Nomenclature

A = area; constant
a = speed of sound; constant
b = constant
C = effective exhaust velocity [Eq. (1.53), Eq. (3.4)]; circumference; work output coefficient
C_A = angularity coefficient
C_C = work output coefficient of core
C_D = coefficient of drag; discharge coefficient
C_F = thrust coefficient
C_{fg} = gross thrust coefficient
C_L = coefficient of lift
C_p = pressure coefficient
C_{prop} = work output coefficient of propeller
C_{tot} = total work output coefficient
C_V = velocity coefficient
C^* = characteristic velocity [Eq. (3.38)]
c = chord
c_p = specific heat at constant pressure
c_v = specific heat at constant volume
c_x = axial chord
D = drag
d = diameter
E = energy; modulus of elasticity
e = internal energy per unit mass; polytropic efficiency; exponential, 2.7183
F = force; uninstalled thrust; thrust
F_g = gross thrust
f = fuel/air ratio; function; friction coefficient
g = acceleration of gravity
g_c = Newton's constant
g_0 = acceleration of gravity at sea level
H = enthalpy; dimensionless enthalpy [Eq. (2.86)]
h = enthalpy per unit mass; height
h_{PR} = low heating value of fuel
$\overline{h_f^o}$ = enthalpy of formation
I = impulse; impulse function, $PA(1 + \gamma M^2)$

I_{sp} = specific impulse [Eq. (1.55), Eq. (3.6)]
K = constant; dimensionless kinetic energy [Eq. (2.86)]
K_P = equilibrium constant [Eq. (2.119)]
L = length
M = Mach number; momentum
$\dot{M}$ = momentum flux, $\dot{m}V$
m = mass
$\dot{m}$ = mass flow rate
$\mathscr{M}$ = molecular weight
N = number of moles; revolutions per minute
n = load factor; burning rate exponent
n_b = number of blades
P = pressure
P_c = electrical output power
P_f = profile factor
P_s = weight specific excess power
P_t = total pressure
Q = heat interaction
$\dot{Q}$ = rate of heat interaction
q = heat interaction per unit mass; dynamic pressure, $\rho V^2/(2g_c)$ electric charge
$\tilde{q}$ = dimensionless heat release [Eq. (5.70)]
R = gas constant; extensive property; radius; additional drag
$\mathscr{R}$ = universal gas constant
r = radius; burning rate
$^\circ R$ = degree of reaction
S = uninstalled thrust specific fuel consumption; entropy
$\dot{S}$ = time rate of change of entropy
S_w = wing planform area
s = entropy per unit mass; blade spacing
Sa = stream thrust function [Eq. (2.94)]
T = temperature; installed thrust
T_t = total temperature
t = time; airfoil thickness
U = blade tangential or rotor velocity
u = velocity
V = absolute velocity; volume
v = volume per unit mass; velocity
W = weight; width
$\dot{W}$ = power
w = work interaction per unit mass; velocity
$\dot{w}$ = weight flow rate
x, y, z = coordinate system
z_e = energy height [Eq. (1.25)]
Z = Zweifel tangential force coefficient [Eq. (9.97)]
α = bypass ratio; angle; coefficient of linear thermal expansion

α_c = specific mass [Eq. (3.33)]
β = angle
Γ = $\sqrt{\gamma\left(\frac{2}{\gamma+1}\right)^{(\gamma+1)/(\gamma-1)}}$; constant
γ = ratio of specific heats; angle
Δ = change
δ = change; dimensionless pressure, P/P_{ref}; dead weight mass ratio; deviation
∂ = partial differential
ε = nozzle area ratio; rotor turning angle; slip factor
ϕ = installation loss coefficient; fuel equivalence ratio; function; total pressure loss coefficient
Φ = function; cooling effectiveness; flow coefficient; dimensionless stream thrust [Eq. (2.95)]
η = efficiency
λ = payload mass ratio
ν = stoichiometric coefficient
θ = angle; dimensionless temperature, T/T_{ref}
Π = product
π = pressure ratio defined by Eq. (5.3)
ρ = density, $1/v$
Σ = sum
σ = control volume boundary; dimensionless density, ρ/ρ_{ref}; tensile stress
τ = temperature ratio defined by Eq. (5.4); shear stress; torque
$\tau\lambda$ = enthalpy ratio defined by Eq. (5.7)
ω = angular speed
ψ = thermal compression ratio, T_3/T_0

Subscripts

A = air mass
a = air; atmosphere
AB = afterburner
add = additive
b = burner or combustor; boattail or afterbody; blade; burning
bo = burnout
C = core stream
c = compressor; corrected; centrifugal; chamber
DB = duct burner
d = diffuser or inlet; disk
dr = disk/rim interface
dry = afterburner not operating
e = exit; exhaust; Earth
ext = external
F = fan stream
f = fan; fuel; final

fn	= fan nozzle
g	= gearing; gas
H	= high-pressure
HP	= horsepower
h	= hub
i	= initial; inside; ideal
int	= internal
j	= jet
L	= low-pressure
M	= mixer
m	= mechanical; mean; middle
max	= corresponding to maximum
N	= new
n	= nozzle
nac	= nacelle
O	= overall; output
o	= overall; outer
opt	= optimum
P	= propulsive; products
p	= propellant
pl	= payload
prop	= propeller
R	= reference; relative; reactants
r	= ram; reduced; rim; rotor
ref	= reference condition
s	= stage; separation; solid; stator
SL	= sea-level
SLS	= sea-level static
T	= thermal
t	= total; turbine; throat; tip; thermal
vac	= vacuum
w	= forebody; wing
wet	= afterburner operating
x, y, z	= directional component
σ	= control volume
$0, 1, 2, \ldots, 19$	= different locations in space

Superscripts

*	= state corresponding to $M = 1$; corresponding to optimum state
$-$	= average