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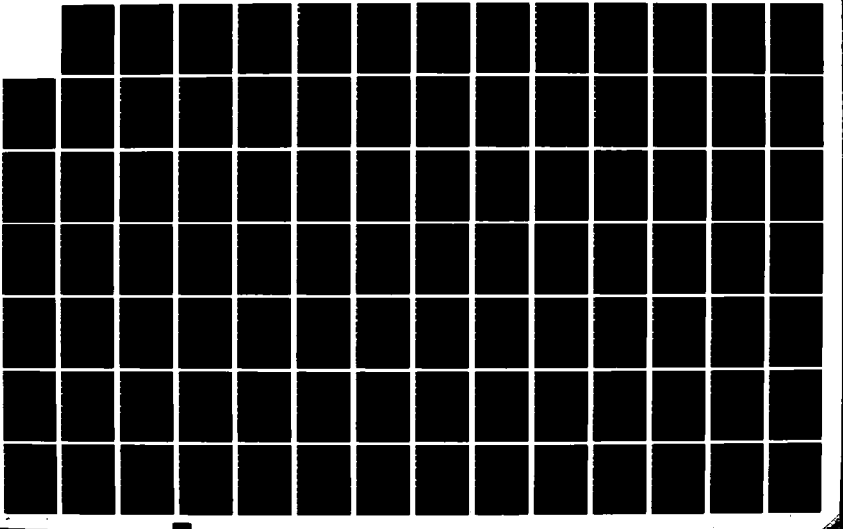

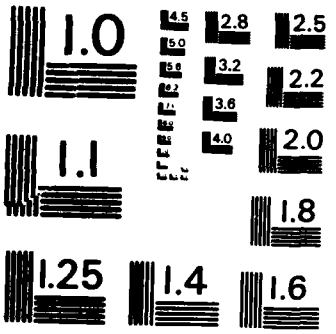

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LGM-30B
STAGE II
DISSECTED
MOTOR
TEST REPORT

PROPELLANT ANALYSIS LABORATORY

MAQCP REPORT NR 514(86)

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LGM-30B, STAGE II

DISSECTED MOTOR

TEST REPORT

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ABSTRACT

Data analysis in this report represents three test periods on dissected motor S/N 0022687. Two of the tests were performed prior to a change in the specimen conditioning requirements.

A Scheffe' test was used to determine where significant differences in test data occurred. Regressions of individual motor trends for many parameters are included in this report. There are statistically significant trend lines when compared to a slope of zero except for stress relaxation modulus. The three points used represent two populations since a change in humidity conditioning occurred in 1985 testing. Therefore, regressions are for visual reference only.

Multi-motor plots are included to show the relationship of motor S/N 0022687 to the other RSLP motors. The data for all Stage II dissected motors tested at OO-ALC are shown on these plots.

Keywords: Dissected Motor Solid Propellant

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REFERENCES

Title and Report Nr	Page
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GLOSSARY OF ABBREVIATIONS AND TERMS

Aging Trend	(Refer to Figure 3 or statistical analysis) A change in properties or performance resulting from aging of material or component
ANX	Outer propellant, ANP-2862
ANY	Inner Propellant, ANP-2864
ASPC	Aerojet Strategic Propulsion Company
Bi-Propellant	Equal sections of ANP-2862 and ANP-2864 in one specimen
CSA	Cross Sectional Area
DB	Dogbone
Degradation	Gradual deterioration of properties or performance
E	Modulus (psi), defined as the slope of the line drawn tangent to the initial linear portion of the curve
EB	End bonded
EGL	Effective Gage Length
e_m	Strain at Maximum Stress (in/in)
e_r	Strain at Rupture (in/in)
"F" ratio	The ratio of the variance accounted for by the regression function to the random unexplained variance. The regression function having the most significant "F" ratio is used for plotting data. The ratio is also used in detecting significant changes in random variation between succeeding time points.
JANNAF	Joint Army, Navy, NASA, Air Force Committee
MAQCP	Propellant Laboratory at OO-ALC
OO-ALC	Ogden Air Logistics Center
Regression	The general form of the regression equation is $Y = a + bX$
Regression Line	Line representing mean test values with respect to time
S_b	Standard error of estimate of the regression coefficient
S_e or $S_{Y.X}$	Standard deviation of the data about the regression line
S_m	Maximum Stress (psi)

GLOSSARY OF TERMS AND ABBREVIATIONS (cont)

S_r	Stress at Rupture (psi)
Standard Deviation (S_Y)	Square root of variance
Strain Rate	Crosshead speed divided by the EGL
't' Test	A statistical test used to detect significant differences between a measured parameter and an expected value of the parameter (determines if regression slope differs from zero at the 95% confidence level).
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results
3 Sigma Band	The area between the upper and lower 3 sigma limit. It can be expected that 99.73% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed
90-90 Band	It can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed

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 expectancy 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 OO-ALC Surveillance Program.

A force modernization program made available some older Minuteman I Stage II motors. In 1973, 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. The test data from Stage II dissected motors were assumed to have a normal population that could be combined. This was a fallacious assumption as shown in MANPA Report Nr. 496(84) where individual regressions for each motor were made with S/N 0022687 visually displayed on the multi plots.

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

Segments D, E and F from section 4 of motor S/N 0022687 were used for testing. Figure 3 illustrates the cutting plan for the latest test period. The general test directive (GTD-2 Dissect Amendment 2, April 1984) specified that test specimens be conditioned at controlled relative humidity. Other changes were different test temperatures for stress relaxation, deletion of some testing, and addition of mini-thin tensile from the bore area.

Motors which have been dissected to date are:

Motor S/N	Cast Date
0022135	63162
0022583	64008
0022788	64197
0022687	64096

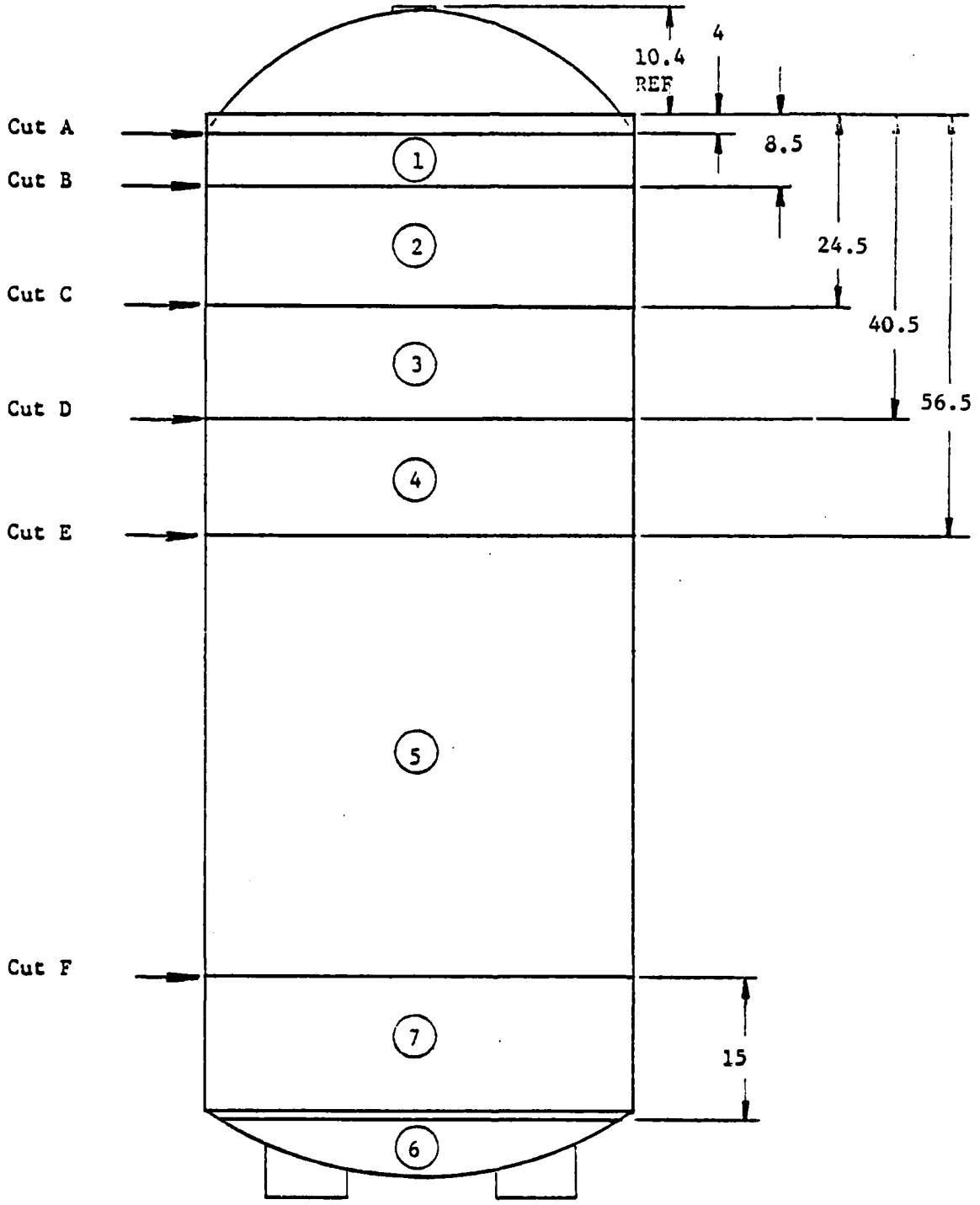


Figure 1 Dissection layout of Cuts, Locations and Section Numbers

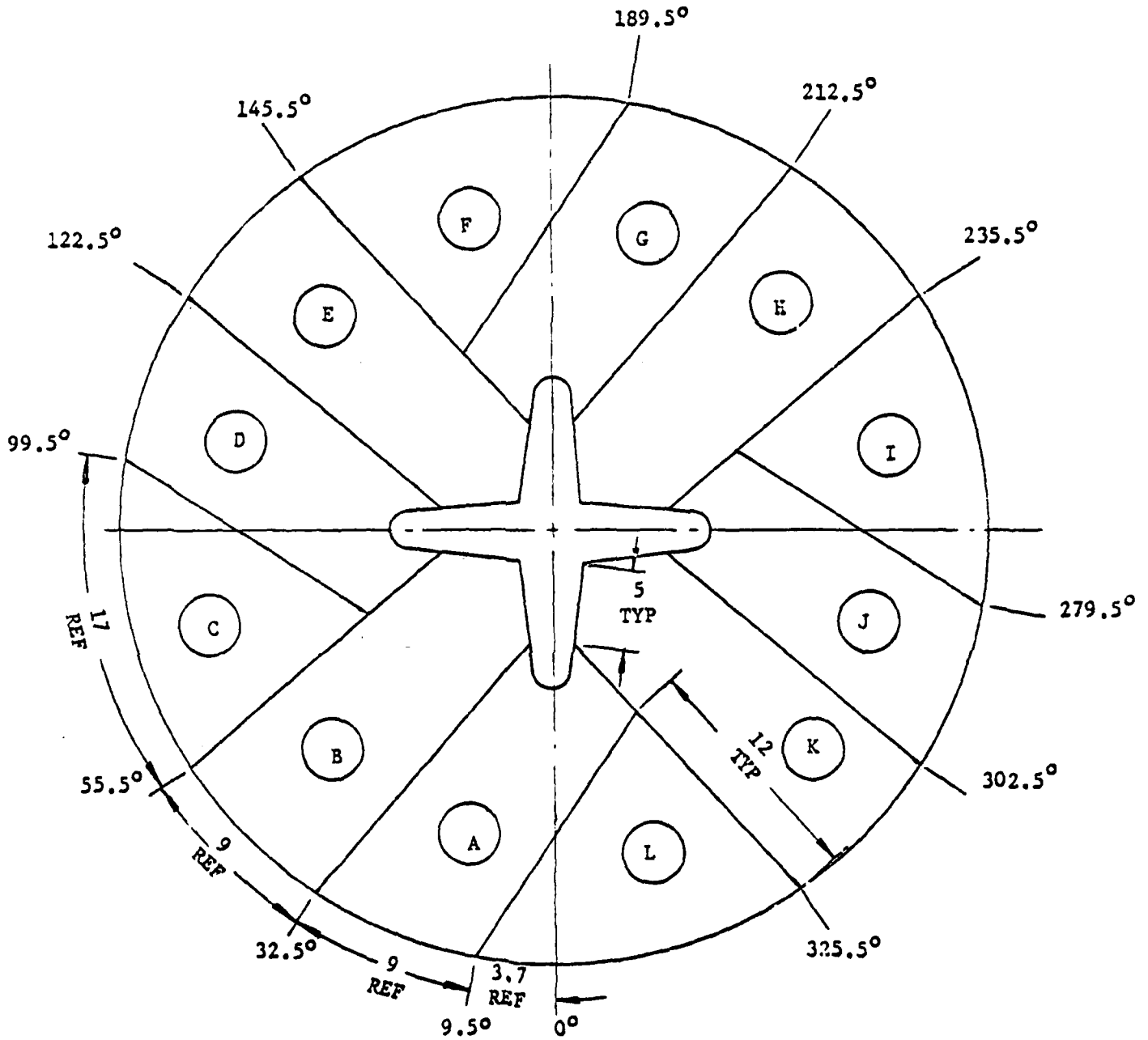


Figure 2 Section 3 and 4 Segment Layout and Letter Identification

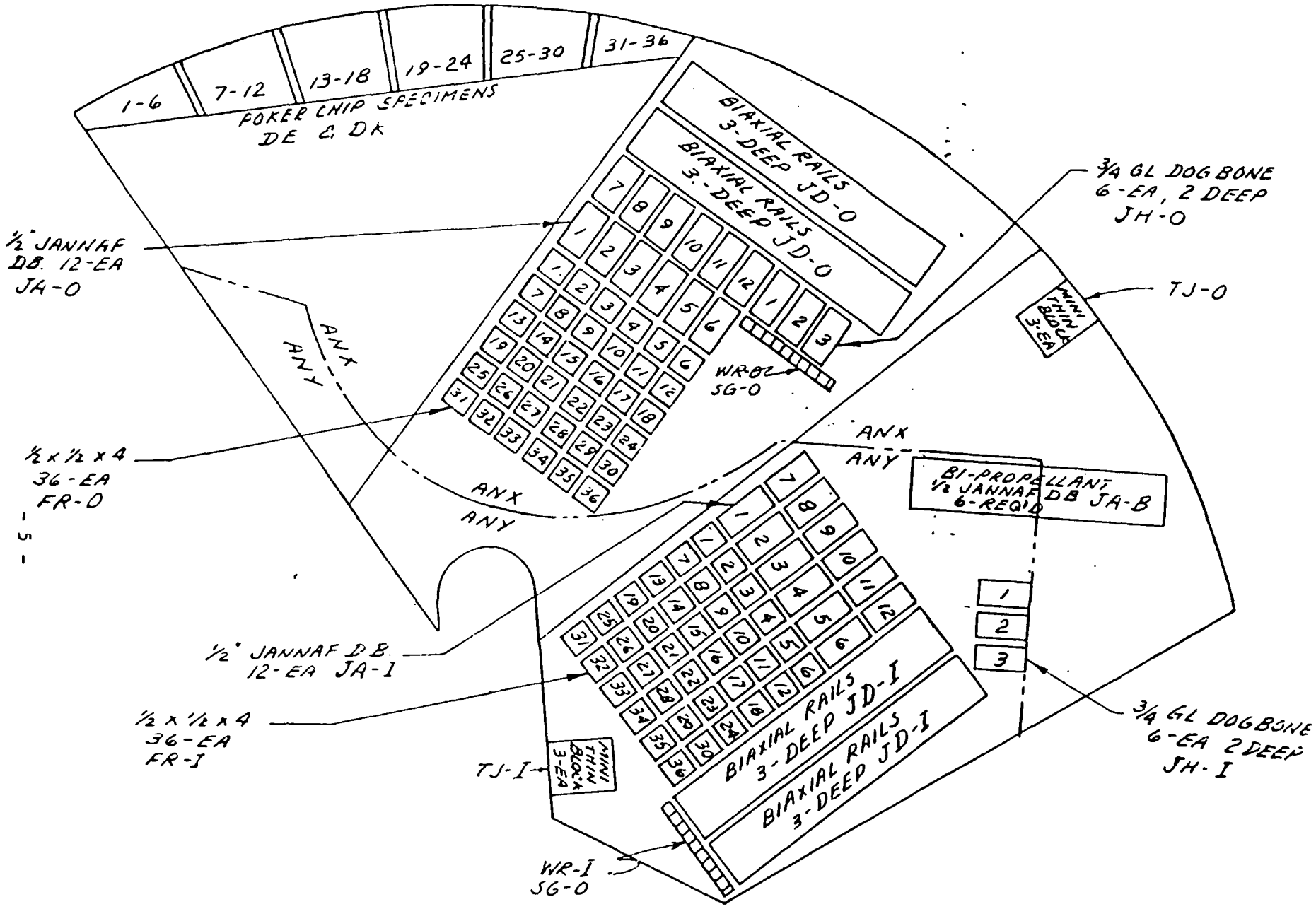


FIGURE 3: LGM-30 STAGE 2 DISSECTED MOTOR CUTTING PLAN, January 1985

STATISTICAL ANALYSIS

Statistical analyses have been performed to determine what statistically significant aging trends are occurring in the propellant. Test data for this report have been derived from the physical/chemical testing of a Stage II dissected motor, S/N 0022687.

For this test period, analyses were made to determine: (1) what aging trends are demonstrated for motor S/N 0022687 within three test periods (1982, 1983 and 1985) and (2) the visual relationship between the data from motor S/N 0022687 and data from previously dissected motors S/Ns 0022135, 0022583 and 0022788. Statistically, no direct motor-to-motor comparisons can be made using the combined motor regressions.

At the present time, there are three data points for motor S/N 0022687 two of which were tested prior to a change in specimen conditioning. With this change another variable is introduced. Furthermore, a statistical bias is introduced when only three data points are used. Therefore, the individual regression plots are for visual observation only. At least two more test periods under the current test conditions will be required before there is any stability in the data base. A summary for the regression trend lines can be found in Table 2.

The linear regression program was used to show aging trends. The linear equation $Y = a + bX$ was found to be the best fit model for the data in this report. The unique mathematical regression equation is listed on the top of each regression plot.

The multi-symbol combined plot program uses a unique plotting code for each motor's data point on the regression plots. This type of reporting is not reliable at this time since the motors cannot be statistically combined as discussed in MANPA Report Nr. 496(84), February 1984. However, this method of data plotting allows a visual display of the mean data from each motor and the overall relationships between dissected motors.

The data from motor S/N 0022687 were statistically compared for combinability using Analysis of Variance at the 5% significance level (Table 1). By comparing the mean values and variances within these values, it was determined which data groups have a non-significant difference and which are combinable.

The Scheffe' test determines where the significant differences lie between data groups in the incompatability of the "F" test results, using Analysis of Variance. The significance of these data groups may be attributed, in part, to aging and random variations in testing. These variations are being investigated. The Scheffe' test was used only if the calculated "F" value was significant. The Scheffe' test is fairly consistent for the outer high rate hydrostatic tensile test, the inner stress relaxation test and for the TCLE inner and outer tests.

The Shore A hardness information consisting of conditioned and unconditioned data was statistically compared for combinability by comparing data variations ("F" test) and mean values ('t' test). Hardness comparisons (Table 4) resulted in significant differences resulting from variance and mean testing. The inner, Shore A, 10 second hardness has a non-significant difference and these data are combinable. Table 6 contains individual hardness values.

For a comparison of minithin values between four blocks, the mean values were checked for compatability. Table 4 contains the Analysis of Variance results for inner and outer propellant. Individual minithin values are 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 in 1985 represents the third test period for motor S/N 0022687. This is the first time testing with specimens conditioned at controlled RH. Consequently, the 1985 data represent a different population than earlier testing.

A different statistical approach was used in which the means were analyzed for the 1982, 1983 and 1985 test data. This type of analysis will demonstrate any change between the data from the three test periods. Table 1, Analysis of Variance, shows the significance or non-significance of means. From the table it can be seen that only a few year-to-year comparisons are not significant in means. Stress relaxation modulus of outer propellant is an exception.

A summary of the regression trend lines is shown in Table 2.

A sample size summary follows the regression plot to which it applies.

Multi-motor regression plots using other dissected motor data, were made to show the relationship of data from motor S/N 0022687 to the other motors.

Table 3 shows the 1985 mini-thin tensile data and Table 4 is an analysis of variance for this data. Table 5 lists the stress relaxation data for all three years and shows the change in test temperatures based on the revised GTD. Hardness data for 1985, showing changes in data caused by conditioning, are shown in Table 6, with "F" and 't' test significance given in Table 7. Bond properties are shown in Table 8 and the miscellaneous data in Table 9.

A. UNIAXIAL TENSILE TEST:

OUTER: Very low rate tensile at 0.0002 in/min shows a significant decrease in the regression trend line for maximum stress and modulus

(figures 4 and 6) with a corresponding increase in strain at rupture (figure 5). The regression trend lines for low rate tensile at 2.0 in/min however, shows a significant increase in strain at rupture (figure 8) with non-significant changes in the other parameters (figures 7 and 9).

INNER: Very low rate tensile shows a significant increase in the trend line for maximum stress (figure 10). The other parameters do not show a significant trend (figures 11 and 12). At 2.0 in/min, both maximum stress and modulus show a significant increase in the regression trend line (figures 13 and 15). Strain at rupture does not show a trend (figure 14).

BI-PROPELLANT: Very low rate tensile shows a significant increase in regression trend lines for all parameters (figures 16, 17 and 18).

B. BIAXIAL TENSILE TEST: Biaxial rails tested at 0.2 in/min show a significant increase in the slope for strain at rupture (figures 20 and 23), and a significant decreasing trend line in modulus for outer propellant (figure 21). Inner propellant does not show a significant change in modulus (figure 24). Neither propellant shows a significant change in maximum stress (figures 19 and 22).

C. HIGH RATE HYDROSTATIC TENSILE: Shortened dogbones are tested at 1750 in/min with 500 psi pressure. Under these conditions, the outer propellant shows a significant increase in the slope for maximum stress and strain at rupture (figures 25 and 26) with a significant decrease in the trend line for modulus (figure 27).

Inner propellant, on the other hand, shows a significant decrease in the slope for maximum stress and modulus (figures 28 and 30) while strain at rupture does not show a significant change (figure 29).

D. MINITHIN TENSILE: Minithin tensile specimens are cut from the case and bore areas as shown in figure 3. A change in the General Test Directive stipulated certain slices to be tested, i.e., 0.1, 0.2, 0.3, 0.6, and 1.0 inch intervals. This was done for the inner propellant and two blocks of outer propellant. In some instances, no valid data for these particular specimens was obtained. When additional blocks from the outer propellant were cut (blocks 4EU5 and 4EU6), a decision was made to test all slices so that if one point was missed the adjacent specimen would provide useable data. No regressions were made since only current data are shown on the plots. The influence of the liner is evident by the variability in the first few slices adjacent to the liner (figures 31 thru 35). Bore propellant data also show variability as shown in figures 36 through 40. Data are listed in Table 3 and analysis of variance is provided in Table 4.

E. STRESS RELAXATION: The latest General Test Directive mandated a change in the temperatures at which the specimens were tested. Prior testing at $-65^{o}F$ and $-40^{o}F$ resulted in so many bond failures that representative data could not be obtained. Less severe temperatures of $0^{o}F$ and $40^{o}F$ were substituted. Data are show in Table 5. The master curves for 1985 testing are shown in figures 41 and 42. These curves appear to be quite similar to those published in MANPA Report Nr. 496(84). There are no significant changes in relaxation modulus for either outer or inner propellants (figures 43 thru 50).

F. THERMAL COEFFICIENT OF LINEAR EXPANSION (TCLE):

Both outer and inner propellant show a significant increasing trend line slope for the coefficient of linear expansion above the glass transition temperature (figures 52 and 55). Neither propellant shows a significant

change in glass transition temperature (figures 53 and 56) or in expansion below the glass transition temperature (figures 51 and 54).

G. HARDNESS: Tensile specimens were tested for hardness when the specimens were first machined. They were then conditioned at 35 ± 5% RH for 14 days and hardness readings were taken for a second time. These data are shown in Table 6. Statistically, there is a significant difference between the conditioned and unconditioned test data except for inner propellant at 10 second hardness readings (Table 7).

Regressions were made using unconditioned data. The outer propellant shows a significant decrease in the trend line slope at 10 seconds (figure 57). There is no significant change in the inner propellant (figure 58).

H. BOND PROPERTIES:

SHEAR: Shear strength tested at 2.0 in/min, 500 psi does not show a change from 1983 testing (Table 8). These specimens had the Avcoat removed from the metal case before testing. Tensile specimens were tested at 20 in/min and 500 psi. There is a marked difference in the two sets of data, and the difference shown at 20 in/min between 1983 and 1985 is striking. There was failure in the propellant at less than 2mm deep in five of the six specimens with a crystalline appearance on the failed surface. This apparent crystallinity may be the result of a higher concentration of NH_4ClO_4 since this surface appearance was not noticable in previous years.

CONSTANT LOAD TENSILE: The specimens showed liner to propellant failure at high loads. As loads decreased, failure within the propellant increased. There was a crystalline appearance to the failed surface. See Table 8.

I. MISCELLANEOUS PROPERTIES: Swell ratio, gel fraction and moisture were done on specimens of insulation and liner. These specimens were obtained from the barrel section. Data are provided in Table 9, and represent means of two replicates.

CONCLUSIONS AND RECOMMENDATIONS

Tighter control of humidity has had an effect on the data, and may account for the shift in means (see hardness study). This change in preconditioning does not affect all tests or all parameters to the same degree.

There are significant increases in strain at rupture in the outer propellant. If both maximum stress and modulus showed decreases of similar magnitude, the probability of the increase being real is greater. There is no such consistency evident at this time. Moreover, a decrease in strain is of greater concern than an increase because the loss of strain capability leads to potential motor failure.

Stress relaxation testing at $77^{\circ}F$ does not show significant changes. Shore A hardness (10 sec) readings would tend to suggest that elasticity of the propellant is decreasing.

Inner propellant does not show the same magnitude of changes as is suggested by the data for outer propellant.

Statistically, the distribution of variance is significant in most tests. However, since three test periods are the minimum required for regression, and one represents a change here, only further testing will determine if the trend lines remain significant. At least two more test periods with the same conditions are needed to provide a stable data base.

The relationship of motor S/N 0022687 to previously dissected motors is ambiguous. Testing did not begin until the motor was nearly 18 years old whereas other motors were approximately half that age when initially tested. Therefore, no comparisons can be made at similar ages.

RECOMMENDATIONS:

Testing of this motor should be continued in order to determine if

changes in means and variance are real or if they are random.

Greater emphasis should be placed on maintaining the same test conditions. Elimination of some tests is understandable, but wherever possible the program should reamin essentially the same as it presently exists.

Although the regressions show two data points from unconditioned specimens and one from conditioned, the same general trend is observed and the regression trend line may be correct. Therefore, it is strongly recommended that this motor be tested as soon as possible to verify this trend.

TABLE 1, ANALYSIS OF VARIANCE

Test	1982 Mean	Nr Samp	Std Dev	1983 Mean	Nr Samp	Std Dev	1985 Mean	Nr Samp	Std Dev	Cal F Value	Sig of F	1982 vs 1983	1982 vs 1985	1983 vs 1985
Tensile, Very Low Rate, 0.0002 in/min														
Outer, Max Stress	45.7	6	2.75	47.6	6	3.51	40.2	6	1.26	12.26	S	N/S	S	S
Strain at Max Stress	.194	6	.0037	.224	6	.0177	.251	6	.0148	27.23	S	S	S	S
Strain at Rupture	.235	6	.0123	.258	6	.0208	.292	6	.0179	16.53	S	N/S	S	S
Stress at Rupture	42.3	6	2.92	43.5	6	3.77	37.8	6	1.51	6.56	S	N/S	N/S	S
Modulus	338.5	6	18.15	290.3	6	40.20	235.2	6	18.54	21.02	S	S	S	S
Inner, Max Stress	48.6	10	2.18	47.9	6	1.65	54.0	6	.731	22.68	S	N/S	S	S
Strain at Max Stress	.356	10	.0250	.272	6	.0629	.372	6	.0030	13.74	S	S	N/S	S
Strain at Rupture	.407	10	.0146	.329	6	.0930	.435	6	.0195	7.52	S	S	N/S	S
Stress at Rupture	46.1	10	2.91	44.1	6	.99	50.2	6	1.18	12.90	S	N/S	S	S
Modulus	185.5	10	5.21	243.7	6	54.27	210.3	6	4.72	8.02	S	S	N/S	N/S
Tensile, Low Rate, 2.0 in/min														
Outer, Max Stress	129.9	6	12.81	112.1	6	7.71	122.8	5	7.51	5.02	S	S	N/S	N/S
Strain at Max Stress	.388	6	.0420	.376	6	0.135	.502	5	.0179	32.79	S	N/S	S	S
Strain at Rupture	.592	6	.0198	.627	6	.0520	.753	5	.0819	12.56	S	N/S	S	S
Stress at Rupture	108.8	6	15.51	92.0	6	9.61	108.0	5	8.87	3.71	N/S	---	---	---
Modulus	944.5	6	89.76	737.5	6	159.32	855.4	5	69.75	4.85	S	S	N/S	N/S
Inner, Max Stress	123.1	9	4.80	116.5	6	6.30	137.4	6	2.97	29.15	S	S	S	S
Strain at Max Stress	.549	9	.1087	.423	6	.0777	.577	6	.0196	5.96	S	S	N/S	S
Strain at Rupture	.730	9	.0401	.712	6	.1042	.751	6	.0390	.0554	N/S	---	---	---
Stress at Rupture	111.4	9	8.22	96.7	6	10.03	126.5	6	2.32	22.42	S	S	S	S
Modulus	643.9	9	62.14	750.7	6	134.93	848.2	6	35.47	10.73	S	N/S	S	N/S
Tensile, Biaxial Low Rate, 0.2 in/min														
Outer, Max Stress	104.3	6	3.57	110.0	6	3.09	106.2	6	2.02	5.78	S	S	N/S	N/S
Strain at Max Stress	.316	6	.0111	.354	6	.0102	.438	6	.0110	200.9	S	S	S	S
Strain at Rupture	.416	6	.0251	.542	6	.0262	.558	6	.0233	52.69	S	N/S	S	S
Stress at Rupture	95.5	6	5.01	99.9	6	4.30	98.4	6	2.88	1.72	N/S	---	---	---
Modulus	696.0	6	41.69	761.5	6	25.68	452.5	6	16.69	178.31	S	S	S	S
Inner, Max Stress	118.1	6	9.00	114.2	6	1.10	116.1	6	13.84	0.246	N/S	---	---	---
Strain at Max Stress	.447	6	.0313	.460	6	.0174	.485	6	.0591	1.45	N/S	---	---	---
Strain at Rupture	.529	6	.0402	.566	6	.0372	.595	6	.0400	4.37	S	N/S	S	N/S
Stress at Rupture	113.3	6	8.93	108.8	6	1.92	108.0	6	13.36	0.559	N/S	---	---	---
Modulus	477.5	6	8.31	470.2	6	15.69	518.5	6	63.51	2.81	N/S	---	---	---

TABLE 1, ANALYSIS OF VARIANCE (cont)

Test	1982 Mean	Nr Samp	Std Dev	1983 Mean	Nr Samp	Std Dev	1985 Mean	Nr Samp	Std Dev	F Value	Sig of F	1982 vs 1983	1982 vs 1985	1983 vs 1985
Tensile, HR Hydro, 1750 in/min, 500 psi														
Outer, Max Stress	557.4	6	8.77	560.6	6	4.25	575.9	6	11.86	17.47	S	N/S	S	S
Strain at Max Stress	.333	6	.0101	.340	6	.0110	.544	6	.0693	51.45	S	N/S	S	S
Strain at Rupture	.419	6	.0147	.432	6	.0202	.657	6	.0737	53.32	S	N/S	S	S
Stress at Rupture	541.6	6	9.25	592.7	6	6.85	550.8	6	15.70	1.20	N/S	---	---	---
Modulus	6887.3	6	958.83	5650.5	6	482.02	4141.8	6	78.00	29.39	S	S	S	S
Inner, Max Stress	606.1	6	4.57	591.2	6	10.46	589.1	6	3.09	10.98	S	S	S	N/S
Strain at Max Stress	.507	6	.0322	.572	6	.0255	.529	6	.0118	10.84	S	S	N/S	S
Strain at Rupture	.665	6	.0518	.748	6	.0541	.679	6	.0256	5.65	S	S	N/S	N/S
Stress at Rupture	583.8	6	7.20	559.2	6	18.63	562.2	6	7.88	7.05	S	S	S	N/S
Modulus	5445.5	6	596.93	4037.8	6	739.64	4035.3	6	184.32	12.71	S	S	S	N/S
Tensile, Very Low Rate, 0.0002 in/min, Bi-Propellant														
Max Stress	37.2	6	2.21	39.9	8	2.18	47.5	6	.314	51.03	S	N/S	S	S
Strain at Max Stress	.217	6	.0135	.229	8	.0106	.262	6	.0092	27.16	S	N/S	S	S
Strain at Rupture	.238	6	.0089	.260	8	.0064	.285	6	.0067	63.24	S	S	S	S
Stress at Rupture	35.4	6	2.29	36.9	8	2.30	45.9	6	.454	53.26	S	N/S	S	S
Modulus	232.2	6	6.79	228.8	8	10.08	241.7	6	4.76	4.76	S	N/S	N/S	S
Stress Relaxation, 3% Strain														
Outer, 20°F, 10 Sec	1635.7	3	32.33	1959.0	3	44.84	2002.7	6	226.76	4.84	S	N/S	S	N/S
50 Sec	958.0	3	41.51	1058.3	3	3.79	1074.8	6	102.49	2.28	N/S	---	---	---
100 Sec	793.3	3	36.91	866.7	3	12.74	875.8	6	85.24	1.64	N/S	---	---	---
1000 Sec	444.3	3	47.10	418.0	3	33.64	492.2	6	40.54	3.68	N/S	---	---	---
77°F, 10 Sec	505.7	3	37.75	466.7	3	73.64	530.7	6	60.59	1.15	N/S	---	---	---
50 Sec	352.0	3	41.51	340.3	3	55.90	369.2	6	47.67	0.38	N/S	---	---	---
100 Sec	318.0	3	38.51	300.7	3	49.64	328.5	6	42.12	0.42	N/S	---	---	---
1000 Sec	242.0	3	30.05	228.7	3	35.50	243.5	6	32.48	0.22	N/S	---	---	---
120°F, 10 Sec	399.0	3	13.86	312.7	3	35.57	306.2	6	42.78	6.93	S	N/S	N/S	S
50 Sec	322.3	3	10.79	246.0	3	28.62	242.0	6	34.93	7.94	S	S	S	N/S
100 Sec	300.0	3	8.89	233.1	3	28.93	221.3	6	30.20	9.04	S	S	S	N/S
1000 Sec	244.7	3	4.04	167.7	3	32.52	183.2	6	21.92	10.36	S	S	S	N/S

TABLE 1, ANALYSIS OF VARIANCE

Test	1982 Mean	Nr Samp	Std Dev	1983 Mean	Nr Samp	Std Dev	1985 Mean	Nr Samp	Std Dev	F Value	Sig of F	1982 vs 1983	1982 vs 1985	1983 vs 1985
Stress Relaxation, 3% Strain														
Outer, 160°F, 10 Sec	274.7	3	26.58	336.7	3	10.69	251.3	6	36.65	7.88	S	N/S	N/S	S
50 Sec	229.0	3	21.52	269.6	3	15.37	203.2	6	29.59	6.90	S	N/S	N/S	S
100 Sec	214.3	3	22.03	248.3	3	13.32	185.3	6	25.94	7.75	S	N/S	N/S	S
1000 Sec	164.7	3	19.66	184.3	3	9.86	139.0	6	16.58	8.37	S	S	N/S	N/S
Inner, 20°F, 10 Sec	1469.7	3	119.30	1567.3	3	29.70	1671.5	6	44.96	9.43	S	N/S	S	N/S
50 Sec	791.0	3	20.30	817.0	3	23.52	964.7	6	28.27	59.57	S	N/S	S	S
100 Sec	622.3	3	30.60	661.3	3	35.72	798.5	6	31.52	36.39	S	N/S	S	S
1000 Sec	342.0	2	21.20	272.7	3	51.05	466.8	6	17.34	45.38	S	N/S	S	S
77°F, 10 Sec	529.0	3	63.50	402.0	3	8.72	479.5	6	19.21	11.08	S	S	N/S	S
50 Sec	380.0	3	52.72	288.7	3	5.51	331.8	6	12.77	8.76	S	S	N/S	N/S
100 Sec	340.3	3	50.30	251.0	3	4.58	296.7	6	11.84	9.28	S	S	N/S	N/S
1000 Sec	253.3	3	38.60	185.3	3	3.06	219.3	6	9.83	8.96	S	S	N/S	N/S
120°F, 10 Sec	399.0	3	13.86	302.3	3	15.18	338.0	6	13.73	36.46	S	S	S	S
50 Sec	296.7	3	43.50	231.3	3	10.50	264.2	6	9.58	6.46	S	S	N/S	N/S
100 Sec	279.0	3	43.03	220.1	3	11.59	246.2	6	9.54	5.32	S	S	N/S	N/S
1000 Sec	220.0	3	24.27	174.3	3	11.72	192.8	6	5.98	8.79	S	S	N/S	N/S
160°F, 10 Sec	294.3	3	33.84	267.7	3	4.16	277.0	6	7.48	1.92	N/S	---	---	---
50 Sec	253.3	3	31.50	214.3	3	5.03	227.7	6	5.32	4.95	S	S	N/S	N/S
100 Sec	237.7	3	30.09	200.6	3	4.04	209.2	6	6.01	5.25	S	S	N/S	N/S
1000 Sec	189.7	3	20.82	162.3	3	7.51	165.8	6	3.31	6.23	S	S	S	N/S
Hardness, Shore A, 10 Sec, Outer	70.0	8	6.78	63.3	12	2.71	62.5	12	1.31	10.54	S	S	S	N/S
Inner	61.6	9	.53	65.2	12	1.34	61.1	12	2.61	18.00	S	S	N/S	S
TCLE, Below Tg, Outer	.0000629	3	.000001779	.0000572	4	.000005767	.0001125	7	.00000628	158.07	S	N/S	S	S
Tg, Outer	-56	3	2.1	-60	4	1.7	-56	7	2.3	5.11	S	N/S	N/S	S
Above Tg, Outer	.000102	3	.00000319	.0001	4	.00000296	.0000614	7	.00000341	257.78	S	N/S	S	S
Below Tg, Inner	.0000645	3	.00000427	.0000592	3	.00000266	.00001081	6	.00000361	251.06	S	N/S	S	S
Tg, Inner	-57	3	1.5	-57	3	2.3	-58	6	1.4	0.54	N/S	---	---	---
Above Tg, Inner	.0000983	3	.0000029	.0000989	3	.00000733	.0000625	6	.00000492	71.73	S	N/S	S	S

S = Significant difference in means. The means are not the same
NS = Non-significant difference in means. The m eans are equal
-- = Non applicable

NOTE: All testing was performed at the 5% significance level

TABLE 2

REGRESSION TREND LINE SUMMARY

Test	Sm	er	E
Uniaxial Tensile, 0.0002 in/min			
Outer	S(-)	S(+)	S(-)
Inner	S(+)	NS	NS
Bipropellant	S(+)	S(+)	S(+)
Uniaxial Tensile, 2.0 in/min			
Outer	NS	S(+)	NS
Inner	S(+)	NS	S(+)
Biaxial Tensile, 0.2 in/min			
Outer	NS	S(+)	S(-)
Inner	NS	S(+)	NS
High Rate Hydrostatic Tensile. 1750 in/min			
Outer	S(+)	S(+)	S(-)
Inner	S(-)	NS	S(-)

Stress Relaxation, 3% Strain, $77^{o}F$	10 sec	50 sec	100 sec	1000 sec
Outer	NS	NS	NS	NS
Inner	NS	NS	NS	NS

Thermal Coefficient of Linear Expansion	Below Tg	Above Tg	Tg
Outer	NS	S(+)	NS
Inner	NS	S(+)	NS

Hardness, 10 sec, Unconditioned	
Outer	S(-)
Inner	NS

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

TABLE 3

MINITHIN TENSILE DATA
Test Temp 77°F, CHS = 1.0 in/min
Motor S/N 0022687, 1985 data only
Outer Propellant

Specimen Location	Max Stress	Strain at Max Stress	Strain at Rupture	Stress at Rupture	Modulus
4EU11	116.4	0.729	0.802	110.2	636
12	120.8	0.731	0.772	116.9	615
13	127.0	0.782	0.876	120.6	586
A	124.2	0.707	———	———	557
Block 1 $\bar{X}$	122.1	0.7373	0.8167	115.9	598.5
S.D.	4.568	0.03175	0.05353	5.27162	34.4335
N =	4	4	3	3	4
4EU21	119.8	0.712	0.775	115.3	603
22	124.9	0.764	0.806	122.2	587
23	126.6	0.733	0.786	122.4	580
26	122.4	0.755	0.849	116.7	507
Block 2 $\bar{X}$	123.43	0.7410	0.8040	119.15	369.25
S.D.	2.9691	0.02331	0.0326	3.683	42.6019
N =	4	4	4	4	4
4EU51	98.1	0.628	0.724	92.3	759
52	106.5	0.567	0.726	95.8	822
53	97.2	0.522	0.665	88.7	567
54	101.4	0.492	0.642	90.7	695
55	102.4	0.494	0.661	89.0	631
56	102.7	0.485	0.645	93.0	704
57	102.2	0.486	0.614	94.0	677
58	102.8	0.490	0.683	89.4	677
59	100.9	0.479	0.684	85.2	693
A	104.3	0.495	0.648	93.8	674
B	103.9	0.491	0.643	92.5	708
Block 5 $\bar{X}$	102.04	0.5117	0.66682	91.31	691.55
S.D.	2.65114	0.04584	0.03489	3.0389	64.74313
N =	11	11	11	11	11
4EU61	61.6	0.601	0.731	55.5	558
62	73.8	0.532	0.649	66.3	540
63	81.0	0.511	0.606	74.9	572
64	89.7	0.477	0.626	79.7	663
65	91.2	0.444	0.589	80.1	741
66	91.0	0.444	0.595	81.3	716
67	93.3	0.431	0.560	82.9	738
68	95.2	0.439	0.592	83.0	733
69	96.3	0.441	0.612	83.6	733
A	97.2	0.429	0.617	80.5	756
B	96.7	0.435	0.598	82.6	697
Block 6 $\bar{X}$	87.91	0.4713	0.6159	77.31	677.0
S.D.	11.30836	0.05504	0.44426	8.79471	81.48742
N =	11	11	11	11	11

TABLE 3 (cont)

Inner Propellant

Specimen Location	Max Stress	Strain at Max Stress	Strain at Rupture	Stress at Rupture	Modulus
4EU11	54.2	0.553	0.646	50.5	527
12	55.4	0.603	0.697	52.2	391
13	73.7	0.574	0.739	66.5	579
A	88.8	0.416	0.590	76.9	678
Block 1 $\bar{X}$	68.025	0.5365	0.6680	61.5250	543.75
S.D.	16.4755	0.08291	0.06442	12.51196	119.553
N =	4	4	4	4	4
4EU21	68.8	0.618	0.793	61.1	567
22	73.7	0.604	0.823	64.3	512
23	81.1	0.532	0.670	74.5	591
26	87.2	0.440	0.651	74.4	665
A	89.3	0.437	0.598	79.9	632
Block 2 $\bar{X}$	80.02	0.5262	0.7070	70.840	593.4
S.D.	8.72737	0.08646	0.09649	7.83888	59.0449
N =	5	5	5	5	5
4EU32	89.6	0.439	0.601	78.0	618
33	90.1	0.442	0.609	79.2	592
36	88.1	0.444	0.607	77.1	651
A	86.3	0.429	0.506	79.6	670
Block 3 $\bar{X}$	88.5250	0.4350	0.58075	78.4750	632.75
S.D.	1.70953	0.006658	0.4995	1.14127	34.6350
N =	4	4	4	4	4
4EU42	84.1	0.465	0.526	79.9	512
43	85.2	0.467	0.665	73.2	612
46	85.7	0.456	0.560	78.7	622
A	79.8	0.357	0.392	76.1	576
Block 4 $\bar{X}$	83.7	0.4362	0.53575	76.975	580.5
S.D.	2.68452	0.05305	0.112624	2.97475	49.75607

TABLE 4

ANALYSIS OF VARIANCE FOR MINITHIN DATA
at The 5% Significance Level

Test Parameter	Location	Nr Samples Per Group	Mean	Std Dev	Cal F Value	Sig of F-Test
OUTER PROPELLANT						
Max Stress	4EU1	4	122.10	4.5680		
	4EU2	4	123.43	2.9691	33.9429	S
	4EU5	11	102.04	2.6511		
	4EU6	11	87.91	11.3084		
Strain at Max Stress	4EU1	4	0.7373	0.03175		
	4EU2	4	0.7410	0.02331	57.1172	S
	4EU5	11	0.5117	0.04584		
	4EU6	11	0.4713	0.05504		
Strain at Rupture	4EU1	3	0.8167	0.05353		
	4EU2	4	0.8040	0.03260	0.6875	NS
	4EU5	11	0.6668	0.3489		
	4EU6	11	0.6159	0.44426		
Stress at Rupture	4EU1	3	115.90	5.27162		
	4EU2	4	119.15	3.68300	60.9510	S
	4EU5	11	91.31	3.03890		
	4EU6	11	77.31	8.79471		
Modulus	4EU1	4	598.50	34.4335		
	4EU2	4	569.25	42.6019	4.5810	S
	4EU5	11	691.55	64.7431		
	4EU6	11	677.00	81.4874		
INNER PROPELLANT						
Max Stress	4EU1	4	68.025	16.4755		
	4EU2	5	80.020	8.7274	3.4647	S
	4EU3	4	88.525	1.7095		
	4EU4	4	83.700	2.6845		
Strain at Max Stress	4EU1	4	0.5365	0.08291		
	4EU2	5	0.5262	0.08646	2.7287	NS
	4EU3	4	0.4385	0.00666		
	4EU4	4	0.4362	0.05305		
Strain at Rupture	4EU1	4	0.6680	0.6442	0.4175	NS
	4EU2	5	0.7070	0.09649		
	4EU3	4	0.5808	0.49950		
	4EU4	4	0.53575	0.11262		
Stress at Rupture	4EU1	4	61.525	12.51196		
	4EU2	5	70.840	7.83888	4.1371	S
	4EU3	4	78.475	1.14127		
	4EU4	4	76.975	2.97475		

TABLE 4 (cont)

Test Parameter	Location	Nr Samples Per Group	Mean	Std Dev	Cal F Value	Sig of F-Test
Modulus	4EU1	4	543.75	119.5530		
	4EU2	5	593.40	59.0449	1.0355	NS
	4EU3	4	632.75	34.6350		
	4EU4	4	580.50	49.7561		

NOTE:

S = A significant difference between the 4 means.
NS = No significant difference between the 4 means.

TABLE 5

STRESS RELAXATION DATA
3% STRAIN, MEAN VALUES

Temp (°F)	Year Tested	10 sec (psi)	50 sec (psi)	100 sec (psi)	1000 sec (psi)
		OUTER			
0	1985	3638	2015	1623	834
20	1982	1635	958	793	444
	1983	1959	1058	866	---
	1985	2003	1075	876	492
40	1985	992	600	506	304
77	1982	506	352	318	242
	1983	467	340	301	229
	1985	531	369	328	244
120	1982	399	322	300	245
	1983	313	246	233	168
	1985	306	242	221	183
160	1982	275	229	214	165
	1983	337	269	248	184
	1985	251	203	185	139
		INNER			
0	1985	3383	1881	1531	857
20	1982	1470	791	622	342
	1983	1567	817	661	273
	1985	1672	965	798	467
40	1985	955	576	474	314
77	1982	529	380	340	253
	1983	402	289	261	185
	1985	480	332	297	219
120	1982	399	297	279	220
	1983	302	231	220	174
	1985	338	264	246	193
160	1982	294	253	238	190
	1983	268	214	201	162
	1985	277	228	209	166

TABLE 6

HARDNESS DATA, SHORE A
Motor S/N 0022687, 1985 Data

Specimen Location	Unconditioned		Conditioned	
	Initial	10 sec	Initial	10 sec
Outer	71	63	70	59
	74	65	70	60
	71	63	71	60
	71	60	71	60
	71	62	63	52
	72	62	67	58
	73	62	70	60
	72	63	71	62
	73	62	72	62
	71	61	71	60
	72	64	72	61
	73	63	71	62
$\bar{X}$ =	72.0	62.50	69.92	59.67
S.D. =	1.044	1.314	2.539	2.708
Inner	65	58	66	60
	66	57	72	63
	71	60	71	62
	71	59	71	60
	72	60	70	60
	74	61	71	62
	74	65	71	62
	72	64	70	56
	64	60	66	57
	75	65	68	64
	73	62	71	62
	72	62	68	60
$\bar{X}$ =	70.75	61.08	69.58	60.67
S.D. =	3.696	2.610	2.065	2.348

TABLE 7

HARDNESS DATA COMPARISON
F and t Tests

Test	Unconditioned $\bar{X}$	N	S.D.	Conditioned $\bar{X}$	N	S.D.	Comparison Results
Hardness							
Outer Initial	72.0	12	1.044	69.92	12	2.539	S/F
10 sec	62.50	12	1.314	59.67	12	2.708	S/F
Inner Initial	70.75	12	3.696	69.58	12	2.065	S/F
10 sec	61.08	12	2.610	60.67	12	2.348	NS

NS = "F" and 't' results are not significant at the 5% significance level.
S/F = "F" test results are significant.
S/t = "F" test results are not significant, but the 't' test results are significant.

NOTE:
The F-test compares the variance within data groups.
The t-test compares the means between data groups.
The t-test is not applicable when the F-test shows a significant difference.

TABLE 8

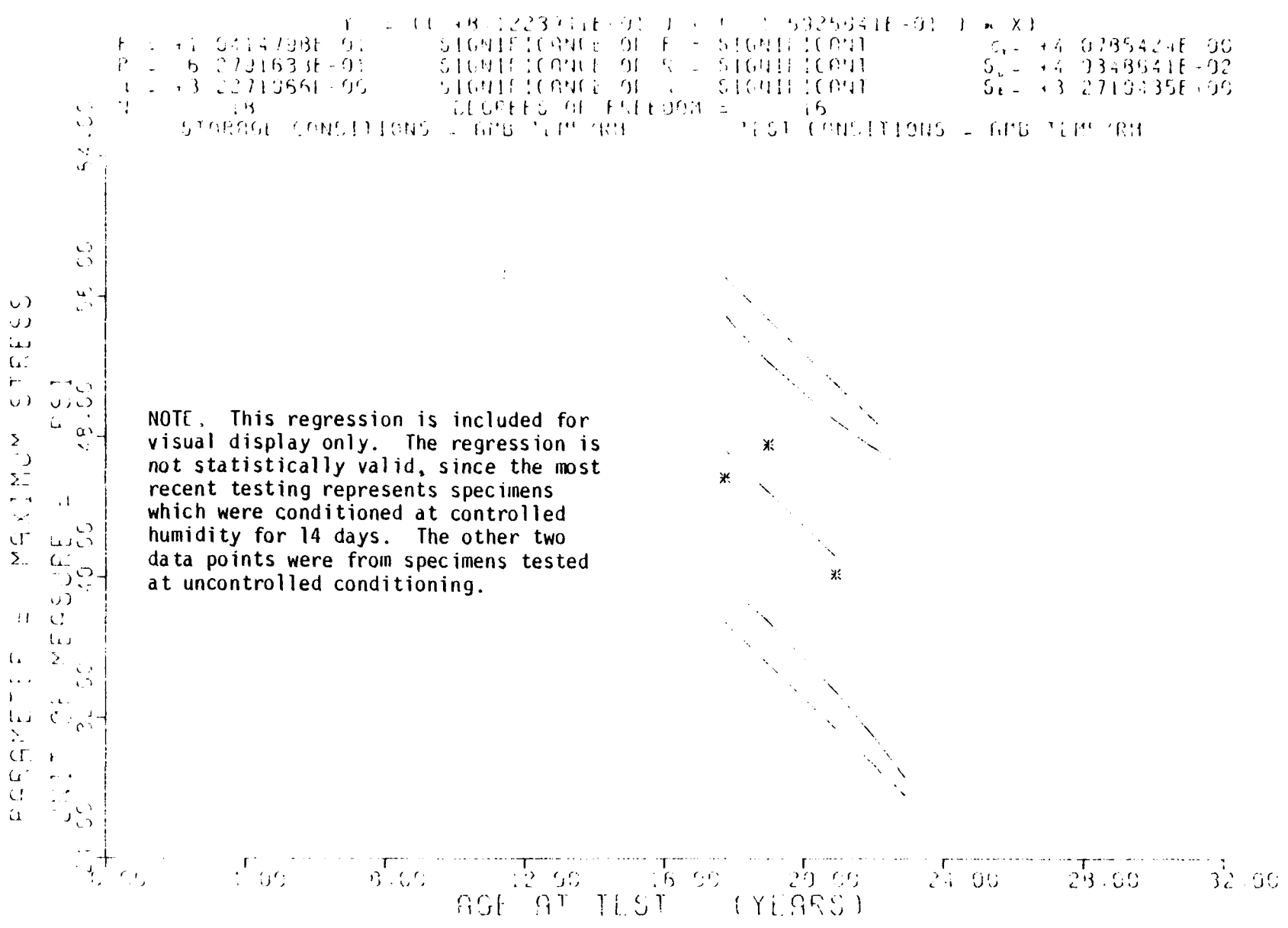
BOND PROPERTIES

Test Conditions	1982 $\bar{X}$	1983 $\bar{X}$	Without Avcoat 1985 $\bar{X}$
Shear Strength, Composite (psi) 2.0 in/min, 500 psi	171	153.2	152.7
Tensile Strength, Composite (psi) 20 in/min, 500 psi	508	419.5	249.7
Constant Load Tensile (Log Stress (psi) vs Log Time to Failure/min)	@ 100 min 37.8	@ 1 min 79.73 @ 10 min 51.23 @ 100 min 32.9	@ 1 min 82.69 @ 10 min 56.74 @ 100 min 38.93 @ 1000 min 26.72

TABLE 9

MISCELLANEOUS PROPERTIES

Test	1982 $\bar{X}$	1983 $\bar{X}$	1985 $\bar{X}$
Swell Ratio			
Insulation	1.47	1.58	1.15
Liner	2.42	2.07	2.09
Gel Fraction			
Insulation	89.69	87.59	91.16
Liner	63.33	67.52	67.93
Moisture (%)			
Insulation	0.92	1.57	1.37



NOTE, This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 4

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+4.5686645E+01	+2.7491374E+00	+4.9759994E+01	+4.2579986E+01	+4.7301895E+01
228.0	6	+4.7581619E+01	+3.4837952E+00	+5.2649993E+01	+4.3839996E+01	+4.4913009E+01
251.0	6	+4.0199655E+01	+1.2480158E+00	+4.1949996E+01	+3.8369995E+01	+4.1250076E+01

II STAGE DSCT MTRS,OUTER,AXIAL POS,V.L.RATE CHS=0.0002 MAX STRESS <0022687>

Figure 4a

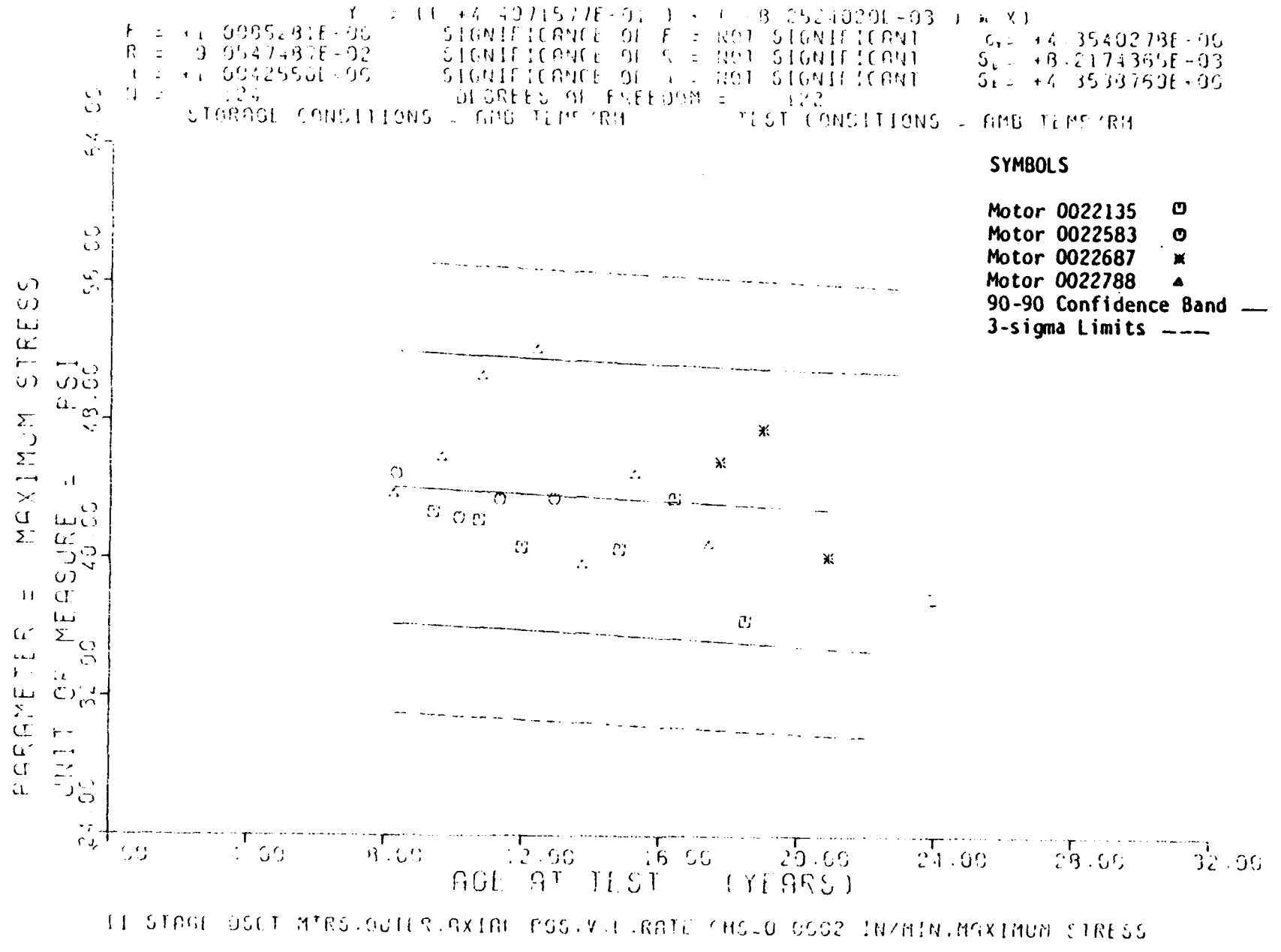
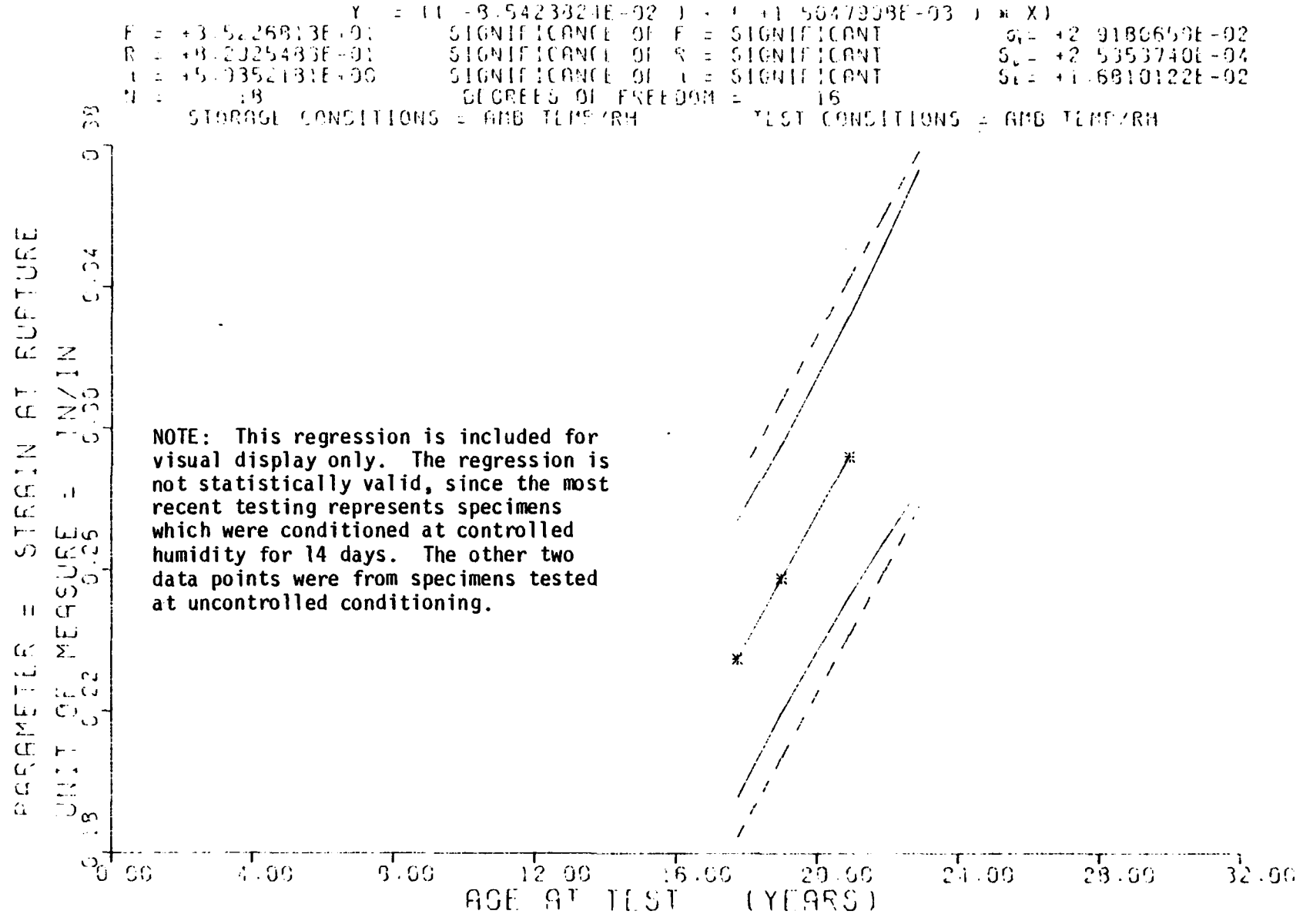

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
AGE AT TEST (YEARS)

Figure 4-B



II STAGE DSCI MTR <0022687>.OUTER.AXIAL POS.V.I.RATE CHS-0.0002.STRAIN RUPTURE

Figure 5

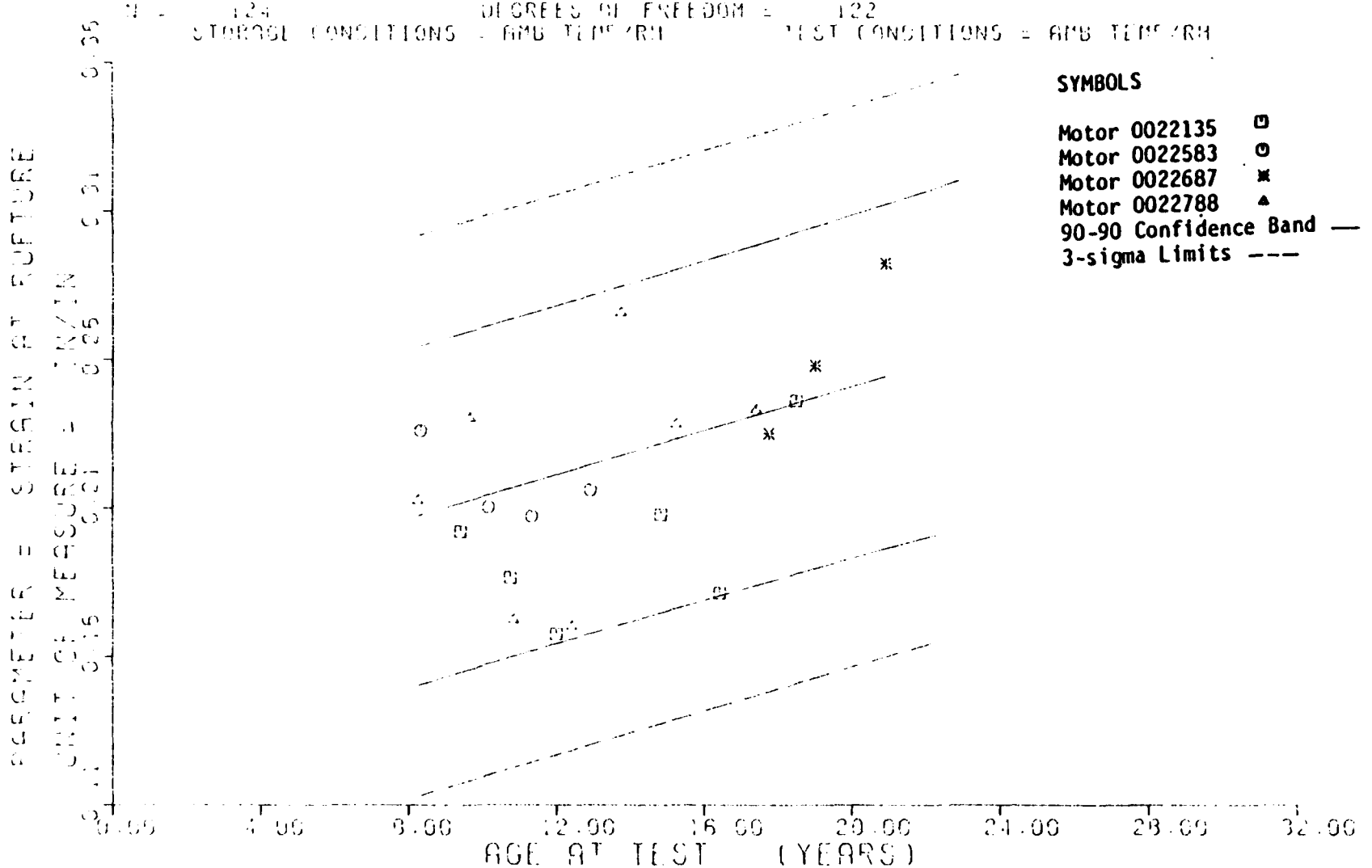
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+2.3499977E-01	+1.2347918E-02	+2.5799995E-01	+2.2399997E-01	+2.3509848E-01
228.0	6	+2.5783300E-01	+2.0763929E-02	+2.8599995E-01	+2.3199999E-01	+2.5767052E-01
251.0	6	+2.9221642E-01	+1.7915299E-02	+3.1399995E-01	+2.5999999E-01	+2.9228091E-01

II STAGE DSCT MTR <0022687>,OUTER,AXIAL POS,V.L.RATE CHS=0.0002,STRAIN RUPTURE.

Figure 5-A



FT STAGE OCT MTRS.OUTER.AXIAL POS.V.I.RATE CHS.0.0002 IN/MIN.STRAIN/RUPTURE

Figure 5-B

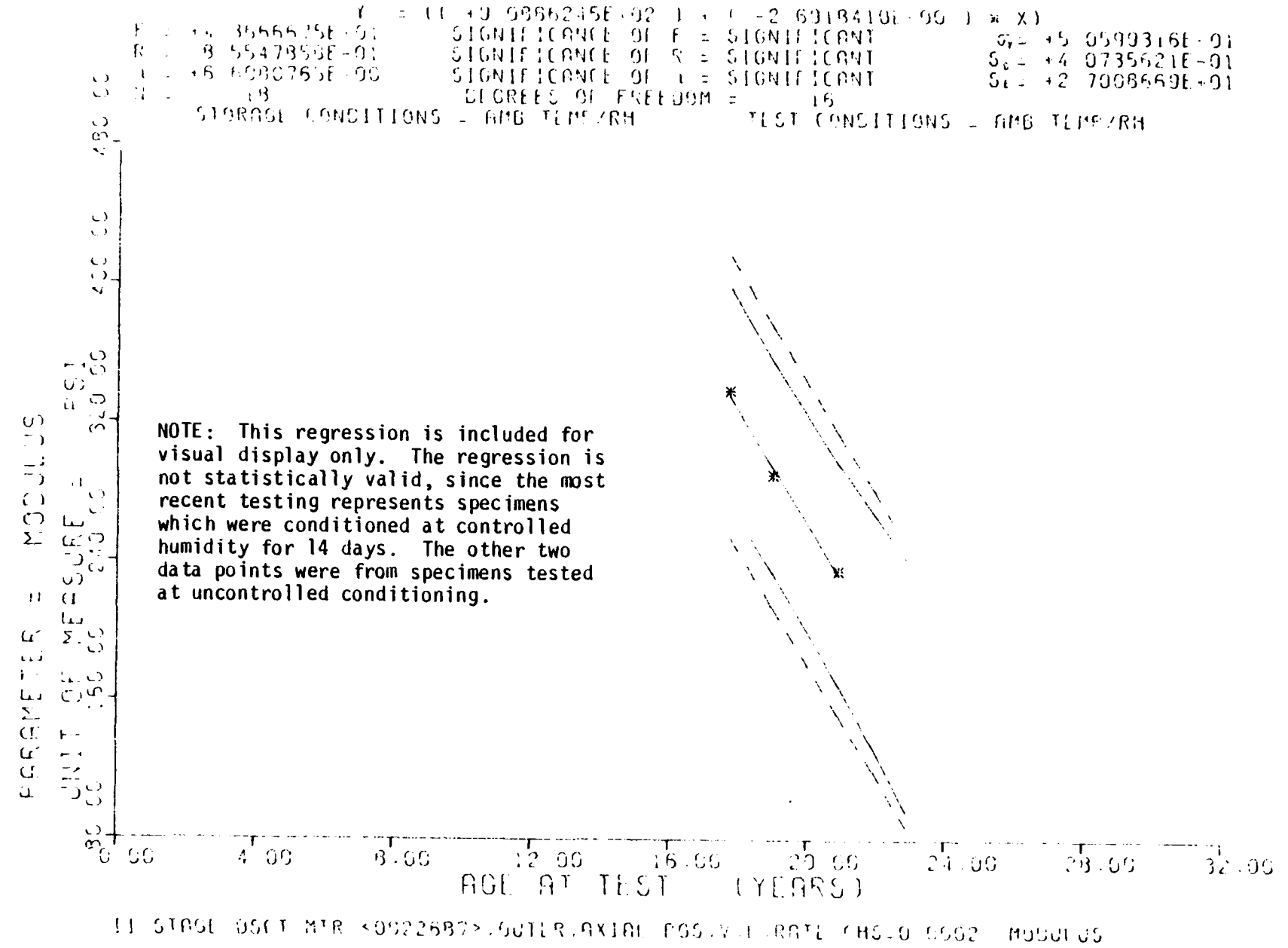

Y = (+9.9866245E+02) + (-2.6918410E+00) * X)
R = +6.3566635E-01
R = .8.5547856E-01
t = +6.6080765E+00
N = 18
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 16
S_y = +5.0599316E-01
S_c = +4.0735621E-01
S_t = +2.7008669E+01
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = KSI
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
II STAGE OSCT MTR <0922687>.OUTER.AXIAL POS.V.I.RATE (MS-0.0002" MODULUS

Figure 6

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+3.3850000E+02	+1.8152134E+01	+3.6500000E+02	+3.1300000E+02	+3.3550024E+02
228.0	6	+2.9016650E+02	+4.0201575E+01	+3.4700000E+02	+2.3700000E+02	+2.9512255E+02
251.0	6	+2.3516665E+02	+1.8540945E+01	+2.6700000E+02	+2.1900000E+02	+2.3321034E+02

II STAGE DSCT MTR <0022687>.OUTER.AXIAL POS.V.L.RATE CHS=0.0002. MODULUS.

Figure 6-A

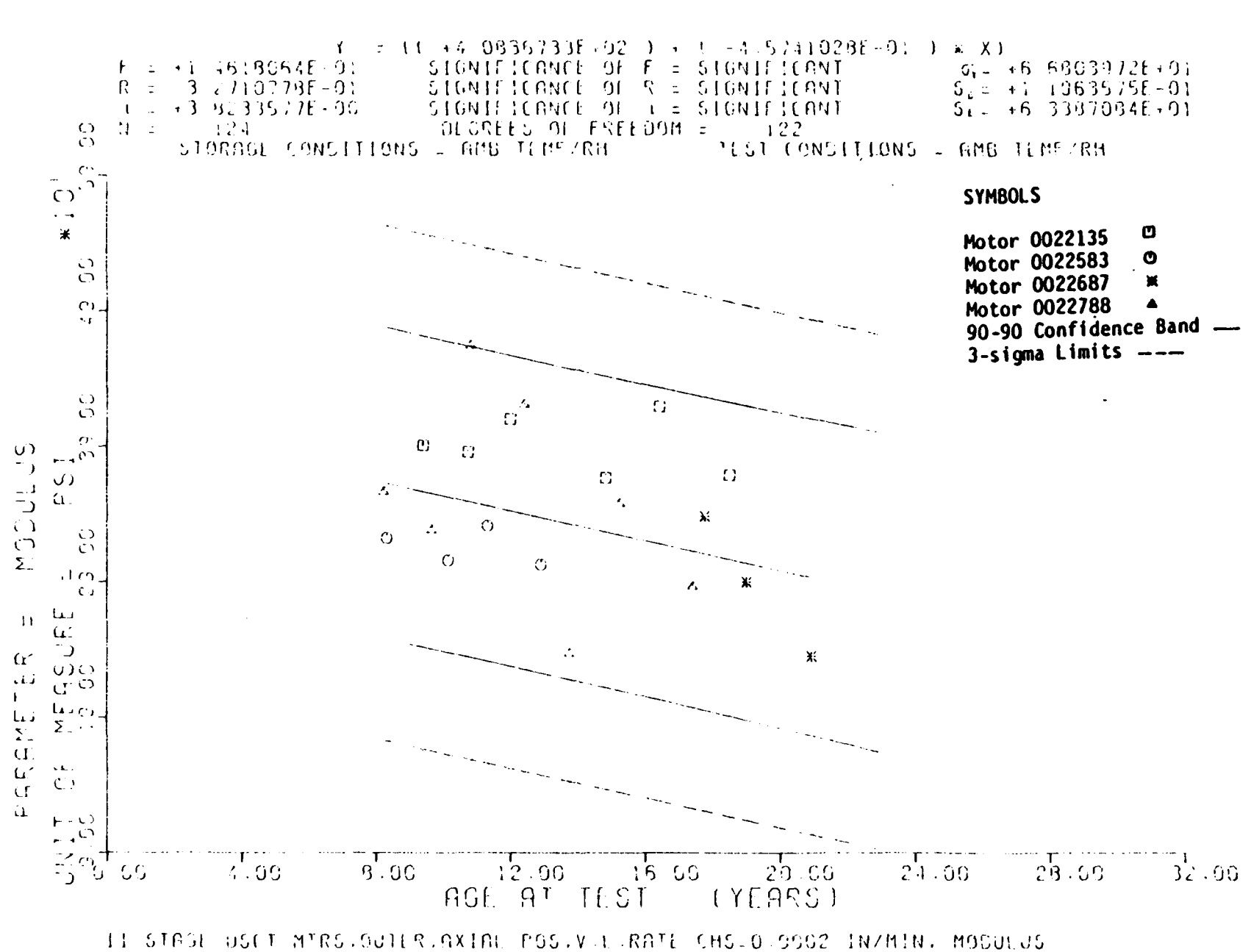
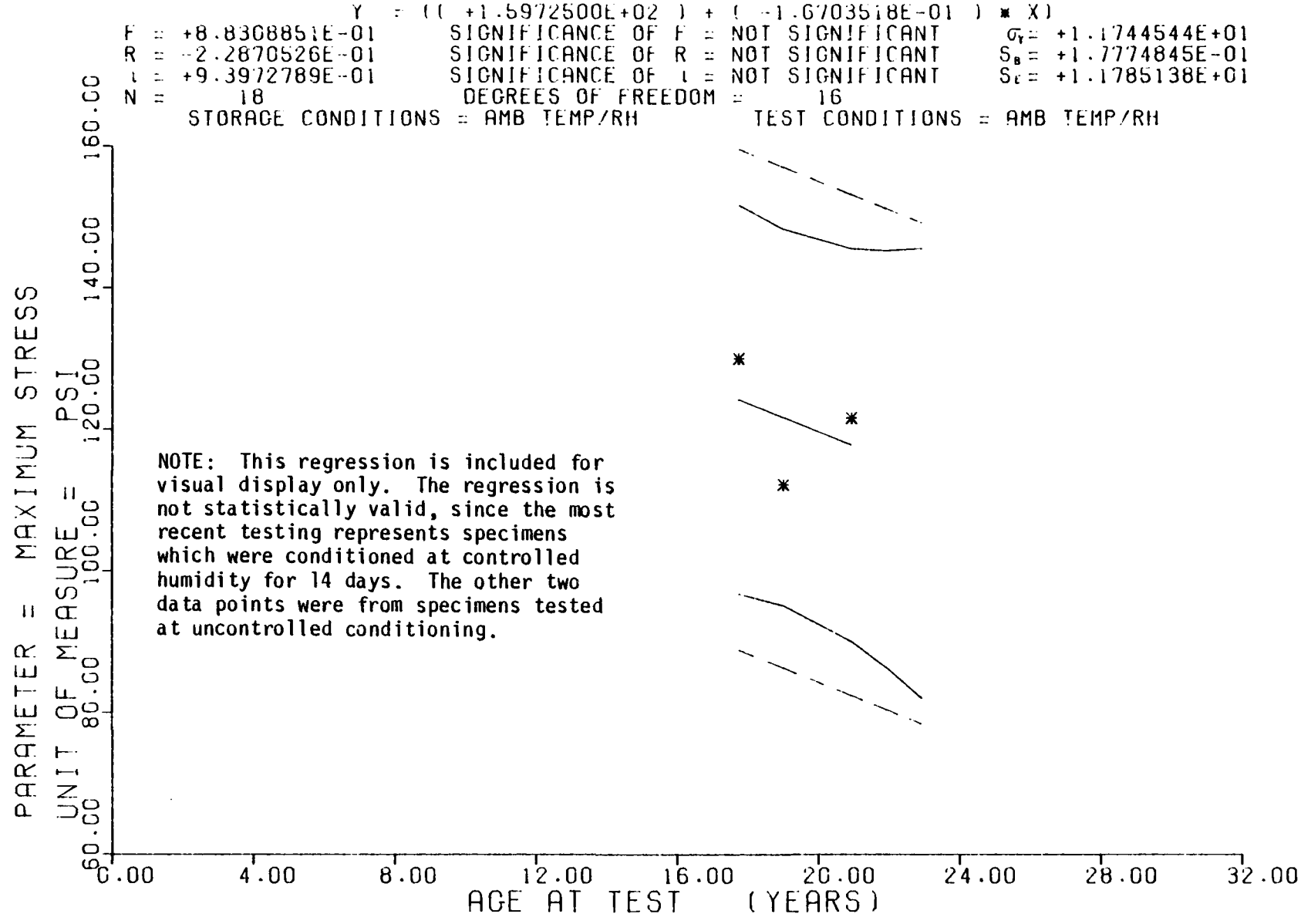

Y = (+6.0836733E-02) + (-4.5741028E-01) * X)
F = +1.4618054E-01 SIGNIFICANCE OF F = SIGNIFICANT
R = 3.2710278E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +3.8233577E-06 SIGNIFICANCE OF t = SIGNIFICANT
N = 124 DEGREES OF FREEDOM = 122
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
TI STAGE 0SCT MTRS.OUTER.AXIAL POS.V.L.RATE CHS-0.0002 IN/MIN. MODULUS

Figure 6-B



II STAGE DSCT MTRS ONLY, OUTER,AXIAL POS.LOW RATE CHS=2.0 MAX STRESS <0022687>

Figure 7

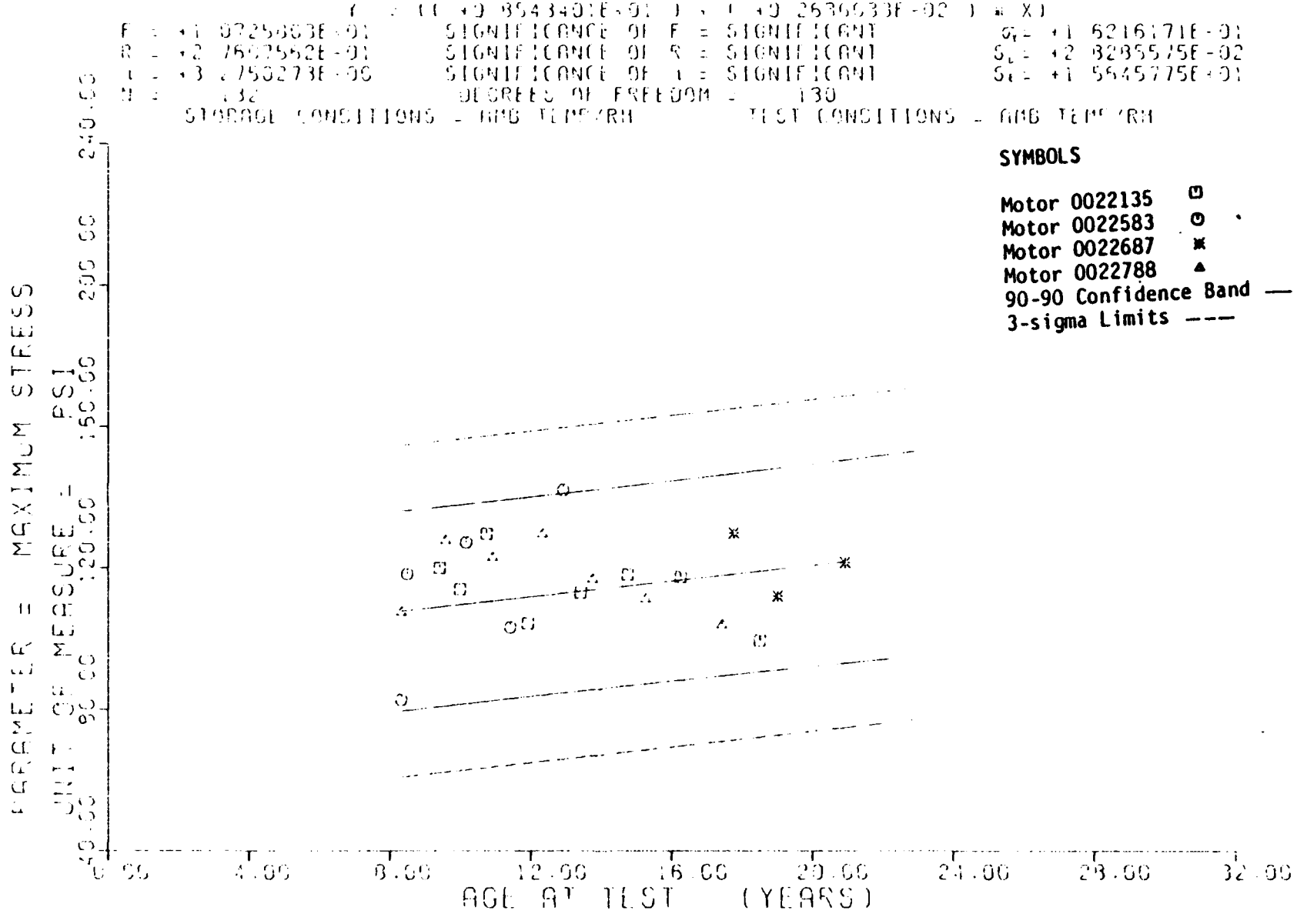
****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+1.2992324E+02	+1.2813510E+01	+1.4937998E+02	+1.0767999E+02	+1.2414649E+02
228.0	6	+1.1209663E+02	+7.7169372E+00	+1.2400000E+02	+1.0412998E+02	+1.2164097E+02
251.0	6	+1.2156600E+02	+7.3711455E+00	+1.3386599E+02	+1.1471998E+02	+1.1779916E+02

II STAGE DSCT MTRS ONLY, OUTER,AXIAL PCS,LOW RATE CHS=2.0 MAX STRESS <0022687>

Figure 7-A



II STAGE DSCT MTRS ONLY. OUTER.AXIAL POS LOW RATE CHS-2 0 IN/MIN.MAX STRESS

Figure 7-B

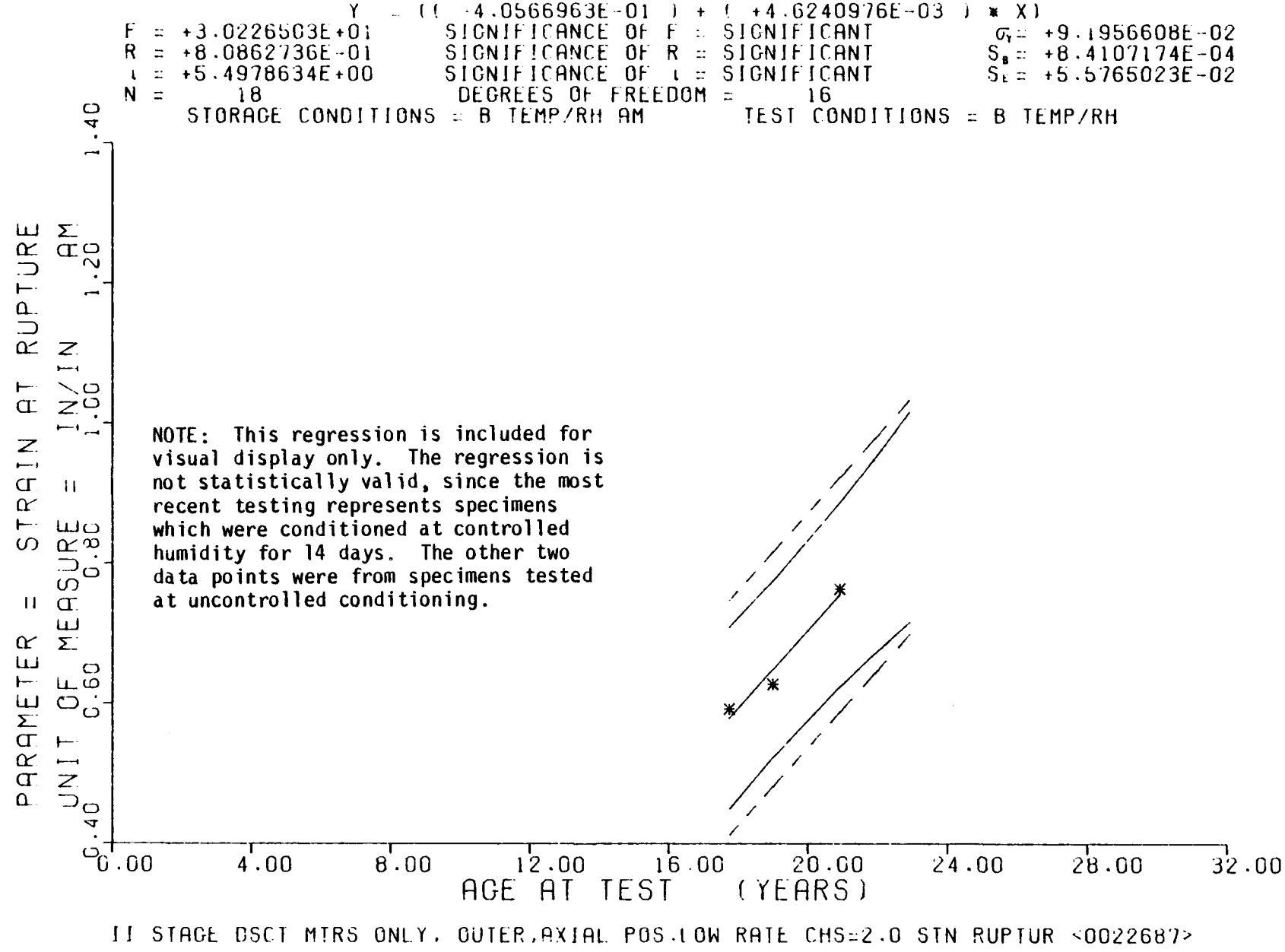

Y = (-4.0566963E-01) + (+4.6240976E-03) * X)
F = +3.0226503E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +9.1956608E-02
R = +8.0862736E-01 SIGNIFICANCE OF R = SIGNIFICANT S_B = +8.4107174E-04
t = +5.4978634E+00 SIGNIFICANCE OF t = SIGNIFICANT S_E = +5.5765023E-02
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN AM
1.40
1.20
1.00
0.80
0.60
0.40
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
II STAGE DSCT MTRS ONLY, OUTER,AXIAL POS.LOW RATE CHS=2.0 STN RUPTUR <0022687>

Figure 8

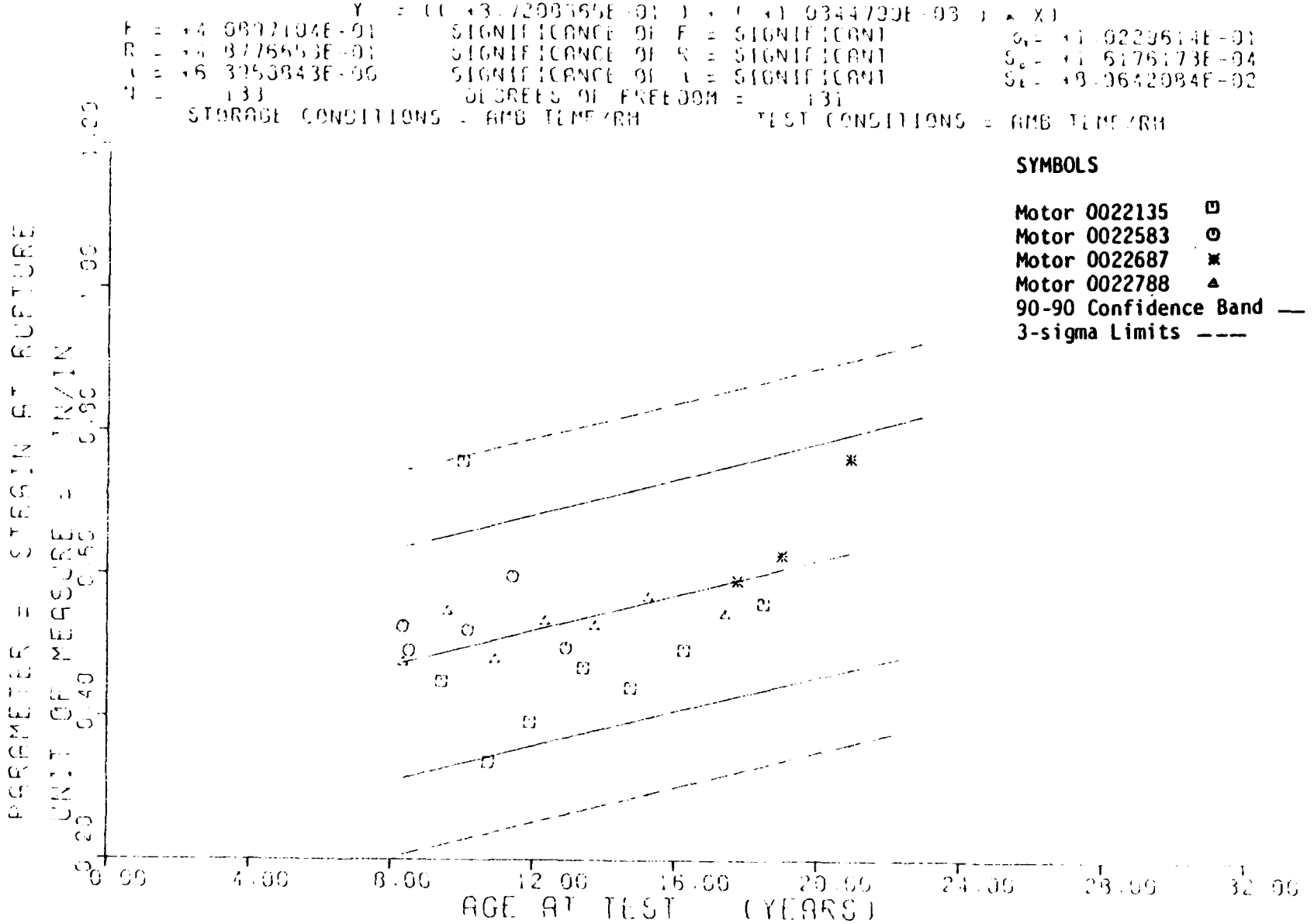
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MINUTES)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+5.9214937E-01	+1.9773917E-02	+6.1469995E-01	+5.5499994E-01	+5.7926315E-01
223.0	6	+6.2733298E-01	+5.1973416E-02	+6.7599999E-01	+5.5500996E-01	+6.4862459E-01
251.0	6	+7.6338291E-01	+7.7664837E-02	+8.1999999E-01	+6.1109995E-01	+7.5497883E-01

II STAGE DSCT MTRS ONLY, OUTER, AXIAL PCS, LOW RATE CHS=2.0 STN RUPTUR <0022687>

Figure 8-A



II STAGE DSCT MTRS ONLY. OUTER AXIAL POS-FLOW RATE (HS-2 0 IN/MIN.STRAIN/RUPTURE

Figure 8-B

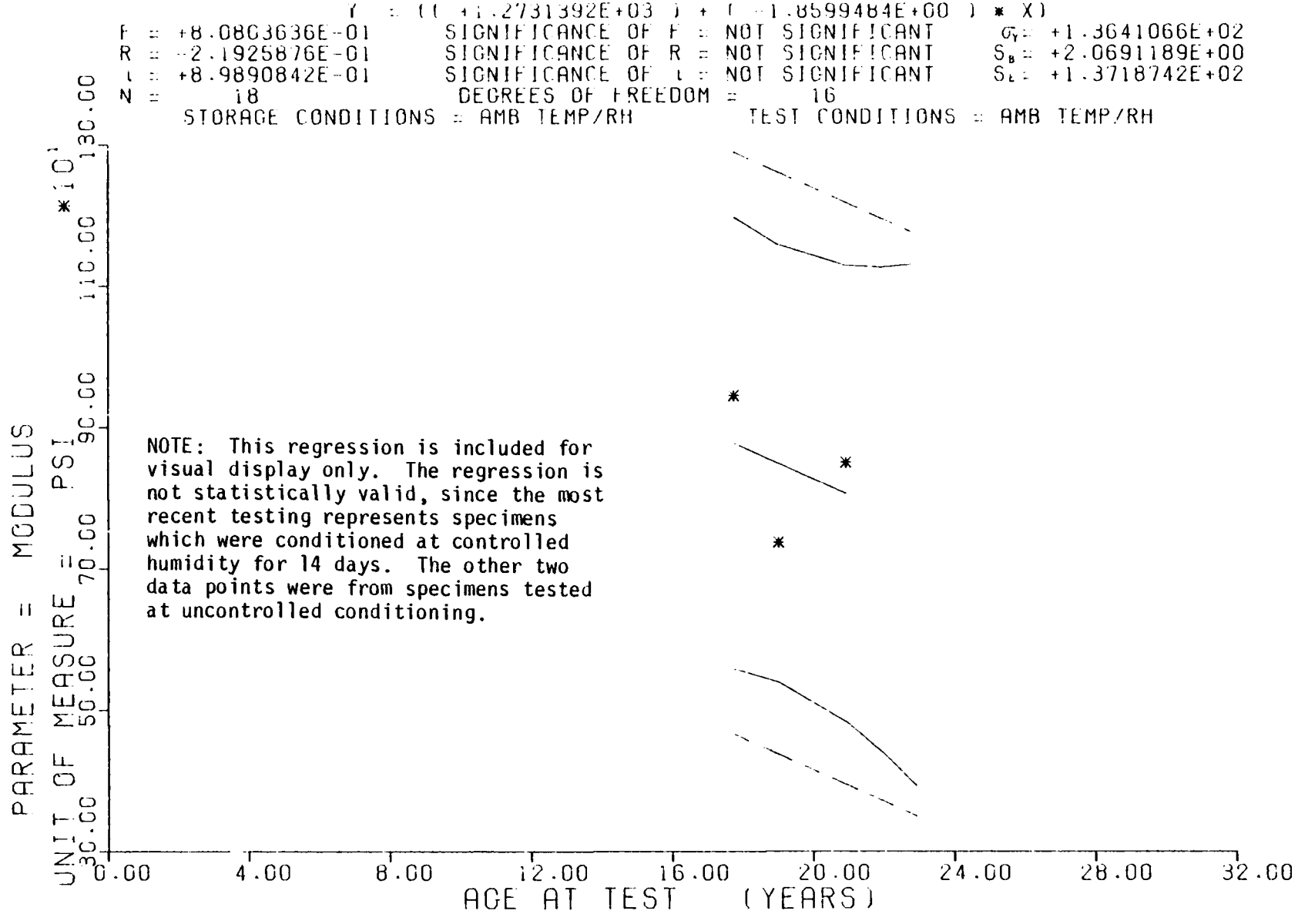

Y = (+1.2731392E+03) + (-1.8599484E+00) * X)
R = +8.0803636E-01
R = -2.1925876E-01
r = +8.9890842E-01
N = 18
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF r = NOT SIGNIFICANT
DEGREES OF FREEDOM = 16
σ_Y = +1.3641066E+02
S_B = +2.0691189E+00
S_E = +1.3718742E+02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10^1
30.00
50.00
70.00
90.00
110.00
130.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
!! STAGE,DSCT MTRS,ONLY, OUTER,AXIAL POS,LOW RATE CHS=2.0 <0022687> MODULUS

Figure 9

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
214.0	6	+9.4450000E+02	+8.9761350E+01	+1.0450000E+03	+8.1800000E+02	+8.7696997E+02
228.0	6	+7.3750000E+02	+1.5932451E+02	+8.7900000E+02	+4.4300000E+02	+8.4907080E+02
251.0	6	+8.5033325E+02	+6.3610271E+01	+9.6100000E+02	+7.6900000E+02	+8.0629199E+02

II STAGE,CSCT MTRS,CNLY, OUTER,AXIAL PCS,LOW RATE CHS=2.0 <0022687> MODULUS

Figure 9-A

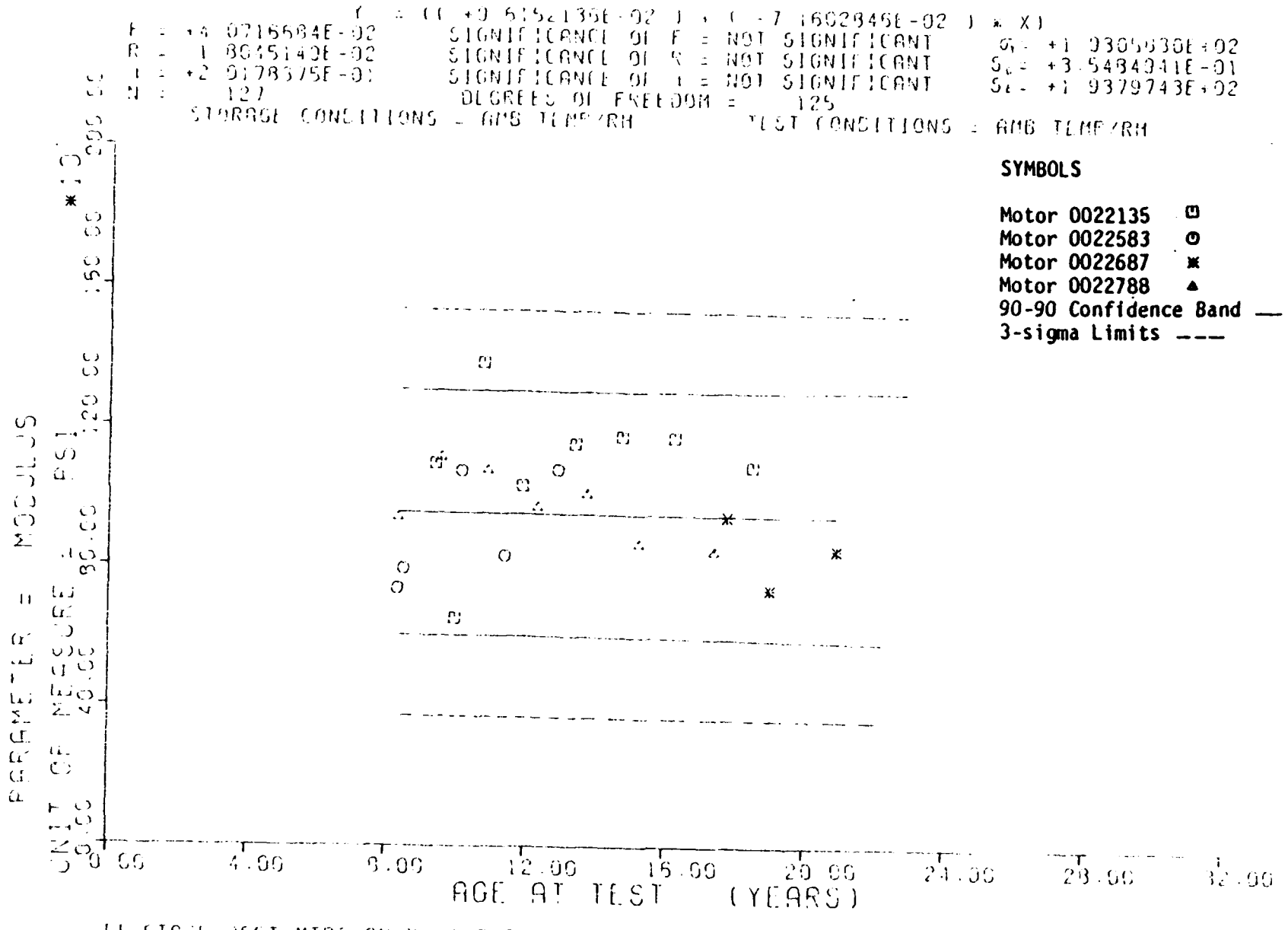

Y = (+3.515213E-02) + (-7.1602846E-02) * X)
F = +4.0216684E-02
R = 1.8645140E-02
I = +2.0178375E-01
N = 127
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF I = NOT SIGNIFICANT
DEGREES OF FREEDOM = 125
σ_y = +1.0305630E+02
$S_{\bar{x}}$ = +3.5484941E-01
S_x = +1.9379743E+02
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
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
0.00
40.00
80.00
120.00
160.00
200.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE OSCT MTRS ONLY, OUTER AXIAL POS LOW RATE CHS-2.9 IN/MIN. MODULUS

Figure 9-B

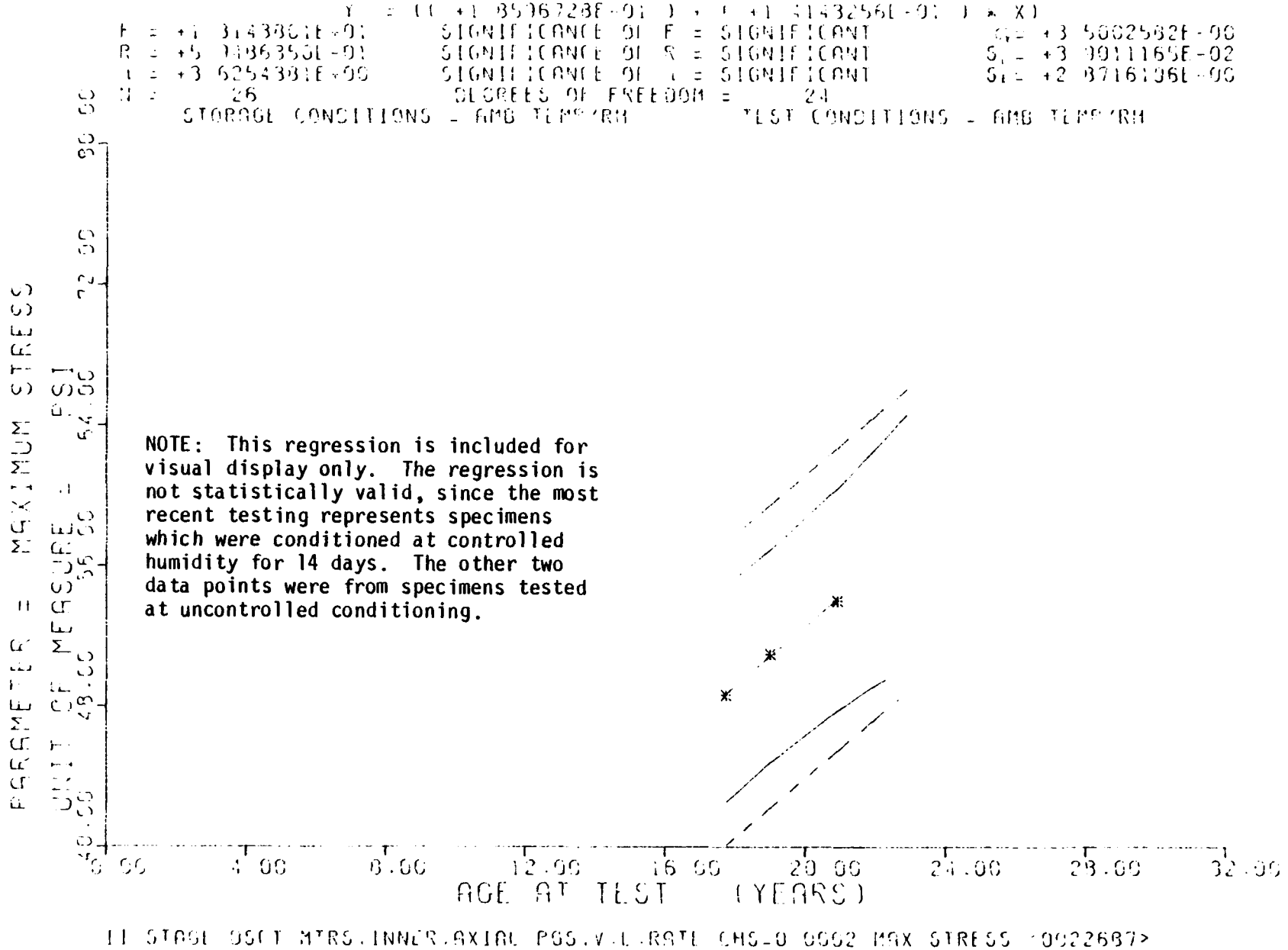

Y = (+1.8596728E-01) + (+1.5143256E-01) * X)
F = +1.3143861E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +5.7886355E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +3.6254381E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 26 DEGREES OF FREEDOM = 24
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 10

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	10	+4.664392DE+01	+2.1851710E+00	+5.1019589E+01	+4.4000000E+01	+4.8721862E+01
228.0	10	+5.0971939E+01	+4.1117136E+00	+5.6049587E+01	+4.4769989E+01	+5.0843353E+01
251.0	6	+5.4011627E+01	+7.2418703E-01	+5.5069592E+01	+5.3079986E+01	+5.4096298E+01

II STAGE DSCT MTRS,INNER,AXIAL POS,V.L.RATE CHS=0.0002 MAX STRESS <0022687>

Figure 10-A

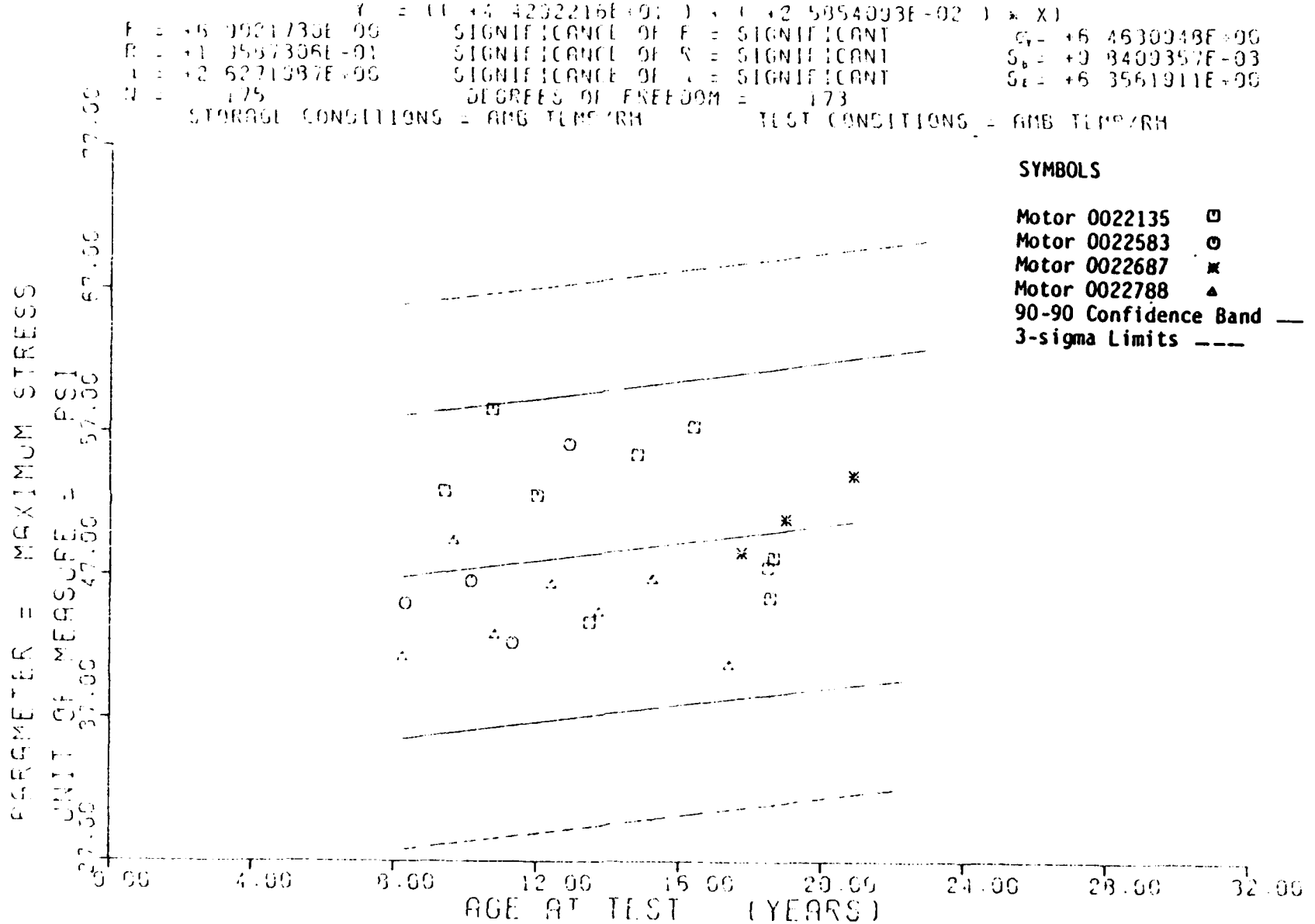

Y = (+4.4232216E+01) + (+2.5954003E-02) * X)
F = +5.0021730E 00
R = +1.3567306E-01
A = +2.6271987E+00
N = 175
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF A = SIGNIFICANT
DEGREES OF FREEDOM = 173
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
57.00
47.00
37.00
27.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS.INNER.AXIAL POS.V.L.RATE CHG=0.0002 IN/MIN.MAXIMUM STRESS

Figure 10-B

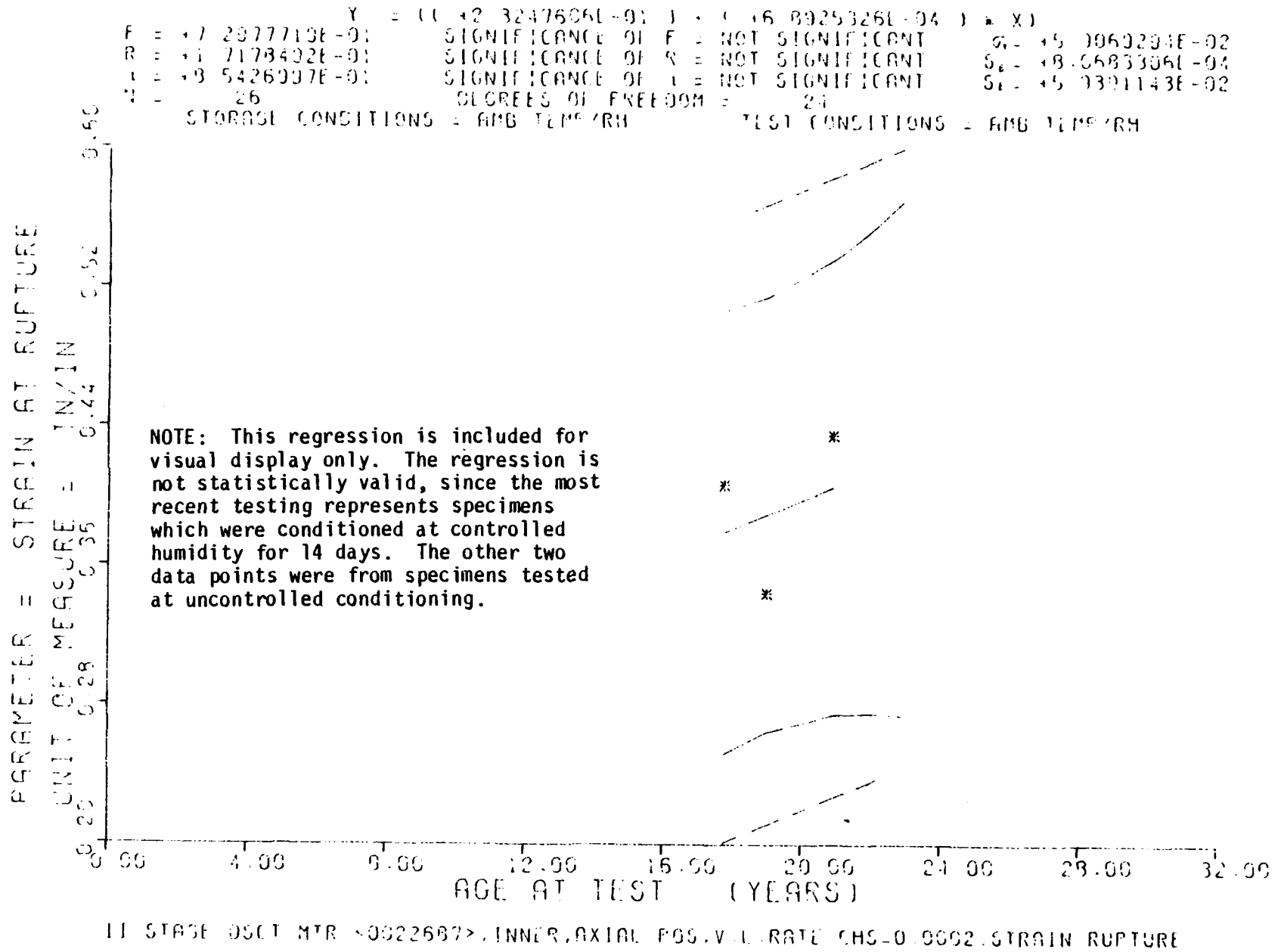

Y = (+2.3247606E-01) + (+6.8925326E-04) * X)
F = +7.2977719E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT
R = +1.7178402E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT
t = +8.5426097E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT
N = 26 DEGREES OF FREEDOM = 24
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.20
0.28
0.36
0.44
0.52
0.60
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
II STAGE OSCT MTR (0022607),INNER,AXIAL POS.V.L.RATE CHS-0.0002,STRAIN RUPTURE

Figure 11

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	10	+4.0659970E-01	+1.4653066E-02	+4.2199996E-01	+3.8399994E-01	+3.7928700E-01
228.0	10	+3.4449976E-01	+7.2815583E-02	+4.3499994E-01	+2.4199998E-01	+3.8962578E-01
251.0	6	+4.3510618E-01	+1.9464523E-02	+4.6299999E-01	+4.0499997E-01	+4.0547859E-01

II STAGE DSCT MTR <0022687>,INNER,AXIAL PCS,V.L.RATE CHS=0.0002,STRAIN RUPTURE.

Figure 11-A

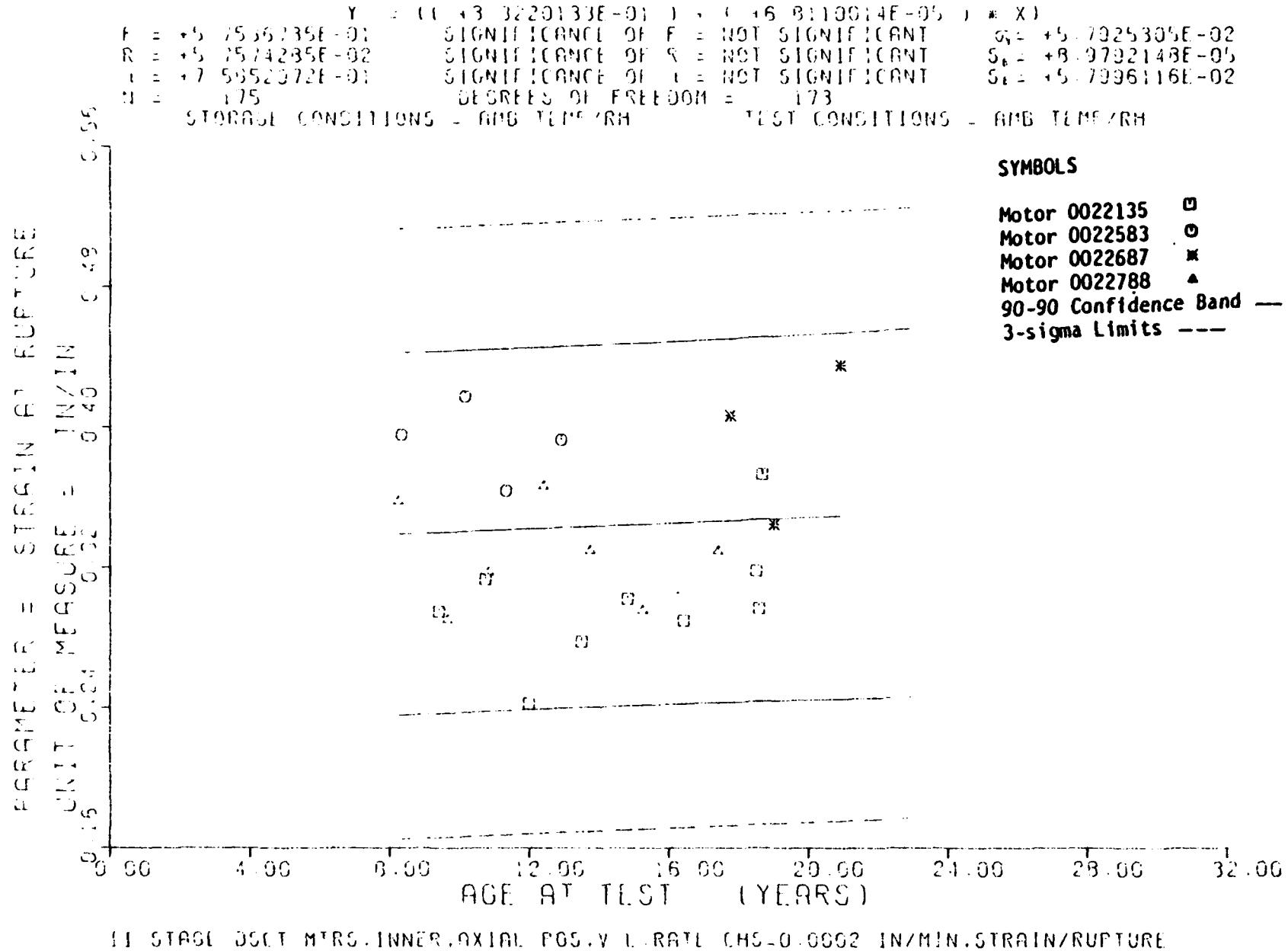

Y = (+3.3220133E-01) + (+6.8110614E-05) * X)
F = +5.7536235E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT
R = +5.2574285E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT
t = +7.5852372E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT
N = 175 DEGREES OF FREEDOM = 173
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.56
0.48
0.40
0.32
0.24
0.16
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DOCT MTRS.INNER.AXIAL POS.V L.RATE CHS-0.0002 IN/MIN.STRAIN/RUPTURE

Figure 11-B

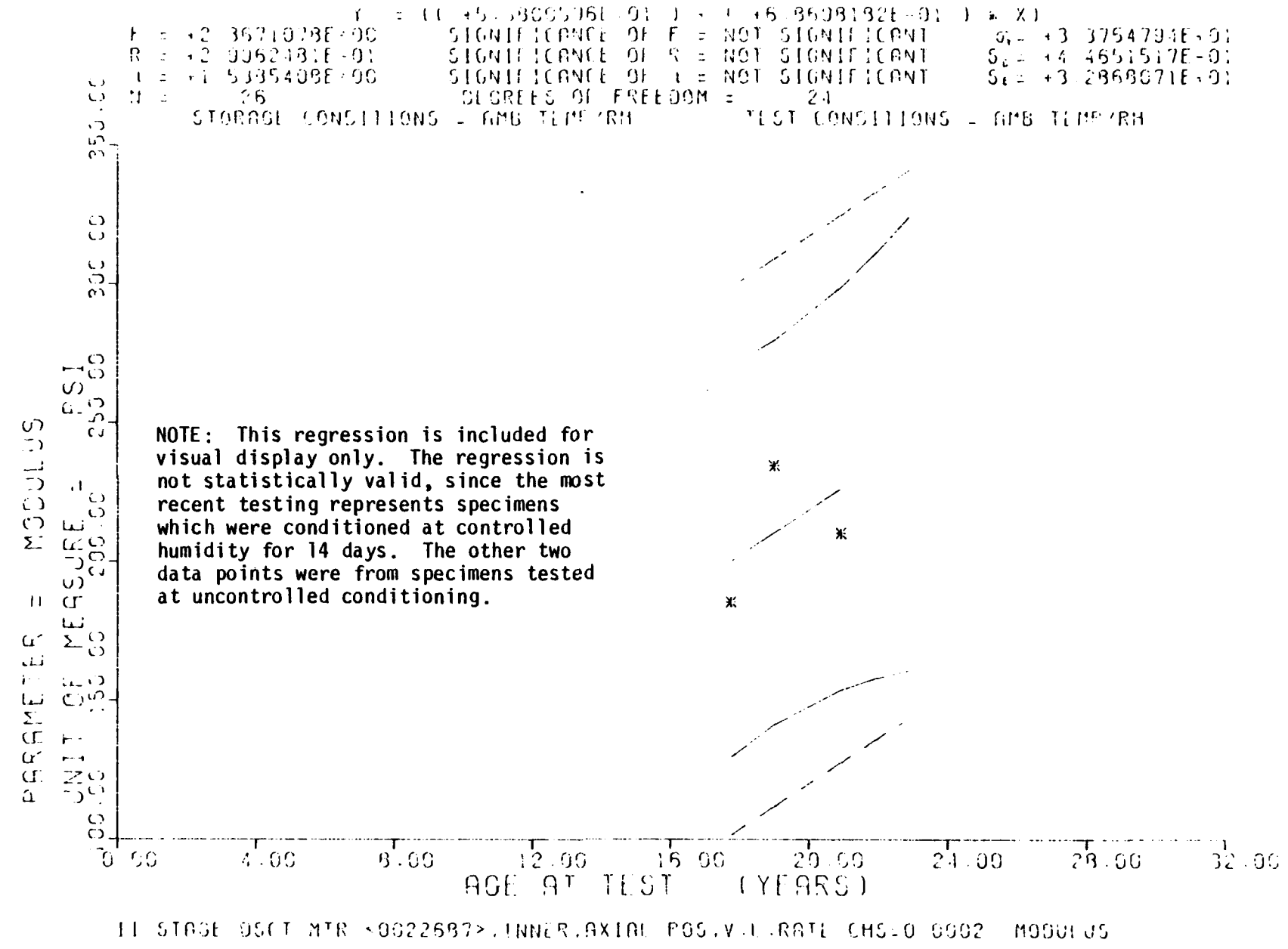

Y = (+5.3869596E-01) + (+6.8608182E-01) * X)
F = +2.3671028E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_1 = +3.3754794E-01
R = +2.0062381E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_b = +4.4651517E-01
t = +1.5385408E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_t = +3.2868071E-01
N = 26 DEGREES OF FREEDOM = 24
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTR <0822687>.INNER.AXIAL POS.V.I.RATE CHS-0.0002 MODULUS

Figure 12

**** LINEAR REGRESSICN ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	10	+1.8550000E+02	+5.2121652E+00	+1.9700000E+02	+1.7900000E+02	+2.0012771E+02
228.0	10	+2.3459999E+02	+4.2261619E+01	+3.0900000E+02	+1.8700000E+02	+2.1043244E+02
251.0	6	+2.1033332E+02	+4.7187568E+00	+2.1700000E+02	+2.0300000E+02	+2.2623303E+02

II STAGE DSCT MTR <0022687>.INNER.AXIAL PCS.V.L.RATE CHS=0.0002. MCDULUS.

Figure 12-A

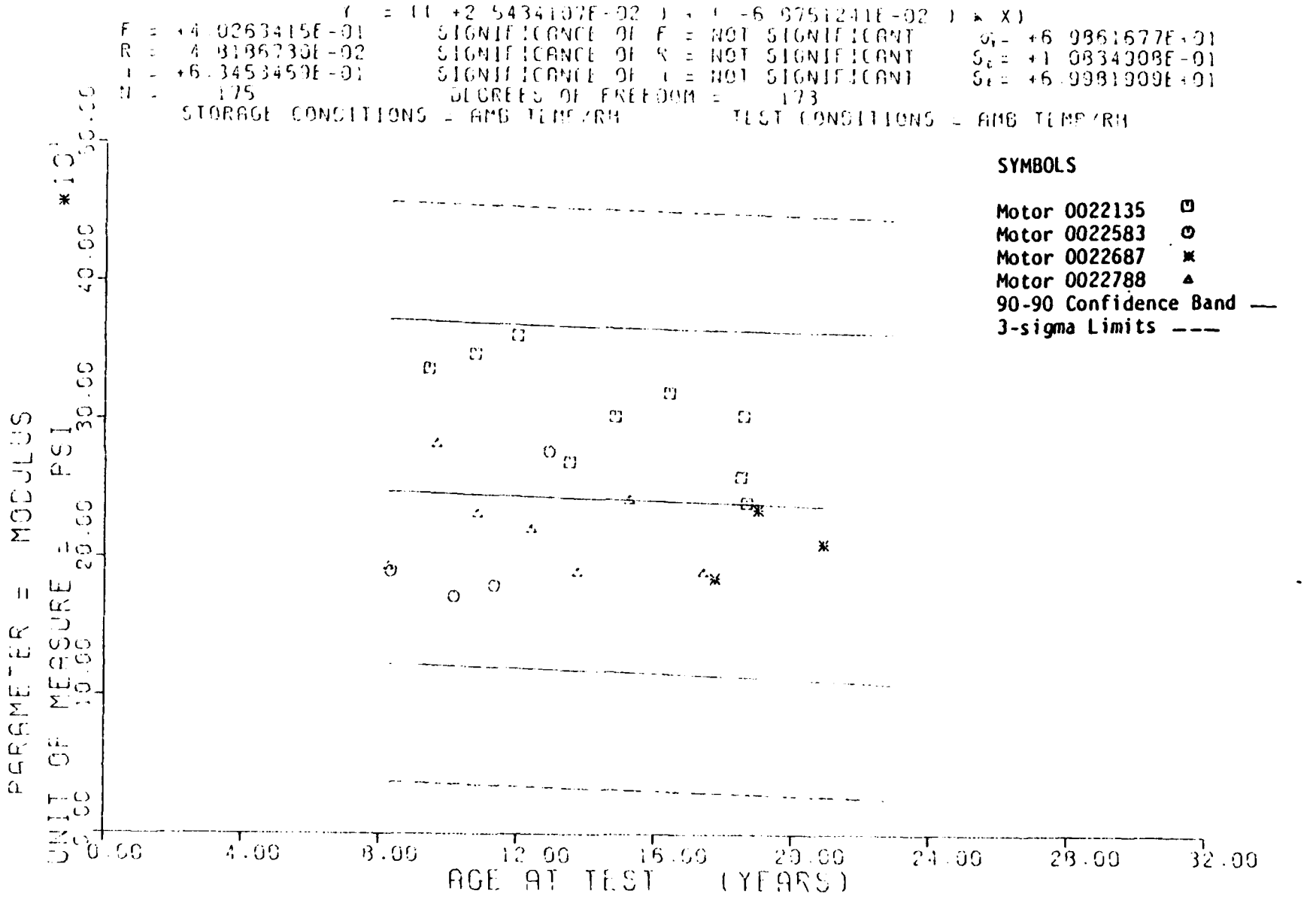

Y = (+2.5434107E-02) + (-6.8751241E-02) * X)
F = +4.0263415E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT S_y = +6.9861677E-01
R = .4.8186730E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_x = +1.0834308E-01
t = +6.3453459E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_t = +6.9981909E+01
N = 175 DEGREES OF FREEDOM = 173
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
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10
10.00
20.00
30.00
40.00
50.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSET M1RS.INNER.AXIAL POS.V.I.RATE CHS-0.0002 IN/MIN. MODULUS

Figure 12-B

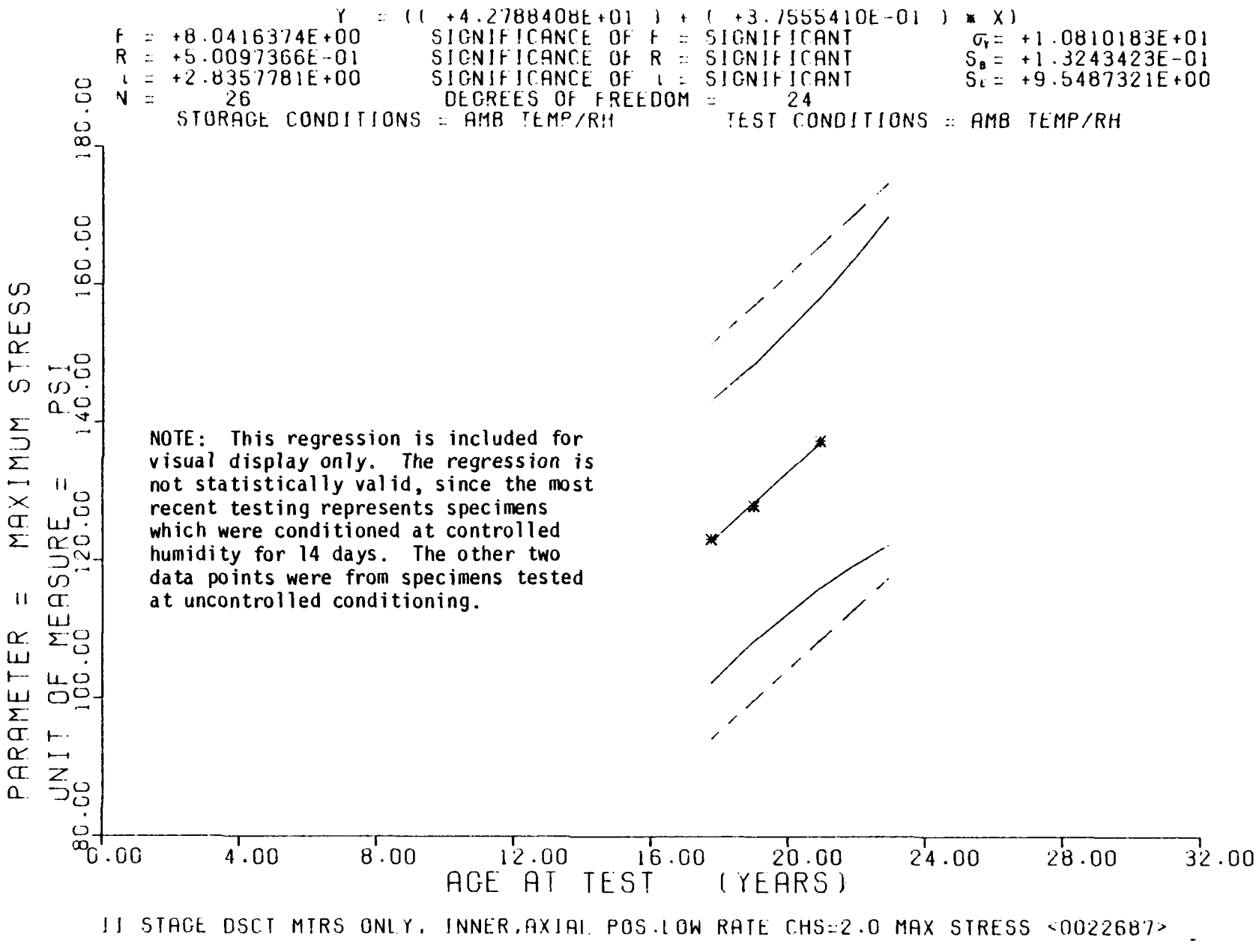

Y = (+4.2788408E+01) + (+3.7555410E-01) * X
F = +8.0416374E+00
SIGNIFICANCE OF F = SIGNIFICANT
σY = +1.0810183E+01
R = +5.0097366E-01
SIGNIFICANCE OF R = SIGNIFICANT
Sb = +1.3243423E-01
t = +2.8357781E+00
SIGNIFICANCE OF t = SIGNIFICANT
St = +9.5487321E+00
N = 26
DEGREES OF FREEDOM = 24
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
80.00
100.00
120.00
140.00
160.00
180.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS ONLY, INNER,AXIAL POS.LOW RATE CHS=2.0 MAX STRESS <0022687>

Figure 13

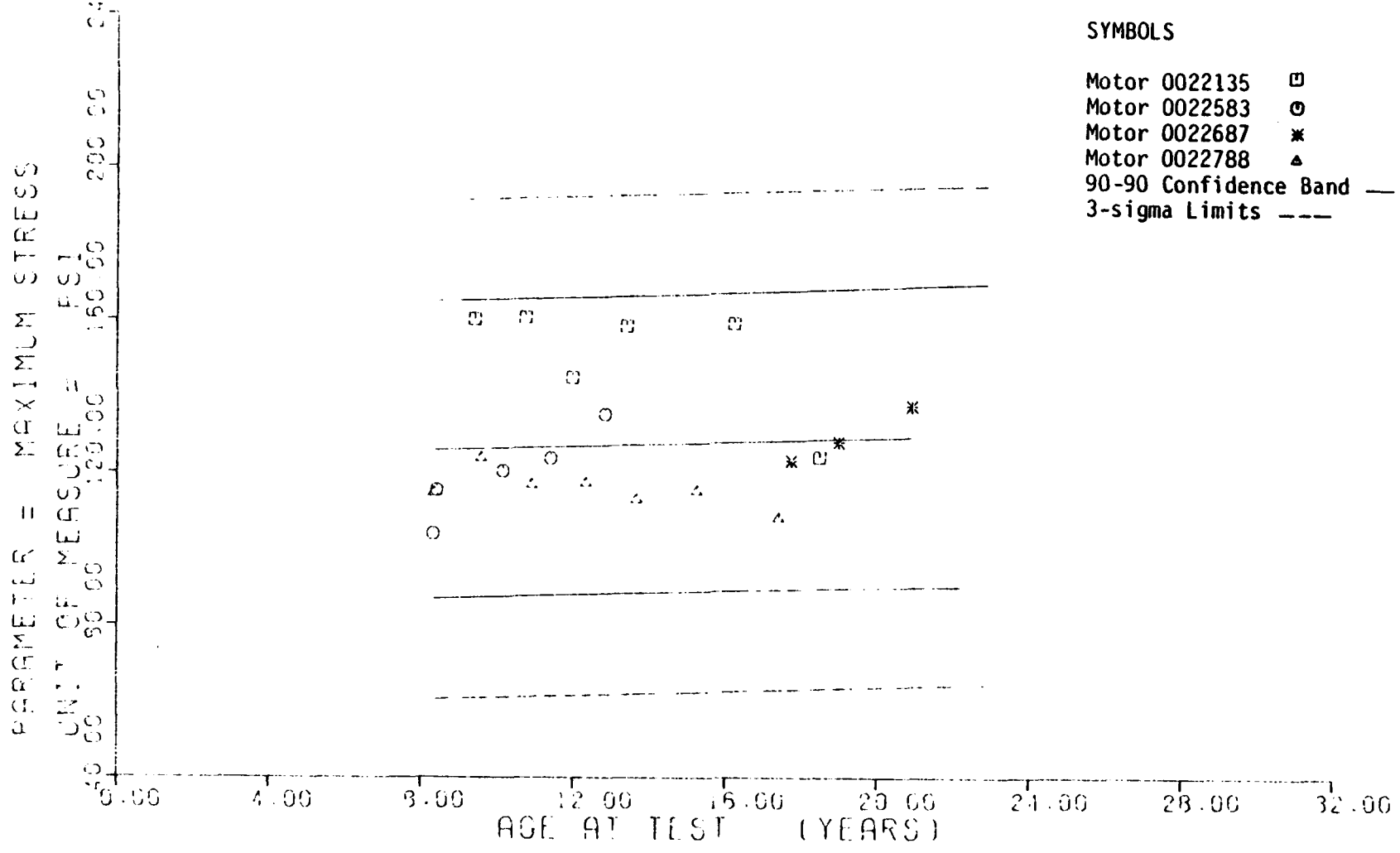
****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+1.2311099E+02	+4.7983309E+00	+1.3032998E+02	+1.1590998E+02	+1.2278141E+02
229.0	11	+1.2796896E+02	+1.3983126E+01	+1.4398999E+02	+1.0908999E+02	+1.2841473E+02
251.0	6	+1.3737487E+02	+2.9658988E+00	+1.4307998E+02	+1.3526998E+02	+1.3705247E+02

II STAGE DSCT MTRS ONLY, INNER,AXIAL PCS,LOW RATE CHS=2.0 MAX STRESS <0022687>

Figure 13-A



II STAGE OSOT MTRS.ONLY. INNER.AXIAL POS LOW RATE CHS-2.0 IN/MIN.MAX STRESS

Figure 13-B

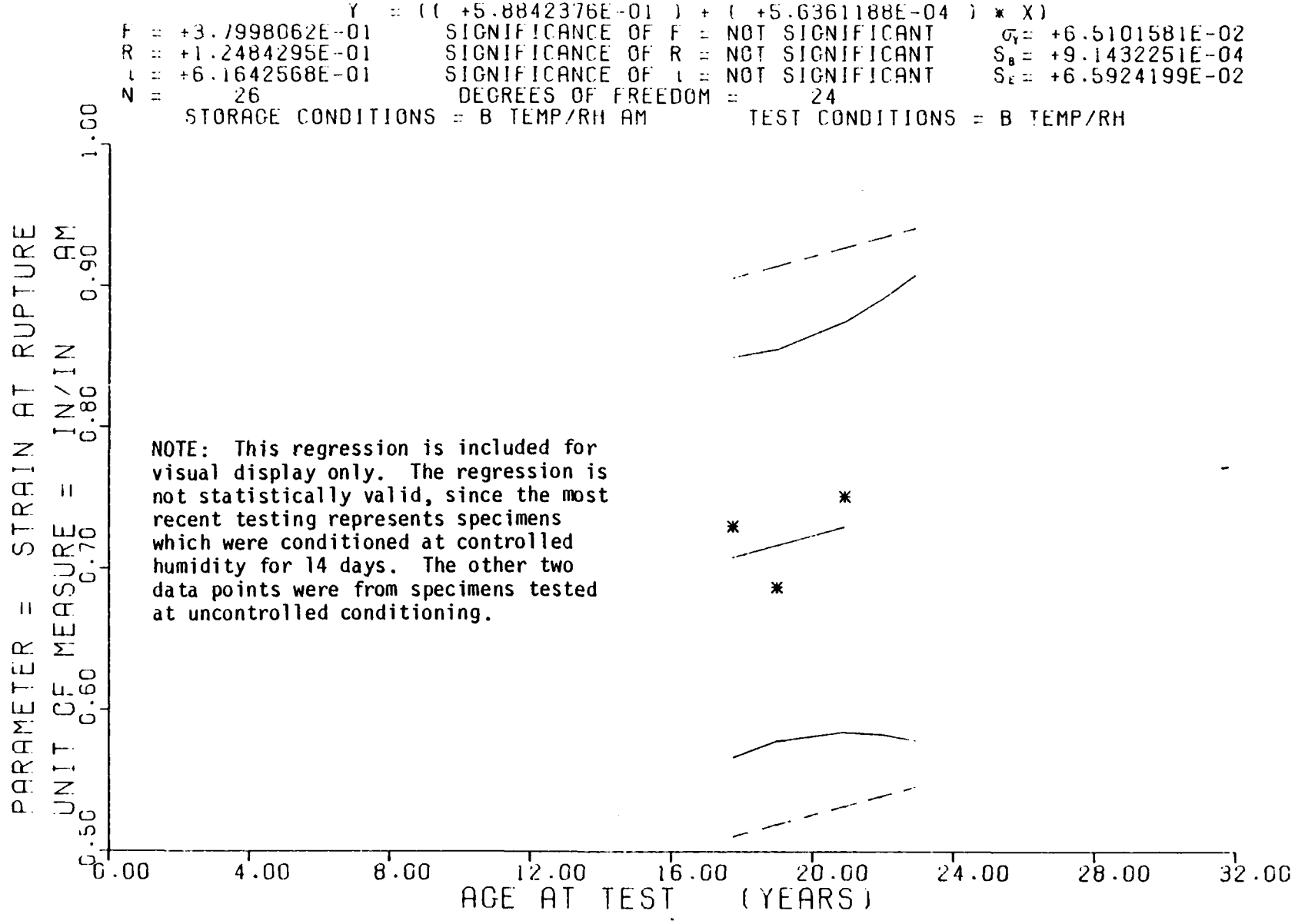

Y = (+5.8842376E-01) + (+5.6361188E-04) * X)
F = +3.7998062E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +6.5101581E-02
R = +1.2484295E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sβ = +9.1432251E-04
t = +6.1642568E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Sε = +6.5924199E-02
N = 26 DEGREES OF FREEDOM = 24
STORAGE CONDITIONS = B TEMP/RH AM TEST CONDITIONS = B TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN AM
0.50
0.60
0.70
0.80
0.90
1.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
II STAGE DSCT MTRS ONLY, INNER,AXIAL POS.LOW RATE CHS=2.0 STN RUPTUR <0022687>

Figure 14

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+7.3047721E-01	+4.0140348E-02	+8.1099998E-01	+6.7459994E-01	+7.0847308E-01
228.0	11	+6.9719135E-01	+8.1737301E-02	+8.1799995E-01	+5.8529996E-01	+7.1692723E-01
251.0	6	+7.5141632E-01	+3.9137815E-02	+7.9889994E-01	+6.9299995E-01	+7.2989034E-01

II STAGE DSCT MTRS ONLY, INNER,AXIAL PCS,LOW RATE CHS=2.0 STN RUPTUR <0022687>

Figure 14-A

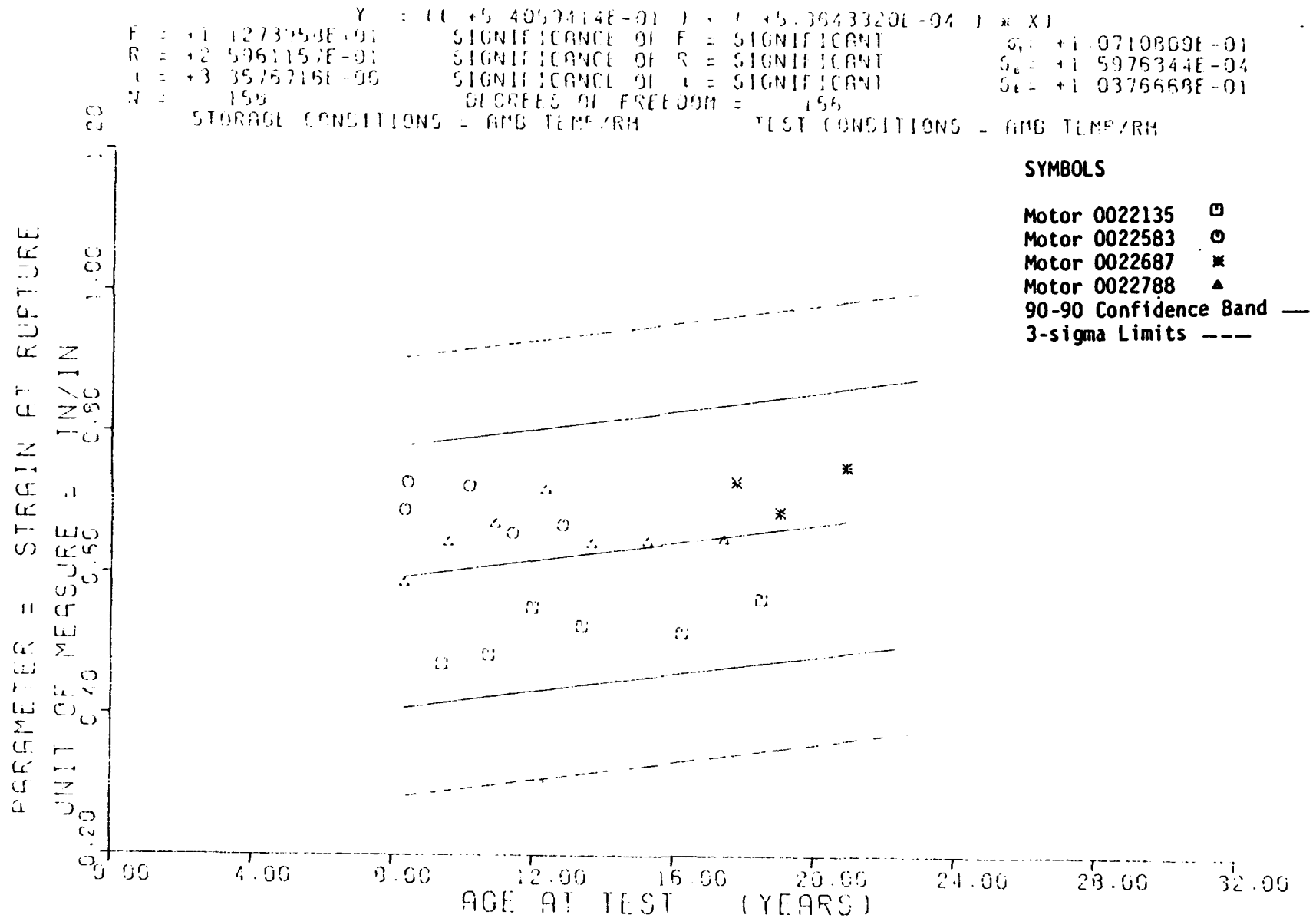

Y = (+5.4053414E-01) + (+5.3643320E-04) * X)
F = +1.1273958E+01
SIGNIFICANCE OF F = SIGNIFICANT
R = +2.5961157E-01
SIGNIFICANCE OF R = SIGNIFICANT
t = +3.3576716E-00
SIGNIFICANCE OF t = SIGNIFICANT
N = 156
DEGREES OF FREEDOM = 156
S_y = +1.0710809E-01
S_e = +1.5976344E-04
S_t = +1.0376668E-01
STORAGE 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
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.20
0.40
0.60
0.80
1.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE.OSCT MTRS.ONLY. INNER.AXIAL POS LOW RATE CHG-2 0 IN/MIN.STRAIN/RUPTURE

Figure 14-B

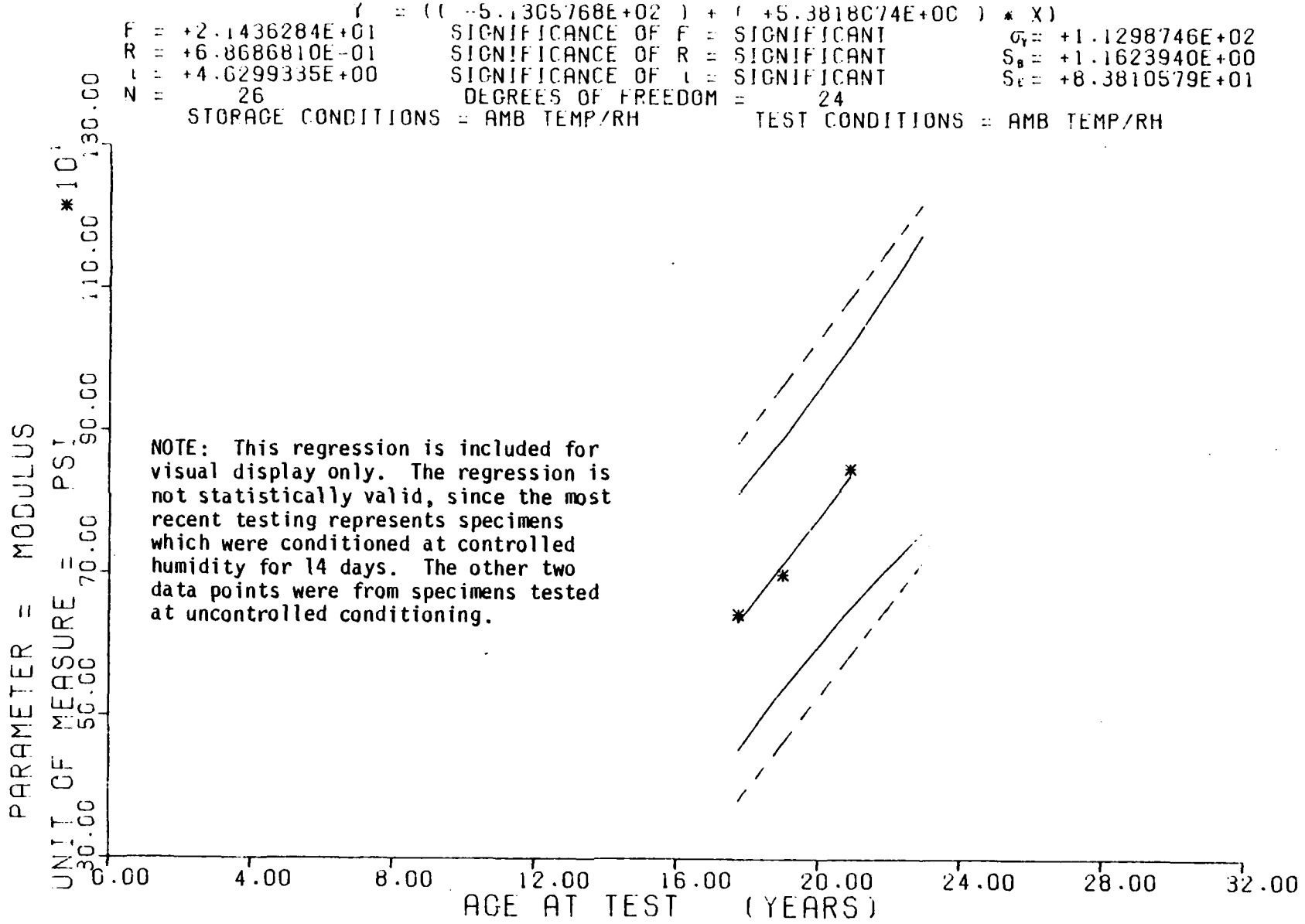

Y = (-5.1305768E+02) + (+5.3818C74E+0C) * X)
F = +2.1436284E+01
SIGNIFICANCE OF F = SIGNIFICANT
σY = +1.1298746E+02
R = +6.8686810E-01
SIGNIFICANCE OF R = SIGNIFICANT
SB = +1.1623940E+00
t = +4.6299335E+00
SIGNIFICANCE OF t = SIGNIFICANT
SE = +8.3810579E+01
N = 26
DEGREES OF FREEDOM = 24
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10¹
130.00
110.00
90.00
70.00
50.00
30.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE,DSCT MTRS,ONLY, INNER,AXIAL POS,LOW RATE CHS=2.0 <0022687> MODULUS

Figure 15

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (HOURS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	9	+6.43E8867E+02	+6.2139851E+01	+7.0600000E+02	+5.6100000E+02	+6.3326708E+02
228.0	11	+6.9963623E+02	+1.1290285E+02	+8.9400000E+02	+5.7000000E+02	+7.1399438E+02
251.0	6	+8.4916650E+02	+3.5465006E+01	+8.8600000E+02	+8.0100000E+02	+8.3777587E+02

II STAGE,CSCT MTRS,CNLY, INNER,AXIAL PCS,LOW RATE CHS=2.0 <0022687> MODULUS

Figure 15-A

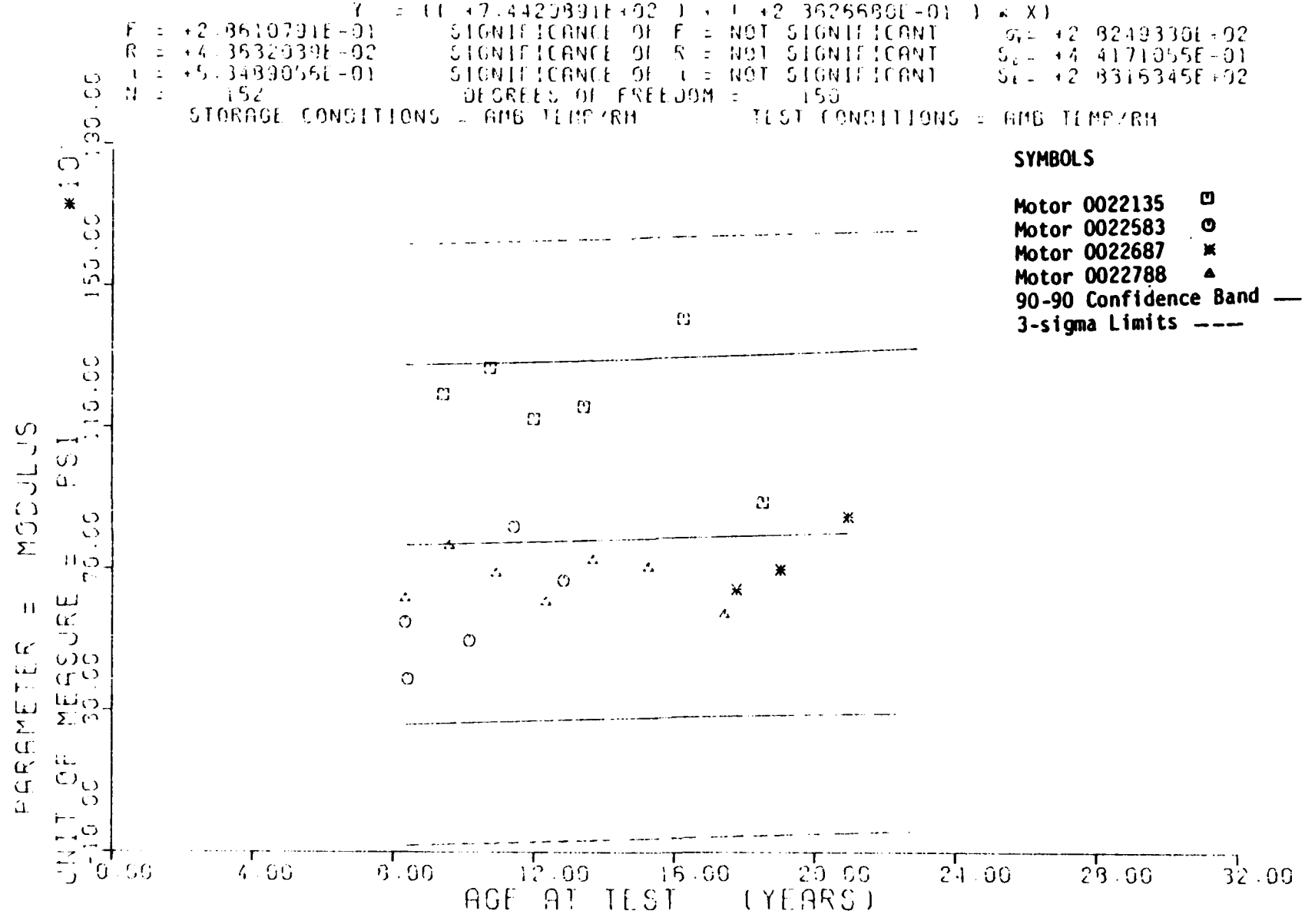

Y = (+7.4420891E+02) + (+2.3626680E-01) * X)
F = +2.8610791E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT
R = +4.3632939E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT
t = +5.3489056E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT
N = 152 DEGREES OF FREEDOM = 150
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MODULUS
UNIT OF MEASURE = PSI * 10
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
II STAGE OSCT MTRS.ONLY. INNER.AXIAL POS.LOW RATE CHS-2 0 IN/MIN. MODULUS

Figure 15-B

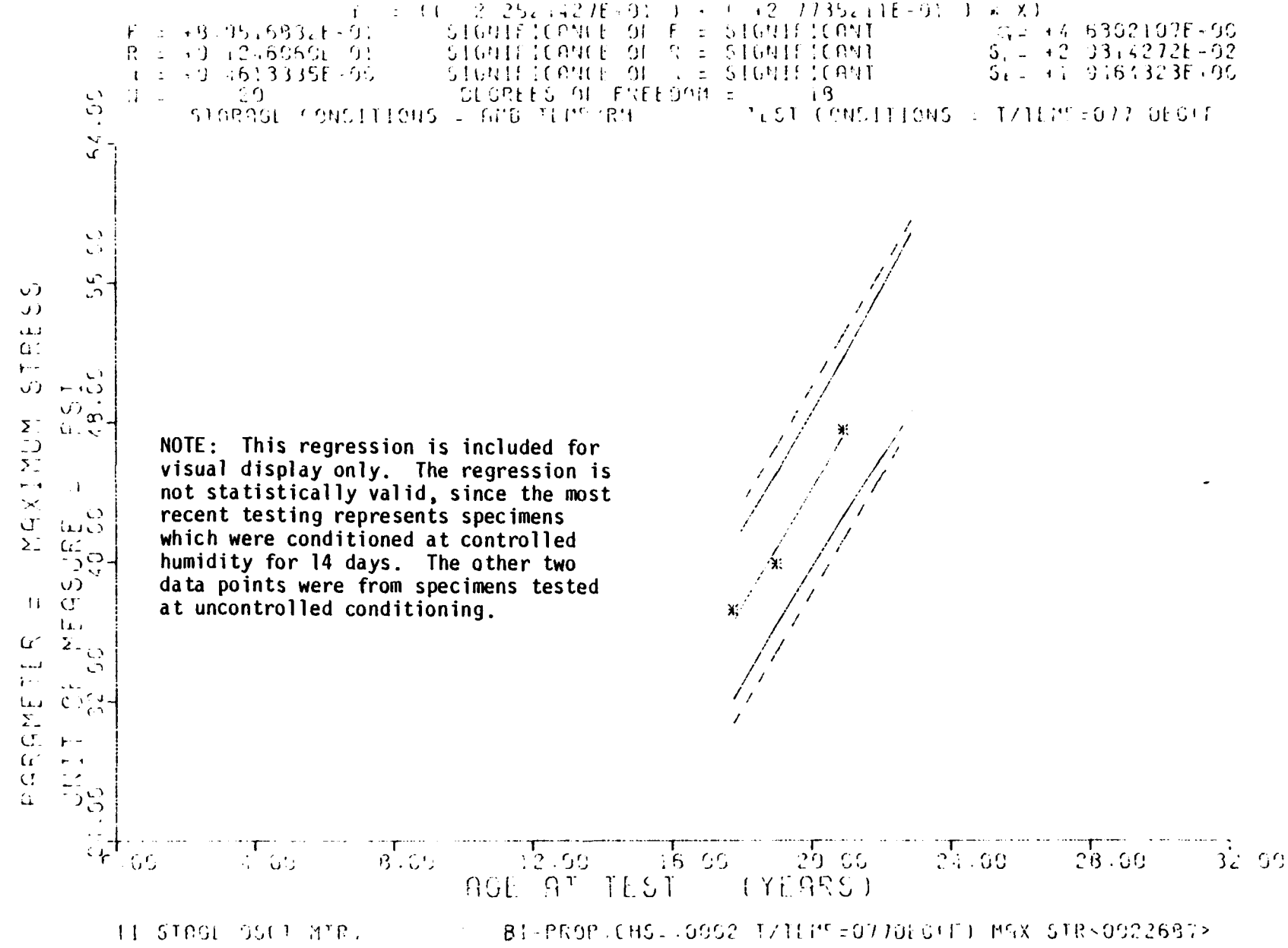

Y = (-2.254427E-01) + (+2.773511E-01) * X)
F = +8.956832E-01 SIGNIFICANCE OF F = SIGNIFICANT S = +4.6302107E-00
R = +0.1246059L-01 SIGNIFICANCE OF R = SIGNIFICANT S = +2.3314272E-02
t = +0.4613335E-00 SIGNIFICANCE OF t = SIGNIFICANT S = +1.9161323E-00
N = 20 DEGREES OF FREEDOM = 18
STORAGE CONDITIONS - AMB TEMP/RH TEST CONDITIONS - T/TEMP=077 DEGF
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
AGE AT TEST (YEARS)
11 STOR 0001 MTR. BI-PROP.CHS-.0002 T/TEMP=077DEGF) MAX STR=0022687>

Figure 16

****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+3.7234985E+01	+2.2073982E+00	+4.1239990E+01	+3.5000000E+01	+3.6551559E+01
228.0	8	+3.9864990E+01	+2.1988991E+00	+4.2539993E+01	+3.5969985E+01	+4.0711853E+01
251.0	6	+4.2536651E+01	+3.1155856E-01	+4.2919998E+01	+4.2199996E+01	+4.2090942E+01

II STAGE DSCT MTR, BI-PROP,CHS=.0002,T/TEMP=077DEG(F),MAX STR<0022687>

Figure 16-A

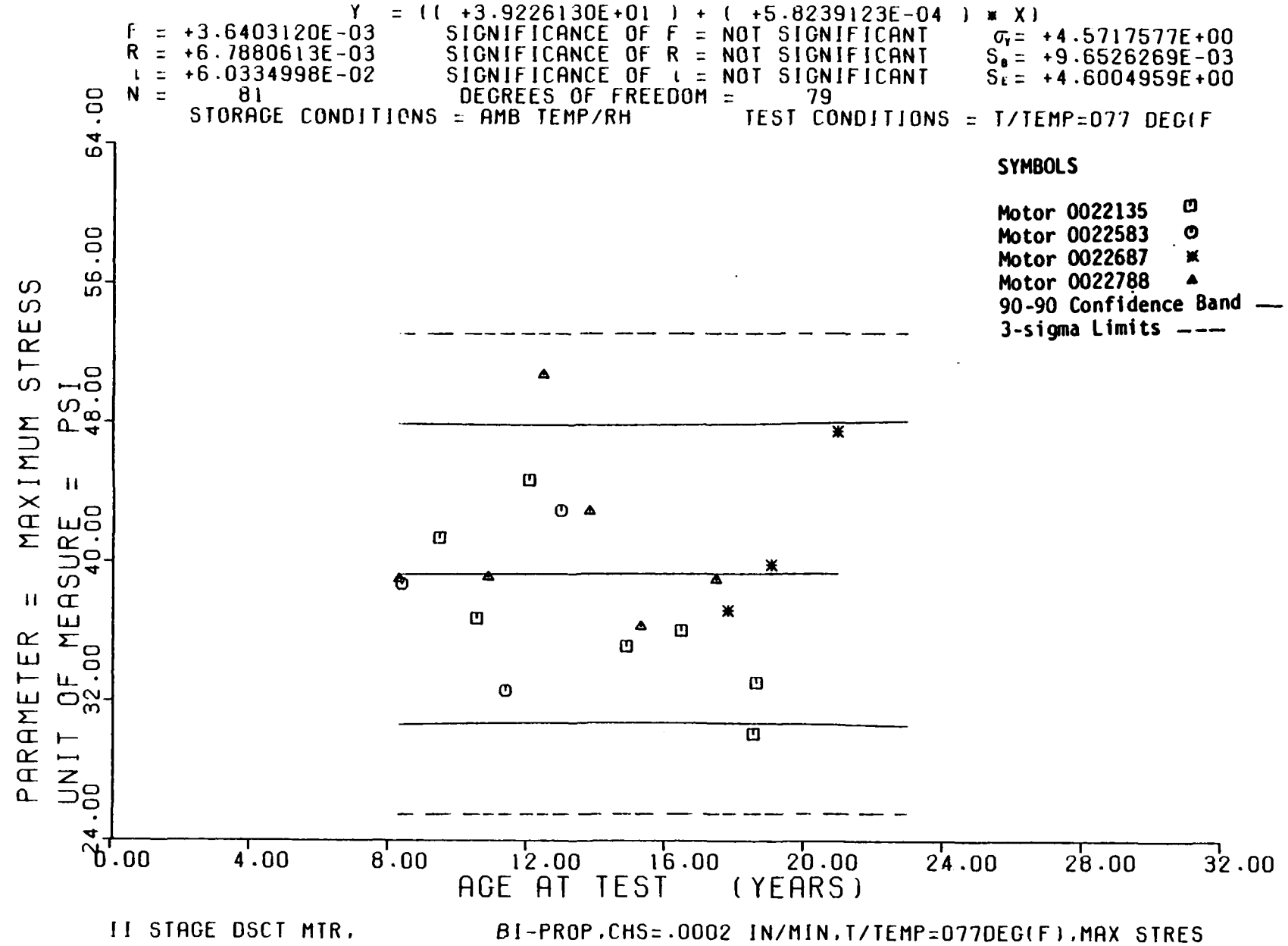
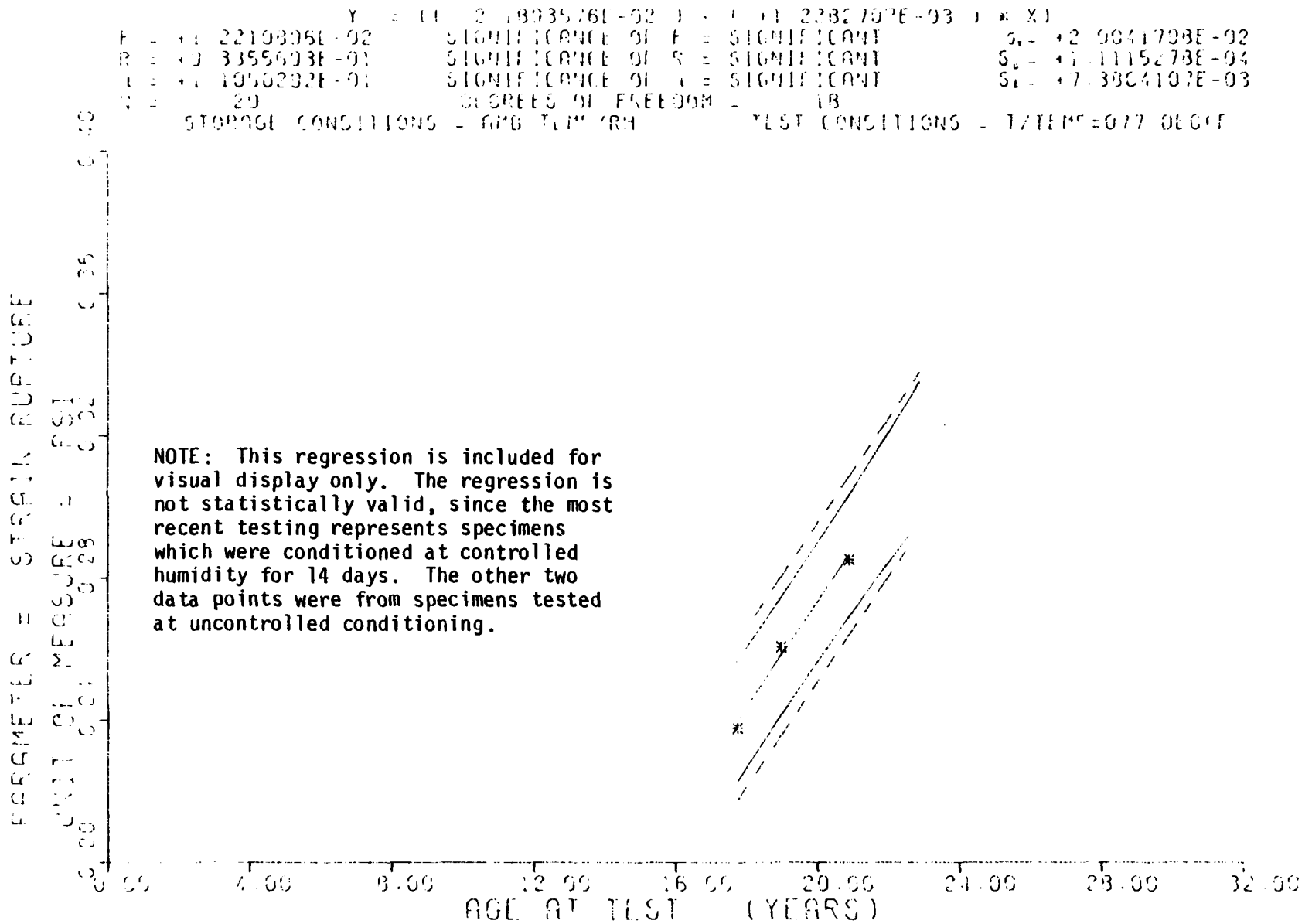

Y = ((+3.9226130E+01) + (+5.8239123E-04) * X)
F = +3.6403120E-03 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +4.5717577E+00
R = +6.7880613E-03 SIGNIFICANCE OF R = NOT SIGNIFICANT Sθ = +9.6526269E-03
ι = +6.0334998E-02 SIGNIFICANCE OF ι = NOT SIGNIFICANT Sε = +4.6004959E+00
N = 81 DEGREES OF FREEDOM = 79
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
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
64.00
56.00
48.00
40.00
32.00
24.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTR, BI-PROP,CHS=.0002 IN/MIN,T/TEMP=077DEG(F),MAX STRES

Figure 16-B



NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 17

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+2.3783302E-01	+8.8937423E-03	+2.5099998E-01	+2.2799998E-01	+2.3972803E-01
228.0	8	+2.6049971E-01	+6.4245220E-03	+2.7099996E-01	+2.5099998E-01	+2.5815212E-01
251.0	6	+2.8516638E-01	+6.6851655E-03	+2.9099994E-01	+2.7399998E-01	+2.8640234E-01

II STAGE LSCT MTR, BI-PRCP,CHS=.0002,T/TEMP=077DEG(F),STN RUF<0022687>

Figure 17-A

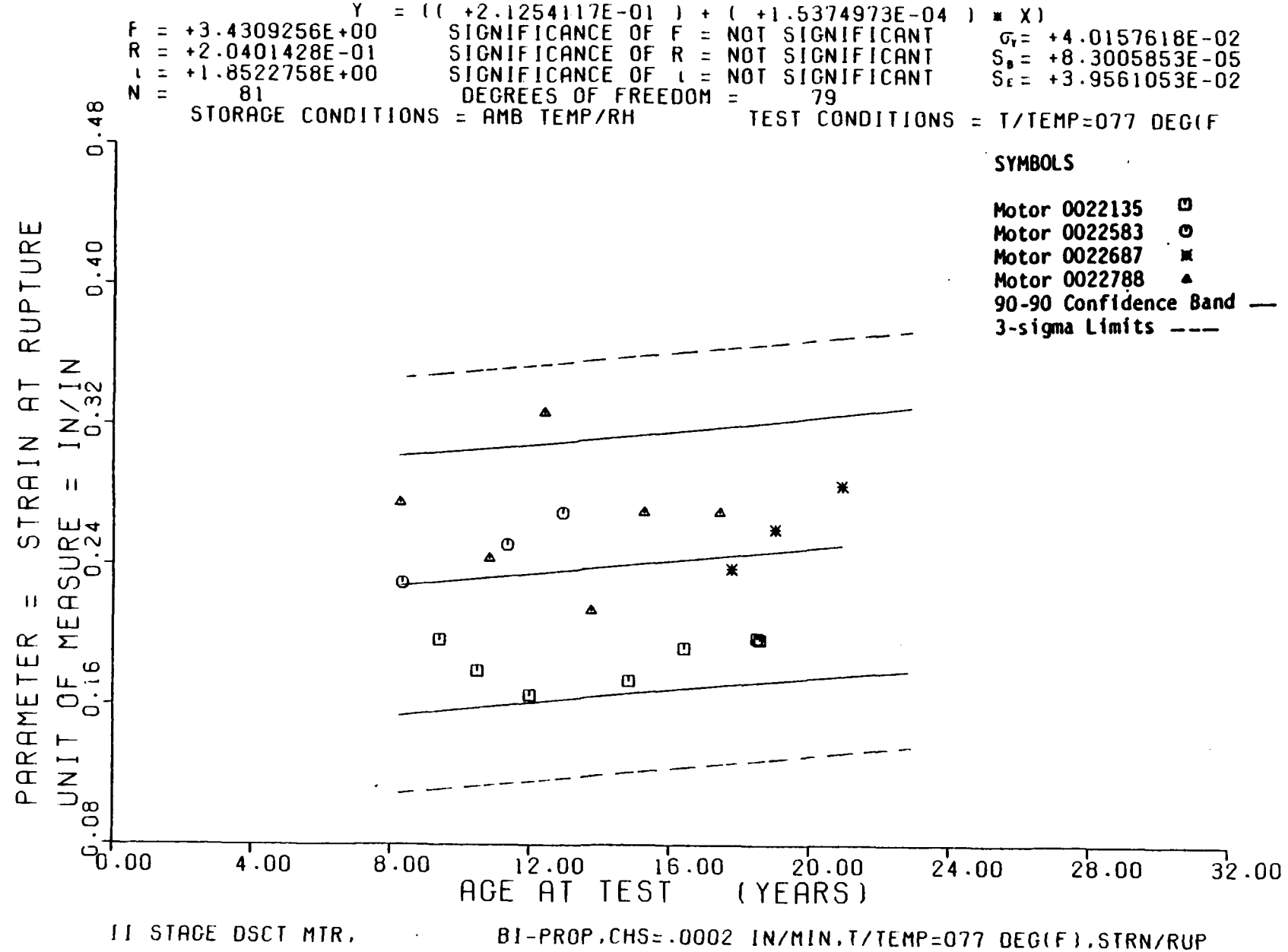

Y = ((+2.1254117E-01) + (+1.5374973E-04) * X)
F = +3.4309256E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT
R = +2.0401428E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT
ι = +1.8522758E+00 SIGNIFICANCE OF ι = NOT SIGNIFICANT
N = 81 DEGREES OF FREEDOM = 79
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = T/TEMP=077 DEG(F
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.08
0.16
0.24
0.32
0.40
0.48
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTR,
BI-PROP,CHS=.0002 IN/MIN,T/TEMP=077 DEG(F),STRN/RUP

Figure 17-B

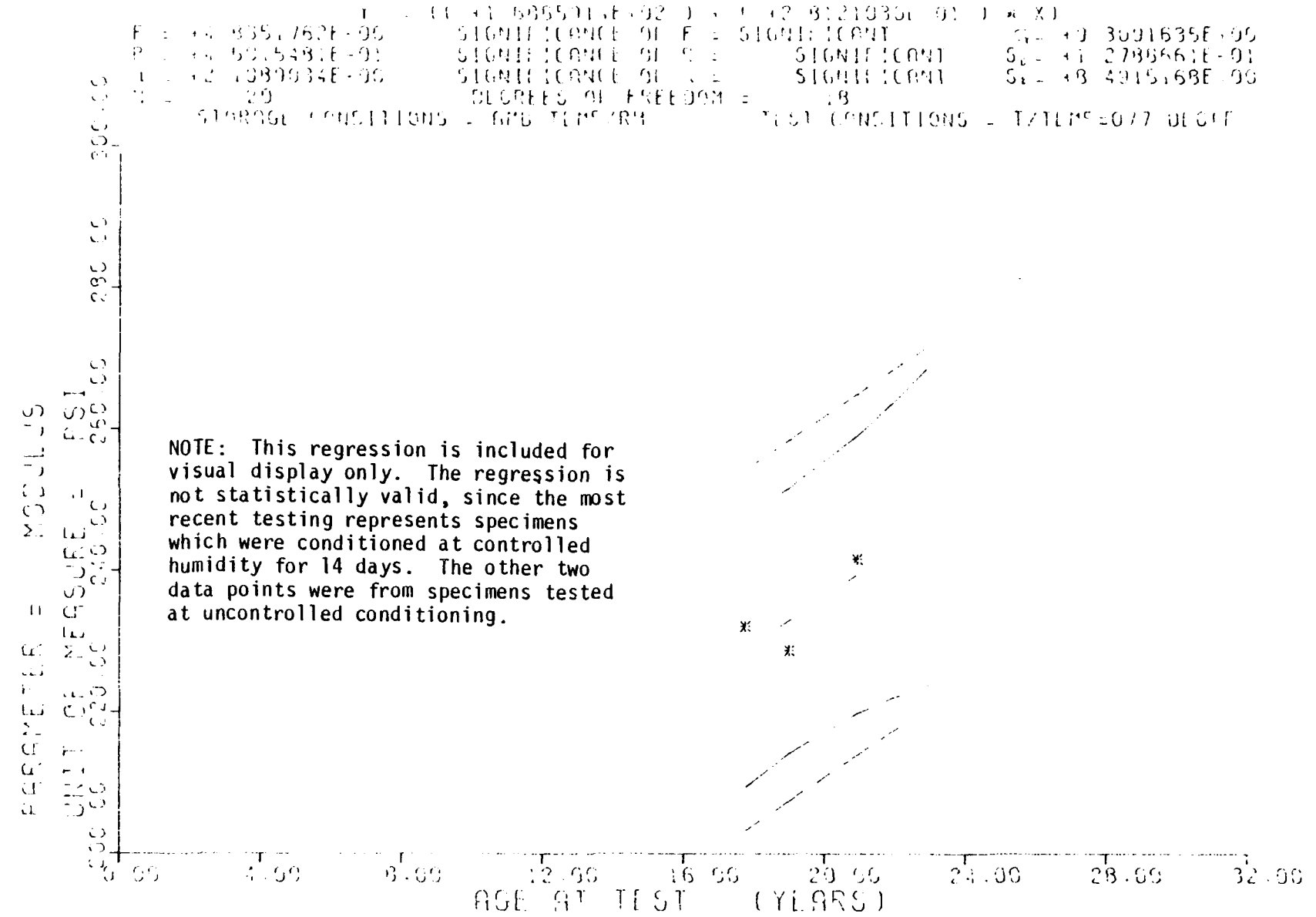

NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
AGE AT TEST (YEARS)

Figure 18

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+2.3216665E+02	+6.7946057E+00	+2.3900000E+02	+2.2300000E+02	+2.2875692E+02
228.0	8	+2.2875000E+02	+1.0031808E+01	+2.4200000E+02	+2.1000000E+02	+2.3297508E+02
251.0	6	+2.4166665E+02	+4.7609522E+00	+2.4800000E+02	+2.3600000E+02	+2.3944293E+02

II STAGE DSCT MTR, BI-PROP.CHS=.0002,T/TEMP=077DEG(F),MODULUS<0022687>

Figure 18-A

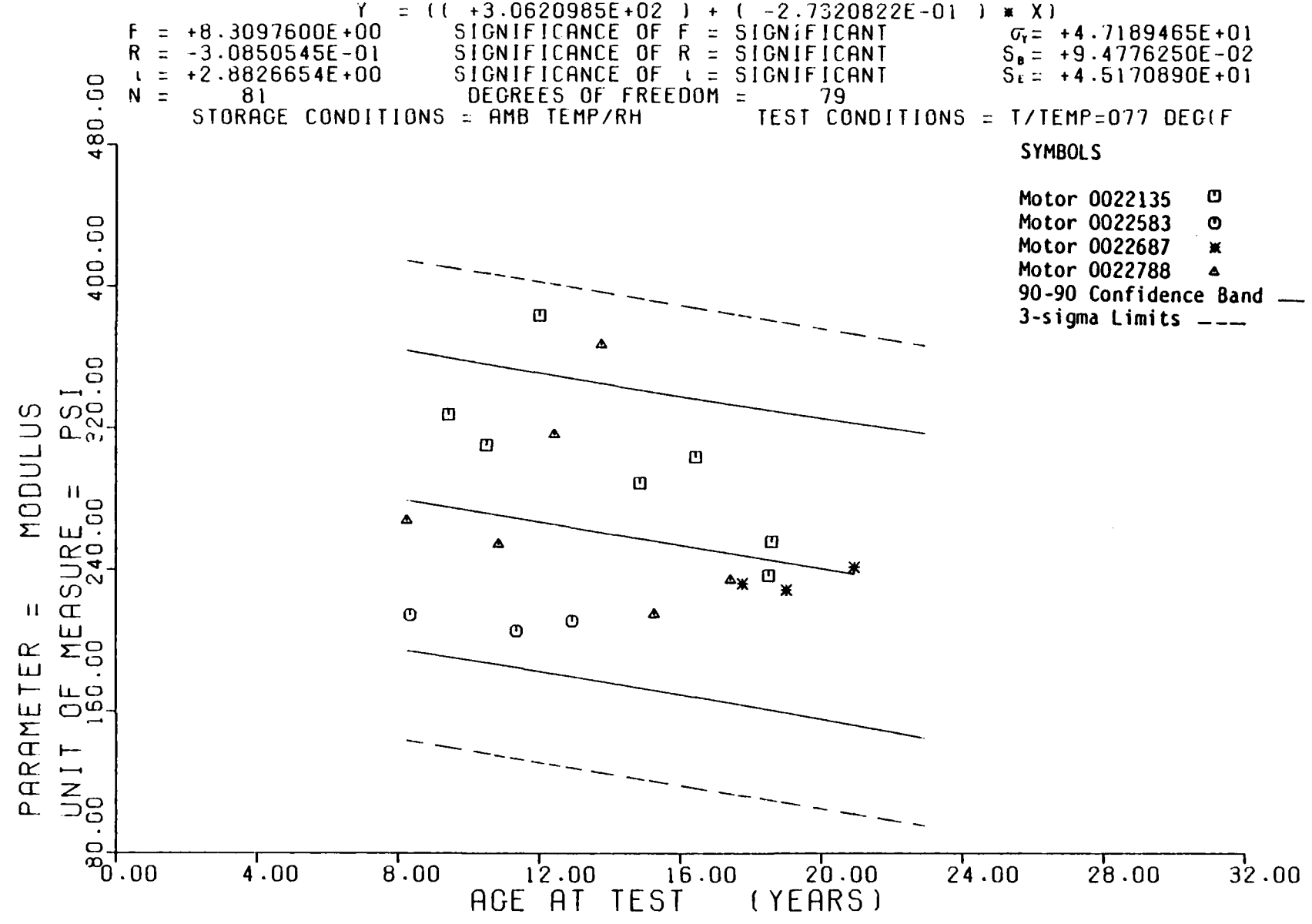
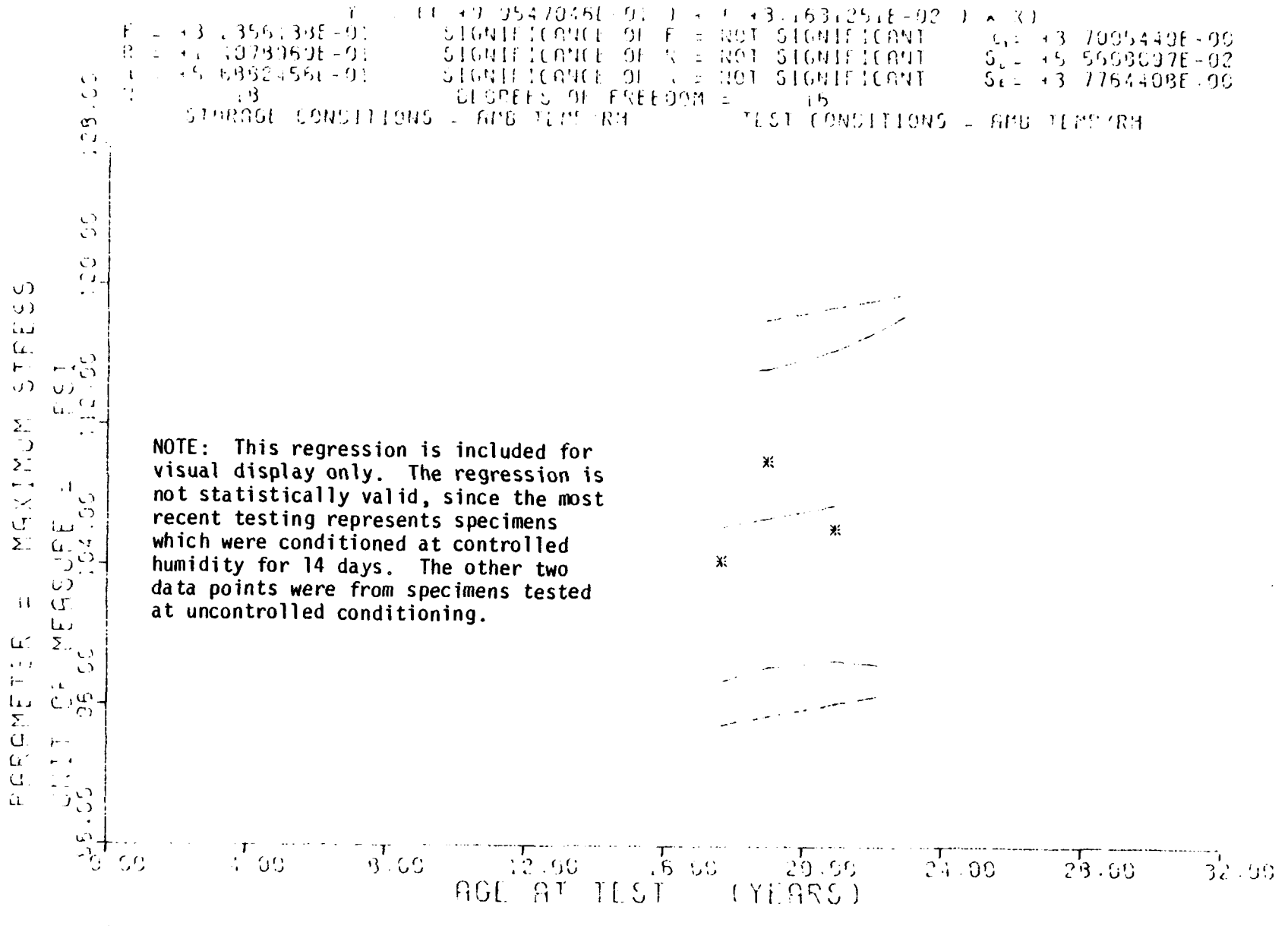

Y = ((+3.0620985E+02) + (-2.7320822E-01) * X)
F = +8.3097600E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = -3.0850545E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.8826654E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 81 DEGREES OF FREEDOM = 79
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = T/TEMP=077 DEG(F
σY = +4.7189465E+01
SB = +9.4776250E-02
Sε = +4.5170890E+01
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
80.00
160.00
240.00
320.00
400.00
480.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTR,
BI-PROP,CHS=.0002 IN/MIN,T/TEMP=077 DEG(F),MODULUS

Figure 18-B



NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 19

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	6	+1.0433157E+02	+3.5768483E+00	+1.0858999E+02	+1.0026998E+02	+1.0625286E+02
228.0	6	+1.1001663E+02	+3.0872500E+00	+1.1398999E+02	+1.0575999E+02	+1.0675895E+02
251.0	6	+1.0614990E+02	+2.0094474E+00	+1.0909999E+02	+1.0340998E+02	+1.0748648E+02

II STAGE DSCT MTRS ONLY,OUTER,AXIAL POS,BIAXIAL CHS=0.2 MAX STRESS <0022687>

Figure 19-A

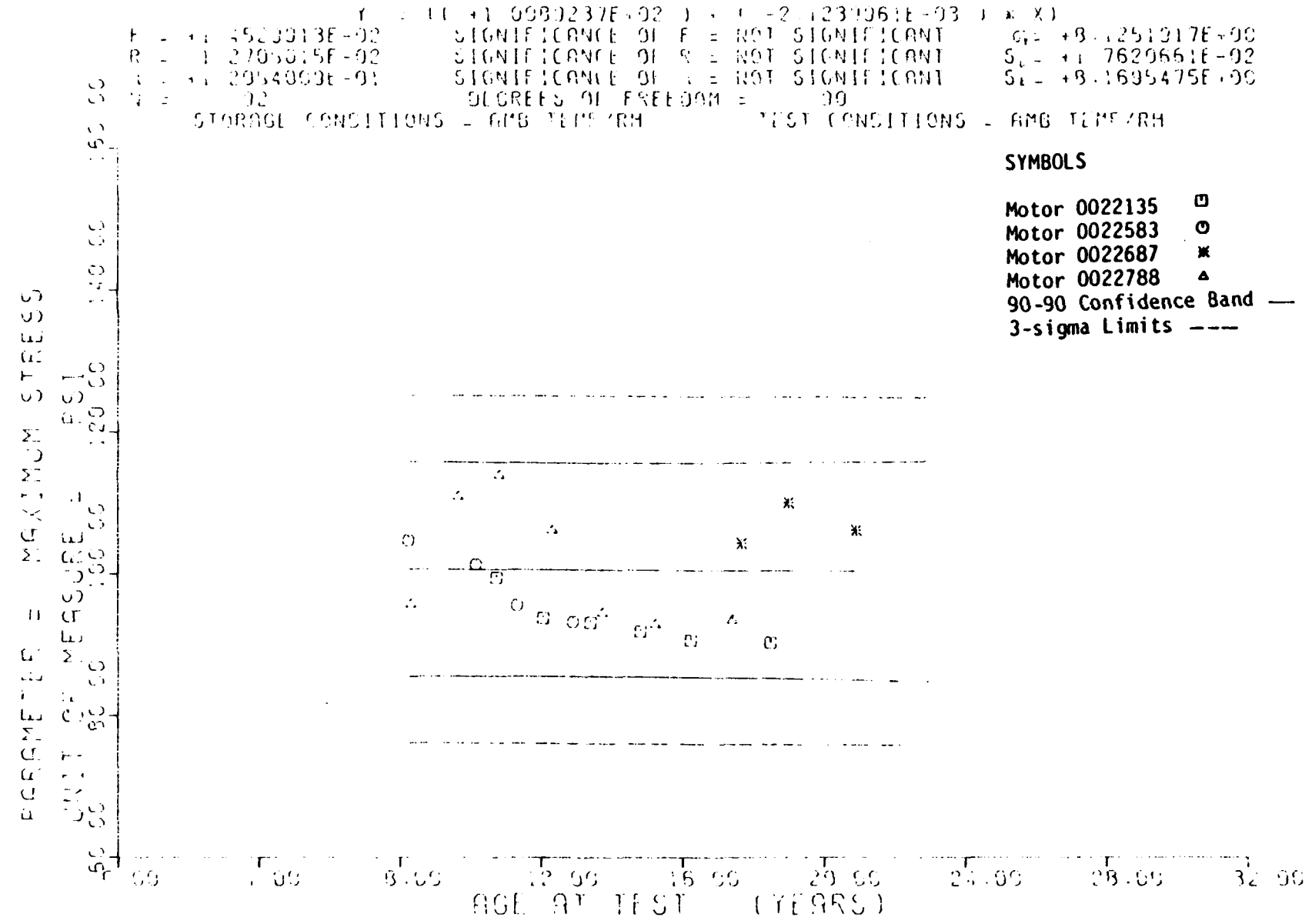

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
AGE AT TEST (YEARS)

Figure 19-B

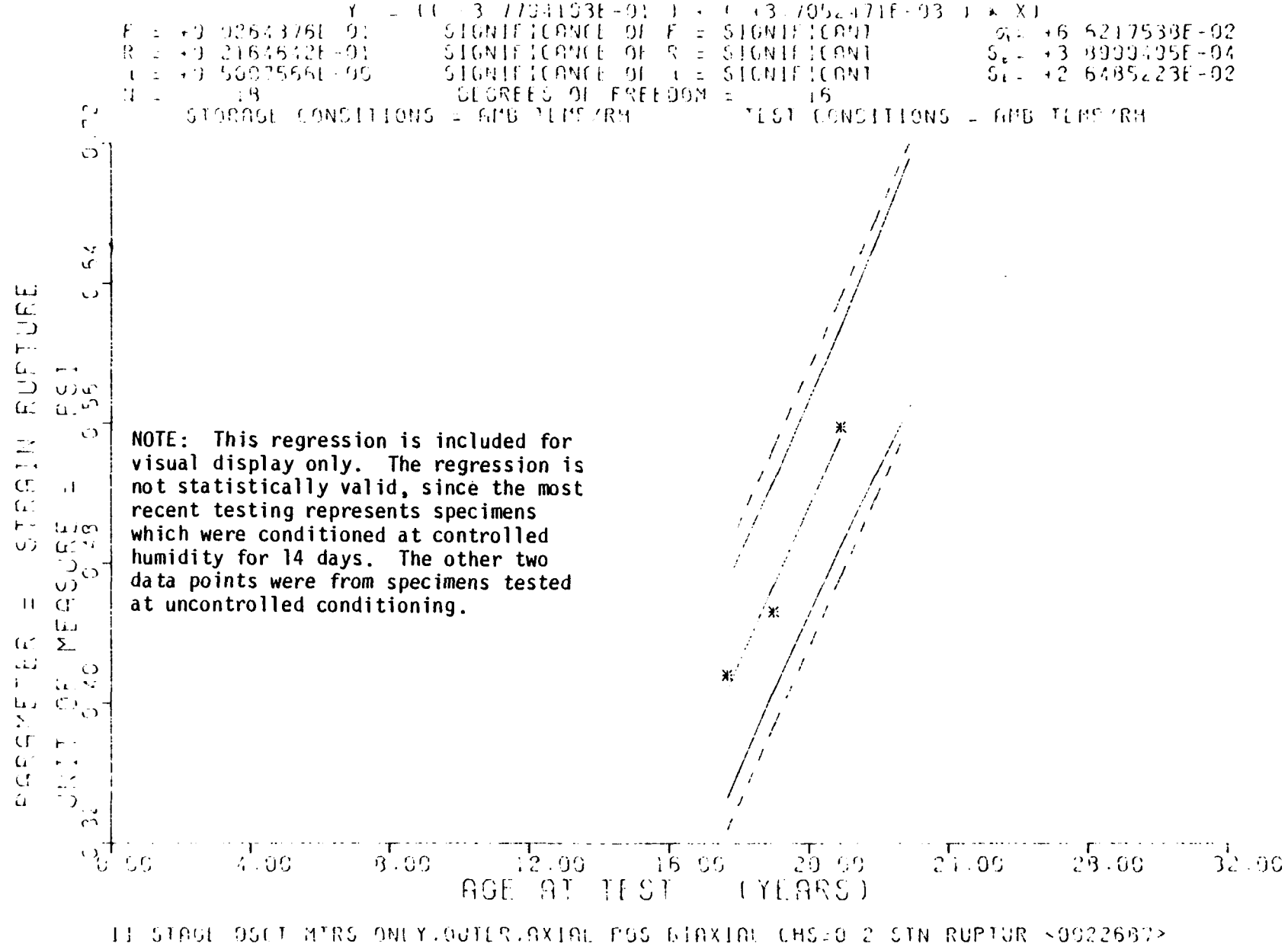

Y = (3.7734193E-01) + (3.7052471E-03) * X1
R = +0.9264376E-01
SIGNIFICANCE OF R = SIGNIFICANT
S = +6.5217538E-02
t = +0.5007566E-05
SIGNIFICANCE OF t = SIGNIFICANT
S = +3.8900405E-04
N = 18
DEGREES OF FREEDOM = 16
S = +2.6485223E-02
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
11 STAGE DSCT MTRS ONLY.OUTER.AXIAL POS BIAXIAL CHS=0.2 STN RUPTUR <0022687>

Figure 20

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	6	+4.1618299E-01	+2.5147934E-02	+4.4879596E-01	+3.8239997E-01	+4.0757042E-01
228.0	6	+4.5224964E-01	+2.6090483E-02	+4.8189997E-01	+4.1409999E-01	+4.6685439E-01
251.0	6	+5.5806636E-01	+2.3319520E-02	+5.8189994E-01	+5.2289998E-01	+5.5207508E-01

II STAGE CSCT MTRS ONLY,OUTER,AXIAL POS,BIAXIAL CHS=0.2 STN RUPTUR <0022687>

Figure 20-A

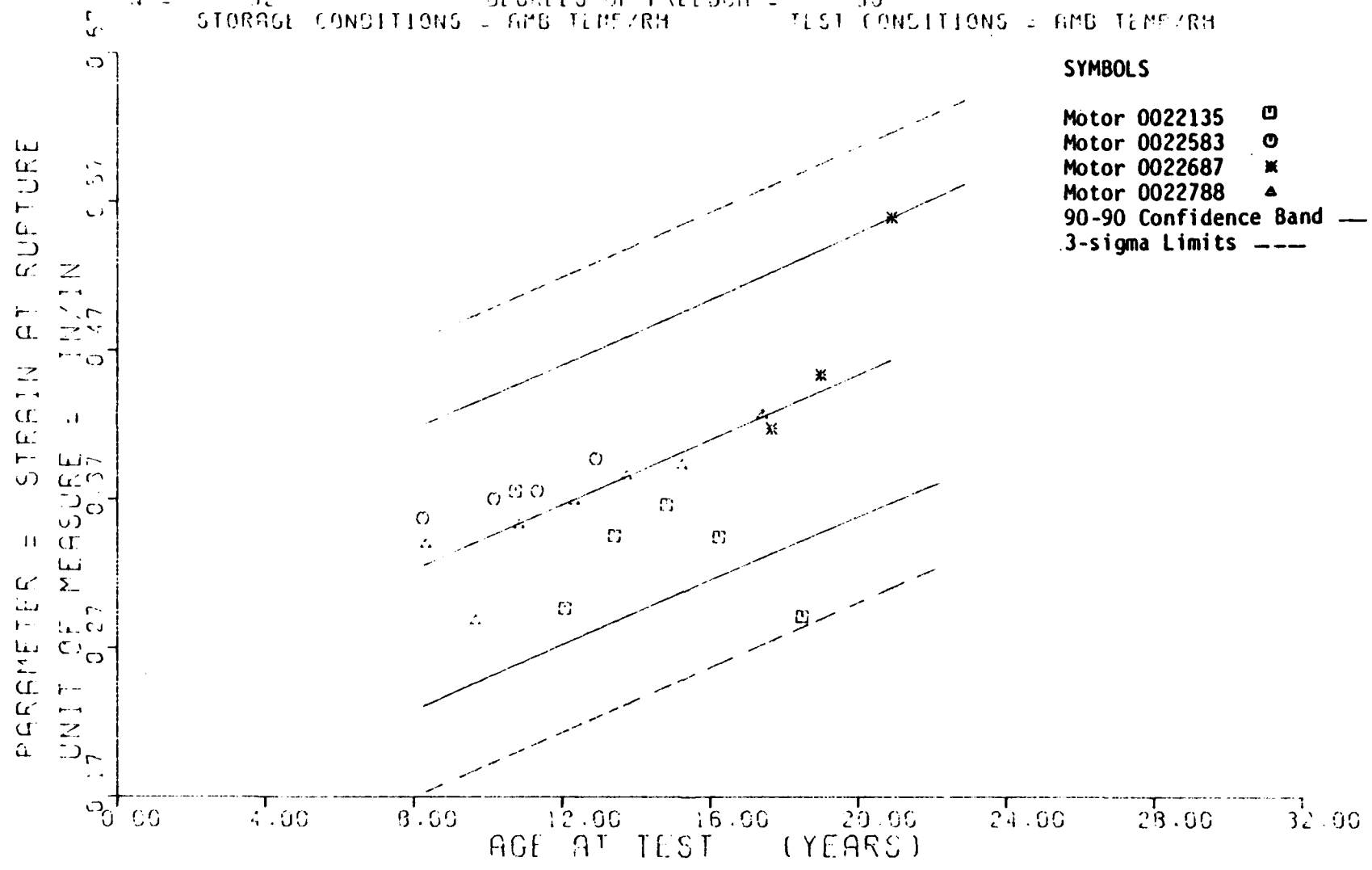

Y = (+2.3321435E-01) + (+9.0873504E-04) * X)
R = +6.8231071E-01
R = +6.5683117E-01
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
σ_y = +6.2241686E-02
S_b = +1.0096521E-04
N = 32
DEGREES OF FREEDOM = 30
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.17
0.27
0.37
0.47
0.57
0.67
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE 9SCT MTRS ONLY.OUTER.AXIAL POS BIAXIAL CHS=0.2 IN/MIN.STRAIN/RUPTURE

Figure 20-B

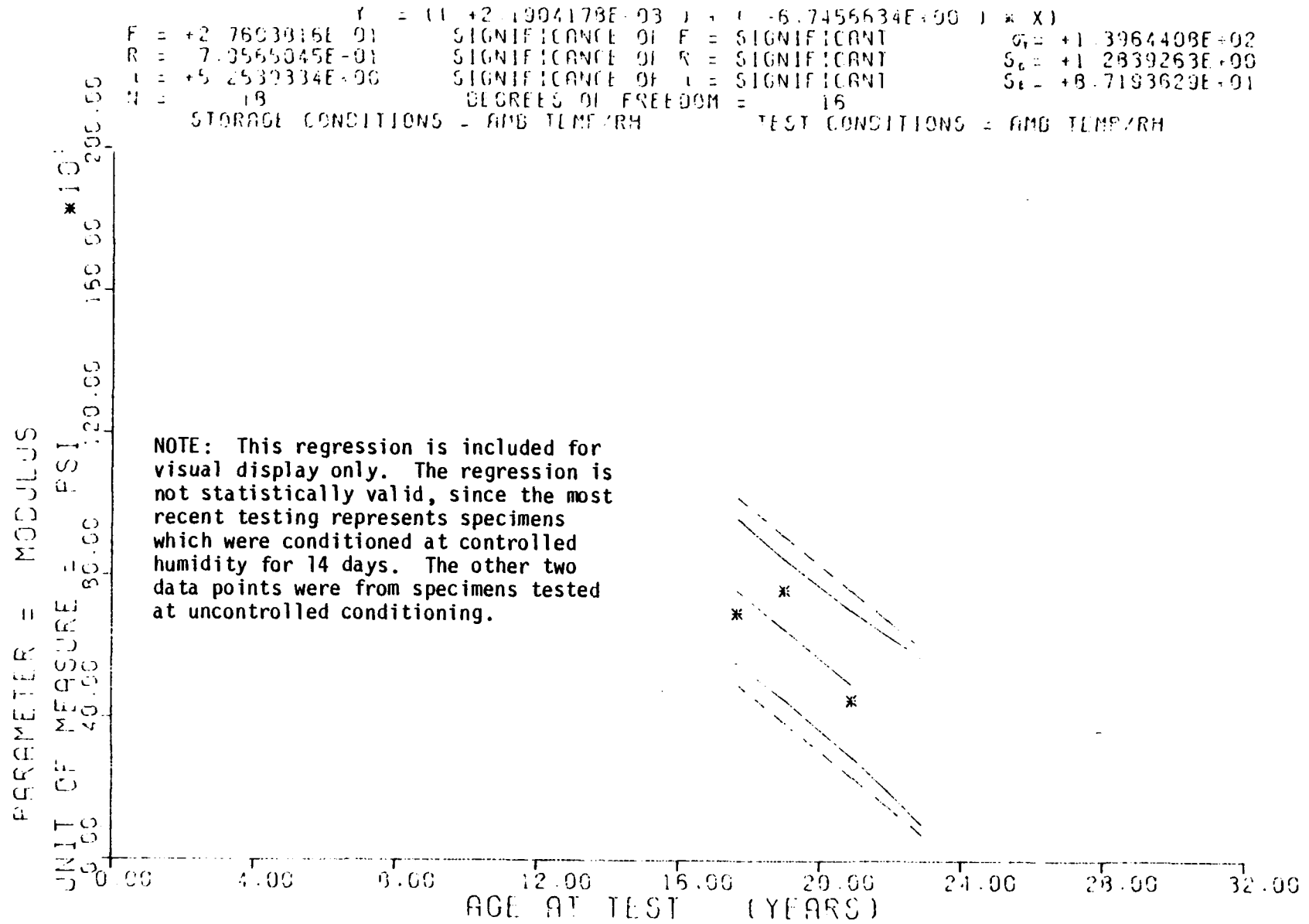

Y = (+2.1904178E-03) + (-6.7456634E-06) * X)
F = +2.7603816E 01
R = 7.0565045E-01
t = +5.2539334E-06
N = 18
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 16
S_y = +1.3964408E+02
S_a = +1.2839263E+00
S_t = +8.7193629E-01
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
* 10
200.00
160.00
120.00
80.00
40.00
0.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE OSCT MTRS ONLY,OUTER,AXIAL POS BIAXIAL CHS=0.2 MODULUS
<0022607>

Figure 21

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	6	+6.9600000E+02	+4.1689327E+01	+7.4900000E+02	+6.4200000E+02	+7.6033715E+02
228.0	6	+7.6150000E+02	+2.5680732E+01	+7.8800000E+02	+7.1500000E+02	+6.5240649E+02
251.0	6	+4.5250000E+02	+1.6694310E+01	+4.6800000E+02	+4.2900000E+02	+4.9725610E+02

II STAGE DSCT MTRS ONLY,OUTER,AXIAL POS,BIAXIAL CHS=0.2 MODULUS <0022687>

Figure 21-A

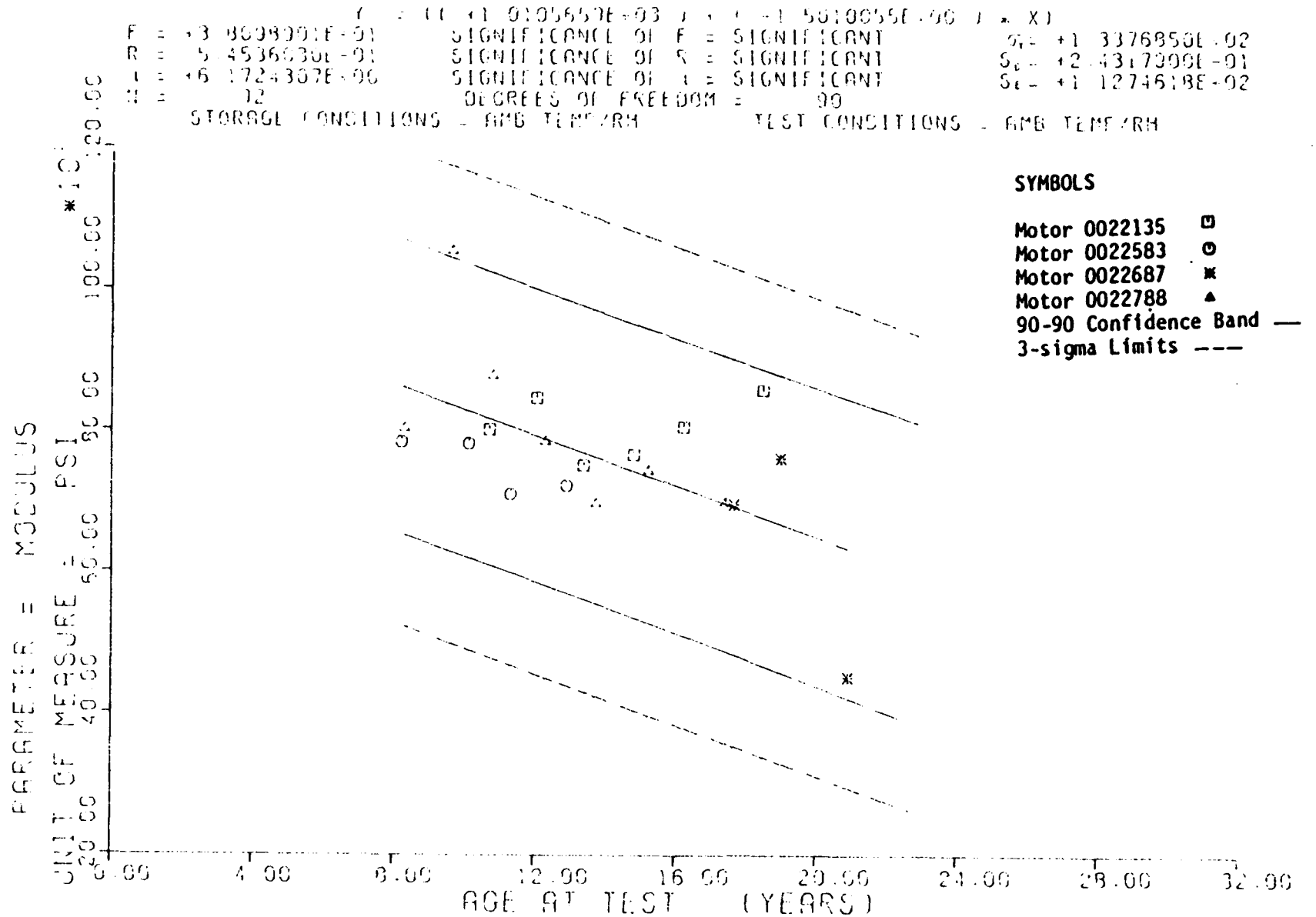
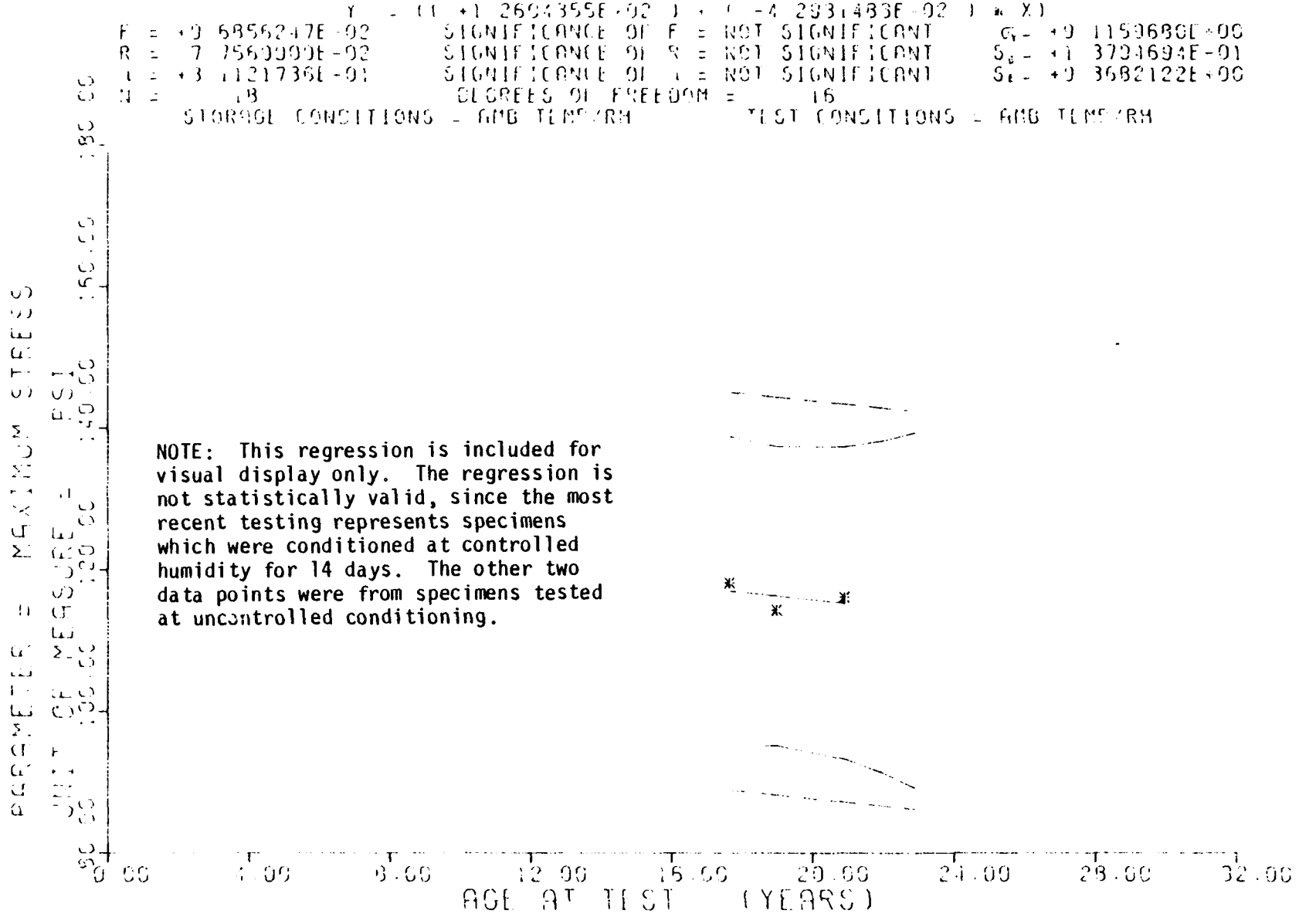

Y = (+1.0105650E+03) + (-1.5610655E-00) * X)
F = +3.8698891E-01 SIGNIFICANCE OF F = SIGNIFICANT
R = -5.4536630E-01 SIGNIFICANCE OF R = SIGNIFICANT
T = +6.1724337E-06 SIGNIFICANCE OF T = SIGNIFICANT
N = 12 DEGREES OF FREEDOM = 90
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
40.00
60.00
80.00
100.00
120.00
II STAGE DSCT MTRS ONLY.OUTER.AXIAL POS BIAXIAL CHS.0.2 IN/MIN. MODULUS

Figure 21-B



NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 22

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

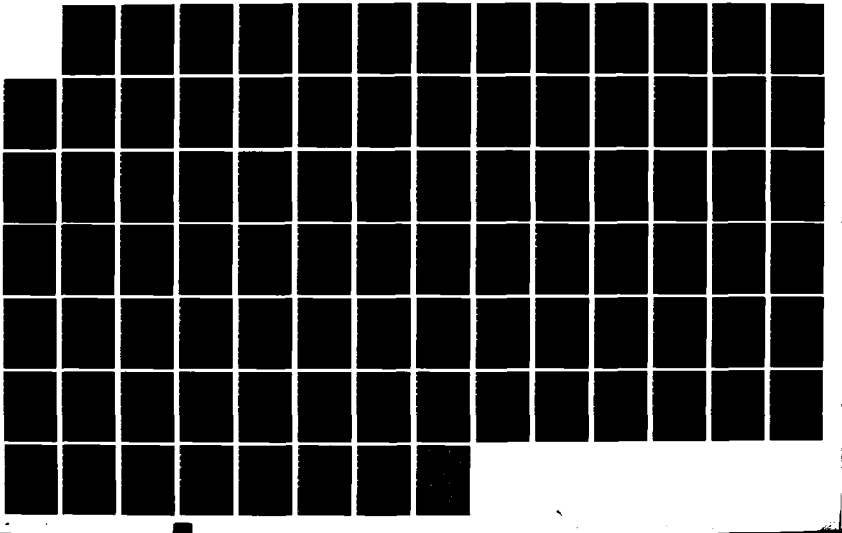
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	6	+1.1812158E+02	+9.0041784E+00	+1.3273999E+02	+1.0825000E+02	+1.1694206E+02
228.0	6	+1.1425495E+02	+1.1017208E+00	+1.1536999E+02	+1.1277999E+02	+1.1625517E+02
251.0	6	+1.1608821E+02	+1.3831803E+01	+1.2755999E+02	+9.1019989E+01	+1.1526774E+02

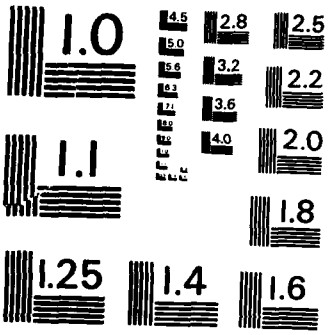
II STAGE DSCT MTRS ONLY.INNER.AXIAL POS.BIAXIAL CHS=0.2 MAX STRESS <0022687>

Figure 22-A

AD-A166 583 LGM-30B STAGE II DISSECTED MOTOR TEST REPORT(U) OGDEN AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANALYSIS LAB E M DALABA JAN 86 MAQCP-514(86) 2/2

UNCLASSIFIED F/G 21/9.2 NL





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

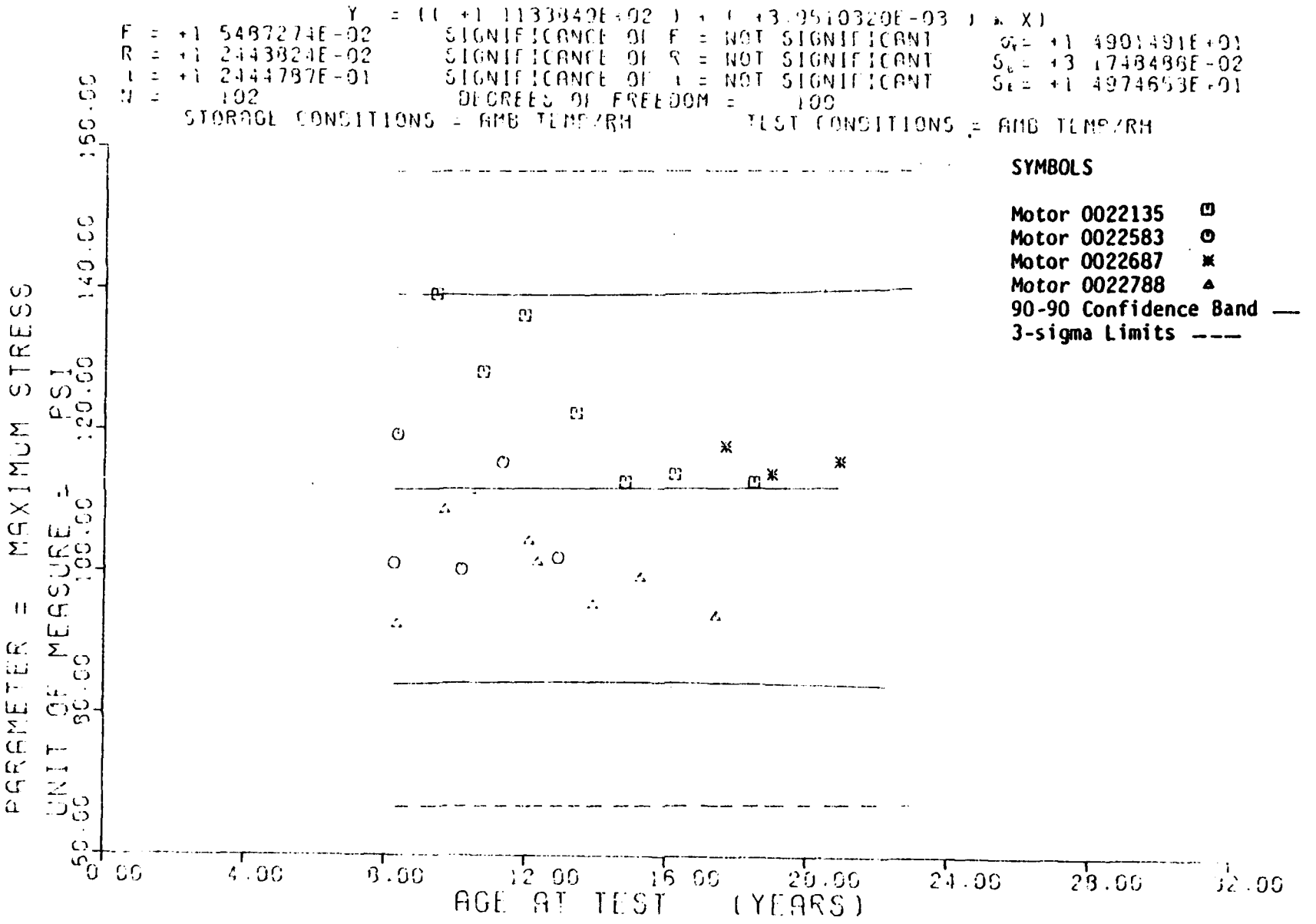
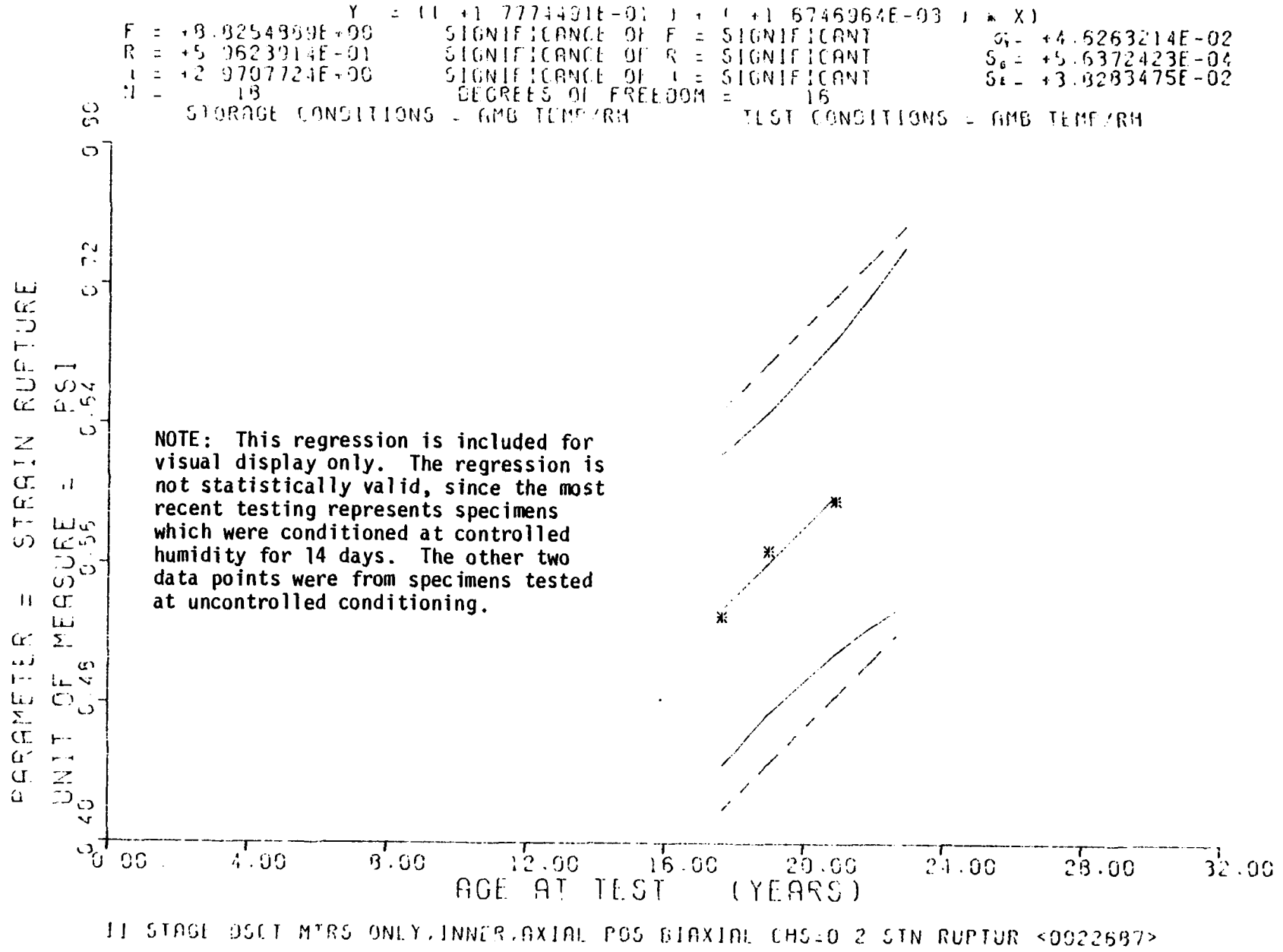

Y = (+1.1133849E+02) + (+3.9510320E-03) * X)
R = +1.5487274E-02
R = +1.2443824E-02
I = +1.2444787E-01
N = 102
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF I = NOT SIGNIFICANT
DEGREES OF FREEDOM = 100
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
160.00
140.00
120.00
100.00
80.00
60.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II DISSECTED MTRS.INNER.AXIAL POS BIAXIAL CHS=0.2 IN/MIN.MAX STRESS

Figure 22-B



II STAGE DSCT MTRS ONLY,INNER,AXIAL POS BIAXIAL CHS=0 2 STN RUPTUR <0022687>

Figure 23

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	6	+5.2871620E-01	+4.0176787E-02	+5.8889997E-01	+4.7499996E-01	+5.3278052E-01
228.0	6	+5.6646615E-01	+3.7288596E-02	+6.1599999E-01	+5.0499999E-01	+5.5957567E-01
251.0	6	+5.9526634E-01	+3.9995651E-02	+6.3709998E-01	+5.1999998E-01	+5.9809368E-01

II STAGE DSCT NTRS ONLY,INNER,AXIAL POS.BIAXIAL CHS=0.2 STN RUPTUR <0022687>

Figure 23-A

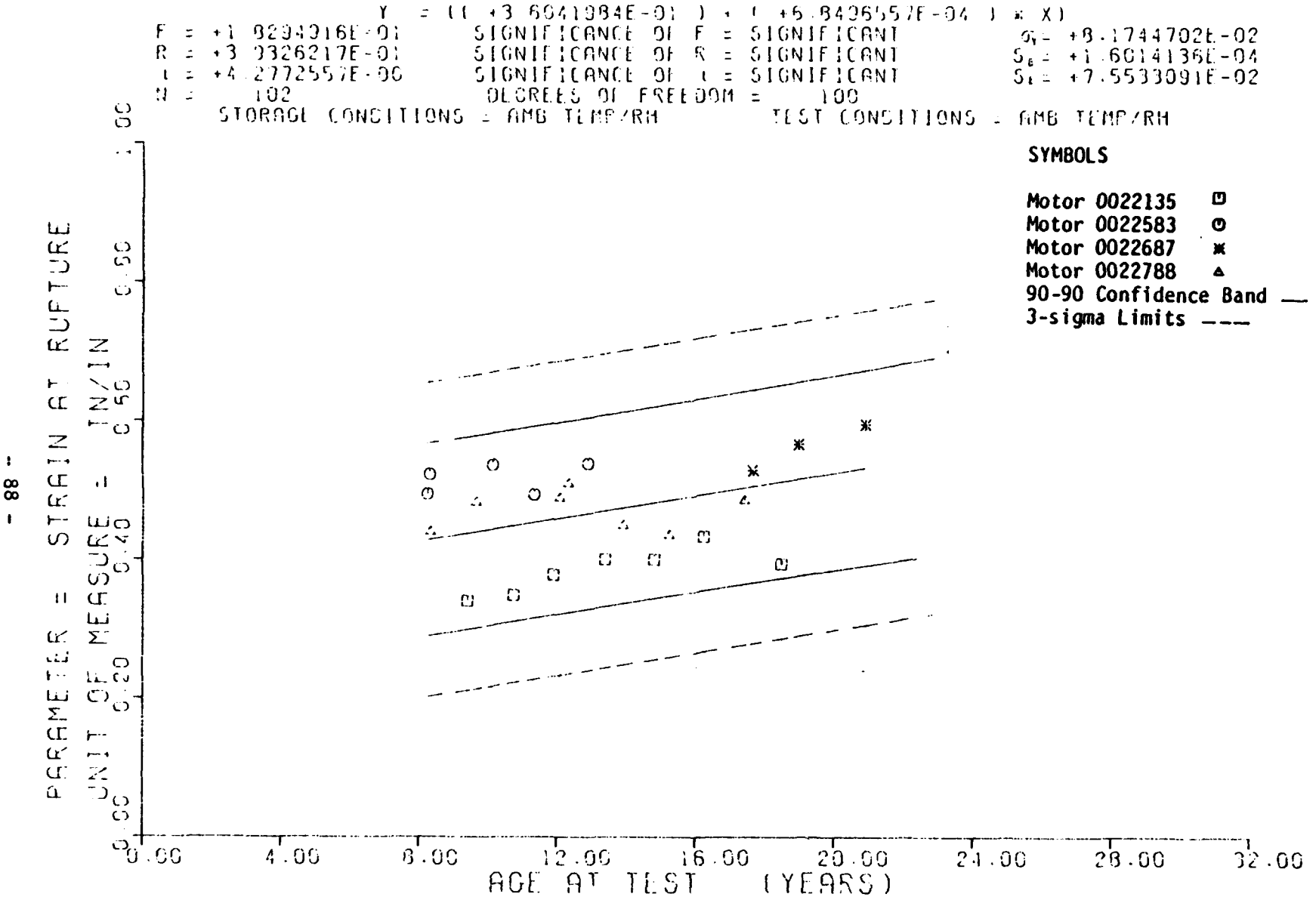

Y = (+3.6041984E-01) + (+6.8436557E-04) * X)
F = +1.8294016E-01
R = +3.3326217E-01
t = +4.2772557E-00
N = 102
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 100
S_y = +8.1744702E-02
S_e = +1.6014136E-04
S_t = +7.5533091E-02
STORAGE 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
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.00
0.20
0.40
0.60
0.80
1.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS.INNER.AXIAL POS.BIAXIAL CHS=0.2 IN/MIN.STRAIN AT RUPURE

Figure 23-B

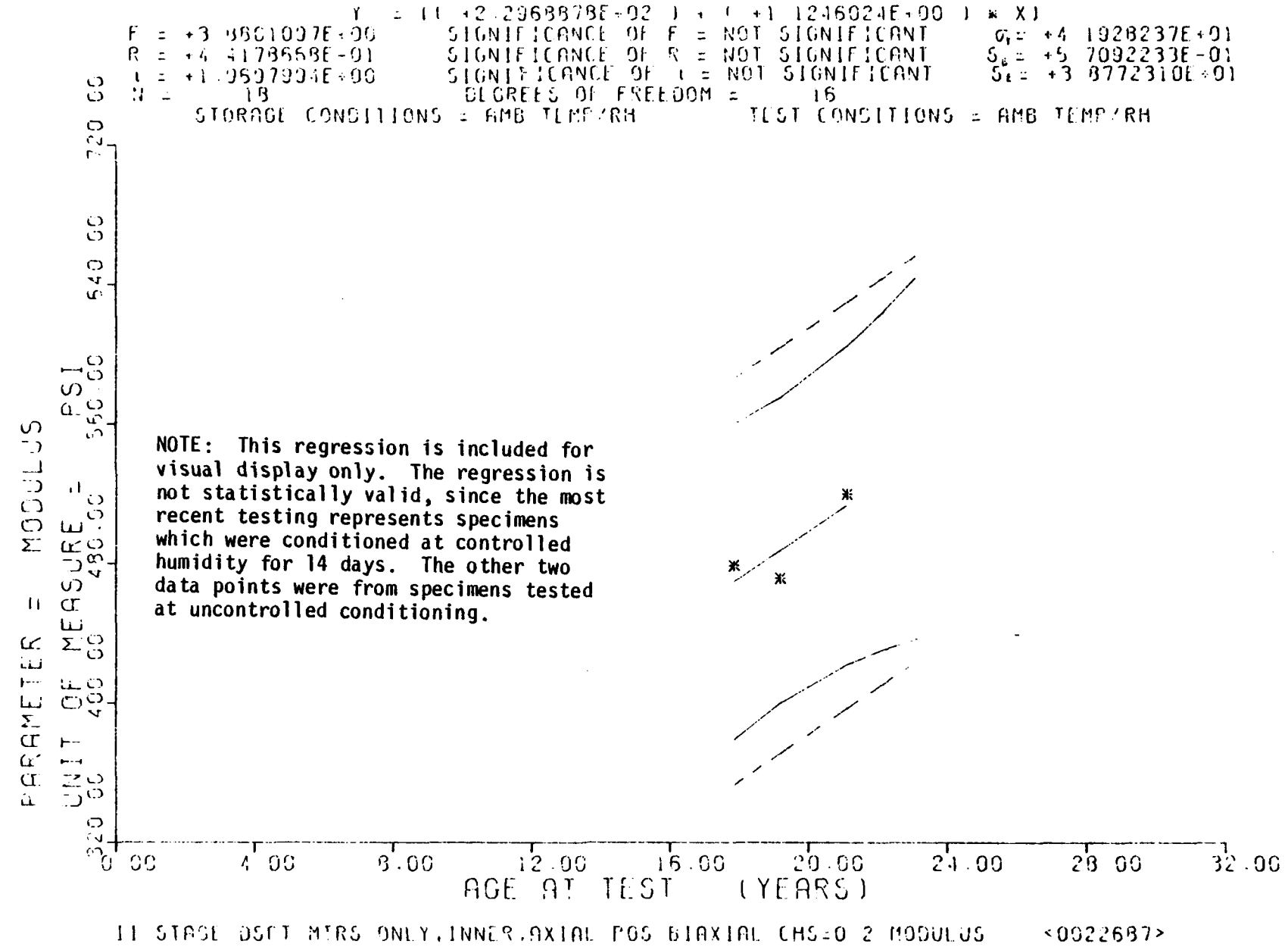

Y = (+2.2968878E+02) + (+1.1246024E+00) * X)
F = +3.8601037E+00
R = +4.5178568E-01
t = +1.9607934E+00
N = 18
SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 16
σ_t = +4.1928237E+01
S_b = +5.7092233E-01
S_t = +3.8772310E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
320.00
400.00
480.00
560.00
640.00
720.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
II STAGE DSET MTRS ONLY,INNER,AXIAL POS BIAXIAL CHS=0 2 MODULUS <0022687>

Figure 24

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	6	+4.7750000E+02	+8.3126409E+00	+4.8900000E+02	+4.7000000E+02	+4.6810449E+02
228.0	6	+4.7016650E+02	+1.5689699E+01	+4.8300000E+02	+4.4000000E+02	+4.8609814E+02
251.0	6	+5.1850000E+02	+6.3509841E+01	+6.2800000E+02	+4.6500000E+02	+5.1196386E+02

II STAGE CSCT MTRS ONLY,INNER,AXIAL POS,BIAXIAL CHS=0.2 MODULUS <0022687>

Figure 24-A

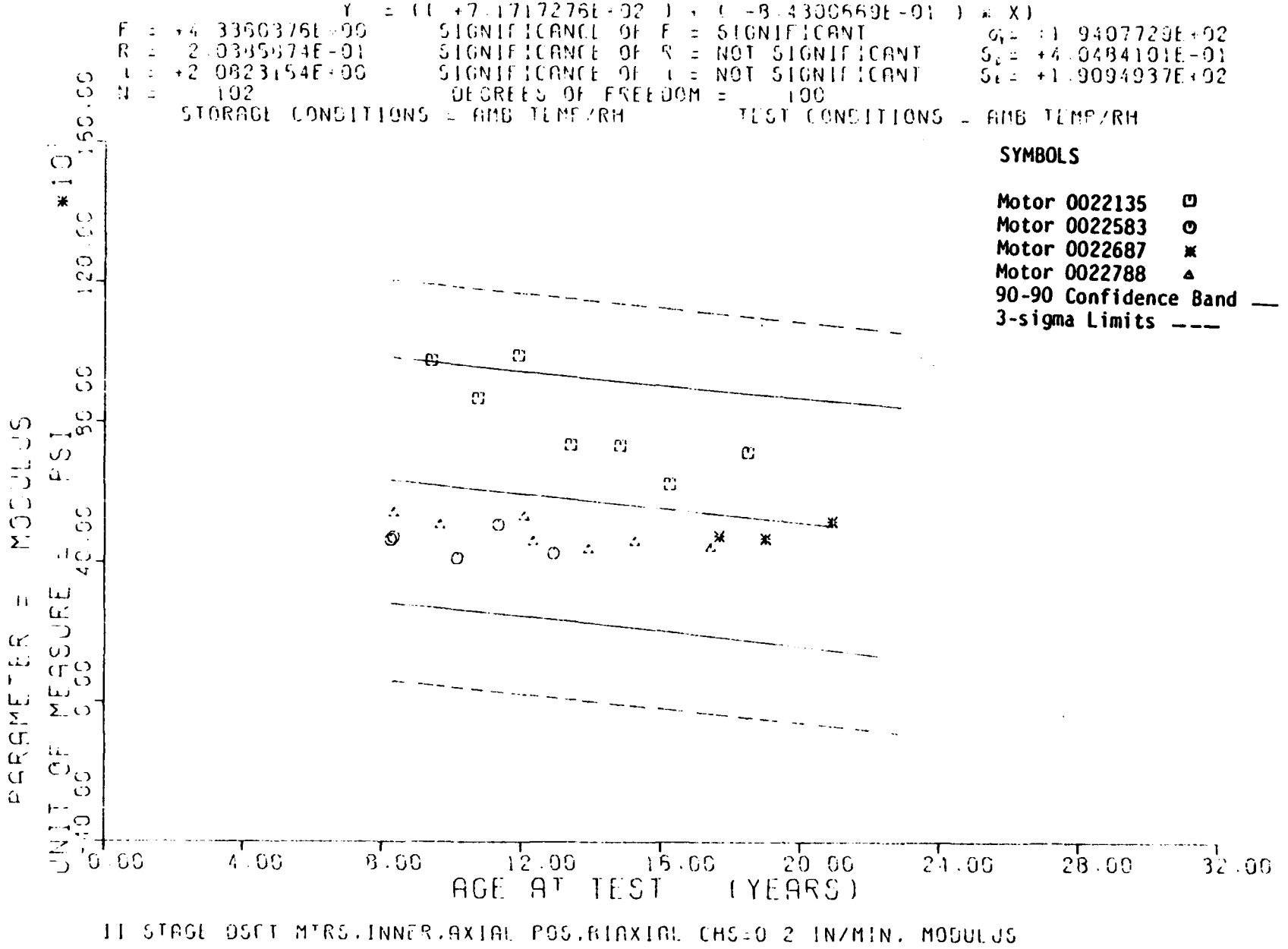

Y = (+7.1717276E-02) + (-8.4300669E-01) * X)
F = +4.3360376E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = 2.0345674E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT
t = +2.0823154E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT
N = 102 DEGREES OF FREEDOM = 100
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10
160.00
120.00
80.00
40.00
0.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS.INNER.AXIAL POS.RIAXIAL CHS=0.2 IN/MIN. MODULUS

Figure 24-B

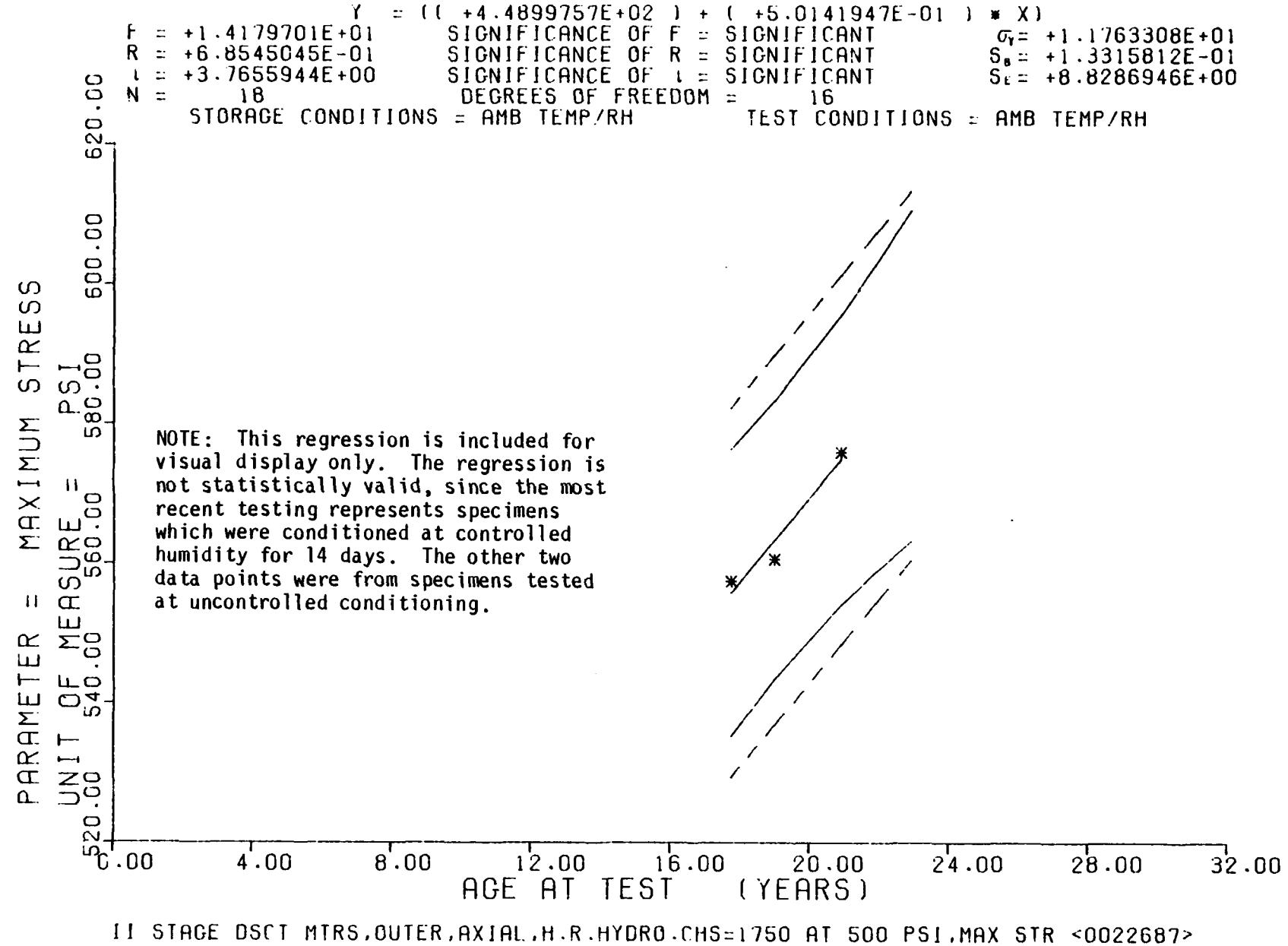

Y = ((+4.4899757E+02) + (+5.0141947E-01) * X)
F = +1.4179701E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +6.8545045E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +3.7655944E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
520.00
540.00
560.00
580.00
600.00
620.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS,OUTER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,MAX STR <0022687>

Figure 25

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+5.5744970E+02	+8.7619177E+00	+5.6937588E+02	+5.4351977E+02	+5.5579980E+02
228.0	6	+5.6059472E+02	+4.2243251E+00	+5.6818594E+02	+5.5569995E+02	+5.6332104E+02
251.0	6	+5.7592993E+02	+1.1859873E+01	+5.8400000E+02	+5.5207983E+02	+5.7485375E+02

II STAGE DSCT MTRS,OUTER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI.MAX STR <0022687>

Figure 25-A

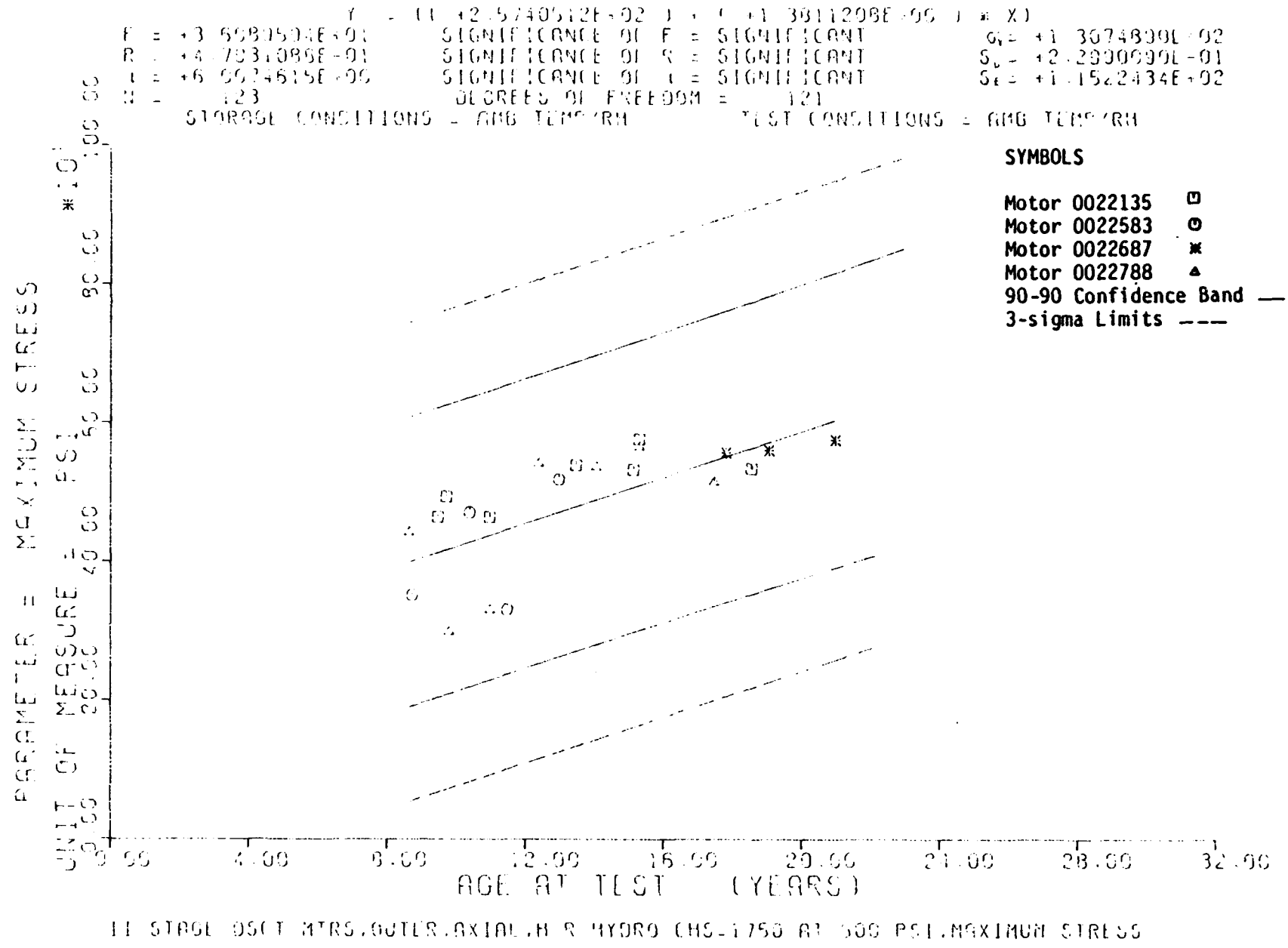

Y = (+2.5740512E+02) + (+1.3811208E+00) * X)
F = +3.9681504E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +4.7831086E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +6.3024615E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 123 DEGREES OF FREEDOM = 121
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
*10**3
0.00
40.00
60.00
80.00
100.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
TE STAGE 9SCT MTRS,OUTER,AXIAL,H R HYDRO CHS-1758 AT 500 PSI,MAXIMUM STRESS

Figure 25-B

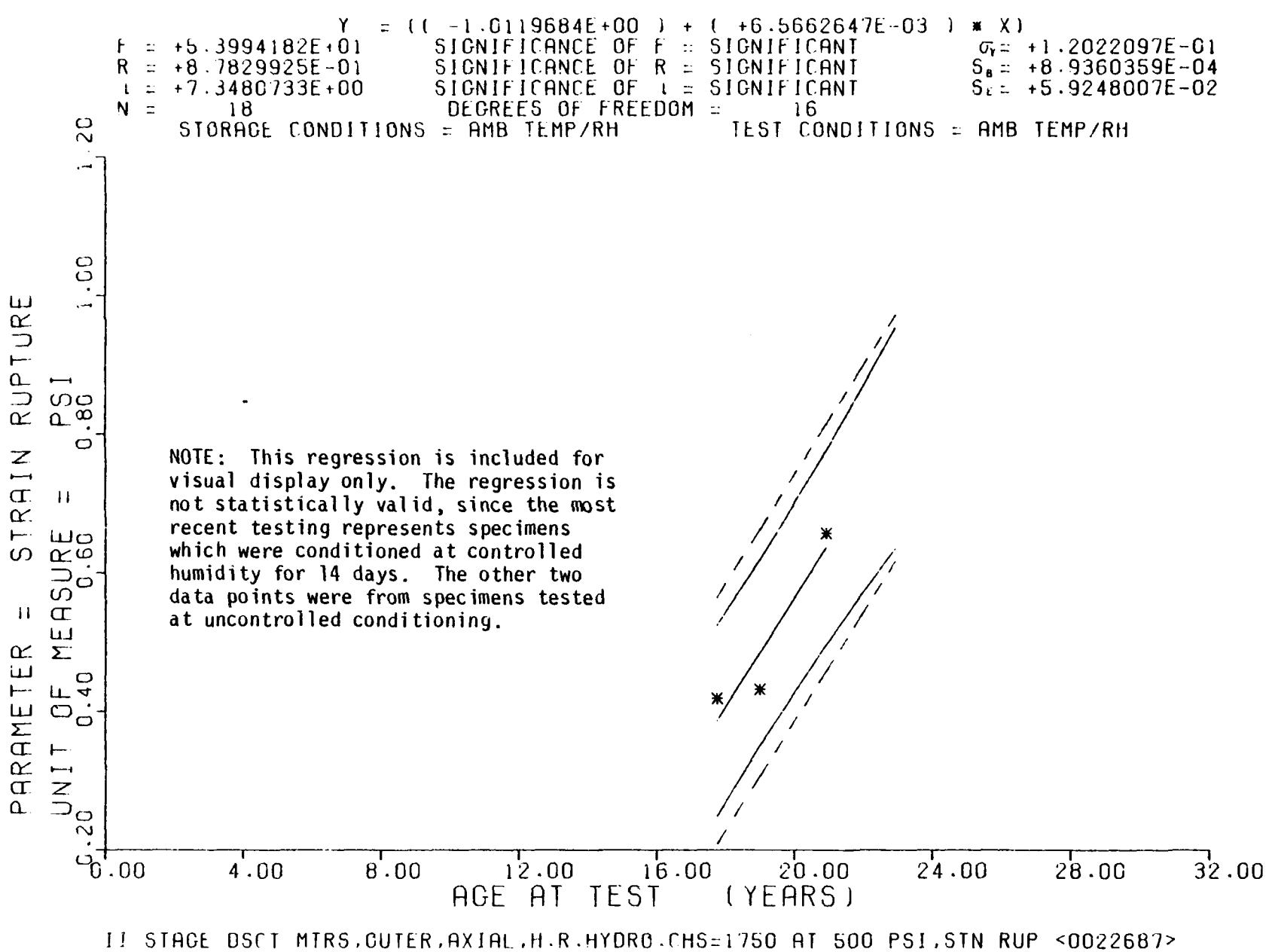

Y = ((-1.0119684E+00) + (+6.5662647E-03) * X)
F = +5.3994182E+01 SIGNIFICANCE OF F = SIGNIFICANT σv = +1.2022097E-01
R = +8.7829925E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +8.9360359E-04
t = +7.3480733E+00 SIGNIFICANCE OF t = SIGNIFICANT Sε = +5.9248007E-02
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN RUPTURE
UNIT OF MEASURE = PSI
1.20
1.00
0.80
0.60
0.40
0.20
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
II STAGE DSCT MTRS,OUTER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,STN RUP <0022687>

Figure 26

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+4.1884976E-01	+1.4755564E-02	+4.3229997E-01	+3.9659994E-01	+3.8664597E-01
228.0	6	+4.3193292E-01	+2.0334499E-02	+4.6099996E-01	+4.1299998E-01	+4.8513990E-01
251.0	6	+6.5716630E-01	+7.3698002E-02	+7.4299997E-01	+5.2499997E-01	+6.3616400E-01

II STAGE DSCT MTRS,OUTER,AXIAL,R.T.HYDRO.CHS=1750 AT 500 PSI,STN RUP <0022697>

Figure 26-A

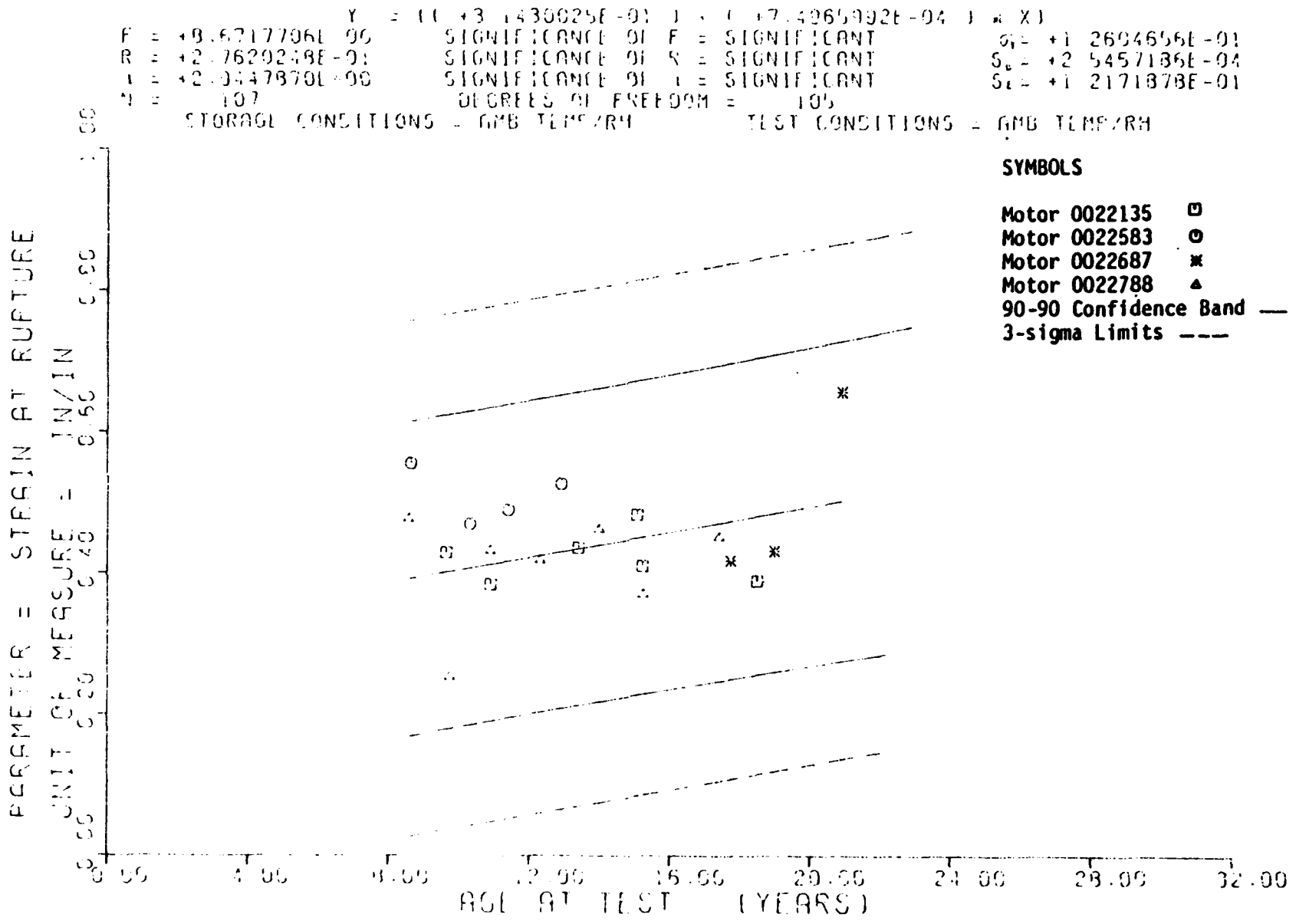

Y = (+3.1430625E-01) + (+7.4065902E-04) * X)
F = +8.6217706E 00
SIGNIFICANCE OF F = SIGNIFICANT
σ_1 = +1.2604656E-01
R = +2.7629248E-01
SIGNIFICANCE OF R = SIGNIFICANT
S_b = +2.5457186E-04
t = +2.9447870E+00
SIGNIFICANCE OF t = SIGNIFICANT
S_E = +1.2171878E-01
N = 107
DEGREES OF FREEDOM = 105
STORAGE 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
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE 05CT MTRS.OUTER.AXIAL.H R HYDRO (HS-1750 AT 500 PSI.STRAIN/RUPTURE

Figure 26-B

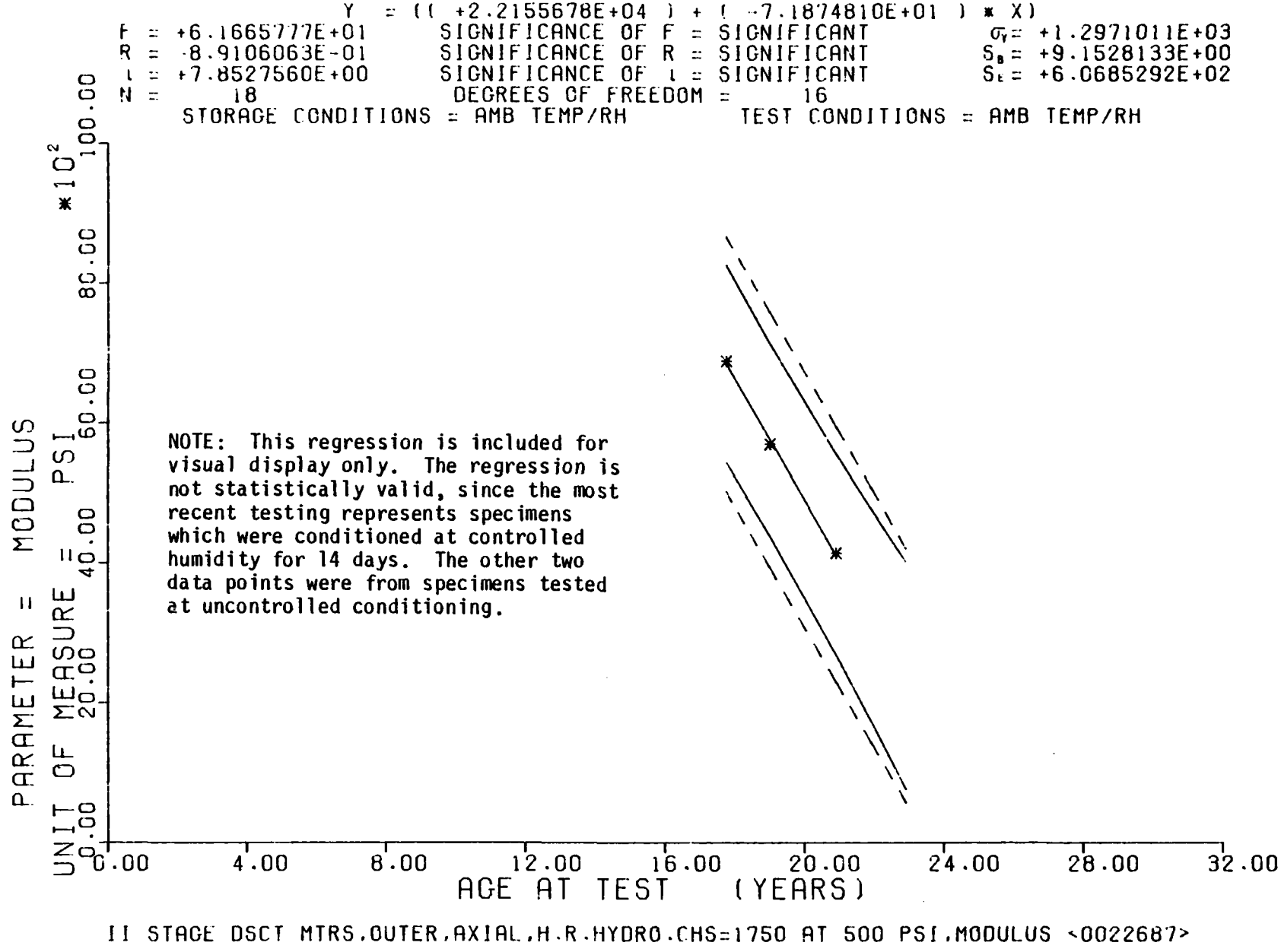

Y = ((+2.2155678E+04) + (-7.1874810E+01) * X)
F = +6.1665777E+01 SIGNIFICANCE OF F = SIGNIFICANT σY = +1.2971011E+03
R = -8.9106063E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +9.1528133E+00
t = +7.8527560E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +6.0685292E+02
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
0.00
20.00
40.00
60.00
80.00
100.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS.OUTER.AXIAL.H.R.HYDRO.CHS=1750 AT 500 PSI.MODULUS <0022687>

Figure 27

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+6.667332OE+03	+9.5881899E+02	+8.1160000E+03	+5.8940000E+03	+6.8463437E+03
228.0	6	+5.7005000E+03	+4.9460903E+02	+6.2510000E+03	+5.1830000E+03	+5.7682187E+03
251.0	6	+4.1418320E+03	+7.7979270E+01	+4.2740000E+03	+4.0400000E+03	+4.1150976E+03

II STAGE DSCT MTRS.OUTER.AXIAL.H.R.HYDRO.CHS=1750 AT 500 PSI.MODULUS <0022687>

Figure 27-A

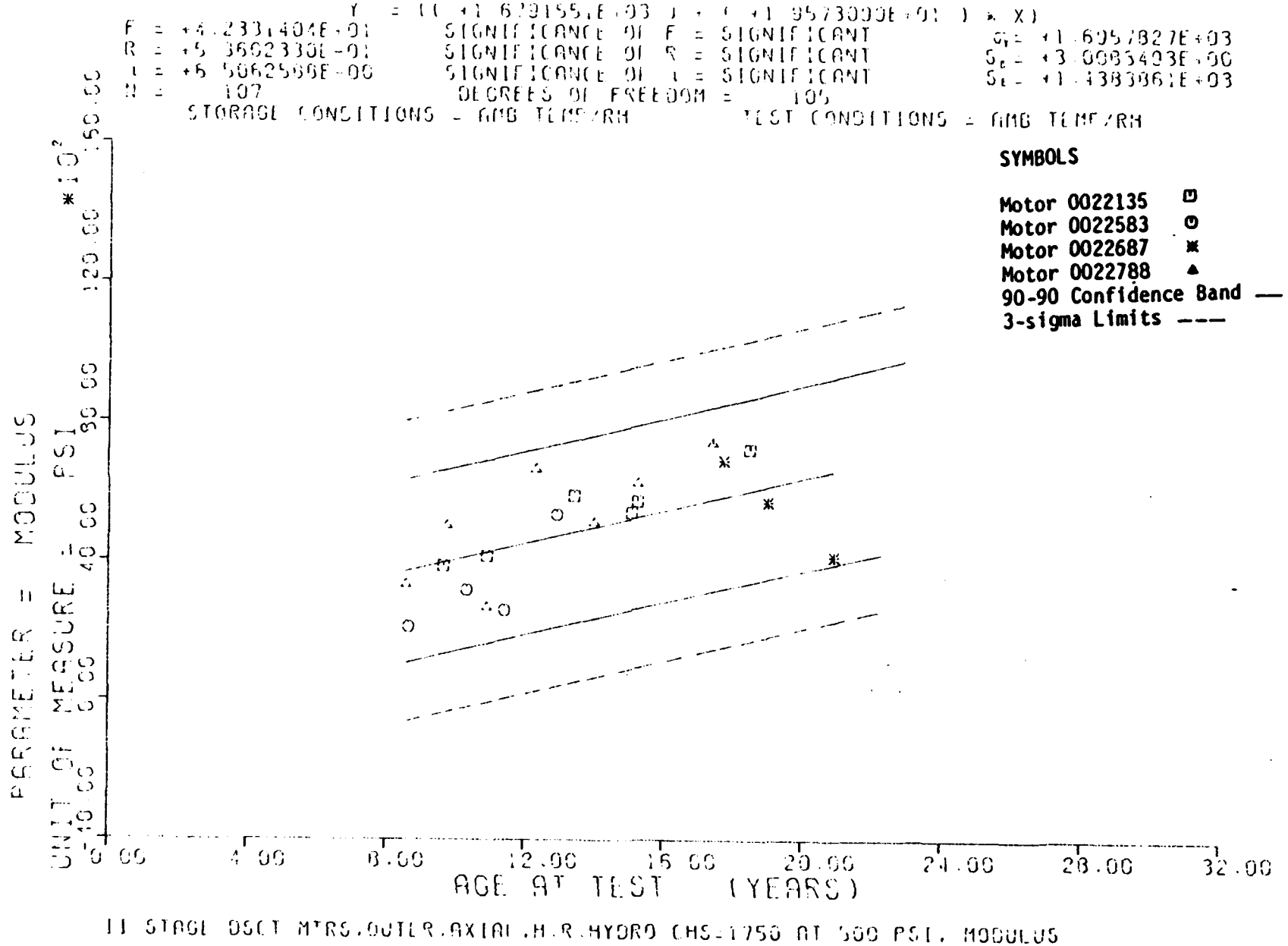

Y = (+1.629155E+03) + (+1.957300E+01) * X)
F = +4.233140E+01
R = +5.366233E-01
t = +6.506256E-00
N = 107
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 105
S_y = +1.605782E+03
S_e = +3.008540E+00
S_t = +1.438306E+03
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
*10²
-40.00
0.00
40.00
80.00
120.00
160.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE OSCT M'RS.OUTER.AXIAL.H.R.HYDRO CHS-1750 AT 500 PSI, MODULUS

Figure 27-B

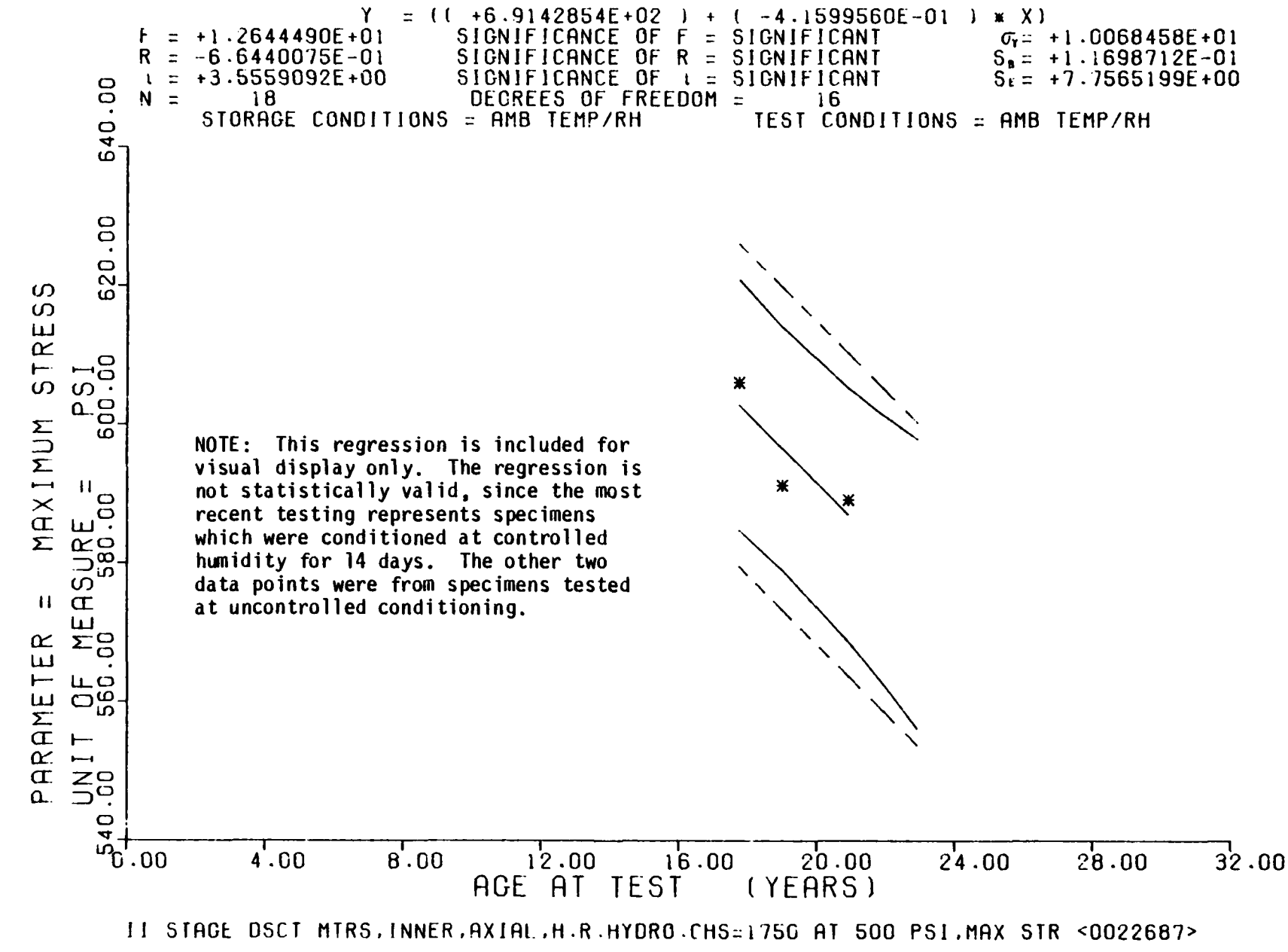

Y = ((+6.9142854E+02) + (-4.1599560E-01) * X)
F = +1.2644490E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -6.6440075E-01 SIGNIFICANCE OF R = SIGNIFICANT
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
540.00
560.00
580.00
600.00
620.00
640.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS,INNER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,MAX STR <0022687>

Figure 28

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+6.0607153E+02	+4.5273372E+00	+6.1338989E+02	+5.9927978E+02	+6.0282128E+02
228.0	6	+5.9121142E+02	+1.0456794E+01	+6.0462988E+02	+5.8229980E+02	+5.9658154E+02
251.0	6	+5.8913305E+02	+3.0756719E+00	+5.9379980E+02	+5.8569995E+02	+5.8701342E+02

II STAGE DSCT MTRS.INNER.AXIAL.H.R.HYDRO.CHS=1750 AT 500 PSI.MAX STR <0022687>

Figure 28-A

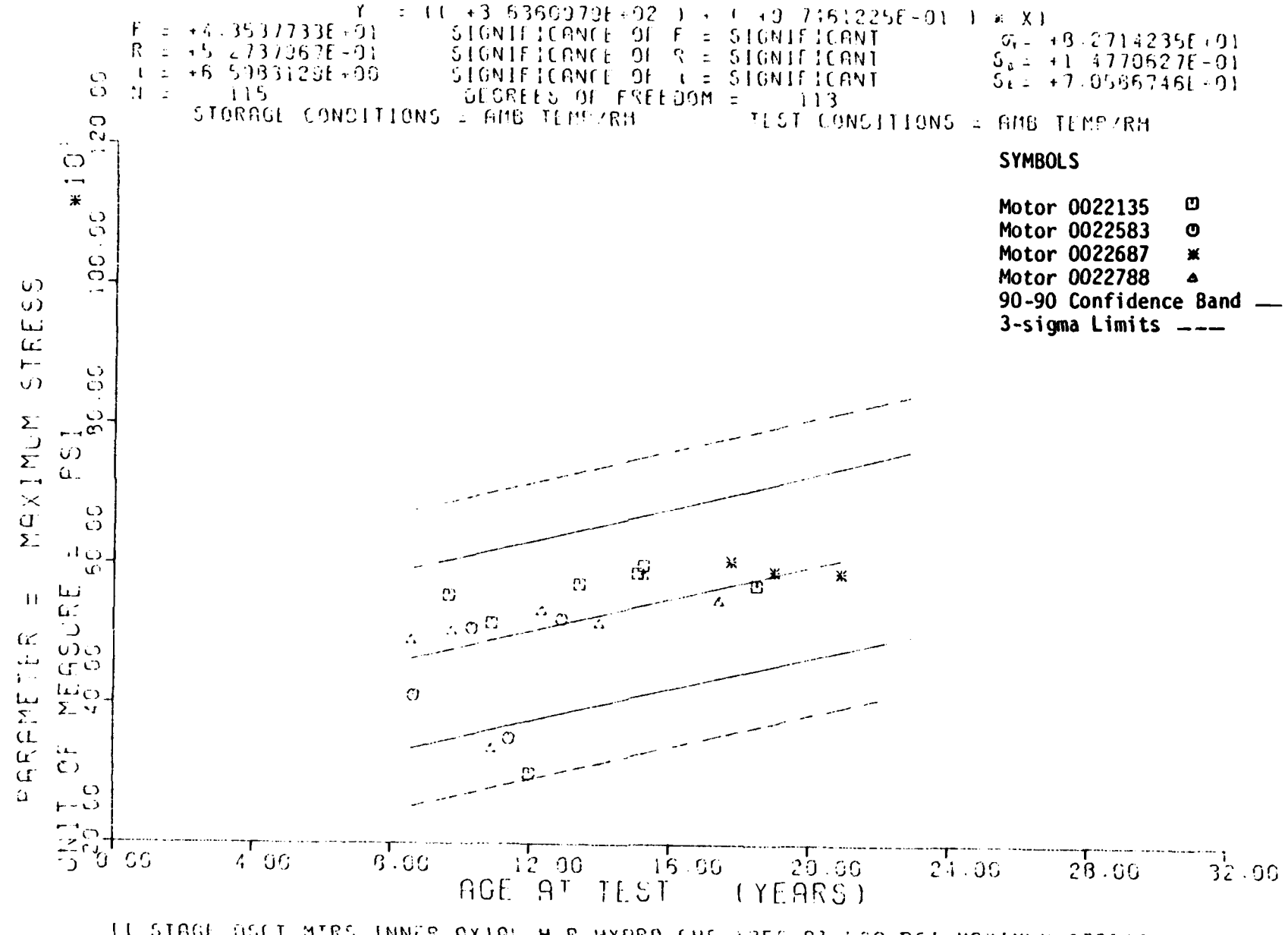

Y = (+3.6360979E+02) + (+9.7761225E-01) * X)
F = +4.3537733E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +5.2737367E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +6.5983129E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 115 DEGREES OF FREEDOM = 113
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
*10
120.00
100.00
80.00
60.00
40.00
20.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE OSCT MTRS.INNER.AXIAL.H.R HYDRO (HS=1750 AT 500 PSI.MAXIMUM STRESS

Figure 28-B

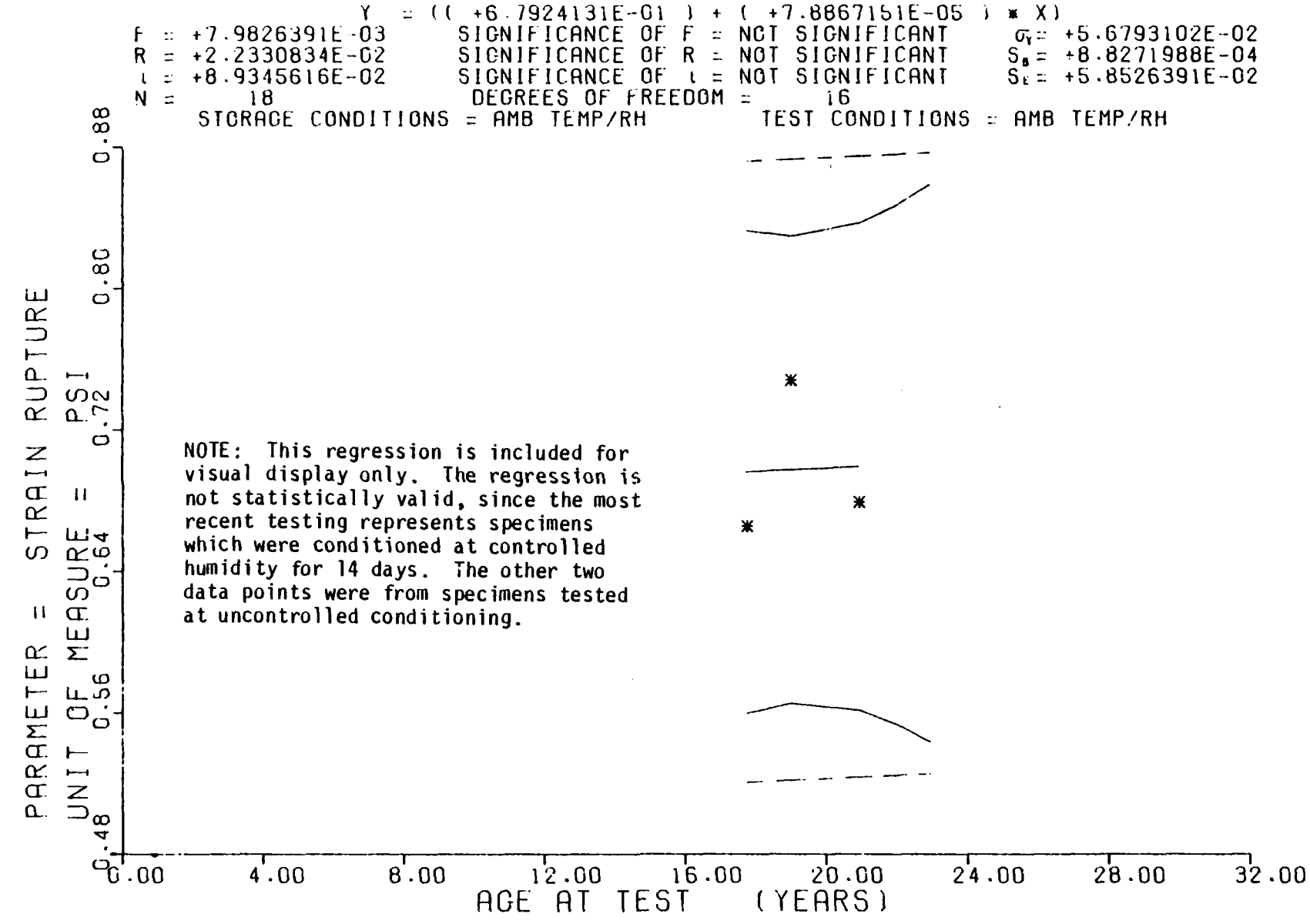

Y = ((+6.7924131E-01) + (+7.8867151E-05) * X)
F = +7.9826391E-03 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +5.6793102E-02
R = +2.2330834E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +8.8271988E-04
ι = +8.9345616E-02 SIGNIFICANCE OF ι = NOT SIGNIFICANT Sε = +5.8526391E-02
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = STRAIN RUPTURE
UNIT OF MEASURE = PSI
0.88
0.80
0.72
0.64
0.56
0.48
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS,INNER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,STN RUP <0022687>

Figure 29

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+6.6331622E-01	+5.1772293E-02	+7.1319997E-01	+5.8569997E-01	+6.9603997E-01
228.0	6	+7.4758297E-01	+5.4051484E-02	+8.1099998E-01	+6.7419999E-01	+6.9722300E-01
251.0	6	+6.7899954E-01	+2.5564301E-02	+7.0899999E-01	+6.4599996E-01	+6.9903695E-01

II STAGE DSCT MTRS,INNER,AXIAL,H.R,HYDRO,CHS=1750 AT 500 PSI,STN RUP <0022687>

Figure 29-A

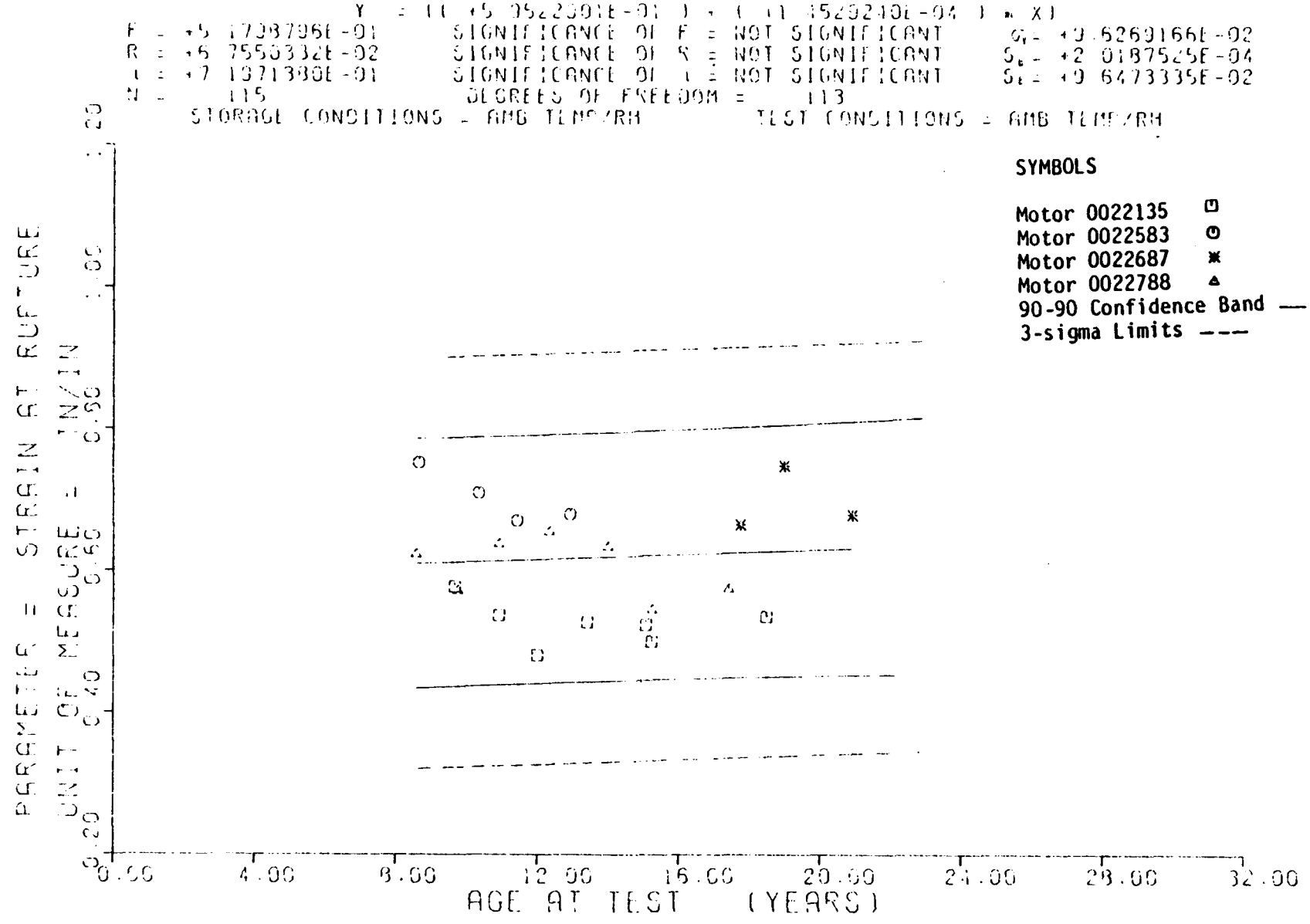

Y = (+5.9522301E-01) + (+1.8529240E-04) * X)
F = +5.1738796E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_1 = +9.6269166E-02
R = +6.7553332E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_b = +2.0187525E-04
t = +7.1371380E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_t = +9.6473335E-02
N = 115 DEGREES OF FREEDOM = 113
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
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.20
0.40
0.60
0.80
1.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE OSCT MTRS.INNER.AXIAL.H.R HYDRO (HS-1750 AT 500 PSI.STRAIN/RUPTURE

Figure 29-B

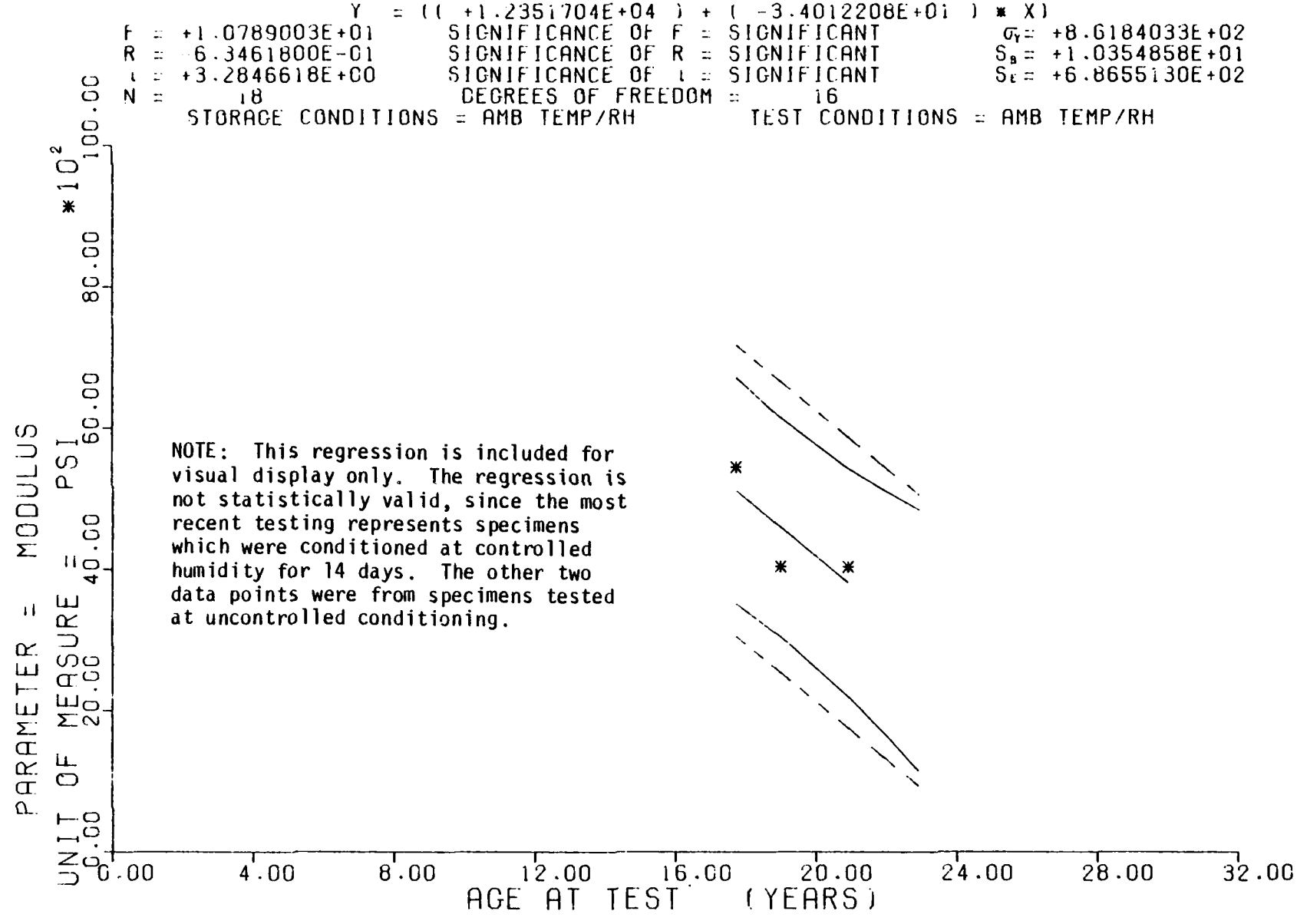

Y = ((+1.2351704E+04) + (-3.4012208E+01) * X)
F = +1.0789003E+01 SIGNIFICANCE OF F = SIGNIFICANT σY = +8.6184033E+02
R = 6.3461800E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +1.0354858E+01
t = +3.2846618E+00 SIGNIFICANCE OF t = SIGNIFICANT St = +6.8655130E+02
N = 18 DEGREES OF FREEDOM = 16
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
0.00
20.00
40.00
60.00
80.00
100.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS,INNER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,MODULUS <0022687>

Figure 30

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	6	+5.4455000E+03	+5.5692589E+02	+6.1400000E+03	+4.6490000E+03	+5.1071015E+03
228.0	6	+4.0378332E+03	+7.3963934E+02	+5.2340000E+03	+3.2330000E+03	+4.5969179E+03
251.0	6	+4.0353332E+03	+1.8431133E+02	+4.3930000E+03	+3.8830000E+03	+3.8146406E+03

II STAGE CSCT MTRS,INNER,AXIAL,H.R.HYDRO.CHS=1750 AT 500 PSI,MODULUS <0022687>

Figure 30-A

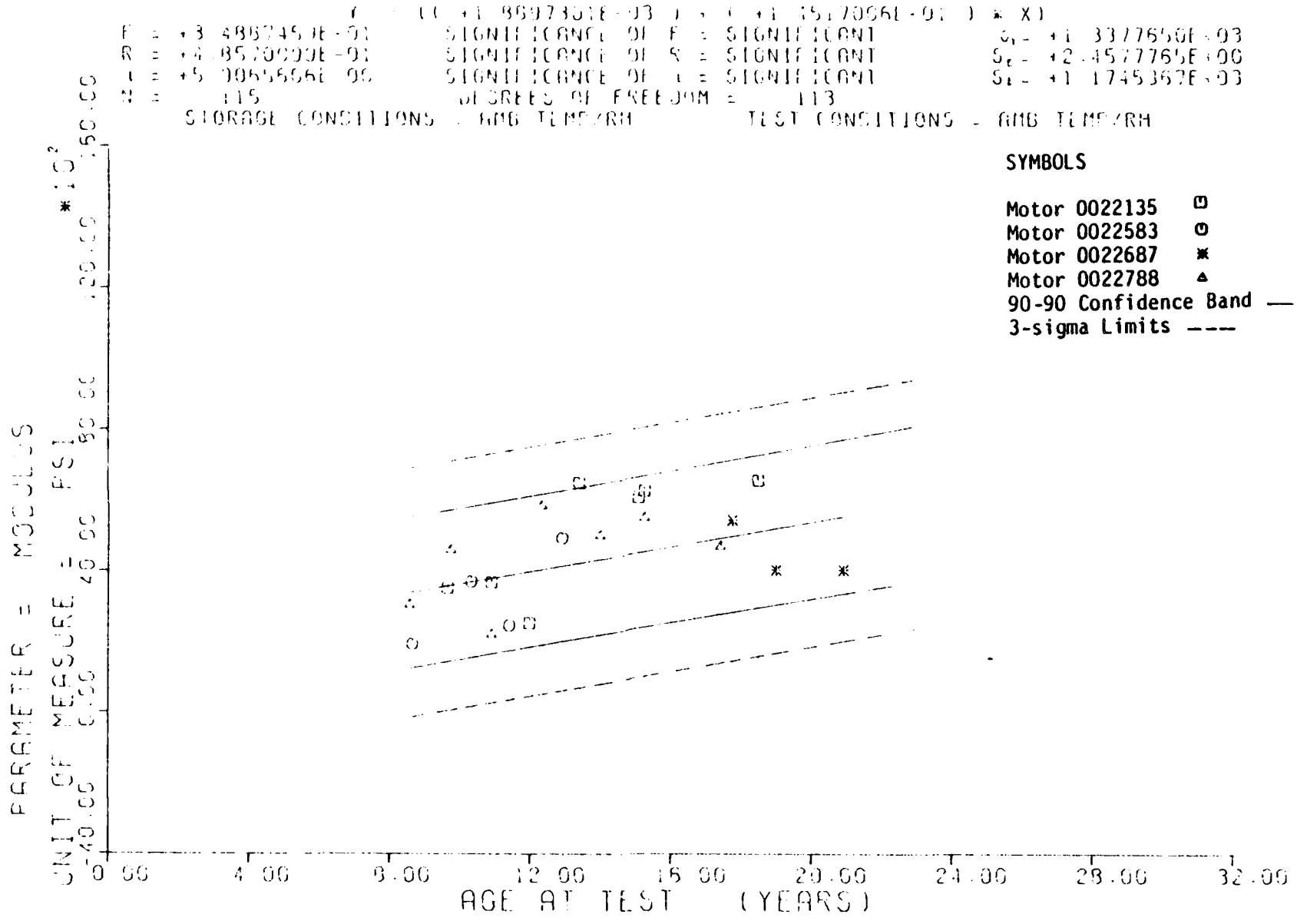
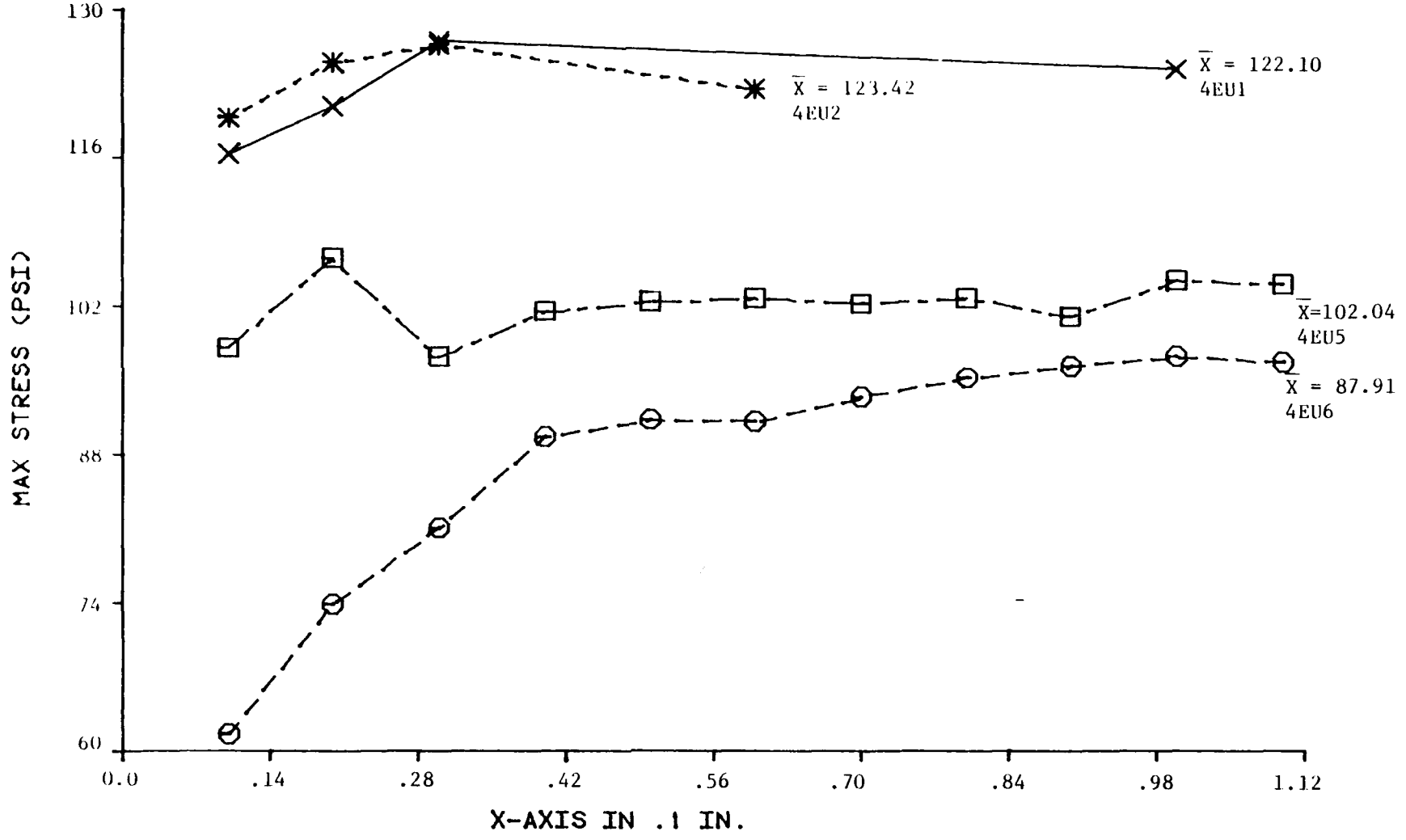
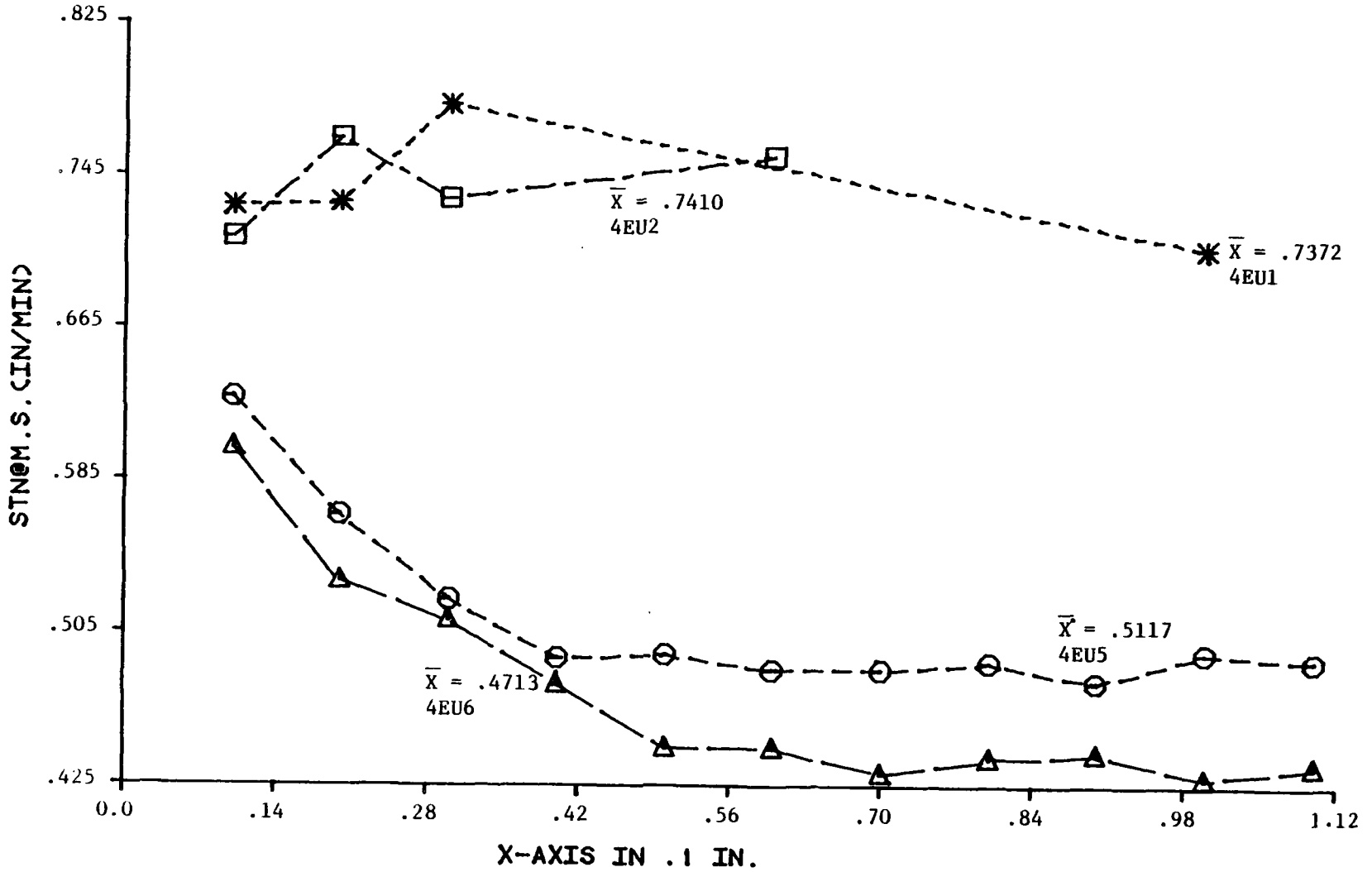

Y = (+1.8697303E-03) + (+1.3517066E-01) * X)
R = +3.4867459E-01
R = +4.8570000E-01
t = +5.0055556E 00
N = 115
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 113
S_1 = +1.3377656E-03
S_2 = +2.4577765E+00
S_t = +1.1745362E-03
STORAGE 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
PARAMETER = MODULUS
UNIT OF MEASURE = PSI
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
-40.00
0.00
40.00
80.00
120.00
160.00
II STAGE DOCT M'RS.INNER.AXIAL.H R HYDRO.CHS-1750 AT 500 PSI. MODULUS

Figure 30-B



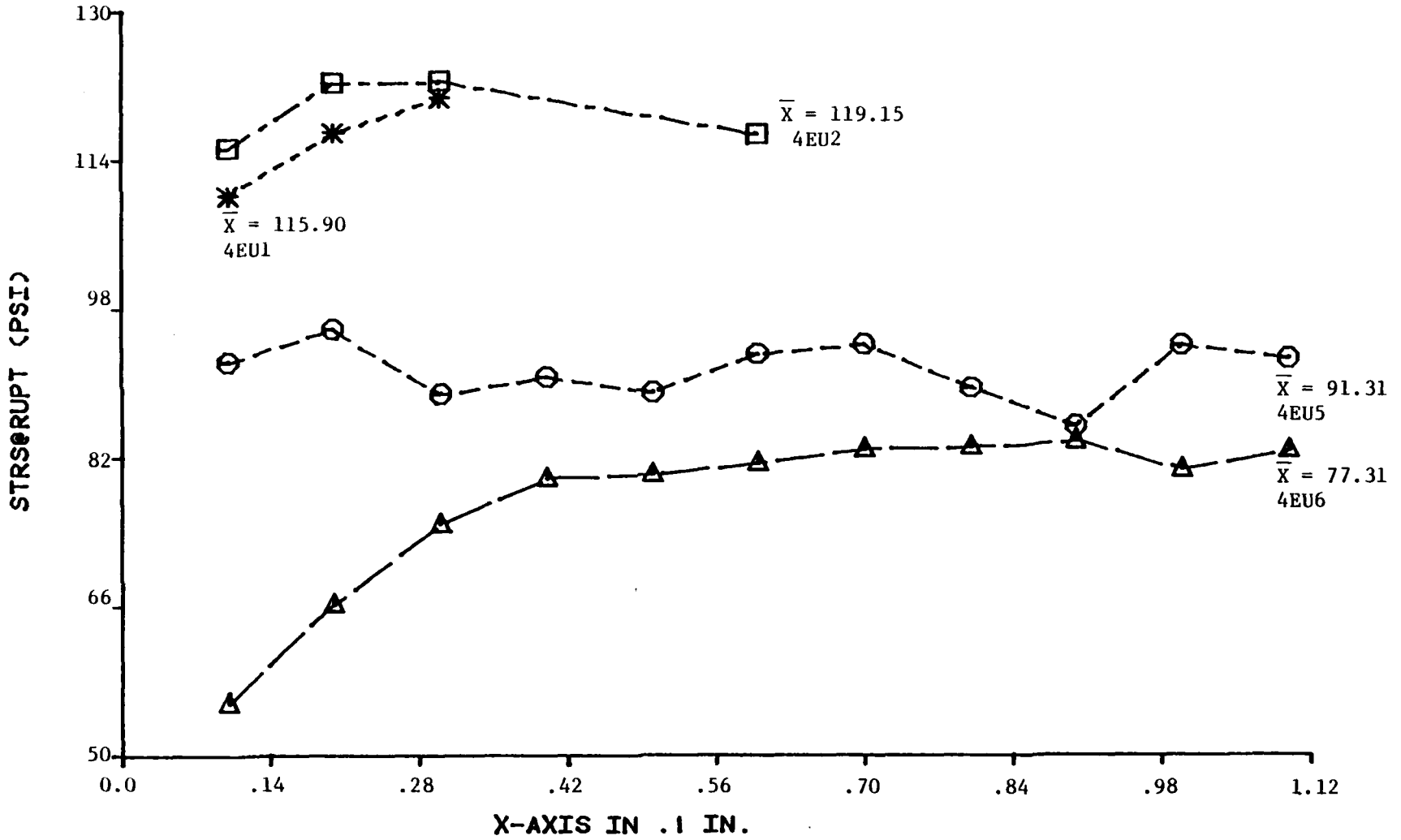
OUTER TEST COMPARISON OF MINITHIN MAX STRESS VALUES FOR 4 BLOCKS

Figure 31



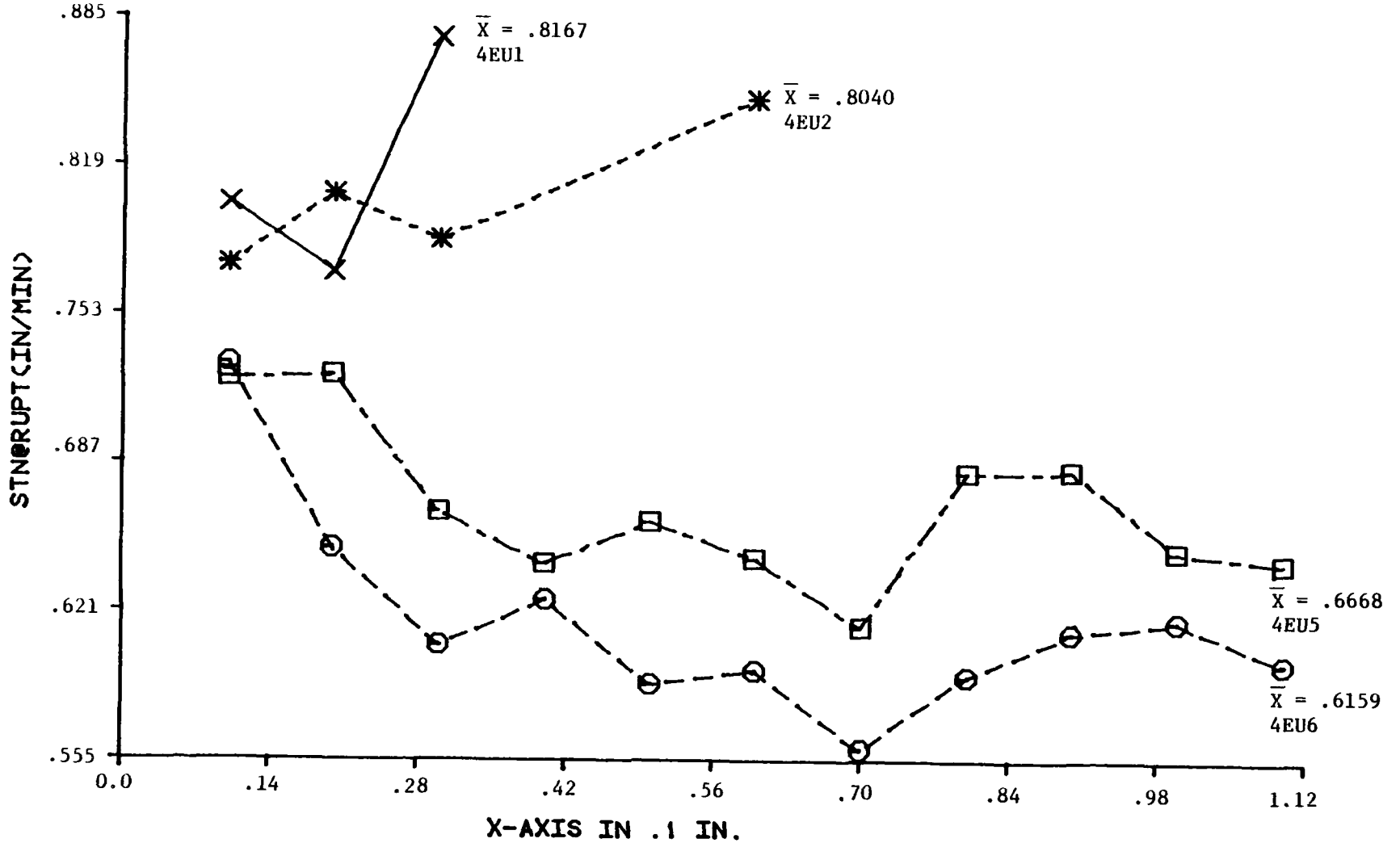
OUTER TEST COMPARISON OF MINITHIN STRN. @ MAX STRS. VALUES FOR 4 BLOCKS

Figure 32



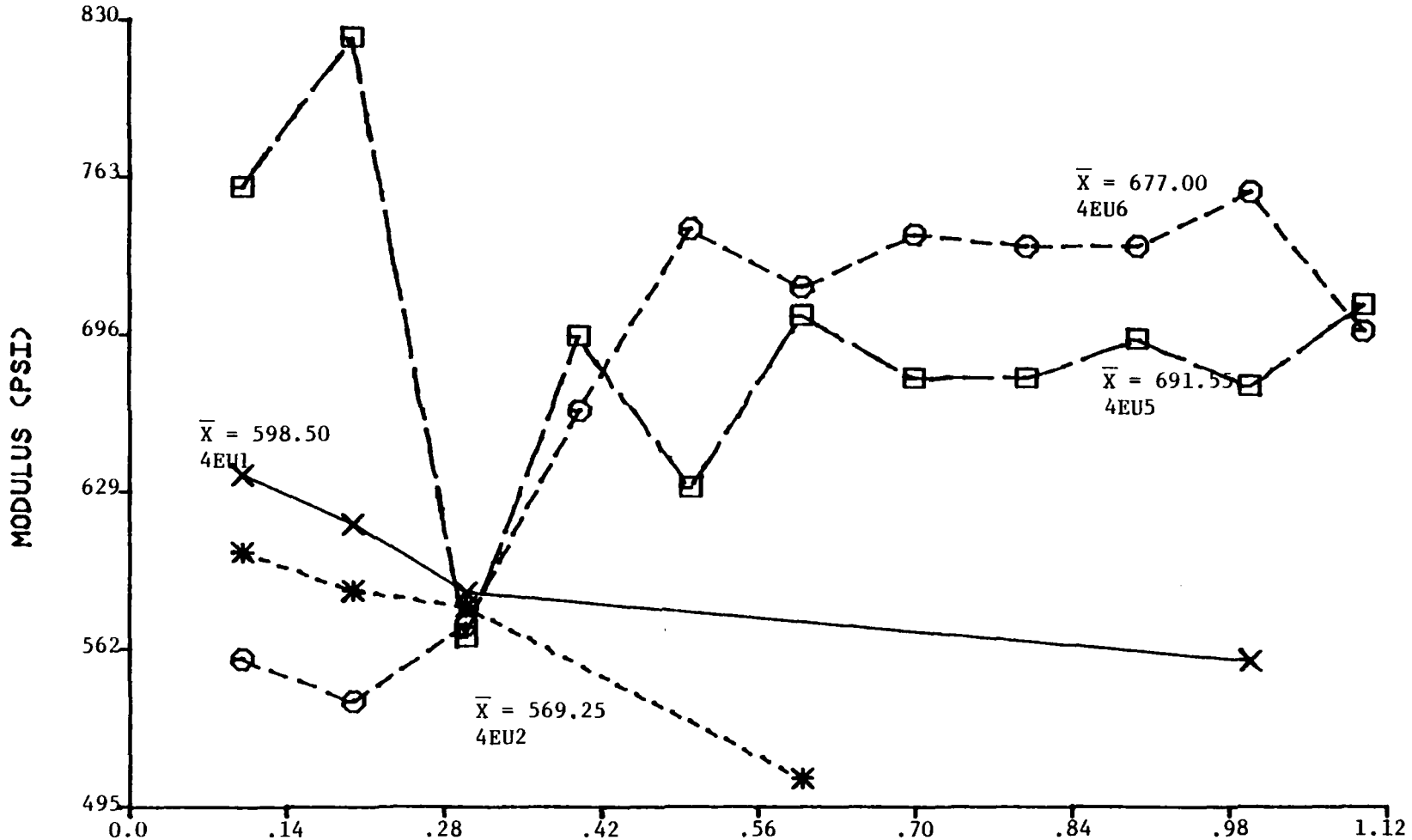
OUTER TEST COMPARISON OF MINITHIN STRESS @ RUPTURE VALUES FOR 4 BLOCKS

Figure 33



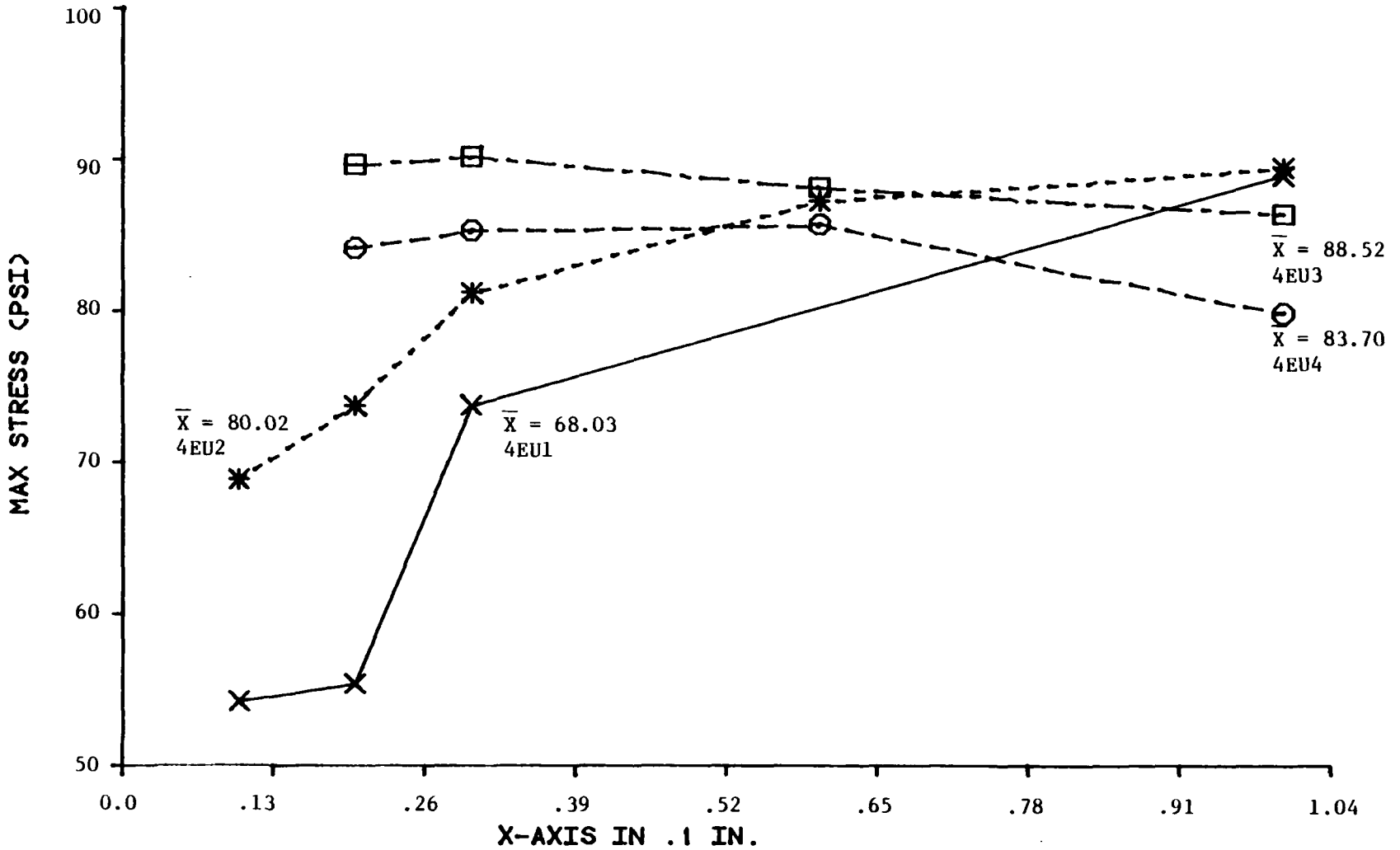
OUTER TEST COMPARISON OF MINITHIN STRAIN @ RUPTURE VALUES FOR 4 BLOCKS

Figure 34



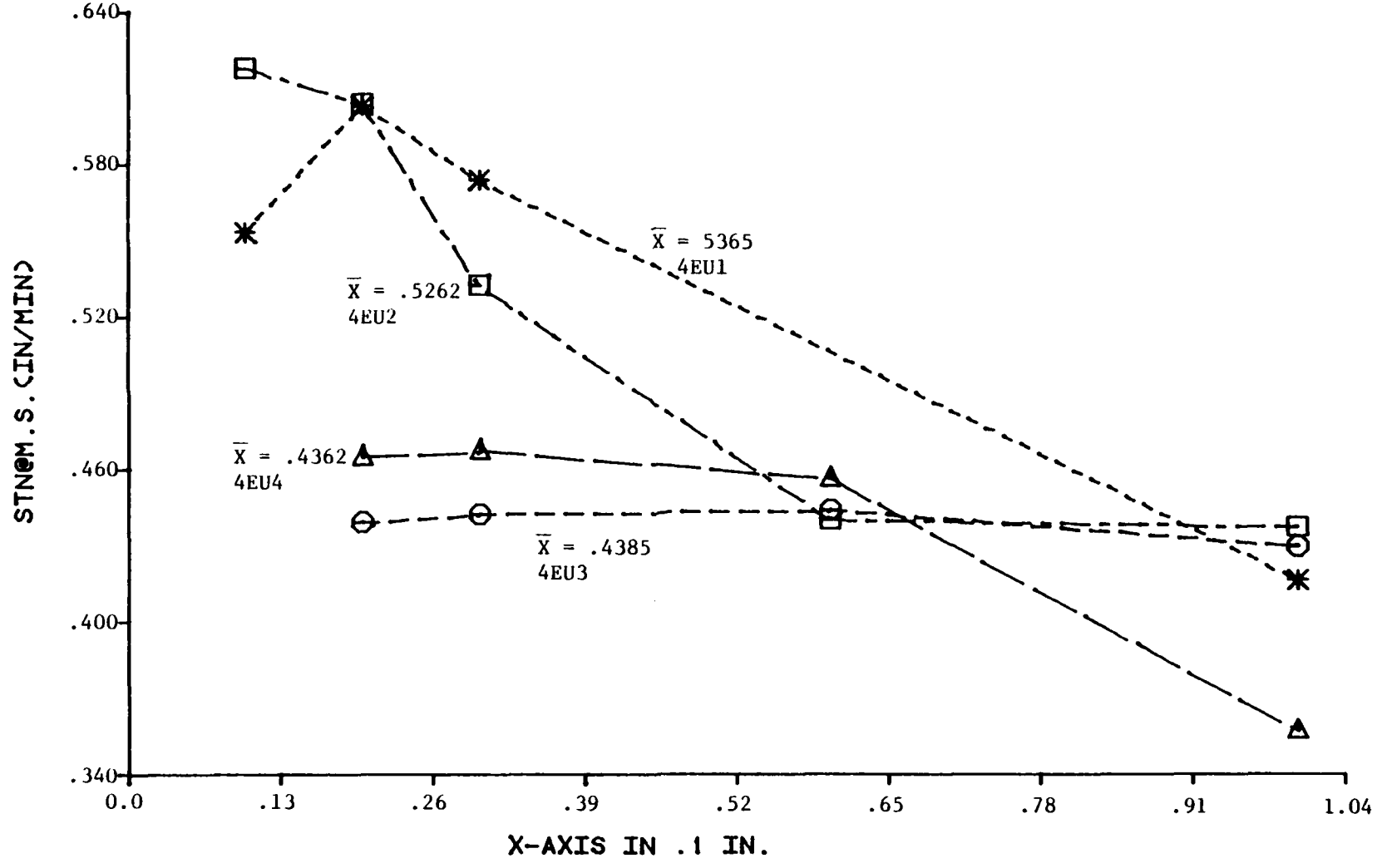
OUTER TEST COMPARISON OF MINITHIN MODULUS VALUES FOR 4 BLOCKS

Figure 35



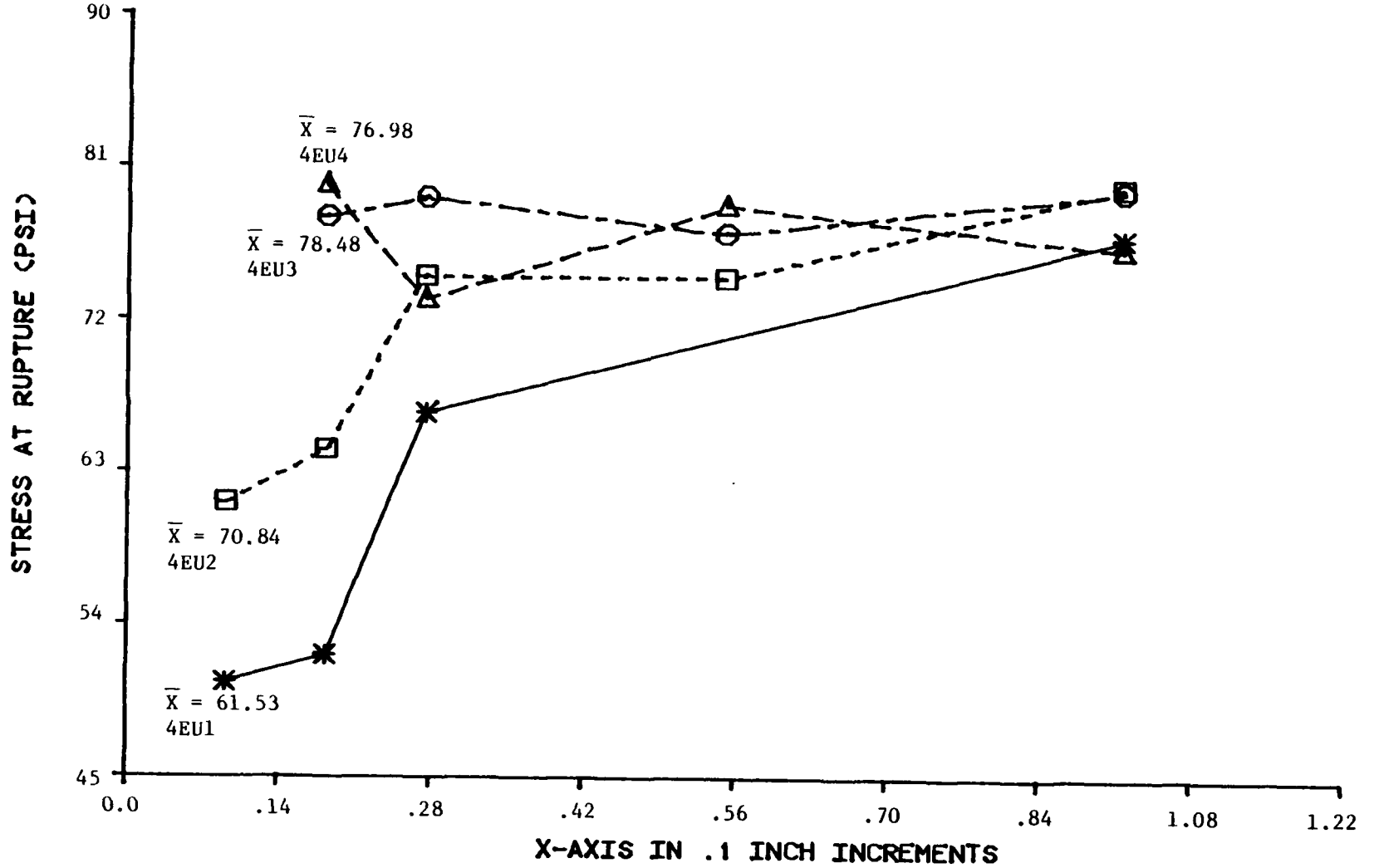
INNER TEST COMPARISON OF MINITHIN MAX STRESS VALUES FOR 4 BLOCKS

Figure 36



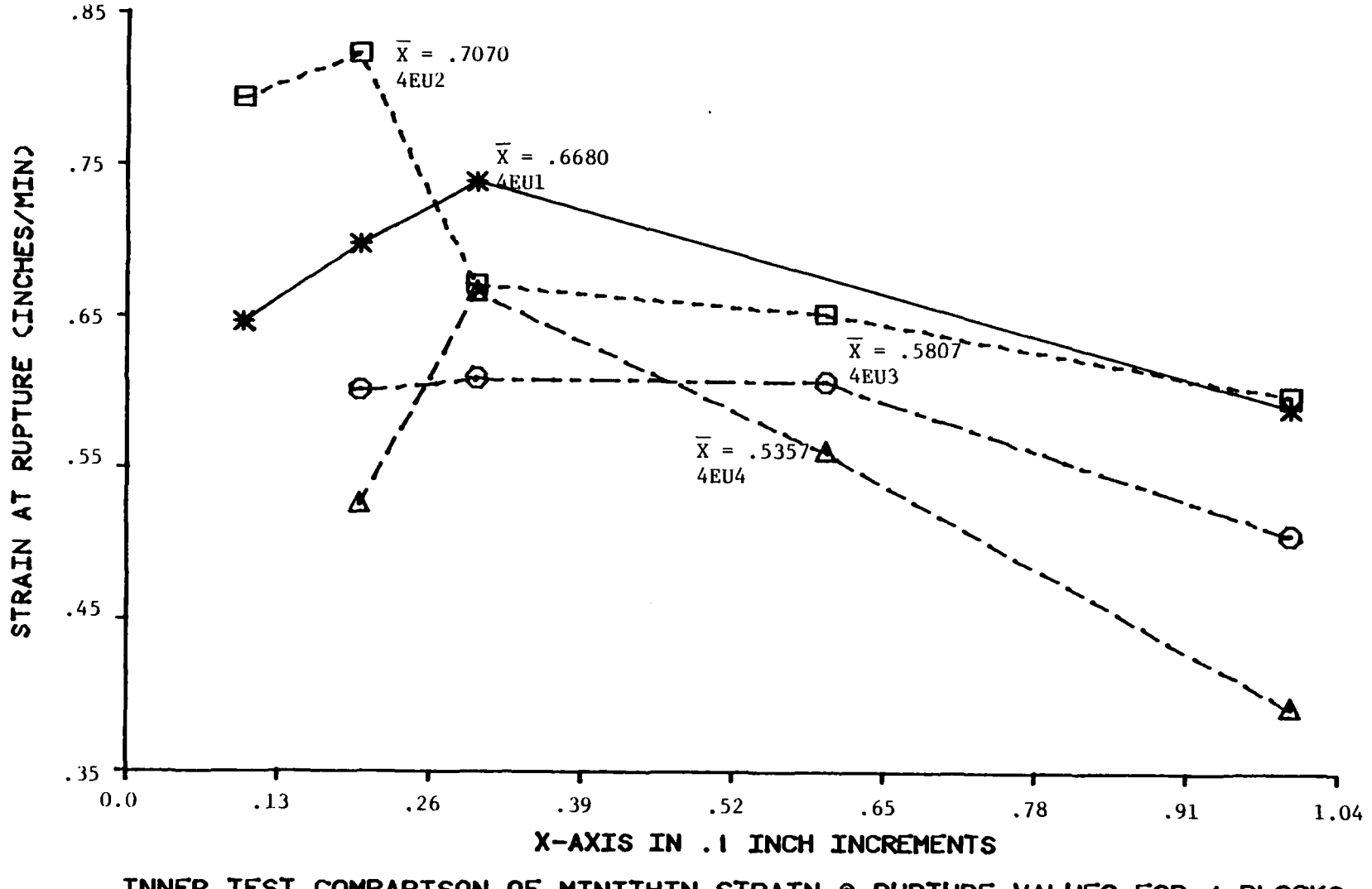
INNER TEST COMPARISON OF MINITHIN STRN. @ MAX STRS. VALUES FOR 4 BLOCKS

Figure 37



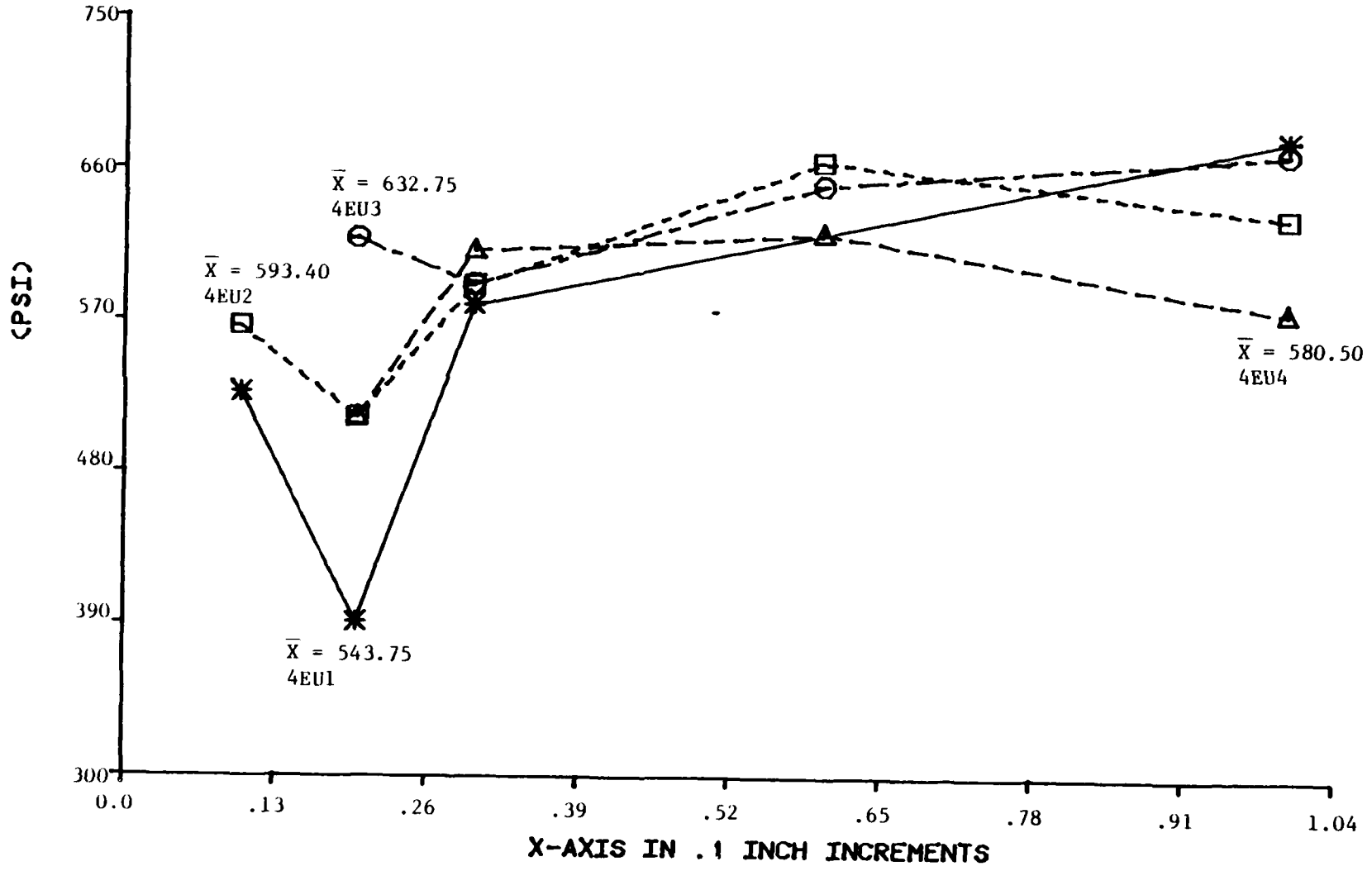
INNER TEST COMPARISON OF MINITHIN STRESS AT RUPTURE VALUES FOR 4 BLOCKS

Figure 38



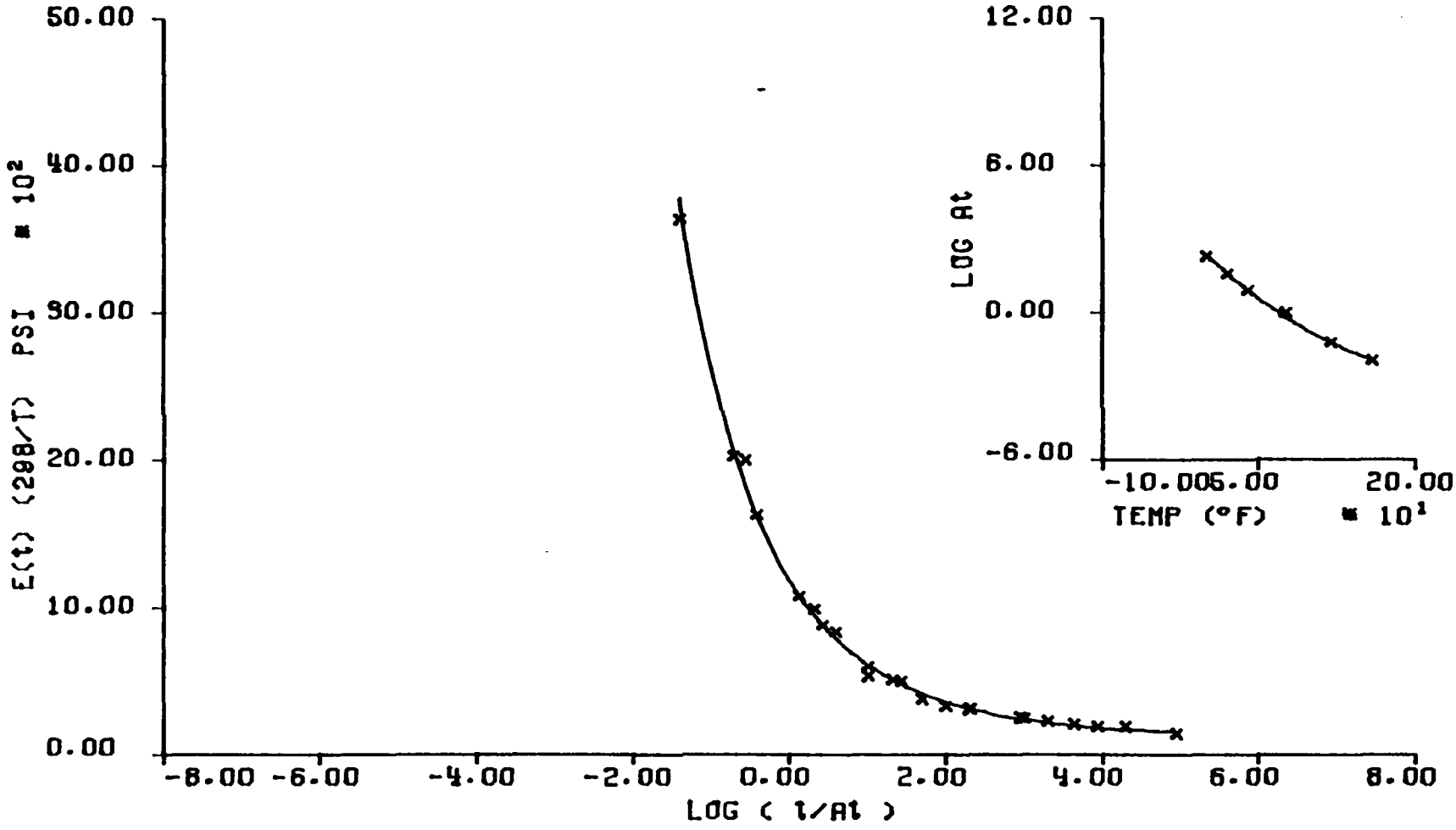
INNER TEST COMPARISON OF MINITHIN STRAIN @ RUPTURE VALUES FOR 4 BLOCKS

Figure 39



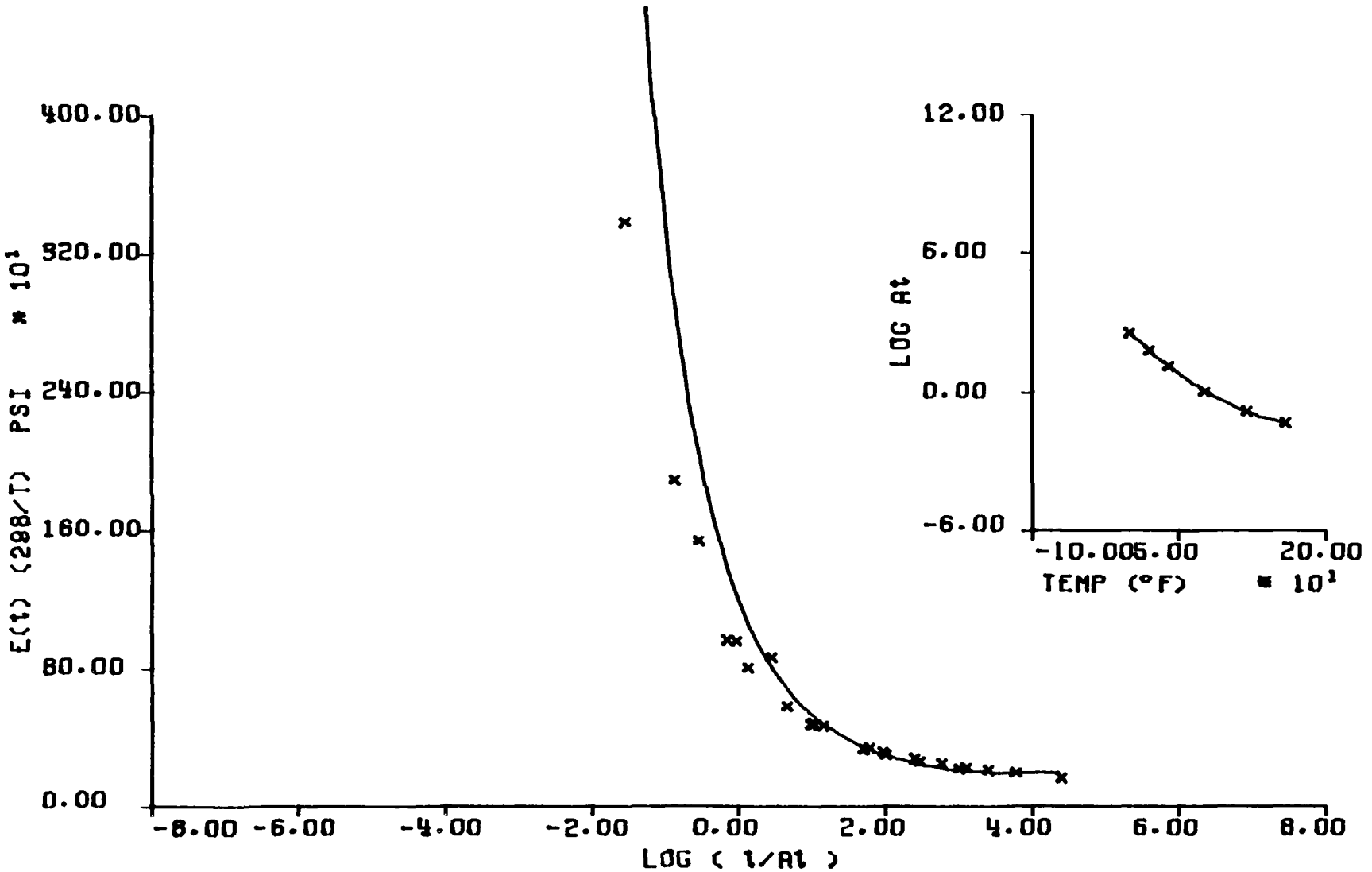
INNER TEST COMPARISON OF MINITHIN MODULUS VALUES FOR 4 BLOCKS

Figure 40



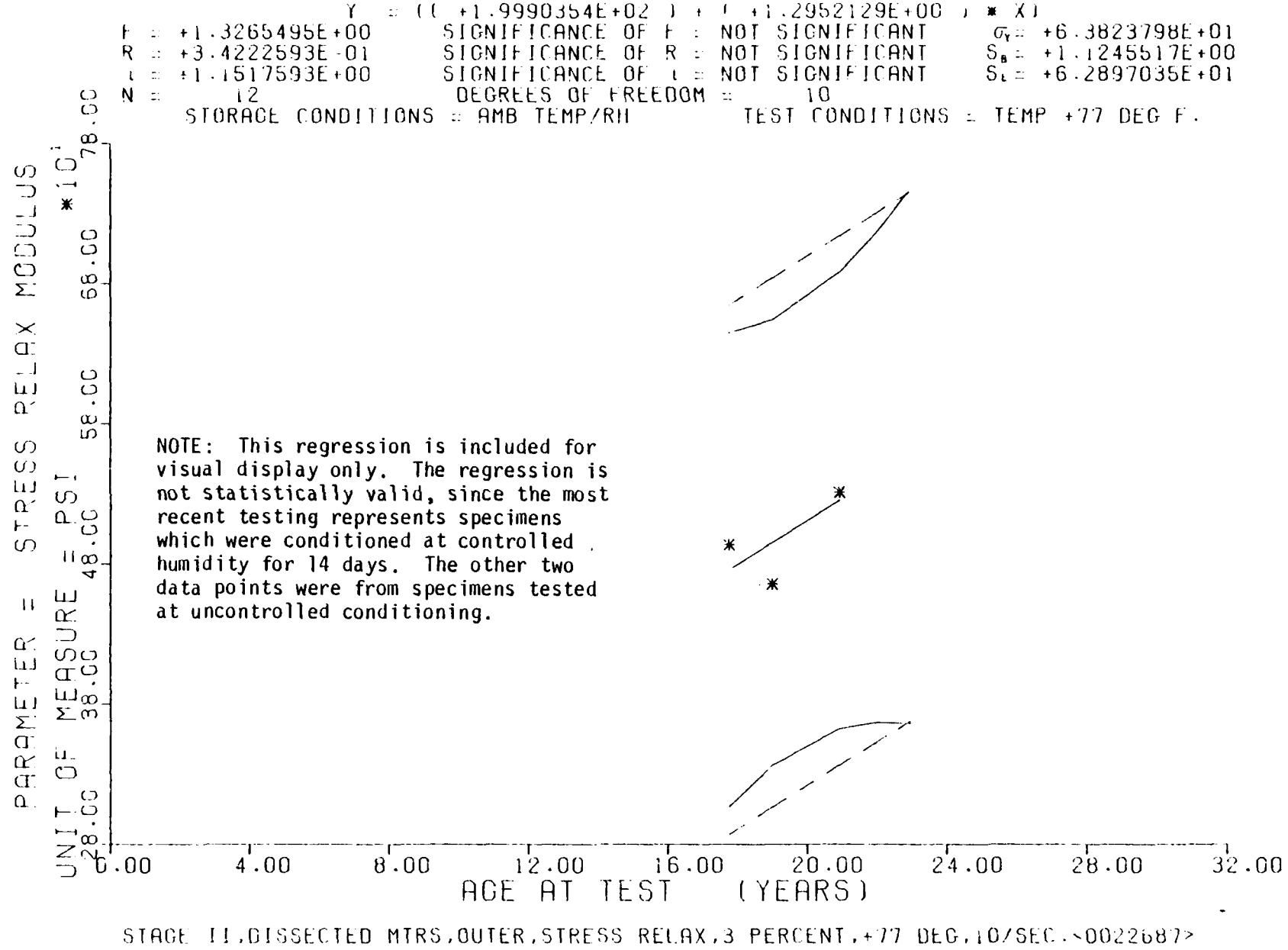
STAGE II DISCTED MOTOR(0022687). OUTER.3% STRAIN. MASTER STRESS RELAXATION.1885.

Figure 41



STAGE II DISCTED MOTOR(0022687). INNER.3% STRAIN. MASTER STRESS RELAXATION.1985.

Figure 42



STAGE II,DISSECTED MTRS,OUTER,STRESS RELAX,3 PERCENT,+77 DEG,10/SEC.<0022687>

Figure 43

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+4.9366650E+02	+5.5075705E+01	+5.4700000E+02	+4.3700000E+02	+4.7578369E+02
228.0	3	+4.6566650E+02	+7.4332585E+01	+5.2700000E+02	+3.8300000E+02	+4.9521191E+02
251.0	6	+5.3083325E+02	+6.1091461E+01	+6.0300000E+02	+4.5300000E+02	+5.2500195E+02

STAGE II,DISSECTED MTRS,OUTER,STRESS RELAX,3 PERCENT,+77 DEG,10/SEC,<0022697>

Figure 43-A

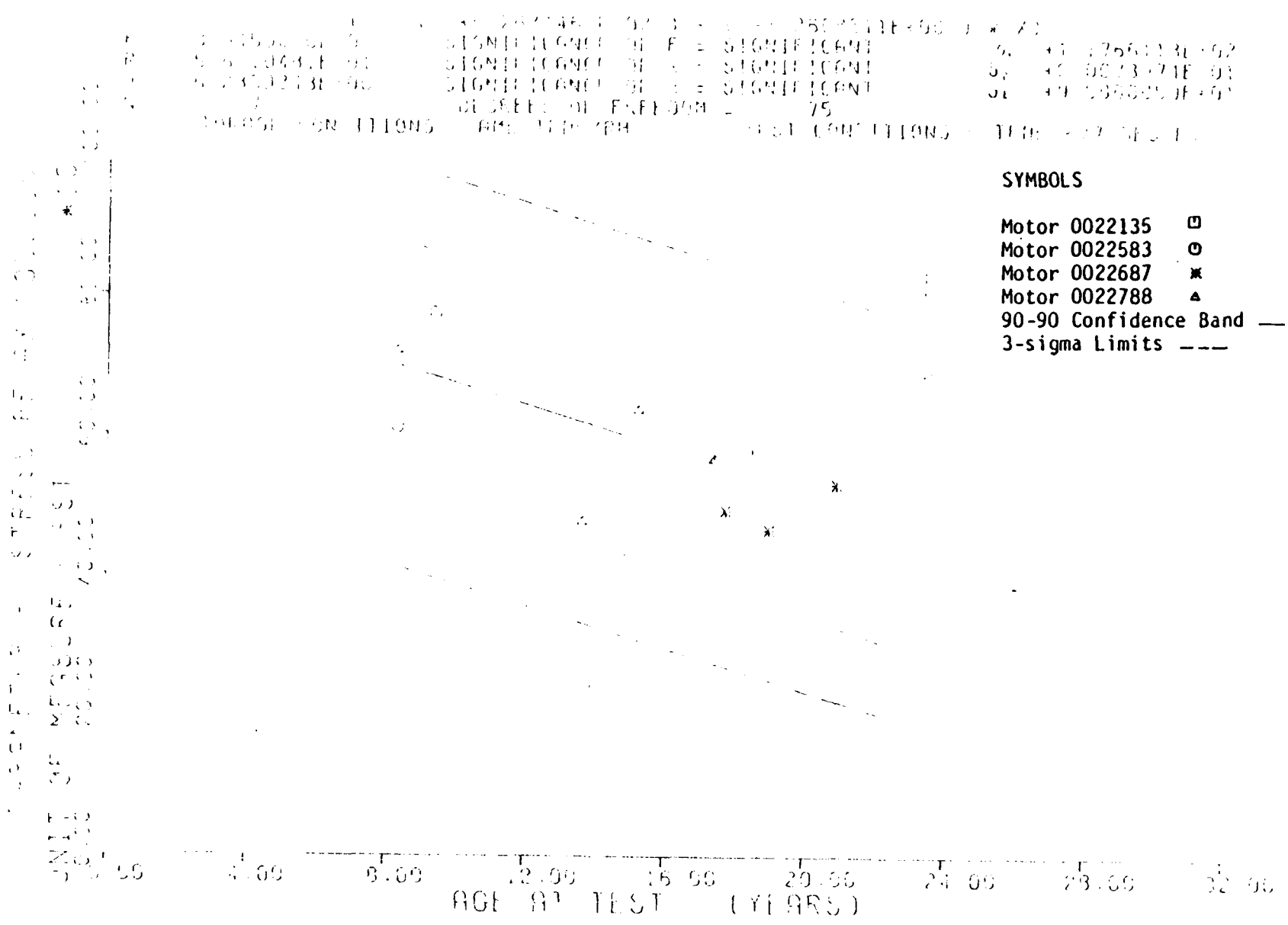

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
AGE AT TEST (YEARS)

Figure 43-B

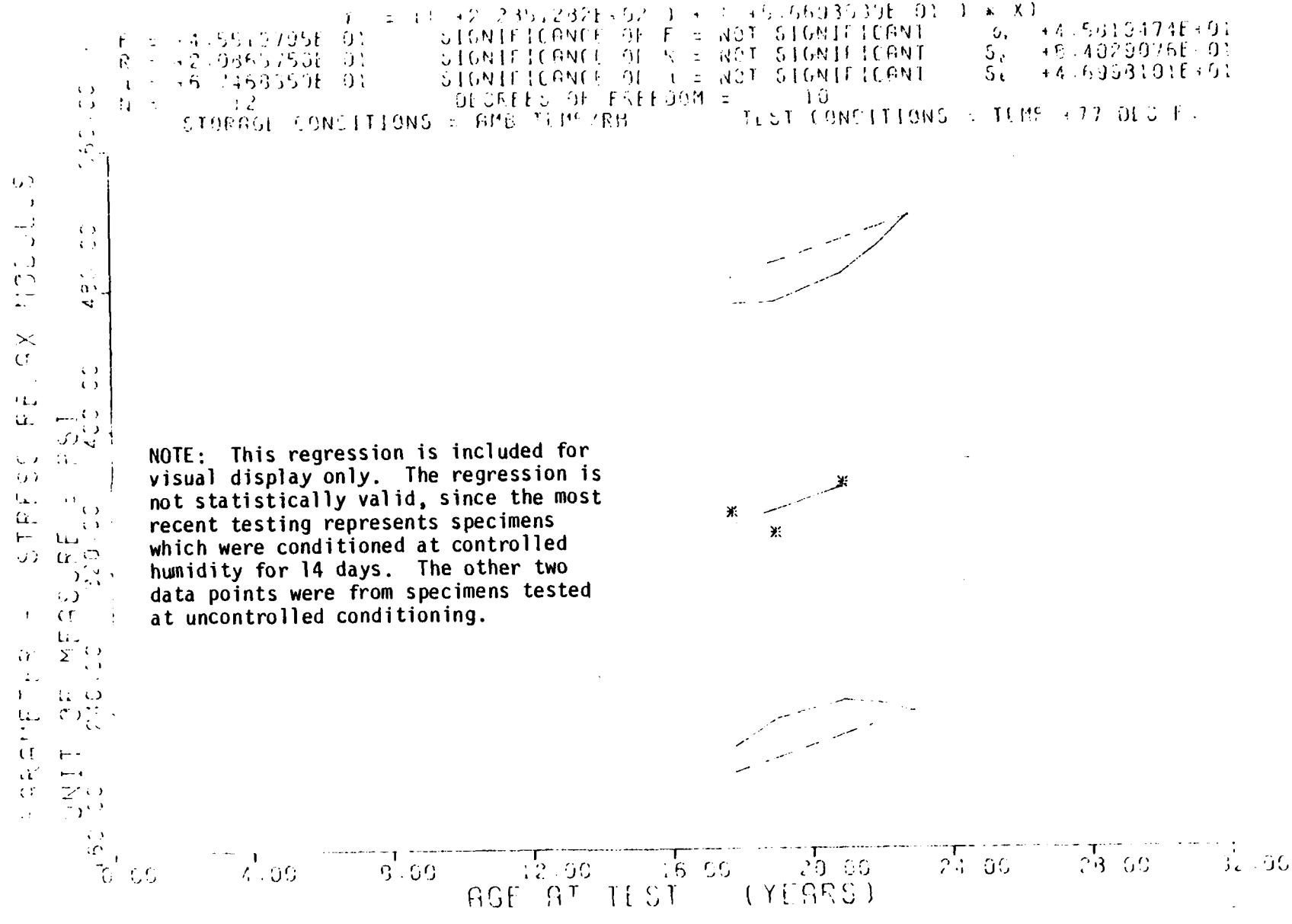

Y = (+2.285282E+02) + (+6.6603639E 01) * X)
F = +4.5513795E 01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_e +4.5819474E+01
R = +2.0865755E 01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_y +9.4029076E 01
t = +6.7468550E 01 SIGNIFICANCE OF t = NOT SIGNIFICANT S_t +4.6958101E+01
N = 12 DEGREES OF FREEDOM = 10
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
4.00
8.00
12.00
16.00
20.00
24.00
28.00
AGE AT TEST (YEARS)

Figure 44

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+3.5200000E+02	+4.1509035E+01	+3.9300000E+02	+3.1000000E+02	+3.4426879E+02
228.0	3	+3.4000000E+02	+5.6824290E+01	+3.9300000E+02	+2.8000000E+02	+3.5277294E+02
251.0	6	+3.6833325E+02	+4.7911028E+01	+4.2700000E+02	+3.0300000E+02	+3.6581225E+02

STAGE II,DISSECTED MTRS,OUTER,STRESS RELAX,3 PERCENT,+77 DEG,50/SEC.<0022687>

Figure 44-A

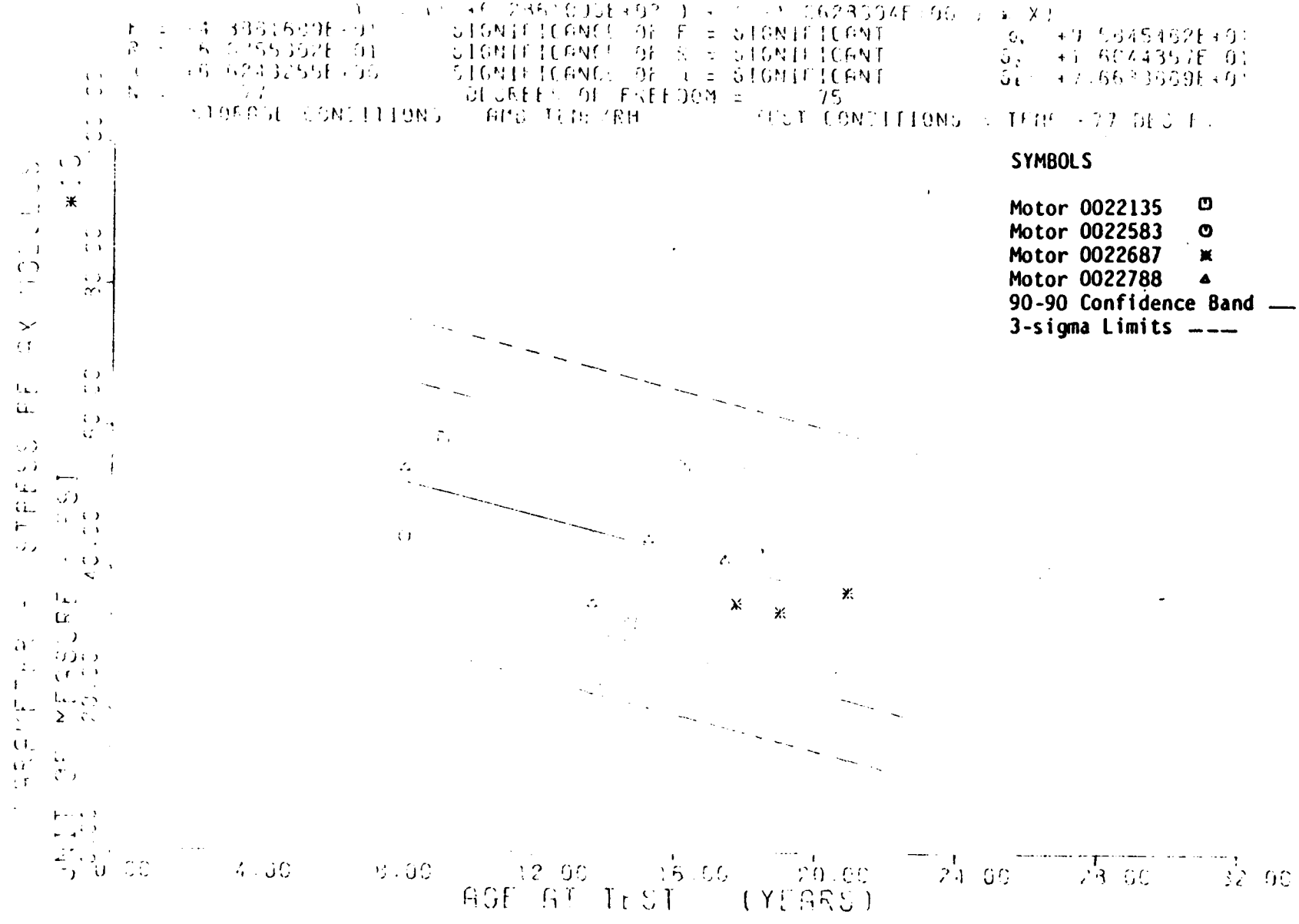

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
AGE AT TEST (YEARS)

Figure 44-B

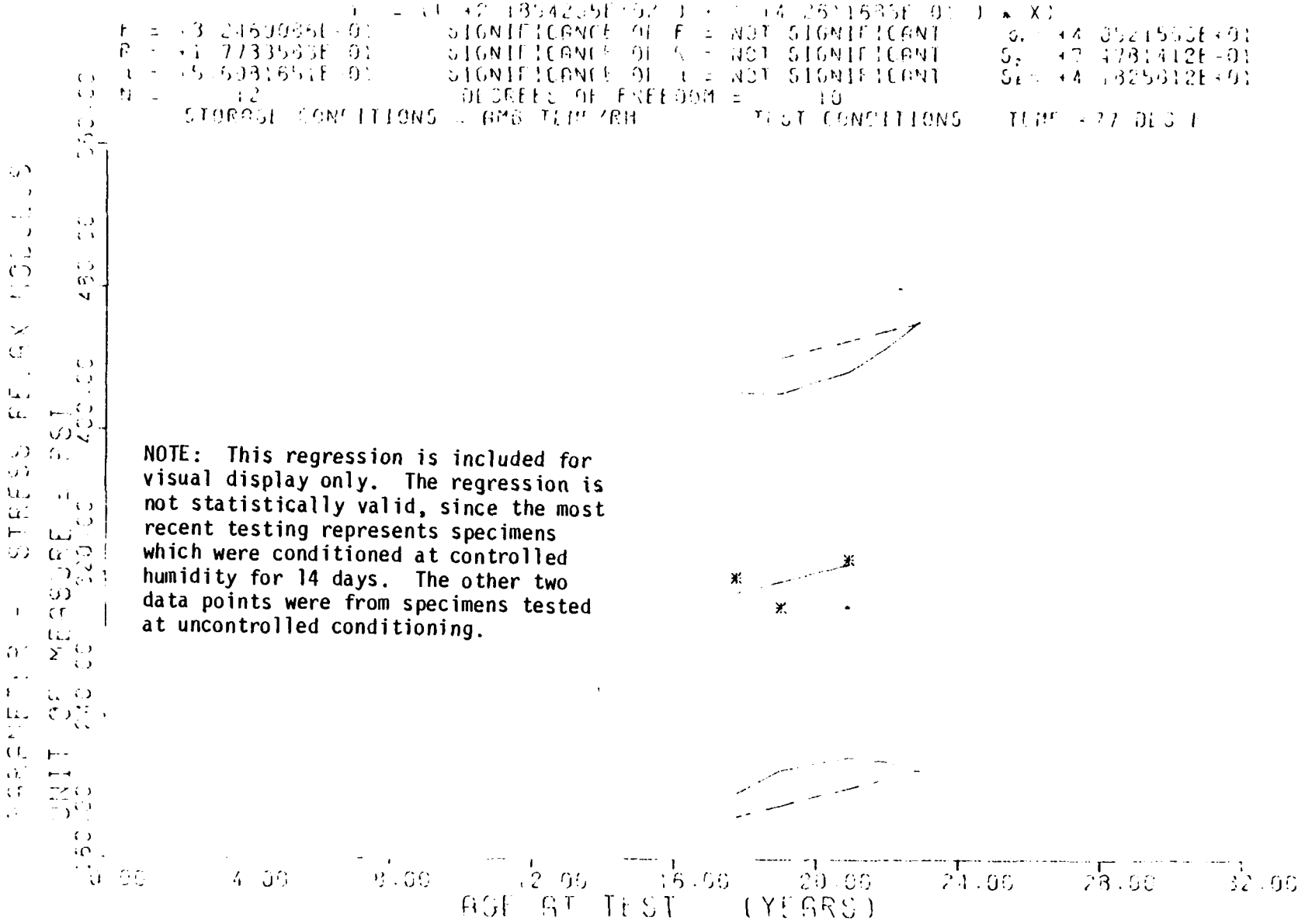

SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF T = NOT SIGNIFICANT
DEGREES OF FREEDOM = 10
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS TEMP +72 DEG F
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
AGE AT TEST (YEARS)

Figure 45

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+3.1800000E+02	+3.8509739E+01	+3.5700000E+02	+2.8000000E+02	+3.0930566E+02
228.0	3	+3.0133325E+02	+4.8747649E+01	+3.4700000E+02	+2.5000000E+02	+3.1569750E+02
251.0	6	+3.2833325E+02	+4.2145778E+01	+3.8300000E+02	+2.7000000E+02	+3.2549804E+02

STAGE II,DISSECTED MTRS,OUTER,STRESS RELAX,3 PERCENT,+77 DEG,100/SEC,<0022687>

Figure 45-A

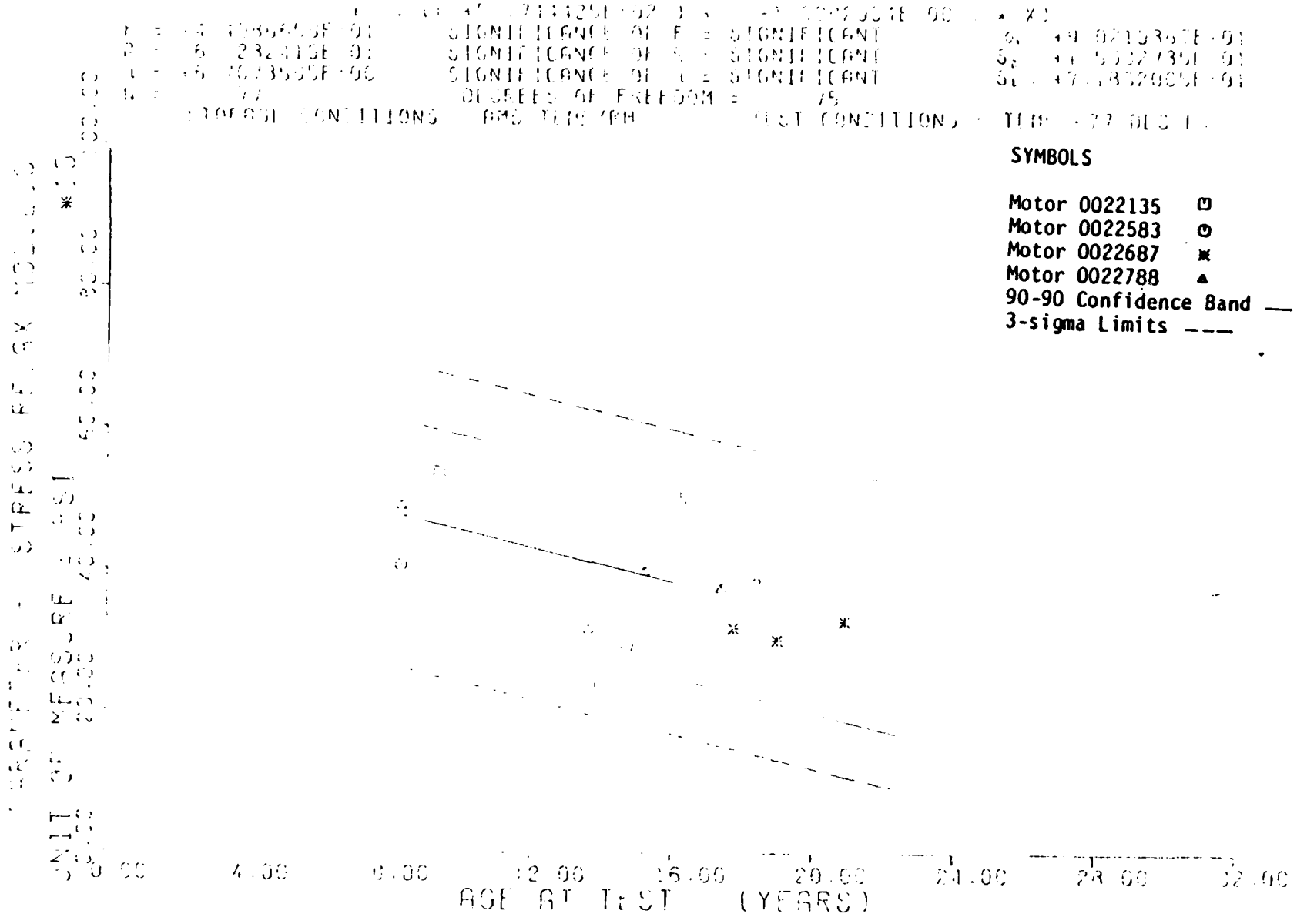

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)

Figure 45-B

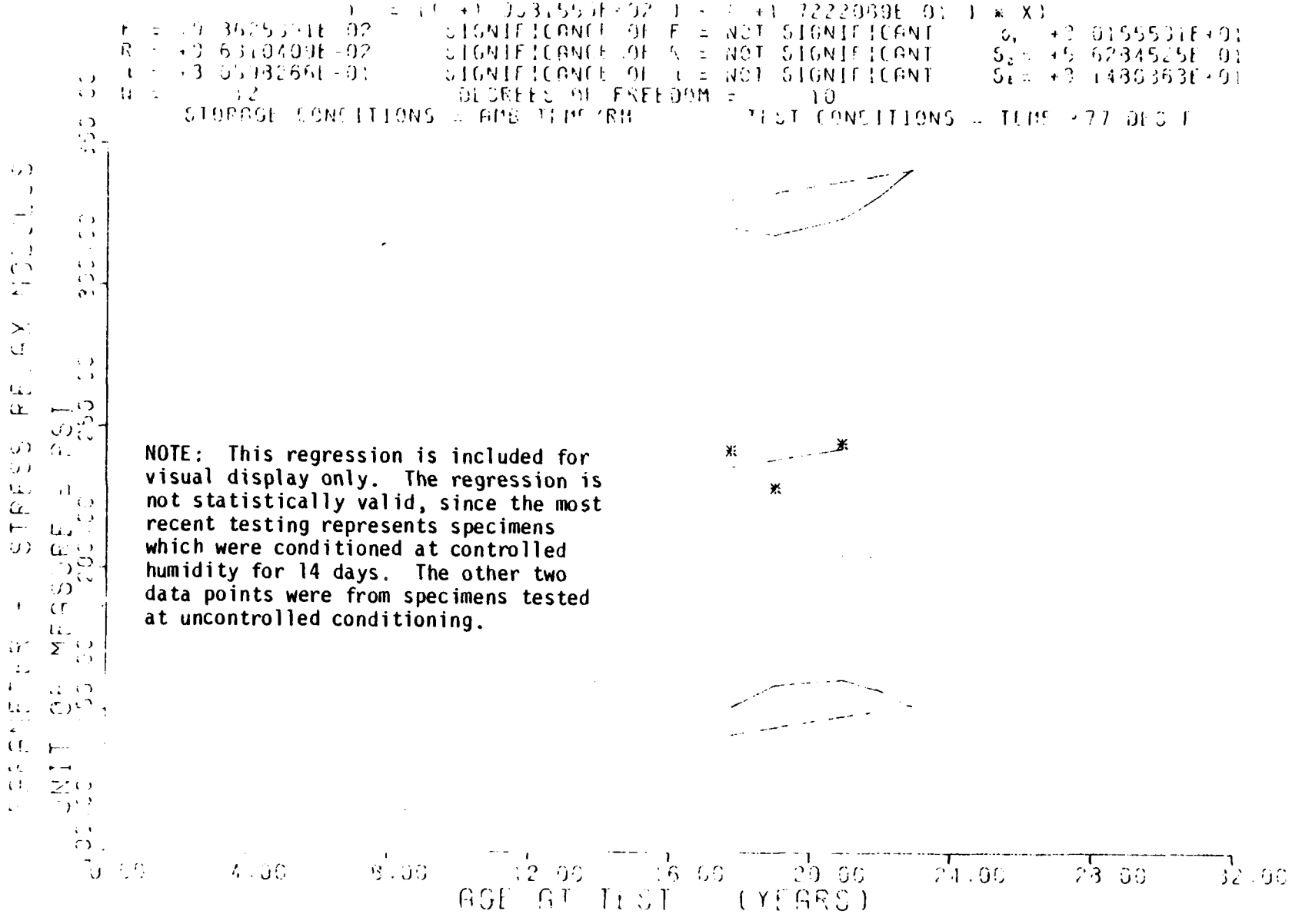

SIGNIFICANCE OF F = NOT SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 10
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = TEMP +77 DEG F
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
AGE AT TEST (YEARS)

Figure 46

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+2.4200000E+02	+3.0049958E+01	+2.7300000E+02	+2.1300000E+02	+2.3599862E+02
228.0	3	+2.2866665E+02	+3.5019042E+01	+2.6300000E+02	+1.9300000E+02	+2.3858193E+02
251.0	6	+2.4450000E+02	+3.2328006E+01	+2.9000000E+02	+2.0000000E+02	+2.4254302E+02

STAGE II,DISSECTED MTRS,OUTER,STRESS RELAX,3 PERCENT,+77 DEG,1000/SEC<0022687>

Figure 46-A

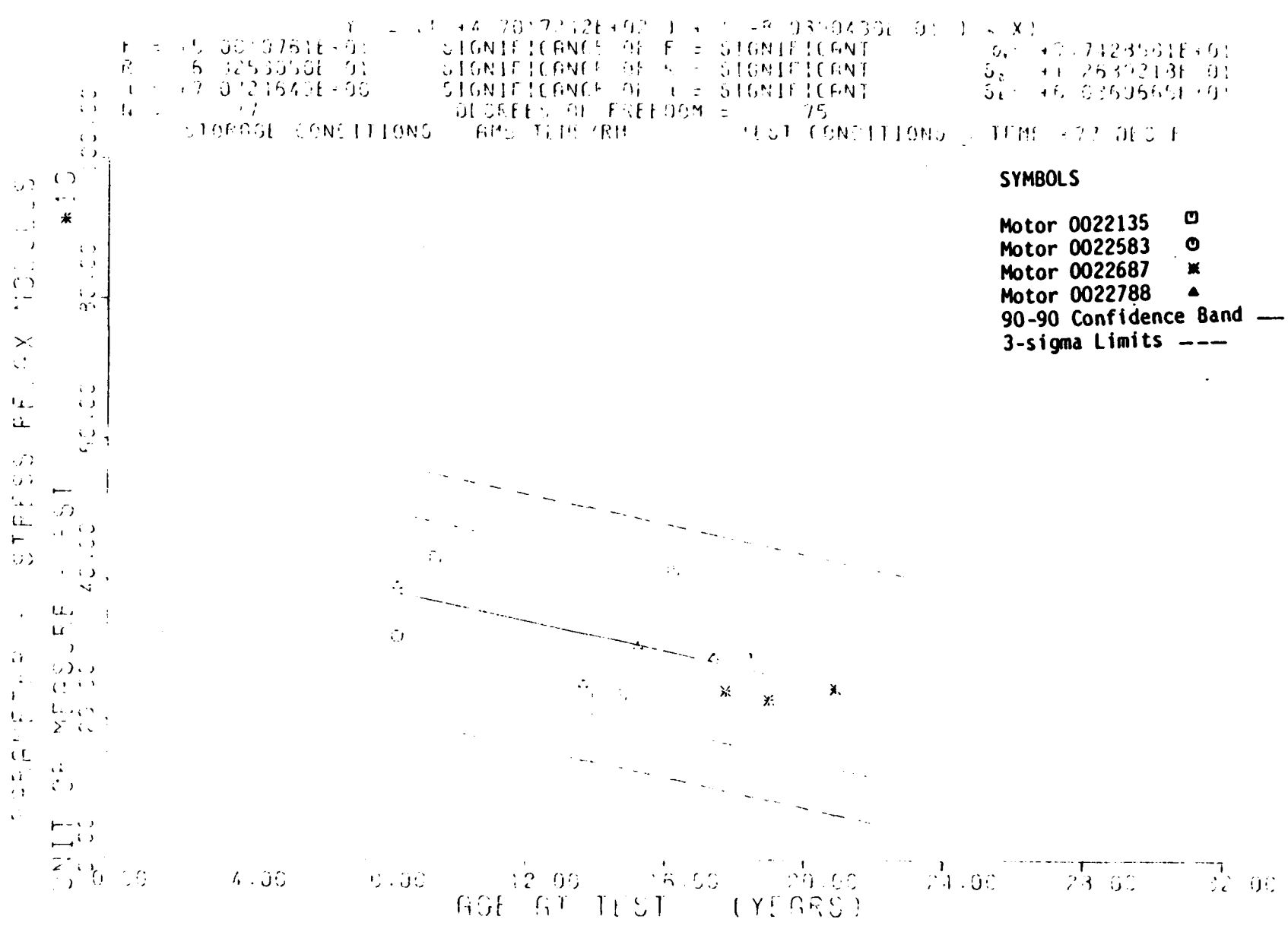
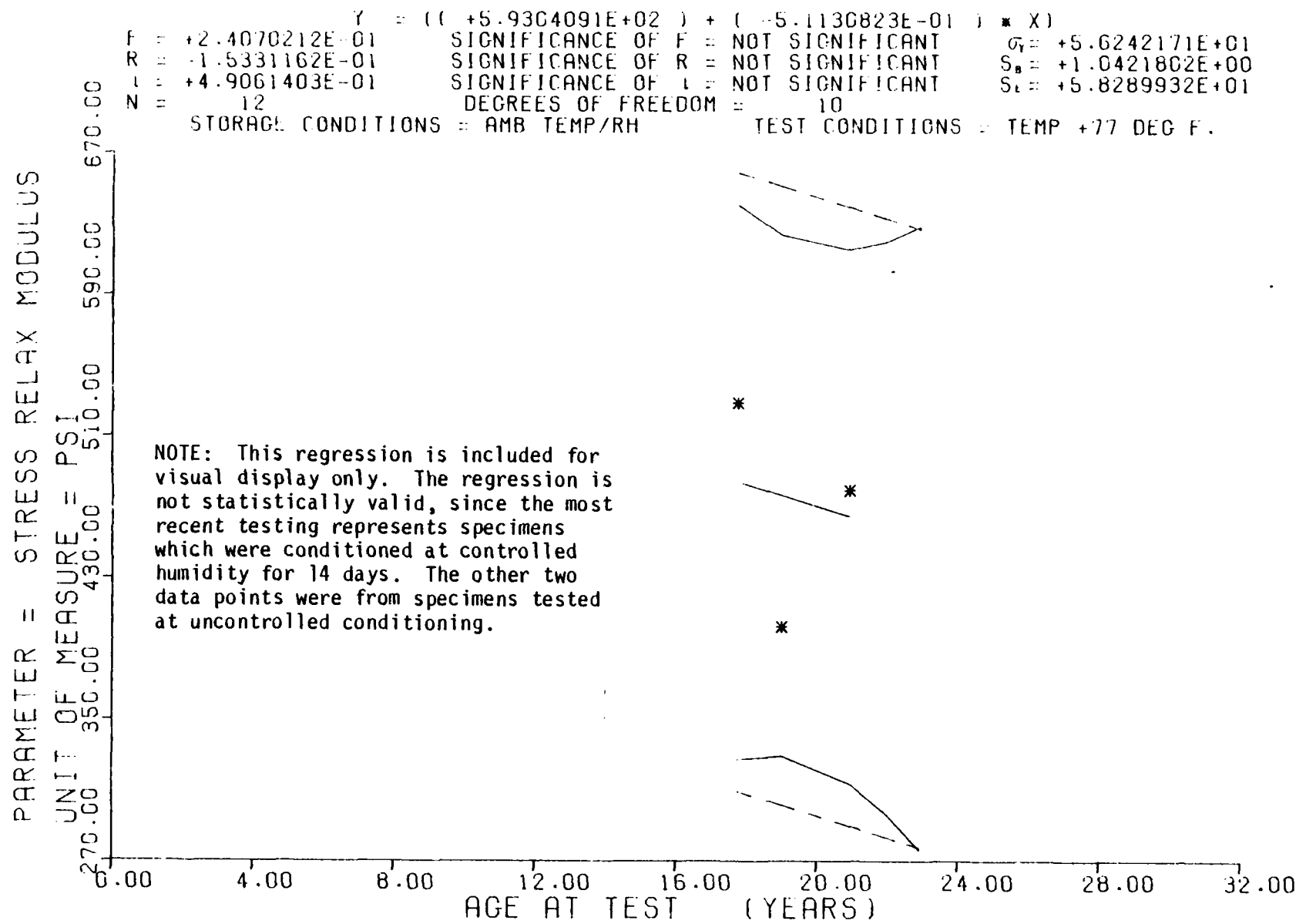

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
AGE AT TEST (YEARS)

Figure 46-B



STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,10/SEC.<002268?>

Figure 47

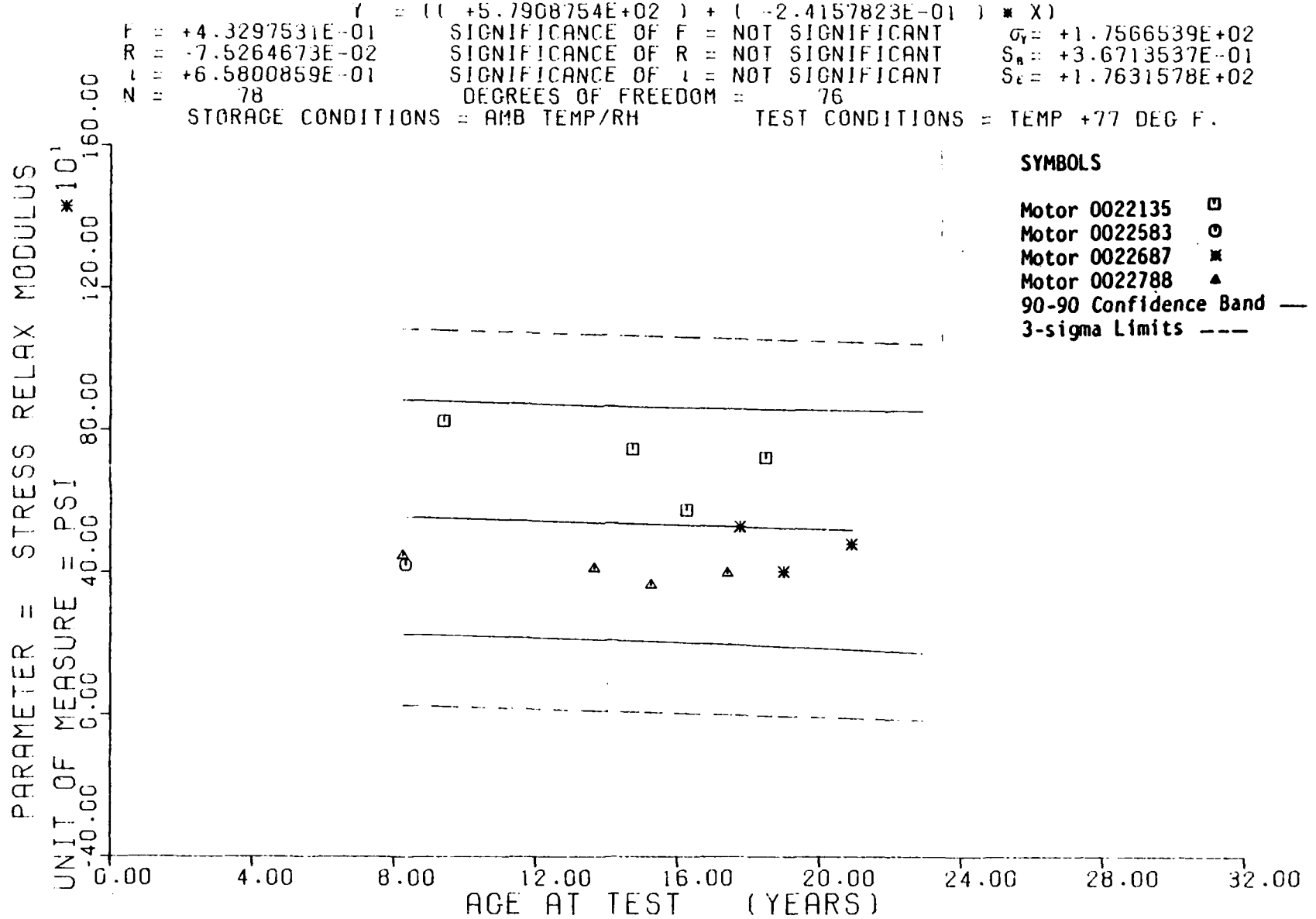
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+5.2900000E+02	+6.3498031E+01	+5.7700000E+02	+4.5700000E+02	+4.8413208E+02
228.0	3	+4.0233325E+02	+8.0829037E+00	+4.0700000E+02	+3.9300000E+02	+4.7646240E+02
251.0	6	+4.7933325E+02	+1.9866219E+01	+4.9700000E+02	+4.4300000E+02	+4.6470239E+02

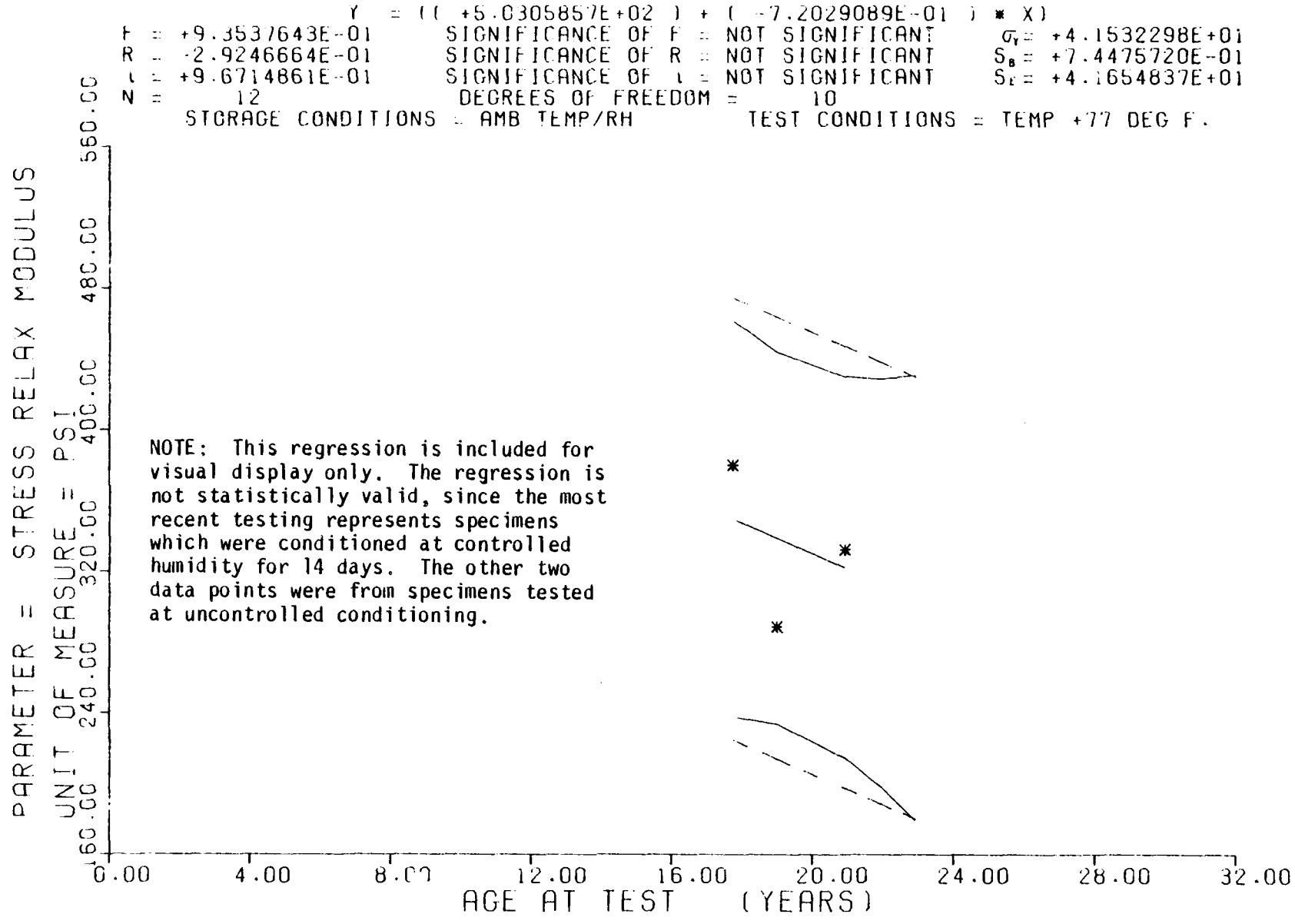
STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,10/SEC.<0022687>

Figure 47-A



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

Figure 47-B



STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,50/SEC.<0022687>

Figure 48

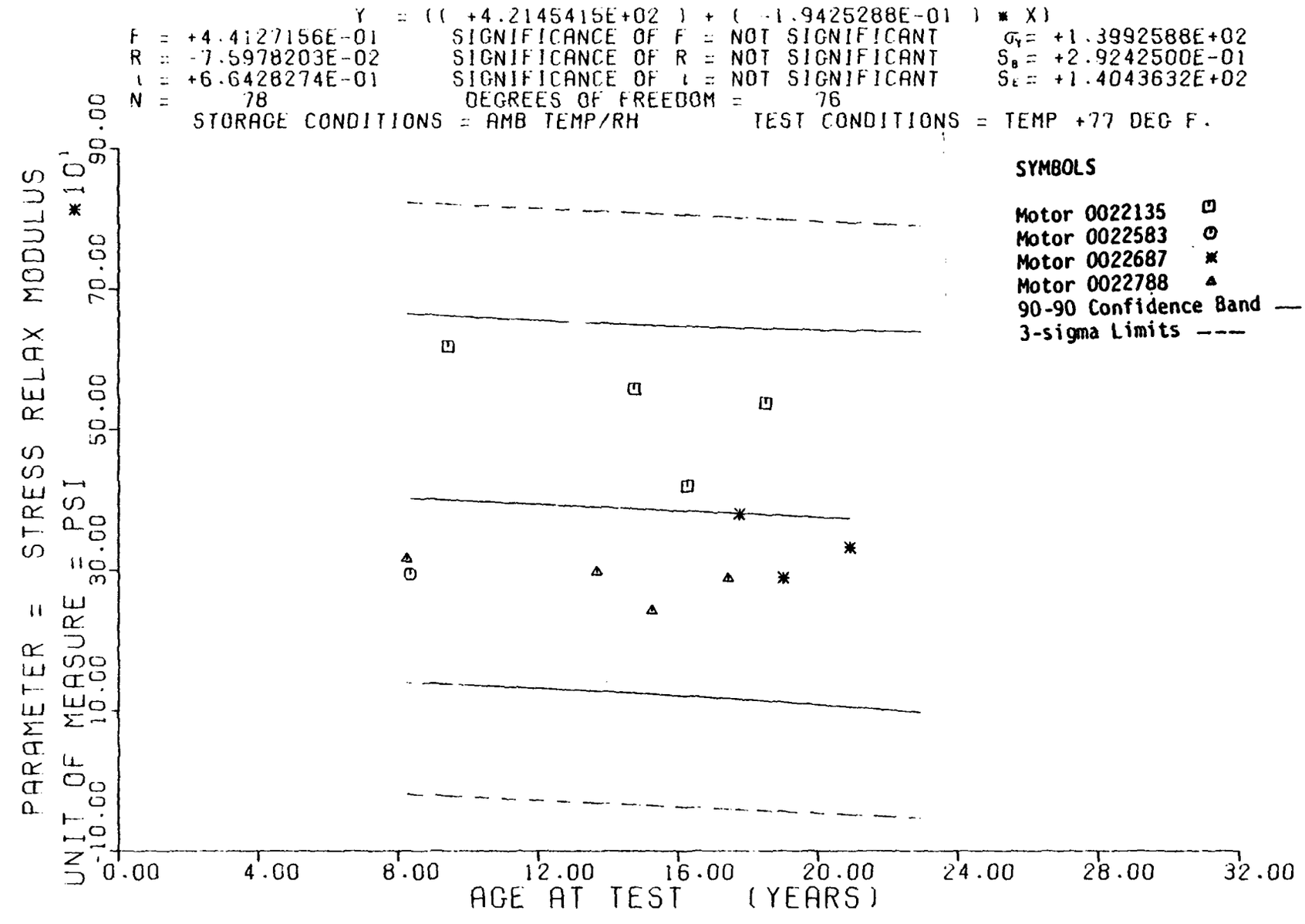
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+3.8000000E+02	+5.2716221E+01	+4.2700000E+02	+3.2300000E+02	+3.4963647E+02
228.0	3	+2.8866650E+02	+5.1316014E+00	+2.9300000E+02	+2.8300000E+02	+3.3883203E+02
251.0	6	+3.3216650E+02	+1.2937026E+01	+3.4300000E+02	+3.0700000E+02	+3.2226538E+02

STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,50/SEC,<0022687>

Figure 48-A



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

Figure 48-B

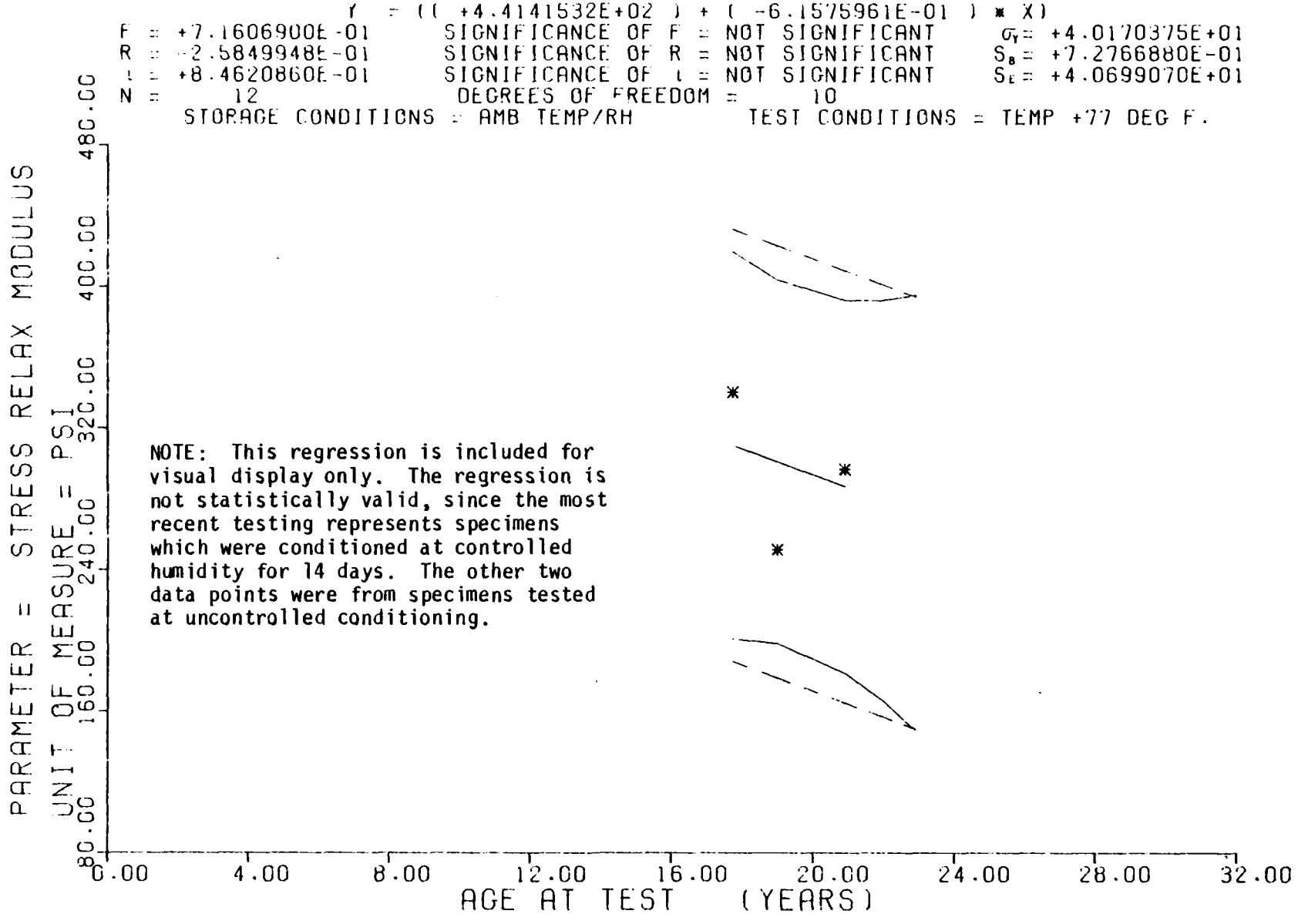

Y = ((+4.4141532E+02) + (-6.1575961E-01) * X)
F = +7.1606900E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +4.0170375E+01
R = -2.5849948E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT SB = +7.2766880E-01
t = +8.4620860E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT SE = +4.0699070E+01
N = 12 DEGREES OF FREEDOM = 10
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI
480.00
400.00
320.00
240.00
160.00
80.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,100/SEC.<002268?>

Figure 49

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+3.4033325E+02	+5.0332229E+01	+3.8700000E+02	+2.8700000E+02	+3.1025830E+02
228.0	3	+2.5133332E+02	+5.1316014E+00	+2.5700000E+02	+2.4700000E+02	+3.0102197E+02
251.0	6	+2.9666650E+02	+1.2225656E+01	+3.0700000E+02	+2.7300000E+02	+2.8685961E+02

STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,100/SEC.<0022687>

Figure 49-A

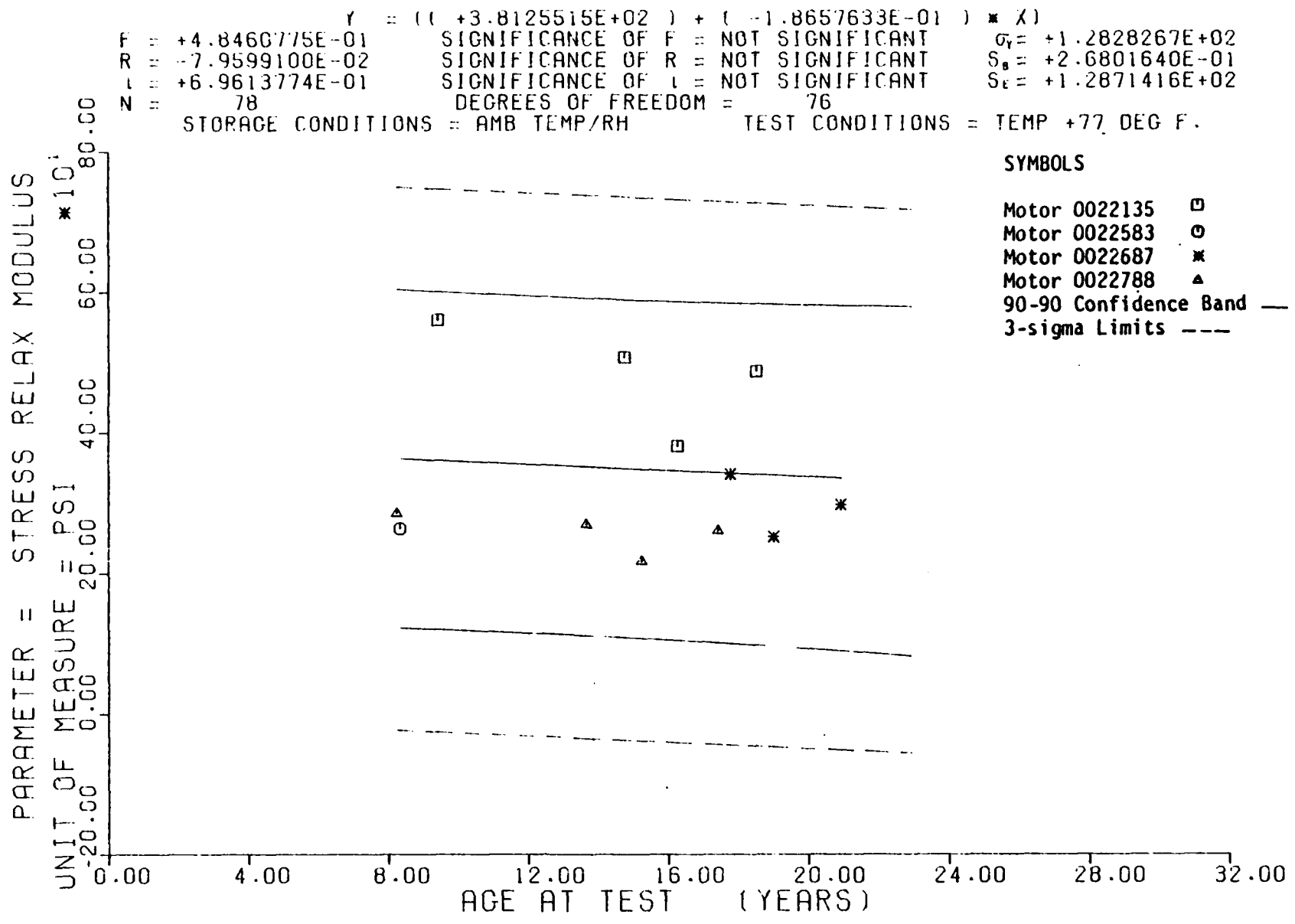

Y = (+3.8125515E+02) + (-1.8657633E-01) * X)
F = +4.8460775E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +1.2828267E+02
R = -7.9599100E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sβ = +2.6801640E-01
ι = +6.9613774E-01 SIGNIFICANCE OF ι = NOT SIGNIFICANT Sε = +1.2871416E+02
N = 78 DEGREES OF FREEDOM = 76
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
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI *10^1
80.00
60.00
40.00
20.00
0.00
-20.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II,DISSECTED MTRS,INNER,STRESS RELAXATION,3 PERCENT,+77 DEG,100/SEC.

Figure 49-B

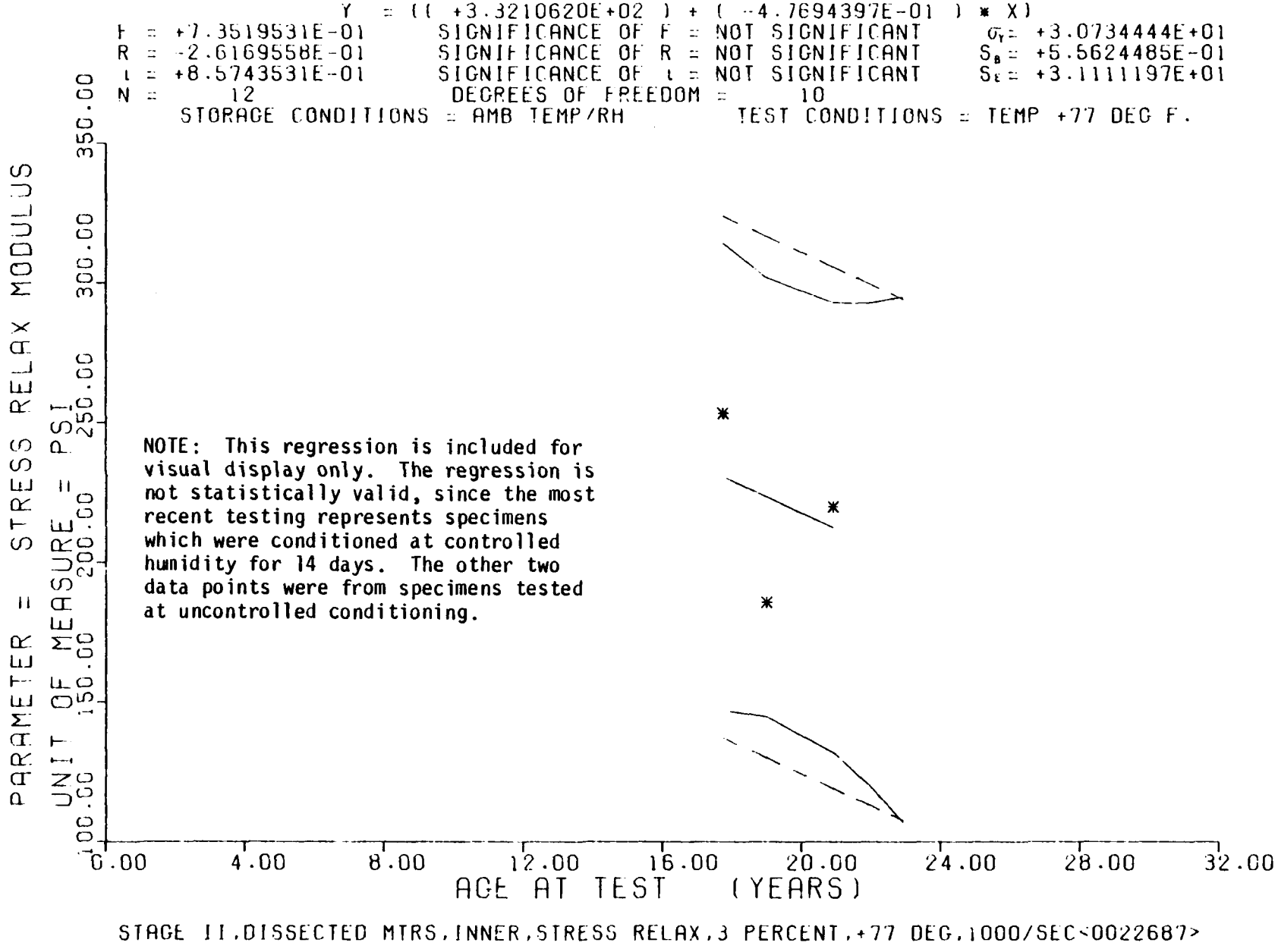

Y = ((+3.3210620E+02) + (-4.7694397E-01) * X)
F = +7.3519531E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +3.0734444E+01
R = -2.6169558E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sβ = +5.5624485E-01
t = +8.5743531E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Sε = +3.1111197E+01
N = 12 DEGREES OF FREEDOM = 10
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = TEMP +77 DEG F.
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI
100.00
150.00
200.00
250.00
300.00
350.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,1000/SEC<0022687>

Figure 50

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+2.5333332E+02	+3.8630730E+01	+2.9000000E+02	+2.1300000E+02	+2.3051713E+02
228.0	3	+1.8566665E+02	+2.3094010E+00	+1.8700000E+02	+1.8300000E+02	+2.2336297E+02
251.0	6	+2.1983332E+02	+1.0264826E+01	+2.3000000E+02	+2.0000000E+02	+2.1239326E+02

STAGE II,DISSECTED MTRS,INNER,STRESS RELAX,3 PERCENT,+77 DEG,1000/SEC<0022687>

Figure 50-A

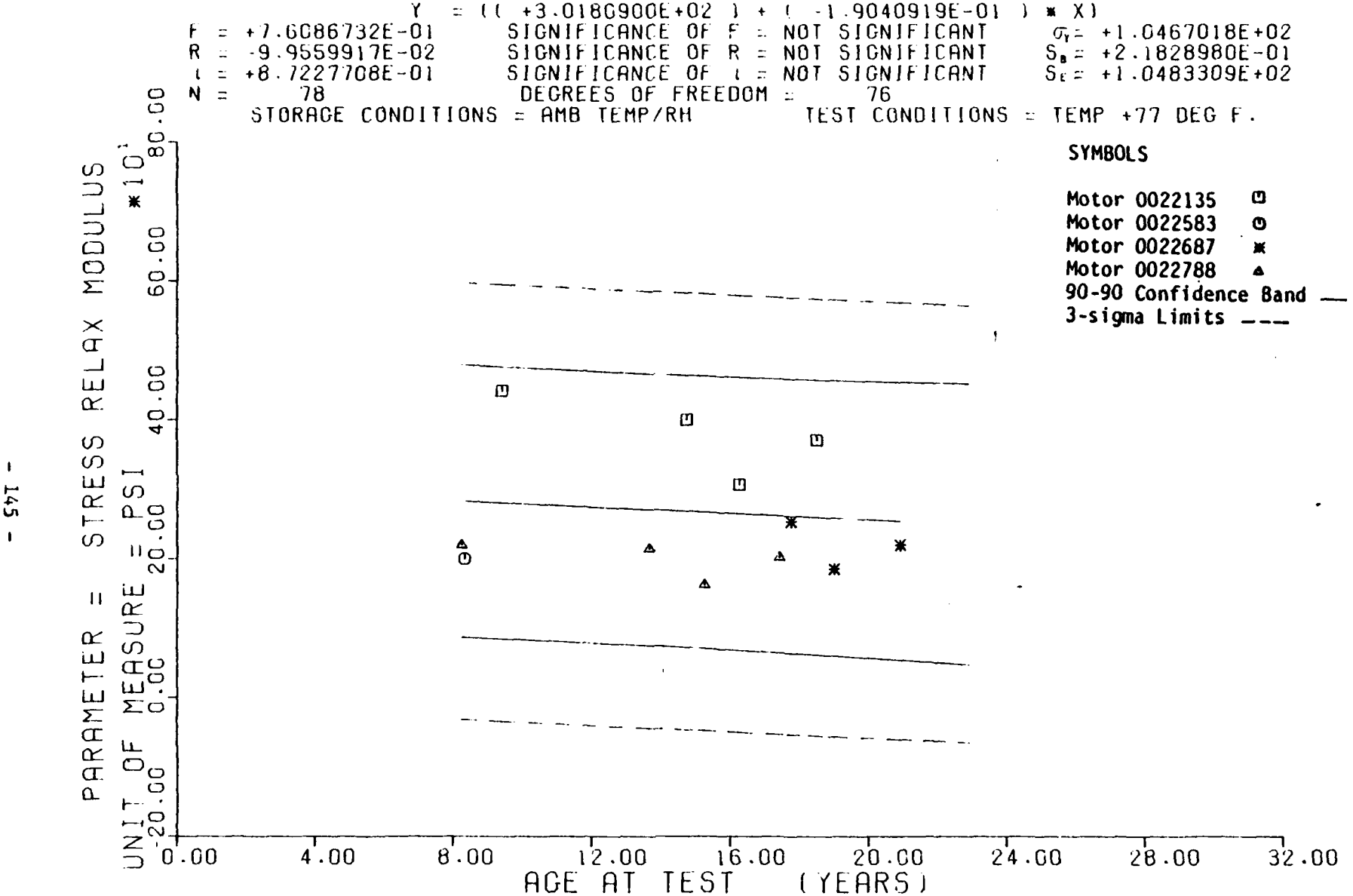
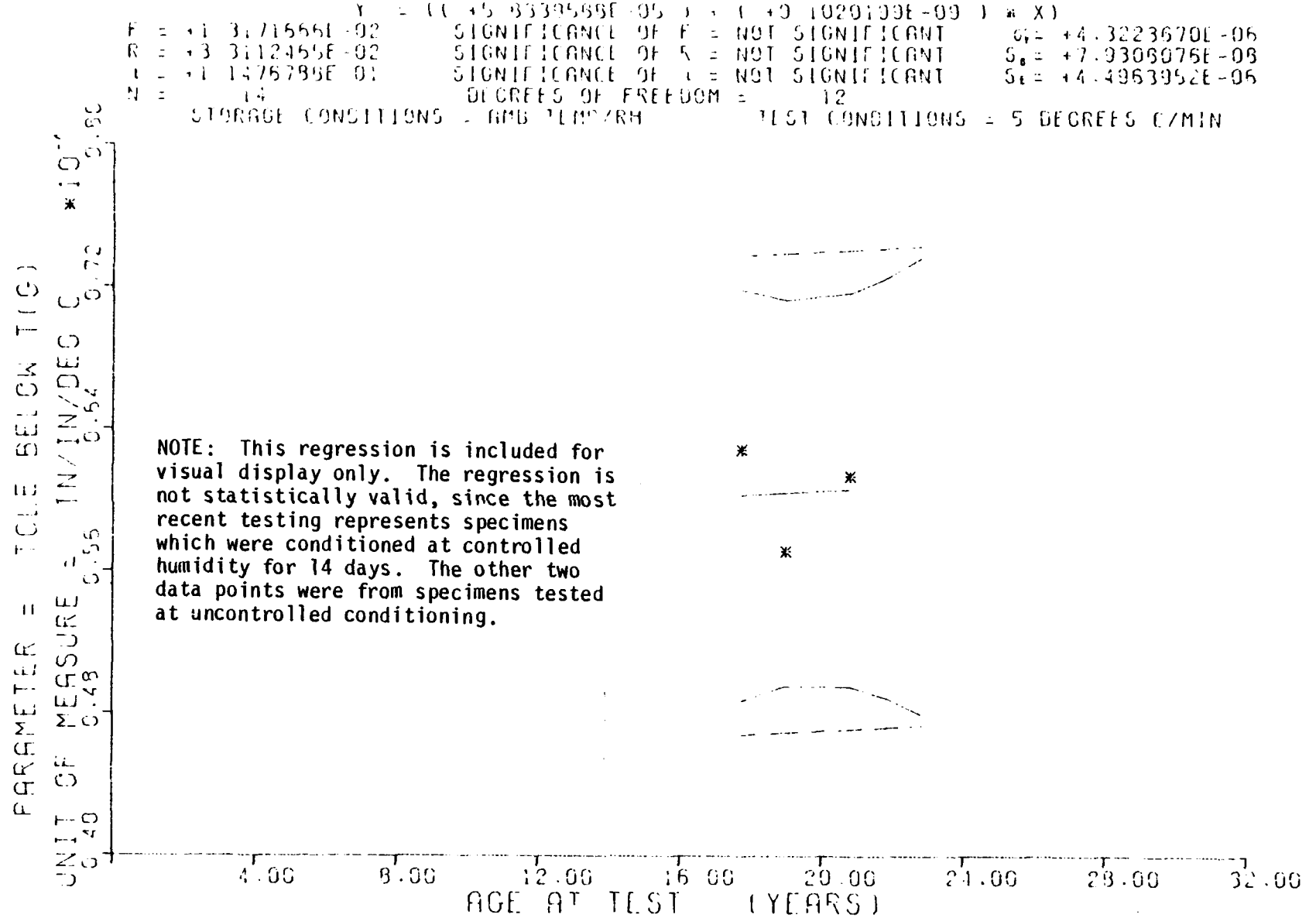

Y = ((+3.0180900E+02) + (-1.9040919E-01) * X)
F = +7.6086732E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +1.0467018E+02
R = -9.9559917E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT SB = +2.1828980E-01
t = +8.7227708E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT SE = +1.0483309E+02
N = 78 DEGREES OF FREEDOM = 76
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
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI *10³
80.00
60.00
40.00
20.00
0.00
-20.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II,DISSECTED MTRS,INNER,STRESS RELAXATION,3 PERCENT,+77 DEG,1000/SEC.

Figure 50-B



NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 51

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+6.2866660E-05	+1.7779052E-06	+6.4899599E-05	+6.1599988E-05	+6.0278311E-05
228.0	4	+5.7149984E-05	+5.7673593E-06	+6.3399587E-05	+4.9599999E-05	+6.0414837E-05
250.0	7	+6.1371363E-05	+3.4107091E-06	+6.5499589E-05	+5.5299999E-05	+6.0615086E-05

STAGE II DISSEC MTRS,OUTER,THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022687>

Figure 51-A

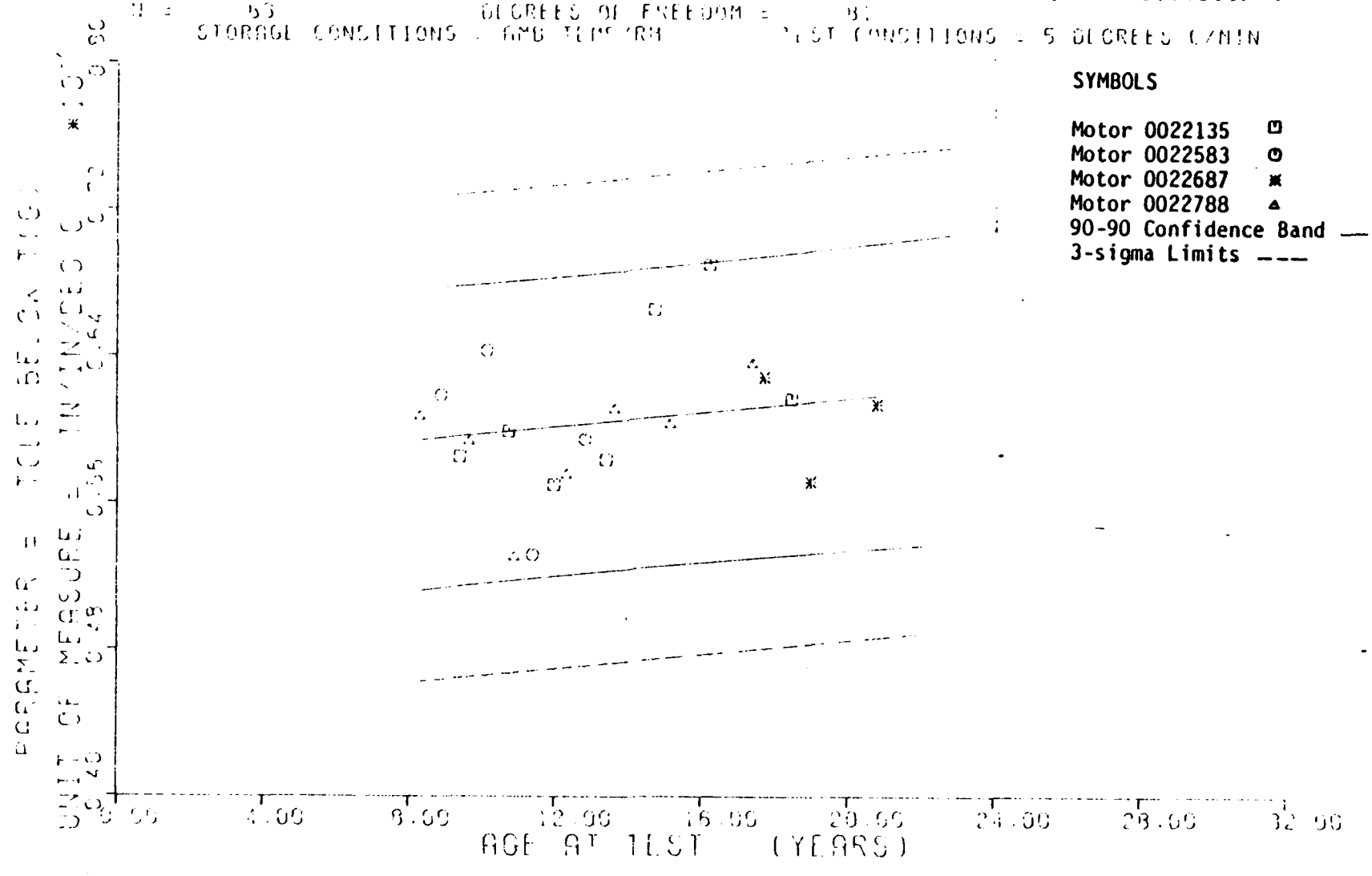
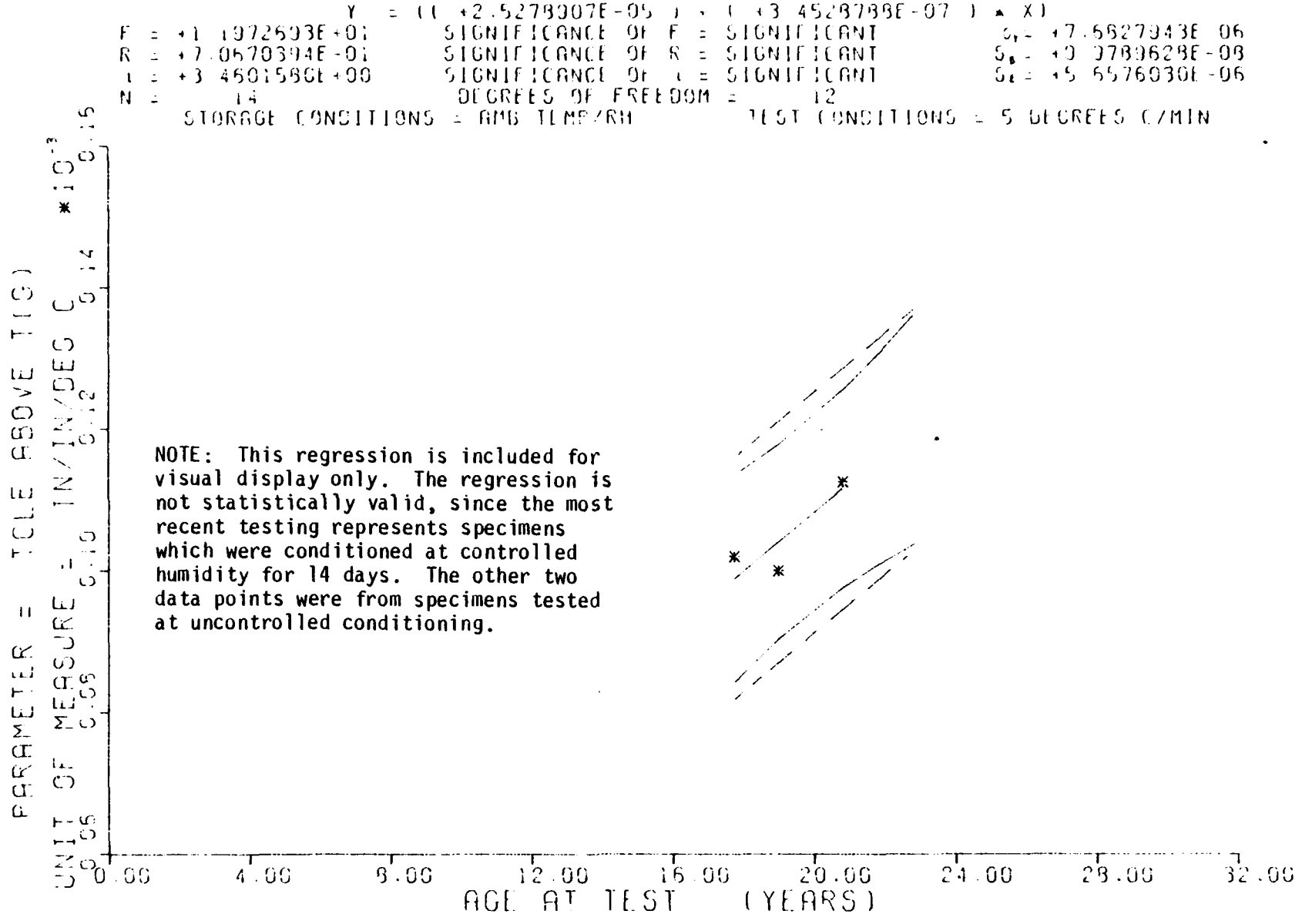

SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
AGE AT TEST (YEARS)

Figure 51-B



STAGE II DISSEC MTRS,OUTER,THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022687>

Figure 52

****** LINEAR REGRESSION ANALYSIS ******

***** ANALYSIS OF TIME SERIES *****

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	+1.0199991E-04	+3.1988033E-06	+1.0449999E-04	+9.8399992E-05	+9.8825214E-05
228.0	4	+9.9999946E-05	+2.9628903E-06	+1.0179999E-04	+9.6699994E-05	+1.0400453E-04
250.0	7	+1.1252847E-04	+6.2854267E-06	+1.2319999E-04	+1.0329998E-04	+1.1160086E-04

STAGE II DISSEC MTRS.OUTER.THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022687>

Figure 52-A

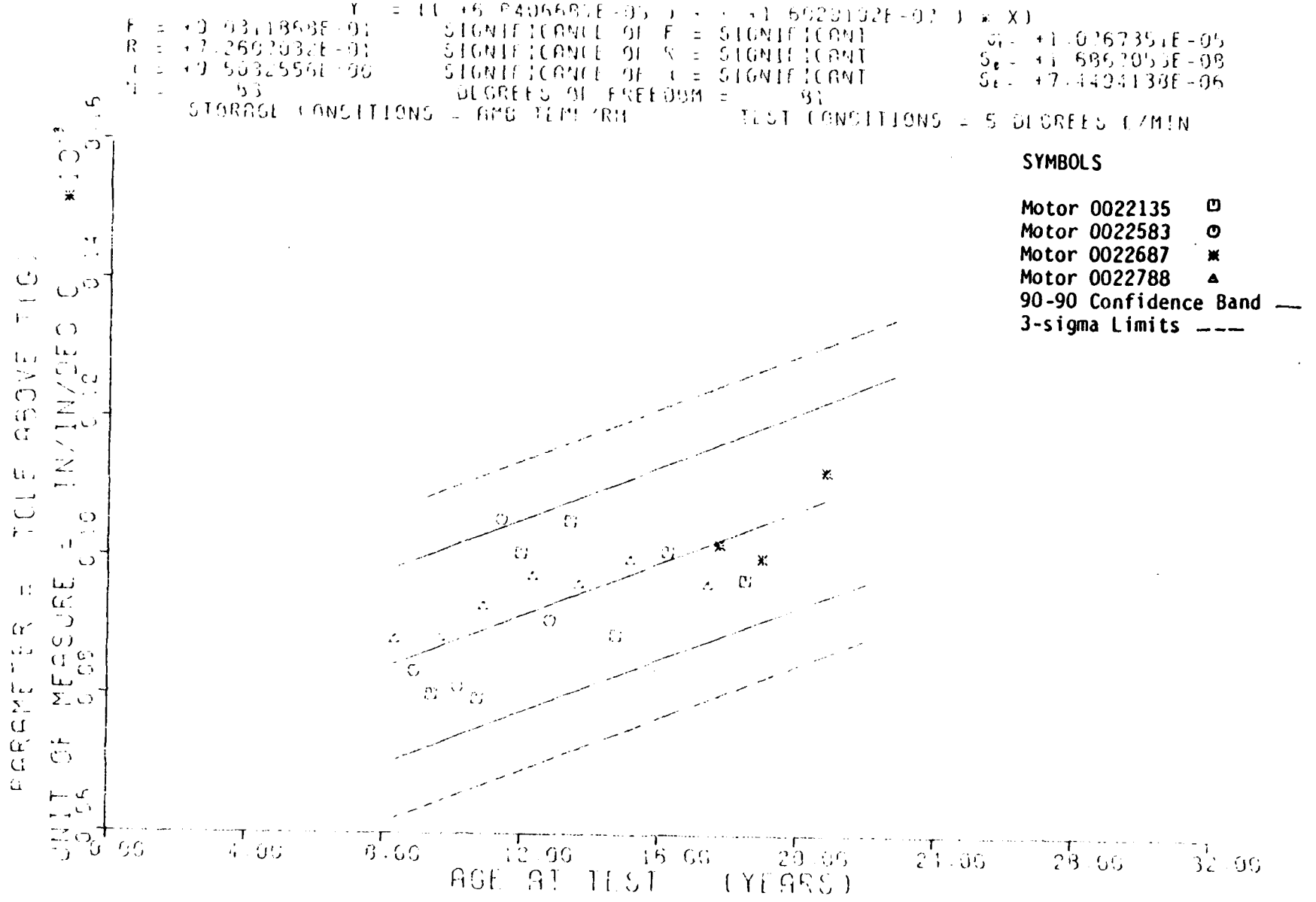
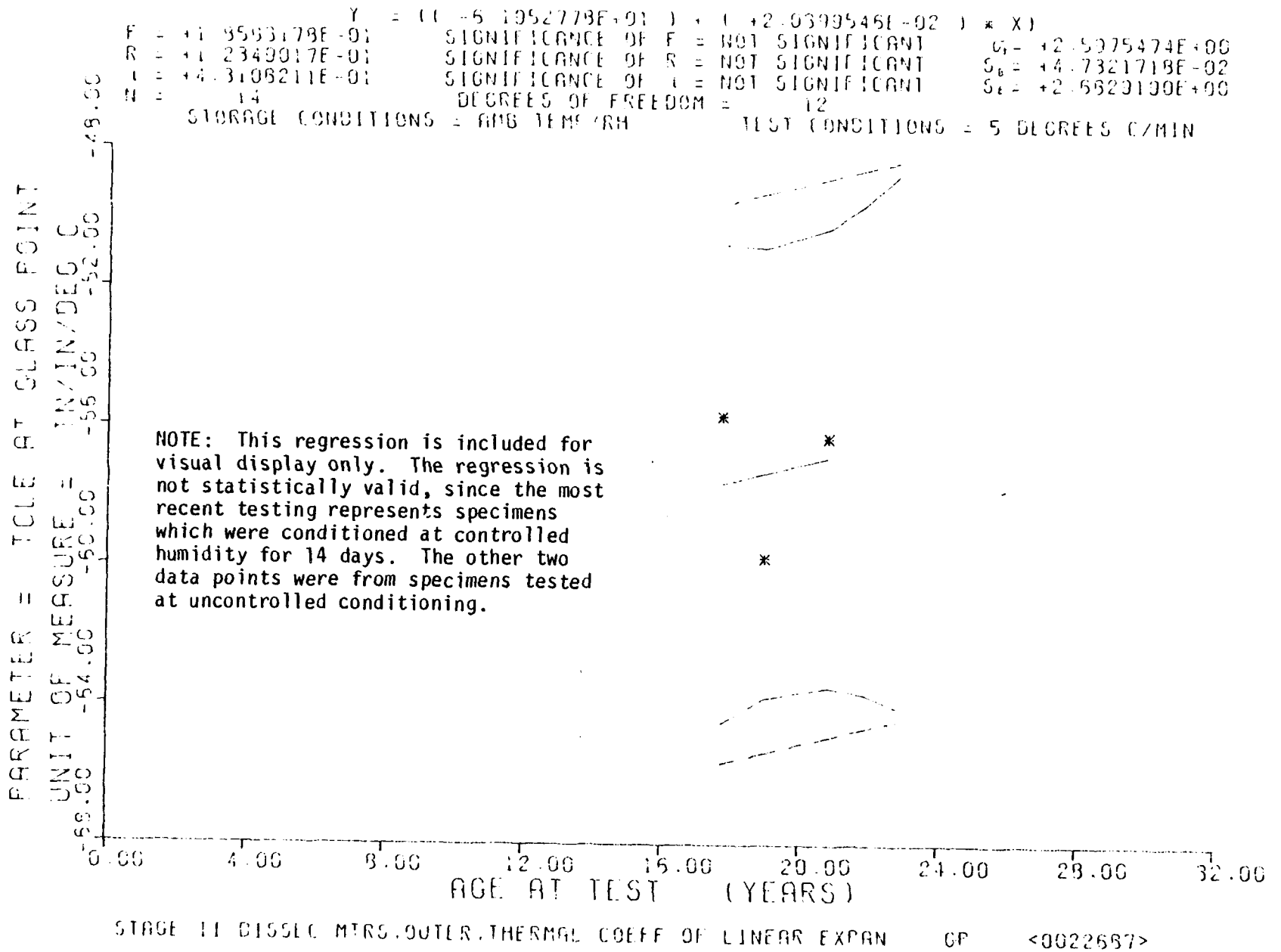

Y = (+6.8406681E-05) + (+1.6029132E-02) * X)
F = +0.9311868E-01
R = +7.2602032E-01
t = +0.5532556E-00
N = 53
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 51
S_1 = +1.0767351E-05
S_0 = +1.6862053E-08
S_t = +7.4434130E-06
STORAGE CONDITIONS - AMB TEMP/RH
TEST CONDITIONS - 5 DEGREES F/MIN
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = HOLE ABOVE FIG.
UNIT OF MEASURE = IN/IN/DEG C *10**6
AGE AT TEST (YEARS)
STAGE II DISSECTED MTRS.OUTER,THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 52-B



NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.

Figure 53

**** LINEAR REGRESSICN ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
213.0	3	-5.5666656E+01	+2.0816659E+00	-5.4000000E+01	-5.8000000E+01	-5.7607666E+01
228.0	4	-5.9750000E+01	+1.7078251E+00	-5.8000000E+01	-6.2000000E+01	-5.7301681E+01
250.0	7	-5.6285705E+01	+2.2886885E+00	-5.3000000E+01	-6.0000000E+01	-5.6852890E+01

STAGE II DISSEC MTRS.OUTER.THERMAL COEFF OF LINEAR EXPAN GP <0022687>

Figure 53-A

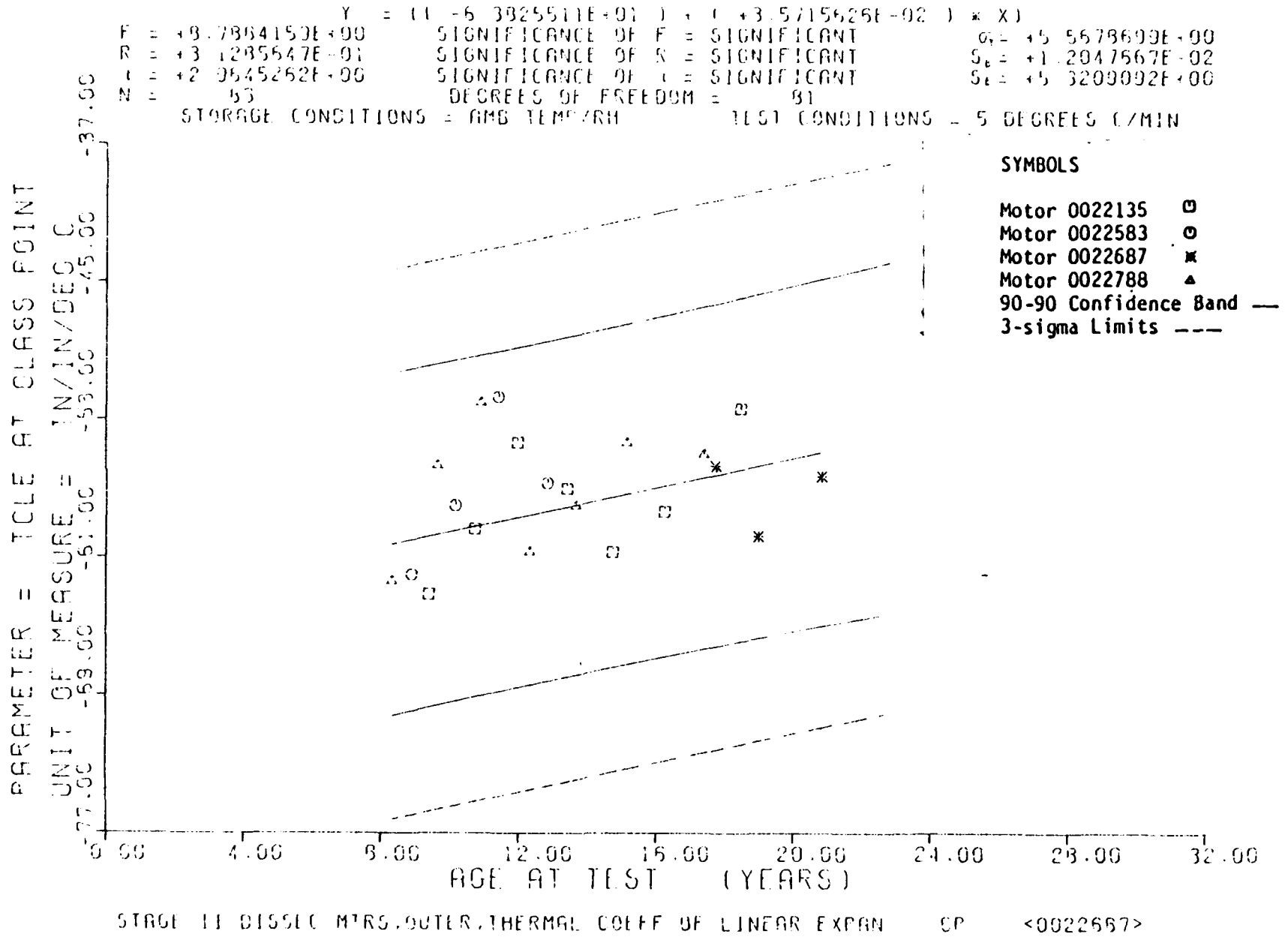
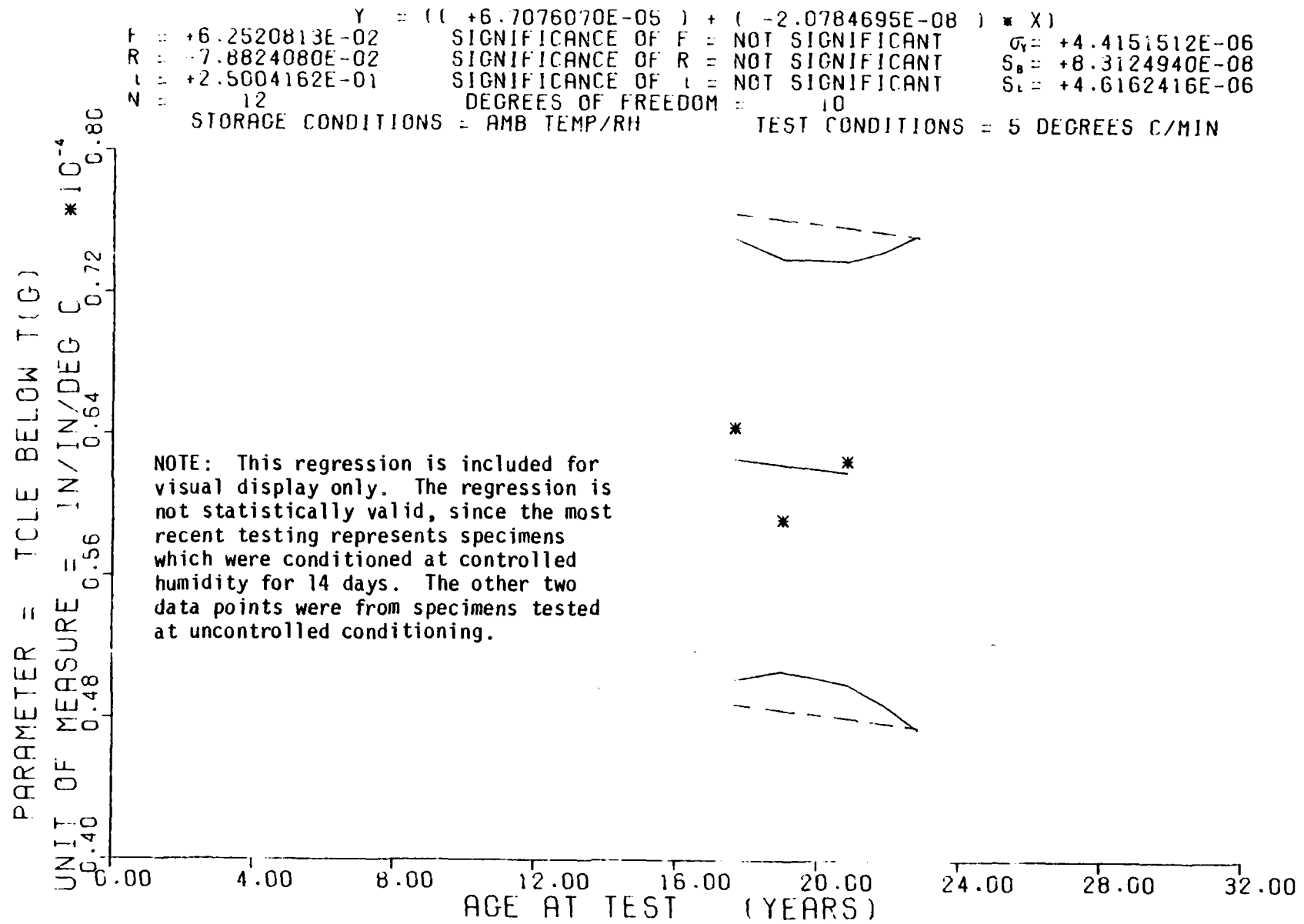

Y = (-6.3825511E+01) + (+3.5715626E-02) * X)
F = +8.7864159E+00
R = +3.1285547E-01
σ = +2.9545262E+00
N = 53
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF σ = SIGNIFICANT
DEGREES OF FREEDOM = 51
S_a = +5.5678609E+00
S_b = +1.2047567E-02
S_σ = +5.3209092E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 5 DEGREES C/MIN
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = TCLE AT CLASS POINT
UNIT OF MEASURE = IN/IN/DEG C
-37.00
-45.00
-53.00
-61.00
-69.00
-77.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II DISSEC MTRS,OUTER,THERMAL COEFF OF LINEAR EXPAN OP <0022687>

Figure 53-B



STAGE II DISSEC MTRS,INNER,THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022687>

Figure 54

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	3	+6.4466657E-05	+4.2712507E-06	+6.9199588E-05	+6.0899998E-05	+6.2669700E-05
228.0	3	+5.9233323E-05	+2.6649306E-06	+6.1199585E-05	+5.6199991E-05	+6.2337145E-05
250.0	6	+6.2533305E-05	+4.9246900E-06	+7.1099588E-05	+5.7699988E-05	+6.1879894E-05

STAGE II DISSEC MTRS.INNER.THERMAL COEFF OF LINEAR EXPAN BELOW TG <0022687>

Figure 54-A

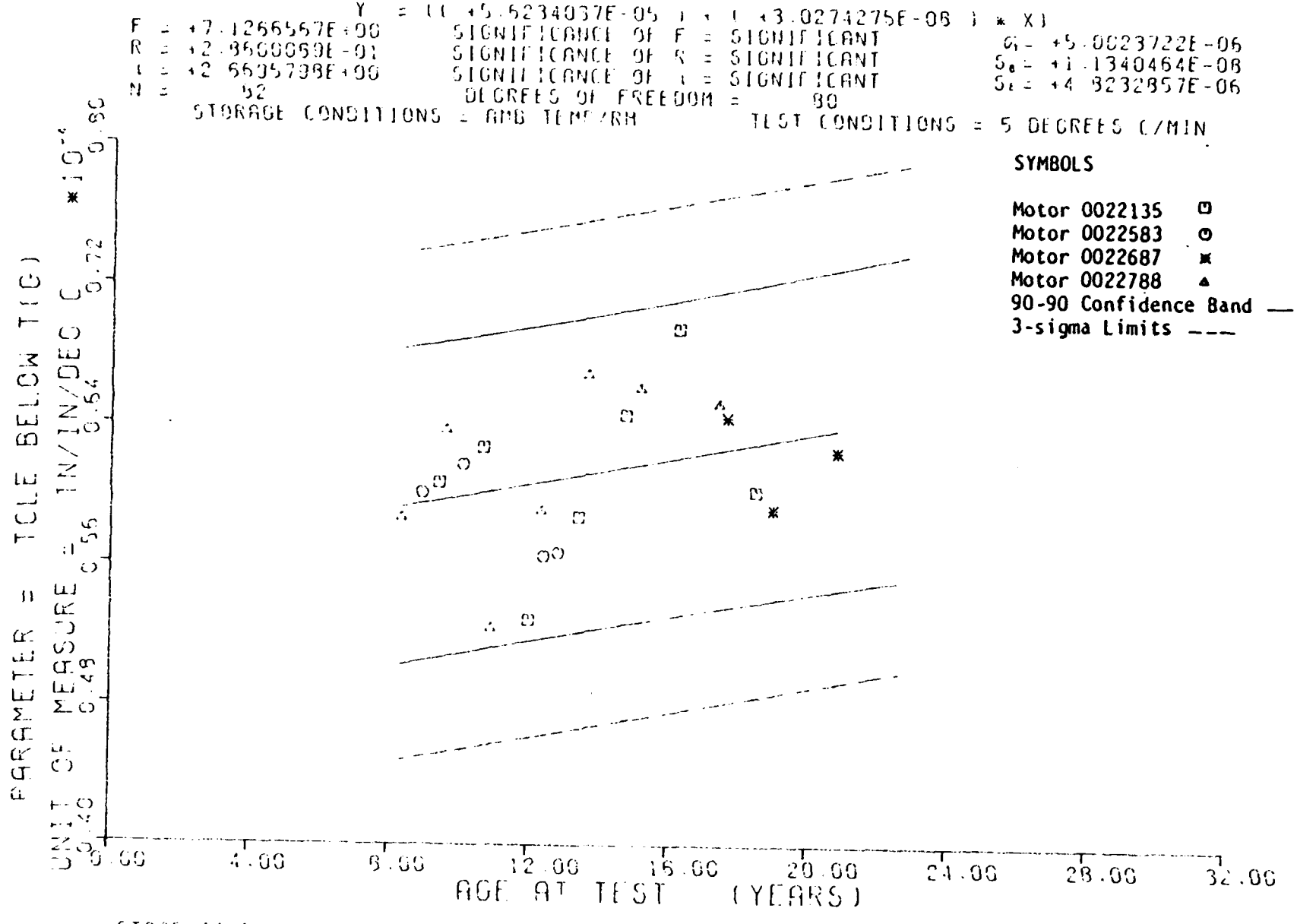
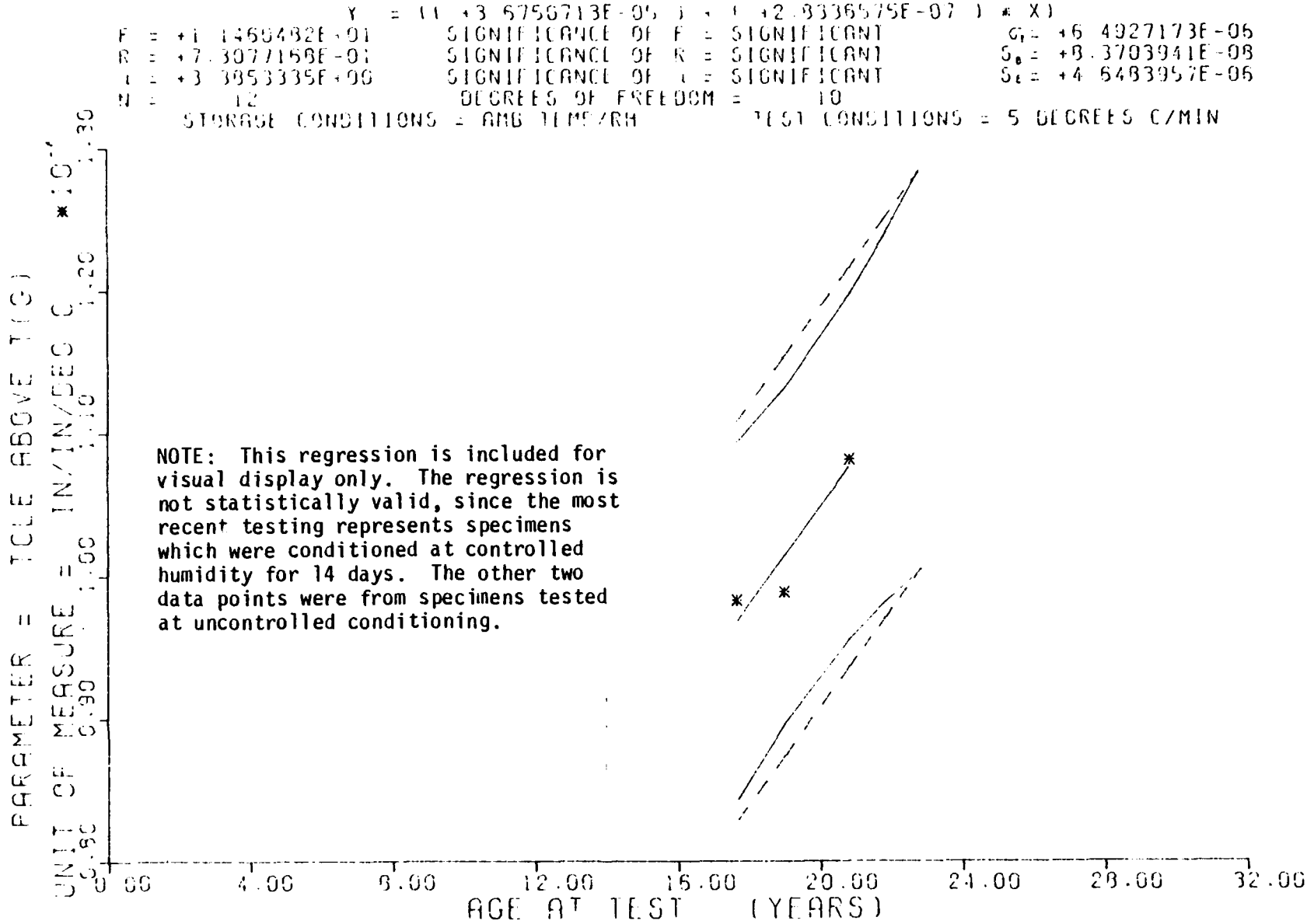

Y = (+5.6234037E-05) + (+3.0274275E-06) * X)
F = +7.1266567E+00
R = +2.8600869E-01
t = +2.6695738E+00
N = 52
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = SIGNIFICANT
SIGNIFICANCE OF t = SIGNIFICANT
DEGREES OF FREEDOM = 80
S_1 = +5.0023722E-06
S_0 = +1.1340464E-08
S_t = +4.8232857E-06
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 5 DEGREES C/MIN
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = TCLE BELOW T(C)
UNIT OF MEASURE = IN/IN/DEG C * 10⁻⁴
0.40
0.48
0.56
0.64
0.72
0.80
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II DISSECTED MTRS, INNER, THERMAL COEFFICIENT OF LINEAR EXPANSION BELOW TG

Figure 54-B



STAGE II DISSEC M1RS.INNER.THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022687>

Figure 55

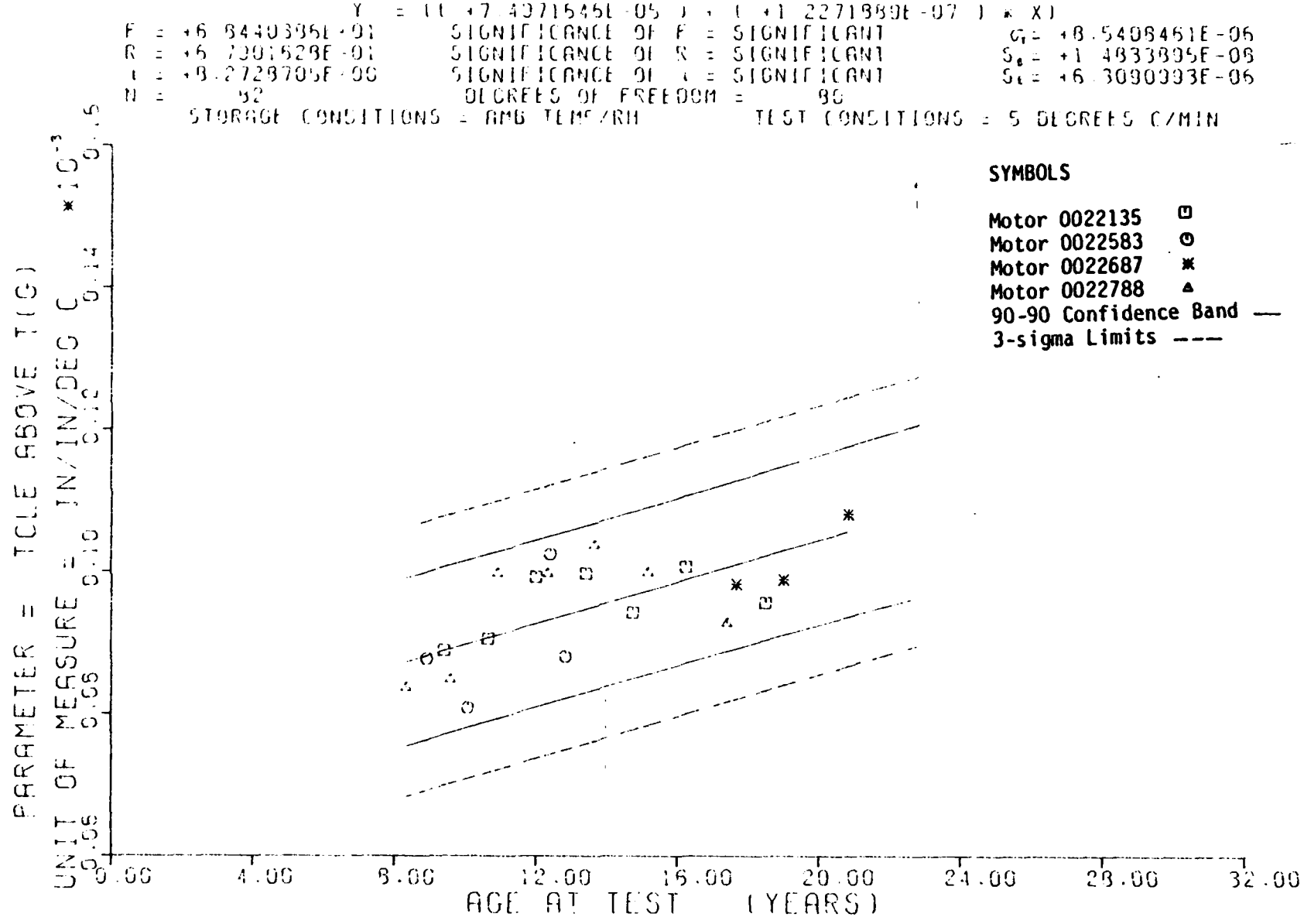
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	3	+9.8266638E-05	+2.9273918E-06	+1.0149998E-04	+9.5799987E-05	+9.6824252E-05
228.0	3	+9.8866643E-05	+7.3230017E-06	+1.0649999E-04	+9.1899986E-05	+1.0135810E-04
250.0	6	+1.0811656E-04	+3.6128091E-06	+1.1699999E-04	+1.0279999E-04	+1.0759214E-04

STAGE II DISSEC MTRS.INNER.THERMAL COEFF OF LINEAR EXPAN ABOVE TG <0022687>

Figure 55-A



STAGE II DISSECTED MTRS.INNER.THERMAL COEFFICIENT OF LINEAR EXPANSION ABOVE TG

Figure 55-B

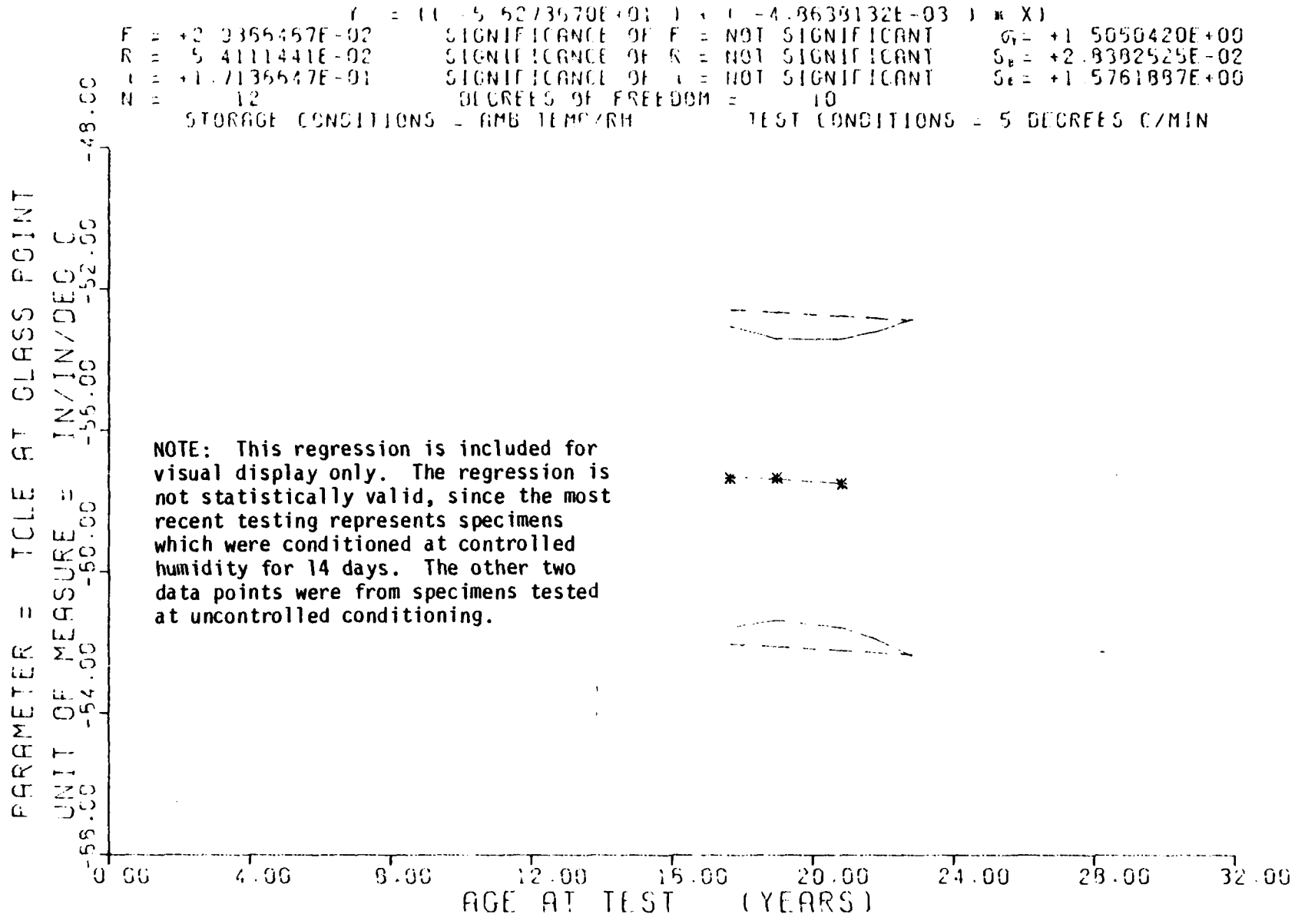

Y = ((-5.5273570E+01) + (-4.8638132E-03) * X)
F = +2.9365467E-02 SIGNIFICANCE OF F = NOT SIGNIFICANT σ1 = +1.5050420E+00
R = 5.4111441E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +2.8382525E-02
t = +1.7136547E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +1.5761887E+00
N = 12 DEGREES OF FREEDOM = 10
STORAGE CONDITIONS - AMB TEMP/RH TEST CONDITIONS - 5 DEGREES C/MIN
PARAMETER = TCLE AT GLASS POINT
UNIT OF MEASURE = IN/IN/DEG C
-48.00
-52.00
-56.00
-54.00
-56.00
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II DISSEC MTRS.INNER.THERMAL COEFF OF LINEAR EXPAN GP <0022687>

Figure 56

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	3	-5.7333328E+01	+1.5275252E+00	-5.6000000E+01	-5.9000000E+01	-5.7304794E+01
228.0	3	-5.7333328E+01	+2.3094010E+00	-5.6000000E+01	-6.0000000E+01	-5.7382614E+01
250.0	6	-5.7500000E+01	+1.3784048E+00	-5.6000000E+01	-5.9000000E+01	-5.7489608E+01

STAGE II DISSEC MTRS.INNER.THERMAL COEFF OF LINEAR EXPAN GP <0022687>

Figure 56-A

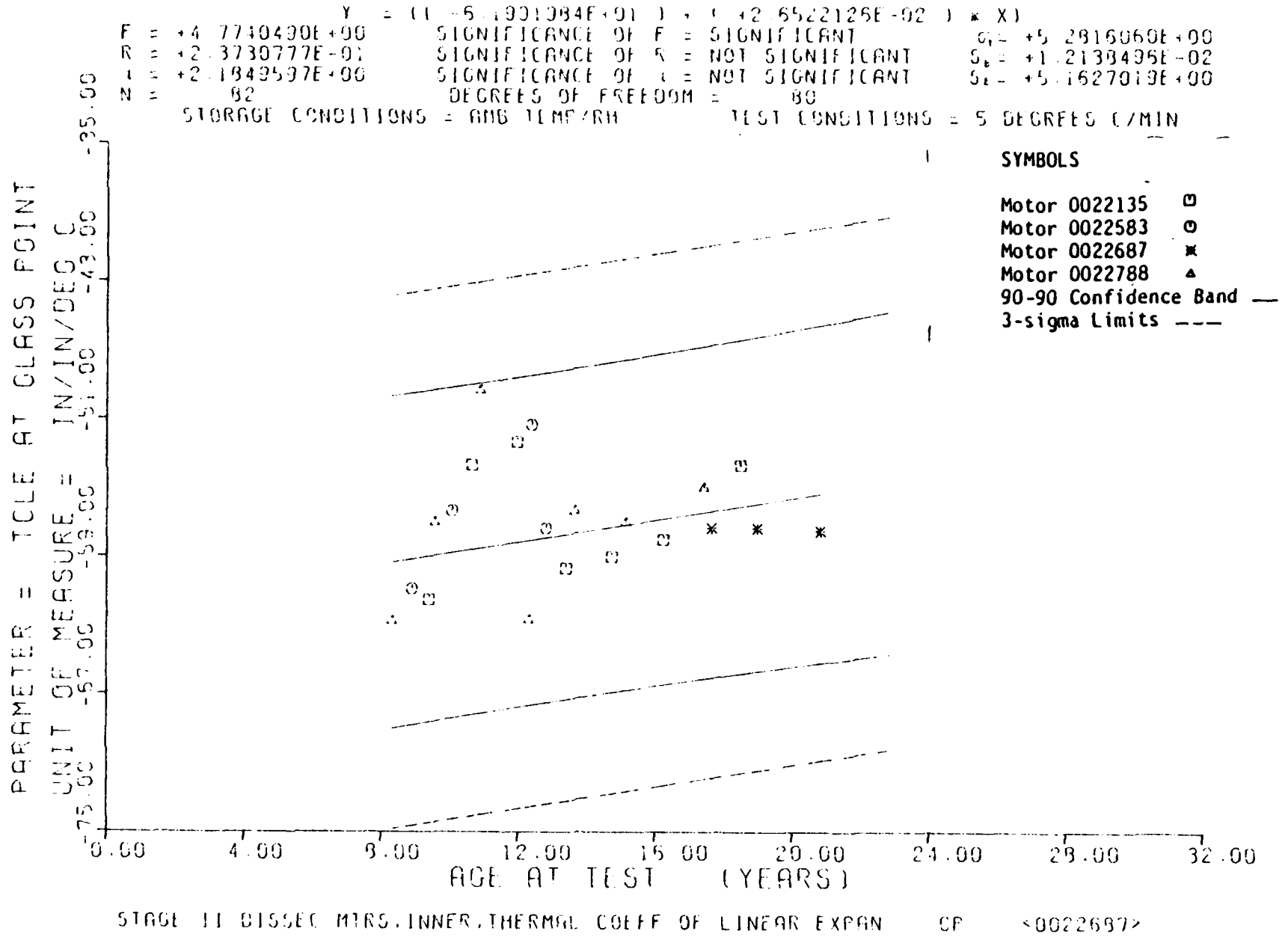

Y = (-5.1931084E+01) + (+2.6522126E-02) * X)
F = +4.7740430E+00
R = +2.3730777E-01
t = +2.1849507E+00
N = 82
SIGNIFICANCE OF F = SIGNIFICANT
SIGNIFICANCE OF R = NOT SIGNIFICANT
SIGNIFICANCE OF t = NOT SIGNIFICANT
DEGREES OF FREEDOM = 80
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = 5 DEGREES C/MIN
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = TCLE AT GLASS POINT
UNIT OF MEASURE = IN/IN/DEG C
-35.00
-43.00
-51.00
-59.00
-67.00
-75.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE II DISSEC MIRS, INNER, THERMAL COEFF OF LINEAR EXPAN OF <0022687>

Figure 56-B

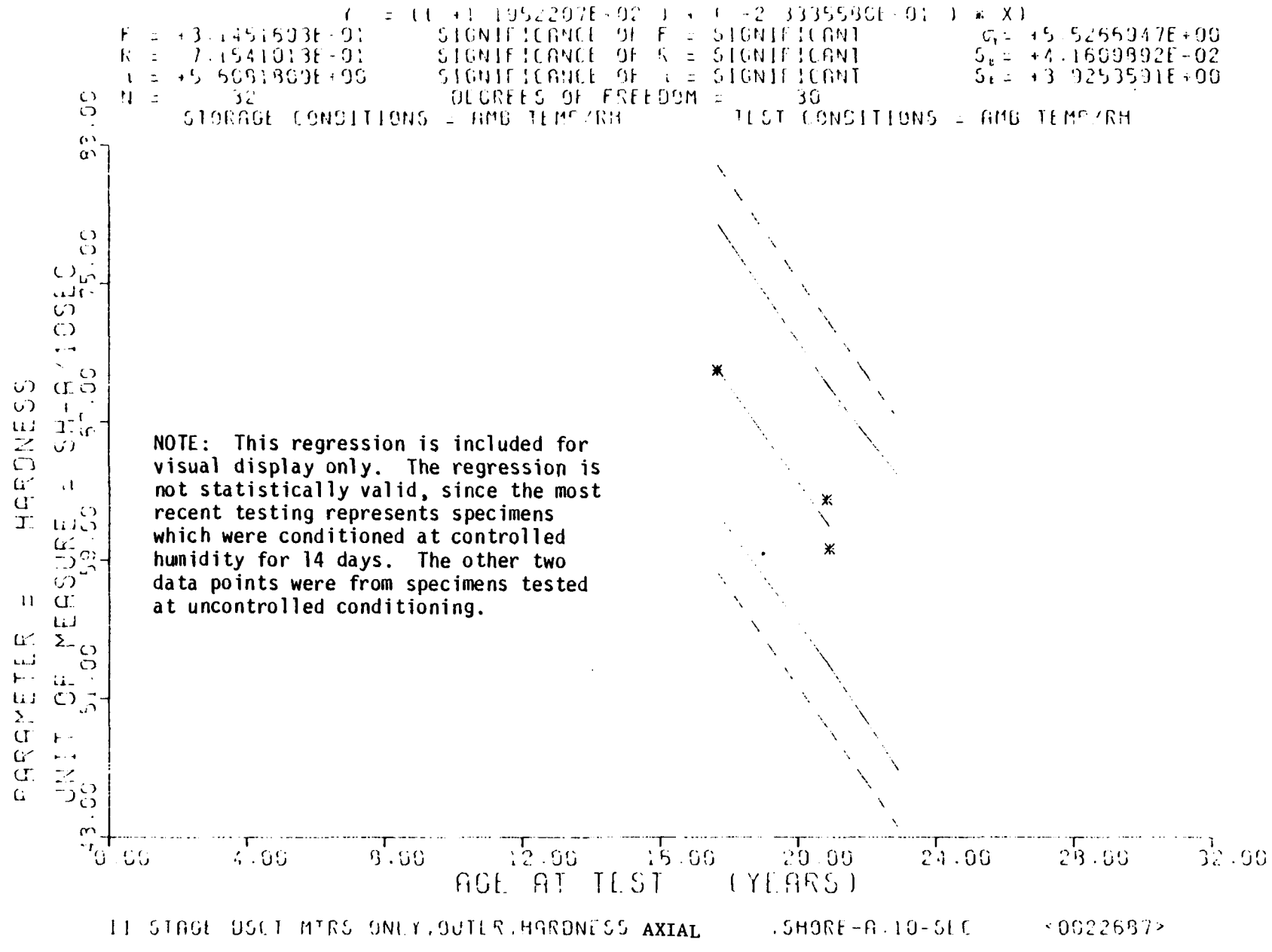

Y = (+1.1952207E+02) + (-2.3335580E+01) * X)
F = +3.1451603E-01 SIGNIFICANCE OF F = SIGNIFICANT σ_y = +5.5265947E+00
R = 7.1541013E-01 SIGNIFICANCE OF R = SIGNIFICANT S_e = +4.1609892E-02
t = +5.6691809E+00 SIGNIFICANCE OF t = SIGNIFICANT S_t = +3.9253591E+00
N = 32 DEGREES OF FREEDOM = 30
STORAGE CONDITIONS - AMB TEMP/RH TEST CONDITIONS - AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
AGE AT TEST (YEARS)
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
11 STAGE DSCT MTRS ONLY,OUTER,HARDNESS AXIAL .SHORE-A,10-SEC <00226B7>

Figure 57

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	8	+7.0000000E+01	+6.7823299E+00	+7.8000000E+01	+6.2000000E+01	+6.8186309E+01
228.0	12	+6.3333328E+01	+2.7080128E+00	+6.8000000E+01	+6.0000000E+01	+6.5421813E+01
250.0	12	+6.2500000E+01	+1.3142574E+00	+6.5000000E+01	+6.0000000E+01	+6.1620635E+01

II STAGE DSCT MTRS ONLY.OUTER.HARDNESS. SHORE-A.10-SEC. <0022687>

Figure 57-A

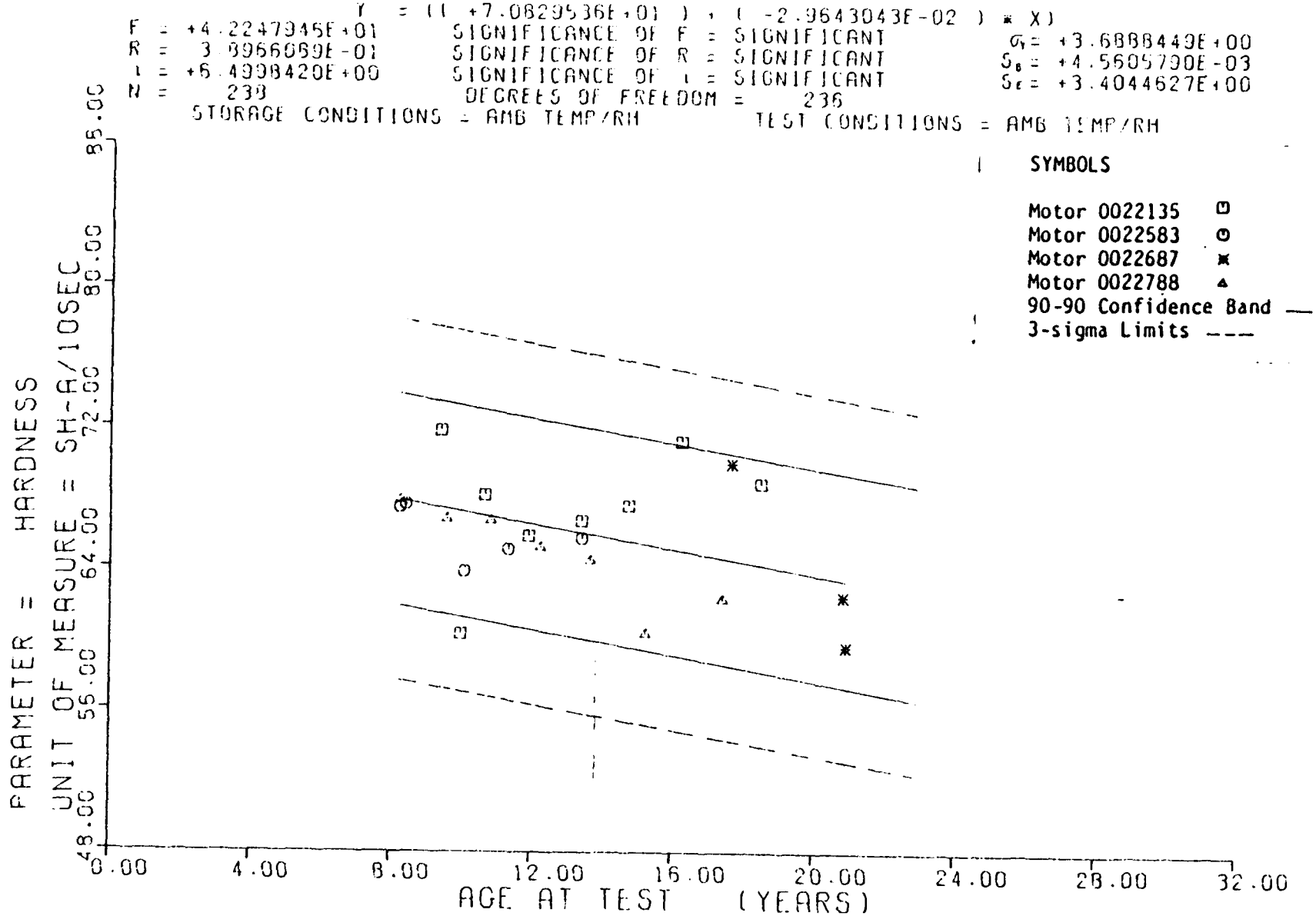

Y = (+7.0829536E+01) + (-2.9643043E-02) * X)
F = +4.2247945E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = 3.9966069E-01 SIGNIFICANCE OF R = SIGNIFICANT
I = +6.4998420E+00 SIGNIFICANCE OF I = SIGNIFICANT
N = 238 DEGREES OF FREEDOM = 236
σT = +3.6888443E+00
Sb = +4.5605790E-03
Se = +3.4044627E+00
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = HARDNESS
UNIT OF MEASURE = SH-A/10SEC
88.00
80.00
72.00
64.00
56.00
48.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE OSCT MTRS ONLY,OUTER,HARDNESS, AXIAL SHORE-A,10-SEC.

Figure 57-B

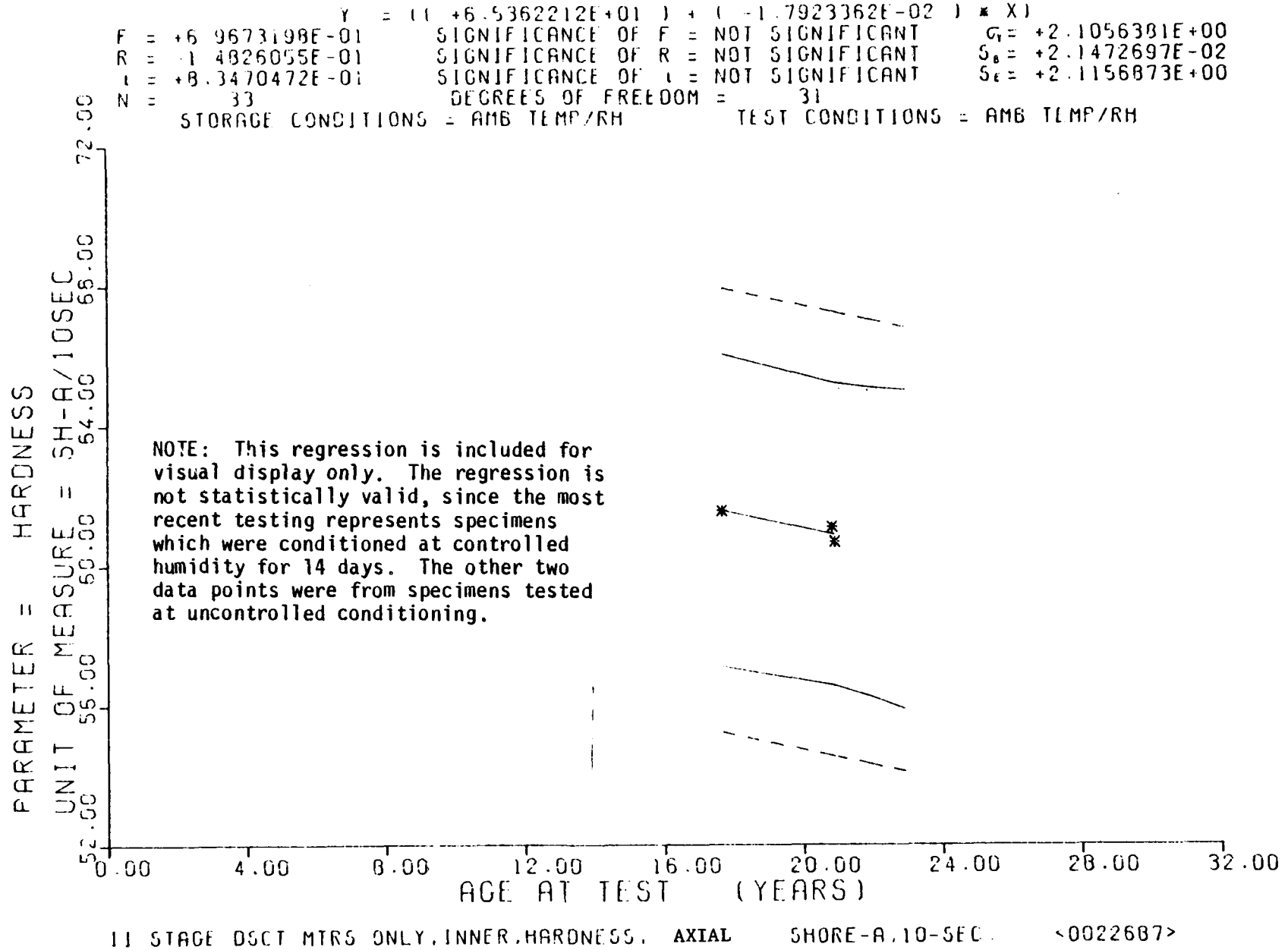

Y = (+6.5362212E+01) + (-1.7923362E-02) * X)
F = +6.9673198E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ1 = +2.1056381E+00
R = -1.4826055E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +2.1472697E-02
t = +8.3470472E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +2.1156873E+00
N = 33 DEGREES OF FREEDOM = 31
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
NOTE: This regression is included for visual display only. The regression is not statistically valid, since the most recent testing represents specimens which were conditioned at controlled humidity for 14 days. The other two data points were from specimens tested at uncontrolled conditioning.
PARAMETER = HARDNESS
UNIT OF MEASURE = SH-A/10SEC
52.00
55.00
60.00
64.00
68.00
72.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCT MTRS ONLY,INNER,HARDNESS, AXIAL SHORE-A,10-SEC <0022687>

Figure 58

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
212.0	9	+6.1555541E+01	+5.2704627E-01	+6.2000000E+01	+6.1000000E+01	+6.3366302E+01
228.0	12	+6.5166656E+01	+1.3371158E+00	+6.7000000E+01	+6.3000000E+01	+6.2820907E+01
250.0	12	+6.1083328E+01	+2.6097137E+00	+6.5000000E+01	+5.7000000E+01	+6.2071014E+01

II STAGE DSCT MTRS ONLY.INNER.HARDNESS. SHORE-A.10-SEC. <0022687>

Figure 58-A

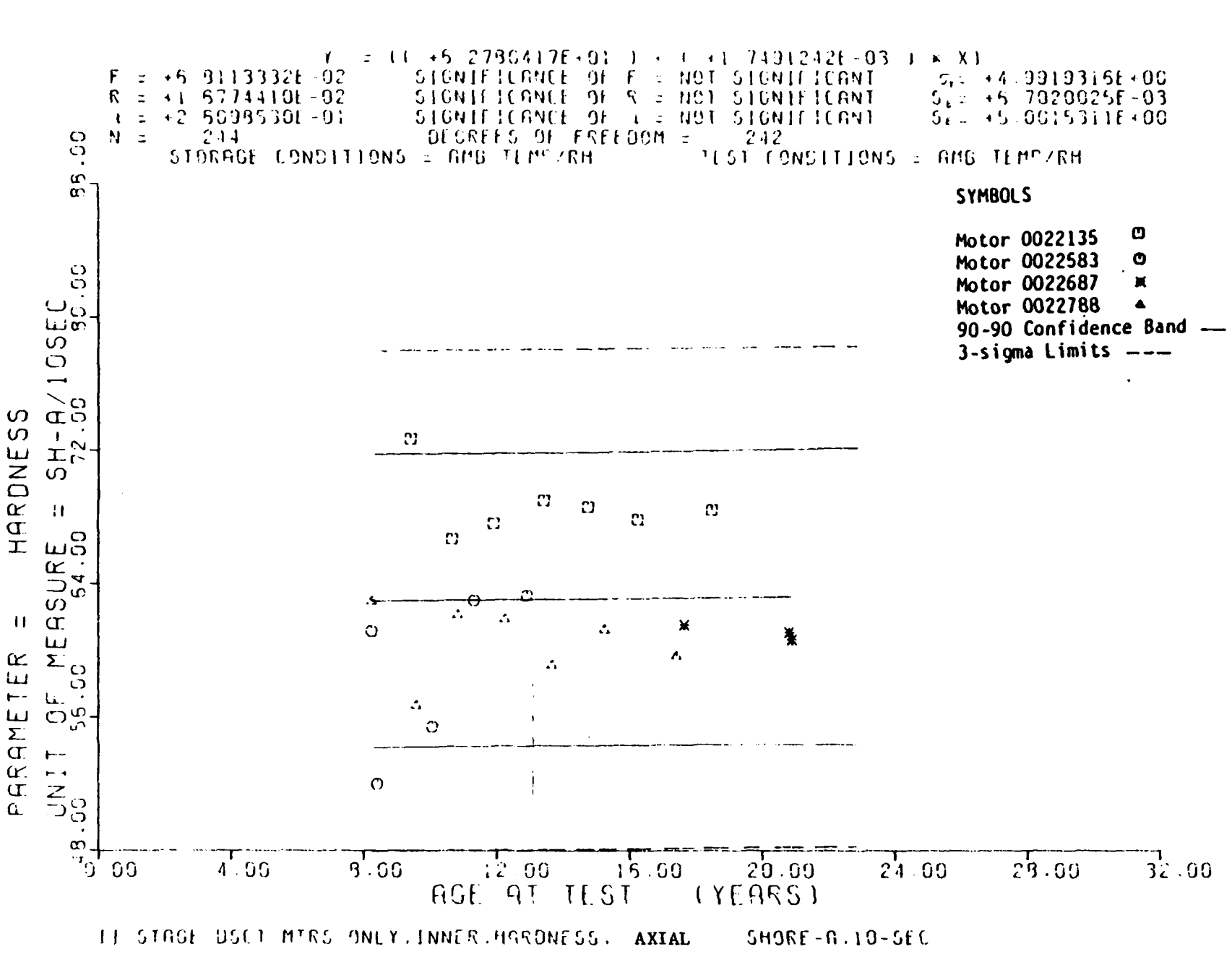

Y = (+5.2780417E+01) + (+1.7431242E-03) * X1
F = +6.9113332E-02 SIGNIFICANCE OF F = NOT SIGNIFICANT
R = +1.6774410E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT
N = 244 DEGREES OF FREEDOM = 242
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
SYMBOLS
Motor 0022135
Motor 0022583
Motor 0022687
Motor 0022788
90-90 Confidence Band
3-sigma Limits
PARAMETER = HARDNESS
UNIT OF MEASURE = SH-A/10SEC
88.00
80.00
72.00
64.00
56.00
48.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
II STAGE DSCI MTRS ONLY, INNER HARDNESS, AXIAL SHORE-A,10-SEC

Figure 58-B

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19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Dissected Motor Solid Propellant
Minuteman
RSLP

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Data analysis in this report represents three test periods on dissected motor S/N 0022687. Two of the tests were performed prior to a change in the specimen conditioning requirements.

A Scheffe' test was used to determine where significant differences in test data occurred. Regressions of individual motor trends for many parameters are included in this report. There are statistically significant trend lines when

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compared to a slope of zero except for stress relaxation modulus. The three points used represent two populations since a change in humidity conditioning occurred in 1985 testing. Therefore, regressions are for visual reference only.

Multi-motor plots are included to show the relationship of motor S/N 0022687 to the other RSLP motors. The data for all Stage II dissected motors tested at OO-ALC are shown on these plots.

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