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# RESEARCH MEMORANDUM

SECTION THRUST COEFFICIENTS FOR A FULL-SCALE,  
THREE-BLADE, SUPERSONIC-TYPE PROPELLER  
OPERATING AT LOW AND NEGATIVE  
BLADE ANGLES

By Leland B. Salters, Jr., and Martha C. Lewis

Langley Aeronautical Laboratory  
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NATIONAL ADVISORY COMMITTEE  
FOR AERONAUTICS

WASHINGTON

March 17, 1958

## NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS

## RESEARCH MEMORANDUM

SECTION THRUST COEFFICIENTS FOR A FULL-SCALE,

THREE-BLADE, SUPERSONIC-TYPE PROPELLER

OPERATING AT LOW AND NEGATIVE

## BLADE ANGLES

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## SUMMARY

An investigation has been conducted at the Langley 16-foot transonic tunnel at Mach number of about 0.14 (110 miles per hour) to determine the aerodynamic loading on a three-blade, 9.75-foot-diameter, supersonic-type propeller when used as a brake. The results of the slipstream survey are presented without analysis in tabular form for blade-angle settings at the 0.75 radial station from  $16.4^\circ$  to  $-13.6^\circ$  in approximately  $5^\circ$  increments.

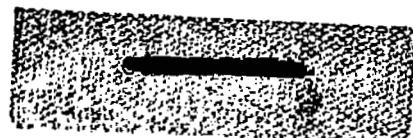
## INTRODUCTION

An investigation of the aerodynamic characteristics of full-scale supersonic-type propellers has been conducted at the Langley 16-foot transonic tunnel and some of the results are given in references 1 and 2. Included in the investigation was an evaluation of the Curtiss-Wright 109626 propeller when used as a brake wherein the propeller was tested at low Mach numbers and at low positive and negative blade-angle settings. The force data obtained during this evaluation were included in reference 1. The wake-survey data are included in this paper without analysis in the form of tabulations for  $16.4^\circ$ ,  $11.4^\circ$ ,  $6.4^\circ$ ,  $1.4^\circ$ ,  $-3.6^\circ$ ,  $-8.6^\circ$ , and  $-13.6^\circ$  blade-angle settings at the 0.75 radial station at Mach number 0.14.

## SYMBOLS

b blade chord, ft

$c_{l,d}$  section design lift coefficient



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|                 |   |
|-----------------|---|
| $c_t$           | section thrust coefficient                          |
| D               | propeller diameter, ft                              |
| h               | blade-section thickness, ft                         |
| J               | advance ratio, $\frac{V}{nD}$                       |
| M               | tunnel airstream Mach number                        |
| n               | propeller rotational speed, rps                     |
| $\Delta p_t$    | pressure rise through the propeller, lb/sq ft       |
| R               | propeller-tip radius, ft                            |
| r               | radius to blade element, ft                         |
| $t_t$           | tunnel airstream total temperature, °F              |
| V               | tunnel airstream velocity, ft/sec                   |
| x               | fractional radius to propeller blade section, $r/R$ |
| $\beta$         | propeller blade angle, deg                          |
| $\beta_{0.75R}$ | blade-angle setting at 0.75 radial station, deg     |
| $\rho_t$        | stagnation density, slugs/cu ft                     |

## APPARATUS

## Propeller

The three-blade 9.75-foot-diameter propeller designated as the Curtiss-Wright design number 109626 is shown in figure 1 and described in reference 1. Blade-form curves are given in figure 2. The blades were of solid steel and designed for a four-blade 10-foot-diameter propeller configuration with peak efficiency at 35,000-foot altitude, 2,600 rpm, a Mach number of 0.95, and an advance ratio of 2.2. The propeller was tested at the Langley 16-foot transonic tunnel on the 6,000-horsepower propeller dynamometer as described in reference 3 and shown in figures 1 and 3.

### Wake-Survey Rakes

The two rakes used in this investigation incorporated static- and total-pressure tubes with radial positions from  $x = 0.324$  to  $x = 1.406$ . Figure 4 gives the details of the rakes and figure 1 shows the rakes installed in the tunnel test section. The rake orifices were located 51 inches (0.44 propeller diameter) behind the propeller plane of rotation.

### TESTS

The tests were made at a constant Mach number of approximately 0.14 with blade angles at the 0.75 radial station varying from  $16.4^\circ$  to  $-13.6^\circ$  in approximately  $5^\circ$  increments. For each blade-angle setting the rotational speed was varied over the greatest possible range within the limitations of power and within the limitations imposed by blade flutter sensitivity.

### REDUCTION OF DATA

The method used for computing the section thrust coefficient from rake data is presented in reference 4, wherein the following equation for the blade-section thrust coefficient is derived:

$$c_t = \frac{1}{4} \frac{J^2 \pi x \Delta p_t}{\frac{1}{2} \rho_t v^2}$$

where  $\Delta p_t$  is obtained directly from total-pressure measurements. No corrections were applied for contraction or expansion of the slipstream between propeller and rake.

### RESULTS

The results of the slipstream survey are presented in tables I to VII. The tables show the total pressure and section thrust coefficient for each rake probe within the boundary of the slipstream for various values of rotational speed and blade-angle settings. It may be noted that because of the 51-inch distance (0.44 propeller diameter) between the propeller plane of rotation and the orifices of the rake probes, the diameter of

the slipstream at the rake is not always equal to the propeller diameter. Both contractions and expansions in slipstream diameter are registered at the rake. Errors in the tabulated values may exist due to malfunctions of some individual total-pressure probes but these will be obvious when the data are plotted.

The following index is provided for convenient reference to the tabulated data:

| Table | $\beta_{0.75R}$ ,<br>deg | M    | Range of rotational<br>speed, rpm |
|-------|--------------------------|------|-----------------------------------|
| I     | 16.4                     | .046 | 1,100 to 2,000                    |
| II    | 11.4                     | .151 | 1,250 to 2,100                    |
| III   | 6.4                      | .145 | 700 to 2,100                      |
| IV    | 1.4                      | .147 | 300 to 590                        |
| V     | -3.6                     | .145 | 300 to 600                        |
| VI    | -8.6                     | .145 | 300 to 950                        |
| VII   | -13.6                    | .136 | 300 to 700                        |

Langley Aeronautical Laboratory,  
National Advisory Committee for Aeronautics,  
Langley Field, Va., December 10, 1957.

#### REFERENCES

1. Maynard, Julian D., Swihart, John M., and Norton, Harry T., Jr.: Effect of Blade-Section Camber on Aerodynamic Characteristics of Full-Scale Supersonic-Type Propellers at Mach Numbers to 1.04. NACA RM L56E10, 1956.
2. Salters, Leland B., Jr.: Investigation at Mach Numbers to 1.04 of Blade-Loading Characteristics of Two Full-Scale Three-Blade Supersonic Propellers Differing in Blade-Section Camber. NACA RM L57C19, 1957.
3. Wood, John H., and Swihart, John M.: The Effect of Blade-Section Camber on the Static Characteristics of Three NACA Propellers. NACA RM L51L28, 1952.
4. Davidson, Robert E.: Propeller Lift and Thrust Distribution From Wake Surveys of Stagnation Condition. NACA RM L51K29, 1952.

TABLE I

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\delta_{0.75R} = 16.4^\circ$  $[M = 0.146; P_t = 2,133 \text{ lb/sq ft}; t_t = 80^\circ \text{ F}]$ 

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 | n = 320 |  |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|---------|--|
|        | 1,100                 |                 | 1,140          |                 | 1,170          |                 | 1,290          |                 | 1,320          |                 |         |  |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |         |  |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |         |  |
| 0.358  | -0.0209               | -2.73           | -0.0111        | -1.55           | -0.0037        | -0.55           | 0.0087         | 1.55            | 0.0118         | 2.22            |         |  |
| .380   | -.0174                | -2.14           | -.0064         | -.84            | .0040          | .55             | .0137          | 2.31            | .0164          | 2.90            |         |  |
| .403   | -.0246                | -2.85           | -.0132         | -1.64           | .0035          | .46             | .0145          | 2.31            | .0187          | 3.11            |         |  |
| .426   | -.0260                | -2.85           | -.0135         | -1.59           | -.0020         | -.25            | .0154          | 2.31            | .0205          | 3.23            |         |  |
| .449   | -.0233                | -2.43           | -.0098         | -1.09           | .0018          | .21             | .0177          | 2.32            | .0216          | 3.23            |         |  |
| .471   | -.0266                | -2.64           | -.0122         | -1.30           | .0019          | .21             | .0185          | 2.52            | .0227          | 3.23            |         |  |
| .495   | -.0280                | -2.64           | -.0111         | -1.13           | .0032          | .34             | .0195          | 2.52            | .0238          | 3.23            |         |  |
| .517   | -.0325                | -2.94           | -.0169         | -1.64           | -.0021         | -.21            | .0186          | 2.31            | .0249          | 3.23            |         |  |
| .540   | -.0359                | -3.11           | -.0226         | -2.10           | -.0056         | -.55            | .0191          | 2.27            | .0255          | 3.15            |         |  |
| .585   | -.0373                | -2.98           | -.0234         | -2.01           | -.0032         | -.29            | .0207          | 2.27            | .0275          | 3.15            |         |  |
| .631   | -.0431                | -3.19           | -.0274         | -2.18           | -.0060         | .50             | .0203          | 2.06            | .0268          | 2.85            |         |  |
| .654   | -.0446                | -3.19           | -.0301         | -2.31           | -.0062         | .50             | .0197          | 1.93            | .0262          | 2.69            |         |  |
| .676   | -.0224                | -1.55           | .0005          | .04             | .0327          | 2.56            | .0266          | 2.52            | .0271          | 2.69            |         |  |
| .700   | -.0527                | -3.52           | -.0357         | -2.56           | -.0094         | -.71            | .0161          | 1.47            | .0232          | 2.22            |         |  |
| .722   | -.0544                | -3.52           | -.0358         | -2.55           | -.0086         | -.65            | .0142          | 1.26            | .0203          | 1.93            |         |  |
| .745   | -.0595                | -3.73           | -.0411         | -2.77           | -.0100         | -.71            | .0113          | .97             | .0168          | 1.51            |         |  |
| .768   | -.0717                | -4.36           | -.0520         | -3.40           | -.0219         | 1.51            | .0050          | .42             | .0129          | 1.13            |         |  |
| .791   | -.0760                | -4.49           | -.0555         | -3.52           | -.0277         | 1.85            | -.0016         | -.13            | .0094          | .80             |         |  |
| .813   | -.0804                | -4.62           | -.0598         | -3.69           | -.0335         | 2.18            | -.0043         | -.34            | .0035          | .29             |         |  |
| .839   | -.0934                | -5.08           | -.0782         | -4.57           | -.0505         | 3.11            | -.0163         | -1.22           | -.0081         | -.63            |         |  |
| .905   | -.1040                | -5.37           | -.0841         | -4.66           | -.0575         | 3.36            | -.0242         | -1.72           | -.0175         | -1.30           |         |  |
| .927   | -.1073                | -5.41           | -.0915         | -4.95           | -.0670         | 3.82            | -.0285         | -1.97           | -.0220         | -1.59           |         |  |
| .950   | -.1110                | -5.46           | -.0937         | -4.95           | -.0708         | 3.94            | -.0317         | -2.14           | -.0249         | -1.76           |         |  |
| .973   | -.1110                | -5.33           | -.0944         | -4.87           | -.0735         | 3.99            | -.0325         | -2.14           | -.0274         | -1.89           |         |  |
| .996   | -.1047                | -4.91           | -.0842         | -4.24           | -.0626         | 3.32            | -.0300         | -1.93           | -.0243         | -1.64           |         |  |
| 1.018  | -.0211                | -.97            | -.0178         | -.88            | -.0073         | -.38            | -.0006         | -.04            | .0000          | .00             |         |  |
| 1.042  | .0029                 | .13             | .0027          | .13             | .0049          | .25             | .0062          | .38             | .0065          | .42             |         |  |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |         |  |
| 0.324  | 0.0012                | 0.17            | 0.0008         | 0.13            | 0.0000         | 0.00            | 0.0002         | 0.04            | 0.0004         | 0.08            |         |  |
| .346   | -.0199                | -2.69           | -.0110         | -1.59           | -.0016         | -.25            | .0072          | 1.34            | .0095          | 1.85            |         |  |
| .369   | -.0159                | -2.01           | -.0086         | -1.17           | .0015          | .21             | .0116          | 2.01            | .0141          | 2.56            |         |  |
| .392   | -.0190                | -2.27           | -.0108         | -1.38           | .0000          | .04             | .0141          | 2.31            | .0174          | 2.98            |         |  |
| .415   | -----                 | -----           | -----          | -----           | -----          | -----           | -----          | -----           | -----          | -----           |         |  |
| .437   | -.0232                | -2.48           | -.0125         | -1.43           | .0017          | .21             | .0157          | 2.31            | .0197          | 3.02            |         |  |
| .460   | -.0239                | -2.43           | -.0096         | -1.05           | .0055          | .63             | .0178          | 2.48            | .0213          | 3.11            |         |  |
| .483   | -.0251                | -2.43           | -.0129         | -1.34           | -.0027         | .29             | .0187          | 2.48            | .0224          | 3.11            |         |  |
| .505   | -.0304                | -2.81           | -.0148         | -1.47           | -.0004         | -.04            | .0182          | 2.31            | .0227          | 3.02            |         |  |
| .531   | -.0336                | -2.85           | -.0175         | -1.59           | -.0008         | .08             | .0195          | 2.27            | .0245          | 2.98            |         |  |
| .557   | -.0402                | -3.15           | -.0239         | -2.01           | -.0062         | .55             | .0199          | 2.14            | .0265          | 2.98            |         |  |
| .620   | -.0467                | -3.52           | -.0311         | -2.52           | -.0103         | .88             | .0187          | 1.93            | .0256          | 2.77            |         |  |
| .642   | -.0484                | -3.52           | -.0301         | -2.35           | -.0097         | .80             | .0185          | 1.85            | .0257          | 2.69            |         |  |
| .666   | -.0502                | -3.52           | -.0312         | -2.55           | -.0084         | .67             | .0192          | 1.85            | .0262          | 2.64            |         |  |
| .688   | -.0489                | -3.32           | -.0288         | -2.10           | -.0055         | .42             | .0185          | 1.72            | .0249          | 2.43            |         |  |
| .710   | -.0555                | -3.65           | -.0374         | -2.64           | -.0130         | .97             | .0148          | 1.34            | .0213          | 2.01            |         |  |
| .734   | -.0619                | -3.94           | -.0424         | -2.90           | -.0192         | 1.38            | .0125          | 1.09            | .0197          | 1.80            |         |  |
| .756   | -.0747                | -4.62           | -.0493         | -3.27           | -.0295         | 2.06            | .0079          | .67             | .0166          | 1.47            |         |  |
| .779   | -.0770                | -4.62           | -.0573         | -3.69           | -.0327         | 2.22            | .0041          | .34             | .0180          | 1.55            |         |  |
| .825   | -.0874                | -4.95           | -.0669         | -4.07           | -.0393         | 2.52            | -.0054         | -.42            | .0016          | .13             |         |  |
| .871   | -.1064                | -5.71           | -.0830         | -4.78           | -.0643         | 3.90            | -.0177         | -1.30           | -.0082         | -.63            |         |  |
| .893   | -.1106                | -5.79           | -.0867         | -4.87           | -.0674         | 3.99            | -.0221         | -1.59           | -.0134         | -1.01           |         |  |
| .916   | -.1168                | -5.96           | -.0973         | -5.33           | -.0771         | 4.45            | -.0282         | -1.97           | -.0195         | -1.43           |         |  |
| .939   | -.1190                | -5.92           | -.0966         | -5.16           | -.0760         | 4.28            | -.0308         | -2.10           | -.0217         | -1.55           |         |  |
| .962   | -.1219                | -5.92           | -.0974         | -5.08           | -.0786         | 4.32            | -.0327         | -2.18           | -.0252         | -1.76           |         |  |
| .984   | -.1247                | -5.92           | -.1012         | -5.16           | -.0804         | 4.32            | -.0355         | -2.31           | -.0277         | -1.89           |         |  |
| 1.007  | -.1177                | -5.46           | -.0943         | -4.70           | -.0743         | 3.90            | -.0324         | -2.06           | -.0258         | -1.72           |         |  |
| 1.030  | -.0278                | -1.26           | -.0181         | -.88            | -.0115         | -.59            | .0013          | .08             | .0000          | .00             |         |  |

TABLE I.- Continued

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\beta_{0.75R} = 16.4^\circ$

$$[M = 0.146; p_t = 2,133 \text{ lb/sq ft}; t_t = 80^\circ F]$$

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|        | 1,350                 |                 | 1,380          |                 | 1,410          |                 | 1,450          |                 | 1,500          |                 |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.358  | 0.0154                | 3.02            | 0.0192         | 3.94            | 0.0229         | 4.91            | 0.0282         | 6.38            | 0.0326         | 7.89            |
| .380   | .0198                 | 3.65            | .0235          | 4.53            | .0283          | 5.71            | .0329          | 7.01            | .0374          | 8.52            |
| .403   | .0234                 | 4.07            | .0283          | 5.16            | .0324          | 6.17            | .0401          | 8.06            | .0445          | 9.57            |
| .426   | .0249                 | 4.11            | .0293          | 5.04            | .0361          | 6.50            | .0430          | 8.18            | .0489          | 9.95            |
| .449   | .0263                 | 4.11            | .0311          | 5.08            | .0388          | 6.63            | .0465          | 8.39            | .0509          | 9.82            |
| .471   | .0282                 | 4.20            | .0337          | 5.23            | .0412          | 6.71            | .0490          | 8.43            | .0545          | 10.03           |
| .493   | .0296                 | 4.20            | .0354          | 5.23            | .0410          | 6.34            | .0520          | 8.52            | .0575          | 10.07           |
| .517   | .0309                 | 4.20            | .0385          | 5.16            | .0450          | 6.67            | .0549          | 8.60            | .0616          | 10.32           |
| .540   | .0316                 | 4.11            | .0402          | 5.16            | .0450          | 6.38            | .0573          | 8.60            | .0649          | 10.41           |
| .585   | .0342                 | 4.11            | .0435          | 5.16            | .0480          | 6.29            | .0630          | 8.73            | .0703          | 10.41           |
| .631   | .0335                 | 3.73            | .0437          | 5.08            | .0497          | 6.04            | .0656          | 8.43            | .0730          | 10.03           |
| .654   | .0340                 | 3.65            | .0438          | 4.91            | .0498          | 5.83            | .0667          | 8.27            | .0735          | 9.74            |
| .676   | .0323                 | 3.36            | .0394          | 4.28            | .0459          | 5.20            | .0616          | 7.39            | .0678          | 8.69            |
| .700   | .0314                 | 3.15            | .0421          | 4.41            | .0502          | 5.50            | .0663          | 7.68            | .0753          | 9.32            |
| .722   | .0285                 | 2.77            | .0393          | 3.99            | .0463          | 4.91            | .0643          | 7.22            | .0717          | 8.60            |
| .745   | .0249                 | 2.55            | .0357          | 5.32            | .0457          | 4.49            | .0615          | 6.67            | .0703          | 8.18            |
| .768   | .0225                 | 2.06            | .0316          | 5.02            | .0412          | 4.11            | .0601          | 6.34            | .0699          | .789            |
| .791   | .0189                 | 1.68            | .0294          | 2.73            | .0381          | 3.69            | .0573          | 5.87            | .0689          | 7.55            |
| .813   | .0122                 | 1.05            | .0242          | 2.18            | .0320          | 3.02            | .0510          | 5.08            | .0626          | 6.67            |
| .859   | .0016                 | .13             | .0137          | 1.17            | .0212          | 1.89            | .0418          | 3.94            | .0532          | 5.37            |
| .905   | -.0098                | -.76            | .0005          | .04             | .0090          | .76             | .0277          | 2.48            | .0377          | 3.61            |
| .927   | -.0144                | -.109           | -.0048         | -.38            | -.0016         | .13             | .0177          | 1.55            | .0243          | 2.27            |
| .950   | -.0187                | -.158           | -.0104         | -.80            | -.0068         | -.55            | .0085          | .71             | .0092          | .84             |
| .973   | -.0196                | -.143           | -.0129         | -.97            | -.0085         | -.67            | .0041          | .34             | .0038          | .34             |
| .996   | -.0184                | -.130           | -.0125         | -.92            | -.0071         | -.55            | .0047          | .38             | .0024          | .21             |
| 1.018  | 0.0000                | .00             | .0029          | .21             | -.0005         | -.04            | .0095          | .76             | .0054          | .46             |
| 1.042  | .0050                 | .34             | .0060          | .42             | .0059          | .29             | .0140          | 1.09            | .0071          | .59             |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.324  | 0.0004                | 0.08            | 0.0004         | 0.08            | 0.0000         | 0.00            | 0.0012         | 0.29            | 0.0000         | 0.00            |
| .346   | .0128                 | 2.60            | .0160          | 3.40            | .0191          | 4.24            | .0253          | 5.92            | .0291          | 7.30            |
| .369   | .0172                 | 5.27            | .0205          | 4.07            | .0245          | 5.04            | .0310          | 6.80            | .0348          | 8.18            |
| .392   | .0206                 | 3.69            | .0242          | 4.53            | .0285          | 5.58            | .0363          | 7.51            | .0397          | 8.77            |
| .415   | ----                  | ----            | ----           | ----            | ----           | ----            | ----           | ----            | ----           | ----            |
| .437   | .0240                 | 3.86            | .0291          | 4.87            | .0335          | 5.87            | .0414          | 7.68            | .0474          | 9.40            |
| .460   | .0258                 | 5.94            | .0310          | 4.95            | .0365          | 6.04            | .0448          | 7.89            | .0510          | 9.60            |
| .483   | .0274                 | 3.99            | .0323          | 4.91            | .0391          | 6.21            | .0485          | 8.14            | .0540          | 9.69            |
| .505   | .0287                 | 3.99            | .0343          | 4.99            | .0418          | 6.34            | .0510          | 8.18            | .0573          | 9.86            |
| .551   | .0313                 | 5.99            | .0379          | 5.04            | .0459          | 6.38            | .0565          | 8.31            | .0638          | 10.03           |
| .597   | .0339                 | 3.99            | .0413          | 5.08            | .0471          | 6.04            | .0621          | 8.43            | .0697          | 10.11           |
| .620   | .0337                 | 3.82            | .0415          | 4.91            | .0506          | 6.25            | .0617          | 8.06            | .0712          | 9.95            |
| .642   | .0334                 | 3.65            | .0404          | 4.62            | .0506          | 6.04            | .0631          | 7.97            | .0728          | 9.82            |
| .666   | .0342                 | 3.61            | .0427          | 4.70            | .0515          | 5.92            | .0645          | 7.85            | .0736          | 9.57            |
| .688   | .0329                 | 3.36            | .0401          | 4.28            | .0501          | 5.58            | .0641          | 7.55            | .0730          | 9.19            |
| .710   | .0398                 | 3.94            | .0381          | 3.94            | .0486          | 5.25            | .0633          | 7.22            | .0729          | 8.90            |
| .734   | .0281                 | 2.69            | .0365          | 3.65            | .0478          | 4.99            | .0620          | 6.84            | .0706          | 8.69            |
| .756   | .0253                 | 2.35            | .0342          | 3.32            | .0443          | 4.49            | .0599          | 6.42            | .0710          | 8.14            |
| .779   | .0229                 | 2.06            | .0308          | 2.90            | .0406          | 3.99            | .0564          | 5.87            | .0668          | 7.43            |
| .825   | .0103                 | .88             | .0189          | 1.68            | .0312          | 2.90            | .0470          | 4.62            | .0575          | 6.04            |
| .871   | .0000                 | .17             | .0109          | .92             | .0219          | 1.93            | .0401          | 3.73            | .0519          | 5.16            |
| .893   | -.0037                | -.29            | .0061          | .50             | .0151          | 1.30            | .0328          | 2.98            | .0471          | 4.57            |
| .916   | -.0099                | -.76            | -.0005         | -.04            | .0075          | .63             | .0261          | 2.51            | .0377          | 3.57            |
| .939   | -.0135                | -.01            | -.0059         | -.46            | .0000          | .00             | .0136          | 1.17            | .0205          | 1.89            |
| .962   | -.0178                | -.130           | -.0121         | -.92            | -.0063         | -.50            | .0050          | .42             | .0032          | .29             |
| .984   | -.0212                | -.151           | -.0152         | -.113           | -.0081         | -.63            | .0005          | .04             | .0009          | .08             |
| 1.007  | -.0186                | -.130           | -.0144         | -.105           | -.0066         | -.50            | -.0010         | -.08            | .0020          | .17             |
| 1.030  | -.0006                | -.04            | .0006          | .04             | .0000          | .00             | .0027          | .21             | .0025          | .21             |

TABLE I.- Concluded

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\beta_{0.75R} = 16.4^\circ$ 

$$[M = 0.146; p_t = 2,153 \text{ lb/sq ft}; t_t = 80^\circ \text{ F}]$$

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|        | 1,550                 |                 | 1,600          |                 | 1,700          |                 | 1,800          |                 | 2,000          |                 |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.358  | 0.0352                | 9.11            | 0.0419         | 11.54           | 0.0483         | 15.02           | 0.0567         | 19.77           | 0.0640         | 27.53           |
| .380   | .0400                 | 9.74            | .0474          | 12.30           | .0541          | 15.86           | .0631          | 20.73           | .0695          | 28.20           |
| .403   | .0481                 | 11.04           | .0566          | 13.85           | .0635          | 17.54           | .0740          | 22.91           | .0823          | 31.47           |
| .426   | .0521                 | 11.33           | .0613          | 14.18           | .0695          | 18.17           | .0816          | 23.92           | .0914          | 33.07           |
| .449   | .0553                 | 11.41           | .0648          | 14.23           | .0738          | 18.30           | .0874          | 24.50           | .0973          | 35.40           |
| .471   | .0587                 | 11.54           | .0693          | 14.52           | .0786          | 18.59           | .0936          | 24.80           | .1045          | 34.20           |
| .495   | .0613                 | 11.46           | .0733          | 14.60           | .0834          | 18.76           | .0990          | 24.97           | .1104          | 34.37           |
| .517   | .0653                 | 11.88           | .0787          | 15.02           | .0900          | 19.39           | .1070          | 25.85           | .1200          | 35.75           |
| .540   | .0681                 | 11.67           | .0809          | 14.77           | .0950          | 19.60           | .1136          | 26.27           | .1276          | 36.42           |
| .585   | .0724                 | 11.46           | .0879          | 14.81           | .1025          | 19.51           | .1241          | 26.48           | .1389          | 36.59           |
| .621   | .0772                 | 11.33           | .0954          | 14.60           | .1101          | 19.43           | .1340          | 26.52           | .1512          | 36.95           |
| .654   | .0780                 | 11.04           | .0952          | 14.35           | .1124          | 19.14           | .1369          | 26.14           | .1546          | 36.42           |
| .676   | .0732                 | 10.03           | .0880          | 12.84           | .1034          | 17.04           | .1270          | 23.46           | .1414          | 32.23           |
| .700   | .0790                 | 10.45           | .0974          | 13.72           | .1160          | 18.46           | .1430          | 25.51           | .1626          | 35.80           |
| .722   | .0779                 | 9.99            | .0968          | 13.22           | .1153          | 17.79           | .1432          | 24.76           | .1622          | 34.62           |
| .745   | .0760                 | 9.43            | .0941          | 12.46           | .1145          | 17.12           | .1415          | 23.71           | .1629          | 33.70           |
| .768   | .0751                 | 9.06            | .0948          | 12.17           | .1158          | 16.79           | .1467          | 23.84           | .1692          | 33.95           |
| .791   | .0724                 | 8.48            | .0915          | 11.41           | .1136          | 15.99           | .1449          | 22.87           | .1691          | 32.94           |
| .813   | .0678                 | 7.72            | .0882          | 10.70           | .1106          | 15.15           | .1432          | 21.99           | .1681          | 31.85           |
| .859   | .0596                 | 6.42            | .0775          | 8.90            | .1023          | 13.26           | .1374          | 19.97           | .1645          | 29.50           |
| .905   | .0439                 | 4.49            | .0605          | 6.59            | .0812          | 9.99            | .1032          | 14.23           | .1119          | 19.05           |
| .927   | .0243                 | 2.43            | .0331          | 3.52            | .0374          | 4.49            | .0346          | 4.66            | .0348          | 5.79            |
| .950   | .0051                 | .50             | .0101          | 1.05            | .0125          | 1.47            | .0147          | 1.93            | .0199          | 3.23            |
| .973   | .0000                 | .00             | .0013          | .15             | .0052          | .59             | .0065          | .84             | .0117          | 1.85            |
| .996   | .0004                 | .04             | .0021          | .21             | .0041          | .46             | .0050          | .63             | .0100          | 1.55            |
| 1.018  | .0004                 | .04             | .0018          | .17             | .0050          | .55             | .0058          | .71             | .0102          | 1.55            |
| 1.042  | .0015                 | .15             | .0031          | .29             | .0043          | .46             | .0042          | .50             | .0111          | 1.64            |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.324  | 0.0000                | 0.00            | 0.0010         | 0.29            | 0.0002         | 0.08            | 0.0005         | 0.21            | 0.0004         | 0.21            |
| .346   | .0315                 | 8.43            | .0383          | 10.91           | .0434          | 13.97           | .0521          | 18.80           | .0581          | 25.89           |
| .369   | .0375                 | 9.40            | .0441          | 11.79           | .0499          | 15.07           | .0594          | 20.10           | .0654          | 27.32           |
| .392   | .0423                 | 9.99            | .0500          | 12.59           | .0573          | 16.28           | .0675          | 21.49           | .0751          | 29.50           |
| .415   |                       |                 |                |                 |                |                 |                |                 |                |                 |
| .437   | .0511                 | 10.83           | .0604          | 13.64           | .0688          | 17.54           | .0820          | 23.42           | .0907          | 31.98           |
| .460   | .0548                 | 11.04           | .0646          | 13.85           | .0733          | 17.75           | .0875          | 23.75           | .0968          | 32.44           |
| .483   | .0584                 | 11.20           | .0694          | 14.18           | .0788          | 18.17           | .0942          | 24.34           | .1047          | 33.40           |
| .505   | .0620                 | 11.37           | .0737          | 14.39           | .0839          | 18.51           | .1003          | 24.80           | .1115          | 34.03           |
| .531   | .0691                 | 11.62           | .0813          | 14.56           | .0934          | 18.88           | .1126          | 25.51           | .1261          | 33.25           |
| .597   | .0766                 | 11.88           | .0897          | 14.81           | .1046          | 19.51           | .1234          | 26.23           | .1419          | 36.63           |
| .620   | .0781                 | 11.67           | .0926          | 14.73           | .1075          | 19.30           | .1309          | 26.35           | .1489          | 37.01           |
| .642   | .0786                 | 11.33           | .0956          | 14.69           | .1108          | 19.22           | .1342          | 26.10           | .1530          | 36.72           |
| .666   | .0803                 | 11.16           | .0978          | 14.48           | .1129          | 18.88           | .1370          | 25.68           | .1565          | 36.21           |
| .688   | .0789                 | 10.62           | .0972          | 13.93           | .1125          | 18.21           | .1385          | 25.14           | .1568          | 33.12           |
| .710   | .0795                 | 10.37           | .0967          | 13.43           | .1132          | 17.75           | .1401          | 24.63           | .1607          | 34.87           |
| .734   | .0798                 | 10.07           | .0974          | 13.09           | .1148          | 17.42           | .1423          | 24.21           | .1647          | 34.58           |
| .756   | .0791                 | 9.69            | .0978          | 12.76           | .1157          | 17.04           | .1446          | 23.88           | .1682          | 34.28           |
| .779   | .0762                 | 9.06            | .0955          | 12.09           | .1136          | 16.24           | .1448          | 23.21           | .1692          | 33.49           |
| .825   | .1047                 | 11.75           | .0863          | 10.32           | .1054          | 14.23           | .1378          | 20.86           | .1656          | 30.93           |
| .871   | .0620                 | 6.59            | .0830          | 9.40            | .1024          | 13.09           | .1358          | 19.47           | .1670          | 29.54           |
| .893   | .0547                 | 5.67            | .0763          | 8.43            | .0962          | 12.00           | .1212          | 16.95           | .1455          | 24.76           |
| .916   | .0448                 | 4.53            | .0628          | 6.76            | .0545          | 8.81            | .0759          | 10.07           | .0651          | 10.95           |
| .939   | .0234                 | 2.31            | .0311          | 3.27            | .0272          | 3.23            | .0230          | 3.06            | .0225          | 3.69            |
| .962   | .0039                 | .58             | .0095          | .97             | .0101          | 1.17            | .0075          | .97             | .0151          | 2.10            |
| .984   | .0004                 | .04             | .0021          | .21             | .0044          | .50             | .0020          | .25             | .0078          | 1.22            |
| 1.007  | .0027                 | .25             | .0039          | .38             | .0026          | .29             | .0017          | .21             | .0082          | 1.26            |
| 1.030  | .0028                 | .25             | .0026          | .25             | .0035          | .38             | .0024          | .29             | .0078          | 1.17            |

TABLE II

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\theta_{0.75R} = 11.4^\circ$ [ $M = 0.151$ ;  $p_t = 2,133 \text{ lb/sq ft}$ ;  $t_t = 89^\circ \text{ F}$ ]

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 |                |                 |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|        | 1,250                 |                 | 1,300          |                 | 1,350          |                 | 1,400          |                 | 1,450          |                 | 1,500          |                 |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |                |                 |
| 0.398  | -0.0339               | -5.58           | -0.0311        | -5.54           | -0.0273        | -5.25           | -0.0219        | -4.53           | -0.0146        | -3.23           | -0.0080        | -1.89           |
| .380   | -0.0387               | -5.08           | -0.0307        | -5.16           | -0.0273        | -4.95           | -0.0211        | -4.11           | -0.0133        | -2.77           | -0.0060        | -1.34           |
| .403   | -0.0422               | -6.17           | -0.0368        | -5.83           | -0.0310        | -5.29           | -0.0240        | -4.41           | -0.0147        | -2.90           | -0.0060        | -1.26           |
| .426   | -0.0470               | -6.50           | -0.0406        | -6.08           | -0.0351        | -5.67           | -0.0270        | -4.70           | -0.0169        | -3.15           | -0.0074        | -1.47           |
| .449   | -0.0486               | -6.38           | -0.0440        | -6.23           | -0.0383        | -5.87           | -0.0303        | -4.99           | -0.0199        | -3.52           | -0.0095        | -1.60           |
| .472   | -0.0535               | -6.67           | -0.0488        | -6.20           | -0.0422        | -6.17           | -0.0328        | -5.16           | -0.0219        | -3.69           | -0.0111        | -2.01           |
| .495   | -0.0571               | -6.80           | -0.0527        | -6.80           | -0.0459        | -6.38           | -0.0362        | -5.41           | -0.0249        | -3.99           | -0.0132        | -2.27           |
| .517   | -0.0651               | -7.43           | -0.0578        | -7.13           | -0.0498        | -6.63           | -0.0396        | -5.67           | -0.0270        | -4.15           | -0.0151        | -2.48           |
| .540   | -0.0723               | -7.89           | -0.0635        | -7.51           | -0.0543        | -6.92           | -0.0435        | -5.96           | -0.0308        | -4.53           | -0.0171        | -2.69           |
| .583   | -0.0770               | -7.76           | -0.0723        | -7.89           | -0.0632        | -7.43           | -0.0521        | -6.59           | -0.0399        | -5.41           | -0.0242        | -3.52           |
| .631   | -0.0939               | -8.77           | -0.0854        | -8.64           | -0.0746        | -8.14           | -0.0626        | -7.34           | -0.0471        | -5.92           | -0.0312        | -4.20           |
| .654   | -0.0996               | -8.98           | -0.0912        | -8.90           | -0.0806        | -8.48           | -0.0679        | -7.68           | -0.0522        | -6.34           | -0.0356        | -4.62           |
| .676   | -0.0828               | -7.22           | -0.0885        | -8.35           | -0.0833        | -8.48           | -0.0728        | -7.97           | -0.0604        | -7.09           | -0.0451        | -5.67           |
| .700   | -0.0642               | -5.41           | -0.1059        | -9.63           | -0.0922        | -9.36           | -0.0802        | -8.48           | -0.0647        | -7.34           | -0.0470        | -5.71           |
| .722   | -0.0694               | -5.67           | -0.1126        | -9.55           | -0.1022        | -9.74           | -0.0884        | -9.06           | -0.0725        | -7.97           | -0.0442        | -6.58           |
| .745   | -0.1272               | -10.07          | -0.1825        | -10.49          | -0.1127        | -10.41          | -0.0975        | -9.69           | -0.0811        | -8.64           | -0.0533        | -7.22           |
| .768   | -0.1431               | -10.99          | -0.1343        | -11.16          | -0.1209        | -10.83          | -0.1098        | -10.20          | -0.0877        | -9.06           | -0.0679        | -7.51           |
| .791   | -0.1520               | -11.33          | -0.1423        | -11.50          | -0.1298        | -11.29          | -0.1143        | -10.70          | -0.0945        | -9.48           | -0.0750        | -8.06           |
| .813   | -0.1609               | -11.67          | -0.1502        | -11.79          | -0.1363        | -11.54          | -0.1203        | -10.95          | -0.1014        | -9.90           | -0.0827        | -8.64           |
| .839   | -0.1792               | -12.30          | -0.1672        | -12.42          | -0.1514        | -12.13          | -0.1359        | -11.54          | -0.1144        | -10.57          | -0.0950        | -9.40           |
| .905   | -0.1920               | -12.51          | -0.1804        | -12.72          | -0.1638        | -12.46          | -0.1462        | -11.96          | -0.1268        | -11.12          | -0.1068        | -10.03          |
| .927   | -0.1966               | -12.63          | -0.1859        | -12.80          | -0.1707        | -12.67          | -0.1524        | -12.17          | -0.1319        | -11.29          | -0.1113        | -10.20          |
| .950   | -0.2069               | -12.84          | -0.1937        | -13.01          | -0.1767        | -12.80          | -0.1579        | -12.50          | -0.1372        | -11.46          | -0.1154        | -10.32          |
| .973   | -0.2119               | -12.84          | -0.1978        | -12.97          | -0.1810        | -12.80          | -0.1617        | -12.50          | -0.1410        | -11.50          | -0.1188        | -10.57          |
| .996   | -0.2098               | -12.42          | -0.1977        | -12.67          | -0.1810        | -12.51          | -0.1632        | -12.33          | -0.1417        | -11.29          | -0.1196        | -10.20          |
| 1.018  | -0.2087               | -12.09          | -0.1881        | -12.42          | -0.1819        | -12.30          | -0.1654        | -11.88          | -0.1367        | -10.66          | -0.1101        | -9.19           |
| 1.042  | -0.0831               | -4.70           | -0.0692        | -4.24           | -0.0547        | -3.61           | -0.0401        | -2.85           | -0.0253        | -1.93           | -0.0150        | -1.22           |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |                |                 |
| 0.324  | -0.0445               | -8.10           | -0.0420        | -8.27           | -0.0370        | -7.85           | -0.0309        | -7.05           | -0.0251        | -5.67           | -0.0157        | -4.11           |
| .346   | -0.0344               | -5.87           | -0.0335        | -6.17           | -0.0302        | -6.00           | -0.0255        | -5.41           | -0.0179        | -4.11           | -0.0114        | -2.81           |
| .369   | -0.0320               | -5.12           | -0.0301        | -5.20           | -0.0256        | -4.76           | -0.0207        | -4.15           | -0.0135        | -2.90           | -0.0073        | -1.68           |
| .392   | -0.0380               | -5.71           | -0.0340        | -5.54           | -0.0284        | -4.99           | -0.0222        | -4.20           | -0.0143        | -2.90           | -0.0066        | -1.43           |
| .415   | —                     | —               | —              | —               | —              | —               | —              | —               | —              | —               | —              | —               |
| .437   | -0.0463               | -6.23           | -0.0428        | -6.23           | -0.0365        | -5.75           | -0.0288        | -4.87           | -0.0194        | -3.52           | -0.0103        | -2.01           |
| .460   | -0.0501               | -6.42           | -0.0466        | -6.46           | -0.0401        | -6.00           | -0.0323        | -5.20           | -0.0219        | -3.78           | -0.0120        | -2.22           |
| .483   | -0.0546               | -6.67           | -0.0502        | -6.63           | -0.0435        | -5.21           | -0.0353        | -5.41           | -0.0245        | -4.05           | -0.0136        | -2.39           |
| .505   | -0.0613               | -7.18           | -0.0564        | -7.13           | -0.0484        | -6.59           | -0.0390        | -5.71           | -0.0270        | -4.24           | -0.0160        | -2.69           |
| .551   | -0.0586               | -7.34           | -0.0656        | -7.60           | -0.0573        | -7.18           | -0.0472        | -6.34           | -0.0390        | -5.04           | -0.0218        | -3.36           |
| .597   | -0.0683               | -8.52           | -0.0777        | -8.32           | -0.0670        | -7.72           | -0.0555        | -6.88           | -0.0401        | -5.33           | -0.0266        | -3.78           |
| .620   | -0.0940               | -8.94           | -0.0839        | -8.60           | -0.0730        | -8.10           | -0.0605        | -7.22           | -0.0446        | -5.71           | -0.0306        | -4.20           |
| .642   | -0.0992               | -9.11           | -0.0899        | -8.98           | -0.0786        | -8.43           | -0.0655        | -7.55           | -0.0502        | -6.21           | -0.0349        | -4.62           |
| .666   | -0.1038               | -9.19           | -0.0921        | -9.11           | -0.0841        | -8.69           | -0.0710        | -7.89           | -0.0542        | -6.46           | -0.0388        | -4.93           |
| .688   | -0.1072               | -9.19           | -0.1022        | -9.48           | -0.0898        | -8.98           | -0.0776        | -8.35           | -0.0611        | -7.05           | -0.0449        | -5.54           |
| .710   | -0.1182               | -9.62           | -0.1101        | -9.90           | -0.0983        | -9.53           | -0.0845        | -8.81           | -0.0680        | -7.60           | -0.0516        | -6.17           |
| .734   | -0.1296               | -10.41          | -0.1202        | -10.45          | -0.1084        | -10.16          | -0.0952        | -9.40           | -0.0749        | -8.10           | -0.0587        | -6.80           |
| .756   | -0.1421               | -11.08          | -0.1292        | -10.91          | -0.1161        | -10.57          | -0.0882        | -9.99           | -0.0828        | -8.69           | -0.0650        | -7.30           |
| .779   | -0.1497               | -11.33          | -0.1388        | -11.37          | -0.1250        | -11.04          | -0.1096        | -10.41          | -0.0898        | -9.15           | -0.0720        | -7.85           |
| .823   | -0.1679               | -12.01          | -0.1551        | -12.00          | -0.1413        | -11.79          | -0.1239        | -11.12          | -0.1047        | -10.07          | -0.0872        | -8.98           |
| .871   | -0.1897               | -12.84          | -0.1713        | -12.55          | -0.1557        | -12.30          | -0.1373        | -11.67          | -0.1160        | -10.57          | -0.0981        | -9.57           |
| .893   | -0.1957               | -12.92          | -0.1780        | -12.72          | -0.1612        | -12.42          | -0.1438        | -11.92          | -0.1223        | -10.87          | -0.1032        | -9.82           |
| .915   | -0.2066               | -13.50          | -0.1862        | -12.97          | -0.1693        | -12.72          | -0.1506        | -12.17          | -0.1274        | -11.04          | -0.1086        | -10.07          |
| .939   | -0.2118               | -13.50          | -0.1914        | -13.01          | -0.1795        | -12.72          | -0.1560        | -12.42          | -0.1373        | -11.33          | -0.1164        | -10.28          |
| .962   | -0.2176               | -13.54          | -0.1979        | -13.13          | -0.1800        | -12.88          | -0.1614        | -12.42          | -0.1405        | -11.33          | -0.1201        | -10.37          |
| .984   | -0.2226               | -13.54          | -0.2023        | -13.13          | -0.1842        | -12.88          | -0.1691        | -12.42          | -0.1441        | -11.12          | -0.1204        | -10.16          |
| 1.007  | -0.2236               | -13.09          | -0.2032        | -12.88          | -0.1842        | -12.59          | -0.1650        | -12.13          | -0.1411        | -11.88          | -0.1204        | -10.16          |
| 1.030  | -0.1883               | -10.78          | -0.1733        | -10.74          | -0.1521        | -10.16          | -0.1244        | -8.94           | -0.0893        | -6.88           | -0.0590        | -4.87           |

TABLE II.- Continued

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\delta_{0.75R} = 11.4^\circ$  $[M = 0.151; p_t = 2,133 \text{ lb/sq ft}; t_t = 89^\circ \text{ F}]$ 

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 |                |                 |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|        | 1,550                 |                 | 1,600          |                 | 1,650          |                 | 1,700          |                 | 1,750          |                 | 1,800          |                 |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |                |                 |
| 0.358  | -0.0020               | -0.50           | 0.0030         | 0.80            | 0.0110         | 3.15            | 0.0158         | 4.83            | 0.0187         | 6.04            | 0.0218         | 7.47            |
| .380   | .0003                 | .06             | .0059          | 1.51            | .0142          | 3.86            | .0188          | 5.41            | .0221          | 6.71            | .0250          | 8.06            |
| .403   | .0015                 | .34             | .0081          | 1.93            | .0178          | 4.53            | .0234          | 6.34            | .0266          | 7.64            | .0298          | 9.06            |
| .426   | .0006                 | .13             | .0076          | 1.72            | .0186          | 4.49            | .0245          | 6.29            | .0283          | 7.68            | .0321          | 9.23            |
| .449   | -.0010                | -.21            | .0066          | 1.43            | .0183          | 4.20            | .0247          | 6.00            | .0290          | 7.47            | .0331          | 9.02            |
| .471   | -.0020                | -.38            | .0061          | 1.26            | .0185          | 4.03            | .0250          | 5.79            | .0297          | 7.30            | .0342          | 8.90            |
| .495   | -.0034                | -.63            | .0047          | .92             | .0182          | 3.78            | .0251          | 5.54            | .0305          | 7.13            | .0355          | 8.77            |
| .517   | -.0048                | -.84            | .0041          | .76             | .0186          | 3.69            | .0260          | 5.50            | .0315          | 7.05            | .0367          | 8.69            |
| .540   | -.0067                | -.15            | .0028          | .50             | .0177          | 3.56            | .0264          | 5.33            | .0298          | 6.58            | .0376          | 8.52            |
| .585   | -.0119                | -.85            | -.0028         | -.46            | -.0138         | 2.43            | -.0229         | 4.28            | -.0291         | 5.75            | .0363          | 7.60            |
| .631   | -.0171                | -2.56           | -.0063         | -.97            | -.0118         | 1.93            | -.0221         | 3.82            | -.0289         | 5.29            | .0366          | 7.09            |
| .654   | -.0218                | -5.02           | -.0100         | -1.47           | -.0088         | 1.58            | -.0196         | 3.27            | -.0268         | 4.74            | .0354          | 6.63            |
| .676   | -.0319                | -4.28           | -.0197         | -2.81           | -.0014         | -.21            | -.0094         | 1.51            | -.0174         | 2.98            | .0264          | 4.78            |
| .700   | -.0330                | -4.28           | -.0195         | -2.69           | -.0005         | -.08            | -.0124         | 1.93            | -.0203         | 3.36            | .0297          | 5.20            |
| .722   | -.0401                | -5.04           | -.0267         | -3.57           | -.0062         | -.88            | -.0077         | 1.17            | -.0157         | 2.52            | .0250          | 4.24            |
| .745   | -.0479                | -5.83           | -.0333         | -4.32           | -.0125         | -1.72           | -.0005         | .08             | -.0097         | 1.51            | .0192          | 3.15            |
| .768   | -.0529                | -6.25           | -.0384         | -4.83           | -.0160         | -2.14           | -.0020         | -.29            | -.0070         | 1.05            | .0166          | 2.64            |
| .791   | -.0600                | -6.88           | -.0443         | -5.41           | -.0226         | -2.94           | -.0085         | -1.17           | -.0005         | .08             | .0103          | 1.59            |
| .813   | -.0673                | -7.51           | -.0519         | -6.17           | -.0302         | -3.82           | -.0156         | -2.10           | -.0059         | -.84            | .0042          | .65             |
| .859   | -.0803                | -8.48           | -.0642         | -7.22           | -.0413         | -4.95           | -.0268         | -3.40           | -.0184         | -2.48           | -.0071         | -1.01           |
| .905   | -.0909                | -9.11           | -.0755         | -8.06           | -.0535         | -6.08           | -.0400         | -4.83           | -.0312         | -3.99           | -.0220         | -2.98           |
| .927   | -.0953                | -9.32           | -.0785         | -8.18           | -.0583         | -6.46           | -.0446         | -5.25           | -.0360         | -4.49           | -.0264         | -3.48           |
| .950   | -.0999                | -9.53           | -.0821         | -8.35           | -.0617         | -6.67           | -.0471         | -5.41           | -.0383         | -4.66           | -.0290         | -3.73           |
| .973   | -.1021                | -9.57           | -.0858         | -8.52           | -.0648         | -6.84           | -.0497         | -5.58           | -.0407         | -4.83           | -.0313         | -3.94           |
| .996   | -.1047                | -9.53           | -.0878         | -8.52           | -.0659         | -6.80           | -.0509         | -5.58           | -.0398         | -4.62           | -.0304         | -3.73           |
| 1.018  | -.0895                | -7.97           | -.0636         | -6.04           | -.0329         | -3.32           | -.0192         | -2.06           | -.0111         | -1.26           | -.0067         | -.80            |
| 1.042  | -.0106                | -.92            | -.0050         | -.46            | -----          | -----           | .0012          | -.13            | -.0012         | -.13            | -.0025         | -.29            |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |                |                 |
| 0.324  | -0.0087               | -2.43           | -0.0030        | -0.88           | 0.0053         | 1.68            | 0.0102         | 3.44            | 0.0135         | 4.74            | 0.0162         | 6.13            |
| .346   | -.0053                | -1.58           | -.0003         | -.08            | .0076          | 2.27            | .0125          | 3.94            | .0156          | 5.20            | .0184          | 6.50            |
| .369   | -.0015                | -.58            | -.0037         | -.97            | .0113          | 3.15            | .0160          | 4.74            | .0193          | 6.04            | .0226          | 7.51            |
| .392   | .0003                 | .08             | .0058          | 1.43            | .0147          | 3.86            | .0194          | 5.41            | .0231          | 6.80            | .0262          | 8.18            |
| .415   | -----                 | -----           | -----          | -----           | -----          | -----           | -----          | -----           | -----          | -----           | -----          | -----           |
| .437   | -.0016                | -.34            | .0053          | 1.17            | .0164          | 3.86            | .0222          | 5.34            | .0263          | 6.97            | .0306          | 8.56            |
| .460   | -.0032                | -.63            | .0046          | .97             | .0160          | 3.57            | .0226          | 5.37            | .0272          | 6.84            | .0319          | 8.48            |
| .483   | -.0040                | -.76            | .0040          | .80             | .0164          | 3.48            | .0234          | 5.29            | .0282          | 6.76            | .0335          | 8.48            |
| .505   | -.0058                | -1.05           | .0026          | .50             | .0161          | 3.27            | .0237          | 5.12            | .0288          | 6.59            | .0341          | 8.27            |
| .551   | -.0102                | -1.68           | -.0014         | -.25            | -.0135         | 2.52            | -.0220         | 4.36            | -.0284         | 5.96            | -.0348         | 7.72            |
| .597   | -.0136                | -2.06           | -.0026         | -.42            | -.0137         | 2.35            | -.0227         | 4.15            | -.0297         | 5.75            | -.0366         | 7.51            |
| .620   | -.0172                | -2.52           | -.0056         | -.88            | -.0119         | 1.97            | -.0215         | 3.78            | -.0284         | 5.29            | -.0357         | 7.05            |
| .642   | -.0211                | -2.98           | -.0092         | -1.38           | -.0086         | 1.38            | -.0192         | 3.27            | -.0263         | 4.74            | -.0348         | 6.63            |
| .666   | -.0244                | -3.32           | -.0119         | -1.72           | -.0071         | 1.09            | -.0169         | 2.77            | -.0249         | 4.32            | -.0331         | 6.08            |
| .688   | -.0306                | -4.03           | -.0177         | -2.48           | -.0011         | 1.7             | -.0122         | 1.95            | -.0212         | 3.57            | -.0295         | 5.25            |
| .710   | -.0368                | -4.70           | -.0240         | -3.27           | -.0035         | -.50            | -.0085         | 1.30            | -.0168         | 2.73            | -.0258         | 4.45            |
| .734   | -.0432                | -5.33           | -.0299         | -3.94           | -.0084         | -1.17           | -.0040         | -.59            | -.0123         | 1.93            | -.0214         | 3.57            |
| .756   | -.0497                | -5.96           | -.0348         | -4.45           | -.0136         | -1.85           | -.0006         | -.08            | -.0077         | 1.17            | -.0179         | 2.90            |
| .779   | -.0555                | -6.46           | -.0416         | -5.16           | -.0197         | -2.60           | -.0069         | -.97            | -.0026         | -.38            | -.0125         | 1.97            |
| .825   | -.0711                | -7.81           | -.0570         | -6.67           | -.0347         | -4.32           | -.0219         | -2.90           | -.0123         | -1.72           | -.0009         | -.13            |
| .871   | -.0815                | -8.48           | -.0654         | -7.26           | -.0434         | -5.12           | -.0305         | -3.82           | -.0206         | -2.73           | -.0093         | -1.30           |
| .893   | -.0868                | -8.81           | -.0710         | -7.68           | -.0496         | -5.71           | -.0367         | -4.49           | -.0279         | -3.61           | -.0181         | -2.48           |
| .916   | -.0920                | -9.11           | -.0752         | -7.93           | -.0546         | -6.13           | -.0423         | -5.04           | -.0339         | -4.28           | -.0239         | -3.19           |
| .939   | -.0956                | -9.23           | -.0795         | -8.18           | -.0579         | -6.34           | -.0465         | -5.41           | -.0375         | -4.62           | -.0274         | -3.57           |
| .962   | -.0997                | -9.40           | -.0831         | -8.35           | -.0617         | -6.59           | -.0492         | -5.58           | -.0405         | -4.87           | -.0303         | -3.86           |
| .984   | -.1025                | -9.44           | -.0864         | -8.48           | -.0642         | -6.71           | -.0515         | -5.71           | -.0429         | -5.04           | -.0330         | -4.11           |
| 1.007  | -.1016                | -9.15           | -.0836         | -8.02           | -.0605         | -6.17           | -.0465         | -5.04           | -.0369         | -4.24           | -.0290         | -3.52           |
| 1.050  | -.0324                | -2.85           | -.0192         | -1.80           | -.0088         | -.88            | -.0043         | -.46            | -.0019         | -.21            | -.0014         | -.17            |

TABLE II.- Concluded

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\beta_{0.75R} = 11.4^\circ$  $[M = 0.151; p_t = 2,135 \text{ lb/sq ft}; t_t = 89^\circ F]$ 

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|        | 1,850                 |                 | 1,900          |                 | 1,950          |                 | 2,000          |                 | 2,100          |                 |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.358  | 0.0269                | 9.69            | 0.0293         | 11.16           | 0.0317         | 12.72           | 0.0366         | 15.44           | 0.0411         | 19.09           |
| .380   | .0309                 | 10.49           | .0331          | 11.88           | .0356          | 13.43           | .0404          | 16.07           | .0453          | 19.83           |
| .403   | .0361                 | 11.58           | .0390          | 13.18           | .0416          | 14.81           | .0474          | 17.75           | .0529          | 21.86           |
| .426   | .0389                 | 11.79           | .0421          | 13.47           | .0451          | 15.19           | .0522          | 18.21           | .0583          | 22.79           |
| .449   | .0404                 | 11.62           | .0438          | 13.30           | .0474          | 15.15           | .0545          | 18.34           | .0611          | 22.66           |
| .471   | .0422                 | 11.58           | .0460          | 13.30           | .0495          | 15.07           | .0576          | 18.46           | .0647          | 22.87           |
| .495   | .0437                 | 11.41           | .0479          | 13.18           | .0518          | 15.02           | .0601          | 18.34           | .0683          | 22.95           |
| .517   | .0457                 | 11.41           | .0500          | 13.18           | .0546          | 15.15           | .0632          | 18.46           | .0689          | 22.16           |
| .540   | .0472                 | 11.29           | .0524          | 13.22           | .0570          | 15.15           | .0660          | 18.46           | .0760          | 23.42           |
| .585   | .0470                 | 10.37           | .0530          | 12.34           | .0575          | 14.10           | .0673          | 17.37           | .0773          | 21.99           |
| .631   | .0480                 | 9.82            | .0550          | 11.88           | .0620          | 14.10           | .0715          | 17.12           | .0839          | 22.12           |
| .654   | .0474                 | 9.36            | .0542          | 11.29           | .0599          | 13.13           | .0718          | 16.58           | .0840          | 21.36           |
| .676   | .0387                 | 7.39            | .0466          | 9.40            | .0522          | 11.08           | .0635          | 14.18           | .0757          | 18.63           |
| .700   | .0423                 | 7.81            | .0500          | 9.74            | .0567          | 11.62           | .0692          | 14.94           | .0857          | 19.89           |
| .722   | .0382                 | 6.84            | .0465          | 8.77            | .0534          | 10.62           | .0666          | 13.93           | .0808          | 18.63           |
| .745   | .0332                 | 5.75            | .0422          | 7.72            | .0490          | 9.44            | .0631          | 12.80           | .0782          | 17.46           |
| .768   | .0304                 | 5.12            | .0407          | 7.22            | .0479          | 8.94            | .0623          | 12.25           | .0791          | 17.12           |
| .791   | .0292                 | 4.11            | .0351          | 6.04            | .0428          | 7.76            | .0573          | 10.95           | .0748          | 15.74           |
| .813   | .0193                 | 3.06            | .0295          | 4.95            | .0368          | 6.50            | .0529          | 9.82            | .0711          | 14.56           |
| .859   | .0075                 | 1.13            | .0172          | 2.73            | .0261          | 4.36            | .0420          | 7.39            | .0620          | 12.00           |
| .905   | -.0103                | -1.47           | -.0025         | -.38            | .0045          | .71             | .0176          | 2.94            | .0322          | 5.92            |
| .927   | -.0151                | -2.10           | -.0083         | -1.22           | -.0038         | -.59            | .0039          | .63             | .0098          | 1.76            |
| .950   | -.0182                | -2.48           | -.0111         | -1.59           | -.0072         | -1.09           | -.0016         | -.23            | .0019          | .34             |
| .973   | -.0206                | -2.73           | -.0132         | -1.85           | -.0085         | -1.26           | -.0030         | -.46            | .0012          | .21             |
| .996   | -.0197                | -2.56           | -.0116         | -1.59           | -.0076         | -1.09           | -.0022         | -.34            | .0013          | .21             |
| 1.018  | -.0056                | -4.46           | -----          | -----           | .0003          | .04             | .0017          | .23             | .0026          | .42             |
| 1.042  | .0020                 | .25             | .0058          | .50             | .0040          | .55             | .0034          | .50             | .0031          | .50             |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.324  | 0.0213                | 8.48            | 0.0237         | 9.95            | 0.0261         | 11.54           | 0.0306         | 14.27           | 0.0353         | 18.13           |
| .346   | .0234                 | 8.73            | .0258          | 10.16           | .0282          | 11.71           | .0329          | 14.35           | .0368          | 17.71           |
| .369   | .0276                 | 9.65            | .0298          | 10.99           | .0329          | 12.80           | .0375          | 15.36           | .0421          | 18.97           |
| .392   | .0321                 | 10.57           | .0346          | 12.04           | .0373          | 13.64           | .0427          | 16.45           | .0474          | 20.14           |
| .415   | -----                 | -----           | -----          | -----           | -----          | -----           | -----          | -----           | -----          | -----           |
| .437   | .0377                 | 11.16           | .0409          | 12.76           | .0443          | 14.56           | .0513          | 17.73           | .0579          | 22.03           |
| .460   | .0396                 | 11.12           | .0431          | 12.76           | .0468          | 14.56           | .0541          | 17.75           | .0612          | 22.12           |
| .483   | .0414                 | 11.08           | .0452          | 12.76           | .0492          | 14.60           | .0572          | 17.88           | .0651          | 22.41           |
| .505   | .0430                 | 10.99           | .0470          | 12.67           | .0514          | 14.60           | .0598          | 17.88           | .0685          | 22.58           |
| .521   | .0446                 | 10.45           | .0495          | 12.25           | .0542          | 14.10           | .0641          | 17.58           | .0735          | 22.20           |
| .547   | .0475                 | 10.28           | .0528          | 12.04           | .0583          | 14.02           | .0695          | 17.58           | .0805          | 22.45           |
| .620   | .0473                 | 9.86            | .0531          | 11.67           | .0592          | 13.68           | .0710          | 17.29           | .0830          | 22.28           |
| .642   | .0467                 | 9.40            | .0524          | 11.12           | .0590          | 13.18           | .0715          | 16.83           | .0840          | 21.78           |
| .666   | .0461                 | 8.94            | .0525          | 10.74           | .0590          | 12.72           | .0718          | 16.28           | .0880          | 21.98           |
| .688   | .0429                 | 8.06            | .0496          | 9.82            | .0562          | 11.71           | .0700          | 15.36           | .0829          | 20.06           |
| .710   | .0399                 | 7.26            | .0468          | 8.98            | .0536          | 10.83           | .0674          | 14.35           | .0820          | 19.22           |
| .734   | .0365                 | 6.42            | .0441          | 8.18            | .0571          | 10.11           | .0656          | 13.51           | .0813          | 18.42           |
| .756   | .0327                 | 5.58            | .0407          | 7.34            | .0493          | 9.36            | .0647          | 12.92           | .0808          | 17.79           |
| .779   | .0283                 | 4.70            | .0369          | 6.46            | .0458          | 8.43            | .0615          | 11.92           | .0774          | 16.53           |
| .825   | .0161                 | 2.52            | .0246          | 4.07            | .0340          | 5.92            | .0511          | 9.36            | .0689          | 13.89           |
| .871   | .0068                 | 1.01            | .0145          | 2.27            | .0242          | 3.99            | .0423          | 7.34            | .0617          | 11.79           |
| .893   | -.0038                | -.55            | .0044          | .67             | .0128          | 2.06            | .0288          | 4.87            | .0469          | 8.73            |
| .916   | -.0116                | -1.64           | -.0045         | -.67            | -.0027         | .42             | .0145          | 2.39            | .0233          | 4.24            |
| .939   | -.0158                | -2.18           | -.0095         | -1.38           | -.0039         | -.59            | .0024          | .38             | .0062          | 1.09            |
| .962   | -.0185                | -2.48           | -.0124         | -1.76           | -.0073         | -1.09           | -.0013         | -.21            | .0014          | .25             |
| .984   | -.0208                | -2.73           | -.0142         | -1.97           | -.0089         | -1.30           | -.0025         | -.38            | .0012          | .21             |
| 1.007  | -.0164                | -2.20           | -.0106         | -1.43           | -.0062         | -.88            | -.0014         | -.21            | .0013          | .21             |
| 1.030  | .0003                 | .04             | .0006          | .08             | .0018          | .25             | .0023          | .34             | .0021          | .34             |

TABLE III

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\theta_{0,TDR} = 6.4^\circ$  $[M = 0.145; p_t = 2,135 \text{ lb/sq ft}; t_t = 83^\circ \text{ F}]$ 

| x      | Rotational speed, rpm |              |         |              |         |              |         |              |         |              |
|--------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
|        | 700                   |              | 800     |              | 900     |              | 1,000   |              | 1,100   |              |
|        | $c_t$                 | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ |
| Rake 1 |                       |              |         |              |         |              |         |              |         |              |
| 0.358  | -0.3540               | -18.46       | -0.2756 | -18.76       | -0.2153 | -18.55       | -0.1641 | -17.46       | -0.1287 | -16.56       |
| .380   | -.3548                | -17.42       | -.2840  | -18.21       | -.2234  | -18.13       | -.1700  | -17.04       | -.1352  | -16.39       |
| .403   | -.4113                | -19.05       | -.3137  | -18.97       | -.2407  | -18.42       | -.1816  | -17.16       | -.1434  | -16.39       |
| .426   | -.4350                | -19.05       | -.3338  | -19.09       | -.2556  | -18.51       | -.1958  | -17.50       | -.1570  | -16.98       |
| .449   | -.4585                | -19.05       | -.3595  | -19.51       | -.2809  | -19.30       | -.2192  | -18.59       | -.1790  | -18.36       |
| .471   | -.4925                | -19.51       | -.3870  | -20.02       | -.3057  | -20.02       | -.2403  | -19.43       | -.1950  | -19.07       |
| .493   | -.5434                | -20.48       | -.4238  | -20.86       | -.3548  | -20.86       | -.2645  | -20.35       | -.2140  | -19.91       |
| .517   | -.5803                | -20.94       | -.4496  | -21.19       | -.3592  | -21.19       | -.2609  | -20.69       | -.2277  | -20.29       |
| .540   | -.6159                | -21.28       | -.4818  | -21.74       | -.3850  | -21.99       | -.3070  | -21.63       | -.2437  | -20.79       |
| .583   | -.6644                | -21.19       | -.5131  | -22.62       | -.4465  | -23.24       | -.3558  | -23.16       | -.2894  | -22.47       |
| .631   | -.8161                | -24.13       | -.6477  | -25.01       | -.5090  | -24.88       | -.3929  | -23.71       | -.3130  | -22.85       |
| .694   | -.8504                | -24.26       | -.6804  | -25.59       | -.5267  | -24.84       | -.4113  | -23.96       | -.5280  | -23.10       |
| .767   | -.7906                | -21.82       | -.6656  | -23.92       | -.5380  | -24.55       | -.4521  | -24.34       | -.3477  | -23.69       |
| .700   | -.9371                | -25.51       | -.7347  | -26.27       | -.5819  | -25.64       | -.4503  | -24.51       | -.3600  | -23.69       |
| .722   | -.9810                | -25.35       | -.7722  | -26.06       | -.5992  | -25.60       | -.4662  | -24.59       | -.3758  | -23.85       |
| .745   | -1.0003               | -25.05       | -.7904  | -25.85       | -.6111  | -25.30       | -.4777  | -24.42       | -.3885  | -24.02       |
| .768   | -1.0625               | -25.81       | -.8214  | -26.06       | -.6322  | -25.39       | -.4985  | -24.72       | -.4040  | -24.23       |
| .791   | -1.0799               | -25.47       | -.8592  | -25.85       | -.6403  | -24.97       | -.5091  | -24.51       | -.4175  | -24.31       |
| .813   | -1.0899               | -25.01       | -.8872  | -25.39       | -.6492  | -24.63       | -.5233  | -24.51       | -.4321  | -24.48       |
| .859   | -1.1322               | -24.59       | -.8817  | -25.01       | -.6790  | -24.38       | -.5576  | -24.72       | -.4629  | -24.82       |
| .905   | -1.0929               | -22.55       | -.8602  | -23.16       | -.6933  | -23.63       | -.5865  | -24.67       | -.4892  | -24.90       |
| .927   | -1.0678               | -21.49       | -.8491  | -22.52       | -.6980  | -23.16       | -.5925  | -24.34       | -.5003  | -24.86       |
| .950   | -1.0342               | -20.31       | -.8297  | -21.28       | -.7044  | -22.87       | -.6092  | -24.42       | -.5136  | -24.90       |
| .973   | -9.737                | -18.67       | -.7926  | -19.85       | -.6978  | -22.12       | -.6153  | -24.09       | -.5296  | -25.07       |
| .996   | -.8963                | -16.79       | -.7223  | -17.67       | -.6694  | -20.73       | -.6167  | -23.58       | -.5367  | -24.82       |
| 1.018  | -.7808                | -14.51       | -.6225  | -14.90       | -.6287  | -19.05       | -.6079  | -22.74       | -.2466  | -24.73       |
| 1.042  | -.6350                | -11.37       | -.5239  | -12.23       | -.5642  | -16.70       | -.5752  | -21.02       | -.5481  | -24.23       |
| 1.064  | -.4186                | -7.34        | -.3629  | -8.51        | -.4515  | -13.09       | -.4750  | -17.00       | -.4814  | -20.84       |
| 1.085  | -.2222                | -3.82        | -.2169  | -4.87        | -.3113  | -8.85        | -.3191  | -11.20       | -.3239  | -13.75       |
| 1.133  | -.0279                | -4.46        | -.0391  | -8.84        | -.0834  | -2.27        | -.0699  | -2.35        | -.0578  | -2.35        |
| 1.179  | -.0373                | -5.9         | -.0367  | .80          | -.0150  | .54          | -.0170  | .55          | -.0094  | .21          |
| 1.201  | .0541                 | .84          | -.0394  | .80          | -.0164  | .42          | -.0252  | .80          | -.0110  | .42          |
| Rake 2 |                       |              |         |              |         |              |         |              |         |              |
| 0.324  | -0.2900               | -16.70       | -0.2338 | -17.58       | -0.1917 | -18.25       | -0.1578 | -18.55       | -0.1313 | -18.66       |
| .346   | -.3051                | -16.45       | -.2496  | -17.58       | -.2058  | -18.17       | -.1666  | -18.34       | -.1360  | -18.11       |
| .369   | -.3436                | -17.37       | -.2726  | -18.00       | -.2194  | -18.34       | -.1773  | -18.30       | -.1408  | -17.57       |
| .392   | -.3826                | -18.21       | -.3031  | -18.84       | -.2421  | -19.05       | -.1914  | -18.59       | -.1477  | -17.36       |
| .415   | -----                 | -----        | -----   | -----        | -----   | -----        | -----   | -----        | -----   | -----        |
| .437   | -.4324                | -18.46       | -.3492  | -19.47       | -.2801  | -19.77       | -.2142  | -18.67       | -.1651  | -17.40       |
| .460   | -.4653                | -18.88       | -.3787  | -20.06       | -.3072  | -20.60       | -.2517  | -19.18       | -.1850  | -18.32       |
| .483   | -.5061                | -19.56       | -.4101  | -20.69       | -.3285  | -20.98       | -.2501  | -19.72       | -.2022  | -19.28       |
| .505   | -.5365                | -20.56       | -.4400  | -21.23       | -.3559  | -21.74       | -.2727  | -20.56       | -.2174  | -19.83       |
| .531   | -.6246                | -21.15       | -.5020  | -22.20       | -.4109  | -23.00       | -.3193  | -22.07       | -.2542  | -21.25       |
| .557   | -.7379                | -23.08       | -.5851  | -23.88       | -.4746  | -24.42       | -.3639  | -23.21       | -.2890  | -22.30       |
| .620   | -.8172                | -24.59       | -.6384  | -25.09       | -.5077  | -25.26       | -.3601  | -23.96       | -.3076  | -22.85       |
| .642   | -.8692                | -25.26       | -.6790  | -25.77       | -.5320  | -25.56       | -.4090  | -24.26       | -.3249  | -23.31       |
| .666   | -.9064                | -25.39       | -.7134  | -26.10       | -.5508  | -25.51       | -.4237  | -24.34       | -.3401  | -23.52       |
| .688   | -.9330                | -25.30       | -.7393  | -26.19       | -.5719  | -25.64       | -.4443  | -24.59       | -.3582  | -23.98       |
| .710   | -.9822                | -25.81       | -.7728  | -26.32       | -.5932  | -25.77       | -.4624  | -24.80       | -.3723  | -24.15       |
| .734   | -1.0351               | -26.31       | -.8052  | -26.73       | -.6151  | -25.83       | -.4765  | -24.72       | -.3867  | -24.27       |
| .756   | -1.0698               | -26.40       | -.8216  | -26.48       | -.6247  | -25.68       | -.4898  | -24.67       | -.4011  | -24.44       |
| .779   | -1.0888               | -26.10       | -.8411  | -26.31       | -.6402  | -25.35       | -.5057  | -24.72       | -.4140  | -24.48       |
| .825   | -1.1466               | -25.93       | -.8823  | -26.06       | -.6700  | -25.05       | -.5390  | -24.68       | -.4476  | -24.99       |
| .871   | -1.1676               | -25.01       | -.8836  | -24.72       | -.6862  | -24.30       | -.5654  | -24.72       | -.4753  | -25.05       |
| .893   | -1.1411               | -25.84       | -.8829  | -24.09       | -.6948  | -24.00       | -.5737  | -24.55       | -.4876  | -25.15       |
| .916   | -1.1371               | -25.16       | -.8849  | -23.54       | -.7127  | -24.00       | -.5965  | -24.80       | -.5017  | -25.24       |
| .939   | -1.3051               | -25.93       | -.8621  | -22.37       | -.7194  | -23.63       | -.6044  | -24.51       | -.5149  | -25.24       |
| .962   | -1.0235               | -19.85       | -.8366  | -21.19       | -.7289  | -23.37       | -.6245  | -24.72       | -.5305  | -25.40       |
| .984   | -.9272                | -17.58       | -.7846  | -19.43       | -.7236  | -22.87       | -.6373  | -24.57       | -.5482  | -25.66       |
| 1.007  | -.8134                | -15.07       | -.7345  | -17.29       | -.7084  | -21.70       | -.6447  | -24.58       | -.5619  | -25.70       |
| 1.030  | -.6371                | -11.54       | -.5994  | -14.18       | -.6685  | -20.02       | -.6321  | -23.37       | -.5738  | -25.66       |
| 1.052  | -.4635                | -8.22        | -.4766  | -11.04       | -.5767  | -16.91       | -.5611  | -20.31       | -.5405  | -24.06       |
| 1.097  | -.1852                | -3.15        | -.2098  | -4.66        | -.2970  | -8.35        | -.2708  | -9.40        | -.2546  | -10.69       |
| 1.143  | -.0080                | -1.13        | -.0197  | -4.42        | -.0609  | -1.64        | -.0403  | -1.34        | -.0355  | -1.34        |
| 1.167  | .0156                 | .25          | .0101   | .21          | .0049   | .13          | .0040   | .13          | -.0033  | .13          |
| 1.188  | .0318                 | .50          | .0307   | .65          | -.0015  | -.04         | .0066   | .21          | -.0010  | -.04         |

TABLE III.- Continued

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\beta_{0.75R} = 6.4^\circ$ 

$$[M = 0.145; p_t = 2,135 \text{ lb/sq ft}; t_t = 85^\circ \text{ F}]$$

| x      | Rotational speed, rpm |                 |                |                 |                |                 |                |                 |                |                 |
|--------|-----------------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|        | 1,230                 |                 | 1,300          |                 | 1,400          |                 | 1,500          |                 | 1,600          |                 |
|        | c <sub>t</sub>        | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> | c <sub>t</sub> | Δp <sub>t</sub> |
| Rake 1 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.358  | -0.0925               | -14.88          | -0.0726        | -13.12          | -0.0575        | -12.03          | -0.0400        | -9.60           | -0.0267        | -7.29           |
| .380   | -.0960                | -14.54          | -.0762         | -12.95          | -.0598         | -11.78          | -.0411         | -9.31           | -.0273         | -7.04           |
| .403   | -.1038                | -14.84          | -.0835         | -13.37          | -.0666         | -12.37          | -.0462         | -9.85           | -.0306         | -7.42           |
| .426   | -.1181                | -15.97          | -.0952         | -14.42          | -.0758         | -13.33          | -.0532         | -10.73          | -.0356         | -8.17           |
| .449   | -.1353                | -17.10          | -.1073         | -15.43          | -.0852         | -14.21          | -.0604         | -11.57          | -.0412         | -8.97           |
| .471   | -.1453                | -17.77          | -.1172         | -16.06          | -.0944         | -15.01          | -.0668         | -12.20          | -.0450         | -9.35           |
| .495   | -.1585                | -18.44          | -.1292         | -16.85          | -.1034         | -15.64          | -.0741         | -12.87          | -.0516         | -10.19          |
| .517   | -.1667                | -18.57          | -.1366         | -17.06          | -.1097         | -15.89          | -.0794         | -13.21          | -.0556         | -10.52          |
| .540   | -.1819                | -19.41          | -.1476         | -17.65          | -.1176         | -16.31          | -.0869         | -13.85          | -.0618         | -11.19          |
| .563   | -.2099                | -20.67          | -.1717         | -18.93          | -.1388         | -17.77          | -.1058         | -15.55          | -.0777         | -13.00          |
| .611   | -.2331                | -21.29          | -.1918         | -19.62          | -.1554         | -18.45          | -.1212         | -16.52          | -.0903         | -14.04          |
| .654   | -.2441                | -21.50          | -.2042         | -20.16          | -.1665         | -19.07          | -.1307         | -17.19          | -.0989         | -14.80          |
| .676   | -.2606                | -22.21          | -.2208         | -21.09          | -.1812         | -20.08          | -.1451         | -18.43          | -.1132         | -16.39          |
| .700   | -.2729                | -22.46          | -.2318         | -21.38          | -.1892         | -20.25          | -.1509         | -18.53          | -.1175         | -16.43          |
| .722   | -.2868                | -22.88          | -.2453         | -21.93          | -.2024         | -21.00          | -.1398         | -19.33          | -.1265         | -17.15          |
| .745   | -.3040                | -23.51          | -.2608         | -22.60          | -.2147         | -21.59          | -.1740         | -20.08          | -.1373         | -18.03          |
| .768   | -.3196                | -23.97          | -.2743         | -23.06          | -.2282         | -22.26          | -.1843         | -20.63          | -.1471         | -18.74          |
| .791   | -.3358                | -24.31          | -.2882         | -23.52          | -.2421         | -22.95          | -.1965         | -21.34          | -.1566         | -19.57          |
| .813   | -.3502                | -24.81          | -.3020         | -23.98          | -.2543         | -23.43          | -.2074         | -21.93          | -.1672         | -20.12          |
| .859   | -.3802                | -25.49          | -.3303         | -24.82          | -.2794         | -24.36          | -.2291         | -22.93          | -.1877         | -21.58          |
| .905   | -.4050                | -25.78          | -.3561         | -25.40          | -.3019         | -24.99          | -.2506         | -23.81          | -.2063         | -22.30          |
| .927   | -.4156                | -25.82          | -.3685         | -25.66          | -.3124         | -25.24          | -.2594         | -24.06          | -.2133         | -22.51          |
| .950   | -.4300                | -26.07          | -.3813         | -25.91          | -.3228         | -25.45          | -.2596         | -24.40          | -.2210         | -22.76          |
| .973   | -.4439                | -26.28          | -.3923         | -26.03          | -.3316         | -25.53          | -.2770         | -24.48          | -.2280         | -22.93          |
| .996   | -.4580                | -26.49          | -.4042         | -26.20          | -.3412         | -25.66          | -.2840         | -24.52          | -.2347         | -23.06          |
| 1.018  | -.4739                | -26.82          | -.4185         | -26.54          | -.3521         | -25.91          | -.2939         | -24.82          | -.2407         | -23.14          |
| 1.042  | -.4798                | -26.53          | -.4318         | -26.75          | -.3650         | -26.24          | -.3068         | -25.32          | -.2531         | -23.77          |
| 1.064  | -.4889                | -23.22          | -.5896         | -23.64          | -.1866         | -23.14          | -.2511         | -20.29          | -.1718         | -15.80          |
| 1.085  | -.2541                | -15.49          | -.1973         | -11.74          | -.1451         | -10.02          | -.0782         | -6.20           | -.0377         | -3.40           |
| 1.133  | -.0356                | -1.81           | -.0205         | -1.17           | -.0089         | -.59            | -.0017         | -.13            | -.0024         | .21             |
| 1.179  | -.0027                | -.13            | -.0053         | .29             | -.0054         | .34             | -.0069         | .50             | -.0076         | .63             |
| Rake 2 |                       |                 |                |                 |                |                 |                |                 |                |                 |
| 0.324  | -0.1023               | -18.19          | -0.0823        | -16.39          | -0.0651        | -15.05          | -0.0479        | -12.70          | -0.0334        | -10.10          |
| .346   | -.0990                | -16.47          | -.0771         | -14.58          | -.0612         | -13.25          | -.0439         | -10.90          | -.0302         | -8.55           |
| .369   | -.0985                | -15.34          | -.0760         | -13.29          | -.0593         | -12.03          | -.0412         | -9.60           | -.0273         | -7.25           |
| .392   | -.1028                | -15.09          | -.0803         | -13.23          | -.0624         | -12.12          | -.0439         | -9.64           | -.0289         | -7.21           |
| .415   | -----                 | -----           | -----          | -----           | -----          | -----           | -----          | -----           | -----          | -----           |
| .437   | -.1227                | -16.18          | -.1021         | -15.09          | -.0810         | -13.88          | -.0581         | -11.44          | -.0397         | -8.89           |
| .460   | -.1385                | -17.35          | -.1129         | -15.85          | -.0888         | -14.46          | -.0646         | -12.07          | -.0453         | -9.64           |
| .483   | -.1505                | -17.94          | -.1229         | -16.43          | -.0970         | -15.05          | -.0713         | -12.70          | -.0493         | -9.98           |
| .505   | -.1639                | -18.69          | -.1335         | -17.06          | -.1071         | -15.89          | -.0776         | -13.21          | -.0550         | -10.65          |
| .551   | -.1897                | -19.83          | -.1597         | -18.24          | -.1235         | -17.06          | -.0932         | -14.55          | -.0692         | -12.28          |
| .597   | -.2158                | -20.92          | -.1772         | -19.16          | -.1410         | -17.69          | -.1077         | -15.51          | -.0800         | -13.12          |
| .620   | -.2302                | -21.38          | -.1888         | -19.66          | -.1523         | -18.40          | -.1170         | -16.22          | -.0887         | -14.00          |
| .642   | -.2489                | -21.79          | -.2001         | -20.12          | -.1634         | -19.07          | -.1255         | -16.81          | -.0968         | -14.76          |
| .666   | -.2535                | -22.92          | -.2115         | -20.50          | -.1737         | -19.54          | -.1334         | -17.48          | -.1050         | -15.43          |
| .688   | -.2687                | -22.50          | -.2232         | -21.13          | -.1883         | -20.50          | -.1466         | -18.52          | -.1152         | -16.39          |
| .710   | -.2805                | -22.76          | -.2389         | -21.72          | -.1983         | -20.92          | -.1573         | -19.07          | -.1241         | -17.10          |
| .734   | -.2955                | -23.18          | -.2355         | -22.30          | -.2099         | -21.42          | -.1678         | -19.66          | -.1340         | -17.86          |
| .756   | -.3130                | -23.85          | -.2671         | -22.81          | -.2221         | -22.01          | -.1780         | -20.23          | -.1445         | -18.70          |
| .779   | -.3288                | -24.31          | -.2802         | -23.22          | -.2363         | -22.72          | -.2100         | -21.18          | -.1562         | -19.62          |
| .825   | -.3607                | -25.19          | -.3113         | -24.36          | -.2646         | -24.02          | -.2160         | -22.51          | -.1764         | -20.92          |
| .871   | -.3897                | -25.78          | -.3365         | -24.94          | -.2866         | -24.65          | -.2340         | -23.10          | -.1929         | -21.67          |
| .993   | -.3984                | -25.70          | -.3491         | -25.24          | -.2964         | -24.86          | -.2443         | -23.52          | -.2016         | -22.09          |
| .916   | -.4127                | -25.95          | -.3617         | -25.49          | -.3101         | -25.36          | -.2532         | -23.77          | -.2111         | -22.55          |
| .939   | -.4250                | -26.07          | -.3732         | -25.66          | -.3179         | -25.36          | -.2627         | -24.06          | -.2193         | -22.85          |
| .962   | -.4382                | -26.24          | -.3855         | -25.87          | -.3268         | -25.45          | -.2711         | -24.23          | -.2247         | -22.85          |
| .984   | -.4535                | -26.53          | -.3993         | -26.20          | -.3376         | -25.70          | -.2777         | -24.27          | -.2315         | -23.02          |
| 1.007  | -.4682                | -26.78          | -.4113         | -26.37          | -.3494         | -25.99          | -.2853         | -24.36          | -.2373         | -23.06          |
| 1.030  | -.4847                | -27.11          | -.4247         | -26.62          | -.3603         | -26.20          | -.2918         | -24.36          | -.2427         | -23.06          |
| 1.052  | -.4807                | -26.32          | -.4233         | -25.99          | -.3613         | -25.74          | -.2898         | -23.69          | -.2294         | -21.34          |
| 1.097  | -.1861                | -9.77           | -.1189         | -7.00           | -.0810         | -5.53           | -.0401         | -5.14           | -.0221         | -1.97           |
| 1.145  | -.0217                | -1.09           | -.0096         | -.54            | -.0052         | -.34            | -.0028         | .21             | -.0029         | .29             |
| 1.167  | -.0059                | -.29            | 0              | 0               | -.0006         | .04             | -.0023         | .17             | -.0010         | .08             |
| 1.188  | -----                 | -----           | -----          | -----           | -.0021         | .13             | -.0058         | .42             | -.0029         | .21             |

TABLE III.- Concluded

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $B_{0.75} = 6.4^\circ$

$$[M = 0.145; p_t = 2,135 \text{ lb/sq ft}; t_t = 85^\circ F]$$

TABLE IV

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\delta_{0.75R} = 1.4^\circ$ [ $M = 0.147$ ;  $p_t = 2,133 \text{ lb/sq ft}$ ;  $t_t = 83^\circ \text{ F}$ ]

| x      | Rotational speed, rpm |              |         |              |         |              |         |              |         |              |
|--------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
|        | 300                   |              | 400     |              | 500     |              | 550     |              | 590     |              |
|        | $a_t$                 | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ |
| Rake 1 |                       |              |         |              |         |              |         |              |         |              |
| 0.358  | -0.9419               | -9.06        | -0.7801 | -13.34       | -0.9369 | -29.01       | -0.7410 | -23.79       | -0.6683 | -24.84       |
| .380   | -0.9766               | -8.85        | -0.7921 | -12.76       | -0.9829 | -24.72       | -0.8187 | -24.76       | -0.7593 | -25.89       |
| .402   | -1.0759               | -9.19        | -0.9091 | -13.81       | -1.1026 | -27.57       | -0.9299 | -26.52       | -0.8558 | -27.35       |
| .425   | -1.1418               | -9.23        | -0.9464 | -13.60       | -1.2120 | -27.19       | -0.9923 | -26.77       | -0.8839 | -27.61       |
| .449   | -1.2426               | -9.53        | -0.9850 | -13.43       | -1.2577 | -26.77       | -1.0755 | -27.53       | -0.9600 | -26.45       |
| .471   | -1.3377               | -9.76        | -1.0364 | -13.17       | -1.3031 | -26.44       | -1.1282 | -27.53       | -1.0070 | -26.45       |
| .493   | -1.5322               | -10.66       | -1.1264 | -13.93       | -1.3887 | -26.81       | -1.2271 | -28.49       | -1.1067 | -29.75       |
| .517   | -1.6005               | -10.66       | -1.1874 | -14.06       | -1.4233 | -26.31       | -1.2344 | -27.44       | -1.1283 | -29.04       |
| .540   | -1.7234               | -10.99       | -1.2623 | -14.31       | -1.4703 | -26.02       | -1.3053 | -27.78       | -1.1988 | -29.54       |
| .563   | -2.1388               | -12.59       | -1.4439 | -15.11       | -1.5206 | -24.84       | -1.3956 | -27.55       | -1.3246 | -30.13       |
| .584   | -2.4861               | -13.09       | -1.6049 | -15.57       | -1.5906 | -24.09       | -1.4720 | -26.81       | -1.4169 | -29.88       |
| .606   | -2.3636               | -12.04       | -1.6866 | -14.73       | -1.4543 | -20.56       | -1.4316 | -24.34       | -1.3620 | -26.81       |
| .700   | -2.6955               | -13.26       | -1.7758 | -15.53       | -1.5280 | -20.86       | -1.5129 | -24.84       | -1.4924 | -28.37       |
| .722   | -2.6734               | -12.76       | -1.7668 | -15.15       | -1.4392 | -19.03       | -1.4466 | -23.33       | -1.4617 | -26.94       |
| .745   | -2.6611               | -12.50       | -1.7670 | -14.52       | -1.3581 | -17.57       | -1.3956 | -21.53       | -1.4428 | -25.77       |
| .766   | -2.6674               | -11.96       | -1.7375 | -13.85       | -1.2714 | -15.82       | -1.3659 | -20.44       | -1.4536 | -25.22       |
| .791   | -2.5543               | -11.12       | -1.6694 | -12.92       | -1.1844 | -14.32       | -1.2897 | -18.84       | -1.4017 | -25.58       |
| .813   | -2.2994               | -9.57        | -1.5155 | -11.41       | -1.0745 | -12.63       | -1.1994 | -16.87       | -1.3282 | -21.74       |
| .835   | -1.9881               | -7.97        | -1.5835 | -9.86        | -1.0148 | -11.29       | -1.0852 | -14.52       | -1.2188 | -18.88       |
| .855   | -1.3903               | -5.29        | -1.0230 | -6.92        | -0.9238 | -9.65        | -0.9252 | -11.73       | -1.0045 | -14.77       |
| .877   | -1.2195               | -4.53        | -0.9343 | -6.17        | -0.8914 | -9.19        | -0.8852 | -10.93       | -0.9328 | -13.39       |
| .890   | -1.0870               | -3.94        | -0.8009 | -5.29        | -0.8589 | -8.64        | -0.8291 | -10.03       | -0.8746 | -12.23       |
| .913   | -0.9581               | -3.32        | -0.7200 | -4.53        | -0.8035 | -7.89        | -0.7614 | -9.23        | -0.8235 | -11.29       |
| .936   | -0.7781               | -2.69        | -0.6150 | -3.78        | -0.6995 | -6.71        | -0.6550 | -8.02        | -0.7183 | -9.57        |
| 1.018  | -0.6711               | -2.27        | -0.5987 | -3.56        | -0.6185 | -5.75        | -0.5880 | -7.09        | -0.6419 | -8.39        |
| 1.042  | -0.4650               | -1.55        | -0.4647 | -2.73        | -0.5397 | -4.55        | -0.4746 | -6.04        | -0.5624 | -7.22        |
| 1.064  | -0.2997               | -0.97        | -0.4154 | -2.39        | -0.4620 | -4.15        | -0.4703 | -5.08        | -0.4650 | -5.79        |
| 1.085  | -0.1575               | -0.50        | -0.3492 | -1.97        | -0.4053 | -3.57        | -0.4153 | -4.41        | -0.3832 | -4.70        |
| 1.133  | .0823                 | .25          | -0.2332 | -1.26        | -0.2940 | -2.48        | -0.3105 | -3.15        | -0.2469 | -2.90        |
| 1.179  | .3013                 | .88          | -0.1136 | -.59         | -0.1197 | -.97         | -0.1549 | -1.51        | -0.1037 | -1.17        |
| 1.201  | .3802                 | 1.09         | -0.0902 | -.46         | -0.1106 | -.86         | -0.1275 | -1.22        | -0.0830 | -.92         |
| 1.223  | .4617                 | 1.30         | -0.0779 | -.29         | -0.0704 | -.55         | -0.0936 | -.88         | -0.0586 | -.42         |
| 1.247  | .4708                 | 1.30         | -0.0428 | -.21         | -0.0456 | -.38         | -0.0707 | -.71         | -0.0073 | -.08         |
| 1.269  | .5270                 | 1.43         | -0.0166 | -.08         | -0.0236 | -.17         | -0.0740 | -.67         | -0.0076 | -.08         |
| Rake 2 |                       |              |         |              |         |              |         |              |         |              |
| 0.324  | -0.9117               | -9.69        | -0.7350 | -13.83       | -0.7228 | -21.32       | -0.5762 | -20.44       | -0.4969 | -20.39       |
| .346   | -0.8943               | -8.90        | -0.7431 | -13.13       | -0.8099 | -22.57       | -0.6720 | -22.32       | -0.5837 | -22.45       |
| .369   | -0.7068               | -9.06        | -0.8071 | -13.39       | -0.9448 | -24.21       | -0.7658 | -23.79       | -0.6761 | -24.38       |
| .392   | -0.1655               | -9.36        | -0.8920 | -13.93       | -1.0508 | -26.55       | -0.8775 | -25.72       | -0.7859 | -26.61       |
| .415   | -----                 | -----        | -----   | -----        | -----   | -----        | -----   | -----        | -----   | -----        |
| .437   | -1.1713               | -9.23        | -0.9737 | -13.64       | -1.1857 | -25.93       | -1.0058 | -26.40       | -0.8998 | -27.40       |
| .460   | -1.2450               | -9.32        | -1.0061 | -13.39       | -1.2279 | -23.51       | -1.0799 | -26.98       | -0.9704 | -26.07       |
| .483   | -1.3185               | -9.40        | -1.0564 | -13.39       | -1.2767 | -23.26       | -1.1393 | -27.11       | -1.0327 | -26.45       |
| .505   | -1.4401               | -9.82        | -1.1318 | -13.72       | -1.3549 | -23.64       | -1.2171 | -27.10       | -1.1116 | -29.29       |
| .521   | -1.7385               | -10.99       | -1.2655 | -14.06       | -1.4495 | -23.14       | -1.3467 | -26.07       | -1.2406 | -29.96       |
| .541   | -2.0143               | -11.82       | -1.4253 | -14.68       | -1.5295 | -24.12       | -1.4342 | -27.61       | -1.3293 | -29.63       |
| .620   | -2.1984               | -12.21       | -1.5556 | -15.36       | -1.5987 | -24.22       | -1.5170 | -28.12       | -1.4118 | -30.30       |
| .642   | -2.3153               | -12.42       | -1.6066 | -15.22       | -1.5901 | -23.67       | -1.5473 | -27.70       | -1.4496 | -30.07       |
| .666   | -2.3866               | -12.34       | -1.6340 | -15.02       | -1.5527 | -22.28       | -1.5368 | -26.52       | -1.4554 | -29.04       |
| .688   | -2.4395               | -12.21       | -1.6700 | -14.86       | -1.5169 | -21.07       | -1.5199 | -25.39       | -1.4513 | -28.07       |
| .710   | -2.5258               | -12.29       | -1.7176 | -14.81       | -1.4688 | -19.77       | -1.5117 | -24.47       | -1.4668 | -27.49       |
| .734   | -2.6026               | -12.21       | -1.7409 | -14.52       | -1.3986 | -18.21       | -1.5099 | -23.58       | -1.4866 | -26.95       |
| .756   | -2.6133               | -12.04       | -1.7412 | -14.10       | -1.3282 | -16.79       | -1.4577 | -22.16       | -1.4902 | -26.23       |
| .779   | -2.6400               | -11.67       | -1.7191 | -13.51       | -1.2488 | -15.32       | -1.3909 | -20.52       | -1.4594 | -24.93       |
| .829   | -2.6833               | -11.20       | -1.7021 | -12.63       | -1.1447 | -13.26       | -1.2521 | -17.24       | -1.3714 | -22.12       |
| .871   | -2.4839               | -9.82        | -1.5039 | -10.57       | -1.0481 | -11.50       | -1.1194 | -14.77       | -1.2495 | -19.09       |
| .893   | -2.3184               | -8.94        | -1.3223 | -9.82        | -1.0232 | -10.95       | -1.0278 | -13.22       | -1.1180 | -16.66       |
| .916   | -2.2877               | -8.60        | -1.3356 | -9.06        | -1.0381 | -10.83       | -0.9971 | -12.51       | -1.0636 | -15.48       |
| .939   | -2.1297               | -7.81        | -1.5130 | -8.56        | -1.0062 | -10.24       | -0.9461 | -11.58       | -0.9633 | -13.68       |
| .962   | -2.0058               | -7.18        | -1.2131 | -7.72        | -0.9503 | -9.44        | -0.8990 | -10.74       | -0.8892 | -12.30       |
| .984   | -1.9431               | -6.80        | -1.1605 | -7.22        | -0.8855 | -8.60        | -0.8519 | -9.95        | -0.8068 | -10.91       |
| 1.007  | -1.8891               | -6.46        | -1.1465 | -6.97        | -0.8598 | -7.97        | -0.7888 | -8.98        | -0.7431 | -9.82        |
| 1.030  | -1.7947               | -6.00        | -1.0583 | -6.29        | -0.7329 | -6.88        | -0.6919 | -7.72        | -0.6401 | -8.27        |
| 1.052  | -1.7444               | -5.71        | -1.0672 | -5.21        | -0.6924 | -6.29        | -0.6261 | -6.84        | -0.5510 | -6.97        |
| 1.097  | -1.3642               | -4.91        | -1.0447 | -5.83        | -0.5728 | -4.99        | -0.5164 | -5.41        | -0.5342 | -4.87        |
| 1.145  | -0.8080               | -2.43        | -0.7294 | -3.90        | -0.3367 | -2.81        | -0.3178 | -3.19        | -0.1988 | -2.31        |
| 1.167  | -----                 | -----        | -----   | -----        | -----   | -----        | -----   | -----        | -----   | -----        |
| 1.188  | -0.5760               | -1.09        | -0.5703 | -2.94        | -0.2001 | -2.10        | -0.2646 | -2.56        | -0.1161 | -1.30        |
| 1.213  | -0.2360               | -0.67        | -0.4736 | -2.39        | -0.2082 | -1.64        | -0.2079 | -1.97        | -0.0729 | -0.80        |
| 1.239  | -0.0468               | -0.13        | -0.3744 | -1.05        | -0.1465 | -1.13        | -0.1897 | -1.76        | -0.0446 | -0.50        |
| 1.257  | .1241                 | .34          | -0.2751 | -1.34        | -0.0881 | -0.67        | -0.1378 | -1.26        | -0.0161 | -0.17        |

TABLE V

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\theta_{0.75R} = -3.6^\circ$  $[M = 0.145; p_t = 2,134 \text{ lb/sq ft}; t_t = 93^\circ F]$ 

| x      | Rotational speed, rpm |              |         |              |         |              |         |              |         |              |         |              |
|--------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
|        | 300                   |              | 400     |              | 450     |              | 500     |              | 550     |              | 600     |              |
|        | $c_t$                 | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ |
| Rake 1 |                       |              |         |              |         |              |         |              |         |              |         |              |
| 0.358  | -0.8680               | -8.18        | -0.8087 | -13.55       | -0.8855 | -18.77       | -0.8946 | -25.42       | -0.8372 | -26.52       | -0.7157 | -26.98       |
| .380   | -0.8413               | -7.47        | -0.8059 | -12.72       | -0.9367 | -18.72       | -0.9443 | -23.29       | -0.8861 | -26.61       | -0.7397 | -26.98       |
| .403   | -0.9520               | -7.97        | -0.9386 | -13.97       | -1.0500 | -19.77       | -1.0991 | -25.56       | -1.0455 | -29.42       | -0.8947 | -29.96       |
| .426   | -1.0013               | -7.93        | -0.9773 | -13.76       | -1.1066 | -19.73       | -1.1577 | -24.47       | -1.1112 | -29.58       | -0.9618 | -30.47       |
| .449   | -1.0447               | -7.83        | -1.0053 | -13.43       | -1.1870 | -20.07       | -1.2185 | -25.35       | -1.1712 | -29.58       | -1.0108 | -30.38       |
| .471   | -1.1657               | -8.39        | -1.0640 | -13.55       | -1.2397 | -19.98       | -1.2674 | -25.22       | -1.2198 | -29.37       | -1.0648 | -30.31       |
| .495   | -1.3175               | -8.98        | -1.1329 | -13.97       | -1.3464 | -20.65       | -1.3632 | -25.81       | -1.3169 | -30.17       | -1.1514 | -31.59       |
| .517   | -1.4527               | -9.48        | -1.2222 | -14.18       | -1.3701 | -20.11       | -1.4050 | -25.47       | -1.3412 | -29.42       | -1.2010 | -31.35       |
| .540   | -1.6725               | -10.43       | -1.2955 | -14.59       | -1.4281 | -20.07       | -1.4652 | -25.43       | -1.4009 | -29.42       | -1.2660 | -32.64       |
| .563   | -1.9320               | -11.16       | -1.4240 | -14.60       | -1.6072 | -20.86       | -1.5626 | -25.05       | -1.4768 | -28.62       | -1.3208 | -30.47       |
| .581   | -2.3854               | -12.76       | -1.6159 | -15.36       | -1.7060 | -20.52       | -1.6502 | -24.51       | -1.5413 | -27.70       | -1.4247 | -30.47       |
| .604   | -2.4656               | -12.72       | -1.6748 | -15.36       | -1.7390 | -20.19       | -1.6601 | -23.79       | -1.5413 | -26.73       | -1.4224 | -29.33       |
| .676   | -2.2200               | -11.08       | -1.5699 | -13.93       | -1.8312 | -20.56       | -1.6647 | -25.08       | -1.5111 | -25.25       | -1.2909 | -25.77       |
| .700   | -2.7428               | -13.22       | -1.8217 | -15.61       | -1.8615 | -20.19       | -1.7268 | -25.12       | -1.5777 | -29.56       | -1.1913 | -28.75       |
| .722   | -2.7562               | -12.88       | -1.8381 | -15.17       | -1.8654 | -19.61       | -1.6971 | -22.03       | -1.5280 | -24.00       | -1.4523 | -27.15       |
| .745   | -2.7160               | -12.30       | -1.8246 | -14.69       | -1.8575 | -18.93       | -1.6375 | -20.60       | -1.4584 | -22.20       | -1.4061 | -25.47       |
| .768   | -2.8180               | -12.38       | -1.8792 | -14.52       | -1.8470 | -18.26       | -1.5988 | -19.51       | -1.4208 | -20.98       | -1.4091 | -24.76       |
| .791   | -2.7055               | -11.54       | -1.8093 | -13.72       | -1.7969 | -17.23       | -1.5268 | -18.09       | -1.3590 | -19.14       | -1.3528 | -23.08       |
| .813   | -2.4673               | -10.24       | -1.6834 | -12.42       | -1.6863 | -15.75       | -1.4305 | -16.49       | -1.2399 | -17.29       | -1.2695 | -21.07       |
| .839   | -2.2532               | -8.85        | -1.6812 | -11.46       | -1.6112 | -14.24       | -1.3189 | -14.39       | -1.1157 | -14.73       | -1.1833 | -18.59       |
| .905   | -1.5987               | -5.96        | -1.2478 | -8.27        | -1.2937 | -10.85       | -1.1346 | -11.72       | -0.9712 | -12.17       | -0.9876 | -14.73       |
| .927   | -1.3997               | -5.08        | -1.1220 | -7.26        | -1.1804 | -9.67        | -1.0944 | -10.66       | -0.9155 | -11.20       | -0.9163 | -13.34       |
| .950   | -1.2164               | -4.32        | -0.9650 | -6.08        | -1.0487 | -8.38        | -0.9882 | -9.69        | -0.8721 | -10.41       | -0.8592 | -12.21       |
| .973   | -1.0777               | -3.73        | -0.8716 | -5.23        | -0.9564 | -7.46        | -0.8988 | -8.60        | -0.8063 | -9.40        | -0.8046 | -11.16       |
| .996   | -0.8915               | -3.02        | -0.7240 | -4.36        | -0.8682 | -6.62        | -0.7981 | -7.51        | -0.7369 | -8.39        | -0.7218 | -9.78        |
| 1.018  | -0.7845               | -2.60        | -0.6483 | -3.82        | -0.7746 | -5.78        | -0.7288 | -6.71        | -0.6670 | -7.43        | -0.6646 | -8.81        |
| 1.042  | -0.5961               | -1.93        | -0.5942 | -3.19        | -0.6851 | -4.99        | -0.6626 | -5.96        | -0.6053 | -6.59        | -0.5930 | -7.68        |
| 1.064  | -0.3172               | -1.64        | -0.4845 | -2.75        | -0.5929 | -4.23        | -0.6020 | -5.20        | -0.5395 | -5.75        | -0.5164 | -6.55        |
| 1.085  | -0.4052               | -1.26        | -0.4251 | -2.25        | -0.5322 | -3.72        | -0.5231 | -4.57        | -0.4822 | -5.04        | -0.4523 | -5.63        |
| 1.133  | -0.2955               | -0.88        | -0.3292 | -1.76        | -0.4567 | -3.06        | -0.4765 | -3.94        | -0.4146 | -4.15        | -0.3526 | -4.20        |
| 1.179  | -0.1607               | -0.46        | -0.1730 | -0.88        | -0.2796 | -1.80        | -0.3384 | -2.69        | -0.2620 | -2.32        | -0.2306 | -2.64        |
| 1.201  | -0.0890               | -0.25        | -0.1522 | -0.76        | -0.2658 | -1.68        | -0.2960 | -2.31        | -0.2266 | -2.14        | -0.1869 | -2.10        |
| 1.223  | -0.0184               | -0.04        | -0.1366 | -0.67        | -0.2240 | -1.39        | -0.2466 | -1.89        | -0.1941 | -1.80        | -0.1595 | -1.76        |
| 1.247  | -0.0148               | -0.04        | -0.0790 | -0.58        | -0.1659 | -1.01        | -0.2182 | -1.64        | -0.1616 | -1.47        | -0.1201 | -1.30        |
| 1.269  | 0.0301                | 0.08         | -0.0529 | -0.25        | -0.1337 | -0.80        | -0.1814 | -1.34        | -0.1410 | -1.26        | -0.1187 | -1.26        |
| Rake 2 |                       |              |         |              |         |              |         |              |         |              |         |              |
| 0.324  | -0.9229               | -9.61        | -0.7616 | -14.20       | -0.7918 | -18.56       | -0.7432 | -21.44       | -0.6714 | -23.50       | -0.5500 | -22.91       |
| .346   | -0.8604               | -8.39        | -0.7430 | -12.88       | -0.8484 | -18.60       | -0.8104 | -21.95       | -0.7315 | -24.63       | -0.6133 | -23.96       |
| .369   | -0.9088               | -8.31        | -0.8108 | -13.18       | -0.9261 | -19.06       | -0.9170 | -23.29       | -0.8616 | -26.48       | -0.7161 | -26.19       |
| .392   | -0.9748               | -8.39        | -0.8914 | -13.64       | -1.0236 | -19.82       | -1.0494 | -29.09       | -0.9834 | -28.45       | -0.8290 | -28.54       |
| .415   |                       |              |         |              |         |              |         |              |         |              |         |              |
| .437   | -1.0491               | -8.10        | -0.9603 | -13.18       | -1.1382 | -19.77       | -1.1624 | -24.93       | -1.1129 | -26.87       | -0.9498 | -29.35       |
| .460   | -1.0866               | -7.97        | -0.9786 | -12.76       | -1.2054 | -19.90       | -1.2315 | -25.09       | -1.1796 | -29.08       | -1.0069 | -29.34       |
| .483   | -1.1596               | -8.10        | -1.0444 | -12.97       | -1.2660 | -19.90       | -1.2930 | -25.09       | -1.2334 | -28.96       | -1.0757 | -30.00       |
| .505   | -1.3067               | -8.73        | -1.1307 | -13.43       | -1.3438 | -20.19       | -1.3681 | -25.39       | -1.3023 | -29.23       | -1.1526 | -30.80       |
| .521   | -1.5285               | -9.69        | -1.2567 | -13.68       | -1.4953 | -20.60       | -1.4827 | -25.22       | -1.4231 | -29.29       | -1.2628 | -30.93       |
| .537   | -1.9163               | -10.83       | -1.4532 | -14.60       | -1.5822 | -20.11       | -1.5823 | -24.84       | -1.5088 | -26.66       | -1.3718 | -31.01       |
| .560   | -2.1519               | -11.71       | -1.5980 | -15.44       | -1.6995 | -20.81       | -1.6770 | -25.35       | -1.5877 | -29.04       | -1.4573 | -31.72       |
| .582   | -2.2682               | -11.98       | -1.6655 | -15.37       | -1.7429 | -20.60       | -1.7043 | -24.88       | -1.6683 | -26.41       | -1.4871 | -31.26       |
| .606   | -2.3609               | -11.96       | -1.7092 | -15.36       | -1.7680 | -20.15       | -1.7055 | -24.00       | -1.5953 | -27.15       | -1.4850 | -30.09       |
| .638   | -2.4042               | -11.79       | -1.7286 | -15.07       | -1.8141 | -20.02       | -1.7068 | -25.23       | -1.5786 | -26.02       | -1.4657 | -28.73       |
| .710   | -2.5158               | -11.96       | -1.7933 | -15.15       | -1.8259 | -19.52       | -1.7136 | -22.62       | -1.5683 | -25.05       | -1.4816 | -28.20       |
| .734   | -2.6176               | -12.17       | -1.8442 | -15.07       | -1.8470 | -19.10       | -1.6956 | -21.65       | -1.5398 | -23.79       | -1.3109 | -27.78       |
| .756   | -2.7650               | -12.34       | -1.8830 | -14.98       | -1.8351 | -18.43       | -1.6220 | -20.48       | -1.4879 | -22.32       | -1.1896 | -26.52       |
| .779   | -2.8007               | -12.13       | -1.8837 | -14.35       | -1.7969 | -17.51       | -1.5909 | -19.14       | -1.4189 | -20.65       | -1.4458 | -25.22       |
| .803   | -2.8829               | -11.79       | -1.9050 | -13.85       | -1.7851 | -16.42       | -1.5070 | -17.12       | -1.3007 | -17.88       | -1.3645 | -22.32       |
| .871   | -2.8604               | -11.08       | -1.7977 | -12.38       | -1.5919 | -13.53       | -1.2985 | -15.97       | -1.1313 | -14.75       | -1.2811 | -19.85       |
| .893   | -2.7103               | -10.28       | -1.7240 | -11.58       | -1.5386 | -12.23       | -1.2234 | -12.84       | -1.0547 | -13.39       | -1.1606 | -17.54       |
| .916   | -2.7448               | -10.11       | -1.6921 | -11.08       | -1.5556 | -11.23       | -1.1689 | -11.96       | -1.0137 | -12.55       | -1.1254 | -16.58       |
| .939   | -2.5465               | -9.15        | -1.5777 | -9.95        | -1.2476 | -10.09       | -1.1101 | -11.08       | -0.9621 | -11.62       | -1.0305 | -14.81       |
| .962   | -2.4179               | -8.48        | -1.4611 | -9.11        | -1.1514 | -9.09        | -1.0593 | -10.32       | -0.9221 | -10.87       | -0.9608 | -13.47       |
| .984   | -2.3128               | -7.93        | -1.3698 | -8.35        | -1.0697 | -8.28        | -1.0066 | -9.53        | -0.8816 | -10.16       | -0.9027 | -12.38       |
| 1.007  | -2.2663               | -7.60        | -1.3179 | -7.85        | -1.0052 | -7.58        | -0.9880 | -8.73        | -0.8462 | -9.53        | -0.8327 | -11.16       |
| 1.030  | -2.1767               | -7.13        | -1.1814 | -6.88        | -0.8748 | -6.45        | -0.8588 | -7.76        | -0.7702 | -8.48        | -0.7625 | -9.99        |
| 1.052  | -2.1577               | -6.92        | -1.1800 | -6.50        | -0.8759 | -6.32        | -0.8293 | -7.34        | -0.7245 | -7.81        | -0.6899 | -8.85        |
| 1.097  | -2.1297               | -6.53        | -1.1504 | -6.29        | -0.8657 | -5.99        | -0.7734 | -6.59        | -0.6413 | -6.63        | -0.5560 | -6.84        |
| 1.143  | -1.3676               | -4.03        | -0.7922 | -4.15        | -0.6260 | -4.13        | -0.5883 | -4.57        | -0.4881 | -4.24        | -0.3309 | -3.90        |
| 1.167  |                       |              |         |              |         |              |         |              |         |              |         |              |
| 1.188  | -0.9723               | -2.77        | -0.6776 | -3.32        | -0.5634 | -3.60        | -0.4994 | -3.98        | -0.3646 | -3.48        | -0.2694 | -3.06        |
| 1.213  | -0.7694               | -2.14        | -0.7674 | -2.85        | -0.4994 | -3.10        | -0.4504 | -3.48        | -0.3102 | -2.90        | -0.2301 | -2.56        |
| 1.239  | -0.6023               | -1.64        | -0.4772 | -2.31        | -0.3505 | -2.76        | -0.3992 | -3.02        | -0.2641 | -2.60        | -0.2121 | -2.31        |
| 1.257  | -0.3763               | -1.01        | -0.3321 | -1.68        | -0.2662 | -1.97        | -0.3152 | -2.35        | -0.2228 | -2.01        | -0.1602 | -1.72        |

TABLE VI

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\beta_{0.75R} = -8.6^\circ$  $[M = 0.145; p_t = 2,138 \text{ lb/sq ft}; t_t = 89^\circ \text{ F}]$ 

| x      | Rotational speed, rpm |              |         |              |         |              |         |              |         |              |         |              |
|--------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
|        | 300                   |              | 350     |              | 400     |              | 450     |              | 500     |              | 550     |              |
|        | $a_t$                 | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ | $a_t$   | $\Delta p_t$ |
| Bake 1 |                       |              |         |              |         |              |         |              |         |              |         |              |
| 0.358  | -0.8991               | -8.18        | -0.8936 | -11.58       | -0.8905 | -15.07       | -0.8884 | -18.39       | -0.8820 | -21.82       | -0.9690 | -30.97       |
| .380   | -0.8561               | -7.68        | -0.9173 | -11.20       | -0.8599 | -14.35       | -0.8691 | -17.54       | -0.8572 | -21.36       | -1.0259 | -30.89       |
| .403   | -0.9319               | -8.39        | -1.0719 | -12.34       | -1.0755 | -15.57       | -0.9811 | -18.67       | -0.9751 | -22.91       | -1.1884 | -33.74       |
| .426   | -1.0860               | -8.69        | -1.1560 | -12.59       | -1.0945 | -15.57       | -1.0286 | -18.59       | -1.0566 | -23.04       | -1.2555 | -33.99       |
| .449   | -1.1723               | -8.90        | -1.2388 | -12.80       | -1.1625 | -15.69       | -1.0737 | -18.34       | -1.0906 | -23.00       | -1.3390 | -34.12       |
| .471   | -1.3044               | -9.44        | -1.3248 | -13.05       | -1.2265 | -15.78       | -1.1378 | -18.51       | -1.1441 | -23.00       | -1.4023 | -34.07       |
| .495   | -1.1987               | -10.32       | -1.4734 | -13.81       | -1.3772 | -16.37       | -1.2186 | -18.88       | -1.2348 | -23.42       | -1.4943 | -34.54       |
| .517   | -1.1626               | -10.83       | -1.5623 | -14.02       | -1.3966 | -16.37       | -1.2700 | -18.84       | -1.2760 | -23.37       | -1.5424 | -34.20       |
| .540   | -1.1812               | -11.37       | -1.6900 | -14.52       | -1.4623 | -16.41       | -1.3181 | -18.72       | -1.3282 | -23.29       | -1.5863 | -33.61       |
| .563   | -2.0595               | -12.00       | -1.9317 | -15.32       | -1.6382 | -16.79       | -1.4401 | -18.88       | -1.4235 | -23.04       | -1.6908 | -33.07       |
| .585   | -2.3843               | -12.88       | -2.1176 | -15.57       | -1.7323 | -16.83       | -1.5554 | -18.88       | -1.5267 | -22.91       | -1.7609 | -31.93       |
| .607   | -2.1959               | -12.80       | -2.1948 | -15.57       | -1.7937 | -16.62       | -1.5744 | -18.46       | -1.5561 | -22.24       | -1.7729 | -30.72       |
| .629   | -2.2390               | -11.29       | -2.1668 | -14.73       | -1.7882 | -16.03       | -1.5645 | -17.73       | -1.4921 | -20.90       | -1.6661 | -28.20       |
| .700   | -2.7148               | -13.22       | -2.3990 | -15.90       | -1.9637 | -17.00       | -1.7088 | -18.72       | -1.6901 | -22.32       | -1.8128 | -29.63       |
| .722   | -2.7828               | -12.88       | -2.4090 | -15.48       | -1.9897 | -16.70       | -1.7266 | -18.34       | -1.6478 | -21.61       | -1.7713 | -28.07       |
| .745   | -2.7342               | -12.51       | -2.4456 | -15.23       | -2.0015 | -16.28       | -1.7242 | -17.73       | -1.6342 | -20.77       | -1.7216 | -26.14       |
| .768   | -2.6147               | -12.67       | -2.4946 | -15.07       | -2.0531 | -16.20       | -1.7324 | -17.50       | -1.6579 | -20.44       | -1.6734 | -24.93       |
| .791   | -2.6148               | -12.13       | -2.4824 | -14.56       | -2.0271 | -15.53       | -1.7441 | -16.91       | -1.6340 | -19.26       | -1.6481 | -23.84       |
| .813   | -2.3851               | -10.83       | -2.3166 | -13.22       | -1.9252 | -14.35       | -1.6815 | -18.86       | -1.5567 | -18.13       | -1.5119 | -21.70       |
| .835   | -2.5704               | -10.20       | -2.3699 | -12.80       | -1.9746 | -13.93       | -1.7014 | -15.19       | -1.5078 | -16.62       | -1.4144 | -18.84       |
| .859   | -1.8505               | -6.97        | -1.8746 | -9.61        | -1.5980 | -10.70       | -1.5913 | -11.19       | -1.2449 | -13.15       | -1.1619 | -14.69       |
| .872   | -1.7242               | -6.34        | -1.7263 | -8.64        | -1.4701 | -9.61        | -1.2885 | -10.66       | -1.1903 | -11.73       | -1.0808 | -13.34       |
| .895   | -1.5078               | -5.41        | -1.6074 | -7.83        | -1.5153 | -8.39        | -1.1594 | -9.36        | -1.0193 | -10.16       | -0.9964 | -12.00       |
| .917   | -1.3644               | -4.78        | -1.4429 | -6.88        | -1.1994 | -7.47        | -1.0492 | -8.27        | -0.9146 | -8.90        | -0.9210 | -10.83       |
| .939   | -1.1523               | -3.94        | -1.2341 | -5.75        | -1.0207 | -6.21        | -0.9204 | -7.01        | -0.7721 | -7.34        | -0.8292 | -9.48        |
| 1.018  | -1.0901               | -3.65        | -1.1234 | -5.12        | -1.0272 | -5.46        | -0.7964 | -6.00        | -0.6859 | -6.38        | -0.7294 | -8.51        |
| 1.042  | -0.8865               | -2.90        | -0.9702 | -4.32        | -0.7789 | -4.53        | -0.6956 | -5.12        | -0.6097 | -5.34        | -0.6903 | -7.47        |
| 1.064  | -0.7160               | -2.39        | -0.8717 | -3.63        | -0.7771 | -3.86        | -0.5938 | -4.28        | -0.5000 | -4.43        | -0.6007 | -6.46        |
| 1.085  | -0.5889               | -1.85        | -0.7156 | -3.06        | -0.5783 | -3.23        | -0.5164 | -3.63        | -0.4118 | -4.03        | -0.5329 | -5.62        |
| 1.132  | -0.5889               | -1.17        | -0.5226 | -2.14        | -0.4469 | -2.39        | -0.4151 | -2.81        | -0.4116 | -3.44        | -0.4517 | -4.36        |
| 1.179  | -0.2041               | -0.59        | -0.1705 | -0.67        | -0.1887 | -0.97        | -0.2121 | -1.38        | -0.2565 | -2.06        | -0.2658 | -2.56        |
| 1.201  | -0.1198               | -0.34        | -0.0880 | -0.54        | -0.1407 | -0.71        | -0.1770 | -1.15        | -0.2292 | -1.76        | -0.2383 | -2.27        |
| 1.223  | -0.0601               | -0.17        | -0.0448 | -0.17        | -0.0848 | -0.42        | -0.1403 | -0.88        | -0.1847 | -1.45        | -0.2020 | -1.89        |
| 1.247  | -0.0146               | -0.04        | -0.0457 | -0.17        | -0.0268 | -0.13        | -0.0683 | -0.42        | -0.1583 | -1.05        | -0.1504 | -1.38        |
| 1.269  | ---                   | ---          | 0.1039  | 0.38         | 0.0556  | 0.17         | -0.0215 | -0.13        | -0.1072 | -0.80        | -0.1165 | -0.05        |
| Bake 2 |                       |              |         |              |         |              |         |              |         |              |         |              |
| 0.324  | -0.9334               | -9.82        | -0.9058 | -12.97       | -0.8480 | -15.86       | -0.7959 | -18.84       | -0.7394 | -21.61       | -0.8034 | -26.37       |
| .346   | -0.8344               | -8.22        | -0.8793 | -11.79       | -0.8486 | -14.86       | -0.7990 | -17.17       | -0.7791 | -21.32       | -0.8718 | -26.83       |
| .369   | -0.8812               | -8.14        | -0.9449 | -11.88       | -0.9276 | -15.07       | -0.8742 | -18.17       | -0.8885 | -22.03       | -0.9988 | -30.97       |
| .392   | -0.9597               | -8.31        | -1.0173 | -12.04       | -0.9988 | -15.44       | -0.9545 | -18.67       | -0.9609 | -23.21       | -1.1516 | -33.03       |
| .415   | ---                   | ---          | ---     | ---          | ---     | ---          | ---     | ---          | ---     | ---          | ---     | ---          |
| .437   | -1.0974               | -8.56        | -1.1699 | -12.42       | -1.1286 | -15.65       | -1.0496 | -18.42       | -1.0712 | -23.21       | -1.2726 | -33.32       |
| .460   | -1.1660               | -8.64        | -1.2314 | -14.42       | -1.1751 | -15.48       | -1.1024 | -18.38       | -1.1212 | -23.08       | -1.3596 | -33.32       |
| .483   | -1.3022               | -9.19        | -1.3190 | -12.67       | -1.2442 | -15.61       | -1.1601 | -18.42       | -1.1773 | -23.08       | -1.4063 | -33.36       |
| .505   | -1.4741               | -9.95        | -1.3446 | -13.18       | -1.3359 | -16.03       | -1.2327 | -18.72       | -1.2955 | -23.34       | -1.4817 | -33.37       |
| .531   | -1.7700               | -10.93       | -1.6947 | -14.27       | -1.4923 | -16.41       | -1.3264 | -18.88       | -1.3668 | -23.29       | -1.4411 | -33.36       |
| .597   | -2.0877               | -11.92       | -1.8787 | -14.60       | -1.6374 | -16.62       | -1.4654 | -18.80       | -1.4654 | -23.21       | -1.7035 | -32.61       |
| .620   | -2.3553               | -12.84       | -2.0473 | -15.32       | -1.7516 | -17.12       | -1.5473 | -19.14       | -1.5662 | -23.29       | -1.7783 | -32.82       |
| .642   | -2.1334               | -12.92       | -2.1211 | -15.48       | -1.8273 | -17.25       | -1.5680 | -19.09       | -1.6022 | -23.63       | -1.8034 | -32.14       |
| .665   | -2.2444               | -12.98       | -2.2221 | -15.48       | -1.8728 | -17.04       | -1.6266 | -18.72       | -1.6177 | -23.00       | -1.7981 | -30.89       |
| .688   | -2.3765               | -12.76       | -2.3030 | -15.55       | -1.9199 | -16.91       | -1.6605 | -18.71       | -1.6694 | -22.37       | -1.7689 | -29.75       |
| .710   | -2.7349               | -13.13       | -2.5827 | -15.57       | -1.9749 | -16.83       | -1.6942 | -18.50       | -1.6919 | -22.03       | -1.7865 | -28.79       |
| .734   | -2.8467               | -13.22       | -2.4633 | -15.57       | -0.0237 | -16.79       | -1.7290 | -18.17       | -1.6882 | -21.78       | -1.8469 | -28.79       |
| .756   | -2.9964               | -13.51       | -2.4882 | -15.27       | -0.0247 | -16.41       | -1.7576 | -17.83       | -1.6886 | -21.15       | -1.7349 | -28.36       |
| .779   | -3.0212               | -13.22       | -2.5219 | -15.02       | -0.0265 | -16.07       | -1.7644 | -17.37       | -1.6602 | -20.18       | -1.7001 | -24.97       |
| .802   | -3.2505               | -13.43       | -2.6493 | -14.90       | -0.1538 | -15.82       | -1.8867 | -17.00       | -1.6228 | -18.97       | -1.6094 | -22.52       |
| .871   | -3.2273               | -12.63       | -2.4744 | -13.18       | -0.2081 | -14.18       | -1.7115 | -15.07       | -1.4973 | -16.28       | -1.4053 | -18.16       |
| .893   | -3.1228               | -11.92       | -2.3829 | -12.38       | -1.9850 | -13.47       | -1.6464 | -14.14       | -1.4090 | -14.94       | -1.3034 | -16.70       |
| .915   | -2.2410               | -11.96       | -2.3357 | -11.83       | -1.9603 | -12.97       | -1.3993 | -13.39       | -1.3234 | -13.68       | -1.2229 | -15.65       |
| .939   | -3.0223               | -11.08       | -2.0801 | -10.91       | -1.8207 | -11.75       | -1.4803 | -12.09       | -1.2148 | -12.23       | -1.1916 | -14.52       |
| .962   | -2.0767               | -10.20       | -2.0714 | -9.99        | -1.6715 | -10.53       | -1.3635 | -10.87       | -1.1044 | -10.87       | -1.1216 | -13.34       |
| .984   | -2.7311               | -9.55        | -1.9046 | -8.98        | -1.7684 | -9.40        | -1.2446 | -9.78        | -1.0122 | -9.74        | -1.0778 | -12.50       |
| 1.007  | -2.7031               | -9.15        | -1.8037 | -8.31        | -1.4258 | -8.64        | -1.1463 | -8.75        | -0.9189 | -8.64        | -1.0086 | -11.46       |
| 1.030  | -2.5624               | -8.48        | -1.6295 | -7.34        | -1.2408 | -7.50        | -0.9979 | -7.45        | -0.8169 | -7.31        | -0.9443 | -10.49       |
| 1.052  | -2.6017               | -8.43        | -1.5510 | -6.84        | -1.1733 | -6.76        | -0.9328 | -6.80        | -0.7366 | -6.65        | -0.9029 | -9.82        |
| 1.097  | -2.5133               | -7.81        | -1.4768 | -6.23        | -1.0626 | -5.87        | -0.7810 | -5.46        | -0.6662 | -5.15        | -0.7728 | -8.06        |
| 1.145  | -1.6493               | -4.91        | -0.9803 | -3.73        | -0.6821 | -3.61        | -0.5643 | -3.78        | -0.4668 | -3.86        | -0.4934 | -4.95        |
| 1.167  | ---                   | ---          | ---     | ---          | ---     | ---          | ---     | ---          | ---     | ---          | ---     | ---          |
| 1.188  | -1.2268               | -3.52        | -0.6453 | -2.52        | -0.5274 | -2.69        | -0.478  | -3.02        | -0.4216 | -3.26        | -0.3831 | -3.69        |
| 1.213  | -0.9715               | -2.73        | -0.5255 | -2.01        | -0.4204 | -2.10        | -0.3966 | -2.52        | -0.3869 | -3.02        | -0.3467 | -3.27        |
| 1.239  | -0.7924               | -2.18        | -0.4139 | -1.55        | -0.3435 | -1.68        | -0.3222 | -2.18        | -0.3350 | -2.56        | -0.3045 | -2.81        |
| 1.257  | -0.5568               | -1.51        | -0.2984 | -0.88        | -0.2178 | -1.05        | -0.2940 | -1.55        | -0.2615 | -1.97        | -0.2164 | -1.97        |

TABLE VI.- Concluded

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\theta_{0.75R} = -8.6^\circ$ [ $M = 0.145$ ;  $P_t = 2,138 \text{ lb/sq ft}$ ;  $t_t = 89^\circ \text{ F}$ ]

| x       | Rotational speed, rpm |              |         |              |         |              |         |              |         |              |         |              |
|---------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
|         | 600                   |              | 650     |              | 700     |              | 800     |              | 900     |              | 950     |              |
|         | $c_t$                 | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ |
| Table 1 |                       |              |         |              |         |              |         |              |         |              |         |              |
| 0.358   | -0.8605               | -32.73       | -0.7306 | -32.61       | -0.6242 | -32.51       | -0.4820 | -32.52       | -0.3609 | -30.76       | -0.3208 | -30.47       |
| .360    | -0.9394               | -33.66       | -0.8123 | -34.16       | -0.7072 | -34.49       | -0.5407 | -34.57       | -0.4013 | -32.23       | -0.2540 | -31.68       |
| .403    | -1.0545               | -33.63       | -0.9145 | -36.26       | -0.8048 | -37.01       | -0.6035 | -36.17       | -0.4445 | -33.66       | -0.3969 | -33.49       |
| .426    | -1.1328               | -36.21       | -0.9923 | -37.22       | -0.8749 | -38.06       | -0.6571 | -37.26       | -0.4868 | -34.87       | -0.4342 | -34.66       |
| .449    | -1.2218               | -37.05       | -1.0824 | -38.52       | -0.9558 | -39.45       | -0.7207 | -38.77       | -0.5397 | -36.68       | -0.4788 | -36.26       |
| .471    | -1.2961               | -37.47       | -1.1526 | -39.11       | -1.0133 | -39.87       | -0.7659 | -39.28       | -0.5803 | -37.60       | -0.5178 | -37.38       |
| .495    | -1.4050               | -38.69       | -1.2518 | -40.41       | -1.0997 | -41.17       | -0.8243 | -40.71       | -0.6331 | -39.03       | -0.5632 | -38.69       |
| .517    | -1.4546               | -38.51       | -1.3129 | -40.58       | -1.1427 | -40.96       | -0.8669 | -40.50       | -0.6626 | -39.11       | -0.5966 | -39.26       |
| .540    | -1.5229               | -38.40       | -1.3780 | -40.66       | -1.2092 | -41.50       | -0.9146 | -40.91       | -0.7084 | -40.03       | -0.6332 | -39.87       |
| .563    | -1.6712               | -58.90       | -1.5303 | -41.80       | -1.5868 | -42.95       | -1.0346 | -42.72       | -0.8004 | -41.75       | -0.7155 | -41.59       |
| .584    | -1.7364               | -57.47       | -1.6040 | -40.62       | -1.6188 | -41.67       | -1.0907 | -41.75       | -0.8494 | -41.08       | -0.7662 | -41.29       |
| .606    | -1.7959               | -36.65       | -1.6404 | -40.08       | -1.4617 | -41.42       | -1.1272 | -41.65       | -0.8823 | -41.17       | -0.7919 | -41.17       |
| .627    | -1.7227               | -34.70       | -1.6331 | -38.65       | -1.4711 | -40.35       | -1.1522 | -41.17       | -0.9054 | -40.87       | -0.8143 | -40.96       |
| .700    | -1.8425               | -35.84       | -1.7239 | -39.49       | -1.5437 | -40.87       | -1.2013 | -41.46       | -0.9284 | -40.91       | -0.8427 | -41.08       |
| .722    | -1.8511               | -34.91       | -1.7481 | -38.69       | -1.5728 | -40.57       | -1.2291 | -41.12       | -0.9641 | -40.73       | -0.8687 | -40.91       |
| .745    | -1.8222               | -33.36       | -1.7386 | -37.72       | -1.5923 | -40.61       | -1.2556 | -40.71       | -0.9873 | -40.45       | -0.8937 | -40.79       |
| .768    | -1.8438               | -32.69       | -1.7831 | -37.10       | -1.6295 | -39.32       | -1.2915 | -40.62       | -1.0350 | -40.35       | -0.9184 | -40.66       |
| .791    | -1.8090               | -31.14       | -1.7825 | -36.01       | -1.6548 | -38.77       | -1.3125 | -40.08       | -1.0389 | -40.08       | -0.9422 | -40.50       |
| .813    | -1.7464               | -29.23       | -1.7373 | -34.45       | -1.6912 | -37.64       | -1.3319 | -39.57       | -1.0577 | -39.70       | -0.9643 | -40.33       |
| .839    | -1.6547               | -26.23       | -1.7460 | -32.48       | -1.6923 | -36.51       | -1.3894 | -39.07       | -1.1127 | -39.53       | -1.0256 | -39.20       |
| .863    | -1.4110               | -21.23       | -1.5688 | -27.70       | -1.5066 | -32.90       | -1.3580 | -37.18       | -1.1412 | -38.48       | -1.0288 | -39.78       |
| .877    | -1.2942               | -19.01       | -1.4776 | -29.47       | -1.3491 | -30.97       | -1.3803 | -35.96       | -1.1829 | -37.94       | -1.0742 | -39.40       |
| .890    | -1.2063               | -17.29       | -1.5822 | -23.29       | -1.3029 | -29.32       | -1.3797 | -35.08       | -1.1881 | -37.52       | -1.0986 | -39.28       |
| .913    | -1.0976               | -15.36       | -1.2750 | -20.94       | -1.4144 | -26.94       | -1.3559 | -35.66       | -1.1880 | -36.65       | -1.1109 | -38.88       |
| .936    | -0.9728               | -13.50       | -1.1431 | -18.34       | -1.2899 | -24.00       | -1.2960 | -31.43       | -1.1492 | -35.21       | -1.1175 | -38.35       |
| 1.018   | -0.8755               | -11.71       | -1.0546 | -16.24       | -1.1920 | -21.70       | -1.2501 | -29.67       | -1.1396 | -34.16       | -1.1287 | -37.60       |
| 1.042   | -0.7997               | -10.45       | -0.9779 | -11.69       | -1.1183 | -19.89       | -1.2148 | -28.16       | -1.1306 | -33.11       | -1.1330 | -36.97       |
| 1.064   | -0.6833               | -8.77        | -0.8436 | -12.67       | -1.0024 | -17.46       | -1.1330 | -25.72       | -1.1004 | -31.26       | -1.1293 | -36.09       |
| 1.089   | -0.5849               | -7.54        | -0.7211 | -10.62       | -0.8836 | -15.11       | -1.0426 | -23.21       | -1.0610 | -29.84       | -1.1168 | -35.00       |
| 1.133   | -0.4085               | -4.91        | -0.5148 | -7.26        | -0.6260 | -10.24       | -0.7932 | -16.91       | -0.9160 | -24.67       | -1.0686 | -31.89       |
| 1.179   | -0.1888               | -2.18        | -0.2664 | -3.61        | -0.5068 | -4.87        | -1.178  | -8.56        | -0.5707 | -24.77       | -0.7712 | -22.24       |
| 1.201   | -0.1517               | -1.72        | -0.2180 | -2.90        | -0.5002 | -5.85        | -0.5192 | -6.42        | -0.4542 | -22.54       | -0.6241 | -17.67       |
| 1.223   | -0.1096               | -1.22        | -0.1607 | -2.10        | -0.4742 | -2.64        | -0.2253 | -4.45        | -0.3365 | -8.39        | -0.4647 | -12.92       |
| 1.247   | -0.0504               | -0.59        | -0.1116 | -1.43        | -0.1184 | -1.76        | -0.1989 | -2.69        | -0.2162 | -5.29        | -0.3155 | -8.60        |
| 1.269   | -0.0158               | -0.17        | -0.0770 | -0.97        | -0.0663 | -1.26        | -0.0653 | -1.59        | -0.1266 | -3.02        | -0.1896 | -5.08        |
| Table 2 |                       |              |         |              |         |              |         |              |         |              |         |              |
| 0.324   | -0.6979               | -29.33       | -0.5606 | -27.65       | -0.4797 | -27.44       | -0.3885 | -28.96       | -0.2976 | -28.05       | -0.2635 | -27.65       |
| .346    | -0.7826               | -30.80       | -0.6461 | -29.84       | -0.5557 | -30.30       | -0.502  | -31.43       | -0.3888 | -29.88       | -0.2976 | -29.25       |
| .369    | -0.8743               | -32.27       | -0.7306 | -31.64       | -0.6517 | -32.73       | -0.542  | -33.66       | -0.3803 | -31.47       | -0.3320 | -30.59       |
| .392    | -0.9655               | -34.37       | -0.8277 | -33.74       | -0.7473 | -35.35       | -0.5816 | -35.84       | -0.4275 | -33.26       | -0.3775 | -32.73       |
| .415    | —                     | —            | —       | —            | —       | —            | —       | —            | —       | —            | —       | —            |
| .437    | -1.1500               | -35.21       | -0.9755 | -35.67       | -0.8826 | -37.42       | -0.6803 | -37.60       | -0.5114 | -35.72       | -0.4530 | -35.25       |
| .460    | -1.2121               | -35.88       | -1.0692 | -37.14       | -0.9571 | -38.86       | -0.7376 | -38.73       | -0.5979 | -37.01       | -0.4939 | -36.21       |
| .483    | -1.2862               | -36.26       | -1.1441 | -37.85       | -1.0268 | -39.36       | -0.7963 | -39.32       | -0.5991 | -37.85       | -0.5341 | -37.60       |
| .505    | -1.3663               | -36.84       | -1.2281 | -38.86       | -1.0965 | -40.24       | -0.8369 | -40.03       | -0.6438 | -38.90       | -0.5758 | -38.77       |
| .521    | -1.4547               | -38.10       | -1.4196 | -41.17       | -1.2598 | -42.17       | -0.9598 | -42.05       | -0.7558 | -40.75       | -0.6882 | -40.62       |
| .537    | -1.6319               | -37.22       | -1.5191 | -40.66       | -1.3343 | -41.42       | -1.0279 | -41.59       | -0.7980 | -40.79       | -0.7185 | -40.91       |
| .562    | -1.7120               | -37.60       | -1.6036 | -41.33       | -1.3998 | -41.84       | -1.0614 | -42.13       | -0.8365 | -41.17       | -0.7522 | -41.25       |
| .582    | -1.7568               | -37.25       | -1.6146 | -40.96       | -1.4408 | -41.39       | -1.1166 | -42.01       | -0.8643 | -41.08       | -0.7769 | -41.25       |
| .606    | -1.7794               | -36.38       | -1.6755 | -40.20       | -1.4765 | -41.08       | -1.1489 | -41.67       | -0.8923 | -40.87       | -0.8039 | -41.04       |
| .628    | -1.8129               | -35.88       | -1.7059 | -39.70       | -1.5113 | -40.79       | -1.1786 | -41.38       | -0.9196 | -40.79       | -0.8304 | -41.04       |
| .710    | -1.8229               | -34.96       | -1.7302 | -38.98       | -1.5417 | -40.24       | -1.2087 | -41.12       | -0.9472 | -40.71       | -0.8661 | -41.00       |
| .734    | -1.8662               | -34.02       | -1.7694 | -38.24       | -1.5823 | -39.92       | -1.2419 | -40.87       | -0.9731 | -40.34       | -0.8814 | -40.83       |
| .756    | -1.8777               | -33.82       | -1.7926 | -37.89       | -1.6279 | -39.66       | -1.2701 | -40.58       | -0.9959 | -40.20       | -0.9050 | -40.75       |
| .779    | -1.8556               | -32.40       | -1.8106 | -37.14       | -1.6406 | -39.05       | -1.2994 | -40.29       | -1.0209 | -39.99       | -0.9288 | -40.24       |
| .823    | -1.8504               | -30.21       | -1.8437 | -35.73       | -1.7037 | -38.27       | -1.3672 | -40.03       | -1.0801 | -39.53       | -0.9805 | -40.41       |
| .871    | -1.6895               | -26.33       | -1.8004 | -33.03       | -1.7079 | -36.34       | -1.4164 | -39.28       | -1.1294 | -39.57       | -1.0308 | -40.24       |
| .893    | -1.5661               | -23.88       | -1.7073 | -30.55       | -1.6846 | -34.96       | -1.4456 | -38.56       | -1.1445 | -39.11       | -1.0492 | -39.59       |
| .916    | -1.4705               | -21.86       | -1.6670 | -29.08       | -1.6800 | -33.99       | -1.4498 | -38.23       | -1.1728 | -39.07       | -1.0741 | -39.87       |
| .939    | -1.3427               | -19.47       | -1.5513 | -26.40       | -1.6158 | -31.83       | -1.4504 | -37.31       | -1.1853 | -38.32       | -1.0917 | -39.53       |
| .962    | -1.2392               | -17.54       | -1.4376 | -23.88       | -1.5592 | -29.96       | -1.4375 | -36.09       | -1.1973 | -37.98       | -1.1063 | -39.11       |
| .984    | -1.1358               | -15.69       | -1.3233 | -21.49       | -1.4793 | -27.86       | -1.4221 | -34.91       | -1.1976 | -37.14       | -1.1234 | -38.82       |
| 1.007   | -1.0243               | -13.35       | -1.2112 | -19.22       | -1.3726 | -25.26       | -1.3820 | -35.15       | -1.1992 | -36.34       | -1.1361 | -38.36       |
| 1.030   | -0.9145               | -12.09       | -1.1009 | -17.08       | -1.3061 | -23.50       | -1.3637 | -31.96       | -1.2026 | -32.55       | -1.1454 | -37.61       |
| 1.052   | -0.8567               | -10.83       | -0.9974 | -15.15       | -1.1932 | -21.02       | -1.3122 | -30.15       | -1.1876 | -34.45       | -1.1491 | -37.14       |
| 1.077   | -0.6832               | -8.48        | -0.7867 | -11.46       | -0.9288 | -15.69       | -1.1801 | -28.84       | -1.1163 | -31.05       | -1.1508 | -35.67       |
| 1.145   | -0.3742               | -4.45        | -0.4600 | -6.42        | -0.5398 | -8.69        | -0.7337 | -15.90       | -0.8739 | -23.29       | -0.994  | -29.50       |
| 1.167   | -0.2417               | -2.77        | -0.2840 | -3.82        | -0.3013 | -4.70        | -0.4623 | -9.40        | -0.6026 | -15.48       | -0.7418 | -21.23       |
| 1.213   | -0.1719               | -1.93        | -0.2323 | -3.06        | -0.2114 | -3.23        | -0.3435 | -6.84        | -0.4671 | -11.73       | -0.6047 | -16.93       |
| 1.239   | -0.1374               | -1.51        | -0.1893 | -2.39        | -0.1695 | -2.32        | -0.2283 | -4.45        | -0.3220 | -7.93        | -0.4449 | -12.21       |
| 1.257   | -0.0739               | -0.80        | -0.1290 | -1.64        | -0.0997 | -1.47        | -0.1462 | -2.81        | -0.2093 | -5.08        | -0.2980 | -8.06        |

TABLE VII

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\theta_{0,TDR} = -13.6^\circ$ [ $M = 0.136$ ;  $p_t = 2,131 \text{ lb/sq ft}$ ;  $t_t = 90^\circ \text{ F}$ ]

| x      | Rotational speed, rpm |              |         |              |         |              |         |              |         |              |
|--------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
|        | 300                   |              | 350     |              | 400     |              | 450     |              | 500     |              |
|        | $c_t$                 | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ |
| Rate 1 |                       |              |         |              |         |              |         |              |         |              |
| 0.358  | -0.9644               | -9.15        | -0.8956 | -11.54       | -1.0696 | -18.00       | -0.9731 | -20.77       | -0.9162 | -24.09       |
| .360   | -1.0002               | -8.94        | -0.9108 | -11.08       | -1.0880 | -17.25       | -0.9952 | -19.97       | -0.9587 | -23.75       |
| .403   | -1.1307               | -9.55        | -1.0574 | -12.13       | -1.2154 | -18.17       | -1.0956 | -20.73       | -1.0673 | -24.93       |
| .486   | -1.2680               | -10.11       | -1.1528 | -12.51       | -1.2848 | -18.17       | -1.1486 | -20.56       | -1.1282 | -24.93       |
| .449   | -1.3920               | -10.53       | -1.2393 | -12.76       | -1.3541 | -18.17       | -1.1982 | -20.35       | -1.1891 | -24.93       |
| .471   | -1.5600               | -11.25       | -1.3595 | -13.30       | -1.4338 | -18.34       | -1.2724 | -20.60       | -1.2214 | -25.01       |
| .495   | -1.7371               | -12.92       | -1.5055 | -14.06       | -1.5179 | -18.84       | -1.3645 | -21.02       | -1.3393 | -25.47       |
| .517   | -1.9041               | -12.51       | -1.6193 | -14.48       | -1.6244 | -18.93       | -1.4251 | -21.02       | -1.3944 | -25.39       |
| .540   | -2.1149               | -13.50       | -1.7544 | -15.02       | -1.7110 | -19.09       | -1.5077 | -21.15       | -1.4662 | -25.56       |
| .585   | -2.4216               | -14.06       | -1.9918 | -15.74       | -1.9070 | -19.64       | -1.6609 | -21.63       | -1.5909 | -25.60       |
| .631   | -2.6543               | -14.18       | -2.1306 | -15.61       | -1.9774 | -18.88       | -1.7394 | -21.02       | -1.6677 | -24.88       |
| .651   | -2.7072               | -14.06       | -2.1899 | -15.48       | -2.0058 | -18.46       | -1.7599 | -20.32       | -1.6880 | -24.21       |
| .676   | -2.8473               | -12.80       | -2.1290 | -14.56       | -1.9826 | -17.67       | -1.7295 | -19.51       | -1.6390 | -22.85       |
| .700   | -2.9573               | -14.33       | -2.3757 | -15.69       | -2.1448 | -18.46       | -1.8910 | -20.60       | -1.7914 | -24.09       |
| .722   | -2.9887               | -14.06       | -2.4178 | -15.48       | -2.1523 | -17.96       | -1.8966 | -20.02       | -1.7928 | -23.37       |
| .745   | -3.0002               | -13.68       | -2.4479 | -15.19       | -2.1689 | -17.54       | -1.8856 | -19.30       | -1.7767 | -22.45       |
| .768   | -3.1316               | -13.85       | -2.5102 | -15.11       | -2.1989 | -17.85       | -1.9227 | -19.09       | -1.8079 | -22.16       |
| .791   | -3.1276               | -13.43       | -2.5272 | -14.77       | -2.1978 | -16.74       | -1.9107 | -18.42       | -1.7806 | -21.19       |
| .813   | -3.9536               | -12.34       | -2.3987 | -13.64       | -2.1294 | -15.78       | -1.8434 | -17.29       | -1.7247 | -19.97       |
| .829   | -3.0778               | -12.17       | -2.4957 | -13.43       | -2.1843 | -15.32       | -1.8621 | -16.53       | -1.7155 | -18.80       |
| .905   | -2.4593               | -9.23        | -2.0790 | -10.62       | -1.8912 | -12.59       | -1.6034 | -13.31       | -1.4680 | -15.27       |
| .927   | -2.2789               | -8.35        | -1.9611 | -9.78        | -1.8079 | -11.75       | -1.5394 | -12.63       | -1.3799 | -15.81       |
| .950   | -2.0669               | -7.39        | -1.8622 | -8.77        | -1.6604 | -10.53       | -1.3955 | -11.23       | -1.2322 | -12.21       |
| .973   | -1.8892               | -6.63        | -1.6690 | -7.93        | -1.5985 | -9.65        | -1.2964 | -10.16       | -1.1018 | -10.66       |
| .996   | -1.6480               | -5.62        | -1.4564 | -6.76        | -1.3589 | -8.22        | -1.1455 | -8.77        | -0.9723 | -9.19        |
| 1.018  | -1.5109               | -5.04        | -1.3498 | -6.13        | -1.2254 | -7.43        | -1.0360 | -7.76        | -0.8619 | -7.97        |
| 1.042  | -1.3373               | -4.36        | -1.1923 | -5.29        | -1.1103 | -6.42        | -0.9347 | -6.84        | -0.7271 | -6.84        |
| 1.064  | -1.1841               | -3.78        | -1.0729 | -4.66        | -0.9034 | -5.58        | -0.8191 | -5.87        | -0.6499 | -7.73        |
| 1.085  | -1.0605               | -3.32        | -0.9646 | -4.11        | -0.8770 | -4.87        | -0.7895 | -5.12        | -0.5703 | -4.95        |
| 1.133  | -0.8406               | -2.82        | -0.7622 | -3.11        | -0.7184 | -3.82        | -0.6300 | -4.24        | -0.4947 | -4.11        |
| 1.179  | -0.5645               | -1.03        | -0.3647 | -1.43        | -0.4109 | -2.10        | -0.5572 | -2.51        | -0.3136 | -2.52        |
| 1.201  | -0.2510               | -7.71        | -0.2832 | -1.09        | -0.3269 | -1.64        | -0.3103 | -1.97        | -0.2696 | -2.27        |
| 1.223  | -0.1656               | -4.46        | -0.2011 | -0.76        | -0.2477 | -1.22        | -0.2486 | -1.55        | -0.2044 | -1.85        |
| 1.247  | -0.0771               | -2.21        | -0.1884 | -1.55        | -0.1739 | -0.84        | -0.1995 | -1.22        | -0.1347 | -1.47        |
| 1.269  | 0.0149                | 0.04         | -0.0576 | -0.21        | -0.0600 | -0.58        | -0.1265 | -0.76        | -0.1523 | -1.13        |
| Rate 2 |                       |              |         |              |         |              |         |              |         |              |
| 0.324  | -1.0531               | -10.83       | -0.9055 | -12.92       | -1.0067 | -18.72       | -0.9039 | -21.32       | -0.8174 | -23.73       |
| .346   | -0.9402               | -9.25        | -0.8440 | -11.41       | -1.0171 | -17.71       | -0.9216 | -20.31       | -0.8560 | -23.29       |
| .369   | -0.9799               | -9.02        | -0.9179 | -11.50       | -1.1000 | -17.96       | -0.9910 | -20.48       | -0.9561 | -23.88       |
| .392   | -1.0560               | -9.15        | -1.0107 | -11.92       | -1.1935 | -18.34       | -1.0698 | -20.61       | -1.0294 | -24.72       |
| .415   | —                     | —            | —       | —            | —       | —            | —       | —            | —       | —            |
| .427   | -1.2853               | -9.99        | -1.1823 | -12.51       | -1.3121 | -18.09       | -1.1714 | -20.44       | -1.2476 | -24.72       |
| .460   | -1.4206               | -10.49       | -1.2776 | -12.84       | -1.3873 | -18.17       | -1.2252 | -20.31       | -1.2080 | -24.72       |
| .483   | -1.5571               | -10.95       | -1.3957 | -13.24       | -1.4671 | -18.30       | -1.2915 | -20.39       | -1.2684 | -24.72       |
| .505   | -1.7529               | -11.79       | -1.2359 | -14.06       | -1.3758 | -18.80       | -1.3782 | -20.81       | -1.3551 | -24.26       |
| .521   | -2.1040               | -12.97       | -1.8057 | -15.15       | -1.7770 | -19.43       | -1.5528 | -21.49       | -1.5051 | -23.68       |
| .597   | -2.3236               | -13.22       | -1.9719 | -15.27       | -1.8837 | -19.01       | -1.6425 | -20.98       | -1.5912 | -23.09       |
| .620   | -2.5117               | -13.76       | -2.1217 | -18.32       | -1.9913 | -19.52       | -1.7367 | -21.36       | -1.6861 | -23.68       |
| .642   | -2.6294               | -13.89       | -2.1858 | -15.74       | -2.0283 | -19.26       | -1.7807 | -21.15       | -1.7316 | -23.39       |
| .666   | -2.6980               | -13.76       | -2.2301 | -15.48       | -2.0694 | -18.72       | -1.8056 | -20.65       | -1.7489 | -24.72       |
| .688   | -2.7446               | -13.25       | -2.2605 | -15.19       | -2.1055 | -18.42       | -1.6013 | -17.75       | -1.7605 | -24.09       |
| .710   | -2.8595               | -13.68       | -2.3229 | -15.19       | -2.1413 | -18.17       | -1.8594 | -19.97       | -1.7823 | -23.63       |
| .734   | -2.9562               | -13.68       | -2.3927 | -15.07       | -2.1881 | -17.96       | -1.8862 | -19.72       | -1.8191 | -23.33       |
| .756   | -3.0359               | -13.64       | -2.4301 | -14.86       | -2.2009 | -17.54       | -1.9095 | -19.26       | -1.8198 | -22.66       |
| .779   | -3.0709               | -13.39       | -2.4400 | -14.48       | -2.2084 | -17.08       | -1.8921 | -18.59       | -1.8028 | -21.78       |
| .825   | -3.2620               | -13.43       | -2.5608 | -14.35       | -2.2923 | -16.74       | -1.9572 | -18.09       | -1.8098 | -20.65       |
| .871   | -3.1003               | -12.09       | -2.4191 | -12.84       | -2.1411 | -14.81       | -1.8310 | -16.03       | -1.6775 | -18.13       |
| .893   | -2.9787               | -11.35       | -2.3294 | -12.09       | -2.0469 | -13.81       | -1.7590 | -15.02       | -1.5015 | -13.72       |
| .916   | -2.9550               | -10.99       | -2.3123 | -11.67       | -2.0059 | -13.18       | -1.7094 | -14.23       | -1.5228 | -13.63       |
| .939   | -2.7859               | -10.07       | -2.1896 | -10.76       | -1.8843 | -12.09       | -1.6119 | -13.09       | -1.4023 | -14.06       |
| .962   | -2.6396               | -9.32        | -2.0255 | -10.07       | -1.7628 | -11.04       | -1.4874 | -11.79       | -1.2866 | -12.59       |
| .984   | -2.4914               | -8.60        | -1.9838 | -9.32        | -1.6251 | -9.95        | -1.3807 | -10.70       | -1.1760 | -11.25       |
| 1.007  | -2.3629               | -7.97        | -1.9386 | -8.90        | -1.5494 | -9.27        | -1.2968 | -9.82        | -1.0729 | -10.03       |
| 1.030  | -2.2410               | -7.39        | -1.7598 | -8.06        | -1.3623 | -7.97        | -1.1506 | -8.32        | -0.9244 | -8.43        |
| 1.052  | -2.1959               | -7.09        | -1.7386 | -7.64        | -1.3183 | -7.55        | -1.0895 | -7.89        | -0.8437 | -7.55        |
| 1.097  | -2.0755               | -6.42        | -1.6729 | -7.05        | -1.1966 | -6.55        | -0.9783 | -6.80        | -0.7435 | -6.38        |
| 1.145  | -1.3282               | -5.94        | -1.1121 | -4.49        | -0.7755 | -4.07        | -0.6547 | -4.36        | -0.4902 | -4.03        |
| 1.167  | —                     | —            | —       | —            | —       | —            | —       | —            | —       | —            |
| 1.188  | -0.9968               | -2.85        | -0.8500 | -3.25        | -0.7979 | -2.94        | -0.5172 | -3.32        | -0.3779 | -3.27        |
| 1.213  | -0.7785               | -2.18        | -0.6927 | -2.64        | -0.4955 | -2.48        | -0.4254 | -2.65        | -0.2168 | -2.54        |
| 1.239  | -0.5982               | -1.64        | -0.5626 | -2.10        | -0.4051 | -1.97        | -0.3818 | -2.35        | -0.3541 | -2.69        |
| 1.257  | -0.3886               | -1.05        | -0.3888 | -1.43        | -0.2712 | -1.30        | -0.2901 | -1.76        | -0.2684 | -2.01        |

TABLE VII-- Concluded

SECTION THRUST COEFFICIENT AND TOTAL-PRESSURE DIFFERENTIAL FOR  $\theta_{0.7DR} = -13.6^\circ$  $[M = 0.136; p_t = 2,151 \text{ lb/sq ft}; t_t = 90^\circ F]$ 

| x      | Rotational speed, rpm |              |         |              |         |              |         |              |
|--------|-----------------------|--------------|---------|--------------|---------|--------------|---------|--------------|
|        | 550                   |              | 600     |              | 650     |              | 700     |              |
|        | $c_t$                 | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ | $c_t$   | $\Delta p_t$ |
| Rake 1 |                       |              |         |              |         |              |         |              |
| 0.358  | -0.9090               | -26.87       | -0.8683 | -32.82       | -0.7180 | -31.83       | -0.6157 | -31.68       |
| .380   | -0.9522               | -26.49       | -0.9309 | -33.15       | -0.7963 | -33.28       | -0.6847 | -33.19       |
| .403   | -1.0098               | -26.49       | -1.0272 | -34.49       | -0.8892 | -35.04       | -0.7719 | -35.29       |
| .426   | -1.1397               | -30.42       | -1.0978 | -34.87       | -0.9622 | -36.13       | -0.8144 | -36.38       |
| .449   | -1.1930               | -30.21       | -1.1733 | -35.42       | -1.0441 | -36.95       | -0.9105 | -37.55       |
| .472   | -1.2514               | -30.21       | -1.2430 | -35.71       | -1.1078 | -37.32       | -0.9678 | -37.87       |
| .495   | -1.3397               | -30.68       | -1.3251 | -36.17       | -1.1865 | -38.06       | -1.0274 | -38.23       |
| .517   | -1.3920               | -30.68       | -1.3935 | -36.42       | -1.2391 | -38.06       | -1.0730 | -38.23       |
| .540   | -1.4609               | -30.76       | -1.4502 | -36.34       | -1.3000 | -38.23       | -1.1231 | -38.31       |
| .563   | -1.5651               | -30.42       | -1.5784 | -36.51       | -1.4146 | -38.40       | -1.2183 | -38.36       |
| .611   | -1.6394               | -29.34       | -1.6694 | -35.80       | -1.4972 | -37.68       | -1.2894 | -37.64       |
| .654   | -1.6937               | -28.73       | -1.7037 | -35.23       | -1.5433 | -37.43       | -1.3276 | -37.39       |
| .676   | -1.5868               | -26.59       | -1.6501 | -33.03       | -1.5920 | -35.92       | -1.3424 | -36.35       |
| .700   | -1.7111               | -26.28       | -1.7050 | -34.70       | -1.6333 | -37.10       | -1.4090 | -37.05       |
| .722   | -1.7374               | -27.36       | -1.8024 | -33.78       | -1.6676 | -36.68       | -1.4460 | -36.89       |
| .745   | -1.7260               | -26.19       | -1.8135 | -32.94       | -1.6968 | -36.17       | -1.4836 | -36.68       |
| .768   | -1.7424               | -25.81       | -1.8255 | -32.69       | -1.7492 | -36.17       | -1.5294 | -36.68       |
| .791   | -1.7265               | -24.67       | -1.8618 | -31.85       | -1.7852 | -35.84       | -1.5696 | -36.55       |
| .813   | -1.6903               | -23.08       | -1.8457 | -30.72       | -1.8005 | -35.17       | -1.5982 | -36.21       |
| .839   | -1.6266               | -21.53       | -1.8619 | -29.35       | -1.8656 | -34.49       | -1.6770 | -35.96       |
| .865   | -1.5897               | -17.46       | -1.6954 | -25.55       | -1.7934 | -31.47       | -1.6784 | -34.16       |
| .887   | -1.2931               | -15.86       | -1.5982 | -25.33       | -1.7588 | -30.13       | -1.6703 | -33.19       |
| .900   | -1.1814               | -14.14       | -1.5234 | -21.70       | -1.7159 | -28.70       | -1.6643 | -32.27       |
| .913   | -1.0705               | -12.51       | -1.4180 | -19.72       | -1.6328 | -26.65       | -1.6249 | -30.76       |
| .936   | -0.9338               | -10.66       | -1.2542 | -17.04       | -1.5064 | -24.05       | -1.5497 | -28.66       |
| 1.018  | -0.8144               | -9.32        | -1.1397 | -15.15       | -1.4045 | -21.91       | -1.4867 | -26.90       |
| 1.042  | -0.7279               | -8.27        | -1.0534 | -13.68       | -1.3300 | -20.27       | -1.4286 | -25.43       |
| 1.064  | -0.6855               | -7.09        | -0.9270 | -11.79       | -1.2050 | -18.00       | -1.3778 | -25.16       |
| 1.085  | -0.6002               | -6.29        | -0.8074 | -10.07       | -1.0652 | -15.65       | -1.2187 | -20.69       |
| 1.113  | -0.5102               | -5.12        | -0.5970 | -7.15        | -0.7784 | -10.91       | -0.9953 | -15.55       |
| 1.179  | -0.5526               | -3.40        | -0.5511 | -4.03        | -0.4172 | -5.62        | -0.7453 | -8.52        |
| 1.201  | -0.5327               | -3.15        | -0.5018 | -3.40        | -0.3267 | -4.32        | -0.4375 | -6.71        |
| 1.223  | -0.5023               | -2.81        | -0.2314 | -2.56        | -0.2487 | -3.23        | -0.3207 | -4.83        |
| 1.247  | -0.4621               | -2.39        | -0.1898 | -2.06        | -0.1743 | -2.22        | -0.2167 | -3.23        |
| 1.269  | -0.2243               | -2.01        | -0.1491 | -1.59        | -0.1207 | -1.51        | -0.1330 | -1.95        |
| Rake 2 |                       |              |         |              |         |              |         |              |
| 0.324  | -0.8013               | -28.12       | -0.7425 | -31.01       | -0.5874 | -26.79       | -0.4983 | -28.33       |
| .346   | -0.8478               | -27.86       | -0.8070 | -31.56       | -0.6628 | -30.42       | -0.5744 | -30.47       |
| .369   | -0.9356               | -26.83       | -0.8868 | -32.52       | -0.7449 | -32.05       | -0.6907 | -32.48       |
| .392   | -1.0315               | -29.92       | -0.9774 | -35.74       | -0.8401 | -34.05       | -0.7340 | -34.49       |
| .415   | -1.1550               | -30.00       | -1.1158 | -34.49       | -0.9899 | -35.95       | -0.8681 | -35.59       |
| .437   | -1.2157               | -30.00       | -1.1854 | -34.87       | -1.0648 | -36.76       | -0.9286 | -37.35       |
| .460   | -1.2744               | -30.00       | -1.2553 | -35.17       | -1.1348 | -37.31       | -0.9880 | -37.68       |
| .483   | -1.3551               | -30.51       | -1.3327 | -35.71       | -1.2049 | -37.89       | -1.0481 | -38.23       |
| .506   | -1.4826               | -30.59       | -1.4850 | -36.47       | -1.3132 | -38.77       | -1.1598 | -38.77       |
| .521   | -1.5909               | -30.30       | -1.5887 | -36.01       | -1.4387 | -38.27       | -1.2510 | -37.98       |
| .537   | -1.6762               | -30.63       | -1.6614 | -36.26       | -1.4941 | -38.27       | -1.2734 | -37.89       |
| .542   | -1.7086               | -30.26       | -1.5985 | -35.80       | -1.5354 | -37.98       | -1.3105 | -37.60       |
| .566   | -1.7180               | -29.35       | -1.7349 | -35.25       | -1.7152 | -37.56       | -1.3905 | -37.55       |
| .588   | -1.7191               | -28.41       | -1.7153 | -34.45       | -1.6073 | -37.10       | -1.3872 | -37.24       |
| .710   | -1.7426               | -27.91       | -1.7876 | -34.07       | -1.6211 | -36.93       | -1.4220 | -36.97       |
| .734   | -1.7746               | -27.49       | -1.8323 | -35.78       | -1.7027 | -36.84       | -1.4680 | -36.84       |
| .756   | -1.7746               | -26.69       | -1.8615 | -35.32       | -1.7419 | -36.59       | -1.5701 | -36.72       |
| .779   | -1.7512               | -25.56       | -1.8673 | -32.44       | -1.7743 | -36.17       | -1.5492 | -36.63       |
| .823   | -1.7233               | -23.73       | -1.9010 | -31.18       | -1.8572 | -37.73       | -1.6553 | -36.51       |
| .871   | -1.6010               | -20.90       | -1.9040 | -29.58       | -1.9174 | -34.96       | -1.7122 | -36.21       |
| .893   | -1.1930               | -19.01       | -1.7933 | -21.19       | -1.9040 | -33.86       | -1.7274 | -35.63       |
| .916   | -1.1364               | -17.83       | -1.7896 | -26.44       | -1.9265 | -34.40       | -1.7674 | -35.54       |
| .939   | -1.1346               | -16.16       | -1.6918 | -24.38       | -1.8809 | -31.82       | -1.7669 | -34.66       |
| .962   | -1.2289               | -14.32       | -1.7668 | -22.52       | -1.8355 | -30.50       | -1.7492 | -33.49       |
| .984   | -1.1543               | -13.34       | -1.4827 | -20.39       | -1.7079 | -28.57       | -1.7350 | -32.44       |
| 1.007  | -1.0663               | -12.04       | -1.3492 | -18.13       | -1.6683 | -26.31       | -1.6838 | -30.80       |
| 1.030  | -0.9657               | -10.66       | -1.2620 | -16.58       | -1.6065 | -24.80       | -1.6991 | -29.87       |
| 1.052  | -0.8966               | -9.69        | -1.1615 | -14.94       | -1.5011 | -22.66       | -1.5912 | -27.86       |
| 1.077  | -0.7834               | -8.14        | -0.9461 | -11.67       | -1.2261 | -17.73       | -1.3847 | -23.23       |
| 1.143  | -0.5408               | -5.37        | -0.5109 | -7.22        | -0.8018 | -11.12       | -0.9884 | -15.90       |
| 1.167  | -0.1887               | -4.62        | -0.4530 | -5.16        | -0.5244 | -7.01        | -0.6792 | -20.53       |
| 1.213  | -0.4427               | -4.13        | -0.3694 | -4.11        | -0.4102 | -5.37        | -0.5413 | -8.22        |
| 1.239  | -0.4119               | -3.78        | -0.3150 | -5.44        | -0.3144 | -4.03        | -1.009  | -5.96        |
| 1.297  | -0.2438               | -3.11        | -0.2432 | -2.64        | -0.2224 | -2.61        | -0.2921 | -4.28        |



Figure 1.- The 6,000-horsepower propeller dynamometer mounted in the Langley 16-foot transonic tunnel with propeller and wake-survey rakes installed.

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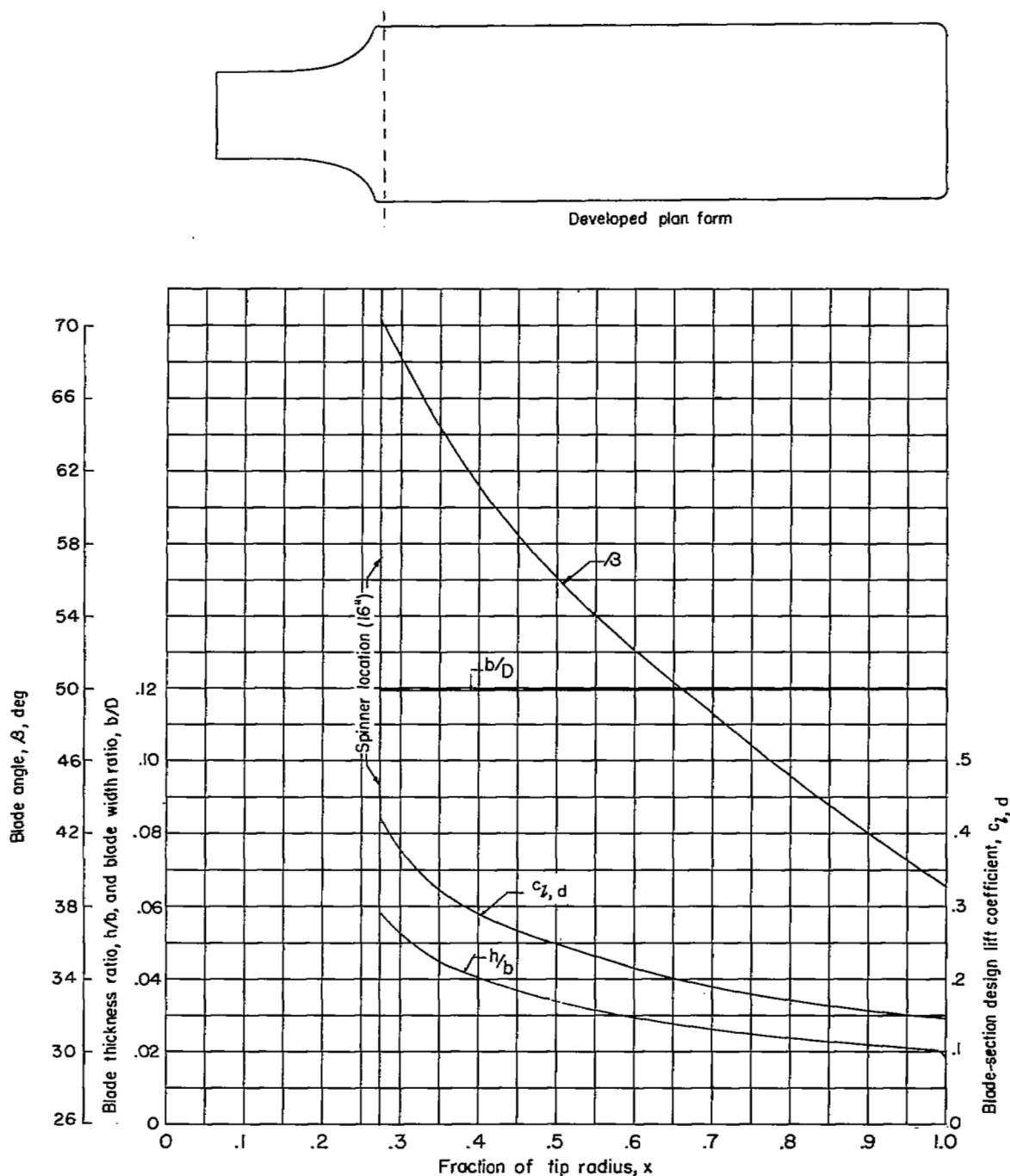


Figure 2.- Blade-form characteristics of the Curtiss-Wright supersonic propeller, design number 109626.

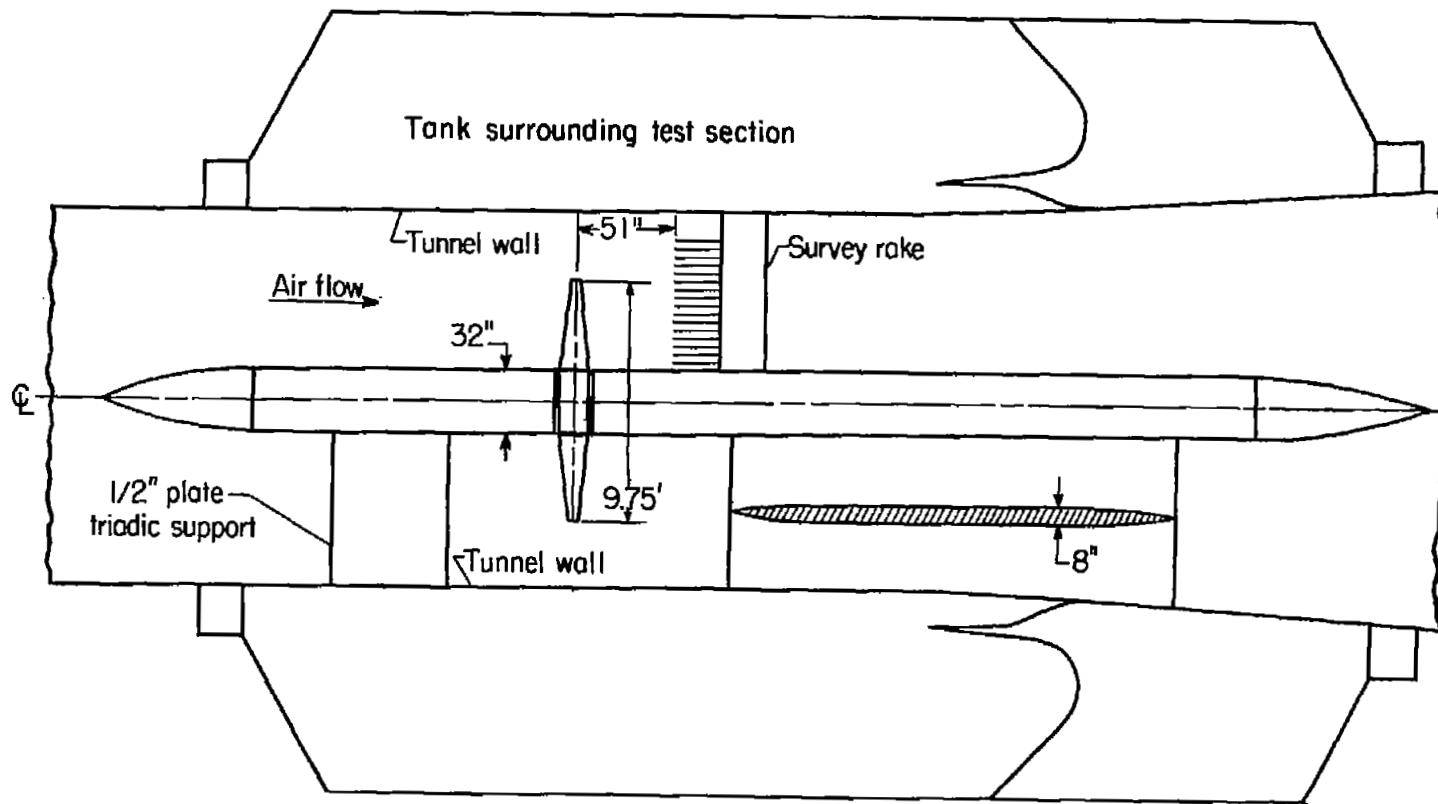


Figure 3.- Dynamometer and survey-rake installation in the test section of the Langley 16-foot transonic tunnel.

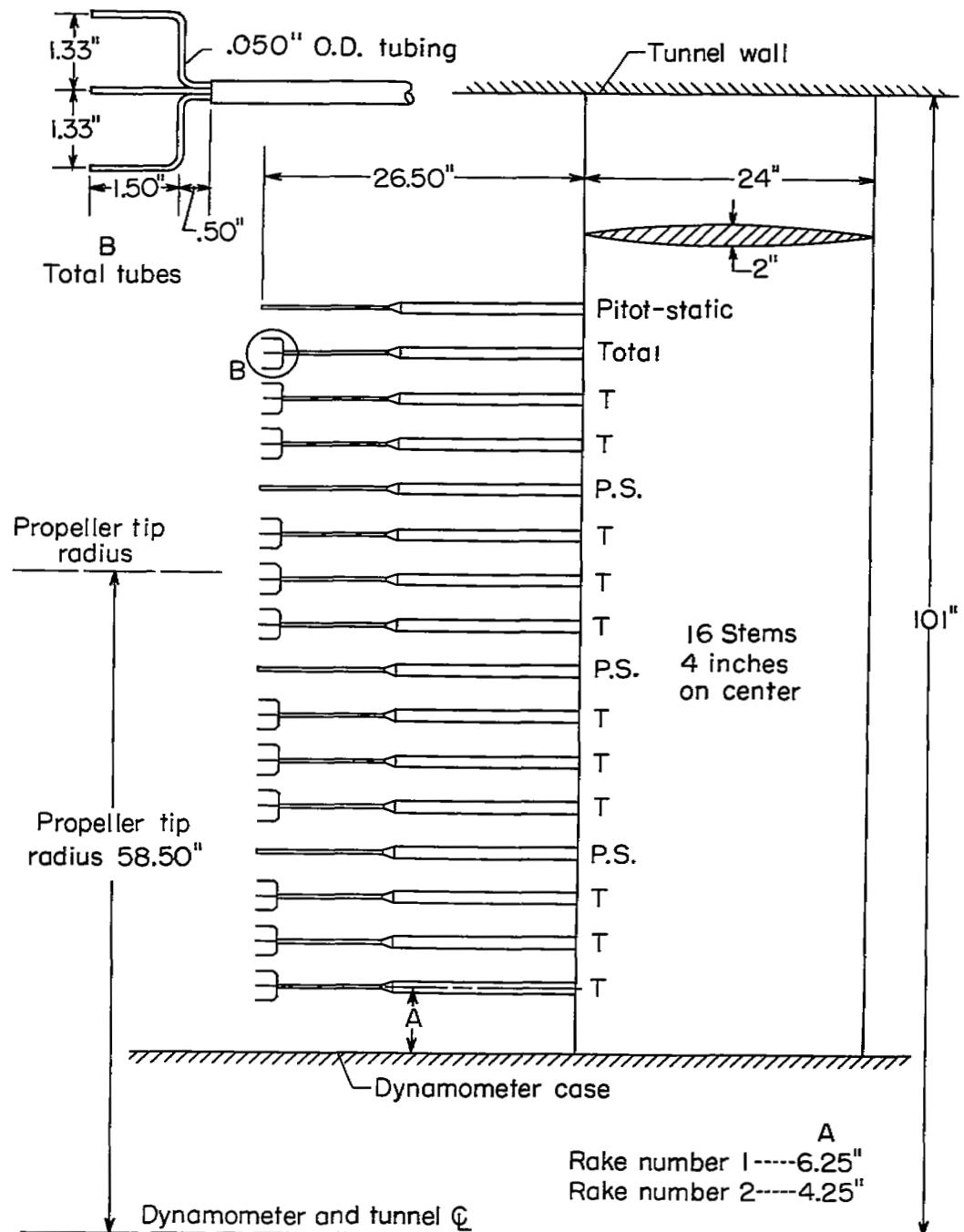


Figure 4.- Sketch of rake number 1. Rake number 2 is identical except in dimension A.

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