

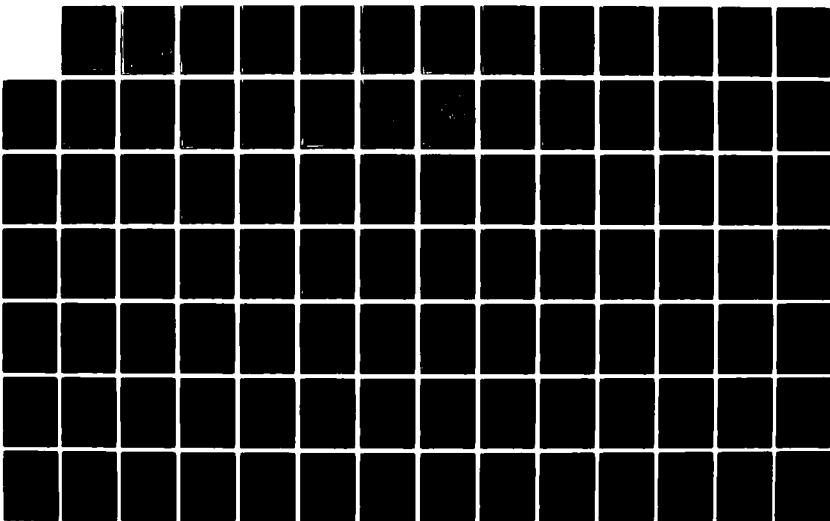
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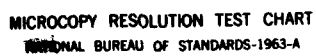
LGM-30B STAGE II DISSECTED MOTOR TEST REPRDT(U) OGDEN  
AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANALYSIS  
LAB E M DALABA FEB 84 MANPA-496(84)

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LGM-30B  
STAGE II  
DISSECTED  
MOTOR  
TEST REPORT

PROPELLANT ANALYSIS LABORATORY

MANPA REPORT NR 496(84)

February 1984

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LGM-30B, STAGE II

DISSECTED MOTOR

TEST REPORT

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# ABSTRACT

↪ Data analysis in this report is the culmination of testing on three dissected motors, as well as two test periods for a fourth dissected motor.

In order to relate the newest dissected motor to previously dissected motors, an analysis of covariance was performed. The new data was subjected to a determination of significance of means and variance. Regressions of individual motor trends for many parameters are included in this report.

Although these individual regressions do show some significant trends, it does not appear that age-out is imminent. ↪

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| LGM-30 Stage II Dissected<br>Motors Test Report 338(76)                                                                                          | May 1976    |
| LGM-30 Stage II Dissected<br>Motors Test Report 384(77)                                                                                          | Dec 1977    |
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## INTRODUCTION

**PURPOSE:** The purpose of this program is to continue surveillance testing of Minuteman Reentry System Launch Program Stage II propellant. This surveillance will elucidate the aging characteristics of the propellant and, using statistical trends derived from laboratory testing, will help to establish the service life expectation of similar motors in the inventory.

**BACKGROUND:** Surveillance testing was initiated in 1963 on cartons of propellant cast from the same propellant used in motor manufacture.

In 1971, all laboratory prepared insulation material and case-to-propellant bond specimens were destroyed in a conditioning chamber malfunction. The number of cartons of propellant were also near depletion, which would have terminated the surveillance program.

A force modernization program made available some older Minuteman I Stage II motors. Three of these motors were selected to represent the motor inventory and were dissected for laboratory surveillance testing. The motors selected were S/N 0022135, cast date June 1963; S/N 0022583, cast date January 1964; and S/N 0022788, cast in July 1964. An additional motor, S/N 0022687, cast in April 1964, became available and was dissected in 1981 for continuing surveillance testing.

MANPA Report 384(77) was the last time that carton data was combined with dissected motor data. Since that time, sufficient dissected motor data have been available for testing and statistical analysis. The test data from Stage II dissected motors were assumed to have a normal population that could be combined. This report demonstrates this to be a false assumption.

The amount of propellant available from motor S/N 0022583 was sufficient for only four test periods. Motors S/N 0022135 and 0022788 contained sufficient propellant for seven (7) test periods. These assets

have been depleted

No insulation materials from the three motors were available for testing since all materials were depleted during the fourth test period.

Test conditions and test parameters have changed since the inception of the program to improve or provide better test techniques or state-of-the-art. Limited data are available for some parameters and is evident in some of the regressions.

Motor S/N 0022687 was dissected in a different manner than other motors. The distance between cuts B and C, and cuts C and D was increased to 16 inches (figures 1 and 2).

Motors which have been dissected to date are:

| <u>Motor S/N</u> | <u>Cast Date</u> |
|------------------|------------------|
| 0022135          | 63162            |
| 0022583          | 64008            |
| 0022788          | 64197            |
| 0022687          | 64096            |

Segments A, B, and C from section 4 of motor S/N 0022687 were used for testing. The samples were cut in their respective orientation as illustrated in figure 3. Figure 4 illustrates the cutting plan for the latest test period.

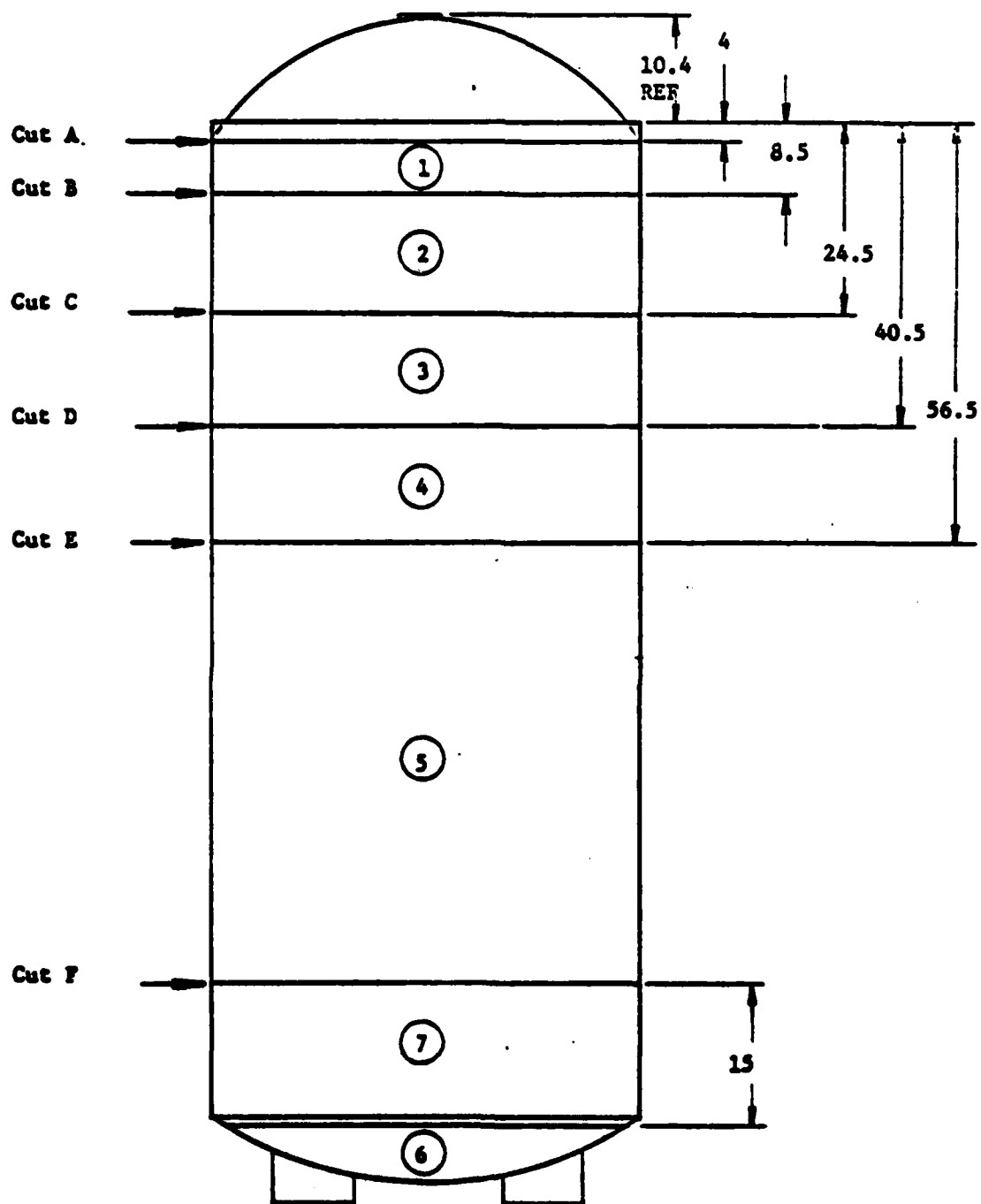


Figure 1 Dissection layout of Cuts, Locations and Section Numbers

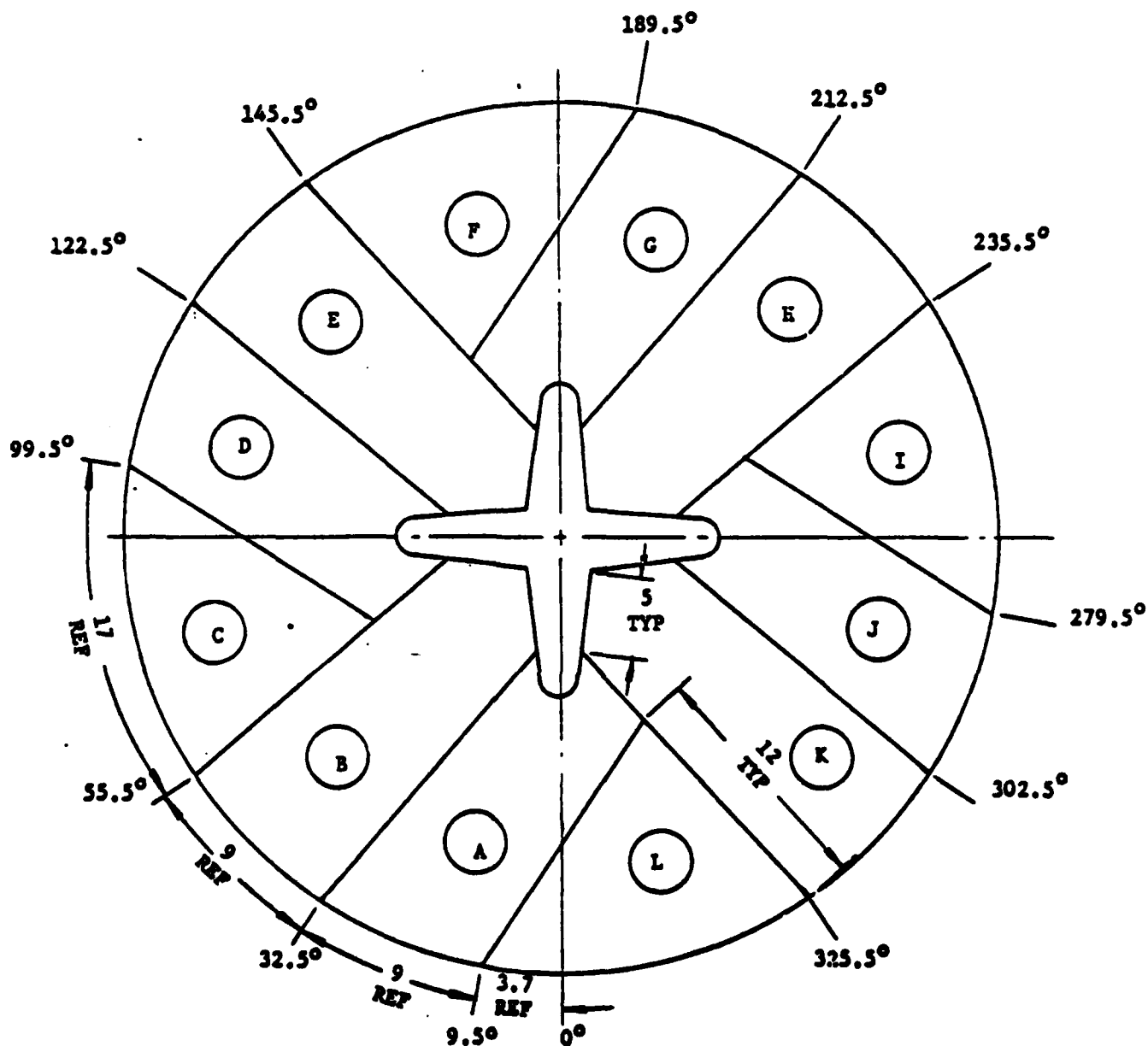


Figure 2 Section 3 and 4 Segment Layout and Letter Identification

This figure illustrates what the various sample orientation terms mean with respect to a segment of the motor.

A JANNAF dogbone is used in the illustration to depict the areas from where the specimens are obtained.

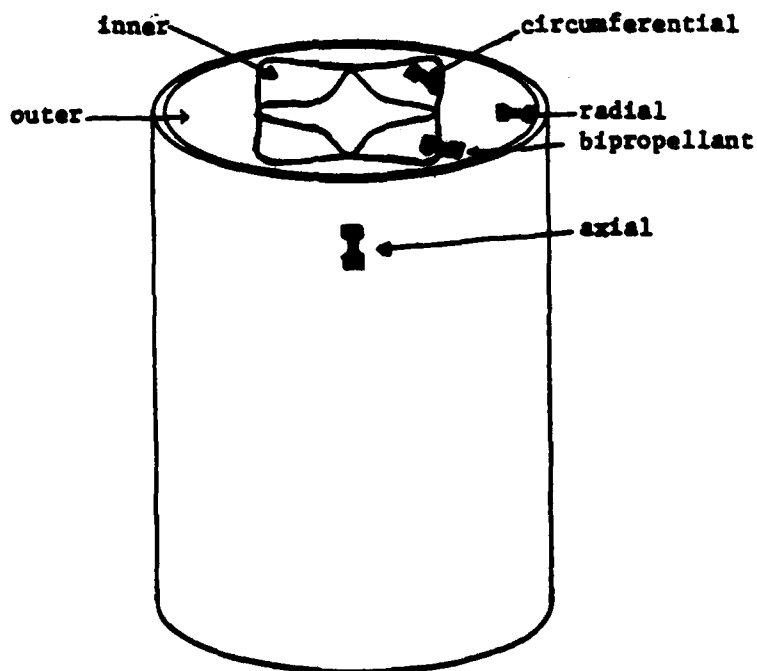
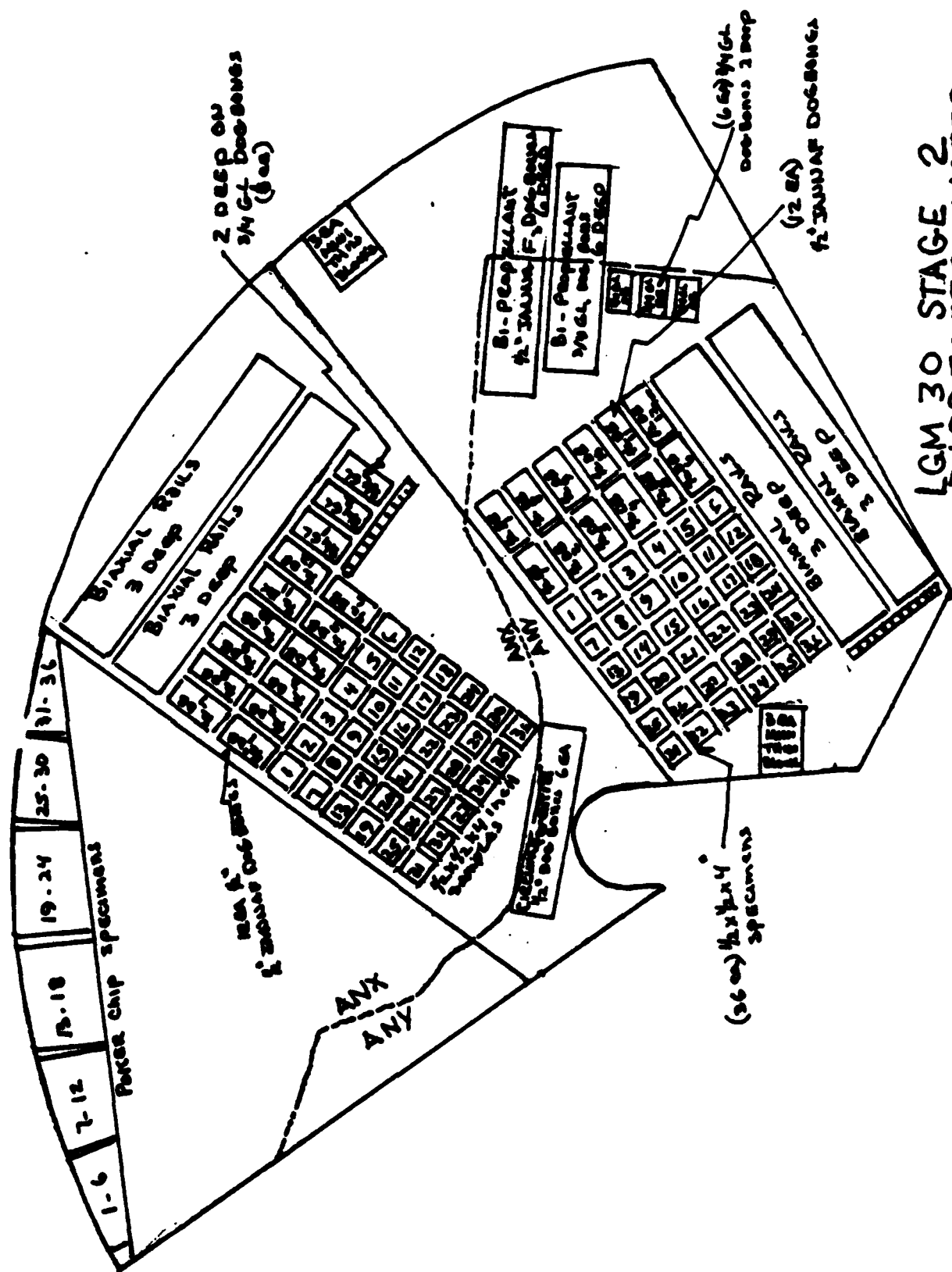


FIGURE 3



LGM 30 STAGE 2  
DISSECTED MOTOR  
CUTTING PLAN

## STATISTICAL ANALYSIS

The objective of this statistical analysis is to determine whether or not any aging trends are demonstrated by accumulated test data in order to assist Service Engineering to more accurately predict motor serviceability.

Testing and statistical analysis were performed to obtain an overall view of the aging trends affecting the Stage II Dissected motor program.

For this test period, analyses were made to determine: (1) what aging trends are demonstrated for motor 0022687 data within two test periods (1982 and 1983) and (2) the relationship between the data from motor S/N 0022687 and data from previously dissected motors 0022135, 0022583 and 0022788.

At the present time there are only two data points for motor 0022687, therefore a regression analysis would not be acceptable and it became necessary to relate the data to other dissected motors.

The data from motor 0022687 covering two test periods were statistically compared for combinability by comparing data variations (F test) and mean values (t test) of each test period at the 5% significance level (Table 1). There are 13 different tensile tests and five parameters per test. Thus, there are a total of 65 comparisons with an average of 7.9 samples per test period. The variance comparison resulted in 17 tests significantly different and 48 tests non-significant. The mean comparisons for those 48 tests with a non-significant variance resulted in 32 tests significantly different and 16 tests with no significant differences between means. Tensile testing comparisons resulted in significant differences from variance testing and mean testing. Sixteen out of 65, or 24.62% have a non-significant difference and data are combinable.

Stress relaxation testing uses two strain rates for two propellants at

five temperatures. Moreover, four times, in seconds, have been selected for comparison giving a total of 80 comparisons. An average of 3 samples per test period represents a small sample size. The variance comparison (F test) resulted in 34 tests significantly different and 46 tests non-significant. The mean comparison (t test) for those 46 tests with a non-significant variance, resulted in 30 tests significantly different and 16 tests non-significantly different between means. Stress relaxation comparisons resulted in 16 out of 80 or 20% indicating a non-significant difference, and these data are combinable.

For hardness, burn rate, and TCLE testing there are 8 comparisons with an average of 5.5 samples per test period, a marginal sample size. The variance comparison resulted in 3 tests significantly different and 5 tests non-significant. The mean comparisons for the 5 tests with a non-significant variance resulted in one test being significantly different and 4 tests non-significant between means. Test results for variance and mean show 4 out of 8 or 50% show a non-significant difference and data are combinable.

The results in the over all comparison testing of data from motor S/N 0022687 statistically indicates some factor has changed the propellant in 15 months time. These changes may be attributed to storage conditions, humidity or personnel change and are being investigated.

In 1977, using propellant from Stage II dissected motors, a normal distribution of the population was assumed (an assumption later proved invalid). Multiple type regressions, using a unique plotting code for each motor (combining data from all dissected motors into one regression) was the method of reporting the test results due to the small amount of data available for each motor. Because of this type reporting, masking of individual motor trends was possible and has been stated in previous reports as such. At the present, with more accumulation of data and improved sta-

tistical tools, individual motor variances and masking have now become obvious within the combined composite regression plots. All combined composite regression plots, using unique plotting codes for each motor, have been included to allow a visual display of the over all relationship between motors.

The data from composite regression plots have been subdivided into separate individual motor regression plots. A selected sample of these individual motor regressions were then tested for the statistical ability to combine these separate regressions to create a composite regression at the 5% significance level. A newly implemented Analysis of Covariance computer program was developed for this purpose. First, the data variance around the trend lines is compared if the variance is non-significant. The trend lines slope and elevation is then tested for combinability. Out of a total of 14 different tests currently used on this propellant, 5 tests were selected or 22 comparisons. All had a significant relationship and statistically should not be combined. Each motor must be individually plotted and analyzed to eliminate errors and provide meaningful regressions. The composite plots in this report show the relationship between the earlier dissected motors and motor 0022687.

Table 2 contains the Analysis of Covariance results for five tests.

The motor-to-motor relationships and direction of regression trend line slopes may be found in Table 3. Table 3 also identifies areas in which the composite plots have been masking individual motor trends. Such an example is very low rate tensile maximum stress on the outer propellant at 0.0002 in/min, where the combined composite regression trend line has a non-significant slope. However, the trend line for motor 0022135 has a negative slope. There are many cases of the composite plots masking the individual motor trends found in Table 3.

## DEFINITION OF THE MASTER STRESS RELAXATION CURVE

The master stress relaxation curve is a composite curve representing the behavior of a polymer over a wide range of time and temperature relationships. From a curve constructed at a given strain level, any combination of time and temperature can be used to determine a corresponding stress relaxation modulus.

## DETERMINATION OF STRESS RELAXATION MODULUS USING A MASTER STRESS RELAXATION CURVE

From test data at a particular strain level, a polymer's stress relaxation modulus corresponding to any combination of time and temperature can be determined. The horizontal axis of the master stress relaxation plot is a logarithmic value  $(t/a_T)$ , and the vertical axis is a linear value,  $E(t)298/T$ , where  $E(t)$  is the stress relaxation modulus dependent on time.  $T$  is temperature in degrees Kelvin,  $a_T$  equals any relaxation time at temperature  $T$  divided by the corresponding time at the reference temperature (298 degrees Kelvin or 77°F), and ' $t$ ' is relaxation time in seconds. The stress relaxation modulus for any combination of temperature and time can be determined by using the following steps:

a. For each stress relaxation plot there is associated a plot of temperature in degrees F versus  $\log a_T$ . From this plot, determine  $\log a_T$  corresponding to the temperature at which stress relaxation modulus is desired.

b. Determine  $\log 't'$  or  $\log$  of the desired stress relaxation time.

c. Determine  $\log (t/a_T)$  by using the equation:

$$\log (t/a_T) = \log t - \log a_T.$$

d. Place the determined value of  $\log (t/a_T)$  in the horizontal axis of the large plot and reference the master stress relaxation curve to determine the corresponding value  $E(t)298/T$  in the vertical axis.

e. Determine  $298/T$  and divide into  $E(t)298T$  to find  $E(t)$ , the stress relaxation modulus at the desired time and temperature.

## TEST RESULTS

### INTRODUCTION:

Testing of only one motor at this test period required a different statistical approach. Means and variance were analyzed for the 1982 and 1983 test data. This type of analysis will track any change between the data from the two test periods. Table 1 shows the significance, or non-significance, of means and variance. From the table, it can be seen that few comparisons are not significant in either means or variance. This comparison resulted in further data analysis.

Combined regressions, using other dissected motor data, were made to show the relationship of data from motor 0022687 to the other motors since a regression using two points is meaningless.

Table 3 shows the significance of slopes for the combined multiple regressions and for each of the three previously dissected motors. This tabular presentation makes it clear that there are significant differences between motors. This current analysis completes the data package on these motors.

Tables 4 and 5 give a presentation of the tensile data on motor S/N 0022687 for two test periods. Table 6 gives stress relaxation data, while Table 7 lists data for miscellaneous test parameters.

### A. UNIAXIAL TENSILE TEST:

Motor 0022687 outer propellant shows an apparent increase in all parameters except modulus at very low rate. At 2.0 in/min, there is an apparent decrease except for strain at rupture (Table 4). Figures 5 through 16 and figures 29 through 40 show all these parameters for all motors.

Inner propellant at both crosshead speeds shows an apparent decrease in all parameters except modulus. Figures 17 through 28 and figures 41 through 52 are regressions for inner propellant on all motors.

**B. BIAXIAL TENSILE TEST:**

For the outer propellant from motor 0022687, the composite regression visually shows an increase in all parameters. Inner propellant, although not statistically verified, shows an increase in strain and modulus with a slight decrease in stress. Outer propellant regressions are shown in figures 53 through 64 and inner propellant for all motors in figures 65 through 76.

**C. HIGH RATE HYDROSTATIC UNIAXIAL TENSILE:**

Motor 0022687 outer propellant shows essentially no change except for a decrease in modulus. Inner propellant shows a significant change in all parameters. Regressions for all motors are shown in figures 77 through 100. There was no change in strain at rupture in any motor. The maximum stress for the individual motor regressions except for motor 0022135, inner propellant, is increasing significantly with age. The modulus for all the individual motor regressions is also increasing with age.

**D. CIRCUMFERENTIAL TENSILE:**

This test has been limited to inner propellant. At 0.0002 in/min, there is a significant difference in means for all parameters for motor 0022687. At 2.0 in/min, only modulus does not show a significant change in means. Figures 101 through 112 represent regressions of available data for this test. There are few significant changes in the individual motor regressions.

**E. BI-PROPELLANT TENSILE:**

Very low rate testing on motor 0022687 showed an apparent increase in all parameters except modulus. This is probably not a real change since trends in the other motors are mostly not significant (figures 113 through 121).

For motor 0022687, the apparent increase in strain and decrease in stress and modulus under hydrostatic conditions are probably not significant (Table 5). There exists only a limited amount of data for this test so there are no regressions.

F. MINITHIN TENSILE:

Minithin tensile specimens are used to measure changes in properties across a gradient. The possibility exists for migration of ingredients from insulation and liner into the propellant, or from the propellant into the insulation and liner. There is also a possibility of propellant from the bore (inner) to show changes across a gradient. Very little data has been acquired from this test (only two test periods). A mean of all the values across the gradient for each block is given in Table 5. No noticeable trend exists in the gradient. There are no regressions for this test.

G. STRESS RELAXATION PROPERTIES:

Stress relaxation data for motor 0022687 are provided in Table 6. A comparison of the significant changes are provided in Table 1.

At  $-65^{\circ}\text{F}$ , all specimens exhibited bond failure, a condition which sometimes occurred at  $-40^{\circ}\text{F}$ . Only data at  $77^{\circ}\text{F}$  are adequate for regression.

Combined regressions for outer propellant are shown in figures 122 through 129. Figures 130 through 137 show combined regressions for inner propellant.

Master curves, as explained in the statistical portion of the report, are also included for 1983 testing of motor 0022687. These are given in figures 138 through 141. Insufficient data points could result in sharp regression trend slopes, but the master curves indicate no problem in stress relaxation at this time.

#### H. BURN RATE:

Burn rate is compared in Table 7. Both outer and inner propellant show faster burning than in 1982 testing. Regressions for all motors are given in figures 142 through 148. A significantly faster burning rate for motor 0022687 would be consistent, at least for inner propellant, with other dissected motors.

#### I. THERMAL COEFFICIENT OF LINEAR EXPANSION (TCLE):

The 1983 data for motor 0022687 shows no significant change for outer or inner propellant for the two parameters measured. The net effect of the slight decrease in TCLE below Tg for outer propellant changes the total regression from significant to non-significant. Regressions for this parameter are shown in figures 149 through 152. TCLE above Tg shows a significant increase (figures 153 through 156). For inner propellant there are changes both in significance and slope depending upon the motor (figures 157 through 164).

#### J. HARDNESS:

Shore A hardness for outer propellant in motor 0022687 appears to decrease and for inner propellant it appears to increase. Two of the other three dissected motors show a significant decrease in hardness at both initial and 10 seconds (figures 165 thru 168 and 173 thru 176) for outer propellant. Inner propellant shows a significant decrease for two of the older motors (figures 169 thru 172 and 177 thru 180). Motor 0022583 propellant however shows a hardening trend.

#### K. SWELL RATIO, GEL FRACTION AND MOISTURE:

For motor 0022687, swell ratio on insulation shows a slight increase and gel fraction shows a slight decrease from 1982 testing. On the other hand, liner shows a decrease and gel fraction an increase over 1982 values.

The moisture in the insulation was higher. The 1983 specimens were obtained from section 4.

Mean values for these tests are given in Table 7.

L. AVCOAT PROPERTIES:

A Shore D hardness test was run on Avcoat material removed from constant load specimens before bonding. A hardness of 59 corresponds, in general, to the hardness obtained on tensile specimens of Avcoat in the component program. Hardness in the 1982 report was for Avcoat plus case.

Shear strength of Avcoat under pressure is somewhat lower than in 1982 (Table 8).

Both shear and tensile strength of composite were lower than in 1982 testing (Table 8).

M. CONSTANT LOAD:

For motor 0022687 the constant load tensile and constant load shear also show lower values than in 1982. Values are given for three time points instead of just 100 minutes. Data for these tests is determined from log stress versus log time to failure. Failure modes differ, usually propellant to liner in the tensile mode. Shear tests showed cohesive failure in the propellant.

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS:

For motor 0022687, an examination of mean values shows significant changes during the 1983 testing. The significance of trends however, cannot be determined from two data points. The relationship of motor 0022687 to other motors in the dissected program is not clear-cut. Although there seems to be a pattern for some parameters, it is not consistent for all tests. This is shown in the multi-motor regressions.

The individual motor regressions have shown significant trends. Thus far, none of these are approaching failure limits.

### RECOMMENDATIONS:

Testing on motor 0022687 should be continued in order to determine trends and their significance.

It would be advantageous to place more emphasis on consistency of test parameters in order to obtain sufficient data for regressions, i.e., minithin testing and hydrostatic testing of bi-propellant.

TABLE 1

SIGNIFICANCE OF VARIANCE AND MEAN  
( 'P' Test and 't' Test )  
Comparison of Motor 0022687 Tested in 1982 & 1983

| <u>Test</u>                                      | <u>Sample</u><br><u>Nr/Grp</u> | <u>Max</u><br><u>Stress</u> | <u>Strain at</u><br><u>Max Stress</u> | <u>Strain at</u><br><u>Rupture</u> | <u>Stress at</u><br><u>Rupture</u> | <u>Modulus</u> |
|--------------------------------------------------|--------------------------------|-----------------------------|---------------------------------------|------------------------------------|------------------------------------|----------------|
| Tensile, Very Low Rate, 0.0002 in/min, Outer     | 6                              | NS                          | Vari                                  | Mean                               | NS                                 | Mean           |
|                                                  | 8                              | NS                          | Vari                                  | Vari                               | Vari                               | Vari           |
| Tensile, Low Rate, 2.0 in/min, Outer             | 6                              | Mean                        | Vari                                  | Vari                               | Mean                               | Mean           |
|                                                  | 7                              | Mean                        | Mean                                  | Vari                               | Mean                               | Vari           |
| Tensile, Biaxial Low Rate, 0.2 in/min, Outer     | 6                              | Mean                        | Mean                                  | Mean                               | NS                                 | Mean           |
|                                                  | 6                              | Vari                        | NS                                    | NS                                 | Vari                               | NS             |
| Tensile, HR Hydro, 1750 in/min, 500 psi, Outer   | 6                              | NS                          | NS                                    | NS                                 | NS                                 | Mean           |
|                                                  | 6                              | Vari                        | Mean                                  | Mean                               | Vari                               | Mean           |
| Tensile, Very Low Rate, 0.0002 in/min, Bi-prop   | 7                              | Mean                        | Mean                                  | Mean                               | NS                                 | NS             |
| Tensile, High Rate, 1750 in/min, 500 psi, Biprop | 7                              | Vari                        | NS                                    | Mean                               | Vari                               | Mean           |
| Tensile, Very Low Rate, 0.0002 in/min, Circumfer | 5                              | Mean                        | Mean                                  | Mean                               | Mean                               | Mean           |
|                                                  | 5                              | Mean                        | Mean                                  | Mean                               | Mean                               | Vari           |
| Tensile, Minithin, 1.0 in/min, Inner             | 28                             | Mean                        | NS                                    | NS                                 | Mean                               | Vari           |
|                                                  |                                |                             | 10 sec                                | 50 sec                             | 100 sec                            | 1000 sec       |
| Stress Relaxation, 3% Strain, Outer, -40°F       | 3                              | Mean                        | Mean                                  | Mean                               | Vari                               | Vari           |
|                                                  | 3                              | Mean                        | Vari                                  | Mean                               | NS                                 | NS             |
|                                                  | 3                              | NS                          | NS                                    | NS                                 | NS                                 | NS             |
|                                                  | 3                              | Mean                        | Mean                                  | Mean                               | Vari                               | Vari           |
|                                                  | 3                              | Mean                        | Mean                                  | Mean                               | NS                                 | NS             |
|                                                  |                                |                             |                                       |                                    |                                    |                |
|                                                  | 3                              | Mean                        | Mean                                  | Mean                               | Mean                               | Mean           |
|                                                  | 3                              | NS                          | NS                                    | NS                                 | NS                                 | NS             |
|                                                  | 3                              | Vari                        | Vari                                  | Vari                               | Vari                               | Vari           |
|                                                  | 3                              | Mean                        | Mean                                  | Mean                               | Mean                               | Mean           |
|                                                  | 3                              | Vari                        | Vari                                  | Vari                               | Vari                               | Vari           |

TABLE 1 (cont)

| Test                                       | Nr/Grp | 10 sec | 50 sec | 100 sec | 1000 sec |
|--------------------------------------------|--------|--------|--------|---------|----------|
| Stress Relaxation, 5% Strain, Outer, -40°F | 3      | Vari   | Vari   | Vari    | Mean     |
| 20°F                                       | 3      | NS     | Mean   | Vari    | Vari     |
| 77°F                                       | 3      | NS     | NS     | NS      | NS       |
| 120°F                                      | 3      | Mean   | Mean   | Mean    | Vari     |
| 160°F                                      | 3      | Mean   | Vari   | Vari    | Mean     |
| Inner, -40°F                               | 3      | Mean   | Mean   | Mean    | Mean     |
| 20°F                                       | 3      | Vari   | Vari   | Vari    | Vari     |
| 77°F                                       | 3      | Vari   | Vari   | Vari    | Vari     |
| 120°F                                      | 3      | Vari   | Vari   | Vari    | Vari     |
| 160°F                                      | 3      | Vari   | Vari   | Vari    | Vari     |
| Hardness, Shore A, 10 sec, Outer           | 10     | Vari   |        |         |          |
| Inner                                      | 10     | Vari   |        |         |          |
| TCLL, Below Tg, Outer                      | 3      | NS     |        |         |          |
| Above Tg, Outer                            | 3      | NS     |        |         |          |
| Below Tg, Inner                            | 3      | NS     |        |         |          |
| Above Tg, Inner                            | 3      | NS     |        |         |          |
| Burn Rate, 500 psi, Outer                  | 6      | Mean   |        |         |          |
| Inner                                      | 6      | Vari   |        |         |          |

NS - Non-significant

Vari - Differences found among data variances

Mean - Differences found among data means

TABLE 2

**ANALYSIS OF COVARIANCE SUMMARY**  
**Comparison of Regressions Between 0022135, 0022583 & 0022788**

| Test                                           | Nr<br>Samples | Residual<br>Mean Squares |           | Difference Between<br>Residual Trend Lines |          |                 |
|------------------------------------------------|---------------|--------------------------|-----------|--------------------------------------------|----------|-----------------|
|                                                |               | 0022135                  | 0022583   | 0022788                                    | Variance | Slope Elevation |
| Tensile, Very Low Rate, 0.0002 in/min,         |               |                          |           |                                            |          |                 |
| Outer, Maximum Stress, 77°F                    | 108           | 10.522                   | 32.998    | 15.530                                     | S        | -               |
| " Strain at Rupture, 77°F                      | 108           | 0.0005906                | 0.0005166 | 0.0009886                                  | NS       | S               |
| " Modulus, 77°F                                | 108           | 3568.1                   | 2470.6    | 3743.8                                     | NS       | NS              |
| Inner, Maximum Stress, 77°F                    | 151           | 34.750                   | 25.790    | 20.678                                     | NS       | S               |
| " Strain at Rupture, 77°F                      | 154           | 0.0010087                | 0.0008333 | 0.0021539                                  | S        | -               |
| " Modulus, 77°F                                | 154           | 2253.2                   | 1422.5    | 1396.4                                     | NS       | S               |
| Tensile, High Rate Hydro, 1750 in/min, 500 psi |               |                          |           |                                            |          |                 |
| Outer, Maximum Stress, 77°F                    | 89            | 1036.6                   | 4207.7    | 33497.0                                    | S        | -               |
| " Strain at Rupture, 77°F                      | 89            | 0.0021534                | 0.0022428 | 0.022861                                   | S        | -               |
| " Modulus, 77°F                                | 89            | 302350.0                 | 1422.5    | 1396.4                                     | S        | -               |
| Inner, Maximum Stress, 77°F                    | 97            | 10081.0                  | 3190.1    | 3108.9                                     | S        | -               |
| " Strain at Rupture, 77°F                      | 97            | 0.0023537                | 0.0042473 | 0.0054679                                  | S        | -               |
| " Modulus, 77°F                                | 97            | 97433.0                  | 568620.0  | 1112200.0                                  | NS       | -               |
| Tensile, Bi-propellant, 0.0002 in/min, 77°F    |               |                          |           |                                            |          |                 |
| Maximum Stress                                 | 48            | 9.5555                   | N/A       | 15.220                                     | NS       | S               |
| Strain at Rupture                              | 49            | 0.00016923               | N/A       | 0.00076906                                 | S        | -               |
| Modulus                                        | 49            | 834.70                   | N/A       | 2248.0                                     | S        | -               |
| Tensile, Circumferential, 0.0002 in/min, 77°F  |               |                          |           |                                            |          |                 |
| Inner, Maximum Stress                          | 36            |                          | N/A       | 2.6135                                     | NS       | S               |
| " Strain at Rupture                            | 36            | 0.0007419                | N/A       | 0.0019289                                  | S        | -               |
| " Modulus                                      | 36            | 379.51                   | N/A       | 2894.3                                     | S        | -               |
| Hardness, Shore A, 77°F                        |               |                          |           |                                            |          |                 |
| Outer, Initial                                 | 200           | 4.2373                   | 3.8086    | 8.6533                                     | S        | -               |
| Inner, Initial                                 | 208           | 4.4194                   | 9.7621    | 40.281                                     | S        | -               |
| Outer, 10 sec                                  | 200           | 6.3445                   | 3.5362    | 2.6123                                     | S        | -               |
| Inner, 10 sec                                  | 208           | 4.6620                   | 14.247    | 7.4148                                     | S        | -               |

S - Data are significantly different

NS - Data not significant

N/A - Only three test periods

- - No further Covariance testing needed

TABLE 3

## REGRESSION SUMMARY

| Test                                                     | Motor<br>S/N | Sample<br>Nr/Grp | Sm | OUTER<br>er | E  | Sample<br>Nr/Grp | Sm | INNER<br>er | E  |
|----------------------------------------------------------|--------------|------------------|----|-------------|----|------------------|----|-------------|----|
| Tensile, Very Low Rate, 0.0002 in/min                    | Composite    | 118/20           | NS | S+          | NS | 169/23           | NS | NS          | NS |
|                                                          | 0022135      | 36/6             | S- | NS          | NS | 60/9             | NS | NS          | S- |
|                                                          | 0022583      | 30/4             | NS | S-          | NS | 36/4             | S+ | NS          | NS |
|                                                          | 0022788      | 42/7             | NS | S+          | S- | 58/7             | NS | NS          | NS |
|                                                          | 0022687      | 10/2             | X  | X           | X  | 15/2             | X  | X           | X  |
| Tensile, Low Rate, 2.0 in/min                            | Composite    | 126/22           | S+ | S-          | NS | 152/20           | NS | S+          | NS |
|                                                          | 0022135      | 41/8             | S+ | NS          | NS | 47/6             | S- | S+          | S- |
|                                                          | 0022583      | 32/5             | S+ | NS          | S+ | 39/5             | S+ | S+          | S+ |
|                                                          | 0022788      | 41/7             | NS | S+          | S- | 46/7             | S- | S-          | NS |
|                                                          | 0022687      | 12/2             | X  | X           | X  | 20/2             | X  | X           | X  |
| Tensile, Biaxial, 0.2 in/min                             | Composite    | 86/19            | NS | S+          | S- | 96/21            | NS | S+          | NS |
|                                                          | 0022135      | 31/7             | S- | NS          | S- | 30/7             | S- | S+          | S- |
|                                                          | 0022583      | 22/4             | S- | S+          | S- | 22/5             | NS | NS          | NS |
|                                                          | 0022788      | 29/7             | NS | S+          | S- | 32/7             | NS | NS          | S- |
|                                                          | 0022687      | 4/2              | X  | X           | X  | 12/2             | X  | X           | X  |
| Tensile, High Rate Hydro, 1750 in/min                    | Composite    | 101/19           | S+ | NS          | S+ | 109/20           | S+ | NS          | S+ |
|                                                          | 0022135      | 28/6             | S+ | NS          | S+ | 38/7             | NS | NS          | S+ |
|                                                          | 0022583      | 21/4             | S+ | NS          | S+ | 24/4             | S+ | NS          | S+ |
|                                                          | 0022788      | 40/7             | S+ | NS          | S+ | 35/7             | S+ | NS          | S+ |
|                                                          | 0022687      | 12/2             | X  | X           | X  | 12/2             | X  | X           | X  |
| Tensile, Very Low Rate, 0.0002 in/min<br>Circumferential | Composite    | NA/NA            | NA | NA          | NA | 55/16            | S+ | NS          | NS |
|                                                          | 0022135      | NA/NA            | NA | NA          | NA | 19/6             | NS | NS          | S- |
|                                                          | 0022583      | NA/NA            | NA | NA          | NA | 10/3             | X  | X           | X  |
|                                                          | 0022788      | NA/NA            | NA | NA          | NA | 17/5             | NS | NS          | NS |
|                                                          | 0022687      | NA/NA            | NA | NA          | NA | 9/2              | X  | X           | X  |
| Tensile, Low Rate, 2.0 in/min,<br>Circumferential        | Composite    | NA/NA            | NA | NA          | NA | 33/7             | NS | S+          | NS |
|                                                          | 0022135      | NA/NA            | NA | NA          | NA | 9/2              | X  | X           | X  |
|                                                          | 0022583      | NA/NA            | NA | NA          | NA | 7/1              | X  | X           | X  |
|                                                          | 0022788      | NA/NA            | NA | NA          | NA | 9/2              | X  | X           | X  |
|                                                          | 0022687      | NA/NA            | NA | NA          | NA | 8/2              | X  | X           | X  |

TABLE 3 (cont)

| Test                                                         | Motor<br>S/N | Sample<br>Nr/Grp | OUTER |    |    | INNER      |    |    |
|--------------------------------------------------------------|--------------|------------------|-------|----|----|------------|----|----|
|                                                              |              |                  | Sm    | er | E  | Sm         | er | E  |
| Tensile, Minithins, 1.0 in/min                               | Composite    | 97/3             | S-    | NS | S- | S+         | NS | S+ |
|                                                              | 0022135      | 44/1             | X     | X  | X  | X          | X  | X  |
|                                                              | 0022583      | X                | X     | X  | X  | X          | X  | X  |
|                                                              | 0022788      | 35/1             | X     | X  | X  | X          | X  | X  |
|                                                              | 0022687      | 18/1             | X     | X  | X  | X          | X  | X  |
| Tensile, Very Low Rate, (ANC) Bi-prop<br>0.0002 in/min       | Composite    | 75/18            | S-    | NS | S- |            |    |    |
|                                                              | 0022135      | 25/7             | S-    | NS | S- |            |    |    |
|                                                              | 0022583      | 13/3             | X     | X  | X  |            |    |    |
|                                                              | 0022788      | 23/6             | NS    | NS | NS |            |    |    |
|                                                              | 0022687      | 14/2             | X     | X  | X  |            |    |    |
| Tensile, High Rate, 1750 in/min,<br>500 psi, ANC             | Composite    | 25/4             | NS    | NS | S- |            |    |    |
|                                                              | 0022135      | 6/1              | X     | X  | X  |            |    |    |
|                                                              | 0022583      | X                | X     | X  | X  |            |    |    |
|                                                              | 0022788      | 6/1              | X     | X  | X  |            |    |    |
|                                                              | 0022687      | 13/2             | X     | X  | X  |            |    |    |
| Stress Relaxation, 3% Strain, -40°F<br>20°F<br>77°F<br>120°F | Composite    | 18/6             | NS    | NS | NS | NS         | NS | NS |
|                                                              | Composite    | 24/8             | NS    | NS | NS | S+         | NS | NS |
|                                                              | Composite    | 71/11            | S-    | S- | S- | NS         | NS | NS |
|                                                              | Composite    | 12/4             | S-    | S- | S- | NS         | NS | NS |
|                                                              | Composite    | 9/3              | S+    | S+ | S+ | S+         | S+ | S+ |
| Stress Relaxation, 5% Strain, -40°F<br>20°F<br>77°F<br>120°F | Composite    | 12/4             | NS    | NS | NS | NS         | NS | NS |
|                                                              | Composite    | 60/7             | S-    | S- | S- | NS         | NS | NS |
|                                                              | Composite    | 12/4             | S+    | S+ | S+ | NS         | NS | NS |
|                                                              | Composite    | 9/3              | S+    | S+ | S+ | S+         | S+ | S+ |
|                                                              | Composite    | 12/4             | S+    | S+ | S+ | NS         | NS | NS |
| Burn Rate, 500 psi, in/sec                                   | Composite    | 78/16(S+)        |       |    |    | 102/21(S+) |    |    |
|                                                              | 0022135      | 23/5 (S+)        |       |    |    | 32/7 (S+)  |    |    |
|                                                              | 0022583      | 17/3 X           |       |    |    | 26/5 (S+)  |    |    |
|                                                              | 0022788      | 26/6 (NS)        |       |    |    | 32/7 (NS)  |    |    |
|                                                              | 0022687      | 12/2 X           |       |    |    | 12/2 X     |    |    |

TABLE 3 (cont)

| Test                      | Motor<br>S/N | Sample<br>Nr/Grp | OUTER | Sample<br>Nr/Grp | INNER |
|---------------------------|--------------|------------------|-------|------------------|-------|
| TCLE, Below Glass Point   | Composite    | 76/20            | NS    | 76/20            | S+    |
|                           | 0022135      | 26/7             | S+    | 27/7             | NS    |
|                           | 0022583      | 17/4             | NS    | 17/4             | NS    |
|                           | 0022788      | 26/7             | NS    | 26/7             | S+    |
|                           | 0022687      | 7/2              | X     | 6/2              | X     |
| TCLE, Above Glass Point   | Composite    | 76/20            | S+    | 76/20            | S+    |
|                           | 0022135      | 26/7             | S+    | 27/7             | NS    |
|                           | 0022583      | 17/4             | S+    | 17/4             | NS    |
|                           | 0022788      | 26/7             | S+    | 26/7             | S+    |
|                           | 0022687      | 7/2              | X     | 6/2              | X     |
| Hardness, Initial Reading | Composite    | 221/19           | S-    | 241/19           | S-    |
|                           | 0022135      | 75/7             | S-    | 75/7             | S-    |
|                           | 0022583      | 50/4             | NS    | 58/4             | S+    |
|                           | 0022788      | 75/7             | S-    | 75/7             | S-    |
|                           | 0022687      | 21/2             | X     | 33/2             | X     |
| Hardness, 10 sec Reading  | Composite    | 220/20           | S-    | 241/20           | S+    |
|                           | 0022135      | 75/7             | NS    | 75/7             | S-    |
|                           | 0022583      | 50/4             | S-    | 58/4             | S+    |
|                           | 0022788      | 75/4             | S-    | 75/7             | NS    |
|                           | 0022687      | 20/2             | X     | 33/2             | X     |

NS = Non-significant Difference

S+ = Significant difference in trend line slope in the positive direction

S- = Significant difference in trend line slope in the negative direction

X = Not sufficient data for regressions

TABLE 4

Bi-Propellant Tensile Test Data  
1982 - 1983 Mean Values

Motor S/N 0022687

| <u>Test</u>                        | <u>CHS</u><br><u>(in/min)</u> | <u>Year</u> | <u>Sm</u><br><u>(psi)</u> | <u>em</u><br><u>(in/min)</u> | <u>er</u><br><u>(in/min)</u> | <u>Sr</u><br><u>(psi)</u> | <u>E</u><br><u>(psi)</u> |
|------------------------------------|-------------------------------|-------------|---------------------------|------------------------------|------------------------------|---------------------------|--------------------------|
| Hydrostatic Tensile,<br>at 500 psi | 1750                          | 1982        | 526.6                     | .380                         | .453                         | 515.8                     | 6323                     |
|                                    |                               | 1983        | 519.3                     | .395                         | .477                         | 504.2                     | 4578                     |
| Uniaxial Tensile                   | .0002                         | 1982        | 37.2                      | .217                         | .237                         | 35.4                      | 232                      |
|                                    |                               | 1983        | 39.9                      | .229                         | .260                         | 36.8                      | 225                      |

TABLE 5

Tensile Test Parameters  
1982 - 1983 Mean Values

| <u>OUTER</u>            |                               |             |                           |                              |                              |                           |                          |
|-------------------------|-------------------------------|-------------|---------------------------|------------------------------|------------------------------|---------------------------|--------------------------|
| <u>Test</u>             | <u>CHS</u><br><u>(in/min)</u> | <u>Year</u> | <u>Sm</u><br><u>(psi)</u> | <u>em</u><br><u>(in/min)</u> | <u>er</u><br><u>(in/min)</u> | <u>Sr</u><br><u>(psi)</u> | <u>E</u><br><u>(psi)</u> |
| Uniaxial Tensile        | 0.0002                        | 1982        | 45.7                      | .194                         | .235                         | 42.3                      | 338                      |
|                         |                               | 1983        | 47.6                      | .224                         | .258                         | 43.5                      | 290                      |
|                         | 2.0                           | 1982        | 129.9                     | .388                         | .592                         | 108.8                     | 944                      |
|                         |                               | 1983        | 112.1                     | .376                         | .627                         | 92.0                      | 737                      |
| Biaxial Tensile         | 0.2                           | 1982        | 104.3                     | .316                         | .416                         | 95.5                      | 696                      |
|                         |                               | 1983        | 110.0                     | .354                         | .452                         | 99.9                      | 761                      |
| Hydrostatic Tensile     | 1750<br>at 500 psi            | 1982        | 557.4                     | .333                         | .419                         | 541.6                     | 6887                     |
|                         |                               | 1983        | 560.6                     | .340                         | .432                         | 542.7                     | 5650                     |
| Minithin Tensile        | 1.0                           | 1983        | 94.1                      | .446                         | .637                         | 79.7                      | 522                      |
| <u>INNER</u>            |                               |             |                           |                              |                              |                           |                          |
| Uniaxial Tensile        | 0.0002                        | 1982        | 48.6                      | .356                         | .407                         | 46.1                      | 185                      |
|                         |                               | 1983        | 47.9                      | .272                         | .329                         | 44.1                      | 244                      |
|                         | 2.0                           | 1982        | 123.1                     | .549                         | .730                         | 111.4                     | 644                      |
|                         |                               | 1983        | 116.5                     | .423                         | .712                         | 96.7                      | 751                      |
| Biaxial Tensile         | 0.2                           | 1982        | 118.1                     | .447                         | .529                         | 113.3                     | 447                      |
|                         |                               | 1983        | 114.2                     | .460                         | .566                         | 108.8                     | 470                      |
| Hydrostatic Tensile     | 1750<br>at 500 psi            | 1982        | 606.1                     | .507                         | .665                         | 583.8                     | 5445                     |
|                         |                               | 1983        | 591.2                     | .572                         | .748                         | 559.2                     | 4037                     |
| Circumferential Tensile | 0.0002                        | 1982        | 49.8                      | .374                         | .402                         | 48.3                      | 185                      |
|                         |                               | 1983        | 55.5                      | .334                         | .368                         | 52.6                      | 22.                      |
|                         | 2.0                           | 1982        | 121.0                     | .429                         | .537                         | 111.3                     | 658                      |
|                         |                               | 1983        | 141.7                     | .596                         | .657                         | 135.4                     | 638                      |
| Minithin Tensile        | 1.0                           | 1982        | 118.5                     | .737                         | .833                         | 113.0                     | 653                      |
|                         |                               | 1983        | 125.6                     | .743                         | .832                         | 120.7                     | 446                      |

TABLE 6  
Stress Relaxation  
1982 - 1983 Mean Values

| OUTER       |           |             |              |              |               |                |
|-------------|-----------|-------------|--------------|--------------|---------------|----------------|
| Strain Rate | Temp (°F) | Year Tested | 10 sec (psi) | 50 sec (psi) | 100 sec (psi) | 1000 sec (psi) |
| 3%          | -40       | 1982        | 12,518       | 7300         | 5859          | 2601           |
|             |           | 1983        | 13,784       | 8176         | 6403          | 3007           |
|             | +20       | 1982        | 1635         | 958          | 793           | 444            |
|             |           | 1983        | 1959         | 1058         | 866           | 4.8            |
|             | +77       | 1982        | 506          | 352          | 318           | 242            |
|             |           | 1983        | 467          | 340          | 301           | 229            |
|             | 120       | 1982        | 399          | 322          | 300           | 245            |
|             |           | 1983        | 313          | 246          | 233           | 168            |
|             | 160       | 1982        | 275          | 229          | 214           | 165            |
|             |           | 1983        | 337          | 269          | 248           | 184            |
| 5%          | -40       | 1982        | 6571         | 3743         | 2951          | 1219           |
|             |           | 1983        | 8512         | 4564         | 3583          | 1663           |
|             | 20        | 1982        | 1595         | 887          | 72.7          | 395            |
|             |           | 1983        | 1629         | 798          | 614           | 303            |
|             | 77        | 1982        | 563          | 399          | .357          | 280            |
|             |           | 1983        | 546          | 369          | 338           | 264            |
|             | 120       | 1982        | 323          | 259          | 241           | 195            |
|             |           | 1983        | 418          | 323          | 300           | 238            |
|             | 160       | 1982        | 304          | 250          | 234           | 179            |
|             |           | 1983        | 275          | 223          | 206           | 143            |
| INNER       |           |             |              |              |               |                |
| Strain Rate | Temp (°F) | Year Tested | 10 sec (psi) | 50 sec (psi) | 100 sec (psi) | 1000 sec (psi) |
| 3%          | -40       | 1982        | 15443        | 9071         | 7282          | 3117           |
|             |           | 1983        | 17436        | 10422        | 8137          | 3911           |
|             | 20        | 1982        | 1470         | 791          | 622           | 342            |
|             |           | 1983        | 1567         | 817          | 661           | 273            |
|             | 77        | 1982        | 529          | 380          | 340           | 253            |
|             |           | 1983        | 402          | 289          | 261           | 185            |

INNER (CONT)

| Strain<br>Rate | Temp<br>(°F) | Year<br>Tested | 10 sec<br>(psi) | 50 sec<br>(psi) | 100 sec<br>(psi) | 1000 sec<br>(psi) |
|----------------|--------------|----------------|-----------------|-----------------|------------------|-------------------|
| 3%(cont)       | 120          | 1982           | 399             | 297             | 279              | 220               |
|                |              | 1983           | 302             | 231             | 220              | 174               |
|                | 160          | 1982           | 294             | 253             | 238              | 190               |
|                |              | 1983           | 268             | 214             | 201              | 162               |
| 5%             | -40          | 1982           | 9356            | 6556            | 6321             | 1854              |
|                |              | 1983           | 11998           | 6590            | 5251             | 2552              |
|                | 20           | 1982           | 1403            | 781             | 631              | 321               |
|                |              | 1983           | 1514            | 783             | 561              | 253               |
|                | 77           | 1982           | 528             | 373             | 334              | 250               |
|                |              | 1983           | 434             | 295             | 261              | 207               |
|                | 120          | 1982           | 370             | 295             | 273              | 217               |
|                |              | 1983           | 334             | 254             | 234              | 193               |
|                | 160          | 1982           | 323             | 279             | 264              | 219               |
|                |              | 1983           | 279             | 228             | 210              | 171               |

TABLE 7  
Miscellaneous Properties

| Test                                           | 1982 $\bar{x}$ | 1983 $\bar{x}$ |
|------------------------------------------------|----------------|----------------|
| Burn Rate                                      |                |                |
| Outer Prop                                     | .297           | .304           |
| Inner Prop                                     | .358           | .373           |
| TCLE (in/in $\times 10^{-5}^{\circ}\text{C}$ ) |                |                |
| Outer Prop Above Tg                            | 10.50          | 10.0           |
| Tg                                             | -56            | -59            |
| Below Tg                                       | 6.29           | 5.71           |
| Inner Prop Above Tg                            | 9.82           | 9.89           |
| Tg                                             | -58            | -57            |
| Below Tg                                       | 6.44           | 5.92           |
| Hardness                                       |                |                |
| Outer Initial                                  | 77             | 75.8           |
| 10 sec                                         | 69             | 63.3           |
| Inner Initial                                  | 74             | 76.7           |
| 10 sec                                         | 62             | 65.0           |
| Swell Ratio                                    |                |                |
| Insulation                                     | 1.47           | 1.58           |
| Liner                                          | 2.42           | 2.07           |
| Gel Fraction                                   |                |                |
| Insulation                                     | 89.69          | 87.59          |
| Liner                                          | 63.33          | 67.52          |
| Moisture (%)                                   |                |                |
| Insulation                                     | 0.92           | 1.57           |

TABLE 8  
AVCOAT Properties

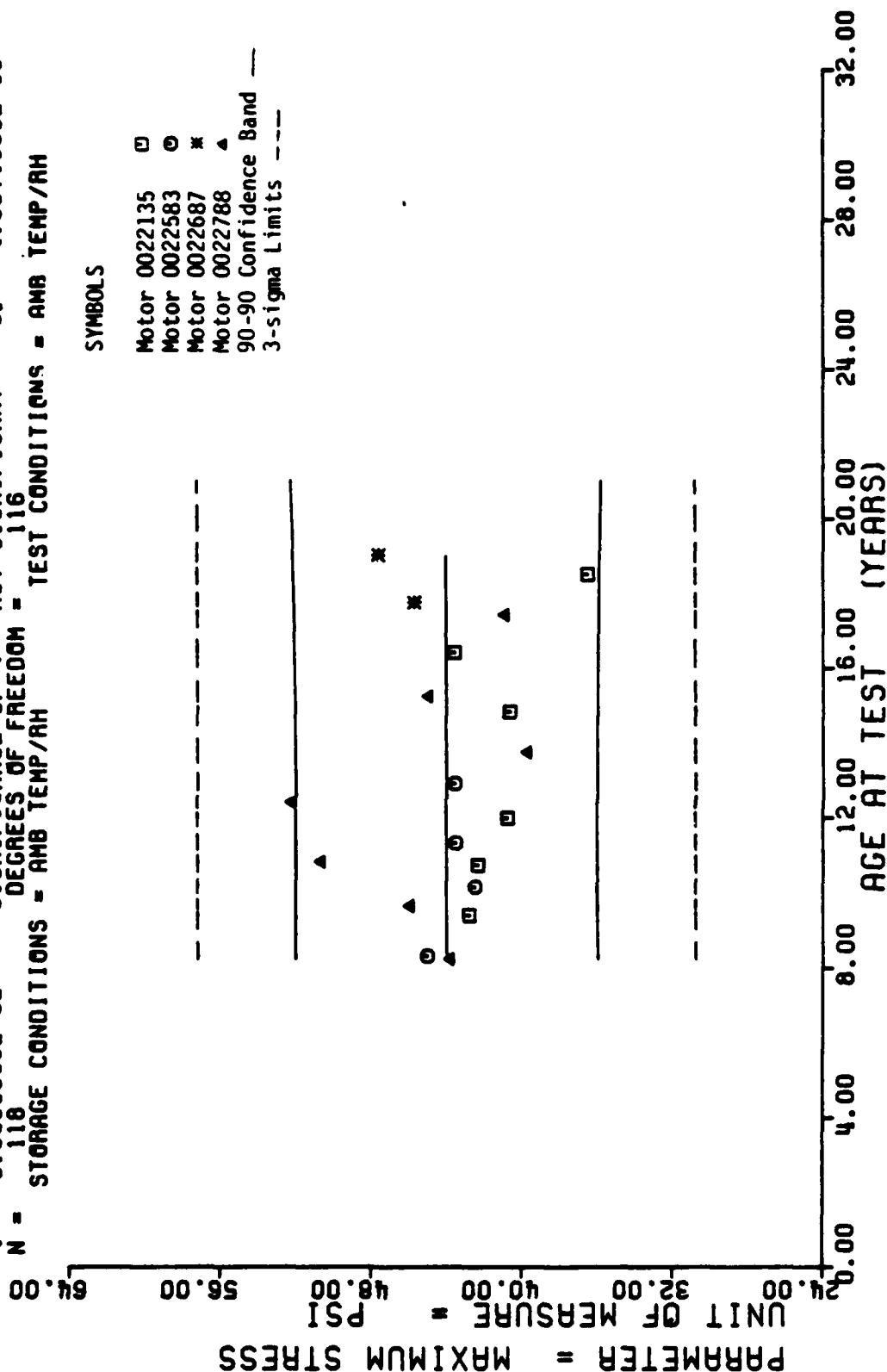
| <u>Test Conditions</u>                                              | <u>1982 <math>\bar{X}</math></u>                   | <u>1983 <math>\bar{X}</math></u>                   |
|---------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------|
| Hardness, Shore D                                                   | 83*                                                | 59                                                 |
| Shear Strength, Avcoat (psi)<br>2.0 in/min, 500 psi                 | 1161                                               | 1016                                               |
| Shear Strength, Composite (psi)<br>2.0 in/min, 500 psi              | 171                                                | 153.2                                              |
| Tensile Strength, Composite (psi)<br>20 in/min, 500 psi             | 508                                                | 419.5                                              |
| Constant Load Tensile (Log stress (psi) vs<br>log time to fail/min) | @ 1 min 79.73<br>@ 10 min 51.23<br>@ 100 min 37.8  | @ 1 min 79.73<br>@ 10 min 51.23<br>@ 100 min 32.9  |
| Constant Load Shear (Log stress (psi) vs<br>log time to fail/min)   | @ 1 min 40.54<br>@ 10 min 30.96<br>@ 100 min 23.65 | @ 1 min 40.54<br>@ 10 min 30.96<br>@ 100 min 23.65 |

\* This represents hardness of Avcoat on titanium. All hardness on Avcoat in the dissect motor program was obtained this way, except for the 1983 data, which is on Avcoat alone.

$Y = ((+4.3898042E+01) + (+4.8169085E-04) \times X)$   
 $F = +2.5039373E-03$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_f = +4.3783819E+00$   
 $R = +4.6459876E-03$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_o = +9.8262396E-03$   
 $t = +5.0039358E-02$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +4.3971663E+00$   
 $N = 116$  DEGREES OF FREEDOM = 116  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

# SYMBOLS

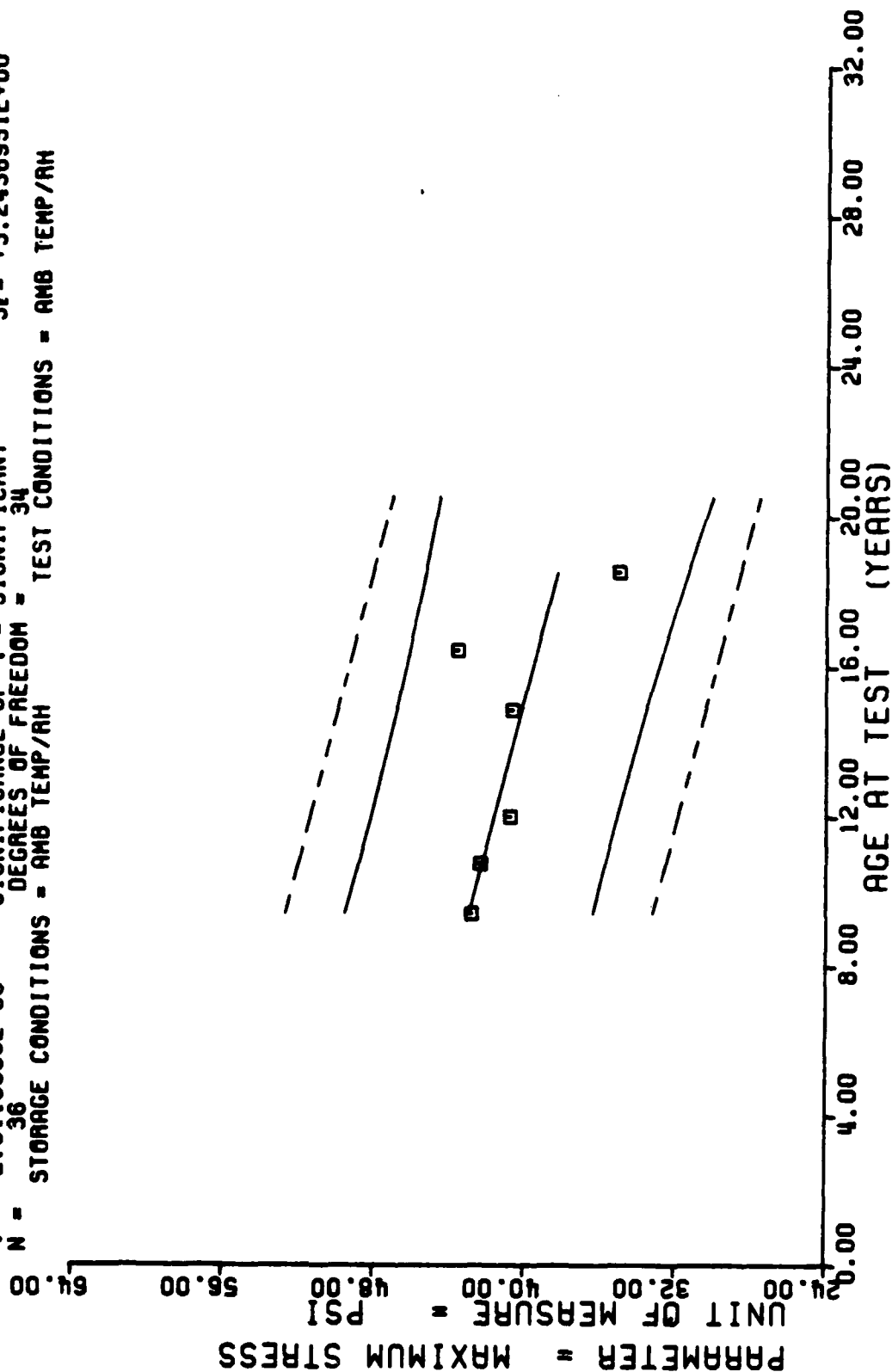
Motor 0022135 □  
 Motor 0022583 ⊙  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCT MTRS. OJTER, AXIAL POS. V.L. RATE CHS=0.0002 IN/MIN. MAXIMUM STRESS

Figure 5

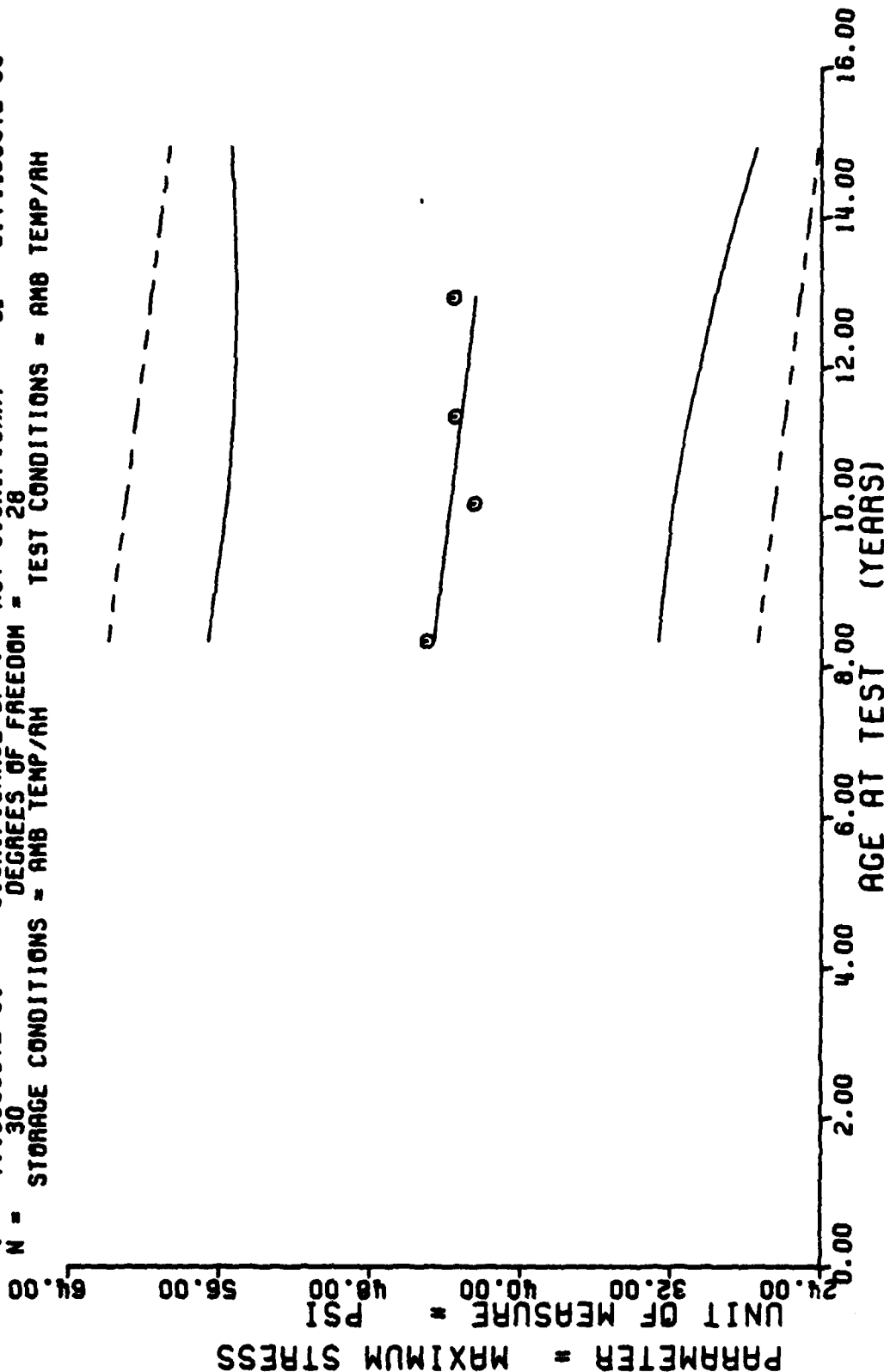
$Y = ((+4.7644773E+01) + (-4.2105836E-02) \times X)$   
 $F = +7.9054817E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma = +3.5492895E+00$   
 $R = -4.3433892E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +1.4975389E-02$   
 $t = +2.8116688E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_r = +3.2436951E+00$   
 $N = 36$  DEGREES OF FREEDOM = 34  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 MAX STRESS <0022135>

Figure 6

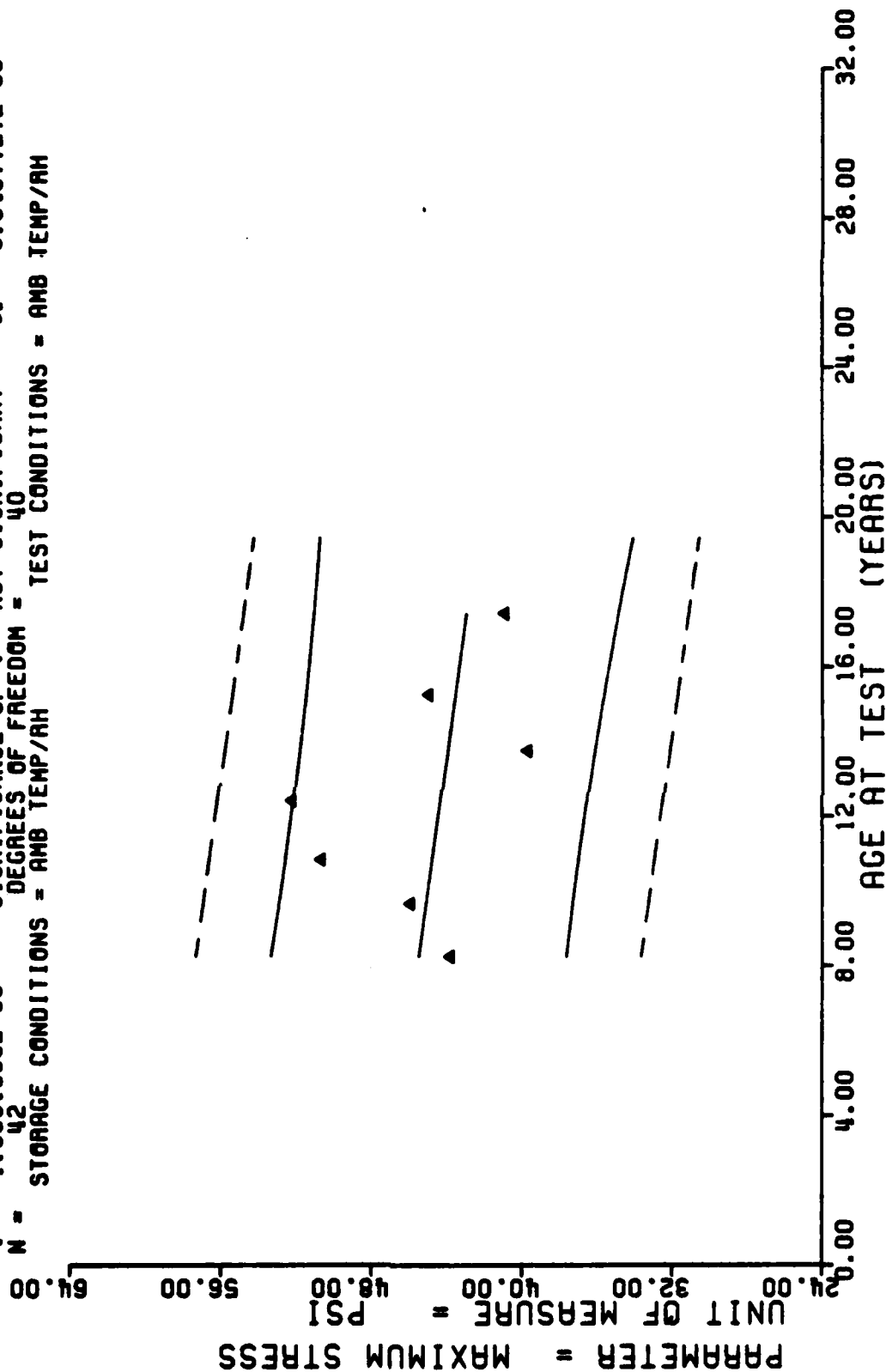
$Y = ((+4.8694143E+01) + (-4.0769585E-02) \times X)$   
 $F = +5.0951125E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma = +5.6955742E+00$   
 $R = -1.3368479E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +5.7116213E-02$   
 $\chi^2 = +7.1380057E-01$  SIGNIFICANCE OF  $\chi^2$  = NOT SIGNIFICANT  $S_i = +5.7443597E+00$   
 $N = 30$  DEGREES OF FREEDOM = 28  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MRS. OUTER AXIAL POS. V.L. RATE CHS=0.0002 MAX STRESS <0022583>

Figure 7

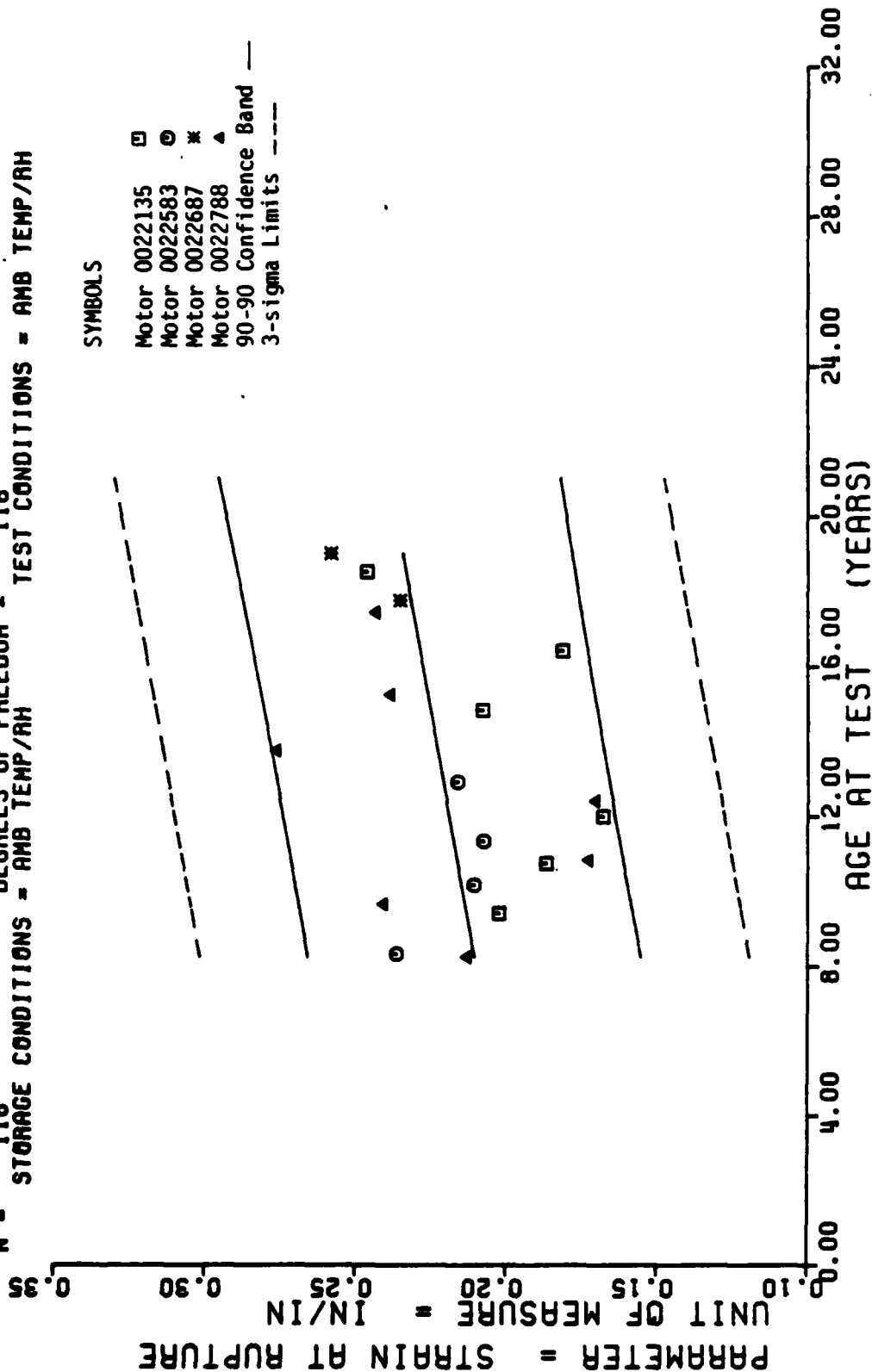
$Y = ((+4.7713753E+01) + (-2.2928572E-02) \times X)$   
 $F = +2.2594000E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G_1 = +4.0008394E+00$   
 $R = -2.3122505E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +1.5253884E-02$   
 $t = +1.5031300E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +3.9407727E+00$   
 $N = 42$  DEGREES OF FREEDOM = 40  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT NTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 MAX STRESS <0022788>

Figure 8

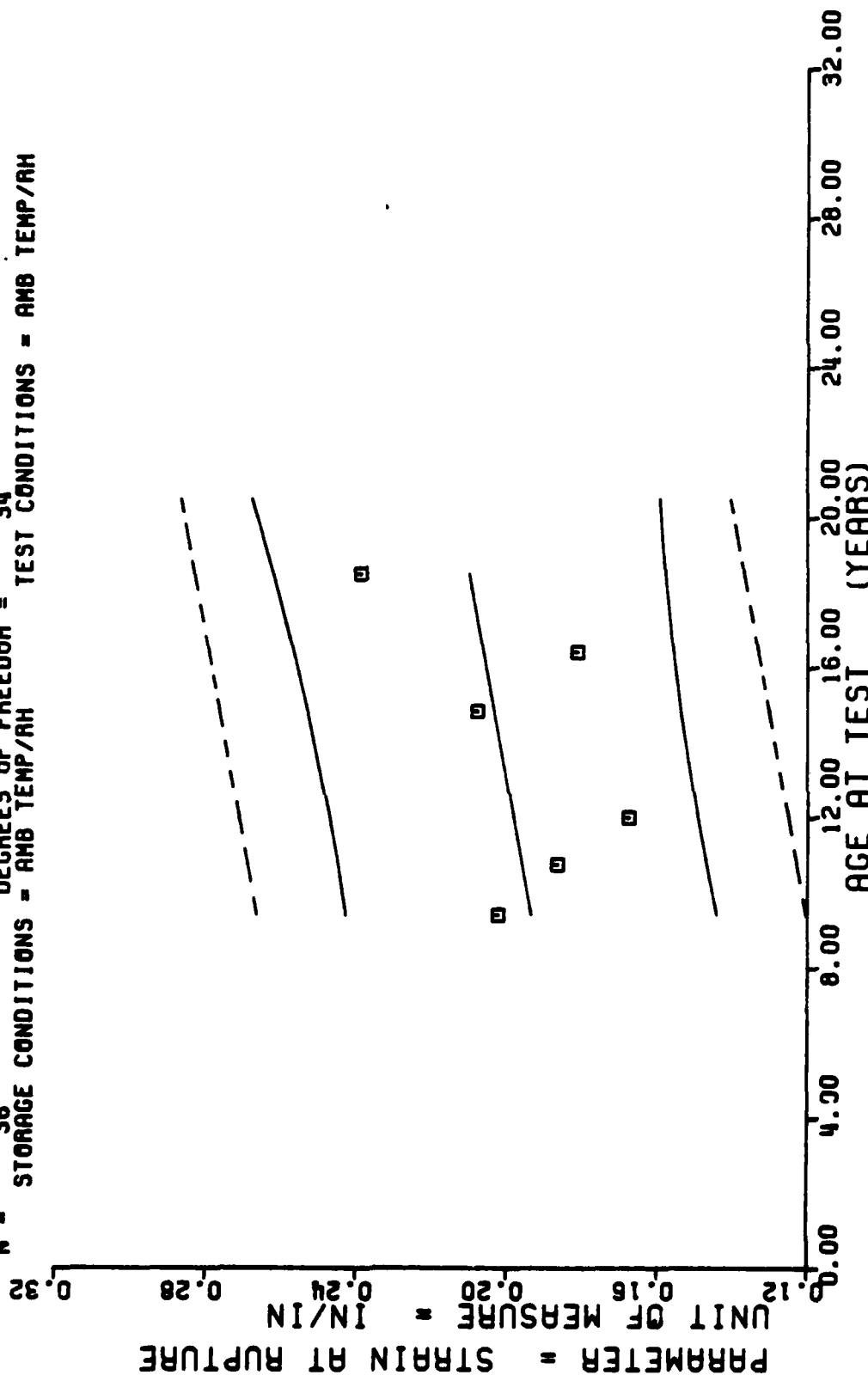
$Y = ((+1.9193779E-01) + (+1.8500950E-04) \times X)$   
 $F = +7.7703939E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +3.1182017E-02$   
 $R = +2.5056080E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +6.6370108E-05$   
 $t = +2.7875426E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +3.0317176E-02$   
 $N = 118$  DEGREES OF FREEDOM = 116  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, STRAIN/RUPTURE

Figure 9

$Y = ((+1.761777E-01) + (+1.5196529E-04) \times X)$   
 $F = +1.8346367E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +2.4589446E-02$   
 $R = +2.2626820E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +1.1219393E-04$   
 $t = +1.3544876E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_c = +2.4301398E-02$   
 $N = 36$  DEGREES OF FREEDOM = 34  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

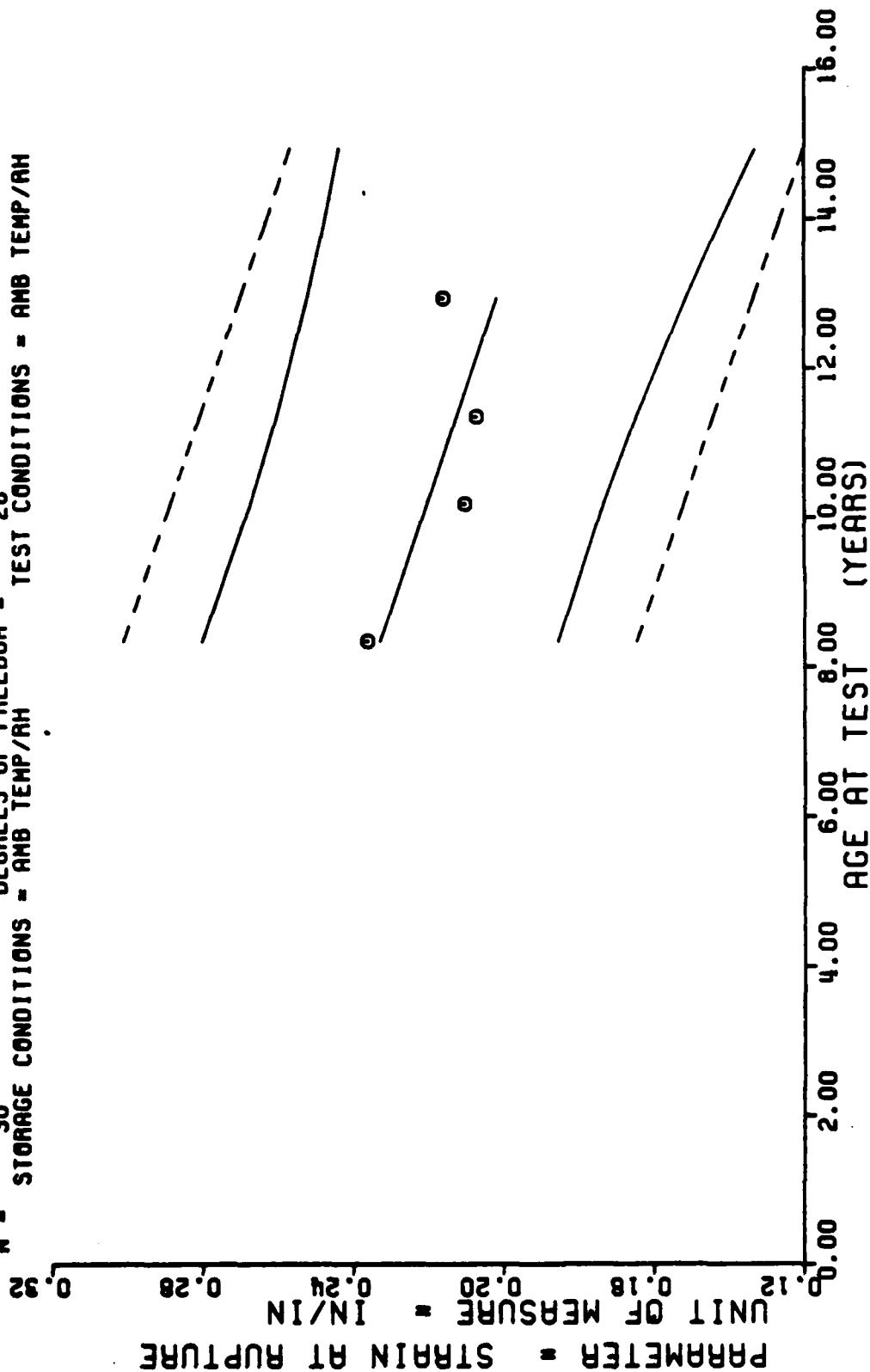


II STAGE DSCT MTA <0022135>, OUTER, AXIAL POS, V.L. RATE CHS=0.0002, STRAIN RUPTURE.

Figure 10

$Y = ((+2.8867746E-01) + (-5.6037225E-04) \times X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF t = SIGNIFICANT  
 DEGREES OF FREEDOM = 28  
 STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH

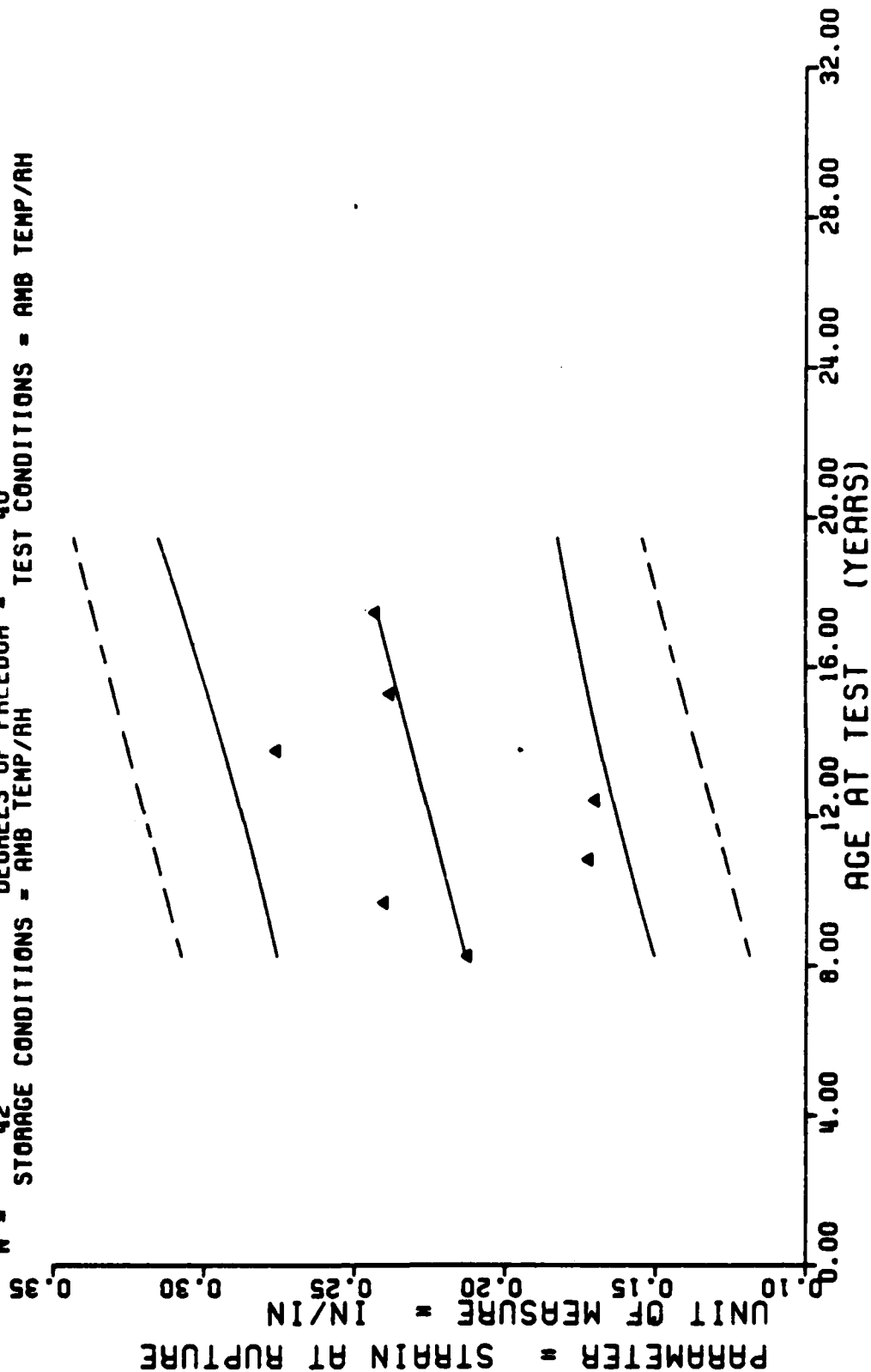
F = +8.1482627E+00  
 R = -4.2431843E-01  
 t = +2.4795690E+00  
 N = 30



II STAGE DSCT MTA <0022583>, OUTER, AXIAL POS, V.L. RATE CHS=0.0002, STRAIN RUPTURE.

Figure 11

$Y = ((+1.8683139E-01) + (+2.6603176E-04) \times X)$   
 $F = +4.7780803E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_r = +3.2858558E-02$   
 $R = +3.2665851E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_o = +1.2170453E-04$   
 $t = +2.1858820E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +3.1441821E-02$   
 $N = 42$  DEGREES OF FREEDOM = 40  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



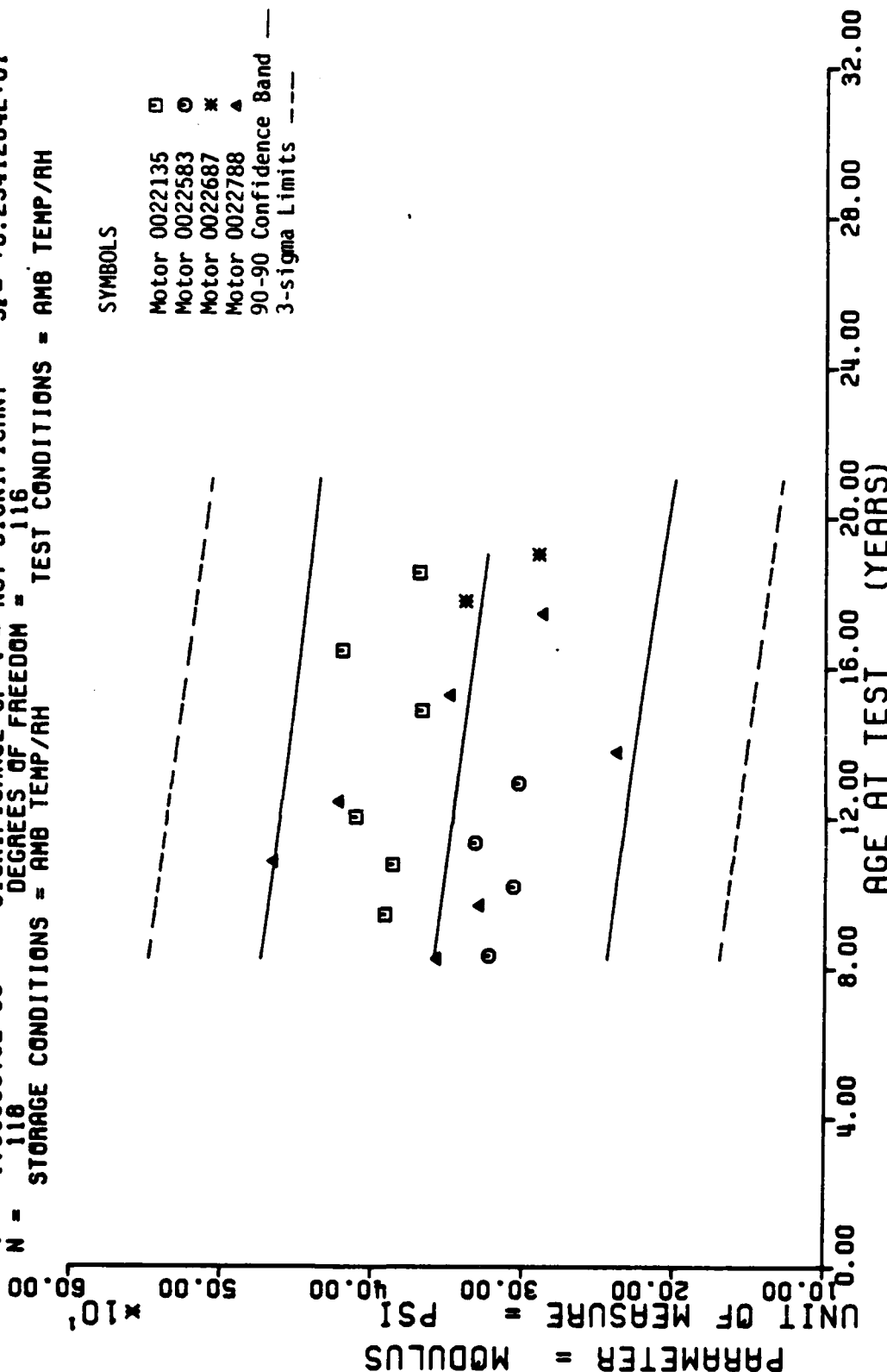
11 STAGE DSCT MTR <0022788>, OUTER, AXIAL POS, V.L. RATE CHS=0.0002, STRAIN RUPTURE.

Figure 12

$Y = ((+3.8518142E+02) + (-2.6877382E-01) * X)$   
 $F = +3.8048319E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -1.7820938E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.9505978E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 118$  DEGREES OF FREEDOM = 116  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

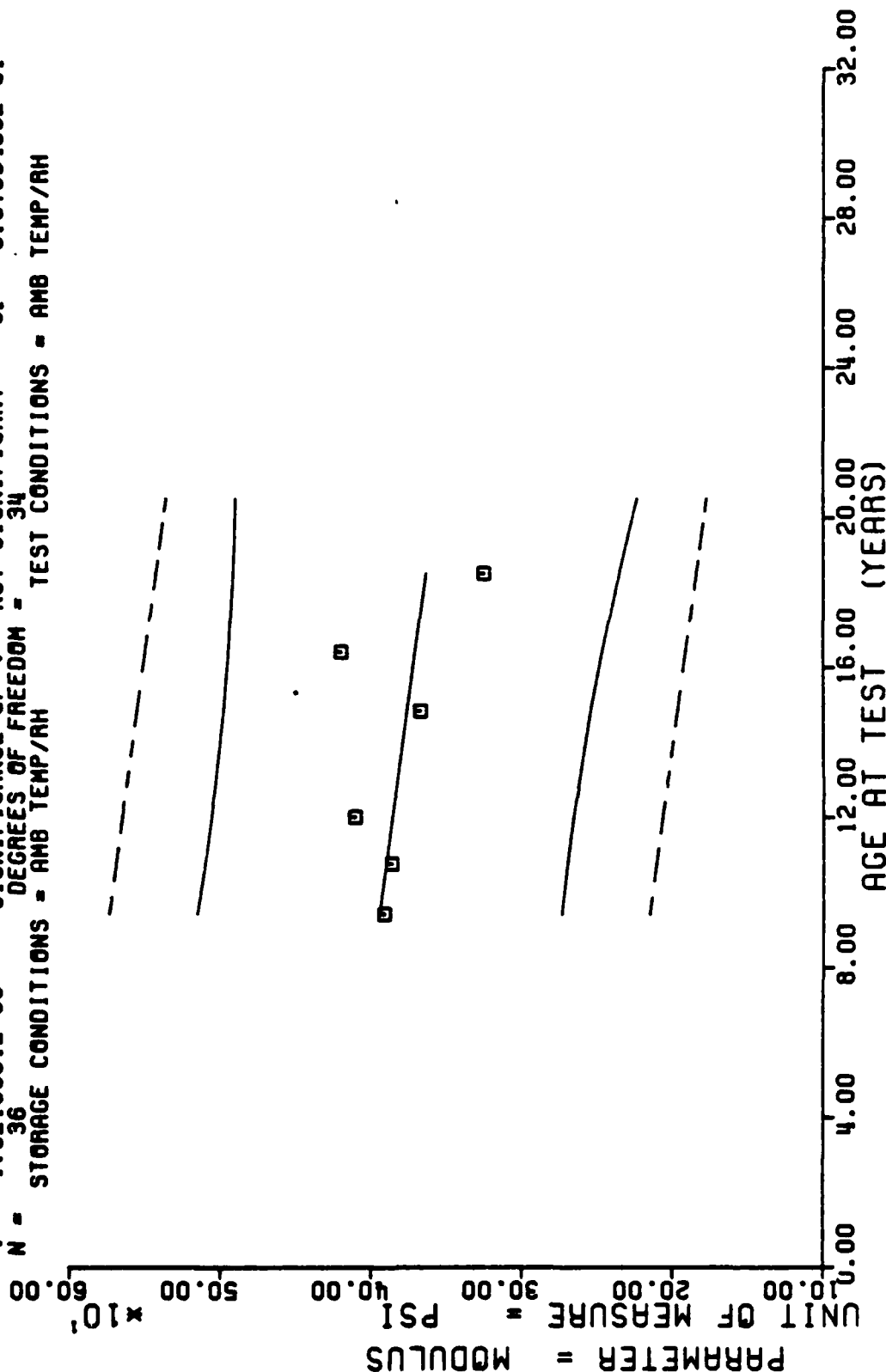
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCT MTRS, OUTER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MODULUS

Figure 13

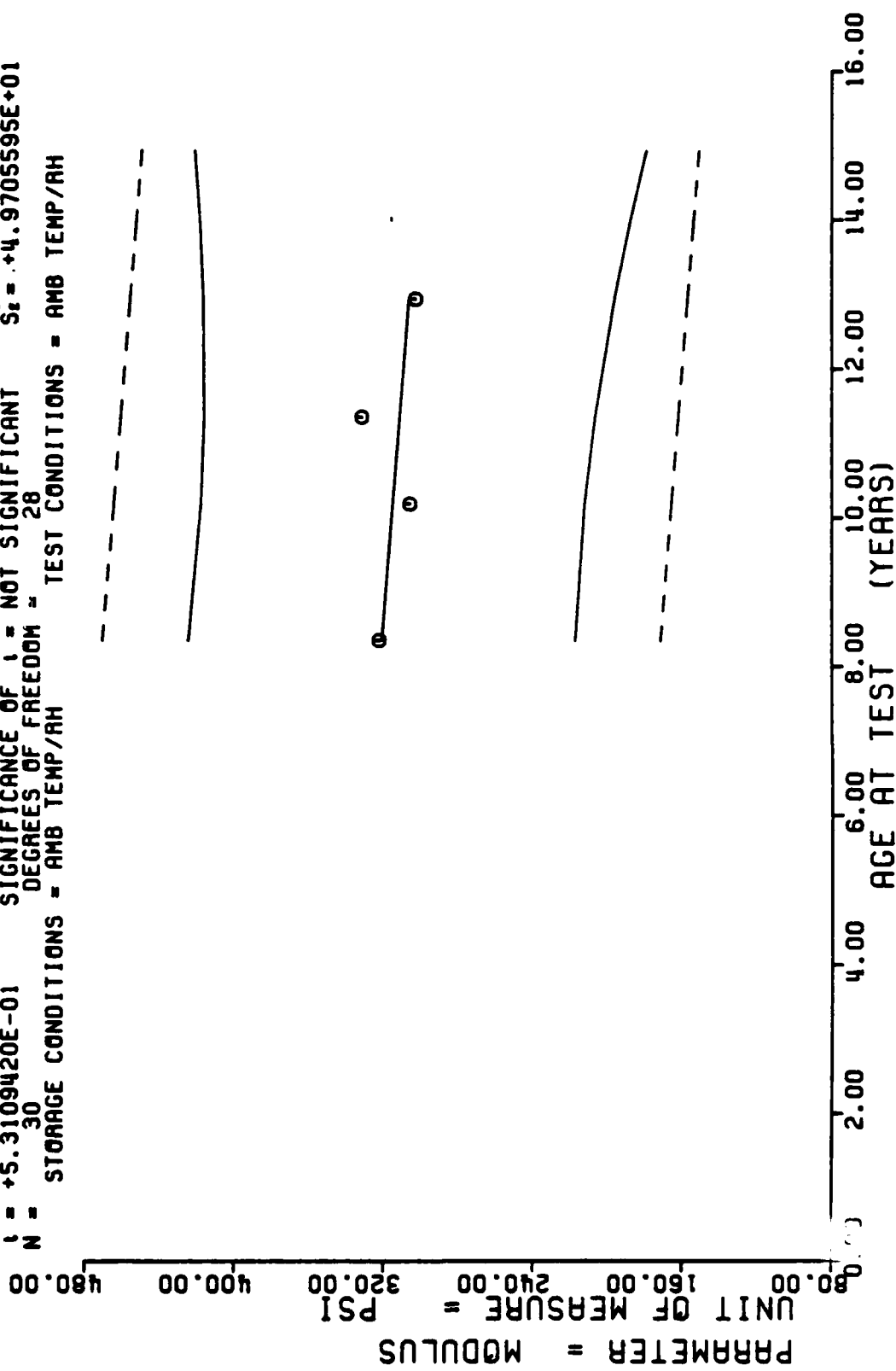
$Y = ((+4.2601743E+02) + (-2.8157765E-01) \times X)$   
 $F = +1.0425209E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha = +5.9769736E+01$   
 $R = -1.7246237E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +2.7577557E-01$   
 $t = +1.0210391E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_c = +5.9733463E+01$   
 $N = 36$  DEGREES OF FREEDOM = 34  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT MTR <0022135>, OUTER, AXIAL POS, V.L. RATE CHS=0.0002, MODULUS.

Figure 14

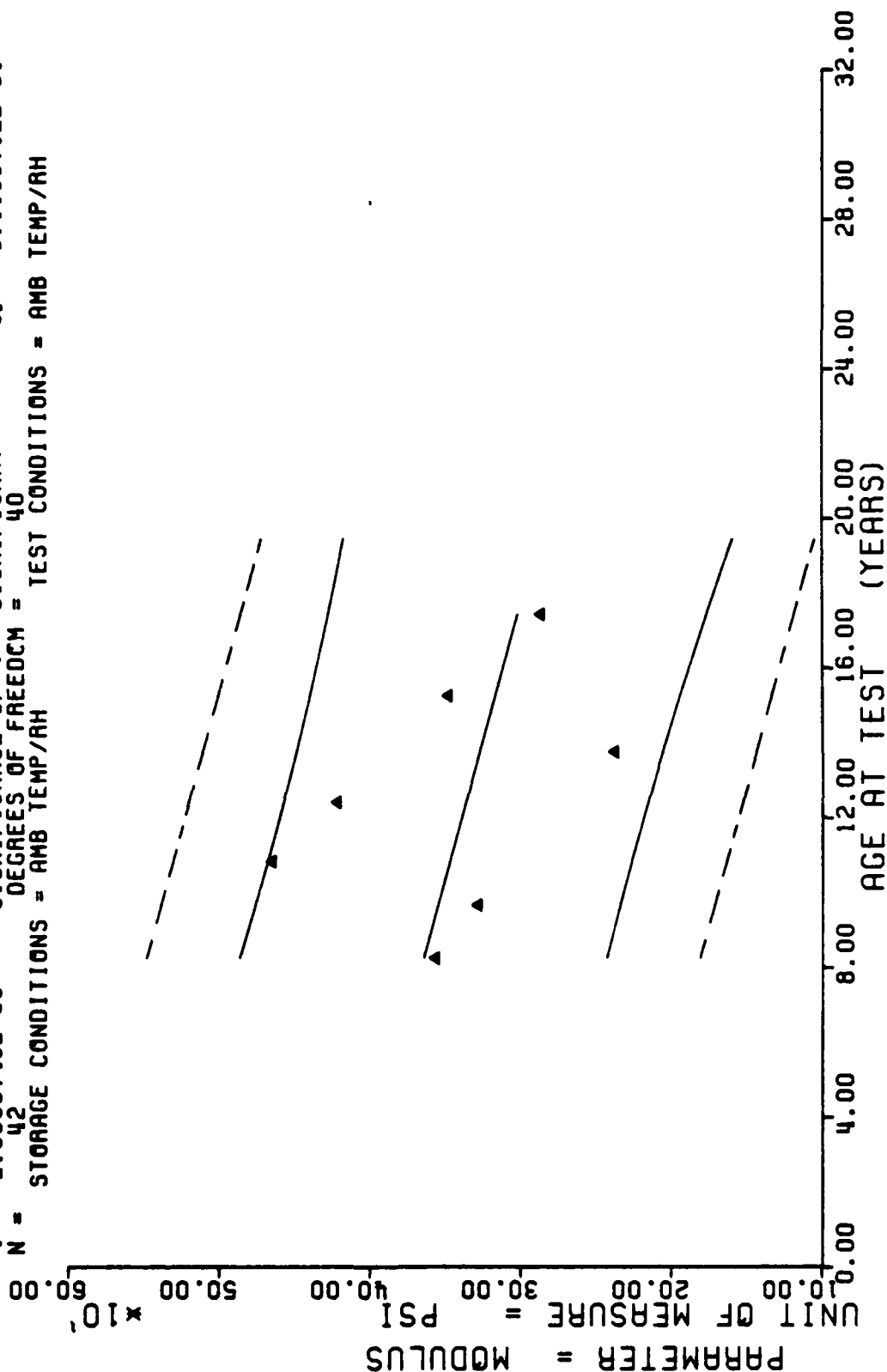
$Y = (( +3.4720967E+02 ) + ( -2.6247903E-01 ) \times X)$   
 $F = +2.8206105E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_f = +4.9086470E+01$   
 $R = -9.9865628E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +4.9422311E-01$   
 $t = +5.3109420E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +4.9705595E+01$   
 $N = 30$  DEGREES OF FREEDOM = 28  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE DSCT MTR <0022583>, OUTER, AXIAL POS, V.L. RATE CHS=0.0002, MODULUS.

Figure 15

$Y = ((+4.2053912E+02) + (-5.6590102E-01) \times X)$   
 $F = +5.7091120E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +6.4605067E+01$   
 $R = -3.5341330E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +2.3684062E-01$   
 $I = +2.3893748E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_t = +6.1186712E+01$   
 $N = 42$  DEGREES OF FREEDOM = 40  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



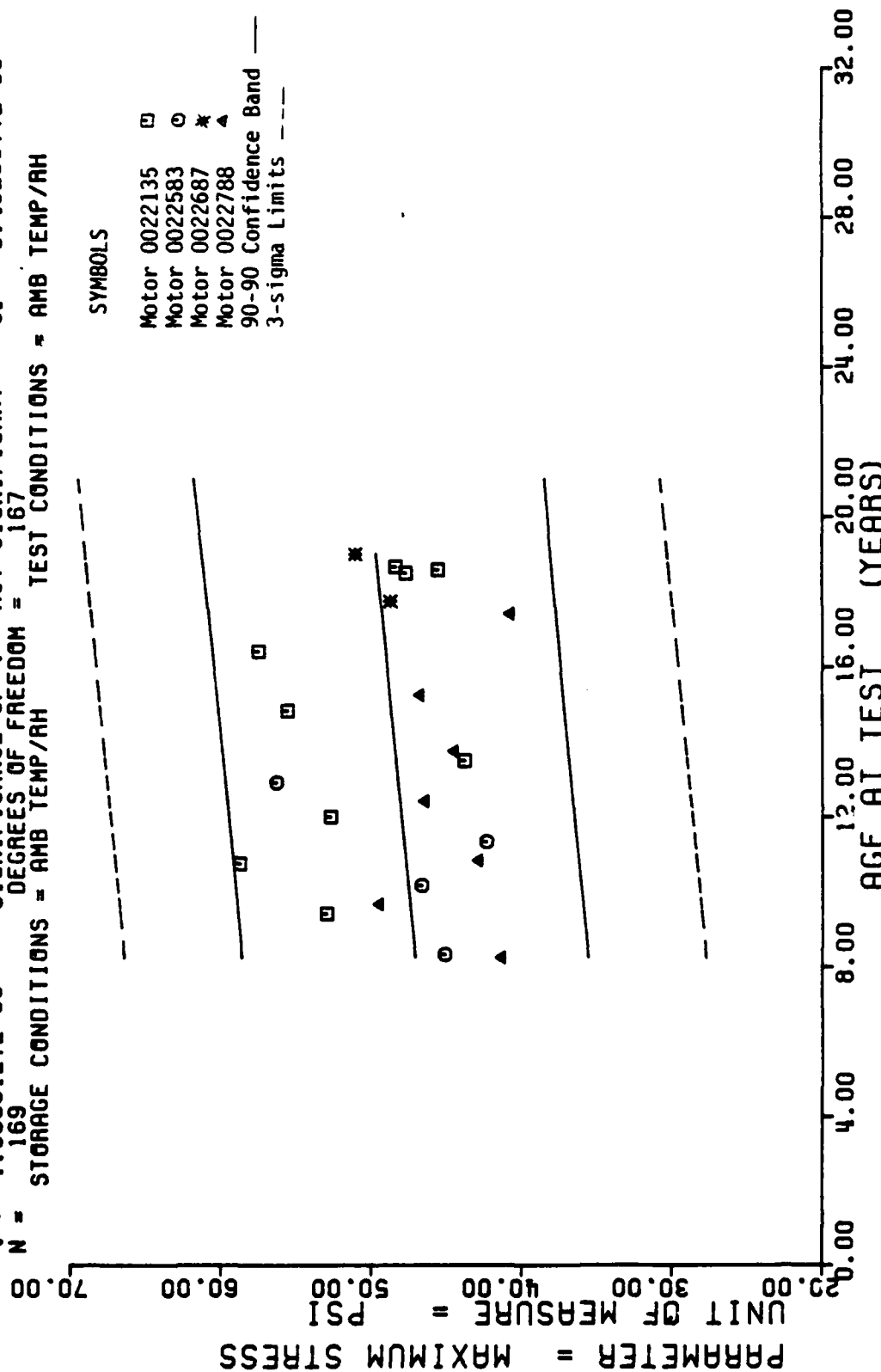
II STAGE DSCT MTR <0022788>, OUTER, AXIAL POS, V.L. RATE CHS=0.0002, MODULUS.

Figure 16

$Y = ((+4.5016806E+01) + (+2.0118471E-02) \times X)$   
 $F = +3.4596474E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +6.4795861E+00$   
 $R = +1.4246399E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +1.0816308E-02$   
 $t = +1.8600127E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_r = +6.4326677E+00$   
 $N = 169$  DEGREES OF FREEDOM = 167  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

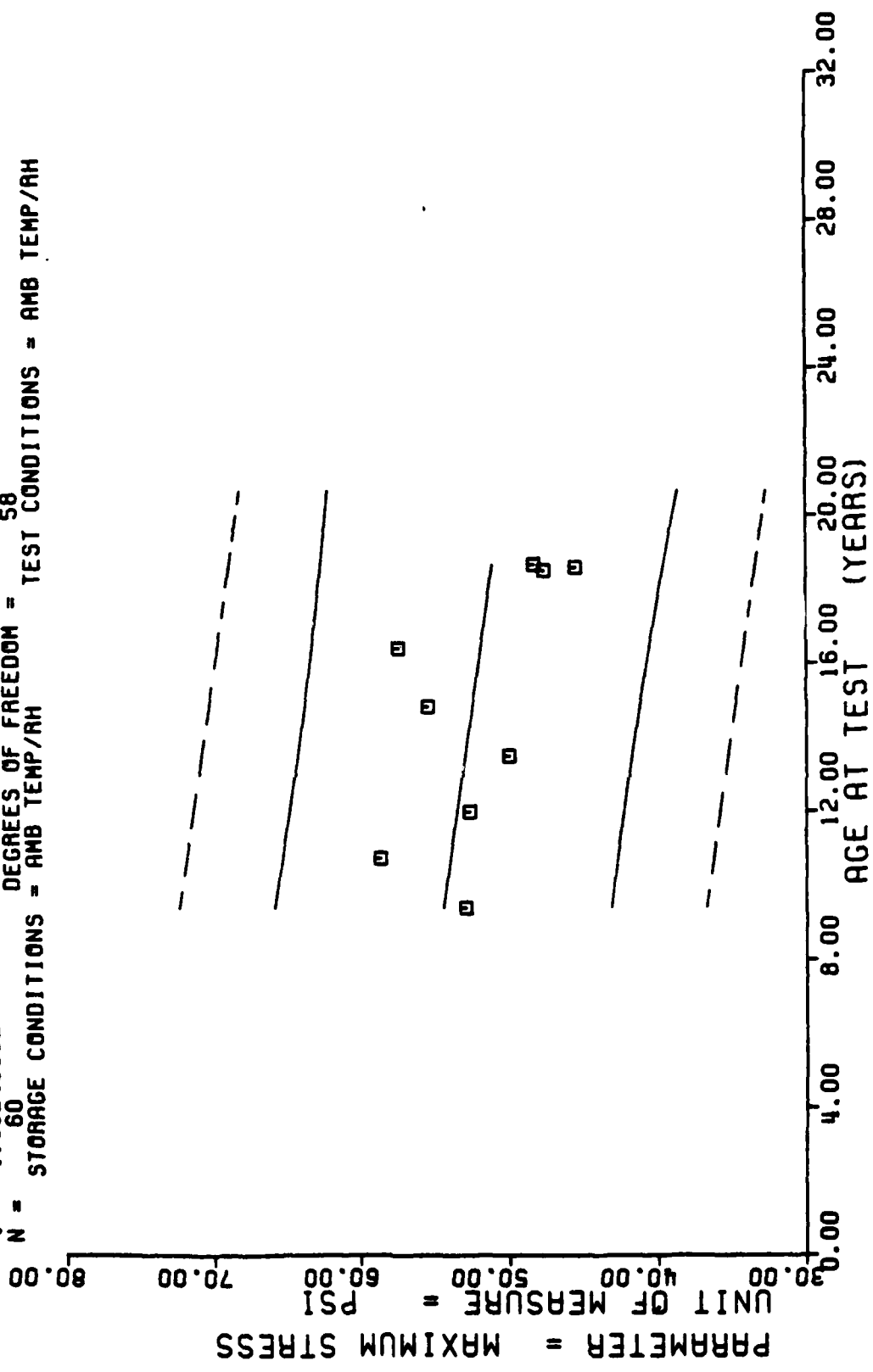
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCT MTRS, INNER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MAXIMUM STRESS

Figure 17

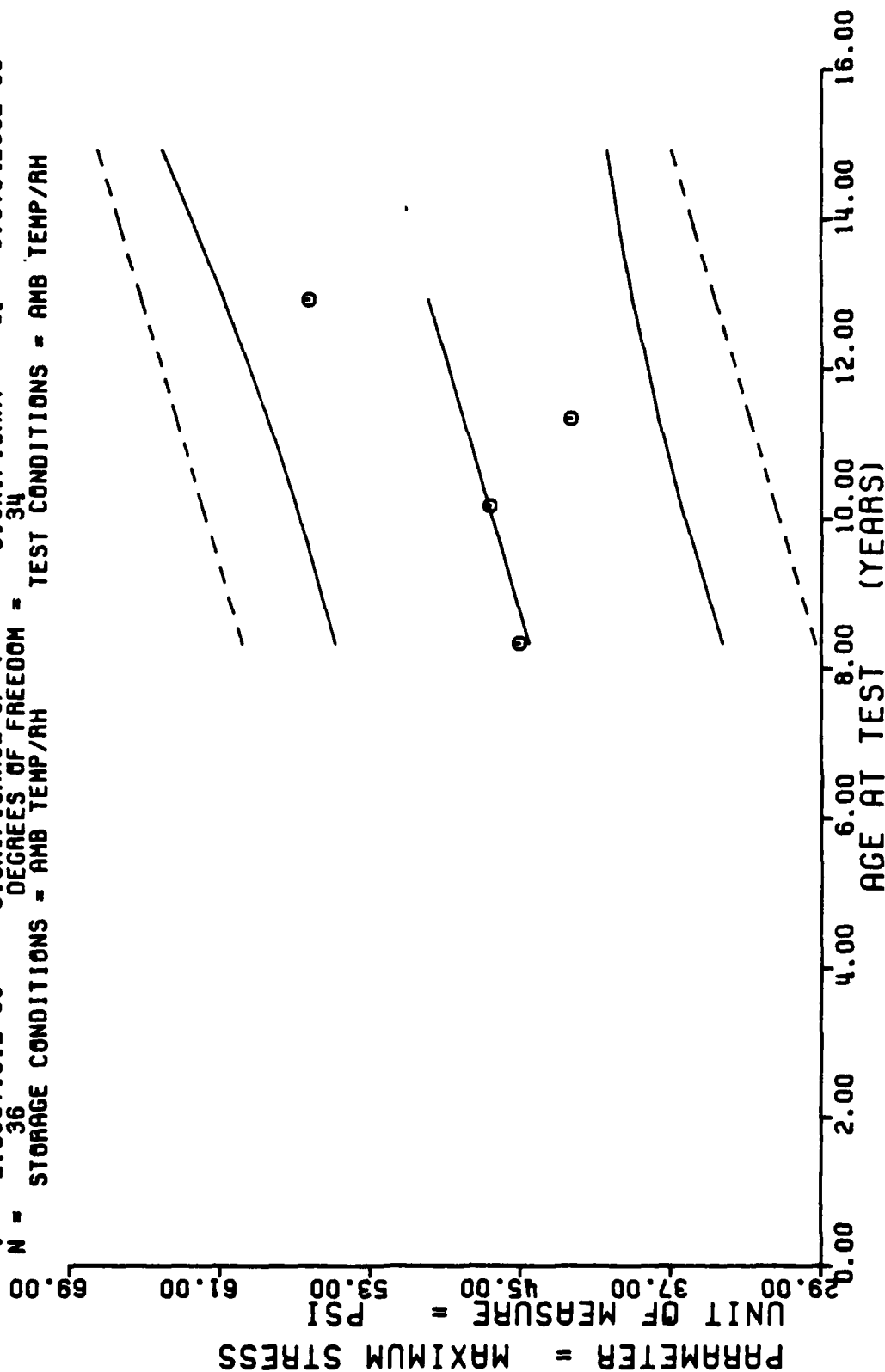
$Y = ((+5.7795558E+01) + (-3.0019127E-02) \times X)$   
 $F = +2.4412839E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +5.9665184E+00$   
 $R = -2.0097512E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +1.9212722E-02$   
 $t = +1.5624608E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_1 = +5.8949483E+00$   
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT HTS, INNER, AXIAL POS, V.L. RATE CHS=0.0002 MAX STRESS <0022135>

Figure 18

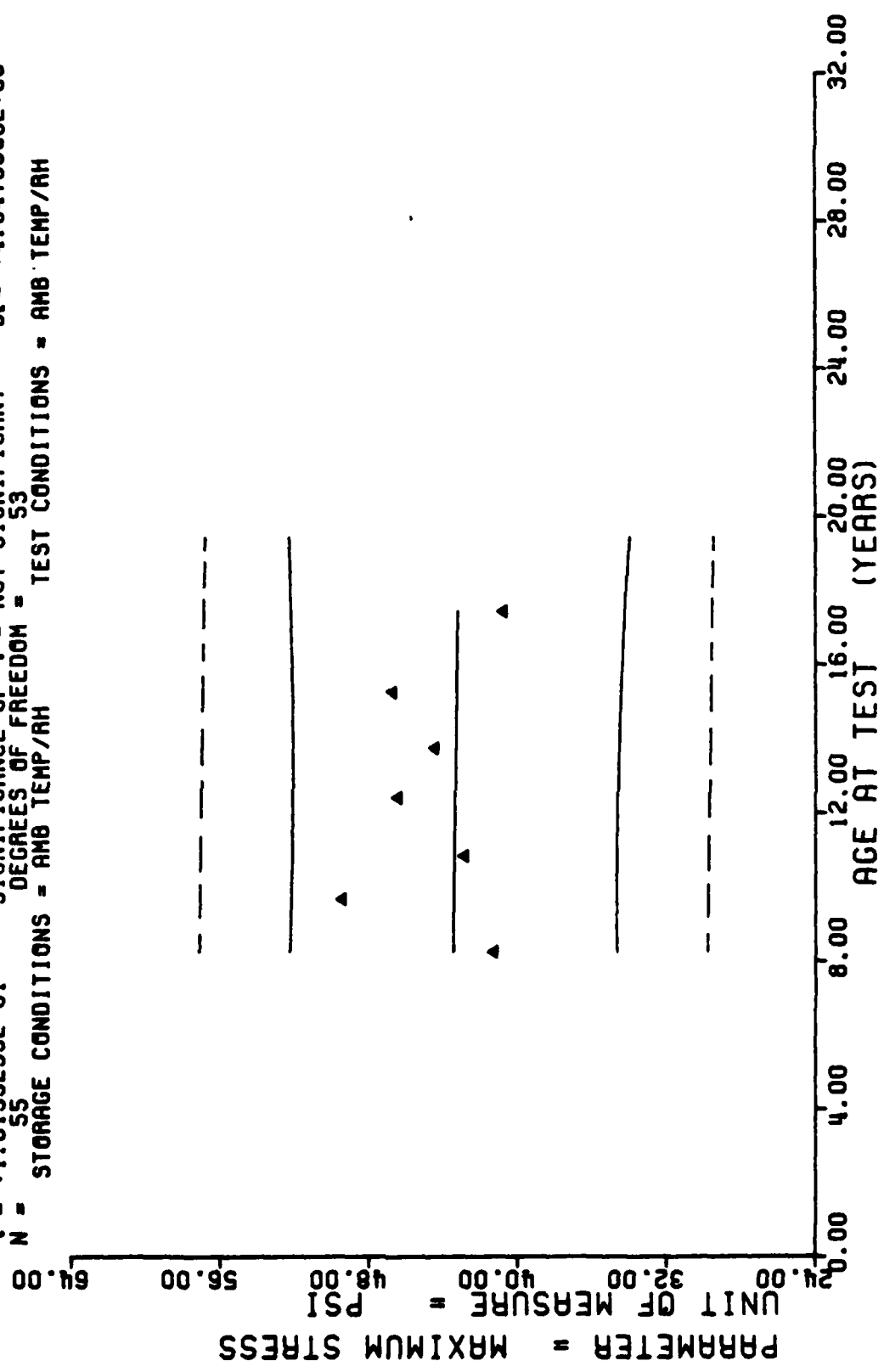
$Y = ((+3.478966E+01) + (+9.7337351E-02) \times X)$   
 $F = +4.3668886E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +5.3170819E+00$   
 $R = +3.3737101E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +4.6579354E-02$   
 $t = +2.0897101E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +5.0784255E+00$   
 $N = 36$  DEGREES OF FREEDOM = 34  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT MTRs, INNER, AXIAL POS, V.L. RATE CHS-0.0002 MAX STRESS <0022563>

Figure 19

Y = (( +4.368802E+01 ) + ( -2.4087070E-03 ) \* X )  
 F = +2.6034502E-02      SIGNIFICANCE OF F = NOT SIGNIFICANT       $\sigma_1$  = +4.5061442E+00  
 R = -2.2158008E-02      SIGNIFICANCE OF R = NOT SIGNIFICANT       $S_0$  = +1.4928242E-02  
 t = +1.6135235E-01      SIGNIFICANCE OF t = NOT SIGNIFICANT       $S_e$  = +4.5473396E+00  
 N = 55      DEGREES OF FREEDOM = 53  
 STORAGE CONDITIONS = AMB TEMP/AH      TEST CONDITIONS = AMB TEMP/AH



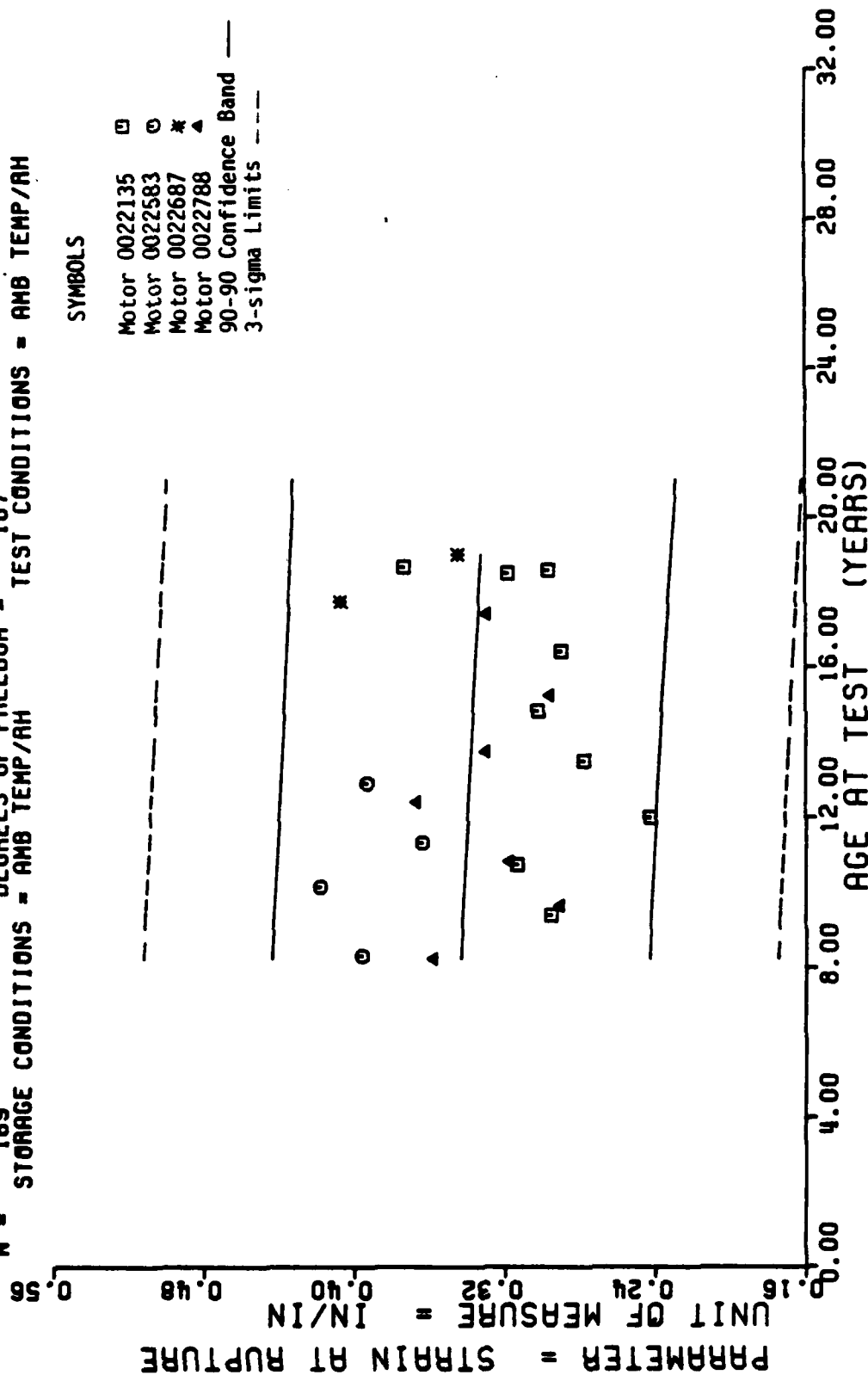
II STAGE DSCY MTRS, INNER, AXIAL POS, V.L.RATE CHS=0.0002 MAX STRESS <0022788>

Figure 20

$Y = ((+3.5146417E-01) + (-8.4368369E-05) \times X)$   
 $F = +7.9936017E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -6.9020162E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +8.9406944E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 169$  DEGREES OF FREEDOM = 167  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

# SYMBOLS

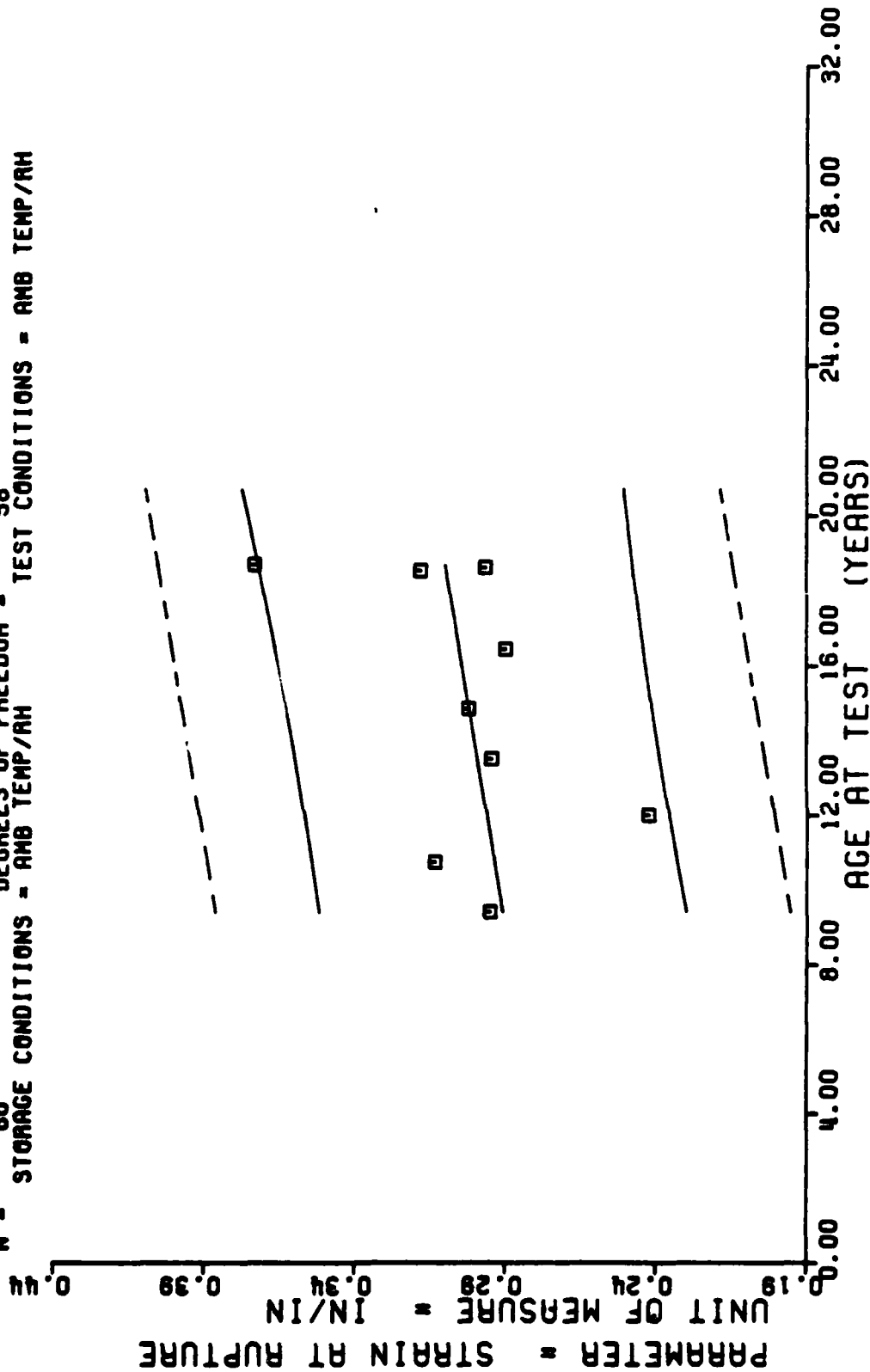
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



II STAGE DSCT MTRS. INNER, AXIAL POS. V.L. RATE CHS=0.0002 IN/MIN. STRAIN/RUPTURE

Figure 21

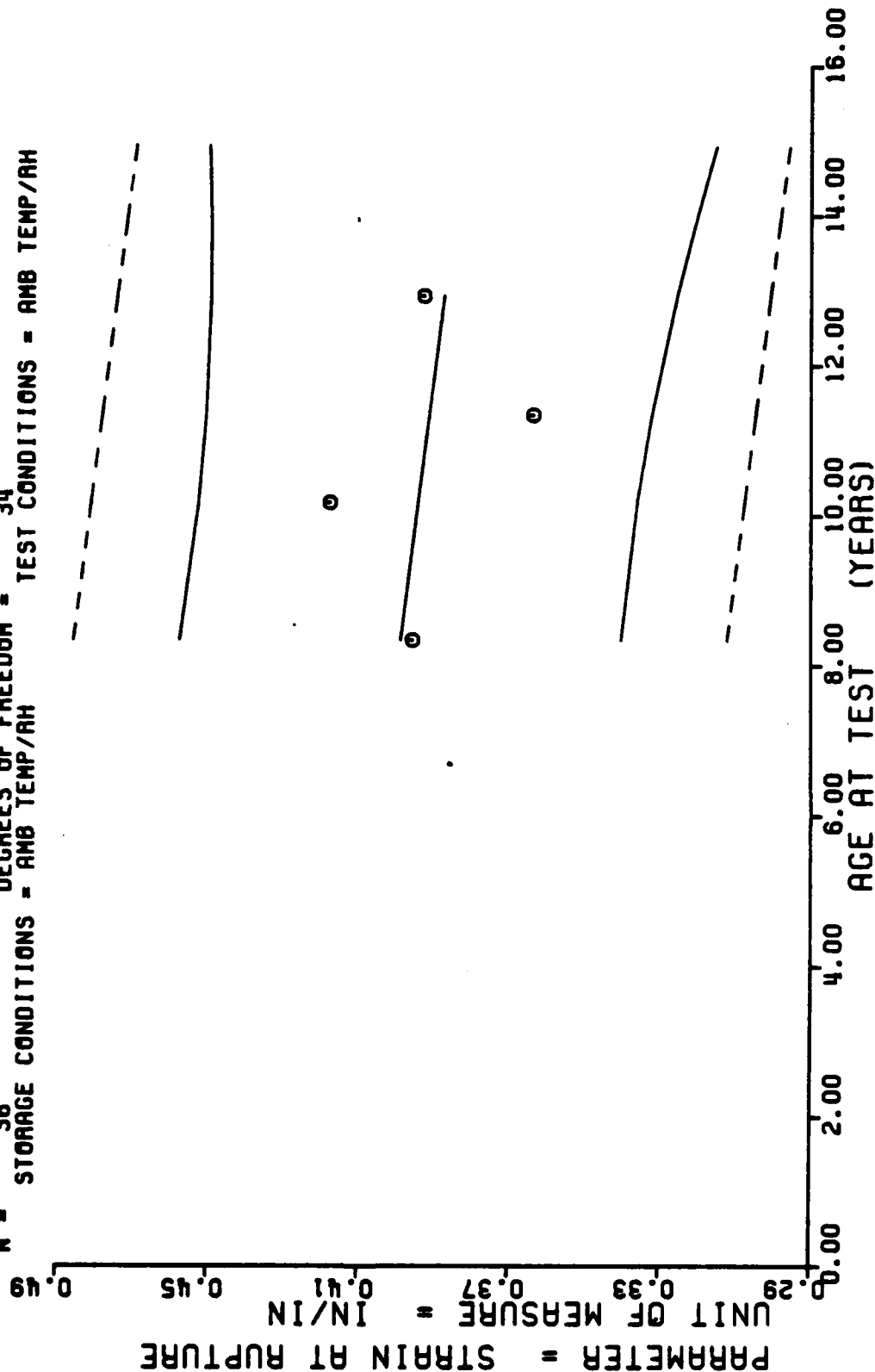
$Y = ((+2.7100958E-01) + (+1.7335889E-04) \times X)$   
 $F = +2.8047759E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma = +3.2242668E-02$   
 $R = +2.1477327E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +1.0351351E-04$   
 $t = +1.6747465E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +3.1760558E-02$   
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT MTR <0022135>, INNER, AXIAL POS, V.L. RATE CHS=0.0002, STRAIN RUPTURE.

Figure 22

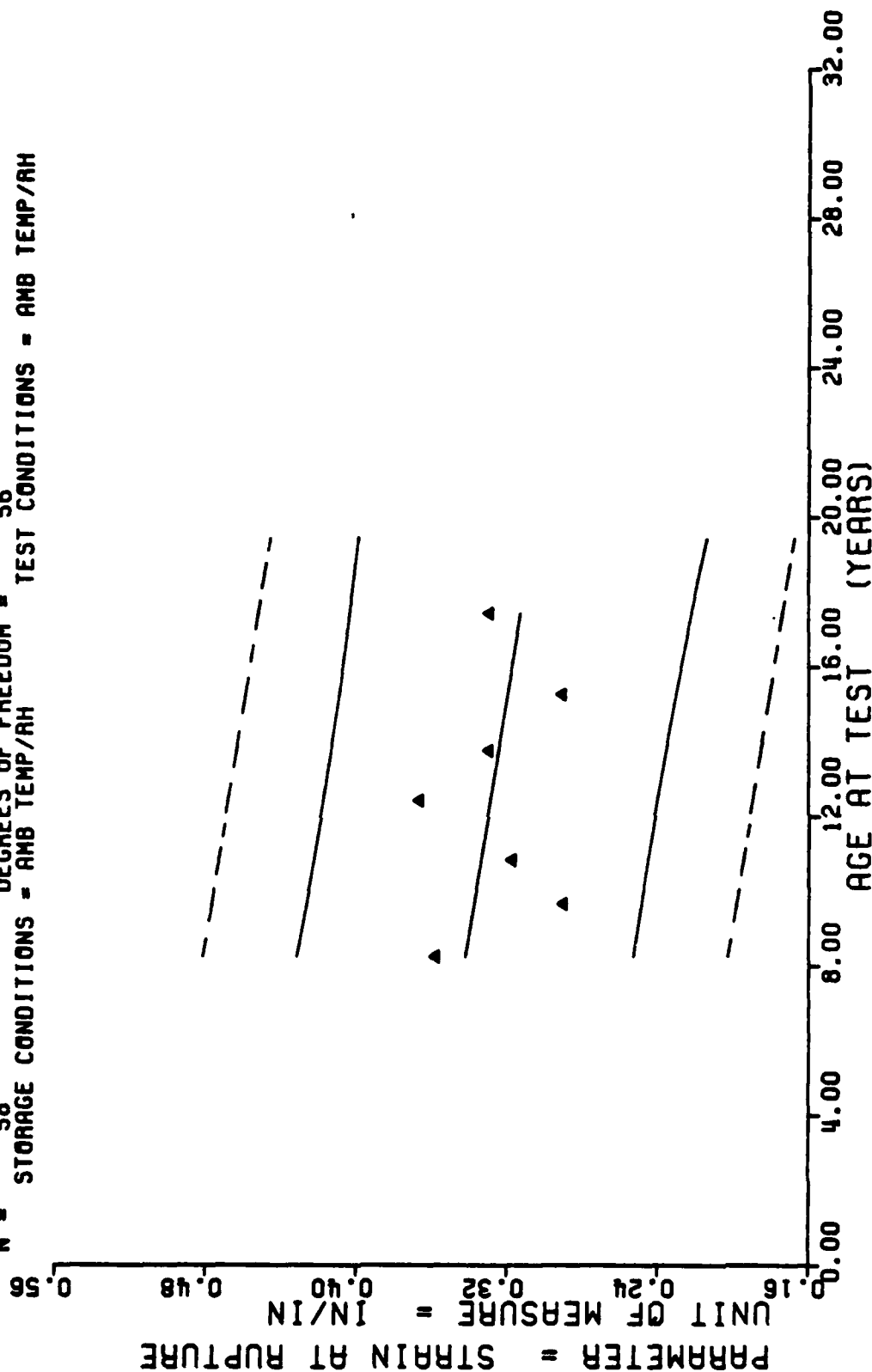
$F = +6.1925719E-01$   
 $R = -1.3374472E-01$   
 $t = +7.8692896E-01$   
 $N = 36$   
 $Y = ((+4.1962779E-01) + (-2.0834760E-04) \times X)$   
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 34  
 STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT MTR <0022583>, INNER, AXIAL POS, V.L. RATE CHS=0.0002, STRAIN RUPTURE.

Figure 23

$Y = ((+3.6773507E-01) + (-2.6157543E-04) \times X)$   
 $F = +3.1505483E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +4.7278069E-02$   
 $R = -2.3078824E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_o = +1.4736823E-04$   
 $t = +1.7749784E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +4.6410663E-02$   
 $N = 58$  DEGREES OF FREEDOM = 56  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



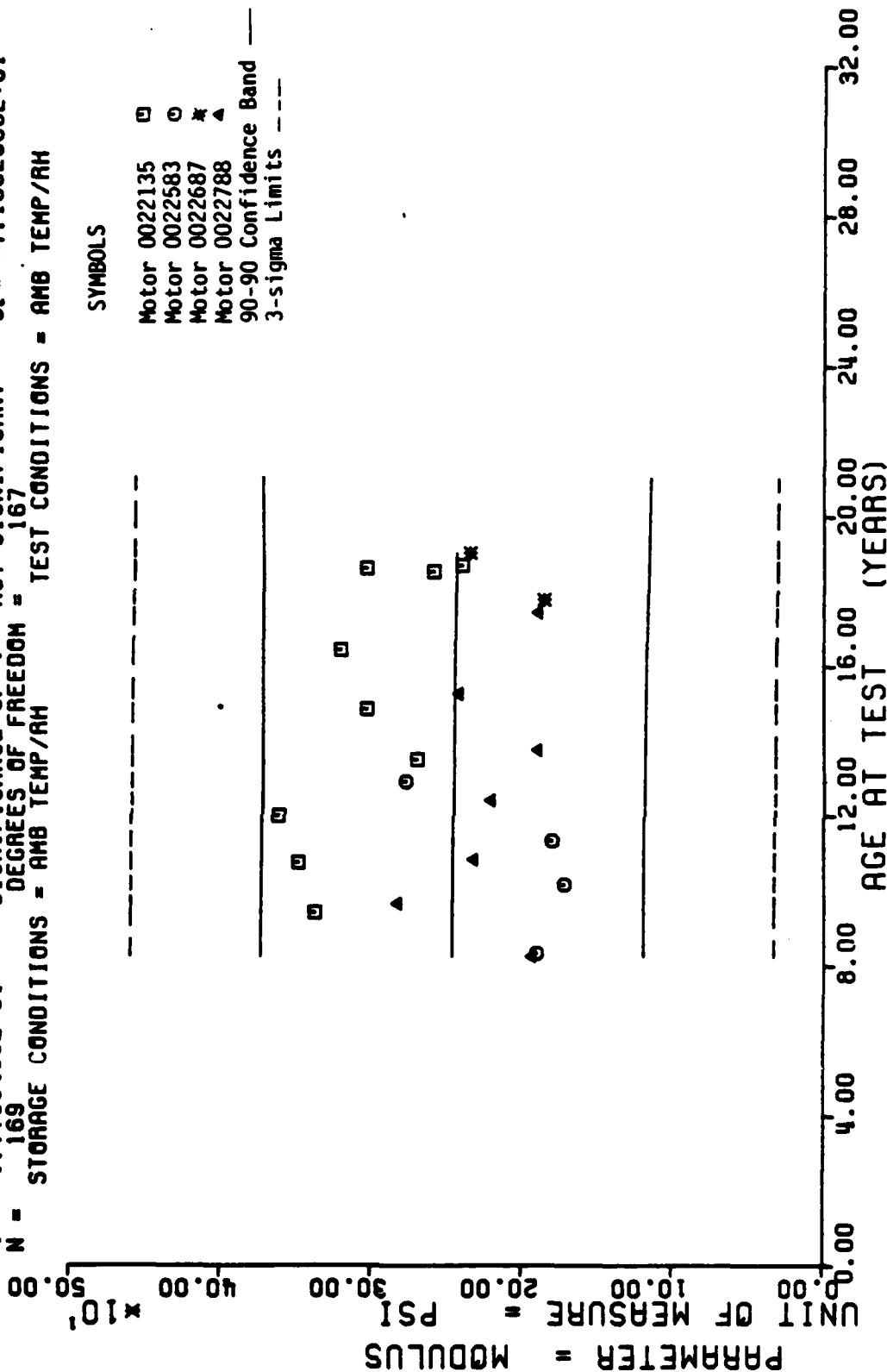
II STAGE OSC TMTA <0022788>, INNER, AXIAL POS, V.L. RATE CHS=0.0002, STRAIN RUPTURE.

Figure 24

$Y = ((+2.4834008E+02) + (-2.1249311E-02) \times X)$   
 $F = +3.1678642E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -1.3771582E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.7798495E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 169$  DEGREES OF FREEDOM = 167  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

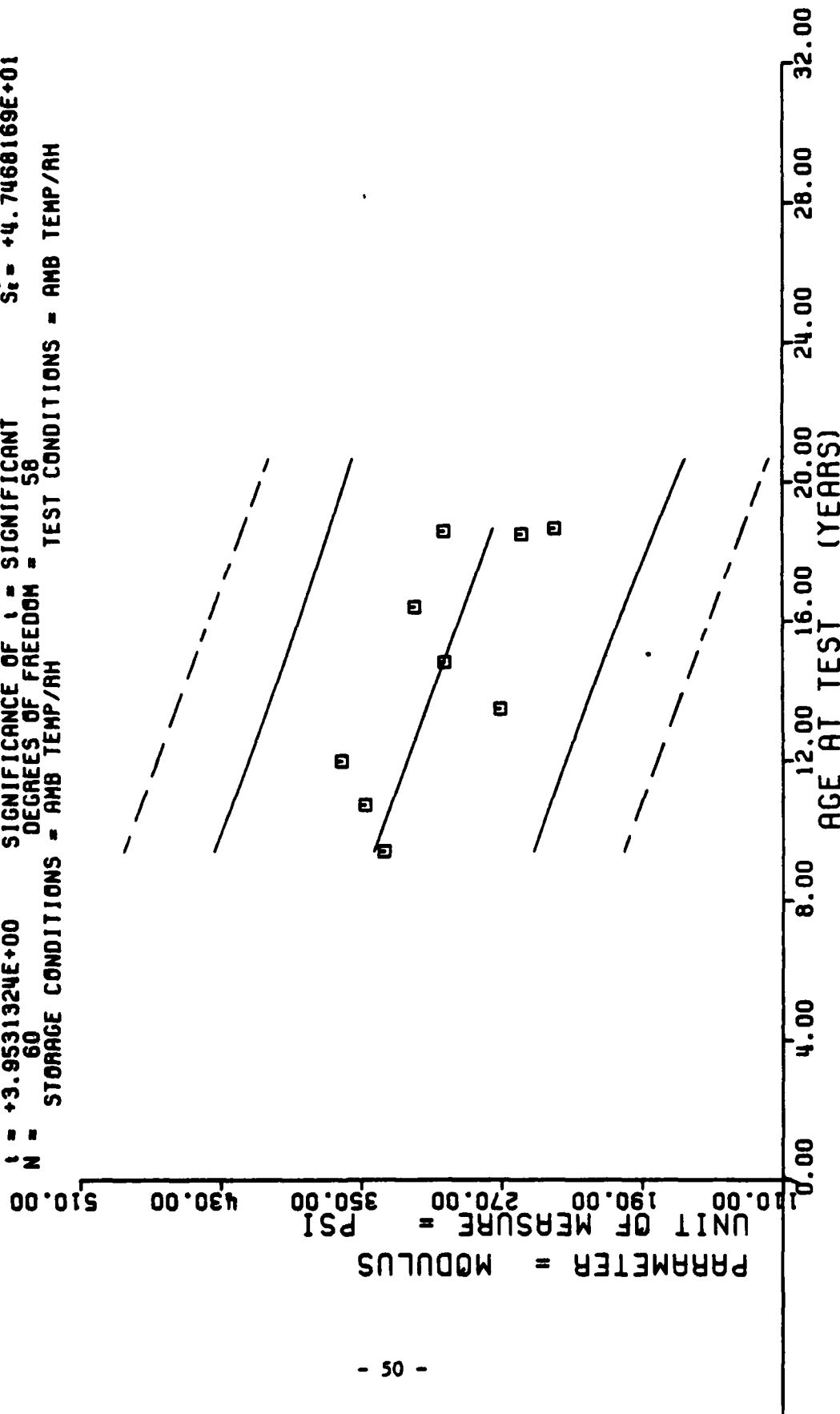
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCT MTRS. INNER, AXIAL POS, V.L. RATE CHS=0.0002 IN/MIN, MODULUS

Figure 25

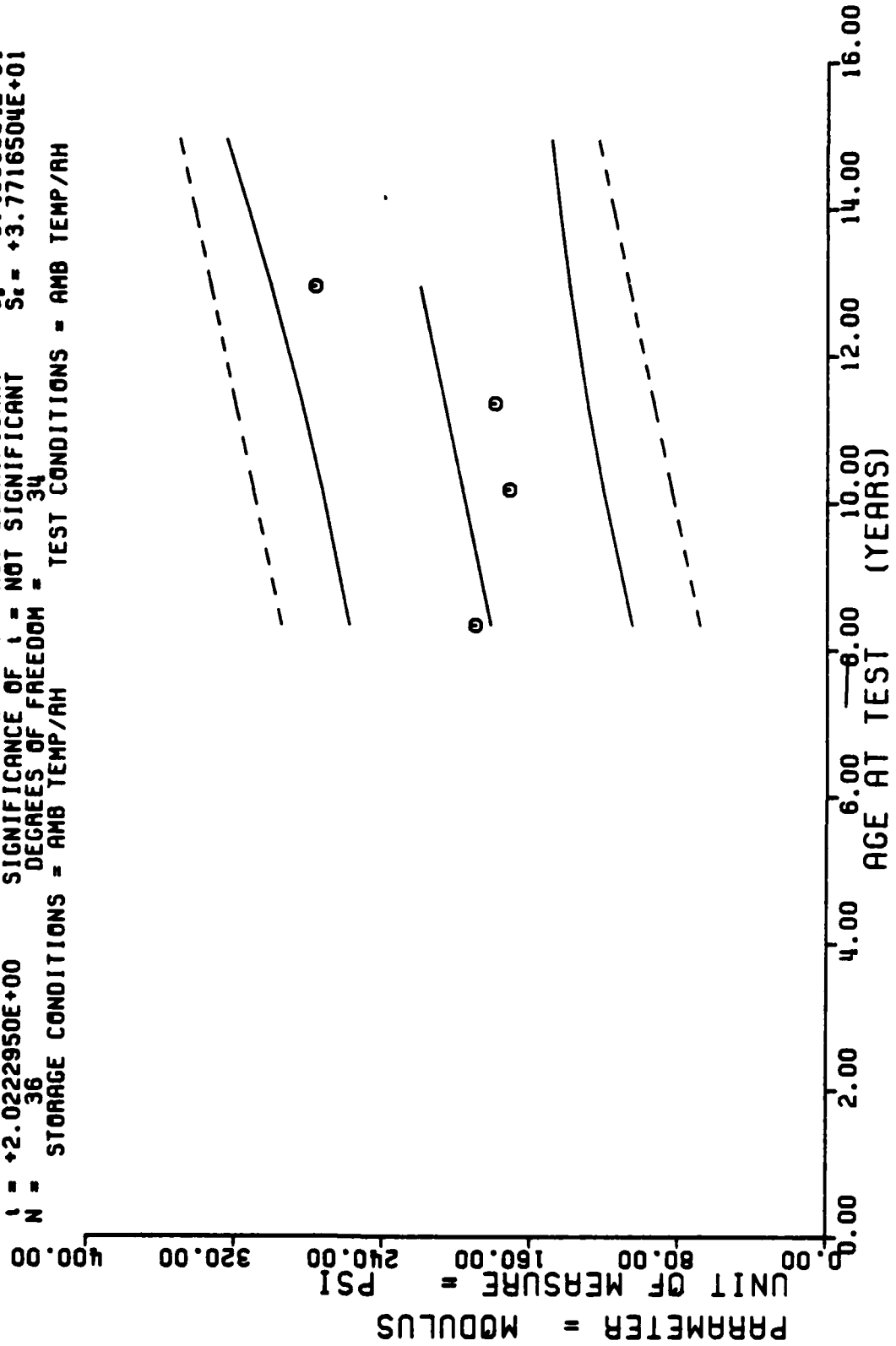
$Y = ((+4.1192257E+02) + (-6.1157927E-01) * X)$   
 $F = +1.5627256E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_1 = +5.3026845E+01$   
 $R = -4.6070408E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +1.5470750E-01$   
 $t = +3.9531324E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +4.7468169E+01$   
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT MTA <0022135>, INNER, AXIAL POS, V.L. RATE CHS=0.0002, MODULUS.

Figure 26

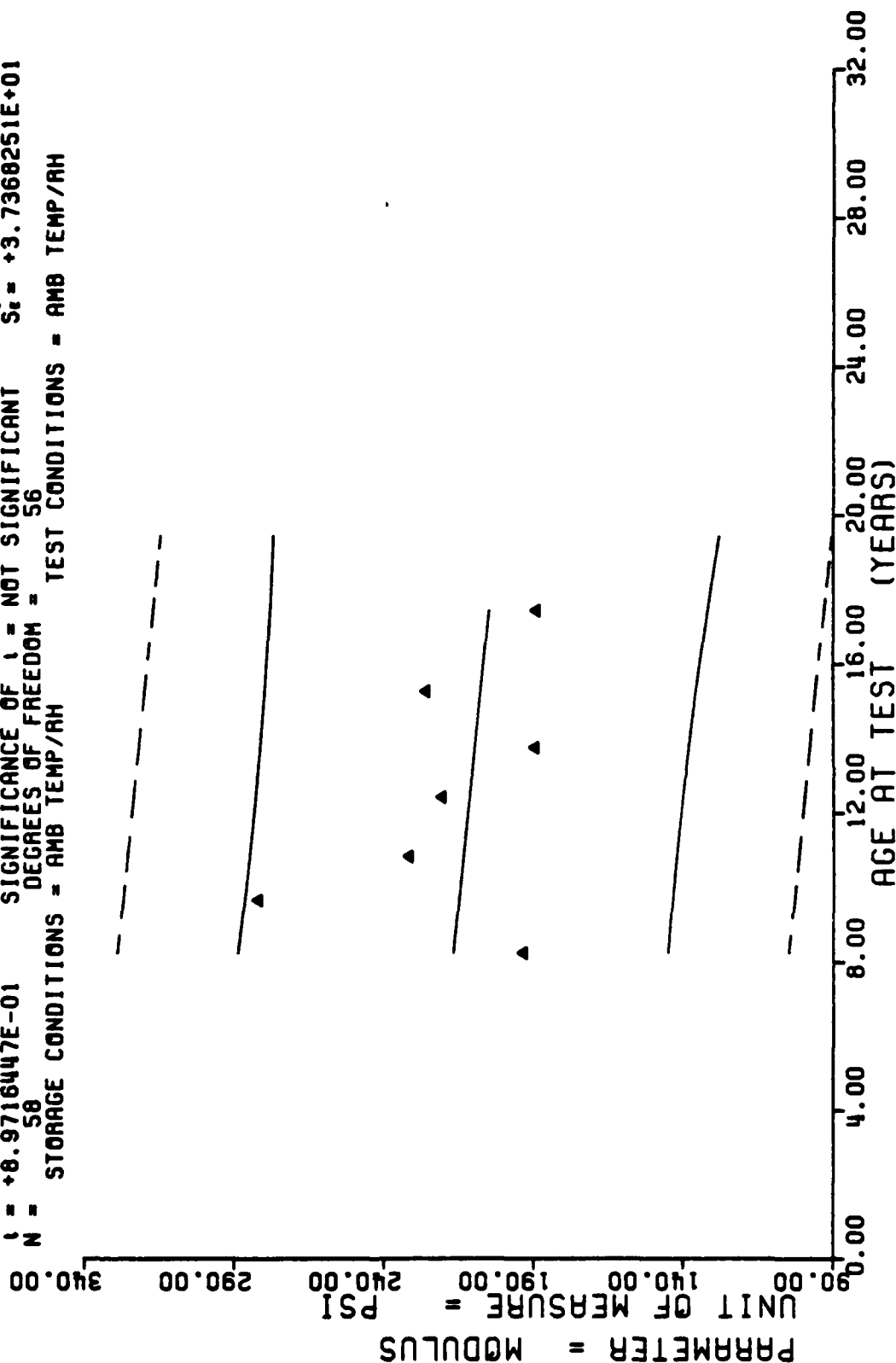
$Y = ((+1.1186142E+02) + (+6.9958474E-01) * X)$   
 F = +4.0896772E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT  $G_1 = +3.9346043E+01$   
 R = +3.2767315E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +3.4593604E-01$   
 A = +2.0222950E+00 SIGNIFICANCE OF A = NOT SIGNIFICANT  $S_t = +3.7716504E+01$   
 N = 36 DEGREES OF FREEDOM = 34  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE OSCI MTR <0022583>, INNER, AXIAL POS, V.L. RATE CHS=0.0002, MODULUS.

Figure 27

$Y = ((+2.2742026E+02) + (-1.0645374E-01) \times X)$   
 $F = +0.0490409E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma = +3.7304246E+01$   
 $R = -1.1903622E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +1.1865577E-01$   
 $t = +8.9716447E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +3.7368251E+01$   
 $N = 58$  DEGREES OF FREEDOM = 56  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT MTR <0022788>, INNER, AXIAL POS, V.L. RATE CHS=0.0002, MODULUS.

$Y = ((+9.8462531E+01) + (+9.3300622E-02) * X)$   
 $F = +7.9676952E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +2.4571549E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.8227106E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 126$  DEGREES OF FREEDOM = 124  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band —  
 3-sigma Limits ---

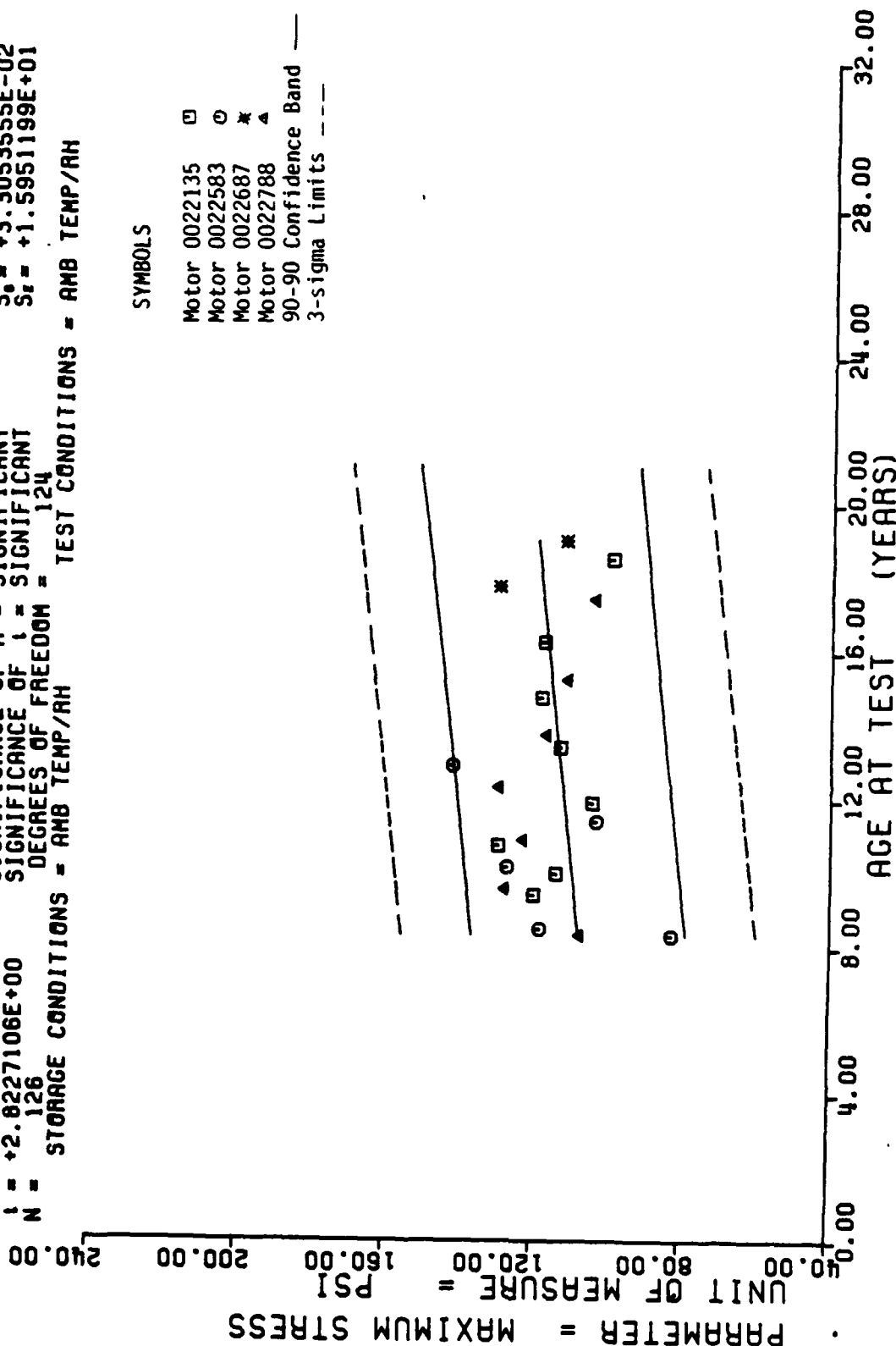
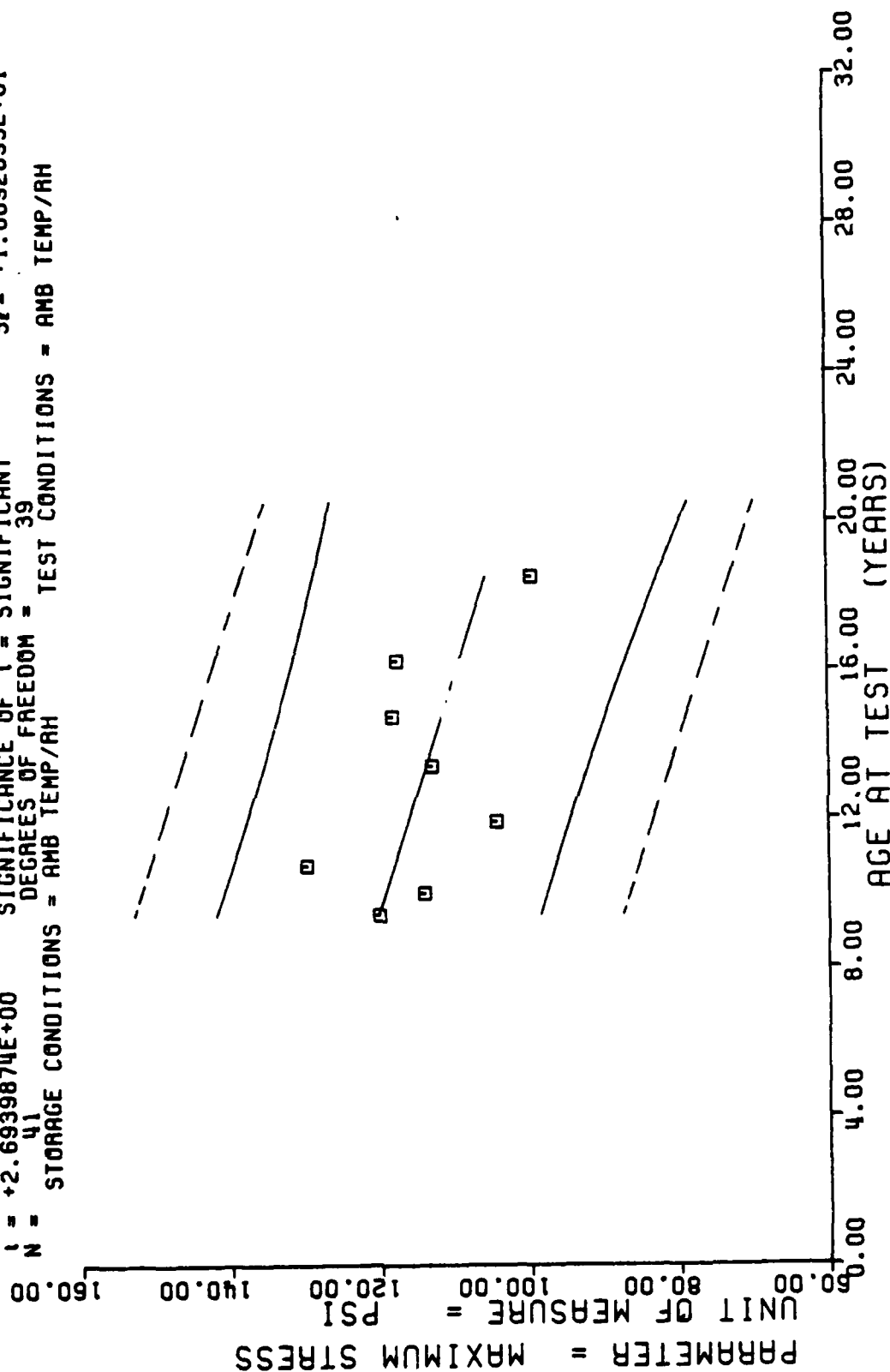


Figure 29

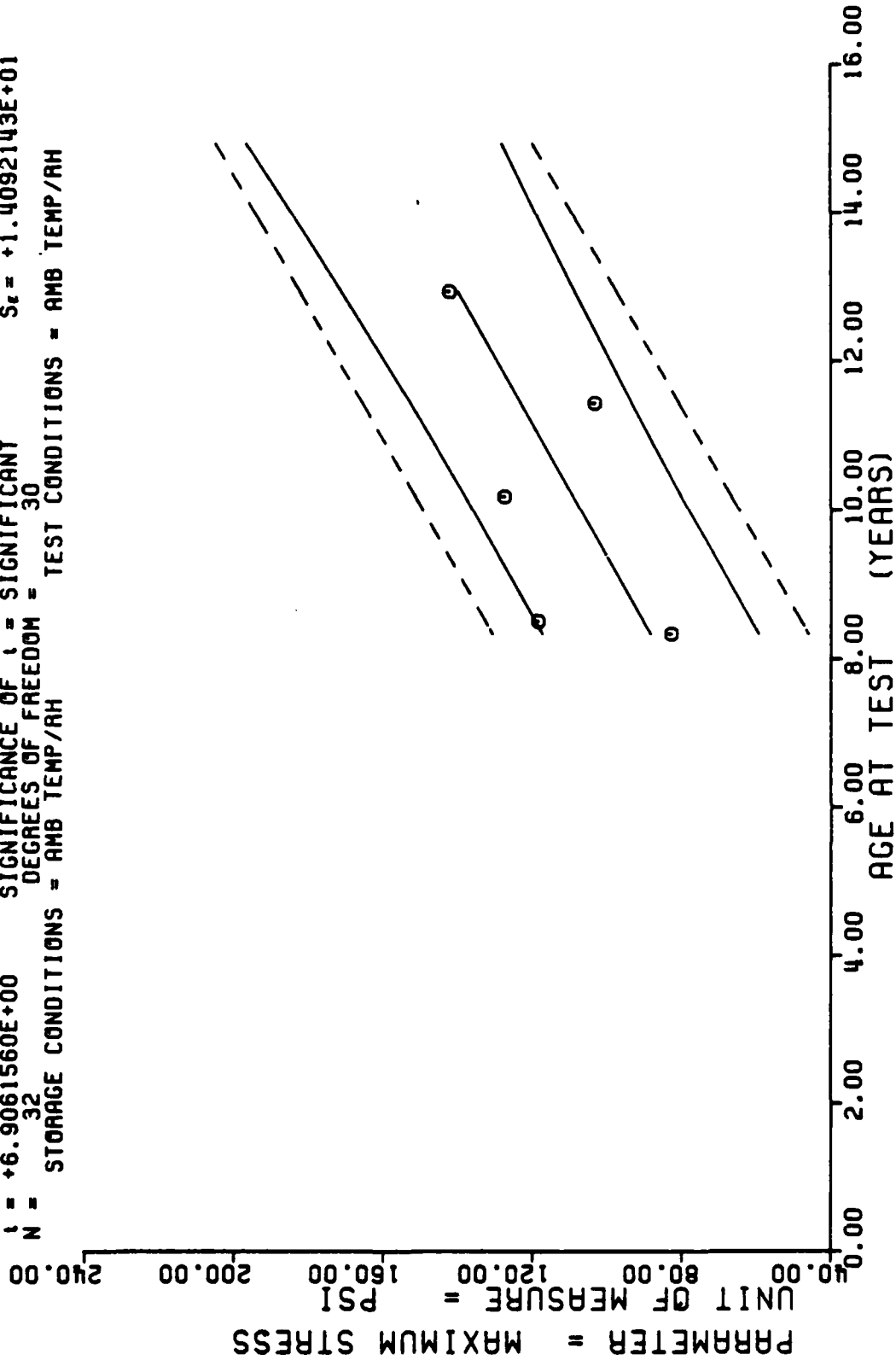
$Y = ((+1.3512443E+02) + (-1.3284034E-01) \times X)$   
 $F = +7.2575686E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_f = +1.1713984E+01$   
 $R = -3.9609939E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +4.9309934E-02$   
 $t = +2.6939874E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +1.0892893E+01$   
 $N = 41$  DEGREES OF FREEDOM = 39  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTAS ONLY, OUTER AXIAL POS. LOW RATE CHS=2.0 MAX STRESS <0022135>

Figure 30

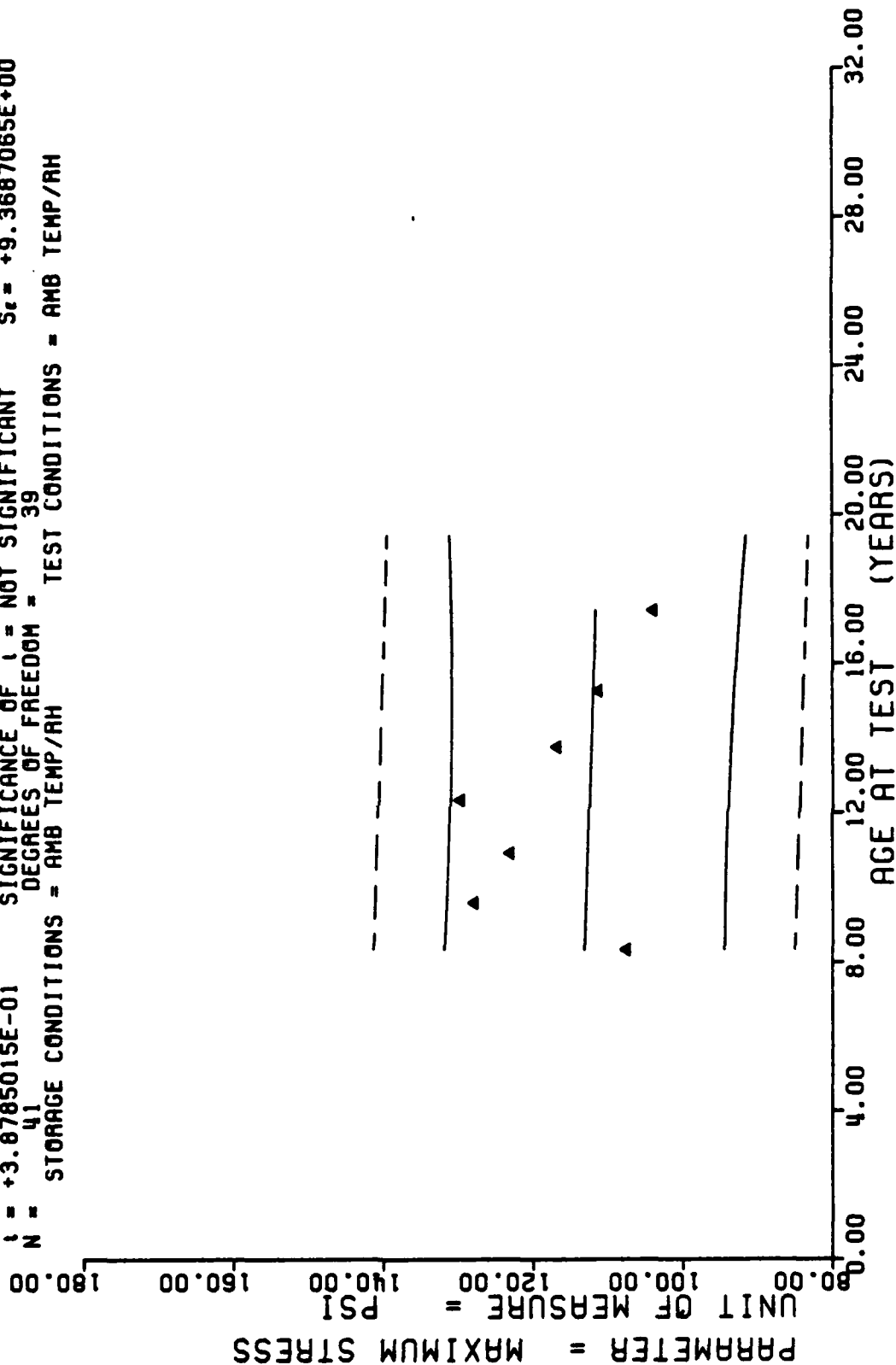
$Y = ((-5.0998974E+00) + (+9.3424557E-01) * X)$   
 $F = +4.7694991E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +7.8350158E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +6.9061560E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 32$  DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRs ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 MAX STRESS <0022583>

Figure 31

$Y = ((+1.1454754E+02) + (-1.3948899E-02) \times X)$   
 $F = +1.5042774E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma^2 = +9.2686801E+00$   
 $R = -6.1986299E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +3.5964662E-02$   
 $t = +3.8785015E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +9.3687065E+00$   
 $N = 41$  DEGREES OF FREEDOM = 39  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRs ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 MAX STRESS <0022788>

Figure 32

$Y = ((+4.1838304E-01) + (+6.5488325E-04) \times X)$   
 $F = +1.4281640E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +3.2021532E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +3.7791058E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 127$  DEGREES OF FREEDOM = 125  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---

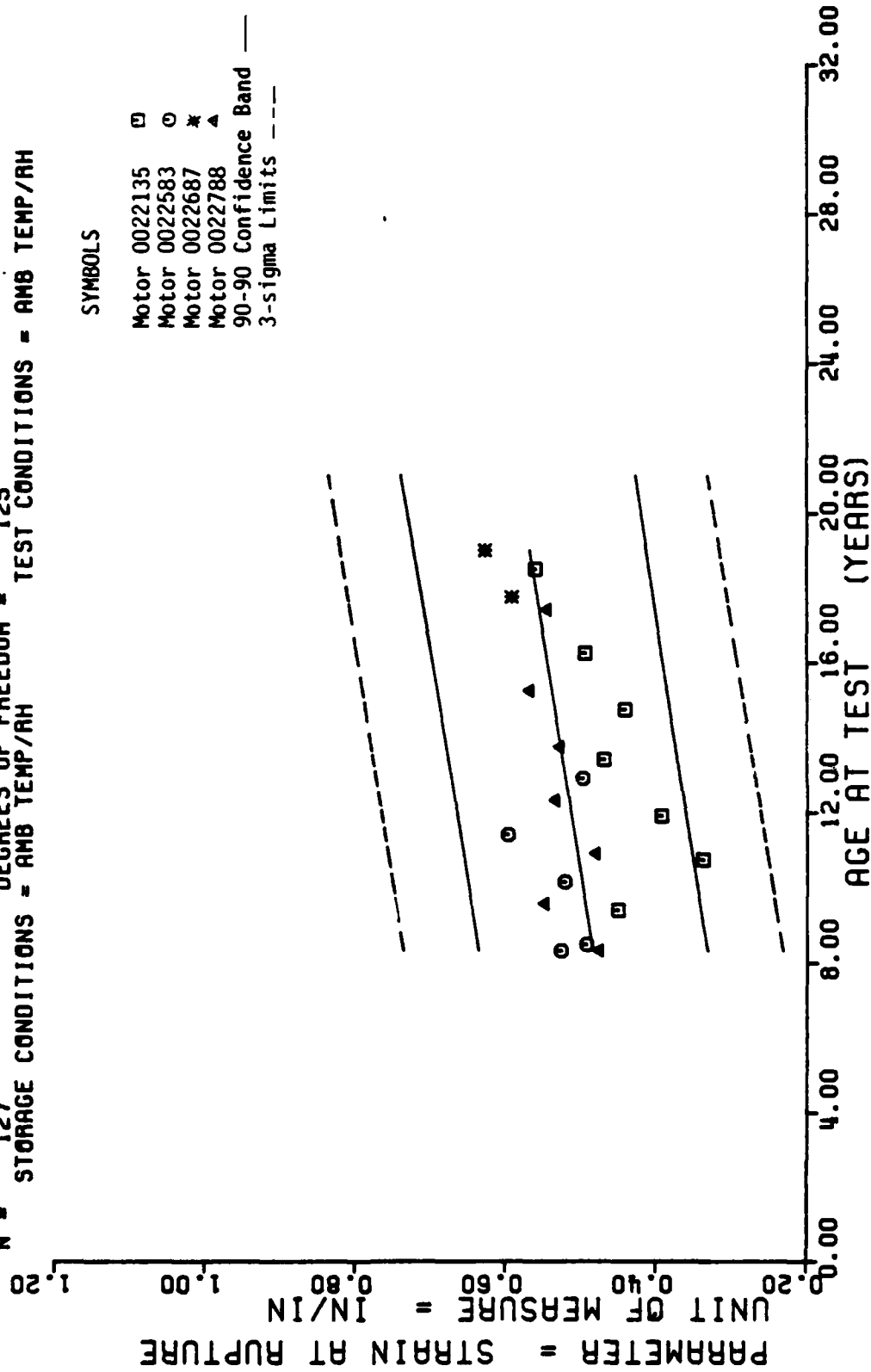
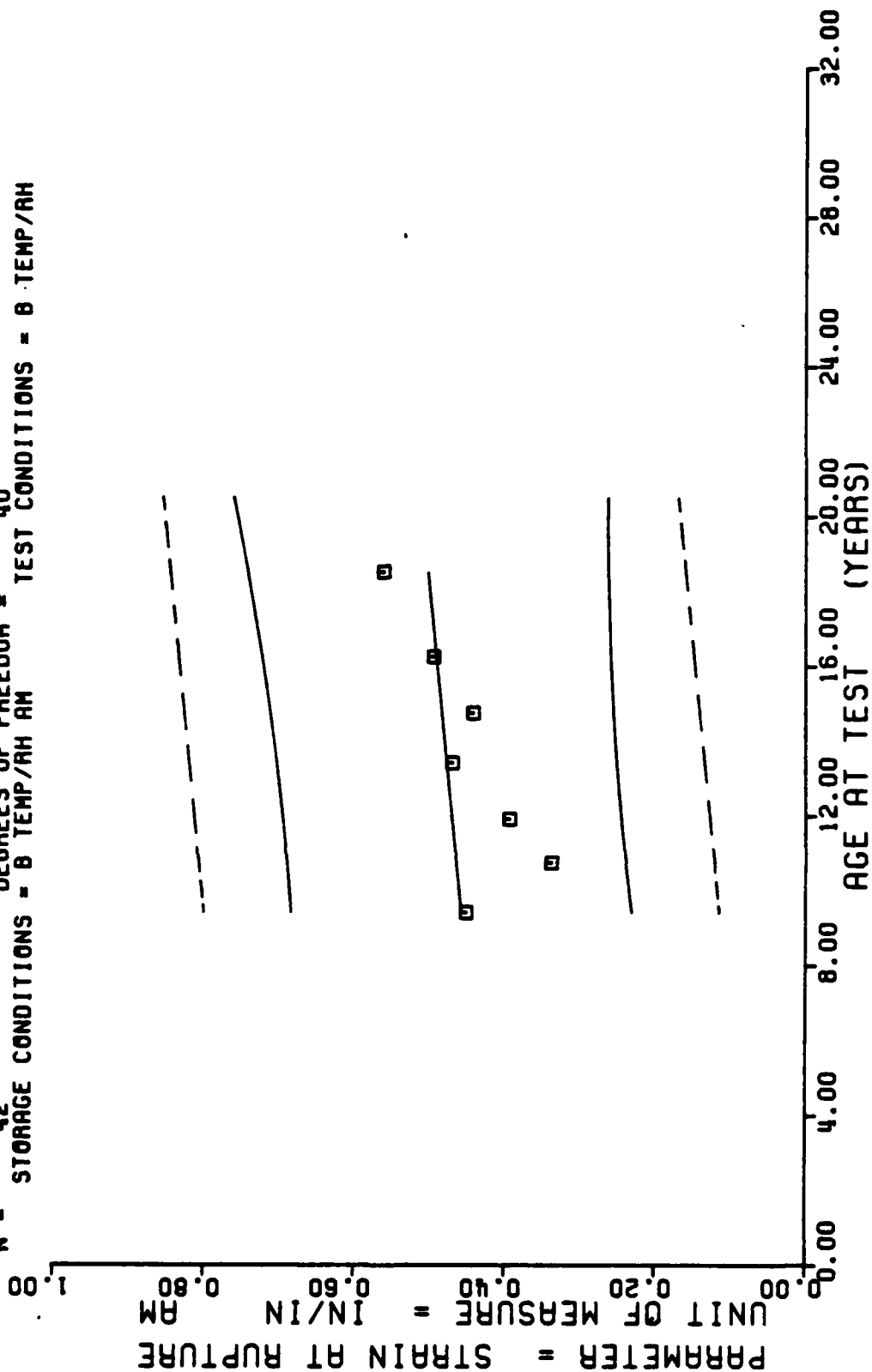


Figure 33

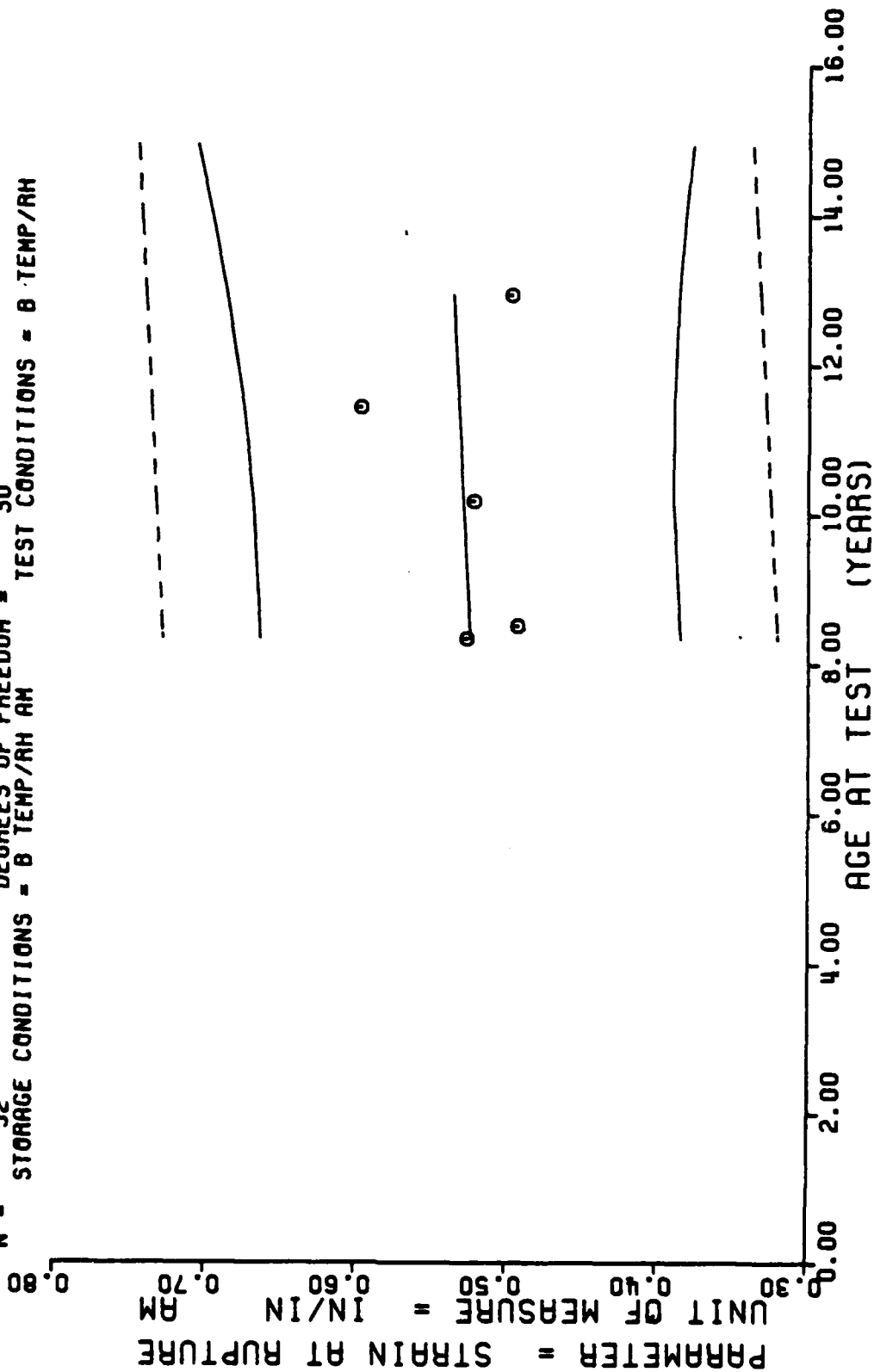
$Y = (( +4.1046104E-01 ) + ( +4.1184919E-04 ) \times X)$   
 $F = +6.5442947E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +1.1362843E-01$   
 $A = +1.2687541E-01$  SIGNIFICANCE OF A = NOT SIGNIFICANT  $S_e = +5.0910434E-04$   
 $I = +8.0896815E-01$  SIGNIFICANCE OF I = NOT SIGNIFICANT  $S_r = +1.1411034E-01$   
 $N = 42$  DEGREES OF FREEDOM = 40  
 STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH



II STAGE DSCT MTRS ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 STN RUPTUR <0022135>

Figure 34

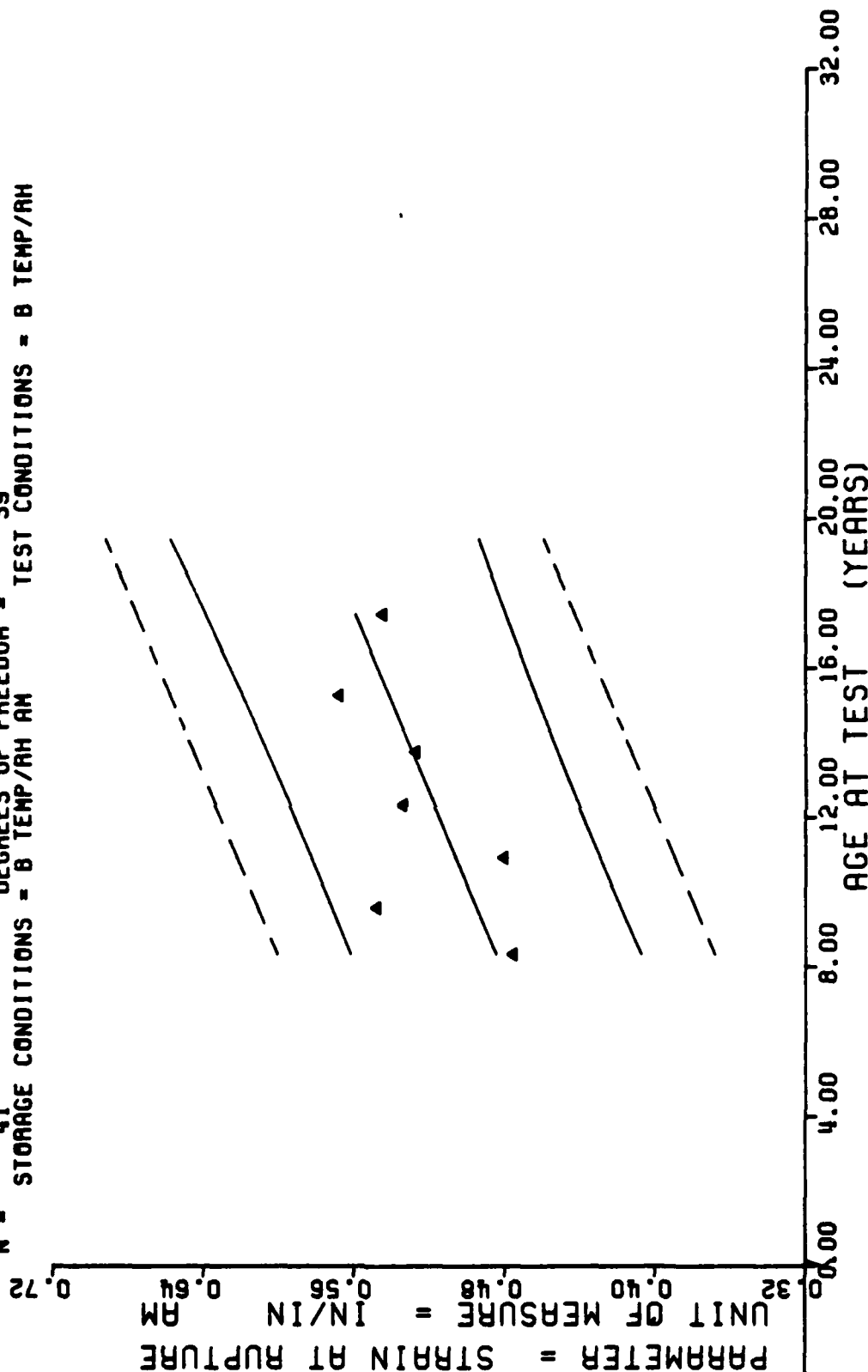
$Y = ((+5.0229690E-01) + (+2.1742268E-04) \cdot X)$   
 $F = +1.1117939E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_f = +6.6946536E-02$   
 $R = +6.0764269E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +6.5206769E-04$   
 $t = +3.3343575E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +6.7927412E-02$   
 $N = 32$  DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH



11 STAGE DSCT MTRS ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 STN RUPTUR <0022583>

Figure 35

$Y = (( +4.1616511E-01 ) + ( +6.8415476E-04 ) \times X)$   
 $F = +2.1149374E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_r = +4.7522010E-02$   
 $R = +5.9297065E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.4876665E-04$   
 $t = +4.5980448E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_c = +3.8753349E-02$   
 $N = 41$  DEGREES OF FREEDOM = 39  
 STORAGE CONDITIONS = B TEMP/AM TEST CONDITIONS = B TEMP/AM



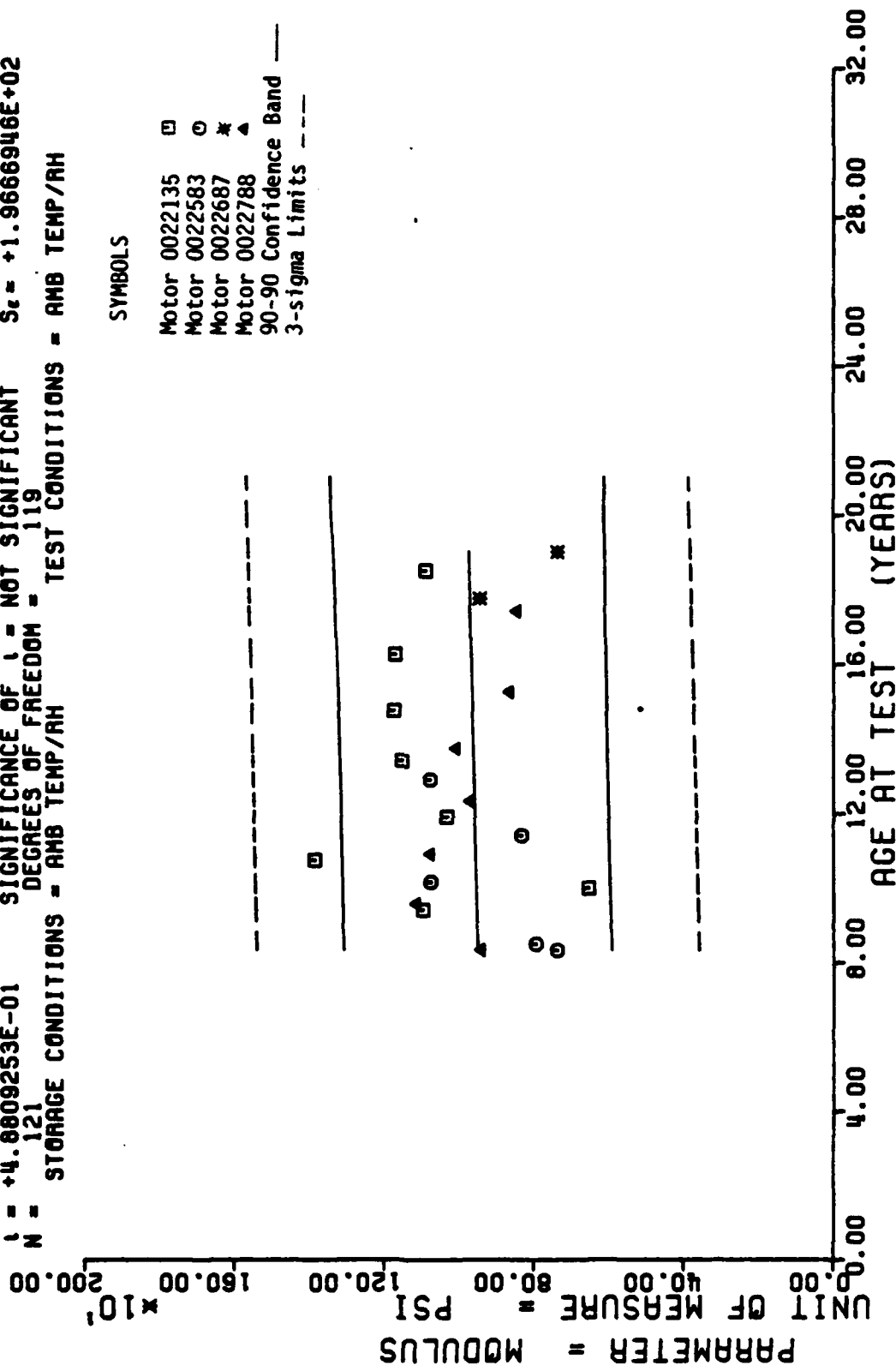
11 STAGE DSCT MTAS ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 SIN RUPTUR <0022788>

Figure 36

$F = +2.3823432E-01$  SIGNIFICANCE OF F = ( +2.0114465E-01 ) \* X)  
 $A = +4.4698648E-02$  SIGNIFICANCE OF A = NOT SIGNIFICANT  
 $I = +4.8809253E-01$  SIGNIFICANCE OF I = NOT SIGNIFICANT  
 $N = 121$  DEGREES OF FREEDOM = 119  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



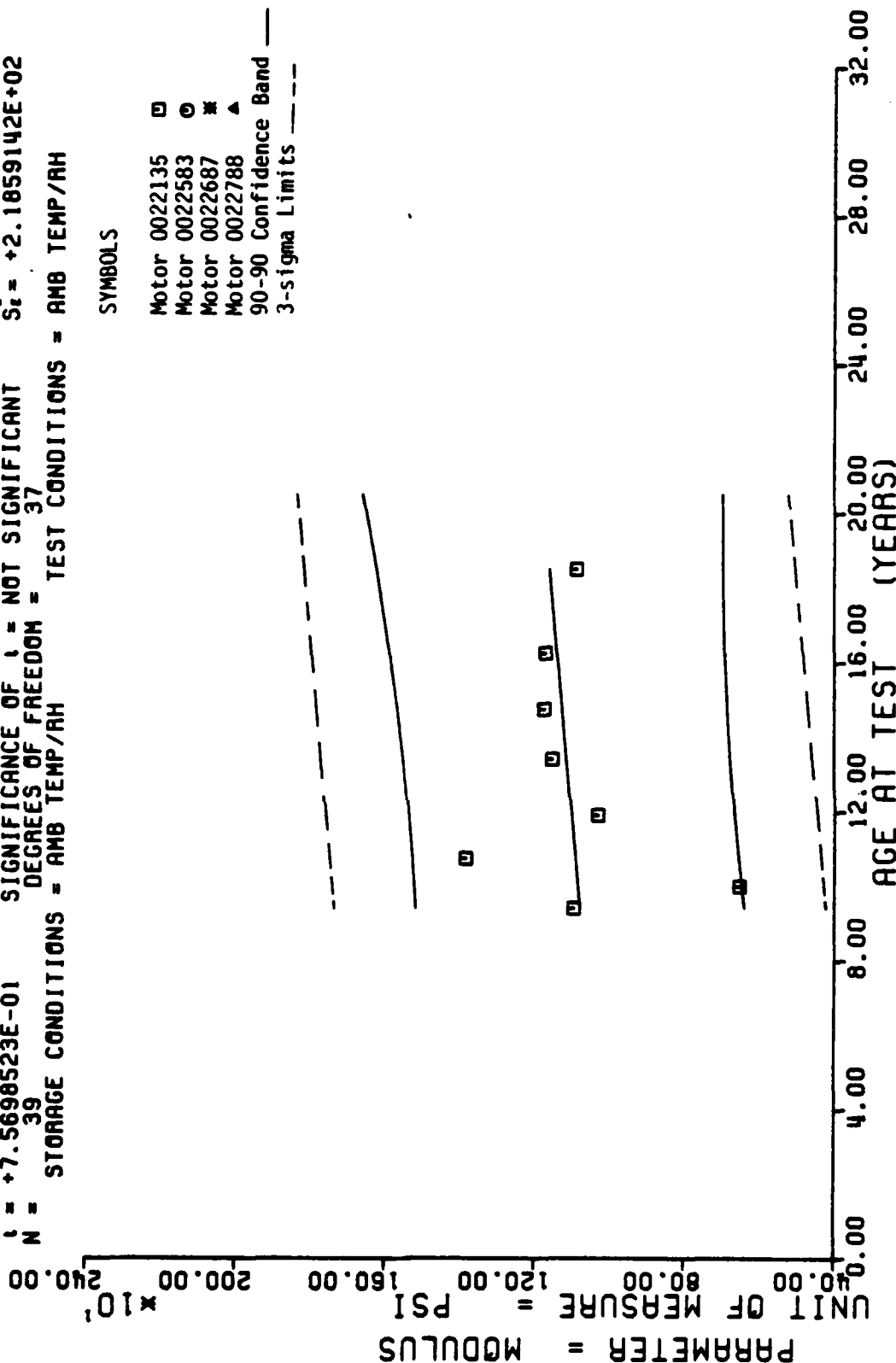
II STAGE DSCT NTAS ONLY. OUTER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN. MODULUS

Figure 37

$Y = ((+9.9273541E+02) + (+7.5553682E-01) \times X)$   
 F = +5.7302663E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_f = +2.1735989E+02$   
 A = +1.2349498E-01 SIGNIFICANCE OF A = NOT SIGNIFICANT  $S_a = +9.9808660E-01$   
 I = +7.5698523E-01 SIGNIFICANCE OF I = NOT SIGNIFICANT  $S_i = +2.1859142E+02$   
 N = 39 DEGREES OF FREEDOM = 37  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

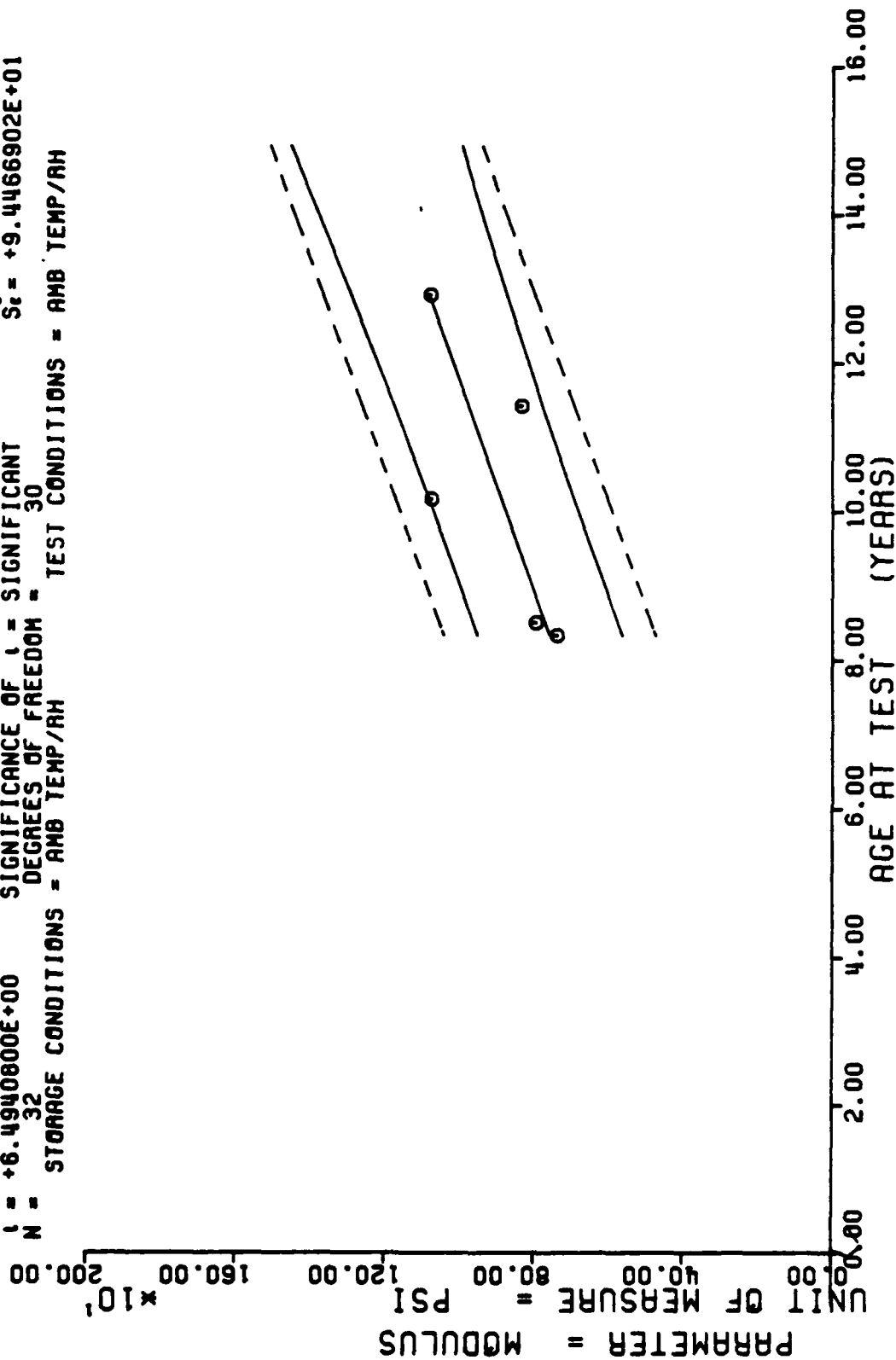
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band —  
 3-sigma Limits ---



II STAGE, DSCT MTRS, ONLY. OUTER, AXIAL POS. LOW RATE CHS=2.0 <0022135> MODULUS

Figure 38

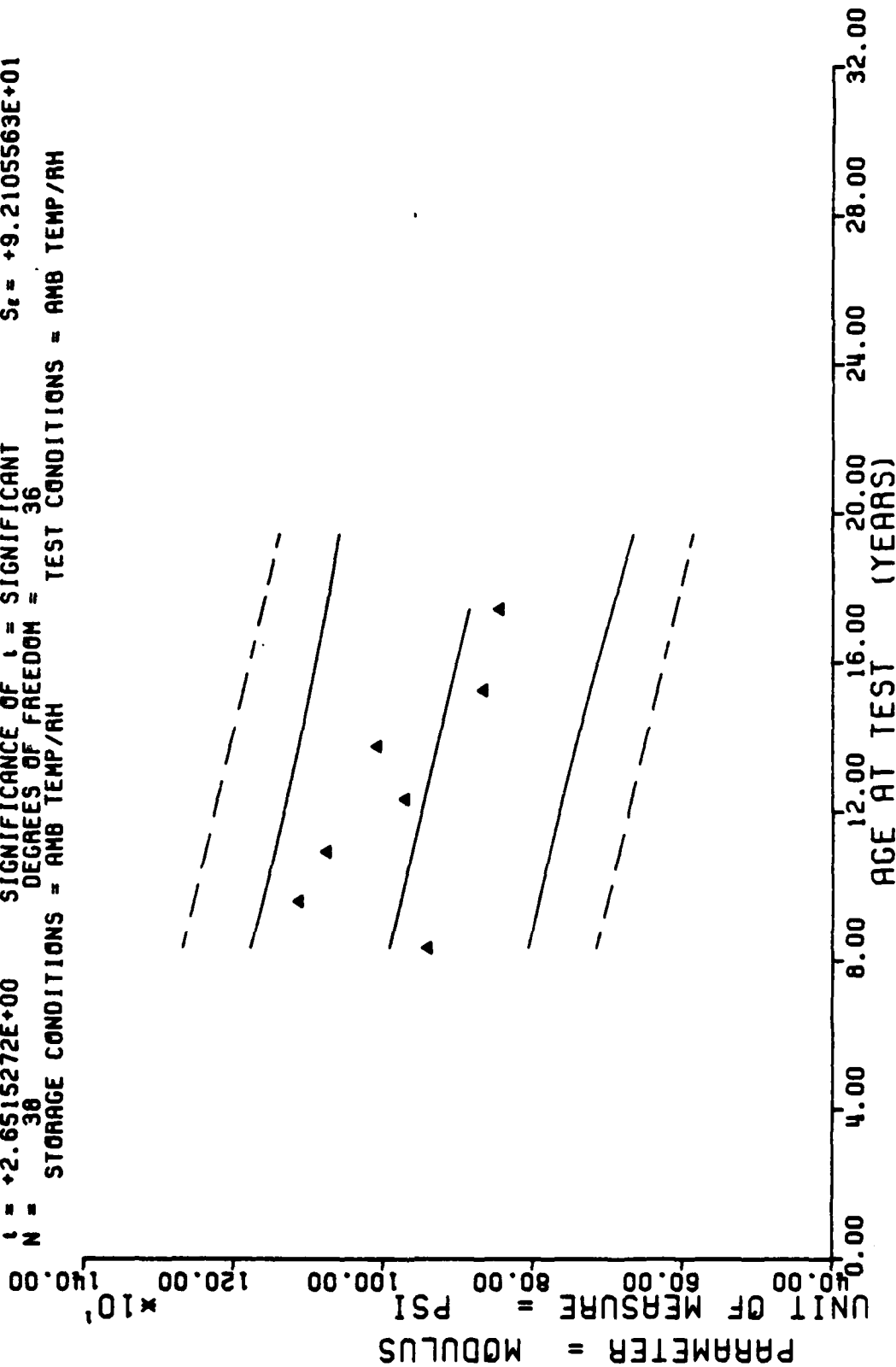
$Y = ((+1.6815959E+02) + (+5.8890456E+00) \times X)$   
 $F = +4.2173075E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_1 = +1.4414063E+02$   
 $R = +7.6441646E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +9.0683293E-01$   
 $t = +6.4940800E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_1 = +9.4466902E+01$   
 $N = 32$  DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MIRS ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 MODULUS <0022583>.

Figure 39

$Y = ((+1.0872816E+03) + (-9.6452374E-01) \times X)$   
 $F = +7.0305968E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $G_r = +9.9328456E+01$   
 $R = -4.0421033E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_o = +3.6376157E-01$   
 $t = +2.6515272E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +9.2105563E+01$   
 $N = 36$  DEGREES OF FREEDOM = 36  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



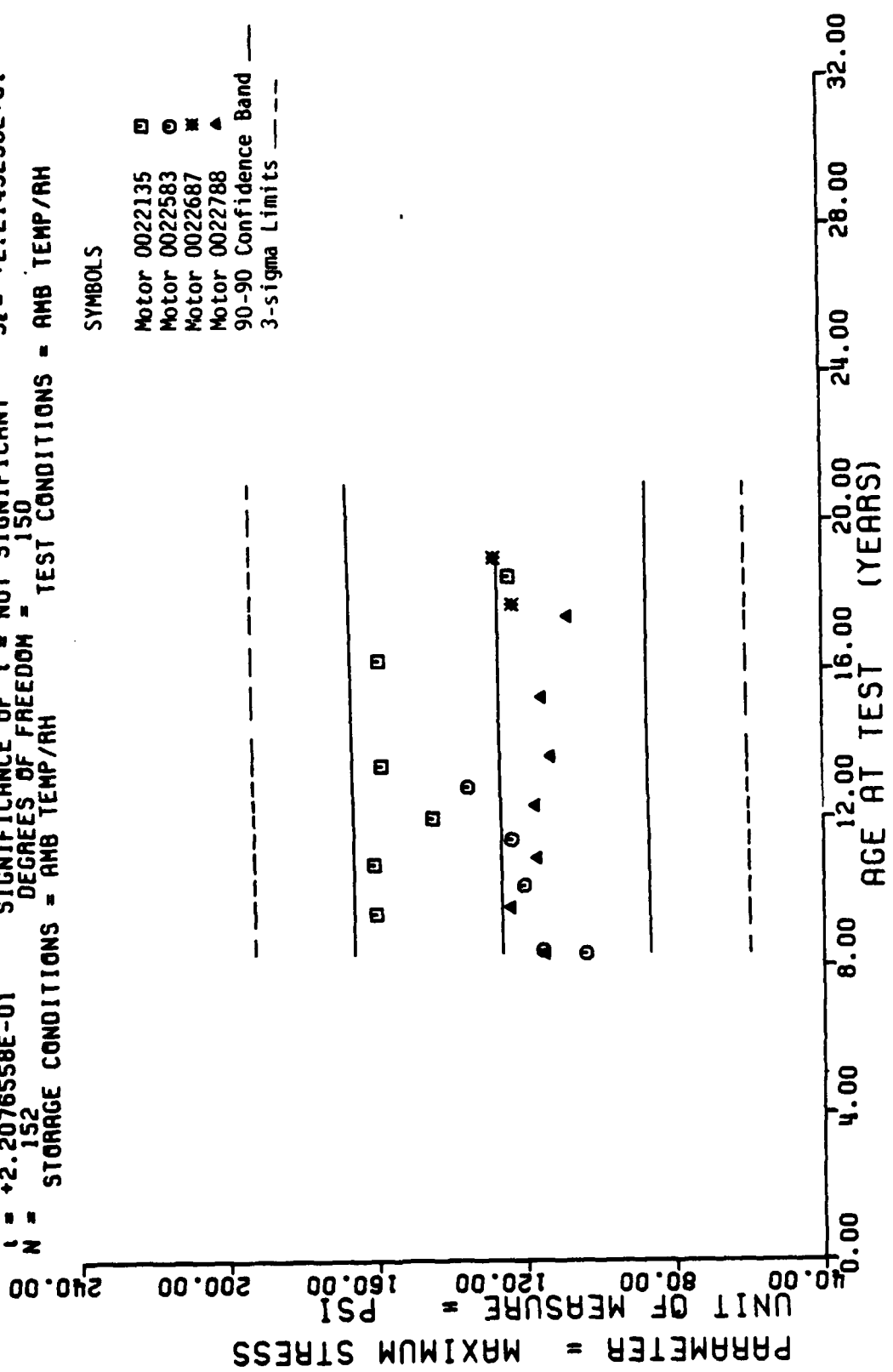
11 STAGE, DSCT MTAS, ONLY, OUTER, AXIAL POS. LOW RATE CHS=2.0 <0022788> MODULUS

Figure 40

$Y = ((+1.2533192E+02) + (+8.1996077E-03) * X)$   
 $F = +4.8737445E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = +1.8022507E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +2.2076558E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 152$  DEGREES OF FREEDOM = 150  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

SYMBOLS

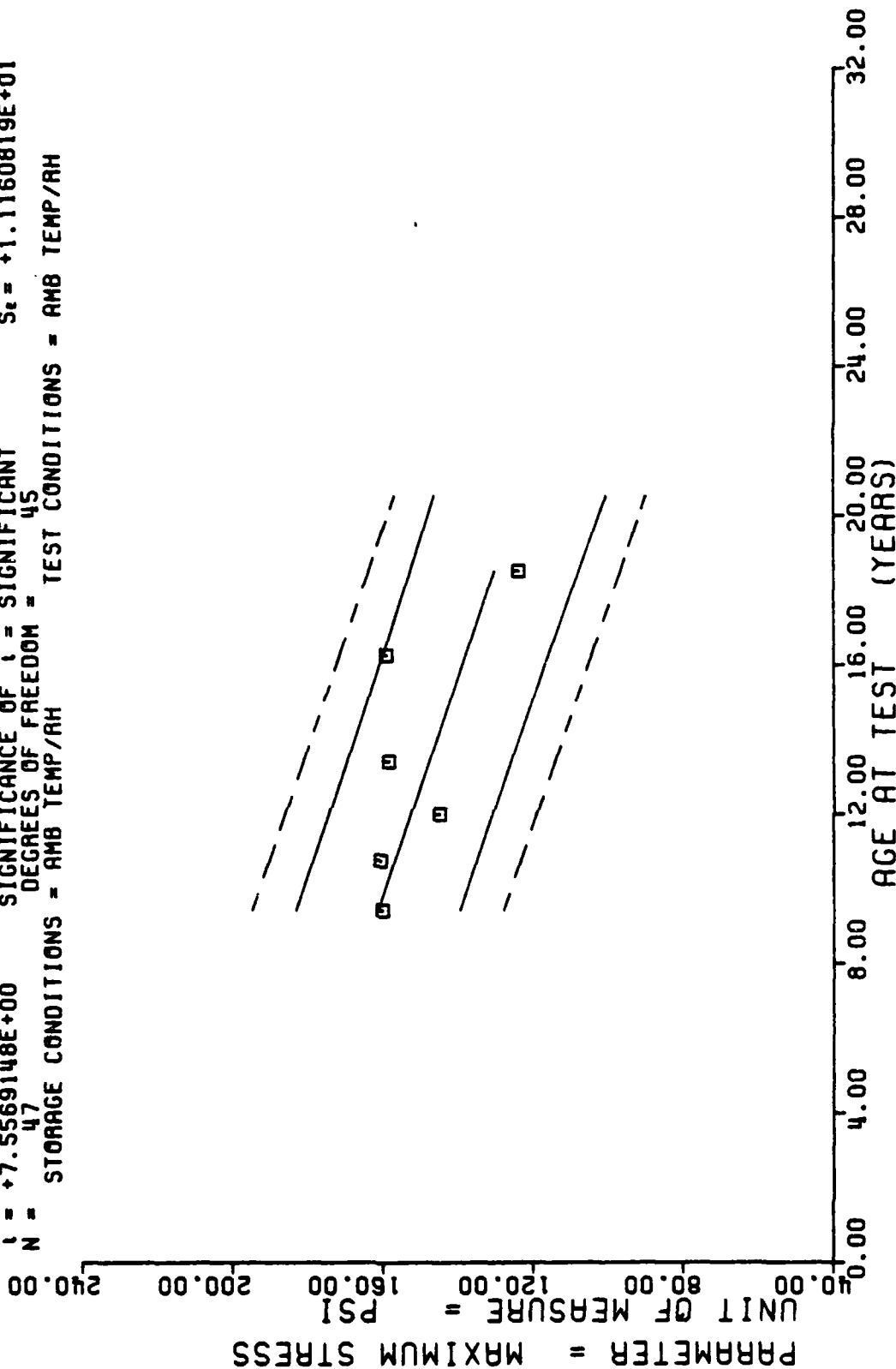
- Motor 0022135 □
- Motor 0022583 ○
- Motor 0022687 ✖
- Motor 0022788 ▲
- 90-90 Confidence Band ---
- 3-sigma Limits ---



11 STAGE, DSCM MTRs, ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN, MAX STRESS

Figure 41

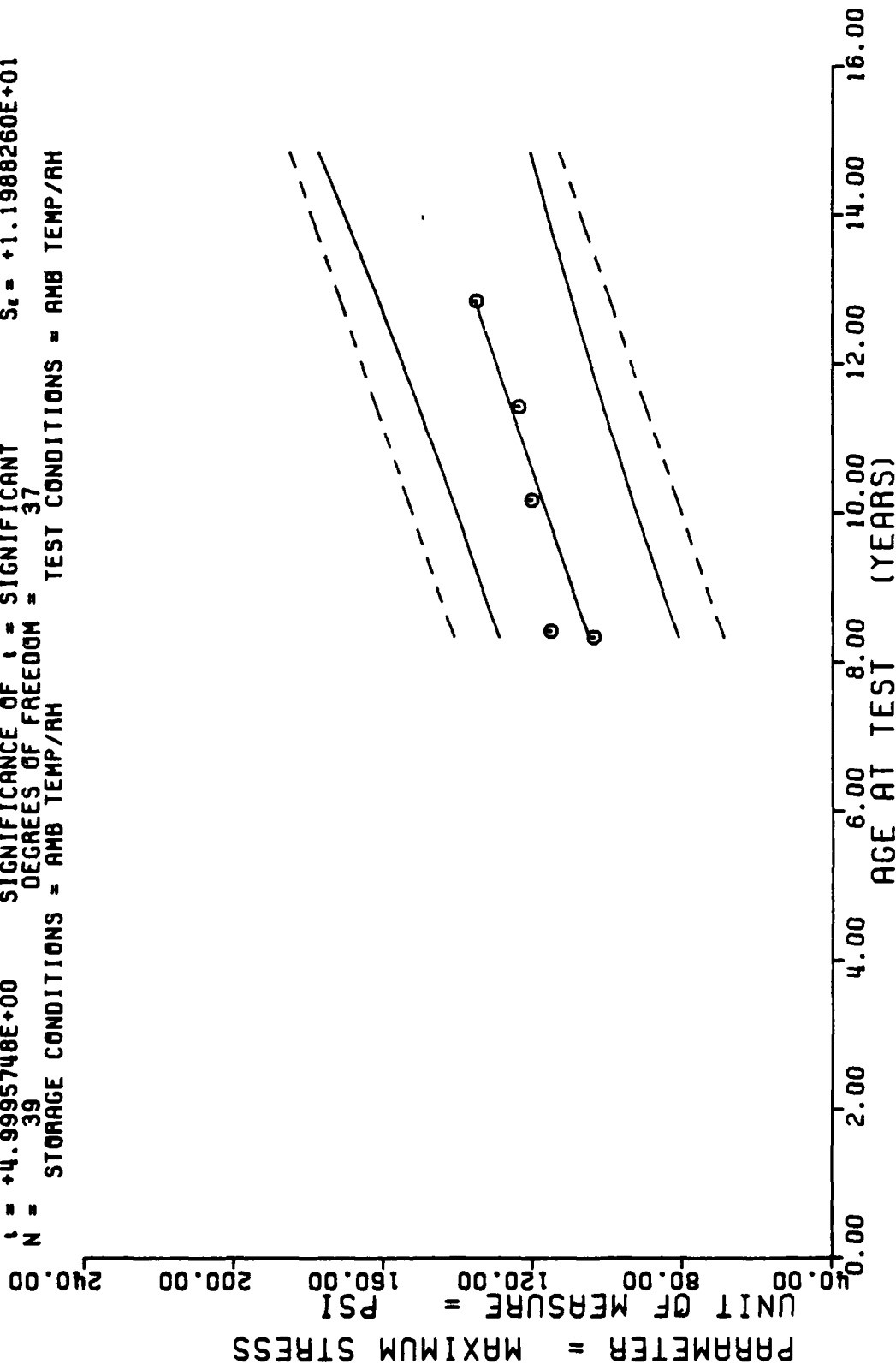
$Y = ((+1.9342108E+02) + (-2.8392175E-01) \times X)$   
 F = +5.7106962E+01 SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_t = +1.6628185E+01$   
 R = -7.4785405E-01 SIGNIFICANCE OF R = SIGNIFICANT  $S_o = +3.7571119E-02$   
 t = +7.5569148E+00 SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +1.1160819E+01$   
 N = 47 DEGREES OF FREEDOM = 45  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 MAX STRESS <0022135>

Figure 42

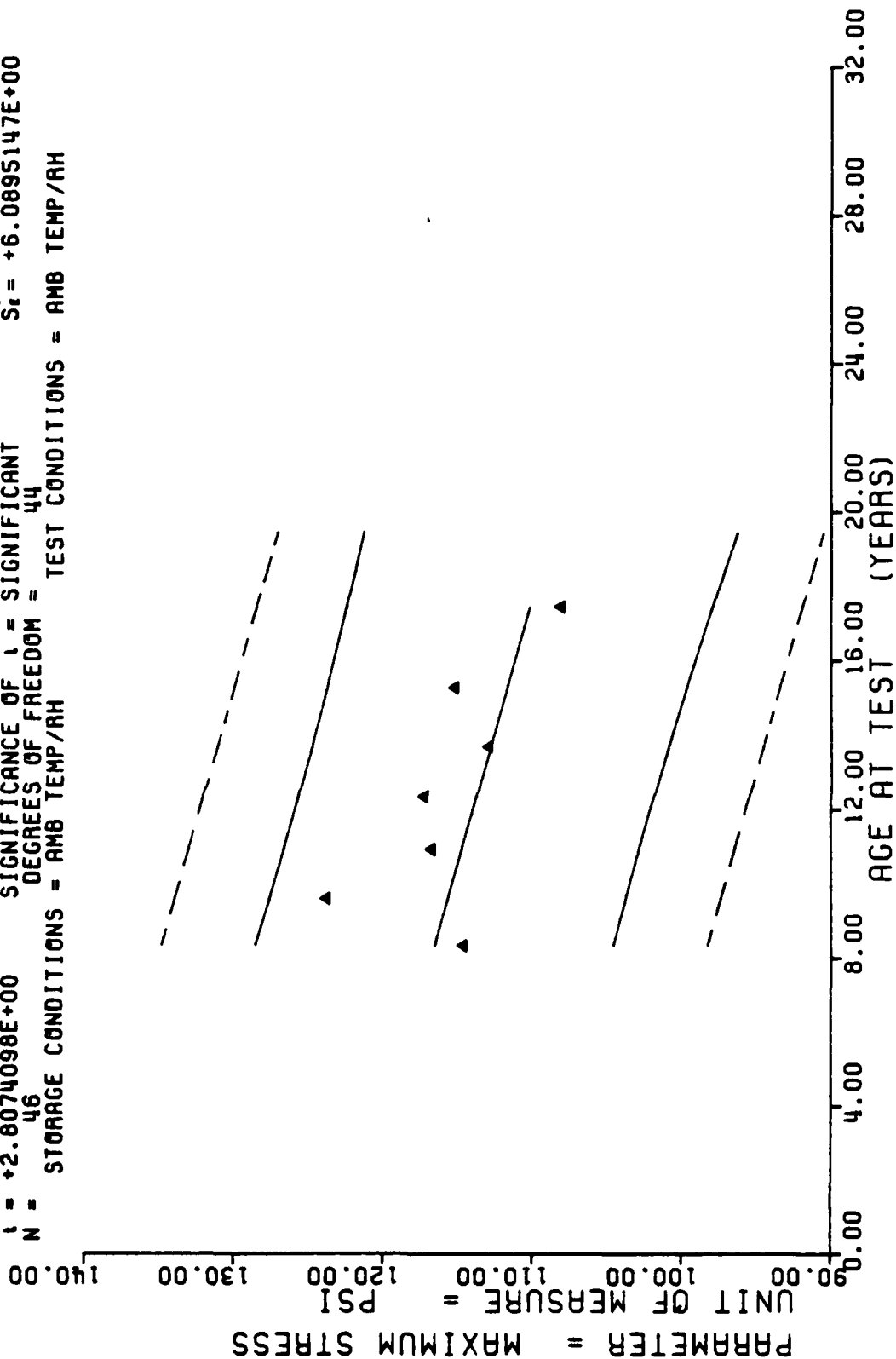
$Y = ((+4.8976320E+01) + (+5.6143609E-01) \times X)$   
 $F = +2.4995748E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_f = +1.5312472E+01$   
 $R = +6.3496841E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.1229676E-01$   
 $t = +4.9995748E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +1.1988260E+01$   
 $N = 39$  DEGREES OF FREEDOM = 37  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTAS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 MAX STRESS <0022583>

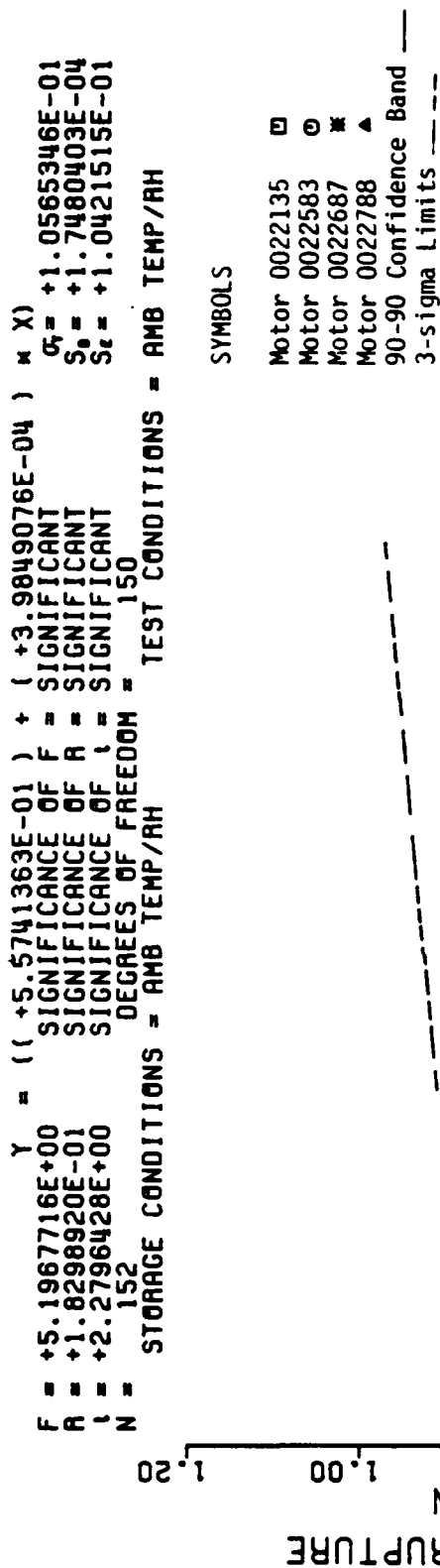
Figure 43

$F = +7.8815500E+00$   
 $R = -3.8976186E-01$   
 $I = +2.8074098E+00$   
 $N =$   
 $Y = (( +1.2235837E+02 ) + ( -5.8180932E-02 ) * X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 44  
 STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH



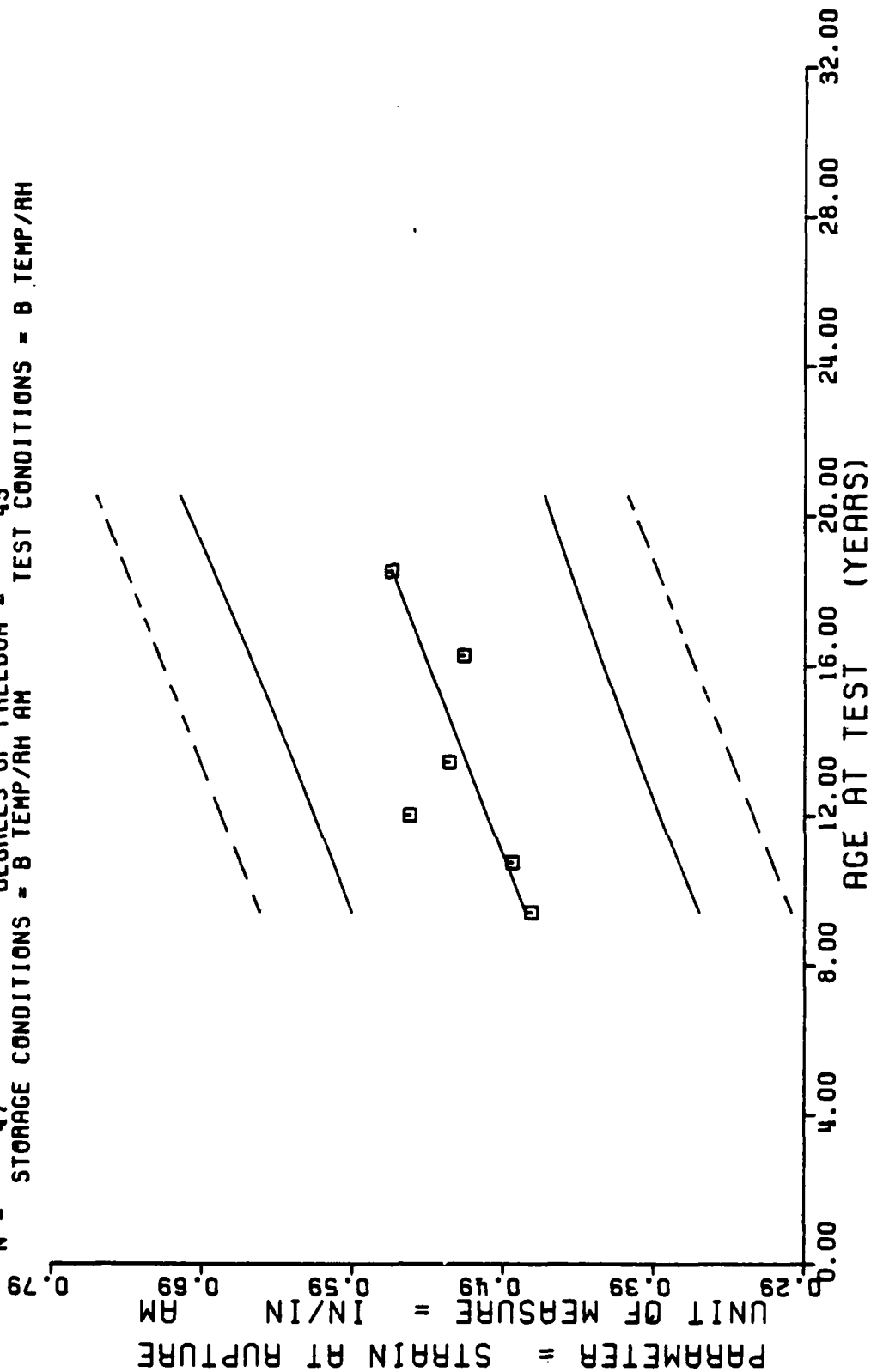
11 STAGE DSCT MTRS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 MAX STRESS <0022768>

Figure 44



II STAGE, DSCCT MTRS. ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN, STRAIN/RUPTURE

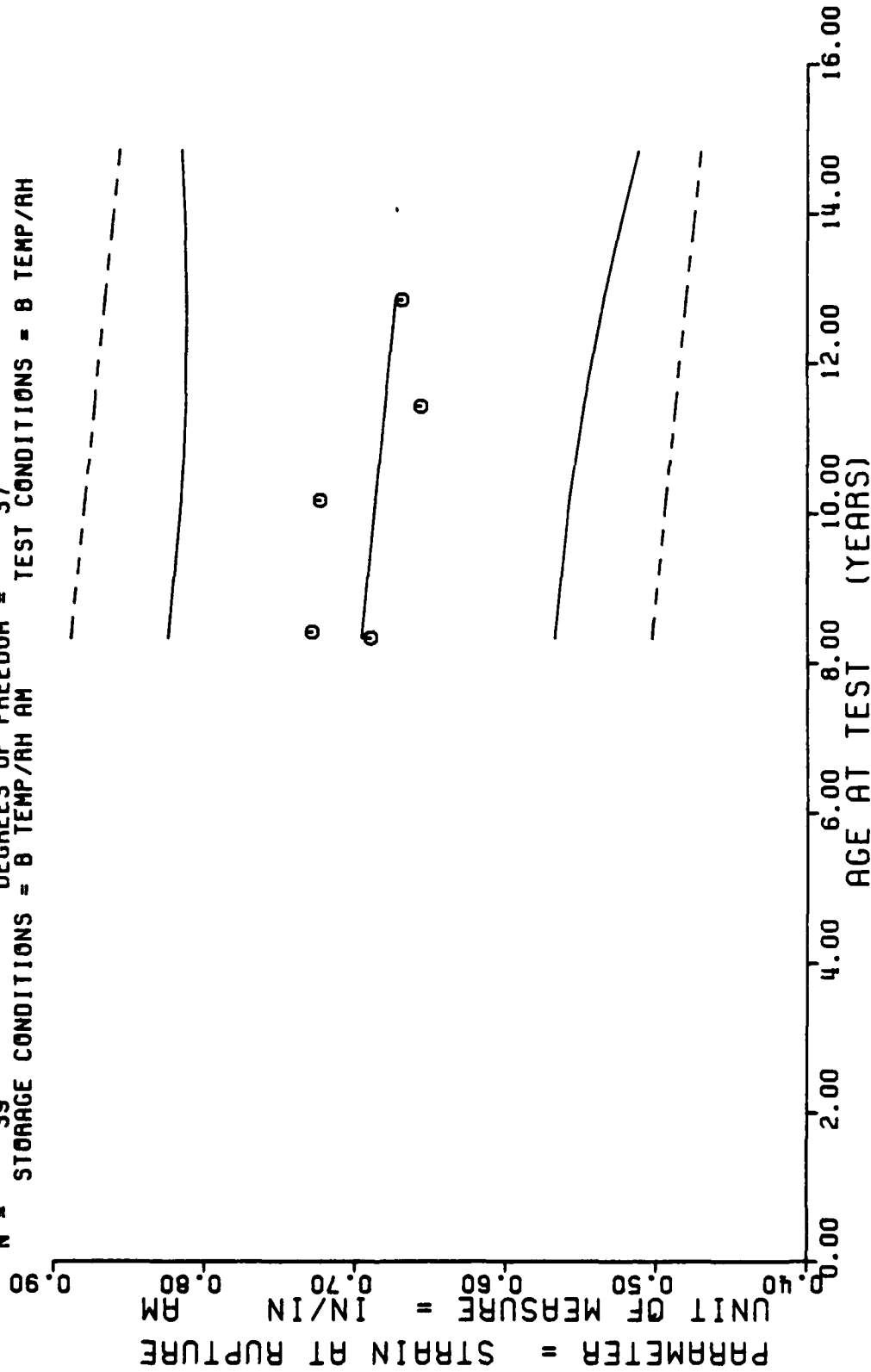
Y = (( +3.8280182E-01 ) + ( +8.1801644E-04 ) \* X)  
 F = +1.7052416E+01 SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_r = +6.8345742E-02$   
 R = +5.2422003E-01 SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.9809297E-04$   
 t = +4.1294571E+00 SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +5.8845198E-02$   
 N = 47 DEGREES OF FREEDOM = 45  
 STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH



11 STAGE DSCT MTRS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 STN RUPTUR <0022135>

Figure 46

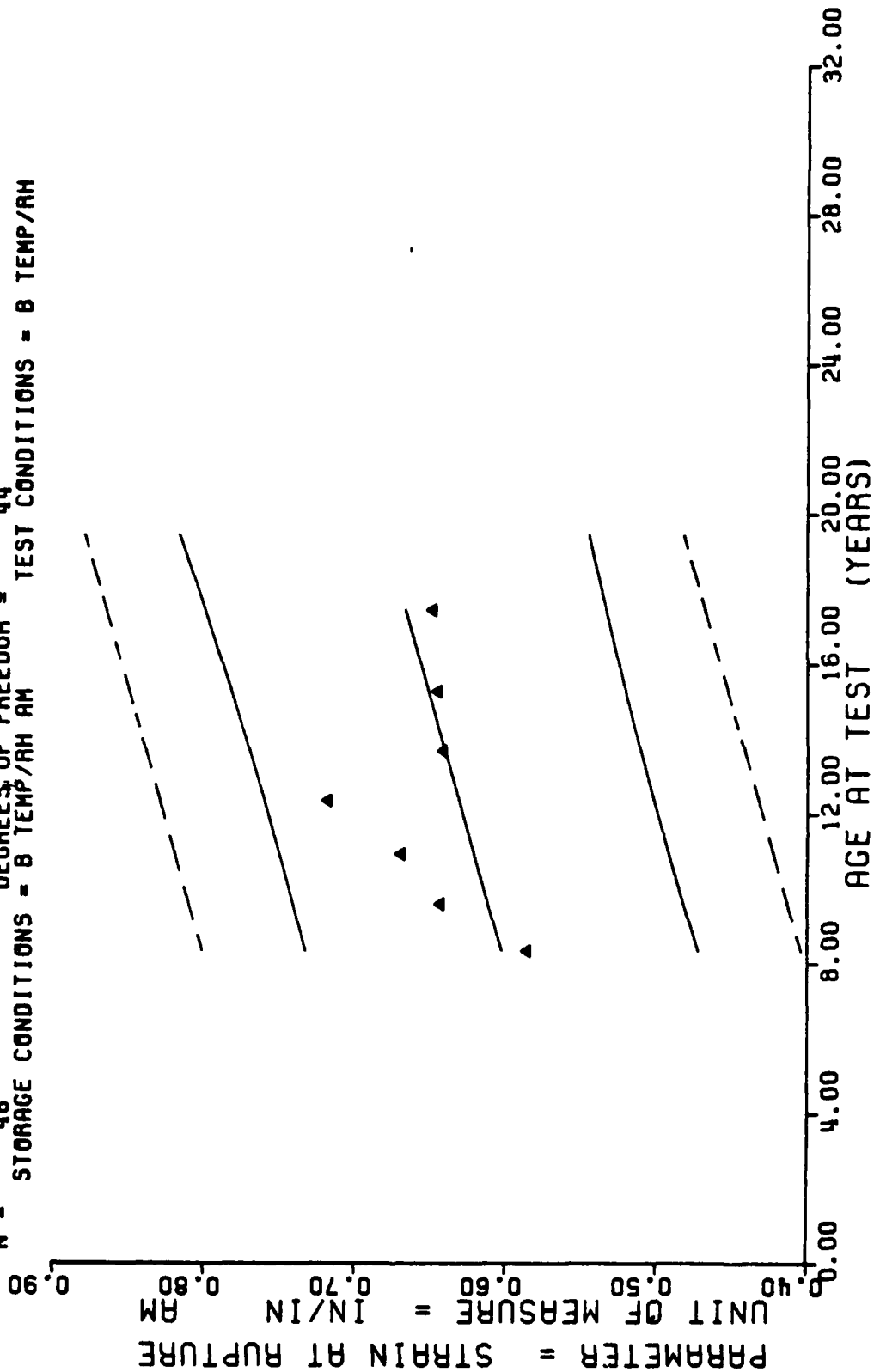
$Y = ((+7.3715409E-01) + (-4.1437847E-04) \times X)$   
 F = +4.7415811E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +6.3796765E-02$   
 R = -1.1248526E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_o = +6.0177701E-04$   
 t = +6.8859139E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +6.4242808E-02$   
 N = 39 DEGREES OF FREEDOM = 37  
 STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH



II STAGE DSCT MTRS ONLY. INNER, AXIAL POS. LOW RATE CHS=2.0 STN RUPTUR <0022583>

Figure 47

Y = (( +5.4402275E-01 ) + ( +5.8650946E-04 ) \* X)  
 F = +6.7797905E+00 SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_t$  = +7.0309483E-02  
 R = +3.6539507E-01 SIGNIFICANCE OF R = SIGNIFICANT  $S_e$  = +2.2525108E-04  
 t = +2.6038030E+00 SIGNIFICANCE OF t = SIGNIFICANT  $S_e$  = +6.6187307E-02  
 N = 46 DEGREES OF FREEDOM = 44  
 STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH



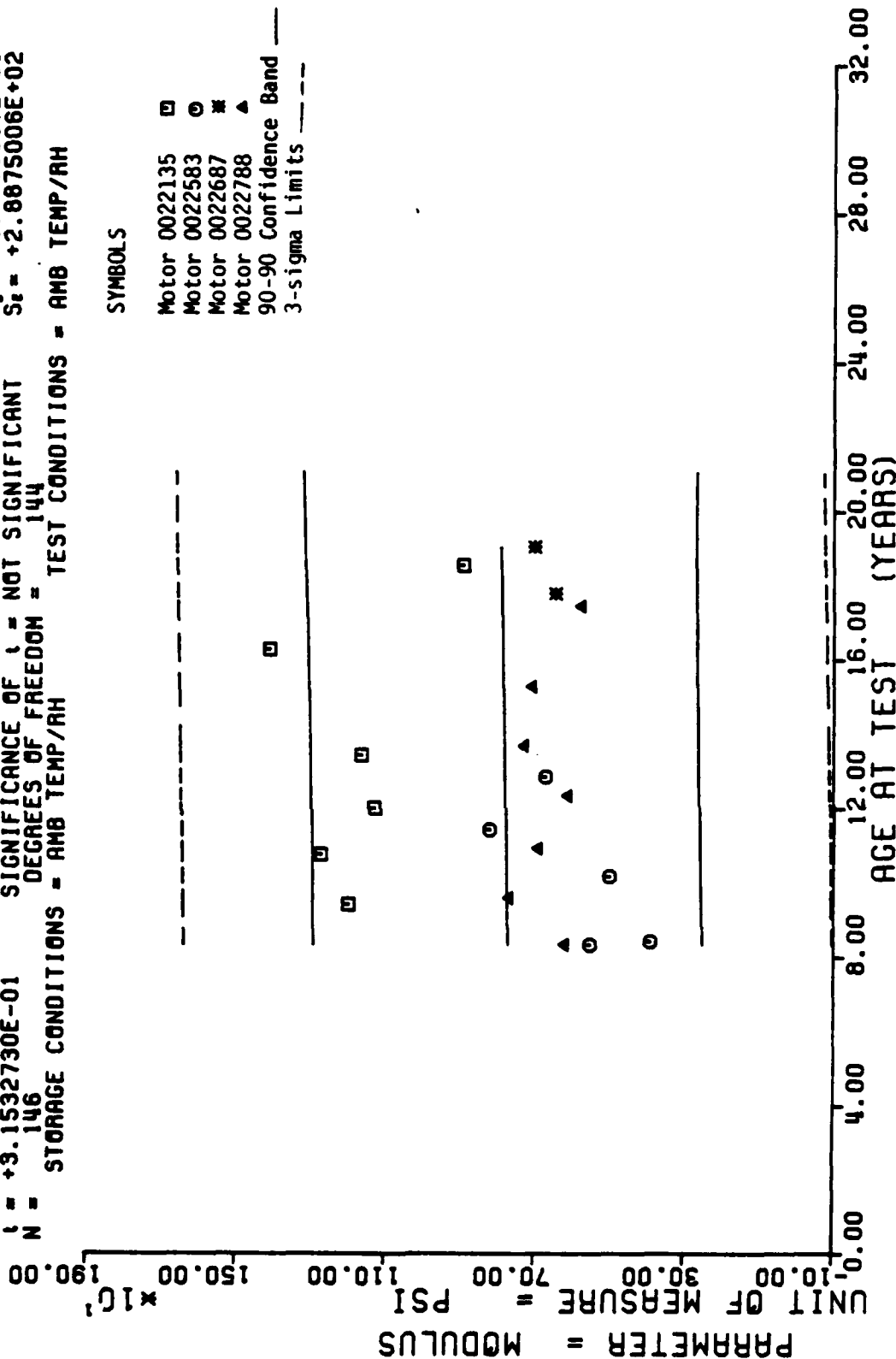
II STAGE DSCT MTRS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 STN RUPTUR <0022788>

Figure 48

$Y = ((+7.5431963E+02) + (+1.5467431E-01) \times X)$   
 $F = +9.9431308E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = +2.6268207E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +3.1532730E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 146$  DEGREES OF FREEDOM = 144  
 $N = 146$  STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

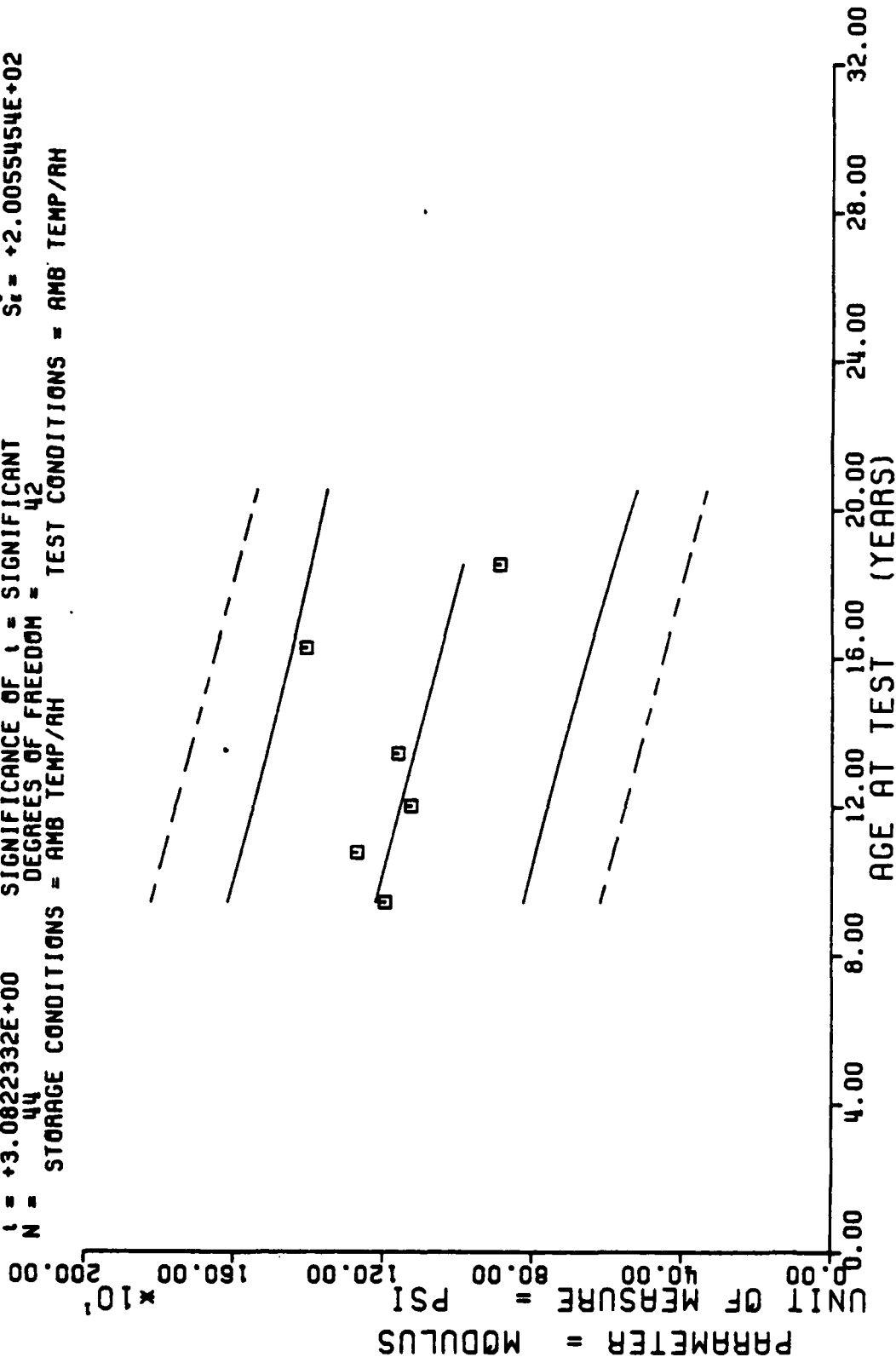
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



II STAGE, OSCT NTAS, ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 IN/MIN. MODULUS

Figure 49

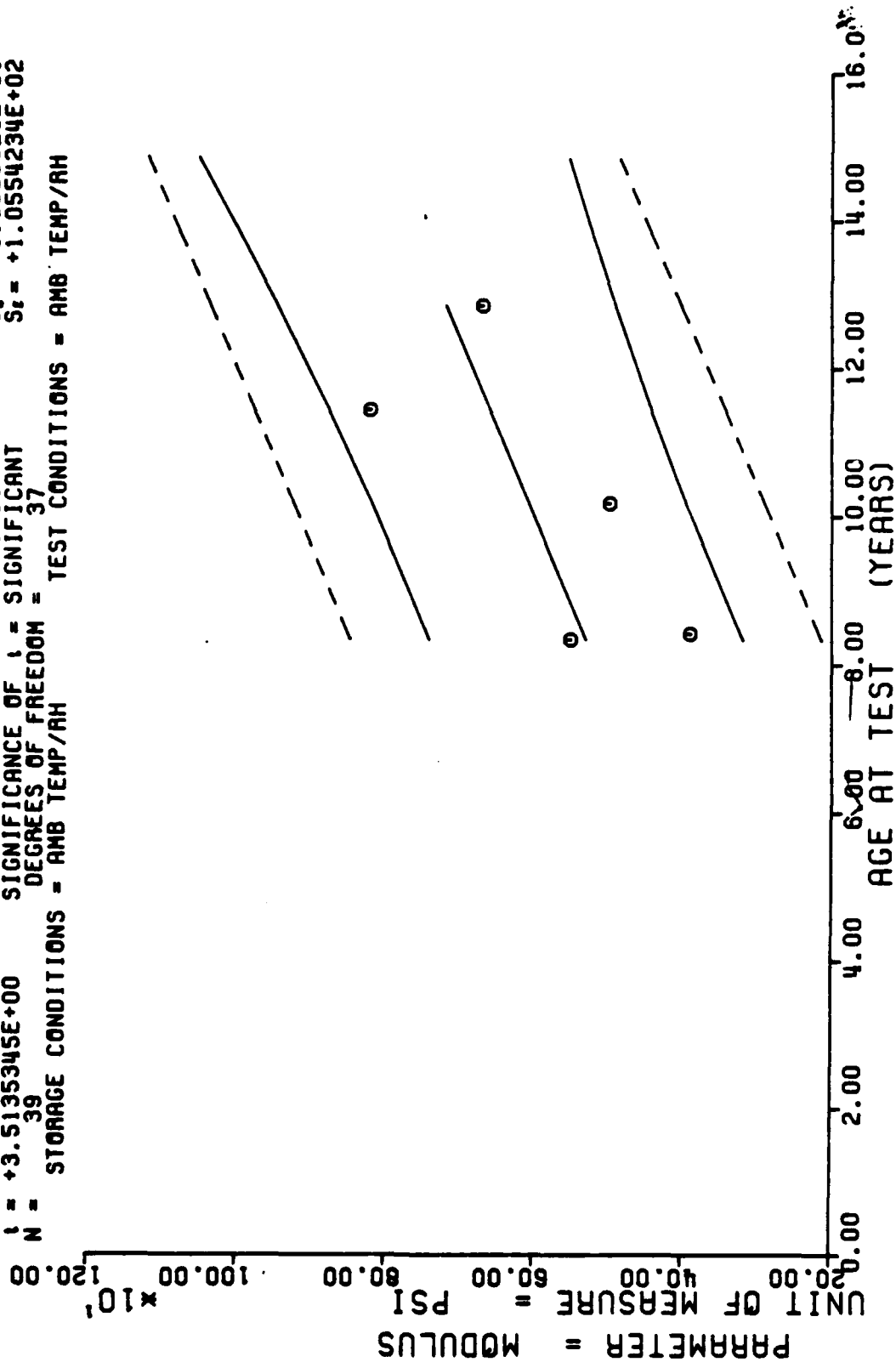
$Y = ((+1.4598250E+03) + (-2.1220463E+00) \times X)$   
 $F = +9.5001621E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -4.2949806E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +3.0822332E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 44$  DEGREES OF FREEDOM = 42  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT MTAS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 MODULUS <0022135>.

Figure 50

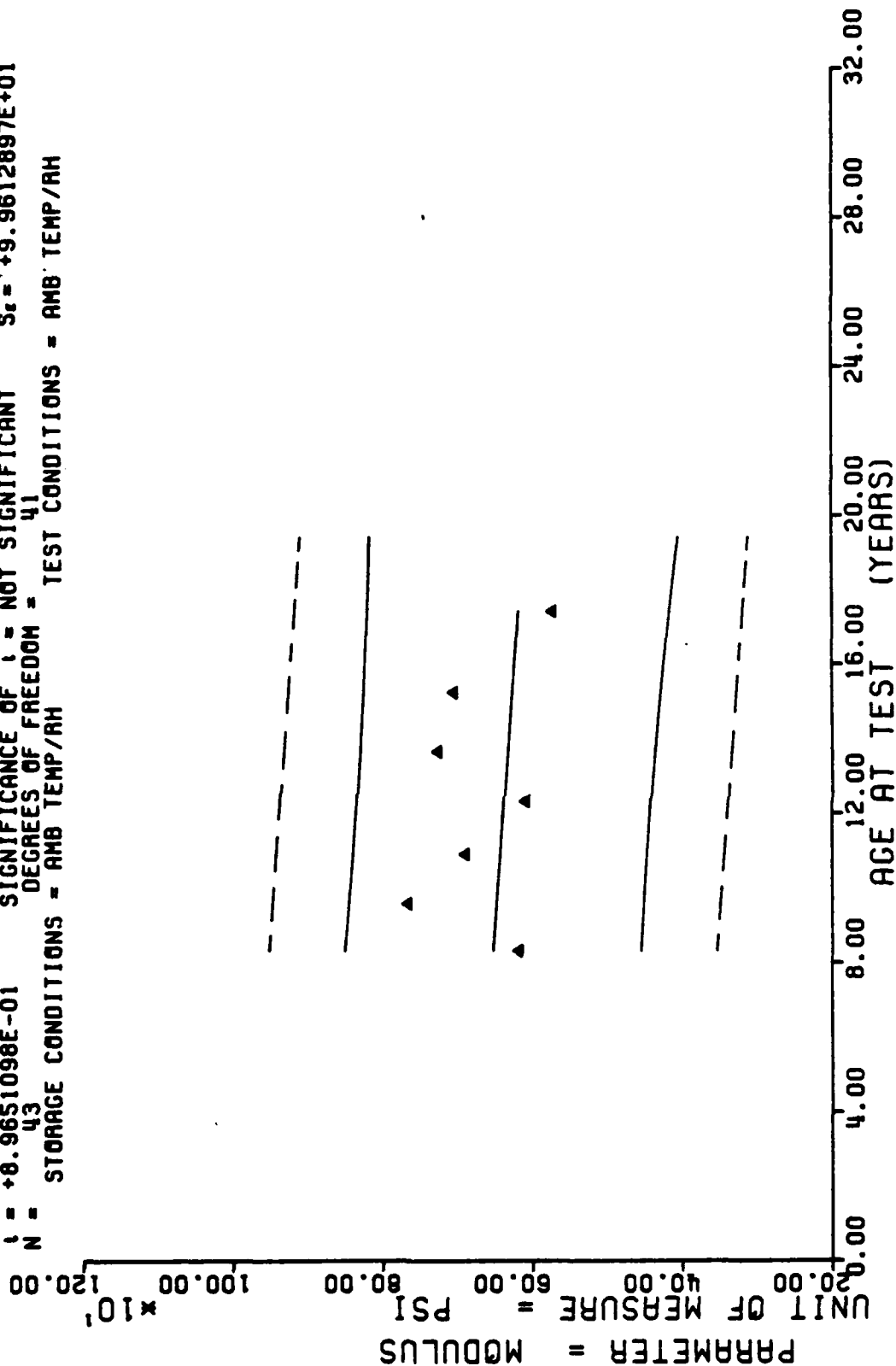
$Y = ((+1.8308955E+02) + (+3.4736180E+00) \times X)$   
 $F = +1.2344925E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma = +1.2026969E+02$   
 $R = +5.0017615E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +9.8863920E-01$   
 $t = +3.5135345E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +1.0554234E+02$   
 $N = 39$  DEGREES OF FREEDOM = 37  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT MTRS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 MODULUS <0022583>.

Figure 51

$Y = ((+6.8390049E+02) + (-3.1213181E-01) \times X)$   
 $F = +8.0373195E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +9.9379876E+01$   
 $R = -1.3865900E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +3.4816283E-01$   
 $t = +8.9651098E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +9.9612897E+01$   
 $N = 43$  DEGREES OF FREEDOM = 41  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



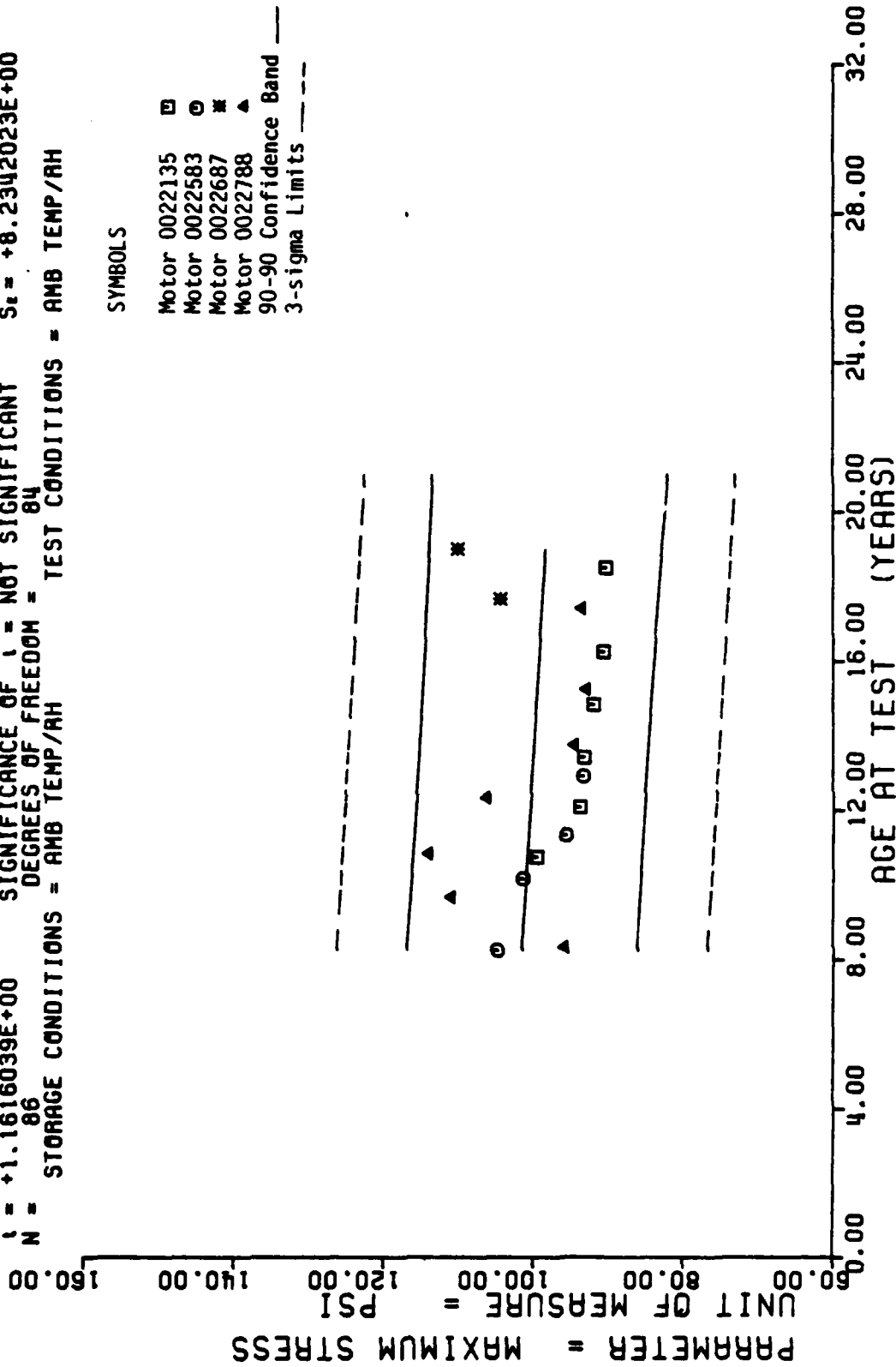
11 STAGE DSCT MTRS ONLY, INNER, AXIAL POS. LOW RATE CHS=2.0 MODULUS <0022788>.

Figure 52

$Y = ((+1.0379110E+02) + (-2.3998077E-02) \times X)$   
 $F = +1.3493237E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -1.2573553E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.1616039E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 86$  DEGREES OF FREEDOM = 84  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

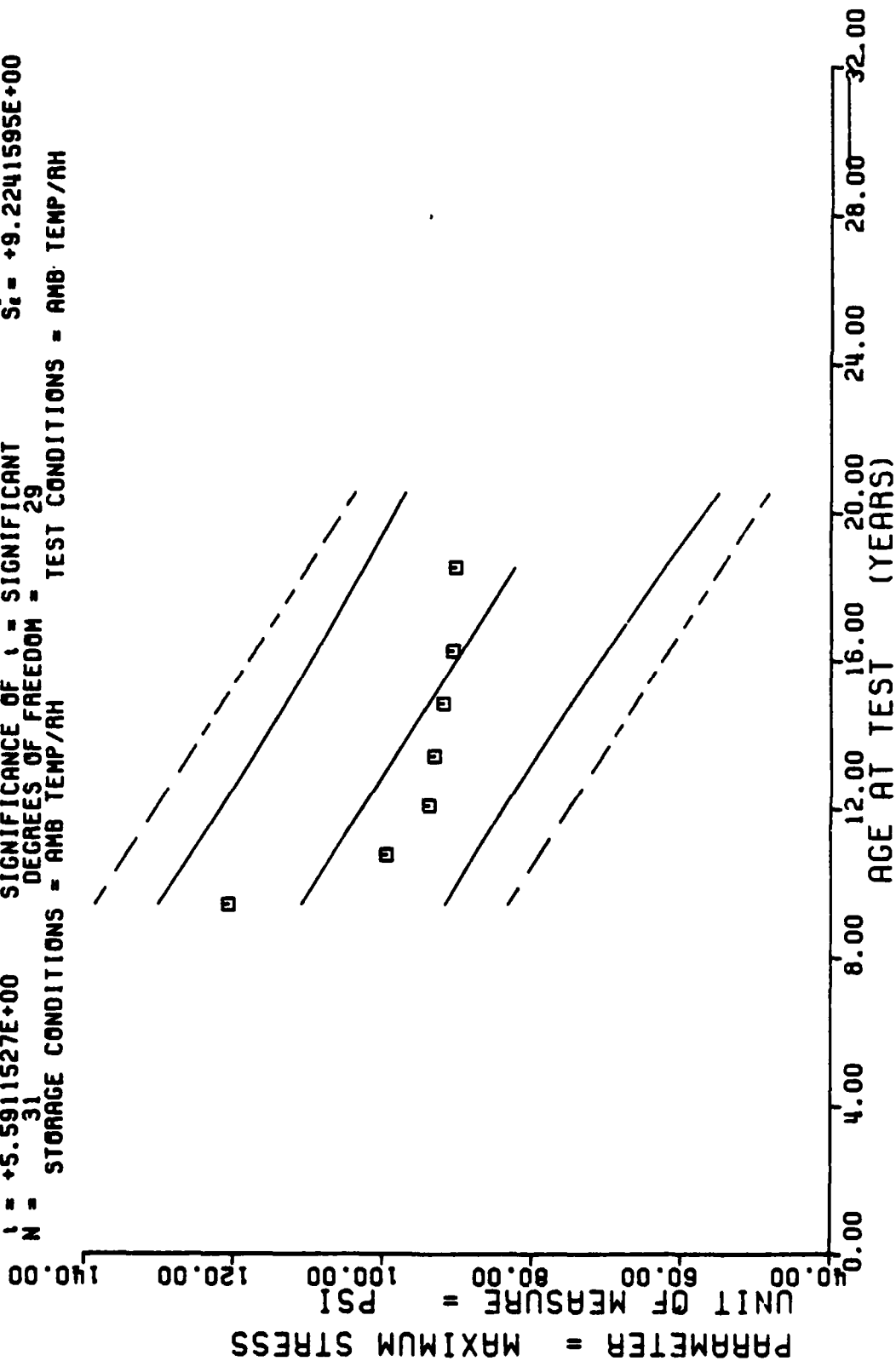
SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



II STAGE DSCT MTRAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, MAXIMUM STRESS

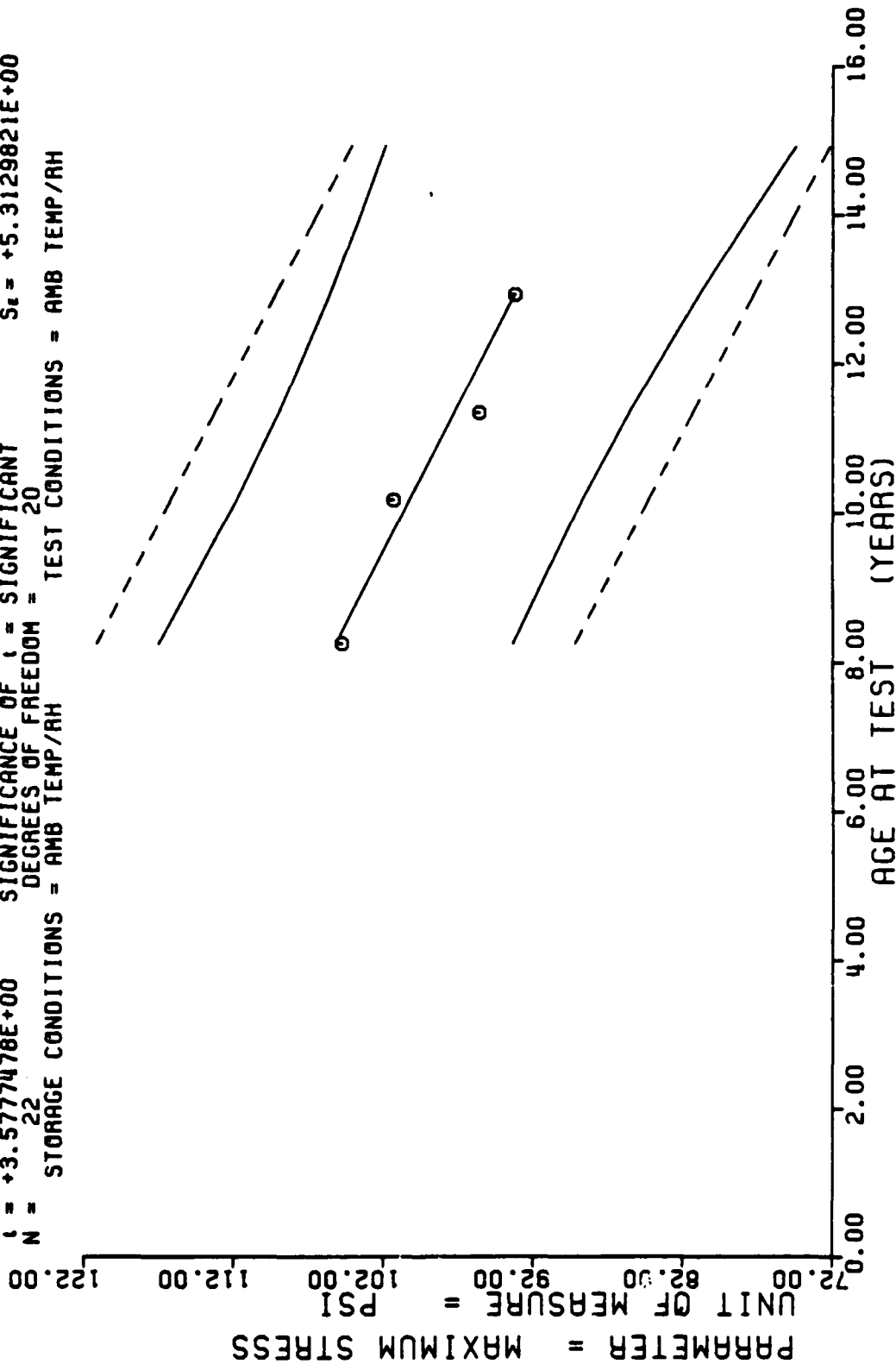
$Y = ((+1.4040693E+02) + (-2.6151216E-01) \cdot X)$   
 $F = +3.1260989E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -7.2024993E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +5.5911527E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 31$  DEGREES OF FREEDOM = 29  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MTRAS ONLY, OUTER, AXIAL POS. BIAxIAL CHS=0.2 MAX STRESS <0022135>

Figure 54

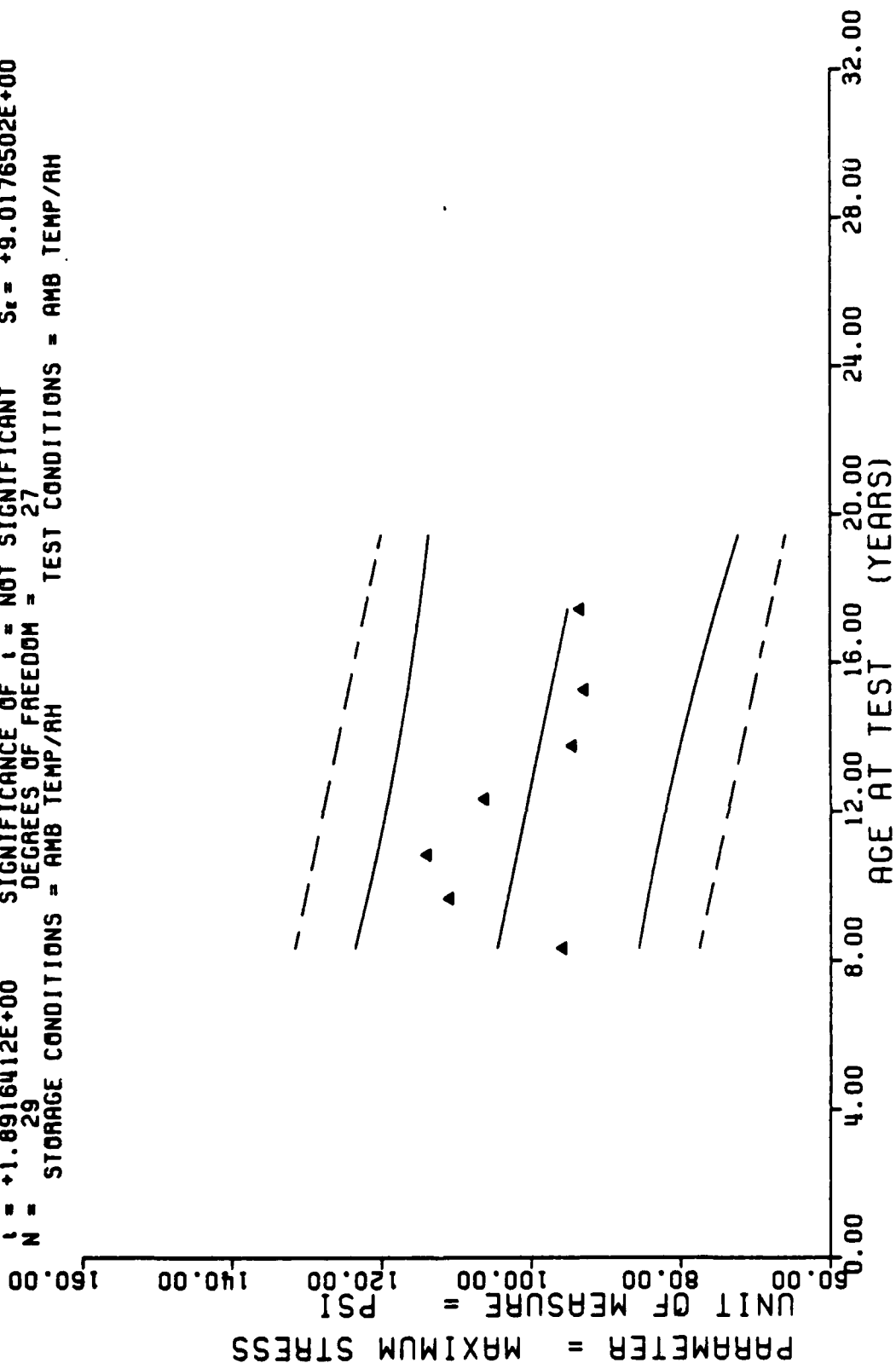
$Y = ((+1.2619436E+02) + (-2.1248237E-01) \times X)$   
 $F = +1.2800280E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_r = +6.6399909E+00$   
 $R = -6.2469921E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_o = +5.9389980E-02$   
 $t = +3.5777478E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +5.3129821E+00$   
 $N = 22$  DEGREES OF FREEDOM = 20  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 MAX STRESS <0022583>

Figure 55

$F = +3.5783066E+00$   
 $R = -3.4208344E-01$   
 $t = +1.8916412E+00$   
 $N = 29$   
 $Y = ((+1.1320721E+02) + (-8.6734530E-02) \times X)$   
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 27  
 STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH



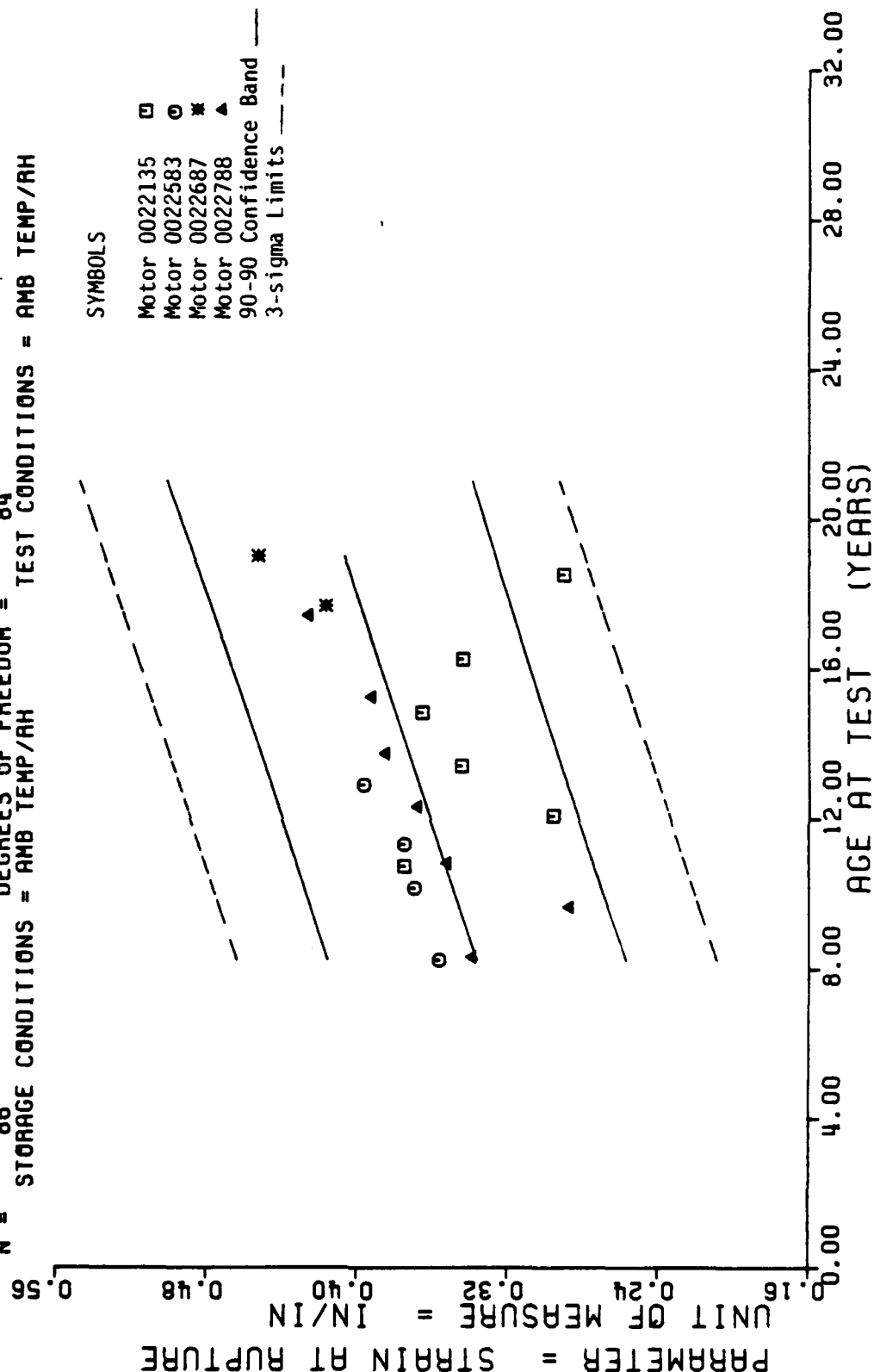
11 STAGE DSCT NTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 MAX STRESS <0022788>

Figure 56

$Y = ((+2.8199990E-01) + (+5.4587665E-04) \times X)$   
 $F = +2.6319306E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $A = +4.8844026E-01$  SIGNIFICANCE OF A = SIGNIFICANT  
 $t = +5.1302345E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 86$  DEGREES OF FREEDOM = 84  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

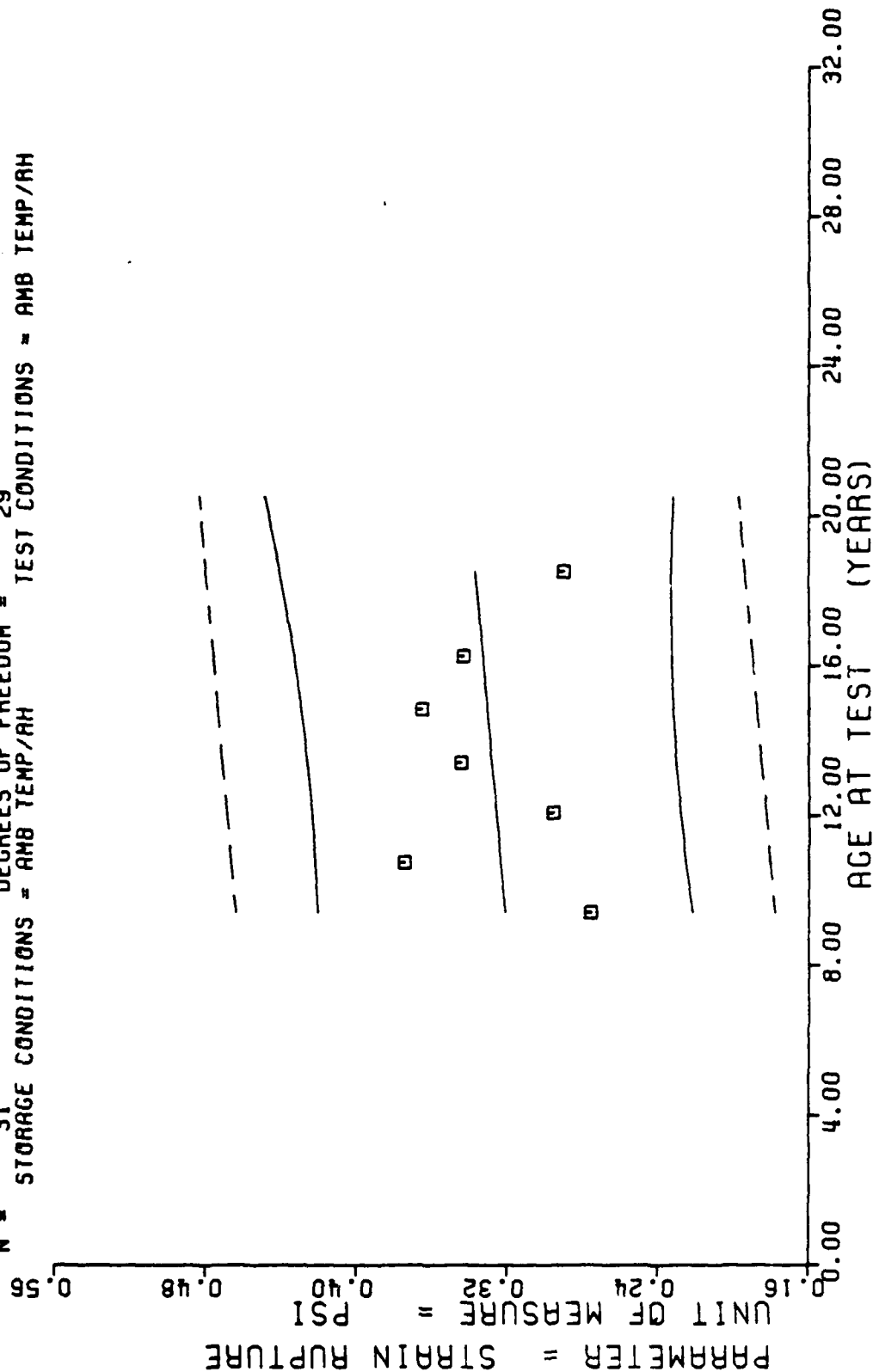
SYMBOLS

- Motor 0022135 □
- Motor 0022583 ○
- Motor 0022687 \*
- Motor 0022788 ▲
- 90-90 Confidence Band ---
- 3-sigma Limits ---



II STAGE DSCT MTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN. STRAIN/RUPTURE

$Y = ((+3.0443442E-01) + (+1.4605145E-04) \times X)$   
 $F = +3.6565453E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +4.7126576E-02$   
 $R = +1.1158752E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_o = +2.4152963E-04$   
 $t = +6.0469375E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_r = +4.7632862E-02$   
 $N = 31$  DEGREES OF FREEDOM = 29  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MTRS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 STN RUPTUR <0022135>

Figure 58

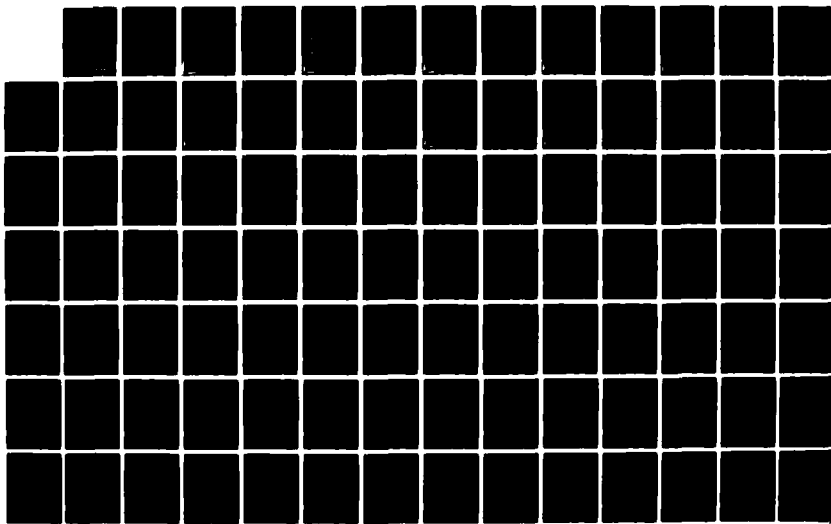
AD-A140 337

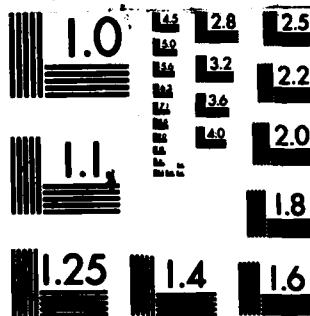
LGM-30B STAGE 11 DISSECTED MOTOR TEST REPORT(U) OGDEN  
AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANALYSIS  
LAB E M DALABA FEB 84 MANPA-496(84)

2/3

UNCLASSIFIED

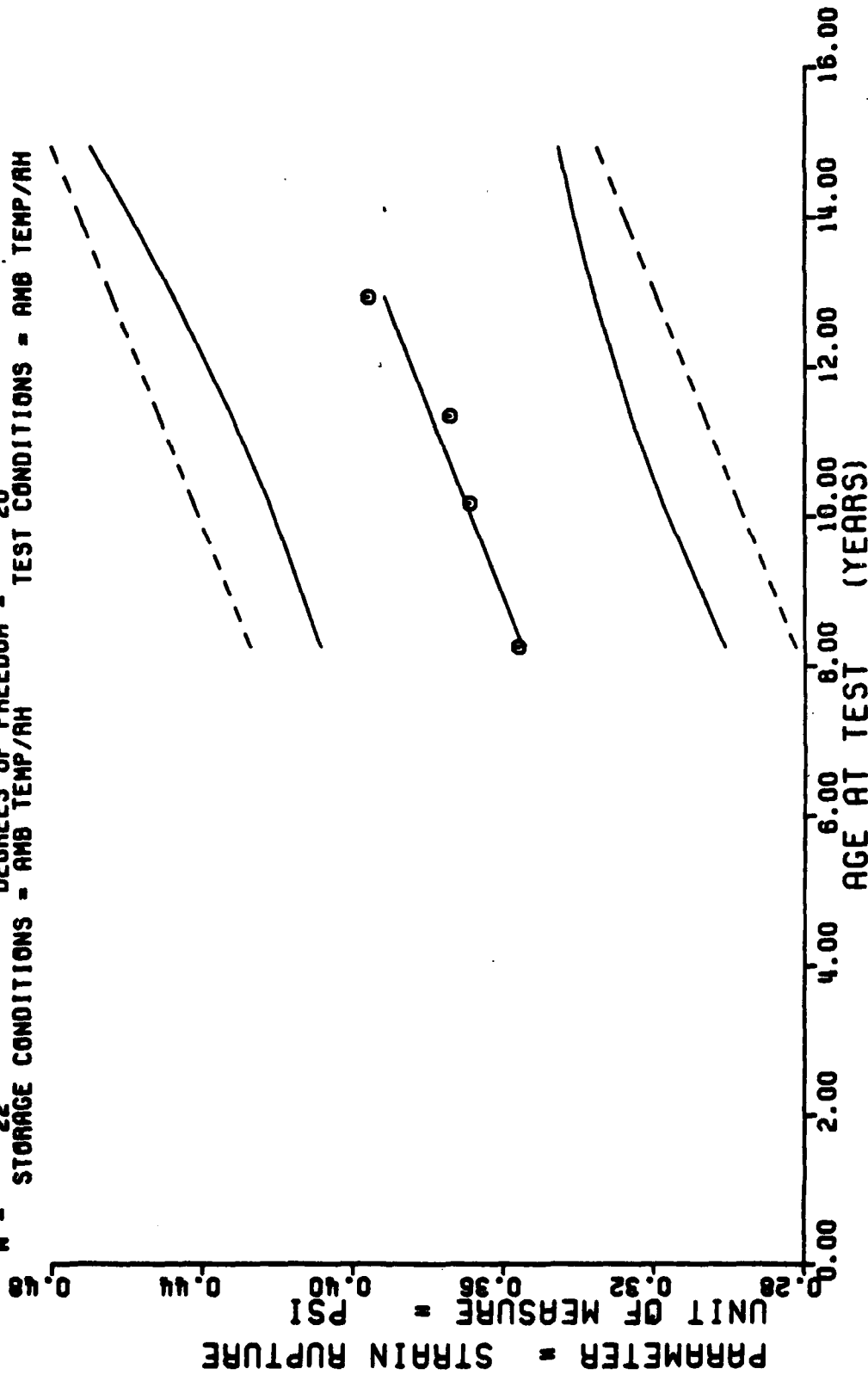
F/G 21/8.2 NL





MICROCOPY RESOLUTION TEST CHART  
NATIONAL BUREAU OF STANDARDS-1963-A

$Y = ((+2.8946036E-01) + (+6.6011813E-04) \times X)$   
 $F = +5.9857241E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_r = +2.6850121E-02$   
 $A = +4.7994441E-01$  SIGNIFICANCE OF A = SIGNIFICANT  $S_e = +2.6981327E-04$   
 $I = +2.4485739E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_t = +2.4137289E-02$   
 $N = 22$  DEGREES OF FREEDOM = 20  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



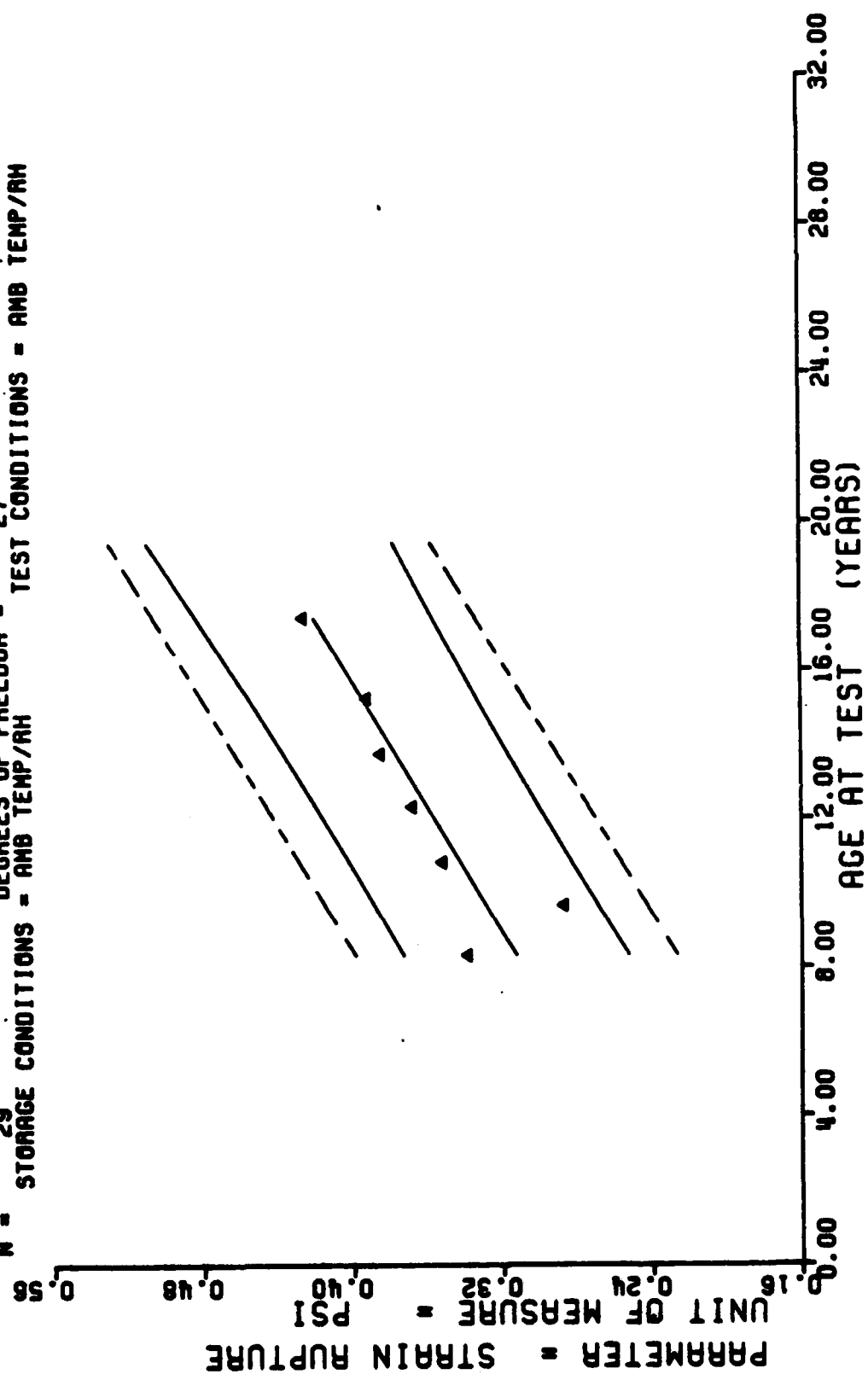
II STAGE DSCT NTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 STN RUPTUR <0022583>

Figure 59

$F = +4.5623828E+01$   
 $A = +7.9260406E-01$   
 $I = +6.7545413E+00$   
 $N = 29$

$Y = ((+2.1409011E-01) + (+9.8273787E-04) \times X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF A = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 27

STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = AMB TEMP/AH



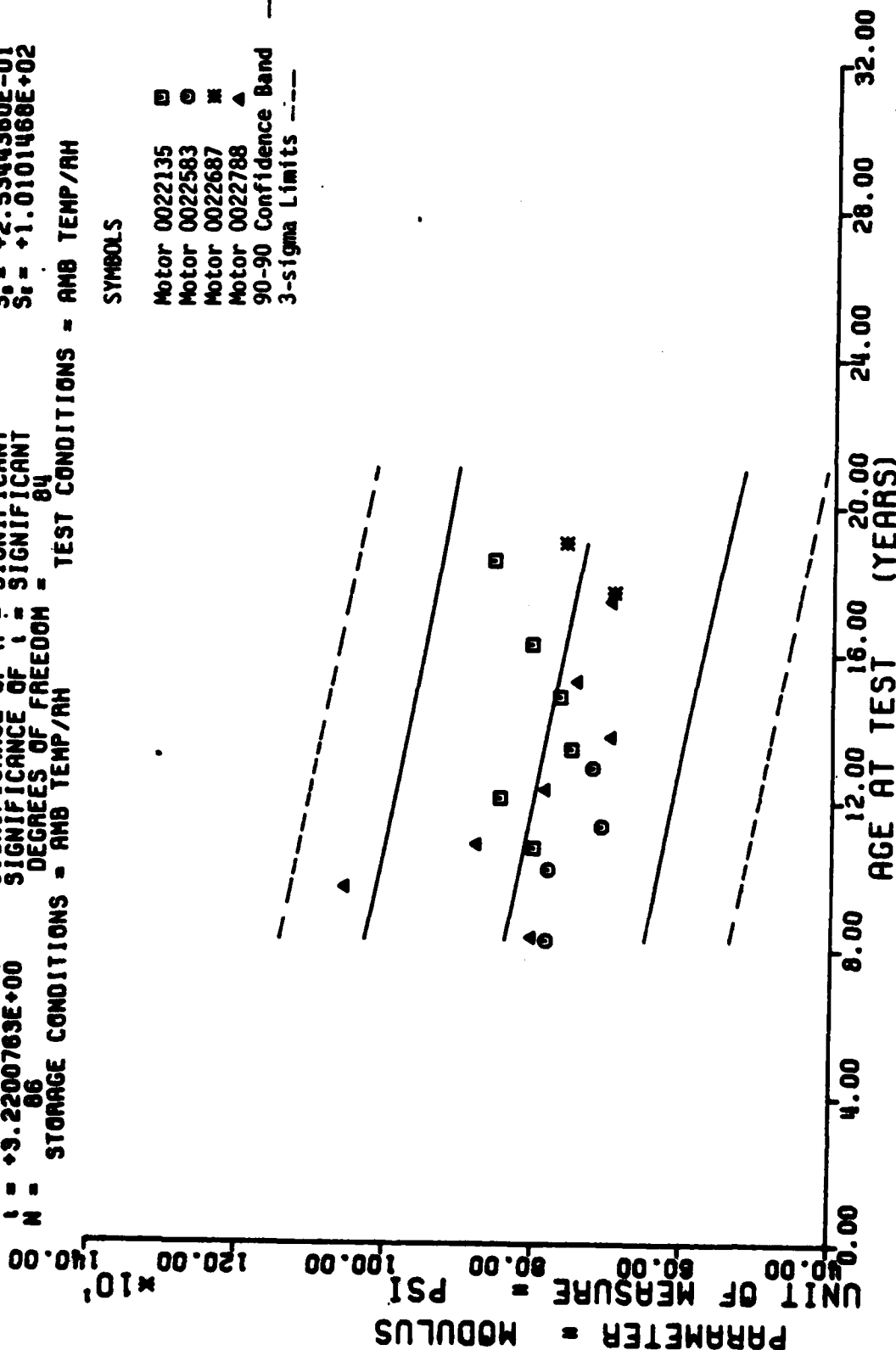
11 STAGE DSCT NTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 STN RUPTUR <0022788>

Figure 60

$Y = ((+9.1980417E+02) + (-8.1610774E-01) \times X)$   
 $F = +1.0368891E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -3.3147573E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +3.2200763E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 86$  DEGREES OF FREEDOM  
 $N = 86$  STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM

# SYMBOLS

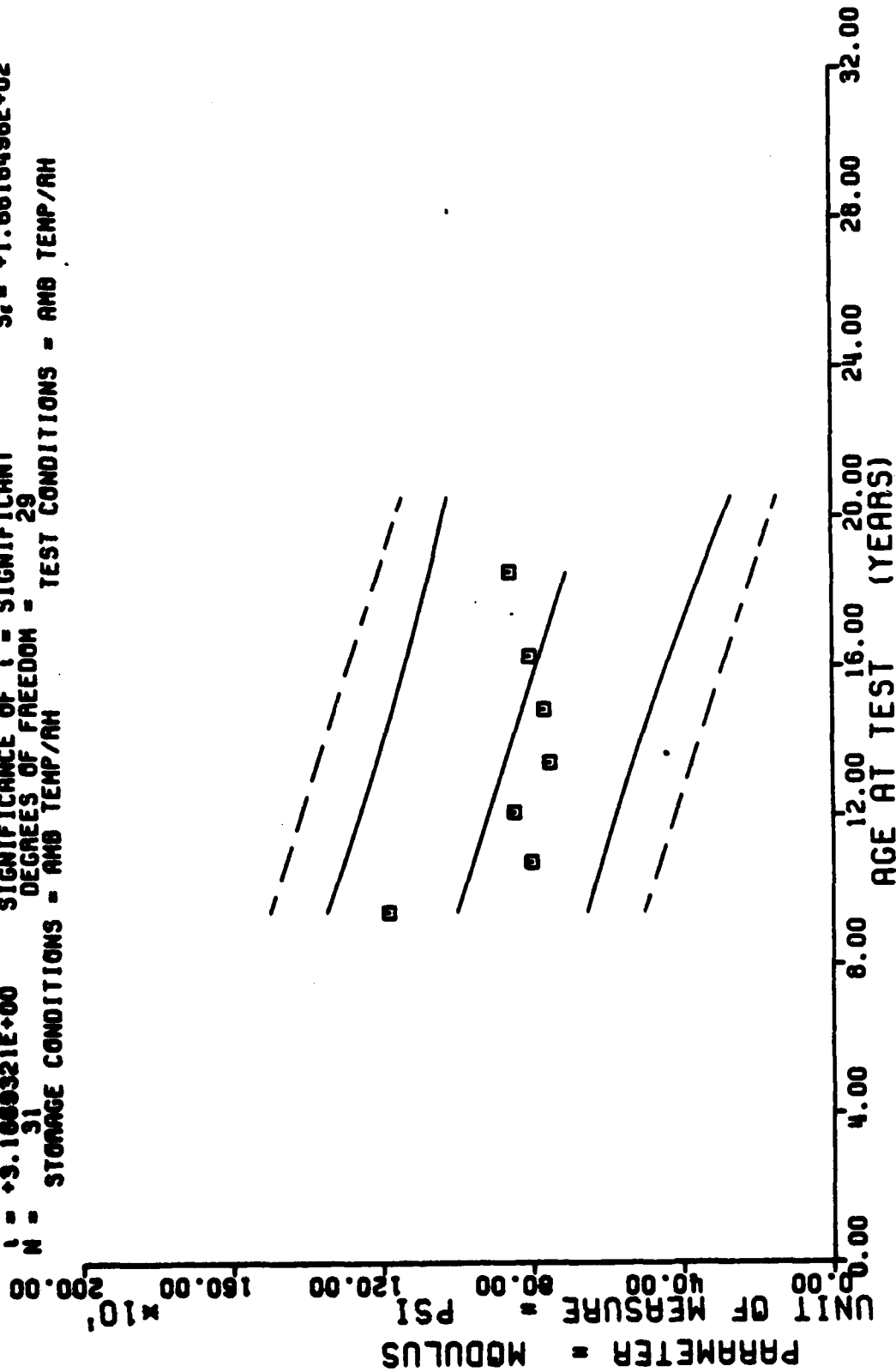
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✕  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



11 STAGE DSCT NTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 IN/MIN, MODULUS

Figure 61

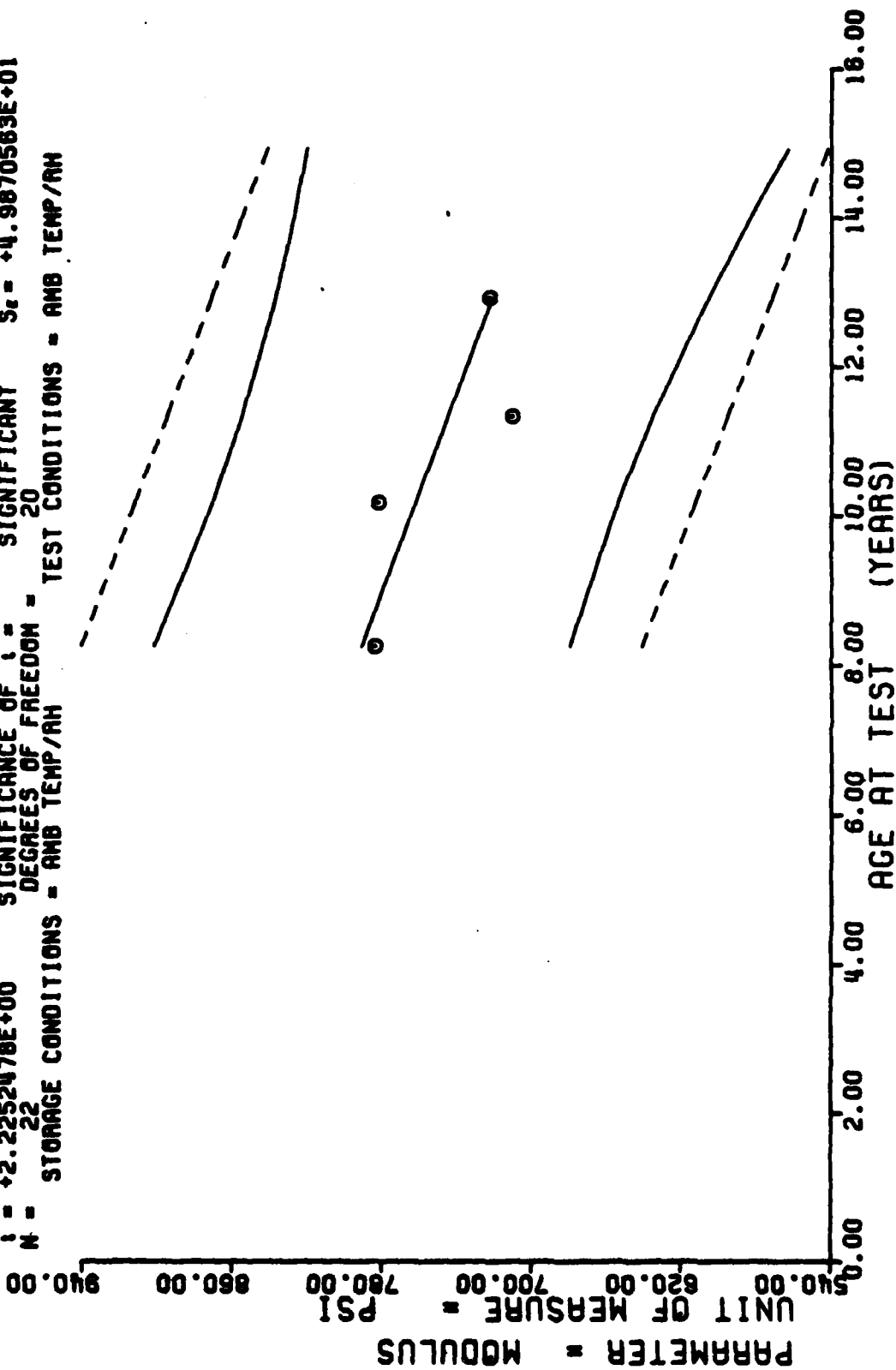
$Y = ((+1.3010145E+03) + (-2.6683448E+00) \times X)$   
 $F = +1.0029459E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -5.0692350E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $L = +9.1889321E+00$  SIGNIFICANCE OF L = SIGNIFICANT  
 $N = 31$  DEGREES OF FREEDOM = 29  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT HTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS-0.2 MODULUS <0022135>

Figure 62

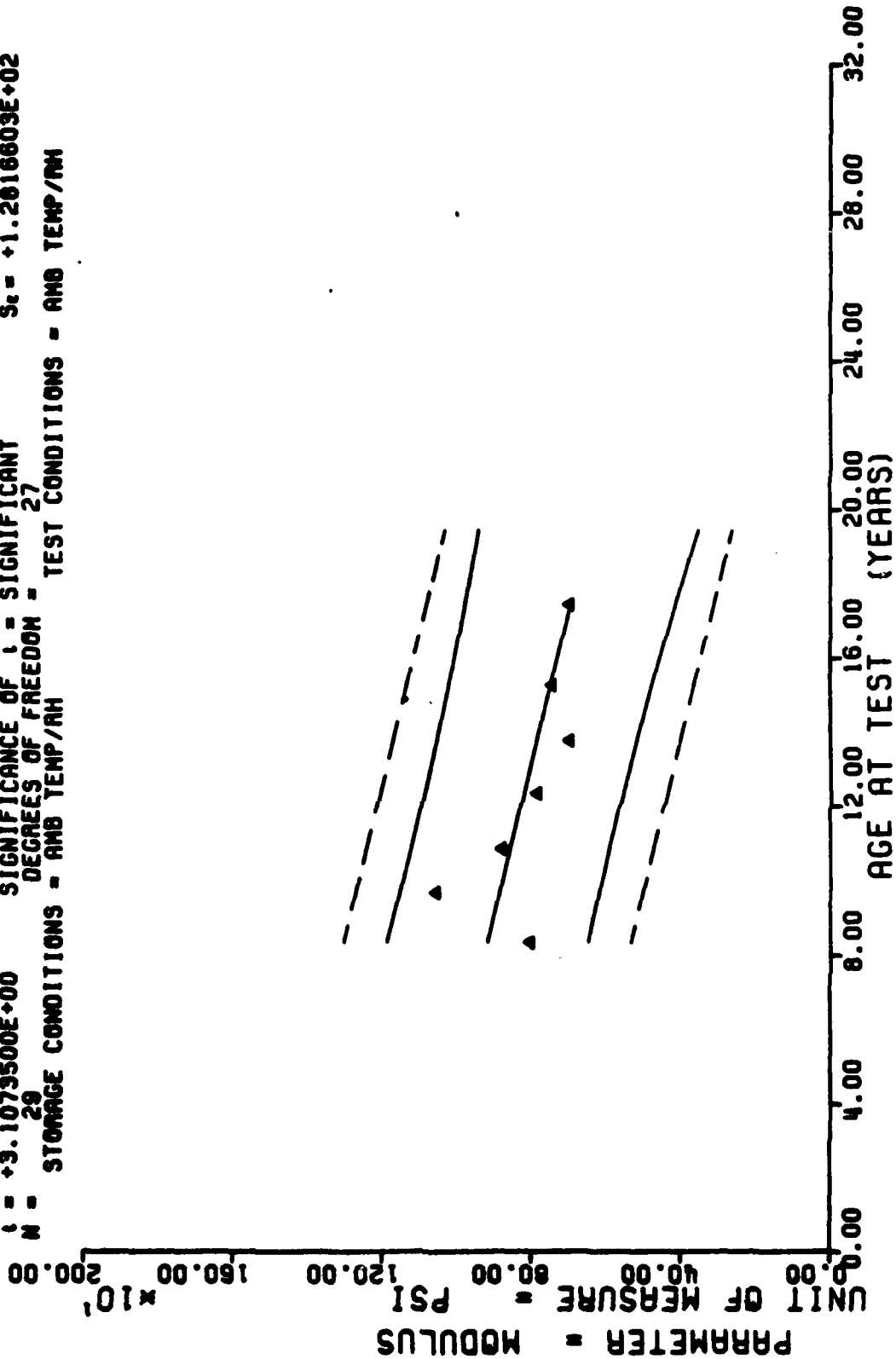
$Y = ((+9.1359845E+02) + (-1.2405020E+00) * X)$   
 $F = +4.9517281E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_f = +5.4360686E+01$   
 $A = -4.4547986E-01$  SIGNIFICANCE OF A = SIGNIFICANT  $S_A = +5.5746692E-01$   
 $I = +2.2252478E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_I = +4.9870583E+01$   
 $N = 22$  DEGREES OF FREEDOM = 20  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



II STAGE DSCT HTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS-0.2 MODULUS <0022583>

Figure 63

$Y = (( +1.1197650E+03 ) + ( -2.0249905E+00 ) \times X1$   
 $F = +9.6558242E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +1.4684398E+02$   
 $R = -5.1323925E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +6.5167764E-01$   
 $I = +3.1073500E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_t = +1.2616603E+02$   
 $N = 29$  DEGREES OF FREEDOM = 27  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



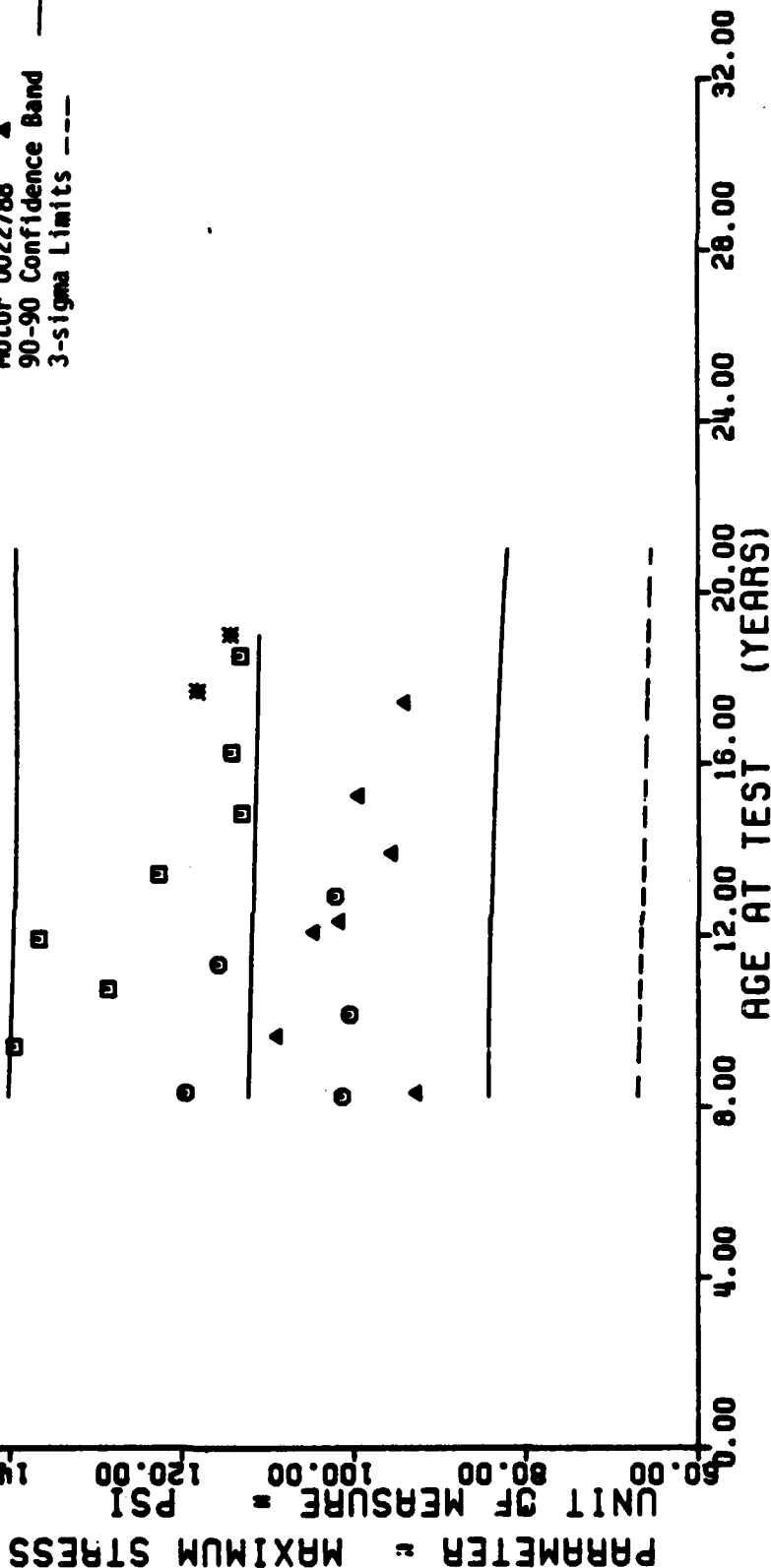
11 STAGE DSCT HTAS ONLY, OUTER, AXIAL POS. BIAXIAL CHS=0.2 MODULUS <0022788>

Figure 64

$Y = ((+1.1319840E+02) + (-1.0092617E-02) \times X)$   
 $F = +7.3449732E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -2.7942262E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +2.7101611E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 96$  DEGREES OF FREEDOM  
 $N = 94$  TEST CONDITIONS = AMB TEMP/AM  
 $N = 96$  STORAGE CONDITIONS = AMB TEMP/AM

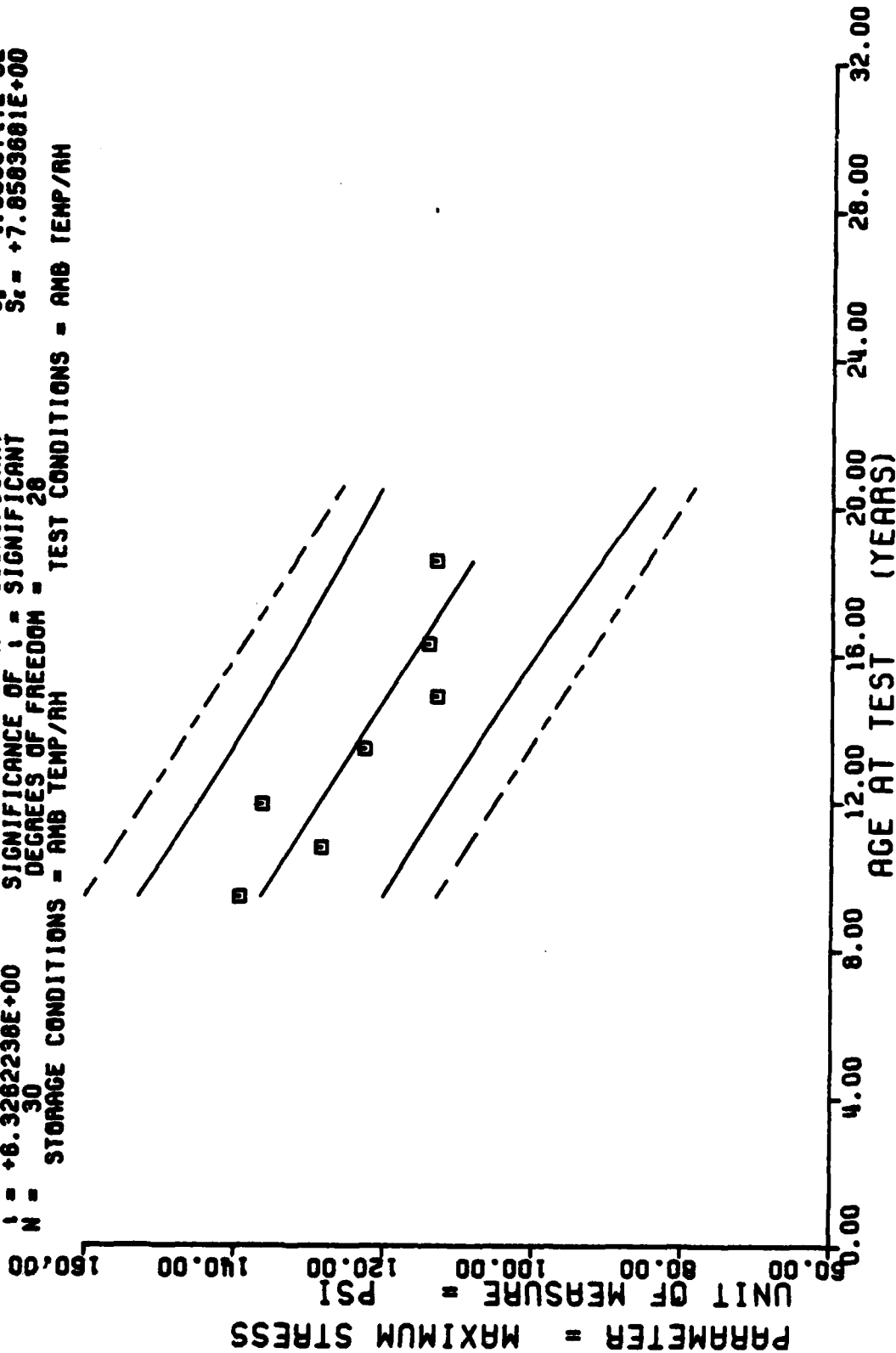
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✕  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



STAGE II DISSECTED MRS, INNER, AXIAL POS. BIAXIAL CHS-0.2 IN/MIN, MAX STRESS

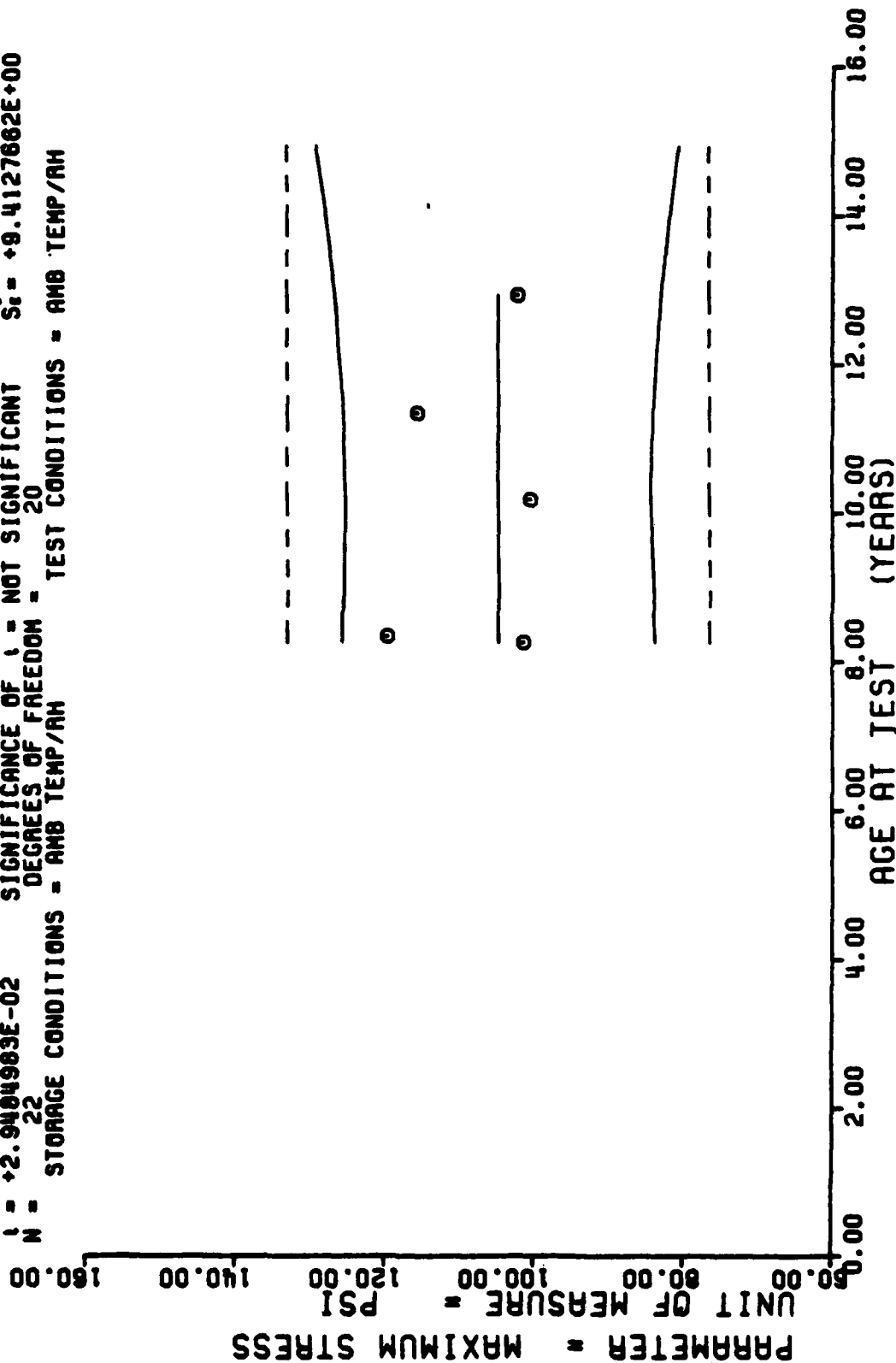
$F = +4.0021108E+01$   
 $R = -7.6704028E-01$   
 $I = +6.3262238E+00$   
 $N = 30$   
 $Y = ((+1.6586115E+02) + (-2.5909522E-01) \times X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 28  
 STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT HTAS ONLY, INNER, AXIAL POS. LOW RATE CHS=0.2 MAX STRESS <0022135>.

Figure 66

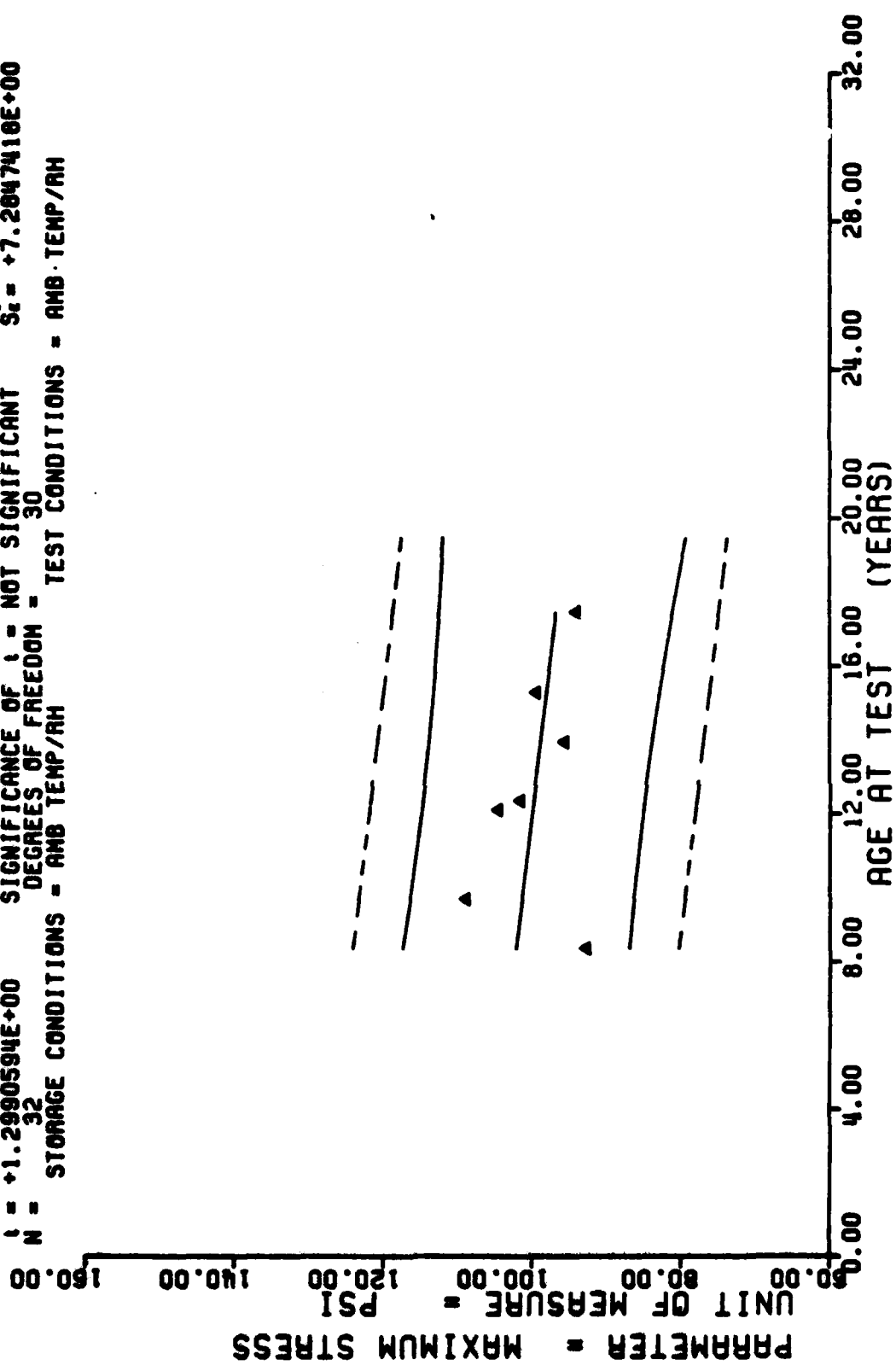
$Y = ((+1.0434536E+02) + (+3.1184542E-03) \times X)$   
 $F = +8.6936424E-04$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma = +9.1861189E+00$   
 $R = +6.5928994E-03$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +1.0576414E-01$   
 $I = +2.9404983E-02$  SIGNIFICANCE OF I = NOT SIGNIFICANT  $S_1 = +9.4127662E+00$   
 $N = 22$  DEGREES OF FREEDOM = 20  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



11 STAGE DSC TMS ONLY, INNER, AXIAL POS. BIAxIAL CHS-0.2 MAX STRESS <0022583>

Figure 67

$Y = ((+1.0687528E+02) + (-4.8333524E-02) \times X)$   
 $F = +1.6875554E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +7.3850897E+00$   
 $R = -2.3077282E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_1 = +3.7206553E-02$   
 $t = +1.2990594E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_2 = +7.2847418E+00$   
 $N = 32$  DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

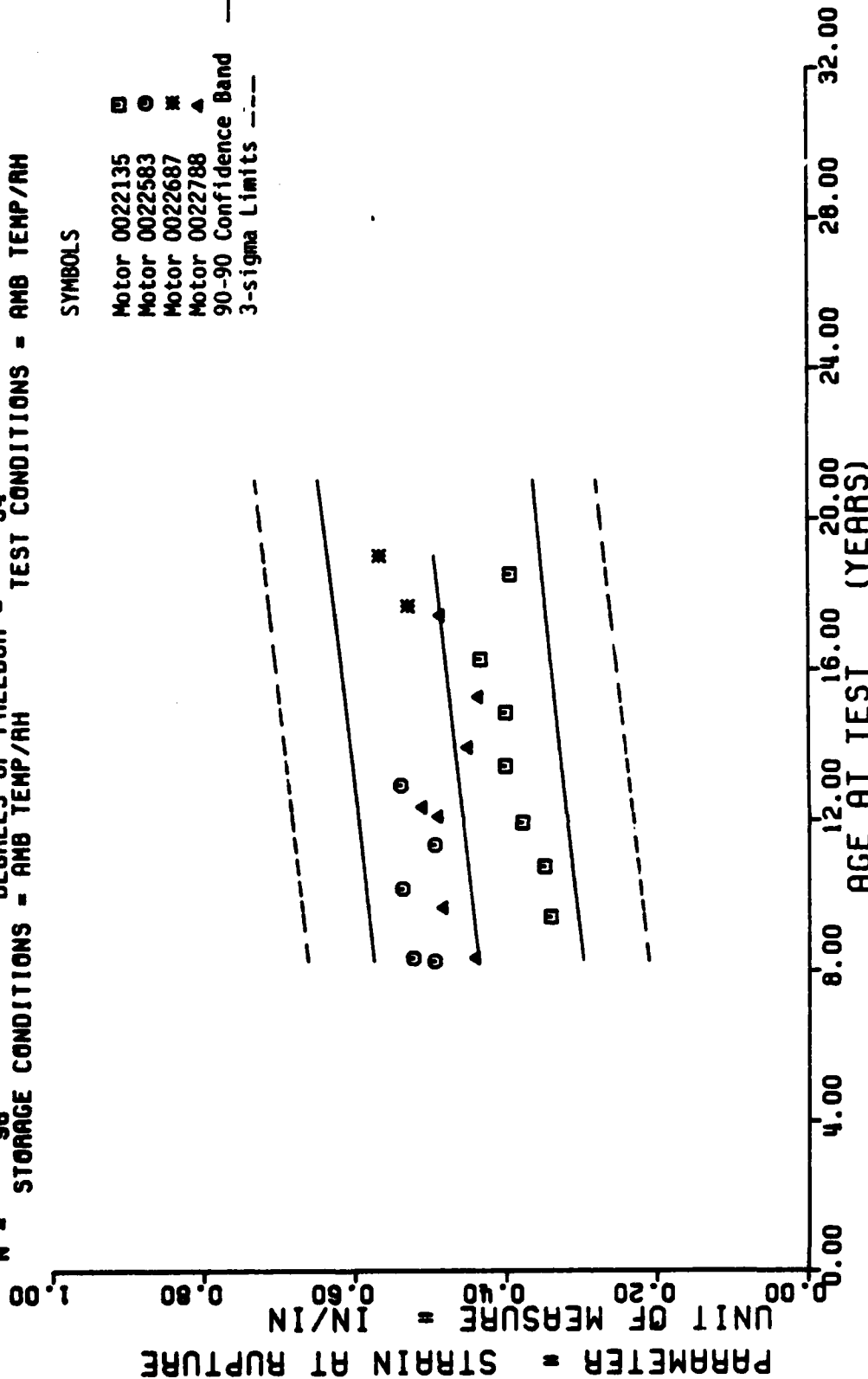


11 STAGE DSCT NTAS ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 MAX STRESS <0022788>

$Y = ((+3.9152593E-01) + (+4.4983996E-04) \times X)$   
 $F = +5.8961739E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +2.4294652E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.4282037E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 96$  DEGREES OF FREEDOM  
 $N = 94$  TEST CONDITIONS = AMB TEMP/AMB  
 $N = 96$  STORAGE CONDITIONS = AMB TEMP/AMB

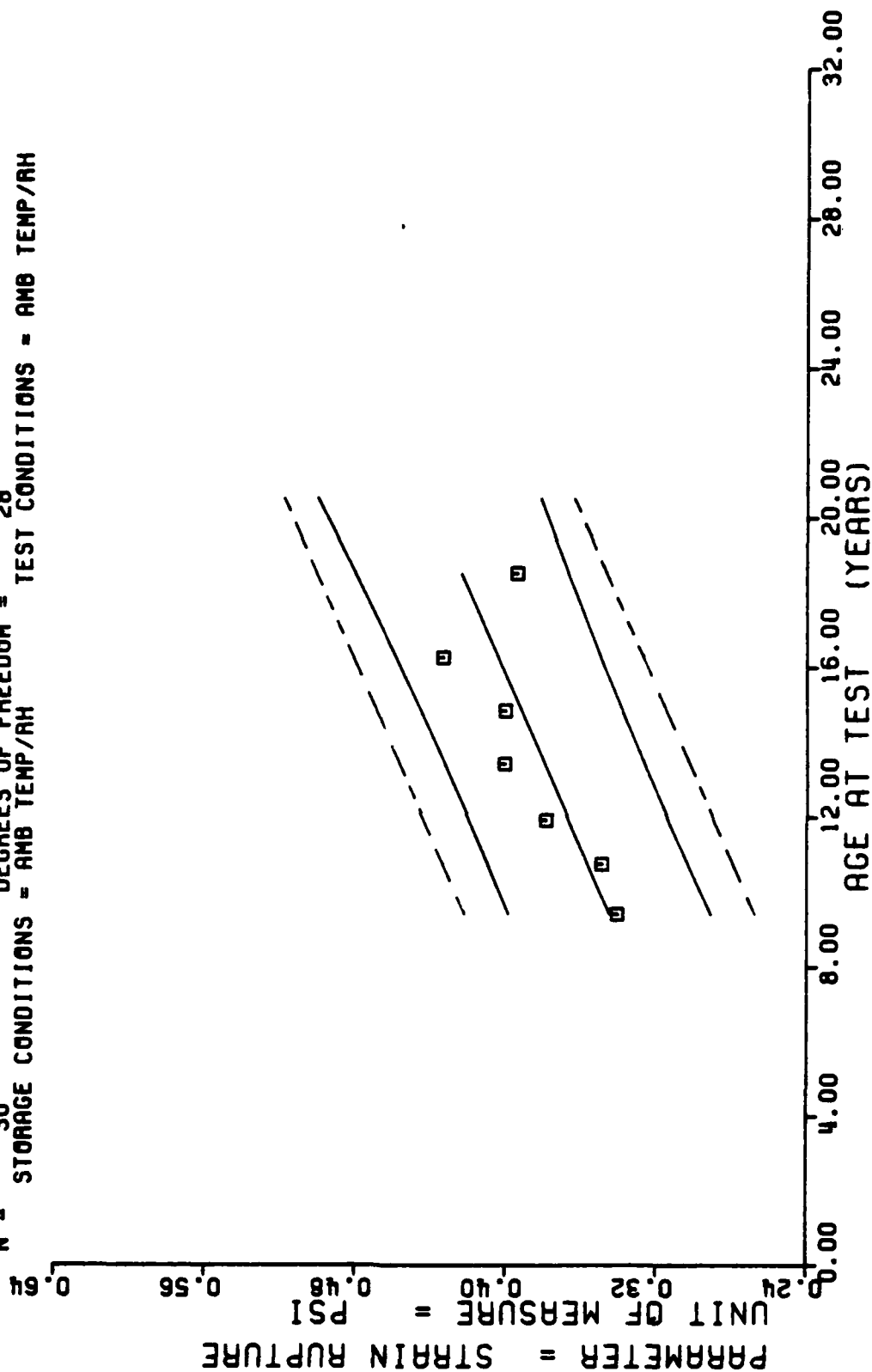
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ×  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



II STAGE DSCT MTRAS, INNER, AXIAL POS, BIAXIAL CHS-0.2 IN/MIN, STRAIN AT RUPTURE

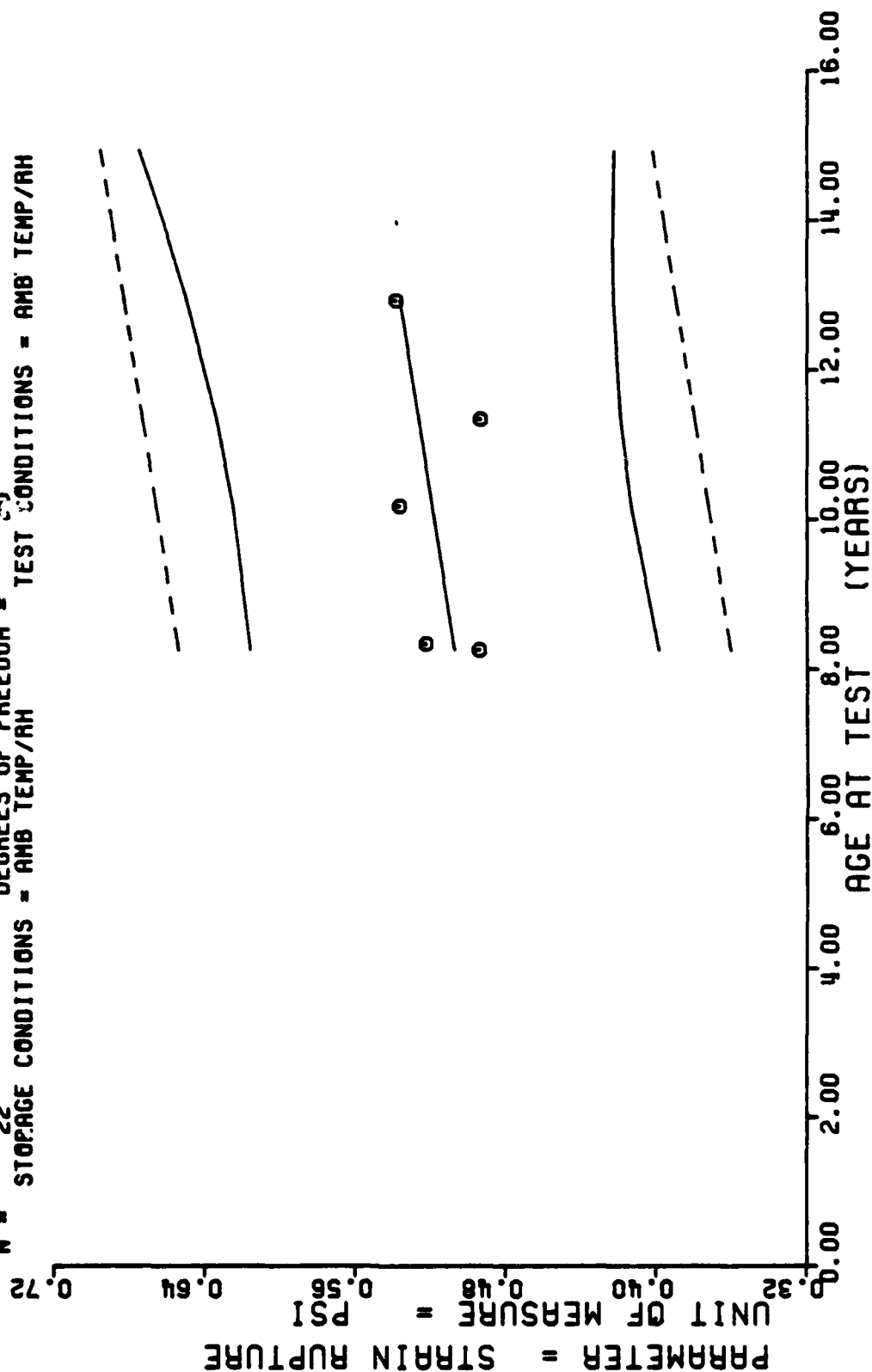
$Y = ((+2.6315576E-01) + (+7.2204303E-04) \times X)$   
 $F = +2.9144719E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +3.6023815E-02$   
 $R = +7.1415402E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +1.3374671E-04$   
 $I = +5.3985849E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_t = +2.5662599E-02$   
 $N = 30$  DEGREES OF FREEDOM = 28  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT MTRS ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 STN RUPTUR <0022135>

Figure 70

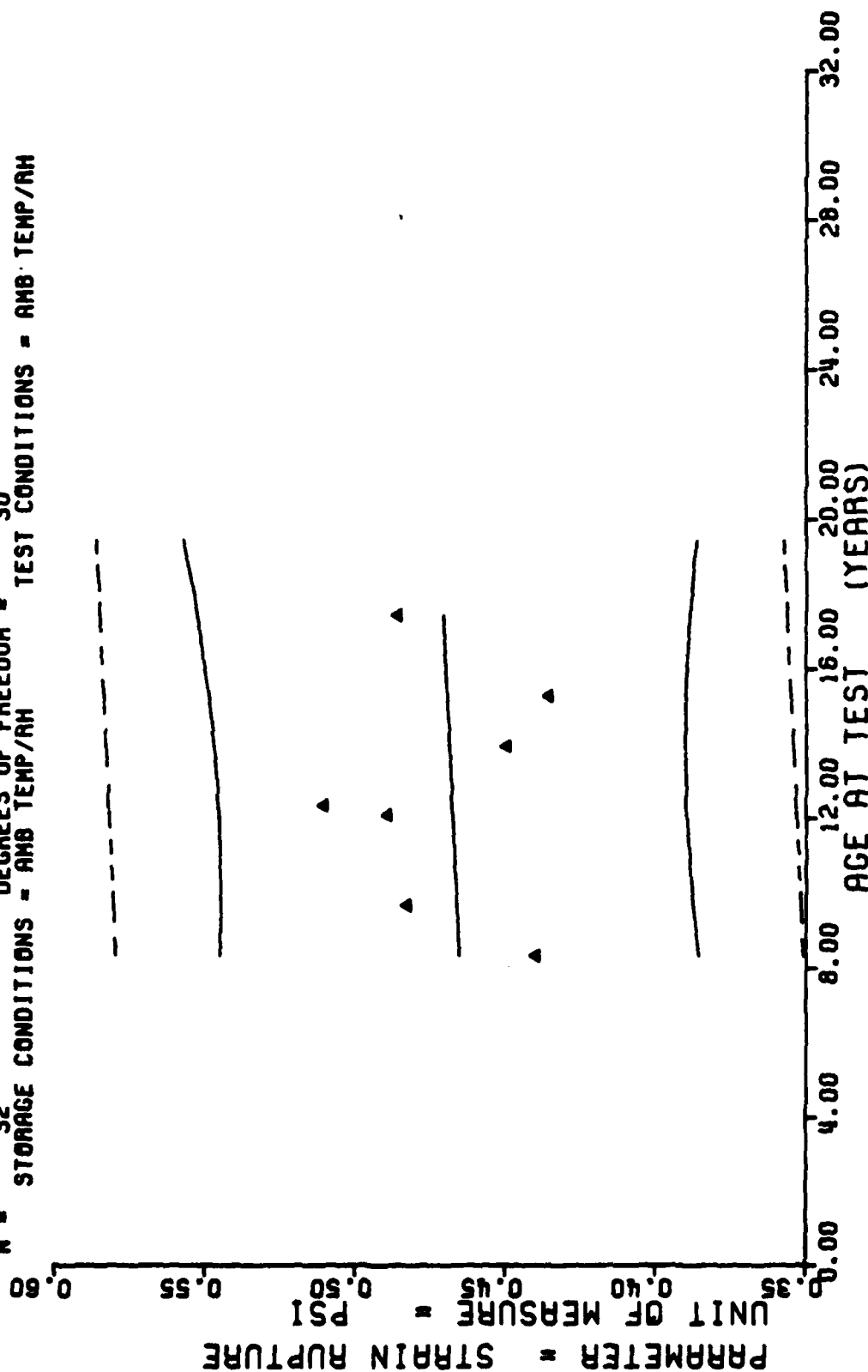
$Y = ((+4.5601425E-01) + (+5.1675809E-04) \times X)$   
 $F = +0.8571783E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +4.8733968E-02$   
 $R = +2.0593159E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +5.4908289E-04$   
 $t = +9.4112583E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +4.8867115E-02$   
 $N = 22$  DEGREES OF FREEDOM = 29  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 STAN RUPT <0022583>

Figure 71

$Y = ((+4.6025936E-01) + (+4.9138544E-05) \times X)$   
 $F = +6.3057694E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha = +3.7493147E-02$   
 $R = +4.6087618E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +1.9445345E-04$   
 $t = +2.5270079E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +3.8072412E-02$   
 $N = 32$  DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



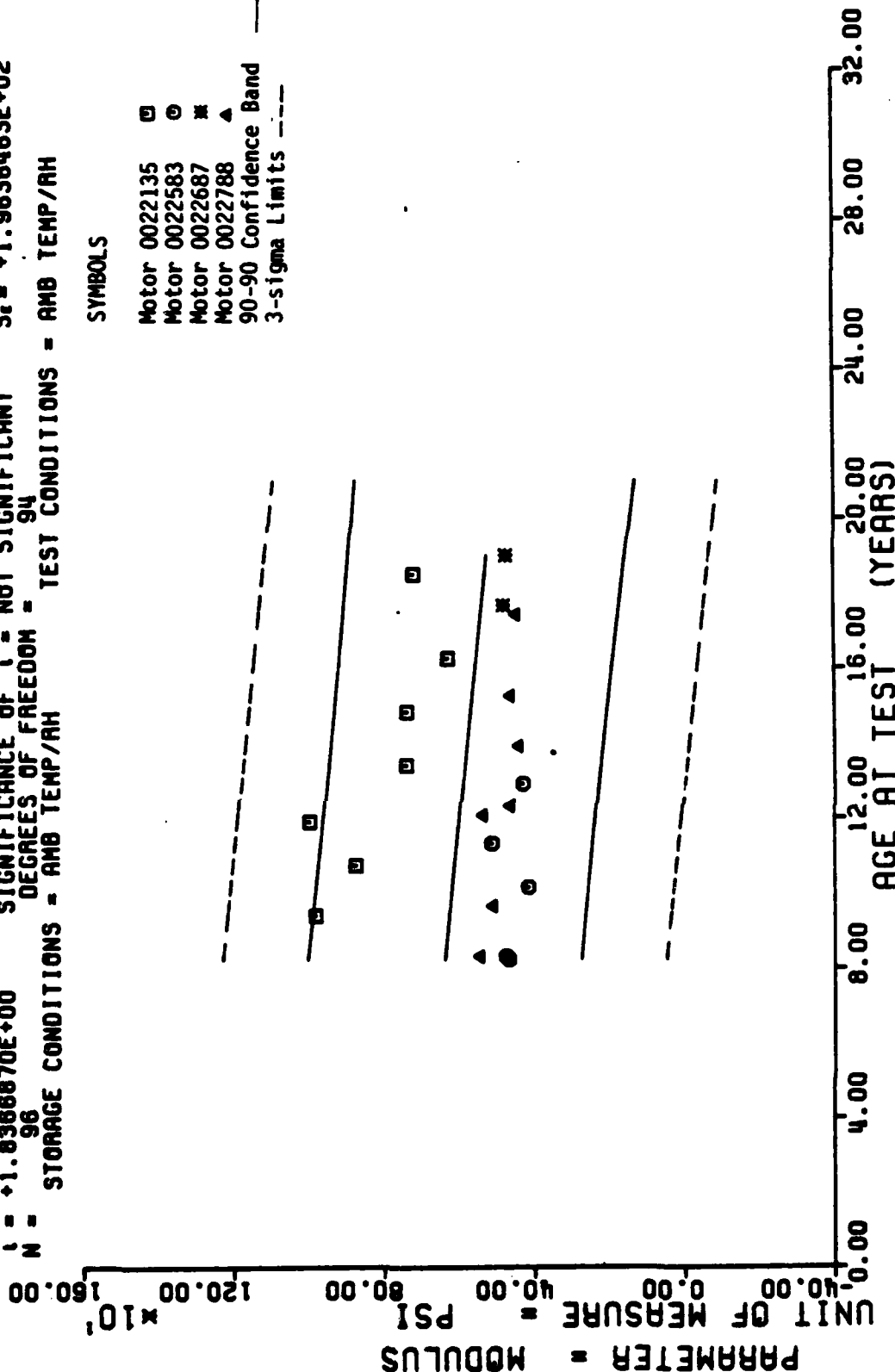
11 STAGE OSC1 MTRAS ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 STN RUPTUR <0022788>

Figure 72

$Y = ((+7.2356099E+02) + (-8.9129422E-01) \times X)$   
 $F = +3.3794191E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -1.8612938E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.8366870E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 96$  DEGREES OF FREEDOM  
 $N = 96$  STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ×  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



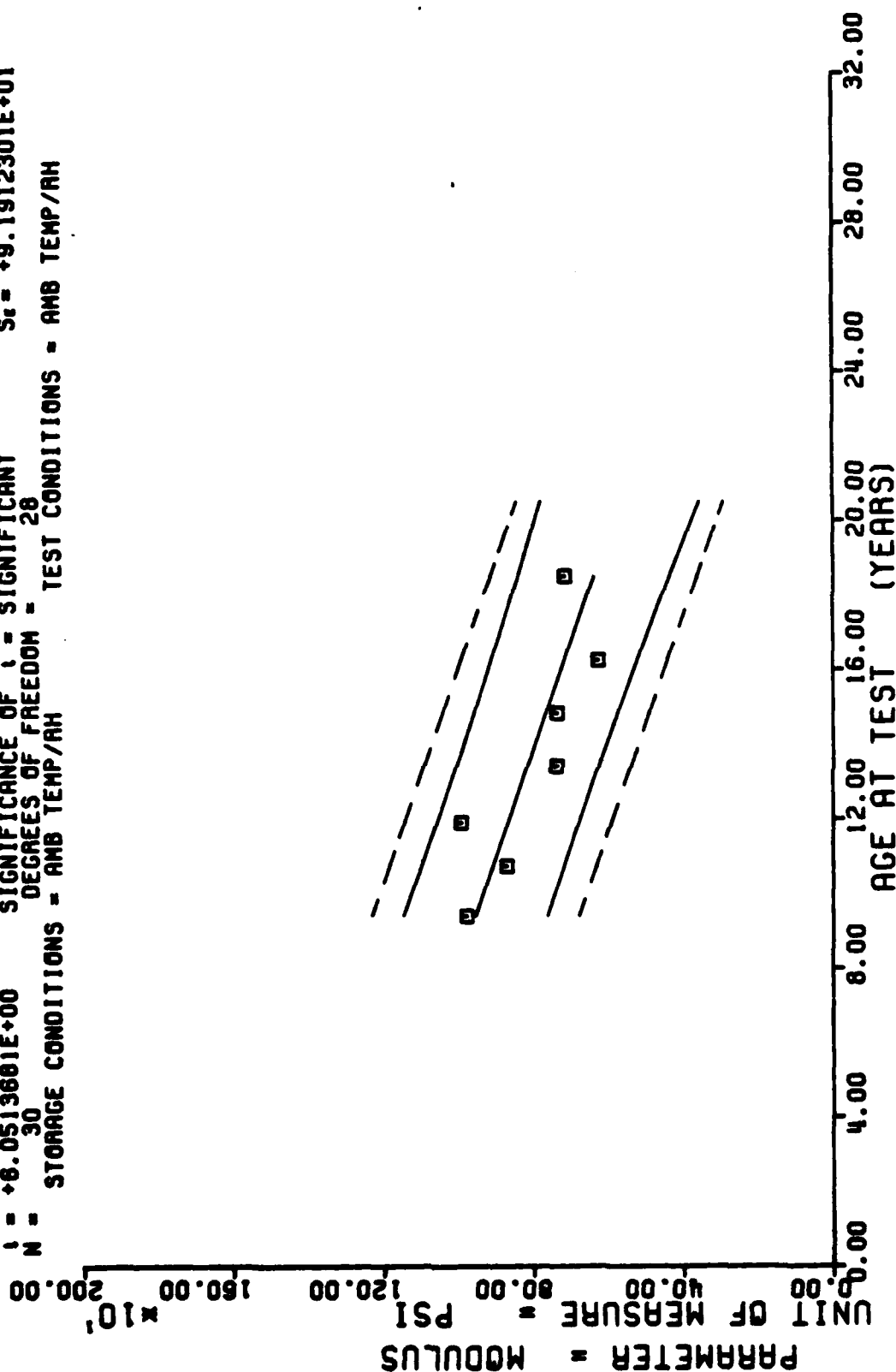
II STAGE DSCT NTAS, INNER, AXIAL POS, BIAXIAL CHS=0.2 IN/MIN, MODULUS

Figure 73

$F = +3.6619056E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -7.5278900E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +6.0513681E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 30$  DEGREES OF FREEDOM = 28  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/RH

$Y = ((+1.2809540E+03) + (-2.8987429E+00) \times X)$

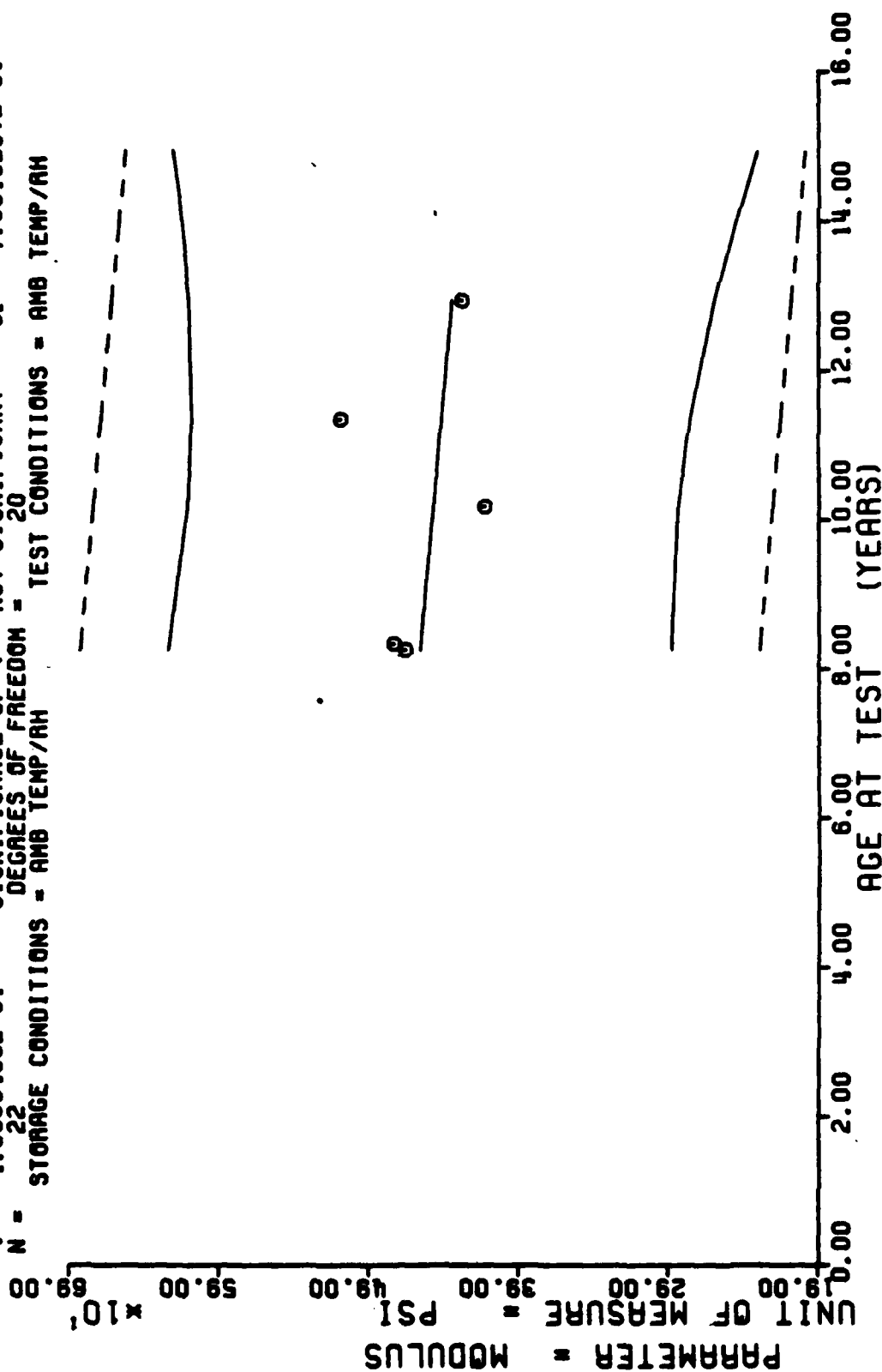
$\sigma = +1.3720028E+02$   
 $S_e = +4.7902273E-01$   
 $S_c = +9.1912301E+01$



11 STAGE 09CT HTAS ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 MODULUS <0022135>

Figure 74

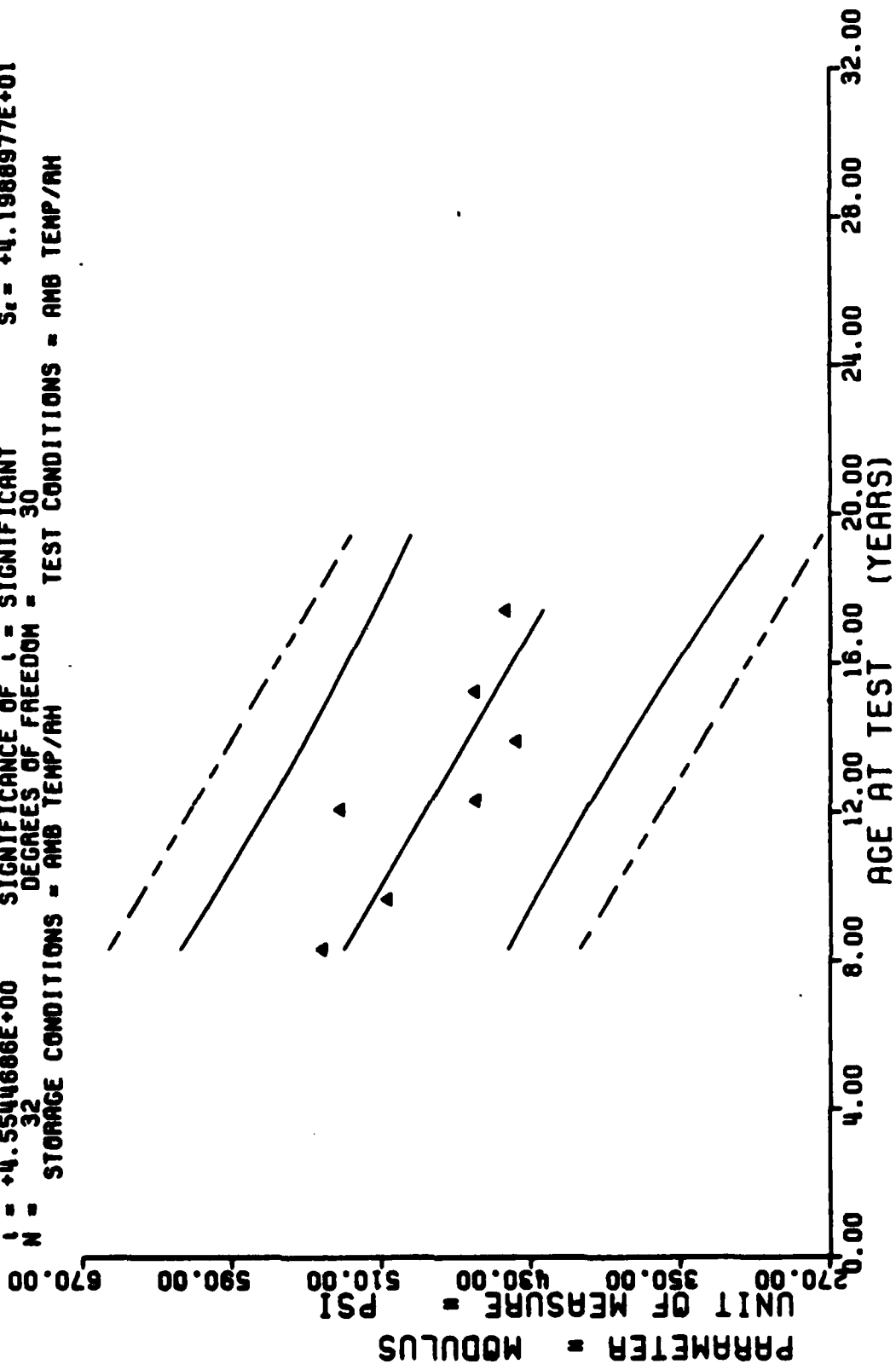
$Y = ((+4.9383043E+02) + (-3.8262181E-01) \times X)$   
 $F = +2.0334236E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G_1 = +7.4069012E+01$   
 $R = -1.0032341E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +8.4850772E-01$   
 $t = +4.5093498E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_1 = +7.5515237E+01$   
 $N = 22$  DEGREES OF FREEDOM = 20  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT HTAS ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 MODULUS <0022583>

Figure 75

Y = (( +6.2769830E+02 ) + ( -9.7673846E-01 ) \* X)  
 F = +2.0743184E+01 SIGNIFICANCE OF F = SIGNIFICANT G = +5.3720909E+01  
 R = -6.3936499E-01 SIGNIFICANCE OF R = SIGNIFICANT S = +2.1445716E-01  
 I = +4.5544686E+00 SIGNIFICANCE OF I = SIGNIFICANT S = +4.1988977E+01  
 N = 32 DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



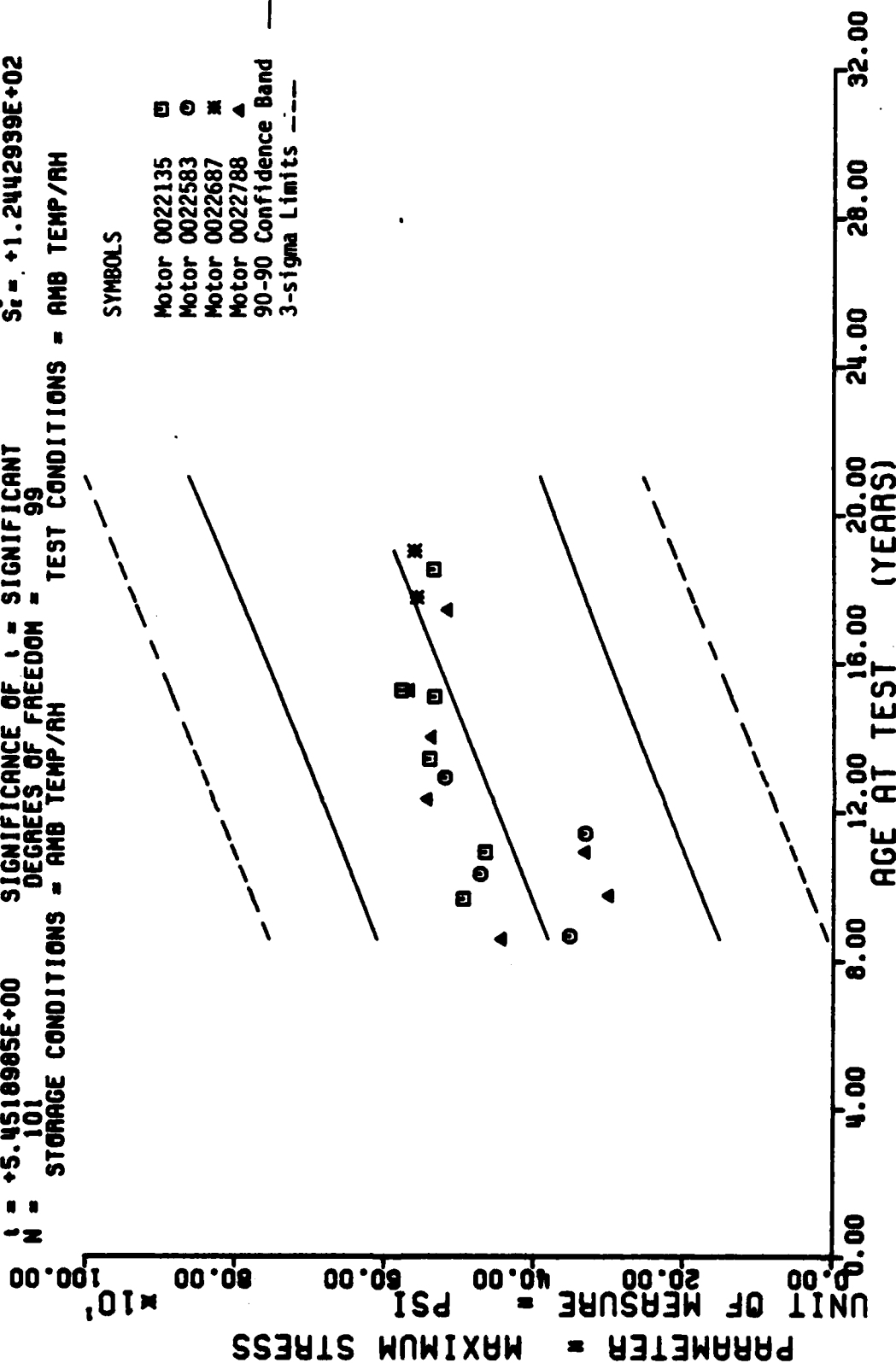
11 STAGE DSCT MTRs ONLY, INNER, AXIAL POS. BIAXIAL CHS=0.2 MODULUS <0022788>

Figure 76

$F = +2.9723198E+01$   
 $A = +4.8052072E-01$   
 $I = +5.4518985E+00$   
 $N = 101$   
 $Y = ((+2.1039908E+02) + (+1.6555067E+00) \times X)$   
 $F$  = SIGNIFICANCE OF F = SIGNIFICANT  
 $A$  = SIGNIFICANCE OF A = SIGNIFICANT  
 $I$  = SIGNIFICANCE OF I = SIGNIFICANT  
 $N$  = DEGREES OF FREEDOM = 99  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

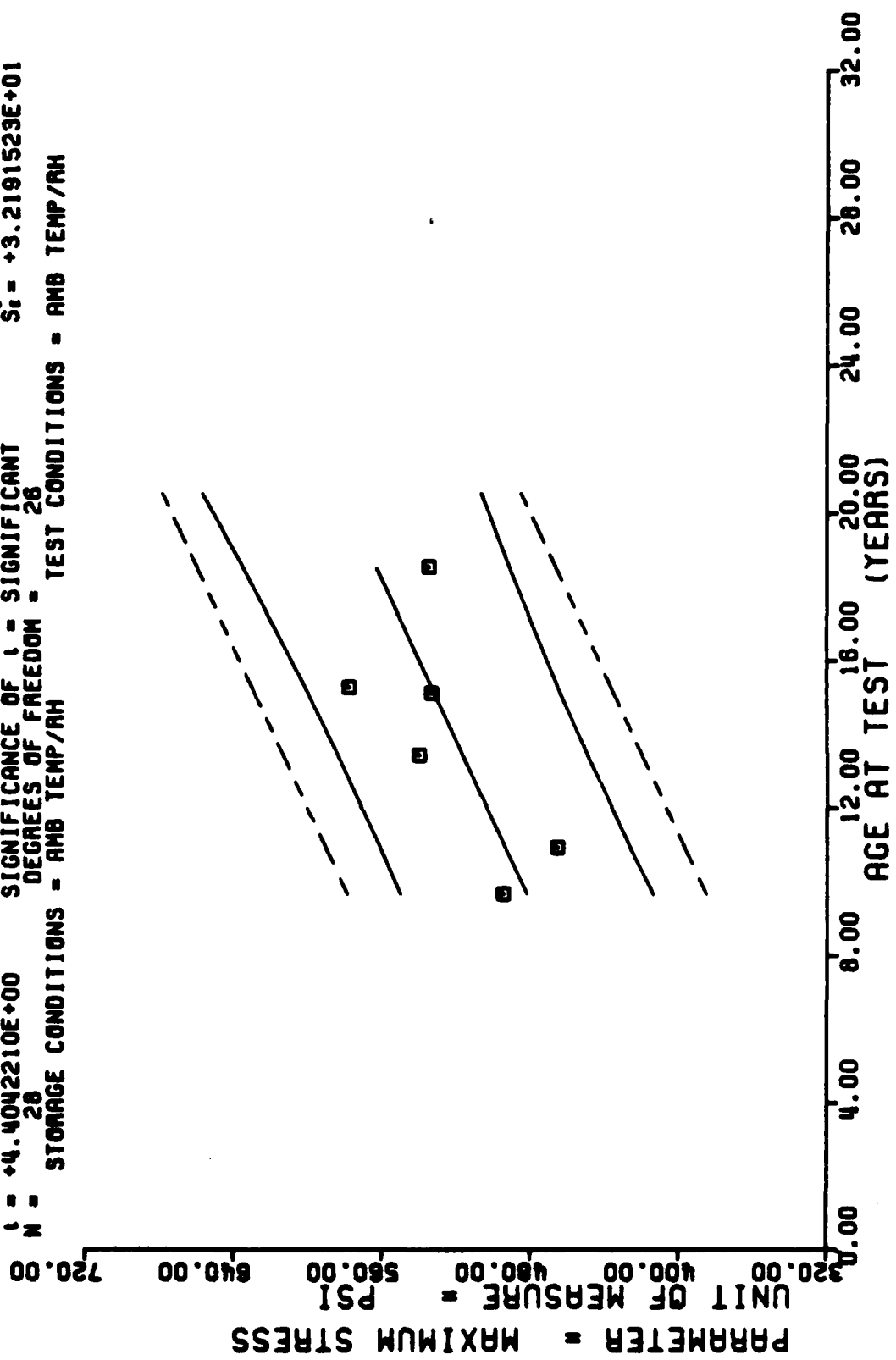
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✕  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ----



II STAGE DSCT NTAS, OUTER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MAXIMUM STRESS

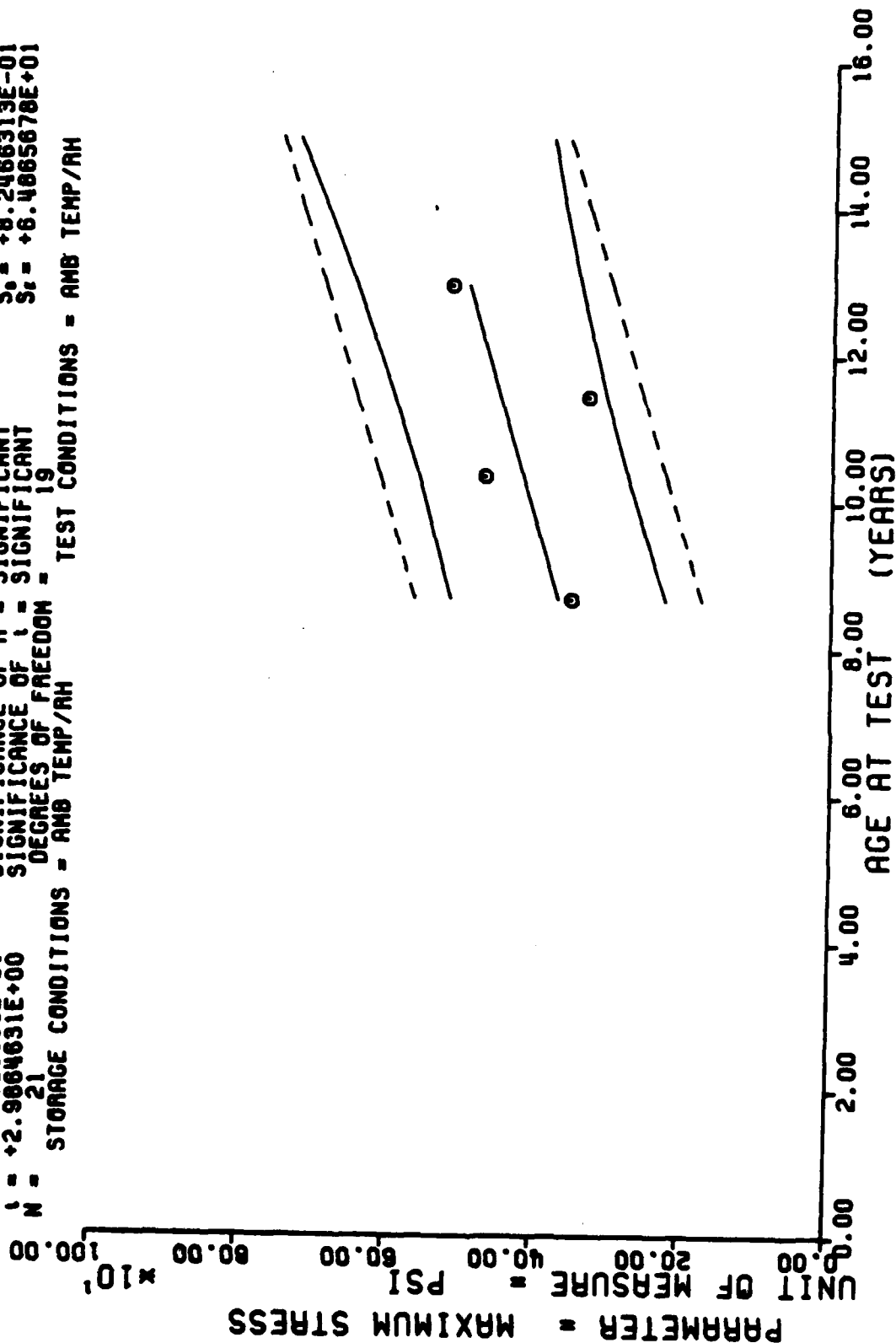
F = +1.9397182E+01  
 R = +6.5366427E-01  
 t = +4.4042210E+00  
 N = 28  
 Y = (( +3.9274510E+02 ) + ( +7.6675527E-01 ) \* X)  
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF t = SIGNIFICANT  
 DEGREES OF FREEDOM = 26  
 STORAGE CONDITIONS = AMB TEMP/AM  
 TEST CONDITIONS = AMB TEMP/AM



11 STAGE DSCT HTAS, OUTER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MAX STA <0022135>

Figure 78

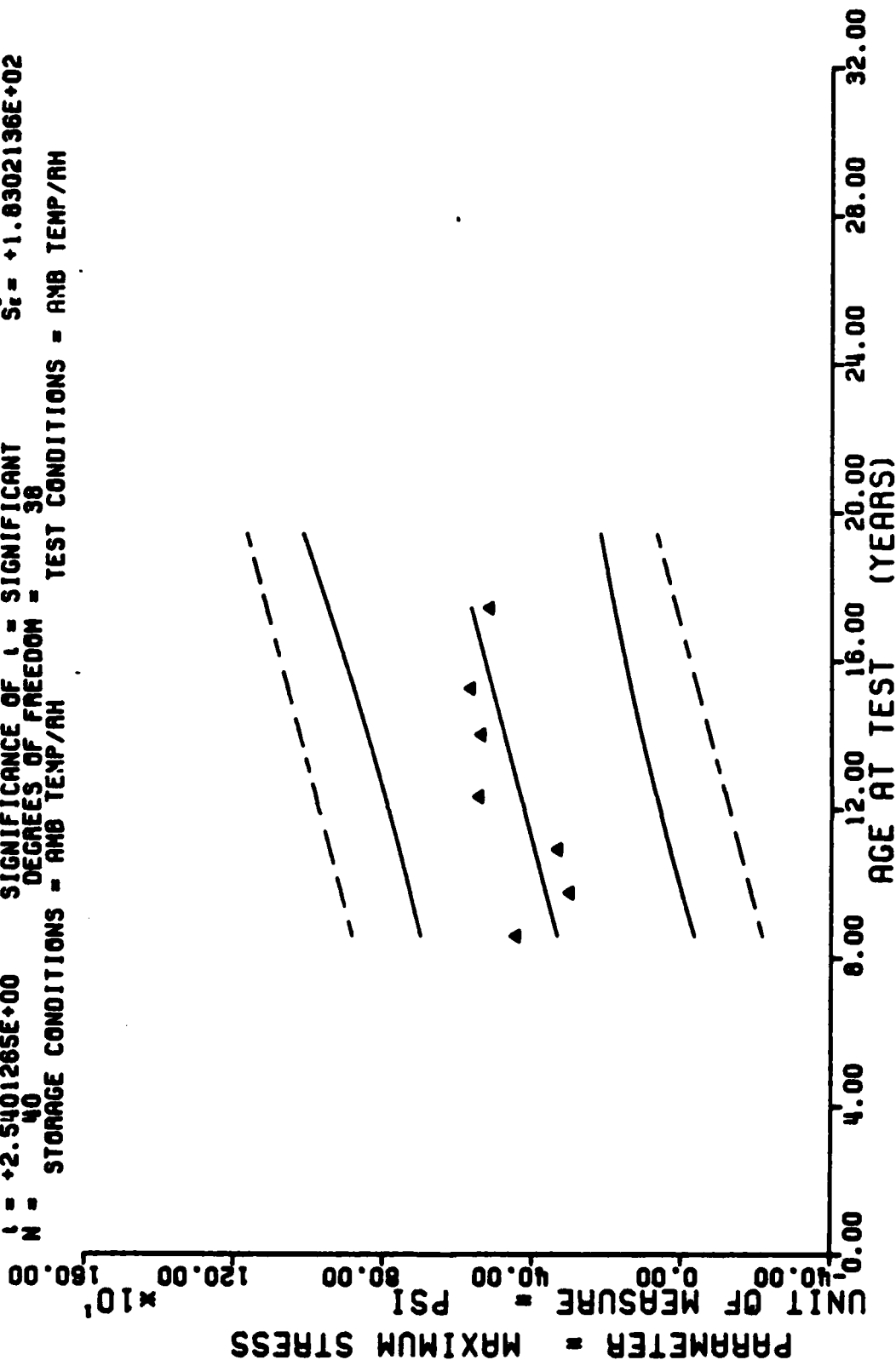
$F = +0.9189622E+00$   
 $R = +5.6520699E-01$   
 $N = +2.9864631E+00$   
 $Y = (( +1.1408873E+02 ) + ( +2.4628260E+00 ) \times X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF t = SIGNIFICANT  
 DEGREES OF FREEDOM = 19  
 STORAGE CONDITIONS = AMB TEMP/AM  
 TEST CONDITIONS = AMB TEMP/AM



II STAGE OSCT NTRs, OUTER, AXIAL-H.R. HYDRO. CHS-1750 AT 500 PSI, MAX STR <0022583>

Figure 79

$Y = ((+1.0762571E+02) + (+2.1847224E+00) \times X)$   
 $F = +6.4522491E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +3.6098556E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.5401265E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 40$  DEGREES OF FREEDOM = 38  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT HTAS, OUTER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MAX STR <0022788>

Figure 80

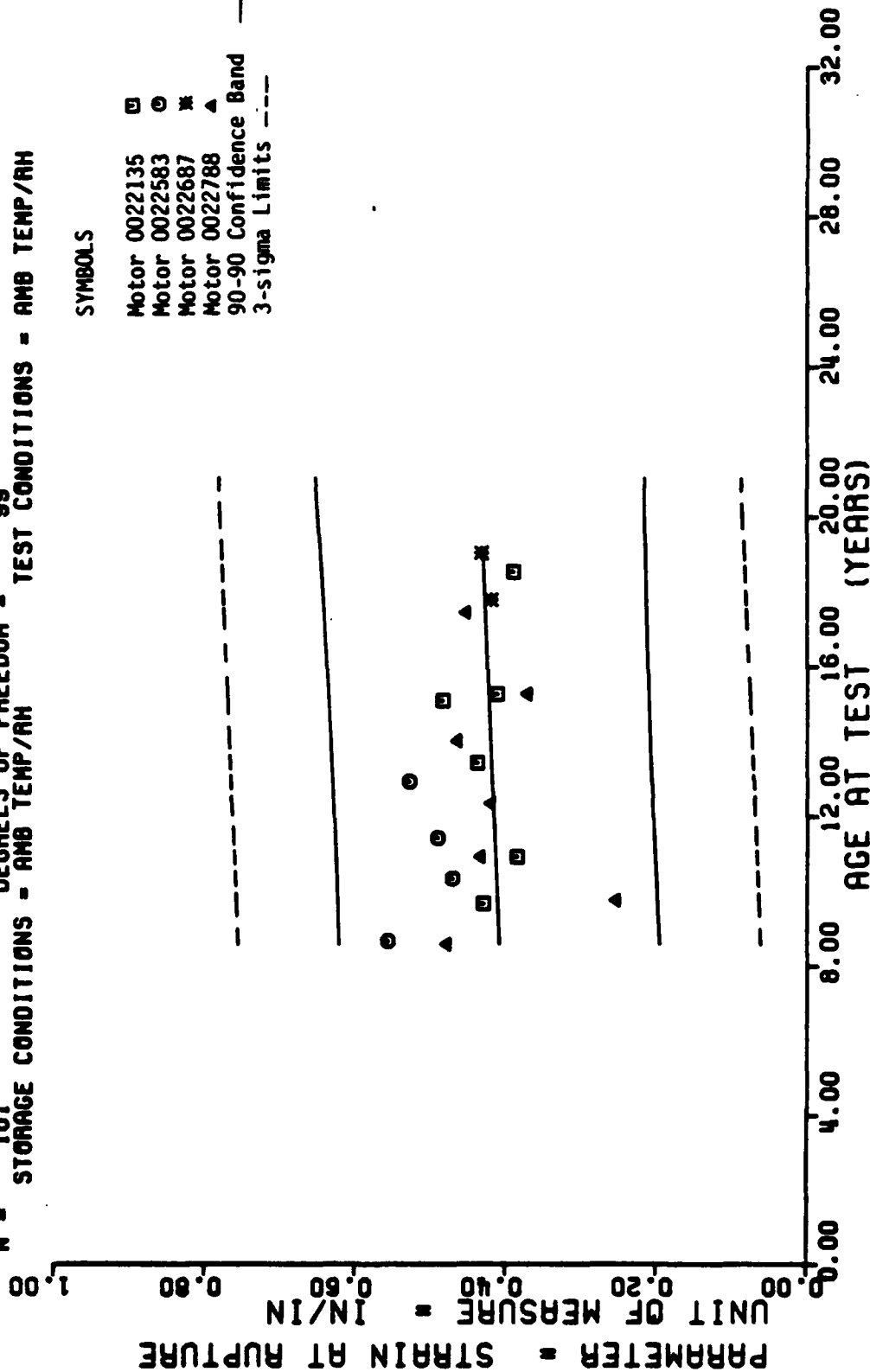
$F = +3.9581310E-01$   
 $R = +6.3104603E-02$   
 $t = +6.2913679E-01$   
 $N = 101$

$Y = (( +3.8950767E-01 ) + ( +1.7737680E-04 ) \times X)$   
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 99

STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

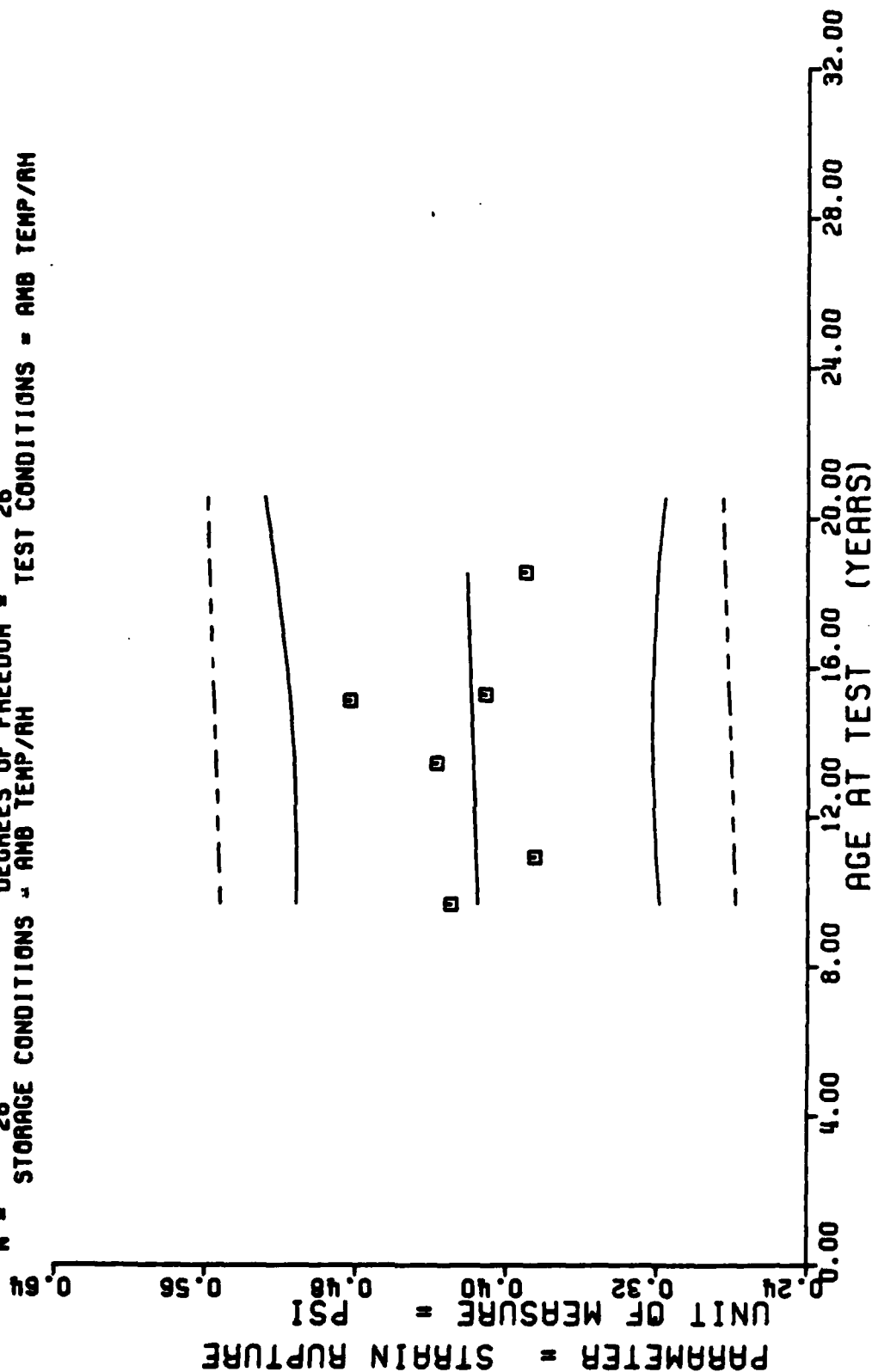
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ×  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



II STAGE DSCT NTAS, OUTER, AXIAL, H.A. HYDRO. CHS-1750 AT 500 PSI. STRAIN/RUPTURE

Figure 81

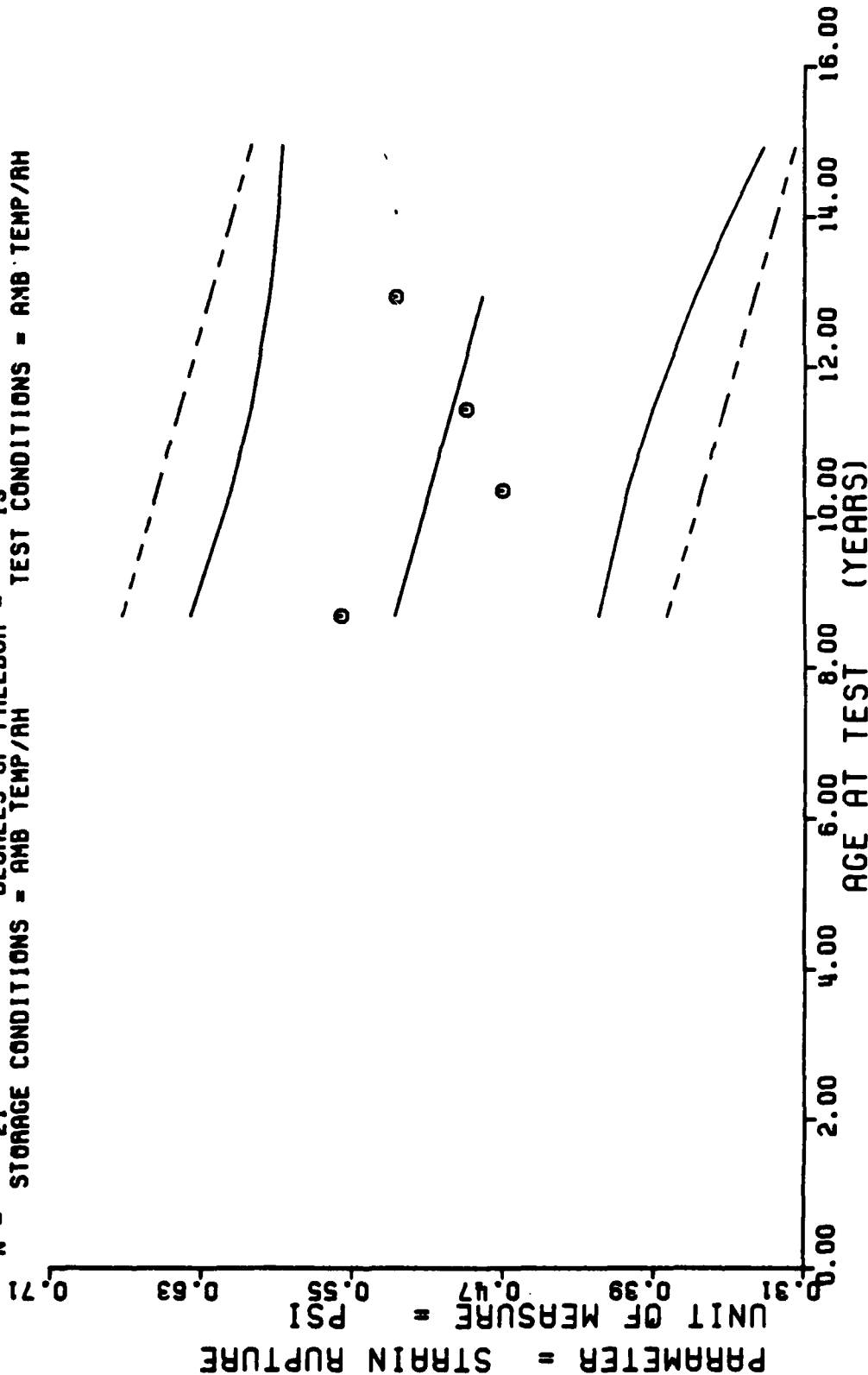
$Y = (( +4.0841593E-01 ) + ( +5.5787030E-05 ) \times X)$   
 F = +5.1197167E-02 SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +4.4781238E-02$   
 R = +4.4331162E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S = +2.4655299E-04$   
 L = +2.2626791E-01 SIGNIFICANCE OF L = NOT SIGNIFICANT  $S_1 = +4.5589427E-02$   
 N = 28 DEGREES OF FREEDOM = 26  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCY MTRAS, OUTER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, STN RUP <0022135>

Figure 82

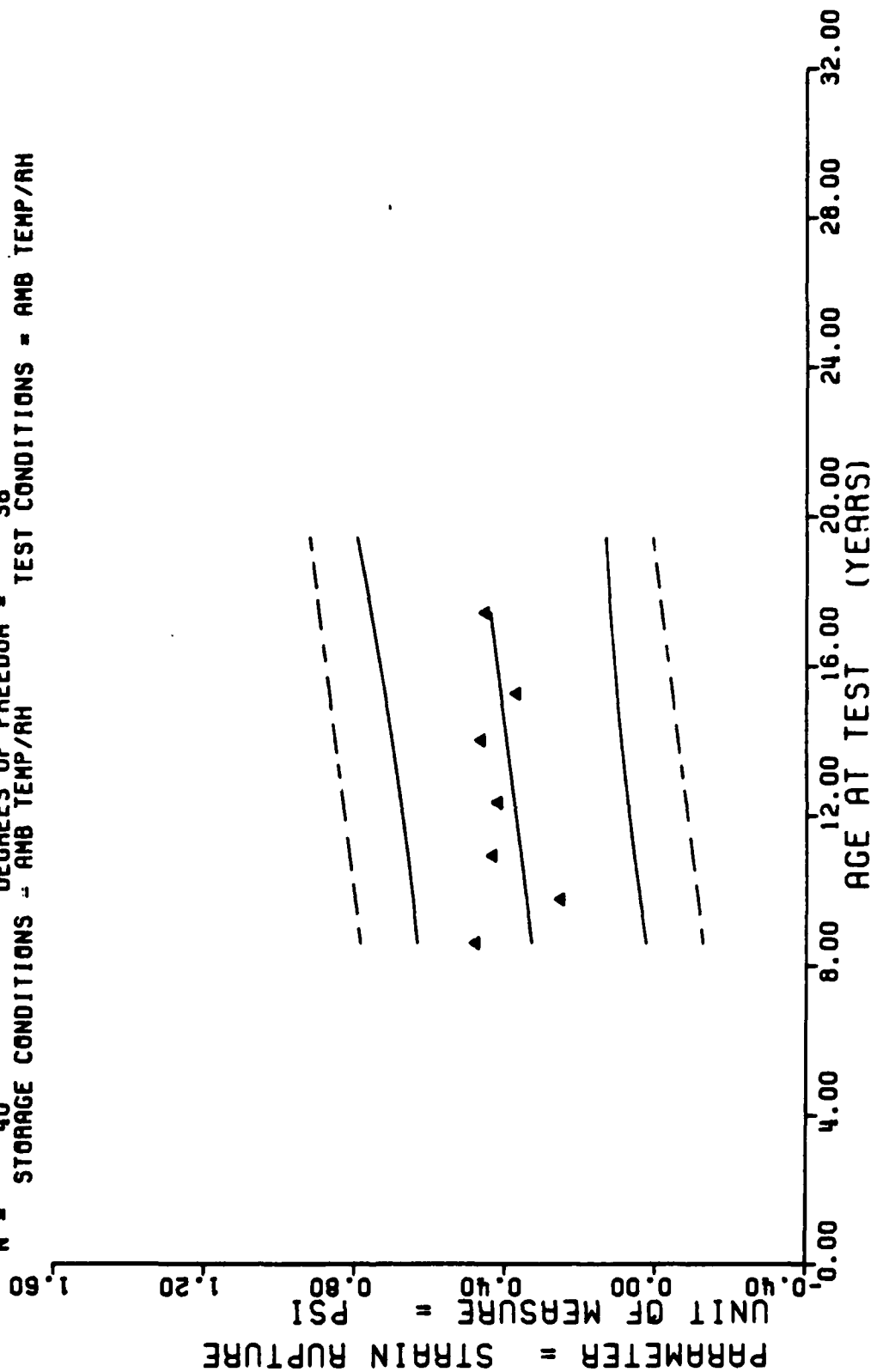
$Y = ((+6.2141130E-01) + (-9.0575404E-04) \times X)$   
 F = +2.1940057E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT  $G_1 = +4.9513236E-02$   
 R = -3.2174540E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +6.1149287E-04$   
 t = +1.4812176E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_1 = +4.8098306E-02$   
 N = 21 DEGREES OF FREEDOM = 19  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT MTR, OUTER, AXIAL, H.R. HYDRO. CHS-1750 AT 500 PSI, STN RUP <0022583>

Figure 83

F = +2.0977173E+00  
 A = +2.2672501E-01  
 t = +1.4483498E+00  
 N = 40  
 Y = (( +2.2246651E-01 ) + ( +1.0319608E-03 ) \* X)  
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF A = NOT SIGNIFICANT  
 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 38  
 STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH



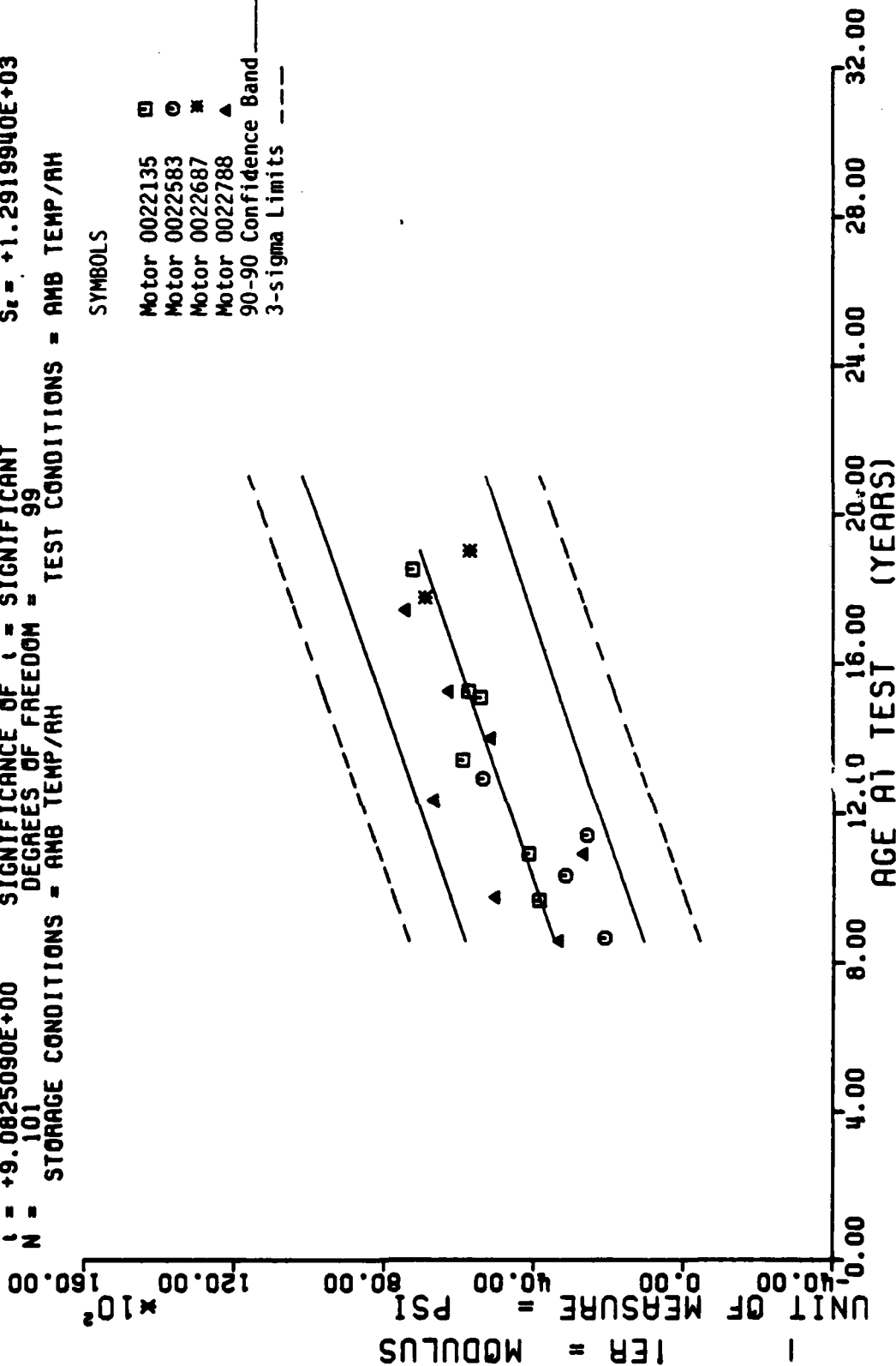
11 STAGE DSC1 MTRAS, OUTER, AXIAL, H.A. HYDRO, CHS=1750 AT 500 PSI, STN RUP <0022788>

Figure 84

$Y = ((+4.8801846E+02) + (+2.8636934E+01) \times X)$   
 $F = +8.2491971E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +6.7418196E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +9.0825090E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 101$  DEGREES OF FREEDOM = 99  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

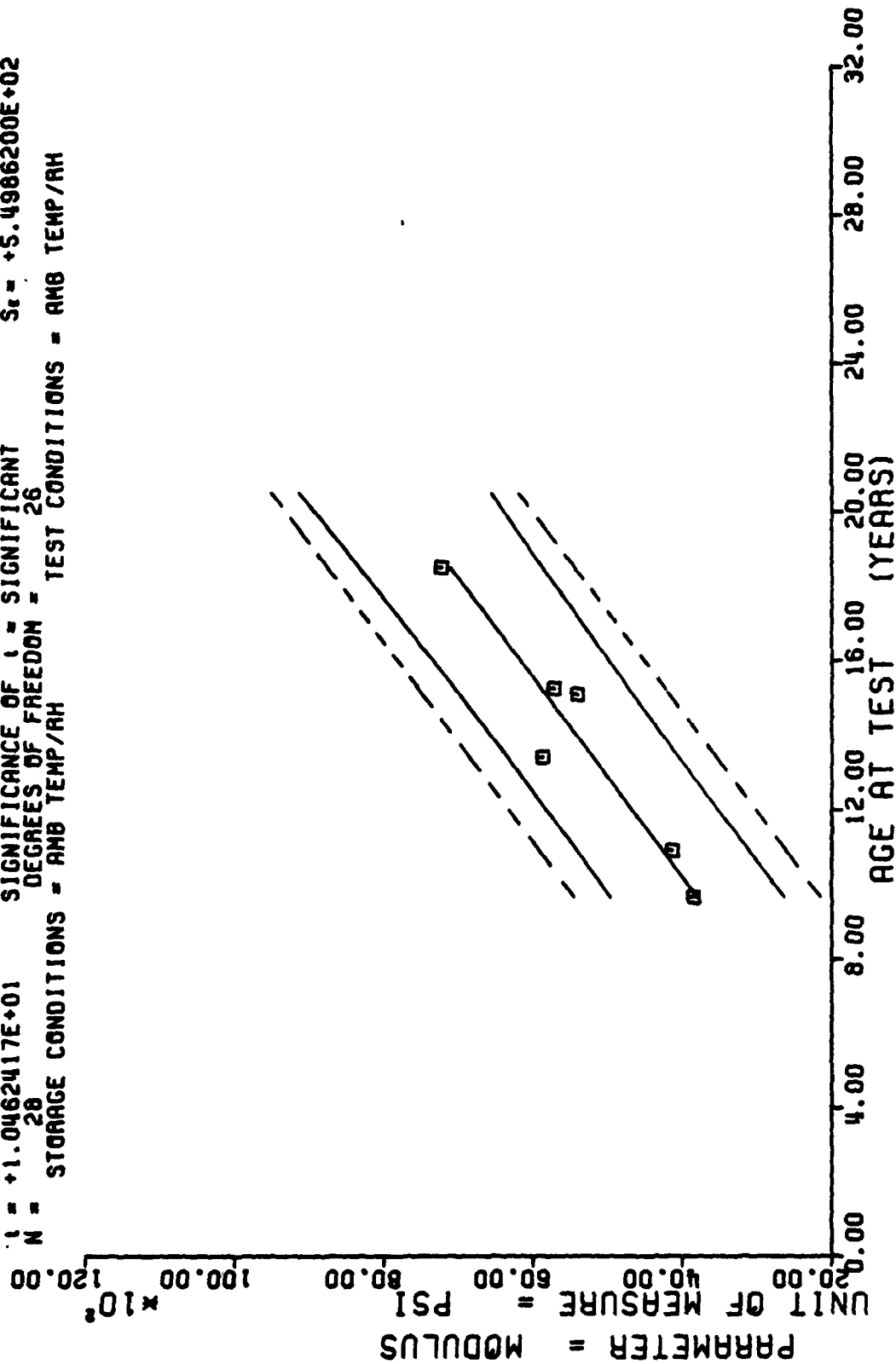
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



II STAGE DSCT MTRAS, OUTER, AXIAL, H.A. HYDRO. CHS-1750 AT 500 PSI, MODULUS

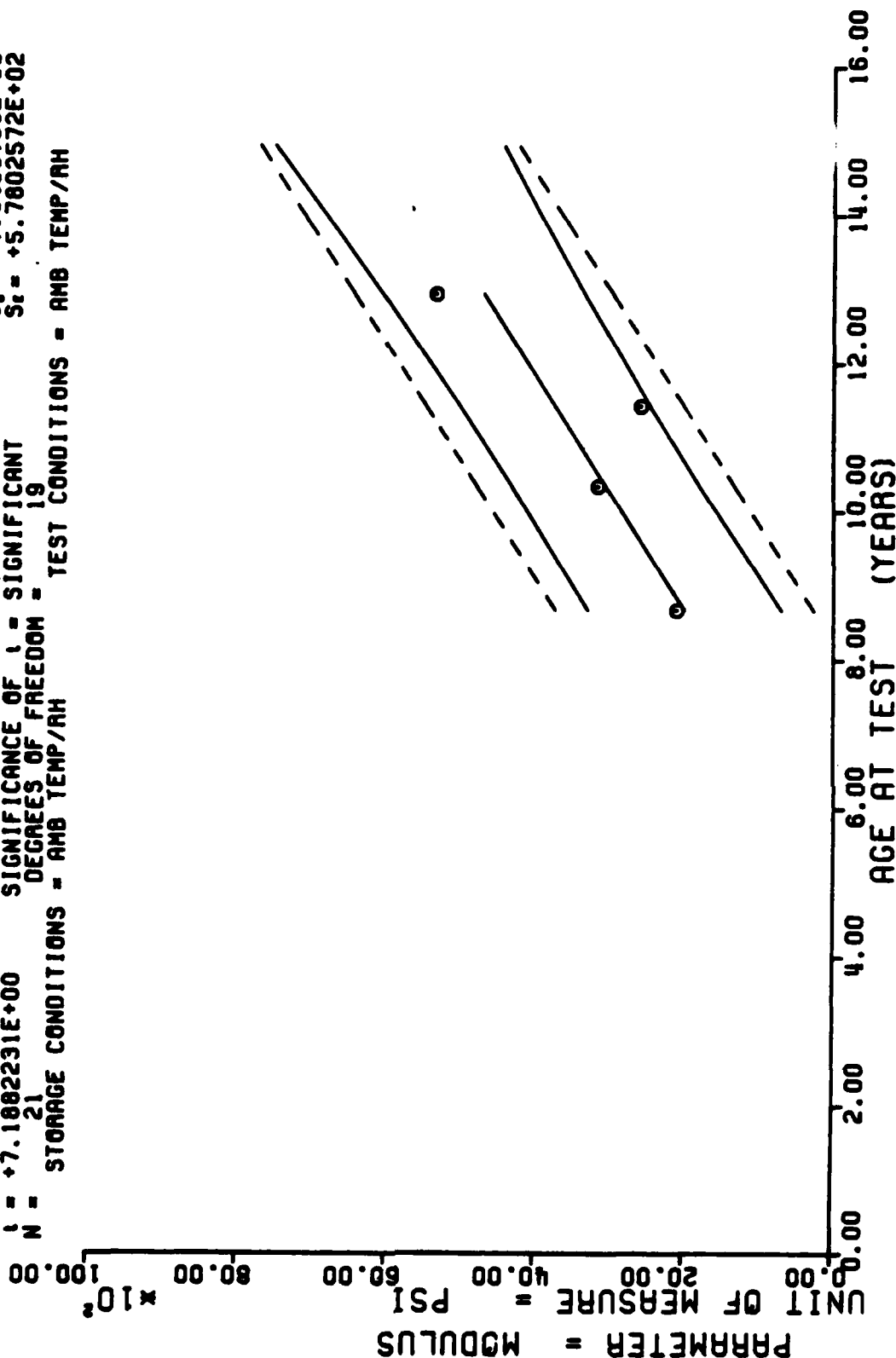
$Y = ((+1.9055333E+02) + (+3.1112285E+01) \times X)$   
 $F = +1.0946218E+02$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +8.9892408E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +1.0462417E+01$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 26$  DEGREES OF FREEDOM = 26  
 $N = 26$  STORAGE CONDITIONS = AMB TEMP/AMB TEST CONDITIONS = AMB TEMP/AM



II STAGE DSCT MTAS, OUTER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, MODULUS <0022135>

Figure 86

$Y = ((-3.4961811E+03) + (+5.2823884E+01) * X)$   
 $F = +5.1670552E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +1.0865542E+03$   
 $R = +8.5507125E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +7.3486706E+00$   
 $t = +7.1882231E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +5.7802572E+02$   
 $N = 21$  DEGREES OF FREEDOM = 19  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



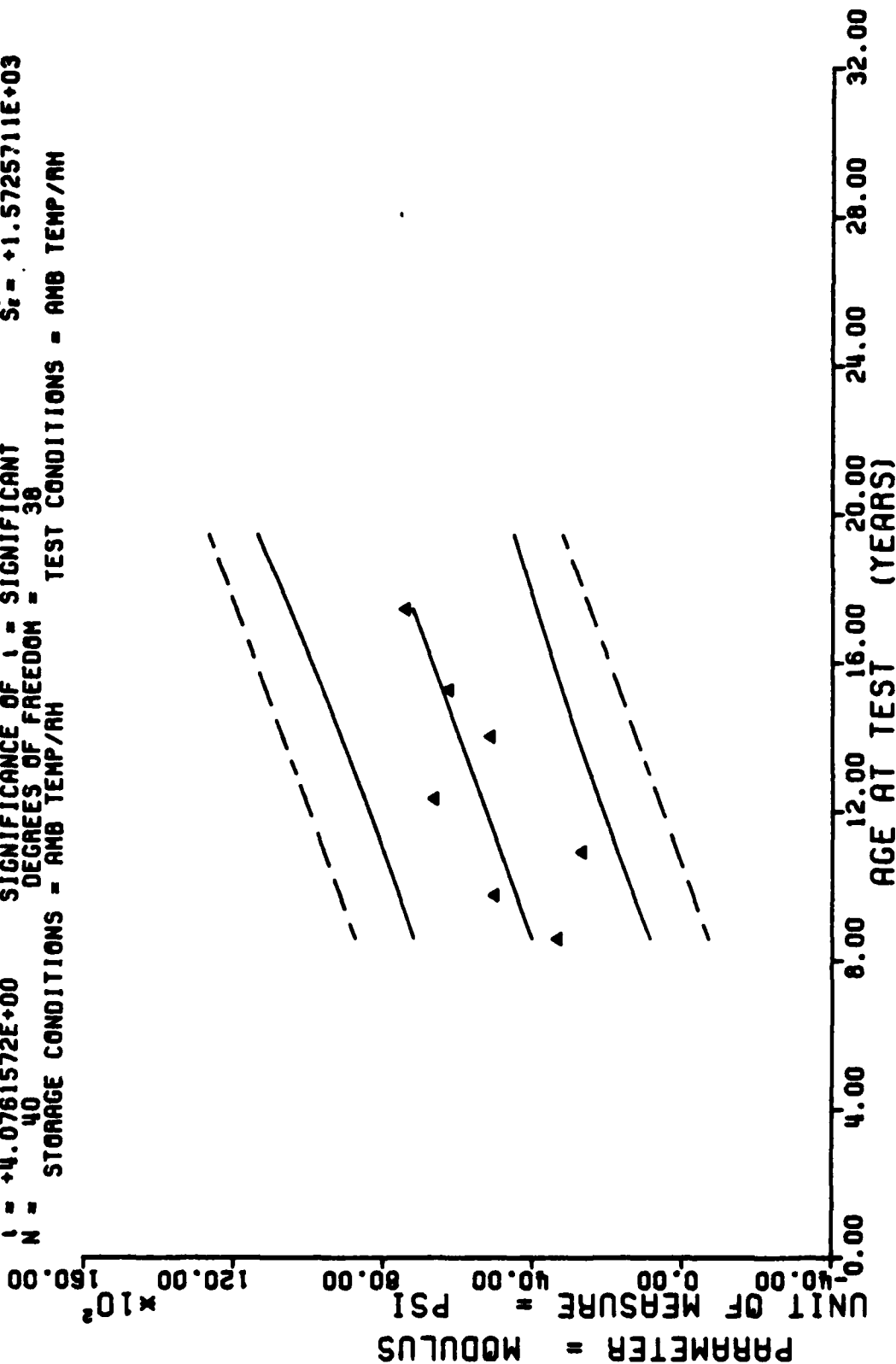
11 STAGE DSCT NTAS, OUTER, AXIAL, N.A. HYDRO. CHS-1750 AT 500 PSI, MODULUS <0022583>

Figure 87

$F = +1.6615058E+01$   
 $R = +5.5158250E-01$   
 $t = +4.0761572E+00$   
 $N = 40$

$Y = (( +9.0783930E+02 ) + ( +3.0123147E+01 ) * X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF t = SIGNIFICANT  
 DEGREES OF FREEDOM = 38

STORAGE CONDITIONS = AMB TEMP/RH      TEST CONDITIONS = AMB TEMP/RH



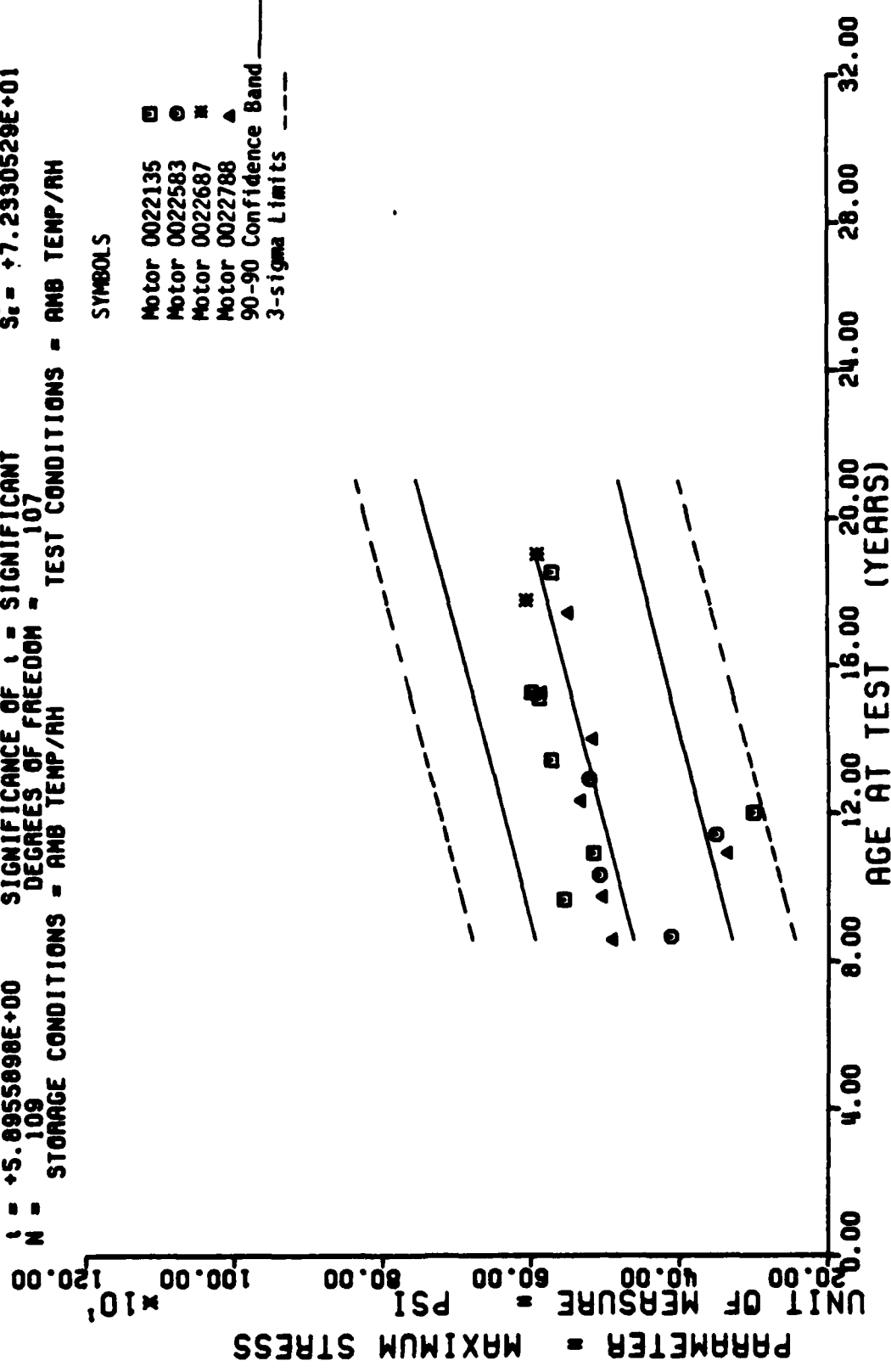
11 STAGE DSCT MTRAS, OUTER, AXIAL, H.A. HYDRO. CHS-1750 AT 500 PSI, MODULUS <0022788>

Figure 88

$Y = ((+3.5407151E+02) + (+1.0470682E+00) \times X)$   
 $F = +3.4757980E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +4.9516906E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +5.8955898E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 109$  DEGREES OF FREEDOM = 107  
 $N = 109$  STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

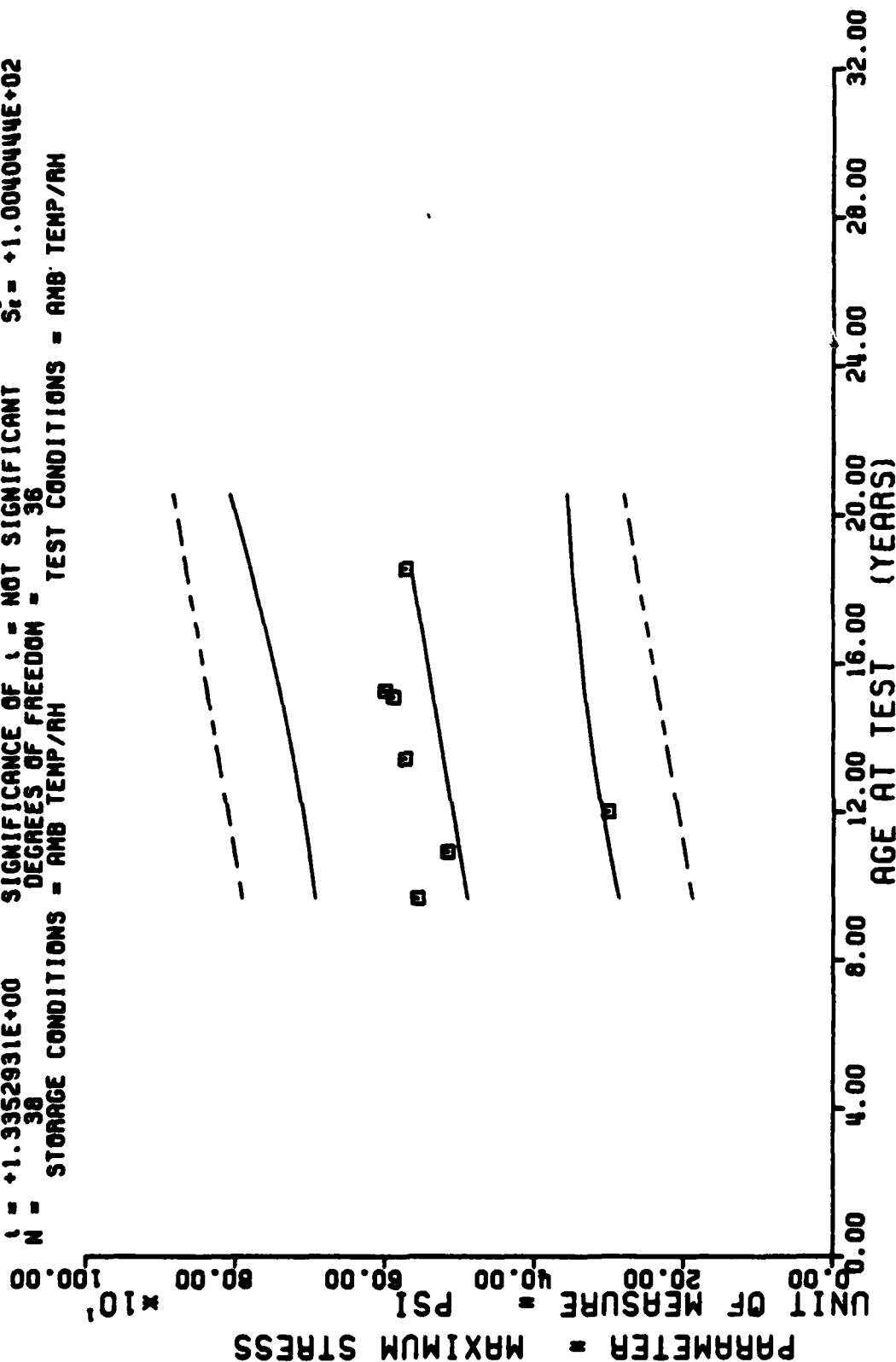
SYMBOLS

- Motor 0022135 □
- Motor 0022583 ○
- Motor 0022687 ×
- Motor 0022788 ▲
- 90-90 Confidence Band ---
- 3-sigma Limits - - -



11 STAGE DSCT NTAS, INNER, AXIAL, H.A. HYDRO. CHS-1750 AT 500 PSI, MAXIMUM STRESS

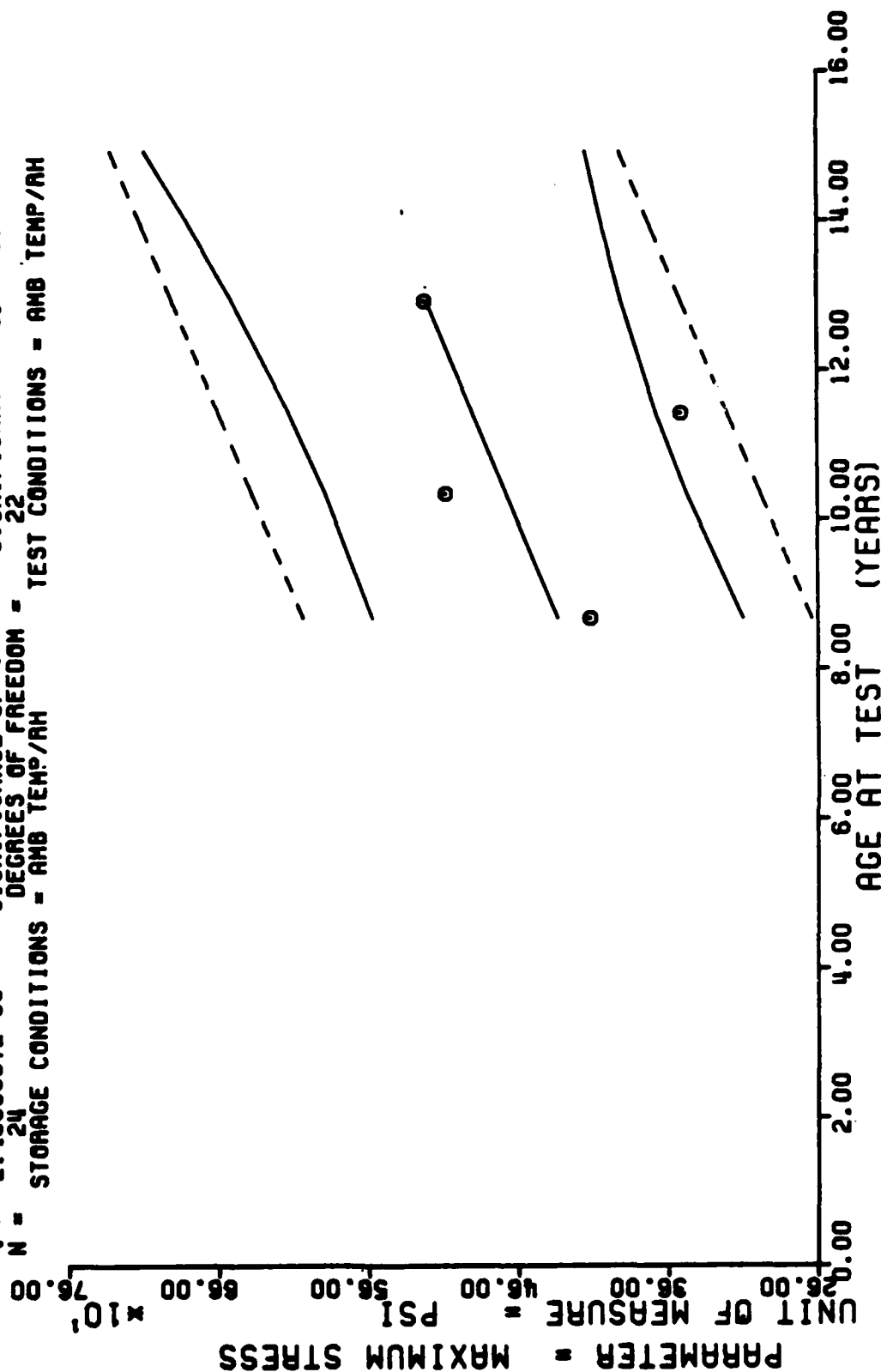
$Y = ((+4.0662790E+02) + (+7.1033180E-01) \times X)$   
 $F = +1.7830078E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha = +1.0146127E+02$   
 $R = +2.1723428E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +5.3196691E-01$   
 $t = +1.3352931E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +1.0040444E+02$   
 $N = 38$  DEGREES OF FREEDOM = 36  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MTRAS. INNER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MAX STA <0022135>

Figure 90

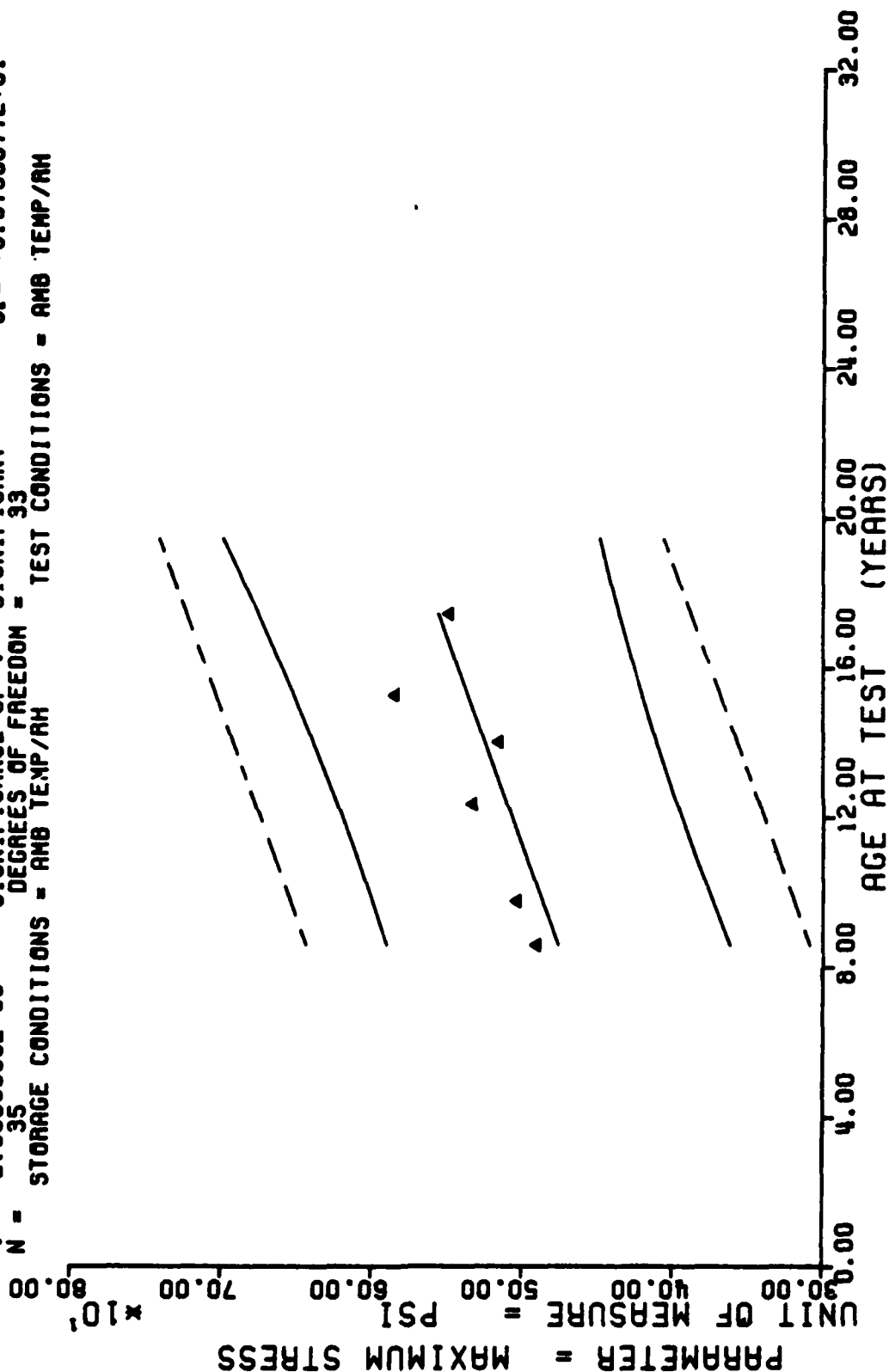
$Y = ((+2.5658772E+02) + (+1.7016131E+00) \times X)$   
 $F = +5.7647856E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +6.2054935E+01$   
 $R = +4.5586360E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +7.0871112E-01$   
 $t = +2.4009967E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +5.6479245E+01$   
 $N = 24$  DEGREES OF FREEDOM = 22  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MTAS, INNER, AXIAL, H.A. HYDRO. CHS-1750 AT 500 PSI, MAX STA <0022583>

Figure 91

$Y = ((+3.9830840E+02) + (+7.5121934E-01) \times X)$   
 $F = +7.1216393E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +4.2130891E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.6686399E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 35$  DEGREES OF FREEDOM = 33  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



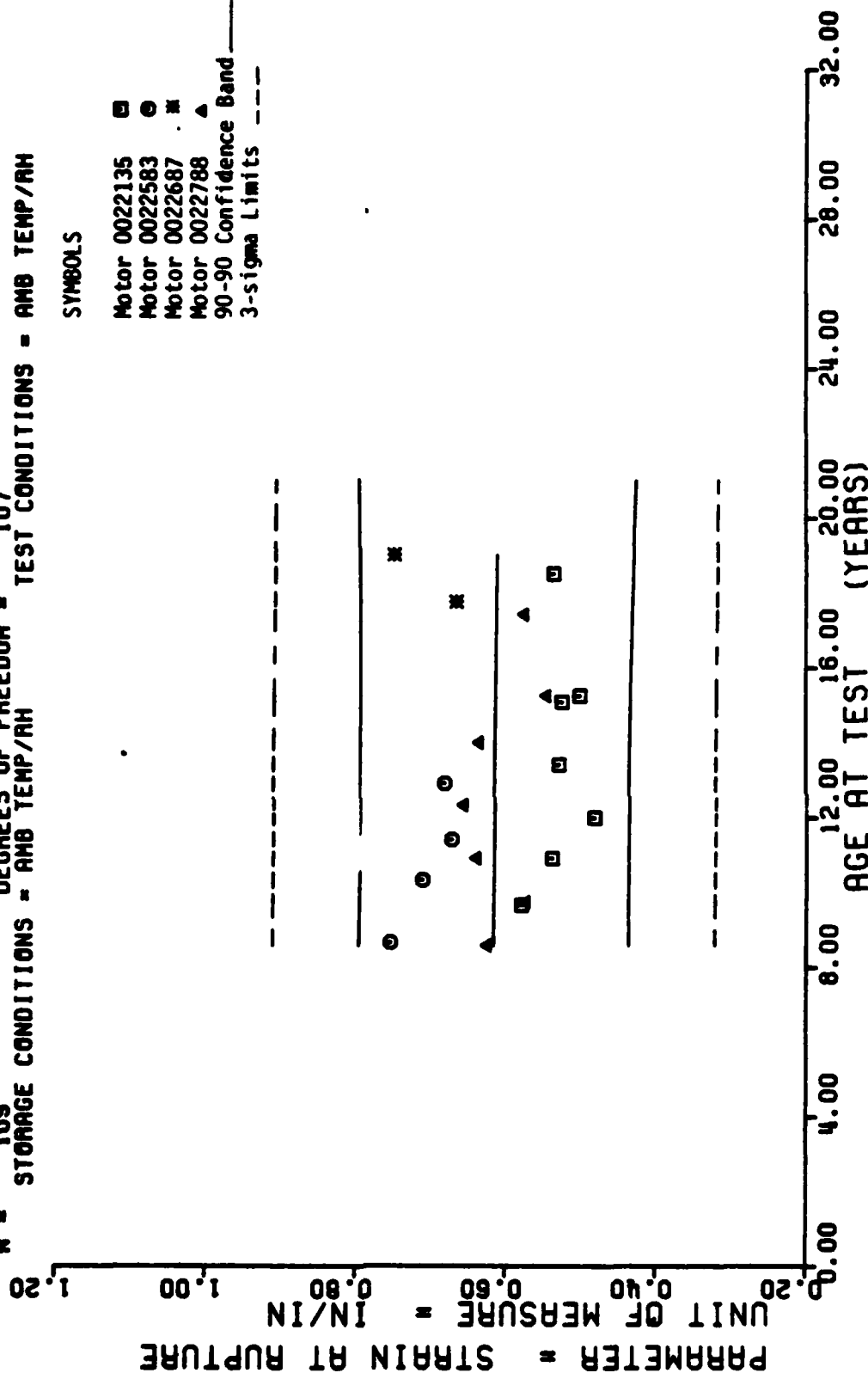
11 STAGE DSCT MTRs, INNER, AXIAL, H.R. HYDRO. CHS-1750 AT 500 PSI, MAX STA <0022788>

Figure 92

$Y = ((+6.1884616E-01) + (-3.4111595E-05) \times X)$   
 $F = +2.0070031E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_f = +9.7618366E-02$   
 $R = -1.3694349E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +2.4078420E-04$   
 $t = +1.4166879E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +9.8062262E-02$   
 $N = 109$  DEGREES OF FREEDOM = 107  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

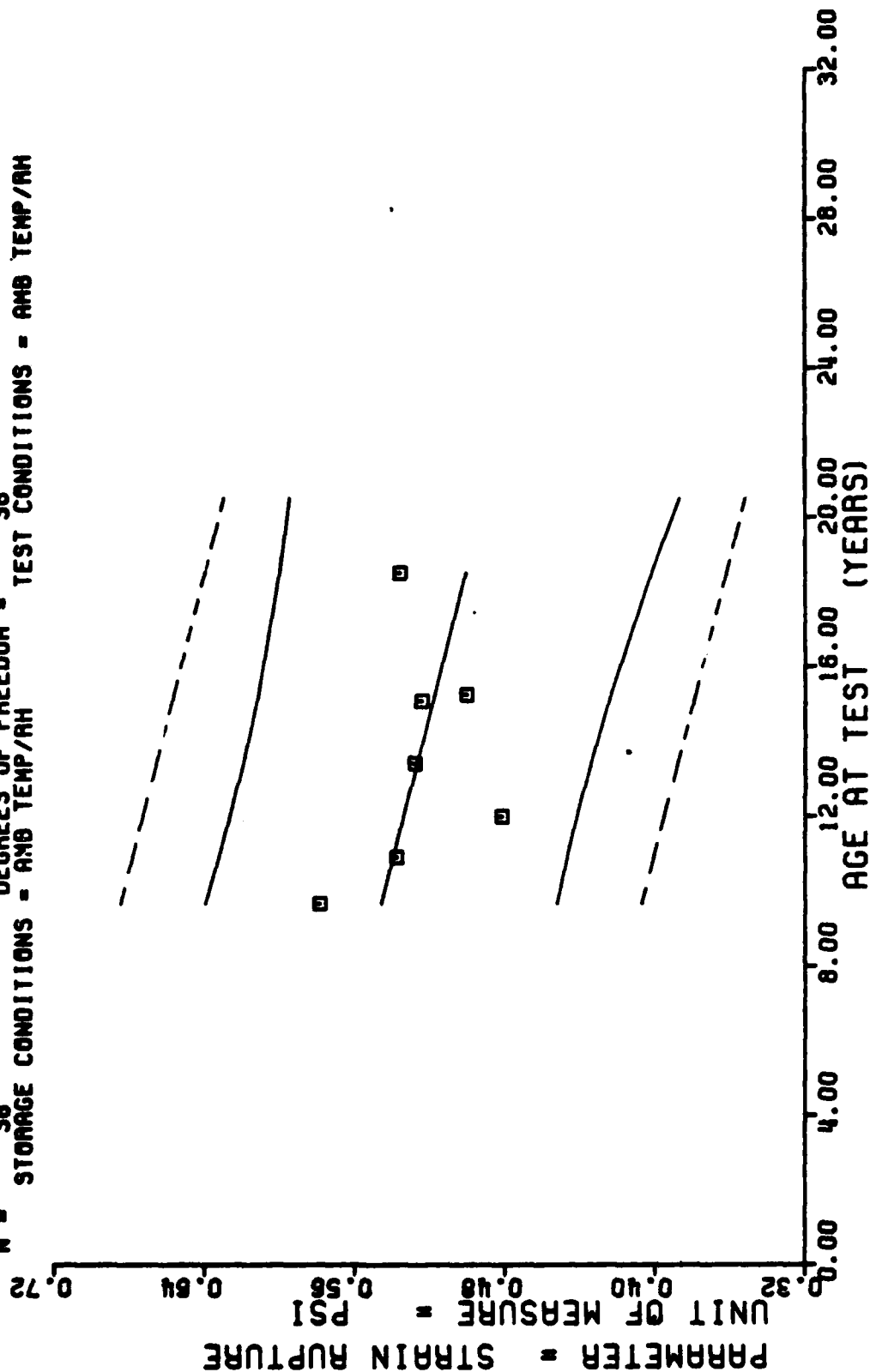
Motor 0022135  $\square$   
 Motor 0022583  $\circ$   
 Motor 0022687  $\times$   
 Motor 0022788  $\triangle$   
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCT MTRAS, INNER, AXIAL, H.A. HYDRO.CHS=1750 AT 500 PSI, STRAIN/RUPTURE

Figure 93

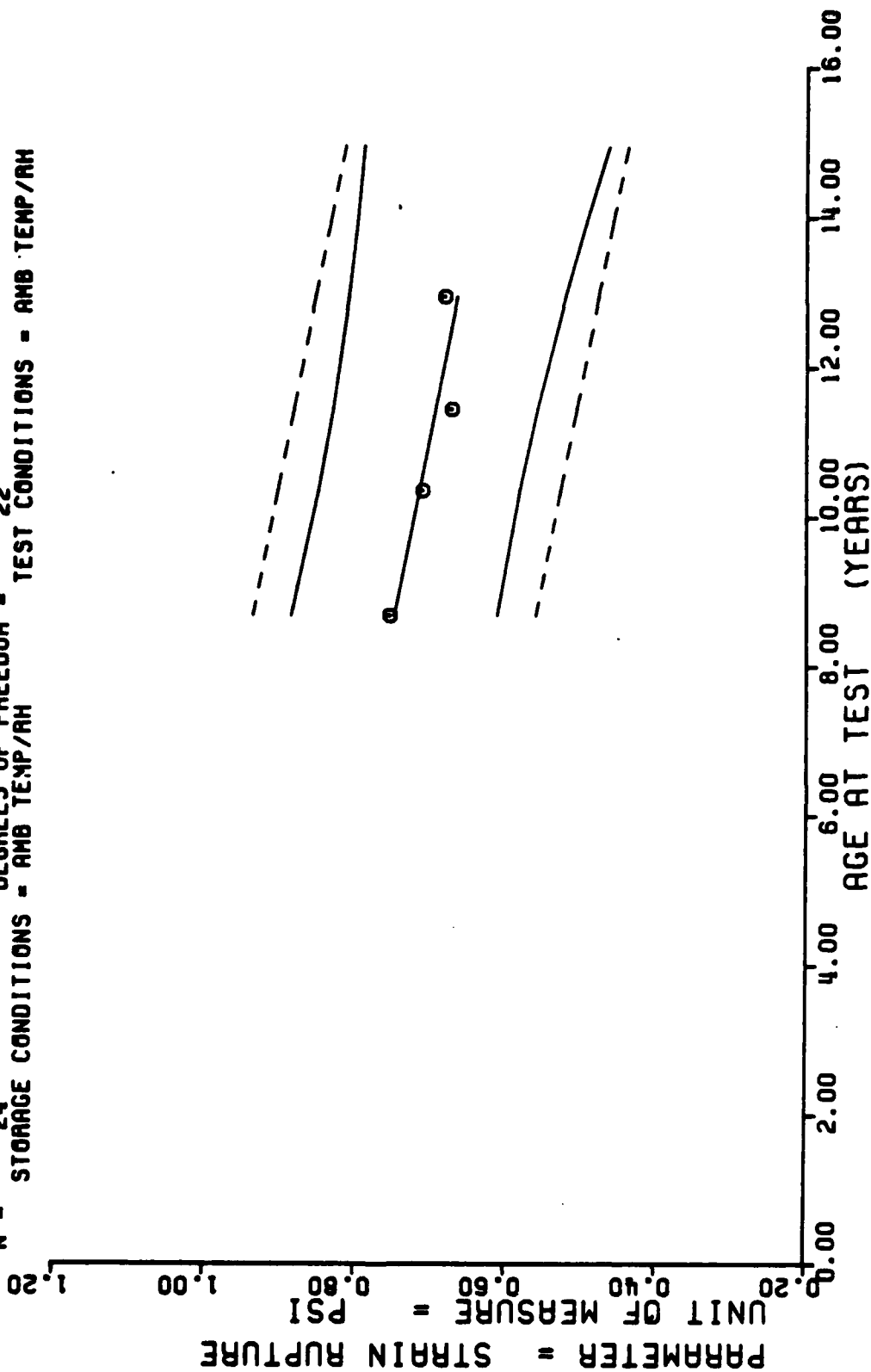
$Y = (( +5.9466302E-01 ) + ( -4.2369222E-04 ) \cdot X)$   
 $F = +2.9930617E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G_1 = +4.7451916E-02$   
 $R = -2.7705383E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_1 = +2.4490218E-04$   
 $t = +1.7300467E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_2 = +4.6223300E-02$   
 $N = 36$  DEGREES OF FREEDOM = 36  
 $N = 36$  STORAGE CONDITIONS = AMB TEMP/AMB TEST CONDITIONS = AMB TEMP/AMB



11 STAGE DSCT MTRAS, INNER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, STN RUP <0022135>

Figure 94

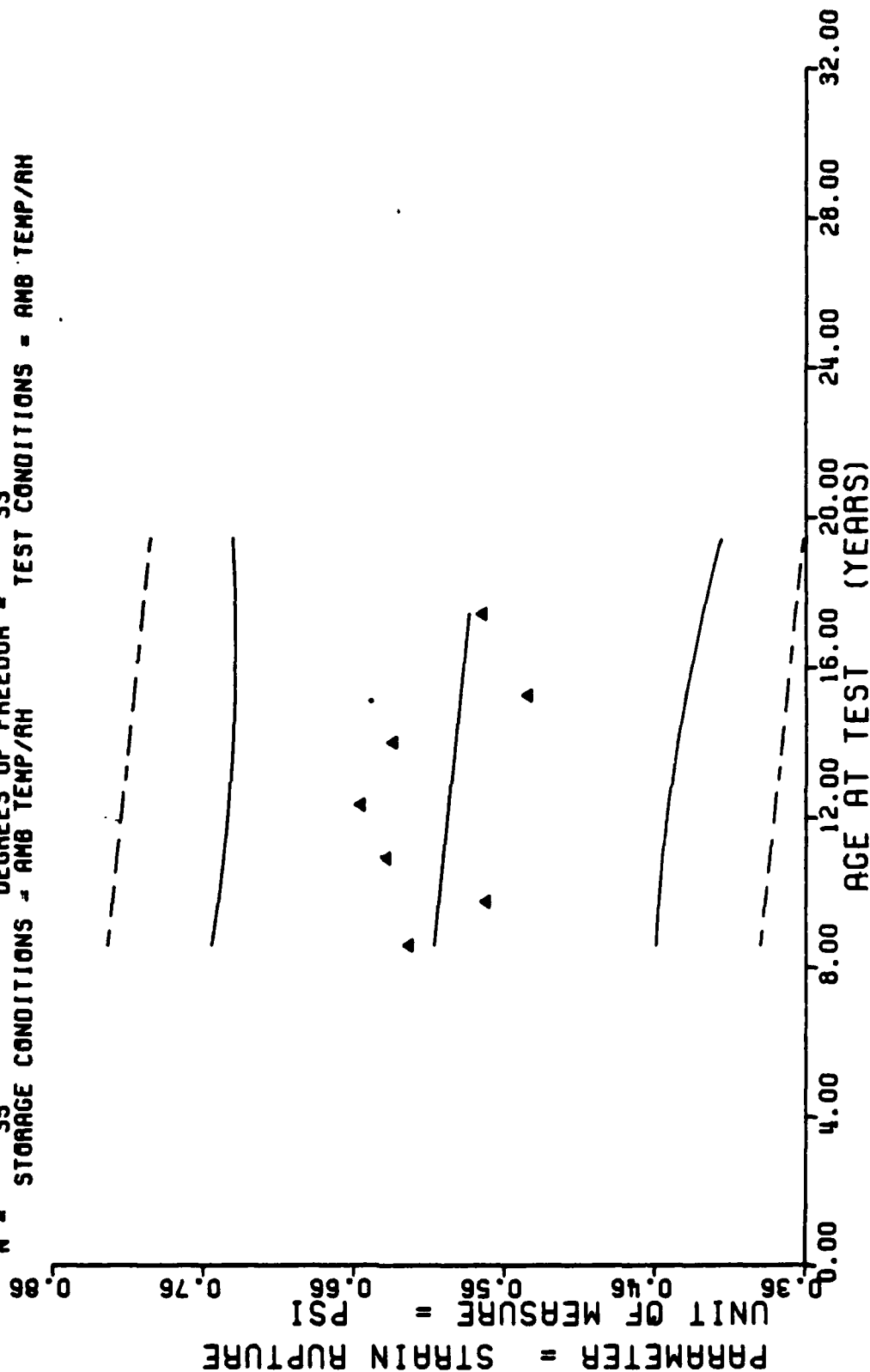
$Y = ((+9.1617957E-01) + (-1.6269539E-03) \times X)$   
 $F = +4.2951929E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha = +6.6892559E-02$   
 $R = -4.0415984E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +7.8502577E-04$   
 $t = +2.0724847E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_r = +6.2560980E-02$   
 $N = 24$  DEGREES OF FREEDOM = 22  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



11 STAGE DSCT NTAS, INNER, AXIAL, H.A. HYDRO. CHS-1750 AT 500 PSI, STN RUP <0022583>

Figure 95

F = +3.5642982E-01  
 R = -1.0337064E-01  
 I = +5.9701744E-01  
 N = 35  
 Y = (( +6.2940312E-01 ) + ( -2.1785233E-04 ) \* XI)  
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF I = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 33  
 STORAGE CONDITIONS = AMB TEMP/RH  
 TEST CONDITIONS = AMB TEMP/RH



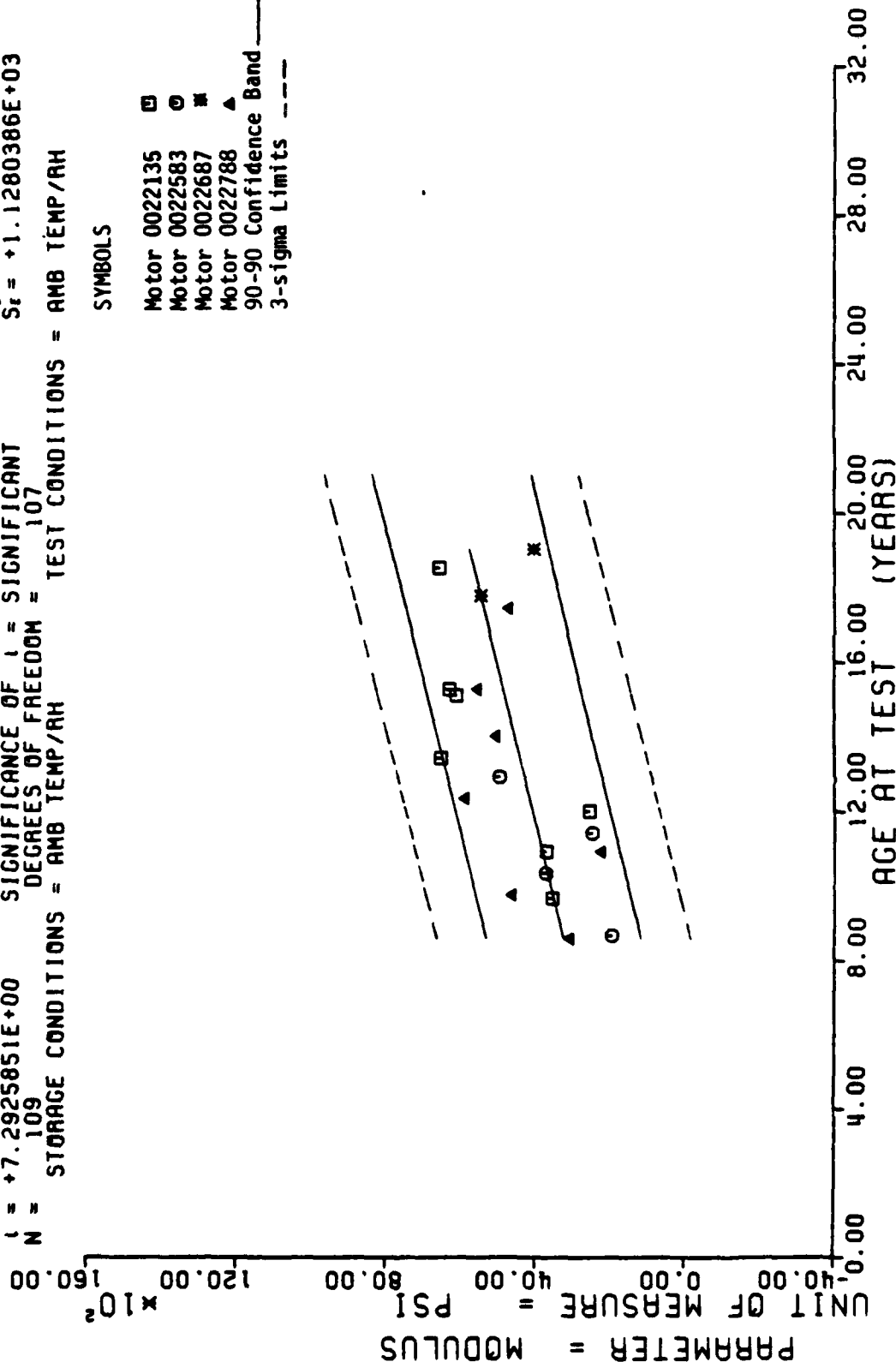
11 STAGE DSCT MTRS, INNER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI. STN RUP <0022788>

Figure 96

$Y = ((+1.1417288E+03) + (+2.0199080E+01) \times X)$   
 $F = +5.3181798E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +5.7620221E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +7.2925851E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 109$  DEGREES OF FREEDOM = 107  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

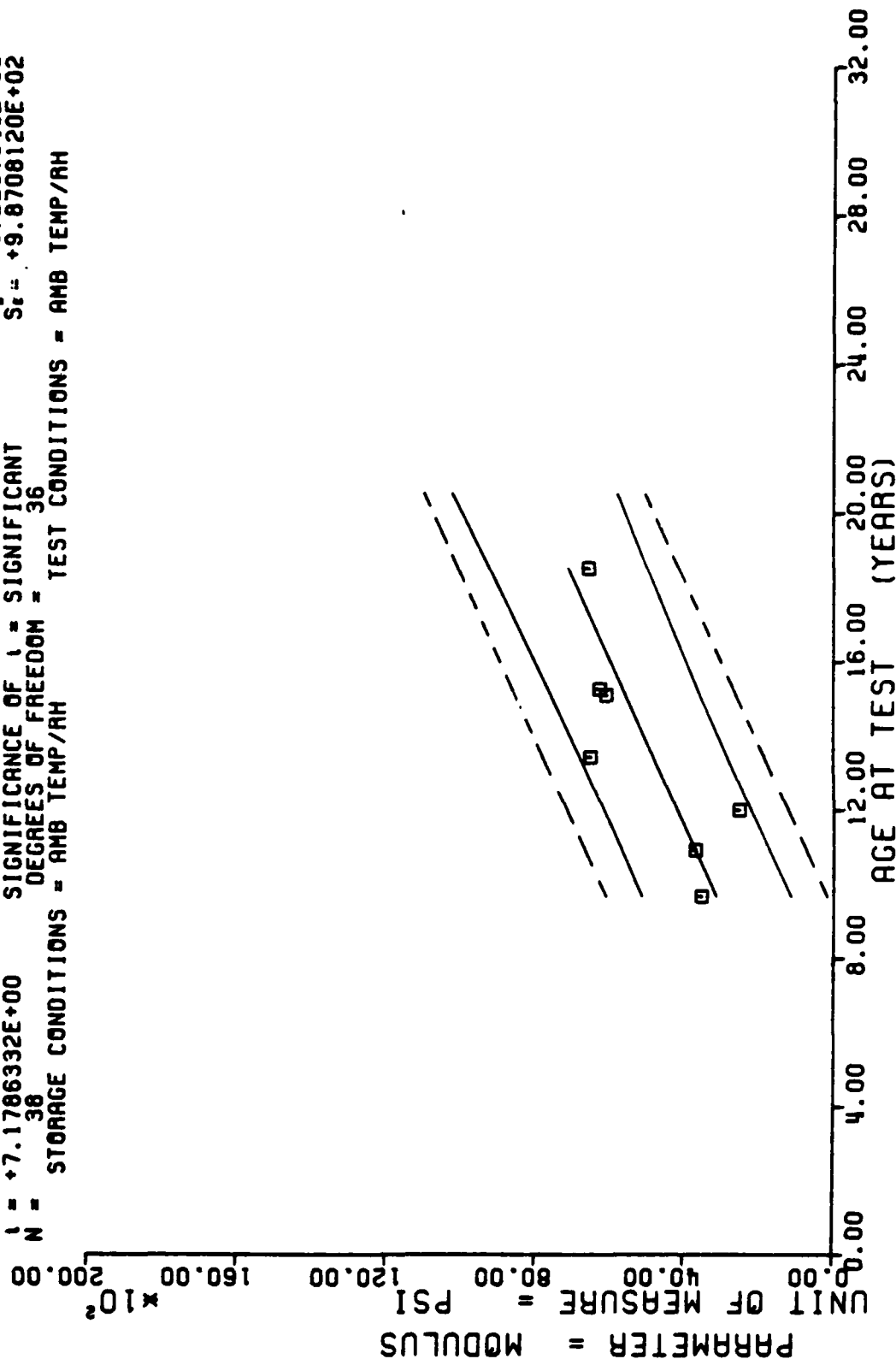
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits - - -



11 STAGE DSC TMS, INNER, AXIAL, H.R. HYDRO. CHS=1750 AT 500 PSI, MODULUS

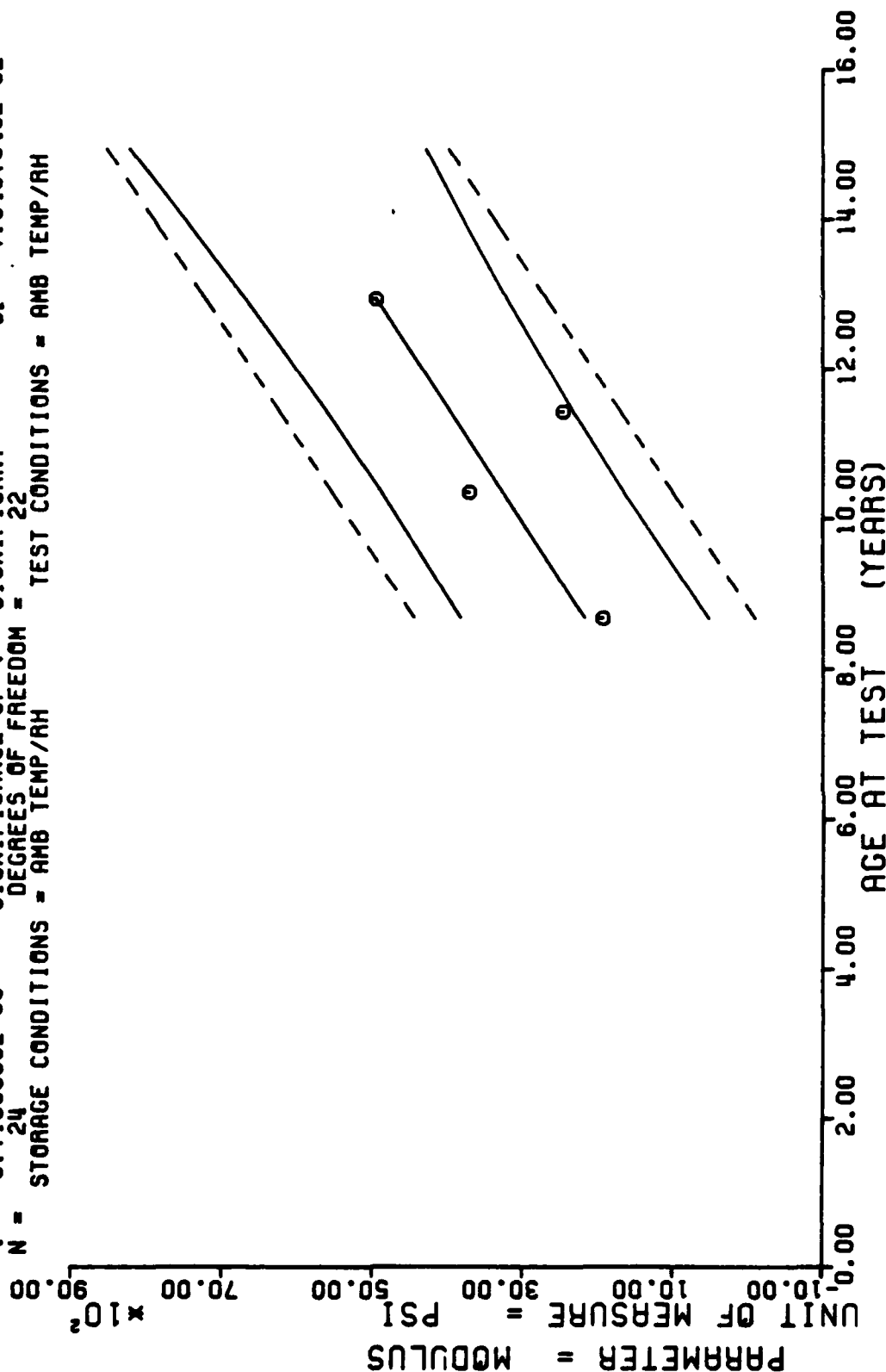
$Y = ((-1.2253405E+03) + (+3.7542773E+01) \times X)$   
 $F = +5.1532775E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\alpha = +1.5182293E+03$   
 $R = +7.6728448E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +5.2297940E+00$   
 $t = +7.1786332E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_r = +9.8708120E+02$   
 $N = 38$  DEGREES OF FREEDOM = 36  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



11 STAGE DSCT HTAS, INNER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MODULUS <0022135>

Figure 98

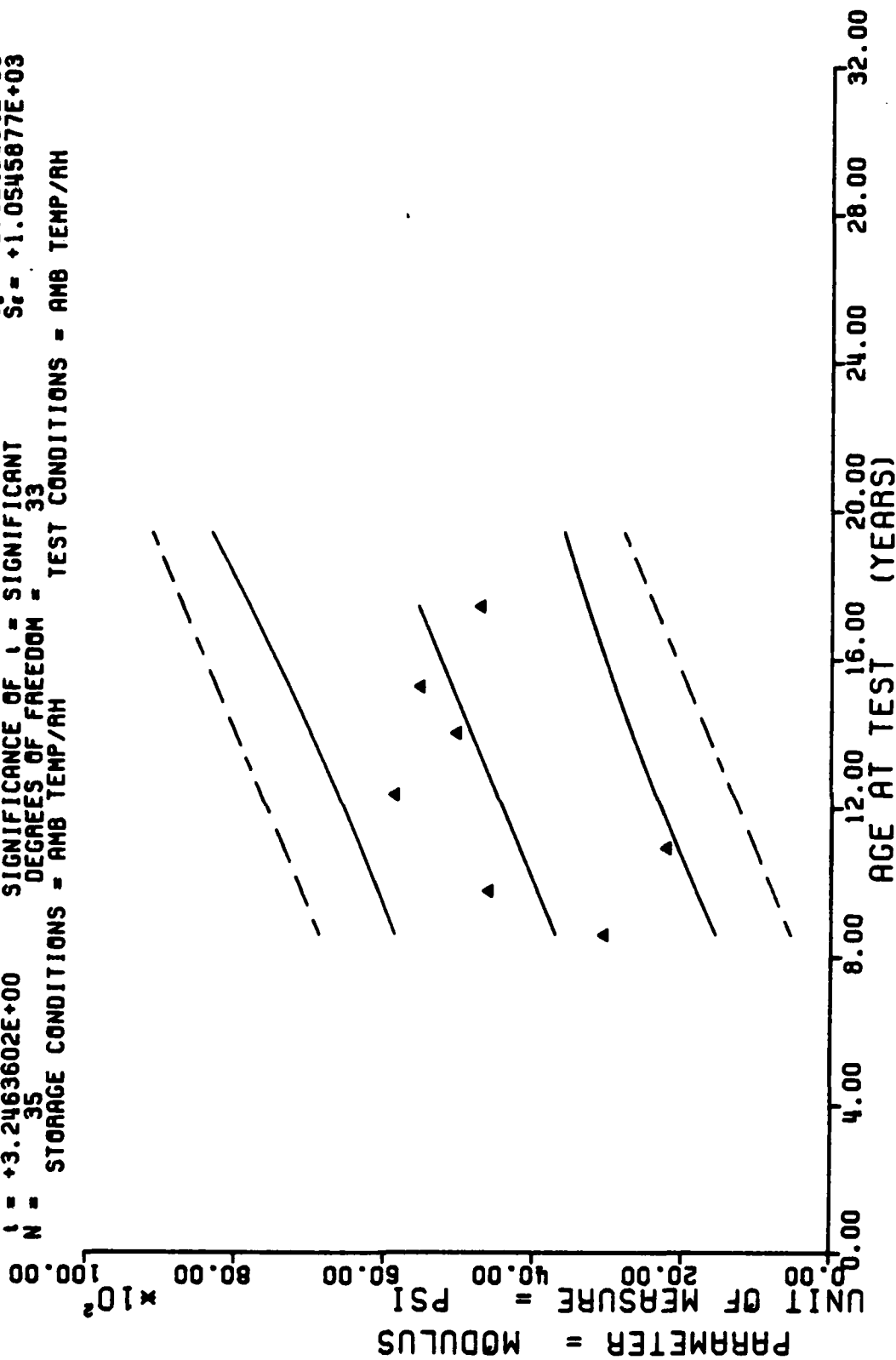
$Y = ((-3.4500814E+03) + (+5.4109694E+01) * X)$   
 $F = +3.2701343E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G_1 = +1.1629123E+03$   
 $R = +7.7318568E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_1 = +9.4622034E+00$   
 $t = +5.7185088E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_2 = +7.5407043E+02$   
 $N = 24$  DEGREES OF FREEDOM = 22  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT MTR, INNER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MODULUS <0022583>

Figure 99

$F = +1.0538854E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G_1 = +1.1933882E+03$   
 $R = +4.9199219E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +5.3243964E+00$   
 $t = +3.2463602E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +1.0545877E+03$   
 $N = 35$  DEGREES OF FREEDOM = 33  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



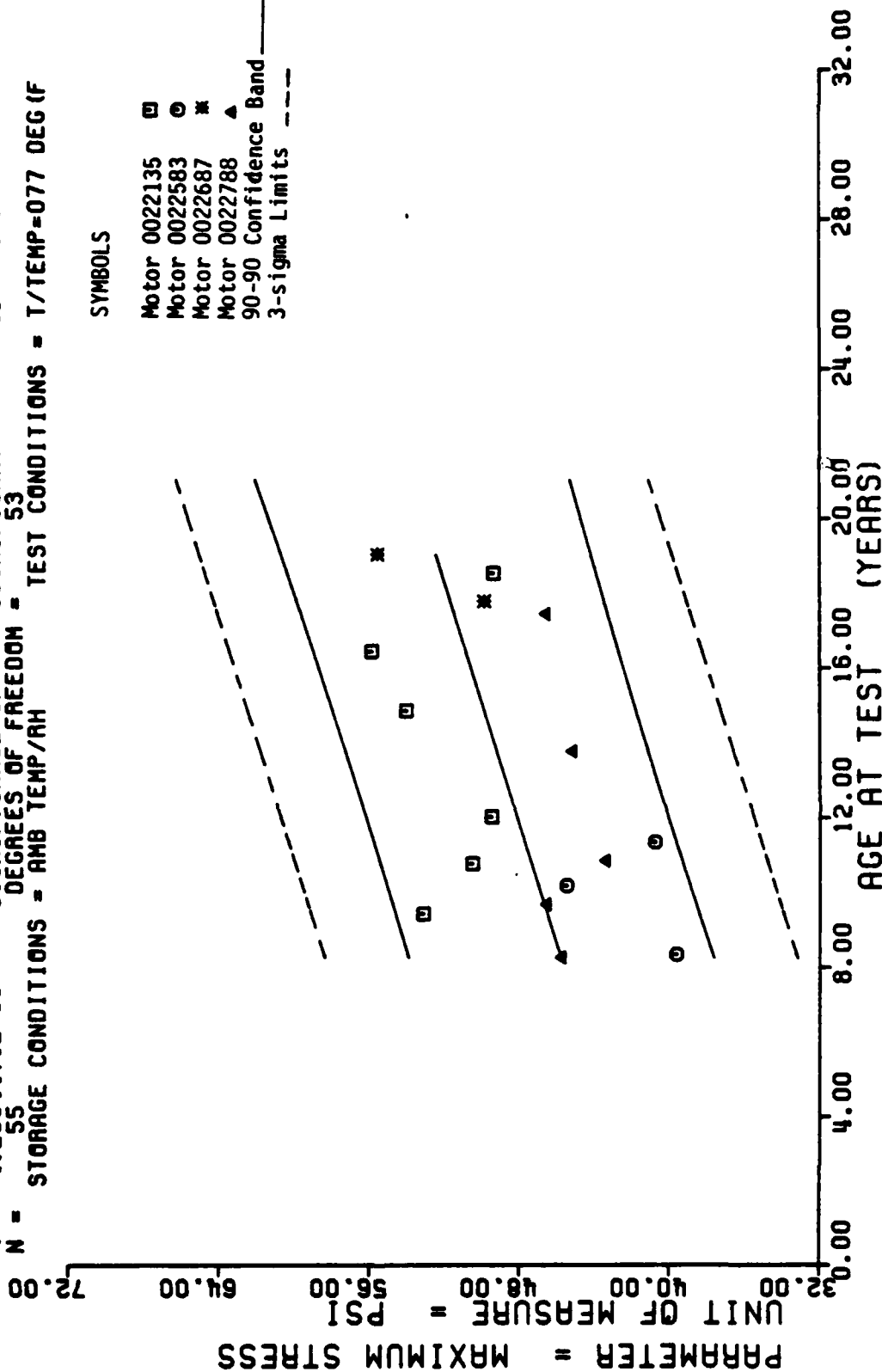
11 STAGE DSCT MTRAS, INNER, AXIAL, H.A. HYDRO. CHS=1750 AT 500 PSI, MODULUS <0022788>

Figure 100

$Y = ((+4.063699E+01) + (+5.1644561E-02) \times X)$   
 $F = +1.7964434E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +5.0313716E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +4.2384471E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 55$  DEGREES OF FREEDOM = 53  
 STORAGE CONDITIONS = RH8 TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F

# SYMBOLS

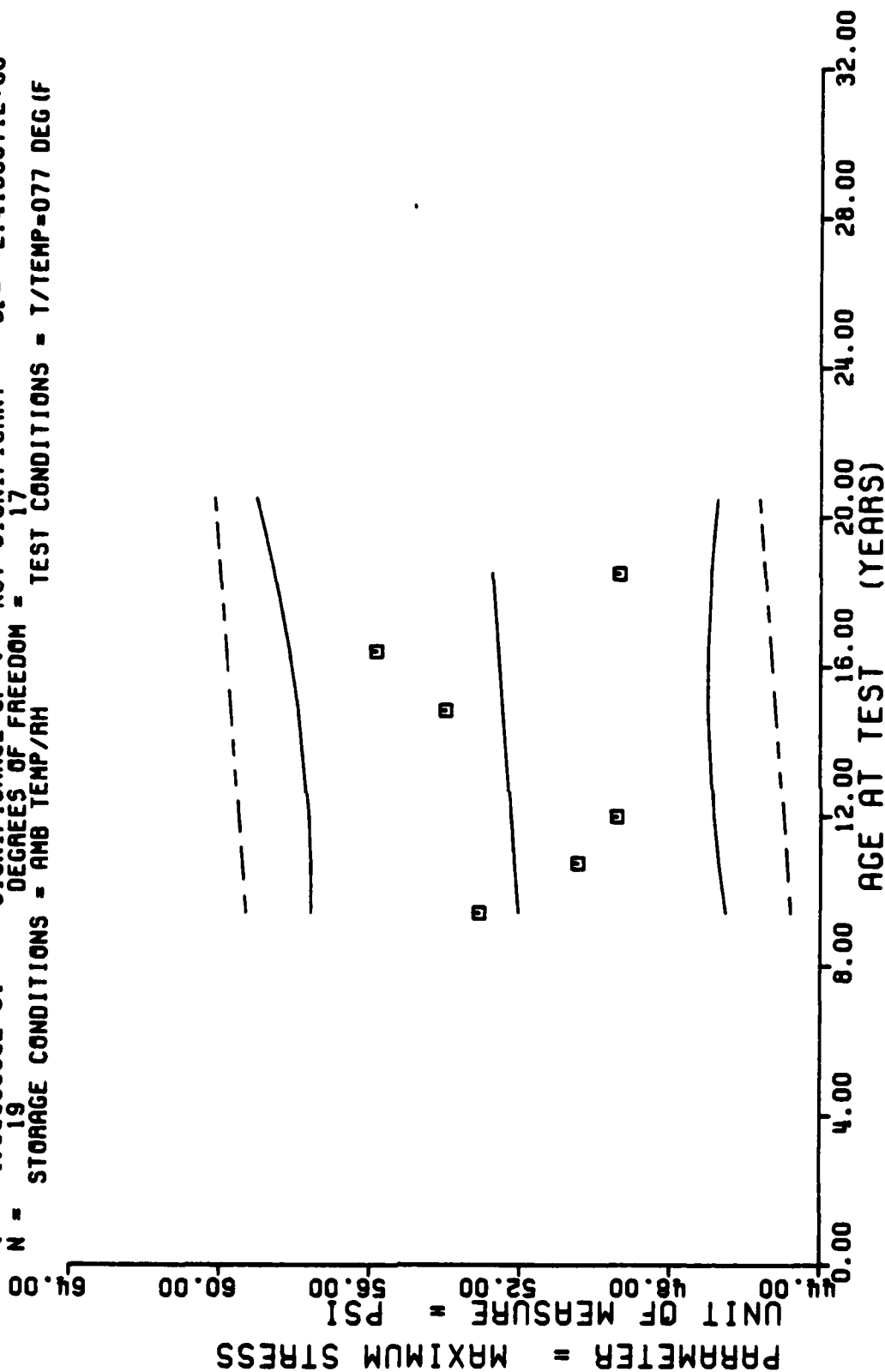
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



11 STAGE DSCTED MTRS, CHS=0.0002 IN/MIN, INNER, CIRCUMF. ORIENT, 77 DEG, MAX STAS.

Figure 101

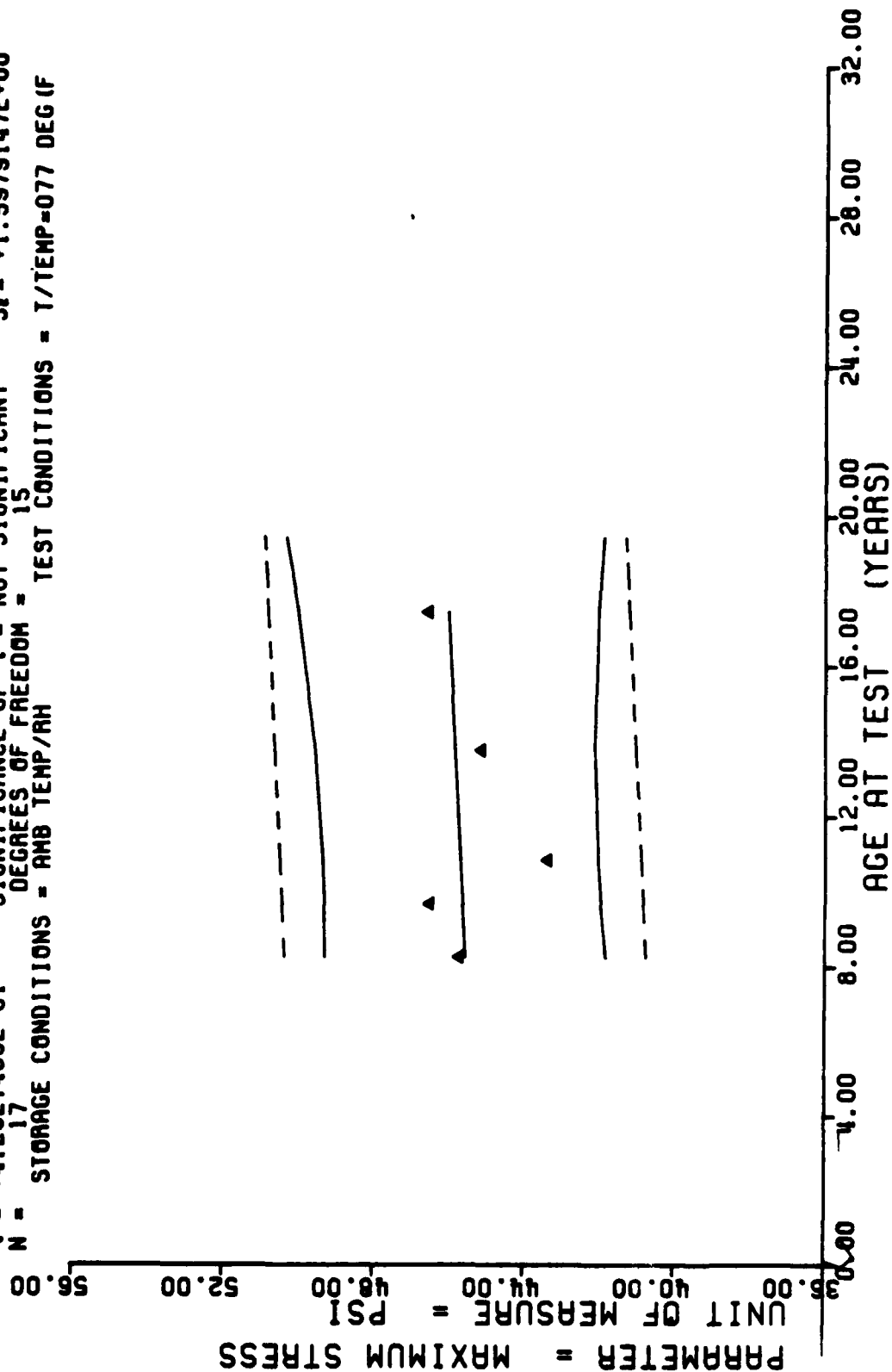
$Y = ((+5.1328774E+01) + (+6.2872524E-03) \times X)$   
 $F = +1.9356601E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +2.3613543E+00$   
 $R = +1.0610449E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +1.4290390E-02$   
 $t = +4.3996365E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +2.4160971E+00$   
 $N = 19$  DEGREES OF FREEDOM = 17  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F



II STAGE DSCTED MTRS, CHS-0.0002, INNER, CIRCUMF. ORIENT, 77 DEG, MAX STA <0022135>

Figure 102

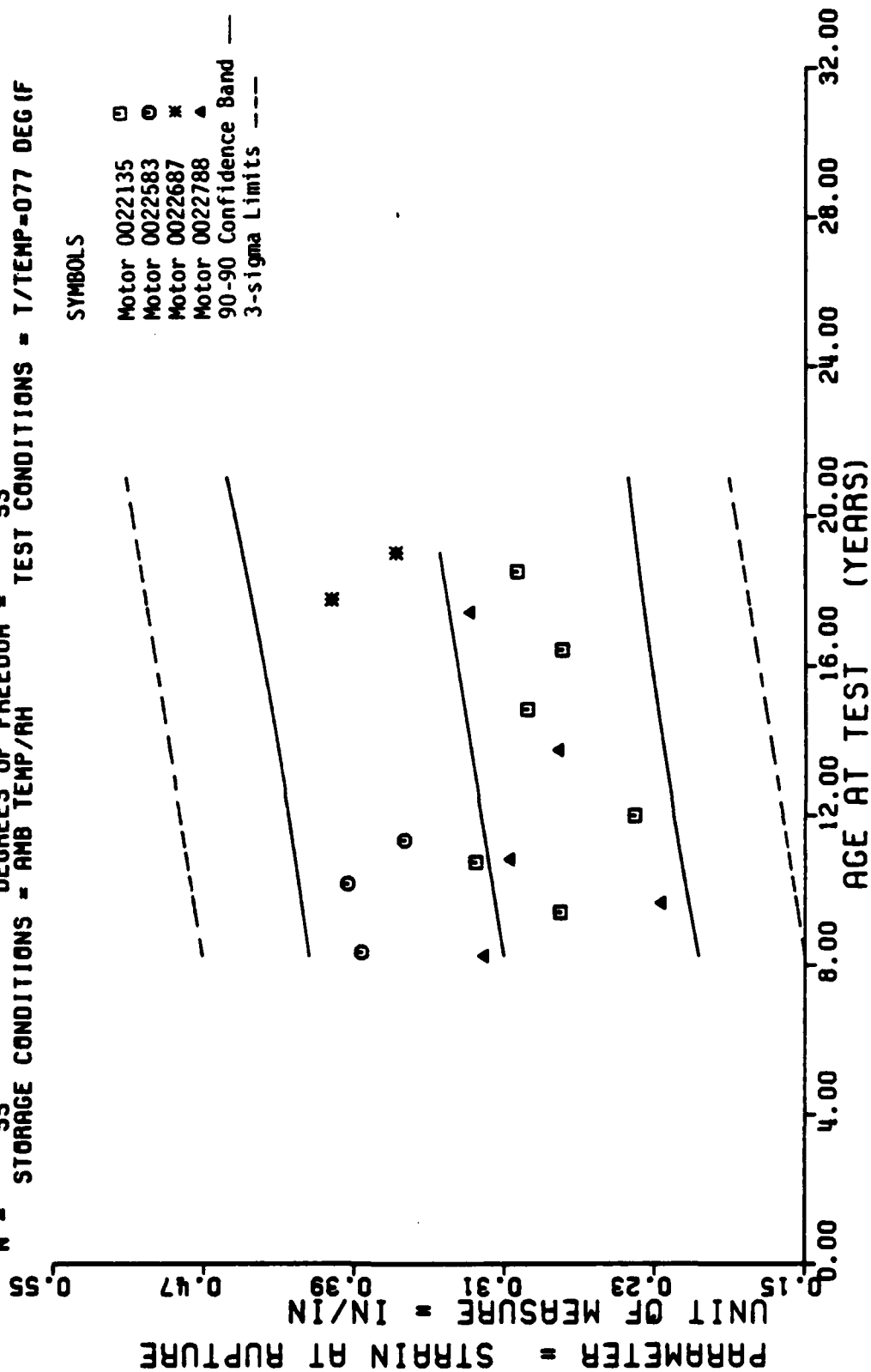
$Y = ((+4.5135606E+01) + (+4.1383230E-03) \times X)$   
 F = +1.8427689E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +1.5566489E+00$   
 R = +1.1016366E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +9.6402643E-03$   
 I = +4.2927485E-01 SIGNIFICANCE OF I = NOT SIGNIFICANT  $S_2 = +1.5979147E+00$   
 N = 17 DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F



11 STAGE DSCTED MTRAS.CHS=0.0002 , INNER.CIRCUMF.ORIENT.77 DEG.MAX STR <0022788>

Figure 103

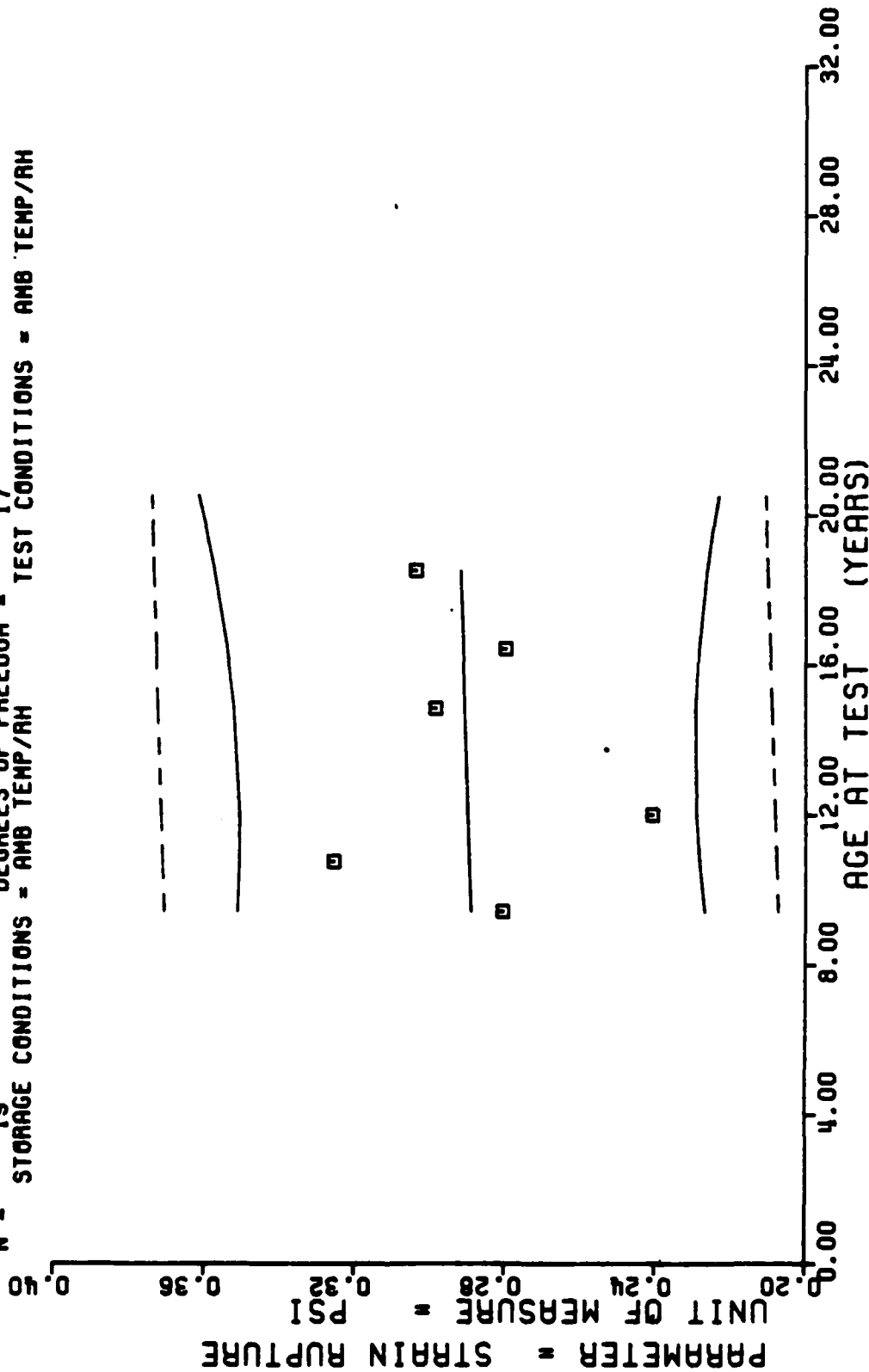
$Y = ((+2.8387614E-01) + (+2.6647099E-04) \times X)$   
 $F = +2.9395706E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = +2.2923577E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.7145176E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 55$  DEGREES OF FREEDOM = 53  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = T/TEMP-077 DEG (F



11 STAGE DSCTED MTRS, CHS=0.0002 IN/MIN, INNER, CIRCUMF. ORIENT, 77 DEG. STAN/RUPT.

Figure 104

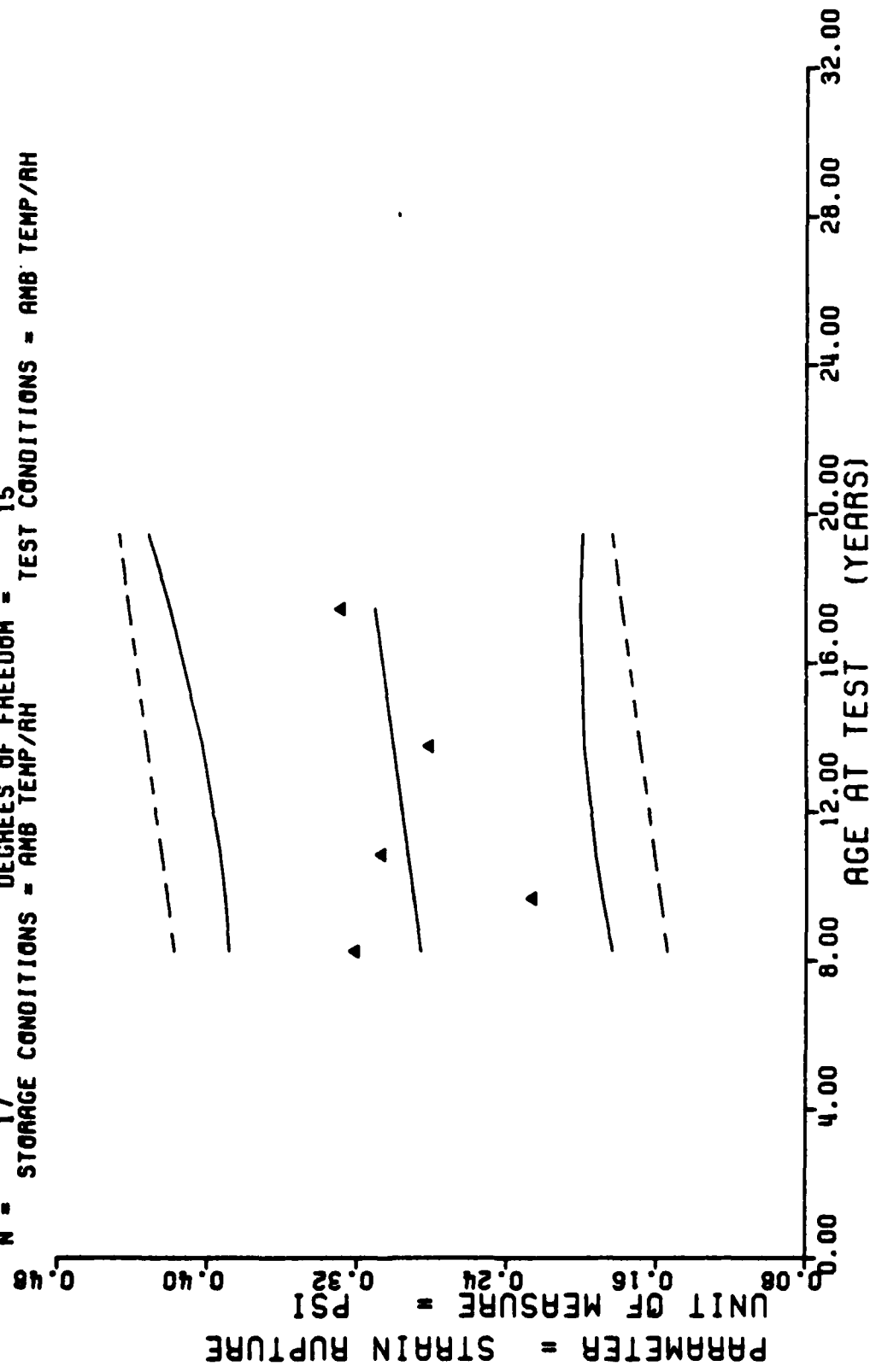
$Y = (( +2.8591646E-01 ) + ( +2.5787397E-05 ) \times X)$   
 $F = +2.5738493E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +2.6430354E-02$   
 $R = +3.8881103E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +1.6073703E-04$   
 $t = +1.6043220E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +2.7176045E-02$   
 $N = 19$  DEGREES OF FREEDOM = 17  
 $N =$  STORAGE CONDITIONS = AMB TEMP/19 TEST CONDITIONS = AMB TEMP/19



11 STAGE DSCTED MTRS, CHS=0.0002, INNER, CIRCUMF. ORIENT. 77 DEG. STAN RUPT 0022135

Figure 105

Y = (( +2.6373001E-01 ) + ( +2.2241310E-04 ) \* X )  
 F = +7.0586214E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_f$  = +4.3474640E-02  
 R = +2.1199667E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_o$  = +2.6472833E-04  
 t = +8.4015602E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e$  = +4.3879846E-02  
 N = 17 DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



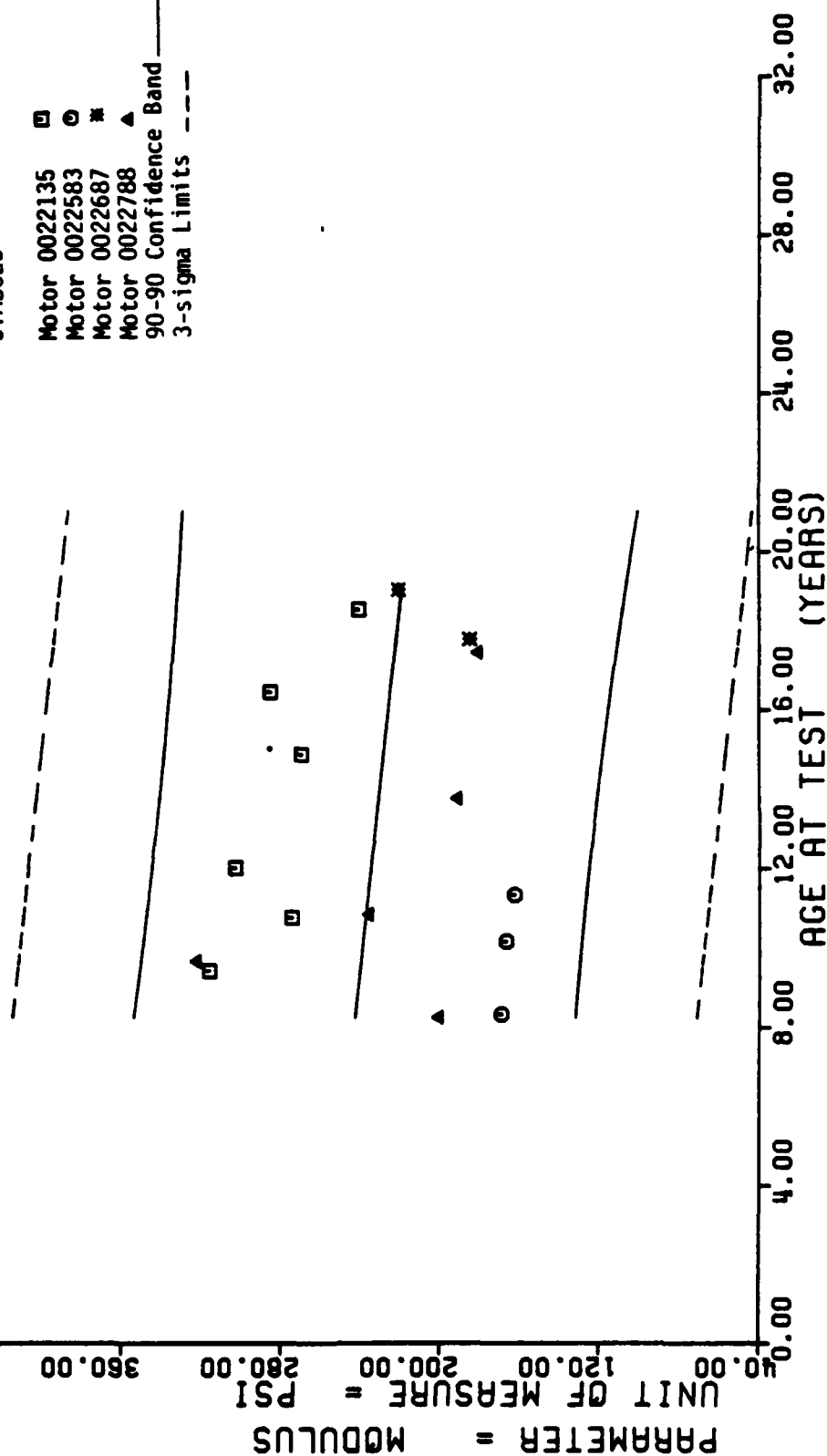
11 STAGE DSCTED MTRS, CHS=0.0002 , INNER, CIRCUMF. ORIENT, 77 DEG, STAN RUPT 0022788

Figure 106

TEST CONDITIONS = T/TEMP=077 DEG (F

## SYMBOLS

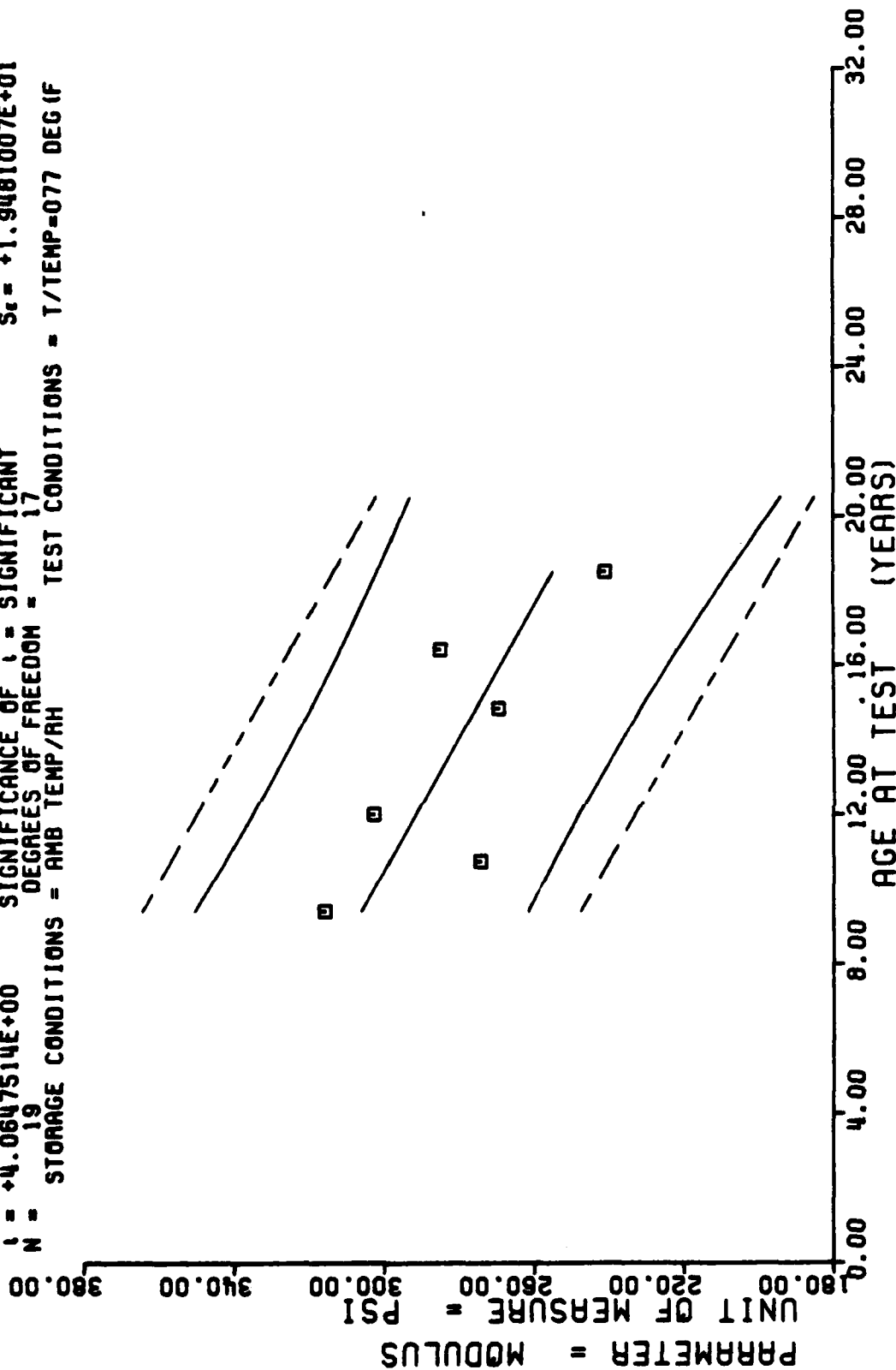
Motor 0022135  
Motor 0022583  
Motor 0022687  
Motor 0022788  
90-90 Confidence B  
3-sigma Limits --



III STAGE DSCTED HTAS, CHS=0.0002 IN/MIN, INNER, CIRCUMF. ORIENT, 77 DEG, MODULUS.

**Figure 107**

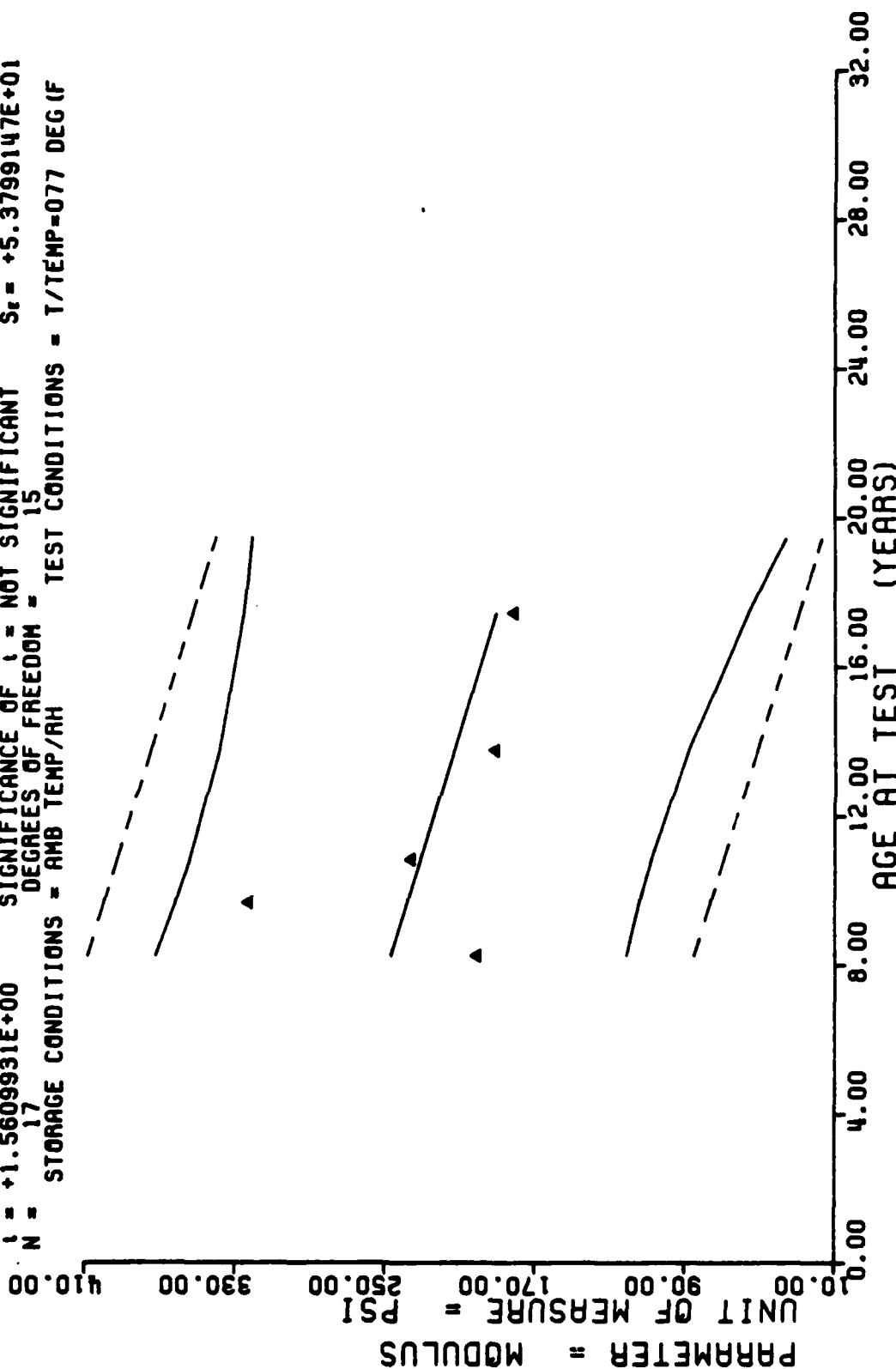
$Y = ((+3.5882019E+02) + (-4.6835494E-01) \times X)$   
 $F = +1.6522204E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_r = +2.6585292E+01$   
 $R = -7.0204946E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.1522351E-01$   
 $t = +4.0647514E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +1.9481007E+01$   
 $N = 19$  DEGREES OF FREEDOM = 17  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG(F



11 STAGE DSCTED MTRS.CHS=0.0002 , INNER.CIRCUMF.ORIENT.77 DEG.MODULUS <0022135>

Figure 108

$Y = ((+2.9644932E+02) + (-5.0685430E-01) * X)$   
 $F = +2.4366997E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +5.6162644E+01$   
 $R = -3.7382544E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +3.2457175E-01$   
 $t = +1.5609931E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_t = +5.3799147E+01$   
 $N = 17$  DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F



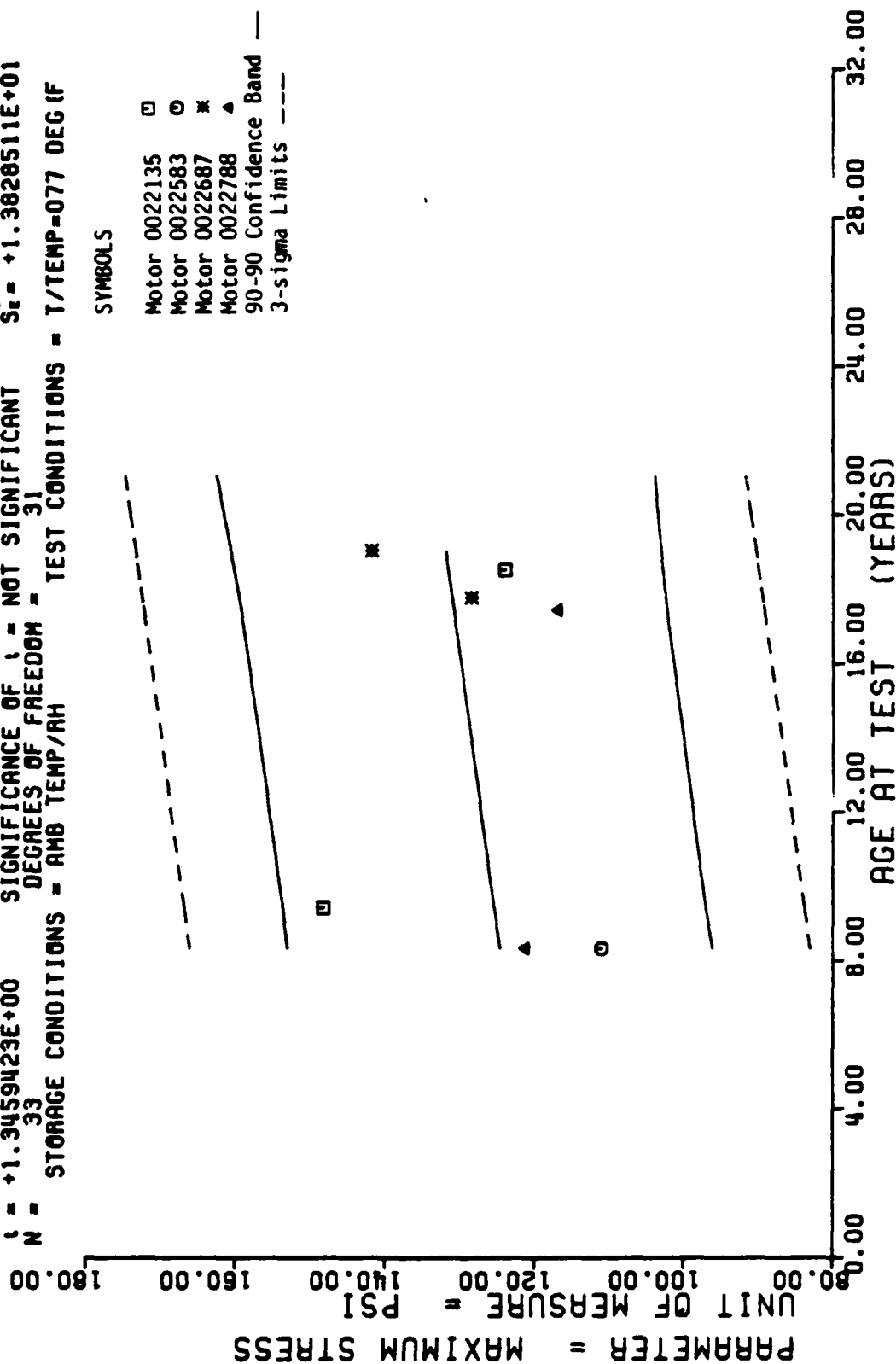
11 STAGE DSCTED MTRS,CHS=0.0002 ,INNER,CIRCUMF.ORIENT,77 DEG,MODULUS <0022788>

Figure 109

$Y = ((+1.1890925E+02) + (+5.6444453E-02) \times X)$   
 $F = +1.8115608E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +1.4002767E+01$   
 $A = +2.3497032E-01$  SIGNIFICANCE OF A = NOT SIGNIFICANT  $S_o = +4.1936753E-02$   
 $t = +1.3459423E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +1.3828511E+01$   
 $N = 33$  DEGREES OF FREEDOM = 31  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F

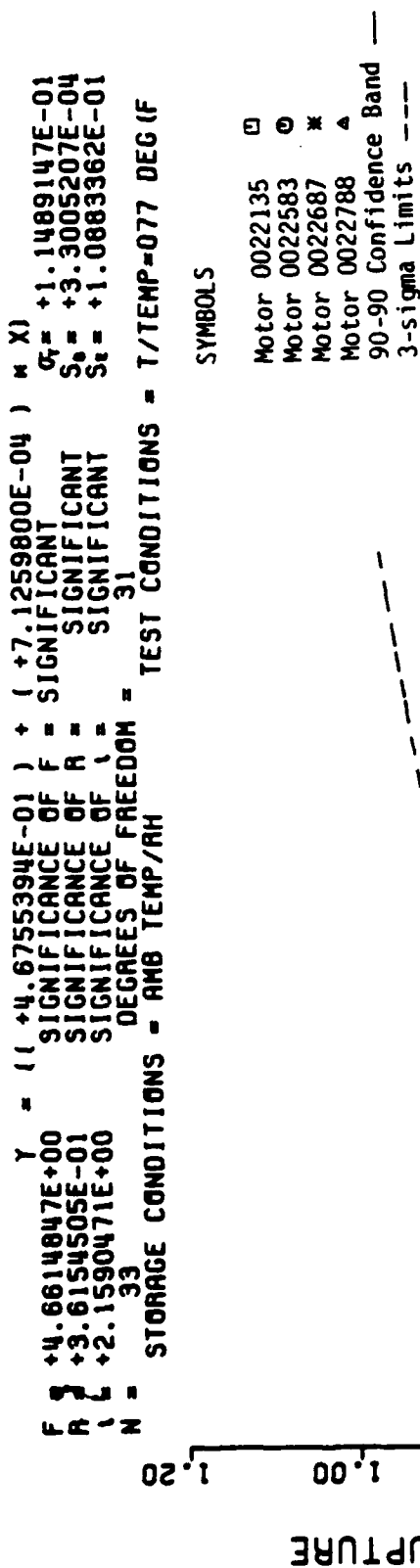
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCIED MTRS. CHS=2.0 IN/MIN. INNER,CIRCUMF.ORIENT.77 DEG. MAX STAS.

Figure 110

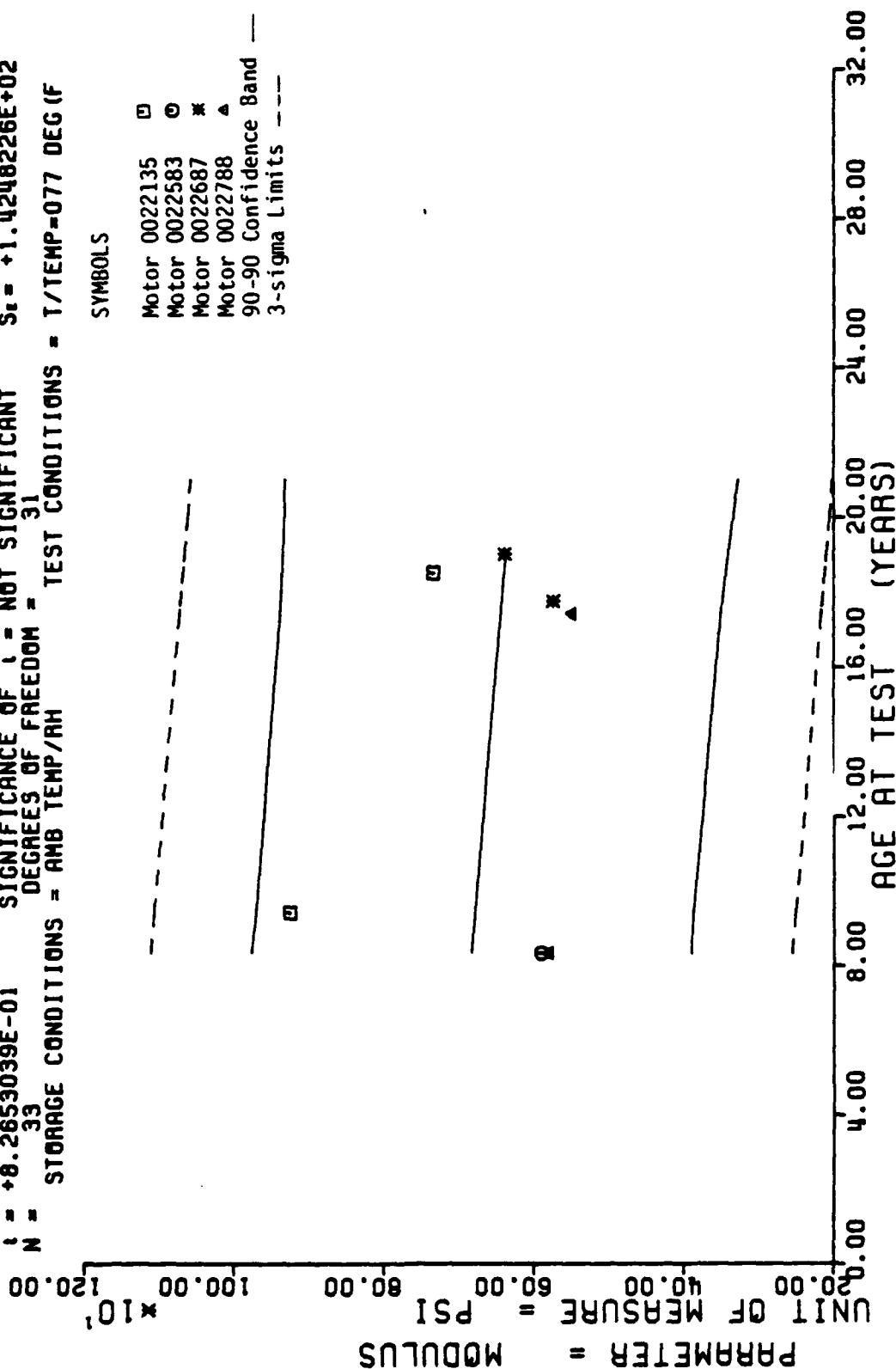


11 STAGE OSCIED MTRAS. CHS=2.0 IN/MIN. INNER.CIRCUMF.ORIENT.77 DEG. STAN/RUPTURE

$Y = ((+7.1859270E+02) + (-3.5714042E-01) \times X)$   
 $F = +6.8315250E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -1.4684008E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +8.2653039E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 33$  DEGREES OF FREEDOM = 31  
 $N = 33$  STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 1/TEMP=077 DEG (F

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCED MTRAS. CHS=2.0 IN/MIN. INNER.CIRCUMF.ORIENT.77 DEG. MODULUS.

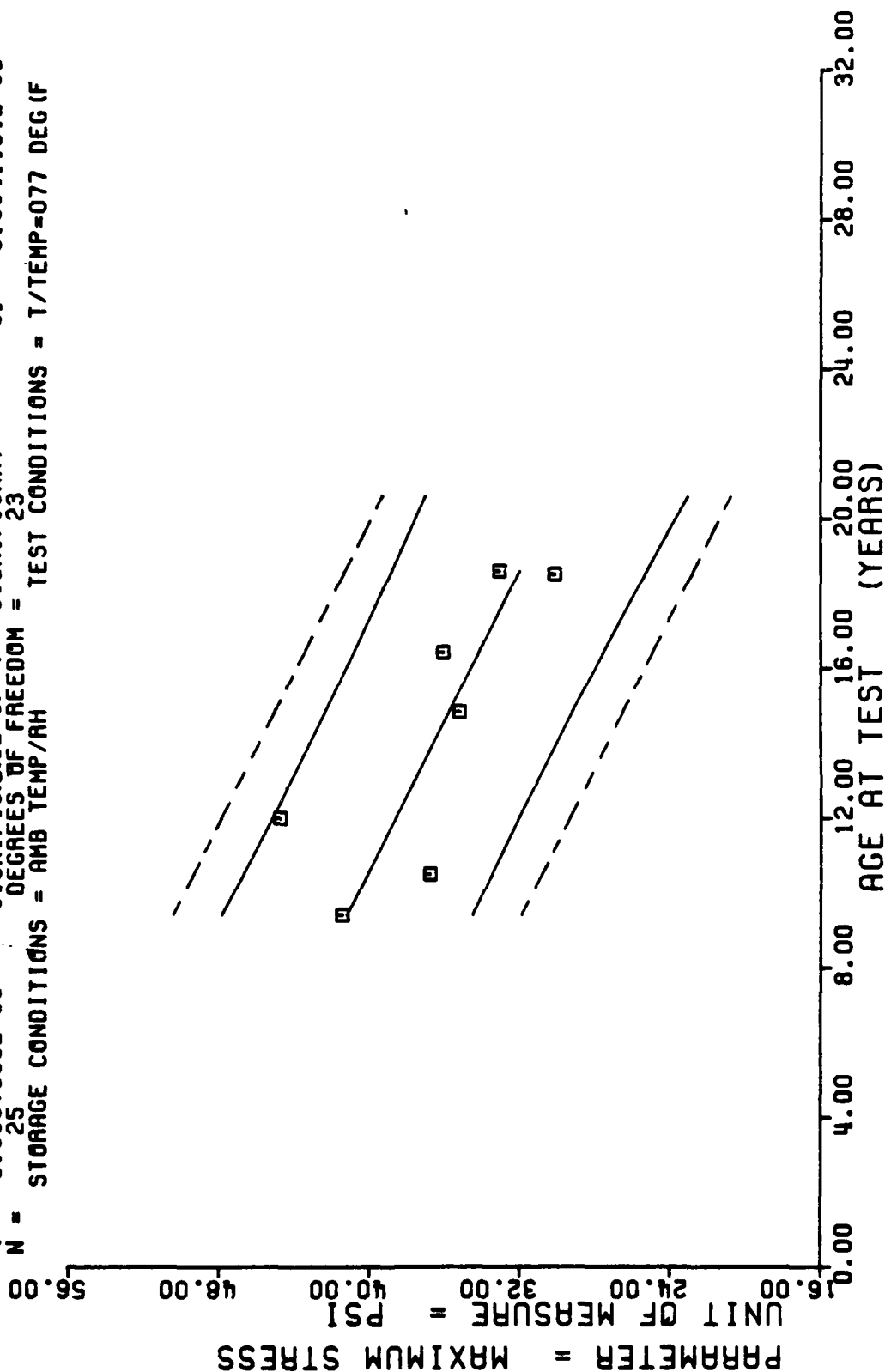
$Y = ((+4.2456810E+01) + (-2.3492913E-02) \times X)$   
 $F = +6.4841459E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -2.8561836E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.5463986E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 75$  DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/4H TEST CONDITIONS = T/TEMP=077 DEG (F)



II STAGE DSCT MTR, 2.0 IN G.L. BI-PROP, CHS=.0002 IN/MIN, T/TEMP=077 DEG (F), MAX STRES

Figure 113

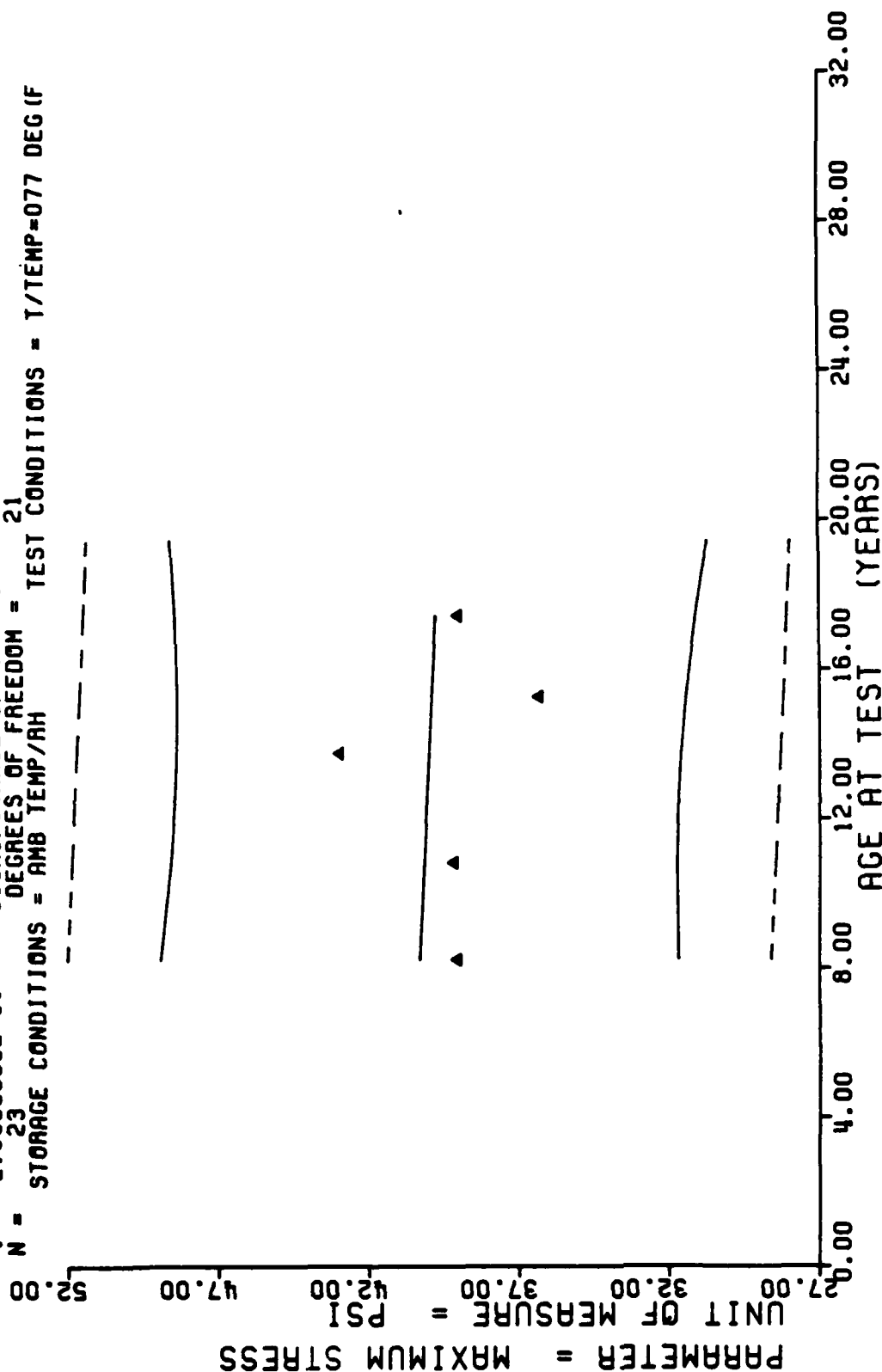
$Y = ((+5.0500197E+01) + (-8.2872755E-02) * X)$   
 $F = +3.6719975E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_f = +4.8650263E+00$   
 $R = -7.8413597E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.3676047E-02$   
 $t = +6.0597009E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +3.0841181E+00$   
 $N = 25$  DEGREES OF FREEDOM = 23  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = T/TEMP=077 DEG (F)



11 STAGE DSCT MTR, 2.0 IN G.L. BI-PROP, CHS=.0002, T/TEMP=077DEG (F), MAX STR<0022135 >

Figure 114

$Y = ((+4.0763863E+01) + (-4.8202314E-03) \times X)$   
 $F = +7.0654096E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_e = +3.8131718E+00$   
 $R = -5.7906813E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +1.8134234E-02$   
 $t = +2.6580838E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +3.8963566E+00$   
 $N = 23$  DEGREES OF FREEDOM = 21  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = T/TEMP=077 DEG (F)



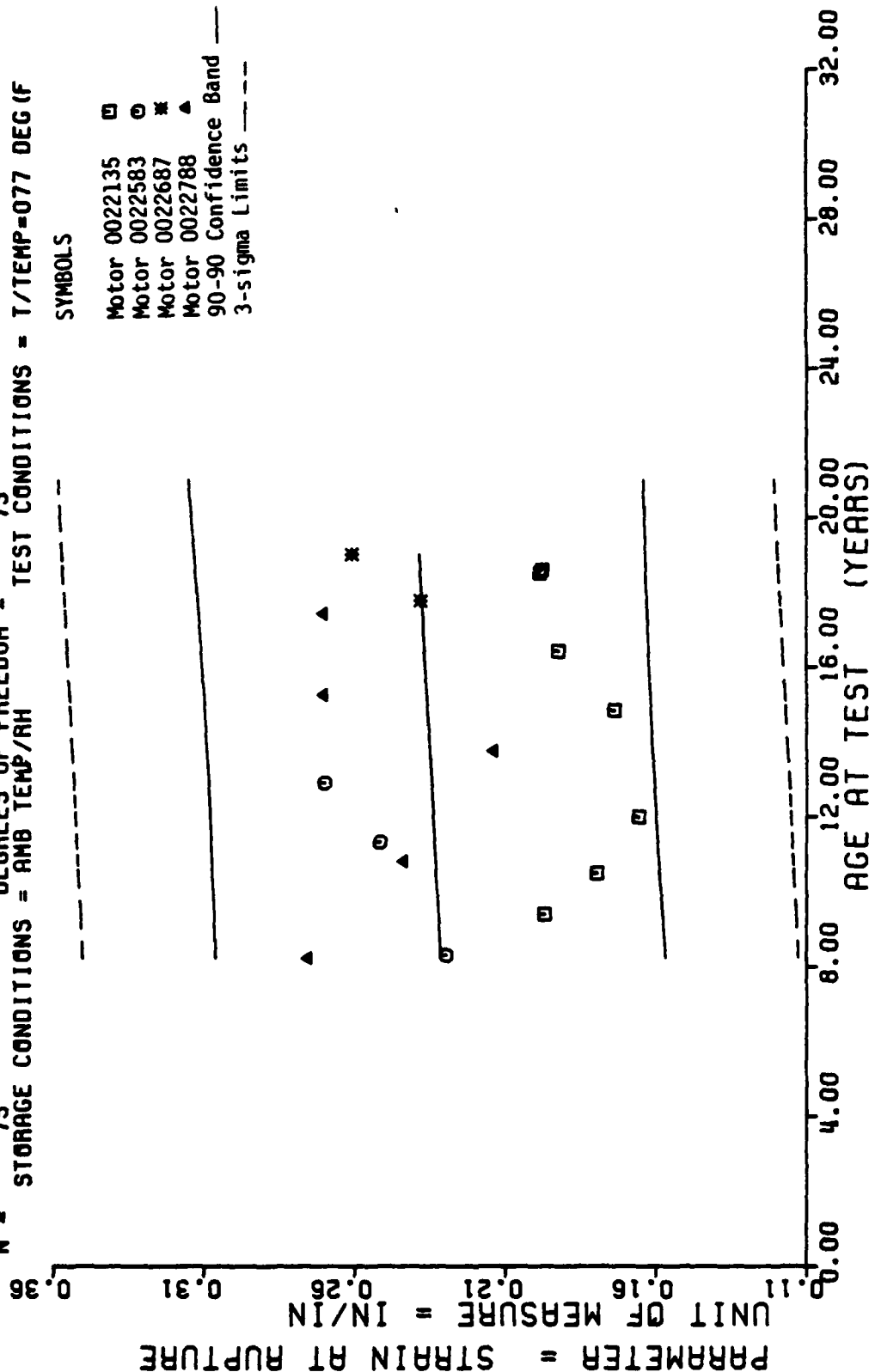
II STAGE DSCT MTR.2.0IN G.L.BI-PROP, CHS=.0002, T/TEMP=077DEG (F), MAX STA<0022786>

Figure 115

$Y = ((+2.2600873E-01) + (+5.3388305E-05) \times X)$   
 $F = +3.3283141E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma = +3.9351912E-02$   
 $R = +6.7369438E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +9.2540956E-05$   
 $t = +5.7691542E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +3.9530515E-02$   
 $N = 75$  DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F)

# SYMBOLS

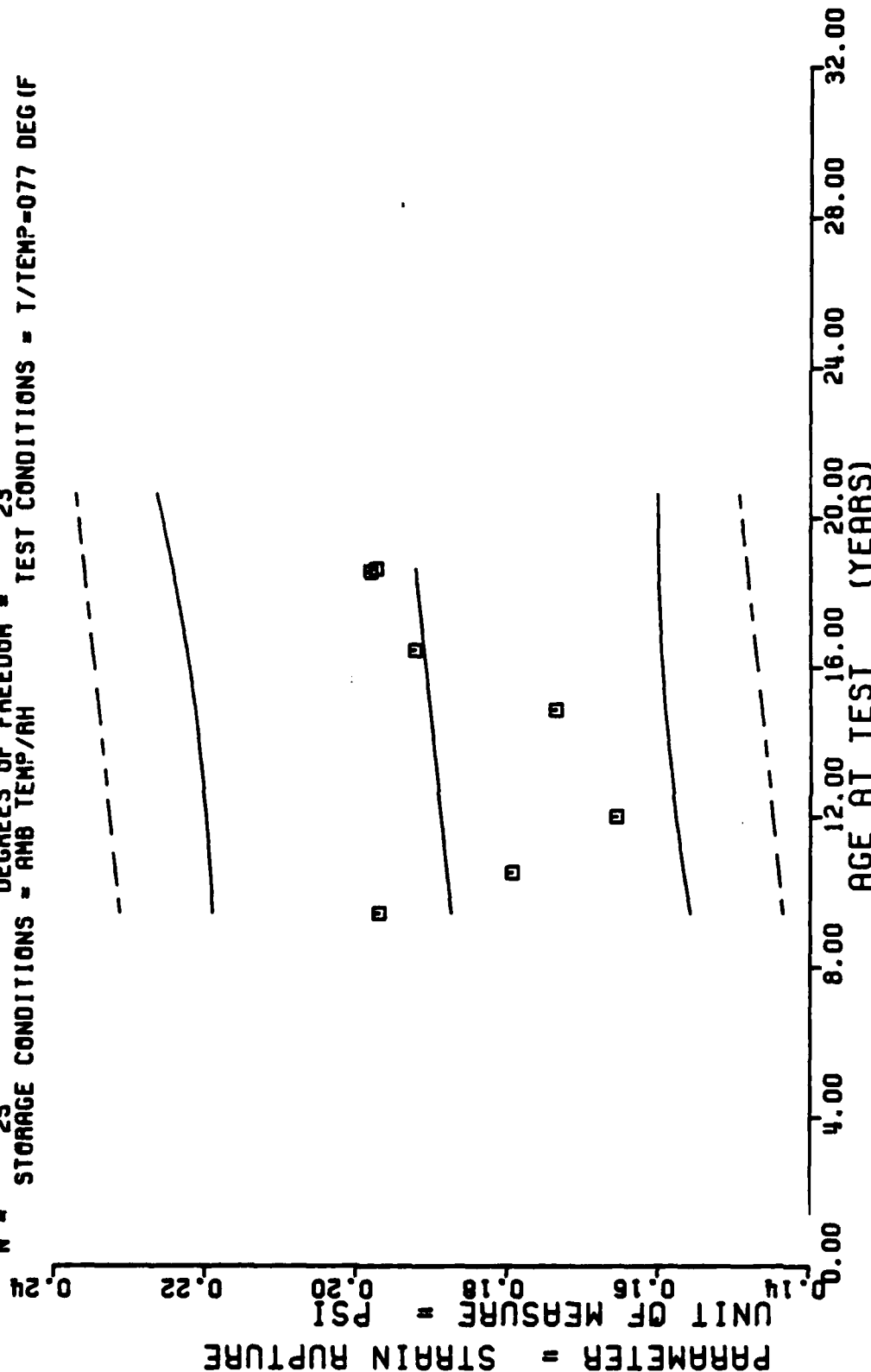
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



11 STAGE DSCT MTR.2.0IN G.L.BI-PROP,CHS=.0002 IN/MIN,T/TEMP=077 DEG (F) , STAN/RUP

Figure 116

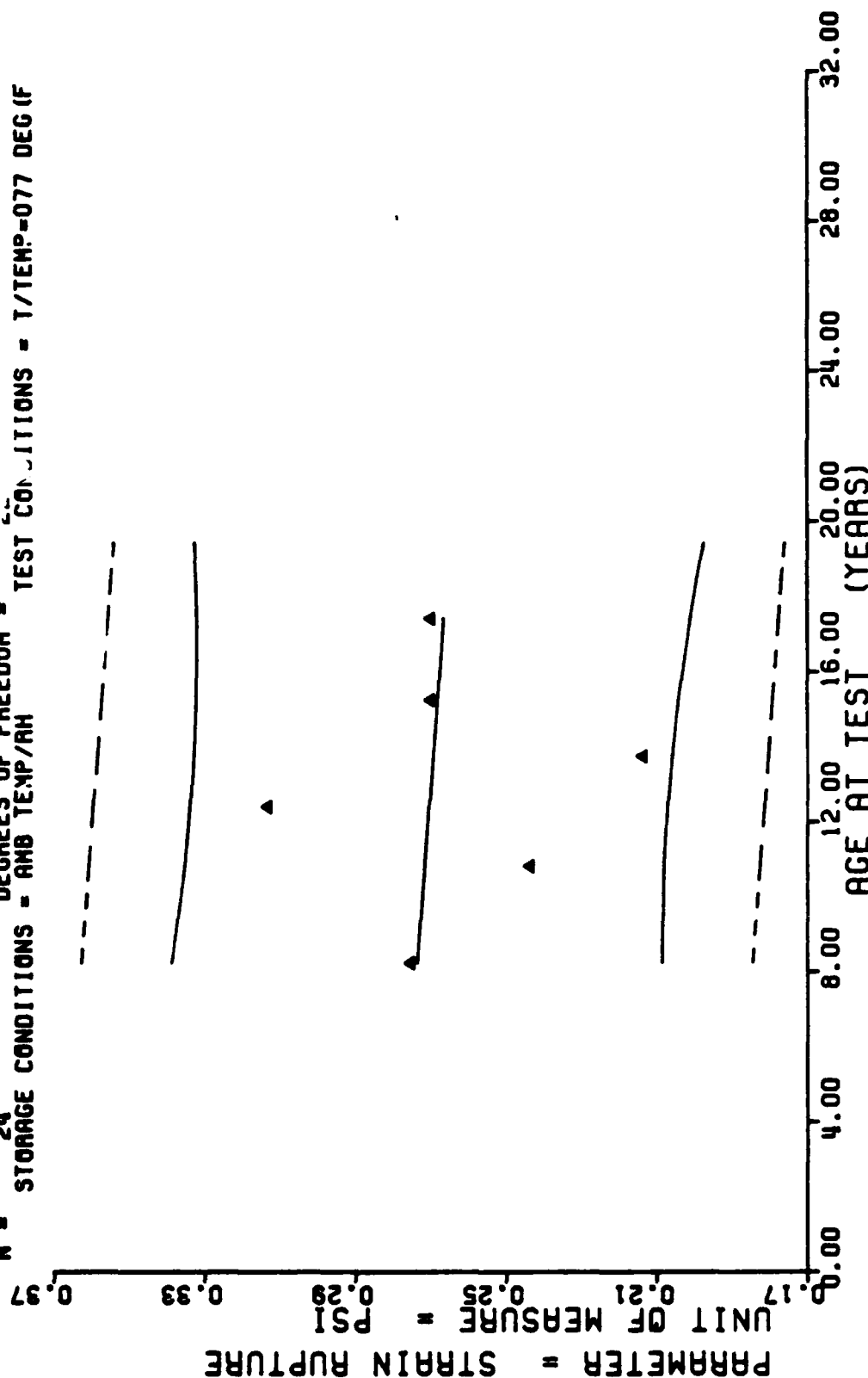
$Y = ((+1.8247544E-01) + (+4.4081938E-05) \times X)$   
 $F = +4.6170011E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +1.4465226E-02$   
 $R = +1.4028145E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +6.4875496E-05$   
 $t = +6.7948518E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_c = +1.4630228E-02$   
 $N = 25$  DEGREES OF FREEDOM = 23  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = T/TEMP-077 DEG (F)



11 STAGE DSCT MTR, 2.0 IN G.L. BI-PROP, CHS=.0002, T/TEMP=077DEG (F), STN RUP-0022135

Figure 117

$Y = ((+2.7977609E-01) + (-6.3057885E-05) \times X)$   
 $F = +2.0841632E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +2.9184505E-02$   
 $R = -9.6873964E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +1.3812539E-04$   
 $t = +4.5652636E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_c = +2.9678716E-02$   
 $N = 24$  DEGREES OF FREEDOM =  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = T/TEMP=077 DEG (F)



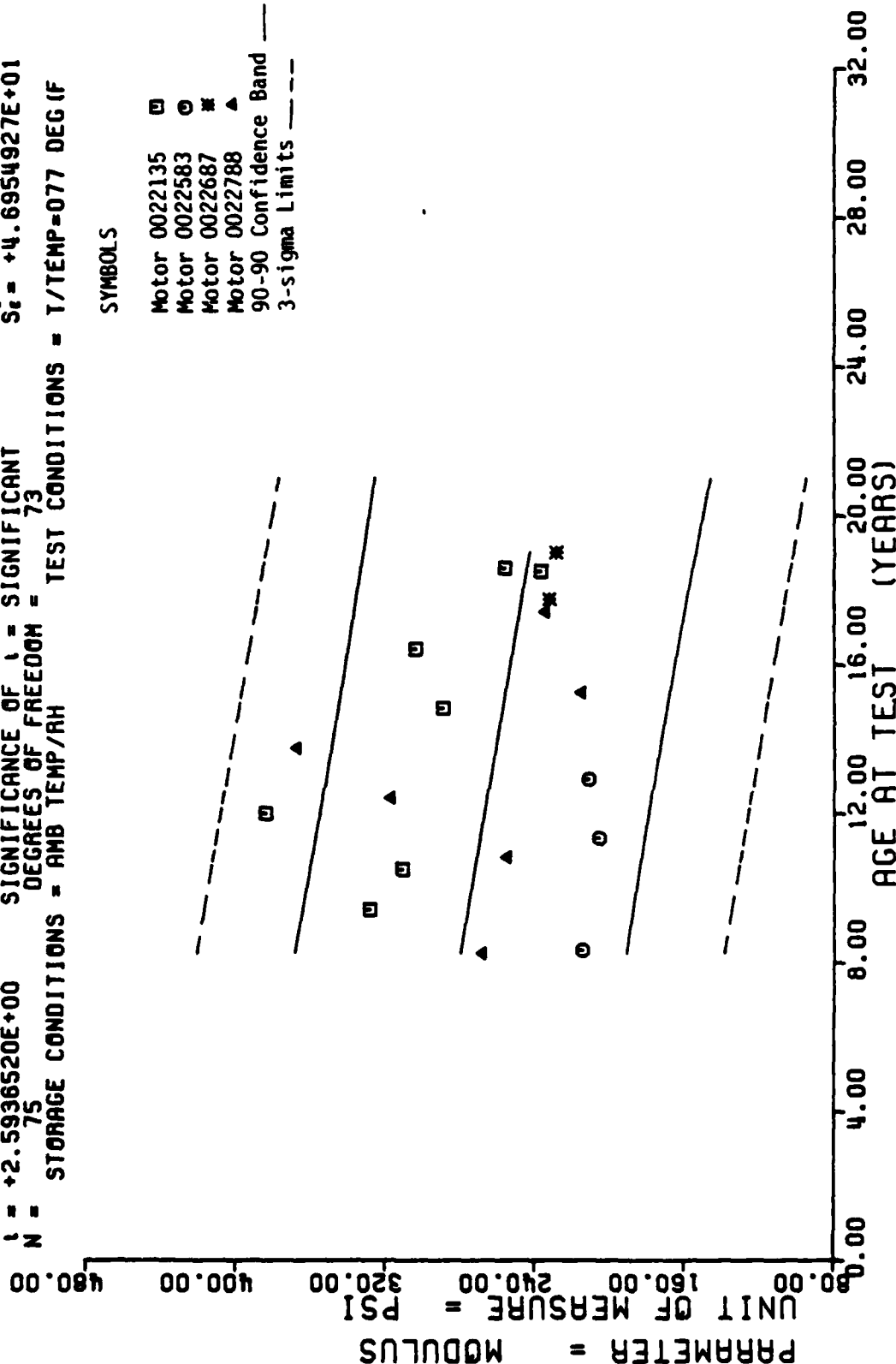
II STAGE DSCT MTR, 2.0IN G.L.BI-PROP, CHS=.0002, T/TEMP=077DEG (F), STN RUP<0022788>

Figure 118

$Y = ((+3.0780536E+02) + (-2.8509814E-01) * X)$   
 $F = +6.7270309E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -2.9047510E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.5936520E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 75$  DEGREES OF FREEDOM = 73  
 $N = 75$  STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = T/TEMP=077 DEG (F)

# SYMBOLS

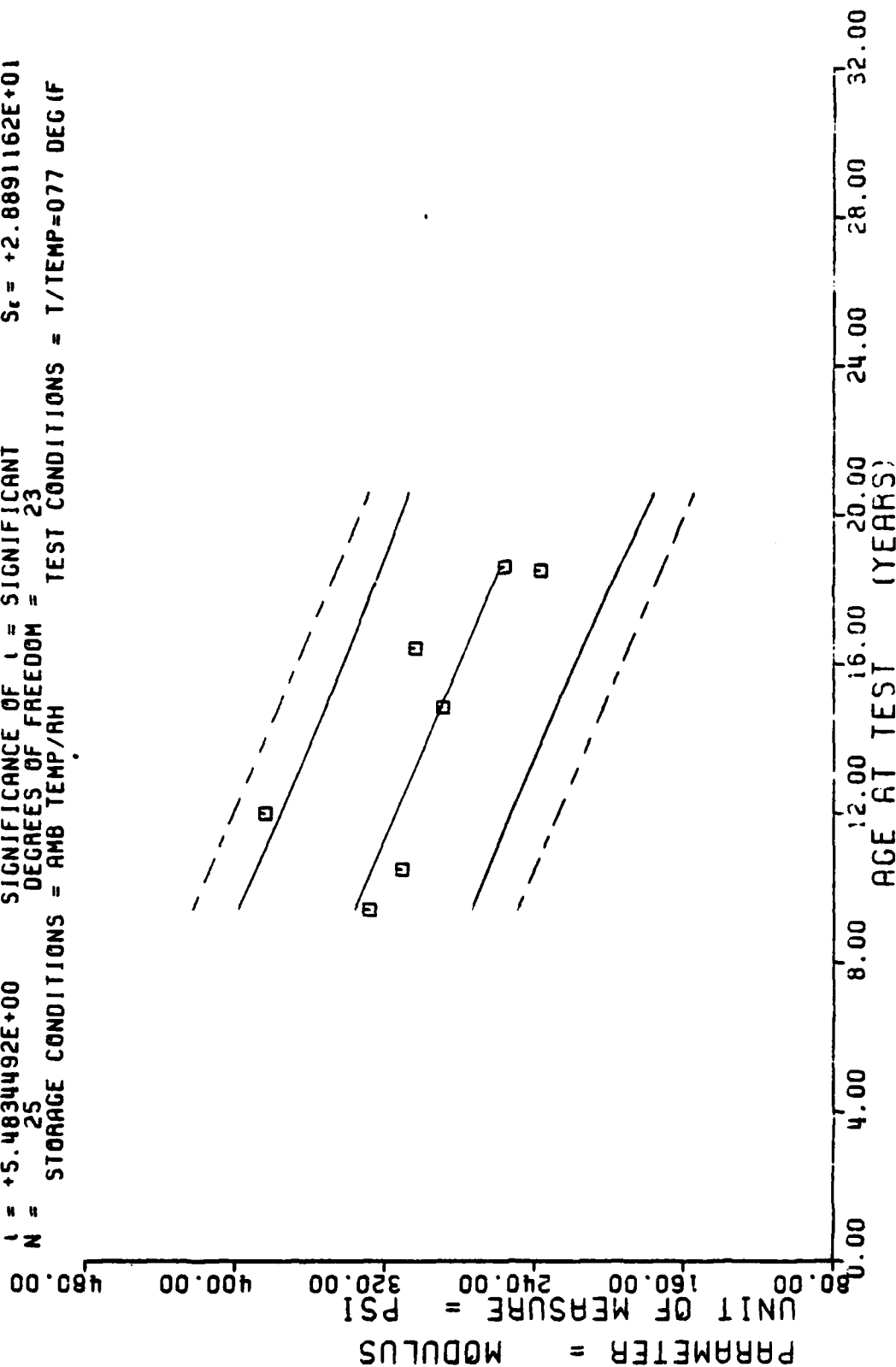
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



II STAGE DSCT MTR.2.0IN G.L.BI-PROP,CHS=.0002 IN/MIN,T/TEMP=077 DEG (F),MODULUS

Figure 119

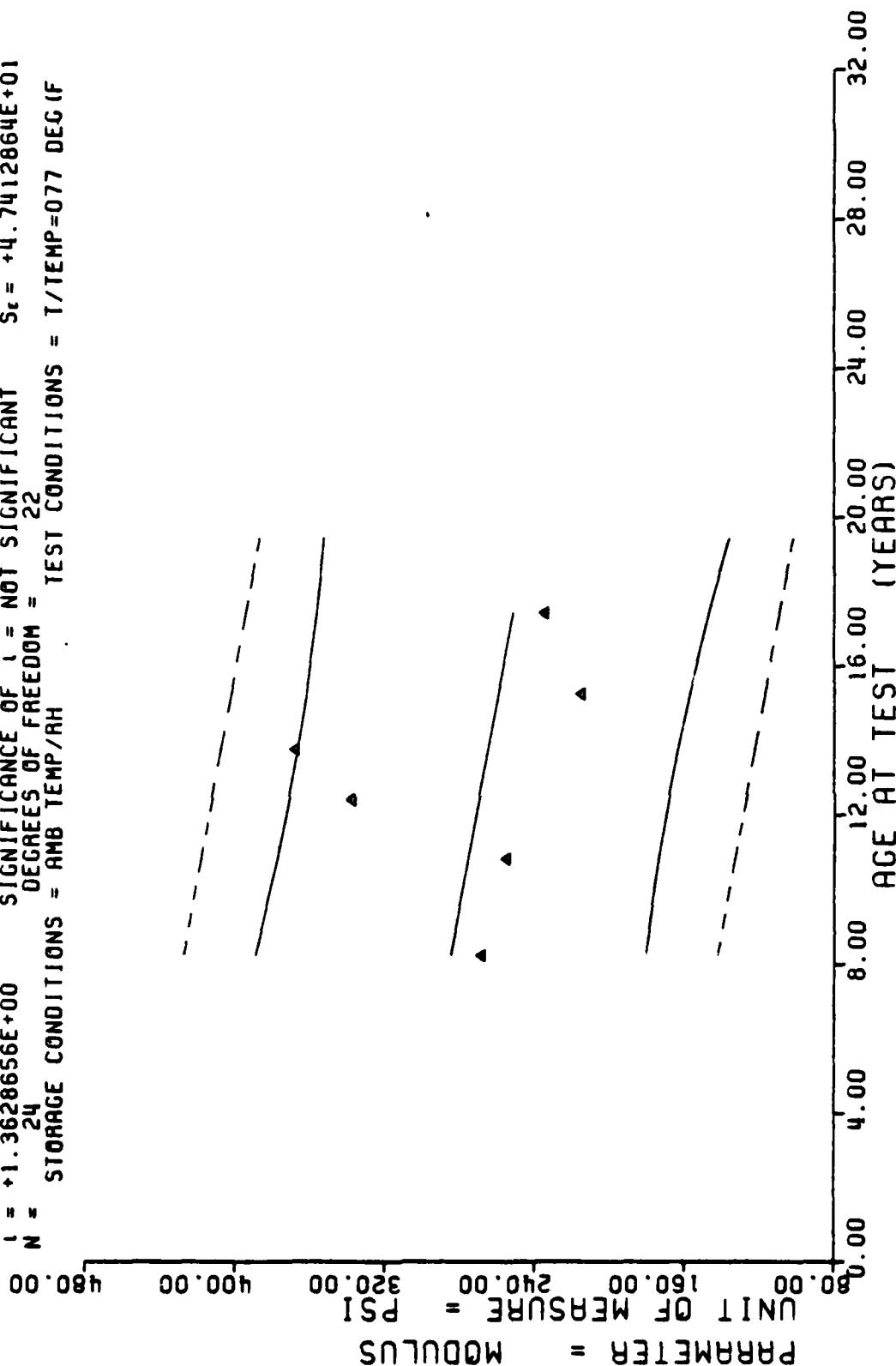
$Y = ( (+4.1495423E+02) + (-7.0250338E-01) ) \times X$   
 $F = +3.0068215E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G_r = +4.2961222E+01$   
 $R = -7.5272542E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_r = +1.2811341E-01$   
 $I = +5.4834492E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_t = +2.8891162E+01$   
 $N = 25$  DEGREES OF FREEDOM = 23  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = T/TEMP=077 DEG (F



11 STAGE DSCT MTR, 2.0IN G.L.BI-PROP, CHS=.0002, T/TEMP=077DEG (F), MODULUS 0022135

Figure 120

$Y = ((+3.1421736E+02) + (-3.0072050E-01) \times X)$   
 $F = +1.8574028E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_t = +4.8288516E+01$   
 $R = -2.7902394E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +2.2065307E-01$   
 $t = +1.3628656E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_c = +4.7412864E+01$   
 $N = 24$  DEGREES OF FREEDOM = 22  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = T/TEMP=077 DEG (F)



11 STAGE DSCT MTR.2.0IN G.L.B1-PROP.CHS=.0002,T/TEMP=077DEG (F) .MODULUS<0022788>

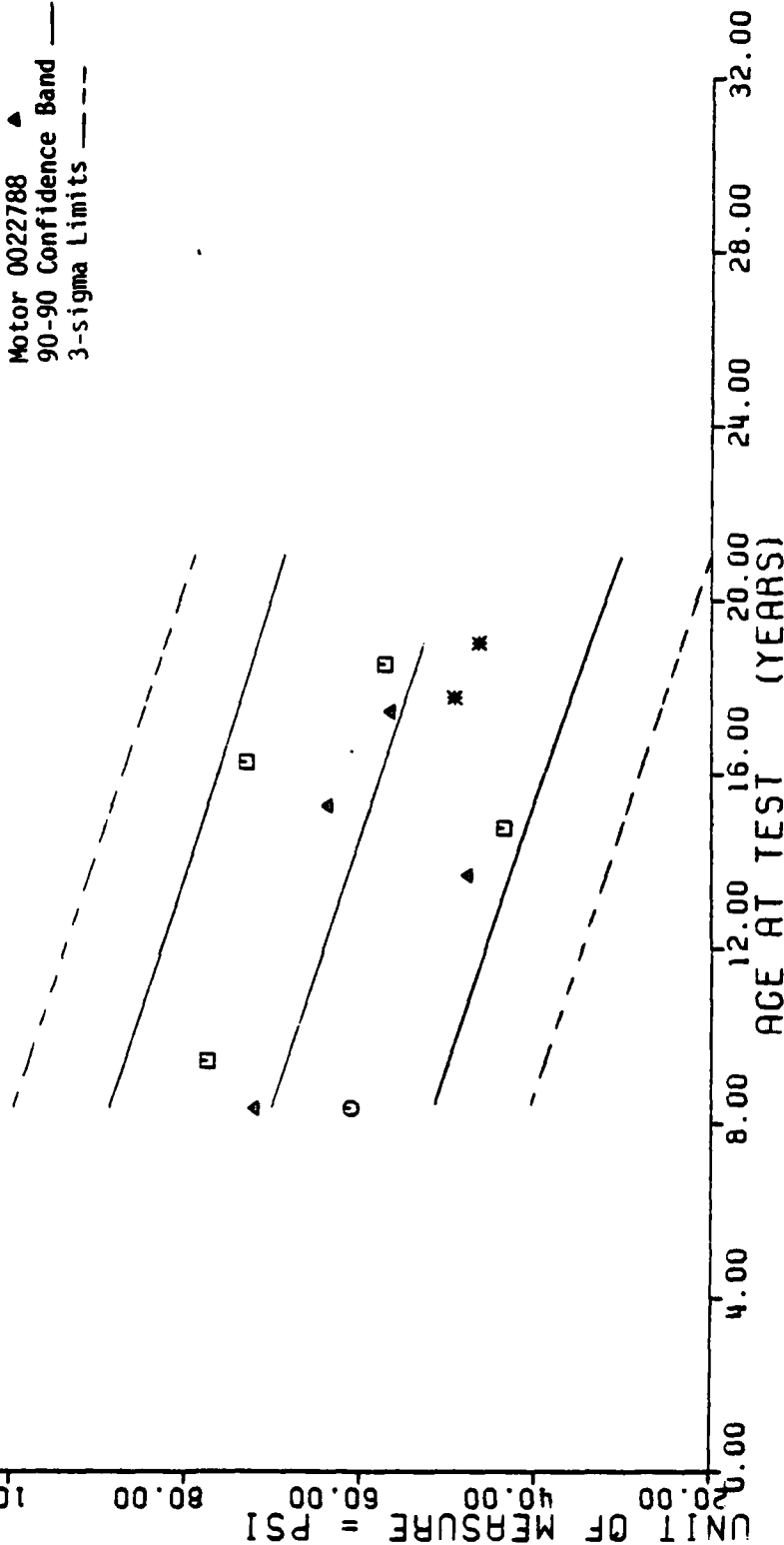
Figure 121

$F = +2.9309050E+01$  SIGNIFICANCE OF  $F =$  SIGNIFICANT  
 $R = -5.4601443E-01$  SIGNIFICANCE OF  $R =$  SIGNIFICANT  
 $t = +5.4137833E+00$  SIGNIFICANCE OF  $t =$  SIGNIFICANT  
 $N = 71$  DEGREES OF FREEDOM = 69  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.

PARAMETER = STRESS RELAX MODULUS  
 UNIT OF MEASURE = PSI  $\times 10^3$

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band —  
 3-sigma Limits ---

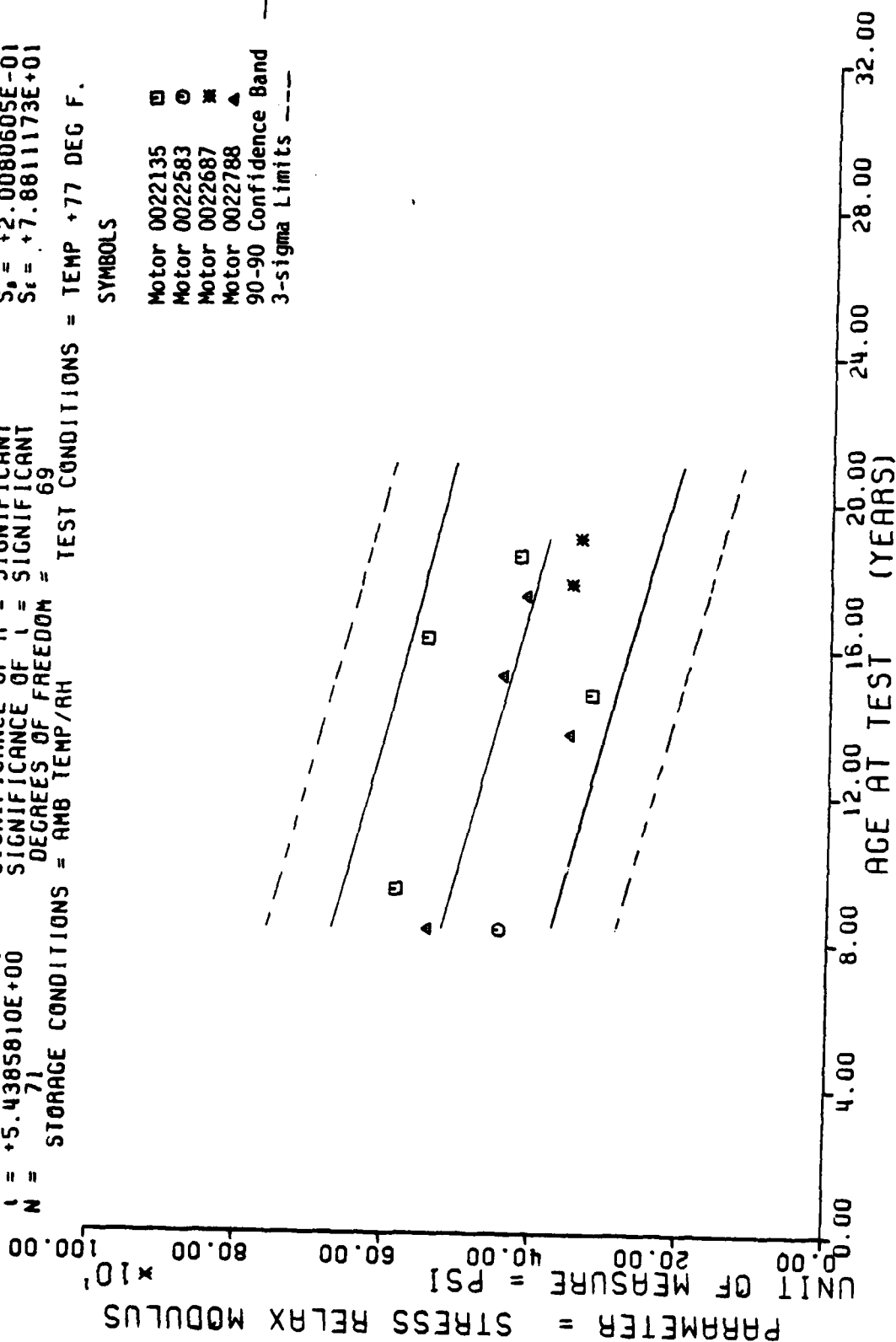


STAGE 11, DISSECTED MTRS, OUTER, STRESS RELAXATION, 3 PERCENT, +77 DEG, 10/SEC.

$F = +2.9578163E+01$   
 $R = -5.4776621E-01$   
 $I = +5.4385810E+00$   
 $N = 71$   
 $Y = ((+6.3202152E+02) + (-1.0920999E+00) \times X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 69  
 STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---

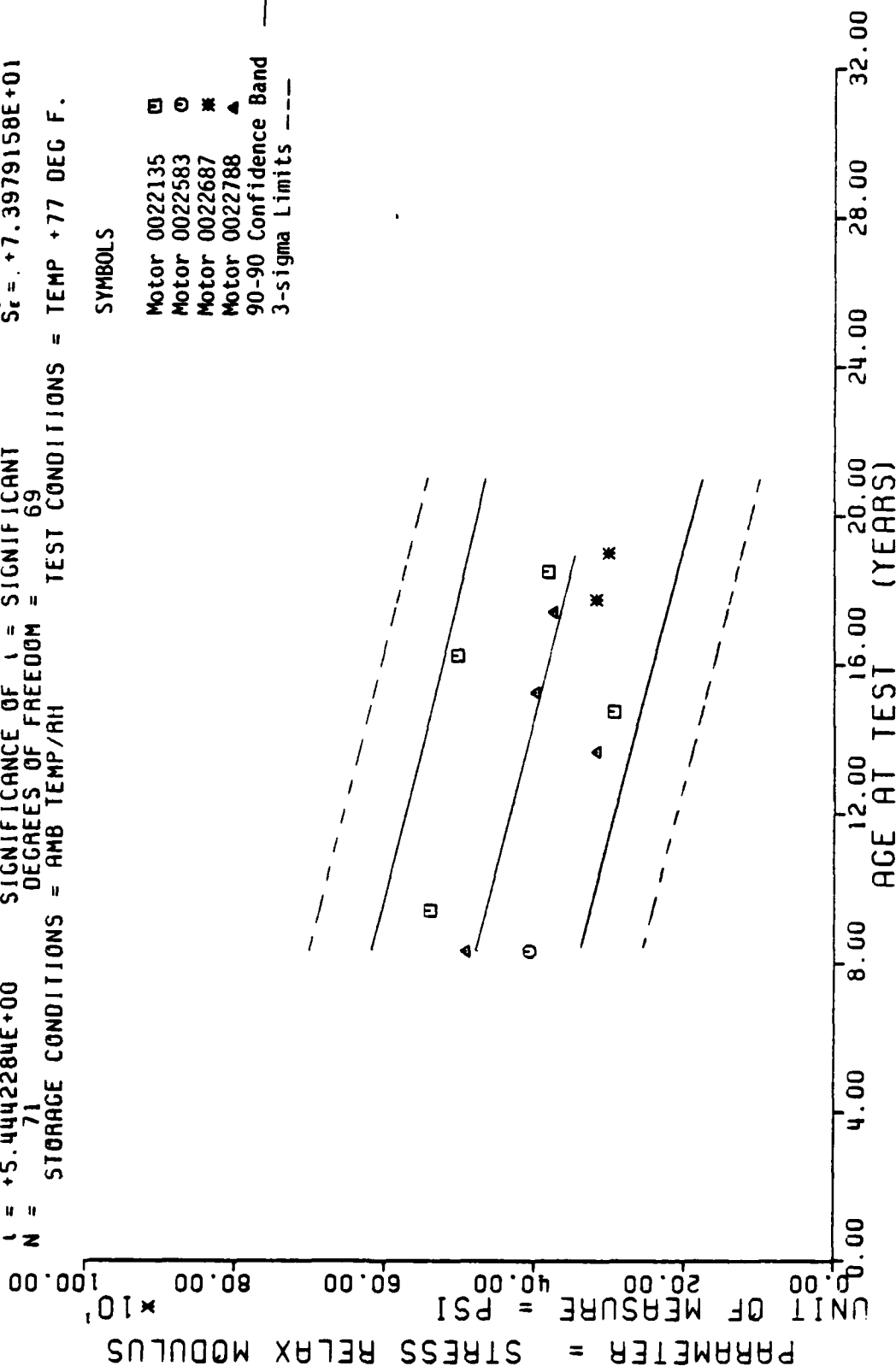


STAGE II, DISSECTED MTRS. OUTER, STRESS RELAXATION. 3 PERCENT, +77 DEG. 50/SEC.

$F = +2.9639623E+01$   
 $R = -5.4816416E-01$   
 $I = +5.4442284E+00$   
 $N = 71$   
 $Y = ((+5.7953079E+02) + (-1.0262064E+00) * X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 69  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



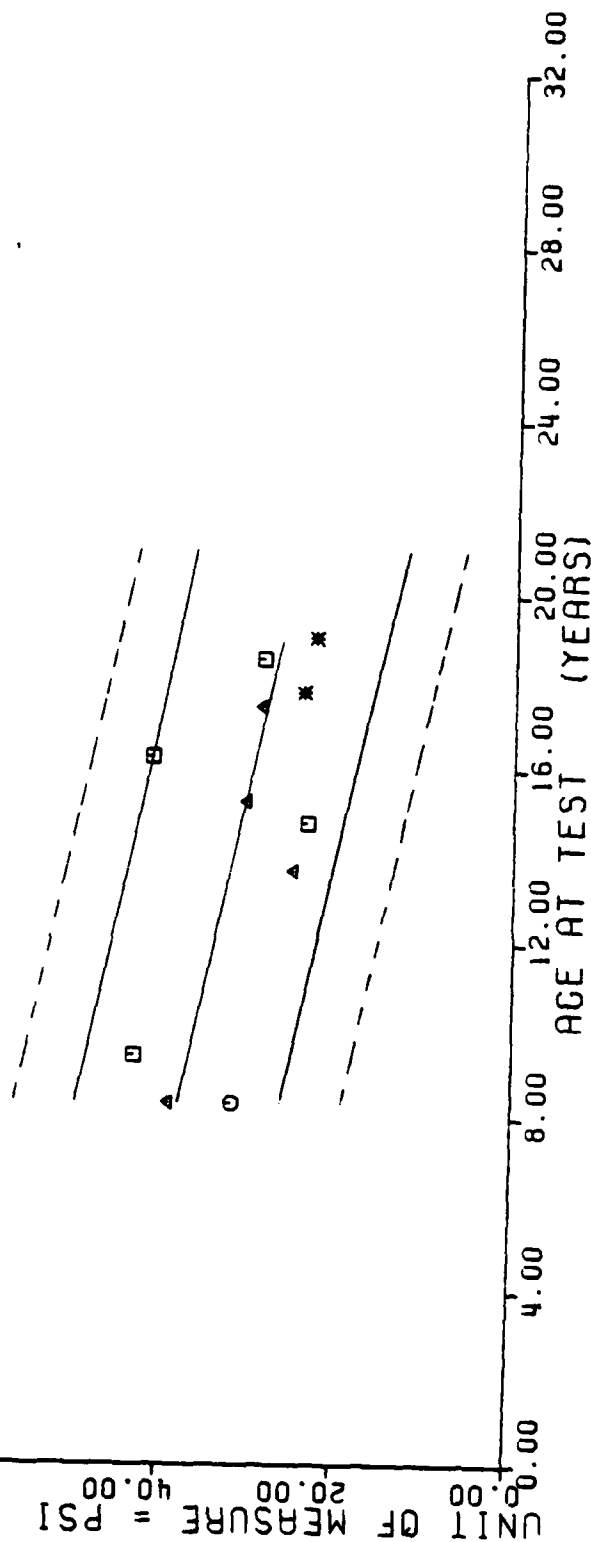
STAGE 11. DISSECTED MTRS. OUTER, STRESS RELAXATION, 3 PERCENT, +77 DEG. 100/SEC.

$F = +3.1263661E+01$   
 $R = -5.5840350E-01$   
 $I = +5.5913917E+00$   
 $N = 71$   
 $Y = (( +4.6948827E+02 ) + ( -8.8803288E-01 ) ) \times X1$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 69  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.

PARAMETER = STRESS RELAX MODULUS  
 UNIT OF MEASURE = PSI  $\times 10^7$

# SYMBOLS

Motor 0022135 □  
 Motor 0622583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



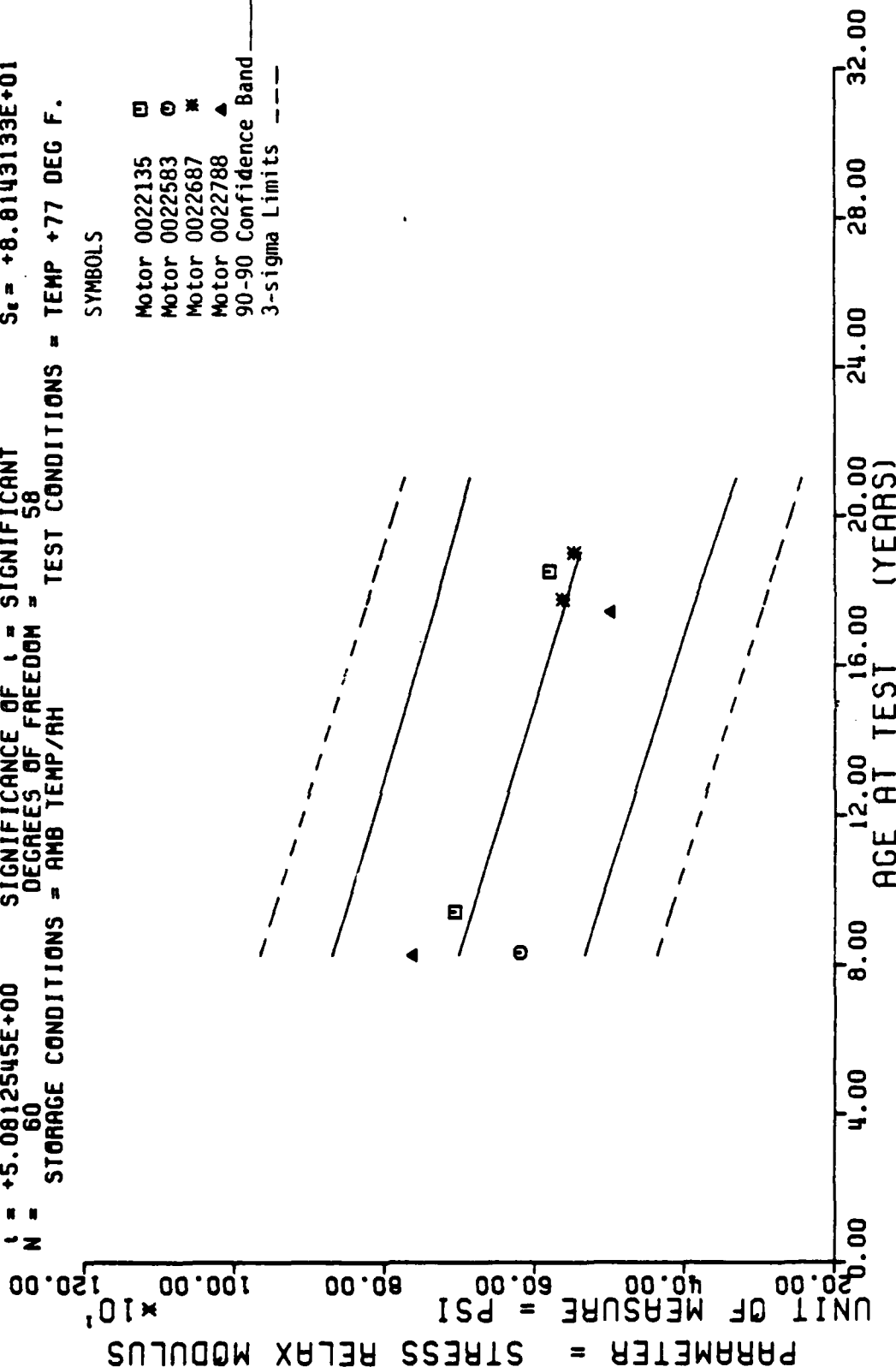
STAGE 11. DISSECTED MTRS. OUTER. STRESS RELAXATION, 3 PERCENT, +77 DEG. 1000/SEC.

Figure 125

$Y = ((+8.2455479E+02) + (-1.2549010E+00) \times X)$   
 $F = +2.5819147E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -5.5500811E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +5.0812545E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/4H TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---

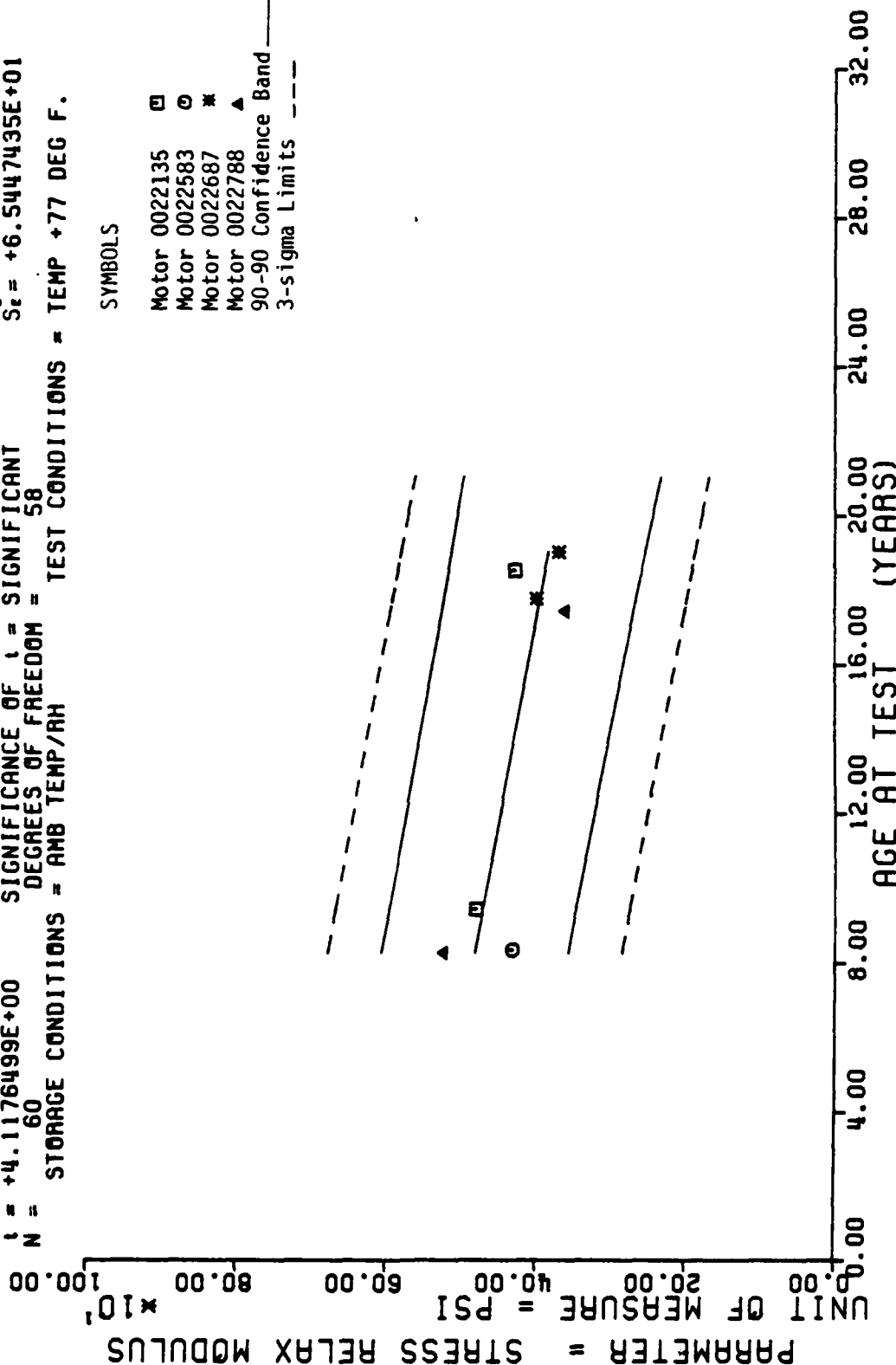


STAGE II, DISSECTED MTRS, OUTER, STRESS RELAXATION, 5 PERCENT, +77 DEG, 10/SEC.

$Y = ((+5.5477720E+02) + (-7.5507852E-01) \times X)$   
 $F = +1.6955041E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -4.7560783E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +4.1176499E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

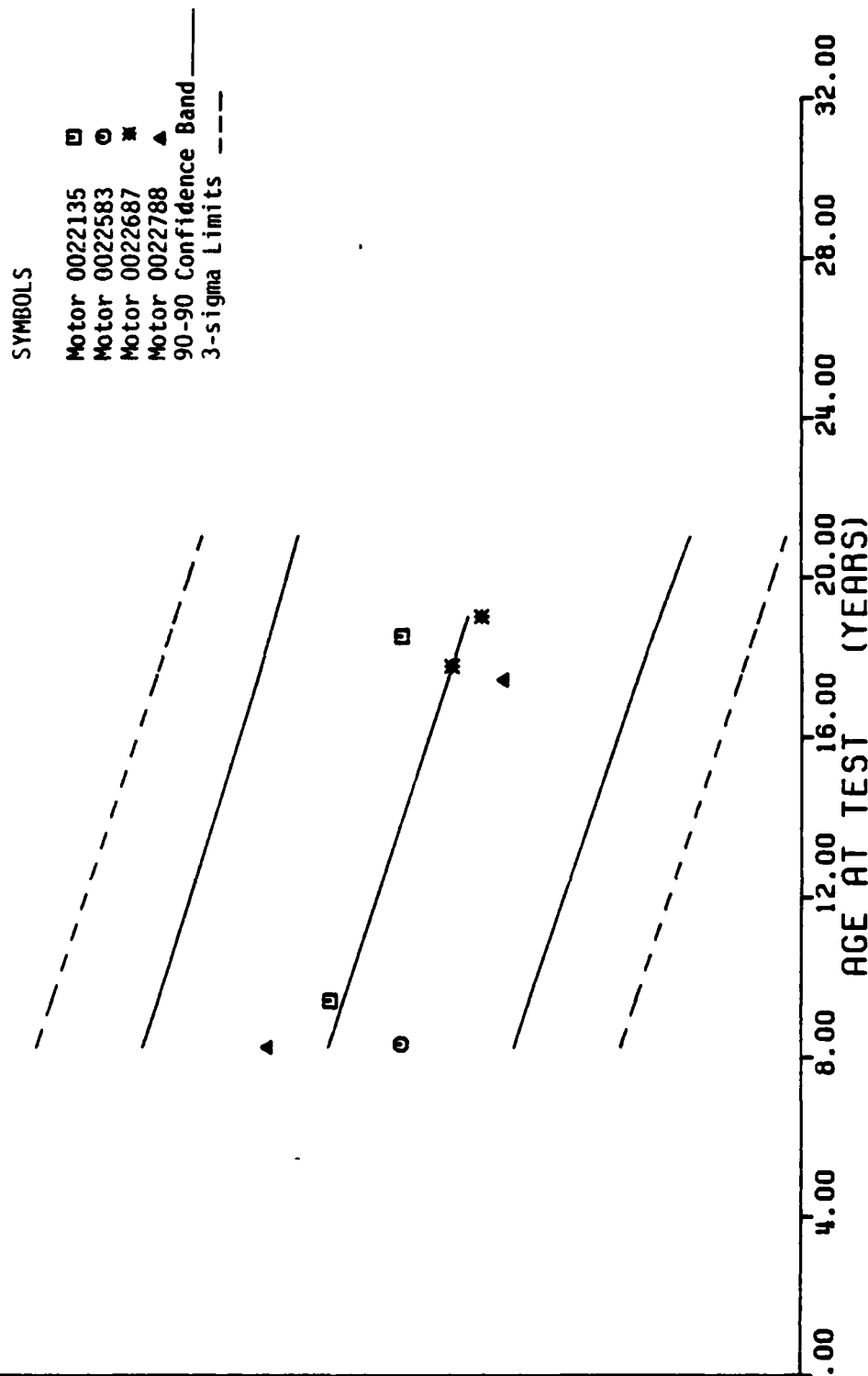
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



STAGE II, DISSECTED MTRAS, OUTER, STRESS RELAXATION, 5 PERCENT, +77 DEG. 50/SEC.

$Y = ((+5.0029827E+02) + (-6.7217356E-01) \times X)$   
 $F = +1.5716720E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -4.6174049E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +3.9644319E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

PARAMETER = STRESS RELAX MODULUS  
 UNIT OF MEASURE = PSI  $\times 10^4$

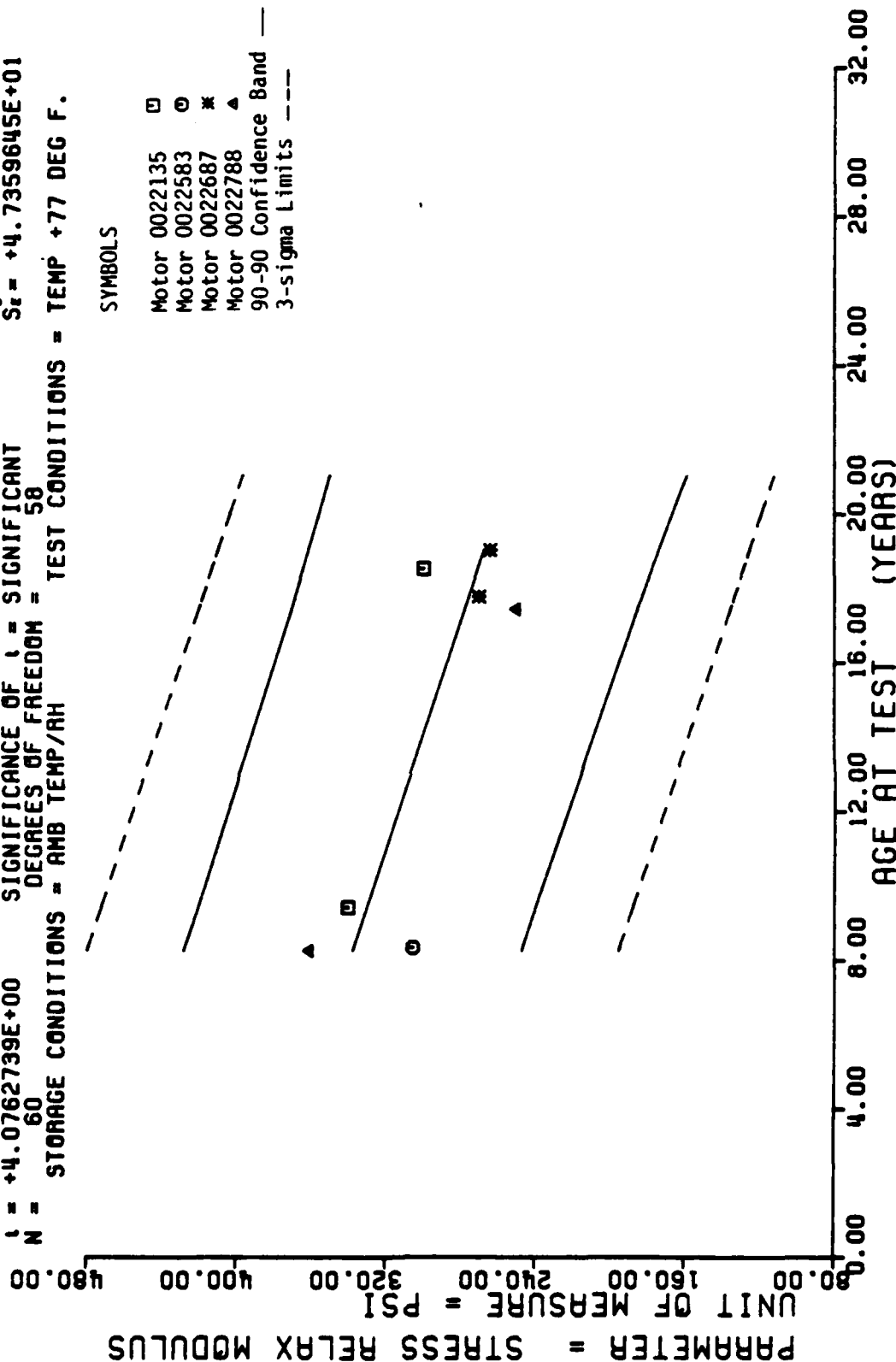


STAGE II, DISSECTED MTRS. OUTER, STRESS RELAXATION, 5 PERCENT, +77 DEG, 100/SEC.

$Y = ((+3.9072022E+02) + (-5.4090607E-01) \times X)$   
 $F = +1.6616009E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -4.7189714E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +4.0762739E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band —  
 3-sigma Limits ---

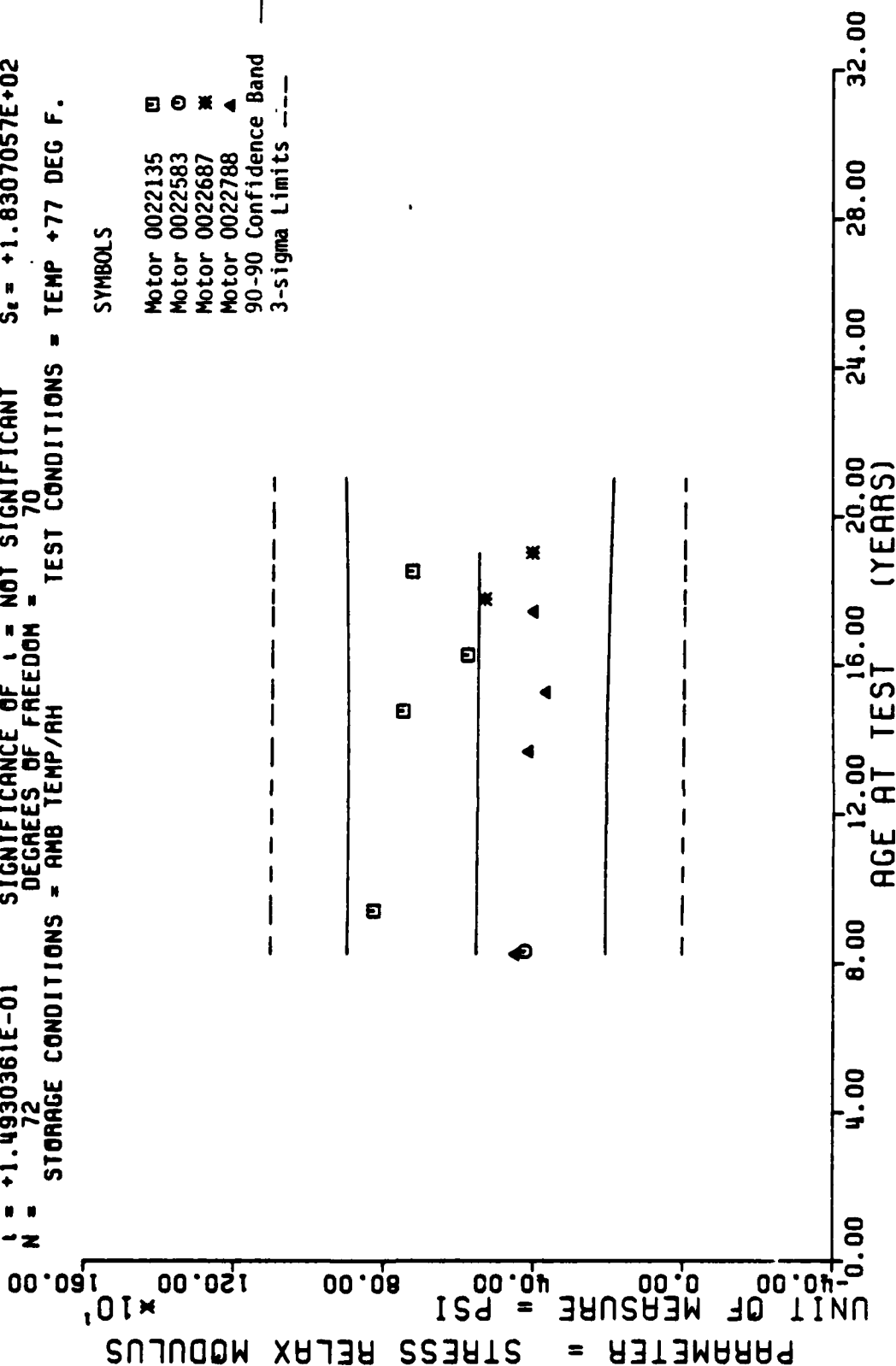


STAGE II, DISSECTED MTRs, OUTER, STRESS RELAXATION, 5 PERCENT, +77 DEG, 1000/SEC.

$Y = ((+5.5894168E+02) + (-6.9001667E-02) \times X)$   
 $F = +2.2291570E-02$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -1.7842355E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.4930361E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 72$  DEGREES OF FREEDOM = 70  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

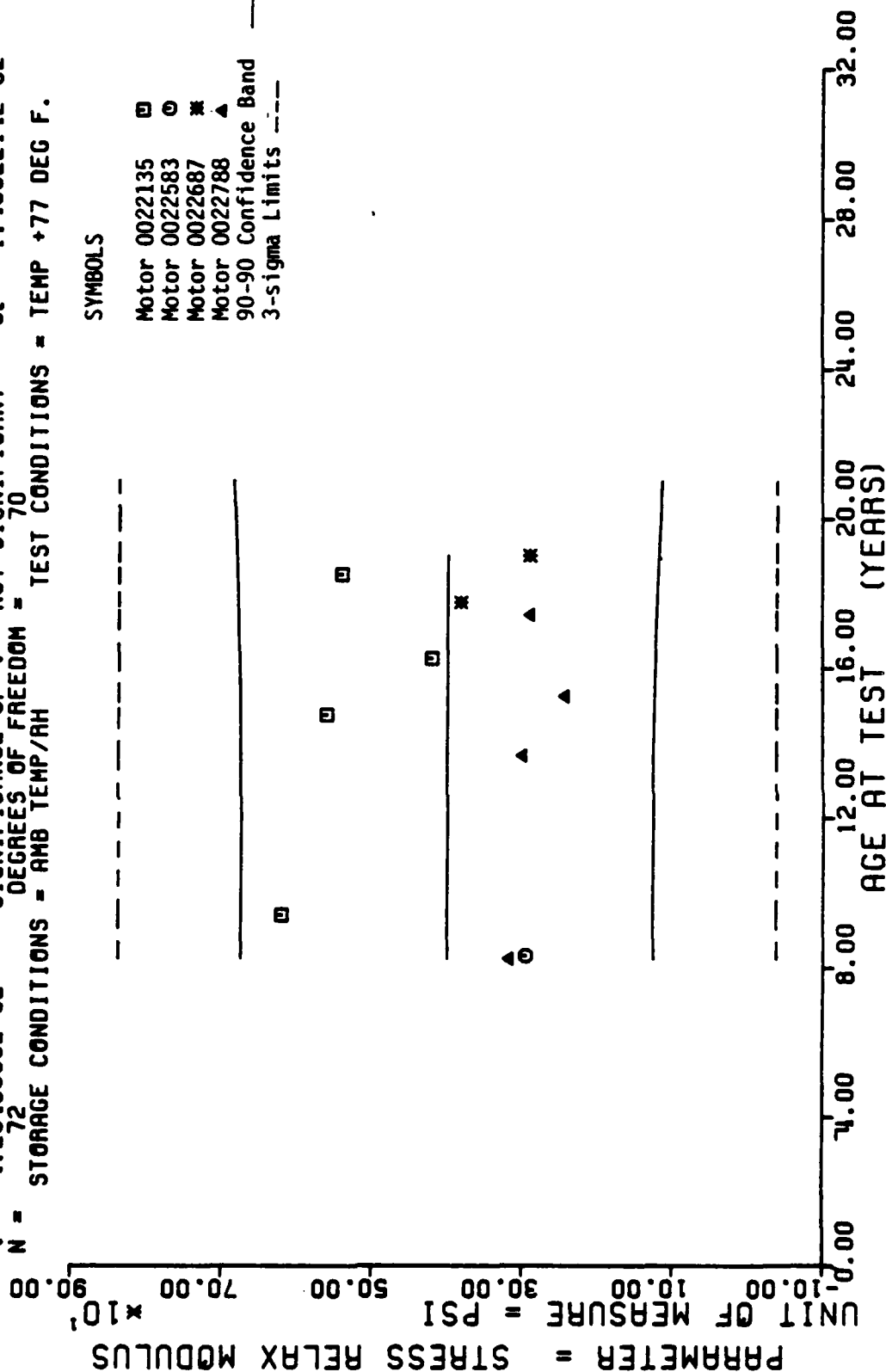
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✱  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



STAGE II, DISSECTED MTRS, INNER, STRESS RELAXATION, 3 PERCENT, +77 DEG, 10/SEC.

$Y = ((+4.0058114E+02) + (-1.5447266E-02) \times X)$   
 $F = +1.7680873E-03$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = -5.0257091E-03$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +4.2048630E-02$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 72$  DEGREES OF FREEDOM = 70  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.



SYMBOLS

Motor 0022135  $\square$   
 Motor 0022583  $\circ$   
 Motor 0022687  $*$   
 Motor 0022788  $\triangle$   
 90-90 Confidence Band  
 3-sigma Limits ---

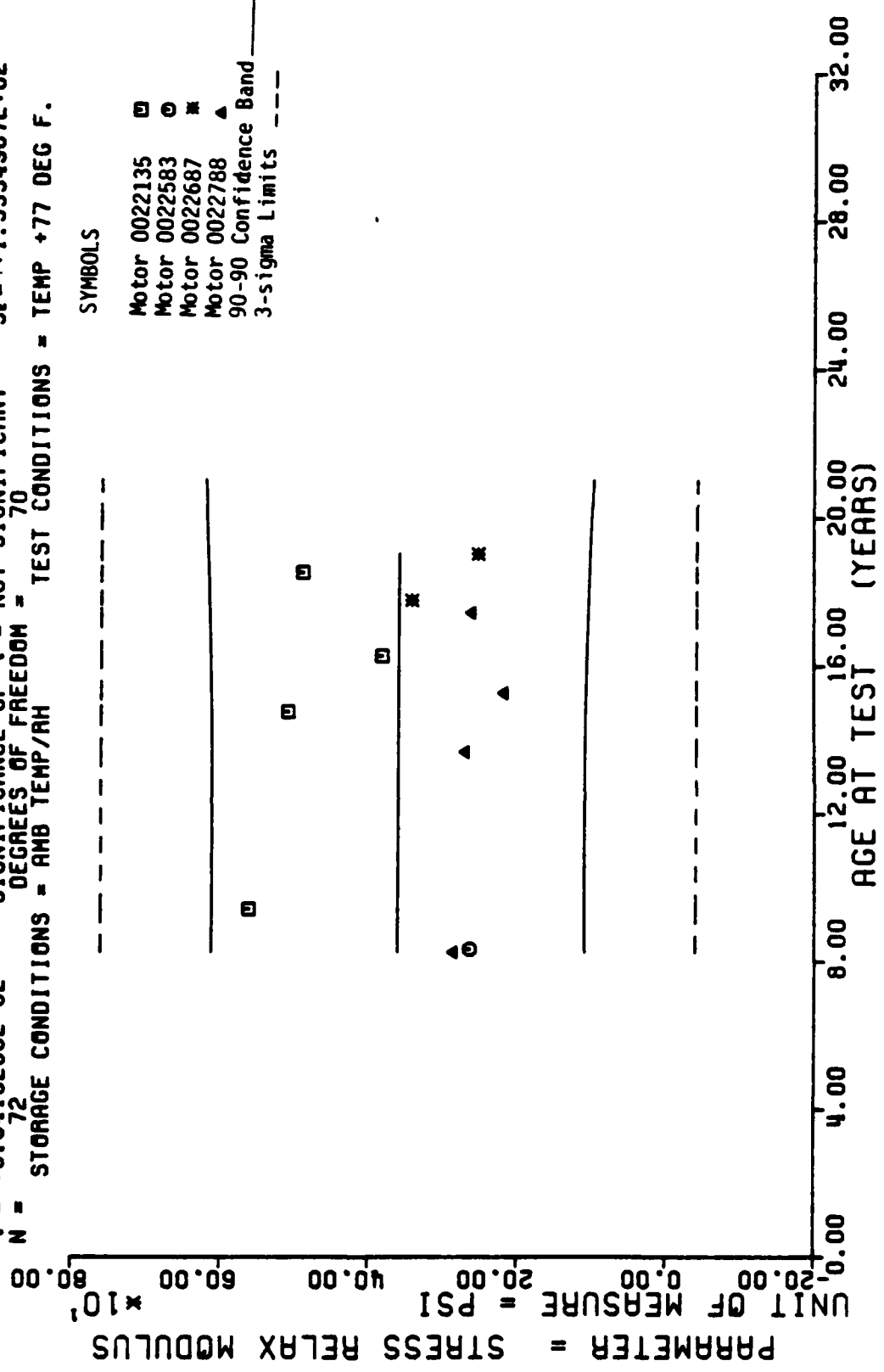
STAGE II, DISSECTED HTAS, INNER, STRESS RELAXATION, 3 PERCENT, +77 DEG, 50/SEC.

Figure 131

$Y = ((+3.6180982E+02) + (-2.0000748E-02) \times X)$   
 F = +3.5299386E-03 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha = +1.3241060E+02$   
 R = -7.1010669E-03 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +3.3663764E-01$   
 t = +5.9413286E-02 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_z = +1.3334967E+02$   
 N = 72 DEGREES OF FREEDOM = 70  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✕  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---

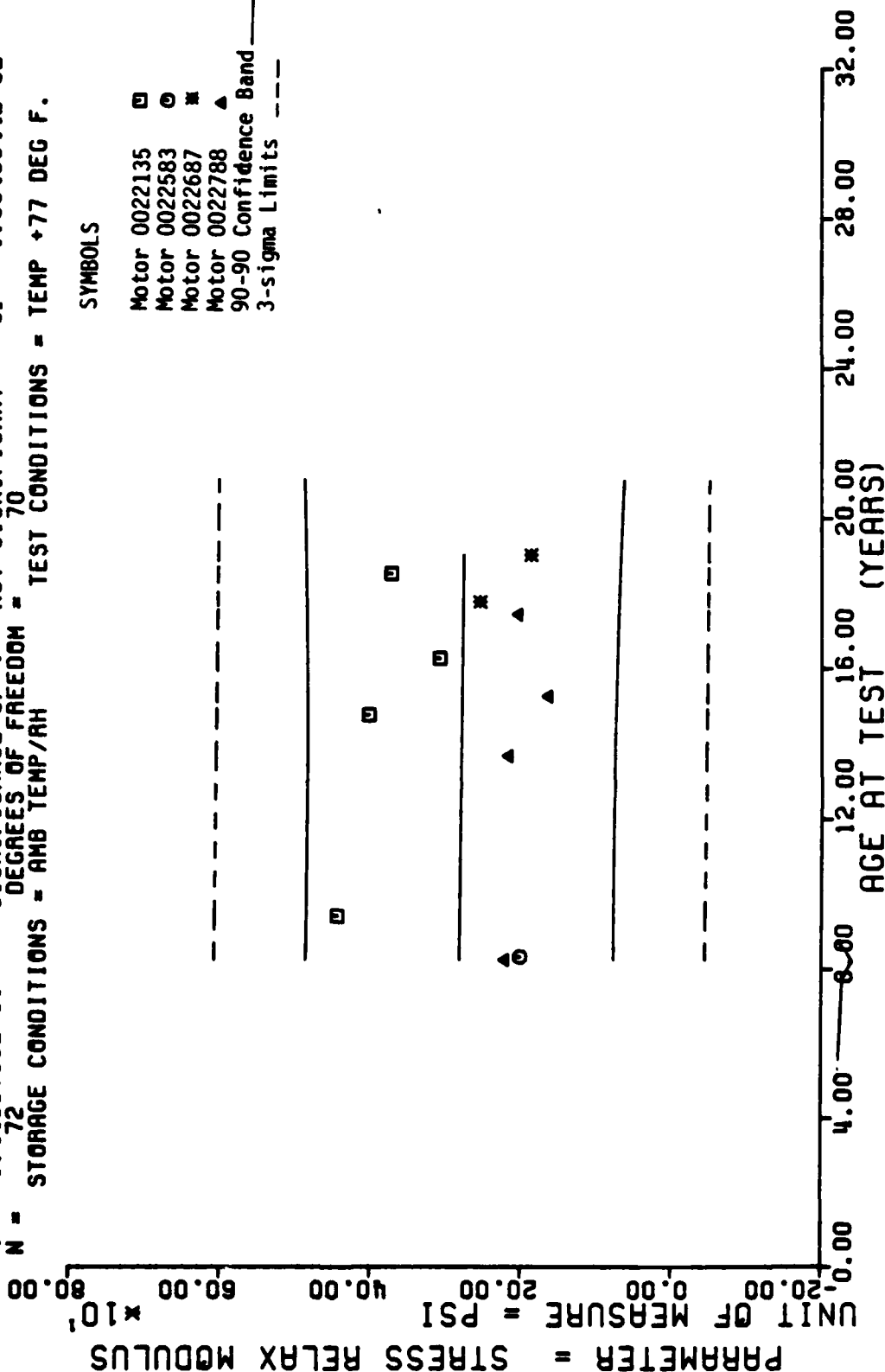


STAGE 11, DISSECTED MTRS, INNER, STRESS RELAXATION, 3 PERCENT, +77 DEG, 100/SEC.

$F = +2.0920063E-02$   
 $R = -1.7284928E-02$   
 $t = +1.4463769E-01$   
 $N = 72$   
 $Y = ((+2.8420473E+02) + (-3.9604780E-02) * X)$   
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 70  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



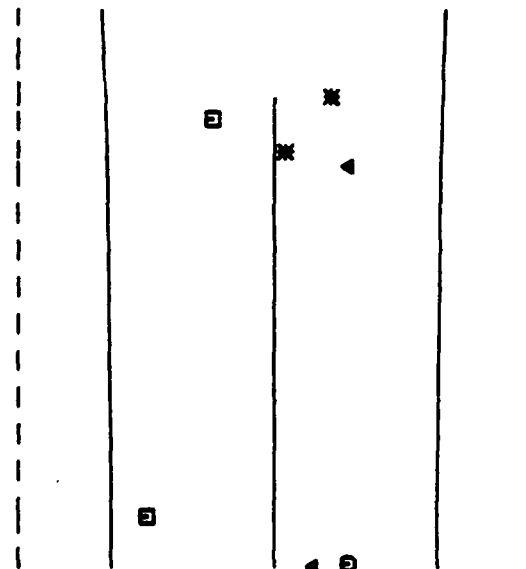
STAGE II, DISSECTED MTRS, INNER, STRESS RELAXATION, 3 PERCENT, +77 DEG, 1000/SEC.

F = +1.1804197E-04  
 R = -1.4266051E-03  
 I = +1.0864712E-02  
 N = 60  
 Y = (( +5.5431843E+02 ) + ( -5.9287358E-03 ) \* X)  
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF I = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

PARAMETER = STRESS RELAX MODULUS  
 UNIT OF MEASURE = PSI \* 10<sup>10</sup>

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



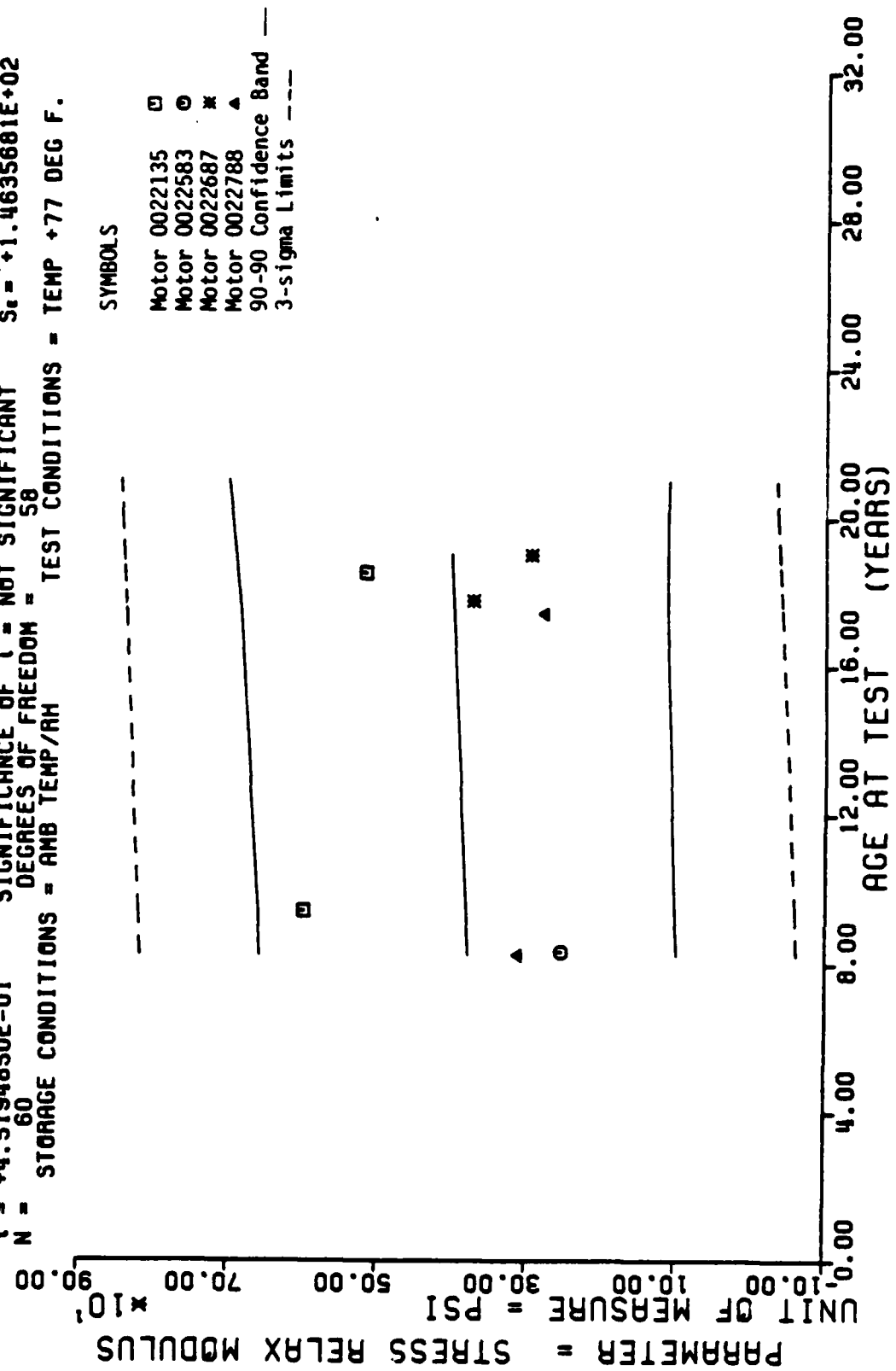
AGE AT TEST (YEARS)  
 0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00

STAGE II, DISSECTED MTRS. INNER, STRESS RELAXATION, 5 PERCENT, +77 DEG, 10/SEC.

Y = (( +3.5929981E+02 ) + ( +1.8533265E-01 ) \* X )  
 F = +2.0425745E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 R = +5.9239526E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 t = +4.5194850E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 N = 60 DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = TEMP +77 DEG F.

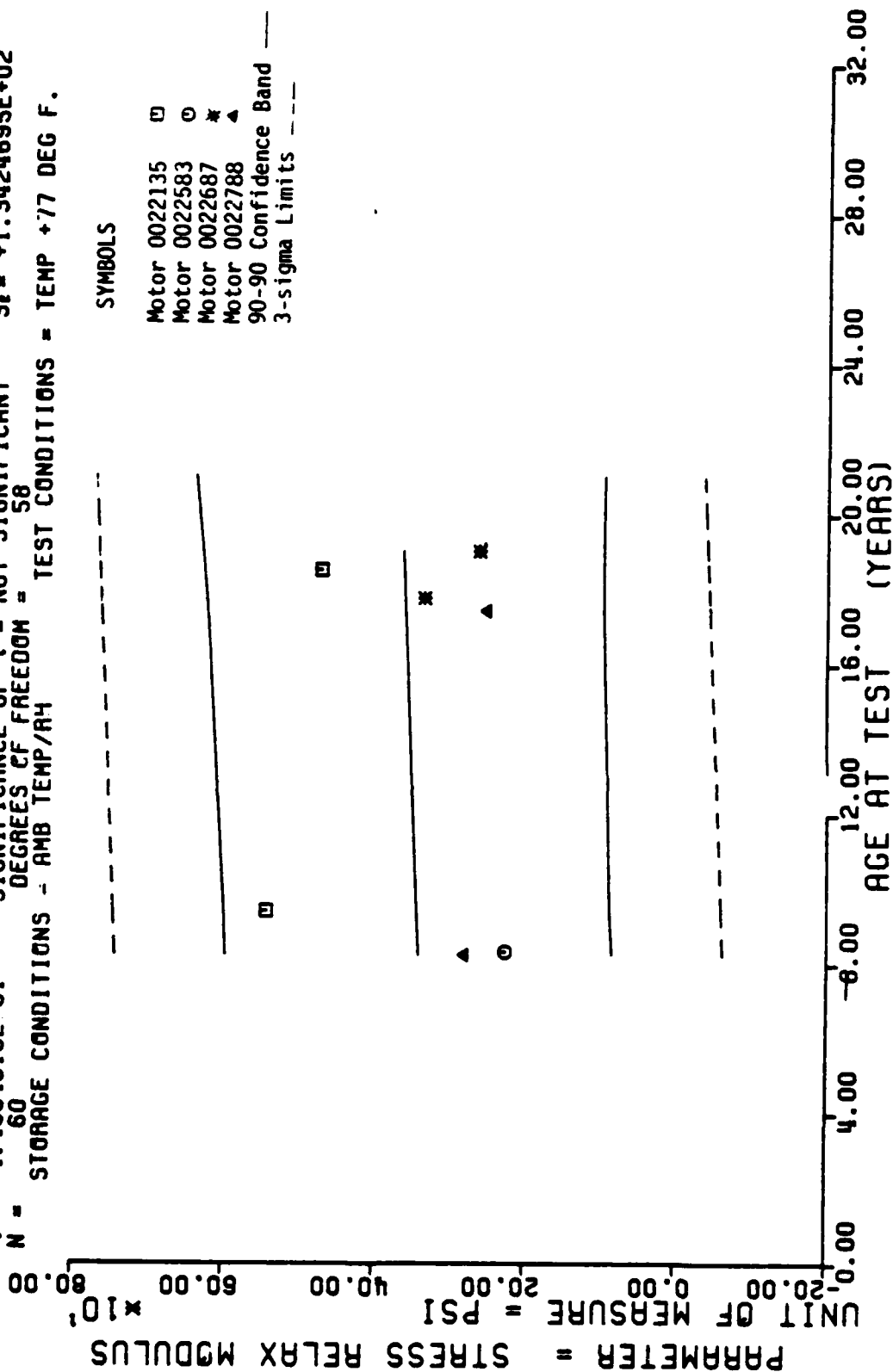
SYMBOLS

- Motor 0022135 □
- Motor 0022583 ○
- Motor 0022687 \*
- Motor 0022788 ▲
- 90-90 Confidence Band ---
- 3-sigma Limits ---



STAGE 11, DISSECTED MTRS, INNER, STRESS RELAXATION, 5 PERCENT, +77 DEG, 50/SEC.

$Y = ((+3.2371620E+02) + (+1.6759041E-01) \times X)$   
 $F = +1.9851316E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = +5.8403478E-02$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +4.4554016E-01$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS - AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.

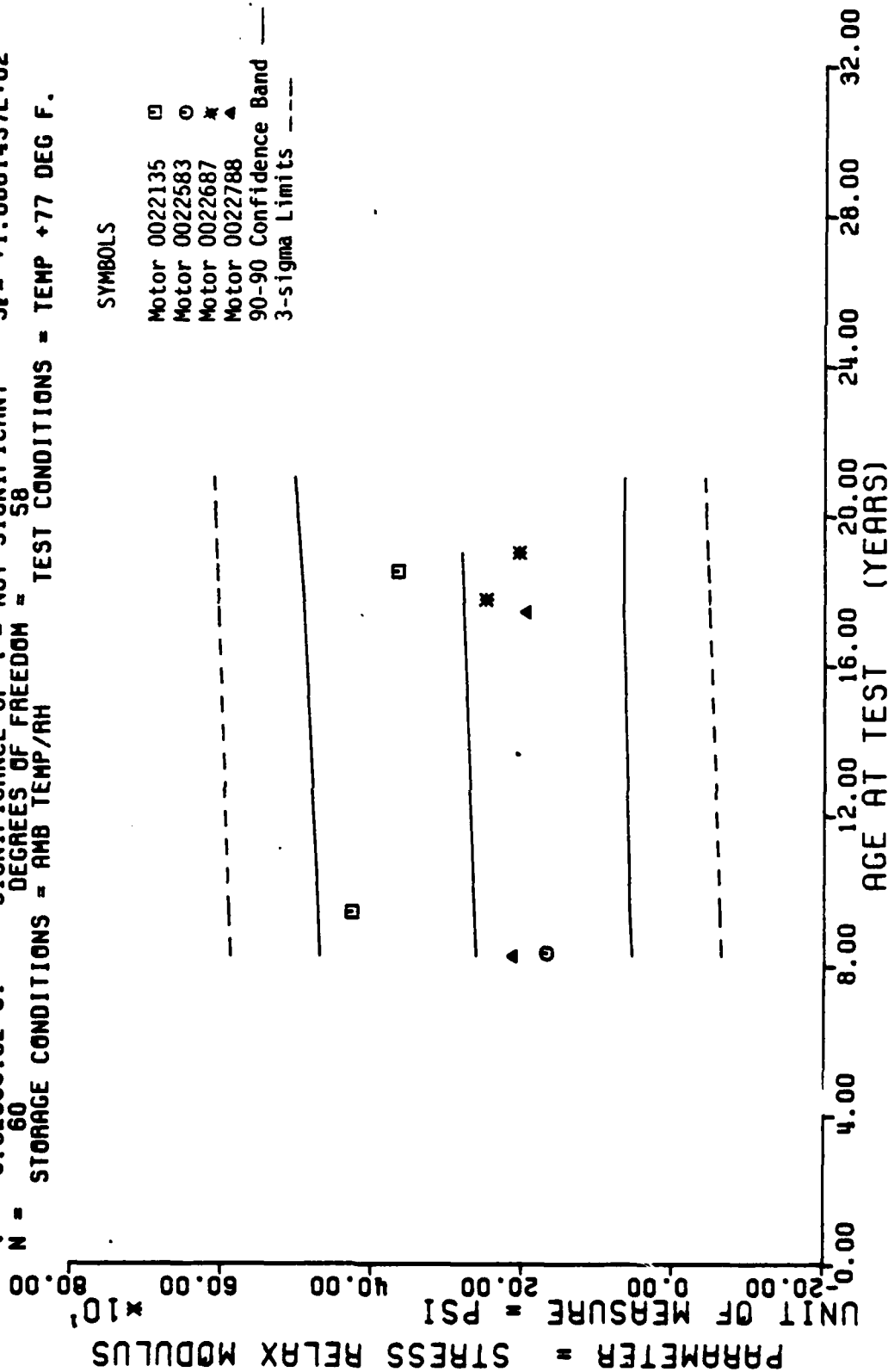


STAGE II, DISSECTED MTRS, INNER, STRESS RELAXATION, 5 PERCENT, +77 DEG, 100/SEC.

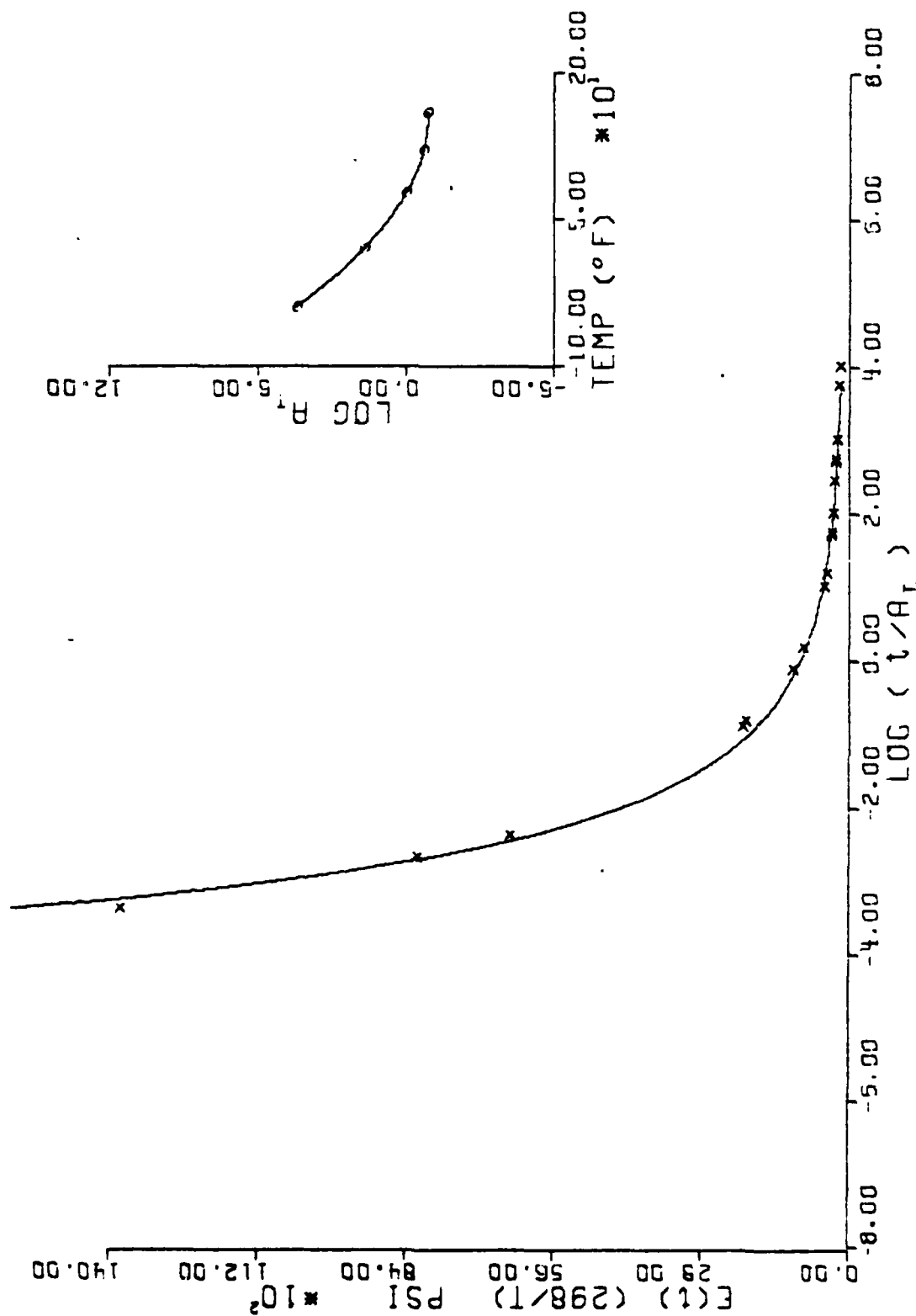
$Y = ((+2.4653082E+02) + (+1.5301665E-01) \times X)$   
 $F = +2.5281398E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $A = +6.5878255E-02$  SIGNIFICANCE OF A = NOT SIGNIFICANT  
 $I = +5.0280610E-01$  SIGNIFICANCE OF I = NOT SIGNIFICANT  
 $N = 60$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---

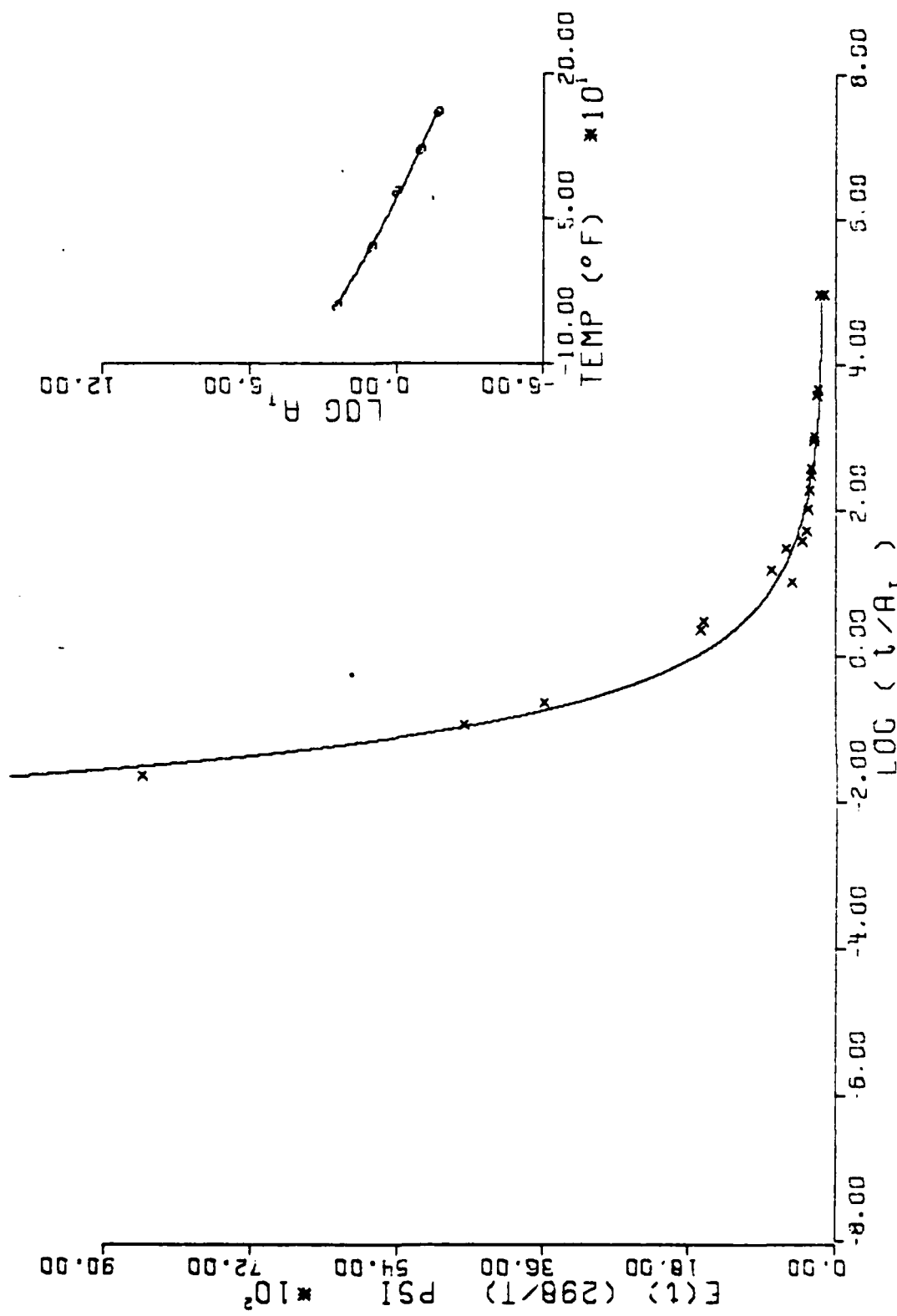


STAGE II. DISSECTED MTRS. INNER. STRESS RELAXATION. 5 PERCENT. +77 DEG. 1000/SEC.



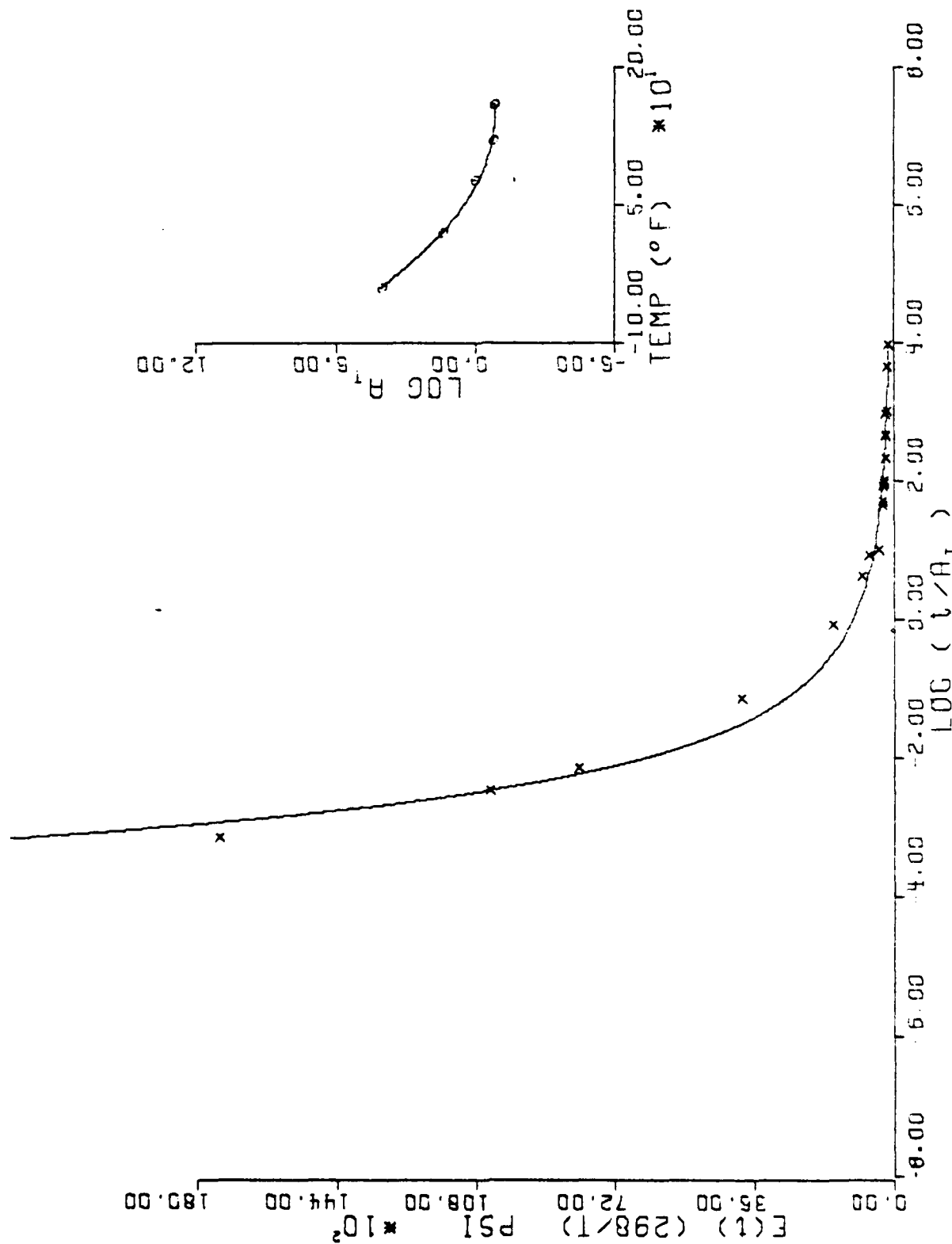
ANP 2862 (OUTER) PROPELLANT. MOTOR 0022687 AT 3% STRAIN. TESTED IN 1983

Figure 138



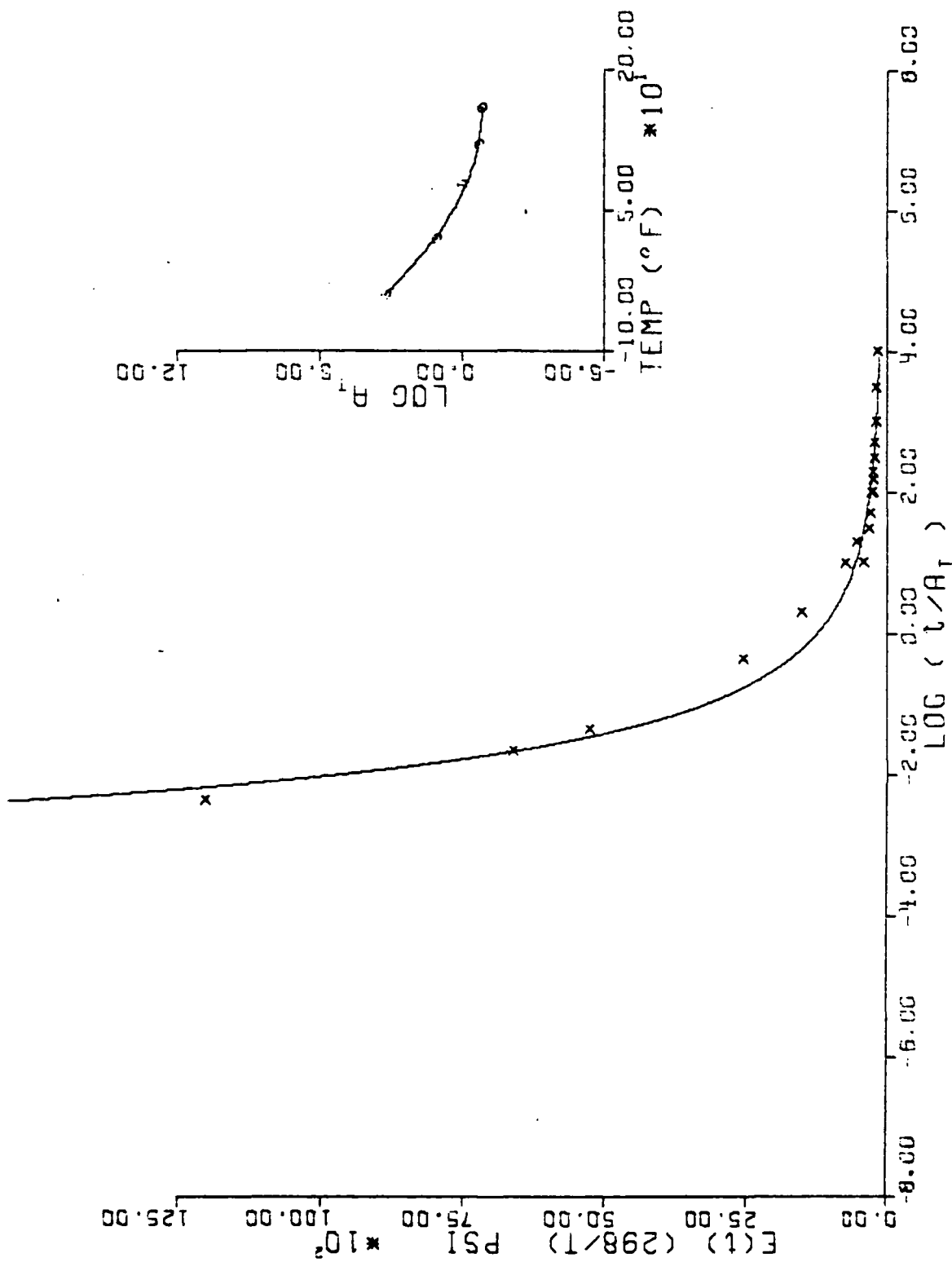
ANP-2002 (OUTER) PROPELLANT, MOTOR 0022687 AT 5% STRAIN, TESTED IN 1983

Figure 139



ANP-2864 (INNER) PROPELLANT, MOTOR 0022687 AT 3% STRAIN, TESTED IN 1983

Figure 140



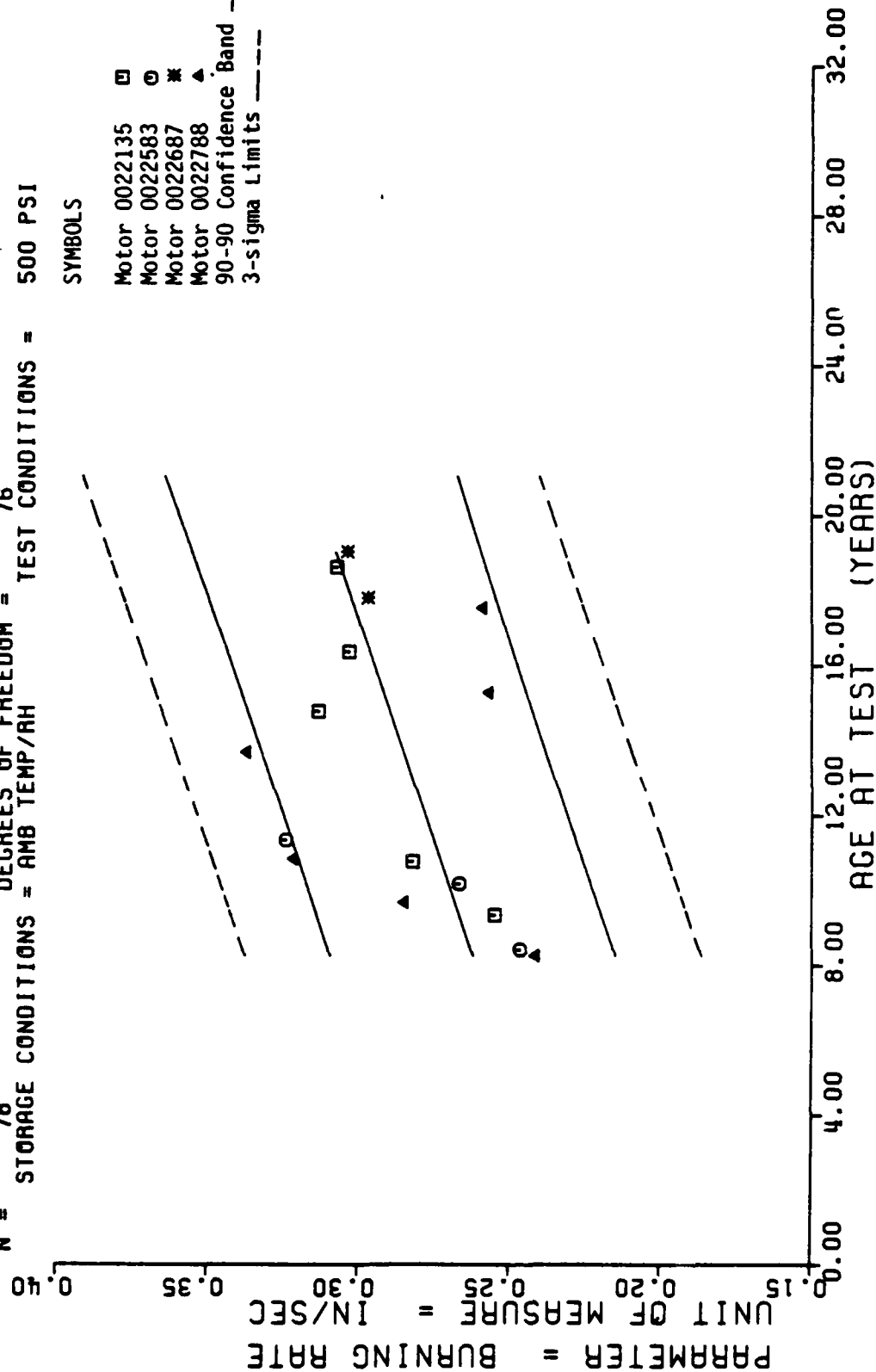
ANP-2964 (INNER) PROPELLANT, MOTOR D022687 AT 5% STRAIN, TESTED IN 1993

Figure 141

$Y = ((+2.2725976E-01) + (+3.5116271E-04) \times X)$   
 $F = +3.2514251E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +5.4738575E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +5.7021269E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 78$  DEGREES OF FREEDOM = 76  
 $N = 78$  STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 500 PSI

# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



STAGE II DISSECTED MTRS. OUTER, BURNING RATE AT 500 PSI

$F = +3.7061772E+01$   
 $R = +7.9894695E-01$   
 $t = +6.0878380E+00$   
 $N = 23$   
 $Y = ((+2.0814904E-01) + (+4.9496011E-04) \times X)$   
 $F =$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R =$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t =$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N =$  DEGREES OF FREEDOM = 21  
 $Y =$  STORAGE CONDITIONS = AMB TEMP/RH  
 $X =$  TEST CONDITIONS = 500 PSI

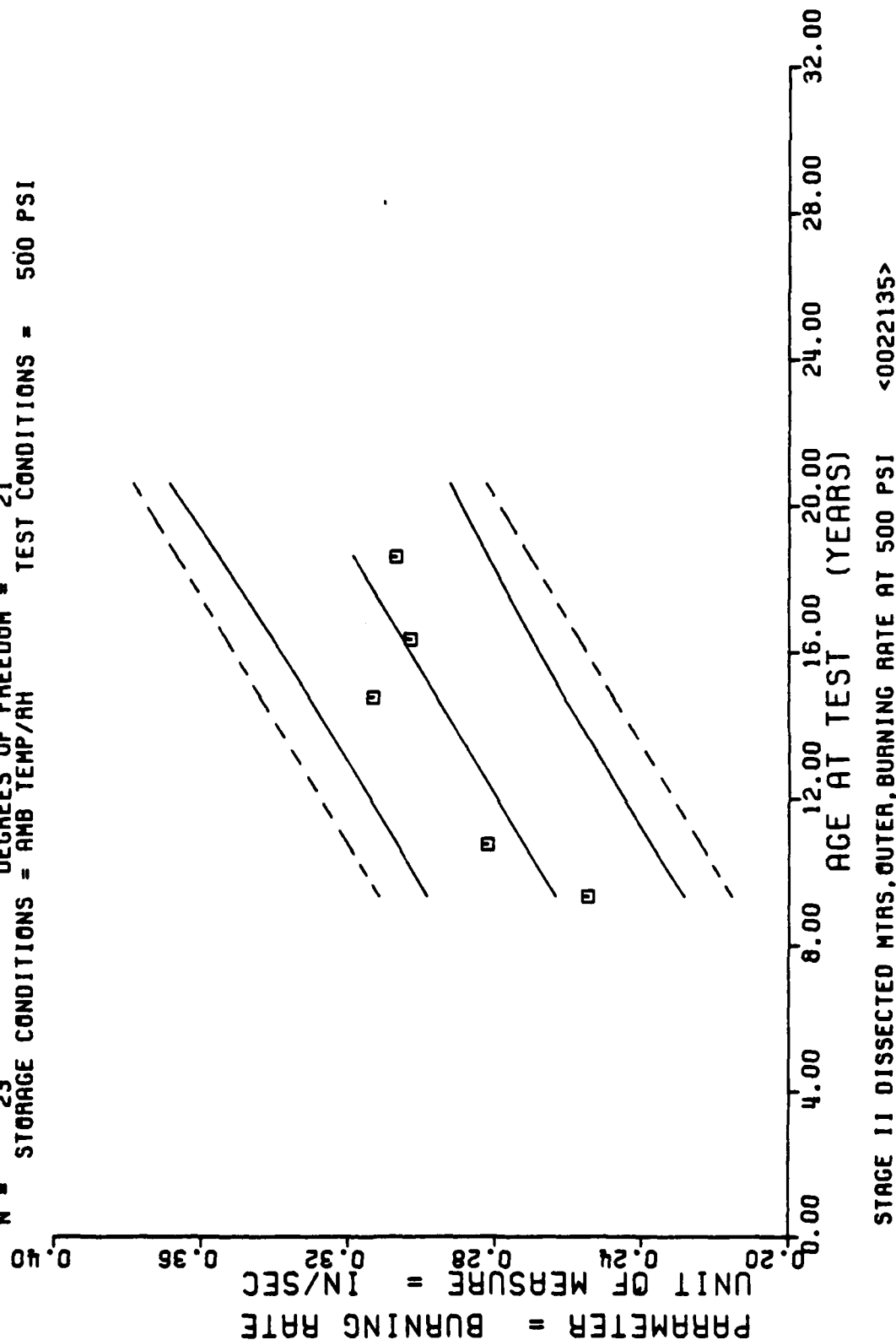
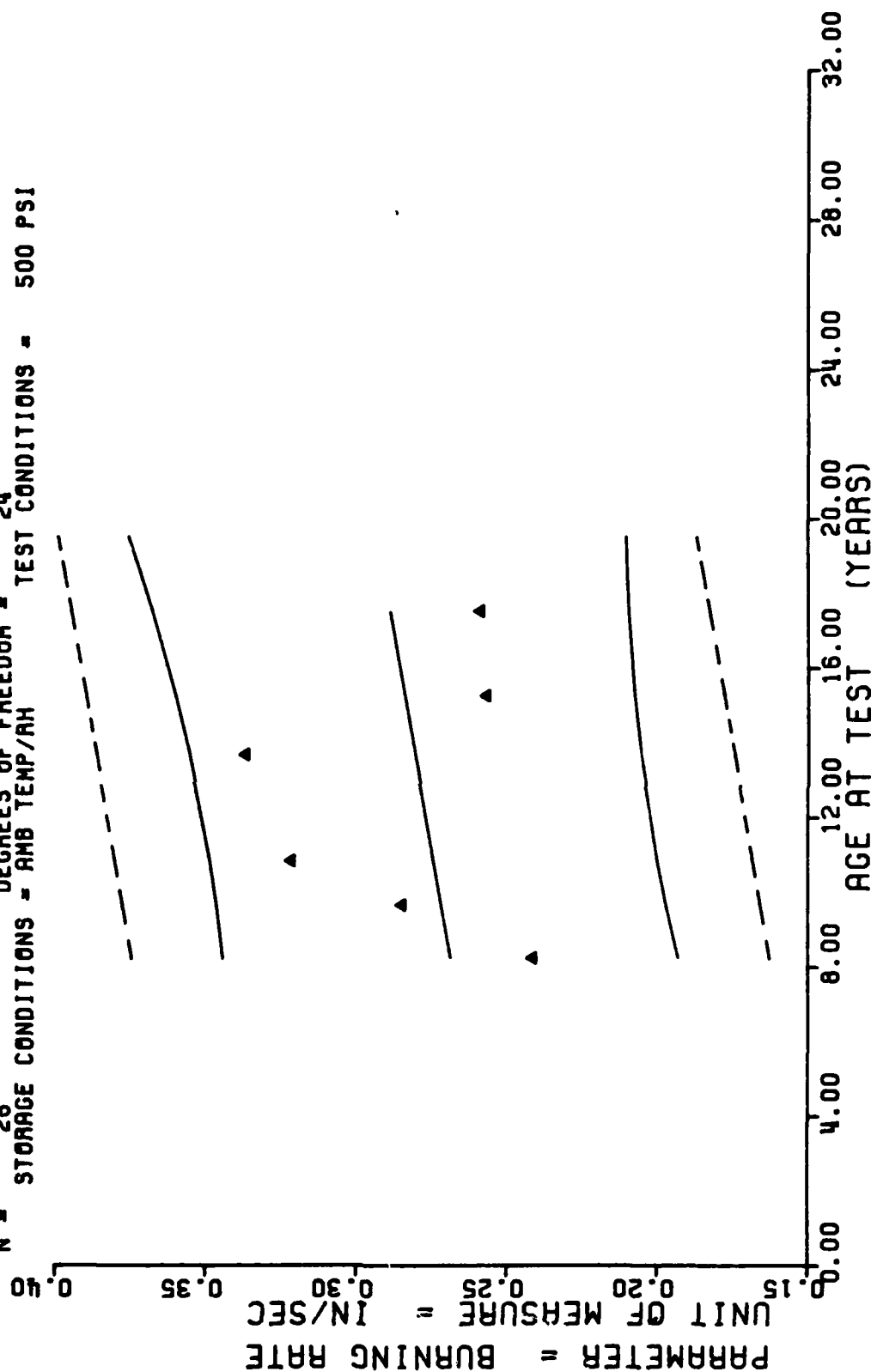


Figure 143

Y = (( +2.5085673E-01 ) + ( +1.7912790E-04 ) \* X)  
 F = +1.0014455E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma^2$  = +3.5287129E-02  
 R = +2.0013871E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e$  = +1.7899858E-04  
 t = +1.0007224E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e$  = +3.5286109E-02  
 N = 26 DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 500 PSI



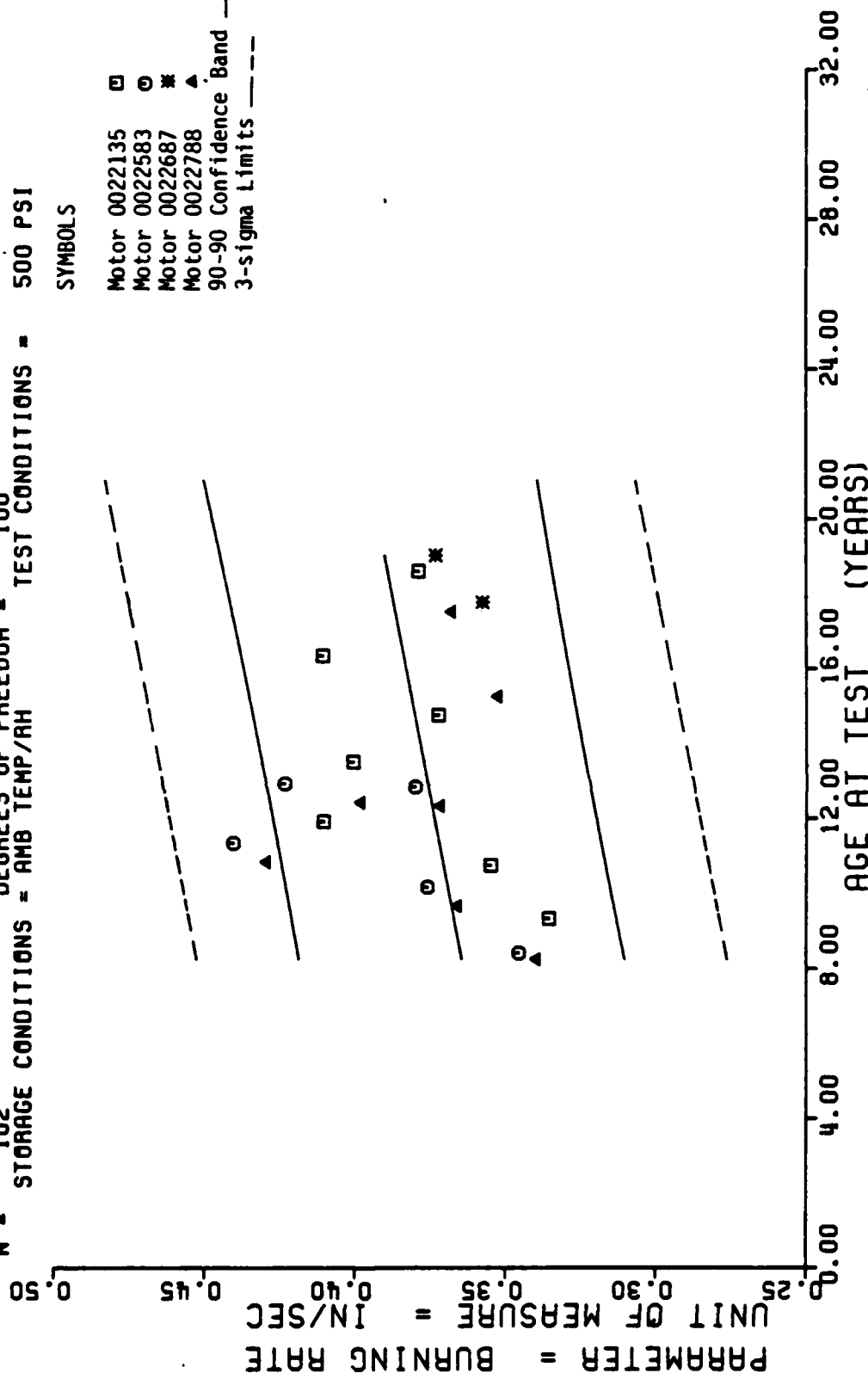
STAGE II DISSECTED MTAS, OUTER, BURNING RATE AT 500 PSI <0022788>

Figure 144

$Y = ((+3.4468077E-01) + (+1.9818641E-04) * X)$   
 $F = +7.6581808E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +2.6670999E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.7673418E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 102$  DEGREES OF FREEDOM = 100  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 500 PSI

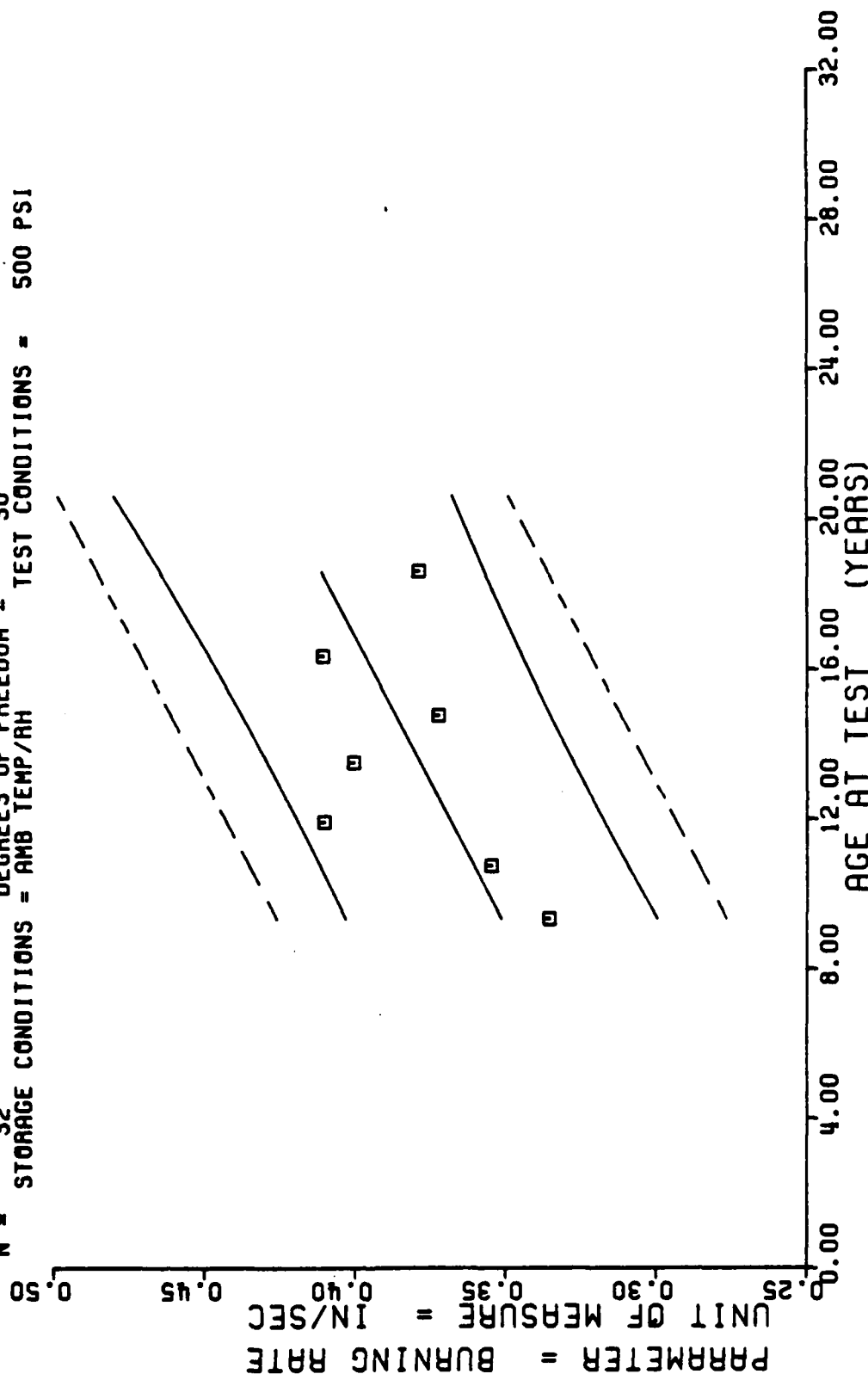
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



STAGE II DISSECTED MOTORS, INNER, BURNING RATE AT 500 PSI

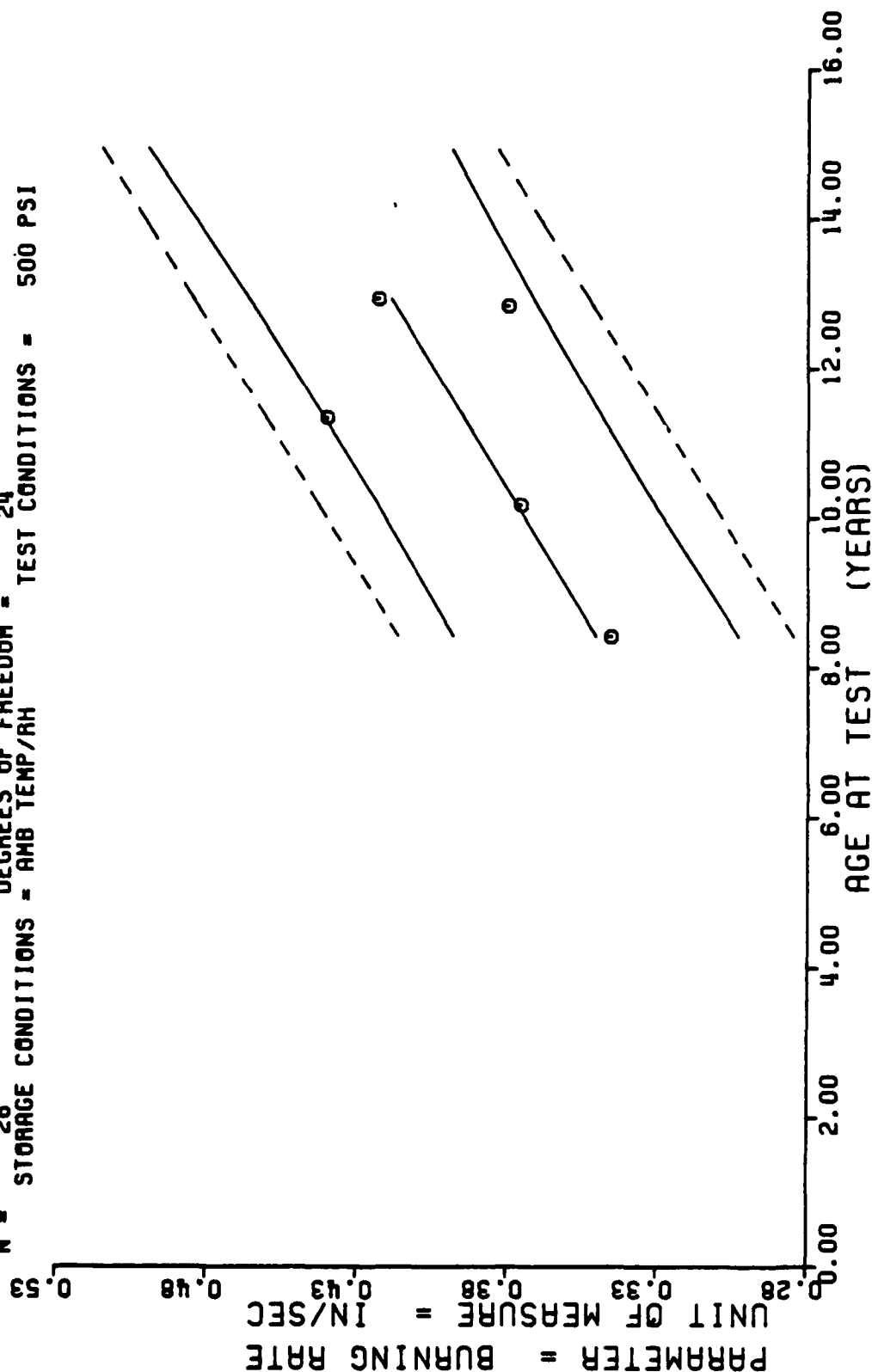
$Y = ((+2.9118456E-01) + (+5.3654948E-04) \times X)$   
 $F = +1.8432952E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma^2 = +3.1093624E-02$   
 $R = +6.1691734E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.2497186E-04$   
 $t = +4.2933614E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +2.4876067E-02$   
 $N = 32$  DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 500 PSI



STAGE II DISSECTED MTRS, INNER, BURNING RATE AT 500 PSI <0022135>

Figure 146

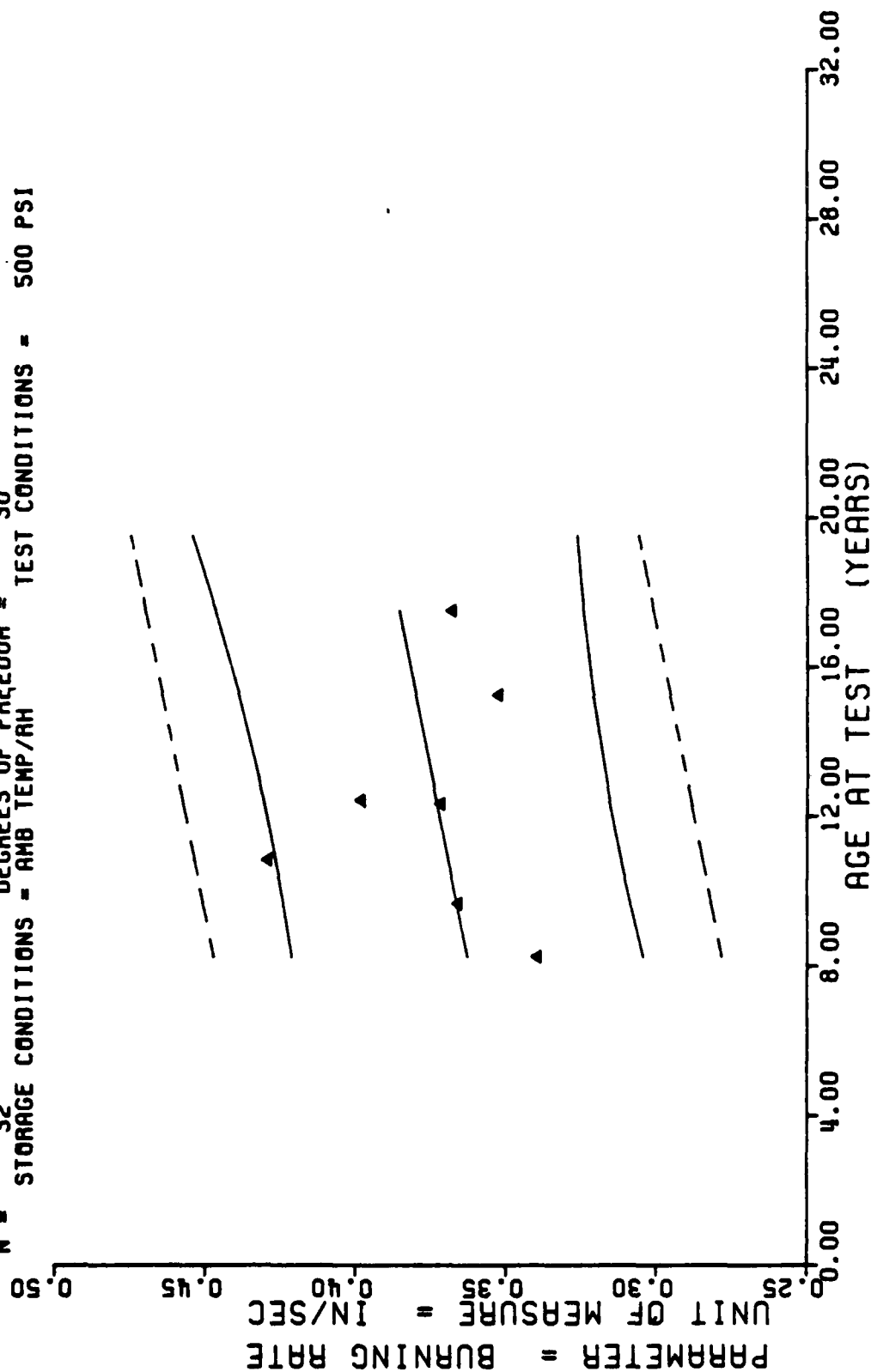
$Y = ((+2.2320633E-01) + (+1.2603698E-03) * X)$   
 $F = +4.1778919E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma_f = +3.5555395E-02$   
 $R = +7.9695763E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.9499317E-04$   
 $t = +6.4636614E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_e = +2.1919576E-02$   
 $N = 26$  DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 500 PSI



STAGE II DISSECTED MTRS, INNER, BURNING RATE AT 500 PSI <0022583>

Figure 147

Y = (( +3.4277438E-01 ) + ( +2.0209777E-04 ) \* X)  
 F = +1.9606245E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r$  = +2.8531798E-02  
 R = +2.4767923E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e$  = +1.4433256E-04  
 t = +1.4002230E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e$  = +2.8099743E-02  
 N = 32 DEGREES OF FREEDOM = 30  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 500 PSI



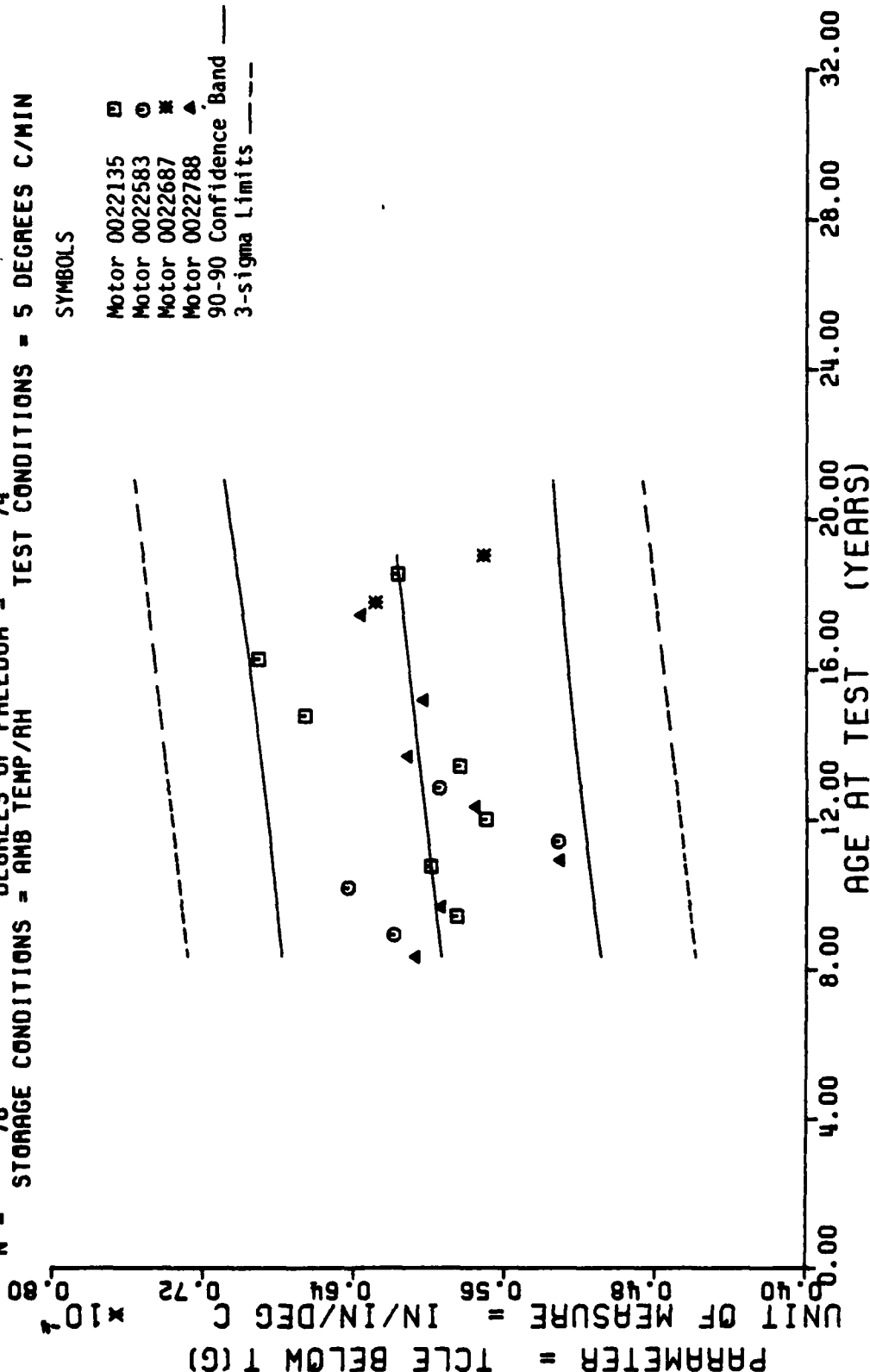
STAGE II DISSECTED MTRAS, INNER, BURNING RATE AT 500 PSI <0022788>

Figure 148

$Y = ((+5.7402796E-05) + (+1.8628806E-08) \times X)$   
 $F = +2.2207573E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  
 $R = +1.7069229E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  
 $t = +1.4902205E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  
 $N = 76$  DEGREES OF FREEDOM = 74  
 $N = 76$  STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN

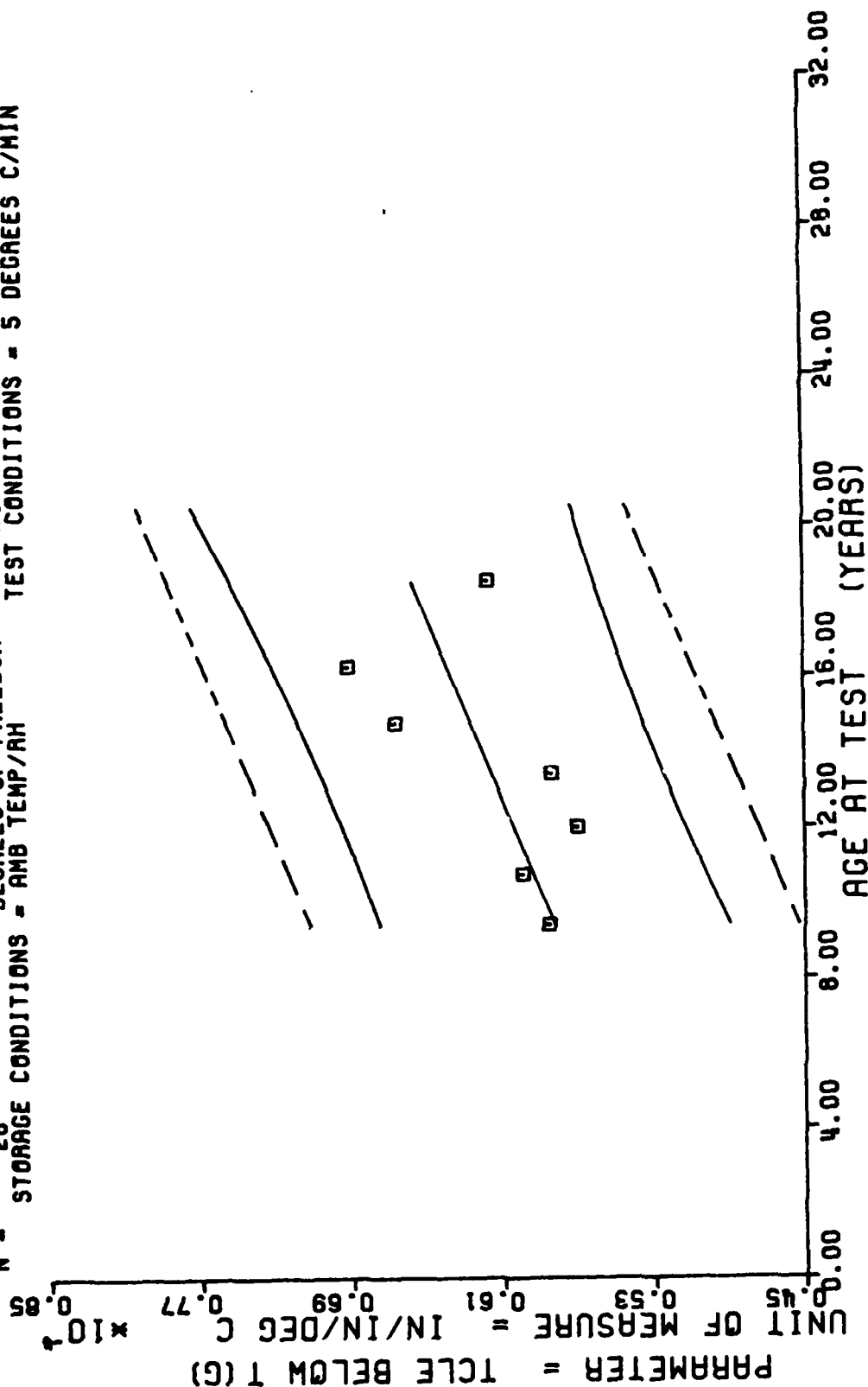
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✱  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



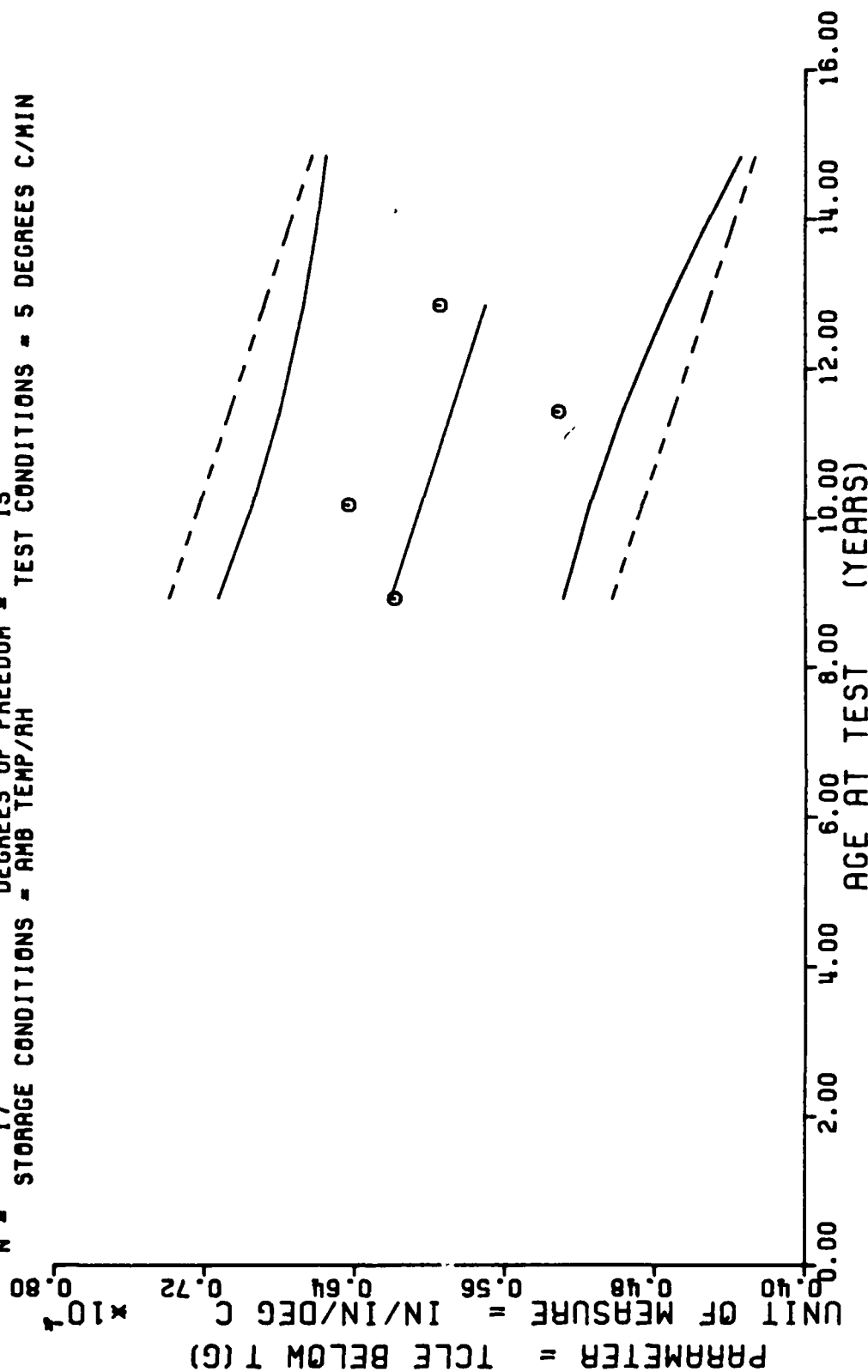
STAGE II DISSECTED MTRS. OUTER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

$Y = ((+5.0556864E-05) + (+6.8034463E-08) \times X)$   
 $F = +9.0848012E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\alpha = +4.9447283E-08$   
 $R = +5.2401467E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +2.2572089E-08$   
 $I = +3.0141004E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_c = +4.2983143E-06$   
 $N = 26$  DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN



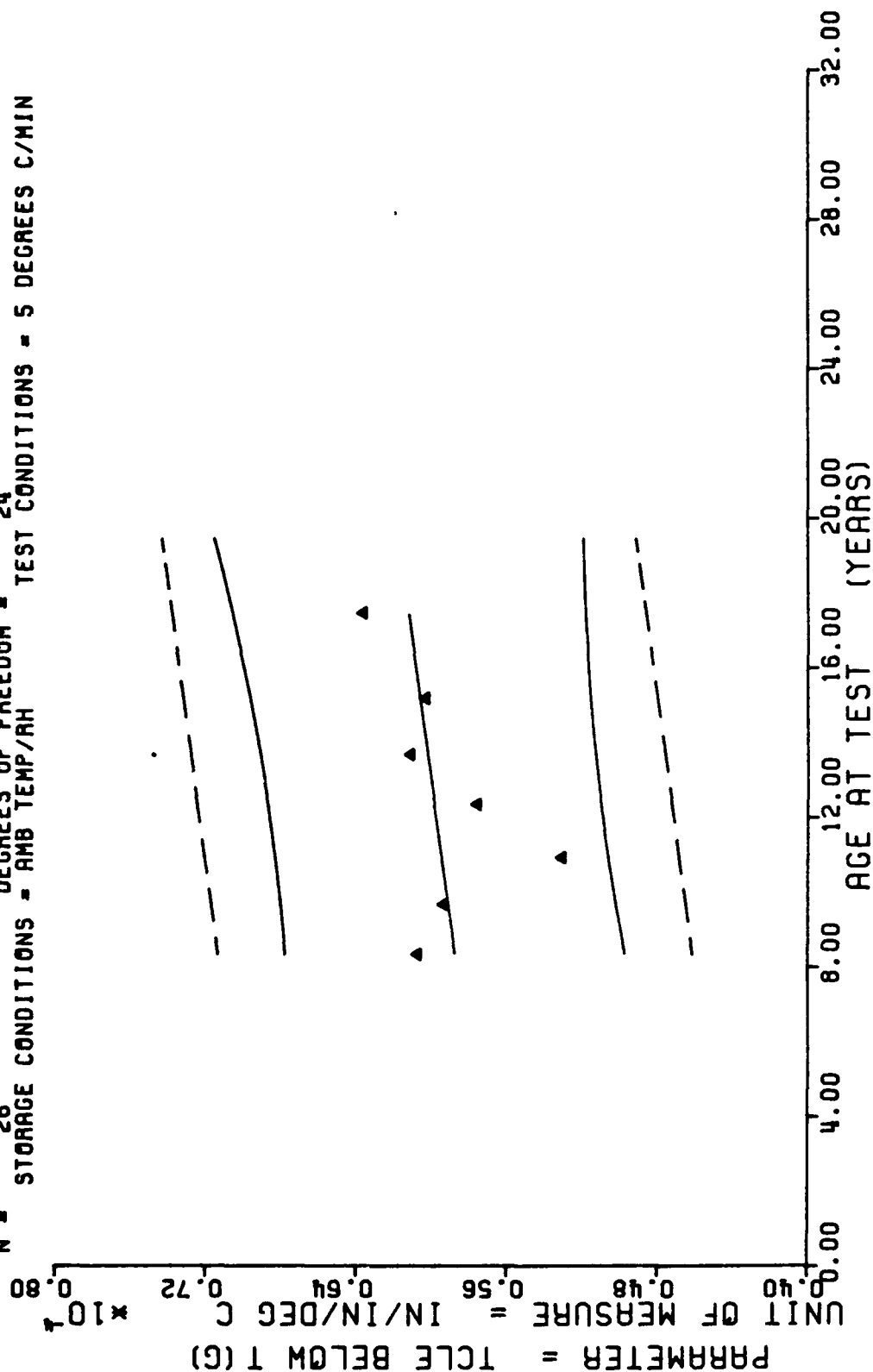
STAGE II DISSEC MTRAS. OUTER, THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022135>

Y = (( +7.3487718E-05 ) + ( -1.0672611E-07 ) \* X )  
 F = +4.0696563E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha$  = +4.2915529E-08  
 R = -4.6196325E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e$  = +5.2904406E-08  
 t = +2.0173389E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e$  = +3.9309998E-08  
 N = 17 DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSEC MTRAS, OUTER, THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022583>

$F = +1.0399515E+00$   
 $R = +2.0379325E-01$   
 $t = +1.0197801E+00$   
 $N = 26$   
 $Y = (( +5.6469181E-05 ) + ( +2.2466101E-08 ) * X)$   
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF t = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/4H  
 TEST CONDITIONS = 5 DEGREES C/MIN



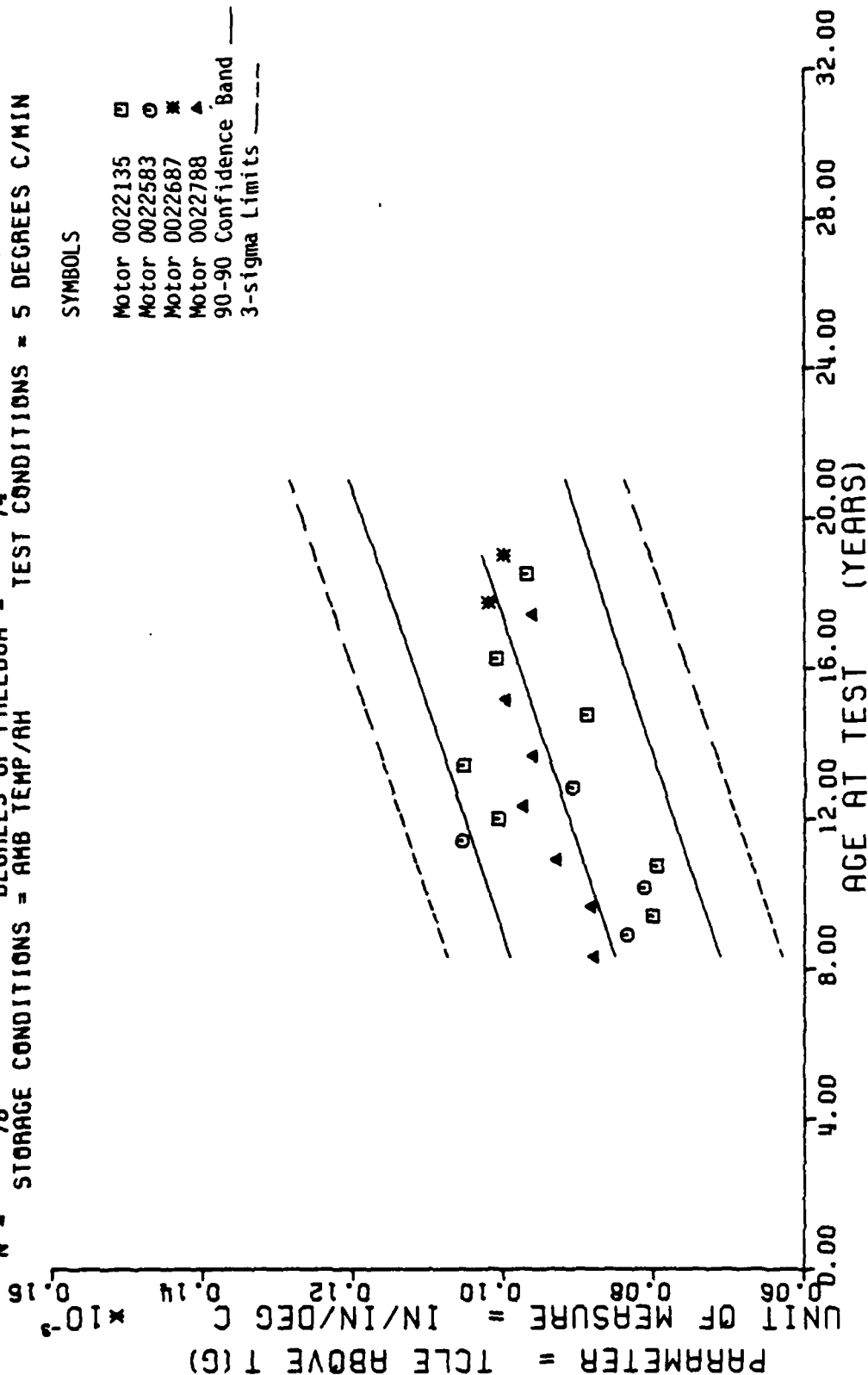
STAGE II DISSEC MTRS. OUTER, THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022788>

Figure 152

$Y = ((+7.1345868E-05) + (+1.3798422E-07) \times X)$   
 $F = +4.4669890E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +6.1353193E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +6.6835537E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 76$  DEGREES OF FREEDOM = 74  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN

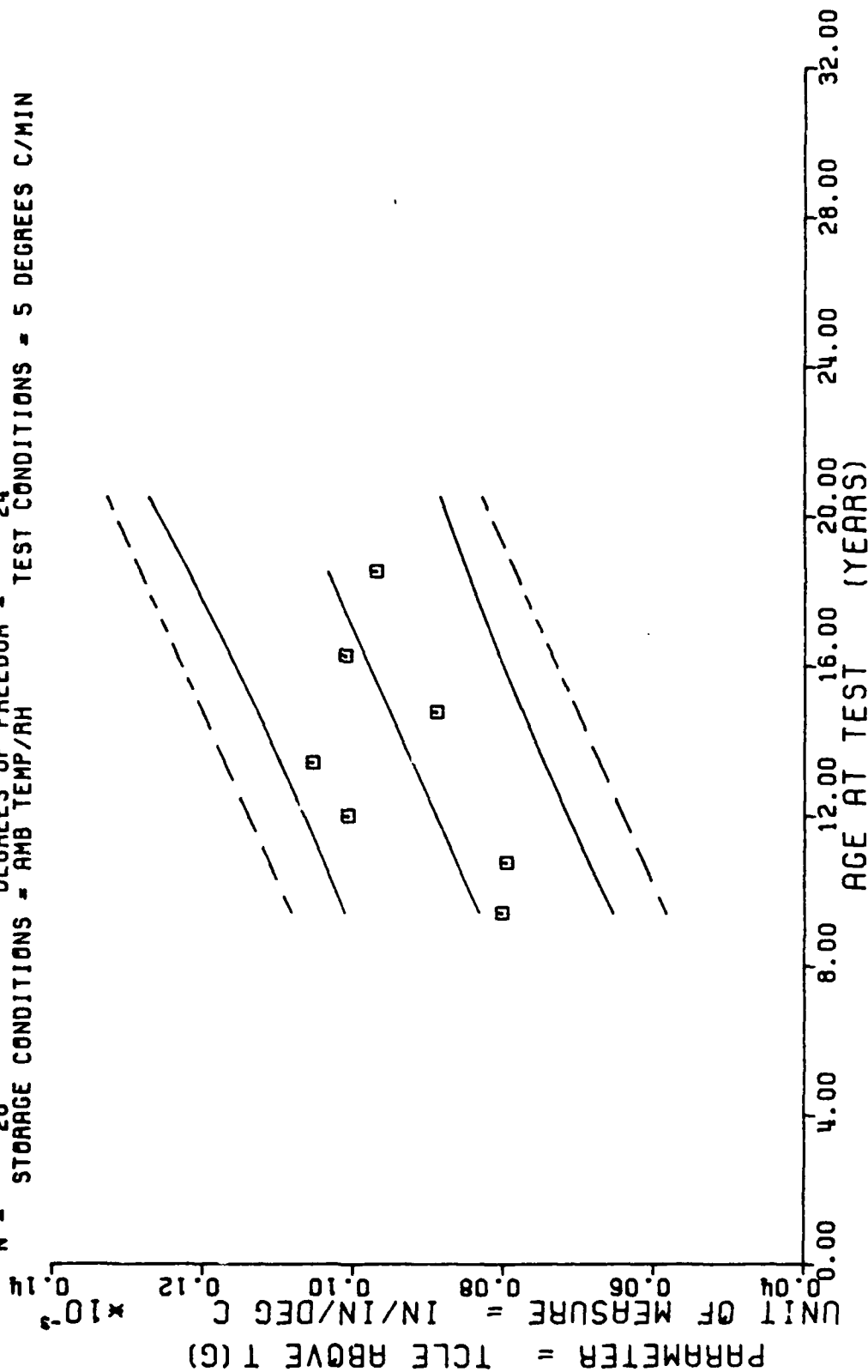
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band ---  
 3-sigma Limits ---



STAGE 11 DISSECTED MTRS, OUTER, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Y = (( +6.2394036E-05 ) + ( +1.8459253E-07 ) \* X)  
 F = +1.7952648E+01 SIGNIFICANCE OF F = SIGNIFICANT  $\sigma^2$  = +1.0746978E-05  
 R = +6.5416088E-01 SIGNIFICANCE OF R = SIGNIFICANT  $S_e$  = +4.3566219E-08  
 t = +4.2370566E+00 SIGNIFICANCE OF t = SIGNIFICANT  $S_e$  = +8.2961515E-06  
 N = 26 DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSEC MTRS, OUTER, THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022135>

Figure 154

AU-A14U 331

LGM-308 STAGE II DISSECTED MOTOR TEST REPORT(U) OGDEN  
AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANALYSIS  
LAB E M DALABA FEB 84 MANPA-496(84)

3/3

UNCLASSIFIED

F/G 21/8.2 NL

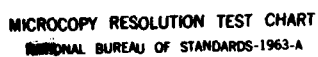
F N E

12876

**FOLIO**

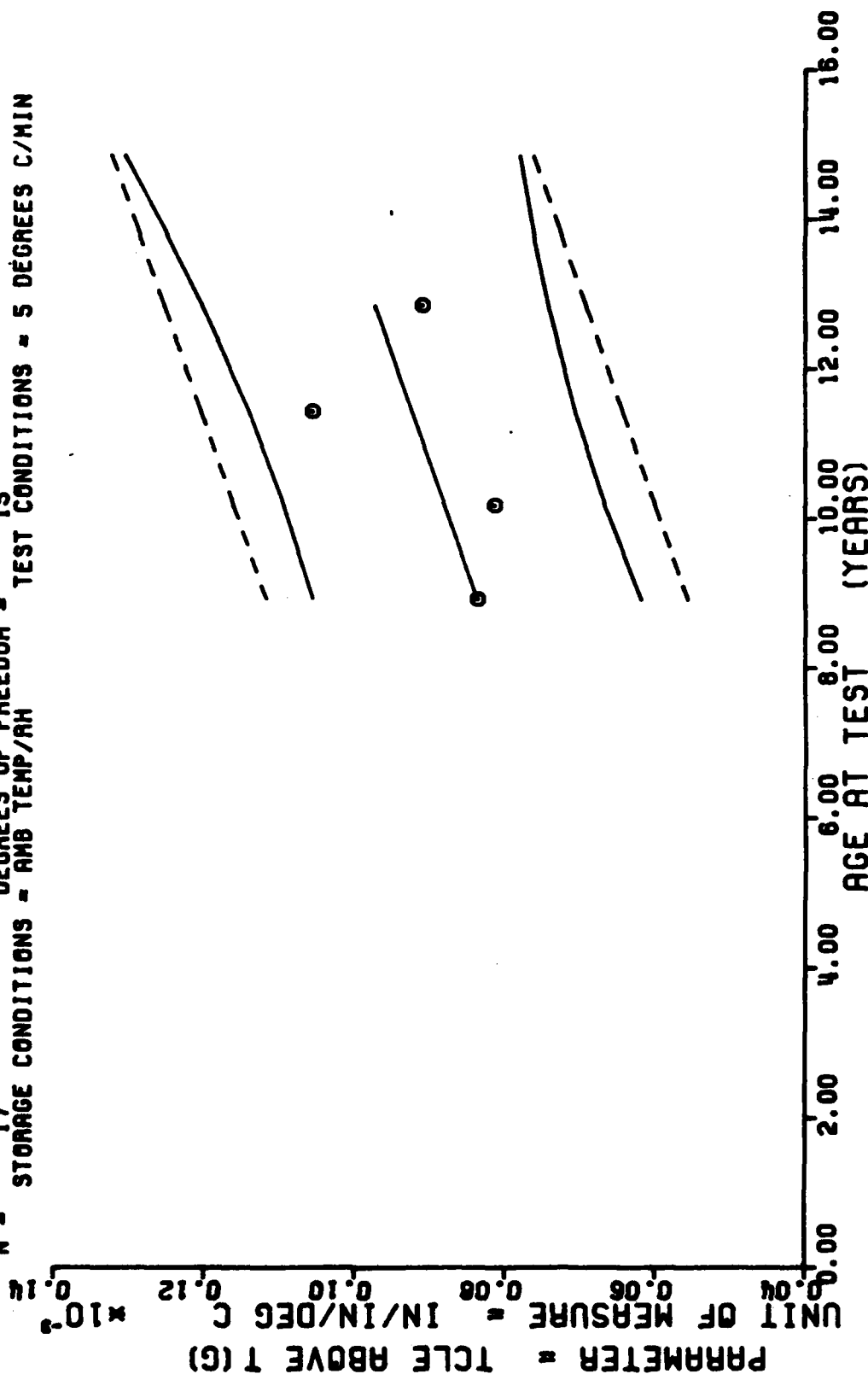
5-11

OTIC



**MICROCOPY RESOLUTION TEST CHART**  
**NATIONAL BUREAU OF STANDARDS-1963-A**

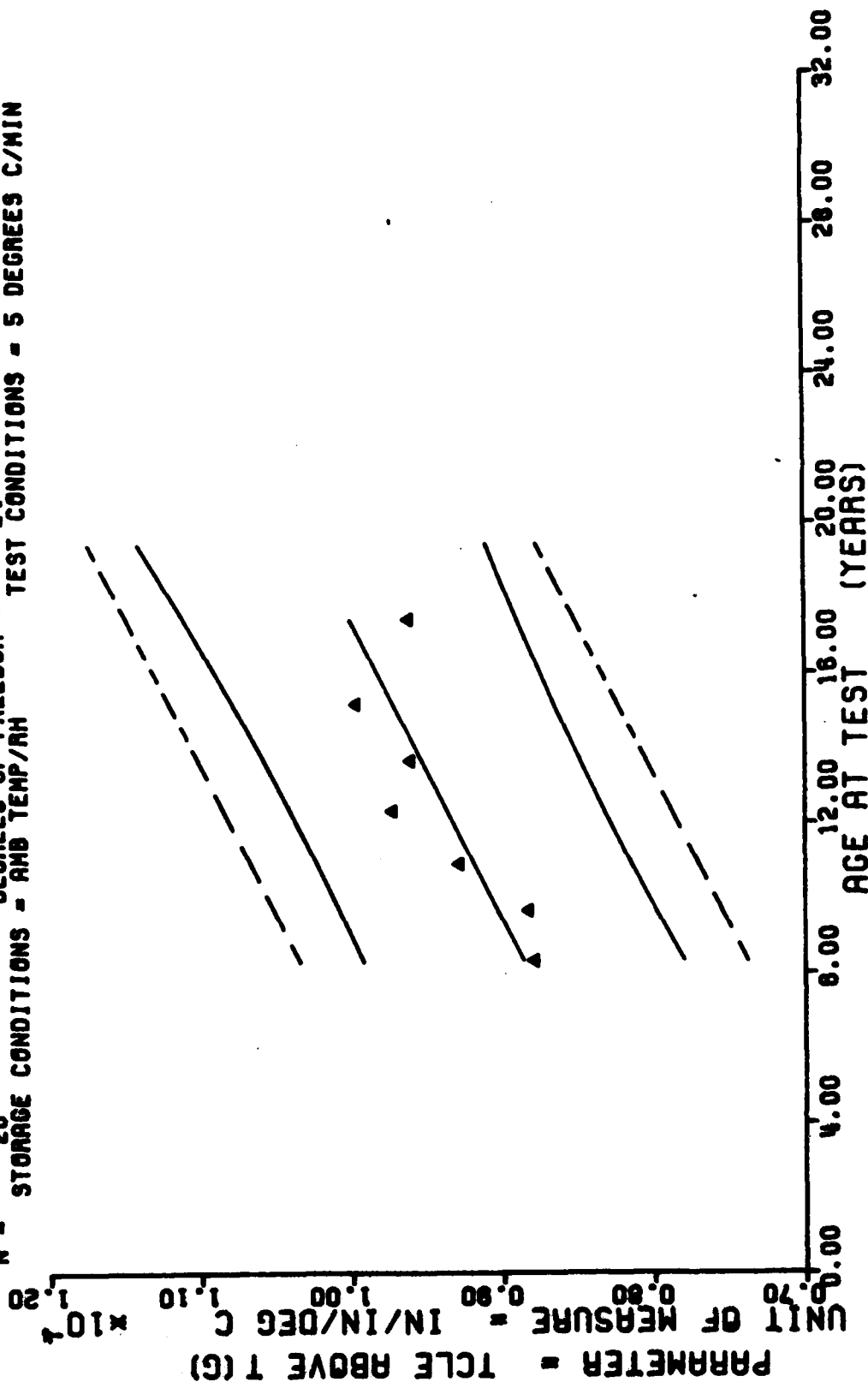
$Y = ((+5.2780090E-05) + (+2.8832385E-07) \times X)$   
 $F = +5.2726452E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma = +1.0502018E-05$   
 $R = +5.0988895E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +1.2556433E-07$   
 $t = +2.2962241E+00$  SIGNIFICANCE OF t = SIGNIFICANT  $S_t = +9.3299105E-06$   
 $N = 17$  DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE 11 DISSEC MTRAS. OUTER, THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022583>

Figure 155

F = +1.6303831E+01  
 R = +6.3602132E-01  
 I = +4.0378003E+00  
 N = 26  
 Y = (( +7.8159039E-05 ) + ( +1.0451095E-07 ) \* X)  
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = RH AND TEMP/RH  
 TEST CONDITIONS = 5 DEGREES C/MIN  
 S<sub>1</sub> = +6.2581638E-08  
 S<sub>2</sub> = +2.5883140E-08  
 S<sub>3</sub> = +4.9288291E-08



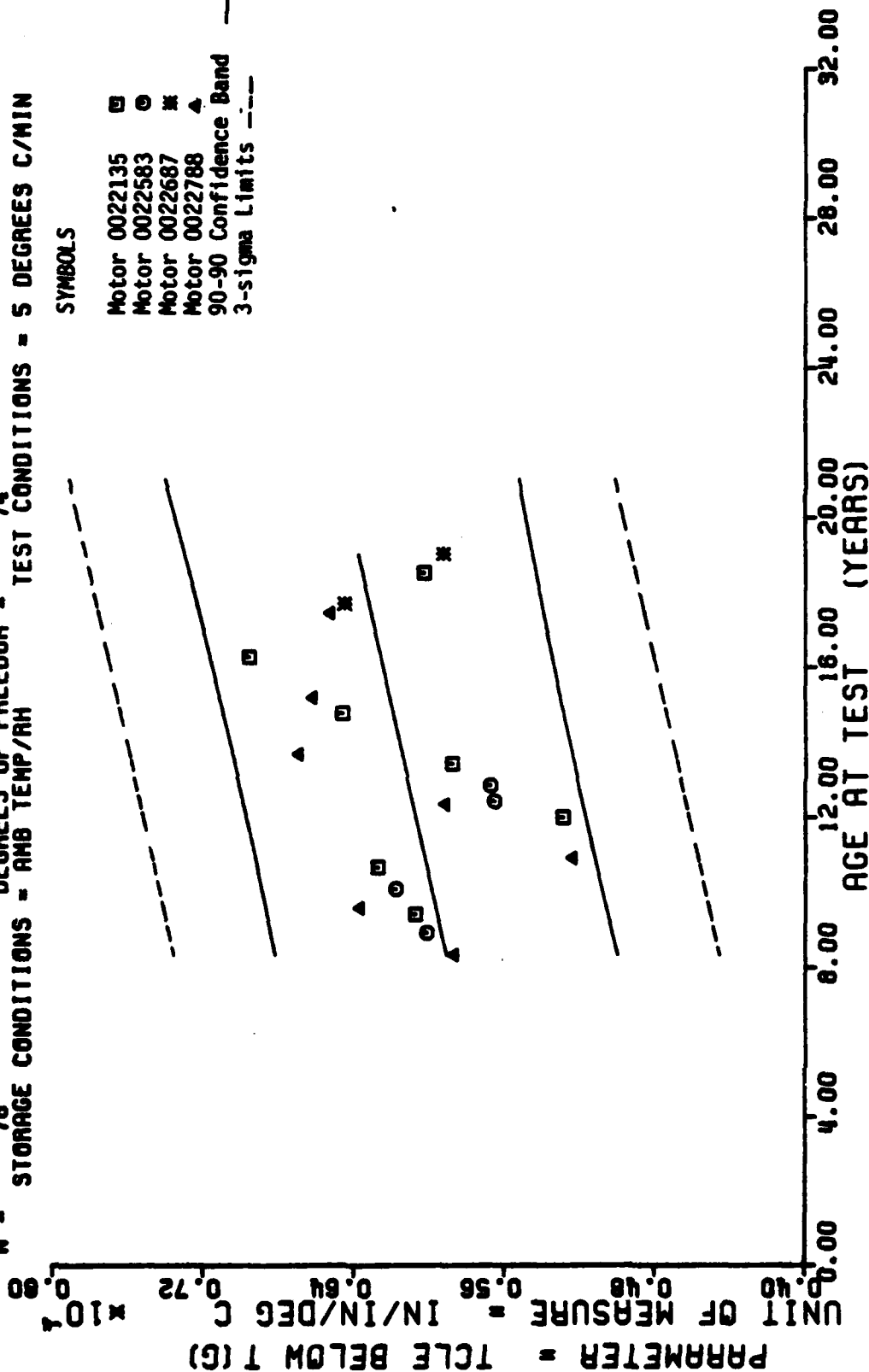
STAGE 11 DISSEC NTAS, OUTER, THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022700>

Figure 156

$Y = ((+5.5401205E-05) + (+3.6573544E-08) \times X)$   
 $F = +7.0696866E+00$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +2.9530502E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +2.6588882E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 76$  DEGREES OF FREEDOM = 74  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN

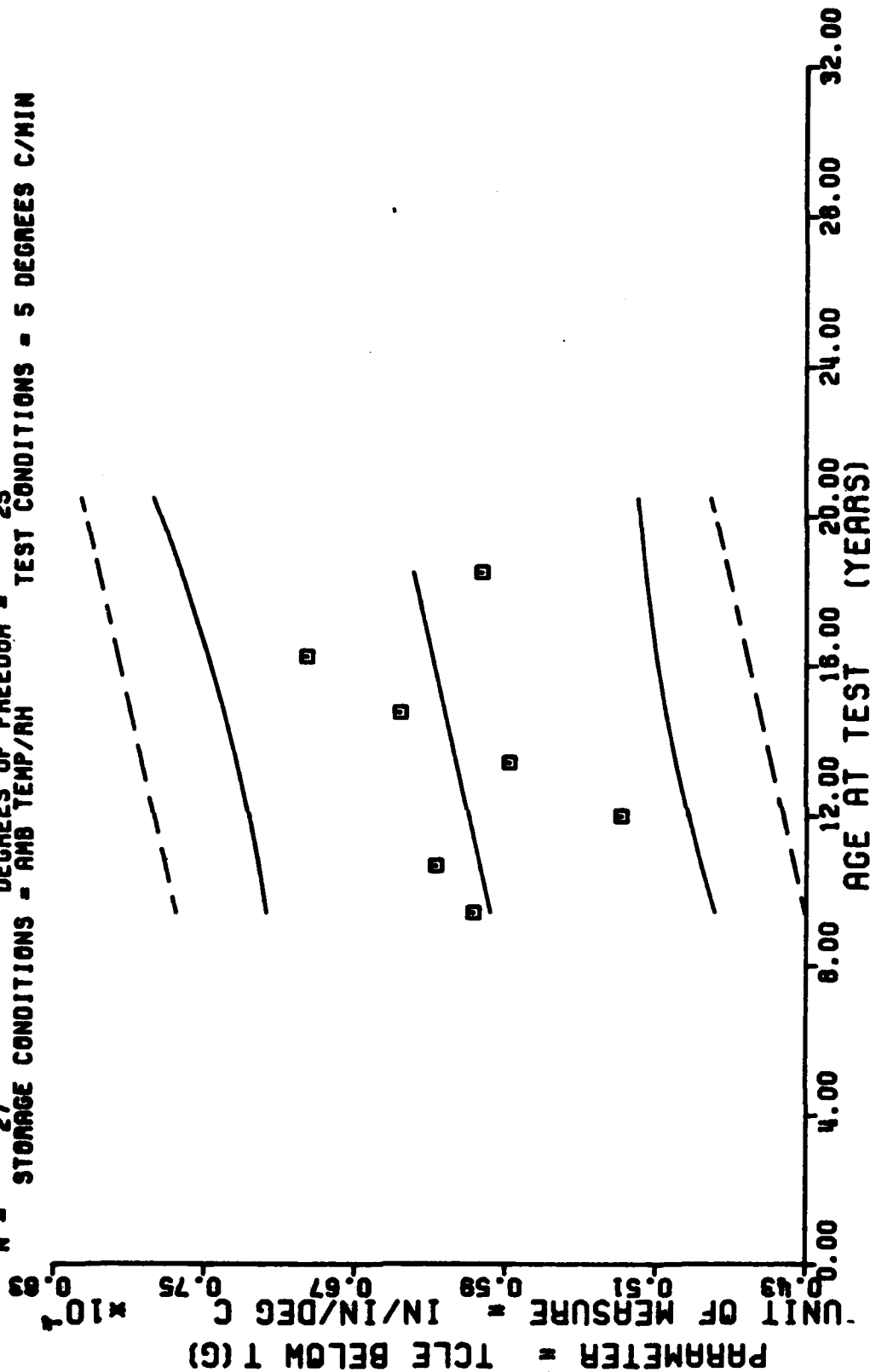
# SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✖  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



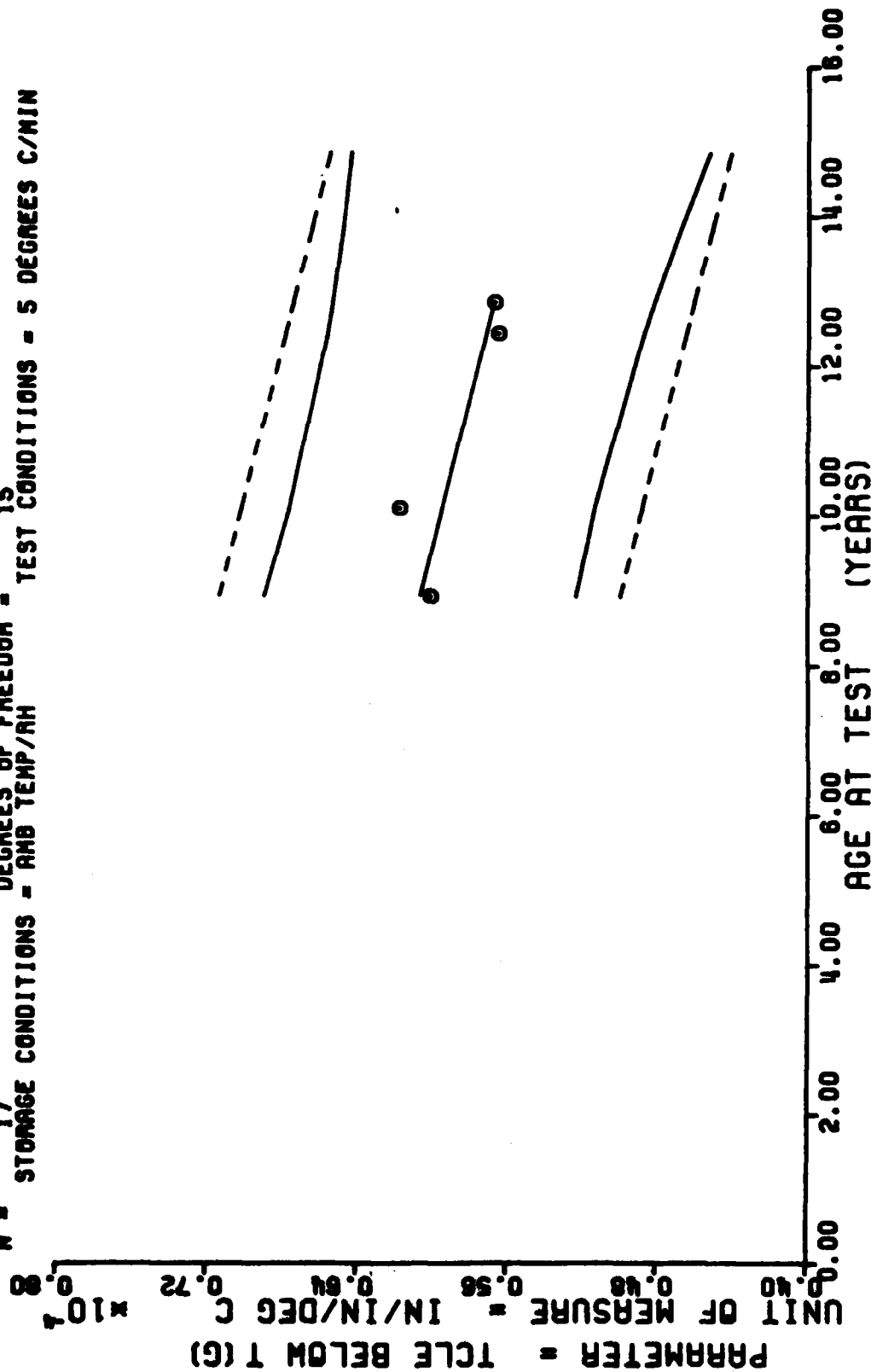
STAGE II DISSECTED HTS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TC

F = +1.0052593E+00  
 R = +2.5130299E-01  
 I = +1.2001754E+00  
 N = 27  
 Y = (( +5.554410E-05 ) + ( +3.7626360E-08 ) \* X )  
 SIGNIFICANCE OF F = NOT SIGNIFICANT  
 SIGNIFICANCE OF R = NOT SIGNIFICANT  
 SIGNIFICANCE OF I = NOT SIGNIFICANT  
 DEGREES OF FREEDOM = 25  
 STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSEC MTRS, INNER, THERMAL COEFF OF LINEAR EXPAN BELOW TC <0022135>

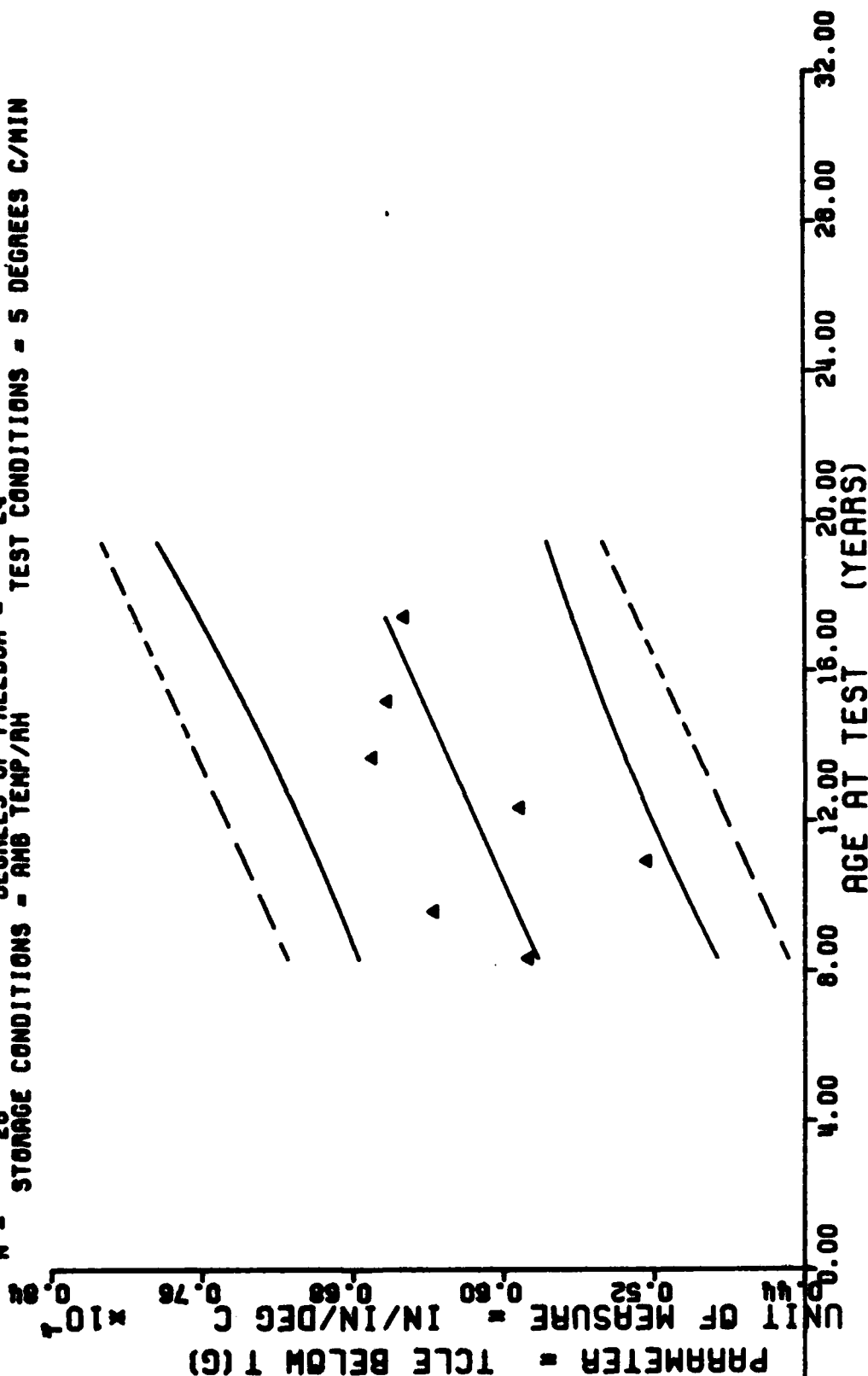
$Y = ((+6.950958E-05) + (-8.2714405E-08) \times X)$   
 $F = +3.7260783E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +3.8480705E-06$   
 $R = -4.4608954E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S = +4.2850427E-08$   
 $t = +1.9303052E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S = +3.5588650E-06$   
 $N = 17$  DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = RH & TEMP/RH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE II DISSEC HTAS, INNER, THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022583>

Figure 159

$Y = ((+5.0762088E-05) + (+7.3892587E-08) \times X)$   
 $F = +1.0160972E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +5.1708529E-08$   
 $R = +5.4538418E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +2.3181057E-08$   
 $I = +3.1876279E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_1 = +4.4233381E-08$   
 $N = 26$  DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN

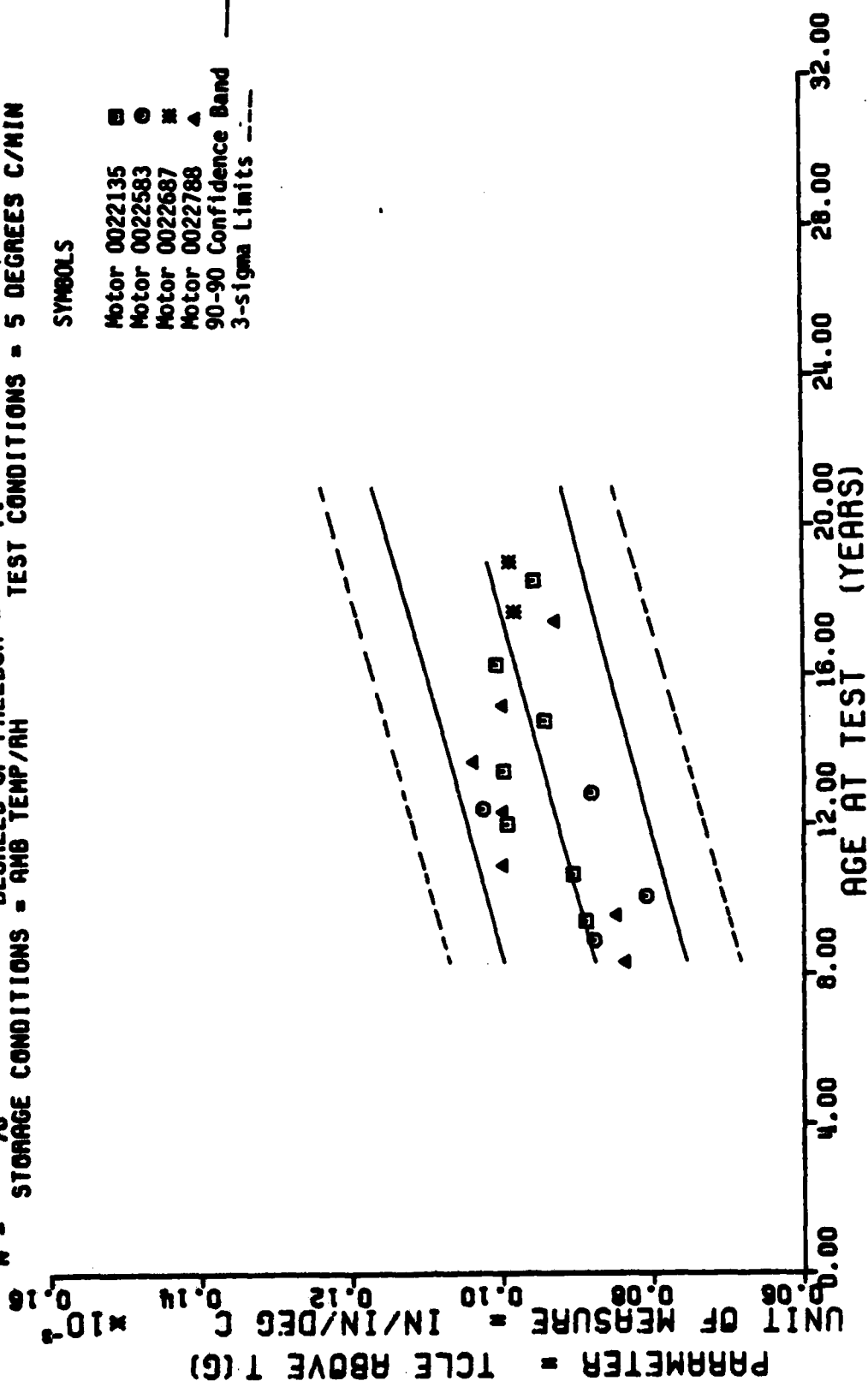


STAGE 11 DISSEC MTAS, INNER, THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022700>

Figure 160

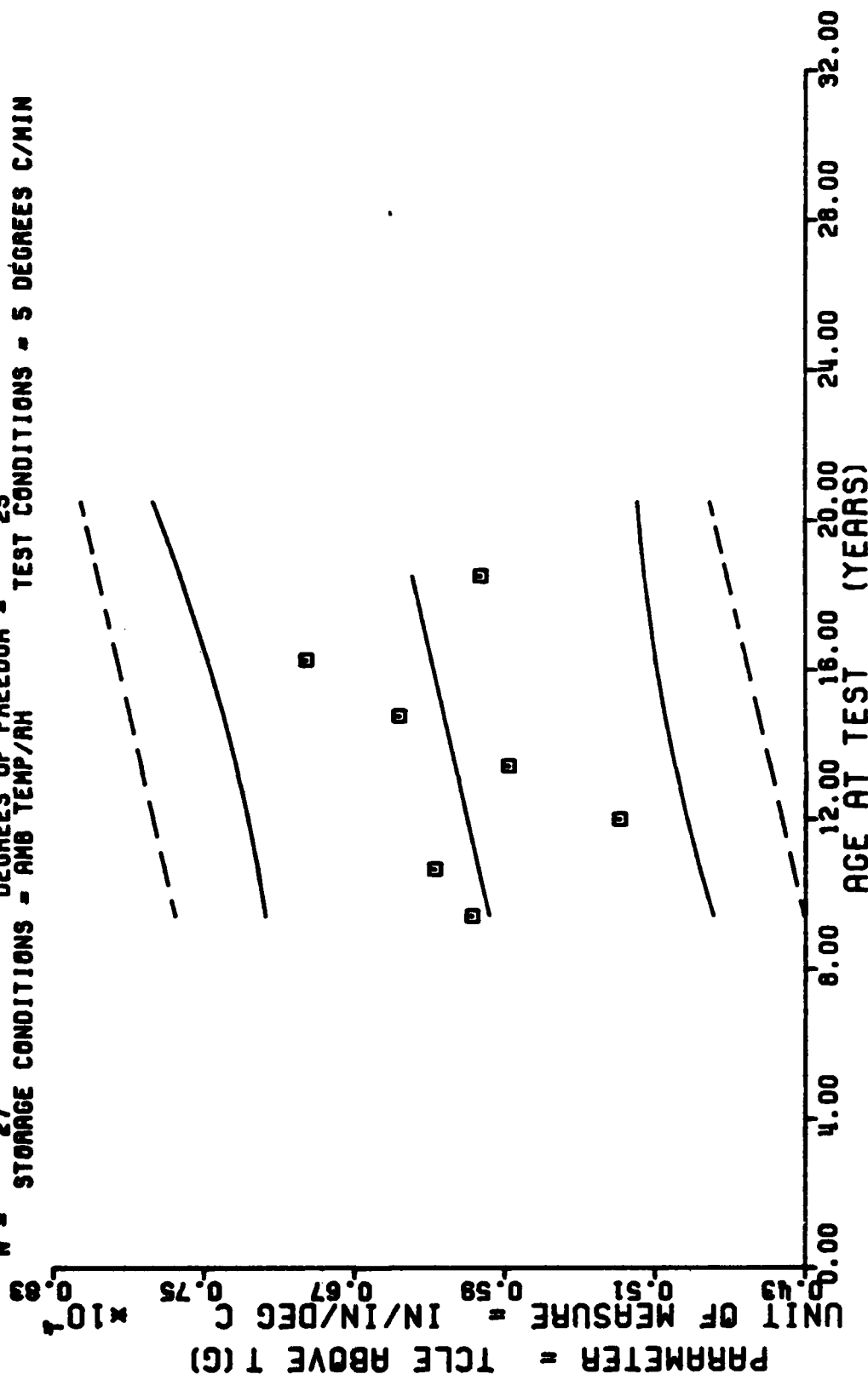
$Y = ((+7.8589247E-05) + (+1.1048389E-07) \times X)$   
 $F = +3.8342980E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = +5.7390212E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +6.0285122E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 76$  DEGREES OF FREEDOM = 74  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN

SYMBOLS  
 Motor 0022135  $\square$   
 Motor 0022583  $\circ$   
 Motor 0022687  $\times$   
 Motor 0022788  $\triangle$   
 90-90 Confidence Band  
 3-sigma Limits ---



STAGE II DISSECTED HTS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

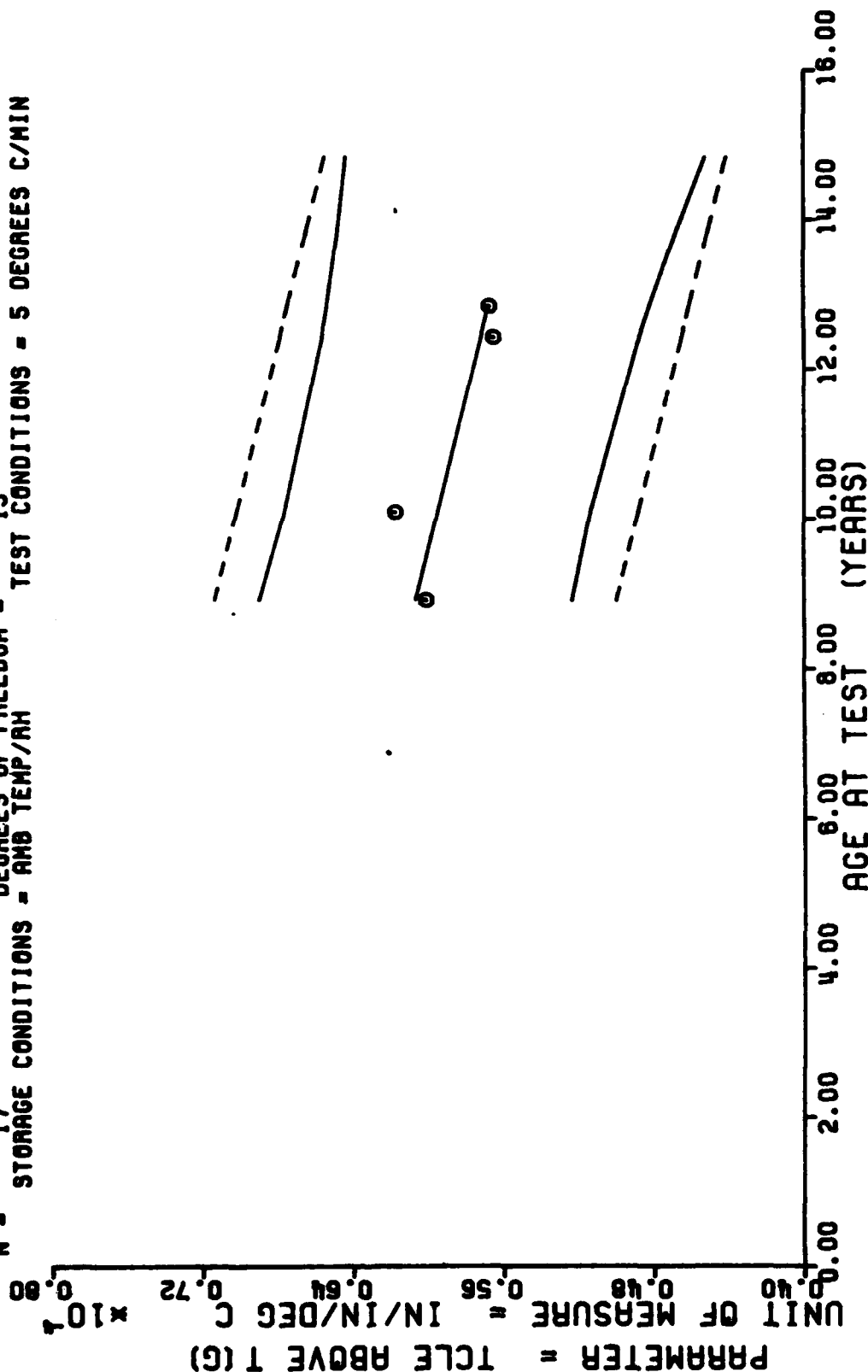
Y = (( +5.554410E-05 ) + ( +3.7626360E-08 ) \* X )  
 F = +1.6852593E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma^2$  = +5.6446253E-08  
 R = +2.5130298E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e$  = +2.6984034E-08  
 t = +1.2981754E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e$  = +5.5716788E-08  
 N = 27 DEGREES OF FREEDOM = 25  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE 11 DISSEC MTRS, INNER, THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022135>

Figure 162

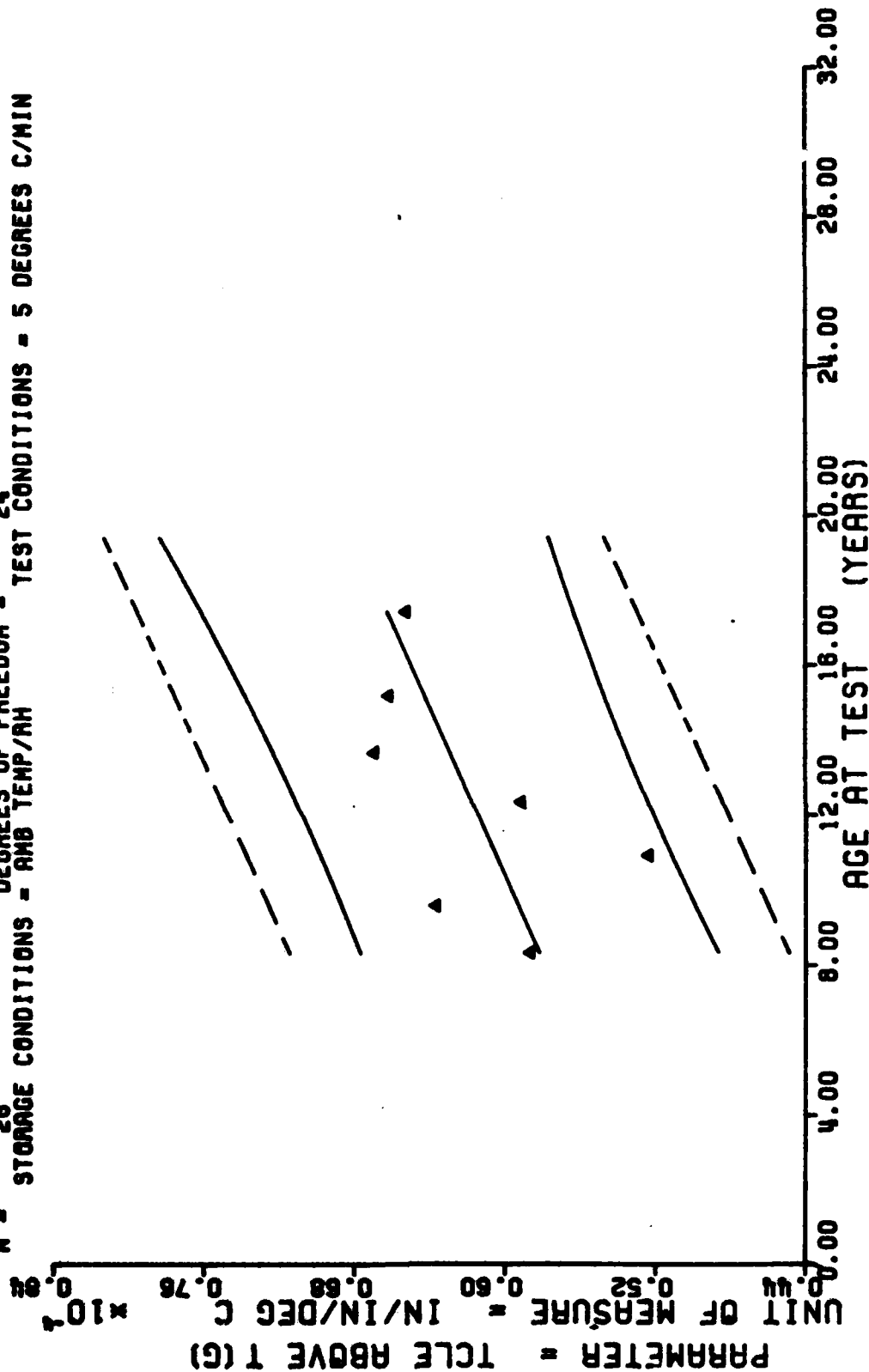
$Y = ((+8.9500958E-05) + (-8.2714405E-08) \times X)$   
 $F = +3.7260783E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +3.8480705E-06$   
 $R = -4.4606954E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +4.2850427E-08$   
 $t = +1.9903052E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +3.5589650E-06$   
 $N = 17$  DEGREES OF FREEDOM = 15  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = 5 DEGREES C/MIN



STAGE 11 DISSEC MTRS, INNER, THERMAL COEFF OF LINEAR EXPAN ABOVE TC <0022583>

Figure 163

F = +1.0160972E+01  
 A = +5.4538416E-01  
 I = +3.1876279E+00  
 N = 26  
 Y = (( +5.0762086E-05 ) + ( +7.3892587E-08 ) \* X)  
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF A = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 24  
 STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = 5 DEGREES C/MIN

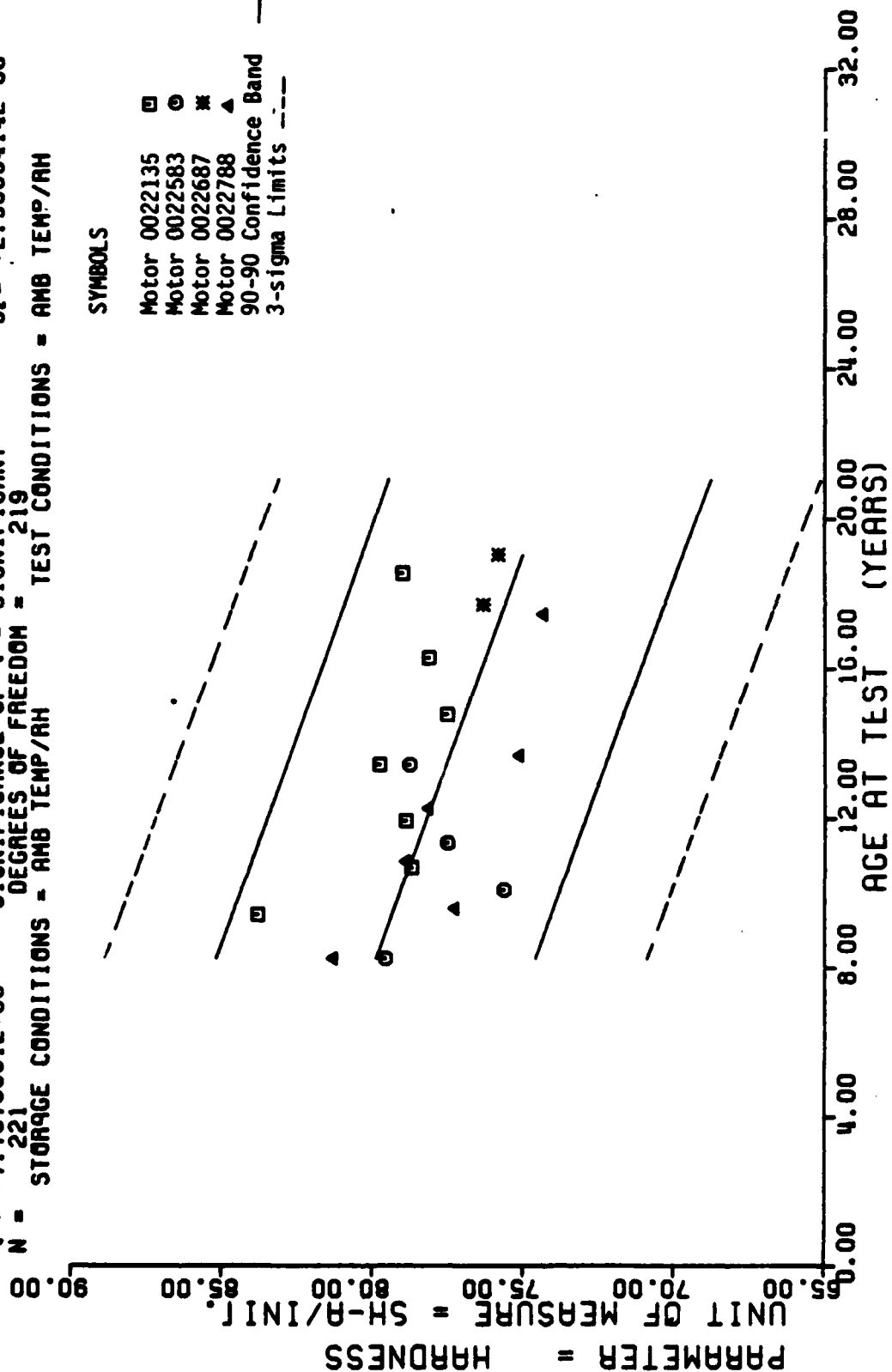


STAGE II DISSEC HTAS, INNER, THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022788>

$Y = ((+8.3565175E+01) + (-3.7539312E-02) \times X)$   
 $F = +6.0181212E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -4.6428790E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +7.7576551E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 221$  DEGREES OF FREEDOM = 219  
 $N =$  STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH

# SYMBOLS

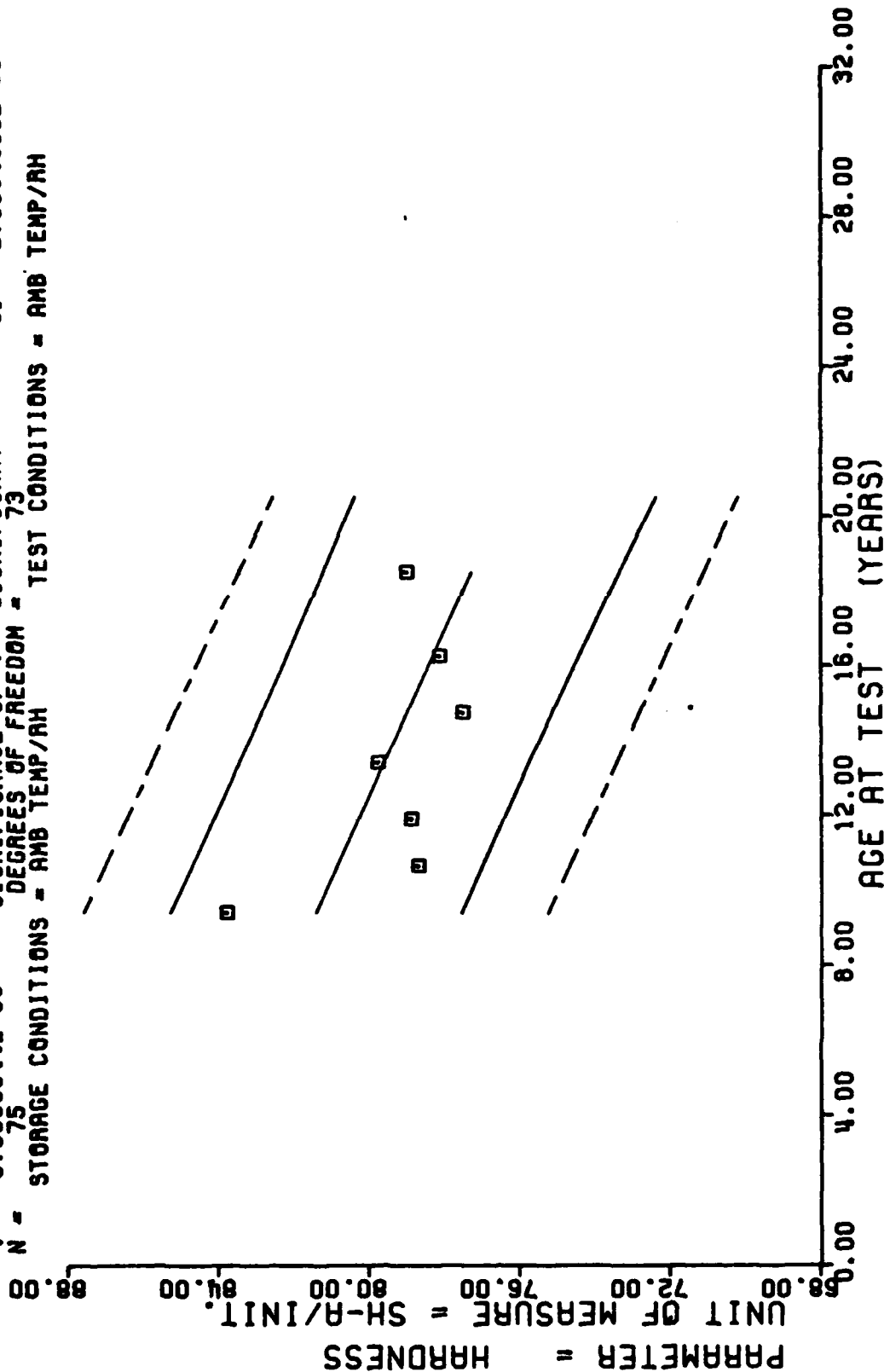
Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 \*  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



11 STAGE DSCT MTRAS ONLY, OUTER, HARDNESS, NON-ORANTO, SHURE-A, INITIAL.

Figure 165

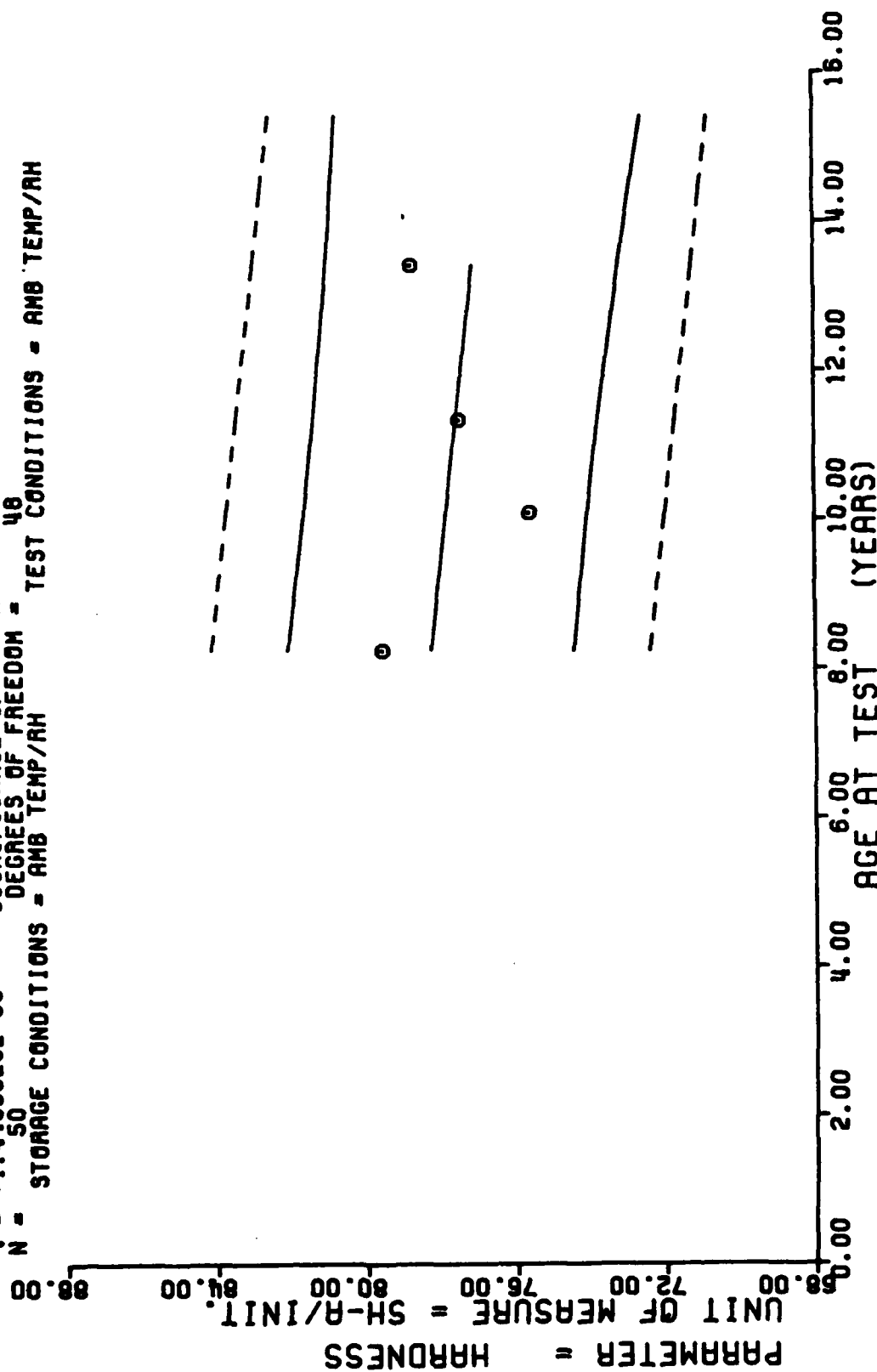
$Y = (1 + 8.5894086E+01) + (-3.7870385E-02) \times X$   
 $F = +3.4414466E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -5.8602958E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +5.8663844E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 75$  DEGREES OF FREEDOM = 73  
 $N =$  STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT HTAS ONLY, OUTER, HARDNESS, NON-GRANTO, SHORE-A, INITIAL. <0022135>

Figure 166

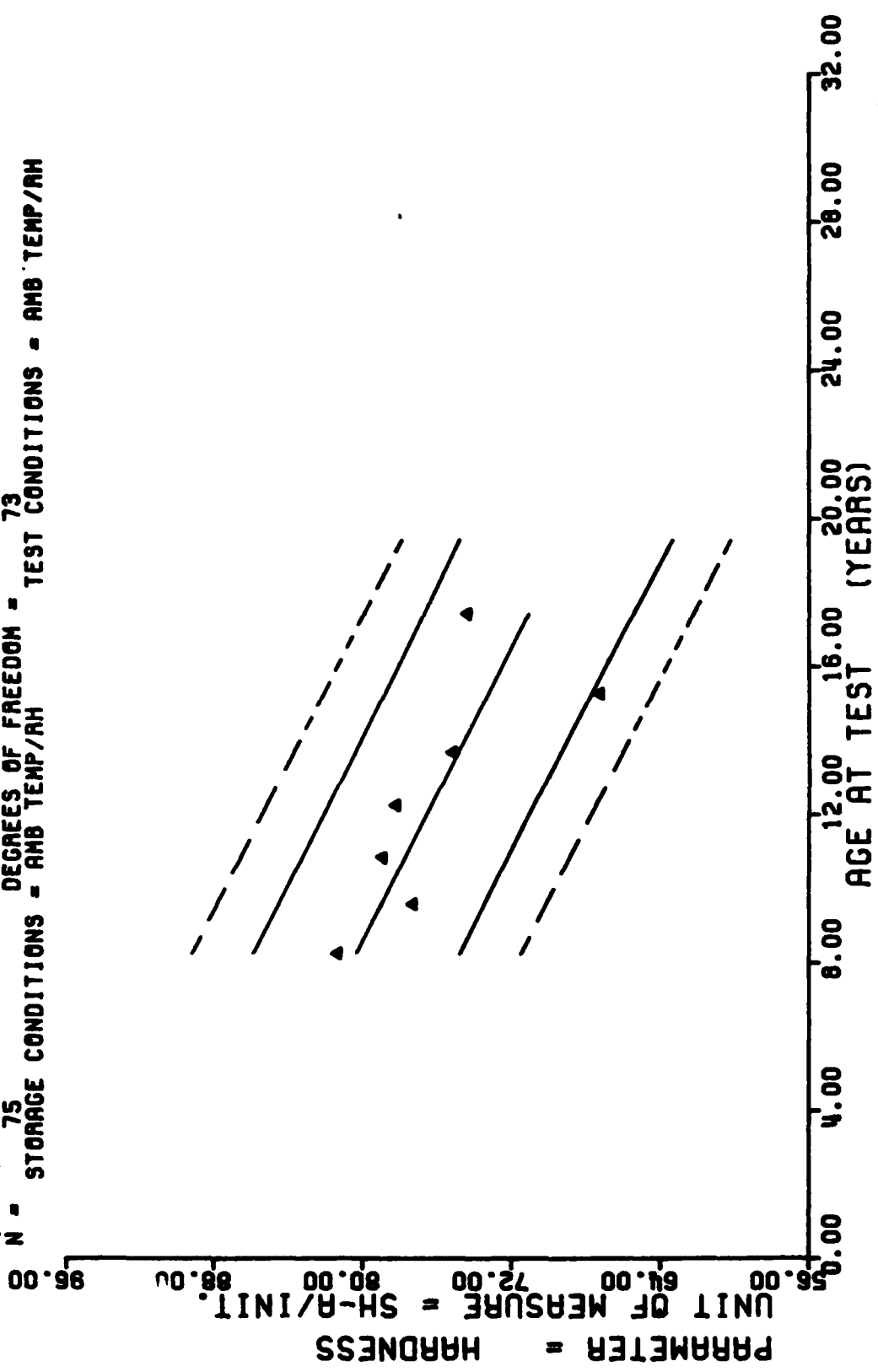
$Y = ((+8.0086423E+01) + (-1.8431437E-02) * X)$   
 $F = +2.0759104E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\sigma_r = +1.9728773E+00$   
 $R = -2.0380567E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_o = +1.2792484E-02$   
 $t = +1.4408020E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +1.9515680E+00$   
 $N = 50$  DEGREES OF FREEDOM = 48  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE DSCT HTAS ONLY, OUTER, HARDNESS, NON-DANTD, SHORE-A, INITIAL. <0022583>

Figure 167

$F = +8.4636880E+01$   
 $A = -7.3274171E-01$   
 $I = +9.1998309E+00$   
 $N = 75$   
 $Y = (( +8.8599948E+01 ) + ( -8.4039653E-02 ) * X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF A = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = AMB TEMP/AH



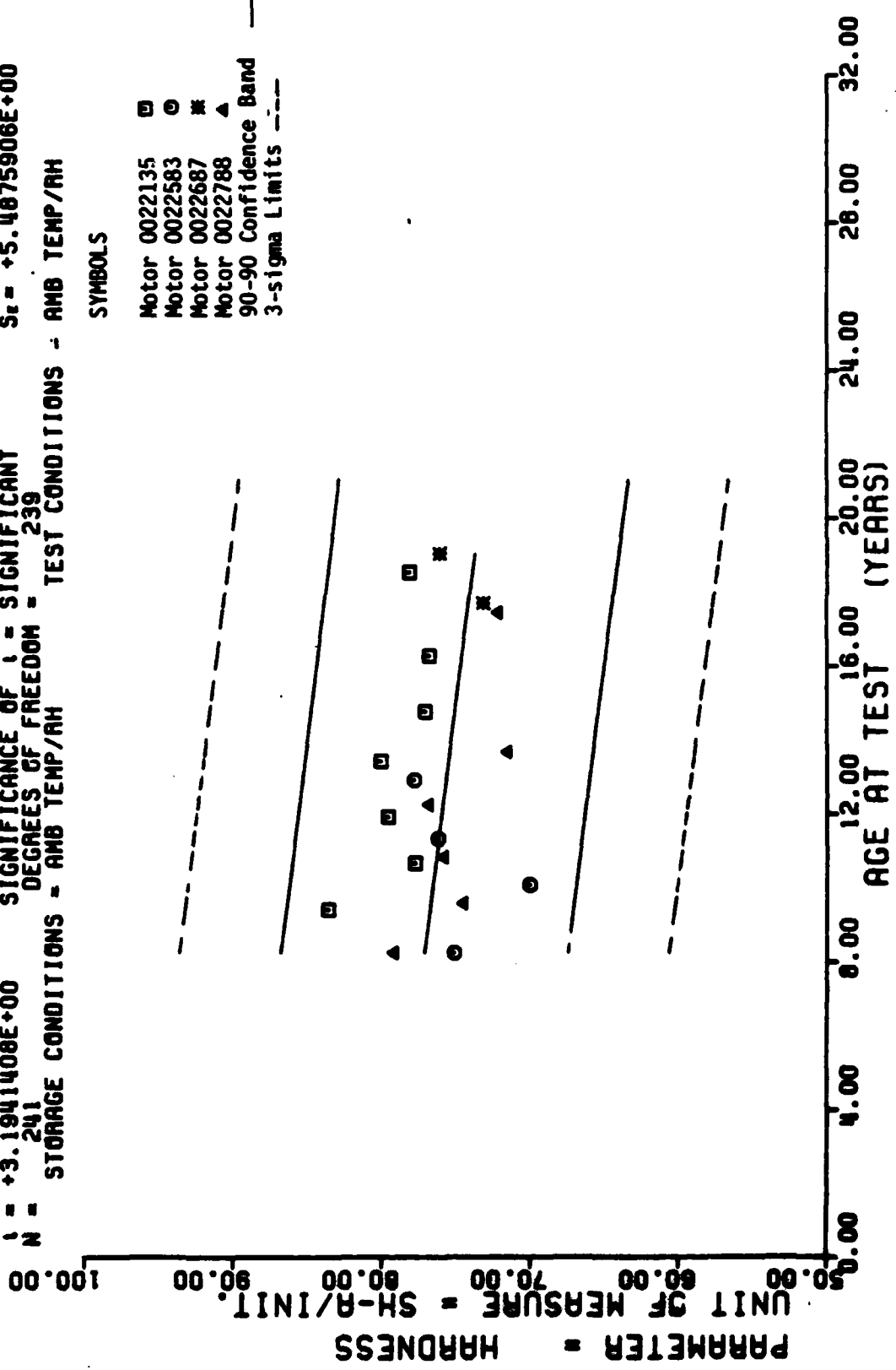
11 STAGE DSCT HTAS ONLY, OUTER, HARDNESS, NON-ORANTO, SHORE-A, INITIAL. <0022788>

Figure 168

$Y = ((+7.9629715E+01) + (-2.5969640E-02) \times X)$   
 $F = +1.0202535E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -2.0233817E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $t = +3.1941408E+00$  SIGNIFICANCE OF t = SIGNIFICANT  
 $N = 241$  DEGREES OF FREEDOM = 239  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH

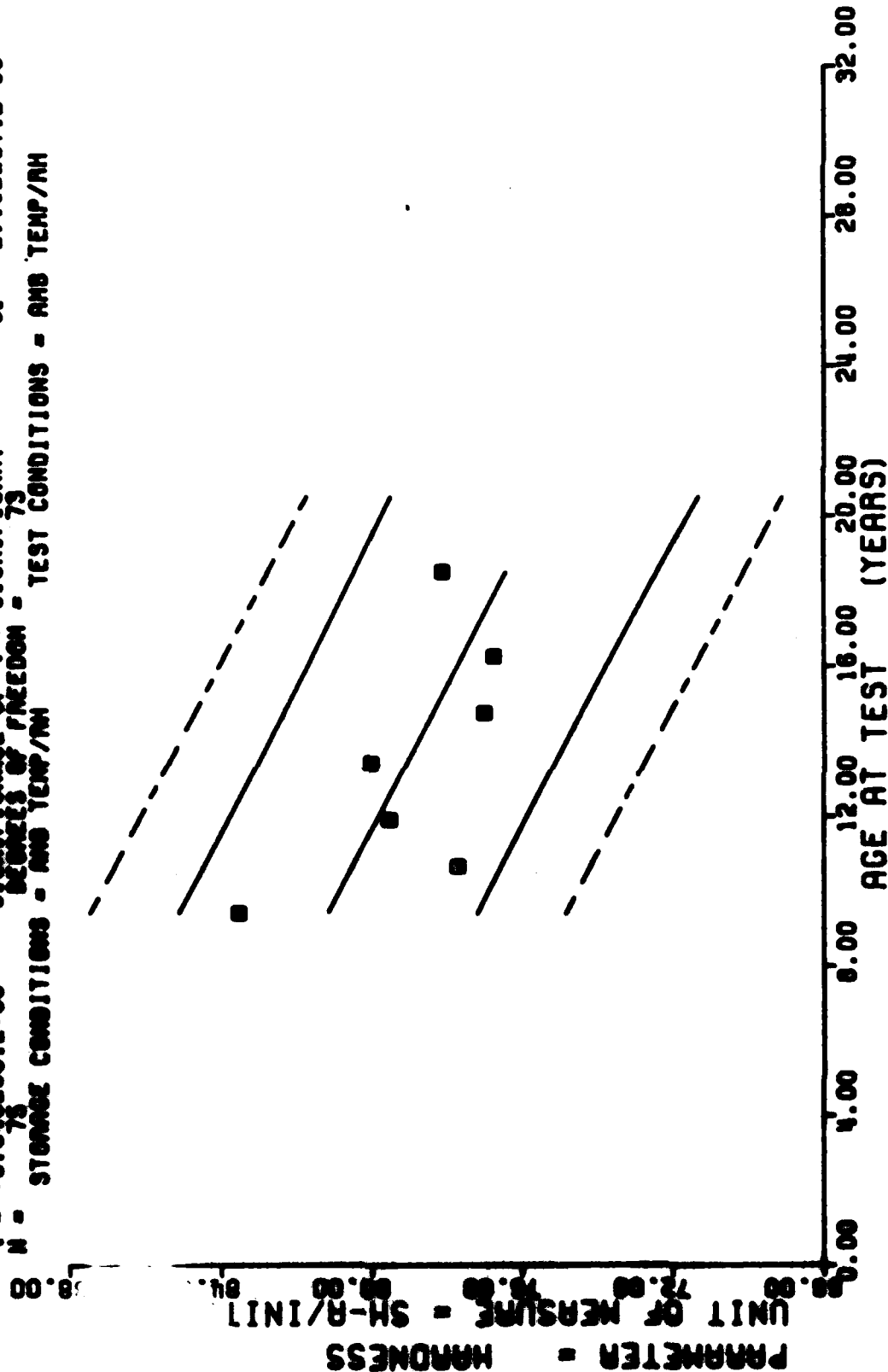
SYMBOLS

Motor 0022135 □  
 Motor 0022583 ○  
 Motor 0022687 ✕  
 Motor 0022788 ▲  
 90-90 Confidence Band  
 3-sigma Limits ---



II STAGE DSCT NTAS ONLY, INNER, HARDNESS, NON-ORNTD, SHORE-A, INITIAL.

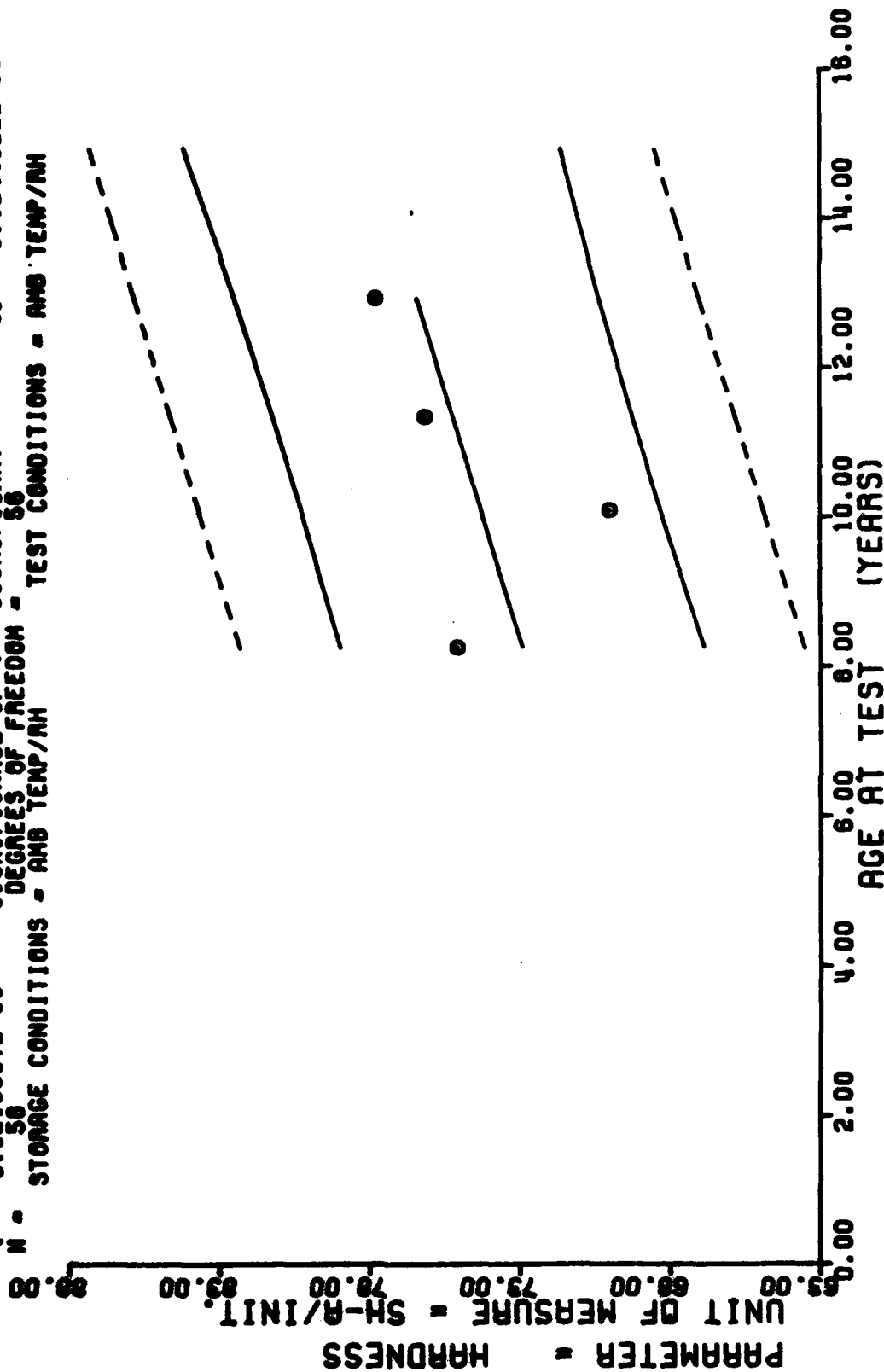
$\gamma = ((+0.0010577E+01) \div (-4.315749E-02)) \times X)$   
 $F = +4.2052001E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $\phi = +2.6303637E+00$   
 $R = -0.0010577E+01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_0 = +6.5927501E-03$   
 $I = +0.5927501E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_1 = +2.1022371E+00$   
 $N = 75$  DEGREES OF FREEDOM = 75  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



11 STAGE D9CT HTAS ONLY, INNER, HARDNESS, NON-ORATO, SHORE-A, INITIAL. <0022135>

Figure 170

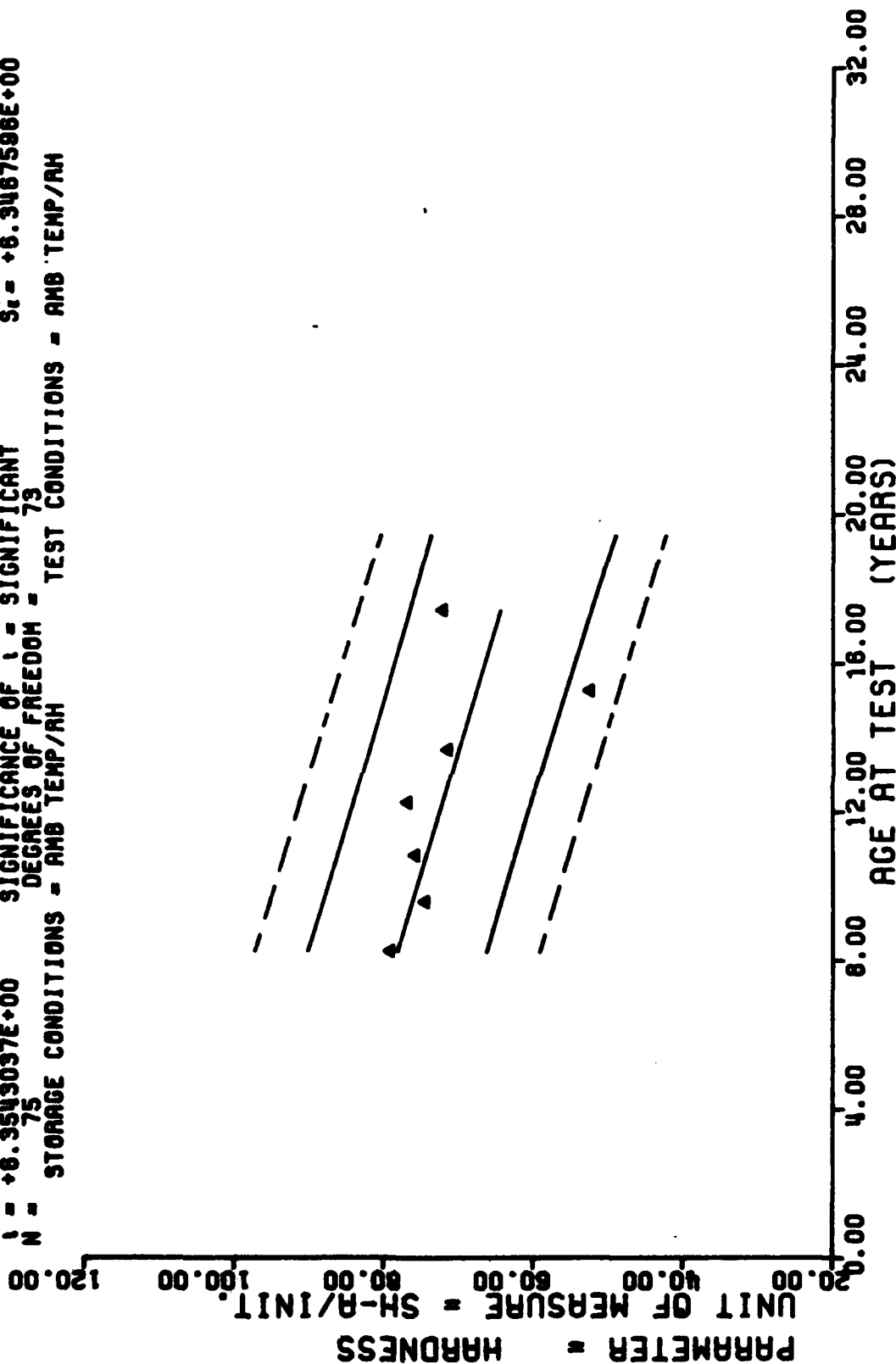
$Y = ((+6.6729678E+01) + (+6.2267179E-02) \cdot X)$   
 $F = +1.1029285E+01$  SIGNIFICANCE OF F = SIGNIFICANT  $G = +3.3881755E+00$   
 $A = +4.0684028E-01$  SIGNIFICANCE OF A = SIGNIFICANT  $S_1 = +1.8749394E-02$   
 $I = +3.3210337E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_2 = +3.1244322E+00$   
 $N = 58$  DEGREES OF FREEDOM  
 $N = 58$  STORAGE CONDITIONS = AMB TEMP/AN TEST CONDITIONS = AMB TEMP/AN



11 STAGE DSCT NTAS ONLY, INNER, HARDNESS, NON-ORNTD, SHORE-A, INITIAL. <0022583>

Figure 171

$F = +4.0377176E+01$  SIGNIFICANCE OF F = SIGNIFICANT  
 $R = -5.9676740E-01$  SIGNIFICANCE OF R = SIGNIFICANT  
 $1 = +6.3543037E+00$  SIGNIFICANCE OF 1 = SIGNIFICANT  
 $N = 75$  DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



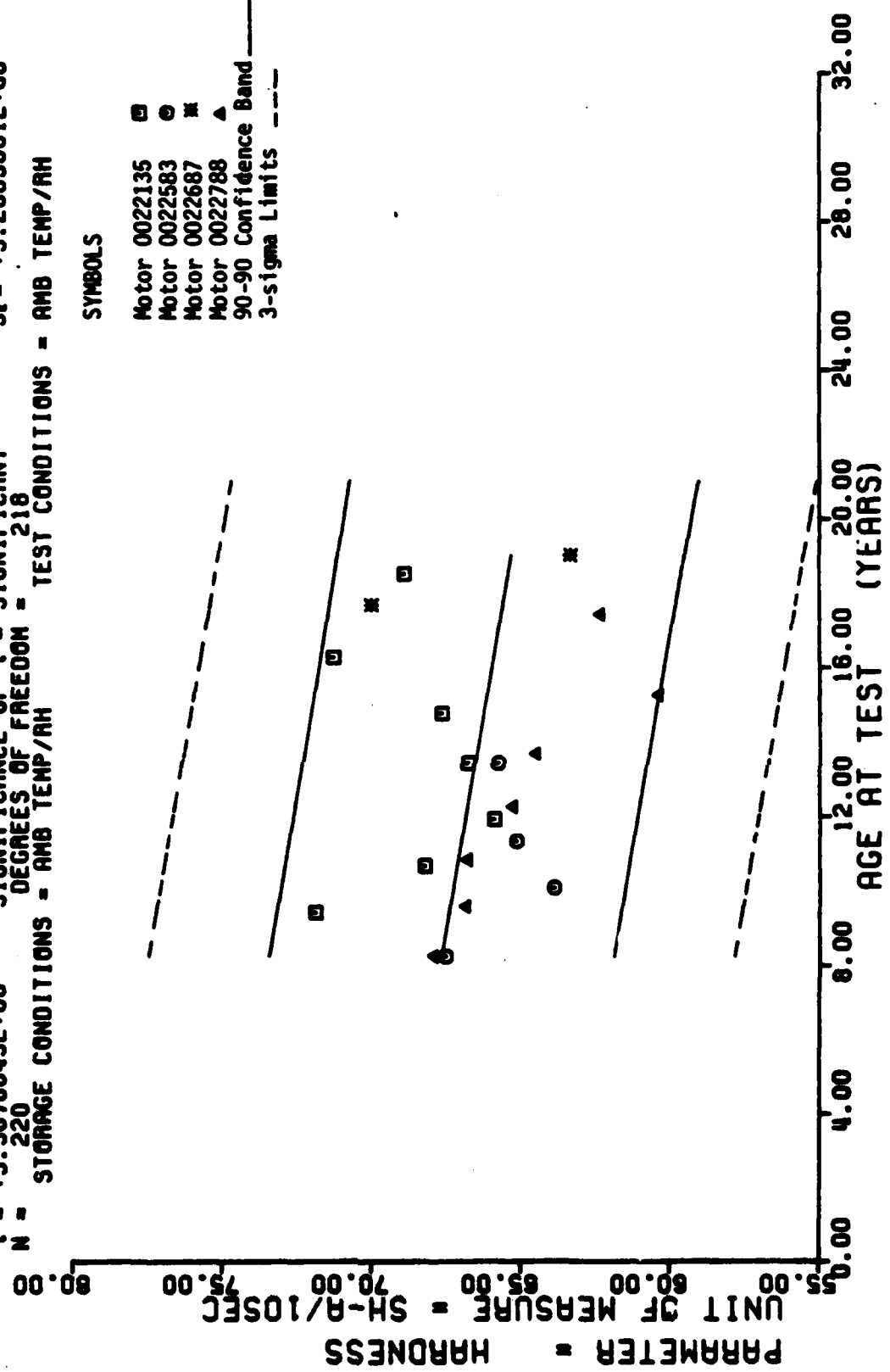
11 STAGE DSCT HTAS ONLY, INNER, HARDNESS, NON-ORANTO, SHORE-A, INITIAL. <0022788>

Figure 172

$F = +1.1477624E+01$   
 $R = -2.2364327E-01$   
 $t = +3.3678643E+00$   
 $N = 220$   
 $Y = ((+8.9414459E+01) + (-1.7969824E-02) \times X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF R = SIGNIFICANT  
 SIGNIFICANCE OF t = SIGNIFICANT  
 DEGREES OF FREEDOM = 218  
 STORAGE CONDITIONS = AMB TEMP/AH  
 TEST CONDITIONS = AMB TEMP/AH

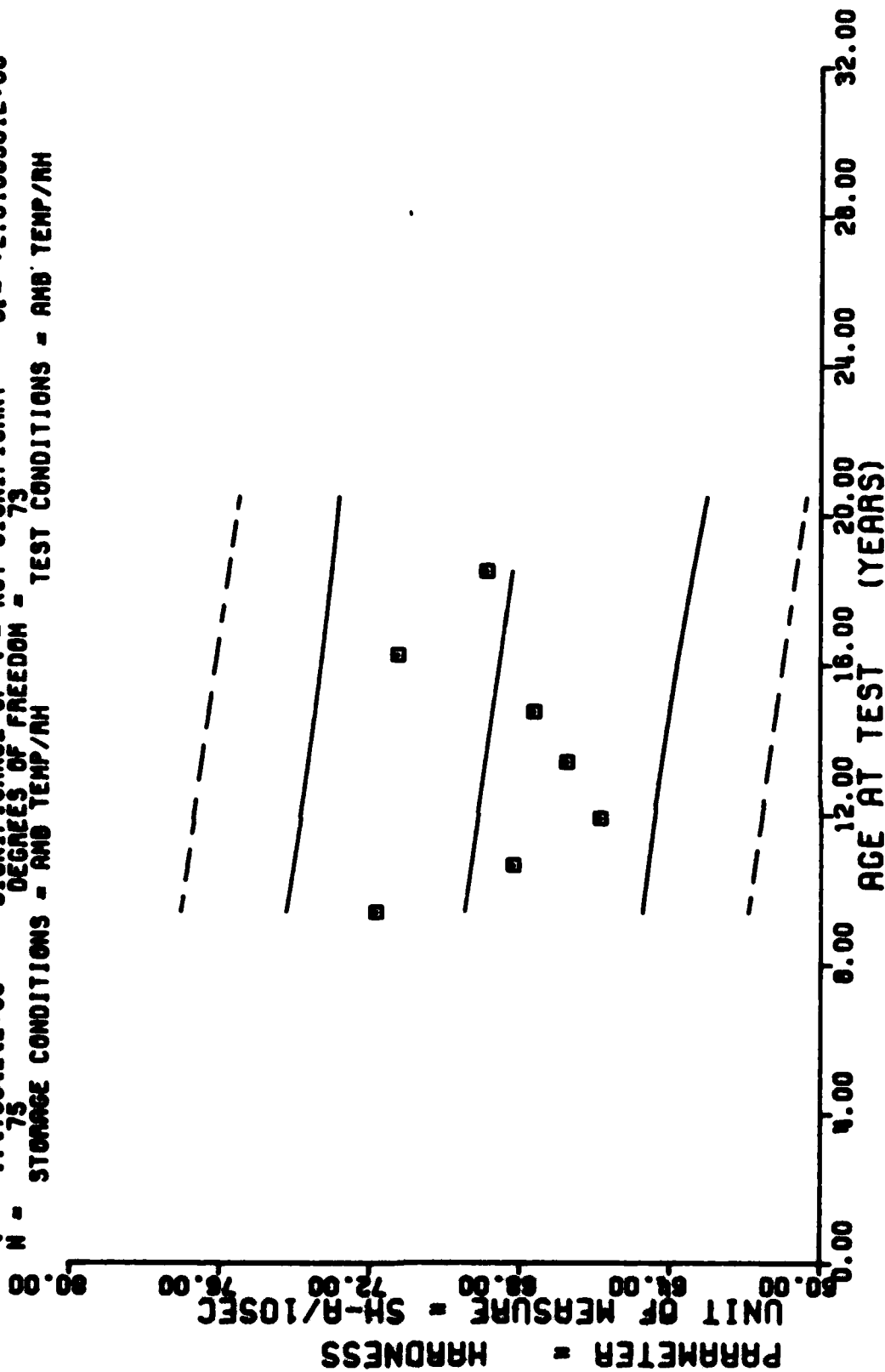
SYMBOLS

- Motor 0022135 □
- Motor 0022583 ○
- Motor 0022687 ✕
- Motor 0022788 ▲
- 90-90 Confidence Band ———
- 3-sigma Limits - - - -



11 STAGE DSCT NTAS ONLY, OUTER, HARDNESS, NON-ORANTO, SHORE-A, 10-SEC.

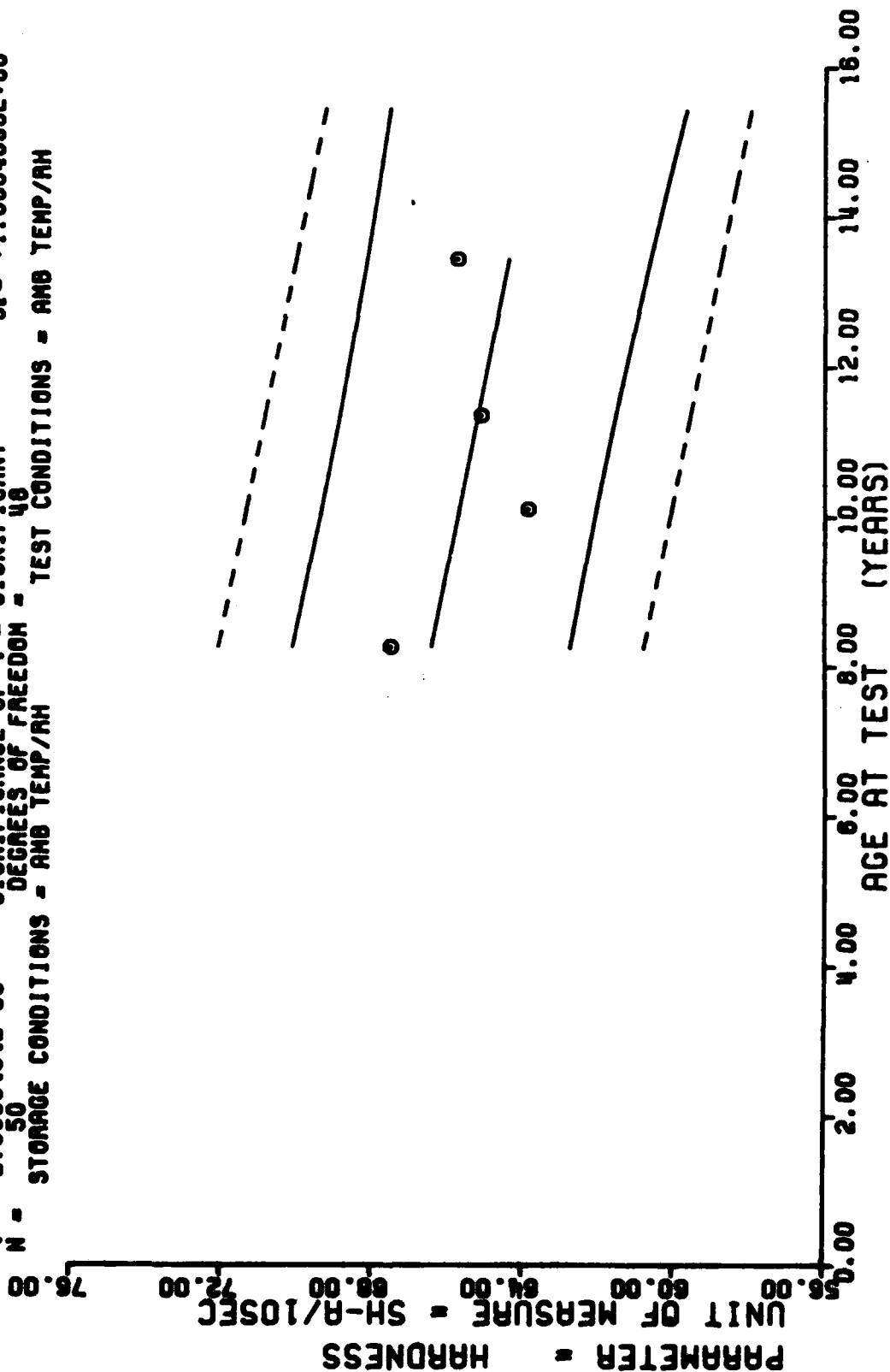
$Y = ((+7.0800238E+01) + (-1.1665892E-02) \times X)$   
 $F = +2.1810637E+00$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $\alpha = +2.5388512E+00$   
 $R = -1.7092580E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_e = +7.8992124E-03$   
 $t = +1.4788424E+00$  SIGNIFICANCE OF t = NOT SIGNIFICANT  $S_e = +2.5188301E+00$   
 $N = 75$  DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/AM TEST CONDITIONS = AMB TEMP/AM



II STAGE DSCT NTAS ONLY, OUTER, HARDNESS, NON-ORANTO, SHORE-A, 10-SEC. <0022135>

Figure 174

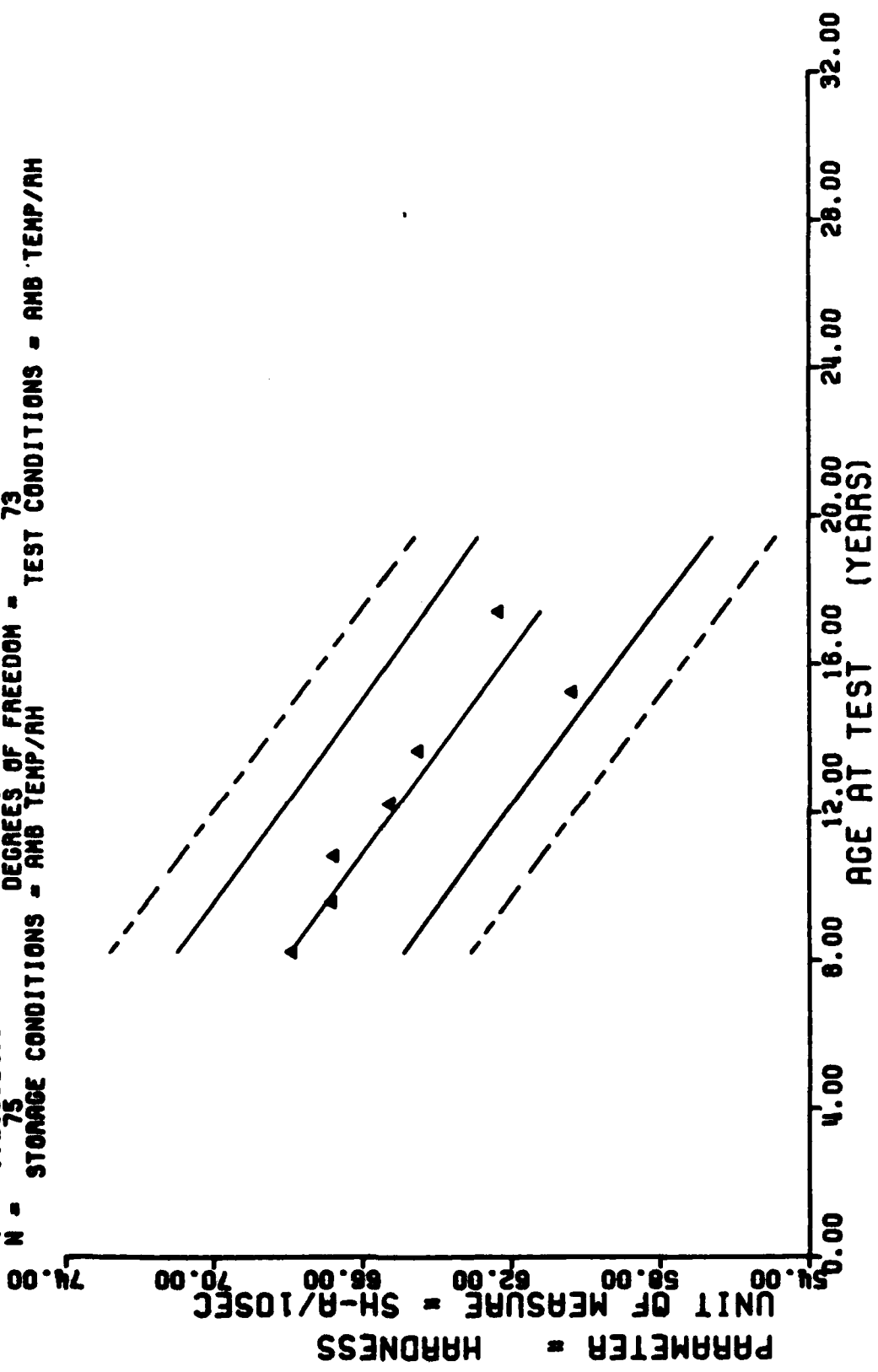
$F = +7.1093981E+00$   
 $A = -3.5917291E-01$   
 $I = +2.6863454E+00$   
 $N = 50$   
 $Y = ((+6.9865814E+01) + (-3.2666875E-02) * X)$   
 SIGNIFICANCE OF F = SIGNIFICANT  
 SIGNIFICANCE OF A = SIGNIFICANT  
 SIGNIFICANCE OF I = SIGNIFICANT  
 DEGREES OF FREEDOM = 48  
 STORAGE CONDITIONS = AND TEMP/°H TEST CONDITIONS = AND TEMP/°H



11 STAGE DSCT MTRG ONLY, OUTER, HARDNESS, NON-GRANTO, SHORE-A, 10-SEC. <0022583>

Figure 175

$Y = ((+7.3960235E+01) + (-6.0983104E-02) \times X)$   
 $F = +1.4762835E+02$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma = +2.7907827E+00$   
 $R = -8.1800179E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S_e = +5.0190860E-03$   
 $I = +1.2150240E+01$  SIGNIFICANCE OF I = SIGNIFICANT  $S_e = +1.6162600E+00$   
 $N = 75$  DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



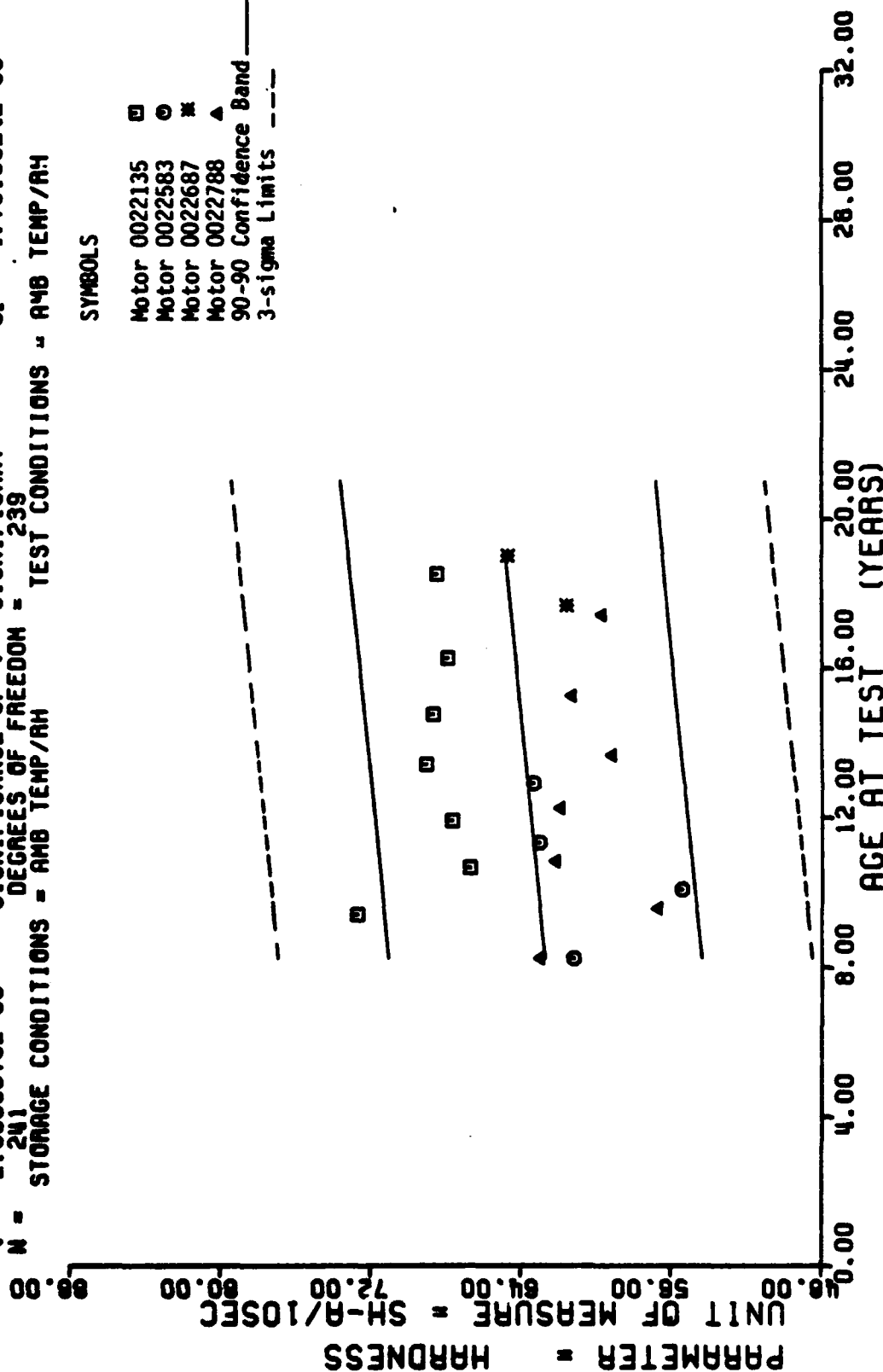
II STAGE DSCT HTAS ONLY, OUTER, HARDNESS, NON-GRANTO, SHORE-A, 10-SEC. <0022708>

Figure 176

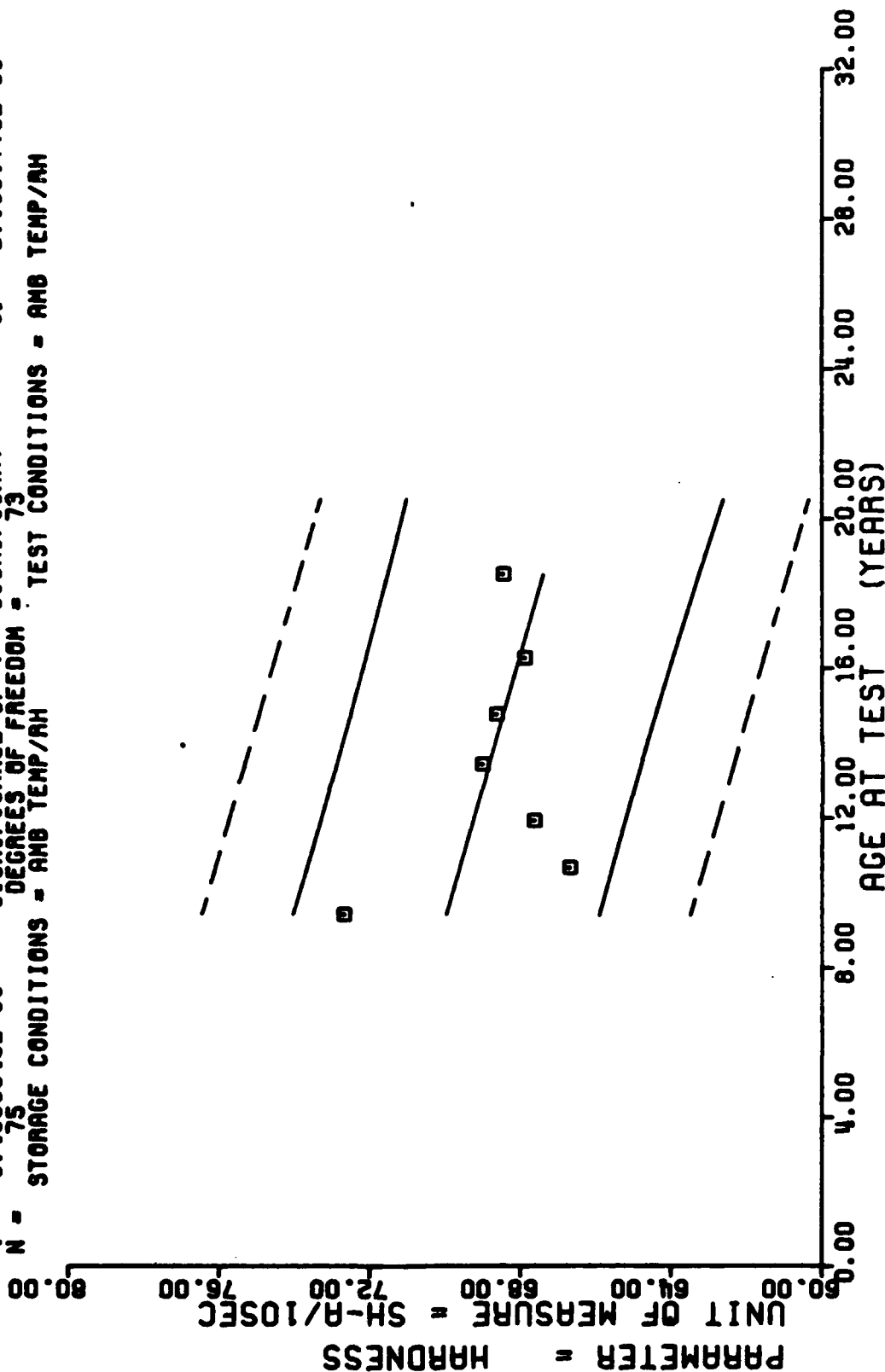
|   | Y                  | Y                  | ( +6.1083769E+01 ) | ( +1.6339093E-02 ) | X                           |
|---|--------------------|--------------------|--------------------|--------------------|-----------------------------|
| F | = +5.4335047E+00   | SIGNIFICANCE OF F  | =                  | SIGNIFICANT        | $\sigma_F$ = +4.7745507E+00 |
| R | = +1.4909382E-01   | SIGNIFICANCE OF R  | =                  | SIGNIFICANT        | $S_R$ = +7.0095143E-03      |
| t | = +2.3309879E+00   | SIGNIFICANCE OF t  | =                  | SIGNIFICANT        | $S_t$ = +4.7310524E+00      |
| N | =                  | DEGREES OF FREEDOM | =                  | 239                |                             |
|   |                    | 241                |                    |                    |                             |
|   | STORAGE CONDITIONS | -AMB TEMP/°RH      |                    | TEST CONDITIONS    | -A4B TEMP/°RH               |

## SYMBOLS

| Motor              | 0022135 | 0 | 0 | 0 | 0 |
|--------------------|---------|---|---|---|---|
| Motor              | 0022583 | 0 | 0 | 0 | 0 |
| Motor              | 0022687 | 0 | 0 | 0 | 0 |
| Motor              | 0022788 | 0 | 0 | 0 | 0 |
| 90-90 Confidence B |         | 0 | 0 | 0 | 0 |
| 3-sigma Limits     |         | 0 | 0 | 0 | 0 |



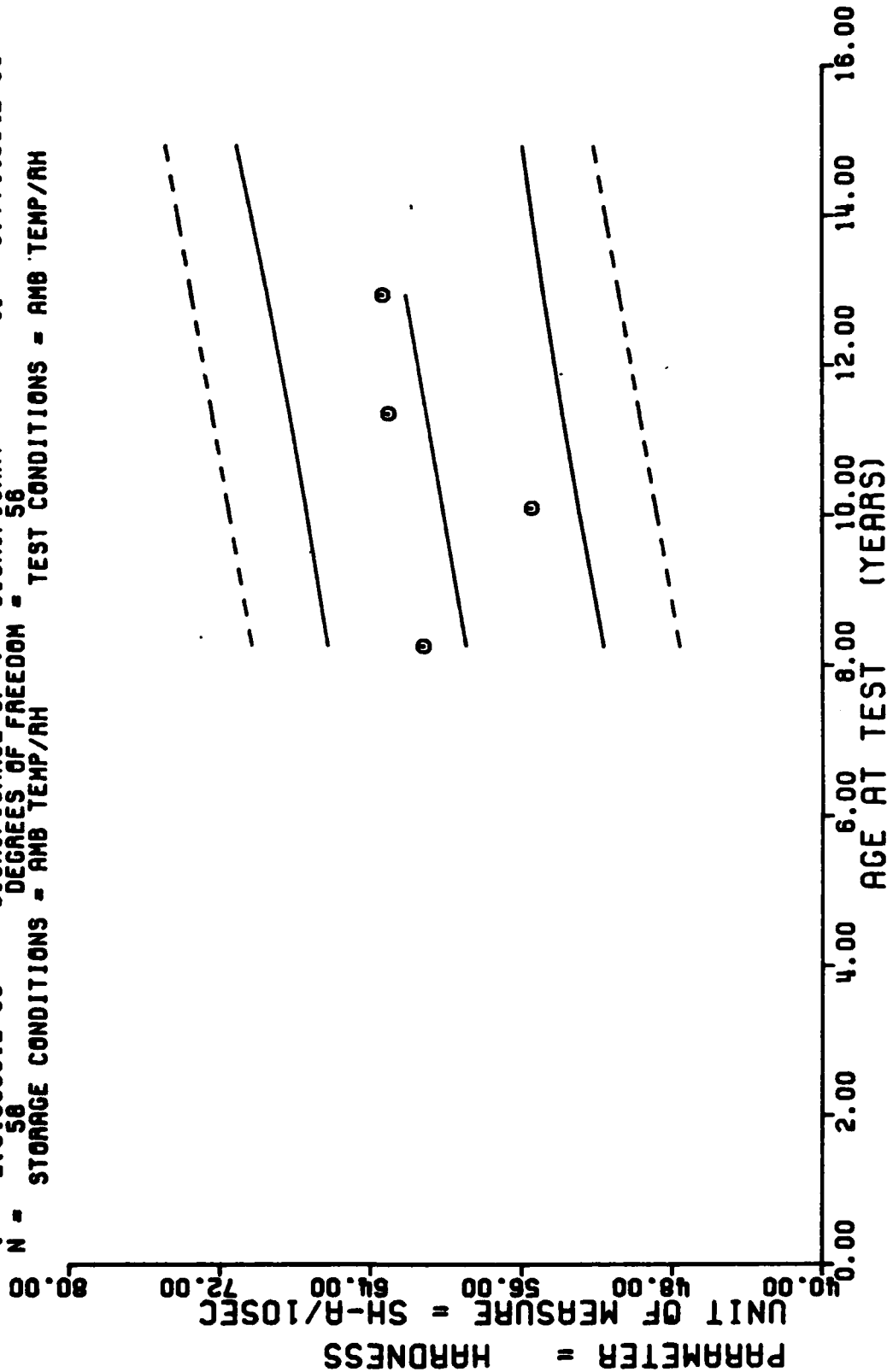
Y = (( +7.2629059E+01 ) + ( -2.3605457E-02 ) \* X)  
 F = +1.2152055E+01 SIGNIFICANCE OF F = SIGNIFICANT G = +2.3161700E+00  
 A = -3.7778051E-01 SIGNIFICANCE OF A = SIGNIFICANT S<sub>0</sub> = +6.7713107E-03  
 I = +3.4060945E+00 SIGNIFICANCE OF I = SIGNIFICANT S<sub>t</sub> = +2.1591775E+00  
 N = 75 DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT HTAS ONLY, INNER, HARDNESS, NON-ORNTD, SHORE-A, 10-SEC. <0022135>

Figure 178

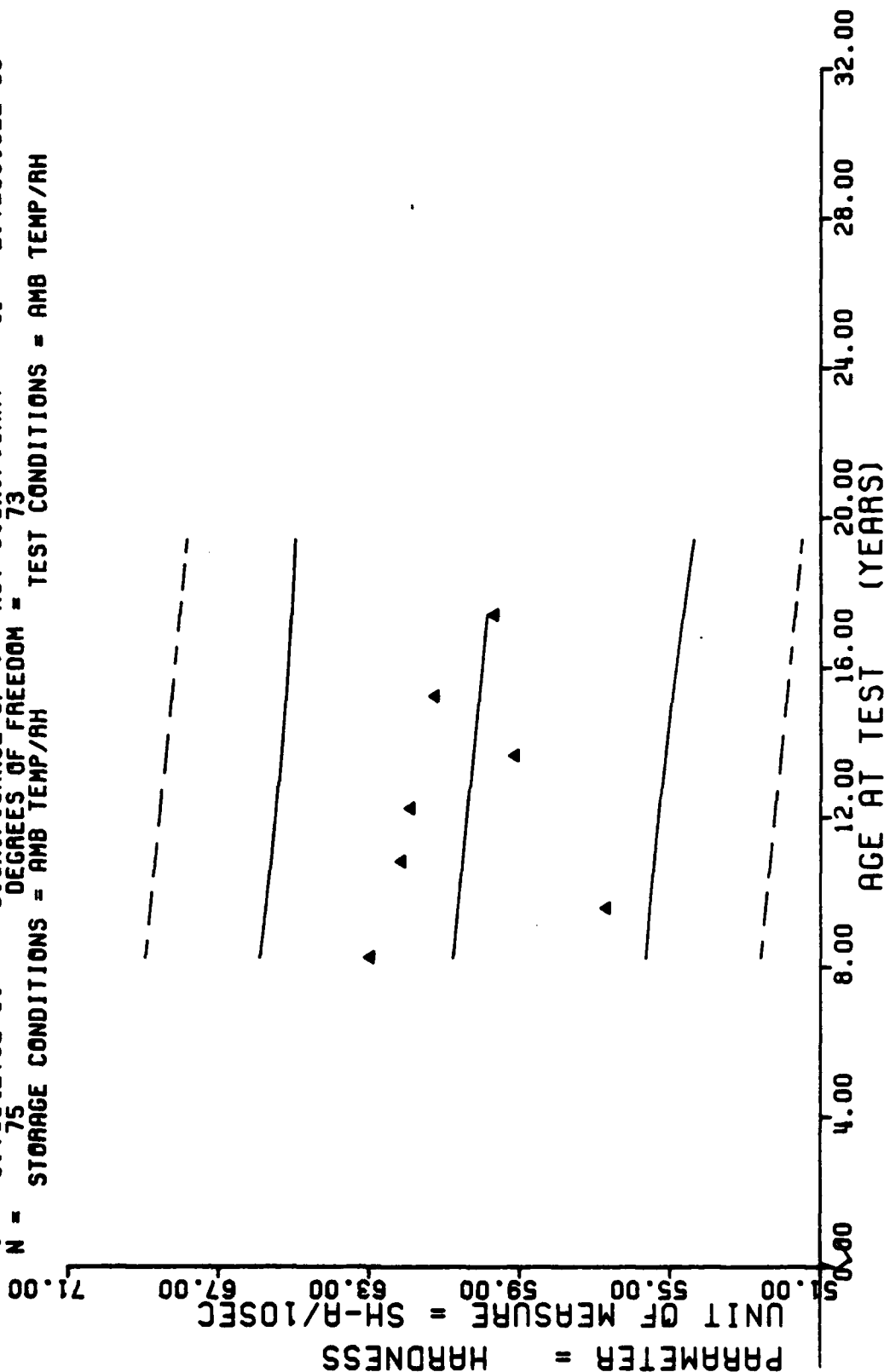
$Y = ((+5.3263361E+01) + (+5.7058063E-02) \times X)$   
 $F = +8.3458455E+00$  SIGNIFICANCE OF F = SIGNIFICANT  $\sigma = +3.9475156E+00$   
 $R = +3.1903695E-01$  SIGNIFICANCE OF R = SIGNIFICANT  $S = +2.2650212E-02$   
 $I = +2.5190961E+00$  SIGNIFICANCE OF I = SIGNIFICANT  $S_i = +3.7744834E+00$   
 $N = 58$  DEGREES OF FREEDOM = 58  
 STORAGE CONDITIONS = AMB TEMP/AH TEST CONDITIONS = AMB TEMP/AH



11 STAGE DSCT MTRS ONLY, INNER, HARDNESS, NON-GRNTO, SHORE-A, 10-SEC. <00225693>

Figure 179

$Y = ((+6.1581592E+01) + (-8.2534008E-03) \times X)$   
 $F = +9.5265936E-01$  SIGNIFICANCE OF F = NOT SIGNIFICANT  $G = +2.7221480E+00$   
 $R = -1.1349897E-01$  SIGNIFICANCE OF R = NOT SIGNIFICANT  $S_0 = +8.4559833E-03$   
 $I = +9.7604270E-01$  SIGNIFICANCE OF I = NOT SIGNIFICANT  $S_1 = +2.7230192E+00$   
 $N = 75$  DEGREES OF FREEDOM = 73  
 STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



II STAGE DSCT MTRS ONLY, INNER, HARDNESS, NON-ORANTD, SHORE-A, 10-SEC. <0022788>

Figure 180

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| 4. TITLE (and Subtitle)<br><br>LGM-30B, Stage II Dissected Motor Test Report                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 5. TYPE OF REPORT & PERIOD COVERED<br>Test Results - Semi-annual |                                             |
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| 18. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                  |                                             |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br>Dissected Motor Solid Propellant<br>Minuteman<br>RSLP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                  |                                             |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br>Data analysis in this report is the culmination of testing on three dissected motors, as well as two test periods for a fourth dissected motor. In order to relate the newest dissected motor to previously dissected motors, an analysis of covariance was performed. The new data was subjected to a determination of significance of means and variance. Regressions of individual motor trends for many parameters are included in this report. Although these individual regressions do show some significant trends, it does not appear that age-out is imminent. |                                                                  |                                             |



