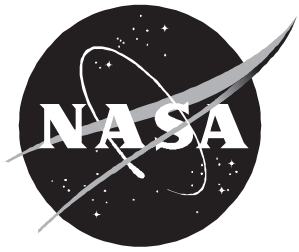

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Mach 10 Experimental Database of a Three-Dimensional Scramjet Inlet Flow Field

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Contents

Summary

The present work documents the experimental database of a combined computational and experimental parametric study of the internal aerodynamics of a generic three-dimensional sidewall-compression scramjet inlet configuration at Mach 10. A total of 256 channels of pressure data, including static pressure orifices, pitot pressures, and exit flow rakes, along with oil flow and infrared thermography, provided a detailed experimental description of the flow. Tests were performed in the Langley 31-Inch Mach 10 Tunnel for three geometric contraction ratios (3, 5, and 9), three Reynolds numbers (Re = 0.55×10^6 per foot, 1.14×10^6 per foot, and 2.15×10^6 per foot), and three cowl positions (cowl leading edge at the throat and two forward positions). The forebody, modeled generically as a flat plate, extended 9 in. in front of the inlet and provided a laminar inflow boundary layer. With increasing contraction ratio (CR), the separation generated by the glancing shocks is observed to grow and, for CR = 5 and 9, extend forward of the inlet entrance. A decrease in the free-stream unit Reynolds number (Re) of only a factor of 2 led to a similar upstream separation. Surface streamlines (oil flows) near the entrance of the inlet indicated significant reverse flow as the flow spilled around the inlet sidewalls. Measured pressures in front of the inlet entrance further showed evidence of lateral pressure relief as the flow spilled around the sidewalls. On a multiengine model (or flight vehicle) the magnitude of such separation is anticipated to be larger due to the lack of lateral pressure relief resulting from the presence of neighboring identical engine modules. Although the presence of such large-scale separations leads to the question of whether the inlet is started, the presence of internal oblique swept shock interactions on the sidewalls seems to indicate that at least in the classical sense, the inlet is not unstarted. The laminar inflow boundary layer therefore appears to be very sensitive to increases in contraction ratio or decreases in Reynolds number; only the CR = 3 configuration with 0, 25, and 50 percent cowl at Re = 2.15×10^6 per foot operated “on design.”

Symbols

a	speed of sound
C_p	pressure coefficient
$C_{x'}$	distance from cowl leading edge to throat entrance, in.
CFD	computational fluid dynamics
CR	geometric contraction ratio, W/g
g	throat gap, in.
H	height of inlet, 4.0 in.
h	enthalpy
M	Mach number
p	pressure, psia
q	dynamic pressure
Re	unit free-stream Reynolds number, per foot
T	temperature, °R
$T_{x'}$	distance from sidewall leading edge to throat, 9.5 in. (see fig. 3)
u	velocity
W	inlet width at the sidewall leading edge, in. (see fig. 2)
x	axial distance measured from baseplate leading edge, in. (see fig. 3)
x'	local axial distance measured from sidewall leading edge, in. (see fig. 3)
y	lateral distance from plane of symmetry, measured from centerline toward sidewall, in. (see fig. 3)
y_{wall}	local inlet width at a given axial station, in.
Z	vertical distance from baseplate, defined for convenience as the negative of z, in. (see fig. 3)
z	vertical distance from baseplate, in. (see fig. 3)
δ	sidewall compression angle, deg
Λ	leading-edge sweep angle, deg
μ	viscosity
ρ	density

Subscripts:

$t,1$	tunnel stagnation conditions
$t,2$	post-normal-shock conditions
∞	free-stream conditions

Introduction

The present work documents the experimental database of a combined computational and experimental parametric study of the internal aerodynamics of a generic three-dimensional sidewall-compression scramjet inlet configuration measured in the Langley 31-Inch Mach 10 Tunnel. The complete study was designed to demonstrate the utility of computational fluid dynamics as a design tool in hypersonic inlet flow fields, to provide a detailed account of the nature and structure of the internal flow interactions, and to provide a comprehensive surface property and flow field database to determine the

effects of contraction ratio, cowl position, and Reynolds number on the performance of a hypersonic scramjet inlet configuration. The work proceeded in several phases: the initial inviscid assessment of the internal shock structure, the preliminary computational parametric design study, the coupling of the optimized configuration with the physical limitations of the facility, the wind tunnel blockage assessment, and the computational and experimental parametric study of the final configuration. An overview and discussion of the entire program with comparative computational and experimental results is provided in reference 1. The primary purpose of the present work is to present the experimental database. (A companion document (ref. 2) presents the computational results.) The experimental database includes static pressures, pitot pressures, and exit flow rake pressures, along with oil flow visualization and infrared thermography to yield a detailed experimental description of the flow. The tests were performed at Mach 10 for three geometric contraction ratios (CR = 3, 5, and 9), three Reynolds numbers (Re = 0.55×10^6 per foot, 1.14×10^6 per foot, and 2.15×10^6 per foot), and three cowl positions (at the throat and two forward positions). Discussions of the test facility and testing techniques are also presented. Tabulated data are presented in the appendix. These data are also available electronically in a tab-delimited ASCII file from the following URL:

http://techreports.larc.nasa.gov/ltrs/ltrs.html

Because this document represents a data release, the reader is strongly encouraged to refer to the primary document (ref. 1) for detailed analysis of the results.

Extensive study has been devoted to the three-dimensional sidewall-compression scramjet inlet for a variety of test conditions, both computationally and experimentally (see, for example, refs. 3–8) for application to airframe-integrated, air-breathing hypersonic propulsion systems. One such generic integrated concept, shown in figure 1, makes use of the forebody bow shock, which precompresses the flow in the vertical direction prior to the inlet entrance. The three-dimensional sidewall-compression scramjet inlet (fig. 2) accomplishes further compression in the horizontal direction via the wedge-shaped sidewalls. The leading edges of these sidewalls are swept both to reduce the aerothermal loads on the leading edge and to provide a window for spillage at the lower Mach numbers to aid in starting the inlet. The present configuration was designed based on the results of a computational parametric study (reported in ref. 9). Although geometrically simple, inlets of this genre generate a very complicated flow field in which corner flow, shock-induced separation, and shock-shock and shock-boundary-layer interactions are among the flow characteristics. The desired result of the interactions generated by the inlet is the delivery of a nearly uniform, supersonic, compressed flow at the combustor face. The prediction of such complicated flow fields is of particular interest to vehicle designers and analysts for whom high local pressure gradients and high heating influence the total aerodynamic and structural design of the flight vehicle.

Experimental Program

Model Description

The leading-edge sweep Λ and the sidewall compression angle δ were fixed at 45° and 6°, respectively (fig. 3). The model was injected into the tunnel in flight orientation, with the cowl on bottom. The inlet sidewalls were 4.0-in. tall with an overall length of 21 in. and were mounted on a 30-in.-long flat plate (referred to as the baseplate) which provided the inflow laminar boundary layer. The baseplate extended 9 in. ahead of the inlet entrance plane (fig. 3). The entire model was manufactured of oxygen-free high-conductivity (OFHC) copper to allow for rapid conduction of heat away from the sharp leading edges. Additionally, the outboard sides of all surfaces near the leading edges were flame sprayed with zirconium oxide, an insulating material. This, combined with the high thermal conductivity of the copper, preserved the integrity of the surfaces while helping to maintain a nearly uniform temperature distribution over the entire model. Pitot probes at the same axial location as the baseplate leading edge (in connection with settling chamber pressure and temperature) provided tunnel flow conditions. For selected runs, the exit plane was traversed by an 11-probe core flow rake (0.040-in. ID stainless steel) which spanned the center 2.85 in. of the internal flow. A photograph of the inlet model is presented in figure 4.

The geometric contraction ratio (CR) is defined as the ratio of the inlet entrance width to the throat gap, W/g (fig. 2), and can be varied by laterally moving the sidewalls closer together. (Contraction ratios of 3, 5, and 9 were tested; table 1 provides the nominal values of W and g for each contraction ratio.) To prevent covering numerous orifices concentrated in the sidewall-baseplate corner region when moving the sidewalls closer together, it was deemed more efficient to fix one sidewall and heavily instrument that corner. An increase in contraction ratio was accomplished by repositioning the movable sidewall. Although this has the disadvantage of having three effective centerlines, it minimizes the number of orifices covered (and hence rendered useless) when the contraction ratio is increased. Static pressure orifices were oriented such that effective centerline pressure distributions could be obtained for each contraction ratio. Pressure orifices located in lateral arrays provided the

Table 1. Inlet Entrance and Throat Gaps for Each Contraction Ratio

CR	*W*, in.	*g*, in.
3	3.00	1.00
5	2.50	.50
9	2.25	.25

horizontal pressure distribution at 25 axial stations between the leading edge of the baseplate and the exit at the inlet throat (fig. 5). Because inviscid shock interactions and impingements occurred along lines of constant sweep, vertical arrays of orifices on the sidewalls were swept at the leading-edge sweep angle (fig. 6). The centerline of the cowl was also instrumented with 15 static pressure orifices.

The cowl position was defined by the forward extent of the cowl leading edge ahead of the throat entrance $C_{x'}$ as a percentage of the distance between the sidewall leading edge and the throat entrance $T_{x'}$ (fig. 6). Thus, when the cowl leading edge was moved forward halfway between the beginning of the throat and the sidewall leading edge, it was termed “50 percent cowl” ($C_{x'}/T_{x'} = 0.50$). Likewise, when the cowl was forward of the throat by one-quarter of the distance between the throat and the sidewall leading edge, it was termed “25 percent cowl” ($C_{x'}/T_{x'} = 0.25$). Finally, when the cowl was located at the throat entrance, it was termed “0 percent cowl” ($C_{x'}/T_{x'} = 0.00$).

Description of Wind Tunnel Facility

The facility used for the present work was the Langley 31-Inch Mach 10 Tunnel, located at the NASA Langley Research Center. A brief outline of the tunnel performance characteristics can be found in reference 10; a lengthier discussion, in reference 11, of which the following is a summary. Formerly known as the Langley Continuous-Flow Hypersonic Tunnel, this facility was originally designed to run in a blowdown start, continuous-flow mode. Because of energy conservation measures, the facility has operated in a blowdown mode only since the mid-1970’s. The test gas, dry air, is supplied from the air storage system, having a volume of 875 ft^3 and rated for a maximum pressure of 4400 psia. A 12.5-MW electrical resistance heater located in a vertical pressure vessel heats the gas to a nominal temperature of 1850˚R to prevent air liquefaction in the 31- by 31-in. square test section. The maximum reservoir pressure is approximately 1500 psia. Screens are placed at the upstream end of the 12-in.-diameter settling chamber, which is faired into the upstream end of the 1.07- by 1.07-in. square throat. The settling chamber, nozzle, throat, test section, adjustable second minimum, and subsonic diffuser are all water cooled. Beckwith and Miller (ref. 12) point out that because of its unique three-dimensional contoured design, the Mach 10 nozzle is free of the centerline disturbances characteristic of axisymmetric contoured nozzles. Primarily because of this highly uniform core flow, Miller (ref. 13) identified this facility as particularly attractive for CFD computer code calibration studies.

The model is supported on a hydraulically operated, sidewall-mounted injection system (fig. 7) capable of injecting the model to centerline in less than 0.6 sec. Prior to injection, the model is stored in a housing isolated from the test section by a sliding door. This enclosure rotates about a vertical axis to provide access to the model. Though somewhat inconvenient in that it blocks the optical path for the schlieren, this sidewall-mounted rotating arrangement was designed to allow access to the model without opening the test section to atmosphere when the tunnel was run in the continuous-flow mode.

Test Conditions and Test Matrix

Nominal test conditions for the present test were chosen to provide as large a range of Reynolds numbers as possible and to coincide with conditions for which previous facility calibrations had been performed. Tests were performed at Mach 10 for nominal reservoir pressures of 1450, 720, and 350 psia at a reservoir temperature of 1850°R. This yielded free-stream unit Reynolds numbers of 2.15×10^6 per foot, 1.14×10^6 per foot, and 0.55×10^6 per foot, respectively. Nominal free-stream static pressures were quite low: 0.03, 0.016, and 0.009 psia, respectively. (Flow conditions specific to each run are tabulated with the pressure data.) Generally the pitot pressure at the test section is not obtained during the run because of the orientation of the injection system and location of the model in the facility. Thus, the test section flow conditions were obtained using measured values of reservoir pressure $p_{t,1}$, temperature $T_{t,1}$, and the results of an unpublished calibration. As discussed in reference 14, the computation of free-stream conditions is performed accounting for imperfect gas effects in the reservoir and assuming an isentropic expansion from the reservoir to the test section. The present model did, however, have pitot probes to measure the free-stream pitot pressure, but because the measured pressures agreed with the facility calibration within the accuracy of the measurement, the procedure to calculate free-stream conditions remained unmodified.

Holland et al. (ref. 15) performed an experimental wind tunnel blockage study to determine the effect of the size of the model on the performance of the facility. Despite the fact that the maximum cross-sectional area of the model exceeded 30 percent of the inviscid test core,

no evidence of tunnel blockage was noted, based on both pitot pressure measurements of the free stream and static pressure measurements along the tunnel sidewall.

The test matrix was then constructed to examine three principal parametric variables: contraction ratio, cowl position, and Reynolds number. Each of these variables has 3 nominal values, yielding 27 configurations to be tested. Run numbers (and table numbers for the tabulated data in the appendix) are provided in tables 2, 3, and 4 for free-stream unit Reynolds numbers of 0.55×10^6 per foot, 1.14×10^6 per foot, and 2.15×10^6 per foot, respectively. (Configurations having more than one run number were used as a check on repeatability.)

Table 2. Run Numbers and Appendix Table Numbers for Re = 0.55×10^6 Per Foot

	0 percent cowl		25 percent cowl		50 percent cowl	
CR	Run	Table	Run	Table	Run	Table
3	64	A27	61	A24	58	A21
5	44	A8	41	A5	37 38	A1 A2
9	47	A11	50	A14	55	A18

Table 3. Run Numbers and Appendix Table Numbers for Re = 1.14×10^6 Per Foot

	0 percent cowl		25 percent cowl		50 percent cowl	
CR	Run	Table	Run	Table	Run	Table
3	65 67	A28 A30	63	A26	59	A22
5	45	A9	42	A6	39	A3
9	48	A12	52	A15	56	A19

Table 4. Run Numbers and Appendix Table Numbers for Re = 2.15×10^6 Per Foot

	0 percent cowl		25 percent cowl		50 percent cowl	
CR	Run	Table	Run	Table	Run	Table
3	66	A29	62	A25	60	A23
5	46	A10	43	A7	40	A4
9	49	A13	53 54	A16 A17	57	A20

Pressure Measurements

The pitot pressures and surface static pressures were measured by an electronically scanned pressure (ESP) silicon sensor (ESP-32 model 780B, manufactured by Pressure Systems, Inc. (PSI)). The ESP modules each contain 32 sensors and were located inside a bay on the model to minimize tubing length and hence settling (lag) time. Pressures were observed to settle in less than 1 sec, allowing for very short run times and hence a minimum heating exposure to the model. In order to maintain the ESP modules at constant temperature, atmospheric air was bled into the ESP bay. Thermocouples placed in the bay on each module indicated that the temperature increased by no more than 1°F during the run. In anticipation of widely differing pressure ranges on the model, the pressure orifices were connected to modules rated for either 0.36, 2.5, or 5.0 psi full scale.

The calibration of the ESP system was accomplished *in situ* prior to each run by sequentially applying three known pressures (chosen to span the range of expected measured pressures) to the ESP module and measuring the voltage output. From these three pressure-voltage points, a second-order curve fit defined the pressure-voltage relationship (which was essentially linear). The calibration coefficients for each pressure port were stored in the data acquisition computer (HP 9000 series 300) so that the output voltage could be converted to measured pressure. Calibration pressures (vacuum levels) were provided by connecting the modules to a turbomolecular vacuum pump and were measured with a DIGIQUARTZ calibration standard (a high-accuracy vibrating quartz pressure standard manufactured by Paroscientific, Inc.). The vacuum reference for the differential sensors was also provided by a turbomolecular vacuum pump.

Surface Temperature Measurements

The primary objective of the infrared (IR) measurements is the verification of wall thermal boundary conditions for the computational work. The technique for obtaining surface temperature distributions using IR thermography has been well described in references 16 and 17; the latter is briefly summarized here. Infrared radiation is the thermal radiation emitted from an object solely due to its temperature and falls within the 0.7- to 30-μm range of the electromagnetic spectrum. Infrared imaging systems are used to detect that radiation and convert it to a two-dimensional monochrome image of the infrared radiation intensity variations across the target. For the present test, a commercially available Agema 880 infrared imaging system was used. This system is sensitive to the 8- to 12-μm range of the electromagnetic spectrum and is shown schematically in figure 8. The device contains a single mercury-cadmium-telluride detector cooled by liquid nitrogen. A television-type raster scanning of the target area was obtained by a pair of synchronized mirrors (also shown in fig. 8). A zinc selenide window optimized for 98 percent transmission of IR radiation in the 8- to 12-μm range was installed at the bottom wall of the Langley 31-Inch Mach 10 Tunnel test section. Prior to the IR runs, the

model was painted flat black to decrease surface reflectivity. Pixel intensity to temperature conversion was accomplished via a calibration based on comparison with thermocouple data.

Oil Flow Visualization

Surface flow visualization by means of surface oil flow has been common practice in many wind tunnel investigations (see, for example, ref. 18 or 19). The method consists of applying a base coat of a low viscosity (in this case, 50 centistokes) vacuum oil to the surface of interest. For the present test, a nontoxic, nonirritating silicone fluid (available in a wide range of viscosities) was used. Discrete dots of a mixture of a higher viscosity (in this case, 200 centistokes) oil with white artist's paint were placed on the surface prior to the run. Oil placed on external surfaces was monitored during the run and compared with postrun photographs to ensure that model injection and retraction did not smear the oil flow patterns. Postrun photographs of the oil streaks were used to obtain a qualitative, global indication of surface flow interactions.

Data Reduction and Uncertainty

Model Alignment

The model was mounted to a rotating disk inset in the tunnel injection plate. Although the angle of attack could not be varied during the run, the angle of attack could be set and locked in place prior to a run. With the model injected into the test section, the angle of attack was set to 0°, as measured by an inclinometer (Hilger and Watts vernier angle gauge, model B), which has a measurement uncertainty of ±0.0083°. Sidewall spacing and alignment were accomplished with a specially machined spacer-alignment block assembly. The block assembly consisted of matching pairs of fore and aft bars that pinned the movable sidewall to the fixed sidewall at a specified spacing while the sidewall was bolted to the baseplate. Fit and alignment were periodically checked with the block assembly to assure that the sidewall had not been moved by aerodynamic loading. The machining tolerance on the block assembly was ±0.002 in., which yielded an alignment uncertainty of ±0.018° and an uncertainty in the nominal contraction ratios (3, 5, and 9) of ±0.002, ±0.007, and ±0.04, respectively. Pressure orifices on opposing sidewalls were also compared to ensure correct alignment.

Pressure Measurements

For the wall static (mean) pressure measurements, the sampling rate was hardware limited to 4 frames/sec and a total of 40 frames (10 sec) of data. Each frame consisted of an average of 8 samples. As previously noted, the pressures were observed to settle (asymptotically approach a constant value) in less than 1 sec, so that data at 2 sec into the run are reported. (This time was selected to be late enough into the run to be assured of settled pressures and early enough to minimize heating to the model and hence the deviation from the constant-temperature thermal wall boundary condition applied in the computational portion of the work.)

Manufacturer specifications indicate that the overall pressure measurement system uncertainty was 0.07 percent of full scale. Thus the largest error was obtained when the lowest pressures were measured. For example, 0.07 percent of full scale for a 0.36-psi module corresponds to an uncertainty of 0.00025 psi. For pressures in the vicinity of free-stream static pressure (0.03 psi for $Re = 2.15 \times 10^6$ per foot), the relative measurement uncertainty was 0.84 percent. At the lowest Reynolds number (0.55×10^6 per foot), the free-stream static pressure is approximately 0.009 psi; at that level, the relative uncertainty would be 2.8 percent. For the 2.5-psi module, a 0.07-percent full-scale uncertainty corresponds to 0.00175 psi. Ideally this range would be used to measure pressures no lower than the maximum of the next lowest range pressure model (0.36 psi). In this case, the relative uncertainty is 0.5 percent. In order to prevent the 0.36-psi modules from being overscaled, orifices where the maximum anticipated pressure for any given configuration in the test matrix exceeded 0.3 psi were connected to the 2.5-psi module. This led to a few instances where, for some configurations, the 2.5-psi module was used to measure pressures below 0.36 psi. For the $Re = 2.15 \times 10^6$ per foot runs, the lowest measured pressure for this range module was 0.13 psi, and the corresponding relative uncertainty was 1.3 percent. For the $Re = 0.55 \times 10^6$ per foot runs, the minimum pressure fell to approximately 0.07 psi, representing a relative uncertainty of 2.5 percent. The 5.0-psi modules were used strictly for pitot measurements, for which the worst case relative uncertainty was 0.35 percent. Thus for the high Reynolds number runs, the worst case relative uncertainty in the pressure measurements was 1.3 percent, and for the low Reynolds number runs, 2.8 percent. Additionally, run-to-run repeatability was examined for three configurations. Most gauges demonstrated repeatability to within 1 percent; however, for a few gauges the deviation reached as high as 4 percent, yielding an average run-to-run repeatability of within 2 percent.

Surface Temperature Measurements

A spatial resolution of 0.08 in. was obtained with the present scanning system. The thermal resolution was 0.1°C (for the 20° to 100°C range of calibration). The data were digitized with an 8-bit resolution and displayed

and stored as 140 lines of data with 140 samples across each line. The system was calibrated by placing a blackbody radiator in the tunnel at the location that would be occupied by the model during the run. The infrared imager then scanned the blackbody and the results were compared with the output of a thermocouple placed on the blackbody. The results revealed a temperature measurement uncertainty of 1.7°C over the 20° to 100°C calibration range.

Presentation of Experimental Database

During the course of the extensive test program, voluminous quantities of data were obtained. Eight ESP-32 (electronically scanned pressure) sensors provided 256 channels of data. A total of 89 pressure orifices were located on the sidewall and 131 on the baseplate. Contour plots of the pressures on these surfaces are presented for comparison of the salient features among the configurations. (Shock locations based on an approximate inviscid analysis are also presented for reference.) Individual line plots of the various lateral and axial arrays of static pressure orifices are also presented to provide a comparison of the relative magnitudes. In order to minimize the total number of plots, these data are presented by way of comparison plots, comparing the effects of contraction ratio, cowl position, or Reynolds number. A general discussion of data trends and their relation to the internal flow physics is included for selected comparison plots, although the reader is directed to reference 1 for a complete analysis.

Contour Plots

Approximate shock locations. The effects of contraction ratio on shock position, compression, and spillage may be approximated through a modification to two-dimensional inviscid oblique shock theory. (See ref. 20.) Although the method is an approximation of the inviscid flow field (because of the assumption of straight, planar shocks), it is useful for initial parametric analyses. A 6° wedge swept at 45° generates a shock sheet that impinges on the sidewall approximately 10 in. aft of the leading edge ($x'/T_{x'} = 1.06$). Table 5 provides the location of the inviscid glancing shock intersection at the centerline and the reflected shock sidewall impingements both in inches and as a percentage of the distance from the leading edge to the throat ($x'/T_{x'}$) for contraction ratios of 3, 5, and 9. The table demonstrates that there exists a forward progression of the shock interactions with increasing contraction ratio. The approximate inviscid shock locations determined in this fashion are included in the contour plots for reference and are denoted by dashed lines.

Table 5. Inviscid Shock Impingement Locations

CR	Centerline		Sidewall impingement	
	x', in.	$x'/T_{x'}$	x', in.	$x'/T_{x'}$
3	8.02	0.84	10.08	1.06
5	6.68	.70	8.40	.88
9	6.01	.63	7.56	.79

Contour levels and observed trends. Because the orifices were concentrated in the expected interaction regions, third-order Lagrangian interpolation was used to obtain additional points to regularize the locations for the contour plotter, i.e., to create an $N \times M$ grid of pressure data. In the contour plots (figs. 9–38), the pressure orifice locations are identified with a circle; the artificially generated (or phantom) points are indicated by the small crosshairs. Because the baseplate pressure orifices were arranged in lateral arrays, these data posed no difficulty to the contour plotting routine. For the sake of convenience, the outline of the cowl is drawn on the bottom of the sidewall contour figures to mark the cowl position. The contraction ratio is increased by positioning one sidewall progressively closer to the other. In the baseplate contour plots, the outline of the fixed sidewall is drawn. When the movable sidewall is positioned for CR = 9, a portion of that sidewall is visible in the plot and it is also sketched. Because at CR = 9 the movable sidewall covers 11 pressure orifices (namely, orifices 172, 177, 181, 186, 191, 196, 201, 206, 211, 216, and 221—see appendix) located on what was the centerline for CR = 3, the resolution in the throat for that configuration is slightly diminished. In order to more easily view the contours in the throat, the lateral (Y) scale is expanded by a factor of 3.

With 30 sets of contour plots representing the 27 configurations, there exists no convenient way to present the plots that offers a sequential comparison of figures. The plots are therefore arranged in groups as outlined in table 6. Some comparisons can be made by examining sequential figures; however, it will be necessary to examine plots from different groups (nonsequentially ordered) to complete the comparisons. Plots of both the baseplate and the sidewall for a given configuration are placed on the same page. Figures 9–18 present pressure contours on the baseplate and sidewall for CR = 3, 5, and 9 at cowl positions of 0, 25, and 50 percent for $\mathrm{Re} = 0.55 \times 10^6$ per foot. A similar set of plots is presented in figures 19–28 for $\mathrm{Re} = 1.14 \times 10^6$ per foot. Likewise, figures 29–38 present the contraction ratio and cowl location effects for $\mathrm{Re} = 2.15 \times 10^6$ per foot. (Figs. 17, 20, and 35 duplicate the configurations of their respective preceding figures to demonstrate the repeatability of the data.)

Table 6. Outline of Contour Plots

Re, per foot	Cowl position	Figure number for CR of—		
		3	5	9
0.55×10^6	0 percent	9	10	11
	25 percent	12	13	14
	50 percent	15	16, 17	18
1.14×10^6	0 percent	19, 20	21	22
	25 percent	23	24	25
	50 percent	26	27	28
2.15×10^6	0 percent	29	30	31
	25 percent	32	33	34, 35
	50 percent	36	37	38

The contour plots typically illustrate that the shocks from the sidewall leading edge glance across the baseplate, intersect at the centerline, and impinge on the sidewalls. The localized expansion aft of the throat shoulder is also evident in the baseplate contours. On the sidewall, both the cowl shock and the sidewall shock impingement are apparent. As the contraction ratio is increased, multiple sidewall shock impingements are evident in the pressure contours. As will be more clearly presented in the discussion of the line plots and oil flows, decreasing Reynolds number and increasing contraction ratio cause regions of separation formed by the sidewall glancing shocks to grow and extend forward of the inlet entrance.

Line Plots

The test matrix, presented in tables 2–4, demonstrates that the combination of 3 contraction ratios, 3 cowl positions, and 3 Reynolds numbers yields a total of 27 configurations. Because the primary purpose of this document is to provide a data release, *all* of the data from these 27 configurations are provided in tabular format; only selected data, however, are plotted to illustrate the observed trends. (Plots presenting contraction ratio effects for each combination of cowl position and Reynolds number, cowl effects for every combination of contraction ratio and Reynolds number, and Reynolds number effects for every combination of contraction ratio and cowl position have been presented in ref. 9.)

Contraction ratio effects. Figures 39(a)–39(h) present the contraction ratio effects for the $\mathrm{Re} = 2.15 \times 10^6$ per foot, 0 percent cowl configuration. Figure 39(a) presents the pressure distributions for CR = 3, 5, and 9 along their respective centerlines. The viscous interaction is evident in that the pressure is observed to be higher near the leading edge ($p/p_\infty \approx 2.3$ at 1 in. aft of the leading edge, $x'/T_{x'} = -0.841$), relaxing back to $p/p_\infty \approx 1.7$ near the inlet entrance. For CR = 3, the pressure is observed to rise monotonically to the throat ($x'/T_{x'} = 1.0$), where the effects of a localized expansion become evident. A secondary rise due to the multiple internal shock reflections is noted at $x'/T_{x'} = 1.3$. At CR = 5 and 9, a higher pressure is noted throughout the inlet and upstream of the inlet entrance plane than for CR = 3. The forward extent of the disturbance cannot be determined from these data because the CR = 5 and 9 centerline orifice arrays do not extend farther forward than $x'/T_{x'} = -0.1$. Therefore, figure 39(b) presents the pressure distribution down the CR = 3 centerline (the most densely populated axial array of orifices) for CR = 3, 5, and 9. These data identify the forward extent of the upstream influence of the inlet at higher contraction ratios to be approximately $x'/T_{x'} = -0.52$.

Figures 39(c)–39(f) present lateral distributions upstream of the inlet entrance. Of particular interest is figure 39(e) ($x'/T_{x'} = -0.1052$), which shows increased pressure levels for CR = 5 and 9. The dome shape of the pressure distribution indicates significant lateral pressure relief as the separated flow spills around the inlet sidewalls. For a model (or flight vehicle) with multiple engine modules, the effect on performance of such a separation is anticipated to be more detrimental because of the lack of lateral pressure relief resulting from the presence of neighboring engine modules. Figure 39(g) presents the approximately order of magnitude increase in cowl centerline pressure distribution with contraction ratio (note that the pressure decrease at large values of $x'/T_{x'}$ is due to the divergence of the model sidewalls aft of the inlet throat). Figure 39(h) shows the axial pressure distribution on the sidewall centerline. Despite the large forward separation on the baseplate and significant increase in cowl pressure, the sidewall pressures demonstrated the forward progression of the shock impingement predicted by the approximate inviscid theory. The inlet is therefore not believed to be unstarted in the classical sense (due to the presence of internal shocks and hence supersonic flow); however, the large separations represent an undesirable operating condition that may be a precursor to classical unstart.

Reynolds number effects. As previously discussed, an increase in contraction ratio at $\mathrm{Re} = 2.15 \times 10^6$ per foot leads to a forward separation, as indicated by the dome-shaped lateral pressure distribution upstream of the inlet entrance. Figure 40 (lateral pressure distribution upstream of the inlet entrance, $x'/T_{x'} = -0.1052$, at $\mathrm{Re} = 1.14 \times 10^6$ per foot and 0 percent cowl for CR = 3, 5, and 9) demonstrates that a decrease in unit free-stream Reynolds number of only a factor of 2 is sufficient to promote a similar forward separation for the CR = 3 configuration. This is further illustrated in figures 41(a) and 41(b), which show Reynolds number effects on axial

and lateral pressure distributions (respectively) for the CR = 3, 0 percent cowl configuration. The viscous interaction at the leading edge of the baseplate is observed in addition to the increased compression on the baseplate with decreased Reynolds number due to the increased boundary-layer growth. The pressure rise on the baseplate due to the glancing shock interaction is observed to move forward from approximately $x'/T_{x'} = 0.1$ for $\mathrm{Re} = 2.15 \times 10^6$ per foot to approximately $x'/T_{x'} = -0.2$ for the lower Reynolds numbers. The increased magnitude and the dome shape of the lateral pressure distributions demonstrate a significant pressure relief due to the lateral flow spillage with decreased Reynolds number. As previously noted, the pressure distributions do not indicate a classical unstart but do represent an undesirable, off-design flow condition obtained with a relatively small decrease in free-stream unit Reynolds number.

Cowl position effects. Baseplate centerline pressure distributions for the CR = 3, $\mathrm{Re} = 2.15 \times 10^6$ per foot configuration at 0, 25, and 50 percent cowl (fig. 42(a)) indicate that the cowl effects are limited to the region downstream of the throat. (Note that for runs 60–66, an instrumentation problem led to an uncertainty of 7 percent for orifices located at $x'/T_{x'} < 0$, which led to a discrepancy upstream of the inlet entrance, as shown in fig. 42(a).) The axial sidewall centerline pressure distribution (fig. 42(b)) shows the cowl influence to be limited to the throat. The extent of the cowl influence down the sidewall is demonstrated in figure 42(c), which shows the pressure distribution between the baseplate ($Z/H = 0$) and the cowl plane ($Z/H = 1.0$) along a line parallel to the sidewall leading edge, located 94 percent of the distance between the sidewall leading edge and the throat entrance. The pressure near the cowl plane rises with forward cowl position, but the pressure augmentation on the sidewall is limited to $Z/H > 0.5$ at this axial position. The cowl pressures are shown in figure 42(d). The pressure distributions for the three cowl positions appear to overlap each other, indicating that the pressure distribution on the cowl is driven primarily by the internal shock locations and the location of the orifice relative to the throat entrance.

An increase in contraction ratio or decrease in unit free-stream Reynolds number was previously noted to cause forward separation on the baseplate without evidence of a classical inlet unstart. Figures 43(a) and 43(b) indicate that the combination of increasing the contraction ratio to 9, decreasing the unit free-stream Reynolds number to 1.14×10^6 per foot, and placing the cowl at the 50-percent position may indeed yield a classical unstart.

Oil Flow Results

Figures 44(a)–44(c) are postrun photographs of the oil streaks for three configurations. Figure 44(a) shows the interior wall of the inlet (for the photographs, one sidewall and the cowl were removed following the run) for the CR = 3, $\mathrm{Re} = 2.15 \times 10^6$ per foot, 0 percent cowl configuration. Several features are evident. The shock wave from the boundary-layer growth on the leading edge of the baseplate is evident in the lower half of the inlet. A weak feathered pattern is noted just below a line of convergence on the sidewall near the corner, possibly indicating the presence of a vortex. The line of convergence and the stagnant region in the corner are consistent with the induced layer discussed in reference 21. Additionally, because the sidewall shock impinges very near the shoulder (with no strong adverse pressure gradient observed in the contour plot (see fig. 29)), no large-scale separation regions are noted on the sidewall in the vicinity of the impingement. A single line of convergence is noted arcing from the baseplate just upstream of the shoulder and may be the only indication of a separation. Multiple lines of convergence (possibly the result of vortices shed from the shock impingement) are noted in the throat downstream of the impingement. Oil patterns near the cowl plane indicate an extremely limited region of influence of the cowl in the 0-percent position.

Figure 44(b) demonstrates the forward progression of the shock impingement (for CR = 5, 0 percent cowl, $\mathrm{Re} = 2.15 \times 10^6$ per foot) and the strong downturning and separation associated with the impingement. This photograph more clearly shows the vortex located just below the line of convergence on the sidewall. Additionally, the effects of the baseplate leading-edge compression are also evident at about the half-height of the inlet sidewall. Near the cowl plane, the oil streaks indicate strong downturning at the first impingement point. A second swept line of convergence is noted in the throat at the second sidewall impingement point. As was the case for CR = 3, the oil flow patterns indicate a limited cowl influence for the 0 percent cowl.

At CR = 9 ($\mathrm{Re} = 2.15 \times 10^6$ per foot, 0 percent cowl), figures 44(c)–44(e) indicate that the dominant flow feature is the large-scale separation on the baseplate. Near the baseplate leading edge, the oil streaks are observed to flow uniformly downstream until approximately $x'/T_{x'} = -0.4$. (This corresponds well to the observed pressure rise on the baseplate at $x'/T_{x'} = -0.38$, fig. 39(b).) In the immediate vicinity of the sidewall leading edge, the surface streamlines indicate that the flow on the surface is moving upstream and spilling around the outside of the inlet, as was suggested

by the dome-shaped CR = 9 pressure distribution at $x'/T_{x'} = -0.1$ (fig. 39(e)). As previously noted, this flow pattern would not be duplicated exactly on a multiengine model or flight vehicle because there would be no lateral pressure relief due to the presence of other identical engine modules on either side of a given module. Because of the lack of a lateral pressure relief, this separation would likely be more severe on a flight vehicle.

Surface Temperature Measurements

Because the IR system used for the test was hardware limited to capturing 6.25 frames/sec, with the capability of storing only 1 image/sec, heat transfer data were not obtained. Surface temperature mappings, however, were obtained to provide a verification of the wall thermal boundary conditions imposed on the computational solution.

Figures 45(a) and 45(b) show the temperature time history for the axial centerline of the baseplate from the leading edge of the flat plate to approximately $x'/T_{x'} = 0.40$ for a nominal free-stream unit Reynolds number of 2.15×10^6 per foot and 0.55×10^6 per foot, respectively. Over the first 2 sec of run time, the surface temperature rose by a maximum of 30K at the leading edge and 3K at 1.5 in. downstream of the leading edge ($x'/T_{x'} = -0.79$) for Re = 2.15×10^6 per foot, and by only 16K at the leading edge and 1K at 1.5 in. downstream of the leading edge ($x'/T_{x'} = -0.79$) for Re = 0.55×10^6 per foot. Because of the reasonably small change in surface temperature over the test time, the fixed constant boundary condition was deemed appropriate.

Exit Plane Flow Field Surveys

A movable rake containing 11 pitot probes was installed inside the inlet to survey the throat exit plane (fig. 3). The 11 probes were manufactured of stainless steel tubing with a 0.0625-in. outside diameter and a 0.040-in. inside diameter. The tubes were spaced 0.285 in. apart and were positioned in the inlet to vertically span the center 2.85 in., i.e., 0.575 in. < Z < 3.425 in. Prior to the run, the rake was positioned flush against the inlet sidewall. During the run, the rake was moved to and paused at nine lateral locations between the sidewall and the inlet centerline (denoted on the plots by open circles) by a microprocessor-based stepper-motor controller to within a lateral positioning uncertainty of ±0.003 in. Prior to completion of the run, the rake was returned to its initial position to demonstrate repeatability with the initial location pressure measurement. (Initial tests were performed with the rake traversing the entire throat width to determine lateral symmetry. With the symmetry thus established, the measurements were concentrated across the half-width.)

Figures 46(a) and 46(b) present pitot rake data taken in the exit plane of the inlet for 0 percent cowl at Re = 2.15×10^6 per foot and CR = 3 and 5, respectively; figure 46(c), for 0 percent cowl at Re = 0.55×10^6 per foot and CR = 3. The data principally show the exit plane shock structure. Despite the multiple internal reflecting shocks, the core flow of the inlet is nominally uniform. The shape of the experimental contours indicates some interference effects near the sidewall in figure 46(a). This is an expected result because pitot measurements are highly intrusive. Results are not presented for the CR = 9 configuration because these probe interference effects dominated the semispan because of the narrow throat. At CR = 9, the throat half-width is 0.125 in. (2 probe diameters). Based on schlieren photographs of a 0.0625-in.-diameter pitot probe in a Mach 6 free stream (the approximate throat Mach number), the bow shock formed around the probe has a stand-off distance of 0.25 probe diameters, and at the probe face, the diameter of the shock is 1.5 probe diameters. The interaction between the probe bow shock and the sidewall boundary layer increases the region influenced by the probe. Thus, for the CR = 9 configuration, the entire exit plane is influenced by the presence of the probe, and reliable intrusive measurements are not possible with the current instrumentation.

Concluding Remarks

A combined computational and experimental parametric study of the internal aerodynamics of a generic three-dimensional sidewall compression scramjet inlet configuration has been performed. The present work documents the experimental database developed in that effort. The complete study was designed to demonstrate the utility of computational fluid dynamics (CFD) as a design tool in hypersonic inlet flow fields, to provide a detailed account of the nature and structure of the internal flow interactions, and to provide a comprehensive surface property and flow field database to determine the effects of contraction ratio (CR), cowl position, and Reynolds number (Re) on the performance of a hypersonic scramjet inlet configuration. Experimentally, a total of 256 channels of pressure data, including static pressure orifices, pitot pressures, and entrance and exit flow rakes, along with oil flow and infrared thermography provided a detailed experimental description of the flow. Mach 10 tests were performed for three geometric contraction ratios (3, 5, and 9), three Reynolds numbers (0.55×10^6 per foot, 1.14×10^6 per foot, and 2.15×10^6 per foot), and three cowl positions (at the throat and two forward positions). The observations made in the study are summarized as follows.

Shocks formed on the sidewall leading edges are observed to glance across the baseplate, intersect at the centerline, and impinge on the sidewalls. The induced corner flow and upstream influence of the glancing shocks are observed to be significant. With increasing contraction ratio, the separation generated by the glancing shocks is observed to grow and, for CR = 5 and 9, extend forward of the inlet entrance. A decrease in the free-stream unit Reynolds number of only a factor of 2 led to a similar upstream separation. Surface streamlines (oil flows) near the entrance of the inlet indicated significant reverse flow as the flow spilled around the inlet sidewalls. Measured pressures in front of the inlet entrance showed a dome-shaped pressure distribution for the higher contraction ratios, indicating the lateral pressure relief as the flow spilled around the sidewalls. Although the presence of such large-scale separations leads to the question of whether the inlet is started, the presence of internal oblique swept shock interactions on the sidewalls seems to indicate that at least in the classical sense, the inlet is not unstarted. The combination of decreased Reynolds number ($Re = 1.14 \times 10^6$ per foot), increased contraction ratio (CR = 9), and forward cowl (50 percent position), however, did appear to promote a classical unstart, with an internal compression ratio exceeding 100. The inlet therefore appears to be very sensitive (with respect to separating the inflow boundary layer) to increases in contraction ratio or decreases in Reynolds number; of the configurations tested, only the CR = 3 configurations with 0 and 50 percent cowl at $Re = 2.15 \times 10^6$ per foot operated "on design." For these configurations, CFD predictions yielded good agreement; however, poorer agreement was obtained for the highly separated flow fields.

Multiple reflecting internal swept shocks were observed to incrementally increase the downturning (as well as the pressure) of the flow. The pressure distribution throughout the inlet was therefore observed to increase with increasing contraction ratio, as was the strength of the cowl shock. Further, a forward placement of the cowl was observed to inhibit a fraction of the shock-induced spillage without adversely affecting starting characteristics.

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June 7, 1995

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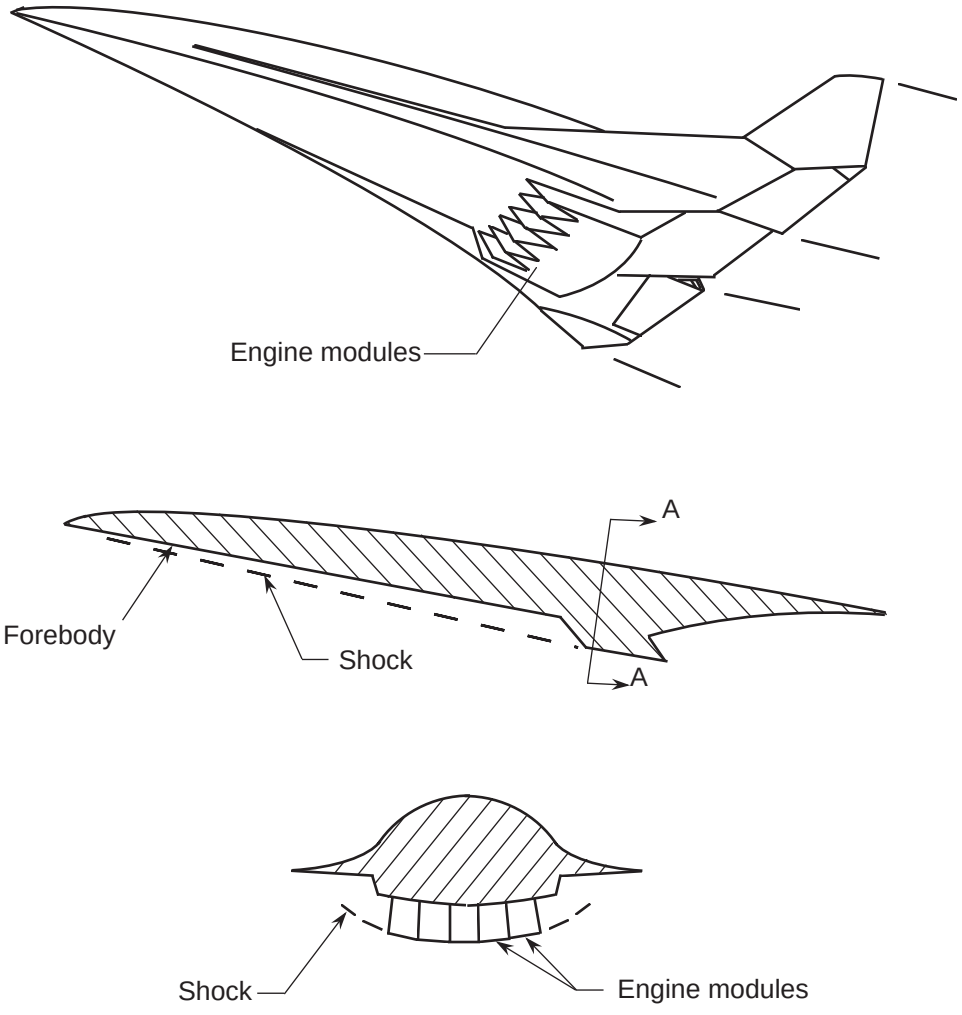

Figure 1. Propulsion-airframe integrated vehicle.

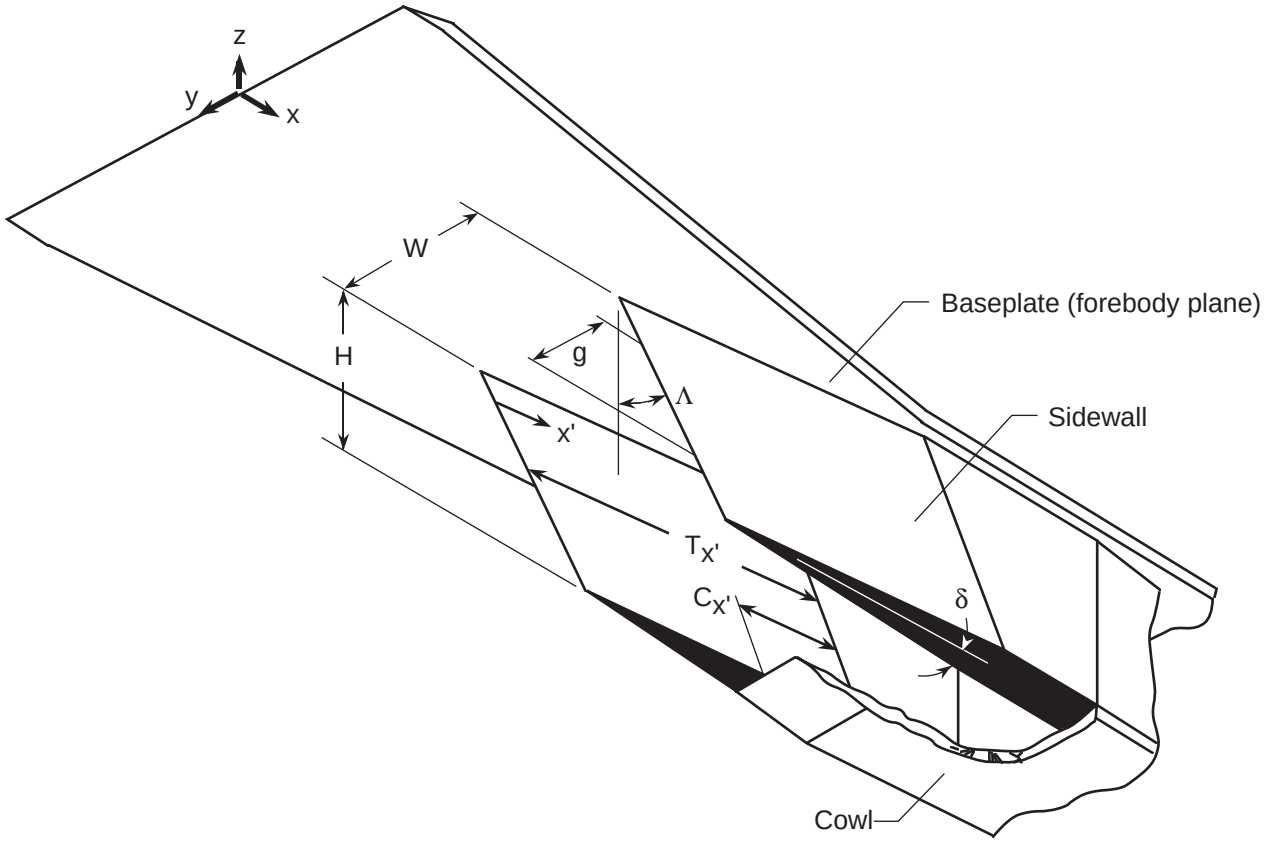

Figure 2. Inlet model shown in flight orientation.

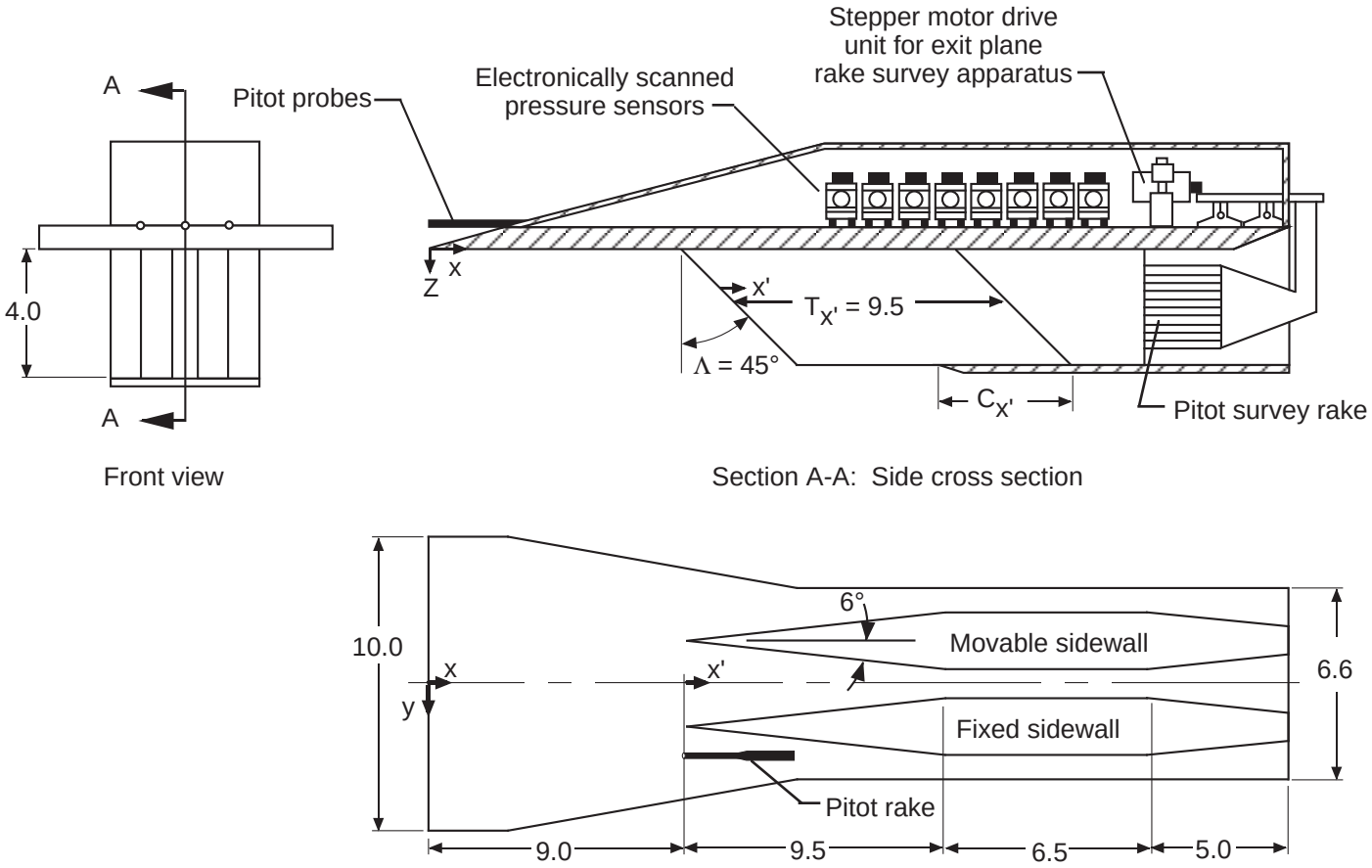

Figure 3. Three-view sketch of inlet configuration. Linear dimensions in inches.

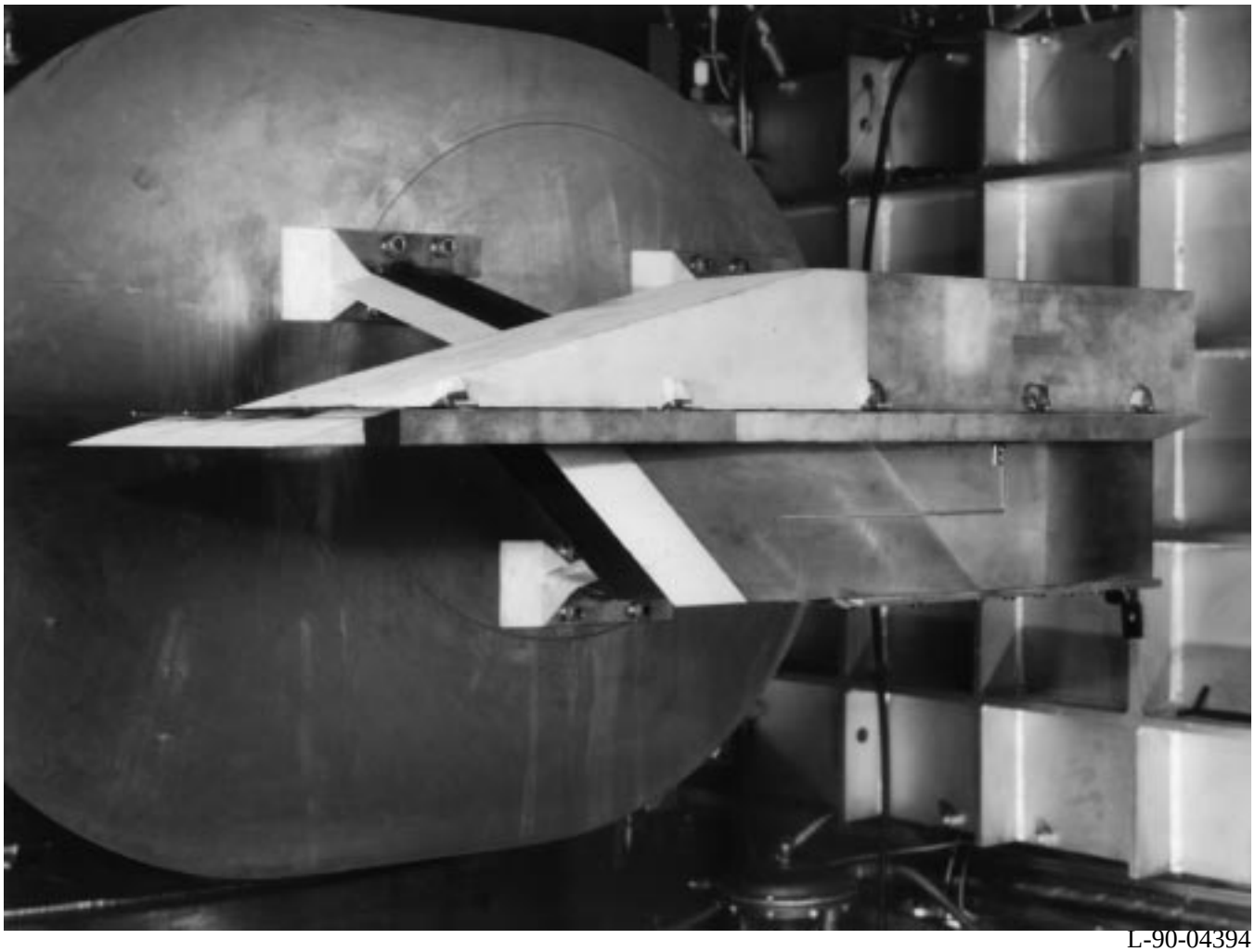

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Figure 4. Inlet model on injection plate.

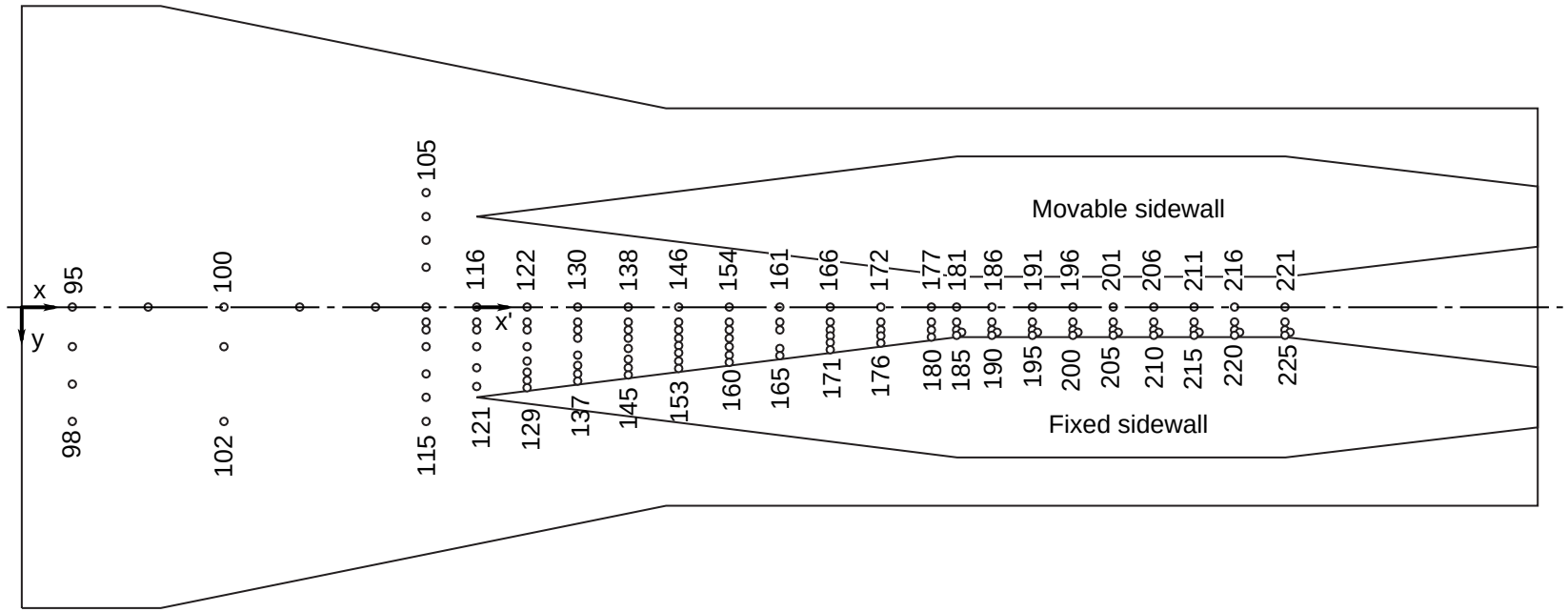


Figure 5. Baseplate orifice locations and coordinate system identification (centerline shown for CR = 3 configuration; orifice size not to scale).

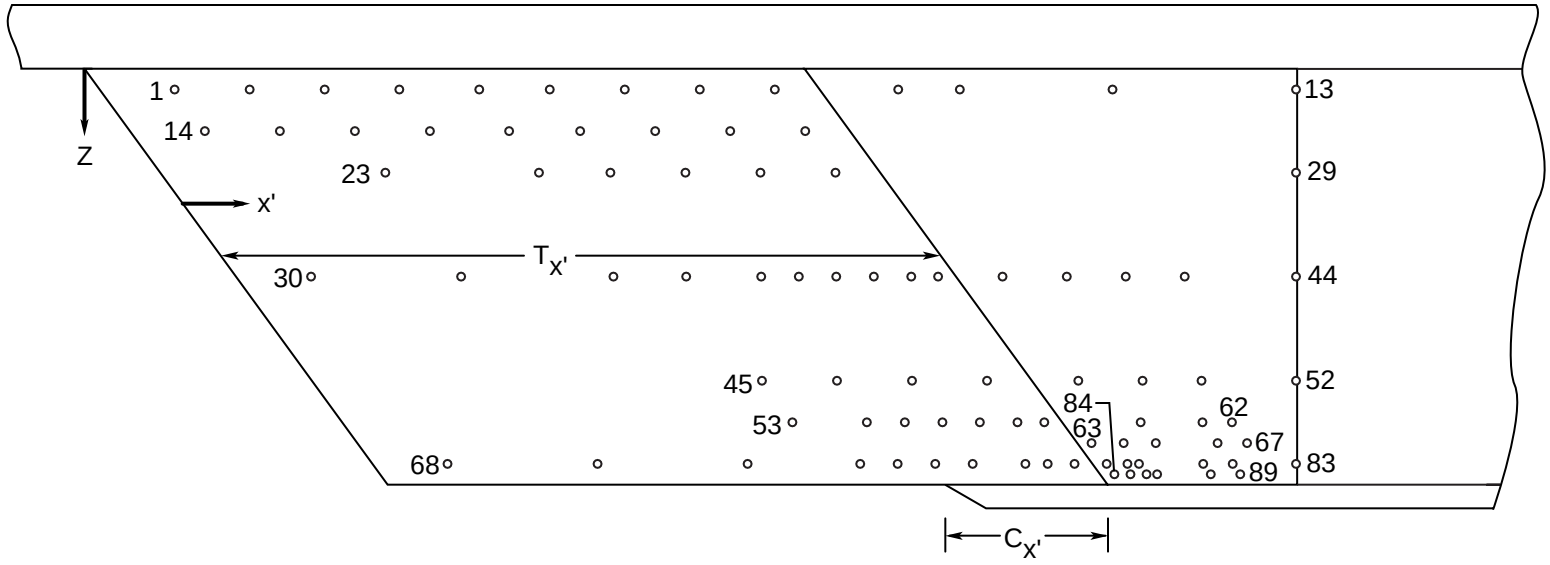


Figure 6. Sidewall orifice locations and identification of coordinate system (orifice size not to scale).

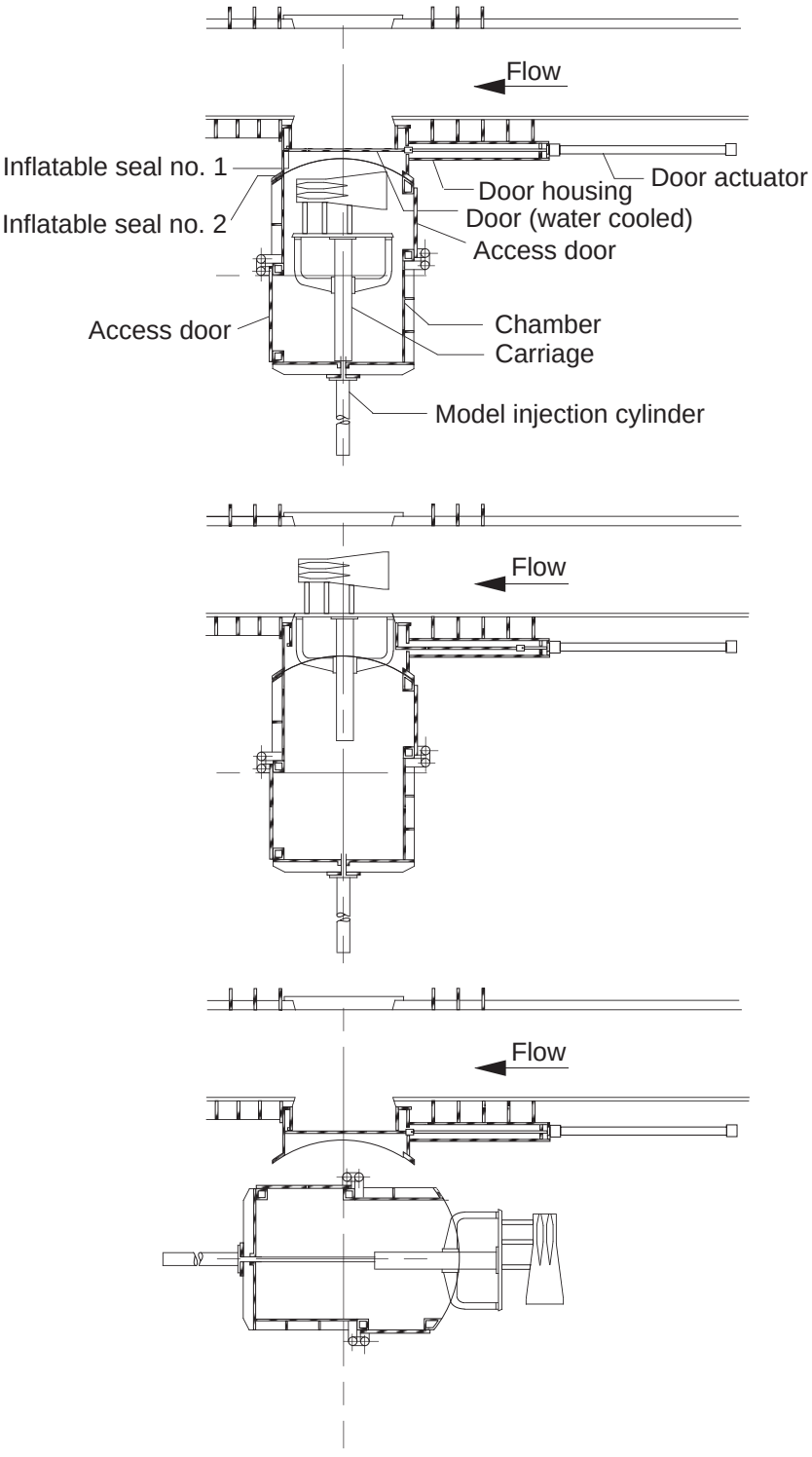


Figure 7. Model injection sequence showing model retracted prior to injection, model injected into the tunnel, and model injected into work area.

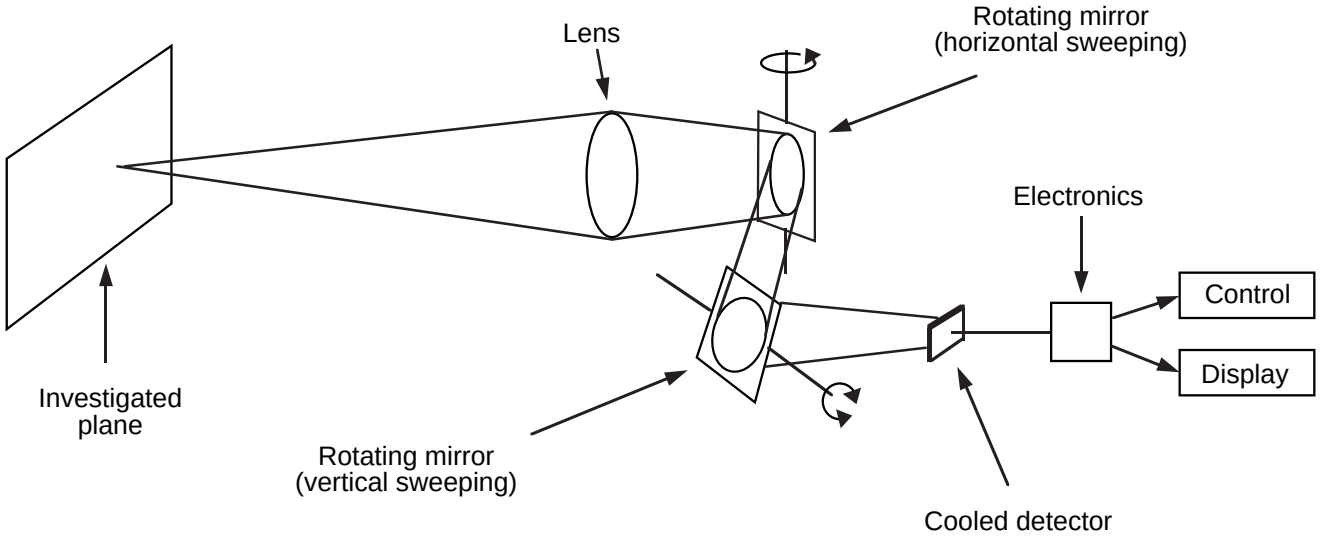
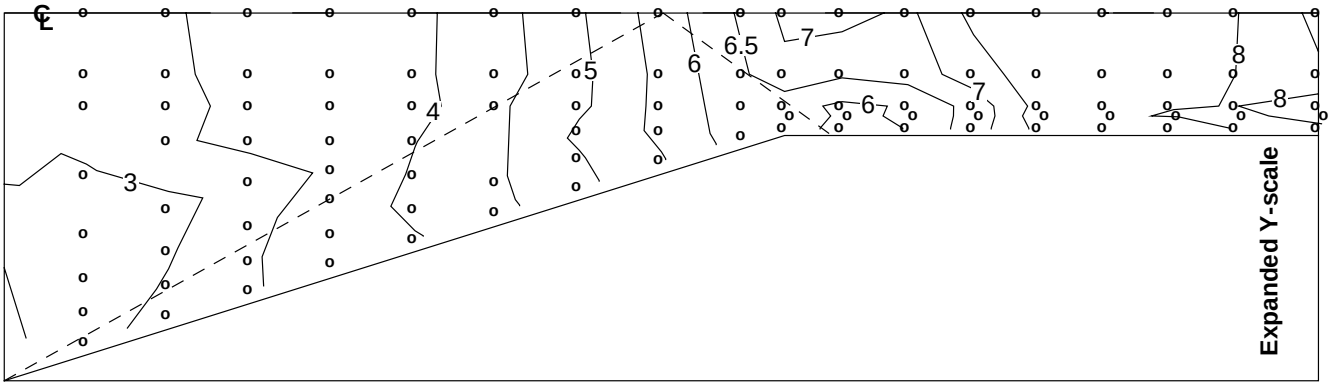
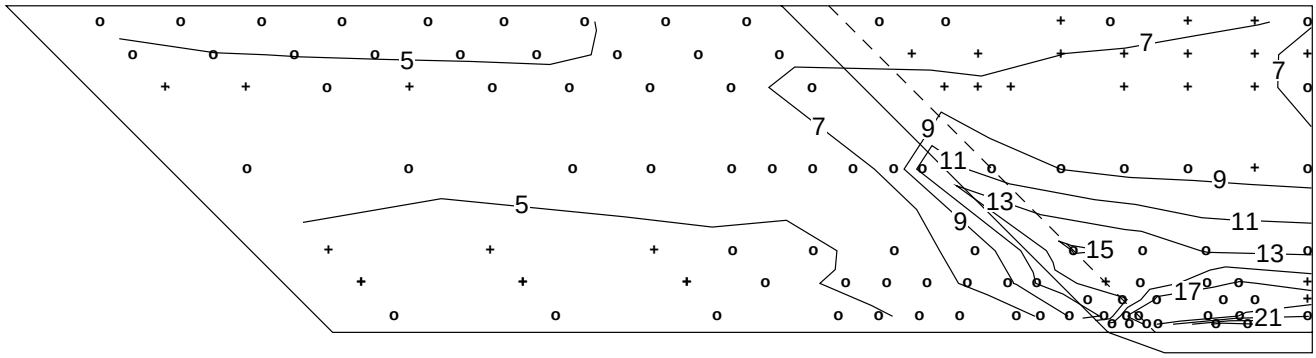


Figure 8. Schematic of infrared thermography system.

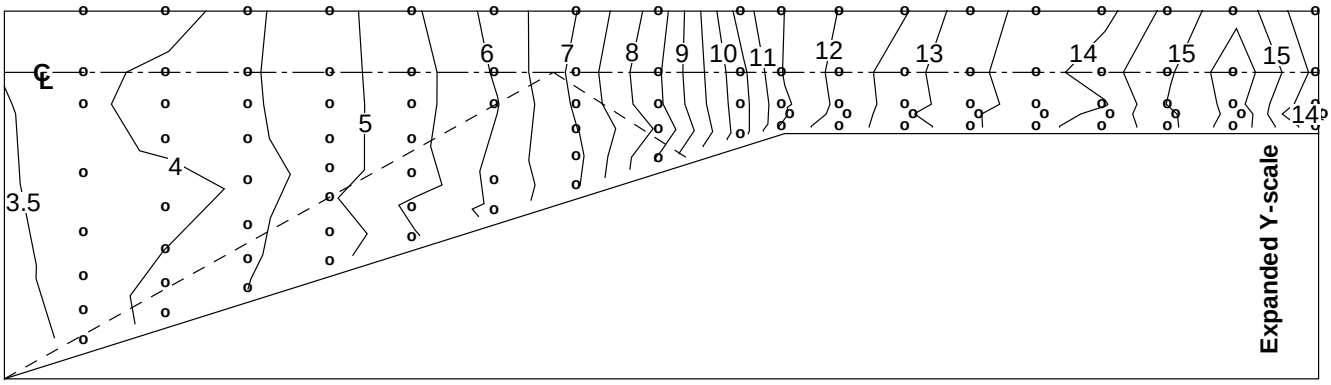


(a) Baseplate.

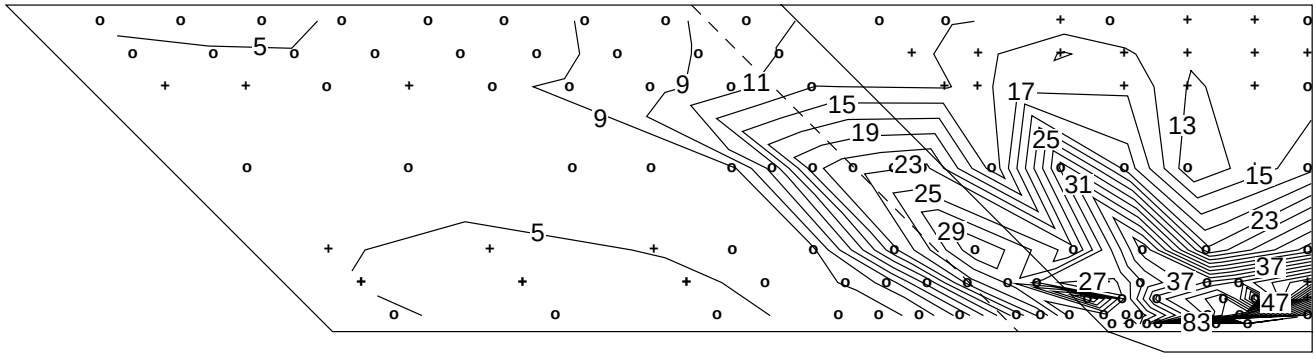


(b) Sidewall.

Figure 9. Contours of p/p_∞. CR = 3; Re = 0.55×10^6 per foot; 0 percent cowl; run 64.

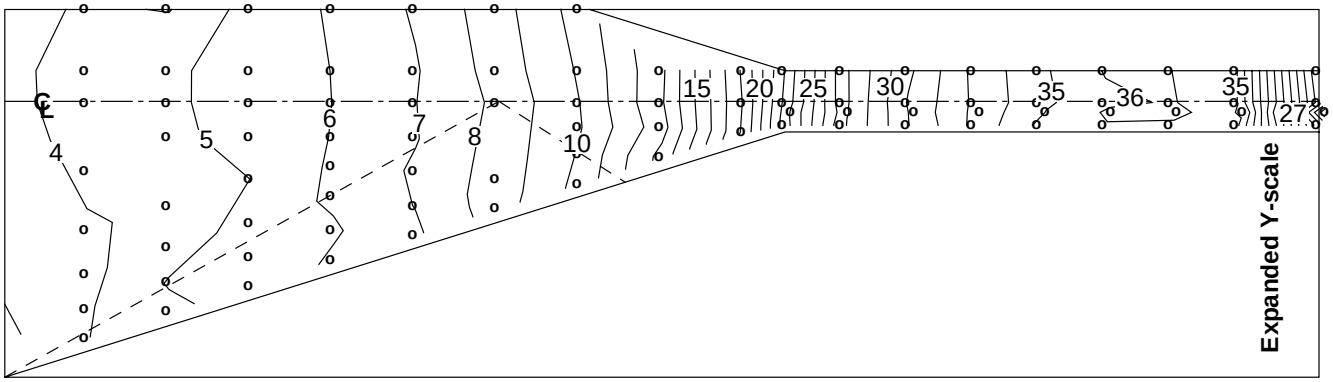


(a) Baseplate.

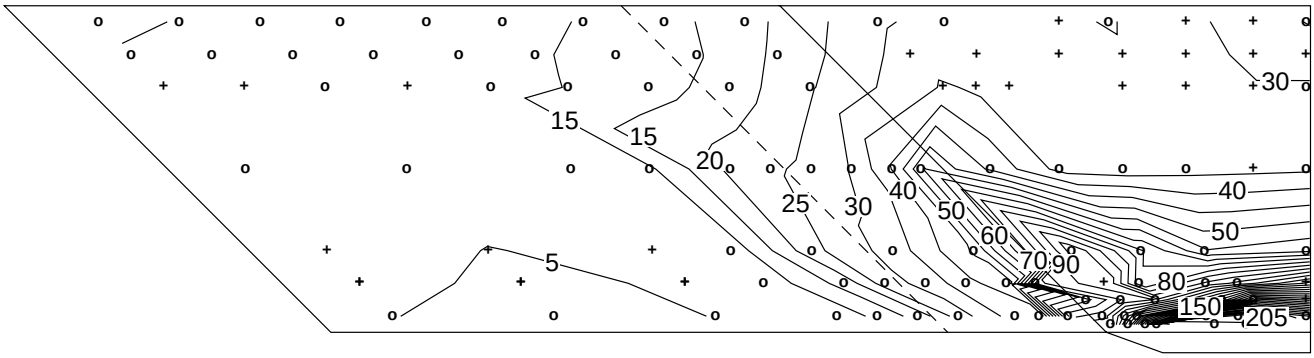


(b) Sidewall.

Figure 10. Contours of p/p_∞. CR = 5; Re = 0.55×10^6 per foot; 0 percent cowl; run 44.

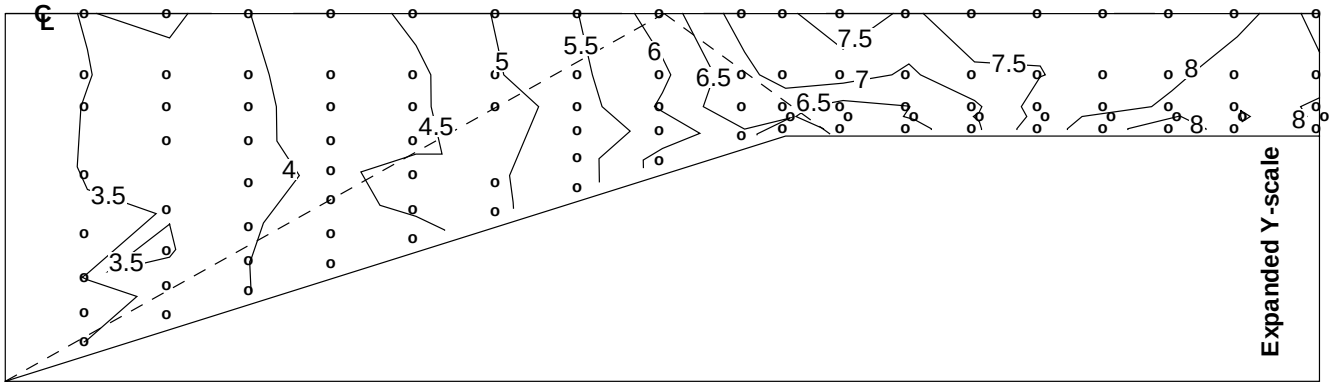


(a) Baseplate.

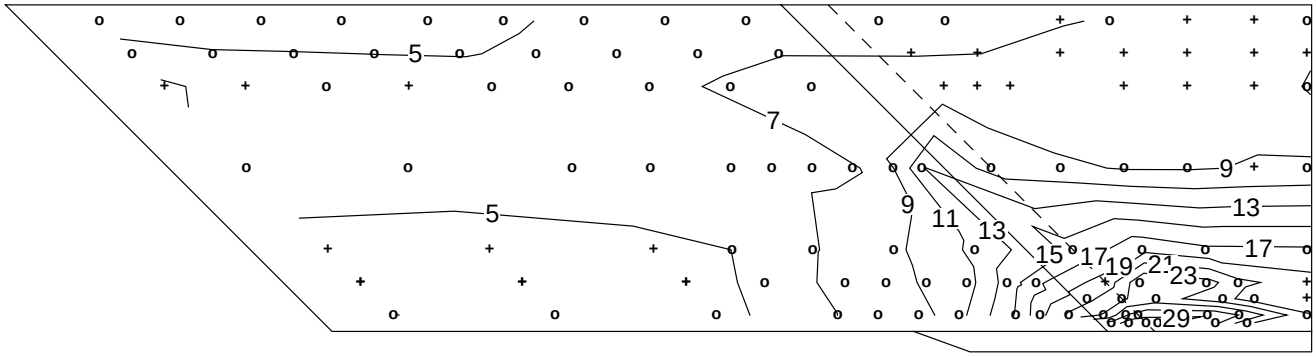


(b) Sidewall.

Figure 11. Contours of p/p_∞. CR = 9; Re = 0.55×10^6 per foot; 0 percent cowl; run 47.

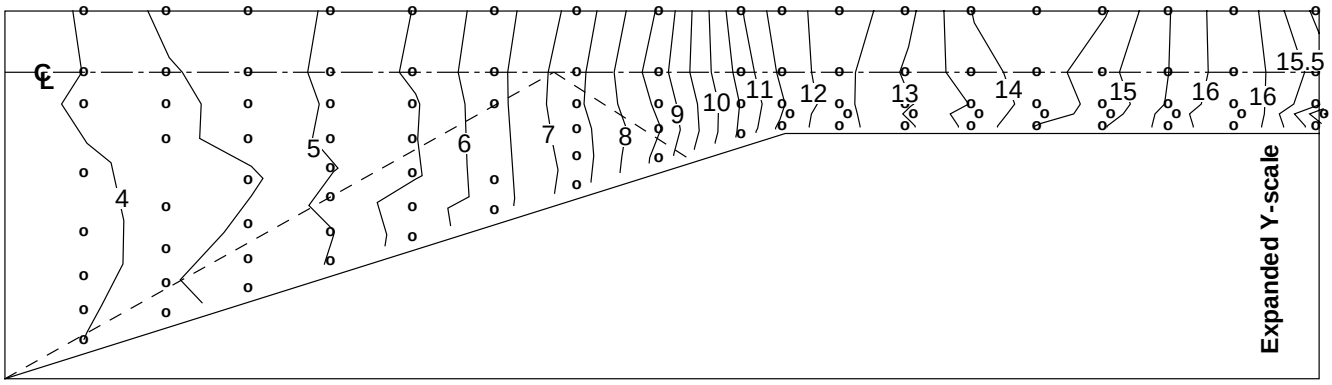


(a) Baseplate.

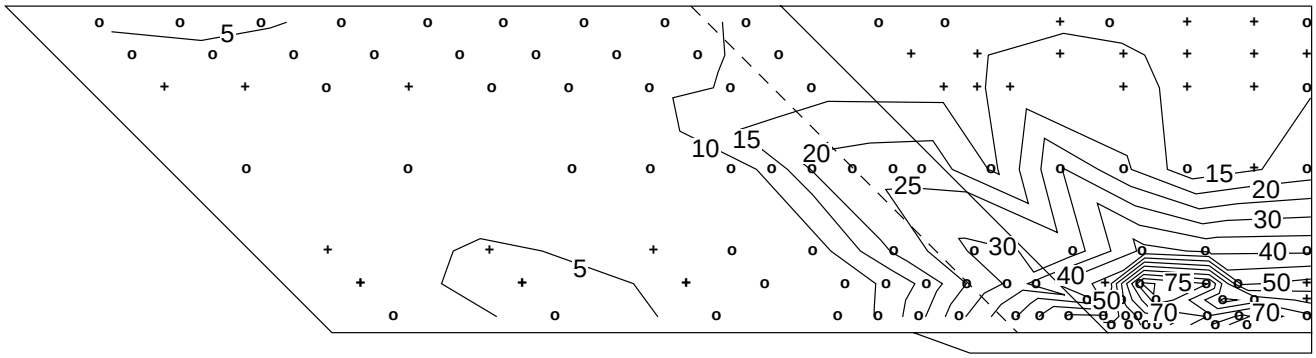


(b) Sidewall.

Figure 12. Contours of p/p_∞. CR = 3; Re = 0.55×10^6 per foot; 25 percent cowl; run 61.

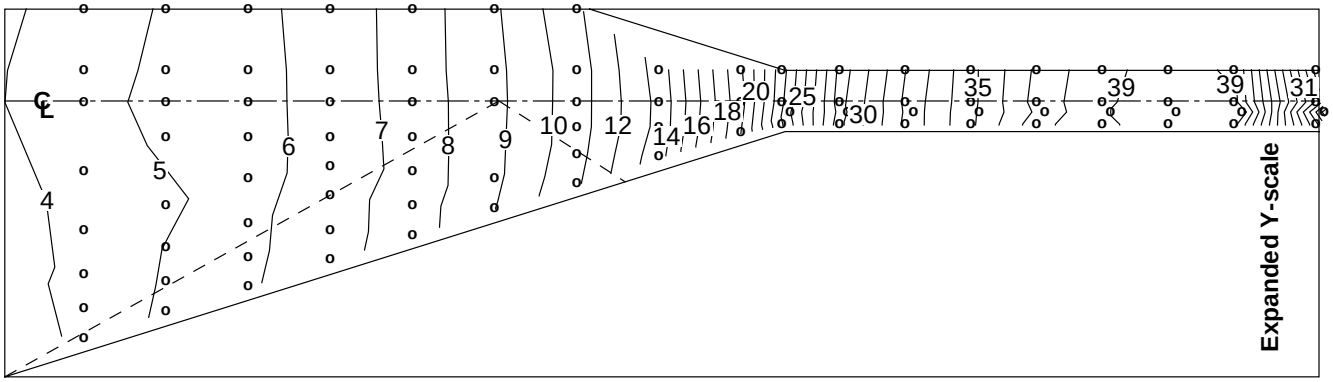


(a) Baseplate.

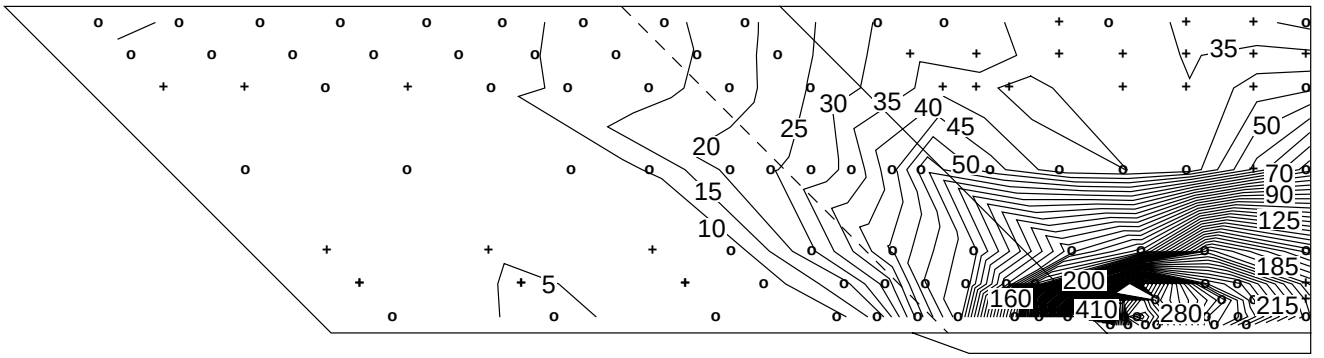


(b) Sidewall.

Figure 13. Contours of p/p_∞. CR = 5; Re = 0.55×10^6 per foot; 25 percent cowl; run 41.

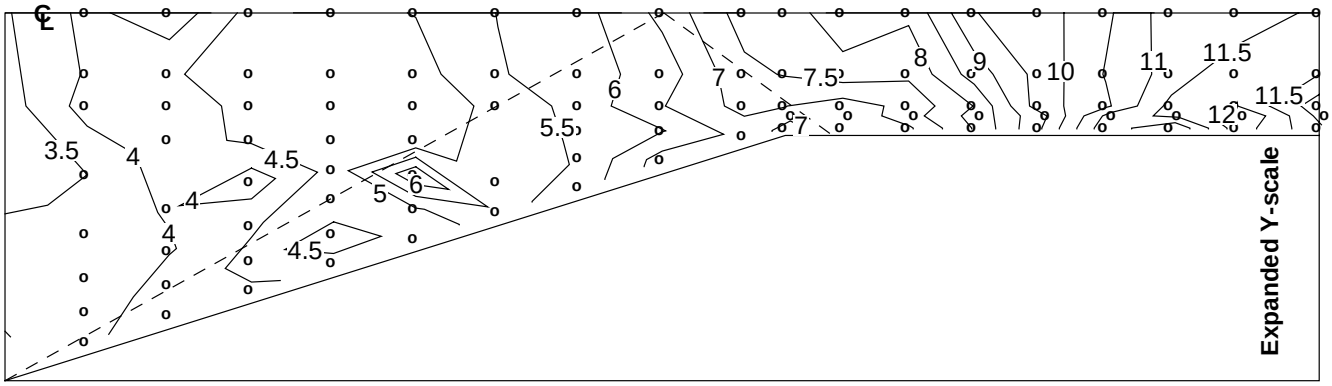


(a) Baseplate.

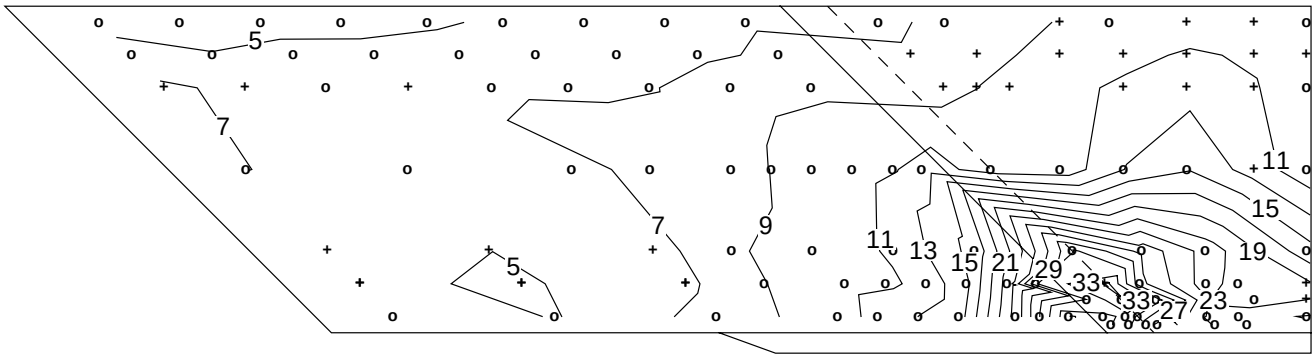


(b) Sidewall.

Figure 14. Contours of p/p_∞. CR = 9; Re = 0.55×10^6 per foot; 25 percent cowl; run 50.

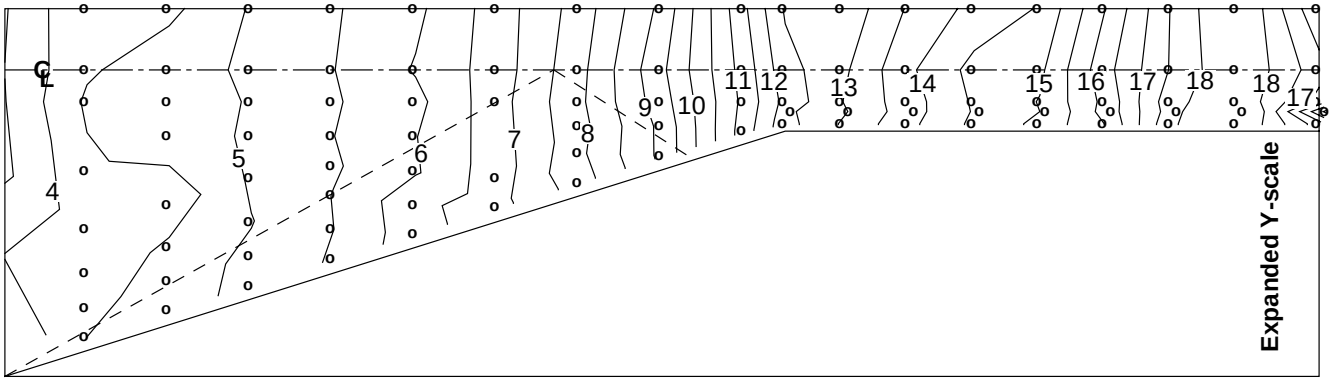


(a) Baseplate.

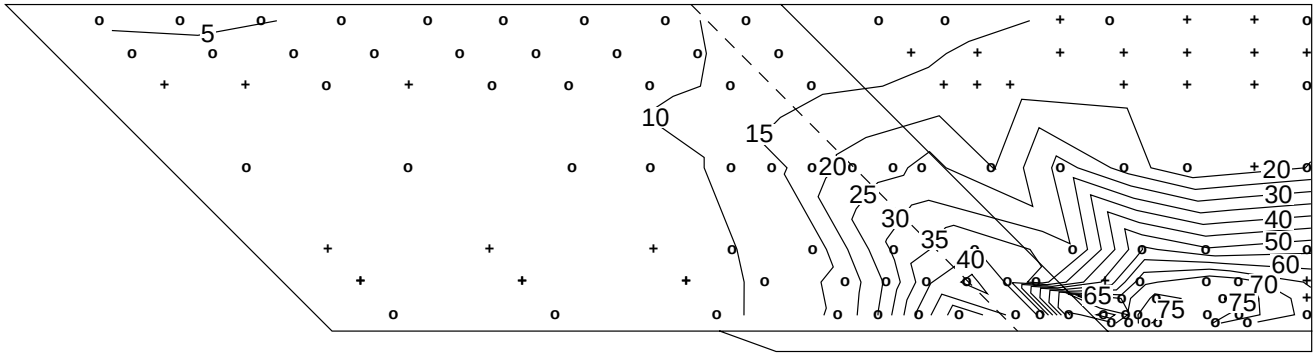


(b) Sidewall.

Figure 15. Contours of p/p_∞. CR = 3; Re = 0.55×10^6 per foot; 50 percent cowl; run 58.

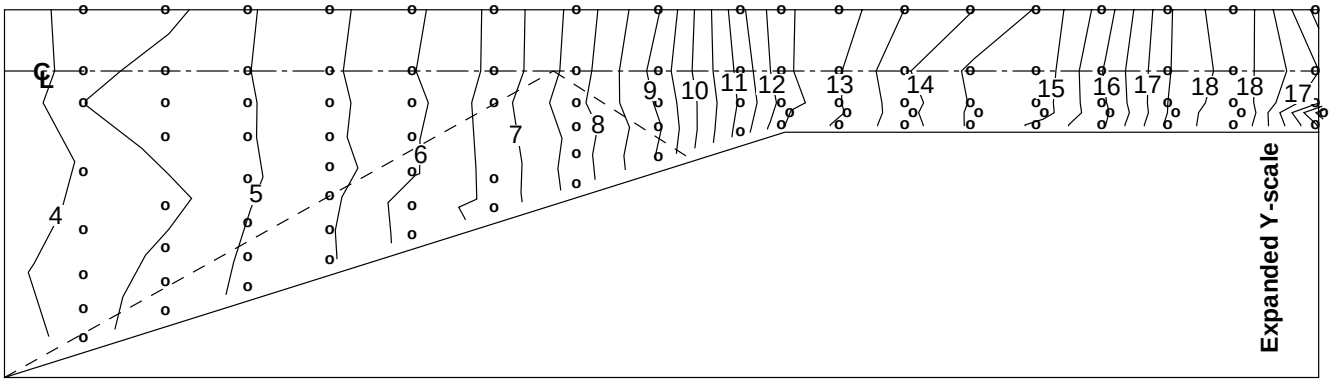


(a) Baseplate.

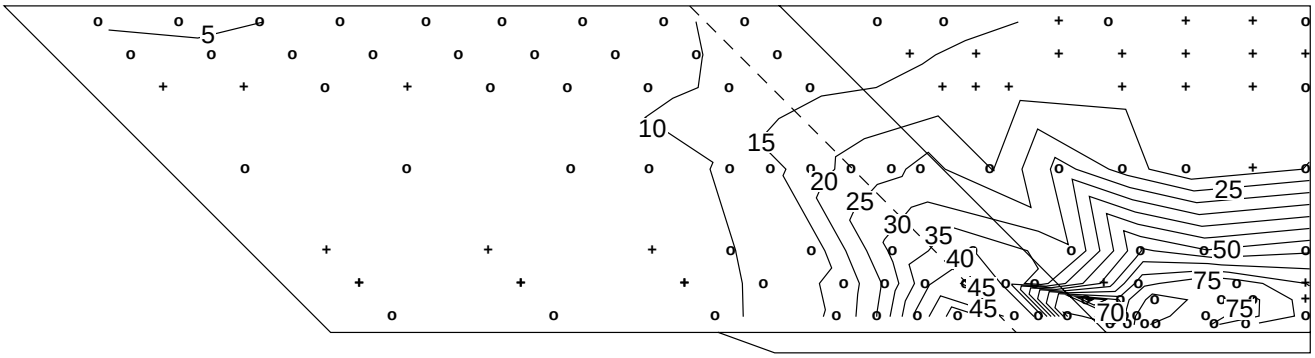


(b) Sidewall.

Figure 16. Contours of p/p_∞. CR = 5; Re = 0.55×10^6 per foot; 50 percent cowl; run 37.

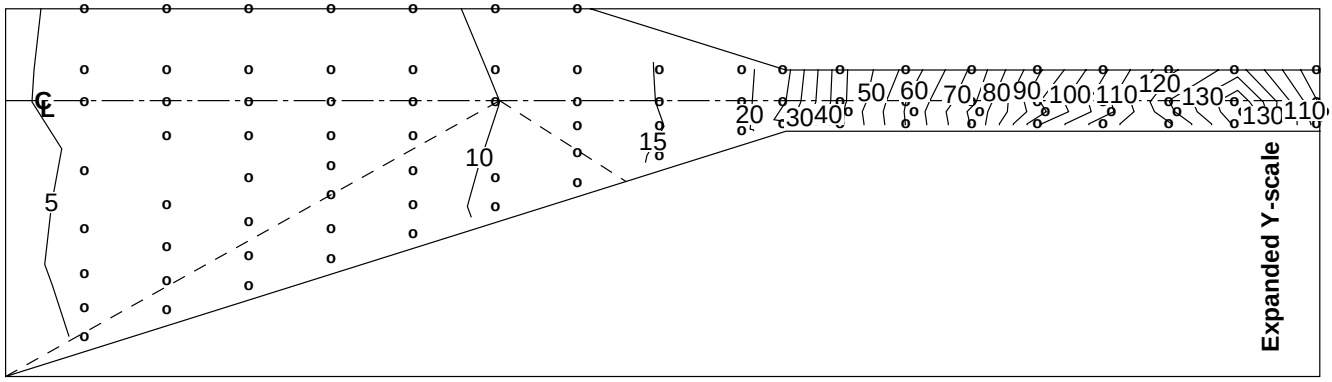


(a) Baseplate.

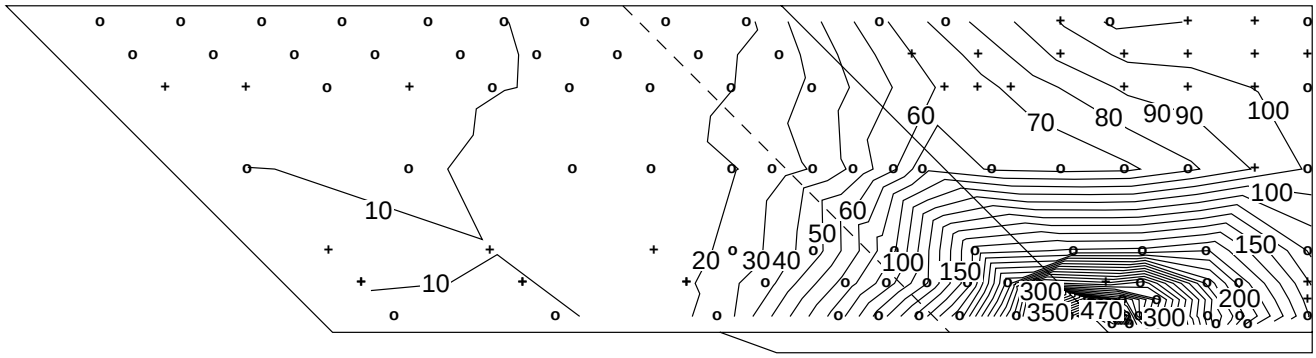


(b) Sidewall.

Figure 17. Contours of p/p_∞. CR = 5; Re = 0.55×10^6 per foot; 50 percent cowl; run 38.

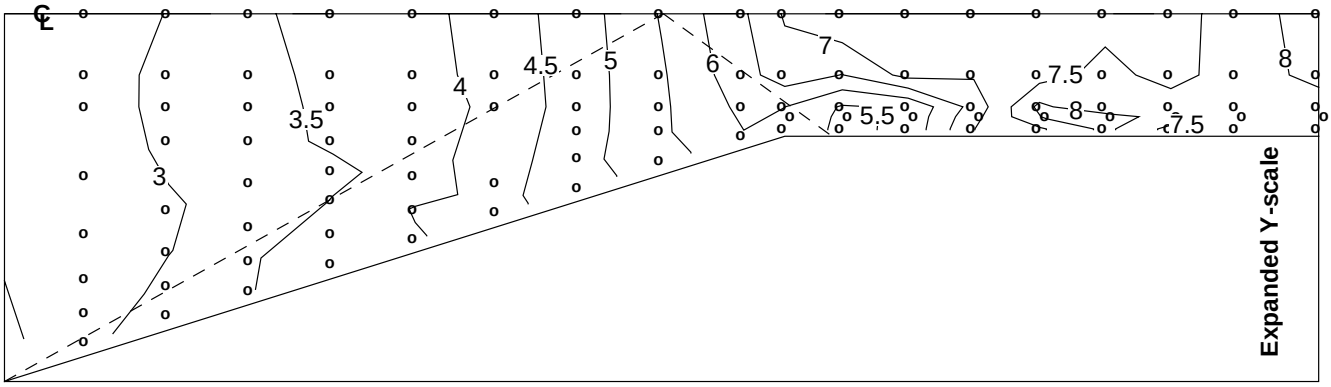


(a) Baseplate.

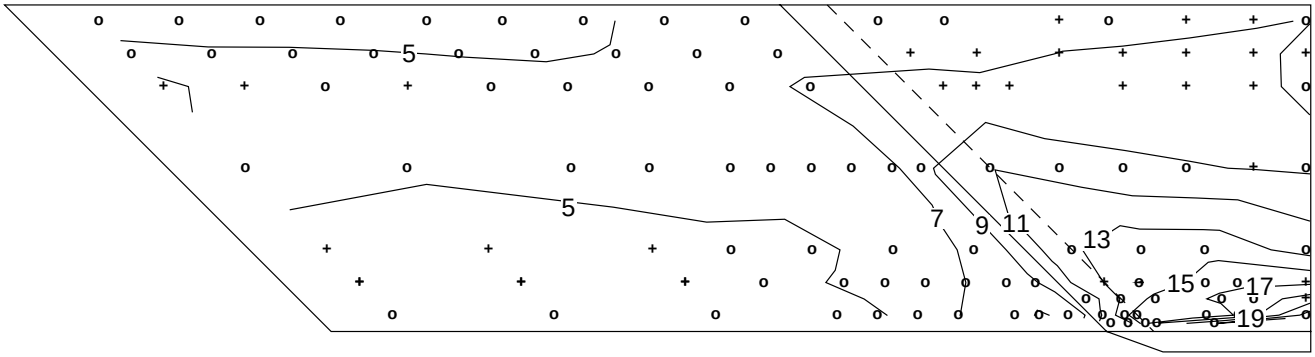


(b) Sidewall.

Figure 18. Contours of p/p_∞. CR = 9; Re = 0.55×10^6 per foot; 50 percent cowl; run 55.

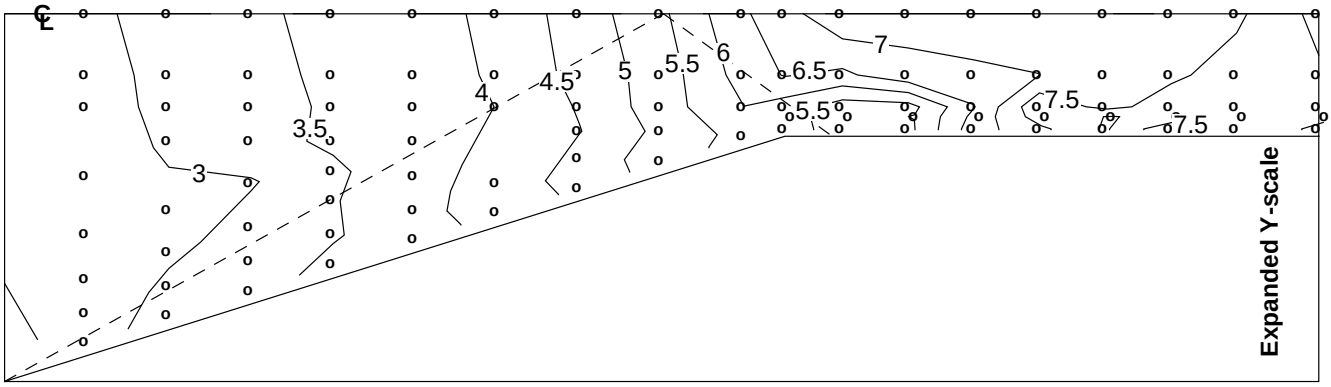


(a) Baseplate.

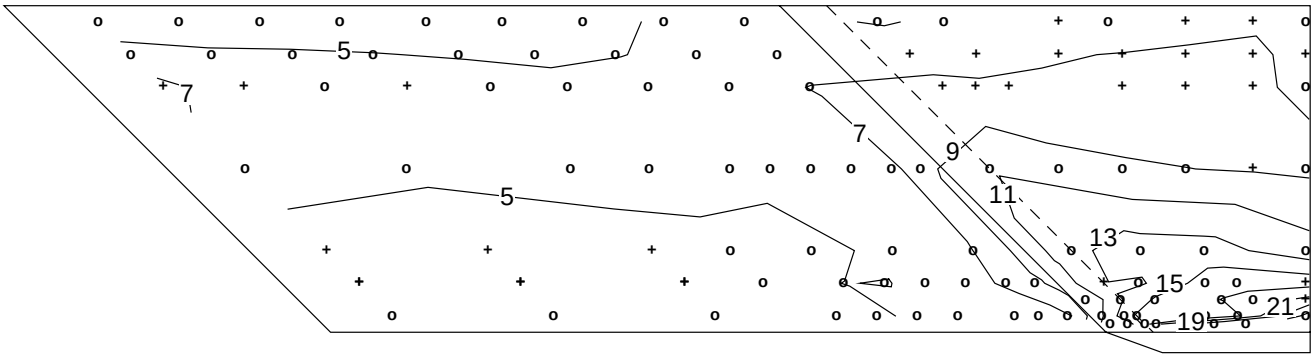


(b) Sidewall.

Figure 19. Contours of p/p_∞. CR = 3; Re = 1.14×10^6 per foot; 0 percent cowl; run 65.

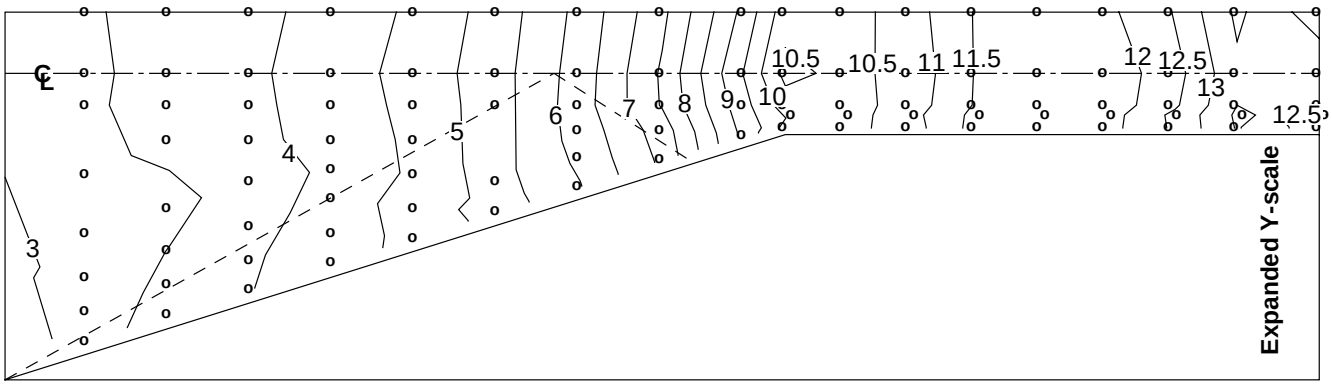


(a) Baseplate.

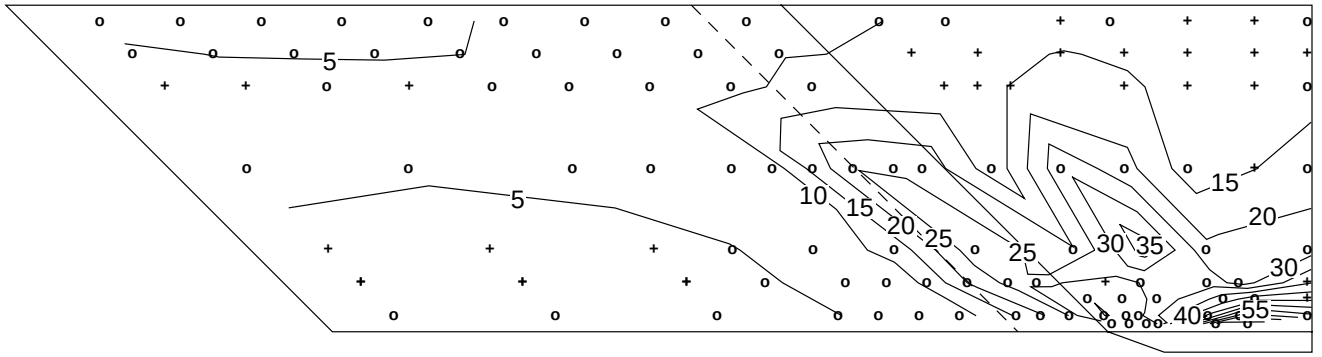


(b) Sidewall.

Figure 20. Contours of p/p_∞. CR = 3; Re = 1.14×10^6 per foot; 0 percent cowl; run 67.

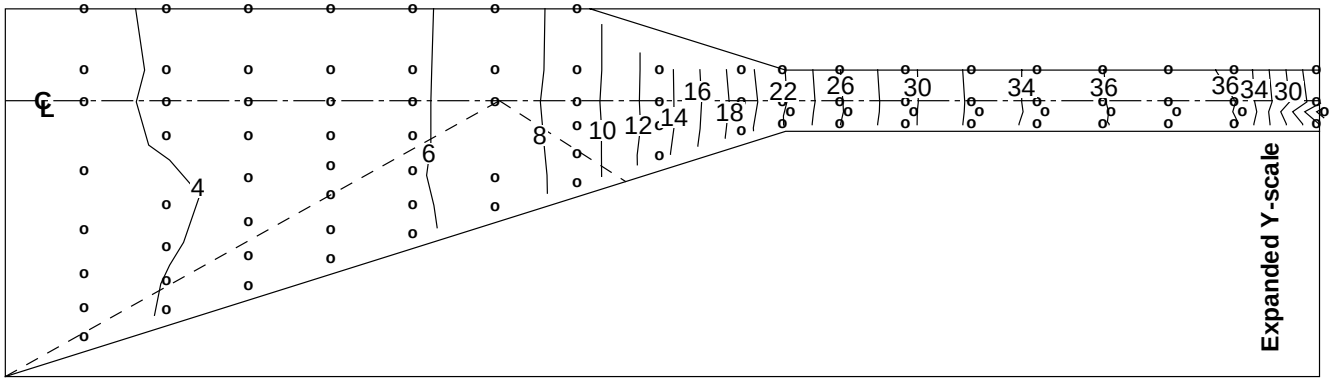


(a) Baseplate.

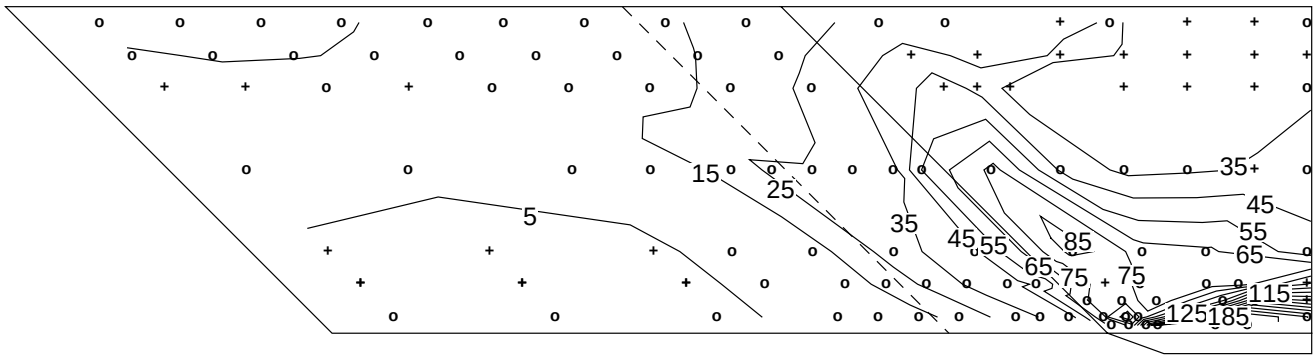


(b) Sidewall.

Figure 21. Contours of p/p_∞. CR = 5; Re = 1.14×10^6 per foot; 0 percent cowl; run 45.

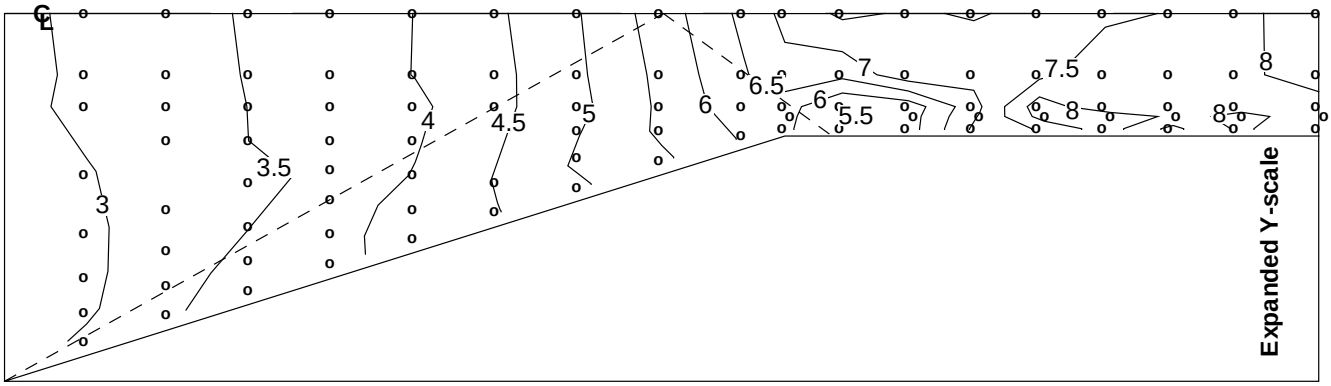


(a) Baseplate.

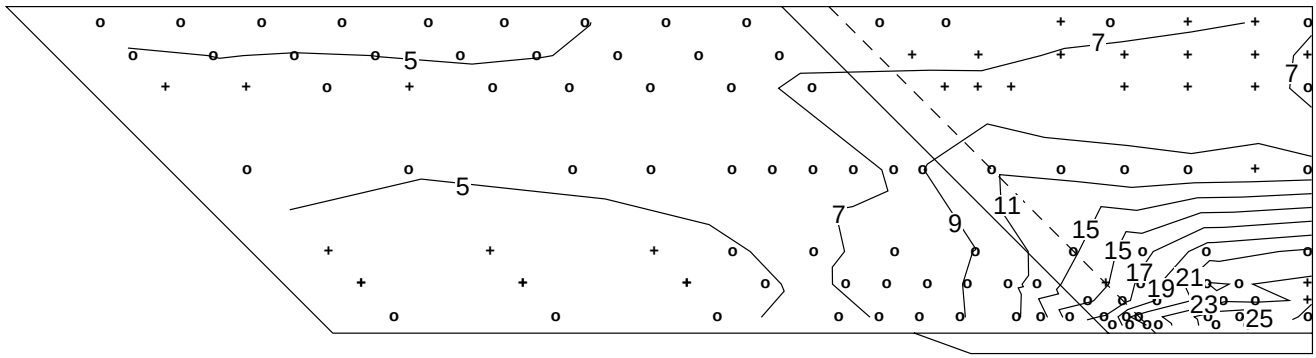


(b) Sidewall.

Figure 22. Contours of p/p_∞. CR = 9; Re = 1.14×10^6 per foot; 0 percent cowl; run 48.

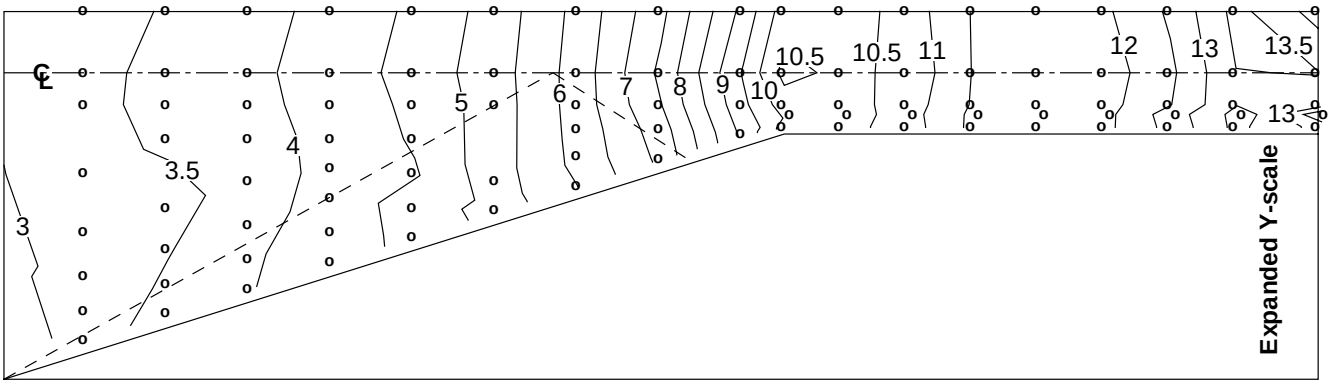


(a) Baseplate.

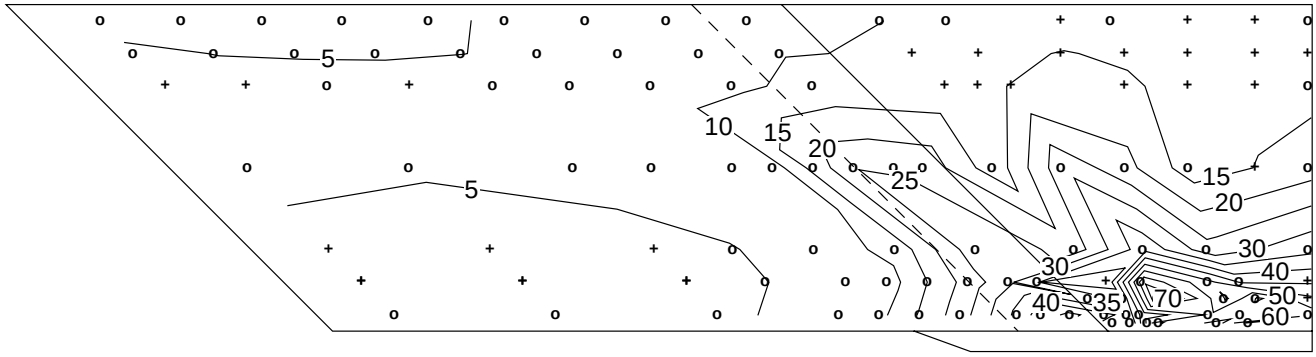


(b) Sidewall.

Figure 23. Contours of p/p_∞. CR = 3; Re = 1.14×10^6 per foot; 25 percent cowl; run 63.

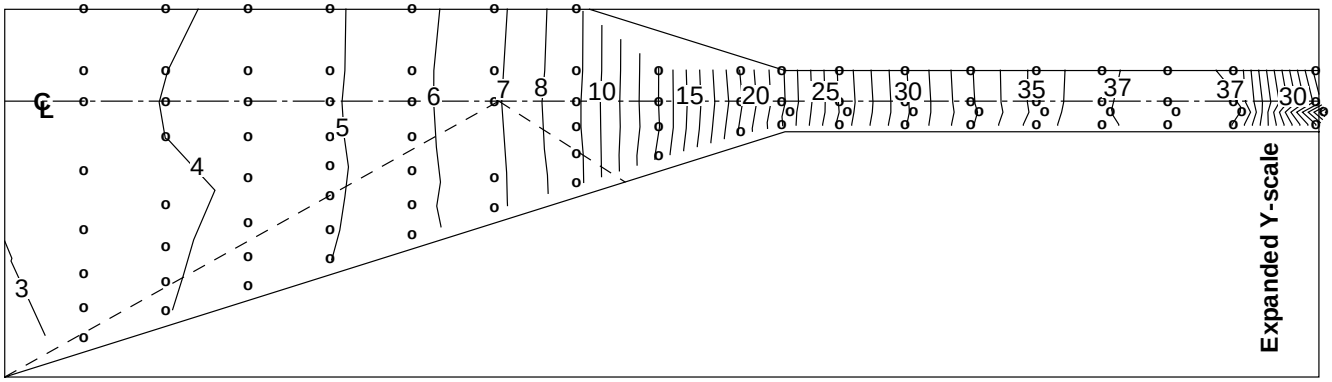


(a) Baseplate.

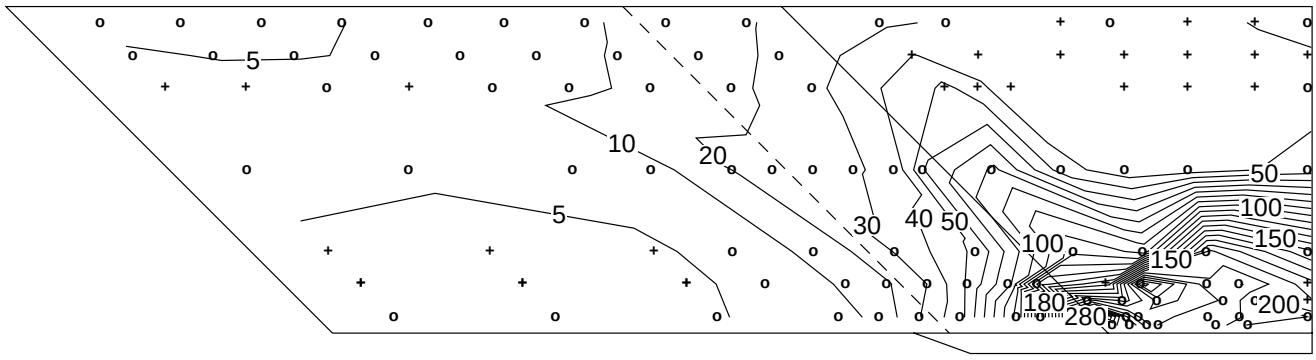


(b) Sidewall.

Figure 24. Contours of p/p_∞. CR = 5; Re = 1.14×10^6 per foot; 25 percent cowl; run 42.

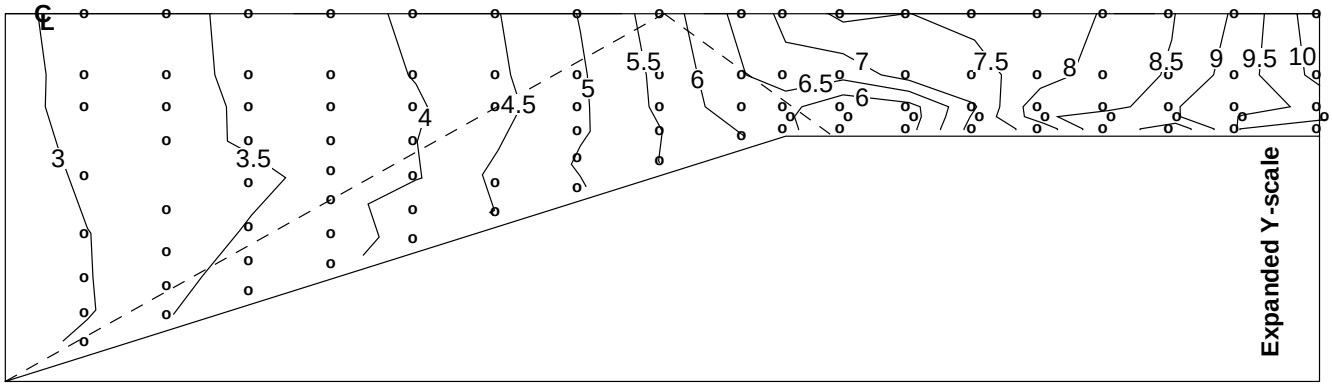


(a) Baseplate.

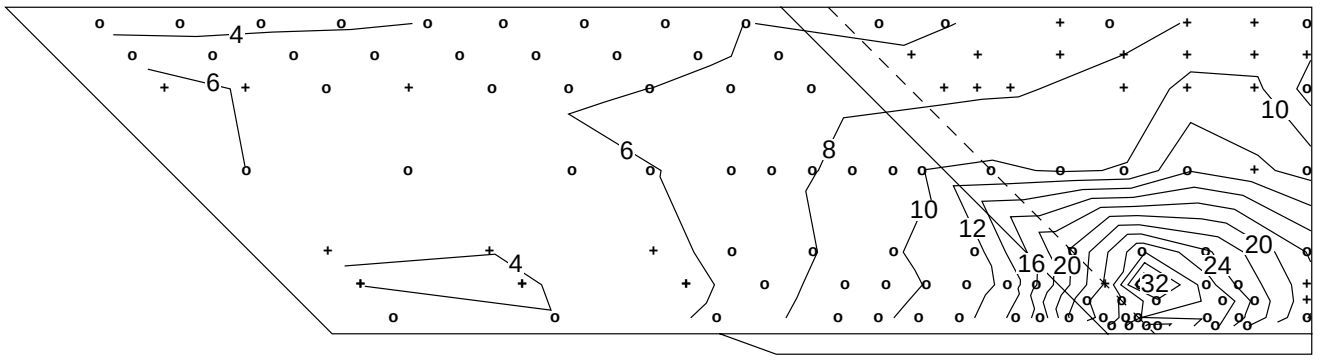


(b) Sidewall.

Figure 25. Contours of p/p_∞. CR = 9; Re = 1.14×10^6 per foot; 25 percent cowl; run 52.

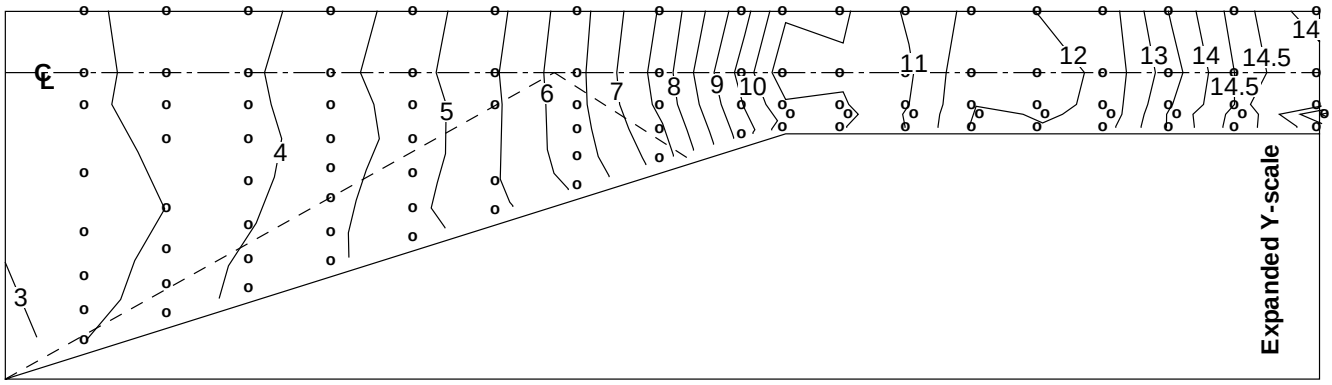


(a) Baseplate.

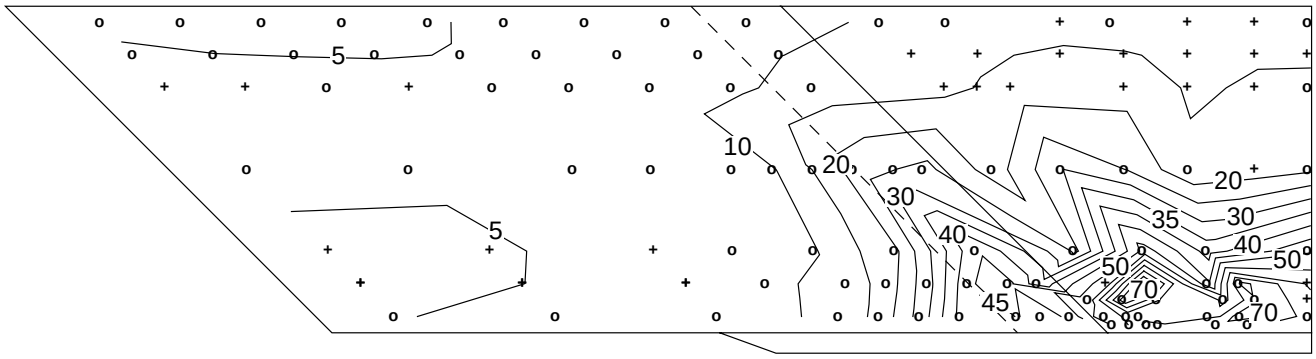


(b) Sidewall.

Figure 26. Contours of p/p_∞. CR = 3; Re = 1.14×10^6 per foot; 50 percent cowl; run 59.

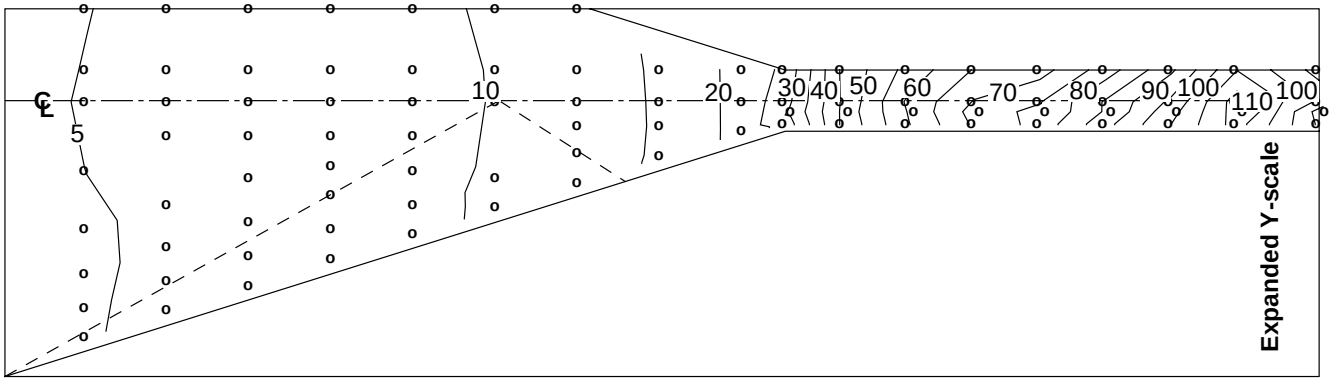


(a) Baseplate.

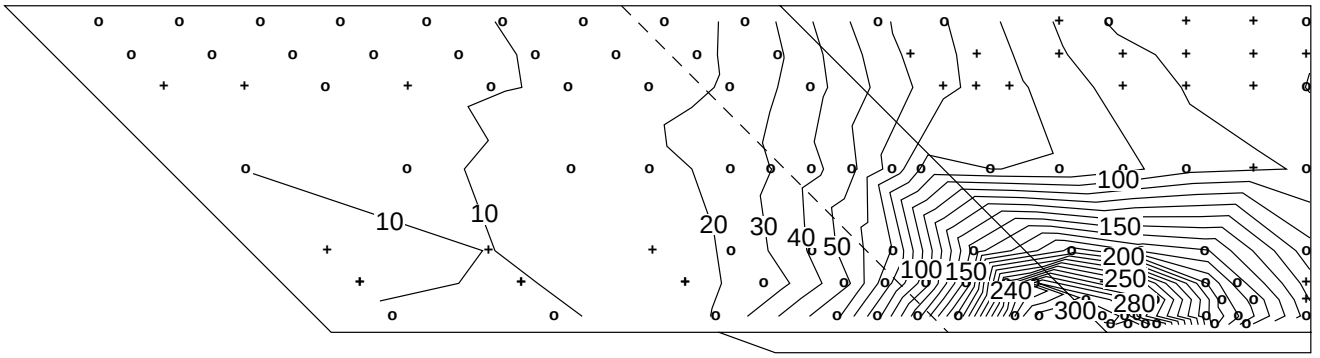


(b) Sidewall.

Figure 27. Contours of p/p_∞. CR = 5; Re = 1.14×10^6 per foot; 50 percent cowl; run 39.

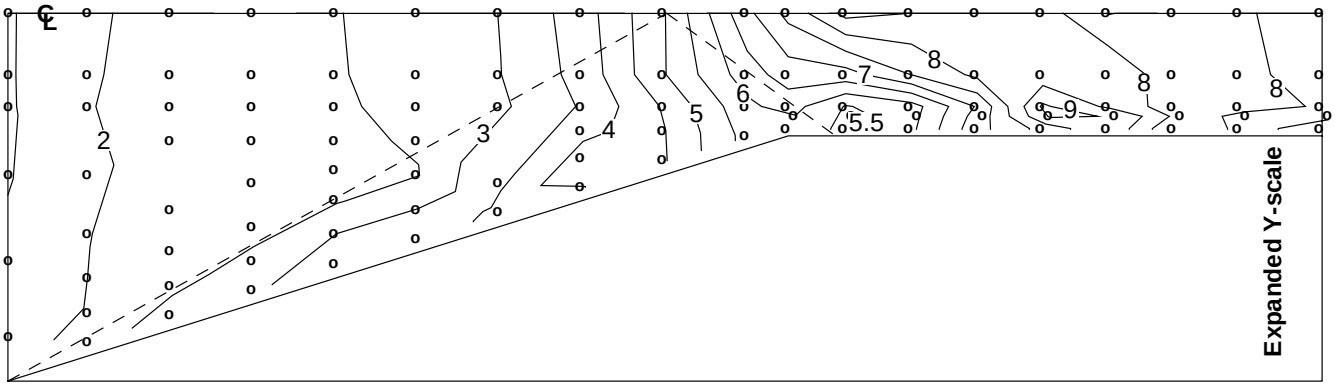


(a) Baseplate.

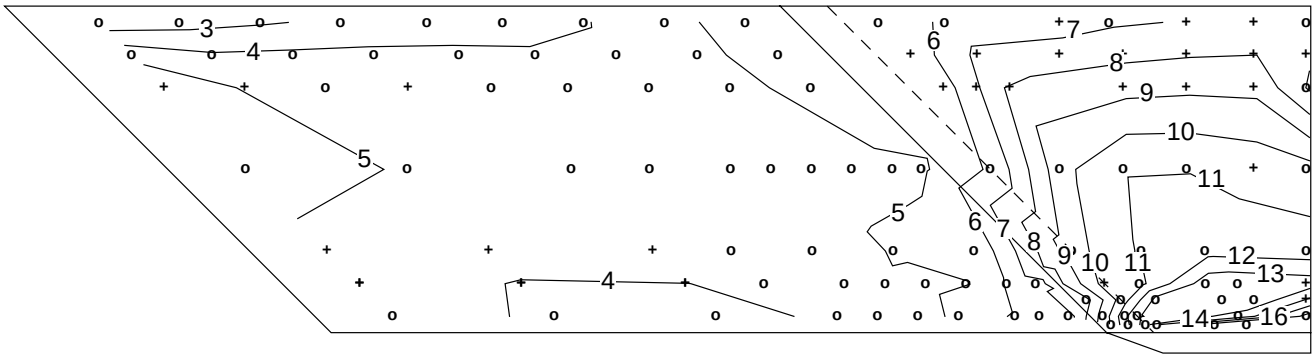


(b) Sidewall.

Figure 28. Contours of p/p_∞. CR = 9; Re = 1.14×10^6 per foot; 50 percent cowl; run 56.

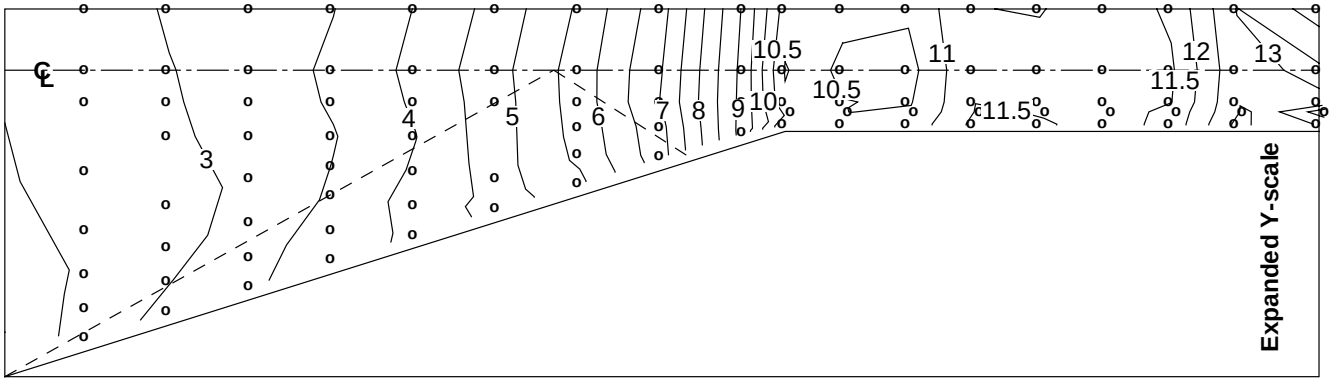


(a) Baseplate.

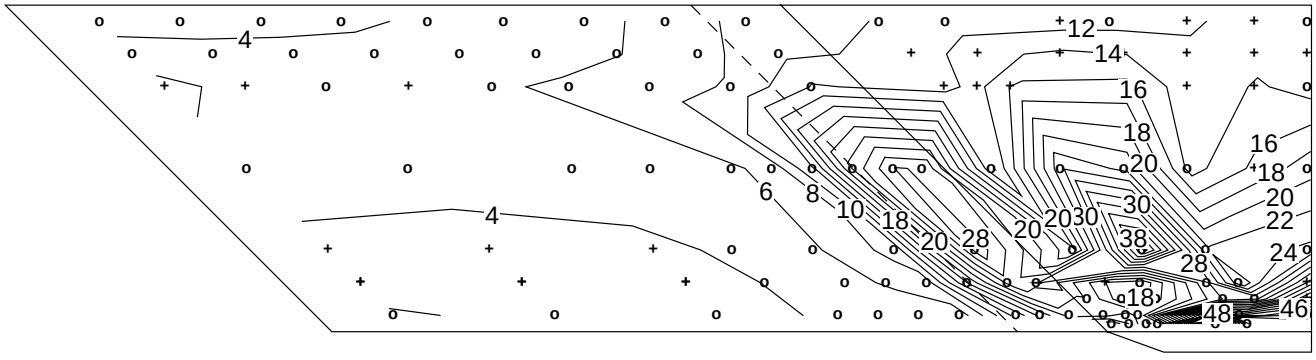


(b) Sidewall.

Figure 29. Contours of p/p_∞. CR = 3; Re = 2.15×10^6 per foot; 0 percent cowl; run 66.

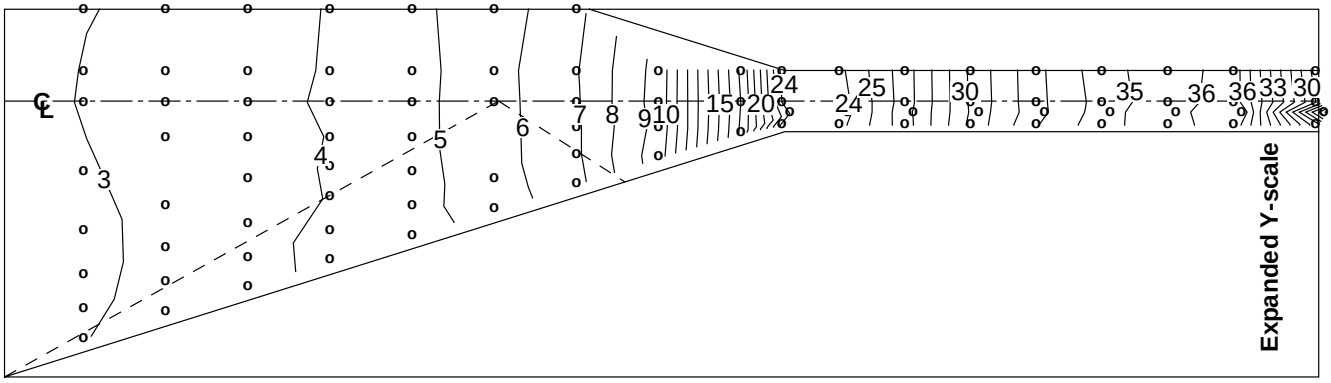


(a) Baseplate.

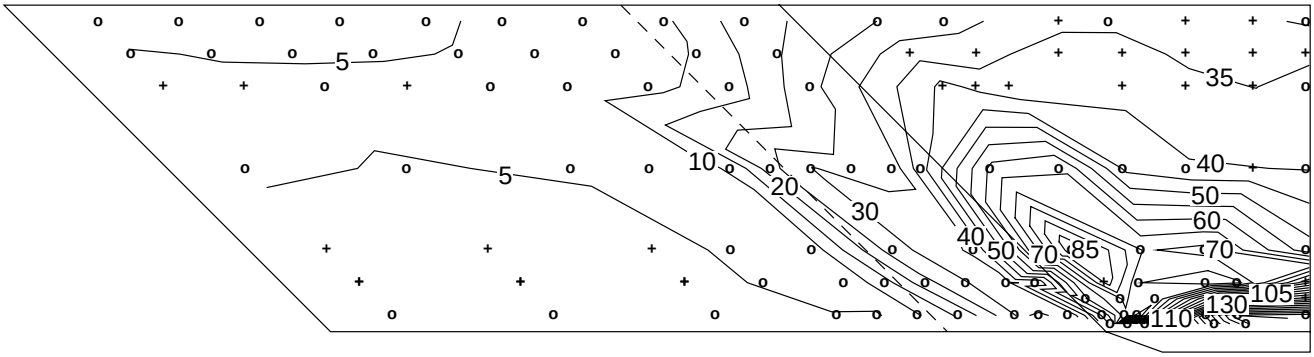


(b) Sidewall.

Figure 30. Contours of p/p_∞. CR = 5; Re = 2.15×10^6 per foot; 0 percent cowl; run 46.

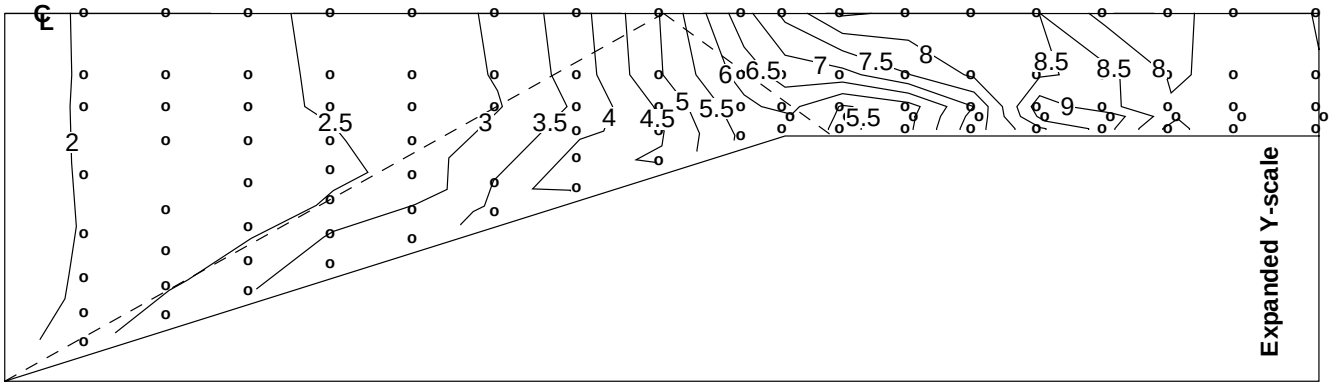


(a) Baseplate.

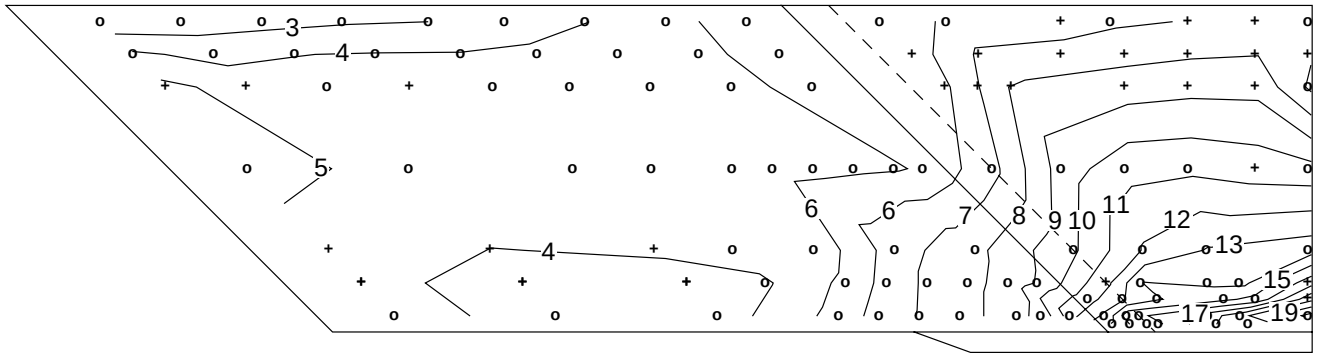


(b) Sidewall.

Figure 31. Contours of p/p_∞. CR = 9; Re = 2.15×10^6 per foot; 0 percent cowl; run 49.

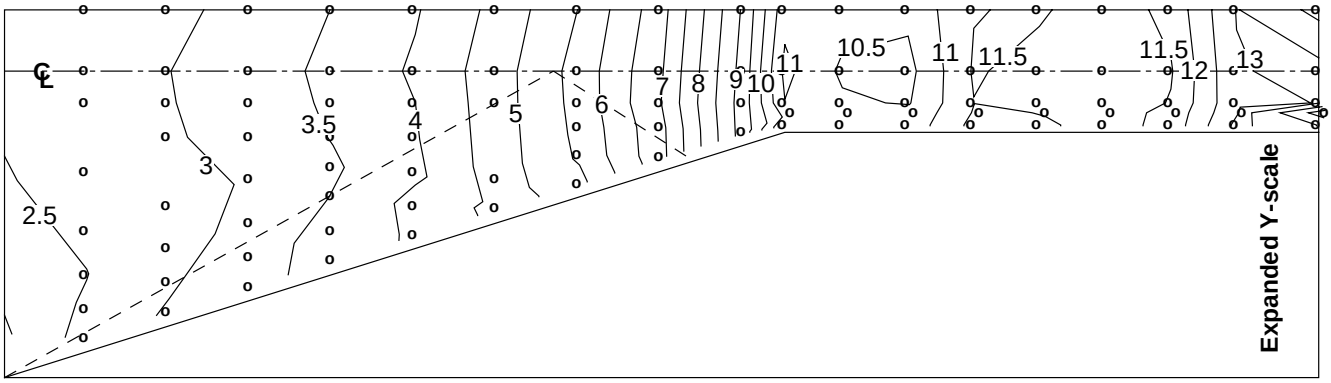


(a) Baseplate.

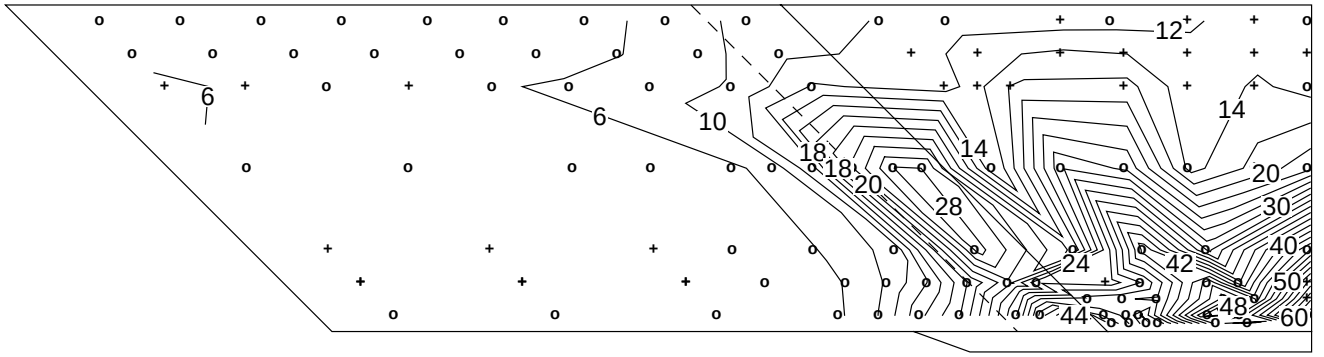


(b) Sidewall.

Figure 32. Contours of p/p_∞. CR = 3; Re = 2.15×10^6 per foot; 25 percent cowl; run 62.

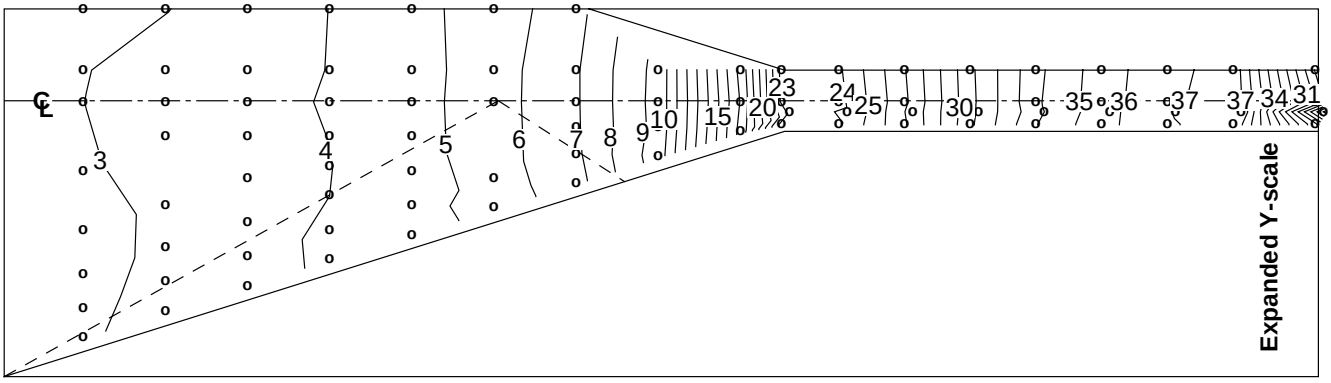


(a) Baseplate.

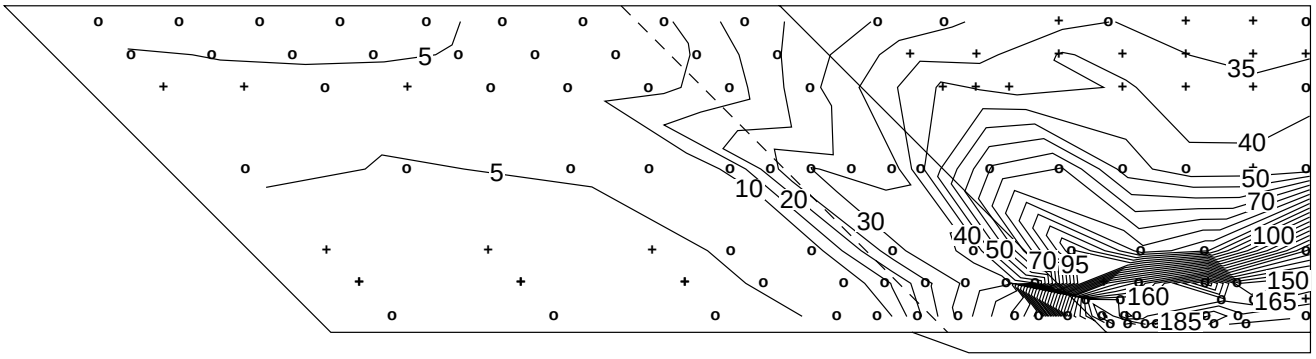


(b) Sidewall.

Figure 33. Contours of p/p_∞. CR = 5; Re = 2.15×10^6 per foot; 25 percent cowl; run 43.

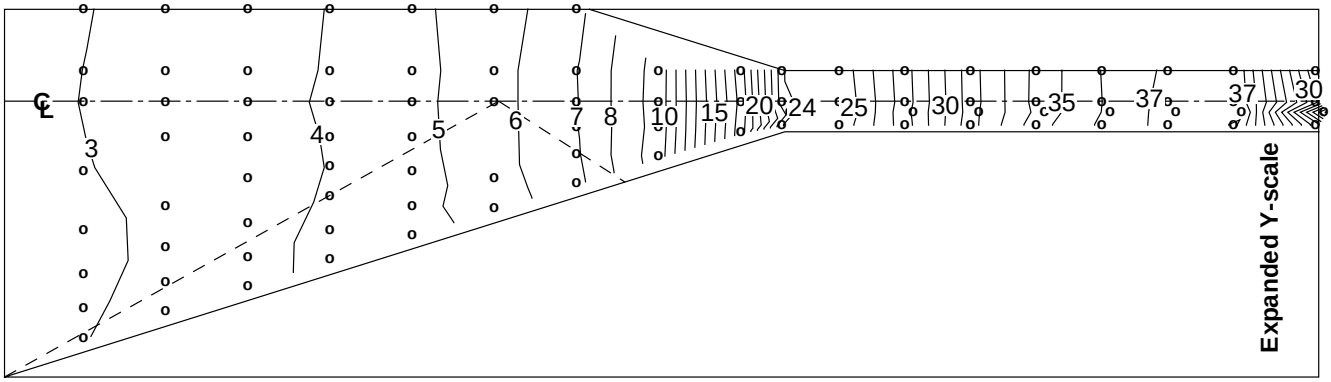


(a) Baseplate.

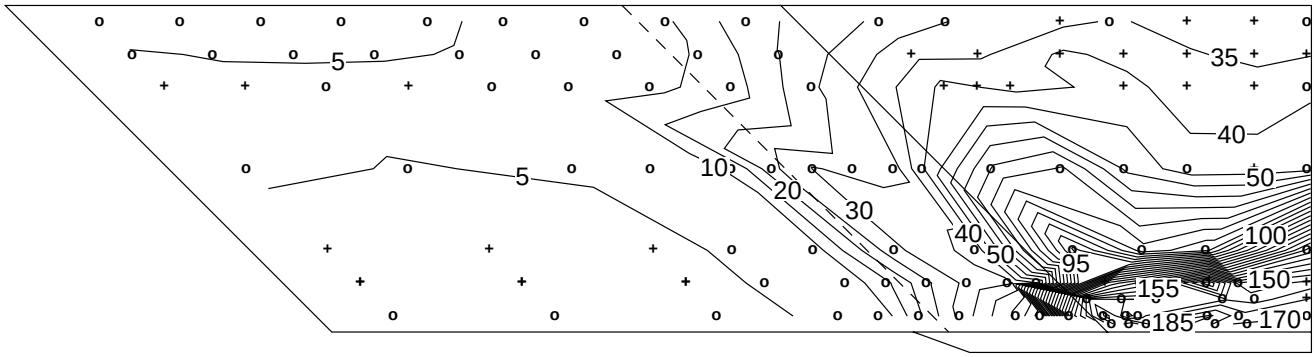


(b) Sidewall.

Figure 34. Contours of p/p_∞. CR = 9; Re = 2.15×10^6 per foot; 25 percent cowl; run 53.

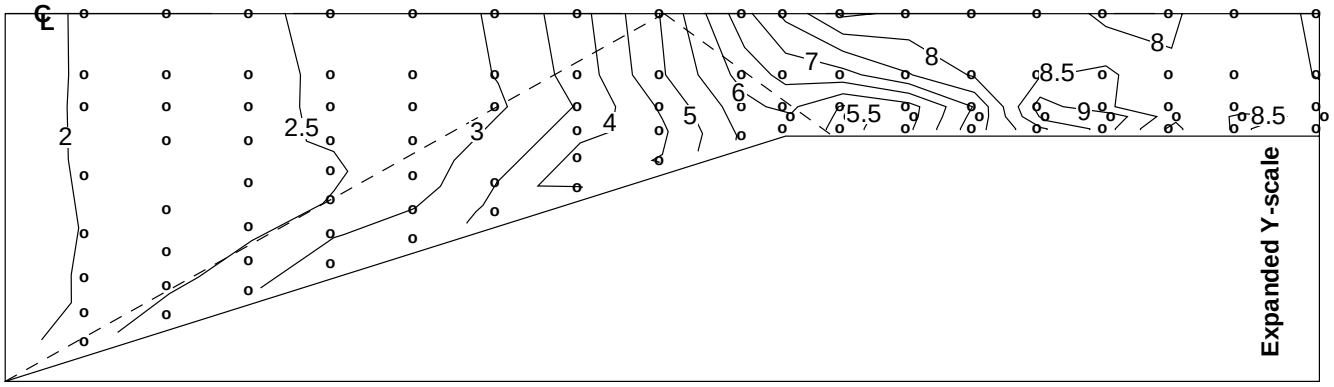


(a) Baseplate.

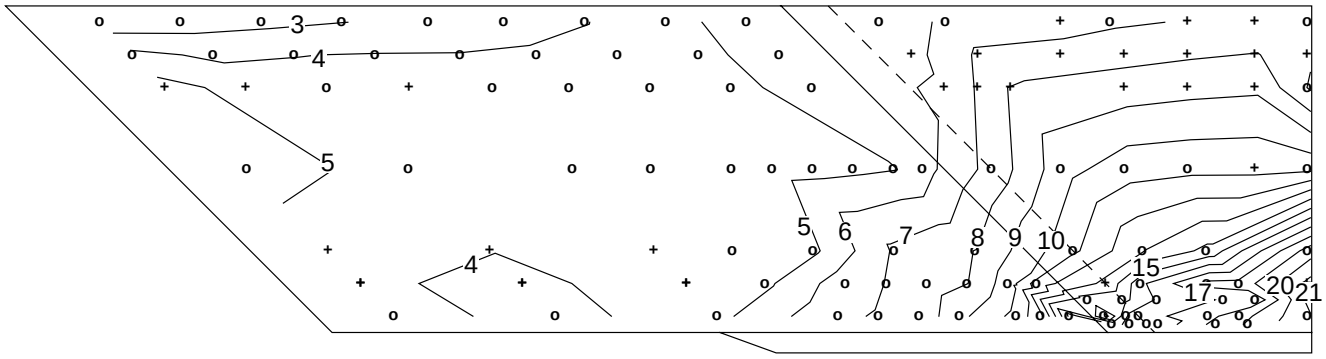


(b) Sidewall.

Figure 35. Contours of p/p_∞. CR = 9; Re = 2.15×10^6 per foot; 25 percent cowl; run 54.

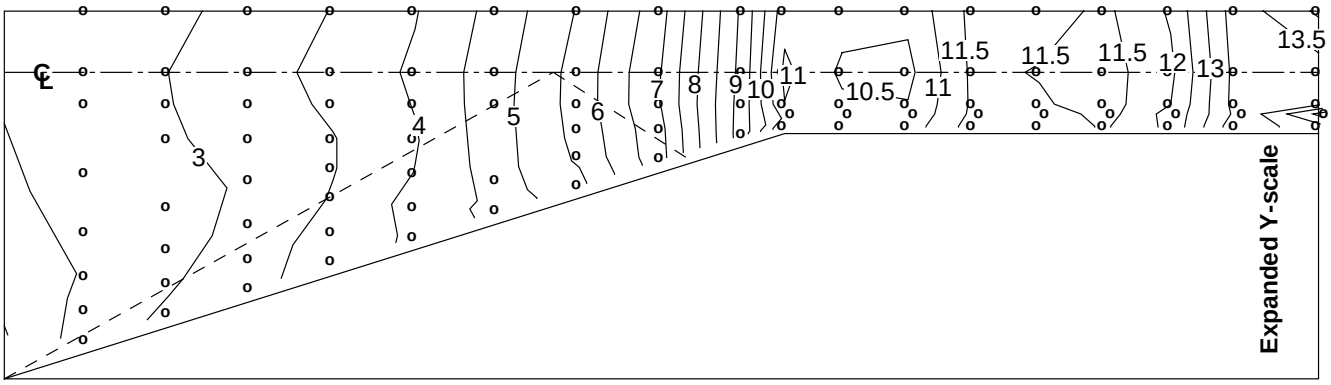


(a) Baseplate.

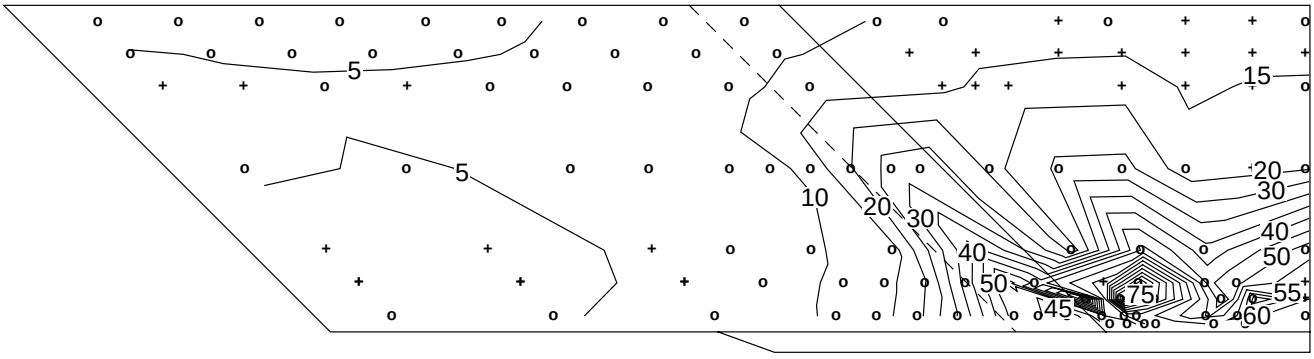


(b) Sidewall.

Figure 36. Contours of p/p_∞. CR = 3; Re = 2.15×10^6 per foot; 50 percent cowl; run 60.

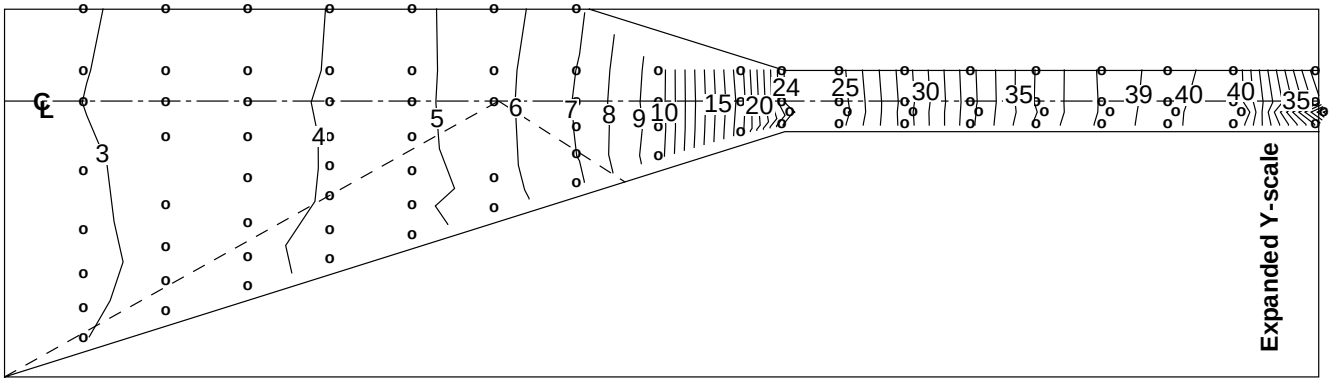


(a) Baseplate.

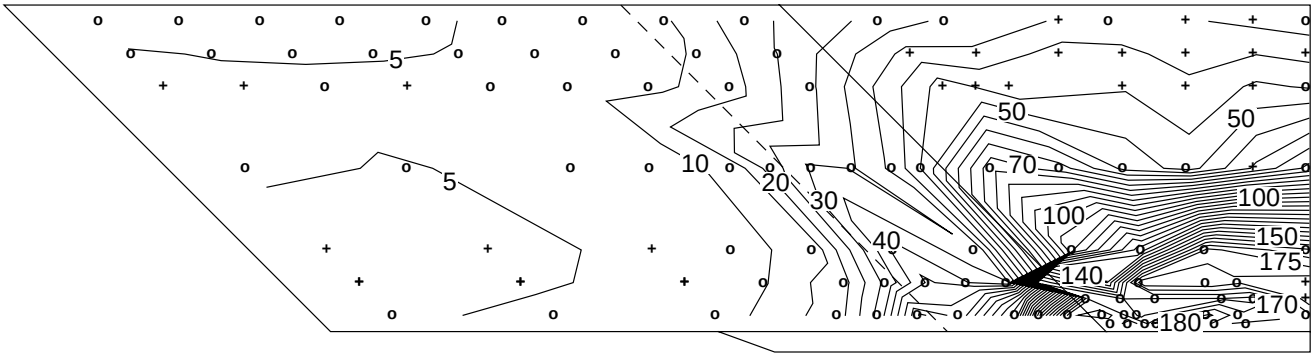


(b) Sidewall.

Figure 37. Contours of p/p_∞. CR = 5; Re = 2.15×10^6 per foot; 50 percent cowl; run 40.

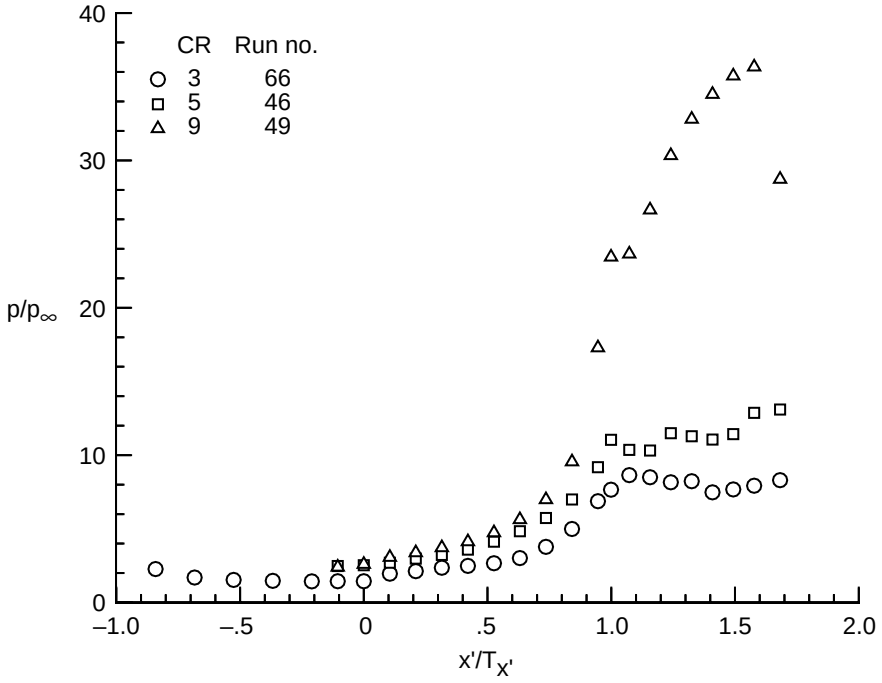


(a) Baseplate.

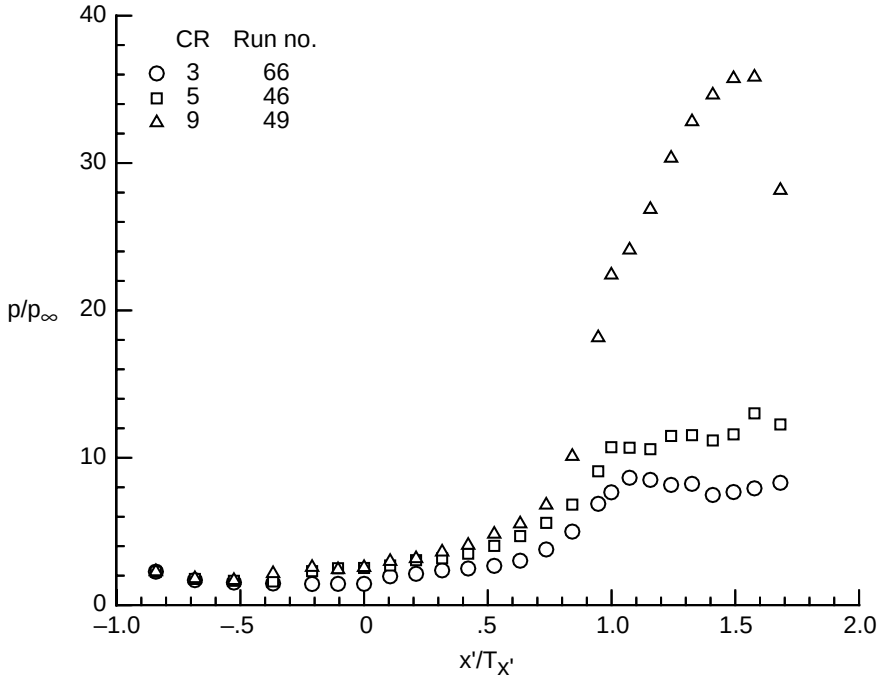


(b) Sidewall.

Figure 38. Contours of p/p_∞. CR = 9; Re = 2.15×10^6 per foot; 50 percent cowl; run 57.

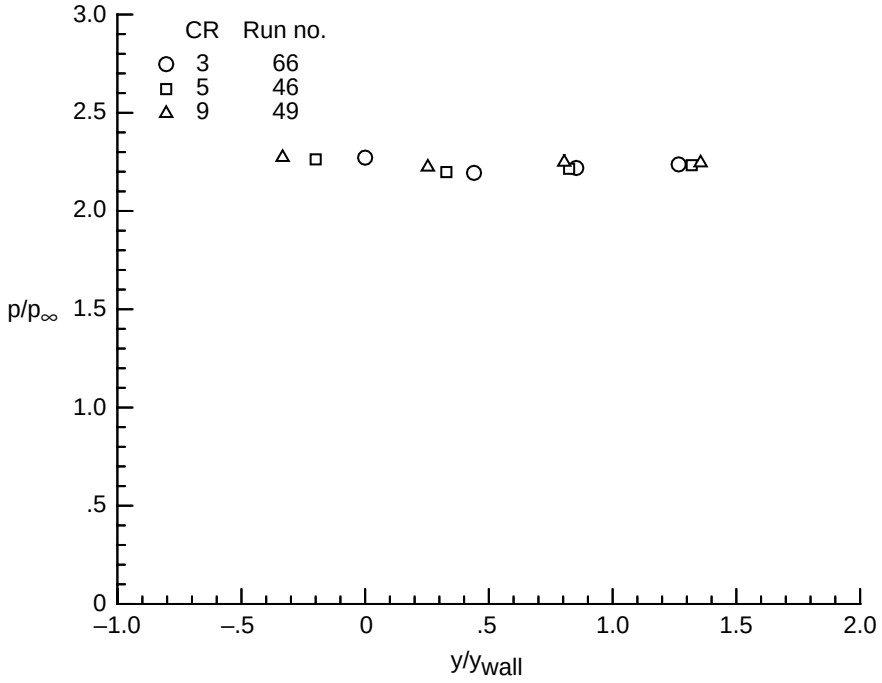


(a) Centerline pressures.

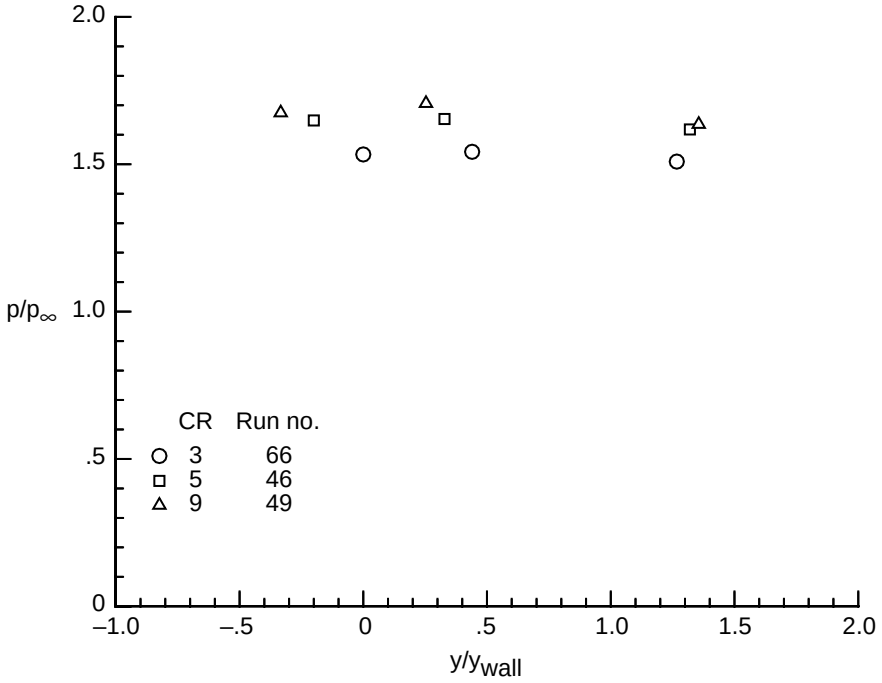


(b) Centerline pressures. Centerline for CR = 3.

Figure 39. Contraction ratio effects. 0 percent cowl; Re = 2.15×10^6 per foot.

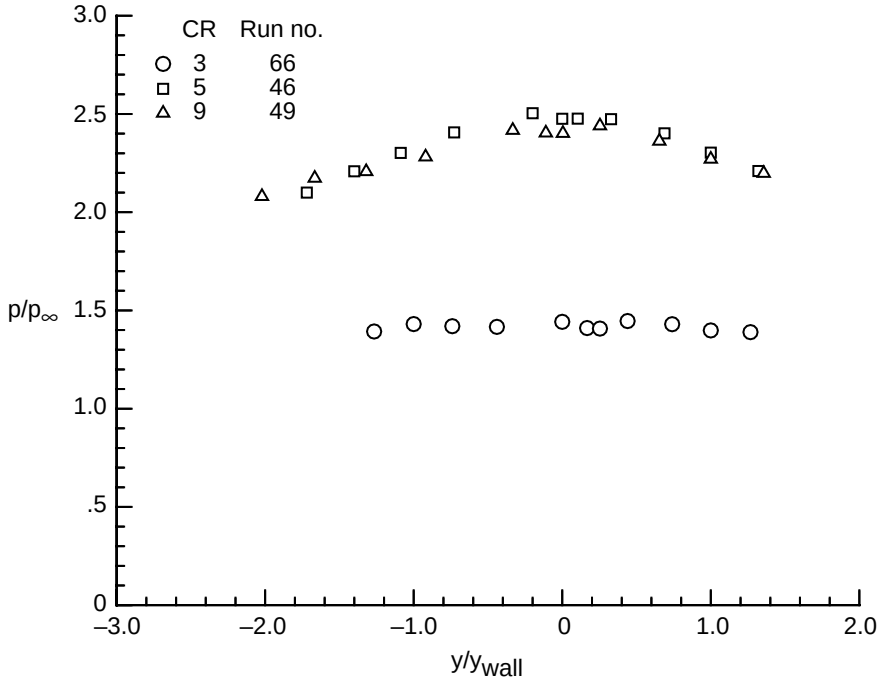


(c) Baseplate pressures. $x'/T_{x'} = -0.8412$.

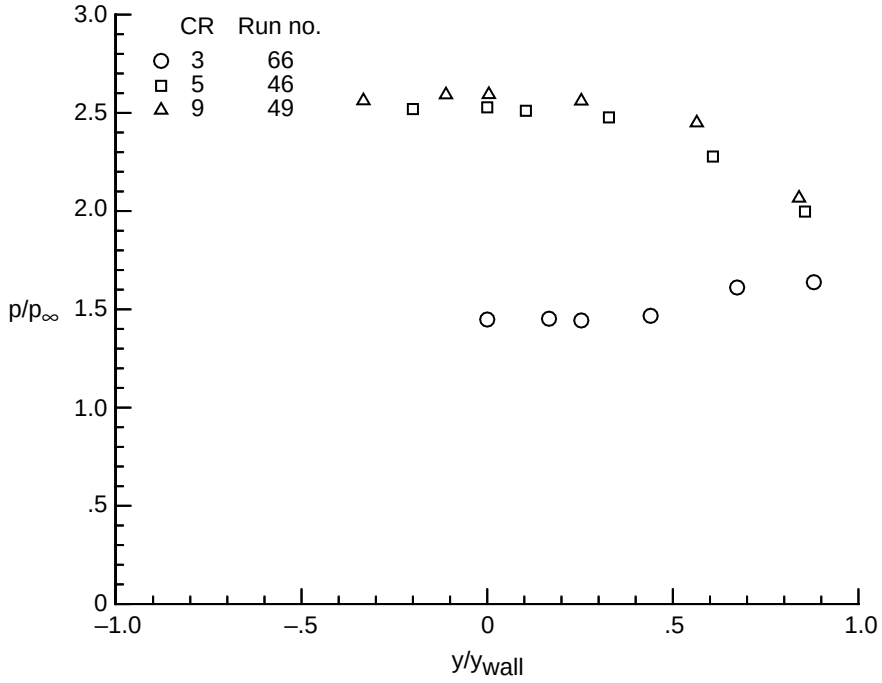


(d) Baseplate pressures. $x'/T_{x'} = -0.5258$.

Figure 39. Continued.

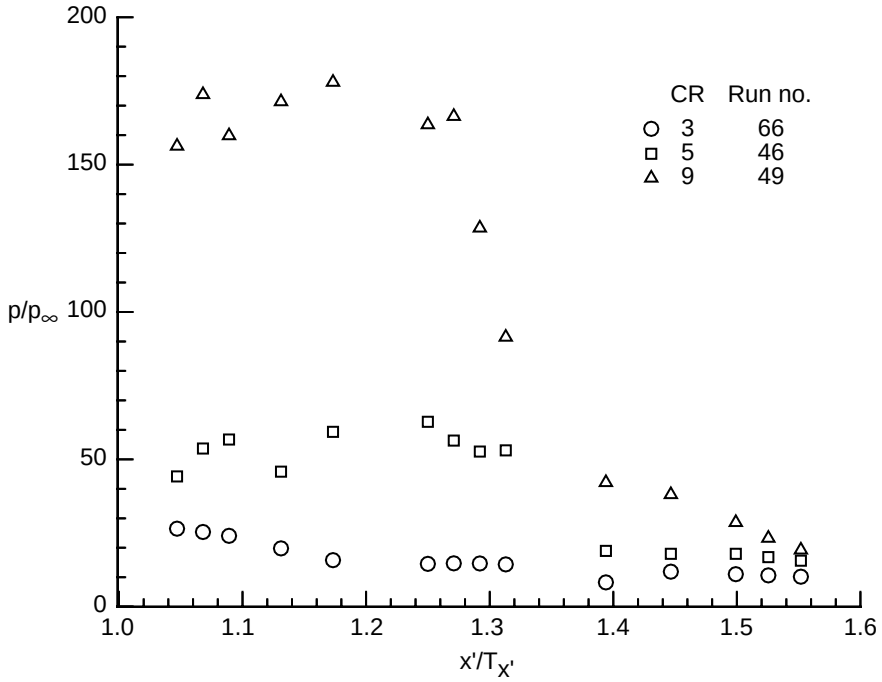


(e) Baseplate pressures. $x'/T_{x'} = -0.1052$.

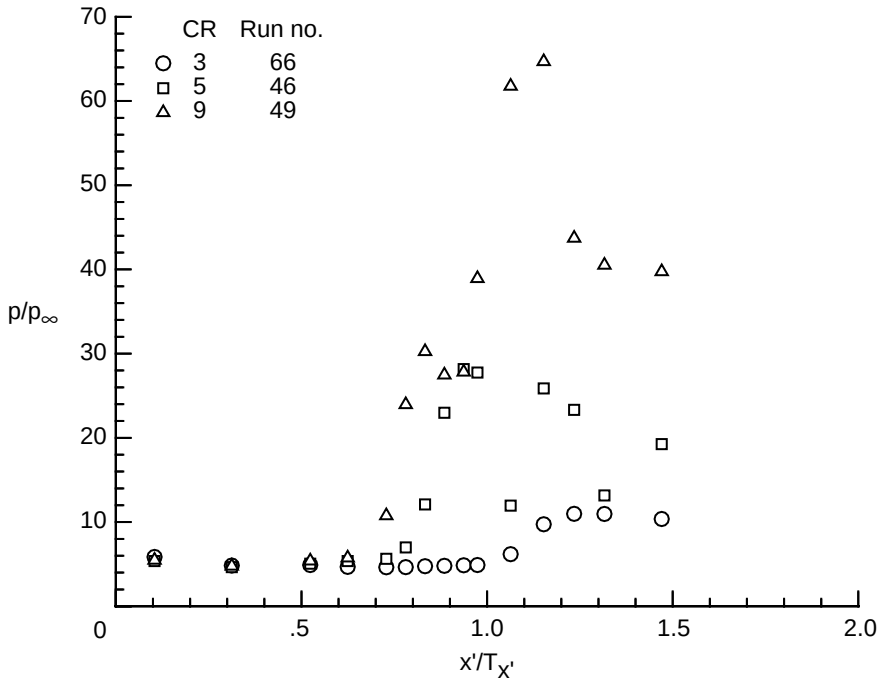


(f) Baseplate pressures. $x'/T_{x'} = 0$.

Figure 39. Continued.



(g) Cowl pressures.



(h) Sidewall pressures. $Z/H = 0.50$.

Figure 39. Concluded.

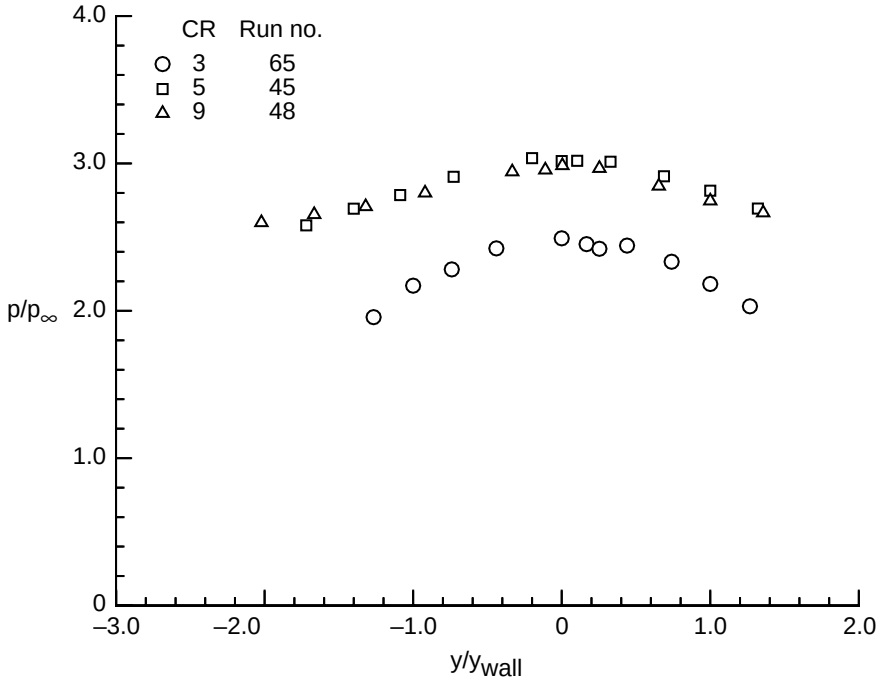
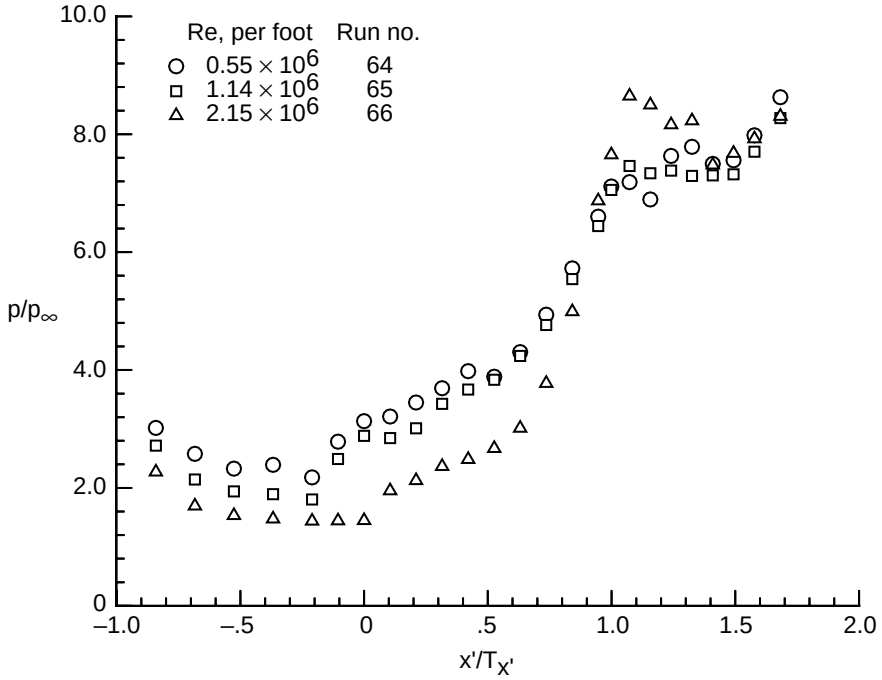
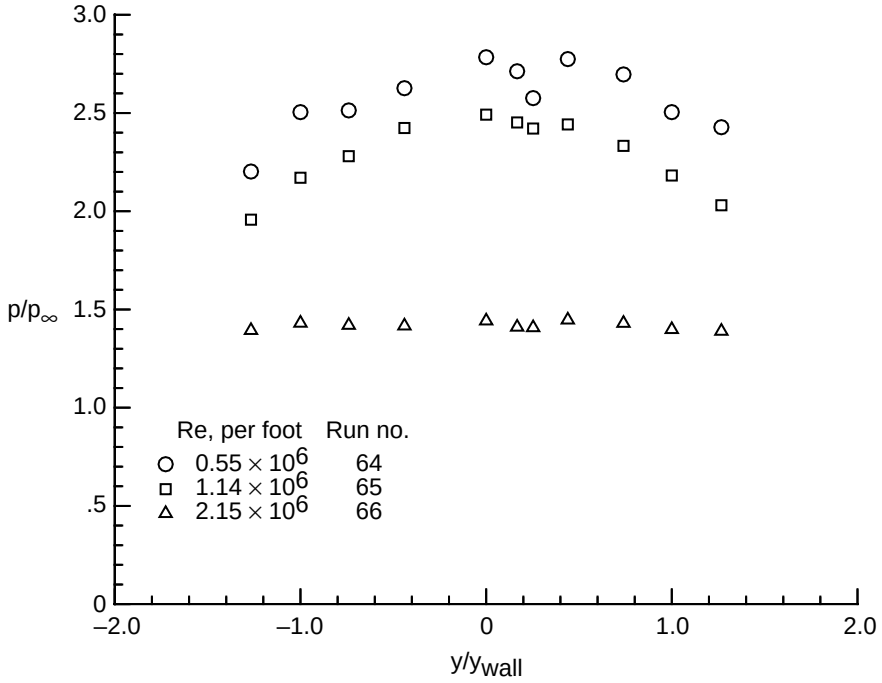


Figure 40. Contraction ratio effects on baseplate pressures. 0 percent cowl; Re = 1.14×10^6 per foot; $x'/T_{x'} = -0.1052$.

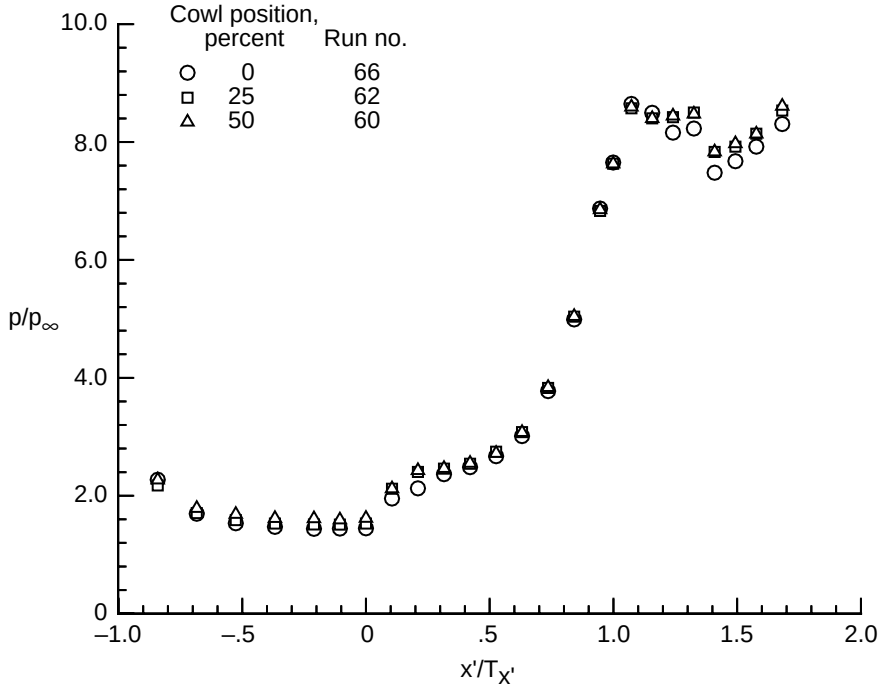


(a) Centerline pressures. Centerline for CR = 3.

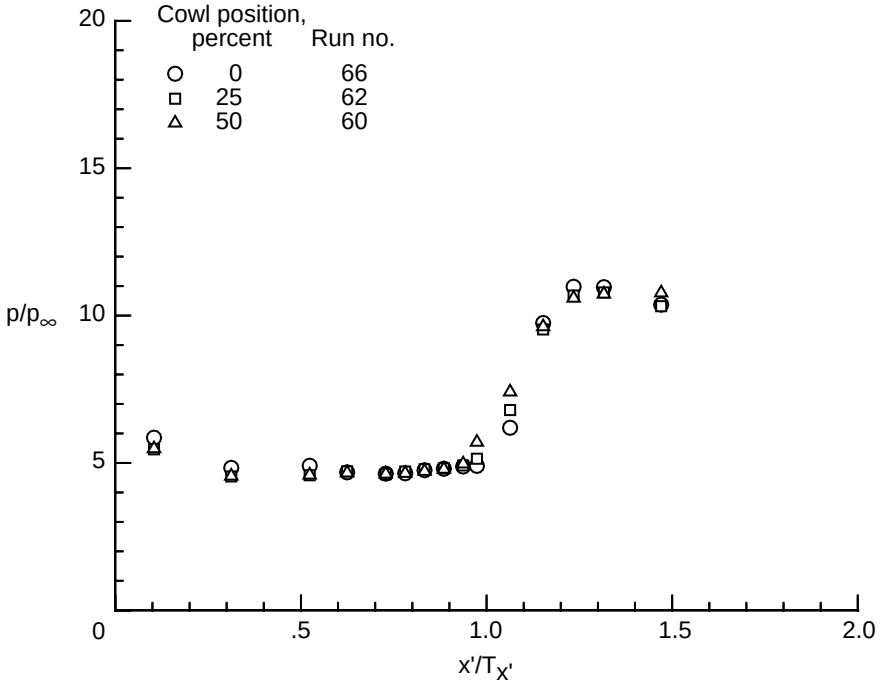


(b) Baseplate pressures. $x'/T_{x'} = -0.1052$.

Figure 41. Reynolds number effects. CR = 3; 0 percent cowl.

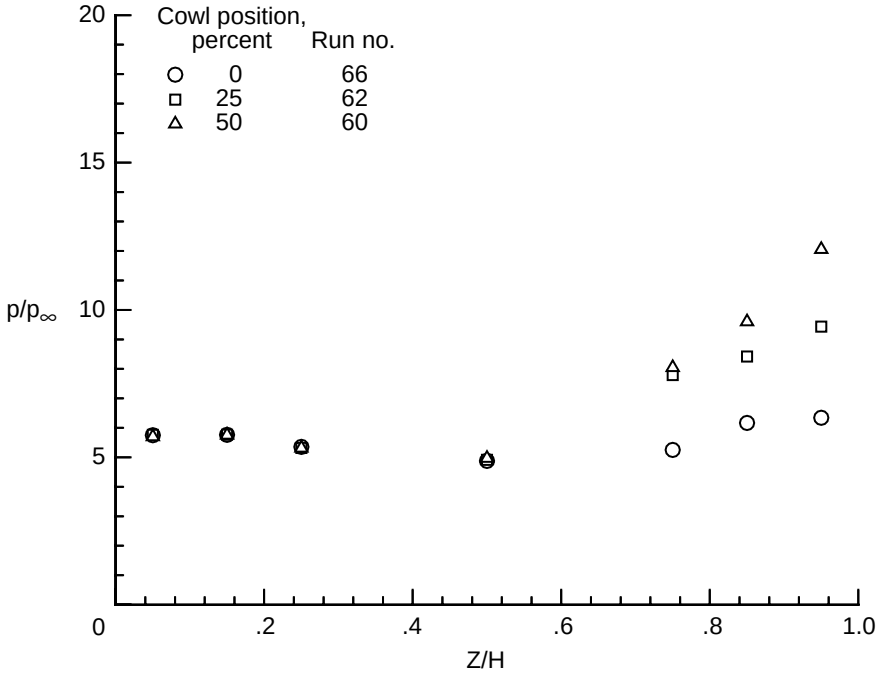


(a) Centerline pressures. Centerline for CR = 3.

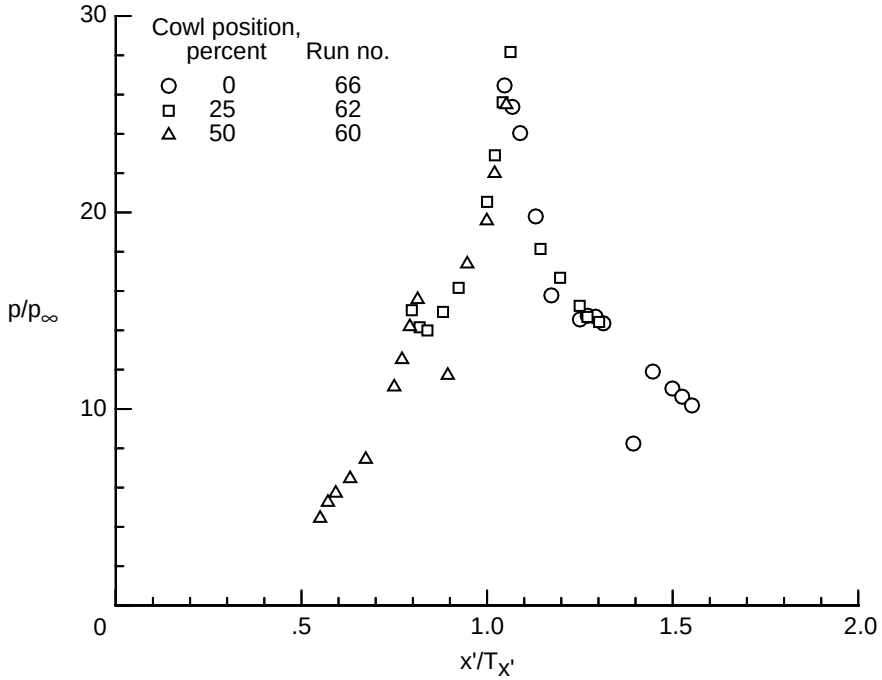


(b) Sidewall centerline pressures. $Z/H = 0.5$.

Figure 42. Cowl effects. CR = 3. Re = 2.15×10^6 per foot.

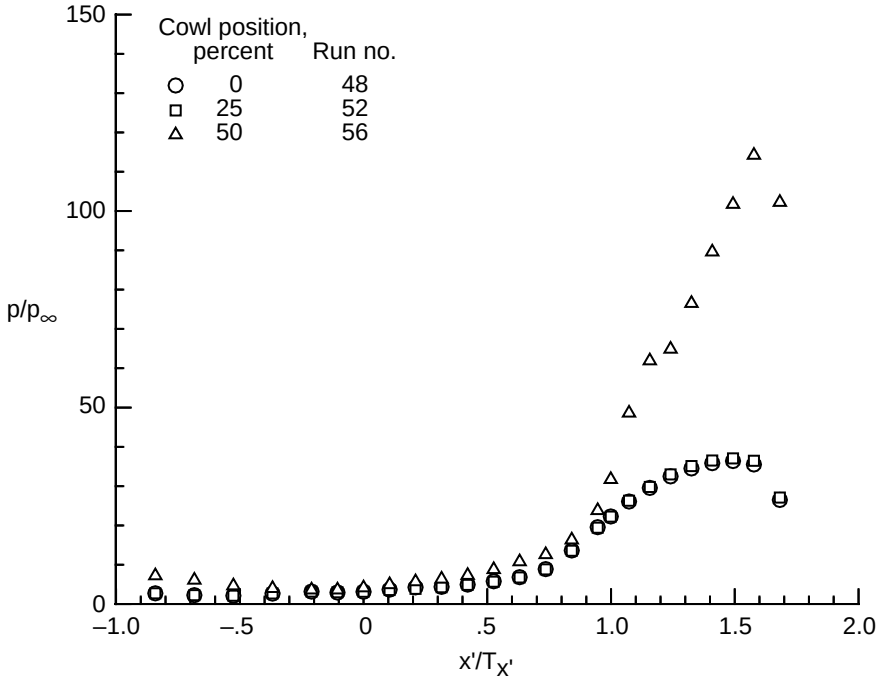


(c) Sidewall pressures. $x'/T_{x'} = 0.9378$.

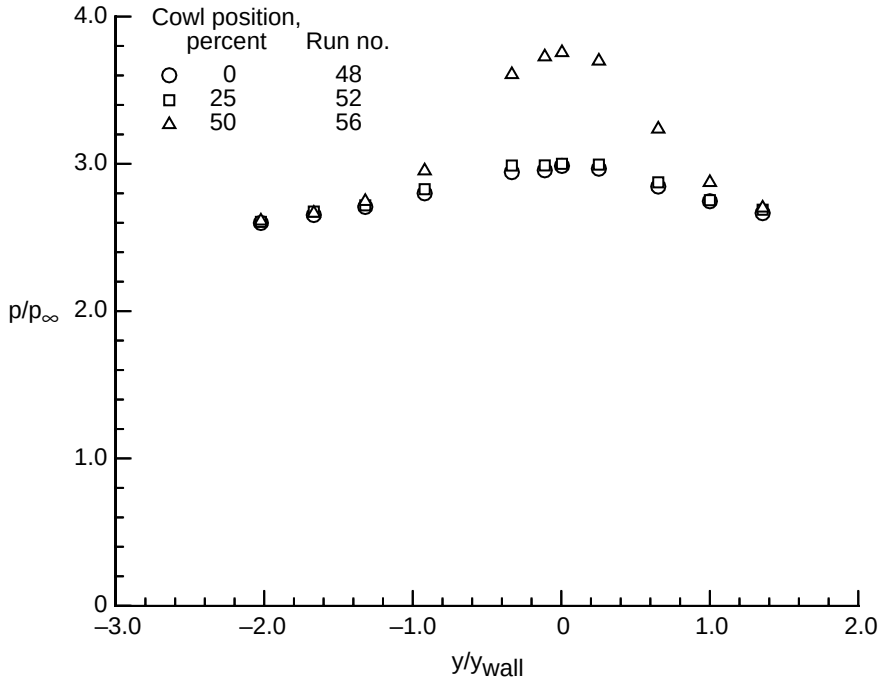


(d) Cowl pressures.

Figure 42. Concluded.

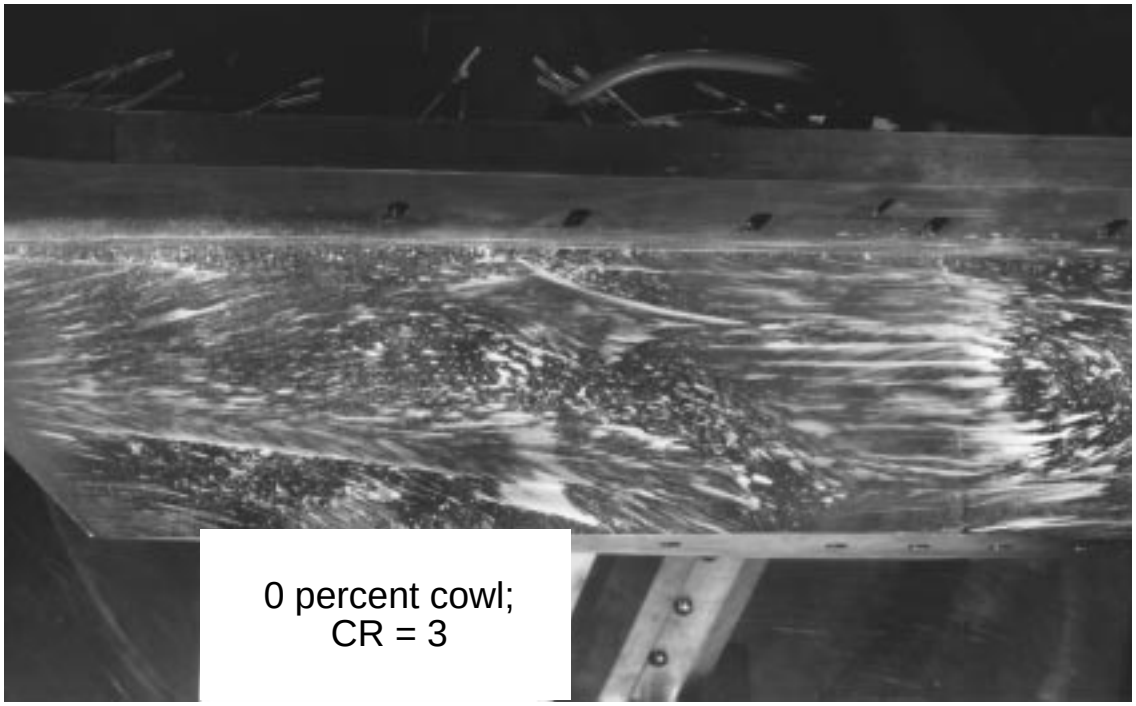


(a) Centerline pressures. Centerline for CR = 3.

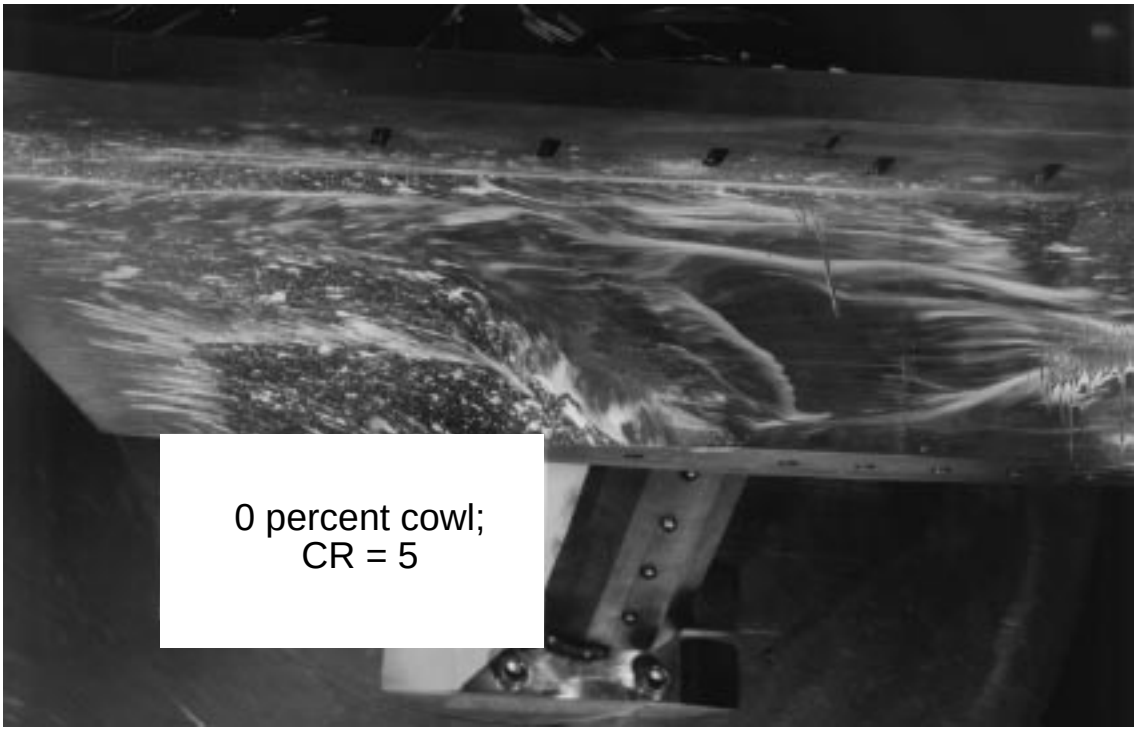


(b) Baseplate pressures. $x'/T_{x'} = -0.1052$.

Figure 43. Cowl position effects. CR = 9; Re = 1.14×10^6 per foot.

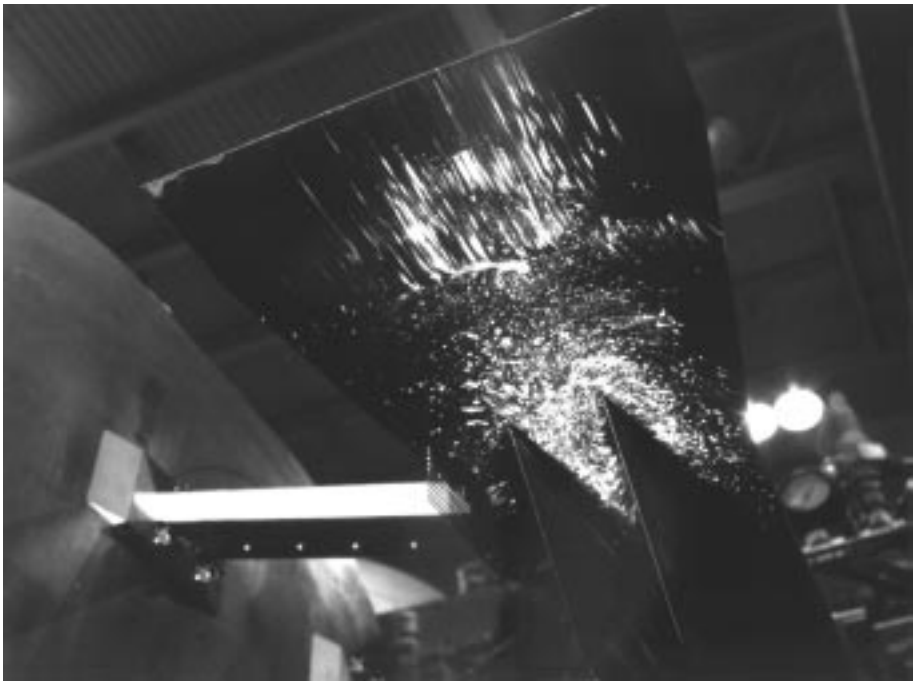


(a) Inlet sidewall. CR = 3; run 39.



(b) Inlet sidewall. CR = 5; run 37.

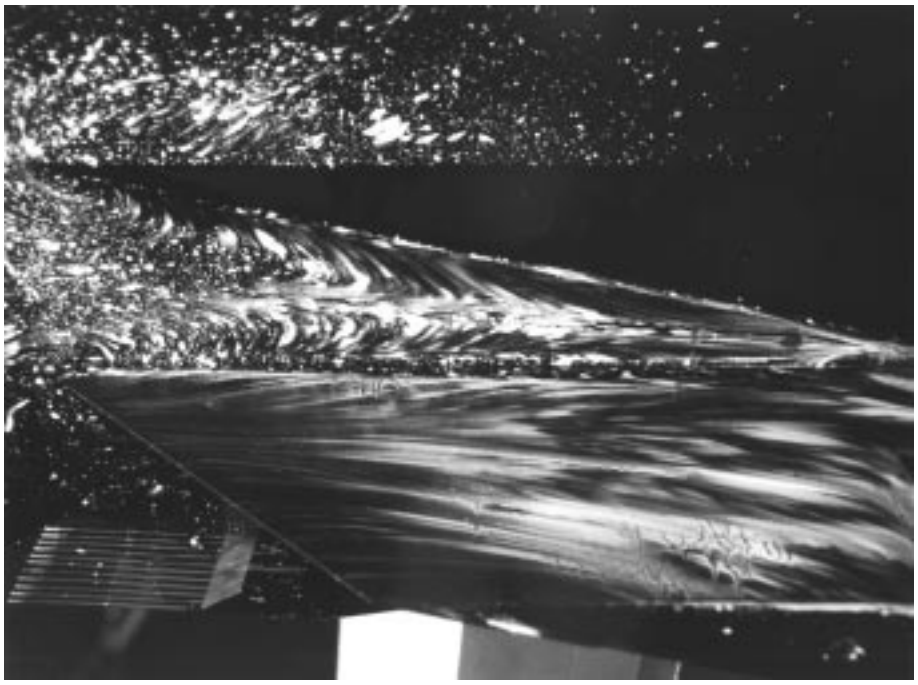
Figure 44. Oil flow photographs. Re = 2.15×10^6 per foot; 0 percent cowl.



(c) Baseplate, showing forward extent of separation. CR = 9.

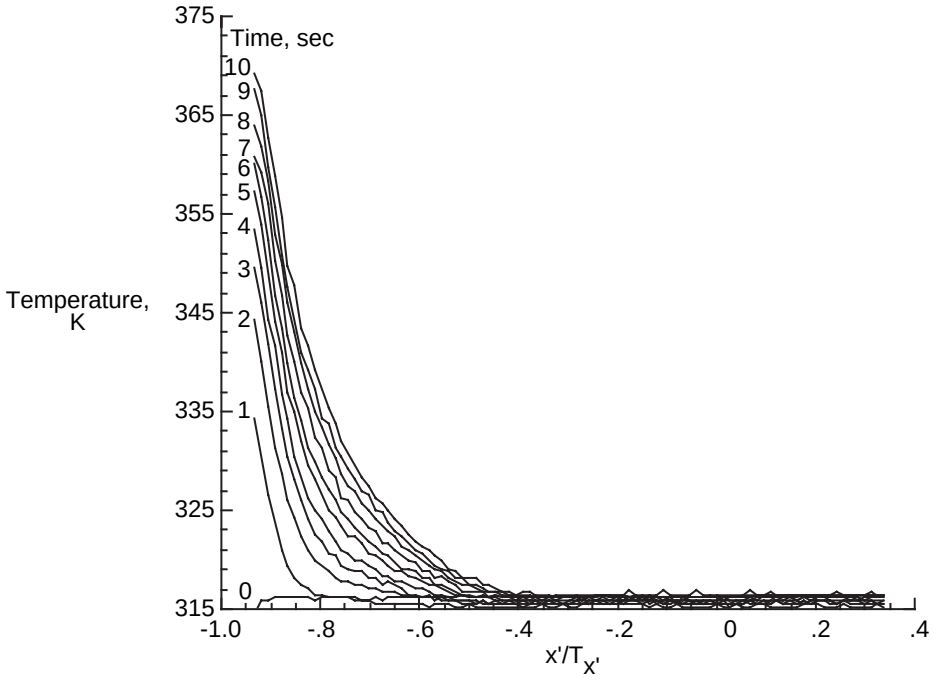
(d) Baseplate, showing oil streaks exiting front of inlet and spilling around sidewalls. CR = 9.

Figure 44. Continued.

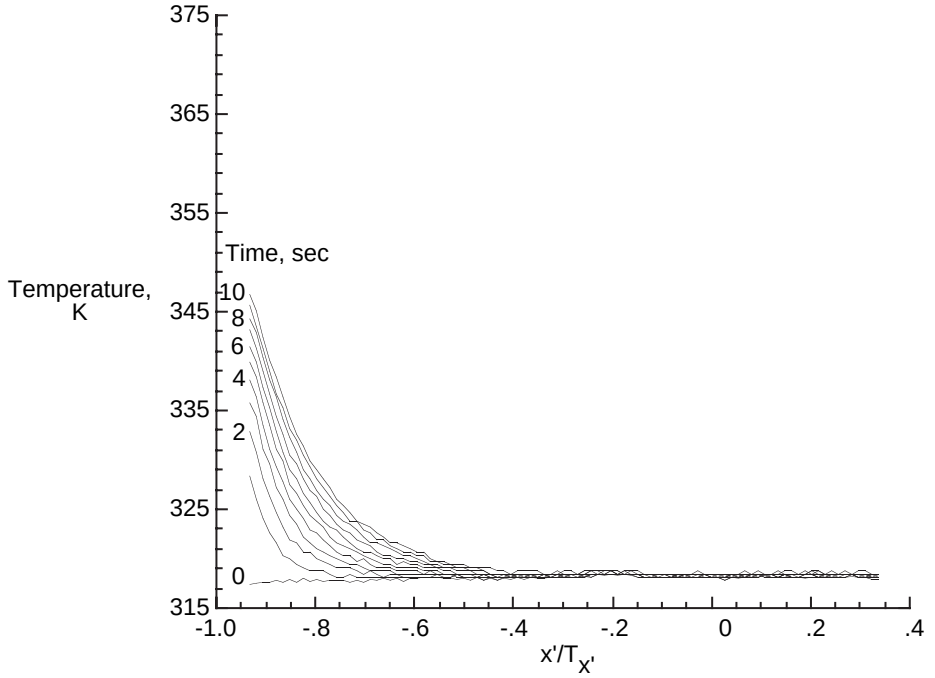


(e) Close-up of oil flow on baseplate and sidewall. CR = 9.

Figure 44. Concluded.

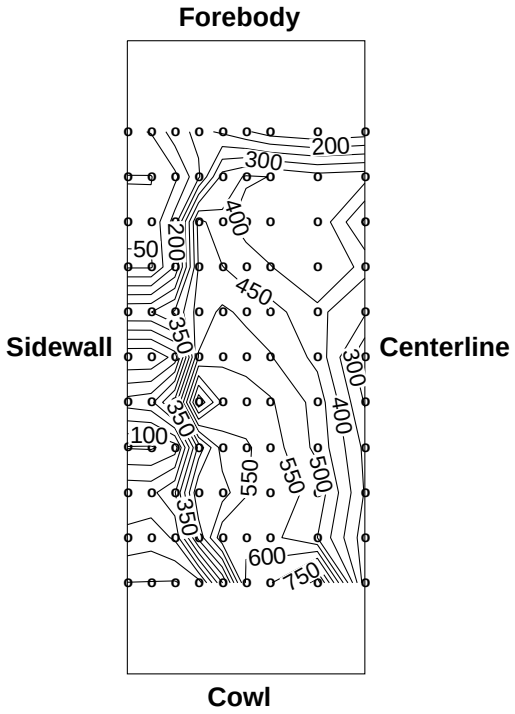


(a) Re = 2.15×10^6 per foot.

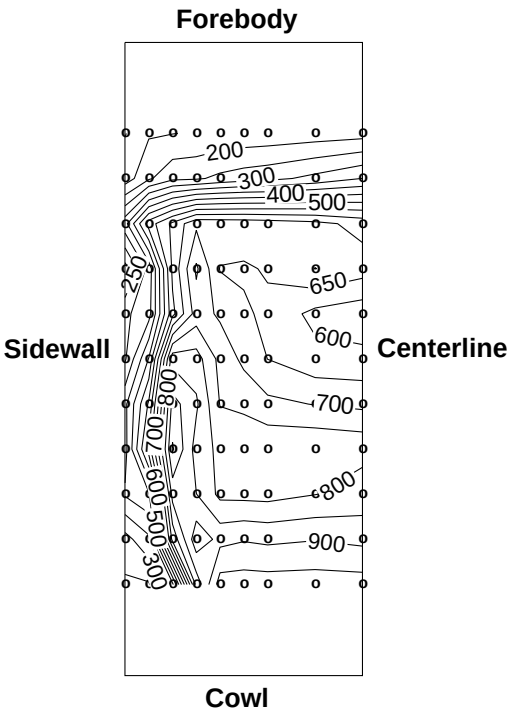


(b) Re = 0.55×10^6 per foot.

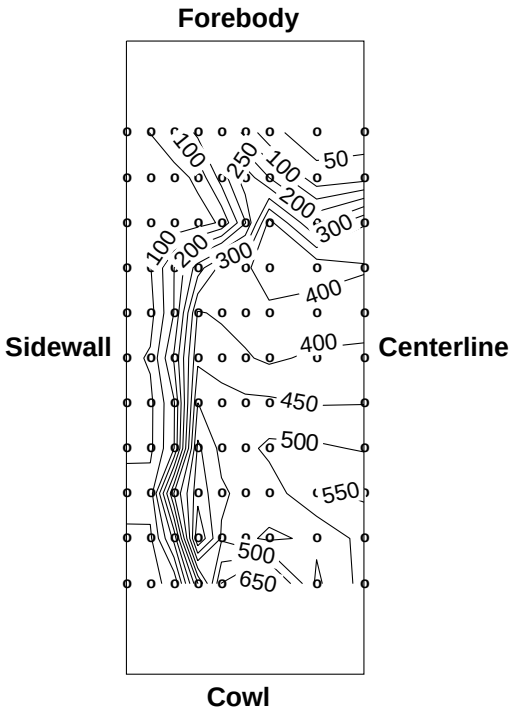
Figure 45. Surface temperature distribution down inlet baseplate centerline. CR = 3; 0 percent cowl.



(a) CR = 3; Re = 2.15×10^6 per foot; run 73.



(b) CR = 5; Re = 2.15×10^6 per foot; run 91.



(c) CR = 3; Re = 0.55×10^6 per foot; run 71.

Figure 46. Measured $p_{t,2}/p_\infty$ exit plane contours. 0 percent cowl; lateral scale expanded by factor of 3.

Appendix A

Tabulated Pressure Data

Model configuration, flow conditions, and measured pressure levels for each wind tunnel run are presented in tables A1 through A30. Stagnation, free-stream, and post-normal-shock conditions are provided in U.S. Customary Units as well as the International System of Units (SI), for convenience. An ASCII (tab-delimited text) version of the tables is available from the following URL:

http://techreports.larc.nasa.gov/ltrs/ltrs.html

A total of 256 pressure ports was available for each test; however, the full set was not used for each run. Data management is simplified when each data file bears the same format, so the full set is consistently reported. Values of 999 are entered in the table to indicate unused (or inappropriate) values or malfunctioning gauges.

Static pressure orifices lie in planes (i.e., on the baseplate, the sidewall, or the cowl) and can be uniquely identified by only two coordinates, namely, an axial coordinate and either a lateral coordinate or a vertical coordinate. To minimize the number of columns in the table, the orifice positions are given by a column of the axial coordinate *x* and a column labelled "*y*, *Z*, in." where the column represents either the lateral dimension or the vertical dimension, depending upon the plane in which the orifice is located. Orifices 1 through 89 are on the sidewall and are therefore represented by *x*, *Z* pairs. Orifices 90 through 94 are on the opposite sidewall and are also represented by *x*, *Z* pairs. Orifices 95 through 225 are on the baseplate (forebody plane) and are represented by *x*, *y* pairs. Orifice 226 is a single pitot probe located at the same axial position as the entrance plane of the inlet. Orifices 227 through 229 are pitot probes located at the leading edge of the model and are represented by *x*, *y* pairs. Orifices 230 through 243 are distributed axially on the cowl centerline and are represented by *x*, *y* pairs. Orifices 244 through 254 and 255 through 256 are reserved for exit plane pitot rakes. Figures 5 and 6 present the numbering scheme graphically.

Even when some orifices were not used, the data system still scanned *all* the pressure channels and recorded the values. For example, for CR = 9 configurations, the movable sidewall covers the first orifice in each of the lateral arrays located downstream of $x'/T_{x'} = 0.79$; pressure levels at orifices 172, 177, 181, 186, 191, 196, 201, 206, 211, 216, and 221 (see fig. 5) are recorded in the data tables but should therefore be disregarded. Data extracted from these tables for comparison with other experimental or computational data should be carefully examined to determine that the data are in fact appropriate for the given run and configuration. The presence of some extraneous data in the data file was accepted as an undesirable artifact of maintaining consistent data file size, format, and structure to simplify automated data handling.

The positions of lateral and axial arrays of pressure data were nondimensionalized according to their location on the model as follows:

1. Axial arrays along the baseplate were nondimensionalized by the throat length, with the origin at the inlet entrance:

$$x'/T_{x'} = (x - 9)/9.51$$

Thus $x'/T_{x'} = 0$ at the sidewall leading edge, and $x'/T_{x'} = 1$ at the throat.

2. Lateral arrays along the baseplate were nondimensionalized by the local width, y_{wall} (the distance between the centerline and the sidewall at that particular axial station). The local width is a function of the axial position of the array as follows:

$$y_{\text{wall}} = W/2 \qquad (x'/T_{x'} < 0)$$

$$y_{\text{wall}} = W/2 - (x - 9)\tan 6^\circ \qquad (0 < x'/T_{x'} < 1)$$

$$y_{\text{wall}} = W/2 - 1.0 = g \qquad (x'/T_{x'} > 1)$$

(Note that *W* varies with CR.)

3. The axial array down the cowl centerline is nondimensionalized by the throat length:

$$x'/T_{x'} = (x - 9 - H \tan \Lambda)/9.51$$

Because the nondimensionalization requires that $x'/T_{x'} = 0$ at the sidewall leading edge, the cowl nondimensionalization accounts for the fact that, in the cowl plane, the sidewall leading edge is located farther aft than at the baseplate because of the leading-edge sweep.

4. Axial arrays down the sidewall must similarly account for the fact that the leading edge has a progressively farther aft position with distance from the baseplate. Correct axial nondimensionalization therefore requires knowledge of the *Z*-dimension of the array as follows:

$$x'/T_{x'} = (x - 9 - Z \tan \Lambda)/9.51$$

5. Sidewall arrays located along lines of constant $x'/T_{x'}$ are simply nondimensionalized by the height of the inlet, *Z*/*H*.

Table A1. Flow Conditions and Pressure Distribution for Run 37

[CR = 5; Re = 0.55×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	353.67	(.24384E+07)
$T_{t,1}$, °R (K)	1831.84	(1017.69)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0161	(8.28)
$h_{t,1}$, btu/lbm (J/kg)	459.56	(.10682E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0100	(69.06)
T_∞, °R (K)	97.01	(53.90)
ρ_∞, slug/ft^3 (kg/m^3)	0.86619E−05	(.44642E−02)
h_∞, btu/lbm (J/kg)	0.23137E+02	(.53781E+05)
a_∞, ft/s (m/s)	483.21	(147.28)
u_∞, ft/s (m/s)	4673.18	(1424.39)
Re_∞, ft^{-1} (m^{-1})	0.55581E+06	(.18235E+07)
q_∞, psia (N/m^2)	0.657	(4528.62)
μ_∞, slug/ft-s (N-s/m^2)	0.72828E−07	(.34870E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.218	(8400.29)
$T_{t,2}$, °R (K)	1833.87	(1018.82)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.55711E−04	(.28712E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0428	4.511	0.0527	3.65E−02	295.2
2	11.18	0.20	0.0448	4.721	0.0558	3.82E−02	308.9
3	12.17	0.20	0.0470	4.948	0.0592	4.00E−02	323.8
4	13.15	0.20	0.0503	5.296	0.0645	4.29E−02	346.6
5	14.21	0.20	0.0567	5.974	0.0746	4.83E−02	390.9
6	15.14	0.20	0.0666	7.013	0.0902	5.68E−02	458.9
7	16.13	0.20	0.0752	7.928	0.1040	6.42E−02	518.8
8	17.12	0.20	0.0882	9.295	0.1245	7.52E−02	608.3
9	18.11	0.20	0.1052	11.083	0.1513	8.97E−02	725.3
10	19.74	0.20	0.1211	12.764	0.1765	1.03E−01	835.3
11	20.55	0.20	0.1307	13.776	0.1917	1.11E−01	901.5
12	22.56	0.20	0.1544	16.267	0.2291	1.32E−01	1064.5
13	24.98	0.20	0.1562	16.457	0.2319	1.33E−01	1076.9
14	10.59	0.60	0.0584	6.152	0.0773	4.98E−02	402.6
15	11.58	0.60	0.0508	5.353	0.0653	4.33E−02	350.3
16	12.57	0.60	0.0553	5.829	0.0725	4.72E−02	381.5
17	13.56	0.60	0.0570	6.004	0.0751	4.86E−02	392.9
18	14.60	0.60	0.0619	6.525	0.0829	5.28E−02	427.0
19	15.54	0.60	0.0675	7.110	0.0917	5.75E−02	465.3
20	16.53	0.60	0.0784	8.264	0.1090	6.69E−02	540.8
21	17.52	0.60	0.0937	9.870	0.1331	7.99E−02	645.9
22	18.51	0.60	0.1125	11.852	0.1628	9.59E−02	775.6
23	12.97	1.00	0.0720	7.582	0.0988	6.14E−02	496.2
24	15.00	1.00	0.0723	7.623	0.0994	6.17E−02	498.8
25	15.94	1.00	0.0760	8.012	0.1052	6.48E−02	524.3
26	16.93	1.00	0.0837	8.823	0.1174	7.14E−02	577.3
27	17.92	1.00	0.1027	10.821	0.1474	8.76E−02	708.2
28	18.91	1.00	0.1333	14.048	0.1958	1.14E−01	919.3
29	24.98	1.00	0.1670	17.598	0.2490	1.42E−01	1151.6
30	11.99	2.00	0.0698	7.350	0.0953	5.95E−02	481.0
31	13.97	2.00	0.0649	6.834	0.0875	5.53E−02	447.2
32	15.98	2.00	0.0766	8.069	0.1061	6.53E−02	528.0
33	16.94	2.00	0.0895	9.427	0.1264	7.63E−02	616.9

Table A1. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0982	10.346	0.1402	8.37E–02	677.0
35	18.42	2.00	0.1291	13.604	0.1891	1.10E–01	890.2
36	18.92	2.00	0.1736	18.291	0.2594	1.48E–01	1197.0
37	19.41	2.00	0.2064	21.744	0.3113	1.76E–01	1422.9
38	19.91	2.00	0.2231	23.506	0.3377	1.90E–01	1538.2
39	20.26	2.00	0.2585	27.238	0.3937	2.20E–01	1782.5
40	21.11	2.00	0.1883	19.835	0.2826	1.61E–01	1298.0
41	21.96	2.00	0.3048	32.112	0.4668	2.60E–01	2101.4
42	22.74	2.00	0.2141	22.560	0.3235	1.83E–01	1476.3
43	23.52	2.00	0.1497	15.778	0.2217	1.28E–01	1032.5
44	24.98	2.00	0.1915	20.180	0.2878	1.63E–01	1320.6
45	17.94	3.00	0.0944	9.949	0.1343	8.05E–02	651.0
46	18.93	3.00	0.1190	12.538	0.1731	1.01E–01	820.5
47	19.92	3.00	0.3007	31.686	0.4604	2.56E–01	2073.5
48	20.91	3.00	0.3778	39.811	0.5823	3.22E–01	2605.3
49	22.11	3.00	0.2922	30.784	0.4469	2.49E–01	2014.5
50	22.96	3.00	0.5315	56.003	0.8253	4.53E–01	3664.8
51	23.74	3.00	0.4809	50.674	0.7453	4.10E–01	3316.1
52	24.98	3.00	0.5104	53.781	0.7919	4.35E–01	3519.4
53	18.34	3.40	0.1026	10.815	0.1473	8.75E–02	707.7
54	19.32	3.40	0.1627	17.144	0.2422	1.39E–01	1121.9
55	19.82	3.40	0.2507	26.417	0.3814	2.14E–01	1728.7
56	20.32	3.40	0.3749	39.500	0.5777	3.20E–01	2584.9
57	20.81	3.40	0.4424	46.608	0.6843	3.77E–01	3050.0
58	21.31	3.40	0.3684	38.821	0.5675	3.14E–01	2540.4
59	21.66	3.40	0.3069	32.339	0.4702	2.62E–01	2116.2
60	22.94	3.40	0.6526	68.762	1.0167	5.57E–01	4499.8
61	23.75	3.40	0.7063	74.416	1.1016	6.02E–01	4869.8
62	24.14	3.40	0.6890	72.593	1.0742	5.88E–01	4750.5
63	22.29	3.60	0.7756	81.715	1.2111	6.61E–01	5347.4
64	22.71	3.60	0.6504	68.531	1.0133	5.55E–01	4484.7
65	23.14	3.60	0.7352	77.462	1.1473	6.27E–01	5069.1
66	23.95	3.60	0.6627	69.829	1.0327	5.65E–01	4569.6
67	24.34	3.60	0.7133	75.156	1.1127	6.08E–01	4918.2
68	13.79	3.80	0.0566	5.964	0.0745	4.83E–02	390.3
69	15.77	3.80	0.0756	7.962	0.1045	6.44E–02	521.0
70	17.75	3.80	0.0806	8.488	0.1124	6.87E–02	555.5
71	19.23	3.80	0.1524	16.062	0.2260	1.30E–01	1051.1
72	19.73	3.80	0.2454	25.852	0.3729	2.09E–01	1691.8
73	20.22	3.80	0.4005	42.200	0.6182	3.42E–01	2761.5
74	20.72	3.80	0.5161	54.376	0.8009	4.40E–01	3558.4
75	21.41	3.80	0.3992	42.058	0.6161	3.40E–01	2752.3
76	21.71	3.80	0.3724	39.239	0.5737	3.18E–01	2567.8
77	22.06	3.80	0.6898	72.677	1.0755	5.88E–01	4756.0
78	22.49	3.80	0.5866	61.805	0.9123	5.00E–01	4044.5
79	22.76	3.80	0.6680	70.383	1.0410	5.70E–01	4605.9
80	22.91	3.80	0.7271	76.614	1.1345	6.20E–01	5013.6
81	23.76	3.80	0.6854	72.217	1.0686	5.84E–01	4725.9
82	24.15	3.80	0.7361	77.557	1.1487	6.28E–01	5075.3
83	24.98	3.80	0.6425	67.694	1.0007	5.48E–01	4429.9
84	22.59	3.90	0.6609	69.632	1.0298	5.64E–01	4556.7
85	22.80	3.90	0.7053	74.317	1.1001	6.01E–01	4863.3
86	23.01	3.90	0.7232	76.200	1.1283	6.17E–01	4986.6
87	23.15	3.90	0.6708	70.680	1.0455	5.72E–01	4625.3
88	23.86	3.90	0.7163	75.474	1.1174	6.11E–01	4939.0
89	24.25	3.90	0.6676	70.338	1.0404	5.69E–01	4602.9
90	11.99	2.00	0.0695	7.325	0.0949	5.93E–02	479.4
91	13.97	2.00	0.0666	7.018	0.0903	5.68E–02	459.3

Table A1. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0768	8.094	0.1064	6.55E–02	529.7
93	17.93	2.00	0.1003	10.566	0.1435	8.55E–02	691.4
94	19.91	2.00	0.2269	23.910	0.3438	1.94E–01	1564.7
95	1.00	–0.25	0.0304	3.201	0.0330	2.59E–02	209.5
96	1.00	0.41	0.0300	3.156	0.0323	2.55E–02	206.5
97	1.00	1.03	0.0299	3.151	0.0323	2.55E–02	206.2
98	1.00	1.65	0.0302	3.183	0.0327	2.58E–02	208.3
99	2.50	–0.25	0.0251	2.647	0.0247	2.14E–02	173.2
100	4.00	–0.25	0.0228	2.403	0.0210	1.94E–02	157.2
101	4.00	0.41	0.0235	2.480	0.0222	2.01E–02	162.3
102	4.00	1.65	0.0234	2.468	0.0220	2.00E–02	161.5
103	5.50	–0.25	0.0219	2.311	0.0197	1.87E–02	151.2
104	7.00	–0.25	0.0289	3.041	0.0306	2.46E–02	199.0
105	8.00	–2.15	0.0269	2.833	0.0275	2.29E–02	185.4
106	8.00	–1.75	0.0284	2.993	0.0299	2.42E–02	195.9
107	8.00	–1.36	0.0294	3.101	0.0315	2.51E–02	202.9
108	8.00	–0.91	0.0311	3.277	0.0342	2.65E–02	214.5
109	8.00	–0.25	0.0324	3.410	0.0362	2.76E–02	223.1
110	8.00	0.00	0.0328	3.454	0.0368	2.80E–02	226.1
111	8.00	0.13	0.0321	3.385	0.0358	2.74E–02	221.5
112	8.00	0.41	0.0324	3.414	0.0362	2.76E–02	223.4
113	8.00	0.86	0.0311	3.279	0.0342	2.65E–02	214.6
114	8.00	1.25	0.0298	3.139	0.0321	2.54E–02	205.4
115	8.00	1.65	0.0285	3.003	0.0301	2.43E–02	196.5
116	9.00	–0.25	0.0328	3.461	0.0369	2.80E–02	226.5
117	9.00	0.00	0.0333	3.506	0.0376	2.84E–02	229.4
118	9.00	0.13	0.0331	3.486	0.0373	2.82E–02	228.1
119	9.00	0.41	0.0324	3.409	0.0361	2.76E–02	223.1
120	9.00	0.76	0.0382	4.020	0.0453	3.25E–02	263.1
121	9.00	1.07	0.0332	3.503	0.0376	2.83E–02	229.2
122	10.00	–0.25	0.0425	4.474	0.0521	3.62E–02	292.8
123	10.00	0.00	0.0420	4.428	0.0514	3.58E–02	289.8
124	10.00	0.13	0.0435	4.582	0.0537	3.71E–02	299.9
125	10.00	0.41	0.0418	4.399	0.0510	3.56E–02	287.9
126	10.00	0.65	0.0408	4.301	0.0495	3.48E–02	281.4
127	10.00	0.83	0.0396	4.175	0.0476	3.38E–02	273.2
128	10.00	0.97	0.0407	4.285	0.0493	3.47E–02	280.4
129	10.00	1.09	0.0427	4.502	0.0525	3.64E–02	294.6
130	11.00	–0.25	0.0415	4.376	0.0507	3.54E–02	286.4
131	11.00	0.00	0.0457	4.817	0.0573	3.90E–02	315.3
132	11.00	0.13	0.0451	4.752	0.0563	3.85E–02	311.0
133	11.00	0.27	0.0453	4.773	0.0566	3.86E–02	312.4
134	11.00	0.55	0.0393	4.139	0.0471	3.35E–02	270.9
135	11.00	0.72	0.0436	4.599	0.0540	3.72E–02	301.0
136	11.00	0.86	0.0456	4.809	0.0572	3.89E–02	314.7
137	11.00	0.98	0.0451	4.754	0.0563	3.85E–02	311.1
138	12.00	–0.25	0.0479	5.047	0.0607	4.08E–02	330.3
139	12.00	0.00	0.0481	5.072	0.0611	4.10E–02	331.9
140	12.00	0.13	0.0478	5.035	0.0605	4.07E–02	329.5
141	12.00	0.27	0.0480	5.059	0.0609	4.09E–02	331.1
142	12.00	0.44	0.0482	5.077	0.0612	4.11E–02	332.2
143	12.00	0.62	0.0473	4.980	0.0597	4.03E–02	325.9
144	12.00	0.76	0.0483	5.087	0.0613	4.12E–02	332.9
145	12.00	0.88	0.0490	5.167	0.0625	4.18E–02	338.2
146	13.00	–0.25	0.0517	5.450	0.0668	4.41E–02	356.6
147	13.00	0.00	0.0521	5.489	0.0674	4.44E–02	359.2
148	13.00	0.13	0.0517	5.452	0.0668	4.41E–02	356.8
149	13.00	0.27	0.0521	5.494	0.0674	4.45E–02	359.5

Table A1. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.0516	5.440	0.0666	4.40E–02	356.0
151	13.00	0.51	0.0524	5.517	0.0678	4.46E–02	361.0
152	13.00	0.65	0.0522	5.497	0.0675	4.45E–02	359.7
153	13.00	0.77	0.0527	5.551	0.0683	4.49E–02	363.2
154	14.00	–0.25	0.0559	5.888	0.0733	4.77E–02	385.3
155	14.00	0.00	0.0573	6.041	0.0756	4.89E–02	395.3
156	14.00	0.13	0.0556	5.860	0.0729	4.74E–02	383.5
157	14.00	0.27	0.0568	5.983	0.0748	4.84E–02	391.5
158	14.00	0.41	0.0564	5.943	0.0742	4.81E–02	388.9
159	14.00	0.55	0.0602	6.346	0.0802	5.14E–02	415.3
160	14.00	0.67	0.0597	6.294	0.0794	5.09E–02	411.9
161	15.00	–0.25	0.0640	6.739	0.0861	5.45E–02	441.0
162	15.00	0.00	0.0640	6.739	0.0861	5.45E–02	441.0
163	15.00	0.13	0.0646	6.807	0.0871	5.51E–02	445.5
164	15.00	0.44	0.0641	6.755	0.0863	5.47E–02	442.0
165	15.00	0.56	0.0648	6.825	0.0874	5.52E–02	446.6
166	16.00	–0.25	0.0733	7.722	0.1009	6.25E–02	505.4
167	16.00	0.00	0.0746	7.856	0.1029	6.36E–02	514.1
168	16.00	0.13	0.0750	7.907	0.1036	6.40E–02	517.4
169	16.00	0.23	0.0744	7.837	0.1026	6.34E–02	512.8
170	16.00	0.34	0.0750	7.901	0.1035	6.39E–02	517.0
171	16.00	0.46	0.0735	7.741	0.1011	6.26E–02	506.6
172	17.00	–0.25	0.0868	9.145	0.1222	7.40E–02	598.5
173	17.00	0.00	0.0893	9.405	0.1261	7.61E–02	615.4
174	17.00	0.13	0.0881	9.279	0.1242	7.51E–02	607.2
175	17.00	0.23	0.0867	9.133	0.1220	7.39E–02	597.7
176	17.00	0.35	0.0866	9.120	0.1218	7.38E–02	596.8
177	18.00	–0.25	0.1083	11.414	0.1563	9.24E–02	746.9
178	18.00	0.00	0.1064	11.210	0.1532	9.07E–02	733.6
179	18.00	0.13	0.1057	11.142	0.1522	9.02E–02	729.1
180	18.00	0.25	0.1067	11.244	0.1537	9.10E–02	735.8
181	18.50	–0.25	0.1192	12.563	0.1735	1.02E–01	822.1
182	18.50	0.00	0.1168	12.309	0.1697	9.96E–02	805.5
183	18.50	0.13	0.1154	12.155	0.1674	9.84E–02	795.4
184	18.60	0.17	0.1184	12.473	0.1721	1.01E–01	816.3
185	18.50	0.22	0.1169	12.319	0.1698	9.97E–02	806.1
186	19.20	–0.25	0.1199	12.638	0.1746	1.02E–01	827.0
187	19.20	0.00	0.1224	12.898	0.1785	1.04E–01	844.0
188	19.20	0.13	0.1234	12.999	0.1800	1.05E–01	850.7
189	19.30	0.17	0.1237	13.030	0.1805	1.05E–01	852.7
190	19.20	0.22	0.1239	13.058	0.1809	1.06E–01	854.5
191	20.00	–0.25	0.1287	13.558	0.1884	1.10E–01	887.2
192	20.00	0.00	0.1320	13.908	0.1937	1.13E–01	910.1
193	20.00	0.13	0.1308	13.784	0.1918	1.12E–01	902.0
194	20.10	0.17	0.1318	13.886	0.1933	1.12E–01	908.7
195	20.00	0.22	0.1317	13.873	0.1931	1.12E–01	907.8
196	20.80	–0.25	0.1343	14.148	0.1973	1.15E–01	925.9
197	20.80	0.00	0.1391	14.661	0.2050	1.19E–01	959.4
198	20.80	0.13	0.1383	14.571	0.2036	1.18E–01	953.5
199	20.90	0.17	0.1389	14.637	0.2046	1.18E–01	957.8
200	20.80	0.22	0.1386	14.608	0.2042	1.18E–01	956.0
201	21.60	–0.25	0.1380	14.538	0.2031	1.18E–01	951.4
202	21.60	0.00	0.1414	14.894	0.2085	1.21E–01	974.7
203	21.60	0.13	0.1426	15.025	0.2104	1.22E–01	983.3
204	21.70	0.17	0.1429	15.052	0.2108	1.22E–01	985.0
205	21.60	0.22	0.1436	15.128	0.2120	1.22E–01	990.0
206	22.40	–0.25	0.1519	16.001	0.2251	1.30E–01	1047.1
207	22.40	0.00	0.1550	16.336	0.2301	1.32E–01	1069.0

Table A1. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.1532	16.143	0.2272	1.31E–01	1056.4
209	22.50	0.17	0.1554	16.373	0.2307	1.33E–01	1071.4
210	22.40	0.22	0.1520	16.019	0.2253	1.30E–01	1048.3
211	23.20	–0.25	0.1664	17.534	0.2481	1.42E–01	1147.4
212	23.20	0.00	0.1666	17.551	0.2483	1.42E–01	1148.5
213	23.20	0.13	0.1692	17.825	0.2525	1.44E–01	1166.5
214	23.30	0.17	0.1705	17.959	0.2545	1.45E–01	1175.3
215	23.20	0.22	0.1702	17.933	0.2541	1.45E–01	1173.6
216	24.00	–0.25	0.1770	18.653	0.2649	1.51E–01	1220.6
217	24.00	0.00	0.1756	18.506	0.2627	1.50E–01	1211.0
218	24.00	0.13	0.1753	18.471	0.2621	1.49E–01	1208.7
219	24.10	0.17	0.1785	18.812	0.2673	1.52E–01	1231.1
220	24.00	0.22	0.1762	18.562	0.2635	1.50E–01	1214.7
221	25.00	–0.25	0.1571	16.558	0.2334	1.34E–01	1083.5
222	25.00	0.00	0.1634	17.217	0.2433	1.39E–01	1126.7
223	25.00	0.13	0.1597	16.823	0.2374	1.36E–01	1100.9
224	25.10	0.17	0.1454	15.324	0.2149	1.24E–01	1002.8
225	25.00	0.22	0.1588	16.737	0.2361	1.35E–01	1095.3
226	9.00	999.00	0.0396	4.168	0.0475	3.37E–02	272.7
227	0.00	–2.50	1.1747	123.771	1.8421	1.00E+00	8099.6
228	0.00	–0.54	1.1876	125.132	1.8625	1.01E+00	8188.6
229	0.00	2.00	1.1572	121.924	1.8144	9.87E–01	7978.7
230	18.23	0.00	0.2007	21.148	0.3023	1.71E–01	1383.9
231	18.43	0.00	0.2685	28.285	0.4094	2.29E–01	1851.0
232	18.63	0.00	0.3289	34.654	0.5050	2.80E–01	2267.8
233	19.00	0.00	0.3357	35.372	0.5157	2.86E–01	2314.8
234	19.40	0.00	0.3578	37.697	0.5506	3.05E–01	2466.9
235	20.13	0.00	0.2652	27.941	0.4042	2.26E–01	1828.5
236	20.33	0.00	0.2080	21.920	0.3139	1.77E–01	1434.5
237	20.53	0.00	0.2079	21.904	0.3136	1.77E–01	1433.4
238	20.73	0.00	0.2413	25.424	0.3665	2.06E–01	1663.8
239	21.50	0.00	0.3482	36.683	0.5354	2.97E–01	2400.5
240	22.00	0.00	0.5522	58.179	0.8579	4.71E–01	3807.3
241	22.50	0.00	0.9413	99.178	1.4731	8.03E–01	6490.2
242	22.70	0.00	0.7627	80.366	1.1908	6.50E–01	5259.1
243	23.00	0.00	0.6187	65.190	0.9631	5.28E–01	4266.0
244	0.58	999.00	0.0318	3.354	0.0353	2.71E–02	219.5
245	0.86	999.00	0.0316	3.327	0.0349	2.69E–02	217.7
246	1.15	999.00	0.0325	3.424	0.0364	2.77E–02	224.1
247	1.43	999.00	0.0315	3.323	0.0349	2.69E–02	217.5
248	1.72	999.00	0.0308	3.245	0.0337	2.63E–02	212.4
249	2.00	999.00	0.0326	3.432	0.0365	2.78E–02	224.6
250	2.29	999.00	0.0320	3.366	0.0355	2.72E–02	220.3
251	2.57	999.00	0.0331	3.484	0.0373	2.82E–02	228.0
252	2.86	999.00	0.0310	3.262	0.0339	2.64E–02	213.5
253	3.14	999.00	0.0319	3.366	0.0355	2.72E–02	220.3
254	3.43	999.00	0.0320	3.375	0.0356	2.73E–02	220.9
255	999.00	999.00	0.0310	3.266	0.0340	2.64E–02	213.7
256	999.00	999.00	0.0324	3.409	0.0361	2.76E–02	223.1

Table A2. Flow Conditions and Pressure Distribution for Run 38

[CR = 5; Re = 0.55×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	348.78	(.24048E+07)
$T_{t,1}$, °R (K)	1840.97	(1022.76)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0158	(8.13)
$h_{t,1}$, btu/lbm (J/kg)	462.06	(.10740E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0099	(68.21)
T_∞, °R (K)	97.61	(54.23)
ρ_∞, slug/ft^3 (kg/m^3)	0.85029E−05	(.43822E−02)
h_∞, btu/lbm (J/kg)	0.23279E+02	(.54110E+05)
a_∞, ft/s (m/s)	484.69	(147.73)
u_∞, ft/s (m/s)	4685.78	(1428.22)
Re_∞, ft^{-1} (m^{-1})	0.54317E+06	(.17821E+07)
q_∞, psia (N/m^2)	0.648	(4469.48)
μ_∞, slug/ft-s (N-s/m^2)	0.73352E−07	(.35121E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.202	(8292.84)
$T_{t,2}$, °R (K)	1843.00	(1023.89)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.54714E−04	(.28199E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0436	4.654	0.0549	3.77E−02	300.8
2	11.18	0.20	0.0442	4.716	0.0558	3.82E−02	304.8
3	12.17	0.20	0.0469	5.002	0.0601	4.05E−02	323.3
4	13.15	0.20	0.0493	5.260	0.0640	4.26E−02	340.0
5	14.21	0.20	0.0577	6.154	0.0774	4.98E−02	397.8
6	15.14	0.20	0.0645	6.882	0.0883	5.57E−02	444.8
7	16.13	0.20	0.0734	7.835	0.1026	6.35E−02	506.4
8	17.12	0.20	0.0871	9.295	0.1245	7.53E−02	600.8
9	18.11	0.20	0.1054	11.244	0.1538	9.11E−02	726.8
10	19.74	0.20	0.1225	13.073	0.1813	1.06E−01	845.0
11	20.55	0.20	0.1306	13.935	0.1942	1.13E−01	900.7
12	22.56	0.20	0.1539	16.414	0.2314	1.33E−01	1060.9
13	24.98	0.20	0.1532	16.344	0.2304	1.32E−01	1056.4
14	10.59	0.60	0.0572	6.098	0.0766	4.94E−02	394.2
15	11.58	0.60	0.0497	5.303	0.0646	4.29E−02	342.8
16	12.57	0.60	0.0539	5.747	0.0713	4.65E−02	371.4
17	13.56	0.60	0.0554	5.914	0.0738	4.79E−02	382.3
18	14.60	0.60	0.0605	6.450	0.0818	5.22E−02	416.9
19	15.54	0.60	0.0656	6.999	0.0901	5.67E−02	452.4
20	16.53	0.60	0.0768	8.194	0.1080	6.64E−02	529.6
21	17.52	0.60	0.0930	9.918	0.1339	8.03E−02	641.1
22	18.51	0.60	0.1117	11.920	0.1640	9.65E−02	770.4
23	12.97	1.00	0.0703	7.496	0.0975	6.07E−02	484.5
24	15.00	1.00	0.0708	7.548	0.0983	6.11E−02	487.9
25	15.94	1.00	0.0744	7.935	0.1041	6.43E−02	512.9
26	16.93	1.00	0.0820	8.752	0.1164	7.09E−02	565.7
27	17.92	1.00	0.1023	10.908	0.1488	8.83E−02	705.0
28	18.91	1.00	0.1314	14.017	0.1955	1.14E−01	906.0
29	24.98	1.00	0.1645	17.551	0.2485	1.42E−01	1134.4
30	11.99	2.00	0.0681	7.268	0.0941	5.89E−02	469.8
31	13.97	2.00	0.0633	6.754	0.0864	5.47E−02	436.6
32	15.98	2.00	0.0753	8.033	0.1056	6.51E−02	519.2
33	16.94	2.00	0.0884	9.434	0.1266	7.64E−02	609.7

Table A2. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0959	10.225	0.1385	8.28E−02	660.9
35	18.42	2.00	0.1272	13.566	0.1887	1.10E−01	876.8
36	18.92	2.00	0.1711	18.253	0.2591	1.48E−01	1179.8
37	19.41	2.00	0.2029	21.640	0.3099	1.75E−01	1398.7
38	19.91	2.00	0.2208	23.555	0.3387	1.91E−01	1522.5
39	20.26	2.00	0.2561	27.322	0.3952	2.21E−01	1766.0
40	21.11	2.00	0.1861	19.851	0.2831	1.61E−01	1283.1
41	21.96	2.00	0.3006	32.068	0.4665	2.60E−01	2072.7
42	22.74	2.00	0.2106	22.467	0.3223	1.82E−01	1452.2
43	23.52	2.00	0.1479	15.775	0.2219	1.28E−01	1019.6
44	24.98	2.00	0.1895	20.220	0.2886	1.64E−01	1306.9
45	17.94	3.00	0.0932	9.940	0.1342	8.05E−02	642.4
46	18.93	3.00	0.1181	12.601	0.1742	1.02E−01	814.4
47	19.92	3.00	0.2987	31.861	0.4634	2.58E−01	2059.4
48	20.91	3.00	0.3708	39.552	0.5789	3.20E−01	2556.5
49	22.11	3.00	0.2892	30.847	0.4482	2.50E−01	1993.8
50	22.96	3.00	0.5238	55.875	0.8240	4.53E−01	3611.5
51	23.74	3.00	0.4723	50.385	0.7415	4.08E−01	3256.7
52	24.98	3.00	0.5092	54.315	0.8005	4.40E−01	3510.6
53	18.34	3.40	0.1013	10.810	0.1473	8.75E−02	698.7
54	19.32	3.40	0.1609	17.166	0.2427	1.39E−01	1109.5
55	19.82	3.40	0.2477	26.424	0.3817	2.14E−01	1707.9
56	20.32	3.40	0.3695	39.418	0.5769	3.19E−01	2547.8
57	20.81	3.40	0.4346	46.356	0.6810	3.75E−01	2996.3
58	21.31	3.40	0.3598	38.380	0.5613	3.11E−01	2480.7
59	21.66	3.40	0.3005	32.053	0.4663	2.60E−01	2071.8
60	22.94	3.40	0.6401	68.282	1.0103	5.53E−01	4413.4
61	23.75	3.40	0.7021	74.895	1.1096	6.07E−01	4840.9
62	24.14	3.40	0.6809	72.633	1.0756	5.88E−01	4694.6
63	22.29	3.60	0.7625	81.344	1.2064	6.59E−01	5257.7
64	22.71	3.60	0.6398	68.256	1.0099	5.53E−01	4411.7
65	23.14	3.60	0.7385	78.782	1.1679	6.38E−01	5092.1
66	23.95	3.60	0.6577	70.164	1.0385	5.68E−01	4535.0
67	24.34	3.60	0.7077	75.496	1.1186	6.11E−01	4879.7
68	13.79	3.80	0.0547	5.835	0.0726	4.73E−02	377.1
69	15.77	3.80	0.0738	7.873	0.1032	6.38E−02	508.9
70	17.75	3.80	0.0792	8.452	0.1119	6.85E−02	546.3
71	19.23	3.80	0.1501	16.010	0.2254	1.30E−01	1034.8
72	19.73	3.80	0.2420	25.811	0.3725	2.09E−01	1668.3
73	20.22	3.80	0.3980	42.460	0.6225	3.44E−01	2744.4
74	20.72	3.80	0.5077	54.160	0.7982	4.39E−01	3500.6
75	21.41	3.80	0.3923	41.844	0.6133	3.39E−01	2704.6
76	21.71	3.80	0.3662	39.064	0.5716	3.16E−01	2524.9
77	22.06	3.80	0.6942	74.050	1.0969	6.00E−01	4786.2
78	22.49	3.80	0.5792	61.787	0.9127	5.00E−01	3993.6
79	22.76	3.80	0.6645	70.885	1.0494	5.74E−01	4581.7
80	22.91	3.80	0.7231	77.142	1.1433	6.25E−01	4986.1
81	23.76	3.80	0.6772	72.245	1.0698	5.85E−01	4669.6
82	24.15	3.80	0.7271	77.564	1.1496	6.28E−01	5013.4
83	24.98	3.80	0.6370	67.957	1.0054	5.50E−01	4392.4
84	22.59	3.90	0.6552	69.897	1.0345	5.66E−01	4517.8
85	22.80	3.90	0.6996	74.634	1.1057	6.04E−01	4824.0
86	23.01	3.90	0.7159	76.372	1.1318	6.19E−01	4936.4
87	23.15	3.90	0.6654	70.984	1.0508	5.75E−01	4588.1
88	23.86	3.90	0.7071	75.430	1.1176	6.11E−01	4875.4
89	24.25	3.90	0.6603	70.434	1.0426	5.70E−01	4552.5
90	11.99	2.00	0.0682	7.275	0.0942	5.89E−02	470.2
91	13.97	2.00	0.0647	6.907	0.0887	5.59E−02	446.4

Table A2. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
92	15.98	2.00	0.0747	7.968	0.1046	6.45E–02	515.0
93	17.93	2.00	0.0994	10.608	0.1443	8.59E–02	685.7
94	19.91	2.00	0.2241	23.903	0.3439	1.94E–01	1545.0
95	1.00	–0.25	0.0298	3.181	0.0328	2.58E–02	205.6
96	1.00	0.41	0.0302	3.227	0.0334	2.61E–02	208.5
97	1.00	1.03	0.0309	3.294	0.0345	2.67E–02	212.9
98	1.00	1.65	0.0301	3.206	0.0331	2.60E–02	207.2
99	2.50	–0.25	0.0252	2.691	0.0254	2.18E–02	173.9
100	4.00	–0.25	0.0223	2.379	0.0207	1.93E–02	153.7
101	4.00	0.41	0.0245	2.609	0.0242	2.11E–02	168.7
102	4.00	1.65	0.0230	2.448	0.0217	1.98E–02	158.3
103	5.50	–0.25	0.0233	2.481	0.0222	2.01E–02	160.4
104	7.00	–0.25	0.0285	3.042	0.0307	2.46E–02	196.6
105	8.00	–2.15	0.0264	2.813	0.0272	2.28E–02	181.8
106	8.00	–1.75	0.0294	3.132	0.0320	2.54E–02	202.4
107	8.00	–1.36	0.0291	3.105	0.0316	2.51E–02	200.7
108	8.00	–0.91	0.0308	3.282	0.0343	2.66E–02	212.2
109	8.00	–0.25	0.0330	3.520	0.0378	2.85E–02	227.5
110	8.00	0.00	0.0328	3.496	0.0375	2.83E–02	226.0
111	8.00	0.13	0.0316	3.369	0.0356	2.73E–02	217.8
112	8.00	0.41	0.0338	3.605	0.0391	2.92E–02	233.0
113	8.00	0.86	0.0328	3.502	0.0376	2.84E–02	226.4
114	8.00	1.25	0.0307	3.277	0.0342	2.65E–02	211.8
115	8.00	1.65	0.0299	3.191	0.0329	2.58E–02	206.3
116	9.00	–0.25	0.0328	3.502	0.0376	2.84E–02	226.4
117	9.00	0.00	0.0326	3.482	0.0373	2.82E–02	225.0
118	9.00	0.13	0.0332	3.540	0.0381	2.87E–02	228.8
119	9.00	0.41	0.0320	3.413	0.0362	2.76E–02	220.6
120	9.00	0.76	0.0366	3.906	0.0436	3.16E–02	252.5
121	9.00	1.07	0.0335	3.569	0.0386	2.89E–02	230.7
122	10.00	–0.25	0.0411	4.382	0.0508	3.55E–02	283.3
123	10.00	0.00	0.0406	4.332	0.0500	3.51E–02	280.0
124	10.00	0.13	0.0424	4.518	0.0528	3.66E–02	292.0
125	10.00	0.41	0.0382	4.078	0.0462	3.30E–02	263.6
126	10.00	0.65	0.0400	4.265	0.0490	3.45E–02	275.7
127	10.00	0.83	0.0391	4.167	0.0475	3.37E–02	269.3
128	10.00	0.97	0.0397	4.231	0.0485	3.43E–02	273.5
129	10.00	1.09	0.0410	4.371	0.0506	3.54E–02	282.6
130	11.00	–0.25	0.0407	4.344	0.0502	3.52E–02	280.8
131	11.00	0.00	0.0444	4.738	0.0561	3.84E–02	306.2
132	11.00	0.13	0.0438	4.670	0.0551	3.78E–02	301.8
133	11.00	0.27	0.0441	4.706	0.0556	3.81E–02	304.2
134	11.00	0.55	0.0406	4.328	0.0500	3.51E–02	279.7
135	11.00	0.72	0.0434	4.632	0.0545	3.75E–02	299.4
136	11.00	0.86	0.0454	4.842	0.0577	3.92E–02	313.0
137	11.00	0.98	0.0445	4.744	0.0562	3.84E–02	306.6
138	12.00	–0.25	0.0466	4.967	0.0596	4.02E–02	321.0
139	12.00	0.00	0.0469	4.999	0.0601	4.05E–02	323.1
140	12.00	0.13	0.0466	4.968	0.0596	4.02E–02	321.1
141	12.00	0.27	0.0466	4.970	0.0596	4.03E–02	321.3
142	12.00	0.44	0.0464	4.948	0.0593	4.01E–02	319.8
143	12.00	0.62	0.0471	5.025	0.0604	4.07E–02	324.8
144	12.00	0.76	0.0473	5.043	0.0607	4.08E–02	325.9
145	12.00	0.88	0.0479	5.112	0.0617	4.14E–02	330.4
146	13.00	–0.25	0.0505	5.386	0.0659	4.36E–02	348.1
147	13.00	0.00	0.0509	5.431	0.0665	4.40E–02	351.0
148	13.00	0.13	0.0506	5.402	0.0661	4.38E–02	349.2
149	13.00	0.27	0.0507	5.405	0.0661	4.38E–02	349.4

Table A2. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
150	13.00	0.39	0.0497	5.300	0.0646	4.29E–02	342.6
151	13.00	0.51	0.0507	5.404	0.0661	4.38E–02	349.3
152	13.00	0.65	0.0514	5.480	0.0673	4.44E–02	354.2
153	13.00	0.77	0.0512	5.465	0.0670	4.43E–02	353.2
154	14.00	–0.25	0.0553	5.898	0.0735	4.78E–02	381.2
155	14.00	0.00	0.0562	5.994	0.0750	4.85E–02	387.4
156	14.00	0.13	0.0548	5.850	0.0728	4.74E–02	378.1
157	14.00	0.27	0.0558	5.958	0.0744	4.83E–02	385.1
158	14.00	0.41	0.0559	5.961	0.0745	4.83E–02	385.3
159	14.00	0.55	0.0590	6.295	0.0795	5.10E–02	406.9
160	14.00	0.67	0.0583	6.219	0.0784	5.04E–02	402.0
161	15.00	–0.25	0.0623	6.641	0.0847	5.38E–02	429.2
162	15.00	0.00	0.0621	6.628	0.0845	5.37E–02	428.4
163	15.00	0.13	0.0637	6.797	0.0870	5.50E–02	439.3
164	15.00	0.44	0.0627	6.692	0.0855	5.42E–02	432.5
165	15.00	0.56	0.0626	6.681	0.0853	5.41E–02	431.8
166	16.00	–0.25	0.0722	7.705	0.1007	6.24E–02	498.0
167	16.00	0.00	0.0729	7.776	0.1017	6.30E–02	502.6
168	16.00	0.13	0.0741	7.903	0.1037	6.40E–02	510.8
169	16.00	0.23	0.0724	7.720	0.1009	6.25E–02	499.0
170	16.00	0.34	0.0730	7.791	0.1020	6.31E–02	503.6
171	16.00	0.46	0.0726	7.745	0.1013	6.27E–02	500.6
172	17.00	–0.25	0.0846	9.025	0.1205	7.31E–02	583.4
173	17.00	0.00	0.0869	9.273	0.1242	7.51E–02	599.3
174	17.00	0.13	0.0855	9.124	0.1220	7.39E–02	589.8
175	17.00	0.23	0.0844	8.999	0.1201	7.29E–02	581.7
176	17.00	0.35	0.0853	9.102	0.1217	7.37E–02	588.3
177	18.00	–0.25	0.1074	11.457	0.1570	9.28E–02	740.5
178	18.00	0.00	0.1053	11.233	0.1537	9.10E–02	726.1
179	18.00	0.13	0.1046	11.160	0.1526	9.04E–02	721.3
180	18.00	0.25	0.1061	11.316	0.1549	9.16E–02	731.4
181	18.50	–0.25	0.1166	12.443	0.1718	1.01E–01	804.3
182	18.50	0.00	0.1163	12.410	0.1713	1.01E–01	802.1
183	18.50	0.13	0.1145	12.217	0.1684	9.89E–02	789.6
184	18.60	0.17	0.1180	12.589	0.1740	1.02E–01	813.7
185	18.50	0.22	0.1171	12.493	0.1726	1.01E–01	807.5
186	19.20	–0.25	0.1197	12.764	0.1766	1.03E–01	825.0
187	19.20	0.00	0.1219	13.002	0.1802	1.05E–01	840.4
188	19.20	0.13	0.1220	13.009	0.1803	1.05E–01	840.9
189	19.30	0.17	0.1223	13.050	0.1809	1.06E–01	843.5
190	19.20	0.22	0.1231	13.136	0.1822	1.06E–01	849.0
191	20.00	–0.25	0.1270	13.547	0.1884	1.10E–01	875.6
192	20.00	0.00	0.1310	13.970	0.1948	1.13E–01	903.0
193	20.00	0.13	0.1296	13.823	0.1925	1.12E–01	893.4
194	20.10	0.17	0.1310	13.974	0.1948	1.13E–01	903.2
195	20.00	0.22	0.1295	13.814	0.1924	1.12E–01	892.9
196	20.80	–0.25	0.1312	13.995	0.1951	1.13E–01	904.6
197	20.80	0.00	0.1371	14.621	0.2045	1.18E–01	945.1
198	20.80	0.13	0.1366	14.569	0.2037	1.18E–01	941.7
199	20.90	0.17	0.1378	14.696	0.2057	1.19E–01	949.9
200	20.80	0.22	0.1370	14.617	0.2045	1.18E–01	944.8
201	21.60	–0.25	0.1365	14.561	0.2036	1.18E–01	941.1
202	21.60	0.00	0.1373	14.649	0.2049	1.19E–01	946.8
203	21.60	0.13	0.1382	14.741	0.2063	1.19E–01	952.8
204	21.70	0.17	0.1395	14.880	0.2084	1.21E–01	961.8
205	21.60	0.22	0.1416	15.107	0.2118	1.22E–01	976.5
206	22.40	–0.25	0.1476	15.744	0.2214	1.28E–01	1017.6
207	22.40	0.00	0.1505	16.055	0.2261	1.30E–01	1037.7

Table A2. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.1497	15.966	0.2247	1.29E–01	1032.0
209	22.50	0.17	0.1507	16.081	0.2264	1.30E–01	1039.4
210	22.40	0.22	0.1499	15.990	0.2251	1.30E–01	1033.5
211	23.20	–0.25	0.1638	17.475	0.2474	1.42E–01	1129.5
212	23.20	0.00	0.1640	17.497	0.2477	1.42E–01	1131.0
213	23.20	0.13	0.1647	17.574	0.2489	1.42E–01	1135.9
214	23.30	0.17	0.1669	17.803	0.2523	1.44E–01	1150.7
215	23.20	0.22	0.1658	17.687	0.2506	1.43E–01	1143.2
216	24.00	–0.25	0.1732	18.479	0.2625	1.50E–01	1194.4
217	24.00	0.00	0.1713	18.270	0.2593	1.48E–01	1180.9
218	24.00	0.13	0.1724	18.386	0.2611	1.49E–01	1188.4
219	24.10	0.17	0.1731	18.466	0.2623	1.50E–01	1193.6
220	24.00	0.22	0.1733	18.484	0.2625	1.50E–01	1194.7
221	25.00	–0.25	0.1526	16.282	0.2295	1.32E–01	1052.4
222	25.00	0.00	0.1594	17.008	0.2404	1.38E–01	1099.3
223	25.00	0.13	0.1550	16.533	0.2332	1.34E–01	1068.6
224	25.10	0.17	0.1410	15.038	0.2108	1.22E–01	972.0
225	25.00	0.22	0.1495	15.947	0.2244	1.29E–01	1030.7
226	9.00	999.00	0.0347	3.705	0.0406	3.00E–02	239.5
227	0.00	–2.50	1.1575	123.475	1.8390	1.00E+00	7980.8
228	0.00	–0.54	1.1711	124.923	1.8608	1.01E+00	8074.5
229	0.00	2.00	1.1388	121.477	1.8090	9.84E–01	7851.7
230	18.23	0.00	0.1998	21.317	0.3051	1.73E–01	1377.8
231	18.43	0.00	0.2690	28.698	0.4159	2.32E–01	1854.9
232	18.63	0.00	0.3262	34.795	0.5074	2.82E–01	2249.0
233	19.00	0.00	0.3335	35.575	0.5192	2.88E–01	2299.4
234	19.40	0.00	0.3582	38.211	0.5587	3.09E–01	2469.8
235	20.13	0.00	0.2574	27.455	0.3972	2.22E–01	1774.6
236	20.33	0.00	0.2008	21.417	0.3066	1.73E–01	1384.3
237	20.53	0.00	0.2033	21.689	0.3106	1.76E–01	1401.8
238	20.73	0.00	0.2375	25.332	0.3654	2.05E–01	1637.3
239	21.50	0.00	0.3420	36.479	0.5327	2.95E–01	2357.9
240	22.00	0.00	0.5469	58.340	0.8610	4.72E–01	3770.8
241	22.50	0.00	0.9381	100.069	1.4876	8.10E–01	6468.0
242	22.70	0.00	0.7504	80.052	1.1870	6.48E–01	5174.2
243	23.00	0.00	0.6128	65.368	0.9665	5.29E–01	4225.1
244	0.58	999.00	0.0306	3.268	0.0341	2.65E–02	211.2
245	0.86	999.00	0.0305	3.254	0.0338	2.64E–02	210.3
246	1.15	999.00	0.0301	3.211	0.0332	2.60E–02	207.5
247	1.43	999.00	0.0310	3.311	0.0347	2.68E–02	214.0
248	1.72	999.00	0.0285	3.041	0.0306	2.46E–02	196.6
249	2.00	999.00	0.0309	3.299	0.0345	2.67E–02	213.2
250	2.29	999.00	0.0303	3.237	0.0336	2.62E–02	209.2
251	2.57	999.00	0.0301	3.215	0.0333	2.60E–02	207.8
252	2.86	999.00	0.0299	3.194	0.0330	2.59E–02	206.5
253	3.14	999.00	0.0291	3.101	0.0315	2.51E–02	200.4
254	3.43	999.00	0.0308	3.285	0.0343	2.66E–02	212.3
255	999.00	999.00	0.0283	3.019	0.0303	2.45E–02	195.2
256	999.00	999.00	0.0287	3.061	0.0309	2.48E–02	197.8

Table A3. Flow Conditions and Pressure Distribution for Run 39

[CR = 5; Re = 1.14×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	725.05	(.49991E+07)
$T_{t,1}$, °R (K)	1841.37	(1022.98)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0325	(16.75)
$h_{t,1}$, btu/lbm (J/kg)	462.81	(.10758E+07)
Free-stream conditions:		
M_∞	9.78	
p_∞, psia (N/m^2)	0.0190	(131.28)
T_∞, °R (K)	95.64	(53.13)
ρ_∞, slug/ft^3 (kg/m^3)	0.16702E−04	(.86080E−02)
h_∞, btu/lbm (J/kg)	0.22810E+02	(.53020E+05)
a_∞, ft/s (m/s)	479.77	(146.24)
u_∞, ft/s (m/s)	4692.33	(1430.22)
Re_∞, ft^{-1} (m^{-1})	0.10943E+07	(.35903E+07)
q_∞, psia (N/m^2)	1.277	(8803.95)
μ_∞, slug/ft-s (N-s/m^2)	0.71616E−07	(.34290E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.367	(16329.73)
$T_{t,2}$, °R (K)	1845.77	(1025.43)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10760E−03	(.55458E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0642	3.635	0.0384	2.86E−02	442.5
2	11.18	0.20	0.0680	3.850	0.0415	3.03E−02	468.7
3	12.17	0.20	0.0725	4.107	0.0453	3.23E−02	500.0
4	13.15	0.20	0.0779	4.415	0.0498	3.47E−02	537.5
5	14.21	0.20	0.0854	4.838	0.0560	3.80E−02	589.0
6	15.14	0.20	0.0961	5.444	0.0648	4.28E−02	662.7
7	16.13	0.20	0.1094	6.195	0.0757	4.87E−02	754.2
8	17.12	0.20	0.1290	7.309	0.0920	5.75E−02	889.7
9	18.11	0.20	0.1626	9.210	0.1197	7.24E−02	1121.2
10	19.74	0.20	0.1813	10.270	0.1351	8.08E−02	1250.3
11	20.55	0.20	0.1975	11.184	0.1484	8.79E−02	1361.5
12	22.56	0.20	0.2231	12.637	0.1696	9.94E−02	1538.3
13	24.98	0.20	0.2503	14.176	0.1921	1.11E−01	1725.8
14	10.59	0.60	0.1049	5.940	0.0720	4.67E−02	723.1
15	11.58	0.60	0.0894	5.061	0.0592	3.98E−02	616.1
16	12.57	0.60	0.0872	4.941	0.0574	3.88E−02	601.4
17	13.56	0.60	0.0855	4.842	0.0560	3.81E−02	589.4
18	14.60	0.60	0.0899	5.090	0.0596	4.00E−02	619.6
19	15.54	0.60	0.1005	5.694	0.0684	4.48E−02	693.2
20	16.53	0.60	0.1138	6.444	0.0794	5.07E−02	784.4
21	17.52	0.60	0.1382	7.828	0.0995	6.15E−02	952.9
22	18.51	0.60	0.1759	9.966	0.1307	7.84E−02	1213.1
23	12.97	1.00	0.1107	6.270	0.0768	4.93E−02	763.3
24	15.00	1.00	0.1157	6.554	0.0810	5.15E−02	797.8
25	15.94	1.00	0.1226	6.945	0.0867	5.46E−02	845.5
26	16.93	1.00	0.1315	7.449	0.0940	5.86E−02	906.8
27	17.92	1.00	0.1590	9.008	0.1167	7.08E−02	1096.6
28	18.91	1.00	0.2153	12.196	0.1632	9.59E−02	1484.6
29	24.98	1.00	0.2712	15.361	0.2093	1.21E−01	1870.0
30	11.99	2.00	0.1070	6.058	0.0737	4.76E−02	737.5
31	13.97	2.00	0.0955	5.411	0.0643	4.25E−02	658.7
32	15.98	2.00	0.1269	7.186	0.0902	5.65E−02	874.7
33	16.94	2.00	0.1399	7.927	0.1010	6.23E−02	964.9

Table A3. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1487	8.423	0.1082	6.62E−02	1025.4
35	18.42	2.00	0.1735	9.827	0.1287	7.73E−02	1196.2
36	18.92	2.00	0.2730	15.465	0.2109	1.22E−01	1882.7
37	19.41	2.00	0.3934	22.280	0.3102	1.75E−01	2712.2
38	19.91	2.00	0.4418	25.026	0.3502	1.97E−01	3046.5
39	20.26	2.00	0.4663	26.411	0.3704	2.08E−01	3215.1
40	21.11	2.00	0.3109	17.610	0.2421	1.38E−01	2143.7
41	21.96	2.00	0.5309	30.068	0.4237	2.36E−01	3660.3
42	22.74	2.00	0.4384	24.833	0.3474	1.95E−01	3023.0
43	23.52	2.00	0.2813	15.931	0.2176	1.25E−01	1939.4
44	24.98	2.00	0.3354	18.999	0.2624	1.49E−01	2312.8
45	17.94	3.00	0.1426	8.076	0.1032	6.35E−02	983.2
46	18.93	3.00	0.1725	9.768	0.1278	7.68E−02	1189.1
47	19.92	3.00	0.3422	19.383	0.2680	1.52E−01	2359.6
48	20.91	3.00	0.7919	44.855	0.6393	3.53E−01	5460.4
49	22.11	3.00	0.4228	23.947	0.3345	1.88E−01	2915.2
50	22.96	3.00	0.9222	52.233	0.7468	4.11E−01	6358.5
51	23.74	3.00	0.6694	37.914	0.5381	2.98E−01	4615.5
52	24.98	3.00	0.8733	49.464	0.7064	3.89E−01	6021.4
53	18.34	3.40	0.1564	8.856	0.1145	6.96E−02	1078.1
54	19.32	3.40	0.2100	11.895	0.1588	9.35E−02	1448.0
55	19.82	3.40	0.3126	17.704	0.2435	1.39E−01	2155.2
56	20.32	3.40	0.5061	28.667	0.4033	2.25E−01	3489.7
57	20.81	3.40	0.7921	44.866	0.6394	3.53E−01	5461.8
58	21.31	3.40	0.8094	45.844	0.6537	3.60E−01	5580.7
59	21.66	3.40	0.6485	36.732	0.5209	2.89E−01	4471.6
60	22.94	3.40	1.4389	81.500	1.1734	6.41E−01	9921.3
61	23.75	3.40	0.8026	45.458	0.6480	3.57E−01	5533.8
62	24.14	3.40	1.2658	71.694	1.0305	5.64E−01	8727.6
63	22.29	3.60	0.9414	53.320	0.7626	4.19E−01	6490.8
64	22.71	3.60	1.3875	78.586	1.1309	6.18E−01	9566.5
65	23.14	3.60	1.1468	64.954	0.9322	5.11E−01	7907.1
66	23.95	3.60	1.0484	59.383	0.8510	4.67E−01	7228.9
67	24.34	3.60	1.2233	69.288	0.9954	5.45E−01	8434.7
68	13.79	3.80	0.0844	4.782	0.0551	3.76E−02	582.2
69	15.77	3.80	0.1140	6.459	0.0796	5.08E−02	786.3
70	17.75	3.80	0.1226	6.945	0.0867	5.46E−02	845.5
71	19.23	3.80	0.2025	11.471	0.1526	9.02E−02	1396.4
72	19.73	3.80	0.2973	16.838	0.2309	1.32E−01	2049.8
73	20.22	3.80	0.4814	27.269	0.3829	2.14E−01	3319.5
74	20.72	3.80	0.7475	42.337	0.6025	3.33E−01	5153.8
75	21.41	3.80	0.7982	45.210	0.6444	3.55E−01	5503.6
76	21.71	3.80	0.7122	40.339	0.5734	3.17E−01	4910.6
77	22.06	3.80	0.8454	47.881	0.6834	3.76E−01	5828.8
78	22.49	3.80	1.0466	59.280	0.8495	4.66E−01	7216.4
79	22.76	3.80	1.0655	60.352	0.8651	4.75E−01	7346.9
80	22.91	3.80	1.0676	60.468	0.8668	4.75E−01	7361.0
81	23.76	3.80	1.0767	60.985	0.8744	4.80E−01	7424.0
82	24.15	3.80	1.3048	73.905	1.0627	5.81E−01	8996.7
83	24.98	3.80	1.1083	62.776	0.9005	4.94E−01	7641.9
84	22.59	3.90	0.9958	56.403	0.8076	4.43E−01	6866.2
85	22.80	3.90	1.0774	61.026	0.8750	4.80E−01	7428.9
86	23.01	3.90	1.1968	67.784	0.9735	5.33E−01	8251.6
87	23.15	3.90	1.1541	65.370	0.9383	5.14E−01	7957.8
88	23.86	3.90	1.1875	67.261	0.9659	5.29E−01	8188.0
89	24.25	3.90	1.1825	66.977	0.9617	5.27E−01	8153.4
90	11.99	2.00	0.1077	6.102	0.0744	4.80E−02	742.8
91	13.97	2.00	0.1016	5.755	0.0693	4.53E−02	700.6

Table A3. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
92	15.98	2.00	0.1252	7.091	0.0888	5.58E−02	863.2
93	17.93	2.00	0.1541	8.726	0.1126	6.86E−02	1062.3
94	19.91	2.00	0.4411	24.981	0.3496	1.96E−01	3041.1
95	1.00	–0.25	0.0482	2.731	0.0252	2.15E−02	332.5
96	1.00	0.41	0.0471	2.670	0.0243	2.10E−02	325.1
97	1.00	1.03	0.0472	2.676	0.0244	2.10E−02	325.7
98	1.00	1.65	0.0471	2.669	0.0243	2.10E−02	325.0
99	2.50	–0.25	0.0390	2.211	0.0177	1.74E−02	269.2
100	4.00	–0.25	0.0362	2.051	0.0153	1.61E−02	249.6
101	4.00	0.41	0.0368	2.086	0.0158	1.64E−02	253.9
102	4.00	1.65	0.0357	2.024	0.0149	1.59E−02	246.4
103	5.50	–0.25	0.0352	1.996	0.0145	1.57E−02	242.9
104	7.00	–0.25	0.0496	2.810	0.0264	2.21E−02	342.1
105	8.00	–2.15	0.0452	2.561	0.0228	2.01E−02	311.8
106	8.00	–1.75	0.0479	2.710	0.0249	2.13E−02	329.9
107	8.00	–1.36	0.0492	2.786	0.0260	2.19E−02	339.2
108	8.00	–0.91	0.0517	2.930	0.0281	2.30E−02	356.7
109	8.00	–0.25	0.0539	3.053	0.0299	2.40E−02	371.7
110	8.00	0.00	0.0537	3.041	0.0297	2.39E−02	370.1
111	8.00	0.13	0.0535	3.030	0.0296	2.38E−02	368.9
112	8.00	0.41	0.0537	3.043	0.0298	2.39E−02	370.5
113	8.00	0.86	0.0522	2.958	0.0285	2.33E−02	360.1
114	8.00	1.25	0.0497	2.816	0.0265	2.21E−02	342.8
115	8.00	1.65	0.0477	2.699	0.0248	2.12E−02	328.6
116	9.00	–0.25	0.0542	3.073	0.0302	2.42E−02	374.0
117	9.00	0.00	0.0545	3.086	0.0304	2.43E−02	375.7
118	9.00	0.13	0.0540	3.058	0.0300	2.40E−02	372.3
119	9.00	0.41	0.0531	3.010	0.0293	2.37E−02	366.4
120	9.00	0.76	0.0532	3.014	0.0294	2.37E−02	366.9
121	9.00	1.07	0.0475	2.690	0.0246	2.12E−02	327.5
122	10.00	–0.25	0.0598	3.388	0.0348	2.66E−02	412.4
123	10.00	0.00	0.0598	3.386	0.0348	2.66E−02	412.1
124	10.00	0.13	0.0607	3.436	0.0355	2.70E−02	418.3
125	10.00	0.41	0.0578	3.271	0.0331	2.57E−02	398.2
126	10.00	0.65	0.0588	3.329	0.0339	2.62E−02	405.2
127	10.00	0.83	0.0580	3.286	0.0333	2.58E−02	400.0
128	10.00	0.97	0.0590	3.342	0.0341	2.63E−02	406.9
129	10.00	1.09	0.0619	3.506	0.0365	2.76E−02	426.8
130	11.00	–0.25	0.0676	3.828	0.0412	3.01E−02	466.0
131	11.00	0.00	0.0653	3.700	0.0394	2.91E−02	450.5
132	11.00	0.13	0.0645	3.652	0.0387	2.87E−02	444.6
133	11.00	0.27	0.0643	3.644	0.0385	2.87E−02	443.6
134	11.00	0.55	0.0620	3.511	0.0366	2.76E−02	427.4
135	11.00	0.72	0.0646	3.658	0.0387	2.88E−02	445.3
136	11.00	0.86	0.0659	3.734	0.0399	2.94E−02	454.6
137	11.00	0.98	0.0674	3.818	0.0411	3.00E−02	464.8
138	12.00	–0.25	0.0683	3.870	0.0418	3.04E−02	471.1
139	12.00	0.00	0.0695	3.938	0.0428	3.10E−02	479.4
140	12.00	0.13	0.0691	3.915	0.0425	3.08E−02	476.6
141	12.00	0.27	0.0685	3.880	0.0420	3.05E−02	472.3
142	12.00	0.44	0.0689	3.901	0.0423	3.07E−02	474.9
143	12.00	0.62	0.0703	3.981	0.0435	3.13E−02	484.6
144	12.00	0.76	0.0725	4.105	0.0453	3.23E−02	499.7
145	12.00	0.88	0.0727	4.119	0.0455	3.24E−02	501.5
146	13.00	–0.25	0.0744	4.216	0.0469	3.31E−02	513.2
147	13.00	0.00	0.0766	4.337	0.0486	3.41E−02	528.0
148	13.00	0.13	0.0755	4.275	0.0477	3.36E−02	520.4
149	13.00	0.27	0.0743	4.210	0.0468	3.31E−02	512.5

Table A3. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.0752	4.260	0.0475	3.35E–02	518.6
151	13.00	0.51	0.0767	4.346	0.0488	3.42E–02	529.0
152	13.00	0.65	0.0783	4.436	0.0501	3.49E–02	540.0
153	13.00	0.77	0.0783	4.433	0.0500	3.49E–02	539.7
154	14.00	–0.25	0.0840	4.756	0.0547	3.74E–02	579.0
155	14.00	0.00	0.0855	4.842	0.0560	3.81E–02	589.4
156	14.00	0.13	0.0837	4.738	0.0545	3.73E–02	576.8
157	14.00	0.27	0.0836	4.734	0.0544	3.72E–02	576.3
158	14.00	0.41	0.0860	4.871	0.0564	3.83E–02	593.0
159	14.00	0.55	0.0868	4.917	0.0571	3.87E–02	598.5
160	14.00	0.67	0.0848	4.801	0.0554	3.77E–02	584.4
161	15.00	–0.25	0.0951	5.388	0.0640	4.24E–02	655.9
162	15.00	0.00	0.0969	5.488	0.0654	4.32E–02	668.1
163	15.00	0.13	0.0963	5.455	0.0649	4.29E–02	664.0
164	15.00	0.44	0.0967	5.478	0.0653	4.31E–02	666.8
165	15.00	0.56	0.0948	5.368	0.0637	4.22E–02	653.5
166	16.00	–0.25	0.1120	6.344	0.0779	4.99E–02	772.3
167	16.00	0.00	0.1132	6.409	0.0788	5.04E–02	780.2
168	16.00	0.13	0.1129	6.397	0.0787	5.03E–02	778.7
169	16.00	0.23	0.1121	6.350	0.0780	4.99E–02	773.1
170	16.00	0.34	0.1112	6.298	0.0772	4.95E–02	766.7
171	16.00	0.46	0.1079	6.109	0.0745	4.80E–02	743.7
172	17.00	–0.25	0.1339	7.582	0.0959	5.96E–02	922.9
173	17.00	0.00	0.1367	7.741	0.0983	6.09E–02	942.4
174	17.00	0.13	0.1352	7.656	0.0970	6.02E–02	932.0
175	17.00	0.23	0.1316	7.453	0.0941	5.86E–02	907.3
176	17.00	0.35	0.1276	7.226	0.0908	5.68E–02	879.7
177	18.00	–0.25	0.1649	9.340	0.1216	7.34E–02	1136.9
178	18.00	0.00	0.1721	9.749	0.1275	7.67E–02	1186.7
179	18.00	0.13	0.1684	9.539	0.1245	7.50E–02	1161.2
180	18.00	0.25	0.1638	9.275	0.1206	7.29E–02	1129.1
181	18.50	–0.25	0.1839	10.414	0.1372	8.19E–02	1267.8
182	18.50	0.00	0.1920	10.877	0.1440	8.55E–02	1324.1
183	18.50	0.13	0.1842	10.430	0.1375	8.20E–02	1269.7
184	18.60	0.17	0.1829	10.361	0.1364	8.15E–02	1261.3
185	18.50	0.22	0.1832	10.376	0.1367	8.16E–02	1263.1
186	19.20	–0.25	0.1841	10.426	0.1374	8.20E–02	1269.1
187	19.20	0.00	0.1866	10.569	0.1395	8.31E–02	1286.6
188	19.20	0.13	0.1846	10.454	0.1378	8.22E–02	1272.6
189	19.30	0.17	0.1840	10.422	0.1373	8.19E–02	1268.7
190	19.20	0.22	0.1849	10.470	0.1380	8.23E–02	1274.6
191	20.00	–0.25	0.1957	11.087	0.1470	8.72E–02	1349.7
192	20.00	0.00	0.1929	10.925	0.1447	8.59E–02	1330.0
193	20.00	0.13	0.1942	10.997	0.1457	8.65E–02	1338.7
194	20.10	0.17	0.1971	11.163	0.1481	8.78E–02	1358.9
195	20.00	0.22	0.1948	11.034	0.1463	8.68E–02	1343.2
196	20.80	–0.25	0.2057	11.653	0.1553	9.16E–02	1418.6
197	20.80	0.00	0.2108	11.938	0.1594	9.39E–02	1453.3
198	20.80	0.13	0.2113	11.968	0.1599	9.41E–02	1456.9
199	20.90	0.17	0.2144	12.141	0.1624	9.55E–02	1478.0
200	20.80	0.22	0.2134	12.085	0.1616	9.50E–02	1471.1
201	21.60	–0.25	0.2124	12.031	0.1608	9.46E–02	1464.6
202	21.60	0.00	0.2066	11.703	0.1560	9.20E–02	1424.7
203	21.60	0.13	0.2086	11.813	0.1576	9.29E–02	1438.0
204	21.70	0.17	0.2103	11.911	0.1590	9.37E–02	1450.0
205	21.60	0.22	0.2125	12.035	0.1609	9.46E–02	1465.1
206	22.40	–0.25	0.2157	12.218	0.1635	9.61E–02	1487.3
207	22.40	0.00	0.2144	12.145	0.1625	9.55E–02	1478.4

Table A3. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.2146	12.153	0.1626	9.56E–02	1479.4
209	22.50	0.17	0.2177	12.331	0.1652	9.70E–02	1501.0
210	22.40	0.22	0.2173	12.309	0.1648	9.68E–02	1498.4
211	23.20	–0.25	0.2396	13.570	0.1832	1.07E–01	1651.9
212	23.20	0.00	0.2345	13.282	0.1790	1.04E–01	1616.9
213	23.20	0.13	0.2381	13.488	0.1820	1.06E–01	1641.9
214	23.30	0.17	0.2436	13.800	0.1866	1.09E–01	1679.9
215	23.20	0.22	0.2402	13.605	0.1837	1.07E–01	1656.2
216	24.00	–0.25	0.2602	14.737	0.2002	1.16E–01	1794.0
217	24.00	0.00	0.2570	14.558	0.1976	1.14E–01	1772.2
218	24.00	0.13	0.2568	14.547	0.1975	1.14E–01	1770.9
219	24.10	0.17	0.2614	14.808	0.2013	1.16E–01	1802.6
220	24.00	0.22	0.2605	14.755	0.2005	1.16E–01	1796.1
221	25.00	–0.25	0.2402	13.608	0.1838	1.07E–01	1656.5
222	25.00	0.00	0.2541	14.395	0.1952	1.13E–01	1752.3
223	25.00	0.13	0.2516	14.249	0.1931	1.12E–01	1734.6
224	25.10	0.17	0.2267	12.837	0.1725	1.01E–01	1562.8
225	25.00	0.22	0.2421	13.713	0.1853	1.08E–01	1669.3
226	9.00	999.00	0.0436	2.469	0.0214	1.94E–02	300.5
227	0.00	–2.50	2.2166	125.547	1.8154	9.87E–01	15283.2
228	0.00	–0.54	2.2430	127.043	1.8373	9.99E–01	15465.4
229	0.00	2.00	2.2021	124.727	1.8035	9.81E–01	15183.5
230	18.23	0.00	0.2172	12.300	0.1647	9.67E–02	1497.4
231	18.43	0.00	0.2789	15.795	0.2157	1.24E–01	1922.8
232	18.63	0.00	0.4096	23.199	0.3236	1.82E–01	2824.1
233	19.00	0.00	0.4966	28.128	0.3954	2.21E–01	3424.2
234	19.40	0.00	0.5313	30.091	0.4240	2.37E–01	3663.1
235	20.13	0.00	0.7134	40.406	0.5744	3.18E–01	4918.8
236	20.33	0.00	0.6498	36.806	0.5219	2.89E–01	4480.5
237	20.53	0.00	0.4714	26.699	0.3746	2.10E–01	3250.2
238	20.73	0.00	0.4553	25.790	0.3614	2.03E–01	3139.5
239	21.50	0.00	0.6319	35.788	0.5071	2.81E–01	4356.7
240	22.00	0.00	0.9446	53.504	0.7653	4.21E–01	6513.2
241	22.50	0.00	1.2217	69.199	0.9941	5.44E–01	8423.8
242	22.70	0.00	1.3957	79.053	1.1377	6.22E–01	9623.4
243	23.00	0.00	1.0068	57.024	0.8166	4.48E–01	6941.7
244	0.58	999.00	0.0285	1.616	0.0090	1.27E–02	196.7
245	0.86	999.00	0.0292	1.652	0.0095	1.30E–02	201.1
246	1.15	999.00	0.0289	1.637	0.0093	1.29E–02	199.2
247	1.43	999.00	0.0292	1.656	0.0096	1.30E–02	201.6
248	1.72	999.00	0.0275	1.558	0.0081	1.22E–02	189.6
249	2.00	999.00	0.0284	1.607	0.0089	1.26E–02	195.7
250	2.29	999.00	0.0280	1.584	0.0085	1.25E–02	192.9
251	2.57	999.00	0.0287	1.628	0.0092	1.28E–02	198.1
252	2.86	999.00	0.0290	1.643	0.0094	1.29E–02	200.0
253	3.14	999.00	0.0285	1.616	0.0090	1.27E–02	196.7
254	3.43	999.00	0.0284	1.608	0.0089	1.26E–02	195.8
255	999.00	999.00	0.0261	1.477	0.0070	1.16E–02	179.8
256	999.00	999.00	0.0276	1.566	0.0082	1.23E–02	190.6

Table A4. Flow Conditions and Pressure Distribution for Run 40

[CR = 5; Re = 2.15×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1438.95	(.99212E+07)
$T_{t,1}$, °R (K)	1802.41	(1001.34)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0648	(33.40)
$h_{t,1}$, btu/lbm (J/kg)	453.24	(.10535E+07)
Free-stream conditions:		
M_∞	9.93	
p_∞, psia (N/m^2)	0.0348	(240.02)
T_∞, °R (K)	90.91	(50.51)
ρ_∞, slug/ft^3 (kg/m^3)	0.32125E−04	(.16556E−01)
h_∞, btu/lbm (J/kg)	0.21682E+02	(.50399E+05)
a_∞, ft/s (m/s)	467.77	(142.58)
u_∞, ft/s (m/s)	4647.06	(1416.42)
Re_∞, ft^{-1} (m^{-1})	0.22134E+07	(.72620E+07)
q_∞, psia (N/m^2)	2.409	(16608.23)
μ_∞, slug/ft-s (N-s/m^2)	0.67445E−07	(.32293E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.465	(30766.02)
$T_{t,2}$, °R (K)	1810.75	(1005.97)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20685E−03	(.10661E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0925	2.917	0.0269	2.21E−02	638.1
2	11.18	0.20	0.1002	3.158	0.0303	2.40E−02	690.9
3	12.17	0.20	0.1093	3.446	0.0344	2.61E−02	753.9
4	13.15	0.20	0.1196	3.770	0.0389	2.86E−02	824.8
5	14.21	0.20	0.1347	4.245	0.0456	3.22E−02	928.7
6	15.14	0.20	0.1491	4.698	0.0520	3.56E−02	1027.8
7	16.13	0.20	0.1702	5.363	0.0613	4.07E−02	1173.4
8	17.12	0.20	0.2113	6.659	0.0795	5.05E−02	1456.9
9	18.11	0.20	0.2783	8.771	0.1092	6.65E−02	1919.0
10	19.74	0.20	0.3224	10.161	0.1288	7.71E−02	2223.0
11	20.55	0.20	0.3439	10.840	0.1383	8.22E−02	2371.5
12	22.56	0.20	0.3644	11.485	0.1474	8.71E−02	2512.6
13	24.98	0.20	0.4270	13.457	0.1751	1.02E−01	2944.0
14	10.59	0.60	0.1693	5.337	0.0610	4.05E−02	1167.5
15	11.58	0.60	0.1519	4.789	0.0533	3.63E−02	1047.7
16	12.57	0.60	0.1489	4.694	0.0519	3.56E−02	1027.0
17	13.56	0.60	0.1470	4.634	0.0511	3.51E−02	1013.7
18	14.60	0.60	0.1523	4.801	0.0534	3.64E−02	1050.3
19	15.54	0.60	0.1646	5.189	0.0589	3.94E−02	1135.2
20	16.53	0.60	0.1891	5.961	0.0697	4.52E−02	1304.1
21	17.52	0.60	0.2320	7.311	0.0887	5.54E−02	1599.4
22	18.51	0.60	0.3038	9.573	0.1205	7.26E−02	2094.4
23	12.97	1.00	0.1666	5.252	0.0598	3.98E−02	1149.0
24	15.00	1.00	0.1852	5.837	0.0680	4.43E−02	1277.0
25	15.94	1.00	0.1993	6.280	0.0742	4.76E−02	1374.0
26	16.93	1.00	0.2231	7.032	0.0848	5.33E−02	1538.5
27	17.92	1.00	0.2622	8.263	0.1021	6.27E−02	1807.6
28	18.91	1.00	0.3986	12.562	0.1625	9.53E−02	2748.2
29	24.98	1.00	0.4869	15.344	0.2016	1.16E−01	3356.8
30	11.99	2.00	0.1726	5.438	0.0624	4.12E−02	1189.8
31	13.97	2.00	0.1481	4.669	0.0516	3.54E−02	1021.5
32	15.98	2.00	0.1858	5.857	0.0683	4.44E−02	1281.4
33	16.94	2.00	0.2079	6.553	0.0781	4.97E−02	1433.7

Table A4. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.2374	7.482	0.0911	5.67E−02	1636.9
35	18.42	2.00	0.2590	8.161	0.1007	6.19E−02	1785.5
36	18.92	2.00	0.3940	12.416	0.1605	9.42E−02	2716.3
37	19.41	2.00	0.6414	20.216	0.2701	1.53E−01	4422.7
38	19.91	2.00	0.8696	27.408	0.3712	2.08E−01	5996.1
39	20.26	2.00	0.9189	28.959	0.3930	2.20E−01	6335.5
40	21.11	2.00	0.5924	18.671	0.2484	1.42E−01	4084.8
41	21.96	2.00	0.8317	26.211	0.3543	1.99E−01	5734.3
42	22.74	2.00	0.8410	26.504	0.3585	2.01E−01	5798.4
43	23.52	2.00	0.5349	16.860	0.2229	1.28E−01	3688.5
44	24.98	2.00	0.6242	19.671	0.2624	1.49E−01	4303.5
45	17.94	3.00	0.2357	7.428	0.0904	5.63E−02	1625.1
46	18.93	3.00	0.2983	9.402	0.1181	7.13E−02	2057.0
47	19.92	3.00	0.4329	13.642	0.1777	1.03E−01	2984.6
48	20.91	3.00	1.3199	41.597	0.5706	3.15E−01	9100.4
49	22.11	3.00	0.5783	18.225	0.2421	1.38E−01	3987.3
50	22.96	3.00	1.6330	51.466	0.7093	3.90E−01	11259.4
51	23.74	3.00	1.1640	36.685	0.5016	2.78E−01	8025.8
52	24.98	3.00	1.6769	52.848	0.7287	4.01E−01	11561.9
53	18.34	3.40	0.2636	8.309	0.1027	6.30E−02	1817.8
54	19.32	3.40	0.3434	10.822	0.1381	8.21E−02	2367.6
55	19.82	3.40	0.4255	13.410	0.1744	1.02E−01	2933.7
56	20.32	3.40	0.6468	20.386	0.2725	1.55E−01	4460.0
57	20.81	3.40	1.2135	38.245	0.5235	2.90E−01	8367.1
58	21.31	3.40	1.7962	56.610	0.7816	4.29E−01	12384.9
59	21.66	3.40	1.5176	47.829	0.6582	3.63E−01	10463.8
60	22.94	3.40	2.9660	93.478	1.2998	7.09E−01	20450.7
61	23.75	3.40	1.3904	43.820	0.6019	3.32E−01	9586.7
62	24.14	3.40	1.5763	49.678	0.6842	3.77E−01	10868.4
63	22.29	3.60	0.6588	20.762	0.2778	1.57E−01	4542.3
64	22.71	3.60	3.2333	101.902	1.4182	7.73E−01	22293.7
65	23.14	3.60	2.5309	79.765	1.1071	6.05E−01	17450.6
66	23.95	3.60	1.2875	40.578	0.5563	3.08E−01	8877.5
67	24.34	3.60	2.3378	73.680	1.0215	5.59E−01	16119.4
68	13.79	3.80	0.1355	4.269	0.0459	3.24E−02	934.0
69	15.77	3.80	0.1484	4.677	0.0517	3.55E−02	1023.3
70	17.75	3.80	0.2068	6.517	0.0775	4.94E−02	1425.8
71	19.23	3.80	0.3417	10.768	0.1373	8.17E−02	2355.8
72	19.73	3.80	0.4117	12.976	0.1683	9.84E−02	2838.7
73	20.22	3.80	0.6043	19.047	0.2537	1.44E−01	4167.0
74	20.72	3.80	0.9836	30.999	0.4217	2.35E−01	6781.9
75	21.41	3.80	1.7020	53.640	0.7399	4.07E−01	11735.2
76	21.71	3.80	1.5955	50.283	0.6927	3.81E−01	11000.8
77	22.06	3.80	1.3390	42.201	0.5791	3.20E−01	9232.6
78	22.49	3.80	1.7473	55.069	0.7600	4.18E−01	12047.8
79	22.76	3.80	1.9255	60.684	0.8389	4.60E−01	13276.3
80	22.91	3.80	2.0037	63.149	0.8735	4.79E−01	13815.4
81	23.76	3.80	1.5654	49.335	0.6794	3.74E−01	10793.2
82	24.15	3.80	1.9464	61.343	0.8481	4.65E−01	13420.3
83	24.98	3.80	1.8108	57.070	0.7881	4.33E−01	12485.5
84	22.59	3.90	1.7012	53.614	0.7395	4.07E−01	11729.5
85	22.80	3.90	1.6566	52.211	0.7198	3.96E−01	11422.5
86	23.01	3.90	1.9606	61.792	0.8545	4.69E−01	13518.6
87	23.15	3.90	2.0601	64.926	0.8985	4.92E−01	14204.3
88	23.86	3.90	1.8615	58.668	0.8106	4.45E−01	12835.2
89	24.25	3.90	1.7484	55.102	0.7604	4.18E−01	12055.0
90	11.99	2.00	0.1769	5.574	0.0643	4.23E−02	1219.5
91	13.97	2.00	0.1617	5.097	0.0576	3.87E−02	1115.0

Table A4. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
92	15.98	2.00	0.1803	5.681	0.0658	4.31E–02	1242.9
93	17.93	2.00	0.2477	7.808	0.0957	5.92E–02	1708.2
94	19.91	2.00	0.8035	25.322	0.3419	1.92E–01	5539.9
95	1.00	–0.25	0.0722	2.276	0.0179	1.73E–02	497.9
96	1.00	0.41	0.0698	2.200	0.0169	1.67E–02	481.4
97	1.00	1.03	0.0697	2.198	0.0168	1.67E–02	480.8
98	1.00	1.65	0.0710	2.238	0.0174	1.70E–02	489.5
99	2.50	–0.25	0.0561	1.767	0.0108	1.34E–02	386.5
100	4.00	–0.25	0.0521	1.643	0.0090	1.25E–02	359.4
101	4.00	0.41	0.0517	1.631	0.0089	1.24E–02	356.8
102	4.00	1.65	0.0515	1.622	0.0087	1.23E–02	354.8
103	5.50	–0.25	0.0498	1.570	0.0080	1.19E–02	343.4
104	7.00	–0.25	0.0728	2.293	0.0182	1.74E–02	501.7
105	8.00	–2.15	0.0665	2.097	0.0154	1.59E–02	458.7
106	8.00	–1.75	0.0695	2.191	0.0167	1.66E–02	479.2
107	8.00	–1.36	0.0727	2.292	0.0182	1.74E–02	501.5
108	8.00	–0.91	0.0763	2.405	0.0197	1.82E–02	526.1
109	8.00	–0.25	0.0790	2.489	0.0209	1.89E–02	544.5
110	8.00	0.00	0.0784	2.470	0.0207	1.87E–02	540.3
111	8.00	0.13	0.0788	2.485	0.0209	1.88E–02	543.6
112	8.00	0.41	0.0779	2.455	0.0204	1.86E–02	537.0
113	8.00	0.86	0.0751	2.368	0.0192	1.80E–02	518.0
114	8.00	1.25	0.0724	2.281	0.0180	1.73E–02	499.0
115	8.00	1.65	0.0690	2.176	0.0165	1.65E–02	476.0
116	9.00	–0.25	0.0800	2.523	0.0214	1.91E–02	551.9
117	9.00	0.00	0.0803	2.531	0.0215	1.92E–02	553.7
118	9.00	0.13	0.0797	2.510	0.0212	1.90E–02	549.2
119	9.00	0.41	0.0785	2.473	0.0207	1.88E–02	541.1
120	9.00	0.76	0.0712	2.244	0.0175	1.70E–02	490.8
121	9.00	1.07	0.0625	1.968	0.0136	1.49E–02	430.6
122	10.00	–0.25	0.0862	2.716	0.0241	2.06E–02	594.2
123	10.00	0.00	0.0863	2.719	0.0242	2.06E–02	594.9
124	10.00	0.13	0.0870	2.741	0.0245	2.08E–02	599.6
125	10.00	0.41	0.0851	2.682	0.0236	2.03E–02	586.7
126	10.00	0.65	0.0812	2.558	0.0219	1.94E–02	559.7
127	10.00	0.83	0.0804	2.535	0.0216	1.92E–02	554.7
128	10.00	0.97	0.0818	2.578	0.0222	1.96E–02	564.0
129	10.00	1.09	0.0871	2.746	0.0245	2.08E–02	600.7
130	11.00	–0.25	0.0907	2.859	0.0261	2.17E–02	625.5
131	11.00	0.00	0.0952	3.001	0.0281	2.28E–02	656.5
132	11.00	0.13	0.0947	2.986	0.0279	2.26E–02	653.2
133	11.00	0.27	0.0934	2.944	0.0273	2.23E–02	644.0
134	11.00	0.55	0.0852	2.687	0.0237	2.04E–02	587.8
135	11.00	0.72	0.0896	2.825	0.0257	2.14E–02	618.1
136	11.00	0.86	0.0930	2.931	0.0271	2.22E–02	641.2
137	11.00	0.98	0.0980	3.089	0.0294	2.34E–02	675.9
138	12.00	–0.25	0.1016	3.203	0.0310	2.43E–02	700.6
139	12.00	0.00	0.1036	3.266	0.0319	2.48E–02	714.6
140	12.00	0.13	0.1025	3.231	0.0314	2.45E–02	706.9
141	12.00	0.27	0.1011	3.186	0.0307	2.42E–02	697.0
142	12.00	0.44	0.0992	3.128	0.0299	2.37E–02	684.2
143	12.00	0.62	0.1001	3.155	0.0303	2.39E–02	690.3
144	12.00	0.76	0.1055	3.325	0.0327	2.52E–02	727.4
145	12.00	0.88	0.1073	3.381	0.0335	2.56E–02	739.7
146	13.00	–0.25	0.1117	3.519	0.0354	2.67E–02	769.9
147	13.00	0.00	0.1168	3.683	0.0377	2.79E–02	805.7
148	13.00	0.13	0.1140	3.593	0.0364	2.72E–02	786.0
149	13.00	0.27	0.1103	3.477	0.0348	2.64E–02	760.8

Table A4. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.1103	3.475	0.0348	2.64E–02	760.3
151	13.00	0.51	0.1121	3.533	0.0356	2.68E–02	773.0
152	13.00	0.65	0.1163	3.666	0.0375	2.78E–02	802.1
153	13.00	0.77	0.1174	3.701	0.0380	2.81E–02	809.7
154	14.00	–0.25	0.1260	3.970	0.0417	3.01E–02	868.5
155	14.00	0.00	0.1292	4.072	0.0432	3.09E–02	890.8
156	14.00	0.13	0.1277	4.024	0.0425	3.05E–02	880.3
157	14.00	0.27	0.1257	3.961	0.0416	3.00E–02	866.5
158	14.00	0.41	0.1273	4.012	0.0423	3.04E–02	877.8
159	14.00	0.55	0.1328	4.186	0.0448	3.17E–02	915.8
160	14.00	0.67	0.1298	4.091	0.0434	3.10E–02	895.0
161	15.00	–0.25	0.1484	4.677	0.0517	3.55E–02	1023.2
162	15.00	0.00	0.1521	4.794	0.0533	3.64E–02	1048.8
163	15.00	0.13	0.1529	4.818	0.0537	3.65E–02	1054.0
164	15.00	0.44	0.1513	4.767	0.0529	3.62E–02	1042.9
165	15.00	0.56	0.1478	4.657	0.0514	3.53E–02	1018.7
166	16.00	–0.25	0.1762	5.553	0.0640	4.21E–02	1214.9
167	16.00	0.00	0.1810	5.704	0.0661	4.33E–02	1248.0
168	16.00	0.13	0.1811	5.707	0.0662	4.33E–02	1248.6
169	16.00	0.23	0.1796	5.662	0.0655	4.29E–02	1238.7
170	16.00	0.34	0.1773	5.589	0.0645	4.24E–02	1222.7
171	16.00	0.46	0.1703	5.367	0.0614	4.07E–02	1174.2
172	17.00	–0.25	0.2170	6.840	0.0821	5.19E–02	1496.4
173	17.00	0.00	0.2226	7.014	0.0845	5.32E–02	1534.5
174	17.00	0.13	0.2229	7.026	0.0847	5.33E–02	1537.1
175	17.00	0.23	0.2187	6.894	0.0828	5.23E–02	1508.2
176	17.00	0.35	0.2172	6.846	0.0822	5.19E–02	1497.8
177	18.00	–0.25	0.2903	9.148	0.1145	6.94E–02	2001.4
178	18.00	0.00	0.2924	9.217	0.1155	6.99E–02	2016.4
179	18.00	0.13	0.2942	9.271	0.1162	7.03E–02	2028.2
180	18.00	0.25	0.2954	9.309	0.1168	7.06E–02	2036.7
181	18.50	–0.25	0.3424	10.793	0.1376	8.19E–02	2361.2
182	18.50	0.00	0.3529	11.124	0.1423	8.44E–02	2433.6
183	18.50	0.13	0.3485	10.984	0.1403	8.33E–02	2403.0
184	18.60	0.17	0.3443	10.852	0.1385	8.23E–02	2374.1
185	18.50	0.22	0.3483	10.977	0.1402	8.33E–02	2401.5
186	19.20	–0.25	0.3397	10.706	0.1364	8.12E–02	2342.2
187	19.20	0.00	0.3301	10.403	0.1322	7.89E–02	2275.9
188	19.20	0.13	0.3360	10.590	0.1348	8.03E–02	2316.9
189	19.30	0.17	0.3354	10.569	0.1345	8.02E–02	2312.3
190	19.20	0.22	0.3451	10.878	0.1388	8.25E–02	2379.8
191	20.00	–0.25	0.3370	10.620	0.1352	8.05E–02	2323.3
192	20.00	0.00	0.3288	10.364	0.1316	7.86E–02	2267.3
193	20.00	0.13	0.3339	10.522	0.1338	7.98E–02	2302.0
194	20.10	0.17	0.3397	10.707	0.1364	8.12E–02	2342.5
195	20.00	0.22	0.3402	10.723	0.1367	8.13E–02	2345.9
196	20.80	–0.25	0.3697	11.651	0.1497	8.84E–02	2549.0
197	20.80	0.00	0.3688	11.622	0.1493	8.81E–02	2542.5
198	20.80	0.13	0.3678	11.592	0.1489	8.79E–02	2536.1
199	20.90	0.17	0.3727	11.746	0.1510	8.91E–02	2569.8
200	20.80	0.22	0.3722	11.732	0.1508	8.90E–02	2566.6
201	21.60	–0.25	0.3714	11.706	0.1505	8.88E–02	2560.9
202	21.60	0.00	0.3638	11.466	0.1471	8.70E–02	2508.6
203	21.60	0.13	0.3671	11.570	0.1486	8.77E–02	2531.1
204	21.70	0.17	0.3681	11.603	0.1490	8.80E–02	2538.4
205	21.60	0.22	0.3750	11.819	0.1521	8.96E–02	2585.7
206	22.40	–0.25	0.3617	11.401	0.1462	8.65E–02	2494.2
207	22.40	0.00	0.3581	11.287	0.1446	8.56E–02	2469.4

Table A4. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.3575	11.267	0.1443	8.55E–02	2464.9
209	22.50	0.17	0.3618	11.401	0.1462	8.65E–02	2494.3
210	22.40	0.22	0.3630	11.441	0.1468	8.68E–02	2503.0
211	23.20	–0.25	0.3829	12.066	0.1555	9.15E–02	2639.8
212	23.20	0.00	0.3772	11.889	0.1530	9.02E–02	2600.9
213	23.20	0.13	0.3807	11.998	0.1546	9.10E–02	2624.9
214	23.30	0.17	0.3907	12.314	0.1590	9.34E–02	2694.0
215	23.20	0.22	0.3850	12.135	0.1565	9.20E–02	2654.9
216	24.00	–0.25	0.4374	13.785	0.1797	1.05E–01	3015.7
217	24.00	0.00	0.4344	13.689	0.1784	1.04E–01	2994.9
218	24.00	0.13	0.4349	13.706	0.1786	1.04E–01	2998.6
219	24.10	0.17	0.4384	13.817	0.1801	1.05E–01	3022.7
220	24.00	0.22	0.4395	13.851	0.1806	1.05E–01	3030.3
221	25.00	–0.25	0.4097	12.913	0.1674	9.79E–02	2825.0
222	25.00	0.00	0.4369	13.770	0.1795	1.04E–01	3012.5
223	25.00	0.13	0.4314	13.596	0.1770	1.03E–01	2974.6
224	25.10	0.17	0.3882	12.234	0.1579	9.28E–02	2676.5
225	25.00	0.22	0.4181	13.176	0.1711	9.99E–02	2882.5
226	9.00	999.00	0.0681	2.145	0.0161	1.63E–02	469.3
227	0.00	–2.50	4.1894	132.034	1.8417	1.00E+00	28885.7
228	0.00	–0.54	4.2373	133.543	1.8629	1.01E+00	29215.8
229	0.00	2.00	4.1318	130.221	1.8162	9.88E–01	28489.0
230	18.23	0.00	0.2440	7.691	0.0940	5.83E–02	1682.6
231	18.43	0.00	0.2945	9.282	0.1164	7.04E–02	2030.6
232	18.63	0.00	0.3776	11.899	0.1532	9.02E–02	2603.3
233	19.00	0.00	0.6145	19.368	0.2582	1.47E–01	4237.2
234	19.40	0.00	0.8300	26.159	0.3536	1.98E–01	5723.0
235	20.13	0.00	1.0913	34.395	0.4694	2.61E–01	7524.7
236	20.33	0.00	1.3418	42.289	0.5803	3.21E–01	9251.8
237	20.53	0.00	1.3923	43.880	0.6027	3.33E–01	9599.8
238	20.73	0.00	1.2392	39.056	0.5349	2.96E–01	8544.4
239	21.50	0.00	0.9376	29.550	0.4013	2.24E–01	6464.9
240	22.00	0.00	2.0399	64.289	0.8896	4.88E–01	14064.8
241	22.50	0.00	1.8861	59.443	0.8214	4.51E–01	13004.7
242	22.70	0.00	2.2372	70.509	0.9770	5.35E–01	15425.7
243	23.00	0.00	1.4660	46.203	0.6353	3.50E–01	10108.0
244	0.58	999.00	0.0303	0.955	–0.0006	7.24E–03	208.9
245	0.86	999.00	0.0312	0.984	–0.0002	7.47E–03	215.4
246	1.15	999.00	0.0317	0.999	0.0000	7.58E–03	218.6
247	1.43	999.00	0.0312	0.982	–0.0003	7.45E–03	214.8
248	1.72	999.00	0.0296	0.932	–0.0010	7.07E–03	203.9
249	2.00	999.00	0.0313	0.985	–0.0002	7.47E–03	215.5
250	2.29	999.00	0.0293	0.925	–0.0011	7.01E–03	202.3
251	2.57	999.00	0.0316	0.995	–0.0001	7.55E–03	217.8
252	2.86	999.00	0.0299	0.941	–0.0008	7.14E–03	205.8
253	3.14	999.00	0.0307	0.966	–0.0005	7.33E–03	211.4
254	3.43	999.00	0.0311	0.982	–0.0003	7.44E–03	214.8
255	999.00	999.00	0.0278	0.875	–0.0018	6.64E–03	191.4
256	999.00	999.00	0.0287	0.906	–0.0013	6.87E–03	198.1

Table A5. Flow Conditions and Pressure Distribution for Run 41

[CR = 5; Re = 0.55×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	352.06	(.24274E+07)
$T_{t,1}$, °R (K)	1824.71	(1013.73)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0161	(8.28)
$h_{t,1}$, btu/lbm (J/kg)	457.60	(.10637E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0100	(68.77)
T_∞, °R (K)	96.58	(53.66)
ρ_∞, slug/ft^3 (kg/m^3)	0.86637E−05	(.44651E−02)
h_∞, btu/lbm (J/kg)	0.23034E+02	(.53541E+05)
a_∞, ft/s (m/s)	482.13	(146.95)
u_∞, ft/s (m/s)	4663.23	(1421.35)
Re_∞, ft^{-1} (m^{-1})	0.55767E+06	(.18296E+07)
q_∞, psia (N/m^2)	0.654	(4510.28)
μ_∞, slug/ft-s (N-s/m^2)	0.72446E−07	(.34687E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.213	(8365.00)
$T_{t,2}$, °R (K)	1826.70	(1014.8)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.55701E−04	(.28707E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0433	4.586	0.0538	3.71E−02	298.8
2	11.18	0.20	0.0442	4.681	0.0552	3.79E−02	305.0
3	12.17	0.20	0.0465	4.923	0.0589	3.98E−02	320.8
4	13.15	0.20	0.0492	5.205	0.0631	4.21E−02	339.1
5	14.21	0.20	0.0570	6.036	0.0755	4.88E−02	393.3
6	15.14	0.20	0.0604	6.387	0.0808	5.17E−02	416.2
7	16.13	0.20	0.0703	7.444	0.0967	6.02E−02	485.0
8	17.12	0.20	0.0823	8.706	0.1156	7.04E−02	567.3
9	18.11	0.20	0.1005	10.634	0.1445	8.61E−02	692.9
10	19.74	0.20	0.1152	12.185	0.1678	9.86E−02	794.0
11	20.55	0.20	0.1237	13.087	0.1813	1.06E−01	852.7
12	22.56	0.20	0.1331	14.080	0.1962	1.14E−01	917.4
13	24.98	0.20	0.1347	14.251	0.1988	1.15E−01	928.6
14	10.59	0.60	0.0570	6.035	0.0755	4.88E−02	393.2
15	11.58	0.60	0.0497	5.258	0.0639	4.26E−02	342.6
16	12.57	0.60	0.0507	5.366	0.0655	4.34E−02	349.7
17	13.56	0.60	0.0522	5.526	0.0679	4.47E−02	360.1
18	14.60	0.60	0.0574	6.069	0.0760	4.91E−02	395.5
19	15.54	0.60	0.0631	6.677	0.0852	5.40E−02	435.1
20	16.53	0.60	0.0741	7.842	0.1026	6.35E−02	511.0
21	17.52	0.60	0.0892	9.437	0.1266	7.64E−02	614.9
22	18.51	0.60	0.1072	11.341	0.1551	9.18E−02	739.0
23	12.97	1.00	0.0666	7.050	0.0908	5.70E−02	459.4
24	15.00	1.00	0.0677	7.164	0.0925	5.80E−02	466.8
25	15.94	1.00	0.0703	7.443	0.0966	6.02E−02	485.0
26	16.93	1.00	0.0798	8.444	0.1117	6.83E−02	550.2
27	17.92	1.00	0.0994	10.516	0.1427	8.51E−02	685.2
28	18.91	1.00	0.1265	13.383	0.1858	1.08E−01	872.1
29	24.98	1.00	0.1387	14.674	0.2051	1.19E−01	956.2
30	11.99	2.00	0.0649	6.872	0.0881	5.56E−02	447.8
31	13.97	2.00	0.0603	6.385	0.0808	5.17E−02	416.0
32	15.98	2.00	0.0634	6.712	0.0857	5.43E−02	437.3
33	16.94	2.00	0.0648	6.856	0.0878	5.55E−02	446.7

Table A5. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0688	7.277	0.0942	5.89E−02	474.2
35	18.42	2.00	0.1158	12.259	0.1689	9.92E−02	798.8
36	18.92	2.00	0.1988	21.032	0.3005	1.70E−01	1370.4
37	19.41	2.00	0.2168	22.943	0.3292	1.86E−01	1494.9
38	19.91	2.00	0.2187	23.144	0.3322	1.87E−01	1508.1
39	20.26	2.00	0.2248	23.788	0.3418	1.92E−01	1550.0
40	21.11	2.00	0.1337	14.152	0.1973	1.15E−01	922.2
41	21.96	2.00	0.2863	30.291	0.4394	2.45E−01	1973.8
42	22.74	2.00	0.1948	20.610	0.2942	1.67E−01	1342.9
43	23.52	2.00	0.1115	11.804	0.1621	9.55E−02	769.1
44	24.98	2.00	0.1622	17.168	0.2425	1.39E−01	1118.6
45	17.94	3.00	0.0557	5.890	0.0734	4.77E−02	383.8
46	18.93	3.00	0.0710	7.512	0.0977	6.08E−02	489.5
47	19.92	3.00	0.1999	21.151	0.3023	1.71E−01	1378.2
48	20.91	3.00	0.2957	31.294	0.4545	2.53E−01	2039.1
49	22.11	3.00	0.2662	28.173	0.4076	2.28E−01	1835.7
50	22.96	3.00	0.3939	41.676	0.6102	3.37E−01	2715.6
51	23.74	3.00	0.3694	39.084	0.5713	3.16E−01	2546.7
52	24.98	3.00	0.3703	39.187	0.5728	3.17E−01	2553.4
53	18.34	3.40	0.0574	6.069	0.0760	4.91E−02	395.4
54	19.32	3.40	0.0773	8.176	0.1076	6.62E−02	532.7
55	19.82	3.40	0.1030	10.898	0.1485	8.82E−02	710.1
56	20.32	3.40	0.1640	17.350	0.2453	1.40E−01	1130.5
57	20.81	3.40	0.2432	25.731	0.3710	2.08E−01	1676.6
58	21.31	3.40	0.2931	31.012	0.4502	2.51E−01	2020.7
59	21.66	3.40	0.3561	37.685	0.5503	3.05E−01	2455.6
60	22.94	3.40	0.7664	81.099	1.2016	6.56E−01	5284.4
61	23.75	3.40	0.7070	74.814	1.1073	6.05E−01	4874.9
62	24.14	3.40	0.4654	49.252	0.7238	3.99E−01	3209.3
63	22.29	3.60	0.3481	36.832	0.5375	2.98E−01	2400.0
64	22.71	3.60	0.5777	61.126	0.9020	4.95E−01	3983.0
65	23.14	3.60	0.7502	79.384	1.1759	6.42E−01	5172.7
66	23.95	3.60	0.5515	58.355	0.8604	4.72E−01	3802.4
67	24.34	3.60	0.5958	63.044	0.9307	5.10E−01	4108.0
68	13.79	3.80	0.0518	5.479	0.0672	4.43E−02	357.0
69	15.77	3.80	0.0445	4.704	0.0556	3.81E−02	306.5
70	17.75	3.80	0.0490	5.186	0.0628	4.20E−02	337.9
71	19.23	3.80	0.0721	7.626	0.0994	6.17E−02	496.9
72	19.73	3.80	0.0993	10.510	0.1427	8.50E−02	684.8
73	20.22	3.80	0.1798	19.028	0.2704	1.54E−01	1239.9
74	20.72	3.80	0.2765	29.260	0.4239	2.37E−01	1906.6
75	21.41	3.80	0.3814	40.362	0.5905	3.27E−01	2630.0
76	21.71	3.80	0.4327	45.785	0.6718	3.70E−01	2983.3
77	22.06	3.80	0.4823	51.033	0.7506	4.13E−01	3325.3
78	22.49	3.80	0.4816	50.963	0.7495	4.12E−01	3320.8
79	22.76	3.80	0.5499	58.186	0.8579	4.71E−01	3791.4
80	22.91	3.80	0.5779	61.152	0.9023	4.95E−01	3984.7
81	23.76	3.80	0.6695	70.844	1.0477	5.73E−01	4616.2
82	24.15	3.80	0.7198	76.168	1.1276	6.16E−01	4963.1
83	24.98	3.80	0.6226	65.881	0.9733	5.33E−01	4292.8
84	22.59	3.90	0.5324	56.333	0.8301	4.56E−01	3670.6
85	22.80	3.90	0.5543	58.655	0.8649	4.75E−01	3821.9
86	23.01	3.90	0.5809	61.470	0.9071	4.97E−01	4005.3
87	23.15	3.90	0.5921	62.658	0.9249	5.07E−01	4082.8
88	23.86	3.90	0.7249	76.702	1.1356	6.21E−01	4997.9
89	24.25	3.90	0.6782	71.770	1.0616	5.81E−01	4676.5
90	11.99	2.00	0.0646	6.830	0.0875	5.53E−02	445.1
91	13.97	2.00	0.0614	6.494	0.0824	5.25E−02	423.2

Table A5. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0630	6.668	0.0850	5.40E−02	434.5
93	17.93	2.00	0.0693	7.328	0.0949	5.93E−02	477.5
94	19.91	2.00	0.2204	23.323	0.3349	1.89E−01	1519.7
95	1.00	–0.25	0.0305	3.222	0.0333	2.61E−02	210.0
96	1.00	0.41	0.0308	3.261	0.0339	2.64E−02	212.5
97	1.00	1.03	0.0315	3.331	0.0350	2.70E−02	217.1
98	1.00	1.65	0.0308	3.259	0.0339	2.64E−02	212.3
99	2.50	–0.25	0.0259	2.743	0.0261	2.22E−02	178.7
100	4.00	–0.25	0.0235	2.490	0.0224	2.02E−02	162.3
101	4.00	0.41	0.0249	2.639	0.0246	2.14E−02	172.0
102	4.00	1.65	0.0235	2.485	0.0223	2.01E−02	161.9
103	5.50	–0.25	0.0239	2.530	0.0230	2.05E−02	164.9
104	7.00	–0.25	0.0290	3.065	0.0310	2.48E−02	199.7
105	8.00	–2.15	0.0271	2.868	0.0280	2.32E−02	186.9
106	8.00	–1.75	0.0296	3.137	0.0321	2.54E−02	204.4
107	8.00	–1.36	0.0297	3.138	0.0321	2.54E−02	204.5
108	8.00	–0.91	0.0312	3.301	0.0345	2.67E−02	215.1
109	8.00	–0.25	0.0334	3.534	0.0380	2.86E−02	230.3
110	8.00	0.00	0.0328	3.470	0.0371	2.81E−02	226.1
111	8.00	0.13	0.0321	3.401	0.0360	2.75E−02	221.6
112	8.00	0.41	0.0340	3.598	0.0390	2.91E−02	234.5
113	8.00	0.86	0.0333	3.520	0.0378	2.85E−02	229.4
114	8.00	1.25	0.0311	3.290	0.0343	2.66E−02	214.4
115	8.00	1.65	0.0304	3.217	0.0333	2.60E−02	209.6
116	9.00	–0.25	0.0333	3.526	0.0379	2.85E−02	229.7
117	9.00	0.00	0.0333	3.523	0.0378	2.85E−02	229.5
118	9.00	0.13	0.0331	3.507	0.0376	2.84E−02	228.5
119	9.00	0.41	0.0325	3.434	0.0365	2.78E−02	223.8
120	9.00	0.76	0.0342	3.620	0.0393	2.93E−02	235.9
121	9.00	1.07	0.0300	3.172	0.0326	2.57E−02	206.7
122	10.00	–0.25	0.0388	4.101	0.0465	3.32E−02	267.2
123	10.00	0.00	0.0381	4.033	0.0455	3.26E−02	262.8
124	10.00	0.13	0.0399	4.223	0.0483	3.42E−02	275.1
125	10.00	0.41	0.0362	3.833	0.0425	3.10E−02	249.8
126	10.00	0.65	0.0368	3.898	0.0435	3.15E−02	254.0
127	10.00	0.83	0.0362	3.830	0.0424	3.10E−02	249.5
128	10.00	0.97	0.0369	3.900	0.0435	3.16E−02	254.1
129	10.00	1.09	0.0381	4.033	0.0455	3.26E−02	262.8
130	11.00	–0.25	0.0439	4.641	0.0546	3.76E−02	302.4
131	11.00	0.00	0.0421	4.456	0.0518	3.61E−02	290.3
132	11.00	0.13	0.0414	4.384	0.0508	3.55E−02	285.6
133	11.00	0.27	0.0416	4.407	0.0511	3.57E−02	287.2
134	11.00	0.55	0.0390	4.126	0.0469	3.34E−02	268.8
135	11.00	0.72	0.0399	4.220	0.0483	3.41E−02	275.0
136	11.00	0.86	0.0422	4.463	0.0519	3.61E−02	290.8
137	11.00	0.98	0.0413	4.370	0.0506	3.54E−02	284.7
138	12.00	–0.25	0.0442	4.680	0.0552	3.79E−02	305.0
139	12.00	0.00	0.0447	4.735	0.0560	3.83E−02	308.5
140	12.00	0.13	0.0443	4.683	0.0552	3.79E−02	305.1
141	12.00	0.27	0.0440	4.659	0.0549	3.77E−02	303.6
142	12.00	0.44	0.0418	4.422	0.0513	3.58E−02	288.1
143	12.00	0.62	0.0439	4.640	0.0546	3.75E−02	302.4
144	12.00	0.76	0.0448	4.743	0.0561	3.84E−02	309.0
145	12.00	0.88	0.0444	4.697	0.0555	3.80E−02	306.0
146	13.00	–0.25	0.0480	5.074	0.0611	4.11E−02	330.6
147	13.00	0.00	0.0484	5.121	0.0618	4.14E−02	333.7
148	13.00	0.13	0.0479	5.067	0.0610	4.10E−02	330.1
149	13.00	0.27	0.0484	5.119	0.0618	4.14E−02	333.5

Table A5. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.0470	4.976	0.0596	4.03E–02	324.2
151	13.00	0.51	0.0487	5.154	0.0623	4.17E–02	335.9
152	13.00	0.65	0.0472	4.994	0.0599	4.04E–02	325.4
153	13.00	0.77	0.0476	5.038	0.0606	4.08E–02	328.3
154	14.00	–0.25	0.0522	5.523	0.0678	4.47E–02	359.9
155	14.00	0.00	0.0529	5.594	0.0689	4.53E–02	364.5
156	14.00	0.13	0.0516	5.455	0.0668	4.41E–02	355.5
157	14.00	0.27	0.0518	5.480	0.0672	4.43E–02	357.1
158	14.00	0.41	0.0513	5.432	0.0665	4.40E–02	353.9
159	14.00	0.55	0.0549	5.804	0.0721	4.70E–02	378.2
160	14.00	0.67	0.0546	5.775	0.0716	4.67E–02	376.3
161	15.00	–0.25	0.0594	6.285	0.0793	5.09E–02	409.5
162	15.00	0.00	0.0603	6.378	0.0807	5.16E–02	415.6
163	15.00	0.13	0.0601	6.363	0.0805	5.15E–02	414.6
164	15.00	0.44	0.0597	6.313	0.0797	5.11E–02	411.4
165	15.00	0.56	0.0596	6.305	0.0796	5.10E–02	410.8
166	16.00	–0.25	0.0681	7.208	0.0931	5.83E–02	469.7
167	16.00	0.00	0.0699	7.394	0.0959	5.98E–02	481.8
168	16.00	0.13	0.0703	7.440	0.0966	6.02E–02	484.8
169	16.00	0.23	0.0693	7.333	0.0950	5.93E–02	477.8
170	16.00	0.34	0.0686	7.254	0.0938	5.87E–02	472.7
171	16.00	0.46	0.0691	7.310	0.0947	5.91E–02	476.3
172	17.00	–0.25	0.0814	8.615	0.1142	6.97E–02	561.4
173	17.00	0.00	0.0837	8.853	0.1178	7.16E–02	576.9
174	17.00	0.13	0.0818	8.658	0.1149	7.01E–02	564.2
175	17.00	0.23	0.0805	8.514	0.1127	6.89E–02	554.8
176	17.00	0.35	0.0824	8.720	0.1158	7.06E–02	568.2
177	18.00	–0.25	0.1043	11.035	0.1505	8.93E–02	719.1
178	18.00	0.00	0.1017	10.767	0.1465	8.71E–02	701.6
179	18.00	0.13	0.1003	10.610	0.1442	8.59E–02	691.3
180	18.00	0.25	0.1011	10.700	0.1455	8.66E–02	697.2
181	18.50	–0.25	0.1123	11.884	0.1633	9.62E–02	774.4
182	18.50	0.00	0.1105	11.698	0.1605	9.47E–02	762.2
183	18.50	0.13	0.1087	11.506	0.1576	9.31E–02	749.7
184	18.60	0.17	0.1116	11.805	0.1621	9.55E–02	769.2
185	18.50	0.22	0.1110	11.750	0.1613	9.51E–02	765.6
186	19.20	–0.25	0.1151	12.181	0.1677	9.86E–02	793.7
187	19.20	0.00	0.1168	12.357	0.1704	1.00E–01	805.2
188	19.20	0.13	0.1172	12.398	0.1710	1.00E–01	807.8
189	19.30	0.17	0.1175	12.430	0.1715	1.01E–01	809.9
190	19.20	0.22	0.1167	12.350	0.1703	9.99E–02	804.7
191	20.00	–0.25	0.1215	12.859	0.1779	1.04E–01	837.9
192	20.00	0.00	0.1238	13.099	0.1815	1.06E–01	853.5
193	20.00	0.13	0.1224	12.953	0.1793	1.05E–01	844.0
194	20.10	0.17	0.1243	13.154	0.1823	1.06E–01	857.1
195	20.00	0.22	0.1221	12.922	0.1788	1.05E–01	842.0
196	20.80	–0.25	0.1327	14.046	0.1957	1.14E–01	915.3
197	20.80	0.00	0.1304	13.803	0.1921	1.12E–01	899.4
198	20.80	0.13	0.1281	13.551	0.1883	1.10E–01	883.0
199	20.90	0.17	0.1307	13.832	0.1925	1.12E–01	901.3
200	20.80	0.22	0.1293	13.684	0.1903	1.11E–01	891.7
201	21.60	–0.25	0.1360	14.396	0.2010	1.16E–01	938.0
202	21.60	0.00	0.1346	14.245	0.1987	1.15E–01	928.2
203	21.60	0.13	0.1349	14.279	0.1992	1.16E–01	930.4
204	21.70	0.17	0.1349	14.276	0.1992	1.16E–01	930.2
205	21.60	0.22	0.1377	14.573	0.2036	1.18E–01	949.6
206	22.40	–0.25	0.1367	14.461	0.2019	1.17E–01	942.3
207	22.40	0.00	0.1404	14.860	0.2079	1.20E–01	968.3

Table A5. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.1383	14.638	0.2046	1.18E–01	953.8
209	22.50	0.17	0.1404	14.851	0.2078	1.20E–01	967.7
210	22.40	0.22	0.1416	14.985	0.2098	1.21E–01	976.4
211	23.20	–0.25	0.1466	15.510	0.2177	1.26E–01	1010.6
212	23.20	0.00	0.1467	15.525	0.2179	1.26E–01	1011.6
213	23.20	0.13	0.1474	15.599	0.2190	1.26E–01	1016.4
214	23.30	0.17	0.1501	15.887	0.2233	1.29E–01	1035.2
215	23.20	0.22	0.1485	15.716	0.2208	1.27E–01	1024.0
216	24.00	–0.25	0.1552	16.420	0.2313	1.33E–01	1069.9
217	24.00	0.00	0.1547	16.372	0.2306	1.32E–01	1066.8
218	24.00	0.13	0.1557	16.480	0.2322	1.33E–01	1073.9
219	24.10	0.17	0.1572	16.631	0.2345	1.35E–01	1083.7
220	24.00	0.22	0.1565	16.565	0.2335	1.34E–01	1079.4
221	25.00	–0.25	0.1401	14.820	0.2073	1.20E–01	965.7
222	25.00	0.00	0.1447	15.312	0.2147	1.24E–01	997.7
223	25.00	0.13	0.1423	15.060	0.2109	1.22E–01	981.3
224	25.10	0.17	0.1314	13.908	0.1936	1.13E–01	906.2
225	25.00	0.22	0.1387	14.681	0.2052	1.19E–01	956.6
226	9.00	999.00	0.0317	3.350	0.0353	2.71E–02	218.3
227	0.00	–2.50	1.1681	123.600	1.8391	1.00E+00	8053.8
228	0.00	–0.54	1.1798	124.847	1.8578	1.01E+00	8135.0
229	0.00	2.00	1.1482	121.499	1.8076	9.83E–01	7916.8
230	20.58	0.00	0.4382	46.372	0.6806	3.75E–01	3021.6
231	20.78	0.00	0.3534	37.398	0.5460	3.03E–01	2436.9
232	20.98	0.00	0.3304	34.967	0.5095	2.83E–01	2278.4
233	21.38	0.00	0.3888	41.136	0.6021	3.33E–01	2680.4
234	21.78	0.00	0.4363	46.166	0.6775	3.74E–01	3008.1
235	22.51	0.00	0.6608	69.928	1.0340	5.66E–01	4556.5
236	22.71	0.00	0.6561	69.431	1.0265	5.62E–01	4524.1
237	22.91	0.00	0.5659	59.886	0.8834	4.85E–01	3902.2
238	23.11	0.00	0.5313	56.217	0.8283	4.55E–01	3663.1
239	23.88	0.00	0.5983	63.312	0.9347	5.12E–01	4125.4
240	24.38	0.00	0.6726	71.176	1.0527	5.76E–01	4637.8
241	24.88	0.00	0.6657	70.437	1.0416	5.70E–01	4589.7
242	25.08	0.00	0.6661	70.485	1.0423	5.70E–01	4592.8
243	25.38	0.00	0.5775	61.112	0.9017	4.95E–01	3982.1
244	0.58	999.00	0.0337	3.569	0.0385	2.89E–02	232.5
245	0.86	999.00	0.0342	3.617	0.0393	2.93E–02	235.7
246	1.15	999.00	0.0347	3.675	0.0401	2.97E–02	239.5
247	1.43	999.00	0.0345	3.647	0.0397	2.95E–02	237.6
248	1.72	999.00	0.0316	3.347	0.0352	2.71E–02	218.1
249	2.00	999.00	0.0342	3.619	0.0393	2.93E–02	235.8
250	2.29	999.00	0.0333	3.528	0.0379	2.85E–02	229.9
251	2.57	999.00	0.0356	3.771	0.0416	3.05E–02	245.7
252	2.86	999.00	0.0326	3.454	0.0368	2.80E–02	225.1
253	3.14	999.00	0.0344	3.637	0.0396	2.94E–02	237.0
254	3.43	999.00	0.0337	3.563	0.0384	2.88E–02	232.1
255	999.00	999.00	0.0317	3.352	0.0353	2.71E–02	218.4
256	999.00	999.00	0.0336	3.555	0.0383	2.88E–02	231.7

Table A6. Flow Conditions and Pressure Distribution for Run 42

[CR = 5; Re = 1.14×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	720.66	(.49688E+07)
$T_{t,1}$, °R (K)	1849.32	(1027.40)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0322	(16.57)
$h_{t,1}$, btu/lbm (J/kg)	465.00	(.10809E+07)
Free-stream conditions:		
M_∞	9.78	
p_∞, psia (N/m^2)	0.0189	(130.63)
T_∞, °R (K)	96.16	(53.42)
ρ_∞, slug/ft^3 (kg/m^3)	0.16530E−04	(.85191E−02)
h_∞, btu/lbm (J/kg)	0.22935E+02	(.53310E+05)
a_∞, ft/s (m/s)	481.09	(146.64)
u_∞, ft/s (m/s)	4703.29	(1433.56)
Re_∞, ft^{-1} (m^{-1})	0.10786E+07	(.35387E+07)
q_∞, psia (N/m^2)	1.270	(8753.76)
μ_∞, slug/ft-s (N-s/m^2)	0.72078E−07	(.34511E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.354	(16238.06)
$T_{t,2}$, °R (K)	1853.74	(1029.86)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10654E−03	(.54907E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0624	3.550	0.0372	2.79E−02	430.1
2	11.18	0.20	0.0662	3.767	0.0404	2.96E−02	456.4
3	12.17	0.20	0.0706	4.019	0.0440	3.16E−02	486.8
4	13.15	0.20	0.0756	4.303	0.0482	3.39E−02	521.3
5	14.21	0.20	0.0826	4.702	0.0540	3.70E−02	569.6
6	15.14	0.20	0.0926	5.271	0.0623	4.15E−02	638.6
7	16.13	0.20	0.1064	6.058	0.0738	4.77E−02	733.9
8	17.12	0.20	0.1266	7.207	0.0906	5.67E−02	873.1
9	18.11	0.20	0.1596	9.084	0.1179	7.15E−02	1100.5
10	19.74	0.20	0.1756	9.992	0.1312	7.86E−02	1210.5
11	20.55	0.20	0.1908	10.857	0.1438	8.54E−02	1315.3
12	22.56	0.20	0.2068	11.767	0.1571	9.26E−02	1425.5
13	24.98	0.20	0.2267	12.902	0.1736	1.02E−01	1563.1
14	10.59	0.60	0.1010	5.748	0.0693	4.52E−02	696.3
15	11.58	0.60	0.0862	4.908	0.0570	3.86E−02	594.6
16	12.57	0.60	0.0838	4.770	0.0550	3.75E−02	577.8
17	13.56	0.60	0.0828	4.715	0.0542	3.71E−02	571.2
18	14.60	0.60	0.0873	4.971	0.0579	3.91E−02	602.2
19	15.54	0.60	0.0974	5.543	0.0663	4.36E−02	671.5
20	16.53	0.60	0.1105	6.287	0.0771	4.95E−02	761.6
21	17.52	0.60	0.1351	7.688	0.0976	6.05E−02	931.4
22	18.51	0.60	0.1718	9.779	0.1281	7.70E−02	1184.7
23	12.97	1.00	0.1070	6.089	0.0742	4.79E−02	737.7
24	15.00	1.00	0.1115	6.347	0.0780	4.99E−02	769.0
25	15.94	1.00	0.1182	6.726	0.0835	5.29E−02	814.8
26	16.93	1.00	0.1281	7.291	0.0918	5.74E−02	883.3
27	17.92	1.00	0.1539	8.759	0.1132	6.89E−02	1061.1
28	18.91	1.00	0.2079	11.833	0.1580	9.31E−02	1433.5
29	24.98	1.00	0.2354	13.400	0.1809	1.05E−01	1623.3
30	11.99	2.00	0.1037	5.901	0.0715	4.64E−02	714.9
31	13.97	2.00	0.0928	5.280	0.0624	4.15E−02	639.6
32	15.98	2.00	0.1002	5.702	0.0686	4.49E−02	690.8
33	16.94	2.00	0.1054	6.001	0.0730	4.72E−02	727.0

Table A6. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1098	6.249	0.0766	4.92E−02	757.1
35	18.42	2.00	0.1393	7.928	0.1011	6.24E−02	960.5
36	18.92	2.00	0.3022	17.201	0.2363	1.35E−01	2083.8
37	19.41	2.00	0.4377	24.909	0.3488	1.96E−01	3017.6
38	19.91	2.00	0.4302	24.486	0.3426	1.93E−01	2966.4
39	20.26	2.00	0.4101	23.342	0.3259	1.84E−01	2827.8
40	21.11	2.00	0.2089	11.888	0.1588	9.35E−02	1440.2
41	21.96	2.00	0.5056	28.778	0.4052	2.26E−01	3486.3
42	22.74	2.00	0.3756	21.380	0.2973	1.68E−01	2590.1
43	23.52	2.00	0.2164	12.315	0.1651	9.69E−02	1491.9
44	24.98	2.00	0.3075	17.503	0.2408	1.38E−01	2120.4
45	17.94	3.00	0.0864	4.916	0.0571	3.87E−02	595.6
46	18.93	3.00	0.1161	6.607	0.0818	5.20E−02	800.4
47	19.92	3.00	0.2107	11.992	0.1604	9.44E−02	1452.8
48	20.91	3.00	0.5080	28.912	0.4072	2.28E−01	3502.6
49	22.11	3.00	0.4013	22.838	0.3186	1.80E−01	2766.8
50	22.96	3.00	0.6767	38.512	0.5472	3.03E−01	4665.6
51	23.74	3.00	0.4707	26.787	0.3762	2.11E−01	3245.2
52	24.98	3.00	0.5887	33.507	0.4742	2.64E−01	4059.3
53	18.34	3.40	0.0878	4.995	0.0583	3.93E−02	605.1
54	19.32	3.40	0.1207	6.869	0.0856	5.41E−02	832.2
55	19.82	3.40	0.1401	7.974	0.1017	6.27E−02	966.0
56	20.32	3.40	0.2728	15.526	0.2119	1.22E−01	1880.9
57	20.81	3.40	0.3936	22.401	0.3122	1.76E−01	2713.7
58	21.31	3.40	0.5156	29.344	0.4135	2.31E−01	3554.9
59	21.66	3.40	0.6164	35.079	0.4972	2.76E−01	4249.7
60	22.94	3.40	1.1215	63.828	0.9166	5.02E−01	7732.5
61	23.75	3.40	0.8974	51.077	0.7306	4.02E−01	6187.8
62	24.14	3.40	0.7777	44.263	0.6312	3.48E−01	5362.3
63	22.29	3.60	0.5310	30.222	0.4263	2.38E−01	3661.3
64	22.71	3.60	0.6769	38.525	0.5474	3.03E−01	4667.1
65	23.14	3.60	1.2910	73.475	1.0573	5.78E−01	8901.2
66	23.95	3.60	0.8668	49.332	0.7051	3.88E−01	5976.3
67	24.34	3.60	1.0708	60.946	0.8745	4.80E−01	7383.4
68	13.79	3.80	0.0821	4.671	0.0535	3.68E−02	565.8
69	15.77	3.80	0.0715	4.068	0.0448	3.20E−02	492.9
70	17.75	3.80	0.0756	4.302	0.0482	3.39E−02	521.2
71	19.23	3.80	0.1149	6.537	0.0808	5.14E−02	792.0
72	19.73	3.80	0.1584	9.018	0.1170	7.10E−02	1092.5
73	20.22	3.80	0.2794	15.904	0.2174	1.25E−01	1926.7
74	20.72	3.80	0.4046	23.026	0.3213	1.81E−01	2789.5
75	21.41	3.80	0.6497	36.978	0.5249	2.91E−01	4479.8
76	21.71	3.80	0.7606	43.292	0.6170	3.41E−01	5244.7
77	22.06	3.80	0.8113	46.177	0.6591	3.63E−01	5594.2
78	22.49	3.80	0.7199	40.971	0.5831	3.22E−01	4963.5
79	22.76	3.80	0.6700	38.133	0.5417	3.00E−01	4619.6
80	22.91	3.80	0.8141	46.335	0.6614	3.65E−01	5613.3
81	23.76	3.80	0.9838	55.994	0.8023	4.41E−01	6783.5
82	24.15	3.80	0.9989	56.853	0.8148	4.47E−01	6887.6
83	24.98	3.80	1.0235	58.252	0.8352	4.58E−01	7057.0
84	22.59	3.90	0.6599	37.558	0.5333	2.96E−01	4550.1
85	22.80	3.90	0.6609	37.613	0.5341	2.96E−01	4556.7
86	23.01	3.90	0.9420	53.612	0.7675	4.22E−01	6494.9
87	23.15	3.90	1.0571	60.163	0.8631	4.73E−01	7288.6
88	23.86	3.90	0.9363	53.287	0.7628	4.19E−01	6455.6
89	24.25	3.90	1.1798	67.146	0.9650	5.28E−01	8134.5
90	11.99	2.00	0.1045	5.949	0.0722	4.68E−02	720.8
91	13.97	2.00	0.0984	5.600	0.0671	4.41E−02	678.4

Table A6. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
92	15.98	2.00	0.1024	5.827	0.0704	4.59E–02	705.9
93	17.93	2.00	0.1132	6.443	0.0794	5.07E–02	780.6
94	19.91	2.00	0.4210	23.960	0.3350	1.89E–01	2902.7
95	1.00	–0.25	0.0478	2.723	0.0251	2.14E–02	329.9
96	1.00	0.41	0.0468	2.661	0.0242	2.09E–02	322.4
97	1.00	1.03	0.0467	2.656	0.0242	2.09E–02	321.8
98	1.00	1.65	0.0468	2.663	0.0243	2.10E–02	322.6
99	2.50	–0.25	0.0393	2.239	0.0181	1.76E–02	271.2
100	4.00	–0.25	0.0365	2.080	0.0158	1.64E–02	252.0
101	4.00	0.41	0.0369	2.099	0.0160	1.65E–02	254.3
102	4.00	1.65	0.0364	2.074	0.0157	1.63E–02	251.3
103	5.50	–0.25	0.0357	2.030	0.0150	1.60E–02	245.9
104	7.00	–0.25	0.0490	2.788	0.0261	2.19E–02	337.7
105	8.00	–2.15	0.0450	2.559	0.0227	2.01E–02	310.0
106	8.00	–1.75	0.0472	2.685	0.0246	2.11E–02	325.3
107	8.00	–1.36	0.0487	2.770	0.0258	2.18E–02	335.6
108	8.00	–0.91	0.0512	2.915	0.0279	2.29E–02	353.1
109	8.00	–0.25	0.0532	3.027	0.0296	2.38E–02	366.7
110	8.00	0.00	0.0529	3.010	0.0293	2.37E–02	364.7
111	8.00	0.13	0.0530	3.015	0.0294	2.37E–02	365.2
112	8.00	0.41	0.0530	3.016	0.0294	2.37E–02	365.3
113	8.00	0.86	0.0514	2.923	0.0281	2.30E–02	354.1
114	8.00	1.25	0.0493	2.808	0.0264	2.21E–02	340.2
115	8.00	1.65	0.0473	2.694	0.0247	2.12E–02	326.4
116	9.00	–0.25	0.0535	3.048	0.0299	2.40E–02	369.2
117	9.00	0.00	0.0537	3.055	0.0300	2.40E–02	370.1
118	9.00	0.13	0.0534	3.041	0.0298	2.39E–02	368.4
119	9.00	0.41	0.0526	2.995	0.0291	2.36E–02	362.8
120	9.00	0.76	0.0507	2.888	0.0275	2.27E–02	349.9
121	9.00	1.07	0.0450	2.560	0.0228	2.01E–02	310.1
122	10.00	–0.25	0.0589	3.353	0.0343	2.64E–02	406.2
123	10.00	0.00	0.0591	3.362	0.0345	2.65E–02	407.3
124	10.00	0.13	0.0599	3.407	0.0351	2.68E–02	412.7
125	10.00	0.41	0.0575	3.273	0.0332	2.58E–02	396.5
126	10.00	0.65	0.0565	3.213	0.0323	2.53E–02	389.3
127	10.00	0.83	0.0555	3.160	0.0315	2.49E–02	382.8
128	10.00	0.97	0.0566	3.220	0.0324	2.53E–02	390.1
129	10.00	1.09	0.0583	3.318	0.0338	2.61E–02	401.9
130	11.00	–0.25	0.0620	3.531	0.0369	2.78E–02	427.8
131	11.00	0.00	0.0640	3.641	0.0385	2.87E–02	441.1
132	11.00	0.13	0.0635	3.613	0.0381	2.84E–02	437.6
133	11.00	0.27	0.0632	3.598	0.0379	2.83E–02	435.9
134	11.00	0.55	0.0576	3.279	0.0332	2.58E–02	397.2
135	11.00	0.72	0.0610	3.473	0.0361	2.73E–02	420.7
136	11.00	0.86	0.0627	3.567	0.0374	2.81E–02	432.1
137	11.00	0.98	0.0642	3.654	0.0387	2.88E–02	442.7
138	12.00	–0.25	0.0673	3.831	0.0413	3.01E–02	464.1
139	12.00	0.00	0.0684	3.893	0.0422	3.06E–02	471.7
140	12.00	0.13	0.0678	3.861	0.0417	3.04E–02	467.7
141	12.00	0.27	0.0672	3.823	0.0412	3.01E–02	463.1
142	12.00	0.44	0.0662	3.767	0.0404	2.96E–02	456.3
143	12.00	0.62	0.0669	3.805	0.0409	2.99E–02	461.0
144	12.00	0.76	0.0691	3.932	0.0428	3.09E–02	476.4
145	12.00	0.88	0.0699	3.978	0.0434	3.13E–02	481.9
146	13.00	–0.25	0.0729	4.148	0.0459	3.26E–02	502.5
147	13.00	0.00	0.0742	4.221	0.0470	3.32E–02	511.3
148	13.00	0.13	0.0737	4.197	0.0466	3.30E–02	508.4
149	13.00	0.27	0.0726	4.133	0.0457	3.25E–02	500.7

Table A6. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.0728	4.145	0.0459	3.26E–02	502.1
151	13.00	0.51	0.0740	4.209	0.0468	3.31E–02	509.9
152	13.00	0.65	0.0753	4.288	0.0480	3.37E–02	519.5
153	13.00	0.77	0.0751	4.277	0.0478	3.37E–02	518.1
154	14.00	–0.25	0.0808	4.598	0.0525	3.62E–02	557.1
155	14.00	0.00	0.0825	4.693	0.0539	3.69E–02	568.6
156	14.00	0.13	0.0810	4.612	0.0527	3.63E–02	558.8
157	14.00	0.27	0.0801	4.559	0.0519	3.59E–02	552.2
158	14.00	0.41	0.0782	4.453	0.0504	3.50E–02	539.4
159	14.00	0.55	0.0831	4.731	0.0544	3.72E–02	573.2
160	14.00	0.67	0.0813	4.629	0.0529	3.64E–02	560.8
161	15.00	–0.25	0.0917	5.217	0.0615	4.11E–02	632.1
162	15.00	0.00	0.0930	5.291	0.0626	4.16E–02	641.0
163	15.00	0.13	0.0925	5.262	0.0622	4.14E–02	637.5
164	15.00	0.44	0.0928	5.280	0.0624	4.15E–02	639.6
165	15.00	0.56	0.0914	5.201	0.0613	4.09E–02	630.0
166	16.00	–0.25	0.1083	6.165	0.0754	4.85E–02	746.9
167	16.00	0.00	0.1094	6.228	0.0763	4.90E–02	754.5
168	16.00	0.13	0.1095	6.230	0.0763	4.90E–02	754.8
169	16.00	0.23	0.1087	6.186	0.0757	4.87E–02	749.4
170	16.00	0.34	0.1083	6.166	0.0754	4.85E–02	747.0
171	16.00	0.46	0.1056	6.013	0.0731	4.73E–02	728.5
172	17.00	–0.25	0.1296	7.376	0.0930	5.80E–02	893.5
173	17.00	0.00	0.1338	7.614	0.0965	5.99E–02	922.4
174	17.00	0.13	0.1316	7.487	0.0946	5.89E–02	907.1
175	17.00	0.23	0.1278	7.273	0.0915	5.72E–02	881.0
176	17.00	0.35	0.1251	7.117	0.0892	5.60E–02	862.2
177	18.00	–0.25	0.1609	9.156	0.1190	7.21E–02	1109.3
178	18.00	0.00	0.1678	9.552	0.1248	7.52E–02	1157.2
179	18.00	0.13	0.1650	9.393	0.1224	7.39E–02	1137.9
180	18.00	0.25	0.1604	9.129	0.1186	7.18E–02	1105.9
181	18.50	–0.25	0.1802	10.256	0.1350	8.07E–02	1242.5
182	18.50	0.00	0.1874	10.665	0.1410	8.39E–02	1292.0
183	18.50	0.13	0.1801	10.249	0.1349	8.07E–02	1241.7
184	18.60	0.17	0.1794	10.211	0.1344	8.03E–02	1237.0
185	18.50	0.22	0.1793	10.206	0.1343	8.03E–02	1236.4
186	19.20	–0.25	0.1788	10.177	0.1339	8.01E–02	1233.0
187	19.20	0.00	0.1823	10.374	0.1367	8.16E–02	1256.7
188	19.20	0.13	0.1802	10.254	0.1350	8.07E–02	1242.3
189	19.30	0.17	0.1798	10.231	0.1347	8.05E–02	1239.5
190	19.20	0.22	0.1809	10.297	0.1356	8.10E–02	1247.5
191	20.00	–0.25	0.1886	10.733	0.1420	8.45E–02	1300.3
192	20.00	0.00	0.1867	10.624	0.1404	8.36E–02	1287.0
193	20.00	0.13	0.1889	10.750	0.1422	8.46E–02	1302.3
194	20.10	0.17	0.1915	10.900	0.1444	8.58E–02	1320.5
195	20.00	0.22	0.1891	10.762	0.1424	8.47E–02	1303.8
196	20.80	–0.25	0.2027	11.537	0.1537	9.08E–02	1397.6
197	20.80	0.00	0.2025	11.525	0.1535	9.07E–02	1396.2
198	20.80	0.13	0.2029	11.550	0.1539	9.09E–02	1399.3
199	20.90	0.17	0.2058	11.712	0.1563	9.22E–02	1418.9
200	20.80	0.22	0.2043	11.629	0.1551	9.15E–02	1408.8
201	21.60	–0.25	0.2083	11.853	0.1583	9.33E–02	1436.0
202	21.60	0.00	0.2036	11.591	0.1545	9.12E–02	1404.2
203	21.60	0.13	0.2076	11.817	0.1578	9.30E–02	1431.5
204	21.70	0.17	0.2080	11.838	0.1581	9.31E–02	1434.1
205	21.60	0.22	0.2105	11.978	0.1602	9.43E–02	1451.1
206	22.40	–0.25	0.2094	11.917	0.1593	9.38E–02	1443.7
207	22.40	0.00	0.2064	11.750	0.1568	9.25E–02	1423.4

Table A6. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.2076	11.815	0.1578	9.30E–02	1431.3
209	22.50	0.17	0.2102	11.962	0.1599	9.41E–02	1449.2
210	22.40	0.22	0.2086	11.871	0.1586	9.34E–02	1438.2
211	23.20	–0.25	0.2211	12.582	0.1690	9.90E–02	1524.2
212	23.20	0.00	0.2178	12.397	0.1663	9.76E–02	1501.9
213	23.20	0.13	0.2193	12.479	0.1675	9.82E–02	1511.8
214	23.30	0.17	0.2257	12.847	0.1728	1.01E–01	1556.4
215	23.20	0.22	0.2225	12.666	0.1702	9.97E–02	1534.4
216	24.00	–0.25	0.2400	13.660	0.1847	1.07E–01	1654.8
217	24.00	0.00	0.2370	13.488	0.1822	1.06E–01	1634.0
218	24.00	0.13	0.2366	13.466	0.1819	1.06E–01	1631.4
219	24.10	0.17	0.2420	13.772	0.1863	1.08E–01	1668.5
220	24.00	0.22	0.2395	13.630	0.1843	1.07E–01	1651.2
221	25.00	–0.25	0.2249	12.801	0.1722	1.01E–01	1550.9
222	25.00	0.00	0.2375	13.517	0.1826	1.06E–01	1637.5
223	25.00	0.13	0.2339	13.312	0.1796	1.05E–01	1612.7
224	25.10	0.17	0.2109	12.005	0.1606	9.45E–02	1454.4
225	25.00	0.22	0.2255	12.837	0.1727	1.01E–01	1555.1
226	9.00	999.00	0.0374	2.126	0.0164	1.67E–02	257.6
227	0.00	–2.50	2.2029	125.376	1.8145	9.87E–01	15188.9
228	0.00	–0.54	2.2239	126.571	1.8319	9.96E–01	15333.6
229	0.00	2.00	2.1876	124.505	1.8018	9.80E–01	15083.3
230	20.58	0.00	0.8530	48.550	0.6937	3.82E–01	5881.6
231	20.78	0.00	0.7739	44.044	0.6280	3.47E–01	5335.8
232	20.98	0.00	0.5669	32.265	0.4561	2.54E–01	3908.8
233	21.38	0.00	0.5675	32.297	0.4566	2.54E–01	3912.7
234	21.78	0.00	0.6021	34.268	0.4853	2.70E–01	4151.4
235	22.51	0.00	1.0793	61.430	0.8816	4.83E–01	7442.0
236	22.71	0.00	1.1949	68.009	0.9776	5.35E–01	8239.0
237	22.91	0.00	1.0366	58.998	0.8461	4.64E–01	7147.4
238	23.11	0.00	0.7765	44.192	0.6301	3.48E–01	5353.7
239	23.88	0.00	1.0017	57.010	0.8171	4.49E–01	6906.6
240	24.38	0.00	1.1772	67.002	0.9629	5.27E–01	8117.0
241	24.88	0.00	1.1307	64.355	0.9243	5.06E–01	7796.3
242	25.08	0.00	1.1736	66.794	0.9598	5.26E–01	8091.9
243	25.38	0.00	0.9825	55.920	0.8012	4.40E–01	6774.5
244	0.58	999.00	0.0328	1.869	0.0127	1.47E–02	226.4
245	0.86	999.00	0.0331	1.886	0.0129	1.48E–02	228.5
246	1.15	999.00	0.0333	1.894	0.0130	1.49E–02	229.4
247	1.43	999.00	0.0331	1.887	0.0129	1.48E–02	228.6
248	1.72	999.00	0.0331	1.882	0.0129	1.48E–02	228.0
249	2.00	999.00	0.0335	1.904	0.0132	1.50E–02	230.7
250	2.29	999.00	0.0329	1.872	0.0127	1.47E–02	226.8
251	2.57	999.00	0.0329	1.870	0.0127	1.47E–02	226.5
252	2.86	999.00	0.0312	1.776	0.0113	1.40E–02	215.1
253	3.14	999.00	0.0338	1.924	0.0135	1.51E–02	233.1
254	3.43	999.00	0.0331	1.885	0.0129	1.48E–02	228.4
255	999.00	999.00	0.0313	1.780	0.0114	1.40E–02	215.6
256	999.00	999.00	0.0319	1.816	0.0119	1.43E–02	220.1

Table A7. Flow Conditions and Pressure Distribution for Run 43

[CR = 5; Re = 2.15×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1442.07	(.99427E+07)
$T_{t,1}$, °R (K)	1807.55	(1004.19)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0648	(33.37)
$h_{t,1}$, btu/lbm (J/kg)	454.66	(.10568E+07)
Free-stream conditions:		
M_∞	9.93	
p_∞, psia (N/m^2)	0.0349	(240.65)
T_∞, °R (K)	91.23	(50.68)
ρ_∞, slug/ft^3 (kg/m^3)	0.32099E−04	(.16543E−01)
h_∞, btu/lbm (J/kg)	0.21757E+02	(.50573E+05)
a_∞, ft/s (m/s)	468.57	(142.82)
u_∞, ft/s (m/s)	4654.31	(1418.64)
Re_∞, ft^{-1} (m^{-1})	0.22061E+07	(.72377E+07)
q_∞, psia (N/m^2)	2.414	(16646.71)
μ_∞, slug/ft-s (N-s/m^2)	0.67722E−07	(.32425E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.475	(30835.77)
$T_{t,2}$, °R (K)	1815.96	(1008.87)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20674E−03	(.10655E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0939	2.956	0.0275	2.24E−02	647.1
2	11.18	0.20	0.1006	3.168	0.0305	2.40E−02	693.5
3	12.17	0.20	0.1106	3.482	0.0349	2.64E−02	762.3
4	13.15	0.20	0.1203	3.789	0.0392	2.87E−02	829.5
5	14.21	0.20	0.1370	4.316	0.0466	3.27E−02	944.8
6	15.14	0.20	0.1480	4.662	0.0514	3.53E−02	1020.4
7	16.13	0.20	0.1708	5.380	0.0615	4.08E−02	1177.8
8	17.12	0.20	0.2110	6.647	0.0793	5.04E−02	1455.0
9	18.11	0.20	0.2774	8.739	0.1087	6.63E−02	1912.9
10	19.74	0.20	0.3219	10.140	0.1284	7.69E−02	2219.6
11	20.55	0.20	0.3421	10.775	0.1374	8.17E−02	2358.7
12	22.56	0.20	0.3586	11.296	0.1447	8.56E−02	2472.6
13	24.98	0.20	0.4072	12.826	0.1662	9.72E−02	2807.5
14	10.59	0.60	0.1708	5.379	0.0615	4.08E−02	1177.4
15	11.58	0.60	0.1532	4.827	0.0538	3.66E−02	1056.6
16	12.57	0.60	0.1502	4.731	0.0524	3.59E−02	1035.6
17	13.56	0.60	0.1469	4.628	0.0510	3.51E−02	1013.1
18	14.60	0.60	0.1523	4.797	0.0534	3.64E−02	1050.1
19	15.54	0.60	0.1647	5.189	0.0589	3.93E−02	1135.8
20	16.53	0.60	0.1889	5.951	0.0696	4.51E−02	1302.6
21	17.52	0.60	0.2315	7.293	0.0884	5.53E−02	1596.5
22	18.51	0.60	0.3040	9.575	0.1205	7.26E−02	2096.0
23	12.97	1.00	0.1674	5.273	0.0600	4.00E−02	1154.3
24	15.00	1.00	0.1858	5.851	0.0682	4.44E−02	1280.8
25	15.94	1.00	0.1990	6.267	0.0740	4.75E−02	1371.9
26	16.93	1.00	0.2230	7.024	0.0846	5.33E−02	1537.5
27	17.92	1.00	0.2606	8.207	0.1013	6.22E−02	1796.5
28	18.91	1.00	0.3905	12.302	0.1588	9.33E−02	2692.8
29	24.98	1.00	0.4185	13.183	0.1712	1.00E−01	2885.8
30	11.99	2.00	0.1733	5.459	0.0627	4.14E−02	1195.0
31	13.97	2.00	0.1497	4.715	0.0522	3.58E−02	1032.2
32	15.98	2.00	0.1623	5.111	0.0578	3.88E−02	1118.8
33	16.94	2.00	0.1676	5.278	0.0601	4.00E−02	1155.3

Table A7. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1777	5.596	0.0646	4.24E−02	1225.0
35	18.42	2.00	0.2206	6.950	0.0836	5.27E−02	1521.4
36	18.92	2.00	0.3757	11.834	0.1522	8.97E−02	2590.5
37	19.41	2.00	0.7192	22.655	0.3043	1.72E−01	4959.0
38	19.91	2.00	0.8966	28.243	0.3828	2.14E−01	6182.3
39	20.26	2.00	0.8877	27.962	0.3788	2.12E−01	6120.9
40	21.11	2.00	0.3819	12.030	0.1550	9.12E−02	2633.3
41	21.96	2.00	0.8216	25.881	0.3496	1.96E−01	5665.2
42	22.74	2.00	0.7458	23.491	0.3160	1.78E−01	5142.1
43	23.52	2.00	0.4203	13.239	0.1720	1.00E−01	2898.1
44	24.98	2.00	0.6191	19.500	0.2599	1.48E−01	4268.4
45	17.94	3.00	0.1402	4.418	0.0480	3.35E−02	967.0
46	18.93	3.00	0.1885	5.939	0.0694	4.50E−02	1299.9
47	19.92	3.00	0.2819	8.878	0.1107	6.73E−02	1943.4
48	20.91	3.00	0.9137	28.782	0.3904	2.18E−01	6300.3
49	22.11	3.00	0.6089	19.180	0.2554	1.45E−01	4198.5
50	22.96	3.00	1.3102	41.269	0.5658	3.13E−01	9033.7
51	23.74	3.00	0.8739	27.527	0.3727	2.09E−01	6025.5
52	24.98	3.00	1.4621	46.055	0.6331	3.49E−01	10081.2
53	18.34	3.40	0.1443	4.546	0.0498	3.45E−02	995.1
54	19.32	3.40	0.1945	6.126	0.0720	4.64E−02	1340.9
55	19.82	3.40	0.2649	8.345	0.1032	6.33E−02	1826.8
56	20.32	3.40	0.3886	12.242	0.1580	9.28E−02	2679.7
57	20.81	3.40	0.5851	18.430	0.2449	1.40E−01	4034.3
58	21.31	3.40	0.7493	23.601	0.3176	1.79E−01	5166.1
59	21.66	3.40	0.9439	29.733	0.4037	2.25E−01	6508.4
60	22.94	3.40	1.0243	32.264	0.4393	2.45E−01	7062.5
61	23.75	3.40	1.4394	45.340	0.6230	3.44E−01	9924.8
62	24.14	3.40	1.1516	36.275	0.4957	2.75E−01	7940.6
63	22.29	3.60	1.1014	34.694	0.4734	2.63E−01	7594.4
64	22.71	3.60	1.1364	35.795	0.4889	2.71E−01	7835.4
65	23.14	3.60	1.1586	36.495	0.4987	2.77E−01	7988.6
66	23.95	3.60	1.5581	49.077	0.6755	3.72E−01	10742.8
67	24.34	3.60	1.3830	43.562	0.5980	3.30E−01	9535.6
68	13.79	3.80	0.1357	4.275	0.0460	3.24E−02	935.7
69	15.77	3.80	0.1125	3.544	0.0358	2.69E−02	775.8
70	17.75	3.80	0.1143	3.600	0.0365	2.73E−02	788.1
71	19.23	3.80	0.1836	5.784	0.0672	4.39E−02	1266.1
72	19.73	3.80	0.2602	8.195	0.1011	6.21E−02	1793.9
73	20.22	3.80	0.4320	13.609	0.1772	1.03E−01	2979.0
74	20.72	3.80	0.5801	18.272	0.2427	1.39E−01	3999.7
75	21.41	3.80	0.9662	30.435	0.4136	2.31E−01	6662.0
76	21.71	3.80	1.2566	39.581	0.5421	3.00E−01	8664.1
77	22.06	3.80	1.4170	44.633	0.6131	3.38E−01	9770.0
78	22.49	3.80	1.1726	36.936	0.5049	2.80E−01	8085.1
79	22.76	3.80	1.1230	35.372	0.4830	2.68E−01	7742.9
80	22.91	3.80	1.0065	31.704	0.4314	2.40E−01	6939.8
81	23.76	3.80	1.7194	54.158	0.7469	4.11E−01	11855.1
82	24.15	3.80	1.4999	47.245	0.6498	3.58E−01	10341.7
83	24.98	3.80	2.0794	65.498	0.9063	4.97E−01	14337.2
84	22.59	3.90	1.2265	38.634	0.5288	2.93E−01	8456.8
85	22.80	3.90	1.1244	35.417	0.4836	2.69E−01	7752.6
86	23.01	3.90	1.0244	32.266	0.4393	2.45E−01	7063.0
87	23.15	3.90	1.0569	33.291	0.4537	2.52E−01	7287.2
88	23.86	3.90	1.5745	49.595	0.6828	3.76E−01	10856.1
89	24.25	3.90	1.3277	41.820	0.5736	3.17E−01	9154.2
90	11.99	2.00	0.1777	5.597	0.0646	4.24E−02	1225.2
91	13.97	2.00	0.1620	5.104	0.0577	3.87E−02	1117.3

Table A7. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
92	15.98	2.00	0.1714	5.400	0.0618	4.09E–02	1182.1
93	17.93	2.00	0.1876	5.910	0.0690	4.48E–02	1293.6
94	19.91	2.00	0.8400	26.459	0.3577	2.01E–01	5791.8
95	1.00	–0.25	0.0724	2.280	0.0180	1.73E–02	499.2
96	1.00	0.41	0.0709	2.233	0.0173	1.69E–02	488.8
97	1.00	1.03	0.0711	2.239	0.0174	1.70E–02	490.2
98	1.00	1.65	0.0721	2.270	0.0178	1.72E–02	496.9
99	2.50	–0.25	0.0567	1.787	0.0111	1.36E–02	391.2
100	4.00	–0.25	0.0520	1.639	0.0090	1.24E–02	358.7
101	4.00	0.41	0.0528	1.663	0.0093	1.26E–02	364.1
102	4.00	1.65	0.0516	1.624	0.0088	1.23E–02	355.5
103	5.50	–0.25	0.0511	1.611	0.0086	1.22E–02	352.6
104	7.00	–0.25	0.0734	2.311	0.0184	1.75E–02	505.8
105	8.00	–2.15	0.0666	2.098	0.0154	1.59E–02	459.3
106	8.00	–1.75	0.0706	2.222	0.0172	1.68E–02	486.5
107	8.00	–1.36	0.0734	2.311	0.0184	1.75E–02	505.8
108	8.00	–0.91	0.0768	2.420	0.0199	1.83E–02	529.7
109	8.00	–0.25	0.0796	2.509	0.0212	1.90E–02	549.2
110	8.00	0.00	0.0793	2.498	0.0211	1.89E–02	546.9
111	8.00	0.13	0.0786	2.477	0.0208	1.88E–02	542.2
112	8.00	0.41	0.0792	2.495	0.0210	1.89E–02	546.2
113	8.00	0.86	0.0769	2.424	0.0200	1.84E–02	530.6
114	8.00	1.25	0.0739	2.329	0.0187	1.77E–02	509.8
115	8.00	1.65	0.0706	2.223	0.0172	1.69E–02	486.6
116	9.00	–0.25	0.0804	2.532	0.0215	1.92E–02	554.2
117	9.00	0.00	0.0804	2.532	0.0215	1.92E–02	554.3
118	9.00	0.13	0.0805	2.535	0.0216	1.92E–02	554.9
119	9.00	0.41	0.0790	2.490	0.0209	1.89E–02	545.0
120	9.00	0.76	0.0703	2.215	0.0171	1.68E–02	484.8
121	9.00	1.07	0.0613	1.932	0.0131	1.46E–02	422.9
122	10.00	–0.25	0.0856	2.696	0.0238	2.04E–02	590.1
123	10.00	0.00	0.0857	2.699	0.0239	2.05E–02	590.8
124	10.00	0.13	0.0864	2.721	0.0242	2.06E–02	595.6
125	10.00	0.41	0.0832	2.619	0.0228	1.99E–02	573.3
126	10.00	0.65	0.0811	2.556	0.0219	1.94E–02	559.4
127	10.00	0.83	0.0791	2.492	0.0210	1.89E–02	545.5
128	10.00	0.97	0.0807	2.541	0.0217	1.93E–02	556.3
129	10.00	1.09	0.0858	2.701	0.0239	2.05E–02	591.3
130	11.00	–0.25	0.0915	2.883	0.0265	2.19E–02	631.2
131	11.00	0.00	0.0950	2.993	0.0280	2.27E–02	655.1
132	11.00	0.13	0.0945	2.977	0.0278	2.26E–02	651.6
133	11.00	0.27	0.0936	2.948	0.0274	2.24E–02	645.4
134	11.00	0.55	0.0860	2.710	0.0240	2.05E–02	593.1
135	11.00	0.72	0.0894	2.817	0.0255	2.14E–02	616.7
136	11.00	0.86	0.0929	2.926	0.0271	2.22E–02	640.4
137	11.00	0.98	0.0969	3.052	0.0288	2.31E–02	668.2
138	12.00	–0.25	0.1002	3.157	0.0303	2.39E–02	691.1
139	12.00	0.00	0.1035	3.259	0.0317	2.47E–02	713.4
140	12.00	0.13	0.1026	3.233	0.0314	2.45E–02	707.6
141	12.00	0.27	0.1008	3.174	0.0306	2.41E–02	694.9
142	12.00	0.44	0.0976	3.075	0.0292	2.33E–02	673.2
143	12.00	0.62	0.0997	3.142	0.0301	2.38E–02	687.8
144	12.00	0.76	0.1052	3.314	0.0325	2.51E–02	725.5
145	12.00	0.88	0.1065	3.355	0.0331	2.54E–02	734.4
146	13.00	–0.25	0.1116	3.514	0.0353	2.66E–02	769.1
147	13.00	0.00	0.1151	3.625	0.0369	2.75E–02	793.6
148	13.00	0.13	0.1137	3.581	0.0363	2.72E–02	784.0
149	13.00	0.27	0.1119	3.524	0.0355	2.67E–02	771.4

Table A7. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.1091	3.438	0.0343	2.61E–02	752.5
151	13.00	0.51	0.1117	3.520	0.0354	2.67E–02	770.4
152	13.00	0.65	0.1164	3.667	0.0375	2.78E–02	802.7
153	13.00	0.77	0.1167	3.675	0.0376	2.79E–02	804.4
154	14.00	–0.25	0.1255	3.953	0.0415	3.00E–02	865.4
155	14.00	0.00	0.1292	4.069	0.0431	3.09E–02	890.7
156	14.00	0.13	0.1269	3.998	0.0421	3.03E–02	875.2
157	14.00	0.27	0.1257	3.958	0.0416	3.00E–02	866.4
158	14.00	0.41	0.1236	3.894	0.0407	2.95E–02	852.4
159	14.00	0.55	0.1322	4.165	0.0445	3.16E–02	911.8
160	14.00	0.67	0.1296	4.081	0.0433	3.09E–02	893.3
161	15.00	–0.25	0.1476	4.649	0.0513	3.52E–02	1017.6
162	15.00	0.00	0.1517	4.779	0.0531	3.62E–02	1046.2
163	15.00	0.13	0.1517	4.777	0.0531	3.62E–02	1045.7
164	15.00	0.44	0.1500	4.726	0.0523	3.58E–02	1034.4
165	15.00	0.56	0.1471	4.632	0.0510	3.51E–02	1014.0
166	16.00	–0.25	0.1753	5.522	0.0635	4.19E–02	1208.8
167	16.00	0.00	0.1809	5.697	0.0660	4.32E–02	1247.0
168	16.00	0.13	0.1801	5.672	0.0657	4.30E–02	1241.6
169	16.00	0.23	0.1787	5.630	0.0651	4.27E–02	1232.3
170	16.00	0.34	0.1771	5.579	0.0643	4.23E–02	1221.1
171	16.00	0.46	0.1702	5.361	0.0613	4.06E–02	1173.4
172	17.00	–0.25	0.2165	6.821	0.0818	5.17E–02	1493.0
173	17.00	0.00	0.2209	6.959	0.0837	5.28E–02	1523.3
174	17.00	0.13	0.2226	7.012	0.0845	5.32E–02	1534.9
175	17.00	0.23	0.2184	6.880	0.0826	5.22E–02	1506.1
176	17.00	0.35	0.2176	6.854	0.0823	5.20E–02	1500.3
177	18.00	–0.25	0.2887	9.092	0.1137	6.89E–02	1990.2
178	18.00	0.00	0.2928	9.222	0.1155	6.99E–02	2018.6
179	18.00	0.13	0.2942	9.268	0.1162	7.03E–02	2028.8
180	18.00	0.25	0.2936	9.249	0.1159	7.01E–02	2024.7
181	18.50	–0.25	0.3438	10.829	0.1381	8.21E–02	2370.3
182	18.50	0.00	0.3533	11.129	0.1423	8.44E–02	2436.1
183	18.50	0.13	0.3487	10.984	0.1403	8.33E–02	2404.3
184	18.60	0.17	0.3444	10.848	0.1384	8.22E–02	2374.7
185	18.50	0.22	0.3481	10.964	0.1400	8.31E–02	2400.0
186	19.20	–0.25	0.3407	10.730	0.1367	8.14E–02	2348.8
187	19.20	0.00	0.3305	10.409	0.1322	7.89E–02	2278.5
188	19.20	0.13	0.3360	10.582	0.1346	8.02E–02	2316.4
189	19.30	0.17	0.3348	10.547	0.1341	8.00E–02	2308.6
190	19.20	0.22	0.3449	10.865	0.1386	8.24E–02	2378.4
191	20.00	–0.25	0.3370	10.614	0.1351	8.05E–02	2323.4
192	20.00	0.00	0.3285	10.348	0.1314	7.85E–02	2265.2
193	20.00	0.13	0.3320	10.457	0.1329	7.93E–02	2289.0
194	20.10	0.17	0.3398	10.704	0.1364	8.12E–02	2343.1
195	20.00	0.22	0.3388	10.673	0.1359	8.09E–02	2336.3
196	20.80	–0.25	0.3644	11.477	0.1472	8.70E–02	2512.4
197	20.80	0.00	0.3668	11.552	0.1483	8.76E–02	2528.8
198	20.80	0.13	0.3647	11.488	0.1474	8.71E–02	2514.7
199	20.90	0.17	0.3699	11.652	0.1497	8.83E–02	2550.6
200	20.80	0.22	0.3698	11.647	0.1496	8.83E–02	2549.6
201	21.60	–0.25	0.3672	11.567	0.1485	8.77E–02	2532.0
202	21.60	0.00	0.3594	11.319	0.1450	8.58E–02	2477.8
203	21.60	0.13	0.3630	11.434	0.1466	8.67E–02	2503.0
204	21.70	0.17	0.3636	11.452	0.1469	8.68E–02	2506.9
205	21.60	0.22	0.3687	11.614	0.1491	8.81E–02	2542.2
206	22.40	–0.25	0.3563	11.222	0.1436	8.51E–02	2456.4
207	22.40	0.00	0.3518	11.081	0.1416	8.40E–02	2425.6

Table A7. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.3539	11.147	0.1426	8.45E–02	2440.0
209	22.50	0.17	0.3552	11.187	0.1431	8.48E–02	2448.8
210	22.40	0.22	0.3575	11.261	0.1442	8.54E–02	2464.9
211	23.20	–0.25	0.3696	11.643	0.1495	8.83E–02	2548.6
212	23.20	0.00	0.3638	11.458	0.1470	8.69E–02	2508.2
213	23.20	0.13	0.3661	11.532	0.1480	8.74E–02	2524.3
214	23.30	0.17	0.3748	11.807	0.1519	8.95E–02	2584.6
215	23.20	0.22	0.3707	11.677	0.1500	8.85E–02	2556.0
216	24.00	–0.25	0.4134	13.023	0.1689	9.87E–02	2850.6
217	24.00	0.00	0.4112	12.954	0.1680	9.82E–02	2835.5
218	24.00	0.13	0.4099	12.910	0.1673	9.79E–02	2825.9
219	24.10	0.17	0.4166	13.122	0.1703	9.95E–02	2872.3
220	24.00	0.22	0.4166	13.123	0.1703	9.95E–02	2872.5
221	25.00	–0.25	0.3923	12.358	0.1596	9.37E–02	2705.1
222	25.00	0.00	0.4183	13.177	0.1711	9.99E–02	2884.4
223	25.00	0.13	0.4130	13.010	0.1688	9.86E–02	2847.9
224	25.10	0.17	0.3705	11.672	0.1500	8.85E–02	2554.9
225	25.00	0.22	0.3963	12.482	0.1613	9.46E–02	2732.3
226	9.00	999.00	0.0426	1.343	0.0048	1.02E–02	293.9
227	0.00	–2.50	4.1966	132.190	1.8433	1.00E+00	28935.8
228	0.00	–0.54	4.2499	133.867	1.8669	1.01E+00	29303.0
229	0.00	2.00	4.1458	130.589	1.8209	9.90E–01	28585.4
230	20.58	0.00	1.1613	36.581	0.4999	2.77E–01	8007.4
231	20.78	0.00	1.2937	40.750	0.5585	3.09E–01	8920.0
232	20.98	0.00	1.2066	38.007	0.5200	2.88E–01	8319.5
233	21.38	0.00	0.8288	26.106	0.3528	1.98E–01	5714.5
234	21.78	0.00	1.0548	33.224	0.4528	2.52E–01	7272.5
235	22.51	0.00	1.5092	47.537	0.6539	3.60E–01	10405.6
236	22.71	0.00	1.8712	58.940	0.8141	4.47E–01	12901.7
237	22.91	0.00	1.8990	59.817	0.8264	4.54E–01	13093.7
238	23.11	0.00	1.4702	46.309	0.6366	3.51E–01	10136.8
239	23.88	0.00	0.9780	30.807	0.4188	2.34E–01	6743.5
240	24.38	0.00	2.2441	70.687	0.9792	5.36E–01	15473.2
241	24.88	0.00	1.8080	56.951	0.7862	4.32E–01	12466.4
242	25.08	0.00	1.7274	54.412	0.7505	4.13E–01	11910.5
243	25.38	0.00	1.8439	58.081	0.8020	4.40E–01	12713.8
244	0.58	999.00	0.0311	0.979	–0.0003	7.42E–03	214.3
245	0.86	999.00	0.0317	1.000	0.0000	7.58E–03	218.9
246	1.15	999.00	0.0315	0.993	–0.0001	7.53E–03	217.3
247	1.43	999.00	0.0313	0.987	–0.0002	7.48E–03	216.0
248	1.72	999.00	0.0310	0.976	–0.0003	7.40E–03	213.7
249	2.00	999.00	0.0316	0.994	–0.0001	7.54E–03	217.6
250	2.29	999.00	0.0313	0.986	–0.0002	7.47E–03	215.8
251	2.57	999.00	0.0309	0.973	–0.0004	7.38E–03	213.0
252	2.86	999.00	0.0306	0.964	–0.0005	7.31E–03	211.0
253	3.14	999.00	0.0311	0.981	–0.0003	7.43E–03	214.6
254	3.43	999.00	0.0311	0.978	–0.0003	7.42E–03	214.1
255	999.00	999.00	0.0298	0.939	–0.0009	7.12E–03	205.6
256	999.00	999.00	0.0288	0.907	–0.0013	6.87E–03	198.5

Table A8. Flow Conditions and Pressure Distribution for Run 44

[CR = 5; Re = 0.55×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	354.43	(.24437E+07)
$T_{t,1}$, °R (K)	1855.42	(1030.79)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0159	(8.19)
$h_{t,1}$, btu/lbm (J/kg)	466.03	(.10832E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0100	(69.26)
T_∞, °R (K)	98.49	(54.71)
ρ_∞, slug/ft^3 (kg/m^3)	0.85575E−05	(.44104E−02)
h_∞, btu/lbm (J/kg)	0.23488E+02	(.54597E+05)
a_∞, ft/s (m/s)	486.86	(148.39)
u_∞, ft/s (m/s)	4705.86	(1434.35)
Re_∞, ft^{-1} (m^{-1})	0.54326E+06	(.17824E+07)
q_∞, psia (N/m^2)	0.658	(4536.85)
μ_∞, slug/ft-s (N-s/m^2)	0.74126E−07	(.35492E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.220	(8417.16)
$T_{t,2}$, °R (K)	1857.53	(1031.96)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.55109E−04	(.28402E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0408	4.288	0.0494	3.47E−02	281.4
2	11.18	0.20	0.0438	4.597	0.0540	3.72E−02	301.7
3	12.17	0.20	0.0454	4.764	0.0565	3.86E−02	312.7
4	13.15	0.20	0.0488	5.125	0.0620	4.15E−02	336.4
5	14.21	0.20	0.0553	5.809	0.0722	4.71E−02	381.3
6	15.14	0.20	0.0587	6.161	0.0775	4.99E−02	404.4
7	16.13	0.20	0.0682	7.168	0.0927	5.81E−02	470.5
8	17.12	0.20	0.0813	8.542	0.1133	6.92E−02	560.7
9	18.11	0.20	0.0995	10.454	0.1420	8.47E−02	686.2
10	19.74	0.20	0.1147	12.053	0.1660	9.76E−02	791.1
11	20.55	0.20	0.1222	12.841	0.1779	1.04E−01	842.9
12	22.56	0.20	0.1323	13.893	0.1937	1.13E−01	912.0
13	24.98	0.20	0.1312	13.777	0.1919	1.12E−01	904.3
14	10.59	0.60	0.0562	5.898	0.0736	4.78E−02	387.2
15	11.58	0.60	0.0489	5.133	0.0621	4.16E−02	336.9
16	12.57	0.60	0.0481	5.050	0.0608	4.09E−02	331.5
17	13.56	0.60	0.0497	5.216	0.0633	4.23E−02	342.4
18	14.60	0.60	0.0546	5.736	0.0711	4.65E−02	376.5
19	15.54	0.60	0.0610	6.406	0.0812	5.19E−02	420.5
20	16.53	0.60	0.0725	7.612	0.0993	6.17E−02	499.7
21	17.52	0.60	0.0876	9.199	0.1232	7.45E−02	603.8
22	18.51	0.60	0.1060	11.131	0.1522	9.02E−02	730.6
23	12.97	1.00	0.0640	6.724	0.0860	5.45E−02	441.4
24	15.00	1.00	0.0649	6.818	0.0874	5.52E−02	447.5
25	15.94	1.00	0.0685	7.192	0.0930	5.83E−02	472.1
26	16.93	1.00	0.0772	8.110	0.1068	6.57E−02	532.4
27	17.92	1.00	0.0989	10.391	0.1411	8.42E−02	682.0
28	18.91	1.00	0.1241	13.040	0.1809	1.06E−01	855.9
29	24.98	1.00	0.1332	13.991	0.1952	1.13E−01	918.4
30	11.99	2.00	0.0617	6.481	0.0823	5.25E−02	425.4
31	13.97	2.00	0.0576	6.052	0.0759	4.90E−02	397.2
32	15.98	2.00	0.0604	6.348	0.0803	5.14E−02	416.7
33	16.94	2.00	0.0622	6.538	0.0832	5.30E−02	429.2

Table A8. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0653	6.863	0.0881	5.56E−02	450.5
35	18.42	2.00	0.1156	12.141	0.1674	9.84E−02	796.9
36	18.92	2.00	0.1969	20.678	0.2956	1.68E−01	1357.3
37	19.41	2.00	0.2133	22.408	0.3216	1.82E−01	1470.8
38	19.91	2.00	0.2181	22.913	0.3292	1.86E−01	1504.0
39	20.26	2.00	0.2244	23.575	0.3391	1.91E−01	1547.5
40	21.11	2.00	0.1313	13.794	0.1922	1.12E−01	905.5
41	21.96	2.00	0.2861	30.053	0.4364	2.43E−01	1972.7
42	22.74	2.00	0.1906	20.023	0.2857	1.62E−01	1314.3
43	23.52	2.00	0.1078	11.325	0.1551	9.17E−02	743.4
44	24.98	2.00	0.1563	16.418	0.2316	1.33E−01	1077.7
45	17.94	3.00	0.0525	5.511	0.0678	4.46E−02	361.7
46	18.93	3.00	0.0668	7.013	0.0903	5.68E−02	460.3
47	19.92	3.00	0.1993	20.938	0.2995	1.70E−01	1374.4
48	20.91	3.00	0.2950	30.986	0.4504	2.51E−01	2033.9
49	22.11	3.00	0.2249	23.624	0.3399	1.91E−01	1550.7
50	22.96	3.00	0.3642	38.256	0.5596	3.10E−01	2511.1
51	23.74	3.00	0.2042	21.451	0.3072	1.74E−01	1408.0
52	24.98	3.00	0.2863	30.076	0.4368	2.44E−01	1974.2
53	18.34	3.40	0.0523	5.492	0.0675	4.45E−02	360.5
54	19.32	3.40	0.0689	7.240	0.0937	5.87E−02	475.2
55	19.82	3.40	0.0951	9.991	0.1351	8.09E−02	655.8
56	20.32	3.40	0.1536	16.134	0.2273	1.31E−01	1059.0
57	20.81	3.40	0.2304	24.204	0.3486	1.96E−01	1588.7
58	21.31	3.40	0.2621	27.527	0.3985	2.23E−01	1806.8
59	21.66	3.40	0.2810	29.517	0.4284	2.39E−01	1937.5
60	22.94	3.40	0.3155	33.141	0.4828	2.68E−01	2175.4
61	23.75	3.40	0.3780	39.711	0.5815	3.22E−01	2606.6
62	24.14	3.40	0.3969	41.690	0.6112	3.38E−01	2736.5
63	22.29	3.60	0.1805	18.961	0.2698	1.54E−01	1244.6
64	22.71	3.60	0.2796	29.369	0.4261	2.38E−01	1927.8
65	23.14	3.60	0.3841	40.342	0.5910	3.27E−01	2648.0
66	23.95	3.60	0.4490	47.165	0.6935	3.82E−01	3095.9
67	24.34	3.60	0.3142	33.005	0.4808	2.67E−01	2166.4
68	13.79	3.80	0.0488	5.122	0.0619	4.15E−02	336.2
69	15.77	3.80	0.0410	4.307	0.0497	3.49E−02	282.7
70	17.75	3.80	0.0417	4.378	0.0507	3.55E−02	287.4
71	19.23	3.80	0.0562	5.904	0.0737	4.78E−02	387.6
72	19.73	3.80	0.0592	6.222	0.0784	5.04E−02	408.4
73	20.22	3.80	0.0743	7.808	0.1023	6.33E−02	512.5
74	20.72	3.80	0.1144	12.012	0.1654	9.73E−02	788.5
75	21.41	3.80	0.1943	20.413	0.2916	1.65E−01	1339.9
76	21.71	3.80	0.2306	24.228	0.3489	1.96E−01	1590.3
77	22.06	3.80	0.2869	30.132	0.4376	2.44E−01	1977.9
78	22.49	3.80	0.2843	29.860	0.4335	2.42E−01	1960.0
79	22.76	3.80	0.2880	30.247	0.4393	2.45E−01	1985.4
80	22.91	3.80	0.2870	30.142	0.4378	2.44E−01	1978.5
81	23.76	3.80	0.4220	44.326	0.6508	3.59E−01	2909.6
82	24.15	3.80	0.4968	52.183	0.7688	4.23E−01	3425.3
83	24.98	3.80	0.7699	80.872	1.1998	6.55E−01	5308.4
84	22.59	3.90	0.2912	30.588	0.4445	2.48E−01	2007.8
85	22.80	3.90	0.2612	27.440	0.3972	2.22E−01	1801.1
86	23.01	3.90	0.3359	35.279	0.5149	2.86E−01	2315.7
87	23.15	3.90	0.4358	45.775	0.6726	3.71E−01	3004.7
88	23.86	3.90	1.1110	116.700	1.7380	9.45E−01	7660.1
89	24.25	3.90	0.6926	72.755	1.0779	5.89E−01	4775.6
90	11.99	2.00	0.0615	6.460	0.0820	5.23E−02	424.0
91	13.97	2.00	0.0585	6.150	0.0774	4.98E−02	403.7

Table A8. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0600	6.300	0.0796	5.10E–02	413.5
93	17.93	2.00	0.0666	6.995	0.0901	5.67E–02	459.2
94	19.91	2.00	0.2182	22.923	0.3293	1.86E–01	1504.6
95	1.00	–0.25	0.0307	3.220	0.0333	2.61E–02	211.4
96	1.00	0.41	0.0301	3.166	0.0325	2.56E–02	207.8
97	1.00	1.03	0.0305	3.207	0.0332	2.60E–02	210.5
98	1.00	1.65	0.0300	3.151	0.0323	2.55E–02	206.8
99	2.50	–0.25	0.0251	2.639	0.0246	2.14E–02	173.2
100	4.00	–0.25	0.0241	2.530	0.0230	2.05E–02	166.0
101	4.00	0.41	0.0238	2.497	0.0225	2.02E–02	163.9
102	4.00	1.65	0.0230	2.418	0.0213	1.96E–02	158.7
103	5.50	–0.25	0.0228	2.392	0.0209	1.94E–02	157.0
104	7.00	–0.25	0.0294	3.093	0.0314	2.51E–02	203.0
105	8.00	–2.15	0.0275	2.892	0.0284	2.34E–02	189.9
106	8.00	–1.75	0.0288	3.021	0.0304	2.45E–02	198.3
107	8.00	–1.36	0.0299	3.136	0.0321	2.54E–02	205.8
108	8.00	–0.91	0.0312	3.278	0.0342	2.66E–02	215.2
109	8.00	–0.25	0.0325	3.414	0.0363	2.77E–02	224.1
110	8.00	0.00	0.0325	3.415	0.0363	2.77E–02	224.1
111	8.00	0.13	0.0327	3.433	0.0365	2.78E–02	225.3
112	8.00	0.41	0.0330	3.466	0.0370	2.81E–02	227.5
113	8.00	0.86	0.0318	3.341	0.0352	2.71E–02	219.3
114	8.00	1.25	0.0306	3.211	0.0332	2.60E–02	210.8
115	8.00	1.65	0.0290	3.045	0.0307	2.47E–02	199.9
116	9.00	–0.25	0.0333	3.502	0.0376	2.84E–02	229.9
117	9.00	0.00	0.0337	3.536	0.0381	2.86E–02	232.1
118	9.00	0.13	0.0329	3.456	0.0369	2.80E–02	226.9
119	9.00	0.41	0.0329	3.457	0.0369	2.80E–02	226.9
120	9.00	0.76	0.0326	3.421	0.0364	2.77E–02	224.6
121	9.00	1.07	0.0293	3.073	0.0311	2.49E–02	201.7
122	10.00	–0.25	0.0367	3.853	0.0429	3.12E–02	252.9
123	10.00	0.00	0.0365	3.830	0.0425	3.10E–02	251.4
124	10.00	0.13	0.0375	3.937	0.0441	3.19E–02	258.4
125	10.00	0.41	0.0360	3.778	0.0417	3.06E–02	248.0
126	10.00	0.65	0.0350	3.680	0.0403	2.98E–02	241.6
127	10.00	0.83	0.0345	3.624	0.0394	2.94E–02	237.9
128	10.00	0.97	0.0345	3.626	0.0394	2.94E–02	238.0
129	10.00	1.09	0.0359	3.775	0.0417	3.06E–02	247.8
130	11.00	–0.25	0.0347	3.647	0.0398	2.95E–02	239.4
131	11.00	0.00	0.0398	4.183	0.0478	3.39E–02	274.6
132	11.00	0.13	0.0395	4.146	0.0473	3.36E–02	272.2
133	11.00	0.27	0.0392	4.122	0.0469	3.34E–02	270.6
134	11.00	0.55	0.0353	3.705	0.0406	3.00E–02	243.2
135	11.00	0.72	0.0383	4.025	0.0454	3.26E–02	264.2
136	11.00	0.86	0.0412	4.332	0.0501	3.51E–02	284.4
137	11.00	0.98	0.0396	4.157	0.0474	3.37E–02	272.8
138	12.00	–0.25	0.0422	4.428	0.0515	3.59E–02	290.6
139	12.00	0.00	0.0424	4.453	0.0519	3.61E–02	292.3
140	12.00	0.13	0.0423	4.446	0.0518	3.60E–02	291.8
141	12.00	0.27	0.0420	4.417	0.0513	3.58E–02	289.9
142	12.00	0.44	0.0394	4.141	0.0472	3.35E–02	271.8
143	12.00	0.62	0.0415	4.358	0.0504	3.53E–02	286.0
144	12.00	0.76	0.0426	4.471	0.0521	3.62E–02	293.5
145	12.00	0.88	0.0430	4.513	0.0528	3.66E–02	296.2
146	13.00	–0.25	0.0457	4.801	0.0571	3.89E–02	315.2
147	13.00	0.00	0.0461	4.838	0.0577	3.92E–02	317.6
148	13.00	0.13	0.0456	4.794	0.0570	3.88E–02	314.7
149	13.00	0.27	0.0456	4.788	0.0569	3.88E–02	314.3

Table A8. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.0465	4.890	0.0584	3.96E–02	321.0
151	13.00	0.51	0.0472	4.958	0.0595	4.02E–02	325.5
152	13.00	0.65	0.0445	4.671	0.0551	3.78E–02	306.6
153	13.00	0.77	0.0462	4.853	0.0579	3.93E–02	318.5
154	14.00	–0.25	0.0518	5.440	0.0667	4.41E–02	357.1
155	14.00	0.00	0.0504	5.292	0.0645	4.29E–02	347.3
156	14.00	0.13	0.0507	5.329	0.0650	4.32E–02	349.8
157	14.00	0.27	0.0509	5.342	0.0652	4.33E–02	350.6
158	14.00	0.41	0.0493	5.179	0.0628	4.20E–02	339.9
159	14.00	0.55	0.0536	5.634	0.0696	4.56E–02	369.8
160	14.00	0.67	0.0520	5.463	0.0670	4.43E–02	358.6
161	15.00	–0.25	0.0588	6.179	0.0778	5.01E–02	405.6
162	15.00	0.00	0.0578	6.069	0.0761	4.92E–02	398.4
163	15.00	0.13	0.0569	5.975	0.0747	4.84E–02	392.2
164	15.00	0.44	0.0588	6.179	0.0778	5.01E–02	405.6
165	15.00	0.56	0.0586	6.159	0.0775	4.99E–02	404.3
166	16.00	–0.25	0.0669	7.025	0.0905	5.69E–02	461.1
167	16.00	0.00	0.0685	7.192	0.0930	5.83E–02	472.1
168	16.00	0.13	0.0678	7.125	0.0920	5.77E–02	467.7
169	16.00	0.23	0.0668	7.018	0.0904	5.69E–02	460.6
170	16.00	0.34	0.0657	6.902	0.0887	5.59E–02	453.0
171	16.00	0.46	0.0665	6.986	0.0899	5.66E–02	458.6
172	17.00	–0.25	0.0789	8.290	0.1095	6.72E–02	544.2
173	17.00	0.00	0.0810	8.506	0.1128	6.89E–02	558.3
174	17.00	0.13	0.0806	8.465	0.1121	6.86E–02	555.6
175	17.00	0.23	0.0772	8.113	0.1068	6.57E–02	532.5
176	17.00	0.35	0.0822	8.632	0.1147	6.99E–02	566.6
177	18.00	–0.25	0.1031	10.831	0.1477	8.77E–02	710.9
178	18.00	0.00	0.0991	10.408	0.1413	8.43E–02	683.2
179	18.00	0.13	0.0986	10.355	0.1405	8.39E–02	679.7
180	18.00	0.25	0.0985	10.345	0.1404	8.38E–02	679.0
181	18.50	–0.25	0.1095	11.507	0.1578	9.32E–02	755.3
182	18.50	0.00	0.1101	11.563	0.1587	9.37E–02	759.0
183	18.50	0.13	0.1086	11.408	0.1563	9.24E–02	748.8
184	18.60	0.17	0.1112	11.683	0.1605	9.46E–02	766.9
185	18.50	0.22	0.1116	11.719	0.1610	9.49E–02	769.2
186	19.20	–0.25	0.1147	12.044	0.1659	9.76E–02	790.6
187	19.20	0.00	0.1160	12.183	0.1680	9.87E–02	799.7
188	19.20	0.13	0.1158	12.162	0.1677	9.85E–02	798.3
189	19.30	0.17	0.1164	12.230	0.1687	9.91E–02	802.8
190	19.20	0.22	0.1174	12.329	0.1702	9.99E–02	809.3
191	20.00	–0.25	0.1189	12.489	0.1726	1.01E–01	819.8
192	20.00	0.00	0.1223	12.848	0.1780	1.04E–01	843.3
193	20.00	0.13	0.1219	12.803	0.1773	1.04E–01	840.4
194	20.10	0.17	0.1239	13.017	0.1805	1.05E–01	854.4
195	20.00	0.22	0.1213	12.745	0.1764	1.03E–01	836.6
196	20.80	–0.25	0.1271	13.353	0.1856	1.08E–01	876.5
197	20.80	0.00	0.1277	13.410	0.1864	1.09E–01	880.2
198	20.80	0.13	0.1272	13.358	0.1856	1.08E–01	876.8
199	20.90	0.17	0.1285	13.501	0.1878	1.09E–01	886.2
200	20.80	0.22	0.1279	13.432	0.1867	1.09E–01	881.7
201	21.60	–0.25	0.1298	13.634	0.1898	1.10E–01	894.9
202	21.60	0.00	0.1313	13.788	0.1921	1.12E–01	905.0
203	21.60	0.13	0.1306	13.718	0.1910	1.11E–01	900.5
204	21.70	0.17	0.1306	13.718	0.1910	1.11E–01	900.4
205	21.60	0.22	0.1327	13.938	0.1944	1.13E–01	914.9
206	22.40	–0.25	0.1318	13.840	0.1929	1.12E–01	908.5
207	22.40	0.00	0.1364	14.326	0.2002	1.16E–01	940.3

Table A8. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.1328	13.952	0.1946	1.13E–01	915.8
209	22.50	0.17	0.1359	14.280	0.1995	1.16E–01	937.3
210	22.40	0.22	0.1346	14.139	0.1974	1.15E–01	928.1
211	23.20	–0.25	0.1397	14.675	0.2054	1.19E–01	963.3
212	23.20	0.00	0.1423	14.952	0.2096	1.21E–01	981.4
213	23.20	0.13	0.1436	15.080	0.2115	1.22E–01	989.8
214	23.30	0.17	0.1430	15.025	0.2107	1.22E–01	986.2
215	23.20	0.22	0.1417	14.889	0.2086	1.21E–01	977.3
216	24.00	–0.25	0.1462	15.358	0.2157	1.24E–01	1008.1
217	24.00	0.00	0.1510	15.858	0.2232	1.28E–01	1040.9
218	24.00	0.13	0.1492	15.676	0.2205	1.27E–01	1029.0
219	24.10	0.17	0.1502	15.782	0.2220	1.28E–01	1035.9
220	24.00	0.22	0.1507	15.828	0.2227	1.28E–01	1038.9
221	25.00	–0.25	0.1332	13.988	0.1951	1.13E–01	918.2
222	25.00	0.00	0.1362	14.310	0.1999	1.16E–01	939.3
223	25.00	0.13	0.1333	13.997	0.1952	1.13E–01	918.8
224	25.10	0.17	0.1235	12.975	0.1799	1.05E–01	851.7
225	25.00	0.22	0.1340	14.075	0.1964	1.14E–01	923.9
226	9.00	999.00	0.0557	5.848	0.0728	4.74E–02	383.8
227	0.00	–2.50	1.1669	122.571	1.8262	9.93E–01	8045.5
228	0.00	–0.54	1.1765	123.587	1.8414	1.00E+00	8112.2
229	0.00	2.00	1.1468	120.461	1.7945	9.76E–01	7907.0
230	22.96	0.00	1.0615	111.508	1.6600	9.03E–01	7319.3
231	23.16	0.00	1.1846	124.432	1.8541	1.01E+00	8167.7
232	23.36	0.00	1.1344	119.157	1.7749	9.65E–01	7821.4
233	23.76	0.00	0.4541	47.705	0.7016	3.86E–01	3131.3
234	24.16	0.00	0.6011	63.137	0.9334	5.11E–01	4144.3
235	24.89	0.00	0.6689	70.267	1.0405	5.69E–01	4612.3
236	25.09	0.00	0.6314	66.325	0.9813	5.37E–01	4353.5
237	25.29	0.00	0.5617	59.002	0.8713	4.78E–01	3872.9
238	25.49	0.00	0.4817	50.602	0.7451	4.10E–01	3321.5
239	26.26	0.00	0.1652	17.351	0.2456	1.41E–01	1138.9
240	26.76	0.00	0.2546	26.740	0.3867	2.17E–01	1755.2
241	27.26	0.00	0.1876	19.704	0.2810	1.60E–01	1293.4
242	27.51	0.00	0.1656	17.396	0.2463	1.41E–01	1141.8
243	27.76	0.00	0.1547	16.246	0.2290	1.32E–01	1066.4
244	0.58	999.00	0.0254	2.672	0.0251	2.16E–02	175.4
245	0.86	999.00	0.0277	2.908	0.0287	2.36E–02	190.9
246	1.15	999.00	0.0268	2.813	0.0272	2.28E–02	184.7
247	1.43	999.00	0.0260	2.736	0.0261	2.22E–02	179.6
248	1.72	999.00	0.0255	2.681	0.0253	2.17E–02	176.0
249	2.00	999.00	0.0276	2.898	0.0285	2.35E–02	190.2
250	2.29	999.00	0.0256	2.687	0.0253	2.18E–02	176.4
251	2.57	999.00	0.0265	2.781	0.0268	2.25E–02	182.5
252	2.86	999.00	0.0276	2.900	0.0285	2.35E–02	190.4
253	3.14	999.00	0.0275	2.889	0.0284	2.34E–02	189.7
254	3.43	999.00	0.0260	2.732	0.0260	2.21E–02	179.3
255	999.00	999.00	0.0236	2.482	0.0223	2.01E–02	162.9
256	999.00	999.00	0.0231	2.432	0.0215	1.97E–02	159.6

Table A9. Flow Conditions and Pressure Distribution for Run 45

[CR = 5; Re = 1.14×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	725.54	(.50024E+07)
$T_{t,1}$, °R (K)	1854.89	(1030.49)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0323	(16.64)
$h_{t,1}$, btu/lbm (J/kg)	466.54	(.10844E+07)
Free-stream conditions:		
M_∞	9.77	
p_∞, psia (N/m^2)	0.0191	(131.58)
T_∞, °R (K)	96.51	(53.62)
ρ_∞, slug/ft^3 (kg/m^3)	0.16590E-04	(.85503E-02)
h_∞, btu/lbm (J/kg)	0.23017E+02	(.53501E+05)
a_∞, ft/s (m/s)	481.95	(146.90)
u_∞, ft/s (m/s)	4711.05	(1435.93)
Re_∞, ft^{-1} (m^{-1})	0.10798E+07	(.35426E+07)
q_∞, psia (N/m^2)	1.278	(8814.92)
μ_∞, slug/ft-s (N-s/m^2)	0.72383E-07	(.34657E-05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.371	(16339.91)
$T_{t,2}$, °R (K)	1859.38	(1032.99)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10696E-03	(.55125E-01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0618	3.494	0.0364	2.75E–02	426.4
2	11.18	0.20	0.0659	3.723	0.0397	2.93E–02	454.3
3	12.17	0.20	0.0706	3.987	0.0436	3.14E–02	486.5
4	13.15	0.20	0.0757	4.276	0.0478	3.37E–02	521.9
5	14.21	0.20	0.0828	4.678	0.0537	3.68E–02	570.8
6	15.14	0.20	0.0929	5.248	0.0620	4.13E–02	640.4
7	16.13	0.20	0.1069	6.042	0.0736	4.76E–02	737.4
8	17.12	0.20	0.1269	7.171	0.0901	5.64E–02	875.1
9	18.11	0.20	0.1599	9.033	0.1172	7.11E–02	1102.3
10	19.74	0.20	0.1770	10.000	0.1313	7.87E–02	1220.4
11	20.55	0.20	0.1908	10.781	0.1427	8.49E–02	1315.7
12	22.56	0.20	0.2089	11.803	0.1576	9.29E–02	1440.3
13	24.98	0.20	0.2282	12.896	0.1736	1.02E–01	1573.7
14	10.59	0.60	0.1010	5.709	0.0687	4.49E–02	696.7
15	11.58	0.60	0.0863	4.875	0.0565	3.84E–02	594.9
16	12.57	0.60	0.0851	4.806	0.0555	3.78E–02	586.5
17	13.56	0.60	0.0839	4.739	0.0546	3.73E–02	578.3
18	14.60	0.60	0.0883	4.989	0.0582	3.93E–02	608.8
19	15.54	0.60	0.0973	5.496	0.0656	4.33E–02	670.7
20	16.53	0.60	0.1117	6.311	0.0775	4.97E–02	770.2
21	17.52	0.60	0.1354	7.648	0.0970	6.02E–02	933.3
22	18.51	0.60	0.1732	9.788	0.1282	7.70E–02	1194.4
23	12.97	1.00	0.1084	6.126	0.0748	4.82E–02	747.6
24	15.00	1.00	0.1130	6.386	0.0786	5.03E–02	779.3
25	15.94	1.00	0.1185	6.696	0.0831	5.27E–02	817.1
26	16.93	1.00	0.1296	7.320	0.0922	5.76E–02	893.3
27	17.92	1.00	0.1559	8.810	0.1140	6.93E–02	1075.1
28	18.91	1.00	0.2085	11.780	0.1573	9.27E–02	1437.6
29	24.98	1.00	0.2357	13.320	0.1798	1.05E–01	1625.4
30	11.99	2.00	0.1049	5.928	0.0719	4.67E–02	723.5
31	13.97	2.00	0.0946	5.346	0.0634	4.21E–02	652.4
32	15.98	2.00	0.1015	5.737	0.0691	4.52E–02	700.1
33	16.94	2.00	0.1064	6.012	0.0731	4.73E–02	733.6

Table A9. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1116	6.305	0.0774	4.96E−02	769.4
35	18.42	2.00	0.1403	7.924	0.1010	6.24E−02	967.0
36	18.92	2.00	0.3036	17.152	0.2357	1.35E−01	2093.1
37	19.41	2.00	0.4408	24.903	0.3488	1.96E−01	3039.0
38	19.91	2.00	0.4331	24.470	0.3425	1.93E−01	2986.2
39	20.26	2.00	0.4133	23.354	0.3262	1.84E−01	2850.0
40	21.11	2.00	0.2107	11.906	0.1592	9.37E−02	1452.9
41	21.96	2.00	0.5147	29.083	0.4098	2.29E−01	3549.1
42	22.74	2.00	0.3783	21.374	0.2973	1.68E−01	2608.4
43	23.52	2.00	0.2173	12.276	0.1646	9.66E−02	1498.1
44	24.98	2.00	0.3039	17.171	0.2360	1.35E−01	2095.4
45	17.94	3.00	0.0870	4.916	0.0571	3.87E−02	599.9
46	18.93	3.00	0.1144	6.462	0.0797	5.09E−02	788.6
47	19.92	3.00	0.2135	12.065	0.1615	9.50E−02	1472.4
48	20.91	3.00	0.5099	28.810	0.4058	2.27E−01	3515.7
49	22.11	3.00	0.3602	20.354	0.2824	1.60E−01	2483.8
50	22.96	3.00	0.6672	37.700	0.5356	2.97E−01	4600.7
51	23.74	3.00	0.3748	21.178	0.2945	1.67E−01	2584.4
52	24.98	3.00	0.4056	22.919	0.3199	1.80E−01	2796.8
53	18.34	3.40	0.0841	4.751	0.0547	3.74E−02	579.8
54	19.32	3.40	0.1088	6.147	0.0751	4.84E−02	750.1
55	19.82	3.40	0.1140	6.443	0.0794	5.07E−02	786.2
56	20.32	3.40	0.2029	11.463	0.1527	9.02E−02	1398.8
57	20.81	3.40	0.3662	20.691	0.2874	1.63E−01	2525.0
58	21.31	3.40	0.4716	26.645	0.3742	2.10E−01	3251.6
59	21.66	3.40	0.4693	26.516	0.3724	2.09E−01	3235.9
60	22.94	3.40	0.4507	25.467	0.3570	2.00E−01	3107.8
61	23.75	3.40	0.4878	27.559	0.3876	2.17E−01	3363.1
62	24.14	3.40	0.4033	22.789	0.3180	1.79E−01	2781.0
63	22.29	3.60	0.3565	20.141	0.2793	1.59E−01	2457.8
64	22.71	3.60	0.3837	21.679	0.3018	1.71E−01	2645.5
65	23.14	3.60	0.4777	26.988	0.3792	2.12E−01	3293.4
66	23.95	3.60	0.6684	37.768	0.5366	2.97E−01	4608.9
67	24.34	3.60	0.7725	43.645	0.6223	3.44E−01	5326.1
68	13.79	3.80	0.0832	4.699	0.0540	3.70E−02	573.4
69	15.77	3.80	0.0699	3.949	0.0430	3.11E−02	482.0
70	17.75	3.80	0.0701	3.963	0.0432	3.12E−02	483.6
71	19.23	3.80	0.0885	5.001	0.0584	3.94E−02	610.3
72	19.73	3.80	0.0941	5.317	0.0630	4.19E−02	648.9
73	20.22	3.80	0.0926	5.230	0.0617	4.12E−02	638.2
74	20.72	3.80	0.1456	8.228	0.1055	6.48E−02	1004.1
75	21.41	3.80	0.2822	15.944	0.2181	1.25E−01	1945.6
76	21.71	3.80	0.3499	19.768	0.2739	1.56E−01	2412.3
77	22.06	3.80	0.4581	25.884	0.3631	2.04E−01	3158.7
78	22.49	3.80	0.3468	19.596	0.2714	1.54E−01	2391.3
79	22.76	3.80	0.4196	23.706	0.3314	1.87E−01	2892.9
80	22.91	3.80	0.4354	24.601	0.3444	1.94E−01	3002.1
81	23.76	3.80	0.8252	46.622	0.6658	3.67E−01	5689.4
82	24.15	3.80	1.1087	62.641	0.8995	4.93E−01	7644.2
83	24.98	3.80	0.9913	56.012	0.8028	4.41E−01	6835.3
84	22.59	3.90	0.4345	24.552	0.3437	1.93E−01	2996.1
85	22.80	3.90	0.3611	20.403	0.2831	1.61E−01	2489.8
86	23.01	3.90	0.3659	20.673	0.2871	1.63E−01	2522.7
87	23.15	3.90	0.4926	27.830	0.3915	2.19E−01	3396.2
88	23.86	3.90	1.2647	71.457	1.0282	5.62E−01	8720.0
89	24.25	3.90	1.3090	73.957	1.0647	5.82E−01	9025.2
90	11.99	2.00	0.1060	5.988	0.0728	4.71E−02	730.7
91	13.97	2.00	0.0998	5.641	0.0677	4.44E−02	688.3

Table A9. Continued

Orifice	*x*, in.	*y*, *Z*, in.	*p*, psia	p/p_∞	C_p	$p/p_{t,2}$	*p*, Pa
92	15.98	2.00	0.1036	5.852	0.0708	4.61E–02	714.1
93	17.93	2.00	0.1140	6.438	0.0794	5.07E–02	785.7
94	19.91	2.00	0.4241	23.959	0.3350	1.89E–01	2923.8
95	1.00	–0.25	0.0483	2.728	0.0252	2.15E–02	332.9
96	1.00	0.41	0.0470	2.655	0.0242	2.09E–02	324.0
97	1.00	1.03	0.0470	2.654	0.0241	2.09E–02	323.8
98	1.00	1.65	0.0474	2.677	0.0245	2.11E–02	326.7
99	2.50	–0.25	0.0397	2.245	0.0182	1.77E–02	273.9
100	4.00	–0.25	0.0373	2.107	0.0162	1.66E–02	257.1
101	4.00	0.41	0.0373	2.106	0.0161	1.66E–02	257.0
102	4.00	1.65	0.0367	2.072	0.0156	1.63E–02	252.9
103	5.50	–0.25	0.0359	2.027	0.0150	1.60E–02	247.3
104	7.00	–0.25	0.0497	2.807	0.0264	2.21E–02	342.5
105	8.00	–2.15	0.0457	2.580	0.0231	2.03E–02	314.8
106	8.00	–1.75	0.0477	2.693	0.0247	2.12E–02	328.6
107	8.00	–1.36	0.0493	2.785	0.0261	2.19E–02	339.9
108	8.00	–0.91	0.0515	2.909	0.0279	2.29E–02	355.0
109	8.00	–0.25	0.0537	3.036	0.0297	2.39E–02	370.5
110	8.00	0.00	0.0534	3.016	0.0294	2.37E–02	368.0
111	8.00	0.13	0.0534	3.018	0.0294	2.38E–02	368.2
112	8.00	0.41	0.0533	3.011	0.0293	2.37E–02	367.5
113	8.00	0.86	0.0515	2.912	0.0279	2.29E–02	355.4
114	8.00	1.25	0.0498	2.815	0.0265	2.22E–02	343.6
115	8.00	1.65	0.0477	2.693	0.0247	2.12E–02	328.7
116	9.00	–0.25	0.0540	3.049	0.0299	2.40E–02	372.0
117	9.00	0.00	0.0543	3.069	0.0302	2.42E–02	374.5
118	9.00	0.13	0.0538	3.040	0.0298	2.39E–02	371.0
119	9.00	0.41	0.0532	3.005	0.0293	2.37E–02	366.7
120	9.00	0.76	0.0511	2.887	0.0275	2.27E–02	352.3
121	9.00	1.07	0.0451	2.549	0.0226	2.01E–02	311.0
122	10.00	–0.25	0.0601	3.397	0.0350	2.67E–02	414.6
123	10.00	0.00	0.0601	3.396	0.0350	2.67E–02	414.5
124	10.00	0.13	0.0609	3.440	0.0356	2.71E–02	419.8
125	10.00	0.41	0.0591	3.338	0.0341	2.63E–02	407.3
126	10.00	0.65	0.0568	3.208	0.0322	2.53E–02	391.5
127	10.00	0.83	0.0558	3.153	0.0314	2.48E–02	384.8
128	10.00	0.97	0.0568	3.211	0.0323	2.53E–02	391.9
129	10.00	1.09	0.0591	3.339	0.0341	2.63E–02	407.5
130	11.00	–0.25	0.0681	3.846	0.0415	3.03E–02	469.4
131	11.00	0.00	0.0657	3.710	0.0395	2.92E–02	452.7
132	11.00	0.13	0.0648	3.664	0.0389	2.88E–02	447.1
133	11.00	0.27	0.0644	3.641	0.0385	2.87E–02	444.3
134	11.00	0.55	0.0589	3.329	0.0340	2.62E–02	406.2
135	11.00	0.72	0.0622	3.516	0.0367	2.77E–02	429.1
136	11.00	0.86	0.0643	3.635	0.0385	2.86E–02	443.6
137	11.00	0.98	0.0649	3.669	0.0389	2.89E–02	447.7
138	12.00	–0.25	0.0685	3.872	0.0419	3.05E–02	472.5
139	12.00	0.00	0.0693	3.915	0.0425	3.08E–02	477.8
140	12.00	0.13	0.0690	3.897	0.0423	3.07E–02	475.5
141	12.00	0.27	0.0683	3.860	0.0417	3.04E–02	471.1
142	12.00	0.44	0.0667	3.767	0.0404	2.96E–02	459.6
143	12.00	0.62	0.0677	3.828	0.0413	3.01E–02	467.1
144	12.00	0.76	0.0697	3.941	0.0429	3.10E–02	480.9
145	12.00	0.88	0.0706	3.987	0.0436	3.14E–02	486.6
146	13.00	–0.25	0.0739	4.178	0.0464	3.29E–02	509.9
147	13.00	0.00	0.0754	4.262	0.0476	3.35E–02	520.0
148	13.00	0.13	0.0749	4.232	0.0472	3.33E–02	516.5
149	13.00	0.27	0.0747	4.219	0.0470	3.32E–02	514.8

Table A9. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.0725	4.097	0.0452	3.22E–02	500.0
151	13.00	0.51	0.0742	4.193	0.0466	3.30E–02	511.6
152	13.00	0.65	0.0759	4.290	0.0480	3.38E–02	523.6
153	13.00	0.77	0.0762	4.307	0.0483	3.39E–02	525.6
154	14.00	–0.25	0.0814	4.599	0.0525	3.62E–02	561.3
155	14.00	0.00	0.0830	4.689	0.0538	3.69E–02	572.2
156	14.00	0.13	0.0823	4.648	0.0532	3.66E–02	567.2
157	14.00	0.27	0.0813	4.595	0.0525	3.62E–02	560.7
158	14.00	0.41	0.0814	4.597	0.0525	3.62E–02	560.9
159	14.00	0.55	0.0844	4.769	0.0550	3.75E–02	582.0
160	14.00	0.67	0.0819	4.629	0.0530	3.64E–02	564.9
161	15.00	–0.25	0.0925	5.228	0.0617	4.11E–02	638.0
162	15.00	0.00	0.0939	5.307	0.0628	4.18E–02	647.6
163	15.00	0.13	0.0936	5.291	0.0626	4.16E–02	645.7
164	15.00	0.44	0.0938	5.301	0.0628	4.17E–02	646.8
165	15.00	0.56	0.0922	5.211	0.0614	4.10E–02	635.9
166	16.00	–0.25	0.1087	6.143	0.0751	4.84E–02	749.7
167	16.00	0.00	0.1103	6.231	0.0763	4.90E–02	760.4
168	16.00	0.13	0.1109	6.268	0.0769	4.93E–02	764.9
169	16.00	0.23	0.1097	6.199	0.0759	4.88E–02	756.4
170	16.00	0.34	0.1082	6.112	0.0746	4.81E–02	745.9
171	16.00	0.46	0.1058	5.976	0.0726	4.70E–02	729.2
172	17.00	–0.25	0.1305	7.375	0.0930	5.80E–02	899.9
173	17.00	0.00	0.1341	7.575	0.0960	5.96E–02	924.4
174	17.00	0.13	0.1335	7.544	0.0955	5.94E–02	920.6
175	17.00	0.23	0.1282	7.245	0.0911	5.70E–02	884.1
176	17.00	0.35	0.1258	7.106	0.0891	5.59E–02	867.1
177	18.00	–0.25	0.1621	9.160	0.1191	7.21E–02	1117.9
178	18.00	0.00	0.1688	9.538	0.1246	7.51E–02	1163.9
179	18.00	0.13	0.1654	9.343	0.1218	7.35E–02	1140.2
180	18.00	0.25	0.1619	9.149	0.1189	7.20E–02	1116.5
181	18.50	–0.25	0.1819	10.280	0.1354	8.09E–02	1254.5
182	18.50	0.00	0.1886	10.656	0.1409	8.39E–02	1300.4
183	18.50	0.13	0.1816	10.263	0.1352	8.08E–02	1252.5
184	18.60	0.17	0.1798	10.160	0.1337	8.00E–02	1239.9
185	18.50	0.22	0.1799	10.165	0.1337	8.00E–02	1240.4
186	19.20	–0.25	0.1814	10.252	0.1350	8.07E–02	1251.0
187	19.20	0.00	0.1834	10.363	0.1366	8.16E–02	1264.7
188	19.20	0.13	0.1816	10.261	0.1351	8.08E–02	1252.2
189	19.30	0.17	0.1822	10.292	0.1356	8.10E–02	1255.9
190	19.20	0.22	0.1823	10.300	0.1357	8.11E–02	1256.9
191	20.00	–0.25	0.1904	10.756	0.1424	8.47E–02	1312.6
192	20.00	0.00	0.1884	10.644	0.1407	8.38E–02	1298.9
193	20.00	0.13	0.1896	10.715	0.1418	8.43E–02	1307.6
194	20.10	0.17	0.1932	10.918	0.1447	8.59E–02	1332.4
195	20.00	0.22	0.1904	10.761	0.1424	8.47E–02	1313.1
196	20.80	–0.25	0.2039	11.522	0.1535	9.07E–02	1406.1
197	20.80	0.00	0.2037	11.512	0.1534	9.06E–02	1404.8
198	20.80	0.13	0.2040	11.528	0.1536	9.07E–02	1406.8
199	20.90	0.17	0.2074	11.720	0.1564	9.23E–02	1430.3
200	20.80	0.22	0.2063	11.657	0.1555	9.18E–02	1422.5
201	21.60	–0.25	0.2092	11.819	0.1579	9.30E–02	1442.3
202	21.60	0.00	0.2053	11.597	0.1546	9.13E–02	1415.2
203	21.60	0.13	0.2064	11.661	0.1556	9.18E–02	1423.0
204	21.70	0.17	0.2080	11.754	0.1569	9.25E–02	1434.4
205	21.60	0.22	0.2113	11.940	0.1596	9.40E–02	1457.1
206	22.40	–0.25	0.2102	11.876	0.1587	9.35E–02	1449.3
207	22.40	0.00	0.2070	11.698	0.1561	9.21E–02	1427.5

Table A9. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.2068	11.684	0.1559	9.20E–02	1425.8
209	22.50	0.17	0.2101	11.869	0.1586	9.34E–02	1448.4
210	22.40	0.22	0.2090	11.807	0.1577	9.29E–02	1440.8
211	23.20	–0.25	0.2211	12.494	0.1677	9.83E–02	1524.7
212	23.20	0.00	0.2169	12.254	0.1642	9.64E–02	1495.3
213	23.20	0.13	0.2188	12.363	0.1658	9.73E–02	1508.6
214	23.30	0.17	0.2245	12.683	0.1705	9.98E–02	1547.7
215	23.20	0.22	0.2222	12.554	0.1686	9.88E–02	1532.0
216	24.00	–0.25	0.2407	13.599	0.1839	1.07E–01	1659.6
217	24.00	0.00	0.2370	13.393	0.1809	1.05E–01	1634.4
218	24.00	0.13	0.2389	13.497	0.1824	1.06E–01	1647.0
219	24.10	0.17	0.2427	13.713	0.1855	1.08E–01	1673.4
220	24.00	0.22	0.2397	13.541	0.1830	1.07E–01	1652.5
221	25.00	–0.25	0.2248	12.703	0.1708	1.00E–01	1550.2
222	25.00	0.00	0.2370	13.390	0.1808	1.05E–01	1634.0
223	25.00	0.13	0.2331	13.172	0.1776	1.04E–01	1607.4
224	25.10	0.17	0.2120	11.981	0.1602	9.43E–02	1462.0
225	25.00	0.22	0.2245	12.685	0.1705	9.98E–02	1547.9
226	9.00	999.00	0.1123	6.344	0.0780	4.99E–02	774.1
227	0.00	–2.50	2.2147	125.132	1.8115	9.85E–01	15270.1
228	0.00	–0.54	2.2402	126.575	1.8325	9.96E–01	15446.2
229	0.00	2.00	2.1995	124.275	1.7990	9.78E–01	15165.6
230	22.96	0.00	1.3131	74.194	1.0681	5.84E–01	9054.0
231	23.16	0.00	1.4258	80.558	1.1610	6.34E–01	9830.8
232	23.36	0.00	1.2781	72.213	1.0392	5.68E–01	8812.3
233	23.76	0.00	1.5303	86.465	1.2472	6.81E–01	10551.6
234	24.16	0.00	0.9219	52.087	0.7455	4.10E–01	6356.3
235	24.89	0.00	1.1405	64.437	0.9257	5.07E–01	7863.5
236	25.09	0.00	1.1347	64.111	0.9210	5.05E–01	7823.7
237	25.29	0.00	1.0308	58.240	0.8353	4.58E–01	7107.2
238	25.49	0.00	0.9048	51.122	0.7314	4.02E–01	6238.6
239	26.26	0.00	0.3171	17.915	0.2468	1.41E–01	2186.2
240	26.76	0.00	0.3497	19.757	0.2737	1.56E–01	2411.0
241	27.26	0.00	0.3063	17.306	0.2380	1.36E–01	2111.9
242	27.51	0.00	0.3004	16.975	0.2331	1.34E–01	2071.6
243	27.76	0.00	0.2889	16.324	0.2236	1.28E–01	1992.0
244	0.58	999.00	0.0286	1.618	0.0090	1.27E–02	197.5
245	0.86	999.00	0.0297	1.677	0.0099	1.32E–02	204.6
246	1.15	999.00	0.0288	1.629	0.0092	1.28E–02	198.8
247	1.43	999.00	0.0295	1.667	0.0097	1.31E–02	203.4
248	1.72	999.00	0.0279	1.574	0.0084	1.24E–02	192.1
249	2.00	999.00	0.0292	1.652	0.0095	1.30E–02	201.6
250	2.29	999.00	0.0277	1.564	0.0082	1.23E–02	190.8
251	2.57	999.00	0.0292	1.651	0.0095	1.30E–02	201.5
252	2.86	999.00	0.0289	1.633	0.0092	1.29E–02	199.3
253	3.14	999.00	0.0293	1.657	0.0096	1.30E–02	202.2
254	3.43	999.00	0.0294	1.660	0.0096	1.31E–02	202.6
255	999.00	999.00	0.0267	1.508	0.0074	1.19E–02	184.0
256	999.00	999.00	0.0261	1.472	0.0069	1.16E–02	179.7

Table A10. Flow Conditions and Pressure Distribution for Run 46

[CR = 5; Re = 2.15×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1437.56	(.99116E+07)
$T_{t,1}$, °R (K)	1856.08	(1031.16)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0629	(32.42)
$h_{t,1}$, btu/lbm (J/kg)	468.08	(.10880E+07)
Free-stream conditions:		
M_∞	9.92	
p_∞, psia (N/m^2)	0.0350	(241.06)
T_∞, °R (K)	94.23	(52.35)
ρ_∞, slug/ft^3 (kg/m^3)	0.31127E−04	(.16042E−01)
h_∞, btu/lbm (J/kg)	0.22474E+02	(.52239E+05)
a_∞, ft/s (m/s)	476.23	(145.16)
u_∞, ft/s (m/s)	4722.12	(1439.30)
Re_∞, ft^{-1} (m^{-1})	0.20887E+07	(.68525E+07)
q_∞, psia (N/m^2)	2.410	(16616.65)
μ_∞, slug/ft-s (N-s/m^2)	0.70374E−07	(.33695E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.468	(30822.08)
$T_{t,2}$, °R (K)	1865.01	(1036.11)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20100E−03	(.10359E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0919	2.894	0.0267	2.20E−02	633.6
2	11.18	0.20	0.0993	3.127	0.0300	2.38E−02	684.7
3	12.17	0.20	0.1087	3.423	0.0342	2.60E−02	749.4
4	13.15	0.20	0.1188	3.741	0.0386	2.84E−02	818.9
5	14.21	0.20	0.1346	4.239	0.0457	3.22E−02	928.1
6	15.14	0.20	0.1505	4.740	0.0527	3.60E−02	1037.7
7	16.13	0.20	0.1722	5.422	0.0623	4.12E−02	1187.0
8	17.12	0.20	0.2117	6.667	0.0799	5.07E−02	1459.6
9	18.11	0.20	0.2783	8.765	0.1094	6.66E−02	1918.9
10	19.74	0.20	0.3218	10.135	0.1288	7.71E−02	2218.9
11	20.55	0.20	0.3421	10.775	0.1378	8.19E−02	2359.0
12	22.56	0.20	0.3579	11.273	0.1448	8.57E−02	2468.0
13	24.98	0.20	0.4065	12.804	0.1664	9.73E−02	2803.1
14	10.59	0.60	0.1680	5.292	0.0605	4.02E−02	1158.5
15	11.58	0.60	0.1503	4.735	0.0526	3.60E−02	1036.6
16	12.57	0.60	0.1465	4.613	0.0509	3.51E−02	1009.8
17	13.56	0.60	0.1440	4.536	0.0498	3.45E−02	993.1
18	14.60	0.60	0.1496	4.711	0.0523	3.58E−02	1031.5
19	15.54	0.60	0.1657	5.217	0.0594	3.97E−02	1142.2
20	16.53	0.60	0.1894	5.964	0.0700	4.53E−02	1305.6
21	17.52	0.60	0.2331	7.340	0.0894	5.58E−02	1607.0
22	18.51	0.60	0.3043	9.584	0.1210	7.29E−02	2098.2
23	12.97	1.00	0.1654	5.208	0.0593	3.96E−02	1140.1
24	15.00	1.00	0.1836	5.782	0.0674	4.40E−02	1265.8
25	15.94	1.00	0.2007	6.320	0.0750	4.80E−02	1383.6
26	16.93	1.00	0.2245	7.071	0.0856	5.38E−02	1548.0
27	17.92	1.00	0.2623	8.260	0.1023	6.28E−02	1808.3
28	18.91	1.00	0.3885	12.236	0.1584	9.30E−02	2678.8
29	24.98	1.00	0.4160	13.100	0.1705	9.96E−02	2868.1
30	11.99	2.00	0.1705	5.371	0.0616	4.08E−02	1175.9
31	13.97	2.00	0.1477	4.652	0.0515	3.54E−02	1018.5
32	15.98	2.00	0.1604	5.051	0.0571	3.84E−02	1105.7
33	16.94	2.00	0.1705	5.368	0.0616	4.08E−02	1175.3

Table A10. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1789	5.636	0.0653	4.28E−02	1233.8
35	18.42	2.00	0.2218	6.987	0.0844	5.31E−02	1529.5
36	18.92	2.00	0.3839	12.089	0.1563	9.19E−02	2646.7
37	19.41	2.00	0.7296	22.977	0.3097	1.75E−01	5030.4
38	19.91	2.00	0.8943	28.166	0.3829	2.14E−01	6166.4
39	20.26	2.00	0.8812	27.752	0.3770	2.11E−01	6075.7
40	21.11	2.00	0.3798	11.961	0.1545	9.09E−02	2618.6
41	21.96	2.00	0.8213	25.866	0.3505	1.97E−01	5662.9
42	22.74	2.00	0.7408	23.332	0.3147	1.77E−01	5108.1
43	23.52	2.00	0.4180	13.164	0.1714	1.00E−01	2882.1
44	24.98	2.00	0.6114	19.257	0.2573	1.46E−01	4215.8
45	17.94	3.00	0.1379	4.344	0.0471	3.30E−02	951.0
46	18.93	3.00	0.1832	5.768	0.0672	4.39E−02	1262.9
47	19.92	3.00	0.2819	8.877	0.1110	6.75E−02	1943.5
48	20.91	3.00	0.9259	29.159	0.3969	2.22E−01	6383.8
49	22.11	3.00	0.5750	18.110	0.2411	1.38E−01	3964.8
50	22.96	3.00	1.2885	40.581	0.5578	3.09E−01	8884.3
51	23.74	3.00	0.7087	22.319	0.3005	1.70E−01	4886.3
52	24.98	3.00	0.7784	24.516	0.3314	1.86E−01	5367.3
53	18.34	3.40	0.1294	4.075	0.0433	3.10E−02	892.1
54	19.32	3.40	0.1703	5.364	0.0615	4.08E−02	1174.2
55	19.82	3.40	0.1999	6.296	0.0746	4.79E−02	1378.4
56	20.32	3.40	0.2393	7.536	0.0921	5.73E−02	1649.8
57	20.81	3.40	0.5259	16.564	0.2193	1.26E−01	3626.2
58	21.31	3.40	0.7983	25.143	0.3403	1.91E−01	5504.5
59	21.66	3.40	0.8321	26.205	0.3552	1.99E−01	5737.0
60	22.94	3.40	0.5287	16.652	0.2206	1.27E−01	3645.6
61	23.75	3.40	0.8928	28.118	0.3822	2.14E−01	6155.8
62	24.14	3.40	0.6385	20.110	0.2693	1.53E−01	4402.7
63	22.29	3.60	0.6785	21.369	0.2871	1.62E−01	4678.2
64	22.71	3.60	0.5157	16.243	0.2148	1.23E−01	3556.1
65	23.14	3.60	0.6278	19.773	0.2646	1.50E−01	4328.9
66	23.95	3.60	0.9034	28.451	0.3869	2.16E−01	6228.7
67	24.34	3.60	0.9510	29.952	0.4080	2.28E−01	6557.4
68	13.79	3.80	0.1333	4.199	0.0451	3.19E−02	919.3
69	15.77	3.80	0.1099	3.460	0.0347	2.63E−02	757.5
70	17.75	3.80	0.1076	3.390	0.0337	2.58E−02	742.1
71	19.23	3.80	0.1358	4.278	0.0462	3.25E−02	936.6
72	19.73	3.80	0.1435	4.521	0.0496	3.44E−02	989.7
73	20.22	3.80	0.1572	4.952	0.0557	3.76E−02	1084.1
74	20.72	3.80	0.1645	5.180	0.0589	3.94E−02	1134.0
75	21.41	3.80	0.4175	13.149	0.1712	1.00E−01	2878.7
76	21.71	3.80	0.5409	17.035	0.2260	1.30E−01	3729.4
77	22.06	3.80	0.6701	21.104	0.2833	1.60E−01	4620.2
78	22.49	3.80	0.6839	21.541	0.2895	1.64E−01	4715.8
79	22.76	3.80	0.7345	23.131	0.3119	1.76E−01	5064.1
80	22.91	3.80	0.6583	20.733	0.2781	1.58E−01	4539.1
81	23.76	3.80	1.6437	51.769	0.7155	3.94E−01	11333.6
82	24.15	3.80	1.5339	48.309	0.6668	3.67E−01	10576.2
83	24.98	3.80	1.6977	53.467	0.7395	4.06E−01	11705.5
84	22.59	3.90	0.8621	27.153	0.3686	2.06E−01	5944.4
85	22.80	3.90	0.7368	23.206	0.3130	1.76E−01	5080.3
86	23.01	3.90	0.6235	19.637	0.2627	1.49E−01	4299.1
87	23.15	3.90	0.7028	22.134	0.2979	1.68E−01	4845.7
88	23.86	3.90	2.3956	75.447	1.0492	5.74E−01	16517.4
89	24.25	3.90	1.7384	54.751	0.7575	4.16E−01	11986.4
90	11.99	2.00	0.1734	5.462	0.0629	4.15E−02	1195.7
91	13.97	2.00	0.1601	5.043	0.0570	3.83E−02	1104.1

Table A10. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1693	5.332	0.0611	4.05E–02	1167.4
93	17.93	2.00	0.1889	5.949	0.0698	4.52E–02	1302.4
94	19.91	2.00	0.8414	26.498	0.3594	2.01E–01	5801.2
95	1.00	–0.25	0.0718	2.262	0.0178	1.72E–02	495.3
96	1.00	0.41	0.0698	2.198	0.0169	1.67E–02	481.3
97	1.00	1.03	0.0703	2.215	0.0171	1.68E–02	484.9
98	1.00	1.65	0.0709	2.233	0.0174	1.70E–02	488.9
99	2.50	–0.25	0.0564	1.775	0.0109	1.35E–02	388.6
100	4.00	–0.25	0.0523	1.649	0.0091	1.25E–02	360.9
101	4.00	0.41	0.0525	1.654	0.0092	1.26E–02	362.0
102	4.00	1.65	0.0514	1.618	0.0087	1.23E–02	354.2
103	5.50	–0.25	0.0509	1.604	0.0085	1.22E–02	351.1
104	7.00	–0.25	0.0732	2.307	0.0184	1.75E–02	505.0
105	8.00	–2.15	0.0667	2.100	0.0155	1.60E–02	459.7
106	8.00	–1.75	0.0701	2.208	0.0170	1.68E–02	483.3
107	8.00	–1.36	0.0731	2.302	0.0183	1.75E–02	503.9
108	8.00	–0.91	0.0764	2.406	0.0198	1.83E–02	526.7
109	8.00	–0.25	0.0795	2.503	0.0212	1.90E–02	548.0
110	8.00	0.00	0.0786	2.475	0.0208	1.88E–02	541.9
111	8.00	0.13	0.0786	2.476	0.0208	1.88E–02	542.1
112	8.00	0.41	0.0785	2.473	0.0208	1.88E–02	541.4
113	8.00	0.86	0.0762	2.401	0.0197	1.83E–02	525.7
114	8.00	1.25	0.0731	2.303	0.0184	1.75E–02	504.2
115	8.00	1.65	0.0702	2.210	0.0170	1.68E–02	483.7
116	9.00	–0.25	0.0800	2.519	0.0214	1.92E–02	551.5
117	9.00	0.00	0.0803	2.528	0.0215	1.92E–02	553.4
118	9.00	0.13	0.0797	2.510	0.0213	1.91E–02	549.5
119	9.00	0.41	0.0786	2.477	0.0208	1.88E–02	542.2
120	9.00	0.76	0.0723	2.277	0.0180	1.73E–02	498.5
121	9.00	1.07	0.0634	1.998	0.0141	1.52E–02	437.3
122	10.00	–0.25	0.0856	2.695	0.0239	2.05E–02	590.0
123	10.00	0.00	0.0859	2.706	0.0240	2.06E–02	592.4
124	10.00	0.13	0.0862	2.716	0.0242	2.07E–02	594.7
125	10.00	0.41	0.0838	2.640	0.0231	2.01E–02	577.9
126	10.00	0.65	0.0826	2.602	0.0226	1.98E–02	569.7
127	10.00	0.83	0.0813	2.561	0.0220	1.95E–02	560.8
128	10.00	0.97	0.0821	2.585	0.0223	1.97E–02	566.0
129	10.00	1.09	0.0879	2.767	0.0249	2.10E–02	605.8
130	11.00	–0.25	0.0969	3.053	0.0289	2.32E–02	668.4
131	11.00	0.00	0.0946	2.979	0.0279	2.26E–02	652.1
132	11.00	0.13	0.0938	2.954	0.0275	2.25E–02	646.8
133	11.00	0.27	0.0929	2.924	0.0271	2.22E–02	640.2
134	11.00	0.55	0.0889	2.800	0.0254	2.13E–02	612.9
135	11.00	0.72	0.0898	2.829	0.0258	2.15E–02	619.3
136	11.00	0.86	0.0947	2.981	0.0279	2.27E–02	652.6
137	11.00	0.98	0.0992	3.124	0.0299	2.38E–02	684.0
138	12.00	–0.25	0.1009	3.179	0.0307	2.42E–02	696.0
139	12.00	0.00	0.1027	3.233	0.0315	2.46E–02	707.8
140	12.00	0.13	0.1019	3.211	0.0312	2.44E–02	702.9
141	12.00	0.27	0.1004	3.163	0.0305	2.40E–02	692.5
142	12.00	0.44	0.0987	3.108	0.0297	2.36E–02	680.5
143	12.00	0.62	0.1014	3.194	0.0309	2.43E–02	699.3
144	12.00	0.76	0.1065	3.355	0.0332	2.55E–02	734.5
145	12.00	0.88	0.1091	3.437	0.0343	2.61E–02	752.4
146	13.00	–0.25	0.1107	3.487	0.0351	2.65E–02	763.5
147	13.00	0.00	0.1139	3.587	0.0365	2.73E–02	785.3
148	13.00	0.13	0.1128	3.552	0.0360	2.70E–02	777.6
149	13.00	0.27	0.1103	3.472	0.0348	2.64E–02	760.2

Table A10. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.39	0.1116	3.515	0.0354	2.67E–02	769.5
151	13.00	0.51	0.1131	3.563	0.0361	2.71E–02	780.0
152	13.00	0.65	0.1173	3.694	0.0380	2.81E–02	808.7
153	13.00	0.77	0.1184	3.729	0.0385	2.84E–02	816.4
154	14.00	–0.25	0.1277	4.022	0.0426	3.06E–02	880.4
155	14.00	0.00	0.1311	4.129	0.0441	3.14E–02	904.0
156	14.00	0.13	0.1293	4.071	0.0433	3.09E–02	891.2
157	14.00	0.27	0.1266	3.987	0.0421	3.03E–02	873.0
158	14.00	0.41	0.1290	4.064	0.0432	3.09E–02	889.6
159	14.00	0.55	0.1340	4.220	0.0454	3.21E–02	923.9
160	14.00	0.67	0.1307	4.117	0.0439	3.13E–02	901.3
161	15.00	–0.25	0.1488	4.687	0.0520	3.56E–02	1026.2
162	15.00	0.00	0.1535	4.835	0.0540	3.68E–02	1058.5
163	15.00	0.13	0.1523	4.795	0.0535	3.65E–02	1049.8
164	15.00	0.44	0.1517	4.777	0.0532	3.63E–02	1045.8
165	15.00	0.56	0.1487	4.682	0.0519	3.56E–02	1025.0
166	16.00	–0.25	0.1773	5.584	0.0646	4.25E–02	1222.5
167	16.00	0.00	0.1822	5.737	0.0668	4.36E–02	1256.0
168	16.00	0.13	0.1819	5.729	0.0667	4.36E–02	1254.3
169	16.00	0.23	0.1803	5.680	0.0660	4.32E–02	1243.4
170	16.00	0.34	0.1784	5.617	0.0651	4.27E–02	1229.8
171	16.00	0.46	0.1713	5.396	0.0620	4.10E–02	1181.3
172	17.00	–0.25	0.2166	6.821	0.0820	5.19E–02	1493.3
173	17.00	0.00	0.2220	6.993	0.0845	5.32E–02	1531.0
174	17.00	0.13	0.2235	7.040	0.0851	5.35E–02	1541.4
175	17.00	0.23	0.2183	6.876	0.0828	5.23E–02	1505.4
176	17.00	0.35	0.2161	6.807	0.0818	5.18E–02	1490.3
177	18.00	–0.25	0.2885	9.087	0.1140	6.91E–02	1989.5
178	18.00	0.00	0.2916	9.185	0.1154	6.98E–02	2010.8
179	18.00	0.13	0.2923	9.205	0.1156	7.00E–02	2015.1
180	18.00	0.25	0.2933	9.237	0.1161	7.02E–02	2022.3
181	18.50	–0.25	0.3402	10.715	0.1369	8.15E–02	2345.9
182	18.50	0.00	0.3507	11.044	0.1416	8.40E–02	2417.9
183	18.50	0.13	0.3466	10.915	0.1397	8.30E–02	2389.6
184	18.60	0.17	0.3425	10.786	0.1379	8.20E–02	2361.4
185	18.50	0.22	0.3469	10.926	0.1399	8.31E–02	2392.0
186	19.20	–0.25	0.3392	10.684	0.1365	8.12E–02	2339.0
187	19.20	0.00	0.3288	10.355	0.1319	7.87E–02	2267.1
188	19.20	0.13	0.3340	10.519	0.1342	8.00E–02	2302.9
189	19.30	0.17	0.3330	10.489	0.1337	7.97E–02	2296.3
190	19.20	0.22	0.3420	10.770	0.1377	8.19E–02	2357.8
191	20.00	–0.25	0.3361	10.585	0.1351	8.05E–02	2317.5
192	20.00	0.00	0.3275	10.313	0.1313	7.84E–02	2257.8
193	20.00	0.13	0.3313	10.435	0.1330	7.93E–02	2284.6
194	20.10	0.17	0.3373	10.622	0.1356	8.08E–02	2325.4
195	20.00	0.22	0.3382	10.650	0.1360	8.10E–02	2331.6
196	20.80	–0.25	0.3646	11.484	0.1478	8.73E–02	2514.2
197	20.80	0.00	0.3648	11.490	0.1478	8.74E–02	2515.5
198	20.80	0.13	0.3643	11.473	0.1476	8.72E–02	2511.7
199	20.90	0.17	0.3692	11.627	0.1498	8.84E–02	2545.5
200	20.80	0.22	0.3689	11.617	0.1496	8.83E–02	2543.3
201	21.60	–0.25	0.3662	11.534	0.1485	8.77E–02	2525.2
202	21.60	0.00	0.3584	11.286	0.1450	8.58E–02	2470.8
203	21.60	0.13	0.3623	11.412	0.1467	8.68E–02	2498.3
204	21.70	0.17	0.3622	11.408	0.1467	8.67E–02	2497.6
205	21.60	0.22	0.3679	11.588	0.1492	8.81E–02	2537.0
206	22.40	–0.25	0.3549	11.176	0.1434	8.50E–02	2446.8
207	22.40	0.00	0.3512	11.062	0.1418	8.41E–02	2421.9

Table A10. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.13	0.3523	11.095	0.1423	8.43E–02	2429.0
209	22.50	0.17	0.3544	11.160	0.1432	8.48E–02	2443.3
210	22.40	0.22	0.3571	11.247	0.1444	8.55E–02	2462.4
211	23.20	–0.25	0.3680	11.591	0.1493	8.81E–02	2537.5
212	23.20	0.00	0.3629	11.428	0.1470	8.69E–02	2501.9
213	23.20	0.13	0.3647	11.484	0.1478	8.73E–02	2514.3
214	23.30	0.17	0.3745	11.793	0.1521	8.97E–02	2581.9
215	23.20	0.22	0.3708	11.677	0.1505	8.88E–02	2556.4
216	24.00	–0.25	0.4133	13.015	0.1693	9.89E–02	2849.4
217	24.00	0.00	0.4088	12.875	0.1674	9.79E–02	2818.6
218	24.00	0.13	0.4107	12.934	0.1682	9.83E–02	2831.7
219	24.10	0.17	0.4162	13.109	0.1707	9.97E–02	2869.9
220	24.00	0.22	0.4164	13.115	0.1707	9.97E–02	2871.1
221	25.00	–0.25	0.3893	12.261	0.1587	9.32E–02	2684.3
222	25.00	0.00	0.4158	13.095	0.1705	9.96E–02	2866.8
223	25.00	0.13	0.4105	12.929	0.1681	9.83E–02	2830.6
224	25.10	0.17	0.3700	11.653	0.1501	8.86E–02	2551.3
225	25.00	0.22	0.3954	12.453	0.1614	9.47E–02	2726.3
226	9.00	999.00	0.2847	8.965	0.1123	6.82E–02	1962.7
227	0.00	–2.50	4.1822	131.715	1.8423	1.00E+00	28836.1
228	0.00	–0.54	4.2332	133.322	1.8649	1.01E+00	29187.9
229	0.00	2.00	4.1302	130.079	1.8192	9.89E–01	28477.9
230	22.96	0.00	1.4033	44.195	0.6088	3.36E–01	9675.6
231	23.16	0.00	1.7049	53.695	0.7427	4.08E–01	11755.3
232	23.36	0.00	1.8015	56.736	0.7855	4.31E–01	12421.1
233	23.76	0.00	1.4551	45.828	0.6318	3.48E–01	10032.9
234	24.16	0.00	1.8838	59.328	0.8221	4.51E–01	12988.6
235	24.89	0.00	1.9927	62.760	0.8704	4.77E–01	13739.9
236	25.09	0.00	1.7897	56.367	0.7803	4.29E–01	12340.2
237	25.29	0.00	1.6722	52.665	0.7282	4.00E–01	11529.9
238	25.49	0.00	1.6841	53.038	0.7334	4.03E–01	11611.5
239	26.26	0.00	0.6007	18.918	0.2525	1.44E–01	4141.7
240	26.76	0.00	0.5701	17.955	0.2390	1.37E–01	3930.9
241	27.26	0.00	0.5698	17.944	0.2388	1.36E–01	3928.5
242	27.51	0.00	0.5344	16.829	0.2231	1.28E–01	3684.3
243	27.76	0.00	0.4965	15.636	0.2063	1.19E–01	3423.1
244	0.58	999.00	0.0278	0.877	–0.0017	6.67E–03	191.9
245	0.86	999.00	0.0284	0.893	–0.0015	6.79E–03	195.5
246	1.15	999.00	0.0283	0.893	–0.0015	6.79E–03	195.4
247	1.43	999.00	0.0283	0.892	–0.0015	6.78E–03	195.3
248	1.72	999.00	0.0272	0.857	–0.0020	6.51E–03	187.6
249	2.00	999.00	0.0280	0.882	–0.0017	6.71E–03	193.2
250	2.29	999.00	0.0279	0.877	–0.0017	6.67E–03	192.1
251	2.57	999.00	0.0274	0.864	–0.0019	6.57E–03	189.2
252	2.86	999.00	0.0291	0.916	–0.0012	6.97E–03	200.6
253	3.14	999.00	0.0288	0.905	–0.0013	6.88E–03	198.2
254	3.43	999.00	0.0278	0.875	–0.0018	6.66E–03	191.7
255	999.00	999.00	0.0222	0.699	–0.0042	5.32E–03	153.1
256	999.00	999.00	0.0237	0.745	–0.0036	5.67E–03	163.2

Table A11. Flow Conditions and Pressure Distribution for Run 47

[CR = 9; Re = 0.55×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	352.41	(.24298E+07)
$T_{t,1}$, °R (K)	1843.76	(1024.31)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0159	(8.20)
$h_{t,1}$, btu/lbm (J/kg)	462.83	(.10758E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0100	(68.98)
T_∞, °R (K)	97.81	(54.34)
ρ_∞, slug/ft^3 (kg/m^3)	0.85815E-05	(.44227E-02)
h_∞, btu/lbm (J/kg)	0.23327E+02	(.54223E+05)
a_∞, ft/s (m/s)	485.19	(147.89)
u_∞, ft/s (m/s)	4689.63	(1429.40)
Re_∞, ft^{-1} (m^{-1})	0.54731E+06	(.17956E+07)
q_∞, psia (N/m^2)	0.655	(4518.23)
μ_∞, slug/ft-s (N-s/m^2)	0.73531E-07	(.35207E-05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.215	(8372.67)
$T_{t,2}$, °R (K)	1845.81	(1025.45)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.55228E-04	(.28463E-01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0417	4.411	0.0512	3.57E–02	287.8
2	11.18	0.20	0.0486	5.140	0.0622	4.16E–02	335.4
3	12.17	0.20	0.0534	5.639	0.0697	4.57E–02	367.9
4	13.15	0.20	0.0604	6.384	0.0808	5.17E–02	416.5
5	14.21	0.20	0.0679	7.181	0.0928	5.81E–02	468.5
6	15.14	0.20	0.0807	8.526	0.1130	6.90E–02	556.3
7	16.13	0.20	0.0978	10.335	0.1401	8.37E–02	674.2
8	17.12	0.20	0.1252	13.232	0.1836	1.07E–01	863.2
9	18.11	0.20	0.1735	18.333	0.2602	1.48E–01	1196.0
10	19.74	0.20	0.2781	29.386	0.4262	2.38E–01	1917.2
11	20.55	0.20	0.3034	32.067	0.4664	2.60E–01	2092.1
12	22.56	0.20	0.3339	35.289	0.5148	2.86E–01	2302.3
13	24.98	0.20	0.2339	24.717	0.3561	2.00E–01	1612.5
14	10.59	0.60	0.0503	5.320	0.0649	4.31E–02	347.1
15	11.58	0.60	0.0509	5.376	0.0657	4.35E–02	350.7
16	12.57	0.60	0.0533	5.638	0.0696	4.56E–02	367.8
17	13.56	0.60	0.0611	6.458	0.0819	5.23E–02	421.3
18	14.60	0.60	0.0724	7.655	0.0999	6.20E–02	499.4
19	15.54	0.60	0.0912	9.637	0.1297	7.80E–02	628.7
20	16.53	0.60	0.1090	11.520	0.1579	9.33E–02	751.6
21	17.52	0.60	0.1393	14.724	0.2060	1.19E–01	960.6
22	18.51	0.60	0.2007	21.209	0.3034	1.72E–01	1383.7
23	12.97	1.00	0.0675	7.131	0.0920	5.77E–02	465.2
24	15.00	1.00	0.0781	8.252	0.1089	6.68E–02	538.4
25	15.94	1.00	0.0967	10.220	0.1384	8.28E–02	666.8
26	16.93	1.00	0.1221	12.903	0.1787	1.04E–01	841.8
27	17.92	1.00	0.1645	17.391	0.2461	1.41E–01	1134.6
28	18.91	1.00	0.2347	24.805	0.3574	2.01E–01	1618.3
29	24.98	1.00	0.2896	30.608	0.4445	2.48E–01	1996.9
30	11.99	2.00	0.0629	6.643	0.0847	5.38E–02	433.4
31	13.97	2.00	0.0612	6.463	0.0820	5.23E–02	421.7
32	15.98	2.00	0.0701	7.412	0.0963	6.00E–02	483.6
33	16.94	2.00	0.0900	9.513	0.1278	7.70E–02	620.6

Table A11. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.2050	21.668	0.3103	1.75E−01	1413.6
35	18.42	2.00	0.2299	24.294	0.3497	1.97E−01	1584.9
36	18.92	2.00	0.2509	26.514	0.3831	2.15E−01	1729.8
37	19.41	2.00	0.2906	30.709	0.4460	2.49E−01	2003.4
38	19.91	2.00	0.3872	40.921	0.5993	3.31E−01	2669.7
39	20.26	2.00	0.5237	55.349	0.8159	4.48E−01	3611.0
40	21.11	2.00	0.4130	43.652	0.6403	3.53E−01	2847.9
41	21.96	2.00	0.3122	32.991	0.4803	2.67E−01	2152.3
42	22.74	2.00	0.3016	31.879	0.4636	2.58E−01	2079.8
43	23.52	2.00	0.3149	33.278	0.4846	2.69E−01	2171.0
44	24.98	2.00	0.3228	34.120	0.4972	2.76E−01	2226.0
45	17.94	3.00	0.0660	6.979	0.0898	5.65E−02	455.3
46	18.93	3.00	0.2265	23.937	0.3444	1.94E−01	1561.7
47	19.92	3.00	0.3077	32.522	0.4732	2.63E−01	2121.7
48	20.91	3.00	0.4370	46.183	0.6783	3.74E−01	3013.0
49	22.11	3.00	0.8886	93.911	1.3949	7.60E−01	6126.8
50	22.96	3.00	0.6590	69.650	1.0306	5.64E−01	4544.0
51	23.74	3.00	0.5231	55.281	0.8149	4.48E−01	3606.6
52	24.98	3.00	0.5552	58.680	0.8660	4.75E−01	3828.3
53	18.34	3.40	0.0643	6.791	0.0869	5.50E−02	443.0
54	19.32	3.40	0.1642	17.356	0.2456	1.41E−01	1132.3
55	19.82	3.40	0.2673	28.249	0.4091	2.29E−01	1843.0
56	20.32	3.40	0.3001	31.715	0.4611	2.57E−01	2069.1
57	20.81	3.40	0.3668	38.768	0.5670	3.14E−01	2529.2
58	21.31	3.40	0.4064	42.948	0.6298	3.48E−01	2801.9
59	21.66	3.40	0.7945	83.969	1.2456	6.80E−01	5478.2
60	22.94	3.40	0.6660	70.387	1.0417	5.70E−01	4592.1
61	23.75	3.40	0.8203	86.695	1.2865	7.02E−01	5656.0
62	24.14	3.40	0.8691	91.855	1.3640	7.44E−01	5992.7
63	22.29	3.60	0.7047	74.477	1.1031	6.03E−01	4858.9
64	22.71	3.60	0.8114	85.749	1.2723	6.94E−01	5594.3
65	23.14	3.60	0.8582	90.699	1.3467	7.34E−01	5917.2
66	23.95	3.60	1.1600	122.595	1.8255	9.93E−01	7998.1
67	24.34	3.60	1.4390	152.081	2.2682	1.23E+00	9921.8
68	13.79	3.80	0.0475	5.021	0.0604	4.07E−02	327.6
69	15.77	3.80	0.0421	4.444	0.0517	3.60E−02	290.0
70	17.75	3.80	0.0478	5.047	0.0608	4.09E−02	329.3
71	19.23	3.80	0.0675	7.129	0.0920	5.77E−02	465.1
72	19.73	3.80	0.1110	11.729	0.1611	9.50E−02	765.2
73	20.22	3.80	0.1665	17.598	0.2492	1.42E−01	1148.1
74	20.72	3.80	0.2656	28.071	0.4064	2.27E−01	1831.4
75	21.41	3.80	0.3604	38.091	0.5569	3.08E−01	2485.1
76	21.71	3.80	0.3625	38.310	0.5601	3.10E−01	2499.4
77	22.06	3.80	0.7891	83.394	1.2370	6.75E−01	5440.7
78	22.49	3.80	0.8335	88.087	1.3074	7.13E−01	5746.8
79	22.76	3.80	1.0300	108.855	1.6192	8.81E−01	7101.7
80	22.91	3.80	1.1858	125.327	1.8665	1.01E+00	8176.4
81	23.76	3.80	1.8704	197.677	2.9527	1.60E+00	12896.5
82	24.15	3.80	1.9767	208.911	3.1214	1.69E+00	13629.4
83	24.98	3.80	1.7929	189.489	2.8298	1.53E+00	12362.3
84	22.59	3.90	0.9039	95.532	1.4192	7.74E−01	6232.5
85	22.80	3.90	1.1608	122.681	1.8268	9.93E−01	8003.8
86	23.01	3.90	1.5304	161.746	2.4133	1.31E+00	10552.4
87	23.15	3.90	2.0429	215.903	3.2264	1.75E+00	14085.6
88	23.86	3.90	1.9903	210.351	3.1430	1.70E+00	13723.4
89	24.25	3.90	2.0259	214.104	3.1994	1.73E+00	13968.2
90	11.99	2.00	0.0624	6.593	0.0840	5.34E−02	430.1
91	13.97	2.00	0.0612	6.463	0.0820	5.23E−02	421.7

Table A11. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0686	7.245	0.0938	5.87E–02	472.7
93	17.93	2.00	0.2149	22.712	0.3260	1.84E–01	1481.7
94	19.91	2.00	0.4154	43.905	0.6441	3.56E–01	2864.4
95	1.00	–0.38	0.0306	3.234	0.0335	2.62E–02	211.0
96	1.00	0.29	0.0296	3.125	0.0319	2.53E–02	203.9
97	1.00	0.91	0.0299	3.160	0.0324	2.56E–02	206.2
98	1.00	1.53	0.0298	3.144	0.0322	2.55E–02	205.1
99	2.50	–0.38	0.0247	2.611	0.0242	2.11E–02	170.3
100	4.00	–0.38	0.0243	2.568	0.0235	2.08E–02	167.6
101	4.00	0.29	0.0235	2.489	0.0224	2.02E–02	162.4
102	4.00	1.53	0.0232	2.450	0.0218	1.98E–02	159.8
103	5.50	–0.38	0.0334	3.532	0.0380	2.86E–02	230.4
104	7.00	–0.38	0.0350	3.698	0.0405	2.99E–02	241.2
105	8.00	–2.28	0.0296	3.126	0.0319	2.53E–02	203.9
106	8.00	–1.88	0.0293	3.101	0.0315	2.51E–02	202.3
107	8.00	–1.49	0.0301	3.181	0.0327	2.58E–02	207.5
108	8.00	–1.04	0.0303	3.198	0.0330	2.59E–02	208.7
109	8.00	–0.38	0.0313	3.313	0.0347	2.68E–02	216.1
110	8.00	–0.13	0.0317	3.354	0.0353	2.72E–02	218.8
111	8.00	0.01	0.0326	3.449	0.0368	2.79E–02	225.0
112	8.00	0.29	0.0320	3.383	0.0358	2.74E–02	220.7
113	8.00	0.74	0.0306	3.237	0.0336	2.62E–02	211.2
114	8.00	1.13	0.0300	3.166	0.0325	2.56E–02	206.5
115	8.00	1.53	0.0293	3.097	0.0315	2.51E–02	202.1
116	9.00	–0.38	0.0346	3.653	0.0398	2.96E–02	238.3
117	9.00	–0.13	0.0363	3.835	0.0426	3.11E–02	250.2
118	9.00	0.01	0.0354	3.745	0.0412	3.03E–02	244.4
119	9.00	0.29	0.0348	3.683	0.0403	2.98E–02	240.3
120	9.00	0.64	0.0320	3.380	0.0357	2.74E–02	220.5
121	9.00	0.95	0.0262	2.768	0.0265	2.24E–02	180.6
122	10.00	–0.38	0.0390	4.121	0.0469	3.34E–02	268.9
123	10.00	–0.13	0.0404	4.272	0.0491	3.46E–02	278.7
124	10.00	0.01	0.0416	4.392	0.0509	3.56E–02	286.5
125	10.00	0.29	0.0398	4.206	0.0481	3.41E–02	274.4
126	10.00	0.53	0.0367	3.882	0.0433	3.14E–02	253.3
127	10.00	0.71	0.0363	3.834	0.0425	3.10E–02	250.1
128	10.00	0.85	0.0368	3.884	0.0433	3.15E–02	253.4
129	10.00	0.97	0.0375	3.968	0.0446	3.21E–02	258.9
130	11.00	–0.38	0.0374	3.953	0.0443	3.20E–02	257.9
131	11.00	–0.13	0.0461	4.876	0.0582	3.95E–02	318.1
132	11.00	0.01	0.0461	4.871	0.0581	3.94E–02	317.8
133	11.00	0.15	0.0454	4.799	0.0570	3.89E–02	313.1
134	11.00	0.43	0.0404	4.265	0.0490	3.45E–02	278.2
135	11.00	0.60	0.0426	4.507	0.0527	3.65E–02	294.1
136	11.00	0.74	0.0480	5.075	0.0612	4.11E–02	331.1
137	11.00	0.86	0.0454	4.799	0.0570	3.89E–02	313.1
138	12.00	–0.38	0.0510	5.386	0.0658	4.36E–02	351.4
139	12.00	–0.13	0.0504	5.332	0.0650	4.32E–02	347.8
140	12.00	0.01	0.0506	5.348	0.0653	4.33E–02	348.9
141	12.00	0.15	0.0504	5.326	0.0650	4.31E–02	347.5
142	12.00	0.32	0.0474	5.013	0.0602	4.06E–02	327.0
143	12.00	0.50	0.0507	5.358	0.0654	4.34E–02	349.5
144	12.00	0.64	0.0513	5.425	0.0664	4.39E–02	353.9
145	12.00	0.76	0.0517	5.462	0.0670	4.42E–02	356.4
146	13.00	–0.38	0.0579	6.114	0.0768	4.95E–02	398.9
147	13.00	–0.13	0.0570	6.029	0.0755	4.88E–02	393.3
148	13.00	0.01	0.0569	6.014	0.0753	4.87E–02	392.3
149	13.00	0.15	0.0572	6.042	0.0757	4.89E–02	394.2

Table A11. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.0583	6.160	0.0775	4.99E–02	401.9
151	13.00	0.39	0.0583	6.163	0.0775	4.99E–02	402.1
152	13.00	0.53	0.0557	5.886	0.0734	4.77E–02	384.0
153	13.00	0.65	0.0579	6.116	0.0768	4.95E–02	399.0
154	14.00	–0.38	0.0674	7.119	0.0919	5.76E–02	464.4
155	14.00	–0.13	0.0654	6.916	0.0888	5.60E–02	451.2
156	14.00	0.01	0.0660	6.980	0.0898	5.65E–02	455.4
157	14.00	0.15	0.0656	6.930	0.0890	5.61E–02	452.1
158	14.00	0.29	0.0676	7.141	0.0922	5.78E–02	465.9
159	14.00	0.43	0.0665	7.032	0.0906	5.69E–02	458.8
160	14.00	0.55	0.0647	6.836	0.0876	5.54E–02	446.0
161	15.00	–0.38	0.0813	8.595	0.1140	6.96E–02	560.7
162	15.00	–0.13	0.0796	8.408	0.1112	6.81E–02	548.5
163	15.00	0.01	0.0776	8.197	0.1080	6.64E–02	534.8
164	15.00	0.32	0.0802	8.478	0.1123	6.86E–02	553.1
165	15.00	0.44	0.0805	8.507	0.1127	6.89E–02	555.0
166	16.00	–0.38	0.0986	10.424	0.1415	8.44E–02	680.0
167	16.00	–0.13	0.0958	10.126	0.1370	8.20E–02	660.6
168	16.00	0.01	0.0946	10.000	0.1351	8.10E–02	652.4
169	16.00	0.11	0.0939	9.929	0.1341	8.04E–02	647.8
170	16.00	0.22	0.0957	10.115	0.1368	8.19E–02	659.9
171	16.00	0.34	0.0976	10.314	0.1398	8.35E–02	672.9
172	17.00	–0.38	0.1244	13.150	0.1824	1.06E–01	857.9
173	17.00	–0.13	0.1212	12.806	0.1772	1.04E–01	835.4
174	17.00	0.01	0.1219	12.887	0.1785	1.04E–01	840.7
175	17.00	0.11	0.1191	12.588	0.1740	1.02E–01	821.3
176	17.00	0.23	0.1262	13.337	0.1852	1.08E–01	870.1
177	18.00	–0.38	0.1762	18.626	0.2646	1.51E–01	1215.1
178	18.00	–0.13	0.1729	18.269	0.2593	1.48E–01	1191.9
179	18.00	0.01	0.1714	18.117	0.2570	1.47E–01	1181.9
180	18.00	0.13	0.1728	18.260	0.2591	1.48E–01	1191.3
181	18.50	–0.38	0.2097	22.165	0.3177	1.79E–01	1446.0
182	18.50	–0.13	0.2087	22.059	0.3162	1.79E–01	1439.2
183	18.50	0.01	0.2110	22.294	0.3197	1.81E–01	1454.5
184	18.60	0.05	0.2212	23.373	0.3359	1.89E–01	1524.9
185	18.50	0.10	0.2134	22.557	0.3236	1.83E–01	1471.6
186	19.20	–0.38	0.2592	27.396	0.3963	2.22E–01	1787.3
187	19.20	–0.13	0.2622	27.707	0.4010	2.24E–01	1807.6
188	19.20	0.01	0.2618	27.668	0.4004	2.24E–01	1805.1
189	19.30	0.05	0.2665	28.161	0.4078	2.28E–01	1837.3
190	19.20	0.10	0.2632	27.815	0.4026	2.25E–01	1814.7
191	20.00	–0.38	0.2898	30.627	0.4448	2.48E–01	1998.1
192	20.00	–0.13	0.2914	30.798	0.4474	2.49E–01	2009.3
193	20.00	0.01	0.2943	31.104	0.4520	2.52E–01	2029.2
194	20.10	0.05	0.2973	31.415	0.4566	2.54E–01	2049.6
195	20.00	0.10	0.2931	30.972	0.4500	2.51E–01	2020.6
196	20.80	–0.38	0.3147	33.264	0.4844	2.69E–01	2170.2
197	20.80	–0.13	0.3146	33.245	0.4841	2.69E–01	2168.9
198	20.80	0.01	0.3139	33.172	0.4830	2.69E–01	2164.2
199	20.90	0.05	0.3167	33.467	0.4874	2.71E–01	2183.4
200	20.80	0.10	0.3147	33.256	0.4843	2.69E–01	2169.6
201	21.60	–0.38	0.3281	34.672	0.5055	2.81E–01	2262.0
202	21.60	–0.13	0.3292	34.790	0.5073	2.82E–01	2269.7
203	21.60	0.01	0.3288	34.746	0.5066	2.81E–01	2266.8
204	21.70	0.05	0.3319	35.075	0.5116	2.84E–01	2288.3
205	21.60	0.10	0.3331	35.200	0.5134	2.85E–01	2296.5
206	22.40	–0.38	0.3383	35.754	0.5218	2.90E–01	2332.6
207	22.40	–0.13	0.3414	36.077	0.5266	2.92E–01	2353.7

Table A11. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	0.3383	35.756	0.5218	2.90E−01	2332.7
209	22.50	0.05	0.3429	36.243	0.5291	2.93E−01	2364.5
210	22.40	0.10	0.3399	35.928	0.5244	2.91E−01	2343.9
211	23.20	–0.38	0.3392	35.854	0.5233	2.90E−01	2339.1
212	23.20	–0.13	0.3407	36.010	0.5256	2.92E−01	2349.3
213	23.20	0.01	0.3416	36.101	0.5270	2.92E−01	2355.3
214	23.30	0.05	0.3432	36.273	0.5296	2.94E−01	2366.4
215	23.20	0.10	0.3392	35.848	0.5232	2.90E−01	2338.8
216	24.00	–0.38	0.3243	34.278	0.4996	2.78E−01	2236.3
217	24.00	–0.13	0.3315	35.030	0.5109	2.84E−01	2285.4
218	24.00	0.01	0.3315	35.036	0.5110	2.84E−01	2285.7
219	24.10	0.05	0.3290	34.775	0.5071	2.82E−01	2268.7
220	24.00	0.10	0.3336	35.262	0.5144	2.86E−01	2300.5
221	25.00	–0.38	0.2364	24.981	0.3600	2.02E−01	1629.8
222	25.00	–0.13	0.2267	23.960	0.3447	1.94E−01	1563.2
223	25.00	0.01	0.2319	24.513	0.3530	1.98E−01	1599.2
224	25.10	0.05	0.1971	20.830	0.2977	1.69E−01	1358.9
225	25.00	0.10	0.2298	24.288	0.3496	1.97E−01	1584.6
226	9.00	999.00	0.0632	6.675	0.0852	5.41E−02	435.5
227	0.00	–2.63	1.1560	122.171	1.8192	9.89E−01	7970.5
228	0.00	–0.67	1.1665	123.284	1.8359	9.98E−01	8043.1
229	0.00	1.88	1.1375	120.220	1.7899	9.73E−01	7843.2
230	22.96	0.00	2.7476	290.386	4.3446	2.35E+00	18944.9
231	23.16	0.00	2.1974	232.238	3.4716	1.88E+00	15151.3
232	23.36	0.00	2.6162	276.491	4.1360	2.24E+00	18038.4
233	23.76	0.00	2.0741	219.201	3.2759	1.77E+00	14300.8
234	24.16	0.00	2.1207	224.129	3.3498	1.81E+00	14622.2
235	24.89	0.00	1.8088	191.168	2.8550	1.55E+00	12471.9
236	25.09	0.00	1.7452	184.439	2.7540	1.49E+00	12032.9
237	25.29	0.00	1.3416	141.791	2.1137	1.15E+00	9250.5
238	25.49	0.00	0.9452	99.892	1.4847	8.09E−01	6517.0
239	26.26	0.00	0.3147	33.260	0.4843	2.69E−01	2169.9
240	26.76	0.00	0.3405	35.989	0.5253	2.91E−01	2348.0
241	27.26	0.00	0.2319	24.505	0.3529	1.98E−01	1598.7
242	27.51	0.00	0.1946	20.569	0.2938	1.67E−01	1341.9
243	27.76	0.00	0.1694	17.903	0.2538	1.45E−01	1168.0
244	0.58	999.00	0.0228	2.410	0.0212	1.95E−02	157.2
245	0.86	999.00	0.0244	2.574	0.0236	2.08E−02	168.0
246	1.15	999.00	0.0233	2.467	0.0220	2.00E−02	160.9
247	1.43	999.00	0.0232	2.448	0.0217	1.98E−02	159.7
248	1.72	999.00	0.0218	2.307	0.0196	1.87E−02	150.5
249	2.00	999.00	0.0251	2.656	0.0249	2.15E−02	173.3
250	2.29	999.00	0.0228	2.414	0.0212	1.95E−02	157.5
251	2.57	999.00	0.0247	2.613	0.0242	2.12E−02	170.5
252	2.86	999.00	0.0228	2.408	0.0211	1.95E−02	157.1
253	3.14	999.00	0.0247	2.612	0.0242	2.11E−02	170.4
254	3.43	999.00	0.0232	2.455	0.0218	1.99E−02	160.1
255	999.00	999.00	0.0223	2.360	0.0204	1.91E−02	154.0
256	999.00	999.00	0.0221	2.333	0.0200	1.89E−02	152.2

Table A12. Flow Conditions and Pressure Distribution for Run 48

[CR = 9; Re = 1.14×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	728.19	(.50207E+07)
$T_{t,1}$, °R (K)	1827.35	(1015.19)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0329	(16.94)
$h_{t,1}$, btu/lbm (J/kg)	458.96	(.10668E+07)
Free-stream conditions:		
M_∞	9.79	
p_∞, psia (N/m^2)	0.0191	(131.68)
T_∞, °R (K)	94.75	(52.64)
ρ_∞, slug/ft^3 (kg/m^3)	0.16911E−04	(.87155E−02)
h_∞, btu/lbm (J/kg)	0.22597E+02	(.52525E+05)
a_∞, ft/s (m/s)	477.53	(145.55)
u_∞, ft/s (m/s)	4672.88	(1424.29)
Re_∞, ft^{-1} (m^{-1})	0.11157E+07	(.36604E+07)
q_∞, psia (N/m^2)	1.282	(8840.21)
μ_∞, slug/ft-s (N-s/m^2)	0.70829E−07	(.33913E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.377	(16395.18)
$T_{t,2}$, °R (K)	1831.69	(1017.61)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10887E−03	(.56110E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0634	3.579	0.0375	2.81E−02	436.9
2	11.18	0.20	0.0707	3.993	0.0436	3.14E−02	487.6
3	12.17	0.20	0.0771	4.353	0.0488	3.42E−02	531.4
4	13.15	0.20	0.0865	4.884	0.0566	3.84E−02	596.3
5	14.21	0.20	0.0989	5.586	0.0668	4.39E−02	682.0
6	15.14	0.20	0.1226	6.925	0.0863	5.44E−02	845.5
7	16.13	0.20	0.1597	9.021	0.1168	7.09E−02	1101.4
8	17.12	0.20	0.2467	13.930	0.1883	1.09E−01	1700.7
9	18.11	0.20	0.3458	19.529	0.2698	1.53E−01	2384.2
10	19.74	0.20	0.4967	28.050	0.3939	2.20E−01	3424.5
11	20.55	0.20	0.5512	31.131	0.4387	2.45E−01	3800.6
12	22.56	0.20	0.6274	35.433	0.5014	2.78E−01	4325.9
13	24.98	0.20	0.4755	26.852	0.3764	2.11E−01	3278.3
14	10.59	0.60	0.0964	5.444	0.0647	4.28E−02	664.7
15	11.58	0.60	0.0826	4.663	0.0533	3.66E−02	569.3
16	12.57	0.60	0.0862	4.871	0.0564	3.83E−02	594.6
17	13.56	0.60	0.0941	5.312	0.0628	4.17E−02	648.5
18	14.60	0.60	0.1073	6.062	0.0737	4.76E−02	740.1
19	15.54	0.60	0.1321	7.463	0.0941	5.86E−02	911.1
20	16.53	0.60	0.1878	10.608	0.1399	8.33E−02	1295.2
21	17.52	0.60	0.2714	15.326	0.2086	1.20E−01	1871.1
22	18.51	0.60	0.3891	21.977	0.3054	1.73E−01	2683.1
23	12.97	1.00	0.1142	6.450	0.0794	5.07E−02	787.5
24	15.00	1.00	0.1279	7.222	0.0906	5.67E−02	881.8
25	15.94	1.00	0.1474	8.325	0.1067	6.54E−02	1016.4
26	16.93	1.00	0.2073	11.706	0.1559	9.19E−02	1429.1
27	17.92	1.00	0.3141	17.741	0.2438	1.39E−01	2165.9
28	18.91	1.00	0.4895	27.644	0.3879	2.17E−01	3375.0
29	24.98	1.00	0.6044	34.136	0.4825	2.68E−01	4167.6
30	11.99	2.00	0.1073	6.059	0.0737	4.76E−02	739.8
31	13.97	2.00	0.0985	5.565	0.0665	4.37E−02	679.4
32	15.98	2.00	0.1090	6.154	0.0750	4.83E−02	751.4
33	16.94	2.00	0.1159	6.543	0.0807	5.14E−02	798.9

Table A12. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.3520	19.879	0.2749	1.56E−01	2426.9
35	18.42	2.00	0.4849	27.384	0.3842	2.15E−01	3343.2
36	18.92	2.00	0.4623	26.110	0.3656	2.05E−01	3187.7
37	19.41	2.00	0.5068	28.622	0.4022	2.25E−01	3494.4
38	19.91	2.00	0.5996	33.861	0.4785	2.66E−01	4133.9
39	20.26	2.00	1.0258	57.933	0.8290	4.55E−01	7072.8
40	21.11	2.00	1.3814	78.016	1.1214	6.13E−01	9524.8
41	21.96	2.00	0.7433	41.979	0.5967	3.30E−01	5125.1
42	22.74	2.00	0.5742	32.431	0.4576	2.55E−01	3959.4
43	23.52	2.00	0.5991	33.835	0.4781	2.66E−01	4130.8
44	24.98	2.00	0.6603	37.293	0.5284	2.93E−01	4553.0
45	17.94	3.00	0.1126	6.362	0.0781	5.00E−02	776.7
46	18.93	3.00	0.2014	11.372	0.1510	8.93E−02	1388.4
47	19.92	3.00	0.5413	30.568	0.4305	2.40E−01	3732.0
48	20.91	3.00	0.7934	44.810	0.6379	3.52E−01	5470.7
49	22.11	3.00	1.6001	90.365	1.3012	7.10E−01	11032.4
50	22.96	3.00	1.2204	68.922	0.9890	5.41E−01	8414.5
51	23.74	3.00	1.1806	66.673	0.9562	5.24E−01	8139.9
52	24.98	3.00	0.8781	49.593	0.7075	3.90E−01	6054.7
53	18.34	3.40	0.1079	6.095	0.0742	4.79E−02	744.1
54	19.32	3.40	0.1812	10.232	0.1344	8.04E−02	1249.2
55	19.82	3.40	0.3319	18.745	0.2584	1.47E−01	2288.5
56	20.32	3.40	0.4891	27.622	0.3876	2.17E−01	3372.3
57	20.81	3.40	0.6493	36.671	0.5194	2.88E−01	4477.1
58	21.31	3.40	0.6973	39.381	0.5588	3.09E−01	4807.9
59	21.66	3.40	0.8488	47.939	0.6835	3.77E−01	5852.7
60	22.94	3.40	1.2415	70.116	1.0064	5.51E−01	8560.3
61	23.75	3.40	1.2339	69.687	1.0001	5.47E−01	8507.9
62	24.14	3.40	1.2594	71.125	1.0210	5.59E−01	8683.4
63	22.29	3.60	1.3506	76.277	1.0961	5.99E−01	9312.5
64	22.71	3.60	1.3987	78.992	1.1356	6.20E−01	9643.9
65	23.14	3.60	1.2098	68.324	0.9803	5.37E−01	8341.5
66	23.95	3.60	1.8866	106.547	1.5368	8.37E−01	13008.0
67	24.34	3.60	2.6410	149.151	2.1571	1.17E+00	18209.4
68	13.79	3.80	0.0847	4.781	0.0551	3.76E−02	583.7
69	15.77	3.80	0.0727	4.107	0.0452	3.23E−02	501.5
70	17.75	3.80	0.0819	4.626	0.0528	3.63E−02	564.8
71	19.23	3.80	0.1010	5.704	0.0685	4.48E−02	696.4
72	19.73	3.80	0.1394	7.875	0.1001	6.19E−02	961.4
73	20.22	3.80	0.2272	12.833	0.1723	1.01E−01	1566.7
74	20.72	3.80	0.3298	18.624	0.2566	1.46E−01	2273.8
75	21.41	3.80	0.5614	31.704	0.4471	2.49E−01	3870.6
76	21.71	3.80	0.6352	35.875	0.5078	2.82E−01	4379.9
77	22.06	3.80	0.7567	42.736	0.6077	3.36E−01	5217.5
78	22.49	3.80	1.3447	75.945	1.0912	5.97E−01	9271.8
79	22.76	3.80	1.0243	57.847	0.8277	4.54E−01	7062.4
80	22.91	3.80	1.3934	78.696	1.1313	6.18E−01	9607.7
81	23.76	3.80	2.8197	159.243	2.3041	1.25E+00	19441.5
82	24.15	3.80	3.6722	207.394	3.0052	1.63E+00	25320.1
83	24.98	3.80	3.2588	184.045	2.6652	1.45E+00	22469.4
84	22.59	3.90	1.2771	72.124	1.0356	5.67E−01	8805.4
85	22.80	3.90	1.3610	76.864	1.1046	6.04E−01	9384.0
86	23.01	3.90	2.3390	132.095	1.9088	1.04E+00	16127.1
87	23.15	3.90	3.6276	204.874	2.9685	1.61E+00	25012.4
88	23.86	3.90	3.7983	214.512	3.1088	1.68E+00	26189.1
89	24.25	3.90	3.6216	204.532	2.9635	1.61E+00	24970.7
90	11.99	2.00	0.1077	6.081	0.0740	4.78E−02	742.5
91	13.97	2.00	0.1025	5.788	0.0697	4.55E−02	706.7

Table A12. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1102	6.222	0.0760	4.89E–02	759.6
93	17.93	2.00	0.3466	19.577	0.2705	1.54E–01	2390.1
94	19.91	2.00	0.6509	36.762	0.5207	2.89E–01	4488.1
95	1.00	–0.38	0.0483	2.728	0.0252	2.14E–02	333.1
96	1.00	0.29	0.0471	2.658	0.0241	2.09E–02	324.5
97	1.00	0.91	0.0470	2.654	0.0241	2.09E–02	324.1
98	1.00	1.53	0.0473	2.672	0.0243	2.10E–02	326.2
99	2.50	–0.38	0.0399	2.253	0.0182	1.77E–02	275.1
100	4.00	–0.38	0.0377	2.131	0.0165	1.67E–02	260.2
101	4.00	0.29	0.0374	2.114	0.0162	1.66E–02	258.1
102	4.00	1.53	0.0372	2.098	0.0160	1.65E–02	256.2
103	5.50	–0.38	0.0472	2.666	0.0243	2.09E–02	325.4
104	7.00	–0.38	0.0559	3.155	0.0314	2.48E–02	385.2
105	8.00	–2.28	0.0460	2.598	0.0233	2.04E–02	317.2
106	8.00	–1.88	0.0470	2.653	0.0241	2.08E–02	323.9
107	8.00	–1.49	0.0479	2.707	0.0249	2.13E–02	330.5
108	8.00	–1.04	0.0496	2.800	0.0262	2.20E–02	341.8
109	8.00	–0.38	0.0521	2.944	0.0283	2.31E–02	359.4
110	8.00	–0.13	0.0523	2.956	0.0285	2.32E–02	360.9
111	8.00	0.01	0.0529	2.985	0.0289	2.35E–02	364.5
112	8.00	0.29	0.0525	2.967	0.0286	2.33E–02	362.2
113	8.00	0.74	0.0504	2.846	0.0269	2.24E–02	347.5
114	8.00	1.13	0.0486	2.746	0.0254	2.16E–02	335.2
115	8.00	1.53	0.0472	2.665	0.0242	2.09E–02	325.4
116	9.00	–0.38	0.0552	3.118	0.0308	2.45E–02	380.6
117	9.00	–0.13	0.0559	3.158	0.0314	2.48E–02	385.6
118	9.00	0.01	0.0559	3.155	0.0314	2.48E–02	385.2
119	9.00	0.29	0.0552	3.120	0.0309	2.45E–02	380.9
120	9.00	0.64	0.0542	3.063	0.0300	2.41E–02	374.0
121	9.00	0.95	0.0456	2.575	0.0229	2.02E–02	314.3
122	10.00	–0.38	0.0652	3.681	0.0390	2.89E–02	449.4
123	10.00	–0.13	0.0665	3.753	0.0401	2.95E–02	458.2
124	10.00	0.01	0.0674	3.804	0.0408	2.99E–02	464.5
125	10.00	0.29	0.0654	3.691	0.0392	2.90E–02	450.6
126	10.00	0.53	0.0629	3.555	0.0372	2.79E–02	434.0
127	10.00	0.71	0.0619	3.499	0.0364	2.75E–02	427.1
128	10.00	0.85	0.0623	3.519	0.0367	2.76E–02	429.6
129	10.00	0.97	0.0644	3.639	0.0384	2.86E–02	444.3
130	11.00	–0.38	0.0748	4.225	0.0470	3.32E–02	515.9
131	11.00	–0.13	0.0727	4.108	0.0453	3.23E–02	501.6
132	11.00	0.01	0.0732	4.134	0.0456	3.25E–02	504.7
133	11.00	0.15	0.0727	4.106	0.0452	3.23E–02	501.3
134	11.00	0.43	0.0673	3.800	0.0408	2.99E–02	464.0
135	11.00	0.60	0.0696	3.931	0.0427	3.09E–02	479.9
136	11.00	0.74	0.0719	4.059	0.0445	3.19E–02	495.5
137	11.00	0.86	0.0723	4.082	0.0449	3.21E–02	498.4
138	12.00	–0.38	0.0773	4.363	0.0490	3.43E–02	532.7
139	12.00	–0.13	0.0783	4.422	0.0498	3.47E–02	539.9
140	12.00	0.01	0.0786	4.439	0.0501	3.49E–02	542.0
141	12.00	0.15	0.0781	4.409	0.0496	3.46E–02	538.3
142	12.00	0.32	0.0769	4.342	0.0487	3.41E–02	530.1
143	12.00	0.50	0.0769	4.341	0.0486	3.41E–02	530.0
144	12.00	0.64	0.0792	4.475	0.0506	3.52E–02	546.3
145	12.00	0.76	0.0792	4.472	0.0506	3.51E–02	546.0
146	13.00	–0.38	0.0875	4.943	0.0574	3.88E–02	603.5
147	13.00	–0.13	0.0877	4.953	0.0576	3.89E–02	604.7
148	13.00	0.01	0.0879	4.966	0.0577	3.90E–02	606.3
149	13.00	0.15	0.0865	4.886	0.0566	3.84E–02	596.5

Table A12. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.0878	4.960	0.0577	3.90E–02	605.6
151	13.00	0.39	0.0884	4.990	0.0581	3.92E–02	609.2
152	13.00	0.53	0.0884	4.990	0.0581	3.92E–02	609.2
153	13.00	0.65	0.0891	5.030	0.0587	3.95E–02	614.1
154	14.00	–0.38	0.1023	5.775	0.0695	4.54E–02	705.0
155	14.00	–0.13	0.1025	5.788	0.0697	4.55E–02	706.7
156	14.00	0.01	0.1026	5.793	0.0698	4.55E–02	707.2
157	14.00	0.15	0.1031	5.825	0.0703	4.58E–02	711.1
158	14.00	0.29	0.1042	5.883	0.0711	4.62E–02	718.2
159	14.00	0.43	0.1023	5.779	0.0696	4.54E–02	705.6
160	14.00	0.55	0.1014	5.724	0.0688	4.50E–02	698.9
161	15.00	–0.38	0.1210	6.835	0.0850	5.37E–02	834.4
162	15.00	–0.13	0.1221	6.898	0.0859	5.42E–02	842.1
163	15.00	0.01	0.1230	6.946	0.0866	5.46E–02	848.1
164	15.00	0.32	0.1204	6.802	0.0845	5.34E–02	830.5
165	15.00	0.44	0.1204	6.798	0.0844	5.34E–02	829.9
166	16.00	–0.38	0.1573	8.883	0.1148	6.98E–02	1084.5
167	16.00	–0.13	0.1572	8.879	0.1147	6.97E–02	1084.0
168	16.00	0.01	0.1594	9.002	0.1165	7.07E–02	1099.0
169	16.00	0.11	0.1580	8.926	0.1154	7.01E–02	1089.7
170	16.00	0.22	0.1561	8.818	0.1138	6.93E–02	1076.6
171	16.00	0.34	0.1560	8.808	0.1137	6.92E–02	1075.4
172	17.00	–0.38	0.2412	13.620	0.1837	1.07E–01	1662.8
173	17.00	–0.13	0.2333	13.176	0.1773	1.03E–01	1608.6
174	17.00	0.01	0.2333	13.176	0.1773	1.03E–01	1608.7
175	17.00	0.11	0.2323	13.117	0.1764	1.03E–01	1601.4
176	17.00	0.23	0.2375	13.413	0.1807	1.05E–01	1637.6
177	18.00	–0.38	0.3461	19.549	0.2701	1.54E–01	2386.7
178	18.00	–0.13	0.3430	19.370	0.2675	1.52E–01	2364.8
179	18.00	0.01	0.3384	19.112	0.2637	1.50E–01	2333.3
180	18.00	0.13	0.3438	19.416	0.2681	1.53E–01	2370.5
181	18.50	–0.38	0.3943	22.267	0.3097	1.75E–01	2718.5
182	18.50	–0.13	0.3901	22.032	0.3062	1.73E–01	2689.8
183	18.50	0.01	0.3878	21.901	0.3043	1.72E–01	2673.8
184	18.60	0.05	0.4018	22.692	0.3158	1.78E–01	2770.4
185	18.50	0.10	0.3919	22.136	0.3077	1.74E–01	2702.5
186	19.20	–0.38	0.4620	26.092	0.3654	2.05E–01	3185.5
187	19.20	–0.13	0.4640	26.207	0.3670	2.06E–01	3199.5
188	19.20	0.01	0.4606	26.011	0.3642	2.04E–01	3175.6
189	19.30	0.05	0.4696	26.524	0.3716	2.08E–01	3238.2
190	19.20	0.10	0.4636	26.183	0.3667	2.06E–01	3196.6
191	20.00	–0.38	0.5235	29.566	0.4159	2.32E–01	3609.6
192	20.00	–0.13	0.5246	29.627	0.4168	2.33E–01	3617.0
193	20.00	0.01	0.5239	29.591	0.4163	2.32E–01	3612.6
194	20.10	0.05	0.5311	29.995	0.4222	2.36E–01	3661.9
195	20.00	0.10	0.5248	29.641	0.4170	2.33E–01	3618.8
196	20.80	–0.38	0.5749	32.469	0.4582	2.55E–01	3964.1
197	20.80	–0.13	0.5759	32.522	0.4590	2.55E–01	3970.5
198	20.80	0.01	0.5742	32.427	0.4576	2.55E–01	3958.9
199	20.90	0.05	0.5807	32.795	0.4629	2.58E–01	4003.8
200	20.80	0.10	0.5756	32.510	0.4588	2.55E–01	3969.1
201	21.60	–0.38	0.6111	34.515	0.4880	2.71E–01	4213.8
202	21.60	–0.13	0.6124	34.587	0.4890	2.72E–01	4222.6
203	21.60	0.01	0.6130	34.622	0.4896	2.72E–01	4226.9
204	21.70	0.05	0.6155	34.761	0.4916	2.73E–01	4243.8
205	21.60	0.10	0.6147	34.715	0.4909	2.73E–01	4238.2
206	22.40	–0.38	0.6346	35.841	0.5073	2.82E–01	4375.7
207	22.40	–0.13	0.6382	36.043	0.5102	2.83E–01	4400.4

Table A12. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	0.6374	35.998	0.5096	2.83E–01	4394.9
209	22.50	0.05	0.6395	36.116	0.5113	2.84E–01	4409.3
210	22.40	0.10	0.6370	35.975	0.5092	2.83E–01	4392.1
211	23.20	–0.38	0.6440	36.370	0.5150	2.86E–01	4440.3
212	23.20	–0.13	0.6445	36.399	0.5154	2.86E–01	4443.9
213	23.20	0.01	0.6462	36.497	0.5169	2.87E–01	4455.8
214	23.30	0.05	0.6484	36.617	0.5186	2.88E–01	4470.4
215	23.20	0.10	0.6463	36.501	0.5169	2.87E–01	4456.2
216	24.00	–0.38	0.6286	35.502	0.5024	2.79E–01	4334.4
217	24.00	–0.13	0.6339	35.802	0.5067	2.81E–01	4370.9
218	24.00	0.01	0.6372	35.985	0.5094	2.83E–01	4393.3
219	24.10	0.05	0.6348	35.849	0.5074	2.82E–01	4376.7
220	24.00	0.10	0.6377	36.015	0.5098	2.83E–01	4396.9
221	25.00	–0.38	0.4690	26.488	0.3711	2.08E–01	3233.9
222	25.00	–0.13	0.4600	25.980	0.3637	2.04E–01	3171.8
223	25.00	0.01	0.4701	26.547	0.3720	2.09E–01	3241.0
224	25.10	0.05	0.3922	22.148	0.3079	1.74E–01	2704.0
225	25.00	0.10	0.4589	25.920	0.3628	2.04E–01	3164.4
226	9.00	999.00	0.2150	12.144	0.1623	9.54E–02	1482.7
227	0.00	–2.63	2.2286	125.863	1.8181	9.89E–01	15366.3
228	0.00	–0.67	2.2532	127.251	1.8383	1.00E+00	15535.6
229	0.00	1.88	2.2139	125.030	1.8059	9.82E–01	15264.5
230	22.96	0.00	3.4853	196.836	2.8515	1.55E+00	24031.1
231	23.16	0.00	3.1670	178.860	2.5897	1.40E+00	21836.5
232	23.36	0.00	3.8408	216.913	3.1438	1.70E+00	26482.2
233	23.76	0.00	3.5486	200.409	2.9035	1.57E+00	24467.3
234	24.16	0.00	3.6885	208.311	3.0185	1.64E+00	25432.1
235	24.89	0.00	3.3272	187.909	2.7215	1.48E+00	22941.3
236	25.09	0.00	3.2820	185.354	2.6843	1.46E+00	22629.3
237	25.29	0.00	2.5906	146.305	2.1157	1.15E+00	17861.9
238	25.49	0.00	1.8512	104.547	1.5077	8.21E–01	12763.7
239	26.26	0.00	0.7925	44.759	0.6371	3.52E–01	5464.4
240	26.76	0.00	0.7352	41.523	0.5900	3.26E–01	5069.4
241	27.26	0.00	0.5231	29.545	0.4156	2.32E–01	3607.1
242	27.51	0.00	0.4429	25.015	0.3497	1.96E–01	3054.0
243	27.76	0.00	0.3819	21.567	0.2995	1.69E–01	2633.0
244	0.58	999.00	0.0382	2.156	0.0168	1.69E–02	263.2
245	0.86	999.00	0.0384	2.170	0.0170	1.70E–02	264.9
246	1.15	999.00	0.0377	2.127	0.0164	1.67E–02	259.6
247	1.43	999.00	0.0394	2.223	0.0178	1.75E–02	271.3
248	1.72	999.00	0.0375	2.119	0.0163	1.66E–02	258.7
249	2.00	999.00	0.0392	2.213	0.0177	1.74E–02	270.1
250	2.29	999.00	0.0382	2.157	0.0168	1.69E–02	263.3
251	2.57	999.00	0.0395	2.230	0.0179	1.75E–02	272.3
252	2.86	999.00	0.0384	2.171	0.0170	1.71E–02	265.0
253	3.14	999.00	0.0387	2.183	0.0172	1.71E–02	266.5
254	3.43	999.00	0.0380	2.144	0.0167	1.68E–02	261.8
255	999.00	999.00	0.0364	2.054	0.0154	1.61E–02	250.8
256	999.00	999.00	0.0361	2.040	0.0151	1.60E–02	249.1

Table A13. Flow Conditions and Pressure Distribution for Run 49

[CR = 9; Re = 2.15×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1436.35	(.99033E+07)
$T_{t,1}$, °R (K)	1841.64	(1023.13)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0633	(32.64)
$h_{t,1}$, btu/lbm (J/kg)	464.08	(.10787E+07)
Free-stream conditions:		
M_∞	9.92	
p_∞, psia (N/m^2)	0.0349	(240.50)
T_∞, °R (K)	93.33	(51.85)
ρ_∞, slug/ft^3 (kg/m^3)	0.31354E−04	(.16159E−01)
h_∞, btu/lbm (J/kg)	0.22259E+02	(.51741E+05)
a_∞, ft/s (m/s)	473.95	(144.46)
u_∞, ft/s (m/s)	4701.99	(1433.17)
Re_∞, ft^{-1} (m^{-1})	0.21188E+07	(.69515E+07)
q_∞, psia (N/m^2)	2.407	(16595.49)
μ_∞, slug/ft-s (N-s/m^2)	0.69581E−07	(.33316E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.462	(30775.50)
$T_{t,2}$, °R (K)	1850.39	(1027.99)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20231E−03	(.10427E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0954	3.004	0.0282	2.28E−02	657.5
2	11.18	0.20	0.1056	3.327	0.0328	2.53E−02	728.0
3	12.17	0.20	0.1178	3.711	0.0382	2.82E−02	812.2
4	13.15	0.20	0.1301	4.099	0.0437	3.11E−02	897.0
5	14.21	0.20	0.1486	4.680	0.0518	3.56E−02	1024.3
6	15.14	0.20	0.1731	5.454	0.0627	4.14E−02	1193.6
7	16.13	0.20	0.2145	6.758	0.0811	5.14E−02	1479.0
8	17.12	0.20	0.2977	9.379	0.1180	7.13E−02	2052.7
9	18.11	0.20	0.5649	17.797	0.2366	1.35E−01	3894.8
10	19.74	0.20	0.8010	25.236	0.3414	1.92E−01	5522.9
11	20.55	0.20	0.9138	28.789	0.3915	2.19E−01	6300.3
12	22.56	0.20	1.0882	34.286	0.4689	2.61E−01	7503.3
13	24.98	0.20	0.9355	29.474	0.4011	2.24E−01	6450.3
14	10.59	0.60	0.1698	5.351	0.0613	4.07E−02	1171.0
15	11.58	0.60	0.1503	4.735	0.0526	3.60E−02	1036.3
16	12.57	0.60	0.1494	4.707	0.0522	3.58E−02	1030.1
17	13.56	0.60	0.1501	4.730	0.0526	3.59E−02	1035.2
18	14.60	0.60	0.1626	5.123	0.0581	3.89E−02	1121.1
19	15.54	0.60	0.1907	6.008	0.0706	4.57E−02	1314.9
20	16.53	0.60	0.2391	7.532	0.0920	5.72E−02	1648.4
21	17.52	0.60	0.3297	10.389	0.1323	7.89E−02	2273.5
22	18.51	0.60	0.6298	19.843	0.2654	1.51E−01	4342.5
23	12.97	1.00	0.1807	5.694	0.0661	4.33E−02	1246.1
24	15.00	1.00	0.2052	6.466	0.0770	4.91E−02	1415.1
25	15.94	1.00	0.2260	7.121	0.0862	5.41E−02	1558.5
26	16.93	1.00	0.2669	8.409	0.1044	6.39E−02	1840.2
27	17.92	1.00	0.4099	12.915	0.1678	9.81E−02	2826.3
28	18.91	1.00	0.7596	23.932	0.3230	1.82E−01	5237.4
29	24.98	1.00	1.1955	37.667	0.5165	2.86E−01	8243.2
30	11.99	2.00	0.1739	5.480	0.0631	4.16E−02	1199.2
31	13.97	2.00	0.1515	4.772	0.0531	3.63E−02	1044.2
32	15.98	2.00	0.1710	5.389	0.0618	4.10E−02	1179.3
33	16.94	2.00	0.1823	5.742	0.0668	4.36E−02	1256.7

Table A13. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.3414	10.757	0.1374	8.17E−02	2354.1
35	18.42	2.00	0.7605	23.960	0.3234	1.82E−01	5243.6
36	18.92	2.00	0.9605	30.260	0.4122	2.30E−01	6622.3
37	19.41	2.00	0.8721	27.476	0.3730	2.09E−01	6013.0
38	19.91	2.00	0.8827	27.811	0.3777	2.11E−01	6086.3
39	20.26	2.00	1.2357	38.931	0.5343	2.96E−01	8519.8
40	21.11	2.00	1.9605	61.766	0.8560	4.69E−01	13517.3
41	21.96	2.00	2.0532	64.688	0.8972	4.92E−01	14156.7
42	22.74	2.00	1.3874	43.712	0.6017	3.32E−01	9566.1
43	23.52	2.00	1.2860	40.515	0.5567	3.08E−01	8866.6
44	24.98	2.00	1.2615	39.743	0.5458	3.02E−01	8697.7
45	17.94	3.00	0.1804	5.683	0.0660	4.32E−02	1243.7
46	18.93	3.00	0.2490	7.847	0.0964	5.96E−02	1717.2
47	19.92	3.00	0.8984	28.304	0.3846	2.15E−01	6194.3
48	20.91	3.00	1.1535	36.341	0.4979	2.76E−01	7953.2
49	22.11	3.00	2.8619	90.167	1.2561	6.85E−01	19732.6
50	22.96	3.00	2.2045	69.455	0.9643	5.28E−01	15199.9
51	23.74	3.00	2.2854	72.005	1.0003	5.47E−01	15758.0
52	24.98	3.00	1.6534	52.091	0.7197	3.96E−01	11399.9
53	18.34	3.40	0.1748	5.507	0.0635	4.19E−02	1205.3
54	19.32	3.40	0.1982	6.244	0.0739	4.74E−02	1366.4
55	19.82	3.40	0.4342	13.679	0.1786	1.04E−01	2993.6
56	20.32	3.40	0.7539	23.752	0.3205	1.81E−01	5198.1
57	20.81	3.40	0.9509	29.959	0.4079	2.28E−01	6556.4
58	21.31	3.40	1.0916	34.392	0.4704	2.61E−01	7526.4
59	21.66	3.40	1.1475	36.155	0.4952	2.75E−01	7912.3
60	22.94	3.40	2.0640	65.030	0.9020	4.94E−01	14231.6
61	23.75	3.40	1.9328	60.895	0.8437	4.63E−01	13326.6
62	24.14	3.40	2.0449	64.427	0.8935	4.90E−01	14099.6
63	22.29	3.60	1.9268	60.707	0.8411	4.61E−01	13285.4
64	22.71	3.60	2.2369	70.477	0.9787	5.36E−01	15423.7
65	23.14	3.60	2.1237	66.909	0.9285	5.08E−01	14642.7
66	23.95	3.60	3.6037	113.539	1.5854	8.63E−01	24847.6
67	24.34	3.60	3.8060	119.911	1.6751	9.11E−01	26242.0
68	13.79	3.80	0.1368	4.311	0.0466	3.28E−02	943.4
69	15.77	3.80	0.1150	3.622	0.0369	2.75E−02	792.7
70	17.75	3.80	0.1218	3.838	0.0400	2.92E−02	839.9
71	19.23	3.80	0.1567	4.938	0.0555	3.75E−02	1080.7
72	19.73	3.80	0.1530	4.820	0.0538	3.66E−02	1054.8
73	20.22	3.80	0.3146	9.912	0.1255	7.53E−02	2169.3
74	20.72	3.80	0.5131	16.166	0.2137	1.23E−01	3537.9
75	21.41	3.80	0.9668	30.462	0.4150	2.31E−01	6666.4
76	21.71	3.80	0.9389	29.582	0.4026	2.25E−01	6474.0
77	22.06	3.80	0.9984	31.455	0.4290	2.39E−01	6883.9
78	22.49	3.80	1.6635	52.409	0.7242	3.98E−01	11469.6
79	22.76	3.80	2.2101	69.631	0.9668	5.29E−01	15238.4
80	22.91	3.80	1.9706	62.085	0.8605	4.72E−01	13587.1
81	23.76	3.80	4.7008	148.104	2.0723	1.13E+00	32411.9
82	24.15	3.80	5.4253	170.929	2.3938	1.30E+00	37407.2
83	24.98	3.80	5.4805	172.671	2.4183	1.31E+00	37788.3
84	22.59	3.90	1.6729	52.706	0.7284	4.01E−01	11534.5
85	22.80	3.90	4.1028	129.263	1.8068	9.82E−01	28288.6
86	23.01	3.90	3.7312	117.557	1.6419	8.93E−01	25726.8
87	23.15	3.90	3.4118	107.493	1.5002	8.17E−01	23524.5
88	23.86	3.90	4.7159	148.579	2.0790	1.13E+00	32516.0
89	24.25	3.90	5.2456	165.269	2.3141	1.26E+00	36168.5
90	11.99	2.00	0.1770	5.577	0.0645	4.24E−02	1220.5
91	13.97	2.00	0.1639	5.165	0.0587	3.93E−02	1130.4

Table A13. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1773	5.587	0.0646	4.25E−02	1222.6
93	17.93	2.00	0.3693	11.634	0.1498	8.84E−02	2546.0
94	19.91	2.00	0.9887	31.150	0.4247	2.37E−01	6817.2
95	1.00	–0.38	0.0721	2.273	0.0179	1.73E−02	497.4
96	1.00	0.29	0.0706	2.224	0.0172	1.69E−02	486.6
97	1.00	0.91	0.0714	2.249	0.0176	1.71E−02	492.1
98	1.00	1.53	0.0713	2.245	0.0175	1.71E−02	491.4
99	2.50	–0.38	0.0572	1.803	0.0113	1.37E−02	394.6
100	4.00	–0.38	0.0531	1.674	0.0095	1.27E−02	366.5
101	4.00	0.29	0.0542	1.707	0.0100	1.30E−02	373.5
102	4.00	1.53	0.0519	1.635	0.0089	1.24E−02	357.9
103	5.50	–0.38	0.0680	2.142	0.0161	1.63E−02	468.8
104	7.00	–0.38	0.0816	2.571	0.0221	1.95E−02	562.7
105	8.00	–2.28	0.0660	2.080	0.0152	1.58E−02	455.2
106	8.00	–1.88	0.0690	2.173	0.0165	1.65E−02	475.5
107	8.00	–1.49	0.0700	2.206	0.0170	1.68E−02	482.9
108	8.00	–1.04	0.0724	2.281	0.0181	1.73E−02	499.3
109	8.00	–0.38	0.0767	2.417	0.0200	1.84E−02	528.9
110	8.00	–0.13	0.0763	2.403	0.0198	1.83E−02	525.9
111	8.00	0.01	0.0762	2.401	0.0197	1.82E−02	525.5
112	8.00	0.29	0.0774	2.440	0.0203	1.85E−02	534.0
113	8.00	0.74	0.0749	2.361	0.0192	1.79E−02	516.8
114	8.00	1.13	0.0720	2.270	0.0179	1.72E−02	496.7
115	8.00	1.53	0.0698	2.198	0.0169	1.67E−02	481.1
116	9.00	–0.38	0.0813	2.562	0.0220	1.95E−02	560.6
117	9.00	–0.13	0.0823	2.592	0.0224	1.97E−02	567.1
118	9.00	0.01	0.0823	2.593	0.0224	1.97E−02	567.5
119	9.00	0.29	0.0813	2.560	0.0220	1.95E−02	560.2
120	9.00	0.64	0.0777	2.449	0.0204	1.86E−02	536.0
121	9.00	0.95	0.0656	2.066	0.0150	1.57E−02	452.2
122	10.00	–0.38	0.0943	2.970	0.0278	2.26E−02	650.0
123	10.00	–0.13	0.0967	3.046	0.0288	2.31E−02	666.5
124	10.00	0.01	0.0975	3.072	0.0292	2.33E−02	672.3
125	10.00	0.29	0.0932	2.936	0.0273	2.23E−02	642.6
126	10.00	0.53	0.0905	2.850	0.0261	2.17E−02	623.7
127	10.00	0.71	0.0908	2.860	0.0262	2.17E−02	625.9
128	10.00	0.85	0.0892	2.810	0.0255	2.14E−02	615.1
129	10.00	0.97	0.0944	2.974	0.0278	2.26E−02	650.8
130	11.00	–0.38	0.1004	3.164	0.0305	2.40E−02	692.3
131	11.00	–0.13	0.1074	3.384	0.0336	2.57E−02	740.6
132	11.00	0.01	0.1075	3.387	0.0336	2.57E−02	741.2
133	11.00	0.15	0.1068	3.365	0.0333	2.56E−02	736.4
134	11.00	0.43	0.1015	3.198	0.0310	2.43E−02	699.9
135	11.00	0.60	0.1007	3.174	0.0306	2.41E−02	694.6
136	11.00	0.74	0.1072	3.377	0.0335	2.57E−02	739.1
137	11.00	0.86	0.1094	3.448	0.0345	2.62E−02	754.6
138	12.00	–0.38	0.1145	3.606	0.0367	2.74E−02	789.1
139	12.00	–0.13	0.1163	3.664	0.0375	2.78E−02	801.8
140	12.00	0.01	0.1183	3.726	0.0384	2.83E−02	815.4
141	12.00	0.15	0.1163	3.664	0.0375	2.78E−02	801.9
142	12.00	0.32	0.1109	3.495	0.0351	2.66E−02	764.8
143	12.00	0.50	0.1143	3.601	0.0366	2.74E−02	788.1
144	12.00	0.64	0.1209	3.809	0.0396	2.89E−02	833.5
145	12.00	0.76	0.1203	3.790	0.0393	2.88E−02	829.4
146	13.00	–0.38	0.1292	4.070	0.0432	3.09E−02	890.7
147	13.00	–0.13	0.1298	4.090	0.0435	3.11E−02	895.1
148	13.00	0.01	0.1309	4.126	0.0440	3.14E−02	902.9
149	13.00	0.15	0.1283	4.043	0.0429	3.07E−02	884.8

Table A13. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.1308	4.120	0.0440	3.13E–02	901.7
151	13.00	0.39	0.1288	4.058	0.0431	3.08E–02	888.0
152	13.00	0.53	0.1327	4.180	0.0448	3.18E–02	914.7
153	13.00	0.65	0.1325	4.176	0.0447	3.17E–02	913.8
154	14.00	–0.38	0.1530	4.819	0.0538	3.66E–02	1054.7
155	14.00	–0.13	0.1492	4.702	0.0521	3.57E–02	1028.9
156	14.00	0.01	0.1505	4.742	0.0527	3.60E–02	1037.8
157	14.00	0.15	0.1506	4.743	0.0527	3.60E–02	1038.1
158	14.00	0.29	0.1509	4.755	0.0529	3.61E–02	1040.6
159	14.00	0.43	0.1513	4.768	0.0531	3.62E–02	1043.6
160	14.00	0.55	0.1463	4.611	0.0509	3.50E–02	1009.1
161	15.00	–0.38	0.1751	5.516	0.0636	4.19E–02	1207.1
162	15.00	–0.13	0.1792	5.647	0.0655	4.29E–02	1235.9
163	15.00	0.01	0.1786	5.626	0.0652	4.28E–02	1231.3
164	15.00	0.32	0.1779	5.604	0.0649	4.26E–02	1226.5
165	15.00	0.44	0.1725	5.434	0.0625	4.13E–02	1189.1
166	16.00	–0.38	0.2155	6.791	0.0816	5.16E–02	1486.1
167	16.00	–0.13	0.2227	7.017	0.0848	5.33E–02	1535.7
168	16.00	0.01	0.2216	6.980	0.0842	5.30E–02	1527.6
169	16.00	0.11	0.2204	6.944	0.0837	5.28E–02	1519.6
170	16.00	0.22	0.2201	6.935	0.0836	5.27E–02	1517.6
171	16.00	0.34	0.2147	6.764	0.0812	5.14E–02	1480.3
172	17.00	–0.38	0.3205	10.097	0.1281	7.67E–02	2209.6
173	17.00	–0.13	0.3008	9.477	0.1194	7.20E–02	2074.1
174	17.00	0.01	0.3032	9.553	0.1205	7.26E–02	2090.6
175	17.00	0.11	0.2998	9.445	0.1190	7.18E–02	2066.9
176	17.00	0.23	0.3069	9.670	0.1221	7.35E–02	2116.3
177	18.00	–0.38	0.5762	18.153	0.2416	1.38E–01	3972.8
178	18.00	–0.13	0.5554	17.498	0.2324	1.33E–01	3829.3
179	18.00	0.01	0.5486	17.283	0.2294	1.31E–01	3782.4
180	18.00	0.13	0.5550	17.485	0.2322	1.33E–01	3826.5
181	18.50	–0.38	0.7112	22.407	0.3016	1.70E–01	4903.7
182	18.50	–0.13	0.7533	23.734	0.3203	1.80E–01	5194.1
183	18.50	0.01	0.7442	23.448	0.3162	1.78E–01	5131.5
184	18.60	0.05	0.7430	23.409	0.3157	1.78E–01	5123.0
185	18.50	0.10	0.7522	23.699	0.3198	1.80E–01	5186.4
186	19.20	–0.38	0.7650	24.103	0.3255	1.83E–01	5275.0
187	19.20	–0.13	0.7580	23.883	0.3224	1.82E–01	5226.7
188	19.20	0.01	0.7506	23.649	0.3191	1.80E–01	5175.5
189	19.30	0.05	0.7597	23.935	0.3231	1.82E–01	5238.1
190	19.20	0.10	0.7552	23.793	0.3211	1.81E–01	5207.1
191	20.00	–0.38	0.8523	26.854	0.3642	2.04E–01	5876.9
192	20.00	–0.13	0.8465	26.670	0.3616	2.03E–01	5836.6
193	20.00	0.01	0.8455	26.640	0.3612	2.02E–01	5830.0
194	20.10	0.05	0.8633	27.199	0.3691	2.07E–01	5952.4
195	20.00	0.10	0.8475	26.701	0.3620	2.03E–01	5843.3
196	20.80	–0.38	0.9626	30.327	0.4131	2.30E–01	6637.0
197	20.80	–0.13	0.9639	30.367	0.4137	2.31E–01	6645.8
198	20.80	0.01	0.9626	30.327	0.4131	2.30E–01	6636.9
199	20.90	0.05	0.9747	30.710	0.4185	2.33E–01	6720.8
200	20.80	0.10	0.9658	30.429	0.4146	2.31E–01	6659.4
201	21.60	–0.38	1.0412	32.803	0.4480	2.49E–01	7178.8
202	21.60	–0.13	1.0419	32.826	0.4483	2.49E–01	7183.9
203	21.60	0.01	1.0409	32.794	0.4479	2.49E–01	7176.9
204	21.70	0.05	1.0470	32.987	0.4506	2.51E–01	7219.0
205	21.60	0.10	1.0475	33.002	0.4508	2.51E–01	7222.3
206	22.40	–0.38	1.0989	34.623	0.4737	2.63E–01	7577.1
207	22.40	–0.13	1.0996	34.644	0.4739	2.63E–01	7581.7

Table A13. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	1.0946	34.486	0.4717	2.62E–01	7547.2
209	22.50	0.05	1.1042	34.790	0.4760	2.64E–01	7613.7
210	22.40	0.10	1.1010	34.690	0.4746	2.64E–01	7591.7
211	23.20	–0.38	1.1342	35.734	0.4893	2.72E–01	7820.2
212	23.20	–0.13	1.1327	35.688	0.4887	2.71E–01	7810.2
213	23.20	0.01	1.1341	35.732	0.4893	2.72E–01	7819.8
214	23.30	0.05	1.1403	35.925	0.4920	2.73E–01	7862.1
215	23.20	0.10	1.1345	35.743	0.4894	2.72E–01	7822.2
216	24.00	–0.38	1.1373	35.830	0.4907	2.72E–01	7841.3
217	24.00	–0.13	1.1530	36.327	0.4977	2.76E–01	7950.0
218	24.00	0.01	1.1537	36.347	0.4979	2.76E–01	7954.5
219	24.10	0.05	1.1537	36.349	0.4980	2.76E–01	7954.9
220	24.00	0.10	1.1574	36.465	0.4996	2.77E–01	7980.3
221	25.00	–0.38	0.8933	28.144	0.3824	2.14E–01	6159.2
222	25.00	–0.13	0.8965	28.246	0.3838	2.15E–01	6181.5
223	25.00	0.01	0.9117	28.725	0.3906	2.18E–01	6286.4
224	25.10	0.05	0.7537	23.746	0.3204	1.80E–01	5196.7
225	25.00	0.10	0.8905	28.056	0.3811	2.13E–01	6139.9
226	9.00	999.00	0.7701	24.264	0.3277	1.84E–01	5310.1
227	0.00	–2.63	4.1831	131.792	1.8425	1.00E+00	28842.3
228	0.00	–0.67	4.2395	133.571	1.8675	1.02E+00	29231.5
229	0.00	1.88	4.1344	130.259	1.8209	9.90E–01	28506.7
230	22.96	0.00	4.9602	156.278	2.1874	1.19E+00	34200.8
231	23.16	0.00	5.5152	173.762	2.4337	1.32E+00	38027.0
232	23.36	0.00	5.0725	159.813	2.2372	1.21E+00	34974.5
233	23.76	0.00	5.4391	171.366	2.4000	1.30E+00	37502.7
234	24.16	0.00	5.6479	177.944	2.4926	1.35E+00	38942.4
235	24.89	0.00	5.1909	163.546	2.2898	1.24E+00	35791.4
236	25.09	0.00	5.2798	166.346	2.3292	1.26E+00	36404.2
237	25.29	0.00	4.0785	128.497	1.7961	9.77E–01	28121.1
238	25.49	0.00	2.9025	91.447	1.2741	6.95E–01	20012.7
239	26.26	0.00	1.3372	42.130	0.5794	3.20E–01	9219.9
240	26.76	0.00	1.2075	38.042	0.5218	2.89E–01	8325.4
241	27.26	0.00	0.9076	28.595	0.3887	2.17E–01	6257.9
242	27.51	0.00	0.7377	23.241	0.3133	1.77E–01	5086.2
243	27.76	0.00	0.6106	19.238	0.2569	1.46E–01	4210.1
244	0.58	999.00	0.0411	1.294	0.0041	9.83E–03	283.2
245	0.86	999.00	0.0449	1.415	0.0058	1.08E–02	309.6
246	1.15	999.00	0.0420	1.324	0.0046	1.01E–02	289.7
247	1.43	999.00	0.0420	1.322	0.0045	1.00E–02	289.4
248	1.72	999.00	0.0418	1.316	0.0045	1.00E–02	288.0
249	2.00	999.00	0.0432	1.362	0.0051	1.03E–02	298.0
250	2.29	999.00	0.0414	1.304	0.0043	9.91E–03	285.5
251	2.57	999.00	0.0435	1.370	0.0052	1.04E–02	299.7
252	2.86	999.00	0.0427	1.345	0.0049	1.02E–02	294.4
253	3.14	999.00	0.0440	1.386	0.0054	1.05E–02	303.4
254	3.43	999.00	0.0422	1.329	0.0046	1.01E–02	290.8
255	999.00	999.00	0.0409	1.287	0.0040	9.78E–03	281.7
256	999.00	999.00	0.0386	1.215	0.0030	9.23E–03	265.8

Table A14. Flow Conditions and Pressure Distribution for Run 50

[CR = 9; Re = 0.55×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	351.78	(.24255E+07)
$T_{t,1}$, °R (K)	1867.10	(1037.28)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0157	(8.08)
$h_{t,1}$, btu/lbm (J/kg)	469.24	(.10907E+07)
Free-stream conditions:		
M_∞	9.66	
p_∞, psia (N/m^2)	0.0100	(68.92)
T_∞, °R (K)	99.27	(55.15)
ρ_∞, slug/ft^3 (kg/m^3)	0.84476E-05	(.43537E-02)
h_∞, btu/lbm (J/kg)	0.23676E+02	(.55034E+05)
a_∞, ft/s (m/s)	488.80	(148.99)
u_∞, ft/s (m/s)	4721.89	(1439.23)
Re_∞, ft^{-1} (m^{-1})	0.53312E+06	(.17491E+07)
q_∞, psia (N/m^2)	0.654	(4509.13)
μ_∞, slug/ft-s (N-s/m^2)	0.74821E-07	(.35824E-05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.213	(8358.86)
$T_{t,2}$, °R (K)	1869.24	(1038.47)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.54433E-04	(.28054E-01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0434	4.595	0.0540	3.72E–02	299.6
2	11.18	0.20	0.0493	5.210	0.0633	4.22E–02	339.6
3	12.17	0.20	0.0550	5.822	0.0725	4.72E–02	379.5
4	13.15	0.20	0.0617	6.523	0.0830	5.29E–02	425.2
5	14.21	0.20	0.0706	7.463	0.0971	6.05E–02	486.5
6	15.14	0.20	0.0863	9.131	0.1222	7.40E–02	595.3
7	16.13	0.20	0.1034	10.937	0.1494	8.87E–02	713.0
8	17.12	0.20	0.1296	13.709	0.1910	1.11E–01	893.7
9	18.11	0.20	0.1806	19.097	0.2720	1.55E–01	1244.9
10	19.74	0.20	0.2905	30.725	0.4468	2.49E–01	2003.0
11	20.55	0.20	0.3172	33.547	0.4892	2.72E–01	2186.9
12	22.56	0.20	0.3566	37.716	0.5519	3.06E–01	2458.7
13	24.98	0.20	0.2697	28.524	0.4137	2.31E–01	1859.5
14	10.59	0.60	0.0511	5.405	0.0662	4.38E–02	352.4
15	11.58	0.60	0.0515	5.442	0.0668	4.41E–02	354.8
16	12.57	0.60	0.0568	6.009	0.0753	4.87E–02	391.7
17	13.56	0.60	0.0651	6.884	0.0884	5.58E–02	448.8
18	14.60	0.60	0.0763	8.075	0.1063	6.55E–02	526.4
19	15.54	0.60	0.0941	9.958	0.1346	8.07E–02	649.2
20	16.53	0.60	0.1136	12.011	0.1655	9.74E–02	783.0
21	17.52	0.60	0.1448	15.314	0.2151	1.24E–01	998.3
22	18.51	0.60	0.2083	22.033	0.3161	1.79E–01	1436.3
23	12.97	1.00	0.0711	7.521	0.0980	6.10E–02	490.3
24	15.00	1.00	0.0816	8.631	0.1147	7.00E–02	562.6
25	15.94	1.00	0.1012	10.707	0.1459	8.68E–02	698.0
26	16.93	1.00	0.1264	13.370	0.1859	1.08E–01	871.6
27	17.92	1.00	0.1652	17.471	0.2476	1.42E–01	1138.9
28	18.91	1.00	0.2430	25.706	0.3713	2.08E–01	1675.7
29	24.98	1.00	0.4159	43.988	0.6461	3.57E–01	2867.6
30	11.99	2.00	0.0663	7.009	0.0903	5.68E–02	456.9
31	13.97	2.00	0.0641	6.785	0.0869	5.50E–02	442.3
32	15.98	2.00	0.0748	7.915	0.1039	6.42E–02	516.0
33	16.94	2.00	0.0976	10.323	0.1401	8.37E–02	672.9

Table A14. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.2086	22.060	0.3165	1.79E−01	1438.1
35	18.42	2.00	0.2338	24.734	0.3567	2.00E−01	1612.4
36	18.92	2.00	0.2568	27.161	0.3932	2.20E−01	1770.6
37	19.41	2.00	0.3017	31.906	0.4645	2.59E−01	2079.9
38	19.91	2.00	0.4205	44.477	0.6535	3.61E−01	2899.4
39	20.26	2.00	0.5501	58.184	0.8595	4.72E−01	3793.0
40	21.11	2.00	0.4432	46.877	0.6896	3.80E−01	3055.9
41	21.96	2.00	0.3432	36.301	0.5306	2.94E−01	2366.5
42	22.74	2.00	0.3307	34.983	0.5108	2.84E−01	2280.5
43	23.52	2.00	0.3448	36.467	0.5331	2.96E−01	2377.3
44	24.98	2.00	0.6913	73.117	1.0840	5.93E−01	4766.5
45	17.94	3.00	0.0691	7.311	0.0949	5.93E−02	476.6
46	18.93	3.00	0.2357	24.934	0.3597	2.02E−01	1625.5
47	19.92	3.00	0.4392	46.457	0.6833	3.77E−01	3028.6
48	20.91	3.00	0.6145	64.989	0.9618	5.27E−01	4236.6
49	22.11	3.00	1.0400	109.996	1.6383	8.92E−01	7170.6
50	22.96	3.00	1.2114	128.124	1.9107	1.04E+00	8352.4
51	23.74	3.00	1.8168	192.162	2.8733	1.56E+00	12527.0
52	24.98	3.00	1.5383	162.704	2.4305	1.32E+00	10606.6
53	18.34	3.40	0.0684	7.238	0.0938	5.87E−02	471.8
54	19.32	3.40	0.1809	19.129	0.2725	1.55E−01	1247.0
55	19.82	3.40	0.3098	32.769	0.4775	2.66E−01	2136.2
56	20.32	3.40	0.5325	56.321	0.8315	4.57E−01	3671.5
57	20.81	3.40	0.6072	64.226	0.9503	5.21E−01	4186.9
58	21.31	3.40	0.9561	101.129	1.5050	8.20E−01	6592.6
59	21.66	3.40	1.3408	141.808	2.1164	1.15E+00	9244.5
60	22.94	3.40	3.0535	322.961	4.8393	2.62E+00	21053.8
61	23.75	3.40	2.2634	239.393	3.5832	1.94E+00	15606.0
62	24.14	3.40	2.1797	230.542	3.4501	1.87E+00	15029.0
63	22.29	3.60	3.9292	415.586	6.2314	3.37E+00	27092.0
64	22.71	3.60	3.1825	336.603	5.0443	2.73E+00	21943.1
65	23.14	3.60	2.7516	291.034	4.3594	2.36E+00	18972.5
66	23.95	3.60	2.4154	255.471	3.8248	2.07E+00	16654.1
67	24.34	3.60	2.1574	228.188	3.4148	1.85E+00	14875.5
68	13.79	3.80	0.0507	5.364	0.0656	4.35E−02	349.7
69	15.77	3.80	0.0454	4.799	0.0571	3.89E−02	312.9
70	17.75	3.80	0.0533	5.636	0.0697	4.57E−02	367.4
71	19.23	3.80	0.0815	8.625	0.1146	6.99E−02	562.3
72	19.73	3.80	0.1708	18.066	0.2565	1.46E−01	1177.7
73	20.22	3.80	0.4159	43.991	0.6462	3.57E−01	2867.8
74	20.72	3.80	0.6083	64.339	0.9520	5.22E−01	4194.2
75	21.41	3.80	1.4474	153.089	2.2860	1.24E+00	9979.8
76	21.71	3.80	2.3911	252.901	3.7862	2.05E+00	16486.6
77	22.06	3.80	3.9247	415.109	6.2243	3.36E+00	27060.9
78	22.49	3.80	3.9853	421.518	6.3206	3.42E+00	27478.7
79	22.76	3.80	2.9694	314.071	4.7056	2.55E+00	20474.2
80	22.91	3.80	3.0603	323.686	4.8501	2.62E+00	21101.0
81	23.76	3.80	2.3966	253.480	3.7949	2.05E+00	16524.4
82	24.15	3.80	2.3086	244.177	3.6551	1.98E+00	15917.9
83	24.98	3.80	1.8977	200.720	3.0019	1.63E+00	13084.9
84	22.59	3.90	3.4775	367.808	5.5133	2.98E+00	23977.4
85	22.80	3.90	3.0084	318.197	4.7676	2.58E+00	20743.2
86	23.01	3.90	2.9370	310.636	4.6540	2.52E+00	20250.3
87	23.15	3.90	2.8059	296.775	4.4457	2.41E+00	19346.7
88	23.86	3.90	2.3521	248.780	3.7243	2.02E+00	16217.9
89	24.25	3.90	2.1526	227.673	3.4070	1.85E+00	14842.0
90	11.99	2.00	0.0661	6.987	0.0900	5.66E−02	455.5
91	13.97	2.00	0.0644	6.817	0.0874	5.53E−02	444.4

Table A14. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0733	7.748	0.1014	6.28E–02	505.1
93	17.93	2.00	0.2176	23.016	0.3309	1.87E–01	1500.4
94	19.91	2.00	0.4443	46.993	0.6913	3.81E–01	3063.5
95	1.00	–0.38	0.0312	3.299	0.0346	2.67E–02	215.1
96	1.00	0.29	0.0308	3.261	0.0340	2.64E–02	212.6
97	1.00	0.91	0.0310	3.277	0.0342	2.66E–02	213.6
98	1.00	1.53	0.0310	3.279	0.0343	2.66E–02	213.7
99	2.50	–0.38	0.0265	2.803	0.0271	2.27E–02	182.7
100	4.00	–0.38	0.0248	2.618	0.0243	2.12E–02	170.7
101	4.00	0.29	0.0255	2.694	0.0255	2.18E–02	175.6
102	4.00	1.53	0.0249	2.630	0.0245	2.13E–02	171.4
103	5.50	–0.38	0.0362	3.830	0.0425	3.10E–02	249.7
104	7.00	–0.38	0.0357	3.772	0.0417	3.06E–02	245.9
105	8.00	–2.28	0.0308	3.258	0.0339	2.64E–02	212.4
106	8.00	–1.88	0.0315	3.334	0.0351	2.70E–02	217.3
107	8.00	–1.49	0.0311	3.290	0.0344	2.67E–02	214.4
108	8.00	–1.04	0.0316	3.340	0.0352	2.71E–02	217.7
109	8.00	–0.38	0.0335	3.542	0.0382	2.87E–02	230.9
110	8.00	–0.13	0.0338	3.576	0.0387	2.90E–02	233.1
111	8.00	0.01	0.0341	3.606	0.0392	2.92E–02	235.1
112	8.00	0.29	0.0341	3.609	0.0392	2.92E–02	235.2
113	8.00	0.74	0.0327	3.459	0.0370	2.80E–02	225.5
114	8.00	1.13	0.0314	3.323	0.0349	2.69E–02	216.6
115	8.00	1.53	0.0314	3.321	0.0349	2.69E–02	216.5
116	9.00	–0.38	0.0363	3.837	0.0426	3.11E–02	250.1
117	9.00	–0.13	0.0376	3.978	0.0448	3.22E–02	259.3
118	9.00	0.01	0.0378	4.000	0.0451	3.24E–02	260.7
119	9.00	0.29	0.0363	3.844	0.0428	3.12E–02	250.6
120	9.00	0.64	0.0342	3.621	0.0394	2.93E–02	236.0
121	9.00	0.95	0.0293	3.101	0.0316	2.51E–02	202.2
122	10.00	–0.38	0.0422	4.464	0.0521	3.62E–02	291.0
123	10.00	–0.13	0.0441	4.662	0.0550	3.78E–02	303.9
124	10.00	0.01	0.0451	4.775	0.0567	3.87E–02	311.3
125	10.00	0.29	0.0414	4.379	0.0508	3.55E–02	285.5
126	10.00	0.53	0.0393	4.154	0.0474	3.37E–02	270.8
127	10.00	0.71	0.0401	4.246	0.0488	3.44E–02	276.8
128	10.00	0.85	0.0410	4.341	0.0502	3.52E–02	283.0
129	10.00	0.97	0.0416	4.402	0.0511	3.57E–02	287.0
130	11.00	–0.38	0.0485	5.132	0.0621	4.16E–02	334.6
131	11.00	–0.13	0.0492	5.206	0.0632	4.22E–02	339.4
132	11.00	0.01	0.0494	5.229	0.0636	4.24E–02	340.9
133	11.00	0.15	0.0494	5.225	0.0635	4.23E–02	340.6
134	11.00	0.43	0.0455	4.807	0.0572	3.90E–02	313.4
135	11.00	0.60	0.0480	5.073	0.0612	4.11E–02	330.7
136	11.00	0.74	0.0485	5.127	0.0620	4.16E–02	334.2
137	11.00	0.86	0.0492	5.198	0.0631	4.21E–02	338.9
138	12.00	–0.38	0.0541	5.727	0.0710	4.64E–02	373.3
139	12.00	–0.13	0.0539	5.697	0.0706	4.62E–02	371.4
140	12.00	0.01	0.0538	5.693	0.0705	4.61E–02	371.1
141	12.00	0.15	0.0537	5.684	0.0704	4.61E–02	370.6
142	12.00	0.32	0.0531	5.620	0.0694	4.56E–02	366.4
143	12.00	0.50	0.0548	5.799	0.0721	4.70E–02	378.0
144	12.00	0.64	0.0552	5.838	0.0727	4.73E–02	380.6
145	12.00	0.76	0.0558	5.905	0.0737	4.79E–02	385.0
146	13.00	–0.38	0.0612	6.470	0.0822	5.24E–02	421.8
147	13.00	–0.13	0.0605	6.404	0.0812	5.19E–02	417.5
148	13.00	0.01	0.0605	6.399	0.0811	5.19E–02	417.1
149	13.00	0.15	0.0604	6.387	0.0810	5.18E–02	416.4

Table A14. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.0613	6.488	0.0825	5.26E–02	423.0
151	13.00	0.39	0.0622	6.575	0.0838	5.33E–02	428.6
152	13.00	0.53	0.0621	6.572	0.0837	5.33E–02	428.4
153	13.00	0.65	0.0629	6.649	0.0849	5.39E–02	433.5
154	14.00	–0.38	0.0707	7.483	0.0974	6.07E–02	487.8
155	14.00	–0.13	0.0711	7.516	0.0979	6.09E–02	490.0
156	14.00	0.01	0.0707	7.481	0.0974	6.06E–02	487.7
157	14.00	0.15	0.0702	7.422	0.0965	6.02E–02	483.8
158	14.00	0.29	0.0692	7.322	0.0950	5.93E–02	477.3
159	14.00	0.43	0.0713	7.539	0.0983	6.11E–02	491.4
160	14.00	0.55	0.0716	7.574	0.0988	6.14E–02	493.8
161	15.00	–0.38	0.0844	8.927	0.1192	7.24E–02	582.0
162	15.00	–0.13	0.0833	8.812	0.1174	7.14E–02	574.4
163	15.00	0.01	0.0830	8.782	0.1170	7.12E–02	572.5
164	15.00	0.32	0.0837	8.854	0.1180	7.18E–02	577.2
165	15.00	0.44	0.0854	9.037	0.1208	7.33E–02	589.1
166	16.00	–0.38	0.1028	10.877	0.1485	8.82E–02	709.1
167	16.00	–0.13	0.1000	10.576	0.1439	8.57E–02	689.4
168	16.00	0.01	0.1002	10.603	0.1443	8.59E–02	691.2
169	16.00	0.11	0.1002	10.602	0.1443	8.59E–02	691.2
170	16.00	0.22	0.1013	10.718	0.1461	8.69E–02	698.7
171	16.00	0.34	0.1035	10.944	0.1495	8.87E–02	713.4
172	17.00	–0.38	0.1293	13.677	0.1905	1.11E–01	891.6
173	17.00	–0.13	0.1281	13.547	0.1886	1.10E–01	883.1
174	17.00	0.01	0.1264	13.371	0.1859	1.08E–01	871.7
175	17.00	0.11	0.1268	13.407	0.1865	1.09E–01	874.0
176	17.00	0.23	0.1299	13.738	0.1915	1.11E–01	895.6
177	18.00	–0.38	0.1801	19.048	0.2713	1.54E–01	1241.8
178	18.00	–0.13	0.1807	19.115	0.2723	1.55E–01	1246.1
179	18.00	0.01	0.1791	18.942	0.2697	1.54E–01	1234.8
180	18.00	0.13	0.1817	19.214	0.2738	1.56E–01	1252.5
181	18.50	–0.38	0.2162	22.865	0.3286	1.85E–01	1490.5
182	18.50	–0.13	0.2163	22.874	0.3288	1.85E–01	1491.1
183	18.50	0.01	0.2188	23.138	0.3328	1.88E–01	1508.4
184	18.60	0.05	0.2295	24.270	0.3498	1.97E–01	1582.2
185	18.50	0.10	0.2195	23.215	0.3339	1.88E–01	1513.4
186	19.20	–0.38	0.2652	28.051	0.4066	2.27E–01	1828.7
187	19.20	–0.13	0.2703	28.584	0.4146	2.32E–01	1863.4
188	19.20	0.01	0.2725	28.821	0.4182	2.34E–01	1878.9
189	19.30	0.05	0.2774	29.335	0.4259	2.38E–01	1912.3
190	19.20	0.10	0.2735	28.923	0.4197	2.34E–01	1885.5
191	20.00	–0.38	0.2988	31.607	0.4600	2.56E–01	2060.5
192	20.00	–0.13	0.3039	32.143	0.4681	2.61E–01	2095.4
193	20.00	0.01	0.3060	32.362	0.4714	2.62E–01	2109.7
194	20.10	0.05	0.3092	32.703	0.4765	2.65E–01	2131.9
195	20.00	0.10	0.3061	32.381	0.4717	2.62E–01	2110.9
196	20.80	–0.38	0.3302	34.928	0.5100	2.83E–01	2276.9
197	20.80	–0.13	0.3294	34.838	0.5086	2.82E–01	2271.1
198	20.80	0.01	0.3295	34.845	0.5087	2.82E–01	2271.6
199	20.90	0.05	0.3330	35.219	0.5143	2.85E–01	2295.9
200	20.80	0.10	0.3303	34.938	0.5101	2.83E–01	2277.6
201	21.60	–0.38	0.3493	36.944	0.5403	2.99E–01	2408.3
202	21.60	–0.13	0.3528	37.316	0.5458	3.02E–01	2432.6
203	21.60	0.01	0.3546	37.501	0.5486	3.04E–01	2444.7
204	21.70	0.05	0.3553	37.578	0.5498	3.05E–01	2449.7
205	21.60	0.10	0.3568	37.733	0.5521	3.06E–01	2459.8
206	22.40	–0.38	0.3621	38.302	0.5607	3.10E–01	2496.9
207	22.40	–0.13	0.3673	38.848	0.5689	3.15E–01	2532.5

Table A14. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	0.3675	38.866	0.5692	3.15E–01	2533.7
209	22.50	0.05	0.3694	39.069	0.5722	3.17E–01	2546.9
210	22.40	0.10	0.3674	38.854	0.5690	3.15E–01	2532.9
211	23.20	–0.38	0.3680	38.928	0.5701	3.16E–01	2537.7
212	23.20	–0.13	0.3716	39.308	0.5758	3.19E–01	2562.5
213	23.20	0.01	0.3746	39.623	0.5805	3.21E–01	2583.0
214	23.30	0.05	0.3747	39.629	0.5806	3.21E–01	2583.4
215	23.20	0.10	0.3738	39.532	0.5792	3.20E–01	2577.1
216	24.00	–0.38	0.3634	38.435	0.5627	3.12E–01	2505.6
217	24.00	–0.13	0.3675	38.872	0.5692	3.15E–01	2534.0
218	24.00	0.01	0.3694	39.074	0.5723	3.17E–01	2547.2
219	24.10	0.05	0.3706	39.195	0.5741	3.18E–01	2555.1
220	24.00	0.10	0.3691	39.035	0.5717	3.16E–01	2544.7
221	25.00	–0.38	0.2833	29.960	0.4353	2.43E–01	1953.1
222	25.00	–0.13	0.2676	28.303	0.4104	2.29E–01	1845.0
223	25.00	0.01	0.2783	29.436	0.4274	2.39E–01	1918.9
224	25.10	0.05	0.2478	26.206	0.3789	2.12E–01	1708.3
225	25.00	0.10	0.2727	28.838	0.4184	2.34E–01	1879.9
226	9.00	999.00	0.1813	19.177	0.2732	1.55E–01	1250.1
227	0.00	–2.63	1.1673	123.461	1.8407	1.00E+00	8048.4
228	0.00	–0.67	1.1808	124.891	1.8621	1.01E+00	8141.6
229	0.00	1.88	1.1479	121.411	1.8098	9.84E–01	7914.8
230	20.58	0.00	0.6785	71.766	1.0637	5.82E–01	4678.4
231	20.78	0.00	0.7776	82.250	1.2212	6.67E–01	5361.9
232	20.98	0.00	0.9325	98.624	1.4673	7.99E–01	6429.3
233	21.38	0.00	1.3934	147.379	2.2002	1.19E+00	9607.6
234	21.78	0.00	2.5447	269.148	4.0304	2.18E+00	17545.7
235	22.51	0.00	3.9072	413.260	6.1965	3.35E+00	26940.4
236	22.71	0.00	3.2209	340.666	5.1054	2.76E+00	22208.0
237	22.91	0.00	2.9420	311.174	4.6621	2.52E+00	20285.4
238	23.11	0.00	2.8436	300.766	4.5056	2.44E+00	19606.9
239	23.88	0.00	2.0954	221.622	3.3161	1.80E+00	14447.5
240	24.38	0.00	2.2194	234.745	3.5133	1.90E+00	15303.0
241	24.88	0.00	1.9988	211.410	3.1626	1.71E+00	13781.8
242	25.08	0.00	1.6150	170.820	2.5525	1.38E+00	11135.7
243	25.38	0.00	1.0565	111.740	1.6645	9.06E–01	7284.3
244	0.58	999.00	0.0388	4.105	0.0467	3.33E–02	267.6
245	0.86	999.00	0.0385	4.067	0.0461	3.30E–02	265.2
246	1.15	999.00	0.0381	4.033	0.0456	3.27E–02	262.9
247	1.43	999.00	0.0381	4.027	0.0455	3.26E–02	262.5
248	1.72	999.00	0.0362	3.826	0.0425	3.10E–02	249.4
249	2.00	999.00	0.0376	3.981	0.0448	3.23E–02	259.5
250	2.29	999.00	0.0365	3.866	0.0431	3.13E–02	252.0
251	2.57	999.00	0.0381	4.029	0.0455	3.27E–02	262.6
252	2.86	999.00	0.0374	3.961	0.0445	3.21E–02	258.2
253	3.14	999.00	0.0376	3.980	0.0448	3.23E–02	259.5
254	3.43	999.00	0.0385	4.067	0.0461	3.30E–02	265.1
255	999.00	999.00	0.0356	3.766	0.0416	3.05E–02	245.5
256	999.00	999.00	0.0370	3.911	0.0438	3.17E–02	255.0

Table A15. Flow Conditions and Pressure Distribution for Run 52

[CR = 9; Re = 1.14×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	723.45	(.49880E+07)
$T_{t,1}$, °R (K)	1847.07	(1026.15)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0323	(16.66)
$h_{t,1}$, btu/lbm (J/kg)	464.38	(.10794E+07)
Free-stream conditions:		
M_∞	9.78	
p_∞, psia (N/m^2)	0.0190	(131.26)
T_∞, °R (K)	96.05	(53.36)
ρ_∞, slug/ft^3 (kg/m^3)	0.16629E−04	(.85703E−02)
h_∞, btu/lbm (J/kg)	0.22907E+02	(.53245E+05)
a_∞, ft/s (m/s)	480.79	(146.55)
u_∞, ft/s (m/s)	4700.16	(1432.61)
Re_∞, ft^{-1} (m^{-1})	0.10859E+07	(.35627E+07)
q_∞, psia (N/m^2)	1.276	(8794.68)
μ_∞, slug/ft-s (N-s/m^2)	0.71975E−07	(.34462E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.365	(16296.27)
$T_{t,2}$, °R (K)	1851.49	(1028.61)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10716E−03	(.55230E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0646	3.658	0.0388	2.88E−02	445.2
2	11.18	0.20	0.0714	4.043	0.0444	3.18E−02	492.2
3	12.17	0.20	0.0785	4.444	0.0503	3.50E−02	541.0
4	13.15	0.20	0.0882	4.996	0.0583	3.93E−02	608.1
5	14.21	0.20	0.1010	5.720	0.0689	4.50E−02	696.3
6	15.14	0.20	0.1228	6.957	0.0869	5.48E−02	846.8
7	16.13	0.20	0.1599	9.057	0.1176	7.13E−02	1102.5
8	17.12	0.20	0.2457	13.915	0.1884	1.10E−01	1693.8
9	18.11	0.20	0.3449	19.534	0.2704	1.54E−01	2377.8
10	19.74	0.20	0.5008	28.368	0.3993	2.23E−01	3453.1
11	20.55	0.20	0.5561	31.497	0.4450	2.48E−01	3834.0
12	22.56	0.20	0.6358	36.014	0.5109	2.83E−01	4383.8
13	24.98	0.20	0.4796	27.168	0.3818	2.14E−01	3307.0
14	10.59	0.60	0.0977	5.533	0.0661	4.35E−02	673.5
15	11.58	0.60	0.0837	4.743	0.0546	3.73E−02	577.3
16	12.57	0.60	0.0851	4.820	0.0557	3.79E−02	586.7
17	13.56	0.60	0.0930	5.270	0.0623	4.15E−02	641.5
18	14.60	0.60	0.1064	6.029	0.0734	4.74E−02	733.8
19	15.54	0.60	0.1313	7.437	0.0939	5.85E−02	905.3
20	16.53	0.60	0.1880	10.647	0.1408	8.38E−02	1296.0
21	17.52	0.60	0.2712	15.362	0.2095	1.21E−01	1869.9
22	18.51	0.60	0.3883	21.996	0.3063	1.73E−01	2677.5
23	12.97	1.00	0.1140	6.456	0.0796	5.08E−02	785.9
24	15.00	1.00	0.1268	7.184	0.0902	5.65E−02	874.5
25	15.94	1.00	0.1466	8.303	0.1066	6.53E−02	1010.7
26	16.93	1.00	0.2085	11.811	0.1577	9.30E−02	1437.7
27	17.92	1.00	0.3121	17.680	0.2434	1.39E−01	2152.1
28	18.91	1.00	0.4905	27.782	0.3908	2.19E−01	3381.8
29	24.98	1.00	0.6142	34.790	0.4930	2.74E−01	4234.8
30	11.99	2.00	0.1057	5.988	0.0728	4.71E−02	728.9
31	13.97	2.00	0.0969	5.487	0.0655	4.32E−02	667.9
32	15.98	2.00	0.1080	6.118	0.0747	4.81E−02	744.8
33	16.94	2.00	0.1151	6.518	0.0805	5.13E−02	793.4

Table A15. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.3634	20.582	0.2857	1.62E−01	2505.4
35	18.42	2.00	0.4849	27.467	0.3862	2.16E−01	3343.4
36	18.92	2.00	0.4617	26.151	0.3670	2.06E−01	3183.3
37	19.41	2.00	0.5075	28.745	0.4048	2.26E−01	3499.0
38	19.91	2.00	0.6050	34.269	0.4854	2.70E−01	4171.4
39	20.26	2.00	1.0777	61.043	0.8760	4.80E−01	7430.5
40	21.11	2.00	1.4534	82.323	1.1865	6.48E−01	10020.9
41	21.96	2.00	0.7741	43.846	0.6251	3.45E−01	5337.2
42	22.74	2.00	0.5821	32.972	0.4665	2.59E−01	4013.5
43	23.52	2.00	0.6007	34.026	0.4819	2.68E−01	4141.8
44	24.98	2.00	0.7870	44.577	0.6358	3.51E−01	5426.2
45	17.94	3.00	0.1120	6.341	0.0779	4.99E−02	771.9
46	18.93	3.00	0.2047	11.594	0.1546	9.12E−02	1411.3
47	19.92	3.00	0.5509	31.203	0.4407	2.46E−01	3798.3
48	20.91	3.00	0.9356	52.998	0.7587	4.17E−01	6451.2
49	22.11	3.00	2.0752	117.546	1.7004	9.25E−01	14308.4
50	22.96	3.00	1.8833	106.677	1.5418	8.40E−01	12985.4
51	23.74	3.00	3.5727	202.373	2.9381	1.59E+00	24634.0
52	24.98	3.00	2.8535	161.634	2.3437	1.27E+00	19675.1
53	18.34	3.40	0.1083	6.132	0.0749	4.83E−02	746.5
54	19.32	3.40	0.1927	10.917	0.1447	8.59E−02	1328.9
55	19.82	3.40	0.3426	19.404	0.2685	1.53E−01	2362.0
56	20.32	3.40	0.5451	30.878	0.4359	2.43E−01	3758.6
57	20.81	3.40	0.9360	53.018	0.7590	4.17E−01	6453.7
58	21.31	3.40	1.4090	79.809	1.1498	6.28E−01	9714.8
59	21.66	3.40	2.5877	146.576	2.1240	1.15E+00	17842.1
60	22.94	3.40	4.6560	263.729	3.8333	2.08E+00	32102.8
61	23.75	3.40	3.7363	211.640	3.0733	1.67E+00	25762.1
62	24.14	3.40	3.8850	220.057	3.1961	1.73E+00	26786.7
63	22.29	3.60	3.9306	222.642	3.2338	1.75E+00	27101.3
64	22.71	3.60	3.6508	206.792	3.0026	1.63E+00	25172.0
65	23.14	3.60	4.1386	234.427	3.4058	1.84E+00	28535.9
66	23.95	3.60	3.8481	217.971	3.1657	1.72E+00	26532.7
67	24.34	3.60	3.5254	199.689	2.8989	1.57E+00	24307.4
68	13.79	3.80	0.0827	4.687	0.0538	3.69E−02	570.5
69	15.77	3.80	0.0735	4.161	0.0461	3.27E−02	506.5
70	17.75	3.80	0.0863	4.891	0.0568	3.85E−02	595.3
71	19.23	3.80	0.1116	6.319	0.0776	4.97E−02	769.2
72	19.73	3.80	0.2403	13.609	0.1840	1.07E−01	1656.6
73	20.22	3.80	0.5385	30.505	0.4305	2.40E−01	3713.2
74	20.72	3.80	0.8480	48.036	0.6863	3.78E−01	5847.3
75	21.41	3.80	1.8661	105.702	1.5276	8.32E−01	12866.7
76	21.71	3.80	3.0780	174.349	2.5292	1.37E+00	21222.9
77	22.06	3.80	4.5855	259.738	3.7750	2.04E+00	31616.9
78	22.49	3.80	5.3175	301.201	4.3800	2.37E+00	36664.0
79	22.76	3.80	4.3236	244.901	3.5586	1.93E+00	29810.9
80	22.91	3.80	3.9883	225.913	3.2815	1.78E+00	27499.5
81	23.76	3.80	3.7639	213.202	3.0961	1.68E+00	25952.2
82	24.15	3.80	3.7035	209.780	3.0461	1.65E+00	25535.7
83	24.98	3.80	3.5213	199.461	2.8956	1.57E+00	24279.6
84	22.59	3.90	4.7995	271.860	3.9519	2.14E+00	33092.5
85	22.80	3.90	4.4957	254.650	3.7008	2.00E+00	30997.6
86	23.01	3.90	4.0699	230.534	3.3489	1.81E+00	28062.0
87	23.15	3.90	3.8019	215.352	3.1274	1.69E+00	26214.0
88	23.86	3.90	3.7797	214.095	3.1091	1.68E+00	26061.0
89	24.25	3.90	3.4936	197.890	2.8727	1.56E+00	24088.4
90	11.99	2.00	0.1070	6.060	0.0738	4.77E−02	737.7
91	13.97	2.00	0.1009	5.714	0.0688	4.50E−02	695.6

Table A15. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1092	6.187	0.0757	4.87E–02	753.1
93	17.93	2.00	0.3573	20.238	0.2807	1.59E–01	2463.5
94	19.91	2.00	0.6615	37.468	0.5321	2.95E–01	4560.9
95	1.00	–0.38	0.0483	2.738	0.0254	2.16E–02	333.3
96	1.00	0.29	0.0471	2.666	0.0243	2.10E–02	324.5
97	1.00	0.91	0.0470	2.660	0.0242	2.09E–02	323.8
98	1.00	1.53	0.0474	2.688	0.0246	2.12E–02	327.1
99	2.50	–0.38	0.0398	2.255	0.0183	1.77E–02	274.5
100	4.00	–0.38	0.0373	2.115	0.0163	1.66E–02	257.4
101	4.00	0.29	0.0374	2.117	0.0163	1.67E–02	257.7
102	4.00	1.53	0.0370	2.093	0.0159	1.65E–02	254.8
103	5.50	–0.38	0.0474	2.686	0.0246	2.11E–02	326.9
104	7.00	–0.38	0.0560	3.171	0.0317	2.50E–02	386.0
105	8.00	–2.28	0.0460	2.606	0.0234	2.05E–02	317.2
106	8.00	–1.88	0.0472	2.676	0.0245	2.11E–02	325.7
107	8.00	–1.49	0.0480	2.719	0.0251	2.14E–02	330.9
108	8.00	–1.04	0.0499	2.828	0.0267	2.23E–02	344.2
109	8.00	–0.38	0.0528	2.989	0.0290	2.35E–02	363.8
110	8.00	–0.13	0.0528	2.989	0.0290	2.35E–02	363.9
111	8.00	0.01	0.0530	3.001	0.0292	2.36E–02	365.2
112	8.00	0.29	0.0529	2.995	0.0291	2.36E–02	364.5
113	8.00	0.74	0.0507	2.874	0.0273	2.26E–02	349.9
114	8.00	1.13	0.0486	2.753	0.0256	2.17E–02	335.1
115	8.00	1.53	0.0475	2.689	0.0246	2.12E–02	327.3
116	9.00	–0.38	0.0555	3.141	0.0312	2.47E–02	382.3
117	9.00	–0.13	0.0564	3.197	0.0320	2.52E–02	389.1
118	9.00	0.01	0.0564	3.196	0.0320	2.52E–02	389.0
119	9.00	0.29	0.0557	3.156	0.0315	2.48E–02	384.2
120	9.00	0.64	0.0523	2.965	0.0287	2.33E–02	360.9
121	9.00	0.95	0.0438	2.481	0.0216	1.95E–02	302.0
122	10.00	–0.38	0.0631	3.572	0.0375	2.81E–02	434.8
123	10.00	–0.13	0.0643	3.640	0.0385	2.86E–02	443.1
124	10.00	0.01	0.0656	3.715	0.0396	2.92E–02	452.2
125	10.00	0.29	0.0629	3.565	0.0374	2.81E–02	434.0
126	10.00	0.53	0.0606	3.435	0.0355	2.70E–02	418.2
127	10.00	0.71	0.0596	3.374	0.0346	2.66E–02	410.7
128	10.00	0.85	0.0604	3.424	0.0354	2.69E–02	416.8
129	10.00	0.97	0.0625	3.541	0.0371	2.79E–02	431.0
130	11.00	–0.38	0.0681	3.857	0.0417	3.04E–02	469.5
131	11.00	–0.13	0.0707	4.006	0.0439	3.15E–02	487.6
132	11.00	0.01	0.0713	4.039	0.0443	3.18E–02	491.6
133	11.00	0.15	0.0710	4.021	0.0441	3.16E–02	489.4
134	11.00	0.43	0.0644	3.647	0.0386	2.87E–02	443.9
135	11.00	0.60	0.0684	3.875	0.0420	3.05E–02	471.7
136	11.00	0.74	0.0693	3.927	0.0427	3.09E–02	478.0
137	11.00	0.86	0.0703	3.981	0.0435	3.13E–02	484.5
138	12.00	–0.38	0.0752	4.262	0.0476	3.35E–02	518.8
139	12.00	–0.13	0.0762	4.317	0.0484	3.40E–02	525.4
140	12.00	0.01	0.0769	4.353	0.0489	3.43E–02	529.9
141	12.00	0.15	0.0762	4.319	0.0484	3.40E–02	525.7
142	12.00	0.32	0.0755	4.279	0.0478	3.37E–02	520.8
143	12.00	0.50	0.0758	4.292	0.0480	3.38E–02	522.5
144	12.00	0.64	0.0770	4.363	0.0491	3.43E–02	531.1
145	12.00	0.76	0.0783	4.433	0.0501	3.49E–02	539.7
146	13.00	–0.38	0.0861	4.877	0.0566	3.84E–02	593.6
147	13.00	–0.13	0.0861	4.877	0.0566	3.84E–02	593.7
148	13.00	0.01	0.0867	4.913	0.0571	3.87E–02	598.0
149	13.00	0.15	0.0863	4.888	0.0567	3.85E–02	595.0

Table A15. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.0856	4.850	0.0562	3.82E–02	590.4
151	13.00	0.39	0.0861	4.880	0.0566	3.84E–02	594.0
152	13.00	0.53	0.0873	4.943	0.0575	3.89E–02	601.7
153	13.00	0.65	0.0885	5.012	0.0585	3.94E–02	610.1
154	14.00	–0.38	0.1003	5.682	0.0683	4.47E–02	691.7
155	14.00	–0.13	0.1016	5.755	0.0694	4.53E–02	700.5
156	14.00	0.01	0.1014	5.743	0.0692	4.52E–02	699.1
157	14.00	0.15	0.1014	5.741	0.0692	4.52E–02	698.9
158	14.00	0.29	0.1001	5.669	0.0681	4.46E–02	690.1
159	14.00	0.43	0.1013	5.736	0.0691	4.51E–02	698.2
160	14.00	0.55	0.0999	5.659	0.0680	4.45E–02	688.8
161	15.00	–0.38	0.1193	6.757	0.0840	5.32E–02	822.5
162	15.00	–0.13	0.1210	6.855	0.0854	5.39E–02	834.4
163	15.00	0.01	0.1218	6.901	0.0861	5.43E–02	840.0
164	15.00	0.32	0.1194	6.762	0.0841	5.32E–02	823.1
165	15.00	0.44	0.1193	6.758	0.0840	5.32E–02	822.6
166	16.00	–0.38	0.1559	8.830	0.1142	6.95E–02	1074.9
167	16.00	–0.13	0.1562	8.850	0.1145	6.96E–02	1077.3
168	16.00	0.01	0.1578	8.937	0.1158	7.03E–02	1087.8
169	16.00	0.11	0.1578	8.939	0.1158	7.03E–02	1088.1
170	16.00	0.22	0.1555	8.809	0.1139	6.93E–02	1072.2
171	16.00	0.34	0.1550	8.778	0.1135	6.91E–02	1068.5
172	17.00	–0.38	0.2395	13.565	0.1833	1.07E–01	1651.2
173	17.00	–0.13	0.2325	13.169	0.1776	1.04E–01	1603.0
174	17.00	0.01	0.2325	13.170	0.1776	1.04E–01	1603.1
175	17.00	0.11	0.2316	13.117	0.1768	1.03E–01	1596.7
176	17.00	0.23	0.2364	13.390	0.1808	1.05E–01	1629.9
177	18.00	–0.38	0.3427	19.409	0.2686	1.53E–01	2362.6
178	18.00	–0.13	0.3413	19.335	0.2675	1.52E–01	2353.6
179	18.00	0.01	0.3374	19.110	0.2642	1.50E–01	2326.1
180	18.00	0.13	0.3434	19.451	0.2692	1.53E–01	2367.7
181	18.50	–0.38	0.3927	22.243	0.3099	1.75E–01	2707.5
182	18.50	–0.13	0.3897	22.071	0.3074	1.74E–01	2686.6
183	18.50	0.01	0.3883	21.992	0.3063	1.73E–01	2677.0
184	18.60	0.05	0.4017	22.753	0.3174	1.79E–01	2769.7
185	18.50	0.10	0.3913	22.165	0.3088	1.74E–01	2698.0
186	19.20	–0.38	0.4639	26.278	0.3688	2.07E–01	3198.7
187	19.20	–0.13	0.4662	26.406	0.3707	2.08E–01	3214.3
188	19.20	0.01	0.4644	26.305	0.3692	2.07E–01	3202.0
189	19.30	0.05	0.4737	26.833	0.3769	2.11E–01	3266.3
190	19.20	0.10	0.4679	26.504	0.3721	2.09E–01	3226.2
191	20.00	–0.38	0.5259	29.789	0.4200	2.34E–01	3626.0
192	20.00	–0.13	0.5308	30.068	0.4241	2.37E–01	3660.1
193	20.00	0.01	0.5291	29.971	0.4227	2.36E–01	3648.3
194	20.10	0.05	0.5365	30.388	0.4288	2.39E–01	3699.0
195	20.00	0.10	0.5311	30.084	0.4243	2.37E–01	3662.0
196	20.80	–0.38	0.5825	32.994	0.4668	2.60E–01	4016.2
197	20.80	–0.13	0.5833	33.038	0.4674	2.60E–01	4021.6
198	20.80	0.01	0.5821	32.971	0.4665	2.59E–01	4013.4
199	20.90	0.05	0.5862	33.202	0.4698	2.61E–01	4041.5
200	20.80	0.10	0.5825	32.994	0.4668	2.60E–01	4016.2
201	21.60	–0.38	0.6198	35.107	0.4976	2.76E–01	4273.4
202	21.60	–0.13	0.6256	35.438	0.5025	2.79E–01	4313.7
203	21.60	0.01	0.6262	35.470	0.5029	2.79E–01	4317.6
204	21.70	0.05	0.6308	35.730	0.5067	2.81E–01	4349.3
205	21.60	0.10	0.6297	35.671	0.5059	2.81E–01	4342.1
206	22.40	–0.38	0.6448	36.526	0.5183	2.87E–01	4446.2
207	22.40	–0.13	0.6514	36.897	0.5238	2.90E–01	4491.4

Table A15. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	0.6518	36.922	0.5241	2.91E–01	4494.4
209	22.50	0.05	0.6537	37.026	0.5256	2.91E–01	4507.0
210	22.40	0.10	0.6509	36.870	0.5234	2.90E–01	4488.1
211	23.20	–0.38	0.6545	37.071	0.5263	2.92E–01	4512.5
212	23.20	–0.13	0.6594	37.352	0.5304	2.94E–01	4546.7
213	23.20	0.01	0.6632	37.564	0.5335	2.96E–01	4572.6
214	23.30	0.05	0.6647	37.653	0.5348	2.96E–01	4583.3
215	23.20	0.10	0.6622	37.509	0.5327	2.95E–01	4565.8
216	24.00	–0.38	0.6433	36.437	0.5170	2.87E–01	4435.3
217	24.00	–0.13	0.6504	36.838	0.5229	2.90E–01	4484.2
218	24.00	0.01	0.6540	37.045	0.5259	2.92E–01	4509.4
219	24.10	0.05	0.6523	36.948	0.5245	2.91E–01	4497.6
220	24.00	0.10	0.6525	36.959	0.5247	2.91E–01	4498.9
221	25.00	–0.38	0.4785	27.103	0.3808	2.13E–01	3299.1
222	25.00	–0.13	0.4628	26.214	0.3679	2.06E–01	3191.0
223	25.00	0.01	0.4816	27.279	0.3834	2.15E–01	3320.6
224	25.10	0.05	0.4011	22.719	0.3169	1.79E–01	2765.6
225	25.00	0.10	0.4696	26.600	0.3735	2.09E–01	3237.9
226	9.00	999.00	0.8802	49.858	0.7128	3.92E–01	6069.0
227	0.00	–2.63	2.2237	125.956	1.8231	9.91E–01	15332.1
228	0.00	–0.67	2.2462	127.232	1.8418	1.00E+00	15487.5
229	0.00	1.88	2.2060	124.954	1.8085	9.83E–01	15210.2
230	20.58	0.00	0.8546	48.410	0.6917	3.81E–01	5892.8
231	20.78	0.00	0.9413	53.319	0.7633	4.20E–01	6490.3
232	20.98	0.00	1.2628	71.528	1.0290	5.63E–01	8706.8
233	21.38	0.00	2.0471	115.957	1.6773	9.13E–01	14115.0
234	21.78	0.00	3.4214	193.802	2.8130	1.53E+00	23590.8
235	22.51	0.00	5.0689	287.118	4.1745	2.26E+00	34949.8
236	22.71	0.00	4.7536	269.261	3.9140	2.12E+00	32776.1
237	22.91	0.00	4.3067	243.948	3.5447	1.92E+00	29694.9
238	23.11	0.00	3.8768	219.598	3.1894	1.73E+00	26730.8
239	23.88	0.00	3.5224	199.518	2.8964	1.57E+00	24286.6
240	24.38	0.00	3.6215	205.132	2.9783	1.61E+00	24970.0
241	24.88	0.00	3.6335	205.816	2.9883	1.62E+00	25053.2
242	25.08	0.00	3.0251	171.351	2.4855	1.35E+00	20857.9
243	25.38	0.00	2.0437	115.765	1.6744	9.11E–01	14091.6
244	0.58	999.00	0.0495	2.806	0.0263	2.21E–02	341.5
245	0.86	999.00	0.0490	2.778	0.0259	2.19E–02	338.1
246	1.15	999.00	0.0480	2.717	0.0251	2.14E–02	330.7
247	1.43	999.00	0.0501	2.836	0.0268	2.23E–02	345.2
248	1.72	999.00	0.0495	2.803	0.0263	2.21E–02	341.2
249	2.00	999.00	0.0494	2.800	0.0263	2.20E–02	340.8
250	2.29	999.00	0.0497	2.815	0.0265	2.22E–02	342.7
251	2.57	999.00	0.0484	2.739	0.0254	2.16E–02	333.4
252	2.86	999.00	0.0491	2.783	0.0260	2.19E–02	338.8
253	3.14	999.00	0.0494	2.796	0.0262	2.20E–02	340.3
254	3.43	999.00	0.0490	2.777	0.0259	2.19E–02	338.0
255	999.00	999.00	0.0461	2.610	0.0235	2.05E–02	317.7
256	999.00	999.00	0.0486	2.752	0.0256	2.17E–02	335.0

Table A16. Flow Conditions and Pressure Distribution for Run 53

[CR = 9; Re = 2.15×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1439.12	(.99224E+07)
$T_{t,1}$, °R (K)	1832.51	(1018.06)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0638	(32.86)
$h_{t,1}$, btu/lbm (J/kg)	461.56	(.10729E+07)
Free-stream conditions:		
M_∞	9.92	
p_∞, psia (N/m^2)	0.0349	(240.70)
T_∞, °R (K)	92.76	(51.53)
ρ_∞, slug/ft^3 (kg/m^3)	0.31573E−04	(.16272E−01)
h_∞, btu/lbm (J/kg)	0.22123E+02	(.51423E+05)
a_∞, ft/s (m/s)	472.50	(144.02)
u_∞, ft/s (m/s)	4689.28	(1429.29)
Re_∞, ft^{-1} (m^{-1})	0.21434E+07	(.70322E+07)
q_∞, psia (N/m^2)	2.411	(16621.15)
μ_∞, slug/ft-s (N-s/m^2)	0.69076E−07	(.33074E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.469	(30816.27)
$T_{t,2}$, °R (K)	1841.17	(1022.87)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20363E−03	(.10495E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0951	2.993	0.0281	2.27E−02	655.4
2	11.18	0.20	0.1069	3.366	0.0333	2.56E−02	737.2
3	12.17	0.20	0.1191	3.751	0.0387	2.85E−02	821.4
4	13.15	0.20	0.1324	4.170	0.0446	3.17E−02	913.2
5	14.21	0.20	0.1500	4.724	0.0524	3.59E−02	1034.5
6	15.14	0.20	0.1718	5.408	0.0620	4.11E−02	1184.3
7	16.13	0.20	0.2134	6.717	0.0805	5.10E−02	1471.1
8	17.12	0.20	0.2972	9.357	0.1176	7.11E−02	2049.2
9	18.11	0.20	0.5682	17.888	0.2377	1.36E−01	3917.5
10	19.74	0.20	0.8132	25.603	0.3463	1.94E−01	5606.9
11	20.55	0.20	0.9337	29.397	0.3997	2.23E−01	6437.8
12	22.56	0.20	1.1151	35.107	0.4801	2.67E−01	7688.4
13	24.98	0.20	0.9535	30.020	0.4085	2.28E−01	6574.3
14	10.59	0.60	0.1727	5.439	0.0625	4.13E−02	1191.0
15	11.58	0.60	0.1534	4.828	0.0539	3.67E−02	1057.4
16	12.57	0.60	0.1491	4.693	0.0520	3.56E−02	1027.9
17	13.56	0.60	0.1503	4.732	0.0525	3.59E−02	1036.3
18	14.60	0.60	0.1626	5.119	0.0580	3.89E−02	1121.0
19	15.54	0.60	0.1886	5.937	0.0695	4.51E−02	1300.2
20	16.53	0.60	0.2382	7.500	0.0915	5.70E−02	1642.5
21	17.52	0.60	0.3286	10.347	0.1316	7.86E−02	2265.9
22	18.51	0.60	0.6332	19.937	0.2666	1.51E−01	4366.2
23	12.97	1.00	0.1819	5.727	0.0665	4.35E−02	1254.1
24	15.00	1.00	0.2053	6.464	0.0769	4.91E−02	1415.6
25	15.94	1.00	0.2255	7.100	0.0859	5.39E−02	1554.9
26	16.93	1.00	0.2652	8.348	0.1034	6.34E−02	1828.2
27	17.92	1.00	0.4099	12.904	0.1676	9.80E−02	2826.0
28	18.91	1.00	0.7638	24.048	0.3244	1.83E−01	5266.4
29	24.98	1.00	1.2341	38.855	0.5329	2.95E−01	8509.3
30	11.99	2.00	0.1742	5.484	0.0631	4.16E−02	1201.0
31	13.97	2.00	0.1529	4.814	0.0537	3.66E−02	1054.3
32	15.98	2.00	0.1708	5.379	0.0616	4.08E−02	1178.0
33	16.94	2.00	0.1811	5.702	0.0662	4.33E−02	1248.7

Table A16. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.3449	10.858	0.1388	8.25E−02	2377.9
35	18.42	2.00	0.7716	24.292	0.3279	1.84E−01	5320.0
36	18.92	2.00	0.9647	30.374	0.4135	2.31E−01	6651.9
37	19.41	2.00	0.8752	27.556	0.3738	2.09E−01	6034.6
38	19.91	2.00	0.8989	28.300	0.3843	2.15E−01	6197.7
39	20.26	2.00	1.2678	39.917	0.5478	3.03E−01	8741.8
40	21.11	2.00	1.9353	60.933	0.8436	4.63E−01	13344.1
41	21.96	2.00	2.0784	65.436	0.9070	4.97E−01	14330.3
42	22.74	2.00	1.5091	47.514	0.6547	3.61E−01	10405.4
43	23.52	2.00	1.3190	41.527	0.5705	3.15E−01	9094.4
44	24.98	2.00	1.3370	42.093	0.5784	3.20E−01	9218.3
45	17.94	3.00	0.1809	5.695	0.0661	4.32E−02	1247.1
46	18.93	3.00	0.2520	7.935	0.0976	6.03E−02	1737.7
47	19.92	3.00	0.9213	29.007	0.3942	2.20E−01	6352.4
48	20.91	3.00	1.1768	37.051	0.5075	2.81E−01	8114.2
49	22.11	3.00	3.0304	95.411	1.3290	7.25E−01	20894.9
50	22.96	3.00	2.2711	71.502	0.9924	5.43E−01	15658.9
51	23.74	3.00	2.5285	79.607	1.1065	6.05E−01	17433.9
52	24.98	3.00	4.1755	131.462	1.8364	9.98E−01	28789.8
53	18.34	3.40	0.1765	5.558	0.0642	4.22E−02	1217.2
54	19.32	3.40	0.2130	6.705	0.0803	5.09E−02	1468.3
55	19.82	3.40	0.4551	14.329	0.1876	1.09E−01	3137.9
56	20.32	3.40	0.7737	24.359	0.3288	1.85E−01	5334.5
57	20.81	3.40	1.0039	31.607	0.4308	2.40E−01	6921.9
58	21.31	3.40	1.0924	34.393	0.4700	2.61E−01	7531.9
59	21.66	3.40	1.2817	40.354	0.5540	3.06E−01	8837.5
60	22.94	3.40	4.7108	148.315	2.0737	1.13E+00	32480.7
61	23.75	3.40	5.8124	183.000	2.5619	1.39E+00	40076.6
62	24.14	3.40	4.9260	155.093	2.1691	1.18E+00	33965.0
63	22.29	3.60	5.3275	167.734	2.3470	1.27E+00	36733.3
64	22.71	3.60	5.2249	164.503	2.3015	1.25E+00	36025.9
65	23.14	3.60	5.2118	164.089	2.2957	1.25E+00	35935.1
66	23.95	3.60	5.2049	163.874	2.2927	1.24E+00	35888.0
67	24.34	3.60	5.1550	162.300	2.2705	1.23E+00	35543.4
68	13.79	3.80	0.1364	4.294	0.0464	3.26E−02	940.3
69	15.77	3.80	0.1140	3.590	0.0365	2.73E−02	786.3
70	17.75	3.80	0.1244	3.917	0.0411	2.97E−02	857.8
71	19.23	3.80	0.1747	5.499	0.0633	4.18E−02	1204.2
72	19.73	3.80	0.1937	6.100	0.0718	4.63E−02	1335.8
73	20.22	3.80	0.6279	19.768	0.2642	1.50E−01	4329.2
74	20.72	3.80	1.0167	32.011	0.4365	2.43E−01	7010.3
75	21.41	3.80	1.4881	46.852	0.6454	3.56E−01	10260.6
76	21.71	3.80	1.8719	58.934	0.8155	4.48E−01	12906.4
77	22.06	3.80	4.6786	147.302	2.0594	1.12E+00	32258.7
78	22.49	3.80	5.5946	176.142	2.4654	1.34E+00	38574.6
79	22.76	3.80	5.0316	158.417	2.2159	1.20E+00	34692.9
80	22.91	3.80	5.1845	163.230	2.2836	1.24E+00	35746.9
81	23.76	3.80	5.7052	179.624	2.5144	1.36E+00	39337.2
82	24.15	3.80	5.4347	171.109	2.3945	1.30E+00	37472.4
83	24.98	3.80	5.4755	172.393	2.4126	1.31E+00	37753.7
84	22.59	3.90	5.4023	170.088	2.3801	1.29E+00	37248.9
85	22.80	3.90	5.6251	177.101	2.4789	1.34E+00	38784.8
86	23.01	3.90	5.3495	168.427	2.3568	1.28E+00	36885.1
87	23.15	3.90	5.9058	185.939	2.6033	1.41E+00	40720.2
88	23.86	3.90	5.4960	173.038	2.4217	1.31E+00	37895.0
89	24.25	3.90	5.2436	165.091	2.3098	1.25E+00	36154.6
90	11.99	2.00	0.1778	5.599	0.0647	4.25E−02	1226.1
91	13.97	2.00	0.1646	5.182	0.0589	3.93E−02	1134.8

Table A16. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1779	5.599	0.0647	4.25E−02	1226.3
93	17.93	2.00	0.3753	11.815	0.1522	8.97E−02	2587.5
94	19.91	2.00	1.0145	31.940	0.4355	2.43E−01	6994.8
95	1.00	–0.38	0.0721	2.270	0.0179	1.72E−02	497.1
96	1.00	0.29	0.0697	2.195	0.0168	1.67E−02	480.7
97	1.00	0.91	0.0699	2.199	0.0169	1.67E−02	481.7
98	1.00	1.53	0.0711	2.238	0.0174	1.70E−02	490.0
99	2.50	–0.38	0.0561	1.766	0.0108	1.34E−02	386.7
100	4.00	–0.38	0.0523	1.648	0.0091	1.25E−02	360.9
101	4.00	0.29	0.0518	1.631	0.0089	1.24E−02	357.2
102	4.00	1.53	0.0512	1.611	0.0086	1.22E−02	352.9
103	5.50	–0.38	0.0665	2.094	0.0154	1.59E−02	458.6
104	7.00	–0.38	0.0819	2.577	0.0222	1.96E−02	564.4
105	8.00	–2.28	0.0659	2.074	0.0151	1.57E−02	454.1
106	8.00	–1.88	0.0676	2.129	0.0159	1.62E−02	466.2
107	8.00	–1.49	0.0700	2.204	0.0170	1.67E−02	482.8
108	8.00	–1.04	0.0724	2.280	0.0180	1.73E−02	499.3
109	8.00	–0.38	0.0763	2.401	0.0197	1.82E−02	525.9
110	8.00	–0.13	0.0763	2.404	0.0198	1.83E−02	526.4
111	8.00	0.01	0.0768	2.418	0.0200	1.84E−02	529.6
112	8.00	0.29	0.0764	2.406	0.0198	1.83E−02	527.0
113	8.00	0.74	0.0731	2.301	0.0183	1.75E−02	503.9
114	8.00	1.13	0.0706	2.223	0.0172	1.69E−02	486.8
115	8.00	1.53	0.0685	2.157	0.0163	1.64E−02	472.4
116	9.00	–0.38	0.0815	2.567	0.0221	1.95E−02	562.2
117	9.00	–0.13	0.0829	2.610	0.0227	1.98E−02	571.6
118	9.00	0.01	0.0827	2.605	0.0226	1.98E−02	570.4
119	9.00	0.29	0.0817	2.574	0.0222	1.95E−02	563.6
120	9.00	0.64	0.0754	2.373	0.0193	1.80E−02	519.8
121	9.00	0.95	0.0636	2.003	0.0141	1.52E−02	438.6
122	10.00	–0.38	0.0922	2.904	0.0268	2.21E−02	636.0
123	10.00	–0.13	0.0947	2.980	0.0279	2.26E−02	652.7
124	10.00	0.01	0.0956	3.008	0.0283	2.28E−02	658.8
125	10.00	0.29	0.0930	2.929	0.0272	2.22E−02	641.4
126	10.00	0.53	0.0888	2.795	0.0253	2.12E−02	612.0
127	10.00	0.71	0.0889	2.798	0.0253	2.13E−02	612.8
128	10.00	0.85	0.0888	2.794	0.0253	2.12E−02	611.9
129	10.00	0.97	0.0918	2.892	0.0266	2.20E−02	633.3
130	11.00	–0.38	0.0947	2.983	0.0279	2.27E−02	653.3
131	11.00	–0.13	0.1044	3.288	0.0322	2.50E−02	720.1
132	11.00	0.01	0.1061	3.342	0.0330	2.54E−02	731.8
133	11.00	0.15	0.1046	3.293	0.0323	2.50E−02	721.3
134	11.00	0.43	0.0995	3.132	0.0300	2.38E−02	685.9
135	11.00	0.60	0.0997	3.140	0.0301	2.38E−02	687.6
136	11.00	0.74	0.1045	3.289	0.0322	2.50E−02	720.3
137	11.00	0.86	0.1065	3.353	0.0331	2.55E−02	734.4
138	12.00	–0.38	0.1122	3.532	0.0356	2.68E−02	773.5
139	12.00	–0.13	0.1147	3.611	0.0368	2.74E−02	790.9
140	12.00	0.01	0.1170	3.682	0.0378	2.80E−02	806.4
141	12.00	0.15	0.1151	3.623	0.0369	2.75E−02	793.4
142	12.00	0.32	0.1105	3.479	0.0349	2.64E−02	761.8
143	12.00	0.50	0.1129	3.553	0.0359	2.70E−02	778.2
144	12.00	0.64	0.1191	3.751	0.0387	2.85E−02	821.5
145	12.00	0.76	0.1188	3.739	0.0386	2.84E−02	818.9
146	13.00	–0.38	0.1280	4.029	0.0426	3.06E−02	882.3
147	13.00	–0.13	0.1284	4.042	0.0428	3.07E−02	885.2
148	13.00	0.01	0.1301	4.098	0.0436	3.11E−02	897.4
149	13.00	0.15	0.1280	4.031	0.0427	3.06E−02	882.8

Table A16. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.1271	4.000	0.0422	3.04E–02	876.0
151	13.00	0.39	0.1276	4.018	0.0425	3.05E–02	879.9
152	13.00	0.53	0.1318	4.149	0.0443	3.15E–02	908.5
153	13.00	0.65	0.1314	4.136	0.0441	3.14E–02	905.8
154	14.00	–0.38	0.1511	4.757	0.0529	3.61E–02	1041.8
155	14.00	–0.13	0.1475	4.644	0.0513	3.53E–02	1017.0
156	14.00	0.01	0.1484	4.672	0.0517	3.55E–02	1023.2
157	14.00	0.15	0.1482	4.665	0.0516	3.54E–02	1021.7
158	14.00	0.29	0.1454	4.576	0.0503	3.48E–02	1002.2
159	14.00	0.43	0.1502	4.728	0.0525	3.59E–02	1035.5
160	14.00	0.55	0.1455	4.581	0.0504	3.48E–02	1003.2
161	15.00	–0.38	0.1728	5.440	0.0625	4.13E–02	1191.4
162	15.00	–0.13	0.1768	5.567	0.0643	4.23E–02	1219.2
163	15.00	0.01	0.1775	5.588	0.0646	4.24E–02	1223.7
164	15.00	0.32	0.1760	5.541	0.0639	4.21E–02	1213.5
165	15.00	0.44	0.1704	5.366	0.0615	4.08E–02	1175.2
166	16.00	–0.38	0.2139	6.734	0.0807	5.11E–02	1474.7
167	16.00	–0.13	0.2216	6.978	0.0841	5.30E–02	1528.1
168	16.00	0.01	0.2217	6.979	0.0842	5.30E–02	1528.3
169	16.00	0.11	0.2212	6.964	0.0840	5.29E–02	1525.1
170	16.00	0.22	0.2194	6.907	0.0832	5.25E–02	1512.7
171	16.00	0.34	0.2131	6.708	0.0804	5.09E–02	1469.1
172	17.00	–0.38	0.3182	10.020	0.1270	7.61E–02	2194.3
173	17.00	–0.13	0.3002	9.452	0.1190	7.18E–02	2069.9
174	17.00	0.01	0.3015	9.492	0.1195	7.21E–02	2078.8
175	17.00	0.11	0.3002	9.450	0.1190	7.18E–02	2069.6
176	17.00	0.23	0.3064	9.647	0.1217	7.33E–02	2112.6
177	18.00	–0.38	0.5750	18.103	0.2407	1.37E–01	3964.5
178	18.00	–0.13	0.5602	17.638	0.2342	1.34E–01	3862.6
179	18.00	0.01	0.5515	17.363	0.2303	1.32E–01	3802.5
180	18.00	0.13	0.5609	17.660	0.2345	1.34E–01	3867.5
181	18.50	–0.38	0.7091	22.326	0.3002	1.70E–01	4889.4
182	18.50	–0.13	0.7553	23.779	0.3206	1.81E–01	5207.5
183	18.50	0.01	0.7518	23.670	0.3191	1.80E–01	5183.7
184	18.60	0.05	0.7504	23.626	0.3185	1.79E–01	5174.1
185	18.50	0.10	0.7596	23.915	0.3226	1.82E–01	5237.4
186	19.20	–0.38	0.7673	24.158	0.3260	1.83E–01	5290.5
187	19.20	–0.13	0.7619	23.989	0.3236	1.82E–01	5253.5
188	19.20	0.01	0.7563	23.811	0.3211	1.81E–01	5214.6
189	19.30	0.05	0.7668	24.142	0.3258	1.83E–01	5287.0
190	19.20	0.10	0.7618	23.986	0.3236	1.82E–01	5252.8
191	20.00	–0.38	0.8600	27.076	0.3671	2.06E–01	5929.5
192	20.00	–0.13	0.8604	27.090	0.3673	2.06E–01	5932.8
193	20.00	0.01	0.8570	26.981	0.3657	2.05E–01	5908.8
194	20.10	0.05	0.8761	27.583	0.3742	2.09E–01	6040.6
195	20.00	0.10	0.8591	27.048	0.3667	2.05E–01	5923.4
196	20.80	–0.38	0.9849	31.010	0.4224	2.35E–01	6791.1
197	20.80	–0.13	0.9826	30.936	0.4214	2.35E–01	6774.9
198	20.80	0.01	0.9806	30.874	0.4205	2.34E–01	6761.4
199	20.90	0.05	0.9948	31.320	0.4268	2.38E–01	6859.1
200	20.80	0.10	0.9833	30.957	0.4217	2.35E–01	6779.6
201	21.60	–0.38	1.0702	33.693	0.4602	2.56E–01	7378.7
202	21.60	–0.13	1.0749	33.841	0.4623	2.57E–01	7411.1
203	21.60	0.01	1.0775	33.925	0.4635	2.58E–01	7429.4
204	21.70	0.05	1.0839	34.125	0.4663	2.59E–01	7473.3
205	21.60	0.10	1.0822	34.071	0.4655	2.59E–01	7461.5
206	22.40	–0.38	1.1260	35.452	0.4850	2.69E–01	7763.8
207	22.40	–0.13	1.1303	35.585	0.4868	2.70E–01	7793.1

Table A16. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	1.1317	35.631	0.4875	2.71E–01	7803.1
209	22.50	0.05	1.1387	35.852	0.4906	2.72E–01	7851.4
210	22.40	0.10	1.1353	35.745	0.4891	2.71E–01	7828.2
211	23.20	–0.38	1.1632	36.622	0.5014	2.78E–01	8020.1
212	23.20	–0.13	1.1677	36.763	0.5034	2.79E–01	8051.0
213	23.20	0.01	1.1700	36.838	0.5045	2.80E–01	8067.4
214	23.30	0.05	1.1793	37.129	0.5086	2.82E–01	8131.2
215	23.20	0.10	1.1718	36.892	0.5052	2.80E–01	8079.4
216	24.00	–0.38	1.1723	36.910	0.5055	2.80E–01	8083.2
217	24.00	–0.13	1.1887	37.426	0.5127	2.84E–01	8196.2
218	24.00	0.01	1.1921	37.532	0.5142	2.85E–01	8219.5
219	24.10	0.05	1.1922	37.535	0.5143	2.85E–01	8220.0
220	24.00	0.10	1.1955	37.640	0.5158	2.86E–01	8243.2
221	25.00	–0.38	0.9138	28.771	0.3909	2.18E–01	6300.7
222	25.00	–0.13	0.9077	28.578	0.3882	2.17E–01	6258.4
223	25.00	0.01	0.9413	29.635	0.4031	2.25E–01	6489.9
224	25.10	0.05	0.7767	24.455	0.3302	1.86E–01	5355.6
225	25.00	0.10	0.9158	28.832	0.3918	2.19E–01	6314.2
226	9.00	999.00	3.1007	97.625	1.3601	7.41E–01	21379.6
227	0.00	–2.63	4.2038	132.353	1.8490	1.01E+00	28985.1
228	0.00	–0.67	4.2610	134.154	1.8743	1.02E+00	29379.5
229	0.00	1.88	4.1551	130.819	1.8274	9.93E–01	28649.1
230	20.58	0.00	0.8824	27.781	0.3770	2.11E–01	6084.0
231	20.78	0.00	1.1094	34.928	0.4776	2.65E–01	7649.2
232	20.98	0.00	1.3202	41.565	0.5710	3.16E–01	9102.7
233	21.38	0.00	1.8136	57.099	0.7897	4.34E–01	12504.5
234	21.78	0.00	2.9226	92.017	1.2812	6.99E–01	20151.6
235	22.51	0.00	5.3581	168.695	2.3605	1.28E+00	36943.9
236	22.71	0.00	6.0270	189.756	2.6570	1.44E+00	41556.2
237	22.91	0.00	5.4715	172.266	2.4108	1.31E+00	37725.9
238	23.11	0.00	5.3079	167.117	2.3383	1.27E+00	36598.2
239	23.88	0.00	5.6570	178.107	2.4930	1.35E+00	39004.9
240	24.38	0.00	5.5317	174.163	2.4375	1.32E+00	38141.3
241	24.88	0.00	5.6291	177.228	2.4806	1.35E+00	38812.6
242	25.08	0.00	5.0106	157.757	2.2066	1.20E+00	34548.4
243	25.38	0.00	3.2687	102.912	1.4345	7.82E–01	22537.5
244	0.58	999.00	0.0623	1.962	0.0135	1.49E–02	429.6
245	0.86	999.00	0.0631	1.988	0.0139	1.51E–02	435.3
246	1.15	999.00	0.0630	1.984	0.0139	1.51E–02	434.6
247	1.43	999.00	0.0626	1.972	0.0137	1.50E–02	431.9
248	1.72	999.00	0.0603	1.898	0.0126	1.44E–02	415.6
249	2.00	999.00	0.0639	2.011	0.0142	1.53E–02	440.4
250	2.29	999.00	0.0612	1.927	0.0130	1.46E–02	422.0
251	2.57	999.00	0.0633	1.994	0.0140	1.51E–02	436.6
252	2.86	999.00	0.0629	1.979	0.0138	1.50E–02	433.5
253	3.14	999.00	0.0629	1.981	0.0138	1.50E–02	433.8
254	3.43	999.00	0.0637	2.005	0.0142	1.52E–02	439.2
255	999.00	999.00	0.0605	1.906	0.0128	1.45E–02	417.4
256	999.00	999.00	0.0605	1.904	0.0127	1.45E–02	416.9

Table A17. Flow Conditions and Pressure Distribution for Run 54

[CR = 9; Re = 2.15×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1438.08	(.99152E+07)
$T_{t,1}$, °R (K)	1805.70	(1003.17)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0646	(33.32)
$h_{t,1}$, btu/lbm (J/kg)	454.15	(.10556E+07)
Free-stream conditions:		
M_∞	9.94	
p_∞, psia (N/m^2)	0.0348	(239.62)
T_∞, °R (K)	91.08	(50.60)
ρ_∞, slug/ft^3 (kg/m^3)	0.32012E−04	(.16499E−01)
h_∞, btu/lbm (J/kg)	0.21722E+02	(.50491E+05)
a_∞, ft/s (m/s)	468.19	(142.71)
u_∞, ft/s (m/s)	4651.73	(1417.85)
Re_∞, ft^{-1} (m^{-1})	0.22031E+07	(.72281E+07)
q_∞, psia (N/m^2)	2.405	(16583.43)
μ_∞, slug/ft-s (N-s/m^2)	0.67592E−07	(.32363E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.458	(30753.98)
$T_{t,2}$, °R (K)	1814.07	(1007.82)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20617E−03	(.10626E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0940	2.967	0.0276	2.25E−02	647.9
2	11.18	0.20	0.1051	3.319	0.0326	2.52E−02	724.9
3	12.17	0.20	0.1170	3.692	0.0378	2.80E−02	806.4
4	13.15	0.20	0.1300	4.104	0.0436	3.11E−02	896.3
5	14.21	0.20	0.1476	4.661	0.0514	3.53E−02	1017.9
6	15.14	0.20	0.1737	5.483	0.0630	4.16E−02	1197.5
7	16.13	0.20	0.2149	6.784	0.0813	5.14E−02	1481.7
8	17.12	0.20	0.2995	9.454	0.1188	7.17E−02	2064.7
9	18.11	0.20	0.5754	18.166	0.2412	1.38E−01	3967.7
10	19.74	0.20	0.8266	26.095	0.3526	1.98E−01	5699.3
11	20.55	0.20	0.9516	30.041	0.4081	2.28E−01	6561.2
12	22.56	0.20	1.1247	35.505	0.4849	2.69E−01	7754.6
13	24.98	0.20	0.9572	30.219	0.4106	2.29E−01	6600.0
14	10.59	0.60	0.1695	5.352	0.0612	4.06E−02	1169.0
15	11.58	0.60	0.1507	4.759	0.0528	3.61E−02	1039.4
16	12.57	0.60	0.1498	4.730	0.0524	3.59E−02	1033.1
17	13.56	0.60	0.1506	4.753	0.0527	3.60E−02	1038.1
18	14.60	0.60	0.1624	5.128	0.0580	3.89E−02	1120.0
19	15.54	0.60	0.1905	6.015	0.0705	4.56E−02	1313.8
20	16.53	0.60	0.2392	7.552	0.0921	5.73E−02	1649.3
21	17.52	0.60	0.3299	10.415	0.1323	7.90E−02	2274.8
22	18.51	0.60	0.6425	20.283	0.2710	1.54E−01	4430.0
23	12.97	1.00	0.1815	5.730	0.0665	4.34E−02	1251.5
24	15.00	1.00	0.2049	6.467	0.0768	4.90E−02	1412.5
25	15.94	1.00	0.2259	7.130	0.0861	5.41E−02	1557.3
26	16.93	1.00	0.2667	8.420	0.1043	6.38E−02	1839.1
27	17.92	1.00	0.4128	13.033	0.1691	9.88E−02	2846.4
28	18.91	1.00	0.7730	24.403	0.3289	1.85E−01	5329.8
29	24.98	1.00	1.2443	39.283	0.5380	2.98E−01	8579.7
30	11.99	2.00	0.1742	5.499	0.0632	4.17E−02	1201.1
31	13.97	2.00	0.1536	4.848	0.0541	3.68E−02	1058.8
32	15.98	2.00	0.1708	5.393	0.0617	4.09E−02	1177.9
33	16.94	2.00	0.1818	5.740	0.0666	4.35E−02	1253.6

Table A17. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.3424	10.809	0.1378	8.20E−02	2360.7
35	18.42	2.00	0.7680	24.246	0.3267	1.84E−01	5295.5
36	18.92	2.00	0.9653	30.475	0.4142	2.31E−01	6656.0
37	19.41	2.00	0.8799	27.778	0.3763	2.11E−01	6066.9
38	19.91	2.00	0.9041	28.541	0.3870	2.16E−01	6233.5
39	20.26	2.00	1.2779	40.343	0.5529	3.06E−01	8811.2
40	21.11	2.00	1.9306	60.948	0.8424	4.62E−01	13311.6
41	21.96	2.00	2.0799	65.662	0.9087	4.98E−01	14341.1
42	22.74	2.00	1.5457	48.798	0.6717	3.70E−01	10657.9
43	23.52	2.00	1.3333	42.091	0.5774	3.19E−01	9193.0
44	24.98	2.00	1.3604	42.947	0.5895	3.26E−01	9380.0
45	17.94	3.00	0.1818	5.740	0.0666	4.35E−02	1253.6
46	18.93	3.00	0.2543	8.029	0.0988	6.09E−02	1753.7
47	19.92	3.00	0.9224	29.119	0.3951	2.21E−01	6359.7
48	20.91	3.00	1.1840	37.378	0.5112	2.83E−01	8163.5
49	22.11	3.00	3.0550	96.445	1.3412	7.31E−01	21064.2
50	22.96	3.00	2.2767	71.873	0.9959	5.45E−01	15697.6
51	23.74	3.00	2.5224	79.629	1.1049	6.04E−01	17391.6
52	24.98	3.00	4.2110	132.940	1.8541	1.01E+00	29035.0
53	18.34	3.40	0.1764	5.569	0.0642	4.22E−02	1216.4
54	19.32	3.40	0.2188	6.907	0.0830	5.24E−02	1508.6
55	19.82	3.40	0.4587	14.479	0.1894	1.10E−01	3162.4
56	20.32	3.40	0.7786	24.581	0.3314	1.86E−01	5368.7
57	20.81	3.40	1.0125	31.965	0.4351	2.42E−01	6981.4
58	21.31	3.40	1.0937	34.528	0.4712	2.62E−01	7541.2
59	21.66	3.40	1.2749	40.248	0.5515	3.05E−01	8790.4
60	22.94	3.40	4.6636	147.226	2.0548	1.12E+00	32155.3
61	23.75	3.40	5.8384	184.316	2.5760	1.40E+00	40256.0
62	24.14	3.40	4.9321	155.703	2.1739	1.18E+00	34006.6
63	22.29	3.60	5.2775	166.607	2.3272	1.26E+00	36388.2
64	22.71	3.60	5.2288	165.072	2.3056	1.25E+00	36052.9
65	23.14	3.60	5.2203	164.801	2.3018	1.25E+00	35993.8
66	23.95	3.60	5.2094	164.457	2.2970	1.25E+00	35918.7
67	24.34	3.60	5.1613	162.940	2.2756	1.24E+00	35587.2
68	13.79	3.80	0.1369	4.320	0.0467	3.28E−02	943.6
69	15.77	3.80	0.1150	3.632	0.0370	2.75E−02	793.3
70	17.75	3.80	0.1260	3.976	0.0418	3.02E−02	868.5
71	19.23	3.80	0.1798	5.677	0.0657	4.30E−02	1240.0
72	19.73	3.80	0.2010	6.347	0.0751	4.81E−02	1386.2
73	20.22	3.80	0.6297	19.880	0.2653	1.51E−01	4342.0
74	20.72	3.80	1.0160	32.075	0.4367	2.43E−01	7005.5
75	21.41	3.80	1.4884	46.986	0.6462	3.56E−01	10262.2
76	21.71	3.80	1.8616	58.771	0.8118	4.46E−01	12835.9
77	22.06	3.80	4.6702	147.436	2.0578	1.12E+00	32201.0
78	22.49	3.80	5.6152	177.268	2.4770	1.34E+00	38716.6
79	22.76	3.80	5.0179	158.411	2.2120	1.20E+00	34598.1
80	22.91	3.80	5.1887	163.803	2.2878	1.24E+00	35775.9
81	23.76	3.80	5.7211	180.611	2.5240	1.37E+00	39446.7
82	24.15	3.80	5.4412	171.775	2.3998	1.30E+00	37516.9
83	24.98	3.80	5.4959	173.502	2.4241	1.32E+00	37894.1
84	22.59	3.90	5.4222	171.175	2.3914	1.30E+00	37385.9
85	22.80	3.90	5.6399	178.048	2.4879	1.35E+00	38886.9
86	23.01	3.90	5.3614	169.256	2.3644	1.28E+00	36966.7
87	23.15	3.90	5.9137	186.692	2.6094	1.42E+00	40774.8
88	23.86	3.90	5.5045	173.773	2.4279	1.32E+00	37953.3
89	24.25	3.90	5.2558	165.923	2.3176	1.26E+00	36238.9
90	11.99	2.00	0.1772	5.595	0.0646	4.24E−02	1221.9
91	13.97	2.00	0.1643	5.188	0.0589	3.93E−02	1133.1

Table A17. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1774	5.601	0.0647	4.25E–02	1223.4
93	17.93	2.00	0.3750	11.839	0.1523	8.98E–02	2585.7
94	19.91	2.00	1.0088	31.846	0.4335	2.41E–01	6955.4
95	1.00	–0.38	0.0720	2.273	0.0179	1.72E–02	496.5
96	1.00	0.29	0.0697	2.200	0.0169	1.67E–02	480.6
97	1.00	0.91	0.0702	2.216	0.0171	1.68E–02	484.1
98	1.00	1.53	0.0708	2.236	0.0174	1.70E–02	488.4
99	2.50	–0.38	0.0564	1.780	0.0110	1.35E–02	388.8
100	4.00	–0.38	0.0528	1.668	0.0094	1.26E–02	364.3
101	4.00	0.29	0.0527	1.663	0.0093	1.26E–02	363.1
102	4.00	1.53	0.0516	1.629	0.0088	1.23E–02	355.7
103	5.50	–0.38	0.0661	2.085	0.0153	1.58E–02	455.5
104	7.00	–0.38	0.0810	2.557	0.0219	1.94E–02	558.5
105	8.00	–2.28	0.0659	2.080	0.0152	1.58E–02	454.2
106	8.00	–1.88	0.0678	2.141	0.0160	1.62E–02	467.5
107	8.00	–1.49	0.0701	2.214	0.0171	1.68E–02	483.6
108	8.00	–1.04	0.0723	2.281	0.0180	1.73E–02	498.2
109	8.00	–0.38	0.0760	2.400	0.0197	1.82E–02	524.2
110	8.00	–0.13	0.0760	2.398	0.0196	1.82E–02	523.8
111	8.00	0.01	0.0766	2.418	0.0199	1.83E–02	528.0
112	8.00	0.29	0.0764	2.411	0.0198	1.83E–02	526.6
113	8.00	0.74	0.0735	2.319	0.0185	1.76E–02	506.5
114	8.00	1.13	0.0706	2.228	0.0173	1.69E–02	486.6
115	8.00	1.53	0.0690	2.177	0.0165	1.65E–02	475.5
116	9.00	–0.38	0.0807	2.547	0.0217	1.93E–02	556.2
117	9.00	–0.13	0.0819	2.584	0.0223	1.96E–02	564.4
118	9.00	0.01	0.0815	2.572	0.0221	1.95E–02	561.7
119	9.00	0.29	0.0808	2.551	0.0218	1.93E–02	557.1
120	9.00	0.64	0.0780	2.461	0.0205	1.87E–02	537.6
121	9.00	0.95	0.0653	2.061	0.0149	1.56E–02	450.1
122	10.00	–0.38	0.0935	2.952	0.0274	2.24E–02	644.8
123	10.00	–0.13	0.0958	3.024	0.0284	2.29E–02	660.4
124	10.00	0.01	0.0966	3.050	0.0288	2.31E–02	666.2
125	10.00	0.29	0.0938	2.963	0.0276	2.25E–02	647.1
126	10.00	0.53	0.0910	2.872	0.0263	2.18E–02	627.3
127	10.00	0.71	0.0898	2.835	0.0258	2.15E–02	619.2
128	10.00	0.85	0.0893	2.819	0.0256	2.14E–02	615.7
129	10.00	0.97	0.0943	2.978	0.0278	2.26E–02	650.3
130	11.00	–0.38	0.1108	3.498	0.0351	2.65E–02	764.0
131	11.00	–0.13	0.1061	3.350	0.0330	2.54E–02	731.6
132	11.00	0.01	0.1067	3.369	0.0333	2.55E–02	735.9
133	11.00	0.15	0.1058	3.340	0.0329	2.53E–02	729.4
134	11.00	0.43	0.0994	3.138	0.0300	2.38E–02	685.4
135	11.00	0.60	0.1002	3.163	0.0304	2.40E–02	690.7
136	11.00	0.74	0.1095	3.457	0.0345	2.62E–02	755.1
137	11.00	0.86	0.1084	3.423	0.0340	2.60E–02	747.6
138	12.00	–0.38	0.1130	3.568	0.0361	2.71E–02	779.2
139	12.00	–0.13	0.1158	3.655	0.0373	2.77E–02	798.2
140	12.00	0.01	0.1179	3.722	0.0383	2.82E–02	813.0
141	12.00	0.15	0.1159	3.660	0.0374	2.78E–02	799.4
142	12.00	0.32	0.1113	3.513	0.0353	2.66E–02	767.3
143	12.00	0.50	0.1147	3.621	0.0368	2.75E–02	790.8
144	12.00	0.64	0.1197	3.779	0.0391	2.87E–02	825.3
145	12.00	0.76	0.1201	3.791	0.0392	2.87E–02	828.0
146	13.00	–0.38	0.1284	4.052	0.0429	3.07E–02	885.1
147	13.00	–0.13	0.1292	4.078	0.0433	3.09E–02	890.6
148	13.00	0.01	0.1303	4.114	0.0438	3.12E–02	898.5
149	13.00	0.15	0.1288	4.068	0.0431	3.08E–02	888.4

Table A17. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.1286	4.059	0.0430	3.08E–02	886.5
151	13.00	0.39	0.1304	4.118	0.0438	3.12E–02	899.3
152	13.00	0.53	0.1330	4.200	0.0450	3.18E–02	917.2
153	13.00	0.65	0.1329	4.196	0.0449	3.18E–02	916.5
154	14.00	–0.38	0.1529	4.828	0.0538	3.66E–02	1054.5
155	14.00	–0.13	0.1491	4.706	0.0521	3.57E–02	1027.9
156	14.00	0.01	0.1505	4.752	0.0527	3.60E–02	1038.0
157	14.00	0.15	0.1497	4.726	0.0524	3.58E–02	1032.1
158	14.00	0.29	0.1495	4.720	0.0523	3.58E–02	1030.8
159	14.00	0.43	0.1515	4.782	0.0531	3.63E–02	1044.3
160	14.00	0.55	0.1464	4.621	0.0509	3.50E–02	1009.3
161	15.00	–0.38	0.1751	5.528	0.0636	4.19E–02	1207.3
162	15.00	–0.13	0.1791	5.653	0.0654	4.29E–02	1234.8
163	15.00	0.01	0.1793	5.659	0.0655	4.29E–02	1236.0
164	15.00	0.32	0.1782	5.625	0.0650	4.26E–02	1228.5
165	15.00	0.44	0.1720	5.429	0.0622	4.12E–02	1185.8
166	16.00	–0.38	0.2154	6.800	0.0815	5.16E–02	1485.2
167	16.00	–0.13	0.2230	7.039	0.0849	5.34E–02	1537.4
168	16.00	0.01	0.2224	7.020	0.0846	5.32E–02	1533.3
169	16.00	0.11	0.2225	7.024	0.0847	5.33E–02	1534.2
170	16.00	0.22	0.2208	6.969	0.0839	5.28E–02	1522.1
171	16.00	0.34	0.2151	6.790	0.0814	5.15E–02	1482.9
172	17.00	–0.38	0.3219	10.163	0.1288	7.71E–02	2219.7
173	17.00	–0.13	0.3020	9.534	0.1199	7.23E–02	2082.3
174	17.00	0.01	0.3036	9.583	0.1206	7.27E–02	2093.0
175	17.00	0.11	0.3016	9.521	0.1197	7.22E–02	2079.5
176	17.00	0.23	0.3062	9.665	0.1218	7.33E–02	2110.9
177	18.00	–0.38	0.5832	18.410	0.2447	1.40E–01	4020.9
178	18.00	–0.13	0.5685	17.946	0.2381	1.36E–01	3919.5
179	18.00	0.01	0.5590	17.648	0.2339	1.34E–01	3854.5
180	18.00	0.13	0.5676	17.918	0.2377	1.36E–01	3913.3
181	18.50	–0.38	0.7172	22.643	0.3041	1.72E–01	4945.3
182	18.50	–0.13	0.7610	24.025	0.3236	1.82E–01	5247.3
183	18.50	0.01	0.7587	23.952	0.3225	1.82E–01	5231.3
184	18.60	0.05	0.7555	23.850	0.3211	1.81E–01	5209.1
185	18.50	0.10	0.7669	24.212	0.3262	1.84E–01	5288.1
186	19.20	–0.38	0.7813	24.667	0.3326	1.87E–01	5387.4
187	19.20	–0.13	0.7745	24.450	0.3295	1.85E–01	5340.0
188	19.20	0.01	0.7685	24.261	0.3269	1.84E–01	5298.8
189	19.30	0.05	0.7795	24.607	0.3317	1.87E–01	5374.4
190	19.20	0.10	0.7733	24.414	0.3290	1.85E–01	5332.1
191	20.00	–0.38	0.8778	27.713	0.3754	2.10E–01	6052.7
192	20.00	–0.13	0.8798	27.774	0.3762	2.11E–01	6066.0
193	20.00	0.01	0.8774	27.698	0.3752	2.10E–01	6049.4
194	20.10	0.05	0.8969	28.315	0.3838	2.15E–01	6184.3
195	20.00	0.10	0.8786	27.737	0.3757	2.10E–01	6058.1
196	20.80	–0.38	1.0046	31.713	0.4316	2.40E–01	6926.4
197	20.80	–0.13	1.0055	31.743	0.4320	2.41E–01	6932.8
198	20.80	0.01	1.0041	31.700	0.4314	2.40E–01	6923.6
199	20.90	0.05	1.0171	32.108	0.4371	2.43E–01	7012.6
200	20.80	0.10	1.0067	31.782	0.4326	2.41E–01	6941.3
201	21.60	–0.38	1.0870	34.317	0.4682	2.60E–01	7495.1
202	21.60	–0.13	1.0903	34.421	0.4697	2.61E–01	7517.9
203	21.60	0.01	1.0912	34.450	0.4701	2.61E–01	7524.1
204	21.70	0.05	1.0977	34.653	0.4729	2.63E–01	7568.6
205	21.60	0.10	1.0988	34.688	0.4734	2.63E–01	7576.2
206	22.40	–0.38	1.1411	36.025	0.4922	2.73E–01	7868.0
207	22.40	–0.13	1.1440	36.115	0.4935	2.74E–01	7887.8

Table A17. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	1.1427	36.074	0.4929	2.74E–01	7878.8
209	22.50	0.05	1.1501	36.308	0.4962	2.75E–01	7929.9
210	22.40	0.10	1.1485	36.256	0.4954	2.75E–01	7918.6
211	23.20	–0.38	1.1731	37.035	0.5064	2.81E–01	8088.7
212	23.20	–0.13	1.1798	37.247	0.5094	2.82E–01	8135.0
213	23.20	0.01	1.1856	37.429	0.5119	2.84E–01	8174.8
214	23.30	0.05	1.1910	37.598	0.5143	2.85E–01	8211.7
215	23.20	0.10	1.1849	37.407	0.5116	2.84E–01	8169.9
216	24.00	–0.38	1.1794	37.234	0.5092	2.82E–01	8132.2
217	24.00	–0.13	1.1976	37.809	0.5172	2.87E–01	8257.7
218	24.00	0.01	1.2019	37.944	0.5191	2.88E–01	8287.2
219	24.10	0.05	1.1995	37.867	0.5181	2.87E–01	8270.4
220	24.00	0.10	1.2063	38.081	0.5211	2.89E–01	8317.2
221	25.00	–0.38	0.9217	29.096	0.3948	2.21E–01	6354.8
222	25.00	–0.13	0.9123	28.801	0.3907	2.18E–01	6290.3
223	25.00	0.01	0.9445	29.818	0.4050	2.26E–01	6512.4
224	25.10	0.05	0.7838	24.743	0.3336	1.88E–01	5404.1
225	25.00	0.10	0.9213	29.085	0.3947	2.21E–01	6352.5
226	9.00	999.00	3.1211	98.530	1.3705	7.47E–01	21519.8
227	0.00	–2.63	4.1978	132.523	1.8482	1.00E+00	28944.0
228	0.00	–0.67	4.2562	134.367	1.8741	1.02E+00	29346.8
229	0.00	1.88	4.1586	131.286	1.8308	9.95E–01	28673.8
230	20.58	0.00	0.8818	27.839	0.3771	2.11E–01	6080.1
231	20.78	0.00	1.1074	34.961	0.4772	2.65E–01	7635.7
232	20.98	0.00	1.3159	41.543	0.5697	3.15E–01	9073.4
233	21.38	0.00	1.8071	57.050	0.7876	4.33E–01	12460.1
234	21.78	0.00	2.9219	92.242	1.2822	6.99E–01	20146.4
235	22.51	0.00	5.3730	169.622	2.3695	1.29E+00	37046.6
236	22.71	0.00	6.0543	191.131	2.6718	1.45E+00	41744.4
237	22.91	0.00	5.4893	173.293	2.4211	1.31E+00	37848.4
238	23.11	0.00	5.3133	167.737	2.3430	1.27E+00	36634.9
239	23.88	0.00	5.6947	179.777	2.5122	1.36E+00	39264.7
240	24.38	0.00	5.5479	175.145	2.4472	1.33E+00	38253.0
241	24.88	0.00	5.6468	178.267	2.4910	1.35E+00	38934.8
242	25.08	0.00	5.0094	158.144	2.2082	1.20E+00	34539.8
243	25.38	0.00	3.2751	103.393	1.4389	7.84E–01	22581.9
244	0.58	999.00	0.0696	2.197	0.0168	1.67E–02	479.8
245	0.86	999.00	0.0704	2.223	0.0172	1.69E–02	485.6
246	1.15	999.00	0.0691	2.180	0.0166	1.65E–02	476.1
247	1.43	999.00	0.0696	2.196	0.0168	1.67E–02	479.6
248	1.72	999.00	0.0686	2.167	0.0164	1.64E–02	473.2
249	2.00	999.00	0.0700	2.211	0.0170	1.68E–02	482.9
250	2.29	999.00	0.0695	2.194	0.0168	1.66E–02	479.1
251	2.57	999.00	0.0704	2.222	0.0172	1.69E–02	485.4
252	2.86	999.00	0.0694	2.191	0.0167	1.66E–02	478.6
253	3.14	999.00	0.0692	2.186	0.0167	1.66E–02	477.4
254	3.43	999.00	0.0682	2.152	0.0162	1.63E–02	470.1
255	999.00	999.00	0.0668	2.110	0.0156	1.60E–02	460.8
256	999.00	999.00	0.0673	2.124	0.0158	1.61E–02	463.9

Table A18. Flow Conditions and Pressure Distribution for Run 55

[CR = 9; Re = 0.55×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	343.83	(.23706E+07)
$T_{t,1}$, °R (K)	1846.14	(1025.63)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0155	(7.99)
$h_{t,1}$, btu/lbm (J/kg)	463.47	(.10773E+07)
Free-stream conditions:		
M_∞	9.66	
p_∞, psia (N/m^2)	0.0098	(67.42)
T_∞, °R (K)	97.99	(54.44)
ρ_∞, slug/ft^3 (kg/m^3)	0.83713E−05	(.43144E−02)
h_∞, btu/lbm (J/kg)	0.23371E+02	(.54324E+05)
a_∞, ft/s (m/s)	485.64	(148.02)
u_∞, ft/s (m/s)	4692.81	(1430.37)
Re_∞, ft^{-1} (m^{-1})	0.53310E+06	(.17490E+07)
q_∞, psia (N/m^2)	0.640	(4413.52)
μ_∞, slug/ft-s (N-s/m^2)	0.73691E−07	(.35284E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.187	(8183.75)
$T_{t,2}$, °R (K)	1848.15	(1026.75)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.53881E−04	(.27769E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0514	5.550	0.0684	4.50E−02	354.6
2	11.18	0.20	0.0567	6.124	0.0770	4.96E−02	391.3
3	12.17	0.20	0.0624	6.734	0.0862	5.46E−02	430.2
4	13.15	0.20	0.0684	7.378	0.0959	5.98E−02	471.4
5	14.21	0.20	0.0797	8.606	0.1143	6.98E−02	549.8
6	15.14	0.20	0.0924	9.969	0.1348	8.08E−02	636.9
7	16.13	0.20	0.1087	11.736	0.1614	9.51E−02	749.8
8	17.12	0.20	0.1364	14.716	0.2061	1.19E−01	940.2
9	18.11	0.20	0.1699	18.340	0.2606	1.49E−01	1171.7
10	19.74	0.20	0.5422	58.516	0.8644	4.74E−01	3738.6
11	20.55	0.20	0.6984	75.372	1.1178	6.11E−01	4815.5
12	22.56	0.20	1.0380	112.017	1.6686	9.08E−01	7156.7
13	24.98	0.20	0.9840	106.195	1.5811	8.61E−01	6784.8
14	10.59	0.60	0.0509	5.492	0.0675	4.45E−02	350.9
15	11.58	0.60	0.0562	6.070	0.0762	4.92E−02	387.8
16	12.57	0.60	0.0691	7.454	0.0970	6.04E−02	476.3
17	13.56	0.60	0.0753	8.126	0.1071	6.59E−02	519.2
18	14.60	0.60	0.0834	8.997	0.1202	7.29E−02	574.8
19	15.54	0.60	0.0962	10.386	0.1411	8.42E−02	663.6
20	16.53	0.60	0.1158	12.499	0.1728	1.01E−01	798.6
21	17.52	0.60	0.1465	15.815	0.2227	1.28E−01	1010.4
22	18.51	0.60	0.2337	25.218	0.3640	2.04E−01	1611.2
23	12.97	1.00	0.0716	7.729	0.1011	6.27E−02	493.8
24	15.00	1.00	0.0892	9.625	0.1296	7.80E−02	614.9
25	15.94	1.00	0.1016	10.962	0.1497	8.89E−02	700.4
26	16.93	1.00	0.1274	13.744	0.1915	1.11E−01	878.1
27	17.92	1.00	0.1848	19.944	0.2847	1.62E−01	1274.2
28	18.91	1.00	0.2965	32.002	0.4660	2.59E−01	2044.6
29	24.98	1.00	0.9834	106.124	1.5800	8.60E−01	6780.3
30	11.99	2.00	0.0934	10.082	0.1365	8.17E−02	644.1
31	13.97	2.00	0.0884	9.544	0.1284	7.74E−02	609.8
32	15.98	2.00	0.1077	11.628	0.1597	9.43E−02	742.9
33	16.94	2.00	0.1303	14.060	0.1963	1.14E−01	898.3

Table A18. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1817	19.613	0.2798	1.59E−01	1253.1
35	18.42	2.00	0.2276	24.559	0.3541	1.99E−01	1569.1
36	18.92	2.00	0.2923	31.540	0.4590	2.56E−01	2015.1
37	19.41	2.00	0.3972	42.871	0.6293	3.48E−01	2739.0
38	19.91	2.00	0.5567	60.083	0.8880	4.87E−01	3838.7
39	20.26	2.00	0.7241	78.149	1.1595	6.33E−01	4992.9
40	21.11	2.00	0.6344	68.462	1.0139	5.55E−01	4374.0
41	21.96	2.00	0.6176	66.657	0.9868	5.40E−01	4258.7
42	22.74	2.00	0.6293	67.912	1.0057	5.51E−01	4338.9
43	23.52	2.00	0.7257	78.321	1.1621	6.35E−01	5003.9
44	24.98	2.00	0.9432	101.787	1.5148	8.25E−01	6503.1
45	17.94	3.00	0.2012	21.716	0.3114	1.76E−01	1387.5
46	18.93	3.00	0.4302	46.431	0.6828	3.76E−01	2966.4
47	19.92	3.00	0.8450	91.189	1.3555	7.39E−01	5826.0
48	20.91	3.00	1.5329	165.427	2.4713	1.34E+00	10569.1
49	22.11	3.00	1.5922	171.827	2.5675	1.39E+00	10977.9
50	22.96	3.00	1.6037	173.075	2.5862	1.40E+00	11057.7
51	23.74	3.00	1.6691	180.128	2.6922	1.46E+00	11508.3
52	24.98	3.00	1.1857	127.958	1.9081	1.04E+00	8175.2
53	18.34	3.40	0.3396	36.648	0.5358	2.97E−01	2341.5
54	19.32	3.40	0.7059	76.183	1.1300	6.18E−01	4867.3
55	19.82	3.40	0.8999	97.114	1.4446	7.87E−01	6204.6
56	20.32	3.40	1.1290	121.839	1.8162	9.88E−01	7784.2
57	20.81	3.40	1.4683	158.461	2.3666	1.28E+00	10124.0
58	21.31	3.40	2.1317	230.053	3.4426	1.86E+00	14698.0
59	21.66	3.40	2.7237	293.938	4.4028	2.38E+00	18779.6
60	22.94	3.40	2.7500	296.779	4.4455	2.41E+00	18961.1
61	23.75	3.40	1.9832	214.031	3.2018	1.73E+00	13674.4
62	24.14	3.40	1.7115	184.707	2.7611	1.50E+00	11800.9
63	22.29	3.60	3.7501	404.713	6.0677	3.28E+00	25857.0
64	22.71	3.60	3.3342	359.826	5.3930	2.92E+00	22989.2
65	23.14	3.60	2.8707	309.804	4.6412	2.51E+00	19793.3
66	23.95	3.60	1.9215	207.367	3.1016	1.68E+00	13248.6
67	24.34	3.60	1.6850	181.849	2.7181	1.47E+00	11618.3
68	13.79	3.80	0.0729	7.868	0.1032	6.38E−02	502.7
69	15.77	3.80	0.0758	8.186	0.1080	6.64E−02	523.0
70	17.75	3.80	0.2081	22.456	0.3225	1.82E−01	1434.7
71	19.23	3.80	0.8093	87.338	1.2976	7.08E−01	5580.0
72	19.73	3.80	1.0759	116.116	1.7302	9.41E−01	7418.6
73	20.22	3.80	1.3478	145.453	2.1711	1.18E+00	9292.9
74	20.72	3.80	1.6570	178.824	2.6726	1.45E+00	11425.0
75	21.41	3.80	2.5125	271.146	4.0602	2.20E+00	17323.4
76	21.71	3.80	3.0823	332.640	4.9844	2.70E+00	21252.3
77	22.06	3.80	4.0934	441.758	6.6245	3.58E+00	28223.8
78	22.49	3.80	4.6891	506.054	7.5908	4.10E+00	32331.6
79	22.76	3.80	3.5583	384.010	5.7565	3.11E+00	24534.3
80	22.91	3.80	3.0580	330.022	4.9451	2.68E+00	21085.0
81	23.76	3.80	2.1253	229.361	3.4322	1.86E+00	14653.8
82	24.15	3.80	1.8634	201.101	3.0075	1.63E+00	12848.3
83	24.98	3.80	1.3777	148.681	2.2196	1.21E+00	9499.2
84	22.59	3.90	4.5630	492.443	7.3862	3.99E+00	31462.0
85	22.80	3.90	3.4894	376.576	5.6448	3.05E+00	24059.3
86	23.01	3.90	3.2231	347.841	5.2129	2.82E+00	22223.5
87	23.15	3.90	2.8891	311.792	4.6711	2.53E+00	19920.3
88	23.86	3.90	2.0354	219.662	3.2864	1.78E+00	14034.2
89	24.25	3.90	1.7044	183.942	2.7496	1.49E+00	11752.0
90	11.99	2.00	0.0919	9.914	0.1340	8.04E−02	633.4
91	13.97	2.00	0.0900	9.715	0.1310	7.87E−02	620.7

Table A18. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1090	11.764	0.1618	9.54E–02	751.6
93	17.93	2.00	0.1904	20.546	0.2938	1.67E–01	1312.7
94	19.91	2.00	0.5938	64.088	0.9482	5.20E–01	4094.6
95	1.00	–0.38	0.0616	6.651	0.0849	5.39E–02	424.9
96	1.00	0.29	0.0627	6.761	0.0866	5.48E–02	432.0
97	1.00	0.91	0.0640	6.903	0.0887	5.60E–02	441.1
98	1.00	1.53	0.0591	6.375	0.0808	5.17E–02	407.3
99	2.50	–0.38	0.0546	5.896	0.0736	4.78E–02	376.7
100	4.00	–0.38	0.0479	5.167	0.0626	4.19E–02	330.1
101	4.00	0.29	0.0505	5.445	0.0668	4.41E–02	347.9
102	4.00	1.53	0.0442	4.774	0.0567	3.87E–02	305.0
103	5.50	–0.38	0.0443	4.783	0.0569	3.88E–02	305.6
104	7.00	–0.38	0.0365	3.943	0.0442	3.20E–02	251.9
105	8.00	–2.28	0.0258	2.787	0.0269	2.26E–02	178.0
106	8.00	–1.88	0.0285	3.077	0.0312	2.49E–02	196.6
107	8.00	–1.49	0.0275	2.965	0.0295	2.40E–02	189.5
108	8.00	–1.04	0.0297	3.210	0.0332	2.60E–02	205.1
109	8.00	–0.38	0.0385	4.152	0.0474	3.37E–02	265.2
110	8.00	–0.13	0.0365	3.941	0.0442	3.19E–02	251.8
111	8.00	0.01	0.0373	4.022	0.0454	3.26E–02	256.9
112	8.00	0.29	0.0409	4.417	0.0514	3.58E–02	282.2
113	8.00	0.74	0.0378	4.079	0.0463	3.31E–02	260.6
114	8.00	1.13	0.0321	3.463	0.0370	2.81E–02	221.3
115	8.00	1.53	0.0310	3.349	0.0353	2.71E–02	214.0
116	9.00	–0.38	0.0406	4.383	0.0509	3.55E–02	280.1
117	9.00	–0.13	0.0417	4.500	0.0526	3.65E–02	287.5
118	9.00	0.01	0.0416	4.488	0.0524	3.64E–02	286.7
119	9.00	0.29	0.0402	4.340	0.0502	3.52E–02	277.3
120	9.00	0.64	0.0415	4.482	0.0523	3.63E–02	286.4
121	9.00	0.95	0.0321	3.463	0.0370	2.81E–02	221.3
122	10.00	–0.38	0.0539	5.816	0.0724	4.71E–02	371.6
123	10.00	–0.13	0.0551	5.946	0.0743	4.82E–02	379.9
124	10.00	0.01	0.0564	6.090	0.0765	4.94E–02	389.1
125	10.00	0.29	0.0485	5.238	0.0637	4.25E–02	334.7
126	10.00	0.53	0.0511	5.516	0.0679	4.47E–02	352.4
127	10.00	0.71	0.0516	5.570	0.0687	4.51E–02	355.8
128	10.00	0.85	0.0499	5.390	0.0660	4.37E–02	344.4
129	10.00	0.97	0.0506	5.462	0.0671	4.43E–02	348.9
130	11.00	–0.38	0.0608	6.560	0.0836	5.32E–02	419.1
131	11.00	–0.13	0.0624	6.729	0.0861	5.45E–02	429.9
132	11.00	0.01	0.0611	6.591	0.0840	5.34E–02	421.1
133	11.00	0.15	0.0618	6.670	0.0852	5.41E–02	426.1
134	11.00	0.43	0.0588	6.350	0.0804	5.15E–02	405.7
135	11.00	0.60	0.0593	6.396	0.0811	5.18E–02	408.6
136	11.00	0.74	0.0591	6.380	0.0809	5.17E–02	407.6
137	11.00	0.86	0.0621	6.704	0.0857	5.43E–02	428.3
138	12.00	–0.38	0.0684	7.383	0.0959	5.98E–02	471.7
139	12.00	–0.13	0.0682	7.365	0.0957	5.97E–02	470.6
140	12.00	0.01	0.0683	7.369	0.0957	5.97E–02	470.8
141	12.00	0.15	0.0678	7.318	0.0950	5.93E–02	467.6
142	12.00	0.32	0.0634	6.841	0.0878	5.55E–02	437.1
143	12.00	0.50	0.0677	7.306	0.0948	5.92E–02	466.8
144	12.00	0.64	0.0683	7.366	0.0957	5.97E–02	470.6
145	12.00	0.76	0.0682	7.356	0.0955	5.96E–02	470.0
146	13.00	–0.38	0.0755	8.152	0.1075	6.61E–02	520.8
147	13.00	–0.13	0.0752	8.118	0.1070	6.58E–02	518.6
148	13.00	0.01	0.0752	8.116	0.1070	6.58E–02	518.5
149	13.00	0.15	0.0748	8.076	0.1064	6.55E–02	516.0

Table A18. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.0760	8.202	0.1082	6.65E–02	524.0
151	13.00	0.39	0.0749	8.079	0.1064	6.55E–02	516.2
152	13.00	0.53	0.0733	7.912	0.1039	6.41E–02	505.5
153	13.00	0.65	0.0763	8.235	0.1087	6.68E–02	526.2
154	14.00	–0.38	0.0856	9.236	0.1238	7.49E–02	590.1
155	14.00	–0.13	0.0821	8.861	0.1181	7.18E–02	566.1
156	14.00	0.01	0.0822	8.868	0.1183	7.19E–02	566.6
157	14.00	0.15	0.0820	8.854	0.1180	7.18E–02	565.7
158	14.00	0.29	0.0834	9.003	0.1203	7.30E–02	575.2
159	14.00	0.43	0.0849	9.159	0.1226	7.42E–02	585.1
160	14.00	0.55	0.0831	8.967	0.1197	7.27E–02	572.9
161	15.00	–0.38	0.0986	10.637	0.1448	8.62E–02	679.6
162	15.00	–0.13	0.0944	10.187	0.1381	8.26E–02	650.8
163	15.00	0.01	0.0924	9.977	0.1349	8.09E–02	637.4
164	15.00	0.32	0.0962	10.377	0.1409	8.41E–02	663.0
165	15.00	0.44	0.0974	10.515	0.1430	8.52E–02	671.8
166	16.00	–0.38	0.1141	12.317	0.1701	9.98E–02	787.0
167	16.00	–0.13	0.1134	12.235	0.1689	9.92E–02	781.7
168	16.00	0.01	0.1123	12.119	0.1671	9.82E–02	774.3
169	16.00	0.11	0.1103	11.905	0.1639	9.65E–02	760.6
170	16.00	0.22	0.1125	12.146	0.1675	9.85E–02	776.0
171	16.00	0.34	0.1150	12.410	0.1715	1.01E–01	792.9
172	17.00	–0.38	0.1416	15.276	0.2146	1.24E–01	976.0
173	17.00	–0.13	0.1422	15.347	0.2156	1.24E–01	980.5
174	17.00	0.01	0.1416	15.278	0.2146	1.24E–01	976.1
175	17.00	0.11	0.1385	14.946	0.2096	1.21E–01	954.9
176	17.00	0.23	0.1453	15.682	0.2207	1.27E–01	1001.9
177	18.00	–0.38	0.1892	20.423	0.2919	1.66E–01	1304.8
178	18.00	–0.13	0.1759	18.987	0.2703	1.54E–01	1213.1
179	18.00	0.01	0.1753	18.915	0.2693	1.53E–01	1208.4
180	18.00	0.13	0.1749	18.877	0.2687	1.53E–01	1206.1
181	18.50	–0.38	0.2593	27.980	0.4055	2.27E–01	1787.6
182	18.50	–0.13	0.2164	23.352	0.3359	1.89E–01	1491.9
183	18.50	0.01	0.2319	25.032	0.3612	2.03E–01	1599.3
184	18.60	0.05	0.2707	29.219	0.4241	2.37E–01	1866.8
185	18.50	0.10	0.2236	24.135	0.3477	1.96E–01	1542.0
186	19.20	–0.38	0.4323	46.652	0.6861	3.78E–01	2980.6
187	19.20	–0.13	0.4094	44.178	0.6490	3.58E–01	2822.5
188	19.20	0.01	0.4101	44.258	0.6502	3.59E–01	2827.6
189	19.30	0.05	0.4396	47.446	0.6981	3.85E–01	3031.3
190	19.20	0.10	0.4174	45.047	0.6620	3.65E–01	2878.0
191	20.00	–0.38	0.5928	63.979	0.9465	5.19E–01	4087.6
192	20.00	–0.13	0.5281	56.992	0.8415	4.62E–01	3641.2
193	20.00	0.01	0.5633	60.789	0.8986	4.93E–01	3883.8
194	20.10	0.05	0.5854	63.181	0.9346	5.12E–01	4036.6
195	20.00	0.10	0.5645	60.917	0.9005	4.94E–01	3891.9
196	20.80	–0.38	0.7882	85.066	1.2635	6.90E–01	5434.9
197	20.80	–0.13	0.6632	71.568	1.0606	5.80E–01	4572.5
198	20.80	0.01	0.6909	74.563	1.1056	6.04E–01	4763.8
199	20.90	0.05	0.7302	78.800	1.1693	6.39E–01	5034.5
200	20.80	0.10	0.7057	76.156	1.1296	6.17E–01	4865.6
201	21.60	–0.38	0.9401	101.457	1.5098	8.22E–01	6482.0
202	21.60	–0.13	0.8299	89.563	1.3311	7.26E–01	5722.1
203	21.60	0.01	0.8816	95.147	1.4150	7.71E–01	6078.9
204	21.70	0.05	0.8862	95.639	1.4224	7.75E–01	6110.3
205	21.60	0.10	0.9251	99.841	1.4856	8.09E–01	6378.8
206	22.40	–0.38	1.0944	118.108	1.7601	9.57E–01	7545.9
207	22.40	–0.13	0.9699	104.673	1.5582	8.49E–01	6687.5

Table A18. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	1.0074	108.717	1.6190	8.81E–01	6945.9
209	22.50	0.05	1.0208	110.161	1.6407	8.93E–01	7038.1
210	22.40	0.10	1.0533	113.675	1.6935	9.21E–01	7262.6
211	23.20	–0.38	1.2182	131.466	1.9609	1.07E+00	8399.4
212	23.20	–0.13	1.1052	119.270	1.7776	9.67E–01	7620.1
213	23.20	0.01	1.1643	125.655	1.8735	1.02E+00	8028.1
214	23.30	0.05	1.1708	126.351	1.8840	1.02E+00	8072.5
215	23.20	0.10	1.1123	120.040	1.7891	9.73E–01	7669.3
216	24.00	–0.38	1.2671	136.745	2.0402	1.11E+00	8736.6
217	24.00	–0.13	1.1805	127.395	1.8997	1.03E+00	8139.2
218	24.00	0.01	1.2907	139.287	2.0784	1.13E+00	8899.0
219	24.10	0.05	1.3014	140.443	2.0958	1.14E+00	8972.9
220	24.00	0.10	1.2655	136.574	2.0376	1.11E+00	8725.7
221	25.00	–0.38	1.0439	112.657	1.6782	9.13E–01	7197.6
222	25.00	–0.13	0.9702	104.708	1.5587	8.49E–01	6689.8
223	25.00	0.01	1.0129	109.317	1.6280	8.86E–01	6984.2
224	25.10	0.05	0.9168	98.938	1.4720	8.02E–01	6321.2
225	25.00	0.10	0.9896	106.793	1.5900	8.66E–01	6823.0
226	9.00	999.00	0.1320	14.243	0.1990	1.15E–01	910.0
227	0.00	–2.63	1.1751	126.816	1.8910	1.03E+00	8102.2
228	0.00	–0.67	1.1832	127.689	1.9041	1.04E+00	8158.0
229	0.00	1.88	1.1555	124.705	1.8593	1.01E+00	7967.4
230	18.23	0.00	0.6356	68.589	1.0158	5.56E–01	4382.1
231	18.43	0.00	0.6543	70.614	1.0463	5.72E–01	4511.5
232	18.63	0.00	0.7207	77.778	1.1539	6.30E–01	4969.2
233	19.00	0.00	0.8376	90.394	1.3436	7.33E–01	5775.3
234	19.40	0.00	0.9008	97.214	1.4461	7.88E–01	6211.0
235	20.13	0.00	1.2177	131.409	1.9600	1.07E+00	8395.7
236	20.33	0.00	1.3458	145.242	2.1679	1.18E+00	9279.5
237	20.53	0.00	1.5113	163.100	2.4363	1.32E+00	10420.4
238	20.73	0.00	1.7099	184.537	2.7585	1.50E+00	11790.0
239	21.50	0.00	2.3955	258.528	3.8706	2.10E+00	16517.2
240	22.00	0.00	4.0915	441.557	6.6214	3.58E+00	28211.0
241	22.50	0.00	5.4490	588.053	8.8232	4.77E+00	37570.5
242	22.70	0.00	3.9592	427.283	6.4069	3.46E+00	27299.0
243	23.00	0.00	3.3030	356.463	5.3425	2.89E+00	22774.3
244	0.58	999.00	0.0394	4.254	0.0489	3.45E–02	271.8
245	0.86	999.00	0.0415	4.479	0.0523	3.63E–02	286.2
246	1.15	999.00	0.0387	4.181	0.0478	3.39E–02	267.2
247	1.43	999.00	0.0389	4.199	0.0481	3.40E–02	268.3
248	1.72	999.00	0.0357	3.854	0.0429	3.12E–02	246.2
249	2.00	999.00	0.0407	4.387	0.0509	3.56E–02	280.3
250	2.29	999.00	0.0386	4.165	0.0476	3.38E–02	266.1
251	2.57	999.00	0.0413	4.452	0.0519	3.61E–02	284.4
252	2.86	999.00	0.0392	4.228	0.0485	3.43E–02	270.1
253	3.14	999.00	0.0403	4.348	0.0503	3.52E–02	277.8
254	3.43	999.00	0.0387	4.179	0.0478	3.39E–02	267.0
255	999.00	999.00	0.0594	6.413	0.0814	5.20E–02	409.7
256	999.00	999.00	0.0592	6.387	0.0810	5.18E–02	408.1

Table A19. Flow Conditions and Pressure Distribution for Run 56

[CR = 9; Re = 1.14×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	720.03	(.49644E+07)
$T_{t,1}$, °R (K)	1864.44	(1035.80)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0319	(16.43)
$h_{t,1}$, btu/lbm (J/kg)	469.17	(.10906E+07)
Free-stream conditions:		
M_∞	9.77	
p_∞, psia (N/m^2)	0.0190	(130.66)
T_∞, °R (K)	97.12	(53.95)
ρ_∞, slug/ft^3 (kg/m^3)	0.16370E−04	(.84369E−02)
h_∞, btu/lbm (J/kg)	0.23162E+02	(.53839E+05)
a_∞, ft/s (m/s)	483.47	(147.36)
u_∞, ft/s (m/s)	4724.21	(1439.94)
Re_∞, ft^{-1} (m^{-1})	0.10606E+07	(.34795E+07)
q_∞, psia (N/m^2)	1.269	(8746.62)
μ_∞, slug/ft-s (N-s/m^2)	0.72920E−07	(.34914E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.352	(16224.96)
$T_{t,2}$, °R (K)	1868.95	(1038.31)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10559E−03	(.54421E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0853	4.855	0.0563	3.82E−02	588.4
2	11.18	0.20	0.0997	5.675	0.0683	4.47E−02	687.8
3	12.17	0.20	0.1115	6.344	0.0781	5.00E−02	768.9
4	13.15	0.20	0.1274	7.250	0.0913	5.71E−02	878.6
5	14.21	0.20	0.1526	8.680	0.1122	6.84E−02	1051.9
6	15.14	0.20	0.1795	10.212	0.1345	8.04E−02	1237.6
7	16.13	0.20	0.2144	12.196	0.1635	9.61E−02	1478.0
8	17.12	0.20	0.2743	15.607	0.2133	1.23E−01	1891.4
9	18.11	0.20	0.3968	22.579	0.3151	1.78E−01	2736.3
10	19.74	0.20	1.0250	58.318	0.8371	4.59E−01	7067.2
11	20.55	0.20	1.2297	69.964	1.0071	5.51E−01	8478.6
12	22.56	0.20	1.7781	101.168	1.4628	7.97E−01	12260.1
13	24.98	0.20	1.8942	107.770	1.5593	8.49E−01	13060.2
14	10.59	0.60	0.0933	5.308	0.0629	4.18E−02	643.3
15	11.58	0.60	0.1027	5.842	0.0707	4.60E−02	708.0
16	12.57	0.60	0.1163	6.615	0.0820	5.21E−02	801.7
17	13.56	0.60	0.1315	7.480	0.0946	5.89E−02	906.5
18	14.60	0.60	0.1548	8.808	0.1140	6.94E−02	1067.4
19	15.54	0.60	0.1841	10.475	0.1384	8.25E−02	1269.4
20	16.53	0.60	0.2240	12.747	0.1715	1.00E−01	1544.7
21	17.52	0.60	0.3074	17.489	0.2408	1.38E−01	2119.4
22	18.51	0.60	0.5145	29.276	0.4129	2.31E−01	3547.8
23	12.97	1.00	0.1311	7.457	0.0943	5.87E−02	903.7
24	15.00	1.00	0.1637	9.315	0.1214	7.34E−02	1128.8
25	15.94	1.00	0.1973	11.226	0.1493	8.84E−02	1360.5
26	16.93	1.00	0.2527	14.380	0.1954	1.13E−01	1742.7
27	17.92	1.00	0.3812	21.691	0.3022	1.71E−01	2628.6
28	18.91	1.00	0.6450	36.700	0.5214	2.89E−01	4447.5
29	24.98	1.00	1.9438	110.597	1.6005	8.71E−01	13402.7
30	11.99	2.00	0.1739	9.897	0.1299	7.79E−02	1199.3
31	13.97	2.00	0.1639	9.327	0.1216	7.35E−02	1130.3
32	15.98	2.00	0.1999	11.372	0.1515	8.96E−02	1378.1
33	16.94	2.00	0.2837	16.140	0.2211	1.27E−01	1956.0

Table A19. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.4242	24.133	0.3378	1.90E–01	2924.5
35	18.42	2.00	0.5339	30.376	0.4290	2.39E–01	3681.2
36	18.92	2.00	0.6566	37.358	0.5310	2.94E–01	4527.2
37	19.41	2.00	0.8639	49.155	0.7032	3.87E–01	5956.8
38	19.91	2.00	1.1411	64.922	0.9335	5.11E–01	7867.6
39	20.26	2.00	1.4505	82.528	1.1906	6.50E–01	10001.2
40	21.11	2.00	1.4048	79.926	1.1526	6.30E–01	9685.8
41	21.96	2.00	1.4160	80.566	1.1620	6.35E–01	9763.4
42	22.74	2.00	1.5326	87.199	1.2588	6.87E–01	10567.2
43	23.52	2.00	1.7052	97.018	1.4022	7.64E–01	11757.2
44	24.98	2.00	1.7702	100.716	1.4562	7.93E–01	12205.3
45	17.94	3.00	0.3750	21.337	0.2970	1.68E–01	2585.7
46	18.93	3.00	0.7407	42.146	0.6009	3.32E–01	5107.5
47	19.92	3.00	1.2652	71.986	1.0367	5.67E–01	8723.6
48	20.91	3.00	2.7574	156.888	2.2766	1.24E+00	19012.5
49	22.11	3.00	3.4160	194.355	2.8237	1.53E+00	23553.0
50	22.96	3.00	3.1203	177.532	2.5781	1.40E+00	21514.3
51	23.74	3.00	2.9994	170.655	2.4776	1.34E+00	20680.9
52	24.98	3.00	2.1744	123.716	1.7921	9.74E–01	14992.6
53	18.34	3.40	0.4050	23.045	0.3219	1.82E–01	2792.7
54	19.32	3.40	0.8413	47.864	0.6844	3.77E–01	5800.4
55	19.82	3.40	1.3624	77.514	1.1174	6.11E–01	9393.5
56	20.32	3.40	1.9049	108.380	1.5682	8.54E–01	13134.1
57	20.81	3.40	2.7723	157.736	2.2890	1.24E+00	19115.3
58	21.31	3.40	4.3349	246.642	3.5873	1.94E+00	29889.4
59	21.66	3.40	5.1017	290.269	4.2245	2.29E+00	35176.4
60	22.94	3.40	4.6180	262.746	3.8225	2.07E+00	31841.0
61	23.75	3.40	3.4851	198.289	2.8812	1.56E+00	24029.8
62	24.14	3.40	3.0424	173.099	2.5133	1.36E+00	20977.1
63	22.29	3.60	5.2069	296.251	4.3118	2.33E+00	35901.3
64	22.71	3.60	5.0212	285.688	4.1576	2.25E+00	34621.2
65	23.14	3.60	4.6939	267.066	3.8856	2.10E+00	32364.6
66	23.95	3.60	3.3766	192.118	2.7911	1.51E+00	23281.9
67	24.34	3.60	3.0689	174.606	2.5353	1.38E+00	21159.7
68	13.79	3.80	0.1607	9.144	0.1189	7.20E–02	1108.1
69	15.77	3.80	0.1424	8.101	0.1037	6.38E–02	981.7
70	17.75	3.80	0.3629	20.649	0.2869	1.63E–01	2502.3
71	19.23	3.80	1.0499	59.736	0.8578	4.71E–01	7239.1
72	19.73	3.80	1.5704	89.348	1.2902	7.04E–01	10827.7
73	20.22	3.80	2.2763	129.511	1.8768	1.02E+00	15694.9
74	20.72	3.80	3.1086	176.868	2.5684	1.39E+00	21433.9
75	21.41	3.80	4.8424	275.512	4.0089	2.17E+00	33388.0
76	21.71	3.80	5.1876	295.154	4.2958	2.32E+00	35768.4
77	22.06	3.80	5.3426	303.974	4.4246	2.39E+00	36837.3
78	22.49	3.80	5.4420	309.628	4.5072	2.44E+00	37522.5
79	22.76	3.80	5.1523	293.144	4.2664	2.31E+00	35524.8
80	22.91	3.80	4.8410	275.435	4.0078	2.17E+00	33378.8
81	23.76	3.80	3.6802	209.392	3.0433	1.65E+00	25375.3
82	24.15	3.80	3.3081	188.221	2.7342	1.48E+00	22809.6
83	24.98	3.80	2.5330	144.116	2.0900	1.14E+00	17464.8
84	22.59	3.90	5.2530	298.878	4.3502	2.35E+00	36219.7
85	22.80	3.90	5.4043	307.482	4.4758	2.42E+00	37262.3
86	23.01	3.90	5.1006	290.206	4.2235	2.29E+00	35168.8
87	23.15	3.90	5.0651	288.183	4.1940	2.27E+00	34923.6
88	23.86	3.90	3.5105	199.737	2.9023	1.57E+00	24205.2
89	24.25	3.90	3.0212	171.897	2.4958	1.35E+00	20831.4
90	11.99	2.00	0.1653	9.408	0.1228	7.41E–02	1140.1
91	13.97	2.00	0.1598	9.095	0.1182	7.16E–02	1102.1

Table A19. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.2097	11.930	0.1596	9.40E–02	1445.7
93	17.93	2.00	0.4459	25.367	0.3559	2.00E–01	3074.2
94	19.91	2.00	1.1521	65.548	0.9427	5.16E–01	7943.5
95	1.00	–0.38	0.1265	7.199	0.0905	5.67E–02	872.4
96	1.00	0.29	0.1266	7.202	0.0906	5.67E–02	872.8
97	1.00	0.91	0.1252	7.121	0.0894	5.61E–02	863.0
98	1.00	1.53	0.1205	6.858	0.0856	5.40E–02	831.1
99	2.50	–0.38	0.1071	6.091	0.0744	4.80E–02	738.2
100	4.00	–0.38	0.0818	4.654	0.0534	3.67E–02	564.0
101	4.00	0.29	0.0820	4.665	0.0535	3.67E–02	565.3
102	4.00	1.53	0.0777	4.420	0.0499	3.48E–02	535.7
103	5.50	–0.38	0.0696	3.960	0.0432	3.12E–02	479.9
104	7.00	–0.38	0.0636	3.616	0.0382	2.85E–02	438.3
105	8.00	–2.28	0.0459	2.612	0.0235	2.06E–02	316.5
106	8.00	–1.88	0.0468	2.665	0.0243	2.10E–02	323.0
107	8.00	–1.49	0.0483	2.745	0.0255	2.16E–02	332.7
108	8.00	–1.04	0.0519	2.952	0.0285	2.33E–02	357.8
109	8.00	–0.38	0.0634	3.606	0.0381	2.84E–02	437.0
110	8.00	–0.13	0.0655	3.727	0.0398	2.94E–02	451.6
111	8.00	0.01	0.0660	3.756	0.0402	2.96E–02	455.2
112	8.00	0.29	0.0650	3.698	0.0394	2.91E–02	448.1
113	8.00	0.74	0.0569	3.236	0.0327	2.55E–02	392.2
114	8.00	1.13	0.0505	2.874	0.0274	2.26E–02	348.3
115	8.00	1.53	0.0475	2.701	0.0248	2.13E–02	327.3
116	9.00	–0.38	0.0725	4.124	0.0456	3.25E–02	499.7
117	9.00	–0.13	0.0760	4.321	0.0485	3.40E–02	523.7
118	9.00	0.01	0.0762	4.334	0.0487	3.41E–02	525.2
119	9.00	0.29	0.0740	4.212	0.0469	3.32E–02	510.4
120	9.00	0.64	0.0635	3.612	0.0381	2.85E–02	437.8
121	9.00	0.95	0.0482	2.744	0.0255	2.16E–02	332.6
122	10.00	–0.38	0.0869	4.946	0.0576	3.90E–02	599.4
123	10.00	–0.13	0.0892	5.077	0.0595	4.00E–02	615.3
124	10.00	0.01	0.0907	5.161	0.0608	4.07E–02	625.5
125	10.00	0.29	0.0882	5.021	0.0587	3.95E–02	608.5
126	10.00	0.53	0.0835	4.749	0.0547	3.74E–02	575.5
127	10.00	0.71	0.0821	4.669	0.0536	3.68E–02	565.8
128	10.00	0.85	0.0824	4.690	0.0539	3.69E–02	568.3
129	10.00	0.97	0.0844	4.799	0.0555	3.78E–02	581.6
130	11.00	–0.38	0.0999	5.685	0.0684	4.48E–02	688.9
131	11.00	–0.13	0.1000	5.689	0.0685	4.48E–02	689.4
132	11.00	0.01	0.0995	5.662	0.0681	4.46E–02	686.2
133	11.00	0.15	0.0999	5.685	0.0684	4.48E–02	689.0
134	11.00	0.43	0.0956	5.437	0.0648	4.28E–02	658.8
135	11.00	0.60	0.0965	5.493	0.0656	4.33E–02	665.7
136	11.00	0.74	0.1008	5.735	0.0691	4.52E–02	695.0
137	11.00	0.86	0.0998	5.676	0.0683	4.47E–02	687.8
138	12.00	–0.38	0.1116	6.349	0.0781	5.00E–02	769.4
139	12.00	–0.13	0.1106	6.291	0.0773	4.96E–02	762.4
140	12.00	0.01	0.1107	6.300	0.0774	4.96E–02	763.5
141	12.00	0.15	0.1115	6.344	0.0780	5.00E–02	768.8
142	12.00	0.32	0.1098	6.246	0.0766	4.92E–02	756.9
143	12.00	0.50	0.1117	6.353	0.0782	5.00E–02	769.9
144	12.00	0.64	0.1118	6.362	0.0783	5.01E–02	771.0
145	12.00	0.76	0.1135	6.458	0.0797	5.09E–02	782.6
146	13.00	–0.38	0.1283	7.301	0.0920	5.75E–02	884.8
147	13.00	–0.13	0.1270	7.226	0.0909	5.69E–02	875.7
148	13.00	0.01	0.1270	7.226	0.0909	5.69E–02	875.7
149	13.00	0.15	0.1271	7.229	0.0910	5.69E–02	876.1

Table A19. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.1278	7.271	0.0916	5.73E–02	881.1
151	13.00	0.39	0.1293	7.355	0.0928	5.79E–02	891.3
152	13.00	0.53	0.1288	7.327	0.0924	5.77E–02	887.9
153	13.00	0.65	0.1317	7.491	0.0948	5.90E–02	907.8
154	14.00	–0.38	0.1543	8.780	0.1136	6.92E–02	1064.0
155	14.00	–0.13	0.1519	8.645	0.1117	6.81E–02	1047.7
156	14.00	0.01	0.1505	8.562	0.1104	6.74E–02	1037.6
157	14.00	0.15	0.1514	8.617	0.1112	6.79E–02	1044.2
158	14.00	0.29	0.1551	8.826	0.1143	6.95E–02	1069.6
159	14.00	0.43	0.1547	8.804	0.1140	6.93E–02	1067.0
160	14.00	0.55	0.1557	8.859	0.1148	6.98E–02	1073.5
161	15.00	–0.38	0.1891	10.758	0.1425	8.47E–02	1303.7
162	15.00	–0.13	0.1809	10.290	0.1357	8.10E–02	1247.0
163	15.00	0.01	0.1802	10.255	0.1352	8.08E–02	1242.7
164	15.00	0.32	0.1848	10.512	0.1389	8.28E–02	1273.9
165	15.00	0.44	0.1895	10.783	0.1429	8.49E–02	1306.8
166	16.00	–0.38	0.2215	12.605	0.1695	9.93E–02	1527.5
167	16.00	–0.13	0.2142	12.187	0.1634	9.60E–02	1476.9
168	16.00	0.01	0.2143	12.195	0.1635	9.61E–02	1477.8
169	16.00	0.11	0.2134	12.144	0.1627	9.56E–02	1471.6
170	16.00	0.22	0.2175	12.374	0.1661	9.75E–02	1499.5
171	16.00	0.34	0.2247	12.784	0.1721	1.01E–01	1549.3
172	17.00	–0.38	0.2868	16.316	0.2237	1.29E–01	1977.3
173	17.00	–0.13	0.2780	15.816	0.2164	1.25E–01	1916.7
174	17.00	0.01	0.2758	15.694	0.2146	1.24E–01	1901.8
175	17.00	0.11	0.2753	15.665	0.2142	1.23E–01	1898.3
176	17.00	0.23	0.2765	15.734	0.2152	1.24E–01	1906.8
177	18.00	–0.38	0.4182	23.797	0.3329	1.87E–01	2883.8
178	18.00	–0.13	0.3826	21.767	0.3033	1.71E–01	2637.8
179	18.00	0.01	0.3826	21.770	0.3033	1.71E–01	2638.2
180	18.00	0.13	0.3824	21.758	0.3031	1.71E–01	2636.7
181	18.50	–0.38	0.5573	31.710	0.4485	2.50E–01	3842.8
182	18.50	–0.13	0.4596	26.152	0.3673	2.06E–01	3169.2
183	18.50	0.01	0.4939	28.099	0.3958	2.21E–01	3405.2
184	18.60	0.05	0.5562	31.645	0.4475	2.49E–01	3834.9
185	18.50	0.10	0.4752	27.035	0.3802	2.13E–01	3276.2
186	19.20	–0.38	0.8543	48.608	0.6953	3.83E–01	5890.6
187	19.20	–0.13	0.8096	46.064	0.6581	3.63E–01	5582.3
188	19.20	0.01	0.8049	45.794	0.6542	3.61E–01	5549.6
189	19.30	0.05	0.8498	48.353	0.6915	3.81E–01	5859.6
190	19.20	0.10	0.8090	46.028	0.6576	3.63E–01	5577.9
191	20.00	–0.38	1.0882	61.916	0.8896	4.88E–01	7503.3
192	20.00	–0.13	0.9981	56.786	0.8147	4.47E–01	6881.6
193	20.00	0.01	1.0731	61.056	0.8771	4.81E–01	7399.1
194	20.10	0.05	1.0910	62.074	0.8919	4.89E–01	7522.5
195	20.00	0.10	1.0500	59.743	0.8579	4.71E–01	7240.0
196	20.80	–0.38	1.1398	64.849	0.9324	5.11E–01	7858.7
197	20.80	–0.13	1.1490	65.374	0.9401	5.15E–01	7922.4
198	20.80	0.01	1.2367	70.361	1.0129	5.54E–01	8526.7
199	20.90	0.05	1.2902	73.409	1.0574	5.78E–01	8896.1
200	20.80	0.10	1.2454	70.860	1.0202	5.58E–01	8587.2
201	21.60	–0.38	1.3449	76.519	1.1029	6.03E–01	9273.0
202	21.60	–0.13	1.1952	68.005	0.9785	5.36E–01	8241.2
203	21.60	0.01	1.3130	74.704	1.0764	5.88E–01	9053.0
204	21.70	0.05	1.3435	76.438	1.1017	6.02E–01	9263.2
205	21.60	0.10	1.3496	76.788	1.1068	6.05E–01	9305.6
206	22.40	–0.38	1.5748	89.602	1.2939	7.06E–01	10858.5
207	22.40	–0.13	1.3616	77.472	1.1168	6.10E–01	9388.5

Table A19. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	1.5046	85.604	1.2355	6.74E–01	10373.9
209	22.50	0.05	1.5276	86.917	1.2547	6.85E–01	10533.1
210	22.40	0.10	1.5534	88.384	1.2762	6.96E–01	10710.9
211	23.20	–0.38	1.7881	101.736	1.4711	8.01E–01	12328.9
212	23.20	–0.13	1.5665	89.126	1.2870	7.02E–01	10800.7
213	23.20	0.01	1.6896	96.129	1.3893	7.57E–01	11649.4
214	23.30	0.05	1.7583	100.040	1.4464	7.88E–01	12123.3
215	23.20	0.10	1.7576	100.002	1.4458	7.88E–01	12118.8
216	24.00	–0.38	2.0072	114.200	1.6532	8.99E–01	13839.4
217	24.00	–0.13	1.8432	104.871	1.5169	8.26E–01	12708.9
218	24.00	0.01	1.9792	112.607	1.6299	8.87E–01	13646.4
219	24.10	0.05	2.0051	114.080	1.6514	8.99E–01	13824.8
220	24.00	0.10	1.9702	112.095	1.6224	8.83E–01	13584.3
221	25.00	–0.38	1.7965	102.216	1.4782	8.05E–01	12387.1
222	25.00	–0.13	1.6354	93.045	1.3442	7.33E–01	11275.7
223	25.00	0.01	1.7397	98.985	1.4310	7.80E–01	11995.5
224	25.10	0.05	1.5921	90.583	1.3083	7.13E–01	10977.4
225	25.00	0.10	1.6545	94.135	1.3601	7.41E–01	11407.8
226	9.00	999.00	0.4675	26.598	0.3738	2.09E–01	3223.3
227	0.00	–2.63	2.0370	115.898	1.6780	9.13E–01	14045.2
228	0.00	–0.67	2.0610	117.262	1.6979	9.24E–01	14210.5
229	0.00	1.88	2.0227	115.086	1.6661	9.06E–01	13946.7
230	18.23	0.00	0.7367	41.913	0.5975	3.30E–01	5079.3
231	18.43	0.00	0.7519	42.780	0.6102	3.37E–01	5184.4
232	18.63	0.00	0.8020	45.633	0.6518	3.59E–01	5530.1
233	19.00	0.00	1.0138	57.680	0.8277	4.54E–01	6989.9
234	19.40	0.00	1.3418	76.343	1.1003	6.01E–01	9251.6
235	20.13	0.00	2.0703	117.791	1.7056	9.28E–01	14274.5
236	20.33	0.00	2.3667	134.655	1.9519	1.06E+00	16318.3
237	20.53	0.00	2.6958	153.379	2.2253	1.21E+00	18587.3
238	20.73	0.00	3.1467	179.037	2.6000	1.41E+00	21696.6
239	21.50	0.00	4.9056	279.110	4.0615	2.20E+00	33824.0
240	22.00	0.00	5.3777	305.973	4.4538	2.41E+00	37079.4
241	22.50	0.00	5.4763	311.583	4.5357	2.45E+00	37759.4
242	22.70	0.00	5.1416	292.539	4.2576	2.30E+00	35451.5
243	23.00	0.00	5.0905	289.629	4.2151	2.28E+00	35098.9
244	0.58	999.00	–0.1275	–7.254	–0.1205	–5.71E–02	–879.1
245	0.86	999.00	–0.1278	–7.273	–0.1208	–5.73E–02	–881.4
246	1.15	999.00	–0.1275	–7.256	–0.1206	–5.72E–02	–879.3
247	1.43	999.00	–0.1276	–7.261	–0.1206	–5.72E–02	–879.9
248	1.72	999.00	–0.1278	–7.273	–0.1208	–5.73E–02	–881.4
249	2.00	999.00	–0.1277	–7.266	–0.1207	–5.72E–02	–880.5
250	2.29	999.00	–0.1290	–7.338	–0.1218	–5.78E–02	–889.2
251	2.57	999.00	–0.1273	–7.241	–0.1203	–5.70E–02	–877.5
252	2.86	999.00	–0.1286	–7.319	–0.1215	–5.76E–02	–886.9
253	3.14	999.00	–0.1284	–7.304	–0.1213	–5.75E–02	–885.1
254	3.43	999.00	–0.1274	–7.248	–0.1205	–5.71E–02	–878.4
255	999.00	999.00	–0.1311	–7.460	–0.1236	–5.88E–02	–904.1
256	999.00	999.00	–0.1297	–7.380	–0.1224	–5.81E–02	–894.4

Table A20. Flow Conditions and Pressure Distribution for Run 57

[CR = 9; Re = 2.15×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1438.95	(.99212E+07)
$T_{t,1}$, °R (K)	1819.42	(1010.79)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0642	(33.09)
$h_{t,1}$, btu/lbm (J/kg)	457.94	(.10645E+07)
Free-stream conditions:		
M_∞	9.93	
p_∞, psia (N/m^2)	0.0348	(240.19)
T_∞, °R (K)	91.94	(51.08)
ρ_∞, slug/ft^3 (kg/m^3)	0.31791E−04	(.16384E−01)
h_∞, btu/lbm (J/kg)	0.21926E+02	(.50966E+05)
a_∞, ft/s (m/s)	470.39	(143.37)
u_∞, ft/s (m/s)	4670.99	(1423.72)
Re_∞, ft^{-1} (m^{-1})	0.21727E+07	(.71282E+07)
q_∞, psia (N/m^2)	2.408	(16605.27)
μ_∞, slug/ft-s (N-s/m^2)	0.68347E−07	(.32725E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.464	(30792.47)
$T_{t,2}$, °R (K)	1827.94	(1015.52)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20489E−03	(.10560E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0953	3.001	0.0282	2.28E−02	657.1
2	11.18	0.20	0.1060	3.339	0.0329	2.53E−02	731.1
3	12.17	0.20	0.1185	3.731	0.0384	2.83E−02	816.9
4	13.15	0.20	0.1313	4.134	0.0441	3.14E−02	905.2
5	14.21	0.20	0.1496	4.710	0.0522	3.58E−02	1031.4
6	15.14	0.20	0.1747	5.501	0.0633	4.18E−02	1204.5
7	16.13	0.20	0.2168	6.827	0.0820	5.18E−02	1494.8
8	17.12	0.20	0.3012	9.484	0.1194	7.20E−02	2076.8
9	18.11	0.20	0.5821	18.330	0.2438	1.39E−01	4013.6
10	19.74	0.20	0.8543	26.900	0.3644	2.04E−01	5890.3
11	20.55	0.20	0.9922	31.244	0.4255	2.37E−01	6841.5
12	22.56	0.20	1.1904	37.484	0.5133	2.85E−01	8208.0
13	24.98	0.20	1.0308	32.458	0.4426	2.46E−01	7107.4
14	10.59	0.60	0.1708	5.378	0.0616	4.08E−02	1177.6
15	11.58	0.60	0.1517	4.778	0.0532	3.63E−02	1046.3
16	12.57	0.60	0.1481	4.663	0.0515	3.54E−02	1021.1
17	13.56	0.60	0.1505	4.739	0.0526	3.60E−02	1037.8
18	14.60	0.60	0.1628	5.127	0.0581	3.89E−02	1122.7
19	15.54	0.60	0.1912	6.020	0.0706	4.57E−02	1318.1
20	16.53	0.60	0.2416	7.607	0.0929	5.77E−02	1665.6
21	17.52	0.60	0.3326	10.475	0.1333	7.95E−02	2293.6
22	18.51	0.60	0.6471	20.376	0.2726	1.55E−01	4461.7
23	12.97	1.00	0.1817	5.722	0.0664	4.34E−02	1253.0
24	15.00	1.00	0.2050	6.456	0.0768	4.90E−02	1413.6
25	15.94	1.00	0.2284	7.192	0.0871	5.46E−02	1574.8
26	16.93	1.00	0.2681	8.442	0.1047	6.41E−02	1848.6
27	17.92	1.00	0.4155	13.082	0.1700	9.93E−02	2864.6
28	18.91	1.00	0.7782	24.504	0.3307	1.86E−01	5365.8
29	24.98	1.00	1.4132	44.499	0.6120	3.38E−01	9744.0
30	11.99	2.00	0.1742	5.484	0.0631	4.16E−02	1200.9
31	13.97	2.00	0.1520	4.786	0.0533	3.63E−02	1048.1
32	15.98	2.00	0.2002	6.303	0.0746	4.78E−02	1380.1
33	16.94	2.00	0.2303	7.253	0.0880	5.51E−02	1588.1

Table A20. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.3665	11.540	0.1483	8.76E−02	2527.0
35	18.42	2.00	0.7318	23.044	0.3101	1.75E−01	5045.9
36	18.92	2.00	0.9885	31.125	0.4238	2.36E−01	6815.4
37	19.41	2.00	0.9458	29.781	0.4049	2.26E−01	6521.1
38	19.91	2.00	1.1601	36.529	0.4998	2.77E−01	7998.7
39	20.26	2.00	1.4622	46.041	0.6337	3.49E−01	10081.6
40	21.11	2.00	2.3459	73.868	1.0251	5.61E−01	16174.9
41	21.96	2.00	2.1212	66.791	0.9256	5.07E−01	14625.3
42	22.74	2.00	1.6903	53.224	0.7347	4.04E−01	11654.5
43	23.52	2.00	1.5199	47.859	0.6592	3.63E−01	10479.6
44	24.98	2.00	2.2720	71.542	0.9924	5.43E−01	15665.7
45	17.94	3.00	0.2586	8.144	0.1005	6.18E−02	1783.3
46	18.93	3.00	0.3841	12.093	0.1561	9.18E−02	2648.0
47	19.92	3.00	1.3257	41.744	0.5732	3.17E−01	9140.8
48	20.91	3.00	0.9544	30.053	0.4087	2.28E−01	6580.7
49	22.11	3.00	3.3409	105.199	1.4659	7.99E−01	23035.6
50	22.96	3.00	4.2557	134.003	1.8711	1.02E+00	29342.7
51	23.74	3.00	5.6064	176.535	2.4695	1.34E+00	38655.9
52	24.98	3.00	5.2662	165.824	2.3188	1.26E+00	36310.6
53	18.34	3.40	0.3114	9.805	0.1239	7.44E−02	2146.9
54	19.32	3.40	0.6129	19.298	0.2574	1.46E−01	4225.8
55	19.82	3.40	1.0190	32.085	0.4373	2.44E−01	7025.7
56	20.32	3.40	1.4609	46.000	0.6331	3.49E−01	10072.8
57	20.81	3.40	1.2709	40.020	0.5489	3.04E−01	8763.1
58	21.31	3.40	1.1164	35.152	0.4805	2.67E−01	7697.3
59	21.66	3.40	5.2255	164.541	2.3008	1.25E+00	36029.6
60	22.94	3.40	5.8368	183.791	2.5716	1.40E+00	40244.9
61	23.75	3.40	5.8680	184.772	2.5854	1.40E+00	40459.7
62	24.14	3.40	5.7418	180.800	2.5295	1.37E+00	39590.0
63	22.29	3.60	5.3899	169.717	2.3736	1.29E+00	37163.0
64	22.71	3.60	5.2402	165.003	2.3073	1.25E+00	36130.8
65	23.14	3.60	5.2284	164.634	2.3021	1.25E+00	36050.0
66	23.95	3.60	5.2203	164.378	2.2985	1.25E+00	35994.1
67	24.34	3.60	5.1740	162.921	2.2780	1.24E+00	35674.9
68	13.79	3.80	0.1368	4.308	0.0465	3.27E−02	943.3
69	15.77	3.80	0.1890	5.952	0.0697	4.52E−02	1303.3
70	17.75	3.80	0.2273	7.159	0.0866	5.43E−02	1567.6
71	19.23	3.80	0.5710	17.979	0.2389	1.36E−01	3936.9
72	19.73	3.80	1.0135	31.912	0.4349	2.42E−01	6987.8
73	20.22	3.80	1.9446	61.231	0.8474	4.65E−01	13407.9
74	20.72	3.80	1.6410	51.673	0.7129	3.92E−01	11314.9
75	21.41	3.80	2.6696	84.061	1.1685	6.38E−01	18406.8
76	21.71	3.80	4.2246	133.024	1.8574	1.01E+00	29128.3
77	22.06	3.80	5.5351	174.291	2.4379	1.32E+00	38164.7
78	22.49	3.80	5.6384	177.543	2.4837	1.35E+00	38876.8
79	22.76	3.80	5.3714	169.137	2.3654	1.28E+00	37036.1
80	22.91	3.80	5.2013	163.780	2.2901	1.24E+00	35863.0
81	23.76	3.80	5.7479	180.991	2.5322	1.37E+00	39631.8
82	24.15	3.80	5.4533	171.716	2.4017	1.30E+00	37600.8
83	24.98	3.80	5.5224	173.889	2.4323	1.32E+00	38076.7
84	22.59	3.90	5.4463	171.493	2.3986	1.30E+00	37551.9
85	22.80	3.90	5.6563	178.105	2.4916	1.35E+00	38999.9
86	23.01	3.90	5.3763	169.290	2.3676	1.29E+00	37069.7
87	23.15	3.90	5.9218	186.466	2.6092	1.42E+00	40830.7
88	23.86	3.90	5.5169	173.717	2.4299	1.32E+00	38039.0
89	24.25	3.90	5.2720	166.006	2.3214	1.26E+00	36350.6
90	11.99	2.00	0.1785	5.622	0.0650	4.27E−02	1231.0
91	13.97	2.00	0.1649	5.192	0.0590	3.94E−02	1136.9

Table A20. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.2038	6.419	0.0762	4.87E–02	1405.5
93	17.93	2.00	0.4055	12.769	0.1656	9.69E–02	2796.0
94	19.91	2.00	1.2380	38.982	0.5343	2.96E–01	8535.9
95	1.00	–0.38	0.0723	2.276	0.0179	1.73E–02	498.3
96	1.00	0.29	0.0704	2.216	0.0171	1.68E–02	485.2
97	1.00	0.91	0.0711	2.239	0.0174	1.70E–02	490.2
98	1.00	1.53	0.0715	2.252	0.0176	1.71E–02	493.2
99	2.50	–0.38	0.0570	1.794	0.0112	1.36E–02	392.9
100	4.00	–0.38	0.0528	1.663	0.0093	1.26E–02	364.1
101	4.00	0.29	0.0532	1.675	0.0095	1.27E–02	366.9
102	4.00	1.53	0.0520	1.637	0.0090	1.24E–02	358.5
103	5.50	–0.38	0.0673	2.121	0.0158	1.61E–02	464.3
104	7.00	–0.38	0.0816	2.568	0.0221	1.95E–02	562.4
105	8.00	–2.28	0.0661	2.082	0.0152	1.58E–02	455.8
106	8.00	–1.88	0.0688	2.167	0.0164	1.64E–02	474.5
107	8.00	–1.49	0.0707	2.227	0.0173	1.69E–02	487.6
108	8.00	–1.04	0.0728	2.292	0.0182	1.74E–02	501.9
109	8.00	–0.38	0.0771	2.429	0.0201	1.84E–02	531.8
110	8.00	–0.13	0.0766	2.411	0.0199	1.83E–02	528.0
111	8.00	0.01	0.0767	2.414	0.0199	1.83E–02	528.5
112	8.00	0.29	0.0772	2.431	0.0201	1.85E–02	532.4
113	8.00	0.74	0.0745	2.346	0.0189	1.78E–02	513.8
114	8.00	1.13	0.0721	2.270	0.0179	1.72E–02	497.0
115	8.00	1.53	0.0700	2.203	0.0169	1.67E–02	482.5
116	9.00	–0.38	0.0813	2.560	0.0219	1.94E–02	560.6
117	9.00	–0.13	0.0824	2.594	0.0224	1.97E–02	568.1
118	9.00	0.01	0.0823	2.591	0.0224	1.97E–02	567.3
119	9.00	0.29	0.0812	2.558	0.0219	1.94E–02	560.1
120	9.00	0.64	0.0777	2.448	0.0204	1.86E–02	536.0
121	9.00	0.95	0.0656	2.067	0.0150	1.57E–02	452.6
122	10.00	–0.38	0.0929	2.924	0.0271	2.22E–02	640.3
123	10.00	–0.13	0.0948	2.984	0.0279	2.27E–02	653.5
124	10.00	0.01	0.0960	3.024	0.0285	2.30E–02	662.1
125	10.00	0.29	0.0920	2.898	0.0267	2.20E–02	634.5
126	10.00	0.53	0.0921	2.901	0.0267	2.20E–02	635.1
127	10.00	0.71	0.0905	2.849	0.0260	2.16E–02	623.9
128	10.00	0.85	0.0909	2.864	0.0262	2.17E–02	627.0
129	10.00	0.97	0.0949	2.987	0.0280	2.27E–02	654.0
130	11.00	–0.38	0.1051	3.308	0.0325	2.51E–02	724.4
131	11.00	–0.13	0.1057	3.328	0.0327	2.53E–02	728.7
132	11.00	0.01	0.1061	3.341	0.0329	2.54E–02	731.5
133	11.00	0.15	0.1054	3.319	0.0326	2.52E–02	726.8
134	11.00	0.43	0.1016	3.199	0.0309	2.43E–02	700.6
135	11.00	0.60	0.1013	3.191	0.0308	2.42E–02	698.7
136	11.00	0.74	0.1061	3.341	0.0329	2.54E–02	731.6
137	11.00	0.86	0.1087	3.422	0.0341	2.60E–02	749.4
138	12.00	–0.38	0.1143	3.598	0.0366	2.73E–02	788.0
139	12.00	–0.13	0.1155	3.637	0.0371	2.76E–02	796.3
140	12.00	0.01	0.1179	3.711	0.0381	2.82E–02	812.7
141	12.00	0.15	0.1156	3.639	0.0371	2.76E–02	796.9
142	12.00	0.32	0.1130	3.560	0.0360	2.70E–02	779.5
143	12.00	0.50	0.1157	3.645	0.0372	2.77E–02	798.1
144	12.00	0.64	0.1214	3.824	0.0397	2.90E–02	837.3
145	12.00	0.76	0.1207	3.800	0.0394	2.88E–02	832.0
146	13.00	–0.38	0.1283	4.041	0.0428	3.07E–02	884.8
147	13.00	–0.13	0.1290	4.062	0.0431	3.08E–02	889.4
148	13.00	0.01	0.1304	4.106	0.0437	3.12E–02	899.0
149	13.00	0.15	0.1296	4.080	0.0433	3.10E–02	893.4

Table A20. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.27	0.1301	4.096	0.0436	3.11E–02	897.0
151	13.00	0.39	0.1302	4.101	0.0436	3.11E–02	898.0
152	13.00	0.53	0.1347	4.242	0.0456	3.22E–02	928.8
153	13.00	0.65	0.1335	4.203	0.0451	3.19E–02	920.3
154	14.00	–0.38	0.1527	4.807	0.0536	3.65E–02	1052.6
155	14.00	–0.13	0.1510	4.753	0.0528	3.61E–02	1040.8
156	14.00	0.01	0.1515	4.770	0.0530	3.62E–02	1044.6
157	14.00	0.15	0.1505	4.740	0.0526	3.60E–02	1038.0
158	14.00	0.29	0.1449	4.561	0.0501	3.46E–02	998.8
159	14.00	0.43	0.1539	4.846	0.0541	3.68E–02	1061.1
160	14.00	0.55	0.1488	4.687	0.0519	3.56E–02	1026.3
161	15.00	–0.38	0.1764	5.553	0.0641	4.22E–02	1216.0
162	15.00	–0.13	0.1800	5.667	0.0657	4.30E–02	1240.8
163	15.00	0.01	0.1807	5.688	0.0660	4.32E–02	1245.6
164	15.00	0.32	0.1786	5.625	0.0651	4.27E–02	1231.7
165	15.00	0.44	0.1740	5.478	0.0630	4.16E–02	1199.6
166	16.00	–0.38	0.2167	6.825	0.0819	5.18E–02	1494.4
167	16.00	–0.13	0.2243	7.062	0.0853	5.36E–02	1546.4
168	16.00	0.01	0.2266	7.135	0.0863	5.42E–02	1562.4
169	16.00	0.11	0.2256	7.104	0.0859	5.39E–02	1555.5
170	16.00	0.22	0.2241	7.056	0.0852	5.36E–02	1545.0
171	16.00	0.34	0.2169	6.830	0.0820	5.18E–02	1495.7
172	17.00	–0.38	0.3242	10.209	0.1296	7.75E–02	2235.6
173	17.00	–0.13	0.3051	9.608	0.1211	7.29E–02	2103.8
174	17.00	0.01	0.3068	9.661	0.1219	7.33E–02	2115.5
175	17.00	0.11	0.3043	9.581	0.1207	7.27E–02	2097.9
176	17.00	0.23	0.3085	9.715	0.1226	7.37E–02	2127.3
177	18.00	–0.38	0.5874	18.495	0.2461	1.40E–01	4049.8
178	18.00	–0.13	0.5736	18.061	0.2400	1.37E–01	3954.8
179	18.00	0.01	0.5646	17.779	0.2361	1.35E–01	3893.1
180	18.00	0.13	0.5723	18.020	0.2395	1.37E–01	3945.9
181	18.50	–0.38	0.7242	22.805	0.3068	1.73E–01	4993.5
182	18.50	–0.13	0.7661	24.122	0.3253	1.83E–01	5282.1
183	18.50	0.01	0.7625	24.011	0.3237	1.82E–01	5257.6
184	18.60	0.05	0.7612	23.970	0.3231	1.82E–01	5248.6
185	18.50	0.10	0.7708	24.270	0.3274	1.84E–01	5314.5
186	19.20	–0.38	0.7959	25.062	0.3385	1.90E–01	5487.9
187	19.20	–0.13	0.7877	24.804	0.3349	1.88E–01	5431.4
188	19.20	0.01	0.7824	24.635	0.3325	1.87E–01	5394.4
189	19.30	0.05	0.7953	25.043	0.3383	1.90E–01	5483.7
190	19.20	0.10	0.7873	24.790	0.3347	1.88E–01	5428.4
191	20.00	–0.38	0.9077	28.581	0.3880	2.17E–01	6258.4
192	20.00	–0.13	0.9121	28.720	0.3900	2.18E–01	6288.8
193	20.00	0.01	0.9079	28.588	0.3881	2.17E–01	6260.0
194	20.10	0.05	0.9274	29.204	0.3968	2.22E–01	6394.7
195	20.00	0.10	0.9083	28.600	0.3883	2.17E–01	6262.7
196	20.80	–0.38	1.0451	32.909	0.4489	2.50E–01	7206.1
197	20.80	–0.13	1.0446	32.891	0.4487	2.50E–01	7202.2
198	20.80	0.01	1.0423	32.820	0.4477	2.49E–01	7186.7
199	20.90	0.05	1.0598	33.372	0.4554	2.53E–01	7307.5
200	20.80	0.10	1.0460	32.935	0.4493	2.50E–01	7211.9
201	21.60	–0.38	1.1410	35.929	0.4914	2.73E–01	7867.5
202	21.60	–0.13	1.1506	36.230	0.4956	2.75E–01	7933.3
203	21.60	0.01	1.1523	36.284	0.4964	2.75E–01	7945.2
204	21.70	0.05	1.1592	36.502	0.4995	2.77E–01	7992.8
205	21.60	0.10	1.1553	36.379	0.4977	2.76E–01	7966.0
206	22.40	–0.38	1.1995	37.770	0.5173	2.87E–01	8270.5
207	22.40	–0.13	1.2153	38.268	0.5243	2.90E–01	8379.6

Table A20. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.01	1.2134	38.207	0.5234	2.90E–01	8366.2
209	22.50	0.05	1.2218	38.471	0.5272	2.92E–01	8424.1
210	22.40	0.10	1.2173	38.332	0.5252	2.91E–01	8393.5
211	23.20	–0.38	1.2437	39.163	0.5369	2.97E–01	8575.5
212	23.20	–0.13	1.2571	39.585	0.5428	3.00E–01	8667.9
213	23.20	0.01	1.2628	39.762	0.5453	3.02E–01	8706.7
214	23.30	0.05	1.2683	39.938	0.5478	3.03E–01	8745.2
215	23.20	0.10	1.2638	39.796	0.5458	3.02E–01	8714.2
216	24.00	–0.38	1.2680	39.927	0.5476	3.03E–01	8742.9
217	24.00	–0.13	1.2917	40.674	0.5581	3.09E–01	8906.3
218	24.00	0.01	1.2931	40.717	0.5588	3.09E–01	8915.8
219	24.10	0.05	1.2965	40.823	0.5602	3.10E–01	8939.0
220	24.00	0.10	1.2995	40.919	0.5616	3.11E–01	8960.1
221	25.00	–0.38	1.0010	31.520	0.4294	2.39E–01	6902.0
222	25.00	–0.13	0.9852	31.021	0.4223	2.35E–01	6792.6
223	25.00	0.01	1.0250	32.274	0.4400	2.45E–01	7067.1
224	25.10	0.05	0.8704	27.409	0.3715	2.08E–01	6001.7
225	25.00	0.10	1.0012	31.527	0.4295	2.39E–01	6903.5
226	9.00	999.00	4.8613	153.075	2.1395	1.16E+00	33518.9
227	0.00	–2.63	4.2211	132.915	1.8558	1.01E+00	29104.6
228	0.00	–0.67	4.2686	134.410	1.8769	1.02E+00	29431.9
229	0.00	1.88	4.1833	131.724	1.8391	1.00E+00	28843.7
230	18.23	0.00	0.7187	22.630	0.3043	1.72E–01	4955.3
231	18.43	0.00	0.8180	25.757	0.3483	1.96E–01	5640.0
232	18.63	0.00	0.7895	24.860	0.3357	1.89E–01	5443.7
233	19.00	0.00	0.9410	29.630	0.4028	2.25E–01	6488.0
234	19.40	0.00	1.3566	42.717	0.5869	3.24E–01	9353.8
235	20.13	0.00	0.7304	22.997	0.3095	1.75E–01	5035.8
236	20.33	0.00	0.8491	26.737	0.3621	2.03E–01	5854.6
237	20.53	0.00	0.9929	31.264	0.4258	2.37E–01	6845.9
238	20.73	0.00	1.3114	41.292	0.5668	3.13E–01	9041.8
239	21.50	0.00	2.0202	63.611	0.8808	4.83E–01	13928.9
240	22.00	0.00	5.5568	174.973	2.4475	1.33E+00	38314.1
241	22.50	0.00	5.6664	178.426	2.4961	1.35E+00	39070.1
242	22.70	0.00	5.3269	167.733	2.3457	1.27E+00	36728.7
243	23.00	0.00	5.2768	166.156	2.3235	1.26E+00	36383.3
244	0.58	999.00	0.0791	2.491	0.0210	1.89E–02	545.4
245	0.86	999.00	0.0782	2.461	0.0206	1.87E–02	538.9
246	1.15	999.00	0.0772	2.432	0.0201	1.85E–02	532.6
247	1.43	999.00	0.0781	2.459	0.0205	1.87E–02	538.5
248	1.72	999.00	0.0765	2.408	0.0198	1.83E–02	527.3
249	2.00	999.00	0.0780	2.456	0.0205	1.86E–02	537.7
250	2.29	999.00	0.0773	2.433	0.0202	1.85E–02	532.7
251	2.57	999.00	0.0784	2.467	0.0206	1.87E–02	540.3
252	2.86	999.00	0.0768	2.419	0.0200	1.84E–02	529.6
253	3.14	999.00	0.0771	2.427	0.0201	1.84E–02	531.4
254	3.43	999.00	0.0779	2.452	0.0204	1.86E–02	536.8
255	999.00	999.00	0.0739	2.327	0.0187	1.77E–02	509.5
256	999.00	999.00	0.0728	2.291	0.0182	1.74E–02	501.7

Table A21. Flow Conditions and Pressure Distribution for Run 58

[CR = 3; Re = 0.55×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	358.41	(.24711E+07)
$T_{t,1}$, °R (K)	1827.48	(1015.27)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0163	(8.41)
$h_{t,1}$, btu/lbm (J/kg)	458.37	(.10655E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0101	(69.92)
T_∞, °R (K)	96.73	(53.74)
ρ_∞, slug/ft^3 (kg/m^3)	0.87954E−05	(.45330E−02)
h_∞, btu/lbm (J/kg)	0.23069E+02	(.53623E+05)
a_∞, ft/s (m/s)	482.50	(147.06)
u_∞, ft/s (m/s)	4667.18	(1422.56)
Re_∞, ft^{-1} (m^{-1})	0.56561E+06	(.18556E+07)
q_∞, psia (N/m^2)	0.665	(4586.63)
μ_∞, slug/ft-s (N-s/m^2)	0.72576E−07	(.34749E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.233	(8504.56)
$T_{t,2}$, °R (K)	1829.53	(1016.40)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.56557E−04	(.29149E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0387	4.039	0.0456	3.27E−02	267.0
2	11.18	0.20	0.0387	4.038	0.0455	3.26E−02	267.0
3	12.17	0.20	0.0402	4.195	0.0479	3.39E−02	277.4
4	13.15	0.20	0.0422	4.396	0.0509	3.55E−02	290.7
5	14.21	0.20	0.0466	4.856	0.0578	3.93E−02	321.1
6	15.14	0.20	0.0497	5.184	0.0627	4.19E−02	342.8
7	16.13	0.20	0.0547	5.703	0.0705	4.61E−02	377.1
8	17.12	0.20	0.0606	6.315	0.0797	5.11E−02	417.5
9	18.11	0.20	0.0657	6.852	0.0877	5.54E−02	453.0
10	19.74	0.20	0.0628	6.550	0.0832	5.30E−02	433.1
11	20.55	0.20	0.0722	7.529	0.0979	6.09E−02	497.8
12	22.56	0.20	0.0945	9.858	0.1328	7.97E−02	651.8
13	24.98	0.20	0.1021	10.644	0.1446	8.61E−02	703.7
14	10.59	0.60	0.0589	6.140	0.0770	4.96E−02	406.0
15	11.58	0.60	0.0491	5.116	0.0617	4.14E−02	338.3
16	12.57	0.60	0.0554	5.774	0.0716	4.67E−02	381.7
17	13.56	0.60	0.0538	5.610	0.0691	4.54E−02	370.9
18	14.60	0.60	0.0529	5.517	0.0677	4.46E−02	364.8
19	15.54	0.60	0.0542	5.655	0.0698	4.57E−02	373.9
20	16.53	0.60	0.0577	6.018	0.0752	4.87E−02	397.9
21	17.52	0.60	0.0632	6.586	0.0837	5.33E−02	435.5
22	18.51	0.60	0.0711	7.416	0.0962	6.00E−02	490.3
23	12.97	1.00	0.0625	6.518	0.0827	5.27E−02	431.0
24	15.00	1.00	0.0648	6.760	0.0863	5.47E−02	446.9
25	15.94	1.00	0.0627	6.540	0.0830	5.29E−02	432.4
26	16.93	1.00	0.0657	6.854	0.0878	5.54E−02	453.2
27	17.92	1.00	0.0811	8.461	0.1118	6.84E−02	559.4
28	18.91	1.00	0.0826	8.615	0.1141	6.97E−02	569.6
29	24.98	1.00	0.0888	9.264	0.1239	7.49E−02	612.5
30	11.99	2.00	0.0672	7.012	0.0901	5.67E−02	463.6
31	13.97	2.00	0.0604	6.296	0.0794	5.09E−02	416.3
32	15.98	2.00	0.0628	6.548	0.0832	5.29E−02	432.9
33	16.94	2.00	0.0720	7.510	0.0976	6.07E−02	496.5

Table A21. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0808	8.426	0.1113	6.81E−02	557.1
35	18.42	2.00	0.0870	9.077	0.1211	7.34E−02	600.2
36	18.92	2.00	0.0949	9.899	0.1334	8.00E−02	654.5
37	19.41	2.00	0.0958	9.994	0.1348	8.08E−02	660.8
38	19.91	2.00	0.1043	10.879	0.1481	8.80E−02	719.3
39	20.26	2.00	0.1162	12.121	0.1667	9.80E−02	801.4
40	21.11	2.00	0.0947	9.873	0.1330	7.98E−02	652.8
41	21.96	2.00	0.0939	9.793	0.1318	7.92E−02	647.5
42	22.74	2.00	0.1257	13.113	0.1816	1.06E−01	867.0
43	23.52	2.00	0.1428	14.886	0.2081	1.20E−01	984.3
44	24.98	2.00	0.0921	9.608	0.1290	7.77E−02	635.2
45	17.94	3.00	0.0849	8.856	0.1178	7.16E−02	585.5
46	18.93	3.00	0.0925	9.647	0.1296	7.80E−02	637.8
47	19.92	3.00	0.1088	11.349	0.1551	9.18E−02	750.3
48	20.91	3.00	0.1526	15.909	0.2235	1.29E−01	1051.9
49	22.11	3.00	0.2999	31.276	0.4538	2.53E−01	2067.9
50	22.96	3.00	0.2509	26.169	0.3773	2.12E−01	1730.2
51	23.74	3.00	0.2118	22.086	0.3161	1.79E−01	1460.3
52	24.98	3.00	0.1508	15.724	0.2207	1.27E−01	1039.7
53	18.34	3.40	0.0863	8.998	0.1199	7.28E−02	595.0
54	19.32	3.40	0.1020	10.633	0.1444	8.60E−02	703.1
55	19.82	3.40	0.1019	10.628	0.1443	8.59E−02	702.7
56	20.32	3.40	0.1125	11.728	0.1608	9.48E−02	775.5
57	20.81	3.40	0.1438	15.000	0.2098	1.21E−01	991.8
58	21.31	3.40	0.2140	22.319	0.3196	1.80E−01	1475.7
59	21.66	3.40	0.3002	31.309	0.4543	2.53E−01	2070.1
60	22.94	3.40	0.2624	27.367	0.3952	2.21E−01	1809.4
61	23.75	3.40	0.2087	21.767	0.3113	1.76E−01	1439.2
62	24.14	3.40	0.1914	19.956	0.2841	1.61E−01	1319.5
63	22.29	3.60	0.3011	31.396	0.4556	2.54E−01	2075.8
64	22.71	3.60	0.3350	34.936	0.5087	2.82E−01	2309.9
65	23.14	3.60	0.3029	31.582	0.4584	2.55E−01	2088.2
66	23.95	3.60	0.1933	20.157	0.2872	1.63E−01	1332.8
67	24.34	3.60	0.1892	19.729	0.2807	1.60E−01	1304.5
68	13.79	3.80	0.0545	5.685	0.0702	4.60E−02	375.9
69	15.77	3.80	0.0473	4.928	0.0589	3.98E−02	325.8
70	17.75	3.80	0.0747	7.787	0.1017	6.30E−02	514.8
71	19.23	3.80	0.0981	10.233	0.1384	8.27E−02	676.6
72	19.73	3.80	0.1125	11.737	0.1609	9.49E−02	776.0
73	20.22	3.80	0.1257	13.106	0.1815	1.06E−01	866.6
74	20.72	3.80	0.1383	14.426	0.2013	1.17E−01	953.9
75	21.41	3.80	0.2328	24.279	0.3489	1.96E−01	1605.3
76	21.71	3.80	0.2837	29.583	0.4284	2.39E−01	1956.0
77	22.06	3.80	0.3377	35.219	0.5129	2.85E−01	2328.6
78	22.49	3.80	0.3202	33.390	0.4855	2.70E−01	2207.7
79	22.76	3.80	0.3118	32.515	0.4724	2.63E−01	2149.8
80	22.91	3.80	0.2878	30.012	0.4349	2.43E−01	1984.4
81	23.76	3.80	0.2167	22.601	0.3238	1.83E−01	1494.3
82	24.15	3.80	0.2153	22.451	0.3215	1.82E−01	1484.4
83	24.98	3.80	0.2218	23.134	0.3318	1.87E−01	1529.6
84	22.59	3.90	0.3157	32.925	0.4785	2.66E−01	2177.0
85	22.80	3.90	0.2974	31.008	0.4498	2.51E−01	2050.2
86	23.01	3.90	0.2676	27.908	0.4033	2.26E−01	1845.2
87	23.15	3.90	0.2490	25.967	0.3742	2.10E−01	1716.9
88	23.86	3.90	0.2171	22.644	0.3244	1.83E−01	1497.2
89	24.25	3.90	0.2125	22.155	0.3171	1.79E−01	1464.8
90	11.99	2.00	0.0671	6.999	0.0899	5.66E−02	462.8
91	13.97	2.00	0.0614	6.405	0.0810	5.18E−02	423.5

Table A21. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0617	6.433	0.0814	5.20E−02	425.3
93	17.93	2.00	0.0815	8.498	0.1124	6.87E−02	561.9
94	19.91	2.00	0.1018	10.619	0.1442	8.59E−02	702.1
95	1.00	0.00	0.0309	3.227	0.0334	2.61E−02	213.4
96	1.00	0.66	0.0312	3.253	0.0338	2.63E−02	215.1
97	1.00	1.28	0.0334	3.482	0.0372	2.82E−02	230.2
98	1.00	1.90	0.0307	3.204	0.0330	2.59E−02	211.8
99	2.50	0.00	0.0257	2.678	0.0251	2.17E−02	177.1
100	4.00	0.00	0.0241	2.517	0.0227	2.04E−02	166.4
101	4.00	0.66	0.0261	2.726	0.0259	2.20E−02	180.2
102	4.00	1.90	0.0224	2.334	0.0200	1.89E−02	154.3
103	5.50	0.00	0.0260	2.715	0.0257	2.20E−02	179.5
104	7.00	0.00	0.0232	2.419	0.0213	1.96E−02	159.9
105	8.00	−1.90	0.0250	2.604	0.0240	2.11E−02	172.2
106	8.00	−1.50	0.0277	2.888	0.0283	2.33E−02	190.9
107	8.00	−1.11	0.0272	2.838	0.0276	2.29E−02	187.7
108	8.00	−0.66	0.0278	2.896	0.0284	2.34E−02	191.5
109	8.00	0.00	0.0300	3.131	0.0319	2.53E−02	207.0
110	8.00	0.25	0.0269	2.802	0.0270	2.27E−02	185.3
111	8.00	0.38	0.0287	2.995	0.0299	2.42E−02	198.0
112	8.00	0.66	0.0314	3.272	0.0340	2.65E−02	216.3
113	8.00	1.11	0.0309	3.219	0.0333	2.60E−02	212.8
114	8.00	1.50	0.0291	3.032	0.0305	2.45E−02	200.5
115	8.00	1.90	0.0273	2.850	0.0277	2.30E−02	188.4
116	9.00	0.00	0.0330	3.444	0.0366	2.78E−02	227.7
117	9.00	0.25	0.0323	3.366	0.0355	2.72E−02	222.6
118	9.00	0.38	0.0313	3.259	0.0339	2.64E−02	215.5
119	9.00	0.66	0.0309	3.223	0.0333	2.61E−02	213.1
120	9.00	1.01	0.0367	3.830	0.0424	3.10E−02	253.2
121	9.00	1.32	0.0333	3.475	0.0371	2.81E−02	229.8
122	10.00	0.00	0.0397	4.143	0.0471	3.35E−02	273.9
123	10.00	0.25	0.0389	4.057	0.0458	3.28E−02	268.2
124	10.00	0.38	0.0403	4.206	0.0481	3.40E−02	278.1
125	10.00	0.66	0.0336	3.500	0.0375	2.83E−02	231.4
126	10.00	0.90	0.0360	3.756	0.0413	3.04E−02	248.4
127	10.00	1.08	0.0380	3.964	0.0444	3.20E−02	262.1
128	10.00	1.22	0.0342	3.571	0.0385	2.89E−02	236.1
129	10.00	1.34	0.0370	3.857	0.0428	3.12E−02	255.0
130	11.00	0.00	0.0348	3.634	0.0395	2.94E−02	240.3
131	11.00	0.25	0.0429	4.469	0.0520	3.61E−02	295.5
132	11.00	0.38	0.0410	4.276	0.0491	3.46E−02	282.7
133	11.00	0.52	0.0417	4.348	0.0502	3.52E−02	287.5
134	11.00	0.80	0.0387	4.040	0.0456	3.27E−02	267.1
135	11.00	0.97	0.0379	3.956	0.0443	3.20E−02	261.6
136	11.00	1.11	0.0416	4.333	0.0500	3.50E−02	286.5
137	11.00	1.23	0.0422	4.400	0.0510	3.56E−02	290.9
138	12.00	0.00	0.0449	4.681	0.0552	3.78E−02	309.5
139	12.00	0.25	0.0444	4.634	0.0545	3.75E−02	306.4
140	12.00	0.38	0.0444	4.629	0.0544	3.74E−02	306.1
141	12.00	0.52	0.0438	4.565	0.0534	3.69E−02	301.8
142	12.00	0.69	0.0356	3.716	0.0407	3.00E−02	245.7
143	12.00	0.87	0.0428	4.462	0.0519	3.61E−02	295.1
144	12.00	1.01	0.0439	4.579	0.0536	3.70E−02	302.7
145	12.00	1.13	0.0429	4.471	0.0520	3.61E−02	295.6
146	13.00	0.00	0.0466	4.859	0.0578	3.93E−02	321.3
147	13.00	0.25	0.0466	4.860	0.0579	3.93E−02	321.3
148	13.00	0.38	0.0459	4.788	0.0568	3.87E−02	316.6
149	13.00	0.52	0.0465	4.848	0.0577	3.92E−02	320.5

Table A21. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0450	4.692	0.0553	3.79E−02	310.2
151	13.00	0.76	0.0453	4.722	0.0558	3.82E−02	312.2
152	13.00	0.90	0.0421	4.385	0.0507	3.55E−02	289.9
153	13.00	1.02	0.0437	4.555	0.0533	3.68E−02	301.1
154	14.00	0.00	0.0481	5.016	0.0602	4.06E−02	331.7
155	14.00	0.25	0.0460	4.797	0.0569	3.88E−02	317.2
156	14.00	0.38	0.0457	4.765	0.0564	3.85E−02	315.1
157	14.00	0.52	0.0442	4.607	0.0541	3.72E−02	304.6
158	14.00	0.66	0.0615	6.419	0.0812	5.19E−02	424.4
159	14.00	0.80	0.0475	4.957	0.0593	4.01E−02	327.7
160	14.00	0.92	0.0440	4.584	0.0537	3.71E−02	303.1
161	15.00	0.00	0.0529	5.513	0.0677	4.46E−02	364.5
162	15.00	0.25	0.0523	5.455	0.0668	4.41E−02	360.6
163	15.00	0.38	0.0489	5.097	0.0614	4.12E−02	337.0
164	15.00	0.69	0.0518	5.398	0.0659	4.36E−02	356.9
165	15.00	0.81	0.0515	5.369	0.0655	4.34E−02	355.0
166	16.00	0.00	0.0558	5.821	0.0723	4.71E−02	384.8
167	16.00	0.25	0.0555	5.792	0.0718	4.68E−02	383.0
168	16.00	0.38	0.0548	5.712	0.0706	4.62E−02	377.7
169	16.00	0.48	0.0530	5.526	0.0678	4.47E−02	365.4
170	16.00	0.59	0.0529	5.520	0.0677	4.46E−02	365.0
171	16.00	0.71	0.0545	5.683	0.0702	4.60E−02	375.8
172	17.00	0.00	0.0636	6.634	0.0844	5.36E−02	438.6
173	17.00	0.25	0.0596	6.214	0.0781	5.02E−02	410.8
174	17.00	0.38	0.0621	6.473	0.0820	5.23E−02	428.0
175	17.00	0.48	0.0572	5.970	0.0745	4.83E−02	394.7
176	17.00	0.60	0.0645	6.730	0.0859	5.44E−02	445.0
177	18.00	0.00	0.0742	7.734	0.1009	6.25E−02	511.3
178	18.00	0.25	0.0706	7.367	0.0954	5.96E−02	487.1
179	18.00	0.38	0.0687	7.168	0.0925	5.80E−02	473.9
180	18.00	0.50	0.0640	6.678	0.0851	5.40E−02	441.6
181	18.50	0.00	0.0739	7.704	0.1005	6.23E−02	509.4
182	18.50	0.25	0.0723	7.535	0.0980	6.09E−02	498.2
183	18.50	0.38	0.0672	7.009	0.0901	5.67E−02	463.4
184	18.60	0.42	0.0661	6.892	0.0883	5.57E−02	455.7
185	18.50	0.47	0.0686	7.153	0.0922	5.78E−02	473.0
186	19.20	0.00	0.0805	8.395	0.1108	6.79E−02	555.0
187	19.20	0.25	0.0745	7.769	0.1015	6.28E−02	513.7
188	19.20	0.38	0.0647	6.747	0.0861	5.46E−02	446.1
189	19.30	0.42	0.0638	6.652	0.0847	5.38E−02	439.8
190	19.20	0.47	0.0645	6.723	0.0858	5.44E−02	444.5
191	20.00	0.00	0.0777	8.105	0.1065	6.55E−02	535.9
192	20.00	0.25	0.0728	7.595	0.0989	6.14E−02	502.2
193	20.00	0.38	0.0686	7.152	0.0922	5.78E−02	472.9
194	20.10	0.42	0.0709	7.399	0.0959	5.98E−02	489.2
195	20.00	0.47	0.0664	6.921	0.0887	5.60E−02	457.6
196	20.80	0.00	0.0909	9.482	0.1271	7.67E−02	626.9
197	20.80	0.25	0.0837	8.725	0.1158	7.05E−02	576.9
198	20.80	0.38	0.0769	8.018	0.1052	6.48E−02	530.2
199	20.90	0.42	0.0794	8.285	0.1092	6.70E−02	547.8
200	20.80	0.47	0.0771	8.043	0.1056	6.50E−02	531.8
201	21.60	0.00	0.0937	9.776	0.1315	7.90E−02	646.4
202	21.60	0.25	0.0929	9.689	0.1302	7.83E−02	640.6
203	21.60	0.38	0.0938	9.780	0.1316	7.91E−02	646.6
204	21.70	0.42	0.0914	9.527	0.1278	7.70E−02	629.9
205	21.60	0.47	0.0906	9.448	0.1266	7.64E−02	624.7
206	22.40	0.00	0.0997	10.393	0.1408	8.40E−02	687.2
207	22.40	0.25	0.1010	10.537	0.1429	8.52E−02	696.7

Table A21. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.0996	10.389	0.1407	8.40E–02	686.9
209	22.50	0.42	0.1085	11.311	0.1545	9.15E–02	747.8
210	22.40	0.47	0.1086	11.329	0.1548	9.16E–02	749.1
211	23.20	0.00	0.1081	11.278	0.1541	9.12E–02	745.7
212	23.20	0.25	0.1074	11.198	0.1529	9.05E–02	740.4
213	23.20	0.38	0.1118	11.659	0.1598	9.43E–02	770.8
214	23.30	0.42	0.1115	11.627	0.1593	9.40E–02	768.7
215	23.20	0.47	0.1007	10.497	0.1424	8.49E–02	694.0
216	24.00	0.00	0.1059	11.041	0.1505	8.93E–02	730.0
217	24.00	0.25	0.1143	11.922	0.1637	9.64E–02	788.3
218	24.00	0.38	0.1152	12.011	0.1650	9.71E–02	794.1
219	24.10	0.42	0.1191	12.425	0.1713	1.00E–01	821.5
220	24.00	0.47	0.1177	12.275	0.1690	9.93E–02	811.6
221	25.00	0.00	0.1118	11.654	0.1597	9.42E–02	770.5
222	25.00	0.25	0.1103	11.507	0.1575	9.30E–02	760.8
223	25.00	0.38	0.1027	10.713	0.1456	8.66E–02	708.3
224	25.10	0.42	0.1026	10.703	0.1454	8.65E–02	707.6
225	25.00	0.47	0.1065	11.110	0.1515	8.98E–02	734.6
226	9.00	999.00	0.0309	3.221	0.0333	2.60E–02	213.0
227	0.00	–2.25	1.1887	123.959	1.8431	1.00E+00	8195.9
228	0.00	–0.29	1.1668	121.678	1.8089	9.84E–01	8045.2
229	0.00	2.25	1.1668	121.675	1.8088	9.84E–01	8044.9
230	18.23	0.00	0.0749	7.811	0.1021	6.32E–02	516.4
231	18.43	0.00	0.0888	9.256	0.1237	7.48E–02	612.0
232	18.63	0.00	0.0895	9.335	0.1249	7.55E–02	617.2
233	19.00	0.00	0.1115	11.631	0.1594	9.40E–02	769.0
234	19.40	0.00	0.1596	16.641	0.2344	1.35E–01	1100.3
235	20.13	0.00	0.3065	31.963	0.4641	2.58E–01	2113.3
236	20.33	0.00	0.3056	31.872	0.4627	2.58E–01	2107.3
237	20.53	0.00	0.3166	33.018	0.4799	2.67E–01	2183.1
238	20.73	0.00	0.3317	34.596	0.5036	2.80E–01	2287.4
239	21.50	0.00	0.2663	27.765	0.4012	2.24E–01	1835.8
240	22.00	0.00	0.2606	27.172	0.3923	2.20E–01	1796.6
241	22.50	0.00	0.2337	24.366	0.3502	1.97E–01	1611.0
242	22.70	0.00	0.2487	25.939	0.3738	2.10E–01	1715.0
243	23.00	0.00	0.2704	28.196	0.4076	2.28E–01	1864.2
244	0.58	999.00	0.0313	3.269	0.0340	2.64E–02	216.2
245	0.86	999.00	0.0336	3.499	0.0375	2.83E–02	231.4
246	1.15	999.00	0.0320	3.335	0.0350	2.70E–02	220.5
247	1.43	999.00	0.0321	3.343	0.0351	2.70E–02	221.0
248	1.72	999.00	0.0292	3.048	0.0307	2.46E–02	201.5
249	2.00	999.00	0.0353	3.683	0.0402	2.98E–02	243.5
250	2.29	999.00	0.0324	3.381	0.0357	2.73E–02	223.5
251	2.57	999.00	0.0339	3.538	0.0380	2.86E–02	233.9
252	2.86	999.00	0.0323	3.366	0.0355	2.72E–02	222.5
253	3.14	999.00	0.0337	3.518	0.0377	2.84E–02	232.6
254	3.43	999.00	0.0318	3.314	0.0347	2.68E–02	219.1
255	999.00	999.00	0.0313	3.263	0.0339	2.64E–02	215.7
256	999.00	999.00	1.1874	123.825	1.8411	1.00E+00	8187.1

Table A22. Flow Conditions and Pressure Distribution for Run 59

[CR = 3; Re = 1.14×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	720.52	(.49678E+07)
$T_{t,1}$, °R (K)	1853.30	(1029.61)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0321	(16.54)
$h_{t,1}$, btu/lbm (J/kg)	466.09	(.10834E+07)
Free-stream conditions:		
M_∞	9.77	
p_∞, psia (N/m^2)	0.0190	(130.70)
T_∞, °R (K)	96.43	(53.57)
ρ_∞, slug/ft^3 (kg/m^3)	0.16493E−04	(.85002E−02)
h_∞, btu/lbm (J/kg)	0.22997E+02	(.53456E+05)
a_∞, ft/s (m/s)	481.74	(146.84)
u_∞, ft/s (m/s)	4708.78	(1435.24)
Re_∞, ft^{-1} (m^{-1})	0.10740E+07	(.35237E+07)
q_∞, psia (N/m^2)	1.270	(8754.83)
μ_∞, slug/ft-s (N-s/m^2)	0.72310E−07	(.34622E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.354	(16235.15)
$T_{t,2}$, °R (K)	1857.74	(1032.08)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10632E−03	(.54797E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0561	3.193	0.0320	2.51E−02	387.1
2	11.18	0.20	0.0599	3.406	0.0351	2.68E−02	412.9
3	12.17	0.20	0.0635	3.614	0.0381	2.84E−02	438.0
4	13.15	0.20	0.0666	3.787	0.0407	2.98E−02	459.0
5	14.21	0.20	0.0714	4.060	0.0447	3.20E−02	492.2
6	15.14	0.20	0.0798	4.537	0.0516	3.57E−02	549.9
7	16.13	0.20	0.0873	4.963	0.0578	3.91E−02	601.6
8	17.12	0.20	0.0968	5.504	0.0657	4.33E−02	667.2
9	18.11	0.20	0.1062	6.038	0.0735	4.75E−02	731.9
10	19.74	0.20	0.0922	5.246	0.0620	4.13E−02	635.9
11	20.55	0.20	0.1044	5.937	0.0721	4.67E−02	719.7
12	22.56	0.20	0.1310	7.451	0.0941	5.87E−02	903.1
13	24.98	0.20	0.1597	9.084	0.1180	7.15E−02	1101.2
14	10.59	0.60	0.0977	5.556	0.0665	4.37E−02	673.5
15	11.58	0.60	0.0865	4.919	0.0572	3.87E−02	596.2
16	12.57	0.60	0.0897	5.101	0.0599	4.02E−02	618.3
17	13.56	0.60	0.0873	4.967	0.0579	3.91E−02	602.0
18	14.60	0.60	0.0846	4.813	0.0556	3.79E−02	583.4
19	15.54	0.60	0.0874	4.972	0.0580	3.91E−02	602.7
20	16.53	0.60	0.0925	5.261	0.0622	4.14E−02	637.7
21	17.52	0.60	0.1008	5.735	0.0691	4.51E−02	695.2
22	18.51	0.60	0.1133	6.445	0.0795	5.07E−02	781.2
23	12.97	1.00	0.0959	5.455	0.0650	4.29E−02	661.3
24	15.00	1.00	0.0987	5.616	0.0674	4.42E−02	680.8
25	15.94	1.00	0.1009	5.738	0.0691	4.52E−02	695.5
26	16.93	1.00	0.1059	6.022	0.0733	4.74E−02	729.9
27	17.92	1.00	0.1171	6.661	0.0826	5.24E−02	807.4
28	18.91	1.00	0.1324	7.528	0.0953	5.93E−02	912.6
29	24.98	1.00	0.1263	7.186	0.0903	5.66E−02	871.0
30	11.99	2.00	0.1047	5.958	0.0724	4.69E−02	722.2
31	13.97	2.00	0.0903	5.136	0.0604	4.04E−02	622.6
32	15.98	2.00	0.0947	5.386	0.0640	4.24E−02	652.8
33	16.94	2.00	0.1040	5.914	0.0717	4.66E−02	716.8

Table A22. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1207	6.865	0.0856	5.40E−02	832.2
35	18.42	2.00	0.1295	7.365	0.0929	5.80E−02	892.8
36	18.92	2.00	0.1401	7.968	0.1017	6.27E−02	965.8
37	19.41	2.00	0.1479	8.412	0.1082	6.62E−02	1019.6
38	19.91	2.00	0.1557	8.858	0.1147	6.97E−02	1073.8
39	20.26	2.00	0.1763	10.027	0.1317	7.89E−02	1215.4
40	21.11	2.00	0.1818	10.342	0.1363	8.14E−02	1253.6
41	21.96	2.00	0.1718	9.770	0.1280	7.69E−02	1184.2
42	22.74	2.00	0.1784	10.150	0.1335	7.99E−02	1230.3
43	23.52	2.00	0.2442	13.890	0.1881	1.09E−01	1683.7
44	24.98	2.00	0.1972	11.218	0.1491	8.83E−02	1359.8
45	17.94	3.00	0.1239	7.049	0.0883	5.55E−02	854.4
46	18.93	3.00	0.1401	7.971	0.1017	6.27E−02	966.1
47	19.92	3.00	0.1738	9.884	0.1297	7.78E−02	1198.1
48	20.91	3.00	0.2006	11.410	0.1519	8.98E−02	1383.0
49	22.11	3.00	0.3617	20.572	0.2856	1.62E−01	2493.6
50	22.96	3.00	0.4919	27.981	0.3938	2.20E−01	3391.6
51	23.74	3.00	0.4259	24.225	0.3390	1.91E−01	2936.4
52	24.98	3.00	0.3115	17.720	0.2440	1.39E−01	2147.9
53	18.34	3.40	0.1256	7.144	0.0897	5.62E−02	865.9
54	19.32	3.40	0.1606	9.133	0.1187	7.19E−02	1107.0
55	19.82	3.40	0.1681	9.564	0.1250	7.53E−02	1159.3
56	20.32	3.40	0.1775	10.095	0.1327	7.95E−02	1223.6
57	20.81	3.40	0.1889	10.745	0.1422	8.46E−02	1302.4
58	21.31	3.40	0.2253	12.816	0.1725	1.01E−01	1553.5
59	21.66	3.40	0.2867	16.307	0.2234	1.28E−01	1976.6
60	22.94	3.40	0.6015	34.213	0.4847	2.69E−01	4147.1
61	23.75	3.40	0.4679	26.615	0.3738	2.10E−01	3226.1
62	24.14	3.40	0.4108	23.365	0.3264	1.84E−01	2832.2
63	22.29	3.60	0.4241	24.123	0.3375	1.90E−01	2924.0
64	22.71	3.60	0.4646	26.426	0.3711	2.08E−01	3203.2
65	23.14	3.60	0.5172	29.422	0.4148	2.32E−01	3566.3
66	23.95	3.60	0.4773	27.151	0.3817	2.14E−01	3291.0
67	24.34	3.60	0.4054	23.063	0.3220	1.82E−01	2795.5
68	13.79	3.80	0.0837	4.764	0.0549	3.75E−02	577.4
69	15.77	3.80	0.0711	4.046	0.0445	3.19E−02	490.4
70	17.75	3.80	0.1129	6.423	0.0792	5.06E−02	778.6
71	19.23	3.80	0.1636	9.307	0.1212	7.33E−02	1128.1
72	19.73	3.80	0.1729	9.832	0.1289	7.74E−02	1191.8
73	20.22	3.80	0.1822	10.367	0.1367	8.16E−02	1256.6
74	20.72	3.80	0.1973	11.221	0.1492	8.83E−02	1360.1
75	21.41	3.80	0.2595	14.761	0.2008	1.16E−01	1789.3
76	21.71	3.80	0.3015	17.151	0.2357	1.35E−01	2078.9
77	22.06	3.80	0.3966	22.559	0.3146	1.78E−01	2734.4
78	22.49	3.80	0.4341	24.695	0.3458	1.94E−01	2993.3
79	22.76	3.80	0.4756	27.055	0.3803	2.13E−01	3279.4
80	22.91	3.80	0.4923	28.004	0.3941	2.20E−01	3394.5
81	23.76	3.80	0.4817	27.399	0.3853	2.16E−01	3321.2
82	24.15	3.80	0.4259	24.227	0.3390	1.91E−01	2936.6
83	24.98	3.80	0.3136	17.838	0.2457	1.40E−01	2162.2
84	22.59	3.90	0.4661	26.512	0.3723	2.09E−01	3213.6
85	22.80	3.90	0.5042	28.681	0.4040	2.26E−01	3476.5
86	23.01	3.90	0.5333	30.335	0.4281	2.39E−01	3677.0
87	23.15	3.90	0.5392	30.672	0.4331	2.41E−01	3717.9
88	23.86	3.90	0.4581	26.058	0.3657	2.05E−01	3158.6
89	24.25	3.90	0.3839	21.835	0.3041	1.72E−01	2646.7
90	11.99	2.00	0.1049	5.965	0.0725	4.70E−02	723.0
91	13.97	2.00	0.0946	5.381	0.0639	4.24E−02	652.3

Table A22. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0963	5.477	0.0653	4.31E−02	663.9
93	17.93	2.00	0.1176	6.689	0.0830	5.27E−02	810.8
94	19.91	2.00	0.1569	8.923	0.1156	7.02E−02	1081.6
95	1.00	0.00	0.0481	2.736	0.0253	2.15E−02	331.7
96	1.00	0.66	0.0468	2.660	0.0242	2.09E−02	322.5
97	1.00	1.28	0.0471	2.677	0.0245	2.11E−02	324.5
98	1.00	1.90	0.0470	2.674	0.0244	2.11E−02	324.2
99	2.50	0.00	0.0396	2.254	0.0183	1.77E−02	273.2
100	4.00	0.00	0.0375	2.134	0.0166	1.68E−02	258.7
101	4.00	0.66	0.0374	2.128	0.0165	1.68E−02	257.9
102	4.00	1.90	0.0366	2.083	0.0158	1.64E−02	252.4
103	5.50	0.00	0.0361	2.054	0.0154	1.62E−02	249.0
104	7.00	0.00	0.0356	2.027	0.0150	1.60E−02	245.7
105	8.00	−1.90	0.0384	2.183	0.0173	1.72E−02	264.7
106	8.00	−1.50	0.0407	2.314	0.0192	1.82E−02	280.5
107	8.00	−1.11	0.0426	2.421	0.0207	1.91E−02	293.5
108	8.00	−0.66	0.0445	2.530	0.0223	1.99E−02	306.6
109	8.00	0.00	0.0453	2.575	0.0230	2.03E−02	312.1
110	8.00	0.25	0.0447	2.541	0.0225	2.00E−02	308.0
111	8.00	0.38	0.0447	2.545	0.0225	2.00E−02	308.5
112	8.00	0.66	0.0444	2.526	0.0223	1.99E−02	306.2
113	8.00	1.11	0.0427	2.428	0.0208	1.91E−02	294.3
114	8.00	1.50	0.0410	2.332	0.0194	1.84E−02	282.6
115	8.00	1.90	0.0385	2.192	0.0174	1.73E−02	265.8
116	9.00	0.00	0.0508	2.889	0.0276	2.27E−02	350.1
117	9.00	0.25	0.0504	2.869	0.0273	2.26E−02	347.7
118	9.00	0.38	0.0500	2.846	0.0269	2.24E−02	345.0
119	9.00	0.66	0.0496	2.820	0.0266	2.22E−02	341.8
120	9.00	1.01	0.0504	2.868	0.0273	2.26E−02	347.7
121	9.00	1.32	0.0466	2.652	0.0241	2.09E−02	321.5
122	10.00	0.00	0.0557	3.171	0.0317	2.50E−02	384.3
123	10.00	0.25	0.0551	3.133	0.0311	2.47E−02	379.8
124	10.00	0.38	0.0556	3.163	0.0316	2.49E−02	383.4
125	10.00	0.66	0.0541	3.080	0.0304	2.42E−02	373.4
126	10.00	0.90	0.0526	2.991	0.0291	2.35E−02	362.5
127	10.00	1.08	0.0525	2.986	0.0290	2.35E−02	361.9
128	10.00	1.22	0.0520	2.958	0.0286	2.33E−02	358.6
129	10.00	1.34	0.0553	3.146	0.0313	2.48E−02	381.3
130	11.00	0.00	0.0589	3.349	0.0343	2.64E−02	406.0
131	11.00	0.25	0.0597	3.394	0.0349	2.67E−02	411.4
132	11.00	0.38	0.0590	3.357	0.0344	2.64E−02	406.9
133	11.00	0.52	0.0590	3.354	0.0344	2.64E−02	406.6
134	11.00	0.80	0.0564	3.207	0.0322	2.52E−02	388.8
135	11.00	0.97	0.0564	3.206	0.0322	2.52E−02	388.6
136	11.00	1.11	0.0593	3.375	0.0347	2.66E−02	409.1
137	11.00	1.23	0.0613	3.489	0.0363	2.75E−02	423.0
138	12.00	0.00	0.0643	3.658	0.0388	2.88E−02	443.4
139	12.00	0.25	0.0631	3.587	0.0378	2.82E−02	434.7
140	12.00	0.38	0.0627	3.564	0.0374	2.81E−02	432.0
141	12.00	0.52	0.0626	3.561	0.0374	2.80E−02	431.7
142	12.00	0.69	0.0592	3.368	0.0346	2.65E−02	408.3
143	12.00	0.87	0.0624	3.550	0.0372	2.79E−02	430.3
144	12.00	1.01	0.0648	3.688	0.0392	2.90E−02	447.0
145	12.00	1.13	0.0652	3.707	0.0395	2.92E−02	449.3
146	13.00	0.00	0.0672	3.825	0.0412	3.01E−02	463.7
147	13.00	0.25	0.0666	3.788	0.0407	2.98E−02	459.1
148	13.00	0.38	0.0661	3.758	0.0403	2.96E−02	455.5
149	13.00	0.52	0.0658	3.743	0.0400	2.95E−02	453.8

Table A22. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0648	3.688	0.0392	2.90E−02	447.0
151	13.00	0.76	0.0669	3.808	0.0410	3.00E−02	461.6
152	13.00	0.90	0.0674	3.836	0.0414	3.02E−02	465.0
153	13.00	1.02	0.0690	3.926	0.0427	3.09E−02	475.9
154	14.00	0.00	0.0719	4.092	0.0451	3.22E−02	496.0
155	14.00	0.25	0.0707	4.022	0.0441	3.17E−02	487.5
156	14.00	0.38	0.0694	3.945	0.0430	3.11E−02	478.2
157	14.00	0.52	0.0702	3.991	0.0437	3.14E−02	483.8
158	14.00	0.66	0.0696	3.960	0.0432	3.12E−02	480.0
159	14.00	0.80	0.0751	4.270	0.0477	3.36E−02	517.6
160	14.00	0.92	0.0727	4.134	0.0457	3.25E−02	501.0
161	15.00	0.00	0.0788	4.484	0.0509	3.53E−02	543.6
162	15.00	0.25	0.0777	4.422	0.0499	3.48E−02	536.0
163	15.00	0.38	0.0763	4.339	0.0487	3.42E−02	526.0
164	15.00	0.69	0.0812	4.621	0.0528	3.64E−02	560.1
165	15.00	0.81	0.0796	4.526	0.0515	3.56E−02	548.6
166	16.00	0.00	0.0883	5.025	0.0587	3.96E−02	609.1
167	16.00	0.25	0.0869	4.940	0.0575	3.89E−02	598.8
168	16.00	0.38	0.0866	4.924	0.0573	3.88E−02	596.8
169	16.00	0.48	0.0867	4.931	0.0574	3.88E−02	597.7
170	16.00	0.59	0.0889	5.058	0.0592	3.98E−02	613.1
171	16.00	0.71	0.0873	4.963	0.0578	3.91E−02	601.6
172	17.00	0.00	0.1010	5.744	0.0692	4.52E−02	696.3
173	17.00	0.25	0.0991	5.637	0.0677	4.44E−02	683.3
174	17.00	0.38	0.0987	5.612	0.0673	4.42E−02	680.3
175	17.00	0.48	0.0967	5.501	0.0657	4.33E−02	666.8
176	17.00	0.60	0.0971	5.522	0.0660	4.35E−02	669.3
177	18.00	0.00	0.1179	6.707	0.0833	5.28E−02	813.0
178	18.00	0.25	0.1140	6.486	0.0801	5.11E−02	786.1
179	18.00	0.38	0.1118	6.359	0.0782	5.01E−02	770.8
180	18.00	0.50	0.1055	6.002	0.0730	4.72E−02	727.5
181	18.50	0.00	0.1253	7.126	0.0894	5.61E−02	863.8
182	18.50	0.25	0.1205	6.855	0.0854	5.40E−02	830.9
183	18.50	0.38	0.1082	6.155	0.0752	4.85E−02	746.1
184	18.60	0.42	0.1056	6.005	0.0730	4.73E−02	727.9
185	18.50	0.47	0.1076	6.121	0.0747	4.82E−02	741.9
186	19.20	0.00	0.1342	7.633	0.0968	6.01E−02	925.2
187	19.20	0.25	0.1171	6.663	0.0827	5.25E−02	807.7
188	19.20	0.38	0.0985	5.602	0.0672	4.41E−02	679.1
189	19.30	0.42	0.0968	5.509	0.0658	4.34E−02	667.7
190	19.20	0.47	0.0981	5.580	0.0668	4.39E−02	676.4
191	20.00	0.00	0.1318	7.496	0.0948	5.90E−02	908.6
192	20.00	0.25	0.1273	7.243	0.0911	5.70E−02	878.0
193	20.00	0.38	0.1020	5.803	0.0701	4.57E−02	703.4
194	20.10	0.42	0.1040	5.914	0.0717	4.66E−02	716.9
195	20.00	0.47	0.1024	5.827	0.0705	4.59E−02	706.4
196	20.80	0.00	0.1339	7.618	0.0966	6.00E−02	923.4
197	20.80	0.25	0.1291	7.345	0.0926	5.78E−02	890.3
198	20.80	0.38	0.1223	6.957	0.0869	5.48E−02	843.3
199	20.90	0.42	0.1276	7.259	0.0913	5.71E−02	879.9
200	20.80	0.47	0.1270	7.224	0.0908	5.69E−02	875.7
201	21.60	0.00	0.1352	7.691	0.0977	6.05E−02	932.3
202	21.60	0.25	0.1358	7.725	0.0981	6.08E−02	936.4
203	21.60	0.38	0.1472	8.372	0.1076	6.59E−02	1014.8
204	21.70	0.42	0.1482	8.429	0.1084	6.64E−02	1021.7
205	21.60	0.47	0.1347	7.663	0.0972	6.03E−02	928.8
206	22.40	0.00	0.1415	8.051	0.1029	6.34E−02	975.8
207	22.40	0.25	0.1456	8.280	0.1062	6.52E−02	1003.6

Table A22. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.1445	8.221	0.1054	6.47E–02	996.5
209	22.50	0.42	0.1573	8.947	0.1160	7.04E–02	1084.5
210	22.40	0.47	0.1575	8.957	0.1161	7.05E–02	1085.7
211	23.20	0.00	0.1488	8.466	0.1090	6.66E–02	1026.2
212	23.20	0.25	0.1502	8.544	0.1101	6.73E–02	1035.7
213	23.20	0.38	0.1577	8.971	0.1163	7.06E–02	1087.4
214	23.30	0.42	0.1582	8.996	0.1167	7.08E–02	1090.4
215	23.20	0.47	0.1420	8.076	0.1033	6.36E–02	978.9
216	24.00	0.00	0.1598	9.089	0.1181	7.16E–02	1101.8
217	24.00	0.25	0.1628	9.260	0.1205	7.29E–02	1122.4
218	24.00	0.38	0.1618	9.205	0.1197	7.25E–02	1115.7
219	24.10	0.42	0.1682	9.566	0.1250	7.53E–02	1159.6
220	24.00	0.47	0.1672	9.512	0.1242	7.49E–02	1153.0
221	25.00	0.00	0.1818	10.344	0.1364	8.14E–02	1253.8
222	25.00	0.25	0.1787	10.162	0.1337	8.00E–02	1231.8
223	25.00	0.38	0.1699	9.664	0.1264	7.61E–02	1171.4
224	25.10	0.42	0.1691	9.619	0.1258	7.57E–02	1165.9
225	25.00	0.47	0.1603	9.116	0.1184	7.18E–02	1104.9
226	9.00	999.00	0.0417	2.374	0.0201	1.87E–02	287.8
227	0.00	–2.25	2.2208	126.329	1.8291	9.94E–01	15312.7
228	0.00	–0.29	2.2024	125.280	1.8138	9.86E–01	15185.5
229	0.00	2.25	2.2025	125.284	1.8139	9.86E–01	15186.0
230	18.23	0.00	0.0913	5.192	0.0612	4.09E–02	629.3
231	18.43	0.00	0.1201	6.831	0.0851	5.38E–02	828.0
232	18.63	0.00	0.1289	7.331	0.0924	5.77E–02	888.6
233	19.00	0.00	0.1405	7.991	0.1020	6.29E–02	968.7
234	19.40	0.00	0.1713	9.746	0.1276	7.67E–02	1181.4
235	20.13	0.00	0.3164	17.998	0.2481	1.42E–01	2181.6
236	20.33	0.00	0.3816	21.704	0.3022	1.71E–01	2630.9
237	20.53	0.00	0.4598	26.156	0.3671	2.06E–01	3170.4
238	20.73	0.00	0.4601	26.173	0.3674	2.06E–01	3172.5
239	21.50	0.00	0.4001	22.761	0.3176	1.79E–01	2758.9
240	22.00	0.00	0.6103	34.718	0.4921	2.73E–01	4208.2
241	22.50	0.00	0.5503	31.301	0.4422	2.46E–01	3794.1
242	22.70	0.00	0.4698	26.723	0.3754	2.10E–01	3239.2
243	23.00	0.00	0.4177	23.758	0.3321	1.87E–01	2879.7
244	0.58	999.00	0.0447	2.543	0.0225	2.00E–02	308.3
245	0.86	999.00	0.0455	2.587	0.0232	2.04E–02	313.6
246	1.15	999.00	0.0433	2.465	0.0214	1.94E–02	298.8
247	1.43	999.00	0.0438	2.494	0.0218	1.96E–02	302.2
248	1.72	999.00	0.0434	2.467	0.0214	1.94E–02	299.0
249	2.00	999.00	0.0457	2.599	0.0233	2.05E–02	315.0
250	2.29	999.00	0.0418	2.376	0.0201	1.87E–02	287.9
251	2.57	999.00	0.0451	2.564	0.0228	2.02E–02	310.7
252	2.86	999.00	0.0446	2.539	0.0225	2.00E–02	307.8
253	3.14	999.00	0.0440	2.503	0.0219	1.97E–02	303.3
254	3.43	999.00	0.0451	2.564	0.0228	2.02E–02	310.8
255	999.00	999.00	0.0425	2.415	0.0207	1.90E–02	292.7
256	999.00	999.00	2.2199	126.273	1.8283	9.94E–01	15306.0

Table A23. Flow Conditions and Pressure Distribution for Run 60

[CR = 3; Re = 2.15×10^6 per foot; 50 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1435.14	(.98949E+07)
$T_{t,1}$, °R (K)	1816.78	(1009.32)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0641	(33.05)
$h_{t,1}$, btu/lbm (J/kg)	457.20	(.10627E+07)
Free-stream conditions:		
M_∞	9.93	
p_∞, psia (N/m^2)	0.0348	(239.75)
T_∞, °R (K)	91.80	(51.00)
ρ_∞, slug/ft^3 (kg/m^3)	0.31778E−04	(.16378E−01)
h_∞, btu/lbm (J/kg)	0.2189407E+02	(.50892E+05)
a_∞, ft/s (m/s)	470.05	(143.27)
u_∞, ft/s (m/s)	4667.21	(1422.57)
Re_∞, ft^{-1} (m^{-1})	0.21738E+07	(.71318E+07)
q_∞, psia (N/m^2)	2.404	(16571.84)
μ_∞, slug/ft-s (N-s/m^2)	0.68229E−07	(.32668E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.455	(30712.82)
$T_{t,2}$, °R (K)	1825.25	(1014.03)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20477E−03	(.10554E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0750	2.370	0.0193	1.80E−02	516.8
2	11.18	0.20	0.0818	2.585	0.0223	1.96E−02	563.7
3	12.17	0.20	0.0876	2.770	0.0249	2.10E−02	604.1
4	13.15	0.20	0.0948	2.996	0.0281	2.27E−02	653.5
5	14.21	0.20	0.0977	3.089	0.0294	2.34E−02	673.6
6	15.14	0.20	0.1137	3.595	0.0365	2.73E−02	784.0
7	16.13	0.20	0.1261	3.986	0.0420	3.02E−02	869.4
8	17.12	0.20	0.1424	4.502	0.0492	3.42E−02	981.9
9	18.11	0.20	0.1803	5.701	0.0661	4.33E−02	1243.4
10	19.74	0.20	0.1655	5.233	0.0595	3.97E−02	1141.3
11	20.55	0.20	0.1977	6.251	0.0738	4.74E−02	1363.4
12	22.56	0.20	0.2166	6.847	0.0822	5.19E−02	1493.3
13	24.98	0.20	0.2350	7.430	0.0904	5.64E−02	1620.6
14	10.59	0.60	0.1352	4.273	0.0460	3.24E−02	931.9
15	11.58	0.60	0.1203	3.803	0.0394	2.89E−02	829.5
16	12.57	0.60	0.1260	3.982	0.0419	3.02E−02	868.5
17	13.56	0.60	0.1282	4.052	0.0429	3.07E−02	883.7
18	14.60	0.60	0.1287	4.069	0.0432	3.09E−02	887.5
19	15.54	0.60	0.1319	4.169	0.0446	3.16E−02	909.2
20	16.53	0.60	0.1338	4.229	0.0454	3.21E−02	922.4
21	17.52	0.60	0.1462	4.623	0.0509	3.51E−02	1008.2
22	18.51	0.60	0.1820	5.754	0.0669	4.37E−02	1255.0
23	12.97	1.00	0.1346	4.256	0.0458	3.23E−02	928.3
24	15.00	1.00	0.1352	4.275	0.0461	3.24E−02	932.3
25	15.94	1.00	0.1393	4.402	0.0478	3.34E−02	960.1
26	16.93	1.00	0.1427	4.510	0.0494	3.42E−02	983.6
27	17.92	1.00	0.1525	4.822	0.0537	3.66E−02	1051.7
28	18.91	1.00	0.1681	5.314	0.0607	4.03E−02	1159.0
29	24.98	1.00	0.2173	6.870	0.0825	5.21E−02	1498.3
30	11.99	2.00	0.1734	5.483	0.0630	4.16E−02	1195.9
31	13.97	2.00	0.1440	4.554	0.0500	3.46E−02	993.2
32	15.98	2.00	0.1453	4.593	0.0505	3.48E−02	1001.7
33	16.94	2.00	0.1475	4.663	0.0515	3.54E−02	1016.9

Table A23. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1462	4.622	0.0509	3.51E−02	1008.1
35	18.42	2.00	0.1470	4.648	0.0513	3.53E−02	1013.7
36	18.92	2.00	0.1492	4.715	0.0522	3.58E−02	1028.4
37	19.41	2.00	0.1514	4.787	0.0533	3.63E−02	1044.1
38	19.91	2.00	0.1571	4.967	0.0558	3.77E−02	1083.3
39	20.26	2.00	0.1804	5.702	0.0661	4.33E−02	1243.7
40	21.11	2.00	0.2344	7.410	0.0901	5.62E−02	1616.2
41	21.96	2.00	0.3044	9.623	0.1213	7.30E−02	2098.8
42	22.74	2.00	0.3351	10.592	0.1349	8.04E−02	2310.2
43	23.52	2.00	0.3394	10.731	0.1368	8.14E−02	2340.4
44	24.98	2.00	0.3407	10.770	0.1374	8.17E−02	2348.9
45	17.94	3.00	0.1349	4.265	0.0459	3.24E−02	930.2
46	18.93	3.00	0.1544	4.882	0.0546	3.70E−02	1064.8
47	19.92	3.00	0.2280	7.207	0.0873	5.47E−02	1571.9
48	20.91	3.00	0.2545	8.047	0.0991	6.11E−02	1755.0
49	22.11	3.00	0.3441	10.878	0.1389	8.25E−02	2372.5
50	22.96	3.00	0.4118	13.019	0.1690	9.88E−02	2839.4
51	23.74	3.00	0.4522	14.297	0.1870	1.08E−01	3118.3
52	24.98	3.00	0.6182	19.542	0.2607	1.48E−01	4262.1
53	18.34	3.40	0.1532	4.844	0.0541	3.68E−02	1056.5
54	19.32	3.40	0.2099	6.637	0.0793	5.04E−02	1447.6
55	19.82	3.40	0.2230	7.051	0.0851	5.35E−02	1537.8
56	20.32	3.40	0.2385	7.539	0.0920	5.72E−02	1644.3
57	20.81	3.40	0.2538	8.023	0.0988	6.09E−02	1749.7
58	21.31	3.40	0.3036	9.599	0.1209	7.28E−02	2093.6
59	21.66	3.40	0.3672	11.609	0.1492	8.81E−02	2532.0
60	22.94	3.40	0.5024	15.883	0.2093	1.21E−01	3464.2
61	23.75	3.40	0.5795	18.320	0.2436	1.39E−01	3995.7
62	24.14	3.40	0.5825	18.414	0.2449	1.40E−01	4016.1
63	22.29	3.60	0.4642	14.675	0.1923	1.11E−01	3200.6
64	22.71	3.60	0.4680	14.797	0.1940	1.12E−01	3227.1
65	23.14	3.60	0.5131	16.222	0.2141	1.23E−01	3538.1
66	23.95	3.60	0.5425	17.152	0.2271	1.30E−01	3740.8
67	24.34	3.60	0.5515	17.434	0.2311	1.32E−01	3802.4
68	13.79	3.80	0.1370	4.330	0.0468	3.28E−02	944.3
69	15.77	3.80	0.1149	3.632	0.0370	2.76E−02	792.1
70	17.75	3.80	0.1503	4.751	0.0527	3.60E−02	1036.2
71	19.23	3.80	0.2169	6.856	0.0823	5.20E−02	1495.3
72	19.73	3.80	0.2241	7.086	0.0856	5.38E−02	1545.5
73	20.22	3.80	0.2346	7.418	0.0902	5.63E−02	1617.8
74	20.72	3.80	0.2783	8.798	0.1097	6.68E−02	1918.9
75	21.41	3.80	0.3290	10.400	0.1322	7.89E−02	2268.3
76	21.71	3.80	0.3813	12.054	0.1554	9.15E−02	2629.0
77	22.06	3.80	0.5258	16.623	0.2197	1.26E−01	3625.4
78	22.49	3.80	0.4030	12.742	0.1651	9.67E−02	2779.0
79	22.76	3.80	0.5131	16.222	0.2141	1.23E−01	3538.1
80	22.91	3.80	0.5232	16.540	0.2185	1.25E−01	3607.3
81	23.76	3.80	0.5620	17.768	0.2358	1.35E−01	3875.3
82	24.15	3.80	0.5907	18.674	0.2485	1.42E−01	4072.8
83	24.98	3.80	0.6608	20.892	0.2797	1.59E−01	4556.5
84	22.59	3.90	0.4965	15.697	0.2067	1.19E−01	3423.5
85	22.80	3.90	0.5185	16.392	0.2164	1.24E−01	3575.2
86	23.01	3.90	0.5237	16.556	0.2187	1.26E−01	3610.9
87	23.15	3.90	0.5200	16.438	0.2171	1.25E−01	3585.1
88	23.86	3.90	0.5825	18.416	0.2449	1.40E−01	4016.5
89	24.25	3.90	0.6062	19.166	0.2554	1.45E−01	4180.1
90	11.99	2.00	0.1756	5.553	0.0640	4.21E−02	1211.1
91	13.97	2.00	0.1542	4.875	0.0545	3.70E−02	1063.1

Table A23. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1502	4.748	0.0527	3.60E−02	1035.6
93	17.93	2.00	0.1504	4.755	0.0528	3.61E−02	1037.0
94	19.91	2.00	0.1551	4.905	0.0549	3.72E−02	1069.7
95	1.00	0.00	0.0717	2.268	0.0178	1.72E−02	494.7
96	1.00	0.66	0.0694	2.195	0.0168	1.67E−02	478.8
97	1.00	1.28	0.0698	2.207	0.0170	1.67E−02	481.3
98	1.00	1.90	0.0705	2.227	0.0173	1.69E−02	485.8
99	2.50	0.00	0.0565	1.787	0.0111	1.36E−02	389.8
100	4.00	0.00	0.0533	1.685	0.0096	1.28E−02	367.5
101	4.00	0.66	0.0526	1.664	0.0093	1.26E−02	362.8
102	4.00	1.90	0.0519	1.642	0.0090	1.25E−02	358.2
103	5.50	0.00	0.0511	1.616	0.0087	1.23E−02	352.5
104	7.00	0.00	0.0510	1.612	0.0086	1.22E−02	351.5
105	8.00	−1.90	0.0498	1.574	0.0081	1.19E−02	343.2
106	8.00	−1.50	0.0502	1.587	0.0083	1.20E−02	346.1
107	8.00	−1.11	0.0505	1.595	0.0084	1.21E−02	347.9
108	8.00	−0.66	0.0501	1.584	0.0082	1.20E−02	345.5
109	8.00	0.00	0.0503	1.591	0.0083	1.21E−02	346.9
110	8.00	0.25	0.0497	1.571	0.0080	1.19E−02	342.6
111	8.00	0.38	0.0503	1.590	0.0083	1.21E−02	346.8
112	8.00	0.66	0.0502	1.586	0.0082	1.20E−02	345.9
113	8.00	1.11	0.0496	1.567	0.0080	1.19E−02	341.7
114	8.00	1.50	0.0498	1.574	0.0081	1.19E−02	343.3
115	8.00	1.90	0.0489	1.546	0.0077	1.17E−02	337.2
116	9.00	0.00	0.0512	1.617	0.0087	1.23E−02	352.7
117	9.00	0.25	0.0512	1.617	0.0087	1.23E−02	352.7
118	9.00	0.38	0.0509	1.608	0.0085	1.22E−02	350.7
119	9.00	0.66	0.0516	1.632	0.0089	1.24E−02	356.0
120	9.00	1.01	0.0541	1.709	0.0100	1.30E−02	372.7
121	9.00	1.32	0.0547	1.729	0.0102	1.31E−02	377.0
122	10.00	0.00	0.0670	2.119	0.0157	1.61E−02	462.1
123	10.00	0.25	0.0669	2.114	0.0157	1.60E−02	461.0
124	10.00	0.38	0.0674	2.129	0.0159	1.62E−02	464.4
125	10.00	0.66	0.0670	2.118	0.0157	1.61E−02	462.0
126	10.00	0.90	0.0646	2.043	0.0147	1.55E−02	445.7
127	10.00	1.08	0.0655	2.072	0.0151	1.57E−02	451.8
128	10.00	1.22	0.0655	2.071	0.0151	1.57E−02	451.7
129	10.00	1.34	0.0739	2.335	0.0188	1.77E−02	509.3
130	11.00	0.00	0.0768	2.427	0.0201	1.84E−02	529.3
131	11.00	0.25	0.0746	2.359	0.0191	1.79E−02	514.4
132	11.00	0.38	0.0740	2.340	0.0188	1.78E−02	510.3
133	11.00	0.52	0.0743	2.348	0.0190	1.78E−02	512.1
134	11.00	0.80	0.0714	2.259	0.0177	1.71E−02	492.6
135	11.00	0.97	0.0704	2.225	0.0172	1.69E−02	485.3
136	11.00	1.11	0.0759	2.401	0.0197	1.82E−02	523.6
137	11.00	1.23	0.0878	2.775	0.0250	2.11E−02	605.2
138	12.00	0.00	0.0779	2.464	0.0206	1.87E−02	537.4
139	12.00	0.25	0.0776	2.453	0.0204	1.86E−02	535.0
140	12.00	0.38	0.0778	2.461	0.0205	1.87E−02	536.6
141	12.00	0.52	0.0776	2.452	0.0204	1.86E−02	534.7
142	12.00	0.69	0.0734	2.319	0.0185	1.76E−02	505.7
143	12.00	0.87	0.0752	2.376	0.0194	1.80E−02	518.3
144	12.00	1.01	0.0849	2.683	0.0237	2.04E−02	585.1
145	12.00	1.13	0.0940	2.973	0.0277	2.26E−02	648.5
146	13.00	0.00	0.0807	2.552	0.0218	1.94E−02	556.6
147	13.00	0.25	0.0801	2.532	0.0215	1.92E−02	552.3
148	13.00	0.38	0.0800	2.528	0.0215	1.92E−02	551.4
149	13.00	0.52	0.0798	2.524	0.0214	1.92E−02	550.5

Table A23. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0777	2.456	0.0205	1.86E−02	535.7
151	13.00	0.76	0.0797	2.519	0.0214	1.91E−02	549.4
152	13.00	0.90	0.0940	2.973	0.0277	2.26E−02	648.3
153	13.00	1.02	0.1016	3.211	0.0311	2.44E−02	700.3
154	14.00	0.00	0.0861	2.721	0.0242	2.06E−02	593.4
155	14.00	0.25	0.0849	2.684	0.0237	2.04E−02	585.4
156	14.00	0.38	0.0845	2.671	0.0235	2.03E−02	582.6
157	14.00	0.52	0.0809	2.558	0.0219	1.94E−02	557.9
158	14.00	0.66	0.0858	2.714	0.0241	2.06E−02	591.9
159	14.00	0.80	0.0956	3.022	0.0284	2.29E−02	659.0
160	14.00	0.92	0.1016	3.211	0.0311	2.44E−02	700.3
161	15.00	0.00	0.0972	3.074	0.0292	2.33E−02	670.5
162	15.00	0.25	0.0957	3.025	0.0285	2.29E−02	659.7
163	15.00	0.38	0.0927	2.929	0.0271	2.22E−02	638.9
164	15.00	0.69	0.1111	3.511	0.0353	2.66E−02	765.8
165	15.00	0.81	0.1163	3.677	0.0376	2.79E−02	801.9
166	16.00	0.00	0.1214	3.838	0.0399	2.91E−02	837.1
167	16.00	0.25	0.1175	3.713	0.0382	2.82E−02	809.8
168	16.00	0.38	0.1124	3.555	0.0359	2.70E−02	775.3
169	16.00	0.48	0.1182	3.737	0.0385	2.84E−02	815.1
170	16.00	0.59	0.1374	4.344	0.0470	3.30E−02	947.4
171	16.00	0.71	0.1262	3.988	0.0420	3.03E−02	869.8
172	17.00	0.00	0.1595	5.042	0.0568	3.83E−02	1099.7
173	17.00	0.25	0.1566	4.951	0.0556	3.76E−02	1079.8
174	17.00	0.38	0.1451	4.586	0.0504	3.48E−02	1000.3
175	17.00	0.48	0.1397	4.416	0.0480	3.35E−02	963.1
176	17.00	0.60	0.1431	4.523	0.0495	3.43E−02	986.4
177	18.00	0.00	0.2168	6.854	0.0823	5.20E−02	1494.8
178	18.00	0.25	0.1965	6.213	0.0733	4.71E−02	1355.1
179	18.00	0.38	0.1847	5.838	0.0680	4.43E−02	1273.3
180	18.00	0.50	0.1775	5.612	0.0649	4.26E−02	1224.1
181	18.50	0.00	0.2413	7.630	0.0932	5.79E−02	1664.1
182	18.50	0.25	0.2105	6.653	0.0795	5.05E−02	1451.1
183	18.50	0.38	0.1945	6.148	0.0724	4.66E−02	1340.9
184	18.60	0.42	0.1877	5.932	0.0694	4.50E−02	1293.9
185	18.50	0.47	0.1889	5.971	0.0699	4.53E−02	1302.3
186	19.20	0.00	0.2719	8.595	0.1068	6.52E−02	1874.6
187	19.20	0.25	0.2155	6.814	0.0818	5.17E−02	1486.1
188	19.20	0.38	0.1722	5.445	0.0625	4.13E−02	1187.6
189	19.30	0.42	0.1676	5.297	0.0604	4.02E−02	1155.3
190	19.20	0.47	0.1679	5.307	0.0606	4.03E−02	1157.3
191	20.00	0.00	0.2657	8.401	0.1041	6.37E−02	1832.2
192	20.00	0.25	0.2362	7.467	0.0909	5.67E−02	1628.6
193	20.00	0.38	0.1832	5.793	0.0674	4.40E−02	1263.5
194	20.10	0.42	0.1890	5.976	0.0700	4.53E−02	1303.5
195	20.00	0.47	0.1870	5.910	0.0690	4.48E−02	1289.0
196	20.80	0.00	0.2670	8.442	0.1047	6.41E−02	1841.3
197	20.80	0.25	0.2551	8.065	0.0993	6.12E−02	1758.9
198	20.80	0.38	0.2226	7.038	0.0849	5.34E−02	1535.0
199	20.90	0.42	0.2317	7.325	0.0889	5.56E−02	1597.6
200	20.80	0.47	0.2309	7.301	0.0886	5.54E−02	1592.3
201	21.60	0.00	0.2681	8.477	0.1051	6.43E−02	1848.8
202	21.60	0.25	0.2675	8.458	0.1049	6.42E−02	1844.6
203	21.60	0.38	0.2921	9.233	0.1158	7.01E−02	2013.8
204	21.70	0.42	0.2934	9.276	0.1164	7.04E−02	2023.0
205	21.60	0.47	0.2663	8.420	0.1043	6.39E−02	1836.3
206	22.40	0.00	0.2478	7.833	0.0961	5.94E−02	1708.5
207	22.40	0.25	0.2725	8.615	0.1071	6.54E−02	1879.0

Table A23. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.2709	8.564	0.1064	6.50E–02	1867.7
209	22.50	0.42	0.2918	9.224	0.1156	7.00E–02	2011.7
210	22.40	0.47	0.2906	9.189	0.1151	6.97E–02	2004.0
211	23.20	0.00	0.2522	7.974	0.0981	6.05E–02	1739.0
212	23.20	0.25	0.2537	8.020	0.0987	6.09E–02	1749.2
213	23.20	0.38	0.2562	8.101	0.0999	6.15E–02	1766.8
214	23.30	0.42	0.2565	8.109	0.1000	6.15E–02	1768.5
215	23.20	0.47	0.2493	7.880	0.0968	5.98E–02	1718.7
216	24.00	0.00	0.2574	8.137	0.1004	6.17E–02	1774.6
217	24.00	0.25	0.2609	8.250	0.1019	6.26E–02	1799.2
218	24.00	0.38	0.2591	8.191	0.1011	6.21E–02	1786.6
219	24.10	0.42	0.2730	8.631	0.1073	6.55E–02	1882.5
220	24.00	0.47	0.2713	8.578	0.1066	6.51E–02	1870.8
221	25.00	0.00	0.2723	8.609	0.1070	6.53E–02	1877.5
222	25.00	0.25	0.2696	8.524	0.1058	6.47E–02	1859.2
223	25.00	0.38	0.2646	8.365	0.1036	6.35E–02	1824.5
224	25.10	0.42	0.2645	8.362	0.1035	6.34E–02	1823.7
225	25.00	0.47	0.2569	8.121	0.1001	6.16E–02	1771.2
226	9.00	999.00	0.0674	2.132	0.0159	1.62E–02	464.9
227	0.00	–2.25	4.2231	133.510	1.8633	1.01E+00	29118.4
228	0.00	–0.29	4.1691	131.801	1.8393	1.00E+00	28745.7
229	0.00	2.25	4.1717	131.884	1.8405	1.00E+00	28763.8
230	18.23	0.00	0.1403	4.435	0.0483	3.37E–02	967.3
231	18.43	0.00	0.1662	5.253	0.0598	3.99E–02	1145.8
232	18.63	0.00	0.1808	5.716	0.0663	4.34E–02	1246.7
233	19.00	0.00	0.2043	6.458	0.0767	4.90E–02	1408.4
234	19.40	0.00	0.2353	7.438	0.0905	5.64E–02	1622.2
235	20.13	0.00	0.3518	11.122	0.1423	8.44E–02	2425.6
236	20.33	0.00	0.3959	12.515	0.1619	9.50E–02	2729.6
237	20.53	0.00	0.4488	14.188	0.1854	1.08E–01	3094.4
238	20.73	0.00	0.4926	15.572	0.2049	1.18E–01	3396.2
239	21.50	0.00	0.3705	11.711	0.1506	8.89E–02	2554.3
240	22.00	0.00	0.5498	17.382	0.2304	1.32E–01	3790.9
241	22.50	0.00	0.6193	19.577	0.2612	1.49E–01	4269.7
242	22.70	0.00	0.6954	21.984	0.2951	1.67E–01	4794.7
243	23.00	0.00	0.8061	25.485	0.3443	1.93E–01	5558.4
244	0.58	999.00	0.0677	2.141	0.0160	1.62E–02	467.0
245	0.86	999.00	0.0696	2.199	0.0169	1.67E–02	479.7
246	1.15	999.00	0.0681	2.152	0.0162	1.63E–02	469.3
247	1.43	999.00	0.0686	2.167	0.0164	1.64E–02	472.7
248	1.72	999.00	0.0673	2.128	0.0159	1.61E–02	464.1
249	2.00	999.00	0.0701	2.216	0.0171	1.68E–02	483.3
250	2.29	999.00	0.0682	2.157	0.0163	1.64E–02	470.5
251	2.57	999.00	0.0702	2.221	0.0172	1.68E–02	484.3
252	2.86	999.00	0.0692	2.188	0.0167	1.66E–02	477.3
253	3.14	999.00	0.0690	2.180	0.0166	1.65E–02	475.5
254	3.43	999.00	0.0688	2.174	0.0165	1.65E–02	474.2
255	999.00	999.00	0.0670	2.119	0.0157	1.61E–02	462.1
256	999.00	999.00	4.2218	133.467	1.8627	1.01E+00	29109.2

Table A24. Flow Conditions and Pressure Distribution for Run 61

[CR = 3; Re = 0.55×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	351.43	(.24231E+07)
$T_{t,1}$, °R (K)	1832.11	(1017.84)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0160	(8.23)
$h_{t,1}$, btu/lbm (J/kg)	459.63	(.10684E+07)
Free-stream conditions:		
M_∞	9.67	
p_∞, psia (N/m^2)	0.0100	(68.76)
T_∞, °R (K)	97.08	(53.94)
ρ_∞, slug/ft^3 (kg/m^3)	0.86187E−05	(.44419E−02)
h_∞, btu/lbm (J/kg)	0.23154E+02	(.53819E+05)
a_∞, ft/s (m/s)	483.38	(147.33)
u_∞, ft/s (m/s)	4673.46	(1424.47)
Re_∞, ft^{-1} (m^{-1})	0.55261E+06	(.18130E+07)
q_∞, psia (N/m^2)	0.654	(4506.55)
μ_∞, slug/ft-s (N-s/m^2)	0.72889E−07	(.34899E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.212	(8351.18)
$T_{t,2}$, °R (K)	1834.12	(1018.96)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.55432E−04	(.28569E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0345	3.653	0.0398	2.96E−02	237.6
2	11.18	0.20	0.0371	3.933	0.0440	3.18E−02	255.8
3	12.17	0.20	0.0386	4.089	0.0463	3.31E−02	265.9
4	13.15	0.20	0.0416	4.414	0.0512	3.57E−02	287.0
5	14.21	0.20	0.0429	4.548	0.0532	3.68E−02	295.8
6	15.14	0.20	0.0454	4.815	0.0572	3.90E−02	313.2
7	16.13	0.20	0.0506	5.369	0.0656	4.35E−02	349.2
8	17.12	0.20	0.0560	5.941	0.0741	4.81E−02	386.3
9	18.11	0.20	0.0611	6.474	0.0821	5.24E−02	421.0
10	19.74	0.20	0.0564	5.976	0.0747	4.84E−02	388.7
11	20.55	0.20	0.0611	6.475	0.0821	5.24E−02	421.1
12	22.56	0.20	0.0671	7.113	0.0917	5.76E−02	462.6
13	24.98	0.20	0.0736	7.809	0.1022	6.32E−02	507.8
14	10.59	0.60	0.0576	6.112	0.0767	4.95E−02	397.5
15	11.58	0.60	0.0486	5.158	0.0624	4.17E−02	335.4
16	12.57	0.60	0.0478	5.066	0.0610	4.10E−02	329.4
17	13.56	0.60	0.0470	4.983	0.0598	4.03E−02	324.1
18	14.60	0.60	0.0462	4.903	0.0586	3.97E−02	318.8
19	15.54	0.60	0.0500	5.299	0.0645	4.29E−02	344.6
20	16.53	0.60	0.0526	5.572	0.0686	4.51E−02	362.3
21	17.52	0.60	0.0587	6.221	0.0783	5.03E−02	404.6
22	18.51	0.60	0.0656	6.953	0.0893	5.63E−02	452.2
23	12.97	1.00	0.0548	5.811	0.0722	4.70E−02	377.9
24	15.00	1.00	0.0564	5.981	0.0747	4.84E−02	388.9
25	15.94	1.00	0.0561	5.950	0.0743	4.82E−02	386.9
26	16.93	1.00	0.0605	6.419	0.0813	5.19E−02	417.4
27	17.92	1.00	0.0695	7.369	0.0956	5.96E−02	479.2
28	18.91	1.00	0.0737	7.818	0.1023	6.33E−02	508.4
29	24.98	1.00	0.0637	6.752	0.0863	5.46E−02	439.1
30	11.99	2.00	0.0595	6.310	0.0797	5.11E−02	410.3
31	13.97	2.00	0.0527	5.583	0.0688	4.52E−02	363.1
32	15.98	2.00	0.0542	5.743	0.0712	4.65E−02	373.5
33	16.94	2.00	0.0563	5.970	0.0746	4.83E−02	388.3

Table A24. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0564	5.980	0.0747	4.84E−02	388.9
35	18.42	2.00	0.0592	6.278	0.0792	5.08E−02	408.3
36	18.92	2.00	0.0606	6.430	0.0815	5.20E−02	418.1
37	19.41	2.00	0.0636	6.742	0.0862	5.46E−02	438.4
38	19.91	2.00	0.0863	9.154	0.1223	7.41E−02	595.3
39	20.26	2.00	0.1232	13.064	0.1810	1.06E−01	849.6
40	21.11	2.00	0.0968	10.265	0.1390	8.31E−02	667.5
41	21.96	2.00	0.0881	9.338	0.1251	7.56E−02	607.3
42	22.74	2.00	0.0834	8.843	0.1177	7.16E−02	575.1
43	23.52	2.00	0.0835	8.849	0.1178	7.16E−02	575.5
44	24.98	2.00	0.0883	9.363	0.1255	7.58E−02	608.9
45	17.94	3.00	0.0473	5.018	0.0603	4.06E−02	326.3
46	18.93	3.00	0.0653	6.923	0.0889	5.60E−02	450.2
47	19.92	3.00	0.0818	8.676	0.1152	7.02E−02	564.2
48	20.91	3.00	0.1089	11.544	0.1582	9.34E−02	750.7
49	22.11	3.00	0.1488	15.772	0.2216	1.28E−01	1025.7
50	22.96	3.00	0.1744	18.494	0.2625	1.50E−01	1202.7
51	23.74	3.00	0.1637	17.355	0.2454	1.40E−01	1128.6
52	24.98	3.00	0.1628	17.264	0.2440	1.40E−01	1122.7
53	18.34	3.40	0.0508	5.382	0.0658	4.36E−02	350.0
54	19.32	3.40	0.0758	8.037	0.1056	6.50E−02	522.6
55	19.82	3.40	0.0774	8.208	0.1082	6.64E−02	533.8
56	20.32	3.40	0.0882	9.356	0.1254	7.57E−02	608.4
57	20.81	3.40	0.0989	10.489	0.1424	8.49E−02	682.1
58	21.31	3.40	0.1327	14.071	0.1961	1.14E−01	915.0
59	21.66	3.40	0.1578	16.733	0.2361	1.35E−01	1088.2
60	22.94	3.40	0.2335	24.753	0.3564	2.00E−01	1609.7
61	23.75	3.40	0.2226	23.599	0.3391	1.91E−01	1534.6
62	24.14	3.40	0.2025	21.466	0.3071	1.74E−01	1395.9
63	22.29	3.60	0.1950	20.673	0.2952	1.67E−01	1344.3
64	22.71	3.60	0.2163	22.934	0.3291	1.86E−01	1491.4
65	23.14	3.60	0.2245	23.803	0.3421	1.93E−01	1547.9
66	23.95	3.60	0.2029	21.508	0.3077	1.74E−01	1398.7
67	24.34	3.60	0.1860	19.723	0.2809	1.60E−01	1282.6
68	13.79	3.80	0.0473	5.012	0.0602	4.06E−02	325.9
69	15.77	3.80	0.0398	4.225	0.0484	3.42E−02	274.7
70	17.75	3.80	0.0407	4.313	0.0497	3.49E−02	280.5
71	19.23	3.80	0.0668	7.081	0.0912	5.73E−02	460.5
72	19.73	3.80	0.0683	7.246	0.0937	5.86E−02	471.2
73	20.22	3.80	0.0778	8.246	0.1087	6.67E−02	536.2
74	20.72	3.80	0.1001	10.616	0.1443	8.59E−02	690.4
75	21.41	3.80	0.1456	15.439	0.2166	1.25E−01	1004.0
76	21.71	3.80	0.1767	18.734	0.2661	1.52E−01	1218.3
77	22.06	3.80	0.2034	21.567	0.3086	1.75E−01	1402.5
78	22.49	3.80	0.2205	23.379	0.3358	1.89E−01	1520.3
79	22.76	3.80	0.2565	27.192	0.3930	2.20E−01	1768.3
80	22.91	3.80	0.2692	28.540	0.4132	2.31E−01	1856.0
81	23.76	3.80	0.2723	28.868	0.4181	2.34E−01	1877.3
82	24.15	3.80	0.2521	26.735	0.3861	2.16E−01	1738.6
83	24.98	3.80	0.1984	21.038	0.3007	1.70E−01	1368.1
84	22.59	3.90	0.2657	28.172	0.4077	2.28E−01	1832.1
85	22.80	3.90	0.2886	30.604	0.4442	2.48E−01	1990.2
86	23.01	3.90	0.2838	30.091	0.4365	2.44E−01	1956.8
87	23.15	3.90	0.2785	29.526	0.4280	2.39E−01	1920.1
88	23.86	3.90	0.2546	26.999	0.3901	2.19E−01	1755.7
89	24.25	3.90	0.2185	23.165	0.3326	1.87E−01	1506.4
90	11.99	2.00	0.0599	6.356	0.0804	5.14E−02	413.3
91	13.97	2.00	0.0534	5.665	0.0700	4.58E−02	368.4

Table A24. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0541	5.737	0.0711	4.64E−02	373.1
93	17.93	2.00	0.0563	5.966	0.0745	4.83E−02	388.0
94	19.91	2.00	0.0859	9.105	0.1216	7.37E−02	592.1
95	1.00	0.00	0.0304	3.225	0.0334	2.61E−02	209.7
96	1.00	0.66	0.0292	3.097	0.0315	2.51E−02	201.4
97	1.00	1.28	0.0293	3.105	0.0316	2.51E−02	201.9
98	1.00	1.90	0.0295	3.132	0.0320	2.53E−02	203.7
99	2.50	0.00	0.0246	2.611	0.0242	2.11E−02	169.8
100	4.00	0.00	0.0242	2.569	0.0235	2.08E−02	167.1
101	4.00	0.66	0.0234	2.476	0.0221	2.00E−02	161.0
102	4.00	1.90	0.0233	2.468	0.0220	2.00E−02	160.5
103	5.50	0.00	0.0224	2.372	0.0206	1.92E−02	154.2
104	7.00	0.00	0.0229	2.432	0.0215	1.97E−02	158.1
105	8.00	−1.90	0.0244	2.583	0.0238	2.09E−02	168.0
106	8.00	−1.50	0.0243	2.580	0.0237	2.09E−02	167.8
107	8.00	−1.11	0.0261	2.772	0.0266	2.24E−02	180.3
108	8.00	−0.66	0.0271	2.868	0.0280	2.32E−02	186.5
109	8.00	0.00	0.0268	2.846	0.0277	2.30E−02	185.1
110	8.00	0.25	0.0267	2.832	0.0275	2.29E−02	184.2
111	8.00	0.38	0.0279	2.963	0.0295	2.40E−02	192.7
112	8.00	0.66	0.0267	2.829	0.0274	2.29E−02	183.9
113	8.00	1.11	0.0253	2.679	0.0252	2.17E−02	174.2
114	8.00	1.50	0.0241	2.559	0.0234	2.07E−02	166.4
115	8.00	1.90	0.0227	2.411	0.0212	1.95E−02	156.8
116	9.00	0.00	0.0317	3.365	0.0355	2.72E−02	218.8
117	9.00	0.25	0.0321	3.401	0.0360	2.75E−02	221.2
118	9.00	0.38	0.0310	3.291	0.0344	2.66E−02	214.0
119	9.00	0.66	0.0312	3.306	0.0346	2.68E−02	215.0
120	9.00	1.01	0.0315	3.336	0.0351	2.70E−02	217.0
121	9.00	1.32	0.0286	3.030	0.0305	2.45E−02	197.0
122	10.00	0.00	0.0332	3.518	0.0378	2.85E−02	228.8
123	10.00	0.25	0.0329	3.487	0.0373	2.82E−02	226.8
124	10.00	0.38	0.0332	3.518	0.0378	2.85E−02	228.8
125	10.00	0.66	0.0333	3.530	0.0380	2.86E−02	229.5
126	10.00	0.90	0.0321	3.406	0.0361	2.76E−02	221.5
127	10.00	1.08	0.0331	3.511	0.0377	2.84E−02	228.3
128	10.00	1.22	0.0307	3.250	0.0338	2.63E−02	211.4
129	10.00	1.34	0.0332	3.520	0.0378	2.85E−02	228.9
130	11.00	0.00	0.0317	3.356	0.0354	2.72E−02	218.3
131	11.00	0.25	0.0351	3.717	0.0408	3.01E−02	241.7
132	11.00	0.38	0.0347	3.683	0.0403	2.98E−02	239.5
133	11.00	0.52	0.0344	3.644	0.0397	2.95E−02	237.0
134	11.00	0.80	0.0332	3.519	0.0378	2.85E−02	228.8
135	11.00	0.97	0.0327	3.466	0.0370	2.80E−02	225.4
136	11.00	1.11	0.0346	3.665	0.0400	2.97E−02	238.4
137	11.00	1.23	0.0364	3.860	0.0429	3.12E−02	251.0
138	12.00	0.00	0.0378	4.004	0.0451	3.24E−02	260.4
139	12.00	0.25	0.0372	3.949	0.0442	3.20E−02	256.8
140	12.00	0.38	0.0371	3.931	0.0440	3.18E−02	255.7
141	12.00	0.52	0.0369	3.913	0.0437	3.17E−02	254.4
142	12.00	0.69	0.0335	3.547	0.0382	2.87E−02	230.6
143	12.00	0.87	0.0371	3.931	0.0440	3.18E−02	255.7
144	12.00	1.01	0.0378	4.009	0.0451	3.24E−02	260.7
145	12.00	1.13	0.0377	4.001	0.0450	3.24E−02	260.2
146	13.00	0.00	0.0399	4.233	0.0485	3.43E−02	275.2
147	13.00	0.25	0.0395	4.188	0.0478	3.39E−02	272.3
148	13.00	0.38	0.0392	4.160	0.0474	3.37E−02	270.5
149	13.00	0.52	0.0396	4.197	0.0480	3.40E−02	273.0

Table A24. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0408	4.329	0.0500	3.50E−02	281.5
151	13.00	0.76	0.0416	4.413	0.0512	3.57E−02	287.0
152	13.00	0.90	0.0388	4.109	0.0466	3.33E−02	267.2
153	13.00	1.02	0.0402	4.264	0.0490	3.45E−02	277.3
154	14.00	0.00	0.0435	4.612	0.0542	3.73E−02	299.9
155	14.00	0.25	0.0415	4.397	0.0510	3.56E−02	286.0
156	14.00	0.38	0.0420	4.451	0.0518	3.60E−02	289.4
157	14.00	0.52	0.0404	4.284	0.0493	3.47E−02	278.6
158	14.00	0.66	0.0457	4.848	0.0577	3.92E−02	315.3
159	14.00	0.80	0.0431	4.568	0.0535	3.70E−02	297.1
160	14.00	0.92	0.0403	4.269	0.0490	3.45E−02	277.6
161	15.00	0.00	0.0475	5.039	0.0606	4.08E−02	327.7
162	15.00	0.25	0.0469	4.969	0.0595	4.02E−02	323.1
163	15.00	0.38	0.0445	4.716	0.0558	3.82E−02	306.7
164	15.00	0.69	0.0469	4.967	0.0595	4.02E−02	323.0
165	15.00	0.81	0.0465	4.935	0.0590	3.99E−02	320.9
166	16.00	0.00	0.0520	5.511	0.0677	4.46E−02	358.4
167	16.00	0.25	0.0512	5.430	0.0665	4.39E−02	353.1
168	16.00	0.38	0.0499	5.292	0.0644	4.28E−02	344.1
169	16.00	0.48	0.0491	5.203	0.0631	4.21E−02	338.4
170	16.00	0.59	0.0499	5.290	0.0644	4.28E−02	344.0
171	16.00	0.71	0.0498	5.283	0.0643	4.28E−02	343.5
172	17.00	0.00	0.0590	6.251	0.0788	5.06E−02	406.5
173	17.00	0.25	0.0557	5.904	0.0736	4.78E−02	384.0
174	17.00	0.38	0.0573	6.075	0.0762	4.92E−02	395.1
175	17.00	0.48	0.0537	5.693	0.0704	4.61E−02	370.2
176	17.00	0.60	0.0586	6.216	0.0783	5.03E−02	404.2
177	18.00	0.00	0.0685	7.258	0.0939	5.87E−02	472.0
178	18.00	0.25	0.0646	6.848	0.0877	5.54E−02	445.3
179	18.00	0.38	0.0653	6.928	0.0889	5.61E−02	450.5
180	18.00	0.50	0.0601	6.368	0.0805	5.15E−02	414.1
181	18.50	0.00	0.0698	7.405	0.0961	5.99E−02	481.5
182	18.50	0.25	0.0685	7.266	0.0940	5.88E−02	472.5
183	18.50	0.38	0.0626	6.636	0.0846	5.37E−02	431.5
184	18.60	0.42	0.0614	6.512	0.0827	5.27E−02	423.5
185	18.50	0.47	0.0642	6.805	0.0871	5.51E−02	442.6
186	19.20	0.00	0.0741	7.857	0.1029	6.36E−02	510.9
187	19.20	0.25	0.0683	7.242	0.0937	5.86E−02	471.0
188	19.20	0.38	0.0596	6.321	0.0798	5.12E−02	411.0
189	19.30	0.42	0.0585	6.199	0.0780	5.02E−02	403.1
190	19.20	0.47	0.0598	6.342	0.0802	5.13E−02	412.5
191	20.00	0.00	0.0697	7.387	0.0958	5.98E−02	480.4
192	20.00	0.25	0.0652	6.916	0.0888	5.60E−02	449.8
193	20.00	0.38	0.0612	6.493	0.0824	5.25E−02	422.2
194	20.10	0.42	0.0620	6.578	0.0837	5.32E−02	427.8
195	20.00	0.47	0.0593	6.292	0.0794	5.09E−02	409.1
196	20.80	0.00	0.0745	7.903	0.1036	6.40E−02	514.0
197	20.80	0.25	0.0697	7.393	0.0959	5.98E−02	480.8
198	20.80	0.38	0.0651	6.907	0.0886	5.59E−02	449.2
199	20.90	0.42	0.0667	7.071	0.0911	5.72E−02	459.8
200	20.80	0.47	0.0651	6.902	0.0886	5.59E−02	448.8
201	21.60	0.00	0.0717	7.604	0.0991	6.15E−02	494.5
202	21.60	0.25	0.0706	7.482	0.0973	6.06E−02	486.6
203	21.60	0.38	0.0730	7.741	0.1011	6.26E−02	503.4
204	21.70	0.42	0.0727	7.711	0.1007	6.24E−02	501.5
205	21.60	0.47	0.0739	7.831	0.1025	6.34E−02	509.2
206	22.40	0.00	0.0714	7.570	0.0986	6.13E−02	492.2
207	22.40	0.25	0.0727	7.713	0.1007	6.24E−02	501.6

Table A24. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.0717	7.607	0.0991	6.16E–02	494.7
209	22.50	0.42	0.0781	8.278	0.1092	6.70E–02	538.3
210	22.40	0.47	0.0777	8.242	0.1087	6.67E–02	535.9
211	23.20	0.00	0.0754	7.999	0.1050	6.47E–02	520.2
212	23.20	0.25	0.0738	7.823	0.1024	6.33E–02	508.7
213	23.20	0.38	0.0771	8.173	0.1076	6.61E–02	531.5
214	23.30	0.42	0.0754	7.990	0.1049	6.47E–02	519.6
215	23.20	0.47	0.0709	7.516	0.0978	6.08E–02	488.8
216	24.00	0.00	0.0729	7.731	0.1010	6.26E–02	502.8
217	24.00	0.25	0.0796	8.443	0.1117	6.83E–02	549.0
218	24.00	0.38	0.0799	8.473	0.1121	6.86E–02	551.0
219	24.10	0.42	0.0806	8.541	0.1131	6.91E–02	555.4
220	24.00	0.47	0.0796	8.443	0.1117	6.83E–02	549.1
221	25.00	0.00	0.0823	8.722	0.1159	7.06E–02	567.2
222	25.00	0.25	0.0789	8.369	0.1106	6.77E–02	544.2
223	25.00	0.38	0.0741	7.858	0.1029	6.36E–02	511.0
224	25.10	0.42	0.0737	7.817	0.1023	6.33E–02	508.3
225	25.00	0.47	0.0738	7.821	0.1023	6.33E–02	508.6
226	9.00	999.00	0.0266	2.824	0.0274	2.29E–02	183.6
227	0.00	–2.25	1.1603	123.021	1.8308	9.96E–01	8000.1
228	0.00	–0.29	1.1390	120.762	1.7969	9.77E–01	7853.2
229	0.00	2.25	1.1387	120.732	1.7965	9.77E–01	7851.2
230	20.58	0.00	0.1962	20.806	0.2972	1.68E–01	1353.0
231	20.78	0.00	0.2104	22.308	0.3197	1.81E–01	1450.7
232	20.98	0.00	0.2387	25.313	0.3648	2.05E–01	1646.1
233	21.38	0.00	0.3192	33.843	0.4928	2.74E–01	2200.8
234	21.78	0.00	0.4276	45.342	0.6653	3.67E–01	2948.6
235	22.51	0.00	0.2390	25.340	0.3652	2.05E–01	1647.9
236	22.71	0.00	0.1871	19.842	0.2827	1.61E–01	1290.3
237	22.91	0.00	0.1684	17.852	0.2529	1.44E–01	1160.9
238	23.11	0.00	0.1682	17.831	0.2525	1.44E–01	1159.6
239	23.88	0.00	0.1078	11.427	0.1565	9.25E–02	743.1
240	24.38	0.00	0.1994	21.137	0.3021	1.71E–01	1374.5
241	24.88	0.00	0.2381	25.244	0.3638	2.04E–01	1641.6
242	25.08	0.00	0.2474	26.227	0.3785	2.12E–01	1705.6
243	25.38	0.00	0.2534	26.872	0.3882	2.17E–01	1747.5
244	0.58	999.00	0.0264	2.795	0.0269	2.26E–02	181.8
245	0.86	999.00	0.0280	2.968	0.0295	2.40E–02	193.0
246	1.15	999.00	0.0264	2.803	0.0271	2.27E–02	182.3
247	1.43	999.00	0.0276	2.930	0.0290	2.37E–02	190.5
248	1.72	999.00	0.0261	2.765	0.0265	2.24E–02	179.8
249	2.00	999.00	0.0293	3.105	0.0316	2.51E–02	201.9
250	2.29	999.00	0.0258	2.740	0.0261	2.22E–02	178.2
251	2.57	999.00	0.0284	3.007	0.0301	2.43E–02	195.5
252	2.86	999.00	0.0275	2.917	0.0288	2.36E–02	189.7
253	3.14	999.00	0.0279	2.957	0.0294	2.39E–02	192.3
254	3.43	999.00	0.0272	2.881	0.0282	2.33E–02	187.3
255	999.00	999.00	0.0267	2.831	0.0275	2.29E–02	184.1
256	999.00	999.00	1.1607	123.065	1.8315	9.96E–01	8003.0

Table A25. Flow Conditions and Pressure Distribution for Run 62

[CR = 3; Re = 2.15×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1437.91	(.99140E+07)
$T_{t,1}$, °R (K)	1826.95	(1014.97)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0639	(32.93)
$h_{t,1}$, btu/lbm (J/kg)	460.02	(.10693E+07)
Free-stream conditions:		
M_∞	9.93	
p_∞, psia (N/m^2)	0.0349	(240.43)
T_∞, °R (K)	92.43	(51.35)
ρ_∞, slug/ft^3 (kg/m^3)	0.31653E−04	(.16313E−01)
h_∞, btu/lbm (J/kg)	0.22043E+02	(.51237E+05)
a_∞, ft/s (m/s)	471.64	(143.76)
u_∞, ft/s (m/s)	4681.49	(1426.92)
Re_∞, ft^{-1} (m^{-1})	0.21545E+07	(.70684E+07)
q_∞, psia (N/m^2)	2.409	(16607.58)
μ_∞, slug/ft-s (N-s/m^2)	0.68779E−07	(.32932E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.465	(30783.58)
$T_{t,2}$, °R (K)	1835.55	(1019.75)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20408E−03	(.10518E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0729	2.297	0.0182	1.74E−02	502.4
2	11.18	0.20	0.0789	2.486	0.0209	1.89E−02	543.8
3	12.17	0.20	0.0851	2.681	0.0237	2.04E−02	586.5
4	13.15	0.20	0.0922	2.906	0.0268	2.21E−02	635.7
5	14.21	0.20	0.0953	3.004	0.0282	2.28E−02	657.2
6	15.14	0.20	0.1140	3.594	0.0365	2.73E−02	786.1
7	16.13	0.20	0.1268	3.997	0.0422	3.03E−02	874.2
8	17.12	0.20	0.1441	4.543	0.0499	3.45E−02	993.8
9	18.11	0.20	0.1828	5.761	0.0670	4.37E−02	1260.3
10	19.74	0.20	0.1653	5.211	0.0593	3.96E−02	1139.9
11	20.55	0.20	0.1968	6.204	0.0732	4.71E−02	1357.1
12	22.56	0.20	0.2169	6.836	0.0821	5.19E−02	1495.4
13	24.98	0.20	0.2344	7.388	0.0899	5.61E−02	1616.0
14	10.59	0.60	0.1322	4.168	0.0446	3.16E−02	911.7
15	11.58	0.60	0.1173	3.699	0.0380	2.81E−02	809.1
16	12.57	0.60	0.1264	3.985	0.0420	3.03E−02	871.7
17	13.56	0.60	0.1286	4.054	0.0430	3.08E−02	886.8
18	14.60	0.60	0.1291	4.070	0.0432	3.09E−02	890.3
19	15.54	0.60	0.1329	4.188	0.0449	3.18E−02	916.2
20	16.53	0.60	0.1351	4.258	0.0458	3.23E−02	931.4
21	17.52	0.60	0.1472	4.639	0.0512	3.52E−02	1014.8
22	18.51	0.60	0.1829	5.766	0.0671	4.38E−02	1261.3
23	12.97	1.00	0.1344	4.238	0.0456	3.22E−02	927.0
24	15.00	1.00	0.1354	4.268	0.0460	3.24E−02	933.7
25	15.94	1.00	0.1414	4.458	0.0487	3.38E−02	975.1
26	16.93	1.00	0.1435	4.524	0.0496	3.43E−02	989.6
27	17.92	1.00	0.1505	4.744	0.0527	3.60E−02	1037.7
28	18.91	1.00	0.1688	5.320	0.0608	4.04E−02	1163.7
29	24.98	1.00	0.2161	6.811	0.0818	5.17E−02	1489.8
30	11.99	2.00	0.1733	5.463	0.0628	4.15E−02	1194.9
31	13.97	2.00	0.1441	4.543	0.0499	3.45E−02	993.8
32	15.98	2.00	0.1454	4.582	0.0504	3.48E−02	1002.3
33	16.94	2.00	0.1495	4.711	0.0522	3.58E−02	1030.5

Table A25. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1465	4.619	0.0509	3.51E−02	1010.3
35	18.42	2.00	0.1493	4.706	0.0521	3.57E−02	1029.3
36	18.92	2.00	0.1518	4.784	0.0532	3.63E−02	1046.4
37	19.41	2.00	0.1527	4.815	0.0537	3.66E−02	1053.2
38	19.91	2.00	0.1559	4.916	0.0551	3.73E−02	1075.2
39	20.26	2.00	0.1632	5.144	0.0583	3.91E−02	1125.2
40	21.11	2.00	0.2156	6.796	0.0816	5.16E−02	1486.6
41	21.96	2.00	0.3023	9.528	0.1200	7.23E−02	2084.2
42	22.74	2.00	0.3389	10.681	0.1362	8.11E−02	2336.4
43	23.52	2.00	0.3421	10.784	0.1377	8.19E−02	2358.9
44	24.98	2.00	0.3273	10.316	0.1311	7.83E−02	2256.5
45	17.94	3.00	0.1335	4.208	0.0451	3.20E−02	920.6
46	18.93	3.00	0.1375	4.335	0.0469	3.29E−02	948.3
47	19.92	3.00	0.2092	6.594	0.0787	5.01E−02	1442.3
48	20.91	3.00	0.2472	7.793	0.0956	5.92E−02	1704.6
49	22.11	3.00	0.3154	9.942	0.1258	7.55E−02	2174.8
50	22.96	3.00	0.3854	12.148	0.1569	9.22E−02	2657.2
51	23.74	3.00	0.4155	13.098	0.1702	9.94E−02	2865.0
52	24.98	3.00	0.4308	13.580	0.1770	1.03E−01	2970.6
53	18.34	3.40	0.1243	3.919	0.0411	2.98E−02	857.3
54	19.32	3.40	0.1682	5.303	0.0605	4.03E−02	1159.9
55	19.82	3.40	0.2046	6.449	0.0767	4.90E−02	1410.7
56	20.32	3.40	0.2293	7.229	0.0876	5.49E−02	1581.2
57	20.81	3.40	0.2452	7.730	0.0947	5.87E−02	1690.8
58	21.31	3.40	0.2671	8.420	0.1044	6.39E−02	1841.9
59	21.66	3.40	0.2899	9.137	0.1145	6.94E−02	1998.6
60	22.94	3.40	0.4457	14.050	0.1836	1.07E−01	3073.3
61	23.75	3.40	0.4360	13.743	0.1793	1.04E−01	3006.2
62	24.14	3.40	0.4345	13.697	0.1787	1.04E−01	2996.2
63	22.29	3.60	0.3720	11.728	0.1510	8.90E−02	2565.3
64	22.71	3.60	0.4131	13.021	0.1692	9.89E−02	2848.3
65	23.14	3.60	0.4429	13.961	0.1824	1.06E−01	3053.9
66	23.95	3.60	0.4700	14.816	0.1944	1.12E−01	3240.8
67	24.34	3.60	0.4880	15.382	0.2024	1.17E−01	3364.6
68	13.79	3.80	0.1372	4.325	0.0468	3.28E−02	946.0
69	15.77	3.80	0.1142	3.601	0.0366	2.73E−02	787.7
70	17.75	3.80	0.1108	3.493	0.0351	2.65E−02	764.1
71	19.23	3.80	0.1707	5.381	0.0617	4.09E−02	1177.1
72	19.73	3.80	0.2062	6.501	0.0774	4.94E−02	1422.0
73	20.22	3.80	0.2254	7.105	0.0859	5.39E−02	1554.2
74	20.72	3.80	0.2403	7.574	0.0925	5.75E−02	1656.8
75	21.41	3.80	0.2768	8.725	0.1087	6.62E−02	1908.6
76	21.71	3.80	0.2993	9.434	0.1187	7.16E−02	2063.7
77	22.06	3.80	0.3725	11.741	0.1511	8.91E−02	2568.3
78	22.49	3.80	0.4222	13.310	0.1732	1.01E−01	2911.3
79	22.76	3.80	0.5015	15.809	0.2084	1.20E−01	3458.1
80	22.91	3.80	0.5023	15.832	0.2087	1.20E−01	3463.0
81	23.76	3.80	0.5586	17.607	0.2337	1.34E−01	3851.3
82	24.15	3.80	0.5948	18.750	0.2498	1.42E−01	4101.4
83	24.98	3.80	0.6778	21.365	0.2866	1.62E−01	4673.5
84	22.59	3.90	0.4512	14.222	0.1860	1.08E−01	3110.8
85	22.80	3.90	0.4814	15.175	0.1995	1.15E−01	3319.4
86	23.01	3.90	0.4940	15.573	0.2051	1.18E−01	3406.5
87	23.15	3.90	0.5066	15.969	0.2106	1.21E−01	3493.1
88	23.86	3.90	0.5737	18.083	0.2404	1.37E−01	3955.5
89	24.25	3.90	0.5756	18.145	0.2413	1.38E−01	3969.0
90	11.99	2.00	0.1756	5.536	0.0638	4.20E−02	1210.9
91	13.97	2.00	0.1546	4.874	0.0545	3.70E−02	1066.2

Table A25. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1501	4.732	0.0525	3.59E−02	1035.1
93	17.93	2.00	0.1521	4.795	0.0534	3.64E−02	1048.8
94	19.91	2.00	0.1552	4.892	0.0548	3.71E−02	1070.0
95	1.00	0.00	0.0690	2.175	0.0165	1.65E−02	475.9
96	1.00	0.66	0.0669	2.108	0.0156	1.60E−02	461.0
97	1.00	1.28	0.0669	2.108	0.0156	1.60E−02	461.1
98	1.00	1.90	0.0679	2.141	0.0160	1.63E−02	468.2
99	2.50	0.00	0.0541	1.706	0.0099	1.30E−02	373.2
100	4.00	0.00	0.0503	1.587	0.0083	1.20E−02	347.1
101	4.00	0.66	0.0502	1.582	0.0082	1.20E−02	346.0
102	4.00	1.90	0.0497	1.567	0.0080	1.19E−02	342.7
103	5.50	0.00	0.0485	1.529	0.0074	1.16E−02	334.5
104	7.00	0.00	0.0480	1.513	0.0072	1.15E−02	330.9
105	8.00	−1.90	0.0471	1.483	0.0068	1.13E−02	324.5
106	8.00	−1.50	0.0477	1.504	0.0071	1.14E−02	329.0
107	8.00	−1.11	0.0481	1.517	0.0073	1.15E−02	331.8
108	8.00	−0.66	0.0475	1.499	0.0070	1.14E−02	327.8
109	8.00	0.00	0.0479	1.511	0.0072	1.15E−02	330.5
110	8.00	0.25	0.0471	1.486	0.0068	1.13E−02	325.1
111	8.00	0.38	0.0478	1.506	0.0071	1.14E−02	329.4
112	8.00	0.66	0.0477	1.504	0.0071	1.14E−02	329.1
113	8.00	1.11	0.0472	1.487	0.0069	1.13E−02	325.3
114	8.00	1.50	0.0470	1.481	0.0068	1.12E−02	324.1
115	8.00	1.90	0.0465	1.466	0.0066	1.11E−02	320.7
116	9.00	0.00	0.0485	1.529	0.0074	1.16E−02	334.5
117	9.00	0.25	0.0485	1.530	0.0075	1.16E−02	334.7
118	9.00	0.38	0.0482	1.521	0.0073	1.15E−02	332.6
119	9.00	0.66	0.0489	1.543	0.0076	1.17E−02	337.4
120	9.00	1.01	0.0535	1.687	0.0097	1.28E−02	369.1
121	9.00	1.32	0.0550	1.735	0.0103	1.32E−02	379.5
122	10.00	0.00	0.0672	2.119	0.0157	1.61E−02	463.5
123	10.00	0.25	0.0668	2.107	0.0156	1.60E−02	460.8
124	10.00	0.38	0.0674	2.124	0.0158	1.61E−02	464.6
125	10.00	0.66	0.0670	2.111	0.0156	1.60E−02	461.7
126	10.00	0.90	0.0656	2.067	0.0150	1.57E−02	452.2
127	10.00	1.08	0.0662	2.088	0.0153	1.59E−02	456.7
128	10.00	1.22	0.0671	2.115	0.0157	1.61E−02	462.5
129	10.00	1.34	0.0746	2.352	0.0190	1.79E−02	514.5
130	11.00	0.00	0.0762	2.403	0.0197	1.82E−02	525.6
131	11.00	0.25	0.0738	2.328	0.0187	1.77E−02	509.1
132	11.00	0.38	0.0740	2.333	0.0188	1.77E−02	510.4
133	11.00	0.52	0.0744	2.345	0.0189	1.78E−02	513.1
134	11.00	0.80	0.0714	2.250	0.0176	1.71E−02	492.3
135	11.00	0.97	0.0718	2.265	0.0178	1.72E−02	495.4
136	11.00	1.11	0.0776	2.445	0.0203	1.86E−02	534.8
137	11.00	1.23	0.0880	2.775	0.0250	2.11E−02	607.1
138	12.00	0.00	0.0780	2.459	0.0205	1.87E−02	537.9
139	12.00	0.25	0.0774	2.440	0.0203	1.85E−02	533.6
140	12.00	0.38	0.0777	2.449	0.0204	1.86E−02	535.6
141	12.00	0.52	0.0775	2.444	0.0203	1.86E−02	534.6
142	12.00	0.69	0.0760	2.396	0.0196	1.82E−02	524.1
143	12.00	0.87	0.0762	2.403	0.0197	1.82E−02	525.6
144	12.00	1.01	0.0853	2.690	0.0238	2.04E−02	588.3
145	12.00	1.13	0.0946	2.981	0.0279	2.26E−02	652.1
146	13.00	0.00	0.0807	2.544	0.0217	1.93E−02	556.4
147	13.00	0.25	0.0806	2.541	0.0217	1.93E−02	555.7
148	13.00	0.38	0.0802	2.527	0.0215	1.92E−02	552.8
149	13.00	0.52	0.0786	2.477	0.0208	1.88E−02	541.8

Table A25. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0775	2.444	0.0203	1.86E−02	534.7
151	13.00	0.76	0.0801	2.525	0.0215	1.92E−02	552.4
152	13.00	0.90	0.0965	3.041	0.0287	2.31E−02	665.3
153	13.00	1.02	0.1033	3.256	0.0317	2.47E−02	712.3
154	14.00	0.00	0.0871	2.747	0.0246	2.09E−02	600.8
155	14.00	0.25	0.0861	2.713	0.0241	2.06E−02	593.4
156	14.00	0.38	0.0848	2.674	0.0236	2.03E−02	584.9
157	14.00	0.52	0.0833	2.627	0.0229	1.99E−02	574.6
158	14.00	0.66	0.0817	2.577	0.0222	1.96E−02	563.6
159	14.00	0.80	0.0976	3.077	0.0292	2.34E−02	673.0
160	14.00	0.92	0.1041	3.281	0.0321	2.49E−02	717.6
161	15.00	0.00	0.0977	3.078	0.0292	2.34E−02	673.4
162	15.00	0.25	0.0964	3.038	0.0287	2.31E−02	664.6
163	15.00	0.38	0.0940	2.963	0.0276	2.25E−02	648.0
164	15.00	0.69	0.1125	3.545	0.0358	2.69E−02	775.5
165	15.00	0.81	0.1167	3.678	0.0377	2.79E−02	804.6
166	16.00	0.00	0.1215	3.829	0.0398	2.91E−02	837.6
167	16.00	0.25	0.1188	3.744	0.0386	2.84E−02	819.1
168	16.00	0.38	0.1141	3.598	0.0366	2.73E−02	787.1
169	16.00	0.48	0.1208	3.808	0.0395	2.89E−02	832.9
170	16.00	0.59	0.1406	4.431	0.0483	3.36E−02	969.1
171	16.00	0.71	0.1282	4.041	0.0428	3.07E−02	884.0
172	17.00	0.00	0.1598	5.038	0.0568	3.82E−02	1102.0
173	17.00	0.25	0.1581	4.984	0.0561	3.78E−02	1090.2
174	17.00	0.38	0.1460	4.601	0.0507	3.49E−02	1006.4
175	17.00	0.48	0.1418	4.468	0.0488	3.39E−02	977.4
176	17.00	0.60	0.1438	4.532	0.0497	3.44E−02	991.3
177	18.00	0.00	0.2167	6.832	0.0821	5.19E−02	1494.4
178	18.00	0.25	0.1976	6.228	0.0736	4.73E−02	1362.3
179	18.00	0.38	0.1861	5.866	0.0685	4.45E−02	1283.1
180	18.00	0.50	0.1786	5.631	0.0652	4.27E−02	1231.6
181	18.50	0.00	0.2421	7.632	0.0933	5.79E−02	1669.3
182	18.50	0.25	0.2127	6.704	0.0803	5.09E−02	1466.5
183	18.50	0.38	0.1961	6.182	0.0729	4.69E−02	1352.3
184	18.60	0.42	0.1889	5.955	0.0697	4.52E−02	1302.6
185	18.50	0.47	0.1896	5.976	0.0700	4.54E−02	1307.2
186	19.20	0.00	0.2720	8.574	0.1066	6.51E−02	1875.4
187	19.20	0.25	0.2161	6.810	0.0818	5.17E−02	1489.7
188	19.20	0.38	0.1729	5.451	0.0626	4.14E−02	1192.4
189	19.30	0.42	0.1687	5.317	0.0608	4.04E−02	1163.1
190	19.20	0.47	0.1696	5.345	0.0611	4.06E−02	1169.1
191	20.00	0.00	0.2666	8.403	0.1042	6.38E−02	1838.1
192	20.00	0.25	0.2373	7.480	0.0912	5.68E−02	1636.1
193	20.00	0.38	0.1833	5.779	0.0672	4.39E−02	1264.1
194	20.10	0.42	0.1910	6.021	0.0707	4.57E−02	1317.1
195	20.00	0.47	0.1871	5.899	0.0689	4.48E−02	1290.3
196	20.80	0.00	0.2672	8.422	0.1044	6.39E−02	1842.3
197	20.80	0.25	0.2567	8.091	0.0998	6.14E−02	1769.9
198	20.80	0.38	0.2224	7.010	0.0846	5.32E−02	1533.4
199	20.90	0.42	0.2327	7.335	0.0891	5.57E−02	1604.5
200	20.80	0.47	0.2315	7.296	0.0886	5.54E−02	1595.9
201	21.60	0.00	0.2697	8.502	0.1056	6.45E−02	1859.7
202	21.60	0.25	0.2676	8.434	0.1046	6.40E−02	1844.9
203	21.60	0.38	0.2949	9.295	0.1167	7.06E−02	2033.2
204	21.70	0.42	0.2962	9.337	0.1173	7.09E−02	2042.4
205	21.60	0.47	0.2673	8.427	0.1045	6.40E−02	1843.3
206	22.40	0.00	0.2485	7.833	0.0962	5.95E−02	1713.4
207	22.40	0.25	0.2746	8.655	0.1077	6.57E−02	1893.2

Table A25. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.2743	8.645	0.1076	6.56E−02	1891.0
209	22.50	0.42	0.2920	9.203	0.1154	6.99E−02	2013.1
210	22.40	0.47	0.2918	9.197	0.1153	6.98E−02	2011.8
211	23.20	0.00	0.2513	7.922	0.0974	6.01E−02	1732.8
212	23.20	0.25	0.2520	7.943	0.0977	6.03E−02	1737.4
213	23.20	0.38	0.2552	8.043	0.0991	6.11E−02	1759.3
214	23.30	0.42	0.2552	8.044	0.0991	6.11E−02	1759.6
215	23.20	0.47	0.2482	7.825	0.0960	5.94E−02	1711.7
216	24.00	0.00	0.2583	8.142	0.1005	6.18E−02	1781.0
217	24.00	0.25	0.2579	8.130	0.1003	6.17E−02	1778.4
218	24.00	0.38	0.2579	8.129	0.1003	6.17E−02	1778.1
219	24.10	0.42	0.2685	8.464	0.1050	6.43E−02	1851.5
220	24.00	0.47	0.2681	8.450	0.1048	6.41E−02	1848.3
221	25.00	0.00	0.2708	8.535	0.1060	6.48E−02	1867.0
222	25.00	0.25	0.2689	8.475	0.1052	6.43E−02	1853.8
223	25.00	0.38	0.2654	8.365	0.1036	6.35E−02	1829.8
224	25.10	0.42	0.2635	8.306	0.1028	6.31E−02	1816.9
225	25.00	0.47	0.2585	8.147	0.1006	6.19E−02	1782.1
226	9.00	999.00	0.0698	2.200	0.0169	1.67E−02	481.3
227	0.00	–2.25	4.2328	133.423	1.8634	1.01E+00	29184.9
228	0.00	–0.29	4.1789	131.723	1.8395	1.00E+00	28813.2
229	0.00	2.25	4.1798	131.753	1.8399	1.00E+00	28819.7
230	20.58	0.00	0.4766	15.025	0.1973	1.14E−01	3286.5
231	20.78	0.00	0.4492	14.158	0.1852	1.07E−01	3097.0
232	20.98	0.00	0.4440	13.996	0.1829	1.06E−01	3061.6
233	21.38	0.00	0.4739	14.937	0.1961	1.13E−01	3267.4
234	21.78	0.00	0.5127	16.161	0.2133	1.23E−01	3535.0
235	22.51	0.00	0.6517	20.542	0.2750	1.56E−01	4493.4
236	22.71	0.00	0.7267	22.905	0.3082	1.74E−01	5010.3
237	22.91	0.00	0.8124	25.608	0.3463	1.94E−01	5601.4
238	23.11	0.00	0.8936	28.166	0.3823	2.14E−01	6161.1
239	23.88	0.00	0.5755	18.141	0.2412	1.38E−01	3968.2
240	24.38	0.00	0.5291	16.676	0.2206	1.27E−01	3647.8
241	24.88	0.00	0.4837	15.247	0.2005	1.16E−01	3335.1
242	25.08	0.00	0.4658	14.682	0.1925	1.11E−01	3211.5
243	25.38	0.00	0.4577	14.428	0.1890	1.10E−01	3156.0
244	0.58	999.00	0.0710	2.237	0.0174	1.70E−02	489.2
245	0.86	999.00	0.0716	2.257	0.0177	1.71E−02	493.8
246	1.15	999.00	0.0709	2.236	0.0174	1.70E−02	489.0
247	1.43	999.00	0.0710	2.238	0.0174	1.70E−02	489.6
248	1.72	999.00	0.0698	2.201	0.0169	1.67E−02	481.6
249	2.00	999.00	0.0715	2.253	0.0176	1.71E−02	492.7
250	2.29	999.00	0.0712	2.244	0.0175	1.70E−02	490.8
251	2.57	999.00	0.0712	2.244	0.0175	1.70E−02	490.9
252	2.86	999.00	0.0700	2.207	0.0170	1.68E−02	482.8
253	3.14	999.00	0.0709	2.236	0.0174	1.70E−02	489.1
254	3.43	999.00	0.0729	2.298	0.0183	1.74E−02	502.6
255	999.00	999.00	0.0684	2.157	0.0163	1.64E−02	471.8
256	999.00	999.00	4.2319	133.394	1.8630	1.01E+00	29178.7

Table A26. Flow Conditions and Pressure Distribution for Run 63

[CR = 3; Re = 1.14×10^6 per foot; 25 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	719.54	(.49611E+07)
$T_{t,1}$, °R (K)	1847.86	(1026.59)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0321	(16.56)
$h_{t,1}$, btu/lbm (J/kg)	464.59	(.10799E+07)
Free-stream conditions:		
M_∞	9.78	
p_∞, psia (N/m^2)	0.0189	(130.49)
T_∞, °R (K)	96.09	(53.38)
ρ_∞, slug/ft^3 (kg/m^3)	0.16524E−04	(.85160E−02)
h_∞, btu/lbm (J/kg)	0.22916E+02	(.53268E+05)
a_∞, ft/s (m/s)	480.90	(146.58)
u_∞, ft/s (m/s)	4701.24	(1432.94)
Re_∞, ft^{-1} (m^{-1})	0.10788E+07	(.35392E+07)
q_∞, psia (N/m^2)	1.268	(8743.03)
μ_∞, slug/ft-s (N-s/m^2)	0.72011E−07	(.34479E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.351	(16214.77)
$T_{t,2}$, °R (K)	1852.27	(1029.04)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10649E−03	(.54883E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0568	3.234	0.0326	2.55E−02	391.4
2	11.18	0.20	0.0592	3.375	0.0347	2.66E−02	408.4
3	12.17	0.20	0.0637	3.632	0.0384	2.86E−02	439.5
4	13.15	0.20	0.0667	3.798	0.0408	2.99E−02	459.6
5	14.21	0.20	0.0718	4.090	0.0451	3.22E−02	494.9
6	15.14	0.20	0.0802	4.572	0.0521	3.60E−02	553.3
7	16.13	0.20	0.0875	4.983	0.0581	3.92E−02	603.0
8	17.12	0.20	0.0972	5.537	0.0662	4.36E−02	670.1
9	18.11	0.20	0.1067	6.082	0.0741	4.79E−02	736.0
10	19.74	0.20	0.0905	5.156	0.0606	4.06E−02	623.9
11	20.55	0.20	0.1001	5.702	0.0686	4.49E−02	690.0
12	22.56	0.20	0.1165	6.637	0.0822	5.22E−02	803.1
13	24.98	0.20	0.1261	7.186	0.0903	5.66E−02	869.6
14	10.59	0.60	0.0970	5.528	0.0661	4.35E−02	669.0
15	11.58	0.60	0.0866	4.933	0.0574	3.88E−02	597.0
16	12.57	0.60	0.0901	5.136	0.0603	4.04E−02	621.5
17	13.56	0.60	0.0875	4.987	0.0582	3.92E−02	603.5
18	14.60	0.60	0.0844	4.806	0.0555	3.78E−02	581.6
19	15.54	0.60	0.0869	4.952	0.0577	3.90E−02	599.3
20	16.53	0.60	0.0923	5.259	0.0621	4.14E−02	636.4
21	17.52	0.60	0.1008	5.743	0.0692	4.52E−02	694.9
22	18.51	0.60	0.1137	6.478	0.0799	5.10E−02	783.9
23	12.97	1.00	0.0946	5.388	0.0640	4.24E−02	652.0
24	15.00	1.00	0.0974	5.552	0.0664	4.37E−02	671.8
25	15.94	1.00	0.1011	5.762	0.0695	4.53E−02	697.3
26	16.93	1.00	0.1046	5.957	0.0723	4.69E−02	720.9
27	17.92	1.00	0.1136	6.473	0.0798	5.09E−02	783.3
28	18.91	1.00	0.1305	7.438	0.0939	5.85E−02	900.1
29	24.98	1.00	0.1096	6.243	0.0765	4.91E−02	755.4
30	11.99	2.00	0.1039	5.920	0.0718	4.66E−02	716.4
31	13.97	2.00	0.0899	5.121	0.0601	4.03E−02	619.7
32	15.98	2.00	0.0940	5.354	0.0635	4.21E−02	647.9
33	16.94	2.00	0.0983	5.602	0.0671	4.41E−02	677.9

Table A26. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1007	5.736	0.0691	4.51E−02	694.1
35	18.42	2.00	0.1038	5.913	0.0717	4.65E−02	715.5
36	18.92	2.00	0.1065	6.071	0.0740	4.78E−02	734.7
37	19.41	2.00	0.1103	6.283	0.0771	4.94E−02	760.3
38	19.91	2.00	0.1303	7.426	0.0938	5.84E−02	898.6
39	20.26	2.00	0.1597	9.099	0.1182	7.16E−02	1101.0
40	21.11	2.00	0.1910	10.884	0.1442	8.57E−02	1317.1
41	21.96	2.00	0.1768	10.074	0.1324	7.93E−02	1219.1
42	22.74	2.00	0.1662	9.470	0.1236	7.45E−02	1146.0
43	23.52	2.00	0.1627	9.270	0.1207	7.29E−02	1121.7
44	24.98	2.00	0.1677	9.553	0.1248	7.52E−02	1156.0
45	17.94	3.00	0.0826	4.705	0.0541	3.70E−02	569.4
46	18.93	3.00	0.1124	6.404	0.0788	5.04E−02	775.0
47	19.92	3.00	0.1429	8.140	0.1042	6.41E−02	985.0
48	20.91	3.00	0.1591	9.066	0.1177	7.13E−02	1097.0
49	22.11	3.00	0.2262	12.890	0.1735	1.01E−01	1559.8
50	22.96	3.00	0.2912	16.590	0.2275	1.31E−01	2007.5
51	23.74	3.00	0.3542	20.180	0.2798	1.59E−01	2441.9
52	24.98	3.00	0.3752	21.380	0.2973	1.68E−01	2587.1
53	18.34	3.40	0.0791	4.506	0.0511	3.55E−02	545.2
54	19.32	3.40	0.1343	7.652	0.0971	6.02E−02	926.0
55	19.82	3.40	0.1383	7.878	0.1004	6.20E−02	953.3
56	20.32	3.40	0.1464	8.344	0.1071	6.57E−02	1009.7
57	20.81	3.40	0.1609	9.167	0.1192	7.21E−02	1109.3
58	21.31	3.40	0.1810	10.314	0.1359	8.12E−02	1248.1
59	21.66	3.40	0.2128	12.123	0.1623	9.54E−02	1467.0
60	22.94	3.40	0.3111	17.726	0.2440	1.39E−01	2145.0
61	23.75	3.40	0.4061	23.137	0.3230	1.82E−01	2799.8
62	24.14	3.40	0.4020	22.904	0.3196	1.80E−01	2771.6
63	22.29	3.60	0.2607	14.852	0.2021	1.17E−01	1797.2
64	22.71	3.60	0.2916	16.617	0.2279	1.31E−01	2010.8
65	23.14	3.60	0.3404	19.398	0.2684	1.53E−01	2347.3
66	23.95	3.60	0.3999	22.786	0.3179	1.79E−01	2757.3
67	24.34	3.60	0.3955	22.533	0.3142	1.77E−01	2726.7
68	13.79	3.80	0.0830	4.729	0.0544	3.72E−02	572.3
69	15.77	3.80	0.0701	3.994	0.0437	3.14E−02	483.3
70	17.75	3.80	0.0710	4.045	0.0444	3.18E−02	489.5
71	19.23	3.80	0.1203	6.853	0.0854	5.39E−02	829.3
72	19.73	3.80	0.1240	7.066	0.0885	5.56E−02	855.1
73	20.22	3.80	0.1336	7.614	0.0965	5.99E−02	921.3
74	20.72	3.80	0.1565	8.916	0.1155	7.02E−02	1078.9
75	21.41	3.80	0.1921	10.947	0.1451	8.62E−02	1324.7
76	21.71	3.80	0.2203	12.550	0.1685	9.88E−02	1518.6
77	22.06	3.80	0.2867	16.334	0.2237	1.29E−01	1976.6
78	22.49	3.80	0.3023	17.223	0.2367	1.36E−01	2084.1
79	22.76	3.80	0.3676	20.947	0.2910	1.65E−01	2534.7
80	22.91	3.80	0.3811	21.717	0.3023	1.71E−01	2628.0
81	23.76	3.80	0.4575	26.068	0.3657	2.05E−01	3154.4
82	24.15	3.80	0.4740	27.006	0.3794	2.13E−01	3267.9
83	24.98	3.80	0.3873	22.066	0.3074	1.74E−01	2670.2
84	22.59	3.90	0.3205	18.260	0.2518	1.44E−01	2209.6
85	22.80	3.90	0.3542	20.180	0.2798	1.59E−01	2442.0
86	23.01	3.90	0.3733	21.269	0.2957	1.67E−01	2573.7
87	23.15	3.90	0.3904	22.245	0.3100	1.75E−01	2691.8
88	23.86	3.90	0.4658	26.539	0.3726	2.09E−01	3211.5
89	24.25	3.90	0.4413	25.145	0.3523	1.98E−01	3042.8
90	11.99	2.00	0.1039	5.919	0.0718	4.66E−02	716.3
91	13.97	2.00	0.0932	5.308	0.0629	4.18E−02	642.3

Table A26. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0948	5.400	0.0642	4.25E−02	653.4
93	17.93	2.00	0.1017	5.793	0.0699	4.56E−02	701.0
94	19.91	2.00	0.1264	7.202	0.0905	5.67E−02	871.5
95	1.00	0.00	0.0480	2.734	0.0253	2.15E−02	330.8
96	1.00	0.66	0.0471	2.683	0.0246	2.11E−02	324.6
97	1.00	1.28	0.0473	2.697	0.0248	2.12E−02	326.4
98	1.00	1.90	0.0471	2.686	0.0246	2.11E−02	325.0
99	2.50	0.00	0.0400	2.280	0.0187	1.79E−02	275.9
100	4.00	0.00	0.0372	2.121	0.0164	1.67E−02	256.7
101	4.00	0.66	0.0380	2.165	0.0170	1.70E−02	262.0
102	4.00	1.90	0.0370	2.107	0.0161	1.66E−02	254.9
103	5.50	0.00	0.0369	2.104	0.0161	1.66E−02	254.7
104	7.00	0.00	0.0352	2.007	0.0147	1.58E−02	242.9
105	8.00	−1.90	0.0376	2.143	0.0167	1.69E−02	259.3
106	8.00	−1.50	0.0403	2.294	0.0189	1.81E−02	277.6
107	8.00	−1.11	0.0418	2.380	0.0201	1.87E−02	288.0
108	8.00	−0.66	0.0438	2.496	0.0218	1.96E−02	302.1
109	8.00	0.00	0.0449	2.560	0.0228	2.01E−02	309.8
110	8.00	0.25	0.0441	2.512	0.0221	1.98E−02	304.0
111	8.00	0.38	0.0440	2.508	0.0220	1.97E−02	303.5
112	8.00	0.66	0.0444	2.527	0.0223	1.99E−02	305.8
113	8.00	1.11	0.0429	2.445	0.0211	1.92E−02	295.9
114	8.00	1.50	0.0404	2.302	0.0190	1.81E−02	278.5
115	8.00	1.90	0.0387	2.208	0.0176	1.74E−02	267.2
116	9.00	0.00	0.0504	2.870	0.0273	2.26E−02	347.3
117	9.00	0.25	0.0502	2.858	0.0271	2.25E−02	345.8
118	9.00	0.38	0.0499	2.842	0.0269	2.24E−02	343.9
119	9.00	0.66	0.0492	2.804	0.0263	2.21E−02	339.4
120	9.00	1.01	0.0489	2.784	0.0260	2.19E−02	336.9
121	9.00	1.32	0.0461	2.625	0.0237	2.07E−02	317.7
122	10.00	0.00	0.0545	3.106	0.0307	2.44E−02	375.9
123	10.00	0.25	0.0540	3.079	0.0303	2.42E−02	372.6
124	10.00	0.38	0.0548	3.122	0.0310	2.46E−02	377.8
125	10.00	0.66	0.0520	2.960	0.0286	2.33E−02	358.2
126	10.00	0.90	0.0515	2.933	0.0282	2.31E−02	354.9
127	10.00	1.08	0.0515	2.932	0.0282	2.31E−02	354.8
128	10.00	1.22	0.0514	2.931	0.0282	2.31E−02	354.7
129	10.00	1.34	0.0546	3.110	0.0308	2.45E−02	376.4
130	11.00	0.00	0.0561	3.198	0.0321	2.52E−02	387.0
131	11.00	0.25	0.0581	3.310	0.0337	2.60E−02	400.5
132	11.00	0.38	0.0577	3.285	0.0333	2.59E−02	397.5
133	11.00	0.52	0.0581	3.308	0.0337	2.60E−02	400.3
134	11.00	0.80	0.0558	3.179	0.0318	2.50E−02	384.7
135	11.00	0.97	0.0561	3.196	0.0320	2.51E−02	386.7
136	11.00	1.11	0.0593	3.376	0.0347	2.66E−02	408.6
137	11.00	1.23	0.0603	3.438	0.0356	2.71E−02	416.0
138	12.00	0.00	0.0630	3.589	0.0378	2.82E−02	434.2
139	12.00	0.25	0.0619	3.529	0.0369	2.78E−02	427.0
140	12.00	0.38	0.0616	3.512	0.0366	2.76E−02	424.9
141	12.00	0.52	0.0615	3.506	0.0366	2.76E−02	424.2
142	12.00	0.69	0.0586	3.339	0.0341	2.63E−02	404.1
143	12.00	0.87	0.0615	3.502	0.0365	2.76E−02	423.8
144	12.00	1.01	0.0635	3.619	0.0382	2.85E−02	437.9
145	12.00	1.13	0.0656	3.736	0.0399	2.94E−02	452.1
146	13.00	0.00	0.0663	3.777	0.0405	2.97E−02	457.1
147	13.00	0.25	0.0653	3.724	0.0397	2.93E−02	450.6
148	13.00	0.38	0.0649	3.699	0.0394	2.91E−02	447.6
149	13.00	0.52	0.0651	3.709	0.0395	2.92E−02	448.9

Table A26. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0642	3.660	0.0388	2.88E−02	442.9
151	13.00	0.76	0.0654	3.727	0.0398	2.93E−02	451.0
152	13.00	0.90	0.0684	3.898	0.0423	3.07E−02	471.7
153	13.00	1.02	0.0683	3.892	0.0422	3.06E−02	471.0
154	14.00	0.00	0.0703	4.007	0.0439	3.15E−02	484.9
155	14.00	0.25	0.0705	4.016	0.0440	3.16E−02	485.9
156	14.00	0.38	0.0684	3.897	0.0423	3.07E−02	471.5
157	14.00	0.52	0.0694	3.954	0.0431	3.11E−02	478.5
158	14.00	0.66	0.0707	4.028	0.0442	3.17E−02	487.5
159	14.00	0.80	0.0742	4.226	0.0471	3.33E−02	511.3
160	14.00	0.92	0.0731	4.166	0.0462	3.28E−02	504.1
161	15.00	0.00	0.0777	4.427	0.0500	3.48E−02	535.7
162	15.00	0.25	0.0767	4.369	0.0492	3.44E−02	528.7
163	15.00	0.38	0.0769	4.381	0.0493	3.45E−02	530.2
164	15.00	0.69	0.0797	4.544	0.0517	3.58E−02	549.9
165	15.00	0.81	0.0786	4.479	0.0508	3.52E−02	542.0
166	16.00	0.00	0.0875	4.985	0.0581	3.92E−02	603.3
167	16.00	0.25	0.0866	4.932	0.0574	3.88E−02	596.8
168	16.00	0.38	0.0857	4.883	0.0567	3.84E−02	590.9
169	16.00	0.48	0.0875	4.983	0.0581	3.92E−02	603.0
170	16.00	0.59	0.0893	5.087	0.0596	4.00E−02	615.6
171	16.00	0.71	0.0866	4.934	0.0574	3.88E−02	597.0
172	17.00	0.00	0.1009	5.747	0.0693	4.52E−02	695.4
173	17.00	0.25	0.0987	5.625	0.0675	4.43E−02	680.7
174	17.00	0.38	0.0981	5.591	0.0670	4.40E−02	676.6
175	17.00	0.48	0.0981	5.589	0.0670	4.40E−02	676.4
176	17.00	0.60	0.0949	5.405	0.0643	4.25E−02	654.0
177	18.00	0.00	0.1163	6.627	0.0821	5.22E−02	801.9
178	18.00	0.25	0.1132	6.450	0.0795	5.08E−02	780.5
179	18.00	0.38	0.1110	6.322	0.0777	4.98E−02	765.1
180	18.00	0.50	0.1064	6.060	0.0738	4.77E−02	733.3
181	18.50	0.00	0.1252	7.136	0.0895	5.62E−02	863.5
182	18.50	0.25	0.1202	6.847	0.0853	5.39E−02	828.6
183	18.50	0.38	0.1087	6.192	0.0758	4.87E−02	749.3
184	18.60	0.42	0.1060	6.040	0.0735	4.75E−02	730.8
185	18.50	0.47	0.1069	6.089	0.0743	4.79E−02	736.9
186	19.20	0.00	0.1334	7.599	0.0963	5.98E−02	919.5
187	19.20	0.25	0.1165	6.636	0.0822	5.22E−02	803.1
188	19.20	0.38	0.0970	5.527	0.0661	4.35E−02	668.9
189	19.30	0.42	0.0959	5.465	0.0652	4.30E−02	661.4
190	19.20	0.47	0.0968	5.517	0.0659	4.34E−02	667.6
191	20.00	0.00	0.1307	7.446	0.0940	5.86E−02	901.0
192	20.00	0.25	0.1286	7.326	0.0923	5.77E−02	886.5
193	20.00	0.38	0.1000	5.696	0.0685	4.48E−02	689.2
194	20.10	0.42	0.1038	5.916	0.0717	4.66E−02	715.9
195	20.00	0.47	0.1012	5.769	0.0696	4.54E−02	698.1
196	20.80	0.00	0.1324	7.544	0.0955	5.94E−02	912.9
197	20.80	0.25	0.1259	7.174	0.0901	5.65E−02	868.1
198	20.80	0.38	0.1197	6.818	0.0849	5.37E−02	825.0
199	20.90	0.42	0.1243	7.084	0.0888	5.58E−02	857.2
200	20.80	0.47	0.1244	7.086	0.0888	5.58E−02	857.5
201	21.60	0.00	0.1295	7.376	0.0930	5.80E−02	892.6
202	21.60	0.25	0.1295	7.376	0.0930	5.80E−02	892.6
203	21.60	0.38	0.1452	8.273	0.1061	6.51E−02	1001.1
204	21.70	0.42	0.1454	8.286	0.1063	6.52E−02	1002.6
205	21.60	0.47	0.1326	7.556	0.0957	5.95E−02	914.3
206	22.40	0.00	0.1301	7.410	0.0935	5.83E−02	896.7
207	22.40	0.25	0.1371	7.810	0.0994	6.15E−02	945.1

Table A26. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.1341	7.639	0.0969	6.01E–02	924.4
209	22.50	0.42	0.1450	8.261	0.1059	6.50E–02	999.7
210	22.40	0.47	0.1448	8.249	0.1058	6.49E–02	998.2
211	23.20	0.00	0.1320	7.523	0.0952	5.92E–02	910.3
212	23.20	0.25	0.1323	7.541	0.0954	5.93E–02	912.5
213	23.20	0.38	0.1391	7.923	0.1010	6.24E–02	958.8
214	23.30	0.42	0.1382	7.874	0.1003	6.20E–02	952.8
215	23.20	0.47	0.1292	7.364	0.0929	5.80E–02	891.1
216	24.00	0.00	0.1369	7.801	0.0992	6.14E–02	944.0
217	24.00	0.25	0.1384	7.886	0.1005	6.21E–02	954.3
218	24.00	0.38	0.1374	7.826	0.0996	6.16E–02	947.0
219	24.10	0.42	0.1427	8.130	0.1040	6.40E–02	983.8
220	24.00	0.47	0.1415	8.065	0.1031	6.35E–02	975.9
221	25.00	0.00	0.1476	8.408	0.1081	6.62E–02	1017.4
222	25.00	0.25	0.1443	8.220	0.1053	6.47E–02	994.7
223	25.00	0.38	0.1369	7.802	0.0992	6.14E–02	944.1
224	25.10	0.42	0.1352	7.701	0.0978	6.06E–02	931.9
225	25.00	0.47	0.1361	7.755	0.0986	6.10E–02	938.4
226	9.00	999.00	0.0439	2.502	0.0219	1.97E–02	302.8
227	0.00	–2.25	2.2188	126.425	1.8300	9.95E–01	15298.6
228	0.00	–0.29	2.2021	125.476	1.8161	9.87E–01	15183.7
229	0.00	2.25	2.2029	125.520	1.8167	9.88E–01	15189.0
230	20.58	0.00	0.2901	16.532	0.2266	1.30E–01	2000.6
231	20.78	0.00	0.2838	16.172	0.2214	1.27E–01	1957.0
232	20.98	0.00	0.2972	16.936	0.2325	1.33E–01	2049.4
233	21.38	0.00	0.3476	19.806	0.2744	1.56E–01	2396.7
234	21.78	0.00	0.4179	23.814	0.3329	1.87E–01	2881.7
235	22.51	0.00	0.6696	38.152	0.5420	3.00E–01	4616.7
236	22.71	0.00	0.6837	38.957	0.5538	3.07E–01	4714.2
237	22.91	0.00	0.6106	34.791	0.4930	2.74E–01	4210.0
238	23.11	0.00	0.4878	27.792	0.3909	2.19E–01	3363.1
239	23.88	0.00	0.1928	10.985	0.1457	8.65E–02	1329.3
240	24.38	0.00	0.3071	17.499	0.2407	1.38E–01	2117.6
241	24.88	0.00	0.3379	19.254	0.2663	1.52E–01	2329.9
242	25.08	0.00	0.3539	20.166	0.2796	1.59E–01	2440.3
243	25.38	0.00	0.3701	21.089	0.2931	1.66E–01	2551.9
244	0.58	999.00	0.0450	2.563	0.0228	2.02E–02	310.1
245	0.86	999.00	0.0448	2.554	0.0227	2.01E–02	309.1
246	1.15	999.00	0.0446	2.541	0.0225	2.00E–02	307.4
247	1.43	999.00	0.0456	2.597	0.0233	2.04E–02	314.3
248	1.72	999.00	0.0435	2.481	0.0216	1.95E–02	300.3
249	2.00	999.00	0.0446	2.539	0.0225	2.00E–02	307.3
250	2.29	999.00	0.0434	2.470	0.0214	1.94E–02	298.9
251	2.57	999.00	0.0449	2.559	0.0227	2.01E–02	309.6
252	2.86	999.00	0.0446	2.542	0.0225	2.00E–02	307.6
253	3.14	999.00	0.0449	2.558	0.0227	2.01E–02	309.5
254	3.43	999.00	0.0438	2.494	0.0218	1.96E–02	301.8
255	999.00	999.00	0.0426	2.430	0.0209	1.91E–02	294.1
256	999.00	999.00	2.2171	126.326	1.8285	9.94E–01	15286.6

Table A27. Flow Conditions and Pressure Distribution for Run 64

[CR = 3; Re = 0.55×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	353.25	(.24356E+07)
$T_{t,1}$, °R (K)	1861.66	(1034.25)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0158	(8.14)
$h_{t,1}$, btu/lbm (J/kg)	467.75	(.10873E+07)
Free-stream conditions:		
M_∞	9.66	
p_∞, psia (N/m^2)	0.0100	(69.18)
T_∞, °R (K)	98.93	(54.96)
ρ_∞, slug/ft^3 (kg/m^3)	0.85089E−05	(.43853E−02)
h_∞, btu/lbm (J/kg)	0.23594E+02	(.54842E+05)
a_∞, ft/s (m/s)	487.95	(148.73)
u_∞, ft/s (m/s)	4714.40	(1436.95)
Re_∞, ft^{-1} (m^{-1})	0.53833E+06	(.17662E+07)
q_∞, psia (N/m^2)	0.657	(4527.46)
μ_∞, slug/ft-s (N-s/m^2)	0.74516E−07	(.35679E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	1.218	(8391.08)
$T_{t,2}$, °R (K)	1863.78	(1035.43)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.54813E−04	(.28249E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0373	3.925	0.0440	3.18E−02	256.8
2	11.18	0.20	0.0370	3.903	0.0436	3.16E−02	255.4
3	12.17	0.20	0.0397	4.188	0.0479	3.39E−02	274.0
4	13.15	0.20	0.0409	4.310	0.0497	3.49E−02	282.0
5	14.21	0.20	0.0448	4.719	0.0559	3.82E−02	308.8
6	15.14	0.20	0.0431	4.540	0.0532	3.68E−02	297.1
7	16.13	0.20	0.0469	4.941	0.0592	4.00E−02	323.3
8	17.12	0.20	0.0536	5.650	0.0699	4.58E−02	369.7
9	18.11	0.20	0.0588	6.199	0.0781	5.02E−02	405.6
10	19.74	0.20	0.0525	5.529	0.0681	4.48E−02	361.8
11	20.55	0.20	0.0563	5.934	0.0741	4.81E−02	388.3
12	22.56	0.20	0.0636	6.701	0.0857	5.43E−02	438.5
13	24.98	0.20	0.0672	7.080	0.0914	5.74E−02	463.3
14	10.59	0.60	0.0573	6.034	0.0756	4.89E−02	394.8
15	11.58	0.60	0.0482	5.075	0.0612	4.11E−02	332.1
16	12.57	0.60	0.0470	4.953	0.0594	4.01E−02	324.1
17	13.56	0.60	0.0464	4.886	0.0584	3.96E−02	319.7
18	14.60	0.60	0.0455	4.797	0.0570	3.89E−02	313.9
19	15.54	0.60	0.0446	4.705	0.0557	3.81E−02	307.8
20	16.53	0.60	0.0491	5.171	0.0627	4.19E−02	338.4
21	17.52	0.60	0.0556	5.861	0.0730	4.75E−02	383.5
22	18.51	0.60	0.0631	6.646	0.0848	5.39E−02	434.9
23	12.97	1.00	0.0539	5.684	0.0704	4.61E−02	371.9
24	15.00	1.00	0.0550	5.797	0.0721	4.70E−02	379.3
25	15.94	1.00	0.0540	5.693	0.0705	4.61E−02	372.5
26	16.93	1.00	0.0571	6.019	0.0754	4.88E−02	393.9
27	17.92	1.00	0.0623	6.561	0.0836	5.32E−02	429.3
28	18.91	1.00	0.0720	7.587	0.0990	6.15E−02	496.4
29	24.98	1.00	0.0585	6.166	0.0776	5.00E−02	403.4
30	11.99	2.00	0.0592	6.236	0.0787	5.05E−02	408.1
31	13.97	2.00	0.0512	5.397	0.0661	4.37E−02	353.1
32	15.98	2.00	0.0529	5.575	0.0687	4.52E−02	364.8
33	16.94	2.00	0.0522	5.498	0.0676	4.45E−02	359.7

Table A27. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0541	5.696	0.0706	4.62E−02	372.7
35	18.42	2.00	0.0558	5.875	0.0732	4.76E−02	384.4
36	18.92	2.00	0.0571	6.014	0.0753	4.87E−02	393.5
37	19.41	2.00	0.0599	6.316	0.0799	5.12E−02	413.3
38	19.91	2.00	0.0745	7.850	0.1029	6.36E−02	513.7
39	20.26	2.00	0.1177	12.398	0.1713	1.00E−01	811.3
40	21.11	2.00	0.0953	10.043	0.1359	8.14E−02	657.1
41	21.96	2.00	0.0848	8.938	0.1193	7.24E−02	584.9
42	22.74	2.00	0.0796	8.389	0.1110	6.80E−02	548.9
43	23.52	2.00	0.0796	8.392	0.1111	6.80E−02	549.1
44	24.98	2.00	0.0752	7.927	0.1041	6.42E−02	518.7
45	17.94	3.00	0.0455	4.797	0.0571	3.89E−02	313.9
46	18.93	3.00	0.0435	4.587	0.0539	3.72E−02	300.2
47	19.92	3.00	0.0592	6.241	0.0788	5.06E−02	408.4
48	20.91	3.00	0.0731	7.698	0.1006	6.24E−02	503.7
49	22.11	3.00	0.1456	15.342	0.2155	1.24E−01	1003.9
50	22.96	3.00	0.1370	14.432	0.2018	1.17E−01	944.3
51	23.74	3.00	0.1211	12.765	0.1768	1.03E−01	835.3
52	24.98	3.00	0.1192	12.565	0.1738	1.02E−01	822.2
53	18.34	3.40	0.0423	4.458	0.0520	3.61E−02	291.7
54	19.32	3.40	0.0503	5.305	0.0647	4.30E−02	347.1
55	19.82	3.40	0.0525	5.532	0.0681	4.48E−02	362.0
56	20.32	3.40	0.0595	6.272	0.0792	5.08E−02	410.4
57	20.81	3.40	0.0694	7.313	0.0949	5.93E−02	478.5
58	21.31	3.40	0.0833	8.776	0.1168	7.11E−02	574.3
59	21.66	3.40	0.1079	11.371	0.1558	9.21E−02	744.1
60	22.94	3.40	0.1268	13.365	0.1858	1.08E−01	874.6
61	23.75	3.40	0.1568	16.525	0.2333	1.34E−01	1081.3
62	24.14	3.40	0.1639	17.267	0.2444	1.40E−01	1129.9
63	22.29	3.60	0.1157	12.187	0.1681	9.88E−02	797.4
64	22.71	3.60	0.1211	12.757	0.1767	1.03E−01	834.7
65	23.14	3.60	0.1692	17.827	0.2528	1.44E−01	1166.5
66	23.95	3.60	0.1770	18.650	0.2652	1.51E−01	1220.4
67	24.34	3.60	0.1734	18.268	0.2595	1.48E−01	1195.3
68	13.79	3.80	0.0465	4.895	0.0585	3.97E−02	320.3
69	15.77	3.80	0.0379	3.988	0.0449	3.23E−02	261.0
70	17.75	3.80	0.0375	3.953	0.0444	3.20E−02	258.7
71	19.23	3.80	0.0446	4.703	0.0556	3.81E−02	307.7
72	19.73	3.80	0.0461	4.856	0.0579	3.93E−02	317.7
73	20.22	3.80	0.0516	5.439	0.0667	4.41E−02	355.9
74	20.72	3.80	0.0581	6.127	0.0770	4.96E−02	400.9
75	21.41	3.80	0.0609	6.422	0.0815	5.20E−02	420.2
76	21.71	3.80	0.0699	7.368	0.0957	5.97E−02	482.1
77	22.06	3.80	0.0886	9.335	0.1252	7.56E−02	610.8
78	22.49	3.80	0.1090	11.488	0.1576	9.31E−02	751.7
79	22.76	3.80	0.1652	17.403	0.2465	1.41E−01	1138.8
80	22.91	3.80	0.1725	18.181	0.2582	1.47E−01	1189.6
81	23.76	3.80	0.1690	17.807	0.2525	1.44E−01	1165.2
82	24.15	3.80	0.1823	19.213	0.2737	1.56E−01	1257.2
83	24.98	3.80	0.1973	20.795	0.2974	1.69E−01	1360.7
84	22.59	3.90	0.1522	16.039	0.2260	1.30E−01	1049.5
85	22.80	3.90	0.1488	15.679	0.2206	1.27E−01	1025.9
86	23.01	3.90	0.1687	17.773	0.2520	1.44E−01	1163.0
87	23.15	3.90	0.1870	19.708	0.2811	1.60E−01	1289.6
88	23.86	3.90	0.2449	25.810	0.3728	2.09E−01	1688.9
89	24.25	3.90	0.2385	25.132	0.3626	2.04E−01	1644.5
90	11.99	2.00	0.0588	6.198	0.0781	5.02E−02	405.6
91	13.97	2.00	0.0524	5.516	0.0679	4.47E−02	361.0

Table A27. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0529	5.570	0.0687	4.51E−02	364.5
93	17.93	2.00	0.0538	5.668	0.0701	4.59E−02	370.9
94	19.91	2.00	0.0774	8.151	0.1074	6.60E−02	533.3
95	1.00	0.00	0.0286	3.018	0.0303	2.45E−02	197.5
96	1.00	0.66	0.0291	3.068	0.0311	2.49E−02	200.7
97	1.00	1.28	0.0295	3.105	0.0316	2.52E−02	203.2
98	1.00	1.90	0.0289	3.049	0.0308	2.47E−02	199.5
99	2.50	0.00	0.0245	2.578	0.0237	2.09E−02	168.7
100	4.00	0.00	0.0221	2.327	0.0199	1.89E−02	152.3
101	4.00	0.66	0.0235	2.477	0.0222	2.01E−02	162.1
102	4.00	1.90	0.0221	2.332	0.0200	1.89E−02	152.6
103	5.50	0.00	0.0227	2.392	0.0209	1.94E−02	156.5
104	7.00	0.00	0.0207	2.179	0.0177	1.77E−02	142.6
105	8.00	−1.90	0.0209	2.202	0.0181	1.78E−02	144.1
106	8.00	−1.50	0.0238	2.505	0.0226	2.03E−02	163.9
107	8.00	−1.11	0.0238	2.513	0.0227	2.04E−02	164.4
108	8.00	−0.66	0.0249	2.626	0.0244	2.13E−02	171.8
109	8.00	0.00	0.0264	2.784	0.0268	2.26E−02	182.2
110	8.00	0.25	0.0257	2.713	0.0257	2.20E−02	177.5
111	8.00	0.38	0.0244	2.576	0.0237	2.09E−02	168.6
112	8.00	0.66	0.0263	2.775	0.0267	2.25E−02	181.6
113	8.00	1.11	0.0256	2.696	0.0255	2.18E−02	176.4
114	8.00	1.50	0.0238	2.504	0.0226	2.03E−02	163.9
115	8.00	1.90	0.0230	2.428	0.0215	1.97E−02	158.8
116	9.00	0.00	0.0297	3.132	0.0320	2.54E−02	205.0
117	9.00	0.25	0.0293	3.086	0.0313	2.50E−02	201.9
118	9.00	0.38	0.0297	3.134	0.0321	2.54E−02	205.1
119	9.00	0.66	0.0290	3.060	0.0310	2.48E−02	200.2
120	9.00	1.01	0.0239	2.513	0.0227	2.04E−02	164.5
121	9.00	1.32	0.0225	2.369	0.0206	1.92E−02	155.0
122	10.00	0.00	0.0305	3.210	0.0332	2.60E−02	210.1
123	10.00	0.25	0.0300	3.157	0.0324	2.56E−02	206.6
124	10.00	0.38	0.0315	3.324	0.0349	2.69E−02	217.5
125	10.00	0.66	0.0279	2.940	0.0292	2.38E−02	192.4
126	10.00	0.90	0.0259	2.733	0.0260	2.21E−02	178.8
127	10.00	1.08	0.0261	2.751	0.0263	2.23E−02	180.0
128	10.00	1.22	0.0260	2.738	0.0261	2.22E−02	179.2
129	10.00	1.34	0.0272	2.865	0.0280	2.32E−02	187.4
130	11.00	0.00	0.0327	3.448	0.0368	2.79E−02	225.6
131	11.00	0.25	0.0325	3.421	0.0364	2.77E−02	223.8
132	11.00	0.38	0.0318	3.354	0.0354	2.72E−02	219.4
133	11.00	0.52	0.0325	3.429	0.0365	2.78E−02	224.4
134	11.00	0.80	0.0271	2.851	0.0278	2.31E−02	186.6
135	11.00	0.97	0.0280	2.949	0.0293	2.39E−02	193.0
136	11.00	1.11	0.0289	3.046	0.0307	2.47E−02	199.3
137	11.00	1.23	0.0298	3.137	0.0321	2.54E−02	205.2
138	12.00	0.00	0.0350	3.692	0.0405	2.99E−02	241.6
139	12.00	0.25	0.0348	3.665	0.0400	2.97E−02	239.8
140	12.00	0.38	0.0346	3.641	0.0397	2.95E−02	238.3
141	12.00	0.52	0.0345	3.634	0.0396	2.94E−02	237.8
142	12.00	0.69	0.0305	3.209	0.0332	2.60E−02	210.0
143	12.00	0.87	0.0322	3.396	0.0360	2.75E−02	222.2
144	12.00	1.01	0.0328	3.459	0.0369	2.80E−02	226.3
145	12.00	1.13	0.0328	3.459	0.0369	2.80E−02	226.3
146	13.00	0.00	0.0378	3.980	0.0448	3.23E−02	260.4
147	13.00	0.25	0.0372	3.922	0.0439	3.18E−02	256.6
148	13.00	0.38	0.0373	3.925	0.0440	3.18E−02	256.8
149	13.00	0.52	0.0375	3.952	0.0444	3.20E−02	258.6

Table A27. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0341	3.596	0.0390	2.91E−02	235.3
151	13.00	0.76	0.0353	3.716	0.0408	3.01E−02	243.2
152	13.00	0.90	0.0357	3.757	0.0414	3.04E−02	245.8
153	13.00	1.02	0.0353	3.722	0.0409	3.02E−02	243.6
154	14.00	0.00	0.0369	3.887	0.0434	3.15E−02	254.3
155	14.00	0.25	0.0371	3.906	0.0437	3.17E−02	255.6
156	14.00	0.38	0.0361	3.801	0.0421	3.08E−02	248.7
157	14.00	0.52	0.0378	3.988	0.0449	3.23E−02	260.9
158	14.00	0.66	0.0384	4.052	0.0459	3.28E−02	265.1
159	14.00	0.80	0.0391	4.118	0.0468	3.34E−02	269.5
160	14.00	0.92	0.0376	3.958	0.0444	3.21E−02	259.0
161	15.00	0.00	0.0408	4.303	0.0496	3.49E−02	281.6
162	15.00	0.25	0.0406	4.278	0.0493	3.47E−02	279.9
163	15.00	0.38	0.0420	4.427	0.0515	3.59E−02	289.7
164	15.00	0.69	0.0419	4.416	0.0513	3.58E−02	288.9
165	15.00	0.81	0.0414	4.367	0.0506	3.54E−02	285.8
166	16.00	0.00	0.0469	4.939	0.0592	4.00E−02	323.2
167	16.00	0.25	0.0462	4.873	0.0582	3.95E−02	318.8
168	16.00	0.38	0.0464	4.889	0.0584	3.96E−02	319.9
169	16.00	0.48	0.0484	5.099	0.0616	4.13E−02	333.6
170	16.00	0.59	0.0471	4.964	0.0596	4.02E−02	324.8
171	16.00	0.71	0.0461	4.854	0.0579	3.93E−02	317.6
172	17.00	0.00	0.0543	5.724	0.0710	4.64E−02	374.5
173	17.00	0.25	0.0534	5.630	0.0696	4.56E−02	368.4
174	17.00	0.38	0.0535	5.642	0.0697	4.57E−02	369.2
175	17.00	0.48	0.0532	5.608	0.0692	4.54E−02	367.0
176	17.00	0.60	0.0518	5.458	0.0670	4.42E−02	357.1
177	18.00	0.00	0.0627	6.602	0.0842	5.35E−02	432.0
178	18.00	0.25	0.0611	6.440	0.0817	5.22E−02	421.4
179	18.00	0.38	0.0600	6.320	0.0799	5.12E−02	413.5
180	18.00	0.50	0.0595	6.270	0.0792	5.08E−02	410.3
181	18.50	0.00	0.0675	7.114	0.0919	5.76E−02	465.5
182	18.50	0.25	0.0652	6.869	0.0882	5.57E−02	449.5
183	18.50	0.38	0.0587	6.186	0.0779	5.01E−02	404.8
184	18.60	0.42	0.0598	6.298	0.0796	5.10E−02	412.1
185	18.50	0.47	0.0590	6.212	0.0783	5.03E−02	406.5
186	19.20	0.00	0.0682	7.188	0.0930	5.83E−02	470.4
187	19.20	0.25	0.0624	6.577	0.0838	5.33E−02	430.4
188	19.20	0.38	0.0560	5.906	0.0737	4.79E−02	386.5
189	19.30	0.42	0.0555	5.845	0.0728	4.74E−02	382.5
190	19.20	0.47	0.0557	5.869	0.0732	4.76E−02	384.0
191	20.00	0.00	0.0654	6.894	0.0886	5.59E−02	451.1
192	20.00	0.25	0.0638	6.719	0.0859	5.44E−02	439.7
193	20.00	0.38	0.0573	6.043	0.0758	4.90E−02	395.4
194	20.10	0.42	0.0584	6.156	0.0775	4.99E−02	402.8
195	20.00	0.47	0.0570	6.011	0.0753	4.87E−02	393.3
196	20.80	0.00	0.0724	7.632	0.0997	6.18E−02	499.4
197	20.80	0.25	0.0689	7.258	0.0940	5.88E−02	474.9
198	20.80	0.38	0.0636	6.699	0.0856	5.43E−02	438.3
199	20.90	0.42	0.0642	6.761	0.0866	5.48E−02	442.4
200	20.80	0.47	0.0642	6.763	0.0866	5.48E−02	442.5
201	21.60	0.00	0.0739	7.787	0.1020	6.31E−02	509.5
202	21.60	0.25	0.0738	7.781	0.1019	6.30E−02	509.1
203	21.60	0.38	0.0728	7.674	0.1003	6.22E−02	502.1
204	21.70	0.42	0.0754	7.950	0.1044	6.44E−02	520.2
205	21.60	0.47	0.0725	7.640	0.0998	6.19E−02	499.9
206	22.40	0.00	0.0711	7.497	0.0976	6.08E−02	490.6
207	22.40	0.25	0.0755	7.950	0.1044	6.44E−02	520.2

Table A27. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.0747	7.867	0.1032	6.37E–02	514.8
209	22.50	0.42	0.0754	7.945	0.1044	6.44E–02	519.9
210	22.40	0.47	0.0751	7.917	0.1039	6.42E–02	518.0
211	23.20	0.00	0.0717	7.557	0.0985	6.12E–02	494.5
212	23.20	0.25	0.0717	7.555	0.0985	6.12E–02	494.4
213	23.20	0.38	0.0757	7.978	0.1049	6.47E–02	522.1
214	23.30	0.42	0.0763	8.039	0.1058	6.51E–02	526.0
215	23.20	0.47	0.0714	7.520	0.0980	6.09E–02	492.1
216	24.00	0.00	0.0758	7.982	0.1049	6.47E–02	522.3
217	24.00	0.25	0.0760	8.005	0.1053	6.49E–02	523.8
218	24.00	0.38	0.0760	8.008	0.1053	6.49E–02	524.0
219	24.10	0.42	0.0772	8.138	0.1073	6.59E–02	532.5
220	24.00	0.47	0.0764	8.053	0.1060	6.53E–02	527.0
221	25.00	0.00	0.0819	8.629	0.1146	6.99E–02	564.6
222	25.00	0.25	0.0799	8.424	0.1116	6.83E–02	551.2
223	25.00	0.38	0.0734	7.735	0.1012	6.27E–02	506.1
224	25.10	0.42	0.0728	7.670	0.1002	6.22E–02	501.9
225	25.00	0.47	0.0777	8.189	0.1080	6.64E–02	535.9
226	9.00	999.00	0.0269	2.839	0.0276	2.30E–02	185.8
227	0.00	–2.25	1.1661	122.878	1.8313	9.96E–01	8040.4
228	0.00	–0.29	1.1481	120.980	1.8028	9.80E–01	7916.2
229	0.00	2.25	1.1471	120.873	1.8012	9.79E–01	7909.2
230	22.96	0.00	0.2487	26.211	0.3788	2.12E–01	1715.1
231	23.16	0.00	0.2046	21.562	0.3090	1.75E–01	1410.9
232	23.36	0.00	0.1790	18.864	0.2684	1.53E–01	1234.3
233	23.76	0.00	0.1805	19.019	0.2708	1.54E–01	1244.5
234	24.16	0.00	0.2027	21.360	0.3059	1.73E–01	1397.6
235	24.89	0.00	0.2538	26.747	0.3869	2.17E–01	1750.2
236	25.09	0.00	0.2560	26.974	0.3903	2.19E–01	1765.0
237	25.29	0.00	0.2514	26.494	0.3831	2.15E–01	1733.6
238	25.49	0.00	0.2433	25.636	0.3702	2.08E–01	1677.5
239	26.26	0.00	0.1118	11.784	0.1620	9.55E–02	771.1
240	26.76	0.00	0.1706	17.975	0.2551	1.46E–01	1176.1
241	27.26	0.00	0.1459	15.370	0.2159	1.25E–01	1005.7
242	27.51	0.00	0.1374	14.478	0.2025	1.17E–01	947.4
243	27.76	0.00	0.1268	13.361	0.1857	1.08E–01	874.2
244	0.58	999.00	0.0289	3.040	0.0307	2.46E–02	198.9
245	0.86	999.00	0.0290	3.060	0.0310	2.48E–02	200.3
246	1.15	999.00	0.0284	2.991	0.0299	2.42E–02	195.7
247	1.43	999.00	0.0292	3.080	0.0312	2.50E–02	201.5
248	1.72	999.00	0.0276	2.907	0.0287	2.36E–02	190.2
249	2.00	999.00	0.0290	3.060	0.0309	2.48E–02	200.2
250	2.29	999.00	0.0273	2.877	0.0282	2.33E–02	188.2
251	2.57	999.00	0.0290	3.058	0.0309	2.48E–02	200.1
252	2.86	999.00	0.0285	3.004	0.0301	2.43E–02	196.6
253	3.14	999.00	0.0268	2.824	0.0274	2.29E–02	184.8
254	3.43	999.00	0.0282	2.972	0.0296	2.41E–02	194.5
255	999.00	999.00	0.0260	2.738	0.0261	2.22E–02	179.2
256	999.00	999.00	1.1655	122.808	1.8303	9.95E–01	8035.8

Table A28. Flow Conditions and Pressure Distribution for Run 65

[CR = 3; Re = 1.14×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	718.84	(.49563E+07)
$T_{t,1}$, °R (K)	1845.21	(1025.12)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0322	(16.57)
$h_{t,1}$, btu/lbm (J/kg)	463.86	(.10782E+07)
Free-stream conditions:		
M_∞	9.78	
p_∞, psia (N/m^2)	0.0189	(130.47)
T_∞, °R (K)	95.95	(53.31)
ρ_∞, slug/ft^3 (kg/m^3)	0.16545E−04	(.85270E−02)
h_∞, btu/lbm (J/kg)	0.22884E+02	(.53192E+05)
a_∞, ft/s (m/s)	480.55	(146.47)
u_∞, ft/s (m/s)	4697.52	(1431.80)
Re_∞, ft^{-1} (m^{-1})	0.10811E+07	(.35470E+07)
q_∞, psia (N/m^2)	1.268	(8740.45)
μ_∞, slug/ft-s (N-s/m^2)	0.71890E−07	(.34421E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.350	(16200.22)
$T_{t,2}$, °R (K)	1849.60	(1027.55)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.10661E−03	(.54945E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0592	3.374	0.0346	2.66E−02	408.2
2	11.18	0.20	0.0623	3.549	0.0372	2.79E−02	429.4
3	12.17	0.20	0.0676	3.854	0.0416	3.03E−02	466.2
4	13.15	0.20	0.0709	4.040	0.0444	3.18E−02	488.8
5	14.21	0.20	0.0770	4.389	0.0495	3.45E−02	531.0
6	15.14	0.20	0.0768	4.374	0.0492	3.44E−02	529.2
7	16.13	0.20	0.0839	4.779	0.0551	3.76E−02	578.2
8	17.12	0.20	0.0949	5.409	0.0643	4.26E−02	654.4
9	18.11	0.20	0.1045	5.958	0.0723	4.69E−02	720.8
10	19.74	0.20	0.0893	5.091	0.0597	4.01E−02	616.0
11	20.55	0.20	0.0972	5.540	0.0662	4.36E−02	670.2
12	22.56	0.20	0.1145	6.526	0.0806	5.14E−02	789.5
13	24.98	0.20	0.1236	7.044	0.0882	5.54E−02	852.2
14	10.59	0.60	0.1073	6.115	0.0746	4.81E−02	739.9
15	11.58	0.60	0.0947	5.398	0.0642	4.25E−02	653.1
16	12.57	0.60	0.0929	5.295	0.0627	4.17E−02	640.7
17	13.56	0.60	0.0898	5.117	0.0601	4.03E−02	619.1
18	14.60	0.60	0.0862	4.913	0.0571	3.87E−02	594.4
19	15.54	0.60	0.0844	4.809	0.0556	3.78E−02	581.8
20	16.53	0.60	0.0893	5.087	0.0596	4.00E−02	615.5
21	17.52	0.60	0.0994	5.663	0.0680	4.46E−02	685.2
22	18.51	0.60	0.1102	6.280	0.0770	4.94E−02	759.9
23	12.97	1.00	0.0987	5.624	0.0675	4.43E−02	680.4
24	15.00	1.00	0.1020	5.813	0.0702	4.58E−02	703.3
25	15.94	1.00	0.0985	5.613	0.0673	4.42E−02	679.1
26	16.93	1.00	0.1027	5.850	0.0708	4.60E−02	707.8
27	17.92	1.00	0.1108	6.316	0.0776	4.97E−02	764.1
28	18.91	1.00	0.1278	7.282	0.0917	5.73E−02	881.0
29	24.98	1.00	0.1069	6.090	0.0743	4.79E−02	736.8
30	11.99	2.00	0.1094	6.233	0.0764	4.91E−02	754.2
31	13.97	2.00	0.0920	5.244	0.0619	4.13E−02	634.4
32	15.98	2.00	0.0975	5.555	0.0665	4.37E−02	672.1
33	16.94	2.00	0.0955	5.442	0.0648	4.28E−02	658.4

Table A28. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0988	5.632	0.0676	4.43E−02	681.4
35	18.42	2.00	0.1003	5.714	0.0688	4.50E−02	691.3
36	18.92	2.00	0.1039	5.920	0.0718	4.66E−02	716.2
37	19.41	2.00	0.1070	6.095	0.0744	4.80E−02	737.5
38	19.91	2.00	0.1176	6.699	0.0832	5.27E−02	810.5
39	20.26	2.00	0.1525	8.690	0.1122	6.84E−02	1051.4
40	21.11	2.00	0.1923	10.961	0.1453	8.63E−02	1326.1
41	21.96	2.00	0.1757	10.010	0.1315	7.88E−02	1211.1
42	22.74	2.00	0.1638	9.336	0.1216	7.35E−02	1129.6
43	23.52	2.00	0.1599	9.112	0.1184	7.17E−02	1102.5
44	24.98	2.00	0.1537	8.761	0.1132	6.90E−02	1060.0
45	17.94	3.00	0.0838	4.773	0.0551	3.76E−02	577.5
46	18.93	3.00	0.0811	4.622	0.0528	3.64E−02	559.2
47	19.92	3.00	0.1028	5.859	0.0709	4.61E−02	708.8
48	20.91	3.00	0.1292	7.365	0.0929	5.80E−02	891.1
49	22.11	3.00	0.2254	12.847	0.1729	1.01E−01	1554.4
50	22.96	3.00	0.2501	14.255	0.1934	1.12E−01	1724.7
51	23.74	3.00	0.2507	14.288	0.1939	1.12E−01	1728.7
52	24.98	3.00	0.2145	12.223	0.1638	9.62E−02	1478.9
53	18.34	3.40	0.0768	4.377	0.0493	3.45E−02	529.6
54	19.32	3.40	0.0917	5.228	0.0617	4.11E−02	632.5
55	19.82	3.40	0.0949	5.409	0.0643	4.26E−02	654.5
56	20.32	3.40	0.1070	6.098	0.0744	4.80E−02	737.7
57	20.81	3.40	0.1242	7.079	0.0887	5.57E−02	856.5
58	21.31	3.40	0.1329	7.574	0.0959	5.96E−02	916.4
59	21.66	3.40	0.1583	9.022	0.1171	7.10E−02	1091.6
60	22.94	3.40	0.2273	12.951	0.1744	1.02E−01	1566.9
61	23.75	3.40	0.2835	16.154	0.2211	1.27E−01	1954.5
62	24.14	3.40	0.2891	16.475	0.2258	1.30E−01	1993.3
63	22.29	3.60	0.1770	10.084	0.1326	7.94E−02	1220.1
64	22.71	3.60	0.2347	13.375	0.1806	1.05E−01	1618.3
65	23.14	3.60	0.2777	15.828	0.2164	1.25E−01	1915.0
66	23.95	3.60	0.3061	17.443	0.2399	1.37E−01	2110.4
67	24.34	3.60	0.3191	18.188	0.2508	1.43E−01	2200.5
68	13.79	3.80	0.0848	4.831	0.0559	3.80E−02	584.5
69	15.77	3.80	0.0682	3.889	0.0422	3.06E−02	470.5
70	17.75	3.80	0.0664	3.786	0.0407	2.98E−02	458.1
71	19.23	3.80	0.0827	4.711	0.0542	3.71E−02	570.0
72	19.73	3.80	0.0838	4.777	0.0551	3.76E−02	578.0
73	20.22	3.80	0.1084	6.180	0.0756	4.86E−02	747.7
74	20.72	3.80	0.1233	7.027	0.0879	5.53E−02	850.2
75	21.41	3.80	0.1266	7.217	0.0907	5.68E−02	873.2
76	21.71	3.80	0.1211	6.899	0.0861	5.43E−02	834.7
77	22.06	3.80	0.1285	7.325	0.0923	5.77E−02	886.2
78	22.49	3.80	0.2013	11.471	0.1528	9.03E−02	1387.9
79	22.76	3.80	0.2619	14.926	0.2032	1.17E−01	1805.8
80	22.91	3.80	0.2780	15.844	0.2166	1.25E−01	1917.0
81	23.76	3.80	0.2782	15.852	0.2167	1.25E−01	1917.9
82	24.15	3.80	0.3050	17.382	0.2390	1.37E−01	2103.1
83	24.98	3.80	0.4199	23.928	0.3346	1.88E−01	2895.1
84	22.59	3.90	0.2248	12.813	0.1724	1.01E−01	1550.3
85	22.80	3.90	0.2253	12.837	0.1727	1.01E−01	1553.1
86	23.01	3.90	0.2981	16.988	0.2333	1.34E−01	2055.4
87	23.15	3.90	0.3367	19.191	0.2654	1.51E−01	2321.9
88	23.86	3.90	0.4044	23.046	0.3217	1.81E−01	2788.4
89	24.25	3.90	0.3800	21.654	0.3014	1.70E−01	2619.9
90	11.99	2.00	0.1090	6.214	0.0761	4.89E−02	751.9
91	13.97	2.00	0.0969	5.520	0.0660	4.34E−02	667.9

Table A28. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0989	5.639	0.0677	4.44E−02	682.2
93	17.93	2.00	0.0997	5.681	0.0683	4.47E−02	687.3
94	19.91	2.00	0.1172	6.680	0.0829	5.26E−02	808.2
95	1.00	0.00	0.0477	2.718	0.0251	2.14E−02	328.8
96	1.00	0.66	0.0466	2.654	0.0241	2.09E−02	321.1
97	1.00	1.28	0.0464	2.646	0.0240	2.08E−02	320.1
98	1.00	1.90	0.0467	2.663	0.0243	2.10E−02	322.2
99	2.50	0.00	0.0376	2.142	0.0167	1.69E−02	259.2
100	4.00	0.00	0.0341	1.941	0.0137	1.53E−02	234.8
101	4.00	0.66	0.0348	1.983	0.0143	1.56E−02	239.9
102	4.00	1.90	0.0337	1.920	0.0134	1.51E−02	232.3
103	5.50	0.00	0.0332	1.893	0.0130	1.49E−02	229.0
104	7.00	0.00	0.0317	1.804	0.0117	1.42E−02	218.2
105	8.00	−1.90	0.0343	1.957	0.0140	1.54E−02	236.8
106	8.00	−1.50	0.0381	2.170	0.0171	1.71E−02	262.6
107	8.00	−1.11	0.0400	2.280	0.0187	1.79E−02	275.9
108	8.00	−0.66	0.0425	2.423	0.0208	1.91E−02	293.2
109	8.00	0.00	0.0437	2.492	0.0218	1.96E−02	301.5
110	8.00	0.25	0.0430	2.452	0.0212	1.93E−02	296.7
111	8.00	0.38	0.0425	2.421	0.0207	1.91E−02	292.9
112	8.00	0.66	0.0428	2.442	0.0210	1.92E−02	295.4
113	8.00	1.11	0.0409	2.333	0.0194	1.84E−02	282.2
114	8.00	1.50	0.0383	2.182	0.0172	1.72E−02	264.0
115	8.00	1.90	0.0356	2.030	0.0150	1.60E−02	245.6
116	9.00	0.00	0.0506	2.884	0.0275	2.27E−02	348.9
117	9.00	0.25	0.0502	2.862	0.0272	2.25E−02	346.3
118	9.00	0.38	0.0500	2.850	0.0270	2.24E−02	344.8
119	9.00	0.66	0.0492	2.801	0.0263	2.20E−02	338.9
120	9.00	1.01	0.0446	2.543	0.0225	2.00E−02	307.7
121	9.00	1.32	0.0417	2.374	0.0200	1.87E−02	287.2
122	10.00	0.00	0.0499	2.845	0.0269	2.24E−02	344.2
123	10.00	0.25	0.0491	2.798	0.0262	2.20E−02	338.5
124	10.00	0.38	0.0506	2.881	0.0274	2.27E−02	348.6
125	10.00	0.66	0.0470	2.680	0.0245	2.11E−02	324.2
126	10.00	0.90	0.0476	2.714	0.0250	2.14E−02	328.4
127	10.00	1.08	0.0467	2.664	0.0243	2.10E−02	322.3
128	10.00	1.22	0.0478	2.726	0.0252	2.15E−02	329.8
129	10.00	1.34	0.0512	2.916	0.0280	2.30E−02	352.9
130	11.00	0.00	0.0528	3.011	0.0293	2.37E−02	364.3
131	11.00	0.25	0.0546	3.114	0.0308	2.45E−02	376.8
132	11.00	0.38	0.0538	3.069	0.0302	2.42E−02	371.3
133	11.00	0.52	0.0545	3.103	0.0307	2.44E−02	375.5
134	11.00	0.80	0.0516	2.939	0.0283	2.31E−02	355.6
135	11.00	0.97	0.0524	2.985	0.0290	2.35E−02	361.2
136	11.00	1.11	0.0547	3.117	0.0309	2.45E−02	377.1
137	11.00	1.23	0.0558	3.178	0.0318	2.50E−02	384.5
138	12.00	0.00	0.0601	3.426	0.0354	2.70E−02	414.5
139	12.00	0.25	0.0592	3.375	0.0347	2.66E−02	408.3
140	12.00	0.38	0.0587	3.343	0.0342	2.63E−02	404.4
141	12.00	0.52	0.0586	3.340	0.0342	2.63E−02	404.2
142	12.00	0.69	0.0566	3.223	0.0324	2.54E−02	390.0
143	12.00	0.87	0.0576	3.283	0.0333	2.58E−02	397.2
144	12.00	1.01	0.0608	3.466	0.0360	2.73E−02	419.4
145	12.00	1.13	0.0612	3.489	0.0363	2.75E−02	422.2
146	13.00	0.00	0.0644	3.668	0.0389	2.89E−02	443.8
147	13.00	0.25	0.0633	3.609	0.0381	2.84E−02	436.6
148	13.00	0.38	0.0630	3.591	0.0378	2.83E−02	434.5
149	13.00	0.52	0.0626	3.568	0.0375	2.81E−02	431.6

Table A28. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0599	3.415	0.0352	2.69E−02	413.1
151	13.00	0.76	0.0617	3.515	0.0367	2.77E−02	425.2
152	13.00	0.90	0.0657	3.742	0.0400	2.95E−02	452.8
153	13.00	1.02	0.0647	3.686	0.0392	2.90E−02	445.9
154	14.00	0.00	0.0673	3.834	0.0414	3.02E−02	463.9
155	14.00	0.25	0.0668	3.807	0.0410	3.00E−02	460.6
156	14.00	0.38	0.0651	3.713	0.0396	2.92E−02	449.2
157	14.00	0.52	0.0656	3.739	0.0400	2.94E−02	452.4
158	14.00	0.66	0.0642	3.657	0.0388	2.88E−02	442.5
159	14.00	0.80	0.0709	4.040	0.0444	3.18E−02	488.7
160	14.00	0.92	0.0693	3.948	0.0430	3.11E−02	477.6
161	15.00	0.00	0.0744	4.238	0.0473	3.34E−02	512.8
162	15.00	0.25	0.0734	4.182	0.0464	3.29E−02	506.0
163	15.00	0.38	0.0727	4.144	0.0459	3.26E−02	501.4
164	15.00	0.69	0.0756	4.310	0.0483	3.39E−02	521.5
165	15.00	0.81	0.0758	4.320	0.0484	3.40E−02	522.7
166	16.00	0.00	0.0836	4.764	0.0549	3.75E−02	576.4
167	16.00	0.25	0.0833	4.747	0.0547	3.74E−02	574.3
168	16.00	0.38	0.0833	4.746	0.0547	3.74E−02	574.2
169	16.00	0.48	0.0835	4.756	0.0548	3.74E−02	575.4
170	16.00	0.59	0.0859	4.897	0.0569	3.85E−02	592.5
171	16.00	0.71	0.0842	4.801	0.0555	3.78E−02	580.8
172	17.00	0.00	0.0973	5.542	0.0663	4.36E−02	670.6
173	17.00	0.25	0.0955	5.442	0.0648	4.28E−02	658.4
174	17.00	0.38	0.0952	5.423	0.0645	4.27E−02	656.1
175	17.00	0.48	0.0953	5.433	0.0647	4.28E−02	657.3
176	17.00	0.60	0.0920	5.241	0.0619	4.13E−02	634.1
177	18.00	0.00	0.1130	6.442	0.0794	5.07E−02	779.4
178	18.00	0.25	0.1107	6.310	0.0775	4.97E−02	763.4
179	18.00	0.38	0.1074	6.121	0.0747	4.82E−02	740.6
180	18.00	0.50	0.1047	5.968	0.0725	4.70E−02	722.1
181	18.50	0.00	0.1238	7.056	0.0884	5.55E−02	853.6
182	18.50	0.25	0.1189	6.778	0.0843	5.33E−02	820.1
183	18.50	0.38	0.1054	6.004	0.0730	4.73E−02	726.4
184	18.60	0.42	0.1034	5.893	0.0714	4.64E−02	713.0
185	18.50	0.47	0.1038	5.914	0.0717	4.65E−02	715.5
186	19.20	0.00	0.1309	7.461	0.0943	5.87E−02	902.7
187	19.20	0.25	0.1138	6.485	0.0800	5.10E−02	784.6
188	19.20	0.38	0.0956	5.448	0.0649	4.29E−02	659.1
189	19.30	0.42	0.0930	5.300	0.0627	4.17E−02	641.2
190	19.20	0.47	0.0941	5.360	0.0636	4.22E−02	648.5
191	20.00	0.00	0.1288	7.338	0.0925	5.78E−02	887.8
192	20.00	0.25	0.1256	7.158	0.0899	5.63E−02	866.0
193	20.00	0.38	0.0977	5.569	0.0667	4.38E−02	673.8
194	20.10	0.42	0.1013	5.771	0.0696	4.54E−02	698.2
195	20.00	0.47	0.0987	5.624	0.0675	4.43E−02	680.5
196	20.80	0.00	0.1295	7.383	0.0931	5.81E−02	893.2
197	20.80	0.25	0.1237	7.052	0.0883	5.55E−02	853.2
198	20.80	0.38	0.1173	6.685	0.0830	5.26E−02	808.8
199	20.90	0.42	0.1227	6.990	0.0874	5.50E−02	845.7
200	20.80	0.47	0.1227	6.992	0.0874	5.50E−02	845.9
201	21.60	0.00	0.1280	7.293	0.0918	5.74E−02	882.3
202	21.60	0.25	0.1277	7.278	0.0916	5.73E−02	880.5
203	21.60	0.38	0.1425	8.119	0.1039	6.39E−02	982.4
204	21.70	0.42	0.1424	8.117	0.1038	6.39E−02	982.0
205	21.60	0.47	0.1303	7.426	0.0938	5.85E−02	898.5
206	22.40	0.00	0.1281	7.301	0.0919	5.75E−02	883.4
207	22.40	0.25	0.1345	7.667	0.0973	6.03E−02	927.6

Table A28. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.1325	7.551	0.0956	5.94E–02	913.5
209	22.50	0.42	0.1431	8.154	0.1044	6.42E–02	986.5
210	22.40	0.47	0.1425	8.124	0.1039	6.39E–02	982.9
211	23.20	0.00	0.1284	7.320	0.0922	5.76E–02	885.6
212	23.20	0.25	0.1282	7.309	0.0921	5.75E–02	884.3
213	23.20	0.38	0.1361	7.757	0.0986	6.11E–02	938.5
214	23.30	0.42	0.1361	7.757	0.0986	6.11E–02	938.5
215	23.20	0.47	0.1289	7.343	0.0926	5.78E–02	888.4
216	24.00	0.00	0.1352	7.704	0.0978	6.06E–02	932.1
217	24.00	0.25	0.1361	7.757	0.0986	6.11E–02	938.6
218	24.00	0.38	0.1371	7.814	0.0994	6.15E–02	945.4
219	24.10	0.42	0.1401	7.985	0.1019	6.28E–02	966.1
220	24.00	0.47	0.1388	7.909	0.1008	6.23E–02	956.9
221	25.00	0.00	0.1452	8.274	0.1061	6.51E–02	1001.1
222	25.00	0.25	0.1428	8.136	0.1041	6.40E–02	984.4
223	25.00	0.38	0.1365	7.781	0.0989	6.12E–02	941.4
224	25.10	0.42	0.1348	7.680	0.0975	6.05E–02	929.3
225	25.00	0.47	0.1352	7.706	0.0979	6.07E–02	932.3
226	9.00	999.00	0.0405	2.308	0.0191	1.82E–02	279.3
227	0.00	–2.25	2.2341	127.319	1.8432	1.00E+00	15404.3
228	0.00	–0.29	2.2189	126.453	1.8306	9.95E–01	15299.5
229	0.00	2.25	2.2188	126.446	1.8305	9.95E–01	15298.7
230	22.96	0.00	0.5122	29.187	0.4113	2.30E–01	3531.3
231	23.16	0.00	0.4397	25.058	0.3511	1.97E–01	3031.8
232	23.36	0.00	0.3692	21.040	0.2924	1.66E–01	2545.6
233	23.76	0.00	0.3031	17.273	0.2375	1.36E–01	2089.9
234	24.16	0.00	0.2956	16.845	0.2312	1.33E–01	2038.0
235	24.89	0.00	0.3372	19.216	0.2658	1.51E–01	2325.0
236	25.09	0.00	0.3429	19.541	0.2706	1.54E–01	2364.3
237	25.29	0.00	0.3462	19.731	0.2733	1.55E–01	2387.3
238	25.49	0.00	0.3458	19.706	0.2729	1.55E–01	2384.2
239	26.26	0.00	0.2339	13.327	0.1799	1.05E–01	1612.5
240	26.76	0.00	0.3167	18.051	0.2488	1.42E–01	2184.0
241	27.26	0.00	0.2759	15.724	0.2148	1.24E–01	1902.4
242	27.51	0.00	0.2509	14.301	0.1941	1.13E–01	1730.3
243	27.76	0.00	0.2281	12.997	0.1751	1.02E–01	1572.5
244	0.58	999.00	0.0445	2.533	0.0224	1.99E–02	306.5
245	0.86	999.00	0.0436	2.484	0.0217	1.96E–02	300.6
246	1.15	999.00	0.0440	2.510	0.0220	1.98E–02	303.7
247	1.43	999.00	0.0448	2.551	0.0226	2.01E–02	308.7
248	1.72	999.00	0.0434	2.473	0.0215	1.95E–02	299.2
249	2.00	999.00	0.0434	2.472	0.0215	1.95E–02	299.1
250	2.29	999.00	0.0437	2.490	0.0217	1.96E–02	301.3
251	2.57	999.00	0.0450	2.563	0.0228	2.02E–02	310.1
252	2.86	999.00	0.0431	2.457	0.0213	1.93E–02	297.3
253	3.14	999.00	0.0444	2.531	0.0223	1.99E–02	306.2
254	3.43	999.00	0.0442	2.516	0.0221	1.98E–02	304.4
255	999.00	999.00	0.0407	2.317	0.0192	1.82E–02	280.3
256	999.00	999.00	2.2334	127.278	1.8426	1.00E+00	15399.4

Table A29. Flow Conditions and Pressure Distribution for Run 66

[CR = 3; Re = 2.15×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	1443.80	(.99547E+07)
$T_{t,1}$, °R (K)	1808.86	(1004.92)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0648	(33.39)
$h_{t,1}$, btu/lbm (J/kg)	455.03	(.10577E+07)
Free-stream conditions:		
M_∞	9.93	
p_∞, psia (N/m^2)	0.0349	(240.85)
T_∞, °R (K)	91.29	(50.72)
ρ_∞, slug/ft^3 (kg/m^3)	0.32101E−04	(.16544E−01)
h_∞, btu/lbm (J/kg)	0.21773E+02	(.50610E+05)
a_∞, ft/s (m/s)	468.74	(142.87)
u_∞, ft/s (m/s)	4656.20	(1419.21)
Re_∞, ft^{-1} (m^{-1})	0.22052E+07	(.72349E+07)
q_∞, psia (N/m^2)	2.417	(16661.41)
μ_∞, slug/ft-s (N-s/m^2)	0.67780E−07	(.32453E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	4.479	(30872.14)
$T_{t,2}$, °R (K)	1817.30	(1009.61)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.20678E−03	(.10657E+00)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0780	2.451	0.0204	1.86E−02	538.0
2	11.18	0.20	0.0853	2.679	0.0236	2.03E−02	588.2
3	12.17	0.20	0.0929	2.917	0.0269	2.21E−02	640.3
4	13.15	0.20	0.1014	3.185	0.0307	2.42E−02	699.2
5	14.21	0.20	0.1051	3.300	0.0323	2.50E−02	724.5
6	15.14	0.20	0.1124	3.531	0.0356	2.68E−02	775.2
7	16.13	0.20	0.1264	3.970	0.0418	3.01E−02	871.6
8	17.12	0.20	0.1435	4.506	0.0493	3.42E−02	989.3
9	18.11	0.20	0.1830	5.749	0.0668	4.36E−02	1262.1
10	19.74	0.20	0.1657	5.203	0.0591	3.95E−02	1142.2
11	20.55	0.20	0.1984	6.230	0.0735	4.73E−02	1367.8
12	22.56	0.20	0.2186	6.867	0.0825	5.21E−02	1507.5
13	24.98	0.20	0.2352	7.386	0.0898	5.60E−02	1621.5
14	10.59	0.60	0.1481	4.650	0.0513	3.53E−02	1020.9
15	11.58	0.60	0.1309	4.112	0.0437	3.12E−02	902.7
16	12.57	0.60	0.1337	4.200	0.0450	3.19E−02	922.0
17	13.56	0.60	0.1364	4.283	0.0462	3.25E−02	940.2
18	14.60	0.60	0.1368	4.297	0.0464	3.26E−02	943.4
19	15.54	0.60	0.1326	4.164	0.0445	3.16E−02	914.2
20	16.53	0.60	0.1326	4.164	0.0445	3.16E−02	914.3
21	17.52	0.60	0.1475	4.634	0.0511	3.52E−02	1017.3
22	18.51	0.60	0.1834	5.761	0.0669	4.37E−02	1264.7
23	12.97	1.00	0.1430	4.491	0.0491	3.41E−02	986.1
24	15.00	1.00	0.1442	4.529	0.0496	3.44E−02	994.2
25	15.94	1.00	0.1404	4.411	0.0479	3.35E−02	968.3
26	16.93	1.00	0.1441	4.527	0.0496	3.43E−02	993.8
27	17.92	1.00	0.1499	4.708	0.0521	3.57E−02	1033.5
28	18.91	1.00	0.1705	5.354	0.0612	4.06E−02	1175.3
29	24.98	1.00	0.2187	6.870	0.0825	5.21E−02	1508.2
30	11.99	2.00	0.1865	5.856	0.0683	4.44E−02	1285.7
31	13.97	2.00	0.1539	4.833	0.0539	3.67E−02	1061.0
32	15.98	2.00	0.1562	4.905	0.0549	3.72E−02	1076.8
33	16.94	2.00	0.1491	4.683	0.0518	3.55E−02	1028.1

Table A29. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.1476	4.635	0.0511	3.52E−02	1017.6
35	18.42	2.00	0.1480	4.649	0.0513	3.53E−02	1020.7
36	18.92	2.00	0.1513	4.753	0.0528	3.61E−02	1043.4
37	19.41	2.00	0.1530	4.804	0.0535	3.64E−02	1054.7
38	19.91	2.00	0.1553	4.877	0.0545	3.70E−02	1070.7
39	20.26	2.00	0.1560	4.899	0.0548	3.72E−02	1075.4
40	21.11	2.00	0.1972	6.194	0.0730	4.70E−02	1359.8
41	21.96	2.00	0.3103	9.746	0.1230	7.39E−02	2139.7
42	22.74	2.00	0.3496	10.979	0.1403	8.33E−02	2410.3
43	23.52	2.00	0.3490	10.962	0.1401	8.32E−02	2406.7
44	24.98	2.00	0.3303	10.373	0.1318	7.87E−02	2277.2
45	17.94	3.00	0.1434	4.503	0.0493	3.42E−02	988.7
46	18.93	3.00	0.1366	4.290	0.0463	3.25E−02	941.8
47	19.92	3.00	0.1627	5.108	0.0578	3.88E−02	1121.5
48	20.91	3.00	0.1672	5.252	0.0598	3.98E−02	1152.9
49	22.11	3.00	0.3085	9.690	0.1222	7.35E−02	2127.4
50	22.96	3.00	0.3568	11.204	0.1435	8.50E−02	2459.8
51	23.74	3.00	0.3711	11.654	0.1498	8.84E−02	2558.5
52	24.98	3.00	0.3649	11.460	0.1471	8.69E−02	2516.0
53	18.34	3.40	0.1316	4.134	0.0441	3.14E−02	907.6
54	19.32	3.40	0.1537	4.827	0.0538	3.66E−02	1059.7
55	19.82	3.40	0.1551	4.870	0.0544	3.69E−02	1069.1
56	20.32	3.40	0.1528	4.799	0.0534	3.64E−02	1053.6
57	20.81	3.40	0.1586	4.983	0.0560	3.78E−02	1093.9
58	21.31	3.40	0.1964	6.168	0.0727	4.68E−02	1354.1
59	21.66	3.40	0.2106	6.613	0.0789	5.02E−02	1451.9
60	22.94	3.40	0.3451	10.840	0.1383	8.22E−02	2379.7
61	23.75	3.40	0.4339	13.628	0.1775	1.03E−01	2991.9
62	24.14	3.40	0.4381	13.758	0.1794	1.04E−01	3020.5
63	22.29	3.60	0.2523	7.923	0.0973	6.01E−02	1739.3
64	22.71	3.60	0.3384	10.628	0.1353	8.06E−02	2333.2
65	23.14	3.60	0.4306	13.522	0.1760	1.03E−01	2968.7
66	23.95	3.60	0.4331	13.603	0.1772	1.03E−01	2986.4
67	24.34	3.60	0.4242	13.322	0.1732	1.01E−01	2924.7
68	13.79	3.80	0.1464	4.599	0.0506	3.49E−02	1009.6
69	15.77	3.80	0.1194	3.749	0.0386	2.84E−02	823.0
70	17.75	3.80	0.1135	3.566	0.0361	2.70E−02	782.8
71	19.23	3.80	0.1359	4.268	0.0459	3.24E−02	936.9
72	19.73	3.80	0.1365	4.287	0.0462	3.25E−02	941.2
73	20.22	3.80	0.1402	4.402	0.0478	3.34E−02	966.3
74	20.72	3.80	0.1723	5.410	0.0620	4.10E−02	1187.8
75	21.41	3.80	0.1953	6.134	0.0722	4.65E−02	1346.7
76	21.71	3.80	0.2020	6.343	0.0751	4.81E−02	1392.5
77	22.06	3.80	0.2140	6.722	0.0804	5.10E−02	1475.7
78	22.49	3.80	0.3063	9.621	0.1212	7.30E−02	2112.1
79	22.76	3.80	0.3833	12.039	0.1552	9.13E−02	2643.1
80	22.91	3.80	0.4123	12.949	0.1680	9.82E−02	2842.8
81	23.76	3.80	0.4445	13.961	0.1822	1.06E−01	3065.1
82	24.15	3.80	0.4589	14.414	0.1886	1.09E−01	3164.4
83	24.98	3.80	0.5551	17.434	0.2310	1.32E−01	3827.6
84	22.59	3.90	0.3307	10.385	0.1319	7.88E−02	2279.8
85	22.80	3.90	0.3884	12.200	0.1575	9.25E−02	2678.3
86	23.01	3.90	0.4390	13.786	0.1797	1.05E−01	3026.6
87	23.15	3.90	0.4762	14.957	0.1962	1.13E−01	3283.7
88	23.86	3.90	0.5665	17.791	0.2360	1.35E−01	3905.7
89	24.25	3.90	0.5564	17.474	0.2316	1.33E−01	3836.2
90	11.99	2.00	0.1885	5.921	0.0692	4.49E−02	1299.9
91	13.97	2.00	0.1653	5.191	0.0589	3.94E−02	1139.6

Table A29. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.1606	5.042	0.0568	3.83E−02	1107.0
93	17.93	2.00	0.1516	4.763	0.0529	3.61E−02	1045.6
94	19.91	2.00	0.1547	4.859	0.0542	3.69E−02	1066.7
95	1.00	0.00	0.0723	2.272	0.0179	1.72E−02	498.7
96	1.00	0.66	0.0699	2.194	0.0168	1.66E−02	481.7
97	1.00	1.28	0.0706	2.219	0.0171	1.68E−02	487.1
98	1.00	1.90	0.0712	2.237	0.0174	1.70E−02	491.2
99	2.50	0.00	0.0539	1.694	0.0098	1.28E−02	371.8
100	4.00	0.00	0.0488	1.533	0.0075	1.16E−02	336.6
101	4.00	0.66	0.0491	1.542	0.0076	1.17E−02	338.5
102	4.00	1.90	0.0480	1.509	0.0072	1.14E−02	331.2
103	5.50	0.00	0.0469	1.473	0.0067	1.12E−02	323.4
104	7.00	0.00	0.0458	1.438	0.0062	1.09E−02	315.7
105	8.00	−1.90	0.0444	1.393	0.0055	1.06E−02	305.8
106	8.00	−1.50	0.0455	1.431	0.0061	1.09E−02	314.1
107	8.00	−1.11	0.0452	1.419	0.0059	1.08E−02	311.6
108	8.00	−0.66	0.0451	1.416	0.0059	1.07E−02	310.9
109	8.00	0.00	0.0459	1.442	0.0062	1.09E−02	316.6
110	8.00	0.25	0.0449	1.410	0.0058	1.07E−02	309.6
111	8.00	0.38	0.0448	1.408	0.0057	1.07E−02	309.0
112	8.00	0.66	0.0460	1.446	0.0063	1.10E−02	317.5
113	8.00	1.11	0.0455	1.430	0.0060	1.08E−02	313.9
114	8.00	1.50	0.0445	1.398	0.0056	1.06E−02	307.0
115	8.00	1.90	0.0442	1.389	0.0055	1.05E−02	305.0
116	9.00	0.00	0.0461	1.448	0.0063	1.10E−02	317.8
117	9.00	0.25	0.0462	1.452	0.0064	1.10E−02	318.8
118	9.00	0.38	0.0460	1.443	0.0062	1.09E−02	316.9
119	9.00	0.66	0.0467	1.467	0.0066	1.11E−02	322.0
120	9.00	1.01	0.0513	1.611	0.0086	1.22E−02	353.7
121	9.00	1.32	0.0522	1.638	0.0090	1.24E−02	359.6
122	10.00	0.00	0.0622	1.952	0.0134	1.48E−02	428.6
123	10.00	0.25	0.0619	1.945	0.0133	1.48E−02	427.1
124	10.00	0.38	0.0632	1.984	0.0138	1.50E−02	435.5
125	10.00	0.66	0.0607	1.907	0.0127	1.45E−02	418.6
126	10.00	0.90	0.0635	1.995	0.0140	1.51E−02	438.0
127	10.00	1.08	0.0641	2.013	0.0142	1.53E−02	441.9
128	10.00	1.22	0.0647	2.032	0.0145	1.54E−02	446.2
129	10.00	1.34	0.0727	2.283	0.0180	1.73E−02	501.2
130	11.00	0.00	0.0676	2.124	0.0158	1.61E−02	466.3
131	11.00	0.25	0.0723	2.271	0.0179	1.72E−02	498.6
132	11.00	0.38	0.0708	2.222	0.0172	1.69E−02	487.8
133	11.00	0.52	0.0710	2.229	0.0173	1.69E−02	489.3
134	11.00	0.80	0.0692	2.173	0.0165	1.65E−02	477.2
135	11.00	0.97	0.0699	2.194	0.0168	1.66E−02	481.7
136	11.00	1.11	0.0762	2.392	0.0196	1.81E−02	525.2
137	11.00	1.23	0.0862	2.707	0.0240	2.05E−02	594.2
138	12.00	0.00	0.0753	2.364	0.0192	1.79E−02	519.1
139	12.00	0.25	0.0755	2.372	0.0193	1.80E−02	520.8
140	12.00	0.38	0.0755	2.371	0.0193	1.80E−02	520.4
141	12.00	0.52	0.0754	2.369	0.0193	1.80E−02	520.2
142	12.00	0.69	0.0739	2.319	0.0185	1.76E−02	509.2
143	12.00	0.87	0.0738	2.317	0.0185	1.76E−02	508.8
144	12.00	1.01	0.0839	2.636	0.0230	2.00E−02	578.6
145	12.00	1.13	0.0938	2.946	0.0274	2.23E−02	646.7
146	13.00	0.00	0.0791	2.485	0.0209	1.88E−02	545.5
147	13.00	0.25	0.0788	2.473	0.0207	1.88E−02	543.0
148	13.00	0.38	0.0781	2.452	0.0204	1.86E−02	538.3
149	13.00	0.52	0.0779	2.446	0.0203	1.86E−02	536.9

Table A29. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0756	2.374	0.0193	1.80E−02	521.1
151	13.00	0.76	0.0775	2.434	0.0202	1.85E−02	534.4
152	13.00	0.90	0.0957	3.004	0.0282	2.28E−02	659.5
153	13.00	1.02	0.1018	3.196	0.0309	2.42E−02	701.7
154	14.00	0.00	0.0850	2.670	0.0235	2.03E−02	586.1
155	14.00	0.25	0.0844	2.651	0.0232	2.01E−02	582.0
156	14.00	0.38	0.0831	2.609	0.0226	1.98E−02	572.8
157	14.00	0.52	0.0805	2.527	0.0215	1.92E−02	554.8
158	14.00	0.66	0.0792	2.488	0.0209	1.89E−02	546.2
159	14.00	0.80	0.0960	3.016	0.0283	2.29E−02	662.2
160	14.00	0.92	0.1030	3.234	0.0314	2.45E−02	709.9
161	15.00	0.00	0.0959	3.013	0.0283	2.29E−02	661.4
162	15.00	0.25	0.0954	2.995	0.0280	2.27E−02	657.5
163	15.00	0.38	0.0929	2.918	0.0270	2.21E−02	640.7
164	15.00	0.69	0.1097	3.446	0.0344	2.61E−02	756.6
165	15.00	0.81	0.1157	3.635	0.0370	2.76E−02	797.9
166	16.00	0.00	0.1202	3.774	0.0390	2.86E−02	828.6
167	16.00	0.25	0.1173	3.683	0.0377	2.79E−02	808.5
168	16.00	0.38	0.1133	3.557	0.0359	2.70E−02	780.9
169	16.00	0.48	0.1197	3.759	0.0388	2.85E−02	825.2
170	16.00	0.59	0.1396	4.384	0.0476	3.33E−02	962.5
171	16.00	0.71	0.1269	3.986	0.0420	3.02E−02	875.2
172	17.00	0.00	0.1589	4.991	0.0561	3.79E−02	1095.8
173	17.00	0.25	0.1587	4.984	0.0560	3.78E−02	1094.2
174	17.00	0.38	0.1455	4.569	0.0502	3.47E−02	1003.1
175	17.00	0.48	0.1430	4.490	0.0491	3.41E−02	985.8
176	17.00	0.60	0.1423	4.469	0.0488	3.39E−02	981.1
177	18.00	0.00	0.2188	6.871	0.0825	5.21E−02	1508.5
178	18.00	0.25	0.1996	6.268	0.0741	4.75E−02	1376.0
179	18.00	0.38	0.1872	5.880	0.0686	4.46E−02	1291.0
180	18.00	0.50	0.1807	5.675	0.0657	4.30E−02	1245.9
181	18.50	0.00	0.2437	7.653	0.0935	5.81E−02	1680.1
182	18.50	0.25	0.2144	6.732	0.0806	5.11E−02	1478.0
183	18.50	0.38	0.1982	6.223	0.0734	4.72E−02	1366.3
184	18.60	0.42	0.1903	5.977	0.0700	4.53E−02	1312.2
185	18.50	0.47	0.1905	5.984	0.0701	4.54E−02	1313.7
186	19.20	0.00	0.2753	8.647	0.1075	6.56E−02	1898.5
187	19.20	0.25	0.2161	6.788	0.0814	5.15E−02	1490.3
188	19.20	0.38	0.1741	5.467	0.0628	4.15E−02	1200.1
189	19.30	0.42	0.1692	5.313	0.0606	4.03E−02	1166.3
190	19.20	0.47	0.1697	5.329	0.0609	4.04E−02	1169.9
191	20.00	0.00	0.2706	8.497	0.1054	6.45E−02	1865.5
192	20.00	0.25	0.2391	7.510	0.0915	5.70E−02	1648.8
193	20.00	0.38	0.1841	5.782	0.0672	4.39E−02	1269.4
194	20.10	0.42	0.1910	5.999	0.0703	4.55E−02	1316.9
195	20.00	0.47	0.1876	5.892	0.0688	4.47E−02	1293.6
196	20.80	0.00	0.2598	8.161	0.1007	6.19E−02	1791.6
197	20.80	0.25	0.2583	8.114	0.1000	6.15E−02	1781.2
198	20.80	0.38	0.2246	7.055	0.0851	5.35E−02	1548.8
199	20.90	0.42	0.2350	7.380	0.0897	5.60E−02	1620.2
200	20.80	0.47	0.2334	7.330	0.0890	5.56E−02	1609.3
201	21.60	0.00	0.2620	8.229	0.1016	6.24E−02	1806.6
202	21.60	0.25	0.2611	8.199	0.1012	6.22E−02	1800.0
203	21.60	0.38	0.2892	9.082	0.1136	6.89E−02	1993.9
204	21.70	0.42	0.2894	9.088	0.1137	6.89E−02	1995.1
205	21.60	0.47	0.2603	8.174	0.1009	6.20E−02	1794.6
206	22.40	0.00	0.2382	7.480	0.0911	5.67E−02	1642.1
207	22.40	0.25	0.2690	8.449	0.1047	6.41E−02	1854.9

Table A29. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.2674	8.397	0.1040	6.37E−02	1843.4
209	22.50	0.42	0.2854	8.964	0.1120	6.80E−02	1967.9
210	22.40	0.47	0.2849	8.947	0.1117	6.79E−02	1964.2
211	23.20	0.00	0.2444	7.676	0.0938	5.82E−02	1685.1
212	23.20	0.25	0.2437	7.653	0.0935	5.81E−02	1680.1
213	23.20	0.38	0.2463	7.734	0.0947	5.87E−02	1698.0
214	23.30	0.42	0.2470	7.759	0.0950	5.89E−02	1703.3
215	23.20	0.47	0.2396	7.525	0.0917	5.71E−02	1652.1
216	24.00	0.00	0.2523	7.923	0.0973	6.01E−02	1739.4
217	24.00	0.25	0.2505	7.868	0.0966	5.97E−02	1727.3
218	24.00	0.38	0.2483	7.797	0.0956	5.91E−02	1711.8
219	24.10	0.42	0.2598	8.159	0.1006	6.19E−02	1791.3
220	24.00	0.47	0.2583	8.111	0.1000	6.15E−02	1780.7
221	25.00	0.00	0.2644	8.305	0.1027	6.30E−02	1823.3
222	25.00	0.25	0.2619	8.224	0.1016	6.24E−02	1805.5
223	25.00	0.38	0.2564	8.052	0.0991	6.11E−02	1767.8
224	25.10	0.42	0.2563	8.051	0.0991	6.11E−02	1767.5
225	25.00	0.47	0.2506	7.872	0.0966	5.97E−02	1728.1
226	9.00	999.00	0.0579	1.817	0.0115	1.38E−02	398.9
227	0.00	–2.25	4.2675	134.029	1.8702	1.02E+00	29424.7
228	0.00	–0.29	4.2196	132.524	1.8490	1.01E+00	29094.4
229	0.00	2.25	4.2182	132.479	1.8484	1.00E+00	29084.5
230	22.96	0.00	0.8426	26.462	0.3580	2.01E−01	5809.4
231	23.16	0.00	0.8079	25.374	0.3427	1.92E−01	5570.5
232	23.36	0.00	0.7654	24.037	0.3239	1.82E−01	5277.2
233	23.76	0.00	0.6305	19.801	0.2643	1.50E−01	4347.1
234	24.16	0.00	0.5024	15.779	0.2078	1.20E−01	3464.1
235	24.89	0.00	0.4634	14.552	0.1905	1.10E−01	3194.9
236	25.09	0.00	0.4693	14.741	0.1932	1.12E−01	3236.2
237	25.29	0.00	0.4678	14.693	0.1925	1.11E−01	3225.8
238	25.49	0.00	0.4573	14.362	0.1878	1.09E−01	3153.0
239	26.26	0.00	0.2624	8.240	0.1018	6.25E−02	1809.0
240	26.76	0.00	0.3789	11.901	0.1532	9.03E−02	2612.7
241	27.26	0.00	0.3514	11.038	0.1411	8.37E−02	2423.2
242	27.51	0.00	0.3381	10.620	0.1352	8.06E−02	2331.5
243	27.76	0.00	0.3240	10.175	0.1290	7.72E−02	2233.9
244	0.58	999.00	0.0621	1.952	0.0134	1.48E−02	428.5
245	0.86	999.00	0.0632	1.984	0.0138	1.51E−02	435.6
246	1.15	999.00	0.0626	1.965	0.0136	1.49E−02	431.4
247	1.43	999.00	0.0619	1.943	0.0133	1.47E−02	426.5
248	1.72	999.00	0.0605	1.899	0.0126	1.44E−02	416.9
249	2.00	999.00	0.0612	1.921	0.0130	1.46E−02	421.8
250	2.29	999.00	0.0615	1.932	0.0131	1.47E−02	424.2
251	2.57	999.00	0.0624	1.960	0.0135	1.49E−02	430.3
252	2.86	999.00	0.0614	1.929	0.0131	1.46E−02	423.5
253	3.14	999.00	0.0622	1.954	0.0134	1.48E−02	428.9
254	3.43	999.00	0.0616	1.934	0.0131	1.47E−02	424.5
255	999.00	999.00	0.0580	1.820	0.0115	1.38E−02	399.6
256	999.00	999.00	4.2627	133.877	1.8680	1.02E+00	29391.2

Table A30. Flow Conditions and Pressure Distribution for Run 67

[CR = 3; Re = 1.14×10^6 per foot; 0 percent cowl position]

Stagnation conditions:		
$p_{t,1}$, psia (N/m^2)	725.82	(.50043E+07)
$T_{t,1}$, °R (K)	1781.48	(989.71)
$\rho_{t,1}$, slug/ft^3 (kg/m^3)	0.0336	(17.32)
$h_{t,1}$, btu/lbm (J/kg)	446.36	(.10376E+07)
Free-stream conditions:		
M_∞	9.80	
p_∞, psia (N/m^2)	0.0190	(131.05)
T_∞, °R (K)	91.94	(51.08)
ρ_∞, slug/ft^3 (kg/m^3)	0.17343E−04	(.89385E−02)
h_∞, btu/lbm (J/kg)	0.21927E+02	(.50969E+05)
a_∞, ft/s (m/s)	470.41	(143.38)
u_∞, ft/s (m/s)	4608.57	(1404.69)
Re_∞, ft^{-1} (m^{-1})	0.11694E+07	(.38365E+07)
q_∞, psia (N/m^2)	1.279	(8818.52)
μ_∞, slug/ft-s (N-s/m^2)	0.68353E−07	(.32727E−05)
Post-normal-shock conditions:		
$p_{t,2}$, psia (N/m^2)	2.370	(16345.73)
$T_{t,2}$, °R (K)	1785.56	(991.98)
$\rho_{t,2}$, slug/ft^3 (kg/m^3)	0.11138E−03	(.57403E−01)

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
1	10.19	0.20	0.0585	3.323	0.0337	2.60E−02	403.6
2	11.18	0.20	0.0631	3.582	0.0375	2.81E−02	435.1
3	12.17	0.20	0.0668	3.793	0.0406	2.97E−02	460.7
4	13.15	0.20	0.0704	3.997	0.0435	3.13E−02	485.5
5	14.21	0.20	0.0768	4.361	0.0488	3.42E−02	529.7
6	15.14	0.20	0.0731	4.150	0.0458	3.25E−02	504.1
7	16.13	0.20	0.0815	4.627	0.0527	3.63E−02	562.0
8	17.12	0.20	0.0911	5.173	0.0606	4.05E−02	628.3
9	18.11	0.20	0.1009	5.727	0.0687	4.49E−02	695.6
10	19.74	0.20	0.0854	4.848	0.0559	3.80E−02	588.9
11	20.55	0.20	0.0945	5.362	0.0634	4.20E−02	651.3
12	22.56	0.20	0.1131	6.422	0.0788	5.03E−02	780.1
13	24.98	0.20	0.1224	6.949	0.0864	5.45E−02	844.0
14	10.59	0.60	0.1075	6.102	0.0741	4.78E−02	741.1
15	11.58	0.60	0.0946	5.371	0.0635	4.21E−02	652.4
16	12.57	0.60	0.0923	5.240	0.0616	4.11E−02	636.5
17	13.56	0.60	0.0891	5.059	0.0590	3.96E−02	614.4
18	14.60	0.60	0.0857	4.864	0.0561	3.81E−02	590.8
19	15.54	0.60	0.0827	4.693	0.0536	3.68E−02	570.0
20	16.53	0.60	0.0872	4.949	0.0574	3.88E−02	601.1
21	17.52	0.60	0.0954	5.417	0.0642	4.25E−02	657.9
22	18.51	0.60	0.1079	6.123	0.0744	4.80E−02	743.7
23	12.97	1.00	0.0988	5.609	0.0669	4.40E−02	681.3
24	15.00	1.00	0.1020	5.793	0.0696	4.54E−02	703.6
25	15.94	1.00	0.0961	5.458	0.0647	4.28E−02	662.9
26	16.93	1.00	0.1008	5.722	0.0686	4.48E−02	695.0
27	17.92	1.00	0.1130	6.412	0.0786	5.03E−02	778.8
28	18.91	1.00	0.1243	7.057	0.0880	5.53E−02	857.2
29	24.98	1.00	0.1049	5.957	0.0720	4.67E−02	723.5
30	11.99	2.00	0.1093	6.205	0.0756	4.86E−02	753.7
31	13.97	2.00	0.0929	5.276	0.0621	4.13E−02	640.8
32	15.98	2.00	0.0980	5.563	0.0663	4.36E−02	675.7
33	16.94	2.00	0.0934	5.299	0.0624	4.15E−02	643.7

Table A30. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
34	17.93	2.00	0.0960	5.452	0.0647	4.27E−02	662.3
35	18.42	2.00	0.0982	5.573	0.0664	4.37E−02	676.9
36	18.92	2.00	0.1014	5.754	0.0690	4.51E−02	698.8
37	19.41	2.00	0.1023	5.805	0.0698	4.55E−02	705.0
38	19.91	2.00	0.1150	6.530	0.0803	5.12E−02	793.1
39	20.26	2.00	0.1502	8.526	0.1093	6.68E−02	1035.6
40	21.11	2.00	0.1911	10.849	0.1430	8.50E−02	1317.7
41	21.96	2.00	0.1744	9.898	0.1292	7.76E−02	1202.2
42	22.74	2.00	0.1624	9.218	0.1194	7.22E−02	1119.6
43	23.52	2.00	0.1589	9.020	0.1165	7.07E−02	1095.6
44	24.98	2.00	0.1525	8.656	0.1112	6.78E−02	1051.4
45	17.94	3.00	0.0844	4.790	0.0550	3.75E−02	581.8
46	18.93	3.00	0.0771	4.378	0.0491	3.43E−02	531.8
47	19.92	3.00	0.0994	5.645	0.0675	4.42E−02	685.6
48	20.91	3.00	0.1243	7.058	0.0880	5.53E−02	857.3
49	22.11	3.00	0.2227	12.643	0.1691	9.91E−02	1535.6
50	22.96	3.00	0.2466	13.997	0.1888	1.10E−01	1700.1
51	23.74	3.00	0.2440	13.852	0.1867	1.09E−01	1682.5
52	24.98	3.00	0.2073	11.768	0.1564	9.22E−02	1429.3
53	18.34	3.40	0.0772	4.380	0.0491	3.43E−02	532.0
54	19.32	3.40	0.0889	5.046	0.0588	3.96E−02	613.0
55	19.82	3.40	0.0864	4.903	0.0567	3.84E−02	595.5
56	20.32	3.40	0.1026	5.824	0.0701	4.56E−02	707.4
57	20.81	3.40	0.1147	6.513	0.0801	5.10E−02	791.0
58	21.31	3.40	0.1279	7.260	0.0909	5.69E−02	881.8
59	21.66	3.40	0.1509	8.567	0.1099	6.71E−02	1040.6
60	22.94	3.40	0.2250	12.772	0.1710	1.00E−01	1551.3
61	23.75	3.40	0.2818	15.999	0.2179	1.25E−01	1943.2
62	24.14	3.40	0.2841	16.129	0.2197	1.26E−01	1959.0
63	22.29	3.60	0.1690	9.593	0.1248	7.52E−02	1165.2
64	22.71	3.60	0.2295	13.026	0.1747	1.02E−01	1582.1
65	23.14	3.60	0.2723	15.459	0.2100	1.21E−01	1877.7
66	23.95	3.60	0.3014	17.108	0.2340	1.34E−01	2077.9
67	24.34	3.60	0.3159	17.931	0.2459	1.41E−01	2177.9
68	13.79	3.80	0.0847	4.811	0.0553	3.77E−02	584.3
69	15.77	3.80	0.0678	3.851	0.0414	3.02E−02	467.8
70	17.75	3.80	0.0666	3.783	0.0404	2.96E−02	459.4
71	19.23	3.80	0.0753	4.277	0.0476	3.35E−02	519.5
72	19.73	3.80	0.0796	4.521	0.0511	3.54E−02	549.1
73	20.22	3.80	0.1018	5.779	0.0694	4.53E−02	701.9
74	20.72	3.80	0.1177	6.680	0.0825	5.24E−02	811.3
75	21.41	3.80	0.1201	6.818	0.0845	5.34E−02	828.1
76	21.71	3.80	0.1132	6.425	0.0788	5.04E−02	780.4
77	22.06	3.80	0.1210	6.870	0.0853	5.38E−02	834.5
78	22.49	3.80	0.1977	11.224	0.1485	8.80E−02	1363.3
79	22.76	3.80	0.2564	14.555	0.1969	1.14E−01	1767.9
80	22.91	3.80	0.2721	15.444	0.2098	1.21E−01	1875.8
81	23.76	3.80	0.2757	15.649	0.2128	1.23E−01	1900.7
82	24.15	3.80	0.2997	17.014	0.2326	1.33E−01	2066.5
83	24.98	3.80	0.4198	23.831	0.3316	1.87E−01	2894.5
84	22.59	3.90	0.2215	12.576	0.1681	9.86E−02	1527.5
85	22.80	3.90	0.2188	12.423	0.1659	9.74E−02	1508.9
86	23.01	3.90	0.2922	16.587	0.2264	1.30E−01	2014.7
87	23.15	3.90	0.3319	18.843	0.2592	1.48E−01	2288.7
88	23.86	3.90	0.4032	22.888	0.3179	1.79E−01	2780.0
89	24.25	3.90	0.3784	21.479	0.2975	1.68E−01	2608.8
90	11.99	2.00	0.1088	6.173	0.0751	4.84E−02	749.8
91	13.97	2.00	0.0976	5.543	0.0660	4.34E−02	673.3

Table A30. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
92	15.98	2.00	0.0993	5.638	0.0674	4.42E−02	684.8
93	17.93	2.00	0.0965	5.475	0.0650	4.29E−02	665.0
94	19.91	2.00	0.1129	6.408	0.0786	5.02E−02	778.3
95	1.00	0.00	0.0479	2.722	0.0250	2.13E−02	330.6
96	1.00	0.66	0.0464	2.636	0.0238	2.07E−02	320.2
97	1.00	1.28	0.0473	2.684	0.0245	2.10E−02	326.0
98	1.00	1.90	0.0465	2.640	0.0238	2.07E−02	320.6
99	2.50	0.00	0.0374	2.120	0.0163	1.66E−02	257.5
100	4.00	0.00	0.0347	1.972	0.0141	1.55E−02	239.5
101	4.00	0.66	0.0349	1.980	0.0142	1.55E−02	240.4
102	4.00	1.90	0.0328	1.860	0.0125	1.46E−02	225.9
103	5.50	0.00	0.0334	1.897	0.0130	1.49E−02	230.4
104	7.00	0.00	0.0325	1.843	0.0122	1.44E−02	223.9
105	8.00	−1.90	0.0351	1.990	0.0144	1.56E−02	241.7
106	8.00	−1.50	0.0387	2.196	0.0174	1.72E−02	266.7
107	8.00	−1.11	0.0408	2.313	0.0191	1.81E−02	281.0
108	8.00	−0.66	0.0425	2.410	0.0205	1.89E−02	292.7
109	8.00	0.00	0.0447	2.536	0.0223	1.99E−02	308.0
110	8.00	0.25	0.0430	2.438	0.0209	1.91E−02	296.1
111	8.00	0.38	0.0431	2.447	0.0210	1.92E−02	297.3
112	8.00	0.66	0.0440	2.498	0.0218	1.96E−02	303.4
113	8.00	1.11	0.0418	2.373	0.0199	1.86E−02	288.2
114	8.00	1.50	0.0390	2.212	0.0176	1.73E−02	268.7
115	8.00	1.90	0.0365	2.072	0.0156	1.62E−02	251.7
116	9.00	0.00	0.0505	2.866	0.0271	2.25E−02	348.1
117	9.00	0.25	0.0502	2.848	0.0268	2.23E−02	346.0
118	9.00	0.38	0.0493	2.801	0.0262	2.20E−02	340.2
119	9.00	0.66	0.0489	2.776	0.0258	2.18E−02	337.1
120	9.00	1.01	0.0455	2.581	0.0230	2.02E−02	313.4
121	9.00	1.32	0.0405	2.301	0.0189	1.80E−02	279.5
122	10.00	0.00	0.0502	2.850	0.0269	2.23E−02	346.2
123	10.00	0.25	0.0495	2.812	0.0263	2.20E−02	341.6
124	10.00	0.38	0.0505	2.865	0.0271	2.25E−02	348.0
125	10.00	0.66	0.0468	2.658	0.0241	2.08E−02	322.9
126	10.00	0.90	0.0459	2.607	0.0233	2.04E−02	316.7
127	10.00	1.08	0.0466	2.645	0.0239	2.07E−02	321.3
128	10.00	1.22	0.0455	2.584	0.0230	2.03E−02	313.8
129	10.00	1.34	0.0493	2.801	0.0262	2.20E−02	340.2
130	11.00	0.00	0.0574	3.258	0.0328	2.55E−02	395.7
131	11.00	0.25	0.0553	3.139	0.0311	2.46E−02	381.2
132	11.00	0.38	0.0542	3.079	0.0302	2.41E−02	374.0
133	11.00	0.52	0.0543	3.080	0.0302	2.41E−02	374.1
134	11.00	0.80	0.0505	2.869	0.0271	2.25E−02	348.5
135	11.00	0.97	0.0505	2.869	0.0271	2.25E−02	348.5
136	11.00	1.11	0.0552	3.134	0.0310	2.46E−02	380.7
137	11.00	1.23	0.0563	3.196	0.0319	2.50E−02	388.2
138	12.00	0.00	0.0599	3.402	0.0349	2.67E−02	413.2
139	12.00	0.25	0.0592	3.360	0.0343	2.63E−02	408.1
140	12.00	0.38	0.0587	3.335	0.0339	2.61E−02	405.0
141	12.00	0.52	0.0586	3.324	0.0338	2.61E−02	403.8
142	12.00	0.69	0.0521	2.955	0.0284	2.32E−02	358.9
143	12.00	0.87	0.0565	3.207	0.0321	2.51E−02	389.6
144	12.00	1.01	0.0595	3.379	0.0346	2.65E−02	410.5
145	12.00	1.13	0.0599	3.399	0.0349	2.66E−02	412.9
146	13.00	0.00	0.0643	3.648	0.0385	2.86E−02	443.1
147	13.00	0.25	0.0633	3.591	0.0376	2.81E−02	436.1
148	13.00	0.38	0.0627	3.560	0.0372	2.79E−02	432.4
149	13.00	0.52	0.0631	3.583	0.0375	2.81E−02	435.2

Table A30. Continued

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
150	13.00	0.64	0.0601	3.410	0.0350	2.67E−02	414.2
151	13.00	0.76	0.0611	3.467	0.0358	2.72E−02	421.2
152	13.00	0.90	0.0611	3.468	0.0358	2.72E−02	421.2
153	13.00	1.02	0.0629	3.570	0.0373	2.80E−02	433.6
154	14.00	0.00	0.0660	3.749	0.0399	2.94E−02	455.3
155	14.00	0.25	0.0637	3.616	0.0380	2.83E−02	439.3
156	14.00	0.38	0.0636	3.610	0.0379	2.83E−02	438.5
157	14.00	0.52	0.0632	3.588	0.0376	2.81E−02	435.8
158	14.00	0.66	0.0674	3.824	0.0410	3.00E−02	464.4
159	14.00	0.80	0.0679	3.852	0.0414	3.02E−02	467.9
160	14.00	0.92	0.0653	3.707	0.0393	2.91E−02	450.3
161	15.00	0.00	0.0732	4.157	0.0459	3.26E−02	504.9
162	15.00	0.25	0.0724	4.110	0.0452	3.22E−02	499.2
163	15.00	0.38	0.0708	4.017	0.0438	3.15E−02	487.9
164	15.00	0.69	0.0760	4.312	0.0481	3.38E−02	523.8
165	15.00	0.81	0.0746	4.236	0.0470	3.32E−02	514.5
166	16.00	0.00	0.0833	4.730	0.0542	3.71E−02	574.6
167	16.00	0.25	0.0819	4.648	0.0530	3.64E−02	564.5
168	16.00	0.38	0.0801	4.544	0.0515	3.56E−02	552.0
169	16.00	0.48	0.0790	4.483	0.0506	3.51E−02	544.5
170	16.00	0.59	0.0826	4.688	0.0536	3.67E−02	569.5
171	16.00	0.71	0.0809	4.592	0.0522	3.60E−02	557.8
172	17.00	0.00	0.0952	5.405	0.0640	4.24E−02	656.5
173	17.00	0.25	0.0924	5.246	0.0617	4.11E−02	637.1
174	17.00	0.38	0.0929	5.271	0.0620	4.13E−02	640.3
175	17.00	0.48	0.0904	5.131	0.0600	4.02E−02	623.3
176	17.00	0.60	0.0927	5.262	0.0619	4.12E−02	639.1
177	18.00	0.00	0.1134	6.440	0.0790	5.05E−02	782.2
178	18.00	0.25	0.1094	6.209	0.0757	4.87E−02	754.2
179	18.00	0.38	0.1056	5.996	0.0726	4.70E−02	728.2
180	18.00	0.50	0.1000	5.678	0.0679	4.45E−02	689.6
181	18.50	0.00	0.1199	6.806	0.0843	5.33E−02	826.7
182	18.50	0.25	0.1151	6.532	0.0804	5.12E−02	793.4
183	18.50	0.38	0.1018	5.779	0.0694	4.53E−02	701.9
184	18.60	0.42	0.0997	5.662	0.0677	4.44E−02	687.7
185	18.50	0.47	0.1025	5.817	0.0700	4.56E−02	706.6
186	19.20	0.00	0.1307	7.419	0.0932	5.81E−02	901.1
187	19.20	0.25	0.1126	6.394	0.0783	5.01E−02	776.6
188	19.20	0.38	0.0925	5.251	0.0617	4.12E−02	637.7
189	19.30	0.42	0.0902	5.123	0.0599	4.02E−02	622.3
190	19.20	0.47	0.0913	5.180	0.0607	4.06E−02	629.2
191	20.00	0.00	0.1266	7.188	0.0899	5.63E−02	873.1
192	20.00	0.25	0.1207	6.851	0.0850	5.37E−02	832.2
193	20.00	0.38	0.0934	5.300	0.0625	4.15E−02	643.7
194	20.10	0.42	0.0978	5.550	0.0661	4.35E−02	674.1
195	20.00	0.47	0.0943	5.351	0.0632	4.19E−02	649.9
196	20.80	0.00	0.1310	7.435	0.0935	5.83E−02	903.1
197	20.80	0.25	0.1208	6.858	0.0851	5.37E−02	833.0
198	20.80	0.38	0.1140	6.474	0.0795	5.07E−02	786.3
199	20.90	0.42	0.1195	6.783	0.0840	5.32E−02	823.8
200	20.80	0.47	0.1192	6.766	0.0838	5.30E−02	821.8
201	21.60	0.00	0.1245	7.066	0.0881	5.54E−02	858.3
202	21.60	0.25	0.1233	6.998	0.0871	5.49E−02	850.0
203	21.60	0.38	0.1390	7.888	0.1000	6.18E−02	958.1
204	21.70	0.42	0.1386	7.869	0.0998	6.17E−02	955.8
205	21.60	0.47	0.1300	7.381	0.0927	5.78E−02	896.4
206	22.40	0.00	0.1277	7.249	0.0908	5.68E−02	880.4
207	22.40	0.25	0.1304	7.402	0.0930	5.80E−02	899.1

Table A30. Concluded

Orifice	x, in.	y, Z, in.	p, psia	p/p_∞	C_p	$p/p_{t,2}$	p, Pa
208	22.40	0.38	0.1294	7.343	0.0921	5.76E–02	891.9
209	22.50	0.42	0.1413	8.023	0.1020	6.29E–02	974.5
210	22.40	0.47	0.1420	8.063	0.1026	6.32E–02	979.4
211	23.20	0.00	0.1291	7.328	0.0919	5.74E–02	890.0
212	23.20	0.25	0.1305	7.411	0.0931	5.81E–02	900.1
213	23.20	0.38	0.1362	7.729	0.0977	6.06E–02	938.8
214	23.30	0.42	0.1367	7.762	0.0982	6.08E–02	942.8
215	23.20	0.47	0.1251	7.103	0.0887	5.57E–02	862.8
216	24.00	0.00	0.1305	7.406	0.0930	5.80E–02	899.5
217	24.00	0.25	0.1357	7.704	0.0974	6.04E–02	935.7
218	24.00	0.38	0.1357	7.702	0.0974	6.04E–02	935.5
219	24.10	0.42	0.1406	7.981	0.1014	6.26E–02	969.4
220	24.00	0.47	0.1400	7.947	0.1009	6.23E–02	965.3
221	25.00	0.00	0.1436	8.151	0.1039	6.39E–02	990.1
222	25.00	0.25	0.1397	7.928	0.1006	6.21E–02	962.9
223	25.00	0.38	0.1347	7.648	0.0966	5.99E–02	929.0
224	25.10	0.42	0.1340	7.608	0.0960	5.96E–02	924.0
225	25.00	0.47	0.1301	7.383	0.0927	5.79E–02	896.7
226	9.00	999.00	0.0390	2.212	0.0176	1.73E–02	268.6
227	0.00	–2.25	2.2532	127.907	1.8433	1.00E+00	15535.7
228	0.00	–0.29	2.2403	127.176	1.8327	9.97E–01	15446.9
229	0.00	2.25	2.2385	127.076	1.8312	9.96E–01	15434.7
230	22.96	0.00	0.5131	29.127	0.4085	2.28E–01	3537.8
231	23.16	0.00	0.4408	25.022	0.3489	1.96E–01	3039.2
232	23.36	0.00	0.3692	20.961	0.2899	1.64E–01	2545.9
233	23.76	0.00	0.3007	17.073	0.2335	1.34E–01	2073.7
234	24.16	0.00	0.2936	16.669	0.2276	1.31E–01	2024.6
235	24.89	0.00	0.3330	18.904	0.2601	1.48E–01	2296.1
236	25.09	0.00	0.3407	19.341	0.2664	1.52E–01	2349.2
237	25.29	0.00	0.3435	19.502	0.2687	1.53E–01	2368.7
238	25.49	0.00	0.3412	19.371	0.2668	1.52E–01	2352.8
239	26.26	0.00	0.2294	13.022	0.1746	1.02E–01	1581.7
240	26.76	0.00	0.3123	17.729	0.2430	1.39E–01	2153.4
241	27.26	0.00	0.2716	15.419	0.2094	1.21E–01	1872.8
242	27.51	0.00	0.2465	13.995	0.1887	1.10E–01	1699.8
243	27.76	0.00	0.2224	12.625	0.1688	9.89E–02	1533.4
244	0.58	999.00	0.0382	2.171	0.0170	1.70E–02	263.7
245	0.86	999.00	0.0405	2.299	0.0189	1.80E–02	279.2
246	1.15	999.00	0.0392	2.228	0.0178	1.75E–02	270.6
247	1.43	999.00	0.0391	2.218	0.0177	1.74E–02	269.4
248	1.72	999.00	0.0368	2.087	0.0158	1.64E–02	253.4
249	2.00	999.00	0.0394	2.237	0.0180	1.75E–02	271.7
250	2.29	999.00	0.0374	2.123	0.0163	1.66E–02	257.8
251	2.57	999.00	0.0400	2.270	0.0184	1.78E–02	275.7
252	2.86	999.00	0.0396	2.247	0.0181	1.76E–02	272.9
253	3.14	999.00	0.0400	2.269	0.0184	1.78E–02	275.5
254	3.43	999.00	0.0389	2.211	0.0176	1.73E–02	268.5
255	999.00	999.00	0.0374	2.124	0.0163	1.67E–02	258.0
256	999.00	999.00	2.2520	127.839	1.8423	1.00E+00	15527.5

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13. ABSTRACT *(Maximum 200 words)*

The present work documents the experimental database of a combined computational and experimental parametric study of the internal aerodynamics of a generic three-dimensional sidewall compression scramjet inlet configuration at Mach 10. A total of 256 channels of pressure data, including static pressure orifices, pitot pressures, and exit flow rakes, along with oil flow and infrared thermography, provided a detailed experimental description of the flow. Mach 10 tests were performed for three geometric contraction ratios (3, 5, and 9), three Reynolds numbers (0.55×10^6 per foot, 1.14×10^6 per foot, and 2.15×10^6 per foot), and three cowl positions (at the throat and two forward positions). For the higher contraction ratios, a large forward separation of the inflow boundary layer was observed, making the high contraction ratio configurations unsuitable for flight operation. A decrease in the free-stream unit Reynolds number (Re) of only a factor of 2 led to a similar upstream separation. Although the presence of such large-scale separations leads to the question of whether the inlet is started, the presence of internal oblique swept shock interactions on the sidewalls seems to indicate that at least in the classical sense, the inlet is not unstarted. The laminar inflow boundary layer therefore appears to be very sensitive to increases in contraction ratio (CR) or decreases in Reynolds number; only the CR = 3 configuration with 0, 25, and 50 percent cowl at Re = 2.15×10^6 per foot operated “on design.”

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