLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30151	-5.	-4.	-16.	-0.052	-0.082
30129	-8.	-6.	4.	-0.025	-0.007
	3000.	3000.	3000.		
30120	7.	-4.	-6.	0.026	-0.053
30113	-1.	-32.	35.	-0.002	0.013
30109	0.	-51.	48.	-0.004	-0.013
30107	-2.	-88.	64.	-0.040	-0.100
30105	2.	-71.	80.	0.022	0.037
30103	5.	-61.	72.	0.042	0.045
30101	8.	-51.	60.	0.056	0.035
	3000.	3000.	3000.		

TABLE 597

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, 41-5246 IN. LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30161	-0.033	-0.102	0.035	32.2	0.102
30129	0.011	-0.008	0.020	35.4	0.055
NO DATA AVAILABLE					
30120	0.026	-0.053	0.039	0.0	0.078
30113	0.180	-0.169	0.175	43.8	0.350
30109	0.250	-0.266	0.258	-44.5	0.516
30107	0.327	-0.457	0.397	-72.8	0.795
30105	0.423	-0.364	0.394	44.5	0.788
30103	0.390	-0.304	0.347	44.9	0.694
30101	0.335	-0.244	0.296	-44.0	0.579
NO DATA AVAILABLE					

TABLE 598

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, 41-5246 IN. LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	LONGITUDINAL	TANGENTIAL
40151	-1.	-9.	0.	-0.015	-0.033
40129	-1.	0.	0.	-0.006	0.000
	3000.	3000.	3000.		
40120	-3.	-1.	5.	-0.012	0.018
40113	7.	-17.	22.	0.046	0.019
40109	7.	-6.	7.	0.041	0.002
40107	2.	10.	-13.	0.008	-0.013
40105	-6.	49.	-59.	-0.024	0.040
40103	-14.	121.	-116.	-0.074	0.025
40101	-10.	242.	-213.	-0.137	0.131
401-2	-42.	351.	-314.	-0.196	0.169

TABLE B99

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, N1-5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40161	-0.002	-0.047	0.023	-33.3	0.047
40129	0.000	-0.005	0.003	0.0	0.006
NO DATA AVAILABLE					
40120	0.024	-0.019	0.022	23.1	0.043
40113	0.135	-0.070	0.103	-41.2	0.205
40109	0.061	-0.018	0.039	-30.0	0.078
40107	0.058	-0.064	0.061	40.0	0.122
40105	0.341	-0.325	0.333	-42.3	0.665
40103	0.596	-0.644	0.620	-42.7	1.240
40101	1.191	-1.197	1.194	-41.8	2.388
401-2	1.730	-1.757	1.743	-42.0	3.487

TABLE B100

MEMBRANE AND BENDING STRESSES - NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, N1-5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 1

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40161	-0.038	-0.058	-0.019	-0.025
40129	-0.015	-0.003	-0.010	-0.004
NO DATA AVAILABLE				
40120	0.007	-0.017	0.019	-0.035
40113	0.022	0.016	-0.024	-0.003
40109	0.019	-0.005	-0.022	-0.007
40107	-0.016	-0.057	-0.024	-0.043
40105	-0.001	0.038	0.023	-0.001
40103	-0.016	0.035	0.058	0.010
40101	-0.040	0.083	0.097	-0.048
401-2	NO DATA AVAILABLE			

TABLE B101

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10301	-378.	-143.	-345.	-2.737	-1.930
10303	-331.	-97.	-341.	-2.409	-1.734
	3000.	3000.	3000.		
10307	-273.	-52.	-315.	-1.994	-1.455
	3000.	3000.	3000.		
10314	-141.	-30.	-289.	-1.464	-1.279
	3000.	3000.	3000.		
10322	-142.	-29.	-239.	-1.129	-1.000
10330	-114.	-9.	-179.	-0.874	-0.753
10362	-53.	-8.	-110.	-0.438	-0.462

TABLE B102

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10301	-1.670	-2.996	0.663	-26.3	2.996
10303	-1.352	-2.792	0.720	-31.0	2.792
NO DATA AVAILABLE					
10307	-0.987	-2.461	0.737	-34.3	2.461
NO DATA AVAILABLE					
10314	-0.692	-2.056	0.682	-41.0	2.056
NO DATA AVAILABLE					
10322	-0.556	-1.653	0.548	-43.7	1.653
10330	-0.366	-1.261	0.447	-41.1	1.261
10362	-0.173	-0.727	0.277	43.8	0.727

TABLE B103

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 3

NOS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
203-2	128.	414.	90.	1.329	2.076
20301	325.	415.	94.	2.859	2.035
	3000.	3000.	3000.		
	3000.	3000.	3000.		
20307	257.	416.	68.	2.041	1.951
	3000.	3000.	3000.		
20314	190.	319.	41.	1.512	1.452
	3000.	3000.	3000.		
20322	140.	275.	13.	1.141	1.165
20330	115.	233.	26.	0.964	1.051
20362	60.	131.	7.	0.506	0.561

TABLE B104

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 3

NOS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
203-2	2.626	0.779	0.924	-33.1	2.626
20301	3.110	1.383	0.863	37.9	3.110
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
20307	2.905	1.088	0.908	43.6	2.905
	NO DATA AVAILABLE				
20314	2.204	0.756	0.725	43.8	2.204
	NO DATA AVAILABLE				
20322	1.836	0.470	0.683	-44.5	1.836
20330	1.544	0.464	0.541	-42.7	1.544
20362	0.858	0.209	0.324	-42.6	0.858

TABLE B105

MEMBRANE AND BENDING STRESSES - PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.-LB.PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)			BENDING STRESSES (NORMALIZED)		
	REGIONAL TANGENTIAL			REGIONAL TANGENTIAL		
203-2	NO DATA AVAILABLE			-2.598	-1.982	
20301	-0.139	0.052				
	NO DATA AVAILABLE					
20307	0.024	0.248		-2.018	-1.703	
	NO DATA AVAILABLE					
20314	0.022	0.086		-1.490	-1.365	
	NO DATA AVAILABLE					
20322	0.006	0.042		-1.135	-1.123	
20330	0.045	0.149		-0.919	-0.902	
20362	0.034	0.049		-0.472	-0.511	

TABLE B106

STRAINS AND STRESSES - OTHER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.-LB.PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)		
	GAGE 1 GAGE 2 GAGE 3			REGIONAL TANGENTIAL		
30361	-113.	-23.	-9.	-0.683	-0.099	
30329	-124.	-2.	-10.	-0.722	-0.011	
	3000.					
30320	-94.	-6.	9.	-0.533	0.042	
30313	-89.	-51.	-9.	-0.583	-0.236	
30309	-109.	-129.	-42.	-0.820	-0.667	
30307	-140.	-203.	-81.	-1.136	-1.148	
	3000.					
30303	-336.	-274.	-161.	-2.434	-1.720	
30301	-227.	-290.	-237.	-1.921	-2.141	
	3000.					

TABLE B107

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, 41-5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30361	-0.096	-0.685	0.294	3.6	0.685
30329	-0.011	-0.722	0.356	-1.7	0.722
NO DATA AVAILABLE					
30320	0.045	-0.535	0.290	3.9	0.580
30313	-0.200	-0.619	0.209	17.1	0.619
30309	-0.514	-0.973	0.230	35.2	0.973
30307	-0.824	-1.460	0.318	-44.5	1.460
NO DATA AVAILABLE					
30303	-1.614	-2.540	0.463	19.8	2.540
30301	-1.855	-2.208	0.177	-25.8	2.208
NO DATA AVAILABLE					

TABLE B108

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, 41-5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
40361	-108.	-4.	9.	-0.610	0.055
40329	-120.	-13.	-2.	-0.702	-0.025
	3000.	3000.	3000.		
40320	-100.	-22.	22.	-0.571	0.032
40313	-103.	-50.	-26.	-0.678	-0.287
40309	-76.	-78.	-70.	-0.609	-0.597
40307	-16.	-65.	-83.	-0.267	-0.616
40305	100.	-52.	-118.	0.368	-0.746
40303	225.	-108.	-94.	1.044	-0.920
40301	451.	-237.	49.	2.350	-0.933
403-2	283.	307.	-100.	1.861	0.780

TABLE B109

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40361	0.057	-0.612	0.334	2.9	0.669
40329	-0.024	-0.704	0.340	2.4	0.704
NO DATA AVAILABLE					
40320	0.053	-0.592	0.322	10.4	0.644
40313	-0.277	-0.688	0.205	8.9	0.688
40309	-0.582	-0.625	0.022	37.0	0.625
40307	-0.261	-0.625	0.161	7.5	0.623
40305	0.394	-0.772	0.523	8.6	1.166
40303	1.044	-0.920	0.982	-1.1	1.964
40301	2.511	-1.094	1.802	-12.2	3.605
403-2	2.511	0.129	1.191	31.5	2.511

TABLE B110

MEMBRANE AND BENDING STRESSES - NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.PLAT PLATE ONE NOZZLE
STRINGER NO. 3

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40361	-0.646	-0.022	-0.036	-0.077
40329	-0.712	-0.018	-0.016	0.007
NO DATA AVAILABLE				
40320	-0.552	0.037	0.019	0.005
40313	-0.630	-0.261	0.048	0.025
40309	-0.715	-0.632	-0.105	-0.035
40307	-0.702	-0.882	-0.435	-0.266
40305	NO DATA AVAILABLE			
40303	-0.695	-1.320	-1.739	-0.400
40301	0.214	-1.537	-2.135	-0.604
403-2	NO DATA AVAILABLE			

TABLE B111

STRAINS AND STRESSES - NOZZLE SIDE OF PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5286 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
	3000.	3000.	3000.		
10501	-371.	-389.	-369.	-3.017	-3.066
10503	-457.	-310.	-297.	-3.329	-2.408
	3000.	3000.	3000.		
10507	-395.	-272.	-289.	-2.920	-2.231
	3000.	3000.	3000.		
10514	-295.	-223.	-237.	-2.230	-1.838
	3000.	3000.	3000.		
10522	-220.	-178.	-200.	-1.704	-1.518
10530	-170.	-158.	-176.	-1.367	-1.349
10562	-93.	-87.	-95.	-0.747	-0.735

TABLE B112

PRINCIPAL STRESS DATA - NOZZLE SIDE OF PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5286 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
NO DATA AVAILABLE					
10501	-2.984	-3.099	0.057	-32.6	3.099
10503	-2.403	-3.330	0.463	2.1	3.330
NO DATA AVAILABLE					
10507	-2.228	-2.923	0.348	-3.7	2.923
NO DATA AVAILABLE					
10514	-1.835	-2.233	0.199	-5.3	2.233
NO DATA AVAILABLE					
10522	-1.501	-1.721	0.110	-15.8	1.721
10530	-1.310	-1.406	0.044	-39.6	1.406
10562	-0.719	-0.763	0.022	-37.0	0.763

TABLE B113

STRAINS AND STRESSES-OPPOSITE NOZZLE SIDE OF PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	SEMI-DIRECTIONAL	TANGENTIAL
205-2	380.	339.	378.	3.020	2.891
20501	457.	455.	397.	3.620	3.433
20503	445.	388.	412.	3.490	3.219
	3000.	3000.	3000.		
20507	345.	348.	342.	2.788	2.788
	3000.	3000.	3000.		
20514	251.	255.	270.	2.056	2.125
	3000.	3000.	3000.		
20522	212.	202.	204.	1.692	1.638
20530	171.	149.	164.	1.348	1.260
20562	102.	99.	99.	0.817	0.799

TABLE B114

PRINC STRESS DATA - OPPOSITE NOZZLE SIDE OF PLATE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
205-2	3.076	2.835	0.121	-28.8	3.076
20501	3.704	3.349	0.178	29.2	3.704
20503	3.503	3.205	0.149	-12.4	3.503
	NO DATA AVAILABLE				
20507	2.804	2.773	0.016	45.0	2.804
	NO DATA AVAILABLE				
20514	2.143	2.039	0.052	24.2	2.143
	NO DATA AVAILABLE				
20522	1.693	1.637	0.028	-5.4	1.693
20530	1.363	1.245	0.059	-20.9	1.363
20562	0.817	0.799	0.009	0.0	0.817

TABLE B115

MEMBRANE AND BENDING STRESSES - PLATE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1-5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 5

ROS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
205-2	NO DATA AVAILABLE			
20501	0.301	0.174	-3.319	-3.249
20503	0.080	0.407	-3.409	-2.811
	NO DATA AVAILABLE			
20507	-0.066	0.279	-2.854	-2.510
	NO DATA AVAILABLE			
20514	-0.087	0.143	-2.143	-1.982
	NO DATA AVAILABLE			
20522	-0.006	0.060	-1.698	-1.578
20530	-0.010	-0.044	-1.357	-1.305
20562	0.035	0.032	-0.782	-0.767

TABLE B116

STRAINS AND STRESSES - OUTER SURFACE OF NOZZLE
BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1-5246 IN.LB.

PLAT PLATE ONE NOZZLE
STRINGER NO. 5

ROS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
30501	-175.	-8.	-7.	-1.016	-0.008
30529	-172.	-7.	-30.	-1.025	-0.101
	3000.	3000.	3000.		
	3000.	3000.	3000.		
30513	-115.	-29.	-54.	-0.755	-0.312
30509	-141.	-119.	-99.	-1.064	-0.871
30507	-222.	-164.	-158.	-1.649	-1.282
30505	-322.	-228.	-228.	-2.379	-1.813
30503	-408.	-307.	-307.	-3.628	-2.417
30501	-605.	-390.	-399.	-4.361	-3.123
	3000.	3000.	3000.		

TABLE B117

PRINCIPAL STRESS DATA - OUTER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
30561	-0.008	-1.016	0.508	0.1	1.016
29	-0.097	-1.029	0.466	-3.7	1.029
NO DATA AVAILABLE					
NO DATA AVAILABLE					
30513	-0.303	-0.764	0.231	-8.2	0.764
30509	-0.858	-1.077	0.110	14.2	1.077
30507	-1.281	-1.650	0.184	2.4	1.650
30505	-1.813	-2.379	0.283	0.0	2.379
30503	-2.418	-3.628	0.605	0.0	3.628
30501	-3.123	-4.361	0.619	-1.1	4.361
NO DATA AVAILABLE					

TABLE B118

STRAINS AND STRESSES - INNER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	STRAINS (MICROINCHES PER INCH)			TOTAL STRESSES (NORMALIZED)	
	GAGE 1	GAGE 2	GAGE 3	MERIDIONAL	TANGENTIAL
40561	-117.	5.	-11.	-0.675	0.012
	3000.	3000.	3000.		
	3000.	3000.	3000.		
40520	-155.	-44.	8.	-0.927	-0.102
40513	-182.	-83.	-75.	-1.226	-0.606
40509	-108.	-100.	-123.	-0.881	-0.902
40507	1.	-143.	-126.	-0.314	-1.130
	3000.	3000.	3000.		
40505	362.	-29.	-64.	1.955	-0.505
40501	727.	-3.	20.	4.168	-0.159
405-2	357.	111.	105.	2.293	0.794

TABLE B119

PRINCIPAL STRESS DATA - INNER SURFACE OF NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	PRIN. STRESSES (NORMALIZED)		MAX. SHEAR STRESS (NORMALIZED)	ANGLE OF PRIN. STRESS (DEGREES)	STRESS INTENSITY (NORMALIZED)
	MAX.	MIN.			
40561	0.014	-0.677	0.346	-3.5	0.691
	NO DATA AVAILABLE				
	NO DATA AVAILABLE				
40520	-0.080	-0.945	0.434	9.1	0.949
40513	-0.605	-1.227	0.311	1.9	1.227
40509	-0.631	-0.953	0.061	40.0	0.953
40507	-0.312	-1.132	0.410	-3.1	1.132
	NO DATA AVAILABLE				
40503	1.958	-0.509	1.233	2.1	2.466
40501	4.168	-0.160	2.164	-0.8	4.328
405-2	2.293	0.794	0.750	0.6	2.293

TABLE B120

MEMBRANE AND BENDING STRESSES - NOZZLE

BENDING MOMENT APPLIED TO NOZZLE END
AND DIRECTED ALONG STRINGER 1, M1=5246 IN.LB.FLAT PLATE ONE NOZZLE
STRINGER NO. 5

POS. POS.	MEMBRANE STRESSES (NORMALIZED)		BENDING STRESSES (NORMALIZED)	
	MERIDIONAL	TANGENTIAL	MERIDIONAL	TANGENTIAL
40561	-0.845	0.002	-0.171	-0.010
	NO DATA AVAILABLE			
	NO DATA AVAILABLE			
40520	NO DATA AVAILABLE			
40513	-0.990	-0.459	0.236	0.147
40509	-0.972	-0.887	-0.091	0.016
40507	-0.982	-1.206	-0.668	-0.076
	NO DATA AVAILABLE			
40503	-0.837	-1.461	-2.791	-0.956
40501	-0.096	-1.641	-4.264	-1.482
405-2	NO DATA AVAILABLE			