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REPORT NO. RD-TR-70-11

AD 1

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INVESTIGATION OF THE EFFECT OF LOW THRUST LEVELS ON THE BASE PRESSURE OF A CYLINDRICAL BODY AT SUPERSONIC SPEEDS

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T. A. Martin
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INVESTIGATION OF THE EFFECT OF LOW THRUST LEVELS ON THE BASE PRESSURE OF A CYLINDRICAL BODY AT SUPERSONIC SPEEDS

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**Advanced Systems Laboratory
Research and Engineering Directorate
U. S. Army Missile Command
Redstone Arsenal, Alabama 35809**

Abstract

Results of supersonic wind tunnel tests are presented which show the effects of varying nozzle geometry, location, and supply pressure on the base pressure of a cylindrical body at zero angle of attack. The purpose of the tests was to investigate the parametric influences in the regions where base pressure is near a minimum, which occurs in the lower range of thrust levels. A bibliography of related experimental results is also included.

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1. Introduction

The base drag on a missile with thrust is generally greatest at low thrust levels and is significantly influenced by the various rocket nozzle geometric parameters. For clarifying the influences of the nozzle geometric parameters, a series of supersonic wind tunnel tests has been conducted with a cylindrical body by using cold, dry air to simulate the rocket exhaust. Nozzle parameters varied were diameter, expansion ratio and expansion angle, longitudinal position, and thrust level.

The basic results of the tests (base pressure variation with nozzle chamber pressure) are presented in plotted form without detailed analysis, but they are arranged to illustrate major parametric influences. These results are repeated in tabular form, and additional nozzle flow parameters and test condition information are shown in the appendix.

2. Apparatus

The model was mounted to the tunnel topwall and aligned with the tunnel flow by means of a fixed swept strut which also provided routing of the instrumentation lines and cold air supply used to simulate the exhaust flow. The external shape of the model was defined by a 4-caliber tangent-ogive nose plus a cylindrical body which was 2 calibers long. Details of the model are shown in Figure 1.

Two types of base configurations were used during these tests. One model configuration, designated as the "open base" configuration, contained an active nozzle mounted concentrically in a larger inactive nozzle. This configuration presented considerable base area which was not adjacent to the region where the exhaust was exiting from the model. Also, this configuration was constructed so that the exit plane of the active nozzle was located at positions other than the plane of the model base. This configuration was made by combining the nozzles (Figure 1b) and the "open base" body (Figure 1a).

The model configurations designated as "closed base" were made by installing the nozzles, including sonic (Figure 1c), conical supersonic (Figure 1d), and contoured supersonic (Figure 1e) into the body identified in Figure 1a as the "closed base" body.

Tunnel No. 1 of the Ballistic Research Laboratories is a continuous flow, supersonic wind tunnel capable of operating over the Mach number range of

1.20 to 5.0. The test section dimensions are 13 by 15 inches. The minimum test Mach number for this model in this facility is 2.5. Complete details of this facility are given by Baughman.¹

The estimated range of inaccuracy of all data presented herein is as follows:

Mach number, ± 0.008
Local model pressure, ± 0.100 psi
Air supply pressure,

0 to 15 psi range ± 0.030 psi
0 to 100 psi range ± 0.200 psi
0 to 300 psi range ± 0.600 psi

3. Presentation of Data

The information presented here consists of:

- a) Justification for direct comparison between results obtained with open and closed base configurations
- b) Observations on the insignificant influence of Reynolds number over the test Reynolds number range
- c) Plotted basic results arranged to illustrate major parameteric influences
- d) Tabulated results.

A detailed listing of the test condition, test configurations, base pressure, and base pressure coefficient variation with nozzle chamber pressure, thrust coefficient (CT), and momentum flux ratio (RMF) is presented in the appendix. The values of CT and RMF have been calculated by using measured values, nozzle physical dimensions, and one-dimensional flow relationships. An index to the tabulated data and symbol notation as used in this tabulation are also shown in the appendix.

Two cylindrical body configurations were tested: a closed base configuration and an open base configuration, which simulated an inactive large boost

¹ Baughman, L. E., and Kochendorfer, F. D., "Jet Effects on Base Pressures of Conical Air Bodies at Mach 1.91 and 3.12," NACA RM E57E06, August 1957

nozzle surrounding an active small sustainer nozzle (Figure 1a). A comparison of results from each of the bodies with identical nozzles is shown in Figure 2. This comparison indicates that effects due to base configuration difference are very slight. On the basis of this comparison, no further reference to the base difference will be made. Excellent repeatability of data acquired in separate test entries is also shown in Figure 2.

A group of nozzles were tested at a Reynolds number lower than the nominal value to extend the range of thrust level. The results are presented in Figure 5 together with results obtained at the nominal Reynolds number. In these results there is a slight but consistent shift in the base pressure ratio at comparable chamber pressure ratios, although different chamber pressures were used to produce the comparable ones. To investigate this shift in base pressure, further testing was conducted both over a greater Reynolds number range and without the standard boundary layer transition strip on the nose. These data, presented in Figure 3, show no consistent trends with Reynolds number over the range in question ($R_N \approx 0.20$ to 0.50 million per inch). On the basis of this observation, it is felt that the shift is due to data acquisition errors and is not a Reynolds number effect.

The basic results from the test are presented in Figures 4 through 19. The nozzle configuration variable for each group of data is shown in Table I.

TABLE I. NOZZLE CONFIGURATION VARIABLES

Configuration Variable	Configuration Constants	Figure No.
Nozzle Mach No.	$r^*/DB = 0.141, \theta_j = 0 \text{ deg}$	4
	$\theta_j = 0 \text{ deg}, D_j/D_B = 0.20$	5
	$\theta_j = 20 \text{ deg}, D_j/D_B = 0.20$	6
Nozzle Expansion Angle	$M_j = 1.78, D_j/D_B = 0.20$	7
	$M_j = 2.20, D_j/D_B = 0.20$	8
	$M_j = 2.70, D_j/D_B = 0.20$	9
	$M_j = 3.20, D_j/D_B = 0.20$	10

TABLE I. NOZZLE CONFIGURATION VARIABLES (Concluded)

Configuration Variable	Configuration Constants	Figure No.
Nozzle Exit Diameter	$M_j = 1.0, \theta_j = 0$	11
	$M_j = 1.78, \theta_j = 0$	12
	$M_j = 1.78, \theta_j = 20$	13
	$M_j = 2.70, \theta_j = 0$	14
	$M_j = 2.70, \theta_j = 20 \text{ deg}$	15
	$M_j = 3.20, \theta_j = 0 \text{ deg}$	16
Nozzle Exit Position	Nozzle, $D_j/D_B = 0.1$	17
	Nozzle, $D_j/D_B = 0.2$	18
	Nozzle, $D_j/D_B = 0.3$	19

The symbols used in these figures are identified in the following list, while those used with the tabulated data are given in the preface of that section.

D_B	Reference diameter of model
D_j	Diameter of nozzle at exit plane
M_j	Nozzle design Mach number
M_∞	Free stream Mach number
p_c	Jet stagnation pressure
p_B	Mean base pressure
p_∞	Free stream static pressure
R_N	Reynolds number per inch
X_n	Location of nozzle exit plane relative to model base, negative rearward
θ_j	Half-angle divergence of nozzles

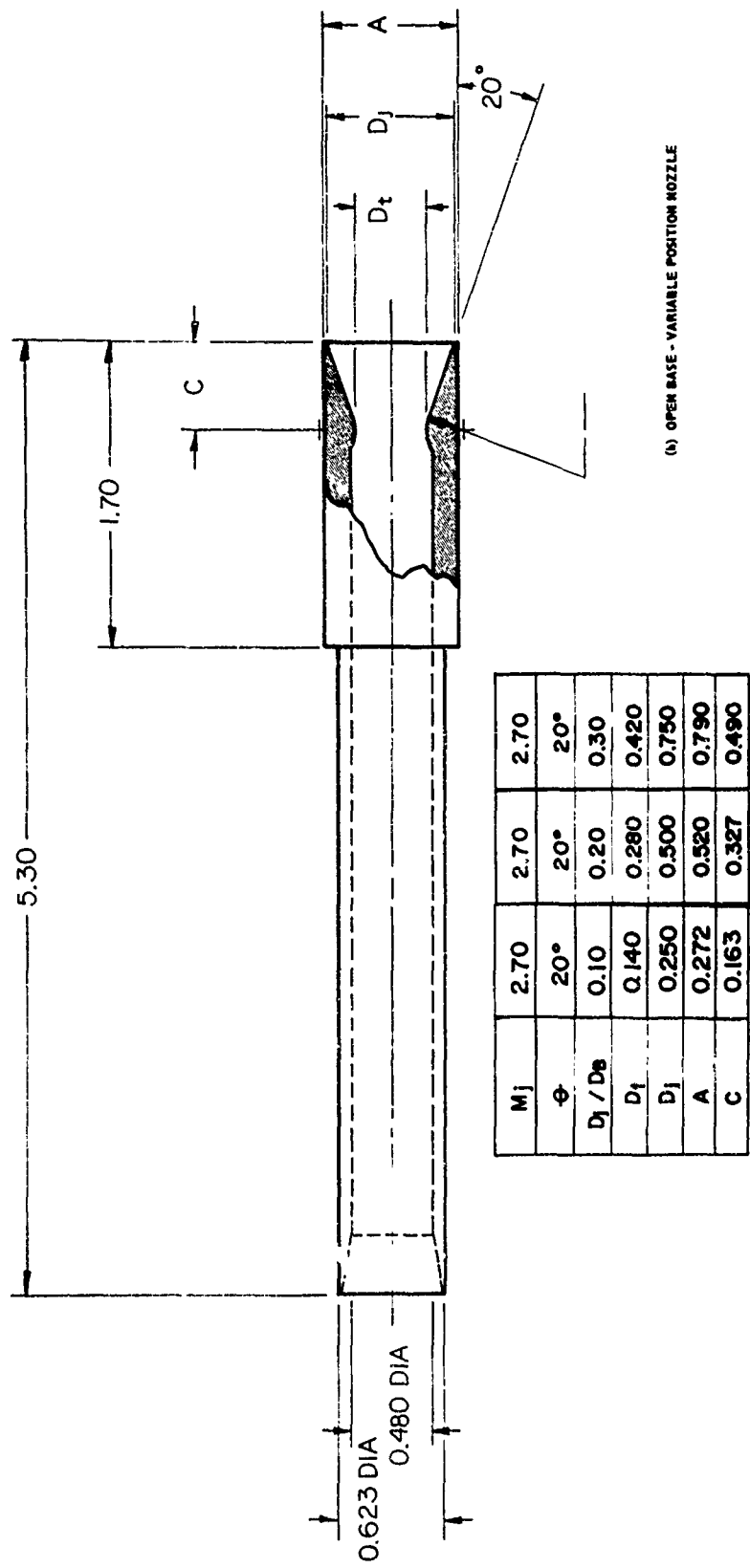
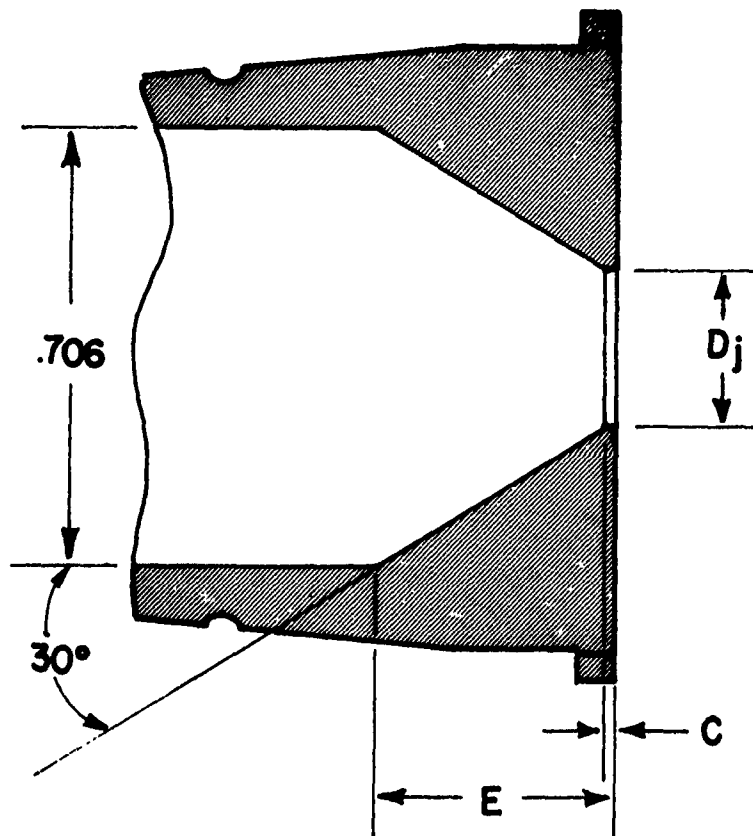


FIGURE 1. MODEL DETAIL (Continued)

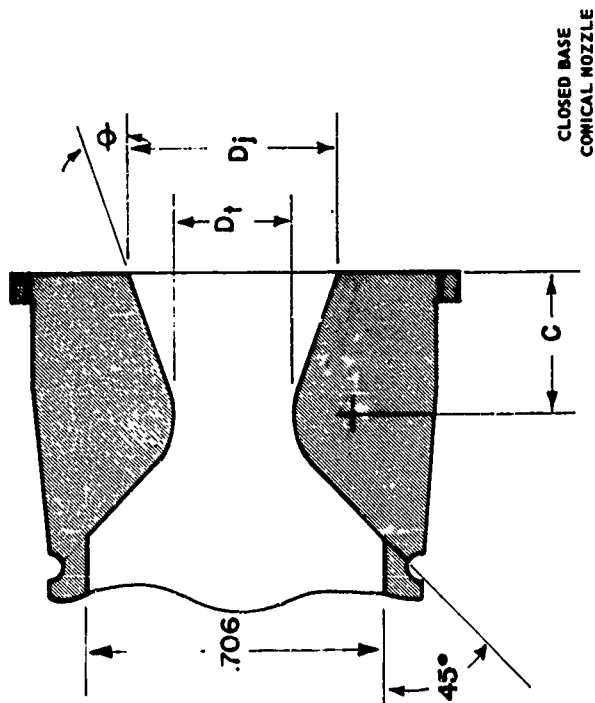
CLOSED BASE SONIC NOZZLE



M_j	1.0	1.0	1.0
Θ	—	—	—
D_j/D_B	0.100	0.140	0.200
D_j	0.250	0.352	0.500
C	0.010	0.010	0.010
E	0.404	0.302	0.191

(c) SONIC NOZZLES

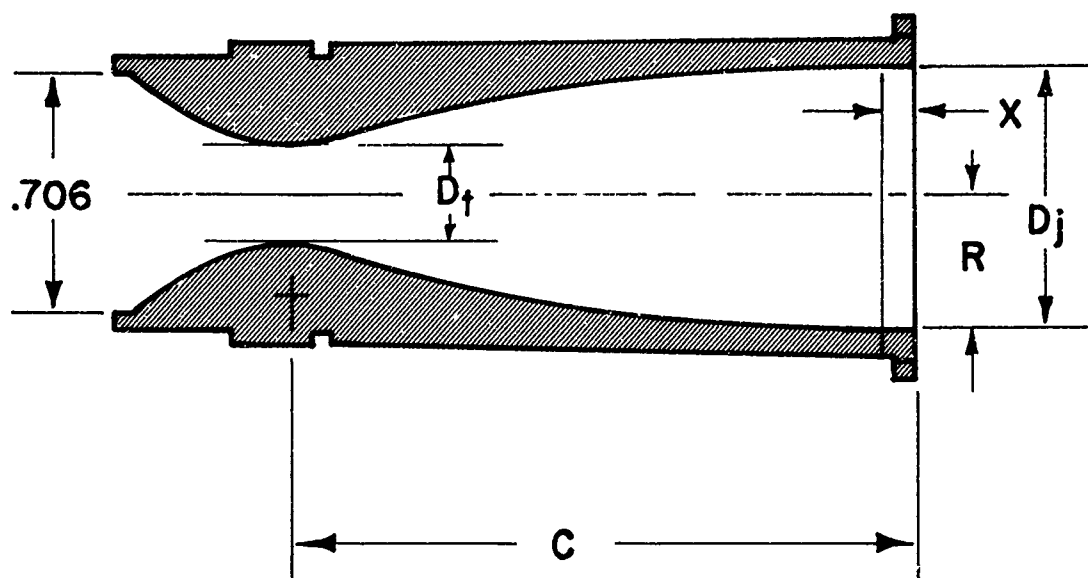
FIGURE 1. MODEL DETAIL (Continued)



M_j	1.78	1.78	1.78	1.78	2.20	2.70	2.70	2.70	2.70	2.70	2.70	3.20	3.80
ϕ	5°	20°	20°	20°	20°	10°	15°	20°	20°	20°	20°	20°	20°
D_j/D_s	.200	.100	.200	.300	.200	.200	.200	.200	.200	.300	.200	.200	.200
D_t	.420	.209	.420	.630	.353	.280	.280	.280	.280	.420	.221	.500	.167
D_j	.500	.250	.500	.750	.500	.500	.500	.500	.500	.750	.500	.500	.500
C	.464	.075	.143	.221	.233	.636	.429	.327	.491	.403	.472		

(d) CONICAL NOZZLES

FIGURE 1. MODEL DETAIL (Continued)



CLOSED BASE
CONTOURED NOZZLES

M_j	1.78	1.78	2.20	2.70	2.70	3.20	3.20
θ	0	0	0	0	0	0	0
D_j/D_s	.168	.200	.200	.200	.252	.200	.320
D_t	.352	.420	.352	.280	.352	.220	.362
D_j	.420	.500	.500	.500	.629	.500	.800
C	.591	.703	.909	1.096	1.382	1.249	1.996

(e) CONTOURED NOZZLES

FIGURE 1. MODEL DETAIL (Concluded)

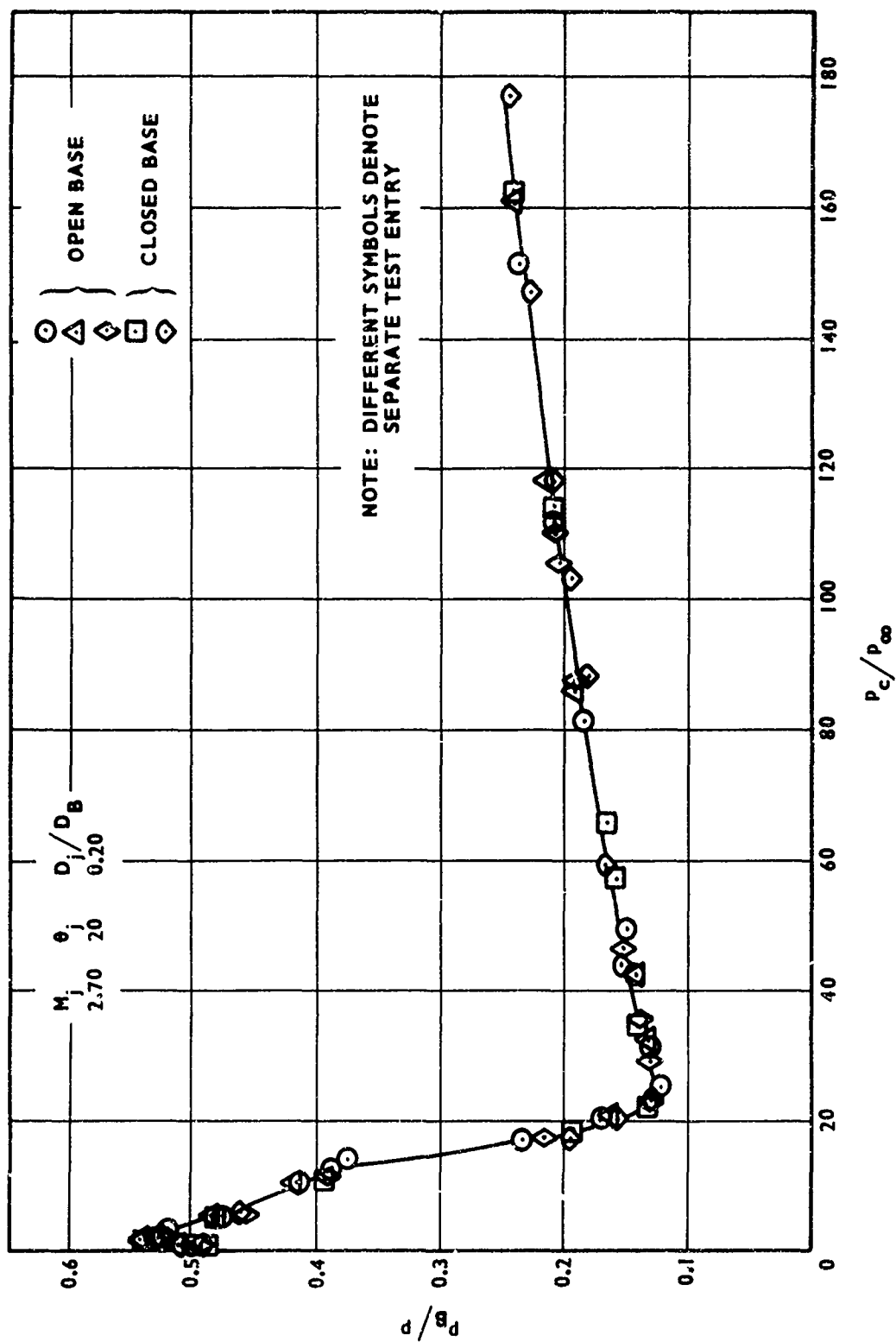
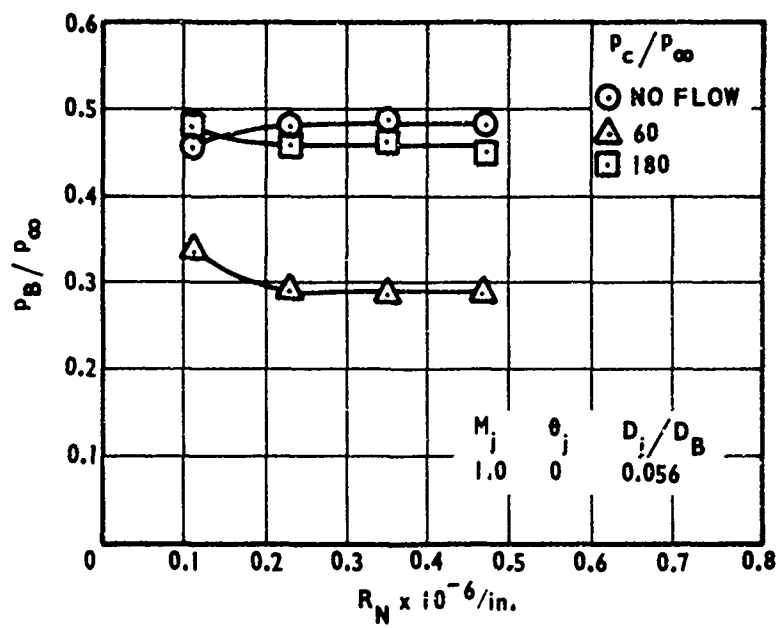
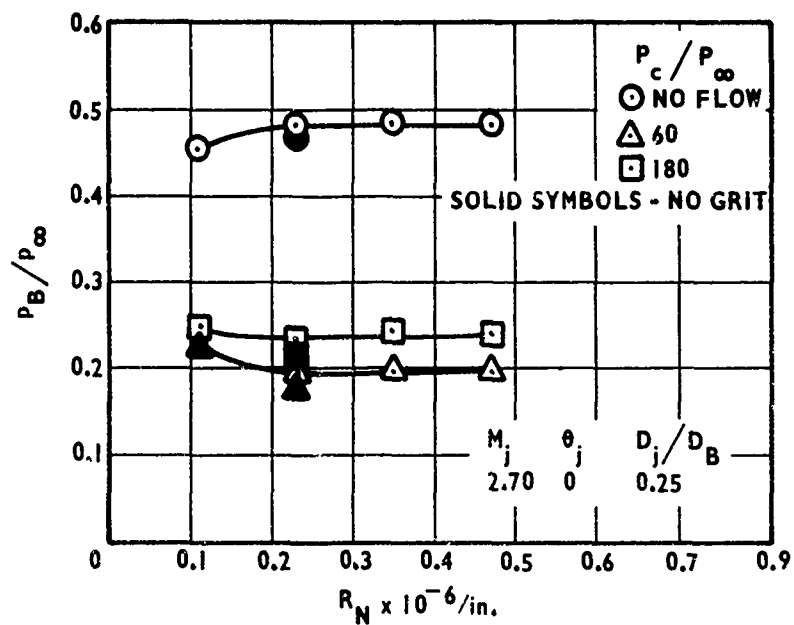


FIGURE 2. BASE PRESSURE FOR OPEN VERSUS CLOSED BASE CONFIGURATIONS



a. SONIC NOZZLE



b. SUPERSONIC NOZZLE

FIGURE 3. REYNOLDS NUMBER EFFECT ON BASE PRESSURE

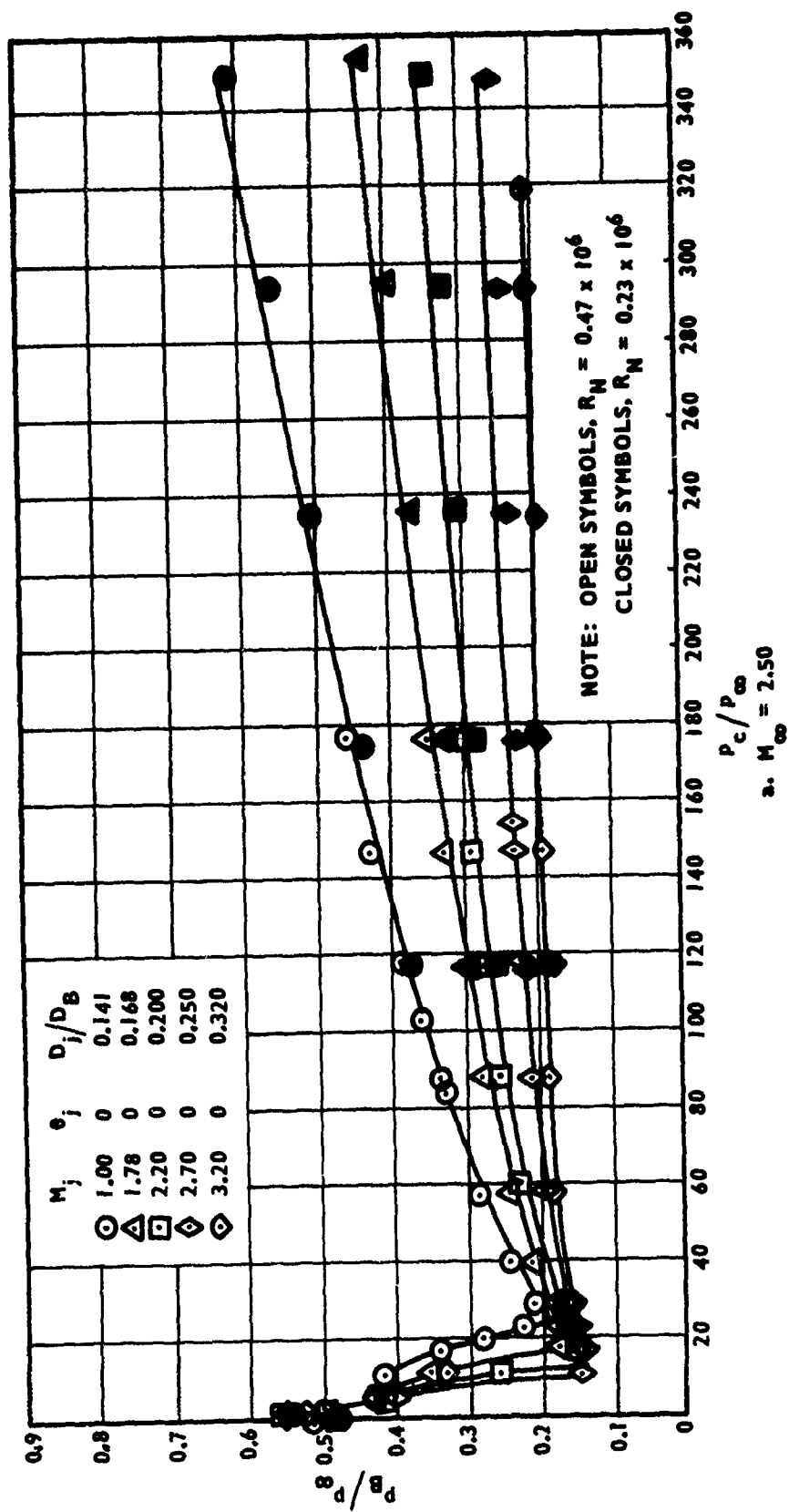


FIGURE 4. EFFECT OF JET MACH NUMBER ON BASE PRESSURE, CONSTANT THROAT DIAMETER

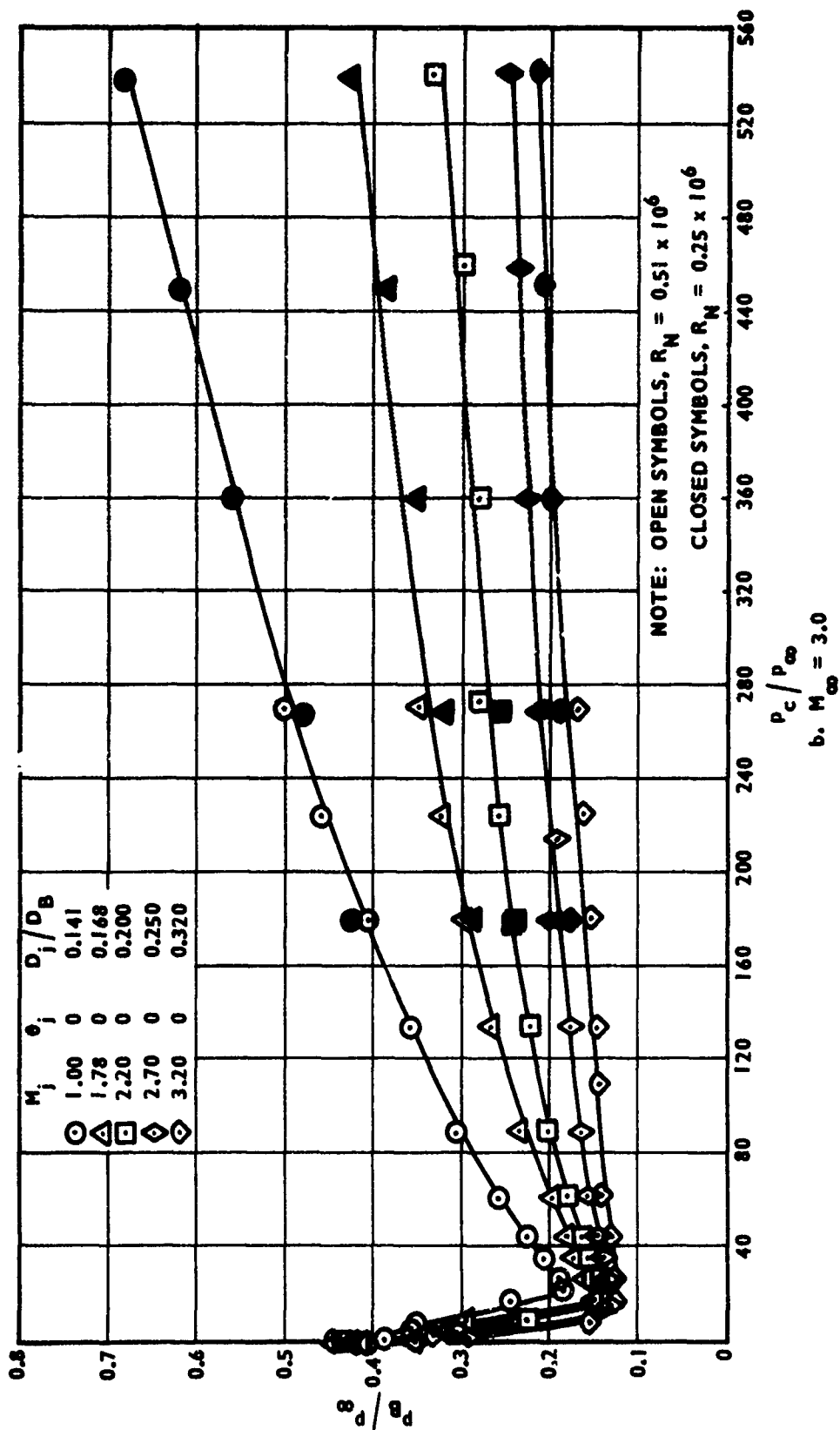


FIGURE 4. EFFECT OF JET MACH NUMBER ON BASE PRESSURE, CONSTANT THROAT DIAMETER
 (Concluded)

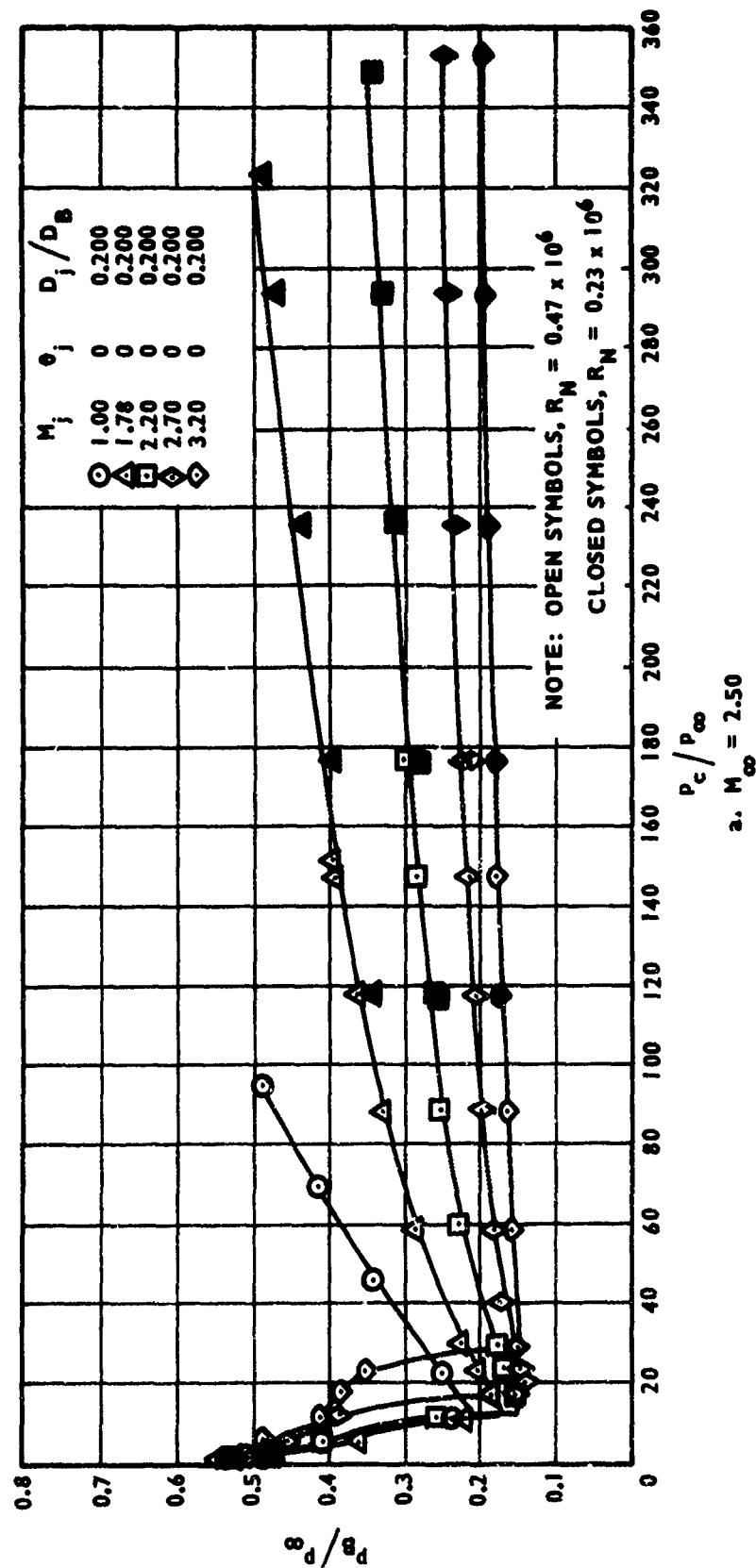


FIGURE 5. EFFECT OF JET MACH NUMBER ON BASE PRESSURE, CONTOURED NOZZLES, CONSTANT EXIT DIAMETER

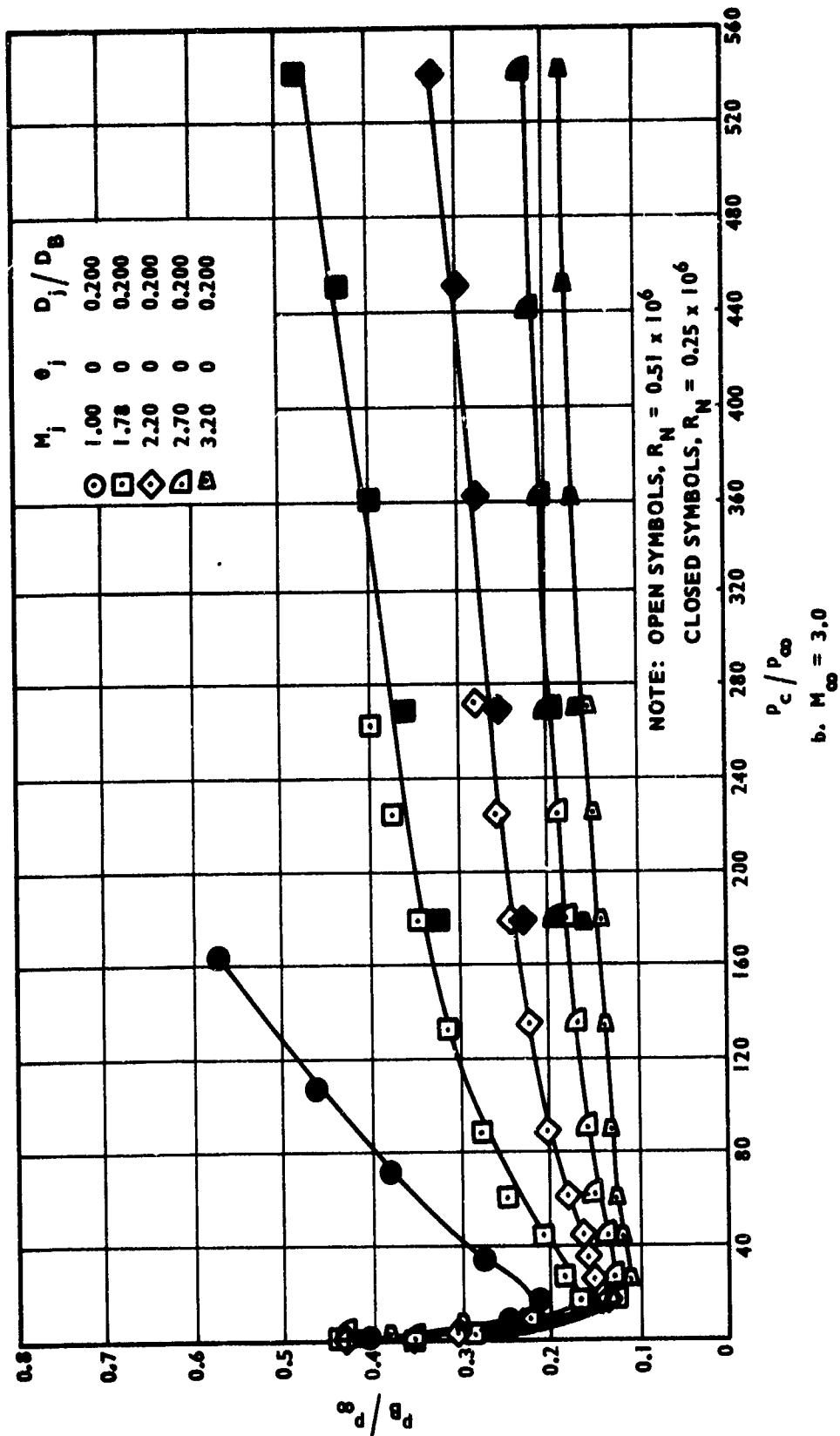


FIGURE 5. EFFECT OF JET MACH NUMBER ON BASE PRESSURE, CONTOURED NOZZLES, CONSTANT EXIT DIAMETER (Concluded)

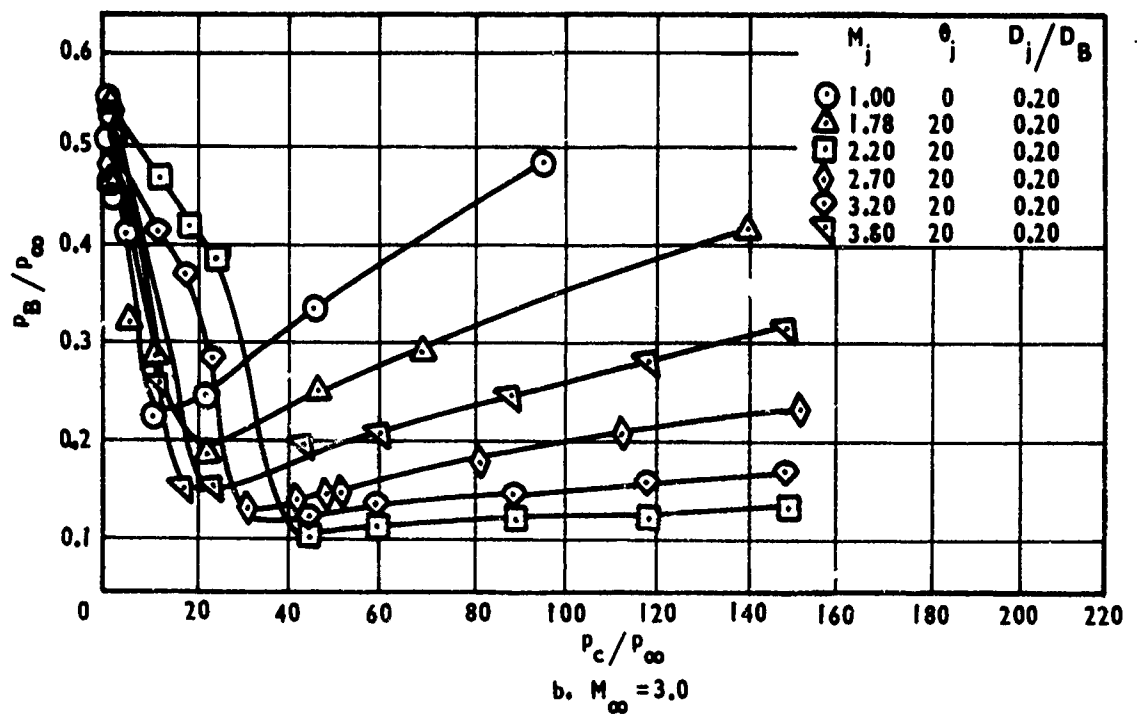
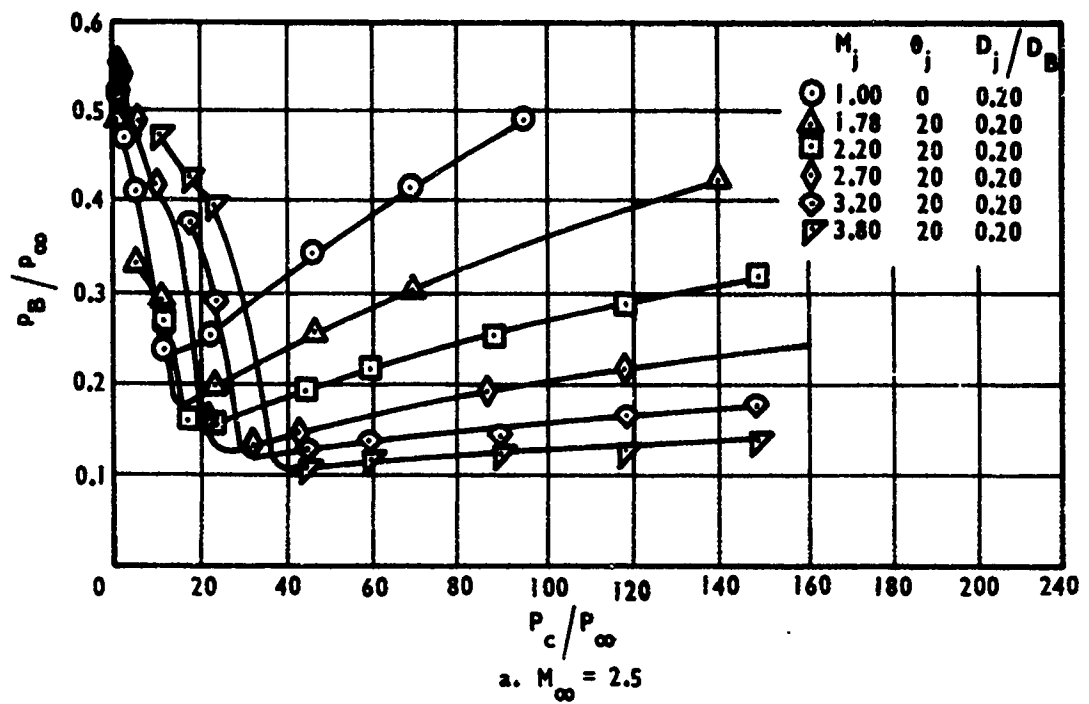


FIGURE 6. EFFECT OF JET MACH NUMBER ON BASE PRESSURE, CONICAL NOZZLES, CONSTANT EXIT DIAMETER

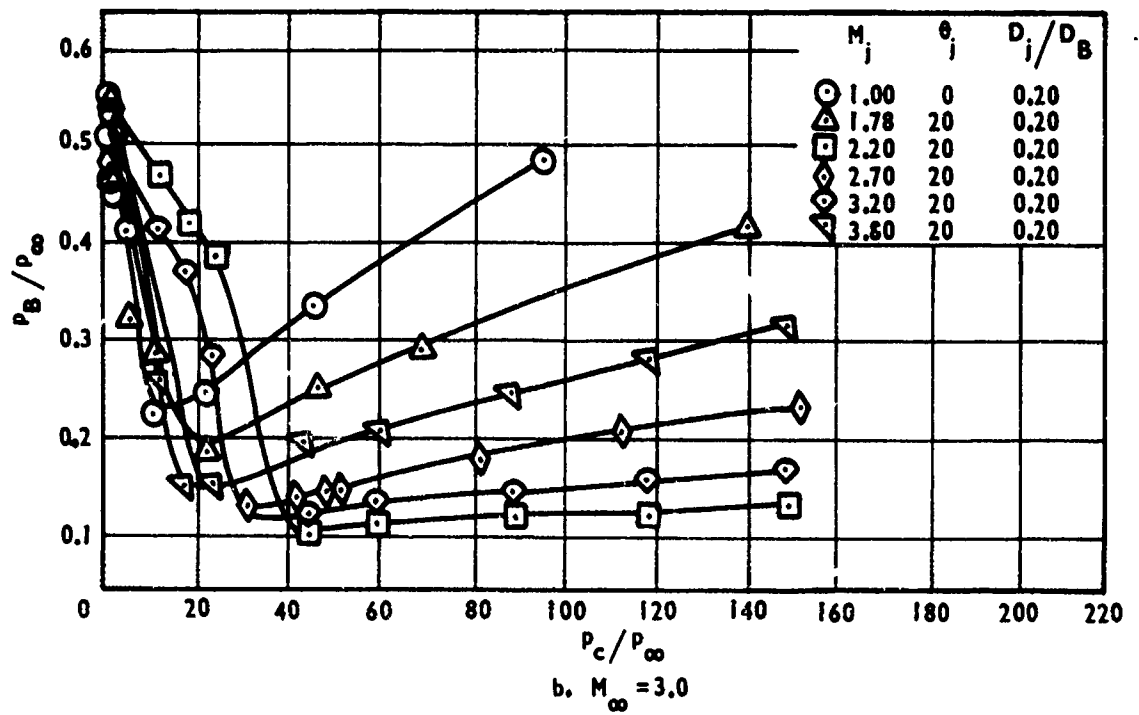
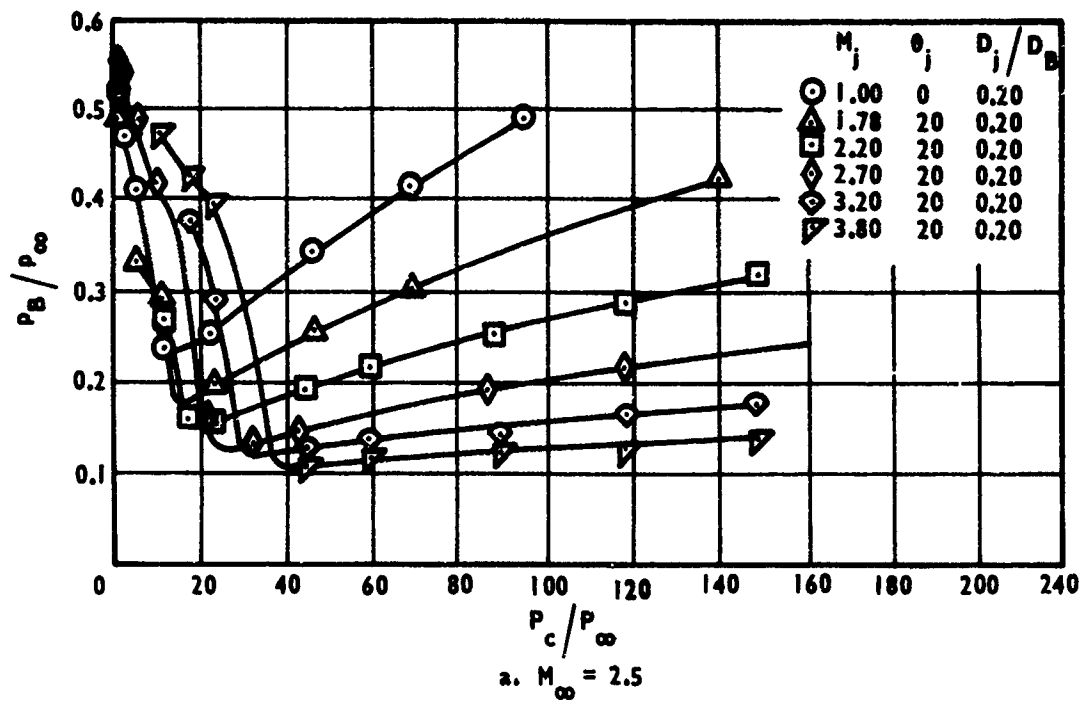


FIGURE 6. EFFECT OF JET MACH NUMBER ON BASE PRESSURE, CONICAL NOZZLES, CONSTANT EXIT DIAMETER

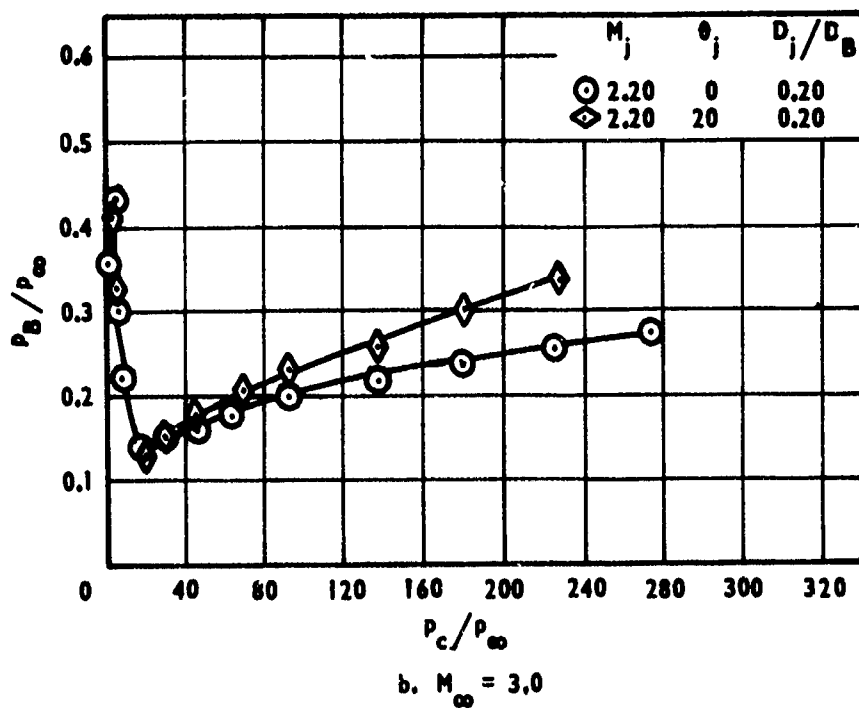
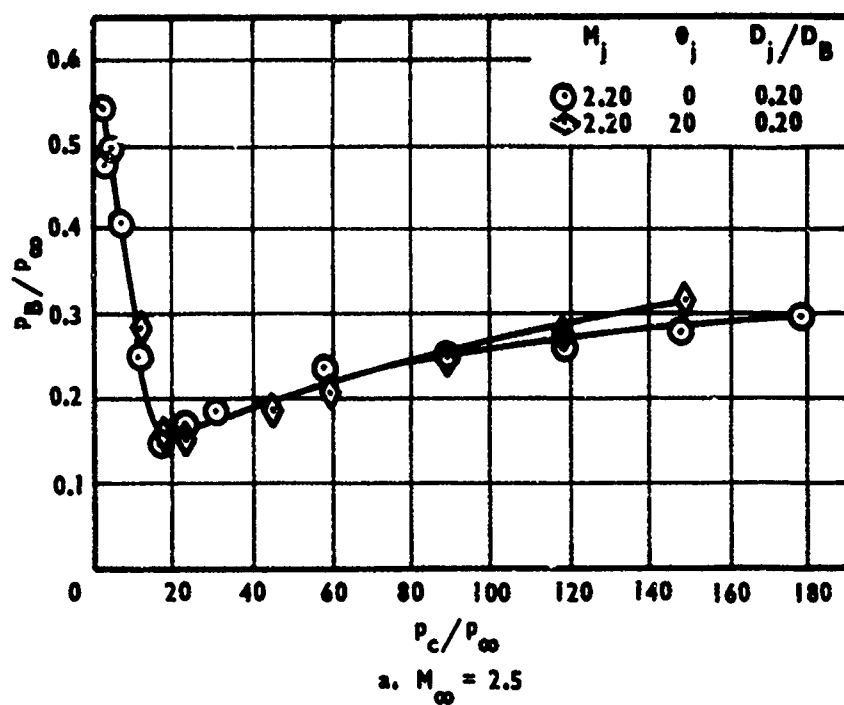


FIGURE 8. EFFECT OF NOZZLE ANGLE ON BASE PRESSURE, EXIT MACH NUMBER = 2.20

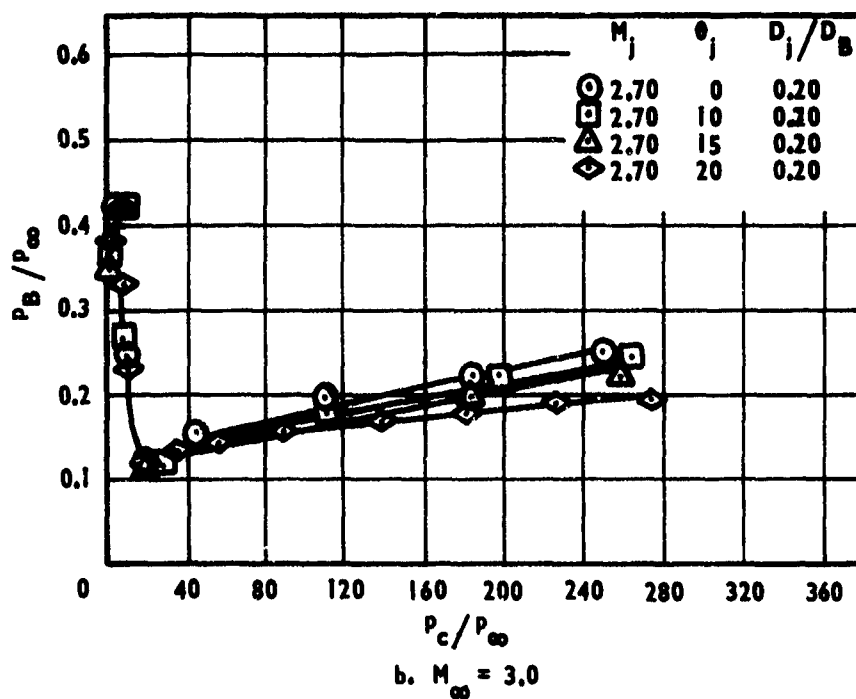
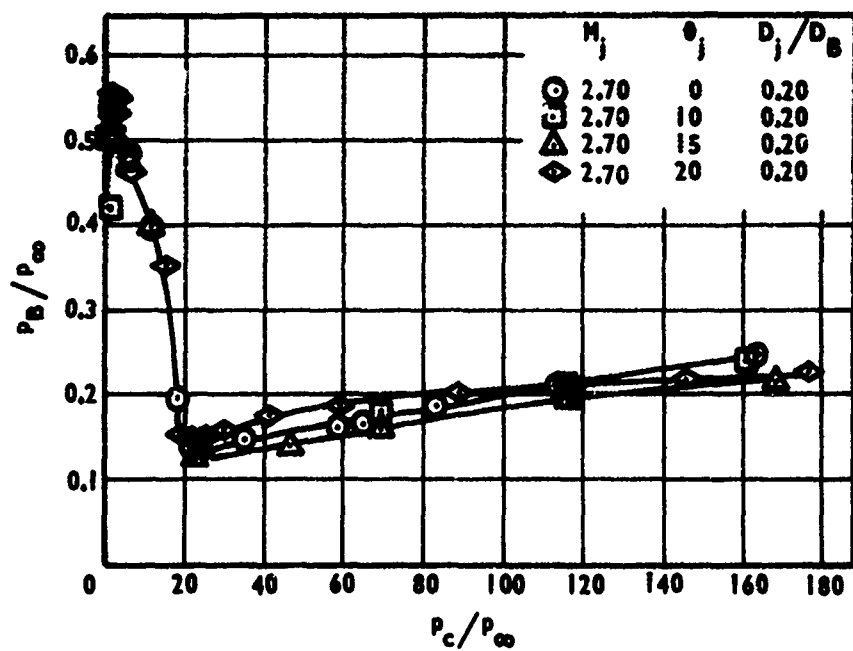


FIGURE 9. EFFECT OF NOZZLE ANGLE ON BASE PRESSURE,
EXIT MACH NUMBER = 2.70

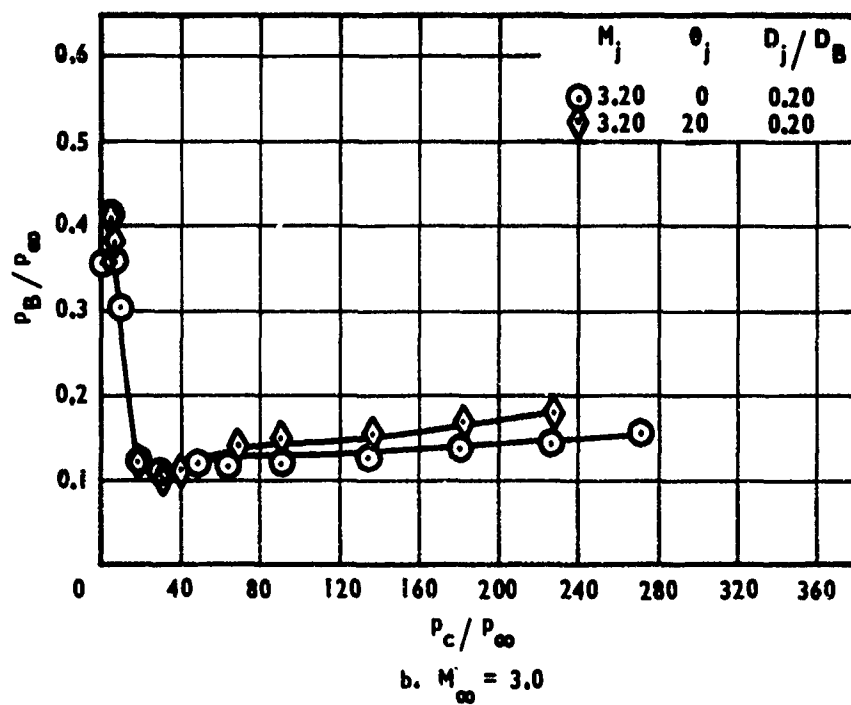
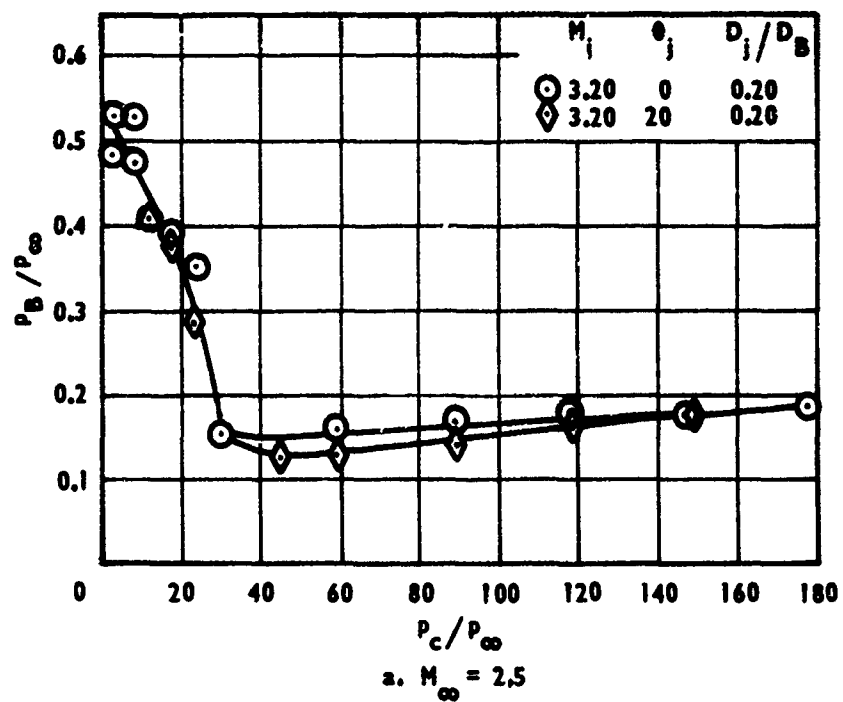


FIGURE 10. EFFECT OF NOZZLE ANGLE ON BASE PRESSURE, EXIT MACH NUMBER = 3.20

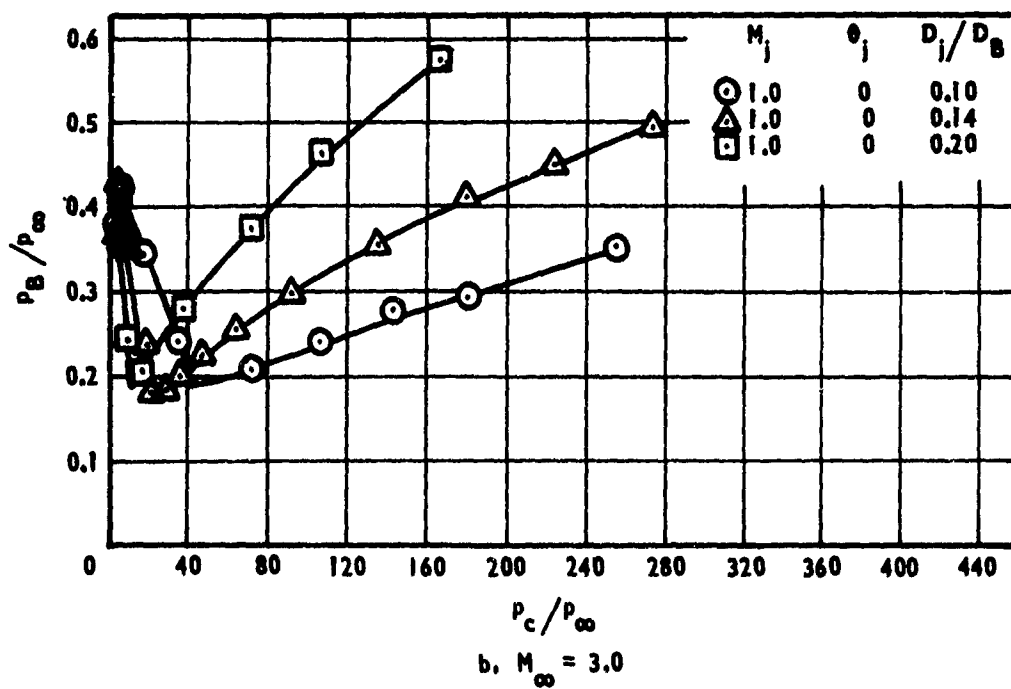
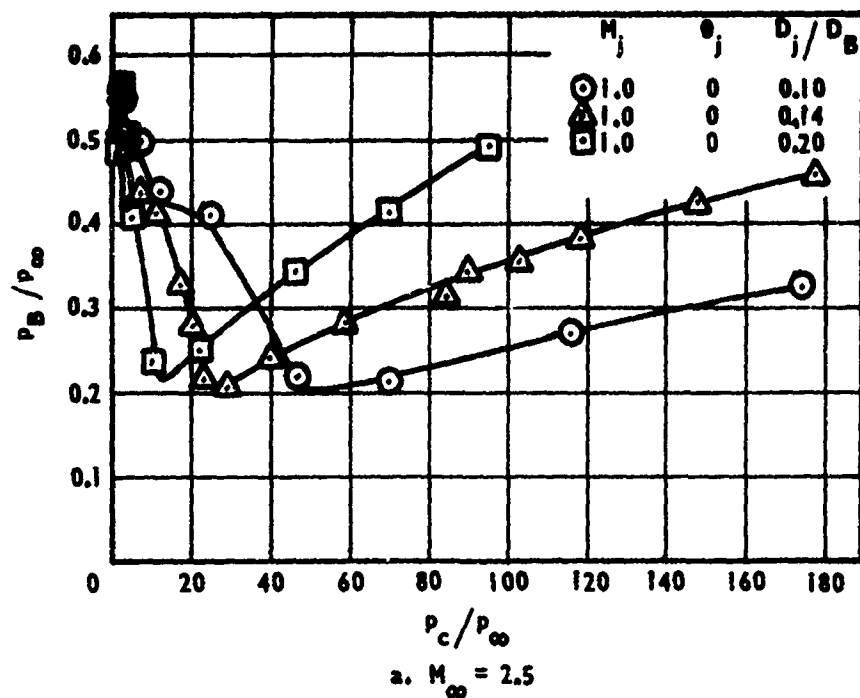


FIGURE 11. EFFECT OF NOZZLE DIAMETER ON BASE PRESSURE,
EXIT MACH NUMBER = 1.00

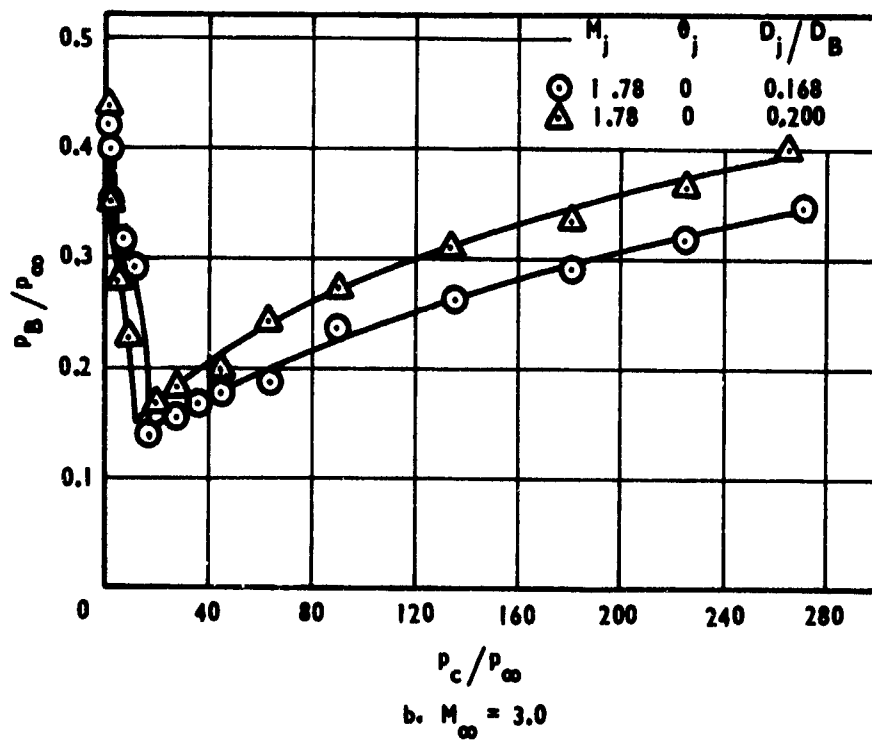
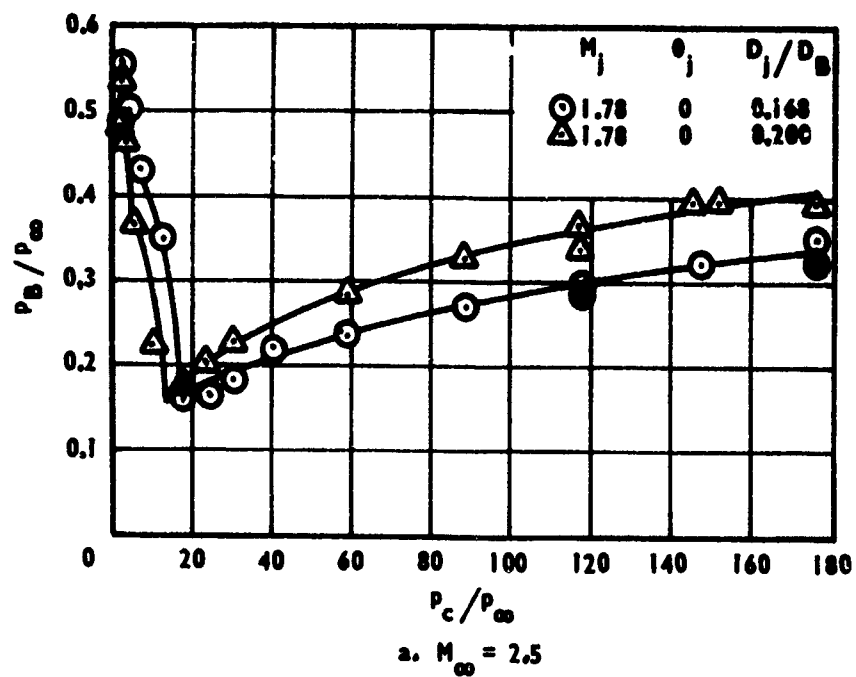


FIGURE 12. EFFECT OF NOZZLE DIAMETER ON BASE PRESSURE, EXIT MACH NUMBER = 1.78, CONTOURED NOZZLES

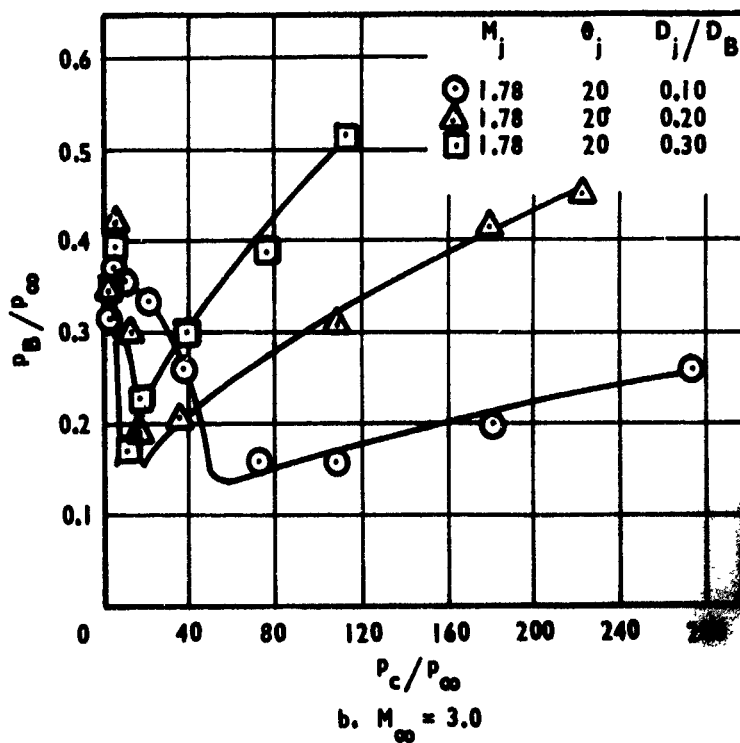
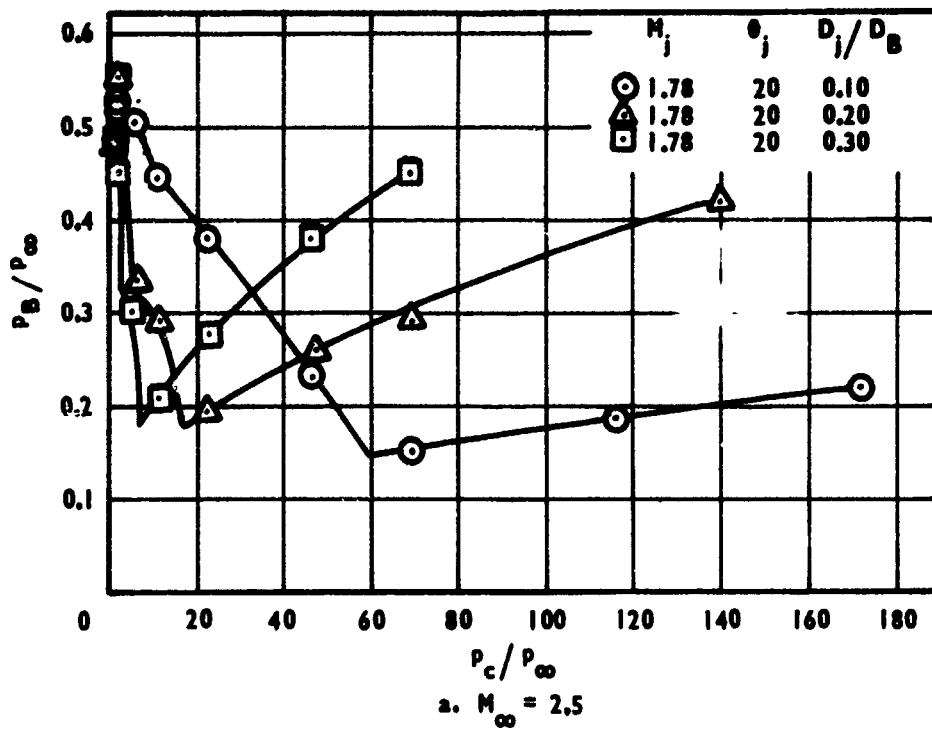


FIGURE 13. EFFECT OF NOZZLE DIAMETER ON BASE PRESSURE, EXIT MACH NUMBER = 1.78, CONICAL NOZZLES

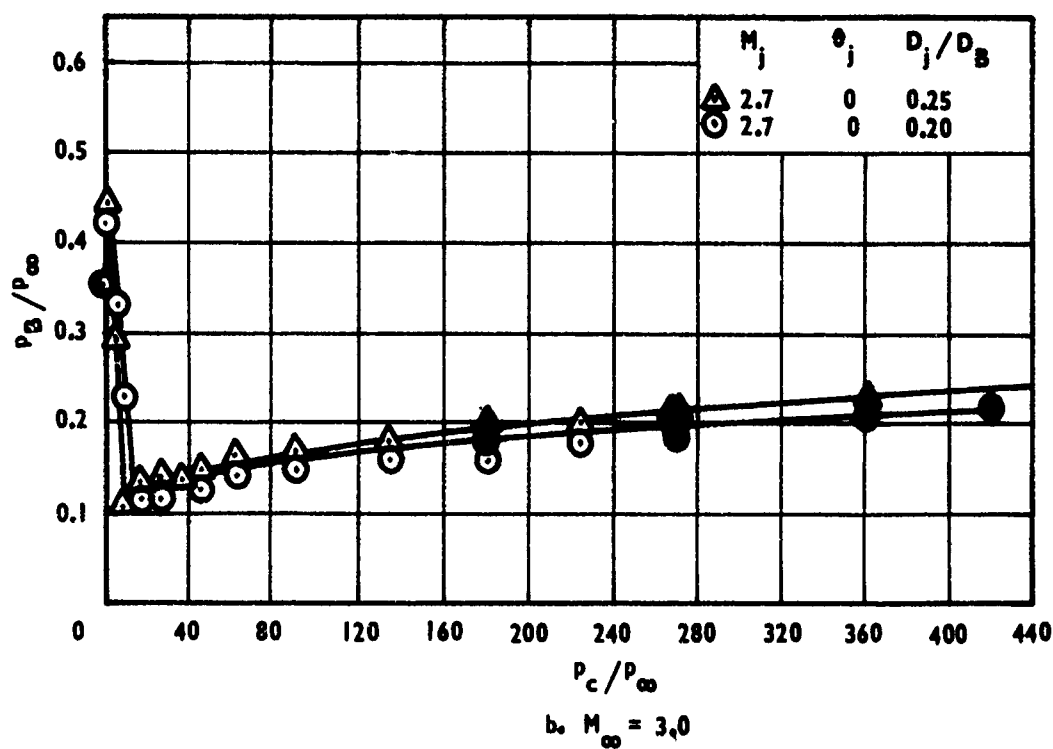
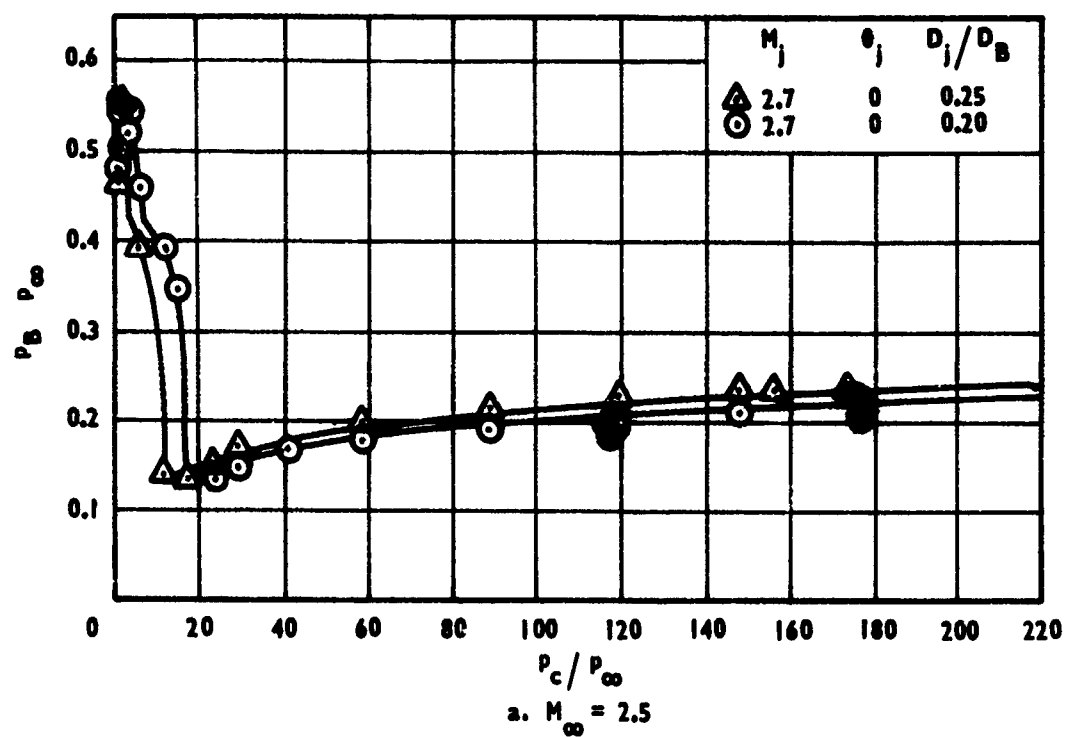


FIGURE 14. EFFECT OF NOZZLE DIAMETER ON BASE PRESSURE, EXIT MACH NUMBER = 2.70, CONTOURED NOZZLES

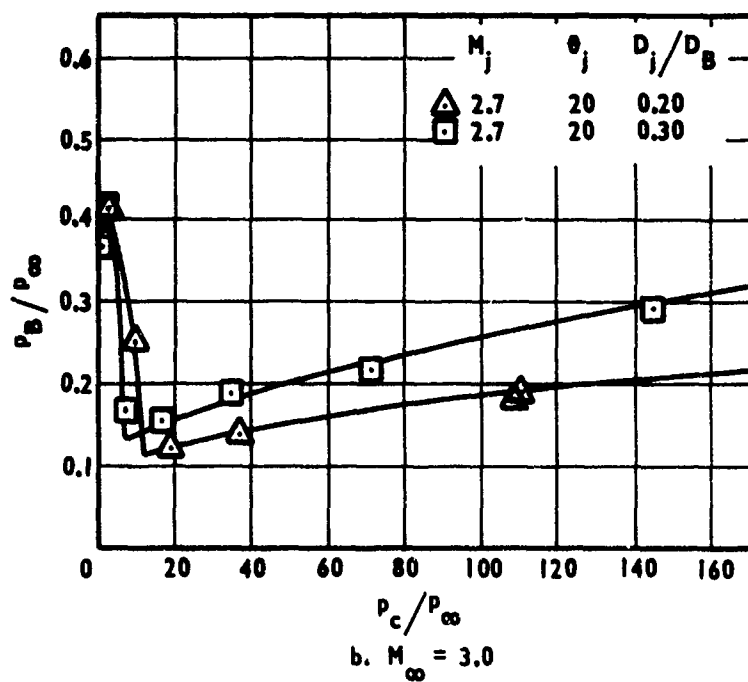
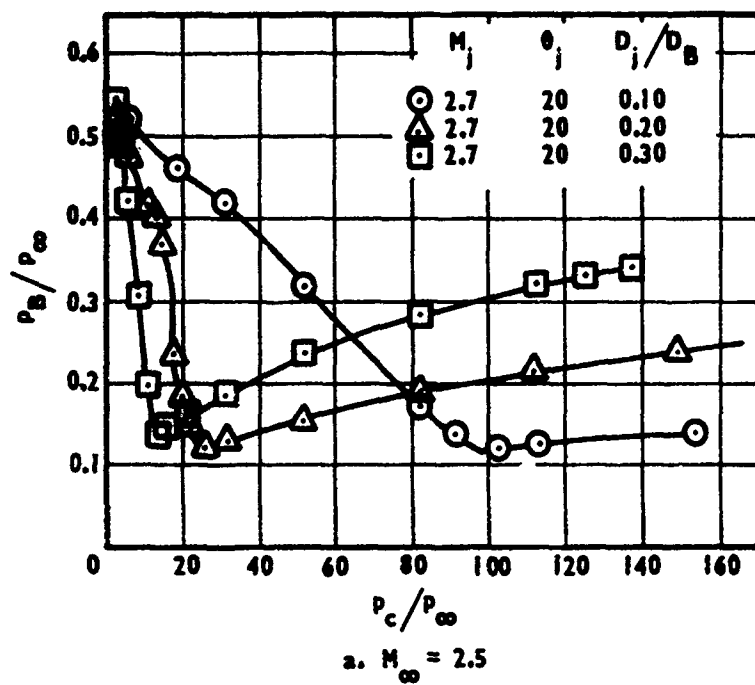


FIGURE 15. EFFECT OF NOZZLE DIAMETER ON BASE PRESSURE, EXIT MACH NUMBER = 2.70, CONICAL NOZZLES

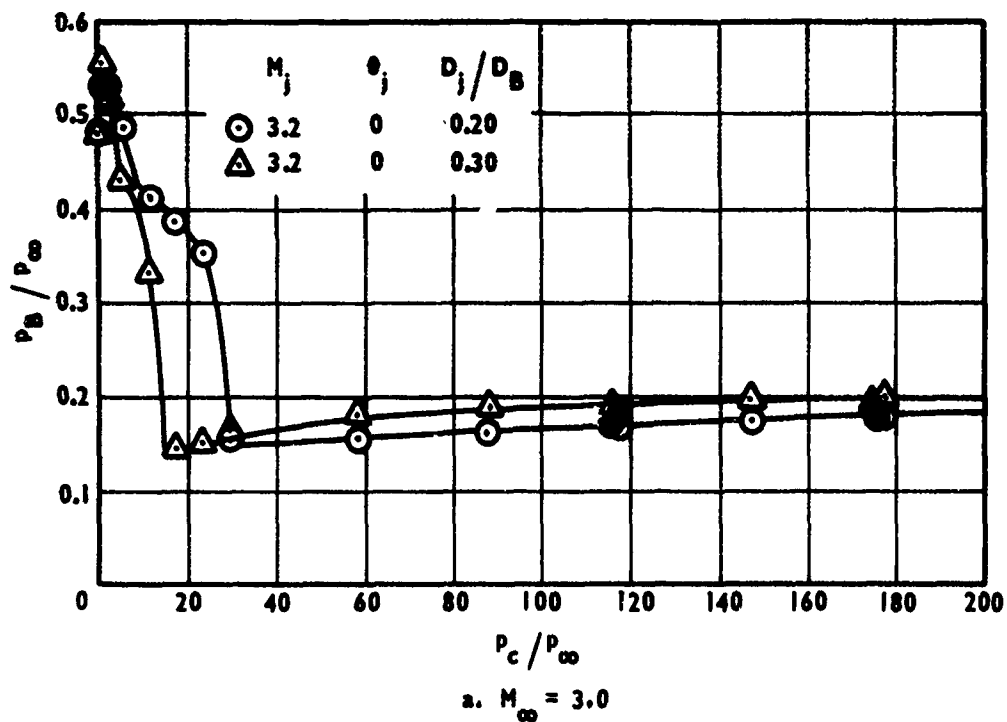
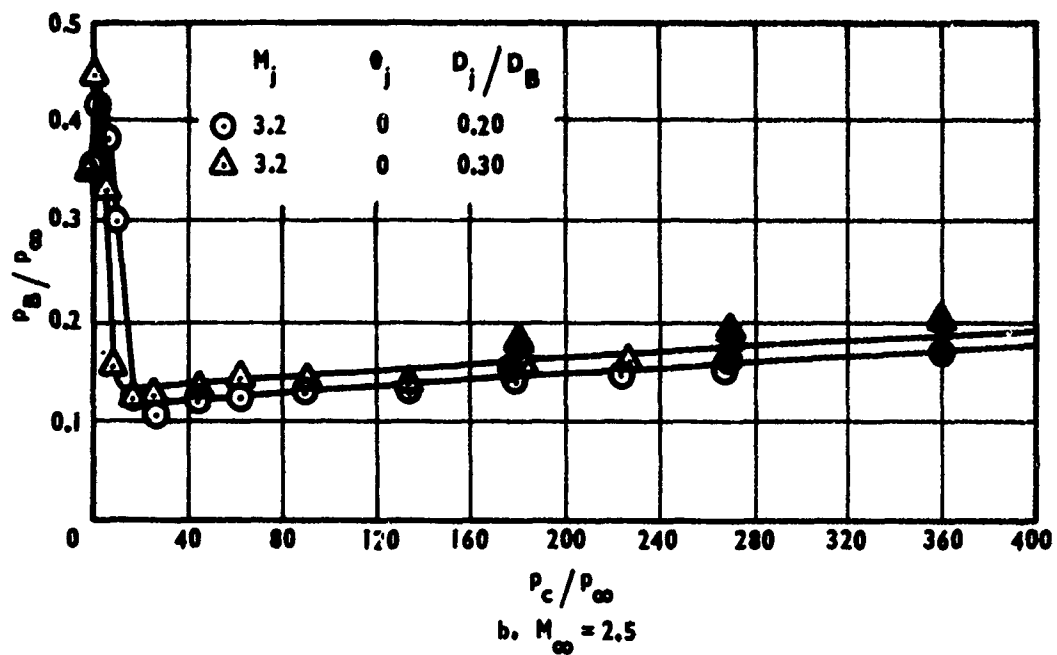


FIGURE 16. EFFECT OF NOZZLE DIAMETER ON BASE PRESSURE, EXIT MACH NUMBER = 3.20

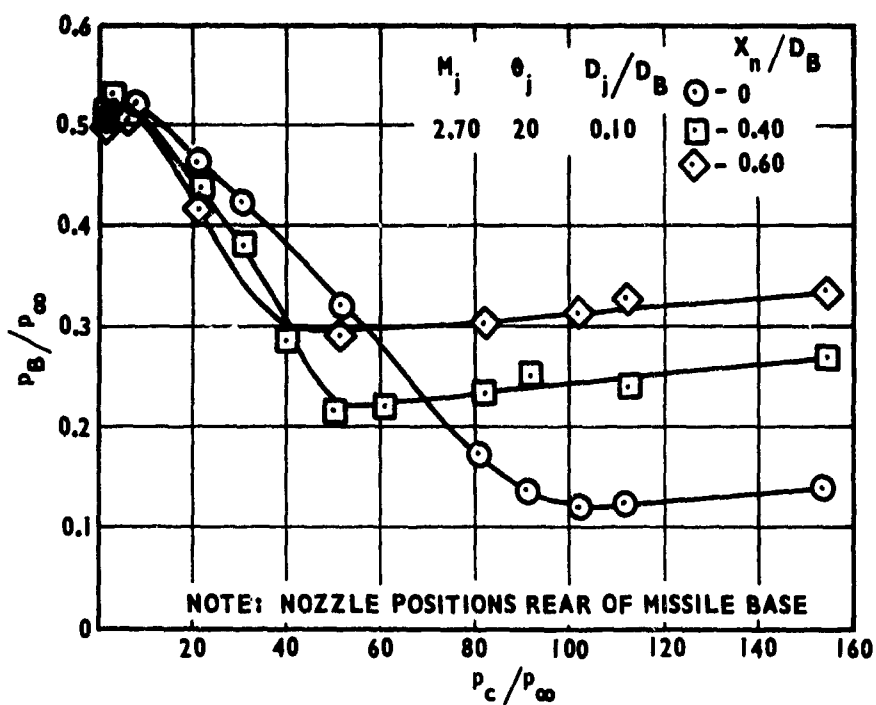
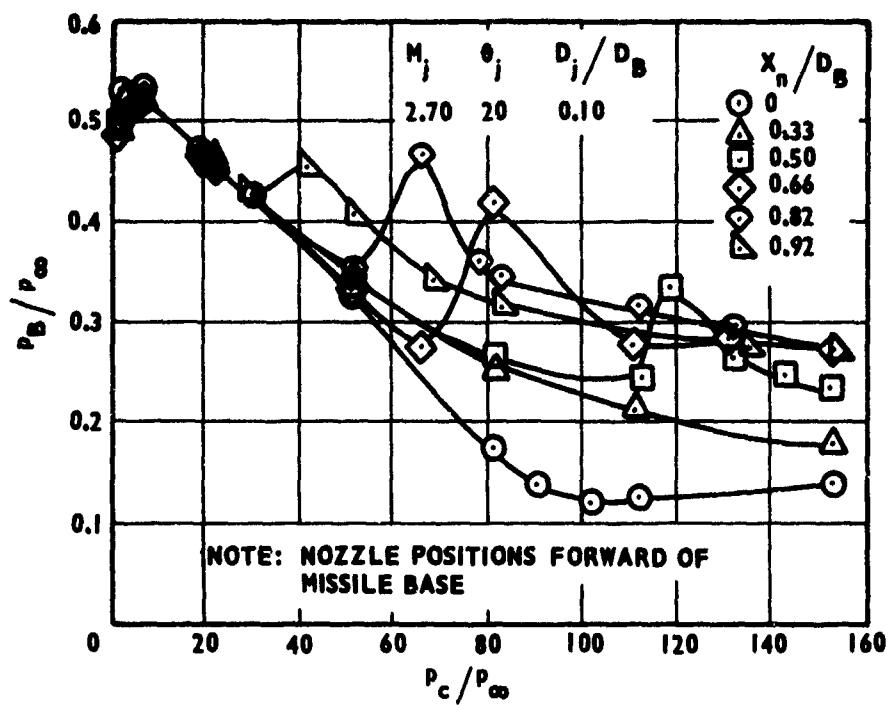


FIGURE 17. EFFECT OF NOZZLE POSITION ON BASE PRESSURE, NOZZLE-BASE RATIO = 0.10, MACH NUMBER = 2.50

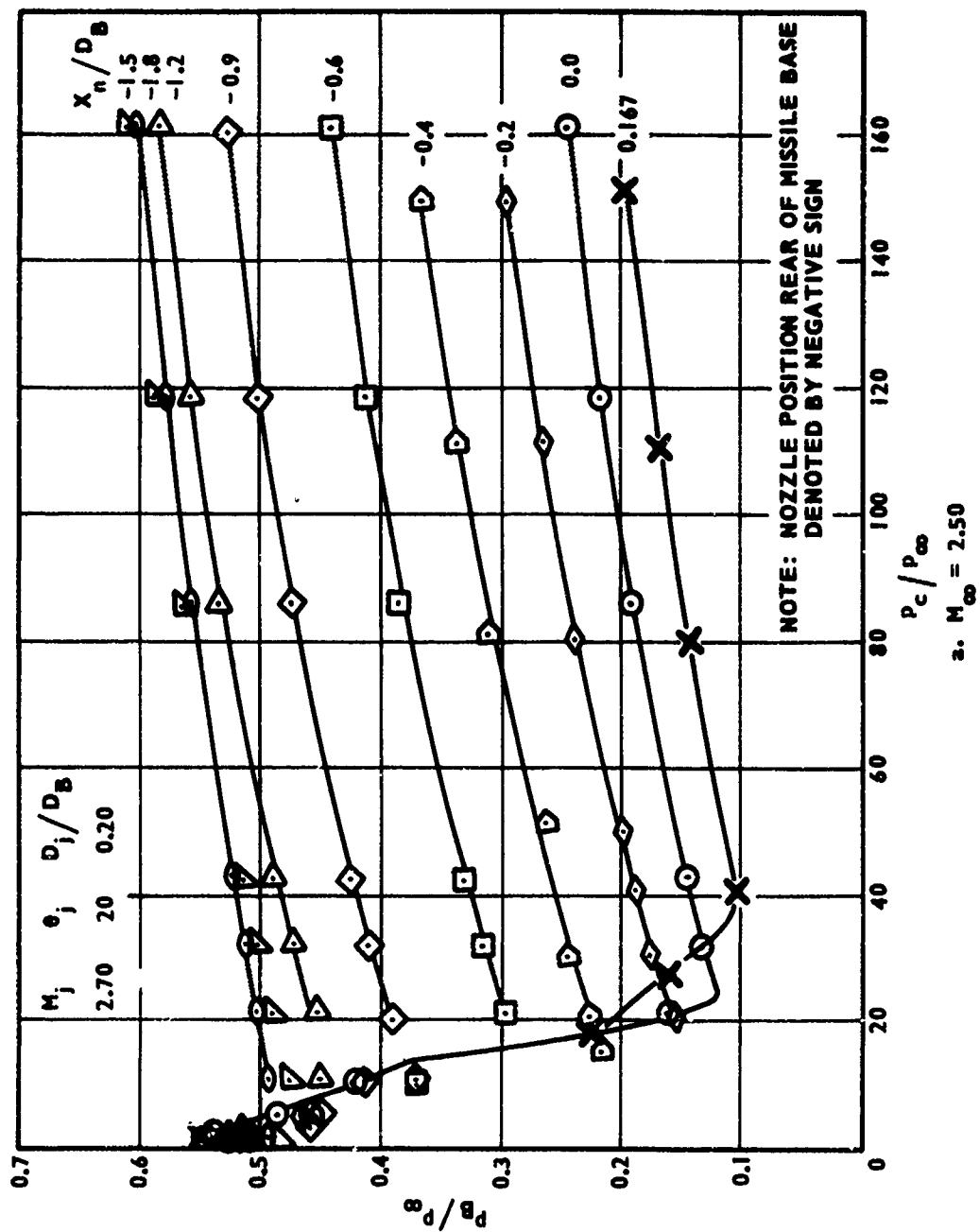


FIGURE 18. EFFECT OF NOZZLE POSITION ON BASE PRESSURE, NOZZLE-BASE RATIO = 0.20

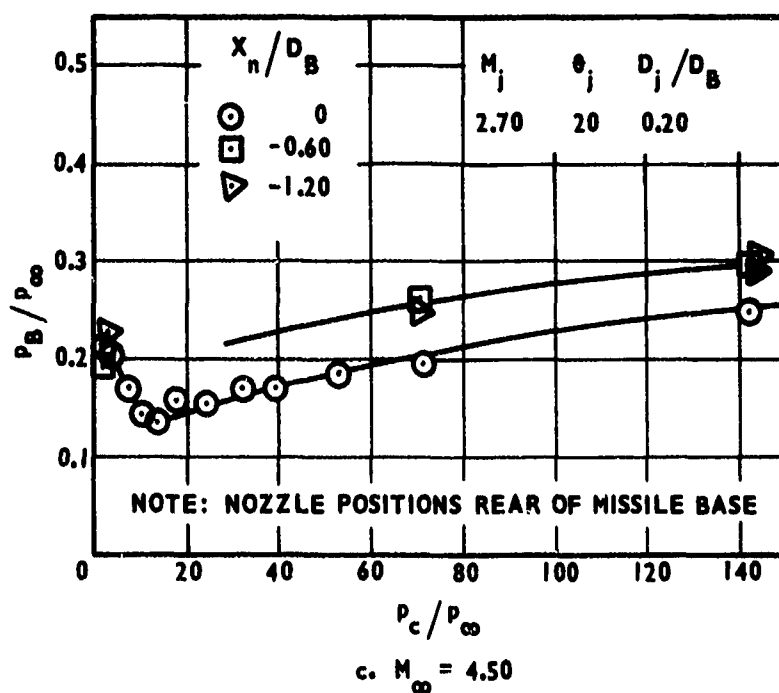
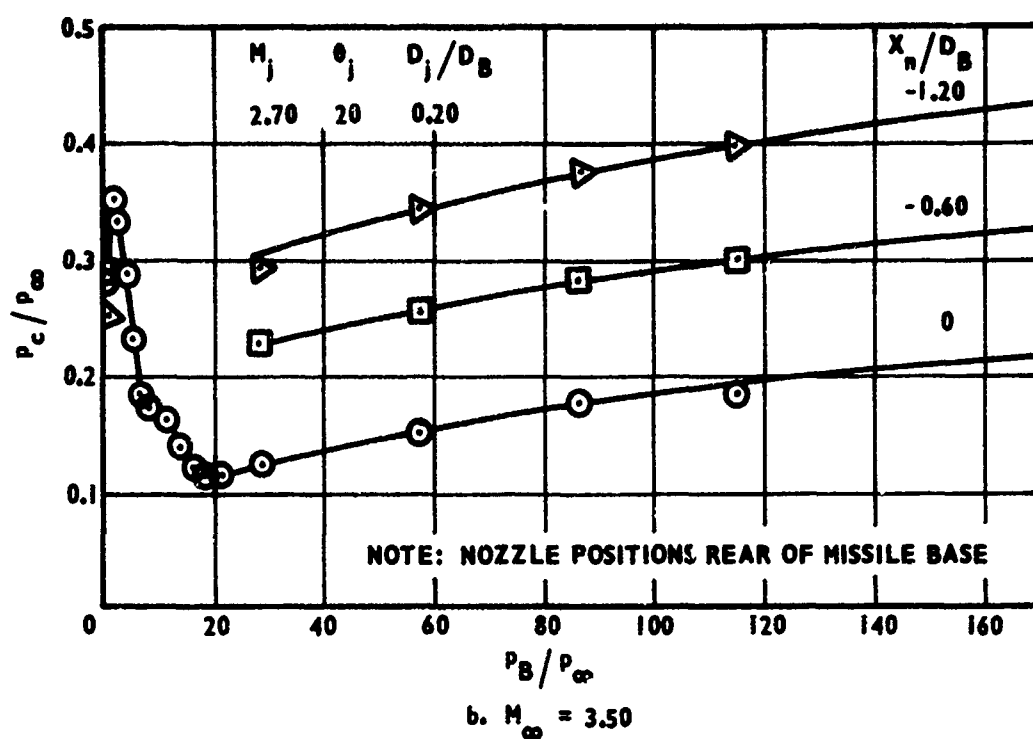


FIGURE 18. EFFECT OF NOZZLE POSITION ON BASE PRESSURE, NOZZLE-BASE RATIO = 0.20 (Concluded)

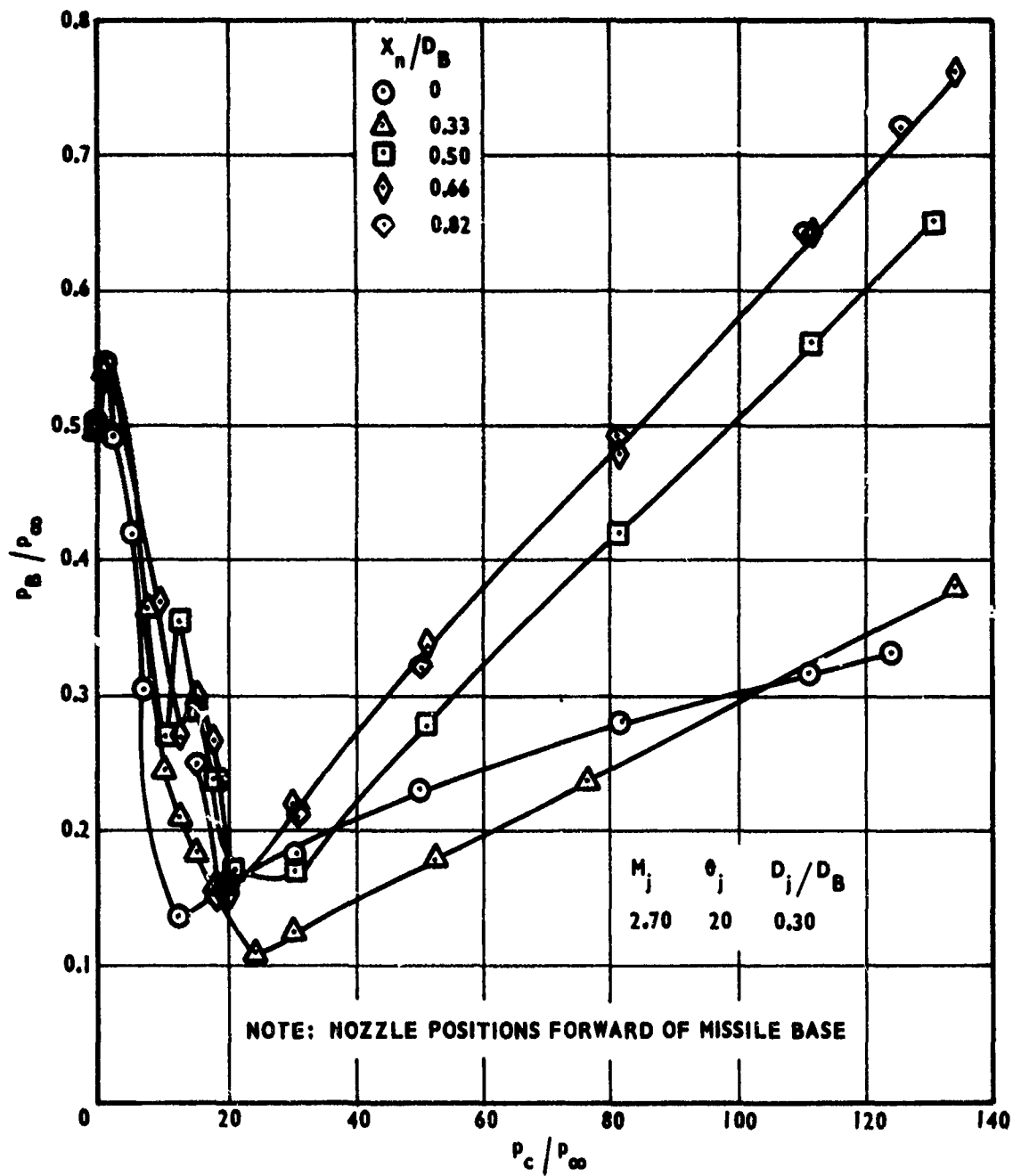


FIGURE 19. EFFECT OF NOZZLE POSITION ON BASE PRESSURE,
NOZZLE-BASE RATIO = 0.30, MACH NUMBER = 2.50

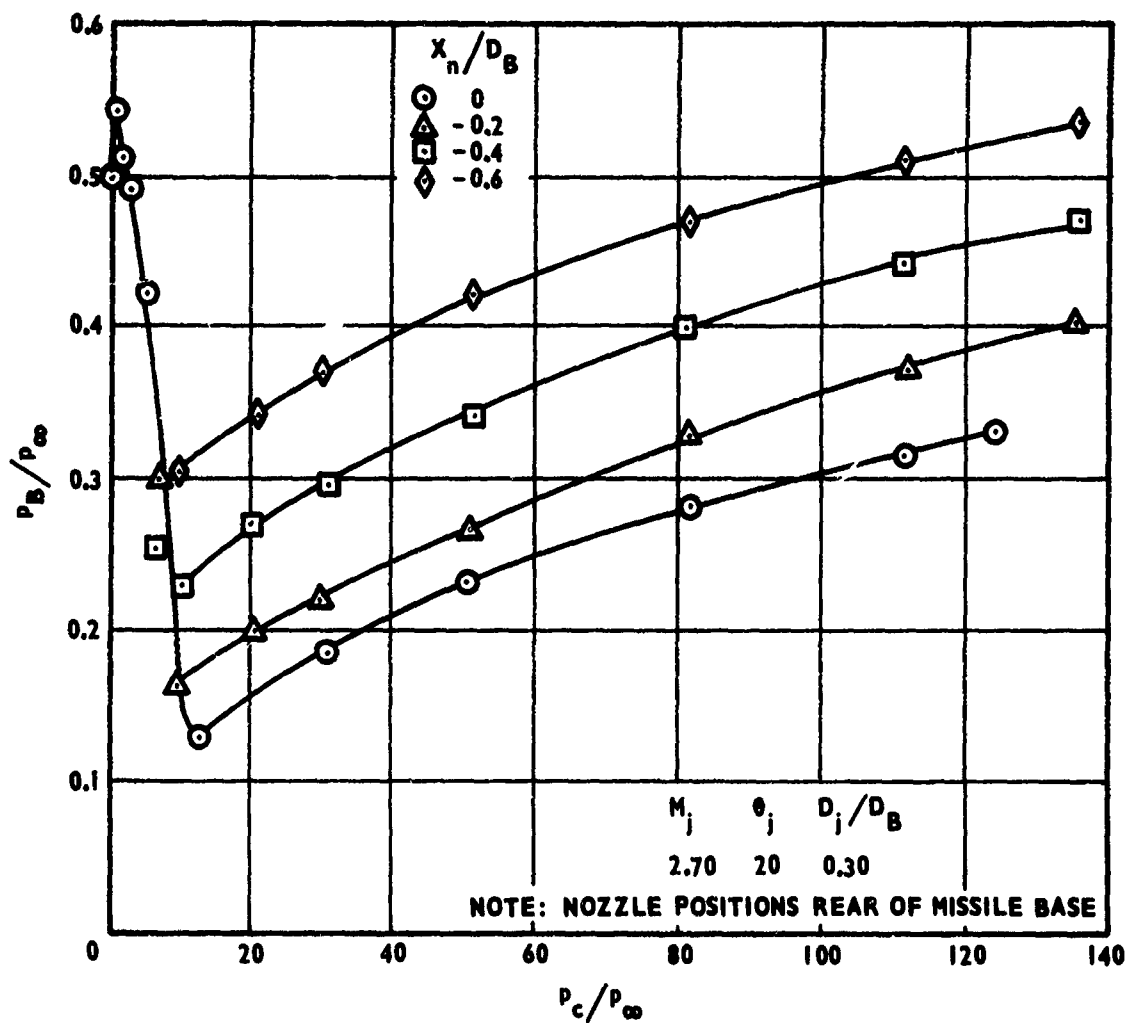


FIGURE 19. EFFECT OF NOZZLE POSITION ON BASE PRESSURE, NOZZLE-BASE RATIO = 0.30, MACH NUMBER = 2.50

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Appendix Tabulated Test Results

The following data were listed from computer equipment and the symbols used to designate various parameters were selected to facilitate the use of this equipment. The following list identifies the symbols used in this portion of the report:

CPB	Base pressure coefficient, $\left[\frac{PB}{PF} - 1.0 \right] \frac{1.0}{0.7 (MF)^2}$
CT	Thrust coefficient, thrust/[dynamic pressure $\times$ reference area]
D*	Diameter of nozzle at the throat (in.)
DJ	Diameter of nozzle at the exit plane (in.)
DB	Reference diameter of body, 2.50 in.
GJ	Jet specific heat ratio
L	Model length (in.)
MF	Free stream Mach number
MJ	Jet exit Mach number
PB	Mean base pressure (psia)
PC	Jet stagnation pressure (psia)
PF	Free stream static pressure (psia)
RMF	Jet momentum flux ratio, $\frac{(PJ)(AJ)(MJ)^2}{(PF)(AB)(MF)^2}$, where $AJ = \pi \overline{DJ}^2$, $AB = \pi \overline{DB}^2$, and PJ = jet static pressure
THEJ	Divergence half-angle of nozzles (deg)
TOF	Free stream static temperature ($^{\circ}$ F)
RN	Reynolds number per inch
XJ	Location of nozzle exit plane relative to model base (in.) (negative positions rear of model base)

The data are arranged according to the index given in Tables A-I through A-III.

TABLE A-I. INDEX TO TABULATED DATA

Group	M_j	θ_j	D_j/D_B	M_∞	$R_N \times 10^{-6}$
1A	1.0	0	0.10	2.50	0.47
↓	1.0	0	0.10	3.00	0.51
1B	1.0	0	0.14	2.50	0.23
↓	1.0	0	0.14	2.50	0.47
↓	1.0	0	0.14	3.00	0.25
↓	1.0	0	0.14	3.00	0.51
1C	1.0	0	0.20	2.50	0.47
↓	1.0	0	0.20	3.00	0.51
2A	1.78	0	0.16	2.50	0.23
↓	1.78	0	0.16	2.50	0.47
↓	1.78	0	0.16	3.00	0.25
↓	1.78	0	0.16	3.00	0.51
2B	1.78	0	0.20	2.50	0.23
↓	1.78	0	0.20	2.50	0.47
↓	1.78	0	0.20	3.00	0.25
↓	1.78	0	0.20	3.00	0.51
2C	1.78	5	0.20	2.50	0.47
↓	1.78	5	0.20	3.00	0.51
2D	1.78	20	0.10	2.50	0.47
↓	1.78	20	0.10	3.00	0.51
2E	1.78	20	0.20	2.50	0.47
↓	1.78	20	0.20	3.00	0.51
2F	1.78	20	0.30	2.50	0.47
↓	1.78	20	0.30	3.00	0.51
3A	2.20	0	0.20	2.50	0.23
↓	2.20	0	0.20	2.50	0.47
↓	2.20	0	0.20	3.00	0.25
↓	2.20	0	0.20	3.00	0.51
3B	2.20	20	0.20	2.50	0.47
↓	2.20	20	0.20	3.00	0.51
4A	2.70	0	0.20	2.50	0.23
↓	2.70	0	0.20	2.50	0.51
↓	2.70	0	0.20	3.00	0.25
↓	2.70	0	0.20	3.00	0.51

TABLE A-I. INDEX TO TABULATED DATA (Concluded)

Group	M_j	θ_j	D_j/D_B	M_∞	$R_N \times 10^{-6}$
4B ↓	2.70	0	0.25	2.50	0.23
	2.70	0	0.25	2.50	0.47
	2.70	0	0.25	3.00	0.25
	2.70	0	0.25	3.00	0.51
4C ↓	2.70	10	0.20	2.50	0.47
	2.70	10	0.20	3.00	0.51
4D ↓	2.70	15	0.20	2.50	0.47
	2.70	15	0.20	3.00	0.51
4E ↓	2.70	20	0.20	2.50	0.47
	2.70	20	0.20	3.00	0.54
	2.70	20	0.20	3.50	0.50
	2.70	20	0.20	4.00	0.50
	2.70	20	0.20	4.50	0.49
	2.70	20	0.20	4.50	0.54
4F ↓	2.70	20	0.30	2.50	0.54
	2.70	20	0.30	3.00	0.54
5A ↓	3.20	0	0.20	2.50	0.23
	3.20	0	0.20	2.50	0.47
	3.20	0	0.20	3.00	0.25
	3.20	0	0.20	3.00	0.51
5B ↓	3.20	0	0.31	2.50	0.23
	3.20	0	0.31	2.50	0.47
	3.20	0	0.31	3.00	0.25
	3.20	0	0.31	3.00	0.51
5C ↓	3.20	20	0.20	2.50	0.47
	3.20	20	0.20	3.00	0.51
6A ↓	3.80	20	0.20	3.00	0.50
	3.80	20	0.20	2.50	0.47

TABLE A-II. NOZZLE POSITION DATA

Group	M_j	θ_j	D_j/D_B	M_∞	R_N (in.)	X_N/D_B
7A	2.70	20	0.10	2.50	0.55×10^6	-0.60
						-0.40
						0
						0.33
						0.50
						0.67
						0.82
						0.98
7B	2.70	20	0.20	2.50	0.55×10^6	-0.60
						-0.40
						-0.20
						0
						0.33
						0.50
						0.67
						0.82
						0.98
7C	2.70	20	0.30	3.50	0.50×10^6	-0.60
				4.50	0.49×10^6	-1.20
				2.50	0.55×10^6	-0.60
						-1.20
						-0.60
						-0.40
						-0.20
						0
						0.33
						0.50
						0.67
						0.82

TABLE A-III. REYNOLDS NUMBER DATA

Group	M_j	θ_j	D_j/D_B	M_∞	R_N (in.)
8A	2.70	0	0.25	2.50	0.12×10^6
					0.23×10^6
					0.35×10^6
					0.47×10^6
8B	1.00	0	0.056	2.50	0.12×10^6
					0.23×10^6
					0.35×10^6
					0.47×10^6

GROUP 1A

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.70	.75	.25	.10	0.00	1.00	0.00	.25	.25	.10	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	103.30	1.73	1.40	15.0	.47	3.00	100.30	1.11	1.40	15.0	.51
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
1.15	.5416	-.1071	.0005*	-.001*	63.00	.38	.3682	-.1011	.0001*	.001*	60.00
1.73	.5378	-.1080	.0010	.002	63.00	1.81	.4178	-.0931	.0010	.002	60.00
5.50	.4966	-.1176	.0040	.013	63.00	9.14	.3571	-.1028	.0050	.014	60.00
11.17	.4289	-.1335	.0090	.030	63.00	18.05	.3523	-.1039	.0100	.034	60.00
23.00	.4263	-.1387	.0190	.064	63.00	35.94	.2450	-.1208	.0210	.070	60.00
46.08	.2168	-.1831	.0380	.131	63.00	72.53	.2141	-.1257	.0420	.144	60.00
69.71	.2155	-.1828	.0580	.199	63.00	107.43	.2403	-.1216	.0630	.214	60.00
115.88	.2694	-.1702	.0970	.333	63.00	180.33	.2955	-.1127	.1050	.361	60.00
173.62	.3238	-.1587	.1460	.500	63.00	255.85	.3503	-.1040	.1500	.513	60.00
						144.55	.2706	-.1163	.0840	.289	60.00

GROUP 1B

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.70	.35	.35	.14	0.00	1.00	0.00	.35	.35	.14	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	93.30	1.69	1.40	15.3	.47	2.50	93.00	.85	1.40	15.0	.23
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.49	.4856	-.1175	.0004*	-.003*	60.00	.49	.4767	-.1195	.0004*	-.003*	60.00
.58	.5195	-.1098	.0005*	-.002*	60.00	117.29	.3729	-.1433	.1960	.669	60.00
1.17	.5496	-.1029	.0010	.002	60.00	175.88	.4634	-.1272	.2840	1.005	60.00
1.76	.5397	-.1053	.0020	.005	60.00	234.58	.5075	-.1125	.3930	1.343	60.00
2.94	.5034	-.1134	.0040	.012	60.00	293.05	.5617	-.1003	.4910	1.679	60.00
5.86	.4278	-.1307	.0090	.029	60.00	347.57	.6140	-.0882	.5820	1.992	60.00
11.74	.4160	-.1334	.0190	.062	60.00						
17.60	.3393	-.1510	.0290	.096	60.00						
20.65	.2809	-.1643	.0340	.114	60.00						
23.54	.2257	-.1769	.0390	.130	60.00						
29.39	.2089	-.1808	.0490	.164	60.00						
40.68	.2399	-.1737	.0680	.229	60.00						
58.31	.2822	-.1640	.0970	.350	60.00						
84.99	.3289	-.1533	.1420	.483	60.00						
88.39	.3359	-.1517	.1480	.503	60.00						
103.10	.3585	-.1466	.1720	.587	60.00						
117.99	.3801	-.1416	.1970	.673	60.00						
147.32	.4225	-.1319	.2460	.841	60.00						
176.80	.4553	-.1244	.2960	1.011	60.00						

GROUP 1B (Concluded)

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.00	.35	.35	.14	0.00	1.00	0.00	.35	.35	.14	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
3.00	93.00	1.10	1.40	15.0	.51	3.00	93.00	.55	1.40	15.0	.25
PC/PE	PR/PE	CFB	RMF	CT	TC	PC/PE	PR/PE	CPR	RMF	CT	TC
.37	.3548	-.1023	.0002*	-.0002*	60.00	180.38	.4198	-.0920	.2090	.716	60.00
.90	.4232	-.0915	.0010	0.000	60.00	269.87	.4792	-.0826	.3140	1.073	60.00
1.81	.4056	-.0943	.0030	.005	60.00	360.28	.5593	-.0713	.4190	1.434	60.00
2.71	.3852	-.0975	.0040	.011	60.00	.50.83	.6154	-.0610	.5240	1.795	60.00
4.53	.3525	-.1027	.0070	.021	60.00	540.97	.6771	-.0512	.6290	2.155	60.00
8.90	.3480	-.1034	.0140	.046	60.00						
17.93	.3480	-.1206	.0300	.098	60.00						
22.45	.1826	-.1297	.0370	.124	60.00						
27.02	.1865	-.1291	.0450	.150	60.00						
36.07	.2268	-.1258	.0600	.202	60.00						
45.09	.2248	-.1230	.0750	.254	60.00						
62.32	.2557	-.1181	.1040	.353	60.00						
80.37	.2994	-.1112	.1510	.514	60.00						
125.14	.3545	-.1024	.2260	.772	60.00						
180.70	.4053	-.0943	.3020	1.033	60.00						
225.63	.4529	-.0868	.3780	1.291	60.00						
271.02	.4930	-.0804	.4540	1.552	60.00						

GROUP 1C

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.00	.50	.50	.20	0.00	1.00	0.00	.50	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	100.00	1.73	1.40	15.0	.47	3.00	100.00	1.11	1.40	15.0	.51
PC/PE	PR/PE	CPR	RMF	CT	TC	PC/PE	PR/PE	CPR	RMF	CT	TC
.49	.4883	-.1200	.0009*	-.0006*	73.00	1.79	.4283	-.0949	.0040	.008	68.00
1.14	.5512	-.1255	.0030	.004	73.00	9.04	.2467	-.1206	.0210	.066	68.00
1.72	.5181	-.1130	.0050	.010	73.00	17.81	.2399	-.1236	.0410	.137	68.00
2.59	.4739	-.1240	.0080	.020	73.00	35.51	.2745	-.1162	.0830	.279	68.00
5.47	.4119	-.1379	.0180	.054	73.00	72.53	.3784	-.0996	.1700	.577	68.00
11.22	.2368	-.1789	.0370	.121	73.00	108.70	.4592	-.0868	.2550	.868	68.00
22.75	.2510	-.1711	.0760	.254	73.00	165.36	.5705	-.0686	.3480	1.324	68.00
46.42	.3428	-.1502	.1560	.528	73.00						
69.28	.4149	-.1337	.2340	.793	73.00						
94.75	.4884	-.1169	.3300	1.089	73.00						

GROUP 2B

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.78	0.00	.42	.50	.20	0.00	1.78	0.00	.42	.50	.20	0.00
MF	TDF	PF	GJ	LENGTH	RN/IN	MF	TDF	PF	GJ	LENGTH	RN/IN
2.50	93.70	1.69	1.40	15.0	.47	2.50	93.70	.85	1.40	15.0	.23
PC/PE	PR/PE	CPB	RMF	CT	TC	PC/PE	PR/PE	CPB	RMF	CT	TC
.49	.4787	-.1191	.0009*	-.006*	60.00	.50	.4773	-.1194	.0010*	-.006*	60.00
1.17	.5379	-.1056	.0023*	-.003*	60.00	.50	.4773	-.1194	.0010*	-.006*	60.00
2.95	.4662	-.1220	.0100	.017	60.00	117.66	.3493	-.1487	.4280	1.040	60.00
5.68	.3658	-.1449	.0200	.041	60.00	176.46	.3983	-.1375	.6420	1.564	60.00
11.64	.2238	-.1773	.0420	.094	60.00	235.72	.4389	-.1282	.8570	2.092	60.00
17.55	.1828	-.1867	.0630	.147	60.00	293.34	.4733	-.1203	1.0670	2.606	60.00
23.39	.2033	-.1820	.0850	.199	60.00	372.80	.4935	-.1164	1.1740	2.869	60.00
29.38	.2253	-.1770	.1080	.252	60.00						
58.75	.2865	-.1630	.2130	.514	60.00						
88.27	.3798	-.1531	.3210	.778	60.00						
117.81	.3643	-.1452	.4280	1.041	60.00						
146.92	.3914	-.1391	.5340	1.301	60.00						
150.28	.3947	-.1383	.5460	1.329	60.00						

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.78	0.00	.42	.50	.20	0.00	1.78	0.00	.42	.50	.20	0.00
MF	TDF	PF	GJ	LENGTH	RN/IN	MF	TDF	PF	GJ	LENGTH	RN/IN
3.70	93.70	1.10	1.40	15.0	.51	3.70	93.70	.55	1.40	15.0	.25
PC/PE	PR/PE	CPB	RMF	CT	TC	PC/PE	PR/PE	CPB	RMF	CT	TC
.38	.3558	-.1022	.0005*	-.005*	60.00	.18	.3751	-.1071	.4550	1.109	60.00
.50	.4384	-.0891	.0012*	-.003*	60.00	269.52	.3623	-.1012	.6810	1.662	60.00
4.52	.2857	-.1134	.0110	.021	60.00	363.23	.3991	-.0953	.9100	2.224	60.00
9.71	.2288	-.1224	.0220	.046	60.00	450.61	.4347	-.0897	1.1380	2.784	60.00
18.73	.1645	-.1326	.0450	.105	60.00	547.97	.4743	-.0834	1.3660	3.443	60.00
27.75	.1818	-.1298	.0680	.161	60.00						
45.22	.2068	-.1258	.1140	.273	60.00						
62.45	.2439	-.1200	.1570	.380	60.00						
90.45	.2754	-.1150	.2280	.553	60.00						
134.95	.3125	-.1091	.3410	.829	60.00						
180.50	.3433	-.1042	.4560	1.111	60.00						
225.64	.3719	-.0996	.5700	1.391	60.00						
263.15	.3969	-.0957	.6640	1.623	60.00						

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[illegible]

GROUP 2D

M	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.78	20.00	.20	.25	.10	0.00	1.78	20.00	.20	.25	.10	0.00
MF	TDF	PF	GJ	LENGTH	RN/IN	PC/PF	TDF	PF	GJ	LENGTH	RN/IN
2.50	100.00	1.73	1.40	15.0	.47	3.00	100.00	1.11	1.40	15.0	.51
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.69	.5843	-.1205	.0002*	-.001*	70.00	.41	.3299	-.1008	.0001*	-.0001*	65.00
1.14	.5395	-.1077	.0005*	-.001*	70.00	1.91	.3825	-.0928	.0006*	0.0000*	65.00
1.74	.5363	-.1086	.0008*	0.000*	70.00	9.11	.3527	-.1038	.0050	.012	65.00
2.52	.5334	-.1092	.0012*	0.000*	70.00	18.15	.3372	-.1061	.0110	.026	65.00
5.39	.5297	-.1148	.0040	.009	70.00	36.10	.2639	-.1178	.0220	.054	65.00
11.27	.4474	-.1293	.0100	.022	70.00	72.04	.1527	-.1357	.0450	.109	65.00
22.93	.3805	-.1702	.0200	.048	70.00	108.11	.1081	-.1658	.0680	.165	65.00
46.27	.2355	-.1789	.0420	.100	70.00	180.27	.2358	-.1272	.1130	.277	65.00
69.14	.1541	-.1981	.0620	.151	70.00	270.91	.2550	-.1192	.1710	.417	65.00
115.78	.1875	-.1902	.1050	.255	70.00						
172.42	.2201	-.1826	.1560	.382	70.00						

GROUP 2E

[illegible]

GROUP 2F

[illegible]

GROUP 3A

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.20	0.00	.35	.50	.20	0.00	2.20	0.00	.35	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	93.00	1.69	1.40	15.0	.47	2.50	93.00	.85	1.40	15.0	.23
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.49	.4797	-.1189	.0009*	-.006*	60.00	.49	.4766	-.1196	.0009*	-.006*	60.00
1.18	.5433	-.1043	.0023*	-.003*	60.00	117.89	.2596	-.1692	.3410	.774	60.00
2.95	.4934	-.1164	.0054*	.003*	60.00	176.44	.2871	-.1629	.5110	1.164	60.00
5.93	.4102	-.1347	.0170	.030	60.00	236.08	.3108	-.1575	.6430	1.560	60.00
11.81	.2546	-.1703	.0340	.069	60.00	293.96	.3277	-.1536	.8510	1.945	60.00
17.73	.1553	-.1930	.0510	.108	50.00	348.13	.3453	-.1496	1.0080	2.305	60.00
23.62	.1656	-.1907	.0880	.147	60.00						
29.62	.1763	-.1882	.0850	.187	60.00						
59.77	.2264	-.1768	.1710	.383	60.00						
88.47	.2594	-.1713	.2560	.579	60.00						
118.08	.2697	-.1659	.3420	.776	60.00						
147.12	.2845	-.1635	.4260	.969	60.00						
176.94	.2984	-.1603	.5120	1.167	60.00						

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.20	0.00	.35	.50	.20	0.00	2.20	0.00	.35	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
3.00	93.00	1.10	1.40	15.0	.51	3.00	93.00	.55	1.40	15.0	.25
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.38	.3541	-.1025	.0005*	-.005*	60.00	182.43	.2377	-.1709	.3620	.826	60.00
.90	.4337	-.0898	.0012*	-.003*	60.00	270.58	.2581	-.1177	.5440	1.243	60.00
1.81	.4108	-.0935	.0025*	.000*	60.00	361.14	.2793	-.1143	.7260	1.661	60.00
4.53	.3046	-.1103	.0090	.014	60.00	451.39	.3023	-.1110	.9080	2.077	60.00
8.86	.2218	-.1235	.0170	.034	60.00	541.84	.3253	-.1070	1.0900	2.495	60.00
17.93	.1389	-.1366	.0360	.076	60.00						
27.01	.1503	-.1348	.0540	.118	60.00						
36.08	.1571	-.1337	.0720	.160	60.00						
45.11	.1633	-.1327	.0900	.201	60.00						
62.38	.1794	-.1302	.1250	.281	60.00						
90.44	.2014	-.1267	.1810	.411	60.00						
135.20	.2211	-.1236	.2710	.617	60.00						
179.92	.2398	-.1206	.3610	.824	60.00						
225.44	.2577	-.1179	.4530	1.034	60.00						
273.63	.2757	-.1149	.5500	1.257	60.00						

GROUP 3B

MJ	THEJ	D*	DJ	NJ/DB	XJ/DB	MJ	THEJ	D*	DJ	NJ/DB	XJ/DB
2.20	20.20	.16	.50	.20	0.00	2.20	20.20	.16	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	108.20	1.69	1.40	15.0	.47	3.00	96.00	1.10	1.40	15.0	.51
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
11.83	.2667	-.1676	.0340	.069	70.00	1.81	.4109	-.0934	.0025*	0.000*	70.00
17.81	.1589	-.1922	.0510	.109	70.00	4.54	.3198	-.1079	.0090	.014	70.00
23.79	.1559	-.1929	.0680	.149	70.00	18.09	.1346	-.1373	.0360	.077	70.00
44.59	.1925	-.1845	.1290	.287	70.00	27.29	.1520	-.1345	.0540	.119	70.00
59.35	.2146	-.1795	.1710	.385	70.00	36.39	.1660	-.1323	.0730	.161	70.00
88.76	.2512	-.1711	.2570	.581	70.00	68.29	.2040	-.1263	.1370	.308	70.00
118.60	.2877	-.1627	.3430	.779	70.00	91.09	.2231	-.1233	.1830	.414	70.00
148.34	.3157	-.1565	.4290	.977	70.00	136.40	.2562	-.1180	.2740	.623	70.00
						181.40	.3034	-.1110	.3640	.831	70.00
						227.19	.3363	-.1053	.4570	1.042	70.00

GROUP 4A

MJ	THEJ	D*	DJ	NJ/DB	XJ/DB	MJ	THEJ	D*	DJ	NJ/DB	XJ/DB
2.70	0.20	.28	.50	.20	0.00	2.70	0.20	.28	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	93.20	1.64	1.40	15.0	.47	2.50	93.20	.85	1.40	15.0	.23
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.49	.4864	-.1173	.0009*	-.006*	60.00	.49	.4743	-.1201	.0009*	CT	TC
.59	.5080	-.1124	.0011*	-.006*	60.00	117.52	.2034	-.1820	.2350	.508*	60.00
1.18	.5559	-.1014	.0023*	-.003*	60.00	176.22	.2178	-.1787	.3530	.765	60.00
1.77	.5472	-.1034	.0035*	-.001*	60.00	235.27	.2340	-.1758	.4710	1.025	60.00
2.94	.5301	-.1073	.0058*	.003*	60.00	293.67	.2403	-.1737	.5880	1.283	60.00
5.85	.4581	-.1238	.0117*	.016*	60.00	352.49	.2477	-.1720	.7060	1.641	60.00
11.77	.3933	-.1386	.0230	.042	60.00						
14.73	.3483	-.1489	.0290	.055	60.00						
17.68	.1577	-.1941	.0350	.068	60.00						
20.66	.1435	-.1957	.0410	.081	60.00						
23.58	.1462	-.1951	.0470	.094	60.00						
29.46	.1533	-.1935	.0590	.120	60.00						
40.70	.1711	-.1894	.0810	.169	60.00						
58.95	.1863	-.1864	.1180	.250	60.00						
88.32	.1974	-.1834	.1760	.379	60.00						
117.86	.2080	-.1810	.2360	.509	60.00						
147.30	.2158	-.1792	.2950	.639	60.00						
176.48	.2222	-.1777	.3530	.767	60.00						

GROUP 4A (Concluded)

MJ	THFJ	D*	DJ	DJ/DB	XJ/DB	MJ	THFJ	D*	DJ	DJ/DB	XJ/DB
2.70	0.70	.28	.50	.20	0.00	2.70	0.70	.28	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
3.00	93.70	1.10	1.40	15.0	.51	3.00	93.70	.55	1.40	15.0	.25
PC/PF	PB/PF	CPR	RMF	CT	TC	PC/PF	PB/PF	CPR	RMF	CT	TC
.38	.3544	-.1024	.0005*	-.005*	60.00	183.74	.1873	-.1289	.2510	.545	60.00
.90	.4293	-.0905	.0012*	-.003*	60.00	270.05	.1941	-.1275	.3750	.818	60.00
4.53	.3457	-.1038	.0062	.007*	60.00	360.09	.2162	-.1259	.5010	1.094	60.00
8.94	.2375	-.1221	.0120	.020	60.00	450.25	.2157	-.1244	.6260	1.369	60.00
17.99	.1226	-.1392	.0250	.048	60.00	543.90	.2249	-.1230	.7520	1.646	60.00
27.73	.1276	-.1384	.0370	.076	60.00						
45.54	.1353	-.1372	.0630	.132	60.00						
62.40	.1522	-.1348	.0860	.184	60.00						
90.49	.1559	-.1339	.1250	.270	60.00						
135.09	.1661	-.1323	.1870	.406	60.00						
180.44	.1758	-.1308	.2510	.545	60.00						
225.76	.1846	-.1294	.3140	.683	60.00						
270.93	.1934	-.1280	.3770	.821	60.00						

GROUP 4B

MJ	THFJ	D*	DJ	DJ/DB	XJ/DB	MJ	THFJ	D*	DJ	DJ/DB	XJ/DB
2.70	0.70	.35	.62	.25	0.00	2.70	0.00	.35	.62	.25	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	93.70	1.69	1.40	15.0	.23	2.50	93.70	.85	1.40	15.0	.47
PC/PF	PB/PF	CPR	RMF	CT	TC	PC/PF	PB/PF	CPR	RMF	CT	TC
.49	.4782	-.1192	.0015*	-.011*	60.00	116.88	.4741	-.1201	.0015*	-.010*	60.00
1.18	.5554	-.1016	.0037*	-.006*	60.00	175.99	.2290	-.1197	.3700	.798	60.00
2.94	.4973	-.1148	.0093*	.006*	60.00	235.07	.2407	-.1162	.5570	1.210	60.00
5.89	.4021	-.1366	.0186*	.026*	60.00	293.34	.2519	-.11735	.7440	1.621	60.00
11.79	.1452	-.1953	.0370	.067	60.00	147.13	.2619	-.11709	.9290	2.026	60.00
17.70	.1438	-.1954	.0560	.108	60.00			-.1807	1.0990	2.401	60.00
23.60	.1541	-.1933	.0740	.149	60.00						
29.50	.1660	-.1906	.0930	.190	60.00						
58.94	.1957	-.1838	.1860	.395	60.00						
88.39	.2106	-.1804	.2800	.600	60.00						
118.08	.2212	-.1780	.3740	.807	60.00						
147.35	.2321	-.1759	.4660	1.010	60.00						
154.19	.2329	-.1753	.4880	1.058	60.00						

GROUP 4B (Concluded)

MJ	2.70	THEJ	10.20	D*	.35	DJ	.62	OJ/DB	.25	XJ/DB	0.00	RM/IN	.25	TC		DJ/DB	.25	XJ/DB	0.00	RM/IN	.51	TC	
MF	3.00	TDF	93.00	PF	1.10	GJ	1.40	LENGTH	15.0								LENGTH	15.0					
PC/PF	.38	PB/PF	.3548	CPB	-.1024	RMF	.0008*	CT									CT						
	.90		.4432		-.0883		.0019*		-.0008*														
	4.52		.2974		-.1115		.0099*		.011*														
	8.94		.1196		-.1397		.0190		.033														
	17.99		.1273		-.1385		.0390		.076														
	27.03		.1327		-.1376		.0590		.120														
	36.09		.1371		-.1369		.0790		.164														
	45.24		.1435		-.1359		.0990		.208														
	62.33		.1581		-.1336		.1370		.291														
	90.41		.1636		-.1327		.1980		.426														
	135.21		.1739		-.1311		.2970		.643														
	180.42		.1840		-.1295		.3970		.861														
	225.96		.1937		-.1279		.4970		1.081														
	271.10		.2078		-.1257		.5960		1.300														

GROUP 4C

MJ	2.70	THEJ	10.20	D*	.28	DJ	.50	OJ/DB	.20	XJ/DB	0.00	RM/IN	.47	TC		DJ/DB	.20	XJ/DB	0.00	RM/IN	.51	TC	
MF	2.50	TDF	100.00	PF	1.73	GJ	1.40	LENGTH	15.0								LENGTH	15.0					
PC/PF	.49	PB/PF	.4897	CPB	-.1192	RMF	.0009*	CT									CT						
	1.16		.5468		-.1058		.0023*		-.004*														
	5.49		.4706		-.1236		.0110*		.015*														
	11.29		.4009		-.1399		.0220		.040														
	23.12		.1363		-.2017		.0460		.092														
	69.88		.1727		-.1929		.1400		.298														
	116.87		.2126		-.1833		.2340		.505														
	162.33		.2388		-.1777		.3250		.705														

GROUP 4D

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	15.00	.28	.50	.20	0.00	2.70	15.00	.28	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	110.00	1.69	1.40	15.0	.47	3.00	130.00	1.10	1.40	15.0	.51
PC/PF	PR/PF	CPB	RMF	CT	TC	PC/PF	PR/PF	CPB	RMF	CT	TC
1.19	.5496	-.1029	.0023*	-.003*	75.00	.90	.4261	-.0910	.0012*	-.003*	70.00
2.97	.5259	-.1083	.0059*	.003*	75.00	1.81	.4148	-.0928	.0025*	0.000*	70.00
11.78	.3765	-.1425	.0230	.042	75.00	4.54	.3541	-.1025	.0063*	.007*	70.00
20.71	.1181	-.2015	.0410	.081	75.00	8.91	.2435	-.1200	.0120	.020	70.00
23.69	.1224	-.2005	.0470	.095	75.00	18.06	.1376	-.1416	.0250	.048	70.00
44.44	.1434	-.1957	.0890	.186	75.00	27.11	.1188	-.1398	.0370	.076	70.00
59.37	.1539	-.1940	.1180	.252	75.00	36.25	.1292	-.1382	.0500	.104	70.00
88.82	.1753	-.1884	.1770	.381	75.00	45.45	.1387	-.1368	.0630	.132	70.00
133.69	.1868	-.1858	.2070	.447	75.00	68.12	.1545	-.1342	.0940	.201	70.00
118.47	.1949	-.1840	.2370	.512	75.00	91.75	.1606	-.1332	.1260	.271	70.00
168.75	.2115	-.1802	.2960	.642	75.00	135.97	.1731	-.1312	.1890	.409	70.00
						158.61	.1839	-.1295	.2200	.478	70.00
						181.55	.1937	-.1279	.2520	.548	70.00
						226.96	.2396	-.1254	.3150	.887	70.00
						266.57	.2231	-.1233	.3700	.808	70.00

GROUP 4E

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.70	.28	.50	.20	0.00	2.70	20.70	.28	.50	.20	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	130.00	1.73	1.40	15.0	.47	3.00	93.00	1.10	1.40	15.0	.54
PC/PF	PR/PF	CPB	RMF	CT	TC	PC/PF	PR/PF	CPB	RMF	CT	TC
.49	.4877	-.1196	.0009*	-.006*	68.00	.41	.3738	-.0993	.0005*	-.005*	70.00
.80	.5406	-.1072	.0016*	-.005*	68.00	.95	.4177	-.0924	.0013*	-.003*	70.00
1.63	.5417	-.1069	.0032*	-.001*	68.00	4.78	.3492	-.1032	.0066*	.008*	70.00
2.06	.5375	-.1079	.0041*	0.000*	68.00	5.85	.3231	-.1074	.0081*	.011*	70.00
5.20	.4779	-.1218	.0104*	.013*	68.00	15.77	.1569	-.1338	.0200	.039	70.00
11.24	.3942	-.1410	.0220	.040	68.00	24.16	.1227	-.1392	.0330	.087	70.00
18.20	.1913	-.1885	.0360	.070	68.00	28.62	.1285	-.1383	.0390	.081	70.00
22.33	.1311	-.2025	.0440	.089	68.00	33.29	.1340	-.1374	.0460	.095	70.00
33.77	.1442	-.1995	.0670	.139	68.00	47.41	.1442	-.1358	.0590	.123	70.00
34.93	.1424	-.1999	.0700	.144	68.00	65.10	.1639	-.1327	.0900	.192	70.00
57.39	.1591	-.1964	.1150	.243	68.00	87.93	.1741	-.1310	.1220	.262	70.00
65.76	.1646	-.1947	.1310	.280	68.00	128.84	.1938	-.1284	.1790	.387	70.00
114.37	.2391	-.1843	.2290	.494	68.00	159.32	.2149	-.1261	.2210	.480	70.00
162.91	.2438	-.1775	.3260	.707	68.00	181.88	.2164	-.1243	.2530	.549	70.00
						227.67	.2385	-.1208	.3160	.889	70.00
						269.91	.2562	-.1180	.3750	.818	70.00

GROUP 4E (Concluded)

MJ	2.70	THEJ	20.30	D*	.28	DJ	.50	DJ/DB	.20	XJ/DB	0.00	XJ/DB	0.00
MF	3.50	TDF	0.30	PF	.69	GJ	1.40	LENGTH	15.0	AN/IN	.50	AN/IN	.50
PC/PF	.60	PB/PF	.2831	CPR	-.0836	RMF	.0006*	CT	-.003*	TC		CT	0.000*
.60		.2795		-.0840		.0006*		-.003*				.004	60.00
.62		.2821		-.0837		.0006*		-.003*				.008	60.00
1.47		.3475		-.0760		.0015*		-.001*				.015	60.00
2.88		.3311		-.0780		.0029*		.001*				.034	60.00
4.30		.2865		-.0832		.0043*		.004*				.054	60.00
5.78		.2317		-.0895		.0050		.008				.0520	60.00
7.12		.1811		-.0954		.0070		.011				.0700	60.00
8.64		.1717		-.0965		.0080		.014				.111	60.00
10.00		.1717		-.0965		.0100		.017				.150	60.00
11.52		.1639		-.0975		.0110		.021				.1250	60.00
14.22		.1400		-.1002		.0140		.027					
16.13		.1128		-.1022		.0160		.031					
17.21		.1169		-.1029		.0170		.033					
21.54		.1169		-.1029		.0220		.043					
28.81		.1253		-.1020		.0290		.060					
57.53		.1529		-.0987		.0580		.124					
86.34		.1769		-.0959		.0880		.189					
115.19		.1856		-.0949		.1170		.253					
230.31		.2266		-.0901		.2350		.512					
316.85		.2515		-.0872		.3230		.706					
432.17		.2891		-.0829		.4410		.965					
D*	.28	THEJ	20.30	D*	.28	DJ	.50	DJ/DB	.20	XJ/DB	0.00	XJ/DB	0.00
PF	.69	TDF	0.30	PF	.28	GJ	1.40	LENGTH	15.0	AN/IN	.50	AN/IN	.50
RMF	.0006*	PB/PF	.2831	CPR	-.0836	RMF	.0006*	CT	-.003*	TC		CT	0.000*
.0006*		.2795		-.0840		.0006*		-.003*				.004	60.00
.0006*		.2821		-.0837		.0006*		-.003*				.008	60.00
.0015*		.3475		-.0760		.0015*		-.001*				.015	60.00
.0029*		.3311		-.0780		.0029*		.001*				.034	60.00
.0043*		.2865		-.0832		.0043*		.004*				.054	60.00
.0050		.2317		-.0895		.0050		.008				.0520	60.00
.0070		.1811		-.0954		.0070		.011				.0700	60.00
.0080		.1717		-.0965		.0080		.014				.111	60.00
.0100		.1717		-.0965		.0100		.017				.150	60.00
.0110		.1639		-.0975		.0110		.021				.1250	60.00
.0140		.1400		-.1002		.0140		.027					
.0160		.1128		-.1022		.0160		.031					
.0170		.1169		-.1029		.0170		.033					
.0220		.1169		-.1029		.0220		.043					
.0290		.1253		-.1020		.0290		.060					
.0580		.1529		-.0987		.0580		.124					
.0880		.1769		-.0959		.0880		.189					
.1170		.1856		-.0949		.1170		.253					
.2350		.2266		-.0901		.2350		.512					
.3230		.2515		-.0872		.3230		.706					
.4410		.2891		-.0829		.4410		.965					
D*	.28	THEJ	20.30	D*	.28	DJ	.50	DJ/DB	.20	XJ/DB	0.00	XJ/DB	0.00
PF	.28	TDF	0.30	PF	.28	GJ	1.40	LENGTH	15.0	AN/IN	.50	AN/IN	.50
RMF	.0006*	PB/PF	.2831	CPR	-.0836	RMF	.0006*	CT	-.003*	TC		CT	0.000*
.0006*		.2795		-.0840		.0006*		-.003*				.004	60.00
.0006*		.2821		-.0837		.0006*		-.003*				.008	60.00
.0015*		.3475		-.0760		.0015*		-.001*				.015	60.00
.0029*		.3311		-.0780		.0029*		.001*				.034	60.00
.0043*		.2865		-.0832		.0043*		.004*				.054	60.00
.0050		.2317		-.0895		.0050		.008				.0520	60.00
.0070		.1811		-.0954		.0070		.011				.0700	60.00
.0080		.1717		-.0965		.0080		.014				.111	60.00
.0100		.1717		-.0965		.0100		.017				.150	60.00
.0110		.1639		-.0975		.0110		.021				.1250	60.00
.0140		.1400		-.1002		.0140		.027					
.0160		.1128		-.1022		.0160		.031					
.0170		.1169		-.1029		.0170		.033					
.0220		.1169		-.1029		.0220		.043					
.0290		.1253		-.1020		.0290		.060					
.0580		.1529		-.0987		.0580		.124					
.0880		.1769		-.0959		.0880		.189					
.1170		.1856		-.0949		.1170		.253					
.2350		.2266		-.0901		.2350		.512					
.3230		.2515		-.0872		.3230		.706					
.4410		.2891		-.0829		.4410		.965					
D*	.28	THEJ	20.30	D*	.28	DJ	.50	DJ/DB	.20	XJ/DB	0.00	XJ/DB	0.00
PF	.28	TDF	0.30	PF	.28	GJ	1.40	LENGTH	15.0	AN/IN	.50	AN/IN	.50
RMF	.0006*	PB/PF	.2831	CPR	-.0836	RMF	.0006*	CT	-.003*	TC		CT	0.000*
.0006*		.2795		-.0840		.0006*		-.003*				.004	60.00
.0006*		.2821		-.0837		.0006*		-.003*				.008	60.00
.0015*		.3475		-.0760		.0015*		-.001*				.015	60.00
.0029*		.3311		-.0780		.0029*		.001*				.034	60.00
.0043*		.2865		-.0832		.0043*		.004*				.054	60.00
.0050		.2317		-.0895		.0050		.008				.0520	60.00
.0070		.1811		-.0954		.0070		.011				.0700	60.00
.0080		.1717		-.0965		.0080		.014				.111	60.00
.0100		.1717		-.0965		.0100		.017				.150	60.00
.0110		.1639		-.0975		.0110		.021				.1250	60.00
.0140		.1400		-.1002		.0140		.027					
.0160		.1128		-.1022		.0160		.031					
.0170		.1169		-.1029		.0170		.033					
.0220		.1169		-.1029		.0220		.043					
.0290		.1253		-.1020		.0290		.060					
.0580		.1529		-.0987		.0580		.124					
.0880		.1769		-.0959		.0880		.189					
.1170		.1856		-.0949		.1170		.253					
.2350		.2266		-.0901		.2350		.512					
.3230		.2515		-.0872		.3230		.706					
.4410		.2891		-.0829		.4410		.965					
D*	.28	THEJ	20.30	D*	.28	DJ	.50	DJ/DB	.20	XJ/DB	0.00	XJ/DB	0.00
PF	.28	TDF	0.30	PF	.28	GJ	1.40	LENGTH	15.0	AN/IN	.50	AN/IN	.50
RMF	.0006*	PB/PF	.2831	CPR	-.0836	RMF	.0006*	CT	-.003*	TC		CT	0.000*
.0006*		.2795		-.0840		.0006*		-.003*				.004	60.00
.0006*		.2821		-.0837		.0006*		-.003*				.008	60.00
.0015*		.3475		-.0760		.0015*		-.001*				.015	60.00
.0029*		.3311		-.0780		.0029*		.001*				.034	60.00
.0043*		.2865		-.0832		.0043*		.004*				.054	60.00
.0050		.2317		-.0895		.0050		.008				.0520	60.00
.0070		.1811		-.0954		.0070		.011				.0700	60.00
.0080		.1717		-.0965		.0080		.014				.111	60.00
.0100		.1717		-.0965		.0100		.017				.150	60.00
.0110		.1639		-.0975		.0110		.021				.1250	60.00
.0140		.1400		-.1002		.0140		.027					
.0160		.1128		-.1022		.0160		.031					
.0170		.1169		-.1029		.0170		.033					
.0220		.1169		-.1029		.0220		.043					
.0290		.1253		-.1020		.0290		.060					
.0580		.1529		-.0987		.0580		.124					
.0880		.1769		-.0959		.0880		.189					
.1170		.1856		-.0949		.1170		.253					
.2350		.2266		-.0901		.2350		.512					
.3230		.2515		-.0872		.3230		.706					
.4410		.2891		-.0829		.4410		.965					
D*	.28	THEJ	20.30	D*	.28	DJ	.50	DJ/DB	.20	XJ/DB	0.00	XJ/DB	0.00
PF	.28	TDF	0.30	PF	.28	GJ	1.40	LENGTH	15.0	AN/IN	.50	AN/IN	.50
RMF	.0006*	PB/PF	.2831	CPR	-.0836	RMF	.0006*	CT	-.003*	TC		CT	0.000*
.0006*		.2795		-.0840		.0006*		-.003*				.004	60.00
.0006*		.2821		-.0837		.0006*		-.003*				.008	60.00
.0015*		.3475		-.0760		.0015*		-.001*				.015	60.00
.0029*		.3311		-.0780		.0029*		.001*				.034	60.00
.0043*		.2865		-.0832		.0043*		.004*				.054	60.00
.0050		.2317		-.0895		.0050		.008				.0520	60.00
.0070		.1811		-.0954		.0070		.011					

GROUP 5A

MJ	TIMEJ	D*	DJ	DJ/DB	XJ/DB	MJ	TIMEJ	D*	DJ	DJ/DB	XJ/DB
3.20	0.20	.22	.50	.20	0.00	3.20	0.20	.22	.50	.20	0.00
MF	93.70	PF	GJ	LENGTH	RN/IN	MF	93.70	PF	GJ	LENGTH	RN/IN
2.50		1.69	1.40	15.0	.47	2.50		.85	1.40	15.0	.23
PC/PF	PR/PF	CPB	RMF	CT	TC	PC/PF	PR/PF	CPB	RMF	CT	TC
.48	.4790	-.1190	.0009*	-.007*	60.00	.49	.4761	-.1197	.0009*	-.006*	60.00
1.18	.5311	-.1071	.0023*	-.003*	60.00	117.84	.1722	-.1892	.1560	.325	60.00
2.95	.5313	-.1071	.0053*	.003*	60.00	176.17	.1791	-.1876	.2330	.490	60.00
5.91	.4852	-.1176	.0118*	.016*	60.00	235.03	.1860	-.1860	.3110	.657	60.00
11.85	.4127	-.1343	.0237*	.043*	60.00	293.47	.1916	-.1847	.3890	.823	60.00
17.74	.3851	-.1405	.0355*	.068*	60.00	352.74	.1973	-.1834	.4670	.991	60.00
23.62	.3507	-.1485	.0310	.057	60.00						
29.55	.1562	-.1928	.0390	.074	60.00						
58.97	.1577	-.1926	.0780	.158	60.00						
88.44	.1637	-.1912	.1170	.241	60.00						
117.90	.1701	-.1896	.1560	.325	60.00						
177.2	.1772	-.1880	.1950	.408	60.00						
176.70	.1831	-.1867	.2340	.492	60.00						

GROUP 5A (Concluded)

MJ	TIMEJ	D*	DJ	DJ/OB	XJ/OB	MJ	TIMEJ	D*	DJ	DJ/OB	XJ/OB
3.20	0.70	.22	.50	.20	0.00	3.20	0.70	.22	.50	.20	0.00
MF	TF	PF	GJ	LENGTH	RN/IN	MF	TF	PF	GJ	LENGTH	RN/IN
3.00	93.00	1.10	1.40	15.0	.51	3.00	93.00	.55	1.40	15.0	.25
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.38	.3552	-.1023	.0003*	-.005*	60.00	178.60	.1563	-.1339	.1640	.345	60.00
.90	.4145	-.0929	.0012*	-.003*	60.00	270.45	.1623	-.1329	.2480	.524	60.00
4.52	.3811	-.0982	.0062*	.007*	60.00	360.43	.1690	-.1318	.3310	.703	60.00
9.01	.3005	-.1110	.0125*	.021*	60.00	451.45	.1762	-.1307	.4150	.882	60.00
18.02	.1247	-.1389	.0160	.029	60.00	542.05	.1813	-.1299	.4990	1.061	60.00
27.11	.1138	-.0240	.0240	.047	60.00						
47.30	.1202	-.1396	.0410	.082	60.00						
62.45	.1250	-.1388	.0570	.116	60.00						
93.99	.1286	-.1383	.0830	.172	60.00						
135.30	.1339	-.1374	.1240	.260	60.00						
180.58	.1405	-.1364	.1660	.349	60.00						
225.68	.1471	-.1353	.2070	.438	60.00						
271.23	.1535	-.1343	.2490	.527	60.00						

GROUP 5B

[illegible]

GROUP 5B (Concluded)

MJ	3.20	THEJ	0.30	D*	.35	UJ	.74	XJ/DB	0.00	XJ/DB	0.00
MF	3.20	TPE	93.30	PF	1.10	GJ	1.40	RM/IN	.51	RM/IN	.25
PC/PE	.39	PR/PE	.3536	CPR	-.1025	RMF	.0013	CT	.013	CT	.013
	.91		.4417	-.0086	.0031		.0031	-.0099	-.0099	-.0099	-.0099
	4.53		.333	-.1054	.0160		.0160	.019	.019	.019	.019
	9.33		.1517	-.1346	.0210		.0210	.029	.029	.029	.029
	18.34		.1242	-.1390	.0420		.0420	.074	.074	.074	.074
	27.39		.1253	-.1388	.0630		.0630	.119	.119	.119	.119
	45.25		.1191	-.1382	.1060		.1060	.211	.211	.211	.211
	62.49		.1187	-.1367	.1460		.1460	.297	.297	.297	.297
	90.58		.1470	-.1364	.2120		.2120	.439	.439	.439	.439
	115.27		.1459	-.1355	.3179		.3179	.663	.663	.663	.663
	180.40		.1532	-.1344	.4230		.4230	.890	.890	.890	.890
	226.35		.1603	-.1333	.5310		.5310	1.120	1.120	1.120	1.120
	270.94		.1649	-.1322	.6360		.6360	1.345	1.345	1.345	1.345

GROUP 5C

MJ	3.20	THEJ	73.30	D*	.22	UJ	.50	XJ/DB	0.00	XJ/DB	0.00
MF	2.50	TPE	108.10	PF	1.69	GJ	1.40	RM/IN	.47	RM/IN	.51
PC/PE	11.91	PR/PE	.4194	CPR	-.1326	RMF	.0238	CT	.043	CT	.043
	17.85		.3747	-.1429	.0357		.0357	-.069	-.069	-.069	-.069
	23.80		.2884	-.1626	.0310		.0310	.058	.058	.058	.058
	44.57		.1277	-.1993	.0590		.0590	.117	.117	.117	.117
	59.43		.1366	-.1973	.0780		.0780	.159	.159	.159	.159
	89.10		.1443	-.1954	.1180		.1180	.243	.243	.243	.243
	118.64		.1621	-.1915	.1570		.1570	.327	.327	.327	.327
	148.26		.1768	-.1861	.1960		.1960	.411	.411	.411	.411

GROUP 6A

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
3.80	20.70	.35	.50	.20	0.00	3.80	20.70	.35	.50	.20	0.00
MF	TNF	PF	GJ	LFNGTH	RN/IN	MF	TNF	PF	GJ	LFNGTH	RN/IN
2.50	138.70	1.69	1.40	15.0	.47	3.30	95.70	1.10	1.40	15.0	.51
PC/PF	PR/PF	CPB	RMF	CT	TC	PC/PF	PR/PF	CPB	RMF	CT	TC
11.85	.4711	-.1208	.0237*	.043*	70.00	1.81	.4057	-.0943	.0012*	-.003*	70.00
17.82	.4249	-.1314	.0357*	.069*	70.00	4.34	.4015	-.0942	.0025*	0.000*	70.00
23.79	.3950	-.1382	.0476*	.095*	70.00	9.12	.3644	-.0949	.0053*	.007*	70.00
44.53	.1383	-.2038	.0350	.065	70.00	18.21	.2721	-.1155	.0126*	.021*	70.00
59.38	.1163	-.2019	.0470	.090	70.00	27.33	.1189	-.1398	.0753*	.049*	70.00
89.72	.1237	-.2002	.0700	.139	70.00	31.44	.11975	-.1432	.0150	.025	70.00
118.61	.1273	-.1994	.0940	.189	70.00	36.79	.1966	-.1433	.0170	.030	70.00
148.28	.1385	-.1968	.1180	.239	70.00	45.20	.1028	-.1424	.0200	.036	70.00
						45.57	.1715	-.1426	.0250	.046	70.00
						68.40	.1124	-.1408	.0370	.073	70.00
						91.21	.1216	-.1394	.0500	.099	70.00
						136.63	.1354	-.1380	.0750	.152	70.00
						159.38	.1289	-.1382	.0880	.178	70.00
						181.61	.1294	-.1381	.1000	.204	70.00
						227.68	.1397	-.1365	.1250	.258	70.00
						272.80	.1485	-.1351	.1510	.310	70.00

GROUP 7A

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.14	.25	.10	-0.60	2.70	20.00	.14	.25	.10	-0.60	2.70	20.00	.14	.25	.10	-0.60
MF	TOF	PF	GJ	LENGTH	RM/IN	MF	TOF	PF	GJ	LENGTH	RM/IN	MF	TOF	PF	GJ	LENGTH	RM/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.62	.5059	-.1117	.0003	-.0002	75.00	.62	.5059	-.1117	.0003	-.0002	75.00	.62	.5059	-.1117	.0003	-.0002	75.00
2.02	.5147	-.1097	.0010	.000	75.00	2.02	.5147	-.1097	.0010	.000	75.00	2.02	.5147	-.1097	.0010	.000	75.00
20.68	.4187	-.1314	.0103	.021	75.00	20.68	.4187	-.1314	.0103	.021	75.00	20.68	.4187	-.1314	.0103	.021	75.00
51.66	.2970	-.1589	.0258	.0550	75.00	51.66	.2970	-.1589	.0258	.0550	75.00	51.66	.2970	-.1589	.0258	.0550	75.00
102.43	.3145	-.1545	.0512	.1104	75.00	102.43	.3145	-.1545	.0512	.1104	75.00	102.43	.3145	-.1545	.0512	.1104	75.00
81.61	.3056	-.1570	.0408	.087	75.00	81.61	.3056	-.1570	.0408	.087	75.00	81.61	.3056	-.1570	.0408	.087	75.00
102.45	.3164	-.1545	.0512	.110	75.00	102.45	.3164	-.1545	.0512	.110	75.00	102.45	.3164	-.1545	.0512	.110	75.00
112.32	.3216	-.1534	.0512	.110	75.00	112.32	.3216	-.1534	.0512	.110	75.00	112.32	.3216	-.1534	.0512	.110	75.00
153.24	.3386	-.1495	.0766	.121	75.00	153.24	.3386	-.1495	.0766	.121	75.00	153.24	.3386	-.1495	.0766	.121	75.00

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.14	.25	.10	0.00	2.70	20.00	.14	.25	.10	0.00	2.70	20.00	.14	.25	.10	0.00
MF	TOF	PF	GJ	LENGTH	RM/IN	MF	TOF	PF	GJ	LENGTH	RM/IN	MF	TOF	PF	GJ	LENGTH	RM/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.49	.4973	-.1136	.0003	-.0017	75.00	.49	.4973	-.1136	.0003	-.0017	75.00	.49	.4973	-.1136	.0003	-.0017	75.00
.95	.5065	-.1114	.0005	-.001	75.00	.95	.5065	-.1114	.0005	-.001	75.00	.95	.5065	-.1114	.0005	-.001	75.00
5.07	.5193	-.1087	.0025	.003	75.00	5.07	.5193	-.1087	.0025	.003	75.00	5.07	.5193	-.1087	.0025	.003	75.00
2.01	.5197	-.1086	.0010	0.000	75.00	2.01	.5197	-.1086	.0010	0.000	75.00	2.01	.5197	-.1086	.0010	0.000	75.00
18.06	.4585	-.1224	.0090	.017	75.00	18.06	.4585	-.1224	.0090	.017	75.00	18.06	.4585	-.1224	.0090	.017	75.00
30.56	.4170	-.1318	.0153	.031	75.00	30.56	.4170	-.1318	.0153	.031	75.00	30.56	.4170	-.1318	.0153	.031	75.00
51.27	.3166	-.1545	.0256	0.054	75.00	51.27	.3166	-.1545	.0256	0.054	75.00	51.27	.3166	-.1545	.0256	0.054	75.00
81.20	.1715	-.1873	.0406	.087	75.00	81.20	.1715	-.1873	.0406	.087	75.00	81.20	.1715	-.1873	.0406	.087	75.00
111.80	.1240	-.1980	.0559	.120	75.00	111.80	.1240	-.1980	.0559	.120	75.00	111.80	.1240	-.1980	.0559	.120	75.00
152.61	.1384	-.1948	.0763	.166	75.00	152.61	.1384	-.1948	.0763	.166	75.00	152.61	.1384	-.1948	.0763	.166	75.00
91.43	.1376	-.1950	.0457	.098	75.00	91.43	.1376	-.1950	.0457	.098	75.00	91.43	.1376	-.1950	.0457	.098	75.00
112.15	.1261	-.1956	.0561	.121	75.00	112.15	.1261	-.1956	.0561	.121	75.00	112.15	.1261	-.1956	.0561	.121	75.00
112.37	.1265	-.1975	.0562	.121	75.00	112.37	.1265	-.1975	.0562	.121	75.00	112.37	.1265	-.1975	.0562	.121	75.00
153.22	.1420	-.1940	.0766	.166	75.00	153.22	.1420	-.1940	.0766	.166	75.00	153.22	.1420	-.1940	.0766	.166	75.00

GROUP 7A (Continued)

[illegible]

	D*	DJ	DJ/DB	MJ	THEJ	TOF	PF	D*	DJ	DJ/DB	THEJ	TOF	PF	PC/PP	PC/PF	PB/PP	CPB	CP	CP/DB
1	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.51	20.70	.431	-.1277	.0003	1.118
2	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
3	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
4	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
5	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
6	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
7	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
8	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
9	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
10	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
11	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
12	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
13	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
14	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
15	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
16	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
17	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
18	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
19	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
20	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
21	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
22	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
23	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
24	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
25	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
26	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
27	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
28	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
29	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
30	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
31	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
32	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
33	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
34	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
35	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
36	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
37	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
38	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
39	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
40	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
41	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
42	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
43	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
44	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
45	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
46	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
47	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
48	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
49	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
50	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
51	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
52	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
53	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
54	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
55	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
56	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
57	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
58	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
59	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
60	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
61	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
62	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
63	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
64	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
65	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
66	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
67	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
68	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
69	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
70	.14	.25	.10	2.70	20.00	95.0	1.96	.14	.25	.10	20.00	95.0	1.96	5.06	20.70	.431	-.1277	.0003	1.118
71	.14	.25	.10	2.70	20.00	95.0	1.96	.14											

GROUP 7B

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.42	.50	.20	-0.60	2.70	20.00	.28	.30	.20	-0.60	2.70	20.00	.28	.30	.20	-0.60
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	.55	.55	2.50	95.0	1.96	1.40	.55	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.60	.5011	-.1095	.0012	-.007	75.00	.58	.4996	-.1098	.0012	-.007	75.00	.58	.4996	-.1098	.0012	-.007	75.00
1.00	.5206	-.1052	.0020	-.005	75.00	1.00	.5287	-.1034	.0020	-.005	75.00	1.00	.5287	-.1034	.0020	-.005	75.00
2.01	.5171	-.1059	.0040	.000	75.00	2.01	.5189	-.1056	.0040	.000	75.00	2.01	.5189	-.1056	.0040	.000	75.00
5.07	.4475	-.1212	.0101	.013	75.00	5.15	.4545	-.1186	.0103	.013	75.00	5.15	.4545	-.1186	.0103	.013	75.00
10.20	.3706	-.1381	.0204	.036	75.00	10.21	.3665	-.1390	.0205	.036	75.00	10.21	.3665	-.1390	.0205	.036	75.00
12.79	.3303	-.1469	.0256	.047	75.00	12.79	.3255	-.1472	.0256	.047	75.00	12.79	.3255	-.1472	.0256	.047	75.00
14.09	.3137	-.1506	.0282	.053	75.00	14.09	.3088	-.1506	.0282	.053	75.00	14.09	.3088	-.1506	.0282	.053	75.00
15.35	.3021	-.1531	.0307	.058	75.00	15.35	.3021	-.1531	.0307	.058	75.00	15.35	.3021	-.1531	.0307	.058	75.00
20.47	.2463	-.1544	.0410	.0810	75.00	20.47	.2463	-.1544	.0410	.0810	75.00	20.47	.2463	-.1544	.0410	.0810	75.00
30.60	.3140	-.1505	.0613	.126	75.00	30.60	.3140	-.1505	.0613	.126	75.00	30.60	.3140	-.1505	.0613	.126	75.00
17.00	.2935	-.1550	.0341	.066	75.00	17.00	.2935	-.1550	.0341	.066	75.00	17.00	.2935	-.1550	.0341	.066	75.00
51.22	.3455	-.1436	.1026	.216	75.00	51.22	.3455	-.1436	.1026	.216	75.00	51.22	.3455	-.1436	.1026	.216	75.00
81.31	.3813	-.1357	.1628	.349	75.00	81.31	.3813	-.1357	.1628	.349	75.00	81.31	.3813	-.1357	.1628	.349	75.00
112.61	.4080	-.1299	.2243	.4840	75.00	112.61	.4080	-.1299	.2243	.4840	75.00	112.61	.4080	-.1299	.2243	.4840	75.00
149.58	.4350	-.1240	.2996	.6490	75.00	149.58	.4350	-.1240	.2996	.6490	75.00	149.58	.4350	-.1240	.2996	.6490	75.00

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.28	.50	.20	-0.20	2.70	20.00	.28	.50	.20	-0.20	2.70	20.00	.28	.50	.20	-0.20
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	.55	.55	2.50	95.0	1.96	1.40	.55	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.53	.4991	-.1099	.0010	-.007	75.00	.51	.4995	-.1098	.0010	-.007	75.00	.51	.4995	-.1098	.0010	-.007	75.00
1.01	.5311	-.1029	.0020	-.005	75.00	1.03	.5332	-.1024	.0020	-.005	75.00	1.03	.5332	-.1024	.0020	-.005	75.00
2.02	.5266	-.1039	.0040	-.030	75.00	2.01	.5259	-.1040	.0040	-.030	75.00	2.01	.5259	-.1040	.0040	-.030	75.00
5.22	.4697	-.1164	.0056	.003	75.00	5.06	.4736	-.1155	.0056	.003	75.00	5.06	.4736	-.1155	.0056	.003	75.00
50.53	.1990	-.1757	.1012	.014	75.00	50.53	.1990	-.1757	.1012	.014	75.00	50.53	.1990	-.1757	.1012	.014	75.00
80.01	.2378	-.1672	.1622	.213	75.00	80.01	.2378	-.1672	.1622	.213	75.00	80.01	.2378	-.1672	.1622	.213	75.00
111.92	.2654	-.1612	.2242	.347	75.00	111.92	.2654	-.1612	.2242	.347	75.00	111.92	.2654	-.1612	.2242	.347	75.00
149.26	.2950	-.1547	.2989	.483	75.00	149.26	.2950	-.1547	.2989	.483	75.00	149.26	.2950	-.1547	.2989	.483	75.00
20.43	.1548	-.1854	.0409	.648	75.00	20.43	.1548	-.1854	.0409	.648	75.00	20.43	.1548	-.1854	.0409	.648	75.00
31.46	.1747	-.1811	.0630	.881	75.00	31.46	.1747	-.1811	.0630	.881	75.00	31.46	.1747	-.1811	.0630	.881	75.00
40.63	.1863	-.1785	.0814	.170	75.00	40.63	.1863	-.1785	.0814	.170	75.00	40.63	.1863	-.1785	.0814	.170	75.00

GROUP 283 (Continued)

MJ		THEJ		D*		DJ		DJ/DB		XJ/DB		MJ		THEJ		D*		DJ		DJ/DB		XJ/DB		
2.70	20.00	.28	.50	.20	.50	.20	.50	.20	.50	.20	.50	2.70	20.00	.28	.50	.20	.50	.20	.50	.20	.50	.20	.50	
MF	TOF	PF	GJ	LENGTH	CT	RMF	PC/Pr	PC/PF	PB/PF	CPH	IC	RN/IN	RN/IN	TOF	PF	GJ	LENGTH	CT	RMF	PC/Pr	PB/PF	CPH	IC	
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40
2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50	.20	2.70	20.00	.28	.50	.20	.0050	.0020	1.02	2.70	20.00	.28	.50
2.50	95.0	1.96	1.40	15.0	-0.07	.0010	.49	2.50	95.0	1.96	1.40	15.0	2.50	95.0										

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GROUP 7B (Continued)

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.28	.50	.20	-1.20
MF	TOF	PF	GJ	LENGTH	RN/IN
4.50	95.00	.28	1.40	15.0	.49
PC/PF	PB/PF	CPB	RMF	CT	TC
1.30	.2150	-.0554	.0007	.001	---
71.45	.2487	-.0530	.0440	.094	---
143.00	.2898	-.0572	.0880	.191	---
285.99	.3824	-.0436	.1760	.383	---
142.82	.3020	-.0495	.0880	.191	---
572.57	.4374	-.0396	.3550	.774	---
787.43	.4773	-.0439	.4870	1.068	---
1073.95	.5230	-.0336	.6640	1.457	---

GROUP 7C

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.42	.75	.30	-0.40
MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.0	1.56	1.40	15.0	.34
PC/PF	PB/PF	CPB	RMF	CT	TC
10.41	.3015	-.1415	.0469	.0824	.75.00
20.69	.3429	-.1365	.0933	.1843	.75.00
30.82	.3732	-.1302	.2333	.491	.75.00
81.81	.4723	-.1097	.3688	.789	.75.00
112.33	.5084	-.1022	.5064	1.091	.75.00
135.63	.5335	-.0969	.6114	1.322	.75.00
MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.42	.75	.30	-0.40
MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.0	1.56	1.40	15.0	.34
PC/PF	PB/PF	CPB	RMF	CT	TC
10.53	.2288	-.1603	.0472	.084	.75.00
20.68	.2674	-.1522	.0932	.184	.75.00
30.81	.2954	-.1464	.1389	.284	.75.00
7.94	.2550	-.1548	.0358	.058	.75.00
51.86	.3397	-.1372	.2338	.493	.75.00
81.76	.3996	-.1248	.3687	.789	.75.00
112.37	.4421	-.1159	.5060	1.092	.75.00
136.19	.4688	-.1104	.6140	1.327	.75.00

GROUP 7C (Continued)

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.42	.75	.30	-0.20	2.70	20.00	.42	.75	.30	-0.20
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
7.95	.2986	-.1457	.0159	-.0127	75.00	7.95	.2986	-.1457	.0159	-.0127	75.00
10.64	.1598	-.1746	.0213	.104	75.00	10.64	.1598	-.1746	.0213	.104	75.00
30.95	.2229	-.1615	.0619	.307	75.00	30.95	.2229	-.1615	.0619	.307	75.00
51.87	.2644	-.1529	.1037	.517	75.00	51.87	.2644	-.1529	.1037	.517	75.00
82.11	.3285	-.1395	.1642	.812	75.00	82.11	.3285	-.1395	.1642	.812	75.00
112.63	.3726	-.1304	.2253	1.124	75.00	112.63	.3726	-.1304	.2253	1.124	75.00
136.95	.4028	-.1241	.2739	1.368	75.00	136.95	.4028	-.1241	.2739	1.368	75.00
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
51	.4974	-.1044	.0073	-.316	75.00	51	.4974	-.1044	.0073	-.316	75.00
2.02	.5187	-.0938	.0045	-.011	75.00	2.02	.5187	-.0938	.0045	-.011	75.00
5.08	.4206	-.1056	.0126	-.007	75.00	5.08	.4206	-.1056	.0126	-.007	75.00
10.44	.1450	-.1204	.0279	.029	75.00	10.44	.1450	-.1204	.0279	.029	75.00
15.56	.1432	-.1673	.0471	.082	75.00	15.56	.1432	-.1673	.0471	.082	75.00
7.85	.3050	-.1780	.0701	.133	75.00	7.85	.3050	-.1780	.0701	.133	75.00
12.99	.1576	-.1444	.0344	.057	75.00	12.99	.1576	-.1444	.0344	.057	75.00
30.83	.1342	-.1799	.0586	.108	75.00	30.83	.1342	-.1799	.0586	.108	75.00
51.11	.2322	-.1701	.2304	.285	75.00	51.11	.2322	-.1701	.2304	.285	75.00
81.78	.2801	-.1496	.3687	.789	75.00	81.78	.2801	-.1496	.3687	.789	75.00
112.39	.3174	-.1618	.5067	1.092	75.00	112.39	.3174	-.1618	.5067	1.092	75.00
126.91	.3316	-.1389	.5721	1.235	75.00	126.91	.3316	-.1389	.5721	1.235	75.00

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.42	.75	.30	0.30	2.70	20.00	.42	.75	.30	0.30
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.50	.4951	-.1049	.0022	-.015	75.00	.50	.4951	-.1049	.0022	-.015	75.00
1.05	.5404	-.0955	.0047	-.010	75.00	1.05	.5404	-.0955	.0047	-.010	75.00
7.84	.3640	-.1320	.0353	.057	75.00	7.84	.3640	-.1320	.0353	.057	75.00
10.42	.2445	-.1570	.0470	.082	75.00	10.42	.2445	-.1570	.0470	.082	75.00
12.99	.2161	-.1629	.0586	.108	75.00	12.99	.2161	-.1629	.0586	.108	75.00
15.44	.1817	-.1700	.0696	.132	75.00	15.44	.1817	-.1700	.0696	.132	75.00
18.51	.1629	-.1699	.0697	.133	75.00	18.51	.1629	-.1699	.0697	.133	75.00
20.72	.1962	-.1740	.0818	.159	75.00	20.72	.1962	-.1740	.0818	.159	75.00
30.84	.1231	-.1678	.0934	.185	75.00	30.84	.1231	-.1678	.0934	.185	75.00
24.96	.1094	-.1822	.1390	.285	75.00	24.96	.1094	-.1822	.1390	.285	75.00
52.33	.1771	-.1951	.1125	.226	75.00	52.33	.1771	-.1951	.1125	.226	75.00
76.45	.2365	-.1710	.2359	.498	75.00	76.45	.2365	-.1710	.2359	.498	75.00
112.31	.3249	-.1587	.3446	.736	75.00	112.31	.3249	-.1587	.3446	.736	75.00
134.60	.3788	-.1403	.5065	1.091	75.00	134.60	.3788	-.1403	.5065	1.091	75.00
		-.1241	.6067	1.312	75.00			-.1241	.6067	1.312	75.00

GROUP 7C (Continued)

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	20.00	.42	.75	.30	0.67	2.70	20.00	.42	.75	.30	0.67
MF	TOF	PF	GJ	LENGTH	RM/IN	MF	TOF	PF	GJ	LENGTH	RM/IN
2.50	95.0	1.96	1.40	15.0	.55	2.50	95.0	1.96	1.40	15.0	.55
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
1.01	.5416	-.0953	.0046	-.0110	75.00	1.01	.5416	-.0953	.0046	-.0110	75.00
10.43	.3690	-.1311	.0469	.0830	75.00	10.43	.3690	-.1311	.0469	.0830	75.00
13.03	.2683	-.1520	.0587	.108	75.00	13.03	.2683	-.1520	.0587	.108	75.00
7.85	.3414	-.1368	.0354	.057	75.00	7.85	.3414	-.1368	.0354	.057	75.00
15.42	.2966	-.1462	.0695	.132	75.00	15.42	.2966	-.1462	.0695	.132	75.00
18.16	.2648	-.1528	.0819	.1592	75.00	18.16	.2648	-.1528	.0819	.1592	75.00
29.71	.1582	-.1749	.0934	.1844	75.00	29.71	.1582	-.1749	.0934	.1844	75.00
30.79	.2194	-.1622	.1388	.284	75.00	30.79	.2194	-.1622	.1388	.284	75.00
51.88	.3385	-.1375	.2339	.493	75.00	51.88	.3385	-.1375	.2339	.493	75.00
81.77	.4803	-.1080	.3686	.789	75.00	81.77	.4803	-.1080	.3686	.789	75.00
112.41	.6430	-.0742	.5067	1.092	75.00	112.41	.6430	-.0742	.5067	1.092	75.00
134.89	.7618	-.0495	.6081	1.315	75.00	134.89	.7618	-.0495	.6081	1.315	75.00

GROUP 8A

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
2.70	0.00	.352	.628	.25	0.00	2.70	0.00	.352	.628	.25	0.00
MF	TOF	PF	GJ	LENGTH	RM/IN	MF	TOF	PF	GJ	LENGTH	RM/IN
2.50	95.00	0.42	1.40	15.0	.12	2.50	95.00	0.42	1.40	15.0	.12
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.52	.4539	-.1248	.0016	-.011	65.00	.52	.4539	-.1248	.0016	-.011	65.00
18.52	.2017	-.1824	.0596	.117	65.00	18.52	.2017	-.1824	.0596	.117	65.00
35.42	.2158	-.1792	.1118	.231	65.00	35.42	.2158	-.1792	.1118	.231	65.00
35.62	.2147	-.1794	.1124	.233	65.00	35.62	.2147	-.1794	.1124	.233	65.00
59.24	.2245	-.1772	.1869	.396	65.00	59.24	.2245	-.1772	.1869	.396	65.00
82.73	.2221	-.1764	.2610	.559	65.00	82.73	.2221	-.1764	.2610	.559	65.00
118.06	.2383	-.1740	.3725	.804	65.00	118.06	.2383	-.1740	.3725	.804	65.00
118.23	.2378	-.1741	.3756	.805	65.00	118.23	.2378	-.1741	.3756	.805	65.00
177.58	.2418	-.1732	.5595	1.216	65.00	177.58	.2418	-.1732	.5595	1.216	65.00

GROUP 3 B

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB	NJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.00	.14	.14	.056	0.00	1.00	0.00	.14	.14	.056	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.00	0.85	1.40	15.0	.23	2.50	95.00	0.85	1.40	15.0	.23
MF	TOF	PF	GJ	LENGTH	RN/IN	MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.00	0.42	1.40	15.0	.12	2.50	95.00	0.42	1.40	15.0	.12
PC/PF	PB/PF	CPB	RMF	CT	TC	PC/PF	PB/PF	CPB	RMF	CT	TC
.49	.4765	-.1196	.0000	.000	65.00	.49	.4765	-.1196	.0000	.000	45.00
17.76	.3365	-.1516	.0005	.001	65.00	17.76	.3365	-.1516	.0005	.001	65.00
29.51	.2302	-.1759	.0008	.002	65.00	29.51	.2302	-.1759	.0008	.002	65.00
59.00	.2911	-.1620	.0016	.004	65.00	59.00	.2911	-.1620	.0016	.004	65.00
59.18	.2909	-.1620	.0016	.004	65.00	59.18	.2909	-.1620	.0016	.004	65.00
88.69	.3401	-.1508	.0023	.006	65.00	88.69	.3401	-.1508	.0023	.006	65.00
118.21	.3831	-.1409	.0031	.008	65.00	118.21	.3831	-.1409	.0031	.008	65.00
118.97	.3830	-.1410	.0031	.008	65.00	118.97	.3830	-.1410	.0031	.008	65.00
177.39	.4592	-.1235	.0047	.0	65.00	177.39	.4592	-.1235	.0047	.0	65.00

GROUP 98 (Continued)

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.00	.14	.14	.056	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.00	1.27	1.40	15.0	.35
PC/PF	PR/PF	CPB	RMF	CT	TC
.51	.4840	-.1179	.0001	.0000	65.00
18.10	.3286	-.1534	.0005	.001	65.00
18.16	.3255	-.1534	.0005	.001	65.00
18.16	.3285	-.1534	.0005	.001	65.00
59.33	.2851	-.1633	.0018	.003	65.00
78.95	.3246	-.1543	.0021	.005	65.00
79.45	.3244	-.1544	.0021	.005	65.00
99.04	.3558	-.1472	.0026	.007	65.00
146.58	.4158	-.1335	.0036	.010	65.00
177.17	.4505	-.1255	.0047	.012	65.00

MJ	THEJ	D*	DJ	DJ/DB	XJ/DB
1.00	0.00	.14	.14	.056	0.00
MF	TOF	PF	GJ	LENGTH	RN/IN
2.50	95.00	1.70	1.40	15.0	.47
PC/PF	PR/PF	CPB	RMF	CT	TC
17.66	.3316	-.1527	.0005	.001	65.00
.48	.4809	-.1186	.0000	.001	65.00
44.25	.2522	-.1709	.0012	.	65.00
44.25	.2522	-.1709	.0012	.003	65.00
58.1	.2870	-.1629	.0016	.004	65.00
59.44	.2874	-.1628	.0016	.004	65.00
88.50	.3371	-.1515	.0023	.006	65.00
118.02	.3787	-.1419	.0031	.008	65.00

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13. ABSTRACT Results of supersonic wind tunnel tests are presented which show the effects of varying nozzle geometry, location, and supply pressure on the base pressure of a cylindrical body at zero angle of attack. The purpose of the tests was to investigate the parametric influences in the regions where base pressure is near a minimum, which occurs in the lower range of thrust levels. A bibliography of related experimental results is also included.		

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